I-376 Bathtub Alternatives Analysis Report

I-376 (Parkway Central)
Pittsburgh, Allegheny County, PA

Pennsylvania Department of Transportation, Engineering District 11-0

Agreement No. E03024 WO 6

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DEPARTMENT OF TRANSPORTATION

AECOM

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1.0 Executive Summary

This Alternatives Analysis report investigated three (3) alternatives to reduce the frequency of flooding along the portion of I-376 Westbound from the Grant Street Exit to just west of Stanwix Street (aka "The Bathtub") in the City of Pittsburgh, PA.

F1. Increase Height of Current Floodwall: Three options were investigated.

1A) Completely rebuild the existing stem from the top of the footing to elevation 724.5. Reconstructing the floodwall to this height would have prevented fifteen (15) of the seventeen (17) flood events that have occurred since the wall was constructed in 1985. The cost to fully rebuild the floodwall stem is $6,780,000 to $8,640,000.

1B) Partially rebuild the floodwall stem from just above the gutterline wherever the existing vertical reinforcement is adequate and fully rebuild the stem wherever additional reinforcement needs to be doweled into the existing footing. The proposed top of floodwall is the same as the first option, 724.5. The cost to rebuild the floodwall in this manner is $5,890,000 to $7,670,000.

1C) Rebuild the floodwall from just above the gutterline to elevation 722. This elevation represents the floodwall height that can be attained by reusing the existing vertical reinforcement for the full length of the floodwall. However, only ten (10) of the seventeen (17) flood events since 1985 would have been prevented if the floodwall was built to elevation 722. The estimated cost of this option is $4,380,000 to $6,540,000.

The major advantages of these alternatives include lowest cost, simple construction materials and methods, and minimal impact to utilities. Disadvantages include construction adjacent to I-376 traffic, little room for Contractor staging, and reliance on existing foundation slabs and reinforcement constructed in the mid-1980s.

F2. Construct a Tunnel over I-376: This alternative considers a watertight rigid frame structure constructed over I-376 from the Grant Street tunnel extending approximately 2600 feet west to just past the Stanwix Street overpass. The structure would include lighting, fire suppression, and ventilation systems. The estimate cost of this alternative ranges from $122,280,000 to $144,290,000. Protection from higher flood events and the opportunity to create a new riverfront urban park on top of the tunnel are advantages of this alternative. Cost, impact to traffic during construction, complicated construction, traffic slowdowns as driver's expectations change approaching the tunnel, and future maintenance needs are among the disadvantages.

F3. Construct a Floodwall Between the Mon River and the Mon-Wharf Parking Lot: This alternative consists of elevating the current trail and Mon Wharf Landing Park on a precast bin wall that extends from the Smithfield Street Pedestrian switchback ramp at the eastern limit to the Point State Park connector ramp at the western limit for an approximate length of 2,150 feet. The alternative includes pedestrian railings, lighting, and an ADA ramp at each end leading down to the Mon Wharf parking area. The estimate cost of this alternative ranges from $31,270,000 to

$39,080,000. Advantages include that a wall located along the river would act as a first line of defense against future flood events, the trail and Mon Wharf parking lot would be protected from the frequent flooding that currently occurs, no impact to I-376 traffic during construction, and an adequate Contractor staging area via a barge alongside the work area. Higher cost and the need to coordinate and reach an agreement with the City of Pittsburgh and the Riverlife organization are some of the major disadvantages.

The mitigation of the additional hydrostatic uplift exerted on the existing foundations due to the retention of floodwaters at a high elevation associated with each of the alternatives summarized above was investigated. The estimated costs for hydrostatic mitigation are in addition to the estimated costs for each flooding reduction alternative.

Hydrostatic mitigation options include:

- U1. Retrieval of Additional Subsurface Data and Monitoring of Groundwater ($150,000 to $200,000)
- U2. Tie-in to Existing Structures ($2,000,000 to $3,000,000)
- U3. Tie-downs Anchoring to Bedrock ($3,000,000 to $5,000,000)
- U4. Pressure Relief Wells ($2,000,000 to $3,000,000)
- U5. Cut-Off Walls (< $10,000,000+)

An H&H analysis was completed for each of the three (3) alternatives described above and none of them cause any objectionable increases to the FEMA 100-year flood elevations.

Each alternative had negligible impact on the storm sewer system, other than the sump pumps having to pump against additional head should the floodwalls be raised. If the sluice gates work properly, the increase in retained floodwaters should not surcharge the existing drainage system or cause unanticipated flooding of I-376.

This report also includes a proposed alternative (Alternative T1) that does not reduce the frequency of flooding but automates the detection of flooding and the procedure to close I-376 and establish the detour during future flood events. The system includes pressure transducers mounted to the floodwall to remotely monitor rising water, automatic gates to close the roadways leading to the flooded portion of I-376, and a network of DMS signs to remotely establish detour route signing. The estimated cost of this system is $4,100,000 to $5,200,000.

Finally, a traffic analysis was performed to optimize traffic flow along the detour route during flood events by improving detour route signal timing and increasing advanced warning of I-376 closure via existing DMS signs (Alternative T2). The analysis shows that the detour route travel time can be reduced as much as 13% for the AM peak, 46% for mid-day, and 11% for the PM peak. The estimated cost to improve the signal timing and use the existing DMS signs is less than $10,000.

2.0 Background

2.1 Project Description

The bathtub section of I-376 Westbound is a 2,500-foot long portion of the interstate that lies between the Monongahela River and downtown Pittsburgh. This segment of three-lane highway (two through lanes and one auxiliary exit lane) is roughly 5 feet higher than the normal river stage of 16 feet and is currently protected by a variable height floodwall with a minimum height of approximately 4 feet at the sump pump locations. The “Parkway Central Bathtub” floods when river stages exceed 25 feet (elevation 719.5) and is closed to traffic when the river stage is within one foot of the top of the wall (river stage 24 feet, elevation 718.5).

Preliminary engineering efforts have generated and assessed three (3) structure improvement alternatives along with proposed traffic control improvements for the project area. These alternatives have been developed with regards to socio-economic, natural and cultural resources impacts, safety, constructability, and construction cost to arrive at a preferred alternative that meets the needs of the project.

2.2 Project Purpose and Need

The purpose of this project is to maintain the movement of traffic, including freight vehicles, and emergency service providers along the Parkway Central during significant Monongahela River flood events and to improve response time to Parkway Central flood events. The full project purpose and need statement approved by the FHWA appears in Appendix H.

2.2.1 NEED 1: Reduce Frequency of or Eliminate Flooding

The primary need of the I-376, Section A69 Parkway Central “Bathtub” Flooding project is to significantly reduce or eliminate the frequency of Monongahela River flooding of the Parkway Central, thereby eliminating as much as practical the potential closure of the highway and the detouring of traffic through the City during river flooding that exceeds the current flood wall height (river stage in excess of 25 feet, elevation 719.5).

- The existing floodwall was built in 1985 and can prevent flooding of the Parkway Central up to a 25-foot river stage (elevation 719.5). District 11-0 closes the Parkway Central when floodwaters are within 12 inches of the top of the floodwall (24-foot river stage, elevation 718.5);
- The height of the current floodwall is limited by the hydrostatic uplift pressure on the Parkway Central concrete roadway slabs;

- The Parkway Central has been closed due to high waters seventeen (17) times since the floodwall was built in 1985; four (4) times since 2018;
- The flooding of the 2500-ft portion of the "Parkway Central Bathtub" requires detouring of I-376 eastbound traffic 3.3 miles and I-376 westbound traffic 0.8 miles through the downtown streets of Pittsburgh due to the low elevation of the roadway with respect to the Mon River.

2.2.2 NEED 2: Improve Maintenance Response Time

The secondary need of this project is to improve the response time needed to close the Parkway Central, establish the detour, pump out the flood water and clean-up debris from the roadway, and reopen to traffic following a flood event that exceeds the flood wall height.

- The closure and detour of the Parkway Central are currently accomplished via Fort Pitt Tunnel and Allegheny County maintenance crews and the City of Pittsburgh Police. This is inefficient, expensive, and ties up resources from responding to other emergencies;
- After flooding of the Parkway Central occurs, it takes about 12 hours to pump out the water and cleanup the flood debris using the two 4-inch permanent pumps supplemented by two 8-inch pumps that are supplied by a Contractor that is on standby. The cost of cleanup is approximately $100K;
- During the Parkway Central closures, sawhorse and barrel type barriers are used due to their portability. However, these barrier types do not always prevent motorists from trying to drive through the flooded portion of the Parkway Central which is a safety hazard. Two motorists had to be rescued from their vehicles after the January 13, 2018 flood event;
- Detouring traffic within the City of Pittsburgh causes substantial additional delays/congestion and increased emergency service provider response times and safety concerns;
- The cleanup operations to remove mud and debris result in additional wear and tear on the Parkway Central pavement.

2.3 Report Purpose

Specific goals of this Alternatives Analysis Report include the following:

- Evaluate alternatives based on hydraulic improvements and increasing safety and mobility throughout the project area during a flood event.
- Evaluate alternatives with respect to their impacts to environmental constraints.
- Evaluate alternatives based on their overall construction costs.
- Evaluate alternatives with respect to their level of utility and right-of-way impacts.
- Evaluate alternatives based on their constructability and ability to maintain traffic during construction.

Project Location Map – I-376 Bathtub – Parkway Central

NTS

3.0 Existing Features

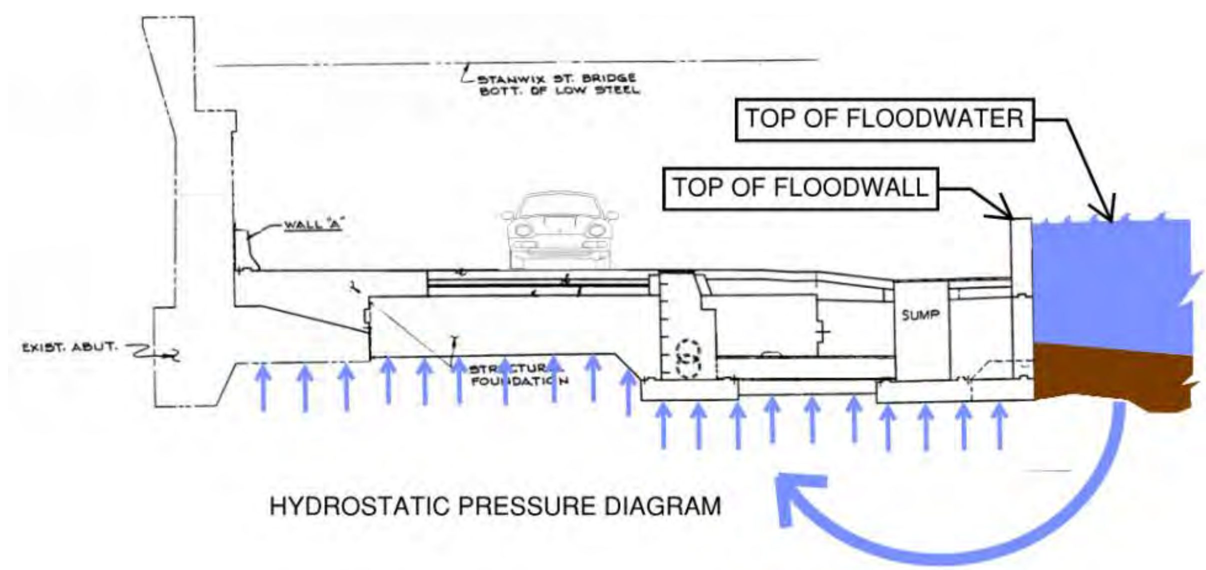
To better understand the impacts of each alternative studied, the existing features of the project site are described below.

3.1 Current Floodwall

The current floodwall was constructed in the mid-1980s as part of a Parkway East reconstruction project. The existing floodwall plans divided the wall into five sections, Walls A, B, C, D, and E. Walls B and C contain the two sump pump areas known as "the little bathtub" and "the big bathtub" respectively. Walls D and E were relocated as part of the 2001 Fort Pitt Blvd Eastbound / Interstate Connector Project.

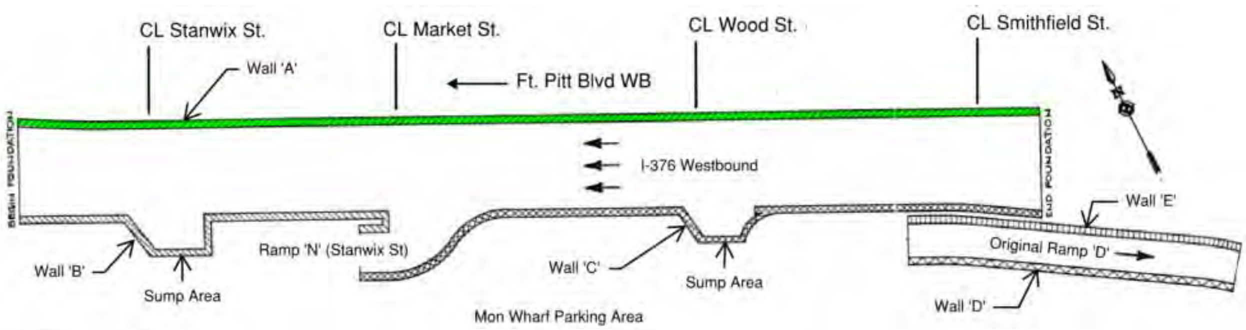
The height of the current floodwall (measured at the gutterline) varies from a typical roadway barrier height of 2'-8" to a maximum of approximately 4 feet at the Stanwix Street sump pump area (aka "the little bathtub) and 6 feet at the Wood Street sump pump area (aka "the big bathtub). Measuring from the top of the spread footings that support the wall, the stem height varies from 4'-1" minimum to 8'-1" maximum. The top of wall elevation at each sump pump area is 719.5 (NAVD 88).

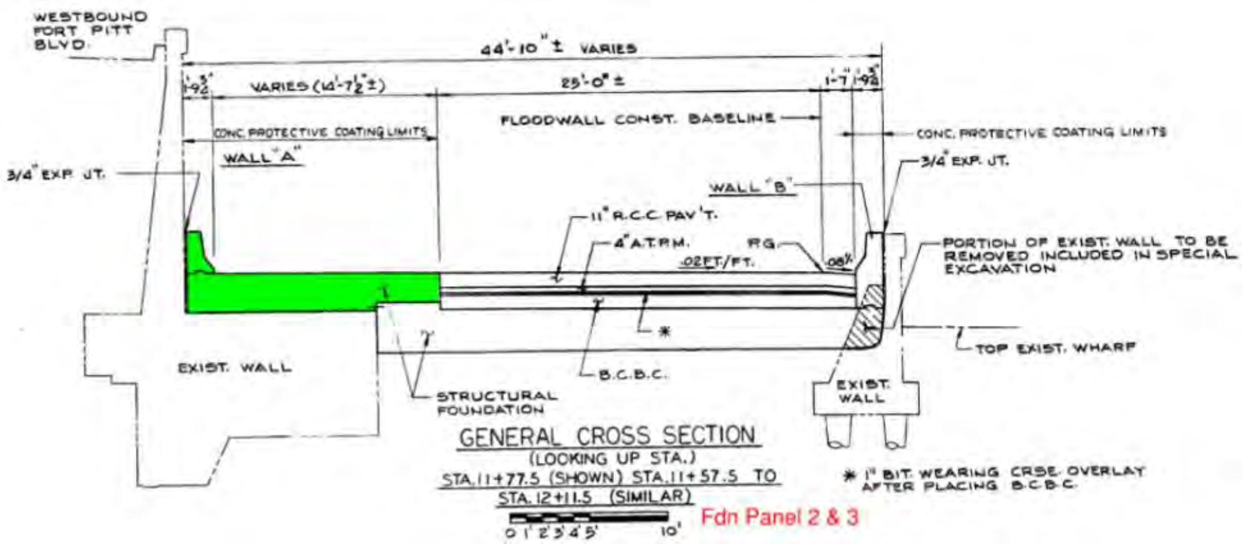
According to testimony from current PennDOT personnel and as cited in a 2005 Pittsburgh Post-Gazette article entitled *"Getting Around: No ring about the Parkway East's Downtown bathtub"* written by Joe Grata, the current wall height is limited by the hydrostatic uplift pressure that is exerted on the spread footings beneath the parkway during flood events. If the current wall were built any taller, there is the risk that the hydrostatic pressure could heave the foundations, and the riding surface of the parkway, upwards after a flood event. This phenomenon is discussed in greater detail in Section 5.2 - Hydrostatic Uplift Pressure. A copy of the newspaper article appears in Appendix C.



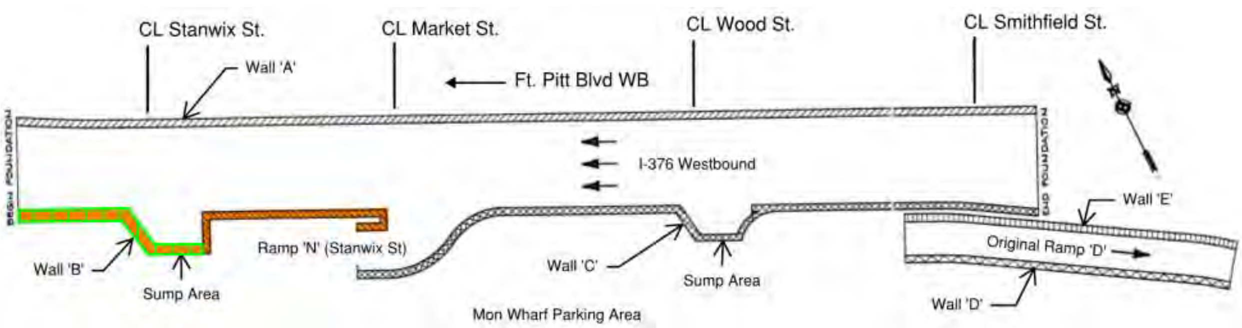
The sections are described as follows:

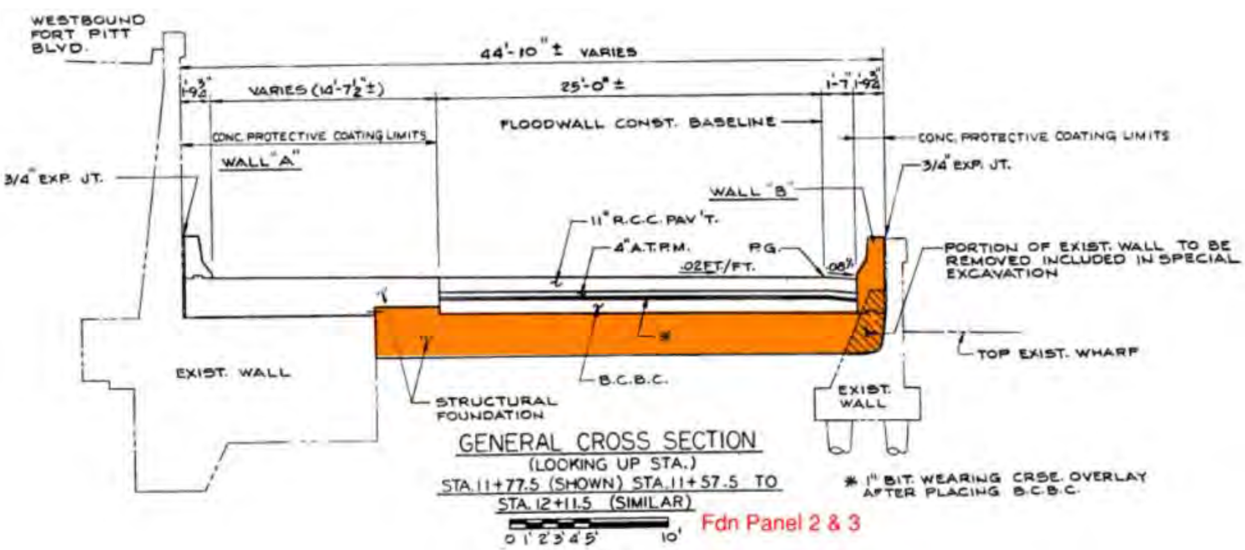
- **Wall 'A'** – Wall 'A' is a 2'-8" tall safety-shaped barrier supported by a spread footing foundation that runs from just west of Stanwix Street to just east of Smithfield Street adjacent to Fort Pitt Blvd Westbound (1,802 feet long). This wall does not prevent any flooding from the Mon River and will not be modified as part of this project.



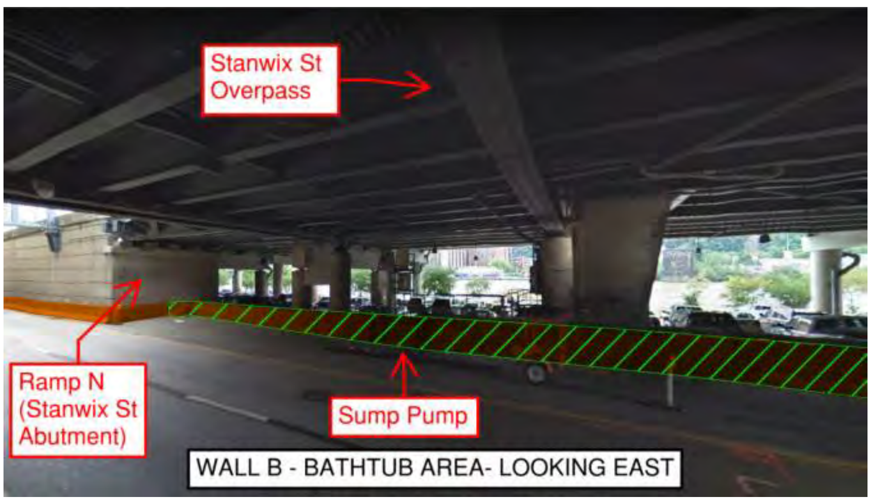


- **Wall 'B'** – The majority of Wall 'B' is a 2'-8" tall safety-shaped barrier supported by a spread footing foundation that runs from just west of Stanwix Street to below Market Street that separates I-376 WB traffic from the Mon-Wharf and Ramp N (Stanwix Street exit). The total length of the wall, including the portion along Ramp N (Stanwix Street exit), is 684 feet. The beginning of the wall to the portion that ties into the Ramp N (Stanwix Street exit) abutment serves as a floodwall for the Mon River (green hatched area below). This portion is 351 feet long, transitions to an 18" thick vertical faced barrier approximately four feet tall and includes one of the two sump pump areas along the Parkway Central (aka "the little bathtub"). This portion is proposed to be raised to reduce the frequency of flooding. The remaining 333 feet runs in front of Ramp N (Stanwix Street exit) which ultimately protects the parkway from flooding for this stretch and will not need to be altered to further reduce flooding.



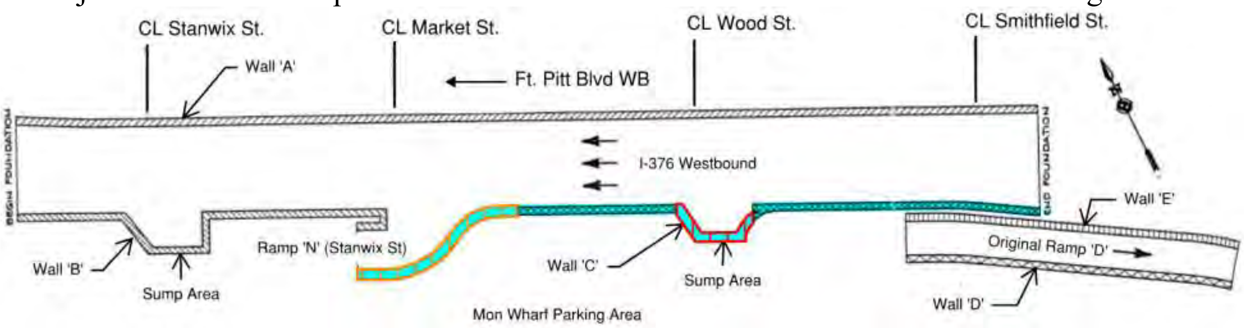


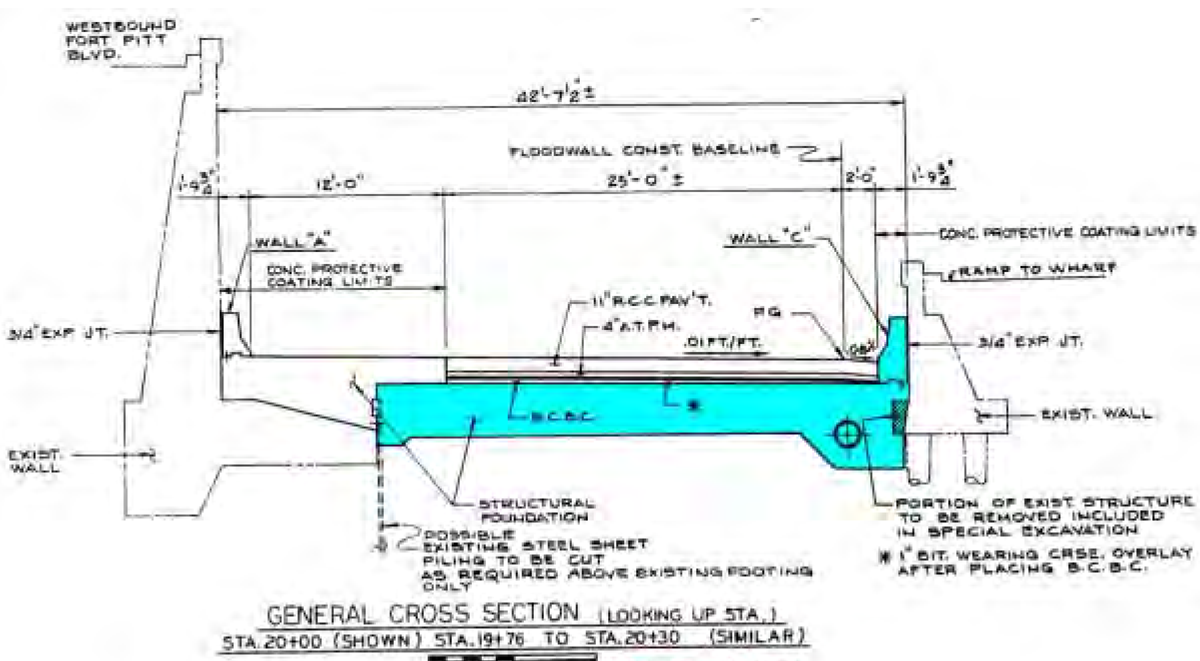

Stanwix
Street
Begin Wall 'B'
BEGIN WALL B - LOOKING EAST


Stanwix St
Overpass
Ramp N
(Stanwix St
Abutment)
Sump Pump
WALL B - BATHTUB AREA- LOOKING EAST


Market St
Overpass
Ramp N (Stanwix St Exit)
Stanwix
Street
End Wall 'B'
END WALL B - LOOKING WEST

- **Wall 'C'** – Wall 'C' is primarily a 2'-8" tall safety-shaped barrier supported by a spread footing foundation that runs from just west of Market Street, below Wood Street and ends just east of Smithfield Street. The wall separates I-376 WB traffic from the Mon-Wharf parking and ramp entrance and I-376 Ramp D. The total length of the wall, including the portion along the Mon-Wharf Entrance Ramp is 1248.5 feet. The beginning of the wall to the bottom of the Mon-Wharf Entrance Ramp serves as a floodwall for the Mon River (orange hatched area below). However, the top of wall elevation along this 294'-9" long stretch is approximately 1 foot taller (elevation 720.5 +/-) than both sump pump areas so this portion of the wall is not currently overtopped during flood events. 239'-6" of the wall runs along the Mon-Wharf Entrance Ramp and will not need to be altered to reduce future flooding. The portion of the wall from the Mon-Wharf Entrance Ramp Abutment to the Fort Pitt Blvd Smithfield Exit Ramp Abutment below Wood Street is an 18" thick, vertical faced barrier that is 169'-1" long, approximately six feet tall, and comprises the second of two sump pump areas (aka "the big bathtub") (red hatched area below). The remaining 545 feet of safety-shaped barrier wall runs adjacent to I-376 Ramp D and will not need to be altered to reduce future flooding.





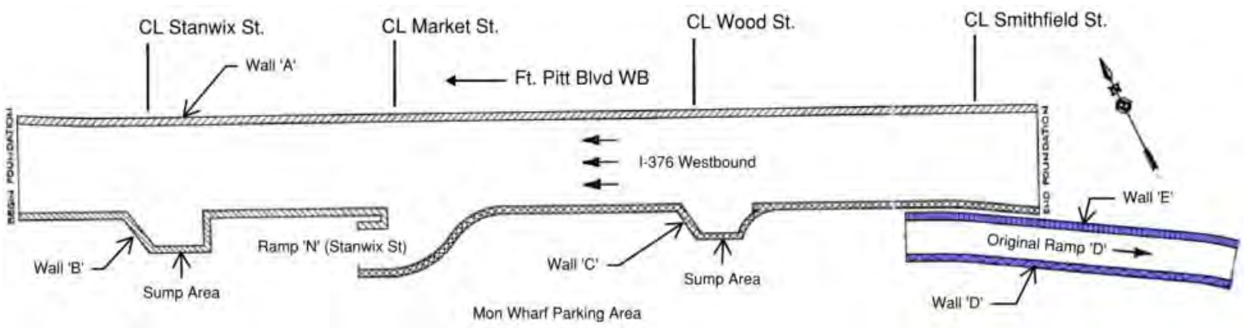
GENERAL CROSS SECTION (LOOKING UP STA.)
STA. 20+00 (SHOWN) STA. 19+76 TO STA. 20+30 (SIMILAR)
Fdn Panel 33, 34


Market St Overpass
Mon-Wharf Ramp
Begin Wall 'C'
BEGIN WALL C - LOOKING EAST

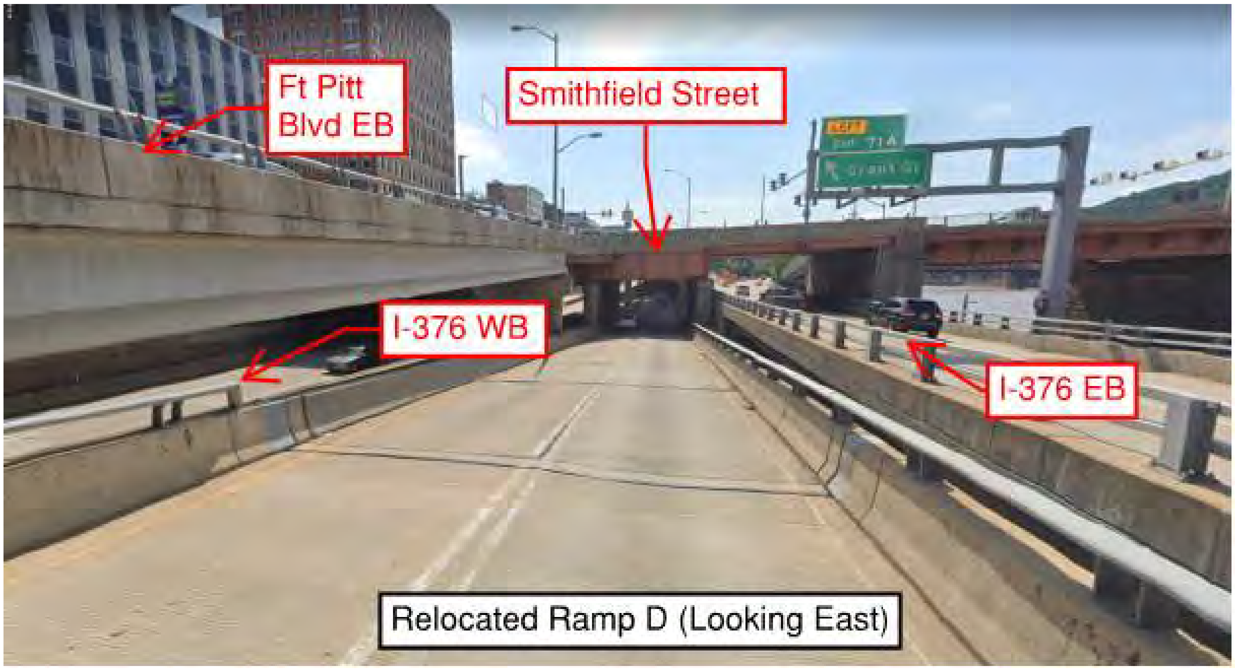

Wood St Overpass
Mon-Wharf Ramp Abutment
Sump Pump
WALL C - BATHTUB AREA- LOOKING EAST

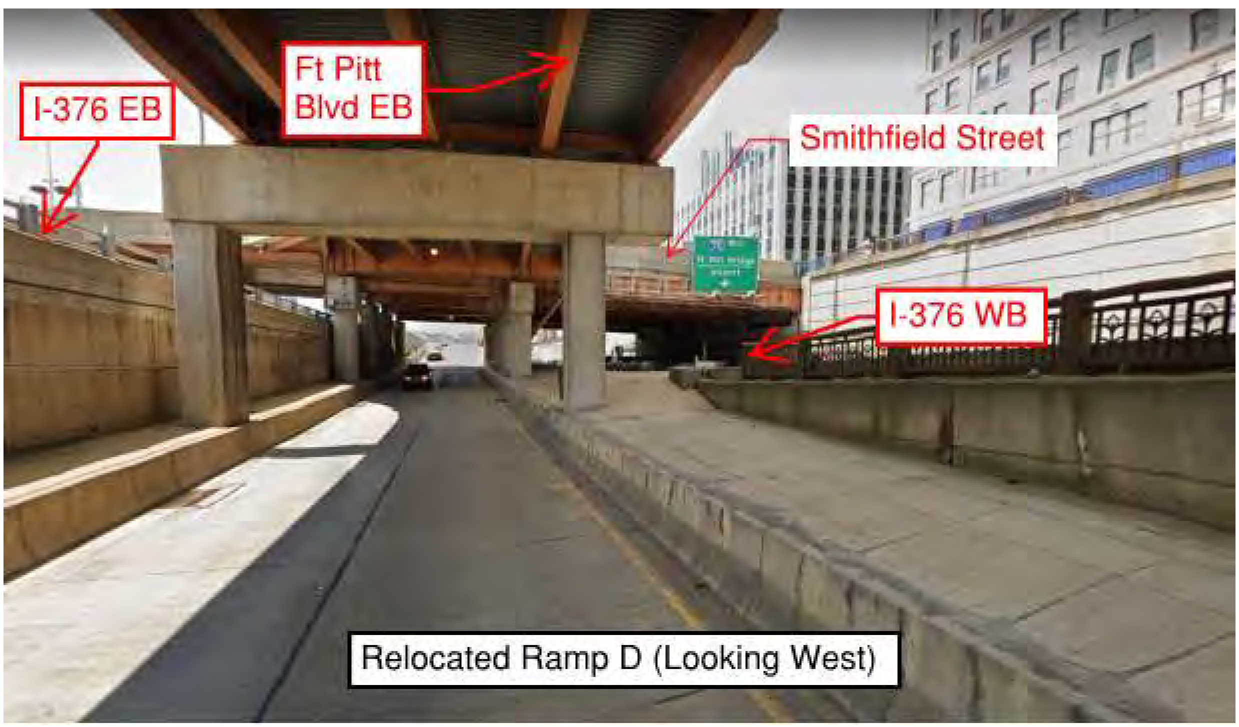

Smithfield St Overpass
I-376 Ramp D
End Wall 'C'
END WALL C - LOOKING WEST

- **Walls 'D' & 'E'**– These two walls, along with Ramp D, were removed and relocated as part of the 2001 Fort Pitt Blvd Eastbound / Interstate Connector Project. The original location is shown in the schematic below.



Relocated Ramp D is shown in the aerial view and Streetviews below. The hatched area represents the portion below Fort Pitt Blvd Eastbound.


Ft Pitt
Blvd EB
Smithfield Street
I-376 WB
I-376 EB
Relocated Ramp D (Looking East)


I-376 EB
Ft Pitt
Blvd EB
Smithfield Street
I-376 WB
Relocated Ramp D (Looking West)

3.2 Other Site Features

3.2.1 Mon Wharf Landing / Three Rivers Heritage Trail System

The Mon Wharf Landing is a $3M linear park constructed in 2009 by the Riverlife organization in partnership with the City of Pittsburgh and Pittsburgh Parking Authority. This project converted former parking spaces along the river's edge into a riverfront park which features decorative paving, benches, lighting, and planters filled with flood-resistant trees and shrubs. In 2018, a switchback ramp leading from the eastern end of the Mon Wharf Landing to the Smithfield Street Bridge was constructed. This $3.2M project was also championed by the Riverlife organization. A final upgrade connecting the western end of the park to Point State Park is being developed by the Department of Conservation and Natural Resources. The estimated cost of the project is $1.8M.

The Three Rivers Heritage Trail System is a network of nearly 30 miles of trail in the City of Pittsburgh and managed primarily by the non-profit organization, Friends of the Riverfront. The network of trails provides a public route for cyclists, walkers, and runners. A portion of the Three Rivers Heritage Trail system utilizes the Mon Wharf Landing park for the full length of the bathtub project terminating at the switchback pedestrian ramp at the Smithfield Street Bridge to the east and extending to Point State Park to the west.

Any impacts, temporary or permanent to the Mon Wharf Landing park would require Section 4(f) involvement.


Mon Wharf Landing Park
(Looking West From Smithfield Street Bridge

Mon Wharf Landing Park
(Looking West Towards Point State Park)

Eastern Terminus of Mon Wharf Landing Park
(Looking East Towards Switchback Ramp)

Western Terminus of Mon Wharf Landing Park
(Looking West Towards Point State Park Connector)

3.2.2 Mon-Wharf Parking Lot

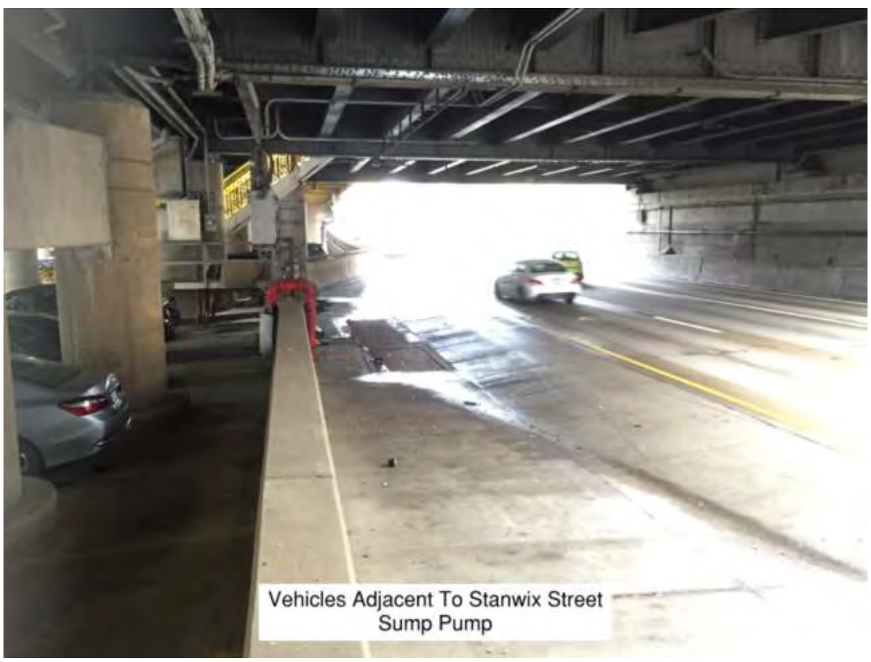
The Mon-Wharf Parking Lot is located beneath the superstructure of Fort Pitt Boulevard Eastbound and comprises 458 parking spaces. Access to the parking lot is via a single two-way ramp at the intersection of Wood Street and Fort Pitt Blvd Westbound. A row of parking spaces is directly adjacent to the full length of the current floodwall. The Mon-Wharf currently floods when the Mon River reaches a stage of 18 feet (Elevation 713.0).

Entrance to Mon-Wharf Parking Lot

Entrance / Exit Ramp to Mon-Wharf Parking Lot

Entrance / Exit Ramp to Mon-Wharf Parking Lot

Vehicles Adjacent To Wood Street Sump Pump


Vehicles Adjacent To Stanwix Street Sump Pump

3.2.3 Utilities / Drainage

AECOM reviewed the available existing plans to preliminarily identify utility and stormwater drainage that may be impacted by the proposed alternates. A PA One Call and a more in-depth investigation will be conducted based on the alternate selected to advance to Preliminary Engineering. A colored set of plans identifying the type, size, and location of the existing utilities is included in Appendix J. A general description of the existing utilities within the project study area is as follows:

Beginning just before Commonwealth Place is an 18" reinforced concrete cylinder pipe (RCCP) which runs the length of the I-376 Westbound corridor studied. This underground pipe is part of a system of inlets and manholes which collect stormwater from the roadway. The pipe is located along the south side of the road and flows west. In a number of locations, the I-376 Westbound 18" RCCP connects with other drainage systems. At both the Stanwix Street and Wood Street crossings, the pipe connects to an ALCOSAN Diversion Structure which outputs into the Monongahela River. At Smithfield Street, the drainage system for the relocated Ramp D feeds into the 18" RCCP.

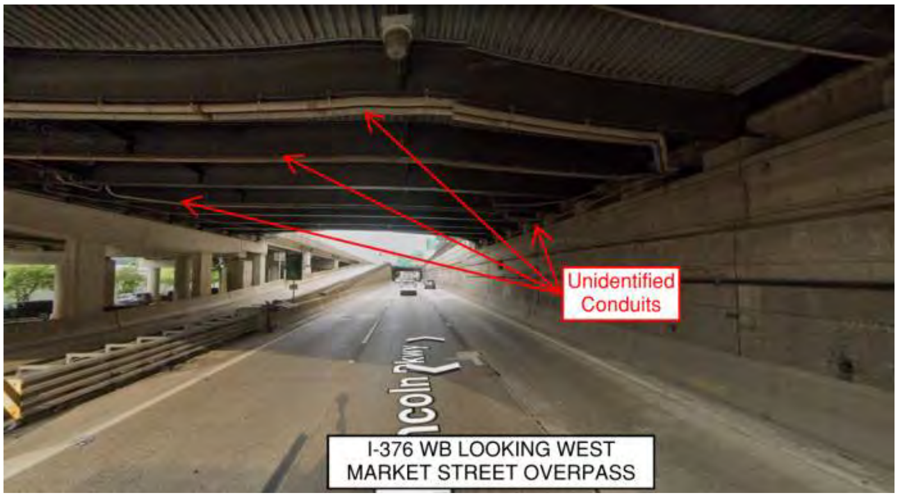
Running linearly along the entire project corridor is an underground electric line under the Mon Wharf parking lot beneath the Ramp F (SR 8041) and Ramp D (SR 8095) superstructures, a 6" diameter water line under the Mon Wharf parking lot beneath the Ramp A (I-376 Eastbound) superstructure, and a deep 90" diameter ALCOSAN interceptor that runs between the edge of the Mon Wharf parking lot and Mon Wharf Landing Park.

In addition to the drainage pipe system, a number of electrical conduits run the length of the I-376 Westbound corridor as shown in the figure below. The majority of these conduits are located on the face of the existing Fort Pitt Blvd Westbound retaining wall on the north side of the roadway. They begin between Commonwealth Place and Stanwix Street where Ramp G meets I-376 Westbound and continue the length of the area studied. These conduits are part of the ITS and lighting systems for I-376 and Fort Pitt Blvd and as such connect to multiple luminaires and overhead sign structures along the roadway. On the south side of I-376 Westbound, electrical conduits are attached to the face of the Fort Pitt Blvd Eastbound retaining wall in a number of locations, as well. These locations include the eastern side of the Stanwix Street overpass and on the western side of the Wood Street overpass.

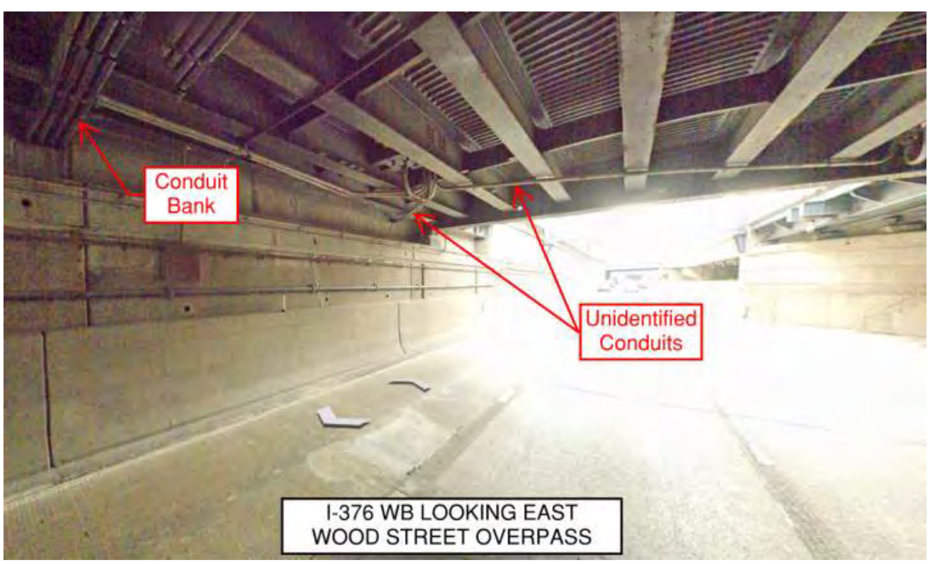
All of the various overpasses which cross the I-376 Westbound corridor have multiple different utilities attached to the underside of the bridge structures. These utilities are frequently not shown on available plans and are unable to be identified. A general description of the number and location of these utilities is provided below, but further investigation through PA One Call may be required.

The Stanwix Street overpass has two bays. There is a bank of four conduits which run along the underside of the eastern bay of the bridge. These conduits connect to an additional conduit which runs along the top of the northern abutment. There are also multiple conduits connected to the underside of the western bay of the bridge which come down through the deck and run across the overpass. None of these utilities are identified on the available plans.

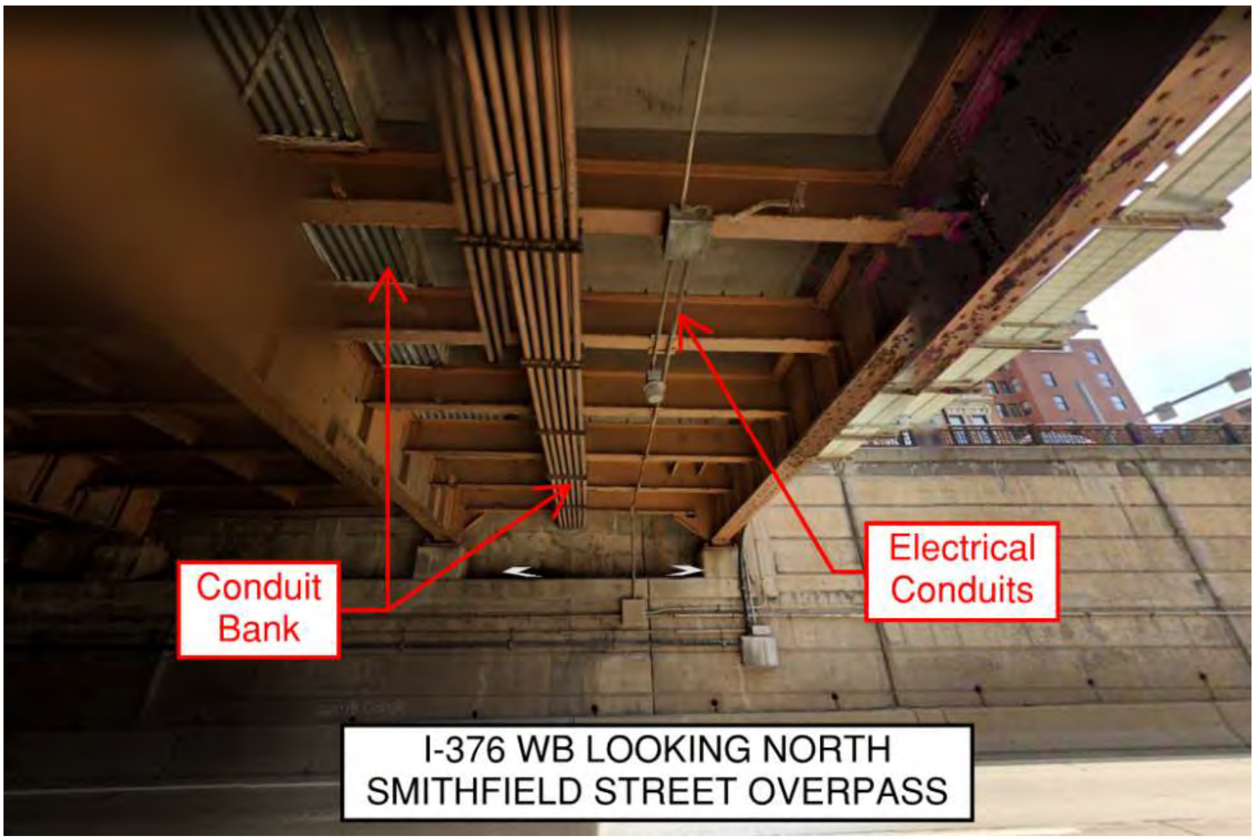
The Market Street overpass has one bay with telecommunication conduits running along the bottom of three of its girders. There is also a conduit which runs along the top of the northern abutment from the west edge of the overpass to the center of the bridge where it then diverts up through the deck.



The Wood Street overpass has three bays. There is a bank of four conduits which run along the inner girder of the eastern bay of the bridge. There is also a group of five conduits in the eastern bay which run down through the deck, along the front of the northern abutment, and across the overpass. The center bay has a similar configuration with four conduits that run down through the deck and fan out across the underside of the structure. Additionally, there is a larger pipe which is attached to the bottom flange of the inner girder of the western bay. The available plans indicate a 6" water line and a 6" gas line which traverse the I-376 Westbound corridor at the Wood Street overpass. There is also a 72" diameter 3-ring brick sewer buried beneath the roadway at an unspecified depth which follows the alignment of Wood Street and outlets into the Monongahela River.



The Smithfield Street overpass has four bays. There is a bank of six conduits which run along the center of the eastern bay of the bridge. A second conduit bank is located adjacent to the first which runs along the inner girder and terminates halfway along the span of the structure. Additionally, there are a number of electrical conduits which are also attached to the underside of the eastern bay. The two center bays contain another bank of five conduits as well as two conduits which run laterally across the overpass above the center of the I-376 Westbound roadway. There is a single pipe which runs along the western side of these bays and across the front face of the Northern abutment. In the western bay of the bridge, a single conduit runs along the center of the bay. The available plans show two gas lines which run the edges of the overpass. There is also a Duquesne Light electric line shown on the western side of the overpass.



4.0 Alternatives Evaluation

AECOM was scoped with investigating the following alternatives to prevent or reduce the frequency of I-376 roadway flooding:

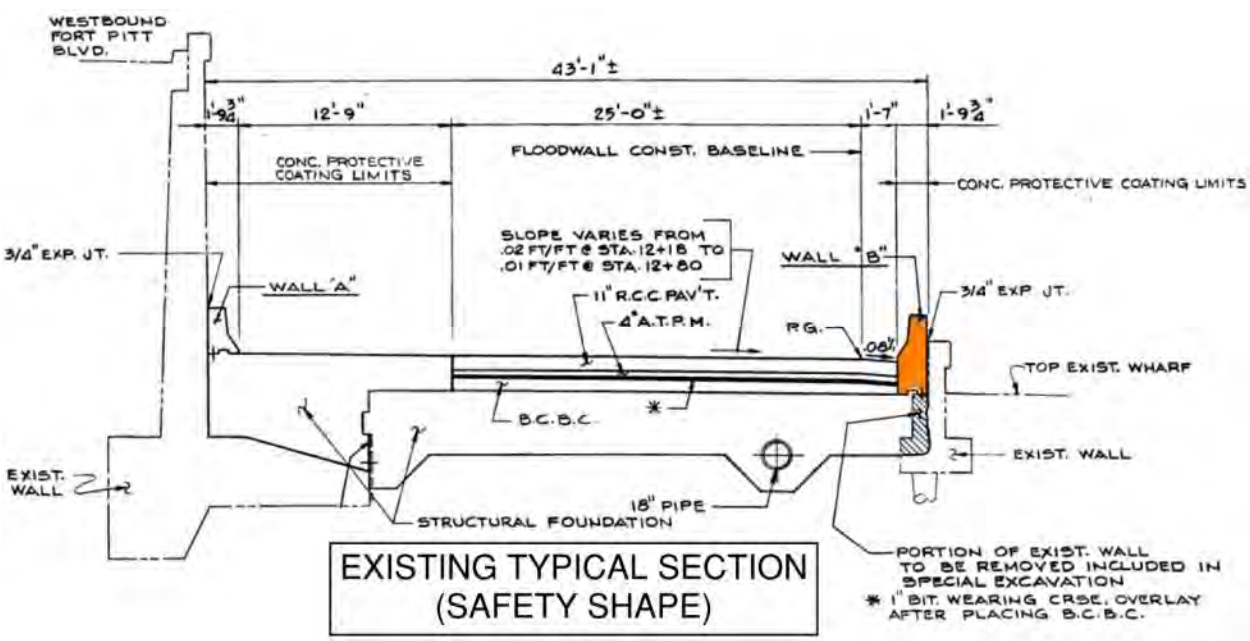
1. Increase the height of the current floodwall.
2. Construct a tunnel over I-376 Westbound
3. Construct a new wall between the Mon River and the Mon-Wharf Parking Lot

Detailed cost estimates for each of the three alternatives appear in Appendix G. Estimates were developed by two independent estimators to provide a range of estimated project costs.

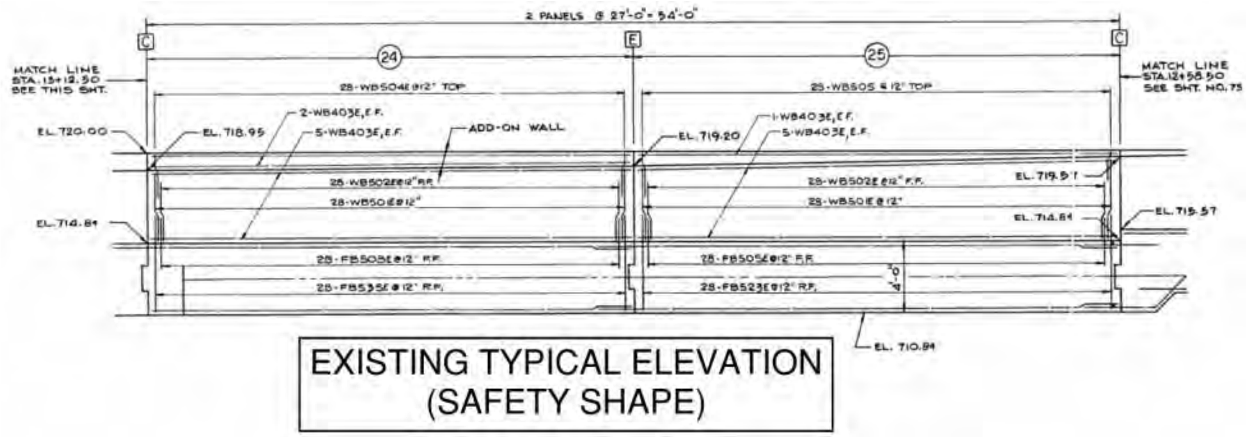
Additionally, AECOM was tasked with investigating an alternative to automate the flood detection and bathtub closure process, reduce detour travel time, and minimize cleanup efforts.

4.1 Alternative F1 – Increase Height of Current Floodwall

The typical section of the current floodwall consists of a 1'-9" wide safety-shaped barrier and equal-width wall stem supported by a structural spread footing foundation beneath the I-376 Westbound. As mentioned in Section 3.1, the thickness of the existing spread footing foundation increases as the wall height increased in order to maintain a factor of safety of 1.3 against hydrostatic uplift. The wall stem is reinforced by No. 5, Grade 60, reinforcing bars spaced at 12 inches in both the front and rear faces.

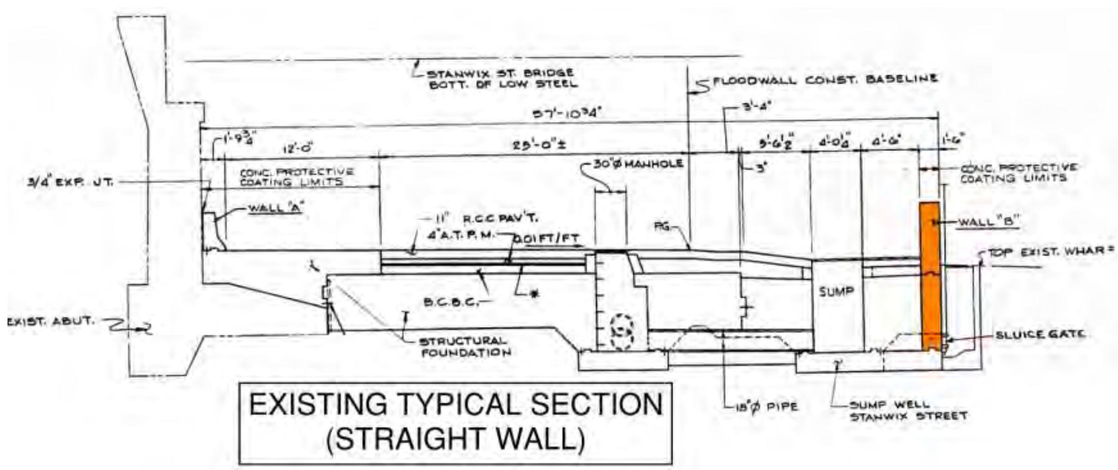


EXISTING TYPICAL SECTION (SAFETY SHAPE)

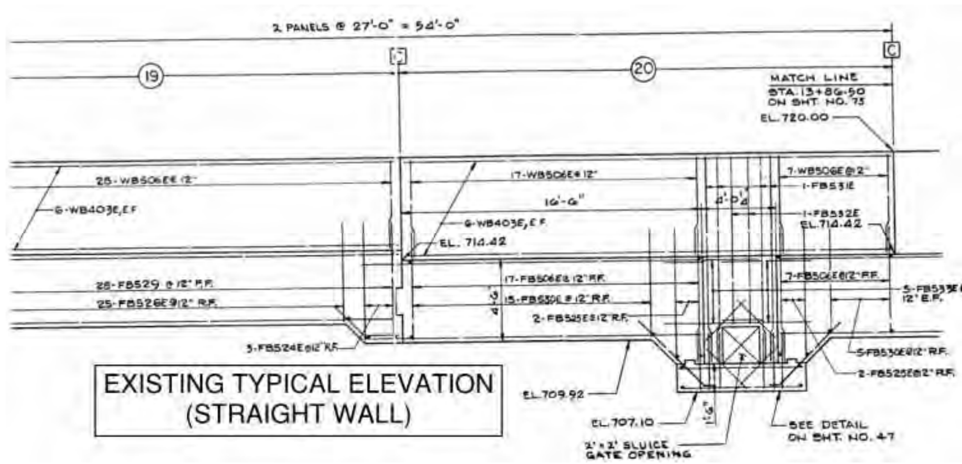


EXISTING TYPICAL ELEVATION
(SAFETY SHAPE)

In the area of the sump pumps at Stanwix and Wood Streets, the wall is a straight-faced wall that is 1’-6” thick and is also reinforced by No. 5, Grade 60, reinforcing bars spaced at 12 inches in both the front and rear faces.



EXISTING TYPICAL SECTION
(STRAIGHT WALL)



EXISTING TYPICAL ELEVATION
(STRAIGHT WALL)

AECOM investigated three scenarios to reconstruct the floodwall at its current location.

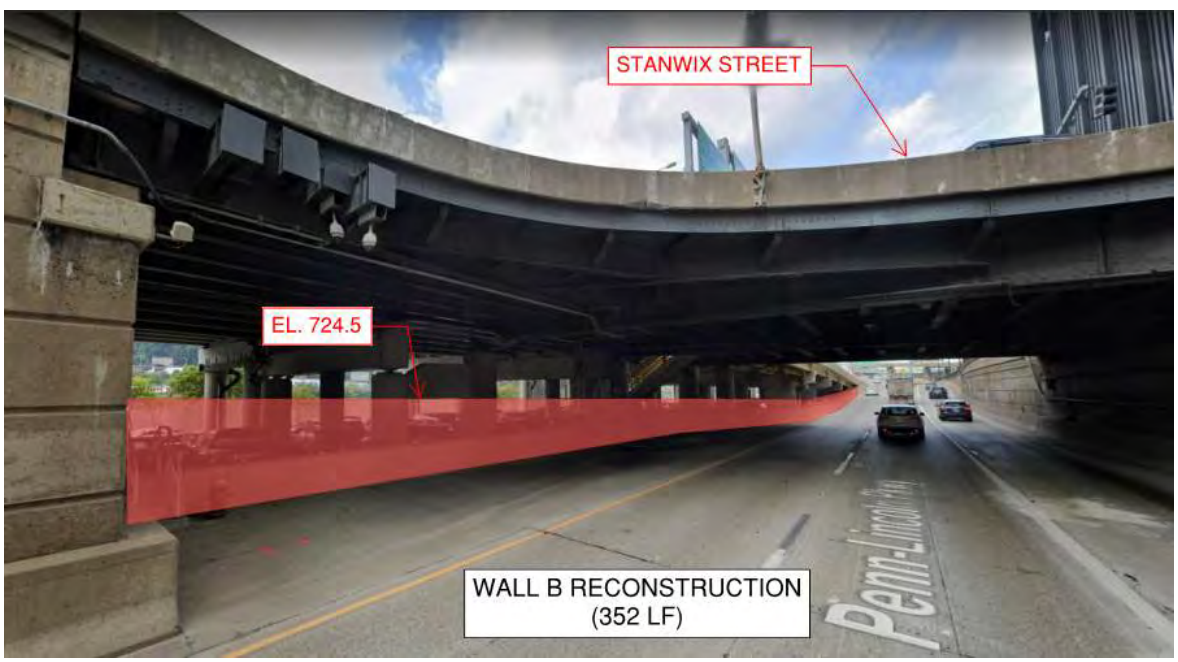
4.1.1 – Reconstruct Stem from Top of Footing to Elevation 724.5 For Entire Length

In conjunction with the H&H analysis completed by NTM Engineering, Inc. (NTM) it was determined that a wall height equal to elevation 724.5 (NAVD88) would have prevented the nine (9) flood events that have occurred since 2005 and fifteen (15) of the seventeen (17) flood events that have occurred since 1985 when the existing floodwall was constructed. (Floodwaters reached elevation 729.1 in 1996 and elevation 725.5 in 2004). This corresponds to raising the current floodwall by a maximum height of 5'-0".

This alternative considers rebuilding the entire stem from the top of the footing to the top of the wall at elevation 724.5. Reconstructing the entire stem will allow the existing bars projecting from the top of the existing footing to be examined and repaired or replaced as necessary. It also provides an opportunity to examine and replace the waterstop between the footing and the stem as needed.

A structural analysis of the proposed wall revealed that wherever the stem height (top of footing to top of wall) is greater than 11'-6" for the 1'-9" wide safety shape sections and 10'-9" for the 1'-6" wide straight wall sections, additional No. 5 bars at 12" need to be staggered with the existing bars and doweled into the existing footing to provide No. 5 bars at 6" to resist the moment due to flood waters at elevation 724.5. Structural calculations appear in Appendix D.

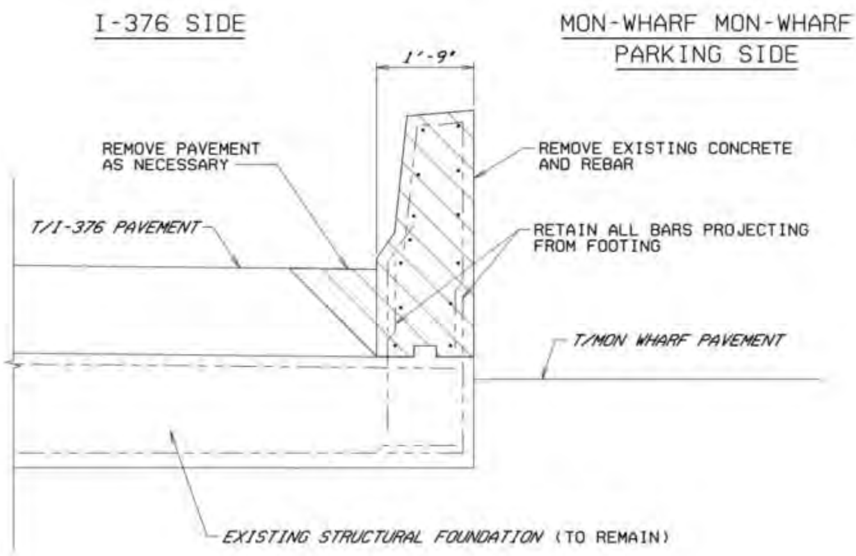
The estimated cost to rebuild the stem of the existing floodwall from the top of the footing to elevation 724.5 for the entire length of the floodwall (833'-10") ranges from $6,780,000 to $8,640,000 (not including costs for hydrostatic uplift mitigation). Two independent cost estimates appear in Appendix G.



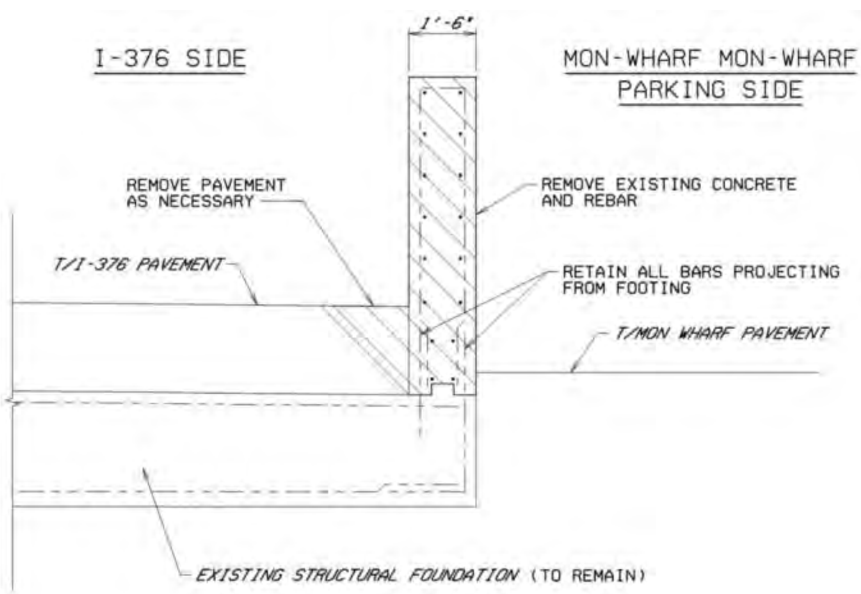

MARKET STREET
EL. 724.5
STANWIX STREET RAMP
WALL C RECONSTRUCTION
MON-WHARF TO STANWIX - LOOKING WEST
(295 LF)


MON-WHARF RAMP
EL. 724.5
WALL C RECONSTRUCTION
MON-WHARF TO STANWIX - LOOKING EAST
(295 LF)

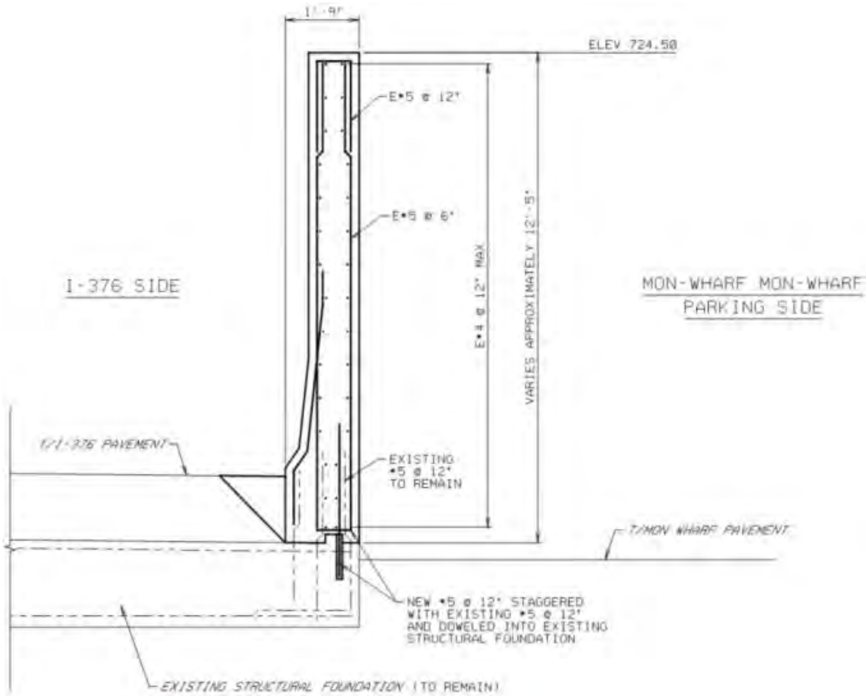

WOOD STREET
EL. 724.5
WALL C RECONSTRUCTION
WOOD STREET - LOOKING WEST
(169 LF)



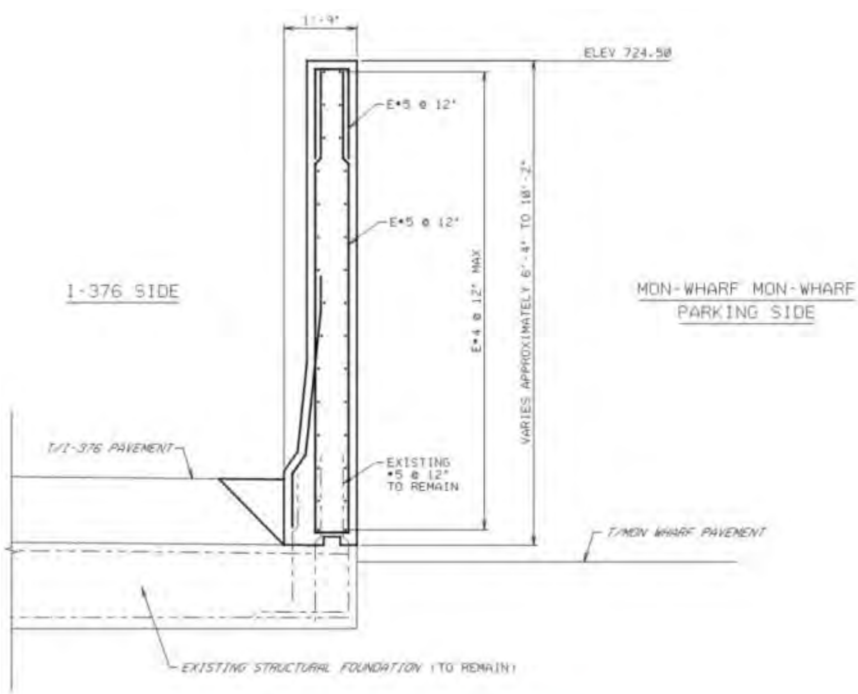
EXISTING FLOODWALL DEMOLITION (SAFETY SHAPE)
FULL STEM REBUILD
NTS



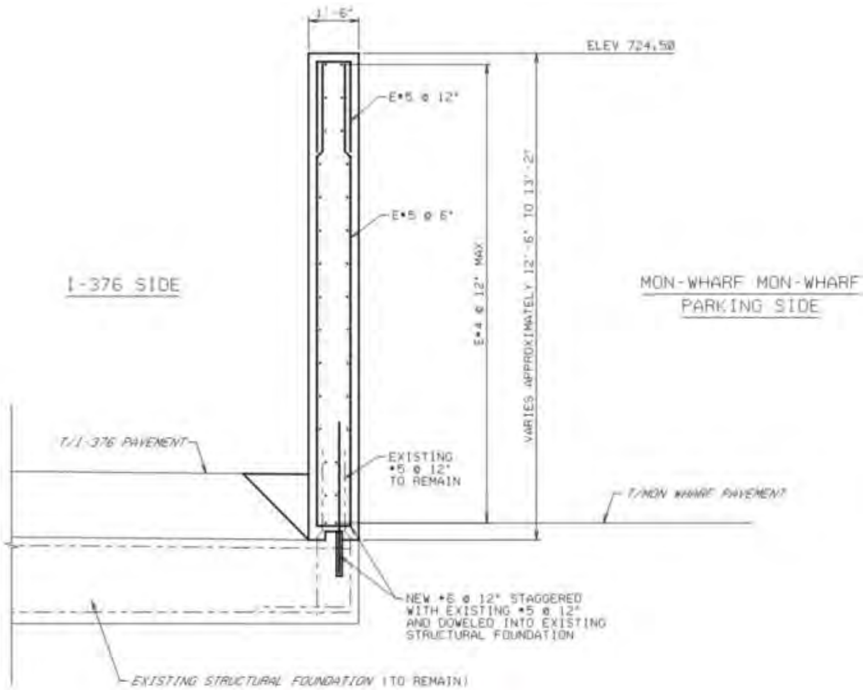
EXISTING FLOODWALL DEMOLITION (SUMP AREA)
FULL STEM REBUILD
NTS



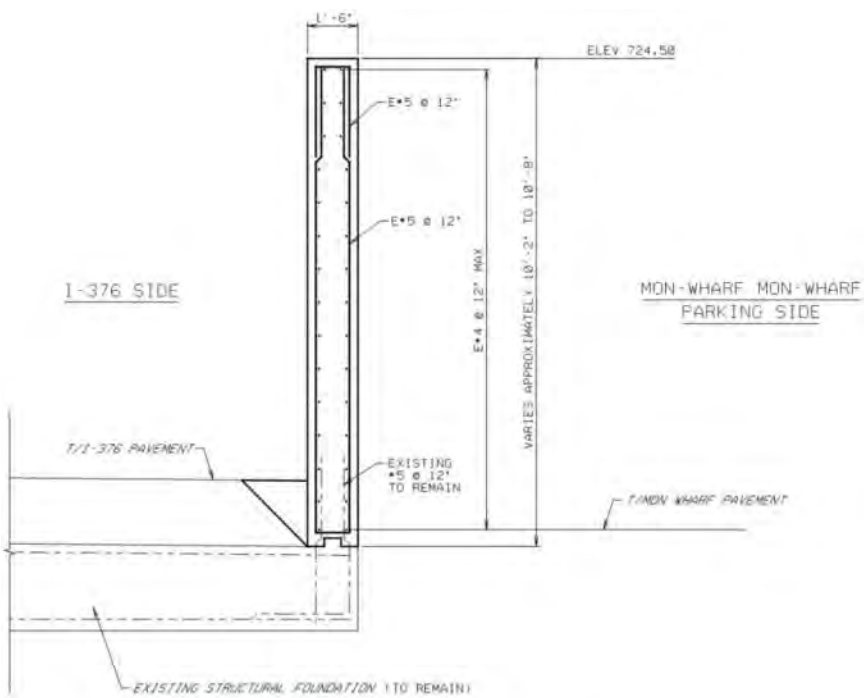
PROPOSED FLOODWALL (SAFETY SHAPE)
FULL STEM REBUILD WITH DOWELS
NTS



PROPOSED FLOODWALL (SAFETY SHAPE)
FULL STEM REBUILD WITHOUT DOWELS
NTS



PROPOSED FLOODWALL (SUMP AREA)
FULL STEM REBUILD WITH DOWELS



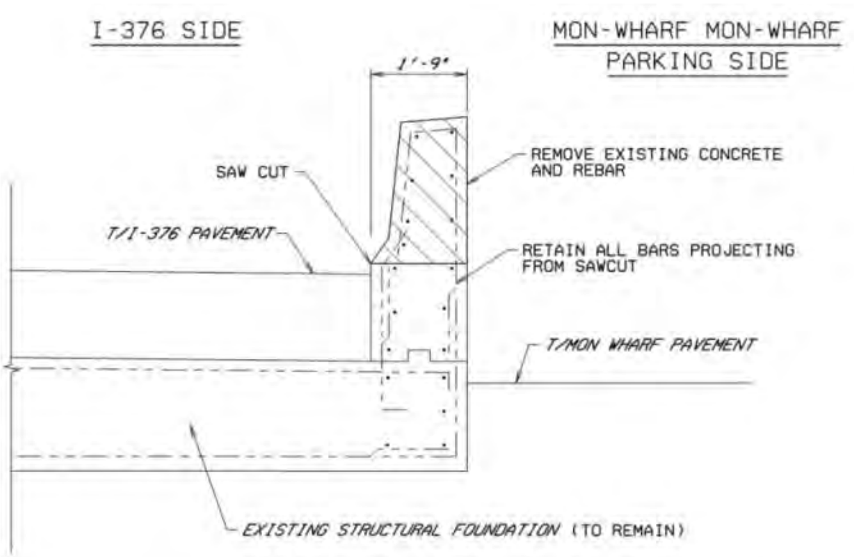
PROPOSED FLOODWALL (SUMP AREA)
FULL STEM REBUILD WITHOUT DOWELS

4.1.2 – Reconstruct Stem from Top of Footing to Elevation 724.5 Only Where Needed

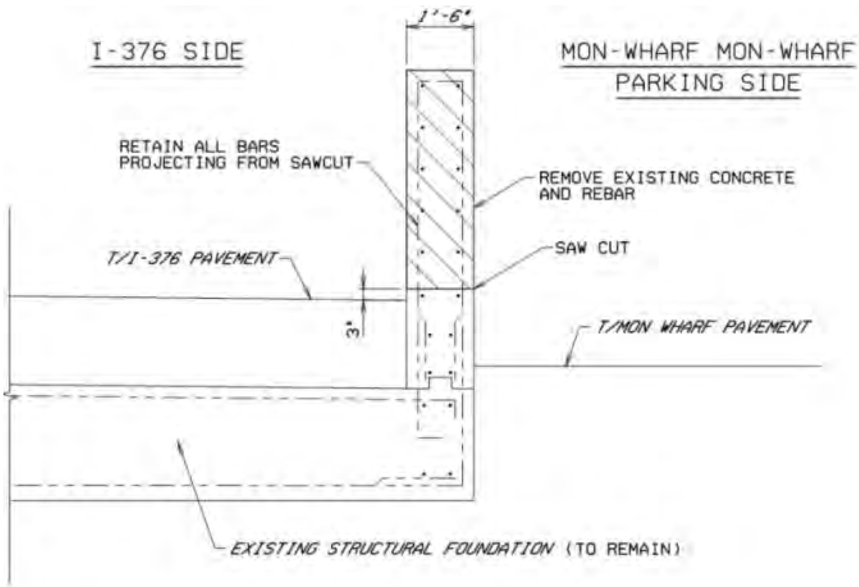
To reduce the cost of fully rebuilding the existing stem, AECOM determined that a stem height of 11’-6” (top of footing to top of wall) for the 1’-9” wide safety shape sections and 10’-9” for the 1’-6” wide straight wall sections can be supported by the existing No. 5 bars at 12” projecting from the footing. Therefore, wherever the stem heights are at or below these heights, the current wall can be sawcut, demolished, and re-poured from 3” above the gutterline up to elevation 724.5 with longer reinforcement spliced to the existing bars. This reduces the amount of demolition needed and reduces the amount of excavation and rebuilding of the parkway pavement needed to expose the existing footing. However, the new wall would be supported by a portion of the stem that was constructed in 1985 and the condition of the existing reinforcement and waterstop at the joint between the top of the footing and the base of the stem would not be able to be examined and repaired if necessary.

Calculations that determine the maximum permissible wall height based on the existing wall thickness and reinforcement are included in Appendix D.

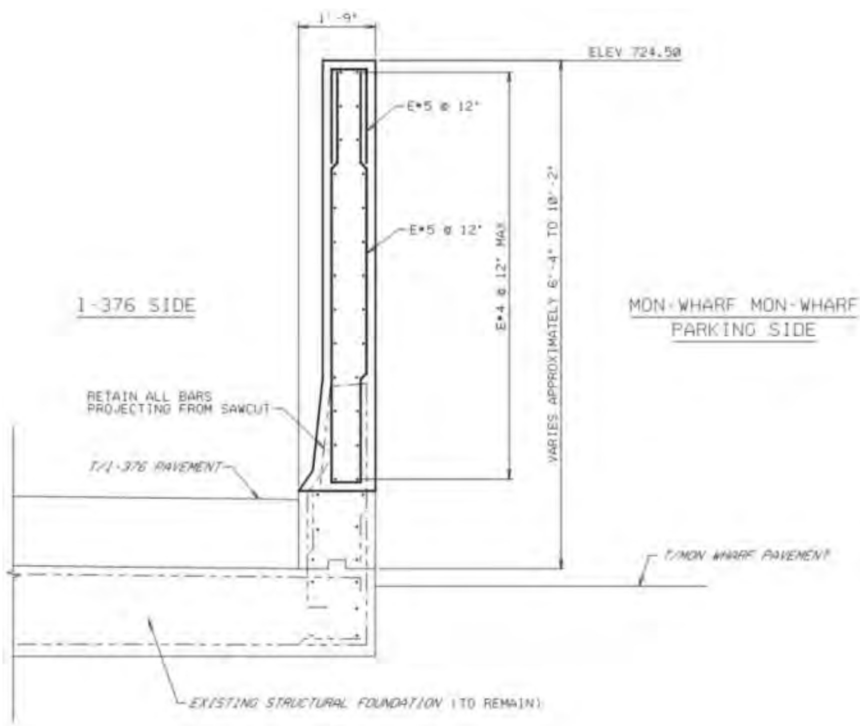
The total length of the full stem reconstruction needed from the top of footing up is 169’-1”. The total length of the partial stem reconstruction from above the gutterline up is 664’-9”. Raising the current floodwall height in this manner reduces the estimated cost range to $5,890,000 to $7,670,000 (not including costs for hydrostatic uplift mitigation). Two independent cost estimates appear in Appendix G.



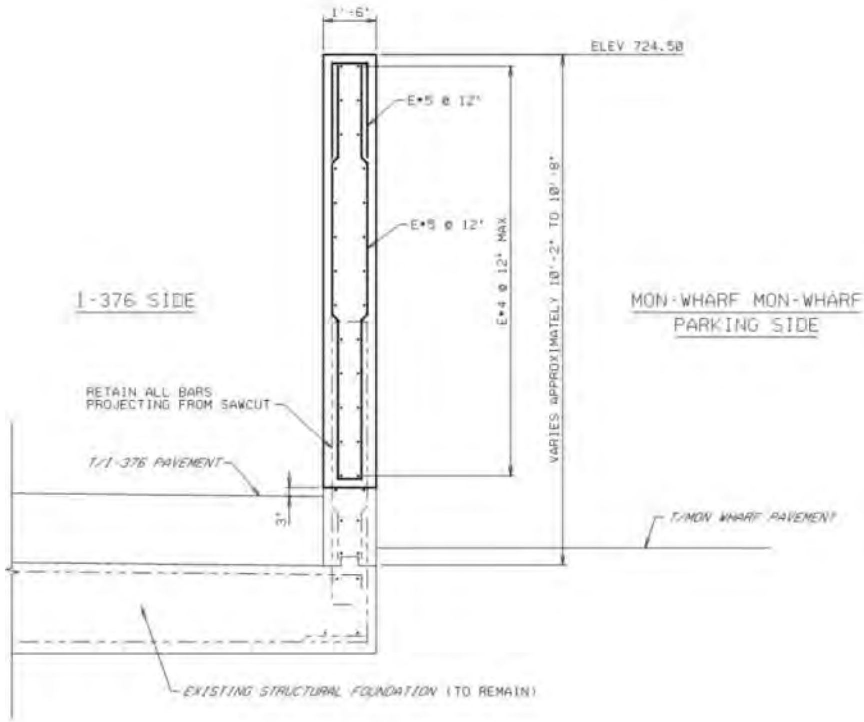
EXISTING FLOODWALL DEMOLITION (SAFETY SHAPE)
PARTIAL STEM REBUILD
NTS



EXISTING FLOODWALL DEMOLITION (SUMP AREA)
PARTIAL STEM REBUILD
NTS



PROPOSED FLOODWALL (SAFETY SHAPE)
PARTIAL STEM REBUILD
NTS

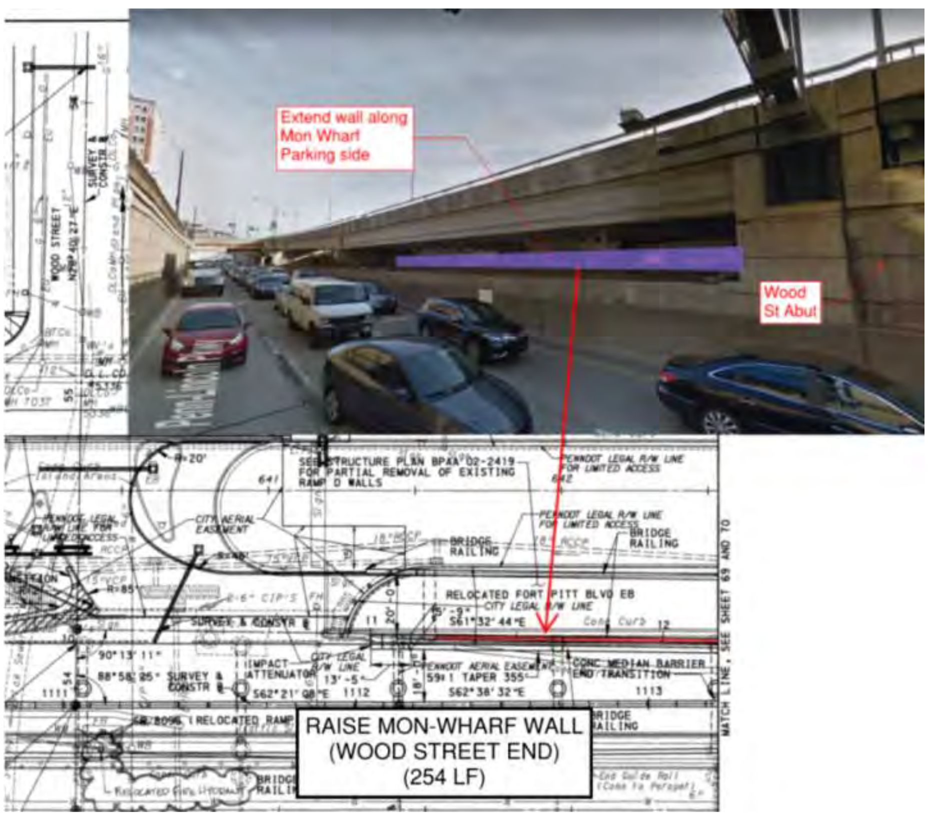


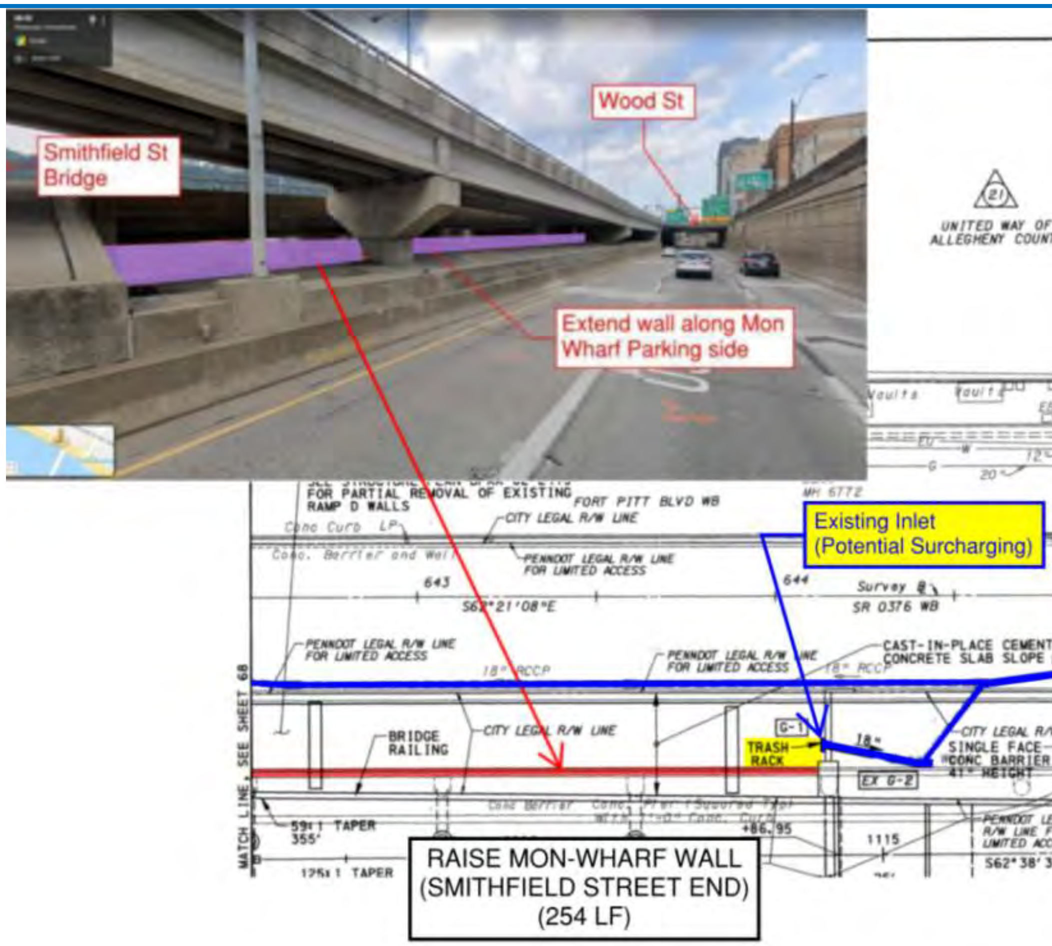
PROPOSED FLOODWALL (SUMP AREA)
PARTIAL STEM REBUILD
NTS

4.1.3 – Reconstruct Ancillary Areas to Elevation 726

The current floodwall overtops at Elevation 719.5 (NAVD88, El. 720 NGVD29). There are two other areas away from the current floodwall that are not currently overtopped during flood events but will need to be raised in conjunction with raising the current wall to the proposed elevation 724.5 as described in Sections 4.1.1 and 4.1.2. The costs associated with modifying these areas are included in the cost estimates previously presented.

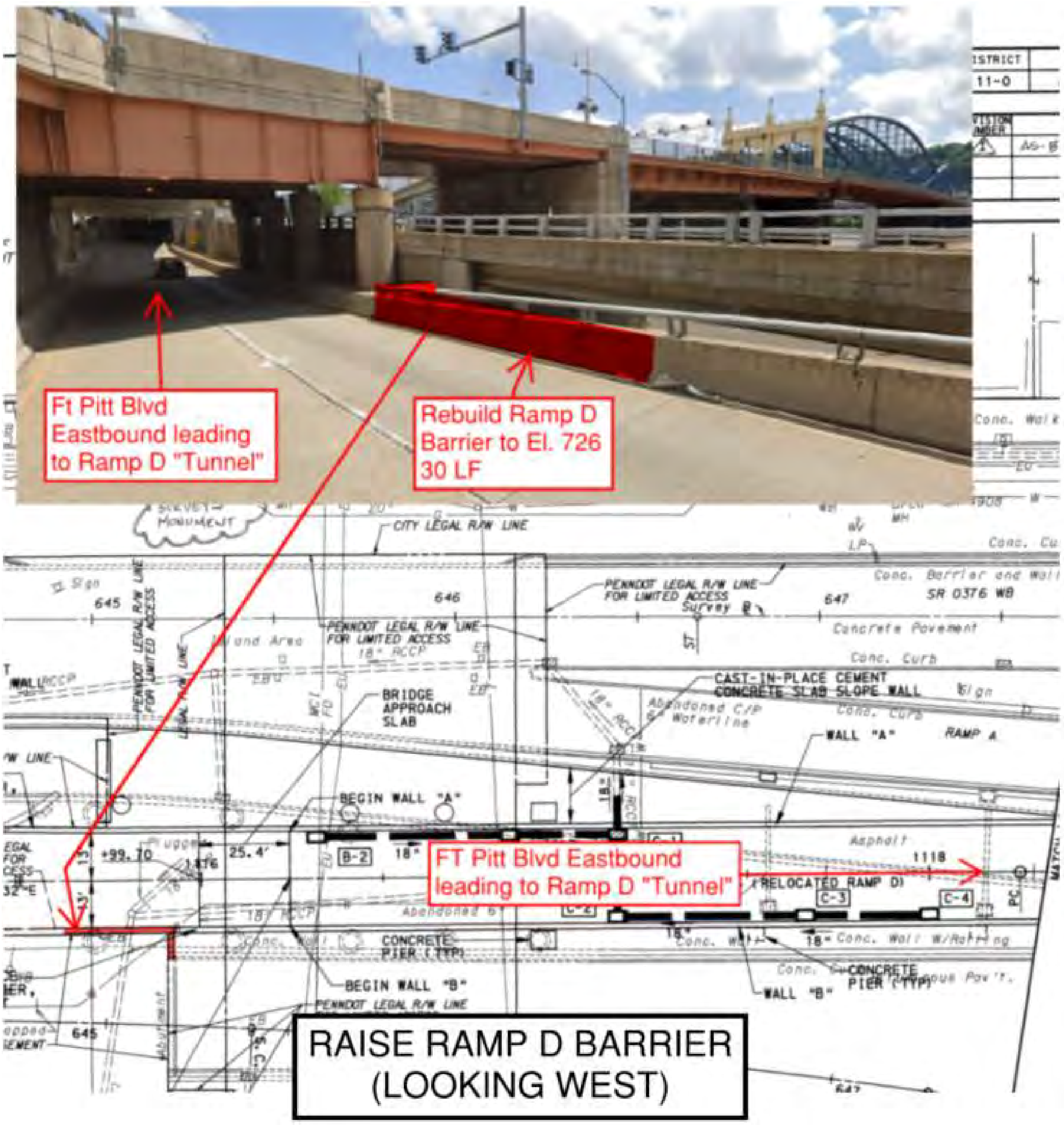
The first area is a 254-foot long portion of the wall along the Mon-Wharf parking lot beneath the Fort Pitt Blvd Eastbound exit to Grant Street. The top of wall elevation ranges from 721.4 to 723.6. To ensure that any future flooding overtops at the current sump pump locations, AECOM recommends that an 18” thick cast-in-place concrete extension to elevation 726 be doweled into the top of the existing concrete gravity retaining wall. This portion of the wall lies with the City of Pittsburgh Legal Right-Of-Way. However, raising the wall along I-376 Westbound that is within PennDOT Legal Right-Of-Way would allow floodwaters to enter the inlet located at the end of the swale in the concrete slope wall and surcharge the stormwater system along I-376.




Smithfield St Bridge
Wood St
Extend wall along Mon Wharf Parking side
UNITED WAY OF ALLEGHENY COUNT
Existing Inlet (Potential Surcharging)
FORT PITT BLVD WB
CITY LEGAL R/W LINE
PENNDOT LEGAL R/W LINE FOR LIMITED ACCESS
Survey
SR 0376 WB
S62°21'08"E
CAST-IN-PLACE CEMENT CONCRETE SLAB SLOPE
18" RCCP
BRIDGE RAILING
TRASH RACK
G-1
EX G-2
SINGLE FACE CONC BARRIER, 41" HEIGHT
59:1 TAPER
355'
125:1 TAPER
+86.95
1115
RAISE MON-WHARF WALL
(SMITHFIELD STREET END)
(254 LF)


El 726
RAISE MON-WHARF WALL
(VIEW FROM PARKING LOT)
(254 LF)

The second area is a portion of the right barrier of Fort Pitt Boulevard Eastbound leading to Ramp D just before it passes beneath the approach span to the Smithfield Street Bridge. The top of barrier elevation ranges from a minimum of 724.1 feet to over 730.0 feet. To ensure that any future flooding does not occur at this location, AECOM recommends rebuilding a portion of this wall to approximately elevation 726. Thirty (30) linear feet of the barrier will need to be rebuilt to a constant elevation of 726 and a closure wall constructed to tie into I-376 Eastbound Ramp E passing under the Smithfield Street Bridge to prevent flooding of the Ramp D tunnel.



A redlined set of existing plans with photos showing the limits of the proposed reconstruction appears in Appendix I.

4.1.4 – Reconstruct Stem from Gutterline to Elevation 722 For Entire Length

Another alternative would be to rebuild the entire floodwall only from the gutterline up to elevation 722 (NAVD 88) which raises the wall at its lowest point by 2'-6". This corresponds to a maximum stem height that can be supported by the existing No.5 bars at 12" throughout the entire length of the existing floodwall (no need for dowels and full reconstruction anywhere regardless of stem height). Reconstruction is assumed from 3" above gutterline to the top of the new wall. The ancillary areas described in Section 4.1.4 below are each above elevation 722 and would not need to be modified either. Raising the wall to elevation 722 would have prevented ten (10) of the seventeen (17) flood events that have occurred since 1985. Although the amount of flood protection is reduced, the estimated cost is also reduced to $4,380,000 to $6,540,000 (not including costs for hydrostatic uplift mitigation). Two independent cost estimates appear in Appendix G.

4.1.5 - Impacts of Alternative

4.1.5.1 Traffic (MPT / Mon Wharf Parking / Trail) / Constructability

With an ADT of over 44,000 vehicles on I-376 Westbound, impacts to traffic was a key consideration for each alternative.

This alternative requires work adjacent to the left lane of I-376 Westbound, Ramp N (Stanwix Street Exit), and Ramp D (Fort Pitt Blvd Eastbound Connector).

For the reconstruction of Wall B near Stanwix Street, a temporary barrier can be placed from the Ramp N abutment (Stanwix Street Exit) extending along the existing yellow pavement marking line along the left edge of the left lane to the end of the Wall B reconstruction limit. The two I-376 through lanes and possibly the SR 279 exit ramp will be temporarily reduced to 11'-0" to allow room for the temporary barrier needed to not only protect the work zone, but provide positive separation between I-376 and the Mon Wharf parking area. A similar configuration will be implemented for the reconstruction of Wall B near the Mon Wharf parking ramp and Stanwix Street exit and Wall C reconstruction under Wood Street.

To reconstruct the right barrier at Ramp D, the length of the two lane portion of the ramp from the existing merge point to where the traffic from Ramp D and the ramp from Fort Pitt Blvd Eastbound come together to form the two lane ramp will be reduced closing the right lane with temporary barrier and the traffic from either Ramp D or Fort Pitt Blvd Eastbound will be in a stop condition at the new temporary Fort Pitt Blvd EB / Ramp D merge point.

Contractor staging areas and material deliveries will be a significant challenge for this alternative. Nighttime closures of the left lane of I-376 will be used for debris removal and material deliveries. The Stanwix Street ramp could be closed during construction and used for a Contractor's trailer and staging area.

Most of the activities involved in the demolition and rebuilding of the floodwall will likely need to occur from the Mon Wharf parking lot. Given the proximity of the parking spaces to the river side of the floodwall, the parking spaces near the work areas will need to be closed off. Coordination with the Pittsburgh Parking Authority and compensation for the loss of parking spaces will likely be required. Additionally, because of the anticipated impact to parking, the proposed wall work could be broken up into manageable segment lengths and phased to reduce the overall impacts to the loss of parking spaces.

This alternative will not have any impact on the use of the Mon Wharf Landing Park and trail.

4.1.5.2 Utilities

By reconstructing the floodwall along its current alignment, impact to utilities will be minimal. The existing ITS conduits and cabinets and sump pump piping at each sump location will need to be raised in conjunction with the wall. A cost to relocate and reconfigure the ITS system for automatic flood detection has been included with Alternative 4.4.

4.1.5.3 Right-of-Way

Much of the permanent reconstruction of the wall will lie within the Department's legal Right-Of-Way. The only portion that is proposed outside of the legal Right-Of-Way is the 254 LF of wall extension needed to the retaining wall beneath Fort Pitt Boulevard Eastbound adjacent to the Mon Wharf parking lot between Wood and Smithfield Street. As explained in Section 4.1.4, raising the wall along I-376 Westbound that is within PennDOT Legal Right-Of-Way would allow floodwaters to enter the inlet located at the end of the swale in the concrete slope wall and surcharge the stormwater system along I-376. Therefore, the wall needs to be raised on the river side of the concrete slope wall.

Although temporary access and staging will be needed within the City of Pittsburgh Right-Of-Way, an agreement will be needed to compensate the Pittsburgh Parking Authority for the loss of parking spaces during construction.

4.1.5.4 Environmental / Section 4(f)

This alternative will not have any impact on the use of the Mon Wharf Landing Park and trail. Reconstructing the existing floodwall will not have any environmental impacts.

4.1.5.5 Existing Structures

Other than the obvious impact to the existing floodwall, the existing overpasses and ramps will not be adversely affected by constructed. As mentioned in the MPT discussion, closing the Stanwix Street Ramp (Ramp N) to use as a Contractor staging area may be something to consider.

4.1.5.6 Future Maintenance

Future maintenance of the reconstructed floodwall will be much the same as the current floodwall which is minimal.

4.1.5.7 Driver's Expectations / Visibility

The raising of the wall 5'-0" maximum from the current height will reduce visibility of the river. However, the view is already obscured by the adjacent overpasses and supporting piers so this should not be a concern. The taller wall may darken the areas beneath the city-owned overpasses so additional or upgraded lighting beneath these structures has been considered in the cost estimate.

4.1.5.8 Stormwater System / H&H

Caution will need to be exercised during demolition of the existing floodwall to not damage the adjacent 18" diameter concrete stormwater pipe that runs adjacent to the floodwall gutterline for the full length of the project. However, the pipe is encased within the structural slab foundations so damaging it is not a major concern.

The H&H analysis shows that raising the wall to elevation 724.5 does not have any impact to the FEMA 100-year water surface elevations. However, surcharging of the stormwater system during flood events may still be an issue if sluice and/or flap gates don't close properly, the pipes joints are not sealed properly and hydrostatic pressure forces inflow, etc.. A complete investigation will be required during the preliminary engineering phase.

4.1.6 – Advantages / Disadvantages of Alternative

Advantages

1. Lowest cost
2. Simple construction materials and methods
3. Minimal impact to utilities
4. Low future maintenance

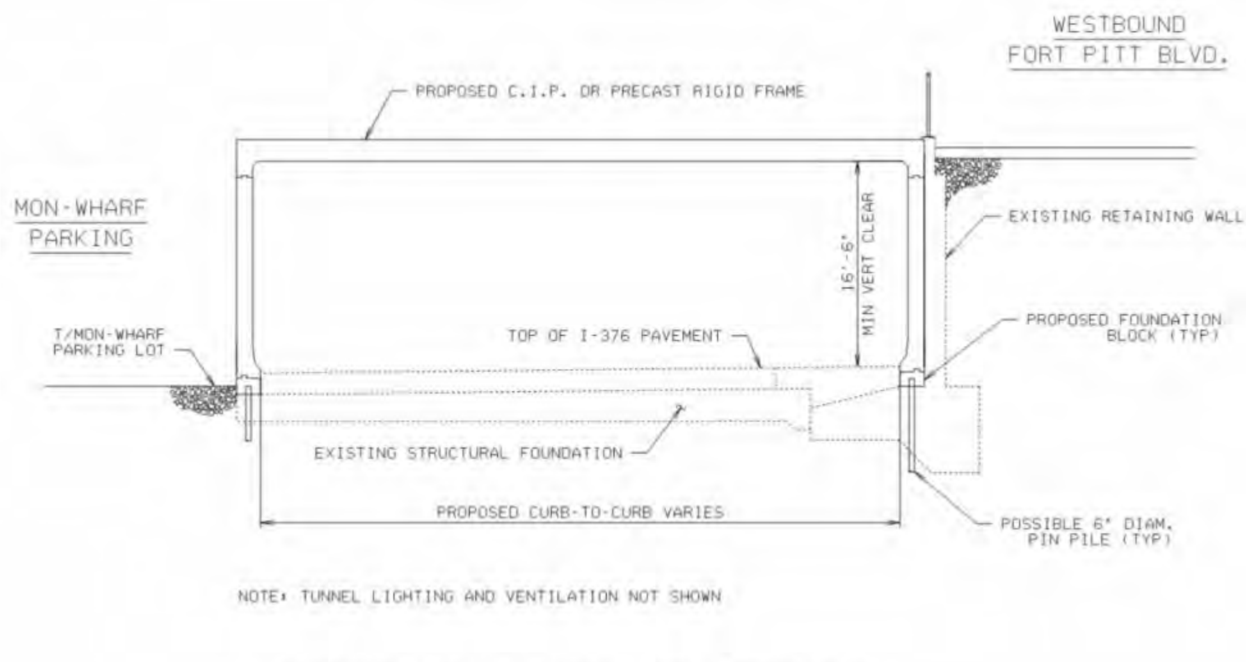
Disadvantages

1. Construction adjacent to traffic
2. Little room for Contractor staging
3. Reliance on existing foundation slabs and reinforcement constructed in the mid-1980s.
4. Pump system and parkway closure still required for overtopping events
5. Requires closure of a row of Mon Wharf parking spaces during construction

4.2 Alternative F2 – Construct a tunnel-like structure over I-376

The second alternative studied to prevent future flooding of the parkway was the construction of a tunnel structure over I-376. AECOM considered a concrete rigid frame constructed using either cast-in-place concrete or precast concrete segments. The tunnel would begin west of Stanwix Street and end at the current Grant Street tunnel for an estimate length of 2600 ft.

It is expected that additional foundation support would be needed to support the additional weight of the rigid frame. A row of pin piles beneath each leg and drilled through the existing foundations is one possible solution. However, pending a structural analysis, the rigid frame could possibly be supported directly by the current floodwall foundation and the footing for the Fort Pitt Boulevard Westbound retaining wall.



PROPOSED FRAME OVER I-376 WESTBOUND
LOOKING WEST (WITH TRAFFIC)

There are several constructability-related challenges associated with this alternative. Typically, 16’-6” of vertical clearance is required for interstate traffic. The Strategic Highway Network (STRAHNET) includes all interstate highways in Pennsylvania. When a new project provides less than the minimum required clearance or does not correct an existing substandard vertical clearance, coordination with the Surface Deployment and Distribution Command Transportation Engineering Agency (SDDCTEA) is required to review and approval an exception. However, interstate traffic into the City of Pittsburgh along I-376 Westbound is currently limited to 13’-6” of vertical clearance due to height restrictions at the Squirrel Hill tunnels.

Currently, three of the four city-owned overpasses have less than 16’-6” but more than 13’-6” of vertical clearance.

Overpass	Stanwix	Market	Wood	Smithfield
Min. Vert. Clr	14’-3 ½”	16’-9 ½”	14’-5”	14’-5”

Making the tunnel discontinuous at each overpass would allow possible entry points for floodwaters. To keep the tunnel continuous from the Grant Street tunnel to beyond Stanwix Street, the parkway would need to be reprofiled and reconstructed to allow the ceiling of the rigid frame to pass below the existing overpasses. Given that the thickness of the ceiling could be as much as two feet, it is not practical to lower the profile enough to provide adequate vertical clearance beneath each overpass. The profile adjustment would impact the foundations of the Fort Pitt Boulevard Westbound retaining wall and the piers of each overpass and clearance to maintain the current overpass superstructures would be an issue.

Alternatively, the current overpass structures could be eliminated and the Stanwix, Market, Wood, and Smithfield Street connections to Fort Pitt Boulevard Eastbound constructed on top of the rigid frame. This would allow the current vertical clearances to be improved. However, coordination and partnership with the City of Pittsburgh would be necessary to eliminate the city-owned overpasses.

If the tunnel structure is discontinuous at each overpass, a floodwall would need to be constructed beneath each city-owned structure. Since the 100-year flood elevations are above the bottom of the existing beams, the floodwall cannot prevent all future flooding. A robust pumping system would need to be installed to drain the tunnel if it is ever breached by floodwaters.

The ceiling of the rigid frame could be post-tensioned or constructed of prestressed concrete to reduce the ceiling thickness as much as possible which, in turn, would reduce the amount of profile adjustment required along the parkway if the constructing the continuous tunnel beneath the existing superstructures is considered.

Another challenge associated with this alternative is the accommodation of the Grant Street I-376 entrance ramp (Ramp A) and the Stanwix Street exit ramp. Since the 100-year flood elevation is near the elevation of Fort Pitt Boulevard Westbound, penetrations in the tunnel for these ramps do not allow the tunnel option to protect against all future flooding. Provisions for flood gates that can be lowered at these locations during high flood events to protect the tunnel from filling with water have been accounted for in the cost estimate.

Also, the variable roadway width at these points will require longer spans for the ceiling of the rigid frame which will require thicker ceiling slabs. This will further compound the vertical clearance issue at the Smithfield and Market Street overpasses as the ramps pass underneath.

Other considerations include tunnel lighting, ventilation, emergency egress, and relocation of overhead signing that are associated with tunnel construction.

This alternative provides the opportunity to construct a new linear park on top of the tunnel between Stanwix, Market, Wood, and Smithfield Street overpasses/intersections similar to the I-579 Cap project that is currently under construction.

The estimated cost of the tunnel alone (not including a profile adjustment or removal of the overpasses) is $122,280,000 to $144,290,000 (not including costs for hydrostatic uplift mitigation). A detailed cost estimate appears in Appendix G.

4.2.1 - Impacts of Alternative

4.2.1.1 Traffic (MPT / Mon Wharf Parking) / Constructability

This alternative will have a severe impact to traffic during construction. Alternating closures of the outside lanes will be required to install the single row of pin piles anticipated to support the rigid frame walls. Full nighttime closures will be needed to install the ceiling slabs and install the lighting, signing, and ventilation inside the tunnel. Longer term full lane closures would be needed if the parkway is reprofiled or if the overpasses are removed. Closure of the Mon Wharf and Stanwix Street ramps would be required as the support walls are constructed adjacent to these structures.

Similar to the existing floodwall alternative, Contractor staging areas and material deliveries will be a significant challenge for this alternative as well. The Stanwix Street ramp could be closed during construction and used for a Contractor's trailer and staging area.

Some of the demolition and installation of the river side support walls could occur from the Mon Wharf parking lot. Given the proximity of the parking spaces to the river side support wall, the parking spaces near the work areas will need to be closed off. Coordination with the Pittsburgh Parking Authority and compensation for the loss of parking spaces will likely be required. Additionally, because of the anticipated impact to parking the proposed wall work could be broken up into manageable segment lengths and phased to reduce the overall impacts to the loss of parking spaces.

This alternative will not have any impact on the use of the Mon Wharf Landing Park and trail.

4.2.1.2 Utilities

The existing communication, electric, and ITS conduits present beneath each city-owned overpass may need to be relocated to ensure that they can be accessed for future maintenance if the tunnel ceiling passes below the existing superstructures or relocated altogether if the overpasses are eliminated.

4.2.1.3 Right-of-Way

All of the permanent construction for the proposed tunnel would be within PennDOT's legal Right-Of-Way. Although temporary access and staging will be needed within the City of Pittsburgh Right-Of-Way, an agreement will be needed to compensate the Pittsburgh Parking Authority for the loss of parking spaces during construction.

4.2.1.4 Environmental / Section 4(f)

This alternative will not have any impact on the use of the Mon Wharf Landing Park and trail. Construction of the tunnel will not have any environmental impacts.

4.2.1.5 Existing Structures

Construction of the northern support wall will require a row of pin piles be drilled through the existing toe of the retaining wall footing that supports Fort Pitt Boulevard Westbound. The footing toe may also be impacted if I-376 Westbound is reprofiled to construct a tunnel that is continuous beneath each overpass. Obviously, if the overpasses are to be removed and a new connecting roadway constructed on top of the tunnel this would be a major impact to these structures as well.

4.2.1.6 Future Maintenance

Ventilation, fire suppression, and lighting are components not associated with the other alternates that will require routine future maintenance to ensure that they are always operational.

4.2.1.7 Driver's Expectations / Visibility

As with most tunnels, traffic slowdowns approaching the tunnel can be expected as drivers pre-position themselves in the correct lanes for upcoming exits and adjust to a change in the light levels. Having the Stanwix Street exit within the tunnel itself would further slow traffic. Finally, with limited vertical space for overhead signing, sudden weave movements by motorists in incorrect lanes can be expected near the exit of the tunnel as drivers decide to continue onward on I-376 Westbound or exit in the right lane to SR 279 North.

4.2.1.8 Stormwater System / H&H

Similar to the reconstruction of the floodwall, the existing 18” diameter concrete stormwater pipe that runs adjacent to the left gutterline for the full length of the project will need to be protected, especially during installation of the pin piles.

The H&H analysis shows that the tunnel could protect against the 100-year flood event. However, since the 100-year flood elevation is near the elevation of Fort Pitt Boulevard Westbound, penetrations in the tunnel for the Grant Street entrance ramp and Stanwix Street exit ramp do not allow the tunnel option to protect against all future flooding. Provisions for flood gates that can be lowered at these locations during high flood events to protect the tunnel from filling with water have been accounted for in the cost estimate.

4.2.2 – Advantages / Disadvantages of Alternative

Advantages

1. Protects against higher flood events (but not all)
2. Potential to create urban park on top of tunnel between overpasses
3. All new construction (no reliance on original construction circa mid-1980s)

Disadvantages

1. Highest cost
2. Major impact to traffic during construction
3. Little room for Contractor staging
4. More complicated construction materials and methods
5. Greatest impact to utilities
6. Greatest future maintenance
7. Pump system and parkway closure still required if tunnel is flooded
8. Rush hour traffic backups will likely increase due to change in driver’s expectations as they approach and drive through the tunnel
9. Emergency response would be more complicated inside a tunnel
10. Requires closure of a row of Mon Wharf parking spaces during construction

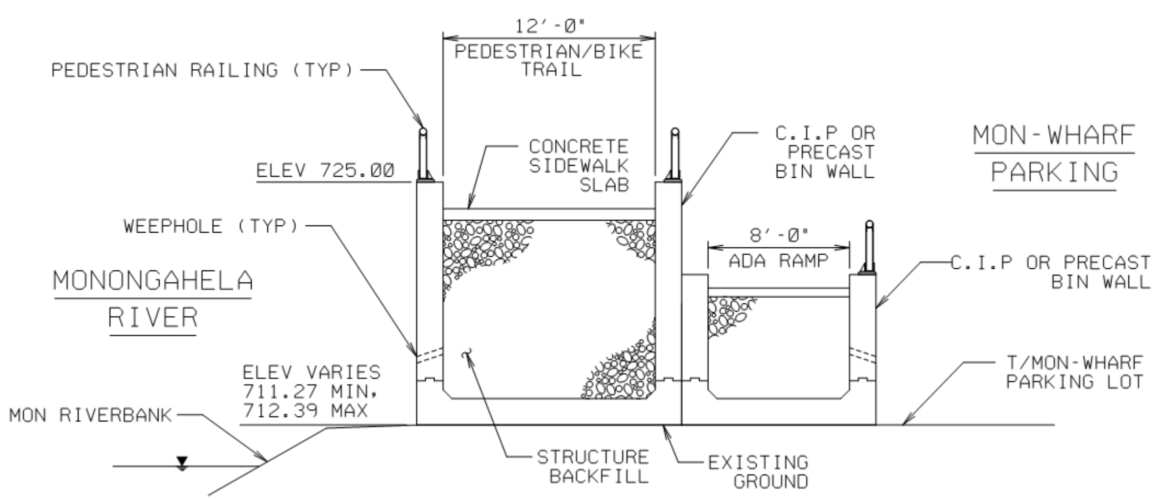
4.3 Alternative F3 – Construct a Floodwall Between the Mon River and the Mon-Wharf Parking Lot

The third alternative studied to prevent future flooding of the parkway considered construction of a floodwall along the riverbank. Initially, a wall constructed between the planters of the Mon Wharf Landing Park and the piers supporting I-376 Eastbound was considered. However, the overhead clearance would make the wall very difficult to construct and the wall would isolate trail users from the Mon Wharf parking lot. Building the wall directly along the riverbank would block all viewsheds from the park and is not practical.

Given the constraints above, AECOM developed an elevated park/trail concept supported by a bin wall as a possible solution. The bin wall would be constructed of precast concrete sections that are post-tensioned together; similar to an upside-down rigid frame. This is the same type of construction as a precast U-wing for a precast concrete culvert. The wall would be filled with free-draining material and topped with a sidewalk slab and pedestrian railings.

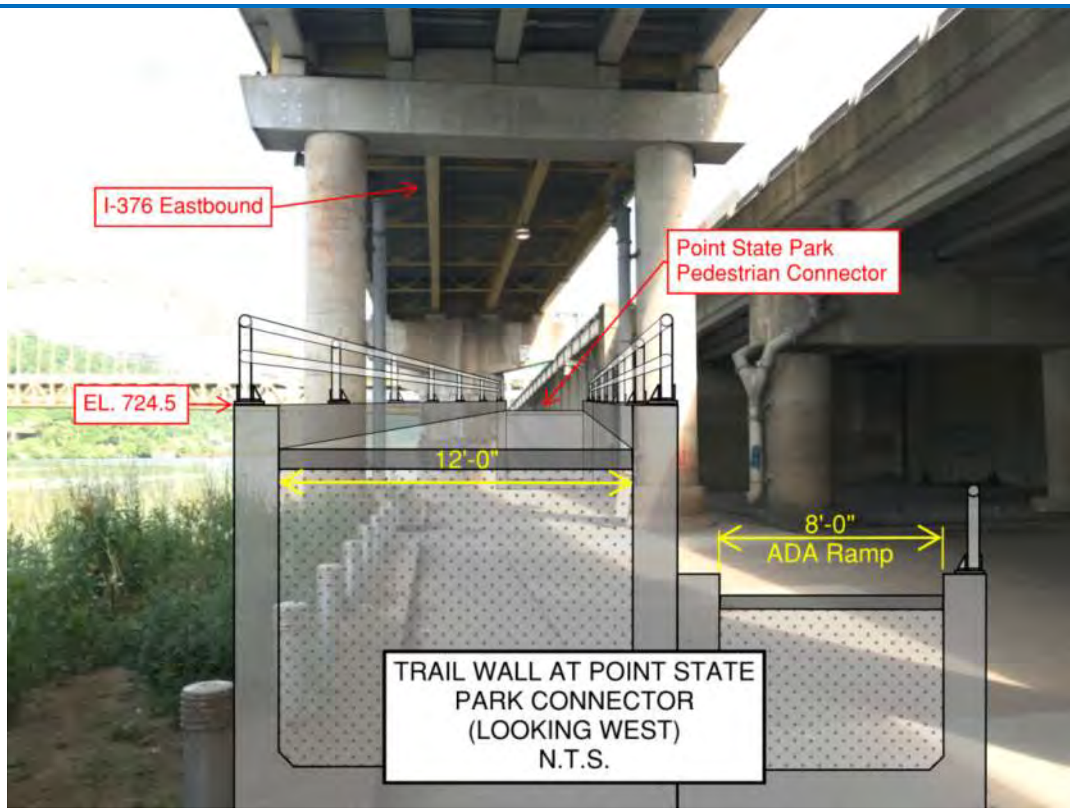
For the purposes of this proposal, AECOM considered a wall that supports a 12-foot wide trail with two 8-foot wide ADA ramps at either end leading down to the Mon Wharf parking lot. The top of wall was set at elevation 724.5 to provide an equal comparison to the alternate that raises the current floodwall to that height. However, the wall can be constructed wider or narrower, taller or shorter as necessary without impacting the 100-year FEMA flood elevation.

Beginning at the western end, the bin wall would pass beneath I-376 Eastbound and tie into the Point State Park pedestrian connector. The elevated park would continue along the river's edge to Smithfield Street where it would connect to the recently constructed switchback ramp for an approximate length of 2,150 feet. The lower switchback ramp would be removed and replaced with the bin wall.



PROPOSED RAISED PEDESTRIAN/BIKE TRAIL

(LOOKING WEST)


I-376 Eastbound
Point State Park
Pedestrian Connector
EL. 724.5
12'-0"
8'-0"
ADA Ramp
TRAIL WALL AT POINT STATE
PARK CONNECTOR
(LOOKING WEST)
N.T.S.


Grant St
EL. 724.5
12'-0"
8'-0"
ADA Ramp
TRAIL WALL AT SMITHFIELD ST.
BRIDGE PEDESTRIAN RAMP
(LOOKING EAST)
N.T.S.

The estimated cost of this alternative is $31,270,000 to $39,080,000 (not including costs for hydrostatic uplift mitigation). A detailed cost estimate appears in Appendix G.

4.3.1 - Impacts of Alternative

4.3.1.1 Traffic (MPT / Mon Wharf Parking) / Constructability

Constructing a new floodwall adjacent to the riverbank has the least impact to traffic of all the alternatives considered as I-376 Westbound traffic would remain uninterrupted for the entire duration of construction. The Contractor could stage on a barge and receive material deliveries via barge as well. Personnel and smaller equipment could access the work site via the Mon Wharf parking ramp. Additional staging and laydown areas also exist near the end of the Smithfield Street pedestrian switchback ramp.

Other than access to the work site, the Mon Wharf parking lot would remain mostly unaffected. The only parking spaces that would need to be possibly closed off are those that would be directly adjacent to the current location of work. Coordination with the Pittsburgh Parking Authority and compensation for the loss of parking spaces will likely be required. Additionally, because of the anticipated impact to parking the proposed elevated park/trail work could be broken up into manageable segment lengths and phased to reduce the overall impacts to the loss of parking spaces.

Obviously, this alternative will have a major impact on the users of the trail and the Mon Wharf Landing Park. The trail and park will need to be completely closed until construction is complete or sections detoured through the parking area by eliminating a series of parking spaces as the work progresses in a linear manner.

4.3.1.2 Utilities

The location of the current trail is largely devoid of existing utilities so relocations, both temporary or permanent, would not be a major concern. The 90” ALCOSAN interceptor that runs parallel to the trail is deep enough to not be impacted by the proposed at-grade construction.

4.3.1.3 Right-of-Way

The City of Pittsburgh owns the property where the proposed elevated trail wall would be located. Therefore, this project would need to be a partnership between PennDOT, the City of Pittsburgh, and Riverlife.

4.3.1.4 Environmental / Section 4(f)

The Section 4(f) process would need to be implemented for this project as the trail and park will need to be completely closed until construction is complete.

4.3.1.5 Existing Structures

It is anticipated that the proposed bin wall would replace the lower ramp of the Smithfield Street pedestrian switchback ramp. To ensure that the proposed wall is watertight, the wall would tie into the Smithfield Street abutment. The other end of the bin wall would snake between the concrete columns that support I-376 Eastbound with the wall tying into the existing I-376 Eastbound pier shaft and Fort Pitt Boulevard Eastbound abutment wall.

4.3.1.6 Future Maintenance

The pedestrian railing, landscape lighting, and snow and debris removal would be future maintenance items that are unique to this alternative. However, it is expected that future maintenance would be the responsibility of the Riverlife organization.

4.3.1.7 Driver's Expectations / Visibility

With the wall located adjacent to the river, driver's expectations through the corridor would not change from present day. Visibility to the river would be impeded by the elevated trail wall but, as mentioned before, this view is already hindered by the adjacent overpasses and support columns over the Mon Wharf parking area.

The height of the raised trail will reduce the amount natural light currently occurring in the Mon Wharf parking lot. Supplemental lighting of the Mon Wharf parking area may be required.

4.3.1.8 Stormwater System / H&H

The H&H analysis shows that raising the wall to elevation 725 does not have any impact to the FEMA 100-year water surface elevations. In fact, raising the elevated trail wall to any height does not cause any adverse effects making this alternative more flexible than the others as it is not encumbered by existing overhead structures.

The location of the elevated trail wall should have no physical impact on the existing stormwater system. The localized stormwater analysis performed for the storm sewer system that drains to the Big Bathtub indicates that the PennDOT storm sewer system has the capacity to convey the 25-year event without surcharging inlets. Raising the floodwall will result in requiring the sump pumps to be able to pump against that additional head.

4.3.2 – Advantages / Disadvantages of Alternative

Advantages

1. Potential to protect against the 100-year flood event. If wall is breached during a flood, serves as a first line of defense before current floodwall is overtopped and parkway is closed.
2. Protects the trail and Mon Wharf parking lot from frequent flooding that currently occurs
3. No impact to parkway traffic during construction and little impact to Mon Wharf parking during construction

4. Opportunity for additional funding sources from the City, Riverlife, and Friends of the Riverfront.
5. No impact to utilities
6. Low future maintenance
7. Contractor has room to stage directly adjacent to work area via a barge
8. Potential to improve the riverfront by expanding the park to include boat docks, outlooks, etc.
9. All new construction (no reliance on original construction circa mid-1980s)

Disadvantages

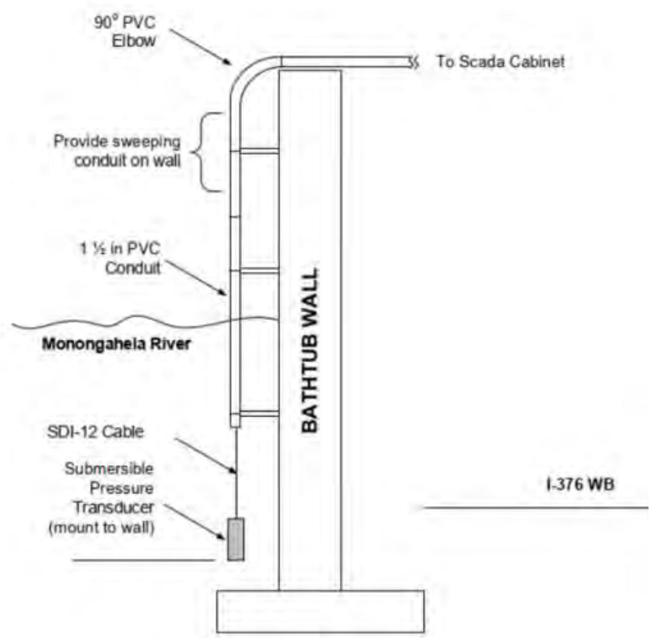
1. Higher cost
2. Requires coordination and agreement with City of Pittsburgh and Riverlife
3. Darkening of Mon Wharf parking area would require additional lighting
4. More complicated construction materials and methods compared to rebuilding the current floodwall (but less complicated than tunnel construction)

4.4 Alternative T1 – Automated Flood Detection and Gate System

This proposed automated system has been proposed to significantly reduce the time and labor force required to close and reopen to traffic the seven access points to the I-376 Parkway East Bathtub area during a flood event. Aligning with the PennDOT response procedures, AECOM has developed recommendations for an Automated Flood Detection/Gate System to be located within and outside the Bathtub area. The system includes a network of advanced warning and detour route DMS signs and gates that can be activated remotely prior to a flood event.

AECOM has determined that additional remote ITS cabinets can be installed and integrated within the existing fiber and wireless Western Regional Transportation Management Center and Ft Pitt Tunnel communication network. Expansion of the existing Fort Pitt Tunnel PLC Scada Monitoring and Control System can be accomplished to incorporate the control of an automated Flood Detection and Gate System coinciding with current flood emergency closure procedures.

Using pressure transducers mounted against the bathtub walls to monitor actual river levels, the Scada system can send out alarms at various critical levels in a timely manner so that Fort Pitt Tunnel maintenance personal can respond quickly to assist the closing of the potential automated sluice gates at the sump locations, Interstate connector and I-376 WB at Grant St off-ramp. Gate closings would be fully automated and would not necessitate the need to use PennDOT resources to field deploy traffic barricades and signs.



The following figure shows the proposed gate locations for the seven access points into and out of the bathtub area that would require closure during a flooding event. Gate locations are shown in light red and are consistent with the following access locations (listed in order of priority).

1. I-376 WB before Grant Street off-ramp
2. Ramp from Grant Street to I-376 WB
3. I-279 SB to I-376 EB on Portal Bridge
4. Access from Point State Park to I-376 EB
5. Ramp from Stanwix Street to I-376 EB
6. Ramp from Market Street to I-376 EB
7. Ramp from Wood Street to I-376 EB

With respect to the seven access areas for proposed gate closures, Additional CCTV coverage is required to view the added gate areas. The table below identifies where new CCTV coverage will be needed.

Gate Location	Existing CCTV	Additional CCTV
I-376 WB before Grant Street off-ramp	YES	NO
Ramp from Grant Street to I-376 WB	YES	Possible
I-279 SB to I-376 EB on Portal Bridge	YES	Possible
Access from Point State Park to I-376 EB	NO	YES
Ramp from Stanwix Street to I-376 EB	NO	YES
Ramp from Market Street to I-376 EB	NO	YES
Ramp from Wood Street to I-376 EB	NO	YES

To warn motorists in advance of a flooded bathtub condition, a combination of nine (9) existing and three (3) additional DMS sign locations are proposed.

<u>EXISTING:</u>
1. DMS 213 - I-279SB, Hazlett ST [Overhead Full matrix DMS]
2. DMS 209 - RT65SB – RT65/McKees Rocks Bridge [Center mount DMS]
3. DMS Insert – I-376WB – County Jail [Grant St Exit Sign DMS Insert]
4. DMS Insert – I-376WB – 2nd Ave [Grant St 3/8th Mile Sign DMS Insert]
5. DMS 50 – I-376 WB, Bates St [Overhead Full matrix DMS]
6. DMS 60 – I376 WB – Saline St [Overhead Full matrix DMS]
7. DMS 70 – I376 WB – Edgewood [Overhead Full matrix DMS]
8. DMS 80 – I376 WB – Greensburg Pike [Overhead Full matrix DMS]
9. DMS 90 – I376 WB – Penn Hills [Overhead Full matrix DMS]

<u>PROPOSED:</u>
1. Three new replacement DMS signs near Heinz field
2. Overhead DMS sign on Ft Duquesne Bridge on existing sign support for I-279 SB
3. Full Truss or Centermount DMS on I376WB 1 mile in advance of Grant St

In addition to the automatic flood detection and gate system and advanced warning via DMS signs, it is proposed that the detour route signing for I-376 Eastbound also be automated using DMS signs along the Banksville Rd Interchange detour loop.

Additional details and the cost estimate for the proposed system can be found in Appendix E.

The estimated cost for the system outlined above ranges from $4,100,000 to $5,200,000.

4.5 Alternative T2 – Traffic Analysis

Per the Scope of Work, AECOM performed a traffic analysis to optimize traffic flow along the detour route during flood events.

Using the turning movement counts collected in 2017 as part of the Downtown CBD Traffic Counts, ADT data provided by PennDOT, and INRIX data, traffic analysis was performed to determine the effects of a closure of the Bathtub section of I-376 West on the detour route of the CBD. Based on this analysis, the following are recommendations to increase the flow of traffic along the detour route:

1. Optimize traffic signal cycle lengths, splits, and offsets
   - Although optimizing the traffic signal lengths, splits, and offsets will not yield acceptable LOS or queuing, it will maximize the flow of traffic along the detour route.
   - Existing traffic signal phasing should remain.
   - Cycle lengths should be short enough that pedestrians comply with the pedestrian phasing and minor street traffic does not significantly impact adjacent intersections within the CBD.

2. Modify the traffic signal progression along the detour route.
   - Modify the reference phase for coordination at two intersections along the detour route in order to progress the flow of traffic along the detour route.

3. Coordinate with the City of Pittsburgh to implement timing plan during flood event
   - Coordination with the City of Pittsburgh should occur to establish a plan for when a flood event occurs and I-376 West traffic must be detoured through the CBD.
   - A predetermined timing plan should be established that can be implemented remotely for the intersections along the detour route to move traffic as efficiently as possible during a flood event.

4. Implement DMS warning messages
   - DMS warning messages should be used to alert drivers that the Bathtub section of I-376 West is closed.
   - The DMS messages should be displayed along I-376 West approaching the closure and, if possible, at the Pennsylvania Turnpike Interchange with I-376 West.

The analysis shows that implementing the recommendations above can reduce the detour route travel time as much as 13% for the AM Peak, 46% for Midday, and 11% for the PM Peak.

Additional details on the proposed recommendations can be found in Appendix F.

Because the recommendations are simply programming modifications to existing traffic hardware, the estimated cost for this alternative is less than $10,000. This alternative can be combined with alternative T1 and T3 or implemented by itself until the other alternatives can be constructed.

4.6 Alternative T3 – Improve Cleanup Time

This alternative provides larger capacity pumps and other equipment necessary to reduce the amount of time to dewater and clean up the parkway after an overtopping event.

The current procedure to dewater both bathtub areas is as follows. The existing permanent 4-inch pumps at the Stanwix Street and Wood Street sump locations are undersized and cannot handle mud and other flood-related debris. Therefore, these pumps are deactivated just prior to the wall being overtopped. After the wall is breached and the floodwaters have receded below the wall, a Contractor, on retainer with PennDOT, trailers in larger 6-inch centrifugal pumps at the Mon Wharf and Stanwix Street Ramps. The 6-inch standpipe systems are used to pump out the bathtub areas more quickly than the 4-inch pumps and without mud and flood debris clogging the pumps. Once the water level in the bathtub reaches a point that the 6-inch pumps are ineffective and flood debris is not a concern, the 4-inch pumps are activated to remove the remaining water.

Runoff volumes to the Big Bathtub and the Ramp D/Tunnel Area were determined and incorporated into evaluating the existing conditions. The existing storm sump pump curves were incorporated into the SWMM model. Alternate pumping rate scenarios were determined through an excel spreadsheet of drawdown times as described in Appendix B. The model was run to determine possible flooding from the drainage systems and it was found to be able to handle the 25-year design event without surcharging the storm sewer system.

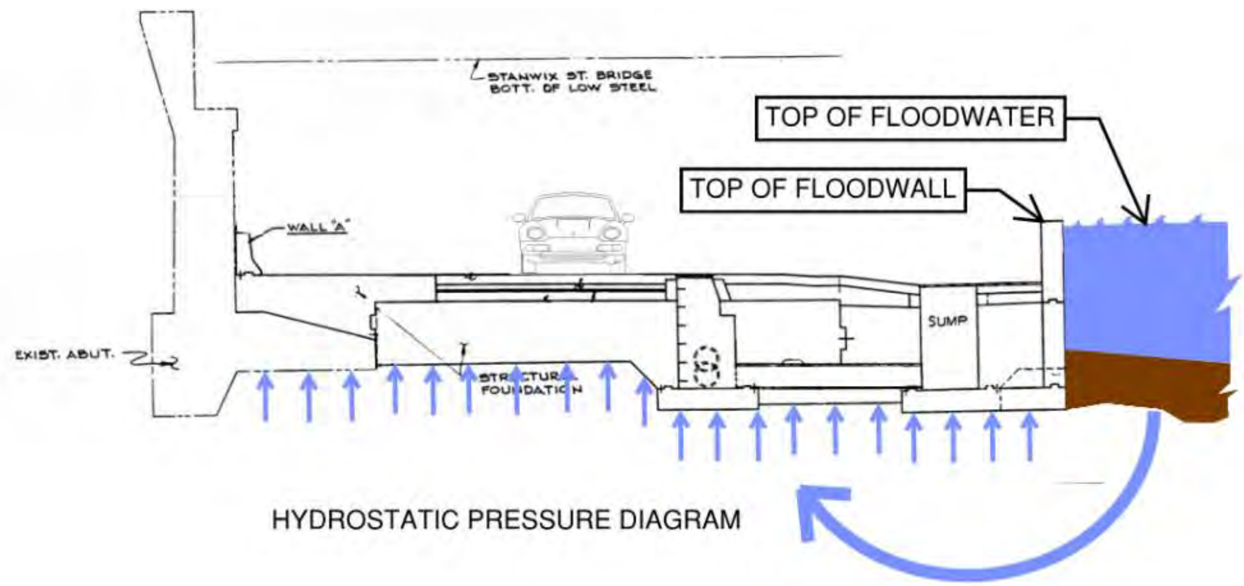
5.0 Geotechnical Summary

5.1 Generalized Subsurface Conditions

AECOM compiled a subsurface profile from thirty-two (32) available existing borings from previous projects within the corridor. The subsurface profile appears in Appendix C. The subsurface conditions below the existing I-376 structure generally consists of alluvial sand and gravels overlying decomposed rock and then bedrock at a depth of approximately 70 feet. Bedrock is siltstone and sandstone. The alluvial sands and gravels do not have any laboratory testing which would indicate fines content or grain-size distribution.

5.2 Hydrostatic Uplift Pressure

As mentioned in Section 3.1, the current wall height is limited by the hydrostatic uplift pressure that is exerted on the spread footings beneath the parkway during flood events. If the current wall were built any taller, there is the risk that the hydrostatic pressure could heave the foundations, and the riding surface of the parkway, upwards after a flood event.



AECOM completed a draft hydrostatic uplift calculation which revealed that the existing foundation thicknesses were varied to maintain a factor of safety against uplift of approximately 1.3 for the current top of wall elevation of 719.5 (720 NGVD 29). The calculation supports the notion that the current floodwall height was limited by the hydrostatic uplift pressure exerted on the wall foundation slabs beneath I-376. Raising the wall elevation to 724.5 results in factors of safety against uplift of less than 1.0 at all locations. A minimum factor of safety of 1.25 is recommended for temporary uplift resisted by dead weight. For uplift resisted by tie-downs or anchors that rely on soil or rock strength, a higher factor of safety would be required. Therefore, retrieval of additional data to complete a less conservative analysis and/or physical mitigation of the uplift pressure will be required in conjunction with raising the wall. The full calculation appears in Appendix C.

			EXISTING FLOODWALL			PROPOSED FLOODWALL		
Wall	Fdn Panel	Ftg Thick (FT)	T/Wall Elev. NGVD 29	Stem Height (FT)	Uplift F.S.	T/Wall Elev. NAVD 88	Stem Height (FT) (1)	Uplift F.S.
B	13, 12	4	720.00	5.2	1.40	724.5	10.2	0.94
B	10, 11, 10S	4.5	720.00	5.6	1.40	724.5	10.6	0.96
B	6-9	4	720.00	5.2	1.40	724.5	10.2	0.94
B	5	3.5	720.05	4.5	1.46	724.5	9.5	0.94
B	4	3	720.46	4.3	1.42	724.5	8.9	0.92
B	3	2.5	721.23	4.4	1.34	724.5	8.2	0.91
B	2	2	722.17	4.5	1.24	724.5	7.4	0.91
B	1	1.5	723.19	4.5	1.14	724.5	6.4	0.93
C	49	6	720.00	7.5	1.31	724.5	12.5	0.98
C	47S	6.5	720.00	8.1	1.29	724.5	13.1	0.99
C	46-44	6	720.00	7.5	1.31	724.5	12.5	0.98
C	34	3.5	720.04	4.6	1.45	724.5	9.5	0.93
C	33	3	720.27	4.2	1.45	724.5	9.0	0.91
C	32	3	720.50	4.4	1.41	724.5	9.0	0.91
C	31	3	720.73	4.7	1.37	724.5	9.0	0.91
C	30	2.69	720.88	4.1	1.43	724.5	8.3	0.93
C	29	2.61	720.97	4.3	1.38	724.5	8.3	0.91
C	28	2.56	721.00	4.4	1.36	724.5	8.4	0.90
C	27	2.52	721.02	4.4	1.34	724.5	8.4	0.89
C	26	2.5	721.21	4.6	1.30	724.5	8.4	0.89
C	25N	2	721.85	4.5	1.24	724.5	7.7	0.88
C	24N	1.5	723.47	5.0	1.06	724.5	6.5	0.92

- F.S of 1.14 and 1.06 for Wall B - Panel 1 and Wall C - Panel 24N, assumes that the water rises to the top of the existing wall, however the current water level is limited to elevation 720 due spillover at the pump locations. Therefore, these numbers are conservative.

- (1) Includes a 0.53' increase in height due to conversion of NVGV 29 Datum to NAVD 88 Datum for B/Ftg Elevation

5.3 Alternative U1 - Retrieve Additional Subsurface Data and Monitor Groundwater

Additional detailed data should be retrieved via additional borings to obtain samples for grain size testing. Also, piezometers can be installed to monitor water pressure below grade near the existing wall during highwater events. The grain size testing can be used for seepage analysis and for design of a relief well system if selected. The piezometric monitoring can be used to verify the current hydrostatic pressure assumptions and results from the seepage analysis. Performing a detailed seepage analysis could possibly show that a taller wall will not result detrimental uplift effects and that physical underground mitigation measurement are not required. AECOM routinely designs automated monitoring systems for piezometers for dams and levees. Specialized software developed for the Army Corps of Engineers by AECOM called DamSmart would be a good application here to remotely monitor the groundwater and plot piezometer data along with river stage elevations. (https://www.geoengineer.org/software/damsmart). The estimated cost for a test boring program (4 to 8 test borings) with piezometers and automated data acquisition is on the order of $150,000 to $200,000.

5.4 Alternative U2 - Tie-In to Existing Structures

Thickened pavement sections generally abut existing structures, e.g. bridge abutments, bridge piers, retaining walls, that potentially could provide additional dead weight and skin friction from existing piles to resist buoyancy. In order to engage the weight of these structures, it may be necessary to dowel the existing thickened pavement sections to them. This would entail drilling and grouting rebar through the thickened pavement sections along their edges into these existing structures. Calculations would need to confirm that the thickened pavement sections have the bending resistance to transfer the buoyant forces to the edges of the pavement and into the existing structures. The disadvantage of this system is that it is non-redundant so individual anchor failures could be a concern. Some of the adjacent structures (Fort Pitt Boulevard Westbound retaining wall, Mon Wharf parking entrance ramp, Mon Wharf retaining wall) are owned by the City of Pittsburgh so an agreement would need to be reached to tie into their structures. Estimated cost for dowelling into existing structures is on the order of $2,000,000 to $3,000,000. However, dowelling may not be required everywhere.

5.5 Alternative U3 - Tie-Downs Anchoring to Bedrock

The thickened pavement sections could also be anchored to bedrock by tie-downs such as rock anchors (grouted bars) or micropiles (small-diameter pipe piles) drilled into bedrock. These could provide high capacity anchors to resist the buoyant forces below the pavement. The bending capacity of the existing thickened pavement section would likely control the anchor spacing. Anchors could be installed on roughly a grid spacing or as needed to supplement doweling to the existing structures as noted above where it was not feasible to install dowels.

A disadvantage of both tie-in/ tie-down options is that they would require working within the roadway and related traffic control and lane closures. Another disadvantage of this non-redundant system is that individual anchor failures could be a concern. A key advantage is that neither solution would rely on mechanical/ electrical systems that are inherently less reliable and require periodic maintenance. Estimated cost is on the order of $3,000,000 to $5,000,000.

5.6 Alternative U4 - Pressure Relief Wells

Pumped relief wells would logically be installed below the Mon Wharf parking lot along the riverside edge of the depressed pavement section to lower the piezometric head in the sand and gravel aquifer. To minimize the number of wells, they should be fully penetrating and designed for a flow that will not lower the water level deeper than about 10 to 20 ft above the top of the well screen. It is estimated that wells spaced between 100 and 300 feet apart will be required to achieve a minimum drawdown to an elevation no higher than the top of the pavement throughout the depressed roadway section. The wells could be designed with individual submersible pumps automatically operated with level controls. The wells would discharge through a buried collector to the storm drainage system for the highway.

A more efficient pumping system that would not require level controls in each well would be a central wet well with a duplex pumping system. It would be ideal if the existing storm drainage pumping system has adequate capacity, of if not, it can be modified to handle the pressure relief well flows. The required flow from the well system will probably be on the order of 1,000 to 3000 gallons per minute. The design investigation will consist of test borings to the bottom of the sand and gravel aquifer, laboratory testing, groundwater quality testing, installing one or more piezometers to monitor groundwater levels and the piezometric response to varying river stages over time, and a 72-hour pumping test on a prototype well with 3 to 5 piezometers installed at varying radii from the well. Daily river stages for at least the past 20 years would be analyzed to select a design river stage for the pressure relief system.

Maintenance of the well system will likely comprise periodic specific capacity testing and chemical treatment/ redevelopment of the wells at least every 5 years. Pump and standby generator maintenance should be like that for the existing pumping system, especially if central pumping is selected. Depending on the groundwater chemistry and microbiology, the service life of the wells should be 25 to 75 years.

The Illinois Department of Transportation has been operating and maintaining several high capacity individually pumped relief well systems for interstate and other highways in the American Bottom of the Mississippi River near St. Louis since the mid-1960s. The New York State Department of Environmental Conservation has been operating and maintaining 65 pressure relief wells, most of which discharge into buried collectors, along its federally constructed flood protection levees in Elmira during flooding of the Chemung River since the early 1950s. More than half of the Elmira wells were replaced in the mid-1970s and now New York State is replacing all wells in the system, along with all buried collector pipes, even though a third of the original wells and all of the buried collector pipes are still performing satisfactorily.

The estimated cost of installation is on the order of $2,000,000 to $3,000,000, not including O&M.

5.7 Alternative U5 - Cut-Off Walls

Installing a cut-off wall to the bedrock would essentially seal off any seepage and potential slab uplift associated with a river rise. Options for these cutoff walls would include: (a) secant pile wall (overlapping drilled shafts); (b) heavy steel sheeting jetted to bedrock; or (c) cement-bentonite slurry wall. These options are quite expensive and would also require that they be tied into high ground along the river or towards the city. These options represent an order of magnitude more expensive than the other options discussed. The estimated cost is in excess of $10,000,000.

6.0 Hydrologic and Hydraulic Summary

A Hydrologic and Hydraulic (H&H) study was performed along the Monongahela River in the vicinity of I-376 Bathtub. The project site is located in a detailed FEMA study area (Zone AE) with a floodway. Proposed alternatives that encroach in the FEMA floodplain are allowed WSE increases up to 1.00 feet without a Conditional Letter of Map Revision (CLOMR). Proposed alternatives that encroach into the FEMA floodway and result in 100-year event WSE increases above 0.00 feet will require a CLOMR. It is likely that the different alternatives will have different FEMA requirements based on the conceptual plans. Changes to the existing floodwall or the construction of a tunnel would likely occur in the FEMA floodplain, while the construction of the new elevated trail adjacent to the Monongahela River would likely infringe into the FEMA floodway. Although some alternatives may allow 100-year WSE increases up to 1.00 feet, it is important that no increases to the 100-year WSE occur to ensure no impacts to adjacent properties.

The existing conditions and proposed alternatives were modeled in the HEC-RAS Version 5.0.6. The peak flow for the 100-year regulatory event was obtained from the Allegheny County FEMA FIS. The model extends approximately 7,600 feet upstream of the confluence with the Allegheny River. Water surface elevations at the project site are affected by highwater on the Allegheny River and Ohio River. Furthermore, the Ohio River water stages are controlled by Emsworth Dam. The hydraulic analysis considers the effects of Allegheny River, Ohio River and Emsworth Dam located downstream of the project site.

Several proposed alternatives have been developed to alleviate flooding on I-376 Bathtub. The proposed alternatives are conceptual and will be finalized in future stages of the proposed project. Alternatives include raising the existing floodwall elevation at the current location, an elevated trail between the Monongahela River and the Mon Wharf parking lot, and a tunnel between the existing floodwall and Fort Pitt Boulevard Westbound. Each alternative analyzed provides a different level of protection from flood events depending on the elevation of the floodwall or elevated trail.

The preliminary results of the hydraulic model show that the proposed alternatives do not result in water surface elevation increases for the 100-year event; therefore, a CLOMR is not anticipated based on the conceptual alternatives evaluated for the I-376 Bathtub.

Note the current H&H results only consider the river flows. The impact of higher head on the river will need to be evaluated with the stormwater system to evaluate if it will surcharge back into the Bathtub area during the preliminary engineering phase.

Complete details of the H&H analysis can be found in Appendix A.

7.0 Stormwater Summary

A stormwater analysis was performed to evaluate the PennDOT District 11-0 (PennDOT) drainage systems and surface flooding into the Bathtub section of the Interstate 376 (I-376) Central Parkway, which encompasses the low area on I-376 West from Grant Street to the Ft. Pitt Bridge. The purpose of the stormwater analysis was to determine if the localized stormwater runoff (runoff from the road and impervious drainage areas to the sump chambers) and storm sewer surcharge is a source of the flooding and see how it might be interconnected to the river flooding.

The three areas of the Central Parkway that typically flood are the Ramp D/Tunnel Area near Grant Street; the “Big Bathtub” area (Wood Street Sump); and the “Little Bathtub” area (Stanwix Street Sump). It was determined during analysis of the collected plan and survey data, preliminary analyses and conference calls, that the sluice gate systems for the Little Bathtub and the Big Bathtub were working properly, and there was not a need to do detailed stormwater PCSWMM modeling any further. It was decided to concentrate on the tunnel/Ramp D flooding area. In analyzing this area, it was discovered that the storm system in this area tied into the Big Bathtub system and sump. Therefore, the PCSWMM model was set up for the entire tunnel/Ramp D and Big Bathtub interconnected areas.

NTM then evaluated the data available for the drainage systems in this section of the Central Parkway. Data provide by others included detailed topography of the drainage area to the Big Bathtub and the surrounding drainage area at 0.5-foot intervals. Plan data on existing conditions was supplemented with field survey. All storm sewers, drainage systems and appurtenance works were evaluated to determine if they should be included in the PCSWMM model.

NTM delineated drainage areas to the three areas of flooding and set up a PCSWMM model for the Big Bathtub area including the tributary areas from the tunnel/Ramp D. Runoff peaks and volumes to the Big Bathtub and the Ramp D/Tunnel Area were determined and incorporated into evaluating the existing conditions. The existing storm sump pump curves were incorporated into the SWMM model, although they had negligible effect in relation to the floodwaters and serve simply as a “after the storm” drawdown mechanism. The model was run to determine possible flooding from the drainage systems, and it was found to be able to handle the 25-year design event without surcharging the inlets of the storm sewer system. Alternate pumping rate scenarios were determined and drawdown times determined as described in Appendix B. Essentially, doubling the pump rate capacity will reduce the drawdown time in half. The final sump and pump size and configuration will be required in the preliminary engineering phase based upon the desired drawdown times.

The storm sewer system southeast of the tunnel drains directly to an ALCOSAN diversion structure, and then drains directly to the river. There is a flap gate at the diversion structure designed to keep the river backwater from surcharging the PennDOT system at this location. However, the condition of the flap gate, and its capability to seat properly was not available and should be investigated in the preliminary engineering phase. There was flooding in the Ramp D/tunnel area in the September 8 to 10, 2018 event where the river was up, flap gates supposedly closed and it continued to rain over the I-376 area. However, the inlets in this area were discovered to have accumulation of sediment, and if clogged, the surface runoff would flow to the Big Bathtub system. The Big Bathtub stormwater model was set up to account for this. It should be determined through field investigation if the flooding was due to the river backwater or the inlets and storm system being clogged with sediment. Near term, removal of sediment from the inlets and storm system should be performed. New inlet modifications, capacity, possible offline sediment traps, and efficient maintenance activities should be considered in the preliminary engineering phase.

Since the ALCOSAN storm sewer system and the PennDOT system are tied together in this area, it is recommended that both systems be tied together and modeled to determine, together with the results of the flap gate inspection, if the river backs up into this area. Additional details on the current analysis of the stormwater system can be found in Appendix B.

Appendix A:

Hydrologic and Hydraulic Memorandum

APPENDIX A - ALTERNATIVES ANALYSIS
HYDROLOGY & HYDRAULICS MEMO

Interstate 376 (I-376 Bathtub)
Monongahela River

City of Pittsburgh
Allegheny County, Pennsylvania

Prepared For:

pennsylvania
DEPARTMENT OF TRANSPORTATION
DISTRICT 11-0

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I-376 BATHTUB ALTERNATIVES ANALYSIS
ALLEGHENY COUNTY | PENNDOT DISTRICT 11-0

I. INTRODUCTION AND PROJECT DESCRIPTION

A Hydrologic and Hydraulic (H&H) study was performed along the Monongahela River in the vicinity of Interstate 376 (Penn Lincoln Parkway) known as the "I-376 Bathtub". The purpose of the study is to analyze alternatives that alleviate current flooding problems in the vicinity of the I-376 Bathtub. The existing condition on I-376 includes a depressed section where the highway passes through downtown Pittsburgh near Point State Park, immediately adjacent to the Monongahela River. The I-376 Bathtub sits lower than most areas along the riverbank; however, a floodwall was constructed in mid-1980s to reduce the frequency of flooding in the I-376 Bathtub. Since the floodwall was constructed, I-376 has been closed several times due to flooding. The current project includes a detailed hydrologic and hydraulic study to evaluate the frequency of overtopping of the highway. Furthermore, the purpose of the current project is to analyze alternatives to minimize flooding on the highway.

This section of the Monongahela River is immediately upstream of the junction of the Monongahela River with the Allegheny River to form the Ohio River. The project site is located within the City of Pittsburgh in Allegheny County, Pennsylvania on the USGS quadrangle maps entitled Pittsburgh East, PA and Pittsburgh West, PA. The project location is shown in **Figure A-1.**

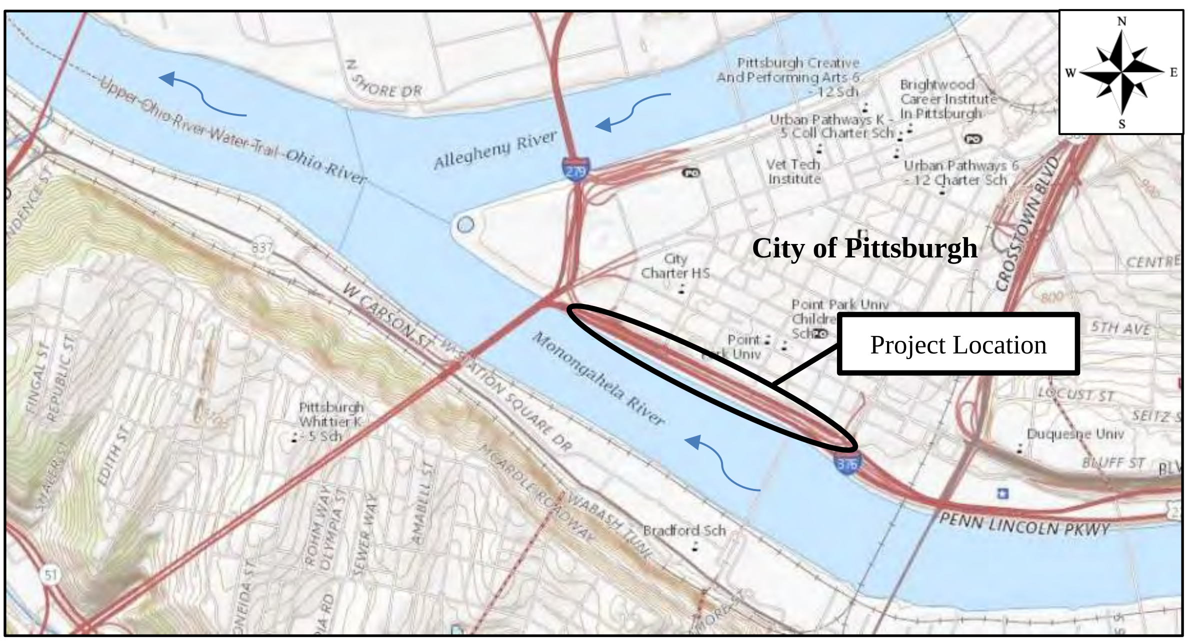

Figure A-1: Project Location

A separate stormwater analysis is being conducted to ensure that stormwater surcharge is also considered for proposed alternatives that prevent the Monongahela River from flooding the I-376 Bathtub.

All elevations in this report are referenced to the NAVD 1988 datum, unless noted otherwise. NTM conducted a field view on January 16, 2020 to collect information relevant to the H&H study. Photographs from the field view and project location maps are provided in **Appendix A-1.**

II. HISTORY OF FLOODING

The I-376 area has an extensive history of flooding, and in the mid-1980s a floodwall was constructed to reduce the frequency of flooding in the Bathtub. Since the existing wall was constructed, the I-376 Bathtub has flooded or been closed several times due to high water on the Monongahela River overtopping the floodwall or being within a foot of the top of the wall. PennDOT monitors high water from the Monongahela River using the Ohio River NOAA Gage at Pittsburgh[1] as well as a Gage located in the Mon Wharf parking lot near the Big Bathtub. A photograph of the gage located at the Mon Wharf parking lot is shown in **Photograph #10** in **Appendix A-1**. By monitoring the river stages near the project site, PennDOT is able to anticipate potential flooding at the I-376 Bathtub. When the Monongahela River water surface elevations (WSE) are within one foot of the top of the floodwall (NOAA River Stage 24.0 feet, WSE 718.5 feet), I-376 is closed due to potential overtopping. According to the Ohio River NOAA Gage at Pittsburgh, WSE at the Fort Pitt Bridge have reached or exceeded the I-376 Bathtub closure elevation seventeen times since 1985. The NOAA Gage shows that the highest stage since 1985 occurred in January 1996 with a river stage of 34.6 feet (WSE 729.1 feet). In 2018 the I-376 Bathtub was closed three times within the same calendar year. **Table A-1** provides a summary of the relevant flood events since 1985 with the river stage, water surface elevation, discharge and approximate return period. Note that the NOAA Gage has recorded higher historic flood events prior to the construction of the floodwall with a maximum recorded river stage of 46.0 feet (WSE 740.5 feet) in 1936.

As shown in **Table A-1**, several events that reached a river stage of 24.0 feet have low return periods. The USGS gage record also showed that events with a similar discharge had lower river stages at the NOAA Gage. Due to the close proximity of the Ohio River and Allegheny River, high water at the I-376 Bathtub can be impacted by the conditions downstream. The Emsworth Dam is located downstream on the Ohio River. Therefore, a detailed analysis was performed to determine the impact of Emsworth Dam on water surface elevations at the project site.

[1] https://water.weather.gov/ahps2/hydrograph.php?wfo=pbz&gage=pttp1

Table A-1: Flooding Events on I-376 Bathtub between 1985-2019

Date	River Stage[1] (feet)	WSE[2] (NAVD 88, feet)	Discharge[3] (cfs)	Approximate Return Period[4]
02/09/2019	24.4	718.9	61,500	1-year
09/11/2018	27.1	721.6	105,000	5-year
02/17/2018	27.5	722.0	120,000	9-year
01/13/2018	25.3	719.8	67,300	1-year
03/12/2011	26.7	721.2	67,900	1-year
12/02/2010	25.3	719.8	58,200	1-year
01/26/2010	25.8	720.3	85,300	2-year
03/16/2007	23.9	718.4	41,600	1-year
01/06/2005	28.4	722.9	91,100	3-year
09/18/2004	31.0	725.5	75,800	2-year
11/20/2003	25.7	720.2	121,000	9-year
01/09/1998	25.6	720.1	64,600	1-year
01/20/1996	34.6	729.1	167,000	45-year
12/31/1990	27.2	721.7	86,000	2-year
12/19/1990	24.7	719.2	92,100	3-year
02/06/1986	24.9	719.4	82,600	2-year
11/06/1985	26.2	720.7	178,000	66-year

[1] River Stage according to Ohio River NOAA Gage at Pittsburgh
[2] Approximate water surface elevations at the I-376 Bathtub
[3] Discharge according to USGS Gage 03075070 Monongahela River at Elizabeth, PA
[4] Approximate Return Period calculated at USGS Gage 03075070 Monongahela River at Elizabeth, PA

III. EMSWORTH DAM

Emsworth Dam is located on the Ohio River approximately 6.3 miles downstream of the project site. Construction of the Emsworth Dam was completed in 1922; the dam was converted into a gated structure by 1938. The Dam is owned and operated by the US Army Corps of Engineers for the purpose of maintaining an acceptable water level for navigation on the Ohio River. However, the hydrologic and hydraulic study indicates that the water surface elevations at the I-376 Bathtub may be dependent on the conditions set at the Emsworth Dam.

An analysis was performed to compare events on the Monongahela River with different conditions at Emsworth Dam. The results show that the Monongahela River water surface elevations at the I-376 Bathtub can vary significantly depending on the conditions at Emsworth Dam. A sensitivity analysis was performed using the existing hydraulic model and available gage data to evaluate the influence of

Emsworth Dam on water surface elevations at the I-376 Bathtub. The analysis showed that the difference was significant for events with a low return period; however, the difference for events with a higher return period was minimal. **Figure A-2** includes water surface elevations for the 1, 2, 5, and 10-year events with and without the influence of Emsworth Dam for comparison. The figure also shows water surface elevations for the 25, 50, and 100-year events as well as the top of floodwall elevation for reference. Note that I-376 Bathtub is closed when water surface elevations on Monongahela River are 1-foot below the top elevation of the floodwall.

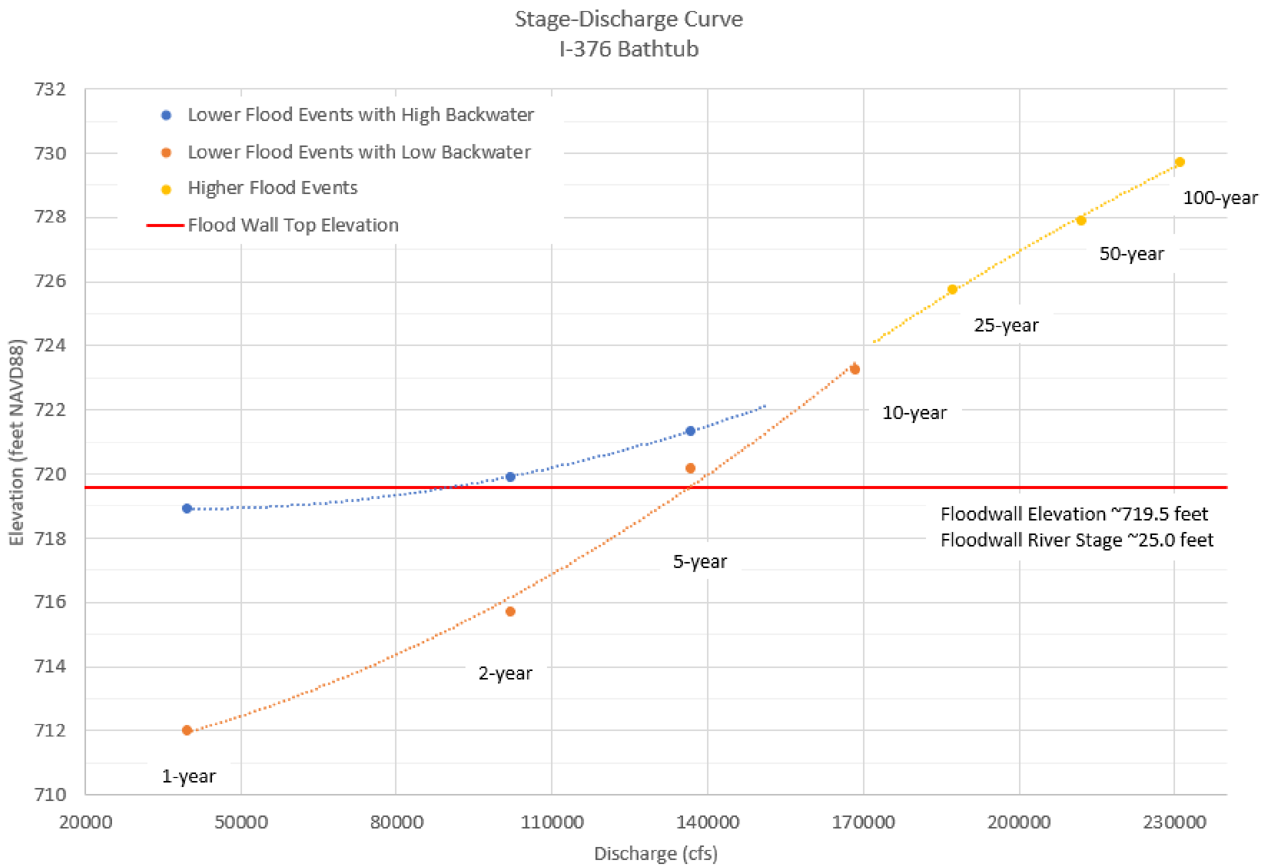

Figure A-2: WSE Comparison at the I-376 Bathtub with different downstream conditions

IV. PROPOSED ALTERNATIVES

Several proposed alternatives have been developed to alleviate flooding on I-376 Bathtub. The proposed alternatives are conceptual and will be finalized in future stages of the proposed project. Alternatives include raising the existing floodwall elevation at the current location, an elevated trail between the Monongahela River and the Mon Wharf parking lot, and a tunnel between the existing floodwall and Fort Pitt Boulevard Westbound. Conceptual plans with the proposed alternatives layout are provided in **Appendix A-2**.

The lowest elevation at the existing floodwall is approximately 719.5 feet. Proposed alternatives include raising the existing floodwall elevation by 2 to 5 feet. If the proposed floodwall is raised by 2 feet the lowest floodwall elevation would be approximately 721.5 feet. Similarly, if the proposed floodwall elevation is raised by 5 feet, the lowest floodwall elevation would be 724.5 feet.

The existing conditions features a trail in the right overbank between the Monongahela River and the Mon Wharf parking lot. Several proposed alternatives have been developed to elevate the existing trail at the same location to prevent floodwaters from inundating the Mon Wharf parking lot and the I-376 Bathtub.

An additional alternative was considered to construct a tunnel at the I-376 Bathtub to prevent floods from inundating the highway. The tunnel is proposed between the existing floodwall and Fort Pitt Boulevard Westbound to encapsulate the I-376 Westbound roadway and the I-376 Bathtub. The top elevation of the tunnel will be similar to the top elevation of the retaining wall along Fort Pitt Boulevard above the 100-year flood. However, the tunnel will accommodate two access points for the Mon-Wharf parking lot ramp and the Stanwix Street exit ramp that will cause a 50-year event to flood the tunnel.

V. FEMA REGULATIONS

The Federal Emergency Management Agency (FEMA) published a Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) for Allegheny County on September 26, 2014. The I-376 Bathtub is located in detailed FEMA study area (Zone AE) with a floodway. Proposed alternatives that encroach in the FEMA floodplain are allowed WSE increases up to 1.00 feet without a Conditional Letter of Map Revision (CLOMR). Proposed alternatives that encroach into the FEMA floodway and result in 100-year event WSE increases above 0.00 feet will require a CLOMR. It is likely that the different alternatives will have different FEMA requirements based on the conceptual plans. Changes to the existing floodwall or the construction of a tunnel would likely occur in the FEMA floodplain, while the construction of the new elevated trail adjacent to the Monongahela River would likely infringe into the FEMA floodway. Although some alternatives may allow 100-year WSE increases up to 1.00 feet, it is important that no increases to the 100-year WSE occur to ensure no impacts to adjacent properties. FEMA maps at the project location along with excerpts of the FEMA FIS are included in **Appendix A-3**.

The Monongahela River hydrology contained in the FEMA FIS was derived from a standard log-Pearson Type III analysis of stream gage data from the Monongahela River using the Bulletin 17B method. This method is an approved methodology for PennDOT projects. The FEMA hydrology for the Monongahela River was most recently updated in the October 4, 1995 FIS. The FEMA 10-, 50-, 100-, and 500-year peak flows in the vicinity of the I-376 Bathtub are shown in **Table A-2**.

FEMA developed a HEC-2 hydraulic model for the Monongahela River to produce the 100-year flood elevations in the FIS. NTM obtained electronic copies of the HEC-2 input/output from FEMA. The FEMA

FIS is based on the NAVD 1988 datum, while the FEMA HEC-2 data is based on the NGVD 1929 datum; therefore, a datum conversion was required for the HEC-RAS data. According to the National Geodetic Survey VERTCON tool, the NGVD 29 height must be adjusted by -0.531 feet to convert to NAVD 88. Excerpts of the FEMA HEC-2 along with the VERTCON datum conversion are included in **Appendix A-3**.

VI. HYDROLOGIC ANALYSIS

The drainage area for the Monongahela River upstream of the confluence with the Allegheny River, as delineated with the USGS StreamStats website[2], is 7,380 square miles. A drainage area map is provided in **Appendix A-4**.

Act 167

An Act 167 (Stormwater Management Plan) for the Monongahela River watershed was published in February 1993, by Chester Environmental and the Allegheny County Department of Planning. The design discharges for the Monongahela River throughout the watershed were determined based on a review of published Flood Insurance Studies. The results from this report are summarized in **Table A-2**. Excerpts of the Act 167 Plan report are in **Appendix A-4**. As the study is over 20 years old, it is no longer valid. However, the flows were provided for comparison to the updated hydrology. An updated version of the Act 167 Plan, the Allegheny County Act 167 Phase 2 County-Wide Stormwater Management Plan, was published on March 31, 2018 by the Allegheny County Department of Economic Development and Michael Baker International, Inc. However, the updated Act 167 Plan does not include updated hydrology for the Monongahela River.

Methods

Peak flows for the current study were computed using the hydrologic methods and models described in Section 10.6.C of DM-2. Peak flows for this study were computed using stream gage analysis at two stream gages.

The USGS publication Guidelines for Determining Flood Flow Frequency (Bulletin 17B) uses a log-Pearson Type III distribution analysis of annual peak flow data from a stream gage. Two gages were considered to best represent flood history: USGS 03085000 at Braddock, PA and USGS 03075070 at Elizabeth, PA. The gage record from USGS 03085000 is located just upstream of the project site; however, the peak flow record ends in 2004. Therefore, a USGS 03075070 located slightly further upstream was considered to capture flows through 2019. Detailed output is included in **Appendix A-4**.

Peak flows from the USGS 03085000 Monongahela River stream gage were used to perform the analysis. The gage located near Braddock, Pennsylvania is upstream of the crossing and has 67 years of record.

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2 http://streamstats.usgs.gov/ss

The gage has a drainage area of 7,337 square miles, which is 0.99 times the drainage area at the project site and within the DM-2 Chapter 10 requirement. Peak flow data is available at this gage between water years 1936 to 2004; since the last major flood-control reservoir was built in 1943, data from 1944 to 2004 were used in the analysis. The USGS PeakFQ version 7.2 computer program, which follows the Bulletin 17B methodology, was used to perform the analysis.

Peak flows from the Monongahela River (USGS 03075070) stream gage were used to perform the analysis. The gage located near Elizabeth, Pennsylvania is much further upstream of the crossing but has more recent data and over 40 years of record. The gage has a drainage area of 5,340 square miles, which is 0.72 times the drainage area at the project site and within the DM-2 Chapter 10 requirement. Peak flow data is available at this gage between water years 1978 to 2017; since the last major flood-control reservoir was built in 1943, the entire range of available data was used in the analysis. The gage record was transposed to the project site per the procedure outlined in DM-2, Chapter 10.6.C.4.a. The USGS PeakFQ version 7.2 computer program, which follows the Bulletin 17B methodology, was used to perform the analysis.

Table A-2: Estimated Peak Flows in the Vicinity of the I-376 Bathtub

Hydrologic Method	Peak Flows (cfs)						
	1-year	2-year	5-year	10-year	25-year	50-year	100-year
FEMA	-	-	-	**168,500**	-	**212,000**	**231,000**
Bulletin 17B USGS 03085000	**39,690**	**101,800**	**136,800**	159,400	**187,200**	207,500	227,600
Bulletin 17B USGS 03075070	51,402	105,433	140,236	161,895	192,859	216,097	240,753
Act 167	-	-	-	162,000		205,000	220,000

The Bulletin 17B flows from USGS 03085000 gage were selected for use in the hydraulic model for the 1-, 2-, 5-, and 25-year events. The USGS 03085000 flows were selected because the gage includes more data points and is located closer to the project site. The difference between the 2- through 25-year event peak flows for the USGS 03085000 and transposed USGS 03075070 gages is less than four percent. The FEMA published peak flows were used for the 10-, 50-, and 100-year events since they produce slightly more conservative results than the Bulletin 17B flows. A flood-frequency graph for the Monongahela River in the vicinity of the I-376 Bathtub is included in **Appendix A-4**. The flows in bold type in **Table A-2** were modeled in HEC-RAS.

One area that was not yet investigated but should be considered as alternatives are progressed to preliminary design is consideration for resilient design flows. PennDOT does not currently have a final policy on resiliency and how future climate should be considered in future designs, but as this project progresses, evaluation of frequency of inundation or overtopping should consider increased future flows.

VII. HYDRAULIC ANALYSIS

Existing HEC-RAS Model

A one-dimensional hydraulic analysis was performed using the U.S. Army Corps of Engineers HEC-RAS River Analysis System program (Version 5.0.6). Existing and proposed conditions were modeled based on the surveyed cross sections and proposed site modifications.

Detailed channel bathymetry provided by the USACOE along with detailed survey in the right overbank and LiDAR data was used to generate the existing geometry for the HEC-RAS model. The USACOE channel bathymetry was surveyed in 2015. The model extends approximately 7,600 feet upstream of the confluence with the Allegheny River. The locations of cross sections used for the hydraulic model are depicted on maps in **Appendix A-5**.

Ineffective flow areas were included in the hydraulic models between Cross Section 9 and 21 in the right overbank since these areas do not actively convey flow. This assumption was confirmed with results from the two-dimensional hydraulic model.

Obstructions were used to model the abandoned stone masonry piers approximately 2,300 feet upstream of the confluence of the Monongahela River and Allegheny River. Pier widths and stations were estimated based on aerial images.

Roughness coefficients, or Manning's 'n' values, for the stream channel and overbank areas were chosen based on field observation, aerial photographs, and Table 3-1 in the HEC-RAS Hydraulic Reference Manual. In general, 0.025 was used for the channel, 0.1 for the densely vegetated overbank areas, 0.05 for overbanks with low vegetation, 0.024 for the gravel areas, and 0.013 for the paved areas. Existing buildings within the 100-year floodplain were included in the HEC-RAS model using higher roughness coefficients. Furthermore, higher roughness coefficients were also used for the columns located at the Mon Wharf parking lot. The FEMA HEC-2 model used the same channel Manning's 'n' value of 0.025; however, FEMA used a single roughness coefficient of 0.06 in the overbanks.

The existing and proposed models utilize levees at several cross sections to keep smaller flood events from low-lying areas of the overbanks. The levee tool in HEC-RAS was also used to prevent lower flood events that do not overtop the floodwall to inundate the I-376 Bathtub.

Four bridges were included in the HEC-RAS model due to their proximity to the project site. Existing survey did not include high chord and low chord elevations for bridges; therefore, the elevations were approximated using nearby ground survey/LiDAR. This assumption does not affect the results since water surface elevations are well below the low chord elevation for all bridges. The piers located within the streambanks were included in the hydraulic model. Pier locations and widths were estimated from the FEMA HEC-2 geometry. The Energy (standard step), Yarnell, and Momentum methods were considered for low flows. The Energy (standard step) method was also selected as the high flow computational method because the low chords of the bridges are not submerged.

- The Fort Pitt Bridge is located approximately 950 feet upstream of the confluence of the Monongahela River and Allegheny River. The piers consist of twin circular columns.
- The Smithfield Street Bridge is located approximately 4,000 feet upstream of the confluence of the Monongahela River and Allegheny River. The piers are elongated with semicircular noses.
- The Panhandle Bridge is located approximately 5,200 feet upstream of the confluence of the Monongahela River and Allegheny River. The piers have 90-degree triangular noses.
- The Liberty Bridge is located approximately 5,600 feet upstream of the confluence of the Monongahela River and Allegheny River. The piers are elongated with semicircular ends.

Steady flow analysis was performed using a subcritical flow regime for all profiles with a single peak flow for each modeled event (i.e., no flow changes). The downstream boundary condition varied for all modeled events. The FEMA 10-, 50-, 100-year events utilized a Known WSE downstream boundary condition obtained from the FEMA FIS. Normal depth boundary conditions were applied for the 25-year event using an average downstream stream bottom slope of 0.0001 feet per feet which resembles the slope for the FEMA profiles as well as the stream slope downstream. A Known WSE downstream boundary condition was applied to the normal, 1-, 2, 5-year events to account for the effects on downstream conditions. The 1-, 2, and 5-year events feature a low and high downstream boundary condition based on historical data obtained from the USGS 03085152 gage. The high downstream boundary condition takes into account the effects of Emsworth Dam on water surface elevations at the project site. **Table A-3** provides a summary of the boundary conditions used for each event.

Table A-3: Boundary Conditions Summary

Event	Downstream Boundary Condition
Normal	Known WS = 710.71 feet
1-year Low	Known WS = 711.71 feet
1-year High	Known WS = 718.71 feet
2-year Low	Normal Depth S = 0.0001 ft/ft
2-year High	Known WS = 719.51 feet
5-year Low	Normal Depth S = 0.0001 ft/ft
5-year High	Known WS = 720.79 feet
10-year	Known WS = 722.57 feet
25-year	Normal Depth S = 0.0001 ft/ft
50-year	Known WS = 727.17 feet
100-year	Known WS = 728.97 feet

Comparison of Existing HEC-RAS and Published FEMA BFEs

A comparison was made between the base flood elevations (BFEs) published in the FEMA FIS with the current existing HEC-RAS hydraulic model 100-year WSE to validate the results. The 100-year WSEs for the Monongahela River at FEMA cross sections within the study limits are compared in **Table A-4**.

Table A-4: FEMA vs. Existing Condition Model WSE Comparison

FEMA Regulatory		Current HEC-RAS		Difference (feet)
Cross Section	WSE (feet NAVD 88)	Cross Section	WSE (feet NAVD 88)	
A	729.0	1	729.0	0.0
B	729.0	2	729.0	0.0
C	729.4	11	729.5	+0.1
D	729.8	20	730.2	+0.4
E	730.2	30	730.6	+0.4

The differences in 100-year WSEs do not exceed 0.5 feet; therefore, the existing HEC-RAS model is consistent with the FEMA. It should be noted that FEMA studies have a very different objective compared to PennDOT studies and generally do not contain the same level of detail and accuracy. A geometry comparison between FEMA and the current hydraulic model is provided in **Appendix A-3**.

Existing SRH 2D Model

NTM developed a two-dimensional (2D) hydraulic model using Sedimentation and River Hydraulics – Two-Dimensional (SRH-2D) hydraulic model in the SMS 13.0 interface to approximate the flooding characteristics at the project site in more detail. SRH-2D is a two-dimensional (2D) hydraulic, sediment, temperature, and vegetation model for river systems developed by the Bureau of Reclamation. The program solves the full two-dimensional, depth-averaged, momentum and continuity equations for free-surface flow using the depth-averaged St. Venant equations.

The 2D hydraulic model utilized channel bathymetry obtained from the USACOE. The overbanks included a detailed survey near the I-376 Bathtub and Mon Wharf parking lot supplemented with LiDAR data. Roughness coefficients were applied similar to the 1D HEC-RAS model. The boundary conditions were applied by introducing flow gradually at the upstream boundary towards the peak flow to approximate a steady state. The downstream boundary condition was obtained from the 1D HEC-RAS model at cross section 6.

Results of the 2D hydraulic model compare well with the results of the 1D model with average water surface elevations within 0.1 feet at several cross sections. The results also show that the assumption to code the I-376 Bathtub area as ineffective is applicable as the velocities in the I-376 Bathtub are 0-2 fps; whereas, velocities in the channel are approximately 6-8 fps. This validates the approach and assumptions used in a 1D hydraulic model. The 100-year SRH-2D results at the I-376 Bathtub show that flow between Smithfield Street and Wood Street is ineffective with reversed flow direction and velocities less than 1 fps. The flow between Market Street and Stanwix Street is aligned with flow direction but velocities are small (1-2 fps). The 2-year SRH-2D results show a similar flow direction as the 100-year with lower velocities throughout. **Figures A-3** shows a plot of the 100-year velocities from the SRH-2D hydraulic model. **Figures A-4** shows a similar plot of the 2-year velocities from the SRH-2D hydraulic model.

As proposed alternatives are refined, the 2D model can be used to evaluate the velocities immediately next to the elevated wall or trail location. Additionally, the 2D model may be useful in evaluating if lower events may have other access points into the bathtub area, if the existing wall is raised.

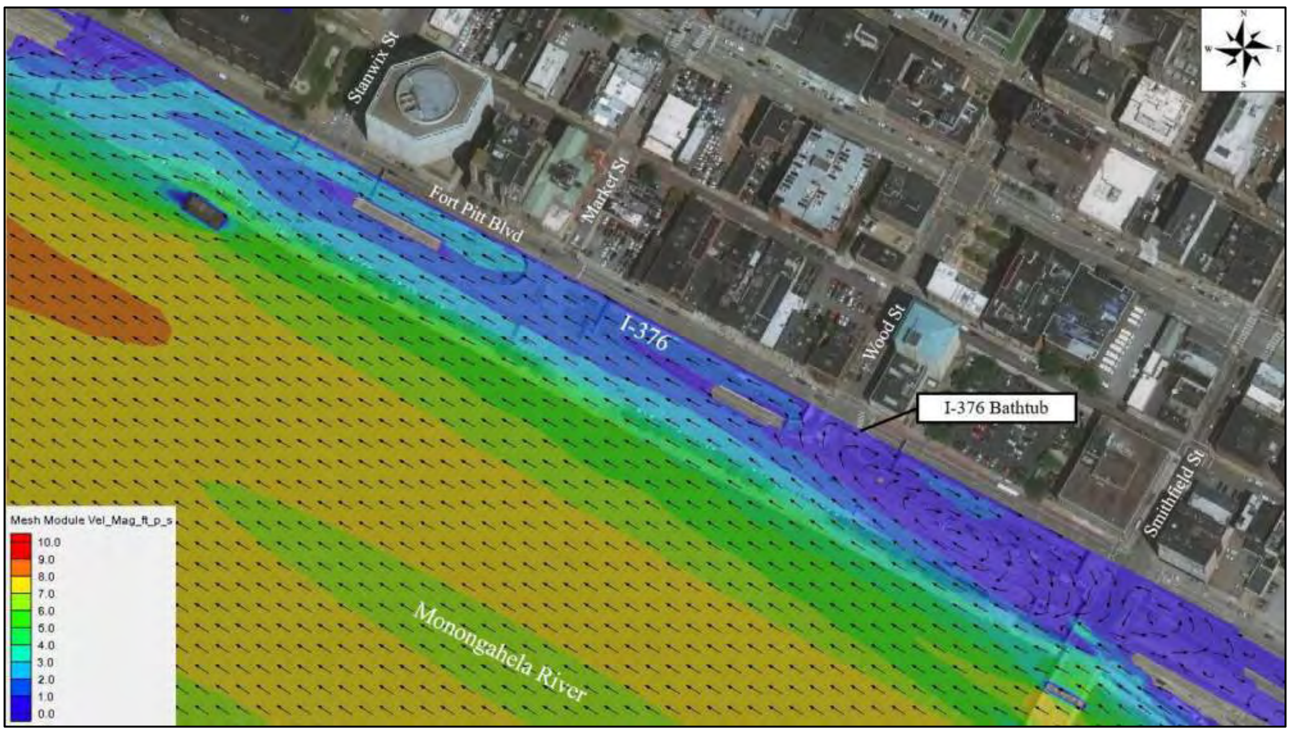

Figure A-3: SRH-2D 100-year Velocities and Velocity Vectors at the I-376 Bathtub

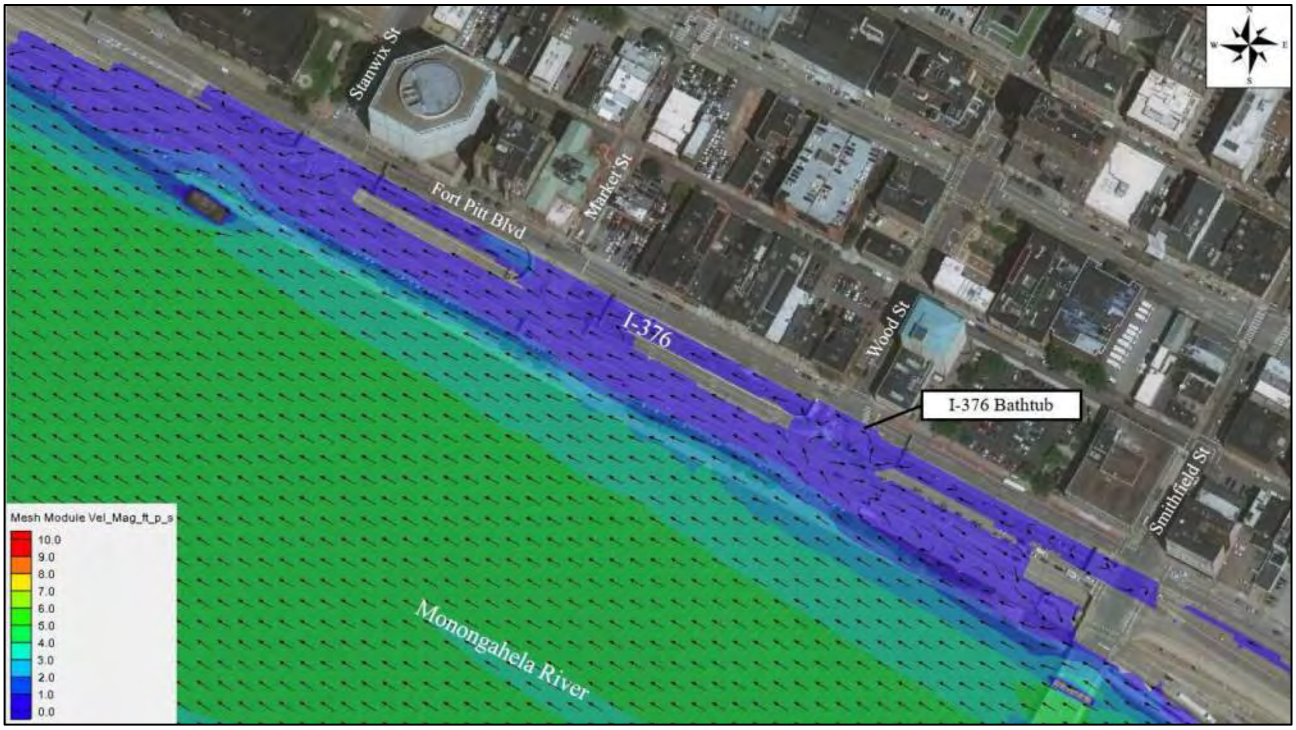

Figure A-4: SRH-2D 2-year Velocities and Velocity Vectors at the I-376 Bathtub

VIII. PROPOSED HYDRAULIC RESULTS

Several proposed alternatives have been developed to alleviate flooding on I-376 Bathtub. Alternatives include raising the existing floodwall elevation at the current location, an elevated trail between the Monongahela River and the Mon Wharf parking lot, and a tunnel between the existing floodwall and Fort Pitt Boulevard. Result from the proposed alternatives hydraulic model are provided in **Appendix A-5**.

The proposed alternatives include raising the existing floodwall 2 to 5 additional feet. If the proposed floodwall is raised by 2 feet the lowest floodwall elevation would be approximately 721.5 feet. Similarly, if the proposed floodwall elevation is raised by 5 feet, the lowest floodwall elevation would be 724.5 feet. Since the existing 100-year water surface elevation at the low point in the floodwall is 729.5 feet, the 100-year water surface elevation will overtop the wall for all of the alternatives to raise the existing wall. Because there is minimal fill associated with the additional height of the wall immediately next to the highway, there are no 100-year water surface elevation increases for any of these alternatives. **Table A-5** shows a summary of the recent closures of the Bathtub from 1985-2020 and indicates if the bathtub would have been closed at different floodwall heights. **Table A-5** shows that if the wall height is increased by 5 feet, only two of the seventeen events from 1985-2019 that closed the I-376 parkway would require I-376 to be closed due to flooding.

Table A-5: Proposed Alternatives I-376 Closure for flood events between 1985-2019[1]

Date	WSE[2] (NAVD88, feet)	Top of Floodwall Elevation (feet)[3]				
		Existing	Proposed			
		719.5	721.5	722.5	723.5	724.5
02/09/2019	718.9	Yes	No	No	No	No
09/11/2018	721.6	Yes	Yes	Yes	No	No
02/17/2018	722.0	Yes	Yes	Yes	No	No
01/13/2018	719.8	Yes	No	No	No	No
03/12/2011	721.2	Yes	Yes	No	No	No
12/02/2010	719.8	Yes	No	No	No	No
01/26/2010	720.3	Yes	No	No	No	No
03/16/2007	718.4	Yes	No	No	No	No
01/06/2005	722.9	Yes	Yes	Yes	Yes	No
09/18/2004	725.5	Yes	Yes	Yes	Yes	Yes
11/20/2003	720.2	Yes	No	No	No	No
01/09/1998	720.1	Yes	No	No	No	No
01/20/1996	729.1	Yes	Yes	Yes	Yes	Yes
12/31/1990	721.7	Yes	Yes	Yes	No	No
12/19/1990	719.2	Yes	No	No	No	No
02/06/1986	719.4	Yes	No	No	No	No
11/06/1985	720.7	Yes	Yes	No	No	No

[1] I-376 Closure is determined when the Monongahela River gage is 1-foot below top of floodwall
[2] Approximate water surface elevations at the I-376 Bathtub
[3] Top of Floodwall is the river stage at the top of floodwall

Four additional alternatives were modeled in HEC-RAS to alleviate flooding on I-376 Bathtub using an elevated trail adjacent to the Monongahela River. Note this alternative is not limited in height by the elevated sections of I-376 above it and/or the ramps that connect near the existing wall. Therefore, the elevated trail alternatives consider protection from larger events. The trail is assumed to be 30 feet wide for all four alternatives. In general, the proposed alternatives showed either no change or decreases to the water surface elevations when compared to existing. There are no increases to the 100-year water surface elevations due to the proposed trail for any of the alternatives below.

- **Elevated Trail Alternative 1:** The hydraulic model includes a levee next to the channel that prevents the 100-year event from inundating the right overbank. The levee elevation is 733.0 feet.
- **Elevated Trail Alternative 2:** The hydraulic model includes a levee next to the channel and a blocked obstruction with an elevation of 725.0 feet that prevents the 10-year event from inundating the right overbank.

- **Elevated Trail Alternative 3:** The hydraulic model includes a levee next to the channel and a blocked obstruction with an elevation of 727.0 feet that prevents the 25-year event from inundating the right overbank. Pictured in the figure below.
- **Elevated Trail Alternative 4:** The hydraulic model includes a levee next to the channel and a blocked obstruction with an elevation of 729.0 feet that prevents the 50-year event from inundating the right overbank.

The proposed tunnel alternative between the existing floodwall and Fort Pitt Boulevard Westbound was also modeled in HEC-RAS. The tunnel was modeled using a levee placed at the I-376 Westbound roadway. The top elevation of the proposed tunnel was set to prevent all events from overtopping the levee, thereby preventing flooding in the I-376 Bathtub. The top elevation of the tunnel generally matches the elevation of the top of the retaining wall between I-376 Westbound and Fort Pitt Boulevard. Results of the hydraulic model shows that there are no increases to the 100-year water surface elevations due to the proposed tunnel.

Note the proposed hydraulic results consider only the river flows. Once the stormwater modeling is completed, the impact of higher head on the river would need to be evaluated with the stormwater system to evaluate if it will surcharge back into the Bathtub area.

IX. SUMMARY OF PROPOSED ALTERNATIVES

A hydraulic study was performed for the Monongahela River in the vicinity of I-376 (Penn Lincoln Parkway) known as the "I-376 Bathtub". Several proposed alternatives were analyzed to alleviate flooding concerns at the project site. The proposed conceptual alternatives include raising the existing floodwall elevation at the current location, an elevated trail between the Monongahela River and the Mon Wharf parking lot, and a tunnel between the existing floodwall and Fort Pitt Boulevard Westbound. Each alternative analyzed provides a different level of protection from flood events depending on the elevation of the floodwall or elevated trail.

The FEMA regulatory 100-year event is used to evaluate risk and demonstrate consistency with the National Flood Insurance Program. The preliminary results of the hydraulic model show that the proposed alternatives do not result in water surface elevation increases for the 100-year event; therefore, a CLOMR is not anticipated based on the conceptual alternatives evaluated for the I-376 Bathtub.

Note the current H&H results only consider the river flows. Once the stormwater modeling is completed, the impact of higher head on the river would need to be evaluated with the stormwater system to evaluate if it will surcharge back into the Bathtub area.

X. REFERENCES

1. Aquaveo. (2020). Surface-Water Modeling System (SMS) Version 13.0.12.

2. U.S. Department of the Interior, Bureau of Reclamation (November 2008). *SRH-2D version 2: Theory and User's Manual.*

3. Commonwealth of Pennsylvania, Department of Environmental Protection, Bureau of Water Quality Protection. (September 2001). *Pennsylvania Code, Title 25: Environmental Protection, Chapter 105: Dam Safety and Waterway Managment.*

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6. Federal Emergency Management Agency. (2014). *Flood Insurance Study Allegheny County, Pennsylvania.*

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8. U.S. Army Corps of Engineers, Hydrologic Engineering Center. (2018). HEC-RAS River Analysis System Version 5.0.6.

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10. U.S. Department of the Interior, U.S. Geological Survey. (n.d.). *USGS Streamstats in Pennsylvania*. Retrieved January 2020, from http://https://streamstats.usgs.gov/ss/

11. U.S. Department of the Interior, U.S. Geological Survey, Office of Water Data Coordination. (March 1982). *Guidelines for Determining Flood Flow Frequency (Bulletin #17B of the Hydrology Subcommittee).*

I-376 Bathtub
Monongahela River

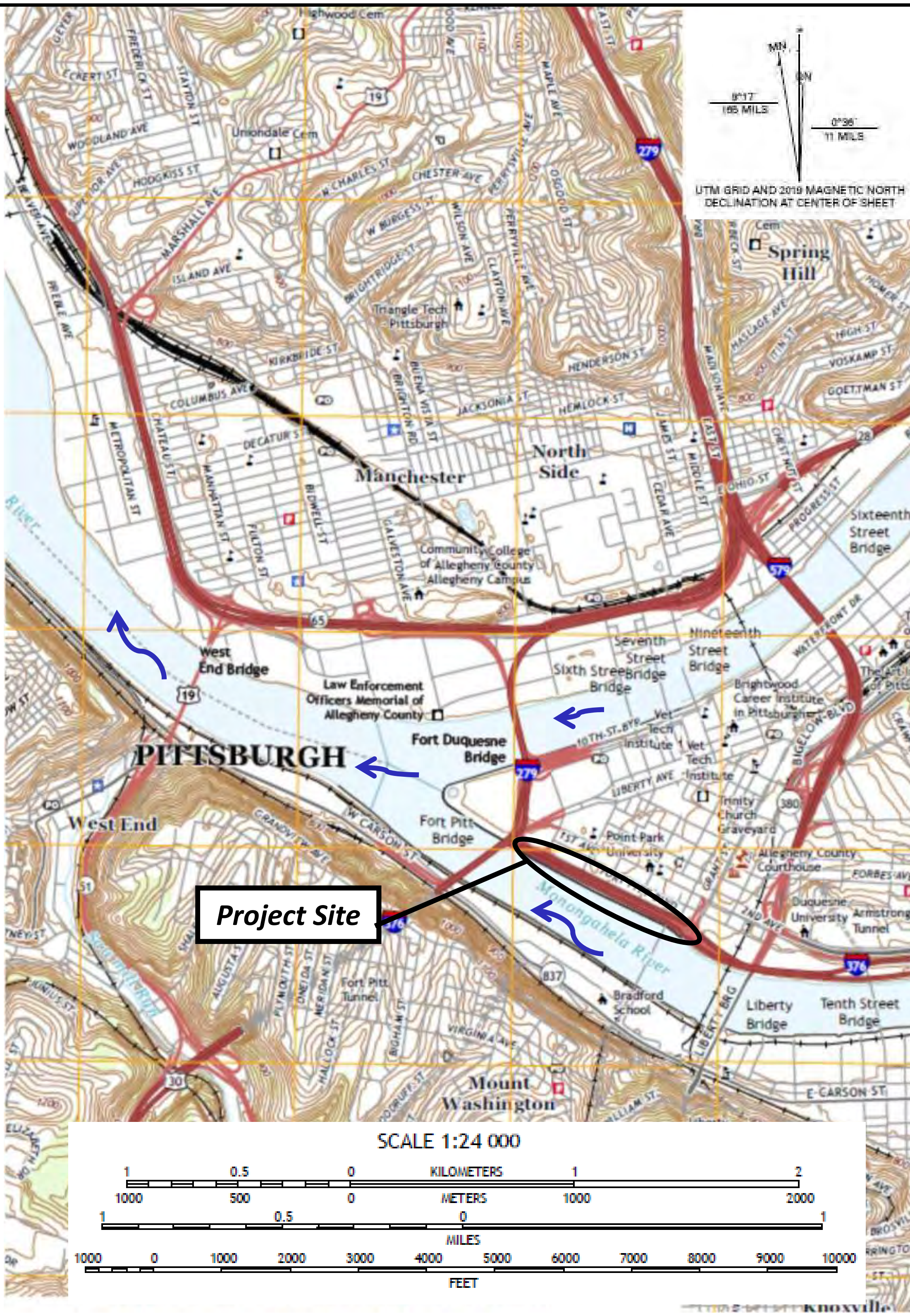
APPENDIX A-1

Location Maps and Photographs

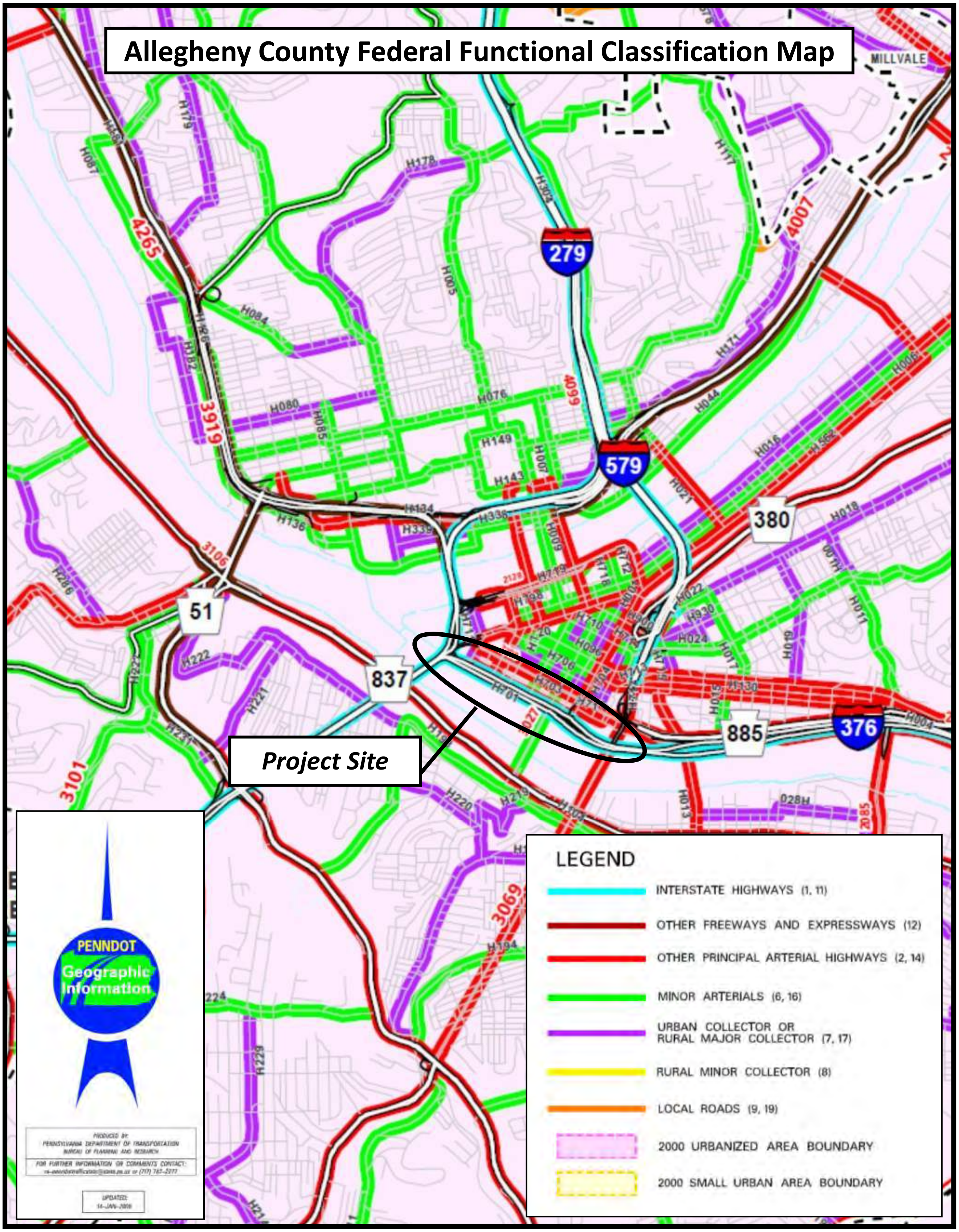
Allegheny County
PennDOT District 11-0

NEWELL
TERESKA &
MACKAY
ENGINEERING

Pittsburgh East & Pittsburgh West, PA USGS Topographic Maps



Allegheny County Type 10 Map
Project Site
PITTSBURGH
MILLVALE
Mount Troy
MT OLIVER
CARLOW UNIVERSITY
RIVER
Brunot Island
FORT PITT TUNNEL
LIBERTY TUBES
Scale
1:65,000
0
0.5
1
2
3
Miles
0
0.5
1
2
3
4
5
Kilometers



Allegheny County Federal Functional Classification Map
Project Site
MILLVALE
279
579
376
380
51
837
885
4265
3919
4099
4007
3106
3101
3069
2085
LEGEND
INTERSTATE HIGHWAYS (1, 11)
OTHER FREEWAYS AND EXPRESSWAYS (12)
OTHER PRINCIPAL ARTERIAL HIGHWAYS (2, 14)
MINOR ARTERIALS (6, 16)
URBAN COLLECTOR OR
RURAL MAJOR COLLECTOR (7, 17)
RURAL MINOR COLLECTOR (8)
LOCAL ROADS (9, 19)
2000 URBANIZED AREA BOUNDARY
2000 SMALL URBAN AREA BOUNDARY
PENNDOT
Geographic
Information


Photo Location Map
Downstream
Left
Right
Upstream
Monongahela River
Smithfield Street Bridge
1
2
3
4
5
6
7
8
9
10
N
E
S
W

PROJECT PHOTOGRAPHS

By: MJK		**Date:** 1/16/2020	**Sheet No.:**		1 of 5
Project Name:	I-376 Bathtub		**Project No.:**	19036.06	

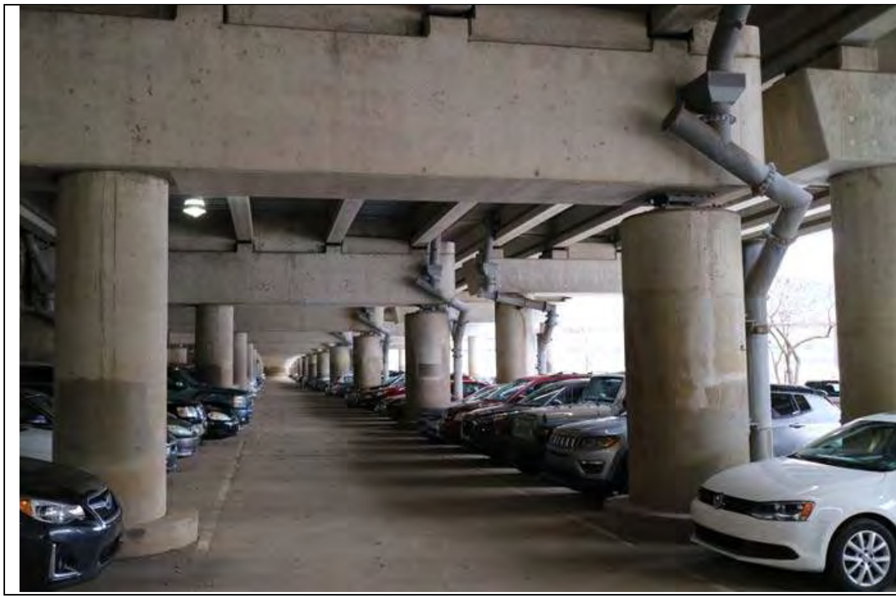


Photo #1
Mon Wharf Parking

Note: Mon Wharf Parking area beneath I-376 between the Smithfield Street Bridge and the Fort Pitt Bridge.

Photo #2
Right Overbank Trail

Note: Looking upstream at the trail along the right overbank of the Monongahela River. The left side of the photograph shows the Mon Wharf parking area.

By: MJK	**Date:** 1/16/2020	**Sheet No.:**	2 of 5
Project Name: I-376 Bathtub		**Project No.:**	19036.06

Photo #3
Big Bathtub

Note: Looking at the Big Bathtub portion of I-376. The sump is visible on the left side of the photo.

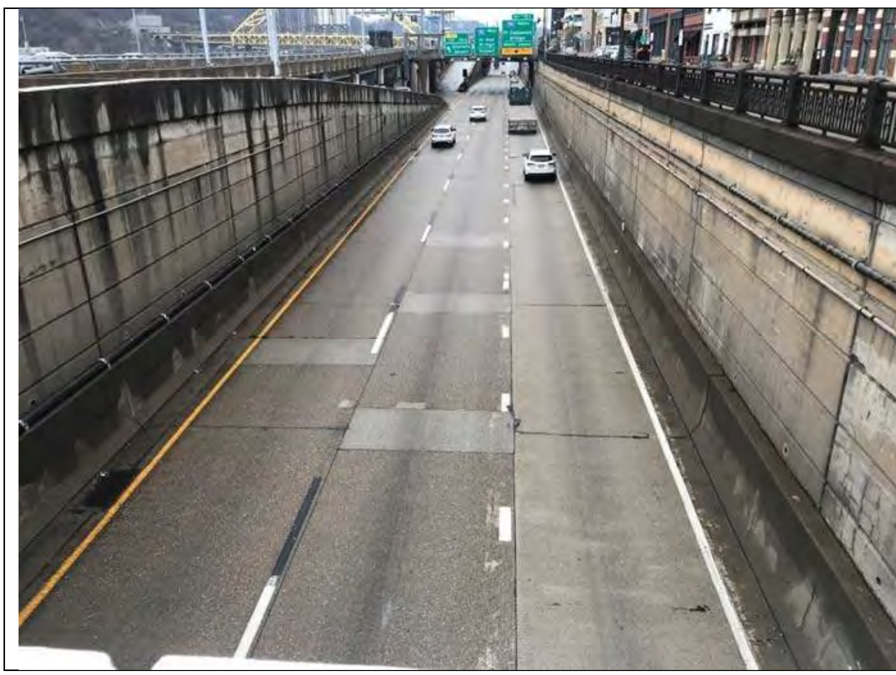


Photo #4
Big Bathtub

Note: Looking at the Big Bathtub portion of I-376 from the overpass at the intersection of Wood Street and Fort Pitt Boulevard. The sump is below the overpass.

NEWELL TERESKA & MACKAY ENGINEERING

PROJECT PHOTOGRAPHS

By: MJK	**Date:** 1/16/2020	**Sheet No.:**	3 of 5
Project Name:	I-376 Bathtub	**Project No.:**	19036.06

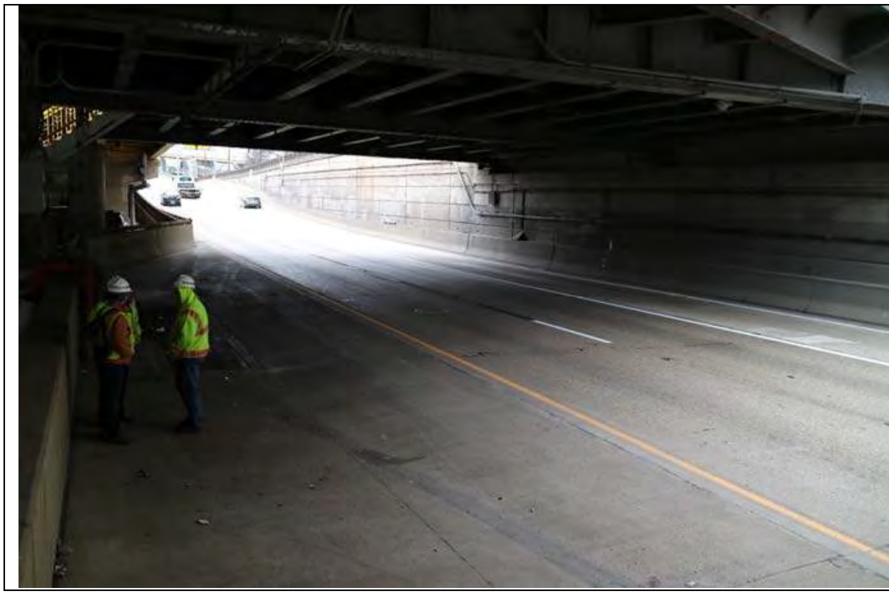


Photo #5
Little Bathtub

Note: Looking at the Little Bathtub portion of I-376. The sump is visible on the left side of the photo.

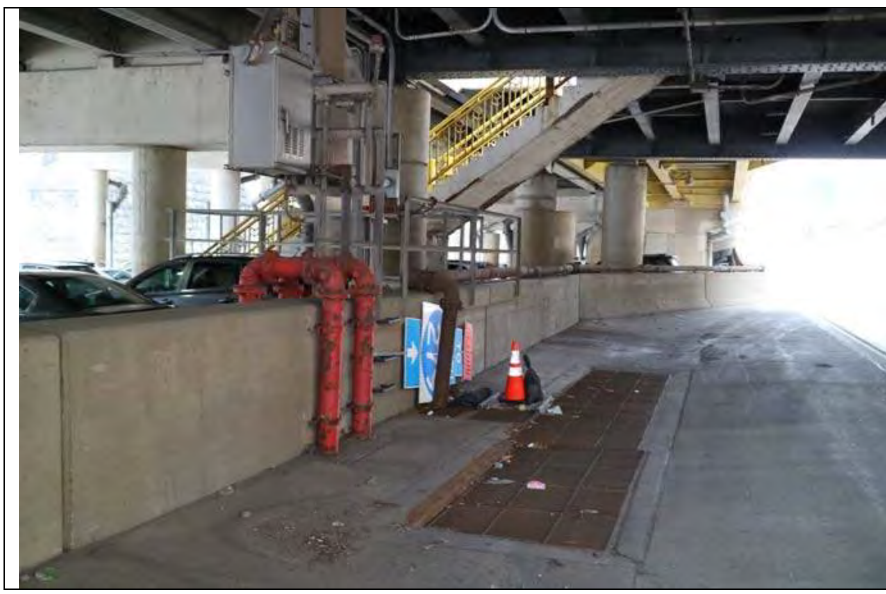


Photo #6
Little Bathtub Sump

Note: Looking at the low point of the Little Bathtub. The floodwall is visible on the left side of the photo.

NEWELL TERESKA & MACKAY ENGINEERING

PROJECT PHOTOGRAPHS

By: MJK	**Date:** 1/16/2020	**Sheet No.:**	
Project Name: I-376 Bathtub		**Project No.:**	19036.06

Photo #7
Panhandle Bridge

Note: Looking at the downstream face of the Panhandle Bridge.

Photo #8
Smithfield Street Bridge

Note: Looking at the downstream face of the Smithfield Bridge.

NEWELL TERESKA & MACKAY
ENGINEERING

PROJECT PHOTOGRAPHS

By: MJK	**Date:** 1/16/2020	**Sheet No.:**	5 of 5
Project Name: I-376 Bathtub		**Project No.:**	19036.06

Photo #9
Abandoned Pier and Fort Pitt Bridge

Note: Looking at the abandoned bridge pier along the right side of the Monongahela River as well as the upstream face of the Fort Pitt Bridge. A similar abandoned pier exists along the left side of the River.

Photo #10
Pier with River Stages

Note: Looking at the pier in the Mon Wharf parking lot near the Big Bathtub. The pier shows measurements of the river stage to anticipate flooding and closing of the I-376 Bathtub.

I-376 Bathtub
Monongahela River

APPENDIX A-2

Preliminary Plans

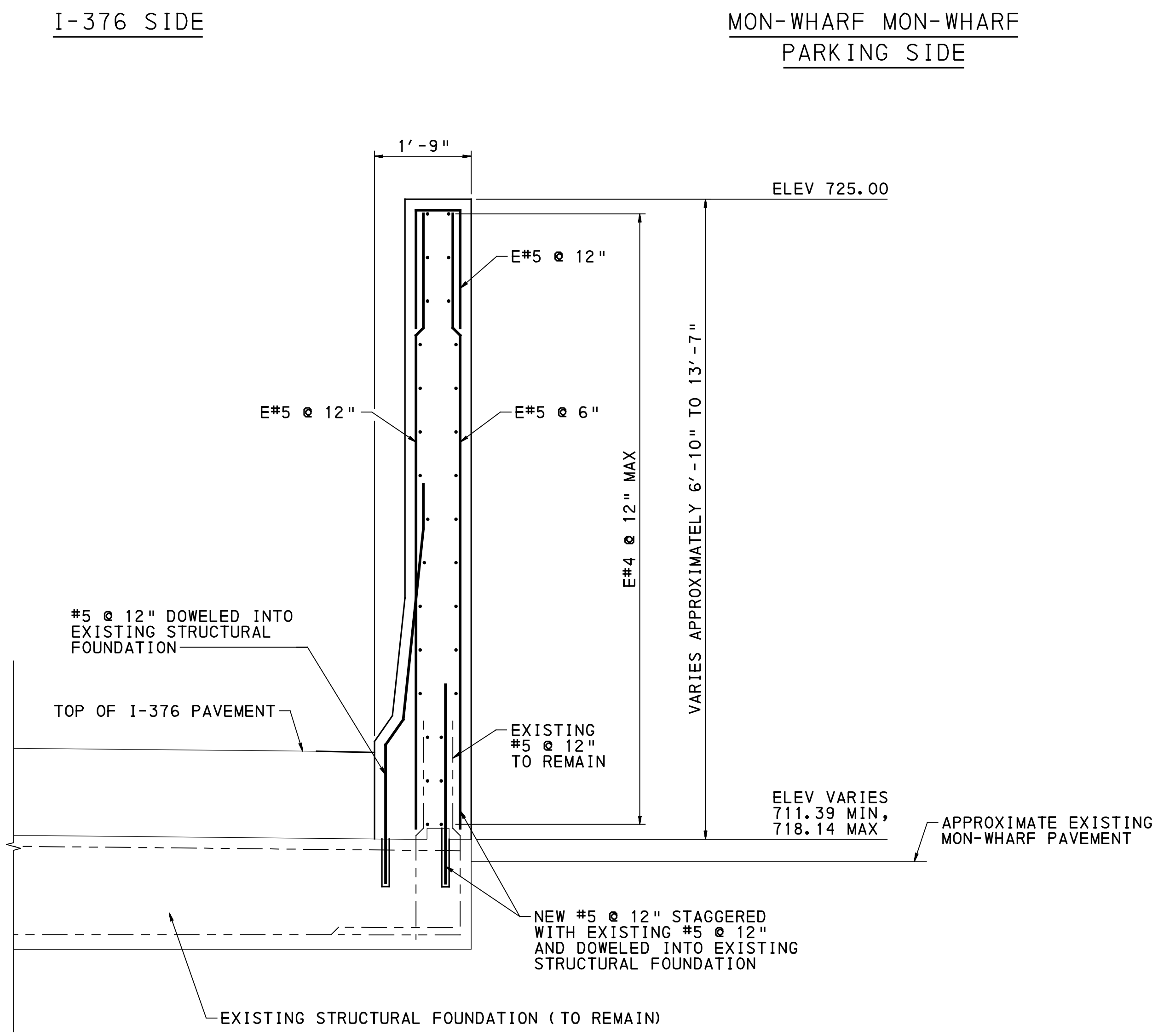
Allegheny County
PennDOT District 11-0

NEWELL TERESKA & MACKAY
ENGINEERING

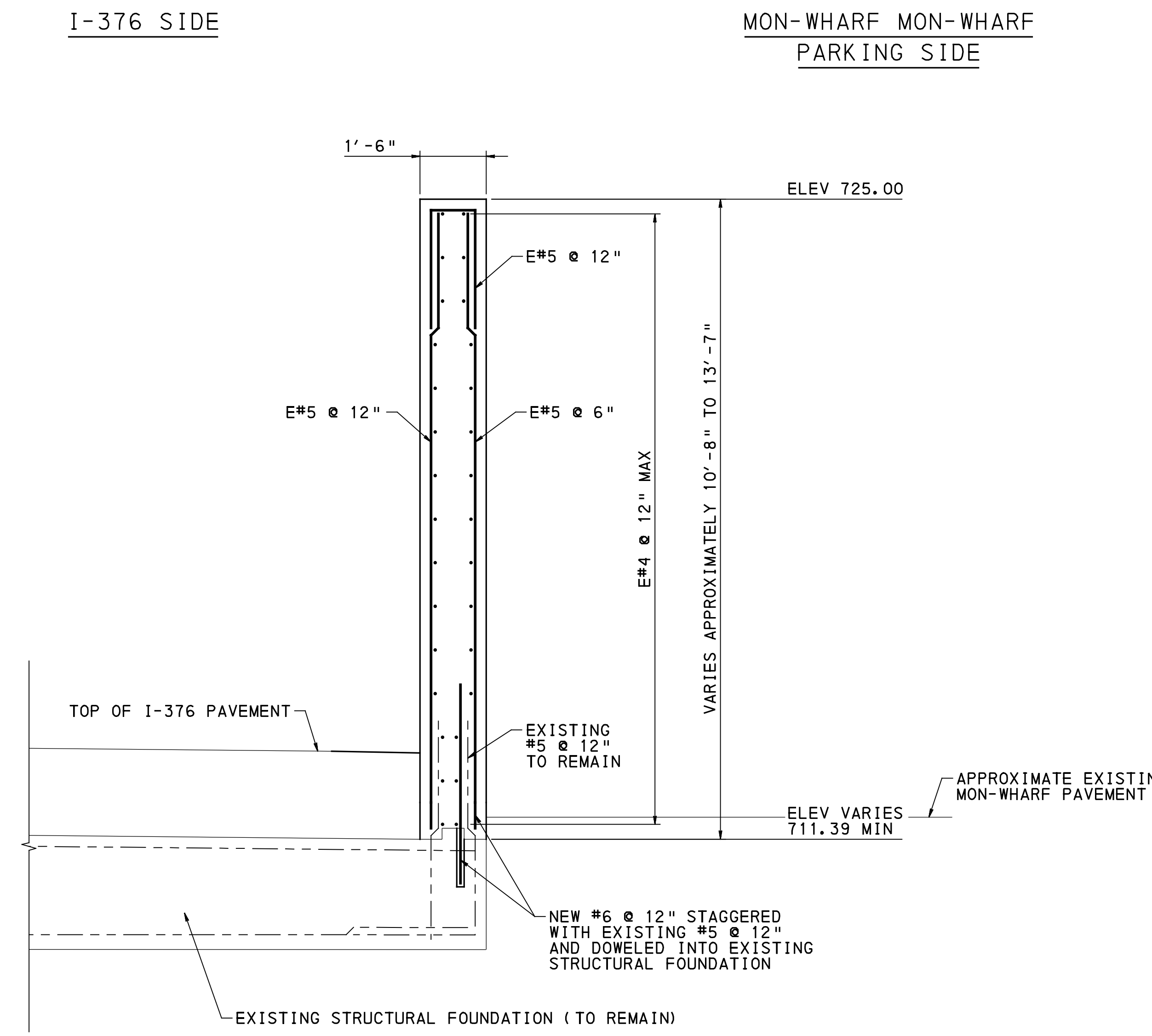
APPENDIX A-2.1

Elevated Floodwall Conceptual Plans

NEWELL
TERESKA &
MACKAY
ENGINEERING



PROPOSED FLOODWALL (SAFETY SHAPE)
FULL STEM REBUILD
NTS

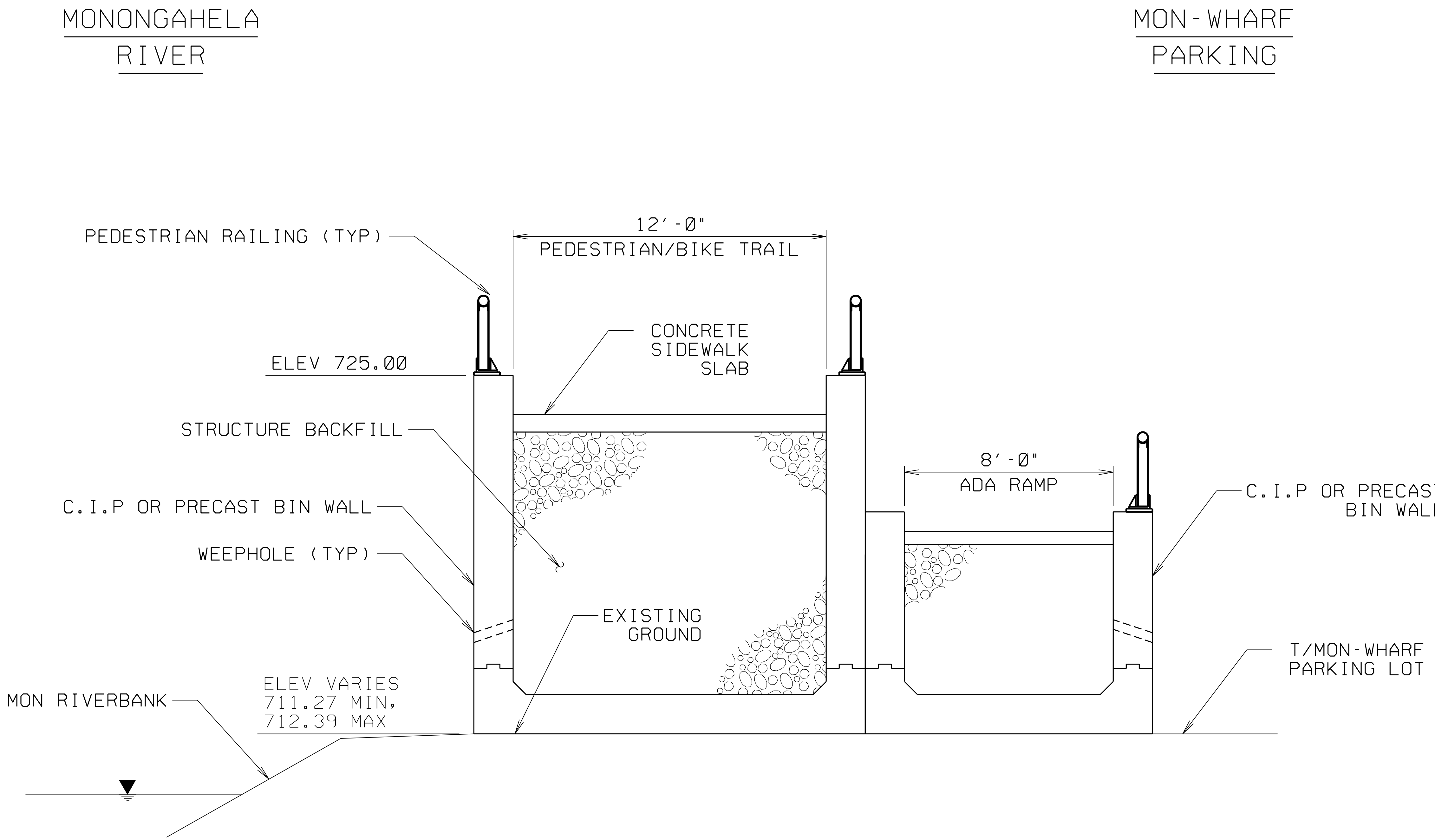


PROPOSED FLOODWALL (SUMP AREA)
FULL STEM REBUILD

APPENDIX A-2.2

Elevated Trail Conceptual Plans

NEWELL
TERESKA &
MACKAY
ENGINEERING



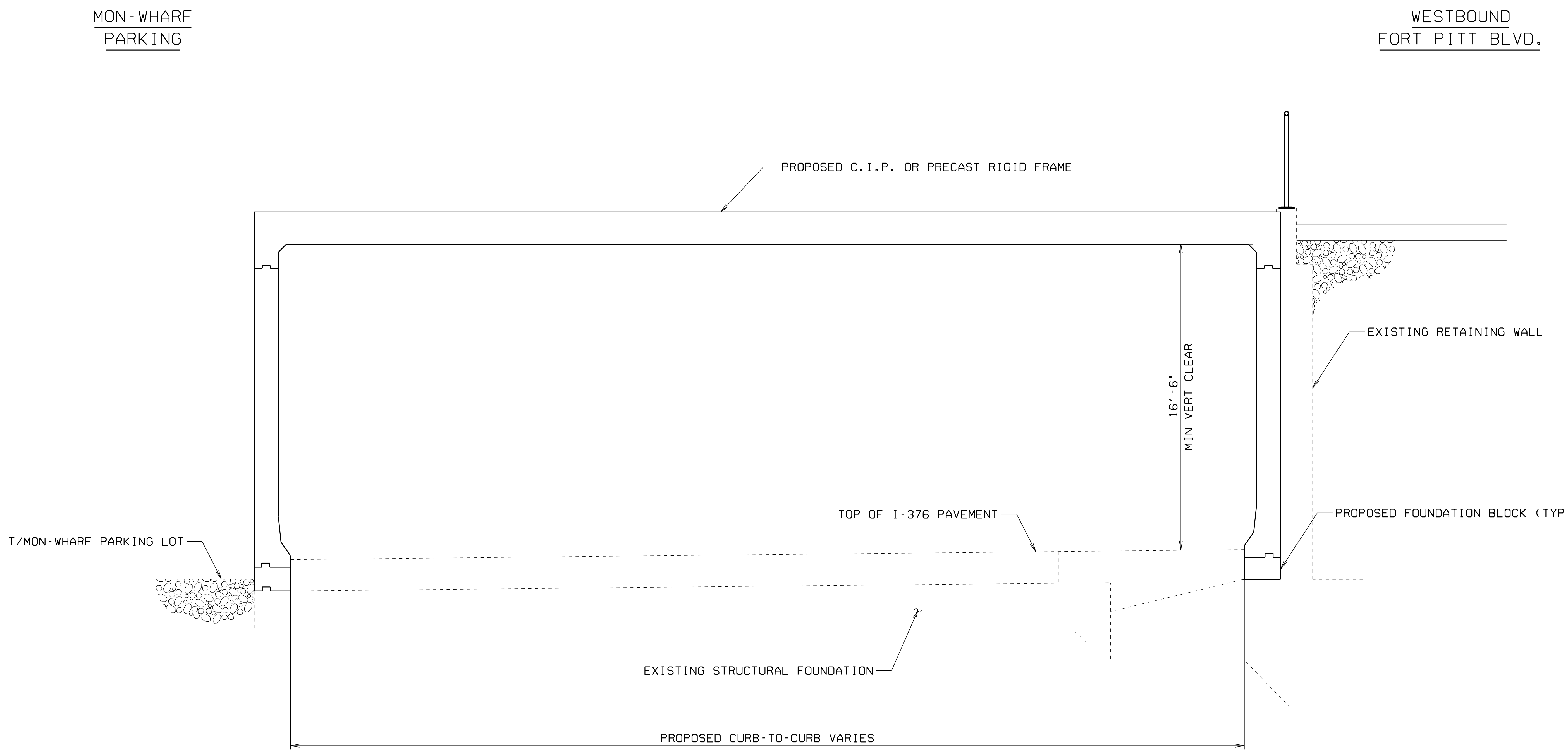
PROPOSED RAISED PEDESTRIAN/BIKE TRAIL

(LOOKING WEST)

APPENDIX A-2.3

Tunnel Conceptual Plans

NEWELL
TERESKA &
MACKAY
ENGINEERING



NOTE: TUNNEL LIGHTING AND VENTILATION NOT SHOWN

PROPOSED FRAME OVER I-376 WESTBOUND

LOOKING WEST (WITH TRAFFIC)

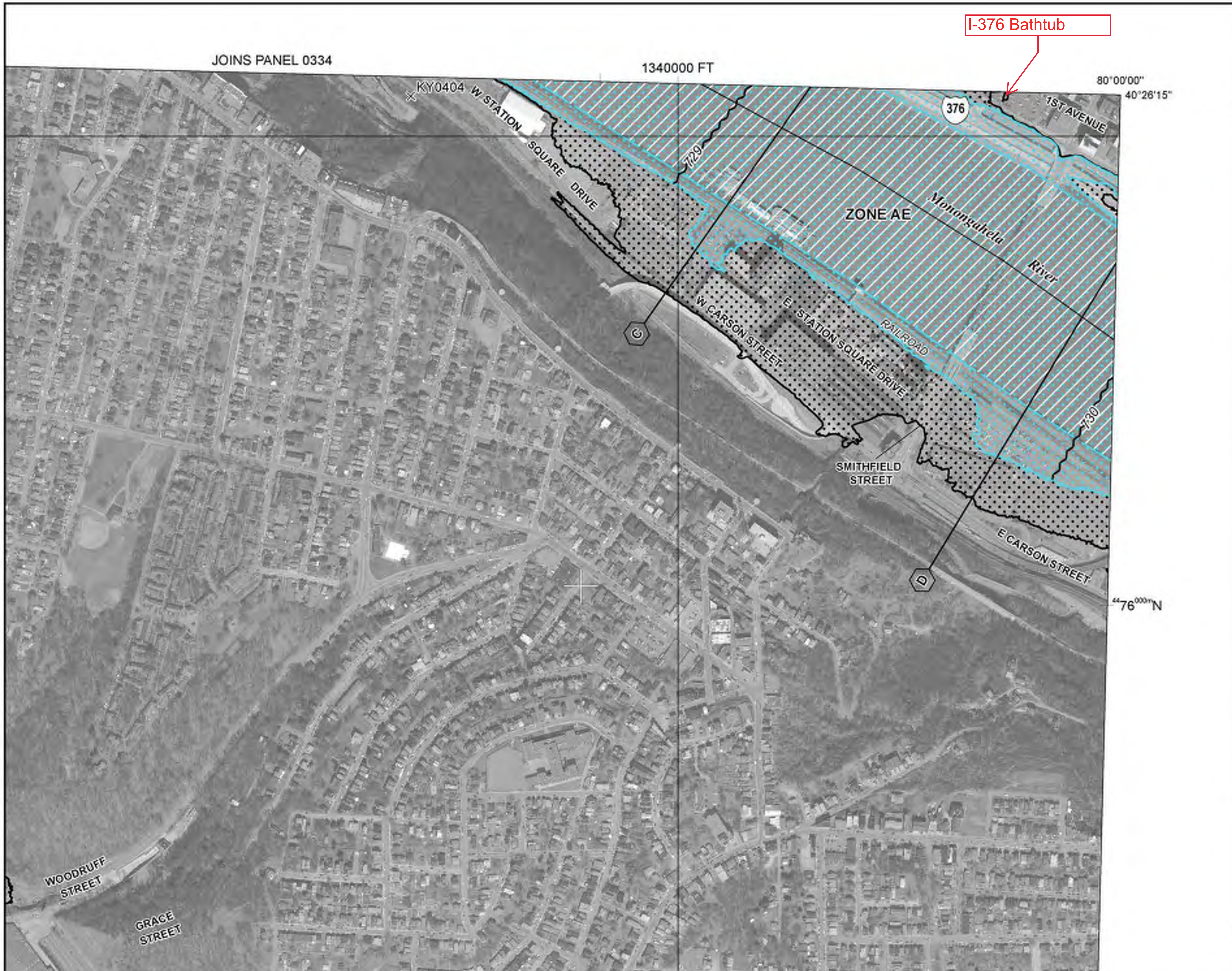
I-376
Monongahela River

APPENDIX A-3

FEMA FIS Information

Allegheny County
PennDOT District 11-0

Newell Tereska & Mackay Engineering



...ional Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

METERS

NATIONAL FLOOD INSURANCE PROGRAM

NFIP

PANEL 0342H

FIRM
FLOOD INSURANCE RATE MAP

ALLEGHENY COUNTY, PENNSYLVANIA
(ALL JURISDICTIONS)

PANEL 342 OF 558

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PITTSBURGH, CITY OF	420063	0342	H

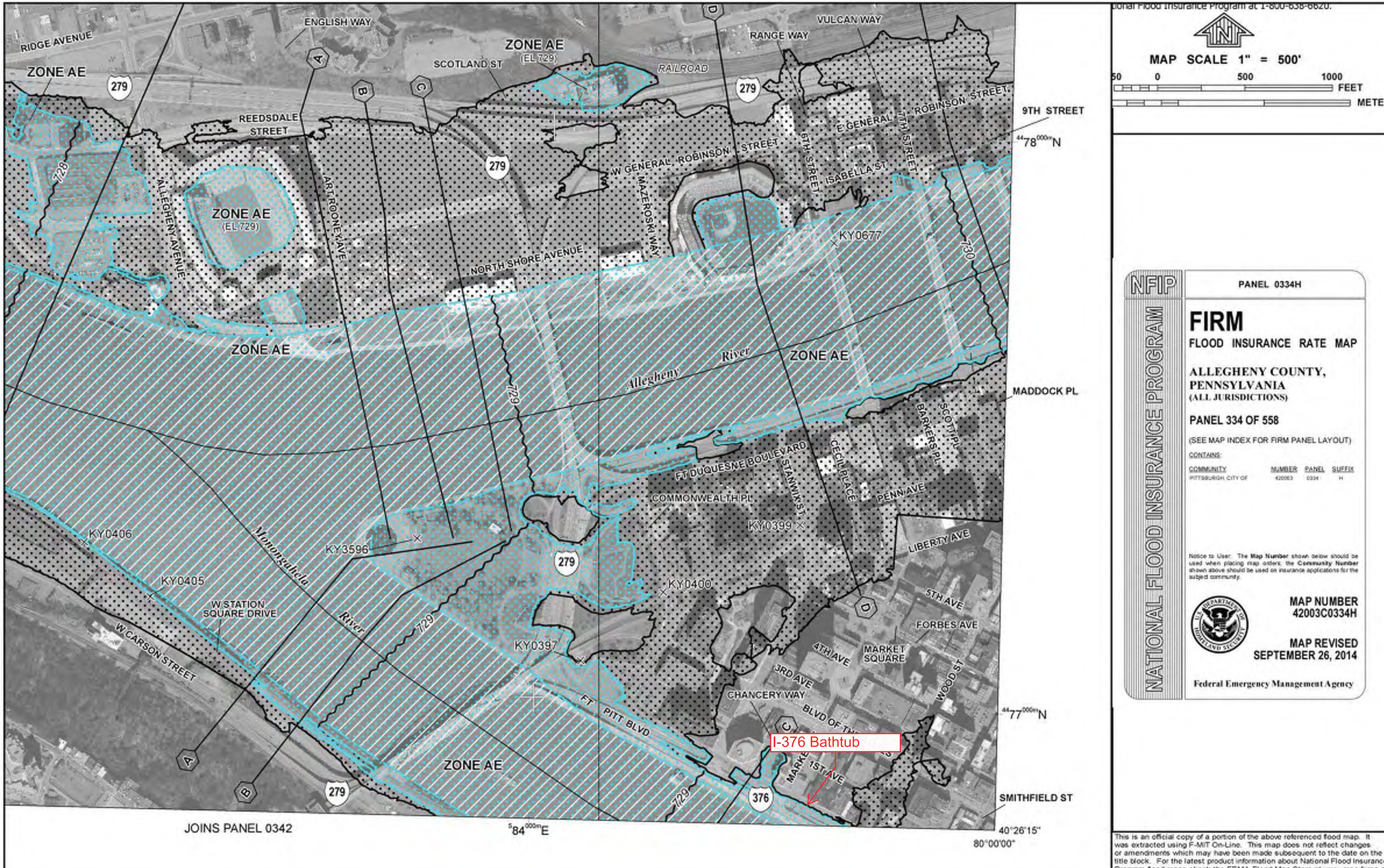
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
42003C0342H

MAP REVISED
SEPTEMBER 26, 2014

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov


ional Flood Insurance Program at 1-800-638-6620.
MAP SCALE 1" = 500'
50 0 500 1000
FEET
METERS
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0334H
FIRM
FLOOD INSURANCE RATE MAP
ALLEGHENY COUNTY, PENNSYLVANIA
(ALL JURISDICTIONS)
PANEL 334 OF 558
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
PITTSBURGH, CITY OF 420063 0334 H
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER 42003C0334H
MAP REVISED SEPTEMBER 26, 2014
Federal Emergency Management Agency
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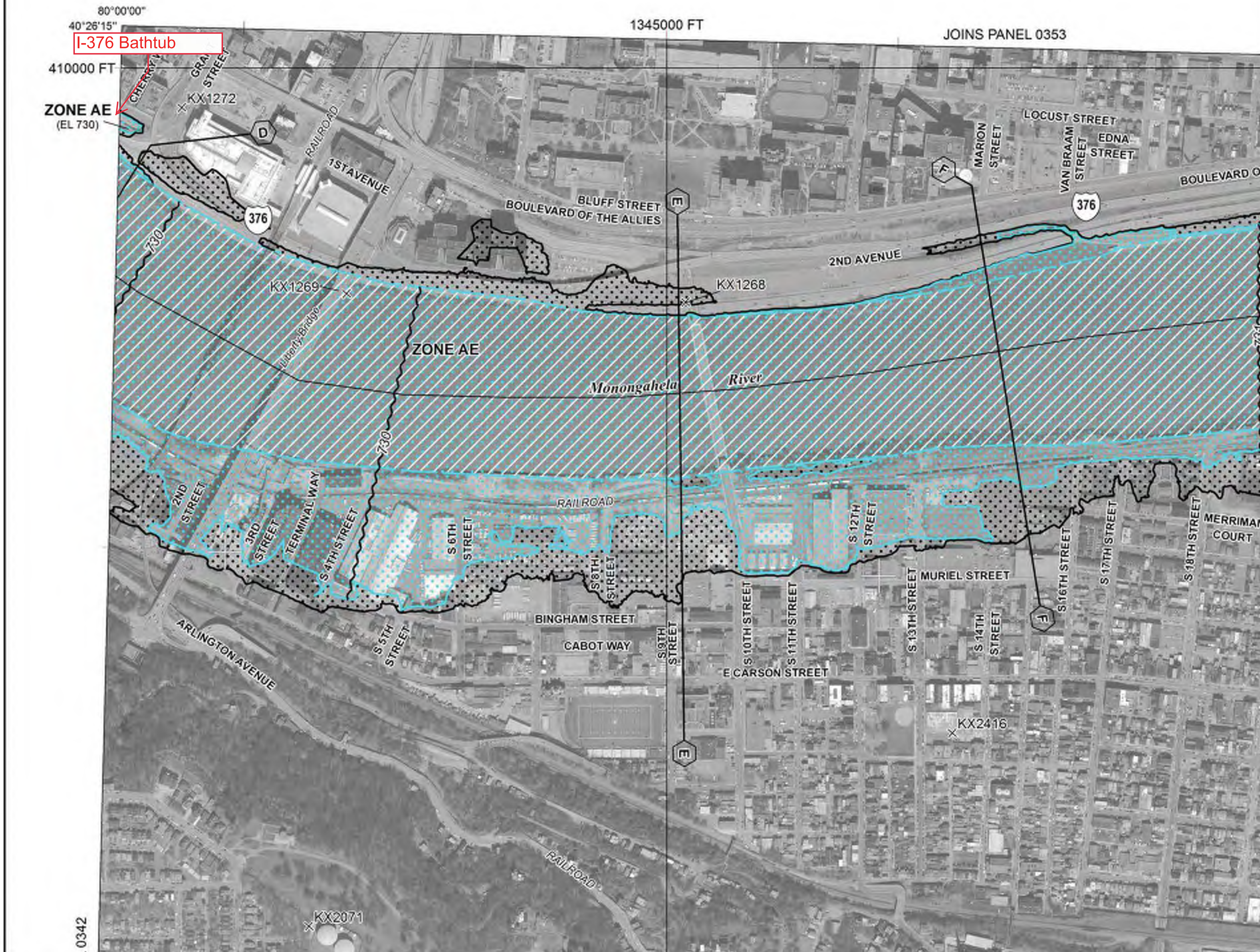
ZONE AE
(EL 729)
ZONE AE
ZONE AE
(EL 729)
ZONE AE
ZONE AE
ZONE AE
RIDGE AVENUE
ENGLISH WAY
SCOTLAND ST
RAILROAD
RANGE WAY
VULCAN WAY
REEDSDALE STREET
ALLEGHENY AVENUE
ART ROONEY AVE
W GENERAL ROBINSON STREET
E GENERAL ROBINSON STREET
MAZEROSKI WAY
6TH STREET
7TH STREET
ISABELLA ST
9TH STREET
NORTH SHORE AVENUE
Allegheny River
Monongahela River
MADDOCK PL
BARKERS PL
SCOTT PL
FT DUQUESNE BOULEVARD
STANWIX ST
CECIL PLACE
PENN AVE
COMMONWEALTH PL
LIBERTY AVE
5TH AVE
FORBES AVE
MARKET SQUARE
4TH AVE
3RD AVE
WOOD ST
CHANCERY WAY
BLVD OF THE
FT PITT BLVD
1ST AVE
MARKET
W STATION SQUARE DRIVE
W CARSON STREET
SMITHFIELD ST
KY0677
KY0399
KY0400
KY0397
KY3596
KY0406
KY0405
728
729
730
279
376
I-376 Bathtub
4478000m N
4477000m N
584000m E
40°26'15"
80°00'00"
JOINS PANEL 0342

onal Flood Insurance Program at 1-800-638-6620.



MAP SCALE 1" = 500'

250 0 500 1000 FEET

METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0361H

FIRM
FLOOD INSURANCE RATE MAP

ALLEGHENY COUNTY, PENNSYLVANIA
(ALL JURISDICTIONS)

PANEL 361 OF 558

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MOUNT OLIVER, BOROUGH OF	420055	0361	H
PITTSBURGH, CITY OF	420063	0361	H

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
42003C0361H

MAP REVISED
SEPTEMBER 26, 2014

Federal Emergency Management Agency

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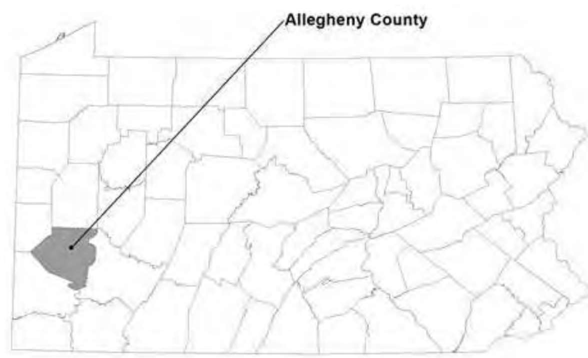
FLOOD INSURANCE STUDY

VOLUME 1 OF 6



ALLEGHENY COUNTY, PENNSYLVANIA (ALL JURISDICTIONS)

COMMUNITY NAME	COMMUNITY NUMBER	COMMUNITY NAME	COMMUNITY NUMBER	COMMUNITY NAME	COMMUNITY NUMBER	COMMUNITY NAME	COMMUNITY NUMBER
ALEPPO, TOWNSHIP OF	421266	*EAST McKEESPORT, BOROUGH OF	420029	LINCOLN, BOROUGH OF	420049	ROSSLYN FARMS, BOROUGH OF	420069
ASPINWALL, BOROUGH OF	420005	EAST PITTSBURGH, BOROUGH OF	422662	MARSHALL, TOWNSHIP OF	421080	SCOTT, TOWNSHIP OF	421100
AVALON, BOROUGH OF	420006	*EDGEWOOD, BOROUGH OF	422663	MCCANDLESS, TOWN OF	421081	SEWICKLEY, BOROUGH OF	420070
BALDWIN, BOROUGH OF	420007	EDGEWORTH, BOROUGH OF	420032	MCDONALD, BOROUGH OF	420855	SEWICKLEY HEIGHTS, BOROUGH OF	420071
BALDWIN, TOWNSHIP OF	422650	ELIZABETH, BOROUGH OF	421263	MCKEESPORT, CITY OF	420051	SEWICKLEY HILLS, BOROUGH OF	420072
BELL ACRES, BOROUGH OF	420008	ELIZABETH, TOWNSHIP OF	420033	MCKEES ROCKS, BOROUGH OF	420052	SHALER, TOWNSHIP OF	421101
BELLEVUE, BOROUGH OF	420009	EMSWORTH, BOROUGH OF	420034	MILLVALE, BOROUGH OF	420053	SHARPSBURG, BOROUGH OF	420073
BEN AVON, BOROUGH OF	420010	ETNA, BOROUGH OF	421062	MONROEVILLE, MUNICIPALITY OF	420054	SOUTH FAYETTE, TOWNSHIP OF	421106
*BEN AVON HEIGHTS, BOROUGH OF	420011	FAWN, TOWNSHIP OF	421285	MOON, TOWNSHIP OF	421082	SOUTH PARK, TOWNSHIP OF	421165
BETHEL PARK, MUNICIPALITY OF	420012	FINDLAY, TOWNSHIP OF	421286	*MOUNT OLIVER, BOROUGH OF	420055	SOUTH VERSAILLES, TOWNSHIP OF	421281
BLAWNOX, BOROUGH OF	420013	*FOREST HILLS, BOROUGH OF	420035	MT. LEBANON, MUNICIPALITY OF	421272	SPRINGDALE, BOROUGH OF	421282
BRACKENRIDGE, BOROUGH OF	420014	FORWARD, TOWNSHIP OF	421064	MUNHALL, BOROUGH OF	420056	SPRINGDALE, TOWNSHIP OF	420074
BRADDOCK, BOROUGH OF	420015	FOX CHAPEL, BOROUGH OF	420036	NEVILLE, TOWNSHIP OF	425385	STOWE, TOWNSHIP OF	421110
*BRADDOCK HILLS, BOROUGH OF	420016	FRANKLIN PARK, BOROUGH OF	420037	NORTH BRADDOCK, BOROUGH OF	420058	SWISSVALE, BOROUGH OF	420075
BRADFORD WOODS, BOROUGH OF	421262	FRAZER, TOWNSHIP OF	421288	NORTH FAYETTE, TOWNSHIP OF	421085	TARENTUM, BOROUGH OF	420076
BRENTWOOD, BOROUGH OF	420017	GLASSPORT, BOROUGH OF	420038	NORTH VERSAILLES, TOWNSHIP OF	421231	THORNBURG, BOROUGH OF	420077
BRIDGEVILLE, BOROUGH OF	420018	GLEN OSBORNE, BOROUGH OF	420061	OAKDALE, BOROUGH OF	420059	TRAFFORD, BOROUGH OF	420903
CARNEGIE, BOROUGH OF	420019	GLENFIELD, BOROUGH OF	420039	OAKMONT, BOROUGH OF	420060	TURTLE CREEK, BOROUGH OF	420079
CASTLE SHANNON, BOROUGH OF	420020	GREEN TREE, BOROUGH OF	420040	O'HARA, TOWNSHIP OF	421088	UPPER ST. CLAIR, TOWNSHIP OF	421119
*CHALFANT, BOROUGH OF	420021	HAMPTON, TOWNSHIP OF	420978	OHIO, TOWNSHIP OF	421089	VERONA, BOROUGH OF	422611
CHESWICK, BOROUGH OF	420022	HARMAR, TOWNSHIP OF	421068	PENN HILLS, MUNICIPALITY OF	421092	VERSAILLES, BOROUGH OF	420081
CHURCHILL, BOROUGH OF	420023	HARRISON, TOWNSHIP OF	420041	*PENNSBURY VILLAGE, BOROUGH OF	422665	WALL, BOROUGH OF	420082
CLAIRTON, CITY OF	420024	HAYSVILLE, BOROUGH OF	420042	PINE, TOWNSHIP OF	421094	WEST DEER, TOWNSHIP OF	421299
COLLIER, TOWNSHIP OF	421058	HEIDELBURG, BOROUGH OF	420043	PITCAIRN, BOROUGH OF	420062	WEST ELIZABETH, BOROUGH OF	420083
CORAOPOLIS, BOROUGH OF	420025	HOMESTEAD, BOROUGH OF	420044	PITTSBURGH, CITY OF	420063	WEST HOMESTEAD, BOROUGH OF	420084
CRAFTON, BOROUGH OF	420026	INDIANA, TOWNSHIP OF	421070	PLEASANT HILLS, BOROUGH OF	420064	WEST MIFFLIN, BOROUGH OF	420085
CRESCENT, TOWNSHIP OF	421060	*INGRAM, BOROUGH OF	420045	PLUM, BOROUGH OF	420065	*WEST VIEW, BOROUGH OF	420086
*DORMONT, BOROUGH OF	422630	JEFFERSON HILLS, BOROUGH OF	420046	PORT VUE, BOROUGH OF	420066	WHITEHALL, BOROUGH OF	420088
DRAVOSBURG, BOROUGH OF	420027	KENNEDY, TOWNSHIP OF	421072	RANKIN, BOROUGH OF	420067	WHITAKER, BOROUGH OF	420087
DUQUESNE, CITY OF	420028	KILBUCK, TOWNSHIP OF	421073	RESERVE, TOWNSHIP OF	420068	WHITE OAK, BOROUGH OF	420089
EAST DEER, TOWNSHIP OF	421061	LEET, TOWNSHIP OF	421075	RICHLAND, TOWNSHIP OF	421199	WILKINS, TOWNSHIP OF	420090
		LEETSDALE, BOROUGH OF	420047	ROBINSON, TOWNSHIP OF	421097	*WILKINSBURG, BOROUGH OF	422667
		LIBERTY, BOROUGH OF	420048	ROSS, TOWNSHIP OF	420979	WILMERDING, BOROUGH OF	420091

*No special flood hazard areas identified

REVISED: September 26, 2014

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER

42003CV001B

where Q = peak discharge
A = drainage area
a = exponent

In the Township of Leet, the equation above was also used to transform flows from the Raccoon Creek watershed to predict peak flows for Big Sewickley Creek.

October 4, 1995, Countywide Analyses

Frequency flood flows for the Monongahela River at the mouth were based on statistical analyses of stage discharge records covering 118-year record at the Pittsburgh “Point” gaging station located at the confluence of the Monongahela and Allegheny Rivers. This gaging station was operated jointly by the USACE, the USGS, and the National Weather Service (NWS). Gage readings have been obtained since 1762. During the period 1762 to 1854, the gage that was established on the Monongahela River at the confluence of the two rivers was read by various personnel resulting in incomplete records. From May 1854 to May 1873, the Pittsburgh gage was read by the USACE personnel. In May 1873, the U.S. Weather Bureau (now the NWS) began reading the gage and made it the official Pittsburgh gage. These records are now maintained by the NWS.

Upstream of the mouth, stage-discharge records have been maintained at Lock and Dam No. 2 located at Braddock, Pennsylvania, river mile 11.2, covering a 66-year period. The gaging station is jointly operated by the USGS and the USACE. Actual lower gage readings have been recorded at Lock and Dam No. 2 since 1905 and are generally affected by backwater from the Ohio River. All stage discharge records are maintained by the Pittsburgh District of the USACE. The actual peak flows at Lock and Dam No. 2 were adjusted for the effect of upstream reservoirs that were constructed between 1938 and 1989 to compute a natural peak flow for each flood event.

The analyses of the natural peak discharge-frequency curves on the Monongahela River followed a standard log-Pearson Type III method (Reference 24). The resulting flood flow frequencies developed at the mouth and at Lock and Dam No. 2 were modified by means of an average reduction curve in order to reflect flow reduction by the present upstream flood control reservoirs.

March 16, 1998, Countywide Analyses

Hydrology for the following streams was developed using the Penn State Runoff Model (Reference 31).

Borough of Etna:	Pine Creek, Little Pine Creek West
Borough of Franklin Park:	Pine Creek
Township of Hampton:	Pine Creek, Harts Run, Gourdhead Run, McCaslin Run, Montour Run No. 1
Township of Indiana:	Little Pine Creek East

TABLE 6 - SUMMARY OF DISCHARGES – (continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	Annual Chance of Flooding 10-percent annual chance	2-percent annual chance	1- percent annual chance	0.2-percent annual chance
McLAUGHLIN RUN					
At the confluence with Chartiers Creek	7.53	955	1,567	1,866	2,677
Approximately 610 feet downstream of Baldwin Street	7.30	937	1,540	1,835	2,635
Approximately 0.6 mile upstream of Baldwin St	6.90	892	1,467	1,748	2,511
Approximately 0.6 miles downstream of Lesnett Road	6.50	842	1,387	1,653	2,376
Approximately 250 feet downstream of Lesnett Road	5.51	742	1,225	1,462	2,106
Approximately 0.3 miles upstream of Morrow Road	4.61	644	1,068	1,276	1,842
Approximately 30 feet upstream of Old Washington Road	4.40	619	1,027	1,227	1,774
Approximately 0.20 miles downstream of Bethel Church Road	1.55	275	467	563	827
Approximately 0.1 miles upstream of Bethel Church Road	1.02	198	339	410	606
MILLERS RUN					
At confluence with Chartiers Creek	28.1	2,400	4,300	5,300	8,100
Above confluence with Tributary at Morgan Hill Road	24.6	2,130	3,800	4,700	7,100
Above confluence with Fishing Run	1.9	1,750	3,100	3,850	5,800
MONONGAHELA RIVER					
At confluence to Lock and Dam No. 2, at river mile 11.2	7,388 5,668[1]	168,500	212,000	231,000	275,000

[1]Reduced due to the Tygart, Stonewall Jackson, and Youghiogheny Dams

It is important to note that temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the Technical Support Data Notebook associated with this FIS and FIRM. Interested individuals may contact FEMA to access this data

3.3 Vertical Datum

All FISs and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FISs and FIRMs was NGVD 29. With the finalization of the North American Vertical Datum of 1988 (NAVD 88), many FIS reports and FIRMs are being prepared using NAVD 88 as the referenced vertical datum.

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD 88. Structure and ground elevations in the county must, therefore, be referenced to NAVD 88. It is important to note that adjacent counties may be referenced to NGVD 29. This may result in differences in BFEs across the county boundaries between the counties.

The average datum shift from NGVD 29 to NAVD 88 for Allegheny County used was -0.52 feet.

For information regarding conversion between the NGVD29 and NAVD88, visit the National Geodetic Survey web site at www.ngs.noaa.gov, or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3242

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS provides 1-percent annual chance floodplain data, which may include a combination of the following: 10-, 2-, 1-, and 0.2-percent-annual-chance flood elevations; delineations of the 1- and 0.2-percent annual chance floodplains; and 1-percent annual chance floodway. This information is presented on the FIRM and in many components of the FIS, including Flood Profiles,

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Millers Run (Continued)								
Z	19,620[1]	60	496	7.8	888.7	888.7	889.6	0.9
AA	21,318[1]	109	488	7.9	896.2	896.2	896.2	0.0
AB	22,338[1]	164	803	4.8	901.1	901.1	901.9	0.8
AC	22,929[1]	114	471	8.2	904.1	904.1	904.3	0.2
AD	23,823[1]	70	540	7.1	911.1	911.1	911.1	0.0
AE	24,699[1]	90	635	6.1	913.5	913.5	914.1	0.6
AF	25,354[1]	46	337	11.4	915.6	915.6	915.9	0.3
AG	26,154[1]	83	580	6.6	920.3	920.3	921.1	0.8
AH	26,659[1]	65	487	7.9	921.9	921.9	922.3	0.4
AI	27,214[1]	60	439	8.8	924.1	924.1	924.4	0.3
Monongahela River								
A	25[2]	991	35,116	6.6	729.0	729.0	730.0	1.0
B	370[2]	930	34,546	6.7	729.0	729.0	730.0	1.0
C	2,640[2]	889	32,636	7.1	729.4	729.4	730.3	0.9
D	4,450[2]	1,019	35,592	6.5	729.8	729.8	730.8	1.0
E	7,640[2]	806	29,638	7.8	730.2	730.2	731.2	1.0
F	9,240[2]	880	31,614	7.3	730.7	730.7	731.6	0.9
G	10,880[2]	1,033	34,472	6.7	731.1	731.1	732.0	0.9
H	13,992[2]	1,000	33,314	6.9	731.9	731.9	732.8	0.9
I	15,680[2]	828	30,811	7.5	732.1	732.1	732.9	0.8
J	17,952[2]	948	33,986	6.8	732.8	732.8	733.6	0.8
K	19,536[2]	916	34,479	6.7	733.0	733.0	733.8	0.8

[1] Feet above confluence with Chartiers Creek
[2] Feet above confluence with Ohio River

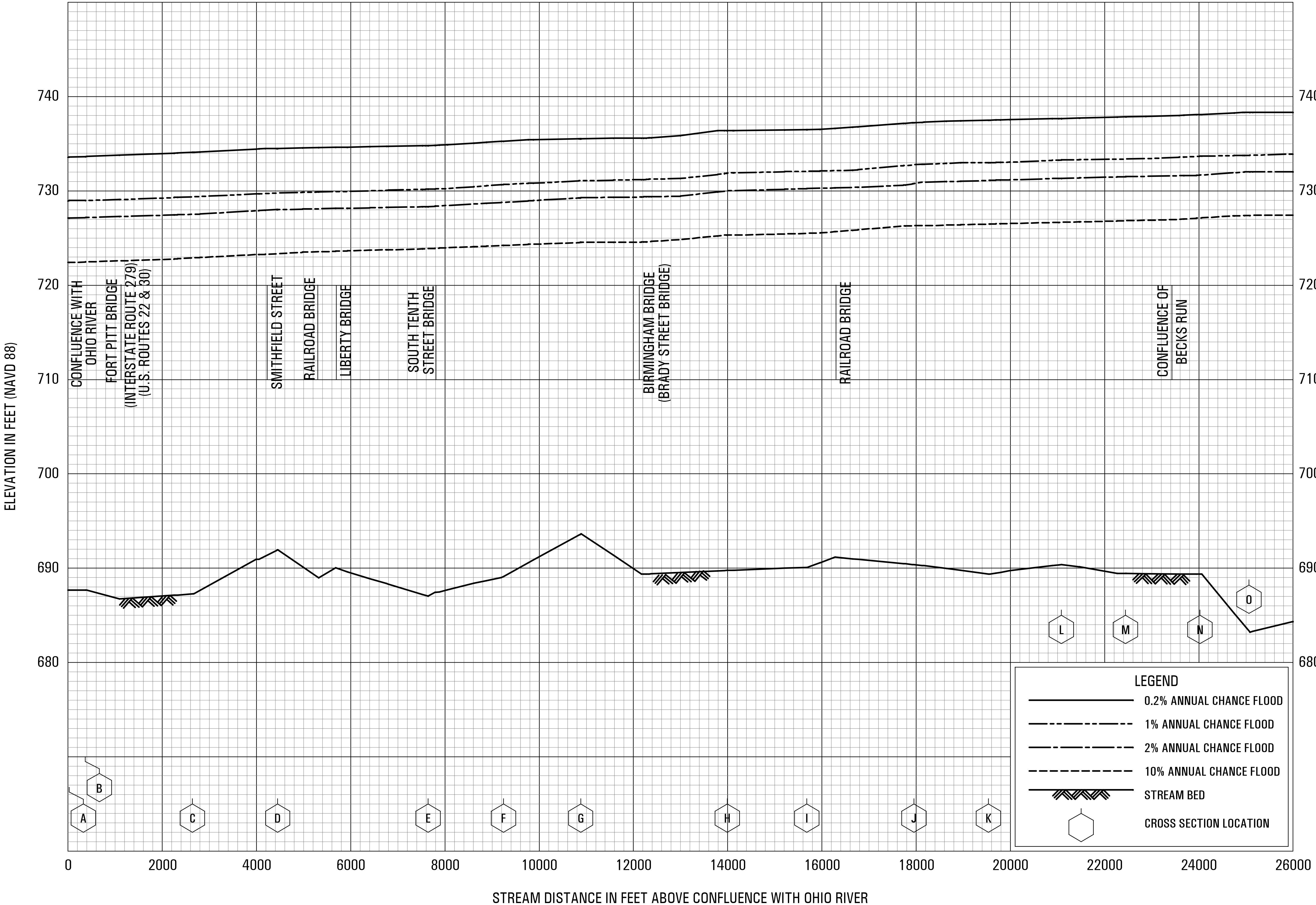
TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGHENY COUNTY, PA
(ALL JURISDICTIONS)

FLOODWAY DATA

MILLERS RUN - MONONGAHELA RIVER



FLOOD PROFILES

MONONGAHELA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGHENY COUNTY, PA

ALL JURISDICTIONS

APPENDIX A-3.1

HEC-2 Geometry Comparison

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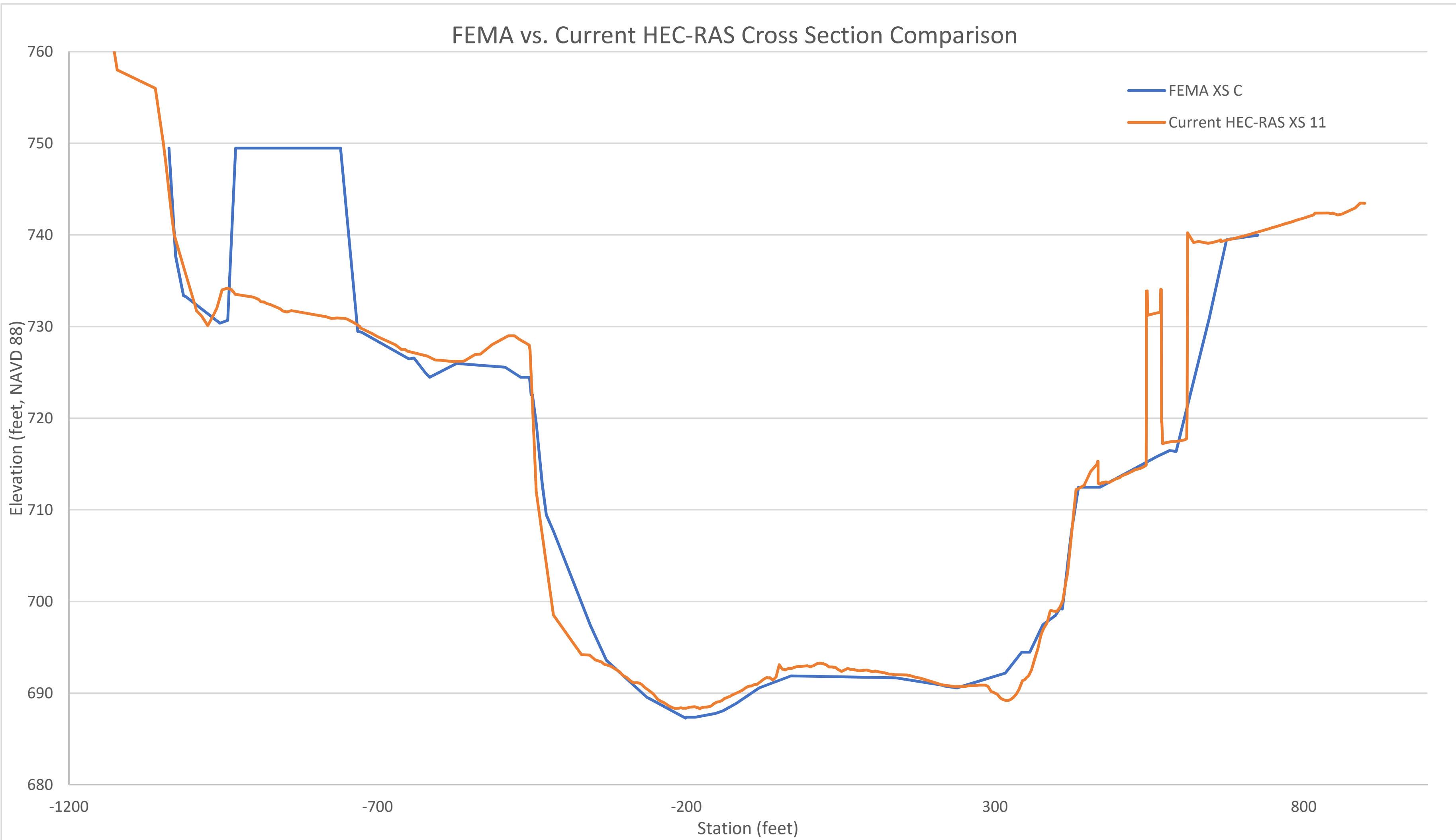
FEMA vs. Current HEC-RAS Cross Section Comparison
760
750
740
730
720
710
700
690
680
Elevation (feet, NAVD 88)
-1200
-700
-200
300
800
Station (feet)
FEMA XS C
Current HEC-RAS XS 11

I-376 Bathtub
Monongahela River

APPENDIX A-4

Hydrology

Allegheny County
PennDOT District 11-0

NEWELL TERESKA & MACKAY
ENGINEERING

APPENDIX A-4.1

Watershed Characteristics

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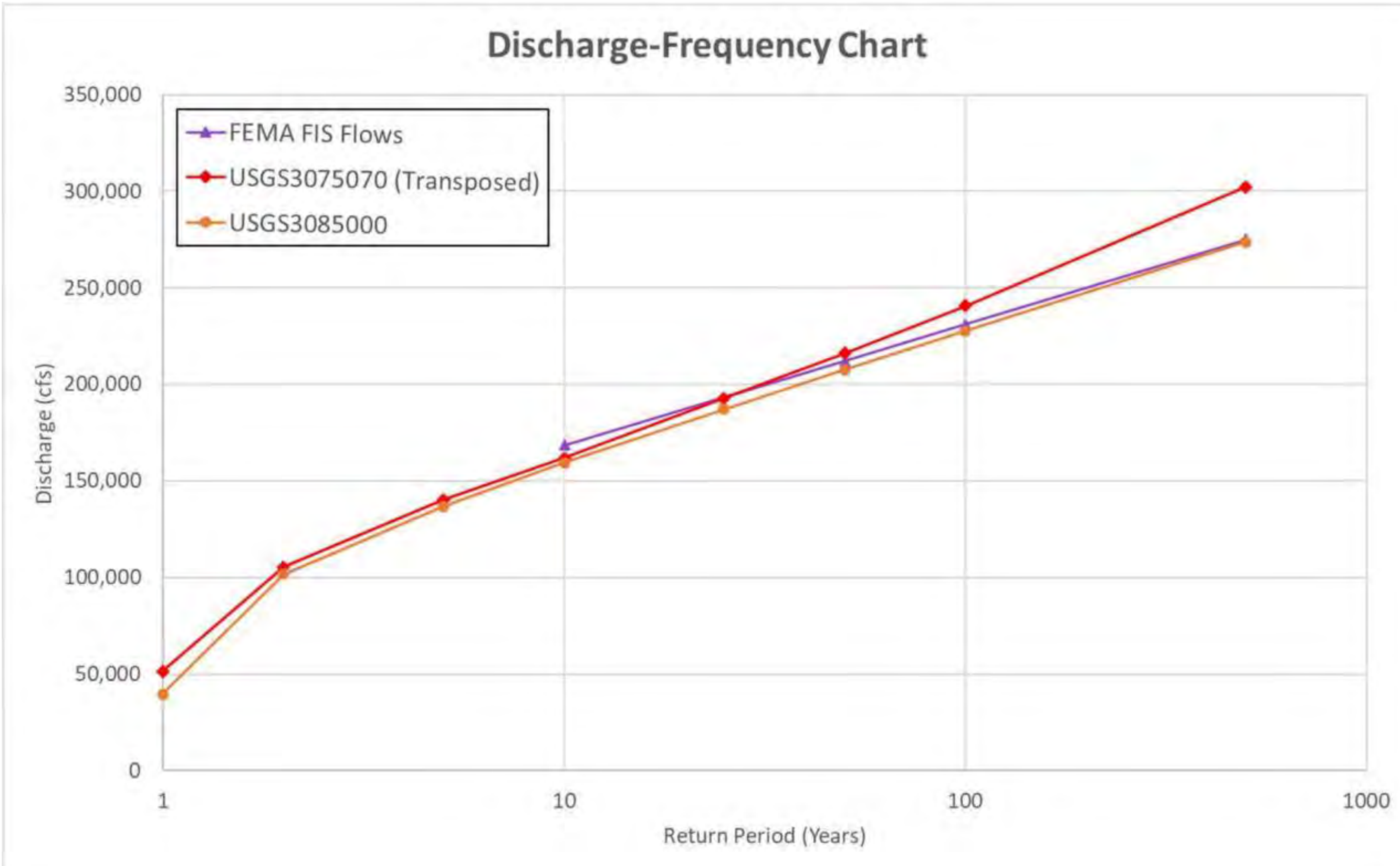
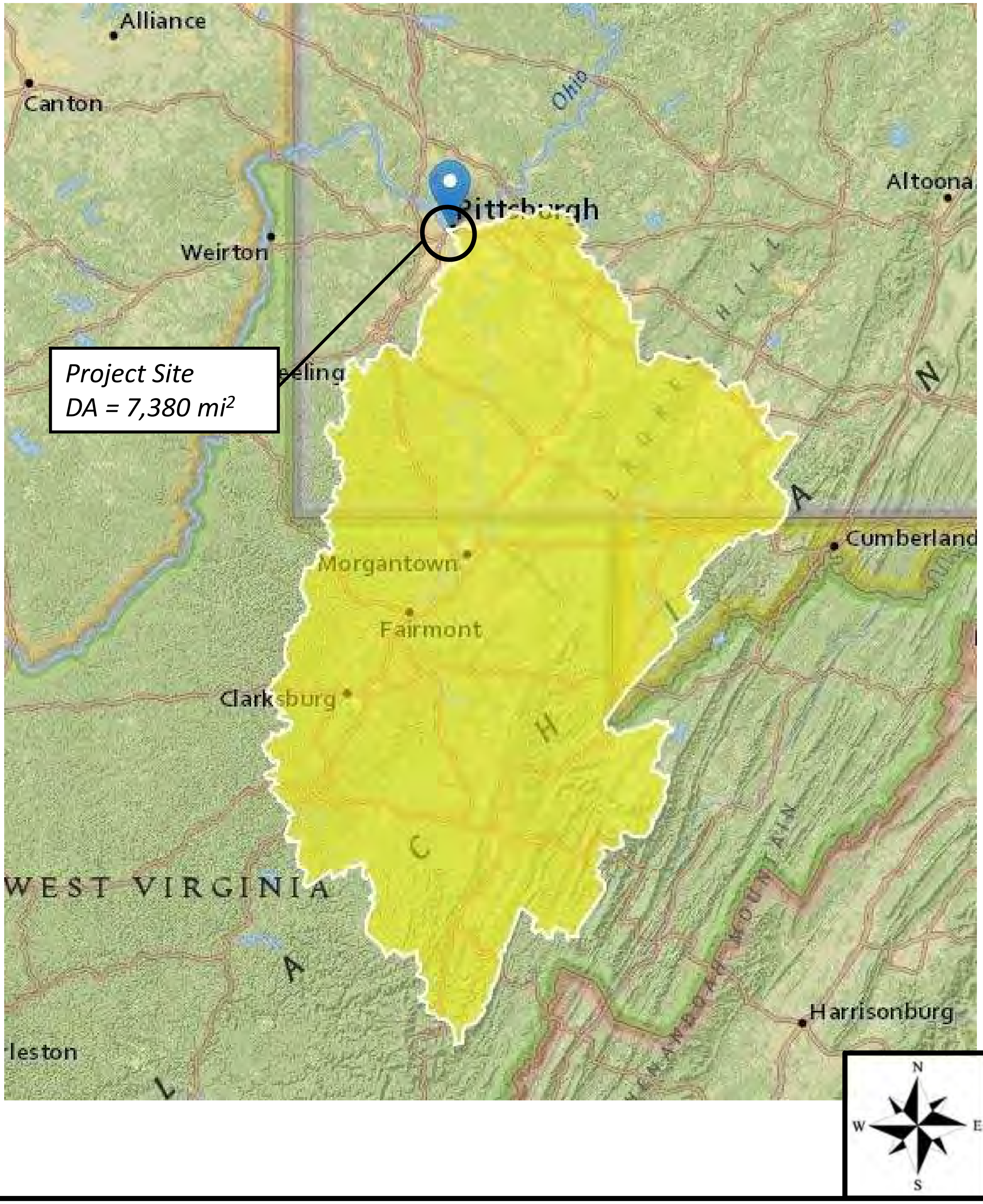
ENGINEERING



Discharge-Frequency Chart
FEMA FIS Flows
USGS3075070 (Transposed)
USGS3085000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
Discharge (cfs)
1
10
100
1000
Return Period (Years)

Drainage Area Delineation



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLOPD	Mean basin slope measured in degrees	10.8	degrees
BSLOPDRAW	Unadjusted basin slope, in degrees	11.01	degrees
CARBON	Percentage of area of carbonate rock	1.5	percent
CENTROXA83	X coordinate of the centroid, in NAD_1983_Albers, meters	-158011.9	meters
CENTROYA83	Basin centroid horizontal (y) location in NAD 1983 Albers	57796.9	meters
DRN	Drainage quality index from STATSGO	3.3	dimensionless
DRNAREA	Area that drains to a point on a stream	7380	square miles
ELEV	Mean Basin Elevation	1836.1	feet
FOREST	Percentage of area covered by forest	72.6	percent
GLACIATED	Percentage of basin area that was historically covered by glaciers	0	percent
IMPNLCD01	Percentage of impervious area determined from NLCD 2001 impervious dataset	2.1	percent
LC01DEV	Percentage of land-use from NLCD 2001 classes 21-24	10.3	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	10.8	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	2.42	percent
LONG_OUT	Longitude of Basin Outlet	-80.01614	degrees
MAXTEMP	Mean annual maximum air temperature over basin area from PRISM 1971-2000 800-m grid	59.3	degrees F
OUTLETXA83	X coordinate of the outlet, in NAD_1983_Albers,meters	-171015	meters
OUTLETYA83	Y coordinate of the outlet, in NAD_1983_Albers, meters	162165	meters
PRECIP	Mean Annual Precipitation	46.2	inches
ROCKDEP	Depth to rock	4.1	feet
STORAGE	Percentage of area of storage (lakes ponds reservoirs wetlands)	0.8	percent
STRDEN	Stream Density -- total length of streams divided by drainage area	2.04	miles per square mile
STRMTOT	total length of all mapped streams (1:24,000-scale) in the basin	15065.14	miles
URBAN	Percentage of basin with urban development	4.5	percent

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APPENDIX A-4.2

Monongahela River Watershed Act 167

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Portion of Subwatershed Map from Monongahela River Watershed Act 167 Plan

Monongahela River Watershed
Act 167
Stormwater Management Plan

Volume 1
Main Plan Document

Submitted to:
Allegheny County Department of Planning
441 Smithfield Street
Pittsburgh, Pennsylvania 15222

February 1993

CHESTER
ENVIRONMENTAL

Act 167 Flood Frequency/Discharge Table

FLOOD FREQUENCY / DISCHARGE INFORMATION

Estimated flood frequency / discharge information for as presented in the various Flood Information Studies completed for municipalities in the watershed are presented in Table III-3: The data presented in Table III-3 were extracted from studies prepared for the City of Duquesene, West Elizabeth Borough, West Mifflin Borough, North Versailles Township, Jefferson Borough, Elizabeth Township and the City of McKeesport. The reader's attention is directed to Section IV of this report for a explanation of the concept of flood frequency - discharge data. Table II-4 contains estimates of 100 year return period peak discharges calculated from data contained in the "Floodway Data" tables included in various Flood Insurance Studies prepared for tributaries in the watershed.

TABLE III-3
REPORTED FLOOD FREQUENCY / DISCHARGE DATA

Location	Peak Discharge (cfs) 10-yr	50-yr	100-yr	500-yr
Monongahela River @ Mile 11.2	162,000	205,000	220,000	262,000
Monongahela River @ Mile 15.6	135,000	167,000	182,500	216,400
Crooked Run @ N. Versailles Border	560	980	1,170	1,710
Crooked Run @ Arcannia Street	470	810	970	1,420
Crooked Run @ Mouth	885	1,530	1,835	2,680
Crooked Run Between Hartman & Fawcett	690	1,190	1,430	2,085
Lobbs Run @ Mouth	760	1,320	1,610	2,410

APPENDIX A-4.3

Gage Analysis

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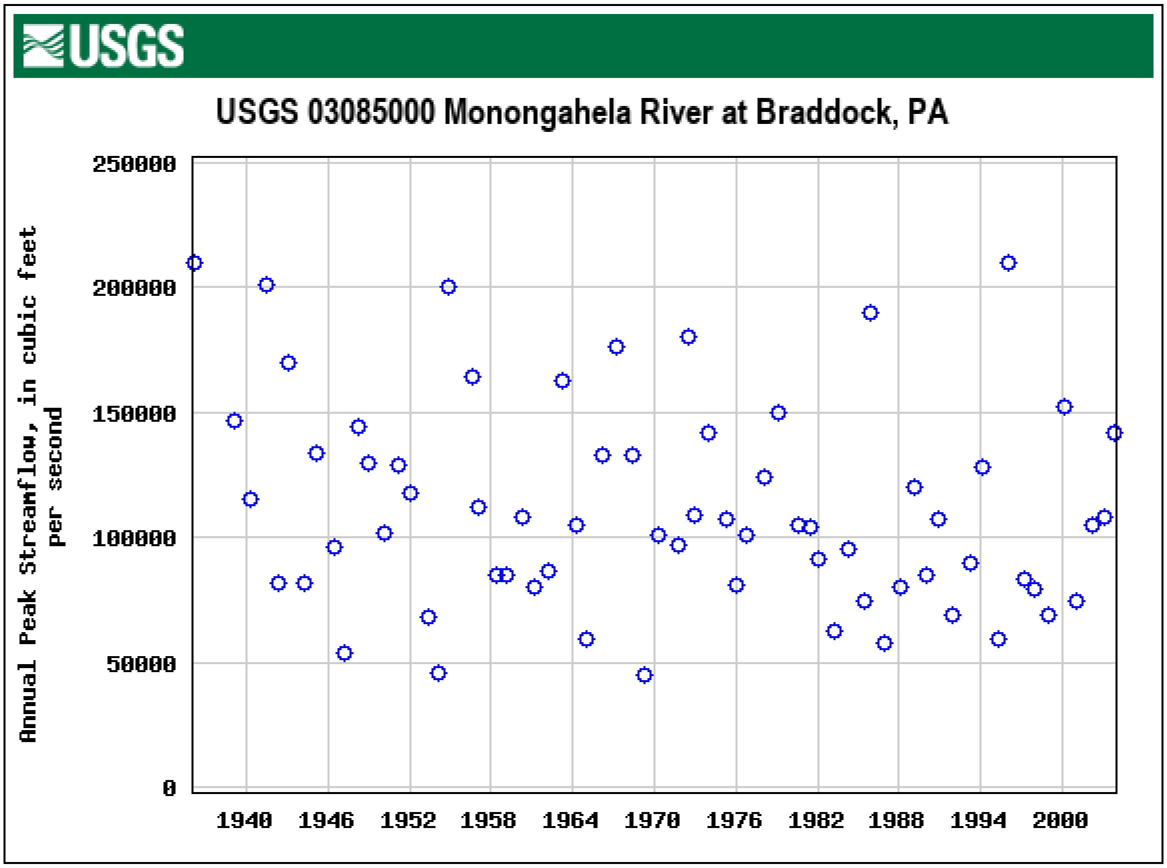
Peak Streamflow
USGS 03085000 Monongahela River at Braddock, PA

Allegheny County, Pennsylvania
Hydrologic Unit Code 05020005
Latitude 40°23’28", Longitude 79°51’30" NAD27
Drainage area 7,337 square miles
Gage datum 709.66 feet above NGVD29



Peak Streamflow
USGS 03085000 Monongahela River at Braddock, PA

Water Year	Date	Gage Height (feet)	Stream-flow (cfs)
1936	Mar. 18, 1936		210,000[6,7]
1939	Feb. 04, 1939	27.20[3]	147,000[6]
1940	Apr. 20, 1940	23.86[3]	115,000[6]
1941	Jun. 05, 1941	31.20[3]	201,000[6]
1942	Apr. 10, 1942	21.23[3]	81,800[6]
1943	Dec. 30, 1942	[2]	170,000[2,6]
1944	Mar. 24, 1944	21.18[3]	81,800[6]
1945	Mar. 07, 1945	[2]	134,000[2,6]
1946	Jun. 03, 1946	22.42[3]	96,200[6]
1947	Mar. 15, 1947	19.21[3]	53,900[6]
1948	Apr. 14, 1948	26.22[3]	144,000[6]
1949	Dec. 16, 1948	24.99[3]	130,000[6]
1950	Feb. 01, 1950	23.07[3]	102,000[6]
1951	Feb. 02, 1951	25.30[3]	129,000[6]
1952	Jan. 28, 1952	23.09	118,000[6]
1953	May 08, 1953	20.16	68,500[6]
1954	Mar. 02, 1954	18.43	46,100[6]
1955	Oct. 16, 1954	30.63	200,000[6]
1956	Aug. 06, 1956	26.57	164,000[6]
1957	Feb. 11, 1957	22.34	112,000[6]
1958	May 06, 1958	21.24	84,900[6]
1959	Jan. 23, 1959	21.15	84,900[6]
1960	Mar. 31, 1960	22.25	108,000[6]
1961	Feb. 20, 1961	20.94	80,200[6]
1962	Mar. 22, 1962	21.33	86,500[6]
1963	Mar. 06, 1963	26.60	163,000[6]
1964	Mar. 11, 1964	22.58	105,000[6]
1965	Jan. 25, 1965	19.40	59,300[6]
1966	Feb. 14, 1966	24.05	133,000[6]
1967	Mar. 07, 1967	27.80	176,000[6]
1968	May 25, 1968	24.09	133,000[6]
1969	Apr. 06, 1969	18.20	45,100[6]
1970	Apr. 03, 1970	21.58	101,000[6]
1971	Sep. 15, 1971	21.27[2]	96,800[6]
1972	Jun. 24, 1972	31.39[1]	180,000[6]

Peak Gage-Height Qualification Codes.

- 1 -- Gage height affected by backwater
- 2 -- Gage height not the maximum for the year
- 3 -- Gage height at different site and(or) datum
- 6 -- Gage datum changed during this year

Peak Streamflow Qualification Codes.

- 2 -- Discharge is an Estimate
- 6 -- Discharge affected by Regulation or Diversion
- 7 -- Discharge is an Historic Peak

Peak Streamflow
USGS 03085000 Monongahela River at Braddock, PA

Water Year	Date	Gage Height (feet)	Stream-flow (cfs)
1973	Dec. 09, 1972	22.87	109,000[6]
1974	Jan. 12, 1974	24.82	142,000[6]
1975	Apr. 26, 1975	22.71	107,000[6]
1976	Jan. 02, 1976	20.94	80,800[6]
1977	Oct. 10, 1976	22.25	101,000[6]
1978	Jan. 27, 1978	24.04	124,000[6]
1979	Feb. 26, 1979		150,000[2,6]
1980	Aug. 19, 1980	22.54	105,000[6]
1981	Jun. 07, 1981	22.49	104,000[6]
1982	Jan. 24, 1982	21.60	91,200[6]
1983	Apr. 25, 1983	19.65	62,600[6]
1984	Apr. 05, 1984	21.92	95,700[6]
1985	Jun. 01, 1985	20.50	74,500[6]
1986	Nov. 06, 1985	29.07	190,000[6]
1987	Nov. 10, 1986	19.25	57,500[6]
1988	Mar. 05, 1988	20.89	80,000[6]
1989	Mar. 07, 1989	23.69	120,000[6]
1990	Jan. 01, 1990	21.21	85,000[6]
1991	Dec. 19, 1990	20.27[6]	107,000[6]
1992	Dec. 03, 1991	17.69	68,800[6]
1993	Mar. 24, 1993	19.06	89,500[6]
1994	Feb. 10, 1994	21.20	128,000[6]
1995	May 15, 1995	17.00	59,700[6]
1996	Jan. 20, 1996	29.07	210,000[6]
1997	Mar. 02, 1997	18.67	83,400[6]
1998	Jan. 09, 1998	18.42	79,500[6]
1999	Jan. 15, 1999	17.67	69,100[6]
2000	Feb. 19, 2000	23.90	152,000[6]
2001	Jan. 31, 2001	18.07	74,200[6]
2002	Mar. 21, 2002	20.10	105,000[6]
2003	Feb. 24, 2003	20.39	108,000[6]
2004	Nov. 20, 2003	23.10	142,000[6]

Peak Gage-Height Qualification Codes.

- 1 -- Gage height affected by backwater
- 2 -- Gage height not the maximum for the year
- 3 -- Gage height at different site and(or) datum
- 6 -- Gage datum changed during this year

Peak Streamflow Qualification Codes.

- 2 -- Discharge is an Estimate
- 6 -- Discharge affected by Regulation or Diversion
- 7 -- Discharge is an Historic Peak

```
1
  Program PeakFq           U. S. GEOLOGICAL SURVEY            Seq.002.000
  Version 7.2         Annual peak flow frequency analysis      Run Date / Time
  3/28/2018                                                     11/20/2019 10:06

                        --- PROCESSING OPTIONS ---

                      Plot option         = Graphics device
                      Basin char output   = None
                      Print option        = Yes
                      Debug print         = No
                      Input peaks listing = Long
                      Input peaks format  = WATSTORE peak file

                      Input files used:
                         peaks (ascii)  - \\server\projects\19036\WO 6 I 376
Flooding\H&H\Hydrology\PeakFQ 7.1\USGS3085000\USGS3085000.TXT
                         specifications - \\server\projects\19036\WO 6 I 376
Flooding\H&H\Hydrology\PeakFQ 7.1\USGS3085000\PKFQWPSF.TMP
                      Output file(s):
                         main - \\server\projects\19036\WO 6 I 376
Flooding\H&H\Hydrology\PeakFQ 7.1\USGS3085000\USGS3085000.PRT


  ***  User responsible for assessment and interpretation of the following analysis  ***

1


  Program PeakFq           U. S. GEOLOGICAL SURVEY            Seq.001.001
  Version 7.2         Annual peak flow frequency analysis      Run Date / Time
  3/28/2018                                                     11/20/2019 10:06

             Station - 03085000  Monongahela River at Braddock, PA


                     TABLE 1 - INPUT DATA SUMMARY

                Number of peaks in record           =       61
                Peaks not used in analysis          =        0
                Gaged peaks in analysis             =       61
                Historic peaks in analysis          =        0
                Beginning Year                      =     1944
                Ending Year                         =     2004
                Historical Period Length            =       61
                Skew option                         =   WEIGHTED
                Regional skew                       =    0.092
                     Standard error                 =    0.550
                     Mean Square error              =    0.303
                Gage base discharge                 =      0.0
                User supplied high outlier threshold =   --
                User supplied PILF (LO) criterion    =   --
                Plotting position parameter         =     0.00
                Type of analysis                      BULL.17B
                PILF (LO) Test Method                     MGBT
```

Perceptible Ranges = Not Applicable
Interval Data = Not Applicable

TABLE 2 - DIAGNOSTIC MESSAGE AND PILF RESULTS

WCF134I-NO SYSTEMATIC PEAKS WERE BELOW GAGE BASE. 0.0
WCF163I-NO HIGH OUTLIERS OR HISTORIC PEAKS EXCEEDED HHBASE. 278162.0
**WCF164W-HISTORIC PERIOD IGNORED. 61.0
WCF002J-CALCS COMPLETED. RETURN CODE = 2

Kendall's Tau Parameters

	TAU	P-VALUE	MEDIAN SLOPE	No. of PEAKS
GAGED PEAKS	-0.068	0.440	-195.261	61

1

Program PeakFq U. S. GEOLOGICAL SURVEY Seq.001.002
Version 7.2 Annual peak flow frequency analysis Run Date / Time
3/28/2018 11/20/2019 10:06

Station - 03085000 Monongahela River at Braddock, PA

TABLE 3 - ANNUAL FREQUENCY CURVE PARAMETERS -- LOG-PEARSON TYPE III

	FLOOD BASE		LOGARITHMIC		
	DISCHARGE	EXCEEDANCE PROBABILITY	MEAN	STANDARD DEVIATION	SKEW
SYSTEMATIC RECORD	0.0	1.0000	5.0059	0.1543	-0.116
BULL.17B ESTIMATE	0.0	1.0000	5.0059	0.1543	-0.067

BULL.17B ESTIMATE OF MSE OF AT-SITE SKEW 0.0922

TABLE 4 - ANNUAL FREQUENCY CURVE -- DISCHARGES AT SELECTED EXCEEDANCE PROBABILITIES

ANNUAL EXCEEDANCE PROBABILITY	BULL.17B ESTIMATE	SYSTEMATIC RECORD	LOG VARIANCE OF EST.	CONFIDENCE INTERVALS 5% LOWER	95% UPPER
			<-- FOR BULLETIN 17B ESTIMATES -->		
0.9950	39690.	39060.	----	33010.0	45710.0
0.9900	43590.	43040.	----	36790.0	49670.0
0.9500	56130.	55860.	----	49190.0	62320.0

0.9000	64130.	64020.	----	57230.0	70360.0
0.8000	75260.	75330.	----	68410.0	81650.0
0.6667	87260.	87470.	----	80340.0	94120.0
0.5000	101800.	102100.	----	94350.0	109800.0
0.4292	108400.	108700.	----	100600.0	117200.0
0.2000	136800.	136900.	----	126100.0	150500.0
0.1000	159400.	159100.	----	145300.0	178500.0
0.0400	187200.	186100.	----	168300.0	214300.0
0.0200	207500.	205600.	----	184600.0	241200.0
0.0100	227600.	224700.	----	200500.0	268200.0
0.0050	247500.	243500.	----	216000.0	295400.0
0.0020	273700.	268100.	----	236200.0	332100.0

1

Station - 03085000 Monongahela River at Braddock, PA

TABLE 5 - INPUT DATA LISTING

WATER YEAR	PEAK VALUE	PEAKFQ CODES	REMARKS
1944	81800.0	K	
1945	134000.0	K	
1946	96200.0	K	
1947	53900.0	K	
1948	144000.0	K	
1949	130000.0	K	
1950	102000.0	K	
1951	129000.0	K	
1952	118000.0	K	
1953	68500.0	K	
1954	46100.0	K	
1955	200000.0	K	
1956	164000.0	K	
1957	112000.0	K	
1958	84900.0	K	
1959	84900.0	K	
1960	108000.0	K	
1961	80200.0	K	
1962	86500.0	K	
1963	163000.0	K	
1964	105000.0	K	
1965	59300.0	K	
1966	133000.0	K	
1967	176000.0	K	
1968	133000.0	K	
1969	45100.0	K	
1970	101000.0	K	
1971	96800.0	K	

1972	180000.0	K
1973	109000.0	K
1974	142000.0	K
1975	107000.0	K
1976	80800.0	K
1977	101000.0	K
1978	124000.0	K
1979	150000.0	K
1980	105000.0	K
1981	104000.0	K
1982	91200.0	K
1983	62600.0	K
1984	95700.0	K
1985	74500.0	K
1986	190000.0	K
1987	57500.0	K
1988	80000.0	K
1989	120000.0	K
1990	85000.0	K
1991	107000.0	K
1992	68800.0	K
1993	89500.0	K
1994	128000.0	K
1995	59700.0	K
1996	210000.0	K
1997	83400.0	K
1998	79500.0	K
1999	69100.0	K
2000	152000.0	K
2001	74200.0	K
2002	105000.0	K
2003	108000.0	K
2004	142000.0	K

Explanation of peak discharge qualification codes

PeakFQ CODE	NWIS CODE	DEFINITION
D	3	Dam failure, non-recurrent flow anomaly
G	8	Discharge greater than stated value
X	3+8	Both of the above
L	4	Discharge less than stated value
K	6 OR C	Known effect of regulation or urbanization
H	7	Historic peak

- Minus-flagged discharge -- Not used in computation
  -8888.0 -- No discharge value given
- Minus-flagged water year -- Historic peak used in computation

Station - 03085000 Monongahela River at Braddock, PA

TABLE 6 - EMPIRICAL FREQUENCY CURVES -- WEIBULL PLOTTING POSITIONS

WATER YEAR	RANKED DISCHARGE	SYSTEMATIC RECORD	B17B ESTIMATE
1996	210000.0	0.0161	0.0161
1955	200000.0	0.0323	0.0323
1986	190000.0	0.0484	0.0484
1972	180000.0	0.0645	0.0645
1967	176000.0	0.0806	0.0806
1956	164000.0	0.0968	0.0968
1963	163000.0	0.1129	0.1129
2000	152000.0	0.1290	0.1290
1979	150000.0	0.1452	0.1452
1948	144000.0	0.1613	0.1613
1974	142000.0	0.1774	0.1774
2004	142000.0	0.1935	0.1935
1945	134000.0	0.2097	0.2097
1966	133000.0	0.2258	0.2258
1968	133000.0	0.2419	0.2419
1949	130000.0	0.2581	0.2581
1951	129000.0	0.2742	0.2742
1994	128000.0	0.2903	0.2903
1978	124000.0	0.3065	0.3065
1989	120000.0	0.3226	0.3226
1952	118000.0	0.3387	0.3387
1957	112000.0	0.3548	0.3548
1973	109000.0	0.3710	0.3710
1960	108000.0	0.3871	0.3871
2003	108000.0	0.4032	0.4032
1975	107000.0	0.4194	0.4194
1991	107000.0	0.4355	0.4355
1964	105000.0	0.4516	0.4516
1980	105000.0	0.4677	0.4677
2002	105000.0	0.4839	0.4839
1981	104000.0	0.5000	0.5000
1950	102000.0	0.5161	0.5161
1970	101000.0	0.5323	0.5323
1977	101000.0	0.5484	0.5484
1971	96800.0	0.5645	0.5645
1946	96200.0	0.5806	0.5806
1984	95700.0	0.5968	0.5968
1982	91200.0	0.6129	0.6129
1993	89500.0	0.6290	0.6290
1962	86500.0	0.6452	0.6452
1990	85000.0	0.6613	0.6613
1958	84900.0	0.6774	0.6774
1959	84900.0	0.6935	0.6935

1997	83400.0	0.7097	0.7097
1944	81800.0	0.7258	0.7258
1976	80800.0	0.7419	0.7419
1961	80200.0	0.7581	0.7581
1988	80000.0	0.7742	0.7742
1998	79500.0	0.7903	0.7903
1985	74500.0	0.8065	0.8065
2001	74200.0	0.8226	0.8226
1999	69100.0	0.8387	0.8387
1992	68800.0	0.8548	0.8548
1953	68500.0	0.8710	0.8710
1983	62600.0	0.8871	0.8871
1995	59700.0	0.9032	0.9032
1965	59300.0	0.9194	0.9194
1987	57500.0	0.9355	0.9355
1947	53900.0	0.9516	0.9516
1954	46100.0	0.9677	0.9677
1969	45100.0	0.9839	0.9839

1

End PeakFQ analysis.
Stations processed : 1
Number of errors : 0
Stations skipped : 0
Station years : 61

Data records may have been ignored for the stations listed below.
(Card type must be Y, Z, N, H, I, 2, 3, 4, or *.)
(2, 4, and * records are ignored.)

For the station below, the following records were ignored:

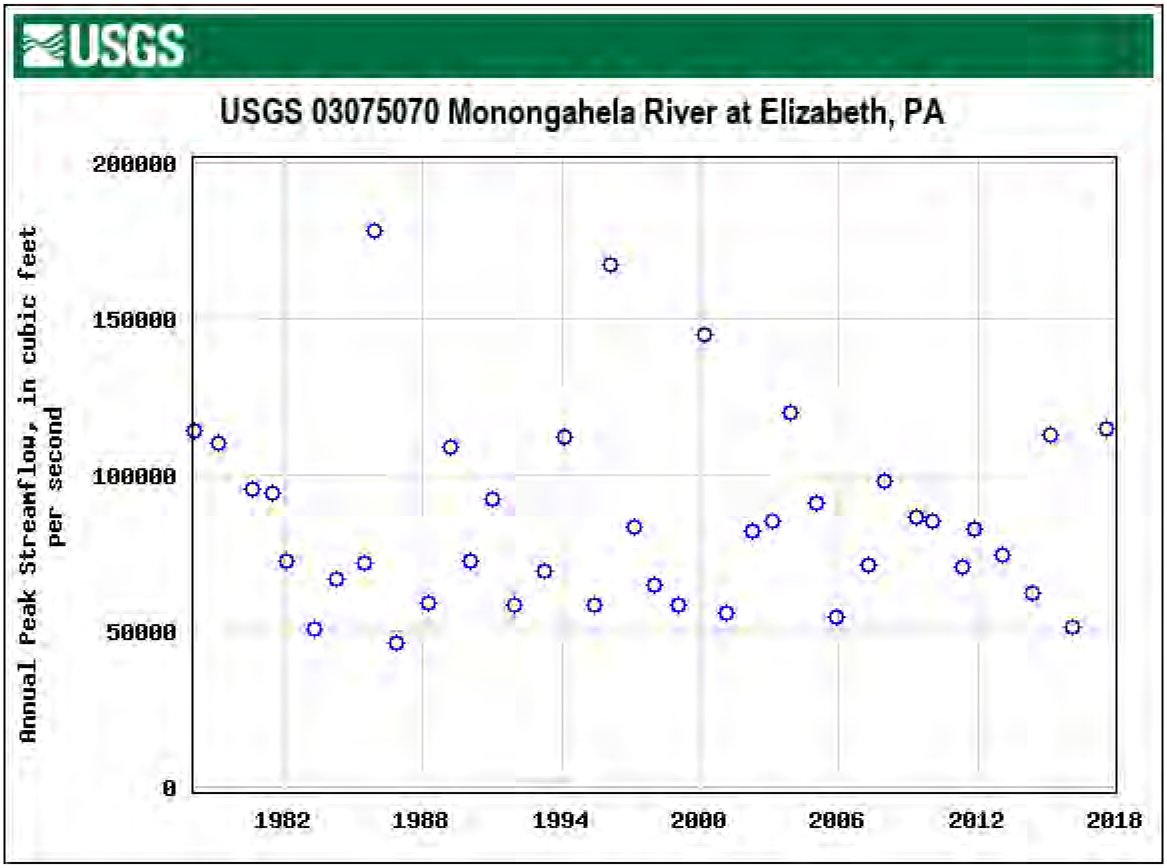
FINISHED PROCESSING STATION: 03085000 USGS Monongahela River at Braddock

For the station below, the following records were ignored:

FINISHED PROCESSING STATION:

Peak Streamflow
USGS 03075070 Monongahela River at Elizabeth, PA

Allegheny County, Pennsylvania
Hydrologic Unit Code 05020005
Latitude 40°15’44", Longitude 79°54’05" NAD27
Drainage area 5,340 square miles
Gage datum 717.90 feet above NGVD29



Peak Streamflow
USGS 03075070 Monongahela River at Elizabeth, PA

Water Year	Date	Gage Height (feet)	Stream-flow (cfs)
1978	Jan. 27, 1978	15.69	114,000[6]
1979	Feb. 26, 1979	15.18	110,000[6]
1980	Aug. 19, 1980	13.60	95,400[6]
1981	Jun. 07, 1981	13.49	94,400[6]
1982	Jan. 24, 1982	11.04	72,400[6]
1983	Apr. 25, 1983	8.69	50,900[6]
1984	Apr. 05, 1984	10.45	67,000[6]
1985	Jun. 01, 1985	10.95	71,500[6]
1986	Nov. 06, 1985	23.60	178,000[6]
1987	Nov. 09, 1986	8.21	46,200[6]
1988	Mar. 05, 1988	9.60	59,300[6]
1989	Mar. 07, 1989	15.06	109,000[6]
1990	Jan. 01, 1990	11.09	72,700[6]
1991	Dec. 19, 1990	21.31[6]	92,100[6]
1992	Dec. 03, 1991	17.56	58,100[6]
1993	Mar. 24, 1993	18.76	69,000[6]
1994	Feb. 10, 1994	23.63	112,000[6]
1995	May 15, 1995	17.58	58,300[6]
1996	Jan. 20, 1996	30.39	167,000[6]
1997	Mar. 03, 1997	20.32	83,100[6]
1998	Jan. 09, 1998	18.27	64,600[6]
1999	Jan. 15, 1999	17.57	58,200[6]
2000	Feb. 19, 2000	27.51	145,000[6]
2001	Jan. 31, 2001	17.35	56,100[6]
2002	Mar. 21, 2002	20.18	81,800[6]
2003	Feb. 24, 2003	20.56	85,200[6]
2004	Nov. 20, 2003	24.69	120,000[6]
2005	Jan. 06, 2005	21.23	91,100[6]
2006	Nov. 30, 2005	17.45	54,600[6]
2007	Apr. 16, 2007	19.02	71,400[6]
2008	Dec. 14, 2007	22.05	98,000[6]
2009	May 05, 2009	20.68	86,300[6]
2010	Jan. 25, 2010	20.57	85,300[6]
2011	Apr. 20, 2011	18.96	70,800[6]
2012	Nov. 23, 2011	20.31	83,000[6]
2013	Jan. 31, 2013	19.33	74,100[6]
2014	May 17, 2014	18.14	62,000[6]
2015	Mar. 05, 2015	23.77	113,000[6]
2016	Feb. 17, 2016	17.13	51,300[6]
2017	Jul. 30, 2017	24.05	115,000[6]

Peak Streamflow Qualification Codes.

- 6 -- Discharge affected by Regulation or Diversion

```
1
  Program PeakFq          U. S. GEOLOGICAL SURVEY           Seq.000.000
  Ver. 5.2           Annual peak flow frequency analysis      Run Date / Time
  11/01/2007         following Bulletin 17-B Guidelines       12/05/2019 15:54

                        --- PROCESSING OPTIONS ---

                     Plot option         = None
                     Basin char output   = None
                     Print option        = Yes
                     Debug print         = No
                     Input peaks listing = Long
                     Input peaks format  = WATSTORE peak file

                     Input files used:
                        peaks (ascii)  - P:\19036\WO 6 I 376 FLOODING\H&H\HYDROLOGY\PEAKFQ
7.1\USGS3075070\3075070.TXT
                        specifications - PKFQWPSF.TMP

                     Output file(s):
                        main - P:\19036\WO 6 I 376 FLOODING\H&H\HYDROLOGY\PEAKFQ
7.1\USGS3075070\3075070.PRT

1


  Program PeakFq          U. S. GEOLOGICAL SURVEY           Seq.001.001
  Ver. 5.2           Annual peak flow frequency analysis      Run Date / Time
  11/01/2007         following Bulletin 17-B Guidelines       12/05/2019 15:54

           Station - 03075070  Monongahela River at Elizabeth, PA


                    I N P U T   D A T A   S U M M A R Y

               Number of peaks in record           =       40
               Peaks not used in analysis          =        0
               Systematic peaks in analysis        =       40
               Historic peaks in analysis          =        0
               Years of historic record            =        0
               Generalized skew                    =    0.102
                    Standard error                 =    0.550
                    Mean Square error              =    0.303
               Skew option                         =   WEIGHTED
               Gage base discharge                 =      0.0
               User supplied high outlier threshold =   --
               User supplied low outlier criterion  =   --
               Plotting position parameter         =     0.00


  *********  NOTICE  --  Preliminary machine computations.        *********
  *********  User responsible for assessment and interpretation.  *********

    WCF134I-NO SYSTEMATIC PEAKS WERE BELOW GAGE BASE.                   0.0
```

WCF163I-NO HIGH OUTLIERS OR HISTORIC PEAKS EXCEEDED HHBASE.   195285.3
WCF195I-NO LOW OUTLIERS WERE DETECTED BELOW CRITERION.   34156.6

1

Station - 03075070 Monongahela River at Elizabeth, PA

ANNUAL FREQUENCY CURVE PARAMETERS -- LOG-PEARSON TYPE III

	FLOOD BASE		LOGARITHMIC		
	DISCHARGE	EXCEEDANCE PROBABILITY	MEAN	STANDARD DEVIATION	SKEW
SYSTEMATIC RECORD	0.0	1.0000	4.9121	0.1412	0.454
BULL.17B ESTIMATE	0.0	1.0000	4.9121	0.1412	0.331

ANNUAL FREQUENCY CURVE -- DISCHARGES AT SELECTED EXCEEDANCE PROBABILITIES

ANNUAL EXCEEDANCE PROBABILITY	BULL.17B ESTIMATE	SYSTEMATIC RECORD	'EXPECTED PROBABILITY' ESTIMATE	95-PCT CONFIDENCE LIMITS FOR BULL. 17B ESTIMATES LOWER	UPPER
0.9950	39110.0	40590.0	37620.0	32260.0	44970.0
0.9900	41530.0	42780.0	40240.0	34660.0	47390.0
0.9500	49420.0	50060.0	48620.0	42630.0	55250.0
0.9000	54560.0	54880.0	53980.0	47890.0	60390.0
0.8000	61880.0	61840.0	61530.0	55360.0	67800.0
0.6667	70020.0	69690.0	69850.0	63580.0	76270.0
0.5000	80220.0	79700.0	80220.0	73560.0	87380.0
0.4292	85040.0	84470.0	85120.0	78110.0	92850.0
0.2000	106700.0	106300.0	107400.0	97420.0	119100.0
0.1000	125100.0	125400.0	126900.0	112800.0	143100.0
0.0400	149500.0	151300.0	153600.0	132100.0	176600.0
0.0200	168400.0	171800.0	175200.0	146700.0	203700.0
0.0100	188100.0	193500.0	198500.0	161500.0	232600.0
0.0050	208600.0	216400.0	223800.0	176600.0	263600.0
0.0020	237300.0	249100.0	261100.0	197300.0	308200.0

1

Program PeakFq   U. S. GEOLOGICAL SURVEY   Seq.001.003
Ver. 5.2   Annual peak flow frequency analysis   Run Date / Time
11/01/2007   following Bulletin 17-B Guidelines   12/05/2019 15:54

Station - 03075070 Monongahela River at Elizabeth, PA

I N P U T   D A T A   L I S T I N G

WATER YEAR	DISCHARGE	CODES	WATER YEAR	DISCHARGE	CODES
1978	114000.0	K	1998	64600.0	K
1979	110000.0	K	1999	58200.0	K
1980	95400.0	K	2000	145000.0	K
1981	94400.0	K	2001	56100.0	K
1982	72400.0	K	2002	81800.0	K
1983	50900.0	K	2003	85200.0	K
1984	67000.0	K	2004	120000.0	K
1985	71500.0	K	2005	91100.0	K
1986	178000.0	K	2006	54600.0	K
1987	46200.0	K	2007	71400.0	K
1988	59300.0	K	2008	98000.0	K
1989	109000.0	K	2009	86300.0	K
1990	72700.0	K	2010	85300.0	K
1991	92100.0	K	2011	70800.0	K
1992	58100.0	K	2012	83000.0	K
1993	69000.0	K	2013	74100.0	K
1994	112000.0	K	2014	62000.0	K
1995	58300.0	K	2015	113000.0	K
1996	167000.0	K	2016	51300.0	K
1997	83100.0	K	2017	115000.0	K

Explanation of peak discharge qualification codes

PeakFQ CODE	NWIS CODE	DEFINITION
D	3	Dam failure, non-recurrent flow anomaly
G	8	Discharge greater than stated value
X	3+8	Both of the above
L	4	Discharge less than stated value
K	6 OR C	Known effect of regulation or urbanization
H	7	Historic peak

- Minus-flagged discharge -- Not used in computation
  -8888.0 -- No discharge value given
- Minus-flagged water year -- Historic peak used in computation

1

EMPIRICAL FREQUENCY CURVES -- WEIBULL PLOTTING POSITIONS

WATER YEAR	RANKED DISCHARGE	SYSTEMATIC RECORD	BULL.17B ESTIMATE
1986	178000.0	0.0244	0.0244
1996	167000.0	0.0488	0.0488
2000	145000.0	0.0732	0.0732
2004	120000.0	0.0976	0.0976
2017	115000.0	0.1220	0.1220
1978	114000.0	0.1463	0.1463
2015	113000.0	0.1707	0.1707
1994	112000.0	0.1951	0.1951
1979	110000.0	0.2195	0.2195
1989	109000.0	0.2439	0.2439
2008	98000.0	0.2683	0.2683
1980	95400.0	0.2927	0.2927
1981	94400.0	0.3171	0.3171
1991	92100.0	0.3415	0.3415
2005	91100.0	0.3659	0.3659
2009	86300.0	0.3902	0.3902
2010	85300.0	0.4146	0.4146
2003	85200.0	0.4390	0.4390
1997	83100.0	0.4634	0.4634
2012	83000.0	0.4878	0.4878
2002	81800.0	0.5122	0.5122
2013	74100.0	0.5366	0.5366
1990	72700.0	0.5610	0.5610
1982	72400.0	0.5854	0.5854
1985	71500.0	0.6098	0.6098
2007	71400.0	0.6341	0.6341
2011	70800.0	0.6585	0.6585
1993	69000.0	0.6829	0.6829
1984	67000.0	0.7073	0.7073
1998	64600.0	0.7317	0.7317
2014	62000.0	0.7561	0.7561
1988	59300.0	0.7805	0.7805
1995	58300.0	0.8049	0.8049
1999	58200.0	0.8293	0.8293
1992	58100.0	0.8537	0.8537
2001	56100.0	0.8780	0.8780
2006	54600.0	0.9024	0.9024
2016	51300.0	0.9268	0.9268
1983	50900.0	0.9512	0.9512
1987	46200.0	0.9756	0.9756

1

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 End PeakFQ analysis.
   Stations processed :       1
   Number of errors   :       0
   Stations skipped   :       0
   Station years      :      40
```

Data records may have been ignored for the stations listed below.
(Card type must be Y, Z, N, H, I, 2, 3, 4, or *.)
(2, 4, and * records are ignored.)

For the station below, the following records were ignored:

FINISHED PROCESSING STATION: 03075070   USGS Monongahela River at Elizabet

For the station below, the following records were ignored:

FINISHED PROCESSING STATION:

Newell Tereska & Mackay Engineering

Project:	I-376 over Monongahela River		
	PennDOT District 11-0		
By:	DEB	Ckd:	FJA
Date:	01/17/20	Date:	01/17/20

Peak Flow Transposition

$$\frac{Q_{site}}{Q_{gage}} = \left(\frac{A_{site}}{A_{gage}}\right)^{b}$$

Reference: PennDOT DM-2.10.6.C.4.a.

Return Period (years)	USGS SIR 2008-5102 Drainage Area Characteristic Coefficient "b"			
	Region 1	Region 2	Region 3	Region 4
2	0.86396	0.69782	0.82143	0.84471
10	0.83197	0.64853	0.78127	0.79689
25	0.82741	0.64014	0.77260	0.78710
50	0.81981	0.62615	0.75816	0.77079
100	0.81626	0.61864	0.75043	0.76279
500	0.81002	0.60294	0.73500	0.74809

Note: 2-year "b" value used for 1-year and 5-year calculations. 25-year "b" value interpolated from 10-year and and 50-year values.

A_{site} (mi^2)	7,380.00	
A_{gage} (mi^2)	5,340.00	
USGS Gage #	3075070	*Monongahela River at Elizabeth, PA*
Flood-Flow Region	4	

Return Period (years)	Q_{gage} (cfs)	Q_{site} (cfs)
1	39,110	**51,402**
2	80,220	**105,433**
5	106,700	**140,236**
10	125,100	**161,895**
25	149,500	**192,859**
50	168,400	**216,097**
100	188,100	**240,753**
500	237,300	**302,284**

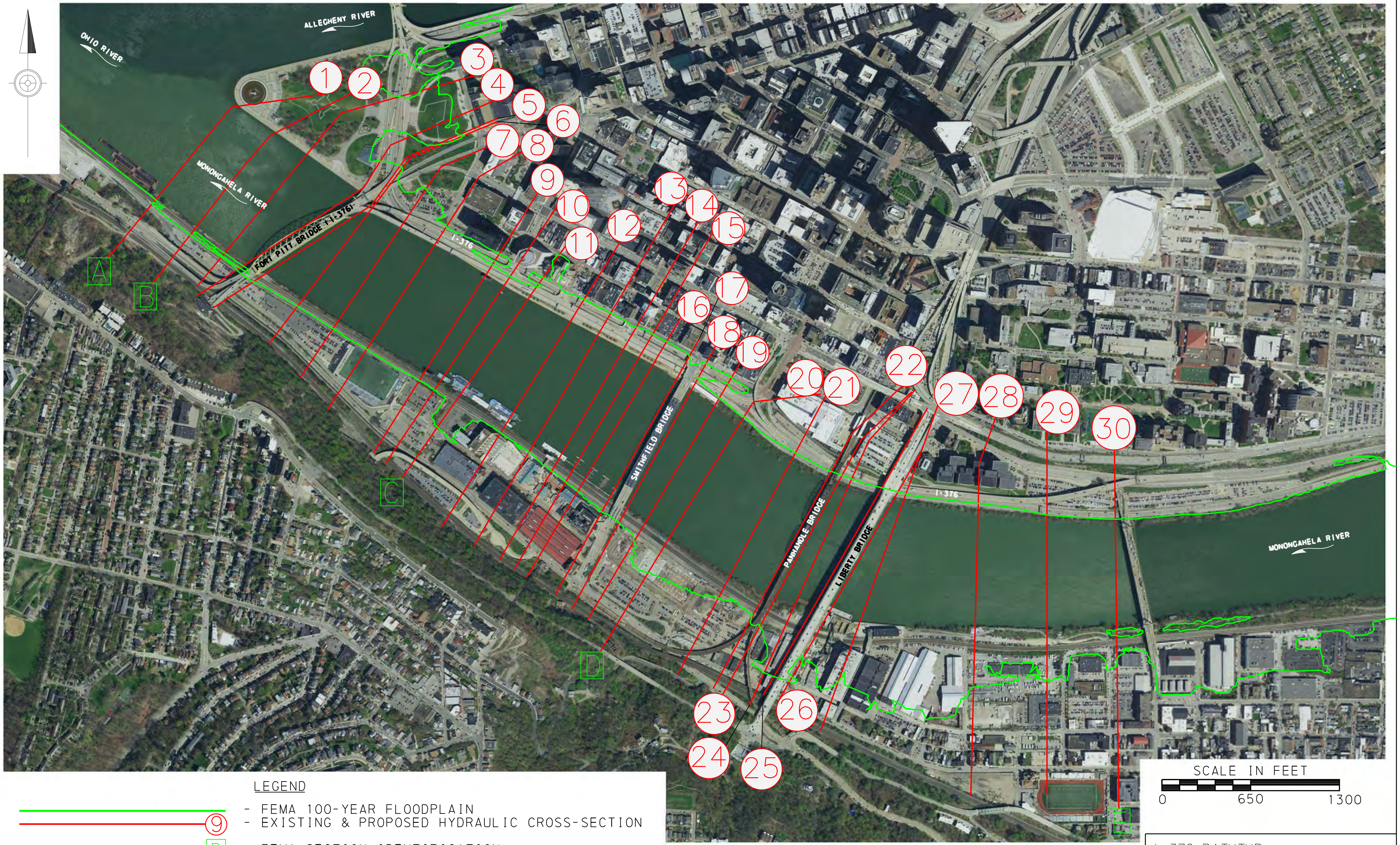
I-376
Monongahela River

APPENDIX A-5

Hydraulic Analysis

Allegheny County
PennDOT District 11-0

NEWELL
TERESKA &
MACKAY
ENGINEERING



SCALE IN FEET

0 650 1300

LEGEND

- FEMA 100-YEAR FLOODPLAIN
9 - EXISTING & PROPOSED HYDRAULIC CROSS-SECTION
B - FEMA SECTION IDENTIFICATION

NEWELL TERESKA & MACKAY ENGINEERING
130 WEST CHURCH, SUITE 200
DILLSBURG, PA 17019
PHONE 717-432-4425
FAX 717-432-4426

I-376 BATHTUB
EXISTING AND PROPOSED
HYDRAULIC CROSS-SECTION MAP

COUNTY: ALLEGHENY
MUNICIPALITY: PITTSBURGH CITY

DATE: 6/23/2020 TIME: 12:02:29 PM
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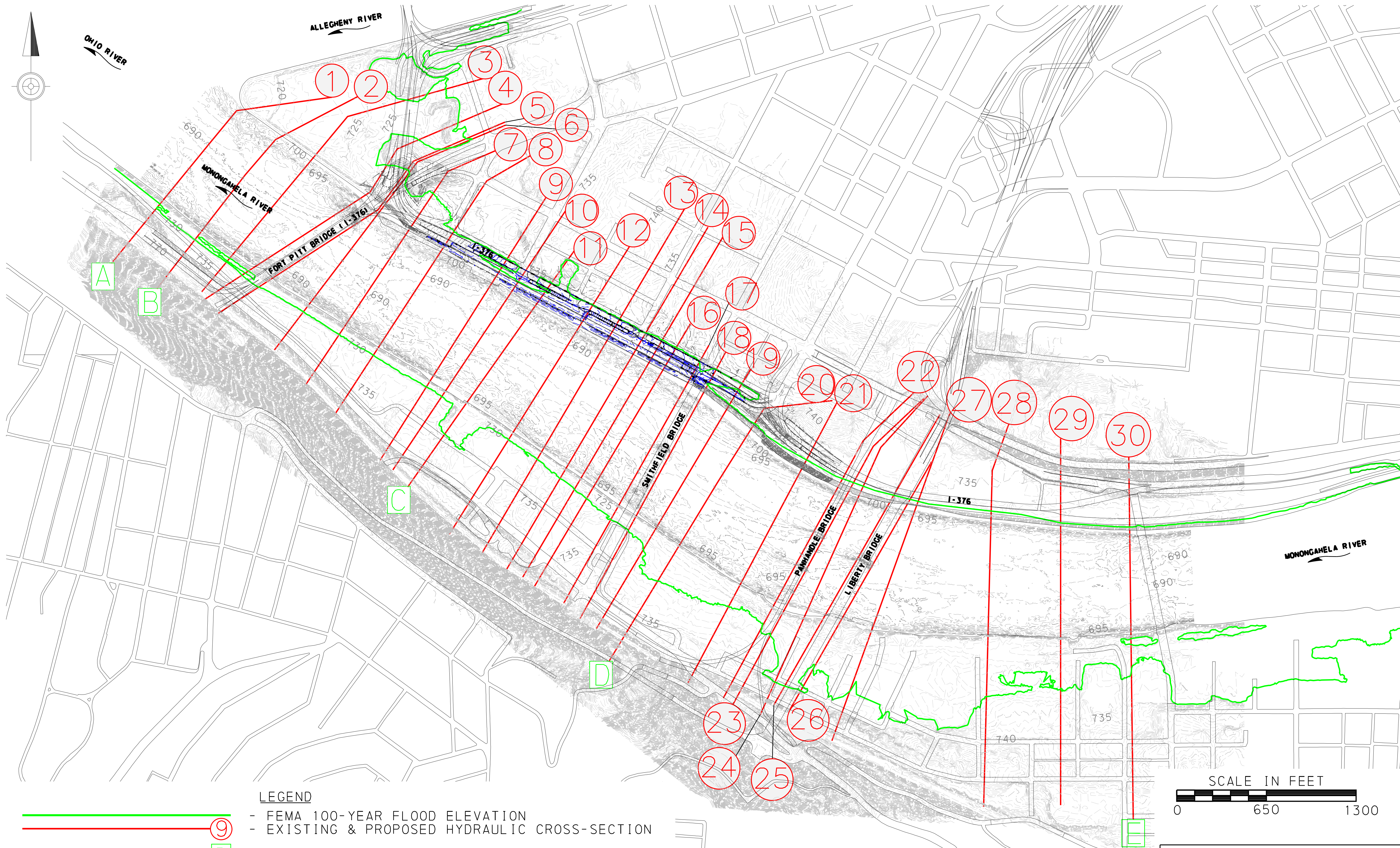


LEGEND

- FEMA 100-YEAR FLOOD ELEVATION
9 - EXISTING & PROPOSED HYDRAULIC CROSS-SECTION
B - FEMA SECTION IDENTIFICATION
- LIDAR CONTOURS
- USACOE CHANNEL BATHYMETRY CONTOURS
- COVERED OVERBANK CONTOURS
- ROADWAY OVERPASS CONTOURS

NEWELL TERESKA & MACKAY ENGINEERING
130 WEST CHURCH, SUITE 200
DILLSBURG, PA 17019
PHONE 717-432-4425
FAX 717-432-4426

I-376 BATHTUB
EXISTING AND PROPOSED
HYDRAULIC CROSS-SECTION MAP

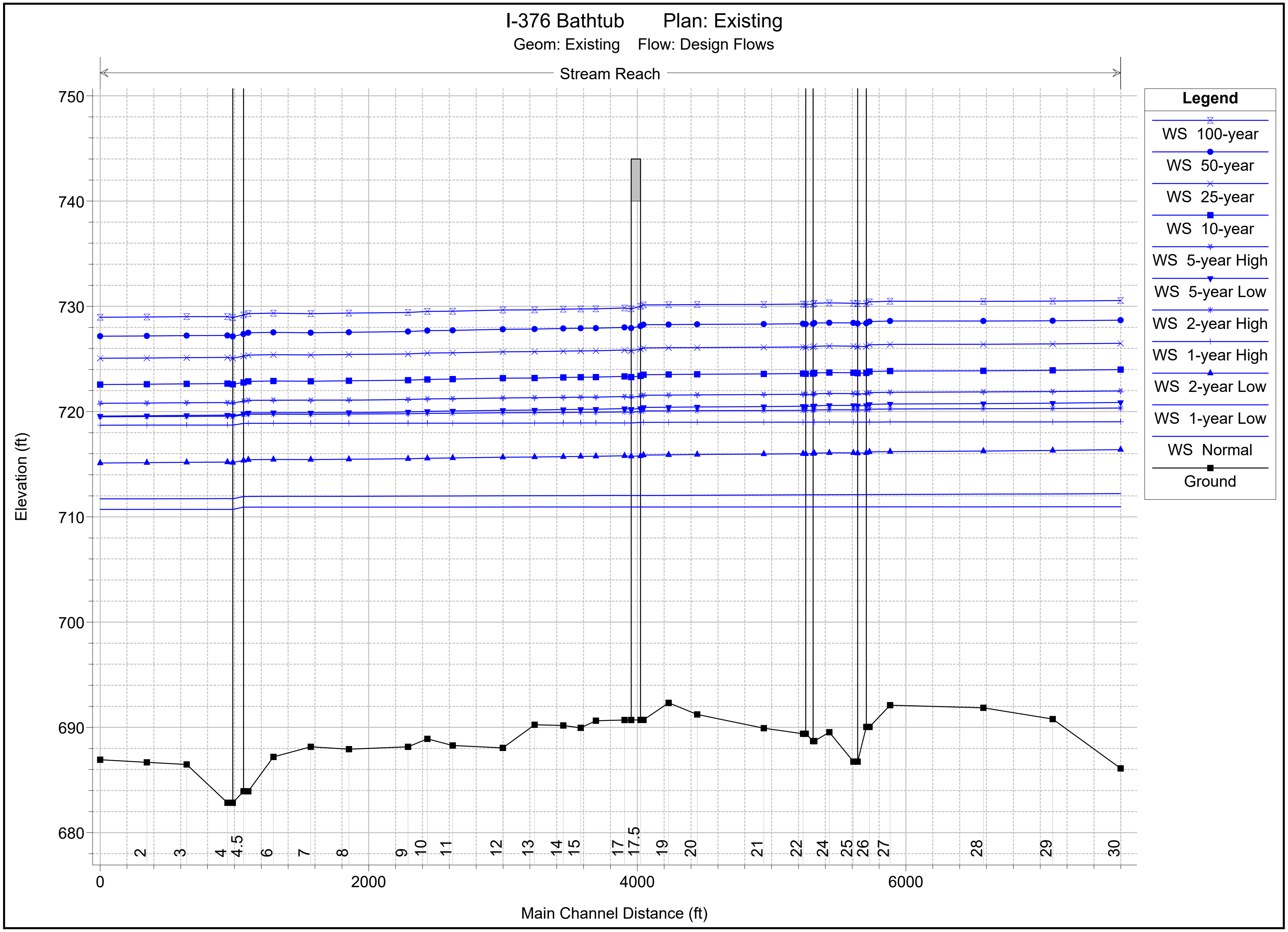
COUNTY: ALLEGHENY
MUNICIPALITY: PITTSBURGH CITY

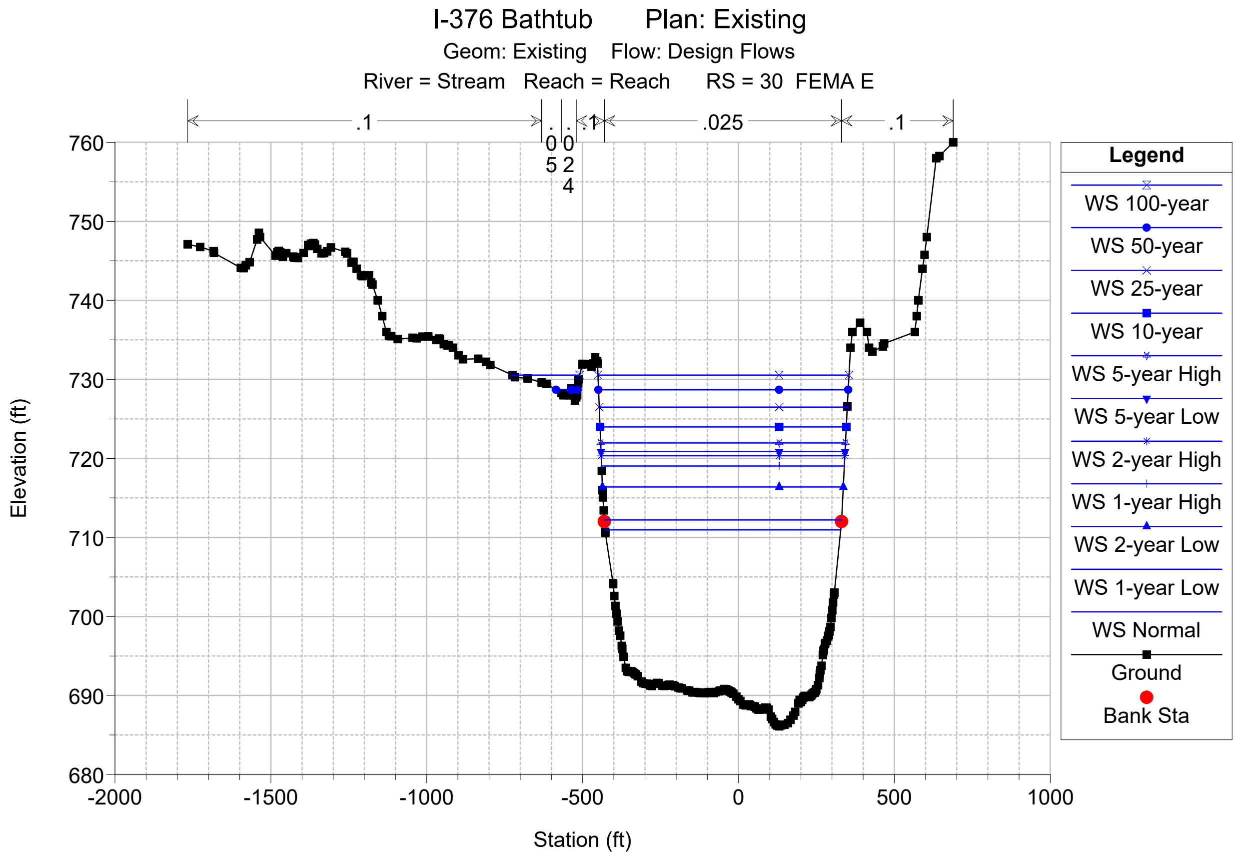
DATE: 6/23/2020 TIME: 3:56:50 PM
FILENAME: P:\19036\WO 6 | 376 Flooding\CADD\Reference\Proposed\H&H\I-376 Cross Section Map.dgn

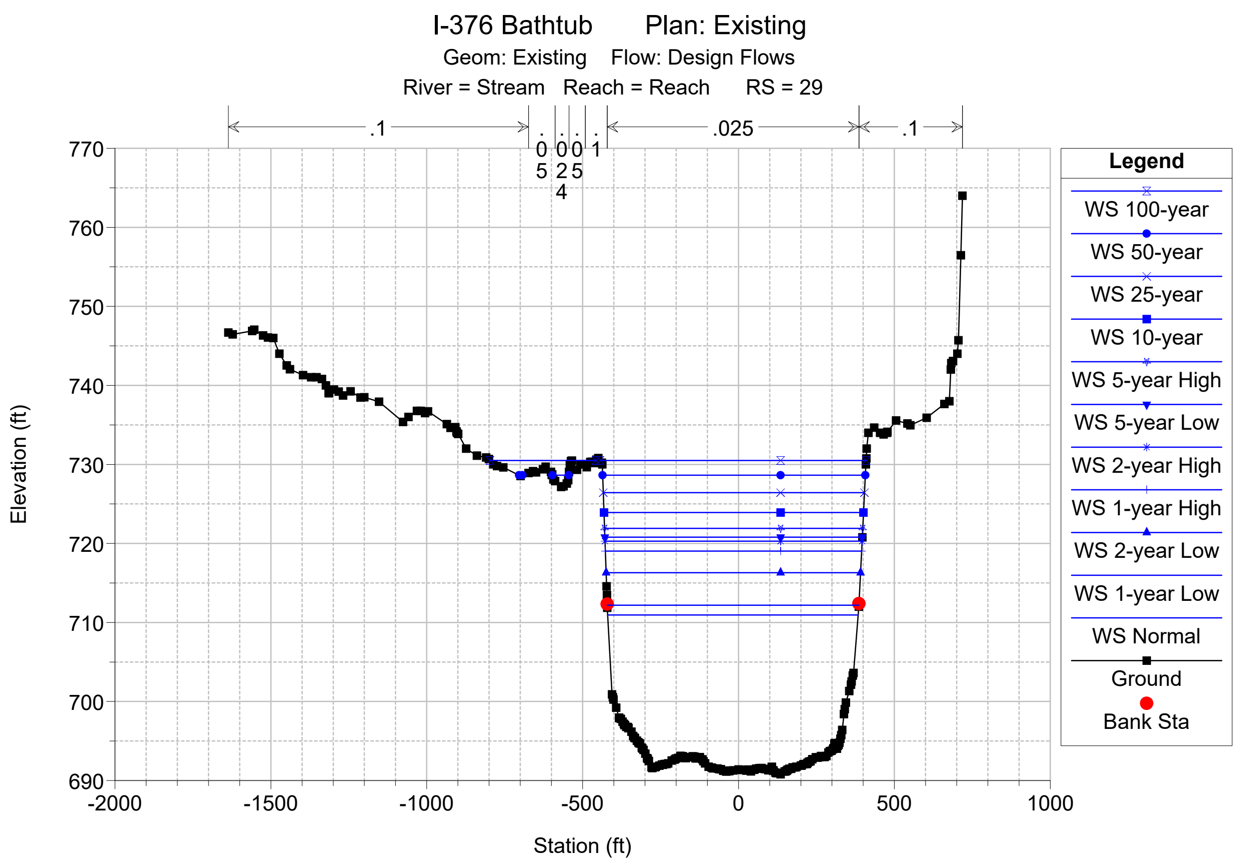
APPENDIX A-5.1

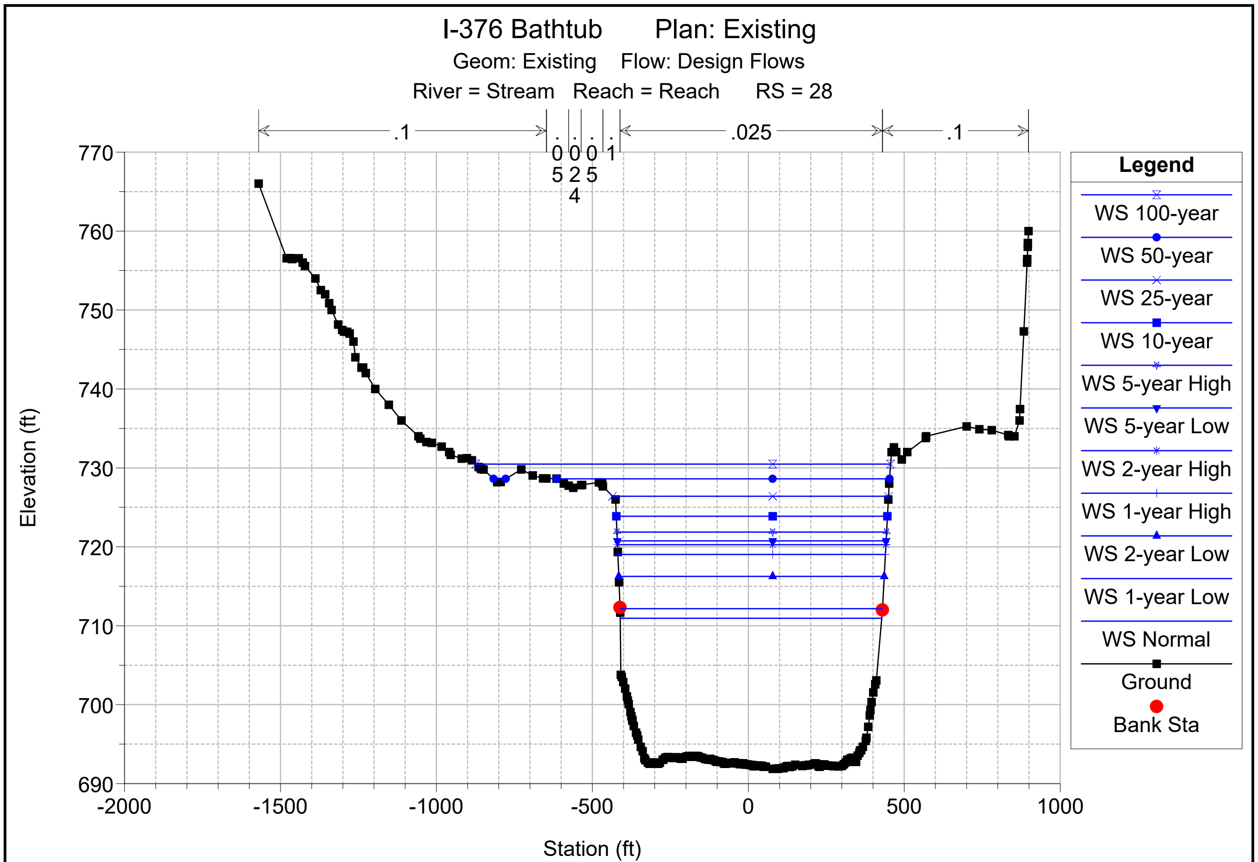
Existing HEC-RAS Model

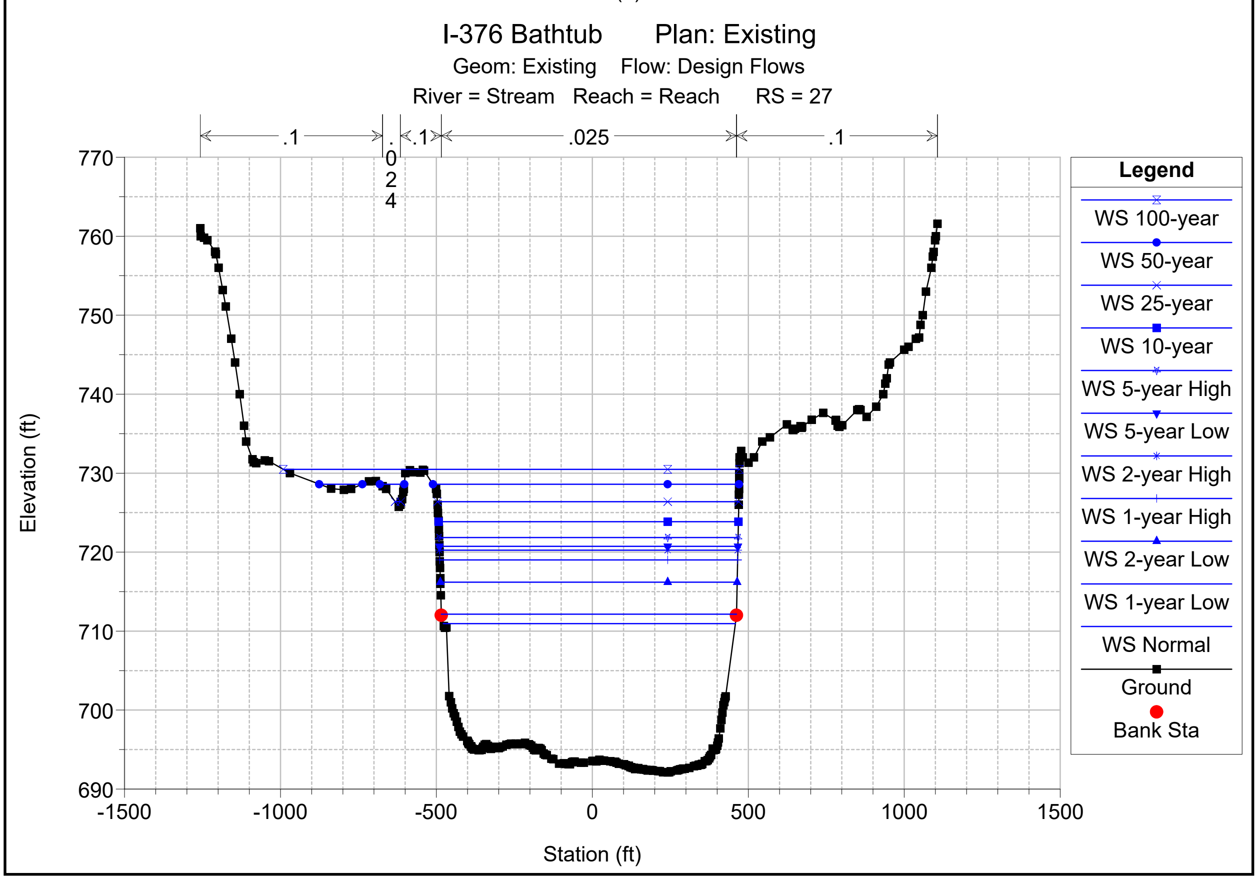
NEWELL
TERESKA &
MACKAY
ENGINEERING

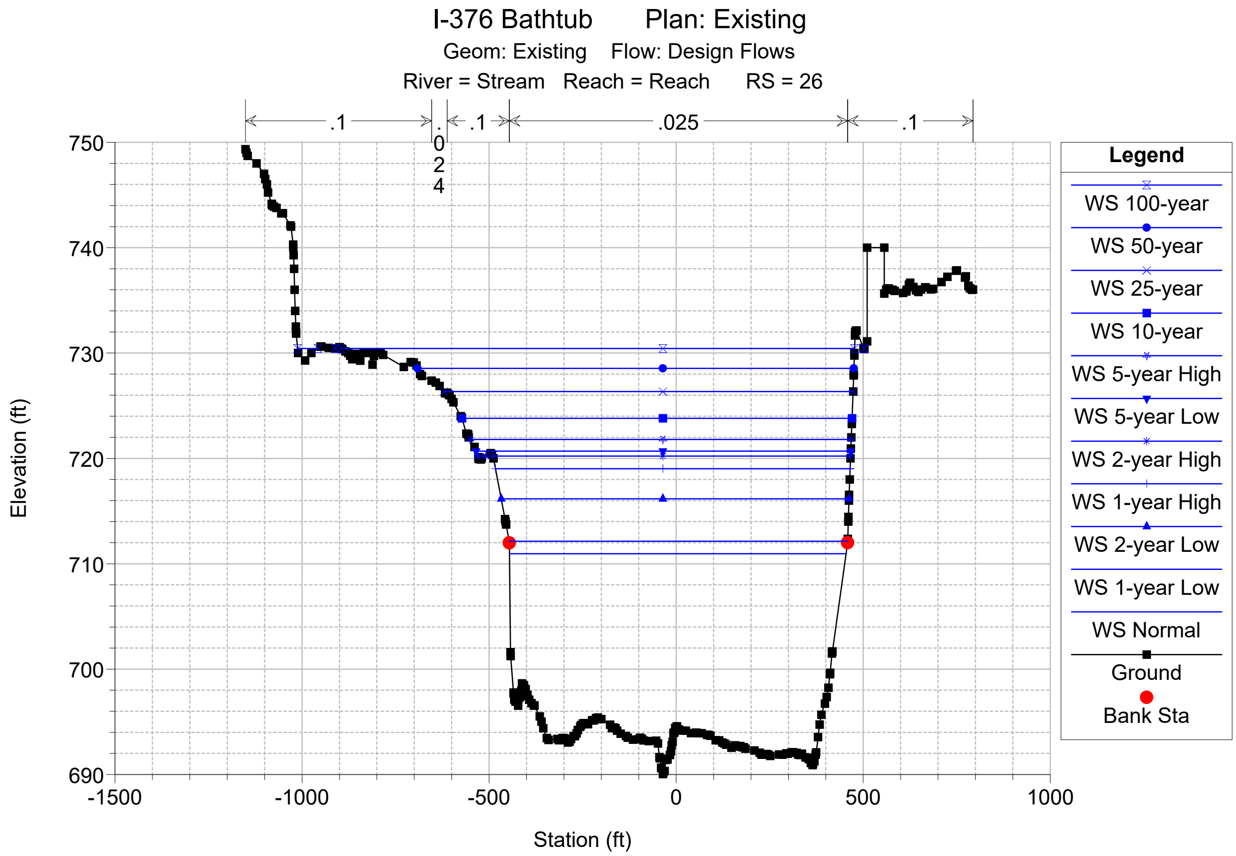

I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
Stream Reach
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Elevation (ft)
750
740
730
720
710
700
690
680
2
3
4
4.5
6
7
8
9
10
11
12
13
14
15
17
17.5
19
20
21
22
24
25
26
27
28
29
30
0
2000
4000
6000
Main Channel Distance (ft)

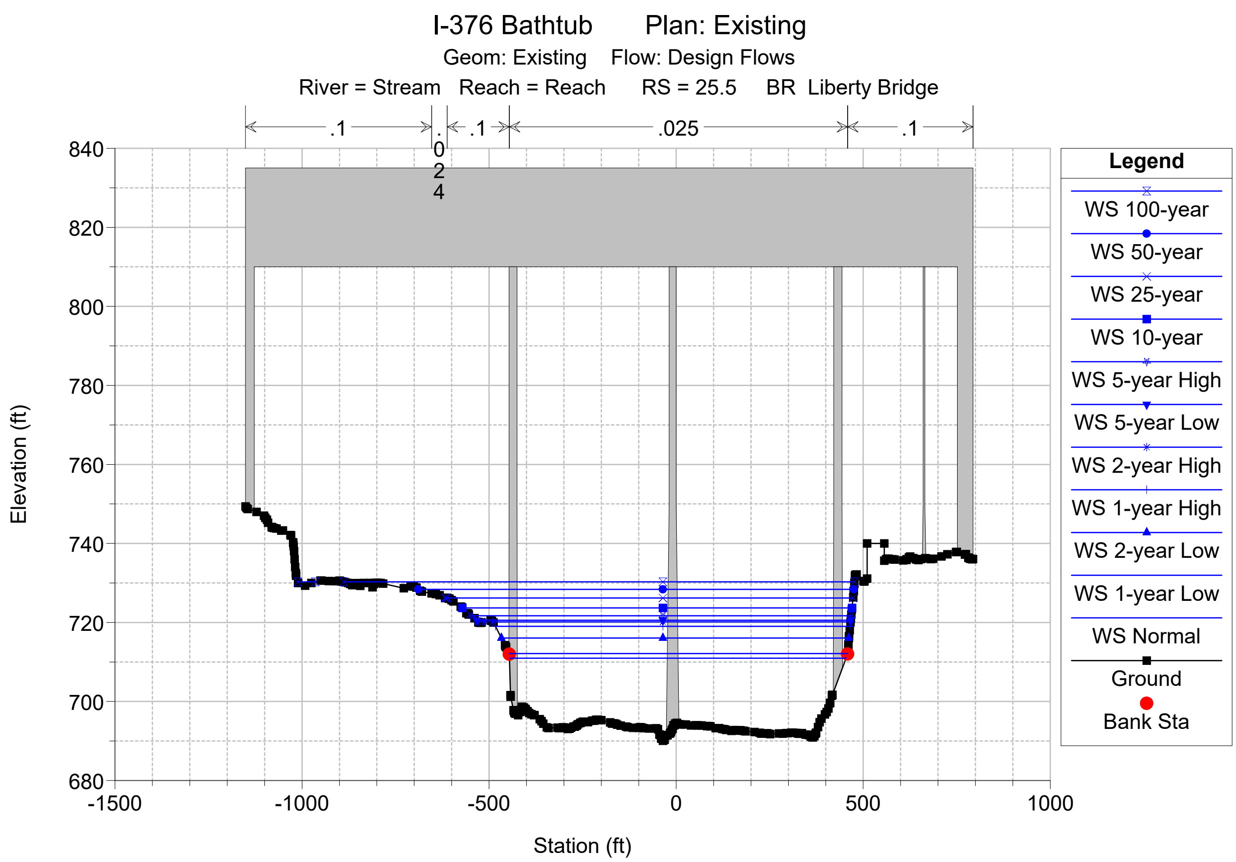

I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 30 FEMA E
.1
.025
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

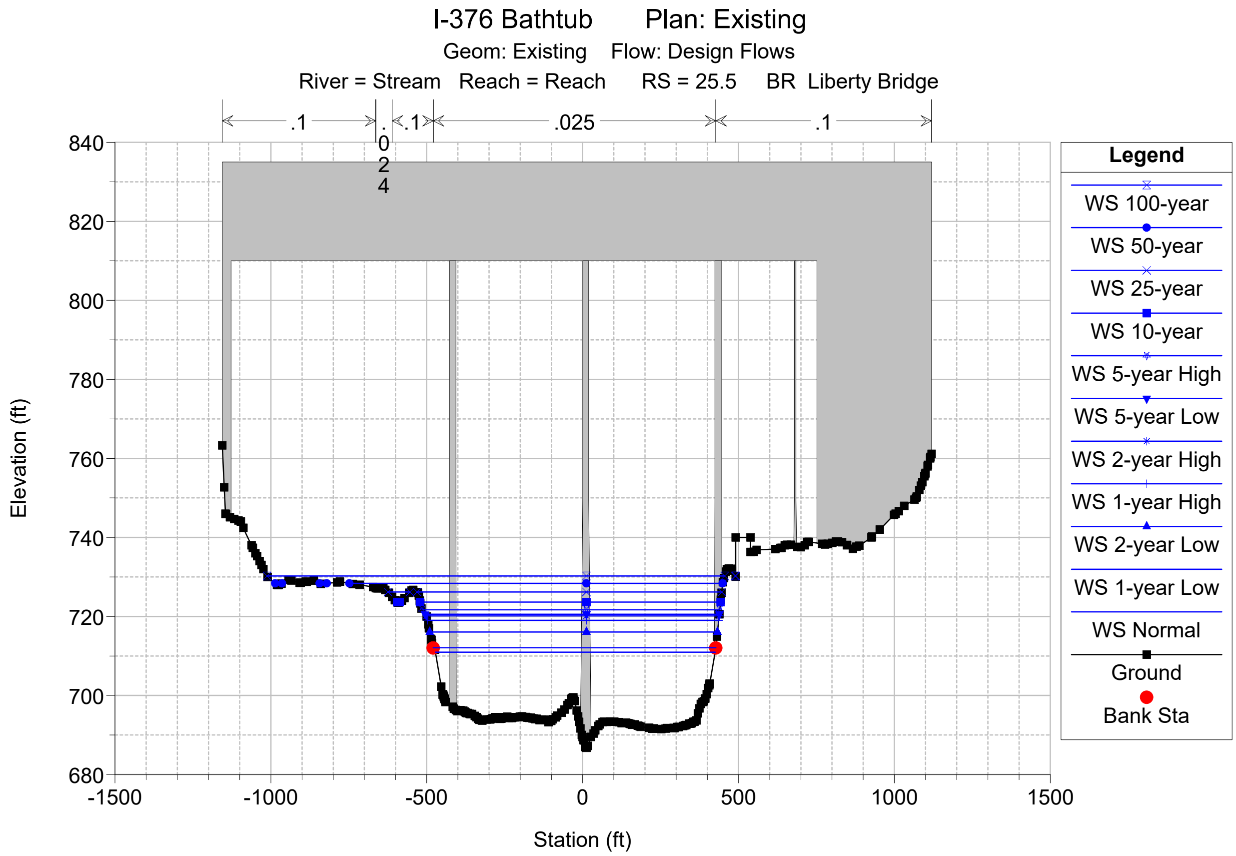

I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 29
.1
.025
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

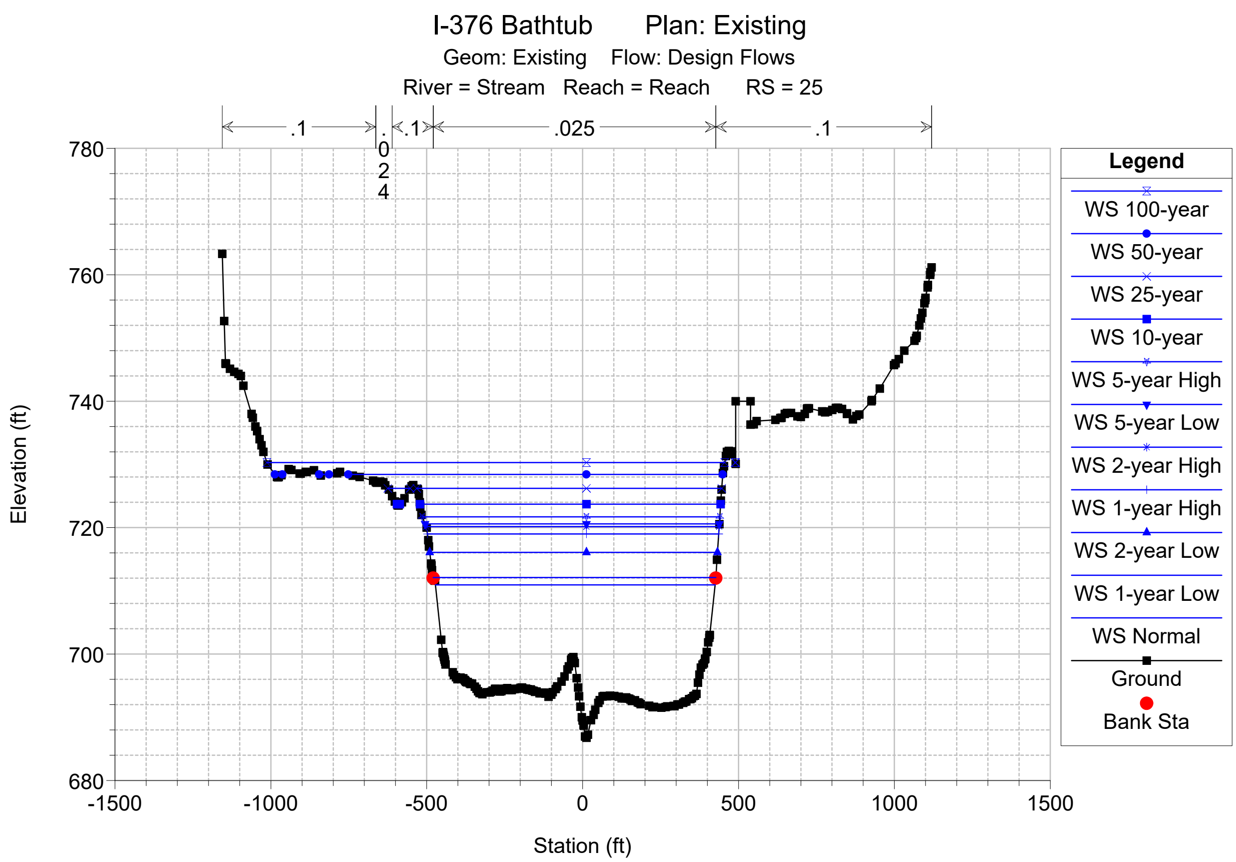

I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 28
.1
.05
.024
.025
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

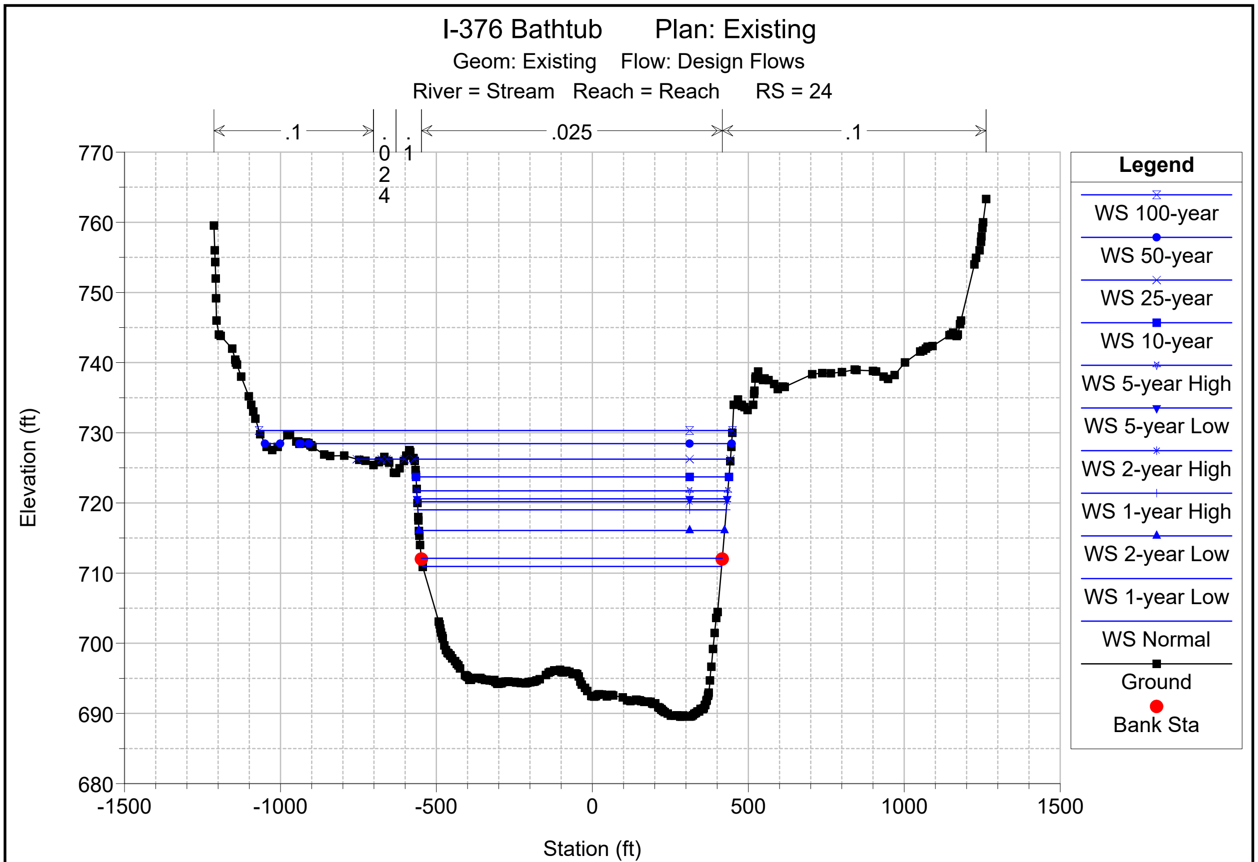

I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 27
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta


I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 26
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

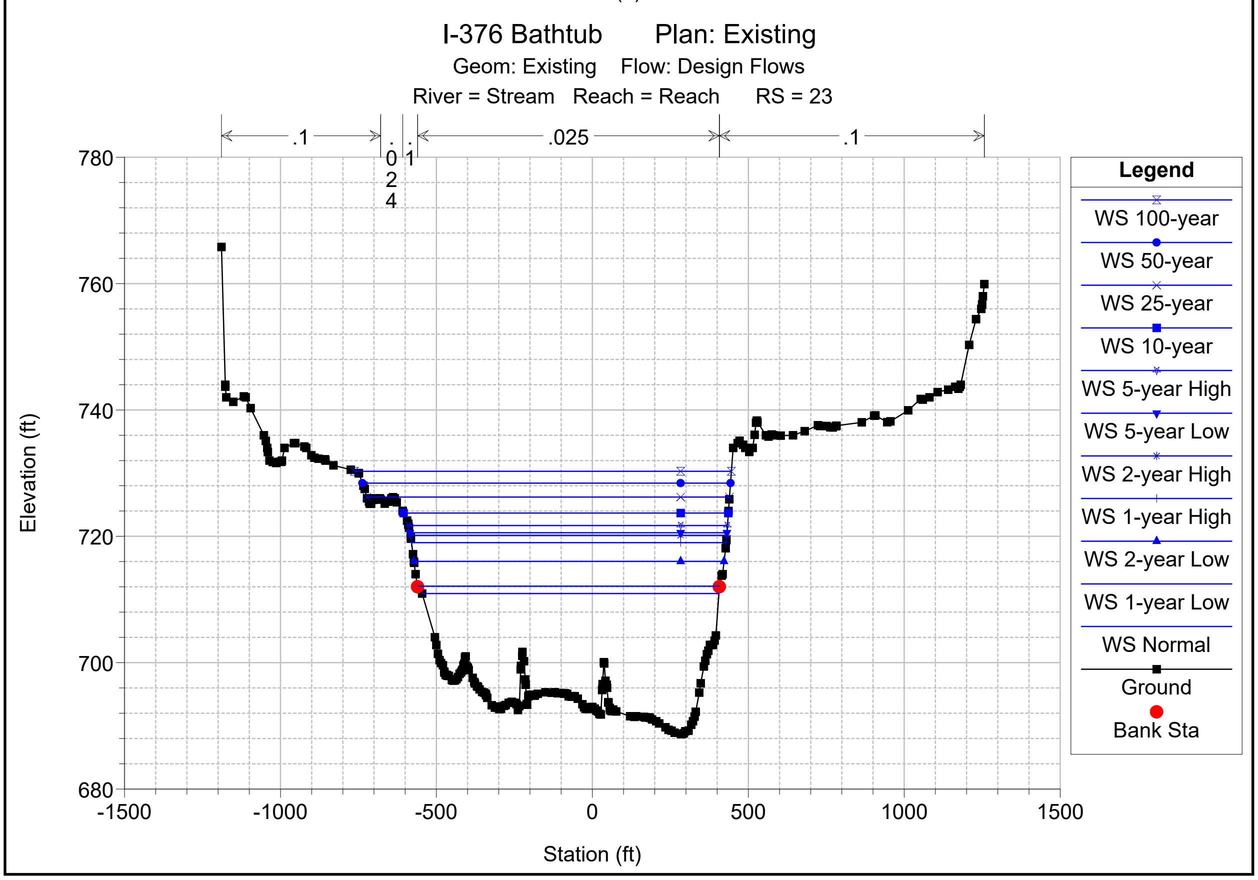

I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 25.5 BR Liberty Bridge
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta


I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 25.5 BR Liberty Bridge
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

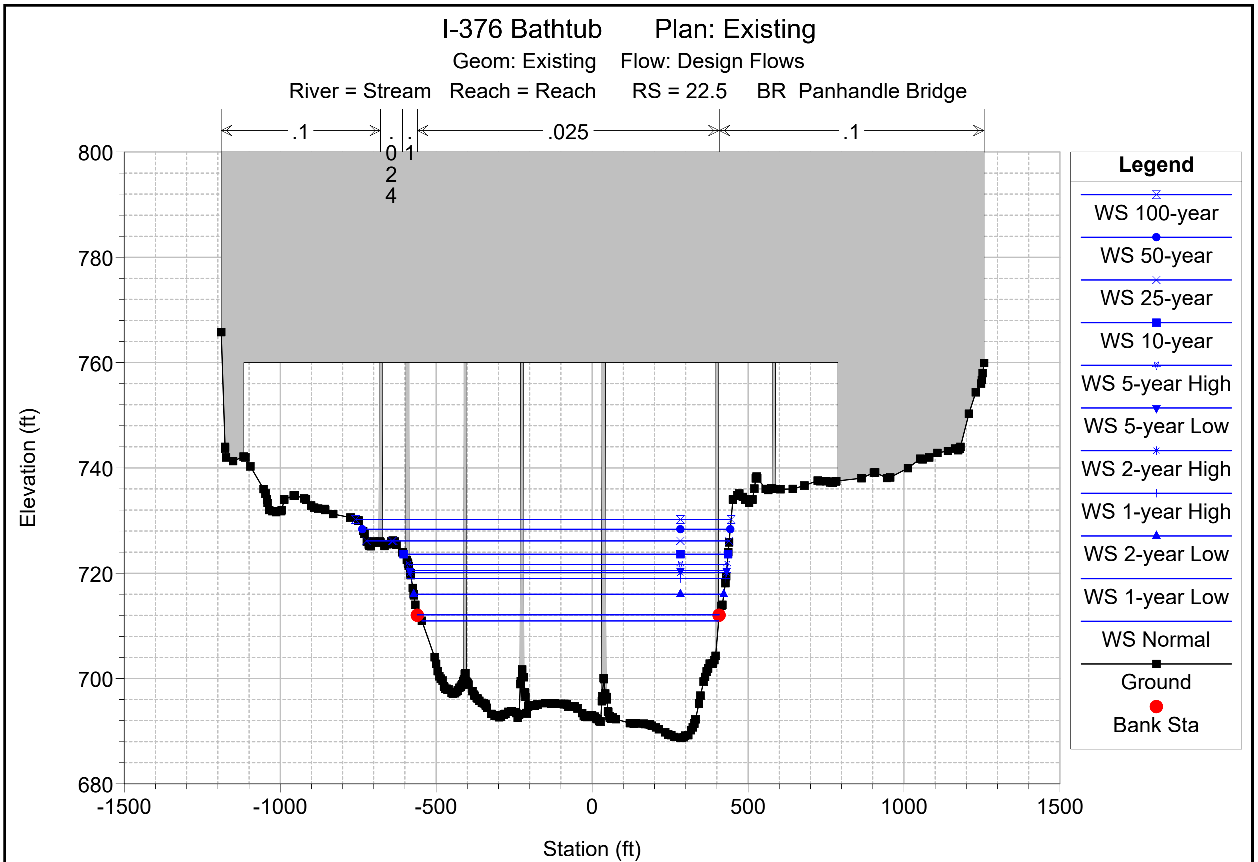

I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 25
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

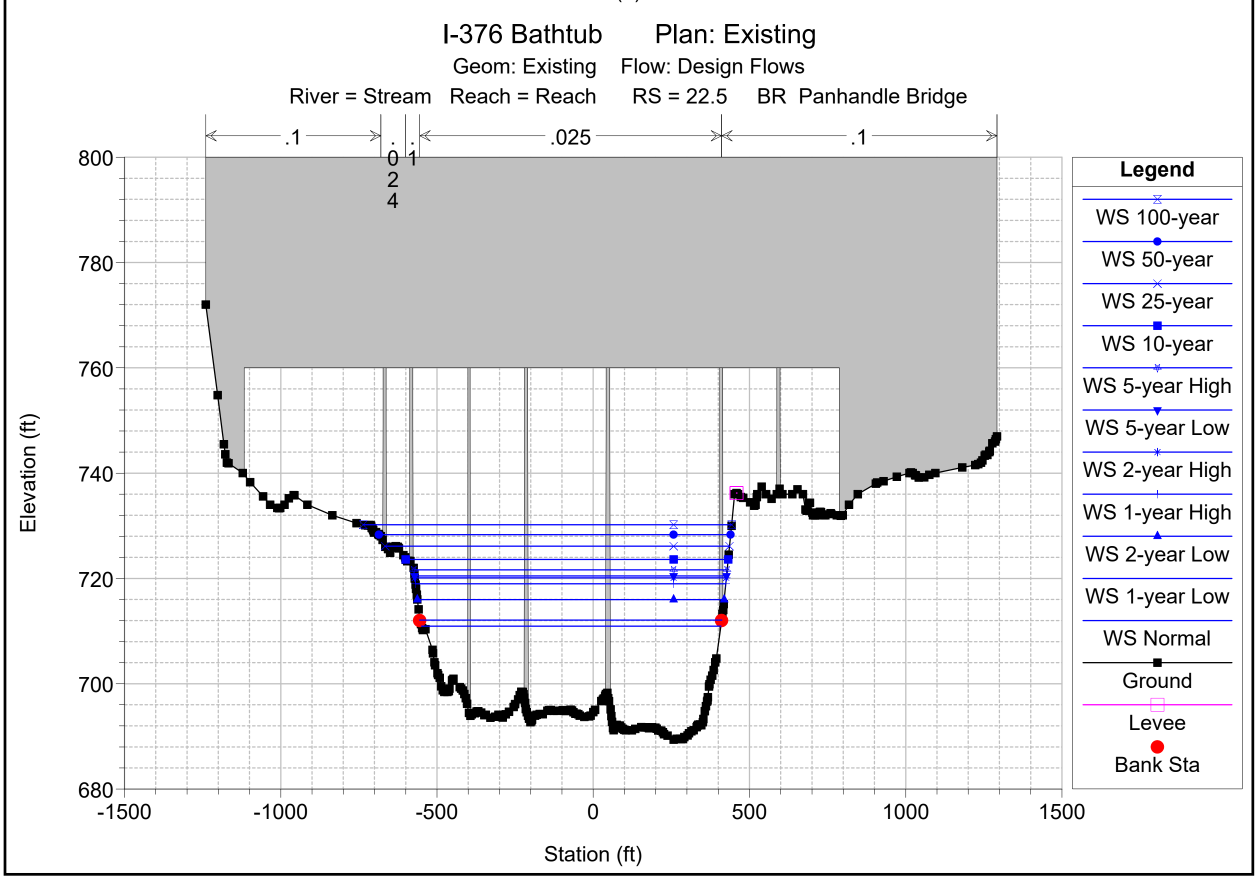


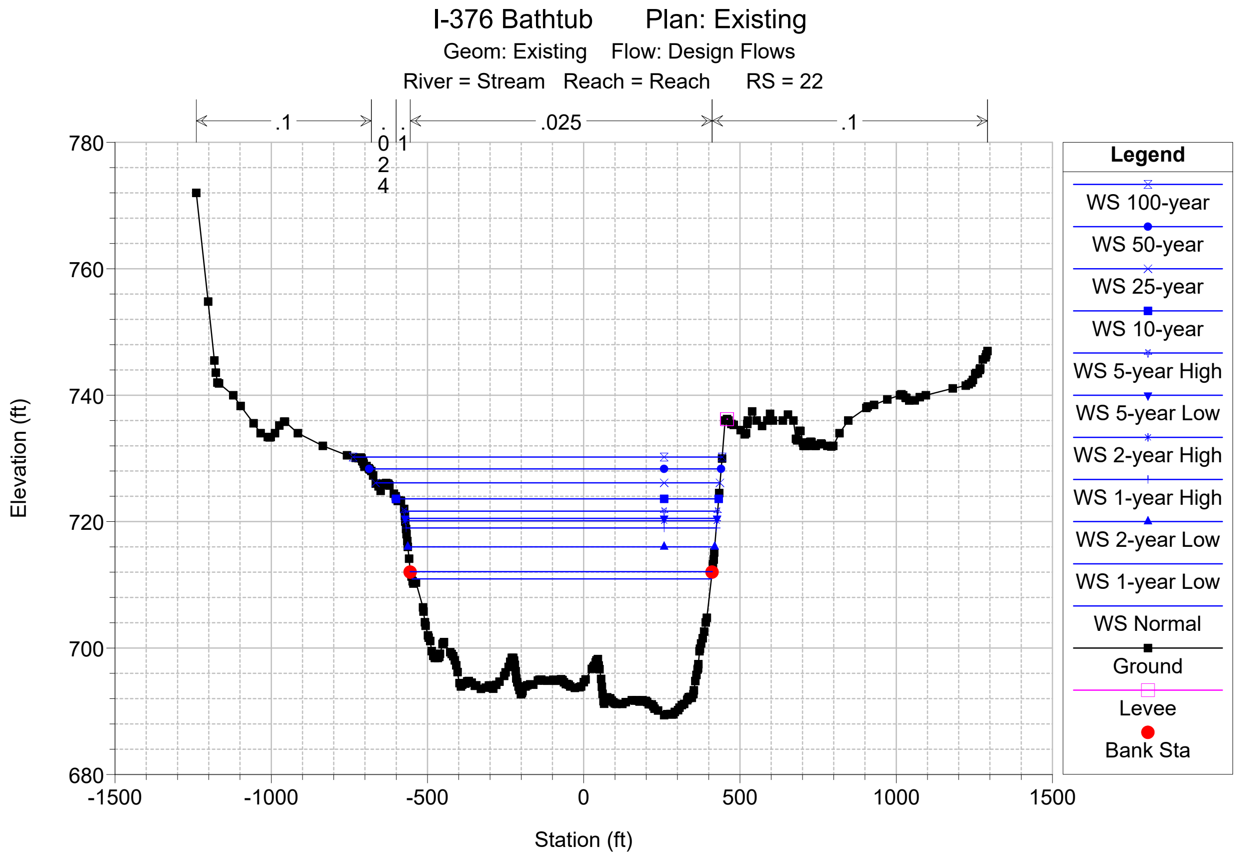
I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 24
.1
.024
.1
.025
.1
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta
Elevation (ft)
Station (ft)
770
760
750
740
730
720
710
700
690
680
-1500
-1000
-500
0
500
1000
1500



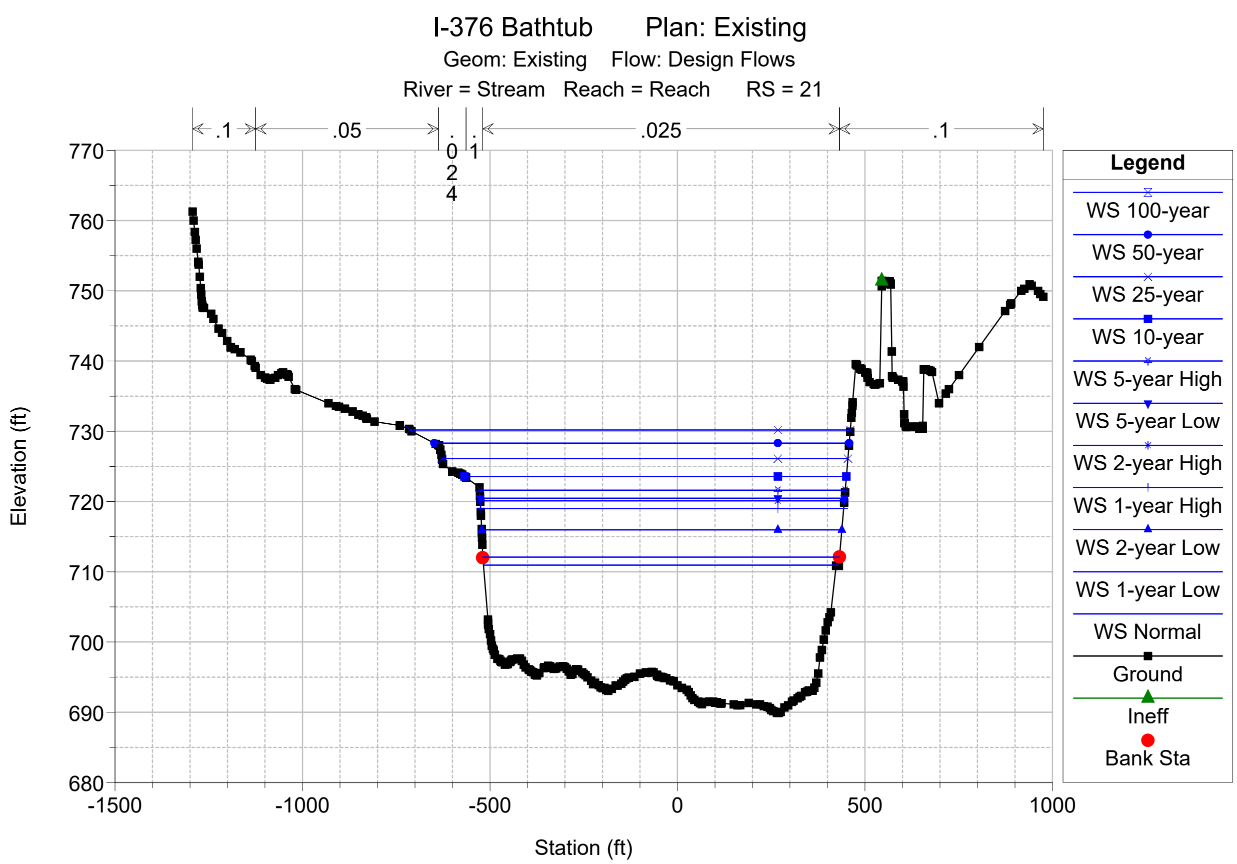
I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 23
.1
.024
.1
.025
.1
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta
Elevation (ft)
Station (ft)
780
760
740
720
700
680
-1500
-1000
-500
0
500
1000
1500


I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 22.5 BR Panhandle Bridge
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

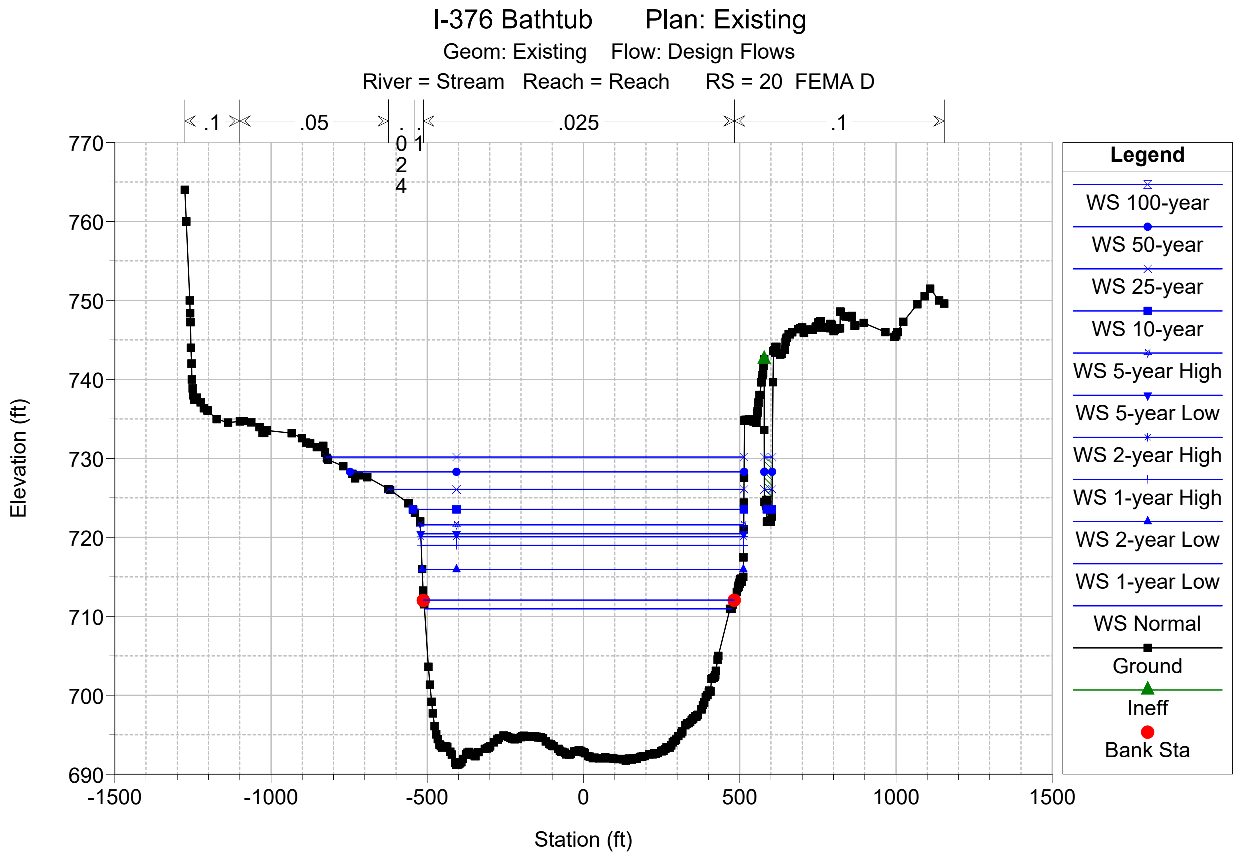

I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 22.5 BR Panhandle Bridge
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta



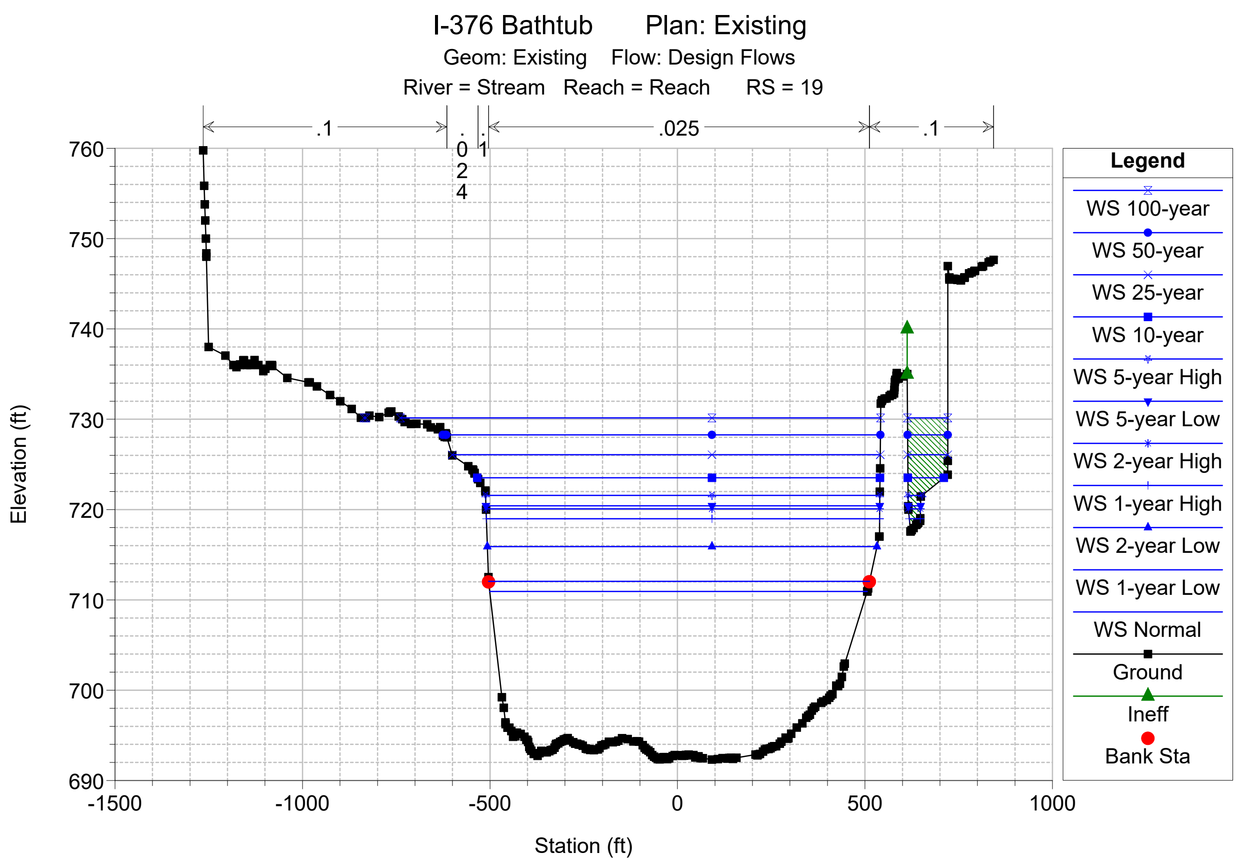
I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 22
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta



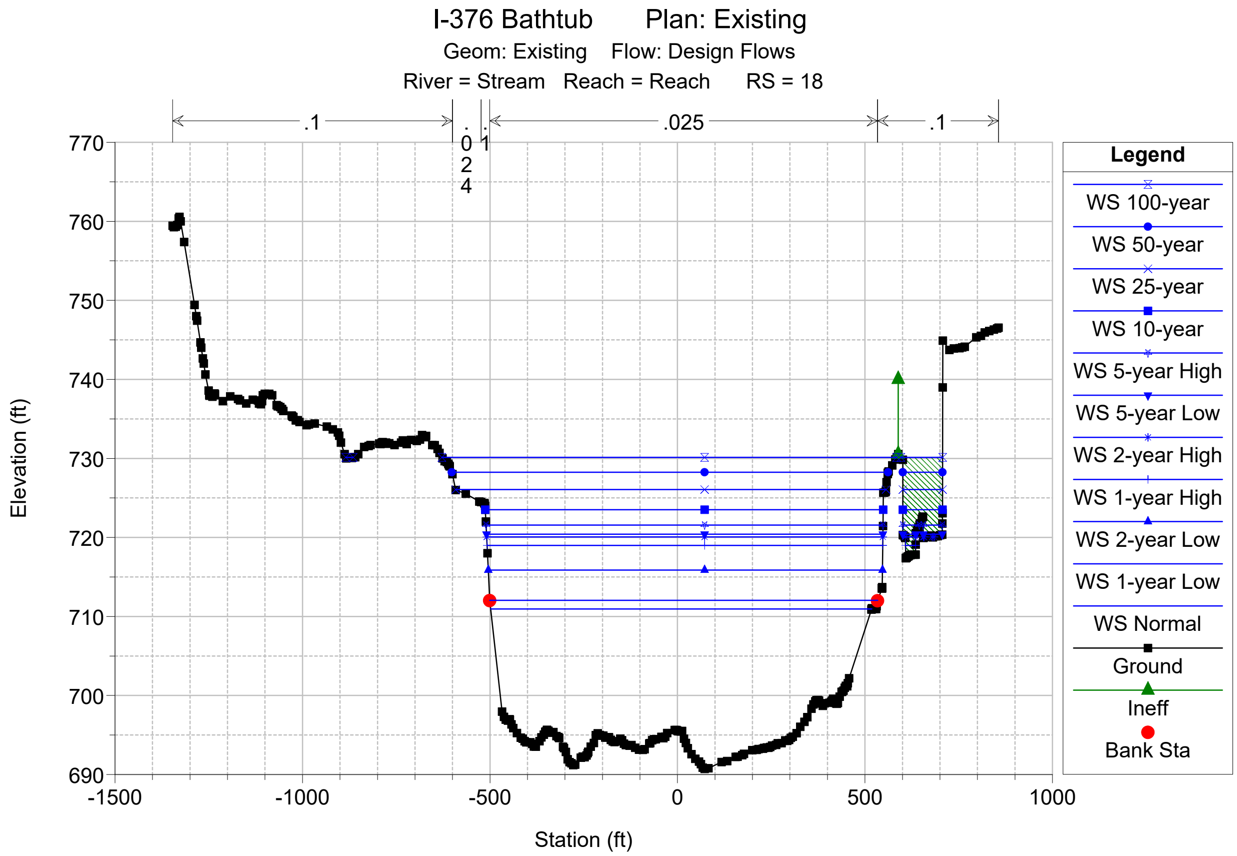
I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 21
.1
.05
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Ineff
Bank Sta



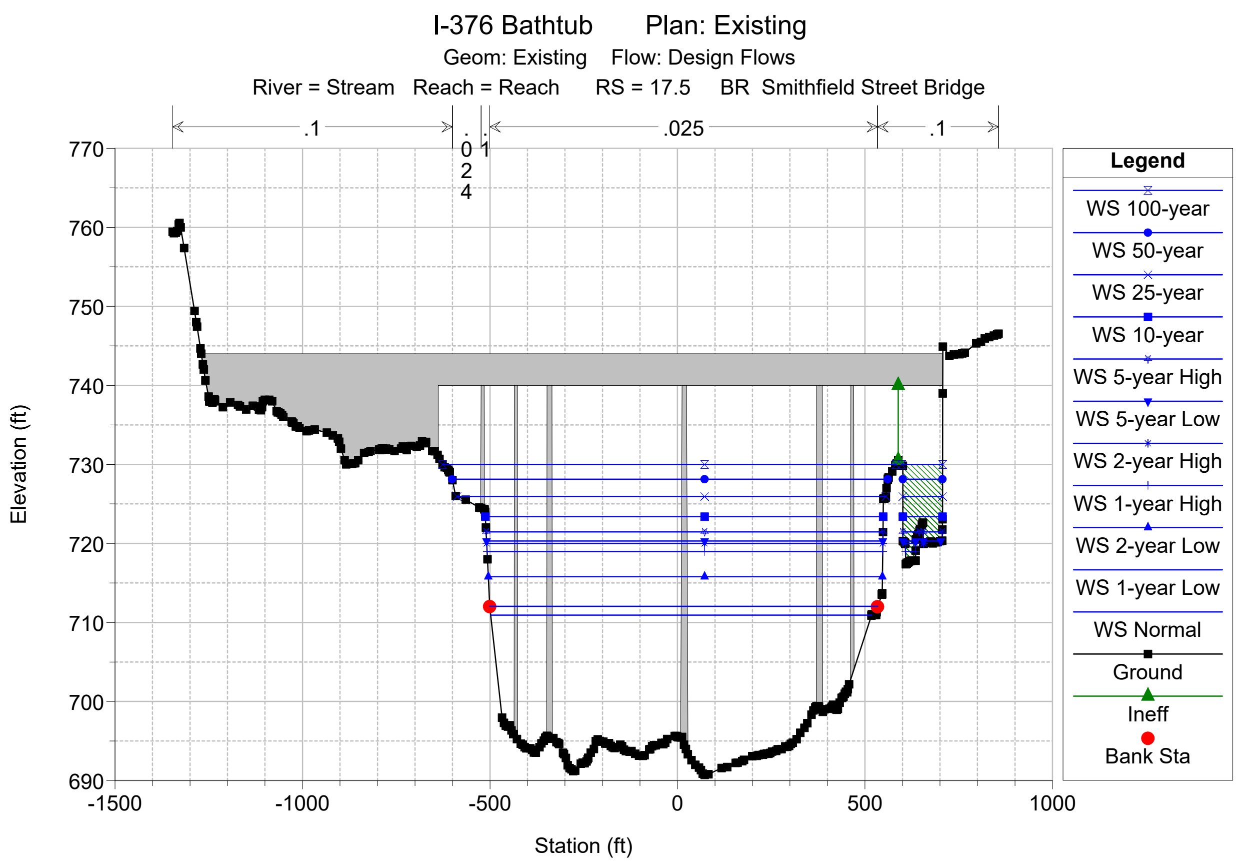
I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 20 FEMA D
.1
.05
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Ineff
Bank Sta



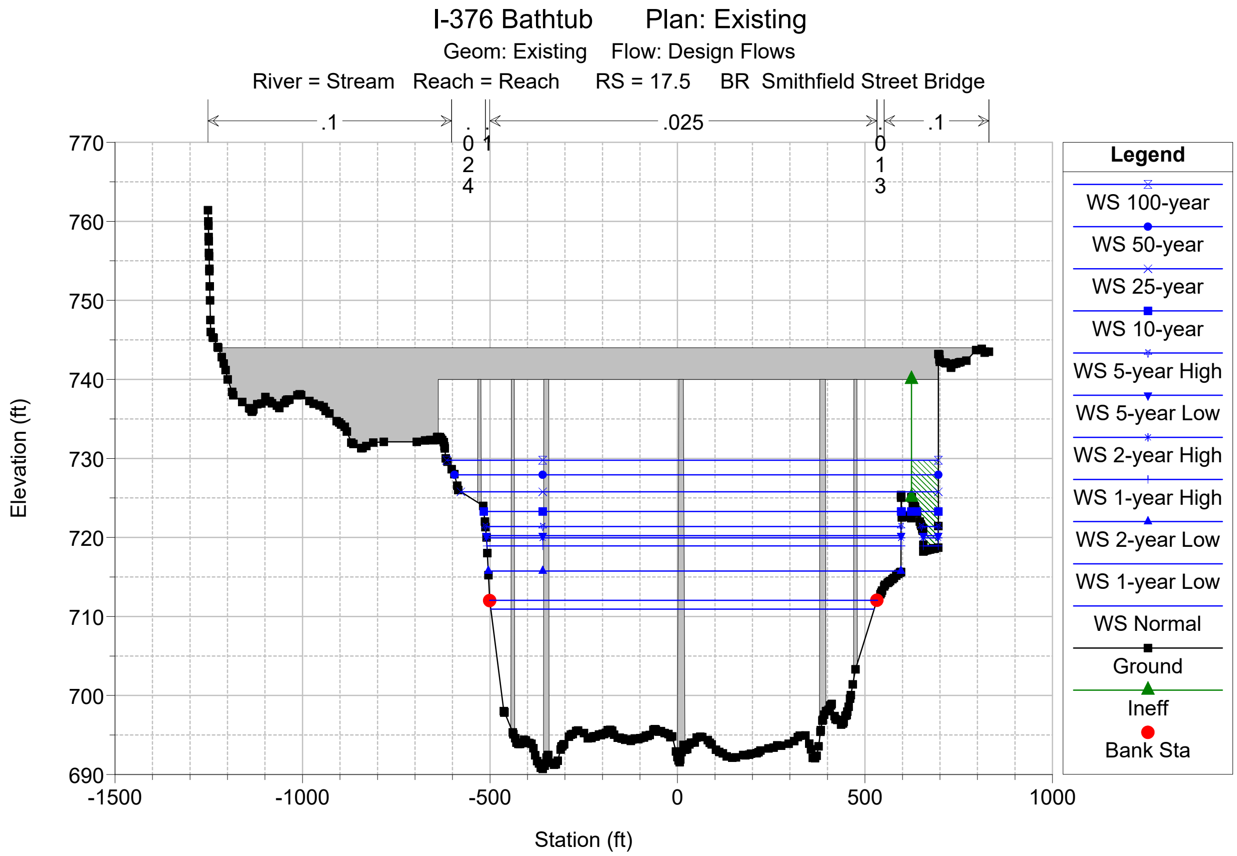
I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 19
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Ineff
Bank Sta

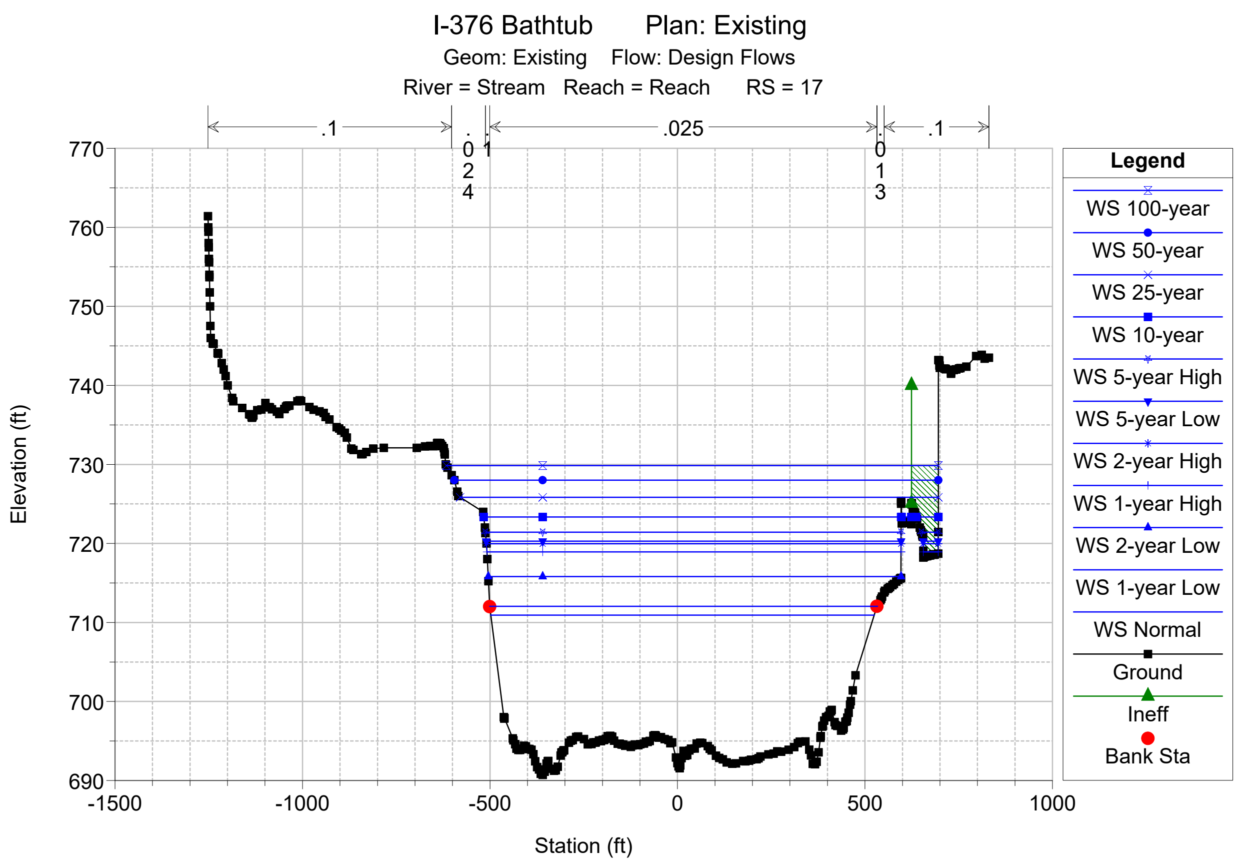


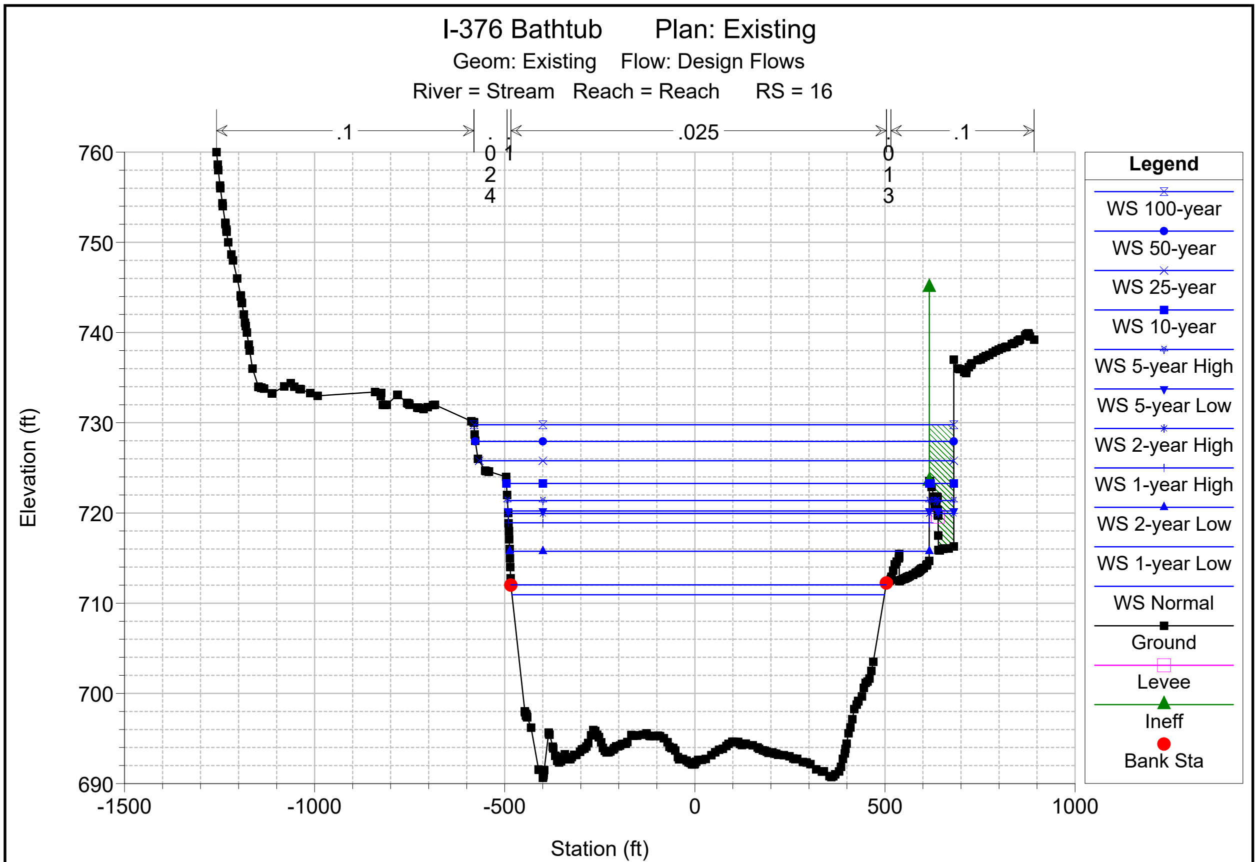
I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 18
.1
.024
.01
.025
.1
Elevation (ft)
Station (ft)
770
760
750
740
730
720
710
700
690
-1500
-1000
-500
0
500
1000
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Ineff
Bank Sta

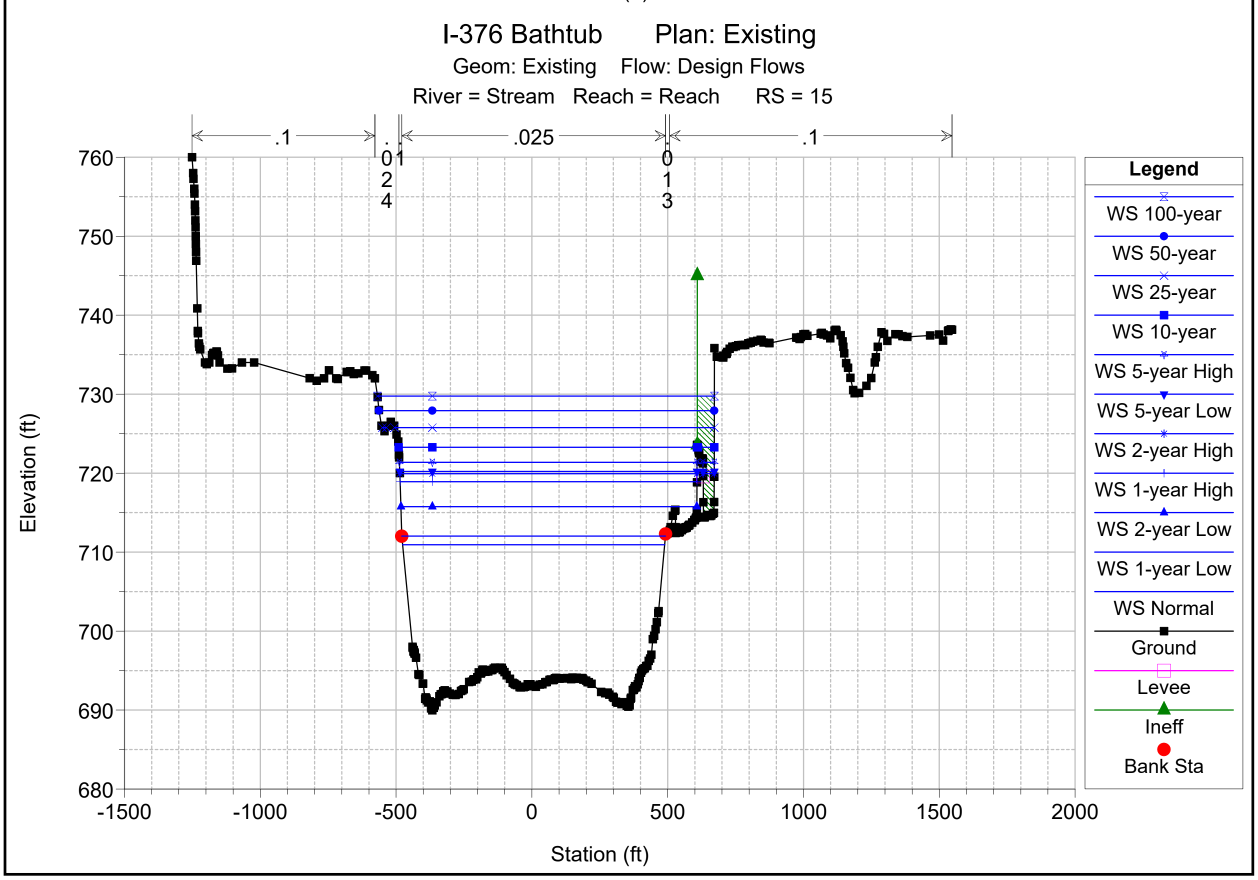


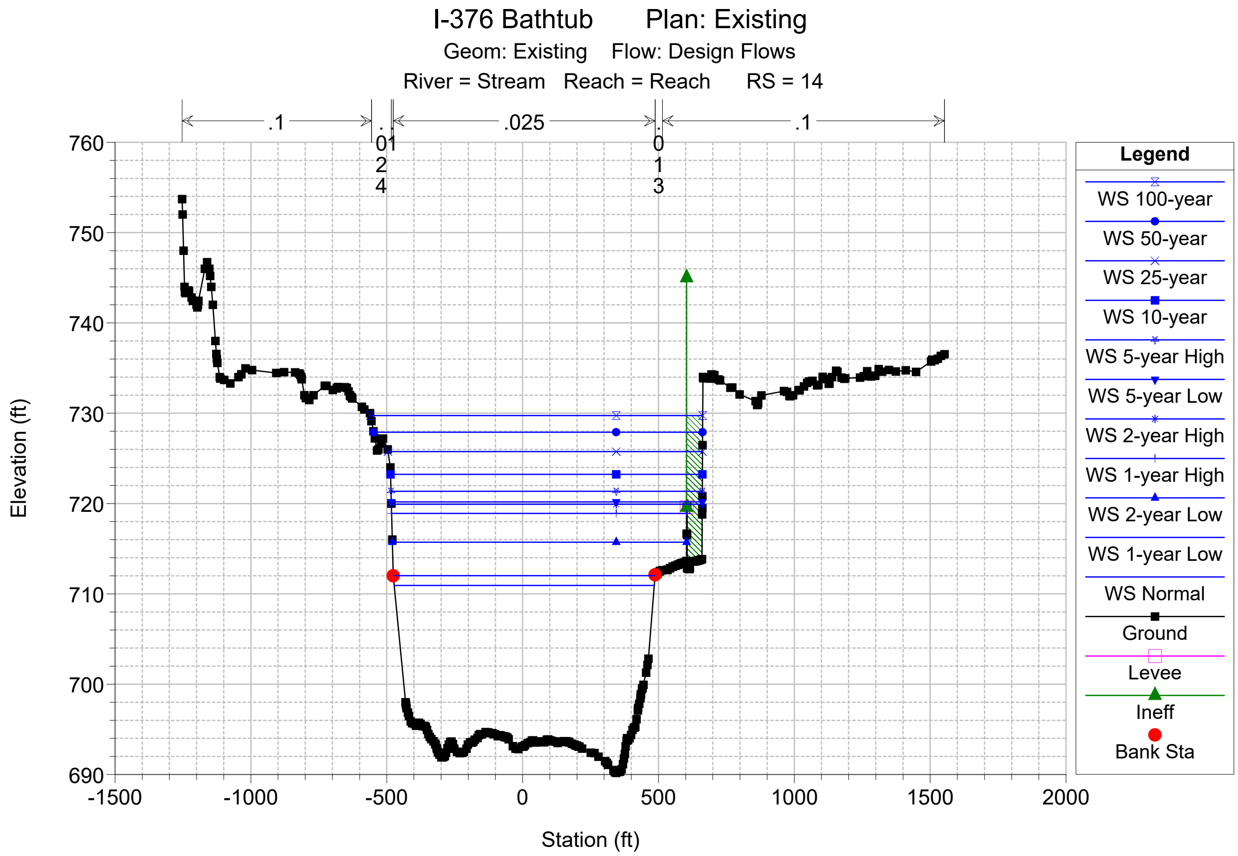
I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 17.5 BR Smithfield Street Bridge
.1
.024
.01
.025
.1
Elevation (ft)
Station (ft)
770
760
750
740
730
720
710
700
690
-1500
-1000
-500
0
500
1000
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Ineff
Bank Sta

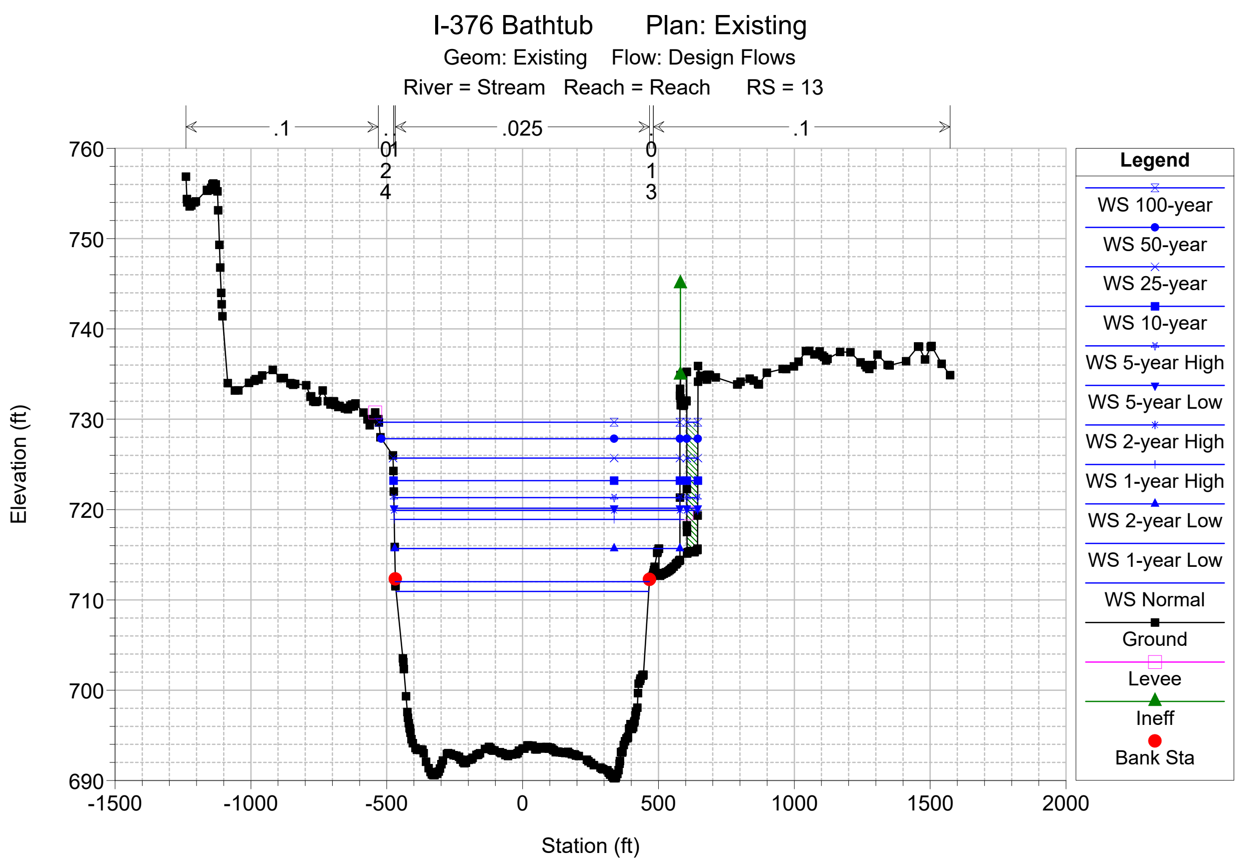

I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 17.5 BR Smithfield Street Bridge
.1
.024
.1
.025
.013
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Ineff
Bank Sta

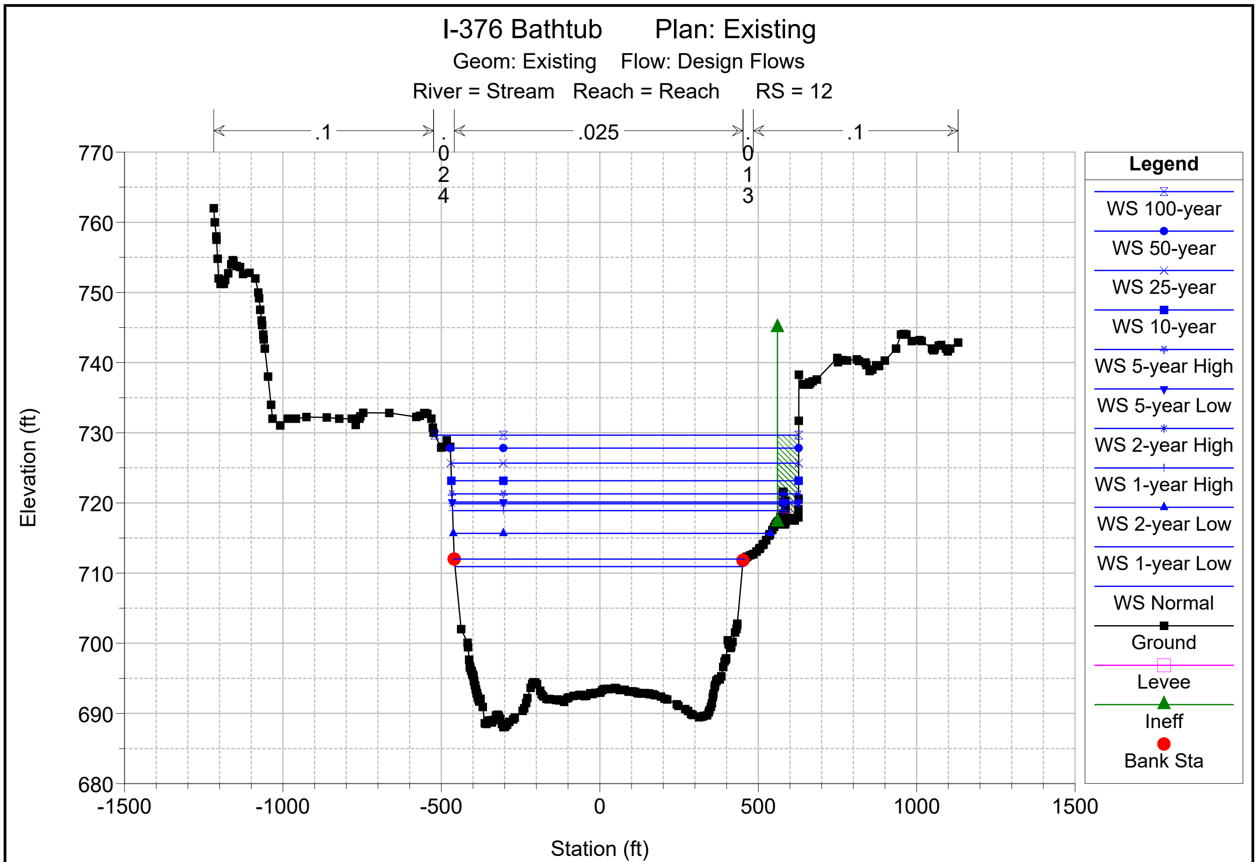

I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 17
.1
.024
.1
.025
.013
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Ineff
Bank Sta


I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 16
.1
.024
.1
.025
.013
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

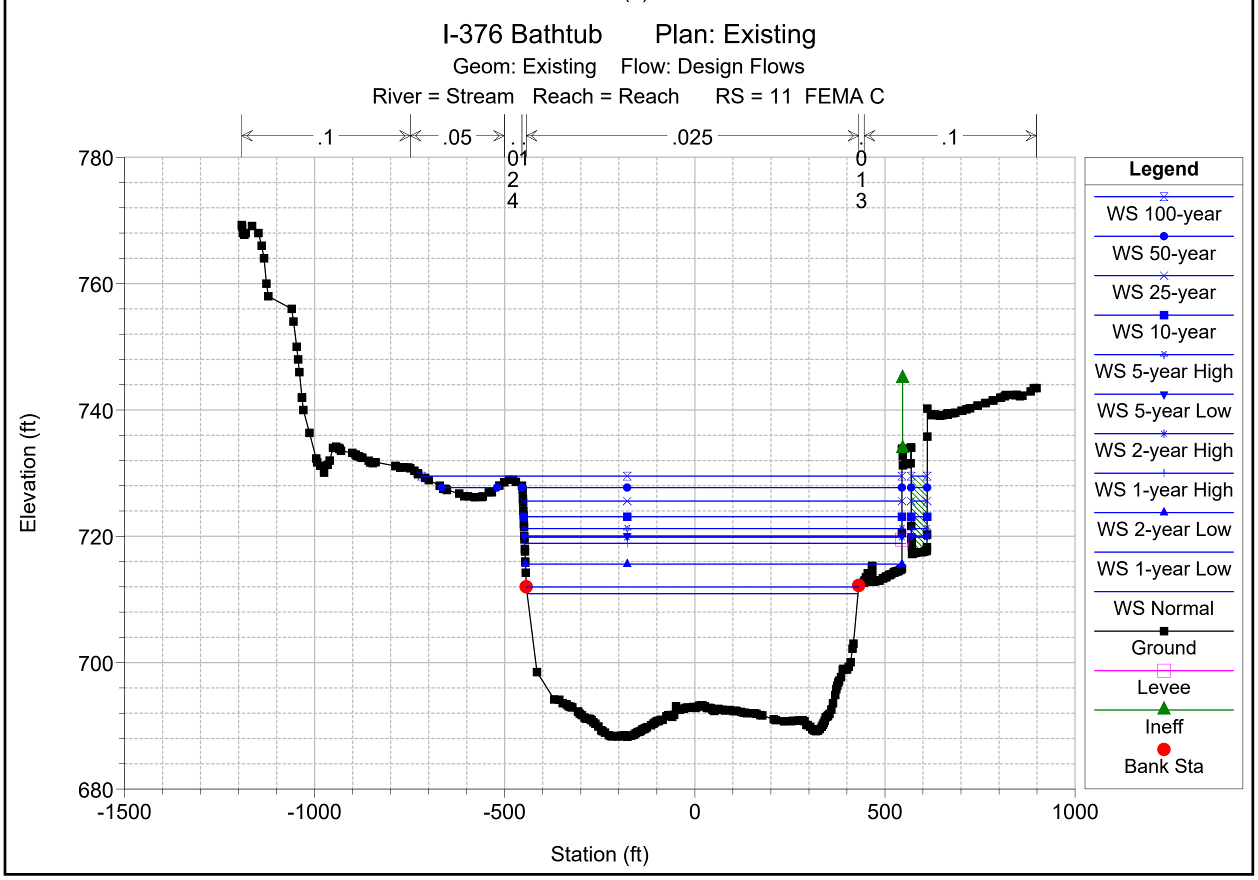

I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 15
.1
.024
.1
.025
.013
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta


I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 14
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

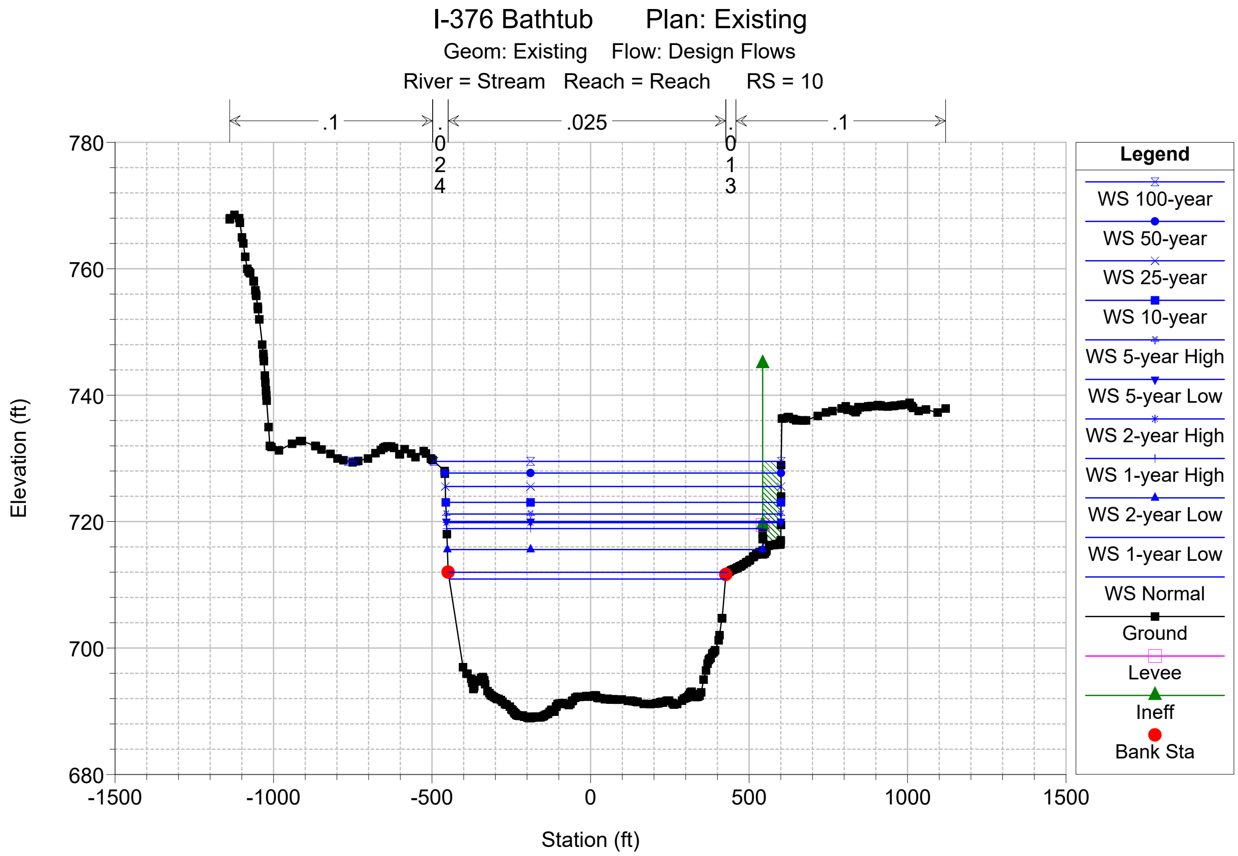

I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 13
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

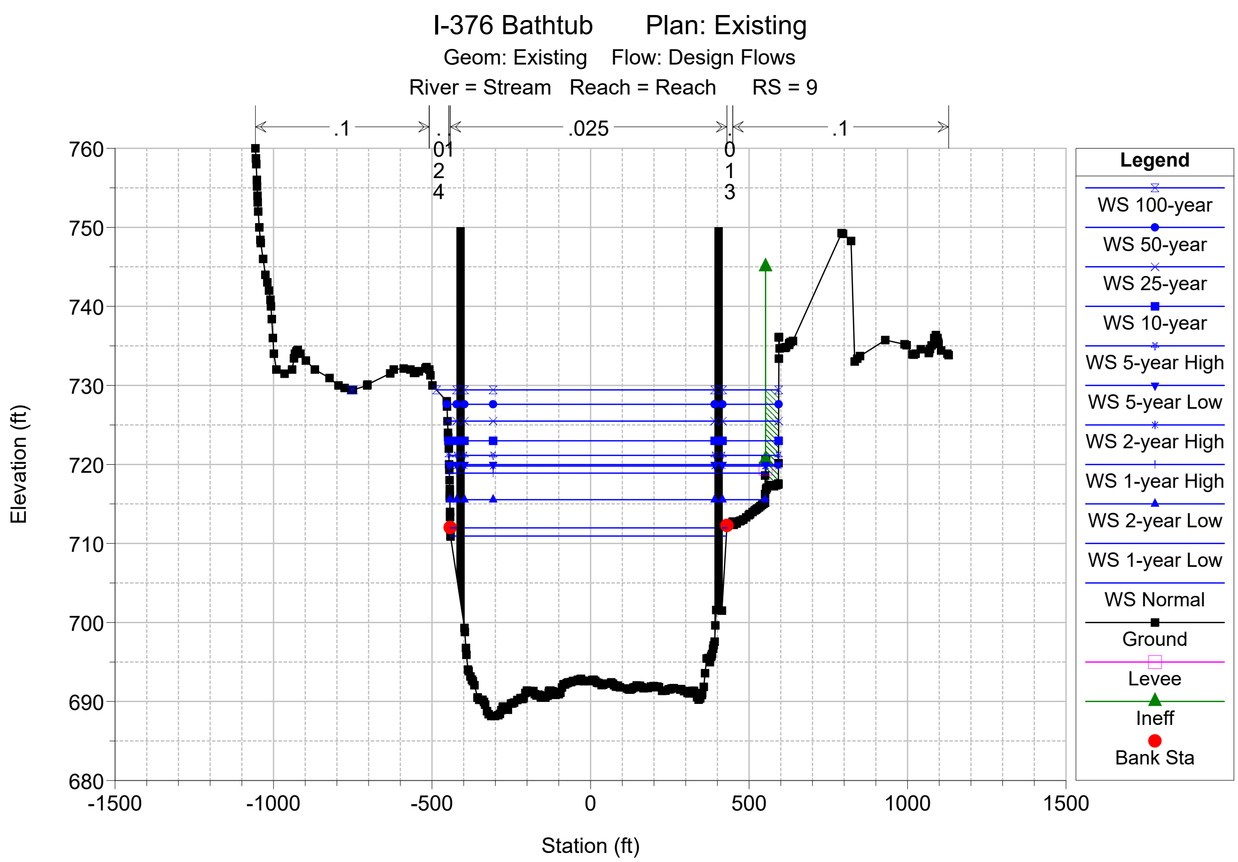


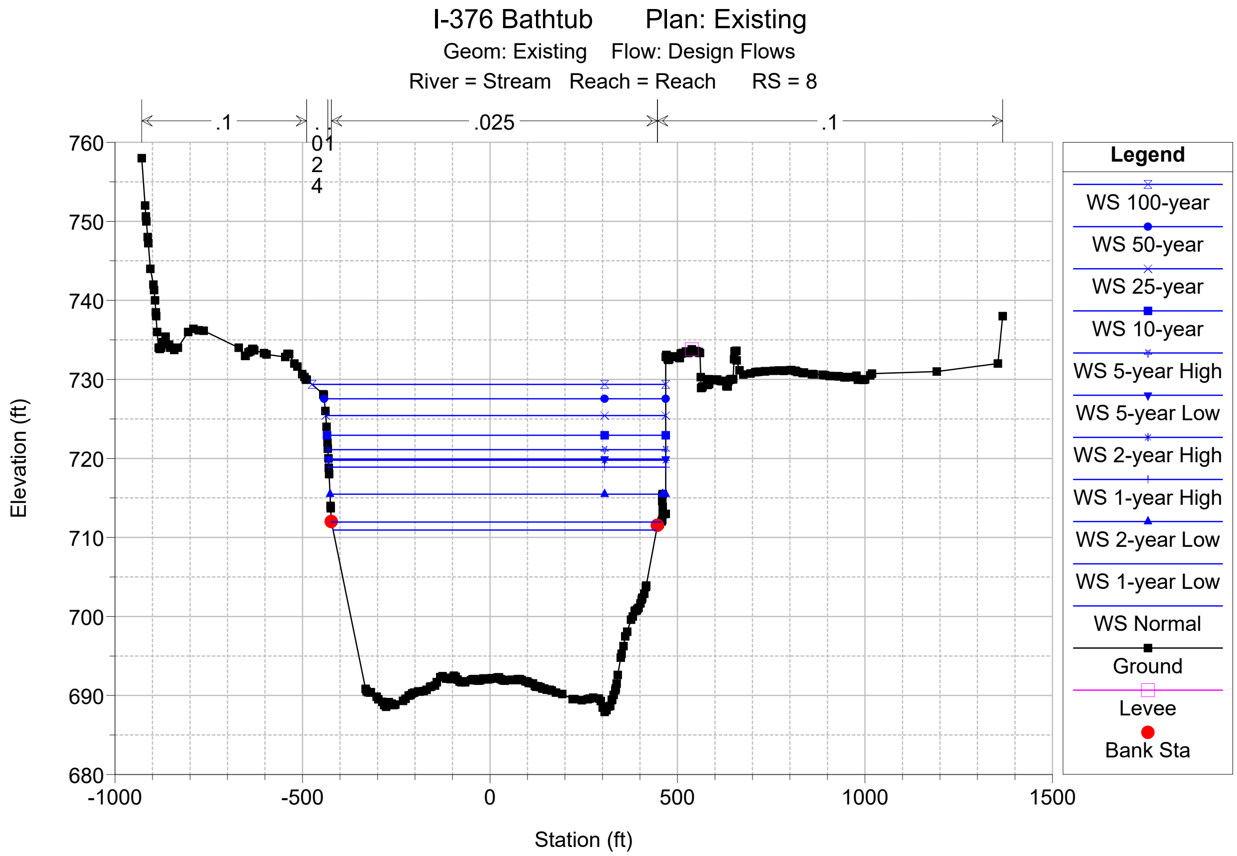
I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 12
.1
.025
.1
.024
.013
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta



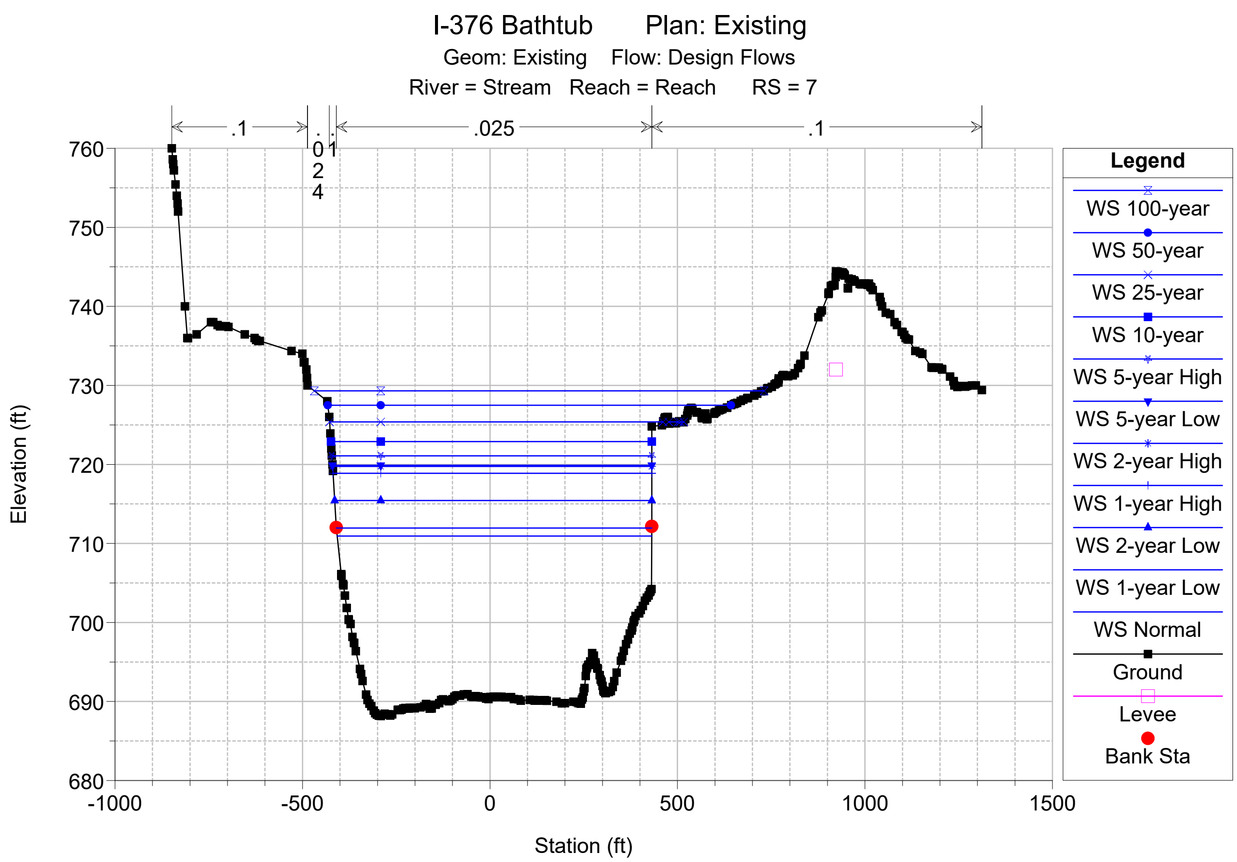
I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 11 FEMA C
.1
.05
.025
.1
.024
.013
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta


I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 10
.1
.025
.1
.024
.013
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

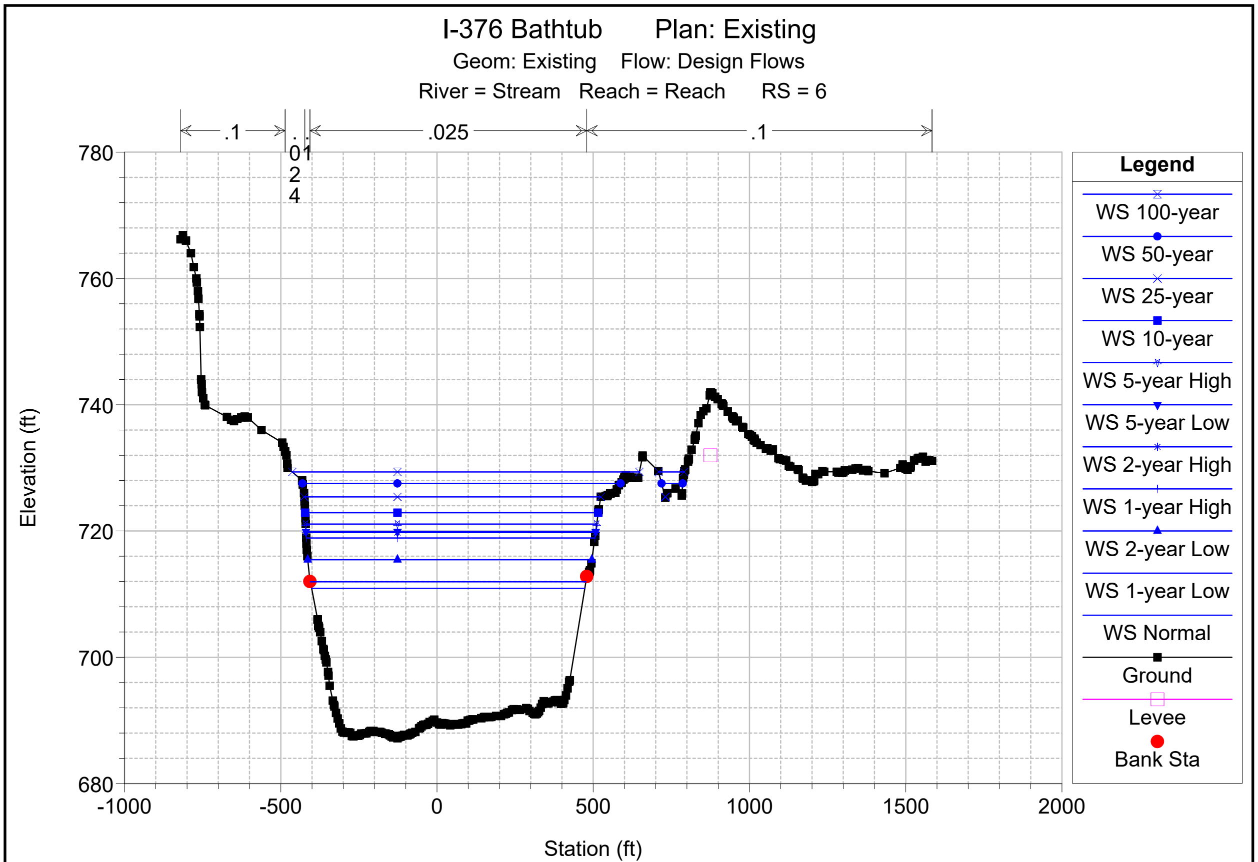

I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 9
.1
.025
.1
.024
.013
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

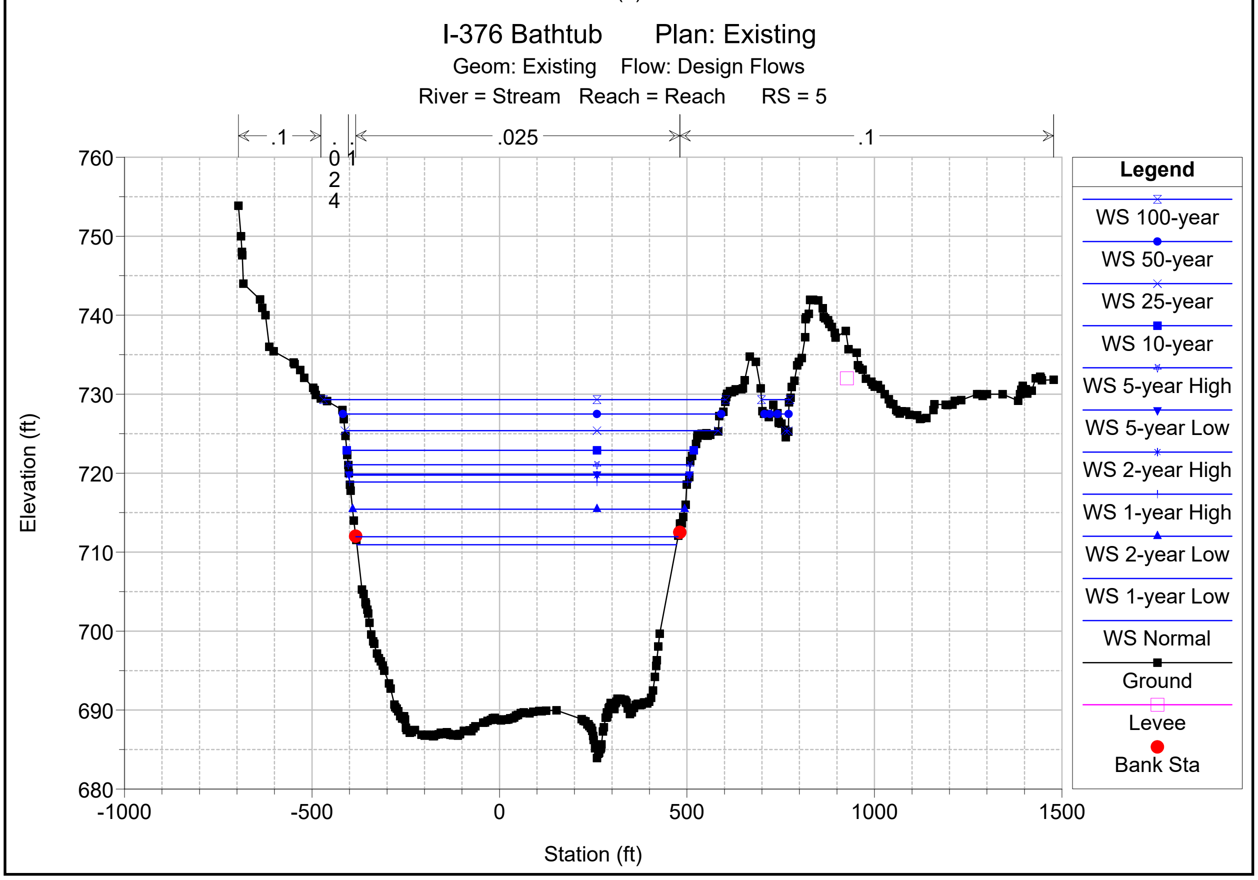


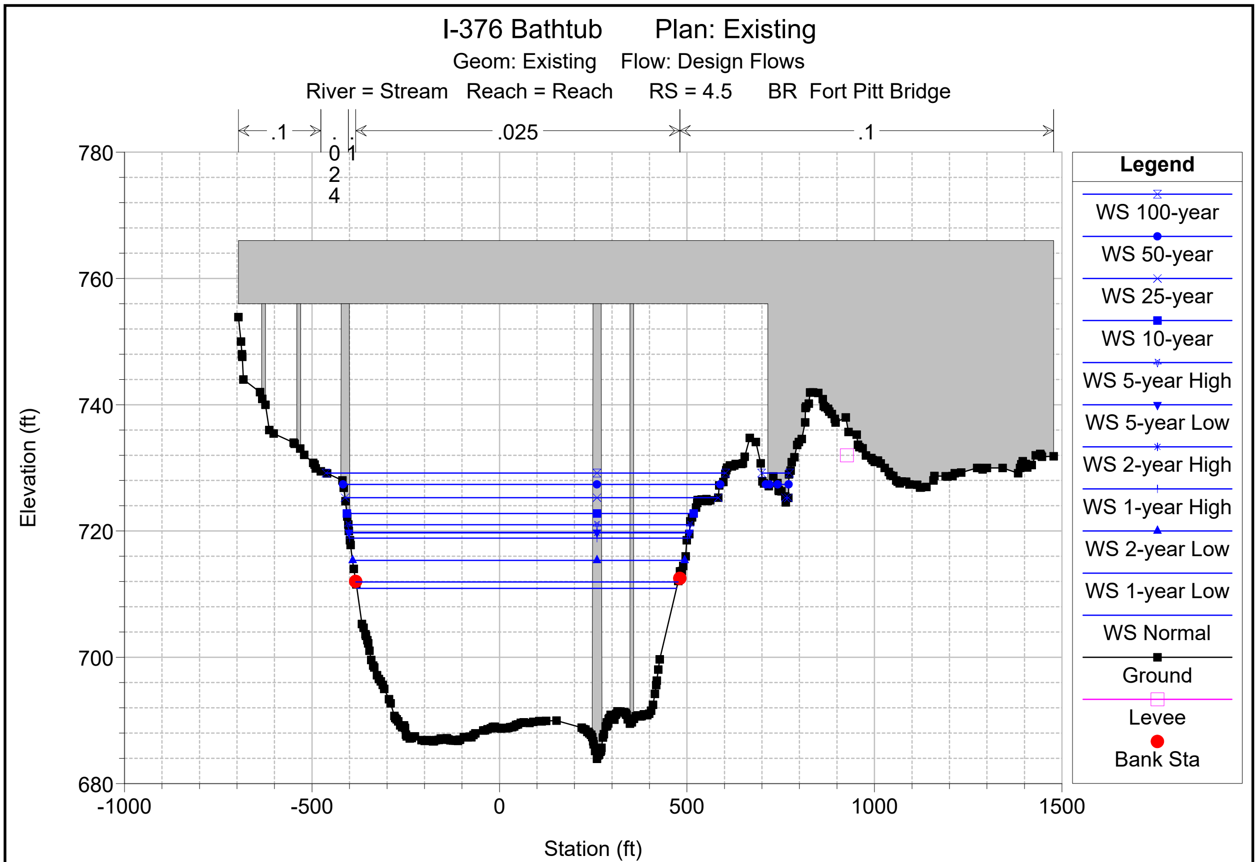
I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 8
.1
.025
.1
.01
2
4
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta

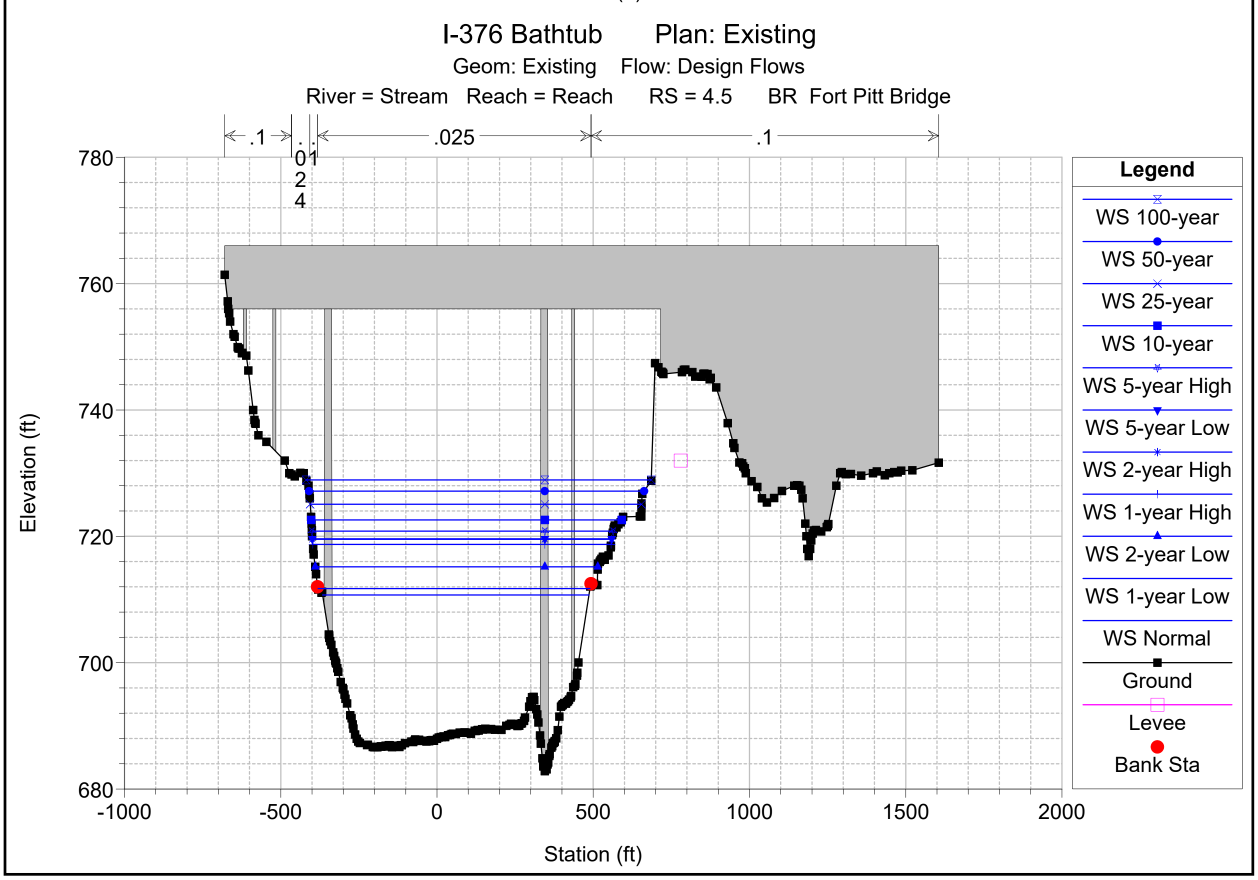


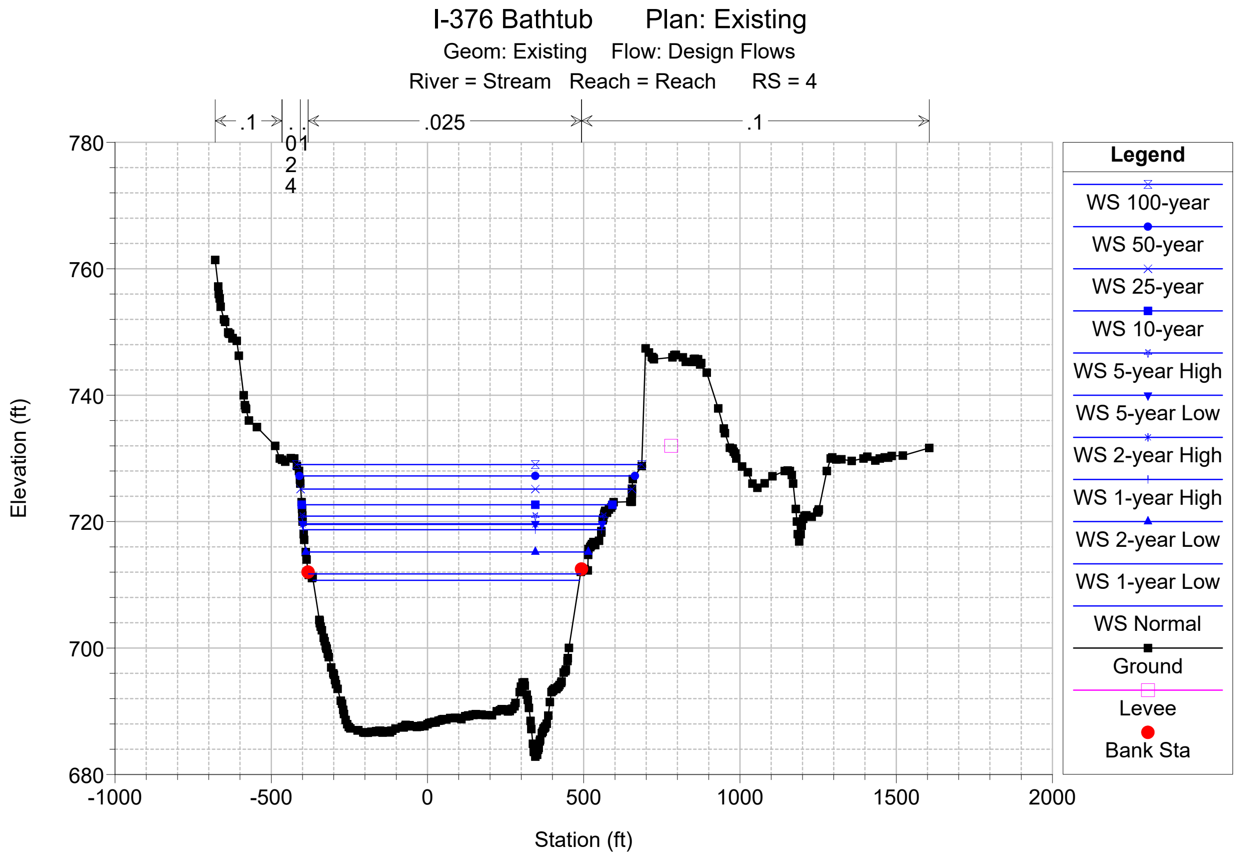
I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 7
.1
.025
.1
.01
2
4
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta


I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 6
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta

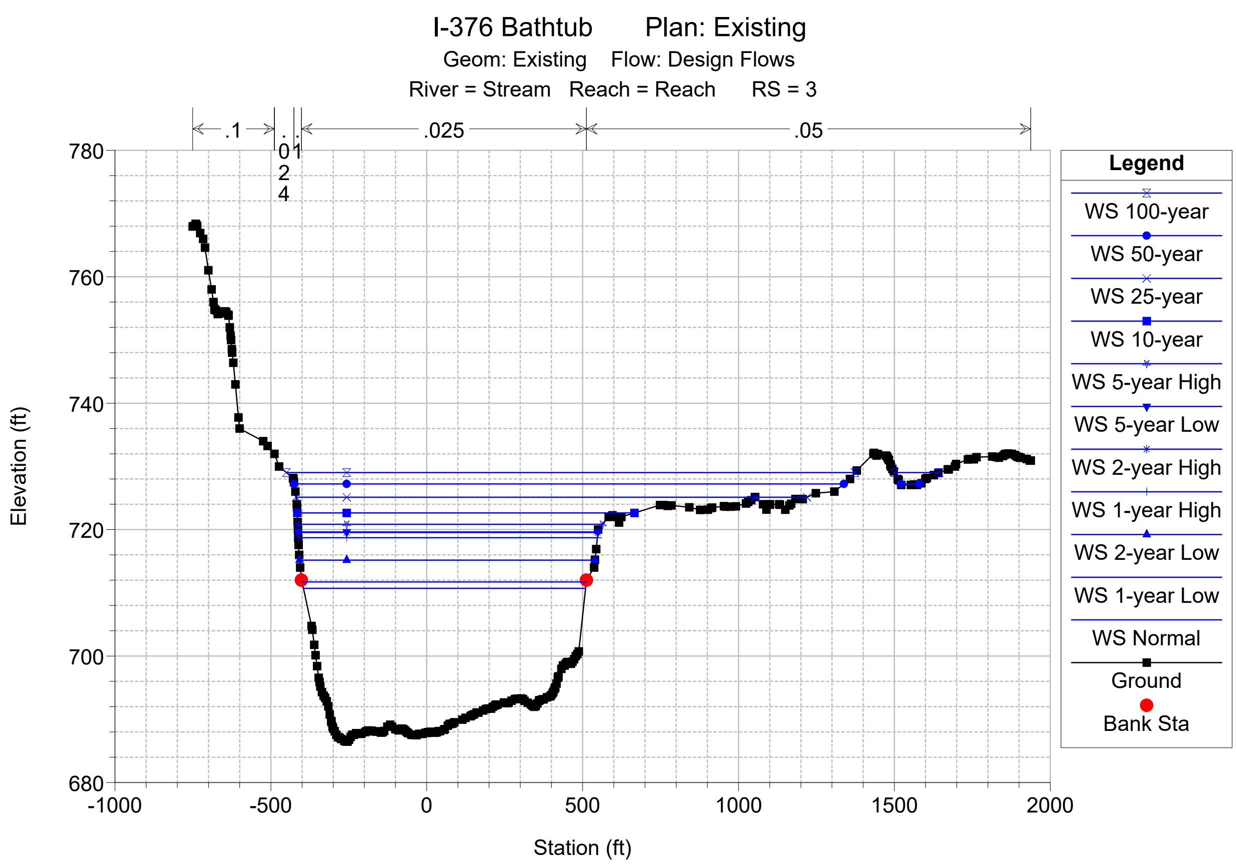

I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 5
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta


I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 4.5 BR Fort Pitt Bridge
.1
.024
.01
.025
.1
Elevation (ft)
Station (ft)
780
760
740
720
700
680
-1000
-500
0
500
1000
1500
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta

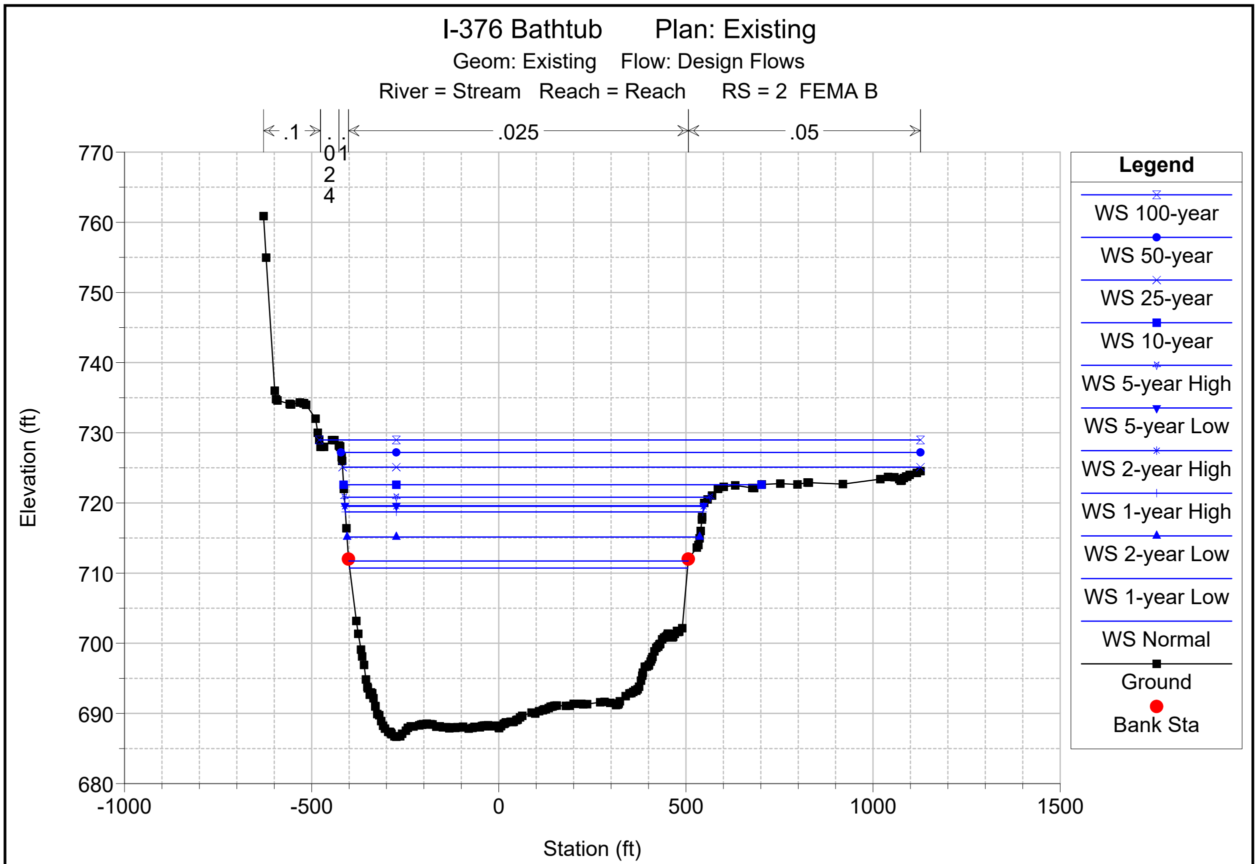

I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 4.5 BR Fort Pitt Bridge
.1
.024
.01
.025
.1
Elevation (ft)
Station (ft)
780
760
740
720
700
680
-1000
-500
0
500
1000
1500
2000
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta



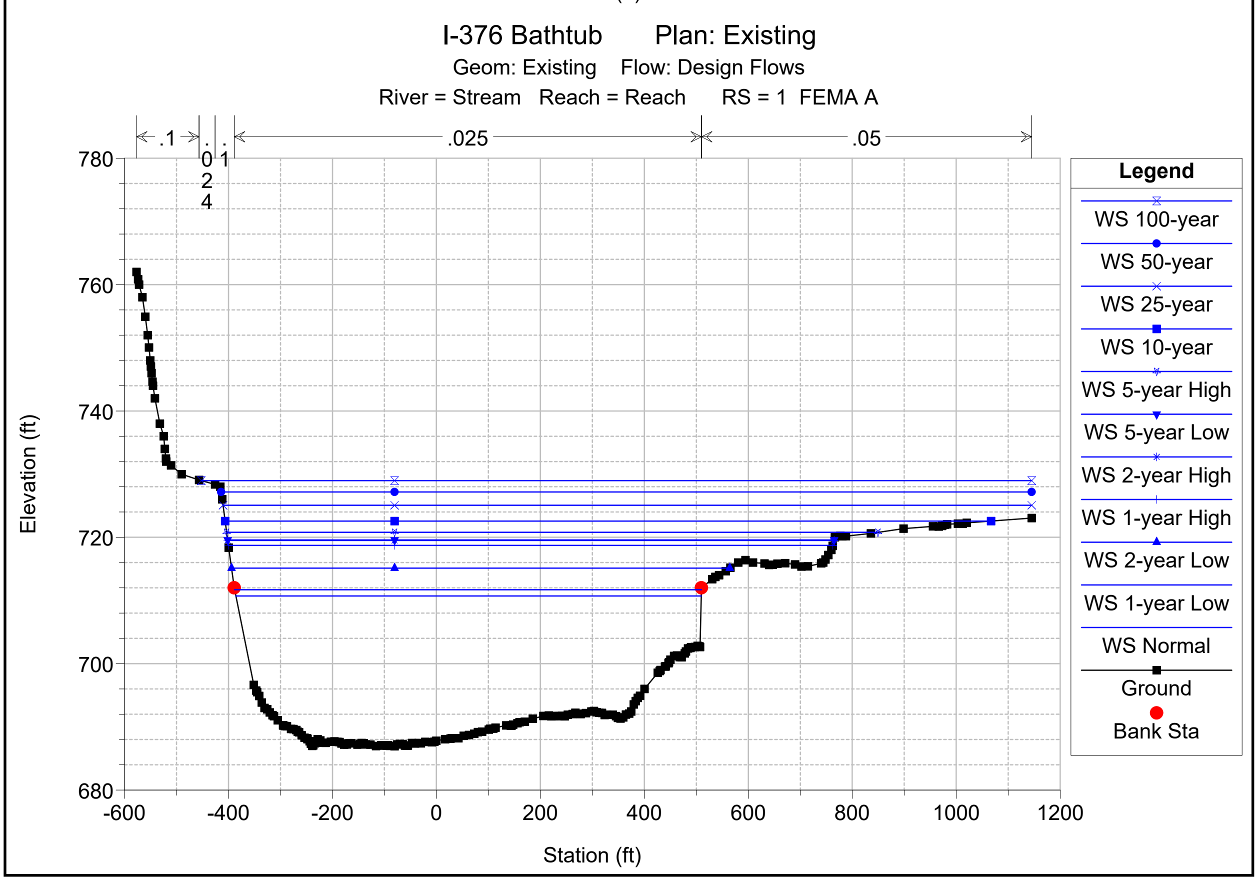
I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 4
.1
.01
.024
.025
.1
Elevation (ft)
Station (ft)
780
760
740
720
700
680
-1000
-500
0
500
1000
1500
2000
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta



I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 3
.1
.01
.024
.025
.05
Elevation (ft)
Station (ft)
780
760
740
720
700
680
-1000
-500
0
500
1000
1500
2000
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta



I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 2 FEMA B
.1
.024
.025
.05
Elevation (ft)
Station (ft)
770
760
750
740
730
720
710
700
690
680
-1000
-500
0
500
1000
1500
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta



I-376 Bathtub Plan: Existing
Geom: Existing Flow: Design Flows
River = Stream Reach = Reach RS = 1 FEMA A
.1
.024
.025
.05
Elevation (ft)
Station (ft)
780
760
740
720
700
680
-600
-400
-200
0
200
400
600
800
1000
1200
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

HEC-RAS Plan: Existing   River: Stream   Reach: Reach

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	30	1-year Low	39690.00	686.10	712.20		712.31	0.000035	2.6	15343.73	761.30	0.10
Reach	30	2-year Low	101800.00	686.10	716.39		716.86	0.000122	5.5	18551.76	772.73	0.20
Reach	30	5-year Low	136800.00	686.10	720.87		721.47	0.000126	6.2	22039.93	782.87	0.20
Reach	30	25-year	187200.00	686.10	726.49		727.28	0.000130	7.1	26474.45	795.75	0.21
Reach	30	10-year	168500.00	686.10	723.99		724.73	0.000135	6.9	24490.60	790.01	0.22
Reach	30	50-year	212000.00	686.10	728.69		729.58	0.000136	7.6	28268.17	868.07	0.22
Reach	30	100-year	231000.00	686.10	730.55		731.51	0.000136	7.9	30007.50	1021.97	0.22
Reach	30	1-year High	39690.00	686.10	719.04		719.09	0.000013	1.9	20606.53	778.67	0.07
Reach	30	5-year High	136800.00	686.10	721.96		722.52	0.000111	6.0	22893.58	785.37	0.19
Reach	30	2-year High	101800.00	686.10	720.34		720.68	0.000074	4.7	21622.20	781.65	0.16
Reach	30	Normal	12700.00	686.10	710.96		710.97	0.000004	0.9	14397.68	755.90	0.04
Reach	29	1-year Low	39690.00	690.79	712.18		712.29	0.000042	2.7	14910.55	807.23	0.11
Reach	29	2-year Low	101800.00	690.79	716.30		716.79	0.000140	5.6	18259.01	816.09	0.21
Reach	29	5-year Low	136800.00	690.79	720.80		721.41	0.000138	6.3	21950.44	825.81	0.21
Reach	29	25-year	187200.00	690.79	726.43		727.21	0.000137	7.1	26633.01	837.82	0.22
Reach	29	10-year	168500.00	690.79	723.92		724.66	0.000145	6.9	24536.54	832.47	0.22
Reach	29	50-year	212000.00	690.79	728.63		729.51	0.000142	7.5	28537.79	905.58	0.22
Reach	29	100-year	231000.00	690.79	730.50		731.44	0.000141	7.8	30509.05	1193.18	0.23
Reach	29	1-year High	39690.00	690.79	719.03		719.09	0.000015	1.9	20489.67	821.98	0.07
Reach	29	5-year High	136800.00	690.79	721.90		722.46	0.000121	6.0	22860.35	828.16	0.20
Reach	29	2-year High	101800.00	690.79	720.30		720.64	0.000081	4.7	21533.57	824.72	0.16
Reach	29	Normal	12700.00	690.79	710.95		710.97	0.000005	0.9	13924.49	803.36	0.04
Reach	28	1-year Low	39690.00	691.86	712.16		712.27	0.000040	2.6	15393.34	841.43	0.11
Reach	28	2-year Low	101800.00	691.86	716.25		716.71	0.000133	5.4	18856.07	851.00	0.20
Reach	28	5-year Low	136800.00	691.86	720.76		721.33	0.000130	6.0	22713.95	861.87	0.21
Reach	28	25-year	187200.00	691.86	726.40		727.12	0.000129	6.8	27613.76	884.65	0.21
Reach	28	10-year	168500.00	691.86	723.88		724.57	0.000137	6.7	25416.51	869.30	0.21
Reach	28	50-year	212000.00	691.86	728.60		729.42	0.000133	7.2	29727.23	1105.77	0.22
Reach	28	100-year	231000.00	691.86	730.48		731.34	0.000132	7.5	32091.86	1330.28	0.22
Reach	28	1-year High	39690.00	691.86	719.02		719.08	0.000014	1.9	21221.31	857.72	0.07
Reach	28	5-year High	136800.00	691.86	721.87		722.39	0.000114	5.8	23669.74	864.51	0.19
Reach	28	2-year High	101800.00	691.86	720.27		720.60	0.000077	4.6	22293.49	860.71	0.16
Reach	28	Normal	12700.00	691.86	710.95		710.96	0.000005	0.9	14377.02	838.25	0.04
Reach	27	1-year Low	39690.00	692.11	712.14		712.24	0.000040	2.5	16110.64	946.55	0.11
Reach	27	2-year Low	101800.00	692.11	716.20		716.60	0.000128	5.1	19961.00	951.60	0.20
Reach	27	5-year Low	136800.00	692.11	720.72		721.22	0.000121	5.6	24279.17	957.16	0.20
Reach	27	25-year	187200.00	692.11	726.39		727.01	0.000116	6.3	29729.16	984.71	0.20
Reach	27	10-year	168500.00	692.11	723.86		724.45	0.000125	6.2	27285.11	961.04	0.20
Reach	27	50-year	212000.00	692.11	728.60		729.30	0.000118	6.7	32045.56	1198.10	0.20
Reach	27	100-year	231000.00	692.11	730.48		731.22	0.000117	6.9	34560.12	1462.56	0.20
Reach	27	1-year High	39690.00	692.11	719.02		719.07	0.000013	1.8	22649.74	955.05	0.06
Reach	27	5-year High	136800.00	692.11	721.84		722.29	0.000105	5.4	25348.16	958.59	0.18
Reach	27	2-year High	101800.00	692.11	720.25		720.53	0.000071	4.3	23825.31	956.62	0.15
Reach	27	Normal	12700.00	692.11	710.95		710.96	0.000005	0.8	14987.79	936.70	0.04
Reach	26	1-year Low	39690.00	690.05	712.13	697.64	712.23	0.000038	2.5	16063.97	905.06	0.10
Reach	26	2-year Low	101800.00	690.05	716.17	701.29	716.58	0.000126	5.2	19762.74	929.52	0.19
Reach	26	5-year Low	136800.00	690.05	720.68	702.96	721.20	0.000122	5.7	24047.01	1001.37	0.20
Reach	26	25-year	187200.00	690.05	726.34	705.12	726.99	0.000119	6.5	29940.92	1094.01	0.20
Reach	26	10-year	168500.00	690.05	723.81	704.33	724.43	0.000127	6.3	27250.09	1042.73	0.21
Reach	26	50-year	212000.00	690.05	728.55	706.10	729.27	0.000121	6.8	32445.99	1166.31	0.21
Reach	26	100-year	231000.00	690.05	730.43	706.84	731.20	0.000120	7.0	34857.70	1430.19	0.21
Reach	26	1-year High	39690.00	690.05	719.02	697.64	719.06	0.000013	1.8	22435.21	947.78	0.06
Reach	26	5-year High	136800.00	690.05	721.80	702.96	722.28	0.000106	5.5	25177.01	1018.92	0.19
Reach	26	2-year High	101800.00	690.05	720.23	701.29	720.52	0.000071	4.4	23592.70	977.93	0.15
Reach	26	Normal	12700.00	690.05	710.95	695.23	710.96	0.000005	0.8	14993.80	899.73	0.04
Reach	25.5		Bridge									
Reach	25	1-year Low	39690.00	686.75	712.11		712.21	0.000040	2.5	15803.08	906.72	0.11
Reach	25	2-year Low	101800.00	686.75	716.08		716.51	0.000133	5.2	19431.82	923.01	0.20
Reach	25	5-year Low	136800.00	686.75	720.58		721.11	0.000127	5.8	23630.38	943.52	0.20
Reach	25	25-year	187200.00	686.75	726.22		726.89	0.000123	6.5	29161.59	1049.74	0.21
Reach	25	10-year	168500.00	686.75	723.69		724.33	0.000132	6.4	26605.84	973.80	0.21
Reach	25	50-year	212000.00	686.75	728.42		729.16	0.000126	6.9	31629.56	1256.43	0.21
Reach	25	100-year	231000.00	686.75	730.30		731.08	0.000124	7.1	34298.73	1469.99	0.21
Reach	25	1-year High	39690.00	686.75	719.01		719.06	0.000013	1.8	22150.29	934.09	0.06
Reach	25	5-year High	136800.00	686.75	721.71		722.20	0.000110	5.6	24702.95	954.63	0.19
Reach	25	2-year High	101800.00	686.75	720.17		720.47	0.000074	4.4	23241.16	939.47	0.15
Reach	25	Normal	12700.00	686.75	710.95		710.96	0.000005	0.9	14751.57	897.17	0.04
Reach	24	1-year Low	39690.00	689.54	712.11		712.20	0.000036	2.4	16676.21	964.89	0.10
Reach	24	2-year Low	101800.00	689.54	716.08		716.46	0.000119	5.0	20534.47	980.03	0.19
Reach	24	5-year Low	136800.00	689.54	720.59		721.06	0.000113	5.5	24987.83	993.78	0.19

HEC-RAS Plan: Existing River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	24	25-year	187200.00	689.54	726.24		726.83	0.000110	6.2	30741.78	1151.88	0.19
Reach	24	10-year	168500.00	689.54	723.71		724.27	0.000118	6.0	28099.69	1003.43	0.20
Reach	24	50-year	212000.00	689.54	728.44		729.10	0.000112	6.5	33620.25	1408.50	0.20
Reach	24	100-year	231000.00	689.54	730.32		731.02	0.000110	6.7	36410.52	1517.87	0.20
Reach	24	1-year High	39690.00	689.54	719.01		719.05	0.000012	1.7	23416.96	988.86	0.06
Reach	24	5-year High	136800.00	689.54	721.72		722.15	0.000098	5.3	26113.62	997.34	0.18
Reach	24	2-year High	101800.00	689.54	720.17		720.44	0.000066	4.2	24574.20	992.47	0.15
Reach	24	Normal	12700.00	689.54	710.95		710.96	0.000005	0.8	15555.52	958.17	0.04
Reach	23	1-year Low	39690.00	688.70	712.10	697.55	712.19	0.000040	2.4	16237.26	968.25	0.11
Reach	23	2-year Low	101800.00	688.70	716.05	701.52	716.45	0.000131	5.1	20112.64	994.58	0.20
Reach	23	5-year Low	136800.00	688.70	720.56	703.21	721.05	0.000123	5.6	24651.71	1016.10	0.20
Reach	23	25-year	187200.00	688.70	726.21	705.39	726.81	0.000117	6.3	30578.92	1163.29	0.20
Reach	23	10-year	168500.00	688.70	723.67	704.60	724.26	0.000126	6.1	27849.98	1041.31	0.20
Reach	23	50-year	212000.00	688.70	728.41	706.36	729.09	0.000119	6.6	33161.89	1180.30	0.20
Reach	23	100-year	231000.00	688.70	730.29	707.08	731.00	0.000117	6.8	35397.66	1208.50	0.20
Reach	23	1-year High	39690.00	688.70	719.00	697.55	719.05	0.000013	1.7	23075.88	1008.93	0.06
Reach	23	5-year High	136800.00	688.70	721.69	703.22	722.14	0.000106	5.4	25808.81	1022.64	0.18
Reach	23	2-year High	101800.00	688.70	720.16	701.52	720.43	0.000072	4.2	24242.40	1013.89	0.15
Reach	23	Normal	12700.00	688.70	710.94	694.58	710.96	0.000005	0.8	15127.02	951.15	0.04
Reach	22.5		Bridge									
Reach	22	1-year Low	39690.00	689.39	712.09	697.71	712.18	0.000040	2.5	16194.77	966.51	0.11
Reach	22	2-year Low	101800.00	689.39	716.00	701.62	716.40	0.000131	5.1	20004.03	981.98	0.20
Reach	22	5-year Low	136800.00	689.39	720.51	703.29	721.00	0.000123	5.6	24466.84	998.39	0.20
Reach	22	25-year	187200.00	689.39	726.15	705.43	726.76	0.000117	6.3	30264.17	1102.27	0.20
Reach	22	10-year	168500.00	689.39	723.61	704.67	724.20	0.000126	6.2	27596.57	1032.39	0.20
Reach	22	50-year	212000.00	689.39	728.34	706.40	729.02	0.000119	6.6	32708.94	1126.06	0.20
Reach	22	100-year	231000.00	689.39	730.22	707.12	730.94	0.000117	6.8	34858.43	1181.36	0.20
Reach	22	1-year High	39690.00	689.39	719.00	697.71	719.05	0.000013	1.7	22964.16	992.85	0.06
Reach	22	5-year High	136800.00	689.39	721.65	703.29	722.10	0.000106	5.4	25607.82	1002.58	0.18
Reach	22	2-year High	101800.00	689.39	720.13	701.62	720.41	0.000071	4.2	24087.50	997.12	0.15
Reach	22	Normal	12700.00	689.39	710.94	695.12	710.95	0.000005	0.8	15090.56	957.86	0.04
Reach	21	1-year Low	39690.00	689.92	712.08	697.85	712.17	0.000037	2.4	16494.53	951.63	0.10
Reach	21	2-year Low	101800.00	689.92	715.97	701.40	716.36	0.000124	5.0	20209.77	960.35	0.19
Reach	21	5-year Low	136800.00	689.92	720.48	703.02	720.96	0.000118	5.6	24564.92	972.01	0.19
Reach	21	25-year	187200.00	689.92	726.11	705.14	726.72	0.000113	6.3	30312.47	1082.53	0.20
Reach	21	10-year	168500.00	689.92	723.58	704.39	724.16	0.000122	6.1	27624.58	1018.43	0.20
Reach	21	50-year	212000.00	689.92	728.31	706.10	728.99	0.000116	6.6	32705.25	1106.34	0.20
Reach	21	100-year	231000.00	689.92	730.19	706.80	730.90	0.000114	6.8	34846.02	1173.76	0.20
Reach	21	1-year High	39690.00	689.92	719.00	697.85	719.04	0.000012	1.7	23128.89	968.19	0.06
Reach	21	5-year High	136800.00	689.92	721.62	703.02	722.06	0.000102	5.3	25679.21	974.96	0.18
Reach	21	2-year High	101800.00	689.92	720.11	701.40	720.39	0.000068	4.2	24208.77	971.05	0.15
Reach	21	Normal	12700.00	689.92	710.94	694.94	710.95	0.000005	0.8	15412.61	947.89	0.04
Reach	20	1-year Low	39690.00	691.23	712.07	697.48	712.15	0.000035	2.3	16979.62	995.12	0.10
Reach	20	2-year Low	101800.00	691.23	715.92	701.09	716.30	0.000118	4.9	20887.71	1027.85	0.19
Reach	20	5-year Low	136800.00	691.23	720.44	702.75	720.89	0.000111	5.4	25543.55	1033.63	0.19
Reach	20	25-year	187200.00	691.23	726.09	704.84	726.65	0.000106	6.0	31553.73	1161.23	0.19
Reach	20	10-year	168500.00	691.23	723.55	704.08	724.09	0.000115	5.9	28778.39	1075.61	0.20
Reach	20	50-year	212000.00	691.23	728.29	705.80	728.92	0.000108	6.4	34182.14	1286.55	0.19
Reach	20	100-year	231000.00	691.23	730.17	706.51	730.83	0.000106	6.6	36624.34	1363.04	0.19
Reach	20	1-year High	39690.00	691.23	718.99	697.48	719.03	0.000011	1.7	24046.66	1031.81	0.06
Reach	20	5-year High	136800.00	691.23	721.59	702.75	722.01	0.000096	5.2	26734.16	1035.08	0.18
Reach	20	2-year High	101800.00	691.23	720.09	701.09	720.35	0.000064	4.1	25179.61	1033.19	0.14
Reach	20	Normal	12700.00	691.23	710.94	695.15	710.95	0.000004	0.8	15865.80	982.92	0.04
Reach	19	1-year Low	39690.00	692.33	712.06	697.90	712.14	0.000038	2.4	16779.09	1015.99	0.10
Reach	19	2-year Low	101800.00	692.33	715.89	701.56	716.27	0.000124	4.9	20720.41	1038.96	0.19
Reach	19	5-year Low	136800.00	692.33	720.42	703.18	720.87	0.000115	5.4	25454.31	1083.45	0.19
Reach	19	25-year	187200.00	692.33	726.07	705.28	726.63	0.000108	6.0	31543.10	1248.68	0.19
Reach	19	10-year	168500.00	692.33	723.52	704.53	724.07	0.000117	5.9	28739.81	1170.30	0.20
Reach	19	50-year	212000.00	692.33	728.27	706.24	728.89	0.000110	6.4	34074.66	1272.01	0.20
Reach	19	100-year	231000.00	692.33	730.15	706.93	730.81	0.000108	6.5	36357.75	1393.66	0.20
Reach	19	1-year High	39690.00	692.33	718.99	697.90	719.03	0.000012	1.7	23957.69	1077.81	0.06
Reach	19	5-year High	136800.00	692.33	721.57	703.18	721.99	0.000099	5.2	26668.56	1089.31	0.18
Reach	19	2-year High	101800.00	692.33	720.07	701.56	720.33	0.000067	4.1	25096.08	1082.19	0.15
Reach	19	Normal	12700.00	692.33	710.94	695.54	710.95	0.000005	0.8	15647.94	1006.60	0.04
Reach	18	1-year Low	39690.00	690.71	712.05	697.98	712.14	0.000038	2.4	16874.60	1034.82	0.10
Reach	18	2-year Low	101800.00	690.71	715.87	701.64	716.24	0.000124	4.9	20874.86	1051.21	0.19
Reach	18	5-year Low	136800.00	690.71	720.40	703.26	720.85	0.000114	5.4	25645.30	1141.53	0.19
Reach	18	25-year	187200.00	690.71	726.05	705.33	726.61	0.000107	6.0	31713.48	1253.54	0.19
Reach	18	10-year	168500.00	690.71	723.51	704.58	724.04	0.000116	5.9	28938.99	1166.54	0.20
Reach	18	50-year	212000.00	690.71	728.26	706.27	728.87	0.000109	6.3	34255.49	1269.49	0.19

HEC-RAS Plan: Existing River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	18	100-year	231000.00	690.71	730.14	706.96	730.78	0.000107	6.5	36487.62	1343.70	0.19
Reach	18	1-year High	39690.00	690.71	718.99	697.98	719.03	0.000012	1.6	24153.99	1082.09	0.06
Reach	18	5-year High	136800.00	690.71	721.56	703.26	721.97	0.000098	5.1	26870.39	1153.38	0.18
Reach	18	2-year High	101800.00	690.71	720.06	701.64	720.32	0.000066	4.0	25291.76	1091.03	0.14
Reach	18	Normal	12700.00	690.71	710.94	695.60	710.95	0.000005	0.8	15727.84	1016.29	0.04
Reach	17.5		Bridge									
Reach	17	1-year Low	39690.00	690.70	712.04	698.05	712.12	0.000036	2.3	17110.04	1033.76	0.10
Reach	17	2-year Low	101800.00	690.70	715.80	701.48	716.16	0.000121	4.8	21107.97	1100.81	0.19
Reach	17	5-year Low	136800.00	690.70	720.28	703.07	720.72	0.000111	5.3	26050.38	1146.37	0.19
Reach	17	25-year	187200.00	690.70	725.84	705.12	726.38	0.000105	5.9	32378.04	1275.41	0.19
Reach	17	10-year	168500.00	690.70	723.34	704.39	723.86	0.000114	5.8	29465.66	1197.91	0.19
Reach	17	50-year	212000.00	690.70	728.00	706.06	728.59	0.000106	6.2	34995.17	1290.62	0.19
Reach	17	100-year	231000.00	690.70	729.84	706.75	730.47	0.000105	6.4	37260.11	1312.20	0.19
Reach	17	1-year High	39690.00	690.70	718.92	698.05	718.96	0.000011	1.6	24550.05	1143.98	0.06
Reach	17	5-year High	136800.00	690.70	721.43	703.07	721.82	0.000095	5.1	27322.30	1153.51	0.18
Reach	17	2-year High	101800.00	690.70	719.97	701.48	720.22	0.000064	4.0	25707.03	1145.59	0.14
Reach	17	Normal	12700.00	690.70	710.94	695.80	710.95	0.000005	0.8	15980.23	1022.61	0.04
Reach	16	1-year Low	39690.00	690.63	712.03	697.67	712.11	0.000036	2.3	16906.15	987.03	0.10
Reach	16	2-year Low	101800.00	690.63	715.75	701.23	716.13	0.000121	4.9	20861.97	1103.50	0.19
Reach	16	5-year Low	136800.00	690.63	720.23	702.87	720.68	0.000114	5.4	25807.08	1149.78	0.19
Reach	16	25-year	187200.00	690.63	725.78	704.94	726.35	0.000109	6.1	32065.94	1248.21	0.19
Reach	16	10-year	168500.00	690.63	723.28	704.20	723.83	0.000117	6.0	29195.76	1173.13	0.20
Reach	16	50-year	212000.00	690.63	727.93	705.90	728.56	0.000111	6.4	34625.43	1258.48	0.20
Reach	16	100-year	231000.00	690.63	729.77	706.61	730.43	0.000109	6.6	36823.56	1261.67	0.20
Reach	16	1-year High	39690.00	690.63	718.92	697.67	718.96	0.000011	1.7	24356.16	1106.44	0.06
Reach	16	5-year High	136800.00	690.63	721.38	702.87	721.80	0.000098	5.2	27086.06	1157.09	0.18
Reach	16	2-year High	101800.00	690.63	719.94	701.23	720.20	0.000065	4.1	25488.77	1149.32	0.14
Reach	16	Normal	12700.00	690.63	710.94	695.40	710.95	0.000004	0.8	15833.90	979.87	0.04
Reach	15	1-year Low	39690.00	689.96	712.02	697.27	712.11	0.000033	2.3	17189.71	970.79	0.10
Reach	15	2-year Low	101800.00	689.96	715.75	700.79	716.12	0.000114	4.9	21092.61	1089.74	0.19
Reach	15	5-year Low	136800.00	689.96	720.22	702.43	720.67	0.000109	5.4	25975.10	1135.19	0.19
Reach	15	25-year	187200.00	689.96	725.77	704.52	726.33	0.000105	6.1	32087.92	1192.00	0.19
Reach	15	10-year	168500.00	689.96	723.27	703.75	723.81	0.000113	5.9	29320.18	1158.70	0.19
Reach	15	50-year	212000.00	689.96	727.92	705.47	728.55	0.000108	6.4	34583.55	1234.78	0.19
Reach	15	100-year	231000.00	689.96	729.76	706.17	730.42	0.000107	6.6	36741.68	1240.42	0.20
Reach	15	1-year High	39690.00	689.96	718.92	697.27	718.96	0.000011	1.7	24550.82	1092.61	0.06
Reach	15	5-year High	136800.00	689.96	721.37	702.43	721.79	0.000094	5.2	27239.01	1137.15	0.18
Reach	15	2-year High	101800.00	689.96	719.94	700.79	720.19	0.000063	4.1	25664.90	1134.74	0.14
Reach	15	Normal	12700.00	689.96	710.93	694.99	710.94	0.000004	0.8	16136.09	964.86	0.03
Reach	14	1-year Low	39690.00	690.18	712.01	697.50	712.10	0.000035	2.4	16787.13	963.43	0.10
Reach	14	2-year Low	101800.00	690.18	715.72	701.09	716.10	0.000121	5.0	20686.68	1083.47	0.19
Reach	14	5-year Low	136800.00	690.18	720.19	702.72	720.65	0.000114	5.5	25544.61	1144.91	0.19
Reach	14	25-year	187200.00	690.18	725.75	704.82	726.32	0.000109	6.1	31606.90	1157.62	0.19
Reach	14	10-year	168500.00	690.18	723.24	704.09	723.80	0.000118	6.0	28868.07	1147.93	0.20
Reach	14	50-year	212000.00	690.18	727.90	705.78	728.53	0.000111	6.5	34039.39	1210.86	0.20
Reach	14	100-year	231000.00	690.18	729.73	706.51	730.41	0.000110	6.7	36168.00	1222.95	0.20
Reach	14	1-year High	39690.00	690.18	718.91	697.50	718.96	0.000011	1.7	24156.46	1086.42	0.06
Reach	14	5-year High	136800.00	690.18	721.35	702.72	721.77	0.000098	5.2	26805.89	1146.06	0.18
Reach	14	2-year High	101800.00	690.18	719.92	701.09	720.18	0.000065	4.1	25249.79	1144.64	0.14
Reach	14	Normal	12700.00	690.18	710.93	695.19	710.94	0.000004	0.8	15749.13	957.08	0.04
Reach	13	1-year Low	39690.00	690.25	712.01	696.97	712.09	0.000034	2.4	16847.27	935.10	0.10
Reach	13	2-year Low	101800.00	690.25	715.69	700.58	716.07	0.000119	5.0	20538.08	1049.68	0.19
Reach	13	5-year Low	136800.00	690.25	720.15	702.30	720.63	0.000114	5.6	25232.59	1092.44	0.19
Reach	13	25-year	187200.00	690.25	725.70	704.43	726.29	0.000111	6.2	31074.80	1096.45	0.20
Reach	13	10-year	168500.00	690.25	723.19	703.66	723.77	0.000119	6.1	28436.70	1094.43	0.20
Reach	13	50-year	212000.00	690.25	727.84	705.42	728.51	0.000114	6.6	33374.90	1139.18	0.20
Reach	13	100-year	231000.00	690.25	729.67	706.15	730.38	0.000113	6.8	35398.96	1149.06	0.20
Reach	13	1-year High	39690.00	690.25	718.91	696.97	718.95	0.000011	1.7	23926.06	1051.49	0.06
Reach	13	5-year High	136800.00	690.25	721.31	702.30	721.75	0.000098	5.3	26455.92	1093.15	0.18
Reach	13	2-year High	101800.00	690.25	719.90	700.58	720.17	0.000065	4.2	24965.39	1092.28	0.14
Reach	13	Normal	12700.00	690.25	710.93	694.68	710.94	0.000004	0.8	15844.61	929.99	0.03
Reach	12	1-year Low	39690.00	688.05	712.00	696.13	712.09	0.000031	2.3	17135.84	916.30	0.09
Reach	12	2-year Low	101800.00	688.05	715.66	699.91	716.04	0.000111	5.0	20676.66	1000.75	0.18
Reach	12	5-year Low	136800.00	688.05	720.13	701.69	720.60	0.000108	5.5	25235.75	1090.70	0.19
Reach	12	25-year	187200.00	688.05	725.68	703.87	726.27	0.000106	6.2	30939.29	1097.86	0.19
Reach	12	10-year	168500.00	688.05	723.17	703.09	723.74	0.000114	6.1	28361.85	1095.77	0.20
Reach	12	50-year	212000.00	688.05	727.82	704.84	728.48	0.000110	6.6	33148.08	1099.65	0.20
Reach	12	100-year	231000.00	688.05	729.65	705.59	730.35	0.000109	6.8	35093.27	1148.36	0.20
Reach	12	1-year High	39690.00	688.05	718.91	696.13	718.95	0.000011	1.7	23980.33	1047.50	0.06
Reach	12	5-year High	136800.00	688.05	721.30	701.69	721.73	0.000093	5.3	26432.22	1093.03	0.18

HEC-RAS Plan: Existing River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	12	2-year High	101800.00	688.05	719.89	699.91	720.15	0.000062	4.1	24984.19	1090.22	0.14
Reach	12	Normal	12700.00	688.05	710.93	693.74	710.94	0.000004	0.8	16162.06	907.57	0.03
Reach	11	1-year Low	39690.00	688.28	711.99	695.75	712.07	0.000030	2.3	16928.60	874.03	0.09
Reach	11	2-year Low	101800.00	688.28	715.60	699.65	716.00	0.000112	5.1	20316.84	990.13	0.19
Reach	11	5-year Low	136800.00	688.28	720.06	701.39	720.56	0.000111	5.7	24735.49	1034.64	0.19
Reach	11	25-year	187200.00	688.28	725.59	703.61	726.22	0.000112	6.4	30233.09	1038.62	0.20
Reach	11	10-year	168500.00	688.28	723.09	702.82	723.69	0.000118	6.3	27744.17	1036.81	0.20
Reach	11	50-year	212000.00	688.28	727.72	704.63	728.43	0.000116	6.8	32496.96	1186.46	0.20
Reach	11	100-year	231000.00	688.28	729.54	705.37	730.30	0.000116	7.0	34703.86	1305.28	0.20
Reach	11	1-year High	39690.00	688.28	718.90	695.75	718.95	0.000011	1.7	23585.16	992.29	0.06
Reach	11	5-year High	136800.00	688.28	721.23	701.39	721.69	0.000097	5.4	25899.58	1035.48	0.18
Reach	11	2-year High	101800.00	688.28	719.85	699.65	720.13	0.000063	4.3	24523.59	1034.42	0.14
Reach	11	Normal	12700.00	688.28	710.93	693.26	710.94	0.000004	0.8	16006.06	870.23	0.03
Reach	10	1-year Low	39690.00	688.91	711.98	696.07	712.07	0.000033	2.4	16536.75	884.17	0.10
Reach	10	2-year Low	101800.00	688.91	715.57	699.98	715.98	0.000120	5.2	19926.07	994.47	0.19
Reach	10	5-year Low	136800.00	688.91	720.03	701.74	720.53	0.000117	5.7	24370.62	1055.23	0.19
Reach	10	25-year	187200.00	688.91	725.56	704.01	726.20	0.000115	6.4	29903.20	1059.53	0.20
Reach	10	10-year	168500.00	688.91	723.06	703.20	723.67	0.000123	6.3	27396.21	1057.59	0.20
Reach	10	50-year	212000.00	688.91	727.70	705.04	728.41	0.000118	6.8	32040.19	1061.20	0.20
Reach	10	100-year	231000.00	688.91	729.52	705.79	730.28	0.000118	7.1	33901.64	1118.49	0.21
Reach	10	1-year High	39690.00	688.91	718.90	696.07	718.95	0.000011	1.7	23243.52	996.86	0.06
Reach	10	5-year High	136800.00	688.91	721.21	701.74	721.67	0.000101	5.5	25545.91	1056.15	0.18
Reach	10	2-year High	101800.00	688.91	719.83	699.98	720.11	0.000066	4.3	24171.57	1055.08	0.15
Reach	10	Normal	12700.00	688.91	710.93	693.50	710.94	0.000004	0.8	15619.10	871.32	0.03
Reach	9	1-year Low	39690.00	688.16	711.97	695.73	712.06	0.000034	2.4	16272.35	822.47	0.10
Reach	9	2-year Low	101800.00	688.16	715.52	699.53	715.96	0.000131	5.3	19446.52	944.28	0.19
Reach	9	5-year Low	136800.00	688.16	719.97	701.29	720.51	0.000135	5.9	23649.41	987.54	0.20
Reach	9	25-year	187200.00	688.16	725.48	703.55	726.17	0.000140	6.7	28888.27	994.49	0.21
Reach	9	10-year	168500.00	688.16	722.98	702.76	723.64	0.000146	6.6	26508.85	991.85	0.21
Reach	9	50-year	212000.00	688.16	727.60	704.63	728.38	0.000147	7.1	30910.79	996.71	0.21
Reach	9	100-year	231000.00	688.16	729.42	705.39	730.25	0.000149	7.4	32674.08	1037.00	0.21
Reach	9	1-year High	39690.00	688.16	718.89	695.73	718.94	0.000013	1.8	22630.79	946.02	0.06
Reach	9	5-year High	136800.00	688.16	721.15	701.29	721.65	0.000118	5.7	24770.25	990.05	0.19
Reach	9	2-year High	101800.00	688.16	719.80	699.53	720.10	0.000076	4.4	23485.73	987.17	0.15
Reach	9	Normal	12700.00	688.16	710.93	693.34	710.94	0.000004	0.8	15416.97	820.08	0.03
Reach	8	1-year Low	39690.00	687.93	711.96	695.48	712.05	0.000034	2.4	16337.99	879.48	0.10
Reach	8	2-year Low	101800.00	687.93	715.47	699.56	715.90	0.000125	5.2	19466.88	895.04	0.20
Reach	8	5-year Low	136800.00	687.93	719.92	701.50	720.45	0.000123	5.9	23456.20	899.44	0.20
Reach	8	25-year	187200.00	687.93	725.43	703.87	726.12	0.000123	6.7	28429.79	906.61	0.21
Reach	8	10-year	168500.00	687.93	722.92	703.04	723.58	0.000131	6.5	26166.72	903.20	0.21
Reach	8	50-year	212000.00	687.93	727.54	704.97	728.32	0.000128	7.1	30351.69	910.74	0.21
Reach	8	100-year	231000.00	687.93	729.36	705.76	730.19	0.000128	7.3	32029.90	943.04	0.21
Reach	8	1-year High	39690.00	687.93	718.89	695.48	718.94	0.000012	1.8	22531.01	898.48	0.06
Reach	8	5-year High	136800.00	687.93	721.11	701.50	721.60	0.000107	5.6	24526.03	900.94	0.19
Reach	8	2-year High	101800.00	687.93	719.77	699.56	720.07	0.000070	4.4	23321.38	899.30	0.15
Reach	8	Normal	12700.00	687.93	710.93	692.96	710.94	0.000004	0.8	15443.61	862.93	0.03
Reach	7	1-year Low	39690.00	688.16	711.95	695.04	712.04	0.000031	2.4	16590.76	841.14	0.09
Reach	7	2-year Low	101800.00	688.16	715.44	699.19	715.86	0.000118	5.2	19536.76	845.75	0.19
Reach	7	5-year Low	136800.00	688.16	719.88	701.09	720.42	0.000119	5.9	23306.06	851.56	0.20
Reach	7	25-year	187200.00	688.16	725.38	703.54	726.08	0.000122	6.7	28025.38	924.31	0.21
Reach	7	10-year	168500.00	688.16	722.88	702.66	723.54	0.000128	6.5	25866.40	855.72	0.21
Reach	7	50-year	212000.00	688.16	727.49	704.60	728.28	0.000127	7.1	30132.94	1075.24	0.21
Reach	7	100-year	231000.00	688.16	729.31	705.37	730.16	0.000128	7.4	32191.87	1199.44	0.21
Reach	7	1-year High	39690.00	688.16	718.89	695.04	718.93	0.000011	1.8	22457.46	850.23	0.06
Reach	7	5-year High	136800.00	688.16	721.07	701.09	721.57	0.000104	5.6	24321.79	853.27	0.19
Reach	7	2-year High	101800.00	688.16	719.75	699.19	720.05	0.000067	4.4	23191.73	851.38	0.15
Reach	7	Normal	12700.00	688.16	710.93	692.33	710.94	0.000004	0.8	15731.90	838.74	0.03
Reach	6	1-year Low	39690.00	687.20	711.95	694.29	712.03	0.000026	2.2	17767.12	881.76	0.09
Reach	6	2-year Low	101800.00	687.20	715.45	698.19	715.82	0.000101	4.9	20906.22	909.31	0.18
Reach	6	5-year Low	136800.00	687.20	719.90	699.98	720.37	0.000102	5.5	24996.05	927.46	0.18
Reach	6	25-year	187200.00	687.20	725.41	702.30	726.02	0.000105	6.3	30161.71	950.76	0.19
Reach	6	10-year	168500.00	687.20	722.90	701.48	723.49	0.000110	6.1	27800.87	937.93	0.19
Reach	6	50-year	212000.00	687.20	727.52	703.37	728.22	0.000110	6.7	32353.29	1084.95	0.20
Reach	6	100-year	231000.00	687.20	729.34	704.15	730.09	0.000110	6.9	34419.21	1192.36	0.20
Reach	6	1-year High	39690.00	687.20	718.89	694.29	718.93	0.000010	1.7	24059.93	923.86	0.06
Reach	6	5-year High	136800.00	687.20	721.09	699.98	721.52	0.000089	5.3	26103.75	931.65	0.17
Reach	6	2-year High	101800.00	687.20	719.76	698.19	720.02	0.000057	4.1	24865.15	926.96	0.14
Reach	6	Normal	12700.00	687.20	710.93	691.61	710.93	0.000003	0.8	16869.39	874.23	0.03
Reach	5	1-year Low	39690.00	683.93	711.94	693.44	712.02	0.000025	2.2	17892.20	859.55	0.09
Reach	5	2-year Low	101800.00	683.93	715.43	697.53	715.80	0.000097	4.9	20935.17	885.76	0.17

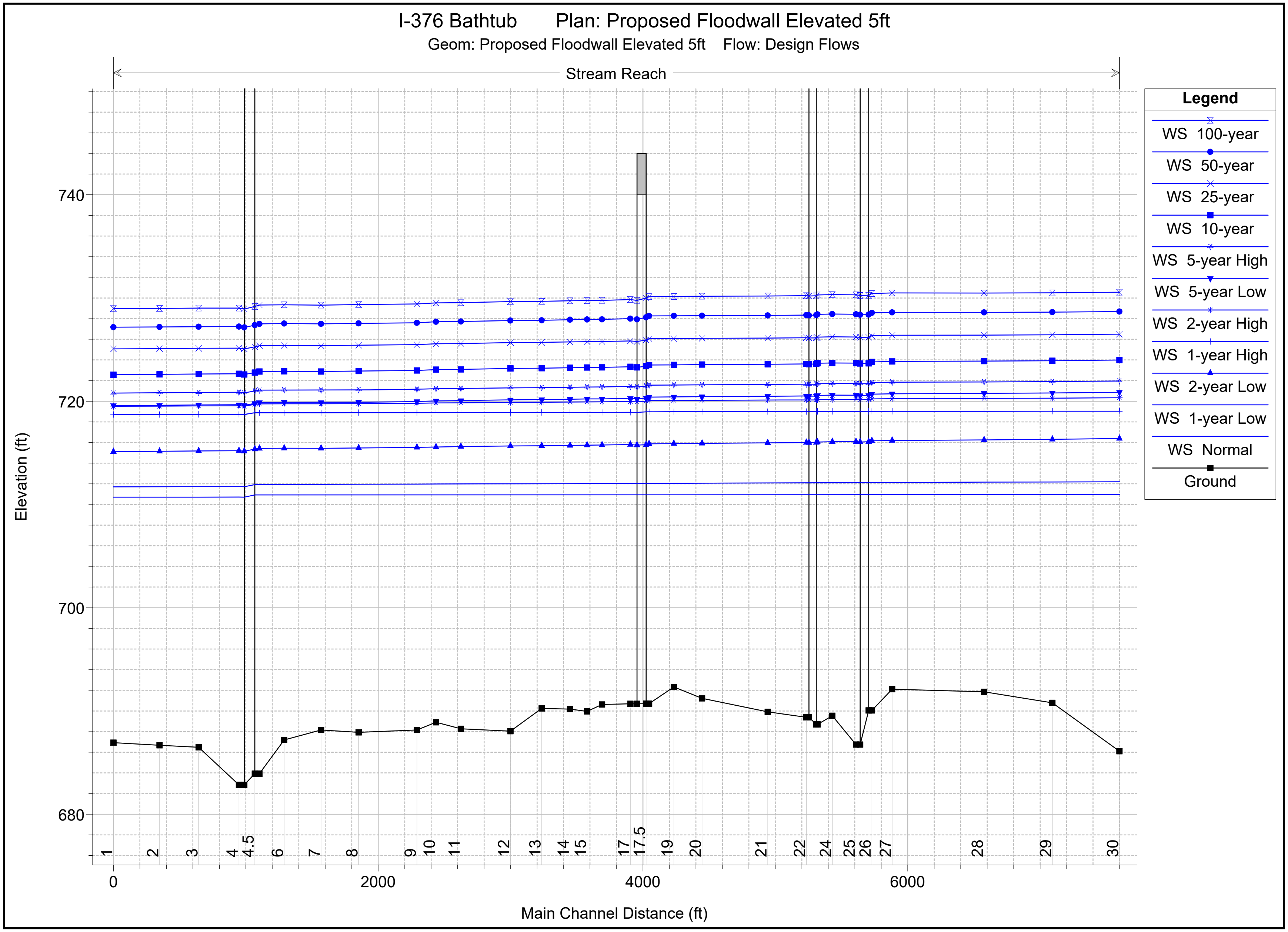
HEC-RAS Plan: Existing River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	5	5-year Low	136800.00	683.93	719.88	699.39	720.35	0.000100	5.5	24918.92	908.14	0.18
Reach	5	25-year	187200.00	683.93	725.38	701.75	726.00	0.000104	6.3	30030.45	1003.98	0.19
Reach	5	10-year	168500.00	683.93	722.88	700.91	723.47	0.000109	6.2	27664.41	925.59	0.19
Reach	5	50-year	212000.00	683.93	727.49	702.84	728.20	0.000109	6.8	32191.72	1053.13	0.20
Reach	5	100-year	231000.00	683.93	729.31	703.66	730.07	0.000110	7.0	34193.30	1148.45	0.20
Reach	5	1-year High	39690.00	683.93	718.88	693.44	718.93	0.000009	1.7	24021.43	901.25	0.06
Reach	5	5-year High	136800.00	683.93	721.07	699.39	721.51	0.000087	5.3	26004.90	911.46	0.17
Reach	5	2-year High	101800.00	683.93	719.74	697.53	720.01	0.000056	4.1	24799.78	907.69	0.14
Reach	5	Normal	12700.00	683.93	710.93	690.84	710.93	0.000003	0.7	17020.12	852.42	0.03
Reach	4.5		Bridge									
Reach	4	1-year Low	39690.00	682.84	711.73	693.18	711.81	0.000025	2.2	17874.35	869.99	0.09
Reach	4	2-year Low	101800.00	682.84	715.21	697.40	715.58	0.000099	4.9	20982.07	904.40	0.18
Reach	4	5-year Low	136800.00	682.84	719.66	699.24	720.13	0.000101	5.5	25162.76	958.52	0.18
Reach	4	25-year	187200.00	682.84	725.14	701.61	725.76	0.000104	6.3	30676.13	1060.38	0.19
Reach	4	10-year	168500.00	682.84	722.66	700.78	723.24	0.000109	6.1	28072.98	994.41	0.19
Reach	4	50-year	212000.00	682.84	727.23	702.70	727.93	0.000109	6.7	32897.46	1073.66	0.20
Reach	4	100-year	231000.00	682.84	729.02	703.52	729.77	0.000110	7.0	34847.16	1105.13	0.20
Reach	4	1-year High	39690.00	682.84	718.72	693.18	718.76	0.000010	1.7	24259.00	954.68	0.06
Reach	4	5-year High	136800.00	682.84	720.86	699.24	721.30	0.000088	5.3	26316.66	964.48	0.17
Reach	4	2-year High	101800.00	682.84	719.56	697.40	719.82	0.000056	4.1	25062.33	958.10	0.14
Reach	4	Normal	12700.00	682.84	710.71	690.44	710.72	0.000003	0.7	16995.94	852.36	0.03
Reach	3	1-year Low	39690.00	686.48	711.73		711.80	0.000026	2.2	17957.64	911.52	0.09
Reach	3	2-year Low	101800.00	686.48	715.18		715.54	0.000101	4.8	21180.54	947.48	0.18
Reach	3	5-year Low	136800.00	686.48	719.64		720.10	0.000101	5.4	25439.04	961.91	0.18
Reach	3	25-year	187200.00	686.48	725.13		725.71	0.000103	6.2	31866.38	1636.62	0.19
Reach	3	10-year	168500.00	686.48	722.63		723.20	0.000109	6.0	28422.77	1081.42	0.19
Reach	3	50-year	212000.00	686.48	727.22		727.87	0.000106	6.5	35459.07	1823.94	0.19
Reach	3	100-year	231000.00	686.48	729.02		729.70	0.000104	6.7	38859.30	1966.97	0.19
Reach	3	1-year High	39690.00	686.48	718.72		718.76	0.000010	1.6	24551.93	959.10	0.06
Reach	3	5-year High	136800.00	686.48	720.84		721.26	0.000087	5.2	26604.84	978.03	0.17
Reach	3	2-year High	101800.00	686.48	719.55		719.80	0.000057	4.0	25348.22	961.62	0.14
Reach	3	Normal	12700.00	686.48	710.71		710.72	0.000003	0.7	17036.53	904.87	0.03
Reach	2	1-year Low	39690.00	686.68	711.72		711.79	0.000026	2.2	18010.96	906.87	0.09
Reach	2	2-year Low	101800.00	686.68	715.15		715.51	0.000100	4.8	21193.56	942.18	0.18
Reach	2	5-year Low	136800.00	686.68	719.61		720.07	0.000100	5.4	25430.82	958.66	0.18
Reach	2	25-year	187200.00	686.68	725.10		725.68	0.000102	6.2	32048.79	1544.22	0.19
Reach	2	10-year	168500.00	686.68	722.60		723.17	0.000108	6.0	28400.58	1116.26	0.19
Reach	2	50-year	212000.00	686.68	727.19		727.84	0.000105	6.5	35284.31	1548.45	0.19
Reach	2	100-year	231000.00	686.68	728.99		729.67	0.000104	6.7	38099.75	1606.26	0.19
Reach	2	1-year High	39690.00	686.68	718.71		718.75	0.000009	1.6	24573.39	955.11	0.06
Reach	2	5-year High	136800.00	686.68	720.82		721.24	0.000087	5.2	26597.28	977.40	0.17
Reach	2	2-year High	101800.00	686.68	719.53		719.78	0.000056	4.0	25353.35	958.34	0.14
Reach	2	Normal	12700.00	686.68	710.71		710.72	0.000003	0.7	17099.07	902.79	0.03
Reach	1	1-year Low	39690.00	686.93	711.71	694.08	711.79	0.000026	2.2	18006.63	898.15	0.09
Reach	1	2-year Low	101800.00	686.93	715.11	698.10	715.48	0.000100	4.8	21154.88	958.39	0.18
Reach	1	5-year Low	136800.00	686.93	719.58	699.96	720.03	0.000100	5.4	26175.16	1166.67	0.18
Reach	1	25-year	187200.00	686.93	725.07	702.37	725.64	0.000100	6.1	33905.90	1555.58	0.19
Reach	1	10-year	168500.00	686.93	722.57	701.54	723.13	0.000107	6.0	30034.65	1473.34	0.19
Reach	1	50-year	212000.00	686.93	727.17	703.45	727.80	0.000103	6.5	37170.46	1559.16	0.19
Reach	1	100-year	231000.00	686.93	728.97	704.16	729.63	0.000102	6.6	39995.21	1597.41	0.19
Reach	1	1-year High	39690.00	686.93	718.71	694.08	718.75	0.000009	1.6	25166.54	1162.62	0.06
Reach	1	5-year High	136800.00	686.93	720.79	699.92	721.21	0.000087	5.2	27627.20	1252.75	0.17
Reach	1	2-year High	101800.00	686.93	719.51	698.11	719.76	0.000056	4.0	26098.12	1166.36	0.14
Reach	1	Normal	12700.00	686.93	710.71	691.10	710.72	0.000003	0.7	17109.86	895.38	0.03

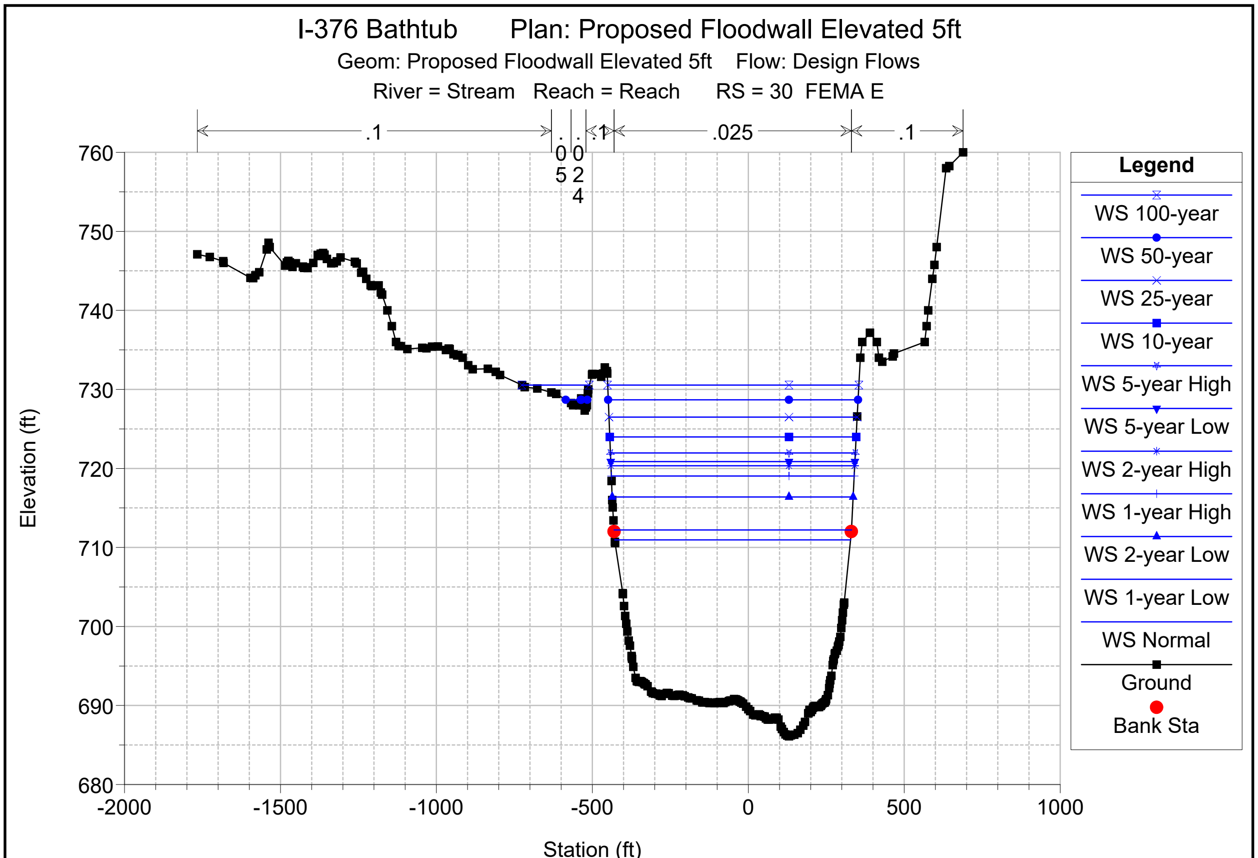
APPENDIX A-5.2

Proposed Elevated Floodwall
HEC-RAS Model

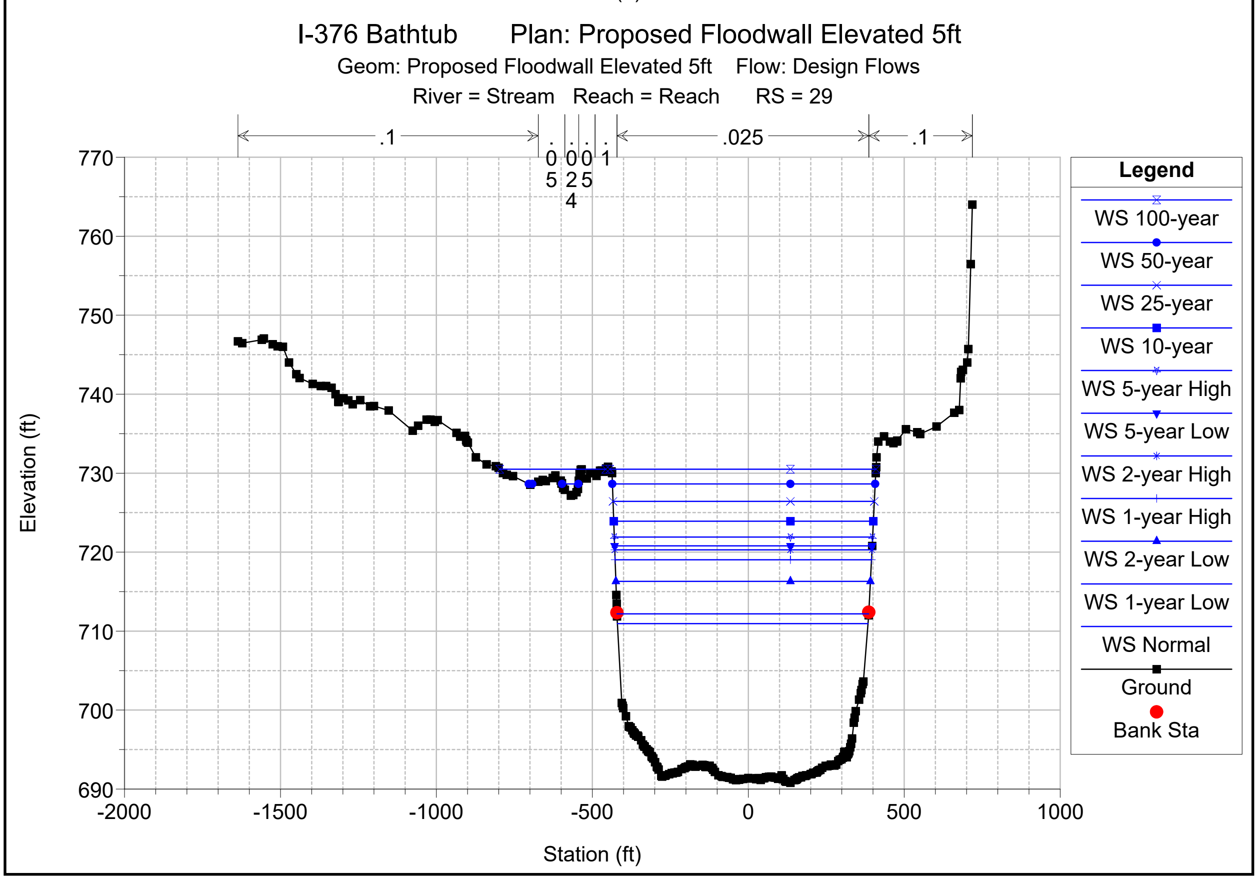
NEWELL
TERESKA &
MACKAY
ENGINEERING



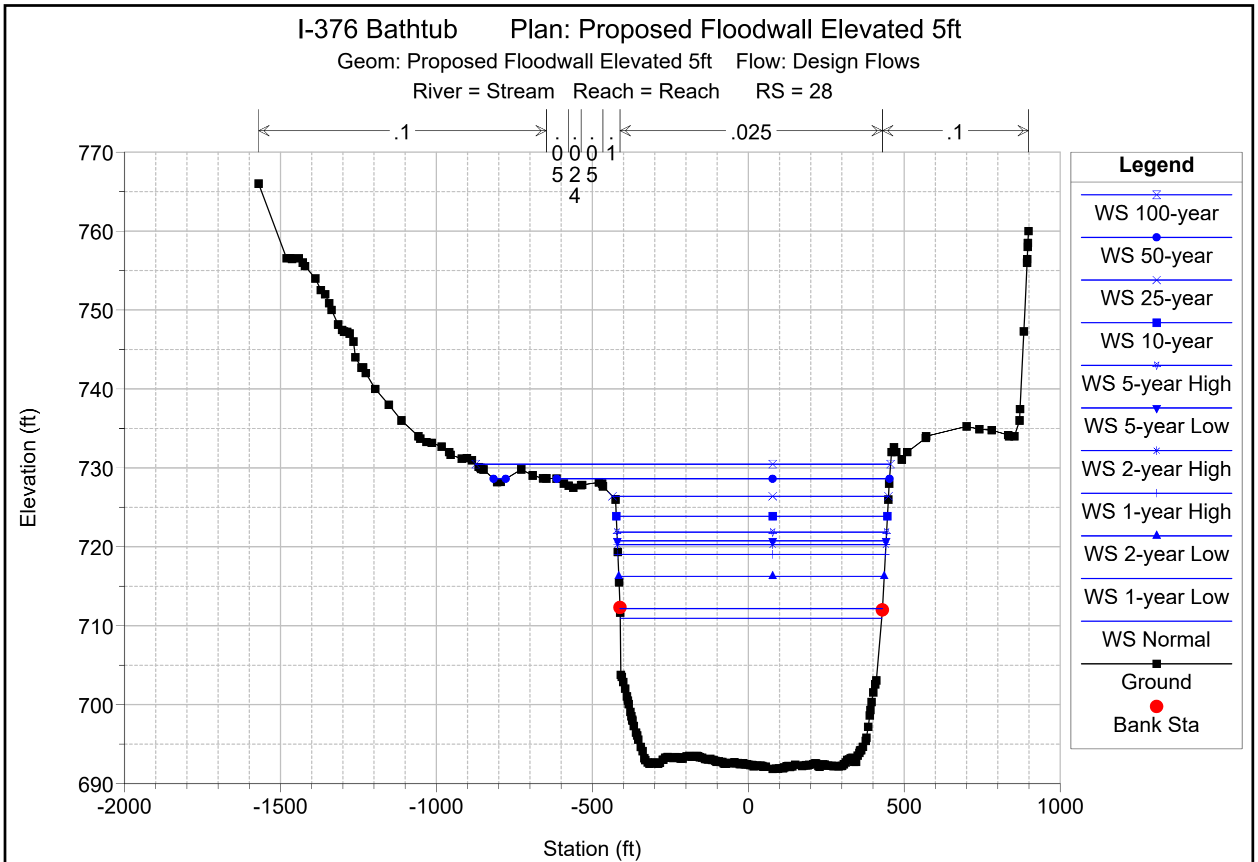
I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
Stream Reach
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Elevation (ft)
740
720
700
680
1 2 3 4 4.5 6 7 8 9 10 11 12 13 14 15 17 17.5 19 20 21 22 24 25 26 27 28 29 30
0
2000
4000
6000
Main Channel Distance (ft)

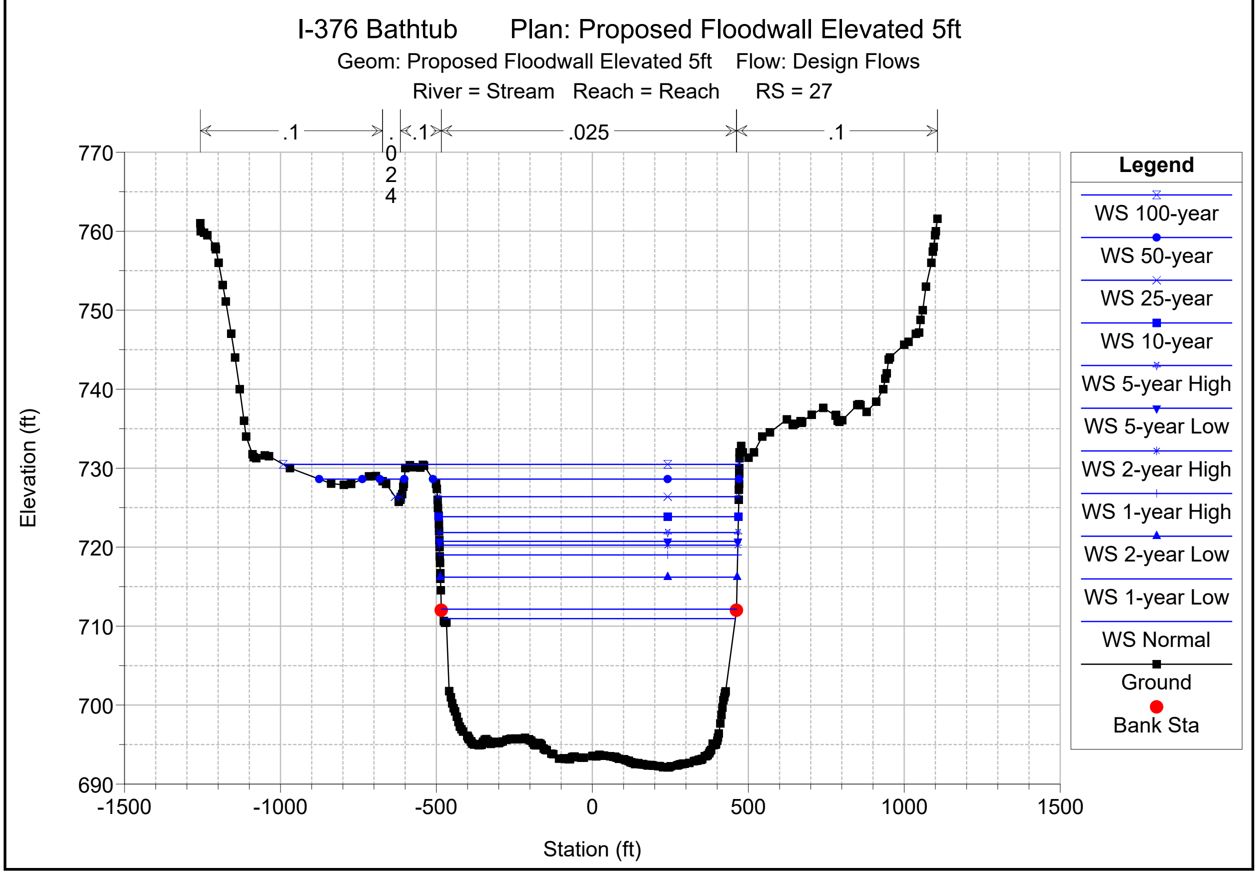


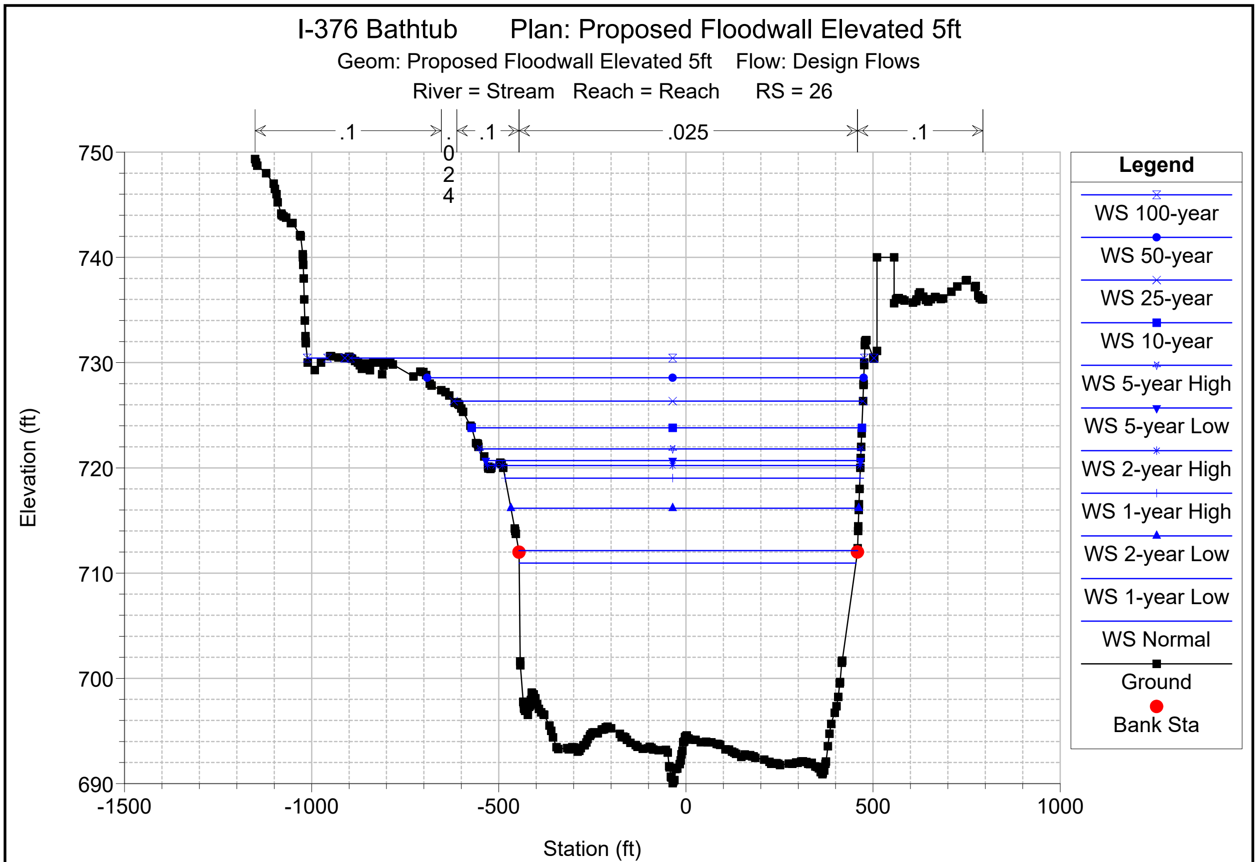
I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 30 FEMA E
.1
.05
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

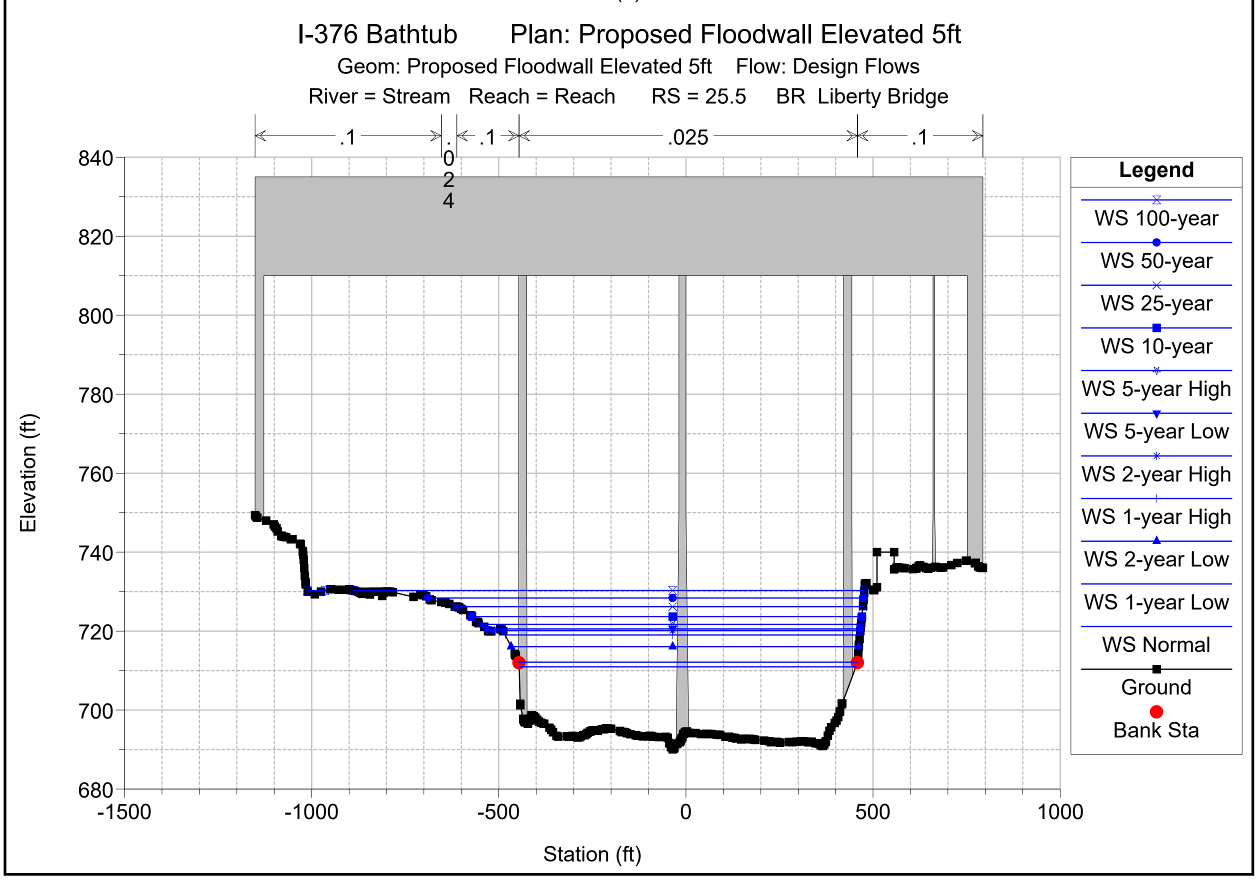


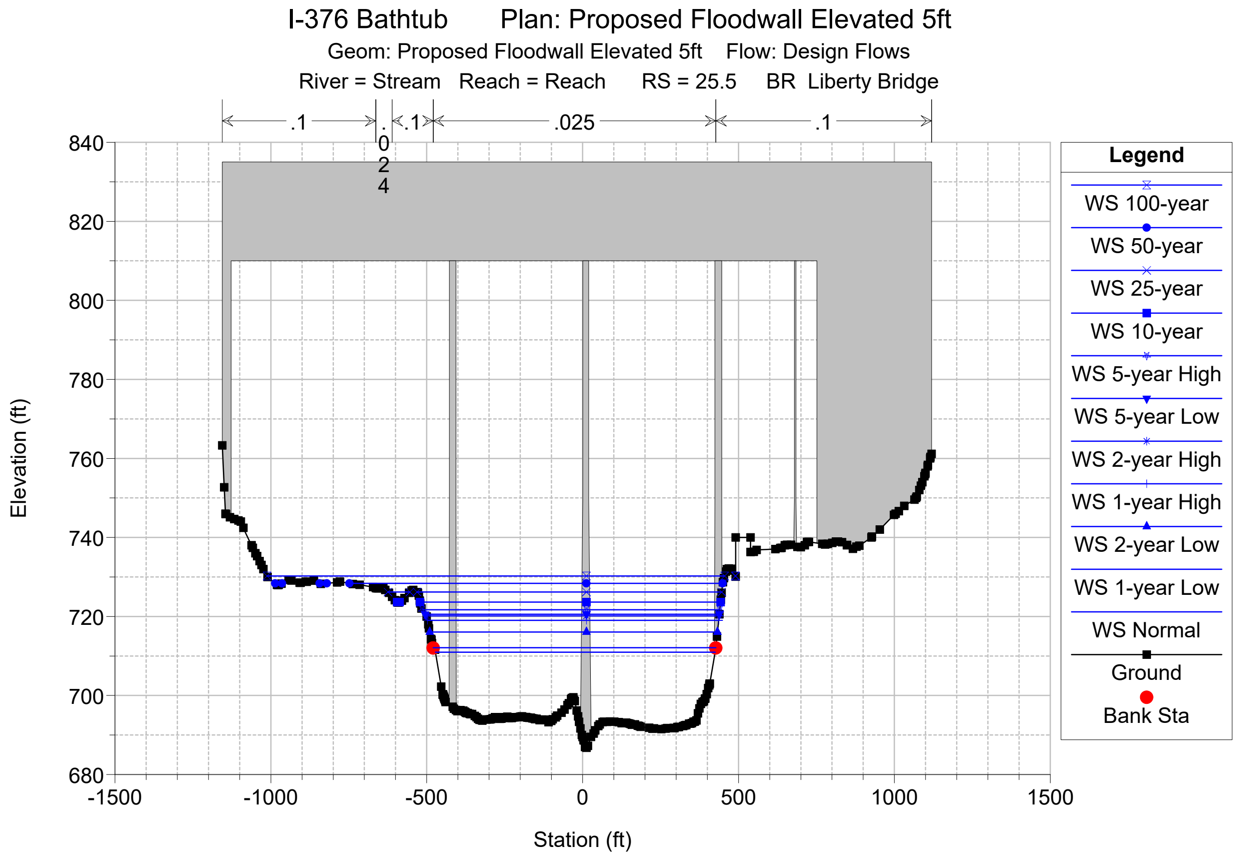
I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 29
.1
.05
.024
.05
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

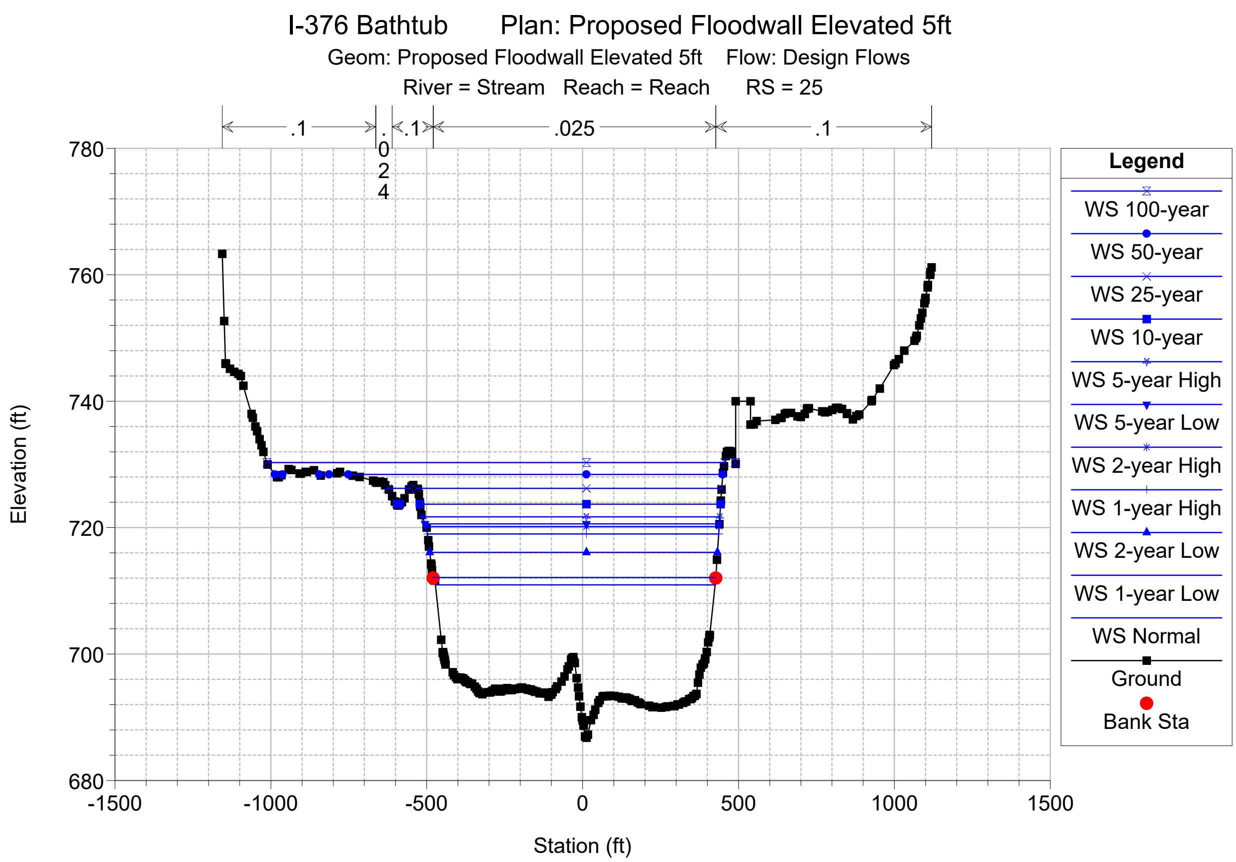

I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 28
.1
.025
.1
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta
Elevation (ft)
Station (ft)

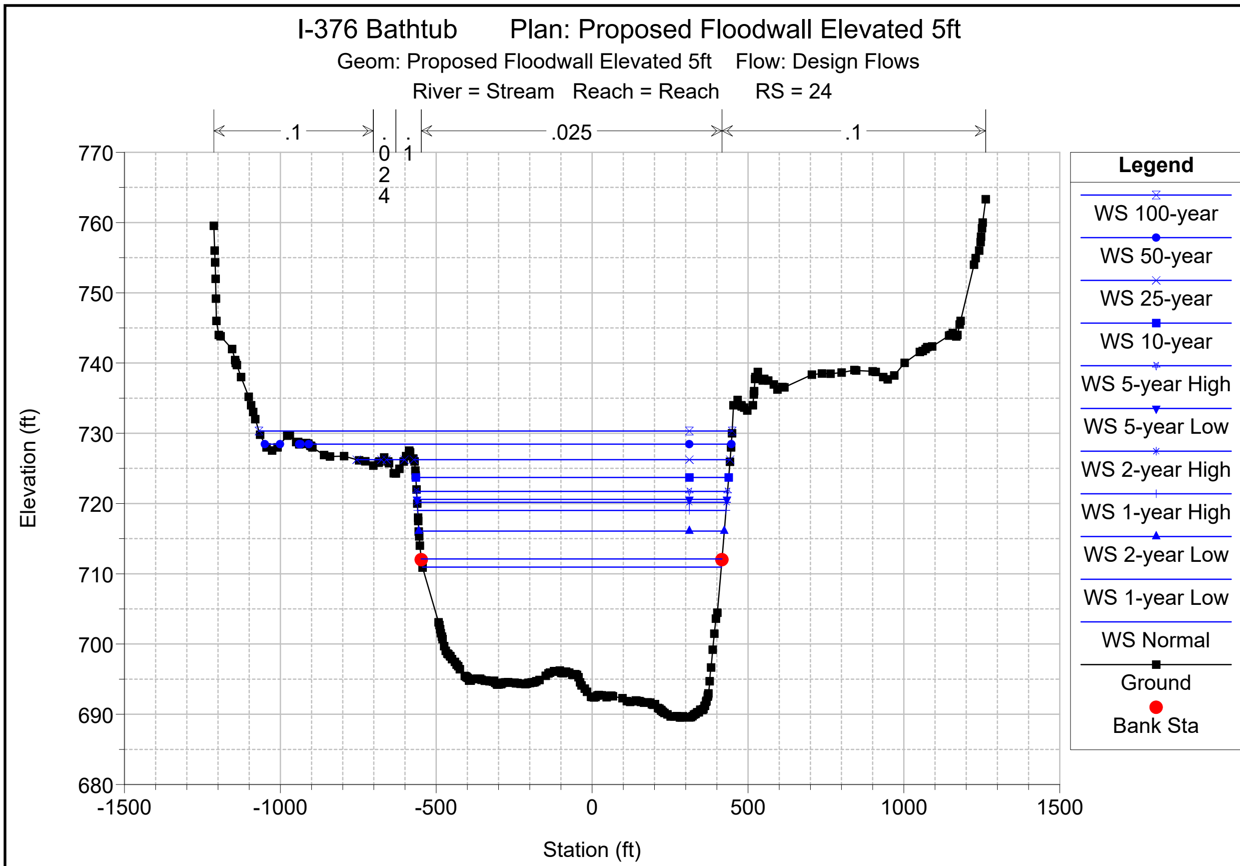

I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 27
.1
.1
.025
.1
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta
Elevation (ft)
Station (ft)


I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 26
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

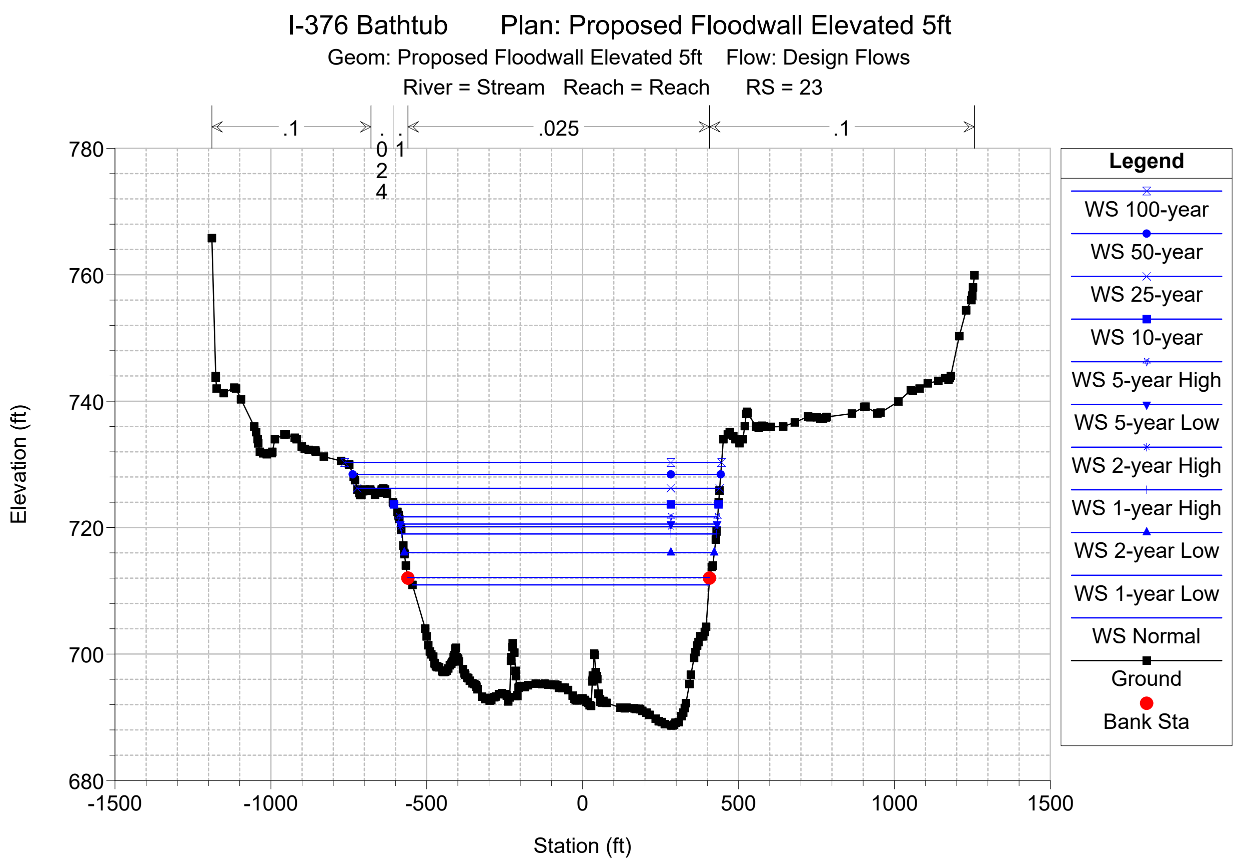

I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 25.5 BR Liberty Bridge
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta


I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 25.5 BR Liberty Bridge
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
840
820
800
780
760
740
720
700
680
-1500
-1000
-500
0
500
1000
1500
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

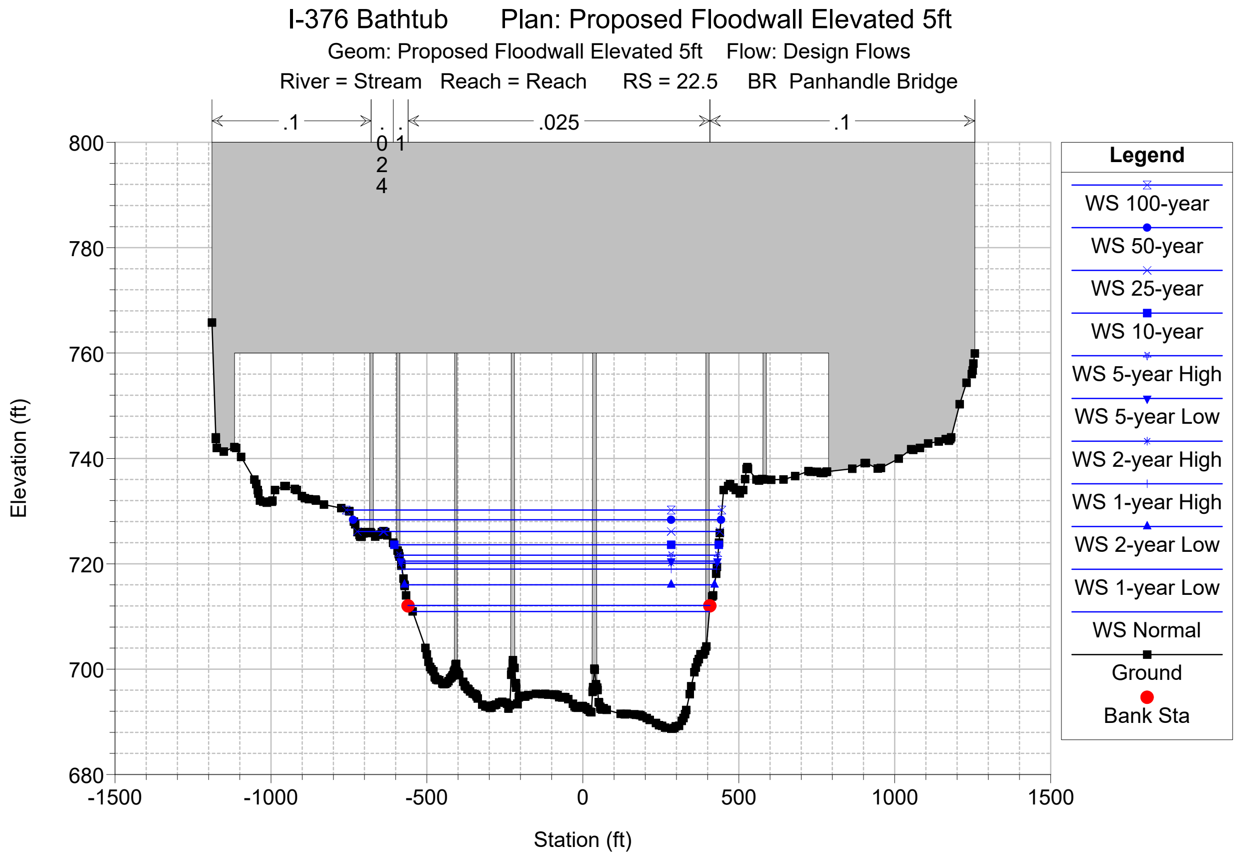

I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 25
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
780
760
740
720
700
680
-1500
-1000
-500
0
500
1000
1500
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

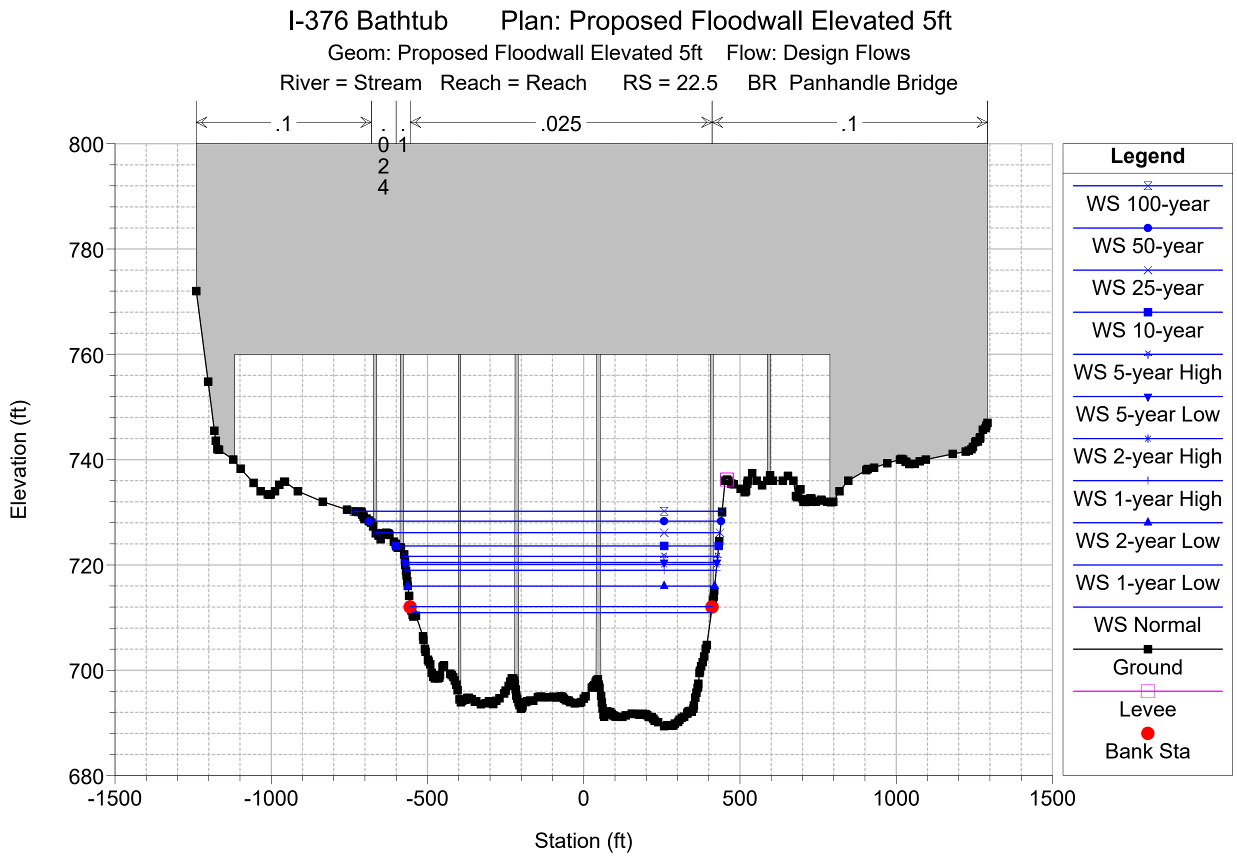


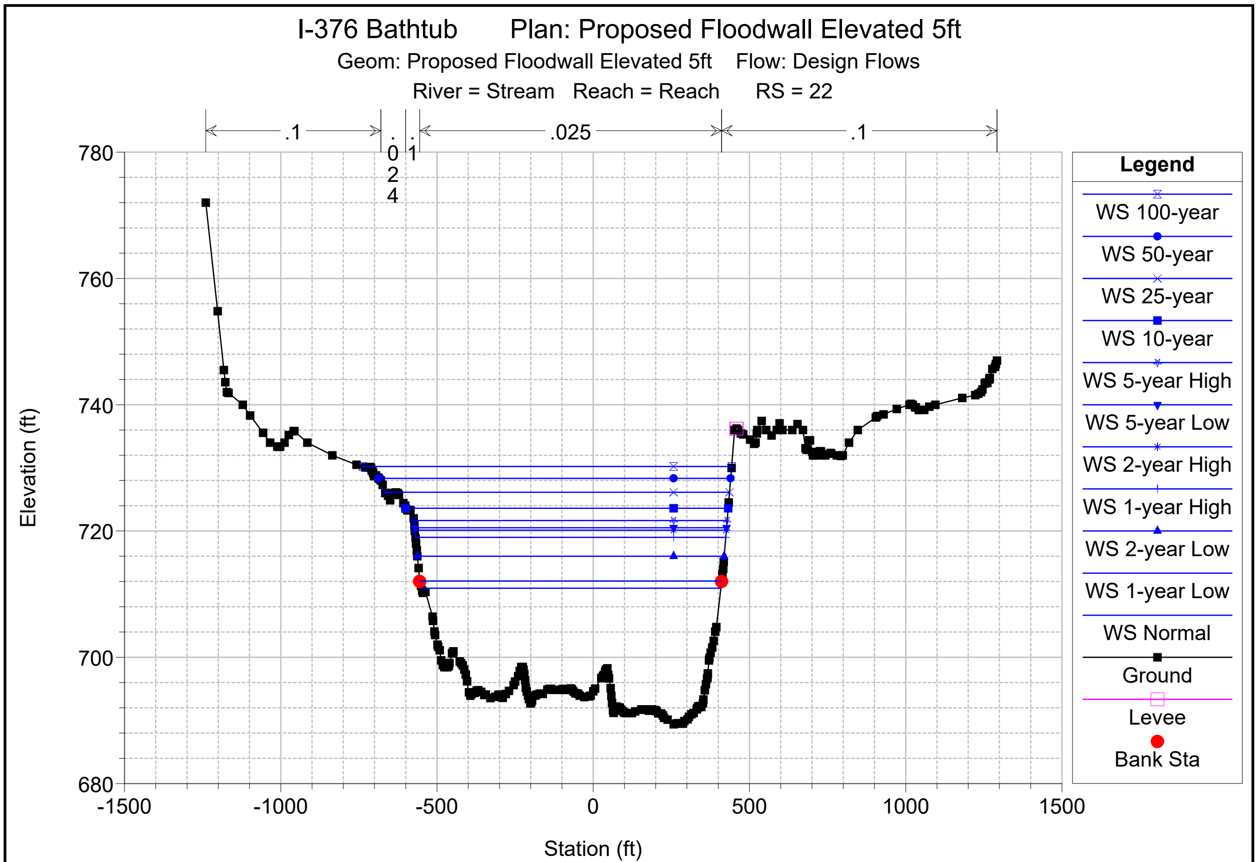
I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 24
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
770
760
750
740
730
720
710
700
690
680
-1500
-1000
-500
0
500
1000
1500
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta



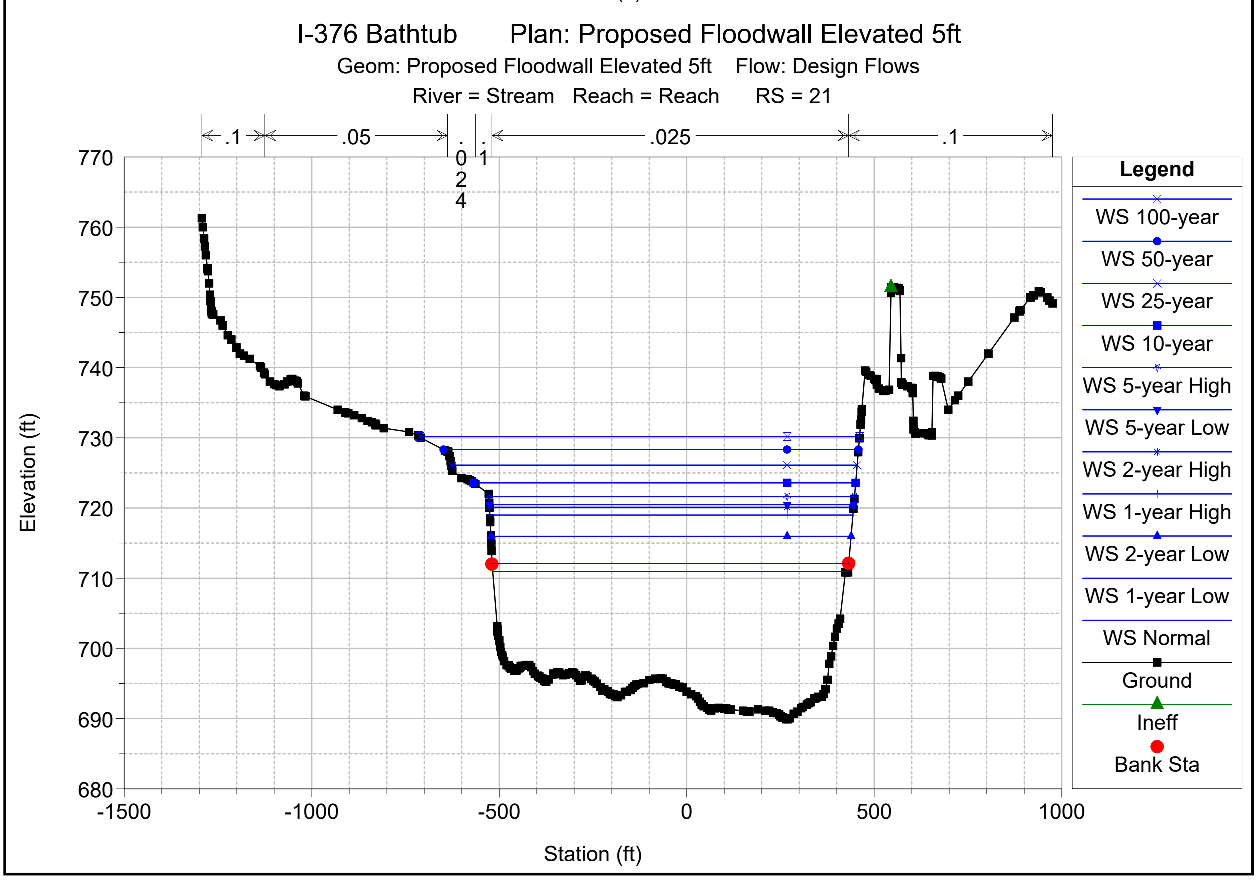
I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 23
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
780
760
740
720
700
680
-1500
-1000
-500
0
500
1000
1500
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta


I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 22.5 BR Panhandle Bridge
.1
.024
.1
.025
.1
Elevation (ft)
800
780
760
740
720
700
680
-1500
-1000
-500
0
500
1000
1500
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

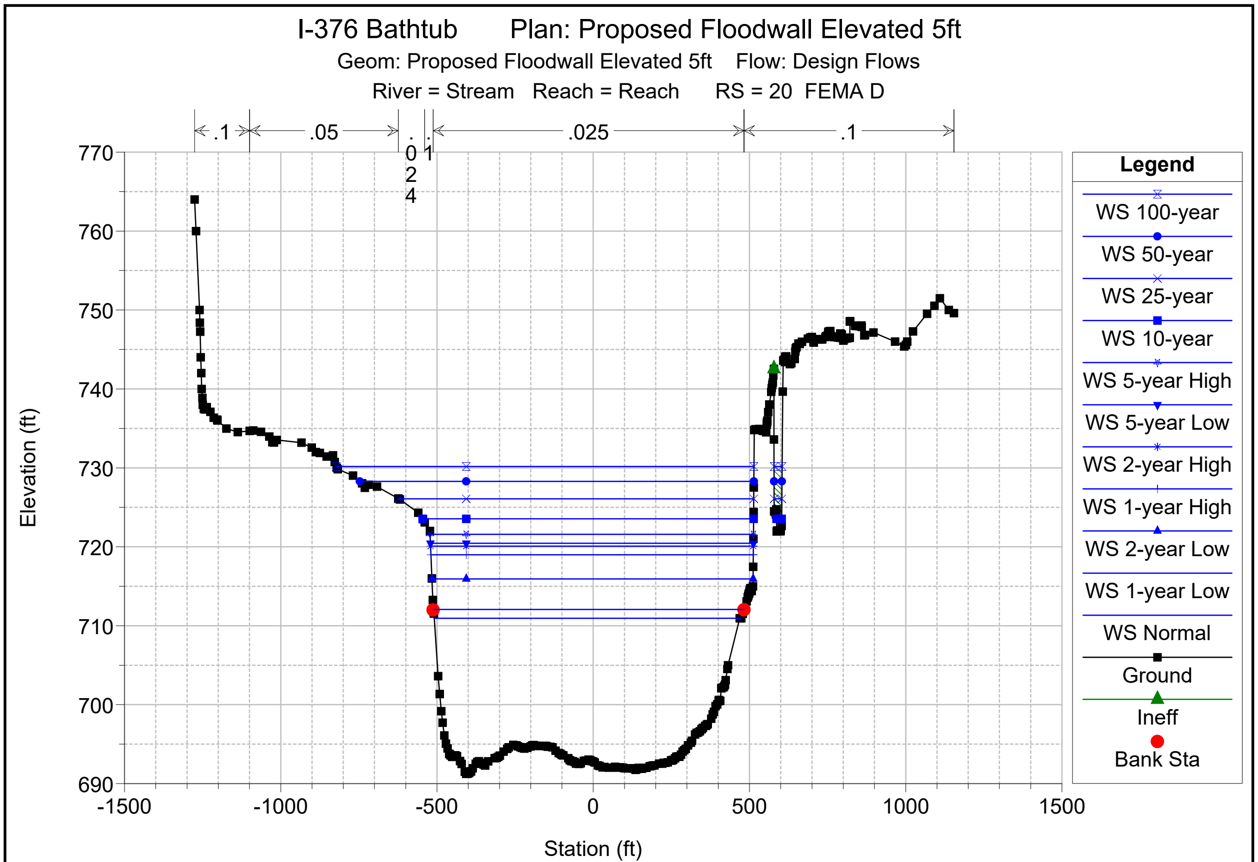

I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 22.5 BR Panhandle Bridge
.1
.024
.1
.025
.1
Elevation (ft)
800
780
760
740
720
700
680
-1500
-1000
-500
0
500
1000
1500
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta

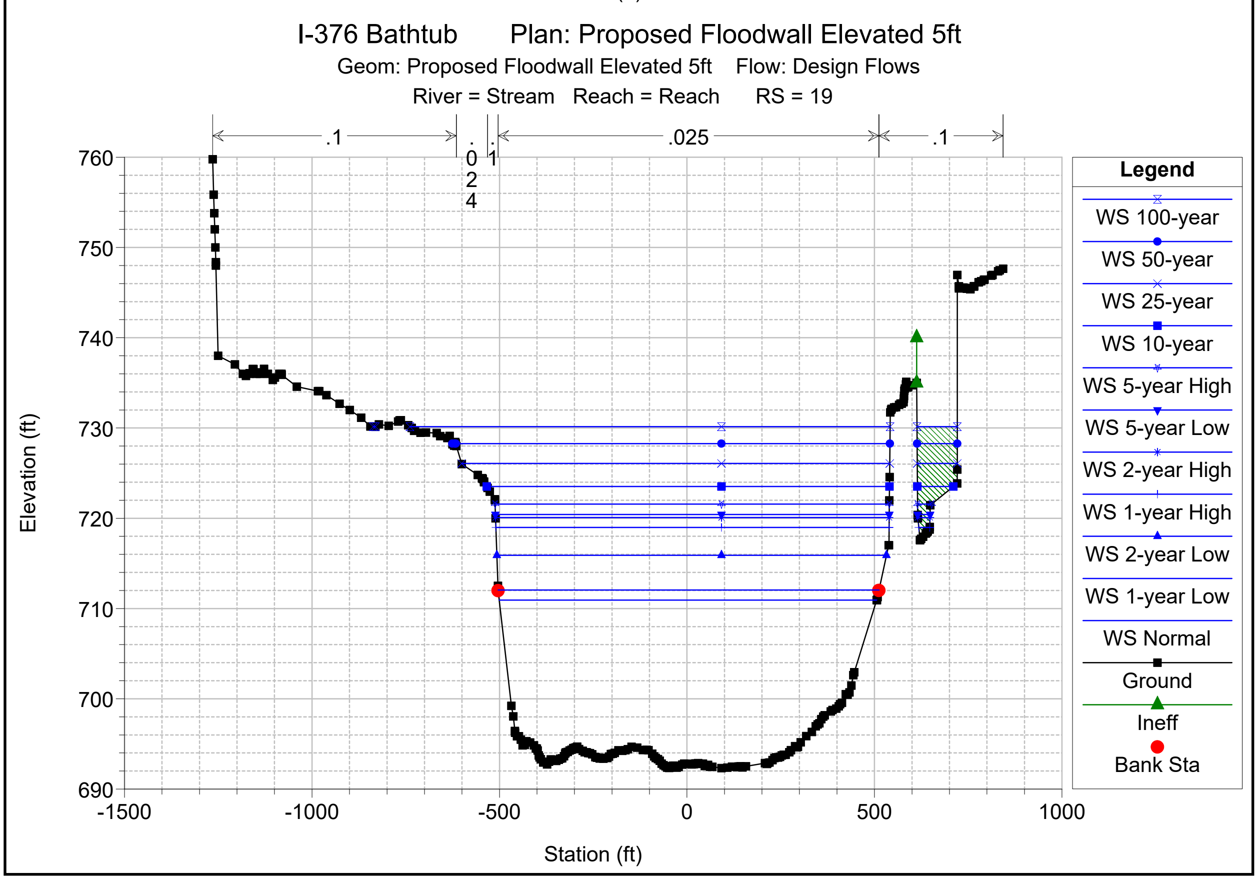


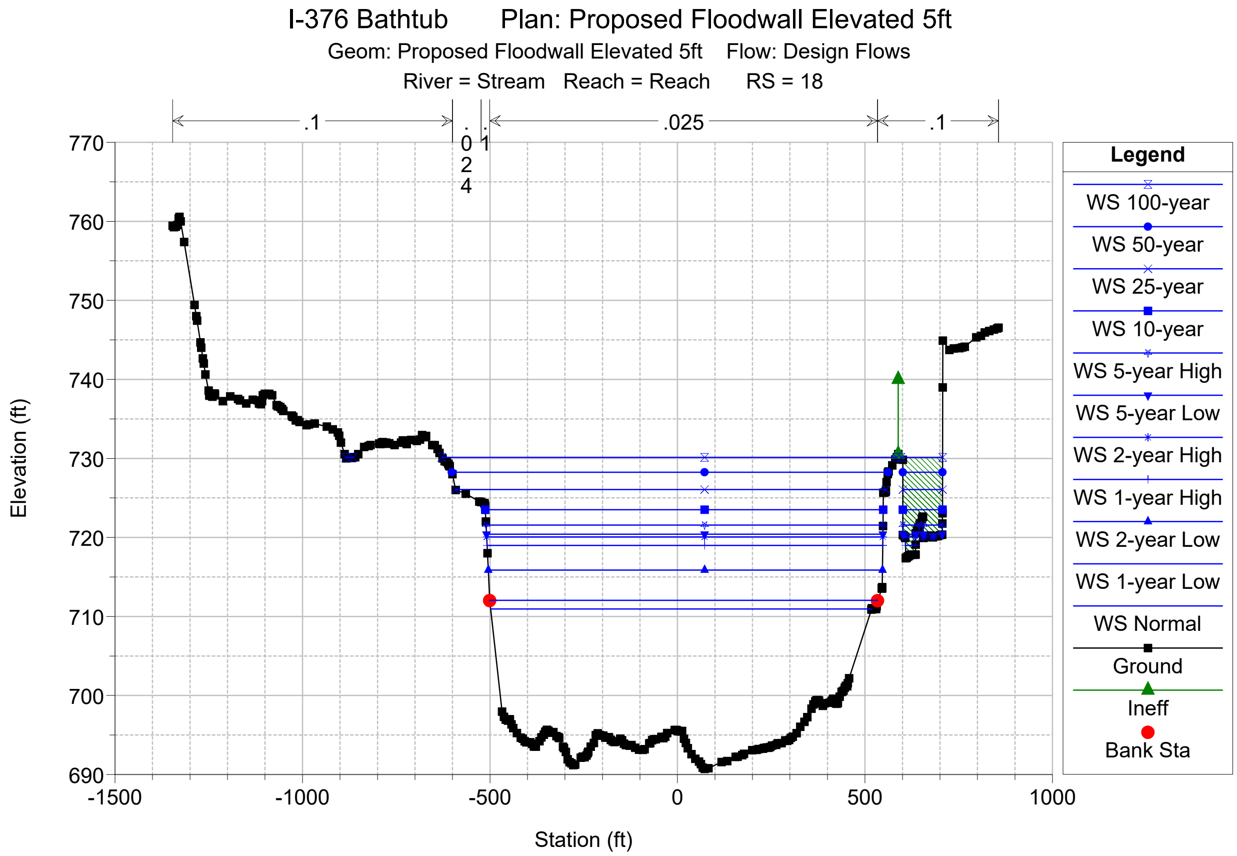
I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 22
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta

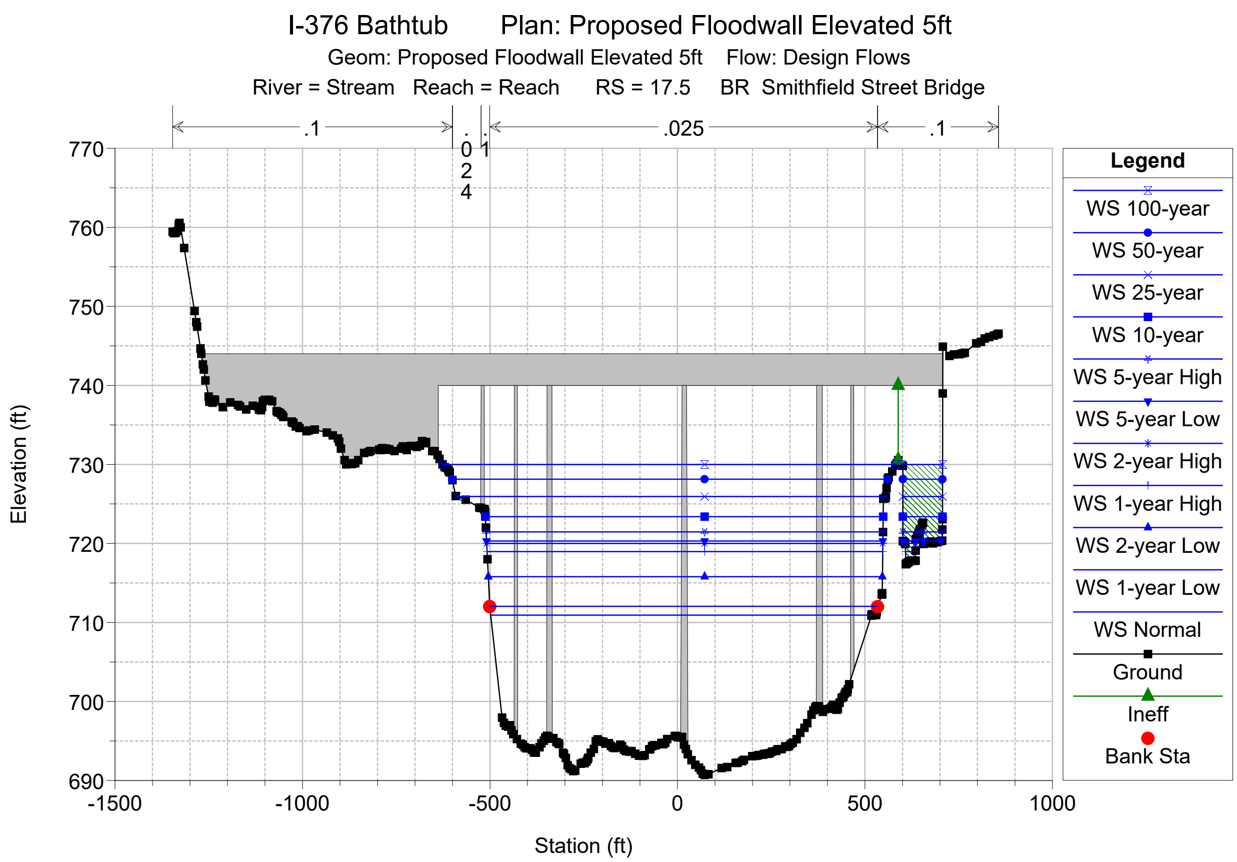


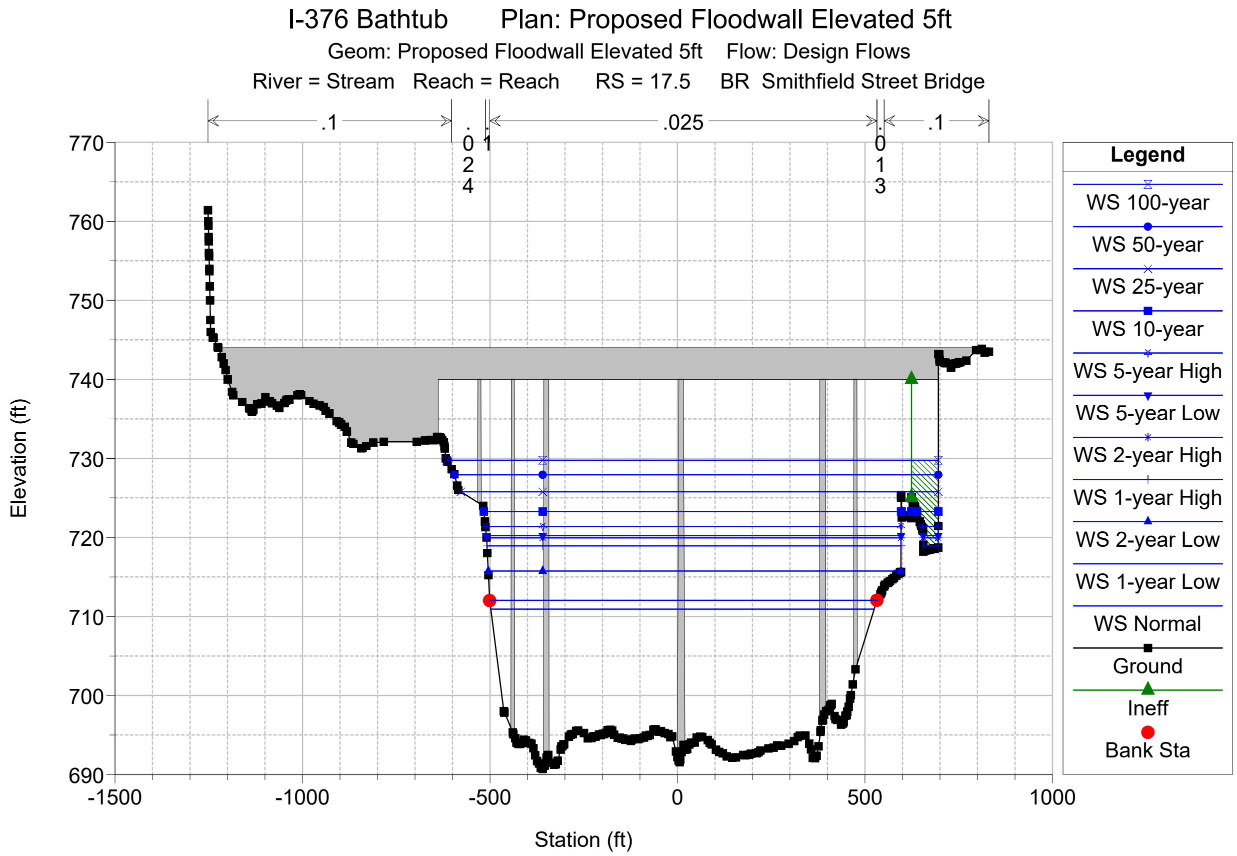
I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 21
.1
.05
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Ineff
Bank Sta

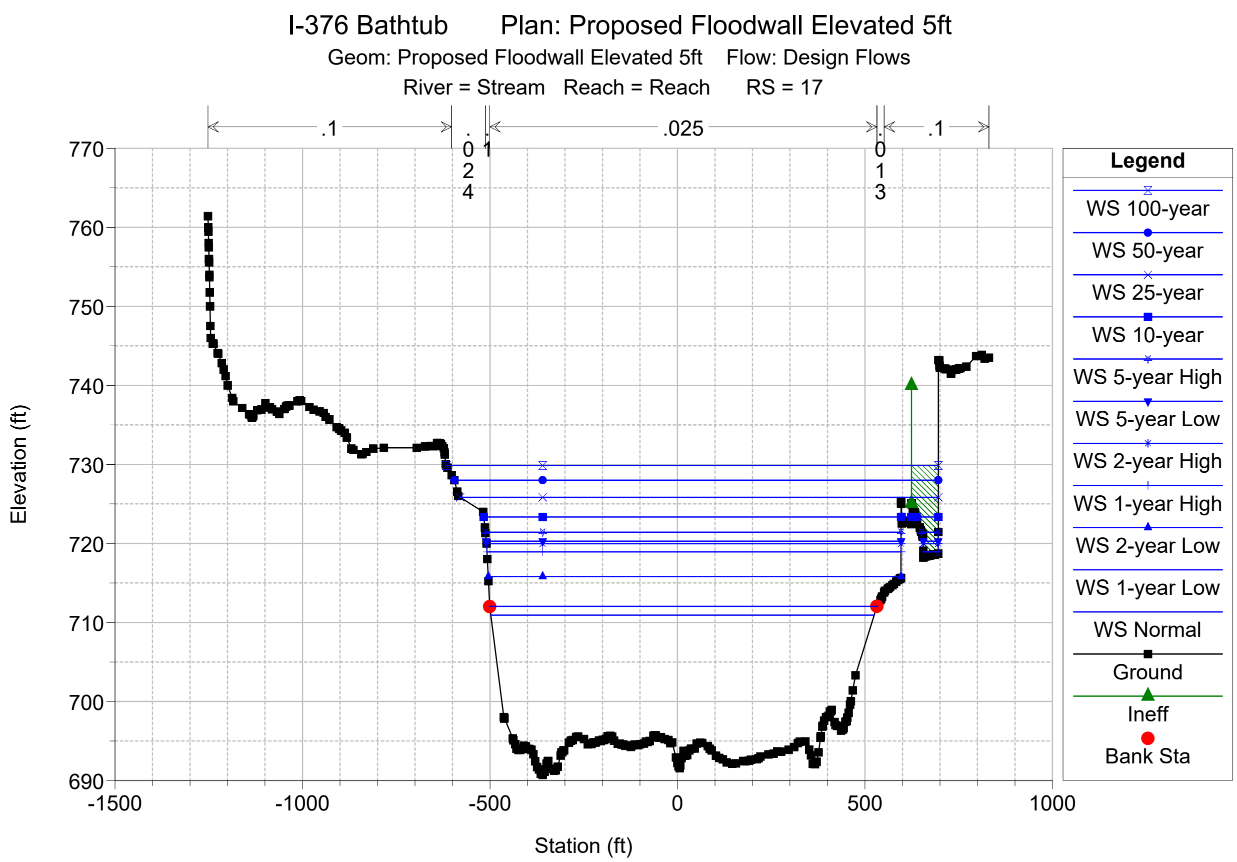

I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 20 FEMA D
.1
.05
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Ineff
Bank Sta

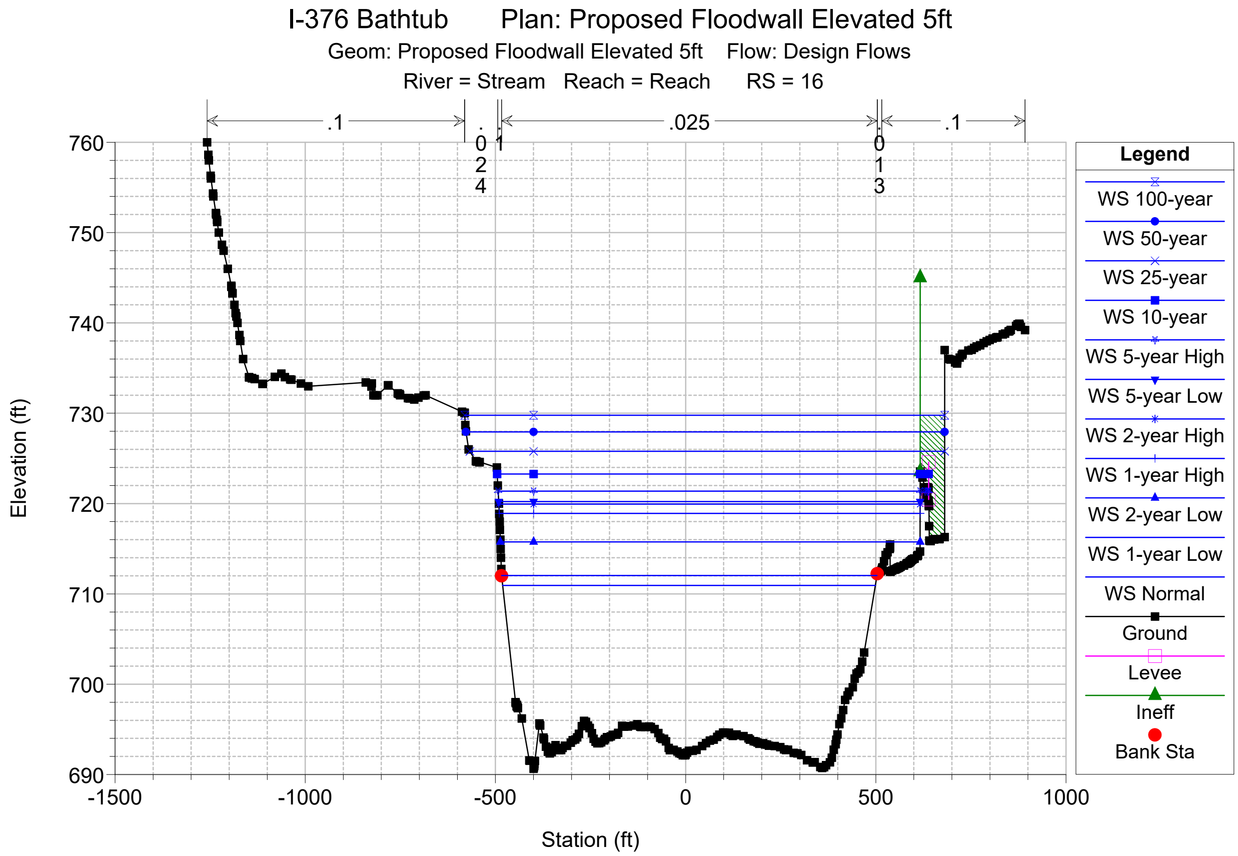

I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 19
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Ineff
Bank Sta


I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 18
.1
.024
.01
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Ineff
Bank Sta

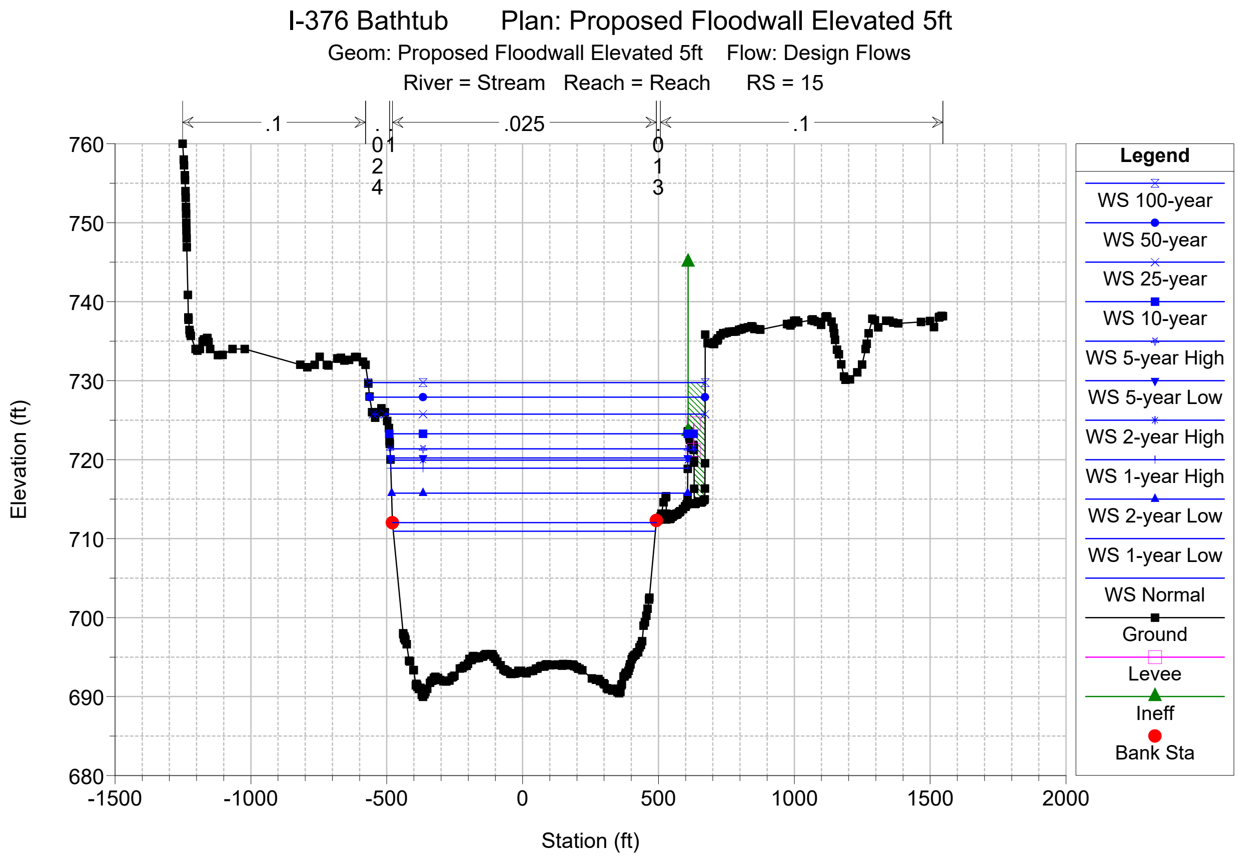

I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 17.5 BR Smithfield Street Bridge
.1
.024
.01
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Ineff
Bank Sta


I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 17.5 BR Smithfield Street Bridge
.1
.024
.1
.025
.013
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Ineff
Bank Sta

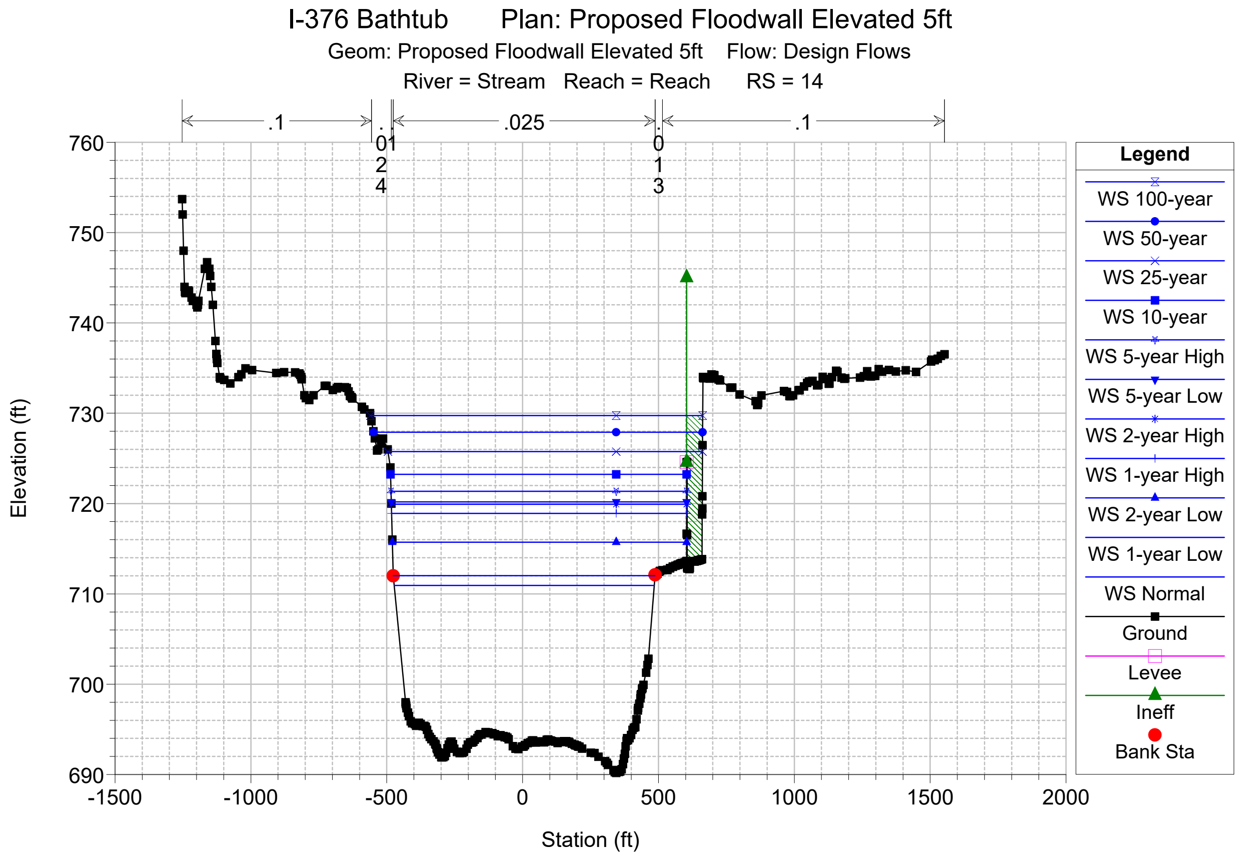

I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 17
.1
.024
.1
.025
.013
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Ineff
Bank Sta



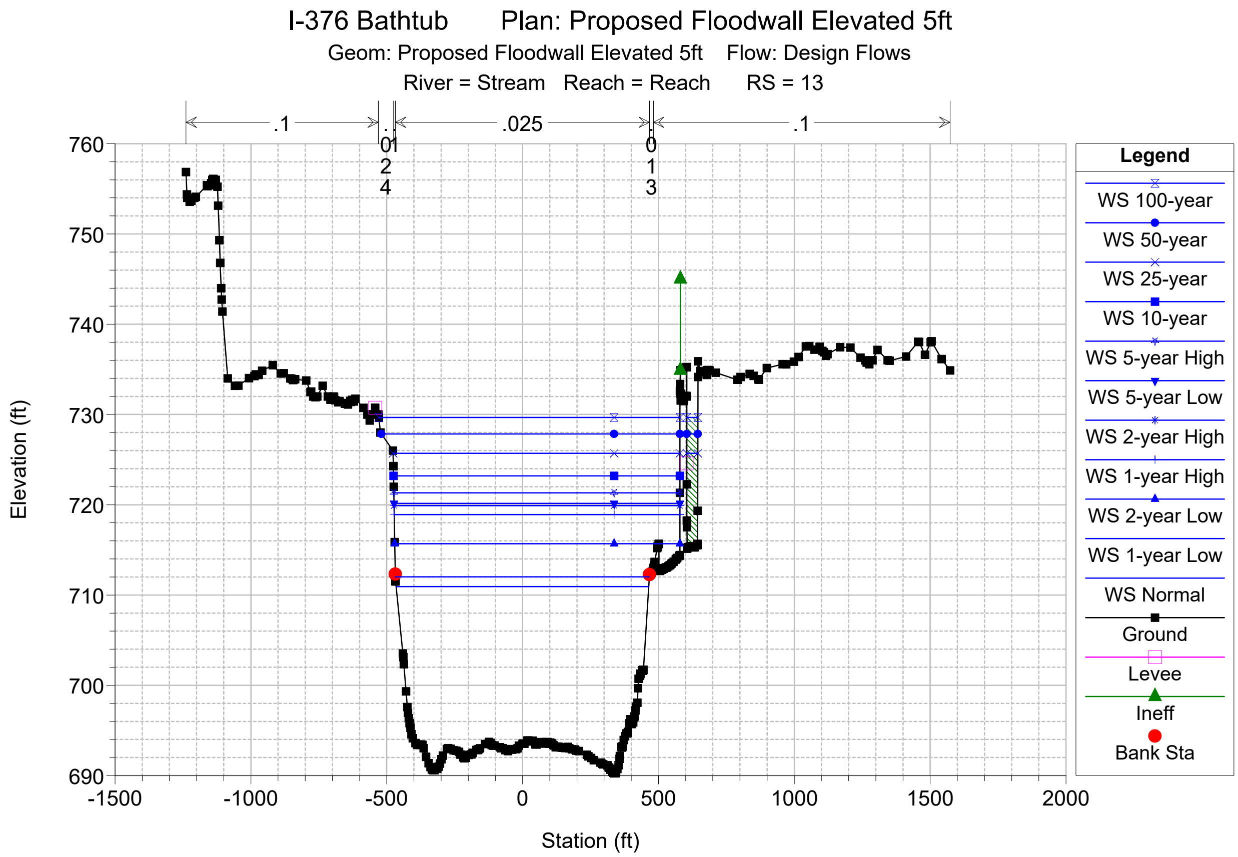
I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 16
.1
.024
.025
.013
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta



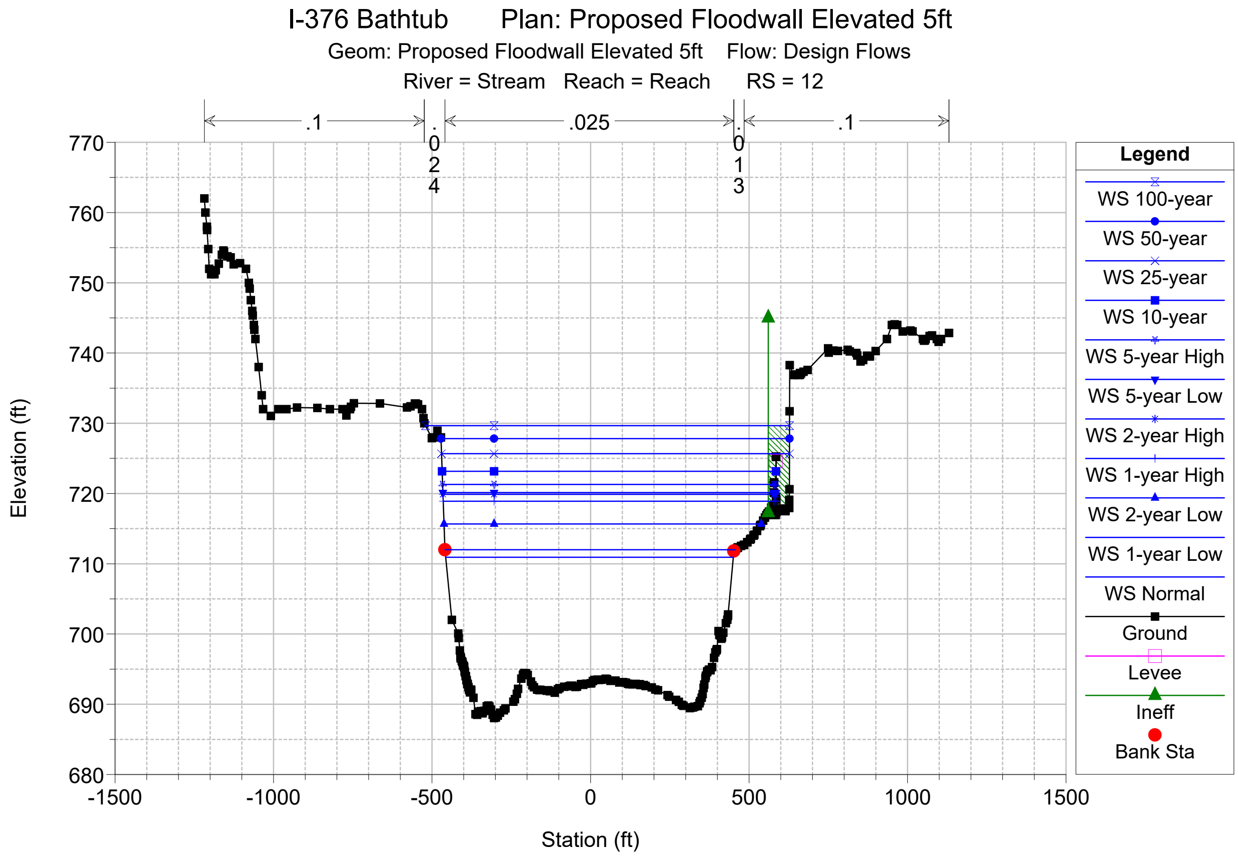
I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 15
.1
.024
.025
.013
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

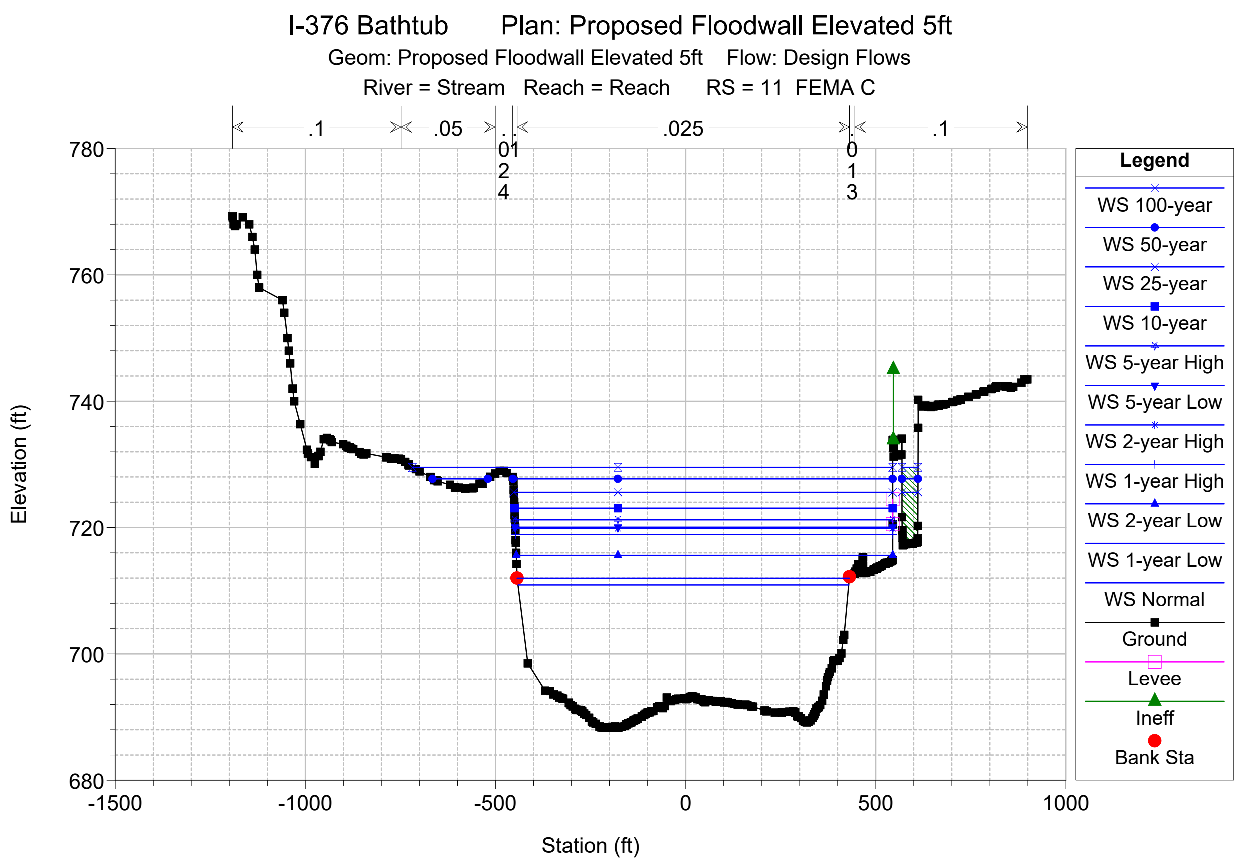


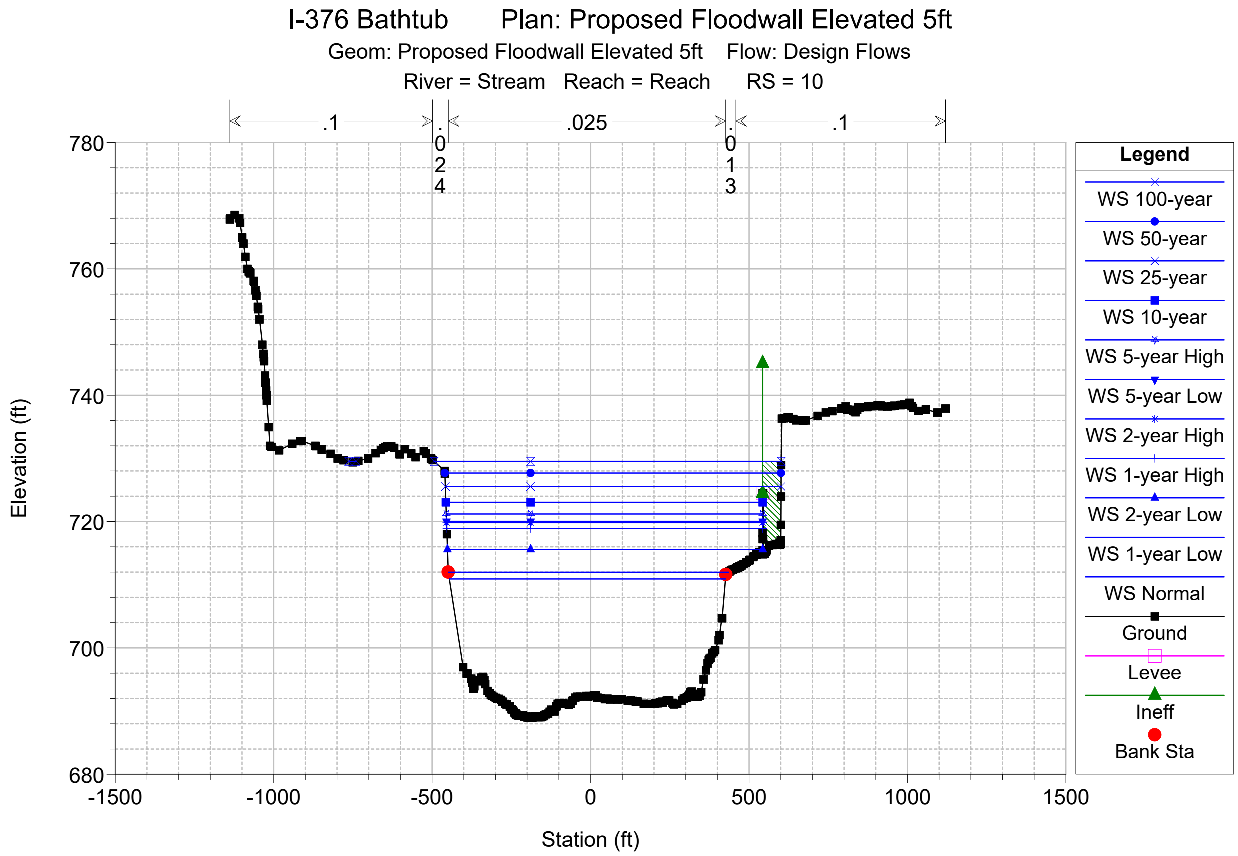
I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 14
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta



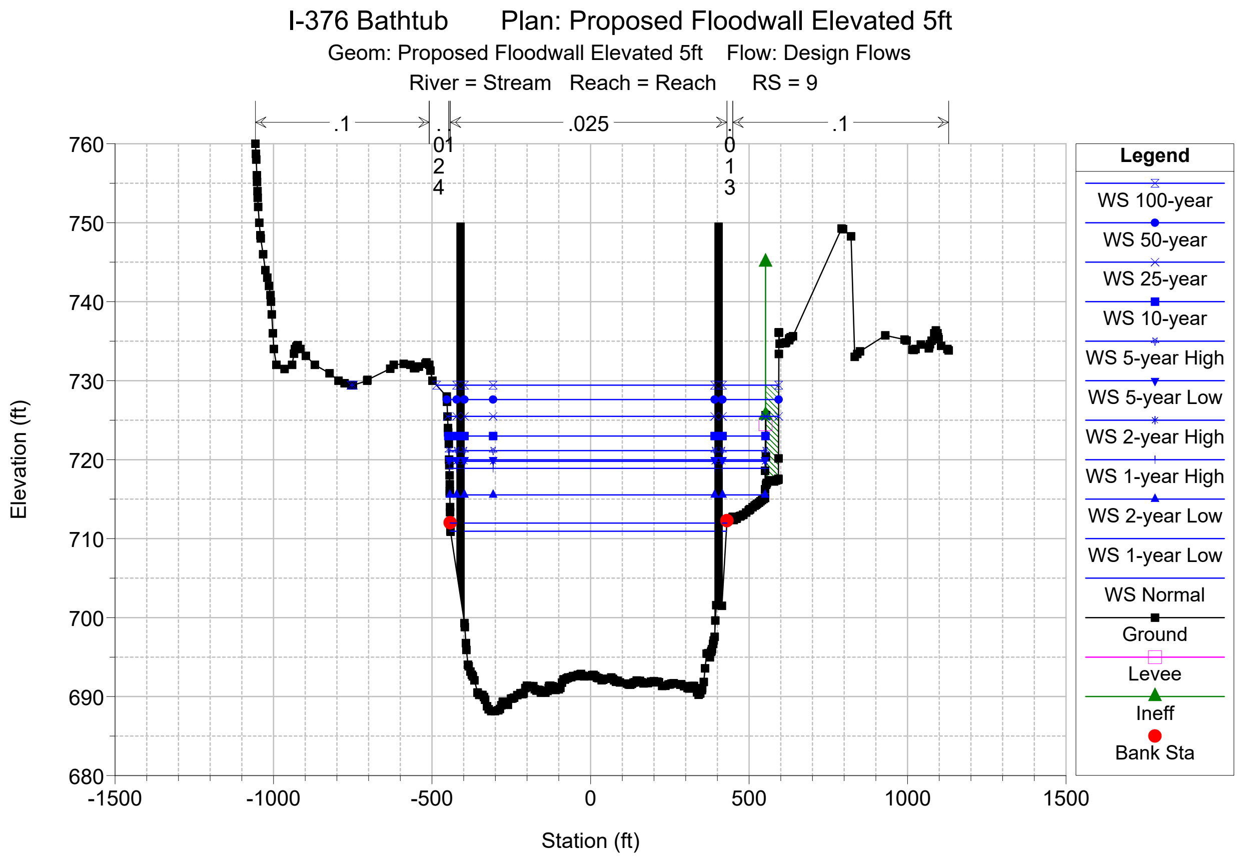
I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 13
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta


I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 12
.1
.025
.1
.024
.013
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

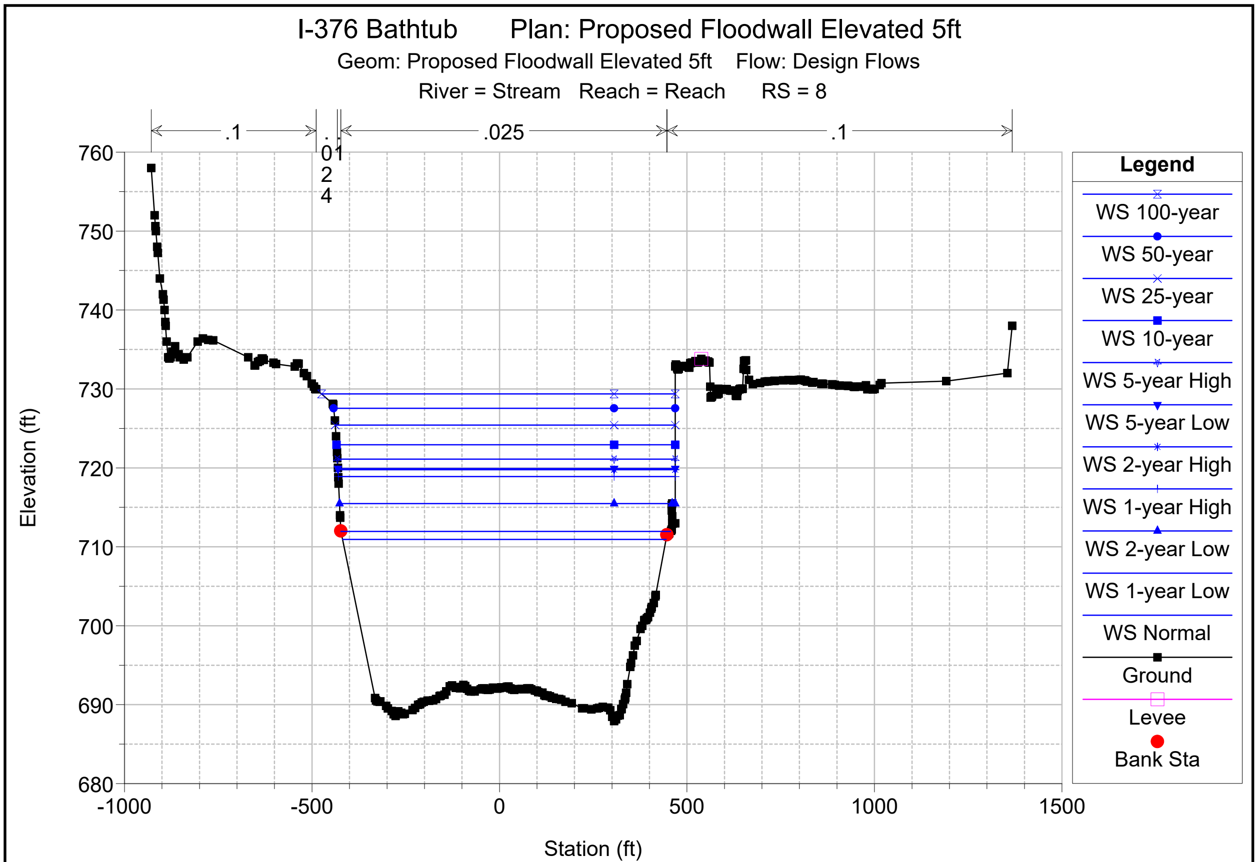

I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 11 FEMA C
.1
.05
.025
.1
.024
.013
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

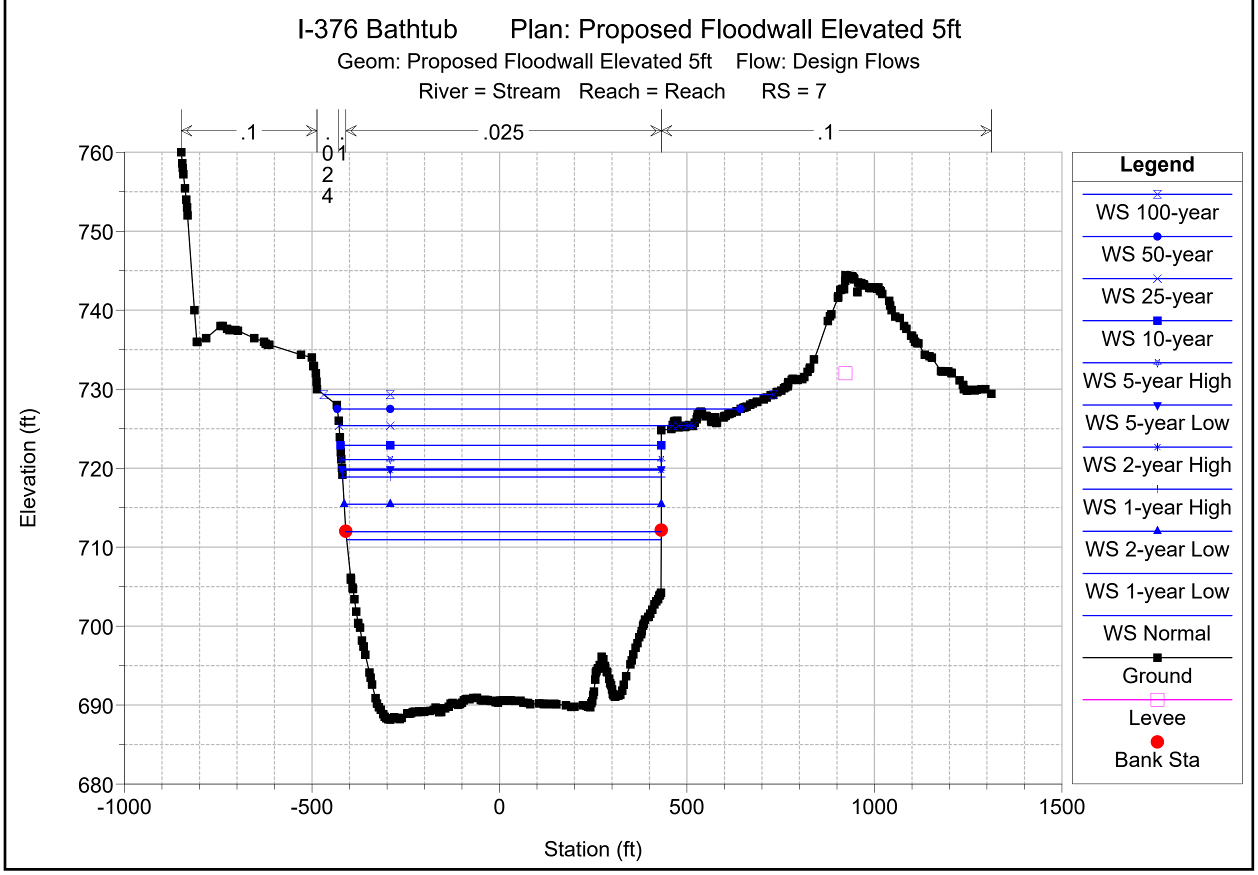


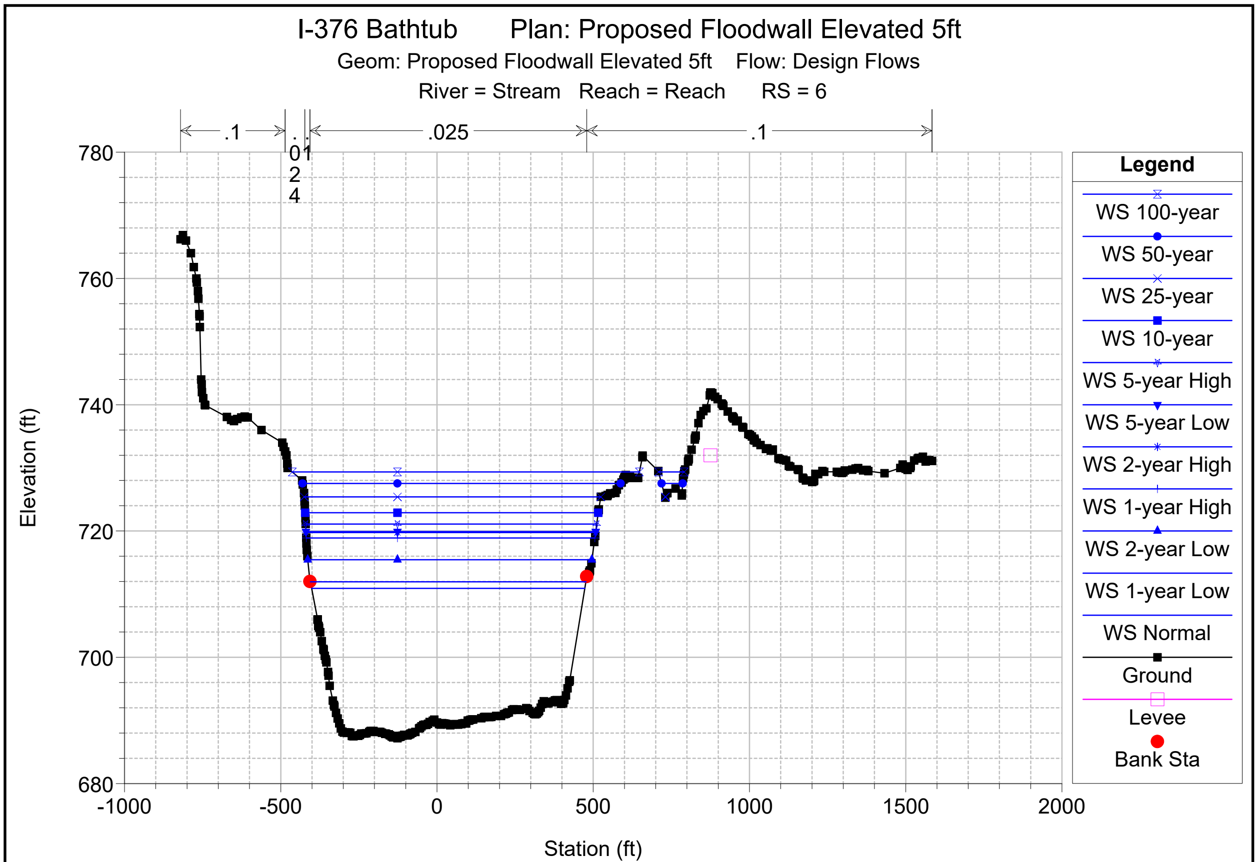
I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 10
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

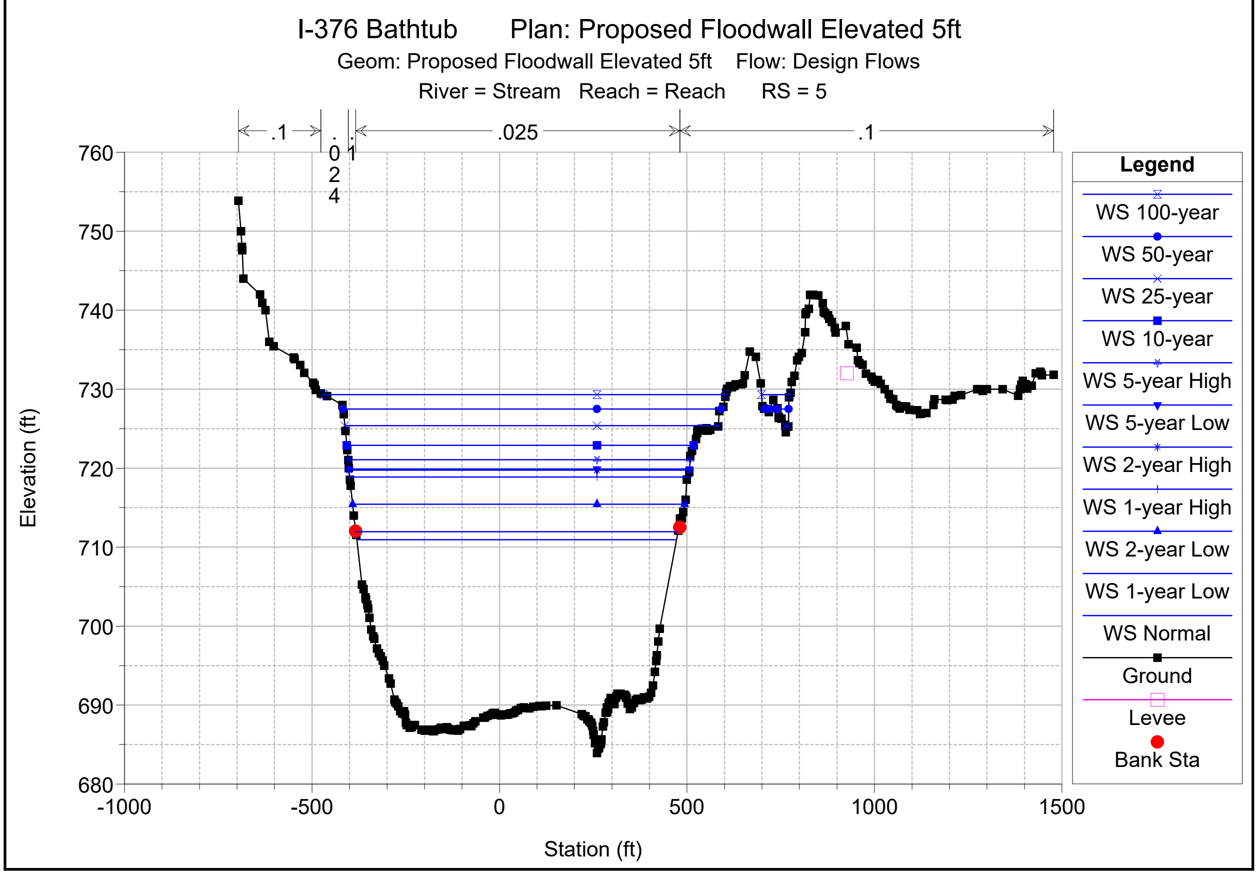


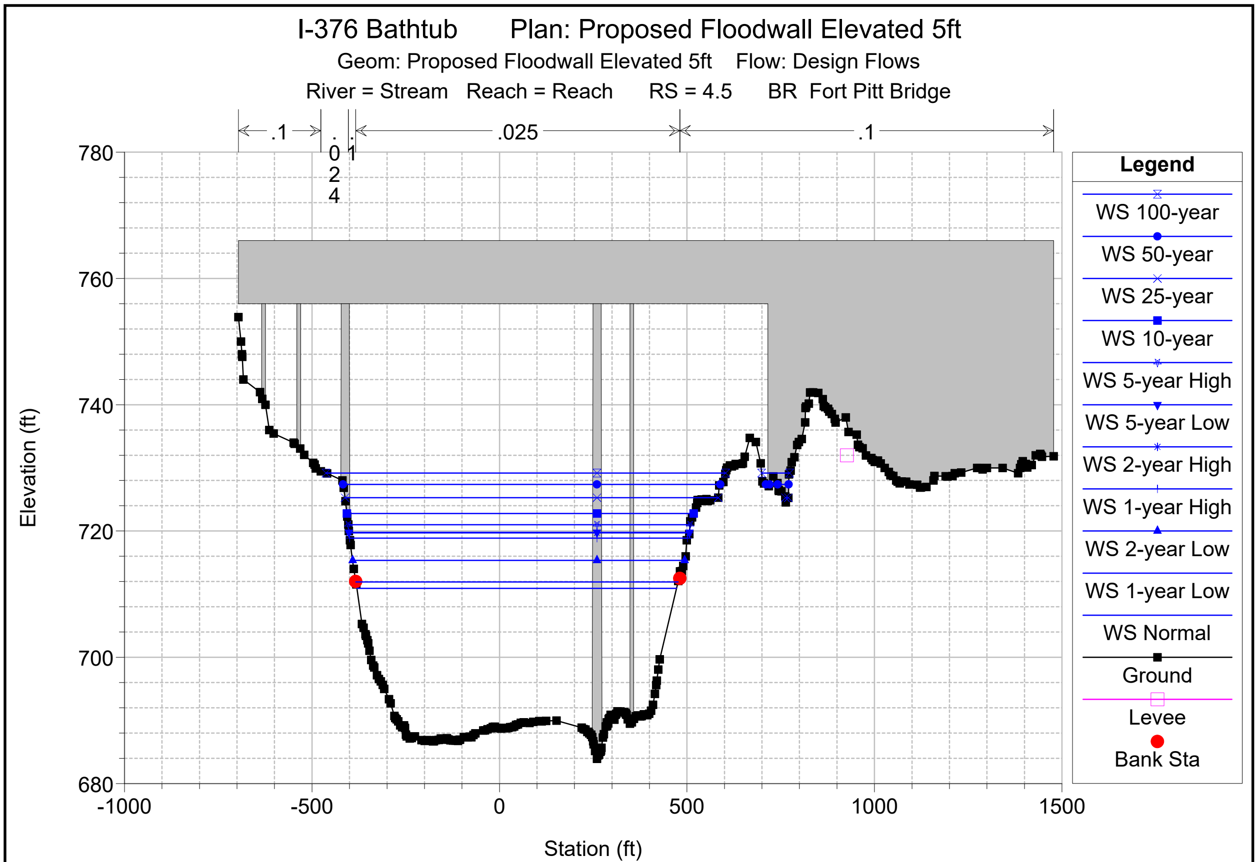
I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 9
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

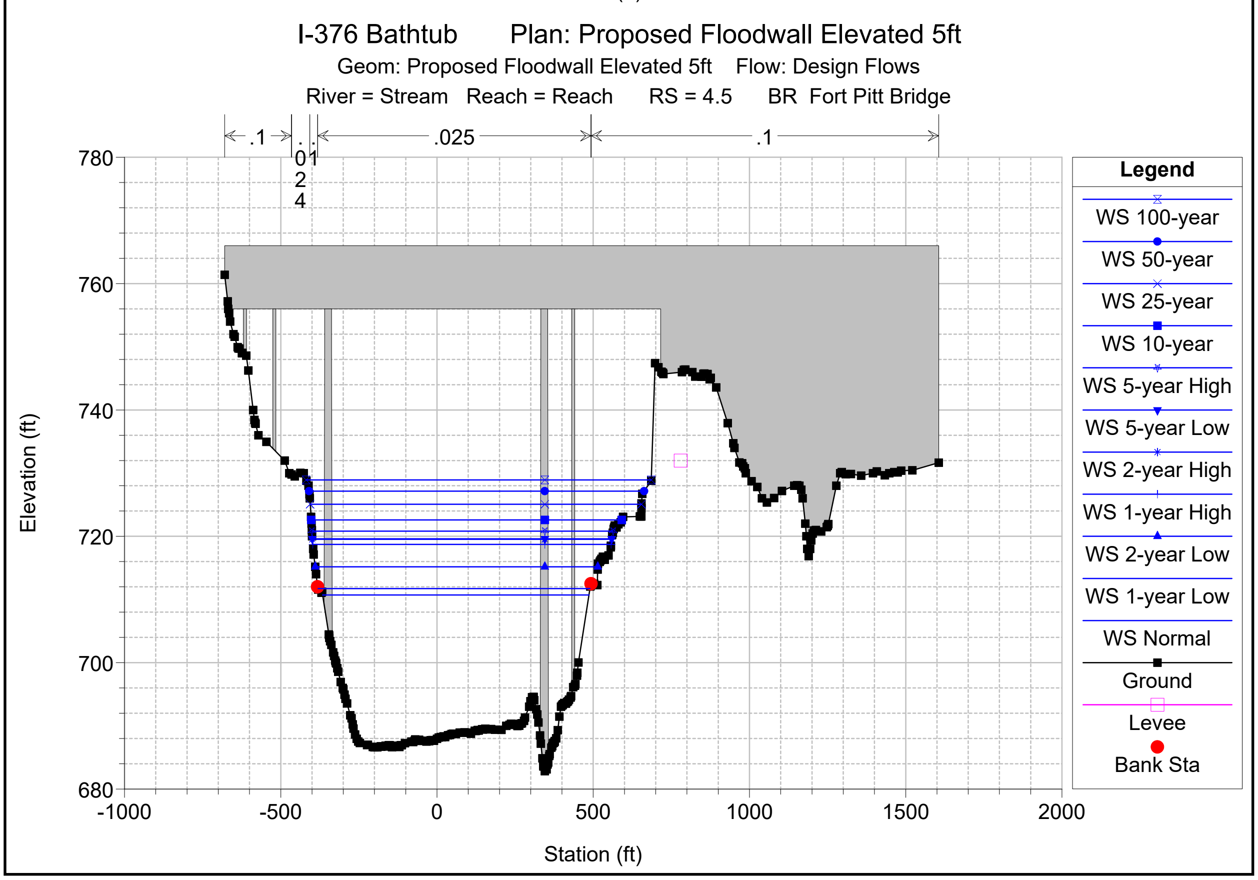

I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 8
.1
.025
.1
.01
.024
Elevation (ft)
760
750
740
730
720
710
700
690
680
-1000
-500
0
500
1000
1500
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta

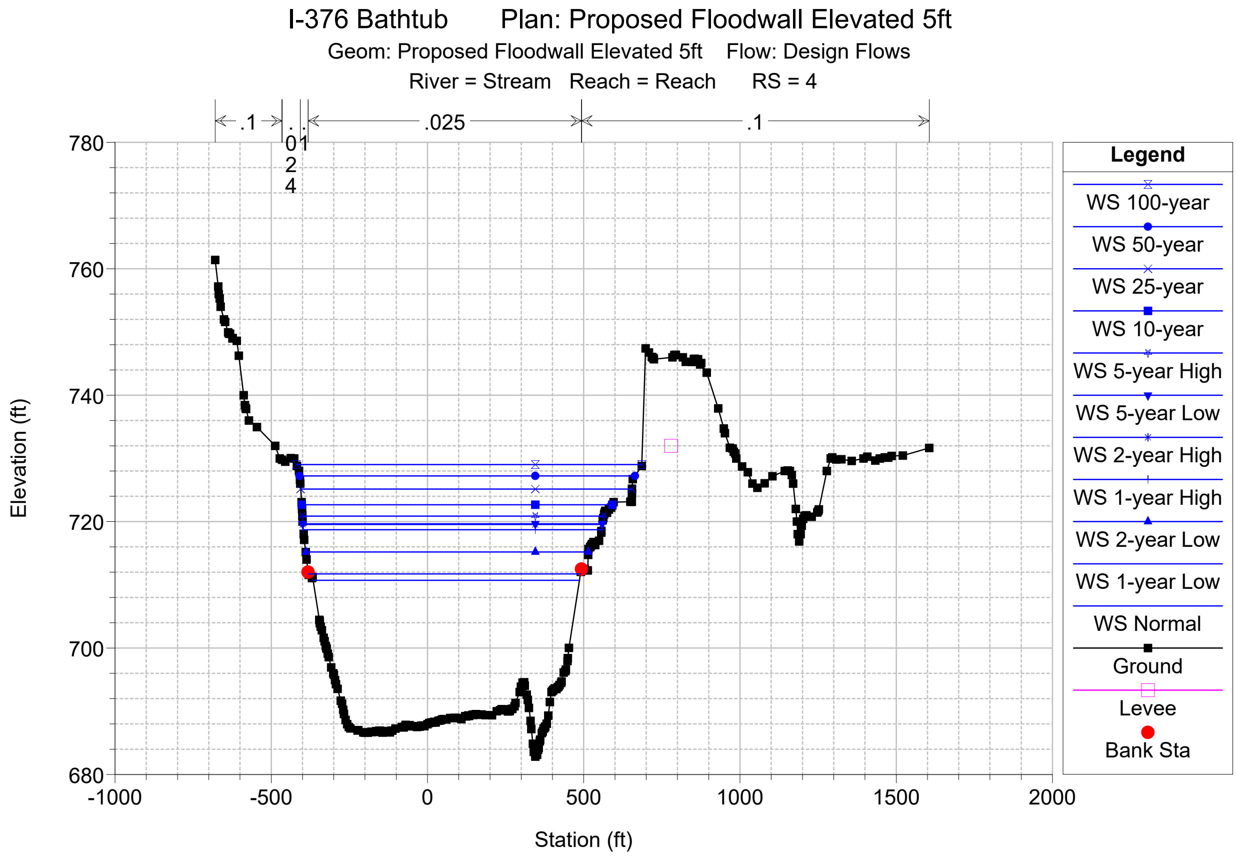

I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 7
.1
.025
.1
.01
.024
Elevation (ft)
760
750
740
730
720
710
700
690
680
-1000
-500
0
500
1000
1500
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta

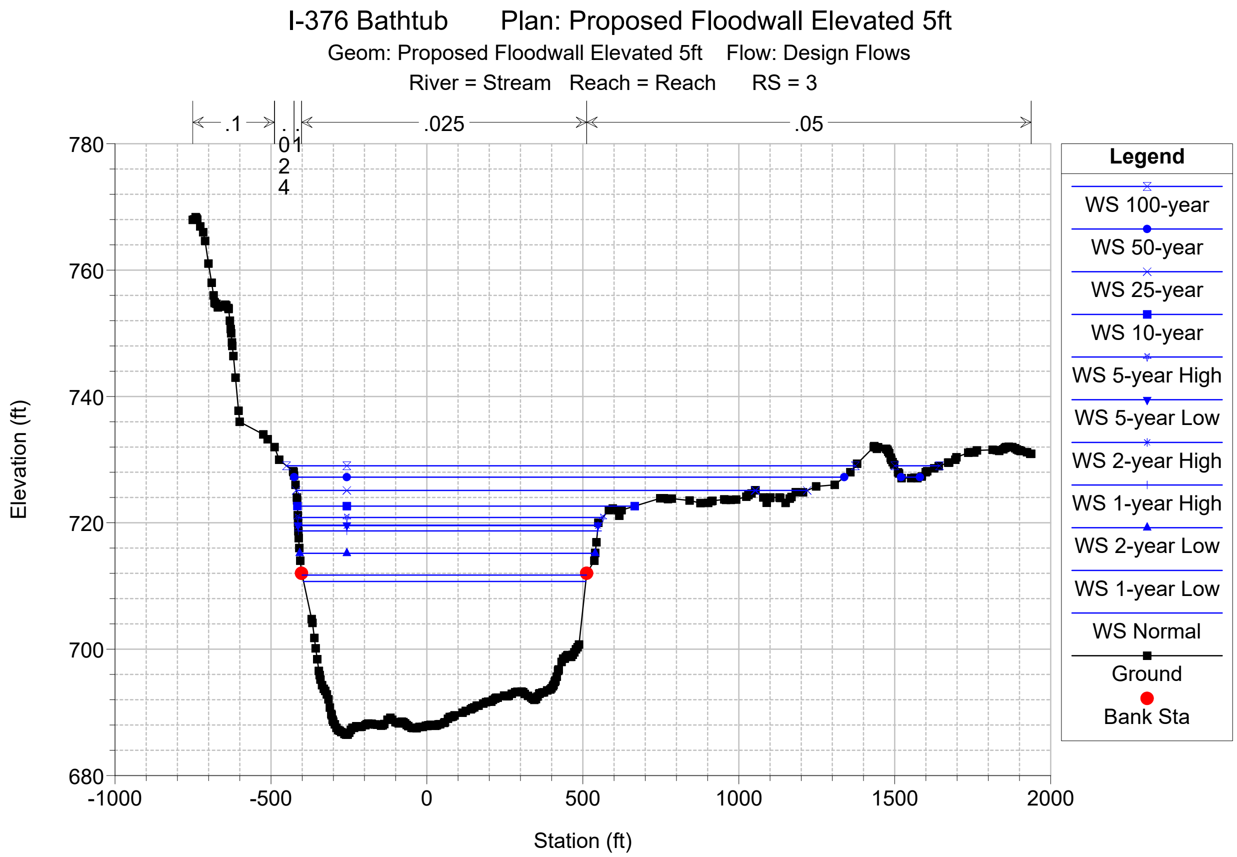

I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 6
.1
.024
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta


I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 5
.1
.024
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta


I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 4.5 BR Fort Pitt Bridge
.1
.024
.01
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta


I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 4.5 BR Fort Pitt Bridge
.1
.024
.01
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta

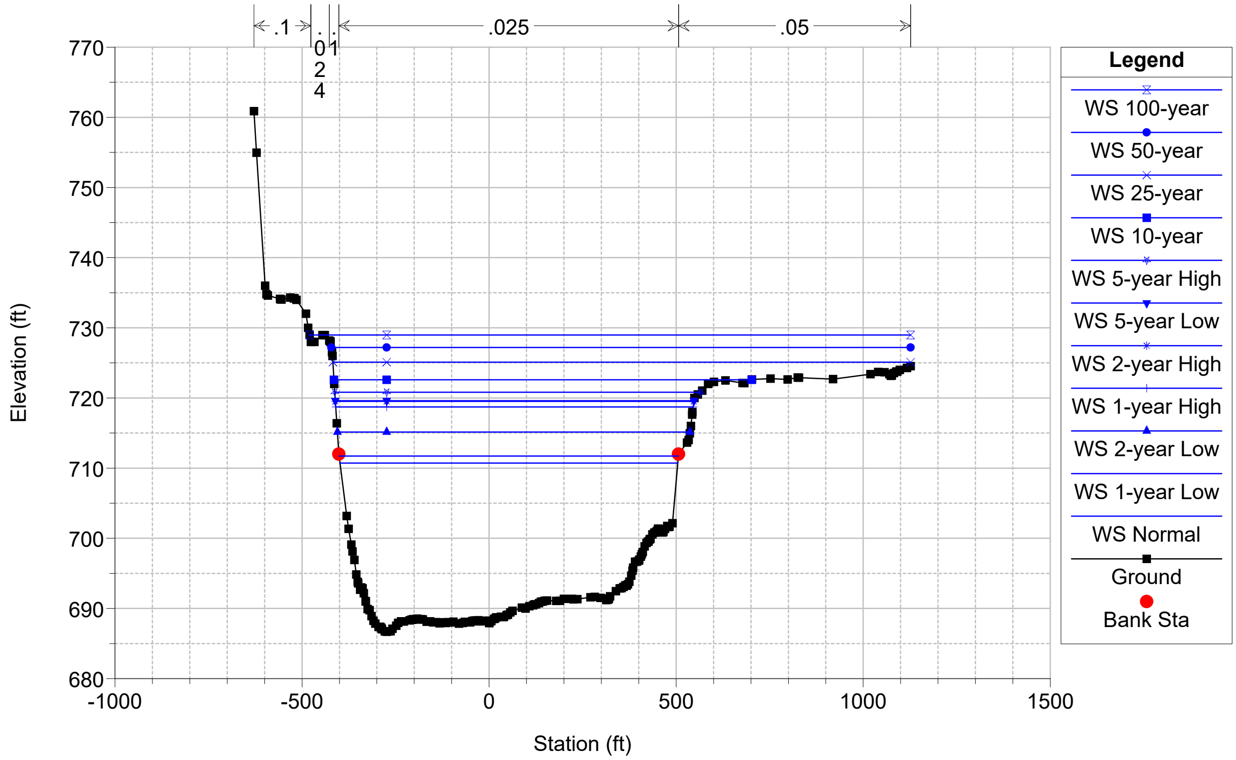

I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 4
.1
.025
.1
.
.
0
1
2
4
Elevation (ft)
Station (ft)
780
760
740
720
700
680
-1000
-500
0
500
1000
1500
2000
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta


I-376 Bathtub Plan: Proposed Floodwall Elevated 5ft
Geom: Proposed Floodwall Elevated 5ft Flow: Design Flows
River = Stream Reach = Reach RS = 3
.1
.025
.05
.
.
0
1
2
4
Elevation (ft)
Station (ft)
780
760
740
720
700
680
-1000
-500
0
500
1000
1500
2000
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

I-376 Bathtub   Plan: Proposed Floodwall Elevated 5ft

Geom: Proposed Floodwall Elevated 5ft   Flow: Design Flows

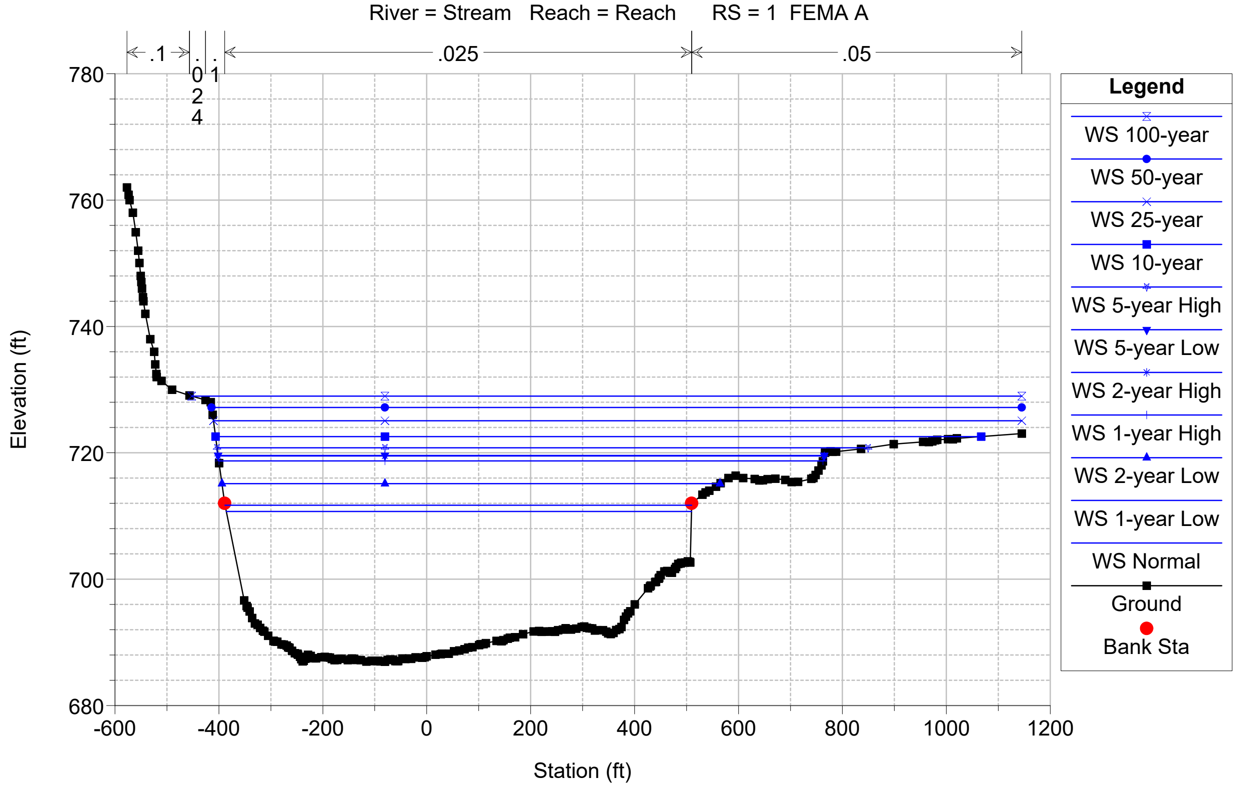
River = Stream   Reach = Reach   RS = 2 FEMA B



I-376 Bathtub   Plan: Proposed Floodwall Elevated 5ft

Geom: Proposed Floodwall Elevated 5ft   Flow: Design Flows

River = Stream   Reach = Reach   RS = 1 FEMA A



HEC-RAS River: Stream Reach: Reach

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	30	1-year Low	Pr Floodwall 5ft	39690.00	686.10	712.20		712.31	0.000035	2.6	15343.73	761.30	0.10
Reach	30	1-year Low	Pr Floodwall 2ft	39690.00	686.10	712.20		712.31	0.000035	2.6	15343.73	761.30	0.10
Reach	30	2-year Low	Pr Floodwall 5ft	101800.00	686.10	716.39		716.86	0.000122	5.5	18551.76	772.73	0.20
Reach	30	2-year Low	Pr Floodwall 2ft	101800.00	686.10	716.39		716.86	0.000122	5.5	18551.76	772.73	0.20
Reach	30	5-year Low	Pr Floodwall 5ft	136800.00	686.10	720.87		721.47	0.000126	6.2	22039.93	782.87	0.20
Reach	30	5-year Low	Pr Floodwall 2ft	136800.00	686.10	720.87		721.47	0.000126	6.2	22039.93	782.87	0.20
Reach	30	25-year	Pr Floodwall 5ft	187200.00	686.10	726.49		727.28	0.000130	7.1	26474.55	795.75	0.21
Reach	30	25-year	Pr Floodwall 2ft	187200.00	686.10	726.49		727.28	0.000130	7.1	26474.45	795.75	0.21
Reach	30	10-year	Pr Floodwall 5ft	168500.00	686.10	723.99		724.73	0.000135	6.9	24490.51	790.01	0.22
Reach	30	10-year	Pr Floodwall 2ft	168500.00	686.10	723.99		724.73	0.000135	6.9	24490.51	790.01	0.22
Reach	30	50-year	Pr Floodwall 5ft	212000.00	686.10	728.69		729.59	0.000136	7.6	28268.79	868.11	0.22
Reach	30	50-year	Pr Floodwall 2ft	212000.00	686.10	728.69		729.59	0.000136	7.6	28268.69	868.10	0.22
Reach	30	100-year	Pr Floodwall 5ft	231000.00	686.10	730.55		731.51	0.000136	7.9	30007.71	1021.99	0.22
Reach	30	100-year	Pr Floodwall 2ft	231000.00	686.10	730.55		731.51	0.000136	7.9	30007.50	1021.97	0.22
Reach	30	1-year High	Pr Floodwall 5ft	39690.00	686.10	719.04		719.09	0.000013	1.9	20606.53	778.67	0.07
Reach	30	1-year High	Pr Floodwall 2ft	39690.00	686.10	719.04		719.09	0.000013	1.9	20606.53	778.67	0.07
Reach	30	5-year High	Pr Floodwall 5ft	136800.00	686.10	721.96		722.52	0.000111	6.0	22893.58	785.37	0.19
Reach	30	5-year High	Pr Floodwall 2ft	136800.00	686.10	721.96		722.52	0.000111	6.0	22893.58	785.37	0.19
Reach	30	2-year High	Pr Floodwall 5ft	101800.00	686.10	720.34		720.68	0.000074	4.7	21622.20	781.65	0.16
Reach	30	2-year High	Pr Floodwall 2ft	101800.00	686.10	720.34		720.68	0.000074	4.7	21622.20	781.65	0.16
Reach	30	Normal	Pr Floodwall 5ft	12700.00	686.10	710.96		710.97	0.000004	0.9	14397.68	755.90	0.04
Reach	30	Normal	Pr Floodwall 2ft	12700.00	686.10	710.96		710.97	0.000004	0.9	14397.68	755.90	0.04
Reach	29	1-year Low	Pr Floodwall 5ft	39690.00	690.79	712.18		712.29	0.000042	2.7	14910.55	807.23	0.11
Reach	29	1-year Low	Pr Floodwall 2ft	39690.00	690.79	712.18		712.29	0.000042	2.7	14910.55	807.23	0.11
Reach	29	2-year Low	Pr Floodwall 5ft	101800.00	690.79	716.30		716.79	0.000140	5.6	18259.01	816.09	0.21
Reach	29	2-year Low	Pr Floodwall 2ft	101800.00	690.79	716.30		716.79	0.000140	5.6	18259.01	816.09	0.21
Reach	29	5-year Low	Pr Floodwall 5ft	136800.00	690.79	720.80		721.41	0.000138	6.3	21950.44	825.81	0.21
Reach	29	5-year Low	Pr Floodwall 2ft	136800.00	690.79	720.80		721.41	0.000138	6.3	21950.44	825.81	0.21
Reach	29	25-year	Pr Floodwall 5ft	187200.00	690.79	726.43		727.21	0.000137	7.1	26633.11	837.82	0.22
Reach	29	25-year	Pr Floodwall 2ft	187200.00	690.79	726.43		727.21	0.000137	7.1	26633.01	837.82	0.22
Reach	29	10-year	Pr Floodwall 5ft	168500.00	690.79	723.92		724.66	0.000145	6.9	24536.43	832.47	0.22
Reach	29	10-year	Pr Floodwall 2ft	168500.00	690.79	723.92		724.66	0.000145	6.9	24536.43	832.47	0.22
Reach	29	50-year	Pr Floodwall 5ft	212000.00	690.79	728.63		729.51	0.000142	7.5	28538.45	905.68	0.22
Reach	29	50-year	Pr Floodwall 2ft	212000.00	690.79	728.63		729.51	0.000142	7.5	28538.34	905.66	0.22
Reach	29	100-year	Pr Floodwall 5ft	231000.00	690.79	730.50		731.44	0.000141	7.8	30509.34	1193.20	0.23
Reach	29	100-year	Pr Floodwall 2ft	231000.00	690.79	730.50		731.44	0.000141	7.8	30509.05	1193.18	0.23
Reach	29	1-year High	Pr Floodwall 5ft	39690.00	690.79	719.03		719.09	0.000015	1.9	20489.67	821.98	0.07
Reach	29	1-year High	Pr Floodwall 2ft	39690.00	690.79	719.03		719.09	0.000015	1.9	20489.67	821.98	0.07
Reach	29	5-year High	Pr Floodwall 5ft	136800.00	690.79	721.90		722.46	0.000121	6.0	22860.35	828.16	0.20
Reach	29	5-year High	Pr Floodwall 2ft	136800.00	690.79	721.90		722.46	0.000121	6.0	22860.35	828.16	0.20
Reach	29	2-year High	Pr Floodwall 5ft	101800.00	690.79	720.30		720.64	0.000081	4.7	21533.57	824.72	0.16
Reach	29	2-year High	Pr Floodwall 2ft	101800.00	690.79	720.30		720.64	0.000081	4.7	21533.57	824.72	0.16
Reach	29	Normal	Pr Floodwall 5ft	12700.00	690.79	710.95		710.97	0.000005	0.9	13924.49	803.36	0.04
Reach	29	Normal	Pr Floodwall 2ft	12700.00	690.79	710.95		710.97	0.000005	0.9	13924.49	803.36	0.04
Reach	28	1-year Low	Pr Floodwall 5ft	39690.00	691.86	712.16		712.27	0.000040	2.6	15393.34	841.43	0.11
Reach	28	1-year Low	Pr Floodwall 2ft	39690.00	691.86	712.16		712.27	0.000040	2.6	15393.34	841.43	0.11
Reach	28	2-year Low	Pr Floodwall 5ft	101800.00	691.86	716.25		716.71	0.000133	5.4	18856.07	851.00	0.20
Reach	28	2-year Low	Pr Floodwall 2ft	101800.00	691.86	716.25		716.71	0.000133	5.4	18856.07	851.00	0.20
Reach	28	5-year Low	Pr Floodwall 5ft	136800.00	691.86	720.76		721.33	0.000130	6.0	22713.95	861.87	0.21
Reach	28	5-year Low	Pr Floodwall 2ft	136800.00	691.86	720.76		721.33	0.000130	6.0	22713.95	861.87	0.21
Reach	28	25-year	Pr Floodwall 5ft	187200.00	691.86	726.40		727.12	0.000129	6.8	27613.87	884.65	0.21
Reach	28	25-year	Pr Floodwall 2ft	187200.00	691.86	726.40		727.12	0.000129	6.8	27613.76	884.65	0.21
Reach	28	10-year	Pr Floodwall 5ft	168500.00	691.86	723.88		724.57	0.000137	6.7	25416.41	869.30	0.21
Reach	28	10-year	Pr Floodwall 2ft	168500.00	691.86	723.88		724.57	0.000137	6.7	25416.41	869.30	0.21
Reach	28	50-year	Pr Floodwall 5ft	212000.00	691.86	728.60		729.42	0.000133	7.2	29728.03	1105.84	0.22
Reach	28	50-year	Pr Floodwall 2ft	212000.00	691.86	728.60		729.42	0.000133	7.2	29727.89	1105.83	0.22
Reach	28	100-year	Pr Floodwall 5ft	231000.00	691.86	730.48		731.34	0.000132	7.5	32092.10	1330.28	0.22
Reach	28	100-year	Pr Floodwall 2ft	231000.00	691.86	730.48		731.34	0.000132	7.5	32091.86	1330.28	0.22
Reach	28	1-year High	Pr Floodwall 5ft	39690.00	691.86	719.02		719.08	0.000014	1.9	21221.31	857.72	0.07
Reach	28	1-year High	Pr Floodwall 2ft	39690.00	691.86	719.02		719.08	0.000014	1.9	21221.31	857.72	0.07
Reach	28	5-year High	Pr Floodwall 5ft	136800.00	691.86	721.87		722.39	0.000114	5.8	23669.74	864.51	0.19
Reach	28	5-year High	Pr Floodwall 2ft	136800.00	691.86	721.87		722.39	0.000114	5.8	23669.74	864.51	0.19
Reach	28	2-year High	Pr Floodwall 5ft	101800.00	691.86	720.27		720.60	0.000077	4.6	22293.49	860.71	0.16
Reach	28	2-year High	Pr Floodwall 2ft	101800.00	691.86	720.27		720.60	0.000077	4.6	22293.49	860.71	0.16
Reach	28	Normal	Pr Floodwall 5ft	12700.00	691.86	710.95		710.96	0.000005	0.9	14377.02	838.25	0.04
Reach	28	Normal	Pr Floodwall 2ft	12700.00	691.86	710.95		710.96	0.000005	0.9	14377.02	838.25	0.04
Reach	27	1-year Low	Pr Floodwall 5ft	39690.00	692.11	712.14		712.24	0.000040	2.5	16110.64	946.55	0.11
Reach	27	1-year Low	Pr Floodwall 2ft	39690.00	692.11	712.14		712.24	0.000040	2.5	16110.64	946.55	0.11
Reach	27	2-year Low	Pr Floodwall 5ft	101800.00	692.11	716.20		716.60	0.000128	5.1	19961.00	951.60	0.20
Reach	27	2-year Low	Pr Floodwall 2ft	101800.00	692.11	716.20		716.60	0.000128	5.1	19961.00	951.60	0.20
Reach	27	5-year Low	Pr Floodwall 5ft	136800.00	692.11	720.72		721.22	0.000121	5.6	24279.17	957.16	0.20
Reach	27	5-year Low	Pr Floodwall 2ft	136800.00	692.11	720.72		721.22	0.000121	5.6	24279.17	957.16	0.20
Reach	27	25-year	Pr Floodwall 5ft	187200.00	692.11	726.39		727.01	0.000116	6.3	29729.27	984.71	0.20
Reach	27	25-year	Pr Floodwall 2ft	187200.00	692.11	726.39		727.01	0.000116	6.3	29729.16	984.71	0.20
Reach	27	10-year	Pr Floodwall 5ft	168500.00	692.11	723.86		724.45	0.000125	6.2	27285.05	961.04	0.20
Reach	27	10-year	Pr Floodwall 2ft	168500.00	692.11	723.86		724.45	0.000125	6.2	27285.05	961.04	0.20
Reach	27	50-year	Pr Floodwall 5ft	212000.00	692.11	728.60		729.30	0.000118	6.7	32046.36	1198.22	0.20
Reach	27	50-year	Pr Floodwall 2ft	212000.00	692.11	728.60		729.30	0.000118	6.7	32046.21	1198.20	0.20
Reach	27	100-year	Pr Floodwall 5ft	231000.00	692.11	730.48		731.22	0.000117	6.9	34560.39	1462.57	0.20
Reach	27	100-year	Pr Floodwall 2ft	231000.00	692.11	730.48		731.22	0.000117	6.9	34560.12	1462.56	0.20
Reach	27	1-year High	Pr Floodwall 5ft	39690.00	692.11	719.02		719.07	0.000013	1.8	22649.74	955.05	0.06
Reach	27	1-year High	Pr Floodwall 2ft	39690.00	692.11	719.02		719.07	0.000013	1.8	22649.74	955.05	0.06

HEC-RAS River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	27	5-year High	Pr Floodwall 5ft	136800.00	692.11	721.84		722.29	0.000105	5.4	25348.16	958.59	0.18
Reach	27	5-year High	Pr Floodwall 2ft	136800.00	692.11	721.84		722.29	0.000105	5.4	25348.16	958.59	0.18
Reach	27	2-year High	Pr Floodwall 5ft	101800.00	692.11	720.25		720.53	0.000071	4.3	23825.31	956.62	0.15
Reach	27	2-year High	Pr Floodwall 2ft	101800.00	692.11	720.25		720.53	0.000071	4.3	23825.31	956.62	0.15
Reach	27	Normal	Pr Floodwall 5ft	12700.00	692.11	710.95		710.96	0.000005	0.8	14987.79	936.70	0.04
Reach	27	Normal	Pr Floodwall 2ft	12700.00	692.11	710.95		710.96	0.000005	0.8	14987.79	936.70	0.04
Reach	26	1-year Low	Pr Floodwall 5ft	39690.00	690.05	712.13	697.64	712.23	0.000038	2.5	16063.97	905.06	0.10
Reach	26	1-year Low	Pr Floodwall 2ft	39690.00	690.05	712.13	697.64	712.23	0.000038	2.5	16063.97	905.06	0.10
Reach	26	2-year Low	Pr Floodwall 5ft	101800.00	690.05	716.17	701.29	716.58	0.000126	5.2	19762.74	929.52	0.19
Reach	26	2-year Low	Pr Floodwall 2ft	101800.00	690.05	716.17	701.29	716.58	0.000126	5.2	19762.74	929.52	0.19
Reach	26	5-year Low	Pr Floodwall 5ft	136800.00	690.05	720.68	702.96	721.20	0.000122	5.7	24047.01	1001.37	0.20
Reach	26	5-year Low	Pr Floodwall 2ft	136800.00	690.05	720.68	702.96	721.20	0.000122	5.7	24047.01	1001.37	0.20
Reach	26	25-year	Pr Floodwall 5ft	187200.00	690.05	726.34	705.12	726.99	0.000119	6.5	29941.04	1094.01	0.20
Reach	26	25-year	Pr Floodwall 2ft	187200.00	690.05	726.34	705.12	726.99	0.000119	6.5	29940.92	1094.01	0.20
Reach	26	10-year	Pr Floodwall 5ft	168500.00	690.05	723.81	704.33	724.43	0.000127	6.3	27250.03	1042.73	0.21
Reach	26	10-year	Pr Floodwall 2ft	168500.00	690.05	723.81	704.33	724.43	0.000127	6.3	27250.03	1042.73	0.21
Reach	26	50-year	Pr Floodwall 5ft	212000.00	690.05	728.55	706.10	729.28	0.000121	6.8	32446.71	1166.31	0.21
Reach	26	50-year	Pr Floodwall 2ft	212000.00	690.05	728.55	706.10	729.28	0.000121	6.8	32446.56	1166.31	0.21
Reach	26	100-year	Pr Floodwall 5ft	231000.00	690.05	730.43	706.84	731.20	0.000120	7.0	34857.88	1430.25	0.21
Reach	26	100-year	Pr Floodwall 2ft	231000.00	690.05	730.43	706.84	731.20	0.000120	7.0	34857.70	1430.19	0.21
Reach	26	1-year High	Pr Floodwall 5ft	39690.00	690.05	719.02	697.64	719.06	0.000013	1.8	22435.21	947.78	0.06
Reach	26	1-year High	Pr Floodwall 2ft	39690.00	690.05	719.02	697.64	719.06	0.000013	1.8	22435.21	947.78	0.06
Reach	26	5-year High	Pr Floodwall 5ft	136800.00	690.05	721.80	702.96	722.28	0.000106	5.5	25177.01	1018.92	0.19
Reach	26	5-year High	Pr Floodwall 2ft	136800.00	690.05	721.80	702.96	722.28	0.000106	5.5	25177.01	1018.92	0.19
Reach	26	2-year High	Pr Floodwall 5ft	101800.00	690.05	720.23	701.29	720.52	0.000071	4.4	23592.70	977.93	0.15
Reach	26	2-year High	Pr Floodwall 2ft	101800.00	690.05	720.23	701.29	720.52	0.000071	4.4	23592.70	977.93	0.15
Reach	26	Normal	Pr Floodwall 5ft	12700.00	690.05	710.95	695.23	710.96	0.000005	0.8	14993.80	899.73	0.04
Reach	26	Normal	Pr Floodwall 2ft	12700.00	690.05	710.95	695.23	710.96	0.000005	0.8	14993.80	899.73	0.04
Reach	25.5			Bridge									
Reach	25	1-year Low	Pr Floodwall 5ft	39690.00	686.75	712.11		712.21	0.000040	2.5	15803.08	906.72	0.11
Reach	25	1-year Low	Pr Floodwall 2ft	39690.00	686.75	712.11		712.21	0.000040	2.5	15803.08	906.72	0.11
Reach	25	2-year Low	Pr Floodwall 5ft	101800.00	686.75	716.08		716.51	0.000133	5.2	19431.82	923.01	0.20
Reach	25	2-year Low	Pr Floodwall 2ft	101800.00	686.75	716.08		716.51	0.000133	5.2	19431.82	923.01	0.20
Reach	25	5-year Low	Pr Floodwall 5ft	136800.00	686.75	720.58		721.11	0.000127	5.8	23630.38	943.52	0.20
Reach	25	5-year Low	Pr Floodwall 2ft	136800.00	686.75	720.58		721.11	0.000127	5.8	23630.38	943.52	0.20
Reach	25	25-year	Pr Floodwall 5ft	187200.00	686.75	726.22		726.89	0.000123	6.5	29161.64	1049.75	0.21
Reach	25	25-year	Pr Floodwall 2ft	187200.00	686.75	726.22		726.89	0.000123	6.5	29161.59	1049.74	0.21
Reach	25	10-year	Pr Floodwall 5ft	168500.00	686.75	723.69		724.33	0.000132	6.4	26605.78	973.80	0.21
Reach	25	10-year	Pr Floodwall 2ft	168500.00	686.75	723.69		724.33	0.000132	6.4	26605.78	973.80	0.21
Reach	25	50-year	Pr Floodwall 5ft	212000.00	686.75	728.42		729.16	0.000126	6.9	31630.33	1256.60	0.21
Reach	25	50-year	Pr Floodwall 2ft	212000.00	686.75	728.42		729.16	0.000126	6.9	31630.17	1256.56	0.21
Reach	25	100-year	Pr Floodwall 5ft	231000.00	686.75	730.30		731.08	0.000124	7.1	34298.91	1469.99	0.21
Reach	25	100-year	Pr Floodwall 2ft	231000.00	686.75	730.30		731.08	0.000124	7.1	34298.73	1469.99	0.21
Reach	25	1-year High	Pr Floodwall 5ft	39690.00	686.75	719.01		719.06	0.000013	1.8	22150.29	934.09	0.06
Reach	25	1-year High	Pr Floodwall 2ft	39690.00	686.75	719.01		719.06	0.000013	1.8	22150.29	934.09	0.06
Reach	25	5-year High	Pr Floodwall 5ft	136800.00	686.75	721.71		722.20	0.000110	5.6	24702.95	954.63	0.19
Reach	25	5-year High	Pr Floodwall 2ft	136800.00	686.75	721.71		722.20	0.000110	5.6	24702.95	954.63	0.19
Reach	25	2-year High	Pr Floodwall 5ft	101800.00	686.75	720.17		720.47	0.000074	4.4	23241.16	939.47	0.15
Reach	25	2-year High	Pr Floodwall 2ft	101800.00	686.75	720.17		720.47	0.000074	4.4	23241.16	939.47	0.15
Reach	25	Normal	Pr Floodwall 5ft	12700.00	686.75	710.95		710.96	0.000005	0.9	14751.57	897.17	0.04
Reach	25	Normal	Pr Floodwall 2ft	12700.00	686.75	710.95		710.96	0.000005	0.9	14751.57	897.17	0.04
Reach	24	1-year Low	Pr Floodwall 5ft	39690.00	689.54	712.11		712.20	0.000036	2.4	16676.21	964.89	0.10
Reach	24	1-year Low	Pr Floodwall 2ft	39690.00	689.54	712.11		712.20	0.000036	2.4	16676.21	964.89	0.10
Reach	24	2-year Low	Pr Floodwall 5ft	101800.00	689.54	716.08		716.46	0.000119	5.0	20534.47	980.03	0.19
Reach	24	2-year Low	Pr Floodwall 2ft	101800.00	689.54	716.08		716.46	0.000119	5.0	20534.47	980.03	0.19
Reach	24	5-year Low	Pr Floodwall 5ft	136800.00	689.54	720.59		721.06	0.000113	5.5	24987.83	993.78	0.19
Reach	24	5-year Low	Pr Floodwall 2ft	136800.00	689.54	720.59		721.06	0.000113	5.5	24987.83	993.78	0.19
Reach	24	25-year	Pr Floodwall 5ft	187200.00	689.54	726.24		726.83	0.000110	6.2	30741.92	1151.90	0.19
Reach	24	25-year	Pr Floodwall 2ft	187200.00	689.54	726.24		726.83	0.000110	6.2	30741.83	1151.89	0.19
Reach	24	10-year	Pr Floodwall 5ft	168500.00	689.54	723.71		724.27	0.000118	6.0	28099.63	1003.43	0.20
Reach	24	10-year	Pr Floodwall 2ft	168500.00	689.54	723.71		724.27	0.000118	6.0	28099.63	1003.43	0.20
Reach	24	50-year	Pr Floodwall 5ft	212000.00	689.54	728.44		729.10	0.000112	6.5	33621.03	1408.73	0.20
Reach	24	50-year	Pr Floodwall 2ft	212000.00	689.54	728.44		729.10	0.000112	6.5	33620.85	1408.68	0.20
Reach	24	100-year	Pr Floodwall 5ft	231000.00	689.54	730.32		731.02	0.000110	6.7	36410.70	1517.87	0.20
Reach	24	100-year	Pr Floodwall 2ft	231000.00	689.54	730.32		731.02	0.000110	6.7	36410.52	1517.87	0.20
Reach	24	1-year High	Pr Floodwall 5ft	39690.00	689.54	719.01		719.05	0.000012	1.7	23416.96	988.86	0.06
Reach	24	1-year High	Pr Floodwall 2ft	39690.00	689.54	719.01		719.05	0.000012	1.7	23416.96	988.86	0.06
Reach	24	5-year High	Pr Floodwall 5ft	136800.00	689.54	721.72		722.15	0.000098	5.3	26113.62	997.34	0.18
Reach	24	5-year High	Pr Floodwall 2ft	136800.00	689.54	721.72		722.15	0.000098	5.3	26113.62	997.34	0.18
Reach	24	2-year High	Pr Floodwall 5ft	101800.00	689.54	720.17		720.44	0.000066	4.2	24574.20	992.47	0.15
Reach	24	2-year High	Pr Floodwall 2ft	101800.00	689.54	720.17		720.44	0.000066	4.2	24574.20	992.47	0.15
Reach	24	Normal	Pr Floodwall 5ft	12700.00	689.54	710.95		710.96	0.000005	0.8	15555.52	958.17	0.04
Reach	24	Normal	Pr Floodwall 2ft	12700.00	689.54	710.95		710.96	0.000005	0.8	15555.52	958.17	0.04
Reach	23	1-year Low	Pr Floodwall 5ft	39690.00	688.70	712.10	697.55	712.19	0.000040	2.4	16237.26	968.25	0.11
Reach	23	1-year Low	Pr Floodwall 2ft	39690.00	688.70	712.10	697.55	712.19	0.000040	2.4	16237.26	968.25	0.11
Reach	23	2-year Low	Pr Floodwall 5ft	101800.00	688.70	716.05	701.52	716.45	0.000131	5.1	20112.64	994.58	0.20
Reach	23	2-year Low	Pr Floodwall 2ft	101800.00	688.70	716.05	701.52	716.45	0.000131	5.1	20112.64	994.58	0.20
Reach	23	5-year Low	Pr Floodwall 5ft	136800.00	688.70	720.56	703.21	721.05	0.000123	5.6	24651.71	1016.10	0.20
Reach	23	5-year Low	Pr Floodwall 2ft	136800.00	688.70	720.56	703.21	721.05	0.000123	5.6	24651.71	1016.10	0.20
Reach	23	25-year	Pr Floodwall 5ft	187200.00	688.70	726.21	705.39	726.81	0.000117	6.3	30579.14	1163.29	0.20

HEC-RAS River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	23	25-year	Pr Floodwall 2ft	187200.00	688.70	726.21	705.39	726.81	0.000117	6.3	30579.06	1163.29	0.20
Reach	23	10-year	Pr Floodwall 5ft	168500.00	688.70	723.67	704.60	724.26	0.000126	6.1	27849.91	1041.31	0.20
Reach	23	10-year	Pr Floodwall 2ft	168500.00	688.70	723.67	704.60	724.26	0.000126	6.1	27849.91	1041.31	0.20
Reach	23	50-year	Pr Floodwall 5ft	212000.00	688.70	728.41	706.36	729.09	0.000119	6.6	33162.62	1180.30	0.20
Reach	23	50-year	Pr Floodwall 2ft	212000.00	688.70	728.41	706.36	729.09	0.000119	6.6	33162.47	1180.30	0.20
Reach	23	100-year	Pr Floodwall 5ft	231000.00	688.70	730.29	707.08	731.00	0.000117	6.8	35397.80	1208.51	0.20
Reach	23	100-year	Pr Floodwall 2ft	231000.00	688.70	730.29	707.08	731.00	0.000117	6.8	35397.66	1208.50	0.20
Reach	23	1-year High	Pr Floodwall 5ft	39690.00	688.70	719.00	697.55	719.05	0.000013	1.7	23075.88	1008.93	0.06
Reach	23	1-year High	Pr Floodwall 2ft	39690.00	688.70	719.00	697.55	719.05	0.000013	1.7	23075.88	1008.93	0.06
Reach	23	5-year High	Pr Floodwall 5ft	136800.00	688.70	721.69	703.22	722.14	0.000106	5.4	25808.81	1022.64	0.18
Reach	23	5-year High	Pr Floodwall 2ft	136800.00	688.70	721.69	703.22	722.14	0.000106	5.4	25808.81	1022.64	0.18
Reach	23	2-year High	Pr Floodwall 5ft	101800.00	688.70	720.16	701.52	720.43	0.000072	4.2	24242.40	1013.89	0.15
Reach	23	2-year High	Pr Floodwall 2ft	101800.00	688.70	720.16	701.52	720.43	0.000072	4.2	24242.40	1013.89	0.15
Reach	23	Normal	Pr Floodwall 5ft	12700.00	688.70	710.94	694.58	710.96	0.000005	0.8	15127.02	951.15	0.04
Reach	23	Normal	Pr Floodwall 2ft	12700.00	688.70	710.94	694.58	710.96	0.000005	0.8	15127.02	951.15	0.04
Reach	22.5			Bridge									
Reach	22	1-year Low	Pr Floodwall 5ft	39690.00	689.39	712.09	697.71	712.18	0.000040	2.5	16194.77	966.51	0.11
Reach	22	1-year Low	Pr Floodwall 2ft	39690.00	689.39	712.09	697.71	712.18	0.000040	2.5	16194.77	966.51	0.11
Reach	22	2-year Low	Pr Floodwall 5ft	101800.00	689.39	716.00	701.62	716.40	0.000131	5.1	20004.03	981.98	0.20
Reach	22	2-year Low	Pr Floodwall 2ft	101800.00	689.39	716.00	701.62	716.40	0.000131	5.1	20004.03	981.98	0.20
Reach	22	5-year Low	Pr Floodwall 5ft	136800.00	689.39	720.51	703.29	721.00	0.000123	5.6	24466.84	998.39	0.20
Reach	22	5-year Low	Pr Floodwall 2ft	136800.00	689.39	720.51	703.29	721.00	0.000123	5.6	24466.84	998.39	0.20
Reach	22	25-year	Pr Floodwall 5ft	187200.00	689.39	726.15	705.43	726.76	0.000117	6.3	30264.31	1102.27	0.20
Reach	22	25-year	Pr Floodwall 2ft	187200.00	689.39	726.15	705.43	726.76	0.000117	6.3	30264.25	1102.27	0.20
Reach	22	10-year	Pr Floodwall 5ft	168500.00	689.39	723.61	704.67	724.20	0.000126	6.2	27596.46	1032.39	0.20
Reach	22	10-year	Pr Floodwall 2ft	168500.00	689.39	723.61	704.67	724.20	0.000126	6.2	27596.46	1032.39	0.20
Reach	22	50-year	Pr Floodwall 5ft	212000.00	689.39	728.34	706.40	729.02	0.000119	6.6	32709.55	1126.07	0.20
Reach	22	50-year	Pr Floodwall 2ft	212000.00	689.39	728.34	706.40	729.02	0.000119	6.6	32709.36	1126.07	0.20
Reach	22	100-year	Pr Floodwall 5ft	231000.00	689.39	730.22	707.12	730.94	0.000117	6.8	34858.57	1181.37	0.20
Reach	22	100-year	Pr Floodwall 2ft	231000.00	689.39	730.22	707.12	730.94	0.000117	6.8	34858.35	1181.36	0.20
Reach	22	1-year High	Pr Floodwall 5ft	39690.00	689.39	719.00	697.71	719.05	0.000013	1.7	22964.16	992.85	0.06
Reach	22	1-year High	Pr Floodwall 2ft	39690.00	689.39	719.00	697.71	719.05	0.000013	1.7	22964.16	992.85	0.06
Reach	22	5-year High	Pr Floodwall 5ft	136800.00	689.39	721.65	703.29	722.10	0.000106	5.4	25607.82	1002.58	0.18
Reach	22	5-year High	Pr Floodwall 2ft	136800.00	689.39	721.65	703.29	722.10	0.000106	5.4	25607.82	1002.58	0.18
Reach	22	2-year High	Pr Floodwall 5ft	101800.00	689.39	720.13	701.62	720.41	0.000071	4.2	24087.50	997.12	0.15
Reach	22	2-year High	Pr Floodwall 2ft	101800.00	689.39	720.13	701.62	720.41	0.000071	4.2	24087.50	997.12	0.15
Reach	22	Normal	Pr Floodwall 5ft	12700.00	689.39	710.94	695.12	710.95	0.000005	0.8	15090.56	957.86	0.04
Reach	22	Normal	Pr Floodwall 2ft	12700.00	689.39	710.94	695.12	710.95	0.000005	0.8	15090.56	957.86	0.04
Reach	21	1-year Low	Pr Floodwall 5ft	39690.00	689.92	712.08	697.85	712.17	0.000037	2.4	16494.53	951.63	0.10
Reach	21	1-year Low	Pr Floodwall 2ft	39690.00	689.92	712.08	697.85	712.17	0.000037	2.4	16494.53	951.63	0.10
Reach	21	2-year Low	Pr Floodwall 5ft	101800.00	689.92	715.97	701.40	716.36	0.000124	5.0	20209.77	960.35	0.19
Reach	21	2-year Low	Pr Floodwall 2ft	101800.00	689.92	715.97	701.40	716.36	0.000124	5.0	20209.77	960.35	0.19
Reach	21	5-year Low	Pr Floodwall 5ft	136800.00	689.92	720.48	703.02	720.96	0.000118	5.6	24564.92	972.01	0.19
Reach	21	5-year Low	Pr Floodwall 2ft	136800.00	689.92	720.48	703.02	720.96	0.000118	5.6	24564.92	972.01	0.19
Reach	21	25-year	Pr Floodwall 5ft	187200.00	689.92	726.11	705.14	726.72	0.000113	6.3	30312.59	1082.53	0.20
Reach	21	25-year	Pr Floodwall 2ft	187200.00	689.92	726.11	705.14	726.72	0.000113	6.3	30312.52	1082.53	0.20
Reach	21	10-year	Pr Floodwall 5ft	168500.00	689.92	723.58	704.39	724.16	0.000122	6.1	27624.46	1018.42	0.20
Reach	21	10-year	Pr Floodwall 2ft	168500.00	689.92	723.58	704.39	724.16	0.000122	6.1	27624.46	1018.42	0.20
Reach	21	50-year	Pr Floodwall 5ft	212000.00	689.92	728.31	706.10	728.99	0.000116	6.6	32705.85	1106.36	0.20
Reach	21	50-year	Pr Floodwall 2ft	212000.00	689.92	728.31	706.10	728.99	0.000116	6.6	32705.64	1106.35	0.20
Reach	21	100-year	Pr Floodwall 5ft	231000.00	689.92	730.19	706.80	730.90	0.000114	6.8	34846.15	1173.76	0.20
Reach	21	100-year	Pr Floodwall 2ft	231000.00	689.92	730.19	706.80	730.90	0.000114	6.8	34845.95	1173.76	0.20
Reach	21	1-year High	Pr Floodwall 5ft	39690.00	689.92	719.00	697.85	719.04	0.000012	1.7	23128.89	968.19	0.06
Reach	21	1-year High	Pr Floodwall 2ft	39690.00	689.92	719.00	697.85	719.04	0.000012	1.7	23128.89	968.19	0.06
Reach	21	5-year High	Pr Floodwall 5ft	136800.00	689.92	721.62	703.02	722.06	0.000102	5.3	25679.21	974.96	0.18
Reach	21	5-year High	Pr Floodwall 2ft	136800.00	689.92	721.62	703.02	722.06	0.000102	5.3	25679.21	974.96	0.18
Reach	21	2-year High	Pr Floodwall 5ft	101800.00	689.92	720.11	701.40	720.39	0.000068	4.2	24208.77	971.05	0.15
Reach	21	2-year High	Pr Floodwall 2ft	101800.00	689.92	720.11	701.40	720.39	0.000068	4.2	24208.77	971.05	0.15
Reach	21	Normal	Pr Floodwall 5ft	12700.00	689.92	710.94	694.94	710.95	0.000005	0.8	15412.61	947.89	0.04
Reach	21	Normal	Pr Floodwall 2ft	12700.00	689.92	710.94	694.94	710.95	0.000005	0.8	15412.61	947.89	0.04
Reach	20	1-year Low	Pr Floodwall 5ft	39690.00	691.23	712.07	697.48	712.15	0.000035	2.3	16979.62	995.12	0.10
Reach	20	1-year Low	Pr Floodwall 2ft	39690.00	691.23	712.07	697.48	712.15	0.000035	2.3	16979.62	995.12	0.10
Reach	20	2-year Low	Pr Floodwall 5ft	101800.00	691.23	715.92	701.09	716.30	0.000118	4.9	20887.71	1027.85	0.19
Reach	20	2-year Low	Pr Floodwall 2ft	101800.00	691.23	715.92	701.09	716.30	0.000118	4.9	20887.71	1027.85	0.19
Reach	20	5-year Low	Pr Floodwall 5ft	136800.00	691.23	720.44	702.75	720.89	0.000111	5.4	25543.55	1033.63	0.19
Reach	20	5-year Low	Pr Floodwall 2ft	136800.00	691.23	720.44	702.75	720.89	0.000111	5.4	25543.55	1033.63	0.19
Reach	20	25-year	Pr Floodwall 5ft	187200.00	691.23	726.09	704.84	726.65	0.000106	6.0	31553.86	1161.23	0.19
Reach	20	25-year	Pr Floodwall 2ft	187200.00	691.23	726.09	704.84	726.65	0.000106	6.0	31553.79	1161.23	0.19
Reach	20	10-year	Pr Floodwall 5ft	168500.00	691.23	723.55	704.08	724.09	0.000115	5.9	28778.27	1075.61	0.20
Reach	20	10-year	Pr Floodwall 2ft	168500.00	691.23	723.55	704.08	724.09	0.000115	5.9	28778.27	1075.61	0.20
Reach	20	50-year	Pr Floodwall 5ft	212000.00	691.23	728.29	705.80	728.92	0.000108	6.4	34182.91	1286.57	0.19
Reach	20	50-year	Pr Floodwall 2ft	212000.00	691.23	728.29	705.80	728.92	0.000108	6.4	34182.59	1286.56	0.19
Reach	20	100-year	Pr Floodwall 5ft	231000.00	691.23	730.17	706.51	730.83	0.000106	6.6	36624.51	1363.04	0.19
Reach	20	100-year	Pr Floodwall 2ft	231000.00	691.23	730.17	706.51	730.83	0.000106	6.6	36624.27	1363.04	0.19
Reach	20	1-year High	Pr Floodwall 5ft	39690.00	691.23	718.99	697.48	719.03	0.000011	1.7	24046.66	1031.81	0.06
Reach	20	1-year High	Pr Floodwall 2ft	39690.00	691.23	718.99	697.48	719.03	0.000011	1.7	24046.66	1031.81	0.06
Reach	20	5-year High	Pr Floodwall 5ft	136800.00	691.23	721.59	702.75	722.01	0.000096	5.2	26734.16	1035.08	0.18
Reach	20	5-year High	Pr Floodwall 2ft	136800.00	691.23	721.59	702.75	722.01	0.000096	5.2	26734.16	1035.08	0.18
Reach	20	2-year High	Pr Floodwall 5ft	101800.00	691.23	720.09	701.09	720.35	0.000064	4.1	25179.61	1033.19	0.14
Reach	20	2-year High	Pr Floodwall 2ft	101800.00	691.23	720.09	701.09	720.35	0.000064	4.1	25179.61	1033.19	0.14
Reach	20	Normal	Pr Floodwall 5ft	12700.00	691.23	710.94	695.15	710.95	0.000004	0.8	15865.80	982.92	0.04

HEC-RAS River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	20	Normal	Pr Floodwall 2ft	12700.00	691.23	710.94	695.15	710.95	0.000004	0.8	15865.80	982.92	0.04
Reach	19	1-year Low	Pr Floodwall 5ft	39690.00	692.33	712.06	697.90	712.14	0.000038	2.4	16779.09	1015.99	0.10
Reach	19	1-year Low	Pr Floodwall 2ft	39690.00	692.33	712.06	697.90	712.14	0.000038	2.4	16779.09	1015.99	0.10
Reach	19	2-year Low	Pr Floodwall 5ft	101800.00	692.33	715.89	701.56	716.27	0.000124	4.9	20720.41	1038.96	0.19
Reach	19	2-year Low	Pr Floodwall 2ft	101800.00	692.33	715.89	701.56	716.27	0.000124	4.9	20720.41	1038.96	0.19
Reach	19	5-year Low	Pr Floodwall 5ft	136800.00	692.33	720.42	703.18	720.87	0.000115	5.4	25454.31	1083.45	0.19
Reach	19	5-year Low	Pr Floodwall 2ft	136800.00	692.33	720.42	703.18	720.87	0.000115	5.4	25454.31	1083.45	0.19
Reach	19	25-year	Pr Floodwall 5ft	187200.00	692.33	726.07	705.28	726.63	0.000108	6.0	31543.24	1248.69	0.19
Reach	19	25-year	Pr Floodwall 2ft	187200.00	692.33	726.07	705.28	726.63	0.000108	6.0	31543.16	1248.68	0.19
Reach	19	10-year	Pr Floodwall 5ft	168500.00	692.33	723.52	704.53	724.07	0.000117	5.9	28739.61	1170.29	0.20
Reach	19	10-year	Pr Floodwall 2ft	168500.00	692.33	723.52	704.53	724.07	0.000117	5.9	28739.61	1170.29	0.20
Reach	19	50-year	Pr Floodwall 5ft	212000.00	692.33	728.27	706.24	728.89	0.000110	6.4	34075.38	1272.02	0.20
Reach	19	50-year	Pr Floodwall 2ft	212000.00	692.33	728.27	706.24	728.89	0.000110	6.4	34075.10	1272.02	0.20
Reach	19	100-year	Pr Floodwall 5ft	231000.00	692.33	730.15	706.93	730.81	0.000108	6.5	36357.91	1393.75	0.20
Reach	19	100-year	Pr Floodwall 2ft	231000.00	692.33	730.15	706.93	730.81	0.000108	6.5	36357.66	1393.62	0.20
Reach	19	1-year High	Pr Floodwall 5ft	39690.00	692.33	718.99	697.90	719.03	0.000012	1.7	23957.69	1077.81	0.06
Reach	19	1-year High	Pr Floodwall 2ft	39690.00	692.33	718.99	697.90	719.03	0.000012	1.7	23957.69	1077.81	0.06
Reach	19	5-year High	Pr Floodwall 5ft	136800.00	692.33	721.57	703.18	721.99	0.000099	5.2	26668.56	1089.31	0.18
Reach	19	5-year High	Pr Floodwall 2ft	136800.00	692.33	721.57	703.18	721.99	0.000099	5.2	26668.56	1089.31	0.18
Reach	19	2-year High	Pr Floodwall 5ft	101800.00	692.33	720.07	701.56	720.33	0.000067	4.1	25096.08	1082.19	0.15
Reach	19	2-year High	Pr Floodwall 2ft	101800.00	692.33	720.07	701.56	720.33	0.000067	4.1	25096.08	1082.19	0.15
Reach	19	Normal	Pr Floodwall 5ft	12700.00	692.33	710.94	695.54	710.95	0.000005	0.8	15647.94	1006.60	0.04
Reach	19	Normal	Pr Floodwall 2ft	12700.00	692.33	710.94	695.54	710.95	0.000005	0.8	15647.94	1006.60	0.04
Reach	18	1-year Low	Pr Floodwall 5ft	39690.00	690.71	712.05	697.98	712.14	0.000038	2.4	16874.60	1034.82	0.10
Reach	18	1-year Low	Pr Floodwall 2ft	39690.00	690.71	712.05	697.98	712.14	0.000038	2.4	16874.60	1034.82	0.10
Reach	18	2-year Low	Pr Floodwall 5ft	101800.00	690.71	715.87	701.64	716.24	0.000124	4.9	20874.86	1051.21	0.19
Reach	18	2-year Low	Pr Floodwall 2ft	101800.00	690.71	715.87	701.64	716.24	0.000124	4.9	20874.86	1051.21	0.19
Reach	18	5-year Low	Pr Floodwall 5ft	136800.00	690.71	720.40	703.26	720.85	0.000114	5.4	25645.30	1141.53	0.19
Reach	18	5-year Low	Pr Floodwall 2ft	136800.00	690.71	720.40	703.26	720.85	0.000114	5.4	25645.30	1141.53	0.19
Reach	18	25-year	Pr Floodwall 5ft	187200.00	690.71	726.06	705.33	726.61	0.000107	6.0	31713.61	1253.54	0.19
Reach	18	25-year	Pr Floodwall 2ft	187200.00	690.71	726.05	705.33	726.61	0.000107	6.0	31713.53	1253.54	0.19
Reach	18	10-year	Pr Floodwall 5ft	168500.00	690.71	723.51	704.58	724.04	0.000116	5.9	28938.75	1166.54	0.20
Reach	18	10-year	Pr Floodwall 2ft	168500.00	690.71	723.51	704.58	724.04	0.000116	5.9	28938.75	1166.54	0.20
Reach	18	50-year	Pr Floodwall 5ft	212000.00	690.71	728.26	706.27	728.87	0.000109	6.3	34256.29	1269.51	0.19
Reach	18	50-year	Pr Floodwall 2ft	212000.00	690.71	728.26	706.27	728.87	0.000109	6.3	34255.99	1269.50	0.19
Reach	18	100-year	Pr Floodwall 5ft	231000.00	690.71	730.14	706.96	730.78	0.000107	6.5	36487.79	1343.71	0.19
Reach	18	100-year	Pr Floodwall 2ft	231000.00	690.71	730.14	706.96	730.78	0.000107	6.5	36487.55	1343.70	0.19
Reach	18	1-year High	Pr Floodwall 5ft	39690.00	690.71	718.99	697.98	719.03	0.000012	1.6	24153.99	1082.09	0.06
Reach	18	1-year High	Pr Floodwall 2ft	39690.00	690.71	718.99	697.98	719.03	0.000012	1.6	24153.99	1082.09	0.06
Reach	18	5-year High	Pr Floodwall 5ft	136800.00	690.71	721.56	703.26	721.97	0.000098	5.1	26870.39	1153.38	0.18
Reach	18	5-year High	Pr Floodwall 2ft	136800.00	690.71	721.56	703.26	721.97	0.000098	5.1	26870.39	1153.38	0.18
Reach	18	2-year High	Pr Floodwall 5ft	101800.00	690.71	720.06	701.64	720.32	0.000066	4.0	25291.76	1091.03	0.14
Reach	18	2-year High	Pr Floodwall 2ft	101800.00	690.71	720.06	701.64	720.32	0.000066	4.0	25291.76	1091.03	0.14
Reach	18	Normal	Pr Floodwall 5ft	12700.00	690.71	710.94	695.60	710.95	0.000005	0.8	15727.84	1016.29	0.04
Reach	18	Normal	Pr Floodwall 2ft	12700.00	690.71	710.94	695.60	710.95	0.000005	0.8	15727.84	1016.29	0.04
Reach	17.5			Bridge									
Reach	17	1-year Low	Pr Floodwall 5ft	39690.00	690.70	712.04	698.05	712.12	0.000036	2.3	17110.04	1033.76	0.10
Reach	17	1-year Low	Pr Floodwall 2ft	39690.00	690.70	712.04	698.05	712.12	0.000036	2.3	17110.04	1033.76	0.10
Reach	17	2-year Low	Pr Floodwall 5ft	101800.00	690.70	715.80	701.48	716.16	0.000121	4.8	21107.97	1100.81	0.19
Reach	17	2-year Low	Pr Floodwall 2ft	101800.00	690.70	715.80	701.48	716.16	0.000121	4.8	21107.97	1100.81	0.19
Reach	17	5-year Low	Pr Floodwall 5ft	136800.00	690.70	720.28	703.07	720.72	0.000111	5.3	26050.45	1146.37	0.19
Reach	17	5-year Low	Pr Floodwall 2ft	136800.00	690.70	720.28	703.07	720.72	0.000111	5.3	26050.45	1146.37	0.19
Reach	17	25-year	Pr Floodwall 5ft	187200.00	690.70	725.84	705.12	726.38	0.000105	5.9	32378.18	1275.41	0.19
Reach	17	25-year	Pr Floodwall 2ft	187200.00	690.70	725.84	705.12	726.38	0.000105	5.9	32378.10	1275.41	0.19
Reach	17	10-year	Pr Floodwall 5ft	168500.00	690.70	723.34	704.39	723.86	0.000114	5.8	29465.45	1197.91	0.19
Reach	17	10-year	Pr Floodwall 2ft	168500.00	690.70	723.34	704.39	723.86	0.000114	5.8	29465.45	1197.91	0.19
Reach	17	50-year	Pr Floodwall 5ft	212000.00	690.70	728.00	706.06	728.60	0.000106	6.2	34995.91	1290.63	0.19
Reach	17	50-year	Pr Floodwall 2ft	212000.00	690.70	728.00	706.06	728.59	0.000106	6.2	34995.68	1290.63	0.19
Reach	17	100-year	Pr Floodwall 5ft	231000.00	690.70	729.84	706.75	730.47	0.000105	6.4	37260.27	1312.20	0.19
Reach	17	100-year	Pr Floodwall 2ft	231000.00	690.70	729.84	706.75	730.47	0.000105	6.4	37260.04	1312.20	0.19
Reach	17	1-year High	Pr Floodwall 5ft	39690.00	690.70	718.92	698.05	718.96	0.000011	1.6	24550.05	1143.98	0.06
Reach	17	1-year High	Pr Floodwall 2ft	39690.00	690.70	718.92	698.05	718.96	0.000011	1.6	24550.05	1143.98	0.06
Reach	17	5-year High	Pr Floodwall 5ft	136800.00	690.70	721.43	703.07	721.82	0.000095	5.1	27322.30	1153.51	0.18
Reach	17	5-year High	Pr Floodwall 2ft	136800.00	690.70	721.43	703.07	721.82	0.000095	5.1	27322.30	1153.51	0.18
Reach	17	2-year High	Pr Floodwall 5ft	101800.00	690.70	719.97	701.48	720.22	0.000064	4.0	25707.03	1145.59	0.14
Reach	17	2-year High	Pr Floodwall 2ft	101800.00	690.70	719.97	701.48	720.22	0.000064	4.0	25707.03	1145.59	0.14
Reach	17	Normal	Pr Floodwall 5ft	12700.00	690.70	710.94	695.80	710.95	0.000005	0.8	15980.23	1022.61	0.04
Reach	17	Normal	Pr Floodwall 2ft	12700.00	690.70	710.94	695.80	710.95	0.000005	0.8	15980.23	1022.61	0.04
Reach	16	1-year Low	Pr Floodwall 5ft	39690.00	690.63	712.03	697.67	712.11	0.000036	2.3	16906.15	987.03	0.10
Reach	16	1-year Low	Pr Floodwall 2ft	39690.00	690.63	712.03	697.66	712.11	0.000036	2.3	16906.15	987.03	0.10
Reach	16	2-year Low	Pr Floodwall 5ft	101800.00	690.63	715.75	701.21	716.13	0.000121	4.9	20861.97	1103.50	0.19
Reach	16	2-year Low	Pr Floodwall 2ft	101800.00	690.63	715.75	701.24	716.13	0.000121	4.9	20861.97	1103.50	0.19
Reach	16	5-year Low	Pr Floodwall 5ft	136800.00	690.63	720.23	702.87	720.68	0.000114	5.4	25807.14	1107.93	0.19
Reach	16	5-year Low	Pr Floodwall 2ft	136800.00	690.63	720.23	702.88	720.68	0.000114	5.4	25807.14	1107.93	0.19
Reach	16	25-year	Pr Floodwall 5ft	187200.00	690.63	725.78	704.95	726.35	0.000109	6.1	32066.10	1248.22	0.19
Reach	16	25-year	Pr Floodwall 2ft	187200.00	690.63	725.78	704.95	726.35	0.000109	6.1	32066.01	1248.22	0.19
Reach	16	10-year	Pr Floodwall 5ft	168500.00	690.63	723.28	704.20	723.83	0.000117	6.0	29195.55	1131.20	0.20
Reach	16	10-year	Pr Floodwall 2ft	168500.00	690.63	723.28	704.20	723.83	0.000117	6.0	29195.55	1173.13	0.20
Reach	16	50-year	Pr Floodwall 5ft	212000.00	690.63	727.93	705.90	728.56	0.000111	6.4	34626.16	1258.48	0.20
Reach	16	50-year	Pr Floodwall 2ft	212000.00	690.63	727.93	705.90	728.56	0.000111	6.4	34625.95	1258.48	0.20

HEC-RAS River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	16	100-year	Pr Floodwall 5ft	231000.00	690.63	729.77	706.59	730.43	0.000109	6.6	36823.70	1261.67	0.20
Reach	16	100-year	Pr Floodwall 2ft	231000.00	690.63	729.77	706.61	730.43	0.000109	6.6	36823.49	1261.67	0.20
Reach	16	1-year High	Pr Floodwall 5ft	39690.00	690.63	718.92	697.67	718.96	0.000011	1.7	24356.16	1106.44	0.06
Reach	16	1-year High	Pr Floodwall 2ft	39690.00	690.63	718.92	697.66	718.96	0.000011	1.7	24356.16	1106.44	0.06
Reach	16	5-year High	Pr Floodwall 5ft	136800.00	690.63	721.38	702.87	721.80	0.000098	5.2	27086.06	1115.16	0.18
Reach	16	5-year High	Pr Floodwall 2ft	136800.00	690.63	721.38	702.88	721.80	0.000098	5.2	27086.06	1115.16	0.18
Reach	16	2-year High	Pr Floodwall 5ft	101800.00	690.63	719.94	701.21	720.20	0.000065	4.1	25488.77	1107.55	0.14
Reach	16	2-year High	Pr Floodwall 2ft	101800.00	690.63	719.94	701.24	720.20	0.000065	4.1	25488.77	1107.55	0.14
Reach	16	Normal	Pr Floodwall 5ft	12700.00	690.63	710.94	695.41	710.95	0.000004	0.8	15833.90	979.87	0.04
Reach	16	Normal	Pr Floodwall 2ft	12700.00	690.63	710.94	695.41	710.95	0.000004	0.8	15833.90	979.87	0.04
Reach	15	1-year Low	Pr Floodwall 5ft	39690.00	689.96	712.02	697.26	712.11	0.000033	2.3	17189.71	970.79	0.10
Reach	15	1-year Low	Pr Floodwall 2ft	39690.00	689.96	712.02	697.27	712.11	0.000033	2.3	17189.71	970.79	0.10
Reach	15	2-year Low	Pr Floodwall 5ft	101800.00	689.96	715.75	700.78	716.12	0.000114	4.9	21092.61	1089.74	0.19
Reach	15	2-year Low	Pr Floodwall 2ft	101800.00	689.96	715.75	700.78	716.12	0.000114	4.9	21092.61	1089.74	0.19
Reach	15	5-year Low	Pr Floodwall 5ft	136800.00	689.96	720.22	702.43	720.67	0.000109	5.4	25975.17	1093.89	0.19
Reach	15	5-year Low	Pr Floodwall 2ft	136800.00	689.96	720.22	702.40	720.67	0.000109	5.4	25975.17	1093.89	0.19
Reach	15	25-year	Pr Floodwall 5ft	187200.00	689.96	725.77	704.52	726.33	0.000105	6.1	32088.13	1192.01	0.19
Reach	15	25-year	Pr Floodwall 2ft	187200.00	689.96	725.77	704.51	726.33	0.000105	6.1	32087.97	1192.01	0.19
Reach	15	10-year	Pr Floodwall 5ft	168500.00	689.96	723.27	703.76	723.81	0.000113	5.9	29319.97	1117.05	0.19
Reach	15	10-year	Pr Floodwall 2ft	168500.00	689.96	723.27	703.76	723.81	0.000113	5.9	29319.97	1158.70	0.19
Reach	15	50-year	Pr Floodwall 5ft	212000.00	689.96	727.92	705.46	728.55	0.000108	6.4	34584.26	1234.79	0.19
Reach	15	50-year	Pr Floodwall 2ft	212000.00	689.96	727.92	705.47	728.55	0.000108	6.4	34584.05	1234.79	0.19
Reach	15	100-year	Pr Floodwall 5ft	231000.00	689.96	729.76	706.17	730.42	0.000107	6.6	36741.84	1240.42	0.20
Reach	15	100-year	Pr Floodwall 2ft	231000.00	689.96	729.76	706.17	730.42	0.000107	6.6	36741.63	1240.42	0.20
Reach	15	1-year High	Pr Floodwall 5ft	39690.00	689.96	718.92	697.26	718.96	0.000011	1.7	24550.82	1092.61	0.06
Reach	15	1-year High	Pr Floodwall 2ft	39690.00	689.96	718.92	697.27	718.96	0.000011	1.7	24550.82	1092.61	0.06
Reach	15	5-year High	Pr Floodwall 5ft	136800.00	689.96	721.37	702.43	721.79	0.000094	5.2	27239.01	1095.58	0.18
Reach	15	5-year High	Pr Floodwall 2ft	136800.00	689.96	721.37	702.40	721.79	0.000094	5.2	27239.01	1095.58	0.18
Reach	15	2-year High	Pr Floodwall 5ft	101800.00	689.96	719.94	700.78	720.19	0.000063	4.1	25664.90	1093.52	0.14
Reach	15	2-year High	Pr Floodwall 2ft	101800.00	689.96	719.94	700.78	720.19	0.000063	4.1	25664.90	1093.52	0.14
Reach	15	Normal	Pr Floodwall 5ft	12700.00	689.96	710.93	694.98	710.94	0.000004	0.8	16136.09	964.86	0.03
Reach	15	Normal	Pr Floodwall 2ft	12700.00	689.96	710.93	694.99	710.94	0.000004	0.8	16136.09	964.86	0.03
Reach	14	1-year Low	Pr Floodwall 5ft	39690.00	690.18	712.01	697.48	712.10	0.000035	2.4	16787.13	963.43	0.10
Reach	14	1-year Low	Pr Floodwall 2ft	39690.00	690.18	712.01	697.48	712.10	0.000035	2.4	16787.13	963.43	0.10
Reach	14	2-year Low	Pr Floodwall 5ft	101800.00	690.18	715.72	701.09	716.10	0.000121	5.0	20686.68	1083.47	0.19
Reach	14	2-year Low	Pr Floodwall 2ft	101800.00	690.18	715.72	701.08	716.10	0.000121	5.0	20686.68	1083.47	0.19
Reach	14	5-year Low	Pr Floodwall 5ft	136800.00	690.18	720.19	702.72	720.65	0.000114	5.5	25544.55	1087.55	0.19
Reach	14	5-year Low	Pr Floodwall 2ft	136800.00	690.18	720.19	702.72	720.65	0.000114	5.5	25544.57	1087.56	0.19
Reach	14	25-year	Pr Floodwall 5ft	187200.00	690.18	725.75	704.83	726.32	0.000109	6.1	31606.64	1157.61	0.19
Reach	14	25-year	Pr Floodwall 2ft	187200.00	690.18	725.75	704.83	726.32	0.000109	6.1	31606.78	1157.62	0.19
Reach	14	10-year	Pr Floodwall 5ft	168500.00	690.18	723.24	704.07	723.80	0.000118	6.0	28867.61	1090.21	0.20
Reach	14	10-year	Pr Floodwall 2ft	168500.00	690.18	723.24	704.08	723.80	0.000118	6.0	28867.76	1147.93	0.20
Reach	14	50-year	Pr Floodwall 5ft	212000.00	690.18	727.90	705.77	728.53	0.000111	6.5	34039.27	1210.86	0.20
Reach	14	50-year	Pr Floodwall 2ft	212000.00	690.18	727.90	705.79	728.53	0.000111	6.5	34039.34	1210.86	0.20
Reach	14	100-year	Pr Floodwall 5ft	231000.00	690.18	729.73	706.49	730.41	0.000110	6.7	36167.53	1222.95	0.20
Reach	14	100-year	Pr Floodwall 2ft	231000.00	690.18	729.73	706.49	730.41	0.000110	6.7	36167.75	1222.95	0.20
Reach	14	1-year High	Pr Floodwall 5ft	39690.00	690.18	718.91	697.48	718.96	0.000011	1.7	24156.43	1086.39	0.06
Reach	14	1-year High	Pr Floodwall 2ft	39690.00	690.18	718.91	697.48	718.96	0.000011	1.7	24156.44	1086.40	0.06
Reach	14	5-year High	Pr Floodwall 5ft	136800.00	690.18	721.35	702.72	721.77	0.000098	5.2	26805.74	1088.56	0.18
Reach	14	5-year High	Pr Floodwall 2ft	136800.00	690.18	721.35	702.72	721.77	0.000098	5.2	26805.78	1088.58	0.18
Reach	14	2-year High	Pr Floodwall 5ft	101800.00	690.18	719.92	701.09	720.18	0.000065	4.1	25249.73	1087.31	0.14
Reach	14	2-year High	Pr Floodwall 2ft	101800.00	690.18	719.92	701.08	720.18	0.000065	4.1	25249.75	1087.32	0.14
Reach	14	Normal	Pr Floodwall 5ft	12700.00	690.18	710.93	695.20	710.94	0.000004	0.8	15749.13	957.08	0.04
Reach	14	Normal	Pr Floodwall 2ft	12700.00	690.18	710.93	695.19	710.94	0.000004	0.8	15749.13	957.08	0.04
Reach	13	1-year Low	Pr Floodwall 5ft	39690.00	690.25	712.01	696.97	712.09	0.000034	2.4	16847.27	935.10	0.10
Reach	13	1-year Low	Pr Floodwall 2ft	39690.00	690.25	712.01	696.97	712.09	0.000034	2.4	16847.27	935.10	0.10
Reach	13	2-year Low	Pr Floodwall 5ft	101800.00	690.25	715.69	700.57	716.07	0.000119	5.0	20538.08	1049.68	0.19
Reach	13	2-year Low	Pr Floodwall 2ft	101800.00	690.25	715.69	700.57	716.07	0.000119	5.0	20538.08	1049.68	0.19
Reach	13	5-year Low	Pr Floodwall 5ft	136800.00	690.25	720.15	702.30	720.63	0.000114	5.6	25232.65	1052.19	0.19
Reach	13	5-year Low	Pr Floodwall 2ft	136800.00	690.25	720.15	702.30	720.63	0.000114	5.6	25232.65	1052.19	0.19
Reach	13	25-year	Pr Floodwall 5ft	187200.00	690.25	725.70	704.44	726.29	0.000111	6.2	31075.07	1096.45	0.20
Reach	13	25-year	Pr Floodwall 2ft	187200.00	690.25	725.70	704.43	726.29	0.000111	6.2	31075.01	1096.45	0.20
Reach	13	10-year	Pr Floodwall 5ft	168500.00	690.25	723.19	703.68	723.77	0.000119	6.1	28436.58	1054.01	0.20
Reach	13	10-year	Pr Floodwall 2ft	168500.00	690.25	723.19	703.66	723.77	0.000119	6.1	28436.58	1094.43	0.20
Reach	13	50-year	Pr Floodwall 5ft	212000.00	690.25	727.84	705.42	728.51	0.000114	6.6	33375.23	1139.19	0.20
Reach	13	50-year	Pr Floodwall 2ft	212000.00	690.25	727.84	705.42	728.51	0.000114	6.6	33375.04	1139.18	0.20
Reach	13	100-year	Pr Floodwall 5ft	231000.00	690.25	729.67	706.14	730.38	0.000113	6.8	35399.09	1149.06	0.20
Reach	13	100-year	Pr Floodwall 2ft	231000.00	690.25	729.67	706.15	730.38	0.000113	6.8	35398.96	1149.06	0.20
Reach	13	1-year High	Pr Floodwall 5ft	39690.00	690.25	718.91	696.97	718.95	0.000011	1.7	23926.06	1051.49	0.06
Reach	13	1-year High	Pr Floodwall 2ft	39690.00	690.25	718.91	696.97	718.95	0.000011	1.7	23926.06	1051.49	0.06
Reach	13	5-year High	Pr Floodwall 5ft	136800.00	690.25	721.31	702.30	721.75	0.000098	5.3	26455.92	1052.84	0.18
Reach	13	5-year High	Pr Floodwall 2ft	136800.00	690.25	721.31	702.30	721.75	0.000098	5.3	26455.92	1052.84	0.18
Reach	13	2-year High	Pr Floodwall 5ft	101800.00	690.25	719.90	700.57	720.17	0.000065	4.2	24965.39	1052.04	0.14
Reach	13	2-year High	Pr Floodwall 2ft	101800.00	690.25	719.90	700.57	720.17	0.000065	4.2	24965.39	1052.04	0.14
Reach	13	Normal	Pr Floodwall 5ft	12700.00	690.25	710.93	694.66	710.94	0.000004	0.8	15844.61	929.99	0.03
Reach	13	Normal	Pr Floodwall 2ft	12700.00	690.25	710.93	694.66	710.94	0.000004	0.8	15844.61	929.99	0.03
Reach	12	1-year Low	Pr Floodwall 5ft	39690.00	688.05	712.00	696.14	712.09	0.000031	2.3	17135.84	916.30	0.09
Reach	12	1-year Low	Pr Floodwall 2ft	39690.00	688.05	712.00	696.13	712.09	0.000031	2.3	17135.84	916.30	0.09
Reach	12	2-year Low	Pr Floodwall 5ft	101800.00	688.05	715.66	699.92	716.04	0.000111	5.0	20676.66	1000.75	0.18
Reach	12	2-year Low	Pr Floodwall 2ft	101800.00	688.05	715.66	699.92	716.04	0.000111	5.0	20676.66	1000.75	0.18
Reach	12	5-year Low	Pr Floodwall 5ft	136800.00	688.05	720.13	701.69	720.60	0.000108	5.5	25235.80	1048.93	0.19

HEC-RAS River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	12	5-year Low	Pr Floodwall 2ft	136800.00	688.05	720.13	701.69	720.60	0.000108	5.5	25235.80	1048.93	0.19
Reach	12	25-year	Pr Floodwall 5ft	187200.00	688.05	725.68	703.85	726.27	0.000106	6.2	30939.55	1097.86	0.19
Reach	12	25-year	Pr Floodwall 2ft	187200.00	688.05	725.68	703.86	726.27	0.000106	6.2	30939.48	1097.86	0.19
Reach	12	10-year	Pr Floodwall 5ft	168500.00	688.05	723.17	703.10	723.74	0.000114	6.1	28361.73	1052.94	0.20
Reach	12	10-year	Pr Floodwall 2ft	168500.00	688.05	723.17	703.08	723.74	0.000114	6.1	28361.73	1095.77	0.20
Reach	12	50-year	Pr Floodwall 5ft	212000.00	688.05	727.82	704.86	728.48	0.000110	6.6	33148.39	1099.65	0.20
Reach	12	50-year	Pr Floodwall 2ft	212000.00	688.05	727.82	704.87	728.48	0.000110	6.6	33148.20	1099.65	0.20
Reach	12	100-year	Pr Floodwall 5ft	231000.00	688.05	729.65	705.59	730.35	0.000109	6.8	35093.41	1148.36	0.20
Reach	12	100-year	Pr Floodwall 2ft	231000.00	688.05	729.65	705.58	730.35	0.000109	6.8	35093.27	1148.36	0.20
Reach	12	1-year High	Pr Floodwall 5ft	39690.00	688.05	718.91	696.14	718.95	0.000011	1.7	23980.33	1047.50	0.06
Reach	12	1-year High	Pr Floodwall 2ft	39690.00	688.05	718.91	696.13	718.95	0.000011	1.7	23980.33	1047.50	0.06
Reach	12	5-year High	Pr Floodwall 5ft	136800.00	688.05	721.30	701.69	721.73	0.000093	5.3	26432.22	1050.27	0.18
Reach	12	5-year High	Pr Floodwall 2ft	136800.00	688.05	721.30	701.69	721.73	0.000093	5.3	26432.22	1050.27	0.18
Reach	12	2-year High	Pr Floodwall 5ft	101800.00	688.05	719.89	699.92	720.15	0.000062	4.1	24984.19	1048.65	0.14
Reach	12	2-year High	Pr Floodwall 2ft	101800.00	688.05	719.89	699.92	720.15	0.000062	4.1	24984.19	1048.65	0.14
Reach	12	Normal	Pr Floodwall 5ft	12700.00	688.05	710.93	693.73	710.94	0.000004	0.8	16162.06	907.57	0.03
Reach	12	Normal	Pr Floodwall 2ft	12700.00	688.05	710.93	693.74	710.94	0.000004	0.8	16162.06	907.57	0.03
Reach	11	1-year Low	Pr Floodwall 5ft	39690.00	688.28	711.99	695.73	712.07	0.000030	2.3	16928.60	874.03	0.09
Reach	11	1-year Low	Pr Floodwall 2ft	39690.00	688.28	711.99	695.74	712.07	0.000030	2.3	16928.60	874.03	0.09
Reach	11	2-year Low	Pr Floodwall 5ft	101800.00	688.28	715.60	699.66	716.00	0.000112	5.1	20316.84	990.13	0.19
Reach	11	2-year Low	Pr Floodwall 2ft	101800.00	688.28	715.60	699.65	716.00	0.000112	5.1	20316.84	990.13	0.19
Reach	11	5-year Low	Pr Floodwall 5ft	136800.00	688.28	720.06	701.38	720.56	0.000111	5.7	24735.55	993.10	0.19
Reach	11	5-year Low	Pr Floodwall 2ft	136800.00	688.28	720.06	701.39	720.56	0.000111	5.7	24735.55	993.10	0.19
Reach	11	25-year	Pr Floodwall 5ft	187200.00	688.28	725.59	703.59	726.22	0.000112	6.4	30232.90	1038.62	0.20
Reach	11	25-year	Pr Floodwall 2ft	187200.00	688.28	725.59	703.61	726.22	0.000112	6.4	30233.15	1038.62	0.20
Reach	11	10-year	Pr Floodwall 5ft	168500.00	688.28	723.09	702.82	723.69	0.000118	6.3	27744.04	995.04	0.20
Reach	11	10-year	Pr Floodwall 2ft	168500.00	688.28	723.09	702.78	723.69	0.000118	6.3	27743.99	1036.81	0.20
Reach	11	50-year	Pr Floodwall 5ft	212000.00	688.28	727.72	704.62	728.43	0.000116	6.8	32496.69	1186.45	0.20
Reach	11	50-year	Pr Floodwall 2ft	212000.00	688.28	727.72	704.63	728.43	0.000116	6.8	32496.96	1186.46	0.20
Reach	11	100-year	Pr Floodwall 5ft	231000.00	688.28	729.54	705.37	730.30	0.000116	7.0	34703.25	1305.27	0.20
Reach	11	100-year	Pr Floodwall 2ft	231000.00	688.28	729.54	705.35	730.30	0.000116	7.0	34703.73	1305.28	0.20
Reach	11	1-year High	Pr Floodwall 5ft	39690.00	688.28	718.90	695.73	718.95	0.000011	1.7	23585.16	992.29	0.06
Reach	11	1-year High	Pr Floodwall 2ft	39690.00	688.28	718.90	695.74	718.95	0.000011	1.7	23585.16	992.29	0.06
Reach	11	5-year High	Pr Floodwall 5ft	136800.00	688.28	721.23	701.38	721.69	0.000097	5.4	25899.58	993.82	0.18
Reach	11	5-year High	Pr Floodwall 2ft	136800.00	688.28	721.23	701.39	721.69	0.000097	5.4	25899.58	993.82	0.18
Reach	11	2-year High	Pr Floodwall 5ft	101800.00	688.28	719.85	699.66	720.13	0.000063	4.3	24523.59	992.94	0.14
Reach	11	2-year High	Pr Floodwall 2ft	101800.00	688.28	719.85	699.65	720.13	0.000063	4.3	24523.59	992.94	0.14
Reach	11	Normal	Pr Floodwall 5ft	12700.00	688.28	710.93	693.25	710.94	0.000004	0.8	16006.06	870.23	0.03
Reach	11	Normal	Pr Floodwall 2ft	12700.00	688.28	710.93	693.27	710.94	0.000004	0.8	16006.06	870.23	0.03
Reach	10	1-year Low	Pr Floodwall 5ft	39690.00	688.91	711.98	696.07	712.07	0.000033	2.4	16536.75	884.17	0.10
Reach	10	1-year Low	Pr Floodwall 2ft	39690.00	688.91	711.98	696.07	712.07	0.000033	2.4	16536.75	884.17	0.10
Reach	10	2-year Low	Pr Floodwall 5ft	101800.00	688.91	715.57	699.99	715.98	0.000120	5.2	19926.07	994.47	0.19
Reach	10	2-year Low	Pr Floodwall 2ft	101800.00	688.91	715.57	699.96	715.98	0.000120	5.2	19926.07	994.47	0.19
Reach	10	5-year Low	Pr Floodwall 5ft	136800.00	688.91	720.03	701.74	720.53	0.000117	5.7	24370.59	997.65	0.19
Reach	10	5-year Low	Pr Floodwall 2ft	136800.00	688.91	720.03	701.74	720.53	0.000117	5.7	24370.60	997.66	0.19
Reach	10	25-year	Pr Floodwall 5ft	187200.00	688.91	725.56	704.01	726.20	0.000115	6.5	29903.07	1059.53	0.20
Reach	10	25-year	Pr Floodwall 2ft	187200.00	688.91	725.56	704.01	726.20	0.000115	6.4	29903.23	1059.53	0.20
Reach	10	10-year	Pr Floodwall 5ft	168500.00	688.91	723.06	703.19	723.67	0.000123	6.3	27395.96	999.80	0.20
Reach	10	10-year	Pr Floodwall 2ft	168500.00	688.91	723.06	703.20	723.67	0.000123	6.3	27396.07	1057.59	0.20
Reach	10	50-year	Pr Floodwall 5ft	212000.00	688.91	727.70	705.04	728.41	0.000118	6.8	32039.99	1061.20	0.20
Reach	10	50-year	Pr Floodwall 2ft	212000.00	688.91	727.70	705.04	728.41	0.000118	6.8	32040.16	1061.20	0.20
Reach	10	100-year	Pr Floodwall 5ft	231000.00	688.91	729.52	705.80	730.28	0.000118	7.1	33901.18	1118.42	0.21
Reach	10	100-year	Pr Floodwall 2ft	231000.00	688.91	729.52	705.76	730.28	0.000118	7.1	33901.48	1118.47	0.21
Reach	10	1-year High	Pr Floodwall 5ft	39690.00	688.91	718.90	696.07	718.95	0.000011	1.7	23243.51	996.85	0.06
Reach	10	1-year High	Pr Floodwall 2ft	39690.00	688.91	718.90	696.07	718.95	0.000011	1.7	23243.51	996.85	0.06
Reach	10	5-year High	Pr Floodwall 5ft	136800.00	688.91	721.21	701.74	721.67	0.000101	5.5	25545.86	998.49	0.18
Reach	10	5-year High	Pr Floodwall 2ft	136800.00	688.91	721.21	701.74	721.67	0.000101	5.5	25545.88	998.50	0.18
Reach	10	2-year High	Pr Floodwall 5ft	101800.00	688.91	719.83	699.99	720.11	0.000066	4.3	24171.54	997.51	0.15
Reach	10	2-year High	Pr Floodwall 2ft	101800.00	688.91	719.83	699.96	720.11	0.000066	4.3	24171.55	997.52	0.15
Reach	10	Normal	Pr Floodwall 5ft	12700.00	688.91	710.93	693.51	710.94	0.000004	0.8	15619.10	871.32	0.03
Reach	10	Normal	Pr Floodwall 2ft	12700.00	688.91	710.93	693.50	710.94	0.000004	0.8	15619.10	871.32	0.03
Reach	9	1-year Low	Pr Floodwall 5ft	39690.00	688.16	711.97	695.74	712.06	0.000034	2.4	16272.35	822.47	0.10
Reach	9	1-year Low	Pr Floodwall 2ft	39690.00	688.16	711.97	695.74	712.06	0.000034	2.4	16272.35	822.47	0.10
Reach	9	2-year Low	Pr Floodwall 5ft	101800.00	688.16	715.52	699.54	715.96	0.000131	5.3	19446.52	944.28	0.19
Reach	9	2-year Low	Pr Floodwall 2ft	101800.00	688.16	715.52	699.54	715.96	0.000131	5.3	19446.52	944.28	0.19
Reach	9	5-year Low	Pr Floodwall 5ft	136800.00	688.16	719.97	701.28	720.51	0.000135	5.9	23648.83	946.80	0.20
Reach	9	5-year Low	Pr Floodwall 2ft	136800.00	688.16	719.97	701.29	720.51	0.000135	5.9	23648.98	947.03	0.20
Reach	9	25-year	Pr Floodwall 5ft	187200.00	688.16	725.48	703.56	726.17	0.000140	6.7	28883.27	993.35	0.21
Reach	9	25-year	Pr Floodwall 2ft	187200.00	688.16	725.48	703.57	726.17	0.000140	6.7	28886.20	994.49	0.21
Reach	9	10-year	Pr Floodwall 5ft	168500.00	688.16	722.98	702.75	723.64	0.000146	6.6	26505.13	949.99	0.21
Reach	9	10-year	Pr Floodwall 2ft	168500.00	688.16	722.98	702.76	723.64	0.000146	6.6	26506.72	991.85	0.21
Reach	9	50-year	Pr Floodwall 5ft	212000.00	688.16	727.60	704.63	728.38	0.000147	7.1	30905.64	996.71	0.21
Reach	9	50-year	Pr Floodwall 2ft	212000.00	688.16	727.60	704.63	728.38	0.000147	7.1	30908.65	996.71	0.21
Reach	9	100-year	Pr Floodwall 5ft	231000.00	688.16	729.42	705.39	730.25	0.000149	7.4	32668.70	1036.89	0.21
Reach	9	100-year	Pr Floodwall 2ft	231000.00	688.16	729.42	705.40	730.25	0.000149	7.4	32671.83	1036.96	0.21
Reach	9	1-year High	Pr Floodwall 5ft	39690.00	688.16	718.89	695.74	718.94	0.000013	1.8	22630.76	945.84	0.06
Reach	9	1-year High	Pr Floodwall 2ft	39690.00	688.16	718.89	695.74	718.94	0.000013	1.8	22630.77	945.89	0.06
Reach	9	5-year High	Pr Floodwall 5ft	136800.00	688.16	721.15	701.28	721.65	0.000118	5.7	24768.36	947.87	0.19
Reach	9	5-year High	Pr Floodwall 2ft	136800.00	688.16	721.15	701.29	721.65	0.000118	5.7	24768.89	948.29	0.19
Reach	9	2-year High	Pr Floodwall 5ft	101800.00	688.16	719.80	699.54	720.10	0.000076	4.4	23485.29	946.63	0.15
Reach	9	2-year High	Pr Floodwall 2ft	101800.00	688.16	719.80	699.54	720.10	0.000076	4.4	23485.41	946.82	0.15
Reach	9	Normal	Pr Floodwall 5ft	12700.00	688.16	710.93	693.32	710.94	0.000004	0.8	15416.97	820.08	0.03

HEC-RAS River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	9	Normal	Pr Floodwall 2ft	12700.00	688.16	710.93	693.34	710.94	0.000004	0.8	15416.97	820.08	0.03
Reach	8	1-year Low	Pr Floodwall 5ft	39690.00	687.93	711.96	695.48	712.05	0.000034	2.4	16337.99	879.48	0.10
Reach	8	1-year Low	Pr Floodwall 2ft	39690.00	687.93	711.96	695.48	712.05	0.000034	2.4	16337.99	879.48	0.10
Reach	8	2-year Low	Pr Floodwall 5ft	101800.00	687.93	715.47	699.56	715.90	0.000125	5.2	19466.88	895.04	0.20
Reach	8	2-year Low	Pr Floodwall 2ft	101800.00	687.93	715.47	699.56	715.90	0.000125	5.2	19466.88	895.04	0.20
Reach	8	5-year Low	Pr Floodwall 5ft	136800.00	687.93	719.92	701.50	720.45	0.000123	5.9	23456.20	899.44	0.20
Reach	8	5-year Low	Pr Floodwall 2ft	136800.00	687.93	719.92	701.50	720.45	0.000123	5.9	23456.20	899.44	0.20
Reach	8	25-year	Pr Floodwall 5ft	187200.00	687.93	725.43	703.87	726.12	0.000123	6.7	28429.79	906.61	0.21
Reach	8	25-year	Pr Floodwall 2ft	187200.00	687.93	725.43	703.87	726.12	0.000123	6.7	28429.79	906.61	0.21
Reach	8	10-year	Pr Floodwall 5ft	168500.00	687.93	722.92	703.04	723.58	0.000131	6.5	26166.72	903.20	0.21
Reach	8	10-year	Pr Floodwall 2ft	168500.00	687.93	722.92	703.04	723.58	0.000131	6.5	26166.72	903.20	0.21
Reach	8	50-year	Pr Floodwall 5ft	212000.00	687.93	727.54	704.97	728.32	0.000128	7.1	30351.69	910.74	0.21
Reach	8	50-year	Pr Floodwall 2ft	212000.00	687.93	727.54	704.97	728.32	0.000128	7.1	30351.69	910.74	0.21
Reach	8	100-year	Pr Floodwall 5ft	231000.00	687.93	729.36	705.76	730.19	0.000128	7.3	32029.90	943.04	0.21
Reach	8	100-year	Pr Floodwall 2ft	231000.00	687.93	729.36	705.76	730.19	0.000128	7.3	32029.90	943.04	0.21
Reach	8	1-year High	Pr Floodwall 5ft	39690.00	687.93	718.89	695.48	718.94	0.000012	1.8	22531.01	898.48	0.06
Reach	8	1-year High	Pr Floodwall 2ft	39690.00	687.93	718.89	695.48	718.94	0.000012	1.8	22531.01	898.48	0.06
Reach	8	5-year High	Pr Floodwall 5ft	136800.00	687.93	721.11	701.50	721.60	0.000107	5.6	24526.03	900.94	0.19
Reach	8	5-year High	Pr Floodwall 2ft	136800.00	687.93	721.11	701.50	721.60	0.000107	5.6	24526.03	900.94	0.19
Reach	8	2-year High	Pr Floodwall 5ft	101800.00	687.93	719.77	699.56	720.07	0.000070	4.4	23321.38	899.30	0.15
Reach	8	2-year High	Pr Floodwall 2ft	101800.00	687.93	719.77	699.56	720.07	0.000070	4.4	23321.38	899.30	0.15
Reach	8	Normal	Pr Floodwall 5ft	12700.00	687.93	710.93	692.96	710.94	0.000004	0.8	15443.61	862.93	0.03
Reach	8	Normal	Pr Floodwall 2ft	12700.00	687.93	710.93	692.96	710.94	0.000004	0.8	15443.61	862.93	0.03
Reach	7	1-year Low	Pr Floodwall 5ft	39690.00	688.16	711.95	695.04	712.04	0.000031	2.4	16590.76	841.14	0.09
Reach	7	1-year Low	Pr Floodwall 2ft	39690.00	688.16	711.95	695.04	712.04	0.000031	2.4	16590.76	841.14	0.09
Reach	7	2-year Low	Pr Floodwall 5ft	101800.00	688.16	715.44	699.19	715.86	0.000118	5.2	19536.76	845.75	0.19
Reach	7	2-year Low	Pr Floodwall 2ft	101800.00	688.16	715.44	699.19	715.86	0.000118	5.2	19536.76	845.75	0.19
Reach	7	5-year Low	Pr Floodwall 5ft	136800.00	688.16	719.88	701.09	720.42	0.000119	5.9	23306.06	851.56	0.20
Reach	7	5-year Low	Pr Floodwall 2ft	136800.00	688.16	719.88	701.09	720.42	0.000119	5.9	23306.06	851.56	0.20
Reach	7	25-year	Pr Floodwall 5ft	187200.00	688.16	725.38	703.54	726.08	0.000122	6.7	28025.38	924.31	0.21
Reach	7	25-year	Pr Floodwall 2ft	187200.00	688.16	725.38	703.54	726.08	0.000122	6.7	28025.38	924.31	0.21
Reach	7	10-year	Pr Floodwall 5ft	168500.00	688.16	722.88	702.66	723.54	0.000128	6.5	25866.40	855.72	0.21
Reach	7	10-year	Pr Floodwall 2ft	168500.00	688.16	722.88	702.66	723.54	0.000128	6.5	25866.40	855.72	0.21
Reach	7	50-year	Pr Floodwall 5ft	212000.00	688.16	727.49	704.60	728.28	0.000127	7.1	30132.94	1075.24	0.21
Reach	7	50-year	Pr Floodwall 2ft	212000.00	688.16	727.49	704.60	728.28	0.000127	7.1	30132.94	1075.24	0.21
Reach	7	100-year	Pr Floodwall 5ft	231000.00	688.16	729.31	705.37	730.16	0.000128	7.4	32191.87	1199.44	0.21
Reach	7	100-year	Pr Floodwall 2ft	231000.00	688.16	729.31	705.37	730.16	0.000128	7.4	32191.87	1199.44	0.21
Reach	7	1-year High	Pr Floodwall 5ft	39690.00	688.16	718.89	695.04	718.93	0.000011	1.8	22457.46	850.23	0.06
Reach	7	1-year High	Pr Floodwall 2ft	39690.00	688.16	718.89	695.04	718.93	0.000011	1.8	22457.46	850.23	0.06
Reach	7	5-year High	Pr Floodwall 5ft	136800.00	688.16	721.07	701.09	721.57	0.000104	5.6	24321.79	853.27	0.19
Reach	7	5-year High	Pr Floodwall 2ft	136800.00	688.16	721.07	701.09	721.57	0.000104	5.6	24321.79	853.27	0.19
Reach	7	2-year High	Pr Floodwall 5ft	101800.00	688.16	719.75	699.19	720.05	0.000067	4.4	23191.73	851.38	0.15
Reach	7	2-year High	Pr Floodwall 2ft	101800.00	688.16	719.75	699.19	720.05	0.000067	4.4	23191.73	851.38	0.15
Reach	7	Normal	Pr Floodwall 5ft	12700.00	688.16	710.93	692.33	710.94	0.000004	0.8	15731.90	838.74	0.03
Reach	7	Normal	Pr Floodwall 2ft	12700.00	688.16	710.93	692.33	710.94	0.000004	0.8	15731.90	838.74	0.03
Reach	6	1-year Low	Pr Floodwall 5ft	39690.00	687.20	711.95	694.29	712.03	0.000026	2.2	17767.12	881.76	0.09
Reach	6	1-year Low	Pr Floodwall 2ft	39690.00	687.20	711.95	694.29	712.03	0.000026	2.2	17767.12	881.76	0.09
Reach	6	2-year Low	Pr Floodwall 5ft	101800.00	687.20	715.45	698.19	715.82	0.000101	4.9	20906.22	909.31	0.18
Reach	6	2-year Low	Pr Floodwall 2ft	101800.00	687.20	715.45	698.19	715.82	0.000101	4.9	20906.22	909.31	0.18
Reach	6	5-year Low	Pr Floodwall 5ft	136800.00	687.20	719.90	699.98	720.37	0.000102	5.5	24996.05	927.46	0.18
Reach	6	5-year Low	Pr Floodwall 2ft	136800.00	687.20	719.90	699.98	720.37	0.000102	5.5	24996.05	927.46	0.18
Reach	6	25-year	Pr Floodwall 5ft	187200.00	687.20	725.41	702.30	726.02	0.000105	6.3	30161.71	950.76	0.19
Reach	6	25-year	Pr Floodwall 2ft	187200.00	687.20	725.41	702.30	726.02	0.000105	6.3	30161.71	950.76	0.19
Reach	6	10-year	Pr Floodwall 5ft	168500.00	687.20	722.90	701.48	723.49	0.000110	6.1	27800.87	937.93	0.19
Reach	6	10-year	Pr Floodwall 2ft	168500.00	687.20	722.90	701.48	723.49	0.000110	6.1	27800.87	937.93	0.19
Reach	6	50-year	Pr Floodwall 5ft	212000.00	687.20	727.52	703.37	728.22	0.000110	6.7	32353.29	1084.95	0.20
Reach	6	50-year	Pr Floodwall 2ft	212000.00	687.20	727.52	703.37	728.22	0.000110	6.7	32353.29	1084.95	0.20
Reach	6	100-year	Pr Floodwall 5ft	231000.00	687.20	729.34	704.15	730.09	0.000110	6.9	34419.21	1192.36	0.20
Reach	6	100-year	Pr Floodwall 2ft	231000.00	687.20	729.34	704.15	730.09	0.000110	6.9	34419.21	1192.36	0.20
Reach	6	1-year High	Pr Floodwall 5ft	39690.00	687.20	718.89	694.29	718.93	0.000010	1.7	24059.93	923.86	0.06
Reach	6	1-year High	Pr Floodwall 2ft	39690.00	687.20	718.89	694.29	718.93	0.000010	1.7	24059.93	923.86	0.06
Reach	6	5-year High	Pr Floodwall 5ft	136800.00	687.20	721.09	699.98	721.52	0.000089	5.3	26103.75	931.65	0.17
Reach	6	5-year High	Pr Floodwall 2ft	136800.00	687.20	721.09	699.98	721.52	0.000089	5.3	26103.75	931.65	0.17
Reach	6	2-year High	Pr Floodwall 5ft	101800.00	687.20	719.76	698.19	720.02	0.000057	4.1	24865.15	926.96	0.14
Reach	6	2-year High	Pr Floodwall 2ft	101800.00	687.20	719.76	698.19	720.02	0.000057	4.1	24865.15	926.96	0.14
Reach	6	Normal	Pr Floodwall 5ft	12700.00	687.20	710.93	691.61	710.93	0.000003	0.8	16869.39	874.23	0.03
Reach	6	Normal	Pr Floodwall 2ft	12700.00	687.20	710.93	691.61	710.93	0.000003	0.8	16869.39	874.23	0.03
Reach	5	1-year Low	Pr Floodwall 5ft	39690.00	683.93	711.94	693.44	712.02	0.000025	2.2	17892.20	859.55	0.09
Reach	5	1-year Low	Pr Floodwall 2ft	39690.00	683.93	711.94	693.44	712.02	0.000025	2.2	17892.20	859.55	0.09
Reach	5	2-year Low	Pr Floodwall 5ft	101800.00	683.93	715.43	697.53	715.80	0.000097	4.9	20935.17	885.76	0.17
Reach	5	2-year Low	Pr Floodwall 2ft	101800.00	683.93	715.43	697.53	715.80	0.000097	4.9	20935.17	885.76	0.17
Reach	5	5-year Low	Pr Floodwall 5ft	136800.00	683.93	719.88	699.39	720.35	0.000100	5.5	24918.92	908.14	0.18
Reach	5	5-year Low	Pr Floodwall 2ft	136800.00	683.93	719.88	699.39	720.35	0.000100	5.5	24918.92	908.14	0.18
Reach	5	25-year	Pr Floodwall 5ft	187200.00	683.93	725.38	701.75	726.00	0.000104	6.3	30030.45	1003.98	0.19
Reach	5	25-year	Pr Floodwall 2ft	187200.00	683.93	725.38	701.75	726.00	0.000104	6.3	30030.45	1003.98	0.19
Reach	5	10-year	Pr Floodwall 5ft	168500.00	683.93	722.88	700.91	723.47	0.000109	6.2	27664.41	925.59	0.19
Reach	5	10-year	Pr Floodwall 2ft	168500.00	683.93	722.88	700.91	723.47	0.000109	6.2	27664.41	925.59	0.19
Reach	5	50-year	Pr Floodwall 5ft	212000.00	683.93	727.49	702.84	728.20	0.000109	6.8	32191.72	1053.13	0.20
Reach	5	50-year	Pr Floodwall 2ft	212000.00	683.93	727.49	702.84	728.20	0.000109	6.8	32191.72	1053.13	0.20
Reach	5	100-year	Pr Floodwall 5ft	231000.00	683.93	729.31	703.66	730.07	0.000110	7.0	34193.30	1148.45	0.20
Reach	5	100-year	Pr Floodwall 2ft	231000.00	683.93	729.31	703.66	730.07	0.000110	7.0	34193.30	1148.45	0.20

HEC-RAS River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	5	1-year High	Pr Floodwall 5ft	39690.00	683.93	718.88	693.44	718.93	0.000009	1.7	24021.43	901.25	0.06
Reach	5	1-year High	Pr Floodwall 2ft	39690.00	683.93	718.88	693.44	718.93	0.000009	1.7	24021.43	901.25	0.06
Reach	5	5-year High	Pr Floodwall 5ft	136800.00	683.93	721.07	699.39	721.51	0.000087	5.3	26004.90	911.46	0.17
Reach	5	5-year High	Pr Floodwall 2ft	136800.00	683.93	721.07	699.39	721.51	0.000087	5.3	26004.90	911.46	0.17
Reach	5	2-year High	Pr Floodwall 5ft	101800.00	683.93	719.74	697.53	720.01	0.000056	4.1	24799.78	907.69	0.14
Reach	5	2-year High	Pr Floodwall 2ft	101800.00	683.93	719.74	697.53	720.01	0.000056	4.1	24799.78	907.69	0.14
Reach	5	Normal	Pr Floodwall 5ft	12700.00	683.93	710.93	690.84	710.93	0.000003	0.7	17020.12	852.42	0.03
Reach	5	Normal	Pr Floodwall 2ft	12700.00	683.93	710.93	690.84	710.93	0.000003	0.7	17020.12	852.42	0.03
Reach	4.5			Bridge									
Reach	4	1-year Low	Pr Floodwall 5ft	39690.00	682.84	711.73	693.18	711.81	0.000025	2.2	17874.35	869.99	0.09
Reach	4	1-year Low	Pr Floodwall 2ft	39690.00	682.84	711.73	693.18	711.81	0.000025	2.2	17874.35	869.99	0.09
Reach	4	2-year Low	Pr Floodwall 5ft	101800.00	682.84	715.21	697.40	715.58	0.000099	4.9	20982.07	904.40	0.18
Reach	4	2-year Low	Pr Floodwall 2ft	101800.00	682.84	715.21	697.40	715.58	0.000099	4.9	20982.07	904.40	0.18
Reach	4	5-year Low	Pr Floodwall 5ft	136800.00	682.84	719.66	699.24	720.13	0.000101	5.5	25162.76	958.52	0.18
Reach	4	5-year Low	Pr Floodwall 2ft	136800.00	682.84	719.66	699.24	720.13	0.000101	5.5	25162.76	958.52	0.18
Reach	4	25-year	Pr Floodwall 5ft	187200.00	682.84	725.14	701.61	725.76	0.000104	6.3	30676.13	1060.38	0.19
Reach	4	25-year	Pr Floodwall 2ft	187200.00	682.84	725.14	701.61	725.76	0.000104	6.3	30676.13	1060.38	0.19
Reach	4	10-year	Pr Floodwall 5ft	168500.00	682.84	722.66	700.78	723.24	0.000109	6.1	28072.98	994.41	0.19
Reach	4	10-year	Pr Floodwall 2ft	168500.00	682.84	722.66	700.78	723.24	0.000109	6.1	28072.98	994.41	0.19
Reach	4	50-year	Pr Floodwall 5ft	212000.00	682.84	727.23	702.70	727.93	0.000109	6.7	32897.46	1073.66	0.20
Reach	4	50-year	Pr Floodwall 2ft	212000.00	682.84	727.23	702.70	727.93	0.000109	6.7	32897.46	1073.66	0.20
Reach	4	100-year	Pr Floodwall 5ft	231000.00	682.84	729.02	703.52	729.77	0.000110	7.0	34847.16	1105.13	0.20
Reach	4	100-year	Pr Floodwall 2ft	231000.00	682.84	729.02	703.52	729.77	0.000110	7.0	34847.16	1105.13	0.20
Reach	4	1-year High	Pr Floodwall 5ft	39690.00	682.84	718.72	693.18	718.76	0.000010	1.7	24259.00	954.68	0.06
Reach	4	1-year High	Pr Floodwall 2ft	39690.00	682.84	718.72	693.18	718.76	0.000010	1.7	24259.00	954.68	0.06
Reach	4	5-year High	Pr Floodwall 5ft	136800.00	682.84	720.86	699.24	721.30	0.000088	5.3	26316.66	964.48	0.17
Reach	4	5-year High	Pr Floodwall 2ft	136800.00	682.84	720.86	699.24	721.30	0.000088	5.3	26316.66	964.48	0.17
Reach	4	2-year High	Pr Floodwall 5ft	101800.00	682.84	719.56	697.40	719.82	0.000056	4.1	25062.33	958.10	0.14
Reach	4	2-year High	Pr Floodwall 2ft	101800.00	682.84	719.56	697.40	719.82	0.000056	4.1	25062.33	958.10	0.14
Reach	4	Normal	Pr Floodwall 5ft	12700.00	682.84	710.71	690.44	710.72	0.000003	0.7	16995.94	852.36	0.03
Reach	4	Normal	Pr Floodwall 2ft	12700.00	682.84	710.71	690.44	710.72	0.000003	0.7	16995.94	852.36	0.03
Reach	3	1-year Low	Pr Floodwall 5ft	39690.00	686.48	711.73		711.80	0.000026	2.2	17957.64	911.52	0.09
Reach	3	1-year Low	Pr Floodwall 2ft	39690.00	686.48	711.73		711.80	0.000026	2.2	17957.64	911.52	0.09
Reach	3	2-year Low	Pr Floodwall 5ft	101800.00	686.48	715.18		715.54	0.000101	4.8	21180.54	947.48	0.18
Reach	3	2-year Low	Pr Floodwall 2ft	101800.00	686.48	715.18		715.54	0.000101	4.8	21180.54	947.48	0.18
Reach	3	5-year Low	Pr Floodwall 5ft	136800.00	686.48	719.64		720.10	0.000101	5.4	25439.04	961.91	0.18
Reach	3	5-year Low	Pr Floodwall 2ft	136800.00	686.48	719.64		720.10	0.000101	5.4	25439.04	961.91	0.18
Reach	3	25-year	Pr Floodwall 5ft	187200.00	686.48	725.13		725.71	0.000103	6.2	31866.38	1636.62	0.19
Reach	3	25-year	Pr Floodwall 2ft	187200.00	686.48	725.13		725.71	0.000103	6.2	31866.38	1636.62	0.19
Reach	3	10-year	Pr Floodwall 5ft	168500.00	686.48	722.63		723.20	0.000109	6.0	28422.77	1081.42	0.19
Reach	3	10-year	Pr Floodwall 2ft	168500.00	686.48	722.63		723.20	0.000109	6.0	28422.77	1081.42	0.19
Reach	3	50-year	Pr Floodwall 5ft	212000.00	686.48	727.22		727.87	0.000106	6.5	35459.07	1823.94	0.19
Reach	3	50-year	Pr Floodwall 2ft	212000.00	686.48	727.22		727.87	0.000106	6.5	35459.07	1823.94	0.19
Reach	3	100-year	Pr Floodwall 5ft	231000.00	686.48	729.02		729.70	0.000104	6.7	38859.30	1966.97	0.19
Reach	3	100-year	Pr Floodwall 2ft	231000.00	686.48	729.02		729.70	0.000104	6.7	38859.30	1966.97	0.19
Reach	3	1-year High	Pr Floodwall 5ft	39690.00	686.48	718.72		718.76	0.000010	1.6	24551.93	959.10	0.06
Reach	3	1-year High	Pr Floodwall 2ft	39690.00	686.48	718.72		718.76	0.000010	1.6	24551.93	959.10	0.06
Reach	3	5-year High	Pr Floodwall 5ft	136800.00	686.48	720.84		721.26	0.000087	5.2	26604.84	978.03	0.17
Reach	3	5-year High	Pr Floodwall 2ft	136800.00	686.48	720.84		721.26	0.000087	5.2	26604.84	978.03	0.17
Reach	3	2-year High	Pr Floodwall 5ft	101800.00	686.48	719.55		719.80	0.000057	4.0	25348.22	961.62	0.14
Reach	3	2-year High	Pr Floodwall 2ft	101800.00	686.48	719.55		719.80	0.000057	4.0	25348.22	961.62	0.14
Reach	3	Normal	Pr Floodwall 5ft	12700.00	686.48	710.71		710.72	0.000003	0.7	17036.53	904.87	0.03
Reach	3	Normal	Pr Floodwall 2ft	12700.00	686.48	710.71		710.72	0.000003	0.7	17036.53	904.87	0.03
Reach	2	1-year Low	Pr Floodwall 5ft	39690.00	686.68	711.72		711.79	0.000026	2.2	18010.96	906.87	0.09
Reach	2	1-year Low	Pr Floodwall 2ft	39690.00	686.68	711.72		711.79	0.000026	2.2	18010.96	906.87	0.09
Reach	2	2-year Low	Pr Floodwall 5ft	101800.00	686.68	715.15		715.51	0.000100	4.8	21193.56	942.18	0.18
Reach	2	2-year Low	Pr Floodwall 2ft	101800.00	686.68	715.15		715.51	0.000100	4.8	21193.56	942.18	0.18
Reach	2	5-year Low	Pr Floodwall 5ft	136800.00	686.68	719.61		720.07	0.000100	5.4	25430.82	958.66	0.18
Reach	2	5-year Low	Pr Floodwall 2ft	136800.00	686.68	719.61		720.07	0.000100	5.4	25430.82	958.66	0.18
Reach	2	25-year	Pr Floodwall 5ft	187200.00	686.68	725.10		725.68	0.000102	6.2	32048.79	1544.22	0.19
Reach	2	25-year	Pr Floodwall 2ft	187200.00	686.68	725.10		725.68	0.000102	6.2	32048.79	1544.22	0.19
Reach	2	10-year	Pr Floodwall 5ft	168500.00	686.68	722.60		723.17	0.000108	6.0	28400.58	1116.26	0.19
Reach	2	10-year	Pr Floodwall 2ft	168500.00	686.68	722.60		723.17	0.000108	6.0	28400.58	1116.26	0.19
Reach	2	50-year	Pr Floodwall 5ft	212000.00	686.68	727.19		727.84	0.000105	6.5	35284.31	1548.45	0.19
Reach	2	50-year	Pr Floodwall 2ft	212000.00	686.68	727.19		727.84	0.000105	6.5	35284.31	1548.45	0.19
Reach	2	100-year	Pr Floodwall 5ft	231000.00	686.68	728.99		729.67	0.000104	6.7	38099.75	1606.26	0.19
Reach	2	100-year	Pr Floodwall 2ft	231000.00	686.68	728.99		729.67	0.000104	6.7	38099.75	1606.26	0.19
Reach	2	1-year High	Pr Floodwall 5ft	39690.00	686.68	718.71		718.75	0.000009	1.6	24573.39	955.11	0.06
Reach	2	1-year High	Pr Floodwall 2ft	39690.00	686.68	718.71		718.75	0.000009	1.6	24573.39	955.11	0.06
Reach	2	5-year High	Pr Floodwall 5ft	136800.00	686.68	720.82		721.24	0.000087	5.2	26597.28	977.40	0.17
Reach	2	5-year High	Pr Floodwall 2ft	136800.00	686.68	720.82		721.24	0.000087	5.2	26597.28	977.40	0.17
Reach	2	2-year High	Pr Floodwall 5ft	101800.00	686.68	719.53		719.78	0.000056	4.0	25353.35	958.34	0.14
Reach	2	2-year High	Pr Floodwall 2ft	101800.00	686.68	719.53		719.78	0.000056	4.0	25353.35	958.34	0.14
Reach	2	Normal	Pr Floodwall 5ft	12700.00	686.68	710.71		710.72	0.000003	0.7	17099.07	902.79	0.03
Reach	2	Normal	Pr Floodwall 2ft	12700.00	686.68	710.71		710.72	0.000003	0.7	17099.07	902.79	0.03
Reach	1	1-year Low	Pr Floodwall 5ft	39690.00	686.93	711.71	694.08	711.79	0.000026	2.2	18006.63	898.15	0.09
Reach	1	1-year Low	Pr Floodwall 2ft	39690.00	686.93	711.71	694.08	711.79	0.000026	2.2	18006.63	898.15	0.09
Reach	1	2-year Low	Pr Floodwall 5ft	101800.00	686.93	715.11	698.10	715.48	0.000100	4.8	21154.88	958.39	0.18
Reach	1	2-year Low	Pr Floodwall 2ft	101800.00	686.93	715.11	698.10	715.48	0.000100	4.8	21154.88	958.39	0.18
Reach	1	5-year Low	Pr Floodwall 5ft	136800.00	686.93	719.58	699.96	720.03	0.000100	5.4	26175.16	1166.67	0.18

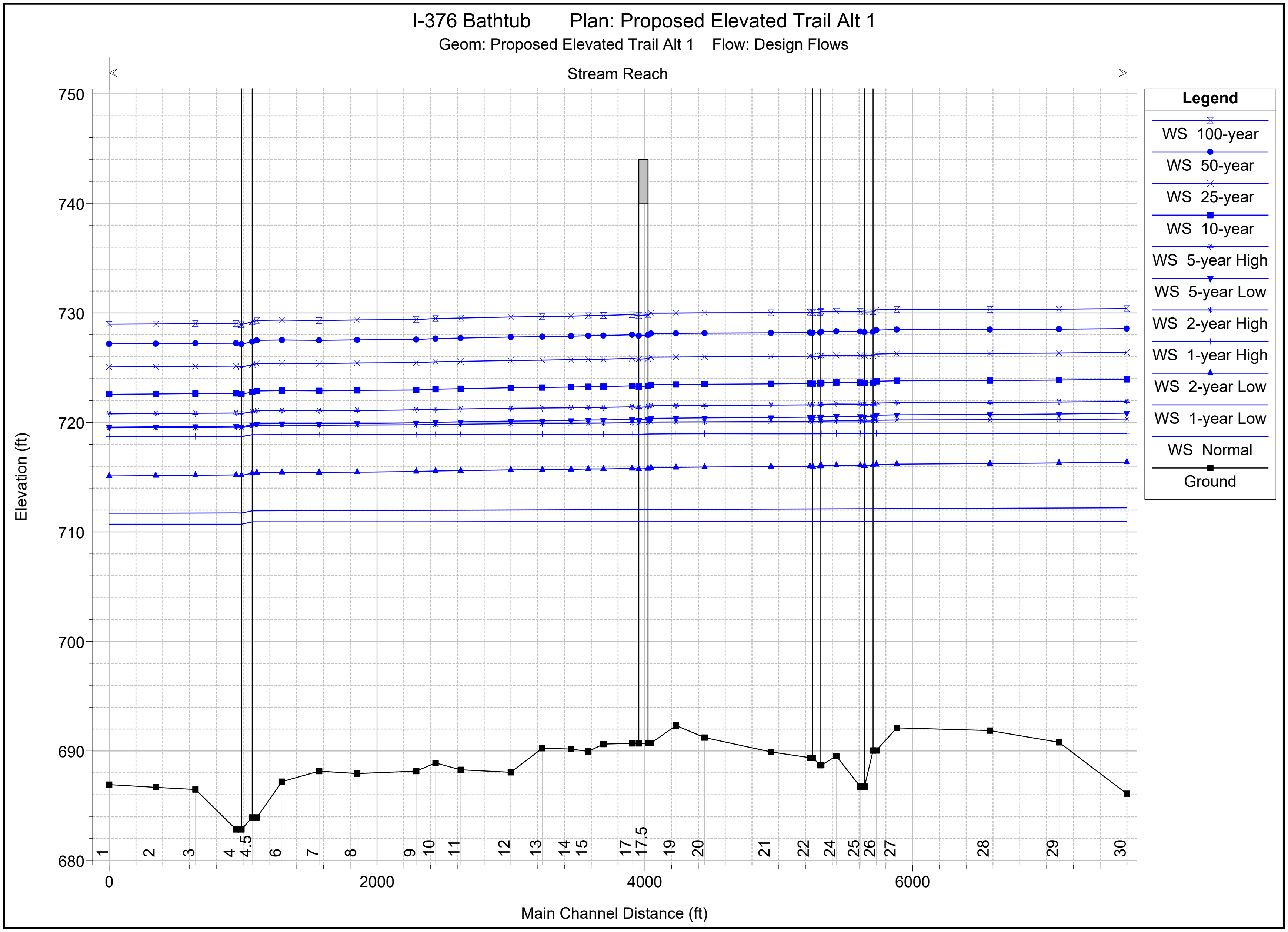
HEC-RAS River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	1	5-year Low	Pr Floodwall 2ft	136800.00	686.93	719.58	699.96	720.03	0.000100	5.4	26175.16	1166.67	0.18
Reach	1	25-year	Pr Floodwall 5ft	187200.00	686.93	725.07	702.37	725.64	0.000100	6.1	33905.90	1555.58	0.19
Reach	1	25-year	Pr Floodwall 2ft	187200.00	686.93	725.07	702.37	725.64	0.000100	6.1	33905.90	1555.58	0.19
Reach	1	10-year	Pr Floodwall 5ft	168500.00	686.93	722.57	701.54	723.13	0.000107	6.0	30034.65	1473.34	0.19
Reach	1	10-year	Pr Floodwall 2ft	168500.00	686.93	722.57	701.54	723.13	0.000107	6.0	30034.65	1473.34	0.19
Reach	1	50-year	Pr Floodwall 5ft	212000.00	686.93	727.17	703.45	727.80	0.000103	6.5	37170.46	1559.16	0.19
Reach	1	50-year	Pr Floodwall 2ft	212000.00	686.93	727.17	703.45	727.80	0.000103	6.5	37170.46	1559.16	0.19
Reach	1	100-year	Pr Floodwall 5ft	231000.00	686.93	728.97	704.16	729.63	0.000102	6.6	39995.21	1597.41	0.19
Reach	1	100-year	Pr Floodwall 2ft	231000.00	686.93	728.97	704.16	729.63	0.000102	6.6	39995.21	1597.41	0.19
Reach	1	1-year High	Pr Floodwall 5ft	39690.00	686.93	718.71	694.08	718.75	0.000009	1.6	25166.54	1162.62	0.06
Reach	1	1-year High	Pr Floodwall 2ft	39690.00	686.93	718.71	694.08	718.75	0.000009	1.6	25166.54	1162.62	0.06
Reach	1	5-year High	Pr Floodwall 5ft	136800.00	686.93	720.79	699.92	721.21	0.000087	5.2	27627.20	1252.75	0.17
Reach	1	5-year High	Pr Floodwall 2ft	136800.00	686.93	720.79	699.92	721.21	0.000087	5.2	27627.20	1252.75	0.17
Reach	1	2-year High	Pr Floodwall 5ft	101800.00	686.93	719.51	698.11	719.76	0.000056	4.0	26098.12	1166.36	0.14
Reach	1	2-year High	Pr Floodwall 2ft	101800.00	686.93	719.51	698.11	719.76	0.000056	4.0	26098.12	1166.36	0.14
Reach	1	Normal	Pr Floodwall 5ft	12700.00	686.93	710.71	691.10	710.72	0.000003	0.7	17109.86	895.38	0.03
Reach	1	Normal	Pr Floodwall 2ft	12700.00	686.93	710.71	691.10	710.72	0.000003	0.7	17109.86	895.38	0.03

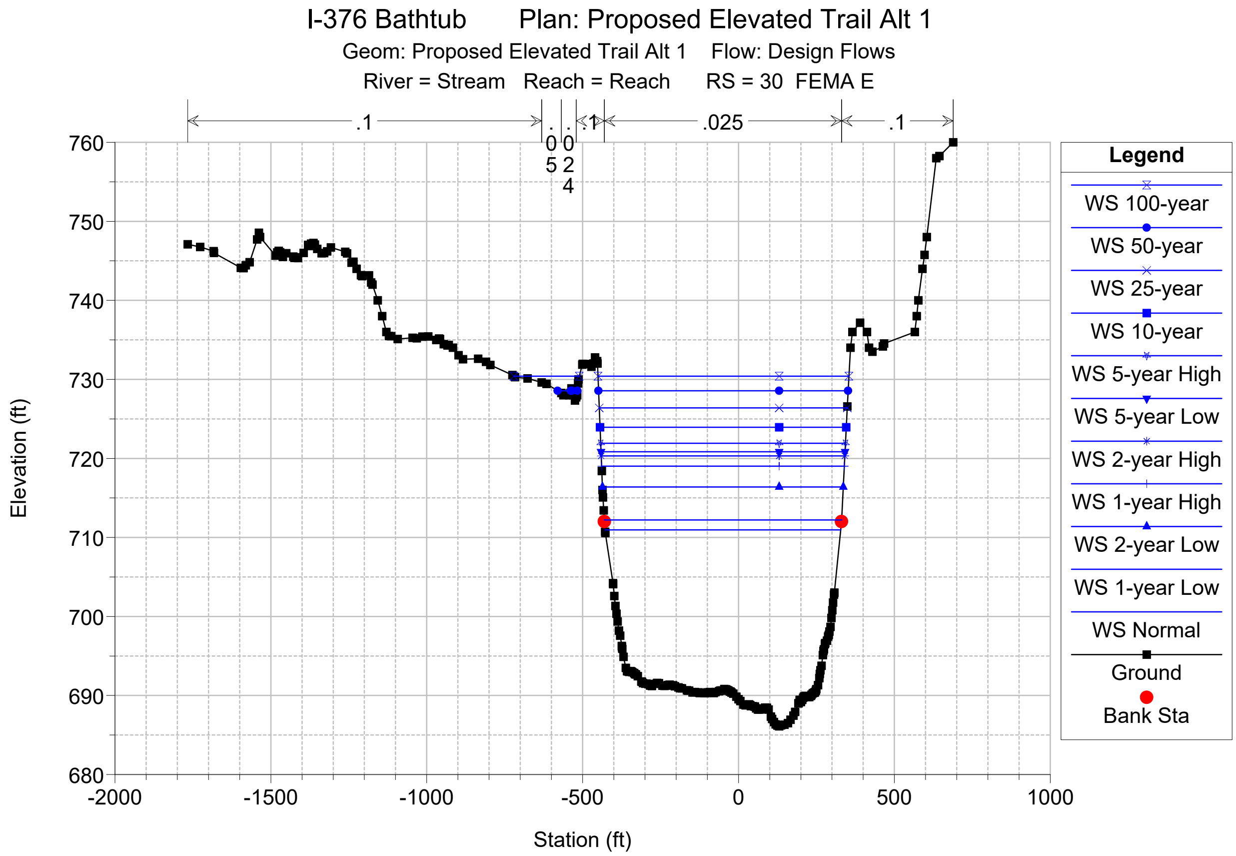
APPENDIX A-5.3

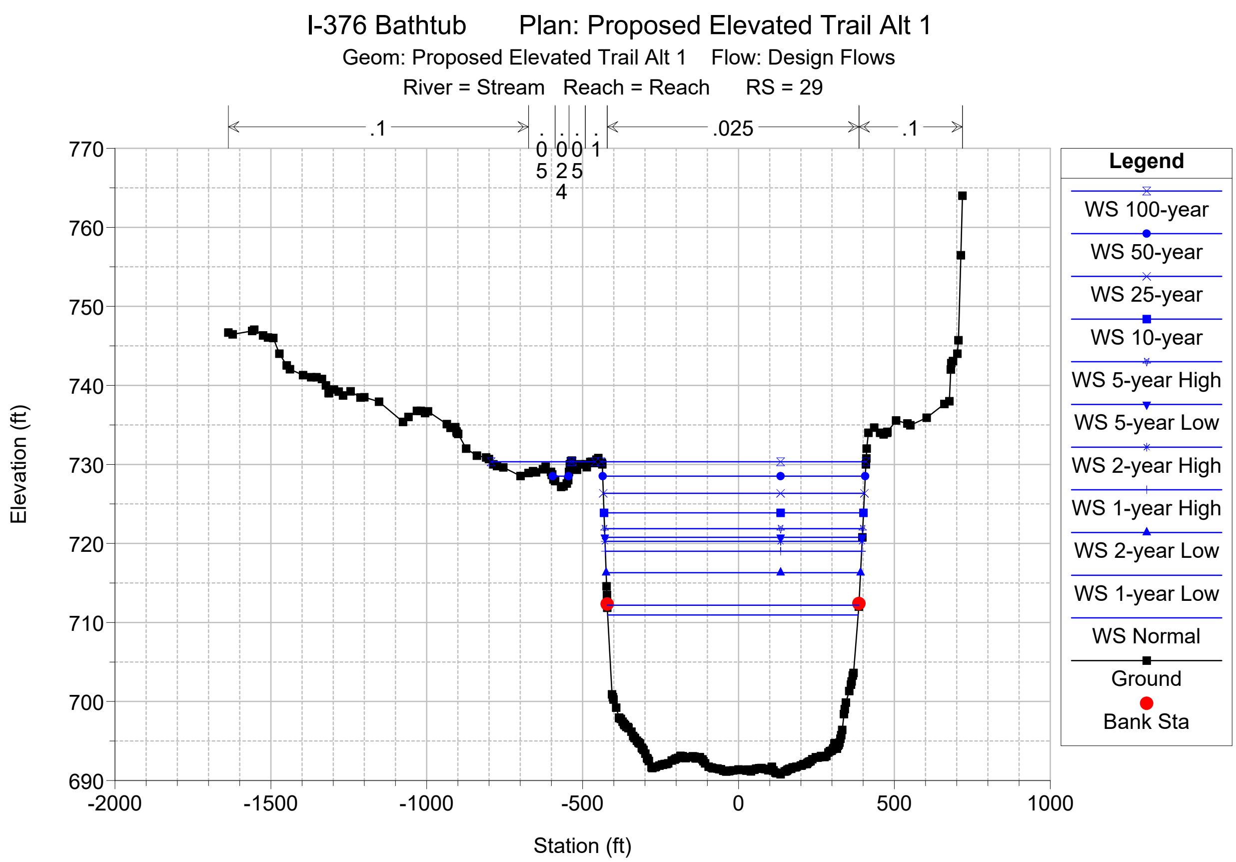
Proposed Elevated Trail
HEC-RAS Model

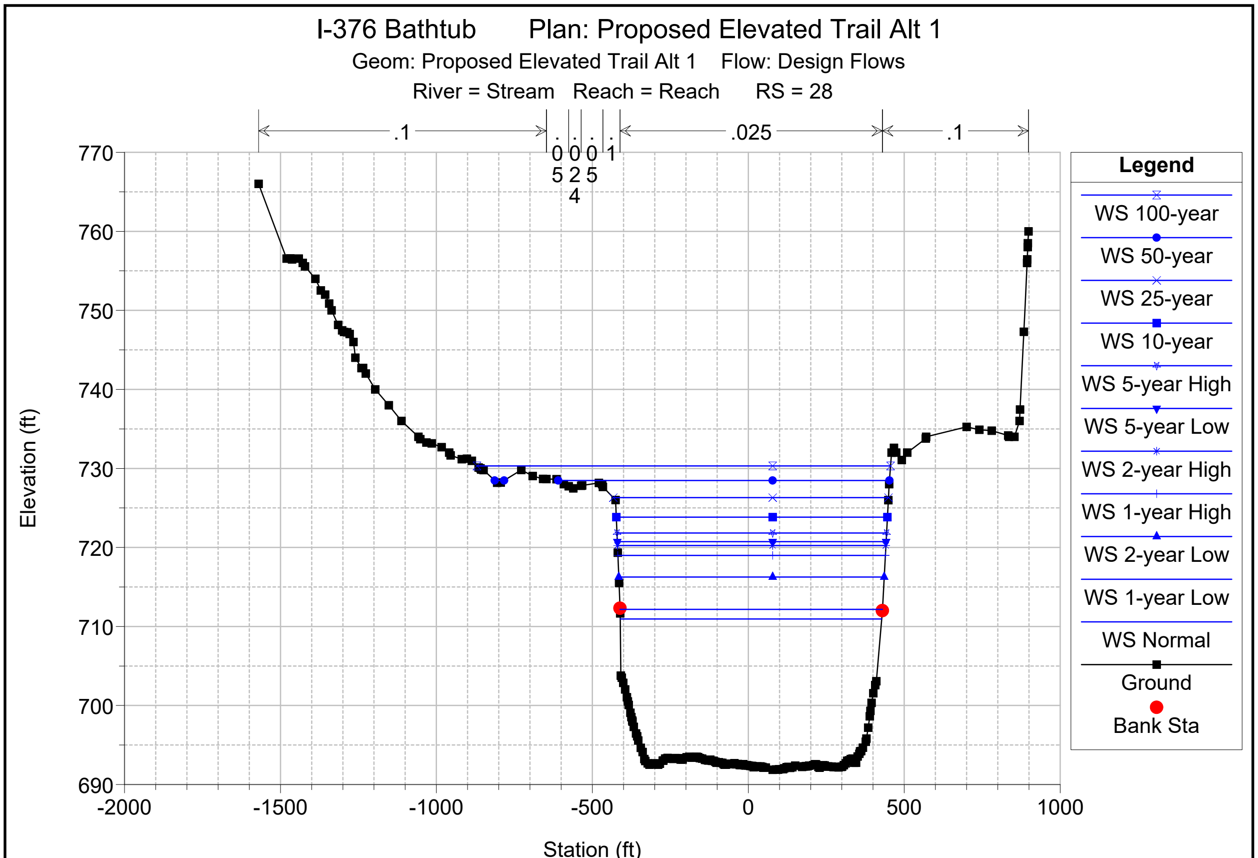
NEWELL
TERESKA &
MACKAY
ENGINEERING



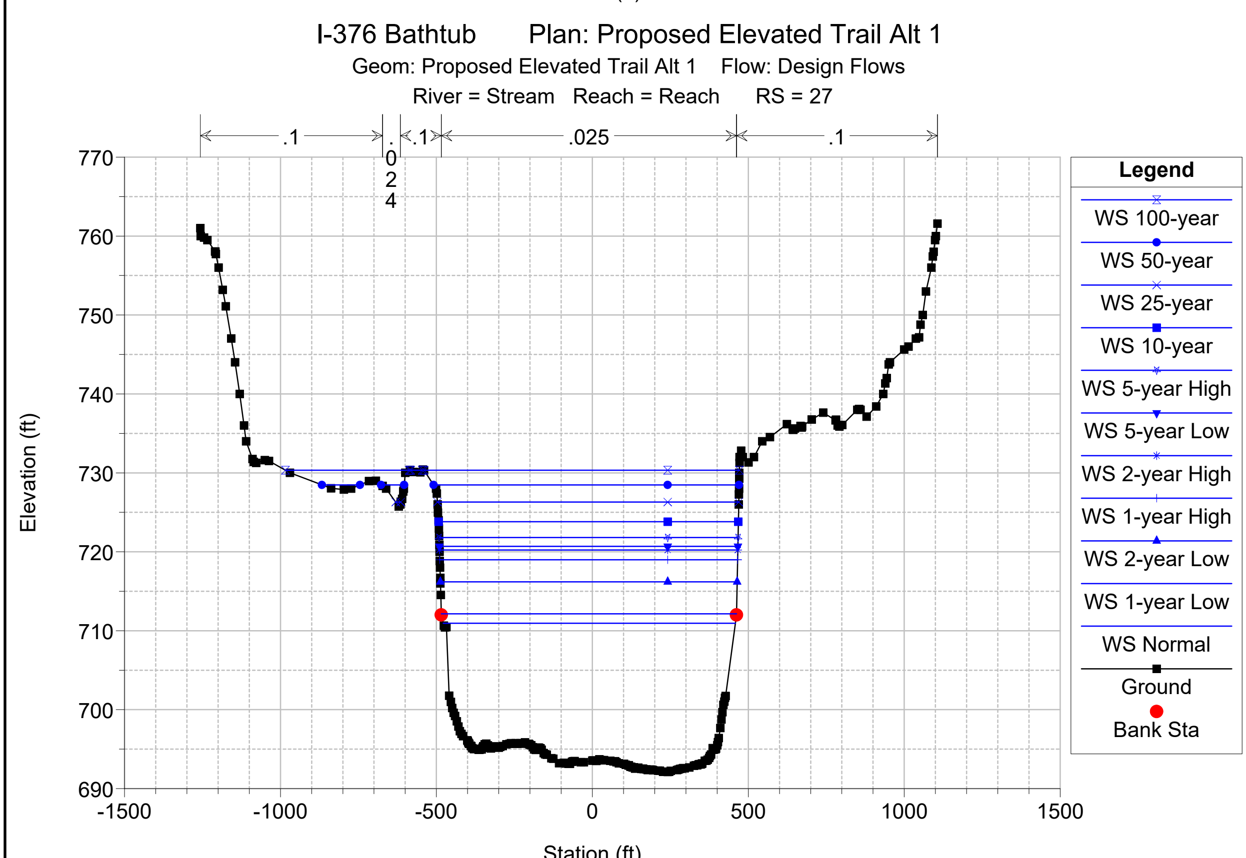
I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
Stream Reach
Elevation (ft)
Main Channel Distance (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground


I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 30 FEMA E
.1
.025
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

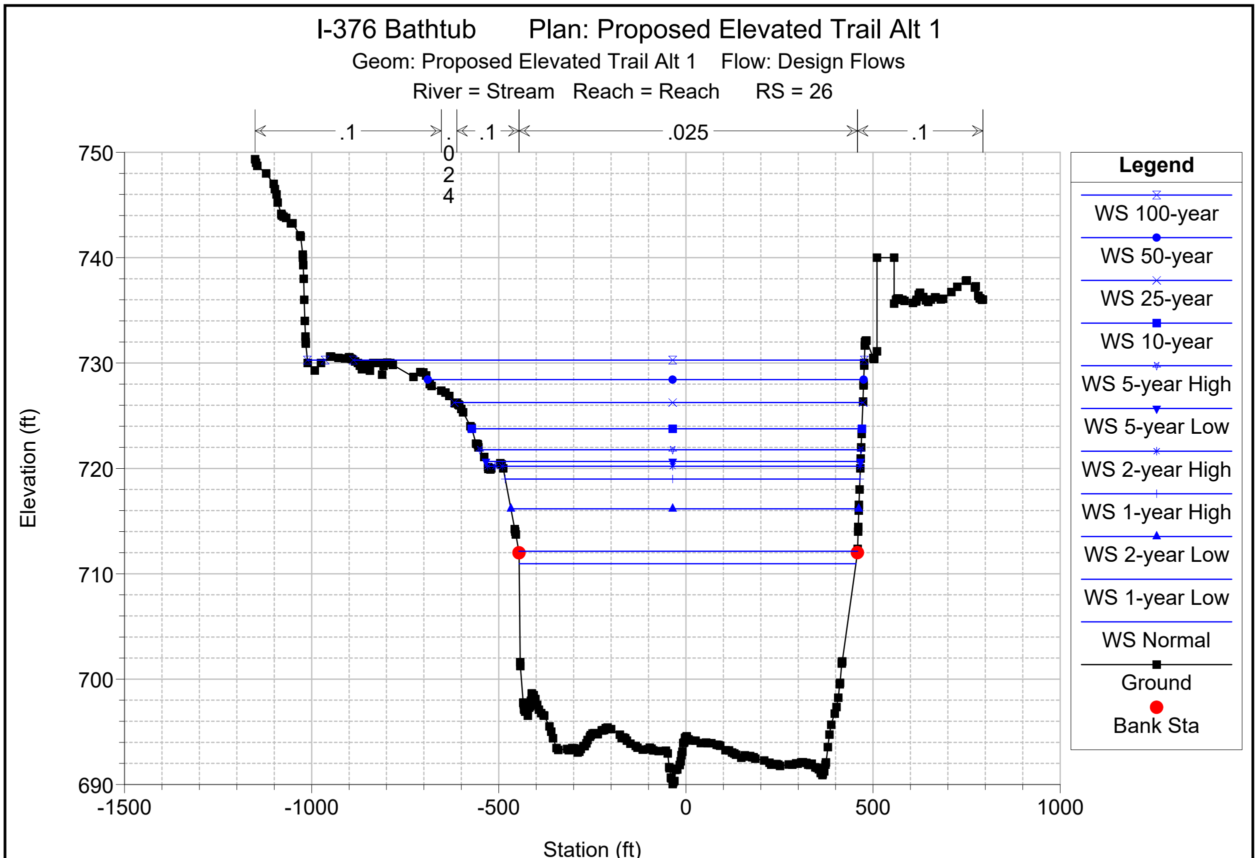

I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 29
.1
.025
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta



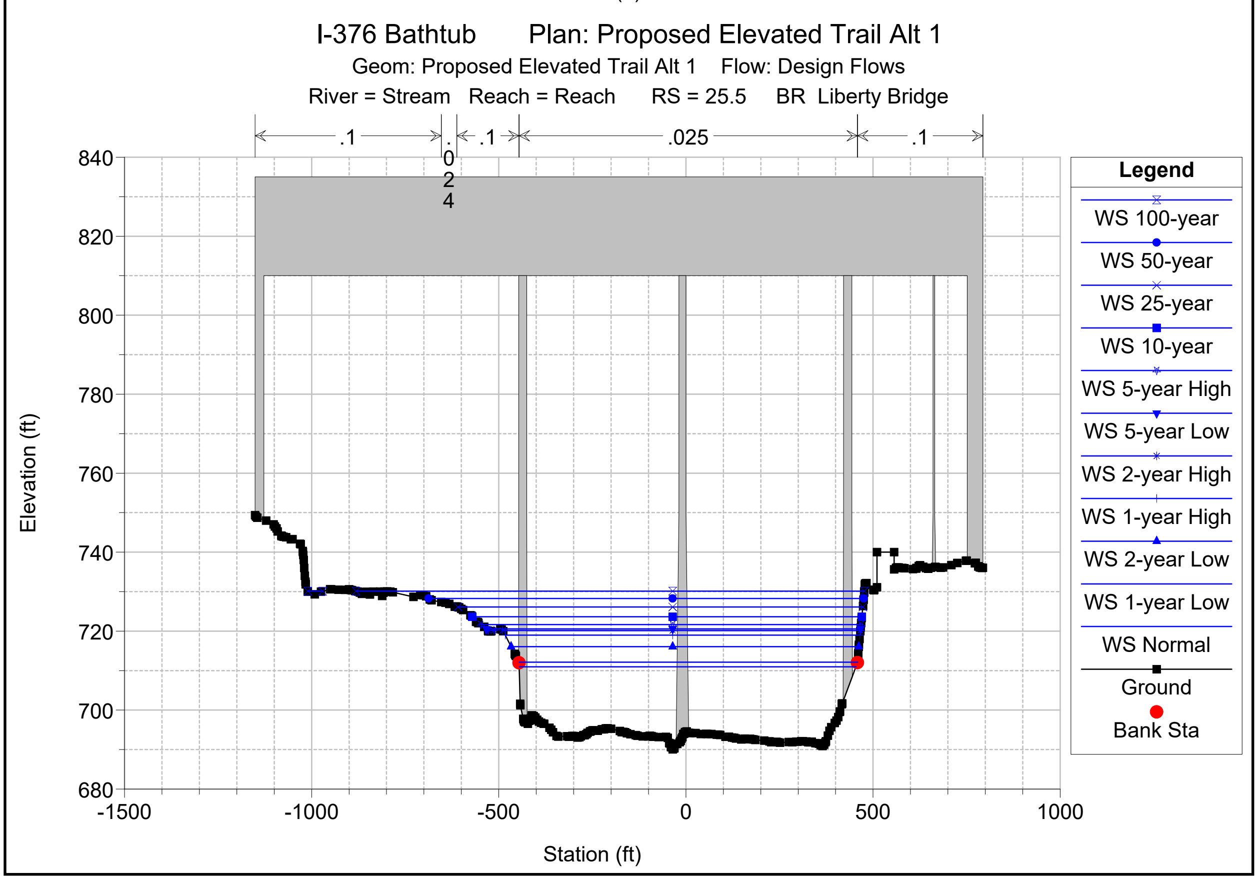
I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 28
.1
.05
.024
.025
.1
.025
.1
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta
Elevation (ft)
Station (ft)
770
760
750
740
730
720
710
700
690
-2000
-1500
-1000
-500
0
500
1000



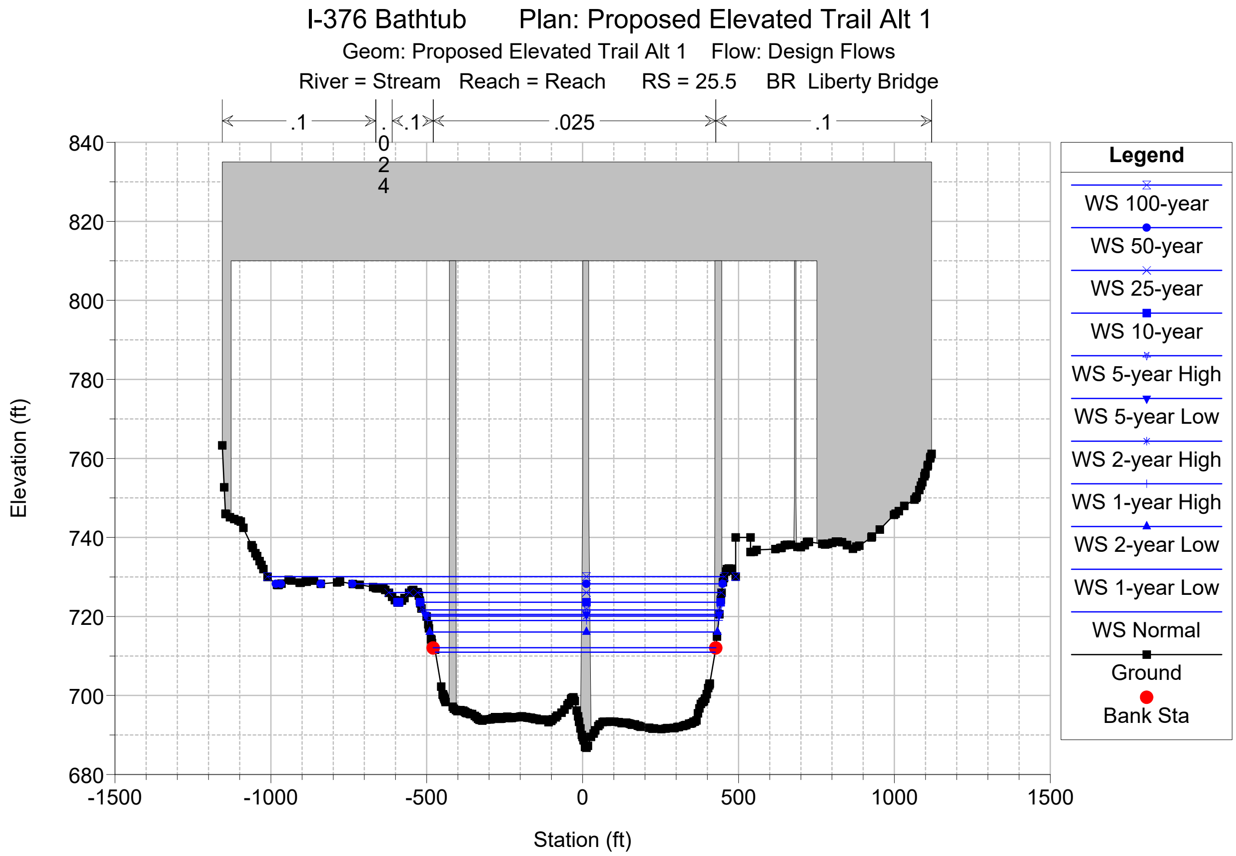
I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 27
.1
.024
.1
.025
.1
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta
Elevation (ft)
Station (ft)
770
760
750
740
730
720
710
700
690
-1500
-1000
-500
0
500
1000
1500

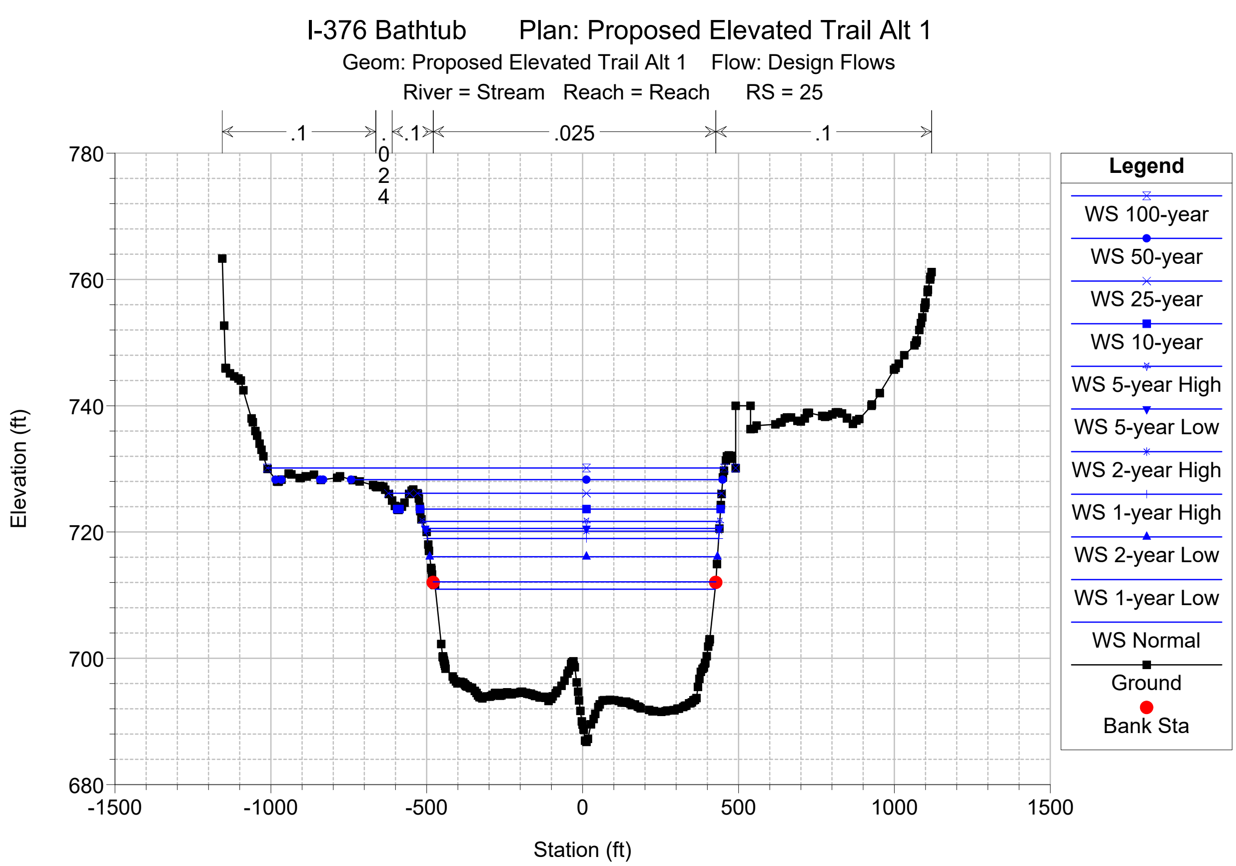


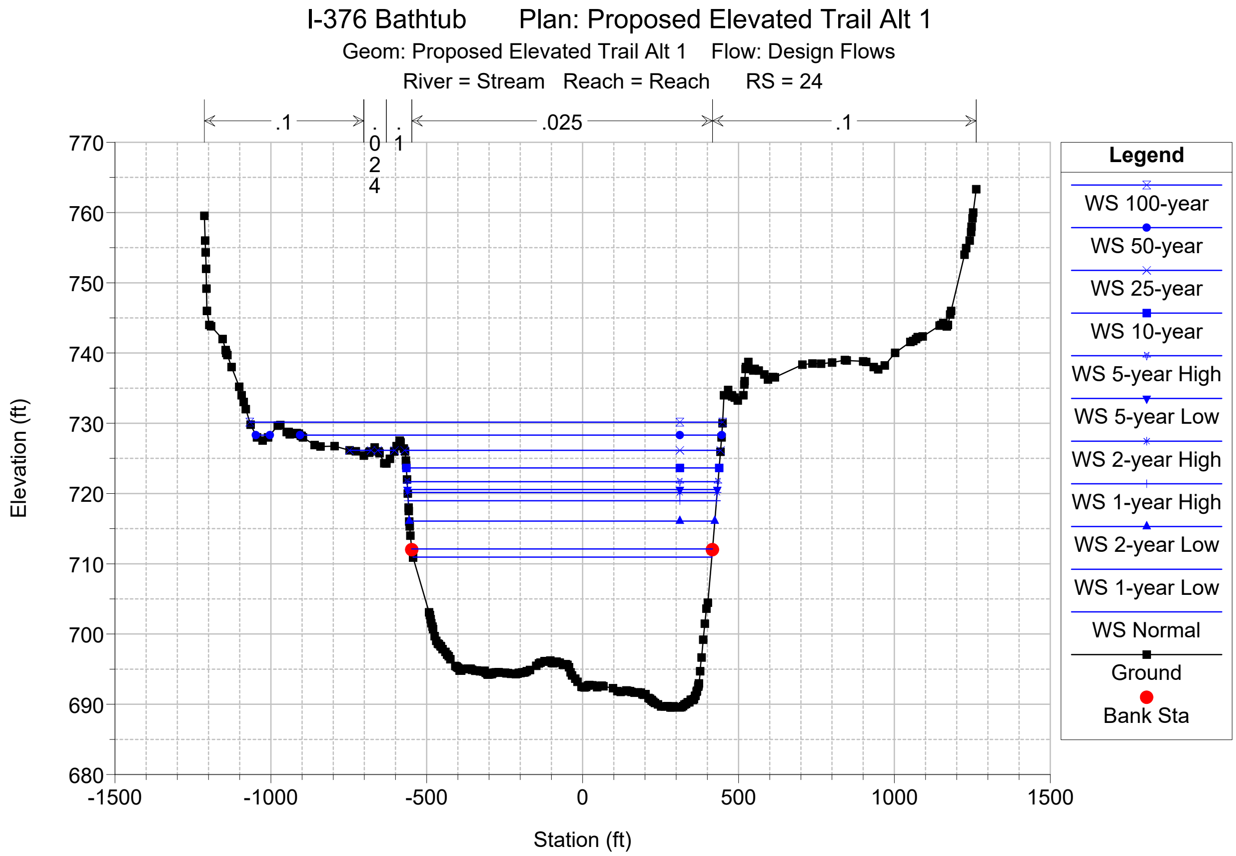
I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 26
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta



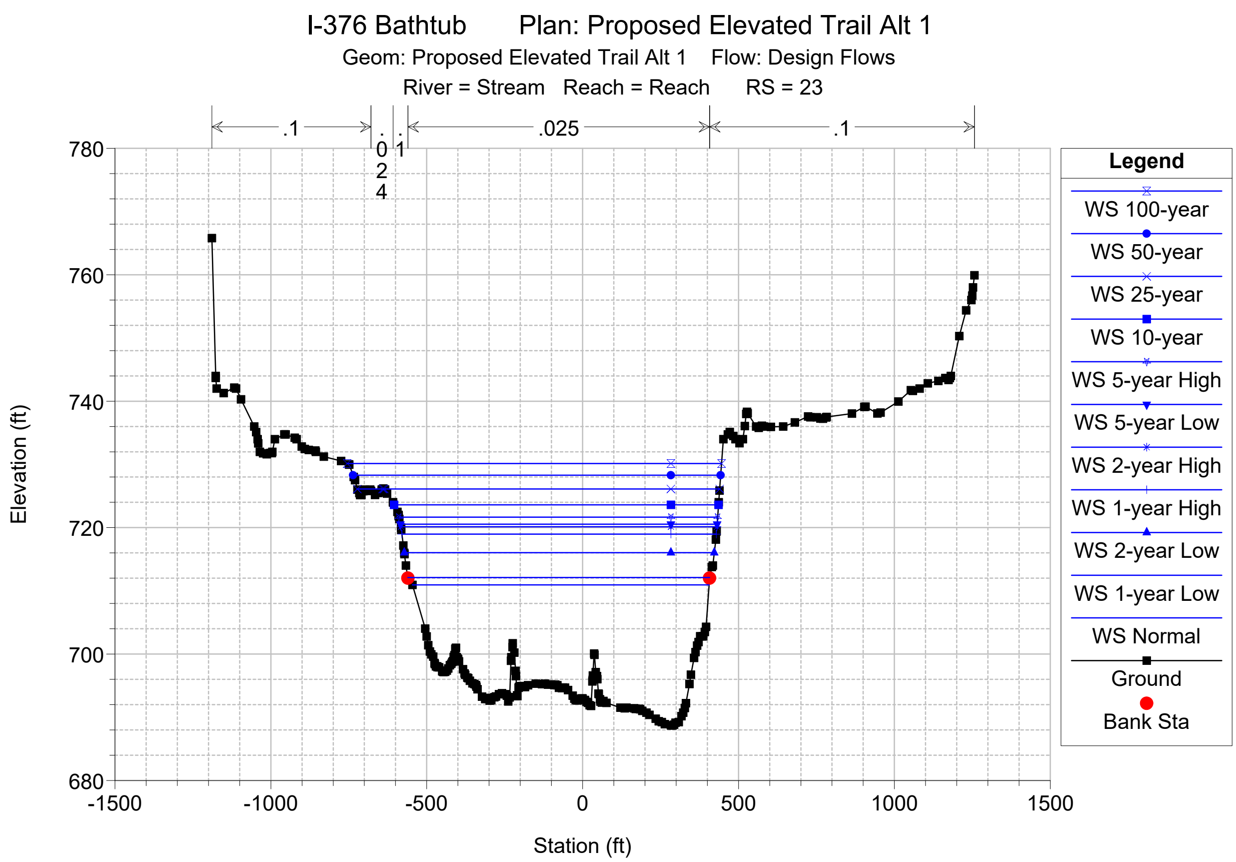
I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 25.5 BR Liberty Bridge
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta


I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 25.5 BR Liberty Bridge
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

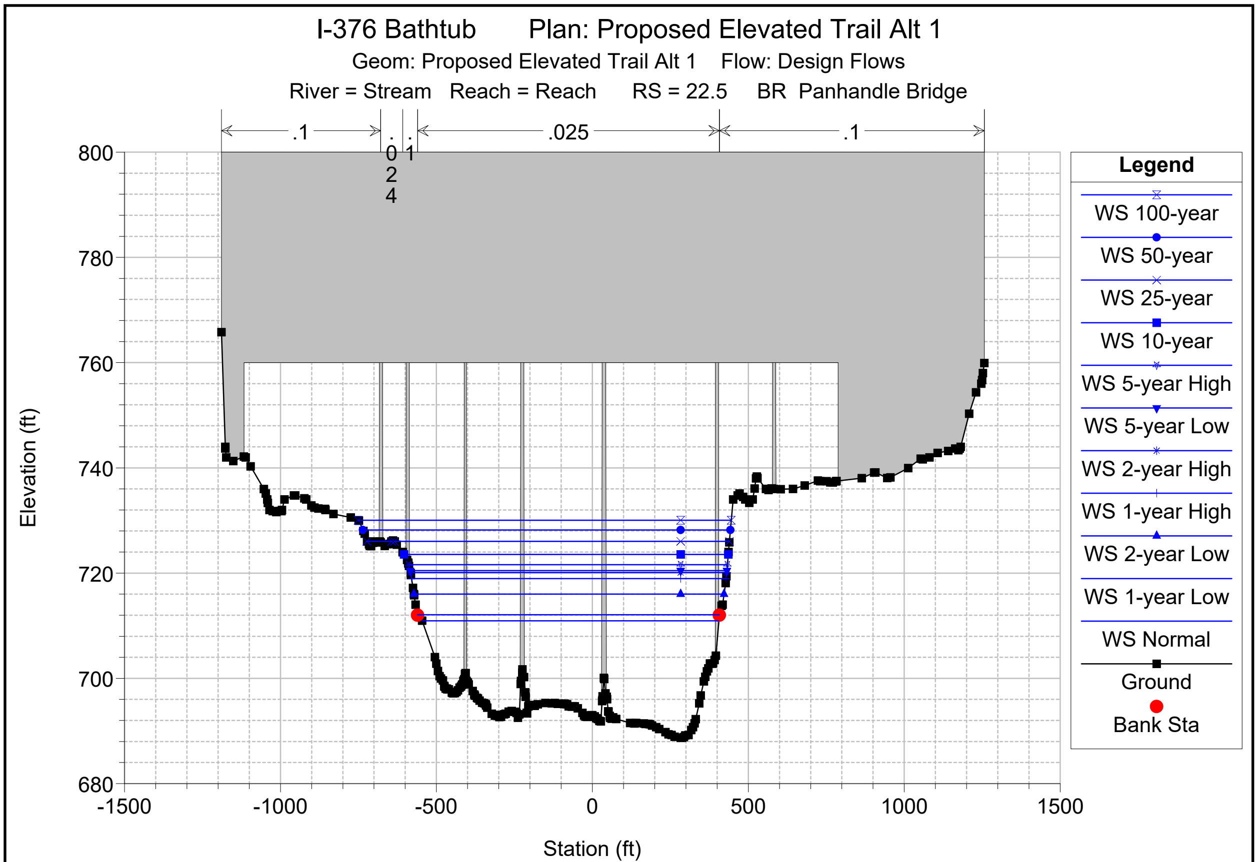

I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 25
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

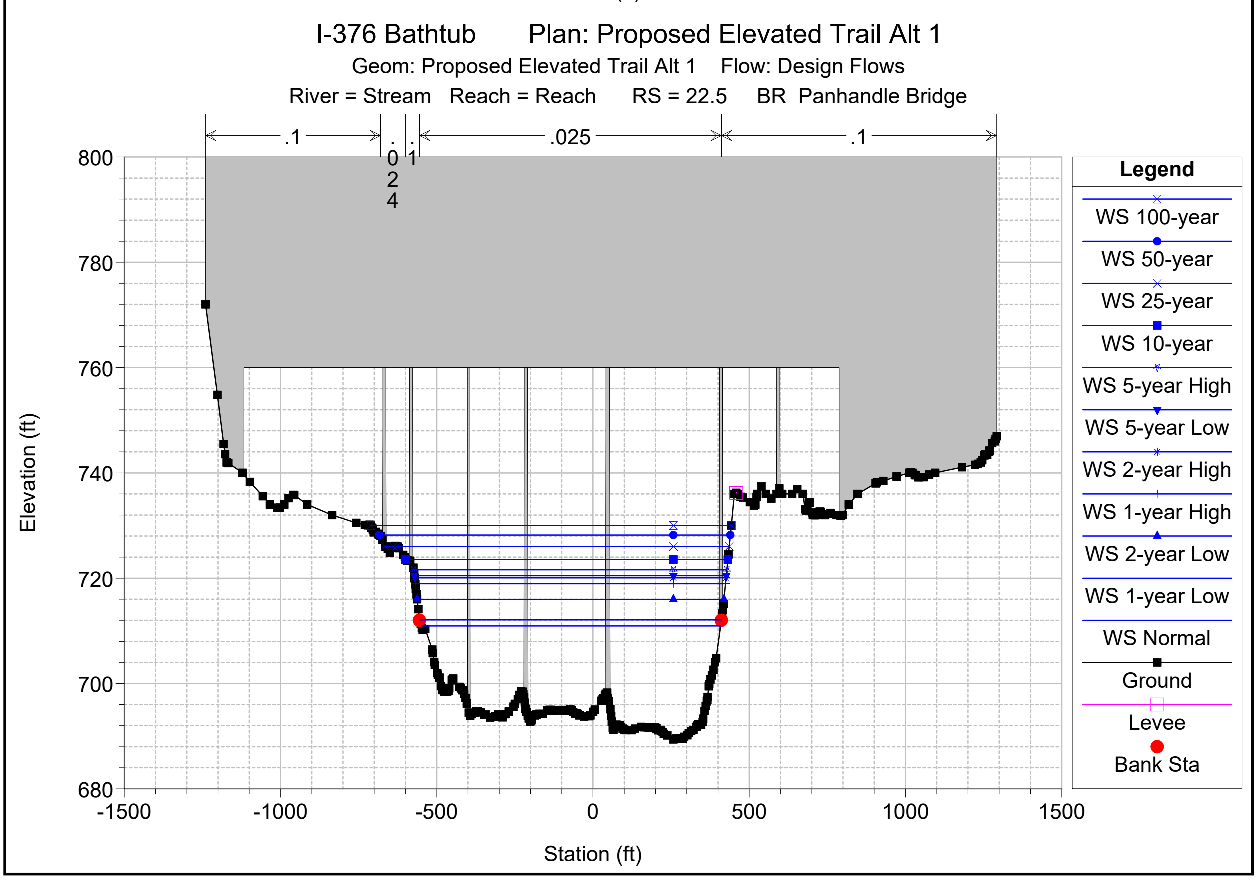


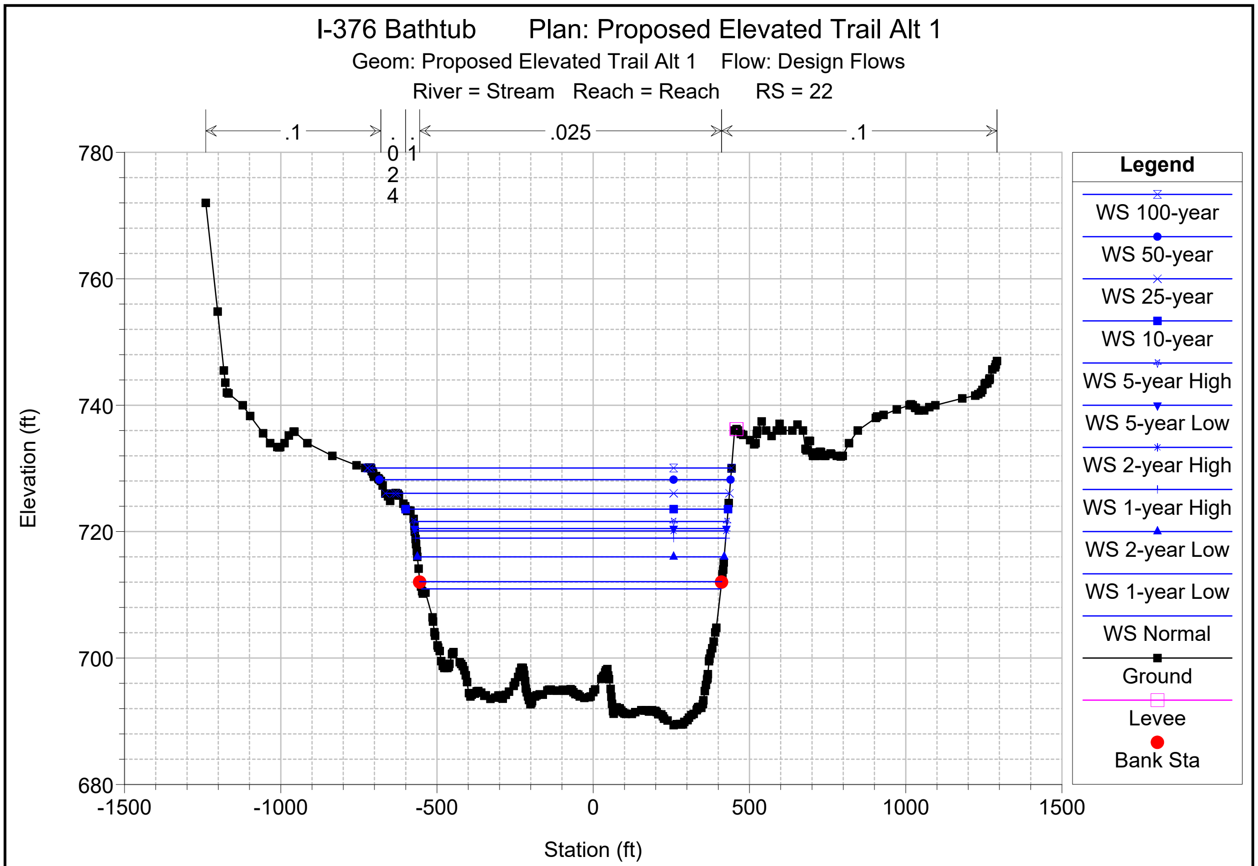
I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 24
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

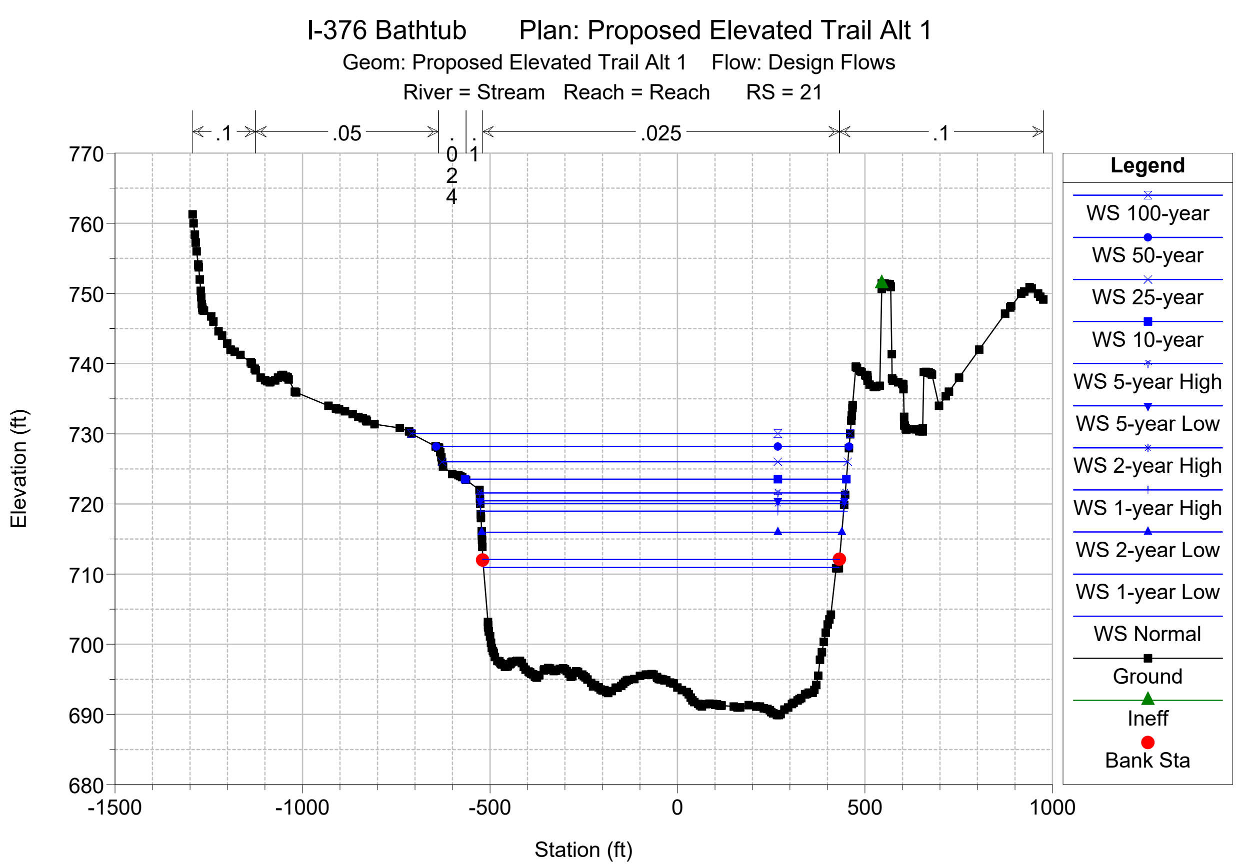


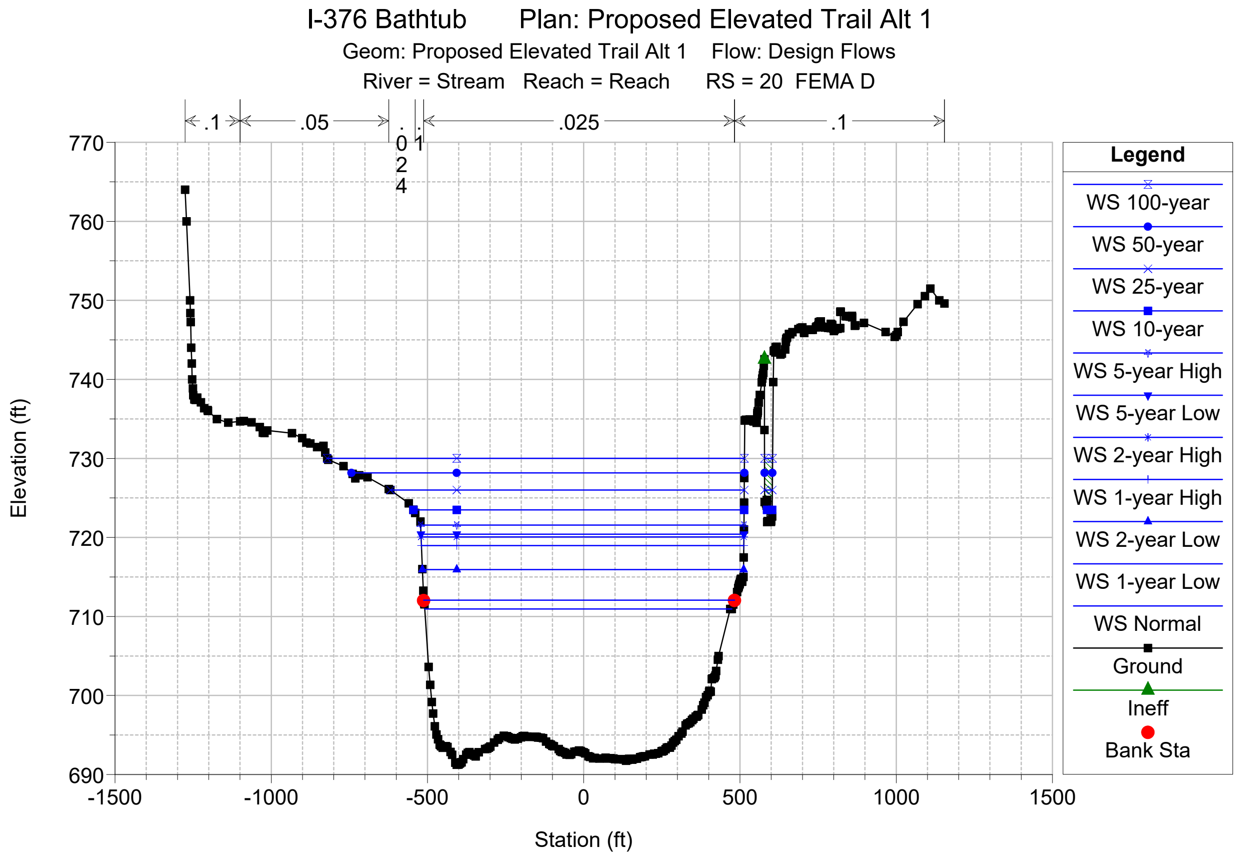
I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 23
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

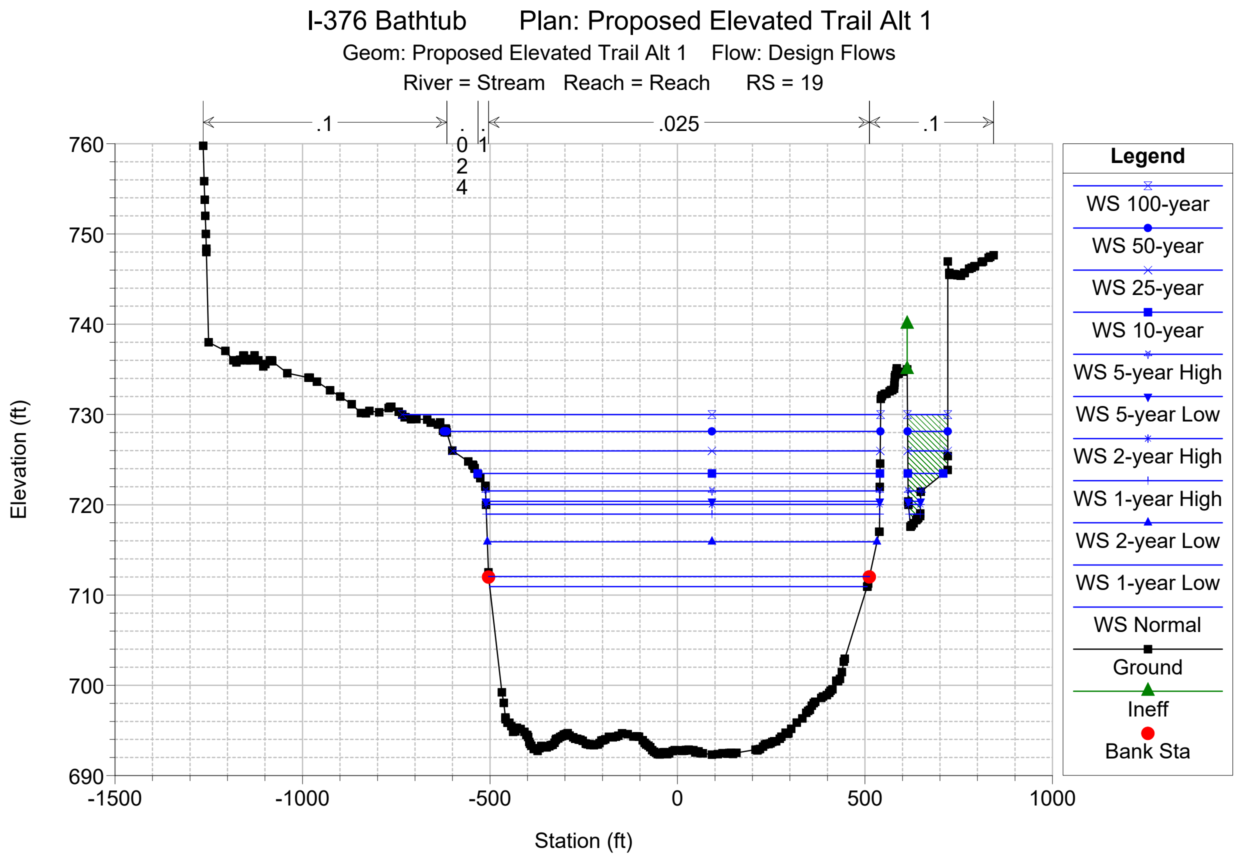

I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 22.5 BR Panhandle Bridge
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

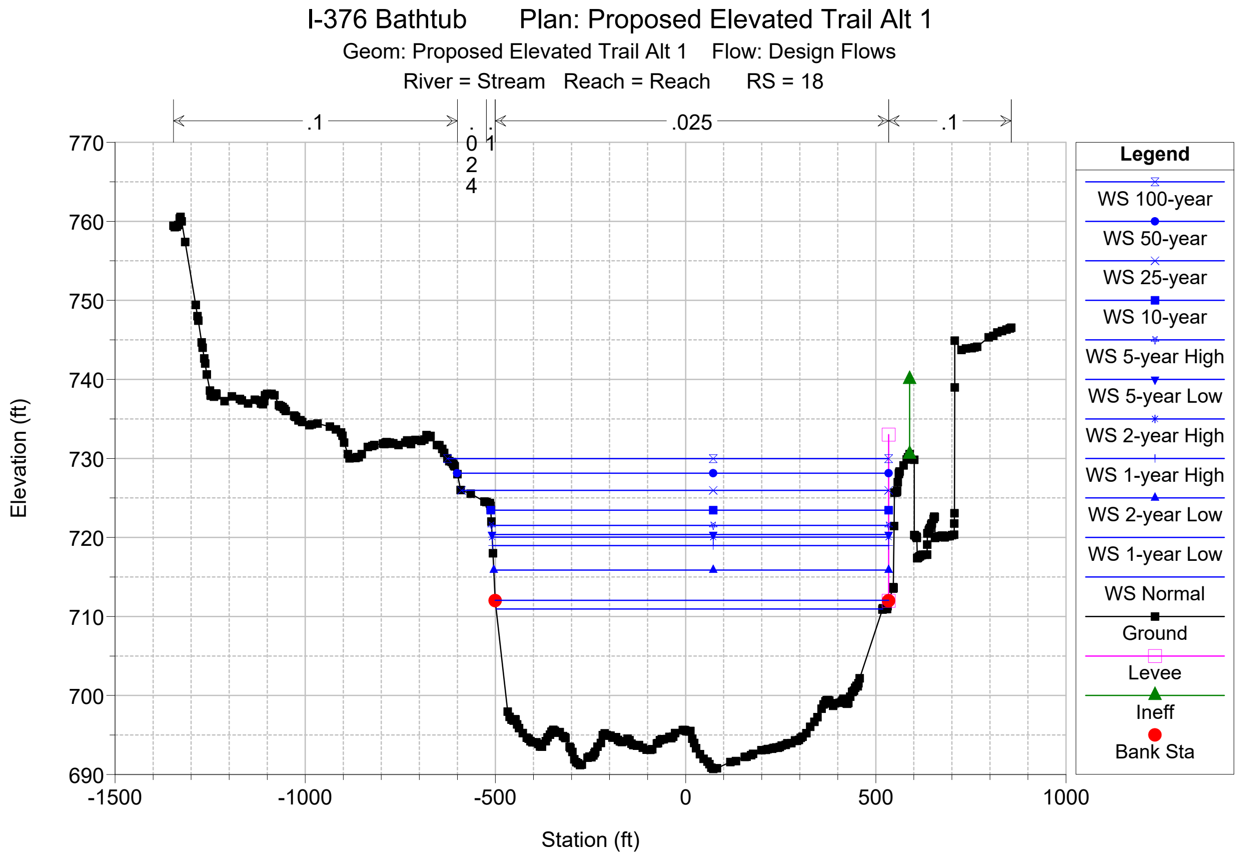

I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 22.5 BR Panhandle Bridge
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta


I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 22
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
780
760
740
720
700
680
-1500
-1000
-500
0
500
1000
1500
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta

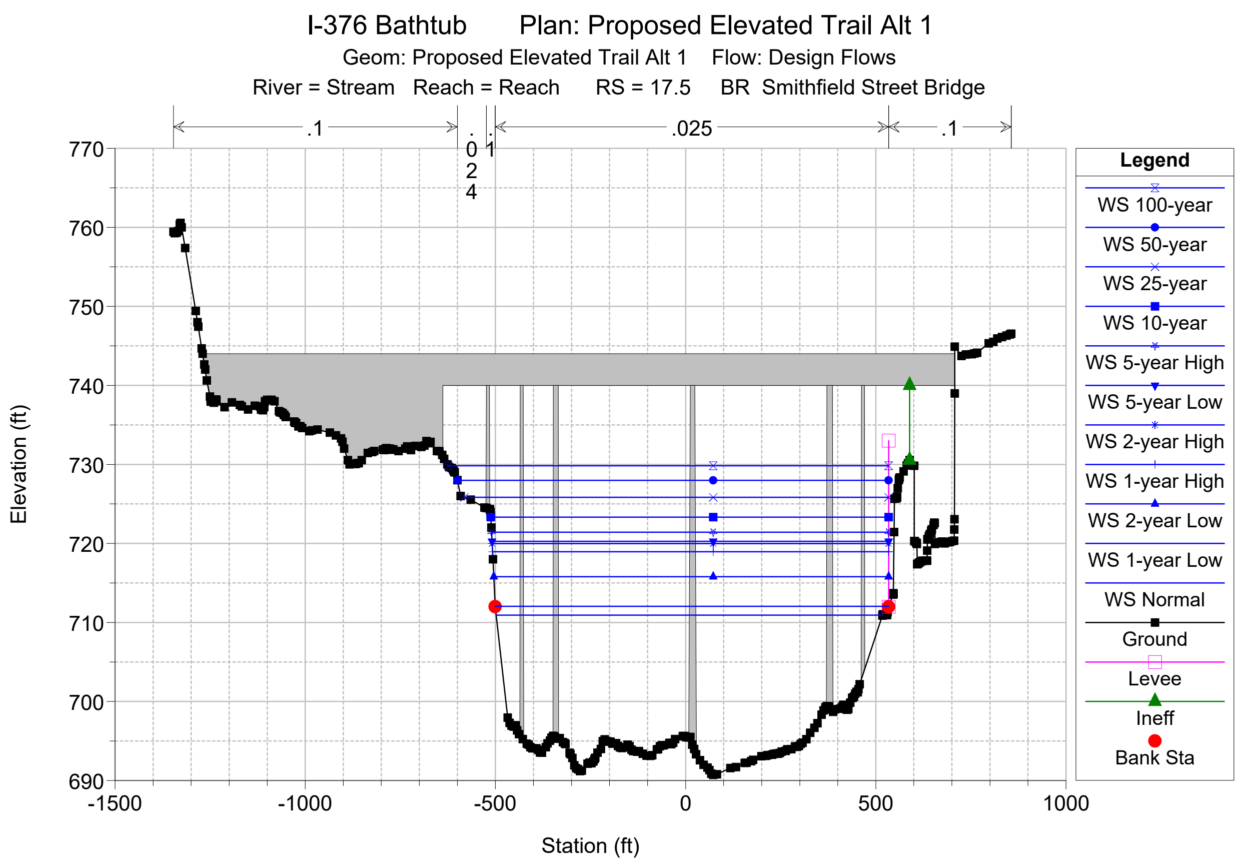

I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 21
.1
.05
.024
.1
.025
.1
Elevation (ft)
Station (ft)
770
760
750
740
730
720
710
700
690
680
-1500
-1000
-500
0
500
1000
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Ineff
Bank Sta


I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 20 FEMA D
.1
.05
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Ineff
Bank Sta

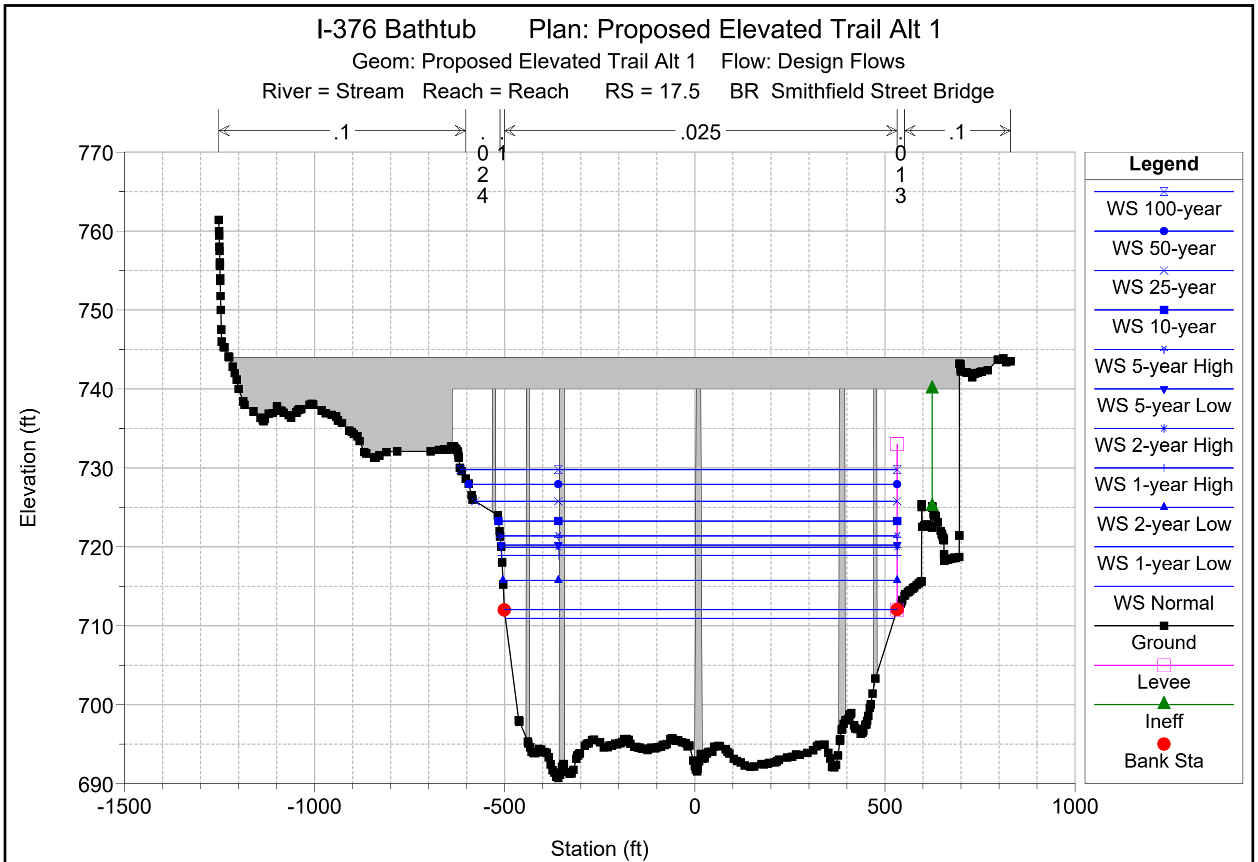

I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 19
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Ineff
Bank Sta

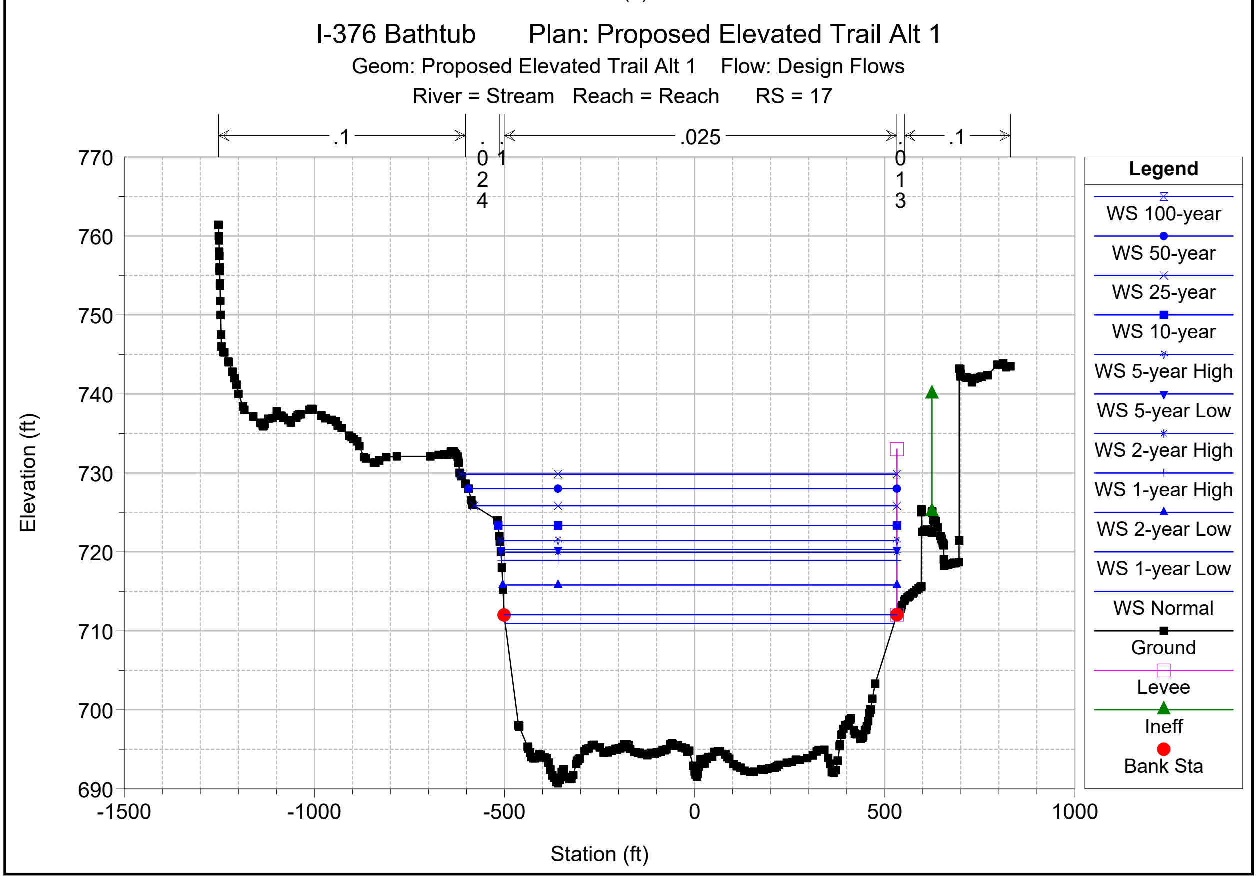


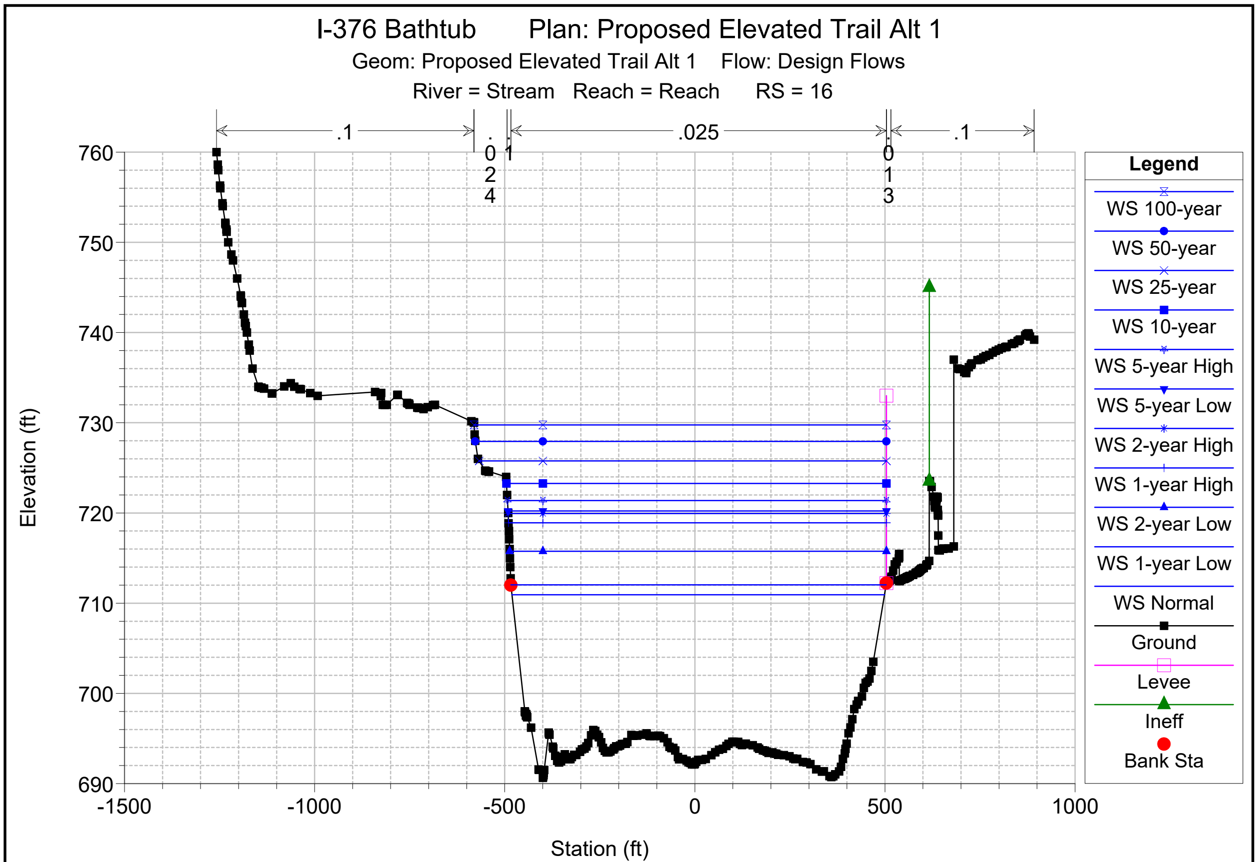
I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 18
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

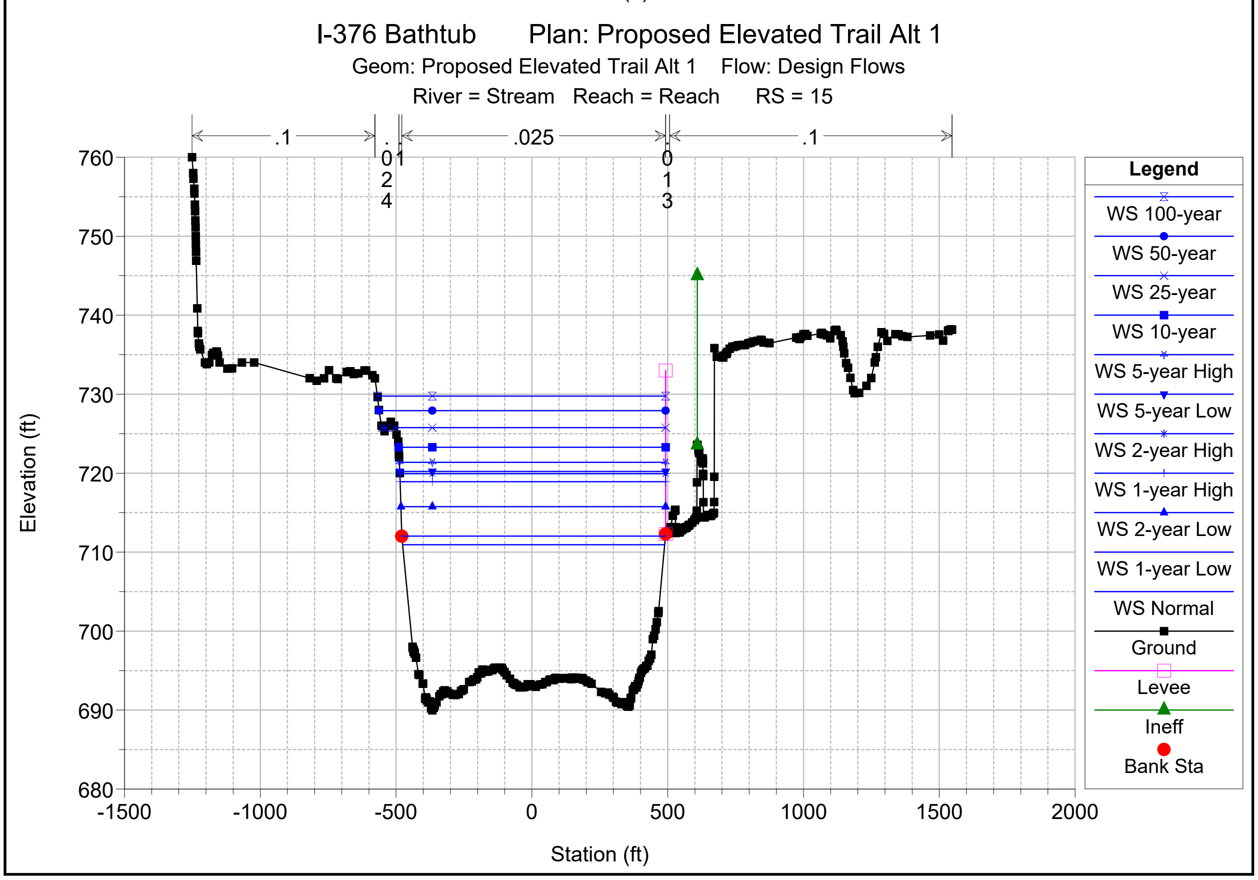


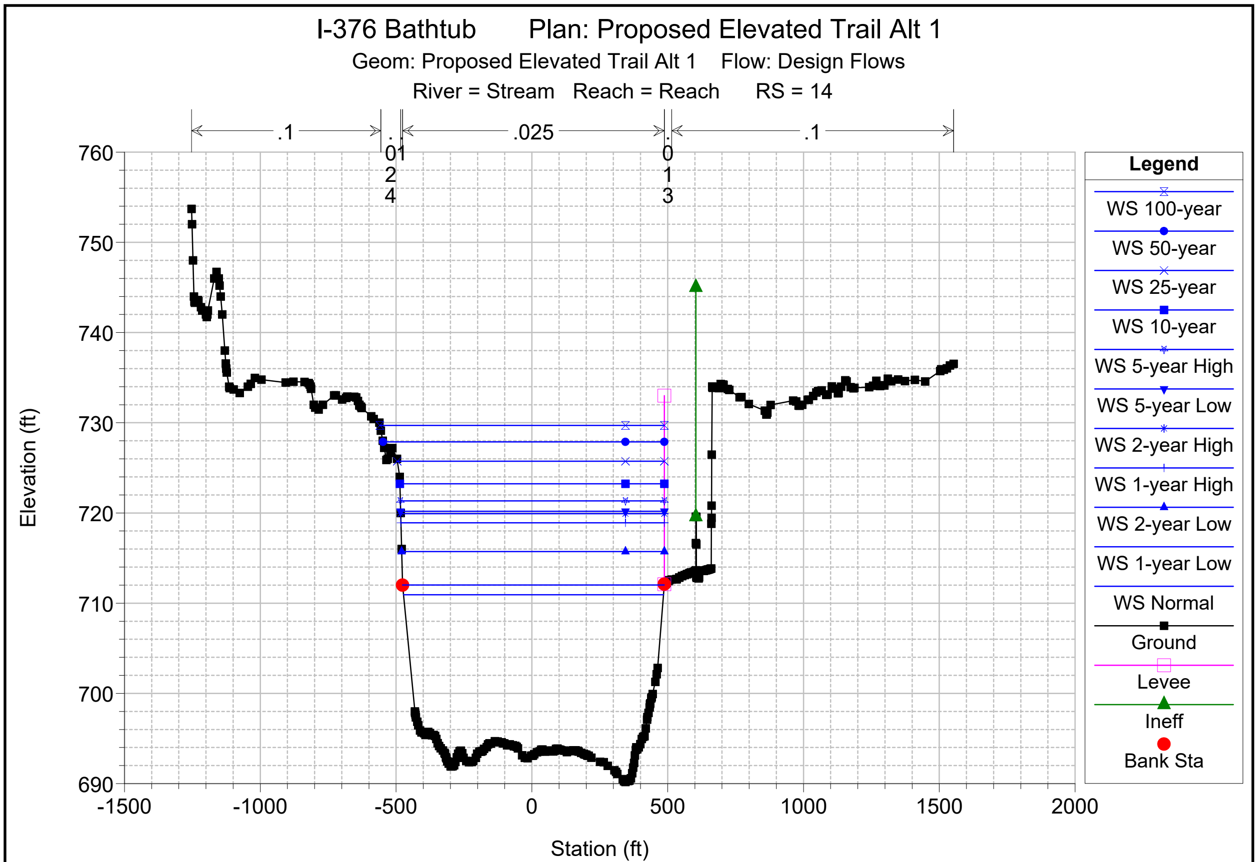
I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 17.5 BR Smithfield Street Bridge
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

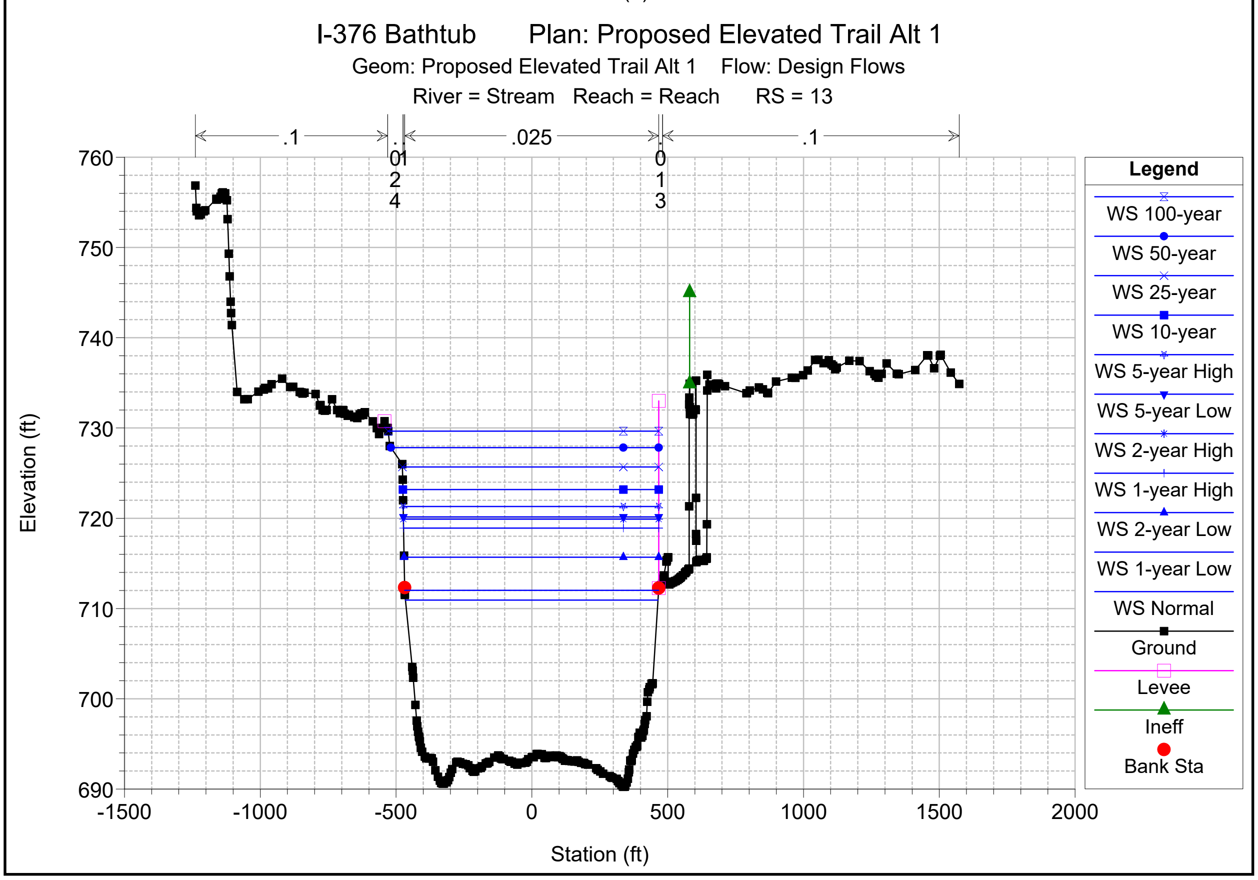

I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 17.5 BR Smithfield Street Bridge
.1
.024
.1
.025
.013
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

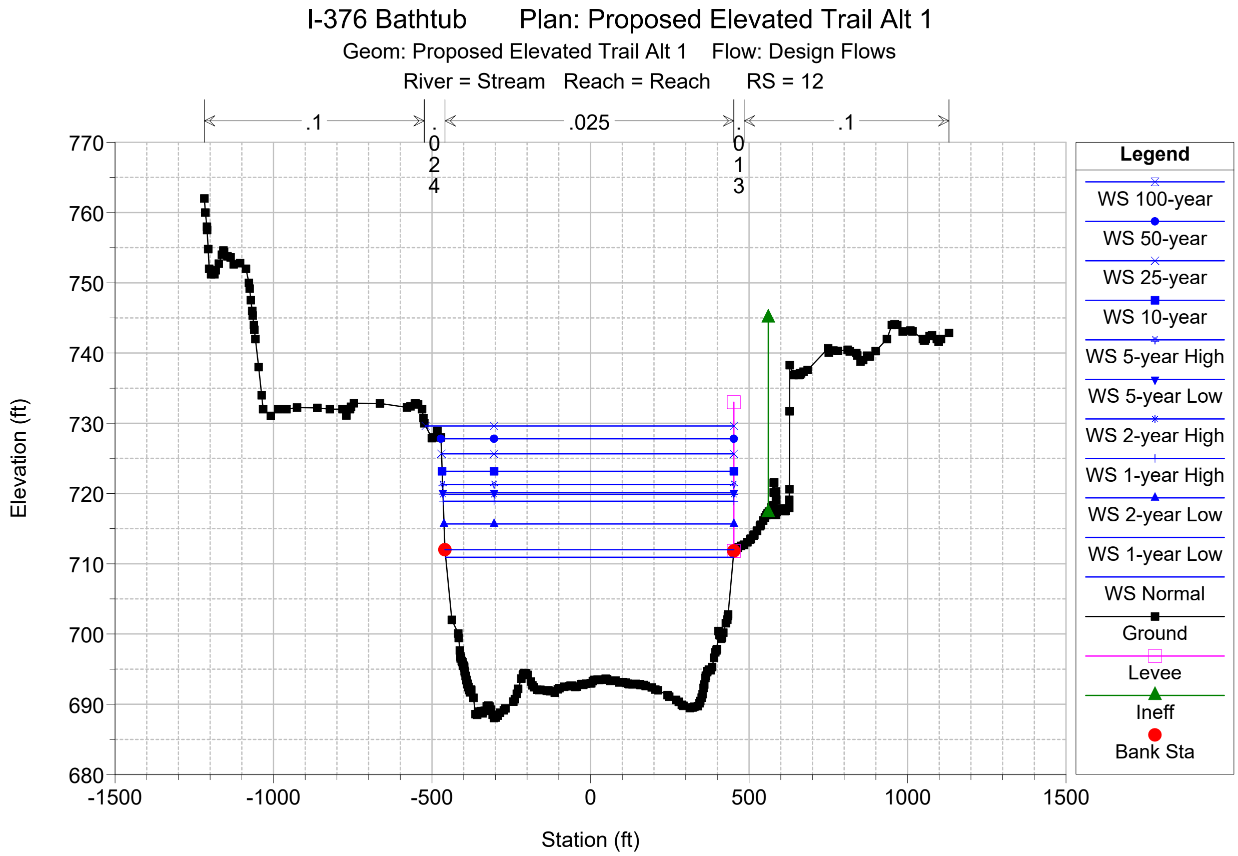

I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 17
.1
.024
.1
.025
.013
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta


I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 16
.1
.024
.1
.025
.013
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

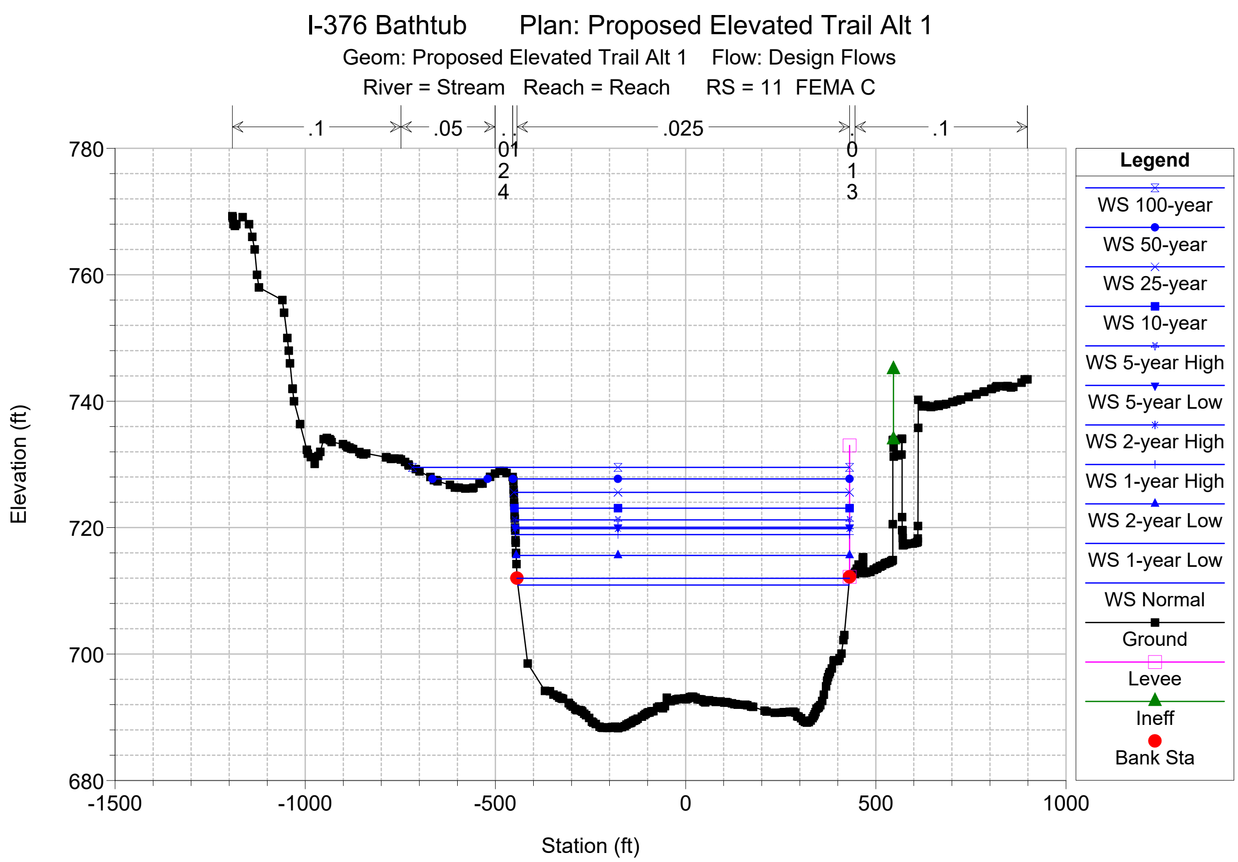

I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 15
.1
.024
.1
.025
.013
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta


I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 14
.1
.025
.1
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)

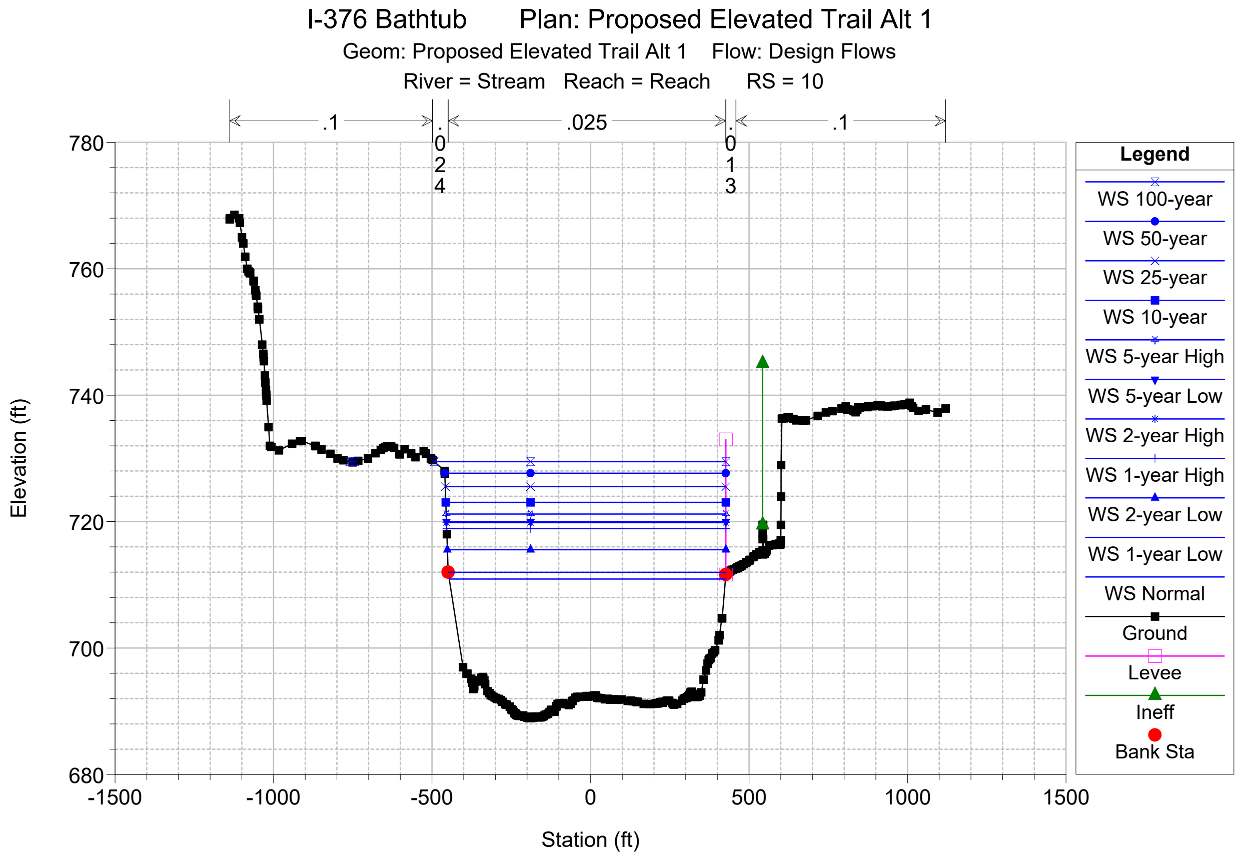

I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 13
.1
.025
.1
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)

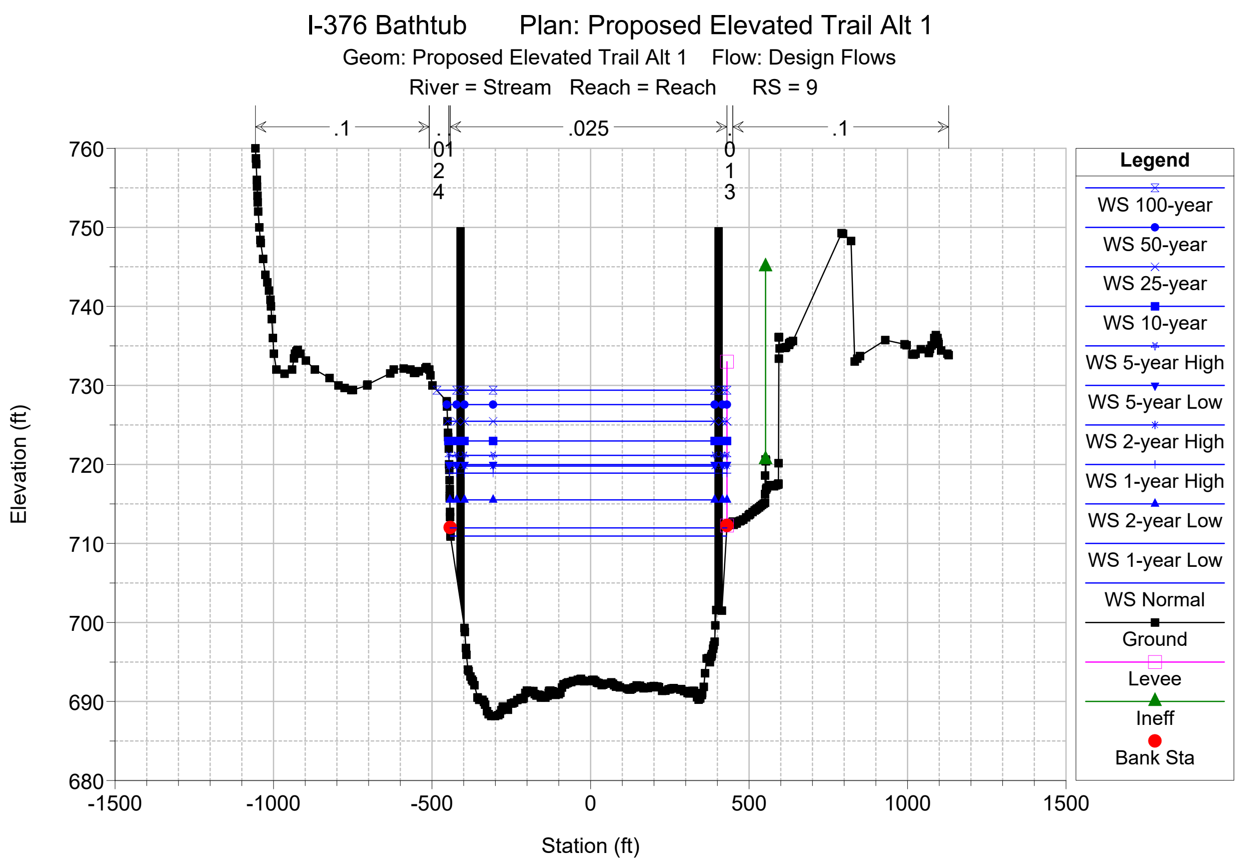


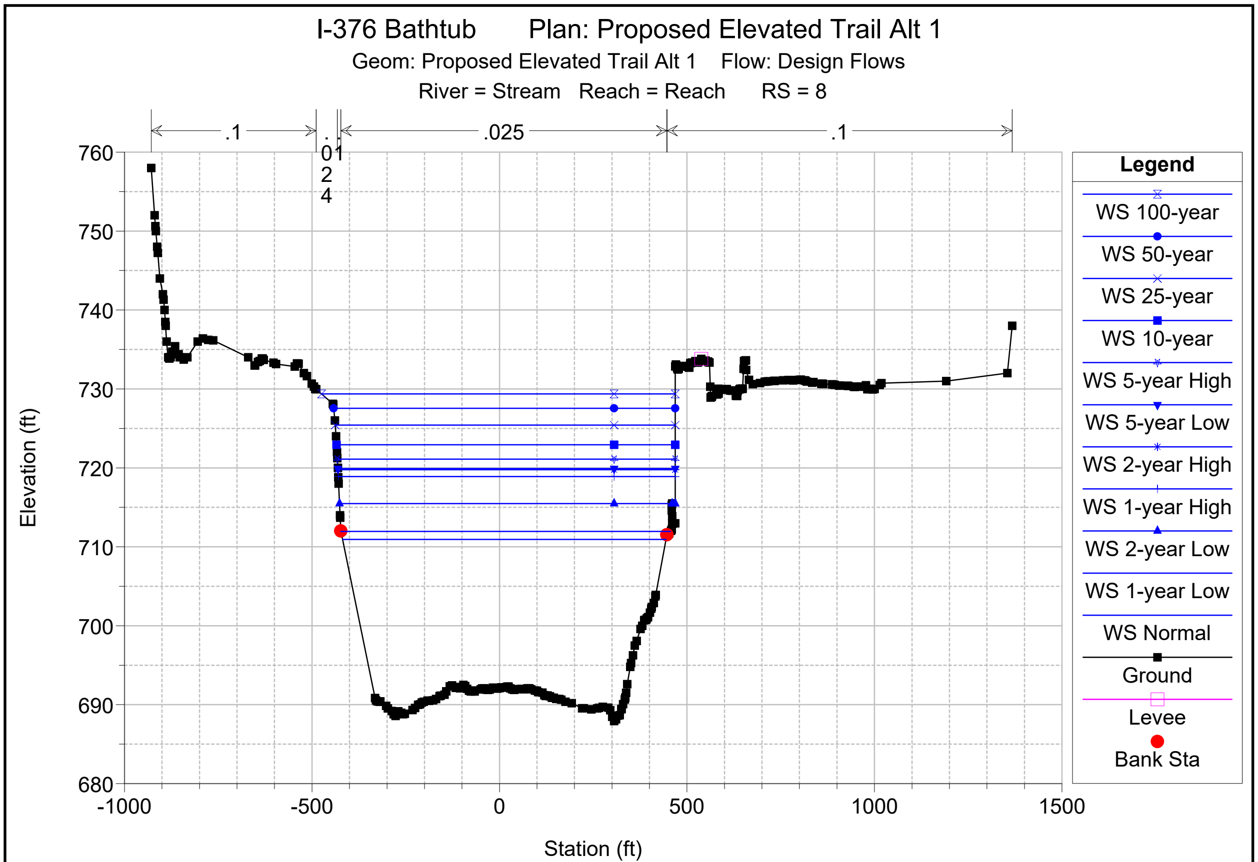
I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 12
.1
.024
.025
.013
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta



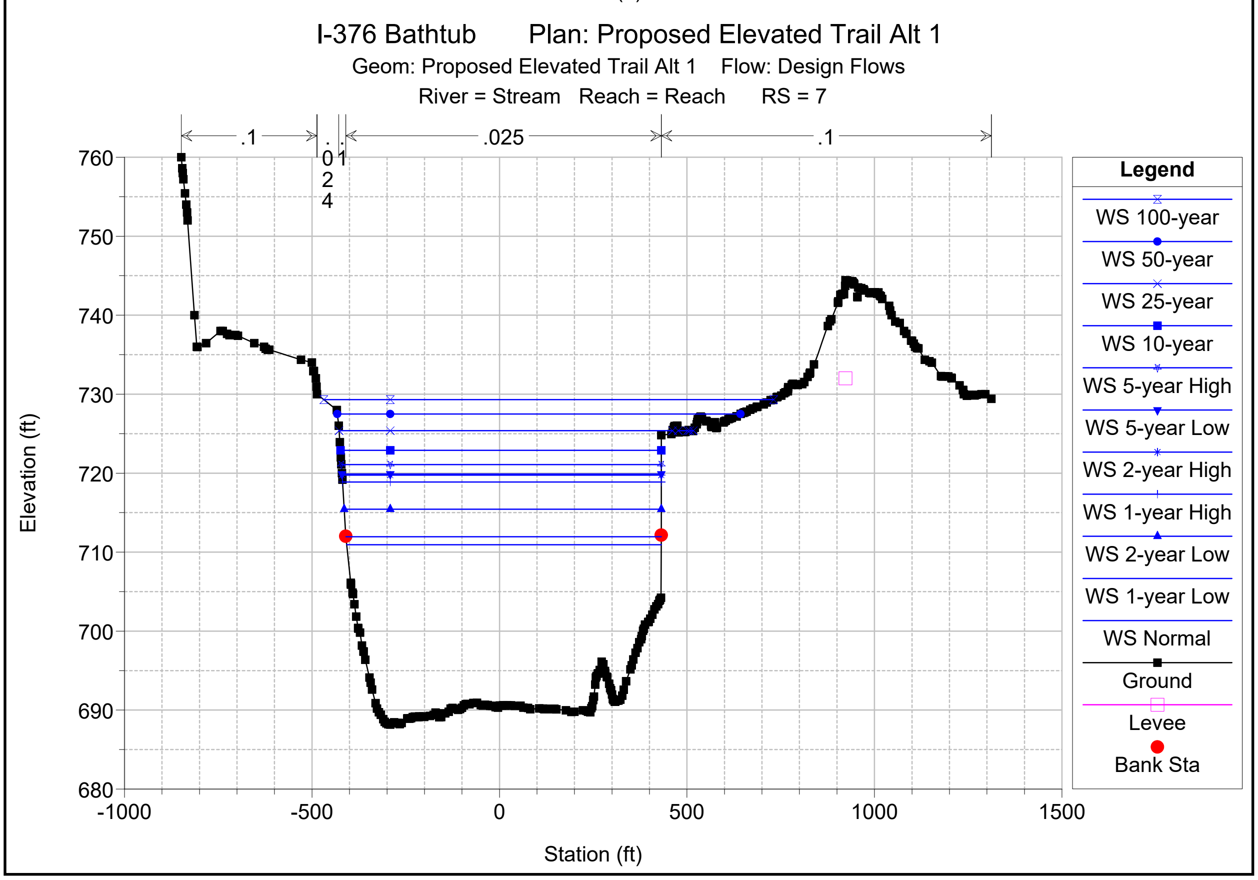
I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 11 FEMA C
.1
.05
.024
.01
.025
.013
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta


I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 10
.1
.025
.1
.024
.013
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
780
760
740
720
700
680
-1500
-1000
-500
0
500
1000
1500

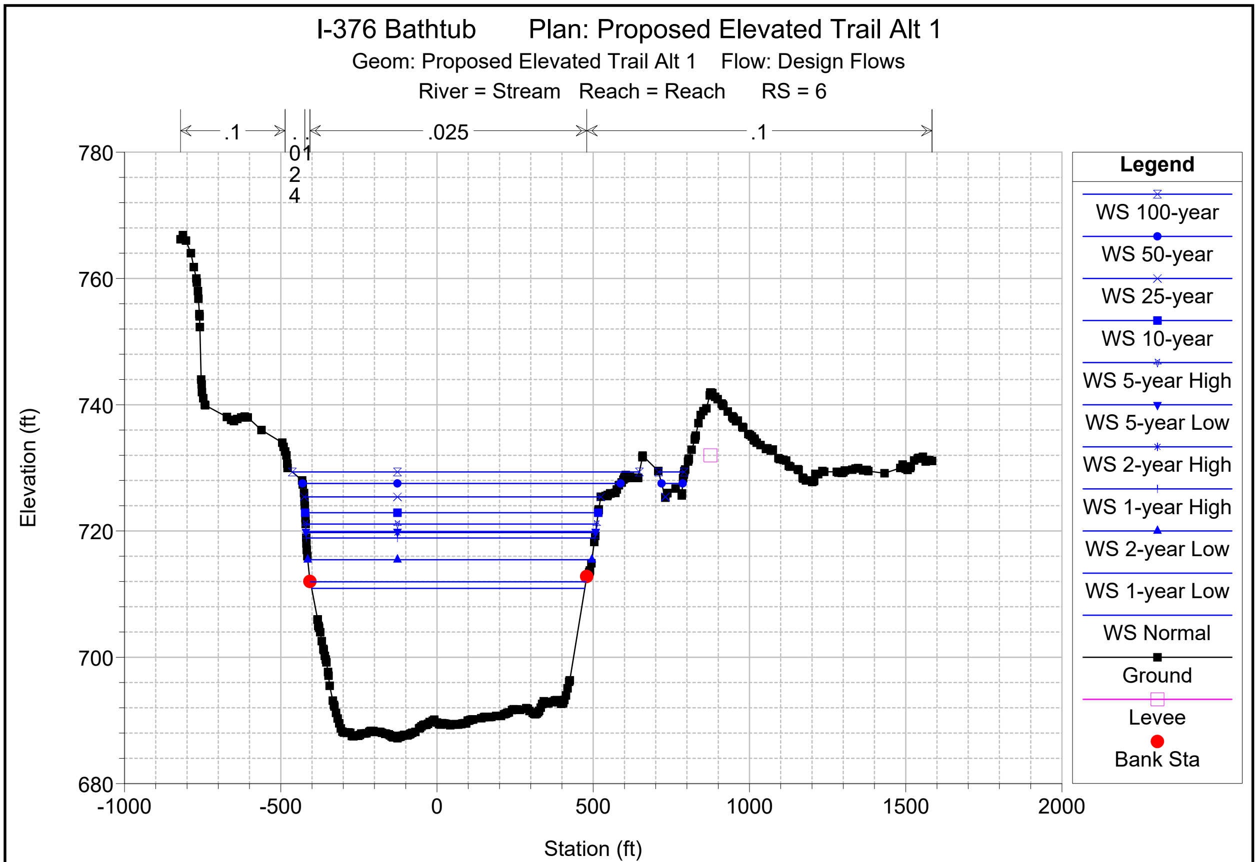

I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 9
.1
.025
.1
.024
.013
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
760
750
740
730
720
710
700
690
680
-1500
-1000
-500
0
500
1000
1500



I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 8
.1
.025
.1
.012
.4
Elevation (ft)
Station (ft)
760
750
740
730
720
710
700
690
680
-1000
-500
0
500
1000
1500
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta



I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 7
.1
.025
.1
.012
.4
Elevation (ft)
Station (ft)
760
750
740
730
720
710
700
690
680
-1000
-500
0
500
1000
1500
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta


I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 6
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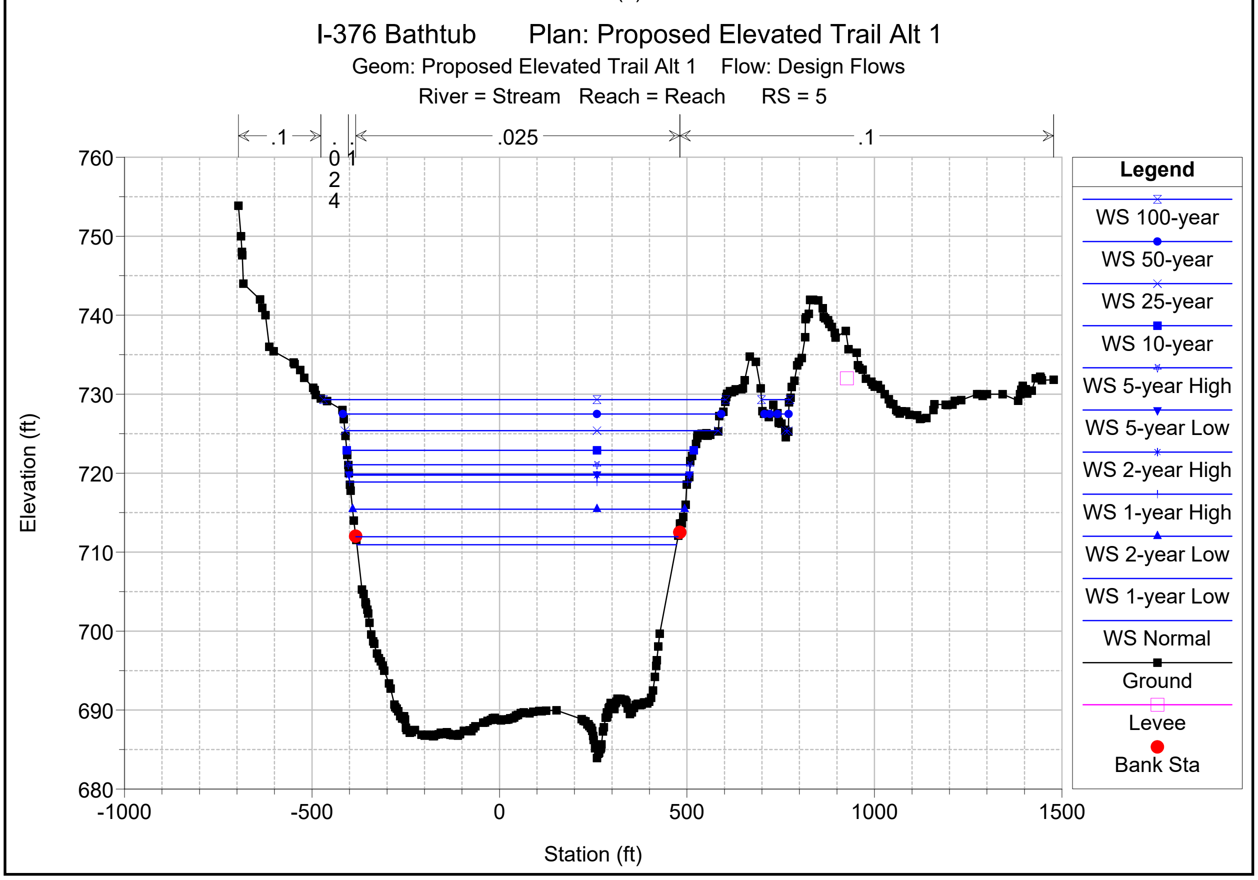
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta


I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 5
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.025
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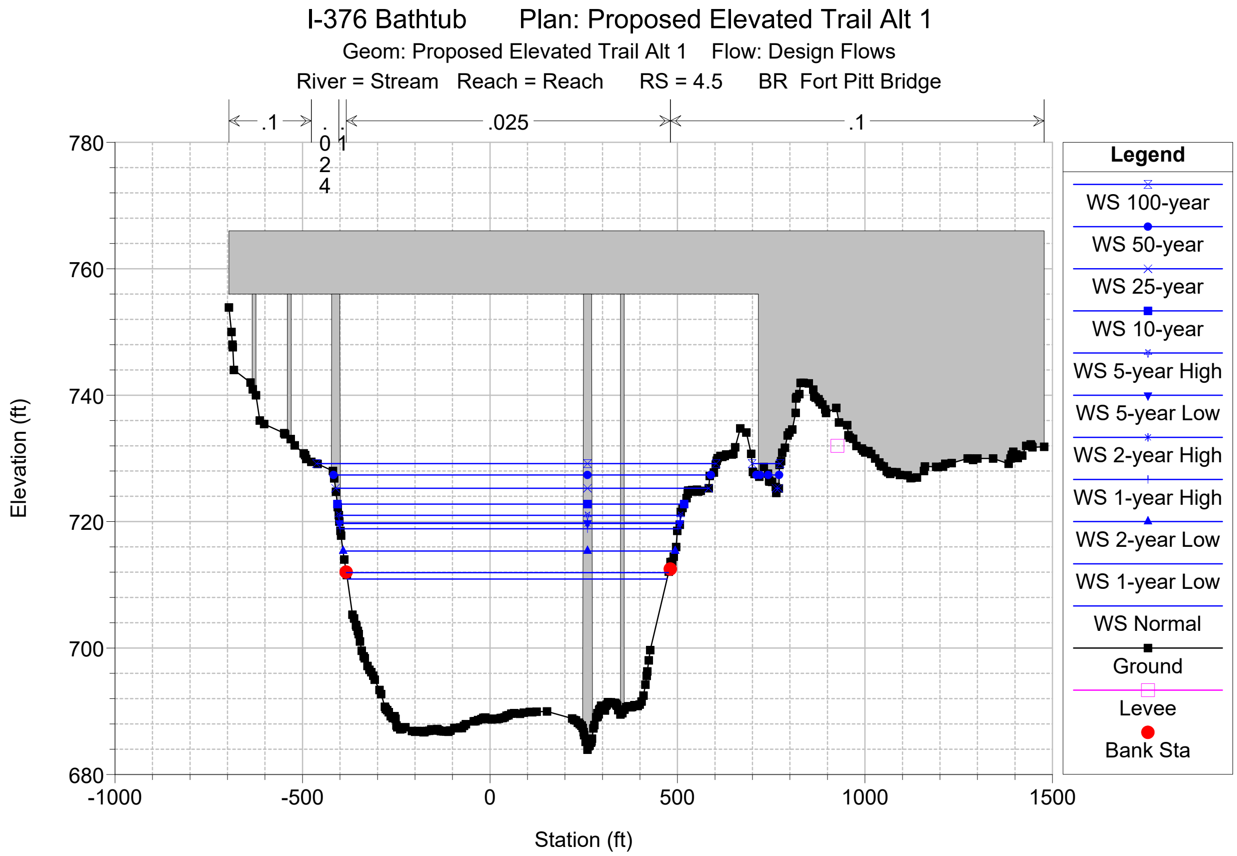
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta


I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 4.5 BR Fort Pitt Bridge
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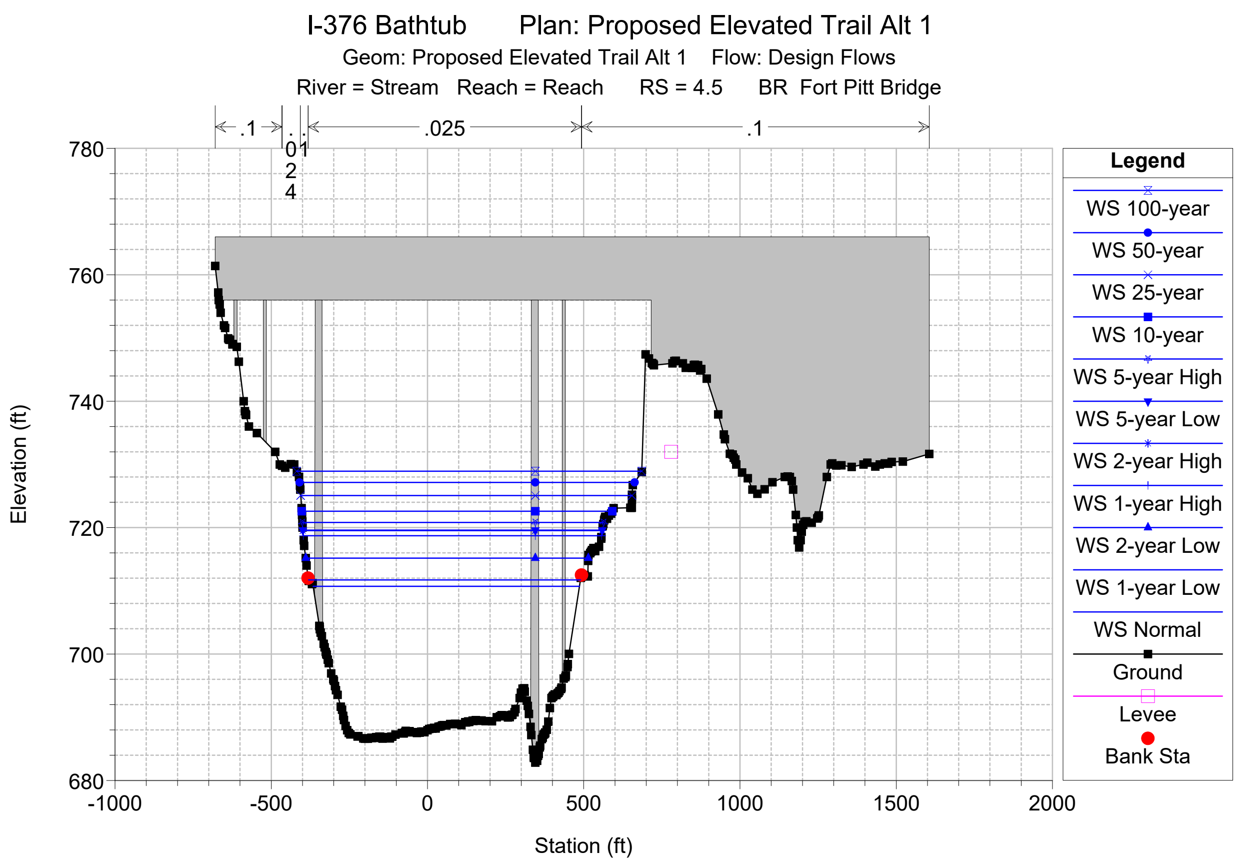
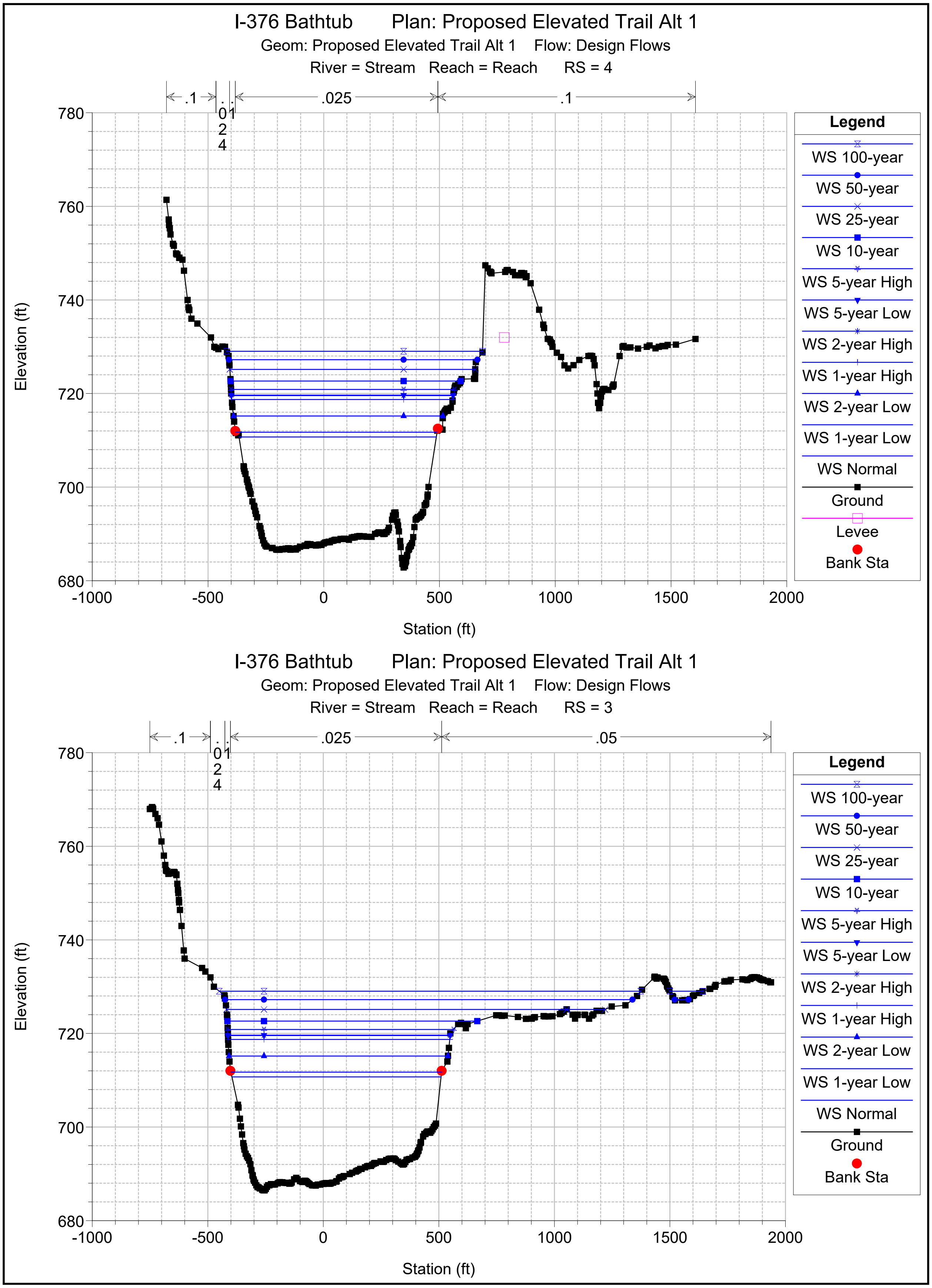
.024
.025
.1
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
780
760
740
720
700
680
-1000
-500
0
500
1000
1500


I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 4.5 BR Fort Pitt Bridge
.1
.024
.025
.1
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
780
760
740
720
700
680
-1000
-500
0
500
1000
1500
2000


I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 4
.1
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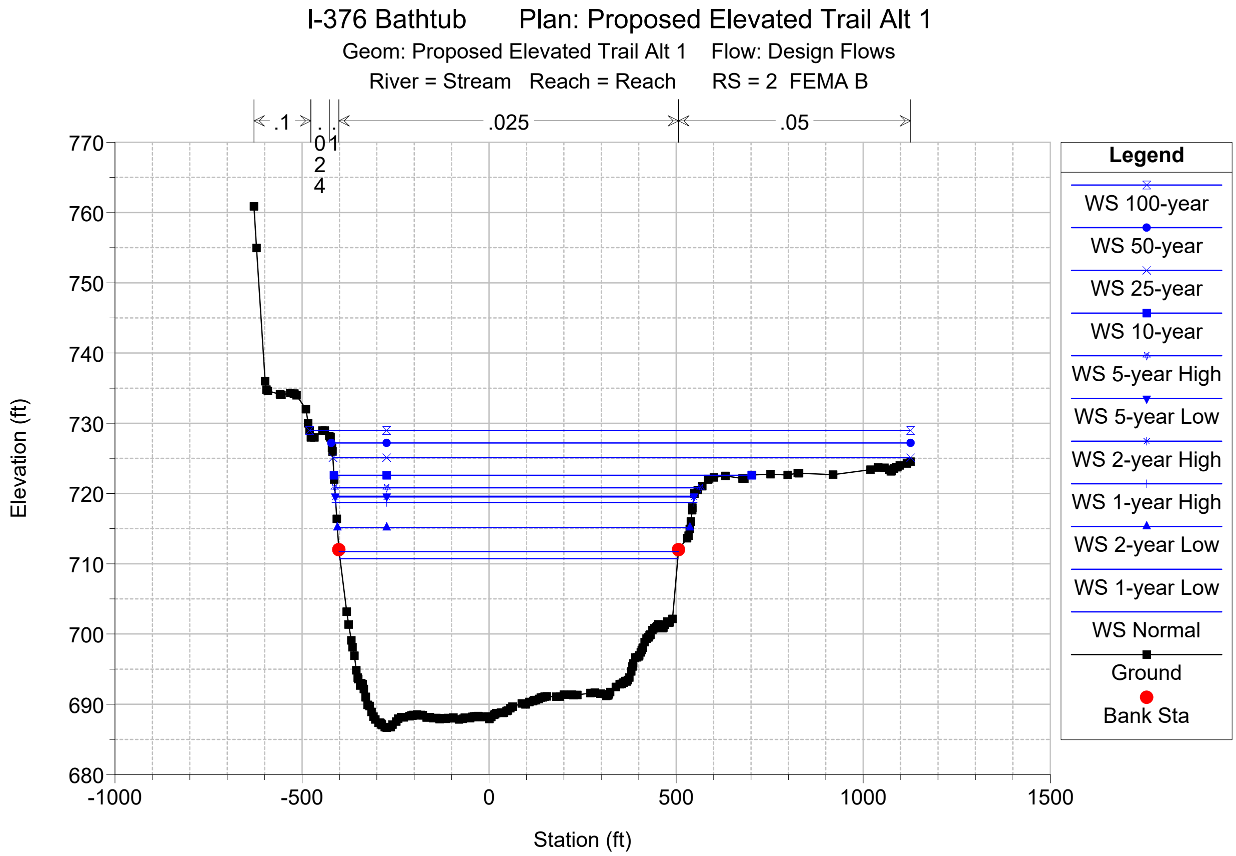
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta
I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 3
.1
.025
.05
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta


I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 2 FEMA B
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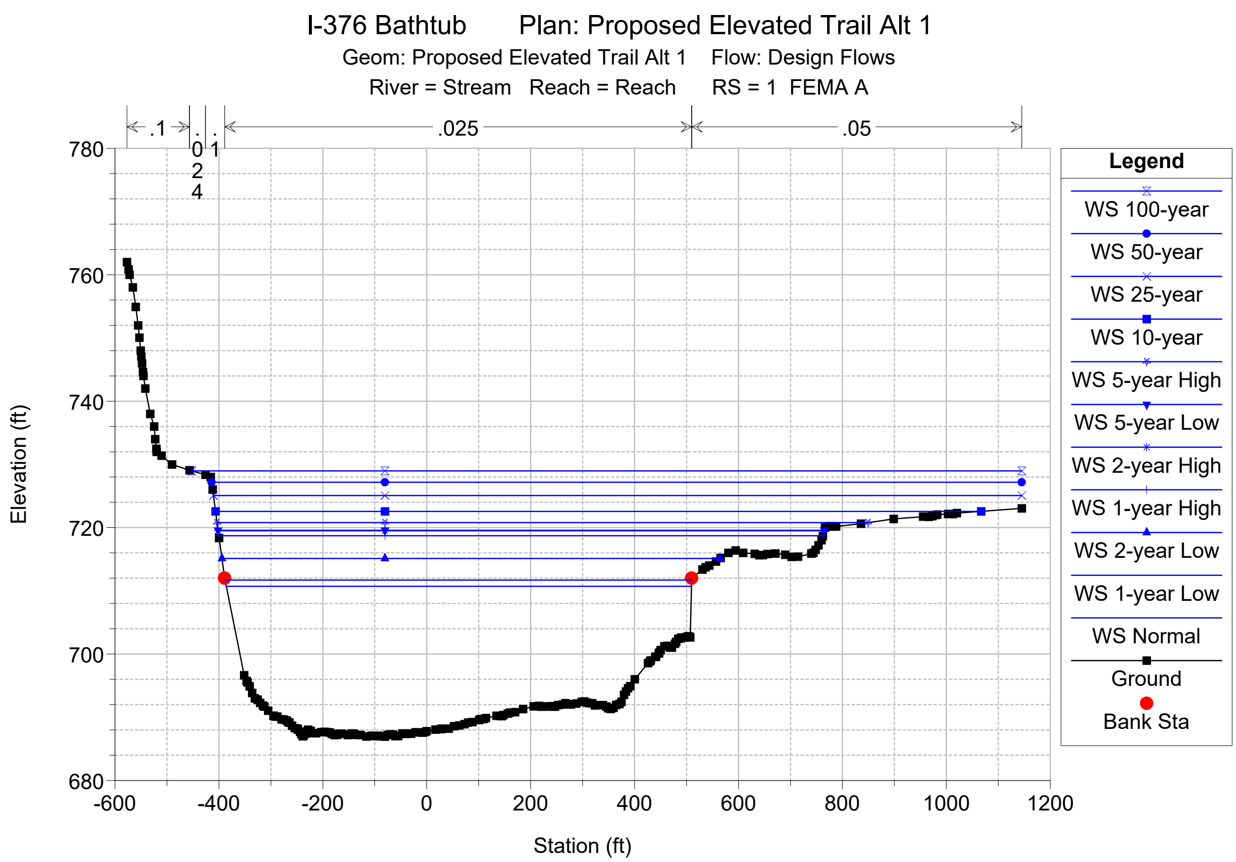
.024
.01
.025
.05
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta


I-376 Bathtub Plan: Proposed Elevated Trail Alt 1
Geom: Proposed Elevated Trail Alt 1 Flow: Design Flows
River = Stream Reach = Reach RS = 1 FEMA A
.1
.024
.01
.025
.05
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

HEC-RAS River: Stream Reach: Reach

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	30	1-year Low	Pr. Elevated Trail 1	39690.00	686.10	712.20		712.31	0.000035	2.6	15343.73	761.30	0.10
Reach	30	1-year Low	Pr Elevated Trail 2	39690.00	686.10	712.20		712.31	0.000035	2.6	15343.73	761.30	0.10
Reach	30	1-year Low	Pr Elevated Trail 3	39690.00	686.10	712.20		712.31	0.000035	2.6	15343.73	761.30	0.10
Reach	30	2-year Low	Pr. Elevated Trail 1	101800.00	686.10	716.38		716.85	0.000122	5.5	18549.73	772.72	0.20
Reach	30	2-year Low	Pr Elevated Trail 2	101800.00	686.10	716.38		716.85	0.000122	5.5	18549.73	772.72	0.20
Reach	30	2-year Low	Pr Elevated Trail 3	101800.00	686.10	716.38		716.85	0.000122	5.5	18549.73	772.72	0.20
Reach	30	5-year Low	Pr. Elevated Trail 1	136800.00	686.10	720.85		721.45	0.000126	6.2	22021.91	782.82	0.20
Reach	30	5-year Low	Pr Elevated Trail 2	136800.00	686.10	720.85		721.45	0.000126	6.2	22021.96	782.82	0.20
Reach	30	5-year Low	Pr Elevated Trail 3	136800.00	686.10	720.85		721.45	0.000126	6.2	22021.96	782.82	0.20
Reach	30	25-year	Pr. Elevated Trail 1	187200.00	686.10	726.40		727.19	0.000131	7.2	26402.25	795.54	0.22
Reach	30	25-year	Pr Elevated Trail 2	187200.00	686.10	726.47		727.26	0.000130	7.1	26458.04	795.70	0.21
Reach	30	25-year	Pr Elevated Trail 3	187200.00	686.10	726.40		727.19	0.000131	7.2	26402.58	795.54	0.22
Reach	30	10-year	Pr. Elevated Trail 1	168500.00	686.10	723.93		724.68	0.000136	6.9	24448.02	789.89	0.22
Reach	30	10-year	Pr Elevated Trail 2	168500.00	686.10	723.93		724.68	0.000136	6.9	24448.13	789.89	0.22
Reach	30	10-year	Pr Elevated Trail 3	168500.00	686.10	723.93		724.68	0.000136	6.9	24448.13	789.89	0.22
Reach	30	50-year	Pr. Elevated Trail 1	212000.00	686.10	728.57		729.47	0.000137	7.6	28160.94	860.88	0.22
Reach	30	50-year	Pr Elevated Trail 2	212000.00	686.10	728.66		729.56	0.000136	7.6	28244.81	866.51	0.22
Reach	30	50-year	Pr Elevated Trail 3	212000.00	686.10	728.66		729.56	0.000136	7.6	28245.98	866.59	0.22
Reach	30	100-year	Pr. Elevated Trail 1	231000.00	686.10	730.40		731.36	0.000138	7.9	29847.84	1014.94	0.22
Reach	30	100-year	Pr Elevated Trail 2	231000.00	686.10	730.52		731.48	0.000137	7.9	29973.42	1020.25	0.22
Reach	30	100-year	Pr Elevated Trail 3	231000.00	686.10	730.52		731.48	0.000137	7.9	29975.54	1020.34	0.22
Reach	30	1-year High	Pr. Elevated Trail 1	39690.00	686.10	719.01		719.07	0.000013	1.9	20585.65	778.61	0.07
Reach	30	1-year High	Pr Elevated Trail 2	39690.00	686.10	719.01		719.07	0.000013	1.9	20585.65	778.61	0.07
Reach	30	1-year High	Pr Elevated Trail 3	39690.00	686.10	719.01		719.07	0.000013	1.9	20585.65	778.61	0.07
Reach	30	5-year High	Pr. Elevated Trail 1	136800.00	686.10	721.92		722.48	0.000112	6.0	22864.49	785.28	0.19
Reach	30	5-year High	Pr Elevated Trail 2	136800.00	686.10	721.92		722.48	0.000112	6.0	22864.54	785.28	0.19
Reach	30	5-year High	Pr Elevated Trail 3	136800.00	686.10	721.92		722.48	0.000112	6.0	22864.54	785.28	0.19
Reach	30	2-year High	Pr. Elevated Trail 1	101800.00	686.10	720.31		720.66	0.000074	4.7	21601.78	781.59	0.16
Reach	30	2-year High	Pr Elevated Trail 2	101800.00	686.10	720.31		720.66	0.000074	4.7	21601.78	781.59	0.16
Reach	30	2-year High	Pr Elevated Trail 3	101800.00	686.10	720.31		720.66	0.000074	4.7	21601.78	781.59	0.16
Reach	30	Normal	Pr. Elevated Trail 1	12700.00	686.10	710.96		710.97	0.000004	0.9	14397.68	755.90	0.04
Reach	30	Normal	Pr Elevated Trail 2	12700.00	686.10	710.96		710.97	0.000004	0.9	14397.68	755.90	0.04
Reach	30	Normal	Pr Elevated Trail 3	12700.00	686.10	710.96		710.97	0.000004	0.9	14397.68	755.90	0.04
Reach	29	1-year Low	Pr. Elevated Trail 1	39690.00	690.79	712.18		712.29	0.000042	2.7	14910.55	807.23	0.11
Reach	29	1-year Low	Pr Elevated Trail 2	39690.00	690.79	712.18		712.29	0.000042	2.7	14910.55	807.23	0.11
Reach	29	1-year Low	Pr Elevated Trail 3	39690.00	690.79	712.18		712.29	0.000042	2.7	14910.55	807.23	0.11
Reach	29	2-year Low	Pr. Elevated Trail 1	101800.00	690.79	716.30		716.79	0.000140	5.6	18256.87	816.09	0.21
Reach	29	2-year Low	Pr Elevated Trail 2	101800.00	690.79	716.30		716.79	0.000140	5.6	18256.87	816.09	0.21
Reach	29	2-year Low	Pr Elevated Trail 3	101800.00	690.79	716.30		716.79	0.000140	5.6	18256.87	816.09	0.21
Reach	29	5-year Low	Pr. Elevated Trail 1	136800.00	690.79	720.78		721.39	0.000138	6.3	21931.24	825.76	0.21
Reach	29	5-year Low	Pr Elevated Trail 2	136800.00	690.79	720.78		721.39	0.000138	6.3	21931.28	825.76	0.21
Reach	29	5-year Low	Pr Elevated Trail 3	136800.00	690.79	720.78		721.39	0.000138	6.3	21931.28	825.76	0.21
Reach	29	25-year	Pr. Elevated Trail 1	187200.00	690.79	726.34		727.12	0.000139	7.1	26556.37	837.63	0.22
Reach	29	25-year	Pr Elevated Trail 2	187200.00	690.79	726.41		727.19	0.000138	7.1	26615.57	837.78	0.22
Reach	29	25-year	Pr Elevated Trail 3	187200.00	690.79	726.34		727.12	0.000139	7.1	26556.67	837.63	0.22
Reach	29	10-year	Pr. Elevated Trail 1	168500.00	690.79	723.87		724.61	0.000146	6.9	24491.21	832.35	0.22
Reach	29	10-year	Pr Elevated Trail 2	168500.00	690.79	723.87		724.61	0.000146	6.9	24491.32	832.35	0.22
Reach	29	10-year	Pr Elevated Trail 3	168500.00	690.79	723.87		724.61	0.000146	6.9	24491.32	832.35	0.22
Reach	29	50-year	Pr. Elevated Trail 1	212000.00	690.79	728.51		729.39	0.000143	7.5	28425.54	893.31	0.23
Reach	29	50-year	Pr Elevated Trail 2	212000.00	690.79	728.61		729.48	0.000142	7.5	28513.24	902.08	0.22
Reach	29	50-year	Pr Elevated Trail 3	212000.00	690.79	728.61		729.48	0.000142	7.5	28514.51	902.26	0.22
Reach	29	100-year	Pr. Elevated Trail 1	231000.00	690.79	730.34		731.29	0.000143	7.8	30321.87	1178.23	0.23
Reach	29	100-year	Pr Elevated Trail 2	231000.00	690.79	730.47		731.40	0.000141	7.8	30469.04	1190.43	0.23
Reach	29	100-year	Pr Elevated Trail 3	231000.00	690.79	730.47		731.41	0.000141	7.8	30471.51	1190.69	0.23
Reach	29	1-year High	Pr. Elevated Trail 1	39690.00	690.79	719.00		719.06	0.000015	1.9	20467.59	821.92	0.07
Reach	29	1-year High	Pr Elevated Trail 2	39690.00	690.79	719.00		719.06	0.000015	1.9	20467.59	821.92	0.07
Reach	29	1-year High	Pr Elevated Trail 3	39690.00	690.79	719.00		719.06	0.000015	1.9	20467.59	821.92	0.07
Reach	29	5-year High	Pr. Elevated Trail 1	136800.00	690.79	721.86		722.43	0.000121	6.0	22829.42	828.08	0.20
Reach	29	5-year High	Pr Elevated Trail 2	136800.00	690.79	721.86		722.43	0.000121	6.0	22829.47	828.08	0.20
Reach	29	5-year High	Pr Elevated Trail 3	136800.00	690.79	721.86		722.43	0.000121	6.0	22829.47	828.08	0.20
Reach	29	2-year High	Pr. Elevated Trail 1	101800.00	690.79	720.27		720.62	0.000082	4.7	21511.87	824.66	0.16
Reach	29	2-year High	Pr Elevated Trail 2	101800.00	690.79	720.27		720.62	0.000082	4.7	21511.87	824.66	0.16
Reach	29	2-year High	Pr Elevated Trail 3	101800.00	690.79	720.27		720.62	0.000082	4.7	21511.87	824.66	0.16
Reach	29	Normal	Pr. Elevated Trail 1	12700.00	690.79	710.95		710.97	0.000005	0.9	13924.49	803.36	0.04
Reach	29	Normal	Pr Elevated Trail 2	12700.00	690.79	710.95		710.97	0.000005	0.9	13924.49	803.36	0.04
Reach	29	Normal	Pr Elevated Trail 3	12700.00	690.79	710.95		710.97	0.000005	0.9	13924.49	803.36	0.04
Reach	28	1-year Low	Pr. Elevated Trail 1	39690.00	691.86	712.16		712.27	0.000040	2.6	15393.34	841.43	0.11
Reach	28	1-year Low	Pr Elevated Trail 2	39690.00	691.86	712.16		712.27	0.000040	2.6	15393.34	841.43	0.11
Reach	28	1-year Low	Pr Elevated Trail 3	39690.00	691.86	712.16		712.27	0.000040	2.6	15393.34	841.43	0.11
Reach	28	2-year Low	Pr. Elevated Trail 1	101800.00	691.86	716.25		716.71	0.000133	5.4	18853.78	850.99	0.20
Reach	28	2-year Low	Pr Elevated Trail 2	101800.00	691.86	716.25		716.71	0.000133	5.4	18853.78	850.99	0.20
Reach	28	2-year Low	Pr Elevated Trail 3	101800.00	691.86	716.25		716.71	0.000133	5.4	18853.78	850.99	0.20
Reach	28	5-year Low	Pr. Elevated Trail 1	136800.00	691.86	720.74		721.30	0.000131	6.0	22693.79	861.81	0.21
Reach	28	5-year Low	Pr Elevated Trail 2	136800.00	691.86	720.74		721.30	0.000131	6.0	22693.84	861.81	0.21
Reach	28	5-year Low	Pr Elevated Trail 3	136800.00	691.86	720.74		721.30	0.000131	6.0	22693.84	861.81	0.21
Reach	28	25-year	Pr. Elevated Trail 1	187200.00	691.86	726.31		727.04	0.000131	6.9	27532.50	882.27	0.21
Reach	28	25-year	Pr Elevated Trail 2	187200.00	691.86	726.38		727.10	0.000130	6.8	27595.31	884.11	0.21
Reach	28	25-year	Pr Elevated Trail 3	187200.00	691.86	726.31		727.04	0.000131	6.9	27532.89	882.28	0.21
Reach	28	10-year	Pr. Elevated Trail 1	168500.00	691.86	723.83		724.52	0.000138	6.7	25368.88	869.17	0.22
Reach	28	10-year	Pr Elevated Trail 2	168500.00	691.86	723.83		724.52	0.000138	6.7	25368.98	869.17	0.22
Reach	28	10-year	Pr Elevated Trail 3	168500.00	691.86	723.83		724.52	0.000138	6.7	25368.98	869.17	0.22
Reach	28	50-year	Pr. Elevated Trail 1	212000.00	691.86	728.48		729.30	0.000135	7.3	29589.12	1092.20	0.22
Reach	28	50-year	Pr Elevated Trail 2	212000.00	691.86	728.58		729.39	0.000134	7.3	29697.10	1102.82	0.22
Reach	28	50-year	Pr Elevated Trail 3	212000.00	691.86	728.58		729.39	0.000134	7.3	29698.65	1102.97	0.22
Reach	28	100-year	Pr. Elevated Trail 1	231000.00	691.86	730.32		731.19	0.000134	7.5	31881.03	1325.88	0.22
Reach	28	100-year	Pr Elevated Trail 2	231000.00	691.86	730.44		731.31	0.000133	7.5	32046.97	1329.34	0.22
Reach	28	100-year	Pr Elevated Trail 3	231000.00	691.86	730.45		731.31	0.000133	7.5	32049.74	1329.40	0.22
Reach	28	1-year High	Pr. Elevated Trail 1	39690.00	691.86	719.00		719.05	0.000014	1.9	21198.28	857.66	0.07

HEC-RAS River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	28	1-year High	Pr Elevated Trail 2	39690.00	691.86	719.00		719.05	0.000014	1.9	21198.28	857.66	0.07
Reach	28	1-year High	Pr Elevated Trail 3	39690.00	691.86	719.00		719.05	0.000014	1.9	21198.28	857.66	0.07
Reach	28	5-year High	Pr. Elevated Trail 1	136800.00	691.86	721.83		722.35	0.000115	5.8	23637.24	864.42	0.19
Reach	28	5-year High	Pr Elevated Trail 2	136800.00	691.86	721.83		722.35	0.000115	5.8	23637.29	864.42	0.19
Reach	28	5-year High	Pr Elevated Trail 3	136800.00	691.86	721.83		722.35	0.000115	5.8	23637.29	864.42	0.19
Reach	28	2-year High	Pr. Elevated Trail 1	101800.00	691.86	720.24		720.57	0.000077	4.6	22270.80	860.64	0.16
Reach	28	2-year High	Pr Elevated Trail 2	101800.00	691.86	720.24		720.57	0.000077	4.6	22270.80	860.64	0.16
Reach	28	2-year High	Pr Elevated Trail 3	101800.00	691.86	720.24		720.57	0.000077	4.6	22270.80	860.64	0.16
Reach	28	Normal	Pr. Elevated Trail 1	12700.00	691.86	710.95		710.96	0.000005	0.9	14377.02	838.25	0.04
Reach	28	Normal	Pr Elevated Trail 2	12700.00	691.86	710.95		710.96	0.000005	0.9	14377.02	838.25	0.04
Reach	28	Normal	Pr Elevated Trail 3	12700.00	691.86	710.95		710.96	0.000005	0.9	14377.02	838.25	0.04
Reach	27	1-year Low	Pr. Elevated Trail 1	39690.00	692.11	712.14		712.24	0.000040	2.5	16110.64	946.55	0.11
Reach	27	1-year Low	Pr Elevated Trail 2	39690.00	692.11	712.14		712.24	0.000040	2.5	16110.64	946.55	0.11
Reach	27	1-year Low	Pr Elevated Trail 3	39690.00	692.11	712.14		712.24	0.000040	2.5	16110.64	946.55	0.11
Reach	27	2-year Low	Pr. Elevated Trail 1	101800.00	692.11	716.20		716.60	0.000128	5.1	19958.38	951.60	0.20
Reach	27	2-year Low	Pr Elevated Trail 2	101800.00	692.11	716.20		716.60	0.000128	5.1	19958.38	951.60	0.20
Reach	27	2-year Low	Pr Elevated Trail 3	101800.00	692.11	716.20		716.60	0.000128	5.1	19958.38	951.60	0.20
Reach	27	5-year Low	Pr. Elevated Trail 1	136800.00	692.11	720.70		721.20	0.000121	5.7	24256.55	957.13	0.20
Reach	27	5-year Low	Pr Elevated Trail 2	136800.00	692.11	720.70		721.20	0.000121	5.7	24256.61	957.13	0.20
Reach	27	5-year Low	Pr Elevated Trail 3	136800.00	692.11	720.70		721.20	0.000121	5.7	24256.61	957.13	0.20
Reach	27	25-year	Pr. Elevated Trail 1	187200.00	692.11	726.29		726.92	0.000117	6.3	29638.17	982.09	0.20
Reach	27	25-year	Pr Elevated Trail 2	187200.00	692.11	726.36		726.99	0.000116	6.3	29708.48	984.02	0.20
Reach	27	25-year	Pr Elevated Trail 3	187200.00	692.11	726.29		726.92	0.000117	6.3	29638.59	982.10	0.20
Reach	27	10-year	Pr. Elevated Trail 1	168500.00	692.11	723.80		724.40	0.000125	6.2	27232.02	960.97	0.20
Reach	27	10-year	Pr Elevated Trail 2	168500.00	692.11	723.80		724.40	0.000125	6.2	27232.15	960.97	0.20
Reach	27	10-year	Pr Elevated Trail 3	168500.00	692.11	723.80		724.40	0.000125	6.2	27232.15	960.97	0.20
Reach	27	50-year	Pr. Elevated Trail 1	212000.00	692.11	728.48		729.17	0.000120	6.7	31895.62	1175.37	0.20
Reach	27	50-year	Pr Elevated Trail 2	212000.00	692.11	728.57		729.27	0.000119	6.7	32012.72	1193.16	0.20
Reach	27	50-year	Pr Elevated Trail 3	212000.00	692.11	728.58		729.27	0.000119	6.7	32014.39	1193.41	0.20
Reach	27	100-year	Pr. Elevated Trail 1	231000.00	692.11	730.32		731.07	0.000119	6.9	34328.10	1445.21	0.21
Reach	27	100-year	Pr Elevated Trail 2	231000.00	692.11	730.45		731.19	0.000117	6.9	34510.50	1461.03	0.20
Reach	27	100-year	Pr Elevated Trail 3	231000.00	692.11	730.45		731.19	0.000117	6.9	34513.54	1461.13	0.20
Reach	27	1-year High	Pr. Elevated Trail 1	39690.00	692.11	718.99		719.04	0.000013	1.8	22624.03	955.02	0.06
Reach	27	1-year High	Pr Elevated Trail 2	39690.00	692.11	718.99		719.04	0.000013	1.8	22624.03	955.02	0.06
Reach	27	1-year High	Pr Elevated Trail 3	39690.00	692.11	718.99		719.04	0.000013	1.8	22624.03	955.02	0.06
Reach	27	5-year High	Pr. Elevated Trail 1	136800.00	692.11	721.80		722.26	0.000105	5.4	25311.88	958.54	0.18
Reach	27	5-year High	Pr Elevated Trail 2	136800.00	692.11	721.80		722.26	0.000105	5.4	25311.94	958.54	0.18
Reach	27	5-year High	Pr Elevated Trail 3	136800.00	692.11	721.80		722.26	0.000105	5.4	25311.94	958.54	0.18
Reach	27	2-year High	Pr. Elevated Trail 1	101800.00	692.11	720.22		720.51	0.000071	4.3	23800.02	956.58	0.15
Reach	27	2-year High	Pr Elevated Trail 2	101800.00	692.11	720.22		720.51	0.000071	4.3	23800.02	956.58	0.15
Reach	27	2-year High	Pr Elevated Trail 3	101800.00	692.11	720.22		720.51	0.000071	4.3	23800.02	956.58	0.15
Reach	27	Normal	Pr. Elevated Trail 1	12700.00	692.11	710.95		710.96	0.000005	0.8	14987.79	936.70	0.04
Reach	27	Normal	Pr Elevated Trail 2	12700.00	692.11	710.95		710.96	0.000005	0.8	14987.79	936.70	0.04
Reach	27	Normal	Pr Elevated Trail 3	12700.00	692.11	710.95		710.96	0.000005	0.8	14987.79	936.70	0.04
Reach	26	1-year Low	Pr. Elevated Trail 1	39690.00	690.05	712.13	697.64	712.23	0.000038	2.5	16063.97	905.06	0.10
Reach	26	1-year Low	Pr Elevated Trail 2	39690.00	690.05	712.13	697.64	712.23	0.000038	2.5	16063.97	905.06	0.10
Reach	26	1-year Low	Pr Elevated Trail 3	39690.00	690.05	712.13	697.64	712.23	0.000038	2.5	16063.97	905.06	0.10
Reach	26	2-year Low	Pr. Elevated Trail 1	101800.00	690.05	716.17	701.29	716.58	0.000126	5.2	19760.19	929.51	0.20
Reach	26	2-year Low	Pr Elevated Trail 2	101800.00	690.05	716.17	701.29	716.58	0.000126	5.2	19760.19	929.51	0.20
Reach	26	2-year Low	Pr Elevated Trail 3	101800.00	690.05	716.17	701.29	716.58	0.000126	5.2	19760.19	929.51	0.20
Reach	26	5-year Low	Pr. Elevated Trail 1	136800.00	690.05	720.66	702.96	721.17	0.000122	5.8	24023.29	1001.09	0.20
Reach	26	5-year Low	Pr Elevated Trail 2	136800.00	690.05	720.66	702.96	721.17	0.000122	5.8	24023.35	1001.09	0.20
Reach	26	5-year Low	Pr Elevated Trail 3	136800.00	690.05	720.66	702.96	721.17	0.000122	5.8	24023.35	1001.09	0.20
Reach	26	25-year	Pr. Elevated Trail 1	187200.00	690.05	726.25	705.12	726.90	0.000120	6.5	29839.38	1091.92	0.20
Reach	26	25-year	Pr Elevated Trail 2	187200.00	690.05	726.32	705.12	726.97	0.000119	6.5	29917.81	1093.53	0.20
Reach	26	25-year	Pr Elevated Trail 3	187200.00	690.05	726.25	705.12	726.90	0.000120	6.5	29839.85	1091.93	0.20
Reach	26	10-year	Pr. Elevated Trail 1	168500.00	690.05	723.76	704.33	724.38	0.000128	6.3	27192.20	1042.23	0.21
Reach	26	10-year	Pr Elevated Trail 2	168500.00	690.05	723.76	704.33	724.38	0.000128	6.3	27192.37	1042.23	0.21
Reach	26	10-year	Pr Elevated Trail 3	168500.00	690.05	723.76	704.33	724.38	0.000128	6.3	27192.37	1042.23	0.21
Reach	26	50-year	Pr. Elevated Trail 1	212000.00	690.05	728.43	706.10	729.15	0.000123	6.9	32298.11	1164.67	0.21
Reach	26	50-year	Pr Elevated Trail 2	212000.00	690.05	728.53	706.10	729.25	0.000122	6.8	32413.84	1165.95	0.21
Reach	26	50-year	Pr Elevated Trail 3	212000.00	690.05	728.53	706.10	729.25	0.000122	6.8	32415.46	1165.97	0.21
Reach	26	100-year	Pr. Elevated Trail 1	231000.00	690.05	730.27	706.84	731.05	0.000122	7.1	34630.38	1412.76	0.21
Reach	26	100-year	Pr Elevated Trail 2	231000.00	690.05	730.40	706.84	731.17	0.000120	7.0	34809.11	1424.65	0.21
Reach	26	100-year	Pr Elevated Trail 3	231000.00	690.05	730.40	706.84	731.17	0.000120	7.0	34812.07	1424.96	0.21
Reach	26	1-year High	Pr. Elevated Trail 1	39690.00	690.05	718.99	697.64	719.04	0.000013	1.8	22409.77	947.60	0.06
Reach	26	1-year High	Pr Elevated Trail 2	39690.00	690.05	718.99	697.64	719.04	0.000013	1.8	22409.77	947.60	0.06
Reach	26	1-year High	Pr Elevated Trail 3	39690.00	690.05	718.99	697.64	719.04	0.000013	1.8	22409.77	947.60	0.06
Reach	26	5-year High	Pr. Elevated Trail 1	136800.00	690.05	721.77	702.96	722.24	0.000106	5.5	25138.29	1018.25	0.19
Reach	26	5-year High	Pr Elevated Trail 2	136800.00	690.05	721.77	702.96	722.24	0.000106	5.5	25138.40	1018.25	0.19
Reach	26	5-year High	Pr Elevated Trail 3	136800.00	690.05	721.77	702.96	722.24	0.000106	5.5	25138.40	1018.25	0.19
Reach	26	2-year High	Pr. Elevated Trail 1	101800.00	690.05	720.20	701.29	720.50	0.000072	4.4	23566.82	976.05	0.15
Reach	26	2-year High	Pr Elevated Trail 2	101800.00	690.05	720.20	701.29	720.50	0.000072	4.4	23566.82	976.05	0.15
Reach	26	2-year High	Pr Elevated Trail 3	101800.00	690.05	720.20	701.29	720.50	0.000072	4.4	23566.82	976.05	0.15
Reach	26	Normal	Pr. Elevated Trail 1	12700.00	690.05	710.95	695.23	710.96	0.000005	0.8	14993.80	899.73	0.04
Reach	26	Normal	Pr Elevated Trail 2	12700.00	690.05	710.95	695.23	710.96	0.000005	0.8	14993.80	899.73	0.04
Reach	26	Normal	Pr Elevated Trail 3	12700.00	690.05	710.95	695.23	710.96	0.000005	0.8	14993.80	899.73	0.04
Reach	25.5			Bridge									
Reach	25	1-year Low	Pr. Elevated Trail 1	39690.00	686.75	712.11		712.21	0.000040	2.5	15803.08	906.72	0.11
Reach	25	1-year Low	Pr Elevated Trail 2	39690.00	686.75	712.11		712.21	0.000040	2.5	15803.08	906.72	0.11
Reach	25	1-year Low	Pr Elevated Trail 3	39690.00	686.75	712.11		712.21	0.000040	2.5	15803.08	906.72	0.11
Reach	25	2-year Low	Pr. Elevated Trail 1	101800.00	686.75	716.08		716.50	0.000133	5.2	19429.28	923.00	0.20
Reach	25	2-year Low	Pr Elevated Trail 2	101800.00	686.75	716.08		716.50	0.000133	5.2	19429.28	923.00	0.20
Reach	25	2-year Low	Pr Elevated Trail 3	101800.00	686.75	716.08		716.50	0.000133	5.2	19429.28	923.00	0.20
Reach	25	5-year Low	Pr. Elevated Trail 1	136800.00	686.75	720.56		721.09	0.000127	5.8	23607.80	943.29	0.20
Reach	25	5-year Low	Pr Elevated Trail 2	136800.00	686.75	720.56		721.09	0.000127	5.8	23607.86	943.29	0.20

HEC-RAS River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	25	5-year Low	Pr Elevated Trail 3	136800.00	686.75	720.56		721.09	0.000127	5.8	23607.86	943.29	0.20
Reach	25	25-year	Pr. Elevated Trail 1	187200.00	686.75	726.13		726.80	0.000124	6.6	29063.47	1044.70	0.21
Reach	25	25-year	Pr Elevated Trail 2	187200.00	686.75	726.20		726.86	0.000123	6.5	29139.30	1048.55	0.21
Reach	25	25-year	Pr Elevated Trail 3	187200.00	686.75	726.13		726.80	0.000124	6.6	29063.92	1044.72	0.21
Reach	25	10-year	Pr. Elevated Trail 1	168500.00	686.75	723.64		724.28	0.000133	6.4	26551.22	971.58	0.21
Reach	25	10-year	Pr Elevated Trail 2	168500.00	686.75	723.64		724.28	0.000133	6.4	26551.33	971.59	0.21
Reach	25	10-year	Pr Elevated Trail 3	168500.00	686.75	723.64		724.28	0.000133	6.4	26551.33	971.59	0.21
Reach	25	50-year	Pr. Elevated Trail 1	212000.00	686.75	728.29		729.04	0.000127	6.9	31470.61	1220.18	0.21
Reach	25	50-year	Pr Elevated Trail 2	212000.00	686.75	728.39		729.14	0.000126	6.9	31594.47	1248.52	0.21
Reach	25	50-year	Pr Elevated Trail 3	212000.00	686.75	728.40		729.14	0.000126	6.9	31596.37	1248.95	0.21
Reach	25	100-year	Pr. Elevated Trail 1	231000.00	686.75	730.14		730.93	0.000126	7.2	34060.86	1467.09	0.21
Reach	25	100-year	Pr Elevated Trail 2	231000.00	686.75	730.27		731.05	0.000124	7.1	34248.25	1469.38	0.21
Reach	25	100-year	Pr Elevated Trail 3	231000.00	686.75	730.27		731.05	0.000124	7.1	34251.29	1469.41	0.21
Reach	25	1-year High	Pr. Elevated Trail 1	39690.00	686.75	718.98		719.03	0.000013	1.8	22125.15	933.99	0.06
Reach	25	1-year High	Pr Elevated Trail 2	39690.00	686.75	718.98		719.03	0.000013	1.8	22125.15	933.99	0.06
Reach	25	1-year High	Pr Elevated Trail 3	39690.00	686.75	718.98		719.03	0.000013	1.8	22125.15	933.99	0.06
Reach	25	5-year High	Pr. Elevated Trail 1	136800.00	686.75	721.68		722.16	0.000111	5.6	24666.37	954.25	0.19
Reach	25	5-year High	Pr Elevated Trail 2	136800.00	686.75	721.68		722.16	0.000111	5.6	24666.49	954.25	0.19
Reach	25	5-year High	Pr Elevated Trail 3	136800.00	686.75	721.68		722.16	0.000111	5.6	24666.49	954.25	0.19
Reach	25	2-year High	Pr. Elevated Trail 1	101800.00	686.75	720.14		720.45	0.000074	4.4	23216.16	939.21	0.15
Reach	25	2-year High	Pr Elevated Trail 2	101800.00	686.75	720.14		720.45	0.000074	4.4	23216.16	939.21	0.15
Reach	25	2-year High	Pr Elevated Trail 3	101800.00	686.75	720.14		720.45	0.000074	4.4	23216.16	939.21	0.15
Reach	25	Normal	Pr. Elevated Trail 1	12700.00	686.75	710.95		710.96	0.000005	0.9	14751.57	897.17	0.04
Reach	25	Normal	Pr Elevated Trail 2	12700.00	686.75	710.95		710.96	0.000005	0.9	14751.57	897.17	0.04
Reach	25	Normal	Pr Elevated Trail 3	12700.00	686.75	710.95		710.96	0.000005	0.9	14751.57	897.17	0.04
Reach	24	1-year Low	Pr. Elevated Trail 1	39690.00	689.54	712.11		712.20	0.000036	2.4	16676.21	964.89	0.10
Reach	24	1-year Low	Pr Elevated Trail 2	39690.00	689.54	712.11		712.20	0.000036	2.4	16676.21	964.89	0.10
Reach	24	1-year Low	Pr Elevated Trail 3	39690.00	689.54	712.11		712.20	0.000036	2.4	16676.21	964.89	0.10
Reach	24	2-year Low	Pr. Elevated Trail 1	101800.00	689.54	716.08		716.46	0.000120	5.0	20531.78	980.02	0.19
Reach	24	2-year Low	Pr Elevated Trail 2	101800.00	689.54	716.08		716.46	0.000120	5.0	20531.78	980.02	0.19
Reach	24	2-year Low	Pr Elevated Trail 3	101800.00	689.54	716.08		716.46	0.000120	5.0	20531.78	980.02	0.19
Reach	24	5-year Low	Pr. Elevated Trail 1	136800.00	689.54	720.57		721.04	0.000114	5.5	24964.07	993.70	0.19
Reach	24	5-year Low	Pr Elevated Trail 2	136800.00	689.54	720.57		721.04	0.000114	5.5	24964.13	993.70	0.19
Reach	24	5-year Low	Pr Elevated Trail 3	136800.00	689.54	720.57		721.04	0.000114	5.5	24964.13	993.70	0.19
Reach	24	25-year	Pr. Elevated Trail 1	187200.00	689.54	726.14		726.74	0.000111	6.2	30634.53	1137.45	0.19
Reach	24	25-year	Pr Elevated Trail 2	187200.00	689.54	726.22		726.81	0.000110	6.2	30717.35	1148.61	0.19
Reach	24	25-year	Pr Elevated Trail 3	187200.00	689.54	726.14		726.74	0.000111	6.2	30635.02	1137.52	0.19
Reach	24	10-year	Pr. Elevated Trail 1	168500.00	689.54	723.65		724.22	0.000118	6.1	28043.35	1003.26	0.20
Reach	24	10-year	Pr Elevated Trail 2	168500.00	689.54	723.65		724.22	0.000118	6.1	28043.47	1003.26	0.20
Reach	24	10-year	Pr Elevated Trail 3	168500.00	689.54	723.65		724.22	0.000118	6.1	28043.47	1003.26	0.20
Reach	24	50-year	Pr. Elevated Trail 1	212000.00	689.54	728.31		728.98	0.000113	6.5	33440.37	1397.13	0.20
Reach	24	50-year	Pr Elevated Trail 2	212000.00	689.54	728.41		729.07	0.000112	6.5	33580.82	1402.37	0.20
Reach	24	50-year	Pr Elevated Trail 3	212000.00	689.54	728.42		729.08	0.000112	6.5	33583.05	1402.46	0.20
Reach	24	100-year	Pr. Elevated Trail 1	231000.00	689.54	730.16		730.86	0.000112	6.7	36164.84	1516.52	0.20
Reach	24	100-year	Pr Elevated Trail 2	231000.00	689.54	730.29		730.99	0.000110	6.7	36358.44	1517.58	0.20
Reach	24	100-year	Pr Elevated Trail 3	231000.00	689.54	730.29		730.99	0.000110	6.7	36361.69	1517.60	0.20
Reach	24	1-year High	Pr. Elevated Trail 1	39690.00	689.54	718.98		719.02	0.000012	1.7	23390.35	988.78	0.06
Reach	24	1-year High	Pr Elevated Trail 2	39690.00	689.54	718.98		719.02	0.000012	1.7	23390.35	988.78	0.06
Reach	24	1-year High	Pr Elevated Trail 3	39690.00	689.54	718.98		719.02	0.000012	1.7	23390.35	988.78	0.06
Reach	24	5-year High	Pr. Elevated Trail 1	136800.00	689.54	721.68		722.12	0.000099	5.3	26075.39	997.22	0.18
Reach	24	5-year High	Pr Elevated Trail 2	136800.00	689.54	721.68		722.12	0.000099	5.3	26075.52	997.22	0.18
Reach	24	5-year High	Pr Elevated Trail 3	136800.00	689.54	721.68		722.12	0.000099	5.3	26075.52	997.22	0.18
Reach	24	2-year High	Pr. Elevated Trail 1	101800.00	689.54	720.15		720.42	0.000067	4.2	24547.73	992.38	0.15
Reach	24	2-year High	Pr Elevated Trail 2	101800.00	689.54	720.15		720.42	0.000067	4.2	24547.73	992.38	0.15
Reach	24	2-year High	Pr Elevated Trail 3	101800.00	689.54	720.15		720.42	0.000067	4.2	24547.73	992.38	0.15
Reach	24	Normal	Pr. Elevated Trail 1	12700.00	689.54	710.95		710.96	0.000005	0.8	15555.52	958.17	0.04
Reach	24	Normal	Pr Elevated Trail 2	12700.00	689.54	710.95		710.96	0.000005	0.8	15555.52	958.17	0.04
Reach	24	Normal	Pr Elevated Trail 3	12700.00	689.54	710.95		710.96	0.000005	0.8	15555.52	958.17	0.04
Reach	23	1-year Low	Pr. Elevated Trail 1	39690.00	688.70	712.10	697.55	712.19	0.000040	2.4	16237.26	968.25	0.11
Reach	23	1-year Low	Pr Elevated Trail 2	39690.00	688.70	712.10	697.55	712.19	0.000040	2.4	16237.26	968.25	0.11
Reach	23	1-year Low	Pr Elevated Trail 3	39690.00	688.70	712.10	697.55	712.19	0.000040	2.4	16237.26	968.25	0.11
Reach	23	2-year Low	Pr. Elevated Trail 1	101800.00	688.70	716.04	701.52	716.44	0.000131	5.1	20109.90	994.57	0.20
Reach	23	2-year Low	Pr Elevated Trail 2	101800.00	688.70	716.04	701.52	716.44	0.000131	5.1	20109.90	994.57	0.20
Reach	23	2-year Low	Pr Elevated Trail 3	101800.00	688.70	716.04	701.52	716.44	0.000131	5.1	20109.90	994.57	0.20
Reach	23	5-year Low	Pr. Elevated Trail 1	136800.00	688.70	720.54	703.21	721.02	0.000123	5.6	24627.34	1015.97	0.20
Reach	23	5-year Low	Pr Elevated Trail 2	136800.00	688.70	720.54	703.21	721.02	0.000123	5.6	24627.39	1015.97	0.20
Reach	23	5-year Low	Pr Elevated Trail 3	136800.00	688.70	720.54	703.21	721.02	0.000123	5.6	24627.39	1015.97	0.20
Reach	23	25-year	Pr. Elevated Trail 1	187200.00	688.70	726.11	705.39	726.72	0.000118	6.3	30469.82	1158.06	0.20
Reach	23	25-year	Pr Elevated Trail 2	187200.00	688.70	726.19	705.39	726.79	0.000117	6.3	30554.29	1162.45	0.20
Reach	23	25-year	Pr Elevated Trail 3	187200.00	688.70	726.11	705.39	726.72	0.000118	6.3	30470.38	1158.09	0.20
Reach	23	10-year	Pr. Elevated Trail 1	168500.00	688.70	723.62	704.60	724.20	0.000127	6.1	27791.34	1040.68	0.20
Reach	23	10-year	Pr Elevated Trail 2	168500.00	688.70	723.62	704.60	724.21	0.000127	6.1	27791.46	1040.69	0.20
Reach	23	10-year	Pr Elevated Trail 3	168500.00	688.70	723.62	704.60	724.21	0.000127	6.1	27791.46	1040.69	0.20
Reach	23	50-year	Pr. Elevated Trail 1	212000.00	688.70	728.29	706.36	728.96	0.000120	6.6	33009.96	1179.16	0.20
Reach	23	50-year	Pr Elevated Trail 2	212000.00	688.70	728.39	706.36	729.06	0.000119	6.6	33128.61	1180.05	0.20
Reach	23	50-year	Pr Elevated Trail 3	212000.00	688.70	728.39	706.36	729.06	0.000119	6.6	33130.50	1180.06	0.20
Reach	23	100-year	Pr. Elevated Trail 1	231000.00	688.70	730.13	707.08	730.85	0.000119	6.8	35202.38	1200.55	0.20
Reach	23	100-year	Pr Elevated Trail 2	231000.00	688.70	730.26	707.08	730.97	0.000117	6.8	35356.22	1206.82	0.20
Reach	23	100-year	Pr Elevated Trail 3	231000.00	688.70	730.26	707.08	730.97	0.000117	6.8	35358.73	1206.92	0.20
Reach	23	1-year High	Pr. Elevated Trail 1	39690.00	688.70	718.98	697.55	719.02	0.000013	1.7	23048.72	1008.81	0.06
Reach	23	1-year High	Pr Elevated Trail 2	39690.00	688.70	718.98	697.55	719.02	0.000013	1.7	23048.72	1008.81	0.06
Reach	23	1-year High	Pr Elevated Trail 3	39690.00	688.70	718.98	697.55	719.02	0.000013	1.7	23048.72	1008.81	0.06
Reach	23	5-year High	Pr. Elevated Trail 1	136800.00	688.70	721.66	703.22	722.10	0.000106	5.4	25769.43	1022.39	0.18
Reach	23	5-year High	Pr Elevated Trail 2	136800.00	688.70	721.66	703.22	722.10	0.000106	5.4	25769.56	1022.39	0.18
Reach	23	5-year High	Pr Elevated Trail 3	136800.00	688.70	721.66	703.22	722.10	0.000106	5.4	25769.56	1022.39	0.18
Reach	23	2-year High	Pr. Elevated Trail 1	101800.00	688.70	720.13	701.52	720.41	0.000072	4.2	24215.36	1013.75	0.15
Reach	23	2-year High	Pr Elevated Trail 2	101800.00	688.70	720.13	701.52	720.41	0.000072	4.2	24215.36	1013.75	0.15
Reach	23	2-year High	Pr Elevated Trail 3	101800.00	688.70	720.13	701.52	720.41	0.000072	4.2	24215.36	1013.75	0.15

HEC-RAS   River: Stream   Reach: Reach (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	23	Normal	Pr. Elevated Trail 1	12700.00	688.70	710.94	694.58	710.96	0.000005	0.8	15127.02	951.15	0.04
Reach	23	Normal	Pr Elevated Trail 2	12700.00	688.70	710.94	694.58	710.96	0.000005	0.8	15127.02	951.15	0.04
Reach	23	Normal	Pr Elevated Trail 3	12700.00	688.70	710.94	694.58	710.96	0.000005	0.8	15127.02	951.15	0.04
Reach	22.5			Bridge									
Reach	22	1-year Low	Pr. Elevated Trail 1	39690.00	689.39	712.09	697.71	712.18	0.000040	2.5	16194.77	966.51	0.11
Reach	22	1-year Low	Pr Elevated Trail 2	39690.00	689.39	712.09	697.71	712.18	0.000040	2.5	16194.77	966.51	0.11
Reach	22	1-year Low	Pr Elevated Trail 3	39690.00	689.39	712.09	697.71	712.18	0.000040	2.5	16194.77	966.51	0.11
Reach	22	2-year Low	Pr. Elevated Trail 1	101800.00	689.39	716.00	701.62	716.40	0.000131	5.1	20001.28	981.97	0.20
Reach	22	2-year Low	Pr Elevated Trail 2	101800.00	689.39	716.00	701.62	716.40	0.000131	5.1	20001.28	981.97	0.20
Reach	22	2-year Low	Pr Elevated Trail 3	101800.00	689.39	716.00	701.62	716.40	0.000131	5.1	20001.28	981.97	0.20
Reach	22	5-year Low	Pr. Elevated Trail 1	136800.00	689.39	720.48	703.29	720.98	0.000123	5.6	24442.83	998.31	0.20
Reach	22	5-year Low	Pr Elevated Trail 2	136800.00	689.39	720.48	703.29	720.98	0.000123	5.6	24442.95	998.31	0.20
Reach	22	5-year Low	Pr Elevated Trail 3	136800.00	689.39	720.48	703.29	720.98	0.000123	5.6	24442.95	998.31	0.20
Reach	22	25-year	Pr. Elevated Trail 1	187200.00	689.39	726.05	705.43	726.67	0.000118	6.3	30160.33	1093.70	0.20
Reach	22	25-year	Pr Elevated Trail 2	187200.00	689.39	726.12	705.43	726.74	0.000117	6.3	30240.56	1102.08	0.20
Reach	22	25-year	Pr Elevated Trail 3	187200.00	689.39	726.05	705.43	726.67	0.000118	6.3	30160.80	1093.75	0.20
Reach	22	10-year	Pr. Elevated Trail 1	168500.00	689.39	723.56	704.67	724.15	0.000127	6.2	27537.97	1032.10	0.20
Reach	22	10-year	Pr Elevated Trail 2	168500.00	689.39	723.56	704.67	724.15	0.000127	6.2	27538.11	1032.10	0.20
Reach	22	10-year	Pr Elevated Trail 3	168500.00	689.39	723.56	704.67	724.15	0.000127	6.2	27538.11	1032.10	0.20
Reach	22	50-year	Pr. Elevated Trail 1	212000.00	689.39	728.21	706.40	728.90	0.000120	6.7	32563.30	1123.81	0.20
Reach	22	50-year	Pr Elevated Trail 2	212000.00	689.39	728.31	706.40	729.00	0.000119	6.6	32676.93	1125.64	0.20
Reach	22	50-year	Pr Elevated Trail 3	212000.00	689.39	728.32	706.40	729.00	0.000119	6.6	32678.77	1125.66	0.20
Reach	22	100-year	Pr. Elevated Trail 1	231000.00	689.39	730.06	707.12	730.78	0.000119	6.9	34667.61	1157.11	0.20
Reach	22	100-year	Pr Elevated Trail 2	231000.00	689.39	730.18	707.12	730.90	0.000117	6.8	34817.64	1178.86	0.20
Reach	22	100-year	Pr Elevated Trail 3	231000.00	689.39	730.19	707.12	730.91	0.000117	6.8	34820.03	1179.00	0.20
Reach	22	1-year High	Pr. Elevated Trail 1	39690.00	689.39	718.97	697.71	719.02	0.000013	1.7	22937.39	992.75	0.06
Reach	22	1-year High	Pr Elevated Trail 2	39690.00	689.39	718.97	697.71	719.02	0.000013	1.7	22937.39	992.75	0.06
Reach	22	1-year High	Pr Elevated Trail 3	39690.00	689.39	718.97	697.71	719.02	0.000013	1.7	22937.39	992.75	0.06
Reach	22	5-year High	Pr. Elevated Trail 1	136800.00	689.39	721.61	703.29	722.06	0.000106	5.4	25569.02	1002.43	0.19
Reach	22	5-year High	Pr Elevated Trail 2	136800.00	689.39	721.61	703.29	722.06	0.000106	5.4	25569.15	1002.44	0.19
Reach	22	5-year High	Pr Elevated Trail 3	136800.00	689.39	721.61	703.29	722.06	0.000106	5.4	25569.15	1002.44	0.19
Reach	22	2-year High	Pr. Elevated Trail 1	101800.00	689.39	720.10	701.62	720.38	0.000072	4.3	24060.85	997.03	0.15
Reach	22	2-year High	Pr Elevated Trail 2	101800.00	689.39	720.10	701.62	720.38	0.000072	4.3	24060.85	997.03	0.15
Reach	22	2-year High	Pr Elevated Trail 3	101800.00	689.39	720.10	701.62	720.38	0.000072	4.3	24060.85	997.03	0.15
Reach	22	Normal	Pr. Elevated Trail 1	12700.00	689.39	710.94	695.12	710.95	0.000005	0.8	15090.56	957.86	0.04
Reach	22	Normal	Pr Elevated Trail 2	12700.00	689.39	710.94	695.12	710.95	0.000005	0.8	15090.56	957.86	0.04
Reach	22	Normal	Pr Elevated Trail 3	12700.00	689.39	710.94	695.12	710.95	0.000005	0.8	15090.56	957.86	0.04
Reach	21	1-year Low	Pr. Elevated Trail 1	39690.00	689.92	712.08	697.85	712.17	0.000037	2.4	16494.53	951.63	0.10
Reach	21	1-year Low	Pr Elevated Trail 2	39690.00	689.92	712.08	697.85	712.17	0.000037	2.4	16494.53	951.63	0.10
Reach	21	1-year Low	Pr Elevated Trail 3	39690.00	689.92	712.08	697.85	712.17	0.000037	2.4	16494.53	951.63	0.10
Reach	21	2-year Low	Pr. Elevated Trail 1	101800.00	689.92	715.97	701.40	716.36	0.000124	5.0	20207.01	960.34	0.19
Reach	21	2-year Low	Pr Elevated Trail 2	101800.00	689.92	715.97	701.40	716.36	0.000124	5.0	20207.01	960.34	0.19
Reach	21	2-year Low	Pr Elevated Trail 3	101800.00	689.92	715.97	701.40	716.36	0.000124	5.0	20207.01	960.34	0.19
Reach	21	5-year Low	Pr. Elevated Trail 1	136800.00	689.92	720.45	703.02	720.94	0.000118	5.6	24541.36	971.94	0.19
Reach	21	5-year Low	Pr Elevated Trail 2	136800.00	689.92	720.45	703.02	720.94	0.000118	5.6	24541.47	971.94	0.19
Reach	21	5-year Low	Pr Elevated Trail 3	136800.00	689.92	720.45	703.02	720.94	0.000118	5.6	24541.47	971.94	0.19
Reach	21	25-year	Pr. Elevated Trail 1	187200.00	689.92	726.02	705.14	726.63	0.000115	6.3	30209.88	1082.07	0.20
Reach	21	25-year	Pr Elevated Trail 2	187200.00	689.92	726.09	705.14	726.70	0.000114	6.3	30289.15	1082.42	0.20
Reach	21	25-year	Pr Elevated Trail 3	187200.00	689.92	726.02	705.14	726.63	0.000115	6.3	30210.27	1082.08	0.20
Reach	21	10-year	Pr. Elevated Trail 1	168500.00	689.92	723.52	704.39	724.11	0.000123	6.2	27566.63	1016.89	0.20
Reach	21	10-year	Pr Elevated Trail 2	168500.00	689.92	723.52	704.39	724.11	0.000123	6.2	27566.76	1016.89	0.20
Reach	21	10-year	Pr Elevated Trail 3	168500.00	689.92	723.52	704.39	724.11	0.000123	6.2	27566.76	1016.89	0.20
Reach	21	50-year	Pr. Elevated Trail 1	212000.00	689.92	728.18	706.10	728.86	0.000117	6.6	32561.87	1101.16	0.20
Reach	21	50-year	Pr Elevated Trail 2	212000.00	689.92	728.28	706.10	728.96	0.000116	6.6	32673.73	1105.27	0.20
Reach	21	50-year	Pr Elevated Trail 3	212000.00	689.92	728.28	706.10	728.96	0.000116	6.6	32675.49	1105.33	0.20
Reach	21	100-year	Pr. Elevated Trail 1	231000.00	689.92	730.02	706.80	730.75	0.000116	6.8	34654.37	1170.36	0.20
Reach	21	100-year	Pr Elevated Trail 2	231000.00	689.92	730.15	706.80	730.87	0.000114	6.8	34805.34	1173.04	0.20
Reach	21	100-year	Pr Elevated Trail 3	231000.00	689.92	730.15	706.80	730.87	0.000114	6.8	34807.77	1173.08	0.20
Reach	21	1-year High	Pr. Elevated Trail 1	39690.00	689.92	718.97	697.85	719.01	0.000012	1.7	23102.78	968.12	0.06
Reach	21	1-year High	Pr Elevated Trail 2	39690.00	689.92	718.97	697.85	719.01	0.000012	1.7	23102.78	968.12	0.06
Reach	21	1-year High	Pr Elevated Trail 3	39690.00	689.92	718.97	697.85	719.01	0.000012	1.7	23102.78	968.12	0.06
Reach	21	5-year High	Pr. Elevated Trail 1	136800.00	689.92	721.58	703.02	722.03	0.000102	5.4	25641.30	974.86	0.18
Reach	21	5-year High	Pr Elevated Trail 2	136800.00	689.92	721.58	703.02	722.03	0.000102	5.4	25641.43	974.86	0.18
Reach	21	5-year High	Pr Elevated Trail 3	136800.00	689.92	721.58	703.02	722.03	0.000102	5.4	25641.43	974.86	0.18
Reach	21	2-year High	Pr. Elevated Trail 1	101800.00	689.92	720.08	701.40	720.36	0.000069	4.2	24182.81	970.98	0.15
Reach	21	2-year High	Pr Elevated Trail 2	101800.00	689.92	720.08	701.40	720.36	0.000069	4.2	24182.81	970.98	0.15
Reach	21	2-year High	Pr Elevated Trail 3	101800.00	689.92	720.08	701.40	720.36	0.000069	4.2	24182.81	970.98	0.15
Reach	21	Normal	Pr. Elevated Trail 1	12700.00	689.92	710.94	694.94	710.95	0.000005	0.8	15412.61	947.89	0.04
Reach	21	Normal	Pr Elevated Trail 2	12700.00	689.92	710.94	694.94	710.95	0.000005	0.8	15412.61	947.89	0.04
Reach	21	Normal	Pr Elevated Trail 3	12700.00	689.92	710.94	694.94	710.95	0.000005	0.8	15412.61	947.89	0.04
Reach	20	1-year Low	Pr. Elevated Trail 1	39690.00	691.23	712.07	697.48	712.15	0.000035	2.3	16979.62	995.12	0.10
Reach	20	1-year Low	Pr Elevated Trail 2	39690.00	691.23	712.07	697.48	712.15	0.000035	2.3	16979.62	995.12	0.10
Reach	20	1-year Low	Pr Elevated Trail 3	39690.00	691.23	712.07	697.48	712.15	0.000035	2.3	16979.62	995.12	0.10
Reach	20	2-year Low	Pr. Elevated Trail 1	101800.00	691.23	715.92	701.09	716.29	0.000118	4.9	20884.75	1027.84	0.19
Reach	20	2-year Low	Pr Elevated Trail 2	101800.00	691.23	715.92	701.09	716.29	0.000118	4.9	20884.75	1027.84	0.19
Reach	20	2-year Low	Pr Elevated Trail 3	101800.00	691.23	715.92	701.09	716.29	0.000118	4.9	20884.75	1027.84	0.19
Reach	20	5-year Low	Pr. Elevated Trail 1	136800.00	691.23	720.42	702.75	720.87	0.000112	5.4	25518.38	1033.60	0.19
Reach	20	5-year Low	Pr Elevated Trail 2	136800.00	691.23	720.42	702.75	720.87	0.000112	5.4	25518.51	1033.60	0.19
Reach	20	5-year Low	Pr Elevated Trail 3	136800.00	691.23	720.42	702.75	720.87	0.000112	5.4	25518.51	1033.60	0.19
Reach	20	25-year	Pr. Elevated Trail 1	187200.00	691.23	725.99	704.84	726.56	0.000108	6.1	31445.66	1156.92	0.19
Reach	20	25-year	Pr Elevated Trail 2	187200.00	691.23	726.07	704.84	726.63	0.000107	6.0	31529.12	1160.23	0.19
Reach	20	25-year	Pr Elevated Trail 3	187200.00	691.23	725.99	704.84	726.56	0.000108	6.1	31446.09	1156.94	0.19
Reach	20	10-year	Pr. Elevated Trail 1	168500.00	691.23	723.49	704.08	724.04	0.000116	5.9	28717.74	1074.58	0.20
Reach	20	10-year	Pr Elevated Trail 2	168500.00	691.23	723.49	704.08	724.04	0.000116	5.9	28717.93	1074.59	0.20
Reach	20	10-year	Pr Elevated Trail 3	168500.00	691.23	723.49	704.08	724.04	0.000116	5.9	28717.93	1074.59	0.20
Reach	20	50-year	Pr. Elevated Trail 1	212000.00	691.23	728.16	705.80	728.79	0.000110	6.4	34017.91	1282.52	0.20

HEC-RAS River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	20	50-year	Pr Elevated Trail 2	212000.00	691.23	728.26	705.80	728.89	0.000109	6.4	34146.06	1285.66	0.20
Reach	20	50-year	Pr Elevated Trail 3	212000.00	691.23	728.26	705.80	728.89	0.000109	6.4	34148.07	1285.71	0.20
Reach	20	100-year	Pr. Elevated Trail 1	231000.00	691.23	730.00	706.51	730.67	0.000108	6.6	36404.92	1361.64	0.20
Reach	20	100-year	Pr Elevated Trail 2	231000.00	691.23	730.13	706.51	730.80	0.000107	6.6	36577.83	1362.74	0.20
Reach	20	100-year	Pr Elevated Trail 3	231000.00	691.23	730.14	706.51	730.80	0.000107	6.6	36580.60	1362.76	0.20
Reach	20	1-year High	Pr. Elevated Trail 1	39690.00	691.23	718.96	697.48	719.01	0.000011	1.7	24018.82	1031.78	0.06
Reach	20	1-year High	Pr Elevated Trail 2	39690.00	691.23	718.96	697.48	719.01	0.000011	1.7	24018.82	1031.78	0.06
Reach	20	1-year High	Pr Elevated Trail 3	39690.00	691.23	718.96	697.48	719.01	0.000011	1.7	24018.82	1031.78	0.06
Reach	20	5-year High	Pr. Elevated Trail 1	136800.00	691.23	721.55	702.75	721.97	0.000096	5.2	26693.66	1035.03	0.18
Reach	20	5-year High	Pr Elevated Trail 2	136800.00	691.23	721.55	702.75	721.97	0.000096	5.2	26693.79	1035.03	0.18
Reach	20	5-year High	Pr Elevated Trail 3	136800.00	691.23	721.55	702.75	721.97	0.000096	5.2	26693.79	1035.03	0.18
Reach	20	2-year High	Pr. Elevated Trail 1	101800.00	691.23	720.06	701.09	720.32	0.000065	4.1	25151.92	1033.16	0.14
Reach	20	2-year High	Pr Elevated Trail 2	101800.00	691.23	720.06	701.09	720.32	0.000065	4.1	25151.92	1033.16	0.14
Reach	20	2-year High	Pr Elevated Trail 3	101800.00	691.23	720.06	701.09	720.32	0.000065	4.1	25151.92	1033.16	0.14
Reach	20	Normal	Pr. Elevated Trail 1	12700.00	691.23	710.94	695.15	710.95	0.000004	0.8	15865.80	982.92	0.04
Reach	20	Normal	Pr Elevated Trail 2	12700.00	691.23	710.94	695.15	710.95	0.000004	0.8	15865.80	982.92	0.04
Reach	20	Normal	Pr Elevated Trail 3	12700.00	691.23	710.94	695.15	710.95	0.000004	0.8	15865.80	982.92	0.04
Reach	19	1-year Low	Pr. Elevated Trail 1	39690.00	692.33	712.06	697.90	712.14	0.000038	2.4	16779.09	1015.99	0.10
Reach	19	1-year Low	Pr Elevated Trail 2	39690.00	692.33	712.06	697.90	712.14	0.000038	2.4	16779.09	1015.99	0.10
Reach	19	1-year Low	Pr Elevated Trail 3	39690.00	692.33	712.06	697.90	712.14	0.000038	2.4	16779.09	1015.99	0.10
Reach	19	2-year Low	Pr. Elevated Trail 1	101800.00	692.33	715.89	701.56	716.27	0.000124	4.9	20717.37	1038.94	0.19
Reach	19	2-year Low	Pr Elevated Trail 2	101800.00	692.33	715.89	701.56	716.27	0.000124	4.9	20717.37	1038.94	0.19
Reach	19	2-year Low	Pr Elevated Trail 3	101800.00	692.33	715.89	701.56	716.27	0.000124	4.9	20717.37	1038.94	0.19
Reach	19	5-year Low	Pr. Elevated Trail 1	136800.00	692.33	720.39	703.18	720.85	0.000115	5.4	25428.68	1083.41	0.19
Reach	19	5-year Low	Pr Elevated Trail 2	136800.00	692.33	720.39	703.18	720.85	0.000115	5.4	25428.81	1083.41	0.19
Reach	19	5-year Low	Pr Elevated Trail 3	136800.00	692.33	720.39	703.18	720.85	0.000115	5.4	25428.81	1083.41	0.19
Reach	19	25-year	Pr. Elevated Trail 1	187200.00	692.33	725.97	705.28	726.54	0.000109	6.0	31434.15	1247.16	0.19
Reach	19	25-year	Pr Elevated Trail 2	187200.00	692.33	726.05	705.28	726.61	0.000109	6.0	31518.37	1248.52	0.19
Reach	19	25-year	Pr Elevated Trail 3	187200.00	692.33	725.97	705.28	726.54	0.000109	6.0	31434.50	1247.17	0.19
Reach	19	10-year	Pr. Elevated Trail 1	168500.00	692.33	723.47	704.53	724.01	0.000118	5.9	28678.06	1167.73	0.20
Reach	19	10-year	Pr Elevated Trail 2	168500.00	692.33	723.47	704.53	724.01	0.000118	5.9	28678.26	1167.74	0.20
Reach	19	10-year	Pr Elevated Trail 3	168500.00	692.33	723.47	704.53	724.01	0.000118	5.9	28678.26	1167.74	0.20
Reach	19	50-year	Pr. Elevated Trail 1	212000.00	692.33	728.14	706.24	728.77	0.000111	6.4	33922.71	1267.56	0.20
Reach	19	50-year	Pr Elevated Trail 2	212000.00	692.33	728.24	706.24	728.87	0.000110	6.4	34041.25	1271.38	0.20
Reach	19	50-year	Pr Elevated Trail 3	212000.00	692.33	728.24	706.24	728.87	0.000110	6.4	34043.11	1271.42	0.20
Reach	19	100-year	Pr. Elevated Trail 1	231000.00	692.33	729.98	706.93	730.65	0.000110	6.6	36147.41	1383.34	0.20
Reach	19	100-year	Pr Elevated Trail 2	231000.00	692.33	730.11	706.93	730.77	0.000108	6.5	36312.95	1387.16	0.20
Reach	19	100-year	Pr Elevated Trail 3	231000.00	692.33	730.12	706.93	730.78	0.000108	6.5	36315.68	1387.23	0.20
Reach	19	1-year High	Pr. Elevated Trail 1	39690.00	692.33	718.96	697.90	719.01	0.000012	1.7	23929.33	1077.70	0.06
Reach	19	1-year High	Pr Elevated Trail 2	39690.00	692.33	718.96	697.90	719.01	0.000012	1.7	23929.33	1077.70	0.06
Reach	19	1-year High	Pr Elevated Trail 3	39690.00	692.33	718.96	697.90	719.01	0.000012	1.7	23929.33	1077.70	0.06
Reach	19	5-year High	Pr. Elevated Trail 1	136800.00	692.33	721.53	703.18	721.95	0.000099	5.2	26627.24	1088.10	0.18
Reach	19	5-year High	Pr Elevated Trail 2	136800.00	692.33	721.53	703.18	721.95	0.000099	5.2	26627.43	1088.10	0.18
Reach	19	5-year High	Pr Elevated Trail 3	136800.00	692.33	721.53	703.18	721.95	0.000099	5.2	26627.43	1088.10	0.18
Reach	19	2-year High	Pr. Elevated Trail 1	101800.00	692.33	720.05	701.56	720.31	0.000067	4.1	25067.83	1082.08	0.15
Reach	19	2-year High	Pr Elevated Trail 2	101800.00	692.33	720.05	701.56	720.31	0.000067	4.1	25067.83	1082.08	0.15
Reach	19	2-year High	Pr Elevated Trail 3	101800.00	692.33	720.05	701.56	720.31	0.000067	4.1	25067.83	1082.08	0.15
Reach	19	Normal	Pr. Elevated Trail 1	12700.00	692.33	710.94	695.54	710.95	0.000005	0.8	15647.94	1006.60	0.04
Reach	19	Normal	Pr Elevated Trail 2	12700.00	692.33	710.94	695.54	710.95	0.000005	0.8	15647.94	1006.60	0.04
Reach	19	Normal	Pr Elevated Trail 3	12700.00	692.33	710.94	695.54	710.95	0.000005	0.8	15647.94	1006.60	0.04
Reach	18	1-year Low	Pr. Elevated Trail 1	39690.00	690.71	712.05	697.98	712.14	0.000038	2.4	16874.58	1034.30	0.10
Reach	18	1-year Low	Pr Elevated Trail 2	39690.00	690.71	712.05	697.98	712.14	0.000038	2.4	16874.58	1034.30	0.10
Reach	18	1-year Low	Pr Elevated Trail 3	39690.00	690.71	712.05	697.98	712.14	0.000038	2.4	16874.58	1034.30	0.10
Reach	18	2-year Low	Pr. Elevated Trail 1	101800.00	690.71	715.87	701.64	716.24	0.000125	4.9	20832.90	1038.11	0.19
Reach	18	2-year Low	Pr Elevated Trail 2	101800.00	690.71	715.87	701.67	716.24	0.000125	4.9	20832.90	1038.11	0.19
Reach	18	2-year Low	Pr Elevated Trail 3	101800.00	690.71	715.87	701.66	716.24	0.000125	4.9	20832.90	1038.11	0.19
Reach	18	5-year Low	Pr. Elevated Trail 1	136800.00	690.71	720.37	703.26	720.82	0.000116	5.4	25518.96	1042.69	0.19
Reach	18	5-year Low	Pr Elevated Trail 2	136800.00	690.71	720.37	703.25	720.82	0.000116	5.4	25519.07	1042.69	0.19
Reach	18	5-year Low	Pr Elevated Trail 3	136800.00	690.71	720.37	703.27	720.82	0.000116	5.4	25519.07	1042.69	0.19
Reach	18	25-year	Pr. Elevated Trail 1	187200.00	690.71	725.96	705.33	726.52	0.000110	6.0	31418.35	1122.58	0.19
Reach	18	25-year	Pr Elevated Trail 2	187200.00	690.71	726.03	705.33	726.59	0.000111	6.0	31519.53	1253.41	0.19
Reach	18	25-year	Pr Elevated Trail 3	187200.00	690.71	725.96	705.33	726.52	0.000110	6.0	31418.74	1122.60	0.19
Reach	18	10-year	Pr. Elevated Trail 1	168500.00	690.71	723.45	704.58	723.99	0.000119	5.9	28732.47	1045.94	0.20
Reach	18	10-year	Pr Elevated Trail 2	168500.00	690.71	723.45	704.58	723.99	0.000119	5.9	28732.66	1045.94	0.20
Reach	18	10-year	Pr Elevated Trail 3	168500.00	690.71	723.45	704.58	723.99	0.000119	5.9	28732.66	1045.94	0.20
Reach	18	50-year	Pr. Elevated Trail 1	212000.00	690.71	728.12	706.27	728.74	0.000112	6.3	33864.45	1134.37	0.20
Reach	18	50-year	Pr Elevated Trail 2	212000.00	690.71	728.23	706.27	728.84	0.000113	6.3	34052.96	1268.93	0.19
Reach	18	50-year	Pr Elevated Trail 3	212000.00	690.71	728.23	706.28	728.84	0.000113	6.3	34013.95	1268.96	0.19
Reach	18	100-year	Pr. Elevated Trail 1	231000.00	690.71	729.97	706.96	730.63	0.000111	6.5	35977.06	1159.57	0.20
Reach	18	100-year	Pr Elevated Trail 2	231000.00	690.71	730.10	706.96	730.75	0.000111	6.5	36275.41	1340.42	0.19
Reach	18	100-year	Pr Elevated Trail 3	231000.00	690.71	730.10	706.95	730.75	0.000111	6.5	36237.04	1340.60	0.19
Reach	18	1-year High	Pr. Elevated Trail 1	39690.00	690.71	718.96	697.98	719.00	0.000012	1.7	24045.16	1041.23	0.06
Reach	18	1-year High	Pr Elevated Trail 2	39690.00	690.71	718.96	697.98	719.00	0.000012	1.7	24045.16	1041.23	0.06
Reach	18	1-year High	Pr Elevated Trail 3	39690.00	690.71	718.96	697.98	719.00	0.000012	1.7	24045.16	1041.23	0.06
Reach	18	5-year High	Pr. Elevated Trail 1	136800.00	690.71	721.52	703.26	721.93	0.000100	5.1	26711.80	1043.87	0.18
Reach	18	5-year High	Pr Elevated Trail 2	136800.00	690.71	721.52	703.25	721.93	0.000100	5.1	26712.06	1043.87	0.18
Reach	18	5-year High	Pr Elevated Trail 3	136800.00	690.71	721.52	703.27	721.93	0.000100	5.1	26712.06	1043.87	0.18
Reach	18	2-year High	Pr. Elevated Trail 1	101800.00	690.71	720.04	701.64	720.29	0.000067	4.0	25167.65	1042.34	0.14
Reach	18	2-year High	Pr Elevated Trail 2	101800.00	690.71	720.04	701.67	720.29	0.000067	4.0	25167.65	1042.34	0.14
Reach	18	2-year High	Pr Elevated Trail 3	101800.00	690.71	720.04	701.66	720.29	0.000067	4.0	25167.65	1042.34	0.14
Reach	18	Normal	Pr. Elevated Trail 1	12700.00	690.71	710.94	695.60	710.95	0.000005	0.8	15727.84	1016.29	0.04
Reach	18	Normal	Pr Elevated Trail 2	12700.00	690.71	710.94	695.60	710.95	0.000005	0.8	15727.84	1016.29	0.04
Reach	18	Normal	Pr Elevated Trail 3	12700.00	690.71	710.94	695.59	710.95	0.000005	0.8	15727.84	1016.29	0.04
Reach	17.5			Bridge									
Reach	17	1-year Low	Pr. Elevated Trail 1	39690.00	690.70	712.04	698.05	712.12	0.000036	2.3	17110.04	1032.71	0.10
Reach	17	1-year Low	Pr Elevated Trail 2	39690.00	690.70	712.04	698.05	712.12	0.000036	2.3	17110.04	1032.71	0.10

HEC-RAS River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	17	1-year Low	Pr Elevated Trail 3	39690.00	690.70	712.04	698.05	712.12	0.000036	2.3	17110.04	1032.71	0.10
Reach	17	2-year Low	Pr. Elevated Trail 1	101800.00	690.70	715.80	701.48	716.17	0.000122	4.8	21005.37	1036.62	0.19
Reach	17	2-year Low	Pr Elevated Trail 2	101800.00	690.70	715.80	701.47	716.17	0.000122	4.8	21005.32	1036.62	0.19
Reach	17	2-year Low	Pr Elevated Trail 3	101800.00	690.70	715.80	701.48	716.17	0.000122	4.8	21005.32	1036.62	0.19
Reach	17	5-year Low	Pr. Elevated Trail 1	136800.00	690.70	720.28	703.07	720.72	0.000114	5.3	25660.32	1041.88	0.19
Reach	17	5-year Low	Pr Elevated Trail 2	136800.00	690.70	720.28	703.04	720.72	0.000114	5.3	25660.32	1041.88	0.19
Reach	17	5-year Low	Pr Elevated Trail 3	136800.00	690.70	720.28	703.07	720.72	0.000114	5.3	25660.32	1041.88	0.19
Reach	17	25-year	Pr. Elevated Trail 1	187200.00	690.70	725.84	705.12	726.40	0.000109	6.0	31544.75	1111.57	0.19
Reach	17	25-year	Pr Elevated Trail 2	187200.00	690.70	725.84	705.12	726.40	0.000111	6.0	32028.54	1275.45	0.19
Reach	17	25-year	Pr Elevated Trail 3	187200.00	690.70	725.84	705.12	726.40	0.000109	6.0	31544.82	1111.57	0.19
Reach	17	10-year	Pr. Elevated Trail 1	168500.00	690.70	723.34	704.39	723.87	0.000117	5.9	28860.60	1048.65	0.20
Reach	17	10-year	Pr Elevated Trail 2	168500.00	690.70	723.34	704.37	723.87	0.000117	5.9	28860.60	1048.65	0.20
Reach	17	10-year	Pr Elevated Trail 3	168500.00	690.70	723.34	704.39	723.87	0.000117	5.9	28860.60	1048.65	0.20
Reach	17	50-year	Pr. Elevated Trail 1	212000.00	690.70	728.00	706.06	728.62	0.000111	6.3	33962.52	1126.75	0.19
Reach	17	50-year	Pr Elevated Trail 2	212000.00	690.70	728.00	706.03	728.61	0.000112	6.3	34643.68	1290.62	0.19
Reach	17	50-year	Pr Elevated Trail 3	212000.00	690.70	728.00	706.06	728.61	0.000113	6.3	34585.08	1290.63	0.19
Reach	17	100-year	Pr. Elevated Trail 1	231000.00	690.70	729.84	706.75	730.50	0.000110	6.5	36058.40	1148.33	0.19
Reach	17	100-year	Pr Elevated Trail 2	231000.00	690.70	729.84	706.76	730.49	0.000110	6.5	36908.23	1312.20	0.19
Reach	17	100-year	Pr Elevated Trail 3	231000.00	690.70	729.84	706.75	730.49	0.000111	6.5	36849.45	1312.21	0.19
Reach	17	1-year High	Pr. Elevated Trail 1	39690.00	690.70	718.92	698.05	718.96	0.000012	1.6	24246.07	1039.92	0.06
Reach	17	1-year High	Pr Elevated Trail 2	39690.00	690.70	718.92	698.05	718.96	0.000012	1.6	24246.07	1039.92	0.06
Reach	17	1-year High	Pr Elevated Trail 3	39690.00	690.70	718.92	698.05	718.96	0.000012	1.6	24246.07	1039.92	0.06
Reach	17	5-year High	Pr. Elevated Trail 1	136800.00	690.70	721.43	703.07	721.83	0.000098	5.1	26858.03	1044.44	0.18
Reach	17	5-year High	Pr Elevated Trail 2	136800.00	690.70	721.43	703.04	721.83	0.000098	5.1	26858.10	1044.44	0.18
Reach	17	5-year High	Pr Elevated Trail 3	136800.00	690.70	721.43	703.07	721.83	0.000098	5.1	26858.10	1044.44	0.18
Reach	17	2-year High	Pr. Elevated Trail 1	101800.00	690.70	719.97	701.48	720.22	0.000066	4.0	25336.42	1041.20	0.14
Reach	17	2-year High	Pr Elevated Trail 2	101800.00	690.70	719.97	701.47	720.22	0.000066	4.0	25336.36	1041.20	0.14
Reach	17	2-year High	Pr Elevated Trail 3	101800.00	690.70	719.97	701.48	720.22	0.000066	4.0	25336.36	1041.20	0.14
Reach	17	Normal	Pr. Elevated Trail 1	12700.00	690.70	710.94	695.80	710.95	0.000005	0.8	15980.23	1022.61	0.04
Reach	17	Normal	Pr Elevated Trail 2	12700.00	690.70	710.94	695.80	710.95	0.000005	0.8	15980.23	1022.61	0.04
Reach	17	Normal	Pr Elevated Trail 3	12700.00	690.70	710.94	695.80	710.95	0.000005	0.8	15980.23	1022.61	0.04
Reach	16	1-year Low	Pr. Elevated Trail 1	39690.00	690.63	712.03	697.66	712.11	0.000036	2.3	16906.15	987.03	0.10
Reach	16	1-year Low	Pr Elevated Trail 2	39690.00	690.63	712.03	697.67	712.11	0.000036	2.3	16906.15	987.03	0.10
Reach	16	1-year Low	Pr Elevated Trail 3	39690.00	690.63	712.03	697.67	712.11	0.000036	2.3	16906.15	987.03	0.10
Reach	16	2-year Low	Pr. Elevated Trail 1	101800.00	690.63	715.75	701.23	716.13	0.000122	4.9	20596.02	990.94	0.19
Reach	16	2-year Low	Pr Elevated Trail 2	101800.00	690.63	715.75	701.24	716.13	0.000122	4.9	20595.25	990.74	0.19
Reach	16	2-year Low	Pr Elevated Trail 3	101800.00	690.63	715.75	701.24	716.13	0.000122	4.9	20595.25	990.74	0.19
Reach	16	5-year Low	Pr. Elevated Trail 1	136800.00	690.63	720.23	702.88	720.69	0.000116	5.5	25036.69	995.31	0.19
Reach	16	5-year Low	Pr Elevated Trail 2	136800.00	690.63	720.23	702.87	720.69	0.000116	5.5	25035.02	995.11	0.19
Reach	16	5-year Low	Pr Elevated Trail 3	136800.00	690.63	720.23	702.87	720.69	0.000116	5.5	25035.02	995.11	0.19
Reach	16	25-year	Pr. Elevated Trail 1	187200.00	690.63	725.78	704.95	726.36	0.000113	6.1	30668.22	1071.14	0.19
Reach	16	25-year	Pr Elevated Trail 2	187200.00	690.63	725.78	704.95	726.36	0.000116	6.1	31720.16	1248.26	0.19
Reach	16	25-year	Pr Elevated Trail 3	187200.00	690.63	725.78	704.93	726.36	0.000113	6.1	30665.44	1070.94	0.19
Reach	16	10-year	Pr. Elevated Trail 1	168500.00	690.63	723.28	704.19	723.84	0.000121	6.0	28080.04	999.43	0.20
Reach	16	10-year	Pr Elevated Trail 2	168500.00	690.63	723.28	704.20	723.84	0.000121	6.0	28077.71	999.23	0.20
Reach	16	10-year	Pr Elevated Trail 3	168500.00	690.63	723.28	704.20	723.84	0.000121	6.0	28077.71	999.23	0.20
Reach	16	50-year	Pr. Elevated Trail 1	212000.00	690.63	727.93	705.90	728.58	0.000116	6.5	32984.52	1081.43	0.20
Reach	16	50-year	Pr Elevated Trail 2	212000.00	690.63	727.93	705.90	728.58	0.000118	6.5	34279.02	1258.49	0.20
Reach	16	50-year	Pr Elevated Trail 3	212000.00	690.63	727.94	705.90	728.58	0.000119	6.5	34219.90	1258.49	0.20
Reach	16	100-year	Pr. Elevated Trail 1	231000.00	690.63	729.77	706.61	730.46	0.000115	6.7	34976.01	1084.63	0.20
Reach	16	100-year	Pr Elevated Trail 2	231000.00	690.63	729.77	706.61	730.45	0.000116	6.6	36477.88	1261.68	0.20
Reach	16	100-year	Pr Elevated Trail 3	231000.00	690.63	729.77	706.61	730.45	0.000117	6.6	36418.61	1261.68	0.20
Reach	16	1-year High	Pr. Elevated Trail 1	39690.00	690.63	718.92	697.66	718.96	0.000012	1.7	23733.83	993.84	0.06
Reach	16	1-year High	Pr Elevated Trail 2	39690.00	690.63	718.92	697.67	718.96	0.000012	1.7	23732.49	993.64	0.06
Reach	16	1-year High	Pr Elevated Trail 3	39690.00	690.63	718.92	697.67	718.96	0.000012	1.7	23732.49	993.64	0.06
Reach	16	5-year High	Pr. Elevated Trail 1	136800.00	690.63	721.38	702.88	721.81	0.000100	5.2	26185.38	996.89	0.18
Reach	16	5-year High	Pr Elevated Trail 2	136800.00	690.63	721.38	702.87	721.81	0.000100	5.2	26183.55	996.69	0.18
Reach	16	5-year High	Pr Elevated Trail 3	136800.00	690.63	721.38	702.87	721.81	0.000100	5.2	26183.55	996.69	0.18
Reach	16	2-year High	Pr. Elevated Trail 1	101800.00	690.63	719.94	701.23	720.20	0.000067	4.1	24751.04	994.94	0.15
Reach	16	2-year High	Pr Elevated Trail 2	101800.00	690.63	719.94	701.24	720.20	0.000067	4.1	24749.43	994.74	0.15
Reach	16	2-year High	Pr Elevated Trail 3	101800.00	690.63	719.94	701.24	720.20	0.000067	4.1	24749.43	994.74	0.15
Reach	16	Normal	Pr. Elevated Trail 1	12700.00	690.63	710.94	695.41	710.95	0.000004	0.8	15833.90	979.87	0.04
Reach	16	Normal	Pr Elevated Trail 2	12700.00	690.63	710.94	695.41	710.95	0.000004	0.8	15833.90	979.87	0.04
Reach	16	Normal	Pr Elevated Trail 3	12700.00	690.63	710.94	695.41	710.95	0.000004	0.8	15833.90	979.87	0.04
Reach	15	1-year Low	Pr. Elevated Trail 1	39690.00	689.96	712.02	697.27	712.11	0.000033	2.3	17189.71	970.79	0.10
Reach	15	1-year Low	Pr Elevated Trail 2	39690.00	689.96	712.02	697.26	712.11	0.000033	2.3	17189.71	970.79	0.10
Reach	15	1-year Low	Pr Elevated Trail 3	39690.00	689.96	712.02	697.27	712.11	0.000033	2.3	17189.71	970.79	0.10
Reach	15	2-year Low	Pr. Elevated Trail 1	101800.00	689.96	715.75	700.79	716.12	0.000115	4.9	20813.20	974.82	0.19
Reach	15	2-year Low	Pr Elevated Trail 2	101800.00	689.96	715.75	700.79	716.12	0.000115	4.9	20813.20	974.82	0.19
Reach	15	2-year Low	Pr Elevated Trail 3	101800.00	689.96	715.75	700.80	716.12	0.000115	4.9	20813.20	974.82	0.19
Reach	15	5-year Low	Pr. Elevated Trail 1	136800.00	689.96	720.22	702.43	720.68	0.000112	5.4	25180.31	978.90	0.19
Reach	15	5-year Low	Pr Elevated Trail 2	136800.00	689.96	720.22	702.43	720.68	0.000112	5.4	25180.31	978.90	0.19
Reach	15	5-year Low	Pr Elevated Trail 3	136800.00	689.96	720.22	702.43	720.68	0.000112	5.4	25180.31	978.90	0.19
Reach	15	25-year	Pr. Elevated Trail 1	187200.00	689.96	725.77	704.52	726.35	0.000110	6.1	30648.61	1012.85	0.19
Reach	15	25-year	Pr Elevated Trail 2	187200.00	689.96	725.77	704.49	726.35	0.000111	6.1	31734.61	1192.06	0.19
Reach	15	25-year	Pr Elevated Trail 3	187200.00	689.96	725.77	704.51	726.35	0.000110	6.1	30648.61	1012.85	0.19
Reach	15	10-year	Pr. Elevated Trail 1	168500.00	689.96	723.27	703.74	723.83	0.000117	6.0	28172.40	983.56	0.20
Reach	15	10-year	Pr Elevated Trail 2	168500.00	689.96	723.27	703.76	723.83	0.000117	6.0	28172.40	983.56	0.20
Reach	15	10-year	Pr Elevated Trail 3	168500.00	689.96	723.27	703.76	723.83	0.000117	6.0	28172.40	983.56	0.20
Reach	15	50-year	Pr. Elevated Trail 1	212000.00	689.96	727.91	705.47	728.57	0.000113	6.5	32891.65	1055.67	0.20
Reach	15	50-year	Pr Elevated Trail 2	212000.00	689.96	727.92	705.47	728.56	0.000114	6.5	34228.36	1234.78	0.20
Reach	15	50-year	Pr Elevated Trail 3	212000.00	689.96	727.92	705.46	728.57	0.000114	6.5	34169.36	1234.79	0.20
Reach	15	100-year	Pr. Elevated Trail 1	231000.00	689.96	729.75	706.17	730.45	0.000113	6.7	34835.02	1061.22	0.20
Reach	15	100-year	Pr Elevated Trail 2	231000.00	689.96	729.76	706.17	730.44	0.000113	6.7	36385.86	1240.41	0.20
Reach	15	100-year	Pr Elevated Trail 3	231000.00	689.96	729.76	706.17	730.44	0.000113	6.7	36326.71	1240.41	0.20
Reach	15	1-year High	Pr. Elevated Trail 1	39690.00	689.96	718.92	697.27	718.96	0.000011	1.7	23906.96	977.63	0.06
Reach	15	1-year High	Pr Elevated Trail 2	39690.00	689.96	718.92	697.26	718.96	0.000011	1.7	23906.96	977.63	0.06
Reach	15	1-year High	Pr Elevated Trail 3	39690.00	689.96	718.92	697.27	718.96	0.000011	1.7	23906.96	977.63	0.06

HEC-RAS River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	15	5-year High	Pr. Elevated Trail 1	136800.00	689.96	721.37	702.43	721.79	0.000097	5.2	26311.02	980.55	0.18
Reach	15	5-year High	Pr Elevated Trail 2	136800.00	689.96	721.37	702.43	721.79	0.000097	5.2	26311.02	980.55	0.18
Reach	15	5-year High	Pr Elevated Trail 3	136800.00	689.96	721.37	702.43	721.79	0.000097	5.2	26311.02	980.55	0.18
Reach	15	2-year High	Pr. Elevated Trail 1	101800.00	689.96	719.93	700.79	720.19	0.000064	4.1	24903.31	978.53	0.14
Reach	15	2-year High	Pr Elevated Trail 2	101800.00	689.96	719.93	700.79	720.19	0.000064	4.1	24903.31	978.53	0.14
Reach	15	2-year High	Pr Elevated Trail 3	101800.00	689.96	719.93	700.80	720.19	0.000064	4.1	24903.31	978.53	0.14
Reach	15	Normal	Pr. Elevated Trail 1	12700.00	689.96	710.93	694.99	710.94	0.000004	0.8	16136.09	964.86	0.03
Reach	15	Normal	Pr Elevated Trail 2	12700.00	689.96	710.93	694.98	710.94	0.000004	0.8	16136.09	964.86	0.03
Reach	15	Normal	Pr Elevated Trail 3	12700.00	689.96	710.93	694.98	710.94	0.000004	0.8	16136.09	964.86	0.03
Reach	14	1-year Low	Pr. Elevated Trail 1	39690.00	690.18	712.01	697.50	712.10	0.000035	2.4	16787.13	963.43	0.10
Reach	14	1-year Low	Pr Elevated Trail 2	39690.00	690.18	712.01	697.50	712.10	0.000035	2.4	16787.13	963.43	0.10
Reach	14	1-year Low	Pr Elevated Trail 3	39690.00	690.18	712.01	697.50	712.10	0.000035	2.4	16787.13	963.43	0.10
Reach	14	2-year Low	Pr. Elevated Trail 1	101800.00	690.18	715.71	701.09	716.10	0.000123	5.0	20357.74	967.11	0.19
Reach	14	2-year Low	Pr Elevated Trail 2	101800.00	690.18	715.71	701.09	716.10	0.000123	5.0	20357.74	967.11	0.19
Reach	14	2-year Low	Pr Elevated Trail 3	101800.00	690.18	715.71	701.08	716.10	0.000123	5.0	20357.74	967.11	0.19
Reach	14	5-year Low	Pr. Elevated Trail 1	136800.00	690.18	720.18	702.72	720.66	0.000118	5.5	24689.40	971.15	0.19
Reach	14	5-year Low	Pr Elevated Trail 2	136800.00	690.18	720.18	702.72	720.66	0.000118	5.5	24689.40	971.15	0.19
Reach	14	5-year Low	Pr Elevated Trail 3	136800.00	690.18	720.18	702.72	720.66	0.000118	5.5	24689.40	971.15	0.19
Reach	14	25-year	Pr. Elevated Trail 1	187200.00	690.18	725.73	704.83	726.33	0.000115	6.2	30095.89	983.10	0.20
Reach	14	25-year	Pr Elevated Trail 2	187200.00	690.18	725.74	704.83	726.33	0.000116	6.2	31218.15	1157.57	0.20
Reach	14	25-year	Pr Elevated Trail 3	187200.00	690.18	725.73	704.83	726.33	0.000115	6.2	30095.89	983.10	0.20
Reach	14	10-year	Pr. Elevated Trail 1	168500.00	690.18	723.23	704.06	723.81	0.000123	6.1	27651.62	973.79	0.20
Reach	14	10-year	Pr Elevated Trail 2	168500.00	690.18	723.23	704.06	723.81	0.000123	6.1	27651.62	973.79	0.20
Reach	14	10-year	Pr Elevated Trail 3	168500.00	690.18	723.23	704.07	723.81	0.000123	6.1	27651.62	973.79	0.20
Reach	14	50-year	Pr. Elevated Trail 1	212000.00	690.18	727.87	705.77	728.55	0.000119	6.6	32271.92	1035.86	0.20
Reach	14	50-year	Pr Elevated Trail 2	212000.00	690.18	727.88	705.79	728.55	0.000119	6.6	33645.50	1210.76	0.20
Reach	14	50-year	Pr Elevated Trail 3	212000.00	690.18	727.88	705.79	728.55	0.000120	6.6	33585.85	1210.76	0.20
Reach	14	100-year	Pr. Elevated Trail 1	231000.00	690.18	729.71	706.51	730.43	0.000118	6.8	34183.18	1047.53	0.20
Reach	14	100-year	Pr Elevated Trail 2	231000.00	690.18	729.72	706.51	730.42	0.000117	6.8	35771.94	1222.85	0.20
Reach	14	100-year	Pr Elevated Trail 3	231000.00	690.18	729.72	706.49	730.42	0.000118	6.8	35711.66	1222.85	0.20
Reach	14	1-year High	Pr. Elevated Trail 1	39690.00	690.18	718.91	697.50	718.96	0.000012	1.7	23456.68	970.01	0.06
Reach	14	1-year High	Pr Elevated Trail 2	39690.00	690.18	718.91	697.50	718.96	0.000012	1.7	23456.68	970.01	0.06
Reach	14	1-year High	Pr Elevated Trail 3	39690.00	690.18	718.91	697.50	718.96	0.000012	1.7	23456.68	970.01	0.06
Reach	14	5-year High	Pr. Elevated Trail 1	136800.00	690.18	721.34	702.72	721.78	0.000102	5.3	25815.01	972.15	0.18
Reach	14	5-year High	Pr Elevated Trail 2	136800.00	690.18	721.34	702.72	721.78	0.000102	5.3	25815.01	972.15	0.18
Reach	14	5-year High	Pr Elevated Trail 3	136800.00	690.18	721.34	702.72	721.78	0.000102	5.3	25815.01	972.15	0.18
Reach	14	2-year High	Pr. Elevated Trail 1	101800.00	690.18	719.92	701.09	720.19	0.000067	4.2	24429.40	970.91	0.15
Reach	14	2-year High	Pr Elevated Trail 2	101800.00	690.18	719.92	701.09	720.19	0.000067	4.2	24429.40	970.91	0.15
Reach	14	2-year High	Pr Elevated Trail 3	101800.00	690.18	719.92	701.08	720.19	0.000067	4.2	24429.40	970.91	0.15
Reach	14	Normal	Pr. Elevated Trail 1	12700.00	690.18	710.93	695.19	710.94	0.000004	0.8	15749.13	957.08	0.04
Reach	14	Normal	Pr Elevated Trail 2	12700.00	690.18	710.93	695.20	710.94	0.000004	0.8	15749.13	957.08	0.04
Reach	14	Normal	Pr Elevated Trail 3	12700.00	690.18	710.93	695.19	710.94	0.000004	0.8	15749.13	957.08	0.04
Reach	13	1-year Low	Pr. Elevated Trail 1	39690.00	690.25	712.01	696.98	712.09	0.000034	2.4	16847.27	935.10	0.10
Reach	13	1-year Low	Pr Elevated Trail 2	39690.00	690.25	712.01	696.96	712.09	0.000034	2.4	16847.27	935.10	0.10
Reach	13	1-year Low	Pr Elevated Trail 3	39690.00	690.25	712.01	696.97	712.09	0.000034	2.4	16847.27	935.10	0.10
Reach	13	2-year Low	Pr. Elevated Trail 1	101800.00	690.25	715.68	700.58	716.08	0.000120	5.0	20291.68	937.80	0.19
Reach	13	2-year Low	Pr Elevated Trail 2	101800.00	690.25	715.68	700.57	716.08	0.000120	5.0	20291.68	937.80	0.19
Reach	13	2-year Low	Pr Elevated Trail 3	101800.00	690.25	715.68	700.58	716.08	0.000120	5.0	20291.68	937.80	0.19
Reach	13	5-year Low	Pr. Elevated Trail 1	136800.00	690.25	720.15	702.30	720.64	0.000116	5.6	24484.49	940.29	0.19
Reach	13	5-year Low	Pr Elevated Trail 2	136800.00	690.25	720.15	702.30	720.64	0.000116	5.6	24484.49	940.29	0.19
Reach	13	5-year Low	Pr Elevated Trail 3	136800.00	690.25	720.15	702.29	720.64	0.000116	5.6	24484.49	940.29	0.19
Reach	13	25-year	Pr. Elevated Trail 1	187200.00	690.25	725.69	704.43	726.31	0.000116	6.3	29702.43	943.97	0.20
Reach	13	25-year	Pr Elevated Trail 2	187200.00	690.25	725.69	704.43	726.31	0.000117	6.3	30725.56	1096.45	0.20
Reach	13	25-year	Pr Elevated Trail 3	187200.00	690.25	725.69	704.43	726.31	0.000116	6.3	29702.43	943.97	0.20
Reach	13	10-year	Pr. Elevated Trail 1	168500.00	690.25	723.19	703.66	723.78	0.000123	6.2	27345.19	942.10	0.20
Reach	13	10-year	Pr Elevated Trail 2	168500.00	690.25	723.19	703.68	723.78	0.000123	6.2	27345.19	942.10	0.20
Reach	13	10-year	Pr Elevated Trail 3	168500.00	690.25	723.19	703.67	723.78	0.000123	6.2	27345.19	942.10	0.20
Reach	13	50-year	Pr. Elevated Trail 1	212000.00	690.25	727.83	705.42	728.52	0.000120	6.7	31760.35	986.37	0.20
Reach	13	50-year	Pr Elevated Trail 2	212000.00	690.25	727.83	705.40	728.52	0.000120	6.7	33023.54	1139.10	0.20
Reach	13	50-year	Pr Elevated Trail 3	212000.00	690.25	727.83	705.42	728.52	0.000121	6.7	32964.19	1139.12	0.20
Reach	13	100-year	Pr. Elevated Trail 1	231000.00	690.25	729.66	706.15	730.40	0.000119	6.9	33578.23	996.29	0.20
Reach	13	100-year	Pr Elevated Trail 2	231000.00	690.25	729.66	706.15	730.39	0.000119	6.9	35046.80	1149.04	0.20
Reach	13	100-year	Pr Elevated Trail 3	231000.00	690.25	729.66	706.16	730.40	0.000120	6.9	34987.26	1149.04	0.20
Reach	13	1-year High	Pr. Elevated Trail 1	39690.00	690.25	718.91	696.98	718.95	0.000012	1.7	23318.91	939.60	0.06
Reach	13	1-year High	Pr Elevated Trail 2	39690.00	690.25	718.91	696.96	718.95	0.000012	1.7	23318.91	939.60	0.06
Reach	13	1-year High	Pr Elevated Trail 3	39690.00	690.25	718.91	696.97	718.95	0.000012	1.7	23318.91	939.60	0.06
Reach	13	5-year High	Pr. Elevated Trail 1	136800.00	690.25	721.31	702.30	721.76	0.000101	5.4	25577.18	940.94	0.18
Reach	13	5-year High	Pr Elevated Trail 2	136800.00	690.25	721.31	702.30	721.76	0.000101	5.4	25577.18	940.94	0.18
Reach	13	5-year High	Pr Elevated Trail 3	136800.00	690.25	721.31	702.29	721.76	0.000101	5.4	25577.18	940.94	0.18
Reach	13	2-year High	Pr. Elevated Trail 1	101800.00	690.25	719.90	700.58	720.17	0.000067	4.2	24246.50	940.15	0.15
Reach	13	2-year High	Pr Elevated Trail 2	101800.00	690.25	719.90	700.57	720.17	0.000067	4.2	24246.50	940.15	0.15
Reach	13	2-year High	Pr Elevated Trail 3	101800.00	690.25	719.90	700.58	720.17	0.000067	4.2	24246.50	940.15	0.15
Reach	13	Normal	Pr. Elevated Trail 1	12700.00	690.25	710.93	694.68	710.94	0.000004	0.8	15844.61	929.99	0.03
Reach	13	Normal	Pr Elevated Trail 2	12700.00	690.25	710.93	694.67	710.94	0.000004	0.8	15844.61	929.99	0.03
Reach	13	Normal	Pr Elevated Trail 3	12700.00	690.25	710.93	694.68	710.94	0.000004	0.8	15844.61	929.99	0.03
Reach	12	1-year Low	Pr. Elevated Trail 1	39690.00	688.05	712.00	696.14	712.09	0.000031	2.3	17135.40	911.66	0.09
Reach	12	1-year Low	Pr Elevated Trail 2	39690.00	688.05	712.00	696.14	712.09	0.000031	2.3	17135.40	911.66	0.09
Reach	12	1-year Low	Pr Elevated Trail 3	39690.00	688.05	712.00	696.13	712.09	0.000031	2.3	17135.40	911.66	0.09
Reach	12	2-year Low	Pr. Elevated Trail 1	101800.00	688.05	715.66	699.92	716.05	0.000113	5.0	20477.60	914.56	0.18
Reach	12	2-year Low	Pr Elevated Trail 2	101800.00	688.05	715.66	699.92	716.05	0.000113	5.0	20477.60	914.56	0.18
Reach	12	2-year Low	Pr Elevated Trail 3	101800.00	688.05	715.66	699.90	716.05	0.000113	5.0	20477.60	914.56	0.18
Reach	12	5-year Low	Pr. Elevated Trail 1	136800.00	688.05	720.13	701.69	720.61	0.000112	5.6	24566.96	918.10	0.19
Reach	12	5-year Low	Pr Elevated Trail 2	136800.00	688.05	720.13	701.69	720.61	0.000112	5.6	24566.96	918.10	0.19
Reach	12	5-year Low	Pr Elevated Trail 3	136800.00	688.05	720.13	701.67	720.61	0.000112	5.6	24566.96	918.10	0.19
Reach	12	25-year	Pr. Elevated Trail 1	187200.00	688.05	725.66	703.87	726.28	0.000113	6.3	29660.80	922.49	0.20
Reach	12	25-year	Pr Elevated Trail 2	187200.00	688.05	725.67	703.87	726.28	0.000114	6.3	30546.91	1097.85	0.19
Reach	12	25-year	Pr Elevated Trail 3	187200.00	688.05	725.66	703.87	726.28	0.000113	6.3	29660.80	922.49	0.20

HEC-RAS River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	12	10-year	Pr. Elevated Trail 1	168500.00	688.05	723.16	703.08	723.75	0.000119	6.2	27357.92	920.51	0.20
Reach	12	10-year	Pr Elevated Trail 2	168500.00	688.05	723.16	703.09	723.75	0.000119	6.2	27357.92	920.51	0.20
Reach	12	10-year	Pr Elevated Trail 3	168500.00	688.05	723.16	703.10	723.75	0.000119	6.2	27357.92	920.51	0.20
Reach	12	50-year	Pr. Elevated Trail 1	212000.00	688.05	727.80	704.86	728.50	0.000117	6.7	31632.25	924.18	0.20
Reach	12	50-year	Pr Elevated Trail 2	212000.00	688.05	727.80	704.86	728.49	0.000118	6.7	32751.53	1099.64	0.20
Reach	12	50-year	Pr Elevated Trail 3	212000.00	688.05	727.80	704.87	728.49	0.000119	6.7	32691.21	1099.64	0.20
Reach	12	100-year	Pr. Elevated Trail 1	231000.00	688.05	729.62	705.59	730.37	0.000118	7.0	33373.45	972.52	0.20
Reach	12	100-year	Pr Elevated Trail 2	231000.00	688.05	729.63	705.59	730.37	0.000117	6.9	34693.06	1148.15	0.20
Reach	12	100-year	Pr Elevated Trail 3	231000.00	688.05	729.63	705.57	730.37	0.000118	6.9	34632.20	1148.15	0.20
Reach	12	1-year High	Pr. Elevated Trail 1	39690.00	688.05	718.91	696.14	718.95	0.000011	1.7	23449.57	917.13	0.06
Reach	12	1-year High	Pr Elevated Trail 2	39690.00	688.05	718.91	696.14	718.95	0.000011	1.7	23449.57	917.13	0.06
Reach	12	1-year High	Pr Elevated Trail 3	39690.00	688.05	718.91	696.13	718.95	0.000011	1.7	23449.57	917.13	0.06
Reach	12	5-year High	Pr. Elevated Trail 1	136800.00	688.05	721.29	701.69	721.73	0.000097	5.3	25636.51	919.02	0.18
Reach	12	5-year High	Pr Elevated Trail 2	136800.00	688.05	721.29	701.69	721.73	0.000097	5.3	25636.51	919.02	0.18
Reach	12	5-year High	Pr Elevated Trail 3	136800.00	688.05	721.29	701.67	721.73	0.000097	5.3	25636.51	919.02	0.18
Reach	12	2-year High	Pr. Elevated Trail 1	101800.00	688.05	719.88	699.92	720.15	0.000064	4.2	24344.58	917.91	0.14
Reach	12	2-year High	Pr Elevated Trail 2	101800.00	688.05	719.88	699.92	720.15	0.000064	4.2	24344.58	917.91	0.14
Reach	12	2-year High	Pr Elevated Trail 3	101800.00	688.05	719.88	699.90	720.15	0.000064	4.2	24344.58	917.91	0.14
Reach	12	Normal	Pr. Elevated Trail 1	12700.00	688.05	710.93	693.74	710.94	0.000004	0.8	16162.06	907.57	0.03
Reach	12	Normal	Pr Elevated Trail 2	12700.00	688.05	710.93	693.74	710.94	0.000004	0.8	16162.06	907.57	0.03
Reach	12	Normal	Pr Elevated Trail 3	12700.00	688.05	710.93	693.73	710.94	0.000004	0.8	16162.06	907.57	0.03
Reach	11	1-year Low	Pr. Elevated Trail 1	39690.00	688.28	711.99	695.75	712.07	0.000030	2.3	16928.60	874.03	0.09
Reach	11	1-year Low	Pr Elevated Trail 2	39690.00	688.28	711.99	695.74	712.07	0.000030	2.3	16928.60	874.03	0.09
Reach	11	1-year Low	Pr Elevated Trail 3	39690.00	688.28	711.99	695.73	712.07	0.000030	2.3	16928.60	874.03	0.09
Reach	11	2-year Low	Pr. Elevated Trail 1	101800.00	688.28	715.60	699.66	716.00	0.000113	5.1	20093.87	876.61	0.19
Reach	11	2-year Low	Pr Elevated Trail 2	101800.00	688.28	715.60	699.65	716.00	0.000113	5.1	20093.87	876.61	0.19
Reach	11	2-year Low	Pr Elevated Trail 3	101800.00	688.28	715.60	699.66	716.00	0.000113	5.1	20093.87	876.61	0.19
Reach	11	5-year Low	Pr. Elevated Trail 1	136800.00	688.28	720.06	701.37	720.56	0.000114	5.7	24004.63	879.52	0.19
Reach	11	5-year Low	Pr Elevated Trail 2	136800.00	688.28	720.06	701.39	720.56	0.000114	5.7	24004.63	879.52	0.19
Reach	11	5-year Low	Pr Elevated Trail 3	136800.00	688.28	720.06	701.38	720.56	0.000114	5.7	24004.63	879.52	0.19
Reach	11	25-year	Pr. Elevated Trail 1	187200.00	688.28	725.58	703.60	726.23	0.000117	6.5	28870.13	883.12	0.20
Reach	11	25-year	Pr Elevated Trail 2	187200.00	688.28	725.58	703.61	726.23	0.000118	6.5	29876.12	1038.62	0.20
Reach	11	25-year	Pr Elevated Trail 3	187200.00	688.28	725.58	703.60	726.23	0.000117	6.5	28870.13	883.12	0.20
Reach	11	10-year	Pr. Elevated Trail 1	168500.00	688.28	723.08	702.82	723.70	0.000123	6.3	26666.75	881.45	0.20
Reach	11	10-year	Pr Elevated Trail 2	168500.00	688.28	723.08	702.82	723.70	0.000123	6.3	26666.75	881.45	0.20
Reach	11	10-year	Pr Elevated Trail 3	168500.00	688.28	723.08	702.80	723.70	0.000123	6.3	26666.75	881.45	0.20
Reach	11	50-year	Pr. Elevated Trail 1	212000.00	688.28	727.71	704.62	728.45	0.000122	6.9	30887.47	1030.41	0.21
Reach	11	50-year	Pr Elevated Trail 2	212000.00	688.28	727.71	704.62	728.44	0.000123	6.9	32137.09	1186.25	0.20
Reach	11	50-year	Pr Elevated Trail 3	212000.00	688.28	727.71	704.62	728.44	0.000123	6.9	32077.02	1186.25	0.20
Reach	11	100-year	Pr. Elevated Trail 1	231000.00	688.28	729.53	705.33	730.32	0.000122	7.1	32882.70	1149.14	0.21
Reach	11	100-year	Pr Elevated Trail 2	231000.00	688.28	729.54	705.33	730.32	0.000122	7.1	34341.70	1305.08	0.21
Reach	11	100-year	Pr Elevated Trail 3	231000.00	688.28	729.54	705.38	730.32	0.000123	7.1	34281.38	1305.07	0.21
Reach	11	1-year High	Pr. Elevated Trail 1	39690.00	688.28	718.90	695.75	718.95	0.000011	1.7	22987.79	878.72	0.06
Reach	11	1-year High	Pr Elevated Trail 2	39690.00	688.28	718.90	695.74	718.95	0.000011	1.7	22987.79	878.72	0.06
Reach	11	1-year High	Pr Elevated Trail 3	39690.00	688.28	718.90	695.73	718.95	0.000011	1.7	22987.79	878.72	0.06
Reach	11	5-year High	Pr. Elevated Trail 1	136800.00	688.28	721.23	701.37	721.69	0.000099	5.5	25035.13	880.23	0.18
Reach	11	5-year High	Pr Elevated Trail 2	136800.00	688.28	721.23	701.39	721.69	0.000099	5.5	25035.13	880.23	0.18
Reach	11	5-year High	Pr Elevated Trail 3	136800.00	688.28	721.23	701.38	721.69	0.000099	5.5	25035.13	880.23	0.18
Reach	11	2-year High	Pr. Elevated Trail 1	101800.00	688.28	719.85	699.66	720.13	0.000065	4.3	23817.77	879.36	0.14
Reach	11	2-year High	Pr Elevated Trail 2	101800.00	688.28	719.85	699.65	720.13	0.000065	4.3	23817.77	879.36	0.14
Reach	11	2-year High	Pr Elevated Trail 3	101800.00	688.28	719.85	699.66	720.13	0.000065	4.3	23817.77	879.36	0.14
Reach	11	Normal	Pr. Elevated Trail 1	12700.00	688.28	710.93	693.26	710.94	0.000004	0.8	16006.06	870.23	0.03
Reach	11	Normal	Pr Elevated Trail 2	12700.00	688.28	710.93	693.27	710.94	0.000004	0.8	16006.06	870.23	0.03
Reach	11	Normal	Pr Elevated Trail 3	12700.00	688.28	710.93	693.26	710.94	0.000004	0.8	16006.06	870.23	0.03
Reach	10	1-year Low	Pr. Elevated Trail 1	39690.00	688.91	711.98	696.07	712.07	0.000033	2.4	16535.34	875.77	0.10
Reach	10	1-year Low	Pr Elevated Trail 2	39690.00	688.91	711.98	696.07	712.07	0.000033	2.4	16535.34	875.77	0.10
Reach	10	1-year Low	Pr Elevated Trail 3	39690.00	688.91	711.98	696.07	712.07	0.000033	2.4	16535.34	875.77	0.10
Reach	10	2-year Low	Pr. Elevated Trail 1	101800.00	688.91	715.56	699.98	715.98	0.000121	5.2	19680.08	878.31	0.19
Reach	10	2-year Low	Pr Elevated Trail 2	101800.00	688.91	715.56	699.99	715.98	0.000121	5.2	19680.08	878.31	0.19
Reach	10	2-year Low	Pr Elevated Trail 3	101800.00	688.91	715.56	699.98	715.98	0.000121	5.2	19680.08	878.31	0.19
Reach	10	5-year Low	Pr. Elevated Trail 1	136800.00	688.91	720.02	701.75	720.54	0.000121	5.8	23598.42	881.42	0.20
Reach	10	5-year Low	Pr Elevated Trail 2	136800.00	688.91	720.02	701.74	720.54	0.000121	5.8	23598.42	881.42	0.20
Reach	10	5-year Low	Pr Elevated Trail 3	136800.00	688.91	720.02	701.74	720.54	0.000121	5.8	23598.42	881.42	0.20
Reach	10	25-year	Pr. Elevated Trail 1	187200.00	688.91	725.54	704.01	726.21	0.000122	6.6	28474.69	885.32	0.20
Reach	10	25-year	Pr Elevated Trail 2	187200.00	688.91	725.54	704.01	726.21	0.000124	6.6	29498.84	1059.52	0.20
Reach	10	25-year	Pr Elevated Trail 3	187200.00	688.91	725.54	704.01	726.21	0.000122	6.6	28474.69	885.32	0.20
Reach	10	10-year	Pr. Elevated Trail 1	168500.00	688.91	723.04	703.20	723.68	0.000129	6.4	26263.92	883.55	0.21
Reach	10	10-year	Pr Elevated Trail 2	168500.00	688.91	723.04	703.20	723.68	0.000129	6.4	26263.92	883.55	0.21
Reach	10	10-year	Pr Elevated Trail 3	168500.00	688.91	723.04	703.20	723.68	0.000129	6.4	26263.92	883.55	0.21
Reach	10	50-year	Pr. Elevated Trail 1	212000.00	688.91	727.66	705.04	728.42	0.000127	7.0	30357.10	886.82	0.21
Reach	10	50-year	Pr Elevated Trail 2	212000.00	688.91	727.67	705.04	728.42	0.000128	7.0	31631.26	1061.18	0.21
Reach	10	50-year	Pr Elevated Trail 3	212000.00	688.91	727.67	705.04	728.42	0.000129	7.0	31570.35	1061.18	0.21
Reach	10	100-year	Pr. Elevated Trail 1	231000.00	688.91	729.48	705.80	730.30	0.000128	7.2	31998.44	936.49	0.21
Reach	10	100-year	Pr Elevated Trail 2	231000.00	688.91	729.50	705.79	730.29	0.000127	7.2	33488.11	1113.48	0.21
Reach	10	100-year	Pr Elevated Trail 3	231000.00	688.91	729.49	705.80	730.29	0.000128	7.2	33426.56	1113.21	0.21
Reach	10	1-year High	Pr. Elevated Trail 1	39690.00	688.91	718.90	696.07	718.95	0.000012	1.8	22612.16	880.63	0.06
Reach	10	1-year High	Pr Elevated Trail 2	39690.00	688.91	718.90	696.07	718.95	0.000012	1.8	22612.16	880.63	0.06
Reach	10	1-year High	Pr Elevated Trail 3	39690.00	688.91	718.90	696.07	718.95	0.000012	1.8	22612.16	880.63	0.06
Reach	10	5-year High	Pr. Elevated Trail 1	136800.00	688.91	721.19	701.75	721.67	0.000105	5.6	24636.07	882.25	0.18
Reach	10	5-year High	Pr Elevated Trail 2	136800.00	688.91	721.19	701.74	721.67	0.000105	5.6	24636.07	882.25	0.18
Reach	10	5-year High	Pr Elevated Trail 3	136800.00	688.91	721.19	701.74	721.67	0.000105	5.6	24636.07	882.25	0.18
Reach	10	2-year High	Pr. Elevated Trail 1	101800.00	688.91	719.82	699.98	720.12	0.000069	4.3	23427.24	881.29	0.15
Reach	10	2-year High	Pr Elevated Trail 2	101800.00	688.91	719.82	699.99	720.12	0.000069	4.3	23427.24	881.29	0.15
Reach	10	2-year High	Pr Elevated Trail 3	101800.00	688.91	719.82	699.98	720.12	0.000069	4.3	23427.24	881.29	0.15
Reach	10	Normal	Pr. Elevated Trail 1	12700.00	688.91	710.93	693.51	710.94	0.000004	0.8	15619.10	871.32	0.03
Reach	10	Normal	Pr Elevated Trail 2	12700.00	688.91	710.93	693.50	710.94	0.000004	0.8	15619.10	871.32	0.03
Reach	10	Normal	Pr Elevated Trail 3	12700.00	688.91	710.93	693.51	710.94	0.000004	0.8	15619.10	871.32	0.03

HEC-RAS River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	9	1-year Low	Pr. Elevated Trail 1	39690.00	688.16	711.97	695.74	712.06	0.000034	2.4	16272.35	822.47	0.10
Reach	9	1-year Low	Pr Elevated Trail 2	39690.00	688.16	711.97	695.73	712.06	0.000034	2.4	16272.35	822.47	0.10
Reach	9	1-year Low	Pr Elevated Trail 3	39690.00	688.16	711.97	695.74	712.06	0.000034	2.4	16272.35	822.47	0.10
Reach	9	2-year Low	Pr. Elevated Trail 1	101800.00	688.16	715.52	699.54	715.96	0.000133	5.3	19197.52	824.13	0.19
Reach	9	2-year Low	Pr Elevated Trail 2	101800.00	688.16	715.52	699.53	715.96	0.000133	5.3	19197.52	824.13	0.19
Reach	9	2-year Low	Pr Elevated Trail 3	101800.00	688.16	715.52	699.54	715.96	0.000133	5.3	19197.52	824.13	0.19
Reach	9	5-year Low	Pr. Elevated Trail 1	136800.00	688.16	719.96	701.29	720.52	0.000138	6.0	22859.58	826.25	0.20
Reach	9	5-year Low	Pr Elevated Trail 2	136800.00	688.16	719.96	701.29	720.52	0.000138	6.0	22859.58	826.25	0.20
Reach	9	5-year Low	Pr Elevated Trail 3	136800.00	688.16	719.96	701.29	720.52	0.000138	6.0	22859.58	826.25	0.20
Reach	9	25-year	Pr. Elevated Trail 1	187200.00	688.16	725.46	703.57	726.19	0.000148	6.8	27415.56	831.29	0.21
Reach	9	25-year	Pr Elevated Trail 2	187200.00	688.16	725.47	703.57	726.18	0.000149	6.8	28498.73	994.48	0.21
Reach	9	25-year	Pr Elevated Trail 3	187200.00	688.16	725.46	703.57	726.19	0.000148	6.8	27415.56	831.29	0.21
Reach	9	10-year	Pr. Elevated Trail 1	168500.00	688.16	722.97	702.74	723.65	0.000152	6.7	25345.53	828.77	0.21
Reach	9	10-year	Pr Elevated Trail 2	168500.00	688.16	722.97	702.77	723.65	0.000152	6.7	25345.53	828.77	0.21
Reach	9	10-year	Pr Elevated Trail 3	168500.00	688.16	722.97	702.74	723.65	0.000152	6.7	25345.53	828.77	0.21
Reach	9	50-year	Pr. Elevated Trail 1	212000.00	688.16	727.57	704.63	728.40	0.000156	7.3	29173.51	833.39	0.22
Reach	9	50-year	Pr Elevated Trail 2	212000.00	688.16	727.58	704.63	728.39	0.000157	7.2	30517.42	996.68	0.21
Reach	9	50-year	Pr Elevated Trail 3	212000.00	688.16	727.58	704.63	728.39	0.000158	7.2	30456.65	996.68	0.21
Reach	9	100-year	Pr. Elevated Trail 1	231000.00	688.16	729.39	705.40	730.27	0.000159	7.5	30708.48	865.04	0.22
Reach	9	100-year	Pr Elevated Trail 2	231000.00	688.16	729.40	705.38	730.26	0.000159	7.5	32277.20	1028.71	0.22
Reach	9	100-year	Pr Elevated Trail 3	231000.00	688.16	729.40	705.39	730.27	0.000160	7.5	32215.86	1028.68	0.22
Reach	9	1-year High	Pr. Elevated Trail 1	39690.00	688.16	718.89	695.74	718.94	0.000013	1.8	21977.47	825.53	0.06
Reach	9	1-year High	Pr Elevated Trail 2	39690.00	688.16	718.89	695.73	718.94	0.000013	1.8	21977.47	825.53	0.06
Reach	9	1-year High	Pr Elevated Trail 3	39690.00	688.16	718.89	695.74	718.94	0.000013	1.8	21977.47	825.53	0.06
Reach	9	5-year High	Pr. Elevated Trail 1	136800.00	688.16	721.14	701.29	721.65	0.000121	5.7	23835.72	827.06	0.19
Reach	9	5-year High	Pr Elevated Trail 2	136800.00	688.16	721.14	701.29	721.65	0.000121	5.7	23835.72	827.06	0.19
Reach	9	5-year High	Pr Elevated Trail 3	136800.00	688.16	721.14	701.29	721.65	0.000121	5.7	23835.72	827.06	0.19
Reach	9	2-year High	Pr. Elevated Trail 1	101800.00	688.16	719.79	699.54	720.10	0.000078	4.5	22720.09	826.11	0.15
Reach	9	2-year High	Pr Elevated Trail 2	101800.00	688.16	719.79	699.53	720.10	0.000078	4.5	22720.09	826.11	0.15
Reach	9	2-year High	Pr Elevated Trail 3	101800.00	688.16	719.79	699.54	720.10	0.000078	4.5	22720.09	826.11	0.15
Reach	9	Normal	Pr. Elevated Trail 1	12700.00	688.16	710.93	693.34	710.94	0.000004	0.8	15416.97	820.08	0.03
Reach	9	Normal	Pr Elevated Trail 2	12700.00	688.16	710.93	693.32	710.94	0.000004	0.8	15416.97	820.08	0.03
Reach	9	Normal	Pr Elevated Trail 3	12700.00	688.16	710.93	693.34	710.94	0.000004	0.8	15416.97	820.08	0.03
Reach	8	1-year Low	Pr. Elevated Trail 1	39690.00	687.93	711.96	695.48	712.05	0.000034	2.4	16337.99	879.48	0.10
Reach	8	1-year Low	Pr Elevated Trail 2	39690.00	687.93	711.96	695.48	712.05	0.000034	2.4	16337.99	879.48	0.10
Reach	8	1-year Low	Pr Elevated Trail 3	39690.00	687.93	711.96	695.48	712.05	0.000034	2.4	16337.99	879.48	0.10
Reach	8	2-year Low	Pr. Elevated Trail 1	101800.00	687.93	715.47	699.56	715.90	0.000125	5.2	19466.88	895.04	0.20
Reach	8	2-year Low	Pr Elevated Trail 2	101800.00	687.93	715.47	699.56	715.90	0.000125	5.2	19466.88	895.04	0.20
Reach	8	2-year Low	Pr Elevated Trail 3	101800.00	687.93	715.47	699.56	715.90	0.000125	5.2	19466.88	895.04	0.20
Reach	8	5-year Low	Pr. Elevated Trail 1	136800.00	687.93	719.92	701.50	720.45	0.000123	5.9	23456.20	899.44	0.20
Reach	8	5-year Low	Pr Elevated Trail 2	136800.00	687.93	719.92	701.50	720.45	0.000123	5.9	23456.20	899.44	0.20
Reach	8	5-year Low	Pr Elevated Trail 3	136800.00	687.93	719.92	701.50	720.45	0.000123	5.9	23456.20	899.44	0.20
Reach	8	25-year	Pr. Elevated Trail 1	187200.00	687.93	725.43	703.87	726.12	0.000123	6.7	28429.79	906.61	0.21
Reach	8	25-year	Pr Elevated Trail 2	187200.00	687.93	725.43	703.87	726.12	0.000123	6.7	28429.79	906.61	0.21
Reach	8	25-year	Pr Elevated Trail 3	187200.00	687.93	725.43	703.87	726.12	0.000123	6.7	28429.79	906.61	0.21
Reach	8	10-year	Pr. Elevated Trail 1	168500.00	687.93	722.92	703.04	723.58	0.000131	6.5	26166.72	903.20	0.21
Reach	8	10-year	Pr Elevated Trail 2	168500.00	687.93	722.92	703.04	723.58	0.000131	6.5	26166.72	903.20	0.21
Reach	8	10-year	Pr Elevated Trail 3	168500.00	687.93	722.92	703.04	723.58	0.000131	6.5	26166.72	903.20	0.21
Reach	8	50-year	Pr. Elevated Trail 1	212000.00	687.93	727.54	704.97	728.32	0.000128	7.1	30351.69	910.74	0.21
Reach	8	50-year	Pr Elevated Trail 2	212000.00	687.93	727.54	704.97	728.32	0.000128	7.1	30351.69	910.74	0.21
Reach	8	50-year	Pr Elevated Trail 3	212000.00	687.93	727.54	704.97	728.32	0.000128	7.1	30351.69	910.74	0.21
Reach	8	100-year	Pr. Elevated Trail 1	231000.00	687.93	729.36	705.76	730.19	0.000128	7.3	32029.90	943.04	0.21
Reach	8	100-year	Pr Elevated Trail 2	231000.00	687.93	729.36	705.76	730.19	0.000128	7.3	32029.90	943.04	0.21
Reach	8	100-year	Pr Elevated Trail 3	231000.00	687.93	729.36	705.76	730.19	0.000128	7.3	32029.90	943.04	0.21
Reach	8	1-year High	Pr. Elevated Trail 1	39690.00	687.93	718.89	695.48	718.94	0.000012	1.8	22531.01	898.48	0.06
Reach	8	1-year High	Pr Elevated Trail 2	39690.00	687.93	718.89	695.48	718.94	0.000012	1.8	22531.01	898.48	0.06
Reach	8	1-year High	Pr Elevated Trail 3	39690.00	687.93	718.89	695.48	718.94	0.000012	1.8	22531.01	898.48	0.06
Reach	8	5-year High	Pr. Elevated Trail 1	136800.00	687.93	721.11	701.50	721.60	0.000107	5.6	24526.03	900.94	0.19
Reach	8	5-year High	Pr Elevated Trail 2	136800.00	687.93	721.11	701.50	721.60	0.000107	5.6	24526.03	900.94	0.19
Reach	8	5-year High	Pr Elevated Trail 3	136800.00	687.93	721.11	701.50	721.60	0.000107	5.6	24526.03	900.94	0.19
Reach	8	2-year High	Pr. Elevated Trail 1	101800.00	687.93	719.77	699.56	720.07	0.000070	4.4	23321.38	899.30	0.15
Reach	8	2-year High	Pr Elevated Trail 2	101800.00	687.93	719.77	699.56	720.07	0.000070	4.4	23321.38	899.30	0.15
Reach	8	2-year High	Pr Elevated Trail 3	101800.00	687.93	719.77	699.56	720.07	0.000070	4.4	23321.38	899.30	0.15
Reach	8	Normal	Pr. Elevated Trail 1	12700.00	687.93	710.93	692.96	710.94	0.000004	0.8	15443.61	862.93	0.03
Reach	8	Normal	Pr Elevated Trail 2	12700.00	687.93	710.93	692.96	710.94	0.000004	0.8	15443.61	862.93	0.03
Reach	8	Normal	Pr Elevated Trail 3	12700.00	687.93	710.93	692.96	710.94	0.000004	0.8	15443.61	862.93	0.03
Reach	7	1-year Low	Pr. Elevated Trail 1	39690.00	688.16	711.95	695.04	712.04	0.000031	2.4	16590.76	841.14	0.09
Reach	7	1-year Low	Pr Elevated Trail 2	39690.00	688.16	711.95	695.04	712.04	0.000031	2.4	16590.76	841.14	0.09
Reach	7	1-year Low	Pr Elevated Trail 3	39690.00	688.16	711.95	695.04	712.04	0.000031	2.4	16590.76	841.14	0.09
Reach	7	2-year Low	Pr. Elevated Trail 1	101800.00	688.16	715.44	699.19	715.86	0.000118	5.2	19536.76	845.75	0.19
Reach	7	2-year Low	Pr Elevated Trail 2	101800.00	688.16	715.44	699.19	715.86	0.000118	5.2	19536.76	845.75	0.19
Reach	7	2-year Low	Pr Elevated Trail 3	101800.00	688.16	715.44	699.19	715.86	0.000118	5.2	19536.76	845.75	0.19
Reach	7	5-year Low	Pr. Elevated Trail 1	136800.00	688.16	719.88	701.09	720.42	0.000119	5.9	23306.06	851.56	0.20
Reach	7	5-year Low	Pr Elevated Trail 2	136800.00	688.16	719.88	701.09	720.42	0.000119	5.9	23306.06	851.56	0.20
Reach	7	5-year Low	Pr Elevated Trail 3	136800.00	688.16	719.88	701.09	720.42	0.000119	5.9	23306.06	851.56	0.20
Reach	7	25-year	Pr. Elevated Trail 1	187200.00	688.16	725.38	703.54	726.08	0.000122	6.7	28025.38	924.31	0.21
Reach	7	25-year	Pr Elevated Trail 2	187200.00	688.16	725.38	703.54	726.08	0.000122	6.7	28025.38	924.31	0.21
Reach	7	25-year	Pr Elevated Trail 3	187200.00	688.16	725.38	703.54	726.08	0.000122	6.7	28025.38	924.31	0.21
Reach	7	10-year	Pr. Elevated Trail 1	168500.00	688.16	722.88	702.66	723.54	0.000128	6.5	25866.40	855.72	0.21
Reach	7	10-year	Pr Elevated Trail 2	168500.00	688.16	722.88	702.66	723.54	0.000128	6.5	25866.40	855.72	0.21
Reach	7	10-year	Pr Elevated Trail 3	168500.00	688.16	722.88	702.66	723.54	0.000128	6.5	25866.40	855.72	0.21
Reach	7	50-year	Pr. Elevated Trail 1	212000.00	688.16	727.49	704.60	728.28	0.000127	7.1	30132.94	1075.24	0.21
Reach	7	50-year	Pr Elevated Trail 2	212000.00	688.16	727.49	704.60	728.28	0.000127	7.1	30132.94	1075.24	0.21
Reach	7	50-year	Pr Elevated Trail 3	212000.00	688.16	727.49	704.60	728.28	0.000127	7.1	30132.94	1075.24	0.21
Reach	7	100-year	Pr. Elevated Trail 1	231000.00	688.16	729.31	705.37	730.16	0.000128	7.4	32191.87	1199.44	0.21
Reach	7	100-year	Pr Elevated Trail 2	231000.00	688.16	729.31	705.37	730.16	0.000128	7.4	32191.87	1199.44	0.21
Reach	7	100-year	Pr Elevated Trail 3	231000.00	688.16	729.31	705.37	730.16	0.000128	7.4	32191.87	1199.44	0.21
Reach	7	1-year High	Pr. Elevated Trail 1	39690.00	688.16	718.89	695.04	718.93	0.000011	1.8	22457.46	850.23	0.06

HEC-RAS River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	7	1-year High	Pr Elevated Trail 2	39690.00	688.16	718.89	695.04	718.93	0.000011	1.8	22457.46	850.23	0.06
Reach	7	1-year High	Pr Elevated Trail 3	39690.00	688.16	718.89	695.04	718.93	0.000011	1.8	22457.46	850.23	0.06
Reach	7	5-year High	Pr. Elevated Trail 1	136800.00	688.16	721.07	701.09	721.57	0.000104	5.6	24321.79	853.27	0.19
Reach	7	5-year High	Pr Elevated Trail 2	136800.00	688.16	721.07	701.09	721.57	0.000104	5.6	24321.79	853.27	0.19
Reach	7	5-year High	Pr Elevated Trail 3	136800.00	688.16	721.07	701.09	721.57	0.000104	5.6	24321.79	853.27	0.19
Reach	7	2-year High	Pr. Elevated Trail 1	101800.00	688.16	719.75	699.19	720.05	0.000067	4.4	23191.73	851.38	0.15
Reach	7	2-year High	Pr Elevated Trail 2	101800.00	688.16	719.75	699.19	720.05	0.000067	4.4	23191.73	851.38	0.15
Reach	7	2-year High	Pr Elevated Trail 3	101800.00	688.16	719.75	699.19	720.05	0.000067	4.4	23191.73	851.38	0.15
Reach	7	Normal	Pr. Elevated Trail 1	12700.00	688.16	710.93	692.33	710.94	0.000004	0.8	15731.90	838.74	0.03
Reach	7	Normal	Pr Elevated Trail 2	12700.00	688.16	710.93	692.33	710.94	0.000004	0.8	15731.90	838.74	0.03
Reach	7	Normal	Pr Elevated Trail 3	12700.00	688.16	710.93	692.33	710.94	0.000004	0.8	15731.90	838.74	0.03
Reach	6	1-year Low	Pr. Elevated Trail 1	39690.00	687.20	711.95	694.29	712.03	0.000026	2.2	17767.12	881.76	0.09
Reach	6	1-year Low	Pr Elevated Trail 2	39690.00	687.20	711.95	694.29	712.03	0.000026	2.2	17767.12	881.76	0.09
Reach	6	1-year Low	Pr Elevated Trail 3	39690.00	687.20	711.95	694.29	712.03	0.000026	2.2	17767.12	881.76	0.09
Reach	6	2-year Low	Pr. Elevated Trail 1	101800.00	687.20	715.45	698.19	715.82	0.000101	4.9	20906.22	909.31	0.18
Reach	6	2-year Low	Pr Elevated Trail 2	101800.00	687.20	715.45	698.19	715.82	0.000101	4.9	20906.22	909.31	0.18
Reach	6	2-year Low	Pr Elevated Trail 3	101800.00	687.20	715.45	698.19	715.82	0.000101	4.9	20906.22	909.31	0.18
Reach	6	5-year Low	Pr. Elevated Trail 1	136800.00	687.20	719.90	699.98	720.37	0.000102	5.5	24996.05	927.46	0.18
Reach	6	5-year Low	Pr Elevated Trail 2	136800.00	687.20	719.90	699.98	720.37	0.000102	5.5	24996.05	927.46	0.18
Reach	6	5-year Low	Pr Elevated Trail 3	136800.00	687.20	719.90	699.98	720.37	0.000102	5.5	24996.05	927.46	0.18
Reach	6	25-year	Pr. Elevated Trail 1	187200.00	687.20	725.41	702.30	726.02	0.000105	6.3	30161.71	950.76	0.19
Reach	6	25-year	Pr Elevated Trail 2	187200.00	687.20	725.41	702.30	726.02	0.000105	6.3	30161.71	950.76	0.19
Reach	6	25-year	Pr Elevated Trail 3	187200.00	687.20	725.41	702.30	726.02	0.000105	6.3	30161.71	950.76	0.19
Reach	6	10-year	Pr. Elevated Trail 1	168500.00	687.20	722.90	701.48	723.49	0.000110	6.1	27800.87	937.93	0.19
Reach	6	10-year	Pr Elevated Trail 2	168500.00	687.20	722.90	701.48	723.49	0.000110	6.1	27800.87	937.93	0.19
Reach	6	10-year	Pr Elevated Trail 3	168500.00	687.20	722.90	701.48	723.49	0.000110	6.1	27800.87	937.93	0.19
Reach	6	50-year	Pr. Elevated Trail 1	212000.00	687.20	727.52	703.37	728.22	0.000110	6.7	32353.29	1084.95	0.20
Reach	6	50-year	Pr Elevated Trail 2	212000.00	687.20	727.52	703.37	728.22	0.000110	6.7	32353.29	1084.95	0.20
Reach	6	50-year	Pr Elevated Trail 3	212000.00	687.20	727.52	703.37	728.22	0.000110	6.7	32353.29	1084.95	0.20
Reach	6	100-year	Pr. Elevated Trail 1	231000.00	687.20	729.34	704.15	730.09	0.000110	6.9	34419.21	1192.36	0.20
Reach	6	100-year	Pr Elevated Trail 2	231000.00	687.20	729.34	704.15	730.09	0.000110	6.9	34419.21	1192.36	0.20
Reach	6	100-year	Pr Elevated Trail 3	231000.00	687.20	729.34	704.15	730.09	0.000110	6.9	34419.21	1192.36	0.20
Reach	6	1-year High	Pr. Elevated Trail 1	39690.00	687.20	718.89	694.29	718.93	0.000010	1.7	24059.93	923.86	0.06
Reach	6	1-year High	Pr Elevated Trail 2	39690.00	687.20	718.89	694.29	718.93	0.000010	1.7	24059.93	923.86	0.06
Reach	6	1-year High	Pr Elevated Trail 3	39690.00	687.20	718.89	694.29	718.93	0.000010	1.7	24059.93	923.86	0.06
Reach	6	5-year High	Pr. Elevated Trail 1	136800.00	687.20	721.09	699.98	721.52	0.000089	5.3	26103.75	931.65	0.17
Reach	6	5-year High	Pr Elevated Trail 2	136800.00	687.20	721.09	699.98	721.52	0.000089	5.3	26103.75	931.65	0.17
Reach	6	5-year High	Pr Elevated Trail 3	136800.00	687.20	721.09	699.98	721.52	0.000089	5.3	26103.75	931.65	0.17
Reach	6	2-year High	Pr. Elevated Trail 1	101800.00	687.20	719.76	698.19	720.02	0.000057	4.1	24865.15	926.96	0.14
Reach	6	2-year High	Pr Elevated Trail 2	101800.00	687.20	719.76	698.19	720.02	0.000057	4.1	24865.15	926.96	0.14
Reach	6	2-year High	Pr Elevated Trail 3	101800.00	687.20	719.76	698.19	720.02	0.000057	4.1	24865.15	926.96	0.14
Reach	6	Normal	Pr. Elevated Trail 1	12700.00	687.20	710.93	691.61	710.93	0.000003	0.8	16869.39	874.23	0.03
Reach	6	Normal	Pr Elevated Trail 2	12700.00	687.20	710.93	691.61	710.93	0.000003	0.8	16869.39	874.23	0.03
Reach	6	Normal	Pr Elevated Trail 3	12700.00	687.20	710.93	691.61	710.93	0.000003	0.8	16869.39	874.23	0.03
Reach	5	1-year Low	Pr. Elevated Trail 1	39690.00	683.93	711.94	693.44	712.02	0.000025	2.2	17892.20	859.55	0.09
Reach	5	1-year Low	Pr Elevated Trail 2	39690.00	683.93	711.94	693.44	712.02	0.000025	2.2	17892.20	859.55	0.09
Reach	5	1-year Low	Pr Elevated Trail 3	39690.00	683.93	711.94	693.44	712.02	0.000025	2.2	17892.20	859.55	0.09
Reach	5	2-year Low	Pr. Elevated Trail 1	101800.00	683.93	715.43	697.53	715.80	0.000097	4.9	20935.17	885.76	0.17
Reach	5	2-year Low	Pr Elevated Trail 2	101800.00	683.93	715.43	697.53	715.80	0.000097	4.9	20935.17	885.76	0.17
Reach	5	2-year Low	Pr Elevated Trail 3	101800.00	683.93	715.43	697.53	715.80	0.000097	4.9	20935.17	885.76	0.17
Reach	5	5-year Low	Pr. Elevated Trail 1	136800.00	683.93	719.88	699.39	720.35	0.000100	5.5	24918.92	908.14	0.18
Reach	5	5-year Low	Pr Elevated Trail 2	136800.00	683.93	719.88	699.39	720.35	0.000100	5.5	24918.92	908.14	0.18
Reach	5	5-year Low	Pr Elevated Trail 3	136800.00	683.93	719.88	699.39	720.35	0.000100	5.5	24918.92	908.14	0.18
Reach	5	25-year	Pr. Elevated Trail 1	187200.00	683.93	725.38	701.75	726.00	0.000104	6.3	30030.45	1003.98	0.19
Reach	5	25-year	Pr Elevated Trail 2	187200.00	683.93	725.38	701.75	726.00	0.000104	6.3	30030.45	1003.98	0.19
Reach	5	25-year	Pr Elevated Trail 3	187200.00	683.93	725.38	701.75	726.00	0.000104	6.3	30030.45	1003.98	0.19
Reach	5	10-year	Pr. Elevated Trail 1	168500.00	683.93	722.88	700.91	723.47	0.000109	6.2	27664.41	925.59	0.19
Reach	5	10-year	Pr Elevated Trail 2	168500.00	683.93	722.88	700.91	723.47	0.000109	6.2	27664.41	925.59	0.19
Reach	5	10-year	Pr Elevated Trail 3	168500.00	683.93	722.88	700.91	723.47	0.000109	6.2	27664.41	925.59	0.19
Reach	5	50-year	Pr. Elevated Trail 1	212000.00	683.93	727.49	702.84	728.20	0.000109	6.8	32191.72	1053.13	0.20
Reach	5	50-year	Pr Elevated Trail 2	212000.00	683.93	727.49	702.84	728.20	0.000109	6.8	32191.72	1053.13	0.20
Reach	5	50-year	Pr Elevated Trail 3	212000.00	683.93	727.49	702.84	728.20	0.000109	6.8	32191.72	1053.13	0.20
Reach	5	100-year	Pr. Elevated Trail 1	231000.00	683.93	729.31	703.66	730.07	0.000110	7.0	34193.30	1148.45	0.20
Reach	5	100-year	Pr Elevated Trail 2	231000.00	683.93	729.31	703.66	730.07	0.000110	7.0	34193.30	1148.45	0.20
Reach	5	100-year	Pr Elevated Trail 3	231000.00	683.93	729.31	703.66	730.07	0.000110	7.0	34193.30	1148.45	0.20
Reach	5	1-year High	Pr. Elevated Trail 1	39690.00	683.93	718.88	693.44	718.93	0.000009	1.7	24021.43	901.25	0.06
Reach	5	1-year High	Pr Elevated Trail 2	39690.00	683.93	718.88	693.44	718.93	0.000009	1.7	24021.43	901.25	0.06
Reach	5	1-year High	Pr Elevated Trail 3	39690.00	683.93	718.88	693.44	718.93	0.000009	1.7	24021.43	901.25	0.06
Reach	5	5-year High	Pr. Elevated Trail 1	136800.00	683.93	721.07	699.39	721.51	0.000087	5.3	26004.90	911.46	0.17
Reach	5	5-year High	Pr Elevated Trail 2	136800.00	683.93	721.07	699.39	721.51	0.000087	5.3	26004.90	911.46	0.17
Reach	5	5-year High	Pr Elevated Trail 3	136800.00	683.93	721.07	699.39	721.51	0.000087	5.3	26004.90	911.46	0.17
Reach	5	2-year High	Pr. Elevated Trail 1	101800.00	683.93	719.74	697.53	720.01	0.000056	4.1	24799.78	907.69	0.14
Reach	5	2-year High	Pr Elevated Trail 2	101800.00	683.93	719.74	697.53	720.01	0.000056	4.1	24799.78	907.69	0.14
Reach	5	2-year High	Pr Elevated Trail 3	101800.00	683.93	719.74	697.53	720.01	0.000056	4.1	24799.78	907.69	0.14
Reach	5	Normal	Pr. Elevated Trail 1	12700.00	683.93	710.93	690.84	710.93	0.000003	0.7	17020.12	852.42	0.03
Reach	5	Normal	Pr Elevated Trail 2	12700.00	683.93	710.93	690.84	710.93	0.000003	0.7	17020.12	852.42	0.03
Reach	5	Normal	Pr Elevated Trail 3	12700.00	683.93	710.93	690.84	710.93	0.000003	0.7	17020.12	852.42	0.03
Reach	4.5			Bridge									
Reach	4	1-year Low	Pr. Elevated Trail 1	39690.00	682.84	711.73	693.18	711.81	0.000025	2.2	17874.35	869.99	0.09
Reach	4	1-year Low	Pr Elevated Trail 2	39690.00	682.84	711.73	693.18	711.81	0.000025	2.2	17874.35	869.99	0.09
Reach	4	1-year Low	Pr Elevated Trail 3	39690.00	682.84	711.73	693.18	711.81	0.000025	2.2	17874.35	869.99	0.09
Reach	4	2-year Low	Pr. Elevated Trail 1	101800.00	682.84	715.21	697.40	715.58	0.000099	4.9	20982.07	904.40	0.18
Reach	4	2-year Low	Pr Elevated Trail 2	101800.00	682.84	715.21	697.40	715.58	0.000099	4.9	20982.07	904.40	0.18
Reach	4	2-year Low	Pr Elevated Trail 3	101800.00	682.84	715.21	697.40	715.58	0.000099	4.9	20982.07	904.40	0.18
Reach	4	5-year Low	Pr. Elevated Trail 1	136800.00	682.84	719.66	699.24	720.13	0.000101	5.5	25162.76	958.52	0.18
Reach	4	5-year Low	Pr Elevated Trail 2	136800.00	682.84	719.66	699.24	720.13	0.000101	5.5	25162.76	958.52	0.18

HEC-RAS River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	4	5-year Low	Pr Elevated Trail 3	136800.00	682.84	719.66	699.24	720.13	0.000101	5.5	25162.76	958.52	0.18
Reach	4	25-year	Pr. Elevated Trail 1	187200.00	682.84	725.14	701.61	725.76	0.000104	6.3	30676.13	1060.38	0.19
Reach	4	25-year	Pr Elevated Trail 2	187200.00	682.84	725.14	701.61	725.76	0.000104	6.3	30676.13	1060.38	0.19
Reach	4	25-year	Pr Elevated Trail 3	187200.00	682.84	725.14	701.61	725.76	0.000104	6.3	30676.13	1060.38	0.19
Reach	4	10-year	Pr. Elevated Trail 1	168500.00	682.84	722.66	700.78	723.24	0.000109	6.1	28072.98	994.41	0.19
Reach	4	10-year	Pr Elevated Trail 2	168500.00	682.84	722.66	700.78	723.24	0.000109	6.1	28072.98	994.41	0.19
Reach	4	10-year	Pr Elevated Trail 3	168500.00	682.84	722.66	700.78	723.24	0.000109	6.1	28072.98	994.41	0.19
Reach	4	50-year	Pr. Elevated Trail 1	212000.00	682.84	727.23	702.70	727.93	0.000109	6.7	32897.46	1073.66	0.20
Reach	4	50-year	Pr Elevated Trail 2	212000.00	682.84	727.23	702.70	727.93	0.000109	6.7	32897.46	1073.66	0.20
Reach	4	50-year	Pr Elevated Trail 3	212000.00	682.84	727.23	702.70	727.93	0.000109	6.7	32897.46	1073.66	0.20
Reach	4	100-year	Pr. Elevated Trail 1	231000.00	682.84	729.02	703.52	729.77	0.000110	7.0	34847.16	1105.13	0.20
Reach	4	100-year	Pr Elevated Trail 2	231000.00	682.84	729.02	703.52	729.77	0.000110	7.0	34847.16	1105.13	0.20
Reach	4	100-year	Pr Elevated Trail 3	231000.00	682.84	729.02	703.52	729.77	0.000110	7.0	34847.16	1105.13	0.20
Reach	4	1-year High	Pr. Elevated Trail 1	39690.00	682.84	718.72	693.18	718.76	0.000010	1.7	24259.00	954.68	0.06
Reach	4	1-year High	Pr Elevated Trail 2	39690.00	682.84	718.72	693.18	718.76	0.000010	1.7	24259.00	954.68	0.06
Reach	4	1-year High	Pr Elevated Trail 3	39690.00	682.84	718.72	693.18	718.76	0.000010	1.7	24259.00	954.68	0.06
Reach	4	5-year High	Pr. Elevated Trail 1	136800.00	682.84	720.86	699.24	721.30	0.000088	5.3	26316.66	964.48	0.17
Reach	4	5-year High	Pr Elevated Trail 2	136800.00	682.84	720.86	699.24	721.30	0.000088	5.3	26316.66	964.48	0.17
Reach	4	5-year High	Pr Elevated Trail 3	136800.00	682.84	720.86	699.24	721.30	0.000088	5.3	26316.66	964.48	0.17
Reach	4	2-year High	Pr. Elevated Trail 1	101800.00	682.84	719.56	697.40	719.82	0.000056	4.1	25062.33	958.10	0.14
Reach	4	2-year High	Pr Elevated Trail 2	101800.00	682.84	719.56	697.40	719.82	0.000056	4.1	25062.33	958.10	0.14
Reach	4	2-year High	Pr Elevated Trail 3	101800.00	682.84	719.56	697.40	719.82	0.000056	4.1	25062.33	958.10	0.14
Reach	4	Normal	Pr. Elevated Trail 1	12700.00	682.84	710.71	690.44	710.72	0.000003	0.7	16995.94	852.36	0.03
Reach	4	Normal	Pr Elevated Trail 2	12700.00	682.84	710.71	690.44	710.72	0.000003	0.7	16995.94	852.36	0.03
Reach	4	Normal	Pr Elevated Trail 3	12700.00	682.84	710.71	690.44	710.72	0.000003	0.7	16995.94	852.36	0.03
Reach	3	1-year Low	Pr. Elevated Trail 1	39690.00	686.48	711.73		711.80	0.000026	2.2	17957.64	911.52	0.09
Reach	3	1-year Low	Pr Elevated Trail 2	39690.00	686.48	711.73		711.80	0.000026	2.2	17957.64	911.52	0.09
Reach	3	1-year Low	Pr Elevated Trail 3	39690.00	686.48	711.73		711.80	0.000026	2.2	17957.64	911.52	0.09
Reach	3	2-year Low	Pr. Elevated Trail 1	101800.00	686.48	715.18		715.54	0.000101	4.8	21180.54	947.48	0.18
Reach	3	2-year Low	Pr Elevated Trail 2	101800.00	686.48	715.18		715.54	0.000101	4.8	21180.54	947.48	0.18
Reach	3	2-year Low	Pr Elevated Trail 3	101800.00	686.48	715.18		715.54	0.000101	4.8	21180.54	947.48	0.18
Reach	3	5-year Low	Pr. Elevated Trail 1	136800.00	686.48	719.64		720.10	0.000101	5.4	25439.04	961.91	0.18
Reach	3	5-year Low	Pr Elevated Trail 2	136800.00	686.48	719.64		720.10	0.000101	5.4	25439.04	961.91	0.18
Reach	3	5-year Low	Pr Elevated Trail 3	136800.00	686.48	719.64		720.10	0.000101	5.4	25439.04	961.91	0.18
Reach	3	25-year	Pr. Elevated Trail 1	187200.00	686.48	725.13		725.71	0.000103	6.2	31866.38	1636.62	0.19
Reach	3	25-year	Pr Elevated Trail 2	187200.00	686.48	725.13		725.71	0.000103	6.2	31866.38	1636.62	0.19
Reach	3	25-year	Pr Elevated Trail 3	187200.00	686.48	725.13		725.71	0.000103	6.2	31866.38	1636.62	0.19
Reach	3	10-year	Pr. Elevated Trail 1	168500.00	686.48	722.63		723.20	0.000109	6.0	28422.77	1081.42	0.19
Reach	3	10-year	Pr Elevated Trail 2	168500.00	686.48	722.63		723.20	0.000109	6.0	28422.77	1081.42	0.19
Reach	3	10-year	Pr Elevated Trail 3	168500.00	686.48	722.63		723.20	0.000109	6.0	28422.77	1081.42	0.19
Reach	3	50-year	Pr. Elevated Trail 1	212000.00	686.48	727.22		727.87	0.000106	6.5	35459.07	1823.94	0.19
Reach	3	50-year	Pr Elevated Trail 2	212000.00	686.48	727.22		727.87	0.000106	6.5	35459.07	1823.94	0.19
Reach	3	50-year	Pr Elevated Trail 3	212000.00	686.48	727.22		727.87	0.000106	6.5	35459.07	1823.94	0.19
Reach	3	100-year	Pr. Elevated Trail 1	231000.00	686.48	729.02		729.70	0.000104	6.7	38859.30	1966.97	0.19
Reach	3	100-year	Pr Elevated Trail 2	231000.00	686.48	729.02		729.70	0.000104	6.7	38859.30	1966.97	0.19
Reach	3	100-year	Pr Elevated Trail 3	231000.00	686.48	729.02		729.70	0.000104	6.7	38859.30	1966.97	0.19
Reach	3	1-year High	Pr. Elevated Trail 1	39690.00	686.48	718.72		718.76	0.000010	1.6	24551.93	959.10	0.06
Reach	3	1-year High	Pr Elevated Trail 2	39690.00	686.48	718.72		718.76	0.000010	1.6	24551.93	959.10	0.06
Reach	3	1-year High	Pr Elevated Trail 3	39690.00	686.48	718.72		718.76	0.000010	1.6	24551.93	959.10	0.06
Reach	3	5-year High	Pr. Elevated Trail 1	136800.00	686.48	720.84		721.26	0.000087	5.2	26604.84	978.03	0.17
Reach	3	5-year High	Pr Elevated Trail 2	136800.00	686.48	720.84		721.26	0.000087	5.2	26604.84	978.03	0.17
Reach	3	5-year High	Pr Elevated Trail 3	136800.00	686.48	720.84		721.26	0.000087	5.2	26604.84	978.03	0.17
Reach	3	2-year High	Pr. Elevated Trail 1	101800.00	686.48	719.55		719.80	0.000057	4.0	25348.22	961.62	0.14
Reach	3	2-year High	Pr Elevated Trail 2	101800.00	686.48	719.55		719.80	0.000057	4.0	25348.22	961.62	0.14
Reach	3	2-year High	Pr Elevated Trail 3	101800.00	686.48	719.55		719.80	0.000057	4.0	25348.22	961.62	0.14
Reach	3	Normal	Pr. Elevated Trail 1	12700.00	686.48	710.71		710.72	0.000003	0.7	17036.53	904.87	0.03
Reach	3	Normal	Pr Elevated Trail 2	12700.00	686.48	710.71		710.72	0.000003	0.7	17036.53	904.87	0.03
Reach	3	Normal	Pr Elevated Trail 3	12700.00	686.48	710.71		710.72	0.000003	0.7	17036.53	904.87	0.03
Reach	2	1-year Low	Pr. Elevated Trail 1	39690.00	686.68	711.72		711.79	0.000026	2.2	18010.96	906.87	0.09
Reach	2	1-year Low	Pr Elevated Trail 2	39690.00	686.68	711.72		711.79	0.000026	2.2	18010.96	906.87	0.09
Reach	2	1-year Low	Pr Elevated Trail 3	39690.00	686.68	711.72		711.79	0.000026	2.2	18010.96	906.87	0.09
Reach	2	2-year Low	Pr. Elevated Trail 1	101800.00	686.68	715.15		715.51	0.000100	4.8	21193.56	942.18	0.18
Reach	2	2-year Low	Pr Elevated Trail 2	101800.00	686.68	715.15		715.51	0.000100	4.8	21193.56	942.18	0.18
Reach	2	2-year Low	Pr Elevated Trail 3	101800.00	686.68	715.15		715.51	0.000100	4.8	21193.56	942.18	0.18
Reach	2	5-year Low	Pr. Elevated Trail 1	136800.00	686.68	719.61		720.07	0.000100	5.4	25430.82	958.66	0.18
Reach	2	5-year Low	Pr Elevated Trail 2	136800.00	686.68	719.61		720.07	0.000100	5.4	25430.82	958.66	0.18
Reach	2	5-year Low	Pr Elevated Trail 3	136800.00	686.68	719.61		720.07	0.000100	5.4	25430.82	958.66	0.18
Reach	2	25-year	Pr. Elevated Trail 1	187200.00	686.68	725.10		725.68	0.000102	6.2	32048.79	1544.22	0.19
Reach	2	25-year	Pr Elevated Trail 2	187200.00	686.68	725.10		725.68	0.000102	6.2	32048.79	1544.22	0.19
Reach	2	25-year	Pr Elevated Trail 3	187200.00	686.68	725.10		725.68	0.000102	6.2	32048.79	1544.22	0.19
Reach	2	10-year	Pr. Elevated Trail 1	168500.00	686.68	722.60		723.17	0.000108	6.0	28400.58	1116.26	0.19
Reach	2	10-year	Pr Elevated Trail 2	168500.00	686.68	722.60		723.17	0.000108	6.0	28400.58	1116.26	0.19
Reach	2	10-year	Pr Elevated Trail 3	168500.00	686.68	722.60		723.17	0.000108	6.0	28400.58	1116.26	0.19
Reach	2	50-year	Pr. Elevated Trail 1	212000.00	686.68	727.19		727.84	0.000105	6.5	35284.31	1548.45	0.19
Reach	2	50-year	Pr Elevated Trail 2	212000.00	686.68	727.19		727.84	0.000105	6.5	35284.31	1548.45	0.19
Reach	2	50-year	Pr Elevated Trail 3	212000.00	686.68	727.19		727.84	0.000105	6.5	35284.31	1548.45	0.19
Reach	2	100-year	Pr. Elevated Trail 1	231000.00	686.68	728.99		729.67	0.000104	6.7	38099.75	1606.26	0.19
Reach	2	100-year	Pr Elevated Trail 2	231000.00	686.68	728.99		729.67	0.000104	6.7	38099.75	1606.26	0.19
Reach	2	100-year	Pr Elevated Trail 3	231000.00	686.68	728.99		729.67	0.000104	6.7	38099.75	1606.26	0.19
Reach	2	1-year High	Pr. Elevated Trail 1	39690.00	686.68	718.71		718.75	0.000009	1.6	24573.39	955.11	0.06
Reach	2	1-year High	Pr Elevated Trail 2	39690.00	686.68	718.71		718.75	0.000009	1.6	24573.39	955.11	0.06
Reach	2	1-year High	Pr Elevated Trail 3	39690.00	686.68	718.71		718.75	0.000009	1.6	24573.39	955.11	0.06
Reach	2	5-year High	Pr. Elevated Trail 1	136800.00	686.68	720.82		721.24	0.000087	5.2	26597.28	977.40	0.17
Reach	2	5-year High	Pr Elevated Trail 2	136800.00	686.68	720.82		721.24	0.000087	5.2	26597.28	977.40	0.17
Reach	2	5-year High	Pr Elevated Trail 3	136800.00	686.68	720.82		721.24	0.000087	5.2	26597.28	977.40	0.17
Reach	2	2-year High	Pr. Elevated Trail 1	101800.00	686.68	719.53		719.78	0.000056	4.0	25353.35	958.34	0.14
Reach	2	2-year High	Pr Elevated Trail 2	101800.00	686.68	719.53		719.78	0.000056	4.0	25353.35	958.34	0.14
Reach	2	2-year High	Pr Elevated Trail 3	101800.00	686.68	719.53		719.78	0.000056	4.0	25353.35	958.34	0.14

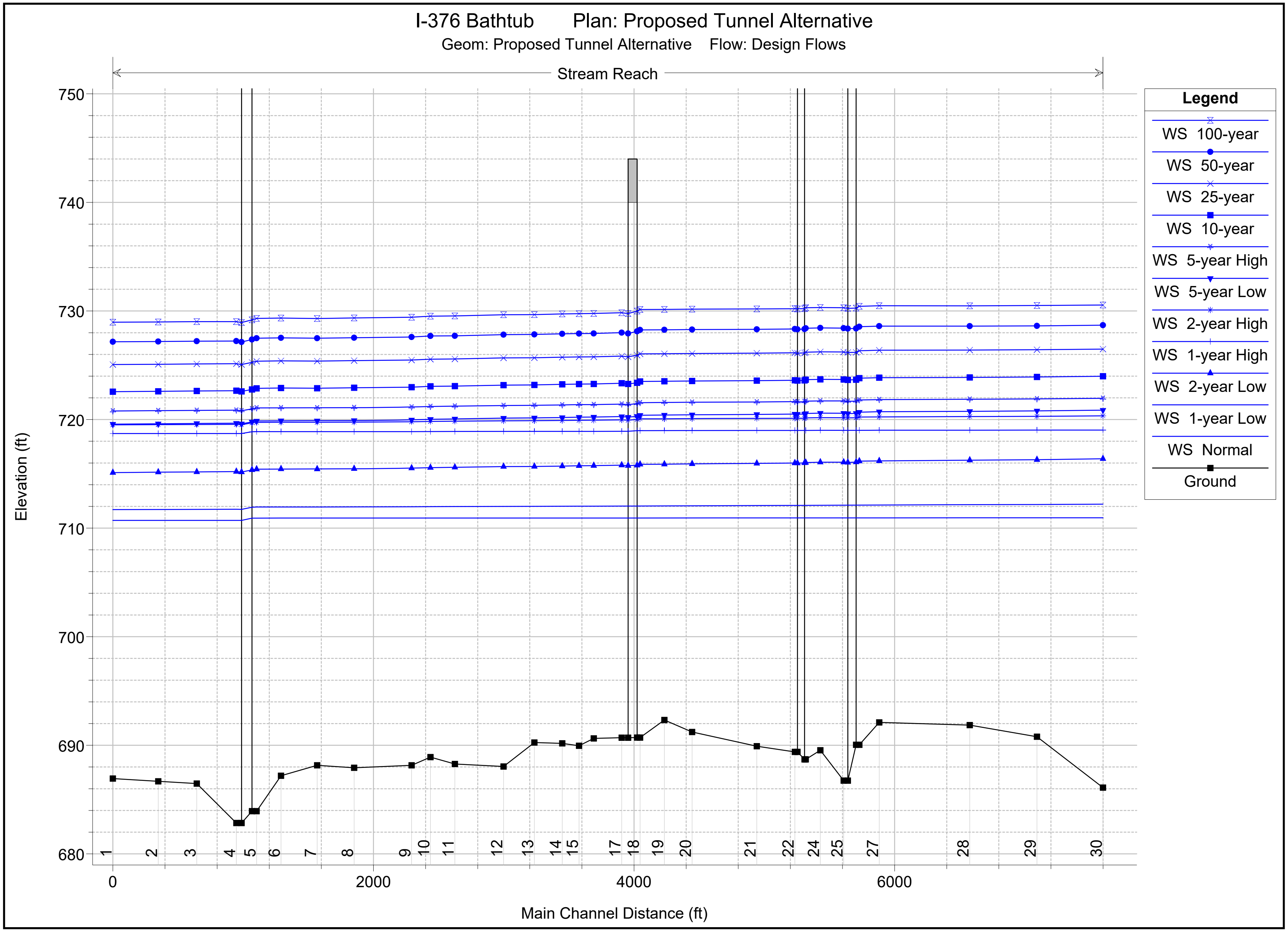
HEC-RAS River: Stream Reach: Reach (Continued)

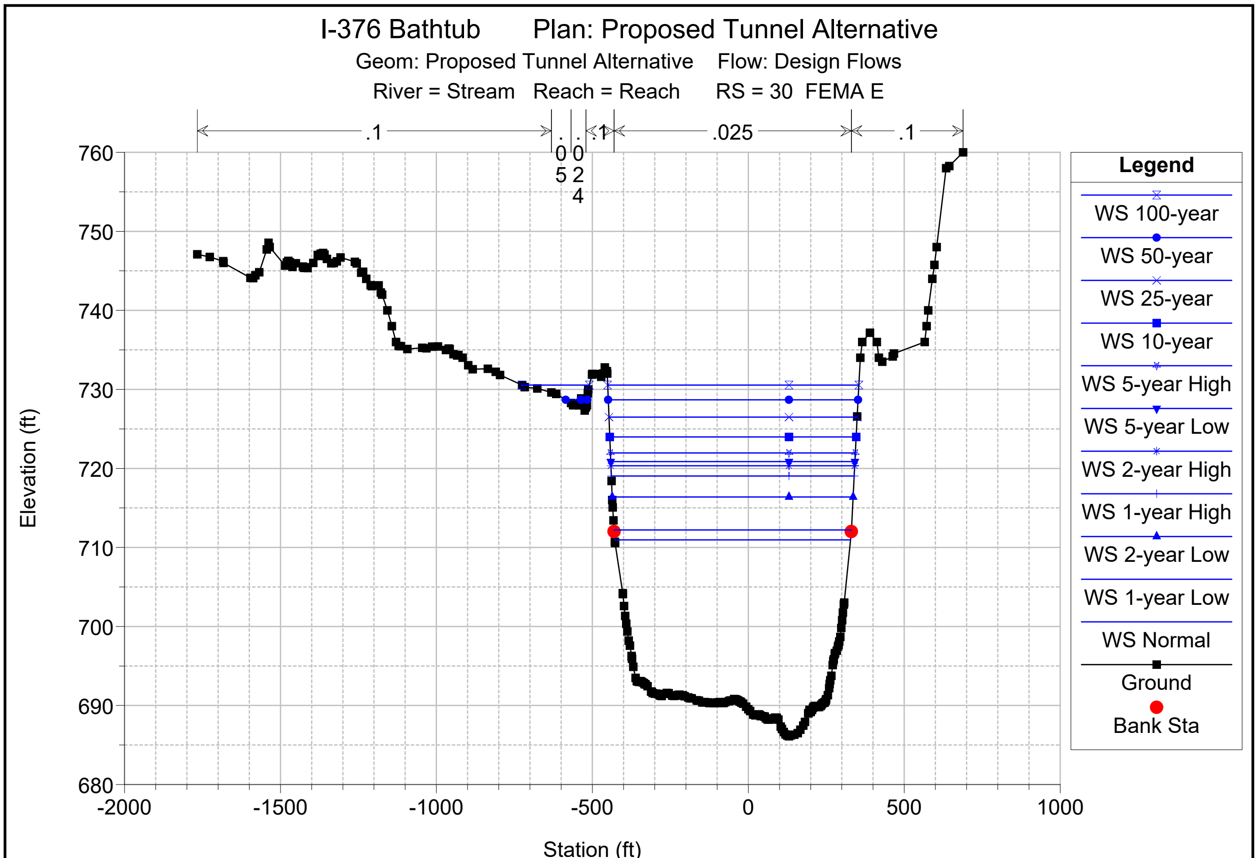
Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	2	Normal	Pr. Elevated Trail 1	12700.00	686.68	710.71		710.72	0.000003	0.7	17099.07	902.79	0.03
Reach	2	Normal	Pr Elevated Trail 2	12700.00	686.68	710.71		710.72	0.000003	0.7	17099.07	902.79	0.03
Reach	2	Normal	Pr Elevated Trail 3	12700.00	686.68	710.71		710.72	0.000003	0.7	17099.07	902.79	0.03
Reach	1	1-year Low	Pr. Elevated Trail 1	39690.00	686.93	711.71	694.08	711.79	0.000026	2.2	18006.63	898.15	0.09
Reach	1	1-year Low	Pr Elevated Trail 2	39690.00	686.93	711.71	694.08	711.79	0.000026	2.2	18006.63	898.15	0.09
Reach	1	1-year Low	Pr Elevated Trail 3	39690.00	686.93	711.71	694.08	711.79	0.000026	2.2	18006.63	898.15	0.09
Reach	1	2-year Low	Pr. Elevated Trail 1	101800.00	686.93	715.11	698.10	715.48	0.000100	4.8	21154.88	958.39	0.18
Reach	1	2-year Low	Pr Elevated Trail 2	101800.00	686.93	715.11	698.10	715.48	0.000100	4.8	21154.88	958.39	0.18
Reach	1	2-year Low	Pr Elevated Trail 3	101800.00	686.93	715.11	698.10	715.48	0.000100	4.8	21154.88	958.39	0.18
Reach	1	5-year Low	Pr. Elevated Trail 1	136800.00	686.93	719.58	699.96	720.03	0.000100	5.4	26175.16	1166.67	0.18
Reach	1	5-year Low	Pr Elevated Trail 2	136800.00	686.93	719.58	699.96	720.03	0.000100	5.4	26175.16	1166.67	0.18
Reach	1	5-year Low	Pr Elevated Trail 3	136800.00	686.93	719.58	699.96	720.03	0.000100	5.4	26175.16	1166.67	0.18
Reach	1	25-year	Pr. Elevated Trail 1	187200.00	686.93	725.07	702.37	725.64	0.000100	6.1	33905.90	1555.58	0.19
Reach	1	25-year	Pr Elevated Trail 2	187200.00	686.93	725.07	702.37	725.64	0.000100	6.1	33905.90	1555.58	0.19
Reach	1	25-year	Pr Elevated Trail 3	187200.00	686.93	725.07	702.37	725.64	0.000100	6.1	33905.90	1555.58	0.19
Reach	1	10-year	Pr. Elevated Trail 1	168500.00	686.93	722.57	701.54	723.13	0.000107	6.0	30034.65	1473.34	0.19
Reach	1	10-year	Pr Elevated Trail 2	168500.00	686.93	722.57	701.54	723.13	0.000107	6.0	30034.65	1473.34	0.19
Reach	1	10-year	Pr Elevated Trail 3	168500.00	686.93	722.57	701.54	723.13	0.000107	6.0	30034.65	1473.34	0.19
Reach	1	50-year	Pr. Elevated Trail 1	212000.00	686.93	727.17	703.45	727.80	0.000103	6.5	37170.46	1559.16	0.19
Reach	1	50-year	Pr Elevated Trail 2	212000.00	686.93	727.17	703.45	727.80	0.000103	6.5	37170.46	1559.16	0.19
Reach	1	50-year	Pr Elevated Trail 3	212000.00	686.93	727.17	703.45	727.80	0.000103	6.5	37170.46	1559.16	0.19
Reach	1	100-year	Pr. Elevated Trail 1	231000.00	686.93	728.97	704.16	729.63	0.000102	6.6	39995.21	1597.41	0.19
Reach	1	100-year	Pr Elevated Trail 2	231000.00	686.93	728.97	704.16	729.63	0.000102	6.6	39995.21	1597.41	0.19
Reach	1	100-year	Pr Elevated Trail 3	231000.00	686.93	728.97	704.16	729.63	0.000102	6.6	39995.21	1597.41	0.19
Reach	1	1-year High	Pr. Elevated Trail 1	39690.00	686.93	718.71	694.08	718.75	0.000009	1.6	25166.54	1162.62	0.06
Reach	1	1-year High	Pr Elevated Trail 2	39690.00	686.93	718.71	694.08	718.75	0.000009	1.6	25166.54	1162.62	0.06
Reach	1	1-year High	Pr Elevated Trail 3	39690.00	686.93	718.71	694.08	718.75	0.000009	1.6	25166.54	1162.62	0.06
Reach	1	5-year High	Pr. Elevated Trail 1	136800.00	686.93	720.79	699.92	721.21	0.000087	5.2	27627.20	1252.75	0.17
Reach	1	5-year High	Pr Elevated Trail 2	136800.00	686.93	720.79	699.92	721.21	0.000087	5.2	27627.20	1252.75	0.17
Reach	1	5-year High	Pr Elevated Trail 3	136800.00	686.93	720.79	699.92	721.21	0.000087	5.2	27627.20	1252.75	0.17
Reach	1	2-year High	Pr. Elevated Trail 1	101800.00	686.93	719.51	698.11	719.76	0.000056	4.0	26098.12	1166.36	0.14
Reach	1	2-year High	Pr Elevated Trail 2	101800.00	686.93	719.51	698.11	719.76	0.000056	4.0	26098.12	1166.36	0.14
Reach	1	2-year High	Pr Elevated Trail 3	101800.00	686.93	719.51	698.11	719.76	0.000056	4.0	26098.12	1166.36	0.14
Reach	1	Normal	Pr. Elevated Trail 1	12700.00	686.93	710.71	691.10	710.72	0.000003	0.7	17109.86	895.38	0.03
Reach	1	Normal	Pr Elevated Trail 2	12700.00	686.93	710.71	691.10	710.72	0.000003	0.7	17109.86	895.38	0.03
Reach	1	Normal	Pr Elevated Trail 3	12700.00	686.93	710.71	691.10	710.72	0.000003	0.7	17109.86	895.38	0.03

APPENDIX A-5.4

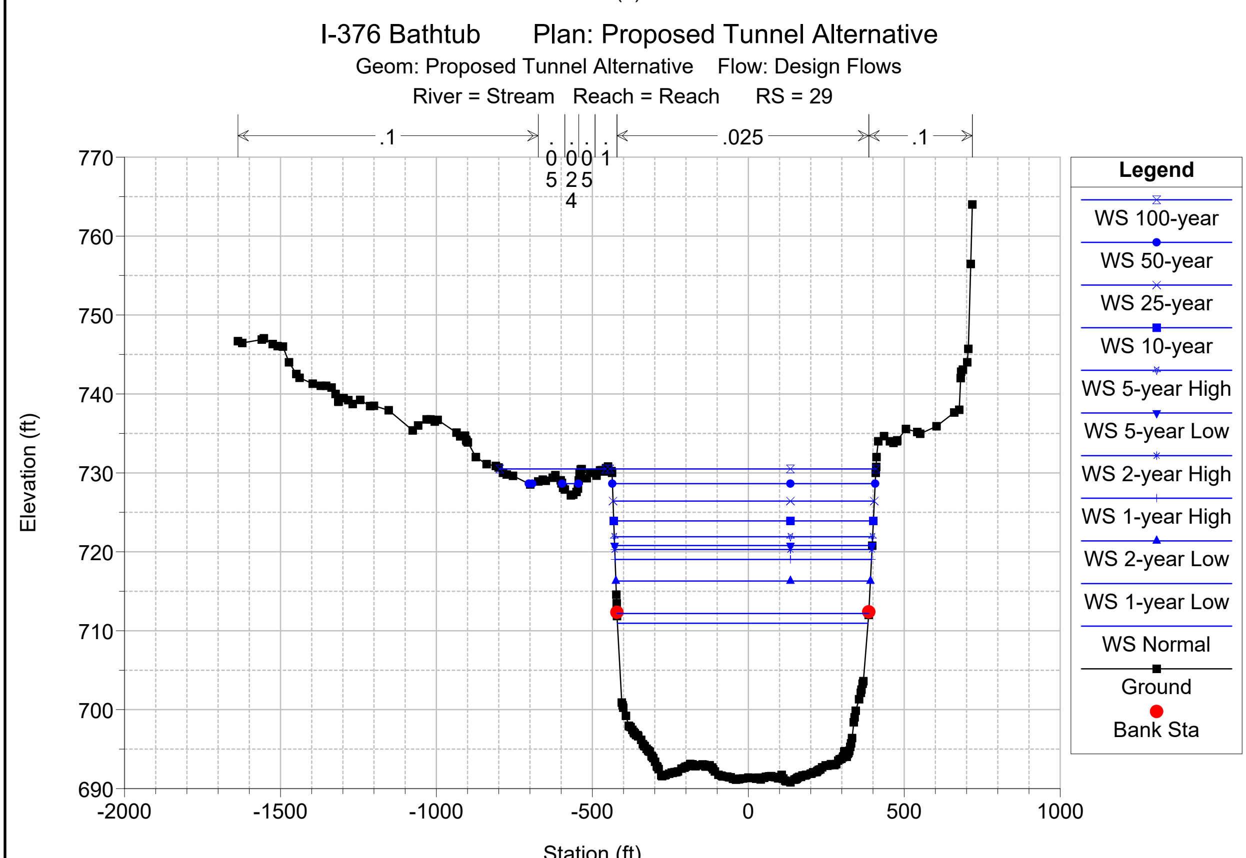
Proposed Tunnel
HEC-RAS Model

NEWELL
TERESKA &
MACKAY
ENGINEERING

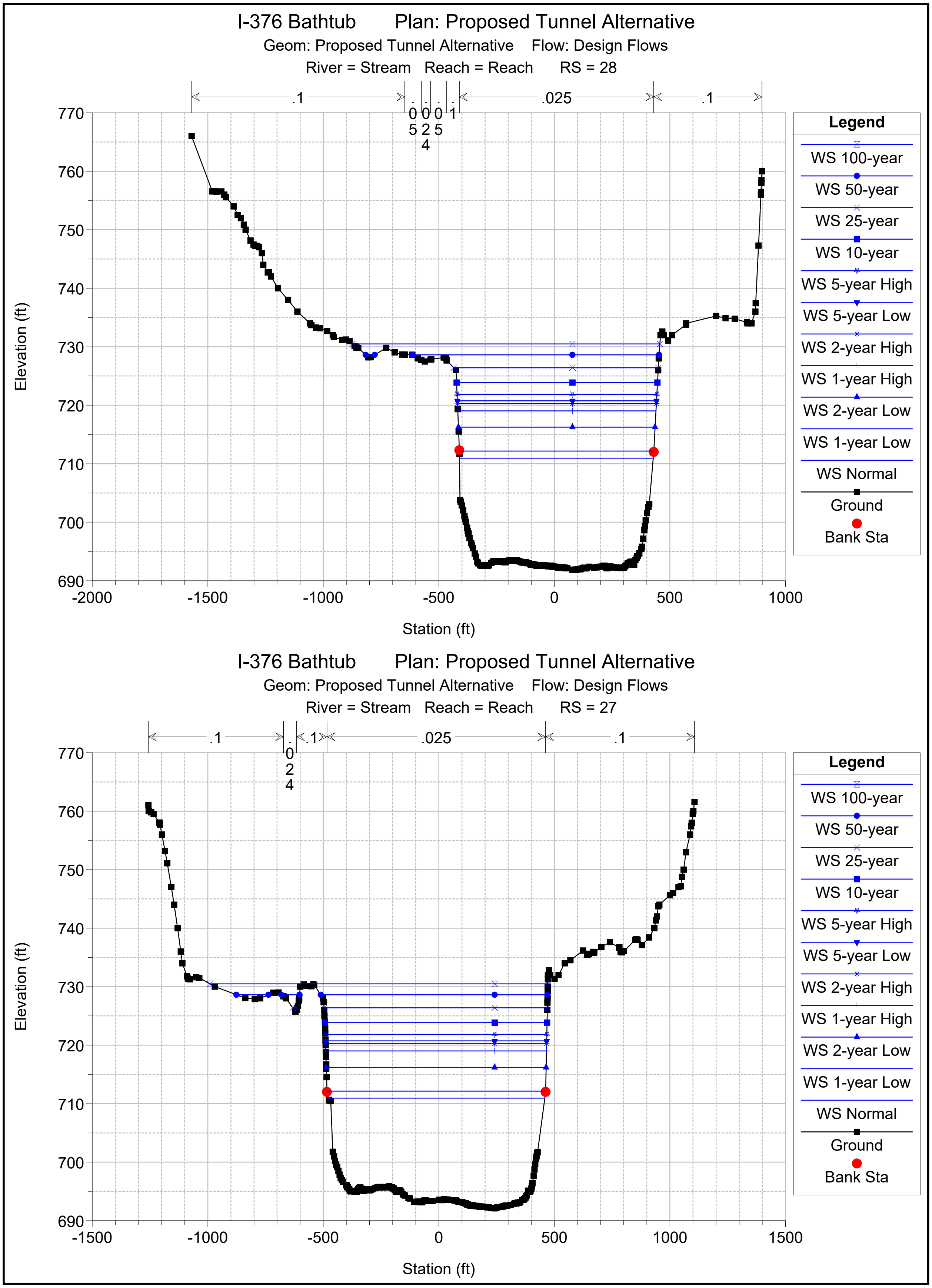

I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
Stream Reach
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Elevation (ft)
Main Channel Distance (ft)
750
740
730
720
710
700
690
680
0
2000
4000
6000
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
17
18
19
20
21
22
24
25
27
28
29
30

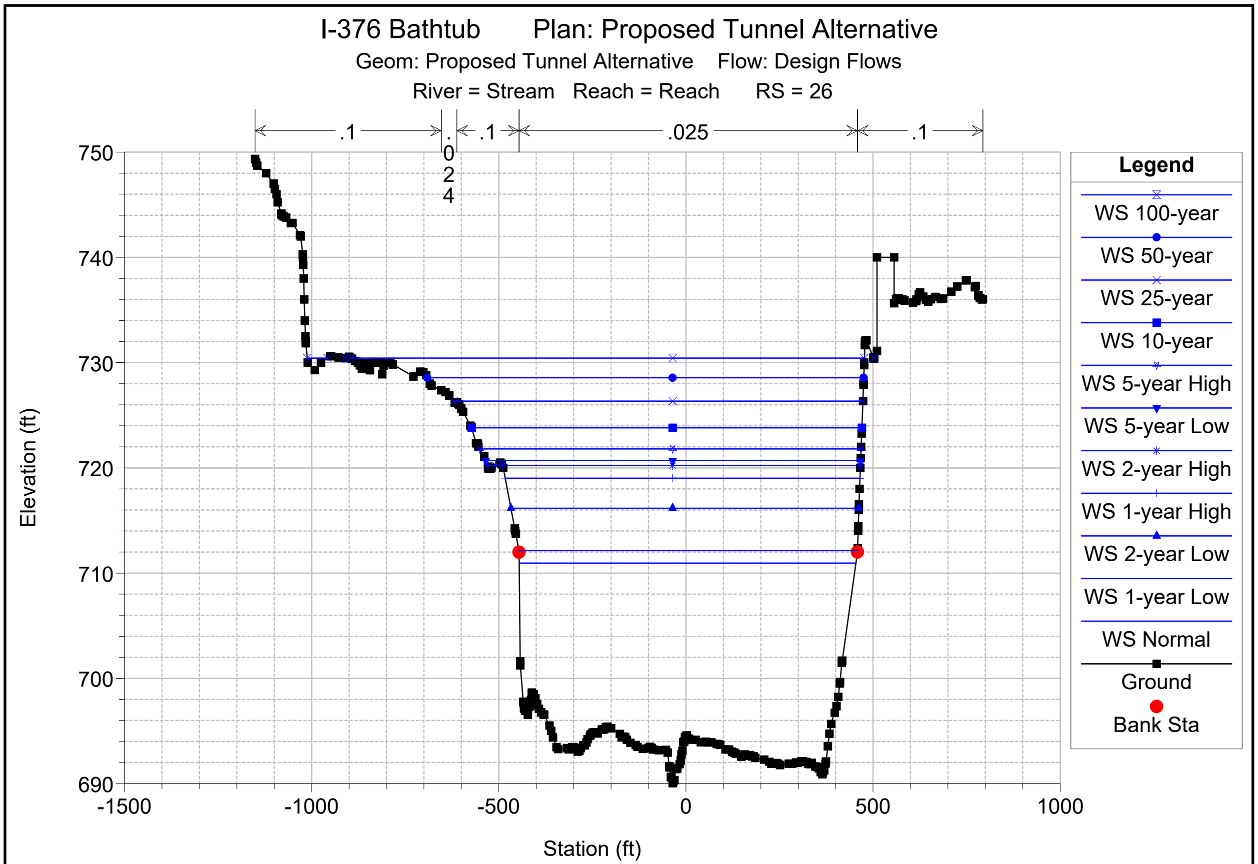


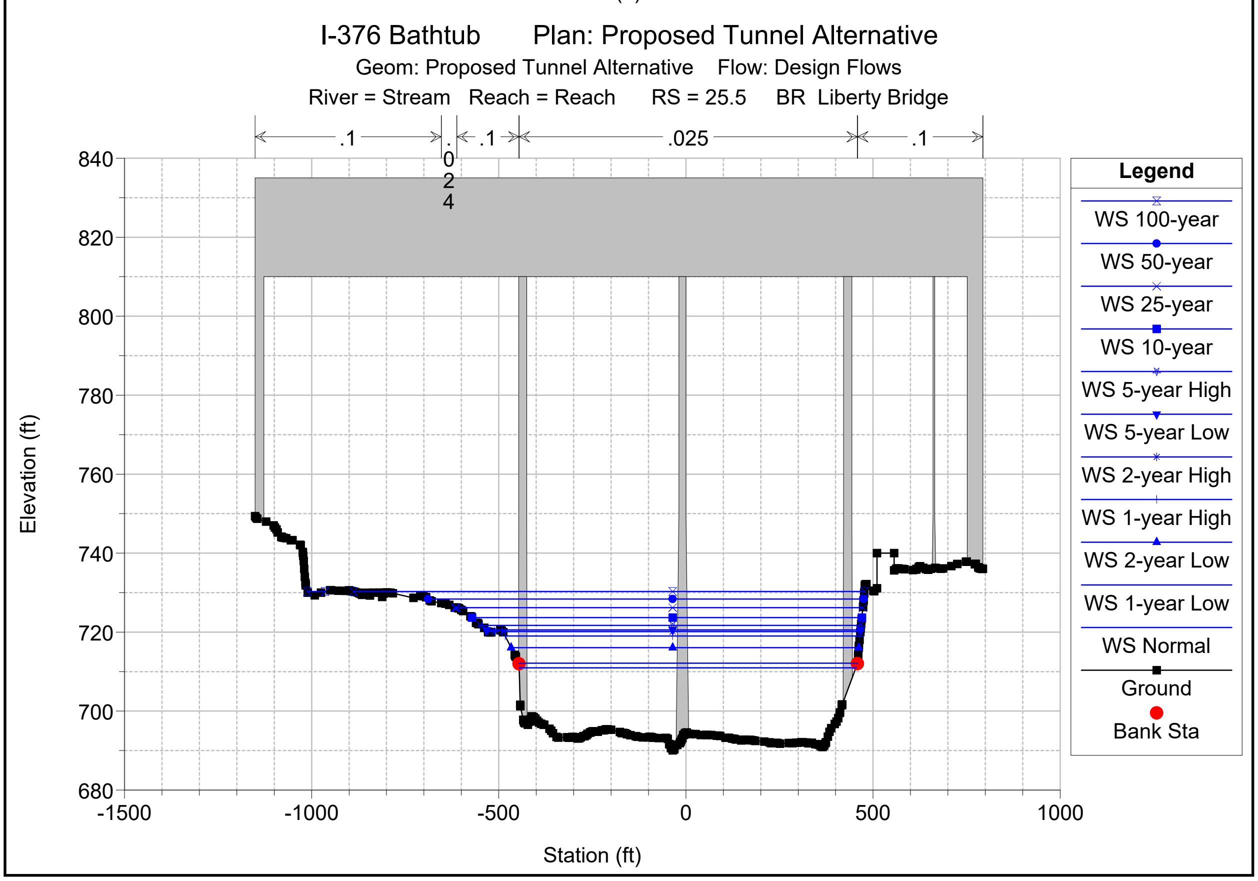
I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 30 FEMA E
.1
.025
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

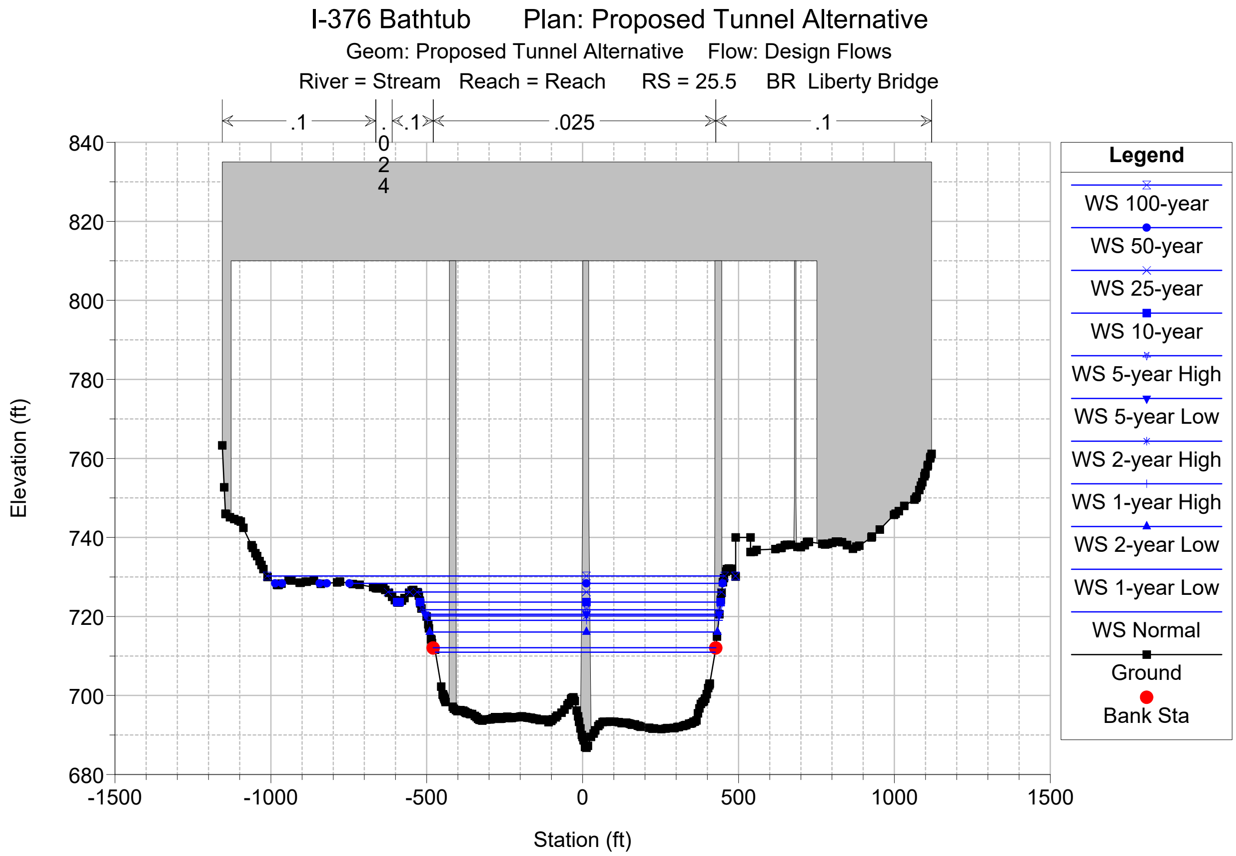


I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 29
.1
.025
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

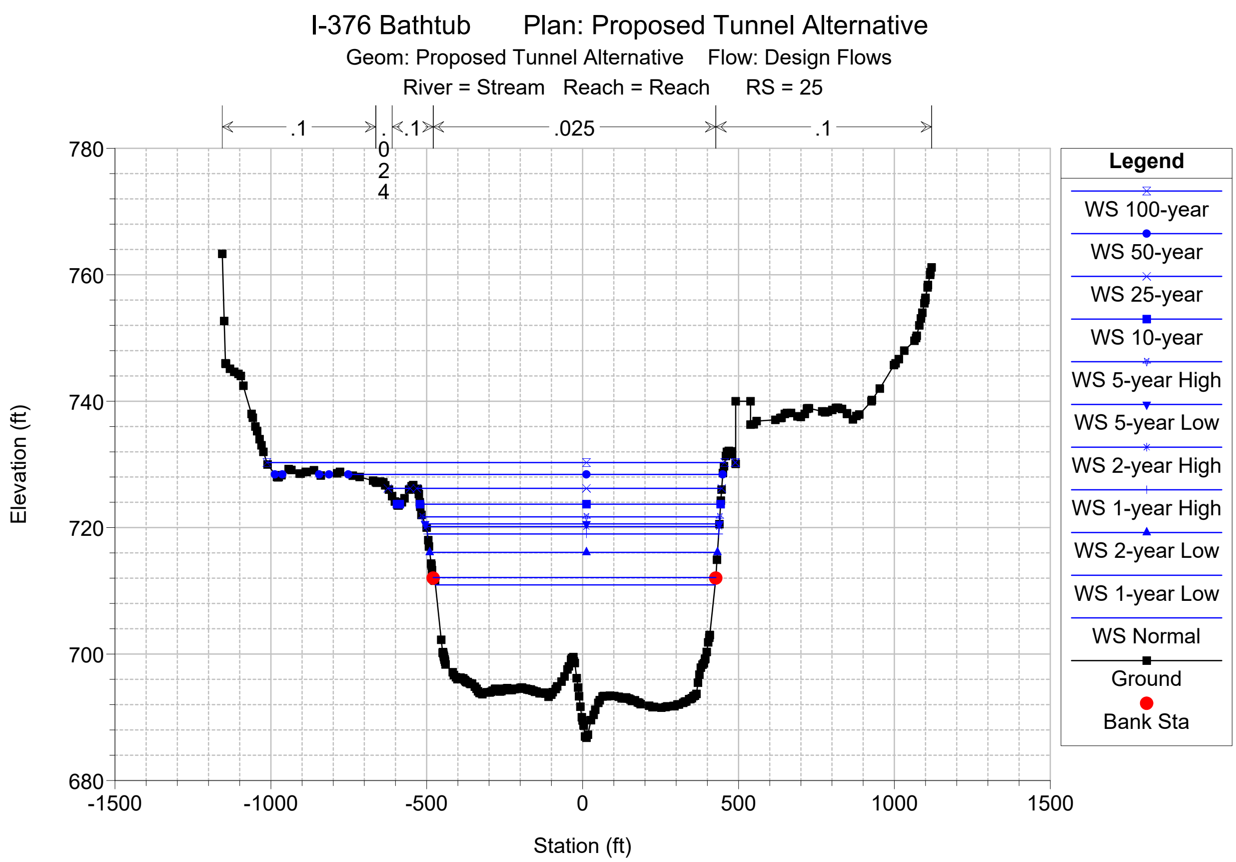

I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 28
.1
.025
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta
Elevation (ft)
Station (ft)
I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 27
.1
.025
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta
Elevation (ft)
Station (ft)


I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 26
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

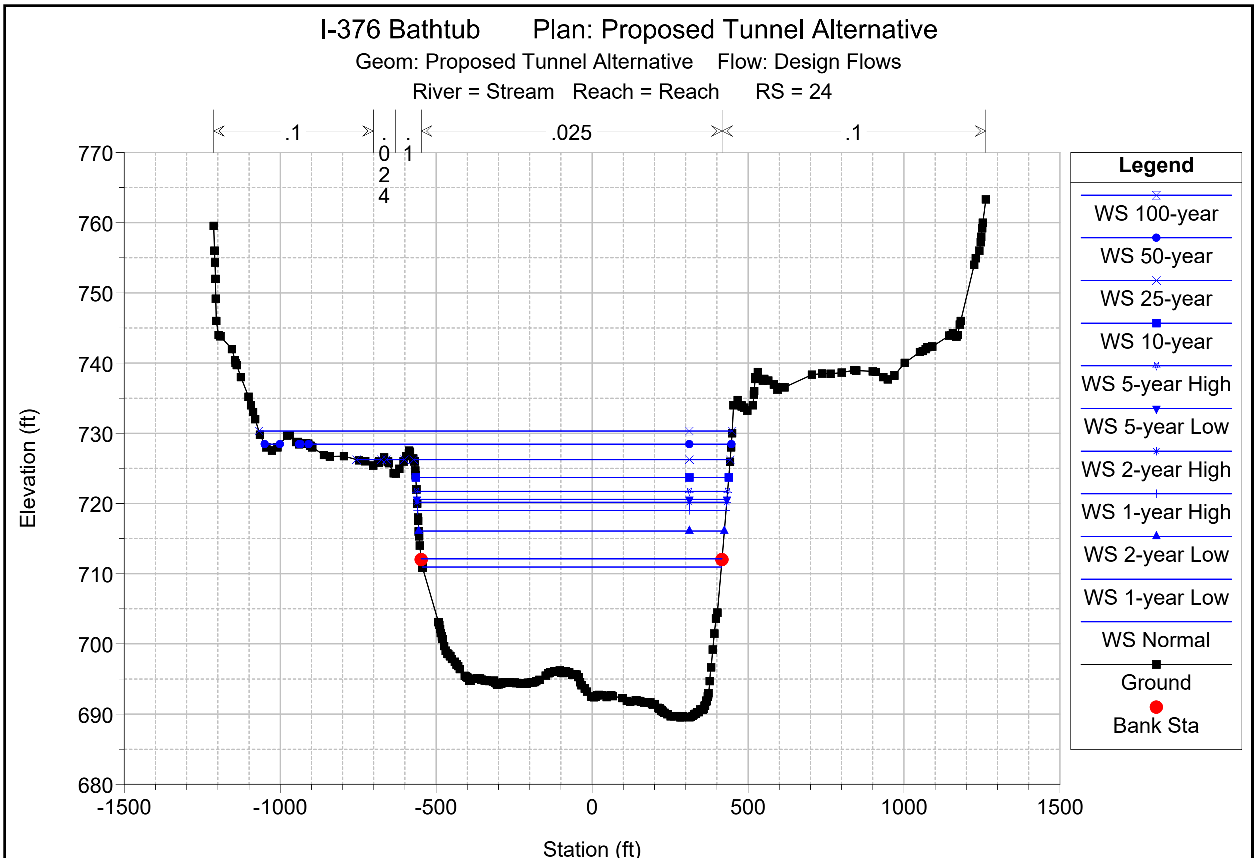

I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 25.5 BR Liberty Bridge
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

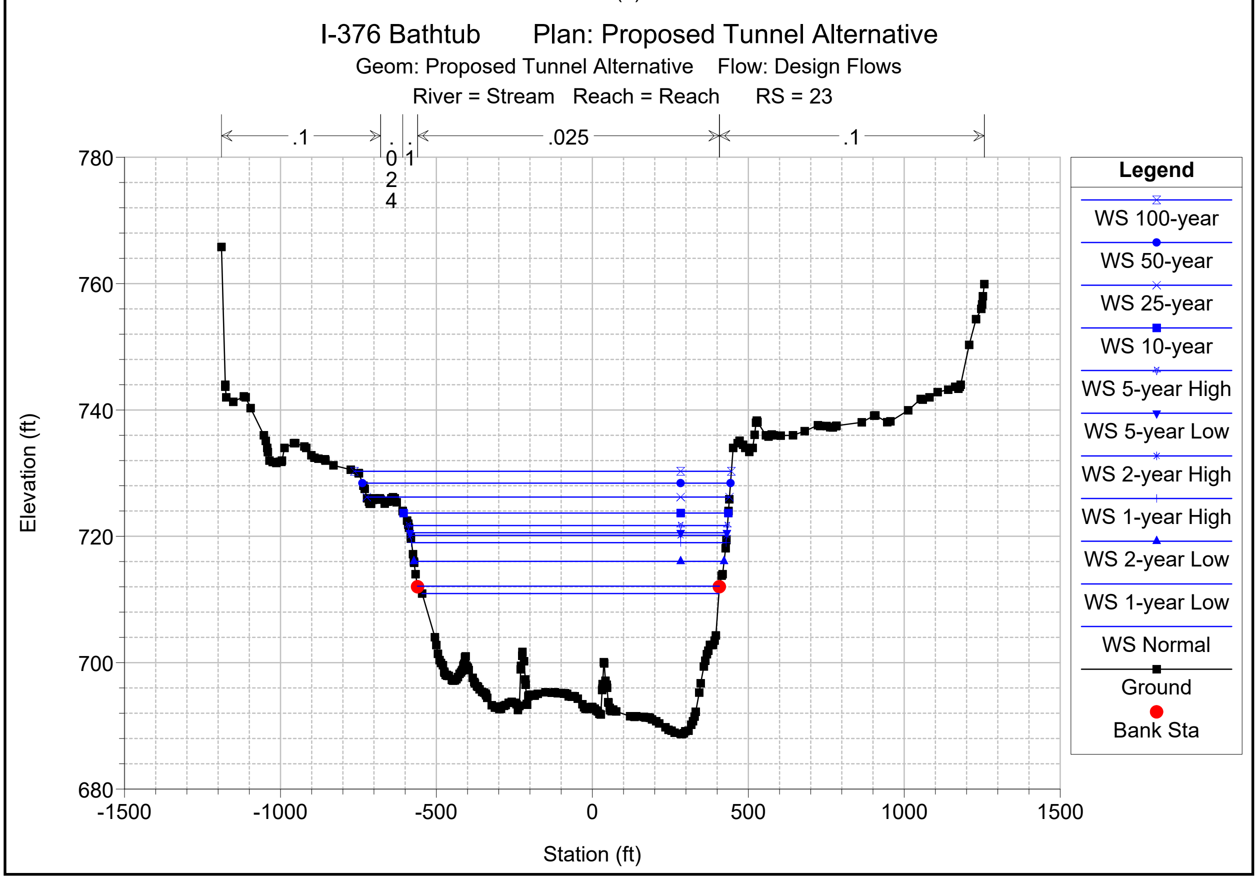


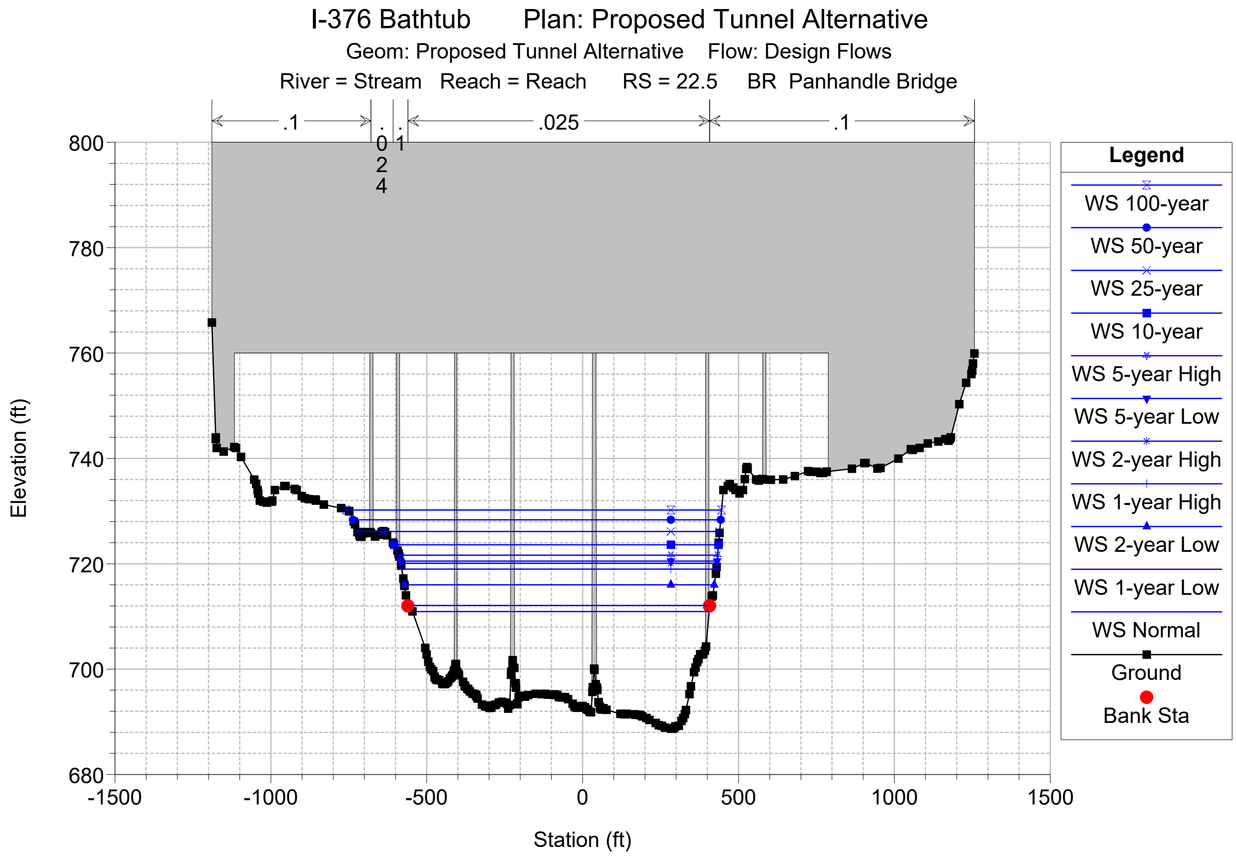
I-376 Bathtub   Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative   Flow: Design Flows
River = Stream   Reach = Reach   RS = 25.5   BR Liberty Bridge
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta



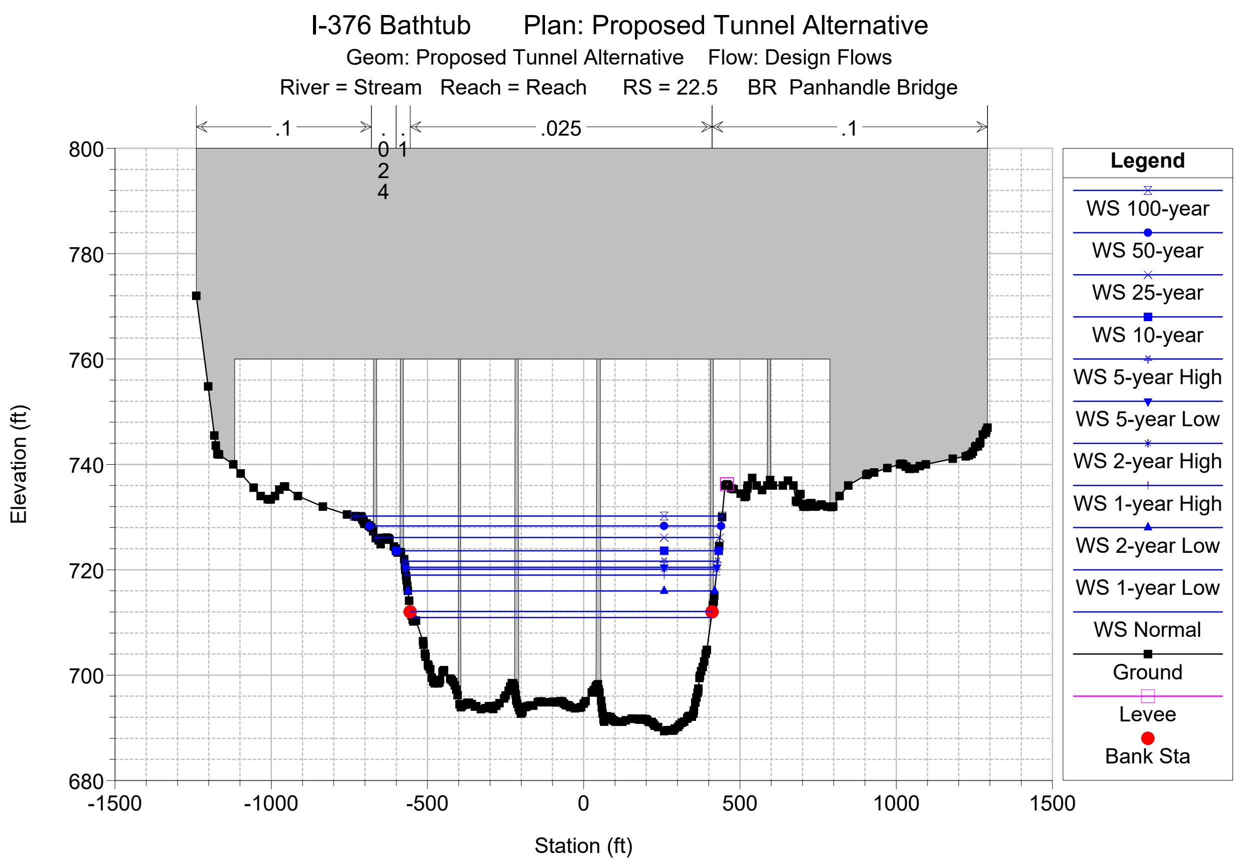
I-376 Bathtub   Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative   Flow: Design Flows
River = Stream   Reach = Reach   RS = 25
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta


I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 24
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

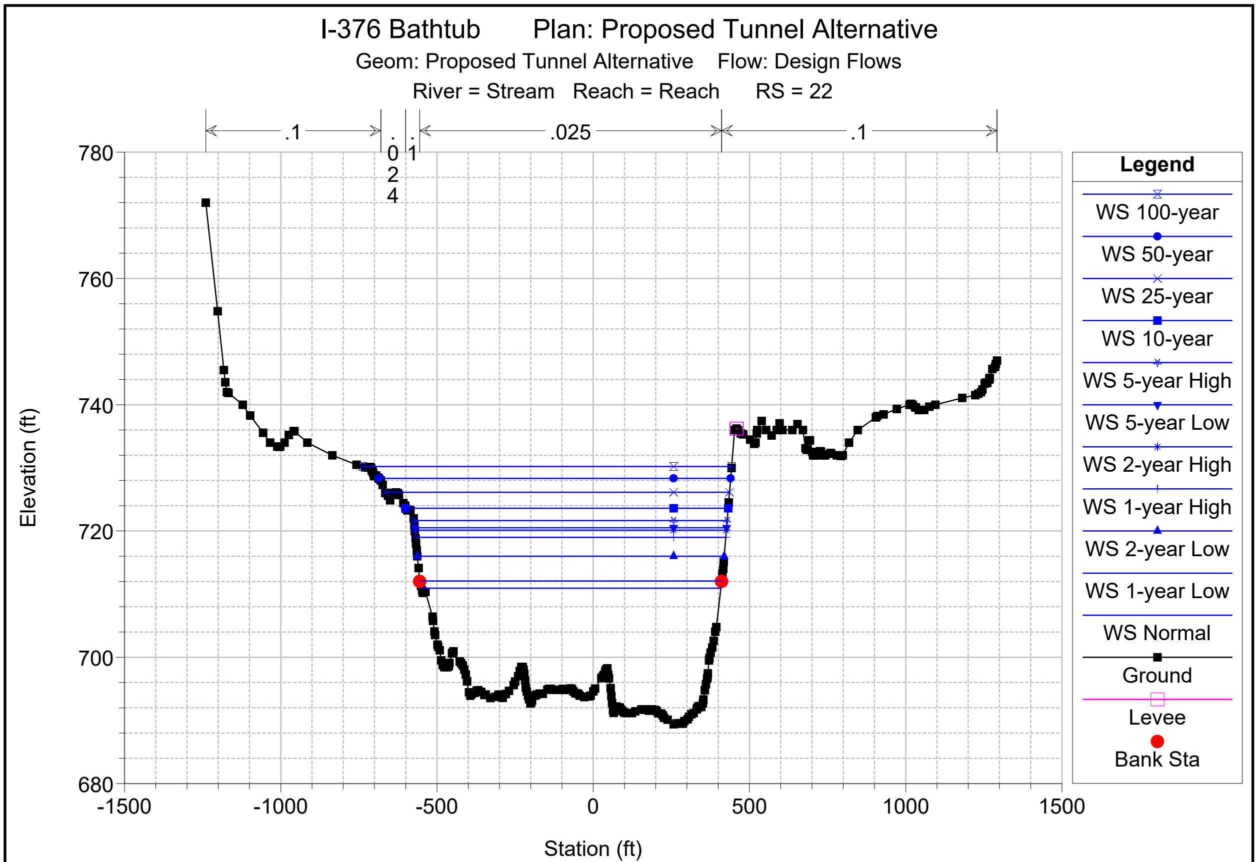

I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 23
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta



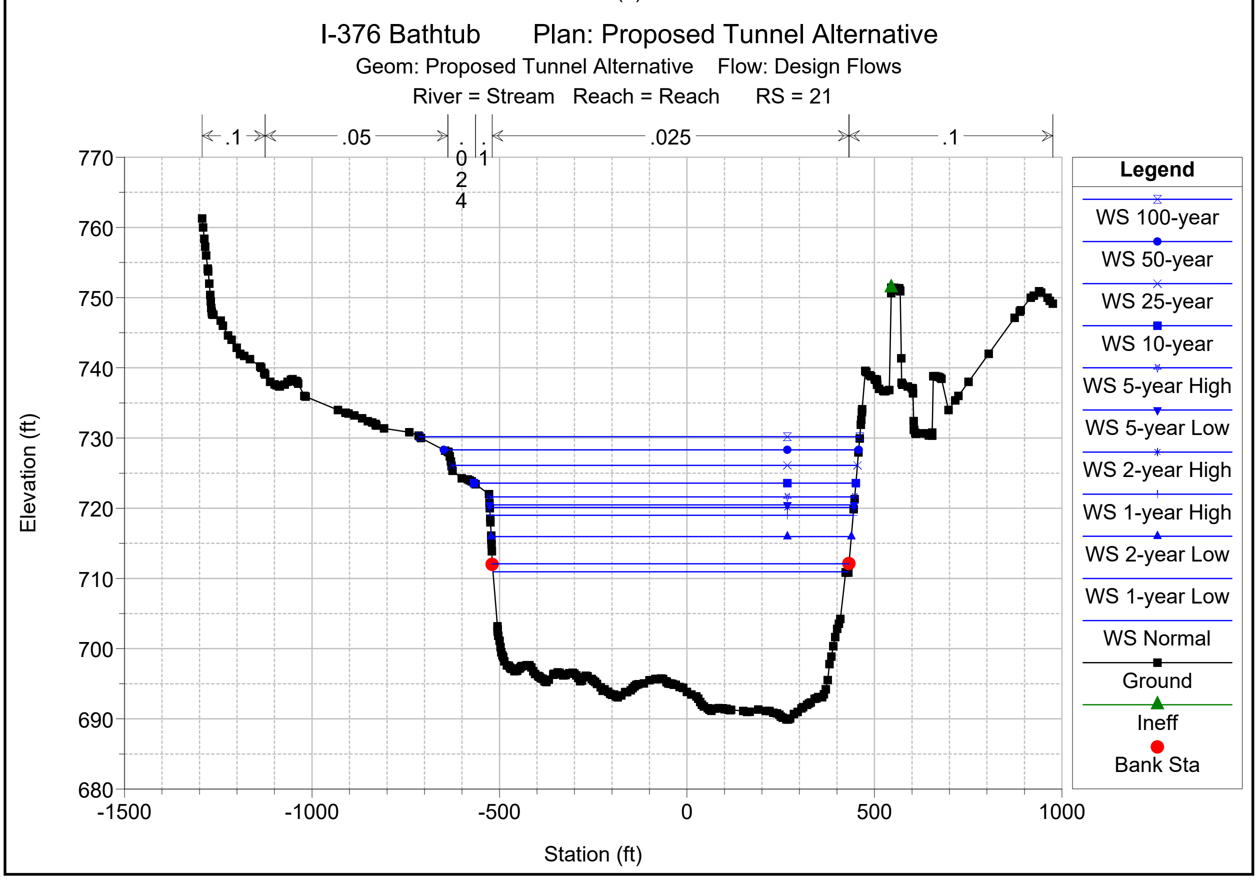
I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 22.5 BR Panhandle Bridge
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta



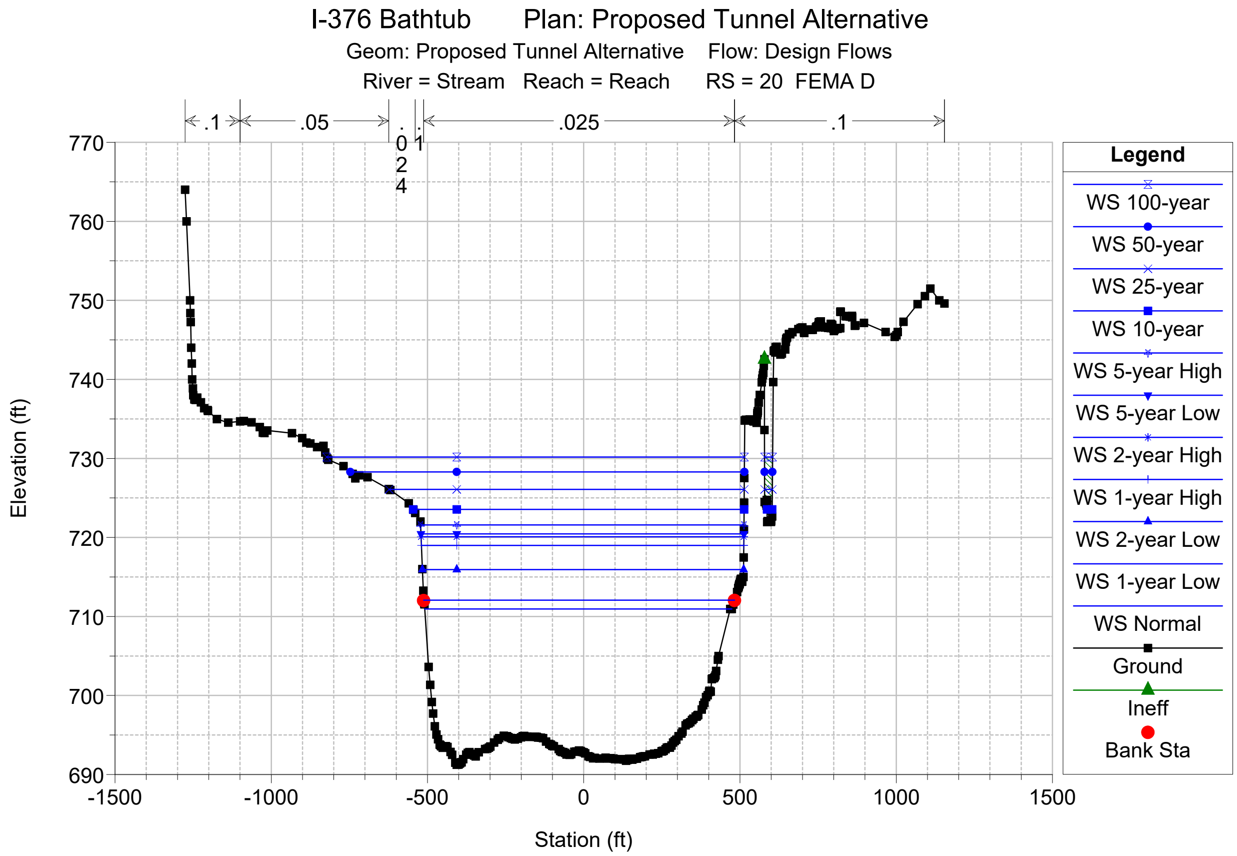
I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 22.5 BR Panhandle Bridge
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta

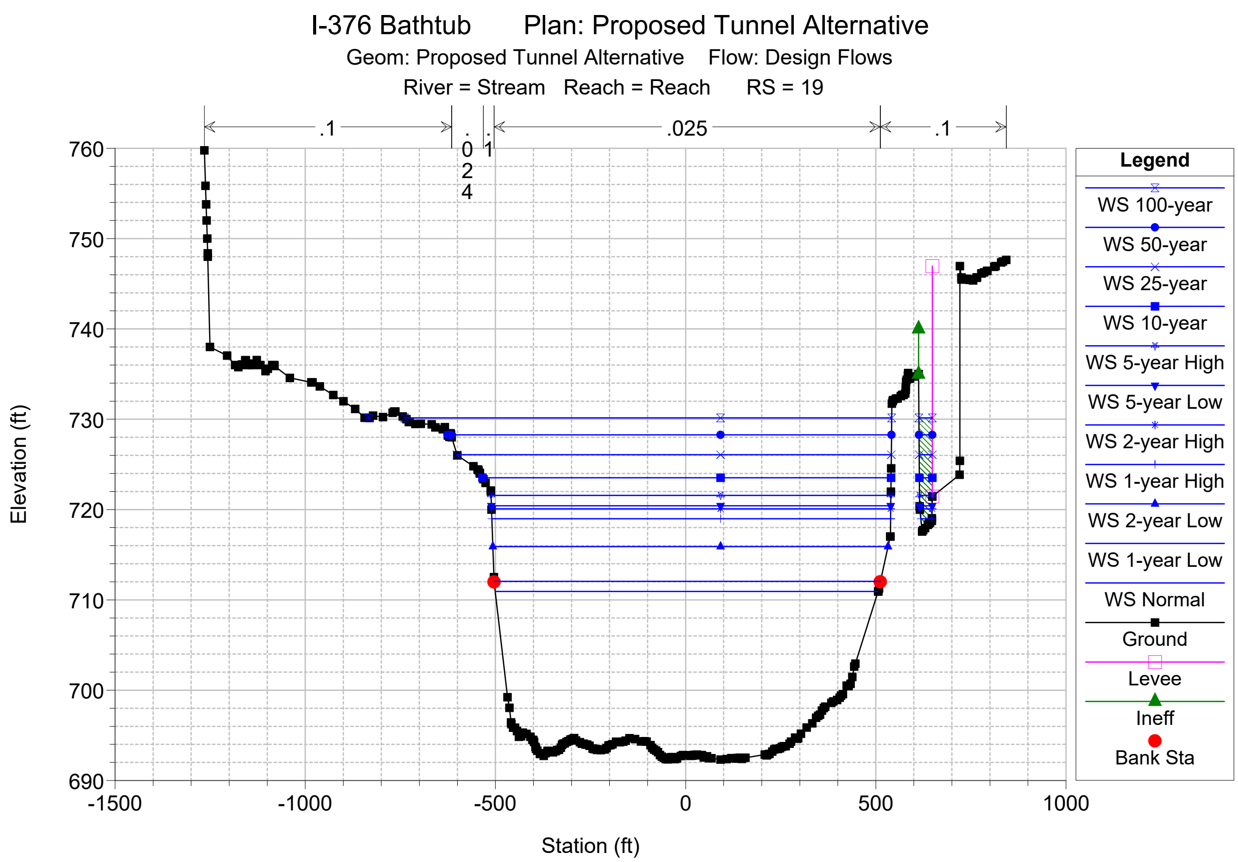


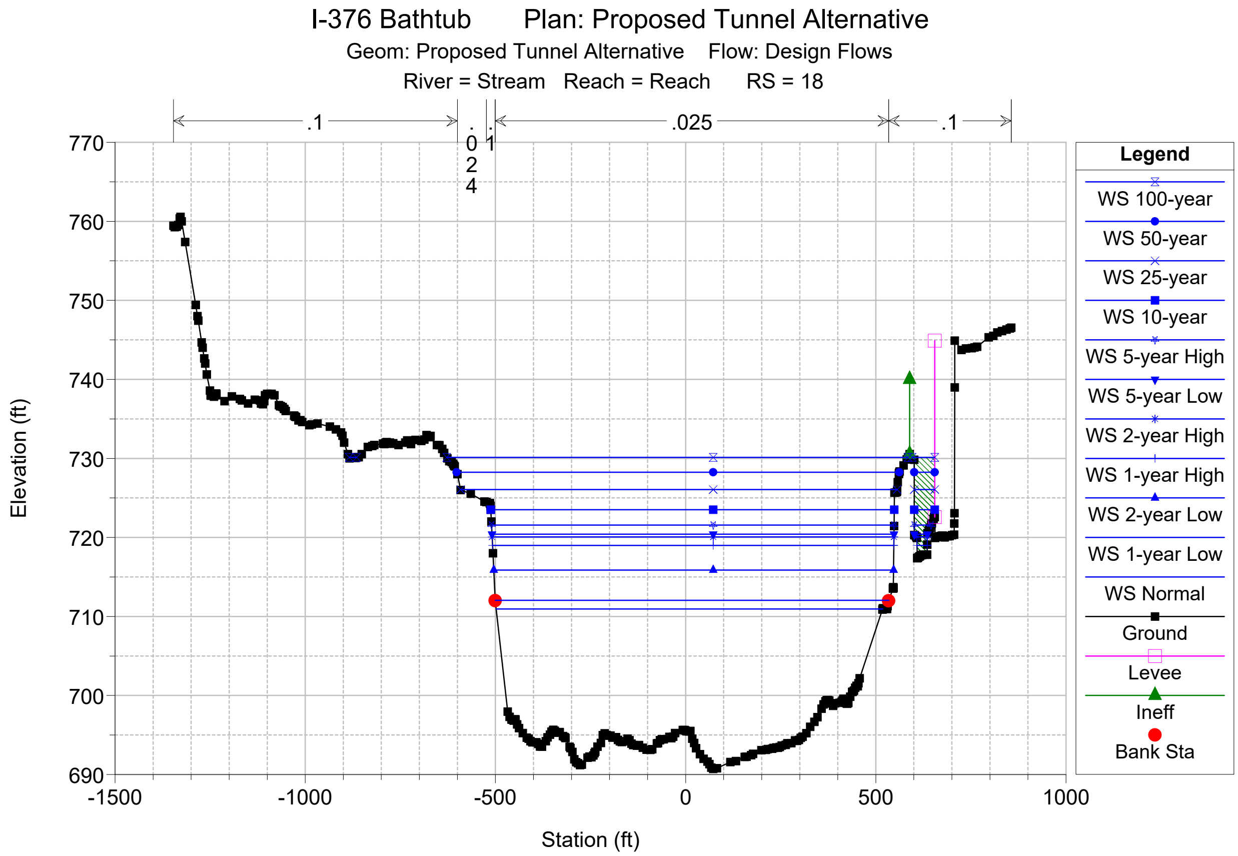
I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 22
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta

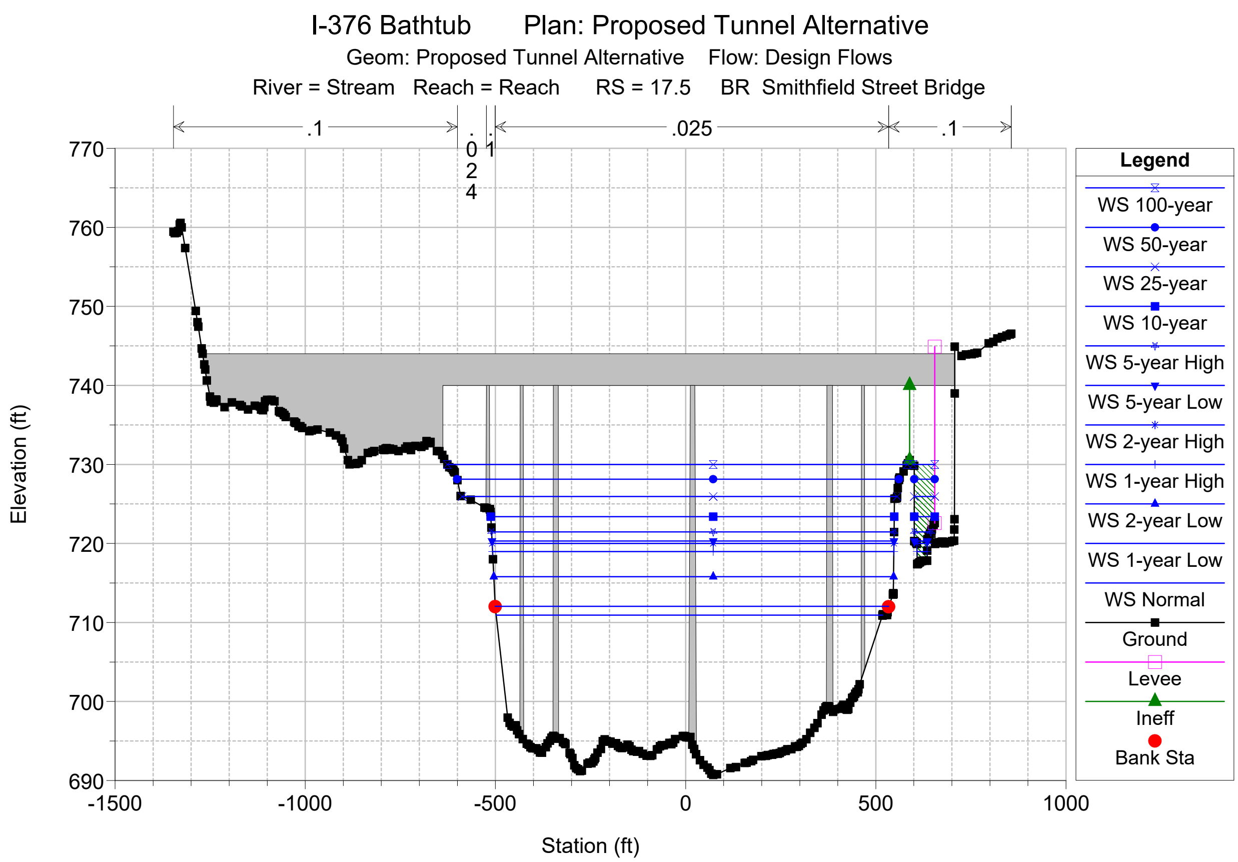


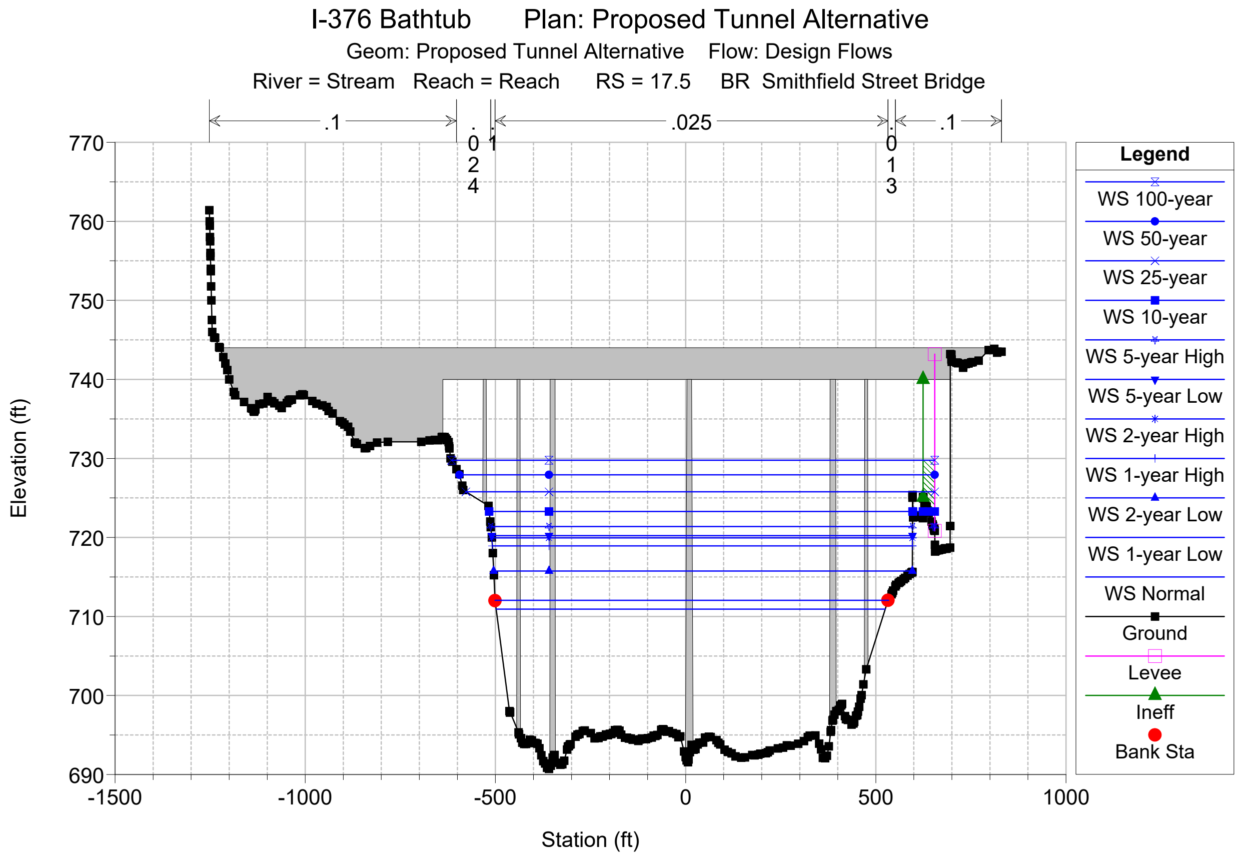
I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 21
.1
.05
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Ineff
Bank Sta

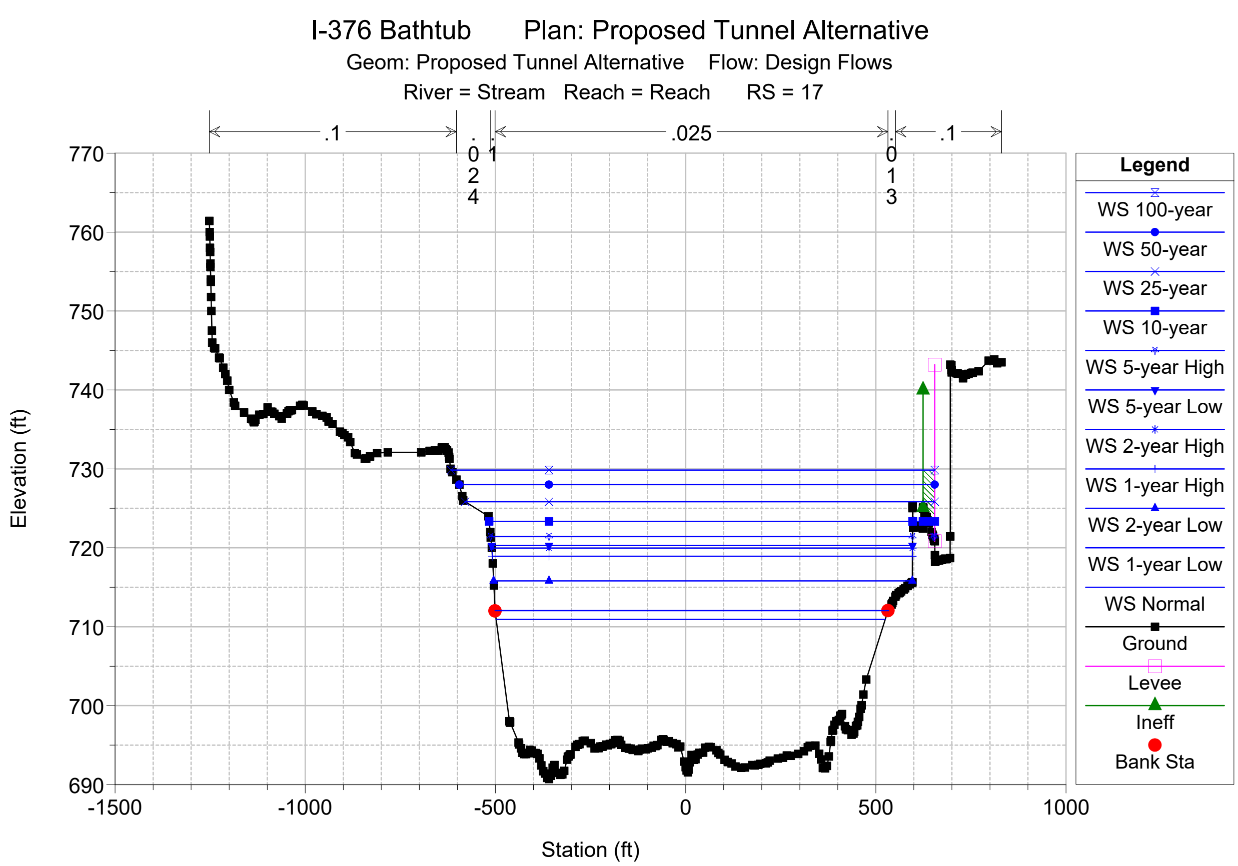

I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 20 FEMA D
.1
.05
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Ineff
Bank Sta

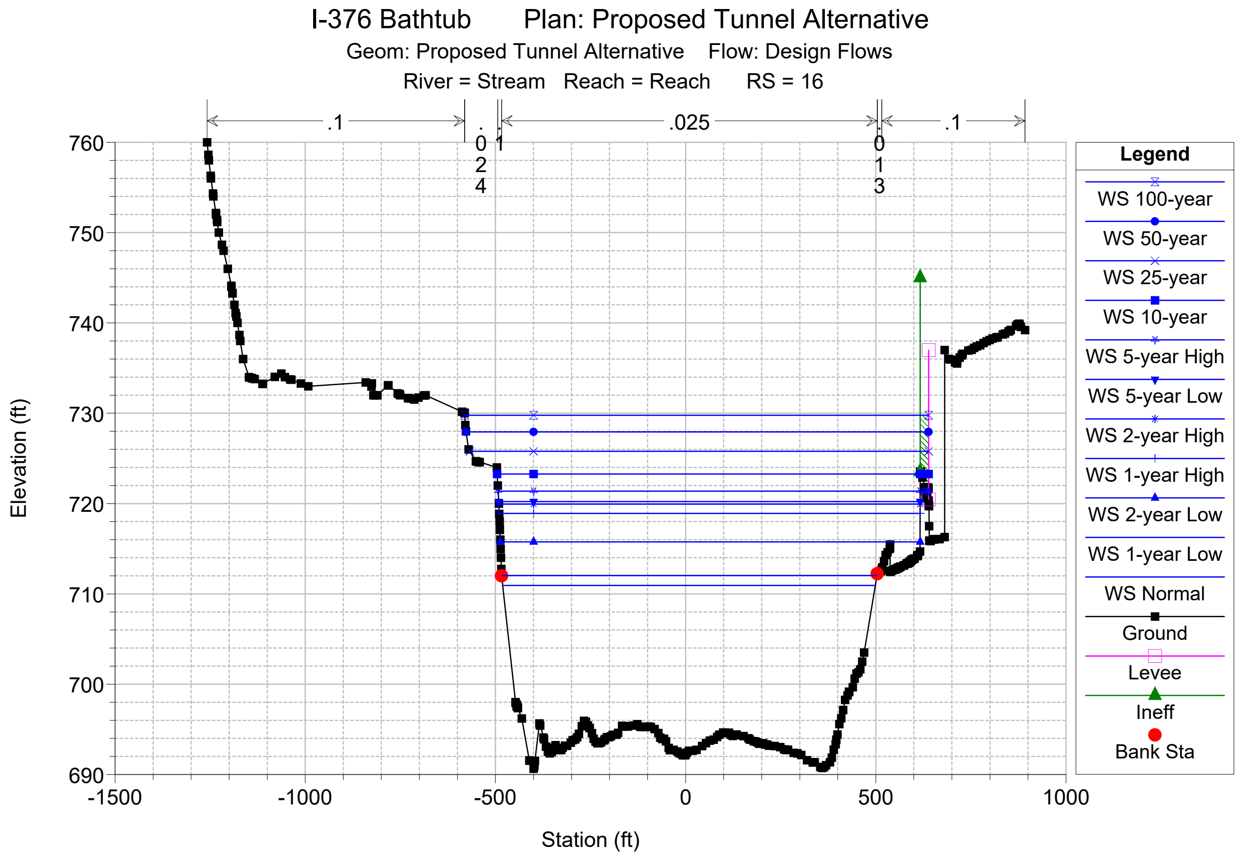

I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 19
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

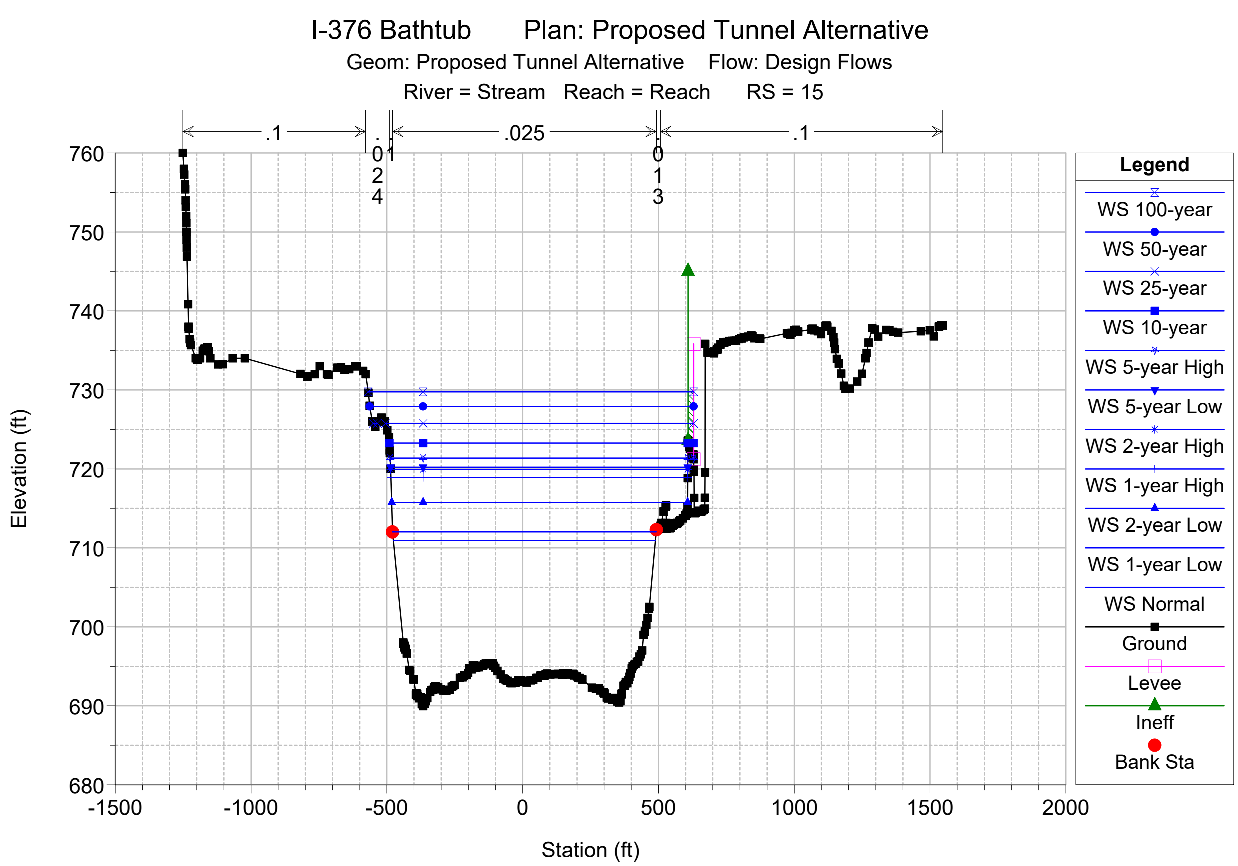

I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 18
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

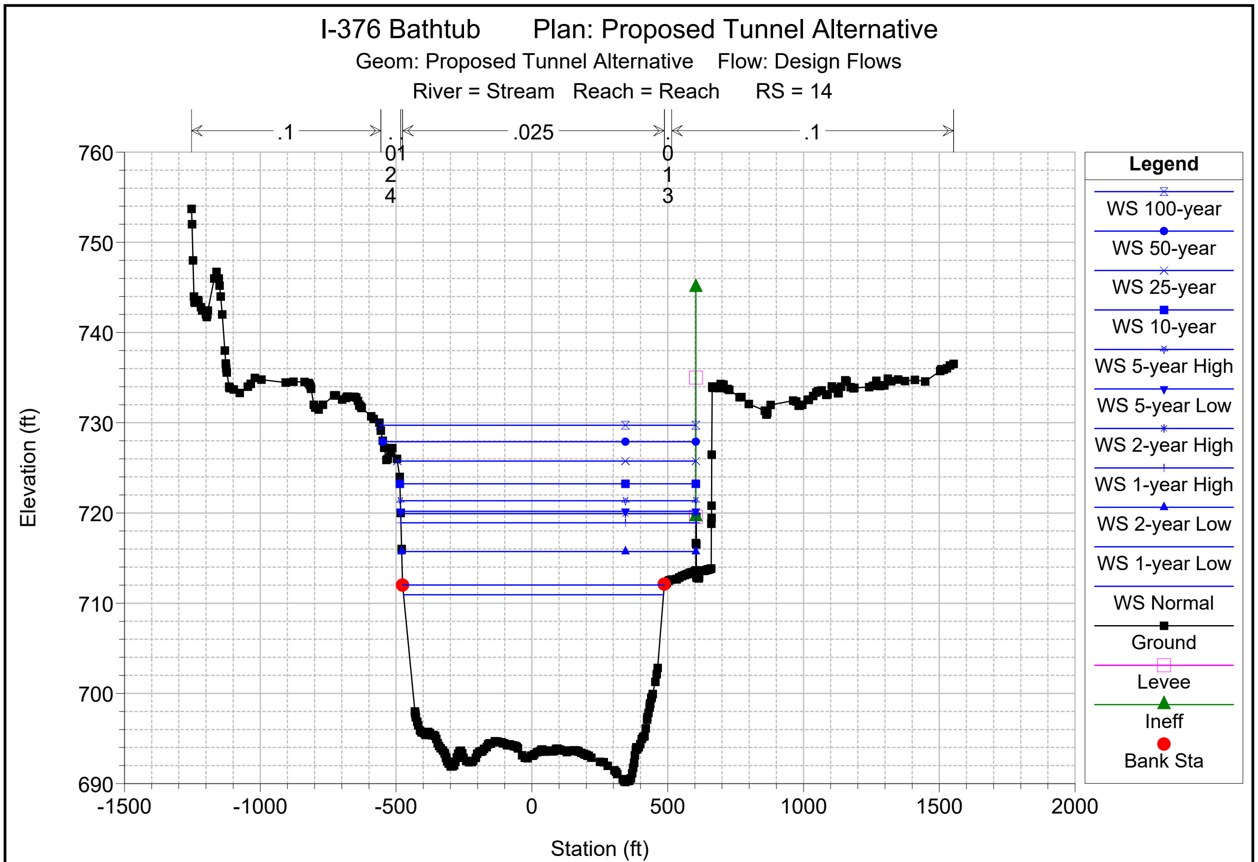

I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 17.5 BR Smithfield Street Bridge
.1
.024
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

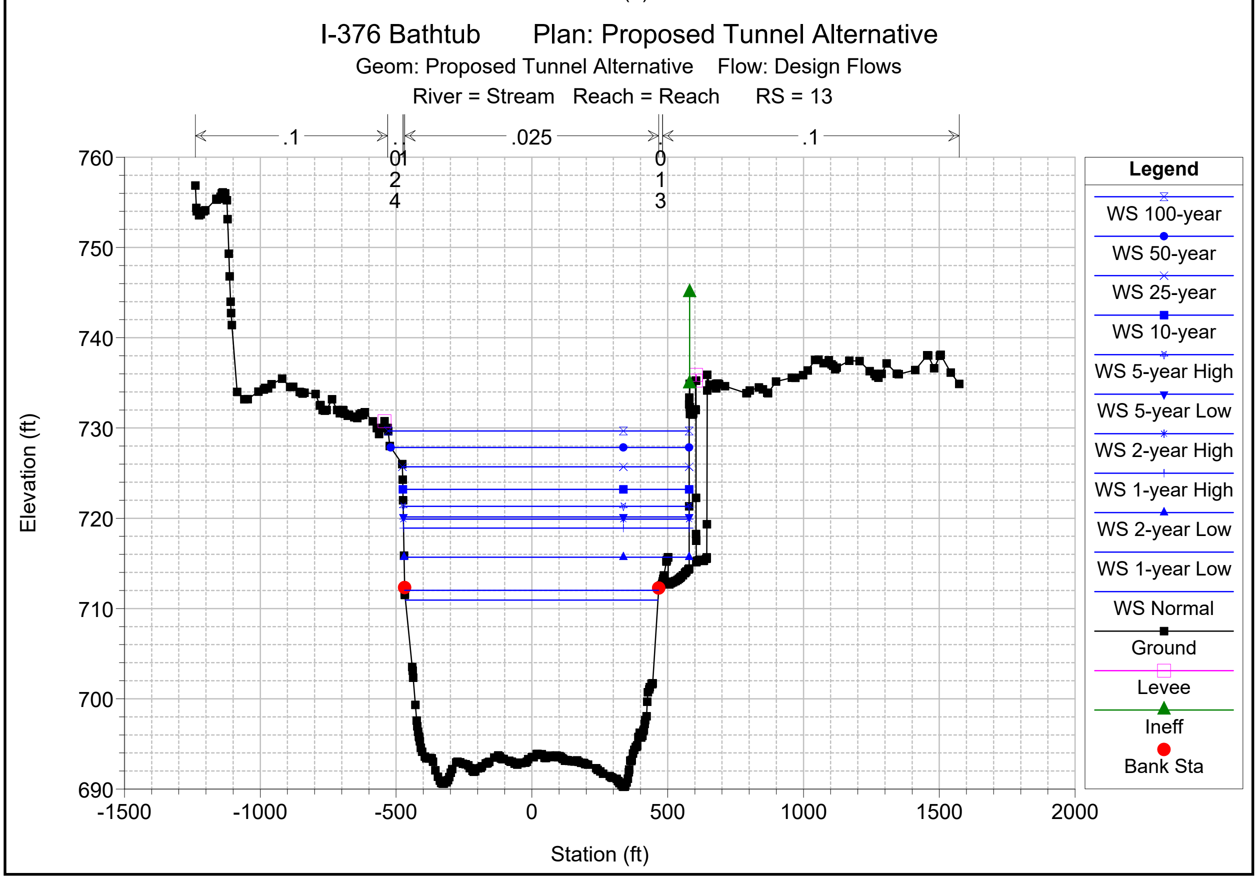

I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 17.5 BR Smithfield Street Bridge
.1
.024
.1
.025
.013
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

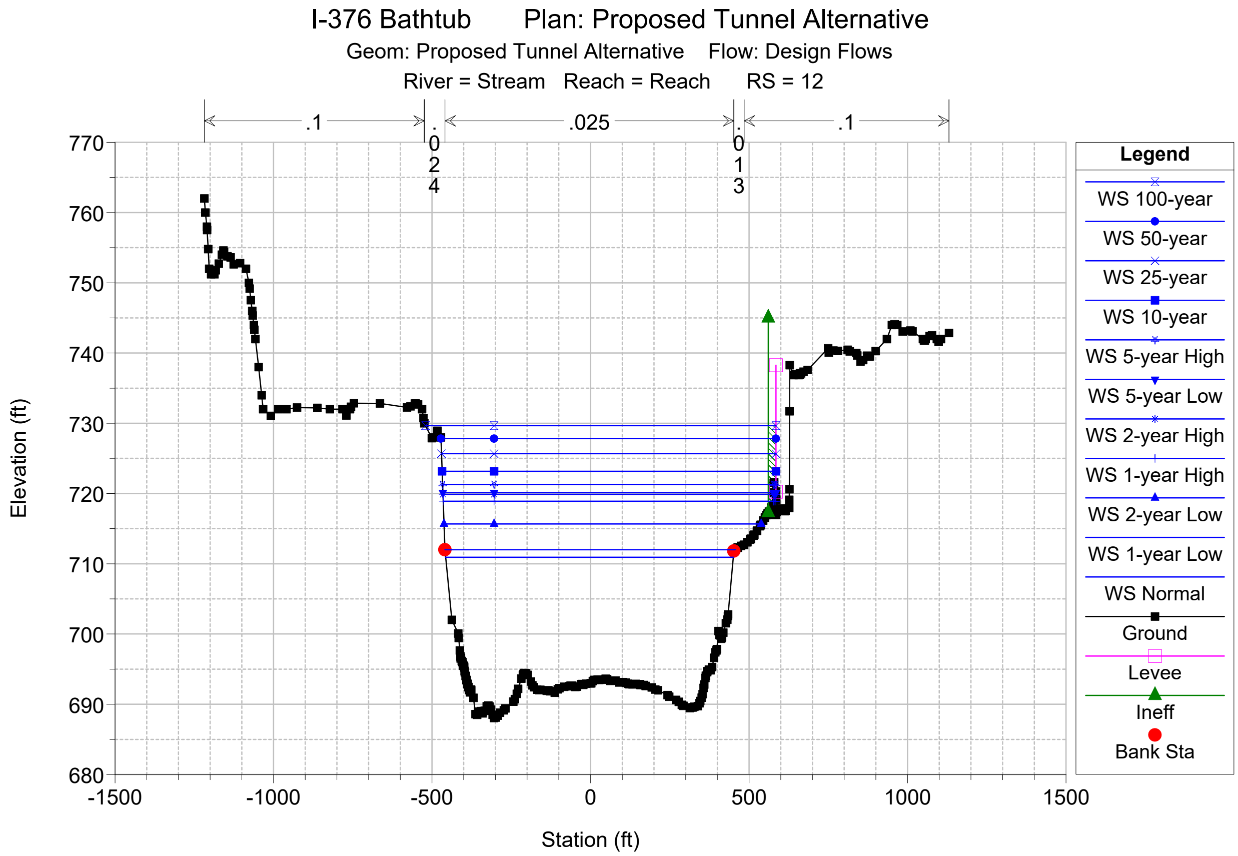

I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 17
.1
.024
.1
.025
.013
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

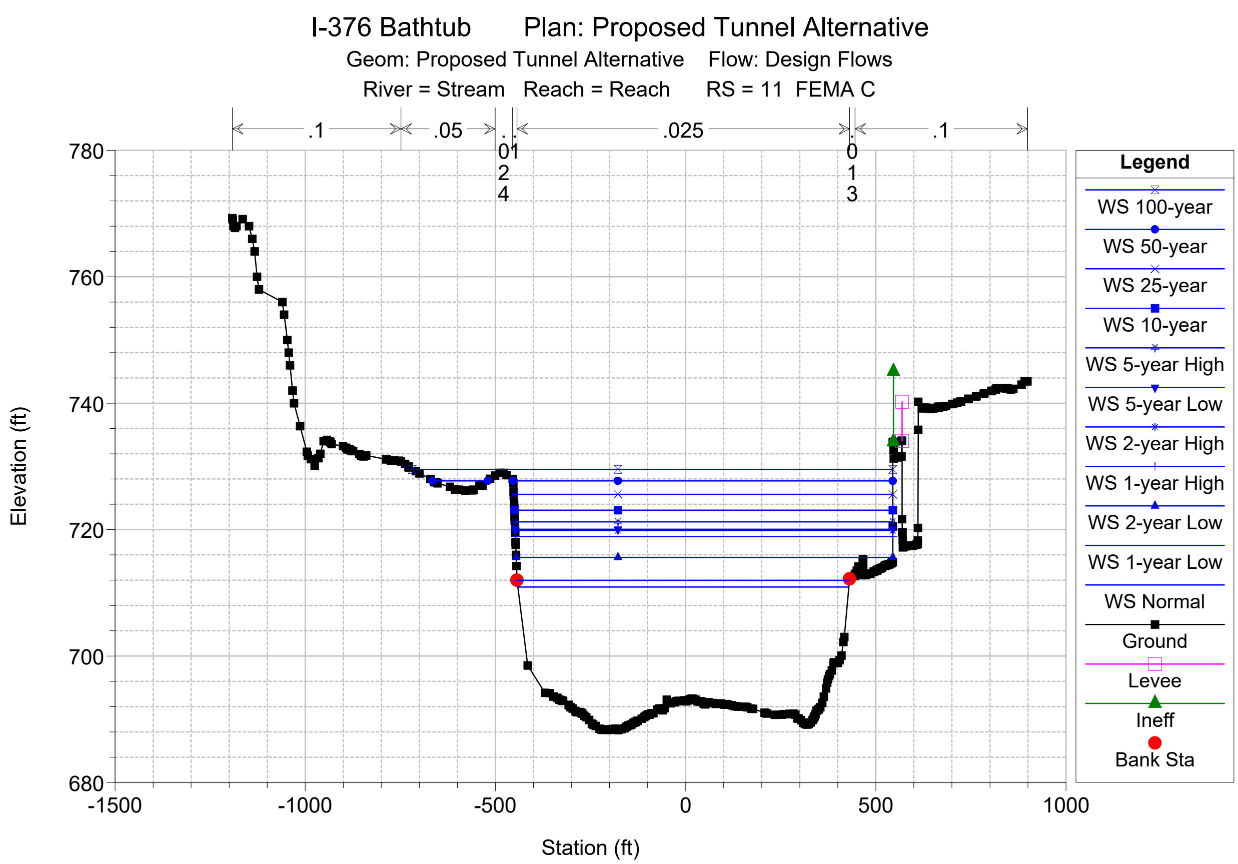

I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 16
.1
.024
.025
.013
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

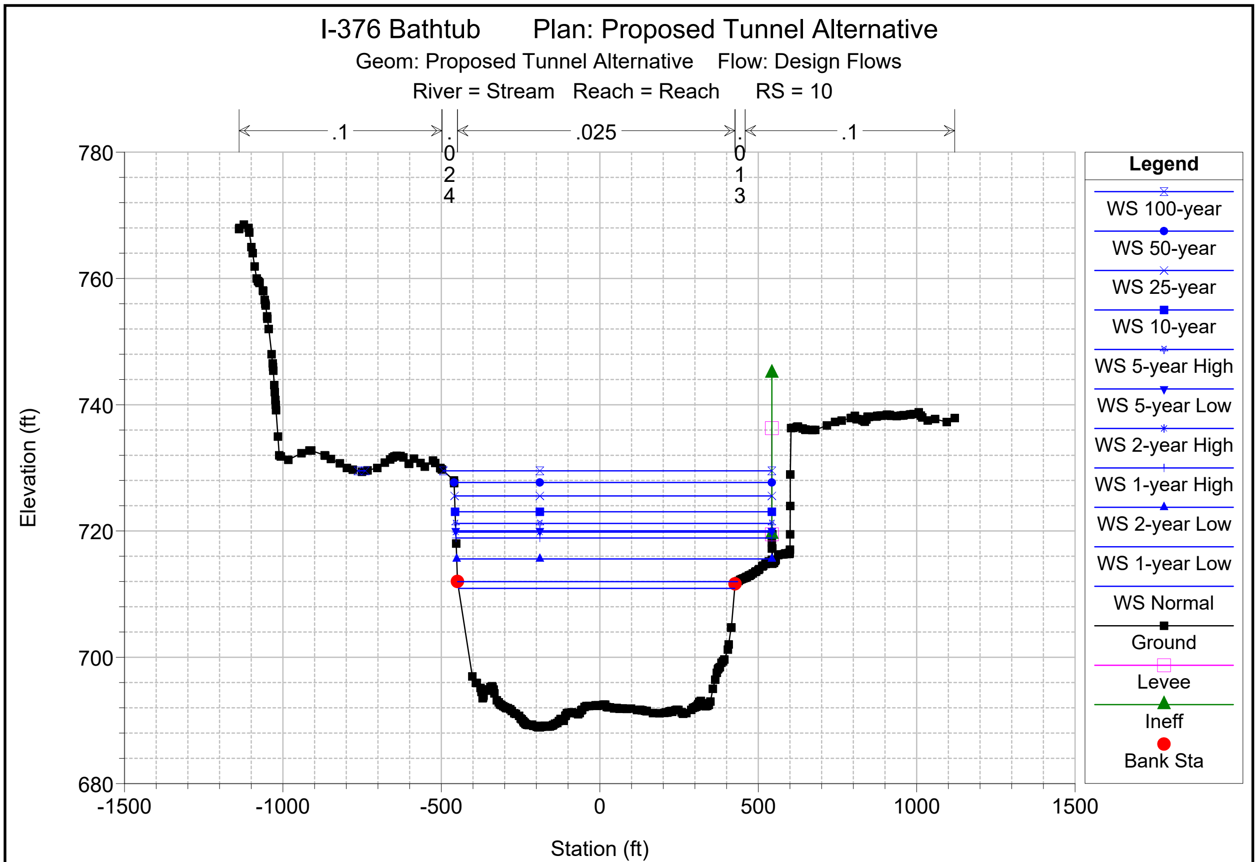

I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 15
.1
.024
.025
.013
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

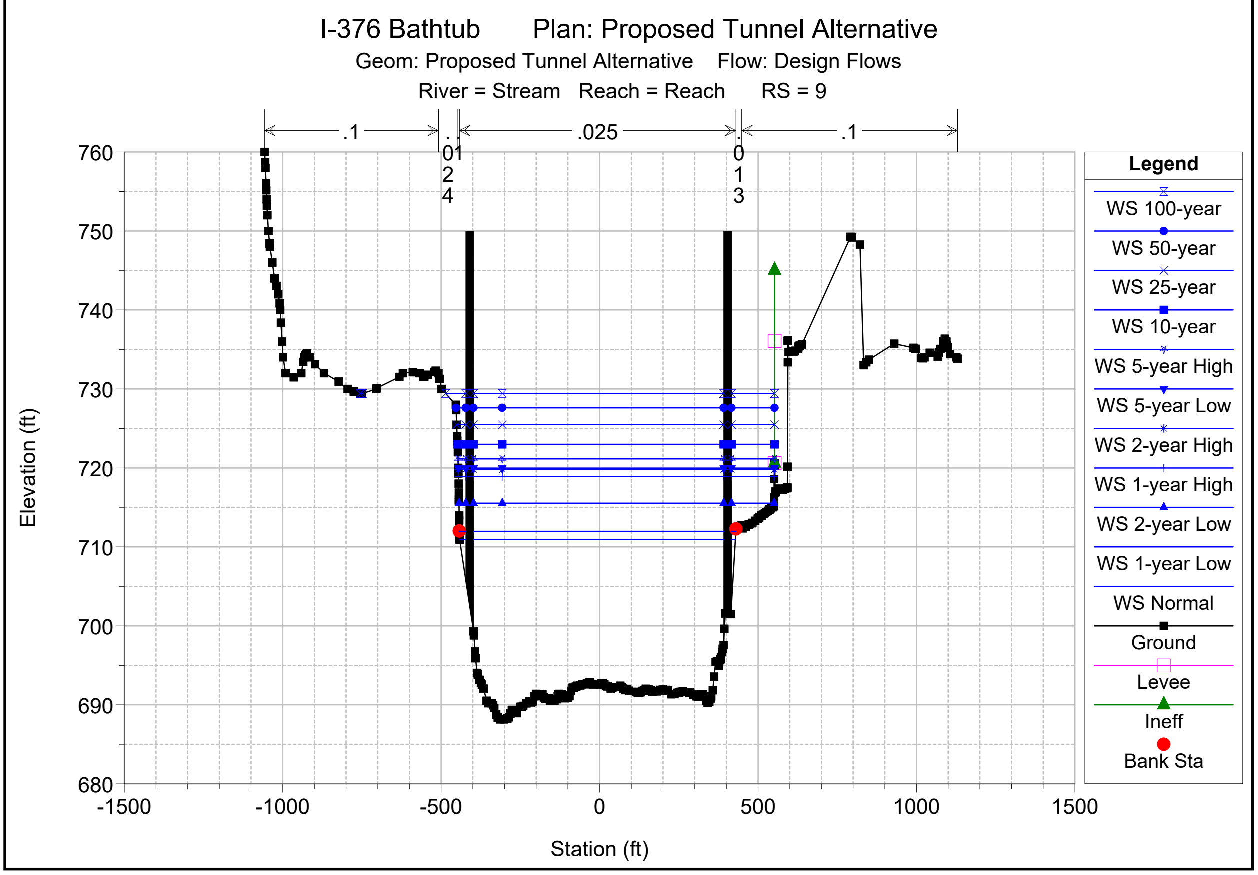

I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 14
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

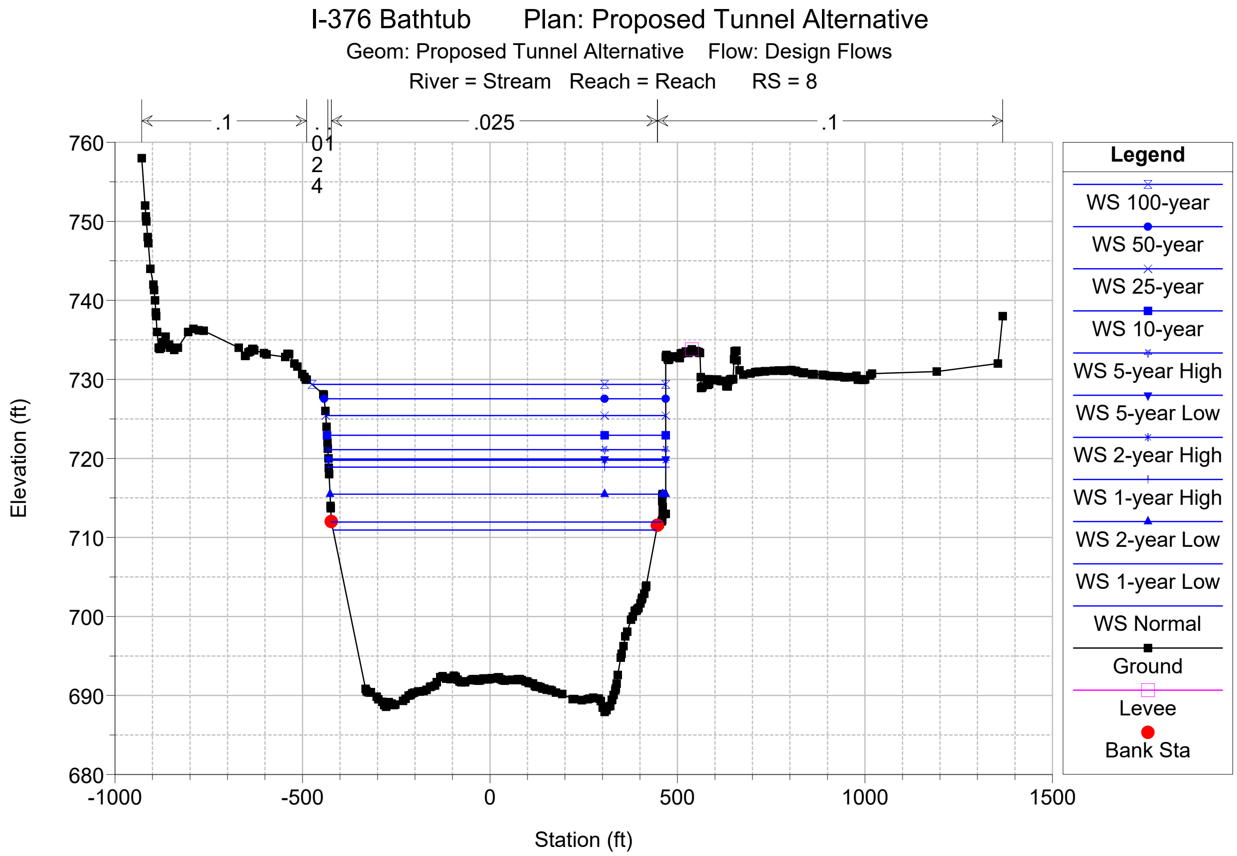

I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 13
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta


I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 12
.1
.025
.024
.013
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

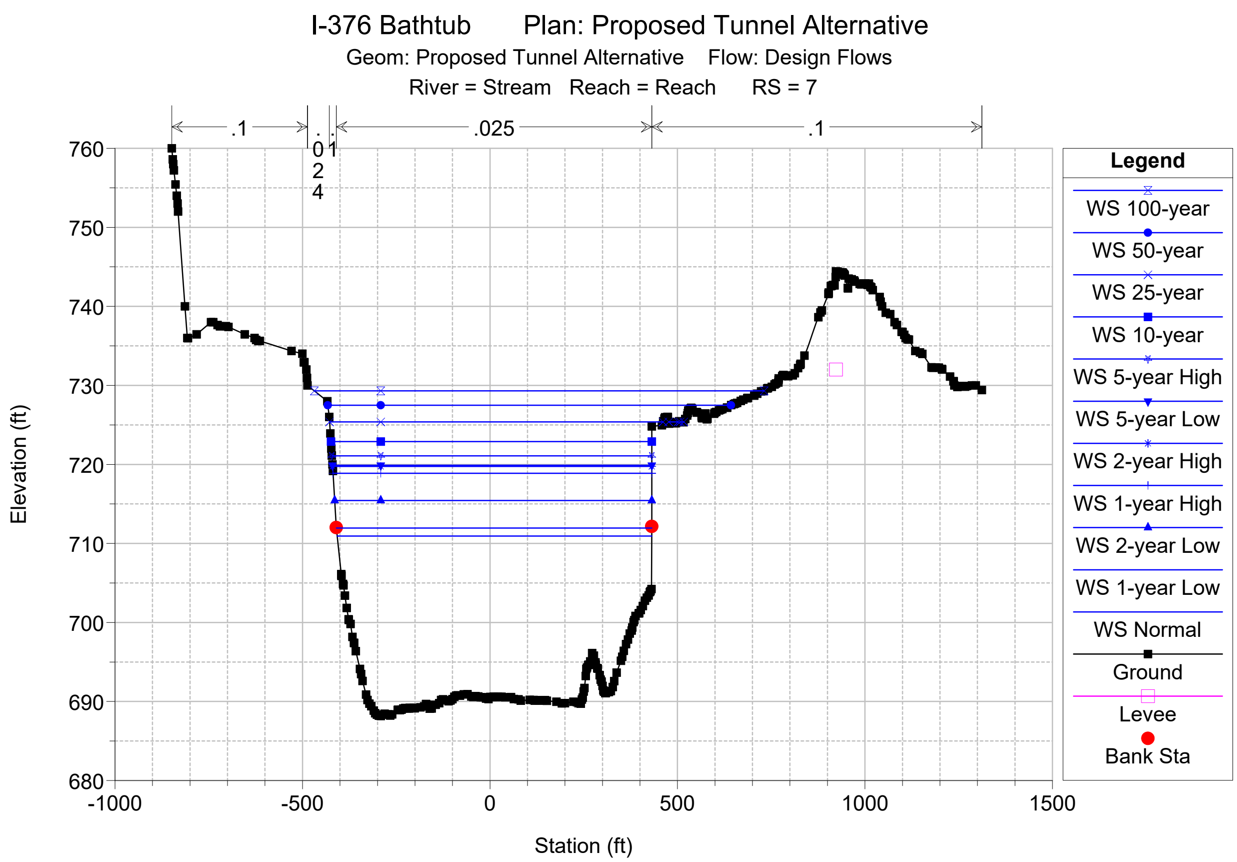

I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 11 FEMA C
.1
.05
.025
.1
.01
.024
.013
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta


I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 10
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta

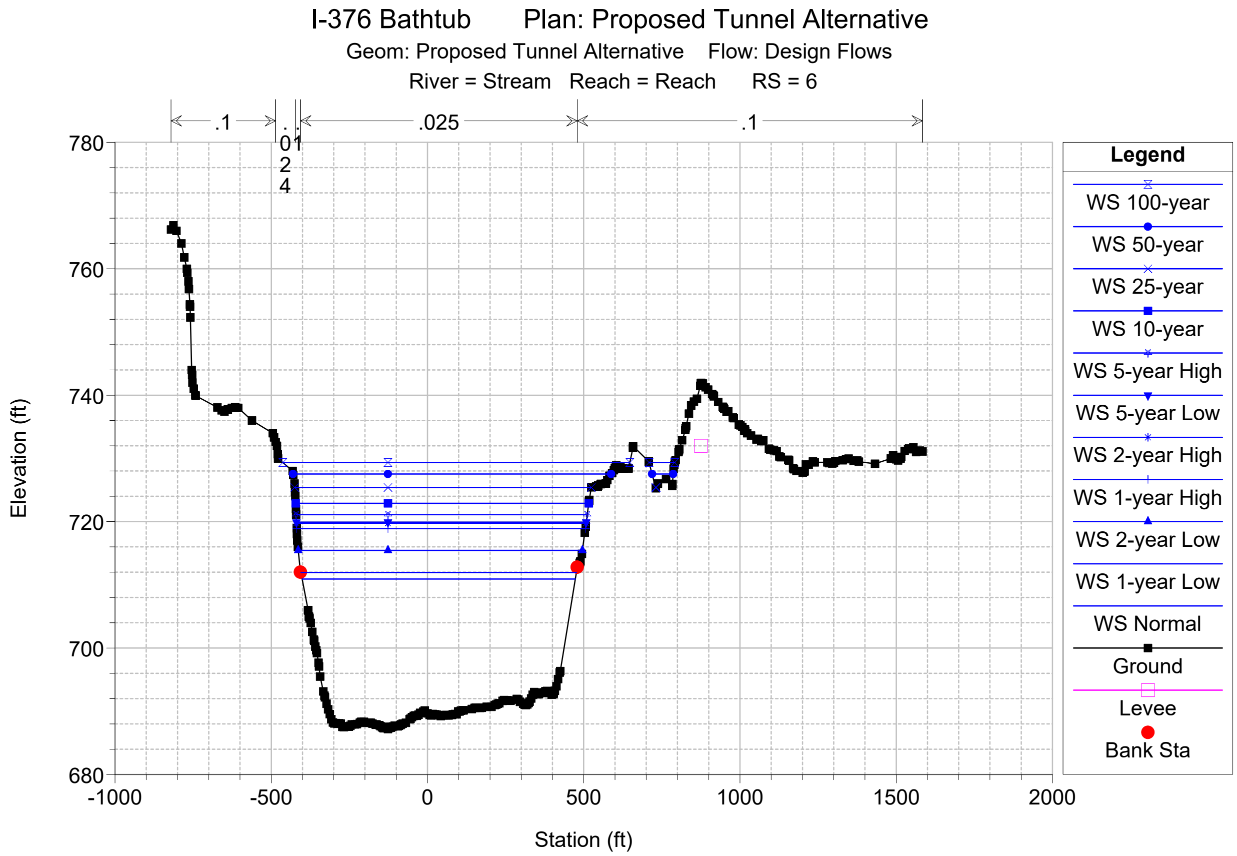

I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 9
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Ineff
Bank Sta



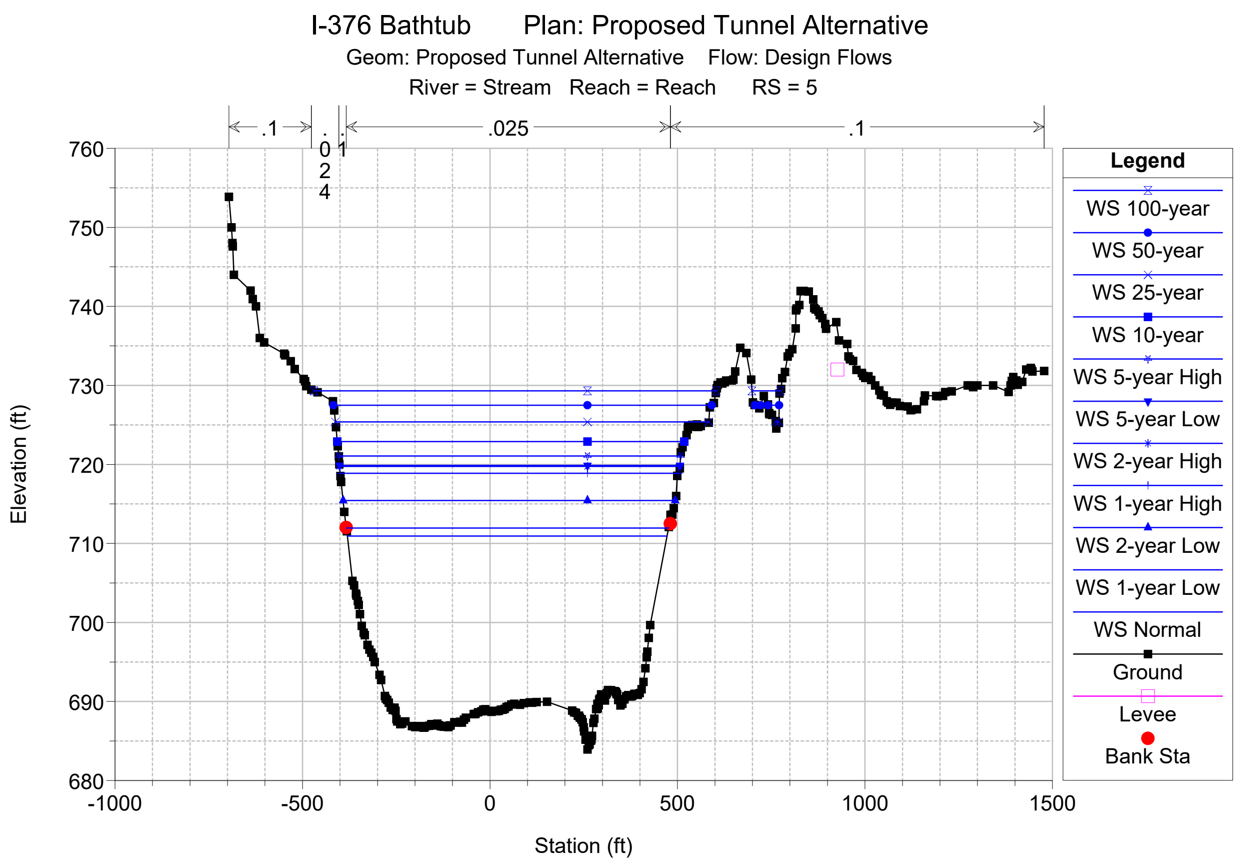
I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 8
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta



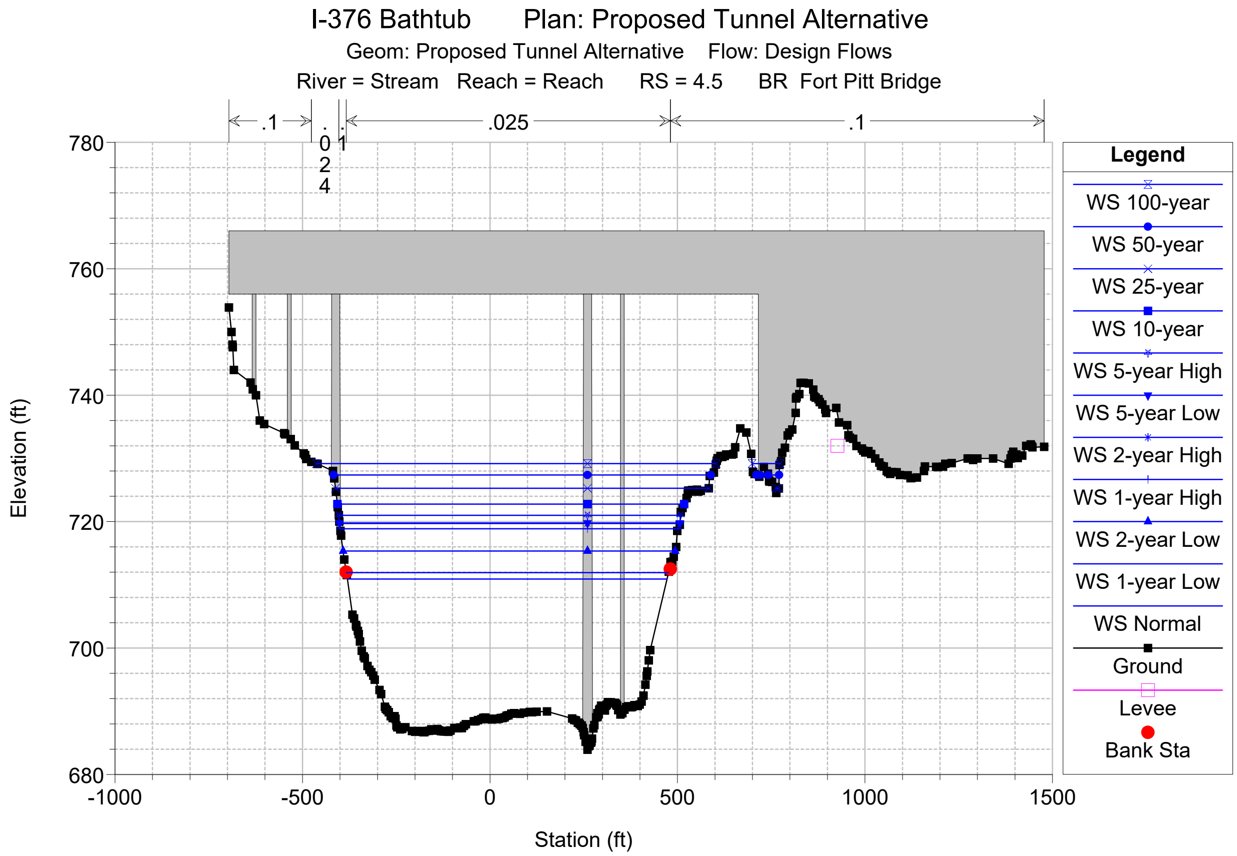
I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 7
.1
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta

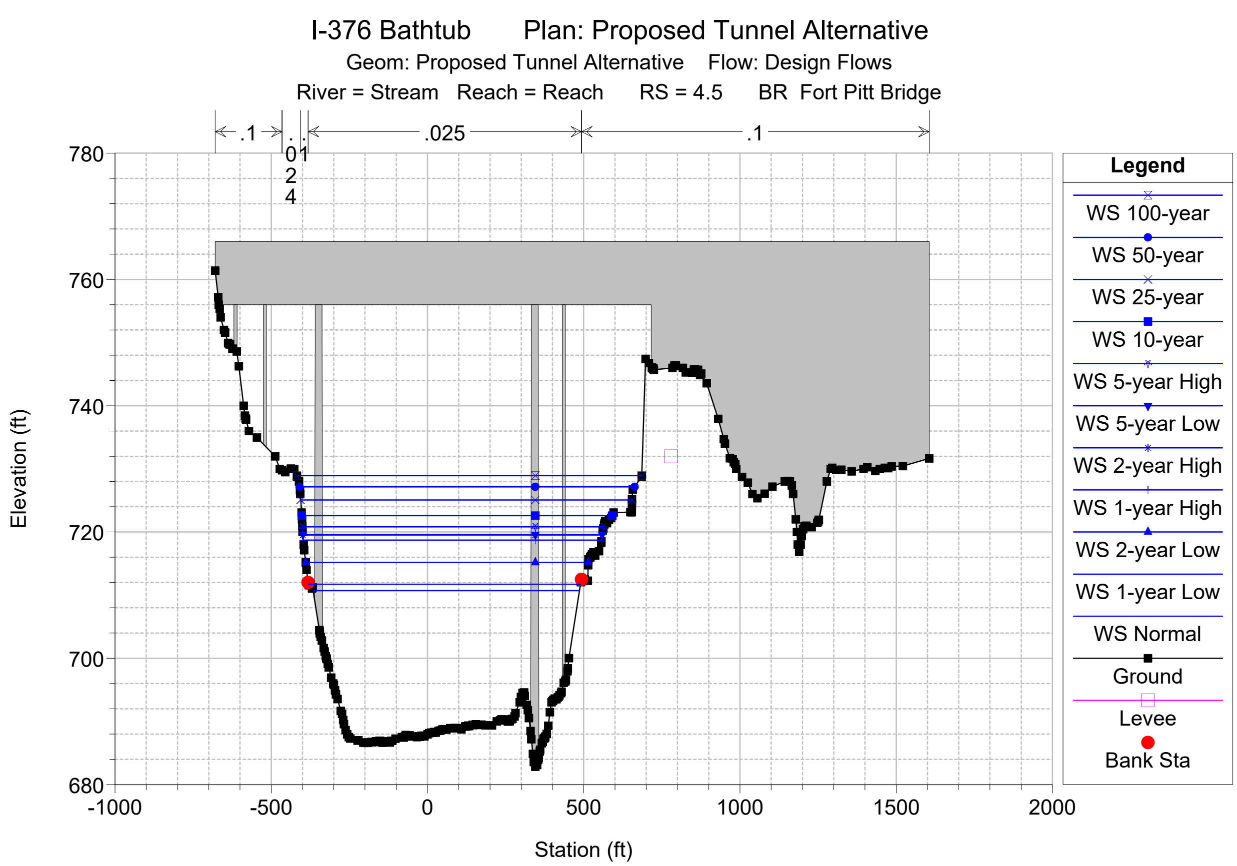


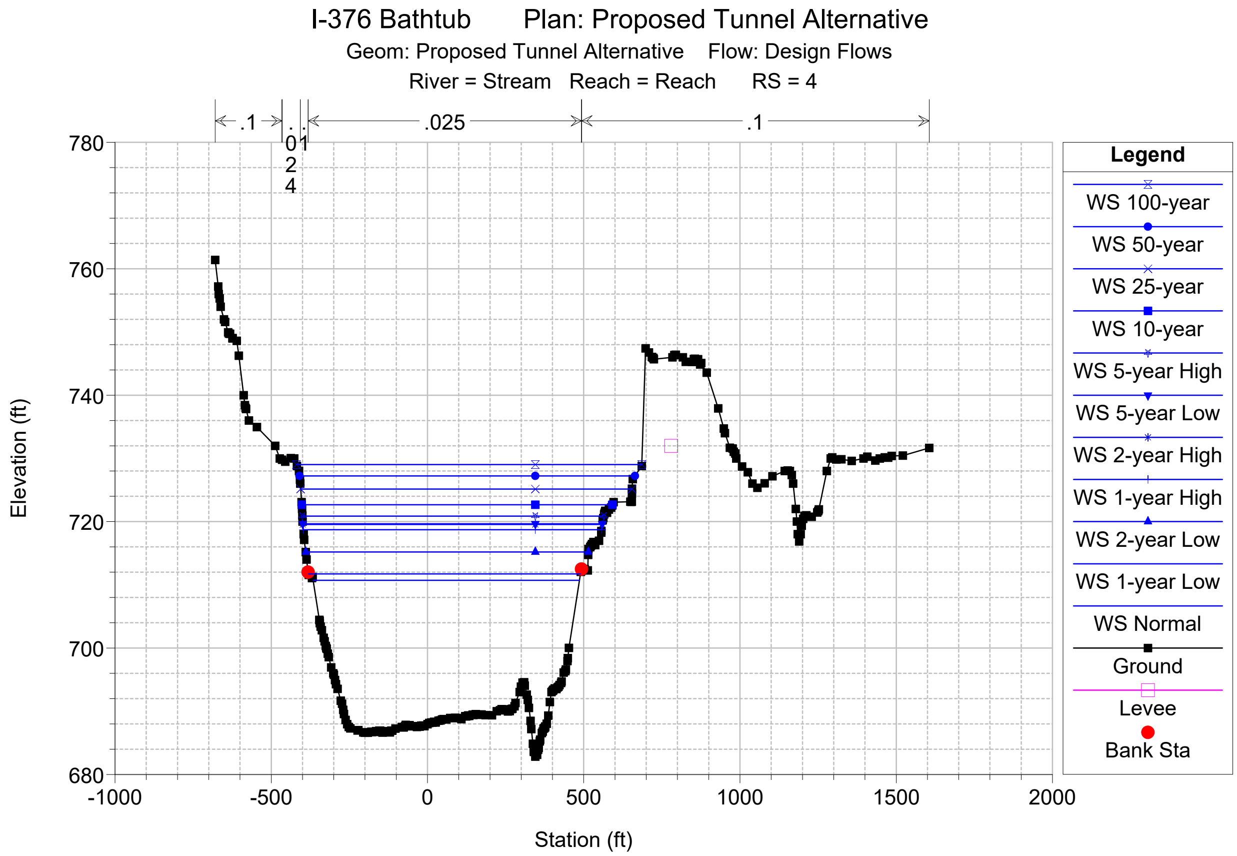
I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 6
.1
.024
.01
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta

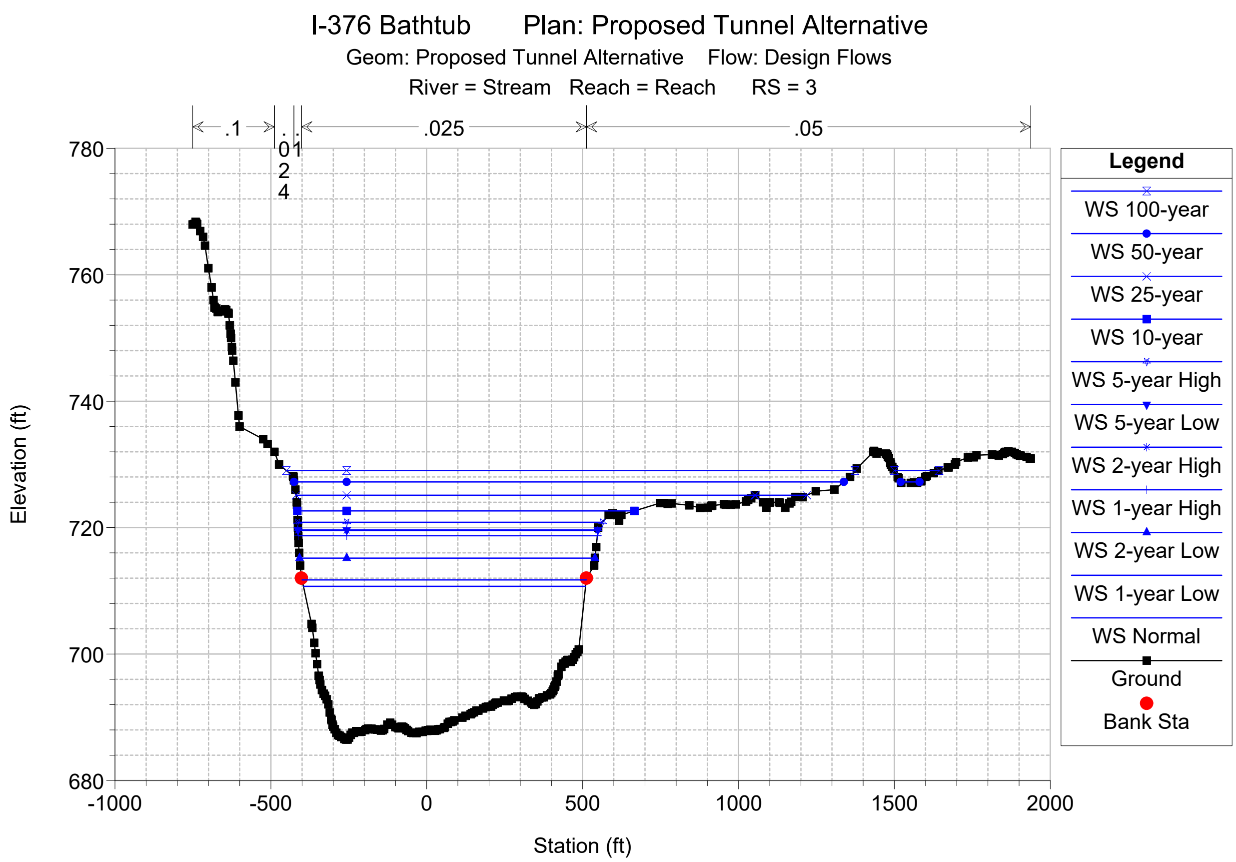


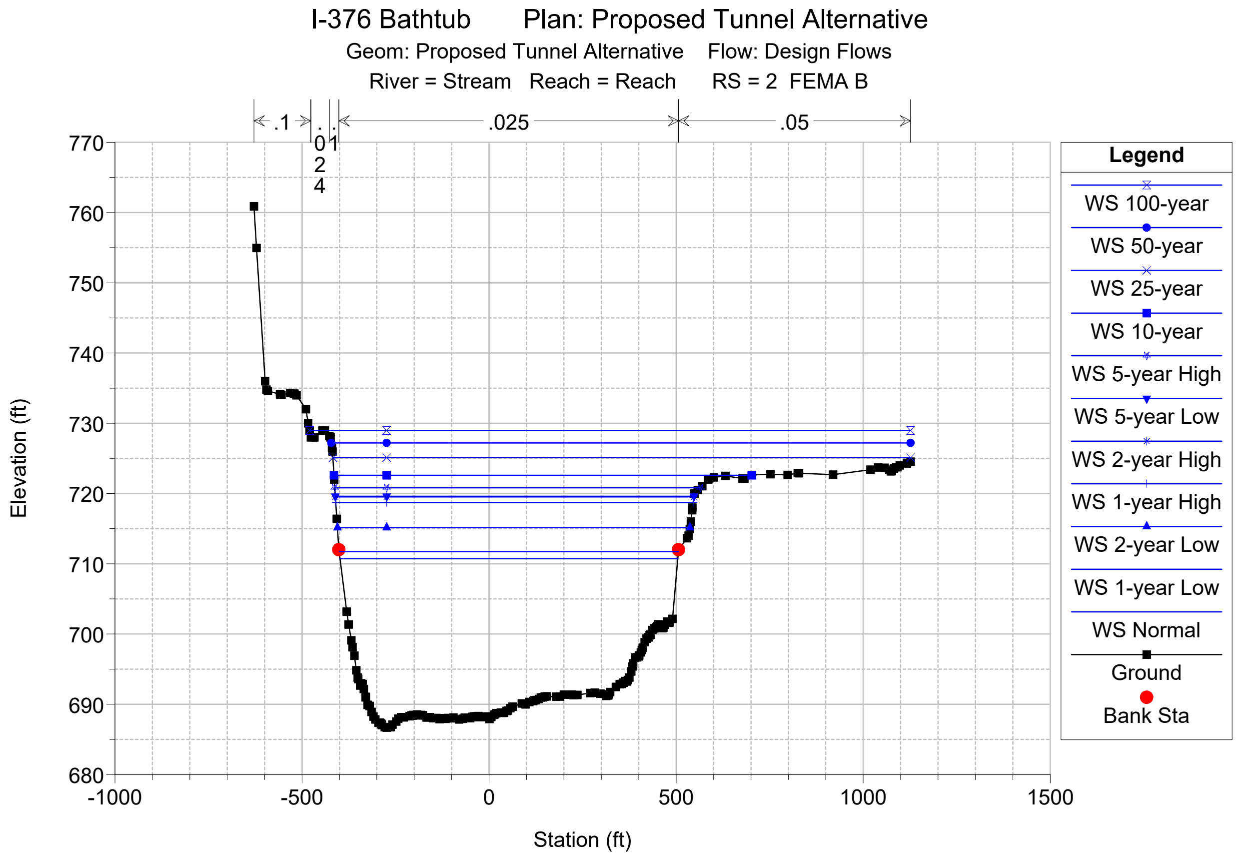
I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 5
.1
.024
.01
.025
.1
Elevation (ft)
Station (ft)
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta

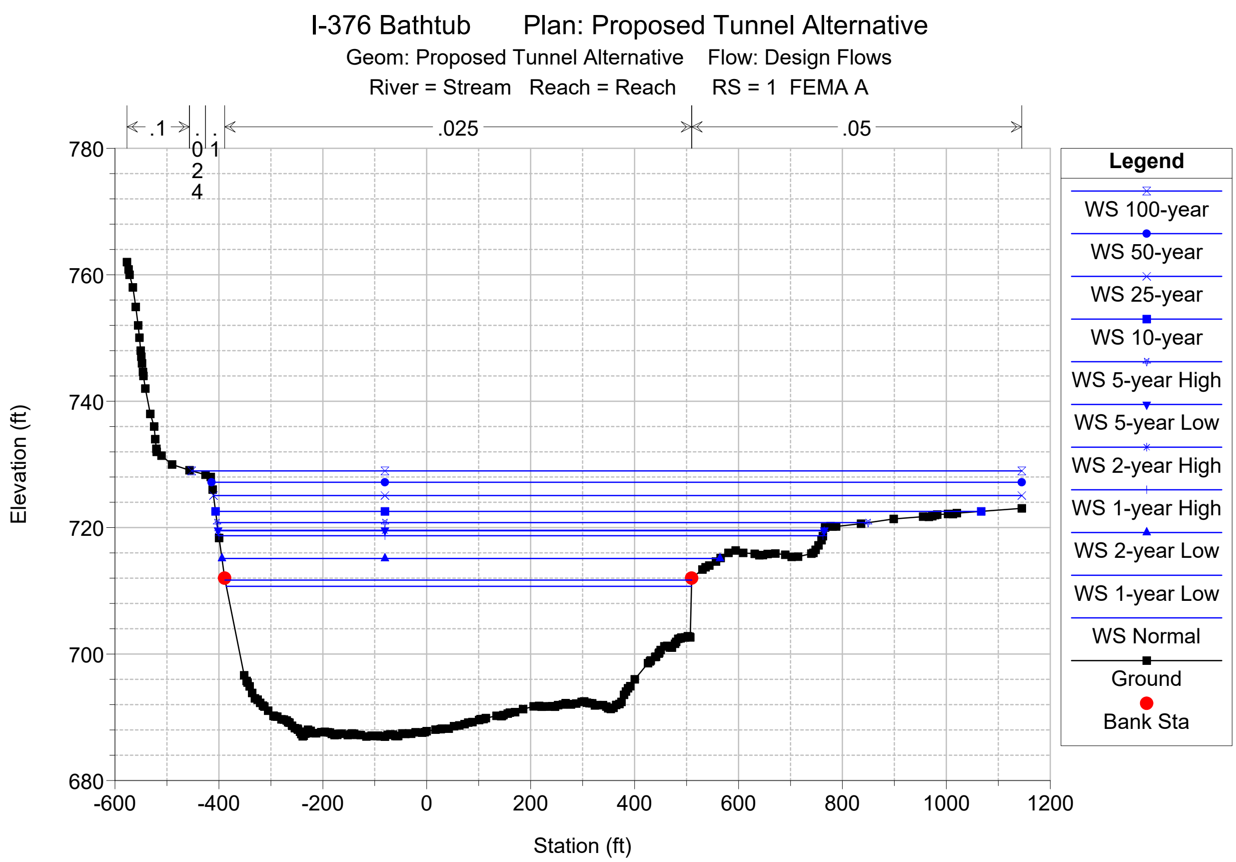

I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 4.5 BR Fort Pitt Bridge
.1
.024
.01
.025
.1
Elevation (ft)
Station (ft)
780
760
740
720
700
680
-1000
-500
0
500
1000
1500
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta


I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 4.5 BR Fort Pitt Bridge
.1
.024
.01
.025
.1
Elevation (ft)
Station (ft)
780
760
740
720
700
680
-1000
-500
0
500
1000
1500
2000
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta


I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 4
.1
.025
.1
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)


I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 3
.1
.025
.05
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta
Elevation (ft)
Station (ft)


I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 2 FEMA B
.1
.024
.01
.025
.05
Elevation (ft)
Station (ft)
770
760
750
740
730
720
710
700
690
680
-1000
-500
0
500
1000
1500
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta


I-376 Bathtub Plan: Proposed Tunnel Alternative
Geom: Proposed Tunnel Alternative Flow: Design Flows
River = Stream Reach = Reach RS = 1 FEMA A
.1
.024
.01
.025
.05
Elevation (ft)
Station (ft)
780
760
740
720
700
680
-600
-400
-200
0
200
400
600
800
1000
1200
Legend
WS 100-year
WS 50-year
WS 25-year
WS 10-year
WS 5-year High
WS 5-year Low
WS 2-year High
WS 1-year High
WS 2-year Low
WS 1-year Low
WS Normal
Ground
Bank Sta

HEC-RAS Plan: Proposed Tunnel Alternative River: Stream Reach: Reach

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	30	1-year Low	39690.00	686.10	712.20		712.31	0.000035	2.6	15343.73	761.30	0.10
Reach	30	2-year Low	101800.00	686.10	716.39		716.86	0.000122	5.5	18551.76	772.73	0.20
Reach	30	5-year Low	136800.00	686.10	720.87		721.47	0.000126	6.2	22039.93	782.87	0.20
Reach	30	25-year	187200.00	686.10	726.49		727.28	0.000130	7.1	26474.55	795.75	0.21
Reach	30	10-year	168500.00	686.10	723.99		724.73	0.000135	6.9	24490.51	790.01	0.22
Reach	30	50-year	212000.00	686.10	728.69		729.59	0.000136	7.6	28268.69	868.10	0.22
Reach	30	100-year	231000.00	686.10	730.55		731.51	0.000136	7.9	30007.13	1021.95	0.22
Reach	30	1-year High	39690.00	686.10	719.04		719.09	0.000013	1.9	20606.53	778.67	0.07
Reach	30	5-year High	136800.00	686.10	721.96		722.52	0.000111	6.0	22893.58	785.37	0.19
Reach	30	2-year High	101800.00	686.10	720.34		720.68	0.000074	4.7	21622.20	781.65	0.16
Reach	30	Normal	12700.00	686.10	710.96		710.97	0.000004	0.9	14397.68	755.90	0.04
Reach	29	1-year Low	39690.00	690.79	712.18		712.29	0.000042	2.7	14910.55	807.23	0.11
Reach	29	2-year Low	101800.00	690.79	716.30		716.79	0.000140	5.6	18259.01	816.09	0.21
Reach	29	5-year Low	136800.00	690.79	720.80		721.41	0.000138	6.3	21950.44	825.81	0.21
Reach	29	25-year	187200.00	690.79	726.43		727.21	0.000137	7.1	26633.11	837.82	0.22
Reach	29	10-year	168500.00	690.79	723.92		724.66	0.000145	6.9	24536.43	832.47	0.22
Reach	29	50-year	212000.00	690.79	728.63		729.51	0.000142	7.5	28538.34	905.66	0.22
Reach	29	100-year	231000.00	690.79	730.50		731.43	0.000141	7.8	30508.62	1193.16	0.23
Reach	29	1-year High	39690.00	690.79	719.03		719.09	0.000015	1.9	20489.67	821.98	0.07
Reach	29	5-year High	136800.00	690.79	721.90		722.46	0.000121	6.0	22860.35	828.16	0.20
Reach	29	2-year High	101800.00	690.79	720.30		720.64	0.000081	4.7	21533.57	824.72	0.16
Reach	29	Normal	12700.00	690.79	710.95		710.97	0.000005	0.9	13924.49	803.36	0.04
Reach	28	1-year Low	39690.00	691.86	712.16		712.27	0.000040	2.6	15393.34	841.43	0.11
Reach	28	2-year Low	101800.00	691.86	716.25		716.71	0.000133	5.4	18856.07	851.00	0.20
Reach	28	5-year Low	136800.00	691.86	720.76		721.33	0.000130	6.0	22713.95	861.87	0.21
Reach	28	25-year	187200.00	691.86	726.40		727.12	0.000129	6.8	27613.87	884.65	0.21
Reach	28	10-year	168500.00	691.86	723.88		724.57	0.000137	6.7	25416.41	869.30	0.21
Reach	28	50-year	212000.00	691.86	728.60		729.42	0.000133	7.2	29727.89	1105.83	0.22
Reach	28	100-year	231000.00	691.86	730.48		731.34	0.000132	7.5	32091.37	1330.27	0.22
Reach	28	1-year High	39690.00	691.86	719.02		719.08	0.000014	1.9	21221.31	857.72	0.07
Reach	28	5-year High	136800.00	691.86	721.87		722.39	0.000114	5.8	23669.74	864.51	0.19
Reach	28	2-year High	101800.00	691.86	720.27		720.60	0.000077	4.6	22293.49	860.71	0.16
Reach	28	Normal	12700.00	691.86	710.95		710.96	0.000005	0.9	14377.02	838.25	0.04
Reach	27	1-year Low	39690.00	692.11	712.14		712.24	0.000040	2.5	16110.64	946.55	0.11
Reach	27	2-year Low	101800.00	692.11	716.20		716.60	0.000128	5.1	19961.00	951.60	0.20
Reach	27	5-year Low	136800.00	692.11	720.72		721.22	0.000121	5.6	24279.17	957.16	0.20
Reach	27	25-year	187200.00	692.11	726.39		727.01	0.000116	6.3	29729.27	984.71	0.20
Reach	27	10-year	168500.00	692.11	723.86		724.45	0.000125	6.2	27285.05	961.04	0.20
Reach	27	50-year	212000.00	692.11	728.60		729.30	0.000118	6.7	32046.21	1198.20	0.20
Reach	27	100-year	231000.00	692.11	730.48		731.22	0.000117	6.9	34559.58	1462.54	0.20
Reach	27	1-year High	39690.00	692.11	719.02		719.07	0.000013	1.8	22649.74	955.05	0.06
Reach	27	5-year High	136800.00	692.11	721.84		722.29	0.000105	5.4	25348.16	958.59	0.18
Reach	27	2-year High	101800.00	692.11	720.25		720.53	0.000071	4.3	23825.31	956.62	0.15
Reach	27	Normal	12700.00	692.11	710.95		710.96	0.000005	0.8	14987.79	936.70	0.04
Reach	26	1-year Low	39690.00	690.05	712.13	697.64	712.23	0.000038	2.5	16063.97	905.06	0.10
Reach	26	2-year Low	101800.00	690.05	716.17	701.29	716.58	0.000126	5.2	19762.74	929.52	0.19
Reach	26	5-year Low	136800.00	690.05	720.68	702.96	721.20	0.000122	5.7	24047.01	1001.37	0.20
Reach	26	25-year	187200.00	690.05	726.34	705.12	726.99	0.000119	6.5	29941.04	1094.01	0.20
Reach	26	10-year	168500.00	690.05	723.81	704.33	724.43	0.000127	6.3	27250.03	1042.73	0.21
Reach	26	50-year	212000.00	690.05	728.55	706.10	729.28	0.000121	6.8	32446.56	1166.31	0.21
Reach	26	100-year	231000.00	690.05	730.43	706.84	731.20	0.000120	7.0	34857.18	1430.01	0.21
Reach	26	1-year High	39690.00	690.05	719.02	697.64	719.06	0.000013	1.8	22435.21	947.78	0.06
Reach	26	5-year High	136800.00	690.05	721.80	702.96	722.28	0.000106	5.5	25177.01	1018.92	0.19
Reach	26	2-year High	101800.00	690.05	720.23	701.29	720.52	0.000071	4.4	23592.70	977.93	0.15
Reach	26	Normal	12700.00	690.05	710.95	695.23	710.96	0.000005	0.8	14993.80	899.73	0.04
Reach	25.5		Bridge									
Reach	25	1-year Low	39690.00	686.75	712.11		712.21	0.000040	2.5	15803.08	906.72	0.11
Reach	25	2-year Low	101800.00	686.75	716.08		716.51	0.000133	5.2	19431.82	923.01	0.20
Reach	25	5-year Low	136800.00	686.75	720.58		721.11	0.000127	5.8	23630.38	943.52	0.20
Reach	25	25-year	187200.00	686.75	726.22		726.89	0.000123	6.5	29161.64	1049.75	0.21
Reach	25	10-year	168500.00	686.75	723.69		724.33	0.000132	6.4	26605.78	973.80	0.21
Reach	25	50-year	212000.00	686.75	728.42		729.16	0.000126	6.9	31630.17	1256.56	0.21
Reach	25	100-year	231000.00	686.75	730.30		731.08	0.000124	7.1	34298.29	1469.99	0.21
Reach	25	1-year High	39690.00	686.75	719.01		719.06	0.000013	1.8	22150.29	934.09	0.06
Reach	25	5-year High	136800.00	686.75	721.71		722.20	0.000110	5.6	24702.95	954.63	0.19
Reach	25	2-year High	101800.00	686.75	720.17		720.47	0.000074	4.4	23241.16	939.47	0.15
Reach	25	Normal	12700.00	686.75	710.95		710.96	0.000005	0.9	14751.57	897.17	0.04
Reach	24	1-year Low	39690.00	689.54	712.11		712.20	0.000036	2.4	16676.21	964.89	0.10
Reach	24	2-year Low	101800.00	689.54	716.08		716.46	0.000119	5.0	20534.47	980.03	0.19
Reach	24	5-year Low	136800.00	689.54	720.59		721.06	0.000113	5.5	24987.83	993.78	0.19

HEC-RAS Plan: Proposed Tunnel Alternative River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	24	25-year	187200.00	689.54	726.24		726.83	0.000110	6.2	30741.92	1151.90	0.19
Reach	24	10-year	168500.00	689.54	723.71		724.27	0.000118	6.0	28099.63	1003.43	0.20
Reach	24	50-year	212000.00	689.54	728.44		729.10	0.000112	6.5	33620.85	1408.68	0.20
Reach	24	100-year	231000.00	689.54	730.32		731.02	0.000110	6.7	36410.15	1517.87	0.20
Reach	24	1-year High	39690.00	689.54	719.01		719.05	0.000012	1.7	23416.96	988.86	0.06
Reach	24	5-year High	136800.00	689.54	721.72		722.15	0.000098	5.3	26113.62	997.34	0.18
Reach	24	2-year High	101800.00	689.54	720.17		720.44	0.000066	4.2	24574.20	992.47	0.15
Reach	24	Normal	12700.00	689.54	710.95		710.96	0.000005	0.8	15555.52	958.17	0.04
Reach	23	1-year Low	39690.00	688.70	712.10	697.55	712.19	0.000040	2.4	16237.26	968.25	0.11
Reach	23	2-year Low	101800.00	688.70	716.05	701.52	716.45	0.000131	5.1	20112.64	994.58	0.20
Reach	23	5-year Low	136800.00	688.70	720.56	703.21	721.05	0.000123	5.6	24651.71	1016.10	0.20
Reach	23	25-year	187200.00	688.70	726.21	705.39	726.81	0.000117	6.3	30579.14	1163.29	0.20
Reach	23	10-year	168500.00	688.70	723.67	704.60	724.26	0.000126	6.1	27849.91	1041.31	0.20
Reach	23	50-year	212000.00	688.70	728.41	706.36	729.09	0.000119	6.6	33162.47	1180.30	0.20
Reach	23	100-year	231000.00	688.70	730.29	707.08	731.00	0.000117	6.8	35397.44	1208.49	0.20
Reach	23	1-year High	39690.00	688.70	719.00	697.55	719.05	0.000013	1.7	23075.88	1008.93	0.06
Reach	23	5-year High	136800.00	688.70	721.69	703.22	722.14	0.000106	5.4	25808.81	1022.64	0.18
Reach	23	2-year High	101800.00	688.70	720.16	701.52	720.43	0.000072	4.2	24242.40	1013.89	0.15
Reach	23	Normal	12700.00	688.70	710.94	694.58	710.96	0.000005	0.8	15127.02	951.15	0.04
Reach	22.5		Bridge									
Reach	22	1-year Low	39690.00	689.39	712.09	697.71	712.18	0.000040	2.5	16194.77	966.51	0.11
Reach	22	2-year Low	101800.00	689.39	716.00	701.62	716.40	0.000131	5.1	20004.03	981.98	0.20
Reach	22	5-year Low	136800.00	689.39	720.51	703.29	721.00	0.000123	5.6	24466.84	998.39	0.20
Reach	22	25-year	187200.00	689.39	726.15	705.43	726.76	0.000117	6.3	30264.31	1102.27	0.20
Reach	22	10-year	168500.00	689.39	723.61	704.67	724.20	0.000126	6.2	27596.46	1032.39	0.20
Reach	22	50-year	212000.00	689.39	728.34	706.40	729.02	0.000119	6.6	32709.36	1126.07	0.20
Reach	22	100-year	231000.00	689.39	730.22	707.12	730.94	0.000117	6.8	34858.14	1181.34	0.20
Reach	22	1-year High	39690.00	689.39	719.00	697.71	719.05	0.000013	1.7	22964.16	992.85	0.06
Reach	22	5-year High	136800.00	689.39	721.65	703.29	722.10	0.000106	5.4	25607.82	1002.58	0.18
Reach	22	2-year High	101800.00	689.39	720.13	701.62	720.41	0.000071	4.2	24087.50	997.12	0.15
Reach	22	Normal	12700.00	689.39	710.94	695.12	710.95	0.000005	0.8	15090.56	957.86	0.04
Reach	21	1-year Low	39690.00	689.92	712.08	697.85	712.17	0.000037	2.4	16494.53	951.63	0.10
Reach	21	2-year Low	101800.00	689.92	715.97	701.40	716.36	0.000124	5.0	20209.77	960.35	0.19
Reach	21	5-year Low	136800.00	689.92	720.48	703.02	720.96	0.000118	5.6	24564.92	972.01	0.19
Reach	21	25-year	187200.00	689.92	726.11	705.14	726.72	0.000113	6.3	30312.59	1082.53	0.20
Reach	21	10-year	168500.00	689.92	723.58	704.39	724.16	0.000122	6.1	27624.46	1018.42	0.20
Reach	21	50-year	212000.00	689.92	728.31	706.10	728.99	0.000116	6.6	32705.64	1106.35	0.20
Reach	21	100-year	231000.00	689.92	730.19	706.80	730.90	0.000114	6.8	34845.74	1173.75	0.20
Reach	21	1-year High	39690.00	689.92	719.00	697.85	719.04	0.000012	1.7	23128.89	968.19	0.06
Reach	21	5-year High	136800.00	689.92	721.62	703.02	722.06	0.000102	5.3	25679.21	974.96	0.18
Reach	21	2-year High	101800.00	689.92	720.11	701.40	720.39	0.000068	4.2	24208.77	971.05	0.15
Reach	21	Normal	12700.00	689.92	710.94	694.94	710.95	0.000005	0.8	15412.61	947.89	0.04
Reach	20	1-year Low	39690.00	691.23	712.07	697.48	712.15	0.000035	2.3	16979.62	995.12	0.10
Reach	20	2-year Low	101800.00	691.23	715.92	701.09	716.30	0.000118	4.9	20887.71	1027.85	0.19
Reach	20	5-year Low	136800.00	691.23	720.44	702.75	720.89	0.000111	5.4	25543.55	1033.63	0.19
Reach	20	25-year	187200.00	691.23	726.09	704.84	726.65	0.000106	6.0	31553.86	1161.23	0.19
Reach	20	10-year	168500.00	691.23	723.55	704.08	724.09	0.000115	5.9	28778.27	1075.61	0.20
Reach	20	50-year	212000.00	691.23	728.29	705.80	728.92	0.000108	6.4	34182.59	1286.56	0.19
Reach	20	100-year	231000.00	691.23	730.17	706.51	730.83	0.000106	6.6	36624.01	1363.04	0.19
Reach	20	1-year High	39690.00	691.23	718.99	697.48	719.03	0.000011	1.7	24046.66	1031.81	0.06
Reach	20	5-year High	136800.00	691.23	721.59	702.75	722.01	0.000096	5.2	26734.16	1035.08	0.18
Reach	20	2-year High	101800.00	691.23	720.09	701.09	720.35	0.000064	4.1	25179.61	1033.19	0.14
Reach	20	Normal	12700.00	691.23	710.94	695.15	710.95	0.000004	0.8	15865.80	982.92	0.04
Reach	19	1-year Low	39690.00	692.33	712.06	697.90	712.14	0.000038	2.4	16779.09	1015.99	0.10
Reach	19	2-year Low	101800.00	692.33	715.89	701.56	716.27	0.000124	4.9	20720.41	1038.96	0.19
Reach	19	5-year Low	136800.00	692.33	720.42	703.18	720.87	0.000115	5.4	25454.31	1083.45	0.19
Reach	19	25-year	187200.00	692.33	726.07	705.28	726.63	0.000108	6.0	31543.24	1176.58	0.19
Reach	19	10-year	168500.00	692.33	723.52	704.53	724.07	0.000117	5.9	28739.61	1108.66	0.20
Reach	19	50-year	212000.00	692.33	728.27	706.24	728.89	0.000110	6.4	34075.10	1199.91	0.20
Reach	19	100-year	231000.00	692.33	730.15	706.93	730.81	0.000108	6.5	36357.41	1321.38	0.20
Reach	19	1-year High	39690.00	692.33	718.99	697.90	719.03	0.000012	1.7	23957.69	1077.81	0.06
Reach	19	5-year High	136800.00	692.33	721.57	703.18	721.99	0.000099	5.2	26668.56	1085.45	0.18
Reach	19	2-year High	101800.00	692.33	720.07	701.56	720.33	0.000067	4.1	25096.08	1082.19	0.15
Reach	19	Normal	12700.00	692.33	710.94	695.54	710.95	0.000005	0.8	15647.94	1006.60	0.04
Reach	18	1-year Low	39690.00	690.71	712.05	697.98	712.14	0.000038	2.4	16874.60	1034.82	0.10
Reach	18	2-year Low	101800.00	690.71	715.87	701.64	716.24	0.000124	4.9	20874.86	1051.21	0.19
Reach	18	5-year Low	136800.00	690.71	720.40	703.26	720.85	0.000114	5.4	25645.30	1091.24	0.19
Reach	18	25-year	187200.00	690.71	726.06	705.33	726.61	0.000107	6.0	31713.61	1201.53	0.19
Reach	18	10-year	168500.00	690.71	723.51	704.58	724.04	0.000116	5.9	28938.75	1114.62	0.20
Reach	18	50-year	212000.00	690.71	728.26	706.27	728.87	0.000109	6.3	34255.99	1217.42	0.19

HEC-RAS Plan: Proposed Tunnel Alternative River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	18	100-year	231000.00	690.71	730.14	706.96	730.78	0.000107	6.5	36487.34	1291.54	0.19
Reach	18	1-year High	39690.00	690.71	718.99	697.98	719.03	0.000012	1.6	24153.99	1082.09	0.06
Reach	18	5-year High	136800.00	690.71	721.56	703.26	721.97	0.000098	5.1	26870.39	1102.30	0.18
Reach	18	2-year High	101800.00	690.71	720.06	701.64	720.32	0.000066	4.0	25291.76	1084.48	0.14
Reach	18	Normal	12700.00	690.71	710.94	695.60	710.95	0.000005	0.8	15727.84	1016.29	0.04
Reach	17.5		Bridge									
Reach	17	1-year Low	39690.00	690.70	712.04	698.05	712.12	0.000036	2.3	17110.04	1033.76	0.10
Reach	17	2-year Low	101800.00	690.70	715.80	701.48	716.16	0.000121	4.8	21107.97	1100.81	0.19
Reach	17	5-year Low	136800.00	690.70	720.28	703.07	720.72	0.000111	5.3	26050.45	1106.20	0.19
Reach	17	25-year	187200.00	690.70	725.84	705.12	726.38	0.000105	5.9	32378.18	1234.58	0.19
Reach	17	10-year	168500.00	690.70	723.34	704.39	723.86	0.000114	5.8	29465.45	1157.08	0.19
Reach	17	50-year	212000.00	690.70	728.00	706.06	728.59	0.000106	6.2	34995.62	1249.80	0.19
Reach	17	100-year	231000.00	690.70	729.84	706.75	730.47	0.000105	6.4	37259.82	1271.37	0.19
Reach	17	1-year High	39690.00	690.70	718.92	698.05	718.96	0.000011	1.6	24550.05	1104.20	0.06
Reach	17	5-year High	136800.00	690.70	721.43	703.07	721.82	0.000095	5.1	27322.30	1113.18	0.18
Reach	17	2-year High	101800.00	690.70	719.97	701.48	720.22	0.000064	4.0	25707.03	1105.51	0.14
Reach	17	Normal	12700.00	690.70	710.94	695.80	710.95	0.000005	0.8	15980.23	1022.61	0.04
Reach	16	1-year Low	39690.00	690.63	712.03	697.66	712.11	0.000036	2.3	16906.15	987.03	0.10
Reach	16	2-year Low	101800.00	690.63	715.75	701.23	716.13	0.000121	4.9	20861.97	1103.50	0.19
Reach	16	5-year Low	136800.00	690.63	720.23	702.88	720.68	0.000114	5.4	25807.14	1107.93	0.19
Reach	16	25-year	187200.00	690.63	725.78	704.95	726.35	0.000109	6.1	32066.10	1206.29	0.19
Reach	16	10-year	168500.00	690.63	723.28	704.19	723.83	0.000117	6.0	29195.55	1131.20	0.20
Reach	16	50-year	212000.00	690.63	727.93	705.90	728.56	0.000111	6.4	34625.86	1216.55	0.20
Reach	16	100-year	231000.00	690.63	729.77	706.61	730.43	0.000109	6.6	36823.25	1219.74	0.20
Reach	16	1-year High	39690.00	690.63	718.92	697.66	718.96	0.000011	1.7	24356.16	1106.44	0.06
Reach	16	5-year High	136800.00	690.63	721.38	702.88	721.80	0.000098	5.2	27086.06	1115.16	0.18
Reach	16	2-year High	101800.00	690.63	719.94	701.23	720.20	0.000065	4.1	25488.77	1107.55	0.14
Reach	16	Normal	12700.00	690.63	710.94	695.41	710.95	0.000004	0.8	15833.90	979.87	0.04
Reach	15	1-year Low	39690.00	689.96	712.02	697.27	712.11	0.000033	2.3	17189.71	970.79	0.10
Reach	15	2-year Low	101800.00	689.96	715.75	700.79	716.12	0.000114	4.9	21092.61	1089.74	0.19
Reach	15	5-year Low	136800.00	689.96	720.22	702.43	720.67	0.000109	5.4	25975.17	1093.89	0.19
Reach	15	25-year	187200.00	689.96	725.77	704.52	726.33	0.000105	6.1	32088.06	1150.25	0.19
Reach	15	10-year	168500.00	689.96	723.27	703.74	723.81	0.000113	5.9	29319.97	1117.05	0.19
Reach	15	50-year	212000.00	689.96	727.92	705.47	728.55	0.000108	6.4	34583.98	1192.93	0.19
Reach	15	100-year	231000.00	689.96	729.76	706.17	730.42	0.000107	6.6	36741.41	1198.48	0.20
Reach	15	1-year High	39690.00	689.96	718.92	697.27	718.96	0.000011	1.7	24550.82	1092.61	0.06
Reach	15	5-year High	136800.00	689.96	721.37	702.43	721.79	0.000094	5.2	27239.01	1095.58	0.18
Reach	15	2-year High	101800.00	689.96	719.94	700.79	720.19	0.000063	4.1	25664.90	1093.52	0.14
Reach	15	Normal	12700.00	689.96	710.93	694.99	710.94	0.000004	0.8	16136.09	964.86	0.03
Reach	14	1-year Low	39690.00	690.18	712.01	697.50	712.10	0.000035	2.4	16787.13	963.43	0.10
Reach	14	2-year Low	101800.00	690.18	715.72	701.09	716.10	0.000121	5.0	20686.68	1083.47	0.19
Reach	14	5-year Low	136800.00	690.18	720.19	702.72	720.65	0.000114	5.5	25544.61	1087.58	0.19
Reach	14	25-year	187200.00	690.18	725.75	704.83	726.32	0.000109	6.1	31606.62	1099.60	0.19
Reach	14	10-year	168500.00	690.18	723.24	704.06	723.80	0.000118	6.0	28867.73	1090.22	0.20
Reach	14	50-year	212000.00	690.18	727.90	705.77	728.53	0.000111	6.5	34038.91	1152.43	0.20
Reach	14	100-year	231000.00	690.18	729.73	706.51	730.41	0.000110	6.7	36166.87	1164.10	0.20
Reach	14	1-year High	39690.00	690.18	718.91	697.50	718.96	0.000011	1.7	24156.46	1086.42	0.06
Reach	14	5-year High	136800.00	690.18	721.35	702.72	721.77	0.000098	5.2	26805.83	1088.58	0.18
Reach	14	2-year High	101800.00	690.18	719.92	701.09	720.18	0.000065	4.1	25249.79	1087.34	0.14
Reach	14	Normal	12700.00	690.18	710.93	695.19	710.94	0.000004	0.8	15749.13	957.08	0.04
Reach	13	1-year Low	39690.00	690.25	712.01	696.98	712.09	0.000034	2.4	16847.27	935.10	0.10
Reach	13	2-year Low	101800.00	690.25	715.69	700.58	716.07	0.000119	5.0	20538.08	1049.68	0.19
Reach	13	5-year Low	136800.00	690.25	720.15	702.30	720.63	0.000114	5.6	25232.65	1052.19	0.19
Reach	13	25-year	187200.00	690.25	725.70	704.43	726.29	0.000111	6.2	31075.01	1055.89	0.20
Reach	13	10-year	168500.00	690.25	723.19	703.66	723.77	0.000119	6.1	28436.58	1054.01	0.20
Reach	13	50-year	212000.00	690.25	727.84	705.42	728.51	0.000114	6.6	33375.04	1098.50	0.20
Reach	13	100-year	231000.00	690.25	729.67	706.15	730.38	0.000113	6.8	35398.74	1108.26	0.20
Reach	13	1-year High	39690.00	690.25	718.91	696.98	718.95	0.000011	1.7	23926.06	1051.49	0.06
Reach	13	5-year High	136800.00	690.25	721.31	702.30	721.75	0.000098	5.3	26455.92	1052.84	0.18
Reach	13	2-year High	101800.00	690.25	719.90	700.58	720.17	0.000065	4.2	24965.39	1052.04	0.14
Reach	13	Normal	12700.00	690.25	710.93	694.68	710.94	0.000004	0.8	15844.61	929.99	0.03
Reach	12	1-year Low	39690.00	688.05	712.00	696.14	712.09	0.000031	2.3	17135.84	916.30	0.09
Reach	12	2-year Low	101800.00	688.05	715.66	699.92	716.04	0.000111	5.0	20676.66	1000.75	0.18
Reach	12	5-year Low	136800.00	688.05	720.13	701.69	720.60	0.000108	5.5	25235.80	1048.94	0.19
Reach	12	25-year	187200.00	688.05	725.68	703.87	726.27	0.000106	6.2	30939.48	1055.04	0.19
Reach	12	10-year	168500.00	688.05	723.17	703.08	723.74	0.000114	6.1	28361.73	1053.06	0.20
Reach	12	50-year	212000.00	688.05	727.82	704.86	728.48	0.000110	6.6	33148.20	1056.74	0.20
Reach	12	100-year	231000.00	688.05	729.65	705.59	730.35	0.000109	6.8	35093.08	1105.37	0.20
Reach	12	1-year High	39690.00	688.05	718.91	696.14	718.95	0.000011	1.7	23980.33	1047.50	0.06
Reach	12	5-year High	136800.00	688.05	721.30	701.69	721.73	0.000093	5.3	26432.22	1050.39	0.18

HEC-RAS Plan: Proposed Tunnel Alternative River: Stream Reach: Reach (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	12	2-year High	101800.00	688.05	719.89	699.92	720.15	0.000062	4.1	24984.19	1048.65	0.14
Reach	12	Normal	12700.00	688.05	710.93	693.74	710.94	0.000004	0.8	16162.06	907.57	0.03
Reach	11	1-year Low	39690.00	688.28	711.99	695.75	712.07	0.000030	2.3	16928.60	874.03	0.09
Reach	11	2-year Low	101800.00	688.28	715.60	699.66	716.00	0.000112	5.1	20316.84	990.13	0.19
Reach	11	5-year Low	136800.00	688.28	720.06	701.37	720.56	0.000111	5.7	24735.55	993.10	0.19
Reach	11	25-year	187200.00	688.28	725.59	703.60	726.22	0.000112	6.4	30233.27	996.74	0.20
Reach	11	10-year	168500.00	688.28	723.09	702.82	723.69	0.000118	6.3	27744.05	995.06	0.20
Reach	11	50-year	212000.00	688.28	727.72	704.62	728.43	0.000116	6.8	32497.10	1144.46	0.20
Reach	11	100-year	231000.00	688.28	729.54	705.33	730.30	0.000116	7.0	34703.64	1263.18	0.20
Reach	11	1-year High	39690.00	688.28	718.90	695.75	718.95	0.000011	1.7	23585.16	992.29	0.06
Reach	11	5-year High	136800.00	688.28	721.23	701.37	721.69	0.000097	5.4	25899.58	993.82	0.18
Reach	11	2-year High	101800.00	688.28	719.85	699.66	720.13	0.000063	4.3	24523.59	992.94	0.14
Reach	11	Normal	12700.00	688.28	710.93	693.26	710.94	0.000004	0.8	16006.06	870.23	0.03
Reach	10	1-year Low	39690.00	688.91	711.98	696.07	712.07	0.000033	2.4	16536.75	884.17	0.10
Reach	10	2-year Low	101800.00	688.91	715.57	699.98	715.98	0.000120	5.2	19926.07	994.47	0.19
Reach	10	5-year Low	136800.00	688.91	720.03	701.75	720.53	0.000117	5.7	24370.62	997.67	0.19
Reach	10	25-year	187200.00	688.91	725.56	704.01	726.20	0.000115	6.5	29903.08	1001.58	0.20
Reach	10	10-year	168500.00	688.91	723.06	703.20	723.67	0.000123	6.3	27396.03	999.81	0.20
Reach	10	50-year	212000.00	688.91	727.69	705.04	728.41	0.000118	6.8	32039.94	1003.09	0.20
Reach	10	100-year	231000.00	688.91	729.52	705.80	730.28	0.000118	7.1	33900.93	1059.95	0.21
Reach	10	1-year High	39690.00	688.91	718.90	696.07	718.95	0.000011	1.7	23243.52	996.86	0.06
Reach	10	5-year High	136800.00	688.91	721.21	701.75	721.67	0.000101	5.5	25545.91	998.50	0.18
Reach	10	2-year High	101800.00	688.91	719.83	699.98	720.11	0.000066	4.3	24171.57	997.53	0.15
Reach	10	Normal	12700.00	688.91	710.93	693.51	710.94	0.000004	0.8	15619.10	871.32	0.03
Reach	9	1-year Low	39690.00	688.16	711.97	695.74	712.06	0.000034	2.4	16272.35	822.47	0.10
Reach	9	2-year Low	101800.00	688.16	715.52	699.54	715.96	0.000131	5.3	19446.52	944.28	0.19
Reach	9	5-year Low	136800.00	688.16	719.97	701.29	720.51	0.000135	5.9	23649.41	947.65	0.20
Reach	9	25-year	187200.00	688.16	725.48	703.57	726.17	0.000140	6.7	28888.09	953.25	0.21
Reach	9	10-year	168500.00	688.16	722.98	702.74	723.64	0.000146	6.6	26508.73	950.73	0.21
Reach	9	50-year	212000.00	688.16	727.60	704.63	728.38	0.000147	7.1	30910.43	955.38	0.21
Reach	9	100-year	231000.00	688.16	729.42	705.40	730.25	0.000149	7.4	32673.25	995.43	0.21
Reach	9	1-year High	39690.00	688.16	718.89	695.74	718.94	0.000013	1.8	22630.79	946.02	0.06
Reach	9	5-year High	136800.00	688.16	721.15	701.29	721.65	0.000118	5.7	24770.25	949.01	0.19
Reach	9	2-year High	101800.00	688.16	719.80	699.54	720.10	0.000076	4.4	23485.73	947.37	0.15
Reach	9	Normal	12700.00	688.16	710.93	693.34	710.94	0.000004	0.8	15416.97	820.08	0.03
Reach	8	1-year Low	39690.00	687.93	711.96	695.48	712.05	0.000034	2.4	16337.99	879.48	0.10
Reach	8	2-year Low	101800.00	687.93	715.47	699.56	715.90	0.000125	5.2	19466.88	895.04	0.20
Reach	8	5-year Low	136800.00	687.93	719.92	701.50	720.45	0.000123	5.9	23456.20	899.44	0.20
Reach	8	25-year	187200.00	687.93	725.43	703.87	726.12	0.000123	6.7	28429.79	906.61	0.21
Reach	8	10-year	168500.00	687.93	722.92	703.04	723.58	0.000131	6.5	26166.72	903.20	0.21
Reach	8	50-year	212000.00	687.93	727.54	704.97	728.32	0.000128	7.1	30351.69	910.74	0.21
Reach	8	100-year	231000.00	687.93	729.36	705.76	730.19	0.000128	7.3	32029.90	943.04	0.21
Reach	8	1-year High	39690.00	687.93	718.89	695.48	718.94	0.000012	1.8	22531.01	898.48	0.06
Reach	8	5-year High	136800.00	687.93	721.11	701.50	721.60	0.000107	5.6	24526.03	900.94	0.19
Reach	8	2-year High	101800.00	687.93	719.77	699.56	720.07	0.000070	4.4	23321.38	899.30	0.15
Reach	8	Normal	12700.00	687.93	710.93	692.96	710.94	0.000004	0.8	15443.61	862.93	0.03
Reach	7	1-year Low	39690.00	688.16	711.95	695.04	712.04	0.000031	2.4	16590.76	841.14	0.09
Reach	7	2-year Low	101800.00	688.16	715.44	699.19	715.86	0.000118	5.2	19536.76	845.75	0.19
Reach	7	5-year Low	136800.00	688.16	719.88	701.09	720.42	0.000119	5.9	23306.06	851.56	0.20
Reach	7	25-year	187200.00	688.16	725.38	703.54	726.08	0.000122	6.7	28025.38	924.31	0.21
Reach	7	10-year	168500.00	688.16	722.88	702.66	723.54	0.000128	6.5	25866.40	855.72	0.21
Reach	7	50-year	212000.00	688.16	727.49	704.60	728.28	0.000127	7.1	30132.94	1075.24	0.21
Reach	7	100-year	231000.00	688.16	729.31	705.37	730.16	0.000128	7.4	32191.87	1199.44	0.21
Reach	7	1-year High	39690.00	688.16	718.89	695.04	718.93	0.000011	1.8	22457.46	850.23	0.06
Reach	7	5-year High	136800.00	688.16	721.07	701.09	721.57	0.000104	5.6	24321.79	853.27	0.19
Reach	7	2-year High	101800.00	688.16	719.75	699.19	720.05	0.000067	4.4	23191.73	851.38	0.15
Reach	7	Normal	12700.00	688.16	710.93	692.33	710.94	0.000004	0.8	15731.90	838.74	0.03
Reach	6	1-year Low	39690.00	687.20	711.95	694.29	712.03	0.000026	2.2	17767.12	881.76	0.09
Reach	6	2-year Low	101800.00	687.20	715.45	698.19	715.82	0.000101	4.9	20906.22	909.31	0.18
Reach	6	5-year Low	136800.00	687.20	719.90	699.98	720.37	0.000102	5.5	24996.05	927.46	0.18
Reach	6	25-year	187200.00	687.20	725.41	702.30	726.02	0.000105	6.3	30161.71	950.76	0.19
Reach	6	10-year	168500.00	687.20	722.90	701.48	723.49	0.000110	6.1	27800.87	937.93	0.19
Reach	6	50-year	212000.00	687.20	727.52	703.37	728.22	0.000110	6.7	32353.29	1084.95	0.20
Reach	6	100-year	231000.00	687.20	729.34	704.15	730.09	0.000110	6.9	34419.21	1192.36	0.20
Reach	6	1-year High	39690.00	687.20	718.89	694.29	718.93	0.000010	1.7	24059.93	923.86	0.06
Reach	6	5-year High	136800.00	687.20	721.09	699.98	721.52	0.000089	5.3	26103.75	931.65	0.17
Reach	6	2-year High	101800.00	687.20	719.76	698.19	720.02	0.000057	4.1	24865.15	926.96	0.14
Reach	6	Normal	12700.00	687.20	710.93	691.61	710.93	0.000003	0.8	16869.39	874.23	0.03
Reach	5	1-year Low	39690.00	683.93	711.94	693.44	712.02	0.000025	2.2	17892.20	859.55	0.09
Reach	5	2-year Low	101800.00	683.93	715.43	697.53	715.80	0.000097	4.9	20935.17	885.76	0.17

HEC-RAS Plan: Proposed Tunnel Alternative River: Stream Reach: Reach (Continued)

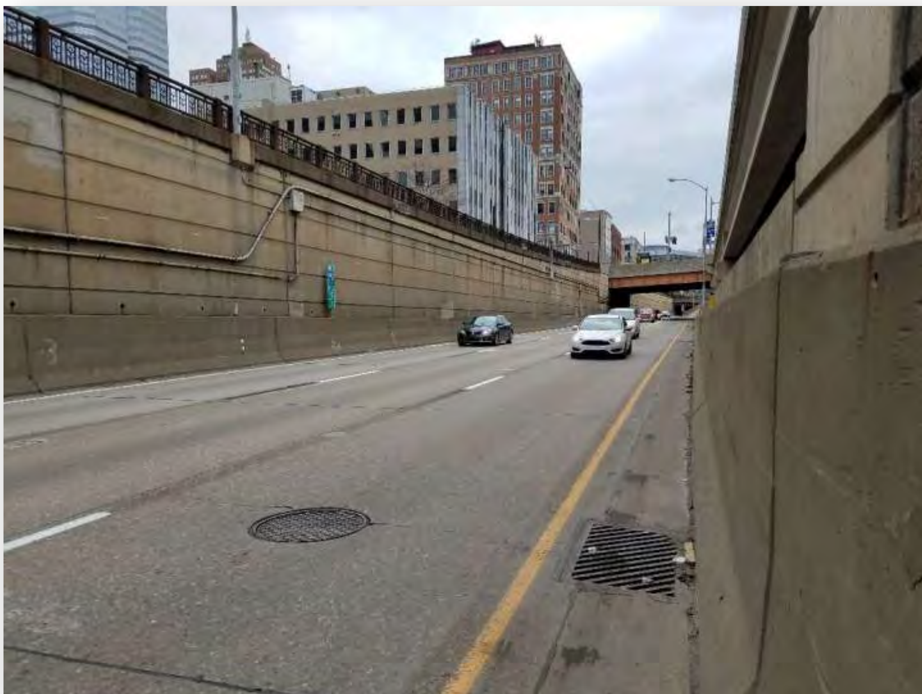
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	5	5-year Low	136800.00	683.93	719.88	699.39	720.35	0.000100	5.5	24918.92	908.14	0.18
Reach	5	25-year	187200.00	683.93	725.38	701.75	726.00	0.000104	6.3	30030.45	1003.98	0.19
Reach	5	10-year	168500.00	683.93	722.88	700.91	723.47	0.000109	6.2	27664.41	925.59	0.19
Reach	5	50-year	212000.00	683.93	727.49	702.84	728.20	0.000109	6.8	32191.72	1053.13	0.20
Reach	5	100-year	231000.00	683.93	729.31	703.66	730.07	0.000110	7.0	34193.30	1148.45	0.20
Reach	5	1-year High	39690.00	683.93	718.88	693.44	718.93	0.000009	1.7	24021.43	901.25	0.06
Reach	5	5-year High	136800.00	683.93	721.07	699.39	721.51	0.000087	5.3	26004.90	911.46	0.17
Reach	5	2-year High	101800.00	683.93	719.74	697.53	720.01	0.000056	4.1	24799.78	907.69	0.14
Reach	5	Normal	12700.00	683.93	710.93	690.84	710.93	0.000003	0.7	17020.12	852.42	0.03
Reach	4.5		Bridge									
Reach	4	1-year Low	39690.00	682.84	711.73	693.18	711.81	0.000025	2.2	17874.35	869.99	0.09
Reach	4	2-year Low	101800.00	682.84	715.21	697.40	715.58	0.000099	4.9	20982.07	904.40	0.18
Reach	4	5-year Low	136800.00	682.84	719.66	699.24	720.13	0.000101	5.5	25162.76	958.52	0.18
Reach	4	25-year	187200.00	682.84	725.14	701.61	725.76	0.000104	6.3	30676.13	1060.38	0.19
Reach	4	10-year	168500.00	682.84	722.66	700.78	723.24	0.000109	6.1	28072.98	994.41	0.19
Reach	4	50-year	212000.00	682.84	727.23	702.70	727.93	0.000109	6.7	32897.46	1073.66	0.20
Reach	4	100-year	231000.00	682.84	729.02	703.52	729.77	0.000110	7.0	34847.16	1105.13	0.20
Reach	4	1-year High	39690.00	682.84	718.72	693.18	718.76	0.000010	1.7	24259.00	954.68	0.06
Reach	4	5-year High	136800.00	682.84	720.86	699.24	721.30	0.000088	5.3	26316.66	964.48	0.17
Reach	4	2-year High	101800.00	682.84	719.56	697.40	719.82	0.000056	4.1	25062.33	958.10	0.14
Reach	4	Normal	12700.00	682.84	710.71	690.44	710.72	0.000003	0.7	16995.94	852.36	0.03
Reach	3	1-year Low	39690.00	686.48	711.73		711.80	0.000026	2.2	17957.64	911.52	0.09
Reach	3	2-year Low	101800.00	686.48	715.18		715.54	0.000101	4.8	21180.54	947.48	0.18
Reach	3	5-year Low	136800.00	686.48	719.64		720.10	0.000101	5.4	25439.04	961.91	0.18
Reach	3	25-year	187200.00	686.48	725.13		725.71	0.000103	6.2	31866.38	1636.62	0.19
Reach	3	10-year	168500.00	686.48	722.63		723.20	0.000109	6.0	28422.77	1081.42	0.19
Reach	3	50-year	212000.00	686.48	727.22		727.87	0.000106	6.5	35459.07	1823.94	0.19
Reach	3	100-year	231000.00	686.48	729.02		729.70	0.000104	6.7	38859.30	1966.97	0.19
Reach	3	1-year High	39690.00	686.48	718.72		718.76	0.000010	1.6	24551.93	959.10	0.06
Reach	3	5-year High	136800.00	686.48	720.84		721.26	0.000087	5.2	26604.84	978.03	0.17
Reach	3	2-year High	101800.00	686.48	719.55		719.80	0.000057	4.0	25348.22	961.62	0.14
Reach	3	Normal	12700.00	686.48	710.71		710.72	0.000003	0.7	17036.53	904.87	0.03
Reach	2	1-year Low	39690.00	686.68	711.72		711.79	0.000026	2.2	18010.96	906.87	0.09
Reach	2	2-year Low	101800.00	686.68	715.15		715.51	0.000100	4.8	21193.56	942.18	0.18
Reach	2	5-year Low	136800.00	686.68	719.61		720.07	0.000100	5.4	25430.82	958.66	0.18
Reach	2	25-year	187200.00	686.68	725.10		725.68	0.000102	6.2	32048.79	1544.22	0.19
Reach	2	10-year	168500.00	686.68	722.60		723.17	0.000108	6.0	28400.58	1116.26	0.19
Reach	2	50-year	212000.00	686.68	727.19		727.84	0.000105	6.5	35284.31	1548.45	0.19
Reach	2	100-year	231000.00	686.68	728.99		729.67	0.000104	6.7	38099.75	1606.26	0.19
Reach	2	1-year High	39690.00	686.68	718.71		718.75	0.000009	1.6	24573.39	955.11	0.06
Reach	2	5-year High	136800.00	686.68	720.82		721.24	0.000087	5.2	26597.28	977.40	0.17
Reach	2	2-year High	101800.00	686.68	719.53		719.78	0.000056	4.0	25353.35	958.34	0.14
Reach	2	Normal	12700.00	686.68	710.71		710.72	0.000003	0.7	17099.07	902.79	0.03
Reach	1	1-year Low	39690.00	686.93	711.71	694.08	711.79	0.000026	2.2	18006.63	898.15	0.09
Reach	1	2-year Low	101800.00	686.93	715.11	698.10	715.48	0.000100	4.8	21154.88	958.39	0.18
Reach	1	5-year Low	136800.00	686.93	719.58	699.96	720.03	0.000100	5.4	26175.16	1166.67	0.18
Reach	1	25-year	187200.00	686.93	725.07	702.37	725.64	0.000100	6.1	33905.90	1555.58	0.19
Reach	1	10-year	168500.00	686.93	722.57	701.54	723.13	0.000107	6.0	30034.65	1473.34	0.19
Reach	1	50-year	212000.00	686.93	727.17	703.45	727.80	0.000103	6.5	37170.46	1559.16	0.19
Reach	1	100-year	231000.00	686.93	728.97	704.16	729.63	0.000102	6.6	39995.21	1597.41	0.19
Reach	1	1-year High	39690.00	686.93	718.71	694.08	718.75	0.000009	1.6	25166.54	1162.62	0.06
Reach	1	5-year High	136800.00	686.93	720.79	699.92	721.21	0.000087	5.2	27627.20	1252.75	0.17
Reach	1	2-year High	101800.00	686.93	719.51	698.11	719.76	0.000056	4.0	26098.12	1166.36	0.14
Reach	1	Normal	12700.00	686.93	710.71	691.10	710.72	0.000003	0.7	17109.86	895.38	0.03

Appendix B:

Stormwater Memorandum

APPENDIX B – ALTERNATIVES ANALYSIS
STORMWATER ASSESSMENT
Interstate 376 (I-376 Bathtub)

City of Pittsburgh
Allegheny County, Pennsylvania



Prepared For:

pennsylvania
DEPARTMENT OF TRANSPORTATION
DISTRICT 11-0

Prepared By:

NEWELL TERESKA & MACKAY
ENGINEERING

December 2020

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I-376 BATHTUB STUDY ALTERNATIVES ANALYSIS
STORMWATER ANALYSIS
ALLEGHENY COUNTY | PENNDOT DISTRICT 11-0

I. INTRODUCTION AND PROJECT DESCRIPTION

A stormwater analysis was performed to evaluate the PennDOT District 11-0 (PennDOT) drainage systems and surface flooding into the “Big Bathtub” and “Little Bathtub” section of the Interstate 376 (I-376) Central Parkway. The analysis also encompasses the Ramp D area of ponding on I-376 West from Grant Street to the Ft. Pitt Bridge. The project site is located within the City of Pittsburgh in Allegheny County, Pennsylvania on the USGS quadrangle maps entitled Pittsburgh East, PA and Pittsburgh West, PA (**Figure B-1A**). The purpose of the stormwater analysis was to determine if the localized stormwater runoff (runoff from the road and impervious drainage areas to the sumps) and storm sewer surcharge is a source of the flooding and see how it might be interconnected to the river flooding.

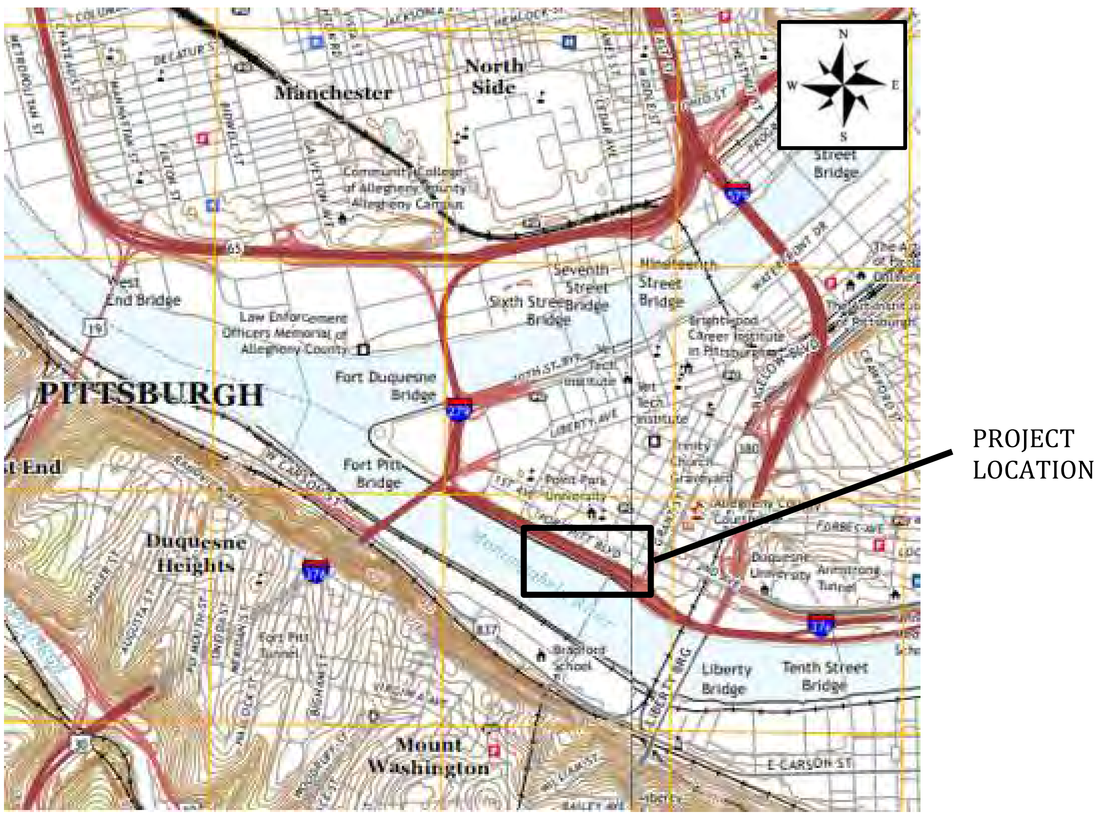


Figure B-1A. *Project Location – USGS Quadrangle*

NTM was tasked with studying the storm water system in the area where Smithfield street crosses I-376. This task was completed with SWMM modeling of the existing stormwater system using the PCSWMM model. PCSWMM is a dynamic rainfall-runoff simulation and storm sewer analysis model used for single event or long-term simulation of runoff quantity and quality from primarily urban areas, and thus is appropriate for this situation. The three areas of the Central Parkway that typically flood are shown in **Figure B1-B**: the Ramp D/Tunnel Area near Grant Street; the "Big Bathtub" area (Wood Street Sump); and the "Little Bathtub" area (Stanwix Street Sump).

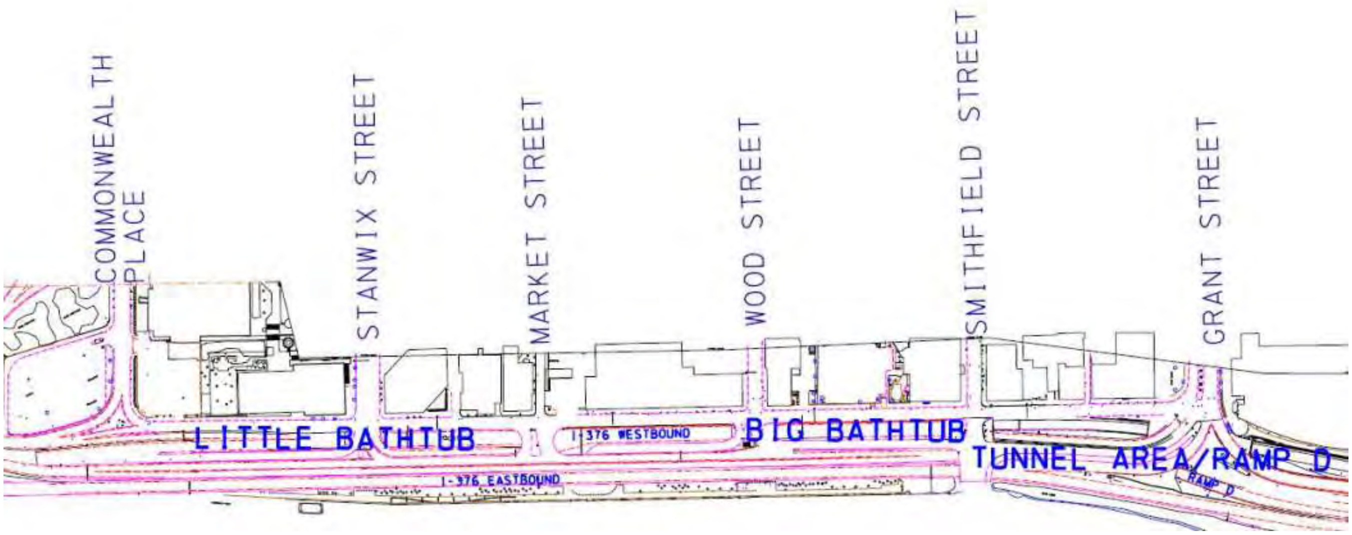


Figure B-1B. *Project Location – CAD Base Mapping*

There are currently two separate PennDOT storm sewer systems consisting of 18-inch diameter pipe in the Little Bathtub and Big Bathtub areas that drain to a sump chamber located at Stanwix Street for the Little Bathtub and Wood Street for the Big Bathtub. A third system is located southeast of the tunnel and flows directly to the river, with a drop structure into the ALCOSAN sewer system.

The sump chambers have sump pumps in them to pump out water during and after flooding events when water from the Monongahela River floods the roads. The pumps are dewatering pumps and do not reduce the flooding event as it is occurring. The areas of the Central Parkway that flood are closed off to traffic during flooding events and the stormwater is pumped out through the pumps over the wall into the parking area between the wall and the River. The existing permanent 4-inch pumps are undersized and cannot handle mud and other flood-related debris. Therefore, these pumps are deactivated just prior to the wall being overtopped. After the wall is breached and the floodwaters have receded below the wall, a Contractor on retainer with PennDOT, trailers in larger 6-inch centrifugal pumps at the Mon Wharf and Stanwix Street Ramps. The 6-inch standpipe systems are used to pump out the bathtub areas more quickly than the 4-inch pumps and without mud and flood debris clogging the pumps. Once the water level in the bathtub reaches a point that the 6-inch pumps are ineffective and flood debris is not a concern, the 4-inch pumps are activated to remove the remaining water.

Although the Little Bathtub and Big Bathtub are separate areas of flooding, when the flood level reaches a high enough elevation between the two areas, the two areas possibly overflow into each other and become contiguous. PennDOT has reported that local drainage area runoff has not contributed to the flooding in the bathtubs and the goal of this analysis is to determine if this is the case.

II. DATA ANALYSIS

General information about the sumps was provided by PennDOT in the March 2, 2020 status conference call. Bill Lester from PennDOT District 11 indicated that the sluice gates on each sump pump chamber outflow pipe in both bathtubs were functioning properly and would be improved or made automated if enhancements are made to alleviate the bathtub's flooding. As such, surcharge into the two bathtub areas would not need to be further analyzed and the stormwater analysis would be focused on the Ramp D/Tunnel Area flooding and surcharge.

The various drawing sets and data for the bathtub obtained from PennDOT and other sources included:

- 1982 PennDOT LR 764 Roadway Plans (76 sheets)
- 1982 PennDOT LR 764 Floodwall Protection Plans (26 sheets)
- 2001 Fort Pitt Boulevard Eastbound/Interstate Connector Plans (88 sheets)
- Project surveyed LiDAR topographic data
- PASDA LiDAR data
- ALCOSAN GIS and SWMM model data
- Google Earth and Google Earth Street View images
- 10th Street Bypass Bathtub/Interstate Connector Emergency Closure Procedure

After further research and after additional plans for the Ramp D/Tunnel area were provided, it was determined that the Ramp D inlets near where there is reported ponding are connected to the Big Bathtub system and Wood Street sump pump chamber. Therefore, the Big Bathtub was included as part of the Ramp D/Tunnel Area PCSWMM model for the analysis.

NTM Engineering, Inc. (NTM) evaluated the data available for the storm drainage systems in this section of the Central Parkway. Data provide by others included detailed topography of the drainage area to the bathtub and the surrounding drainage area at 0.5-foot intervals. There was existing data on storm sewers, inlets and manhole locations provided but there was limited data on inlet/manhole and rim and invert and pipe elevations that drain to this area. All storm sewers, drainage systems and appurtenance works were evaluated to determine if they should be included in the PCSWMM model. On October 10, 2020, additional survey was completed to obtain the inlet/manhole rim and invert elevations for the structures that are located in the Big Bathtub and in the Ramp D/Tunnel Area required to run the PCSWMM model.

The PWSA/ALCOSAN SWMM model and the PennDOT 1982 drawings have a vertical datum of NGVD 1929. Current survey is in NAVD 1988. Elevation reported herein are NAVD 1988 with NGVD 1929 in parentheses (where applicable) to compare against the SWMM model and appurtenant drawings. The NAVD 1988 elevations are 0.52 feet lower than the reported NGVD 1929 elevations. Any data from plans that was recorded in NGVD 1929 datum, was converted to NAVD 1988 datum for input into the PCSWMM model.

Based on the information provided, the PennDOT Big Bathtub storm sewer system is independent of the PWSA/ALCOSAN system. There are, however, drop structure tie-ins at the ALCOSAN 90-inch trunk line diversion structures and at various roadway storm inlets in the area of Ramp D southeast of the Tunnel. The *Fort Pitt Boulevard Eastbound/Interstate Connector Plans* from 2001 are the most current set received from PennDOT. From the available drawings, it appears that the local PennDOT system (the area where stormwater flows to the PennDOT storm sewer system in the bathtub area) eventually flows to the sump chambers (highlighted in yellow southeast of the floodwall in **Figure B-2**).

The floodwall drawings have more detail on the sump chamber system, particularly on how the PennDOT storm system ties into the sump chambers, a sample of which is shown in **Figure B-2**. The PWSA/ALCOSAN system is highlighted in brown while the PennDOT system is shown in yellow. The drawing set provided profiles for road elevations, inverts, and profiles for some of the storm sewers, but did not provide all of the necessary invert data to fully develop the stormwater model.

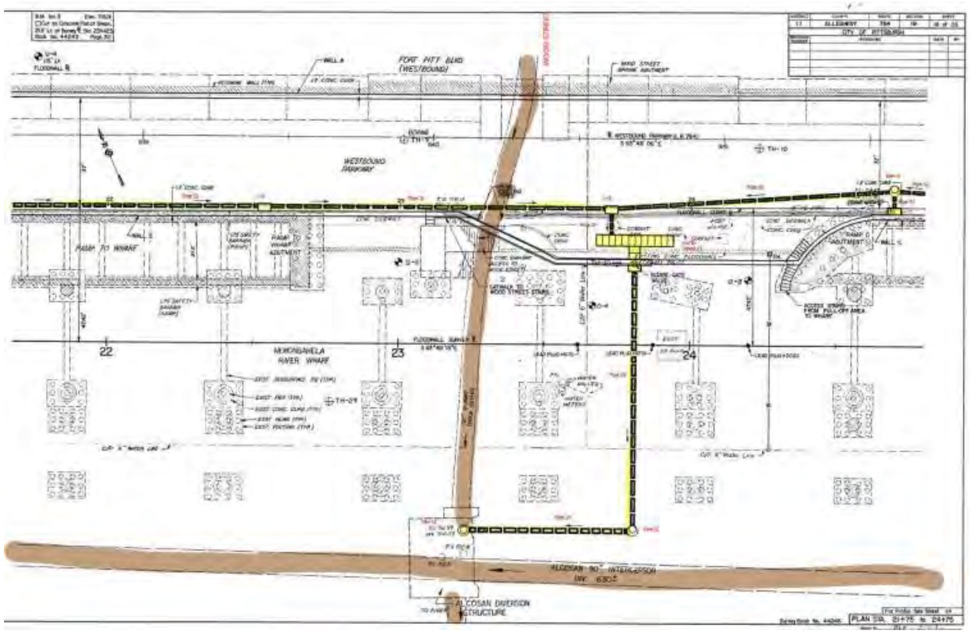


Figure B-2. *Sample Floodwall Drawing for the Big Bathtub Area (Near Wood Street) Showing the Big Bathtub Sump*

Based on the field view, the field survey and the floodwall drawings, stormwater flows from the sump chamber through a manually operated sluice gate on the exterior of the chamber to the 90” ALCOSAN system and ties in via a diversion structure.

The sluice gates prevent the storm sewer on the river side of the floodwall from surcharging into the sump chambers. It appears that for the storm system to function one would expect a baffle within the sump chamber separating the incoming and outgoing storm sewer from the actual sump pump chamber, although no design drawings have been received to confirm this. The field survey uncovered what appeared to be a baffle during the field view, but it does not function as a full baffle due to a 1.5' gap between the bottom of the sump chamber and the bottom of the "baffle". It appears that the upper portion of the baffle is to shield the pumps from the inflow turbulence and prevent floatables from interfering with the pumps, while the open bottom would allow the entire chamber to be pumped dry after an event. From team progress meetings, it has been determined that the sluice gate on the sump pump chamber outflow pipe in the Big Bathtub is functioning properly and would be improved if enhancements are made to alleviate the bathtub's flooding. **Figure B-3** provides a layout of the sump chamber(s) from information received from the field survey.

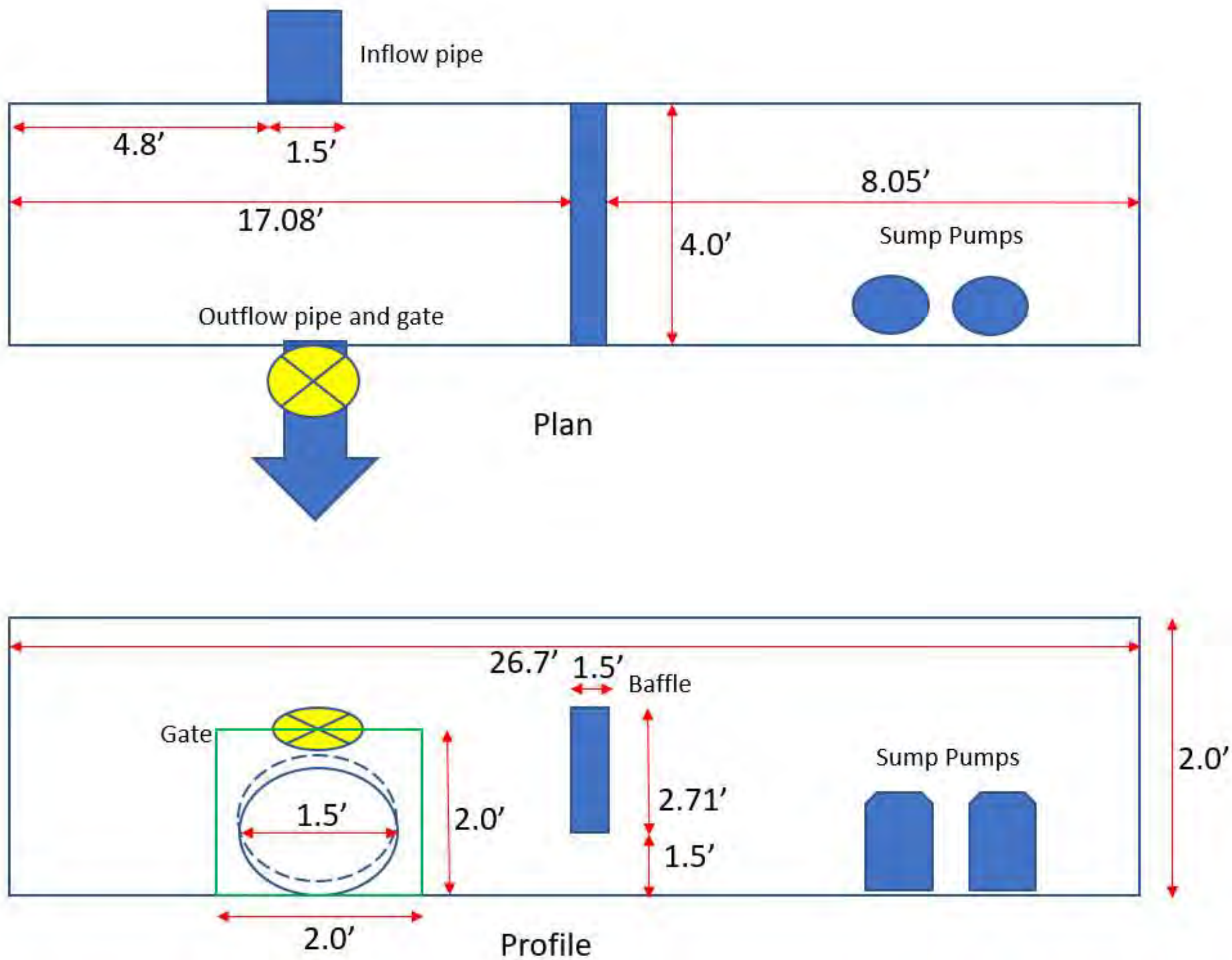


Figure B-3: *Schematic of PennDOT Sump System*

The roadway plans did not have inverts for the storm sewers, an example of which is shown in **Figure B-4**. Therefore, additional survey data was required to complete the storm sewer analysis and the data was collected on October 10, 2020.

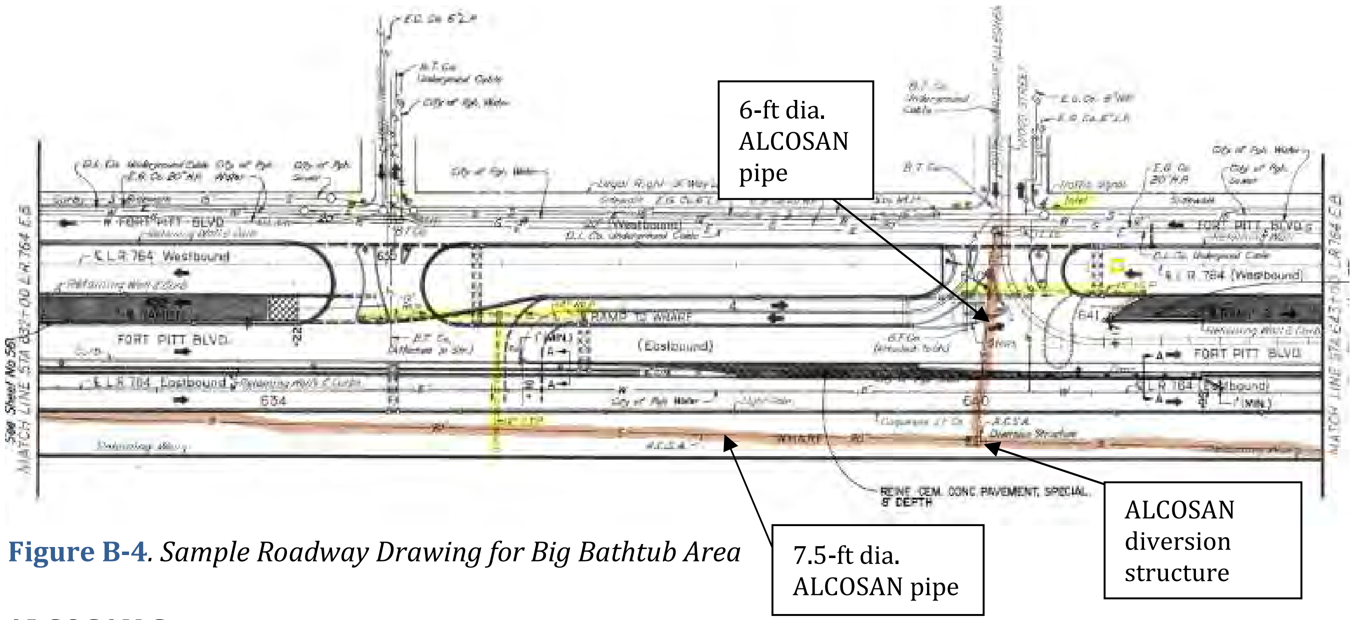


Figure B-4. *Sample Roadway Drawing for Big Bathtub Area*

ALCOSAN Sewer

NTM obtained the ALCOSAN SWMM Model to evaluate if the ALCOSAN system impacted the PennDOT system in the Bathtub area. The ALCOSAN SWMM model has a 4-foot diameter pipe and a 3-foot diameter pipe that traverse the Ramp D area just southeast and northwest of the tunnel respectively (**Figure B-5**) and one 6-foot diameter line pipe that traverses the Big Bathtub area just northwest of the sump (shown in brown in **Figure B-2** and **Figure B-4**). The 6-foot pipe has an invert that is 8 feet below the PennDOT storm sewer and the PennDOT storm system does not tie into it, or vice versa. The six-foot pipe as well as the PennDOT Wood Street sump chamber tie into an ALCOSAN diversion structure downstream of the Wood Street sump chamber (middle-bottom of **Figure B-2**). The tie in of the PennDOT system to the ALCOSAN diversion structure downstream of Wood Street is not shown in **Figure B-4** because it was not included as part of the Roadway Plans.

The 3-foot diameter pipe just northwest of the tunnel in **Figure B-5** traverses Ramp D from Fort Pitt Boulevard on its way to the river. It has a tie in from the PennDOT storm sewer system from Ramp A before the pipe crosses approximately 8 feet under Ramp D[1]. No inlets from Ramp D tie into this pipe.

The 4-foot ALCOSAN pipe just southeast of the tunnel flows towards Ramp D from the City (**Figure B-5**). The pipe first enters a manhole (referred to as a junction in the SWMM model) on the southeast side

[1] Based on the 2001 Fort Pitt Boulevard Eastbound/Interstate Connector Plan details.

of Ramp D with a field surveyed bottom elevation of 709.40 and a rim elevation of 726.10. PennDOT storm sewers on Ramp D southeast of the tunnel area tie into this junction. The ALCOSAN pipe then flows under Ramp D in another 4-foot diameter pipe to a diversion structure. The ALCOSAN SWMM model did not include the PennDOT storm sewer system.

Figure B-5. *ALCOSAN System Layout Through the Ramp D Area as Portrayed by the ALCOSAN SWMM Model*

The invert of the 4-foot diameter ALCOSAN pipe is approximately 6 feet below the PennDOT pipe where they cross. The diversion structure, which has dimensions of 1 foot wide by 0.333 ft in height, diverts some flow to a junction with an invert of 704.84 (705.36) and a rim of 728.77 (729.29). This then flows through another diversion structure with a 1.5-foot diameter. The profile of the ALCOSAN system configuration is shown in **Figure B-6**. The flow then enters another junction to the 90-inch (7.5-foot) diameter ALCOSAN trunk line with an invert of 630.18 (630.7) and a rim of 729.48 (730). Note that the 90-inch trunk line is approximately 100 feet below the ground surface.

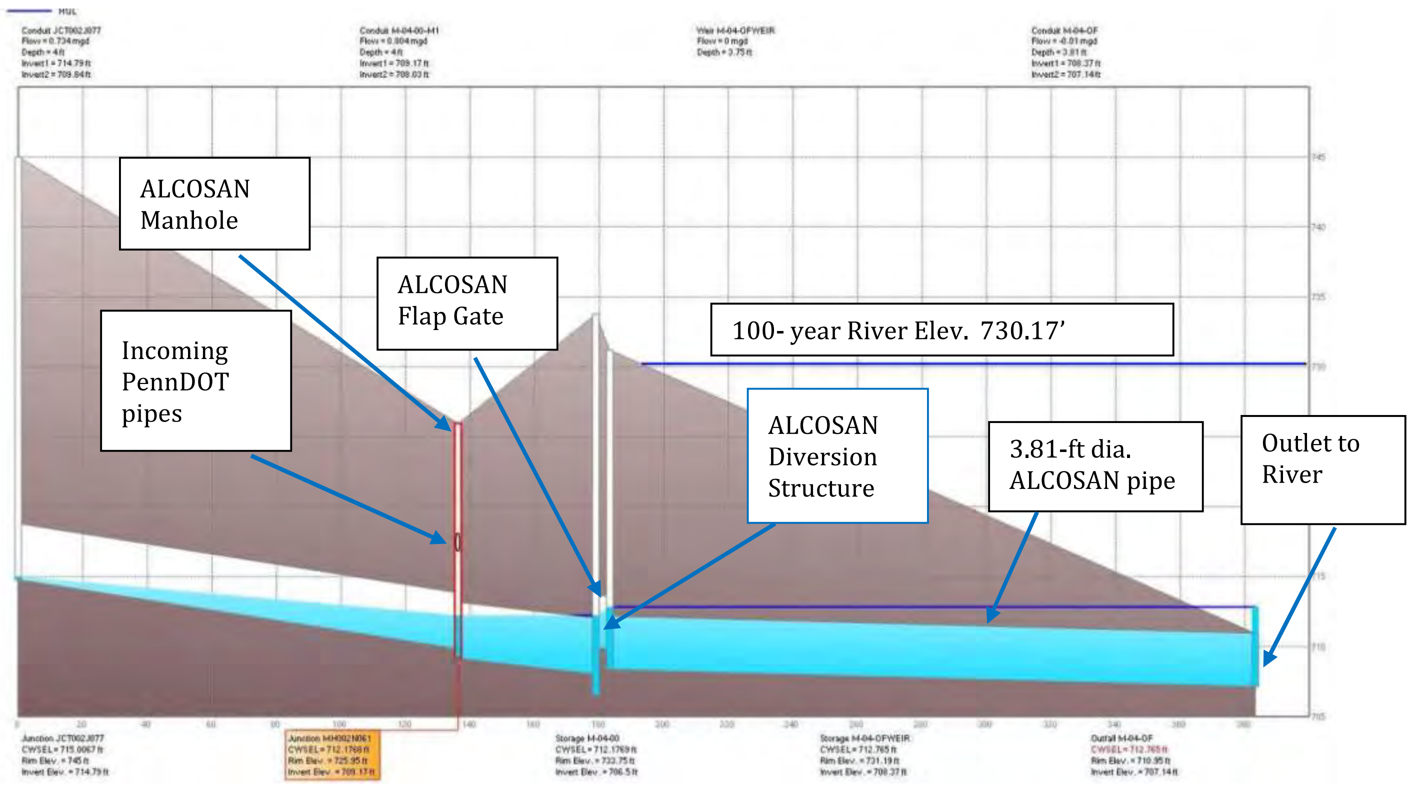


Figure B-6. *SWMM Profile of 4-foot Diameter ALCOSAN Storm Sewer Through the Ramp D Area*

The flow that is not diverted is allowed to flow through another 3.75-foot by 3.75-foot diversion structure and into a junction with an invert of 707.85 (708.37) and a rim of 730.67 (731.19). From there, it flows into a 3.81-foot diameter pipe to its outlet at the river. According to the ALCOSAN SWMM model, this diversion structure has a flap gate on it. (**Figure B-7**). The river outlet has an invert of 706.62 (707.14) (**Figures B-5 and B-6**).

Figure B-7. *Diversion Structure West Side of Ramp D – ALCOSAN System*

Ramp D Surface Data

An initial comparison of the PennDOT Floodwall and Roadway drawings and the street views showed a number of discrepancies. Many of the discrepancies were with the number and location of inlets found in street view versus those shown on the plans. There was also a discrepancy with the location of Ramp D when overlaying the survey over the Floodwall Drawings as shown in **Figure B-8**. Ramp D in the survey did not line up with Ramp D on the plans. Once the *2001 Fort Pitt Boulevard Eastbound/Interstate Connector Plans* were made available, the discrepancies between the Google Street View and the Plans were explained. The *Fort Pitt Boulevard Plans Eastbound/Interstate Connector Plans* showed that Ramp D underneath the Smithfield Bridge was shifted south and new inlets were added in 2001 (**Figure B-10**).

From the Google Street View it appeared that the area of ponding in Ramp D is in the tunnel (approximate location 650+00); the PennDOT Ramp D profile (**Figure B-9**) and project surveyed LiDAR topo indicated a low point under the Smithfield Street bridge overpass at approximately Station 645+40 with an elevation of 717.53 (718.05) from **Figure B-9**. The initial project surveyed LiDAR elevations were not picked up directly inside of the tunnel, however, the subsequent field survey did pick up spot elevations inside the tunnel. The project surveyed LiDAR elevations just southeast of the Smithfield Street bridge indicate a low point of elevation 716.9 at approximately station 646+30 and a top of grate elevation obtained through the field survey at an inlet at that location is 716.97. The subsequent field survey also picked up a relatively flat area just northwest of the tunnel.

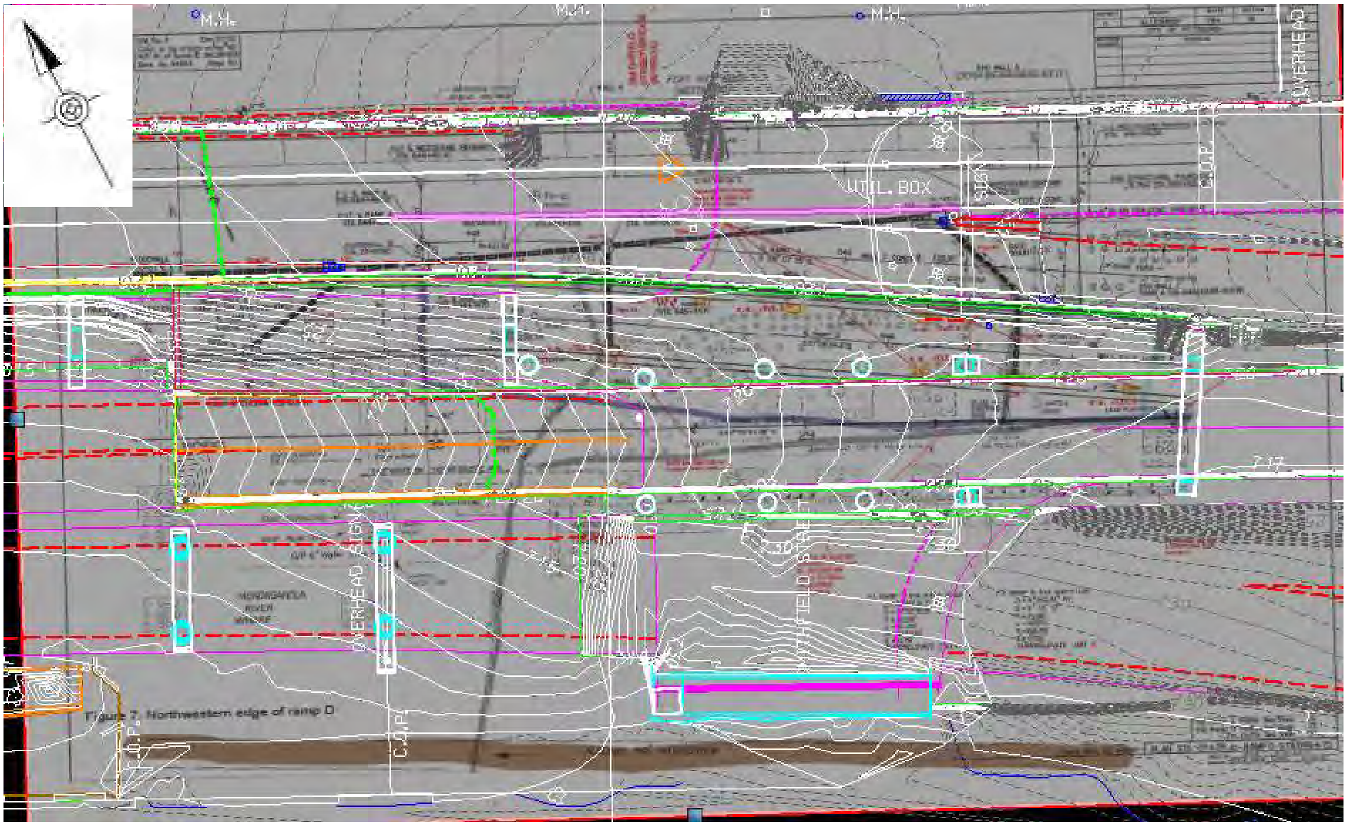


Figure B-8. *Floodwall Drawing Overlay onto Survey*

The profile for Ramp D (**Figure B-9**) shows that there is a constant downward slope northwestward in the tunnel towards the low area northwest of the tunnel. There are six inlets and an 18-inch diameter RCCP storm sewer located in a depressed area of Ramp D (just southeast of the Smithfield Street Bridge), shown in **Figure B-10**, that convey stormwater to the storm sewer system to the Wood Street sump (Big Bathtub). The plans did not provide pipe or inlet invert elevations for these structures, but the invert elevations were provided by AECOM for those six inlets through archived design files supplied by SAI and ultimately provided by AECOM through a field survey. There are no inlets inside the tunnel.

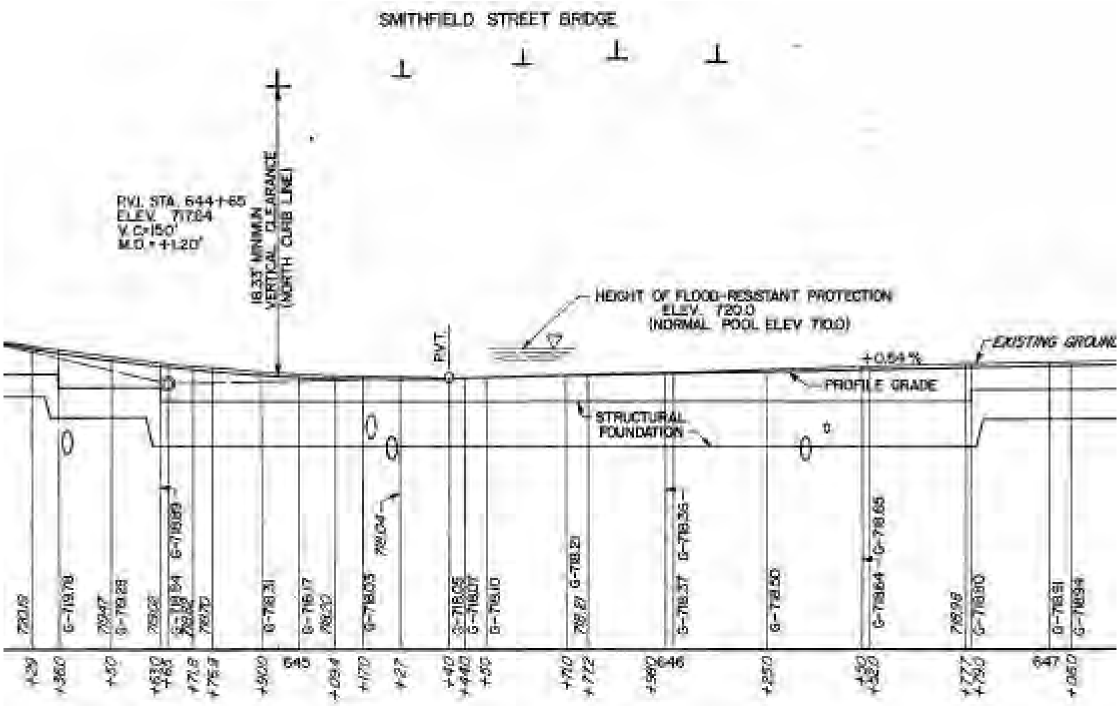


Figure B-9: *Ramp D Profile at Smithfield Street Bridge*

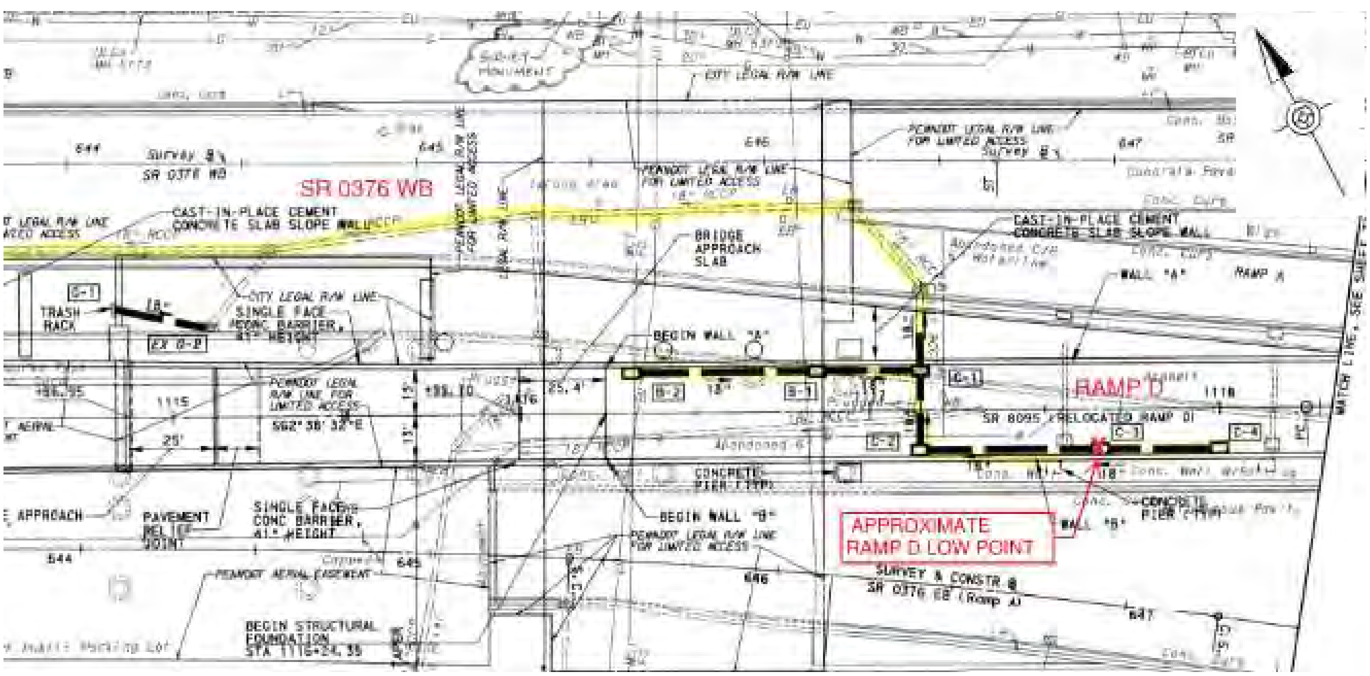


Figure B-10. *Ramp D Inlets at Smithfield Street Bridge Intersection - Source: 2001 Eastbound/ Interstate Connector Drawings*

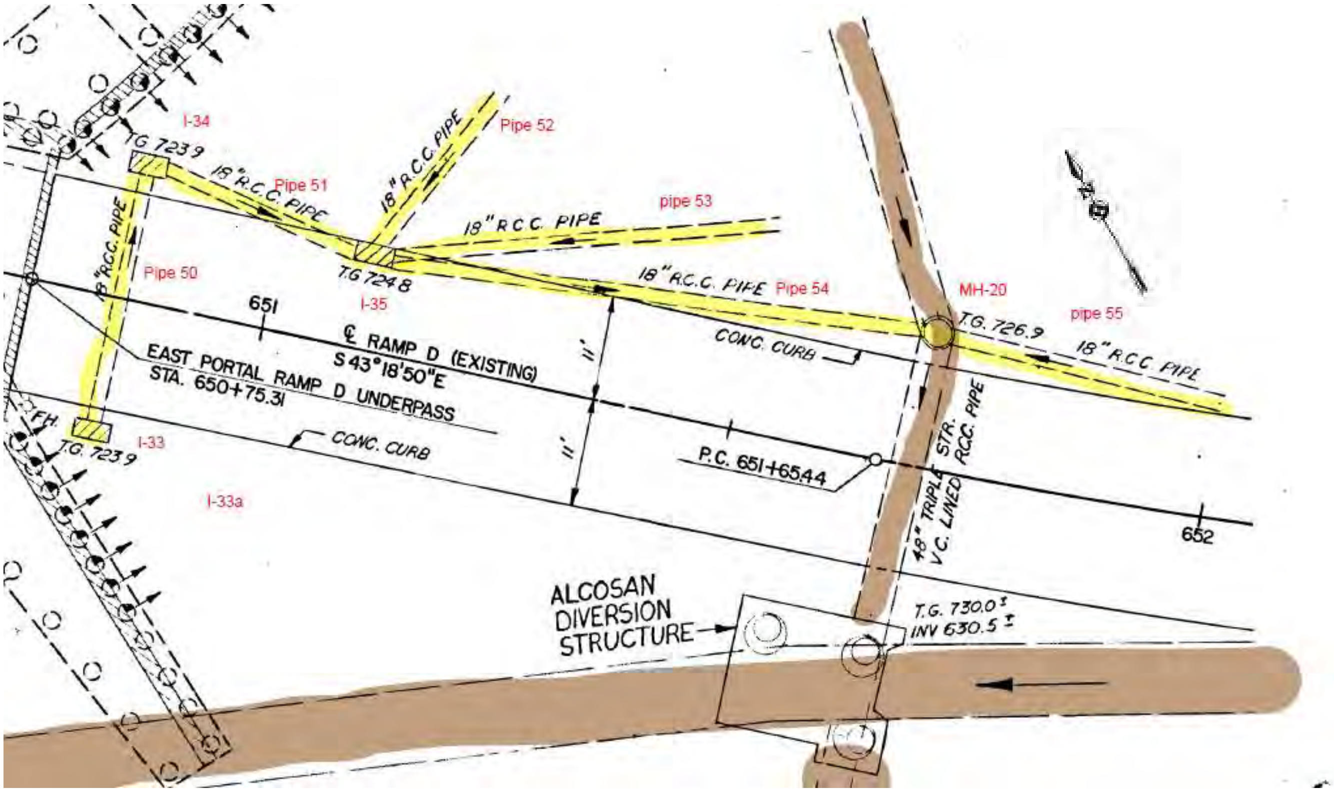


Figure B-11. *Inlets in Ramp D Southeast of the Tunnel Area that Discharge to the ALCOSAN System*

It appears by comparing various elevations (shown in **Figure B-12**) that when the Big Bathtub floods to an elevation above the low point of the Ramp D depressed area, the floodwater from the Big Bathtub could surcharge through the storm sewer to the inlets in Ramp D. It can be seen from **Figure B-12** that the low point elevation of the Ramp D/Tunnel Area is somewhere between the 2- and 5-year river event elevations. However, as has been reported by PennDOT, both bathtubs have sluice valves that are in working order. If this is the case, the inlets in the Ramp D sump should not surcharge until the floodwall is overtopped.

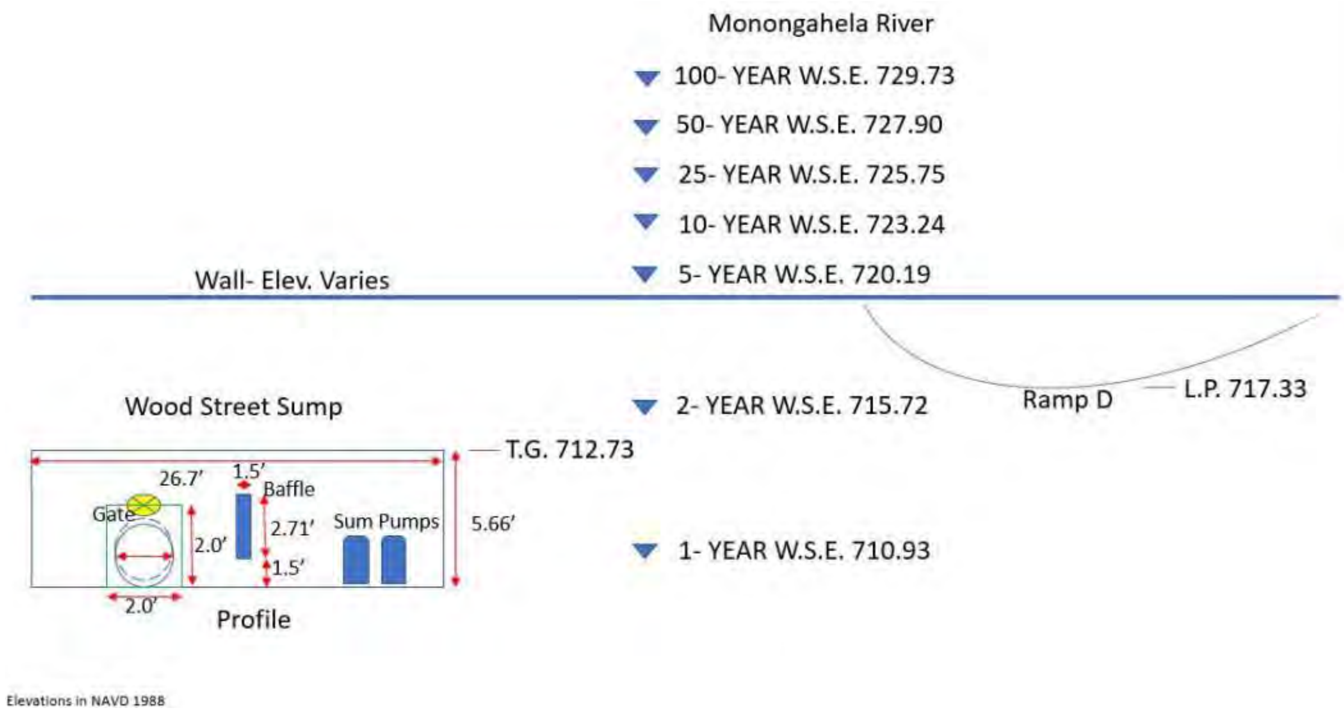


Figure B-12. *Wood Street Sump, Ramp D Low Point, and Monongahela River Elevation Comparison*

Drainage Areas

The various plans, models and other data were compared to determine the surface drainage area that contributes to the Little Bathtub, Big Bathtub, and the Ramp D/Tunnel Area flooding, the low point location, and how the storm sewer system functions in this area.

Drainage areas were delineated to the Little Bathtub area, the Big Bathtub area, and the Tunnel Area, as shown in **Figure B-13**. Only the Big Bathtub and Tunnel Area was analyzed since it was decided in status meetings that the sump sluice gates were functioning properly and preventing backwater from the river from entering the bathtub areas. The Ramp D tunnel is not included in any of the drainage areas because it is completely enclosed and therefore rainfall does not fall on the inside of the tunnel. The portion of the Ramp D location that is tributary to the Big Bathtub is shown as part of the Big Bathtub drainage area in **Figure B-13**. The Tunnel Area drainage area in green in **Figure B-13** was included in the analysis even though its inlets are not tributary to the Big Bathtub It was currently assumed that the inlets that are located southeast of the Tunnel Area (highlighted in yellow in **Figure B-11**) do not capture all of the stormwater tributary to them and that the stormwater bypasses and enters into the Big Bathtub drainage area.

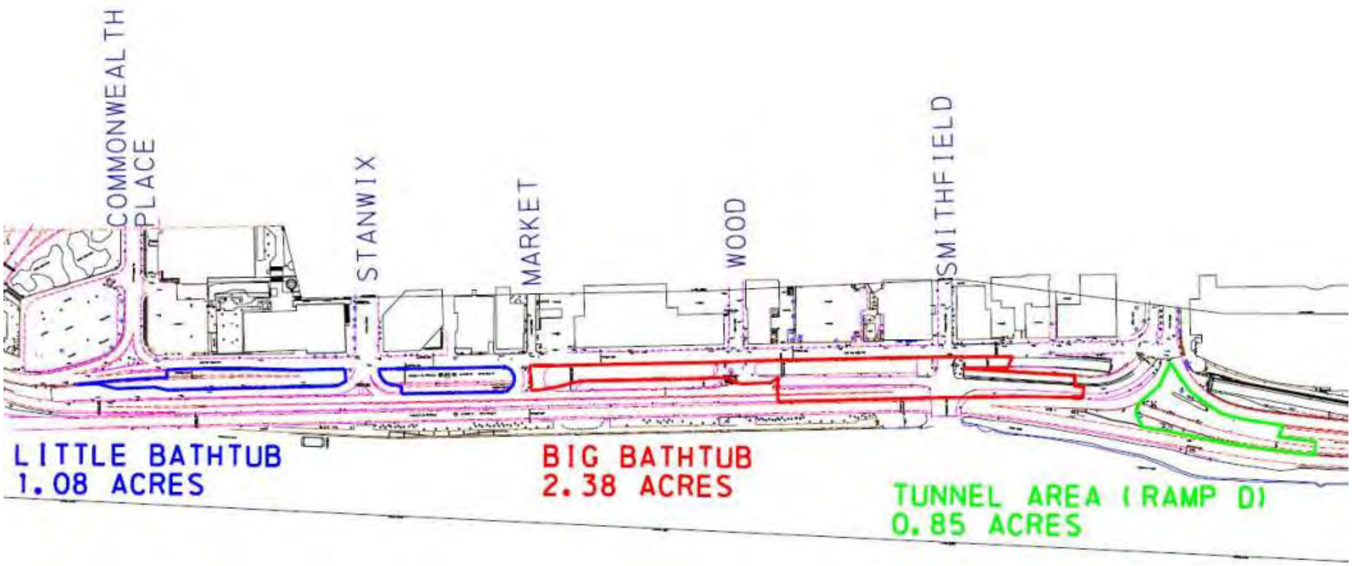


Figure B-13. *Overview of Study Area and Respective Drainage Areas*

PennDOT Storm System Data

An analysis was performed to determine what data (pipe sizes, manhole inlet and pipe inverts, and connectivity) was available for modeling and what data was missing. A significant amount of storm sewer data needed to be surveyed. A complete listing of available PennDOT storm sewer data is listed in Appendix B-1.

Additionally, the stage-storage data for the Ramp D/Tunnel Area, Big Bathtub and Little Bathtub were calculated from the LiDAR survey. An example of the stage-storage data is shown in **Figure B-14**.

STANDARD WORKSHEET #14
Storage Data: Little Bathtub

PROJECT NAME: Little Bathtub- Stanwix
LOCATION: Pittsburgh, PA
PREPARED BY: PB DATE: 2/10/2020
CHECKED BY: PD DATE:

WATER SURFACE ELEVATION (FT.)	AREA (SQ. FT.)	AVERAGE AREA (SQ. FT.)	DIFFERENCE IN ELEVATION (FT.)	STORAGE VOLUME (CU. FT.)	
				INCREMENTAL	TOTAL
715.0	12				0
		283	0.5	141	
715.5	553				141
		1,359	0.5	679	
716.0	2,164				821
		4,831	0.5	2,416	
716.5	7,498				3,236
		9,947	0.5	4,973	
717.0	12,395				8,209
		14,580	0.5	7,290	
717.5	16,765				15,499
		19,020	0.5	9,510	
718.0	21,274				25,009
		45,852	0.5	22,926	
718.5	70,429				47,935
		72,042	0.5	36,021	
719.0	73,654				83,956
		75,298	0.5	37,649	
719.5	76,942				121,605

Figure B-14. *Stage-Storage Data for the Little Bathtub*

III. PCSWMM MODEL

A PCSWMM model has been developed for the storm sewer system from the Ramp D/Tunnel Area to the Wood Street sump in the Big Bathtub (**Figure B-15**). The analysis includes the Ramp D inlets that are tributary to the Wood Street sump and all other inlets along SR 376 Westbound that are tributary to the sump. The model is established with information (inverts, top of grates) from the field survey and the plans.

Flooding area storage data was incorporated into the model. Runoff rates and volumes to the Big Bathtub and the Ramp D/Tunnel Area were determined and incorporated into evaluating the existing conditions and the PCSWMM model was finalized. A storm sump pump curve was incorporated into the model. The model was run to determine possible flooding from the drainage systems for the 25-year design event. The model was also run using rainfall data and river elevation data from an event in September 2018.

Figure B-15. *Preliminary Ramp D/Tunnel Area/Big Bathtub PCSWMM Model*

Sumps, Pumps and Sluice Gate

There are two pumps located in the Wood Street Big Bathtub sump. According to the 10th Street Bypass Bathtub/Interstate Connector Emergency Closure Procedure the sluice gates are manually closed when the river stage is at 18' which corresponds to elevation 711.71. The pump on/off in the sump chamber for the Big Bathtub are set up on floats. When the sump chamber fills to a certain level, the first pump turns on. If the sump chamber continues to fill and sets off the second float the second pump turns on. If both pumps cannot empty the sump chamber the third float activates and sets off an alarm (flashing light). The system changes the lead pump in order to share the hours of operation. If pump number one comes on first under a flood event pump number two will start first in the next event. This is done so one pump is not continually used.

When modeling the Big Bathtub, two pump curves with similar pumping characteristics were provided to NTM for the sump pumps located in the sump chambers. The pump curves were for a Sulzer Submersible Sewage Pump and a Goulds Submersible Sewage Pump. There was no indication of which pump was installed in the sump chambers. The field survey did not obtain the type of pump. Since pump curves were similar, the Goulds pump was chosen for the Big Bathtub model. The pump curves for both are provided in **Figure B-16** and **Figure B-17**.

Dewatering time of the Big Bathtub area assumed both pumps on, and was determined utilizing the top of wall elevation of 719.5 at the Wood Street Sump Chamber, since above that point, the ponded water recedes as the river recedes. The Little Bathtub begins to overflow into the Big Bathtub at elevation 718.5, or vice versa depending on which one fills up first, so the volume in the drawdown calculations includes overflow from the Little Bathtub. The volume of water the pumps need to draw down is 191,929 cubic feet, or 1,435,727 gallons.

Assuming 2 Goulds pumps were installed in the Wood Street sump chamber at 650 GPM (1.45 cfs), the drawdown time for the volume of the Big Bathtub is approximately 18 hours, as shown in the pump drawdown table in **Figure B-18**. If the current pumping capacity were doubled to 1300 GPM each then the drawdown time for the volume of the Big Bathtub would be reduced to 9 hours, as shown in **Figure B-18.**

The sump specifications for the Submersible Pumping System within Wood Street Sump Area provided from the LR 764 project indicate different information than the pump curves supplied. The specifications indicate that the pump shall be capable of delivering 950 GPM (2.12 cfs) against a total head of 13 feet. Assuming 2 pumps at 950 GPM (2.12 cfs), the drawdown time for the volume of the Big Bathtub is 13 hours (**Figure B-18**). According to the pump curves in **Figure B-16** and **Figure B-17**, 13 feet of head and 950 GPM (2.12 cfs) is not within the range of the curves for each pump and appears that the pumps that were installed may not meet the requirements in the specification, but this cannot be confirmed.

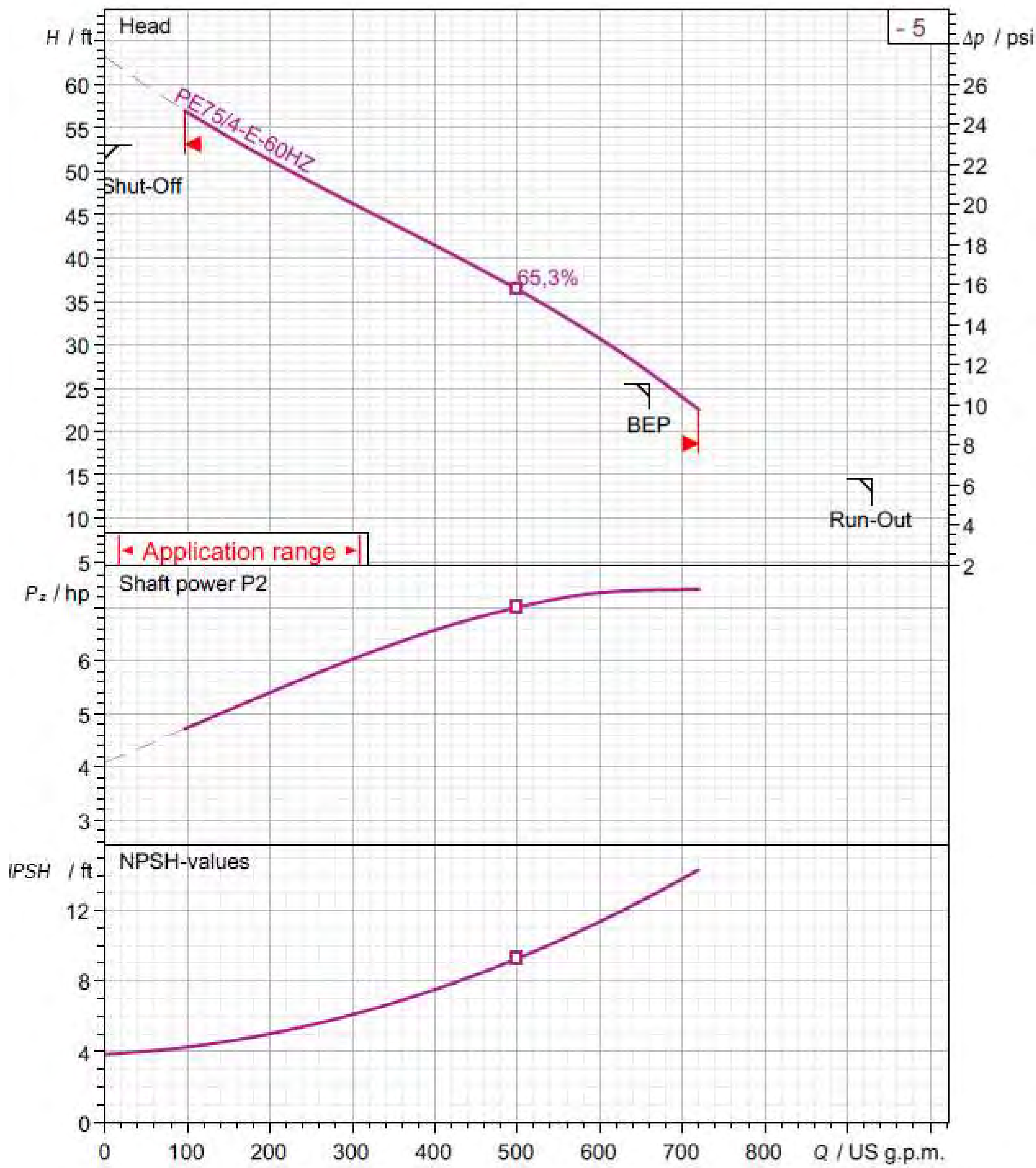


Figure B-16. *SULZER XFP100E Pump Curve*

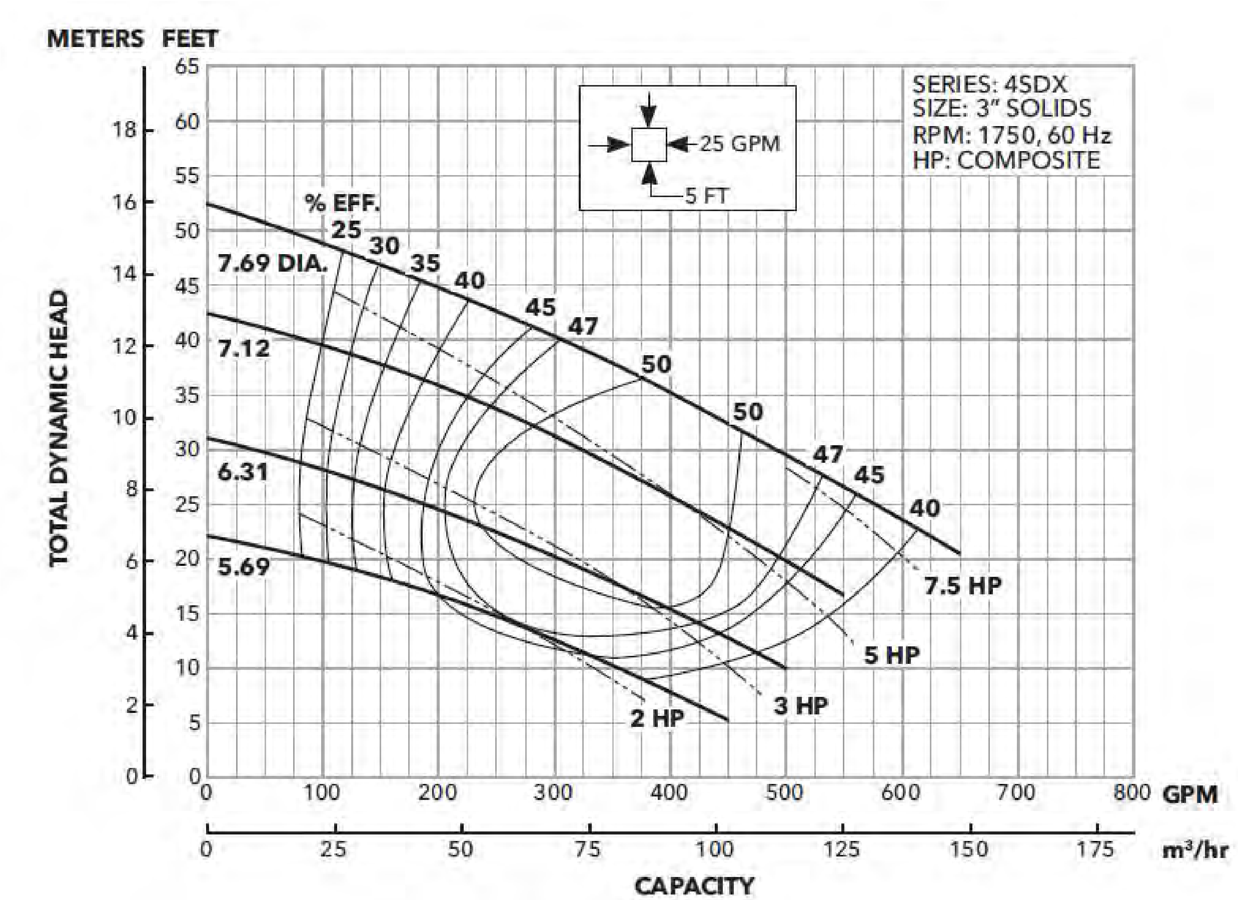


Figure B-17. *GOULDS 4SDX12J2GC 7.69" DIA. Pump Curve*

Pump	Vol- cf	Vol Ac-Ft	Gallons	Pump rate (gpm)	Pump rate (cfs)	Draw-down (min)	Draw-down (hr)	Draw-down (days)
2 Goulds Pumps at 650 gpm each	191929	4.41	1,435,727	1,300	2.86	1,104	18	0.77
2 pumps at 950 gpm from LR 764 Spec	191929	4.41	1,435,727	1,900	4.18	756	13	0.52
2 pumps at 1300 gpm each	191929	4.41	1,435,727	2,600	5.72	552	9	0.38

Figure B-18. *Pump Drawdown Times*

IV. TUNNEL FLOODING

A summary conference call with the District held on November 5th indicated that staff had observed flooding southeast of the Ramp D tunnel. There was a subsequent conference call with William Lester on November 9th to try to pinpoint the exact area of flooding concern. Based on that conversation, William indicated that the flooding was actually in the tunnel and the area directly to the northwest of the tunnel, not southeast of it, and that it only occurred during the three day event September 8 - 11,

2018. **Figure B-19** is the Google Streetview of the location of the flooding, looking southeast, described in the November 9th conference call.

Figure B-19. *Google Streetview of the Location of the Flooding Eastbound Ramp D looking Southeast*

It was discussed in the November 5th meeting that NTM would evaluate modeling scenarios where the inlets southeast of the tunnel were 50% and 100% clogged to see how that would affect the Big Bathtub. In actuality, the entire drainage area and surface runoff leading to the inlets southeast of the tunnel, as shown in green in **Figure B-20** had already been included in the model for the Big Bathtub. This would be equivalent to assuming the inlets were 100% clogged and the runoff southeast of the tunnel and would reach the Big Bathtub storm sewer system. This provides conservative flow estimates in the Big Bathtub area.

Figure B-20. *Drainage area Southeast of Ramp D Tunnel Accounted for Flow to the Big Bathtub.*

Tunnel Area Storm Sewer System

In response to the concerns raised in this status call meeting of November 5th, NTM reviewed the available storm sewer information to determine if there was sufficient information to identify the cause of the ponding that occurred to the northwest and inside the Ramp D tunnel as reported by Bill Lester.

Although the surface runoff was assumed to flow to the Big Bathtub, in actuality, the storm sewer system to the southeast of the Ramp D tunnel is not tributary to the Big Bathtub. It has a separate outfall to the river. The PCSWMM stormwater model in **Figure B-21** illustrates the location of the inlets and the elevations that are available from the survey. The red triangle is the downstream end of the ALCOSAN sewer that crosses Fort Pitt Boulevard. The survey did not get the downstream elevation. This system was not modeled since it ties into the ALCOSAN system which goes outside the scoped study area.

Figure B-21. *PCSWMM Model of the Area Southeast of the Tunnel*

Figure B-22 is a screenshot of the Roadway Plans in the area of the Ramp D Tunnel. Highlighted in yellow are the ALCOSAN and PennDOT storm sewers on the plan. Circled in red below is a manhole that corresponds with Manhole 22 (Node J9) in the PCSWMM model). This manhole is an ALCOSAN manhole and is located on the northeast side of Ramp D. The PennDOT inlets on the southeast side of the tunnel drain to this manhole. A 48" ALCOSAN pipe from the Grant Street area also enters this manhole. According to the survey elevations in **Figure B-26** and **Figure B-27** for the ALCOSAN manhole MH-22 (Node J9), this is approximately 4 feet below the inverts into the manhole from the PennDOT storm sewers in Ramp D. It also appears from the Roadway Plan that there are various other storm sewers that connect to these inlets in Ramp D. There appears that there may also be various sanitary sewers that lead into the system in the upstream area. NTM does not have survey of the extent of the ALCOSAN system.

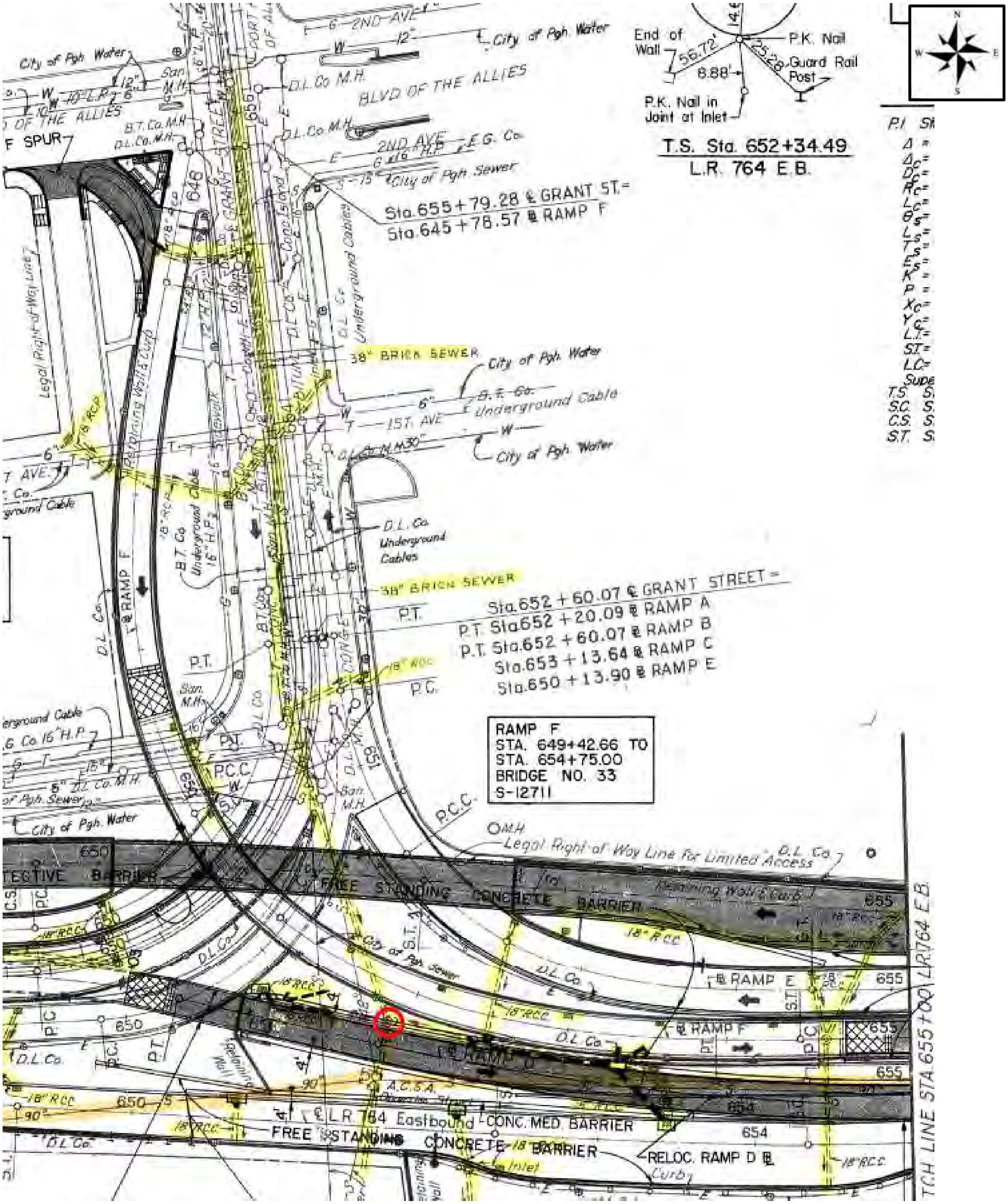


Figure B-22. *Roadway Plan and Storm Sewer in the area southeast of Ramp D Tunnel showing ALCOSAN Manhole (SWMM model Node J9)*

Figure B-23 and **Figure B-24** show the results from the field survey on October 10, 2020. Manhole Node J9 in the PCSWMM model is MH-22 in the field survey in **Figure B-24** below.

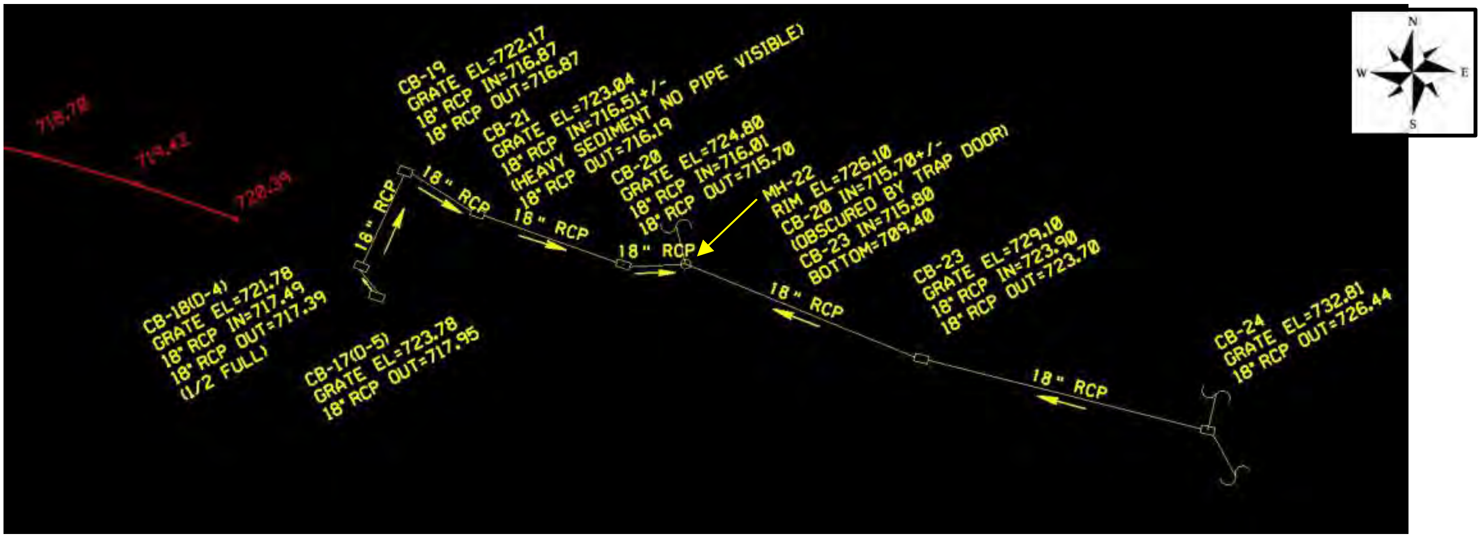


Figure B-23. *Ramp D Inlets Field Survey*

Field Survey Structure ID	SWMM Model Node/Junction	GRATE EL.	INV. IN	INV. OUT	PIPE
CB-17	J1	723.78	-	717.95	-
CB-18	J2	721.78	717.49	717.39	18" RCP
CB-19	J7	722.17	716.87	716.87	18" RCP
CB-21	J3	723.04	716.51+/-	716.19	18" RCP
CB-20	J8	724.80	716.01	715.70	18" RCP
MH-22	J9	726.10	715.70 +/- (CB-20); 715.8 (CB-23)	BOTTOM = 709.40	18" RCP
CB-23	J10	729.10	723.90	723.70	18" RCP
CB-24	J11	732.81	-	726.40	18" RCP

Figure B-24. *Ramp D Inlets Field Survey Results Table*

The bottom of ALCOSAN manhole MH-22 is at elevation 709.40 which appears to be close to the invert of the ALCOSAN 48" pipe entering the manhole. The invert elevations, provided in **Figure B-23** and **Figure B-24**, indicate that the invert in from the Ramp D PennDOT 18-inch storm system are 715.7 and 715.8, indicating the PennDOT storm sewers drop into the 48" ALCOSAN pipe. The field survey identified various inlets in this area that were significantly clogged with sediment. This system southeast of the tunnel was not modeled and all surface flow was assumed to flow to the Big Bathtub storm system since the inlets were clogged with sediment. **Figure B-25** is a photo of CB-18 taken during the survey which shows the sediment in the bottom of the inlet. The survey indicated that the pipe outlet was half full of sediment.

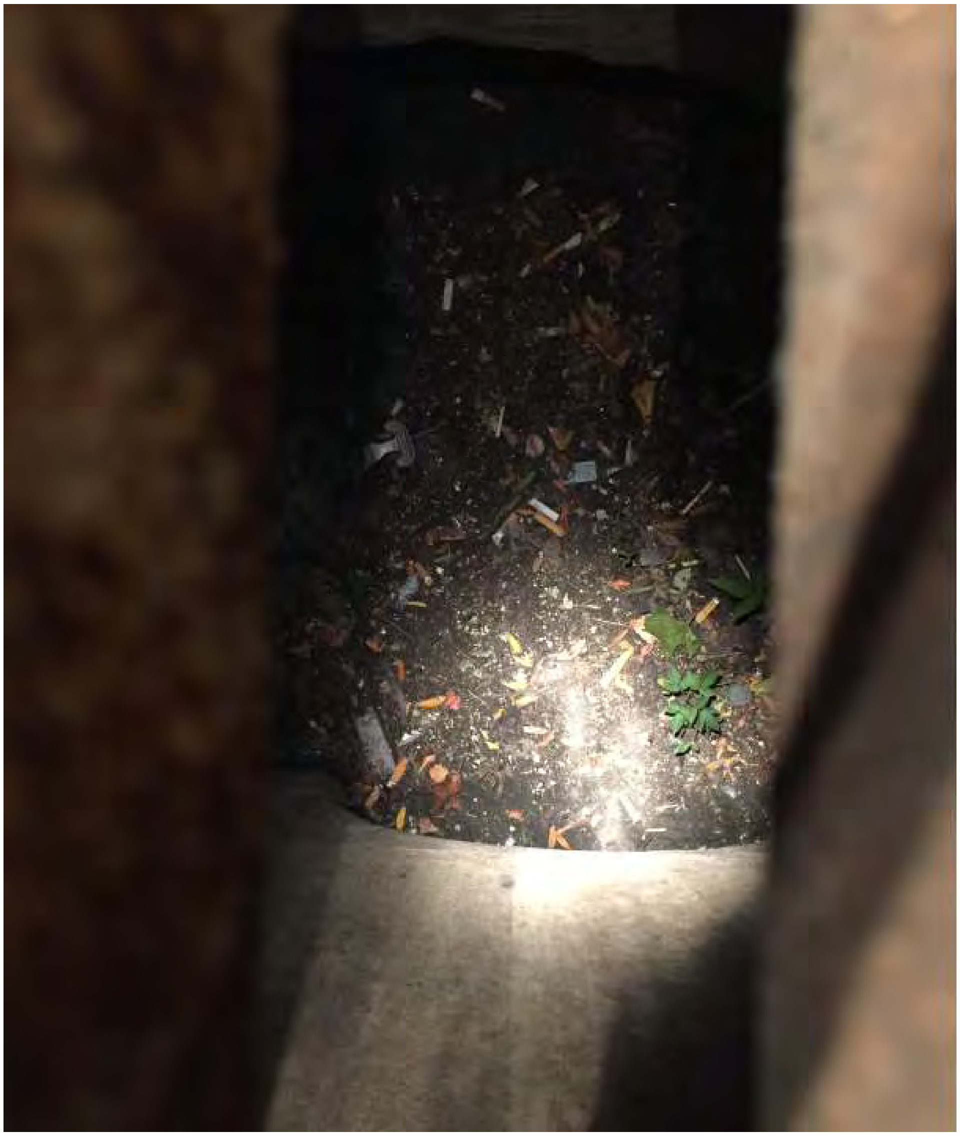


Figure B-25. *Survey Inlet CB-18 Full of Sediment*

Tunnel Area Topography

In **Figure B-26**, in red, are the spot elevations from the field survey in the Ramp D tunnel. **Figure B-27** is a profile of the spot elevations from southeast (right side) to northwest (left side). It is apparent that the tunnel slopes generally downward from southeast to northwest except for one area where it is fairly flat at elevation 717.68 for a distance of approximately 15 feet that could result in slight ponding in this location. The approximate location of reported ponding is shown in **Figure B-26**.

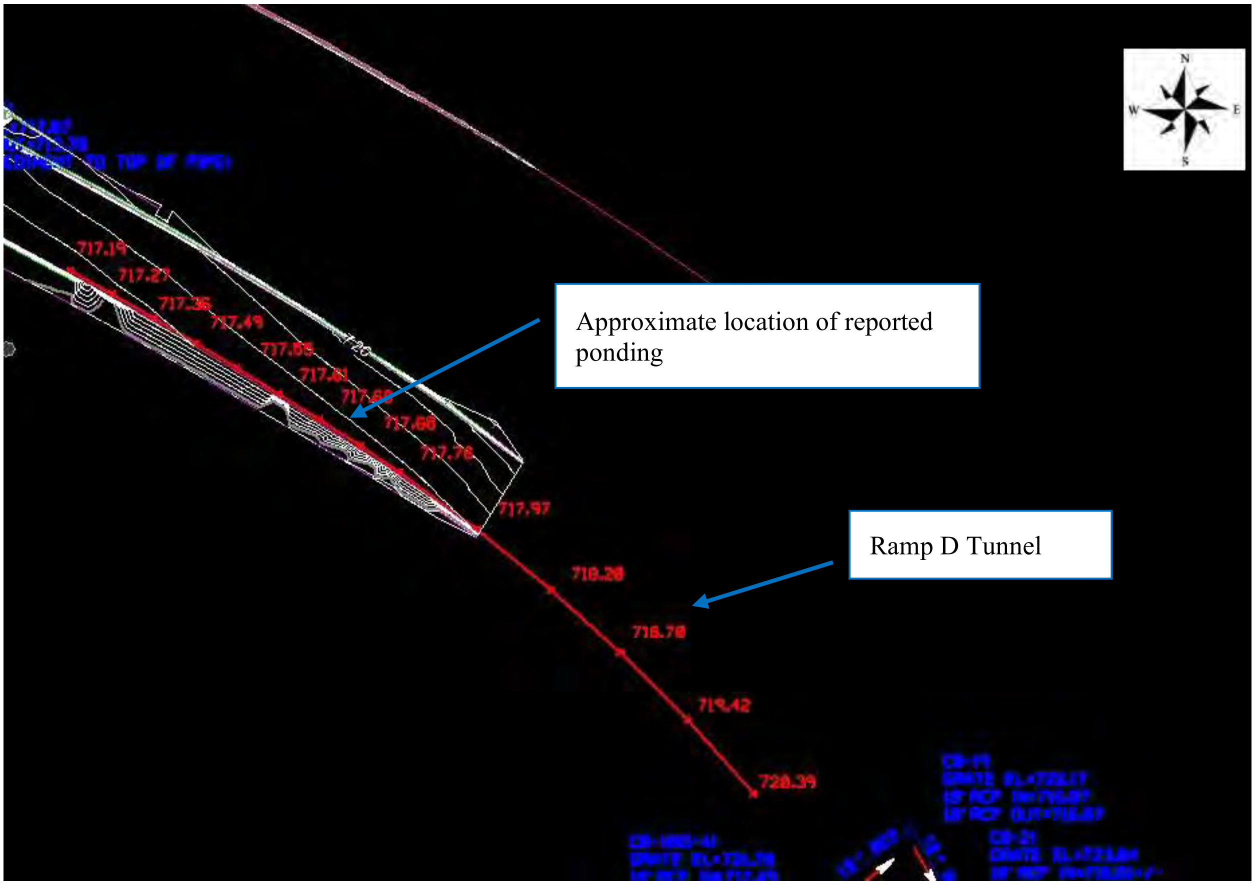


Figure B-26. *Spot Elevations Along Ramp D and the Ramp D Tunnel*

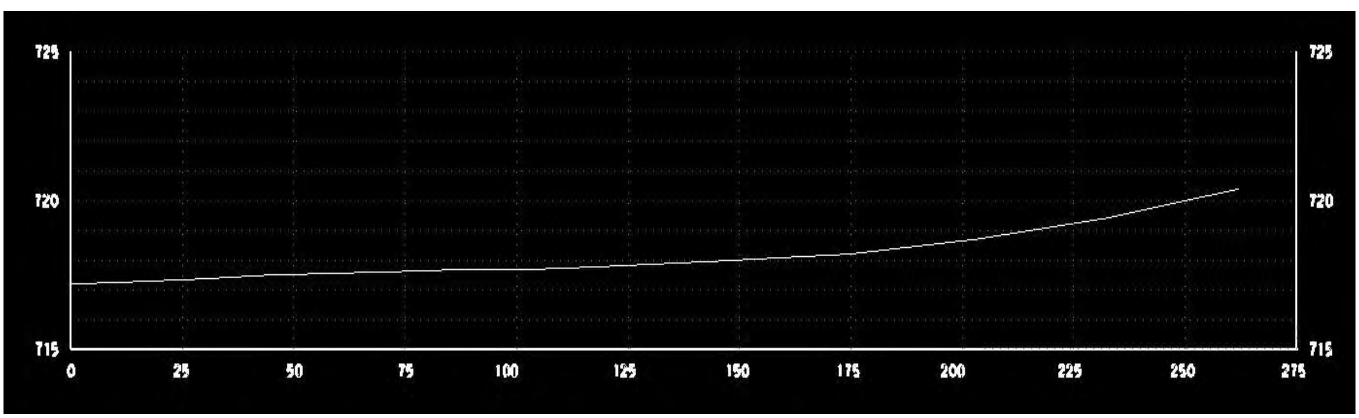


Figure B-27. *Profile of Spot Elevations in Ramp D – Note: LowPoint is Beyond (Northwest of) Station Zero*

River / ALCOSAN System Backwater

The scope of this project was based on analyzing the PennDOT systems and was scoped assuming the ALCOSAN system did not connect directly. Based on the data analysis provided some of the ALCOSAN and PennDOT storm systems are connected so NTM did preliminary investigation as to the interaction between the ALCOSAN and PennDOT systems, but further evaluation will be required during preliminary engineering to fully understand the full interaction of the two systems.

Therefore, the ALCOSAN SWMM model was run to see if it could be determined if the ALCOSAN system caused a backwater into the PennDOT system. The ALCOSAN model was set up by ALCOSAN to run an entire year of rainfall data for a typical rainfall year, from January 1, 2003 to January 1, 2004. The ALCOSAN SWMM model does not have the PennDOT system tied into it. **Figure B-28** is from the ALCOSAN SWMM model showing the ALCOSAN system in the area southeast of the tunnel. According to this model, the HGL in the ALCOSAN manhole on the northwest side of Ramp D reaches a maximum elevation of 711.73 (converted to NAVD88) for a November 19, 2003 event. This storm event is approximately equivalent to a 1.5-year storm and resulted in the closure of I-376 due to the river stage being within 1' from the top of the floodwall.

According to the photo provided from the survey shown in **Figure B-29**, it appears that there is a flap gate on the incoming pipe from CB-20 into the ALCOSAN manhole. In addition, according to the ALCOSAN SWMM model, there is a flap gate in the ALCOSAN diversion structure that, when functioning properly, prevents the river from surcharging into the storm system. During the 1.5-year event it appears that the ALCOSAN storm sewer does not surcharge into the PennDOT Ramp D inlets.

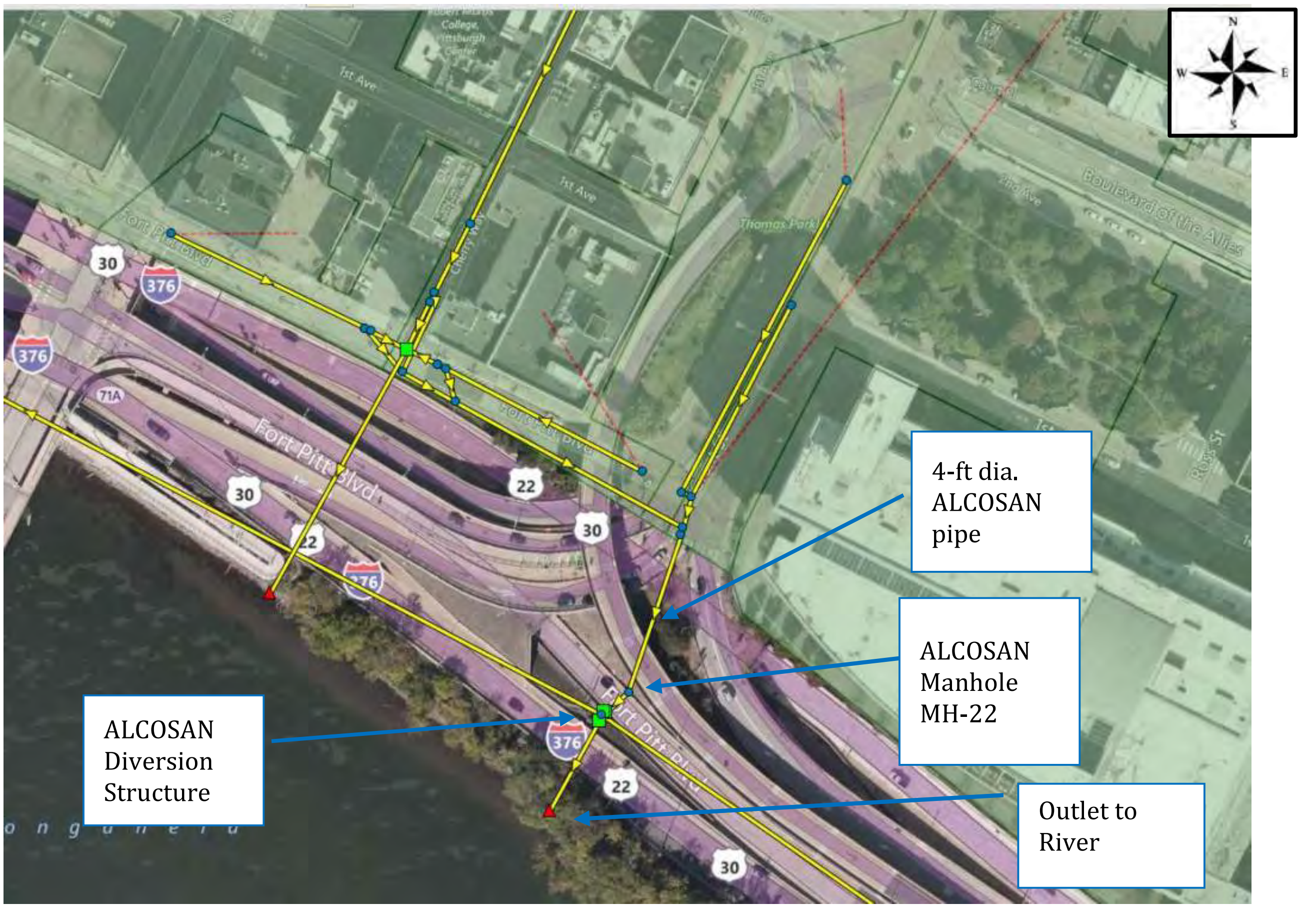


Figure B-28. *ALCOSAN SWMM Model*

Figure B-29. *Photo of MH-22 flap gate from survey*

It is a possibility that if the ALCOSAN flap gate in the diversion structure does not seal properly, then the hydraulic head from the River, shown in **Figure B-6,** could possibly surcharge out of the PennDOT inlets.

September 2018 Event PCSWMM Analysis

A PCSWMM analysis was performed for the storm event of September 8 through 10, 2018 using actual rainfall and river data to model the river overtopping the wall in the Big Bathtub. This is the 3-day storm event where ponding was observed in Ramp D. 5.54 inches of rainfall fell over this period at the Pittsburgh International Airport while 8.26 inches fell at the Allegheny County Airport. Localized rainfall data was not available for the Bathtub area. The rainfall data is displayed in Appendix B-3. In this analysis, the sluice gate closed and the pumps turned on and the river overtopped the Big Bathtub's flood wall. The inlets to the southeast of the Ramp D tunnel were assumed to be 100% blocked and the drainage area was assumed to enter the Big Bathtub system. The results of the analysis showed that the inlets in Ramp D that are connected to the Big Bathtub's system did not surcharge, indicating the flooding was most likely due to clogged inlets and/or the flat area northwest of the tunnel.

V. CONCLUSIONS AND RECOMMENDATIONS

The PCSWMM analysis performed for the storm sewer system that drains to the Big Bathtub indicates that the PennDOT storm sewer system has the capacity to convey the 25-year event.

Although the exact pump installed in the sump chambers could not be confirmed, it appears that the pumps installed do not meet the requirements from the LR 764 project specifications and results in slower dewatering of the Big Bathtub during storms when the river level is high enough to close the sluice gates and turn on the pumps.

The area to the southeast of the tunnel is managed by a separate storm sewer system than the Big Bathtub's storm sewer. It ties into an ALCOSAN diversion structure and 48-inch storm sewer, and then outlets directly into the Monongahela River. The diversion structure has flap gates to prevent the river from backing up into the storm sewer system, however, if these don't seal properly, surcharge could occur.

The exact reason for ponding in Ramp D cannot be determined at this time due to the complexities of the PennDOT/ALCOSAN storm sewer relationship, and relation to the River water levels, although there are a few possibilities.

The only reported flooding event in the Ramp D tunnel was the September 8 to 10, 2018 event, where 5.54 to 8.26 inches of rain fell over a three-day period. What most likely happened is that the river level was up for that period-of-time and the flap gates and sluice gates were closed, so the additional rainfall that fell on day 3 over the bathtub area had no where to go. This coupled with the inlets being clogged in this area most likely caused the flooding in the tunnel area. The frequency of a multi-day event where the river level is elevated and the gates are closed while it is still raining over the bathtub area is rather infrequent.

The inlets southeast of the tunnel are significantly clogged reducing the capacity of the storm sewer system. This reduced capacity could be one reason why there was ponding in the area northwest of the tunnel. The Big Bathtub PCSWMM model assumed the inlets were clogged to account for flow bypassing the inlets.

Ramp D slopes from southeast to northwest with a relatively flat area to the northwest of the Ramp D tunnel in the area that has been identified as having ponded water. It appears that the flat grading of the road in this area causes water to pond. It appears the ponding is not caused by backup of the PennDOT storm sewer system nor the ALCOSAN system during smaller storms up to the 1.5 year event but it is not possible to determine at this time if the ALCOSAN system backs up during larger events. However, it is a possibility that if the ALCOSAN flap gate in the diversion structure did not seal properly, then the hydraulic head from the River could possibly surcharge out of the PennDOT inlets.

This analysis determined the functioning and capacities of the Big Bathtub storm sewer system and determined that the storm sewer system was not a source of flooding the Big Bathtub in localized storm events.

The size of the sump chambers has little effect on the dewater of the Big Bathtub. If larger capacity pumps are installed, a larger sump chamber should be considered to avoid cavitation.

The Little Bathtub storm sewer system, sump and pumps appear to be functioning as designed, and did not warrant further analysis.

As this was an alternatives analysis investigation, it uncovered some additional areas that need additional research and modeling in order to confirm the relationship between the ALCOSAN System and PennDOT's system. In the preliminary engineering (PE) phase of the project, the following tasks are recommended to be evaluated for design:

- Survey the ALCOSAN diversion, flap gate and where the PennDOT system drops into the 48-Inch ALCOSAN storm sewer.
- Tie the ALCOSAN and PennDOT SWMM models together to run the various design storm events to finalize conclusions for their surcharge interaction.
- Size new sump chambers and pumps according to desired drawdown times.
- Evaluate inlet capacities and design new inlets to reduce trash and sediment build up, i.e. offline trash collector with easy maintenance access before connecting to the inlet.

Local Stormwater Analysis- Bathtub Area of I-376

APPENDIX B-1

PennDOT Storm Sewer Data

Allegheny County
PennDOT District 11-0

Newell Tereska & Mackay
Engineering

Little Bathtub Elevation Summary						
Structure ID	**Rim/ T.G.**	**Inv. IN or US Inv**	**INV. OUT or DS Inv**	**Pipe Size/ Type**	**US Struct**	**DS Struct**
I-1	738.98					
Pipe 1			737.7		I-1	MH-1
MH-1	737.7	730.4	730.4			
Pipe 2		737.7	733.7	18" RCC	MH-1	MH-2
MH-2	733.7	733.7	733.7			
Pipe 3			733.7		I-2	MH-2
I-2	735.5					
I-3	729.9					
Pipe 4		733.7	729.7	18" RCC	MH-2	MH-3
Pipe 5			722		I-2	MH-3
MH-3	729.7	722	722			
Pipe 6		722	720.7	18" RCC	MH-3	MH-4
I-4	736.5					
MH-4	728.4	720.7	720.7			
Pipe 7		720.7	719.2		MH-4	MH-5
Pipe 8			719.2		I-4	
MH-5	726.7	718.68	718.68			
Pipe 9					I-5	MH-4
I-5	728.3					
Pipe 10		718.68	715.18	18" RCC	MH-5	MH-6
I-6	722.46		717.84			
Pipe 11		717.84	715.18		I-6	MH-6
MH-6	723.2	715.18	715.18			
Pipe 12		715.18	711.8	18" D.I.	MH-6	MH-7
MH-7		711.8 (MH-6); 711.01 (I-7)	710.78			
Pipe 13			711.01		I-7	MH-7
I-7						
Pipe 14		710.78	710.36	18" D.I.	MH-7	I-8
I-8		710.36	708.93			
Pipe 15		708.93	708.62	18" D.I.	I-8	MH-8
MH-8		709.07 (I-9); 708.62 (I-8)	708.45			
Pipe 16		708.45		18" D.I.	MH-8	Sump-Stanwix St
Sump- Stanwix Street						
Pipe 17				18" R.C.C	Sump- Stanwi	MH-9
MH-9						
Pipe 18					MH-9	MH-10
MH-10						
Pipe 19		710.09	709.7	18" D.I.	I-9	MH-8
I-9		710.26	710.09			
Pipe 20		710.69	710.26	18" D.I.	I-10	I-9
I-10		710.86	710.69			
Pipe 21		711.38	710.86	18" D.I.	I-11	I-10
I-11		711.55	711.38			
Pipe 22		712.07	711.55	18" D.I.	MH-11	I-11
MH-11		712.24	712.07			
Pipe 23			712.24		I-12	MH-11
I-12						

Legend	
	Not Applicable
	Missing information
	Inv. IN and Inv. Out inverts are the same so we might need more information

Big Bathtub Elevation Summary

Structure ID	Rim/ T.G.	Inv. IN or US Inv	INV. OUT or DS Inv	Pipe Size/ Type	US Struct	DS Struct
I-13	717.38		711.89			
Pipe 24		711.89	710.31	18" RCP	I-13	I-14
I-14	715.92	710.31	709.71			
Pipe 25		709.71	708.68	18" RCP	I-14	I-15
I-15	714.11	708.68	708.83			
Pipe 26		708.83	707.96	18" PVC	I-15	I-16
I-16	713.4	707.96 (I-15); 707.44 (MH-14)	707.29			
Pipe 27		707.29	707.14	18" PVC	I-16	Sump- Wood St
Sump- Wood Street	712.73	707.14	706.45			
Pipe 28		706.45		18" RCP	Sump- Wood	MH-12
MH-12	712.66					
Pipe 29			699.77		MH-12	MH-13
MH-13	712.47	699.77				
Pipe 30		707.84	707.37	18" PVC	MH-14	I-16
MH-14	714.11	707.76 (I-18); 707.9 (I-17)	707.71			
I-17	714.01		708.1			
Pipe 31		708.1	707.9	18"PVC	I-17	MH-14
Pipe 32		708.53	707.76	18" RCP	I-18	MH-14
I-18	715.33	709.73	708.53			
Pipe 33		710.15	709.73	18"PVC	I-19	I-18
I-19	716.46	710.2	710.15			
Pipe 34		710.48	709.96	18" PVC	I-21	I-19
I-21	717.59	710.04	709.99			
I-22	726.29	718.84	711.19			
Pipe 36		711.19	710.04	18" RCP	I-22	I-21
Pipe 37		710.82	710.04	18" PVC	MH-15	I-21
I-23						
Pipe 38			710.97	18" PVC	I-23	MH-15
MH-15	718.62	710.97 (I-23); 710.91 (I-24)	710.82			
Pipe 39		711.79	710.81	18" PVC	I-24	MH-15
I-24	719.82	711.73	711.79			
Pipe 40		712.24	711.73	18" RCP	I-25	I-24
I-25	720.02	712.4	712.24			
Pipe 41		712.68	711.73	18" RCP	I-26	I-25
I-26	717.83	712.78 (CB-12); 713.06 (CB-10)	712.68			
Pipe 85		714.2	713.06	18" RCP	I-55	I-26
I-55	718.4	714.39	714.2			
Pipe 84		715.02	714.39	18" RCP	I-56	I-55
I-56	719.12		715.02			
Pipe 86		713.23	712.78	18" RCP	I-57	I-26
I-57	717.41	713.25	713.23			
Pipe 87		713.5	713.25	18" RCP	I-58	I-57
I-58	716.97	713.58	713.5			
Pipe 88		713.76	713.58	18" RCP	I-59	I-58
I-59	717.07		713.76			

Legend	
(black)	Not Applicable
(yellow)	Missing information
(blue)	Info based on Sump TG elevation from Floodwall Details and survey Sump dimensions

Ramp D/Tunnel Elevation Summary

Structure ID	Rim/ T.G.	Inv. IN or US Inv	INV. OUT or DS Inv	Pipe Size/ Type	US Struct	DS Struct
I-33	721.78	717.49	717.39			
Pipe 89		717.95	717.49	18" RCP	i-33A	I-33
I-33a	723.78		717.95			
Pipe 50		717.39	716.87	18" RCP	I-33	I-34
I-34	722.17	716.87	716.87			
Pipe 51		716.87	716.51	18" RCP	I-34	I-35
Pipe 52			716.51	18" R.C.C.		I-35
Pipe 53			716.51	18" R.C.C.		I-35
Pipe 54		716.19	716.01	18" R.C.C.	I-35	I-35a
I-35	723.04	716.51	716.19			
I-35a	724.8	716.01	715.7			
MH-20	726.1	715.7 (I-35A); 715.8 (I-36)	709.4 (BOTTOM)			
Pipe 55		723.7	715.8	18" R.C.C.	I-36	MH-20
I-36	729.1	723.9	723.7			
Pipe 57			724.18		I-39	I-36
I-39						
Pipe 58		729.78	726.48	18" R.C.C.	I-38	I-37
Pipe 59			726.48	8" V.C.		I-37
I-37	732.81	726.48	726.44			
Pipe 60		726.44	723.9	18" R.C.C.	I-37	I-36
Pipe 61			726.48	8" V.C.		I-37
I-49	736.89		729.78			
Pipe 62			724.18	8" V.C.		
Outfall		706.62				
I-50	719.86	715.86	714.4			
Pipe 79		714.4	714.2	18"	I-50	I-51
I-51	718.2	714.2	713.12			
Pipe 80		713.12		18"	I-51	I-26
I-52		713.18	713.09			
Pipe 81		713.09	712.92	18"	I-52	I-26
I-26	717.67	712.92	712.5			
I-53	716.94	713.52	713.35			
Pipe 82		713.35	713.18	18"	I-53	I-52
I-54	717.09	713.84	713.69			
Pipe 83		713.69	713.52	18"	I-54	I-53

Legend	
(black)	Not Applicable
(yellow)	Missing information
(green)	SAI provided drainage design info

Local Stormwater Analysis- Bathtub Area of I-376

APPENDIX B-2

Stage Storage Data

Allegheny County
PennDOT District 11-0

NEWELL TERESKA & MACKAY
ENGINEERING

Local Stormwater Analysis- Bathtub Area of I-376

Little Bathtub

Allegheny County
PennDOT District 11-0

NEWELL
TERESKA &
MACKAY
ENGINEERING

STANDARD WORKSHEET #14

Storage Data: Little Bathtub

PROJECT NAME: Little Bathtub- Stanwix
LOCATION: Pittsburgh, PA
PREPARED BY: PB DATE: 2/10/2020
CHECKED BY: PD DATE: 2/15/2020

WATER SURFACE ELEVATION (FT.)	AREA (SQ. FT.)	AVERAGE AREA (SQ. FT.)	DIFFERENCE IN ELEVATION (FT.)	STORAGE VOLUME (CU. FT.)	
				INCREMENTAL	TOTAL
715.0	12				0
		283	0.5	141	
715.5	553				141
		1,359	0.5	679	
716.0	2,164				821
		4,831	0.5	2,416	
716.5	7,498				3,236
		9,947	0.5	4,973	
717.0	12,395				8,209
		14,580	0.5	7,290	
717.5	16,765				15,499
		19,020	0.5	9,510	
718.0	21,274				25,009
		45,852	0.5	22,926	
718.5	70,429				47,935
		72,042	0.5	36,021	
719.0	73,654				83,956
		75,298	0.5	37,649	
719.5	76,942				121,605

Local Stormwater Analysis- Bathtub Area of I-376

Big Bathtub

Allegheny County
PennDOT District 11-0

NEWELL TERESKA & MACKAY
ENGINEERING

STANDARD WORKSHEET #14
Storage Data: Big Bathtub

PROJECT NAME: Big Bathtub- Wood St
LOCATION: Pittsburgh, PA
PREPARED BY: PB   DATE: 2/10/2020
CHECKED BY: PD   DATE: 2/15/2020

WATER SURFACE ELEVATION (FT.)	AREA (SQ. FT.)	AVERAGE AREA (SQ. FT.)	DIFFERENCE IN ELEVATION (FT.)	STORAGE VOLUME (CU. FT.)	
				INCREMENTAL	TOTAL
707.1	107				0
		107	5.9	626	
713.0	107				626
		259	0.0	3	
713.0	411				629
		947	0.5	473	
713.5	1,482				1,102
		4,459	0.5	2,229	
714.0	7,435				3,331
		9,456	0.5	4,728	
714.5	11,477				8,059
		13,244	0.5	6,622	
715.0	15,011				14,681
		16,689	0.5	8,345	
715.5	18,367				23,026
		20,114	0.5	10,057	
716.0	21,861				33,083
		23,655	0.5	11,827	
716.5	25,448				44,910
		27,233	0.5	13,617	
717.0	29,018				58,526
		30,731	0.5	15,365	
717.5	32,443				73,892
		34,871	0.5	17,436	
718.0	37,299				91,327
		53,864	0.5	26,932	
718.5	70,429				118,259
		72,042	0.5	36,021	
719.0	73,654				154,280
		75,298	0.5	37,649	
719.5	76,942				191,929

Local Stormwater Analysis- Bathtub Area of I-376

APPENDIX B-3

Rainfall Data

Allegheny County
PennDOT District 11-0

NEWELL TERESKA & MACKAY
ENGINEERING

Data selection for site: PITTSBURGH, PA
Pittsburgh International Airport
Database: FAA_HOURLY

Metadata:

Id: KPIT
Name: PITTSBURGH
County: ALLEGHENY
State: PA
Lat: 40.500
Lon: -80.230
Elev (ft): 1150.0
Start_date: 1952-02-01
End_date: 2020-07-08

Requested Start Date: 2018-09-08
Requested End Date: 2018-09-12
Variables Requested: datetime, precip1hr
Records Returned: 119

Date/Time (GMT)	1 Hour Precip (in)	24-Hour Totals
9/8/2018 0:00		
9/8/2018 1:00		
9/8/2018 2:00		
9/8/2018 3:00		
9/8/2018 4:00	0.01	
9/8/2018 5:00	0.03	
9/8/2018 6:00	0.02	
9/8/2018 7:00	0.04	
9/8/2018 8:00	0.09	
9/8/2018 9:00	0.06	
9/8/2018 10:00	0.02	
9/8/2018 11:00	0.05	
9/8/2018 12:00	0.02	
9/8/2018 13:00	0.06	
9/8/2018 14:00	0.03	
9/8/2018 15:00	0.02	
9/8/2018 16:00	0.06	

9/8/2018 17:00	0	
9/8/2018 18:00	0	
9/8/2018 19:00	0.02	
9/8/2018 20:00	0.02	
9/8/2018 21:00	0.06	
9/8/2018 22:00	0.08	
9/8/2018 23:00	0.05	0.74
9/9/2018 0:00	0.06	
9/9/2018 1:00	0.04	
9/9/2018 2:00	0.04	
9/9/2018 3:00	0.06	
9/9/2018 4:00	0.1	
9/9/2018 5:00	0.04	
9/9/2018 6:00	0.04	
9/9/2018 7:00	0.09	
9/9/2018 8:00	0.1	
9/9/2018 9:00	0.06	
9/9/2018 10:00	0.12	
9/9/2018 11:00	0.14	
9/9/2018 12:00	0.16	
9/9/2018 13:00	0.29	
9/9/2018 14:00	0.33	
9/9/2018 15:00	0.65	
9/9/2018 16:00	0.11	
9/9/2018 17:00	0.2	
9/9/2018 18:00	0.25	
9/9/2018 19:00	0.29	
9/9/2018 20:00	0.18	
9/9/2018 21:00	0.15	
9/9/2018 23:00	0.11	3.61
9/10/2018 0:00	0.12	
9/10/2018 1:00	0.03	
9/10/2018 2:00	0.03	
9/10/2018 3:00	0.01	
9/10/2018 4:00	0.09	
9/10/2018 5:00	0.19	
9/10/2018 6:00	0.11	
9/10/2018 7:00	0.08	
9/10/2018 8:00	0.07	
9/10/2018 9:00	0.04	
9/10/2018 10:00	0.16	
9/10/2018 11:00	0.13	
9/10/2018 12:00	0.02	
9/10/2018 13:00	0.03	
9/10/2018 14:00	0.02	
9/10/2018 15:00	0	
9/10/2018 16:00	0	

9/10/2018 17:00	0.01	
9/10/2018 18:00		
9/10/2018 19:00	0.03	
9/10/2018 20:00	0.02	1.19
9/10/2018 21:00		5.54

Data selection for site: PITTSBURGH AGC, PA
Allegheny County Airport
Database: FAA_HOURLY

Metadata:

Id: KAGC
Name: PITTSBURGH AGC
County: ALLEGHENY
State: PA
Lat: 40.355
Lon: -79.922
Elev (ft): 1248.0
Start_date: 1972-01-01
End_date: 2020-07-08

Requested Start Date: 2018-09-08
Requested End Date: 2018-09-12
Variables Requested: datetime, precip1hr
Records Returned: 120

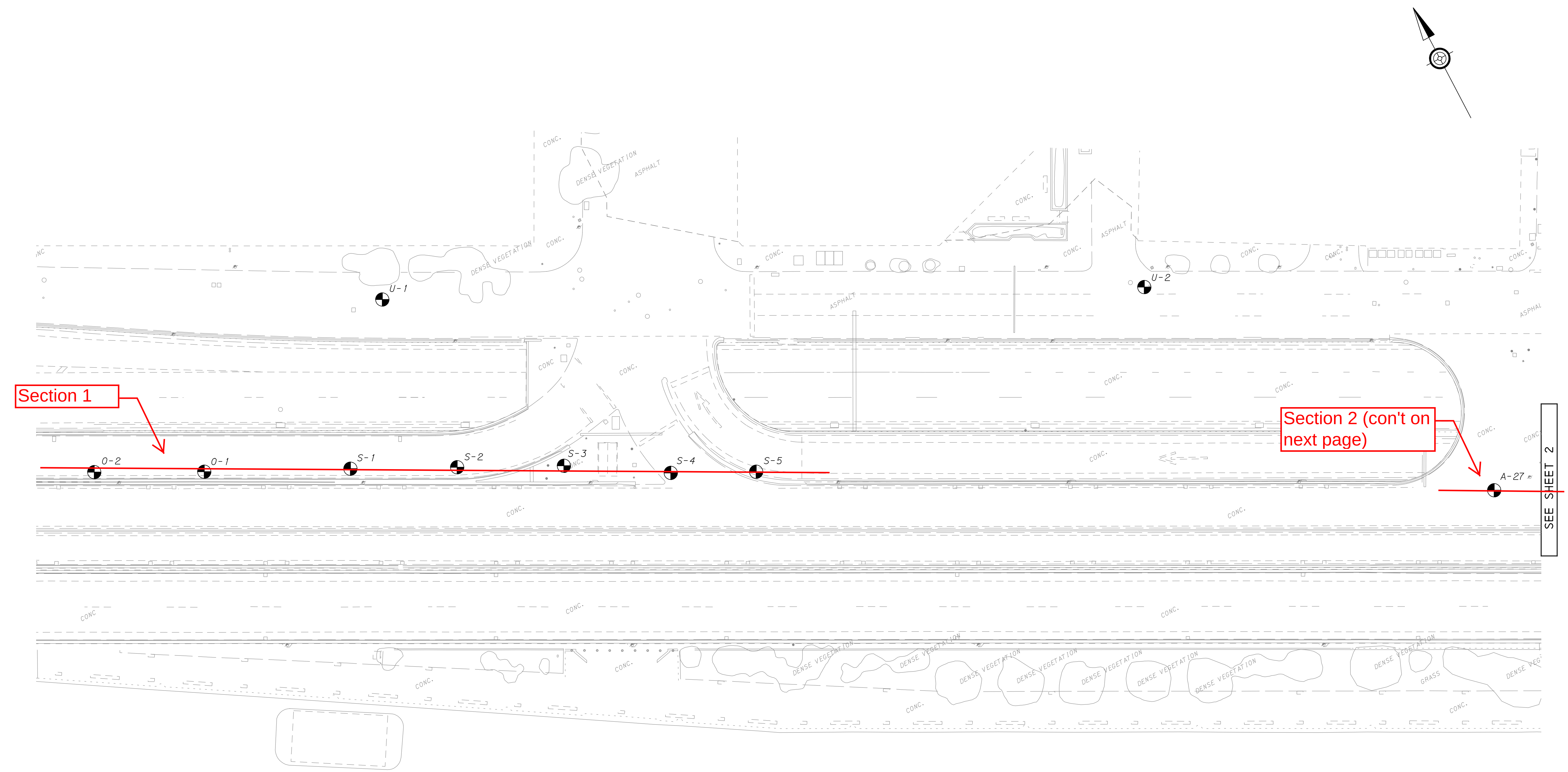
Date/Time (GMT)	1 Hour Precip (in)	24-Hour Totals
9/8/2018 0:00		
9/8/2018 1:00		
9/8/2018 2:00		
9/8/2018 3:00		
9/8/2018 4:00		
9/8/2018 5:00	0.04	
9/8/2018 6:00	0.01	
9/8/2018 7:00	0	
9/8/2018 8:00	0.28	
9/8/2018 9:00	0.52	
9/8/2018 10:00	0.13	
9/8/2018 11:00	0.13	
9/8/2018 12:00	0.08	
9/8/2018 13:00	0.08	
9/8/2018 14:00	0.01	
9/8/2018 15:00	0	
9/8/2018 16:00	0.01	

9/8/2018 17:00	0	
9/8/2018 18:00	0	
9/8/2018 19:00	0.07	
9/8/2018 20:00	0.05	
9/8/2018 21:00	0.09	
9/8/2018 22:00	0.15	
9/8/2018 23:00	0.12	1.77
9/9/2018 0:00	0.07	
9/9/2018 1:00	0.04	
9/9/2018 2:00	0.05	
9/9/2018 3:00	0.09	
9/9/2018 4:00	0.1	
9/9/2018 5:00	0.05	
9/9/2018 6:00	0.09	
9/9/2018 7:00	0.11	
9/9/2018 8:00	0.05	
9/9/2018 9:00	0.11	
9/9/2018 10:00	0.03	
9/9/2018 11:00	0.14	
9/9/2018 12:00	0.19	
9/9/2018 13:00	0.21	
9/9/2018 14:00	0.51	
9/9/2018 15:00	0.24	
9/9/2018 16:00	0.27	
9/9/2018 17:00	0.44	
9/9/2018 18:00	0.45	
9/9/2018 19:00	0.26	
9/9/2018 20:00	0.28	
9/9/2018 21:00	0.14	
9/9/2018 22:00	0.11	
9/9/2018 23:00	0.09	4.12
9/10/2018 0:00	0.02	
9/10/2018 1:00	0.01	
9/10/2018 2:00	0.04	
9/10/2018 3:00	0.02	
9/10/2018 4:00	0.17	
9/10/2018 5:00	0.11	
9/10/2018 6:00	0.14	
9/10/2018 7:00	0.05	
9/10/2018 8:00	0.06	
9/10/2018 9:00	0.29	
9/10/2018 10:00	0.5	
9/10/2018 11:00	0.08	
9/10/2018 12:00	0.28	
9/10/2018 13:00	0.21	
9/10/2018 14:00	0.22	
9/10/2018 15:00	0.01	

9/10/2018 16:00	0.01	
9/10/2018 17:00	0.01	
9/10/2018 18:00	0.01	
9/10/2018 19:00	0	
9/10/2018 20:00	0.01	
9/10/2018 21:00	0.03	
9/10/2018 22:00	0.08	
9/10/2018 23:00	0.01	2.37
9/11/2018 0:00	0.01	8.26

Appendix C:

Geotechnical Data



Prepared by: AECOM Technical Services, Inc.

LEGEND

EXISTING BORING

X-X EXISTING BORING ID

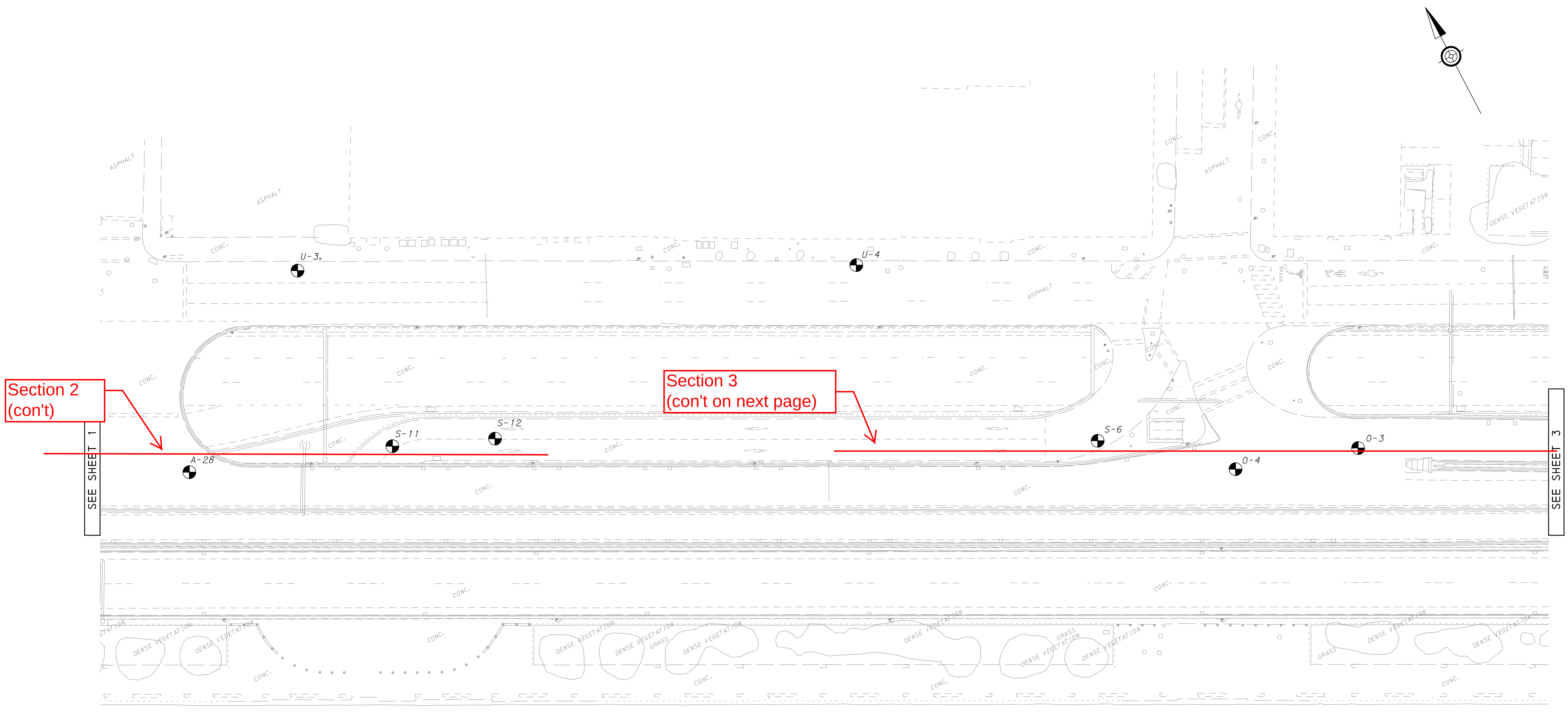
SCALE

0 25 50 FEET

pennsylvania DEPARTMENT OF TRANSPORTATION

Allegheny County
SR 0376 Section Bathtub Study

Horizontal Scale: As Shown	Sheet 1 of 3
Existing Boring Location Plans	Date: 2/14/2020



LEGEND

EXISTING BORING

X-X EXISTING BORING ID

SCALE

0 25 50 FEET

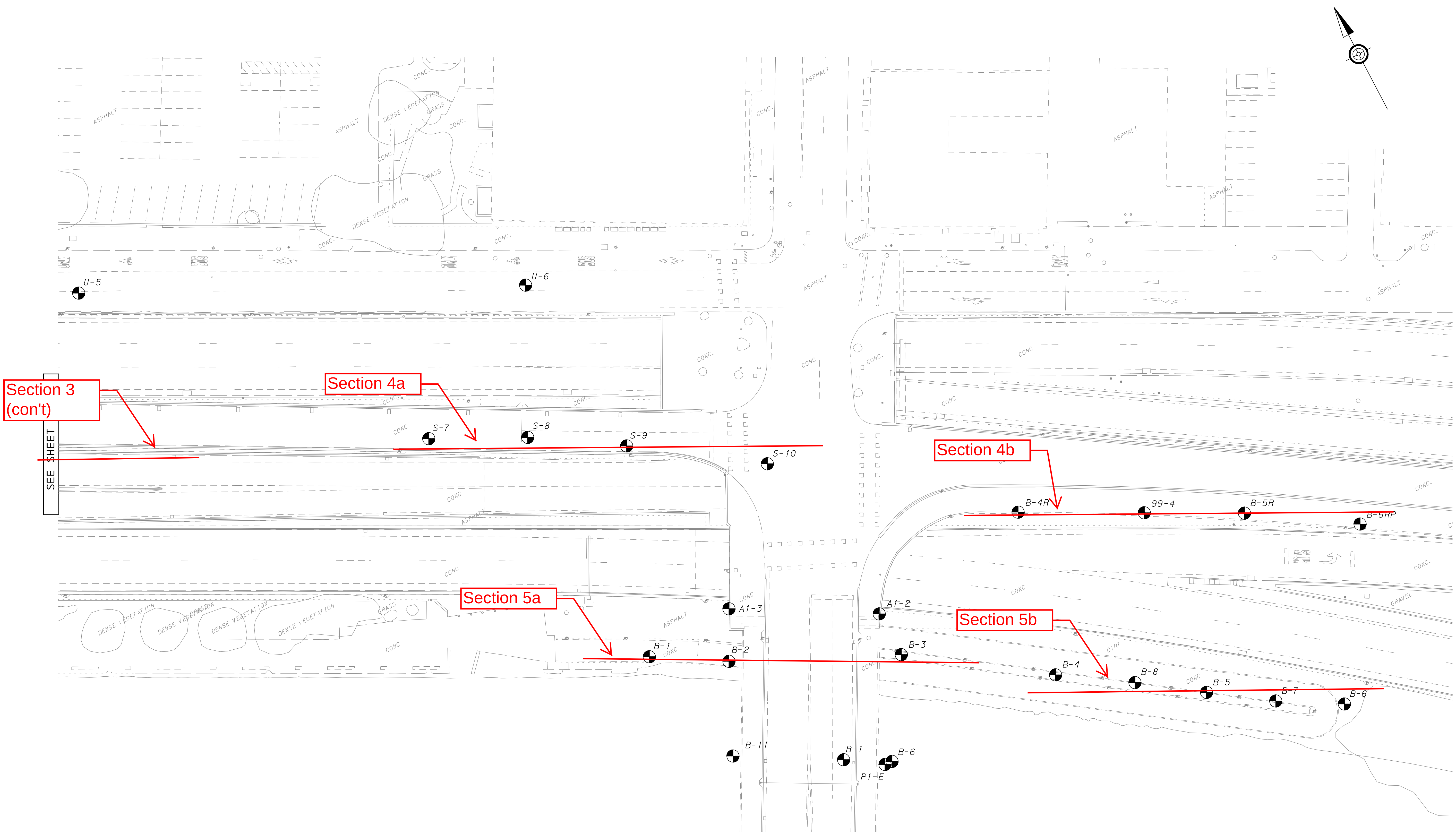
Prepared by: AECOM Technical Services, Inc.

pennsylvania DEPARTMENT OF TRANSPORTATION

Allegheny County
SR 0376 Section Bathtub Study

Horizontal Scale: As Shown	Sheet 2 of 3
Existing Boring Location Plans	Date: 2/14/2020

date.tbl "kathleen.burke" 2/14/2020 P:\Transportation\60612296 E03024 W06 I376 Bathtub Flooding Alt Analysis\900-Work\910-CAD\25-SKETCHES\C\Existing Boring Location Sheets\376_BORINGLOC02.dgn



Prepared by: AECOM Technical Services, Inc.

LEGEND

⊕	EXISTING BORING
X-X	EXISTING BORING ID

SCALE

0 25 50 FEET

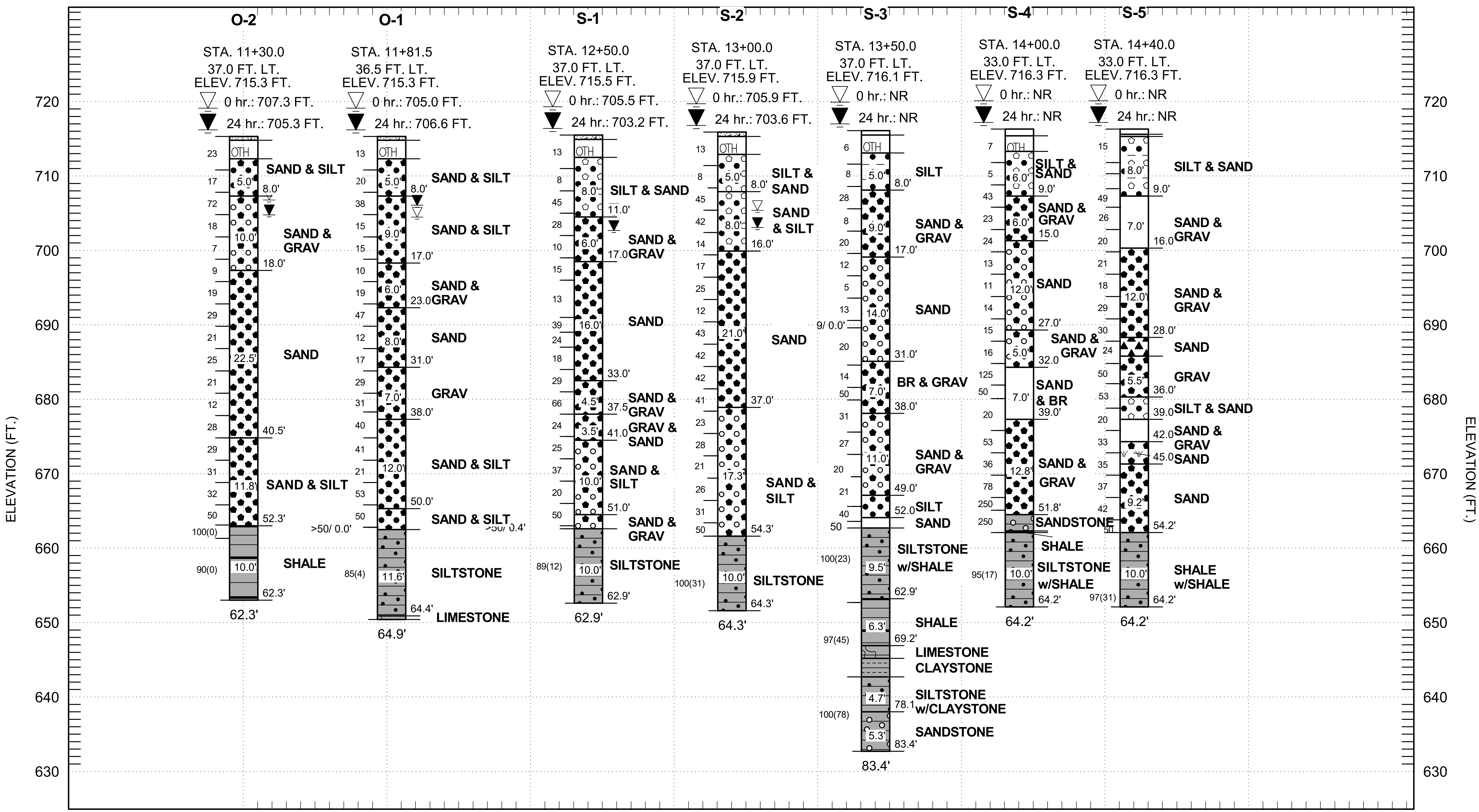
pennsylvania DEPARTMENT OF TRANSPORTATION

Allegheny County
SR 0376 Section Bathtub Study

Horizontal Scale: As Shown	Sheet 3 of 3
Existing Boring Location Plans	Date: 2/14/2020

date.tbl "kathleen.burke" 2/14/2020 P:\Transportation\60612296 E03024 W06 I376 Bathtub Flooding Alt Analysis\900-Work\910-CAD\25-SKETCHES\C\Existing Boring Location Sheets\376_BORINGLOC03.dgn

Note: Lines, if any, drawn between fence diagrams designate estimated subsurface conditions for presentation purposes only to indicate similar materials. Actual subsurface conditions between boring locations are not known.



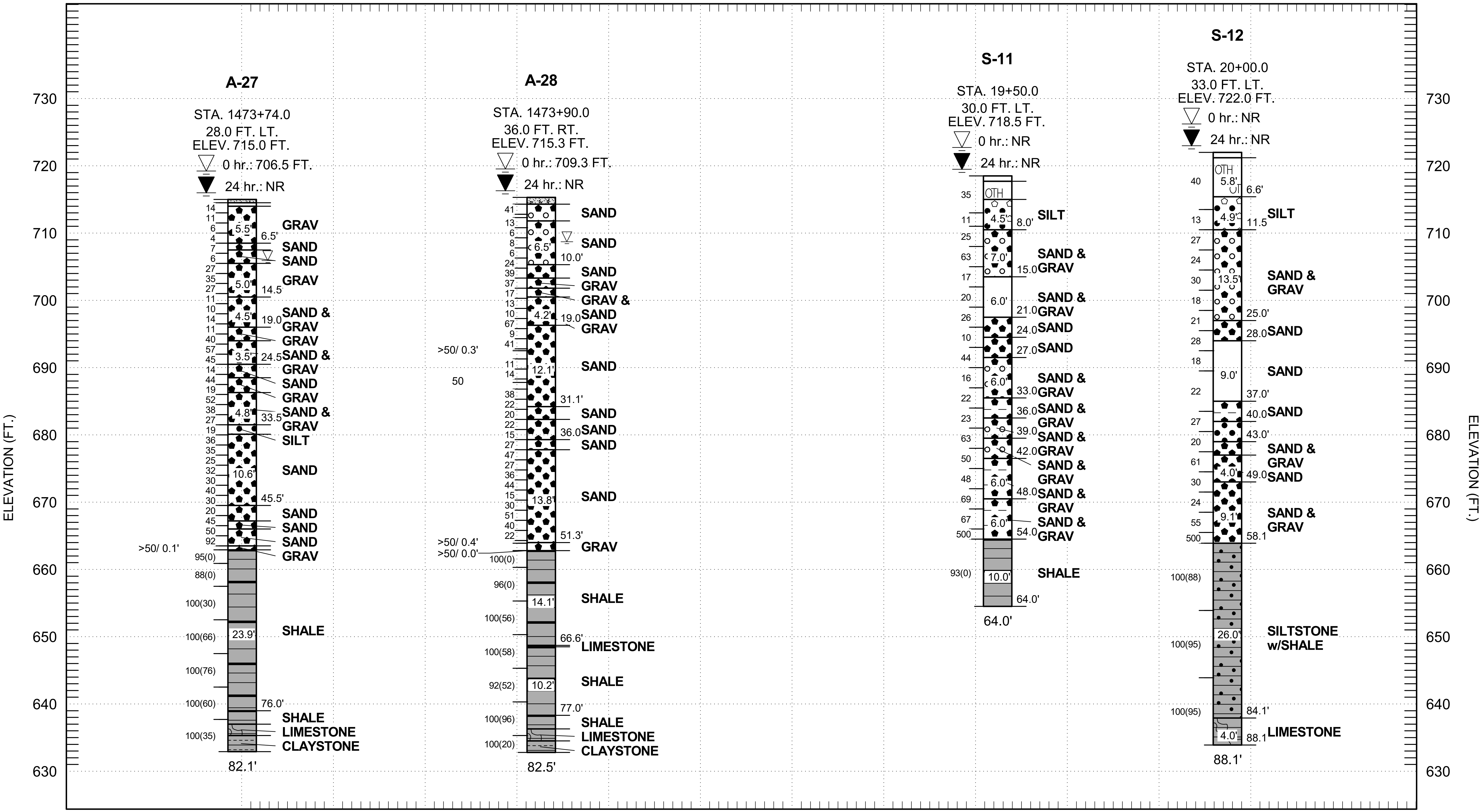
Note:
- For description of graphic symbols see Publication 222.
- See General Notes and Legend for Subsurface Profiles sheet.
- BR = Broken Rock
- GRAV = Gravel
- ORG = Organics
- UNSAMP = Unsampled
- Recovery(RQD)

Prepared by: AECOM Technical Services, Inc.

pennsylvania DEPARTMENT OF TRANSPORTATION	Allegheny County SR 0376 Section Bathtub Study	Subsurface Profile - Section 1
	Horizontal Scale:	Vertical Scale:
	Standard Subsurface Fence Plot	Date: 2/11/2020

PENNDOT STANDARD FENCE PLOT - PENNDOT_GINT_VERSION 1.2.2.3 9-21-2016.GDT - 2/11/20 15:40 - \\USPIT1FP002\DATA\PROJECTS\TRANSPORTATION\60612296 E03024 WO6 I376 BATHTUB FLOODING ALT ANALYSIS\400-TECHNICAL\3 - ALTERNATIVE ANALY

Note: Lines, if any, drawn between fence diagrams designate estimated subsurface conditions for presentation purposes only to indicate similar materials. Actual subsurface conditions between boring locations are not known.



Note:
- For description of graphic symbols see Publication 222.
- See General Notes and Legend for Subsurface Profiles sheet.
- BR = Broken Rock
- GRAV = Gravel
- ORG = Organics
- UNSAMP = Unsampled
- Recovery(RQD)

Prepared by: AECOM Technical Services, Inc.

pennsylvania DEPARTMENT OF TRANSPORTATION

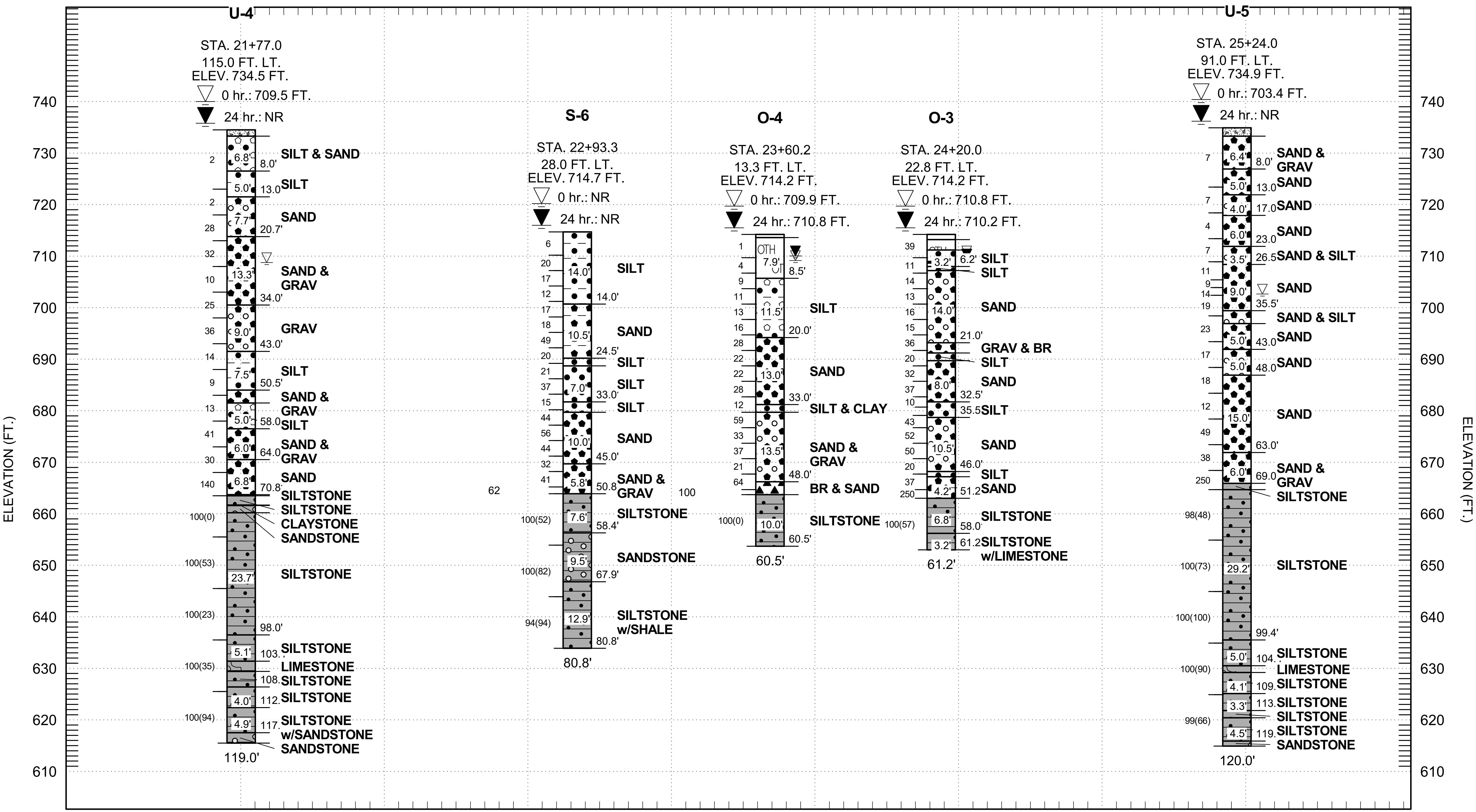
Allegheny County
SR 0376 Section Bathtub Study

Subsurface Profile - Section 2

Horizontal Scale:	Vertical Scale:
Standard Subsurface Fence Plot	Date: 2/12/2020

PENNDOT STANDARD FENCE PLOT - PENNDOT_GINT_VERSION 1.2.2.3 9-21-2016.GDT - 2/12/20 10:55 - \\USPIT1FP002\DATA\PROJECTS\TRANSPORTATION\60612296 E03024 WO6 I376 BATHTUB FLOODING ALT ANALYSIS\400-TECHNICAL\3 - ALTERNATIVE ANALY

Note: Lines, if any, drawn between fence diagrams designate estimated subsurface conditions for presentation purposes only to indicate similar materials. Actual subsurface conditions between boring locations are not known.



Note:
- For description of graphic symbols see Publication 222.
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- BR = Broken Rock
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- UNSAMP = Unsampled
- Recovery(RQD)

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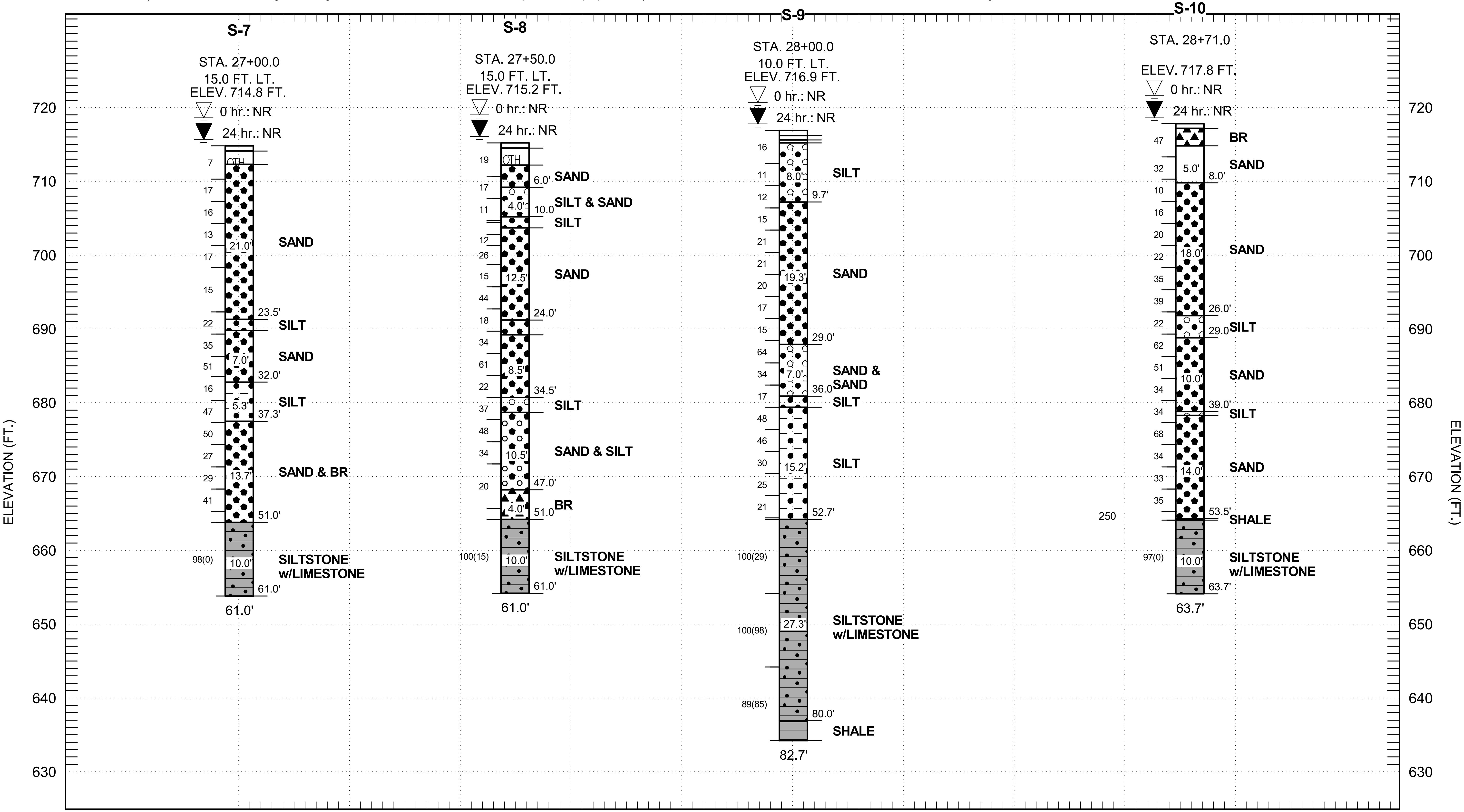
Allegheny County
SR 0376 Section Bathtub Study

Subsurface Profile - Section 3	
Horizontal Scale:	Vertical Scale:
Standard Subsurface Fence Plot	Date: 2/12/2020

Note: Lines, if any, drawn between fence diagrams designate estimated subsurface conditions for presentation purposes only to indicate similar materials. Actual subsurface conditions between boring locations are not known.



Note:
- For description of graphic symbols see Publication 222.
- See General Notes and Legend for Subsurface Profiles sheet.
- BR = Broken Rock
- GRAV = Gravel
- ORG = Organics
- UNSAMP = Unsampled
- Recovery(RQD)

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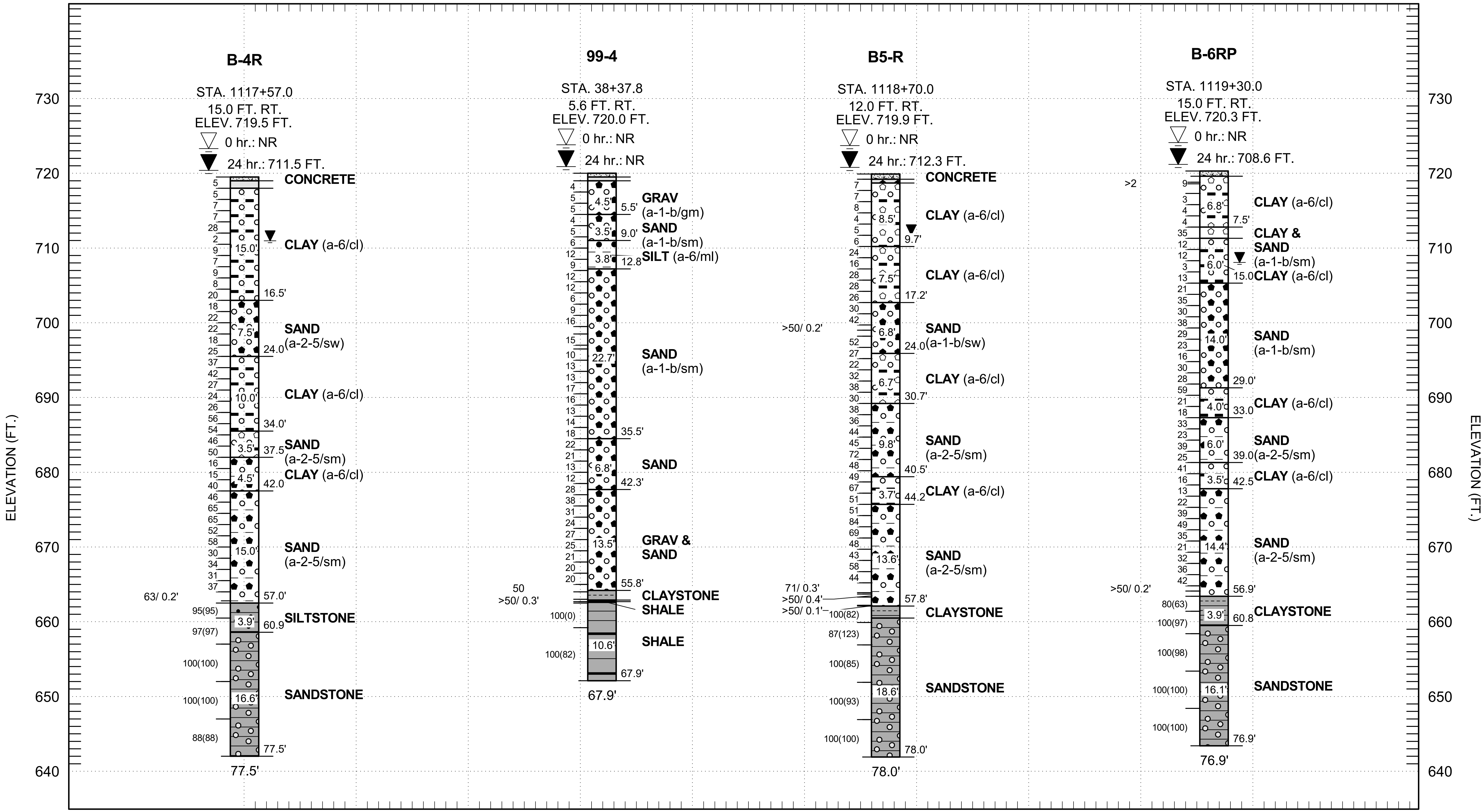
Allegheny County
SR 0376 Section Bathtub Study

Subsurface Profile - Section 4a

Horizontal Scale:	Vertical Scale:
Standard Subsurface Fence Plot	Date: 2/12/2020

Note: Lines, if any, drawn between fence diagrams designate estimated subsurface conditions for presentation purposes only to indicate similar materials. Actual subsurface conditions between boring locations are not known.



Note:
- For description of graphic symbols see Publication 222.
- See General Notes and Legend for Subsurface Profiles sheet.
- BR = Broken Rock
- GRAV = Gravel
- ORG = Organics
- UNSAMP = Unsampled
- Recovery(RQD)

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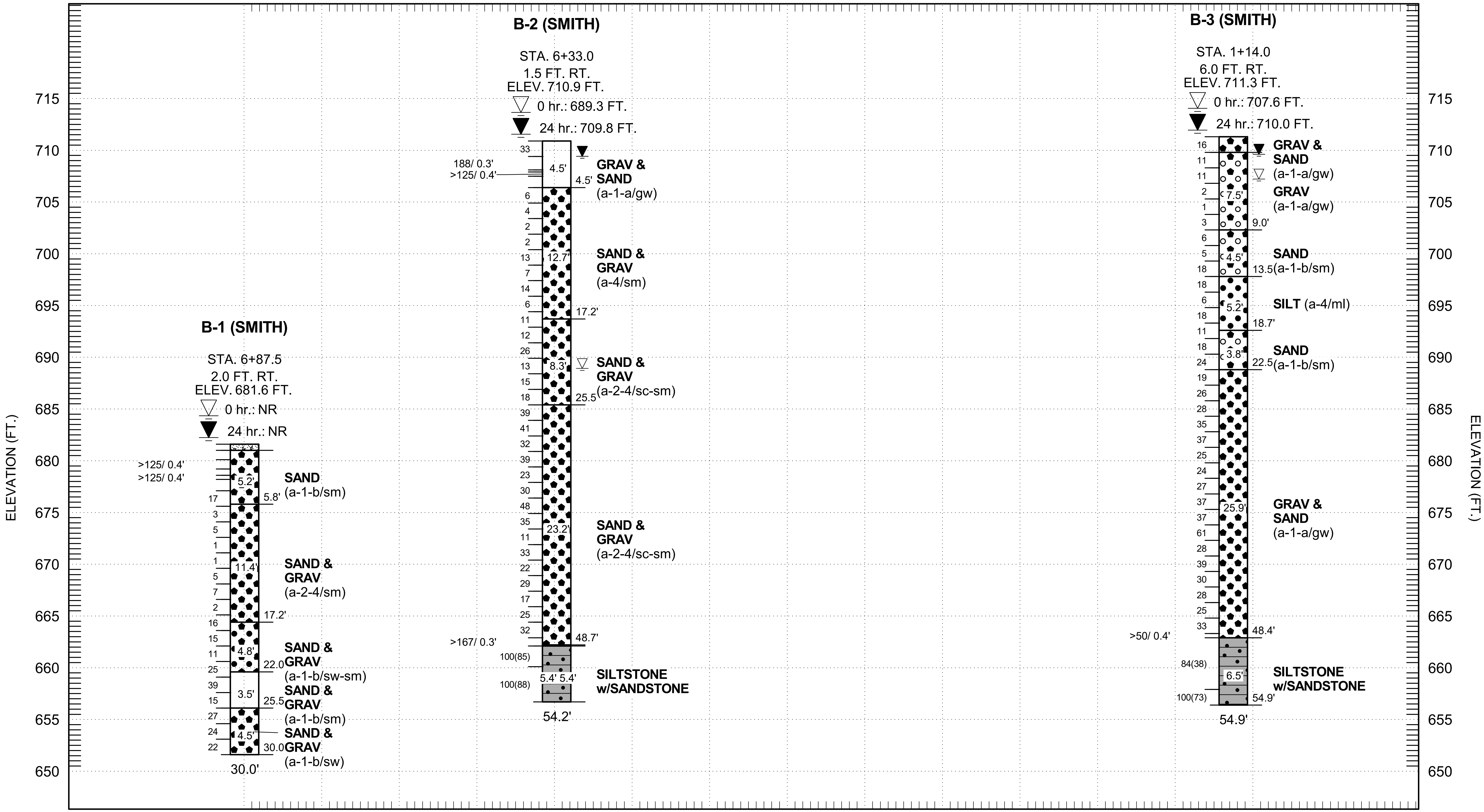
SR 0376 Section Bathtub Study

Subsurface Profile - Section 4b	
Horizontal Scale:	Vertical Scale:
Standard Subsurface Fence Plot	Date: 2/12/2020

Note: Lines, if any, drawn between fence diagrams designate estimated subsurface conditions for presentation purposes only to indicate similar materials. Actual subsurface conditions between boring locations are not known.



Note:
- For description of graphic symbols see Publication 222.
- See General Notes and Legend for Subsurface Profiles sheet.
- BR = Broken Rock
- GRAV = Gravel
- ORG = Organics
- UNSAMP = Unsampled
- Recovery(RQD)

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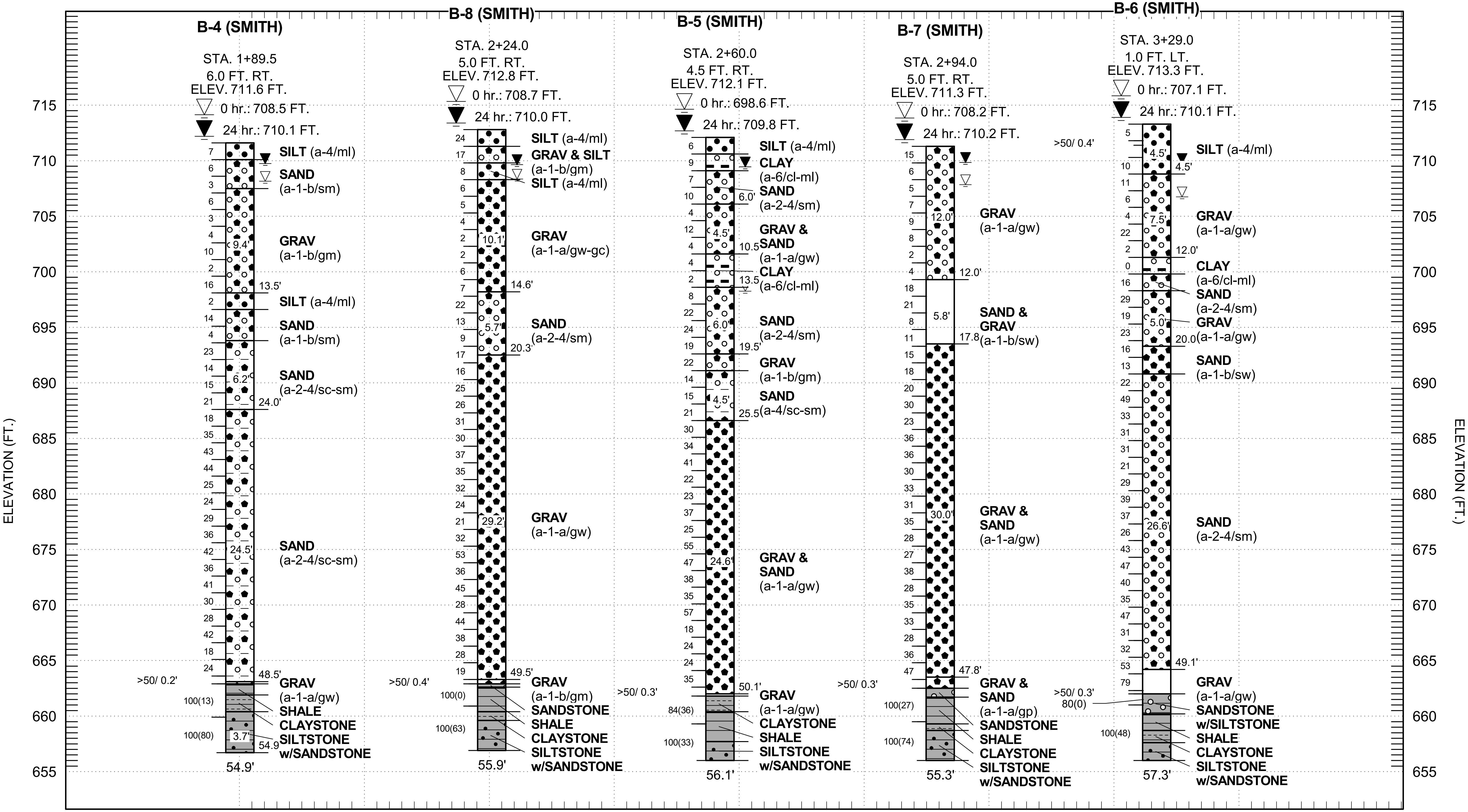
Allegheny County
SR 0376 Section Bathtub Study

Subsurface Profile - Section 5a	
Horizontal Scale:	Vertical Scale:
Standard Subsurface Fence Plot	Date: 2/12/2020

Note: Lines, if any, drawn between fence diagrams designate estimated subsurface conditions for presentation purposes only to indicate similar materials. Actual subsurface conditions between boring locations are not known.



Note:
- For description of graphic symbols see Publication 222.
- See General Notes and Legend for Subsurface Profiles sheet.
- BR = Broken Rock
- GRAV = Gravel
- ORG = Organics
- UNSAMP = Unsampled
- Recovery(RQD)

Prepared by: AECOM Technical Services, Inc.

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Allegheny County
SR 0376 Section Bathtub Study

Subsurface Profile - Section 5b	
Horizontal Scale:	Vertical Scale:
Standard Subsurface Fence Plot	Date: 2/12/2020

I-376 Bathtub Flooding Study - Preliminary Hydrostatic Uplift Analysis BY: JV/SER Date: 5/29/2020
E03204 WO 5 - AECOM Technical Services Chkd: Date

Purpose: Compute the factor of safety for uplift on the existing floodwall foundation due to the hydrostatic pressure exerted by water at the top of the existing and proposed walls.

Assumptions:

- Full communication of river level and foundation materials and no head loss
- Sands and gravels have percent passing of 5 to 15%
- Uplift forces essentially instantaneous with high water

Pavement Density = 135 PCF Input Value
Footing Density = 150 PCF

Calculation: Factor of Safety (F.S.) = (Weight of Pavement + Foundation) / (Height of Water x Unit Weight)
= ((Min. Pvt Depth * Pavement Density) + (Ftg Thick * Footing Density)) / ((T/Wall Elev - B/Ftg Elev) * 62.4 PCF)

Reference: 1982 - L.R. 766 SEC 23 - Floodwall Structure Plans - S-14584 - 114 sheets

						EXISTING FLOODWALL				PROPOSED FLOODWALL			
Wall	Wall Panel	Fdn Panel	Min. Pvt Depth (FT)	Ftg Thick (FT)	B/Ftg Elev. NGVD 29	T/Wall Elev. NGVD 29	Total Height (FT)	Stem Height (FT)	Uplift F.S.	T/Wall Elev. NAVD 88	Total Height (FT) (1)	Stem Height (FT) (1)	Uplift F.S.
B	18, 19	13, 12	1.5	4	710.84	720.00	9.2	5.2	1.40	724.5	14.2	10.2	0.94
B	20, 21	10, 11, 10S	1.5	4.5	709.92	720.00	10.1	5.6	1.40	724.5	15.1	10.6	0.96
B	22 - 25	6-9	1.5	4	710.84	720.00	9.2	5.2	1.40	724.5	14.2	10.2	0.94
B	26	5	1.5	3.5	712.07	720.05	8.0	4.5	1.46	724.5	13.0	9.5	0.94
B	27	4	1.5	3	713.11	720.46	7.3	4.3	1.42	724.5	11.9	8.9	0.92
B	28	3	1.5	2.5	714.3	721.23	6.9	4.4	1.34	724.5	10.7	8.2	0.91
B	29	2	1.5	2	715.66	722.17	6.5	4.5	1.24	724.5	9.4	7.4	0.91
B	30	1	1.5	1.5	717.17	723.19	6.0	4.5	1.14	724.5	7.9	6.4	0.93
C	22	49	1.5	6	706.51	720.00	13.5	7.5	1.31	724.5	18.5	12.5	0.98
C	23, 24	47S	1.5	6.5	705.42	720.00	14.6	8.1	1.29	724.5	19.6	13.1	0.99
C	25-28	46-44	1.5	6	706.51	720.00	13.5	7.5	1.31	724.5	18.5	12.5	0.98
C	38	34	1.5	3.5	711.98	720.04	8.1	4.6	1.45	724.5	13.1	9.5	0.93
C	39	33	1.5	3	713.07	720.27	7.2	4.2	1.45	724.5	12.0	9.0	0.91
C	40	32	1.5	3	713.07	720.50	7.4	4.4	1.41	724.5	12.0	9.0	0.91
C	41	31	1.5	3	713.07	720.73	7.7	4.7	1.37	724.5	12.0	9.0	0.91
C	42	30	1.5	2.69	714.09	720.88	6.8	4.1	1.43	724.5	10.9	8.3	0.93
C	43	29	1.5	2.61	714.09	720.97	6.9	4.3	1.38	724.5	10.9	8.3	0.91
C	44	28	1.5	2.56	714.09	721.00	6.9	4.4	1.36	724.5	10.9	8.4	0.90
C	45	27	1.5	2.52	714.09	721.02	6.9	4.4	1.34	724.5	10.9	8.4	0.89
C	46	26	1.5	2.5	714.09	721.21	7.1	4.6	1.30	724.5	10.9	8.4	0.89
C	47	25N	1.5	2	715.38	721.85	6.5	4.5	1.24	724.5	9.7	7.7	0.88
C	48	24N	1.5	1.5	717.02	723.47	6.5	5.0	1.06	724.5	8.0	6.5	0.92

NOTE: - F.S of 1.14 and 1.06 for Wall B - Panel 30 and Wall C - Panel 48, assumes that the water rises to the top of the existing wall, however the water level will be limited to elevation 720 due spillover at the pump locations. Therefore, these numbers are conservative.
- (1) Includes a 0.53' increase in height due to conversion of NVGD 29 Datum to NAVD 88 Datum for B/Ftg Elevation

Conclusion:

- EXISTING FLOODWALL: The factors of safety are acceptable at all panel points for the existing wall configuration.
- PROPOSED FLOODWALL: The factors of safety are NOT acceptable (< 1.2) at all panel points for the proposed wall height. Therefore, refined analysis or physical mitigation of hydrostatic uplift is necessary at all panel points.

MENU

Getting Around: No ring about the Parkway East's Downtown bathtub

JOE GRATA
Pittsburgh Post-Gazette

JAN 23, 2005 12:00 AM

Pittsburgh Councilman Doug Shields has introduced legislation demanding that PennDOT find a solution to the flooding that sometimes closes the "bathtub" on the Parkway East and disrupts life in the city.

The bathtub is the depressing (as in gloomy) 1,900-foot-long depressed (as in a trough) westbound section along the Monongahela River lip of the Golden Triangle.

When the river spills onto the road and fills the bathtub with water, as it did during Hurricane Frances, Hurricane Ivan and recent heavy rains locally, the parkway westbound is of no benefit to anyone without a boat. Drivers are forced to detour on Fort Pitt Boulevard in the heart of the city to get to the Fort Duquesne or Fort Pitt bridges and points beyond.

"Who was the rocket scientist that designed the bathtub?" Ron Biagiarelli, of West Mifflin, asked in an e-mail.

Shields' resolution asks PennDOT to "act immediately to resolve this matter with the appropriate solution, including but not limited to extending the height of the apparently too-low flood wall." When the Parkway East closes, he said, the city has to deploy extra police to handle the resulting traffic mess, partly because the road also serves as Interstate 376.

Even when the Parkway East is open, the city is a traffic mess every day. The city should act immediately to resolve this matter. And the ridiculously high parking tax, too.

Now some history.

parkway was built in the early 1950s, it was a road to the suburbs, connecting to Business Route 22, west of Monroeville. It was never meant to carry today's volume of cars or 40-ton commercial trucks.

Engineers located the highway along the Monongahela River at the edge of Downtown because there was nowhere else to put it. The city asked the state to shoehorn the westbound lanes, just above river level, between the Mon Wharf and the westbound lanes of bifurcated Fort Pitt Boulevard and to build the high concrete walls that support the boulevard.

In 1980, while he was engineer in charge of the PennDOT District 11 office, Roger Carrier conceived and built the first flood wall, only a couple of feet tall. He also ordered today's stronger, taller (6 feet) wall as part of Parkway East reconstruction in the mid-1980s.

Now some facts.

When the Mon River hits 18 feet, water is even with the edge of the Mon Wharf. At 19 feet, it laps at the foot of the Parkway East floodwall. At 25 feet, or flood stage, the water spills over the wall and into the bathtub.

I don't mean to confuse you, but when the water reaches 21 feet, PennDOT's gravity drain system no longer works. PennDOT closes valves to prevent the water from backing up through the drains and flooding the highway. Any water that leaks through, plus any rainwater that accumulates on the road, flows into a basin at a low point, where two automatically activated sump pumps send it back over the wall and into the river.

When the water level gets to 25 feet and comes over the wall, 1,000 pumps wouldn't save the parkway.

So what about Shields' demand that PennDOT build a higher wall?

Sorry, but PennDOT thought of that years ago, when planning

Engineers determined that 6 feet was as high as they could build the wall without having the bathtub float. What?

That's correct, PennDOT District 11 Executive Karl Ishman and Deputy Executive for Maintenance Andy Kost explained last week.

"PennDOT didn't arbitrarily decide the height of the flood wall," Ishman said. "They measured how much hydrostatic pressure, or water pressure in the ground, that it would take to make the section float like a barge."

While the department realizes the disruption caused when the parkway closes, Kost said the wall had worked pretty well despite the bathtub being filled with water three times over the past five months.

The record bears him out. The last time the parkway had to be closed because of flooding was Nov. 20, 2003. Before that, it was in 1996.

Meanwhile, the wall has enabled the parkway to remain open on dozens of occasions when the Mon Wharf was flooded, so it has been a traffic savior.

There's one more flood-prone section in the same area. It's the lowest part of the new "Interstate Connector" that dips close to Mon Wharf level as it carries traffic from the Fort Duquesne Bridge to the elevated section of the Parkway East toward Monroeville.

That ramp, threaded among other ramps at a corner of Point State Park, also had to be closed two weeks ago because of high water.

PennDOT chose not to proceed with a $750,000 option to install pumps similar to those in the parkway bathtub for such a short distance and, because of the elevation, it's less prone to be flooded. Instead, PennDOT installed new connections in the drainage system and check valves to prevent any backflow.

Next question, Mr. Ishman and Mr. Kost.

If you can't build a higher flood wall, why not raise the road?

"The new minimum height clearance for interstates is 17 feet, 6 inches," Ishman said. "We don't have the room to do that" in the spaghetti of ramps, roads and overpasses between Grant Street and the Fort Pitt Bridge.

Now you know the story.

• • •

Elsewhere. Officials in Seattle have reached agreement on plans for a 1.7-mile, $225 million light-rail extension to Sea-Tac Airport.

• • •

Believe it! PennDOT budgeted more than $194 million and stockpiled more than 500,000 tons of road salt preparing for this winter.

• • •

Plate du jour. While driving on McKnight Road, Kay Mentzer, of the North Hills, spotted the Pennsylvania personalized license plate U LOOZ. Is there A WINNER out there?

Appendix D:

Structural Calculations

AECOM

PennDOT District 11-0		**Designed By:**	HCF	**Date:**	6/12/2020
I-376 Bathtub Analysis		**Checked By:**	WFA	**Date:**	7/2/2020
Job Number:	60612296	**Printed**		7/2/2020	
File Name:	Max Wall Height Calc.xlsx				

Existing Wall, #5 Bars at 12"		
Height of Wall	8	ft
P_{wall}	499.2	lb/ft^2
$M_{max,wall}$	5.32	kip-ft
V_{wall}	2.00	kip

21" Wide Wall, #5 Bars at 6"		
Height of Wall	16.5	ft
P_{wall}	1029.6	lb/ft^2
$M_{max,wall}$	46.72	kip-ft
V_{wall}	8.49	kip

18" Wide Wall, #5 Bars at 6"		
Height of Wall	15.5	ft
P_{wall}	967.2	lb/ft^2
$M_{max,wall}$	38.73	kip-ft
V_{wall}	7.50	kip

21" Wide Wall, #5 Bars at 12"		
Height of Wall	11.5	ft
P_{wall}	717.6	lb/ft^2
$M_{max,wall}$	15.82	kip-ft
V_{wall}	4.13	kip

18" Wide Wall, #5 Bars at 12"		
Height of Wall	10.75	ft
P_{wall}	670.8	lb/ft^2
$M_{max,wall}$	12.92	kip-ft
V_{wall}	3.61	kip

12" Wide Wall, #5 Bars at 12"		
Height of Wall	8.75	ft
P_{wall}	546	lb/ft^2
$M_{max,wall}$	6.97	kip-ft
V_{wall}	2.39	kip

LRFD REINFORCED CONCRETE BEAM DESIGN

8 FT MAX HEIGHT WALL (EXISTING CONDITION)
#5 BARS @ 12"

INPUT PARAMETERS:

F'c	=	3.5	KSI	CONCRETE STRENGTH	
Fy	=	60	KSI	REINFORCEMENT STEEL STRENGTH	
D	=	18.00	IN	BEAM DEPTH	
ds	=	15.69	IN	EFFECTIVE DEPTH = 18.0 - 2.0 - (0.625/2) EXISTING	
b	=	12.00	IN	DESIGN WIDTH	
M	=	5.32	K-FT	FACTORED MOMENT (Load factor for water is 1.0)	
Ms	=	5.32	K-FT	SERVICE LOAD MOMENT	
B1	=	0.8500			LRFD 5.7.2.2
PHI	=	0.9		RESISTANCE FACTOR	LRFD 5.5.4.2.1

CALCULATE AREA OF STEEL REQUIRED:

a	=	(As*Fy)/(0.85*F'c*b)	=	1.68067227	* As	LRFD 5.7.3.2.3
a/2	=		=	0.84033613	* As	
A*As^2	=	PHI*(As)*Fy*(a/2)	=	45.3781513	* As^2	
B*As	=	PHI*As*Fy*d	=	847.125	* As	
C	=	M*12	=	63.84	K-IN	
As(REQ)	=	{B-[SQRT(B^2-4*A*C)]}/(2*A)	=	0.0757	IN^2	

As(PRV)	=	AREA OF REINFORCEMENT PROVIDED	=	0.3100	IN^2
# of BARS	=	NUMBER OF REINFORCEMENT BARS	=	1	
DIA	=	DIAMETER OF REINFORCEMENT BAR	=	0.625	IN

CHECK MOMENT CAPACITY:

a	=	(As*Fy)/(0.85*F'c*b)	=	0.5210084	
a/2	=		=	0.2605042	
Mu	=	[PHI*As*Fy*(d-a/2)]/12	=	21.52	K-FT

CHECK: 21.52 K-FT > 5.32 K-FT **O.K.**

CHECK MINIMUM STEEL:

Ec	=	33000*(0.145^1.5)*SQRT(F'c)	=	3408.79	KSI	LRFD 5.4.2.4
Es	=		=	29000	KSI	LRFD 5.4.3.2
n	=	Es/Ec	=	8.51		LRFD 5.7.1
At	=	(n-1)*As	=	2.33	IN^2	
Ac	=	D*b	=	216.00	IN^2	
Ag	=	At+Ac	=	218.33	IN^2	
dc	=	D-ds	=	2.3125	IN	
Yb	=	[(Ac*D/2)+(At*dc)]/Ag	=	8.9287	IN	
Icg	=		=	5934.97	IN^4	
fr	=	0.24*SQRT(F'c)	=	0.4490	KSI	LRFD 5.4.2.6
γ_1	=		=	1.6		LRFD 5.7.3.3.2
γ_3	=		=	0.67		LRFD 5.7.3.3.2
Mcr	=	$\gamma_1\gamma_3$ (fr*Icg)/Yb	=	26.66	K-FT	
1.33*M	=		=	7.08	K-FT	
Mr	=	MIN (Mcr, 1.33*M)	=	7.08	K-FT	

CHECK: 7.08 K-FT < 21.52 K-FT **O.K.**

USE 1 # 5 BARS As = 0.31 IN^2

<u>CHECK DISTRIBUTION OF FLEXURAL REINFORCEMENT:</u> LRFD/DM4 5.7.3.4

ACTUAL dc = 2.3125 IN USE dc = 2.3125 IN

βs	=	1+(dc/(0.7*(D-dc)))	=	1.21058623	
γe	=		=	1	
Ab	=	[(2*dc*b)-As]/(# of BARS)	=	55.19	IN^2
P	=	As(PRV)/bds	=	0.00165	
Pn	=	P*n	=	0.01401	
K	=	{SQRT[(2*Pn)+(Pn^2)]}-Pn	=	0.1540	
J	=	1-(K/3)	=	0.9487	
fs	=	Ms/(As*J*d)	=	13.84	KSI GOVERNS
OR					
fs	=	0.6*Fy	=	36.00	KSI
smax	=	(700*γe)/(βs*fs) - 2dc	=	37.16	IN

CHECK: 12.00 IN < 37.16 IN **O.K.**

<u>CALCULATE HEIGHT OF WALL</u>

H = (M*1000/10.4)^(1/3) = 8.00 FT

LRFD REINFORCED CONCRETE BEAM DESIGN

18" THICK WALL, #5 BARS @ 6", MOMENT AT TOP OF FOOTING
All new #5 @ 12" bars at new ds location and conservative with existing #5 @ 12" also at new ds location.
See last page of calc for max wall height.

INPUT PARAMETERS:

F'c	=	3.5	KSI	CONCRETE STRENGTH	
Fy	=	60	KSI	REINFORCEMENT STEEL STRENGTH	
D	=	18.00	IN	BEAM DEPTH	
ds	=	14.69	IN	EFFECTIVE DEPTH = 18.0 - 3.0 - (0.625/2) PROPOSED	
b	=	12.00	IN	DESIGN WIDTH	
M	=	38.73	K-FT	FACTORED MOMENT (Load factor for water is 1.0)	
Ms	=	38.73	K-FT	SERVICE LOAD MOMENT	
B1	=	0.8500			LRFD 5.7.2.2
PHI	=	0.9		RESISTANCE FACTOR	LRFD 5.5.4.2.1

CALCULATE AREA OF STEEL REQUIRED:

a	=	(As*Fy)/(0.85*F'c*b)	=	1.6806723	* As	LRFD 5.7.3.2.3
a/2	=		=	0.8403361	* As	
A*As^2	=	PHI*(As)*Fy*(a/2)	=	45.378151	* As^2	
B*As	=	PHI*As*Fy*d	=	793.125	* As	
C	=	M*12	=	464.76	K-IN	
As(REQ)	=	{B-[SQRT(B^2-4*A*C)]}/(2*A)	=	0.6071	IN^2	

As(PRV)	=	AREA OF REINFORCEMENT PROVIDED	=	0.6200	IN^2
# of BARS	=	NUMBER OF REINFORCEMENT BARS	=	2	
DIA	=	DIAMETER OF REINFORCEMENT BAR	=	0.625	IN

CHECK MOMENT CAPACITY:

a	=	(As*Fy)/(0.85*F'c*b)	=	1.0420168	
a/2	=		=	0.5210084	
Mu	=	[PHI*As*Fy*(d-a/2)]/12	=	39.52	K-FT

CHECK: 39.52 K-FT > 38.73 K-FT **O.K.**

CHECK MINIMUM STEEL:

Ec	=	33000*(0.145^1.5)*SQRT(F'c)	=	3408.79	KSI	LRFD 5.4.2.4
Es	=		=	29000	KSI	LRFD 5.4.3.2
n	=	Es/Ec	=	8.51		LRFD 5.7.1
At	=	(n-1)*As	=	4.65	IN^2	
Ac	=	D*b	=	216.00	IN^2	
Ag	=	At+Ac	=	220.65	IN^2	
dc	=	D-ds	=	3.3125	IN	
Yb	=	[(Ac*D/2)+(At*dc)]/Ag	=	8.8800	IN	
Icg	=		=	5979.39	IN^4	
fr	=	0.24*SQRT(F'c)	=	0.4490	KSI	LRFD 5.4.2.6
γ_1	=		=	1.6		LRFD 5.7.3.3.2
γ_3	=		=	0.67		LRFD 5.7.3.3.2
Mcr	=	$\gamma_1\gamma_3$ (fr*Icg)/Yb	=	27.01	K-FT	
1.33*M	=		=	51.51	K-FT	
Mr	=	MIN (Mcr, 1.33*M)	=	27.01	K-FT	

CHECK: 27.01 K-FT < 39.52 K-FT **O.K.**

USE 2 # 5 BARS As = 0.62 IN^2

CHECK DISTRIBUTION OF FLEXURAL REINFORCEMENT: LRFD/DM4 5.7.3.4

ACTUAL dc = 3.3125 IN USE dc = 3.3125 IN

βs	=	1+(dc/(0.7*(D-dc)))	=	1.3221884	
γe	=		=	1	
Ab	=	[(2*dc*b)-As]/(# of BARS)	=	39.44	IN^2
P	=	As(PRV)/bds	=	0.00352	
Pn	=	P*n	=	0.02993	
K	=	{SQRT[(2*Pn)+(Pn^2)]}-Pn	=	0.2165	
J	=	1-(K/3)	=	0.9278	
fs	=	Ms/(As*J*d)	=	55.01	KSI
OR					
fs	=	0.6*Fy	=	36.00	KSI GOVERNS
smax	=	(700*γe)/(βs*fs) - 2dc	=	8.08	IN

CHECK: 6.00 IN < 8.08 IN **O.K.**

CALCULATE HEIGHT OF WALL

H = (M*1000/10.4)^(1/3) = 15.50 FT

LRFD REINFORCED CONCRETE BEAM DESIGN

18" THICK WALL, #5 BARS @ 12", MOMENT AT TOP OF FOOTING
Calc assumes new bars will be lapped with existing #5 bars.
See last page of calc for max wall height.

INPUT PARAMETERS:

F'c	=	3.5	KSI	CONCRETE STRENGTH	
Fy	=	60	KSI	REINFORCEMENT STEEL STRENGTH	
D	=	18.00	IN	BEAM DEPTH	
ds	=	15.69	IN	EFFECTIVE DEPTH = 18.0 - 2.0 - (0.625/2) PROPOSED/EXISTING	
b	=	12.00	IN	DESIGN WIDTH	
M	=	12.92	K-FT	FACTORED MOMENT (Load factor for water is 1.0)	
Ms	=	12.92	K-FT	SERVICE LOAD MOMENT	
B1	=	0.8500			LRFD 5.7.2.2
PHI	=	0.9		RESISTANCE FACTOR	LRFD 5.5.4.2.1

CALCULATE AREA OF STEEL REQUIRED:

a	=	(As*Fy)/(0.85*F'c*b)	=	1.6806723	* As	LRFD 5.7.3.2.3
a/2	=		=	0.8403361	* As	
A*As^2	=	PHI*(As)*Fy*(a/2)	=	45.378151	* As^2	
B*As	=	PHI*As*Fy*d	=	847.125	* As	
C	=	M*12	=	155.04	K-IN	
As(REQ)	=	{B-[SQRT(B^2-4*A*C)]}/(2*A)	=	0.1848	IN^2	

As(PRV)	=	AREA OF REINFORCEMENT PROVIDED	=	0.3100	IN^2
# of BARS	=	NUMBER OF REINFORCEMENT BARS	=	1	
DIA	=	DIAMETER OF REINFORCEMENT BAR	=	0.625	IN

CHECK MOMENT CAPACITY:

a	=	(As*Fy)/(0.85*F'c*b)	=	0.5210084	
a/2	=		=	0.2605042	
Mu	=	[PHI*As*Fy*(d-a/2)]/12	=	21.52	K-FT

CHECK: 21.52 K-FT > 12.92 K-FT **O.K.**

CHECK MINIMUM STEEL:

Ec	=	33000*(0.145^1.5)*SQRT(F'c)	=	3408.79	KSI	LRFD 5.4.2.4
Es	=		=	29000	KSI	LRFD 5.4.3.2
n	=	Es/Ec	=	8.51		LRFD 5.7.1
At	=	(n-1)*As	=	2.33	IN^2	
Ac	=	D*b	=	216.00	IN^2	
Ag	=	At+Ac	=	218.33	IN^2	
dc	=	D-ds	=	2.3125	IN	
Yb	=	[(Ac*D/2)+(At*dc)]/Ag	=	8.9287	IN	
Icg	=		=	5934.97	IN^4	
fr	=	0.24*SQRT(F'c)	=	0.4490	KSI	LRFD 5.4.2.6
γ_1	=		=	1.6		LRFD 5.7.3.3.2
γ_3	=		=	0.67		LRFD 5.7.3.3.2
Mcr	=	$\gamma_1\gamma_3$ (fr*Icg)/Yb	=	26.66	K-FT	
1.33*M	=		=	17.18	K-FT	
Mr	=	MIN (Mcr, 1.33*M)	=	17.18	K-FT	

CHECK: 17.18 K-FT < 21.52 K-FT **O.K.**

USE 1 # 5 BARS As = 0.31 IN^2

CHECK DISTRIBUTION OF FLEXURAL REINFORCEMENT:

LRFD/DM4 5.7.3.4

ACTUAL dc = 2.3125 IN USE dc = 2.3125 IN

βs	=	1+(dc/(0.7*(D-dc)))	=	1.2105862	
γe	=		=	1	
Ab	=	[(2*dc*b)-As]/(# of BARS)	=	55.19	IN^2
P	=	As(PRV)/bds	=	0.00165	
Pn	=	P*n	=	0.01401	
K	=	{SQRT[(2*Pn)+(Pn^2)]}-Pn	=	0.1540	
J	=	1-(K/3)	=	0.9487	
fs	=	Ms/(As*J*d)	=	33.61	KSI GOVERNS
OR					
fs	=	0.6*Fy	=	36.00	KSI
smax	=	(700*γe)/(βs*fs) - 2dc	=	12.58	IN

CHECK: 12.00 IN < 12.58 IN **O.K.**

CALCULATE HEIGHT OF WALL

H = (M*1000/10.4)^(1/3) = 10.75 FT

LRFD REINFORCED CONCRETE BEAM DESIGN

21" THICK WALL@ BASE OF SAFETY SHAPE, #5 BARS @ 6", MOMENT AT TOP OF FOOTING
All new #5 @ 12" bars at new ds location and conservative with #5 @ 12" also assumed at new ds location.
See last page of calc for max wall height.

INPUT PARAMETERS:

F'c	=	3.5	KSI	CONCRETE STRENGTH	
Fy	=	60	KSI	REINFORCEMENT STEEL STRENGTH	
D	=	21.00	IN	BEAM DEPTH	
ds	=	17.69	IN	EFFECTIVE DEPTH = 21.0 - 3.0 - (0.625/2) PROPOSED	
b	=	12.00	IN	DESIGN WIDTH	
M	=	46.72	K-FT	FACTORED MOMENT (Load factor for water is 1.0)	
Ms	=	46.72	K-FT	SERVICE LOAD MOMENT	
B1	=	0.8500			LRFD 5.7.2.2
PHI	=	0.9		RESISTANCE FACTOR	LRFD 5.5.4.2.1

CALCULATE AREA OF STEEL REQUIRED:

a	=	(As*Fy)/(0.85*F'c*b)	=	1.6806723	* As	LRFD 5.7.3.2.3
a/2	=		=	0.8403361	* As	
A*As^2	=	PHI*(As)*Fy*(a/2)	=	45.378151	* As^2	
B*As	=	PHI*As*Fy*d	=	955.125	* As	
C	=	M*12	=	560.64	K-IN	
As(REQ)	=	{B-[SQRT(B^2-4*A*C)]}/(2*A)	=	0.6043	IN^2	

As(PRV)	=	AREA OF REINFORCEMENT PROVIDED	=	0.6200	IN^2
# of BARS	=	NUMBER OF REINFORCEMENT BARS	=	2	
DIA	=	DIAMETER OF REINFORCEMENT BAR	=	0.625	IN

CHECK MOMENT CAPACITY:

a	=	(As*Fy)/(0.85*F'c*b)	=	1.0420168	
a/2	=		=	0.5210084	
Mu	=	[PHI*As*Fy*(d-a/2)]/12	=	47.89	K-FT

CHECK:	47.89	K-FT	>	46.72	K-FT	O.K.

CHECK MINIMUM STEEL:

Ec	=	33000*(0.145^1.5)*SQRT(F'c)	=	3408.79	KSI	LRFD 5.4.2.4
Es	=		=	29000	KSI	LRFD 5.4.3.2
n	=	Es/Ec	=	8.51		LRFD 5.7.1
At	=	(n-1)*As	=	4.65	IN^2	
Ac	=	D*b	=	252.00	IN^2	
Ag	=	At+Ac	=	256.65	IN^2	
dc	=	D-ds	=	3.3125	IN	
Yb	=	[(Ac*D/2)+(At*dc)]/Ag	=	10.3696	IN	
Icg	=		=	9497.10	IN^4	
fr	=	0.24*SQRT(F'c)	=	0.4490	KSI	LRFD 5.4.2.6
γ_1	=		=	1.6		LRFD 5.7.3.3.2
γ_3	=		=	0.67		LRFD 5.7.3.3.2
Mcr	=	$\gamma_1\gamma_3$ (fr*Icg)/Yb	=	36.74	K-FT	
1.33*M	=		=	62.14	K-FT	
Mr	=	MIN (Mcr, 1.33*M)	=	36.74	K-FT	

CHECK:	36.74	K-FT	<	47.89	K-FT	O.K.

USE 2 # 5 BARS As = 0.62 IN^2

CHECK DISTRIBUTION OF FLEXURAL REINFORCEMENT: LRFD/DM4 5.7.3.4

ACTUAL dc = 3.3125 IN USE dc = 3.3125 IN

βs	=	1+(dc/(0.7*(D-dc)))	=	1.2675416	
γe	=		=	1	
Ab	=	[(2*dc*b)-As]/(# of BARS)	=	39.44	IN^2
P	=	As(PRV)/bds	=	0.00292	
Pn	=	P*n	=	0.02485	
K	=	{SQRT[(2*Pn)+(Pn^2)]}-Pn	=	0.1995	
J	=	1-(K/3)	=	0.9335	
fs	=	Ms/(As*J*d)	=	54.77	KSI
OR					
fs	=	0.6*Fy	=	36.00	KSI GOVERNS
smax	=	(700*γe)/(βs*fs) - 2dc	=	8.72	IN

CHECK: 6.00 IN < 8.72 IN **O.K.**

CALCULATE HEIGHT OF WALL

H = (M*1000/10.4)^(1/3) = 16.50 FT

LRFD REINFORCED CONCRETE BEAM DESIGN

21" THICK WALL@ BASE OF SAFETY SHAPE, #5 BARS @ 12", MOMENT AT TOP OF FOOTING
Calc assumes new bars will be lapped with existing #5 bars.
See last page of calc for max wall height.

INPUT PARAMETERS:

F'c	=	3.5	KSI	CONCRETE STRENGTH	
Fy	=	60	KSI	REINFORCEMENT STEEL STRENGTH	
D	=	21.00	IN	BEAM DEPTH	
ds	=	18.69	IN	EFFECTIVE DEPTH = 21.0 - 2.0 - (0.625/2) PROPOSED/EXISTING	
b	=	12.00	IN	DESIGN WIDTH	
M	=	15.82	K-FT	FACTORED MOMENT (Load factor for water is 1.0)	
Ms	=	15.82	K-FT	SERVICE LOAD MOMENT	
B1	=	0.8500			LRFD 5.7.2.2
PHI	=	0.9		RESISTANCE FACTOR	LRFD 5.5.4.2.1

CALCULATE AREA OF STEEL REQUIRED:

a	=	(As*Fy)/(0.85*F'c*b)	=	1.6806723	* As	LRFD 5.7.3.2.3
a/2	=		=	0.8403361	* As	
A*As^2	=	PHI*(As)*Fy*(a/2)	=	45.378151	* As^2	
B*As	=	PHI*As*Fy*d	=	1009.125	* As	
C	=	M*12	=	189.84	K-IN	
As(REQ)	=	{B-[SQRT(B^2-4*A*C)]}/(2*A)	=	0.1897	IN^2	

As(PRV)	=	AREA OF REINFORCEMENT PROVIDED	=	0.3100	IN^2
# of BARS	=	NUMBER OF REINFORCEMENT BARS	=	1	
DIA	=	DIAMETER OF REINFORCEMENT BAR	=	0.625	IN

CHECK MOMENT CAPACITY:

a	=	(As*Fy)/(0.85*F'c*b)	=	0.5210084	
a/2	=		=	0.2605042	
Mu	=	[PHI*As*Fy*(d-a/2)]/12	=	25.71	K-FT

CHECK:	25.71	K-FT	>	15.82	K-FT	O.K.

CHECK MINIMUM STEEL:

Ec	=	33000*(0.145^1.5)*SQRT(F'c)	=	3408.79	KSI	LRFD 5.4.2.4
Es	=		=	29000	KSI	LRFD 5.4.3.2
n	=	Es/Ec	=	8.51		LRFD 5.7.1
At	=	(n-1)*As	=	2.33	IN^2	
Ac	=	D*b	=	252.00	IN^2	
Ag	=	At+Ac	=	254.33	IN^2	
dc	=	D-ds	=	2.3125	IN	
Yb	=	[(Ac*D/2)+(At*dc)]/Ag	=	10.4251	IN	
Icg	=		=	9415.58	IN^4	
fr	=	0.24*SQRT(F'c)	=	0.4490	KSI	LRFD 5.4.2.6
γ_1	=		=	1.6		LRFD 5.7.3.3.2
γ_3	=		=	0.67		LRFD 5.7.3.3.2
Mcr	=	$\gamma_1\gamma_3$ (fr*Icg)/Yb	=	36.23	K-FT	
1.33*M	=		=	21.04	K-FT	
Mr	=	MIN (Mcr, 1.33*M)	=	21.04	K-FT	

CHECK:	21.04	K-FT	<	25.71	K-FT	O.K.

USE	1	# 5 BARS	As =	0.31	IN^2

CHECK DISTRIBUTION OF FLEXURAL REINFORCEMENT: LRFD/DM4 5.7.3.4

ACTUAL dc = 2.3125 IN USE dc = 2.3125 IN

βs	=	1+(dc/(0.7*(D-dc)))	=	1.1767797	
γe	=		=	1	
Ab	=	[(2*dc*b)-As]/(# of BARS)	=	55.19	IN^2
P	=	As(PRV)/bds	=	0.00138	
Pn	=	P*n	=	0.01176	
K	=	{SQRT[(2*Pn)+(Pn^2)]}-Pn	=	0.1421	
J	=	1-(K/3)	=	0.9526	
fs	=	Ms/(As*J*d)	=	34.40	KSI GOVERNS
OR					
fs	=	0.6*Fy	=	36.00	KSI
smax	=	(700*γe)/(βs*fs) - 2dc	=	12.67	IN

CHECK: 12.00 IN < 12.67 IN **O.K.**

CALCULATE HEIGHT OF WALL

H = (M*1000/10.4)^(1/3) = 11.50 FT

LRFD REINFORCED CONCRETE BEAM DESIGN

12" THICK WALL@ TOP OF BARRIER, #5 BARS @ 12", MOMENT AT TOP OF SAFETY SHAPE
Calc assumes new bars will be lapped with existing #5 bars.
See last page of calc for max wall height.

INPUT PARAMETERS:

F'c	=	3.5	KSI	CONCRETE STRENGTH	
Fy	=	60	KSI	REINFORCEMENT STEEL STRENGTH	
D	=	12.00	IN	BEAM DEPTH	
ds	=	9.69	IN	EFFECTIVE DEPTH = 12.0 - 2.0 - (0.625/2) PROPOSED/EXISTING	
b	=	12.00	IN	DESIGN WIDTH	
M	=	6.97	K-FT	FACTORED MOMENT (Load factor for water is 1.0)	
Ms	=	6.97	K-FT	SERVICE LOAD MOMENT	
B1	=	0.8500			LRFD 5.7.2.2
PHI	=	0.9		RESISTANCE FACTOR	LRFD 5.5.4.2.1

CALCULATE AREA OF STEEL REQUIRED:

a	=	(As*Fy)/(0.85*F'c*b)	=	1.6806723	* As	LRFD 5.7.3.2.3
a/2	=		=	0.8403361	* As	
A*As^2	=	PHI*(As)*Fy*(a/2)	=	45.378151	* As^2	
B*As	=	PHI*As*Fy*d	=	523.125	* As	
C	=	M*12	=	83.64	K-IN	
As(REQ)	=	{B-[SQRT(B^2-4*A*C)]}/(2*A)	=	0.1622	IN^2	

As(PRV)	=	AREA OF REINFORCEMENT PROVIDED	=	0.3100	IN^2
# of BARS	=	NUMBER OF REINFORCEMENT BARS	=	1	
DIA	=	DIAMETER OF REINFORCEMENT BAR	=	0.625	IN

CHECK MOMENT CAPACITY:

a	=	(As*Fy)/(0.85*F'c*b)	=	0.5210084	
a/2	=		=	0.2605042	
Mu	=	[PHI*As*Fy*(d-a/2)]/12	=	13.15	K-FT

CHECK:	13.15	K-FT	>	6.97	K-FT	O.K.

CHECK MINIMUM STEEL:

Ec	=	33000*(0.145^1.5)*SQRT(F'c)	=	3408.79	KSI	LRFD 5.4.2.4
Es	=		=	29000	KSI	LRFD 5.4.3.2
n	=	Es/Ec	=	8.51		LRFD 5.7.1
At	=	(n-1)*As	=	2.33	IN^2	
Ac	=	D*b	=	144.00	IN^2	
Ag	=	At+Ac	=	146.33	IN^2	
dc	=	D-ds	=	2.3125	IN	
Yb	=	[(Ac*D/2)+(At*dc)]/Ag	=	5.9414	IN	
Icg	=		=	1759.14	IN^4	
fr	=	0.24*SQRT(F'c)	=	0.4490	KSI	LRFD 5.4.2.6
γ_1	=		=	1.6		LRFD 5.7.3.3.2
γ_3	=		=	0.67		LRFD 5.7.3.3.2
Mcr	=	$\gamma_1\gamma_3$ (fr*Icg)/Yb	=	11.88	K-FT	
1.33*M	=		=	9.27	K-FT	
Mr	=	MIN (Mcr, 1.33*M)	=	9.27	K-FT	

CHECK:	9.27	K-FT	<	13.15	K-FT	O.K.

USE 1 # 5 BARS As = 0.31 IN^2

CHECK DISTRIBUTION OF FLEXURAL REINFORCEMENT:

LRFD/DM4 5.7.3.4

ACTUAL dc = 2.3125 IN USE dc = 2.3125 IN

βs	=	1+(dc/(0.7*(D-dc)))	=	1.3410138	
γe	=		=	1	
Ab	=	[(2*dc*b)-As]/(# of BARS)	=	55.19	IN^2
P	=	As(PRV)/bds	=	0.00267	
Pn	=	P*n	=	0.02269	
K	=	{SQRT[(2*Pn)+(Pn^2)]}-Pn	=	0.1915	
J	=	1-(K/3)	=	0.9362	
fs	=	Ms/(As*J*d)	=	29.75	KSI GOVERNS
OR					
fs	=	0.6*Fy	=	36.00	KSI
smax	=	(700*γe)/(βs*fs) - 2dc	=	12.92	IN

CHECK: 12.00 IN < 12.92 IN **O.K.**

CALCULATE HEIGHT OF WALL

$H_{T/BARRIER}$ = (M*1000/10.4)^(1/3) = 8.75 FT

$H_{T/FOOTING}$ = $H_{T/BARRIER}$ + 3'-6" BARRIER + 2'-0" PVMT = 14.25 FT (VERIFY W/ 21" WALL HEIGHT)

AECOM				
PennDOT District 11-0	Designed By:	HCF	Date:	4/17/2020
I-376 Bathtub Analysis	Checked By:	WFA	Date:	7/2/2020
Job Number: 60612296	Printed			7/2/2020
File Name: Bathtub Wall Shear Analysis.xlsx				

I-376 Bathtub Existing Floodwall Shear Analysis (18" wall, #5 @ 12", 8'-0" wall height)

Calculate Shear Resistance (AASHTO 5.7.3.3)

ABLRFD analysis currently uses the simplified method in AASHTO 5.7.3.4.1 per DC5.7.3.4.1. Use the simplified method to evaluate shear.

Inputs

f'_c	3.5	ksi	
f_y	60	ksi	
h = overall depth	18	in	
d_s = extreme compression fiber to centroid of nonprestressed tensile reinforcement	15.6875	in = d_e = 18.0 - 2.0 - (0.625/2)	
M_u = factored moment at the section	63.84	kip-in	
N_u = applied factored axial force (tension = +)	0	kip	
V_u = factored shear force at section	1.997	kip	
E_s = modulus of elasticity of reinforcing bars	29000	ksi	
A_s = Area of nonprestressed tension reinforcement	0.31	in^2	
β	2		
b_v = design strip width	12	in	
d_v = max(0.9d_e, 0.72h)	14.12	in	(AASHTO C5.7.2.8)
d_e = d_s	15.69	in	(AASHTO C5.7.2.8-2) (d_e = d_s for non-prestressed)
λ = Concrete density modification factor	1		(AASHTO 5.4.2.8) (for normal weight concrete)
ϕ_v	0.9		(AASHTO 5.5.4.2)

Calculate Shear Resistance and Compare to Applied Shear (AASHTO 5.7.3.3)

$V_n = V_c$	20.03	kip	(AASHTO 5.7.3.3-1)
$V_n = 0.25f'_c b_v d_v$	148.25	kip	(AASHTO 5.7.3.3-2)
$V_c = 0.0316\beta\lambda\sqrt{(f'_c)}b_v d_v$	20.03	kip	(AASHTO 5.7.3.3-3)
$V_u \leq \phi V_n$	1.997	<=	18.03 OK

Check for Requirement of Transverse Reinforcement (AASHTO 5.7.2.3)

If $V_u > 0.5\phi(V_c)$, transverse reinforcement is required.

V_u	1.997	kip	
$0.5\phi(V_c)$	9.014489	kip	No transverse reinforcement required.

I-376 Bathtub Proposed Floodwall Shear Analysis (18" wall, #5 @ 6", 15'-6" wall height)

Calculate Shear Resistance (AASHTO 5.7.3.3)

ABLRFD analysis currently uses the simplified method in AASHTO 5.7.3.4.1 per DC5.7.3.4.1. Use the simplified method to evaluate shear.

Inputs

f'_c	3.5	ksi	
f_y	60	ksi	
h = overall depth	18	in	
d_s = extreme compression fiber to centroid of nonprestressed tensile reinforcement	14.6875	in = d_e = 18.0 - 3.0 - (0.625/2)	
M_u = factored moment at the section	464.76	kip-in	
N_u = applied factored axial force (tension = +)	0	kip	
V_u = factored shear force at section	7.5	kip	
E_s = modulus of elasticity of reinforcing bars	29000	ksi	
A_s = Area of nonprestressed tension reinforcement	0.62	in^2	
β	2		
b_v = design strip width	12	in	
d_v = max(0.9d_e, 0.72h)	13.22	in	(AASHTO C5.7.2.8)
d_e = d_s	14.69	in	(AASHTO C5.7.2.8-2) (d_e = d_s for non-prestressed)
λ = Concrete density modification factor	1		(AASHTO 5.4.2.8) (for normal weight concrete)
ϕ_v	0.9		(AASHTO 5.5.4.2)

Calculate Shear Resistance and Compare to Applied Shear (AASHTO 5.7.3.3)

$V_n = V_c$	18.76	kip	(AASHTO 5.7.3.3-1)	Controls
$V_n = 0.25f'_c b_v d_v$	138.80	kip	(AASHTO 5.7.3.3-2)	
$V_c = 0.0316\beta\lambda\sqrt{(f'_c)}b_v d_v$	18.76	kip	(AASHTO 5.7.3.3-3)	
$V_u \leq \phi V_n$	7.5	<=	16.88	OK

Check for Requirement of Transverse Reinforcement (AASHTO 5.7.2.3)

If $V_u > 0.5\phi(V_c)$, transverse reinforcement is required.

V_u	7.5	kip	
$0.5\phi(V_c)$	8.43986	kip	No transverse reinforcement required.

I-376 Bathtub Proposed Floodwall Shear Analysis (18" wall, #5 @ 12", 10'-9" wall height)

Calculate Shear Resistance (AASHTO 5.7.3.3)

ABLRFD analysis currently uses the simplified method in AASHTO 5.7.3.4.1 per DC5.7.3.4.1. Use the simplified method to evaluate shear.

Inputs

f'_c	3.5	ksi	
f_y	60	ksi	
h = overall depth	18	in	
d_s = extreme compression fiber to centroid of nonprestressed tensile reinforcement	15.6875	in = d_e = 18.0 - 2.0 - (0.625/2)	
M_u = factored moment at the section	155.04	kip-in	
N_u = applied factored axial force (tension = +)	0	kip	
V_u = factored shear force at section	3.61	kip	
E_s = modulus of elasticity of reinforcing bars	29000	ksi	
A_s = Area of nonprestressed tension reinforcement	0.31	in^2	
β	2		
b_v = design strip width	12	in	
d_v = max(0.9d_e, 0.72h)	14.12	in	(AASHTO C5.7.2.8)
d_e = d_s	15.69	in	(AASHTO C5.7.2.8-2) (d_e = d_s for non-prestressed)
λ = Concrete density modification factor	1		(AASHTO 5.4.2.8) (for normal weight concrete)
ϕ_v	0.9		(AASHTO 5.5.4.2)

Calculate Shear Resistance and Compare to Applied Shear (AASHTO 5.7.3.3)

$V_n = V_c$	20.03	kip	(AASHTO 5.7.3.3-1)	Controls
$V_n = 0.25f'_c b_v d_v$	148.25	kip	(AASHTO 5.7.3.3-2)	
$V_c = 0.0316\beta\lambda\sqrt{(f'_c)}b_v d_v$	20.03	kip	(AASHTO 5.7.3.3-3)	
$V_u \le \phi V_n$	3.61	<=	18.03	OK

Check for Requirement of Transverse Reinforcement (AASHTO 5.7.2.3)

If $V_u > 0.5\phi(V_c)$, transverse reinforcement is required.

V_u	3.61	kip	
$0.5\phi(V_c)$	9.014489	kip	No transverse reinforcement required.

AECOM

PennDOT District 11-0	**Designed By:**	HCF	**Date:**	4/17/2020
I-376 Bathtub Analysis	**Checked By:**	WFA	**Date:**	7/2/2020
Job Number: 60612296	**Printed**		7/2/2020	
File Name: Bathtub Wall Shear Analysis.xlsx				

I-376 Bathtub Proposed Floodwall Shear Analysis (21" wall, #5 @ 6", 16'-6" wall height)

Calculate Shear Resistance (AASHTO 5.7.3.3)

ABLRFD analysis currently uses the simplified method in AASHTO 5.7.3.4.1 per DC5.7.3.4.1. Use the simplified method to evaluate shear.

Inputs

f'_c	3.5	ksi	
f_y	60	ksi	
h = overall depth	21	in	
d_s = extreme compression fiber to centroid of nonprestressed tensile reinforcement	17.6875	in = d_e = 21.0 - 3.0 - (0.625/2)	
M_u = factored moment at the section	560.64	kip-in	
N_u = applied factored axial force (tension = +)	0	kip	
V_u = factored shear force at section	8.5	kip	
E_s = modulus of elasticity of reinforcing bars	29000	ksi	
A_s = Area of nonprestressed tension reinforcement	0.62	in^2	
β	2		
b_v = design strip width	12	in	
d_v = max(0.9d_e, 0.72h)	15.92	in	(AASHTO C5.7.2.8)
d_e = d_s	17.69	in	(AASHTO C5.7.2.8-2) (d_e = d_s for non-prestressed)
λ = Concrete density modification factor	1		(AASHTO 5.4.2.8) (for normal weight concrete)
ϕ_v	0.9		(AASHTO 5.5.4.2)

Calculate Shear Resistance and Compare to Applied Shear (AASHTO 5.7.3.3)

$V_n = V_c$	22.59	kip	(AASHTO 5.7.3.3-1)	Controls
$V_n = 0.25f'_c b_v d_v$	167.15	kip	(AASHTO 5.7.3.3-2)	
$V_c = 0.0316\beta\lambda\sqrt{(f'_c)}b_v d_v$	22.59	kip	(AASHTO 5.7.3.3-3)	
$V_u \leq \phi V_n$	8.5	<=	20.33	OK

Check for Requirement of Transverse Reinforcement (AASHTO 5.7.2.3)

If $V_u > 0.5\phi(V_c)$, transverse reinforcement is required.

V_u	8.5	kip	
$0.5\phi(V_c)$	10.16375	kip	No transverse reinforcement required.

AECOM				
PennDOT District 11-0	**Designed By:**	HCF	**Date:**	4/17/2020
I-376 Bathtub Analysis	**Checked By:**	WFA	**Date:**	7/2/2020
Job Number: 60612296	**Printed**		7/2/2020	
File Name: Bathtub Wall Shear Analysis.xlsx				

I-376 Bathtub Proposed Floodwall Shear Analysis (21" wall, #5 @ 12", 11'-6" wall height)

Calculate Shear Resistance (AASHTO 5.7.3.3)

ABLRFD analysis currently uses the simplified method in AASHTO 5.7.3.4.1 per DC5.7.3.4.1. Use the simplified method to evaluate shear.

Inputs

f'_c	3.5	ksi	
f_y	60	ksi	
h = overall depth	21	in	
d_s = extreme compression fiber to centroid of nonprestressed tensile reinforcement	18.6875	in = d_e = 21.0 - 2.0 - (0.625/2)	
M_u = factored moment at the section	189.84	kip-in	
N_u = applied factored axial force (tension = +)	0	kip	
V_u = factored shear force at section	4.13	kip	
E_s = modulus of elasticity of reinforcing bars	29000	ksi	
A_s = Area of nonprestressed tension reinforcement	0.31	in^2	
β	2		
b_v = design strip width	12	in	
d_v = max(0.9d_e, 0.72h)	16.82	in	(AASHTO C5.7.2.8)
d_e = d_s	18.69	in	(AASHTO C5.7.2.8-2) (d_e = d_s for non-prestressed)
λ = Concrete density modification factor	1		(AASHTO 5.4.2.8) (for normal weight concrete)
ϕ_v	0.9		(AASHTO 5.5.4.2)

Calculate Shear Resistance and Compare to Applied Shear (AASHTO 5.7.3.3)

$V_n = V_c$	23.86	kip	(AASHTO 5.7.3.3-1)	Controls
$V_n = 0.25f'_c b_v d_v$	176.60	kip	(AASHTO 5.7.3.3-2)	
$V_c = 0.0316\beta\lambda\sqrt{(f'_c)}b_v d_v$	23.86	kip	(AASHTO 5.7.3.3-3)	
$V_u \le \phi V_n$	4.13	<=	21.48	OK

Check for Requirement of Transverse Reinforcement (AASHTO 5.7.2.3)

If $V_u > 0.5\phi(V_c)$, transverse reinforcement is required.

V_u	4.13	kip	
$0.5\phi(V_c)$	10.73838	kip	No transverse reinforcement required.

I-376 Bathtub Proposed Floodwall Shear Analysis (12" wall, #5 @ 12", 8'-9" Above Top of Barrier)

Calculate Shear Resistance (AASHTO 5.7.3.3)

ABLRFD analysis currently uses the simplified method in AASHTO 5.7.3.4.1 per DC5.7.3.4.1. Use the simplified method to evaluate shear.

Inputs

f'_c	3.5	ksi	
f_y	60	ksi	
h = overall depth	12	in	
d_s = extreme compression fiber to centroid of nonprestressed tensile reinforcement	9.6875	in = d_e = 12.0 - 2.0 - (0.625/2)	
M_u = factored moment at the section	83.64	kip-in	
N_u = applied factored axial force (tension = +)	0	kip	
V_u = factored shear force at section	2.39	kip	
E_s = modulus of elasticity of reinforcing bars	29000	ksi	
A_s = Area of nonprestressed tension reinforcement	0.31	in^2	
β	2		
b_v = design strip width	12	in	
d_v = max(0.9d_e, 0.72h)	8.72	in	(AASHTO C5.7.2.8)
d_e = d_s	9.69	in	(AASHTO C5.7.2.8-2) (d_e = d_s for non-prestressed)
λ = Concrete density modification factor	1		(AASHTO 5.4.2.8) (for normal weight concrete)
ϕ_v	0.9		(AASHTO 5.5.4.2)

Calculate Shear Resistance and Compare to Applied Shear (AASHTO 5.7.3.3)

$V_n = V_c$	12.37	kip	(AASHTO 5.7.3.3-1)
$V_n = 0.25f'_c b_v d_v$	91.55	kip	(AASHTO 5.7.3.3-2)
$V_c = 0.0316\beta\lambda\sqrt{(f'_c)}b_v d_v$	12.37	kip	(AASHTO 5.7.3.3-3)
$V_u \leq \phi V_n$	2.39	<=	11.13 OK

Check for Requirement of Transverse Reinforcement (AASHTO 5.7.2.3)

If $V_u > 0.5\phi(V_c)$, transverse reinforcement is required.

V_u	2.39	kip	
$0.5\phi(V_c)$	5.566716	kip	No transverse reinforcement required.

Appendix E:

Automated ITS Flood Detection and Gate System Memorandum

Memorandum

Feb 21, 2020

I-376 Bathtub Flooding Study

High Level Evaluation Flood Detection System and Gate System – Option 3

1) Project Overview

The Bathtub Flooding Study project entails the evaluation of three potential build alternatives to mitigate recurring flood events along the I-376 W bathtub area of the Parkway East:

- Option 1: Increase the size of the wall adjacent to the Mon Wharf parking area
- Option 2: Create Tunnel like structure
- Option 3: Install larger capacity pumps and Automated detection/gate system

This memorandum focuses specifically on Option 3, the High-Level Evaluation for a Flood Detection System and Gate System. A cost estimate for the conceptual Flood Detection System was developed and can be found in the Appendix H. This cost estimate is broken down by the individual Scada Remote Input/Output locations and various devices within those groups.

Based on PennDOT's current Bathtub/Interstate Connector Emergency Closure procedures, the existing Bathtub Flooding Plan calls for the following requirements to be implemented based upon the existing river water levels. The required actions are provided below:

- Bathtub and Interstate Connector flood when river water levels reach 25.0'
- 18.0' River Level: Sluice gates to be closed by Tunnel personnel
- 23.0' River Level:
  - Emergency Management Coordinator to contact Press Officer informing of impending closure
  - Assistant/Incident Commander (IC) to ensure Sign Crew is prepared to close Bathtub and Interstate Connector
  - Crash trucks begin to access staging locations
  - Detour routes are to be implemented
  - Assistant/(IC) to contact State Police to be on-scene for initial closure
  - Assistant/IC to contact City of Pittsburgh Police to be informed of potential Bathtub closure. If Bathtub is closed, Pittsburgh Police must be stationed on

Ft. Pitt Boulevard to facilitate flow of traffic. ADE-Maintenance must be contacted in event Pittsburgh Police are not responsive.

- River Level 12” below top of Mon Wharf wall and Rising:
  - County Manager makes call to close I-376 WB immediately
  - Incident Command Center (ICC) should stand-up
  - County Manager/Assistant to contact TMC and Press Office to notify of closure
- Seven access areas need closed (in order of priority)
  - I-376 WB before Grant Street off-ramp
  - Ramp from Grant Street to I-376 WB
  - I-279 SB to I-376 EB on Portal Bridge
  - Access from Point State Park to I-376 EB
  - Ramp from Stanwix Street to I-376 EB
  - Ramp from Market Street to I-376 EB
  - Ramp from Wood Street to I-376 EB

Aligning with the PennDOT response procedures, AECOM has developed recommendations for an Automated Flood Detection/Gate System to be located within and outside the Bathtub area during severe flooding events. This proposed automated system has been prepared to significantly reduce the time and labor force required to close and reopen to traffic the seven access points to the Bathtub area during a flood event.

2) Existing ITS System within Bathtub Area

The existing ITS devices located in this area include nine (9) CCTV cameras and three (3) DMS insert signs. These devices are connected through a Hybrid of wireless and fiber media with overall fiber connectivity to the Western Regional Transportation Management Center and Ft Pitt Tunnel Control Room. Operators at both locations can monitor and control these devices during the flooding events. The three major DMS insert signs allow the display of a “Closed” message for inbound I-376 traffic in advance of the Grant Street off ramp during a flooding event. There is no existing flood detection or gate system within this area for monitoring and managing the flooding event when it occurs. The existing ITS system within the Bathtub area of I-376 is shown in Figure 1 below.

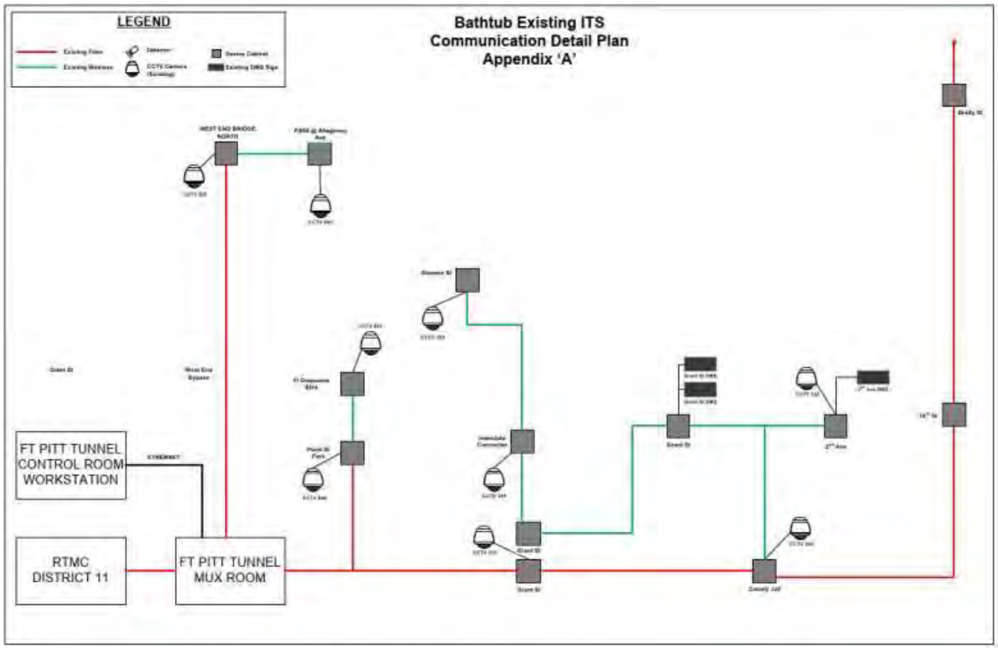


Figure1

3) Proposed Flood Detection System and Gate SCADA Monitoring and Control System

    a) Existing Ft Pitt Tunnel Scada System

        An office meeting was held on November 1, 2019 at the Ft Pitt Tunnel with PennDOT Tunnel Manager, Ben DeVore, and representatives of AECOM in attendance. Discussed at the meeting was the existing PLC Scada Monitoring and Control System equipment operating in the Ft Pitt Tunnel. The current Scada System is an Allen Bradley PLX Control Logix 5573 Controller as shown in Figure 2 below. This system currently controls the tunnel fans and ventilation system.

Figure 2

The existing FT Pitt Tunnel PLC Scada Monitoring and Control System has the ability to be expanded to include new Flood Detection and gate system components simply by adding new remote I/O (Input/Output) control cabinet locations needed for the proposed automated equipment for the Bathtub Flooding areas. This topology expansion would be thru an EtherNet/IP connection using the existing fiber optic network to the Bathtub area. The existing Allen Bradley Factory Talk Software, the current operations (Graphical User Interface) operating at the Ft Pitt Tunnel can be modified to account for the proposed Bathtub Flood Area components.

b) Proposed Remote PLC Scada Monitoring and Control cabinets within the Bathtub Area

(1) Scada Input/Output Modules for Flood Detection, Gates and Pumps

A typical Remote Input/Output SCADA Chassis is shown below in Figure 3

Figure 3

The Remote Input/Output chassis consists of the following components working from left to right:

- Dual 120V power supplies
- Ethernet Ip Network module
- Analog Input Module
- Digital Input Module
- Digital Output Module

The above listed Remote Input/Output modules above are further explained as follows:

Analog Input Module – This module is used to receive any variable signal input from a field device. Variable signal inputs on this project would include

- Pressure Transducer readings for the depth of water behind the flood wall
- Flood Pump parameters such as Speed, GPM etc

Digital Input Module – This module is used to receive a digital "ON" signal from a field device. Digital input readings on this project would include:

- Gate in an Open position
- Gate in a Closed position
- Pump in an on condition
- Pump in an off condition

Digital Output Module – This module is used to send a digital on signal to a field device. Digital input readings on this project would include:

- Command to Open Gate
- Command to Close Gate
- Command to turn pump on
- Command to turn pump off
  Command to turn on any future flashing signs or DMS Blank Out signs

(2) Proposed Remote Scada Input/Output [I/O] locations

AECOM explained at the November 1, 2019 meeting at the Ft Pitt Tunnel that there are several existing ITS cabinets and a wireless network within the Bathtub area that was installed under the I-376-A46 project. [Refer to Figure1] Remote I/O cabinet locations can easily be installed and integrated to the existing fiber and wireless network. These added remote I/O locations will control the various ITS and Flood monitoring and control devices such as Gates, DMS Signs, Flood River level monitors and Pumps.

Figure 4 below is a layout of the proposed Remote Scada Network and devices needed for the Flood Detection System and Gate System.

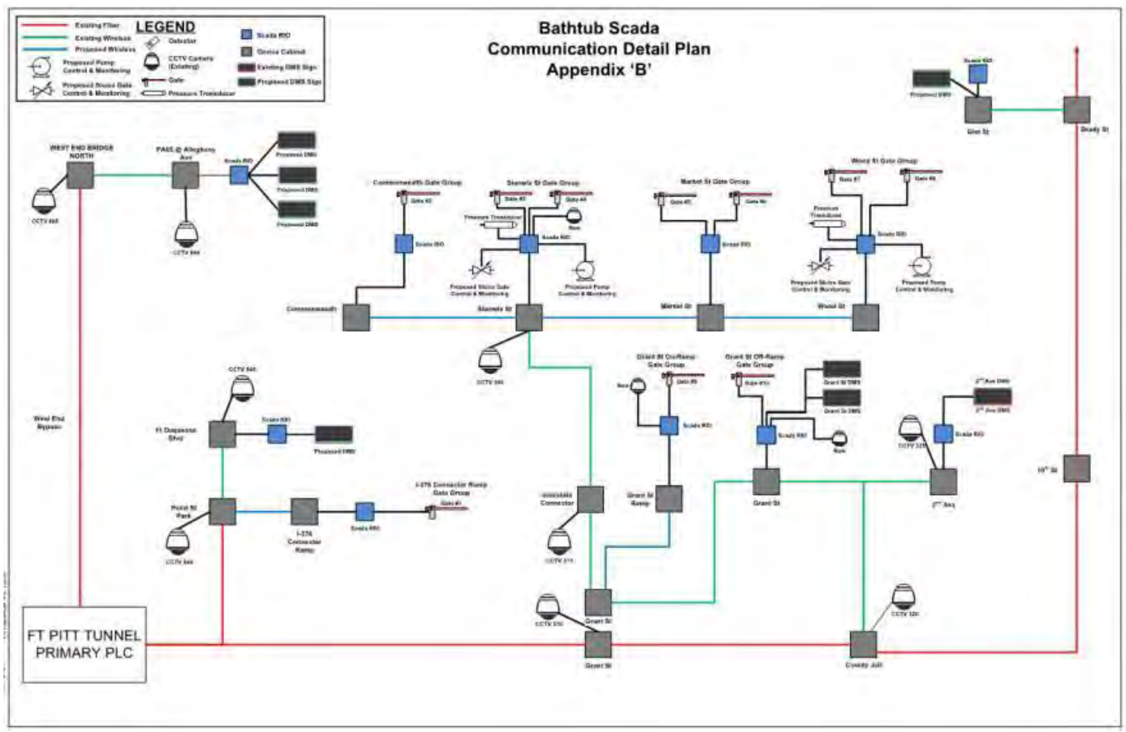


Figure 4

(3) Emergency Closure Procedures – Scada Automated

Incorporating a expansion of the existing SCADA PLC based system to provide an automated Flood Detection System and Gate System following the existing emergency closure procedures can be achieved thru modification and additions to the existing FT Pitt Tunnel Scada System. With Pressure Transducer monitoring of actual river levels against the Bathtub walls, the Scada System can send out alarms at various critical levels in a timely manner so that maintenance personal can act in a quick and efficient manor in assisting the closing of the potential automated Sluice Gates, Interstate connector and I-376 WB at Grant St off-ramp. Gate closings would be fully automated and would not necessitate the need to use PennDOT resources to field deploy traffic barricades and signs.

A new (GUI) will need to be developed for the Bathtub Closure displaying all controlled devices and allowing command control of all Gates and signs. With interconnectivity between the FT Pitt Tunnel, Bathtub Field devices and the TMC, Scada GUI displays for the Bathtub can be added to the existing SCADA HOV GUI displays at the TMC. Operators at the TMC and Ft Pitt Tunnel can monitor or possibly even control Bathtub Scada devices based on Flooding Operational procedures.

The seven access areas that will have gates can be Scada controlled individually and mutually exclusive of each other. Also based on river level readings in relation to Mon Wharf Wall, alerts and events will be capture and logged by the PLC Scada Software during the entire flooding event.

4) Flood Detection Component and Locations

a) Flood Monitoring Vendors and Existing Projects

Flood monitoring devices would include a Submersible Pressure Transducer attached to the Mon Wharf river side wall. The pressure transducer is capable of reading a hydrostatic water pressure at various river levels below the max water height of Mon Wharf Wall. These pressure readings are then converted to an electrical Milli-amp reading for input into the Remote Input/Output module through an Analog Input Card. Changing river levels can be viewed by operators, providing warning messages on the Graphical User Interface (GUI).

Submersible Pressure Transducer

Figure 5

Listed below are vendors of Submersible Pressure Transducers. Three primary vendors are:

- High Sierra Electronics   Project: Washington Blvd
  155 Springhill Rd   Flood Detection
  Grass Valley, CA 95945   City of Pittsburgh

- Campbell Scientific
  W 1800 N
  Logan, UT 84321

- Keller America — Project: 10th St Bridge Vault
  351 Bell King Rd — Acculevel Model
  Newport News, VA

Based upon the high-water readings captured by the Scada System, the Sluice Gates can automatically be closed by issuance of a command by Scada only when the area of the Sluice gates are physically clear and free of any trapped debris.

b) Flood Detection locations

Figure 6 below shows a typical mounting configuration for a Submersible Pressure Transducer to a wall for a submerged condition of flooding behind the bathtub wall along the Mon Wharf area.

Flood Detector wall mounting

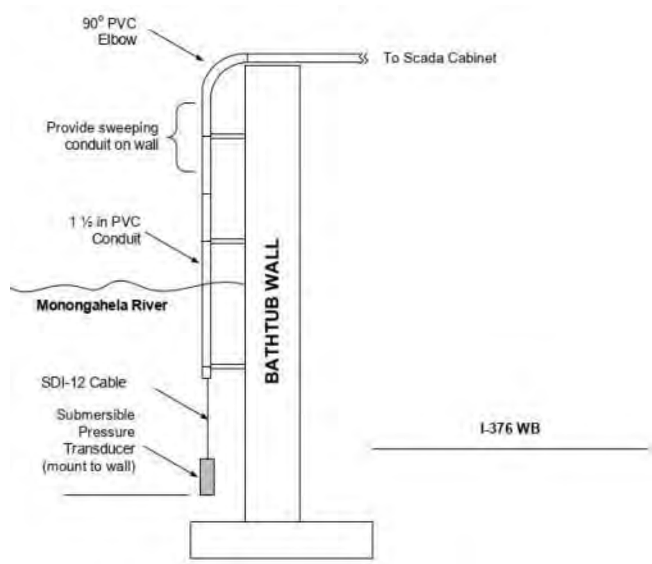


Figure 6

The locations for mounting the Submersible Pressure Transducers should coincide with the existing location for the Sluice Gates and pumps which are currently located near Stanwix St and Wood St intersections with I-376WB Bathtub area.

5) Gate Systems

a) Proposed Gate Locations

The following **Figure 7** shows the proposed gate locations for the seven access points into and out of the bathtub area that would require closure during a flooding event. Gate locations are shown in light red and are consistent with the access locations listed in Section 1 Project Overview.

Figure 7

The locations as per the District's Emergency procedures for the Bathtub are:

1. I-376 WB before Grant Street off-ramp
2. Ramp from Grant Street to I-376 WB
3. I-279 SB to I-376 EB on Portal Bridge
4. Access from Point State Park to I-376 EB
5. Ramp from Stanwix Street to I-376 EB
6. Ramp from Market Street to I-376 EB
7. Ramp from Wood Street to I-376 EB

b) Gate Types and Manufacturers

There are various manufacturers of waring type gate systems deployed in the US and worldwide. The two primary Highway Warning Gate Manufacturer vendors include B&B Roadway Gate Systems and Versilis SwiftGate Systems.

<u>B&B Roadway Gate Systems</u>

B&B Roadway Gate Versilis Swift Gates come in either a Horizontal Gate or a Vertical Gate. The gates previously used on the I-279 HOV are as follows

- Vertical Gate – VW-4

- Horizontal Gate – HW-4

<u>Versilis SwiftGate System</u>

Versilis Swift Gates come in either a Horizontal Crash Tested Gate or a Vertical Gate. The gates used on the I-279 HOV project are as follows:

- Horizontal Crash Tested Gate – Model HSG-18CW
- Vertical Gate – Model VSG-40

The Versilis SwiftGate System has been deployed on numerous projects including the recently renovated I-279 HOV Lanes in Pittsburgh, PA.

The photo to the left shows an aerial view of the I-279 HOV Slip Ramp with a combination of SwiftGate Swing Gates and Vertical gates

The major difference between the two vendors is that the Horizontal Swing Gate from Versilis can be mounted on a concrete barrier where the B&B Roadway Gate cannot and must be ground mounted. Also, the Versilis Gates are more visible to oncoming traffic with flashing arrows mounted on each gate. Considering the limited space within the approach areas to the bathtub area to install gates, it is suggested that the Versilis SwiftGates be used in all areas.

c) CCTV Coverage for proposed gate locations

There are a few existing cameras that are within the vicinity of the proposed Gate locations (Refer to **Figure 1**). The existing CCTV's within the Bathtub area are only able to view the lower Parkway East Outbound roadway and can be used only for surveillance of the flooding condition.

Figure 8 below shows where the existing CCTV are located relative to the Bathtub area

Figure 8

With respect to the seven access areas for proposed gate closures, Table 1 show each location and whether there is existing CCTV coverage and whether there is a need for additional CCTV coverage for gate viewing coverage.

Gate Location	Existing CCTV	Additional CCTV
I-376 WB before Grant Street off-ramp	YES	NO
Ramp from Grant Street to I-376 WB	YES	Possible
I-279 SB to I-376 EB on Portal Bridge	YES	Possible
Access from Point State Park to I-376 EB	NO	YES
Ramp from Stanwix Street to I-376 EB	NO	YES
Ramp from Market Street to I-376 EB	NO	YES
Ramp from Wood Street to I-376 EB	NO	YES

6) DMS System
   a) DMS Types for Flood Detection and Detour Routing

There are three types of DMS signs either existing or proposed that would be used as part of the proposed Flood Detection System and Gate System. These sign types include:

1. Insert DMS Signs – These single line DMS signs are inserted within the sign face area of an overhead major guide sign. They typically display an “Open” or “Closed” message or can be blank as is the case of the existing flood detection insert DMS at the I-376WB off-ramp for Grant St.

2. Full Matrix DMS Signs – These signs are large Full Matrix DMS Signs usually mounted on an overhead sign structure or can be mounted as a ground mounted Type “A” sign. Existing Full Matrix DMS signs can be used as part of the notification of a Bathtub Flood condition.

3. Detour DMS Signs – These signs are smaller 36”x36” Blank Out DMS Signs that can be custom made to display a message similar to the Detour DMS message below or can be a small full matrix that can display any message

INSERT DMS

FULL MATRIX

DETOUR DMS

b) Existing DMS locations for Flood Detection Warning

There are a few existing advanced DMS signs that are part of the Western Regional TMC that can have messages displayed to alert motorists that the I-279 to I-376 Connector is closed due to a flooding condition. Current operational procedures and coordination with TMC needs to be done in advance in order to create a scenario where a group of advance DMS signs would change automatically based on flood event scenario. Individual messages could also be displayed on any advance DMS sign that leads into the Bathtub flood area.

Below is a list of existing DMS Sign locations that can used in advance of the flooded bathtub area to alert motorist of this condition:

1. DMS 213 - I-279SB, Hazlett ST [Overhead Full matrix DMS]
2. DMS 209 - RT65SB – RT65/McKees Rocks Bridge [Center mount DMS]
3. DMS Insert – I-376WB – County Jail [Grant St Exit Sign DMS Insert]
4. DMS Insert – I-376WB – 2nd Ave [Grant St 3/8th Mile Sign DMS Insert]
5. DMS 50 – I-376 WB, Bates St [Overhead Full matrix DMS]
6. DMS 60 – I376 WB – Saline St [Overhead Full matrix DMS]
7. DMS 70 – I376 WB – Edgewood [Overhead Full matrix DMS]
8. DMS 80 – I376 WB – Greensburg Pike [Overhead Full matrix DMS]
9. DMS 90 – I376 WB – Penn Hills [Overhead Full matrix DMS]

c) Proposed DMS Locations for Flood Detection Warning and Detour Routing

Flood Detection Warning DMS's

The proposed new DMS signs for Flood Detection Warning are shown in Figure 9 below. These include:

1. Three new replacement DMS signs near Heinz field on existing structure or Ground Mounted Type 'A"
2. Overhead DMS sign on Ft Duquesne Bridge on existing sign support for I-279 SB

3. Full Truss or Centermount DMS on I376WB 1 mile in advance of Grant St

Figure 9

<u>Flood Detour DMS Signs</u>

The proposed location for Flood Detour DMS Signing is shown in Figure 10 below:

There are three DMS detour signs at the Banksville Interchange circulating traffic around the Banksville interchange loop back to I-376 EB. These signs in addition to the DMS sign on the Ft Duquesne Bridge should be activated during a closure event. All four signs could be control by a relay output from Scada into the DMS Controller or through an IP connection from the ATMS Software at the TMC.

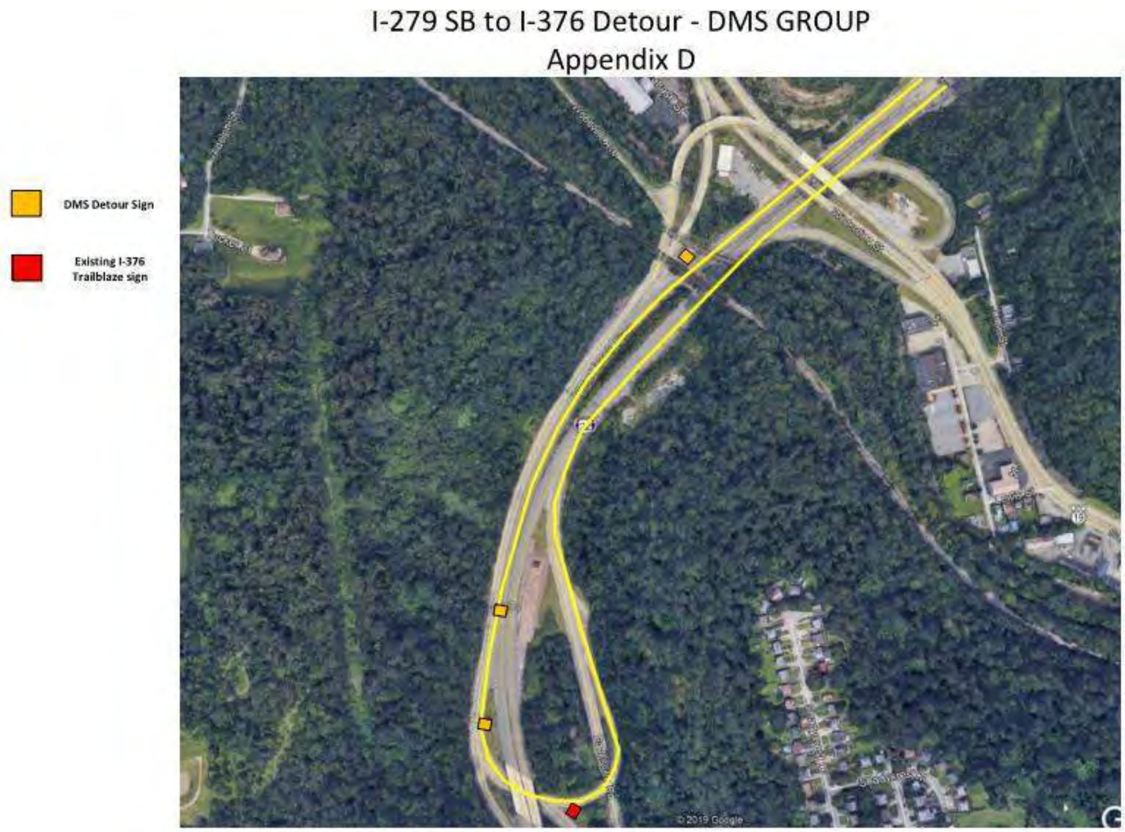


Figure 10

7) Scada/ITS Construction Cost Estimate
The overall construction cost estimate for the Scada/ITS System describe in this memorandum is $4,067,000.00. This cost will be incorporated into the Comparison Matrix and documented in the Alternative Analysis Report. Refer to Appendix H for a complete breakdown of the total by Scada cabinet locations.

APPENDICES

Appendix A – Existing ITS System Bathtub Area

Appendix B – Proposed Scada Communications Bathtub Area

Appendix C – Scada Proposed Gate Locations

Appendix D – Scada Existing/Proposed CCTV Locations

Appendix E – Scada Existing/Proposed DMS Locations

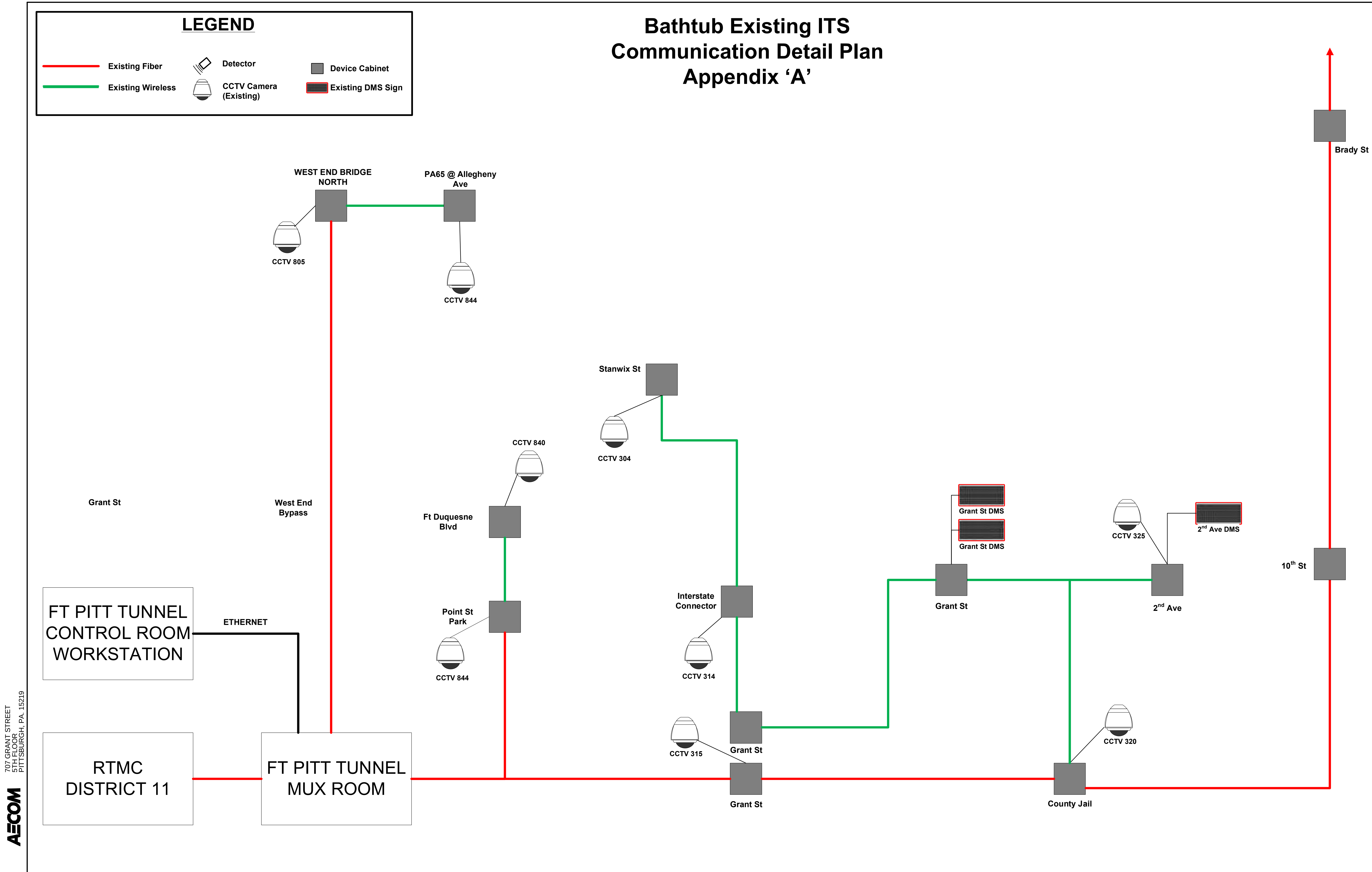
Appendix F – I -279 to I-376 Detour [DMS Group]

Appendix G – Gate Group Sketches

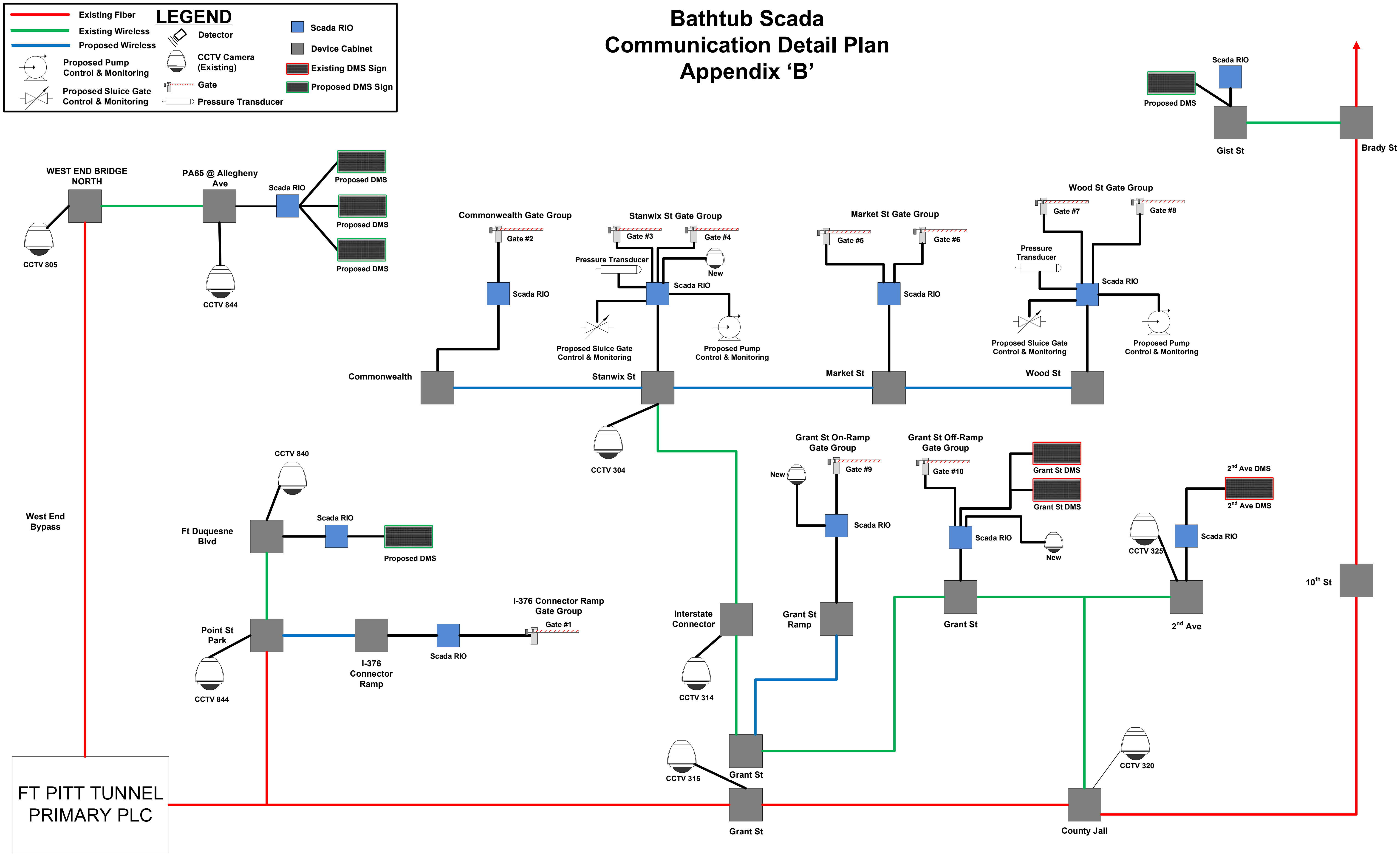
- I-376 Connector Gate Group
- Commonwealth Gate Group
- Stanwix Gate Group
- Market St Gate Group
- Wood St Gate Group
- Grant St On-Ramp Gate Group
- Grant St Off-ramp Gate Group

Appendix H – Construction Cost Estimate

Bathtub Existing ITS Communication Detail Plan Appendix 'A'



Bathtub Scada Communication Detail Plan Appendix 'B'



AECOM

707 GRANT STREET
5TH FLOOR
PITTSBURGH, PA. 15219

SCADA – PROPOSED GATE LOCATIONS
APPENDIX C

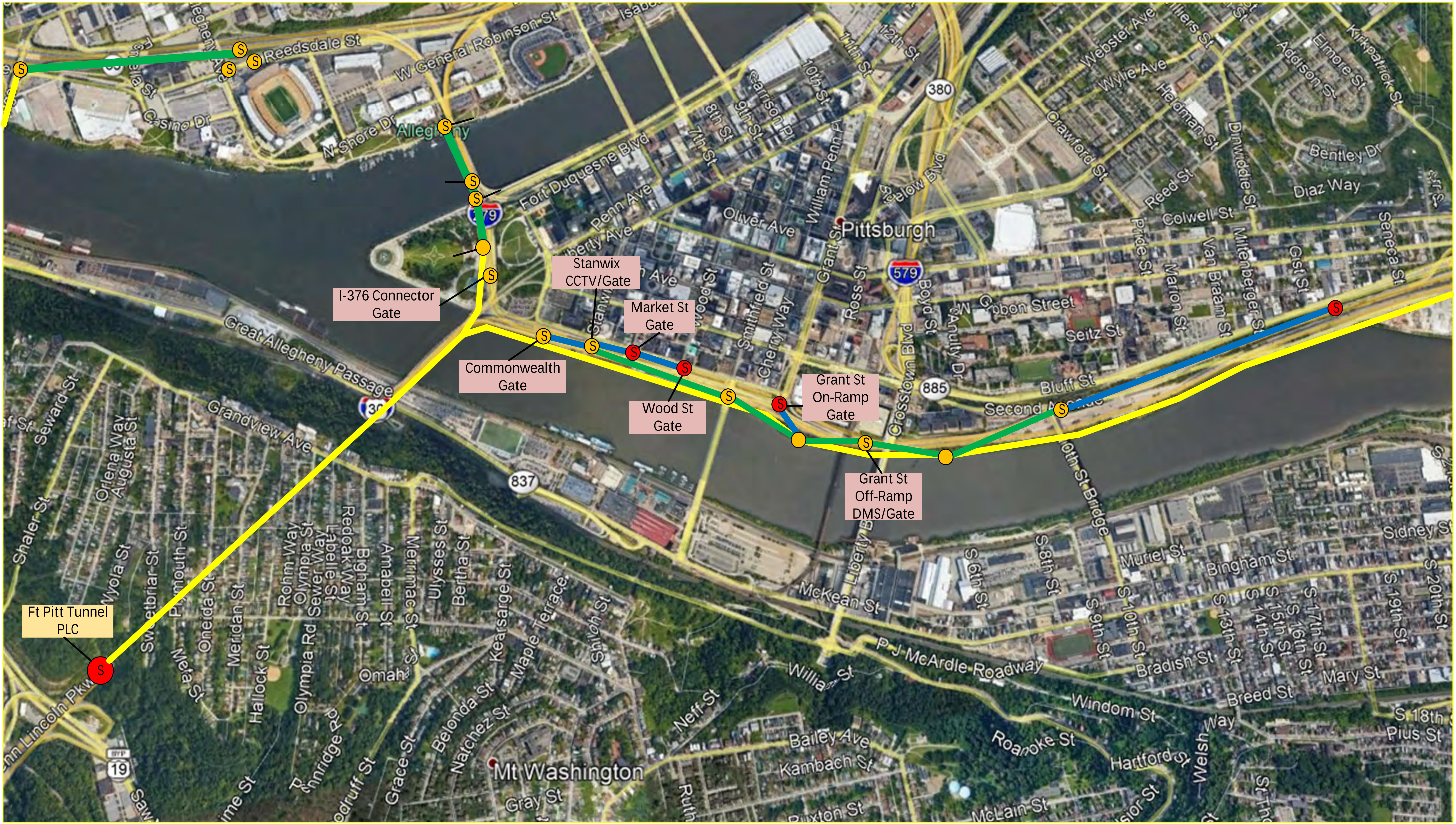
S Proposed Gate Locations

S Proposed Wireless Scada Node

Existing Fiber

Existing Wireless

Proposed Wireless

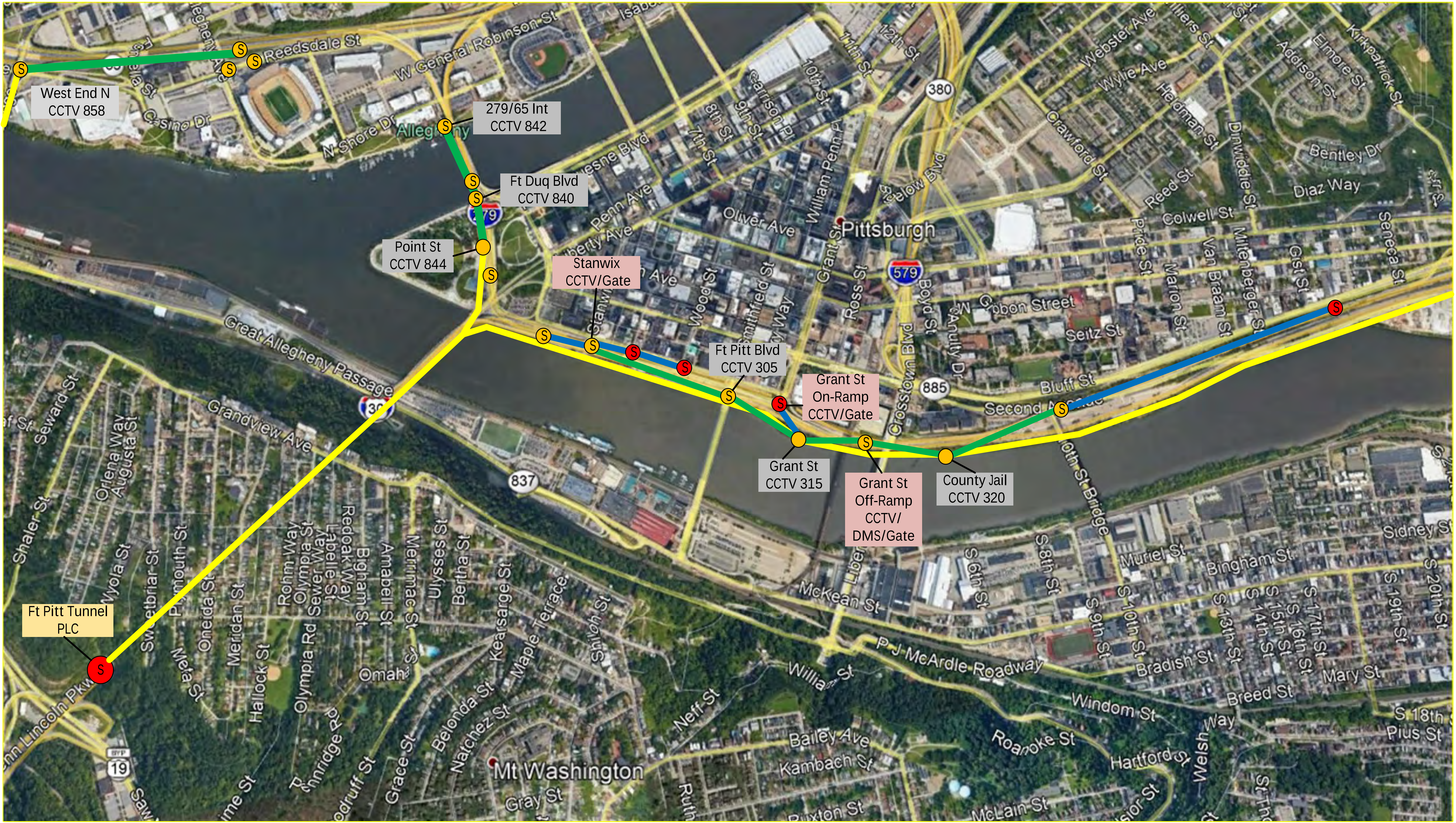


SCADA – EXISTING/PROPOSED CCTV LOCATIONS
APPENDIX D

S Existing/Proposed CCTV/New Scada Node

S Proposed Wireless Scada Node

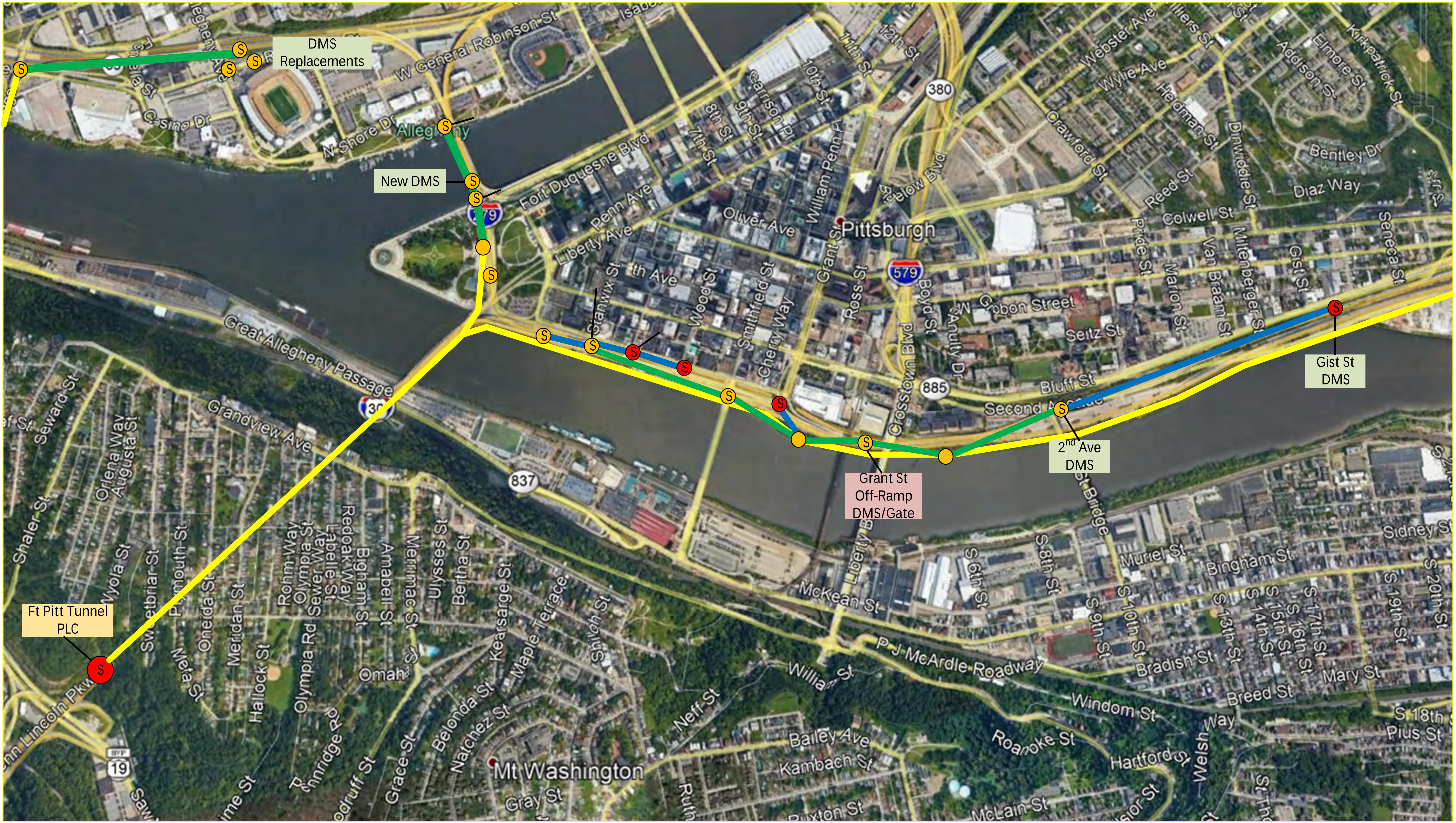
Existing Fiber
Existing Wireless
Proposed Wireless



SCADA – EXISTING/PROPOSED DMS LOCATIONS
APPENDIX E

S Existing/Proposed DMS/New Scada Node
S Proposed Wireless Scada Node

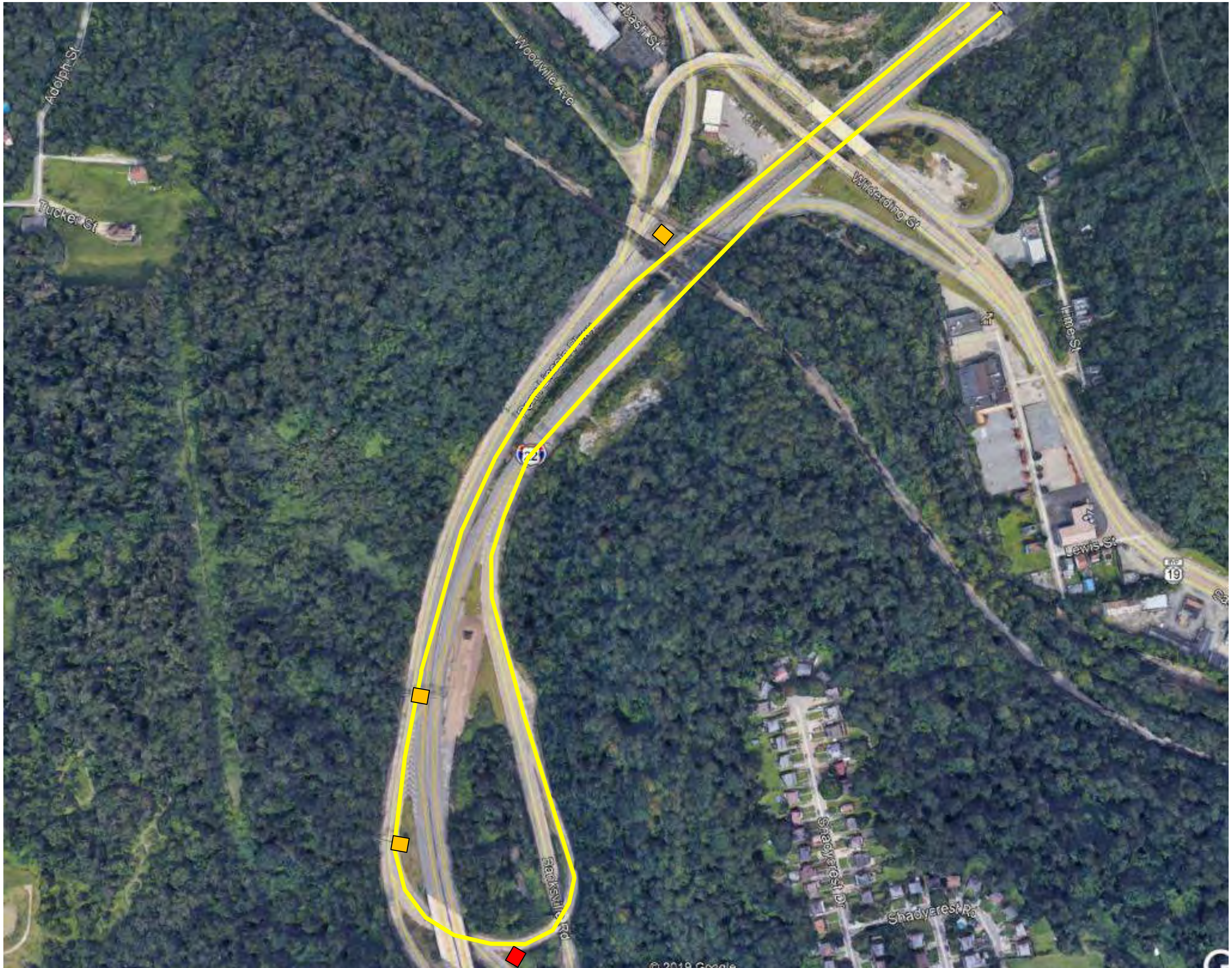
Existing Fiber
Existing Wireless
Proposed Wireless



I-279 SB to I-376 Detour - DMS GROUP
Appendix D

DMS Detour Sign

Existing I-376 Trailblaze sign



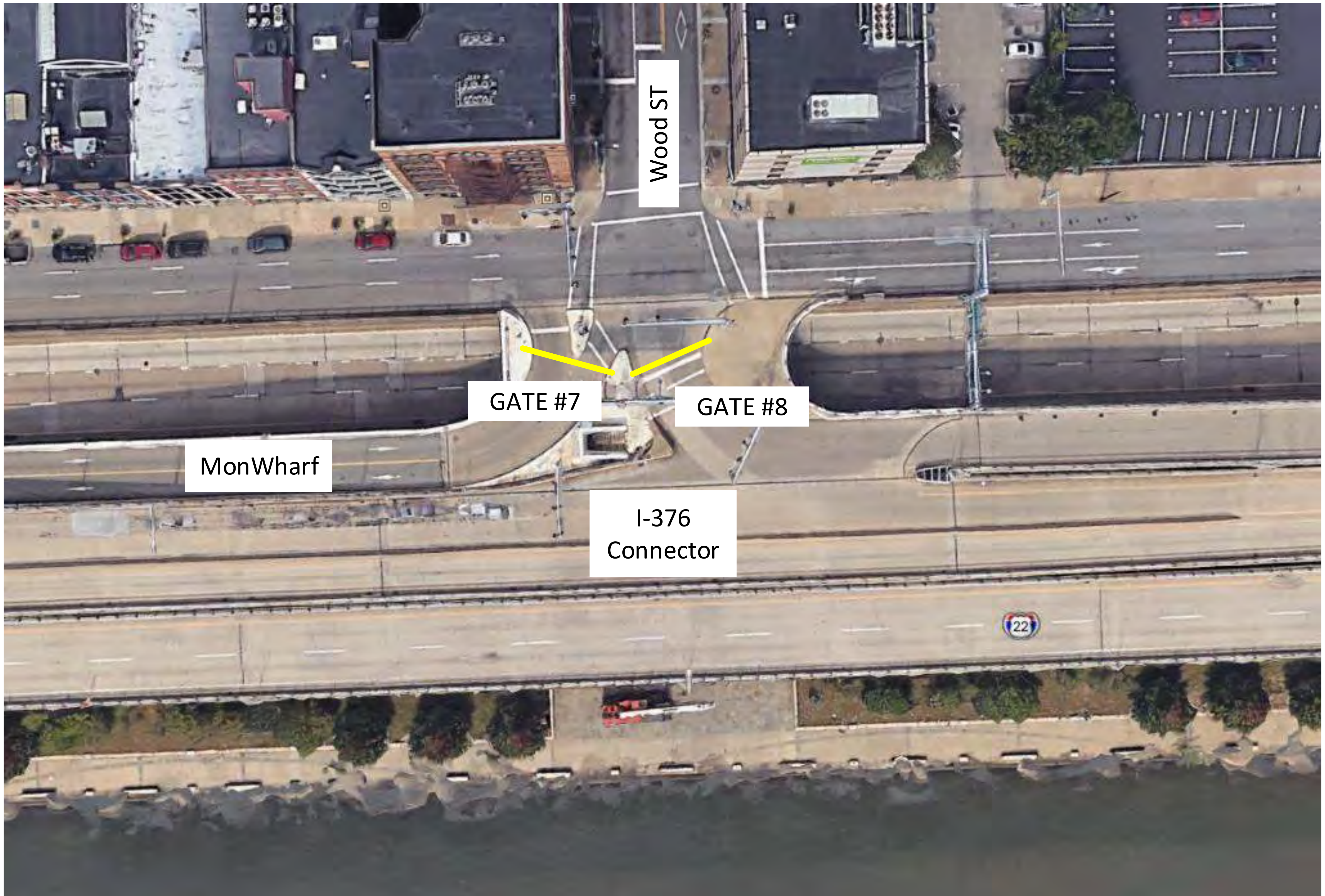
I-279 to I-376 Interstate Connector
Gate Group

COMMONWEALTH - GATE GROUP
I-376 Interstate Connector

STANWIX ST - GATE GROUP

MARKET ST - GATE GROUP

WOOD ST - GATE GROUP



GRANT ST ON RAMP - GATE GROUP

GRANT ST OFF RAMP - GATE GROUP

Appendix H

60612296 - E03024 WO6 I-376 Bathtub Flooding Alt Analysis

Bathtub - ITS/Scada Estimate - Option 3

Scada Cabinet	Device	QTY	Unit Price	Total Price
PA65/Alleghney Ave				
	Remote I/O & Switch	1	$50,000	$50,000
	Communication/Power/Conduit/Cabinet	1	$30,000	$30,000
	DMS & Type A	3	$80,000	$240,000
			Subtotal	$320,000
Ft Duquesne Blvd				
	Remote I/O & Switch	1	$50,000	$50,000
	Communication/Power/Conduit/Cabinet	1	$30,000	$30,000
	DMS & Structural Hanger	1	$80,000	$80,000
			Subtotal	$160,000
Point State Park				
I-376 Connector Ramp	Remote I/O & Switch	1	$50,000	$50,000
	Communication/Power/Conduit/Cabinet	1	$40,000	$40,000
	Gate Group #1 - Horizontal	5	$60,000	$300,000
			Subtotal	$390,000
Commonwealth Place				
	Remote I/O & Switch	1	$25,000	$25,000
	Communication/Power/Conduit/Cabinet	1	$60,000	$60,000
	Gate Group #2 - Horizontal	4	$60,000	$240,000
	Wireless Radio	1	20000	$20,000
			Subtotal	$345,000
Stanwix St				
	Remote I/O & Switch	1	$25,000	$25,000
	Communication/Power/Conduit/Cabinet	1	$60,000	$60,000
	Gate Group #3 - Vertical	1	105000	$105,000
	Gate Group #4 - Vertical	1	105000	$105,000
	CCTV	1	24000	$24,000
	Wireless Radio	1	20000	$20,000
	Pressure transducer	1	25000	$25,000
	Sluice gate Control	1	25000	$25,000
	Pump Control and Monitoring	1	25000	$25,000
			Subtotal	$414,000
Market St				
	Remote I/O & Switch	1	$25,000	$25,000
	Communication/Power/Conduit/Cabinet	1	$60,000	$60,000
	Wireless Radio	1	20000	$20,000
	Gate Group #5 - Vertical	1	105000	$105,000
	Gate Group #6 - Vertical	1	105000	$105,000
			Subtotal	$315,000
Wood St				
	Remote I/O & Switch	1	$25,000	$25,000
	Communication/Power/Conduit/Cabinet	1	$60,000	$60,000
	Gate Group #7 - Vertical	1	105000	$105,000
	Gate Group #8 - Vertical	1	105000	$105,000
	Wireless Radio	1	20000	$20,000
	Pressure transducer	1	25000	$25,000
	Sluice gate Control	1	25000	$25,000
	Pump Control and Monitoring	1	25000	$25,000

			Subtotal	$390,000
Grant St On-Ramp				
	Remote I/O & Switch	1	$25,000	$25,000
	Communication/Power/Conduit/Cabinet	1	$60,000	$60,000
	Gate Group #9 - Vertical	1	105000	$105,000
	Wireless Radio	1	20000	$20,000
	CCTV	1	24000	$24,000
			Subtotal	$234,000
Grant St Off-Ramp				
	Remote I/O & Switch	1	$25,000	$25,000
	Communication/Power/Conduit/Cabinet	1	$60,000	$60,000
	Gate Group #10 - Horizontal	11	60000	$660,000
	CCTV	1	24000	$24,000
			Subtotal	$769,000
2nd Ave				
	Remote I/O & Switch	1	$25,000	$25,000
	Communication/Power/Conduit/Cabinet	1	$10,000	$10,000
			Subtotal	$35,000
Gist St	Remote I/O & Switch	1	$25,000	$25,000
	Communication/Power/Conduit/Cabinet	1	$50,000	$50,000
	Wireless Radio	1	20000	$20,000
	DMS	1	$250,000	$250,000
			Subtotal	$345,000
SCADA Software Programming	Existing Ft Pitt Tunnel PLC	1	$350,000	$350,000
			TOTAL	**$4,067,000**

Appendix F:

Traffic Analysis Memorandum

I-376 Bathtub Flooding Study

Task 13 – Traffic Analysis

Memorandum

May 29, 2020

1.0 Project Overview

The I-376 Bathtub Flooding Study project entails the Alternative analysis of the following three alternatives:

- Option 1: Increase the size of the wall adjacent to the Mon Wharf parking area
- Option 2: Create Tunnel like structure
- Option 3: Install larger capacity pumps and Automated detection/gate system

Option 1 is anticipated to reduce the number of flood events, but not eliminate future flood events by increasing the height of the wall adjacent to the Mon Wharf parking lot. Option 2 would eliminate flood events by creating a tunnel around I-376. Option 3 maintains I-376 but installs larger pumps and installs an automatic food detection and gate system. This traffic analysis focuses on Alternative Option 3 since floods are still anticipated to occur and provides a high-level traffic evaluation for a Flood Detection System and Gate System as per Task 13 scope.

Based on PennDOT's current Bathtub/Interstate Connector Emergency Closure procedures, the Bathtub Flooding Plan calls for the following requirements at various river water levels:

- Bathtub and Interstate Connector flood when river water levels reach 25.0'
- 18.0' River Level: Sluice gates to be closed by Tunnel personnel
- 23.0' River Level:
  - Emergency Management Coordinator to contact Press Officer informing of potential closure
  - Assistant to ensure Sign Crew is prepared to close Bathtub and Interstate Connector
  - Crash trucks to begin accessing staging locations
  - Detour routes are to be implemented
  - Assistant/ Incident Commander (IC) to contact State Police to be on-scene for initial closure
  - Assistant/IC to contact City of Pittsburgh Police to be informed of potential Bathtub closure. If Bathtub is closed, Pittsburgh Police must be stationed on Ft. Pitt Boulevard to facilitate flow of traffic. ADE-Maintenance must be contacted in event Pittsburgh Police are not responsive.

- River Level 12" below top of Mon Wharf wall and Rising:
  - County Manager makes call to close I-376 WB immediately
  - Incident Command Center (ICC) should stand-up
  - County Manager/Assistant to contact TMC and Press Office to notify of closure
- Seven access areas need closed (in order of priority)
  - I-376 WB before Grant Street off-ramp
  - Ramp from Grant Street to I-376 WB
  - I-279 SB to I-376 EB on Portal Bridge
  - Access from Point State Park to I-376 EB
  - Ramp from Stanwix Street to I-376 EB
  - Ramp from Market Street to I-376 EB
  - Ramp from Wood Street to I-376 EB

This task involves identifying any traffic signal operational improvements that can be made along the Detour route within the Central Business District (CBD) to lessen the impacts of the detour.

2.0 Study Area

The study area for traffic analysis includes I-376 West at the Grant Street Exit (Exit 71A) and a portion of the CBD including the following signalized intersections:

- Grant Street with Fort Pitt Boulevard
- Grant Street with First Avenue
- Grant Street with the Boulevard of the Allies (SR 2208)
- Boulevard of the Allies (SR 2208) with Cherry Way
- Boulevard of the Allies (SR 2208) with Smithfield Street
- Boulevard of the Allies (SR 2208) with Wood Street
- Boulevard of the Allies (SR 2208) with Market Street
- Boulevard of the Allies (SR 2208) with Stanwix Street
- Fort Pitt Boulevard with Stanwix Street

3.0 Data Collection

3.1 Traffic Data

PennDOT District 11-0 provided traffic data for I-376 West mainline and the I-376 West ramps to and from Grant Street and Stanwix Street from their Roadway Management Information System (RMIS). This information provided the average daily traffic (ADT) and heavy vehicle percentages for each segment / offset for the years the data was collected. In order to determine the Existing Year 2020 ADT for I-376 West and the on- and off-ramps to Grant Street, the PennDOT Traffic Growth Factors for August 2019 – July 2020 for Urban Interstate in Allegheny County were applied. The compound traffic growth rate of 0.81% was applied to the ADT data from the RMIS to establish the Existing Year 2020 ADT. Since hourly volume data was not available for all highway segments, the hourly breakdown from Traffic Pattern Group (TPG) factors from the 2018 Pennsylvania Traffic Data were utilized to determine AM, Midday, and PM hourly volumes. The ADT data, the heavy vehicle percentages, and the TPG factors for I-376 West and the Grant Street ramps can be seen graphically on **Figure 1**.

3.2 Turning Movement Counts

Turning movement counts at the study intersections within the CBD were performed in 2017 as part of the Downtown CBD Traffic Counts for the City of Pittsburgh's Department of Mobility and Infrastructure.

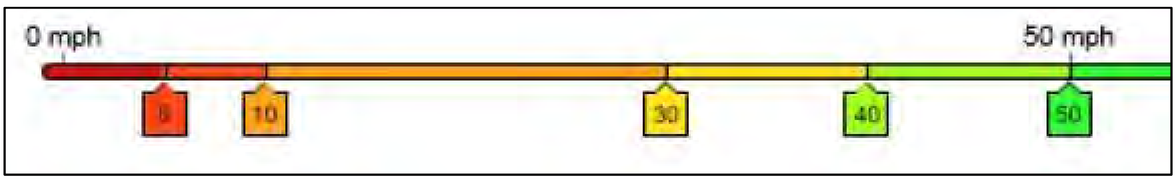
Since a CBD area has different traffic growth trends than an interstate highway, the Southwestern Pennsylvania Commission (SPC) was contacted to obtain a traffic growth rate for the City of Pittsburgh's Downtown area. The turning movement counts were grown to 2020 using a linear growth rate of 0.5% provided by a representative of SPC. TPG factors were applied to the ADT information for I-376 West and the Grant Street Exit (Exit 71A) ramp in order to determine AM, Midday, and PM hourly volumes for the freeway and diverge analysis. The average heavy vehicle percentage for each highway segment and ramp were utilized for all peak hours in the analysis since heavy vehicle percentage for each peak hour was not available. The Existing Year 2020 AM, Midday, and PM peak hour volumes for the CBD intersections, I-376 West segments, and the I-376 West on- and off-ramps to Grant Street and Stanwix Street can be seen on **Figures 2**, **3**, and **4**.

3.3 INRIX Data

3.3.1 Normal Weekday

INRIX is a service that provides real-time and historical traffic information including travel times and speeds along interstates. Color thresholds were established to correspond to speeds on I-376 West as can be seen in **Exhibit 1** below.

Exhibit 1. I-376 West INRIX Data Color Thresholds



Dark red indicates the slowest speeds or vehicles stopped, and bright green indicates free flow speeds. This data was utilized to determine the speeds and queues along I-376 West on normal weekdays and also during a closure of I-376 West between the Grant Street Exit (Exit 71A) and the US-30 / PA-8 Exit (Exit 78). Tuesday, February 25, 2020, was selected as a normal weekday to determine normal queuing on I-376 West. The data is depicted for a full 24 hours in 5-minute increments with the corresponding vehicular speeds for each segment at that increment. The INRIX data for Tuesday, February 25, 2020, can be seen in **Exhibit 2** on the next page.

Exhibit 2. I-376 West INRIX Data on a Normal Weekday

INRIX CONGESTION SCAN

NORMAL DAY - FEBRUARY 25, 2020 (TUESDAY)

As can be seen in **Exhibit 2**, there are several times that I-376 West experiences congestion between the Grant Street Exit (Exit 71A) and the US-30 / PA-8 Exit (Exit 78) on a normal weekday as seen in red, orange, and yellow. During the morning peak period, westbound traffic queues from the US-30 / PA-8 Exit (Exit 78) to the Squirrel Hill Tunnel which is located between Exit 77 (Edgewood / Swissvale) and Exit 74 (Squirrel Hill / Homestead). Westbound traffic also slows to between 30 mph and 40 mph between Second Avenue (Exit 71B) and Grant Street (Exit 71A) in the morning. During the evening peak period, slowdowns are seen in similar areas, but to different degrees than the morning peak period. Westbound traffic still experiences slowdowns before the Squirrel Hill Tunnel, but not as severe as seen in the morning. Congestion is more significant during the evening peak period at the Grant Street Exit (Exit 71A) and extends to Forbes Avenue (Exit 72A).

3.3.2 Flood Event

The following are historical dates where the Bathtub section of I-376 West flooded and was closed in the last two (2) years:

- Saturday, January 13, 2018
- Saturday, February 17, 2018
- Tuesday, September 11, 2018
- Friday, January 25, 2019
- Saturday, February 9, 2019
- Wednesday, February 13, 2019

Each flood event closure causes varying degrees of queues on I-376 West dependent on time of day, day of week, and season of the year of the closure. For this high-level study, a typical weekday closure date was utilized to compare typical weekday peak hour conditions. Tuesday, September 11, 2018, was used to determine the queuing experienced on I-376 West when the Bathtub section was closed since a defined queue on I-376 West can be seen. The INRIX data for Tuesday, September 11, 2018, can be seen in **Exhibit 3** on the next page.

As can be seen in **Exhibit 3**, during a flood event when I-376 West is closed at the Grant Street Exit (Exit 71A), traffic is at a standstill or near standstill as indicated by the dark red (vehicular speed averaging 5 mph or less) from the Grant Street Exit (Exit 71A) to beyond the Second Avenue Exit (Exit 71B) for most of the day.

Exhibit 3. I-376 West INRIX Data during a Flood Event

INRIX CONGESTION SCAN

FLOOD DAY - SEPTEMBER 11, 2018 (TUESDAY)

4.0 Traffic Analysis

4.1 Normal Traffic Condition Analysis

4.1.1 Capacity Analysis

4.1.1.1 Intersection Analysis

Levels of service at the study intersections in the CBD have been determined for the AM, Midday, and PM peak hours. These levels of service (LOS) were determined through implementation of signalized capacity analysis methodologies presented in the 2010 Highway Capacity Manual published by the Transportation Research Board. The LOS ranges from A to F, comparable to a grading system in school, with LOS A being the best traffic conditions and LOS F being the worst. A summary of the LOS criteria has been included in **Exhibit 4** below.

Exhibit 4. Intersection LOS Criteria Summary

Signalized Intersections	
LOS	Delay per Vehicle (seconds)
A	Less than 10
B	Between 10 and 20
C	Between 20 and 35
D	Between 35 and 55
E	Between 55 and 80
F	Greater than 80

The Existing Year 2020 Conditions were modeled in Synchro Version 10.1, build 2, revision 20, and the most recently implemented traffic signal timings for the signalized study intersections were utilized in the Synchro analysis.

The results of the Existing Year 2020 Level of Service (LOS) analyses are provided in **Table 1** in the Tables section of the Attachments for the AM, Midday, and PM peak hours. The Existing Year 2020 capacity analysis results for the signalized intersections can be seen in **Attachment A**. As can be seen from **Table 1**, all the intersections operate at acceptable LOS (LOS D or better) during all peaks analyzed. There are some movements and approaches which operate at LOS E during the AM and PM peak hours at the intersection of Grant Street with Fort Pitt Boulevard.

4.1.1.2 Highway Analysis

LOS for the Freeway and Diverge movements of I-376 West at the Grant Street Exit (Exit 71A) were determined for the AM, Midday, and PM peak hours. These LOS were determined through implementation of freeway and ramps analysis methodologies presented in the 2010 Highway Capacity Manual published by the Transportation Research Board. A summary of the LOS criteria has been included in **Exhibit 5** on the next page.

Exhibit 5. LOS Criteria Summary

	Freeways	Diverge
LOS	Density (pc/mi/ln)	
A	Less than 11	Less than 10
B	Between 11 and 18	Between 10 and 20
C	Between 18 and 26	Between 20 and 28
D	Between 26 and 35	Between 28 and 35
E	Between 35 and 45	Greater than 35
F	Greater than 45	Demand Exceeds Capacity

LOS for the I-376 West highway segment before the Grant Street Exit (Exit 71A) and the diverging movement of the Grant Street Exit (Exit 71A) were determined for the AM, Midday, and PM peak hours. The Existing Year 2020 Conditions were analyzed using Highway Capacity Software (HCS) Version 7. The results of the Existing Year 2020 LOS analyses are provided in **Table 2** in the Tables section of the Attachments for the AM, Midday, and PM peak hours. The Existing Year 2020 capacity analysis results for freeway and diverge sections can be seen in **Attachment B**. As can be seen in **Table 2**, the freeway sections before and after the Grant Street Exit (Exit 71A) operate at acceptable LOS (LOS D or better) for each peak hour analyzed. The diverge section of the Grant Street Exit (Exit 71A) operates at acceptable LOS (LOS D or better) during the Midday peak hour and experiences congestion during the AM and PM peak hours which operate at LOS E and F, respectively.

4.1.2 Queuing Analysis

The Existing Year 2020 AM, Midday, and PM peak hour Synchro models were transferred to SimTraffic. Five (5) separate 60-minute simulations (utilizing a thirty-minute seeding interval) were performed in SimTraffic for each individual peak hour and averaged.

The results of the Existing Year 2020 Conditions queuing analyses are provided in **Table 3** in the Tables section of the Attachments for the AM, Midday, and PM peak hours. The Existing Year 2020 queue analysis results can be seen in **Attachment C**. The queuing analyses show that queues do not extend beyond auxiliary turn lanes to extend beyond the adjacent intersection with the exception of the southbound approach of Grant Street with the Boulevard of the Allies during the AM and Midday peak hours and the westbound approach of Grant Street with Fort Pitt Boulevard during the PM peak hour.

4.1.3 Travel Times

Travel times along the detour route within the CBD (see Section 4.2 for description of Detour Route) were determined for the Existing Year 2020 normal weekday conditions for AM, Midday, and PM peak hours. The travel times and average speeds were determined from the SimTraffic simulations for each peak hour and can be seen in **Exhibit 6** and the results can be seen in **Attachment D**.

Exhibit 6. Existing Year 2020 Travel Times and Average Speed along Detour Route

	AM	**Midday**	**PM**
Travel Time (seconds)	255	225	344
Travel Time (minutes)	4.3	3.8	5.7
Speed (mph)	8	9	6

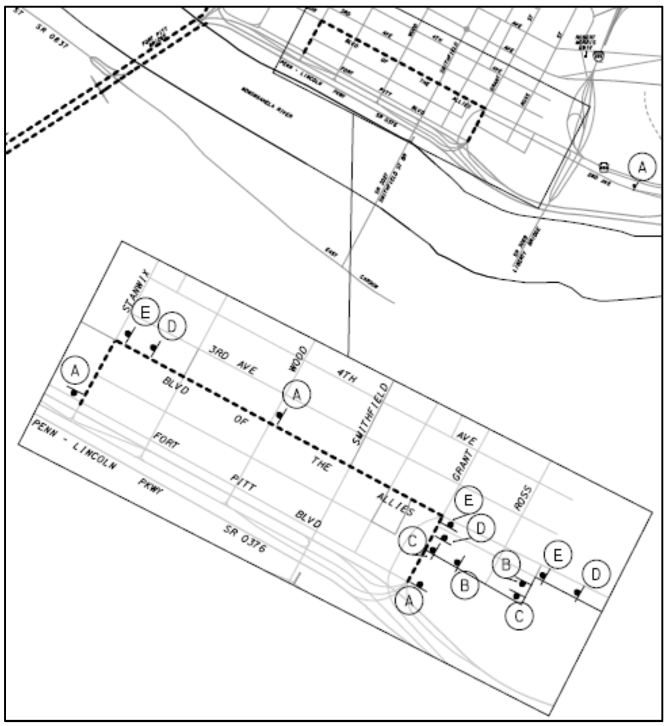
As can be seen in **Exhibit 6**, the travel time along the detour route under normal weekday conditions during the peak hours varies between 3.8 minutes in the Midday peak to 5.7 minutes during the PM peak hour. Average speeds along the detour route also vary between 6 mph in the PM peak to 9 mph in the Midday peak.

4.2 Traffic Condition Analysis with Bathtub Detour

4.2.1 Detour Route during Bathtub Closure

PennDOT's Bathtub / Interstate Connector Emergency Closure Procedure dated March 11, 2019, indicates that when the Bathtub section floods and I-376 West must close, traffic detours through the CBD along Grant Street to the Boulevard of the Allies, to Stanwix Street, and back to I-376 West. This Detour Route can be seen on **Exhibit 7**.

Exhibit 7. Bathtub Detour Route



4.2.2 Bottleneck Analysis

With the Bathtub section of I-376 West closed during a flood event, traffic on I-376 West must detour onto Grant Street to the Boulevard of the Allies and to Stanwix Street to continue on I-376 West. When this detour occurs, the public is informed via multiple Dynamic Message Signs (DMS) from the Pennsylvania Turnpike at the I-376 Interchange and at several points along I-376 West. This advanced warning encourages some traffic to detour and take earlier exits onto other routes to continue to their destination before they must exit I-376 West at Grant Street (Exit 71A).

INRIX historical data was used to determine the percentage of vehicles that would normally continue on I-376 West beyond the Grant Street Exit (Exit 71A) but instead divert off I-376 West before approaching the Grant Street Exit (Exit 71A) because of the closure.

AECOM

The INRIX data seen in **Exhibit 3** was exported to Excel in order to see the speed for each 5-minute interval, which can be seen below in **Exhibit 8**. The exhibit below shows the distance between each ramp, including on ramps and off ramps for each exit.

Exhibit 8. I-376 West INRIX Data during a Flood Event

Exit (Description)	Miles	8:15 AM	8:20 AM	8:25 AM
EXIT 78B (PA-8N)	0.25	58	60	62
EXIT 78A (US 30E)	0.85	30	39	36
Exit 77 (Edgewood / Swissvale)	0.69	19	15	13
Exit 77 (Edgewood / Swissvale)	0.49	11	13	13
Squirrel Hill Tunnel	0.88	26	26	20
Squirrel Hill Tunnel	0.75			
Exit 74 (Squirrel Hill / Homestead)	0.21	41	42	19
Exit 74 (Squirrel Hill / Homestead)	0.55	25	11	9
EXIT 73 (PA-885)	1.00	13	13	10
EXIT 73 (PA-885)	0.18	18	20	23
Exit 72B (Boulevard of the Allies)	0.48	13	14	14
Exit 72B (Boulevard of the Allies)	0.03	18	20	23
Exit 72A (Forbes Ave)	0.04	20	21	22
Exit 72A (Forbes Ave)	**0.39**	**4**	**5**	**3**
Exit 71B (Second Ave)	**0.71**	**2**	**2**	**3**
Exit 71B (Second Ave)	**0.05**	**2**	**2**	**3**
Exit 71A (Grant Street)	**0.32**	**3**	**3**	**5**
Total	**1.47**			

As seen in **Exhibit 8**, the INRIX data on Tuesday, September 11, 2018, indicates that at approximately 1.47 miles from the Grant Street Exit (Exit 71A), the speeds on I-376 West register 5 mph. This is considered the back of queue during a flood event.

Using the INRIX historical data, a bottleneck analysis was then performed to determine the percentage of traffic which is diverted from I-376 West before the Grant Street Exit (Exit 71A). The bottleneck analysis indicated that 50% of the traffic must be diverted from I-376 West to obtain a 1.5-mile queue on I-376 West. The bottleneck analysis can be seen in **Attachment E**.

4.2.3 Traffic Volume Development

With the Bathtub section of I-376 West closed, several ramps and movements within the CBD are prohibited. The traffic volumes for the impacted movements have been redistributed through the study area accordingly and can be seen on **Figures 5**, **6**, and **7** for the AM, Midday, and PM peak hours, respectively.

Figure 8 show the peak hour traffic volume on I-376 West with the Bathtub closed, which consists of a 50% diversion rate as indicated by the bottleneck analysis. To be conservative, all traffic exiting I-376 West was assumed to travel along the posted Detour route to enter I-376 West beyond the closed Bathtub section.

The CBD Redistributed traffic volumes (Figures 5, 6, and 7) and the I-376 West Detoured volumes (Figure 8) were combined with the Existing Year 2020 traffic volumes (Figures 2, 3, and 4) to develop the Existing Year 2020 Bathtub Detour Traffic Volumes for the AM, Midday, and PM peak hours which can be seen in **Figures 9**, **10**, and **11**, respectively.

4.2.4 Travel Times and Average Speeds

Existing Year 2020 under Bathtub Detour Conditions were modeled using the same traffic signal phasing and timings as was seen under Existing Conditions. Under Detour Conditions, police may operate some of the intersections along the detour route, but since not all intersections are always controlled by police during the detour and police operation of the signals is not accurately modeled in Synchro, the existing traffic signal timings were utilized for this analysis.

Travel times along the detour route were determined for the Existing Year 2020 Bathtub Detour Conditions for AM, Midday, and PM peak hours. The travel times were determined from the SimTraffic simulations for each peak hour. The travel times and average speeds along the Detour Route under normal weekday conditions and under Bathtub Detour Conditions can be seen in **Exhibit 9** and the results can be seen in **Attachment F**.

Exhibit 9. Existing Year 2020 Travel Times and Average Speed along Detour Route Under Detour Conditions

Peak Hour / Condition	AM		Midday		PM	
	Normal Weekday	Bathtub Detour	Normal Weekday	Bathtub Detour	Normal Weekday	Bathtub Detour
Travel Time (seconds)	255	2,672	225	5,091	344	12,473
Travel Time (minutes)	4.3	45	3.8	85	5.7	208
Speed (mph)	8	1	9	1	6	1

As can be seen in **Exhibit 9**, the travel times along the detour route increase significantly and the speeds decrease significantly, which is expected with the peak hour volumes on I-376 West being detoured through the CBD. Since it was assumed for this analysis that all the volume on I-376 West will follow the detour route through the CBD, the results can be considered conservative.

4.3 Traffic Condition Analysis with Bathtub Detour & Mitigations

4.3.1 Mitigation Measures

Although there are not mitigation measures to move traffic through the CBD which would result in acceptable LOS or queuing, the following mitigation measures can be implemented to facilitate the movement of vehicles to the maximum capacity:

- Traffic signal cycle length, split, and offset optimization
- Traffic signal progression changes along the detour route

4.3.2 Traffic Signal Timing Optimization

The traffic signal timings along the detour route were optimized under detour conditions for the AM, Midday, and PM peak hours. The traffic signal cycle length along the detour route is currently 95 seconds during all peak periods except for the intersection of Fort Pitt Boulevard with Stanwix Street which has cycle lengths of 110 seconds and 75 seconds during the AM and Midday peak hours, respectively. Cycle lengths between 75 and 110 seconds were considered for Detour Conditions. A 110 second cycle length was considered to be the highest reasonable cycle length since it limits the pedestrian delay and maintains pedestrian compliance at the signalized intersections, and limits the additional queuing on the minor street approaches at the study intersections along the detour route. During all three peak hours analyzed, a cycle length of 110 seconds was chosen for the intersections along the detour route. Offsets at intersections along the detour route were also optimized. The existing traffic signal phasing was maintained for all peak hours analyzed to maintain phasing consistency for pedestrians.

4.3.3 Traffic Signal Progression

In order to optimize progression along the detour route, the reference phase for coordination was changed at two intersections. First, at the intersection of Boulevard of the Allies with Stanwix Street, the progression was changed to reference Phase 1 – Westbound left turn phase. Next, in order to provide progression from the Boulevard of the Allies to the ramp to I-376 West at Fort Pitt Boulevard, the progression was changed to reference Phase 4 – Southbound phase.

4.3.4 Travel Times and Average Speeds

The mitigation measures listed in Section 4.3.1 (Mitigation Measures) were modeled in Synchro and transferred to SimTraffic. The travel times were determined from the SimTraffic simulations for each peak hour. The travel times along the Detour Route under Existing Bathtub Detour Conditions and with the specified mitigation measures can be seen in **Exhibit 10** below and the results can be seen in **Attachment G**.

Exhibit 10. Existing Year 2020 Travel Times and Average Speed along Detour Route Under Detour Conditions with Mitigations

Peak Hour / Condition	AM		Midday		PM	
	Bathtub Detour	With Mitigation	Bathtub Detour	With Mitigation	Bathtub Detour	With Mitigation
Travel Time (seconds)	2,672	2,332	5,091	2,728	12,473	11,119
Travel Time (minutes)	45	39	85	45	208	185
% Difference		**-13%**		**-46%**		**-11%**
Speed (mph)	1	2	1	3	1	2

As can be seen in **Exhibit 10**, implementing a 110 second cycle length along the detour route and modifying the phases of progression, travel times along the corridor decrease and speeds increase. Although the results still indicate significant increases in travel times along the detour route compared to existing travel times, the results indicate that implementing traffic signal control changes will maximize the operations along the detour route to the greatest extent possible during Bathtub closures.

Even though pedestrians and minor street traffic would be negatively impacted by a longer cycle length of 150 seconds along the detour route, it was also modeled to determine the impact on travel times along the detour route. The longer cycle length decreased the travel times by less 5% along the detour route compared to the 110 second cycle length during the AM and PM peak hours as seen in **Exhibit 10**. Since a significant decrease in travel times is not realized from a longer cycle length along the detour route, a 110 second cycle length was utilized for comparison purposes for this analysis.

5.0 Recommendations

Using the turning movement counts collected in 2017 as part of the Downtown CBD Traffic Counts, ADT data provided by PennDOT, and INRIX data, traffic analysis was performed to determine the effects of a closure of the Bathtub section of I-376 West on the detour route of the CBD. Based on this analysis, the following are recommendations to increase the flow of traffic along the detour route:

1. Optimize traffic signal cycle lengths, splits, and offsets
   - Although optimizing the traffic signal lengths, splits, and offsets will not yield acceptable LOS or queuing, it will maximize the flow of traffic along the detour route.
   - Existing traffic signal phasing should remain.
   - Cycle lengths should be short enough that pedestrians comply with the pedestrian phasing and minor street traffic does not significantly impact adjacent intersections within the CBD.
2. Modify the traffic signal progression along the detour route
   - Modify the reference phase for coordination at two intersections along the detour route in order to progress the flow of traffic along the detour route.
3. Coordinate with the City of Pittsburgh to implement timing plan during flood event
   - Coordination with the City of Pittsburgh should occur to establish a plan for when a flood event occurs and I-376 West traffic must be detoured through the CBD.
   - A predetermined timing plan should be established that can be implemented remotely for the intersections along the detour route to move traffic as efficiently as possible during a flood event.
4. Implement DMS warning messages
   - DMS warning messages should be used to alert drivers that the Bathtub section of I-376 West is closed.
   - The DMS messages should be displayed along I-376 West approaching the closure and also if possible, at the Pennsylvania Turnpike Interchange with I-376 West.

Tables

Table 1.
Intersection Level-of-Service Summary: Existing Year 2020

Intersection		Boulevard of the Allies & Cherry Way		
Peak Hour		AM Peak Hour	Midday Peak Hour	PM Peak Hour
Direction	Approach / Movement	Existing Year 2020	Existing Year 2020	Existing Year 2020
Boulevard of the Allies		East/West Roadway		
Eastbound	Through	A (7.9)	A (9.6)	B (10.3)
	Approach	**A (7.9)**	**A (9.6)**	**B (10.3)**
Westbound	Through	B (13.1)	B (11.9)	D (37.6)
	Approach	**B (13.1)**	**B (11.9)**	**D (37.6)**
Cherry Way		North/South Roadway		
Southbound	Left Turn	B (16.4)	B (16.1)	C (21.4)
	Through	B (16.4)	B (15.9)	C (20.6)
	Right Turn			
	Approach	**B (16.4)**	**B (16.0)**	**C (21.0)**
	Overall Intersection	***B (11.9)***	***B (12.0)***	***C (22.1)***
Intersection		Grant Street & Boulevard of the Allies		
Peak Hour		AM Peak Hour	Midday Peak Hour	PM Peak Hour
Direction	Approach / Movement	Existing Year 2020	Existing Year 2020	Existing Year 2020
Boulevard of the Allies		East/West Roadway		
Eastbound	Left Turn	D (39.7)	B (15.2)	C (23.0)
	Through			
	Right Turn	D (40.0)	C (23.7)	B (19.5)
	Approach	**D (39.8)**	**B (18.5)**	**C (22.3)**
Westbound	Left Turn	C (26.1)	C (20.9)	C (25.3)
	Through			
	Right Turn			
	Approach	**C (26.1)**	**C (20.9)**	**C (25.3)**
Grant Street		North/South Roadway		
Northbound	Left Turn	A (2.7)	A (2.9)	A (6.6)
	Through			
	Right Turn			
	Approach	**A (2.7)**	**A (2.9)**	**A (6.6)**
Southbound	Through	B (12.1)	B (16.3)	B (17.6)
	Right Turn			
	Approach	**B (12.1)**	**B (16.3)**	**B (17.6)**
	Overall Intersection	***B (15.6)***	***B (14.0)***	***B (17.7)***

Table 1.
Intersection Level-of-Service Summary: Existing Year 2020

Intersection		Boulevard of the Allies & Market Street		
Peak Hour		AM Peak Hour	Midday Peak Hour	PM Peak Hour
Direction	Approach / Movement	Existing Year 2020	Existing Year 2020	Existing Year 2020
Boulevard of the Allies		East/West Roadway		
Eastbound	Left Turn	B (12.3)	B (16.7)	B (18.9)
	Through	B (19.1)	C (23.5)	C (20.6)
	Right Turn			
	Approach	**B (18.9)**	**C (23.2)**	**C (20.6)**
Westbound	Left Turn	D (36.5)	C (20.3)	D (43.1)
	Through	D (39.4)	C (20.3)	D (43.6)
	Right Turn			
	Approach	**D (39.3)**	**C (20.3)**	**D (43.5)**
Market Street		North/South Roadway		
Southbound	Left Turn	B (14.0)	B (13.3)	B (19.5)
	Through			
	Right Turn			
	Approach	**B (14.0)**	**B (13.3)**	**B (19.5)**
	Overall Intersection	***C (24.4)***	***C (21.2)***	***C (29.8)***
Intersection		Boulevard of the Allies & Smithfield Street		
Peak Hour		AM Peak Hour	Midday Peak Hour	PM Peak Hour
Direction	Approach / Movement	Existing Year 2020	Existing Year 2020	Existing Year 2020
Boulevard of the Allies		East/West Roadway		
Eastbound	Left Turn	A (4.5)	A (5.8)	A (7.9)
	Through	A (4.2)	A (5.3)	A (6.8)
	Right Turn			
	Approach	**A (4.3)**	**A (5.4)**	**A (6.9)**
Westbound	Through	B (12.8)	C (21.0)	B (13.8)
	Right Turn			
	Approach	**B (12.8)**	**C (21.0)**	**B (13.8)**
Smithfield Street		North/South Roadway		
Northbound	Left Turn	C (20.3)	C (28.6)	B (15.5)
	Through			
	Right Turn			
	Approach	**C (20.3)**	**C (28.6)**	**B (15.5)**
Southbound	Left Turn	A (23.8)	C (24.6)	C (33.6)
	Through			
	Right Turn			
	Approach	**A (23.8)**	**C (24.6)**	**C (33.6)**
	Overall Intersection	***B (13.9)***	***B (17.9)***	***B (12.3)***

Table 1.
Intersection Level-of-Service Summary: Existing Year 2020

Intersection		Boulevard of the Allies & Stanwix Street		
Peak Hour		AM Peak Hour	Midday Peak Hour	PM Peak Hour
Direction	Approach / Movement	Existing Year 2020	Existing Year 2020	Existing Year 2020
Boulevard of the Allies		East/West Roadway		
Eastbound	Left Turn	B (13.1)	B (17.4)	C (22.2)
	Through	B (19.3)	C (22.8)	C (25.2)
	Right Turn			
	Approach	**B (17.8)**	**B (21.9)**	**C (24.8)**
Westbound	Left Turn	A (1.5)	A (3.2)	A (8.4)
	Through	B (10.8)	A (3.3)	A (8.8)
	Right Turn			
	Approach	**A (9.1)**	**A (3.3)**	**A (8.7)**
Stanwix Street		North/South Roadway		
Northbound	Left Turn	C (22.6)	B (18.8)	C (25.3)
	Through	C (24.6)	B (19.9)	C (26.9)
	Right Turn			
	Approach	**C (24.4)**	**B (19.8)**	**C (26.8)**
Southbound	Left Turn	C (31.6)	C (22.7)	C (28.6)
	Through	C (21.7)	C (21.0)	B (19.9)
	Right Turn	C (21.7)	B (19.2)	B (23.6)
	Approach	**C (25.6)**	**C (21.5)**	**C (23.6)**
	Overall Intersection	***C (20.2)***	***B (17.1)***	***B (19.6)***

Table 1.
Intersection Level-of-Service Summary: Existing Year 2020

Direction	Approach / Movement	AM Peak Hour	Midday Peak Hour	PM Peak Hour
Intersection		**Boulevard of Allies & Wood Street**		
Peak Hour		**AM Peak Hour**	**Midday Peak Hour**	**PM Peak Hour**
Direction	**Approach / Movement**	**Existing Year 2020**	**Existing Year 2020**	**Existing Year 2020**
Boulevard of the Allies		**East/West Roadway**		
Eastbound	Left Turn	A (1.1)	A (0.0)	A (0.0)
	Through	A (5.8)	C (22.7)	B (10.4)
	Right Turn			
	Approach	**A (5.8)**	**C (22.7)**	**B (10.4)**
Westbound	Left Turn	A (5.9)	B (12.8)	A (3.8)
	Through	C (21.5)	B (13.8)	A (1.9)
	Right Turn			
	Approach	**B (19.1)**	**B (13.5)**	**A (2.3)**
Wood Street		**North/South Roadway**		
Northbound	Left Turn	B (19.1)	B (16.8)	C (26.3)
	Through			
	Right Turn			
	Approach	**B (19.1)**	**B (16.8)**	**C (26.3)**
Southbound	Left Turn	B (15.6)	B (18.2)	C (24.8)
	Through			
	Right Turn		B (15.4)	
	Approach	**B (15.6)**	**B (17.9)**	**C (24.8)**
	Overall Intersection	***B (12.6)***	***B (18.1)***	***B (11.4)***
Intersection		**Grant Street & First Avenue**		
Peak Hour		**AM Peak Hour**	**Midday Peak Hour**	**PM Peak Hour**
Direction	**Approach / Movement**	**Existing Year 2020**	**Existing Year 2020**	**Existing Year 2020**
First Avenue		**East/West Roadway**		
Westbound	Left Turn	C (27.0)	C (23.4)	C (26.4)
	Right Turn			
	Approach	**C (27.0)**	**C (23.4)**	**C (26.4)**
Grant Street		**North/South Roadway**		
Northbound	Left Turn	C (30.8)	A (9.5)	D (35.8)
	Through			
	Right Turn	C (34.7)	B (11.2)	C (32.9)
	Approach	**C (32.1)**	**B (10.1)**	**D (35.1)**
Southbound	Left Turn	B (11.8)	A (6.1)	B (11.2)
	Through	A (5.5)	A (5.7)	A (8.5)
	Approach	**A (6.3)**	**A (5.8)**	**A (8.7)**
	Overall Intersection	***B (25.4)***	***B (10.1)***	***C (22.9)***

Table 1.
Intersection Level-of-Service Summary: Existing Year 2020

Intersection		Grant Street & Fort Pitt Blvd		
Peak Hour		AM Peak Hour	Midday Peak Hour	PM Peak Hour
Direction	Approach / Movement	Existing Year 2020	Existing Year 2020	Existing Year 2020
Fort Pitt Boulevard		East/West Roadway		
Westbound	Left Turn	D (39.5)	C (34.6)	E (70.8)
	Through			
	Right Turn	D (39.5)	C (34.9)	D (35.6)
	Approach	**D (39.5)**	**C (34.7)**	**E (59.6)**
Grant Street		North/South Roadway		
Northbound	Through	E (59.1)	C (22.2)	C (31.3)
	Approach	**E (59.1)**	**C (22.2)**	**C (31.3)**
Southbound	Right Turn	A (8.2)	A (7.2)	B (13.0)
	Sharp Right Turn	A (6.0)	A (6.9)	A (8.5)
Northeastbound	Left Turn	C (33.2)	D (37.7)	C (29.5)
	Through			
	Approach	**C (33.2)**	D (37.7)	C (29.5)
	Overall Intersection	***D (37.4)***	***C (20.3)***	***C (29.1)***
Intersection		Stanwix Street & Fort Pitt Boulevard		
Peak Hour		AM Peak Hour	Midday Peak Hour	PM Peak Hour
Direction	Approach / Movement	Existing Year 2020	Existing Year 2020	Existing Year 2020
Fort Pitt Blcd		East/West Roadway		
Westbound	Left Turn	C (22.6)	A (7.0)	B (12.9)
	Through	C (27.3)	A (7.1)	B (10.9)
	Right Turn			
	Approach	**C (26.8)**	**A (7.1)**	**B (11.7)**
Stanwix Street		North/South Roadway		
Southbound	Through	B (19.8)	B (19.6)	C (20.9)
	Right Turn	B (18.7)	B (18.9)	C (23.2)
	Right Turn 2	B (18.4)	B (17.6)	B (17.3)
	Approach	**B (19.3)**	**B (19.0)**	**C (21.1)**
Northbound	Left Turn	C (25.6)	B (19.0)	B (20.0)
	Right Turn			
	Approach	**C (25.6)**	**B (19.0)**	**B (20.0)**
	Overall Intersection	***C (25.1)***	***B (12.4)***	***B (15.8)***

Table 2.
Freeway / Diverge Level-of-Service Summary: Existing Year 2020

Freeway	I 376 West Before Grant Street		
Peak Hour	AM Peak Hour	Midday Peak Hour	PM Peak Hour
	D (29.7)	C (19.2)	D (31.2)
Diverge	**I 376 West / Grant Street Exit**		
Peak Hour	**AM Peak Hour**	**Midday Peak Hour**	**PM Peak Hour**
	E (36.5)	C (23.3)	F
Freeway	**I 376 West After Grant Street**		
Peak Hour	**AM Peak Hour**	**Midday Peak Hour**	**PM Peak Hour**
	D (30.7)	C (19.9)	D (32.2)

Table 3. Queuing Summary: Existing Year 2020

Intersection			Boulevard of the Allies & Cherry Way		
Peak Hour			AM Peak Hour	Midday Peak Hour	PM Peak Hour
Direction	Approach / Movement	Storage Length (ft)	Existing Year 2020	Existing Year 2020	Existing Year 2020
Boulevard of the Allies			East/West Roadway		
Eastbound	Through	300	95	70	186
Westbound	Through	300	156	78	224
Cherry Way			North/South Roadway		
Southbound	Left Turn	400	75	81	175
	Through	400	91	92	209
	Right Turn				
Intersection			Grant Street & Boulevard of the Allies		
Peak Hour			AM Peak Hour	Midday Peak Hour	PM Peak Hour
Direction	Approach / Movement	Storage Length (ft)	Existing Year 2020	Existing Year 2020	Existing Year 2020
Boulevard of the Allies			East/West Roadway		
Eastbound	Left Turn	300	196	96	254
	Through		197	102	279
	Right Turn	300	138	113	280
Westbound	Left Turn	300	176	130	234
	Through				
	Right Turn				
Grant Street			North/South Roadway		
Northbound	Left Turn	250	129	66	170
	Through				
	Right Turn				
Southbound	Through	175	183	202	202
	Right Turn				
Intersection			Boulevard of the Allies & Market Street		
Peak Hour			AM Peak Hour	Midday Peak Hour	PM Peak Hour
Direction	Approach / Movement	Storage Length (ft)	Existing Year 2020	Existing Year 2020	Existing Year 2020
Boulevard of the Allies			East/West Roadway		
Eastbound	Left Turn	75	41	59	35
	Through	450	166	190	177
	Right Turn				
Westbound	Left Turn	300	22	48	66
	Through	525	137	196	189
	Right Turn				
Market Street			North/South Roadway		
Southbound	Left Turn	200	35	46	141
	Through				
	Right Turn				

Note: Red text indicates queuing beyond available storage length.

Table 3. Queuing Summary: Existing Year 2020

Intersection			Boulevard of the Allies & Smithfield Street		
Peak Hour			AM Peak Hour	Midday Peak Hour	PM Peak Hour
Direction	Approach / Movement	Storage Length (ft)	Existing Year 2020	Existing Year 2020	Existing Year 2020
Boulevard of the Allies			East/West Roadway		
Eastbound	Left Turn	75	70	69	82
	Through	525	71	64	203
	Right Turn				
Westbound	Through	300	163	90	163
	Right Turn				
Smithfield Street			North/South Roadway		
Northbound	Left Turn	425	174	228	142
	Through				
	Right Turn				
Southbound	Left Turn	200	126	84	136
	Through				
	Right Turn				
Intersection			Boulevard of the Allies & Stanwix Street		
Peak Hour			AM Peak Hour	Midday Peak Hour	PM Peak Hour
Direction	Approach / Movement	Storage Length (ft)	Existing Year 2020	Existing Year 2020	Existing Year 2020
Boulevard of the Allies			East/West Roadway		
Eastbound	Left Turn	600	188	78	127
	Through	600	196	121	175
	Right Turn				
Westbound	Left Turn	175	72	67	111
	Through	425	82	104	139
	Right Turn				
Stanwix Street			North/South Roadway		
Northbound	Left Turn	150	76	22	47
	Through	450	177	117	124
	Right Turn				
Southbound	Left Turn	200	136	117	172
	Through		105	114	145
	Right Turn		75	57	95

Note: Red text indicates queuing beyond available storage length.

Table 3. Queuing Summary: Existing Year 2020

Intersection			Boulevard of Allies & Wood Street		
Peak Hour			**AM Peak Hour**	**Midday Peak Hour**	**PM Peak Hour**
Direction	**Approach / Movement**	**Storage Length (ft)**	**Existing Year 2020**	**Existing Year 2020**	**Existing Year 2020**
Boulevard of the Allies			**East/West Roadway**		
Eastbound	Left Turn	75	4	0	0
	Through	525	91	286	147
	Right Turn				
Westbound	Left Turn	150	75	104	100
	Through	525	135	163	140
	Right Turn				
Wood Street			**North/South Roadway**		
Northbound	Left Turn	425	101	64	126
	Through				
	Right Turn				
Southbound	Left Turn	200	82	143	188
	Through				
	Right Turn		63	52	153
Intersection			**Grant Street & First Avenue**		
Peak Hour			**AM Peak Hour**	**Midday Peak Hour**	**PM Peak Hour**
Direction	**Approach / Movement**	**Storage Length (ft)**	**Existing Year 2020**	**Existing Year 2020**	**Existing Year 2020**
First Avenue			**East/West Roadway**		
Westbound	Left Turn	350	189	190	336
	Right Turn				
Grant Street			**North/South Roadway**		
Northbound	Left Turn	200	165	90	186
	Through				
	Right Turn	200	186	137	167
Southbound	Left Turn	225	86	87	86
	Through	225	85	97	146
Intersection			**Grant Street & Fort Pitt Blvd**		
Peak Hour			**AM Peak Hour**	**Midday Peak Hour**	**PM Peak Hour**
Direction	**Approach / Movement**	**Storage Length (ft)**	**Existing Year 2020**	**Existing Year 2020**	**Existing Year 2020**
Fort Pitt Boulevard			**East/West Roadway**		
Westbound	Left Turn	825	803	149	1065
	Through				
	Right Turn		806	104	1071
Grant Street			**North/South Roadway**		
Northbound	Through	550	508	80	293
Southbound	Right Turn	200	141	124	158
	Sharp Right Turn	200	107	93	154
Northeastbound	Left Turn	525	414	284	200
	Through				

Note: Red text indicates queuing beyond available storage length.

Table 3. Queuing Summary: Existing Year 2020

<table>
<tr><th colspan="3">Intersection</th><th colspan="3">Stanwix Street & Fort Pitt Boulevard</th></tr>
<tr><th colspan="3">Peak Hour</th><th>AM Peak Hour</th><th>Midday Peak Hour</th><th>PM Peak Hour</th></tr>
<tr><th>Direction</th><th>Approach / Movement</th><th>Storage Length (ft)</th><th>Existing Year 2020</th><th>Existing Year 2020</th><th>Existing Year 2020</th></tr>
<tr><td colspan="3">Fort Pitt Blvd</td><td colspan="3">East/West Roadway</td></tr>
<tr><td rowspan="3">Westbound</td><td>Left Turn</td><td>375</td><td>54</td><td>82</td><td>207</td></tr>
<tr><td>Through</td><td rowspan="2">375</td><td rowspan="2">193</td><td rowspan="2">93</td><td rowspan="2">134</td></tr>
<tr><td>Right Turn</td></tr>
<tr><td colspan="3">Stanwix Street</td><td colspan="3">North/South Roadway</td></tr>
<tr><td rowspan="3">Southbound</td><td>Through</td><td>150</td><td>113</td><td>102</td><td>189</td></tr>
<tr><td>Right Turn</td><td>450</td><td>59</td><td>102</td><td>219</td></tr>
<tr><td>Right Turn 2</td><td>450</td><td>64</td><td>64</td><td>118</td></tr>
<tr><td rowspan="2">Northbound</td><td>Left Turn</td><td>250</td><td rowspan="2">268</td><td rowspan="2">90</td><td rowspan="2">43</td></tr>
<tr><td>Right Turn</td><td>250</td></tr>
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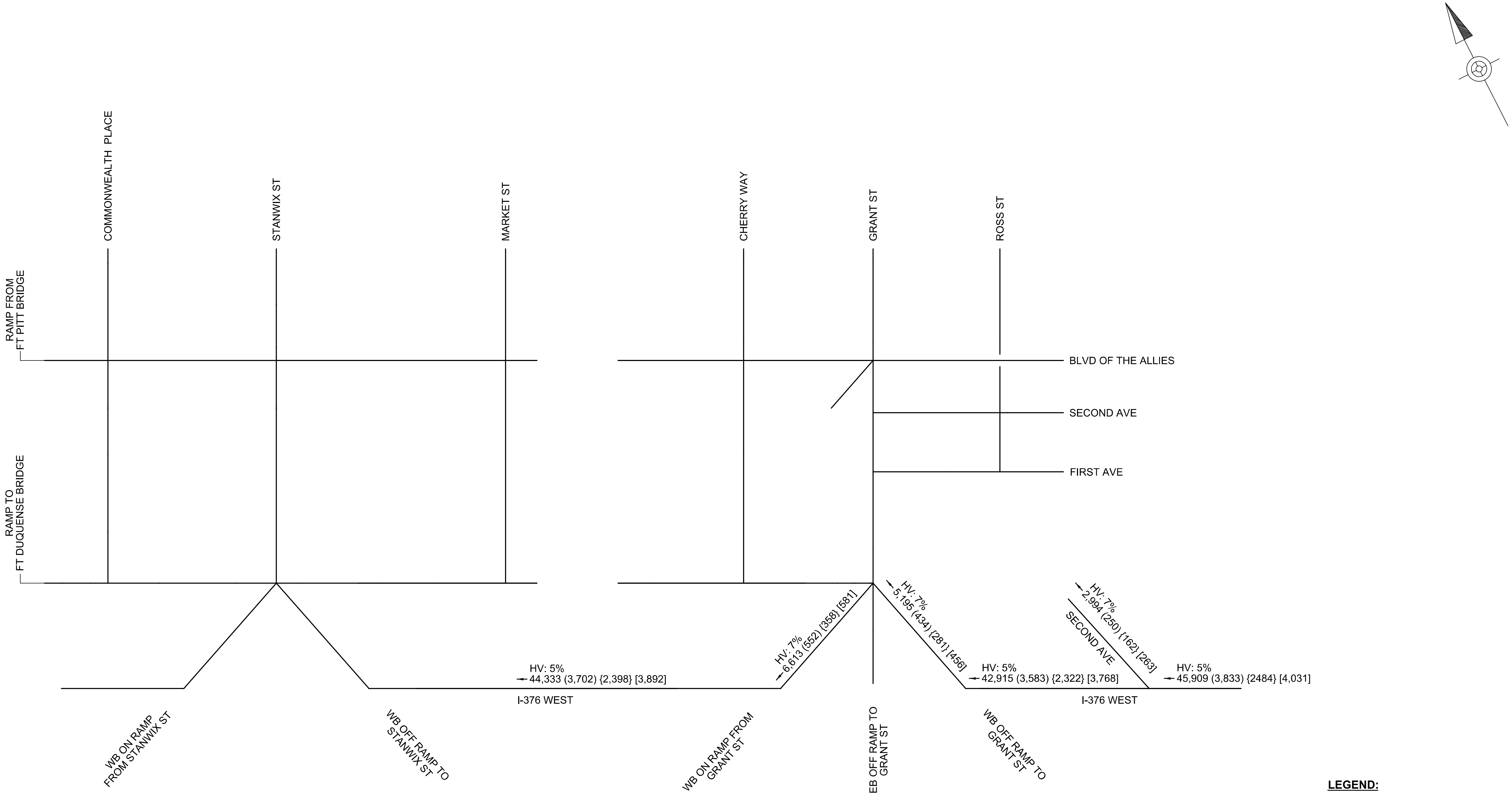
Note: Red text indicates queuing beyond available storage length.

Figures



LEGEND:

XX - ADT (AM DHV) {MD DHV} [PM DHV]

NOTE:
I-376 AND RAMPS ARE CLASSIFIED AS TPG 1 - URBAN INTERSTATE WITH HOURLY FACTORS AM : 8.35% MD : 5.41% PM : 8.78%.

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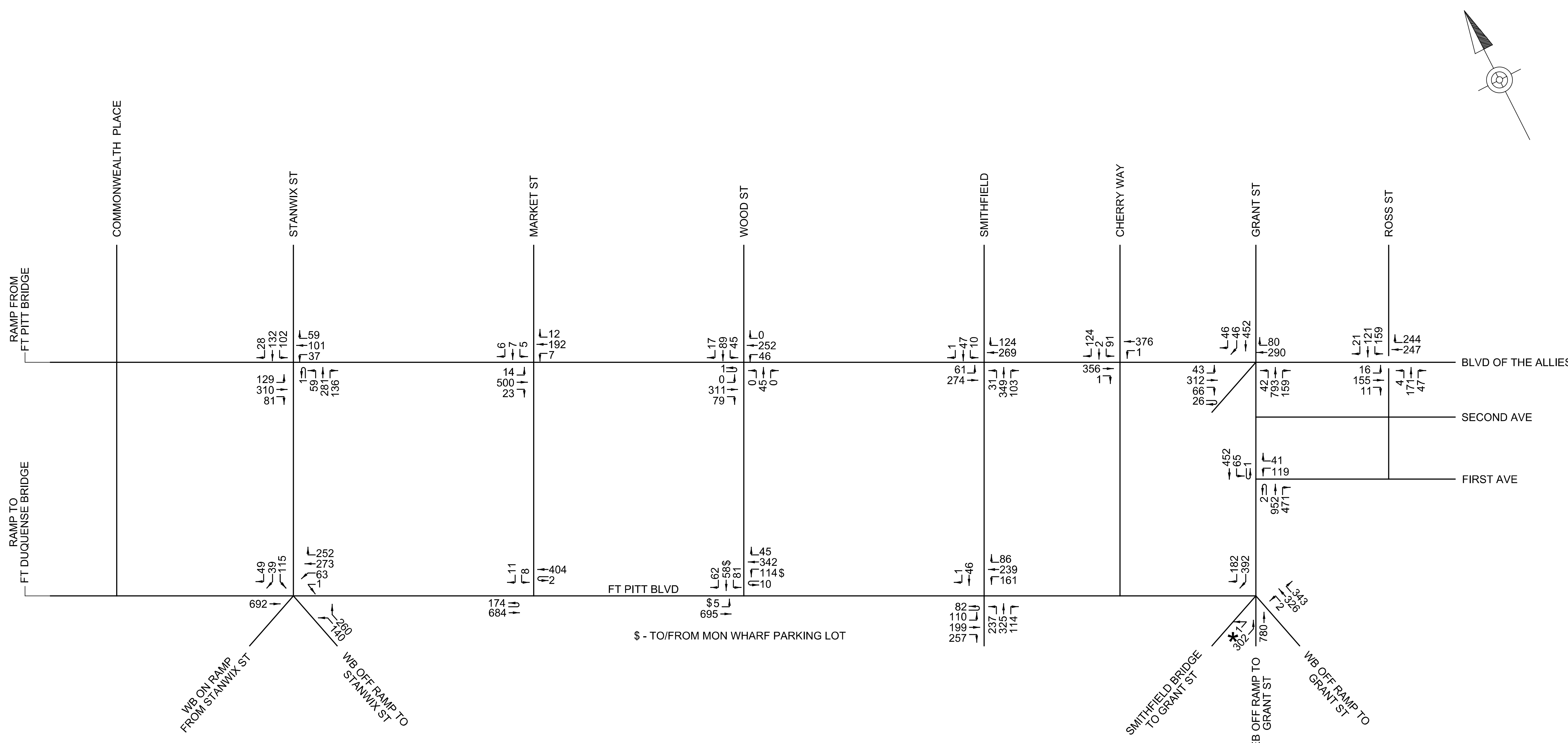
I-376, BATHTUB FLOODING STUDY
EXISTING YEAR 2020 TRAFFIC DATA

FIGURE 1

AECOM



LEGEND:

XX - AM PEAK HOUR VOLUME

* - ILLEGAL MOVEMENT

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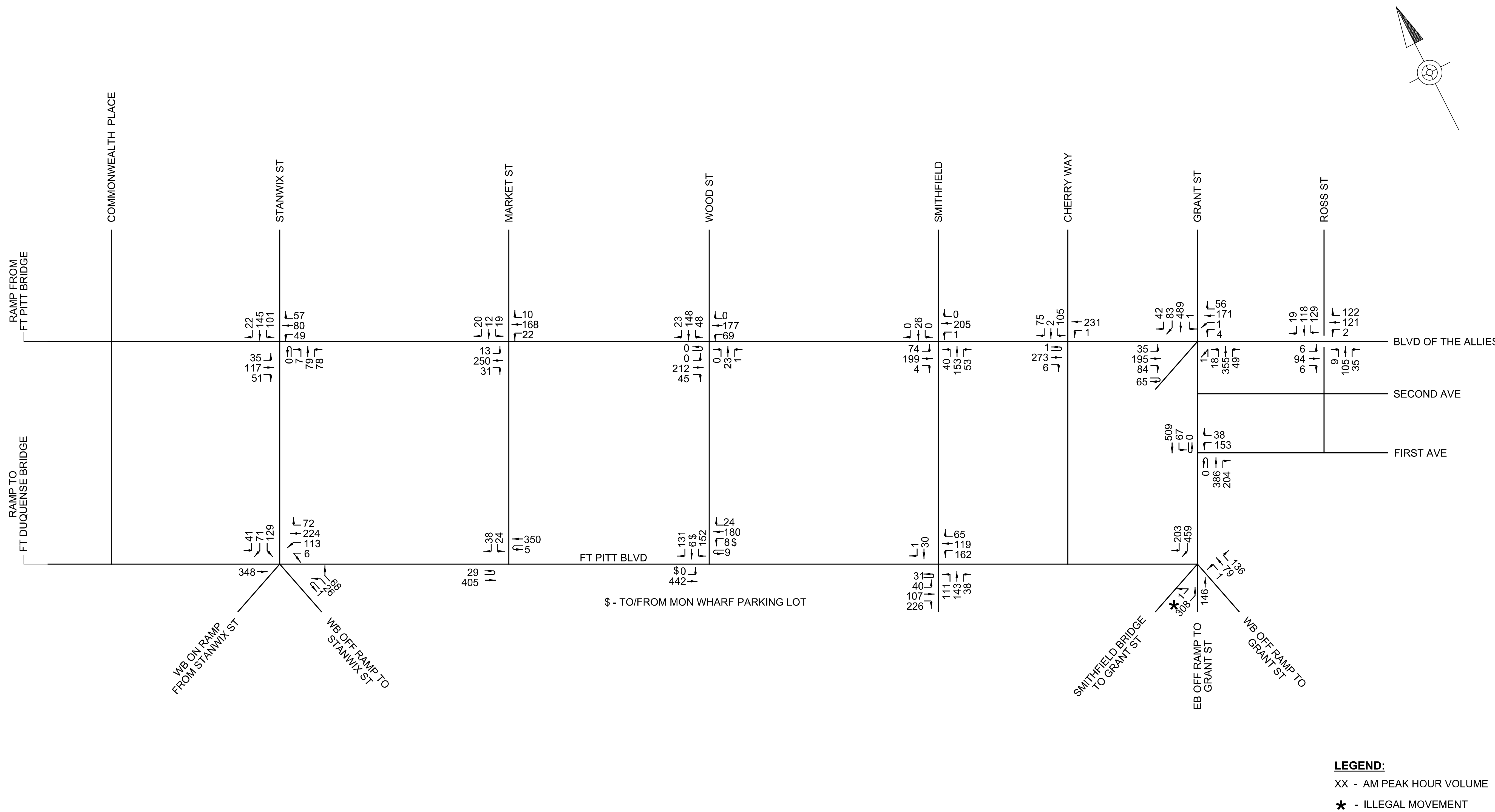
I-376, BATHTUB FLOODING STUDY

2020 VEHICULAR TRAFFIC VOLUMES AM PEAK HOUR

FIGURE 2

AECOM



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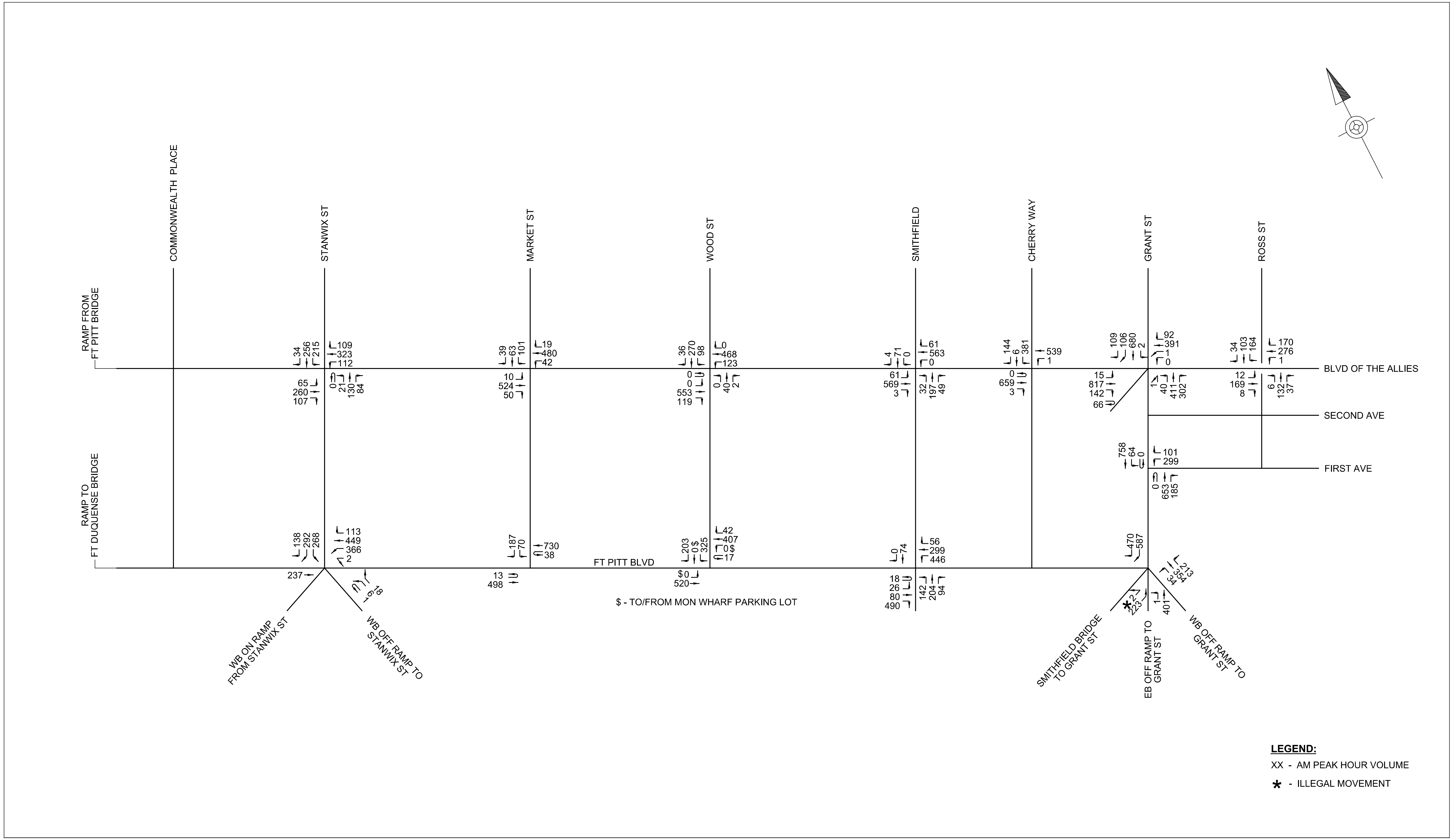
I-376, BATHTUB FLOODING STUDY
2020 VEHICULAR TRAFFIC VOLUMES MIDDAY PEAK HOUR

FIGURE 3

AECOM



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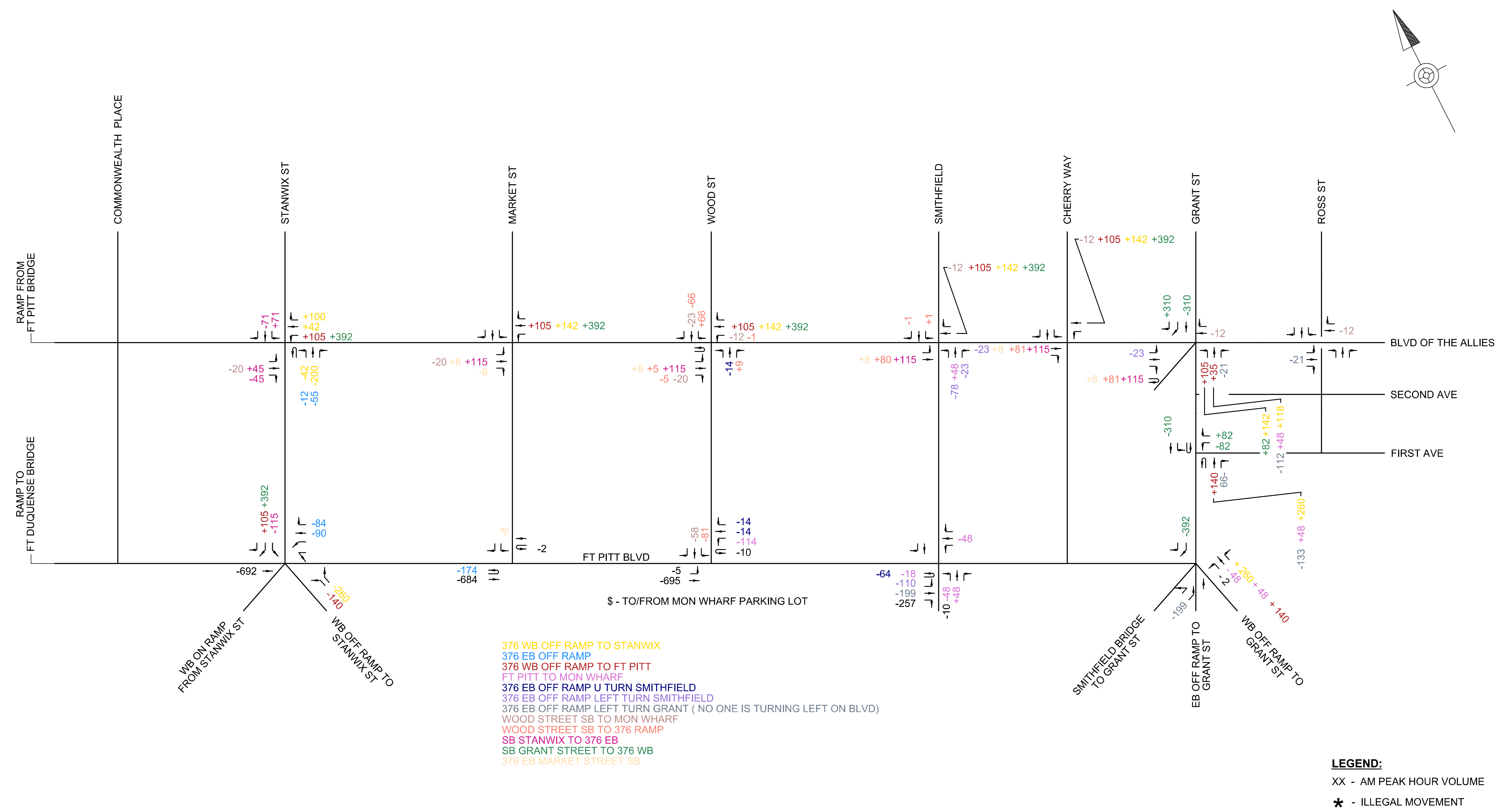
I-376, BATHTUB FLOODING STUDY
2020 VEHICULAR TRAFFIC VOLUMES PM PEAK HOUR

FIGURE 4
AECOM



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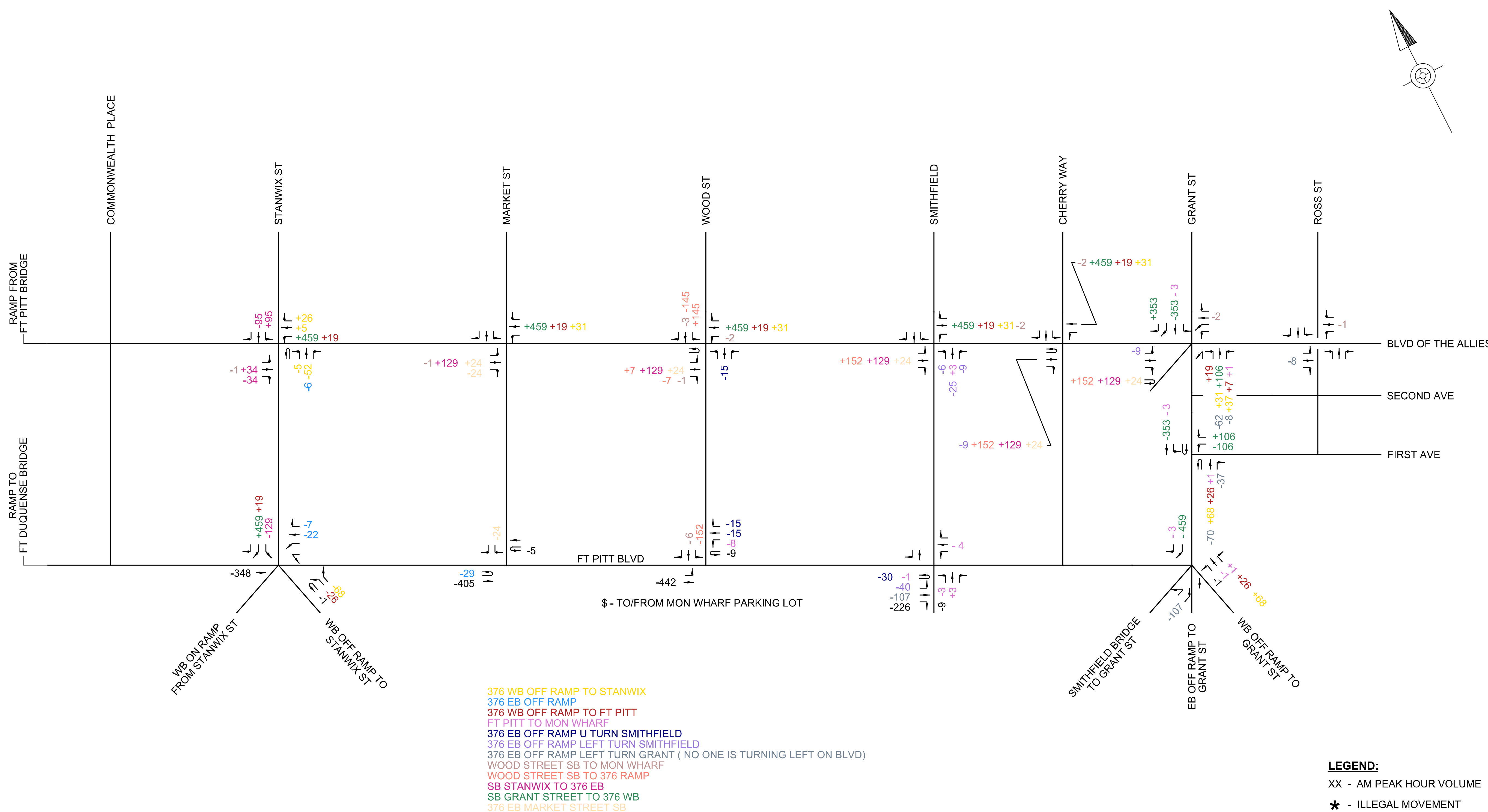
I-376, BATHTUB FLOODING STUDY
2020 VEHICULAR TRAFFIC VOLUMES AM DETOUR PEAK HOUR

FIGURE 5
AECOM



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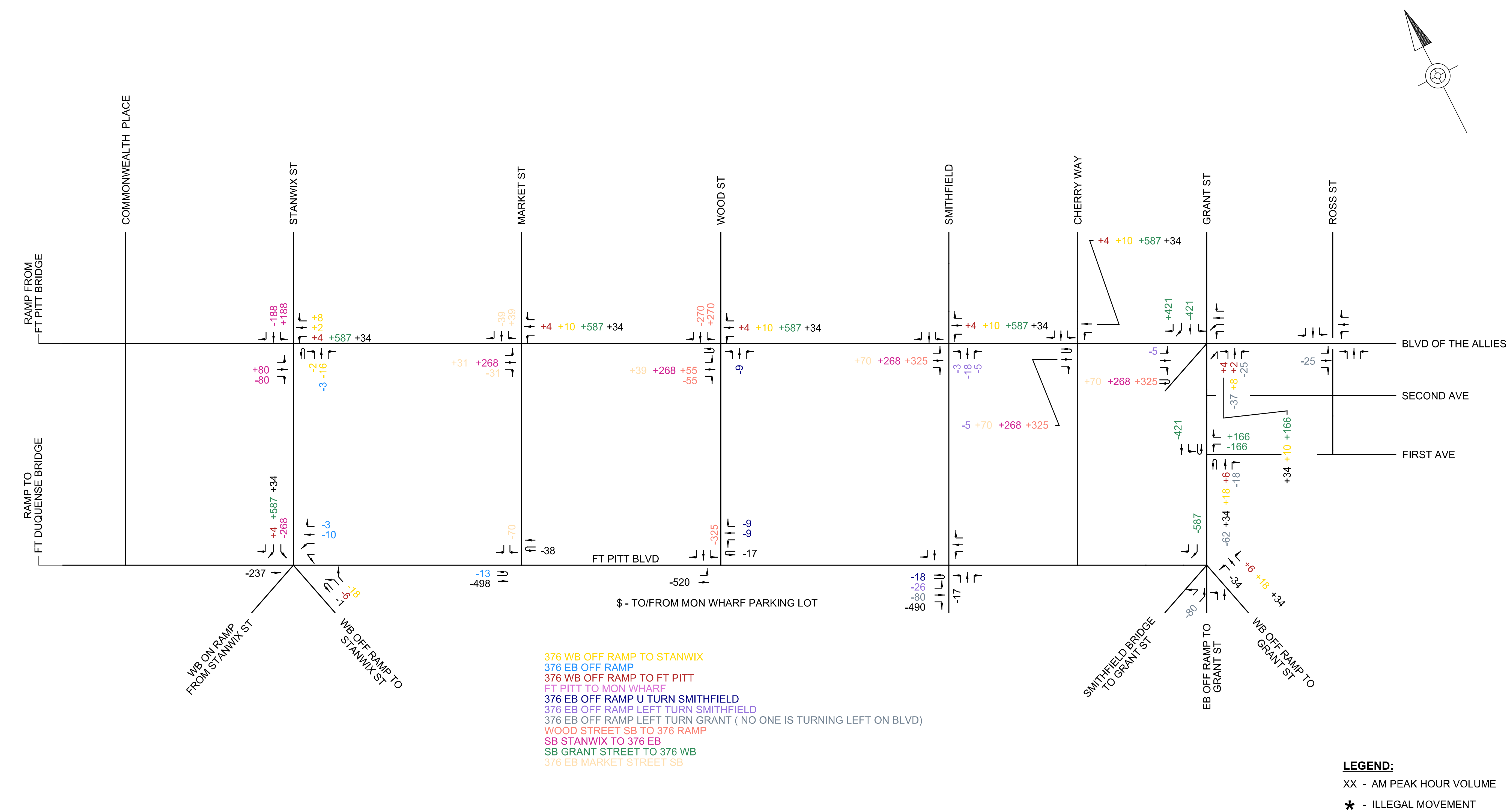
I-376, BATHTUB FLOODING STUDY
2020 VEHICULAR TRAFFIC VOLUMES MIDDAY DETOUR PEAK HOUR

FIGURE 6

AECOM



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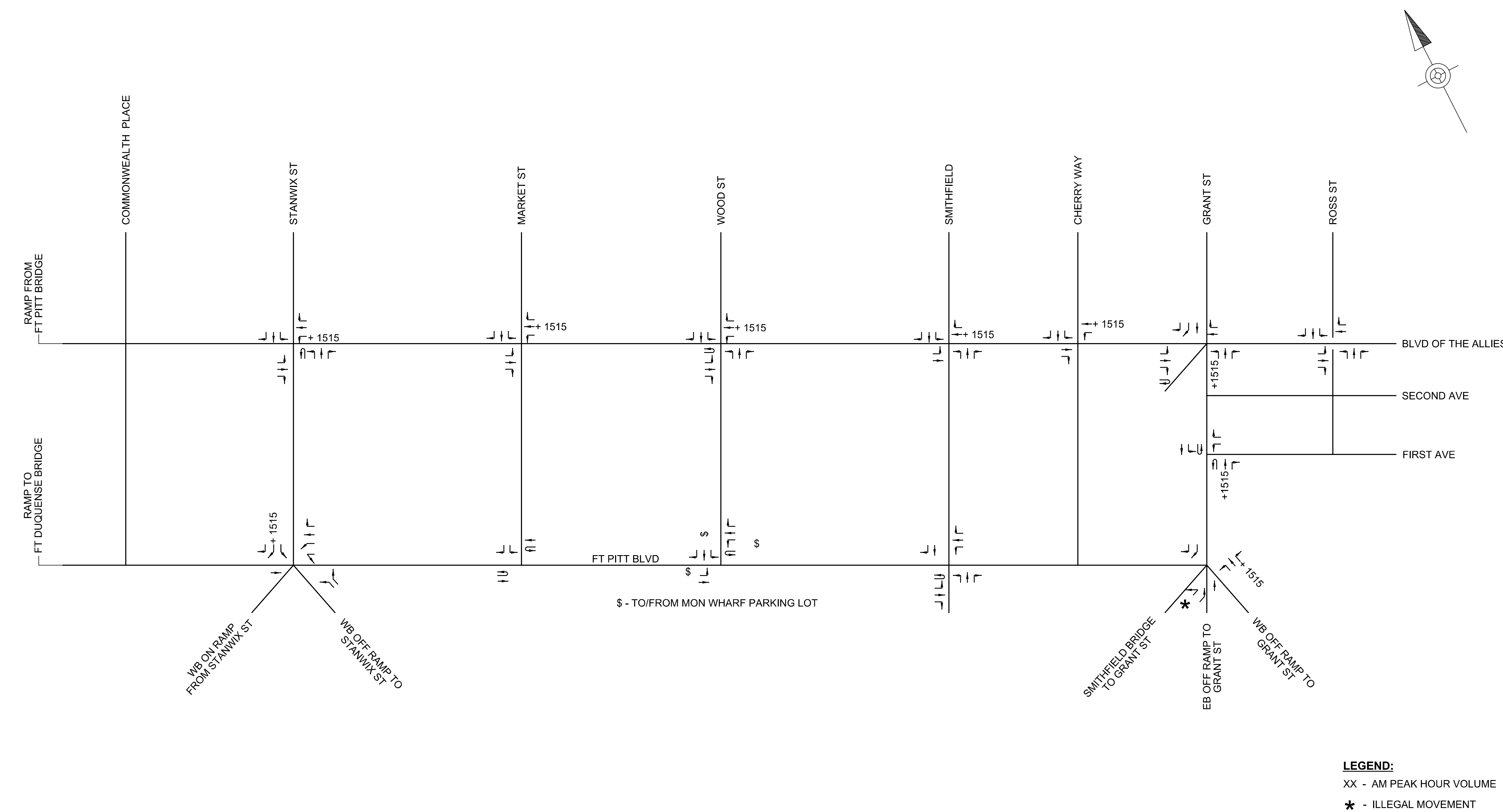
I-376, BATHTUB FLOODING STUDY
2020 VEHICULAR TRAFFIC VOLUMES PM DETOUR PEAK HOUR

FIGURE 7

AECOM



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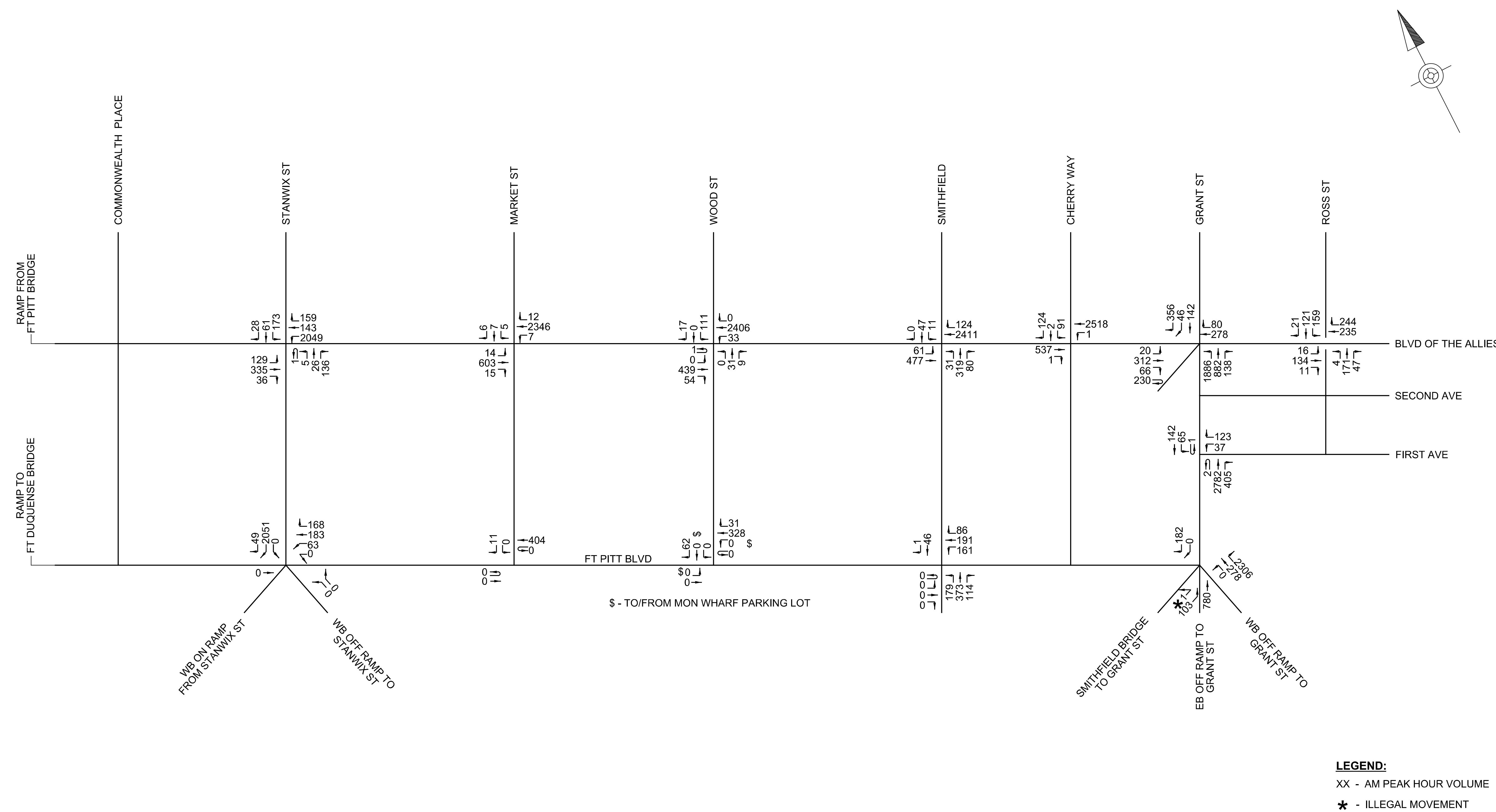
I-376, BATHTUB FLOODING STUDY

2020 VEHICULAR TRAFFIC VOLUMES PARKWAY DETOUR PEAK HOUR

FIGURE 8

AECOM



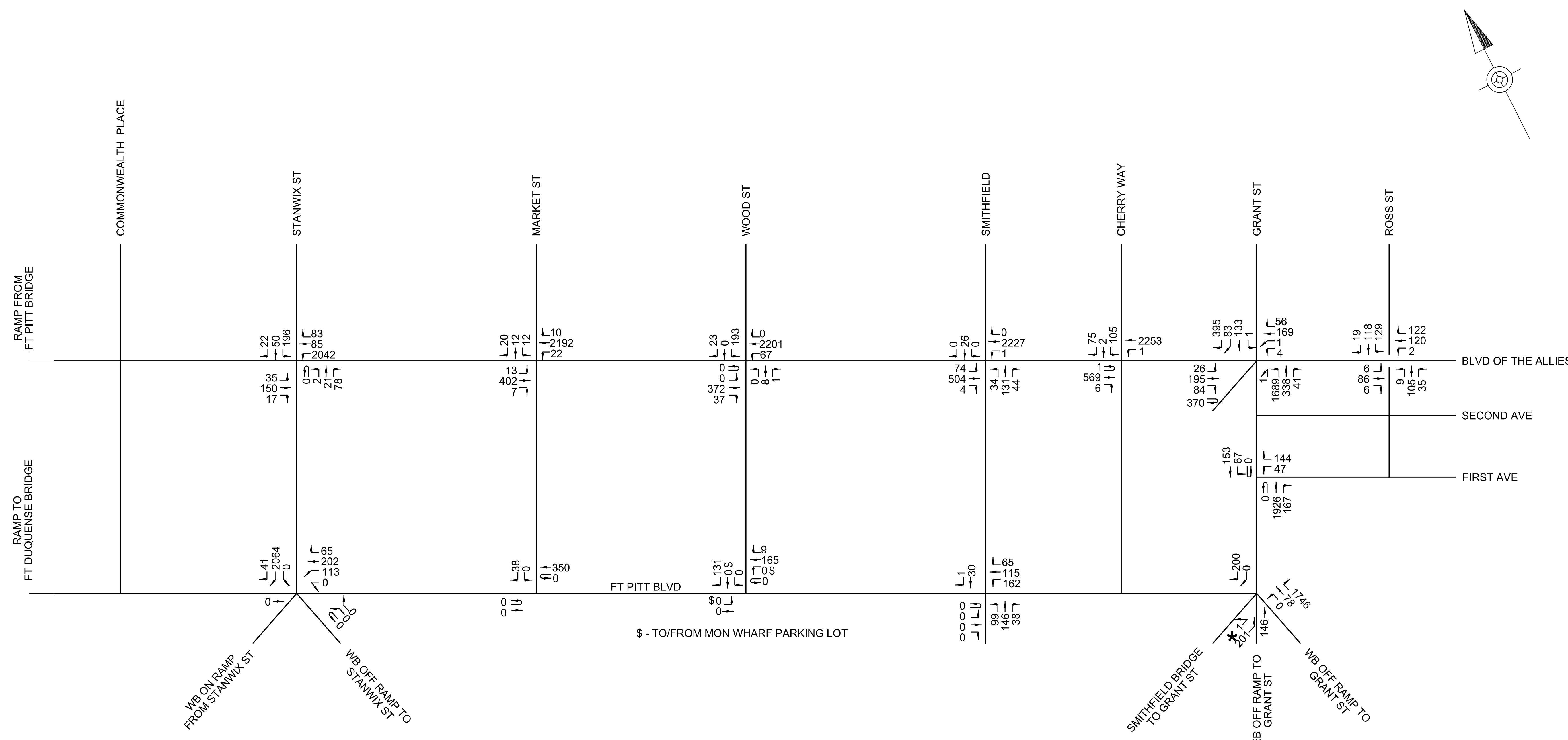
pennsylvania DEPARTMENT OF TRANSPORTATION

I-376, BATHTUB FLOODING STUDY

2020 AM PEAK HOUR VEHICULAR TRAFFIC VOLUMES WITH BATHTUB DETOUR

FIGURE 9

AECOM



LEGEND:

XX - AM PEAK HOUR VOLUME

* - ILLEGAL MOVEMENT

I-376, BATHTUB FLOODING STUDY

2020 MIDDAY PEAK HOUR VEHICULAR TRAFFIC VOLUMES WITH BATHTUB DETOUR

FIGURE 10

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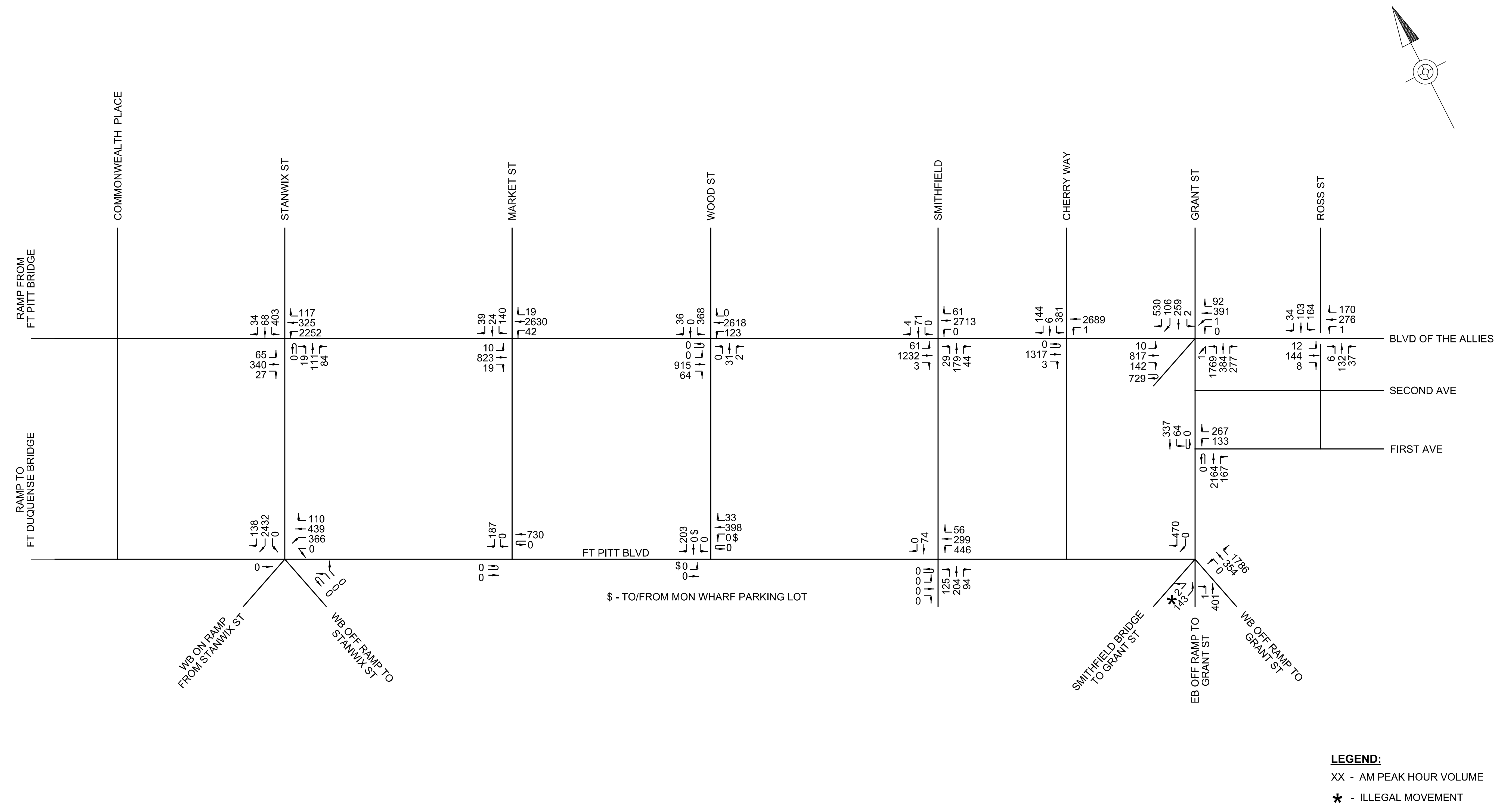
AECOM



I-376, BATHTUB FLOODING STUDY

2020 PM PEAK HOUR VEHICULAR TRAFFIC VOLUMES WITH BATHTUB DETOUR

FIGURE 11

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AECOM

Attachment A

Existing Year 2020 Intersection Capacity Results

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	349	1	1	369	0	0	0	0	89	2	122
Future Volume (vph)	0	349	1	1	369	0	0	0	0	89	2	122
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width	10	11	12	12	12	12	12	12	12	14	14	12
Grade (%)		3%			-1%			0%			-4%	
Total Lost time (s)		6.0			6.0					7.0	7.0	
Lane Util. Factor		0.91			0.95					0.95	0.95	
Frpb, ped/bikes		1.00			1.00					1.00	0.95	
Flpb, ped/bikes		1.00			1.00					1.00	1.00	
Frt		1.00			1.00					1.00	0.86	
Flt Protected		1.00			1.00					0.95	1.00	
Satd. Flow (prot)		4346			3373					1802	1571	
Flt Permitted		1.00			0.95					0.95	1.00	
Satd. Flow (perm)		4346			3219					1802	1571	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	0	383	1	1	405	0	0	0	0	98	2	134
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	76	0
Lane Group Flow (vph)	0	384	0	0	406	0	0	0	0	88	70	0
Confl. Peds. (#/hr)	98		79	79		98	53		6	6		53
Confl. Bikes (#/hr)			1			2						2
Heavy Vehicles (%)	0%	13%	0%	0%	7%	0%	0%	0%	0%	3%	0%	2%
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		2			6					4	4	
Permitted Phases				6								
Actuated Green, G (s)		41.0			41.0					41.0	41.0	
Effective Green, g (s)		41.0			41.0					41.0	41.0	
Actuated g/C Ratio		0.43			0.43					0.43	0.43	
Clearance Time (s)		6.0			6.0					7.0	7.0	
Lane Grp Cap (vph)		1875			1389					777	678	
v/s Ratio Prot		0.09								c0.05	0.04	
v/s Ratio Perm					c0.13							
v/c Ratio		0.20			0.29					0.11	0.10	
Uniform Delay, d1		16.8			17.6					16.1	16.1	
Progression Factor		0.46			0.72					1.00	1.00	
Incremental Delay, d2		0.2			0.5					0.3	0.3	
Delay (s)		7.9			13.1					16.4	16.4	
Level of Service		A			B					B	B	
Approach Delay (s)		7.9			13.1			0.0			16.4	
Approach LOS		A			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	EBR2	WBT	WBR	NBL	NBT	NBR	SBT	SBR	SBR2
Lane Configurations												
Traffic Volume (vph)	42	306	65	25	284	78	41	777	156	443	45	45
Future Volume (vph)	42	306	65	25	284	78	41	777	156	443	45	45
Ideal Flow (vphpl)	2000	2000	2000	2000	2100	2100	2100	2100	2100	2200	2200	2200
Lane Width	12	12	12	12	12	14	12	12	12	11	11	11
Grade (%)		0%			-3%			1%		-1%		
Total Lost time (s)		6.0	6.0		6.0			7.0		7.0		
Lane Util. Factor		0.95	1.00		0.95			0.95		0.95		
Frpb, ped/bikes		1.00	0.64		0.99			0.99		0.99		
Flpb, ped/bikes		1.00	1.00		1.00			1.00		1.00		
Frt		1.00	0.85		0.97			0.98		0.97		
Flt Protected		0.99	1.00		1.00			1.00		1.00		
Satd. Flow (prot)		3024	872		3288			3337		3358		
Flt Permitted		0.86	1.00		1.00			0.90		1.00		
Satd. Flow (perm)		2605	872		3288			3016		3358		
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	44	318	68	26	296	81	43	809	162	461	47	47
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	362	94	0	377	0	0	1014	0	555	0	0
Confl. Peds. (#/hr)	57		116	105		57	61		114			61
Confl. Bikes (#/hr)									5			
Heavy Vehicles (%)	12%	12%	14%	6%	6%	5%	2%	3%	3%	4%	2%	21%
Turn Type	Perm	NA	Perm		NA		Perm	NA		NA		
Protected Phases		4			8			2		6		
Permitted Phases	4		4				2					
Actuated Green, G (s)		30.0	30.0		30.0			52.0		52.0		
Effective Green, g (s)		30.0	30.0		30.0			52.0		52.0		
Actuated g/C Ratio		0.32	0.32		0.32			0.55		0.55		
Clearance Time (s)		6.0	6.0		6.0			7.0		7.0		
Lane Grp Cap (vph)		822	275		1038			1650		1838		
v/s Ratio Prot					0.11					0.17		
v/s Ratio Perm		c0.14	0.11					c0.34				
v/c Ratio		0.44	0.34		0.36			0.61		0.30		
Uniform Delay, d1		25.8	24.9		25.1			14.7		11.7		
Progression Factor		1.47	1.47		1.00			0.10		1.00		
Incremental Delay, d2		1.7	3.3		1.0			1.2		0.4		
Delay (s)		39.7	40.0		26.1			2.7		12.1		
Level of Service		D	D		C			A		B		
Approach Delay (s)		39.8			26.1			2.7		12.1		
Approach LOS		D			C			A		B		

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	115.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	490	23	7	188	12	0	0	0	5	7	6
Future Volume (vph)	14	490	23	7	188	12	0	0	0	5	7	6
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width	10	11	12	10	11	12	12	12	12	12	12	12
Grade (%)		-1%			2%			0%			2%	
Total Lost time (s)	6.0	6.0		6.0	6.0						6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95						1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00						0.96	
Flpb, ped/bikes	0.98	1.00		0.99	1.00						0.98	
Frt	1.00	0.99		1.00	0.99						0.95	
Flt Protected	0.95	1.00		0.95	1.00						0.99	
Satd. Flow (prot)	1655	3263		1645	2948						1653	
Flt Permitted	0.61	1.00		0.32	1.00						0.99	
Satd. Flow (perm)	1056	3263		547	2948						1653	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	16	574	27	8	220	14	0	0	0	6	8	7
RTOR Reduction (vph)	0	4	0	0	6	0	0	0	0	0	4	0
Lane Group Flow (vph)	16	597	0	8	228	0	0	0	0	0	17	0
Confl. Peds. (#/hr)	29		56	56		29	139		98	98		139
Confl. Bikes (#/hr)			2									2
Heavy Vehicles (%)	0%	6%	0%	0%	15%	17%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA					Perm	NA	
Protected Phases	5	2		1	6						4	
Permitted Phases	2			6						4		
Actuated Green, G (s)	35.8	31.8		30.6	29.2						43.8	
Effective Green, g (s)	35.8	31.8		30.6	29.2						43.8	
Actuated g/C Ratio	0.38	0.33		0.32	0.31						0.46	
Clearance Time (s)	6.0	6.0		6.0	6.0						6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0						2.0	
Lane Grp Cap (vph)	423	1092		192	906						762	
v/s Ratio Prot	c0.00	c0.18		0.00	0.08							
v/s Ratio Perm	0.01			0.01							0.01	
v/c Ratio	0.04	0.55		0.04	0.25						0.02	
Uniform Delay, d1	18.7	25.7		27.5	24.7						13.9	
Progression Factor	0.66	0.67		1.33	1.57						1.00	
Incremental Delay, d2	0.0	1.9		0.0	0.7						0.1	
Delay (s)	12.3	19.1		36.5	39.4						14.0	
Level of Service	B	B		D	D						B	
Approach Delay (s)		18.9			39.3			0.0			14.0	
Approach LOS		B			D			A			B	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	269	0	0	264	122	30	342	101	10	46	1
Future Volume (vph)	60	269	0	0	264	122	30	342	101	10	46	1
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	1000	1000	1000
Lane Width	10	11	12	11	10	12	11	12	12	14	14	14
Grade (%)		3%			-3%			1%			0%	
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95			0.95			0.95			1.00	
Frpb, ped/bikes	1.00	1.00			0.97			0.97			1.00	
Flpb, ped/bikes	0.98	1.00			1.00			0.99			0.99	
Frt	1.00	1.00			0.95			0.97			1.00	
Flt Protected	0.95	1.00			1.00			1.00			0.99	
Satd. Flow (prot)	1621	3026			2928			3197			467	
Flt Permitted	0.46	1.00			1.00			0.93			0.90	
Satd. Flow (perm)	788	3026			2928			2996			426	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	66	295	0	0	290	134	33	375	111	11	50	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	66	295	0	0	424	0	0	519	0	0	61	0
Confl. Peds. (#/hr)	81		139	139		81	217		202	202		217
Confl. Bikes (#/hr)			3						6			1
Heavy Vehicles (%)	0%	13%	0%	0%	11%	0%	3%	4%	1%	80%	95%	100%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	10	10	10
Turn Type	pm+pt	NA			NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2						4			8		
Actuated Green, G (s)	43.0	43.0			30.6			40.0			40.0	
Effective Green, g (s)	43.0	43.0			30.6			40.0			40.0	
Actuated g/C Ratio	0.45	0.45			0.32			0.42			0.42	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	2.0	0.2			0.2			0.2			0.2	
Lane Grp Cap (vph)	412	1369			943			1261			179	
v/s Ratio Prot	0.01	c0.10			c0.14							
v/s Ratio Perm	0.06							c0.17			0.14	
v/c Ratio	0.16	0.22			0.45			0.41			0.34	
Uniform Delay, d1	17.3	15.8			25.5			19.3			18.6	
Progression Factor	0.26	0.25			0.44			1.00			1.00	
Incremental Delay, d2	0.1	0.3			1.5			1.0			5.2	
Delay (s)	4.5	4.2			12.8			20.3			23.8	
Level of Service	A	A			B			C			C	
Approach Delay (s)		4.3			12.8			20.3			23.8	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	126	304	79	36	99	58	1	58	275	133	100	129
Future Volume (vph)	126	304	79	36	99	58	1	58	275	133	100	129
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width	10	11	12	10	11	12	12	12	12	12	12	12
Grade (%)		3%			-2%				-1%			1%
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	0.98		1.00	0.98			1.00	0.97		1.00	0.98
Flpb, ped/bikes	0.97	1.00		0.98	1.00			0.90	1.00		0.95	1.00
Frt	1.00	0.97		1.00	0.94			1.00	0.95		1.00	0.97
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1424	3138		1543	2849			1629	3316		1495	3243
Flt Permitted	0.64	1.00		0.47	1.00			0.64	1.00		0.43	1.00
Satd. Flow (perm)	958	3138		758	2849			1096	3316		674	3243
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	144	348	91	41	113	66	1	66	315	152	115	148
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	144	439	0	41	179	0	0	67	467	0	115	179
Confl. Peds. (#/hr)	68		86	86		68		140		105	105	
Confl. Bikes (#/hr)			8							1		
Heavy Vehicles (%)	13%	4%	3%	8%	1%	35%	0%	0%	0%	0%	14%	5%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	Perm	NA		Perm	NA
Protected Phases	5	2		1	6				4			8
Permitted Phases	2			6			4	4			8	
Actuated Green, G (s)	49.2	39.8		38.8	34.6			33.0	33.0		33.0	33.0
Effective Green, g (s)	49.2	39.8		38.8	34.6			33.0	33.0		33.0	33.0
Actuated g/C Ratio	0.52	0.42		0.41	0.36			0.35	0.35		0.35	0.35
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	542	1314		344	1037			380	1151		234	1126
v/s Ratio Prot	c0.03	c0.14		0.01	0.06				0.14			0.06
v/s Ratio Perm	0.11			0.04				0.06			c0.17	
v/c Ratio	0.27	0.33		0.12	0.17			0.18	0.41		0.49	0.16
Uniform Delay, d1	13.0	18.6		18.9	20.5			21.6	23.6		24.4	21.4
Progression Factor	1.00	1.00		0.08	0.51			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.7		0.1	0.4			1.0	1.1		7.2	0.3
Delay (s)	13.1	19.3		1.5	10.8			22.6	24.6		31.6	21.7
Level of Service	B	B		A	B			C	C		C	C
Approach Delay (s)		17.8			9.1				24.4			25.6
Approach LOS		B			A				C			C

Intersection Summary			
HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	27
Future Volume (vph)	27
Ideal Flow (vphpl)	2100
Lane Width	12
Grade (%)	
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.89
Growth Factor (vph)	102%
Adj. Flow (vph)	31
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	140
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	1	0	305	77	45	247	0	0	44	0	44	87
Future Volume (vph)	1	0	305	77	45	247	0	0	44	0	44	87
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	1000	1000	1000	2100	2100
Lane Width	12	10	11	12	10	12	11	13	13	13	11	12
Grade (%)			-2%			-2%			2%			0%
Total Lost time (s)		6.0	6.0		6.0	6.0			6.0			6.0
Lane Util. Factor		1.00	0.95		1.00	0.95			1.00			0.95
Frpb, ped/bikes		1.00	0.99		1.00	1.00			1.00			0.98
Flpb, ped/bikes		0.94	1.00		0.99	1.00			1.00			0.96
Frt		1.00	0.97		1.00	1.00			1.00			0.98
Flt Protected		0.95	1.00		0.95	1.00			1.00			0.99
Satd. Flow (prot)		1596	3161		1646	3267			453			3177
Flt Permitted		0.58	1.00		0.43	1.00			1.00			0.87
Satd. Flow (perm)		971	3161		745	3267			453			2789
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	1	0	350	88	52	283	0	0	50	0	50	100
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1	438	0	52	283	0	0	50	0	0	169
Confl. Peds. (#/hr)		96		43	43		96	188		194	194	
Confl. Bikes (#/hr)				4			2			3		
Heavy Vehicles (%)	0%	0%	8%	0%	2%	11%	0%	0%	95%	0%	6%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	10	10	10	0	0
Turn Type	custom	pm+pt	NA		pm+pt	NA			NA		Perm	NA
Protected Phases		1	6		5	2			4			8
Permitted Phases	1	6			2						8	
Actuated Green, G (s)		26.6	25.2		40.4	33.0			42.6			42.6
Effective Green, g (s)		26.6	25.2		40.4	33.0			42.6			42.6
Actuated g/C Ratio		0.28	0.27		0.43	0.35			0.45			0.45
Clearance Time (s)		6.0	6.0		6.0	6.0			6.0			6.0
Vehicle Extension (s)		2.0	3.0		2.0	3.0			3.0			3.0
Lane Grp Cap (vph)		281	838		404	1134			203			1250
v/s Ratio Prot		0.00	c0.14		c0.01	c0.09			c0.11			
v/s Ratio Perm		0.00			0.04							0.06
v/c Ratio		0.00	0.52		0.13	0.25			0.25			0.14
Uniform Delay, d1		24.6	29.8		19.4	22.2			16.2			15.4
Progression Factor		0.05	0.13		0.30	0.95			1.00			1.00
Incremental Delay, d2		0.0	2.1		0.0	0.5			2.9			0.2
Delay (s)		1.1	5.8		5.9	21.5			19.1			15.6
Level of Service		A	A		A	C			B			B
Approach Delay (s)			5.8			19.1			19.1			15.6
Approach LOS			A			B			B			B

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	17
Future Volume (vph)	17
Ideal Flow (vphpl)	2100
Lane Width	12
Grade (%)	
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.89
Growth Factor (vph)	102%
Adj. Flow (vph)	19
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	188
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	10%
Bus Blockages (#/hr)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	117	40	2	933	462	1	64	443
Future Volume (vph)	117	40	2	933	462	1	64	443
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2200	2200	2200
Lane Width	15	15	12	11	12	12	10	12
Grade (%)	2%			3%				-3%
Total Lost time (s)	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00			0.95	1.00		1.00	0.95
Frpb, ped/bikes	0.99			1.00	0.96		1.00	1.00
Flpb, ped/bikes	1.00			1.00	1.00		1.00	1.00
Frt	0.97			1.00	0.85		1.00	1.00
Flt Protected	0.96			1.00	1.00		0.95	1.00
Satd. Flow (prot)	1721			3385	1488		1730	3637
Flt Permitted	0.96			0.95	1.00		0.19	1.00
Satd. Flow (perm)	1721			3231	1488		346	3637
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	124	42	2	991	491	1	68	471
RTOR Reduction (vph)	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	167	0	0	993	491	0	69	471
Confl. Peds. (#/hr)	4	24			17		17	
Confl. Bikes (#/hr)					2			
Heavy Vehicles (%)	3%	30%	0%	1%	2%	0%	3%	5%
Turn Type	Perm		Perm	NA	Perm	custom	pm+pt	NA
Protected Phases				2			1	6
Permitted Phases	8		2		2	1	6	
Actuated Green, G (s)	29.0			41.0	41.0		54.0	54.0
Effective Green, g (s)	29.0			41.0	41.0		54.0	54.0
Actuated g/C Ratio	0.31			0.43	0.43		0.57	0.57
Clearance Time (s)	6.0			6.0	6.0		6.0	6.0
Lane Grp Cap (vph)	525			1394	642		298	2067
v/s Ratio Prot							0.02	c0.13
v/s Ratio Perm	c0.10			0.31	c0.33		0.11	
v/c Ratio	0.32			0.71	0.76		0.23	0.23
Uniform Delay, d1	25.4			22.2	22.9		19.7	10.2
Progression Factor	1.00			1.31	1.29		0.51	0.52
Incremental Delay, d2	1.6			1.9	5.2		1.8	0.2
Delay (s)	27.0			30.8	34.7		11.8	5.5
Level of Service	C			C	C		B	A
Approach Delay (s)	27.0			32.1				6.3
Approach LOS	C			C				A

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBT	WBR	NBT	SBR	SBR2	NEL2	NEL
Lane Configurations								
Traffic Volume (vph)	2	320	336	765	384	178	1	296
Future Volume (vph)	2	320	336	765	384	178	1	296
Ideal Flow (vphpl)	2100	2100	2100	2100	2200	2200	2100	2100
Lane Width	13	13	13	11	12	12	15	15
Grade (%)		2%		3%				0%
Total Lost time (s)		7.0	7.0	6.0	6.0	6.0		6.0
Lane Util. Factor		0.95	0.95	0.95	1.00	1.00		1.00
Frt		0.99	0.85	1.00	0.85	0.85		1.00
Flt Protected		1.00	1.00	1.00	1.00	1.00		0.95
Satd. Flow (prot)		1761	1546	3352	1626	1552		1936
Flt Permitted		1.00	1.00	1.00	1.00	1.00		1.00
Satd. Flow (perm)		1761	1546	3352	1626	1552		2036
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	2	326	343	780	392	182	1	302
RTOR Reduction (vph)	0	0	0	0	0	77	0	0
Lane Group Flow (vph)	0	362	309	780	392	105	0	303
Heavy Vehicles (%)	0%	3%	1%	2%	4%	9%	0%	2%
Turn Type	Perm	NA	Perm	NA	pt+ov	custom	D.Pm	Prot
Protected Phases		8		4	2 4	2 4		2
Permitted Phases	8		8				2	
Actuated Green, G (s)		27.0	27.0	23.0	55.0	55.0		26.0
Effective Green, g (s)		27.0	27.0	23.0	55.0	55.0		26.0
Actuated g/C Ratio		0.28	0.28	0.24	0.58	0.58		0.27
Clearance Time (s)		7.0	7.0	6.0				6.0
Lane Grp Cap (vph)		500	439	811	941	898		557
v/s Ratio Prot				c0.23	0.24	0.07		
v/s Ratio Perm		0.21	0.20					c0.15
v/c Ratio		0.72	0.70	0.96	0.42	0.12		0.54
Uniform Delay, d1		30.6	30.4	35.6	11.1	9.0		29.4
Progression Factor		1.00	1.00	1.00	0.62	0.64		1.00
Incremental Delay, d2		8.8	9.1	23.6	1.3	0.3		3.8
Delay (s)		39.5	39.5	59.1	8.2	6.0		33.2
Level of Service		D	D	E	A	A		C
Approach Delay (s)		39.5		59.1				33.2
Approach LOS		D		E				C

Intersection Summary			
HCM 2000 Control Delay	37.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL2	WBL	WBT	WBR	SBT	SBR	SBR2	NWL	NWR
Lane Configurations									
Traffic Volume (vph)	1	62	268	247	113	38	48	137	255
Future Volume (vph)	1	62	268	247	113	38	48	137	255
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width	10	10	10	10	12	12	12	16	12
Total Lost time (s)		6.0	6.0		8.0	8.0	8.0	8.0	
Lane Util. Factor		1.00	0.95		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	0.97		1.00	1.00	0.92	1.00	
Flpb, ped/bikes		0.89	1.00		1.00	1.00	1.00	1.00	
Frt		1.00	0.93		1.00	0.85	0.85	0.91	
Flt Protected		0.95	1.00		1.00	1.00	1.00	0.98	
Satd. Flow (prot)		1493	2972		1766	1530	1481	1883	
Flt Permitted		0.95	1.00		1.00	1.00	1.00	0.98	
Satd. Flow (perm)		1493	2972		1766	1530	1481	1883	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	1	66	285	262	120	40	51	146	271
RTOR Reduction (vph)	0	0	0	0	0	0	29	0	0
Lane Group Flow (vph)	0	67	547	0	120	40	22	417	0
Confl. Peds. (#/hr)		91		55			96		
Confl. Bikes (#/hr)				5					
Heavy Vehicles (%)	0%	0%	2%	2%	7%	5%	0%	2%	2%
Turn Type	Perm	Perm	NA		NA	Prot	Perm	Perm	
Protected Phases			6		4	4			
Permitted Phases	6	6					4	8	
Actuated Green, G (s)		46.0	46.0		47.0	47.0	47.0	47.0	
Effective Green, g (s)		46.0	46.0		47.0	47.0	47.0	47.0	
Actuated g/C Ratio		0.42	0.42		0.43	0.43	0.43	0.43	
Clearance Time (s)		6.0	6.0		8.0	8.0	8.0	8.0	
Lane Grp Cap (vph)		624	1242		754	653	632	804	
v/s Ratio Prot			c0.18		0.07	0.03			
v/s Ratio Perm		0.04					0.01	c0.22	
v/c Ratio		0.11	0.44		0.16	0.06	0.03	0.52	
Uniform Delay, d1		19.5	22.8		19.4	18.5	18.3	23.2	
Progression Factor		1.14	1.15		1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.3	1.1		0.5	0.2	0.1	2.4	
Delay (s)		22.6	27.3		19.8	18.7	18.4	25.6	
Level of Service		C	C		B	B	B	C	
Approach Delay (s)			26.8		19.3			25.6	
Approach LOS			C		B			C	

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	119.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	1	0	268	6	1	226	0	0	0	0	103	2
Future Volume (vph)	1	0	268	6	1	226	0	0	0	0	103	2
Ideal Flow (vphpl)	1800	1800	1800	1800	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width	12	10	11	12	12	12	12	12	12	12	14	14
Grade (%)			3%			-1%			0%			-4%
Total Lost time (s)			6.0			6.0					7.0	7.0
Lane Util. Factor			0.91			0.95					0.95	0.95
Frpb, ped/bikes			1.00			1.00					1.00	0.95
Flpb, ped/bikes			1.00			1.00					1.00	1.00
Frt			1.00			1.00					1.00	0.87
Flt Protected			1.00			1.00					0.95	0.99
Satd. Flow (prot)			3947			3372					1734	1574
Flt Permitted			0.94			0.95					0.95	0.99
Satd. Flow (perm)			3708			3218					1734	1574
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	1	0	300	7	1	253	0	0	0	0	115	2
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	19
Lane Group Flow (vph)	0	0	308	0	0	254	0	0	0	0	103	78
Confl. Peds. (#/hr)		206		150	150		206	77		6	6	
Confl. Bikes (#/hr)				4			2					
Heavy Vehicles (%)	0%	0%	6%	0%	0%	7%	0%	0%	0%	0%	7%	0%
Turn Type	Perm		NA		Perm	NA					Split	NA
Protected Phases			2			6					4	4
Permitted Phases	2				6							
Actuated Green, G (s)			40.0			40.0					42.0	42.0
Effective Green, g (s)			40.0			40.0					42.0	42.0
Actuated g/C Ratio			0.42			0.42					0.44	0.44
Clearance Time (s)			6.0			6.0					7.0	7.0
Lane Grp Cap (vph)			1561			1354					766	695
v/s Ratio Prot											c0.06	0.05
v/s Ratio Perm			c0.08			0.08						
v/c Ratio			0.20			0.19					0.13	0.11
Uniform Delay, d1			17.4			17.3					15.7	15.6
Progression Factor			0.54			0.67					1.00	1.00
Incremental Delay, d2			0.3			0.3					0.4	0.3
Delay (s)			9.6			11.9					16.1	15.9
Level of Service			A			B					B	B
Approach Delay (s)			9.6			11.9			0.0			16.0
Approach LOS			A			B			A			B

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.17		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	74
Future Volume (vph)	74
Ideal Flow (vphpl)	2100
Lane Width	12
Grade (%)	
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.91
Growth Factor (vph)	102%
Adj. Flow (vph)	83
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	77
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	34	191	82	64	4	1	168	55	1	18	348	48
Future Volume (vph)	34	191	82	64	4	1	168	55	1	18	348	48
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		0%					-3%				1%	
Total Lost time (s)		6.0	6.0				6.0				7.0	
Lane Util. Factor		0.95	1.00				0.95				0.95	
Frpb, ped/bikes		1.00	0.49				0.97				0.99	
Flpb, ped/bikes		0.99	1.00				0.99				1.00	
Frt		1.00	0.85				0.96				0.98	
Flt Protected		0.99	1.00				1.00				1.00	
Satd. Flow (prot)		3366	775				3310				3260	
Flt Permitted		0.88	1.00				0.95				0.91	
Satd. Flow (perm)		2977	775				3146				2973	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	35	199	85	67	4	1	175	57	1	19	362	50
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	234	152	0	0	0	237	0	0	0	432	0
Confl. Peds. (#/hr)	122		185	191	185	191		122	191	122		130
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	9%	4%	2%	0%	0%	0%	2%	4%	0%	0%	6%	8%
Turn Type	Perm	NA	Perm		Perm	Perm	NA		Perm	Perm	NA	
Protected Phases		4					8				2	
Permitted Phases	4		4		8	8			2	2		
Actuated Green, G (s)		35.0	35.0				35.0				47.0	
Effective Green, g (s)		35.0	35.0				35.0				47.0	
Actuated g/C Ratio		0.37	0.37				0.37				0.49	
Clearance Time (s)		6.0	6.0				6.0				7.0	
Lane Grp Cap (vph)		1096	285				1159				1470	
v/s Ratio Prot												
v/s Ratio Perm		0.08	c0.20				0.08				0.15	
v/c Ratio		0.21	0.53				0.20				0.29	
Uniform Delay, d1		20.6	23.6				20.5				14.2	
Progression Factor		0.72	0.71				1.00				0.17	
Incremental Delay, d2		0.4	6.9				0.4				0.5	
Delay (s)		15.2	23.7				20.9				2.9	
Level of Service		B	C				C				A	
Approach Delay (s)		18.5					20.9				2.9	
Approach LOS		B					C				A	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	113.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Traffic Volume (vph)	1	479	81	41
Future Volume (vph)	1	479	81	41
Ideal Flow (vphpl)	2100	2100	2100	2100
Lane Width	11	11	11	11
Grade (%)		-1%		
Total Lost time (s)		7.0		
Lane Util. Factor		0.95		
Frpb, ped/bikes		0.96		
Flpb, ped/bikes		1.00		
Frt		0.97		
Flt Protected		1.00		
Satd. Flow (prot)		3084		
Flt Permitted		0.95		
Satd. Flow (perm)		2944		
Peak-hour factor, PHF	0.98	0.98	0.98	0.98
Growth Factor (vph)	102%	102%	102%	102%
Adj. Flow (vph)	1	499	84	43
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	627	0	0
Confl. Peds. (#/hr)	130		191	122
Confl. Bikes (#/hr)			1	1
Heavy Vehicles (%)	0%	5%	6%	7%
Turn Type	Perm	NA		
Protected Phases		6		
Permitted Phases	6			
Actuated Green, G (s)		47.0		
Effective Green, g (s)		47.0		
Actuated g/C Ratio		0.49		
Clearance Time (s)		7.0		
Lane Grp Cap (vph)		1456		
v/s Ratio Prot				
v/s Ratio Perm		c0.21		
v/c Ratio		0.43		
Uniform Delay, d1		15.4		
Progression Factor		1.00		
Incremental Delay, d2		0.9		
Delay (s)		16.3		
Level of Service		B		
Approach Delay (s)		16.3		
Approach LOS		B		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	245	30	22	165	10	0	0	0	19	12	20
Future Volume (vph)	13	245	30	22	165	10	0	0	0	19	12	20
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width	10	11	12	10	11	12	12	12	12	12	12	12
Grade (%)		-1%			2%			0%			2%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0						6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00						1.00	
Frpb, ped/bikes	1.00	1.00	0.87	1.00	0.99						0.92	
Flpb, ped/bikes	0.93	1.00	1.00	0.97	1.00						0.91	
Frt	1.00	1.00	0.85	1.00	0.99						0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00						0.98	
Satd. Flow (prot)	1565	1749	1280	1614	1634						1470	
Flt Permitted	0.57	1.00	1.00	0.45	1.00						0.98	
Satd. Flow (perm)	943	1749	1280	761	1634						1470	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	15	287	35	26	193	12	0	0	0	22	14	23
RTOR Reduction (vph)	0	0	25	0	3	0	0	0	0	0	12	0
Lane Group Flow (vph)	15	287	10	26	202	0	0	0	0	0	47	0
Confl. Peds. (#/hr)	120		72	72		120	240		181	181		240
Confl. Bikes (#/hr)			3			3						1
Heavy Vehicles (%)	0%	5%	10%	0%	9%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases	5	2		1	6						4	
Permitted Phases	2		2	6						4		
Actuated Green, G (s)	31.2	28.4	28.4	31.2	28.4						45.8	
Effective Green, g (s)	31.2	28.4	28.4	31.2	28.4						45.8	
Actuated g/C Ratio	0.33	0.30	0.30	0.33	0.30						0.48	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0						6.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0						2.0	
Lane Grp Cap (vph)	328	522	382	275	488						708	
v/s Ratio Prot	0.00	c0.16		c0.00	0.12							
v/s Ratio Perm	0.01		0.01	0.03							0.03	
v/c Ratio	0.05	0.55	0.03	0.09	0.41						0.07	
Uniform Delay, d1	23.5	27.9	23.5	26.8	26.6						13.2	
Progression Factor	0.71	0.69	1.00	0.75	0.66						1.00	
Incremental Delay, d2	0.0	4.1	0.1	0.1	2.6						0.2	
Delay (s)	16.7	23.5	23.7	20.3	20.3						13.3	
Level of Service	B	C	C	C	C						B	
Approach Delay (s)		23.2			20.3			0.0			13.3	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	195	4	1	201	0	39	150	52	0	25	0
Future Volume (vph)	73	195	4	1	201	0	39	150	52	0	25	0
Ideal Flow (vphpl)	2100	2100	2100	1800	1800	1800	2100	2100	2100	1000	1000	1000
Lane Width	10	11	12	11	10	12	11	12	12	14	14	14
Grade (%)		3%			-3%			1%			0%	
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95			1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00			1.00			0.96			1.00	
Flpb, ped/bikes	0.89	1.00			1.00			0.93			1.00	
Frt	1.00	1.00			1.00			0.97			1.00	
Flt Protected	0.95	1.00			1.00			0.99			1.00	
Satd. Flow (prot)	1391	3401			1434			1546			422	
Flt Permitted	0.58	1.00			1.00			0.95			1.00	
Satd. Flow (perm)	854	3401			1433			1480			422	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	82	219	4	1	225	0	44	168	58	0	28	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	82	223	0	0	226	0	0	270	0	0	28	0
Confl. Peds. (#/hr)	199		129	129		199	321		213	213		321
Confl. Bikes (#/hr)			3						3			1
Heavy Vehicles (%)	6%	0%	0%	0%	7%	0%	5%	4%	4%	0%	100%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	30	30	30
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA			NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4					
Actuated Green, G (s)	50.0	50.0			36.8			33.0			33.0	
Effective Green, g (s)	50.0	50.0			36.8			33.0			33.0	
Actuated g/C Ratio	0.53	0.53			0.39			0.35			0.35	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	2.0	0.2			0.2			0.2			0.2	
Lane Grp Cap (vph)	490	1790			555			514			146	
v/s Ratio Prot	c0.01	0.07									0.07	
v/s Ratio Perm	0.08				c0.16			c0.18				
v/c Ratio	0.17	0.12			0.41			0.53			0.19	
Uniform Delay, d1	13.0	11.4			21.2			24.7			21.7	
Progression Factor	0.44	0.45			0.89			1.00			1.00	
Incremental Delay, d2	0.1	0.1			2.2			3.8			2.9	
Delay (s)	5.8	5.3			21.0			28.6			24.6	
Level of Service	A	A			C			C			C	
Approach Delay (s)		5.4			21.0			28.6			24.6	
Approach LOS		A			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	113.3%	ICU Level of Service	H

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	115	50	48	78	56	7	77	76	99	142	22
Future Volume (vph)	34	115	50	48	78	56	7	77	76	99	142	22
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width	10	11	12	10	11	12	12	12	12	12	12	12
Grade (%)		3%			-2%			-1%			1%	
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.95		1.00	0.94		1.00	0.93		1.00	1.00	0.85
Flpb, ped/bikes	0.94	1.00		0.92	1.00		0.89	1.00		0.90	1.00	1.00
Frt	1.00	0.95		1.00	0.94		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1246	1613		1474	2841		1604	3029		1454	1808	1195
Flt Permitted	0.66	1.00		0.64	1.00		0.66	1.00		0.65	1.00	1.00
Satd. Flow (perm)	867	1613		990	2841		1116	3029		993	1808	1195
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	36	122	53	51	83	60	7	82	81	105	151	23
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	36	175	0	51	143	0	7	163	0	105	151	23
Confl. Peds. (#/hr)	158		124	124		158	154		136	136		154
Confl. Bikes (#/hr)			5			1			3			3
Heavy Vehicles (%)	24%	1%	0%	6%	8%	11%	0%	5%	1%	11%	4%	14%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6			4			8		8
Actuated Green, G (s)	38.8	34.6		44.0	37.2		35.6	35.6		35.6	35.6	35.6
Effective Green, g (s)	38.8	34.6		44.0	37.2		35.6	35.6		35.6	35.6	35.6
Actuated g/C Ratio	0.41	0.36		0.46	0.39		0.37	0.37		0.37	0.37	0.37
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	370	587		493	1112		418	1135		372	677	447
v/s Ratio Prot	0.00	c0.11		c0.01	0.05			0.05			0.08	
v/s Ratio Perm	0.04			0.04			0.01			c0.11		0.02
v/c Ratio	0.10	0.30		0.10	0.13		0.02	0.14		0.28	0.22	0.05
Uniform Delay, d1	17.3	21.5		14.7	18.5		18.7	19.6		20.8	20.3	18.9
Progression Factor	1.00	1.00		0.21	0.17		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.0	1.3		0.0	0.2		0.1	0.3		1.9	0.8	0.2
Delay (s)	17.4	22.8		3.2	3.3		18.8	19.9		22.7	21.0	19.2
Level of Service	B	C		A	A		B	B		C	C	B
Approach Delay (s)		21.9			3.3			19.8			21.5	
Approach LOS		C			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	208	44	68	174	0	0	23	1	47	145	23
Future Volume (vph)	0	208	44	68	174	0	0	23	1	47	145	23
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	1000	1000	1000	2100	2100	2100
Lane Width	10	11	12	10	12	11	13	13	13	11	12	12
Grade (%)		-2%			-2%			2%			0%	
Total Lost time (s)		6.0		6.0	6.0			6.0			6.0	6.0
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	1.00
Frpb, ped/bikes		0.98		1.00	1.00			0.98			1.00	0.52
Flpb, ped/bikes		1.00		0.97	1.00			1.00			0.86	1.00
Frt		0.97		1.00	1.00			0.99			1.00	0.85
Flt Protected		1.00		0.95	1.00			1.00			0.99	1.00
Satd. Flow (prot)		1688		1647	1801			434			1539	762
Flt Permitted		1.00		0.49	1.00			1.00			0.93	1.00
Satd. Flow (perm)		1688		851	1801			434			1445	762
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	0	226	48	74	189	0	0	25	1	51	157	25
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	274	0	74	189	0	0	26	0	0	208	25
Confl. Peds. (#/hr)	362		100	100		362	378		709	709		378
Confl. Bikes (#/hr)			3						2			
Heavy Vehicles (%)	0%	5%	2%	0%	6%	0%	0%	85%	0%	4%	5%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	30	30	30	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA			NA		Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4			8		8
Actuated Green, G (s)		28.8		40.4	40.4			42.6			42.6	42.6
Effective Green, g (s)		28.8		40.4	40.4			42.6			42.6	42.6
Actuated g/C Ratio		0.30		0.43	0.43			0.45			0.45	0.45
Clearance Time (s)		6.0		6.0	6.0			6.0			6.0	6.0
Vehicle Extension (s)		3.0		2.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)		511		408	765			194			647	341
v/s Ratio Prot		c0.16		0.01	c0.10			0.06				
v/s Ratio Perm				0.07							c0.14	0.03
v/c Ratio		0.54		0.18	0.25			0.13			0.32	0.07
Uniform Delay, d1		27.5		20.8	17.5			15.4			16.9	14.9
Progression Factor		0.69		0.61	0.74			1.00			1.00	1.00
Incremental Delay, d2		3.6		0.1	0.7			1.4			1.3	0.4
Delay (s)		22.7		12.8	13.8			16.8			18.2	15.4
Level of Service		C		B	B			B			B	B
Approach Delay (s)		22.7			13.5			16.8			17.9	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	103.3%	ICU Level of Service	G

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	150	37	378	200	66	499
Future Volume (vph)	150	37	378	200	66	499
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100
Lane Width	15	15	11	12	10	12
Grade (%)	2%		3%			-3%
Total Lost time (s)	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	1.00		0.95	1.00	1.00	0.95
Frpb, ped/bikes	0.99		1.00	0.96	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.97		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1741		3352	1411	1628	3539
Flt Permitted	0.96		1.00	1.00	0.49	1.00
Satd. Flow (perm)	1741		3352	1411	844	3539
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor (vph)	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	159	39	402	212	70	530
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	198	0	402	213	70	530
Confl. Peds. (#/hr)	4	25		13	13	
Heavy Vehicles (%)	7%	22%	2%	8%	4%	3%
Turn Type	Prot		NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases				2	6	
Actuated Green, G (s)	34.0		36.0	36.0	49.0	49.0
Effective Green, g (s)	34.0		36.0	36.0	49.0	49.0
Actuated g/C Ratio	0.36		0.38	0.38	0.52	0.52
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Lane Grp Cap (vph)	623		1270	534	493	1825
v/s Ratio Prot	c0.11		0.12		0.01	c0.15
v/s Ratio Perm				c0.15	0.06	
v/c Ratio	0.32		0.32	0.40	0.14	0.29
Uniform Delay, d1	22.1		20.8	21.6	13.1	13.1
Progression Factor	1.00		0.43	0.43	0.42	0.41
Incremental Delay, d2	1.3		0.6	2.0	0.6	0.4
Delay (s)	23.4		9.5	11.2	6.1	5.7
Level of Service	C		A	B	A	A
Approach Delay (s)	23.4		10.1			5.8
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBT	WBR	NBT	SBR	SBR2	NEL2	NEL
Lane Configurations								
Traffic Volume (vph)	1	77	133	143	450	199	1	302
Future Volume (vph)	1	77	133	143	450	199	1	302
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width	13	13	13	11	12	12	15	15
Grade (%)		2%		3%				0%
Total Lost time (s)		7.0	7.0	6.0	6.0	6.0		6.0
Lane Util. Factor		0.95	0.95	0.95	1.00	1.00		1.00
Frpb, ped/bikes		1.00	0.99	1.00	1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00		1.00
Frt		0.96	0.85	1.00	0.85	0.85		1.00
Flt Protected		1.00	1.00	1.00	1.00	1.00		0.95
Satd. Flow (prot)		1637	1481	3226	1568	1523		1899
Flt Permitted		1.00	1.00	1.00	1.00	1.00		1.00
Satd. Flow (perm)		1637	1481	3226	1568	1523		1997
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	1	82	141	152	478	211	1	321
RTOR Reduction (vph)	0	0	0	0	0	73	0	0
Lane Group Flow (vph)	0	118	106	152	478	138	0	322
Confl. Peds. (#/hr)			1					
Heavy Vehicles (%)	0%	8%	4%	6%	3%	6%	0%	4%
Turn Type	Perm	NA	Perm	NA	pt+ov	custom	D.Pm	Prot
Protected Phases		8		4	2 4	2 4		2
Permitted Phases	8		8				2	
Actuated Green, G (s)		20.0	20.0	32.0	62.0	62.0		24.0
Effective Green, g (s)		20.0	20.0	32.0	62.0	62.0		24.0
Actuated g/C Ratio		0.21	0.21	0.34	0.65	0.65		0.25
Clearance Time (s)		7.0	7.0	6.0				6.0
Lane Grp Cap (vph)		344	311	1086	1023	993		504
v/s Ratio Prot				0.05	c0.30	0.09		
v/s Ratio Perm		0.07	0.07					c0.16
v/c Ratio		0.34	0.34	0.14	0.47	0.14		0.64
Uniform Delay, d1		31.9	31.9	21.9	8.2	6.3		31.6
Progression Factor		1.00	1.00	1.00	0.69	1.05		1.00
Incremental Delay, d2		2.7	3.0	0.3	1.5	0.3		6.1
Delay (s)		34.6	34.9	22.2	7.2	6.9		37.7
Level of Service		C	C	C	A	A		D
Approach Delay (s)		34.7		22.2				37.7
Approach LOS		C		C				D

Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL2	WBL	WBT	WBR	SBT	SBR	SBR2	NWL2	NWL	NWR
Lane Configurations										
Traffic Volume (vph)	6	111	220	71	126	70	40	1	25	67
Future Volume (vph)	6	111	220	71	126	70	40	1	25	67
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width	10	10	10	10	12	12	12	12	16	12
Total Lost time (s)		6.0	6.0		8.0	8.0	8.0		8.0	
Lane Util. Factor		1.00	0.95		1.00	1.00	1.00		1.00	
Frpb, ped/bikes		1.00	0.99		1.00	1.00	0.97		1.00	
Flpb, ped/bikes		0.97	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.96		1.00	0.85	0.85		0.90	
Flt Protected		0.95	1.00		1.00	1.00	1.00		0.99	
Satd. Flow (prot)		1618	3091		1890	1560	1482		1847	
Flt Permitted		0.95	1.00		1.00	1.00	1.00		0.99	
Satd. Flow (perm)		1618	3091		1890	1560	1482		1847	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	7	120	239	77	137	76	43	1	27	73
RTOR Reduction (vph)	0	0	0	0	0	0	29	0	0	0
Lane Group Flow (vph)	0	127	316	0	137	76	14	0	101	0
Confl. Peds. (#/hr)		23		24			21			
Confl. Bikes (#/hr)				1						
Heavy Vehicles (%)	0%	1%	4%	3%	0%	3%	5%	0%	4%	3%
Turn Type	Perm	Perm	NA		NA	Prot	Perm	Perm	Perm	
Protected Phases			6		4	4				
Permitted Phases	6	6					4	8	8	
Actuated Green, G (s)		34.0	34.0		24.0	24.0	24.0		24.0	
Effective Green, g (s)		34.0	34.0		24.0	24.0	24.0		24.0	
Actuated g/C Ratio		0.45	0.45		0.32	0.32	0.32		0.32	
Clearance Time (s)		6.0	6.0		8.0	8.0	8.0		8.0	
Lane Grp Cap (vph)		733	1401		604	499	474		591	
v/s Ratio Prot			c0.10		c0.07	0.05				
v/s Ratio Perm		0.08					0.01		0.05	
v/c Ratio		0.17	0.23		0.23	0.15	0.03		0.17	
Uniform Delay, d1		12.2	12.5		18.7	18.2	17.5		18.3	
Progression Factor		0.53	0.54		1.00	1.00	1.00		1.00	
Incremental Delay, d2		0.5	0.4		0.9	0.6	0.1		0.6	
Delay (s)		7.0	7.1		19.6	18.9	17.6		19.0	
Level of Service		A	A		B	B	B		B	
Approach Delay (s)			7.1		19.0				19.0	
Approach LOS			A		B				B	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	646	3	1	528	0	0	0	0	374	6	141
Future Volume (vph)	0	646	3	1	528	0	0	0	0	374	6	141
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width	10	11	12	12	12	12	12	12	12	14	14	12
Grade (%)		3%			-1%			0%			-4%	
Total Lost time (s)		6.0			6.0					7.0	7.0	
Lane Util. Factor		0.91			0.95					0.95	0.95	
Frpb, ped/bikes		1.00			1.00					1.00	0.97	
Flpb, ped/bikes		1.00			1.00					1.00	1.00	
Frt		1.00			1.00					1.00	0.92	
Flt Protected		1.00			1.00					0.95	0.98	
Satd. Flow (prot)		4719			3437					1856	1702	
Flt Permitted		1.00			0.95					0.95	0.98	
Satd. Flow (perm)		4719			3280					1856	1702	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	0	740	3	1	605	0	0	0	0	429	7	162
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	48	0
Lane Group Flow (vph)	0	743	0	0	606	0	0	0	0	309	241	0
Confl. Peds. (#/hr)	75		98	98		75	55		1	1		55
Confl. Bikes (#/hr)			11			2						
Heavy Vehicles (%)	0%	4%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		2			6					4	4	
Permitted Phases				6								
Actuated Green, G (s)		43.0			43.0					39.0	39.0	
Effective Green, g (s)		43.0			43.0					39.0	39.0	
Actuated g/C Ratio		0.45			0.45					0.41	0.41	
Clearance Time (s)		6.0			6.0					7.0	7.0	
Lane Grp Cap (vph)		2135			1484					761	698	
v/s Ratio Prot		0.16								c0.17	0.14	
v/s Ratio Perm					c0.18							
v/c Ratio		0.35			0.41					0.41	0.34	
Uniform Delay, d1		16.9			17.5					19.8	19.2	
Progression Factor		0.58			2.11					1.00	1.00	
Incremental Delay, d2		0.4			0.8					1.6	1.4	
Delay (s)		10.3			37.6					21.4	20.6	
Level of Service		B			D					C	C	
Approach Delay (s)		10.3			37.6			0.0			21.0	
Approach LOS		B			D			A			C	

Intersection Summary			
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	15	801	139	65	1	383	90	1	39	403	296	2
Future Volume (vph)	15	801	139	65	1	383	90	1	39	403	296	2
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width	12	12	12	12	12	12	14	12	12	12	12	11
Grade (%)		0%				-3%				1%		
Total Lost time (s)		6.0	6.0			6.0				7.0		
Lane Util. Factor		0.95	1.00			0.95				0.95		
Frpb, ped/bikes		1.00	0.86			0.99				0.98		
Flpb, ped/bikes		1.00	1.00			1.00				1.00		
Frt		1.00	0.85			0.97				0.94		
Flt Protected		1.00	1.00			1.00				1.00		
Satd. Flow (prot)		3513	1314			3387				3218		
Flt Permitted		0.94	1.00			0.95				0.84		
Satd. Flow (perm)		3305	1314			3230				2726		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	16	851	148	69	1	407	96	1	41	428	314	2
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	867	217	0	0	504	0	0	0	785	0	0
Confl. Peds. (#/hr)	52			87	87		52	87	46		70	70
Confl. Bikes (#/hr)											1	
Heavy Vehicles (%)	7%	2%	7%	0%	0%	4%	1%	0%	3%	3%	0%	0%
Turn Type	Perm	NA	Perm		Perm	NA		Perm	Perm	NA		Perm
Protected Phases		4				8				2		
Permitted Phases	4		4		8			2	2			6
Actuated Green, G (s)		33.0	33.0			33.0				49.0		
Effective Green, g (s)		33.0	33.0			33.0				49.0		
Actuated g/C Ratio		0.35	0.35			0.35				0.52		
Clearance Time (s)		6.0	6.0			6.0				7.0		
Lane Grp Cap (vph)		1148	456			1122				1406		
v/s Ratio Prot												
v/s Ratio Perm		c0.26	0.17			0.16				0.29		
v/c Ratio		0.76	0.48			0.45				0.56		
Uniform Delay, d1		27.4	24.2			24.0				15.6		
Progression Factor		0.68	0.67			1.00				0.34		
Incremental Delay, d2		4.4	3.3			1.3				1.3		
Delay (s)		23.0	19.5			25.3				6.6		
Level of Service		C	B			C				A		
Approach Delay (s)		22.3				25.3				6.6		
Approach LOS		C				C				A		

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	126.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR	SBR2
Lane Configurations			
Traffic Volume (vph)	667	104	107
Future Volume (vph)	667	104	107
Ideal Flow (vphpl)	2100	2100	2100
Lane Width	11	11	11
Grade (%)	-1%		
Total Lost time (s)	7.0		
Lane Util. Factor	0.95		
Frpb, ped/bikes	0.98		
Flpb, ped/bikes	1.00		
Frt	0.96		
Flt Protected	1.00		
Satd. Flow (prot)	3228		
Flt Permitted	0.95		
Satd. Flow (perm)	3079		
Peak-hour factor, PHF	0.96	0.96	0.96
Growth Factor (vph)	102%	102%	102%
Adj. Flow (vph)	709	110	114
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	936	0	0
Confl. Peds. (#/hr)		87	46
Confl. Bikes (#/hr)		1	1
Heavy Vehicles (%)	0%	0%	16%
Turn Type	NA		
Protected Phases	6		
Permitted Phases			
Actuated Green, G (s)	49.0		
Effective Green, g (s)	49.0		
Actuated g/C Ratio	0.52		
Clearance Time (s)	7.0		
Lane Grp Cap (vph)	1588		
v/s Ratio Prot			
v/s Ratio Perm	c0.30		
v/c Ratio	0.59		
Uniform Delay, d1	16.0		
Progression Factor	1.00		
Incremental Delay, d2	1.6		
Delay (s)	17.6		
Level of Service	B		
Approach Delay (s)	17.6		
Approach LOS	B		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	514	49	41	471	19	0	0	0	99	62	38
Future Volume (vph)	10	514	49	41	471	19	0	0	0	99	62	38
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width	10	11	12	10	11	12	12	12	12	12	12	12
Grade (%)		-1%			2%			0%			2%	
Total Lost time (s)	6.0	6.0		6.0	6.0						6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95						1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00						0.98	
Flpb, ped/bikes	0.99	1.00		0.99	1.00						0.92	
Frt	1.00	0.99		1.00	0.99						0.97	
Flt Protected	0.95	1.00		0.95	1.00						0.98	
Satd. Flow (prot)	1668	3314		1642	3249						1601	
Flt Permitted	0.37	1.00		0.31	1.00						0.98	
Satd. Flow (perm)	644	3314		539	3249						1601	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	11	576	55	46	528	21	0	0	0	111	69	43
RTOR Reduction (vph)	0	8	0	0	3	0	0	0	0	0	8	0
Lane Group Flow (vph)	11	623	0	46	546	0	0	0	0	0	215	0
Confl. Peds. (#/hr)	49		74	74		49	128		182	182		128
Confl. Bikes (#/hr)			9			6						
Heavy Vehicles (%)	0%	3%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA					Perm	NA	
Protected Phases	5	2		1	6						4	
Permitted Phases	2			6						4		
Actuated Green, G (s)	31.6	30.2		42.0	35.4						40.2	
Effective Green, g (s)	31.6	30.2		42.0	35.4						40.2	
Actuated g/C Ratio	0.33	0.32		0.44	0.37						0.42	
Clearance Time (s)	6.0	6.0		6.0	6.0						6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0						2.0	
Lane Grp Cap (vph)	229	1053		314	1210						677	
v/s Ratio Prot	0.00	c0.19		c0.01	0.17							
v/s Ratio Perm	0.02			0.05							0.13	
v/c Ratio	0.05	0.59		0.15	0.45						0.32	
Uniform Delay, d1	25.3	27.2		21.4	22.5						18.3	
Progression Factor	0.74	0.67		2.01	1.89						1.00	
Incremental Delay, d2	0.0	2.3		0.1	1.2						1.2	
Delay (s)	18.9	20.6		43.1	43.6						19.5	
Level of Service	B	C		D	D						B	
Approach Delay (s)		20.6			43.5			0.0			19.5	
Approach LOS		C			D			A			B	

Intersection Summary			
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	558	3	0	552	60	31	193	48	0	70	4
Future Volume (vph)	60	558	3	0	552	60	31	193	48	0	70	4
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	1000	1000	1000
Lane Width	10	11	12	11	10	12	11	12	12	14	14	14
Grade (%)		3%			-3%			1%			0%	
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95			0.95			0.95			1.00	
Frpb, ped/bikes	1.00	1.00			0.99			0.98			0.99	
Flpb, ped/bikes	0.99	1.00			1.00			0.98			1.00	
Frt	1.00	1.00			0.99			0.97			0.99	
Flt Protected	0.95	1.00			1.00			0.99			1.00	
Satd. Flow (prot)	1635	3278			3223			3276			297	
Flt Permitted	0.28	1.00			1.00			0.92			1.00	
Satd. Flow (perm)	490	3278			3223			3024			297	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	64	593	3	0	586	64	33	205	51	0	74	4
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	64	596	0	0	651	0	0	289	0	0	76	0
Confl. Peds. (#/hr)	105		117	117		105	291		162	162		291
Confl. Bikes (#/hr)			13			4			5			3
Heavy Vehicles (%)	0%	4%	33%	0%	3%	0%	0%	2%	0%	0%	94%	33%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	50	50
Parking (#/hr)											30	
Turn Type	pm+pt	NA			NA		Perm	NA			NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2						4					
Actuated Green, G (s)	39.0	39.0			27.4			44.0			44.0	
Effective Green, g (s)	39.0	39.0			27.4			44.0			44.0	
Actuated g/C Ratio	0.41	0.41			0.29			0.46			0.46	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	2.0	0.2			0.2			0.2			0.2	
Lane Grp Cap (vph)	268	1345			929			1400			137	
v/s Ratio Prot	0.01	c0.18			c0.20						c0.26	
v/s Ratio Perm	0.08							0.10				
v/c Ratio	0.24	0.44			0.70			0.21			0.55	
Uniform Delay, d1	25.2	20.2			30.1			15.1			18.4	
Progression Factor	0.31	0.29			0.32			1.00			1.00	
Incremental Delay, d2	0.1	0.9			4.1			0.3			15.2	
Delay (s)	7.9	6.8			13.8			15.5			33.6	
Level of Service	A	A			B			B			C	
Approach Delay (s)		6.9			13.8			15.5			33.6	
Approach LOS		A			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	255	105	110	317	107	21	127	82	211	251	33
Future Volume (vph)	64	255	105	110	317	107	21	127	82	211	251	33
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width	10	11	12	10	11	12	12	12	12	12	12	12
Grade (%)		3%			-2%			-1%			1%	
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.96		1.00	0.98		1.00	0.96		1.00	0.98	
Flpb, ped/bikes	0.98	1.00		0.97	1.00		0.92	1.00		0.94	1.00	
Frt	1.00	0.96		1.00	0.96		1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1298	3069		1637	3140		1582	3233		1617	3422	
Flt Permitted	0.43	1.00		0.48	1.00		0.56	1.00		0.61	1.00	
Satd. Flow (perm)	589	3069		836	3140		937	3233		1036	3422	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	70	280	115	121	348	117	23	139	90	231	275	36
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	70	395	0	121	465	0	23	229	0	231	311	0
Confl. Peds. (#/hr)	100		149	149		100	159		105	105		159
Confl. Bikes (#/hr)			8			3			3			
Heavy Vehicles (%)	25%	3%	0%	0%	0%	19%	5%	2%	0%	4%	0%	9%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	37.4	31.8		42.6	34.4		37.0	37.0		37.0	37.0	
Effective Green, g (s)	37.4	31.8		42.6	34.4		37.0	37.0		37.0	37.0	
Actuated g/C Ratio	0.39	0.33		0.45	0.36		0.39	0.39		0.39	0.39	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	273	1027		444	1137		364	1259		403	1332	
v/s Ratio Prot	0.02	0.13		c0.02	c0.15			0.07			0.09	
v/s Ratio Perm	0.09			0.10			0.02			c0.22		
v/c Ratio	0.26	0.38		0.27	0.41		0.06	0.18		0.57	0.23	
Uniform Delay, d1	22.0	24.1		18.2	22.7		18.2	19.1		22.8	19.5	
Progression Factor	1.00	1.00		0.46	0.34		1.38	1.40		1.00	1.00	
Incremental Delay, d2	0.2	1.1		0.1	1.0		0.3	0.3		5.8	0.4	
Delay (s)	22.2	25.2		8.4	8.8		25.3	26.9		28.6	19.9	
Level of Service	C	C		A	A		C	C		C	B	
Approach Delay (s)		24.8			8.7			26.8			23.6	
Approach LOS		C			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	542	117	121	459	0	0	39	2	96	265	35
Future Volume (vph)	0	542	117	121	459	0	0	39	2	96	265	35
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	1000	1000	1000	2100	2100	2100
Lane Width	10	11	12	10	12	11	13	13	13	11	12	12
Grade (%)		-2%			-2%			2%			0%	
Total Lost time (s)		6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor		0.95		1.00	0.95			1.00			0.95	
Frpb, ped/bikes		0.98		1.00	1.00			0.99			0.97	
Flpb, ped/bikes		1.00		0.99	1.00			1.00			0.93	
Frt		0.97		1.00	1.00			0.99			0.99	
Flt Protected		1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)		3276		1682	3454			422			3118	
Flt Permitted		1.00		0.29	1.00			1.00			0.86	
Satd. Flow (perm)		3276		512	3454			422			2710	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	0	594	128	133	503	0	0	43	2	105	291	38
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	722	0	133	503	0	0	45	0	0	434	0
Confl. Peds. (#/hr)	180		97	97		180	315		458	458		315
Confl. Bikes (#/hr)			10			5						2
Heavy Vehicles (%)	0%	3%	0%	0%	5%	0%	0%	92%	0%	2%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	30	30	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA			NA		Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2						8		
Actuated Green, G (s)		36.0		49.0	49.0			34.0			34.0	
Effective Green, g (s)		36.0		49.0	49.0			34.0			34.0	
Actuated g/C Ratio		0.38		0.52	0.52			0.36			0.36	
Clearance Time (s)		6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)		3.0		2.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		1241		350	1781			151			969	
v/s Ratio Prot		c0.22		c0.03	0.15			0.11				
v/s Ratio Perm				0.17							c0.16	
v/c Ratio		0.58		0.38	0.28			0.30			0.45	
Uniform Delay, d1		23.5		20.5	13.0			21.9			23.3	
Progression Factor		0.37		0.18	0.12			0.98			1.00	
Incremental Delay, d2		1.8		0.2	0.3			4.8			1.5	
Delay (s)		10.4		3.8	1.9			26.3			24.8	
Level of Service		B		A	A			C			C	
Approach Delay (s)		10.4			2.3			26.3			24.8	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	293	99	640	181	63	743
Future Volume (vph)	293	99	640	181	63	743
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100
Lane Width	15	15	11	12	10	12
Grade (%)	2%		3%			-3%
Total Lost time (s)	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	1.00		0.95	1.00	1.00	*1.00
Frpb, ped/bikes	0.99		1.00	0.94	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.97		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1826		3385	1457	1584	3761
Flt Permitted	0.96		1.00	1.00	0.29	1.00
Satd. Flow (perm)	1826		3385	1457	489	3761
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor (vph)	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	311	105	680	192	67	789
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	416	0	680	192	67	789
Confl. Peds. (#/hr)		18		28	28	
Heavy Vehicles (%)	2%	11%	1%	2%	7%	2%
Turn Type	Perm		NA	Perm	pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8			2	6	
Actuated Green, G (s)	37.0		32.0	32.0	46.0	46.0
Effective Green, g (s)	37.0		32.0	32.0	46.0	46.0
Actuated g/C Ratio	0.39		0.34	0.34	0.48	0.48
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Lane Grp Cap (vph)	711		1140	490	328	1821
v/s Ratio Prot			c0.20		0.02	c0.21
v/s Ratio Perm	c0.23			0.13	0.08	
v/c Ratio	0.59		0.60	0.39	0.20	0.43
Uniform Delay, d1	22.9		26.1	24.1	20.2	16.0
Progression Factor	1.00		1.29	1.28	0.50	0.49
Incremental Delay, d2	3.5		2.1	2.1	1.2	0.6
Delay (s)	26.4		35.8	32.9	11.2	8.5
Level of Service	C		D	C	B	A
Approach Delay (s)	26.4		35.1			8.7
Approach LOS	C		D			A

Intersection Summary			
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBT	WBR	NBL	NBT	SBR	SBR2	NEL2	NEL
Lane Configurations									
Traffic Volume (vph)	33	347	209	1	393	575	461	2	219
Future Volume (vph)	33	347	209	1	393	575	461	2	219
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width	13	13	13	11	11	12	12	15	15
Grade (%)		2%			3%				0%
Total Lost time (s)		7.0	7.0		6.0	6.0	6.0		6.0
Lane Util. Factor		0.95	0.95		0.95	1.00	1.00		1.00
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00
Flpb, ped/bikes		0.99	1.00		1.00	1.00	1.00		1.00
Frt		0.99	0.85		1.00	0.85	0.85		1.00
Flt Protected		1.00	1.00		1.00	1.00	1.00		0.95
Satd. Flow (prot)		1743	1516		3352	1599	1568		1973
Flt Permitted		1.00	1.00		1.00	1.00	1.00		1.00
Satd. Flow (perm)		1743	1516		3352	1599	1568		2067
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	35	369	222	1	418	611	490	2	233
RTOR Reduction (vph)	0	0	0	0	0	0	62	0	0
Lane Group Flow (vph)	0	426	200	0	419	611	428	0	235
Confl. Peds. (#/hr)	53			3				3	
Heavy Vehicles (%)	6%	3%	3%	0%	2%	1%	3%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	pt+ov	custom	D.Pm	Prot
Protected Phases		8			4	2 4	2 4		2
Permitted Phases	8		8	4				2	
Actuated Green, G (s)		24.0	24.0		25.0	58.0	58.0		27.0
Effective Green, g (s)		24.0	24.0		25.0	58.0	58.0		27.0
Actuated g/C Ratio		0.25	0.25		0.26	0.61	0.61		0.28
Clearance Time (s)		7.0	7.0		6.0				6.0
Lane Grp Cap (vph)		440	382		882	976	957		587
v/s Ratio Prot						c0.38	0.27		
v/s Ratio Perm		0.24	0.13		0.13				0.11
v/c Ratio		0.97	0.52		0.48	0.63	0.45		0.40
Uniform Delay, d1		35.1	30.6		29.5	11.7	9.9		27.5
Progression Factor		1.00	1.00		1.00	0.88	0.72		1.00
Incremental Delay, d2		35.7	5.1		1.8	2.7	1.4		2.0
Delay (s)		70.8	35.6		31.3	13.0	8.5		29.5
Level of Service		E	D		C	B	A		C
Approach Delay (s)		59.6			31.3				29.5
Approach LOS		E			C				C

Intersection Summary			
HCM 2000 Control Delay	29.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL2	WBL	WBT	WBR	SBT	SBR	SBR2	NWL2	NWL	NWR
Lane Configurations										
Traffic Volume (vph)	2	359	440	111	263	286	135	1	6	18
Future Volume (vph)	2	359	440	111	263	286	135	1	6	18
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width	10	10	10	10	12	12	12	12	16	12
Total Lost time (s)		6.0	6.0		8.0	8.0	8.0		8.0	
Lane Util. Factor		1.00	0.95		1.00	1.00	1.00		1.00	
Frpb, ped/bikes		1.00	0.99		1.00	1.00	0.93		1.00	
Flpb, ped/bikes		0.92	1.00		1.00	1.00	1.00		0.98	
Frt		1.00	0.97		1.00	0.85	0.85		0.90	
Flt Protected		0.95	1.00		1.00	1.00	1.00		0.99	
Satd. Flow (prot)		1541	2878		1890	1606	1481		1861	
Flt Permitted		0.95	1.00		1.00	1.00	1.00		0.99	
Satd. Flow (perm)		1541	2878		1890	1606	1481		1861	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor (vph)	102%	102%	102%	102%	102%	102%	102%	102%	102%	102%
Adj. Flow (vph)	2	374	458	116	274	298	141	1	6	19
RTOR Reduction (vph)	0	0	0	0	0	0	91	0	0	0
Lane Group Flow (vph)	0	376	574	0	274	298	50	0	26	0
Confl. Peds. (#/hr)	10	62		46			69	62		
Heavy Vehicles (%)	50%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Parking (#/hr)			20	20						
Turn Type	Perm	Perm	NA		NA	Prot	Perm	Perm	Perm	
Protected Phases			6		4	4				
Permitted Phases	6	6					4	8	8	
Actuated Green, G (s)		44.0	44.0		34.0	34.0	34.0		34.0	
Effective Green, g (s)		44.0	44.0		34.0	34.0	34.0		34.0	
Actuated g/C Ratio		0.46	0.46		0.36	0.36	0.36		0.36	
Clearance Time (s)		6.0	6.0		8.0	8.0	8.0		8.0	
Lane Grp Cap (vph)		713	1332		676	574	530		666	
v/s Ratio Prot			0.20		0.14	c0.19				
v/s Ratio Perm		c0.24					0.03		0.01	
v/c Ratio		0.53	0.43		0.41	0.52	0.10		0.04	
Uniform Delay, d1		18.1	17.1		22.9	24.1	20.3		19.9	
Progression Factor		0.57	0.58		0.83	0.83	0.84		1.00	
Incremental Delay, d2		2.7	1.0		1.8	3.3	0.4		0.1	
Delay (s)		12.9	10.9		20.9	23.2	17.3		20.0	
Level of Service		B	B		C	C	B		B	
Approach Delay (s)			11.7		21.1				20.0	
Approach LOS			B		C				B	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Attachment B

Existing Year 2020 Freeway & Diverge Capacity Results

FREEWAY DIVERGE ANALYSIS

File Name:	376 WB OFF RAMP GRANT DIVERGE_AM.xuf
Analyst:	JJS
Agency:	AECOM
Jurisdiction:	WB OFF Grant Street
Date:	5/26/2020
Analysis Year:	2020
Time Period Analyzed:	AM
Project Description:	60612296 E03024 WO6 I-376 Bathtub Flooding Analysis
Units:	United States Customary

LOS and Performance Measures

Density in Off-Ramp (Diverge) Influence Area, DR	36.5	pc/mi/ln
Level of Service, LOS	E	
Average Flow in Outer Lanes, vOA	-	pc/h/ln
Average Speed in Ramp Influence Area, SR	47.1	mi/h
Average Speed in Outer Lanes of Freeway, SO	60.3	mi/h
Average Speed for Off-Ramp (Diverge) Junction, S	47.1	mi/h
Density Across All Lanes, D	46.5	pc/mi/ln

Step 1: Specify Inputs and Convert Demand Volumes to Demand Flow Rates

Freeway Data

Number of Freeway Lanes	2	ln
Freeway Free-Flow Speed, FFS	55.0	mi/h
Segment Length	1500	ft
Multilane Highway or C-D Roadway?	Freeway	
Demand Volume, V	3583	veh/h
Peak Hour Factor, PHF	0.90	

Ramp Data

Number of Ramp Lanes	1	ln
Ramp Free-Flow Speed, SFR	25.0	mi/h
Ramp Side	Left	
Length of First Deceleration Lane, LD or LD1	600	ft
Length of Second Deceleration Lane, LD2	-	ft

Junction Components	Freeway	Ramp	
Demand Volume, V	3583	434	veh/h
Peak Hour Factor, PHF	0.90	0.90	
Percent Total Trucks	5.00	7.00	%
Percent SUTs	-	-	%
Percent TTs	-	-	%
Prop.Total Trucks, PT	0.0500	0.0700	
Heavy Vehicle PCE, ET	3.000	3.000	
Heavy Vehicle Adj., fHV	0.909	0.877	
Terrain Type	Rolling	Rolling	
Percent Grade	-	-	%
Grade Length	-	-	mi
Demand Adj.Factor, DAF	1.000	1.000	
Demand Flow Rate, v	4380	550	pc/h

Step 2: Estimate the Approaching Flow Rate in Lanes 1 and 2

Estimating Flow in Lanes 1 and 2 for Off-Ramps

Adjacent Upstream On-Ramp Equilibrium Distance, LEQ	-	ft
Adjacent Downstream Off-Ramp Equilibrium Distance, LEQ	-	ft
Prop. Freeway Veh. in Lanes 1 and 2, PFD	1.000	
Flow Rate in Lanes 1 and 2, v12	4380	pc/h

Step 3: Estimate Capacity of Ramp-Freeway Junction and Compare Flow Rates

Capacity Checks

	Actual	Maximum	Violation?
vF	4380	4500	No
vR	550	1900	No
v12	4380	4400	No

	Freeway	Ramp	
Unadjusted Capacity, cmd	4500	1900	pc/h
Driver Population	All Familiar	All Familiar	
Driver Population CAF	1.000	1.000	
Weather Type	Non-Severe Weather	Non-Severe Weather	
Weather Type CAF	1.000	1.000	
Incident Type	No Incident	-	
Final Capacity Adj. Factor, CAF	1.000	1.000	
Adjusted Capacity, cmda	4500	1900	pc/h

Step 4: Estimate Density in Ramp Influence Area and Determine LOS

Demand Flow Rate in Lanes 1 and 2, v12	4380	pc/h
Length of Deceleration Lane, LA	600	ft
Density in Off-Ramp Influence Area, DR	36.5	pc/mi/ln
Density in Off-Ramp Influence Area, DR	32.0	veh/mi/ln
Level of Service, LOS	E	

Step 5: Estimate Speeds in the Vicinity of Ramp-Freeway Junctions

Freeway Free-Flow Speed, FFS	55.0	mi/h
Ramp Free-Flow Speed, SFR	25.0	mi/h
Driver Population	All Familiar	
Driver Population SAF	1.000	
Weather Type	Non-Severe Weather	
Weather Type SAF	1.000	
Final Speed Adjustment Factor, SAF	1.000	
Demand Flow Rate on Freeway, vF	4380	pc/h
Demand Flow Rate in Lanes 1 and 2, v12	4380	pc/h
Number of Outer Lanes on Freeway, NO	0	ln
Speed Index for Off-Ramp, DS	0.607	
Average Speed in Ramp Influence Area, SR	47.1	mi/h
Average Flow in Outer Lanes, vOA	-	pc/h/ln
Average Speed in Outer Lanes of Freeway, SO	60.3	mi/h
Average Speed for Off-Ramp Junction, S	47.1	mi/h
Density Across All Lanes, D	46.5	pc/mi/ln

Design Analysis Table

Number of Lanes, ln	2	2	3	3	4	4	5	5
Number of Ramp Lanes, ln	1	2	1	2	1	2	1	2
Density, pc/mi/ln	46.5	46.5	29.1	28.7	21.0	20.4	16.8	16.3
LOS	E	D	C	B	B	A	B	A

This Freeway Diverge Segment text report was created in HCS™ Freeways Version 7.8.5 on 5/26/2020 09:24:59

HCS7 Basic Freeway Segment Text Report

BASIC FREEWAY SEGMENT ANALYSIS

File Name:	I_376_WB AFTER GRANT_AM.xuf
Analyst:	JJS
Agency:	AECOM
Jurisdiction:	I-376 WB Freeway After Grant St
Date:	5/26/2020
Analysis Year:	2020
Time Period Analyzed:	AM
Project Description:	60612296 E03024 WO6 I-376 Bathtub Flooding Analysis
Units:	United States Customary

LOS and Performance Measures

Flow Rate, vp	1508	pc/h/ln
Adjusted Capacity, cadj	2200	pc/h/ln
Speed, S	49.2	mi/h
Density, D	30.7	pc/mi/ln
Level of Service, LOS	D	

Step 1: Input Data

Number of Lanes, N	3	ln
Lane Width	12	ft
Segment Length	-	ft
Terrain Type	Rolling	
Percent Grade	-	%
Grade Length	-	mi
Right-Side Lateral Clearance	10	ft
Total Ramp Density, TRD	2.00	ramps/mi
Demand Volume	3702	veh/h
Peak Hour Factor, PHF	0.90	
Percent Total Trucks	5.00	%
Percent Single-Unit Trucks, SUT	-	%
Percent Tractor-Trailers, TT	-	%

Step 2: Estimate and Adjust FFS

Estimating FFS		
Measured or Base FFS	Base	
Base Free-Flow Speed, BFFS	55.0	mi/h
Lane Width	12	ft
Lane Width Adjustment, fLW	0.0	mi/h
Right-Side Lateral Clearance	10	ft
Right-Side Lateral Clearance Adj., fRLC	0.0	mi/h
Total Ramp Density, TRD	2.00	ramps/mi
TRD Adjustment	5.8	mi/h
Free-Flow Speed, FFS	49.2	mi/h
Speed Adjustments		
Driver Population	All Familiar	
Driver Population SAF	1.000	
Weather Type	Non-Severe Weather	
Weather Type SAF	1.000	
Final Speed Adjustment Factor, SAF	1.000	
Adjusted Free-Flow Speed, FFSadj	49.2	mi/h

Step 3: Estimate and Adjust Capacity

Adjusted Free-flow Speed, FFSadj	49.2	mi/h
Capacity, c	2200	pc/h/ln
Capacity Adjustments		
Driver Population	All Familiar	
Driver Population CAF	1.000	

Weather Type	Non-Severe Weather	
Weather Type CAF	1.000	
Incident Type	No Incident	
Incident Type CAF	1.000	
Final Capacity Adjustment Factor, CAF	1.000	
Adjusted Capacity, cadj	2200	pc/h/ln

Step 4: Adjust Demand Volume

Demand Volume, V	3702	veh/h
Peak Hour Factor, PHF	0.90	
Number of Lanes, N	3	ln
Terrain Type	Rolling	
Percent Grade	-	%
Grade Length	-	mi
Percent Total Trucks	5.00	%
Percent Single-Unit Trucks, SUT	-	%
Percent Tractor-Trailers, TT	-	%
Proportion of Total Trucks, PT	0.0500	
Heavy Vehicle PCE, ET	3.000	
Heavy Vehicle Adjustment, fHV	0.909	
Demand Adjustment Factor, DAF	1.000	
Demand Flow Rate, vp	1508	pc/h/ln

Steps 5 and 6: Estimate Speed and Density and Determine LOS

Demand Flow Rate, vp	1508	pc/h/ln
Adjusted Free-Flow Speed, FFSadj	49.2	mi/h
Capacity Adjustment Factor, CAF	1.000	
Adjusted Capacity, cadj	2200	pc/h/ln
Breakpoint, BP	2032	pc/h/ln
Density at Capacity, Dc	45	pc/mi/ln
Mean Speed under Base Conditions, S	49.2	mi/h
Density, D	30.7	pc/mi/ln
Level of Service, LOS	D	

This Basic Freeway Segment text report was created in HCS™ Freeways Version 7.8.5 on 5/27/2020 10:57:31

HCS7 Basic Freeway Segment Text Report

BASIC FREEWAY SEGMENT ANALYSIS

File Name:	I_376_WB BEFORE GRANT_AM.xuf
Analyst:	JJS
Agency:	AECOM
Jurisdiction:	I-376 WB Freeway before Grant St
Date:	5/26/2020
Analysis Year:	2020
Time Period Analyzed:	AM
Project Description:	60612296 E03024 WO6 I-376 Bathtub Flooding Analysis
Units:	United States Customary

LOS and Performance Measures

Flow Rate, vp	1460	pc/h/ln
Adjusted Capacity, cadj	2200	pc/h/ln
Speed, S	49.2	mi/h
Density, D	29.7	pc/mi/ln
Level of Service, LOS	D	

Step 1: Input Data

Number of Lanes, N	3	ln
Lane Width	12	ft
Segment Length	-	ft
Terrain Type	Rolling	
Percent Grade	-	%
Grade Length	-	mi
Right-Side Lateral Clearance	10	ft
Total Ramp Density, TRD	2.00	ramps/mi
Demand Volume	3583	veh/h
Peak Hour Factor, PHF	0.90	
Percent Total Trucks	5.00	%
Percent Single-Unit Trucks, SUT	-	%
Percent Tractor-Trailers, TT	-	%

Step 2: Estimate and Adjust FFS

Estimating FFS		
Measured or Base FFS	Base	
Base Free-Flow Speed, BFFS	55.0	mi/h
Lane Width	12	ft
Lane Width Adjustment, fLW	0.0	mi/h
Right-Side Lateral Clearance	10	ft
Right-Side Lateral Clearance Adj., fRLC	0.0	mi/h
Total Ramp Density, TRD	2.00	ramps/mi
TRD Adjustment	5.8	mi/h
Free-Flow Speed, FFS	49.2	mi/h
Speed Adjustments		
Driver Population	All Familiar	
Driver Population SAF	1.000	
Weather Type	Non-Severe Weather	
Weather Type SAF	1.000	
Final Speed Adjustment Factor, SAF	1.000	
Adjusted Free-Flow Speed, FFSadj	49.2	mi/h

Step 3: Estimate and Adjust Capacity

Adjusted Free-flow Speed, FFSadj	49.2	mi/h
Capacity, c	2200	pc/h/ln
Capacity Adjustments		
Driver Population	All Familiar	
Driver Population CAF	1.000	

Weather Type	Non-Severe Weather	
Weather Type CAF	1.000	
Incident Type	No Incident	
Incident Type CAF	1.000	
Final Capacity Adjustment Factor, CAF	1.000	
Adjusted Capacity, cadj	2200	pc/h/ln

Step 4: Adjust Demand Volume

Demand Volume, V	3583	veh/h
Peak Hour Factor, PHF	0.90	
Number of Lanes, N	3	ln
Terrain Type	Rolling	
Percent Grade	-	%
Grade Length	-	mi
Percent Total Trucks	5.00	%
Percent Single-Unit Trucks, SUT	-	%
Percent Tractor-Trailers, TT	-	%
Proportion of Total Trucks, PT	0.0500	
Heavy Vehicle PCE, ET	3.000	
Heavy Vehicle Adjustment, fHV	0.909	
Demand Adjustment Factor, DAF	1.000	
Demand Flow Rate, vp	1460	pc/h/ln

Steps 5 and 6: Estimate Speed and Density and Determine LOS

Demand Flow Rate, vp	1460	pc/h/ln
Adjusted Free-Flow Speed, FFSadj	49.2	mi/h
Capacity Adjustment Factor, CAF	1.000	
Adjusted Capacity, cadj	2200	pc/h/ln
Breakpoint, BP	2032	pc/h/ln
Density at Capacity, Dc	45	pc/mi/ln
Mean Speed under Base Conditions, S	49.2	mi/h
Density, D	29.7	pc/mi/ln
Level of Service, LOS	D	

This Basic Freeway Segment text report was created in HCS™ Freeways Version 7.8.5 on 5/27/2020 10:59:35

HCS7 Freeway Diverge Text Report

FREEWAY DIVERGE ANALYSIS

File Name:	376 WB OFF RAMP GRANT DIVERGE_MD.xuf
Analyst:	JJS
Agency:	AECOM
Jurisdiction:	I-376 WB OFF Grant Street
Date:	5/26/2020
Analysis Year:	2020
Time Period Analyzed:	MD
Project Description:	60612296 E03024 WO6 I-376 Bathtub Flooding Analysis
Units:	United States Customary

LOS and Performance Measures

Density in Off-Ramp (Diverge) Influence Area, DR	23.3	pc/mi/ln
Level of Service, LOS	C	
Average Flow in Outer Lanes, vOA	-	pc/h/ln
Average Speed in Ramp Influence Area, SR	47.3	mi/h
Average Speed in Outer Lanes of Freeway, SO	60.3	mi/h
Average Speed for Off-Ramp (Diverge) Junction, S	47.3	mi/h
Density Across All Lanes, D	30.0	pc/mi/ln

Step 1: Specify Inputs and Convert Demand Volumes to Demand Flow Rates

Freeway Data

Number of Freeway Lanes	2	ln
Freeway Free-Flow Speed, FFS	55.0	mi/h
Segment Length	1500	ft
Multilane Highway or C-D Roadway?	Freeway	
Demand Volume, V	2322	veh/h
Peak Hour Factor, PHF	0.90	

Ramp Data

Number of Ramp Lanes	1	ln
Ramp Free-Flow Speed, SFR	25.0	mi/h
Ramp Side	Left	
Length of First Deceleration Lane, LD or LD1	600	ft
Length of Second Deceleration Lane, LD2	-	ft

Junction Components	Freeway	Ramp	
Demand Volume, V	2322	281	veh/h
Peak Hour Factor, PHF	0.90	0.90	
Percent Total Trucks	5.00	7.00	%
Percent SUTs	-	-	%
Percent TTs	-	-	%
Prop.Total Trucks, PT	0.0500	0.0700	
Heavy Vehicle PCE, ET	3.000	3.000	
Heavy Vehicle Adj., fHV	0.909	0.877	
Terrain Type	Rolling	Rolling	
Percent Grade	-	-	%
Grade Length	-	-	mi
Demand Adj.Factor, DAF	1.000	1.000	
Demand Flow Rate, v	2838	356	pc/h

Step 2: Estimate the Approaching Flow Rate in Lanes 1 and 2

Estimating Flow in Lanes 1 and 2 for Off-Ramps

Adjacent Upstream On-Ramp Equilibrium Distance, LEQ	-	ft
Adjacent Downstream Off-Ramp Equilibrium Distance, LEQ	-	ft
Prop. Freeway Veh. in Lanes 1 and 2, PFD	1.000	
Flow Rate in Lanes 1 and 2, v12	2838	pc/h

Step 3: Estimate Capacity of Ramp-Freeway Junction and Compare Flow Rates

Capacity Checks

	Actual	Maximum	Violation?
vF	2838	4500	No
vR	356	1900	No
v12	2838	4400	No

	Freeway	Ramp	
Unadjusted Capacity, cmd	4500	1900	pc/h
Driver Population	All Familiar	All Familiar	
Driver Population CAF	1.000	1.000	
Weather Type	Non-Severe Weather	Non-Severe Weather	
Weather Type CAF	1.000	1.000	
Incident Type	No Incident	-	
Final Capacity Adj. Factor, CAF	1.000	1.000	
Adjusted Capacity, cmda	4500	1900	pc/h

Step 4: Estimate Density in Ramp Influence Area and Determine LOS

Demand Flow Rate in Lanes 1 and 2, v12	2838	pc/h
Length of Deceleration Lane, LA	600	ft
Density in Off-Ramp Influence Area, DR	23.3	pc/mi/ln
Density in Off-Ramp Influence Area, DR	20.4	veh/mi/ln
Level of Service, LOS	C	

Step 5: Estimate Speeds in the Vicinity of Ramp-Freeway Junctions

Freeway Free-Flow Speed, FFS	55.0	mi/h
Ramp Free-Flow Speed, SFR	25.0	mi/h
Driver Population	All Familiar	
Driver Population SAF	1.000	
Weather Type	Non-Severe Weather	
Weather Type SAF	1.000	
Final Speed Adjustment Factor, SAF	1.000	
Demand Flow Rate on Freeway, vF	2838	pc/h
Demand Flow Rate in Lanes 1 and 2, v12	2838	pc/h
Number of Outer Lanes on Freeway, NO	0	ln
Speed Index for Off-Ramp, DS	0.590	
Average Speed in Ramp Influence Area, SR	47.3	mi/h
Average Flow in Outer Lanes, vOA	-	pc/h/ln
Average Speed in Outer Lanes of Freeway, SO	60.3	mi/h
Average Speed for Off-Ramp Junction, S	47.3	mi/h
Density Across All Lanes, D	30.0	pc/mi/ln

This Freeway Diverge Segment text report was created in HCS™ Freeways Version 7.8.5 on 5/26/2020 08:54:24

HCS7 Basic Freeway Segment Text Report

BASIC FREEWAY SEGMENT ANALYSIS

File Name:	I_376_WB AFTER GRANT_MD.xuf
Analyst:	JJS
Agency:	AECOM
Jurisdiction:	I-376 WB Freeway After Grant St
Date:	5/26/2020
Analysis Year:	2020
Time Period Analyzed:	MD
Project Description:	60612296 E03024 WO6 I-376 Bathtub Flooding Analysis
Units:	United States Customary

LOS and Performance Measures

Flow Rate, vp	977	pc/h/ln
Adjusted Capacity, cadj	2200	pc/h/ln
Speed, S	49.2	mi/h
Density, D	19.9	pc/mi/ln
Level of Service, LOS	C	

Step 1: Input Data

Number of Lanes, N	3	ln
Lane Width	12	ft
Segment Length	-	ft
Terrain Type	Rolling	
Percent Grade	-	%
Grade Length	-	mi
Right-Side Lateral Clearance	10	ft
Total Ramp Density, TRD	2.00	ramps/mi
Demand Volume	2398	veh/h
Peak Hour Factor, PHF	0.90	
Percent Total Trucks	5.00	%
Percent Single-Unit Trucks, SUT	-	%
Percent Tractor-Trailers, TT	-	%

Step 2: Estimate and Adjust FFS

Estimating FFS		
Measured or Base FFS	Base	
Base Free-Flow Speed, BFFS	55.0	mi/h
Lane Width	12	ft
Lane Width Adjustment, fLW	0.0	mi/h
Right-Side Lateral Clearance	10	ft
Right-Side Lateral Clearance Adj., fRLC	0.0	mi/h
Total Ramp Density, TRD	2.00	ramps/mi
TRD Adjustment	5.8	mi/h
Free-Flow Speed, FFS	49.2	mi/h
Speed Adjustments		
Driver Population	All Familiar	
Driver Population SAF	1.000	
Weather Type	Non-Severe Weather	
Weather Type SAF	1.000	
Final Speed Adjustment Factor, SAF	1.000	
Adjusted Free-Flow Speed, FFSadj	49.2	mi/h

Step 3: Estimate and Adjust Capacity

Adjusted Free-flow Speed, FFSadj	49.2	mi/h
Capacity, c	2200	pc/h/ln
Capacity Adjustments		
Driver Population	All Familiar	
Driver Population CAF	1.000	

Weather Type	Non-Severe Weather	
Weather Type CAF	1.000	
Incident Type	No Incident	
Incident Type CAF	1.000	
Final Capacity Adjustment Factor, CAF	1.000	
Adjusted Capacity, cadj	2200	pc/h/ln

Step 4: Adjust Demand Volume

Demand Volume, V	2398	veh/h
Peak Hour Factor, PHF	0.90	
Number of Lanes, N	3	ln
Terrain Type	Rolling	
Percent Grade	-	%
Grade Length	-	mi
Percent Total Trucks	5.00	%
Percent Single-Unit Trucks, SUT	-	%
Percent Tractor-Trailers, TT	-	%
Proportion of Total Trucks, PT	0.0500	
Heavy Vehicle PCE, ET	3.000	
Heavy Vehicle Adjustment, fHV	0.909	
Demand Adjustment Factor, DAF	1.000	
Demand Flow Rate, vp	977	pc/h/ln

Steps 5 and 6: Estimate Speed and Density and Determine LOS

Demand Flow Rate, vp	977	pc/h/ln
Adjusted Free-Flow Speed, FFSadj	49.2	mi/h
Capacity Adjustment Factor, CAF	1.000	
Adjusted Capacity, cadj	2200	pc/h/ln
Breakpoint, BP	2032	pc/h/ln
Density at Capacity, Dc	45	pc/mi/ln
Mean Speed under Base Conditions, S	49.2	mi/h
Density, D	19.9	pc/mi/ln
Level of Service, LOS	C	

This Basic Freeway Segment text report was created in HCS™ Freeways Version 7.8.5 on 5/27/2020 10:58:46

HCS7 Basic Freeway Segment Text Report

BASIC FREEWAY SEGMENT ANALYSIS

File Name:	I_376_WB BEFORE GRANT_MD.xuf
Analyst:	JJS
Agency:	AECOM
Jurisdiction:	I-376 WB Freeway before Grant St
Date:	5/26/2020
Analysis Year:	2020
Time Period Analyzed:	MD
Project Description:	60612296 E03024 WO6 I-376 Bathtub Flooding Analysis
Units:	United States Customary

LOS and Performance Measures

Flow Rate, vp	946	pc/h/ln
Adjusted Capacity, cadj	2200	pc/h/ln
Speed, S	49.2	mi/h
Density, D	19.2	pc/mi/ln
Level of Service, LOS	C	

Step 1: Input Data

Number of Lanes, N	3	ln
Lane Width	12	ft
Segment Length	-	ft
Terrain Type	Rolling	
Percent Grade	-	%
Grade Length	-	mi
Right-Side Lateral Clearance	10	ft
Total Ramp Density, TRD	2.00	ramps/mi
Demand Volume	2322	veh/h
Peak Hour Factor, PHF	0.90	
Percent Total Trucks	5.00	%
Percent Single-Unit Trucks, SUT	-	%
Percent Tractor-Trailers, TT	-	%

Step 2: Estimate and Adjust FFS

Estimating FFS		
Measured or Base FFS	Base	
Base Free-Flow Speed, BFFS	55.0	mi/h
Lane Width	12	ft
Lane Width Adjustment, fLW	0.0	mi/h
Right-Side Lateral Clearance	10	ft
Right-Side Lateral Clearance Adj., fRLC	0.0	mi/h
Total Ramp Density, TRD	2.00	ramps/mi
TRD Adjustment	5.8	mi/h
Free-Flow Speed, FFS	49.2	mi/h
Speed Adjustments		
Driver Population	All Familiar	
Driver Population SAF	1.000	
Weather Type	Non-Severe Weather	
Weather Type SAF	1.000	
Final Speed Adjustment Factor, SAF	1.000	
Adjusted Free-Flow Speed, FFSadj	49.2	mi/h

Step 3: Estimate and Adjust Capacity

Adjusted Free-flow Speed, FFSadj	49.2	mi/h
Capacity, c	2200	pc/h/ln
Capacity Adjustments		
Driver Population	All Familiar	
Driver Population CAF	1.000	

Weather Type	Non-Severe Weather	
Weather Type CAF	1.000	
Incident Type	No Incident	
Incident Type CAF	1.000	
Final Capacity Adjustment Factor, CAF	1.000	
Adjusted Capacity, cadj	2200	pc/h/ln

Step 4: Adjust Demand Volume

Demand Volume, V	2322	veh/h
Peak Hour Factor, PHF	0.90	
Number of Lanes, N	3	ln
Terrain Type	Rolling	
Percent Grade	-	%
Grade Length	-	mi
Percent Total Trucks	5.00	%
Percent Single-Unit Trucks, SUT	-	%
Percent Tractor-Trailers, TT	-	%
Proportion of Total Trucks, PT	0.0500	
Heavy Vehicle PCE, ET	3.000	
Heavy Vehicle Adjustment, fHV	0.909	
Demand Adjustment Factor, DAF	1.000	
Demand Flow Rate, vp	946	pc/h/ln

Steps 5 and 6: Estimate Speed and Density and Determine LOS

Demand Flow Rate, vp	946	pc/h/ln
Adjusted Free-Flow Speed, FFSadj	49.2	mi/h
Capacity Adjustment Factor, CAF	1.000	
Adjusted Capacity, cadj	2200	pc/h/ln
Breakpoint, BP	2032	pc/h/ln
Density at Capacity, Dc	45	pc/mi/ln
Mean Speed under Base Conditions, S	49.2	mi/h
Density, D	19.2	pc/mi/ln
Level of Service, LOS	C	

This Basic Freeway Segment text report was created in HCS™ Freeways Version 7.8.5 on 5/27/2020 11:00:04

HCS7 Freeway Diverge Text Report

FREEWAY DIVERGE ANALYSIS

File Name:	Diverge2.xuf
Analyst:	JJS
Agency:	AECOM
Jurisdiction:	I-376 WB OFF Grant Street
Date:	5/26/2020
Analysis Year:	2020
Time Period Analyzed:	PM
Project Description:	60612296 E03024 WO6 I-376 Bathtub Flooding Analysis
Units:	United States Customary

LOS and Performance Measures

Density in Off-Ramp (Diverge) Influence Area, DR	-	pc/mi/ln
Level of Service, LOS	F	
Average Flow in Outer Lanes, vOA	-	pc/h/ln
Average Speed in Ramp Influence Area, SR	-	mi/h
Average Speed in Outer Lanes of Freeway, SO	-	mi/h
Average Speed for Off-Ramp (Diverge) Junction, S	-	mi/h
Density Across All Lanes, D	-	pc/mi/ln

Step 1: Specify Inputs and Convert Demand Volumes to Demand Flow Rates

Freeway Data		
Number of Freeway Lanes	2	ln
Freeway Free-Flow Speed, FFS	55.0	mi/h
Segment Length	1500	ft
Multilane Highway or C-D Roadway?	Freeway	
Demand Volume, V	3768	veh/h
Peak Hour Factor, PHF	0.90	

Ramp Data		
Number of Ramp Lanes	1	ln
Ramp Free-Flow Speed, SFR	25.0	mi/h
Ramp Side	Left	
Length of First Deceleration Lane, LD or LD1	600	ft
Length of Second Deceleration Lane, LD2	-	ft

Junction Components	Freeway	Ramp	
Demand Volume, V	3768	456	veh/h
Peak Hour Factor, PHF	0.90	0.90	
Percent Total Trucks	5.00	7.00	%
Percent SUTs	-	-	%
Percent TTs	-	-	%
Prop.Total Trucks, PT	0.0500	0.0700	
Heavy Vehicle PCE, ET	3.000	3.000	
Heavy Vehicle Adj., fHV	0.909	0.877	
Terrain Type	Rolling	Rolling	
Percent Grade	-	-	%
Grade Length	-	-	mi
Demand Adj.Factor, DAF	1.000	1.000	
Demand Flow Rate, v	4606	578	pc/h

Step 2: Estimate the Approaching Flow Rate in Lanes 1 and 2

Estimating Flow in Lanes 1 and 2 for Off-Ramps		
Adjacent Upstream On-Ramp Equilibrium Distance, LEQ	-	ft
Adjacent Downstream Off-Ramp Equilibrium Distance, LEQ	-	ft
Prop. Freeway Veh. in Lanes 1 and 2, PFD	1.000	
Flow Rate in Lanes 1 and 2, v12	4606	pc/h

Step 3: Estimate Capacity of Ramp-Freeway Junction and Compare Flow Rates

Capacity Checks

	Actual	Maximum	Violation?
vF	4606	4500	Yes
vR	578	1900	No
v12	4606	4400	Yes

	Freeway	Ramp	
Unadjusted Capacity, cmd	4500	1900	pc/h
Driver Population	All Familiar	All Familiar	
Driver Population CAF	1.000	1.000	
Weather Type	Non-Severe Weather	Non-Severe Weather	
Weather Type CAF	1.000	1.000	
Incident Type	No Incident	-	
Final Capacity Adj. Factor, CAF	1.000	1.000	
Adjusted Capacity, cmda	4500	1900	pc/h

Step 4: Estimate Density in Ramp Influence Area and Determine LOS

Demand Flow Rate in Lanes 1 and 2, v12	4606	pc/h
Length of Deceleration Lane, LA	600	ft
Density in Off-Ramp Influence Area, DR	-	pc/mi/ln
Density in Off-Ramp Influence Area, DR	-	veh/mi/ln
Level of Service, LOS	F	

Step 5: Estimate Speeds in the Vicinity of Ramp-Freeway Junctions

Freeway Free-Flow Speed, FFS	55.0	mi/h
Ramp Free-Flow Speed, SFR	25.0	mi/h
Driver Population	All Familiar	
Driver Population SAF	1.000	
Weather Type	Non-Severe Weather	
Weather Type SAF	1.000	
Final Speed Adjustment Factor, SAF	1.000	
Demand Flow Rate on Freeway, vF	4606	pc/h
Demand Flow Rate in Lanes 1 and 2, v12	4606	pc/h
Number of Outer Lanes on Freeway, NO	0	ln
Speed Index for Off-Ramp, DS	-	
Average Speed in Ramp Influence Area, SR	-	mi/h
Average Flow in Outer Lanes, vOA	-	pc/h/ln
Average Speed in Outer Lanes of Freeway, SO	-	mi/h
Average Speed for Off-Ramp Junction, S	-	mi/h
Density Across All Lanes, D	-	pc/mi/ln

This Freeway Diverge Segment text report was created in HCS™ Freeways Version 7.8.5 on 5/26/2020 08:57:57

HCS7 Basic Freeway Segment Text Report

BASIC FREEWAY SEGMENT ANALYSIS

File Name:	I_376_WB AFTER GRANT_PM.xuf
Analyst:	JJS
Agency:	AECOM
Jurisdiction:	I-376 WB Freeway After Grant St
Date:	5/26/2020
Analysis Year:	2020
Time Period Analyzed:	PM
Project Description:	60612296 E03024 WO6 I-376 Bathtub Flooding Analysis
Units:	United States Customary

LOS and Performance Measures

Flow Rate, vp	1586	pc/h/ln
Adjusted Capacity, cadj	2200	pc/h/ln
Speed, S	49.2	mi/h
Density, D	32.2	pc/mi/ln
Level of Service, LOS	D	

Step 1: Input Data

Number of Lanes, N	3	ln
Lane Width	12	ft
Segment Length	-	ft
Terrain Type	Rolling	
Percent Grade	-	%
Grade Length	-	mi
Right-Side Lateral Clearance	10	ft
Total Ramp Density, TRD	2.00	ramps/mi
Demand Volume	3892	veh/h
Peak Hour Factor, PHF	0.90	
Percent Total Trucks	5.00	%
Percent Single-Unit Trucks, SUT	-	%
Percent Tractor-Trailers, TT	-	%

Step 2: Estimate and Adjust FFS

Estimating FFS		
Measured or Base FFS	Base	
Base Free-Flow Speed, BFFS	55.0	mi/h
Lane Width	12	ft
Lane Width Adjustment, fLW	0.0	mi/h
Right-Side Lateral Clearance	10	ft
Right-Side Lateral Clearance Adj., fRLC	0.0	mi/h
Total Ramp Density, TRD	2.00	ramps/mi
TRD Adjustment	5.8	mi/h
Free-Flow Speed, FFS	49.2	mi/h
Speed Adjustments		
Driver Population	All Familiar	
Driver Population SAF	1.000	
Weather Type	Non-Severe Weather	
Weather Type SAF	1.000	
Final Speed Adjustment Factor, SAF	1.000	
Adjusted Free-Flow Speed, FFSadj	49.2	mi/h

Step 3: Estimate and Adjust Capacity

Adjusted Free-flow Speed, FFSadj	49.2	mi/h
Capacity, c	2200	pc/h/ln
Capacity Adjustments		
Driver Population	All Familiar	
Driver Population CAF	1.000	

Weather Type	Non-Severe Weather	
Weather Type CAF	1.000	
Incident Type	No Incident	
Incident Type CAF	1.000	
Final Capacity Adjustment Factor, CAF	1.000	
Adjusted Capacity, cadj	2200	pc/h/ln

Step 4: Adjust Demand Volume

Demand Volume, V	3892	veh/h
Peak Hour Factor, PHF	0.90	
Number of Lanes, N	3	ln
Terrain Type	Rolling	
Percent Grade	-	%
Grade Length	-	mi
Percent Total Trucks	5.00	%
Percent Single-Unit Trucks, SUT	-	%
Percent Tractor-Trailers, TT	-	%
Proportion of Total Trucks, PT	0.0500	
Heavy Vehicle PCE, ET	3.000	
Heavy Vehicle Adjustment, fHV	0.909	
Demand Adjustment Factor, DAF	1.000	
Demand Flow Rate, vp	1586	pc/h/ln

Steps 5 and 6: Estimate Speed and Density and Determine LOS

Demand Flow Rate, vp	1586	pc/h/ln
Adjusted Free-Flow Speed, FFSadj	49.2	mi/h
Capacity Adjustment Factor, CAF	1.000	
Adjusted Capacity, cadj	2200	pc/h/ln
Breakpoint, BP	2032	pc/h/ln
Density at Capacity, Dc	45	pc/mi/ln
Mean Speed under Base Conditions, S	49.2	mi/h
Density, D	32.2	pc/mi/ln
Level of Service, LOS	D	

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HCS7 Basic Freeway Segment Text Report

BASIC FREEWAY SEGMENT ANALYSIS

File Name:	I_376_WB BEFORE GRANT_PM.xuf
Analyst:	JJS
Agency:	AECOM
Jurisdiction:	I-376 WB Freeway before Grant St
Date:	5/26/2020
Analysis Year:	2020
Time Period Analyzed:	PM
Project Description:	60612296 E03024 WO6 I-376 Bathtub Flooding Analysis
Units:	United States Customary

LOS and Performance Measures

Flow Rate, vp	1535	pc/h/ln
Adjusted Capacity, cadj	2200	pc/h/ln
Speed, S	49.2	mi/h
Density, D	31.2	pc/mi/ln
Level of Service, LOS	D	

Step 1: Input Data

Number of Lanes, N	3	ln
Lane Width	12	ft
Segment Length	-	ft
Terrain Type	Rolling	
Percent Grade	-	%
Grade Length	-	mi
Right-Side Lateral Clearance	10	ft
Total Ramp Density, TRD	2.00	ramps/mi
Demand Volume	3768	veh/h
Peak Hour Factor, PHF	0.90	
Percent Total Trucks	5.00	%
Percent Single-Unit Trucks, SUT	-	%
Percent Tractor-Trailers, TT	-	%

Step 2: Estimate and Adjust FFS

Estimating FFS		
Measured or Base FFS	Base	
Base Free-Flow Speed, BFFS	55.0	mi/h
Lane Width	12	ft
Lane Width Adjustment, fLW	0.0	mi/h
Right-Side Lateral Clearance	10	ft
Right-Side Lateral Clearance Adj., fRLC	0.0	mi/h
Total Ramp Density, TRD	2.00	ramps/mi
TRD Adjustment	5.8	mi/h
Free-Flow Speed, FFS	49.2	mi/h
Speed Adjustments		
Driver Population	All Familiar	
Driver Population SAF	1.000	
Weather Type	Non-Severe Weather	
Weather Type SAF	1.000	
Final Speed Adjustment Factor, SAF	1.000	
Adjusted Free-Flow Speed, FFSadj	49.2	mi/h

Step 3: Estimate and Adjust Capacity

Adjusted Free-flow Speed, FFSadj	49.2	mi/h
Capacity, c	2200	pc/h/ln
Capacity Adjustments		
Driver Population	All Familiar	
Driver Population CAF	1.000	

Weather Type	Non-Severe Weather	
Weather Type CAF	1.000	
Incident Type	No Incident	
Incident Type CAF	1.000	
Final Capacity Adjustment Factor, CAF	1.000	
Adjusted Capacity, cadj	2200	pc/h/ln

Step 4: Adjust Demand Volume

Demand Volume, V	3768	veh/h
Peak Hour Factor, PHF	0.90	
Number of Lanes, N	3	ln
Terrain Type	Rolling	
Percent Grade	-	%
Grade Length	-	mi
Percent Total Trucks	5.00	%
Percent Single-Unit Trucks, SUT	-	%
Percent Tractor-Trailers, TT	-	%
Proportion of Total Trucks, PT	0.0500	
Heavy Vehicle PCE, ET	3.000	
Heavy Vehicle Adjustment, fHV	0.909	
Demand Adjustment Factor, DAF	1.000	
Demand Flow Rate, vp	1535	pc/h/ln

Steps 5 and 6: Estimate Speed and Density and Determine LOS

Demand Flow Rate, vp	1535	pc/h/ln
Adjusted Free-Flow Speed, FFSadj	49.2	mi/h
Capacity Adjustment Factor, CAF	1.000	
Adjusted Capacity, cadj	2200	pc/h/ln
Breakpoint, BP	2032	pc/h/ln
Density at Capacity, Dc	45	pc/mi/ln
Mean Speed under Base Conditions, S	49.2	mi/h
Density, D	31.2	pc/mi/ln
Level of Service, LOS	D	

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Attachment C

Existing Year 2020 Queuing Results

Intersection: 20: Cherry Way/Cherry Way & Blvd of the Allies #1

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	T	T	TR	LT	T	L	LTR
Maximum Queue (ft)	96	122	95	181	170	88	116
Average Queue (ft)	17	47	28	93	89	34	49
95th Queue (ft)	58	95	69	156	145	75	91
Link Distance (ft)		210	210	227	227	352	352
Upstream Blk Time (%)				0	0		
Queuing Penalty (veh)				0	0		
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	0	3					
Queuing Penalty (veh)	0	3					

Intersection: 24: Ramp to Parkway East & Grant St #1/Grant St & Blvd of the Allies #1/Blvd of the Allies

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R>	T	TR	LT	TR	T	TR>
Maximum Queue (ft)	215	222	188	211	194	128	143	146	178
Average Queue (ft)	124	133	64	112	87	46	56	37	138
95th Queue (ft)	196	197	138	176	158	119	129	112	183
Link Distance (ft)	227	227	227	255	255	106	106	133	133
Upstream Blk Time (%)	0	0	0	0		1	1	1	18
Queuing Penalty (veh)	0	0	0	0		4	5	0	0
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 26: Market St & Blvd of the Allies #1

Movement	EB	EB	EB	WB	WB	WB	SB
Directions Served	L	T	TR	L	T	TR	LTR
Maximum Queue (ft)	73	184	202	32	158	153	45
Average Queue (ft)	10	101	106	5	66	81	10
95th Queue (ft)	41	166	165	22	129	137	35
Link Distance (ft)		358	358		456	456	142
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75			300			
Storage Blk Time (%)	0	17					
Queuing Penalty (veh)	1	2					

Intersection: 27: Smithfield St & Blvd of the Allies #1

Movement	EB	EB	EB	WB	WB	NB	NB	SB
Directions Served	L	T	TR	T	TR	LT	TR	LTR
Maximum Queue (ft)	85	99	52	174	196	168	205	159
Average Queue (ft)	32	29	8	28	77	79	105	55
95th Queue (ft)	70	71	33	108	163	149	174	126
Link Distance (ft)		472	472	210	210	332	332	138
Upstream Blk Time (%)				0	0			1
Queuing Penalty (veh)				0	0			0
Storage Bay Dist (ft)	75							
Storage Blk Time (%)	1	1						
Queuing Penalty (veh)	1	1						

Intersection: 28: Stanwix St #1/Stanwix St & Blvd of the Allies /Blvd of the Allies #1

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	UL	T	TR	L	T	TR
Maximum Queue (ft)	221	241	199	101	88	110	93	156	202	163	141	99
Average Queue (ft)	101	118	86	26	16	35	37	65	113	71	49	32
95th Queue (ft)	188	196	168	72	55	82	76	131	177	136	105	75
Link Distance (ft)	552	552	552		358	358		365	365	140	140	140
Upstream Blk Time (%)										2	0	0
Queuing Penalty (veh)										0	0	0
Storage Bay Dist (ft)				175			150					
Storage Blk Time (%)								0				
Queuing Penalty (veh)								0				

Intersection: 30: Wood St /Wood St & Blvd of the Allies #1

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	UL	T	TR	L	T	TR	LTR	LT	TR
Maximum Queue (ft)	5	76	131	90	145	155	127	114	86
Average Queue (ft)	0	11	32	32	67	76	35	38	25
95th Queue (ft)	4	43	91	75	125	135	101	82	63
Link Distance (ft)		456	456		472	472	349	145	145
Upstream Blk Time (%)								0	
Queuing Penalty (veh)								0	
Storage Bay Dist (ft)	75			150					
Storage Blk Time (%)		0			0				
Queuing Penalty (veh)		0			0				

Intersection: 320: Grant St #1 & 1st Ave

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	LR	UT	T	R	UL	T	T
Maximum Queue (ft)	226	168	196	182	109	88	108
Average Queue (ft)	102	137	160	156	42	36	39
95th Queue (ft)	189	165	181	186	86	76	85
Link Distance (ft)	296	131	131	131	106	106	106
Upstream Blk Time (%)		17	37	38	0	0	0
Queuing Penalty (veh)		81	174	179	1	0	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 350: Ramp B & Ramp C/Grant St #1 & Fort Pitt Blvd /Ramp E

Movement	WB	WB	NB	NB	SB	SB	NE
Directions Served	LTR	R	T	T	R	>	<L
Maximum Queue (ft)	818	818	461	471	139	134	438
Average Queue (ft)	792	792	305	315	80	51	229
95th Queue (ft)	803	806	498	508	141	107	414
Link Distance (ft)	777	777	504	504	131	131	487
Upstream Blk Time (%)	100	99	6	7	2	0	2
Queuing Penalty (veh)	0	0	0	0	6	1	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 514: Ross St & 2nd Ave

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	T	R	LTR	L	TR
Maximum Queue (ft)	161	212	201	150	149	294
Average Queue (ft)	91	101	112	69	103	97
95th Queue (ft)	156	175	178	134	166	235
Link Distance (ft)	119	218	218	130		366
Upstream Blk Time (%)	6	0	0	2		1
Queuing Penalty (veh)	0	0	0	0		0
Storage Bay Dist (ft)					125	
Storage Blk Time (%)					14	1
Queuing Penalty (veh)					20	2

Intersection: 3521: Smithfield St/Smithfield St & Fort Pitt Blvd

Movement	WB	WB	WB	B9991	B9991	NB	NB	SB
Directions Served	L	T	R	T	T	LT	T	TR
Maximum Queue (ft)	178	255	71	50	123	74	67	194
Average Queue (ft)	70	104	25	2	6	53	31	55
95th Queue (ft)	136	204	55	40	74	65	65	136
Link Distance (ft)	217	217	217	211	211	48	48	332
Upstream Blk Time (%)	0	1				9	2	
Queuing Penalty (veh)	0	2				33	7	
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 3522: Smithfield St Bridge/Smithfield St & Relocated Ft Pitt Blvd EB

Movement	EB	EB	NB	NB	SB
Directions Served	LT	R	T	TR	T
Maximum Queue (ft)	502	416	1486	1468	51
Average Queue (ft)	301	174	1050	1030	7
95th Queue (ft)	509	339	1817	1802	36
Link Distance (ft)	515	515	1688	1688	48
Upstream Blk Time (%)	2	1	19	17	3
Queuing Penalty (veh)	0	0	0	0	6
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3531: Ramp Bu & Stanwix St /Stanwix St #1 & Ramp N & Fort Pitt Blvd/Fort Pitt Blvd

Movement	WB	WB	WB	SB	SB	SB	NW
Directions Served	<L	T	TR	T	R	>	LR
Maximum Queue (ft)	65	142	226	157	77	82	236
Average Queue (ft)	22	68	119	54	21	25	185
95th Queue (ft)	54	122	193	113	59	64	268
Link Distance (ft)	302	302	302		365	365	211
Upstream Blk Time (%)			0				10
Queuing Penalty (veh)			0				0
Storage Bay Dist (ft)				150			
Storage Blk Time (%)				0			
Queuing Penalty (veh)				0			

Intersection: 20: Cherry Way/Cherry Way & Blvd of the Allies #1

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	UT	T	TR	LT	T	L	LTR
Maximum Queue (ft)	100	86	86	103	90	92	115
Average Queue (ft)	34	31	32	39	30	34	45
95th Queue (ft)	78	70	70	78	73	81	92
Link Distance (ft)	223	223	223	227	227	352	352
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 24: Ramp to Parkway East & Grant St #1/Grant St & Blvd of the Allies #1/Blvd of the Allies

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R>	<LT	TR	<LT	TR	LT	TR>
Maximum Queue (ft)	112	128	140	151	128	85	97	172	185
Average Queue (ft)	53	42	55	73	51	17	22	115	149
95th Queue (ft)	96	102	113	130	104	58	66	202	173
Link Distance (ft)	227	227	227	255	255	106	106	133	133
Upstream Blk Time (%)						0	0	17	36
Queuing Penalty (veh)						0	0	0	0
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 26: Market St & Blvd of the Allies #1

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	R	L	TR	LTR
Maximum Queue (ft)	88	213	160	73	238	53
Average Queue (ft)	15	111	46	16	114	17
95th Queue (ft)	59	190	117	48	196	46
Link Distance (ft)		358	358		456	141
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	75			300		
Storage Blk Time (%)		21			0	
Queuing Penalty (veh)		3			0	

Intersection: 27: Smithfield St & Blvd of the Allies #1

Movement	EB	EB	EB	WB	WB	NB	SB
Directions Served	L	T	TR	LT	R	LTR	T
Maximum Queue (ft)	84	78	58	112	62	262	123
Average Queue (ft)	31	26	10	41	4	139	28
95th Queue (ft)	69	64	38	90	28	228	84
Link Distance (ft)		471		223	223	321	139
Upstream Blk Time (%)						0	0
Queuing Penalty (veh)						0	0
Storage Bay Dist (ft)	75		150				
Storage Blk Time (%)	1	1					
Queuing Penalty (veh)	1	1					

Intersection: 28: Stanwix St #1/Stanwix St & Blvd of the Allies /Blvd of the Allies #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	TR	UL	T	TR	L	T	R
Maximum Queue (ft)	105	143	86	72	120	32	79	148	141	139	80
Average Queue (ft)	32	68	26	5	44	5	16	62	60	59	18
95th Queue (ft)	78	121	67	33	104	22	52	117	117	114	57
Link Distance (ft)	553	553		358	358		366	366	140	140	140
Upstream Blk Time (%)									1	0	
Queuing Penalty (veh)									0	0	
Storage Bay Dist (ft)			175			150					
Storage Blk Time (%)			0								
Queuing Penalty (veh)			0								

Intersection: 30: Wood St & Blvd of the Allies #1

Movement	EB	WB	WB	NB	SB	SB
Directions Served	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	331	148	206	88	171	70
Average Queue (ft)	174	50	90	18	76	15
95th Queue (ft)	286	104	163	64	143	52
Link Distance (ft)	456		471	360	157	157
Upstream Blk Time (%)					1	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)		150				
Storage Blk Time (%)	25		2			
Queuing Penalty (veh)	0		1			

Intersection: 320: Grant St #1 & 1st Ave

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	LR	UT	T	R	L	T	T
Maximum Queue (ft)	229	106	113	162	100	105	116
Average Queue (ft)	100	53	44	70	38	44	51
95th Queue (ft)	190	89	90	137	87	87	97
Link Distance (ft)	296	131	131	131	106	106	106
Upstream Blk Time (%)	0	0	0	2	0	0	0
Queuing Penalty (veh)	0	0	0	3	0	0	1
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 350: Ramp B & Ramp C/Grant St #1 & Fort Pitt Blvd /Ramp E

Movement	WB	WB	NB	NB	SB	SB	NE
Directions Served	LTR	R	T	T	R	>	<L
Maximum Queue (ft)	174	135	97	103	128	122	318
Average Queue (ft)	88	50	41	31	72	46	172
95th Queue (ft)	149	104	80	75	124	93	284
Link Distance (ft)	777	777	504	504	131	131	487
Upstream Blk Time (%)					1	0	
Queuing Penalty (veh)					3	1	
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 514: Ross St & 2nd Ave

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	LT	R	LTR	L	TR
Maximum Queue (ft)	112	133	133	127	140	179
Average Queue (ft)	44	55	54	53	78	58
95th Queue (ft)	91	109	109	109	134	126
Link Distance (ft)	119	218	218	130		366
Upstream Blk Time (%)	0		0	1		
Queuing Penalty (veh)	0		0	0		
Storage Bay Dist (ft)					125	
Storage Blk Time (%)					2	0
Queuing Penalty (veh)					3	1

Intersection: 3521: Smithfield St/Smithfield St & Fort Pitt Blvd

Movement	WB	WB	WB	NB	NB	SB
Directions Served	L	T	R	L	T	TR
Maximum Queue (ft)	181	168	85	66	38	136
Average Queue (ft)	95	83	31	41	4	35
95th Queue (ft)	160	147	65	69	22	101
Link Distance (ft)	225	225	225	49	49	321
Upstream Blk Time (%)				4	0	
Queuing Penalty (veh)				6	0	
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3522: Smithfield St Bridge/Smithfield St & Relocated Ft Pitt Blvd EB

Movement	EB	EB	NB	NB	SB
Directions Served	LT	R	T	TR	LT
Maximum Queue (ft)	224	260	169	190	58
Average Queue (ft)	106	147	67	80	5
95th Queue (ft)	184	239	139	155	31
Link Distance (ft)	515	515	1688	1688	49
Upstream Blk Time (%)					3
Queuing Penalty (veh)					5
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3531: Ramp Bu & Stanwix St/Stanwix St #1 & Ramp N & Fort Pitt Blvd

Movement	WB	WB	WB	SB	SB	SB	NW
Directions Served	<L	T	TR	T	R	>	<LR
Maximum Queue (ft)	99	103	110	112	129	60	116
Average Queue (ft)	41	35	49	55	46	29	42
95th Queue (ft)	82	78	93	102	102	64	90
Link Distance (ft)	302	302	302		366		211
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)				150		25	
Storage Blk Time (%)				0	25	14	
Queuing Penalty (veh)				0	43	28	

Intersection: 20: Cherry Way/Cherry Way & Blvd of the Allies #1

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	T	T	TR	LT	T	L	LTR
Maximum Queue (ft)	100	208	185	230	247	213	268
Average Queue (ft)	35	83	66	158	149	109	110
95th Queue (ft)	95	186	174	221	224	175	209
Link Distance (ft)		210	210	227	227	352	352
Upstream Blk Time (%)		4	4	1	1		0
Queuing Penalty (veh)		13	13	3	2		0
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	2	21					
Queuing Penalty (veh)	5	46					

Intersection: 24: Ramp to Parkway East & Grant St #1/Grant St & Blvd of the Allies #1/Blvd of the Allies

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R>	LT	TR	<LT	TR	LT	TR>
Maximum Queue (ft)	235	277	257	254	220	127	170	160	182
Average Queue (ft)	167	198	151	149	104	78	96	114	151
95th Queue (ft)	254	279	280	234	185	151	170	202	165
Link Distance (ft)	227	227	227	255	255	106	106	133	133
Upstream Blk Time (%)	1	8	8	0	0	10	4	23	69
Queuing Penalty (veh)	3	27	27	0	0	40	16	0	0
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 26: Market St & Blvd of the Allies #1

Movement	EB	EB	EB	WB	WB	WB	SB
Directions Served	L	T	TR	L	T	TR	LTR
Maximum Queue (ft)	70	195	198	95	206	211	154
Average Queue (ft)	7	103	112	30	119	125	83
95th Queue (ft)	35	171	177	66	185	189	141
Link Distance (ft)		358	358		456	456	142
Upstream Blk Time (%)							1
Queuing Penalty (veh)							0
Storage Bay Dist (ft)	75			300			
Storage Blk Time (%)		15					
Queuing Penalty (veh)		2					

Intersection: 27: Smithfield St & Blvd of the Allies #1

Movement	EB	EB	EB	WB	WB	NB	NB	SB
Directions Served	L	T	TR	T	TR	LT	TR	TR
Maximum Queue (ft)	98	255	241	190	217	147	168	148
Average Queue (ft)	39	76	64	70	89	50	72	62
95th Queue (ft)	82	203	198	144	163	113	142	136
Link Distance (ft)		472	472	210	210	332	332	138
Upstream Blk Time (%)		1	1	0	0			1
Queuing Penalty (veh)		2	2	0	1			0
Storage Bay Dist (ft)	75							
Storage Blk Time (%)	1	11						
Queuing Penalty (veh)	4	7						

Intersection: 28: Stanwix St #1/Stanwix St & Blvd of the Allies #9/Blvd of the Allies #1

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	UL	T	TR	L	T	TR
Maximum Queue (ft)	162	187	160	129	182	199	57	92	142	161	155	116
Average Queue (ft)	61	107	84	59	30	66	17	39	73	107	79	43
95th Queue (ft)	127	175	151	111	97	139	47	81	124	172	145	95
Link Distance (ft)	552	552	552		358	358		365	365	140	140	140
Upstream Blk Time (%)										6	2	0
Queuing Penalty (veh)										0	0	0
Storage Bay Dist (ft)				175			150					
Storage Blk Time (%)					0							
Queuing Penalty (veh)					0							

Intersection: 30: Wood St & Blvd of the Allies #1

Movement	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	T	TR	L	T	TR	LTR	LT	TR
Maximum Queue (ft)	181	179	119	152	167	160	165	163
Average Queue (ft)	78	84	55	53	62	49	124	79
95th Queue (ft)	139	147	100	124	140	126	188	153
Link Distance (ft)	456	456		472	472	342	145	145
Upstream Blk Time (%)							11	2
Queuing Penalty (veh)							0	0
Storage Bay Dist (ft)			150					
Storage Blk Time (%)	14		0	1				
Queuing Penalty (veh)	0		0	1				

Intersection: 320: Grant St #1 & 1st Ave

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	LR	UT	T	R	L	T	T
Maximum Queue (ft)	326	160	192	169	101	144	144
Average Queue (ft)	220	125	155	99	38	99	108
95th Queue (ft)	336	165	186	167	86	139	146
Link Distance (ft)	296	123	123	123	106	106	106
Upstream Blk Time (%)	11	24	38	9	0	9	17
Queuing Penalty (veh)	0	66	108	25	0	25	47
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 350: Ramp B & Ramp C/Grant St #1 & Fort Pitt Blvd /Ramp E

Movement	WB	WB	B33	B33	NB	NB	SB	SB	NE
Directions Served	LTR	R	T	T	LT	T	R	>	<L
Maximum Queue (ft)	853	851	232	234	276	274	153	146	242
Average Queue (ft)	822	819	198	199	131	147	104	93	115
95th Queue (ft)	841	840	224	231	287	293	158	154	200
Link Distance (ft)	748	748	186	186	504	504	123	123	487
Upstream Blk Time (%)	100	98	99	99	0	0	7	4	
Queuing Penalty (veh)	0	0	0	0	0	0	36	22	
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 514: Ross St & 2nd Ave

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	LT	R	LTR	L	TR
Maximum Queue (ft)	134	206	167	126	149	207
Average Queue (ft)	79	122	83	58	87	69
95th Queue (ft)	135	194	147	115	149	154
Link Distance (ft)	119	218	218	130		366
Upstream Blk Time (%)	3	0	0	1		
Queuing Penalty (veh)	0	0	0	0		
Storage Bay Dist (ft)					125	
Storage Blk Time (%)					4	0
Queuing Penalty (veh)					6	0

Intersection: 3521: Smithfield St/Smithfield St & Fort Pitt Blvd

Movement	WB	WB	WB	NB	NB	SB
Directions Served	L	T	TR	LT	T	TR
Maximum Queue (ft)	362	328	195	75	36	212
Average Queue (ft)	216	81	118	47	3	78
95th Queue (ft)	344	210	188	73	17	176
Link Distance (ft)	485	485	485	49	49	332
Upstream Blk Time (%)				9	0	
Queuing Penalty (veh)				18	0	
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3522: Smithfield St Bridge/Smithfield St & Relocated Ft Pitt Blvd EB

Movement	EB	EB	NB	NB	SB
Directions Served	LT	R	T	TR	T
Maximum Queue (ft)	535	536	317	276	62
Average Queue (ft)	519	529	151	110	14
95th Queue (ft)	612	544	264	217	46
Link Distance (ft)	515	515	1688	1688	49
Upstream Blk Time (%)	57	94			4
Queuing Penalty (veh)	0	0			18
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3531: Ramp Bu & Stanwix St/Stanwix St #1 & Ramp N & Fort Pitt Blvd #2

Movement	WB	WB	WB	SB	SB	SB	NW
Directions Served	<L	T	TR	T	R	>	<LR
Maximum Queue (ft)	259	139	151	174	244	136	55
Average Queue (ft)	113	59	82	106	123	61	14
95th Queue (ft)	207	111	134	189	219	118	43
Link Distance (ft)	302	302	302		365	365	211
Upstream Blk Time (%)	0						
Queuing Penalty (veh)	1						
Storage Bay Dist (ft)				150			
Storage Blk Time (%)				1	4		
Queuing Penalty (veh)				4	10		

Attachment D

Existing Year 2020 Travel Times and Average Speed Results

Arterial Level of Service: EB #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Blvd of the Allies #	28	21.3	34.9	0.1	9
Market St	26	21.8	33.8	0.1	9
Wood St	30	3.4	15.9	0.1	23
Smithfield St	27	1.4	15.4	0.1	23
Cherry Way	20	7.1	14.6	0.1	14
Ramp to Parkway East	24	50.3	68.8	0.1	3
1st Ave	320	15.8	23.1	0.0	7
Fort Pitt Blvd	350	5.5	12.3	0.0	12
Total		126.6	218.8	0.6	9

Arterial Level of Service: WB #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
1st Ave	320	34.2	40.4	0.0	4
Blvd of the Allies	24	12.1	17.9	0.0	9
Cherry Way	20	29.4	38.7	0.1	5
Smithfield St	27	3.4	10.0	0.1	20
Wood St	30	33.4	47.9	0.1	8
Market St	26	30.3	43.1	0.1	8
Stanwix St	28	20.1	31.8	0.1	9
Fort Pitt Blvd	3531	14.1	25.2	0.1	12
Total		177.0	255.0	0.6	8

Arterial Level of Service: EB #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Blvd of the Allies #	28	21.0	33.1	0.1	10
Market St	26	16.6	28.7	0.1	10
Wood St	30	20.2	42.7	0.1	8
Smithfield St	27	2.8	18.1	0.1	20
Cherry Way	20	13.2	24.9	0.1	8
Ramp to Parkway East	24	17.1	27.8	0.1	7
1st Ave	320	17.7	25.0	0.0	6
Fort Pitt Blvd	350	1.6	8.4	0.0	17
Total		110.0	208.8	0.6	10

Arterial Level of Service: WB #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
1st Ave	320	16.8	22.5	0.0	6
Blvd of the Allies	24	26.2	32.0	0.0	5
Cherry Way	20	7.0	15.8	0.1	13
Smithfield St	27	3.2	14.1	0.1	14
Wood St	30	29.6	44.7	0.1	8
Market St	26	21.5	44.3	0.1	8
Stanwix St	28	9.4	23.6	0.1	13
Fort Pitt Blvd	3531	15.9	28.0	0.1	11
Total		129.7	225.1	0.6	9

Arterial Level of Service: EB #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Blvd of the Allies #	28	30.2	40.5	0.1	8
Market St	26	19.7	31.2	0.1	10
Wood St	30	12.1	25.7	0.1	14
Smithfield St	27	13.4	27.8	0.1	13
Cherry Way	20	18.9	26.9	0.1	8
Ramp to Parkway East	24	52.7	63.1	0.1	3
1st Ave	320	30.3	37.1	0.0	4
Fort Pitt Blvd	350	2.3	9.0	0.0	16
Total		179.6	261.3	0.6	8

Arterial Level of Service: WB #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
1st Ave	320	55.0	60.9	0.0	2
Blvd of the Allies	24	121.3	126.9	0.0	1
Cherry Way	20	7.2	15.2	0.1	13
Smithfield St	27	9.7	16.8	0.1	12
Wood St	30	11.9	26.4	0.1	14
Market St	26	31.2	44.8	0.1	8
Stanwix St	28	17.4	29.0	0.1	10
Fort Pitt Blvd #2	3531	11.1	23.7	0.1	13
Total		264.9	343.8	0.6	6

Attachment E

Bottleneck Analysis

Delay and Queue Calc. Spreadsheet
for Bottleneck Work Zones - Quick Version

Note: Use this "Quick Version" when the capacity of the WZ does not vary from hour to hour, hourly volumes can be estimated from the AADT and TPG info., and the facility in question is not an existing bottleneck.

Project: 60612296 E03024 WO6 I376 Bathtub Flooding Alt Analysis
Analyst: JJS
Date: 4/24/2020

One Way Work Zone Capacity (veh/hr)	1200	vph
One Way AADT (veh/day)	44333	vpd
Percent of Peak Period (>1000 vph) Traffic Diverted (%)	50	%
Number of Lanes for Queued Vehicles(lanes)	3	
Percent Trucks (Daily)	5	%
Traffic Pattern Group (Number 1 to 10)	1	
Inbound = 1, Outbound = 2, Neutral =3	1	
Number of vehicles in Queue per Lane Mile (veh)	232	vpm

TPG Index
1=Urban Interstate
2=Rural Interstate
3=Urban Other Principal Arterials
4=Rural Other Principal Arterials
5=Urban Minor Arterials, Collectors, Local Roads
6=North Rural Minor Arterials
7=Central Rural Minor Arterials
8=North Rural Collectors and Local Roads
9=Central Rural Collectors and Local Roads
10=Special Recreational

20-Minute Delay Results

Number of Episodes of 20-Minute Delay	**1**	
Longest Sustained Episode of 20-Minute Delay	**14.56**	hours
Total Hours per Day with Delays > 20-min	**14.56**	hours
Significant Project Based on 20-Minute Delay Threshold?	**Yes**	

Maximum Delay (min) **90** min

Total Daily Delay (vehicle-hours) **17,136** vehicle-hours

Time Begining	Estimated Volume	Reduced Volume	Queue (Veh)	Queue (miles)	Delay for Last Arrival of Hour (min)	Restrict Work to Avoid 20 minute delay
0:00	492	492	0	0.0	0	
1:00	375	375	0	0.0	0	
2:00	347	347	0	0.0	0	
3:00	380	380	0	0.0	0	
4:00	551	551	0	0.0	0	
5:00	1157	578	0	0.0	0	
6:00	2627	1314	114	0.2	6	
7:00	3620	1810	724	1.0	36	X
8:00	3030	1515	1038	1.5	52	
9:00	2414	1207	1045	1.5	52	
10:00	2319	1160	1005	1.4	50	
11:00	2347	1173	978	1.4	49	
12:00	2373	1187	965	1.4	48	
13:00	2396	1198	963	1.4	48	
14:00	2608	1304	1067	1.5	53	
15:00	2886	1443	1310	1.9	66	
16:00	2946	1473	1583	2.3	79	
17:00	2847	1424	1807	2.6	90	
18:00	2313	1156	1763	2.5	88	
19:00	1771	885	1448	2.1	72	
20:00	1470	735	984	1.4	49	
21:00	1277	639	422	0.6	21	
22:00	1030	515	0	0.0	0	
23:00	757	757	0	0.0	0	
	44333	23617				

11

Hourly Percentages from Table 350 of Traffic Data Report	Portion of Hour with Delay>20 min
1.11%	0.00
0.85%	0.00
0.78%	0.00
0.86%	0.00
1.24%	0.00
2.61%	0.00
5.93%	0.00
8.17%	0.53
6.83%	1.00
5.45%	1.00
5.23%	1.00
5.29%	1.00
5.35%	1.00
5.40%	1.00
5.88%	1.00
6.51%	1.00
6.64%	1.00
6.42%	1.00
5.22%	1.00
3.99%	1.00
3.32%	1.00
2.88%	1.00
2.32%	0.03
1.71%	0.00

20-Minute Delay Calculations

Full Hours	Growth Partial Hours	Decline Partial Hours	Cumulative	Maximums
			0.00	
			0.00	
			0.00	
			0.00	
			0.00	
			0.00	
			0.00	
	0.53		0.53	
1			1.53	
1			2.53	
1			3.53	
1			4.53	
1			5.53	
1			6.53	
1			7.53	
1			8.53	
1			9.53	
1			10.53	
1			11.53	
1			12.53	
1			13.53	
1			14.53	
		0.03	14.56	
			0.00	14.56310865
			0	

Attachment F

Existing Year 2020 with Bathtub Detour
Travel Times and Average Speed Results

Arterial Level of Service: EB #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Blvd of the Allies #	28	34.2	47.5	0.1	7
Market St	26	16.6	28.6	0.1	10
Wood St	30	4.4	17.3	0.1	21
Smithfield St	27	2.3	16.3	0.1	22
Cherry Way	20	10.7	18.3	0.1	11
Ramp to Parkway East	24	54.5	72.7	0.1	3
1st Ave	320	14.5	21.9	0.0	7
Total		137.1	222.6	0.5	8

Arterial Level of Service: WB #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
1st Ave	320	147.0	333.6	0.0	1
Blvd of the Allies	24	104.1	126.3	0.0	1
Cherry Way	20	155.1	164.0	0.1	1
Smithfield St	27	136.4	676.6	0.1	1
Wood St	30	302.3	396.8	0.1	1
Market St	26	272.8	702.5	0.1	1
Stanwix St	28	149.4	229.7	0.1	2
Fort Pitt Blvd	3531	28.4	42.4	0.1	7
Total		1295.5	2671.8	0.6	1

Arterial Level of Service: EB #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Blvd of the Allies #	28	36.9	47.1	0.1	7
Market St	26	13.2	25.1	0.1	12
Wood St	30	24.9	47.9	0.1	7
Smithfield St	27	3.1	18.6	0.1	20
Cherry Way	20	16.7	28.8	0.1	7
Ramp to Parkway East	24	27.5	38.3	0.1	5
1st Ave	320	23.7	31.1	0.0	5
Total		145.9	237.0	0.5	8

Arterial Level of Service: WB #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
1st Ave	320	628.7	2108.6	0.0	0
Blvd of the Allies	24	294.0	1782.6	0.0	1
Cherry Way	20	203.0	210.0	0.1	1
Smithfield St	27	146.6	158.5	0.1	1
Wood St	30	201.7	513.6	0.1	2
Market St	26	124.6	146.1	0.1	2
Stanwix St	28	87.0	111.5	0.1	3
Fort Pitt Blvd	3531	45.7	59.9	0.1	5
Total		1731.4	5090.9	0.6	1

Arterial Level of Service: EB #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Blvd of the Allies #	28	739.5	1448.9	0.1	0
Market St	26	221.4	227.0	0.1	1
Wood St	30	324.5	448.0	0.1	1
Smithfield St	27	98.2	148.7	0.1	3
Cherry Way	20	9.3	16.7	0.1	12
Ramp to Parkway East	24	13.8	22.8	0.1	9
1st Ave	320	27.8	35.0	0.0	4
Total		1434.4	2347.1	0.5	1

Arterial Level of Service: WB #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
1st Ave	320	1412.1	9813.9	0.0	0
Blvd of the Allies	24	203.6	420.1	0.0	1
Cherry Way	20	145.1	152.2	0.1	1
Smithfield St	27	252.7	508.3	0.1	1
Wood St	30	462.4	814.7	0.1	1
Market St	26	314.3	532.2	0.1	1
Stanwix St	28	135.3	199.2	0.1	2
Fort Pitt Blvd	3531	18.4	32.5	0.1	10
Total		2943.9	12473.2	0.6	1

Attachment G

Existing Year 2020 with Bathtub Detour and Mitigations
Travel Times and Average Speed Results

Arterial Level of Service: EB #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Blvd of the Allies #	28	80.1	93.6	0.1	3
Market St	26	18.6	30.5	0.1	10
Wood St	30	13.5	26.5	0.1	14
Smithfield St	27	18.2	32.1	0.1	11
Cherry Way	20	15.4	23.0	0.1	9
Ramp to Parkway East	24	27.8	46.1	0.1	4
1st Ave	320	5.2	12.7	0.0	12
Total		178.8	264.5	0.5	7

Arterial Level of Service: WB #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
1st Ave	320	34.9	676.5	0.0	4
Blvd of the Allies	24	84.8	95.1	0.0	2
Cherry Way	20	142.1	151.0	0.1	1
Smithfield St	27	84.7	464.5	0.1	2
Wood St	30	217.0	298.8	0.1	2
Market St	26	198.4	497.9	0.1	2
Stanwix St	28	100.6	123.3	0.1	3
Fort Pitt Blvd	3531	10.8	25.1	0.1	13
Total		873.4	2332.3	0.6	2

Arterial Level of Service: EB #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Blvd of the Allies #	28	64.4	74.9	0.1	4
Market St	26	11.2	23.5	0.1	13
Wood St	30	14.7	37.8	0.1	9
Smithfield St	27	4.0	19.4	0.1	19
Cherry Way	20	11.6	23.8	0.1	8
Ramp to Parkway East	24	46.8	57.7	0.1	4
1st Ave	320	21.5	28.8	0.0	5
Total		174.1	265.8	0.5	7

Arterial Level of Service: WB #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
1st Ave	320	166.7	1942.7	0.0	1
Blvd of the Allies	24	84.4	142.2	0.0	2
Cherry Way	20	122.7	131.4	0.1	2
Smithfield St	27	77.2	89.6	0.1	2
Wood St	30	100.7	254.1	0.1	3
Market St	26	68.7	90.7	0.1	4
Stanwix St	28	38.1	53.1	0.1	6
Fort Pitt Blvd	3531	9.7	24.0	0.1	13
Total		668.1	2727.6	0.6	3

Arterial Level of Service: EB #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Blvd of the Allies #	28	121.1	152.8	0.1	2
Market St	26	141.4	150.3	0.1	2
Wood St	30	218.1	297.5	0.1	2
Smithfield St	27	81.1	140.6	0.1	4
Cherry Way	20	21.0	28.8	0.1	7
Ramp to Parkway East	24	31.0	40.1	0.1	5
1st Ave	320	39.1	46.5	0.0	3
Total		652.8	856.5	0.5	3

Arterial Level of Service: WB #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
1st Ave	320	32.8	9572.2	0.0	4
Blvd of the Allies	24	92.2	126.3	0.0	2
Cherry Way	20	107.8	116.2	0.1	2
Smithfield St	27	150.7	283.1	0.1	1
Wood St	30	274.6	528.3	0.1	1
Market St	26	202.2	364.3	0.1	2
Stanwix St	28	76.7	92.3	0.1	3
Fort Pitt Blvd	3531	21.7	35.9	0.1	9
Total		958.8	11118.6	0.6	2

Appendix G:
Floodwall Cost Estimates

PENNDOT
PROJECT: I-376 "Bathtub" Renovation, Raise Existing Floodwall, Alternate 1 - Option 1
PROJECT NO - 60620418
Project Phase: Conceptual
Date Prepared: 7/1/2020
Estimate Summary Report Report r3

			Total Cost
Project Wide Costs			**$3,040,182**
Raise Existing Floodwall			**$3,941,062**
Pavement Replacement			**$223,971**
	Subtotal		$7,205,216
Unallocated Contingency		10.00%	$720,522
	Subtotal		$7,925,737
Escalation (Assumes a Midpoint of Construction of Summer 2023)		9.00%	$713,316
	Total Construction Cost		**$8,639,053**

PENNDOT
PROJECT: I-376 "Bathtub" Renovation, Raise Existing Floodwall, Alternate 1 - Option 1
PROJECT NO - 60620418
Project Phase: Conceptual
Date Prepared: 7/1/2020
Estimate Summary Report Report r3

Item	QNTY	UOM	UNIT COST	TOTAL COST	Allocated Contingency	Total Cost
Project Wide Costs					**5%**	**$3,040,182**
GENERAL CONDITIONS	1.00	LS	$3,597,145.01	$3,597,145	$179,857.25	$3,040,182
Raise Existing Floodwall					**30%**	**$3,941,062**
SET UP SINGLE LANE CLOSURE MAINTENANCE & PROTECTION OF TRAFFIC						
Traffic Cones	255.00	EA	$26.66	$6,799	$2,039.58	$8,838
Temporary Signs	12.00	EA	$159.97	$1,920	$575.88	$2,495
Construction Barrels	26.00	EA	$46.66	$1,213	$363.92	$1,577
Set up single lane closure MPT - Labor	48.00	HR	$82.48	$3,959	$1,187.73	$5,147
Equipment: Truck	1.00	SHIFT	$161.97	$162	$48.59	$211
FLOODWALL DEMOLITION						
Removal of Portion of Existing Floodwall	237.00	CY				
Volume of Demo Per Shift	10.00	CY				
# of Shifts	24.00	EA				
Crew Size Per Shift	12.00	EA				
Hours Per Shift	96.00	HRS				
Total Hours	2,304.00	HRS				
Remove Floodwall	2,304.00	HR	$97.61	$224,888	$67,466.34	$292,354
Equipment: Truck	24.00	SHIFT	$161.97	$3,887	$1,166.16	$5,053
Equipment: (2) Generators	24.00	SHIFT	$170.63	$4,095	$1,228.54	$5,324
Disposal	1.00	LS	$25,152.00	$25,152	$7,545.60	$32,698
INSTALL FLOODWALL REBAR						
Reinforcement Bars, Epoxy Coated	81,900.00	LBS				
Crew Size Per Shift	6.00	EA				
Hours Per Shift	8.00	HR				
Total Hours Per Shift	48.00	HR				
Amount of Rebar Installed Per Shift	2,000.00	LBS				
Total # of Shifts	41.00	EA				
Total Hours	1,968.00	HRS				
Install Floodwall Rebar	1,968.00	HOURS	$125.56	$247,103	$74,130.86	$321,234
Material: Wall Rebar	81,900.00	LBS	$2.33	$190,545	$57,163.58	$247,709
Equipment: (2) Generators	41.00	SHIFTS	$170.63	$6,996	$2,098.76	$9,095
Equipment: Manlift	41.00	SHIFTS	$117.31	$4,810	$1,442.90	$6,253
Equipment: Small Tools	1.00	LS	$3,772.80	$3,773	$1,131.84	$4,905
INSTALL FLOODWALL DOWELS						
Dowel Holes, 14" Depth	510.00	EA				
Manhours Per Hole	1.00	HRS				
Total Hours	510.00	HRS				
Dowel Install	510.00	HRS	$121.25	$61,835	$18,550.52	$80,386
Dowels	510.00	EA	$18.86	$9,621	$2,886.19	$12,507
Equipment: (2) Generators	16.00	SHIFTS	$170.63	$2,730	$819.03	$3,549
Equipment: Small Tools	1.00	LS	$2,515.20	$2,515	$754.56	$3,270
INSTALL FLOODWALL FORMWORK						
Formwork Area	17,804.00	SF				
Install Area Per Shift	160.00	SF				
Total # of Shifts	111.00	EA				
Crew Size Per Shift	12.00	EA				
Hours Per Shift	8.00	HR				
Total Hours Per Shift	96.00	HR				
Total Hours	10,656.00	HRS				
Install Floodwall Formwork	10,656.00	HRS	$90.93	$968,904	$290,671.34	$1,259,576
Material: Formwork	17,602.00	SF	$6.60	$116,215	$34,864.63	$151,080
Equipment: Truck	111.00	SHIFTS	$161.97	$17,978	$5,393.48	$23,372
Equipment: (2) Manlift	111.00	SHIFTS	$234.62	$26,043	$7,812.77	$33,855
Equipment: Small Tools	1.00	LS	$6,288.00	$6,288	$1,886.40	$8,174
PLACE FLOODWALL CONCRETE						
Volume of Concrete	468.00	SF				
Volume Poured Per Shift	10.00	CY				
Total # of Shifts	47.00	EA				
Crew Size Per Shift	12.00	EA				
Hours Per Shift	8.00	HR				
Total Hours Per Shift	96.00	HR				
Total Hours	4,512.00	HRS				
Place Floodwall Concrete	4,512.00	HOURS	$93.40	$421,437	$126,431.20	$547,869
Material: Concrete	468.00	CY	$193.29	$90,461	$27,138.35	$117,600
Equipment: Pump Truck	47.00	SHIFTS	$917.14	$43,106	$12,931.71	$56,037
Equipment: (3) Manlift	47.00	SHIFTS	$351.93	$16,541	$4,962.17	$21,503
Equipment: Concrete Vibrators (3)	47.00	SHIFTS	$78.92	$3,709	$1,112.73	$4,822
STRIP FORMS						
Formwork Area	17,804.00	SF				
Forms Removed Area Per Shift	800.00	SF				
Total # of Shifts	22.00	EA				
Crew Size Per Shift	12.00	EA				
Hours Per Shift	8.00	HR				
Total Hours Per Shift	96.00	HR				
Total Hours	2,112.00	HRS				
STRIP FORMS	2,112.00	HRS	$90.93	$192,035	$57,610.54	$249,646
Equipment: Truck	22.00	SF	$161.97	$3,563	$1,068.98	$4,632
Equipment: (2) Manlift	22.00	SHIFTS	$234.62	$5,162	$1,548.48	$6,710
SEAL FLOODWALL						
Floodwall Area	17,804.00	SF				
Sealer Applied Per Shift	1,000.00	SF				
Total # of Shifts	18.00	EA				
Crew Size Per Shift	2.00	EA				
Hours Per Shift	8.00	HR				
Total Hours Per Shift	16.00	HR				
Total Hours	288.00	HRS				
Seal Floodwall	288.00	HRS	$79.39	$22,865	$6,859.50	$29,724
Equipment: (2) Manlift	18.00	SHIFTS	$234.62	$4,223	$1,266.94	$5,490
Material - Sealant	17,804.00	SF	$0.44	$7,837	$2,350.98	$10,188
DRAINAGE ALLOWANCE						
Drainage Allowance	1.00	LS	$201,216.00	$201,216	$60,364.80	$261,581
INSTALL FLOODWALL LIGHTING CONDUIT AND LIGHTS (EXCLUDED)						
PUNCH LIST FLOODWALL						
Punchlist	480.00	HRS	$90.92	$43,644	$13,093.13	$56,737
REMOVE MAINTENANCE & PROTECTION OF TRAFFIC						
Remove MPT	24.00	HRS	$82.49	$1,980	$593.90	$2,574

PENNDOT
PROJECT: I-376 "Bathtub" Renovation, Raise Existing Floodwall, Alternate 1 - Option 1
PROJECT NO - 60620418
Project Phase: Conceptual
Date Prepared: 7/1/2020
Estimate Summary Report Report r3

	Item	QNTY	UOM	UNIT COST	TOTAL COST	Allocated Contingency	Total Cost
	INSTALL TEMPORARY LIGHTING						
	Install Temporary Lighting	96.00	HRS	$92.48	$8,878	$2,663.54	$11,542
	Equipment: Truck	3.00	SHIFTS	$161.97	$486	$145.77	$632
	Equipment: Manlift	3.00	SHIFTS	$117.31	$352	$105.58	$458
	Material: Temporary Lighting	1.00	LS	$26,661.12	$26,661	$7,998.34	$34,659
Pavement Replacement						**15%**	**$223,971**
	1-376 PAVEMENT REMOVAL						
	Total Removal	187.00	CY				
	Sawcut Pavement	1,085.00	LF	$8.17	$8,869	$2,116	$10,985
	Demolish Pavement	187.00	CY	$50.10	$9,369	$2,235	$11,604
	Load and Haul Demo'd Pavement	205.70	CY	$10.69	$2,199	$525	$2,723
	Disposal	378.68	TON	$31.44	$11,906	$2,840	$14,746
	I-376 PAVEMENT REPLACEMENT						
	Pavement Total	187.00	CY				
	Concrete pavement formwork (erecting, bracing, stripping and cleaning)	813.75	SF	$6.93	$5,639	$1,345	$6,984
	Concrete Pavement Joints + Sealant	2,332.75	LF	$7.56	$17,642	$4,209	$21,851
	Expansion joint	2,332.75	LF	$10.99	$25,637	$6,116	$31,753
	Pavement Rebar	7.48	TON	$3,717.73	$27,809	$6,634	$34,442
	Ready-Mix Concrete - delivered - excludes any additives	187.00	CY	$183.61	$34,335	$8,191	$42,526
	Concrete placement - direct chute	187.00	CY	$24.74	$4,626	$1,104	$5,730
	Concrete finishing	3,366.00	SF	$1.16	$3,888	$928	$4,816
	Concrete curing	33.66	CSF	$28.78	$969	$231	$1,200
	LINE STRIPING						
	Line Striping Labor	100.00	HRS	$79.39	$7,939	$1,894	$9,833
	Material: Line Striping	2,170.00	LF	$2.52	$5,458	$1,302	$6,760
	PUNCH LIST - PAVEMENT						
	Punchlist	160.00	HRS	$90.92	$14,548	$3,470	$18,018

PENNDOT
PROJECT: I-376 "Bathtub" Renovation, Raise Existing Floodwall, Alternate 1 - Option 2
PROJECT NO - 60620418
Project Phase: Conceptual
Date Prepared: 7/1/2020
Estimate Summary Report Report r3

			Total Cost
Project Wide Costs			**$2,871,020**
Raise Existing Floodwall			**$3,526,010**
Pavement Replacement			**$0**
	Subtotal		$6,397,030
Unallocated Contingency		10.00%	$639,703
	Subtotal		$7,036,733
Escalation (Assumes a Midpoint of Construction of Summer 2023)		9.00%	$633,306
	Total Construction Cost		**$7,670,039**

PENNDOT
PROJECT: I-376 "Bathtub" Renovation, Raise Existing Floodwall, Alternate 1 - Option 2
PROJECT NO - 60620418
Project Phase: Conceptual
Date Prepared: 7/1/2020
Estimate Summary Report Report r3

Item	QNTY	UOM	UNIT COST	TOTAL COST	Allocated Contingency	Total Cost
Project Wide Costs					**5%**	**$2,871,020**
GENERAL CONDITIONS	1.00	LS	$3,396,992.32	$3,396,992	$169,849.62	$2,871,020
Raise Existing Floodwall					**30%**	**$3,526,010**
SET UP SINGLE LANE CLOSURE MAINTENANCE & PROTECTION OF TRAFFIC						
Traffic Cones	255.00	EA	$26.66	$6,799	$2,039.58	$8,838
Temporary Signs	12.00	EA	$159.97	$1,920	$575.88	$2,495
Construction Barrels	26.00	EA	$46.66	$1,213	$363.92	$1,577
Set up single lane closure MPT - Labor	48.00	HR	$82.48	$3,959	$1,187.73	$5,147
Equipment: Truck	1.00	SHIFT	$161.97	$162	$48.59	$211
FLOODWALL DEMOLITION						
Removal of Portion of Existing Floodwall	199.00	CY				
Volume of Demo Per Shift	10.00	CY				
# of Shifts	20.00	EA				
Crew Size Per Shift	12.00	EA				
Hours Per Shift	96.00	HRS				
Total Hours	1,920.00	HRS				
Remove Floodwall	1,920.00	HR	$97.61	$187,406	$56,221.95	$243,628
Equipment: Truck	20.00	SHIFT	$161.97	$3,239	$971.80	$4,211
Equipment: (2) Generators	20.00	SHIFT	$170.63	$3,413	$1,023.79	$4,436
Disposal	1.00	LS	$25,152.00	$25,152	$7,545.60	$32,698
INSTALL FLOODWALL REBAR						
Reinforcement Bars, Epoxy Coated	75,250.00	LBS				
Crew Size Per Shift	6.00	EA				
Hours Per Shift	8.00	HR				
Total Hours Per Shift	48.00	HR				
Amount of Rebar Installed Per Shift	2,000.00	LBS				
Total # of Shifts	38.00	EA				
Total Hours	1,824.00	HRS				
Install Floodwall Rebar	1,824.00	HOURS	$125.56	$229,022	$68,706.65	$297,729
Material: Wall Rebar	75,250.00	LBS	$2.33	$175,074	$52,522.09	$227,596
Equipment: (2) Generators	38.00	SHIFTS	$170.63	$6,484	$1,945.20	$8,429
Equipment: Manlift	38.00	SHIFTS	$117.31	$4,458	$1,337.32	$5,795
Equipment: Small Tools	1.00	LS	$3,772.80	$3,773	$1,131.84	$4,905
INSTALL FLOODWALL DOWELS						
Dowel Holes, 14" Depth	510.00	EA				
Manhours Per Hole	1.00	HRS				
Total Hours	510.00	HRS				
Dowel Install	510.00	HRS	$121.25	$61,835	$18,550.52	$80,386
Dowels	510.00	EA	$18.86	$9,621	$2,886.19	$12,507
Equipment: (2) Generators	16.00	SHIFTS	$170.63	$2,730	$819.03	$3,549
Equipment: Small Tools	1.00	LS	$2,515.20	$2,515	$754.56	$3,270
INSTALL FLOODWALL FORMWORK						
Formwork Area	14,874.00	SF				
Install Area Per Shift	160.00	SF				
Total # of Shifts	93.00	EA				
Crew Size Per Shift	12.00	EA				
Hours Per Shift	8.00	HR				
Total Hours Per Shift	96.00	HR				
Total Hours	8,928.00	HRS				
Install Floodwall Formwork	8,928.00	HRS	$90.93	$811,785	$243,535.45	$1,055,320
Material: Formwork	17,602.00	SF	$6.60	$116,215	$34,864.63	$151,080
Equipment: Truck	93.00	SHIFTS	$161.97	$15,063	$4,518.86	$19,582
Equipment: (2) Manlift	93.00	SHIFTS	$234.62	$21,819	$6,545.84	$28,365
Equipment: Small Tools	1.00	LS	$6,288.00	$6,288	$1,886.40	$8,174
PLACE FLOODWALL CONCRETE						
Volume of Concrete	430.00	CY				
Volume Poured Per Shift	10.00	CY				
Total # of Shifts	43.00	EA				
Crew Size Per Shift	12.00	EA				
Hours Per Shift	8.00	HR				
Total Hours Per Shift	96.00	HR				
Total Hours	4,128.00	HRS				
Place Floodwall Concrete	4,128.00	HOURS	$93.40	$385,570	$115,671.10	$501,241
Material: Concrete	430.00	CY	$193.29	$83,116	$24,934.81	$108,051
Equipment: Pump Truck	43.00	SHIFTS	$917.14	$39,437	$11,831.14	$51,268
Equipment: (3) Manlift	43.00	SHIFTS	$351.93	$15,133	$4,539.86	$19,673
Equipment: Concrete Vibrators (3)	43.00	SHIFTS	$78.92	$3,393	$1,018.03	$4,411
STRIP FORMS						
Formwork Area	14,874.00	SF				
Forms Removed Area Per Shift	800.00	SF				
Total # of Shifts	19.00	EA				
Crew Size Per Shift	12.00	EA				
Hours Per Shift	8.00	HR				
Total Hours Per Shift	96.00	HR				
Total Hours	1,824.00	HRS				
STRIP FORMS	1,824.00	HRS	$90.93	$165,849	$49,754.55	$215,603
Equipment: Truck	19.00	SF	$161.97	$3,077	$923.21	$4,001
Equipment: (2) Manlift	19.00	SHIFTS	$234.62	$4,458	$1,337.32	$5,795
SEAL FLOODWALL						
Floodwall Area	14,874.00	SF				
Sealer Applied Per Shift	1,000.00	SF				
Total # of Shifts	15.00	EA				
Crew Size Per Shift	2.00	EA				
Hours Per Shift	8.00	HR				
Total Hours Per Shift	16.00	HR				
Total Hours	240.00	HRS				
Seal Floodwall	240.00	HRS	$79.39	$19,054	$5,716.25	$24,770
Equipment: (2) Manlift	15.00	SHIFTS	$234.62	$3,519	$1,055.78	$4,575
Material - Sealant	14,874.00	SF	$0.44	$6,547	$1,964.08	$8,511
DRAINAGE ALLOWANCE						
Drainage Allowance	1.00	LS	$201,216.00	$201,216	$60,364.80	$261,581
INSTALL FLOODWALL LIGHTING CONDUIT AND LIGHTS (EXCLUDED)						
PUNCH LIST FLOODWALL						
Punchlist	480.00	HRS	$90.92	$43,644	$13,093.13	$56,737
REMOVE MAINTENANCE & PROTECTION OF TRAFFIC						
Remove MPT	24.00	HRS	$82.49	$1,980	$593.90	$2,574

PENNDOT
PROJECT: I-376 "Bathtub" Renovation, Raise Existing Floodwall, Alternate 1 - Option 2
PROJECT NO - 60620418
Project Phase: Conceptual
Date Prepared: 7/1/2020
Estimate Summary Report Report r3

	Item	QNTY	UOM	UNIT COST	TOTAL COST	Allocated Contingency	Total Cost
	INSTALL TEMPORARY LIGHTING						
	Install Temporary Lighting	96.00	HRS	$92.48	$8,878	$2,663.54	$11,542
	Equipment: Truck	3.00	SHIFTS	$161.97	$486	$145.77	$632
	Equipment: Manlift	3.00	SHIFTS	$117.31	$352	$105.58	$458
	Material: Temporary Lighting	1.00	LS	$26,661.12	$26,661	$7,998.34	$34,659
Pavement Replacement						**15%**	**$0**

PENNDOT
PROJECT: I-376 "Bathtub" Renovation, Raise Existing Floodwall, Alternate 1 - Option 3
PROJECT NO - 60620418
Project Phase: Conceptual
Date Prepared: 7/1/2020
Estimate Summary Report Report r3

			Total Cost
Project Wide Costs			**$2,727,469**
Raise Existing Floodwall			**$2,729,921**
Pavement Replacement			**$0**
	Subtotal		$5,457,391
Unallocated Contingency		10.00%	$545,739
	Subtotal		$6,003,130
Escalation (Assumes a Midpoint of Construction of Summer 2023)		9.00%	$540,282
	Total Construction Cost		**$6,543,412**

PENNDOT
PROJECT: I-376 "Bathtub" Renovation, Raise Existing Floodwall, Alternate 1 - Option 3
PROJECT NO - 60620418
Project Phase: Conceptual
Date Prepared: 7/1/2020
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Item	QNTY	UOM	UNIT COST	TOTAL COST	Allocated Contingency	Total Cost
Project Wide Costs					**5%**	**$2,727,469**
GENERAL CONDITIONS	1.00	LS	$3,227,142.71	$3,227,143	$161,357.14	$2,727,469
Raise Existing Floodwall					**30%**	**$2,729,921**
SET UP SINGLE LANE CLOSURE MAINTENANCE & PROTECTION OF TRAFFIC						
Traffic Cones	255.00	EA	$26.66	$6,799	$2,039.58	$8,838
Temporary Signs	12.00	EA	$159.97	$1,920	$575.88	$2,495
Construction Barrels	26.00	EA	$46.66	$1,213	$363.92	$1,577
Set up single lane closure MPT - Labor	48.00	HR	$82.48	$3,959	$1,187.73	$5,147
Equipment: Truck	1.00	SHIFT	$161.97	$162	$48.59	$211
FLOODWALL DEMOLITION						
Removal of Portion of Existing Floodwall	195.00	CY				
Volume of Demo Per Shift	10.00	CY				
# of Shifts	20.00	EA				
Crew Size Per Shift	12.00	EA				
Hours Per Shift	96.00	HRS				
Total Hours	1,920.00	HRS				
Remove Floodwall	1,920.00	HR	$97.61	$187,406	$56,221.95	$243,628
Equipment: Truck	20.00	SHIFT	$161.97	$3,239	$971.80	$4,211
Equipment: (2) Generators	20.00	SHIFT	$170.63	$3,413	$1,023.79	$4,436
Disposal	1.00	LS	$25,152.00	$25,152	$7,545.60	$32,698
INSTALL FLOODWALL REBAR						
Reinforcement Bars, Epoxy Coated	50,050.00	LBS				
Crew Size Per Shift	6.00	EA				
Hours Per Shift	8.00	HR				
Total Hours Per Shift	48.00	HR				
Amount of Rebar Installed Per Shift	2,000.00	LBS				
Total # of Shifts	25.00	EA				
Total Hours	1,200.00	HRS				
Install Floodwall Rebar	1,200.00	HOURS	$125.56	$150,672	$45,201.74	$195,874
Material: Wall Rebar	50,050.00	LBS	$2.33	$116,444	$34,933.30	$151,378
Equipment: (2) Generators	25.00	SHIFTS	$170.63	$4,266	$1,279.73	$5,546
Equipment: Manlift	25.00	SHIFTS	$117.31	$2,933	$879.82	$3,813
Equipment: Small Tools	1.00	LS	$3,772.80	$3,773	$1,131.84	$4,905
INSTALL FLOODWALL DOWELS						
Dowel Holes, 14" Depth	0.00	EA				
Manhours Per Hole	1.00	HRS				
Total Hours	0.00	HRS				
Dowel Install	0.00	HRS	#DIV/0!	$0	$0.00	$0
Dowels	0.00	EA	#DIV/0!	$0	$0.00	$0
Equipment: (2) Generators	0.00	SHIFTS	#DIV/0!	$0	$0.00	$0
Equipment: Small Tools	0.00	LS	#DIV/0!	$0	$0.00	$0
INSTALL FLOODWALL FORMWORK						
Formwork Area	12,364.00	SF				
Install Area Per Shift	160.00	SF				
Total # of Shifts	77.00	EA				
Crew Size Per Shift	12.00	EA				
Hours Per Shift	8.00	HR				
Total Hours Per Shift	96.00	HR				
Total Hours	7,392.00	HRS				
Install Floodwall Formwork	7,392.00	HRS	$90.93	$672,123	$201,636.88	$873,760
Material: Formwork	12,364.00	SF	$6.60	$81,632	$24,489.62	$106,122
Equipment: Truck	77.00	SHIFTS	$161.97	$12,471	$3,741.42	$16,213
Equipment: (2) Manlift	77.00	SHIFTS	$234.62	$18,066	$5,419.67	$23,485
Equipment: Small Tools	1.00	LS	$6,288.00	$6,288	$1,886.40	$8,174
PLACE FLOODWALL CONCRETE						
Volume of Concrete	286.00	CY				
Volume Poured Per Shift	10.00	CY				
Total # of Shifts	29.00	EA				
Crew Size Per Shift	12.00	EA				
Hours Per Shift	8.00	HR				
Total Hours Per Shift	96.00	HR				
Total Hours	2,784.00	HRS				
Place Floodwall Concrete	2,784.00	HOURS	$93.40	$260,036	$78,010.74	$338,047
Material: Concrete	286.00	CY	$193.29	$55,282	$16,584.55	$71,866
Equipment: Pump Truck	29.00	SHIFTS	$917.14	$26,597	$7,979.14	$34,576
Equipment: (3) Manlift	29.00	SHIFTS	$351.93	$10,206	$3,061.76	$13,268
Equipment: Concrete Vibrators (3)	29.00	SHIFTS	$78.92	$2,289	$686.58	$2,975
STRIP FORMS						
Formwork Area	12,364.00	SF				
Forms Removed Area Per Shift	800.00	SF				
Total # of Shifts	15.00	EA				
Crew Size Per Shift	12.00	EA				
Hours Per Shift	8.00	HR				
Total Hours Per Shift	96.00	HR				
Total Hours	1,440.00	HRS				
STRIP FORMS	1,440.00	HRS	$90.93	$130,933	$39,279.91	$170,213
Equipment: Truck	15.00	SF	$161.97	$2,429	$728.85	$3,158
Equipment: (2) Manlift	15.00	SHIFTS	$234.62	$3,519	$1,055.78	$4,575
SEAL FLOODWALL						
Floodwall Area	12,364.00	SF				
Sealer Applied Per Shift	1,000.00	SF				
Total # of Shifts	12.00	EA				
Crew Size Per Shift	2.00	EA				
Hours Per Shift	8.00	HR				
Total Hours Per Shift	16.00	HR				
Total Hours	192.00	HRS				
Seal Floodwall	192.00	HRS	$79.39	$15,243	$4,573.00	$19,816
Equipment: (2) Manlift	12.00	SHIFTS	$234.62	$2,815	$844.62	$3,660
Material - Sealant	12,364.00	SF	$0.44	$5,442	$1,632.64	$7,075
DRAINAGE ALLOWANCE						
Drainage Allowance	1.00	LS	$201,216.00	$201,216	$60,364.80	$261,581
INSTALL FLOODWALL LIGHTING CONDUIT AND LIGHTS (EXCLUDED)						
PUNCH LIST FLOODWALL						
Punchlist	480.00	HRS	$90.92	$43,644	$13,093.13	$56,737
REMOVE MAINTENANCE & PROTECTION OF TRAFFIC						
Remove MPT	24.00	HRS	$82.49	$1,980	$593.90	$2,574

PENNDOT
PROJECT: I-376 "Bathtub" Renovation, Raise Existing Floodwall, Alternate 1 - Option 3
PROJECT NO - 60620418
Project Phase: Conceptual
Date Prepared: 7/1/2020
Estimate Summary Report Report r3

	Item	QNTY	UOM	UNIT COST	TOTAL COST	Allocated Contingency	Total Cost
	INSTALL TEMPORARY LIGHTING						
	Install Temporary Lighting	96.00	HRS	$92.48	$8,878	$2,663.54	$11,542
	Equipment: Truck	3.00	SHIFTS	$161.97	$486	$145.77	$632
	Equipment: Manlift	3.00	SHIFTS	$117.31	$352	$105.58	$458
	Material: Temporary Lighting	1.00	LS	$26,661.12	$26,661	$7,998.34	$34,659
Pavement Replacement						**15%**	**$0**

PENNDOT
PROJECT: I-376 "Bathtub" Renovation, Cast In Place Tunnel Option
PROJECT NO - 60620418
Project Phase: Conceptual Total Length: 2640 LF
Date Prepared: 7/2/2020
Estimate Summary Report Report

		Total Cost
Project Wide Costs		**$9,499,350**
North Wall		**$31,292,820**
South Wall		**$28,532,140**
Roof/Ceiling		**$29,044,600**
Flood Gates		**$1,162,200**
Pavement Replacement		**$2,293,100**
	Subtotal	$101,824,210
Unallocated Contingency	30.00%	$30,547,263
	Subtotal	$132,371,473
Escalation (Assumes a Midpoint of Construction of Summer 2023)	9.00%	$11,913,432.57
	Total Construction Cost	**$144,284,905.57**

PENNDOT
PROJECT: I-376 "Bathtub" Renovation, Cast In Place Tunnel Option
PROJECT NO - 60620418
Project Phase: Conceptual
Date Prepared: 7/2/2020
Estimate Detail Report

	Item	Total Cost	Allocated Contingency	Total Cost
Project Wide Costs			**5%**	**$9,499,350**
	GENERAL CONDITIONS	$9,047,000	$452,350	$9,499,350
North Wall			**30%**	**$31,292,820**
	SET UP SINGLE LANE CLOSURE MAINTENANCE & PROTECTION OF TRAFFIC	$21,000	$6,300	$27,300
	REMOVE EXISTING CONDUITS - NORTH WALL ONLY	$39,000	$11,700	$50,700
	NORTH WALL FOUNDATIONS	$5,098,400	$1,529,520	$6,627,920
	PIN PILES - 60' LONG - 260 AT NORTH WALL	$1,040,000	$312,000	$1,352,000
	INSTALL NORTH SIDE WALL ANCHORS FOR FORMWORK AND REBAR	$1,064,000	$319,200	$1,383,200
	INSTALL NORTH SIDE WALL REBAR	$1,008,000	$302,400	$1,310,400
	INSTALL NORTH SIDE WALL FORMWORK	$6,631,000	$1,989,300	$8,620,300
	PLACE NORTH WALL CONCRETE	$3,431,000	$1,029,300	$4,460,300
	STRIP FORMS	$612,000	$183,600	$795,600
	PATCH CONCRETE	$500,000	$150,000	$650,000
	PAINT NORTH WALL	$379,000	$113,700	$492,700
	DRAINAGE ALLOWANCE	$1,056,000	$316,800	$1,372,800
	NEW CONDUITS	$568,000	$170,400	$738,400
	ELECTRICAL JUNCTION BOXES	$340,000	$102,000	$442,000
	RUN PROPOSED UTILITIES INSIDE CONDUITS	$983,000	$294,900	$1,277,900
	INSTALL NORTH WALL LIGHTING CONDUIT AND LIGHTS	$1,191,000	$357,300	$1,548,300
	INSTALL NORTH WALL FIRE ESTINGUISHERS	$40,000	$12,000	$52,000
	REMOVE MAINTENANCE & PROTECTION OF TRAFFIC	$2,000	$600	$2,600
	PUNCH LIST - NORTH WALL	$68,000	$20,400	$88,400
South Wall			**30%**	**$28,532,140**
	SET UP SINGLE LANE CLOSURE MAINTENANCE & PROTECTION OF TRAFFIC	$24,000	$7,200	$31,200
	SOUTH WALL FOUNDATIONS	$4,868,800	$1,460,640	$6,329,440
	PIN PILES - 60' LONG - 260 AT SOUTH WALL	$1,040,000	$312,000	$1,352,000
	INSTALL SOUTH SIDE WALL REBAR	$1,069,000	$320,700	$1,389,700
	INSTALL SOUTH SIDE WALL FORMWORK	$6,631,000	$1,989,300	$8,620,300
	PLACE SOUTH WALL CONCRETE	$3,431,000	$1,029,300	$4,460,300
	STRIP FORMS	$612,000	$183,600	$795,600
	PATCH CONCRETE	$429,000	$128,700	$557,700
	PAINT SOUTH WALL	$1,473,000	$441,900	$1,914,900
	DRAINAGE ALLOWANCE	$1,056,000	$316,800	$1,372,800
	INSTALL SOUTH WALL LIGHTING CONDUIT AND LIGHTS	$1,191,000	$357,300	$1,548,300
	INSTALL PERMANENT SOUTH WALL FIRE ESTINGUISHERS	$40,000	$12,000	$52,000
	PUNCH LIST SOUTH WALL	$68,000	$20,400	$88,400
	REMOVE MAINTENANCE & PROTECTION OF TRAFFIC	$2,000	$600	$2,600
	INSTALL TEMPORARY LIGHTING	$13,000	$3,900	$16,900
Roof/Ceiling			**30%**	**$29,044,600**
	INSTALL TEMPORARY JET FANS AT EACH END OF THE TUNNEL IN THE FORMER CONSTRUCTION SHAFTS.	$6,000	$1,800	$7,800
	MAINTENANCE & PROTECTION OF TRAFFIC FOR FULL SHUTDOWN 9PM-5AM	$5,000	$1,500	$6,500
	INSTALL CEILING REBAR	$2,566,000	$769,800	$3,335,800
	MAINTENANCE & PROTECTION OF TRAFFIC FOR FULL SHUTDOWN	$5,000	$1,500	$6,500
	SET UP TRAVELLING FORM	$459,000	$137,700	$596,700
	SET UP TRAVELLING FORM BULKHEADS	$24,000	$7,200	$31,200
	PLACE CEILING CONCRETE	$12,379,000	$3,713,700	$16,092,700
	STRIP FORMS/ADVANCE TRAVELLING FORM	$813,000	$243,900	$1,056,900
	PATCH CONCRETE	$760,000	$228,000	$988,000
	PAINT CEILING	$1,847,000	$554,100	$2,401,100
	PERMANENT VENTILATION	$1,260,000	$378,000	$1,638,000
	PARK ALLOWANCE - EXCLUDED	$0	$0	$0
	ROOF GRATING	$1,980,000	$594,000	$2,574,000
	REMOVE TEMPORARY VENTILLATION	$44,000	$13,200	$57,200
	PREPARE AREAS FOR FLOOD GATES	$81,000	$24,300	$105,300
	REMOVE MAINTENANCE & PROTECTION OF TRAFFIC OPEN TUNNEL	$5,000	$1,500	$6,500
	PUNCH LIST CEILING	$108,000	$32,400	$140,400
Flood Gates			**30%**	**$1,162,200**
	INSTALL FLOOD GATES	$855,000	$256,500	$1,111,500

PENNDOT
PROJECT: I-376 "Bathtub" Renovation, Cast In Place Tunnel Option
PROJECT NO - 60620418
Project Phase: Conceptual
Date Prepared: 7/2/2020
Estimate Detail Report

	Item	Total Cost	Allocated Contingency	Total Cost
	TEST FLOOD GATES	$12,000	$3,600	$15,600
	PUNCH LIST FLOOD GATES	$27,000	$8,100	$35,100
Pavement Replacement			**15%**	**$2,293,100**
	MILL PAVEMENT	$538,000	$80,700	$618,700
	PATCH CONCRETE	$807,000	$121,050	$928,050
	REPAVE SURFACE	$531,000	$79,650	$610,650
	LINE STRIPING	$50,000	$7,500	$57,500
	PUNCH LIST - PAVEMENT	$68,000	$10,200	$78,200

PENNDOT
PROJECT: I-376 "Bathtub" Renovation, Precast Tunnel Option
PROJECT NO - 60620418
Project Phase: Conceptual Total Length: 2640 LF
Date Prepared: 7/2/2020
Estimate Summary Report Report

		Total Cost
Project Wide Costs		**$9,499,350**
North Wall		**$27,246,167**
South Wall		**$24,813,594**
Roof/Ceiling		**$21,276,795**
Flood Gates		**$1,162,200**
Pavement Replacement		**$2,293,100**
	Subtotal	$86,291,206
Unallocated Contingency	30.00%	$25,887,362
	Subtotal	$112,178,567
Escalation (Assumes a Midpoint of Construction of Summer 2023)	9.00%	$10,096,071.04
	Total Construction Cost	**$122,274,638.19**

PENNDOT
PROJECT: I-376 "Bathtub" Renovation, Precast Tunnel Option
PROJECT NO - 60620418
Project Phase: Conceptual
Date Prepared: 7/2/2020
Estimate Detail Report

	Item	Total Cost	Allocated Contingency	Total Cost
Project Wide Costs			**5%**	**$9,499,350**
	GENERAL CONDITIONS	$9,047,000	$452,350	$9,499,350
North Wall			**30%**	**$27,246,167**
	SET UP SINGLE LANE CLOSURE MAINTENANCE & PROTECTION OF TRAFFIC	$21,000	$6,300	$27,300
	REMOVE EXISTING CONDUITS - NORTH WALL ONLY	$39,000	$11,700	$50,700
	NORTH WALL FOUNDATIONS	$5,098,400	$1,529,520	$6,627,920
	PIN PILES - 60' LONG - 260 AT NORTH WALL	$1,040,000	$312,000	$1,352,000
	PRECAST NORTH WALL	$10,133,190	$3,039,957	$13,173,147
	PAINT NORTH WALL	$379,000	$113,700	$492,700
	DRAINAGE ALLOWANCE	$1,056,000	$316,800	$1,372,800
	NEW CONDUITS	$568,000	$170,400	$738,400
	ELECTRICAL JUNCTION BOXES	$340,000	$102,000	$442,000
	RUN PROPOSED UTILITIES INSIDE CONDUITS	$983,000	$294,900	$1,277,900
	INSTALL NORTH WALL LIGHTING CONDUIT AND LIGHTS	$1,191,000	$357,300	$1,548,300
	INSTALL NORTH WALL FIRE ESTINGUISHERS	$40,000	$12,000	$52,000
	REMOVE MAINTENANCE & PROTECTION OF TRAFFIC	$2,000	$600	$2,600
	PUNCH LIST - NORTH WALL	$68,000	$20,400	$88,400
South Wall			**30%**	**$24,813,594**
	SET UP SINGLE LANE CLOSURE MAINTENANCE & PROTECTION OF TRAFFIC	$24,000	$7,200	$31,200
	SOUTH WALL FOUNDATIONS	$4,868,800	$1,460,640	$6,329,440
	PIN PILES - 60' LONG - 260 AT SOUTH WALL	$1,040,000	$312,000	$1,352,000
	PRECAST SOUTH WALL	$9,311,580	$2,793,474	$12,105,054
	PAINT SOUTH WALL	$1,473,000	$441,900	$1,914,900
	DRAINAGE ALLOWANCE	$1,056,000	$316,800	$1,372,800
	INSTALL SOUTH WALL LIGHTING CONDUIT AND LIGHTS	$1,191,000	$357,300	$1,548,300
	INSTALL PERMANENT SOUTH WALL FIRE ESTINGUISHERS	$40,000	$12,000	$52,000
	PUNCH LIST SOUTH WALL	$68,000	$20,400	$88,400
	REMOVE MAINTENANCE & PROTECTION OF TRAFFIC	$2,000	$600	$2,600
	INSTALL TEMPORARY LIGHTING	$13,000	$3,900	$16,900
Roof/Ceiling			**30%**	**$21,276,795**
	INSTALL TEMPORARY JET FANS AT EACH END OF THE TUNNEL IN THE FORMER CONSTRUCTION SHAFTS.	$6,000	$1,800	$7,800
	MAINTENANCE & PROTECTION OF TRAFFIC FOR FULL SHUTDOWN 9PM-5AM	$5,000	$1,500	$6,500
	PRECAST CEILING	$13,005,765	$3,901,730	$16,907,495
	MAINTENANCE & PROTECTION OF TRAFFIC FOR FULL SHUTDOWN	$5,000	$1,500	$6,500
	PAINT CEILING	$1,847,000	$554,100	$2,401,100
	PARK ALLOWANCE- EXCLUDED	$0	$0	$0
	PERMANENT VENTILATION	$1,260,000	$378,000	$1,638,000
	REMOVE TEMPORARY VENTILLATION	$44,000	$13,200	$57,200
	PREPARE AREAS FOR FLOOD GATES	$81,000	$24,300	$105,300
	REMOVE MAINTENANCE & PROTECTION OF TRAFFIC OPEN TUNNEL	$5,000	$1,500	$6,500
	PUNCH LIST CEILING	$108,000	$32,400	$140,400
Flood Gates			**30%**	**$1,162,200**
	INSTALL FLOOD GATES	$855,000	$256,500	$1,111,500
	TEST FLOOD GATES	$12,000	$3,600	$15,600
	PUNCH LIST FLOOD GATES	$27,000	$8,100	$35,100
Pavement Replacement			**15%**	**$2,293,100**
	MILL PAVEMENT	$538,000	$80,700	$618,700
	PATCH CONCRETE	$807,000	$121,050	$928,050
	REPAVE SURFACE	$531,000	$79,650	$610,650
	LINE STRIPING	$50,000	$7,500	$57,500
	PUNCH LIST - PAVEMENT	$68,000	$10,200	$78,200

PENNDOT
PROJECT: I-376 "Bathtub" Renovation, Precast Trail Wall
PROJECT NO - 60620418
Project Phase: Conceptual Total Length: 2150 LF
Date Prepared: 7/2/2020
Estimate Summary Report Report r1

			Total Cost
Project Wide Costs			**$4,365,325**
North Bike Trail Wall			**$11,094,819**
South Bike Trail Wall			**$11,862,573**
Top Slab			**$5,044,013**
Pavement Replacement			**$230,000**
		Subtotal	$32,596,730
	Unallocated Contingency	10.00%	$3,259,673
		Subtotal	$35,856,403
	Escalation (Assumes a Midpoint of Construction of Summer 2023)	9.00%	$3,227,076.24
		Total Construction Cost	**$39,083,478.87**
	Assume low range estimate is 80% of the estimate above that applies full contingencies =		**$31,266,783.00**

PENNDOT
PROJECT: I-376 "Bathtub" Renovation, Precast Trail Wall
PROJECT NO - 60620418
Project Phase: Conceptual
Date Prepared: 7/2/2020
Estimate Summary Report Report r1

	Item	Total Cost	Allocated Contingency	Total Cost
Project Wide Costs			**5%**	**$4,365,325**
	GENERAL CONDITIONS	$4,157,452	$207,873	$4,365,325
North Wall			**30%**	**$11,094,819**
	NORTH WALL FOUNDATIONS	$2,002,736	$600,821	$2,603,557
	PRECAST NORTH WALL	$5,006,840	$1,502,052	$6,508,892
	SEAL NORTH WALL	$214,200	$64,260	$278,460
	DRAINAGE ALLOWANCE	$85,000	$25,500	$110,500
	NEW CONDUITS	$294,100	$88,230	$382,330
	ELECTRICAL JUNCTION BOXES	$289,000	$86,700	$375,700
	RUN PROPOSED UTILITIES INSIDE CONDUITS	$583,100	$174,930	$758,030
	REMOVE MAINTENANCE & PROTECTION OF TRAFFIC	$1,700	$510	$2,210
	PUNCH LIST - NORTH WALL	$57,800	$17,340	$75,140
South Wall			**30%**	**$11,862,573**
	SOUTH WALL FOUNDATIONS	$2,129,216	$638,765	$2,767,981
	SHEET PILING - ENTIRE LENGTH OF WALL, 60' DEEP, DECORATIVE FINISH - EXCLUDED	$0	$0	$0
	BOAT ACCESS	$637,500	$191,250	$828,750
	PRECAST SOUTH WALL	$5,006,840	$1,502,052	$6,508,892
	PATCH CONCRETE	$316,200	$94,860	$411,060
	SEAL SOUTH WALL	$881,450	$264,435	$1,145,885
	DRAINAGE ALLOWANCE	$85,000	$25,500	$110,500
	PUNCH LIST SOUTH WALL	$57,800	$17,340	$75,140
	INSTALL TEMPORARY LIGHTING	$11,050	$3,315	$14,365
Top Slab			**25%**	**$5,044,013**
	PRECAST TOP SLAB	$1,203,600	$361,080	$1,564,680
	BACKFILL	$609,167	$152,292	$761,458
	TRAIL/PARK ALLOWANCE - EXCLUDED	$0	$0	$0
	RAILINGS AT TRAIL	$382,500	$95,625	$478,125
	ADA RAMPS TO MON WARF PARKING	$1,700,000	$425,000	$2,125,000
	PUNCH LIST TOP SLAB	$91,800	$22,950	$114,750
Pavement Replacement			**15%**	**$230,000**
	PAVEMENT REPLACEMENT ALLOWANCE	$200,000	$30,000	$230,000

I-376 Bathtub Renovation, Raise Existing Floodwall, Alternate 1 Option 1

Estimated by	Shannon Landry, CEP, PSP, CCM, PMP
Designed by	
Prepared by	Shannon Landry
Preparation Date	7/6/2020
Effective Date of Pricing	7/6/2020
Estimated Construction Time	365 Days

Designed by

Estimated by
Shannon Landry, CEP, PSP, CCM, PMP
Prepared by
Shannon Landry

Design Document	
Document Date	7/6/2020
District	
Contact	Shannon Landry
Budget Year	2020
UOM System	Original

Direct Costs

LaborCost
EQCost
MatlCost
SubBidCost
UserCost1

Timeline/Currency

Preparation Date	7/6/2020
Escalation Date	7/6/2020
Eff. Pricing Date	7/6/2020
Estimated Duration	365 Day(s)
Currency	US dollars
Exchange Rate	1.000000

Costbook CB16EN: 2016 MII English Cost Book

Labor NLS2016: National Labor Library - Seattle 2016

Note: http://www.wdol.gov is the website for current Davis Bacon & Service Labor Rates. Fringes paid to the laborers are taxable. In a non-union job the whole fringes are taxable. In a union job, the vacation pay fringes are taxable.

Labor Rates

LaborCost1
LaborCost2
LaborCost3
LaborCost4

Equipment EP18R02: 2018_EP1110-1-8_Mii_Library_Region_02_R1

Region 02 - MIDEAST, (2018)

Sales Tax	5.90
Working Hours per Year	1,410
Labor Adjustment Factor	1.02
Cost of Money	3.50
Cost of Money Discount	25.00
Tire Recap Cost Factor	1.50
Tire Recap Wear Factor	1.80
Tire Repair Factor	0.15
Equipment Cost Factor	1.00
Standby Depreciation Factor	0.50

Fuel

Electricity	0.101
Gas	2.710
Diesel Off-Road	2.510
Diesel On-Road	3.020

Shipping Rates

Over 0 CWT	10.53
Over 240 CWT	7.72
Over 300 CWT	6.40
Over 400 CWT	5.57
Over 500 CWT	5.89
Over 700 CWT	5.89
Over 800 CWT	8.66

Labor ID: NLS2016 EQ ID: EP18R02 Currency in US dollars TRACES MII Version 4.4

Direct Cost Markups	**Category**	**Method**
Productivity	Productivity	Productivity
Overtime	Overtime	Overtime

	Days/Week	*Hours/Shift*	*Shifts/Day*	*1st Shift*	*2nd Shift*	*3rd Shift*
Standard	*5.00*	*8.00*	*1.00*	*8.00*	*0.00*	*0.00*
Actual	*5.00*	*8.00*	*1.00*	*8.00*	*0.00*	*0.00*

Day	*OT Factor*	*Working*	*OT Percent*	*FCCM Percent*
Monday	*1.50*	*Yes*	*0.00*	*0.00*
Tuesday	*1.50*	*Yes*		
Wednesday	*1.50*	*Yes*		
Thursday	*1.50*	*Yes*		
Friday	*1.50*	*Yes*		
Saturday	*1.50*	*No*		
Sunday	*2.00*	*No*		

Sales Tax	TaxAdj	Running % on Selected Costs
MatlCost		

Contractor Markups	**Category**	**Method**
JOOH (Small Tools)	Allowance	% of Labor
JOOH	JOOH	JOOH (Calculated)
HOOH	HOOH	Running %
Profit	Profit	Amount
Bond	Bond	Running %
Excise Tax	Excise	Running %

Owner Markups	**Category**	**Method**
Escalation	Escalation	Escalation

StartDate	*StartIndex*	*EndDate*	*EndIndex*	*Escalation*
7/6/2020	*920.40*	*6/1/2023*	*997.96*	*8.43*

Contingency	Contingency	Contract %
SIOH	SIOH	Running %

Currency in US dollars

Description	Quantity	UOM	CostToPrime	ContractCost	Contingency	ProjectCost
Project Cost Summary Report			**2,081,966**	**4,897,749**	**1,469,325**	**6,779,954**
Estimated Cost at Award	**816.00**	**LF**	*2,551.43* **2,081,966**	*6,002.14* **4,897,749**	**1,469,325**	*8,308.77* **6,779,954**
Contractor Mobilization	**1.00**	**LS**	**698,671**	**1,643,598**	**493,079**	**2,275,233**
RSM 015436501600 Mobilization or demobilization, delivery charge for equipment, hauled on 50-ton capacity towed trailer (Note: 8 Pieces Delivered For Mobilization; 8 Pieces Removed from Jobiste for Demobilization.)	14.00	EA	*2,543.93* 35,615	*5,984.51* 83,783	*30.00%* 25,135	*8,284.35* 115,981
RSM 015213200890 Modular office building, delivery, each way (Note: Project Duration of 11-months. Includes demob of office trailers and on-site storage.)	6.00	EA	*2,000.00* 12,000	*4,704.93* 28,230	*30.00%* 8,469	*6,513.03* 39,078
RSM 015113500890 Temporary electrical power equipment (pro-rated per job), connections, office trailer, 200 amp	1.00	EA	*11,293.25* 11,293	*26,566.96* 26,567	*30.00%* 7,970	*36,776.64* 36,777
RSM 015113500040 Temporary electrical power equipment (pro-rated per job), overhead feed, 3 uses, 200 amp	1.00	EA	*11,293.25* 11,293	*26,566.96* 26,567	*30.00%* 7,970	*36,776.64* 36,777
GEN G10Z3060 GENERATOR SET, SKID MOUNTED, 275 KW, 240/480V, 60HZ	4,608.00	HR	*56.41* 259,930	*132.70* 611,475	*30.00%* 183,442	*183.69* 846,464
GEN L40Z4600 LOADER, FRONT END, WHEEL, SKID-STEER, 9-11 CF (0.2-0.3 M3), 60" (1.5 M) BUCKET {BOBCAT}, 13 CWT (590 KG)	4,608.00	HR	*12.49* 57,572	*29.39* 135,435	*30.00%* 40,631	*40.69* 187,483
NLU 013113200880 Field Personnel, motor pools equipment operator (Note: Unit total represents two operators.)	24.00	MO	*12,957.02* 310,968	*30,480.91* 731,542	*30.00%* 219,463	*42,194.72* 1,012,673
Floodwall Demolition	**237.00**	**CY**	*1,806.60* **428,164**	*4,249.96* **1,007,241**	**302,172**	*5,883.22* **1,394,324**
HNC 024113302345 Minor site demolition, concrete, rod reinforcing, to 6" thick, with hand held air equipment, sweep and remove, excludes hauling	6,491.28	SF	*57.45* 372,929	*135.15* 877,301	*30.00%* 263,190	*187.09* 1,214,448
RSM 312323201106 Cycle hauling(wait, load, travel, unload or dump & return) time per cycle, excavated or borrow, loose cubic yards, 15 min load/wait/unload, 12 C.Y. truck, cycle 10 miles, 50 MPH, excludes loading equipment	308.10	LCY	*63.99* 19,716	*150.54* 46,381	*30.00%* 13,914	*208.39* 64,205
RSM 024119200100 Selective demolition, dump charges, typical urban city, building construction materials, includes tipping fees only	480.00	TON	*74.00* 35,520	*174.08* 83,559	*30.00%* 25,068	*240.98* 115,671
Pavement Demolition I-376	**187.00**	**CY**	*297.89* **55,706**	*700.78* **131,045**	**39,314**	*970.08* **181,406**
RSM 024113175500 Demolish, remove pavement & curb, concrete, rod reinforced, 7" to 24" thick, remove with backhoe, excludes hauling	187.00	CY	*142.22* 26,595	*334.56* 62,563	*30.00%* 18,769	*463.13* 86,606
RSM 312323201106 Cycle hauling(wait, load, travel, unload or dump & return) time per cycle, excavated or borrow, loose cubic yards, 15 min load/wait/unload, 12 C.Y. truck, cycle 10 miles, 50 MPH, excludes loading equipment	243.10	LCY	*4.48* 1,089	*10.54* 2,562	*30.00%* 769	*14.59* 3,546
RSM 024119200100 Selective demolition, dump charges, typical urban city, building construction materials, includes tipping fees only	378.68	TON	*74.00* 28,022	*174.08* 65,921	*30.00%* 19,776	*240.98* 91,254
Floodwall Construction	**816.00**	**LF**	*917.00* **748,274**	*2,157.22* **1,760,288**	**528,086**	*2,986.23* **2,436,766**
RSM 040519260060 Masonry reinforcing bars, #5 and #6 reinforcing steel bars, placed vertically, ASTM A615	81,900.00	LB	*2.52* 206,013	*5.92* 484,639	*30.00%* 145,392	*8.19* 670,885
RSM 038213100100 Concrete core drilling, core, reinforced concrete slab, 1" diameter, up to 6" thick slab, includes bit cost, layout and set up time	510.00	EA	*142.03* 72,437	*334.13* 170,404	*30.00%* 51,121	*462.53* 235,891
RSM 038213100150 Concrete core drilling, core, reinforced concrete slab, 1" diameter, up to 6" thick slab, includes bit cost, layout and set up time, for each additional inch of slab thickness in same hole, add	4,080.00	EA	*1.70* 6,955	*4.01* 16,361	*30.00%* 4,908	*5.55* 22,649

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Description	Quantity	UOM	CostToPrime	ContractCost	Contingency	ProjectCost
			435.00	*1,023.32*	*30.00%*	*1,416.58*
RSM 032116100100 Epoxy coating, for reinforcing steel, add to plain steel rebar pricing for epoxy-coated rebar	40.95	TON	17,813	41,905	12,572	58,009
			113.00	*265.83*	*30.00%*	*367.99*
RSM 033113350300 Structural concrete, ready mix, heavyweight, 4000 psi, includes local aggregate, sand, Portland cement (Type I) and water, delivered, excludes all additives and treatments	468.00	CY	52,884	124,408	37,322	172,218
			16.64	*39.15*	*30.00%*	*54.20*
RSM 031113859260 C.I.P. concrete forms, walls, steel framed plywood, over 8' to 16' high, based on 50 uses of purchased forms, 4 uses of bracing lumber, includes erecting, bracing, stripping and cleaning	17,602.00	SFC	292,951	689,156	206,747	953,998
			241.85	*568.94*	*30.00%*	*787.58*
GEN C55Z1960 CONCRETE PUMP, PUMP & BOOM, 117 CY/HR (89 M3/HR), 75' (23 M) BOOM, TRUCK MOUNTED	376.00	HR	90,935	213,922	64,176	296,132
			0.47	*1.09*	*30.00%*	*1.52*
NLU 099113660900 Paints & Coatings, vertical surfaces, application only, form poured concrete wall, 1 coat, spray	17,804.00	SF	8,286	19,494	5,848	26,985
(Note: Material Cost last updated 1 Jan 2010.)						
			413.00	*971.56*		*1,344.94*
Pavement Replacement I-376	**187.00**	**CY**	**77,231**	**181,682**	**54,505**	**251,503**
			113.00	*265.83*	*30.00%*	*367.99*
RSM 033113350300 Structural concrete, ready mix, heavyweight, 4000 psi, includes local aggregate, sand, Portland cement (Type I) and water, delivered, excludes all additives and treatments	187.00	CY	21,131	49,710	14,913	68,813
			5.81	*13.67*	*30.00%*	*18.93*
RSM 031113653050 C.I.P. concrete forms, slab on grade, edge, wood, 7" to 12" high, 4 use, includes erecting, bracing, stripping and cleaning	813.75	SFC	4,730	11,127	3,338	15,402
			2,103.88	*4,949.30*	*30.00%*	*6,851.32*
RSM 032111600250 Reinforcing steel, in place, columns, #8 to #18, A615, grade 60, incl labor for accessories, excl material for accessories	7.48	TON	15,737	37,021	11,106	51,248
			20.77	*48.87*	*30.00%*	*67.65*
HNC 033113701200 Structural concrete, placing, duct bank, direct chute, includes vibrating, excludes material	187.00	CY	3,885	9,139	2,742	12,650
			6.75	*15.89*	*30.00%*	*22.00*
RSM 321313054200 Slip form cement concrete pavement, airports, expansion joint, keyed cold joint, 24 gauge, 12 inch high, includes stakes	2,332.75	LF	15,758	37,069	11,121	51,315
			6.31	*14.85*	*30.00%*	*20.56*
HNC 320113643500 Sealing, roads, resealing joints in concrete	2,332.75	LF	14,730	34,653	10,396	47,970
			0.58	*1.37*	*30.00%*	*1.89*
RSM 321723130200 Painted pavement markings, acrylic waterborne, white or yellow, 6" wide, less than 3000 LF	2,170.00	LF	1,260	2,965	889	4,104
Drainage Allowance	**1.00**	**LS**	**73,920**	**173,894**	**52,168**	**240,722**
			1,540.00	*3,622.79*	*30.00%*	*5,015.03*
HTW 026219116514 Contaminated groundwater recovery, product recovery pump, controls, pneumatic, shallow depths (<=20'), monthly rental	48.00	MO	73,920	173,894	52,168	240,722
(Note: Assumes one recovery system per reconstruction area.)						

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Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	C/O
Job Office Overhead Direct Cost Report									
AA Prime Contractor									
02 AA OVERHEAD ITEMS	**1.00**	**MO**	*1,330,764.90* **1,330,765**	*201,799.86* **201,800**	*167,227.51* **167,228**	*127,272.70* **127,273**	**59,328**	*1,886,392.97* **1,886,393**	
USR AAST Small Tools	1.00	EA	*0.00* 0	*27,114.64* 27,115	*0.00* 0	*0.00* 0	0	*27,114.64* 27,115	
02 0AA JOB OFFICE OVERHEAD	**1.00**	**MO**	*1,330,764.90* **1,330,765**	*174,685.22* **174,685**	*167,227.51* **167,228**	*127,272.70* **127,273**	**59,328**	*1,859,278.33* **1,859,278**	
02 0AA A SUPERVISION AND MANAGEMENT	**1.00**	**MO**	*449,813.29* **449,813**	*26,045.62* **26,046**	*0.00* **0**	*1,000.00* **1,000**	**0**	*476,858.91* **476,859**	
(Note: Includes all top field management personnel, superintendents and non-working foremen, and their subsistence, travel, vehicles, supplies and miscellaneous. *)**									
020AAAa Supervision Personnel	**1.00**	**EA**	*449,813.29* **449,813**	*0.00* **0**	*0.00* **0**	*0.00* **0**	**0**	*449,813.29* **449,813**	
HNC 013113200320 Carpenter superintendent	12.00	MO	*12,228.28* 146,739	*0.00* 0	*0.00* 0	*0.00* 0	0	*12,228.28* 146,739	
HNC 013113200300 General superintendent	12.00	MO	*12,479.09* 149,749	*0.00* 0	*0.00* 0	*0.00* 0	0	*12,479.09* 149,749	
FOP FA-PROJM Project Managers	12.00	MO	*12,777.06* 153,325	*0.00* 0	*0.00* 0	*0.00* 0	0	*12,777.06* 153,325	
(Note: Used http://swz.salary.com/salarywizard/ and assumed median percentile of a Project Manager - Construction for Project Manager. Also assumed 30% of salary = full fringe As of March 14, 2012)									
020AAAb Management Vehicles	**1.00**	**EA**	*0.00* **0**	*26,045.62* **26,046**	*0.00* **0**	*0.00* **0**	**0**	*26,045.62* **26,046**	
USR 015251111 Sedan/C-Pickup (Monthly Cost) Assume 2/3-time Standby	6.00	MO	*0.00* 0	*1,381.53* 8,289	*0.00* 0	*0.00* 0	0	*1,381.53* 8,289	
USR 015251112 4x2 3/4T Pickup (Monthly Cost) Assume 2/3-time Standby	12.00	MO	*0.00* 0	*1,479.70* 17,756	*0.00* 0	*0.00* 0	0	*1,479.70* 17,756	
020AAAc Management Subsistance and Travel	**1.00**	**EA**	*0.00* **0**	*0.00* **0**	*0.00* **0**	*1,000.00* **1,000**	**0**	*1,000.00* **1,000**	
USR DS-2 Home Office Execs Travel to Job	2.00	EA	*0.00* 0	*0.00* 0	*0.00* 0	*500.00* 1,000	0	*500.00* 1,000	
02 0AA B ADMINISTRATION JOB OFFICE	**1.00**	**MO**	*88,906.80* **88,907**	*16,578.36* **16,578**	*8,868.00* **8,868**	*1,500.00* **1,500**	**1,200**	*117,053.16* **117,053**	
(Note: Includes the field office and all field administrating, accounting purchasing inventory, security, and personnel. Also their subsistence and travel, offices, vehicles, supplies and miscellaneous items to run the field office are included here. See item {C} for warehouse and warehouse personnel. *)**									
020AABa Field Office Administration Personnel	**1.00**	**EA**	*88,906.80* **88,907**	*16,578.36* **16,578**	*0.00* **0**	*0.00* **0**	**0**	*105,485.16* **105,485**	
HNC 013113200350 Field Personnel, contract administrator	12.00	MO	*7,408.90* 88,907	*0.00* 0	*0.00* 0	*0.00* 0	0	*7,408.90* 88,907	
USR 015251111 Sedan/Pickup (Monthly Cost) Assume 2/3-time Standby	12.00	MO	*0.00* 0	*1,381.53* 16,578	*0.00* 0	*0.00* 0	0	*1,381.53* 16,578	
020AABb Field Office Building & Supplies	**1.00**	**EA**	*0.00* **0**	*0.00* **0**	*8,868.00* **8,868**	*1,200.00* **1,200**	**1,200**	*11,268.00* **11,268**	
USR FOF-1 Office Equipment & Furniture	12.00	MO	*0.00* 0	*0.00* 0	*0.00* 0	*0.00* 0	1,200	*100.00* 1,200	
USR FOF-2 Office - Supplies Assume 5% of Office Labor costs.	12.00	MO	*0.00* 0	*0.00* 0	*500.00* 6,000	*0.00* 0	0	*500.00* 6,000	

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Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	C/O
			0.00	*0.00*	*239.00*	*0.00*		*239.00*	
RSM 015213200350 Office Trailer, furnished, rent per month, 32' x 8', excl. hookups	12.00	EA	0	0	2,868	0	0	2,868	
			0.00	*0.00*	*0.00*	*100.00*		*100.00*	
USR MS-1 Mailing, Shipping Drawing and Submittal cost	12.00	EA	0	0	0	1,200	0	1,200	
			0.00	*0.00*	*0.00*	*300.00*		*300.00*	
020AABf Field Office Utility Installation	**1.00**	**EA**	**0**	**0**	**0**	**300**	**0**	**300**	
			0.00	*0.00*	*0.00*	*100.00*		*100.00*	
USR INS-2 Install Electrical	1.00	EA	0	0	0	100	0	100	
			0.00	*0.00*	*0.00*	*100.00*		*100.00*	
USR INS-3 Install Sewer	1.00	EA	0	0	0	100	0	100	
			0.00	*0.00*	*0.00*	*100.00*		*100.00*	
USR INS-4 Install Water	1.00	EA	0	0	0	100	0	100	
			97,796.99	*22,053.76*	*0.00*	*0.00*		*132,450.75*	
02 0AA D ENGINEERING AND SURVEYING	**1.00**	**MO**	**97,797**	**22,054**	**0**	**0**	**12,600**	**132,451**	
(Note: Includes all engineering, drafting, scheduling, surveying and change order personnel. Also includes their subsistence and travel, vehicles, miscellaneous computer expenses, shop drawings, submittals and CPM-schedules, O&M manuals, and miscellaneous items. *)**									
			0.00	*0.00*	*0.00*	*0.00*		*12,600.00*	
020AADb Scheduling & Change Order Personnel	**1.00**	**EA**	**0**	**0**	**0**	**0**	**12,600**	**12,600**	
			0.00	*0.00*	*0.00*	*0.00*		*800.00*	
USR CPM-1 CPM Schedule Monthly Updates	12.00	MO	0	0	0	0	9,600	9,600	
USR CPM-2 CPM Computer Schedule Develop	1.00	LS	0	0	0	0	3,000	3,000	
			97,796.99	*22,053.76*	*0.00*	*0.00*		*119,850.75*	
020AADc Field Surveying	**1.00**	**EA**	**97,797**	**22,054**	**0**	**0**	**0**	**119,851**	
			8,149.75	*0.00*	*0.00*	*0.00*		*8,149.75*	
FOP FC-SURYR Surveyors	12.00	MO	97,797	0	0	0	0	97,797	
(Note: Assumed a Occupation Code of #99659 Survey Technician As of March 29, 2012)									
			0.00	*1,670.74*	*0.00*	*0.00*		*1,670.74*	
USR 015251115 4x2 Suburban (Monthly Cost) Assume 2/3-time Standby	6.00	MO	0	10,024	0	0	0	10,024	
			0.00	*1,002.44*	*0.00*	*0.00*		*1,002.44*	
USR 53 Survey Supplies & Equipment Cost Assume 10% of Labor cost.	12.00	MO	0	12,029	0	0	0	12,029	
			164,620.65	*0.00*	*4,756.00*	*99,121.30*		*288,997.95*	
02 0AA E QUALITY CONTROL AND TESTING	**1.00**	**MO**	**164,621**	**0**	**4,756**	**99,121**	**20,500**	**288,998**	
(Note: Includes personnel, vehicles, equipment, and supplies to produce all QC reports, QC inspections, and all other contract quality requirements. Also includes their subsistence and travel, vehicles, supplies and miscellaneous items. *)**									
			161,819.88	*0.00*	*0.00*	*0.00*		*164,319.88*	
020AAEa Quality Control Management	**1.00**	**EA**	**161,820**	**0**	**0**	**0**	**2,500**	**164,320**	
			13,484.99	*0.00*	*0.00*	*0.00*		*13,484.99*	
FOP FC-ENGQC Engineers, Quality Control	12.00	MO	161,820	0	0	0	0	161,820	
(Note: Assumed a Occupation Code of #29086 Engineer Technician III 100% allocation to job duration.)									
			0.00	*0.00*	*0.00*	*0.00*		*1,500.00*	
USR PSL Prepare Submittal List	1.00	EA	0	0	0	0	1,500	1,500	
			0.00	*0.00*	*0.00*	*0.00*		*1,000.00*	
USR PQC Prepare QC Plan	1.00	EA	0	0	0	0	1,000	1,000	
			2,800.77	*0.00*	*4,320.00*	*0.00*		*22,720.77*	
020AAEd Off-Site Testing	**1.00**	**EA**	**2,801**	**0**	**4,320**	**0**	**15,600**	**22,721**	
			700.19	*0.00*	*120.00*	*0.00*		*820.19*	
USR 013404112 Union Welder Cert., 2 Positions Cost range between $60 & $300	4.00	EA	2,801	0	480	0	0	3,281	
(Note: because of welding requirements& number of positions.)									

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Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	C/O
			0.00	*0.00*	*50.00*	*0.00*		*50.00*	
USR OST-14 Weld Inspection - Visual, Steel outside lab testing fee	24.00	HR	0	0	1,200	0	0	1,200	
			0.00	*0.00*	*550.00*	*0.00*		*550.00*	
USR OST-2 Asphaltic Concrete Mix Design, Hveem or Marshall Method -	3.00	EA	0	0	1,650	0	0	1,650	
(Note: Aggr. Test NOT included, ASTMD1560, D1561 & D1559, Asphalticoutside lab testing fee)									
			0.00	*0.00*	*10.00*	*0.00*		*10.00*	
USR OST-3 Compressive Strength, Cylinder 6x12, ASTM C39, Molds included,	18.00	EA	0	0	180	0	0	180	
(Note: Concrete outside lab testing fee)									
			0.00	*0.00*	*270.00*	*0.00*		*270.00*	
USR OST-5 Concrete Mix Design (Compressive Strength), Aggr Tests NOT	3.00	EA	0	0	810	0	0	810	
(Note: included, Concrete outside labtesting fee)									
USR OST-6 Concrete testing	10.00	LS	0	0	0	0	15,000	15,000	
USR OST-7 Gradation Tests	2.00	LS	0	0	0	0	600	600	
			0.00	*0.00*	*436.00*	*99,121.30*		*101,957.30*	
020AAEe Project Monitoring	**1.00**	**EA**	**0**	**0**	**436**	**99,121**	**2,400**	**101,957**	
			0.00	*0.00*	*0.00*	*12.13*		*12.13*	
HTW 019413301111 Project Photo Documentation, photographs processing, color, 24 count, 3-1/2" x 5", includes film	10.00	EA	0	0	0	121	0	121	
			0.00	*0.00*	*436.00*	*0.00*		*436.00*	
HTW 029110104211 Meteorological monitoring stations, purchase, 5 weather readings, 11" x 17"	1.00	EA	0	0	436	0	0	436	
			0.00	*0.00*	*0.00*	*0.00*		*200.00*	
USR 01-Phot Photography Misc. Supplies	12.00	MO	0	0	0	0	2,400	2,400	
			0.00	*0.00*	*0.00*	*450.00*		*450.00*	
RSM 014523505900 Vibration monitoring, seismograph and technician	220.00	DAY	0	0	0	99,000	0	99,000	
			501,759.66	*81,584.61*	*134,623.51*	*1,059.40*		*739,055.18*	
02 0AA F SAFETY, TRAFFIC CONTROL, FIRST AID, FIRE	**1.00**	**MO**	**501,760**	**81,585**	**134,624**	**1,059**	**20,028**	**739,055**	
(Note: Safety, Traffic Control, First Aid, and Fire Prevention. Includes all personnel, supplies and vehicles needed for safety, traffic control, first aid, safety training and fire prevention. Also includes their subsistence and travel, vehicles, supplies and miscellaneous items will be allocated to the job. Assumes safety Engineer allocation at 50% of job duration.)									
			157,036.91	*8,878.22*	*450.00*	*0.00*		*168,265.12*	
020AAFa Safety Management	**1.00**	**EA**	**157,037**	**8,878**	**450**	**0**	**1,900**	**168,265**	
			0.00	*0.00*	*0.00*	*0.00*		*400.00*	
USR SM-1 Prepare Drug Free Plan	1.00	EA	0	0	0	0	400	400	
			0.00	*0.00*	*0.00*	*0.00*		*1,000.00*	
USR SM-2 Prepare Hazard Analysis Plan	1.00	EA	0	0	0	0	1,000	1,000	
			0.00	*0.00*	*0.00*	*0.00*		*500.00*	
USR SM-3 Prepare Safety Plan	1.00	EA	0	0	0	0	500	500	
			0.00	*1,479.70*	*0.00*	*0.00*		*1,479.70*	
USR 015251112 4x2 3/4T Pickup (Monthly Cost) Assume 2/3-time Standby	6.00	MO	0	8,878	0	0	0	8,878	
			75.28	*0.00*	*75.00*	*0.00*		*150.28*	
USR SM-4 Safety Engineer's Supplies Assume 2% of Labor cost.	6.00	MO	452	0	450	0	0	902	
			13,048.77	*0.00*	*0.00*	*0.00*		*13,048.77*	
FOP FD-SAENG Safety Engineers	12.00	MO	156,585	0	0	0	0	156,585	
(Note: Assumed a Occupation Code of #29086 Engineer Technician III 30083 As of March 29, 2012)									
			0.00	*0.00*	*1,339.20*	*0.00*		*1,339.20*	
020AAFb Field First Aid	**1.00**	**EA**	**0**	**0**	**1,339**	**0**	**0**	**1,339**	
			0.00	*0.00*	*54.56*	*0.00*		*54.56*	
HTW 019413201503 First aid kits, 30 ingredients	4.00	EA	0	0	218	0	0	218	

Currency in US dollars

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	C/O
			0.00	*0.00*	*280.24*	*0.00*		*280.24*	
HTW 019413201107 Eye and body wash stations, portable eye wash station, 6 gallon	4.00	EA	0	0	1,121	0	0	1,121	
			0.00	*0.00*	*0.00*	*1,059.40*		*1,059.40*	
020AAFd Safety Training	**1.00**	**EA**	**0**	**0**	**0**	**1,059**	**0**	**1,059**	
			0.00	*0.00*	*0.00*	*52.97*		*52.97*	
HTW 019413206101 Personnel Training, off-site, refresher course, 8 hours, cost per student	20.00	EA	0	0	0	1,059	0	1,059	
			0.00	*0.00*	*2,260.56*	*0.00*		*2,260.56*	
020AAFg Field Fire Protection	**1.00**	**EA**	**0**	**0**	**2,261**	**0**	**0**	**2,261**	
			0.00	*0.00*	*282.57*	*0.00*		*282.57*	
HTW 019413201202 Fire extinguisher, CO2, 10 lb	8.00	EA	0	0	2,261	0	0	2,261	
(Note: Assumes two per work area.)									
020AAFi Traffic Control	**1.00**	**LS**	**344,723**	**72,706**	**130,574**	**0**	**18,128**	**566,131**	
			999.04	*0.00*	*0.00*	*0.00*		*999.04*	
USR 015702112 Two Flagman Crew	150.00	DAY	149,855	0	0	0	0	149,855	
			62.44	*0.00*	*52.00*	*0.00*		*114.44*	
HNC 101453200560 Signs, stock, reflectorized, UTMCD standard, warning sign, 24" x 24", with posts	80.00	EA	4,995	0	4,160	0	0	9,155	
			0.00	*1.78*	*0.00*	*0.00*		*1.78*	
EP TC-6 Flashing Arrows, 25 Lamps, TRLR Solar Panels w/ Battery Charger	4,334.00	HR	0	7,699	0	0	0	7,699	
(Note: Quantity reflects 6 months of 24 hour usage. Based on 4.3 weeks in a month.)									
			0.00	*5.03*	*0.00*	*0.00*		*5.03*	
EP TC-5 Lite Set, 4L/1000W, 6KW-GEN,TRLR	8,668.80	HR	0	43,615	0	0	0	43,615	
			0.00	*0.00*	*70.00*	*0.00*		*70.00*	
USR TC-4 Median Warning Sign Reflective Sheeting w/ stand	16.00	EA	0	0	1,120	0	0	1,120	
			0.00	*0.00*	*44.00*	*0.00*		*52.00*	
USR TC-1 Type 2 w/ Two Striped Boards 24"Long A-Frame, Traffic Barrier	16.00	EA	0	0	704	0	128	832	
			0.00	*0.00*	*30.00*	*0.00*		*75.00*	
USR TC-2 Safety Barrels / Cones to 36" Tall Traffic Barriers	400.00	EA	0	0	12,000	0	18,000	30,000	
(Note: assumes some will be replaced during the course of construction.)									
RSM 344113101410 Control Plan Design	1.00	LS	18,578	2,169	20,400	0	0	41,147	
(Note: Traffic Controls)									
			6.30	*0.79*	*32.50*	*0.00*		*39.59*	
HNC 015623100200 Barricades, precast concrete barrier walls, stock units, buy, 10' sections	150.00	LF	945	119	4,875	0	0	5,939	
			37.06	*0.00*	*5.00*	*0.00*		*42.06*	
RSM 015623100150 Barricades, wood, movable, 3 rail, 5' high, 3 rail @ 2" x 8", movable	16.00	LF	593	0	80	0	0	673	
			133.30	*15.00*	*68.50*	*0.00*		*216.80*	
RSM 323236104500 Gabion retaining walls, stone filled gabions, stone delivered, galvanized, highway surcharge, 3' wide, 6' long, 3'-0" high, excludes excavation	1,273.50	LF	169,756	19,104	87,235	0	0	276,095	
(Note: Assumed to be for flood protection / permanent lane shift during construction.)									
			0.00	*0.00*	*1,980.00*	*20,592.00*		*22,572.00*	
02 0AA G SANITATION FAC & TEMP BLDGS	**1.00**	**MO**	**0**	**0**	**1,980**	**20,592**	**0**	**22,572**	
(Note: Includes sanitation facilities, misc. buildings, yards, and building costs not otherwise classified. But it does not include all utilities costs. *)**									
			0.00	*0.00*	*0.00*	*20,592.00*		*20,592.00*	
020AAGa Sanitation Facilities	**1.00**	**EA**	**0**	**0**	**0**	**20,592**	**0**	**20,592**	
			0.00	*0.00*	*0.00*	*99.00*		*99.00*	
HNC 224213406000 Water closet, chemical portable toilet, per week, note: (40 hours) per 10 people, per OSHA	208.00	WK	0	0	0	20,592	0	20,592	
(Note: Assumes one per work area.)									
			0.00	*0.00*	*1,980.00*	*0.00*		*1,980.00*	

Currency in US dollars

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	C/O
020AAGb Temporary Buildings	**1.00**	**EA**	**0**	**0**	**1,980**	**0**	**0**	**1,980**	
			0.00	*0.00*	*82.50*	*0.00*		*82.50*	
RSM 015213201250 Storage Boxes, rent per month, 20' x 8'	24.00	EA	0	0	1,980	0	0	1,980	
(Note: Assumes rental of two storage box.)									
			24,604.77	*28,422.87*	*0.00*	*0.00*		*53,027.64*	
02 0AA H GENERAL EQUIPMENT EXPENSES	**1.00**	**MO**	**24,605**	**28,423**	**0**	**0**	**0**	**53,028**	
(Note: Includes equipment not required by specific work items. Also includes testing and rental of equipment when not charged to a specific bid item or items of work. Inspection fees and permits are included in mob and demob items. ***)**									
			0.00	*0.00*	*0.00*	*0.00*		*0.00*	
020AAHa Hook Services	**1.00**	**EA**	**0**	**0**	**0**	**0**	**0**	**0**	
			0.00	*0.00*	*0.00*	*0.00*		*0.00*	
GEN C80Z2240 CRANE, HYDRAULIC, TRUCK MOUNTED, 14 TON (12.7 MT), 80' (24.4 M) BOOM, 6X4	0.00	HR	0	0	0	0	0	0	
			1,785.74	*480.55*	*0.00*	*0.00*		*2,266.29*	
020AAHb Crane Testing	**1.00**	**EA**	**1,786**	**481**	**0**	**0**	**0**	**2,266**	
			446.44	*120.14*	*0.00*	*0.00*		*566.57*	
USR 015252122 Crane Testing - 26 to 50 tons Allow two hours per test.	4.00	EA	1,786	481	0	0	0	2,266	
			22,819.03	*27,942.32*	*0.00*	*0.00*		*50,761.35*	
020AAHc Misc. Vehicles & Equipment	**1.00**	**EA**	**22,819**	**27,942**	**0**	**0**	**0**	**50,761**	
			2,535.45	*3,104.70*	*0.00*	*0.00*		*5,640.15*	
USR 015251123 Water Truck w/1/4 Oper,3,000 Gal Assumed 3/4-time Standby	9.00	MO	22,819	27,942	0	0	0	50,761	
			3,262.74	*0.00*	*17,000.00*	*4,000.00*		*29,262.74*	
02 0AA I PROJECT UTILITIES SITE & CLEANUP	**1.00**	**MO**	**3,263**	**0**	**17,000**	**4,000**	**5,000**	**29,263**	
(Note: Includes all project costs not otherwise classified. *)**									
			3,262.74	*0.00*	*0.00*	*0.00*		*3,262.74*	
020AAIa Site Cleanup	**1.00**	**EA**	**3,263**	**0**	**0**	**0**	**0**	**3,263**	
			81.57	*0.00*	*0.00*	*0.00*		*81.57*	
USR 83 Final Site Cleanup	40.00	HR	3,263	0	0	0	0	3,263	
020AAIb Misc Project Expenses	**1.00**	**LS**	**0**	**0**	**17,000**	**0**	**5,000**	**22,000**	
USR MPE-2 Protect Existing Property	5.00	LS	0	0	0	0	5,000	5,000	
			0.00	*0.00*	*34.00*	*0.00*		*34.00*	
RSM 015813500020 Project Signs, sign, high intensity reflectorized, buy, excl. posts	500.00	SF	0	0	17,000	0	0	17,000	
			0.00	*0.00*	*0.00*	*4,000.00*		*4,000.00*	
020AAIc Site Utility Usage Fees	**1.00**	**EA**	**0**	**0**	**0**	**4,000**	**0**	**4,000**	
			0.00	*0.00*	*0.00*	*1,000.00*		*1,000.00*	
USR SUF-1 Site UtilityUsageTelephone	1.00	EA	0	0	0	1,000	0	1,000	
			0.00	*0.00*	*0.00*	*1,000.00*		*1,000.00*	
USR SUF-2 Site Utility Usage Electrical	2.00	EA	0	0	0	2,000	0	2,000	
			0.00	*0.00*	*0.00*	*1,000.00*		*1,000.00*	
USR SUF-4 Site Utility Usage Water	1.00	EA	0	0	0	1,000	0	1,000	

Currency in US dollars

I-376 Bathtub Renovation, Raise Existing Floodwall, Alternate 1 Option 2

Estimated by	Shannon Landry, CEP, PSP, CCM, PMP
Designed by	
Prepared by	Shannon Landry
Preparation Date	7/6/2020
Effective Date of Pricing	7/6/2020
Estimated Construction Time	301 Days

Designed by

Estimated by
Shannon Landry, CEP, PSP, CCM, PMP
Prepared by
Shannon Landry

Design Document	
Document Date	7/6/2020
District	
Contact	Shannon Landry
Budget Year	2020
UOM System	Original

Direct Costs

LaborCost
EQCost
MatlCost
SubBidCost
UserCost1

Timeline/Currency

Preparation Date	7/6/2020
Escalation Date	7/6/2020
Eff. Pricing Date	7/6/2020
Estimated Duration	301 Day(s)
Currency	US dollars
Exchange Rate	1.000000

Costbook CB16EN: 2016 MII English Cost Book

Labor NLS2016: National Labor Library - Seattle 2016

Note: http://www.wdol.gov is the website for current Davis Bacon & Service Labor Rates. Fringes paid to the laborers are taxable. In a non-union job the whole fringes are taxable. In a union job, the vacation pay fringes are taxable.

Labor Rates

LaborCost1
LaborCost2
LaborCost3
LaborCost4

Equipment EP18R02: 2018_EP1110-1-8_Mii_Library_Region_02_R1

Region 02 - MIDEAST, (2018)

Sales Tax	5.90
Working Hours per Year	1,410
Labor Adjustment Factor	1.02
Cost of Money	3.50
Cost of Money Discount	25.00
Tire Recap Cost Factor	1.50
Tire Recap Wear Factor	1.80
Tire Repair Factor	0.15
Equipment Cost Factor	1.00
Standby Depreciation Factor	0.50

Fuel

Electricity	0.101
Gas	2.710
Diesel Off-Road	2.510
Diesel On-Road	3.020

Shipping Rates

Over 0 CWT	10.53
Over 240 CWT	7.72
Over 300 CWT	6.40
Over 400 CWT	5.57
Over 500 CWT	5.89
Over 700 CWT	5.89
Over 800 CWT	8.66

Labor ID: NLS2016 EQ ID: EP18R02 Currency in US dollars TRACES MII Version 4.4

Direct Cost Markups	Category	Method
Productivity	Productivity	Productivity
Overtime	Overtime	Overtime

	Days/Week	Hours/Shift	Shifts/Day	1st Shift	2nd Shift	3rd Shift
Standard	*5.00*	*8.00*	*1.00*	*8.00*	*0.00*	*0.00*
Actual	*5.00*	*8.00*	*1.00*	*8.00*	*0.00*	*0.00*

Day	OT Factor	Working	OT Percent	FCCM Percent
Monday	*1.50*	*Yes*	*0.00*	*0.00*
Tuesday	*1.50*	*Yes*		
Wednesday	*1.50*	*Yes*		
Thursday	*1.50*	*Yes*		
Friday	*1.50*	*Yes*		
Saturday	*1.50*	*No*		
Sunday	*2.00*	*No*		

Sales Tax	TaxAdj	Running % on Selected Costs
MatlCost		

Contractor Markups	Category	Method
JOOH (Small Tools)	Allowance	% of Labor
JOOH	JOOH	JOOH (Calculated)
HOOH	HOOH	Running %
Profit	Profit	Amount
Bond	Bond	Running %
Excise Tax	Excise	Running %

Owner Markups	Category	Method
Escalation	Escalation	Escalation

StartDate	StartIndex	EndDate	EndIndex	Escalation
7/6/2020	*920.40*	*6/1/2023*	*997.96*	*8.43*

Contingency	Contingency	Contract %
SIOH	SIOH	Running %

Currency in US dollars

Description	Quantity	UOM	CostToPrime	ContractCost	Contingency	ProjectCost
Project Cost Summary Report			**1,684,404**	**4,251,549**	**1,275,465**	**5,885,419**
			2,603.41	*6,571.17*		*9,096.48*
Estimated Cost at Award	**647.00**	**LF**	**1,684,404**	**4,251,549**	**1,275,465**	**5,885,419**
Contractor Mobilization	**1.00**	**LS**	**578,227**	**1,459,485**	**437,846**	**2,020,365**
			2,543.93	*6,421.06*	*30.00%*	*8,888.67*
RSM 015436501600 Mobilization or demobilization, delivery charge for equipment, hauled on 50-ton capacity towed trailer	12.00	EA	30,527	77,053	23,116	106,664
(Note: 6 Pieces Delivered For Mobilization; 6 Pieces Removed from Jobiste for Demobilization.)						
			2,000.00	*5,048.14*	*30.00%*	*6,988.13*
RSM 015213200890 Modular office building, delivery, each way	6.00	EA	12,000	30,289	9,087	41,929
(Note: Project Duration of 11-months. Includes demob of office trailers and on-site storage.)						
			11,293.25	*28,504.93*	*30.00%*	*39,459.37*
RSM 015113500890 Temporary electrical power equipment (pro-rated per job), connections, office trailer, 200 amp	1.00	EA	11,293	28,505	8,551	39,459
			11,293.25	*28,504.93*	*30.00%*	*39,459.37*
RSM 015113500040 Temporary electrical power equipment (pro-rated per job), overhead feed, 3 uses, 200 amp	1.00	EA	11,293	28,505	8,551	39,459
			56.41	*142.38*	*30.00%*	*197.09*
GEN G10Z3060 GENERATOR SET, SKID MOUNTED, 275 KW, 240/480V, 60HZ	3,686.00	HR	207,921	524,807	157,442	726,490
			12.49	*31.54*	*30.00%*	*43.65*
GEN L40Z4600 LOADER, FRONT END, WHEEL, SKID-STEER, 9-11 CF (0.2-0.3 M3), 60" (1.5 M) BUCKET {BOBCAT}, 13 CWT (590 KG)	3,686.00	HR	46,052	116,239	34,872	160,910
			12,957.02	*32,704.39*	*30.00%*	*45,272.69*
NLU 013113200880 Field Personnel, motor pools equipment operator	20.00	MO	259,140	654,088	196,226	905,454
(Note: Unit total represents two operators.)						
			1,806.58	*4,559.92*		*6,312.30*
Floodwall Demolition	**199.00**	**CY**	**359,509**	**907,424**	**272,227**	**1,256,148**
			57.45	*145.01*	*30.00%*	*200.74*
HNC 024113302345 Minor site demolition, concrete, rod reinforcing, to 6" thick, with hand held air equipment, sweep and remove, excludes hauling	5,450.48	SF	313,134	790,371	237,111	1,094,111
			63.99	*161.52*	*30.00%*	*223.59*
RSM 312323201106 Cycle hauling(wait, load, travel, unload or dump & return) time per cycle, excavated or borrow, loose cubic yards, 15 min load/wait/unload, 12 C.Y. truck, cycle 10 miles, 50 MPH, excludes loading equipment	258.70	LCY	16,555	41,785	12,536	57,843
			74.00	*186.78*	*30.00%*	*258.56*
RSM 024119200100 Selective demolition, dump charges, typical urban city, building construction materials, includes tipping fees only	402.98	TON	29,820	75,268	22,580	104,194
			1,039.80	*2,624.51*		*3,633.11*
Floodwall Construction	**647.00**	**LF**	**672,748**	**1,698,061**	**509,418**	**2,350,625**
			2.52	*6.35*	*30.00%*	*8.79*
RSM 040519260060 Masonry reinforcing bars, #5 and #6 reinforcing steel bars, placed vertically, ASTM A615	75,250.00	LB	189,286	477,770	143,331	661,377
			142.03	*358.50*	*30.00%*	*496.27*
RSM 038213100100 Concrete core drilling, core, reinforced concrete slab, 1" diameter, up to 6" thick slab, includes bit cost, layout and set up time	510.00	EA	72,437	182,835	54,850	253,098
			1.70	*4.30*	*30.00%*	*5.96*
RSM 038213100150 Concrete core drilling, core, reinforced concrete slab, 1" diameter, up to 6" thick slab, includes bit cost, layout and set up time, for each additional inch of slab thickness in same hole, add	4,080.00	EA	6,955	17,555	5,266	24,301
			435.00	*1,097.97*	*30.00%*	*1,519.92*
RSM 032116100100 Epoxy coating, for reinforcing steel, add to plain steel rebar pricing for epoxy-coated rebar	40.95	TON	17,813	44,962	13,489	62,241
			113.00	*285.22*	*30.00%*	*394.83*
RSM 033113350300 Structural concrete, ready mix, heavyweight, 4000 psi, includes local aggregate, sand, Portland cement (Type I) and water, delivered, excludes all additives and treatments	430.00	CY	48,590	122,644	36,793	169,777
			16.64	*42.01*	*30.00%*	*58.15*
RSM 031113859260 C.I.P. concrete forms, walls, steel framed plywood, over 8' to 16' high, based on 50 uses of purchased forms, 4 uses of bracing lumber, includes erecting, bracing, stripping and cleaning	14,874.00	SFC	247,548	624,829	187,449	864,951
			241.85	*610.44*	*30.00%*	*845.04*
GEN C55Z1960 CONCRETE PUMP, PUMP & BOOM, 117 CY/HR (89 M3/HR), 75' (23 M) BOOM, TRUCK MOUNTED	344.00	HR	83,196	209,992	62,998	290,692
			0.47	*1.17*	*30.00%*	*1.63*
NLU 099113660900 Paints & Coatings, vertical surfaces, application only, form poured concrete wall, 1 coat, spray	14,874.00	SF	6,923	17,473	5,242	24,189

Labor ID: NLS2016 EQ ID: EP18R02 Currency in US dollars TRACES MII Version 4.4

Description	Quantity	UOM	CostToPrime	ContractCost	Contingency	ProjectCost
(Note: Material Cost last updated 1 Jan 2010.)						
Drainage Allowance	**1.00**	**LS**	**73,920**	**186,579**	**55,974**	**258,281**
			1,540.00	*3,887.06*	*30.00%*	*5,380.86*
HTW 026219116514 Contaminated groundwater recovery, product recovery pump, controls, pneumatic, shallow depths (<=20'), monthly rental	48.00	MO	73,920	186,579	55,974	258,281
(Note: Assumes one recovery system per reconstruction area.)						

Labor ID: NLS2016 EQ ID: EP18R02 Currency in US dollars TRACES MII Version 4.4

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	C/O
Job Office Overhead Direct Cost Report									
AA Prime Contractor									
			1,169,750.18	*191,888.34*	*165,344.51*	*123,508.70*		*1,708,019.73*	
02 AA OVERHEAD ITEMS	**1.00**	**MO**	**1,169,750**	**191,888**	**165,345**	**123,509**	**57,528**	**1,708,020**	
			0.00	*23,035.35*	*0.00*	*0.00*		*23,035.35*	
USR AAST Small Tools	1.00	EA	0	23,035	0	0	0	23,035	
			1,169,750.18	*168,852.99*	*165,344.51*	*123,508.70*		*1,684,984.38*	
02 0AA JOB OFFICE OVERHEAD	**1.00**	**MO**	**1,169,750**	**168,853**	**165,345**	**123,509**	**57,528**	**1,684,984**	
			374,844.41	*28,612.33*	*0.00*	*1,000.00*		*404,456.74*	
02 0AA A SUPERVISION AND MANAGEMENT	**1.00**	**MO**	**374,844**	**28,612**	**0**	**1,000**	**0**	**404,457**	
(Note: Includes all top field management personnel, superintendents and non-working foremen, and their subsistence, travel, vehicles, supplies and miscellaneous. *)**									
			374,844.41	*0.00*	*0.00*	*0.00*		*374,844.41*	
020AAAa Supervision Personnel	**1.00**	**EA**	**374,844**	**0**	**0**	**0**	**0**	**374,844**	
			12,228.28	*0.00*	*0.00*	*0.00*		*12,228.28*	
HNC 013113200320 Carpenter superintendent	10.00	MO	122,283	0	0	0	0	122,283	
			12,479.09	*0.00*	*0.00*	*0.00*		*12,479.09*	
HNC 013113200300 General superintendent	10.00	MO	124,791	0	0	0	0	124,791	
			12,777.06	*0.00*	*0.00*	*0.00*		*12,777.06*	
FOP FA-PROJM Project Managers	10.00	MO	127,771	0	0	0	0	127,771	
(Note: Used http://swz.salary.com/salarywizard/ and assumed median percentile of a Project Manager - Construction for Project Manager. Also assumed 30% of salary = full fringe As of March 14, 2012)									
			0.00	*28,612.33*	*0.00*	*0.00*		*28,612.33*	
020AAAb Management Vehicles	**1.00**	**EA**	**0**	**28,612**	**0**	**0**	**0**	**28,612**	
			0.00	*1,381.53*	*0.00*	*0.00*		*1,381.53*	
USR 015251111 Sedan/C-Pickup (Monthly Cost) Assume 2/3-time Standby	10.00	MO	0	13,815	0	0	0	13,815	
			0.00	*1,479.70*	*0.00*	*0.00*		*1,479.70*	
USR 015251112 4x2 3/4T Pickup (Monthly Cost) Assume 2/3-time Standby	10.00	MO	0	14,797	0	0	0	14,797	
			0.00	*0.00*	*0.00*	*1,000.00*		*1,000.00*	
020AAAc Management Subsistance and Travel	**1.00**	**EA**	**0**	**0**	**0**	**1,000**	**0**	**1,000**	
			0.00	*0.00*	*0.00*	*500.00*		*500.00*	
USR DS-2 Home Office Execs Travel to Job	2.00	EA	0	0	0	1,000	0	1,000	
			74,089.00	*13,815.30*	*7,390.00*	*1,300.00*		*97,594.30*	
02 0AA B ADMINISTRATION JOB OFFICE	**1.00**	**MO**	**74,089**	**13,815**	**7,390**	**1,300**	**1,000**	**97,594**	
(Note: Includes the field office and all field administrating, accounting purchasing inventory, security, and personnel. Also their subsistence and travel, offices, vehicles, supplies and miscellaneous items to run the field office are included here. See item {C} for warehouse and warehouse personnel. *)**									
			74,089.00	*13,815.30*	*0.00*	*0.00*		*87,904.30*	
020AABa Field Office Administration Personnel	**1.00**	**EA**	**74,089**	**13,815**	**0**	**0**	**0**	**87,904**	
			7,408.90	*0.00*	*0.00*	*0.00*		*7,408.90*	
HNC 013113200350 Field Personnel, contract administrator	10.00	MO	74,089	0	0	0	0	74,089	
			0.00	*1,381.53*	*0.00*	*0.00*		*1,381.53*	
USR 015251111 Sedan/Pickup (Monthly Cost) Assume 2/3-time Standby	10.00	MO	0	13,815	0	0	0	13,815	
			0.00	*0.00*	*7,390.00*	*1,000.00*		*9,390.00*	
020AABb Field Office Building & Supplies	**1.00**	**EA**	**0**	**0**	**7,390**	**1,000**	**1,000**	**9,390**	
			0.00	*0.00*	*0.00*	*0.00*		*100.00*	
USR FOF-1 Office Equipment & Furniture	10.00	MO	0	0	0	0	1,000	1,000	
			0.00	*0.00*	*500.00*	*0.00*		*500.00*	
USR FOF-2 Office - Supplies Assume 5% of Office Labor costs.	10.00	MO	0	0	5,000	0	0	5,000	

Labor ID: NLS2016 EQ ID: EP18R02 Currency in US dollars TRACES MII Version 4.4

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	C/O
			0.00	*0.00*	*239.00*	*0.00*		*239.00*	
RSM 015213200350 Office Trailer, furnished, rent per month, 32' x 8', excl. hookups	10.00	EA	0	0	2,390	0	0	2,390	
			0.00	*0.00*	*0.00*	*100.00*		*100.00*	
USR MS-1 Mailing, Shipping Drawing and Submittal cost	10.00	EA	0	0	0	1,000	0	1,000	
			0.00	*0.00*	*0.00*	*300.00*		*300.00*	
020AABf Field Office Utility Installation	**1.00**	**EA**	**0**	**0**	**0**	**300**	**0**	**300**	
			0.00	*0.00*	*0.00*	*100.00*		*100.00*	
USR INS-2 Install Electrical	1.00	EA	0	0	0	100	0	100	
			0.00	*0.00*	*0.00*	*100.00*		*100.00*	
USR INS-3 Install Sewer	1.00	EA	0	0	0	100	0	100	
			0.00	*0.00*	*0.00*	*100.00*		*100.00*	
USR INS-4 Install Water	1.00	EA	0	0	0	100	0	100	
			81,497.49	*18,378.13*	*0.00*	*0.00*		*110,875.63*	
02 0AA D ENGINEERING AND SURVEYING	**1.00**	**MO**	**81,497**	**18,378**	**0**	**0**	**11,000**	**110,876**	
(Note: Includes all engineering, drafting, scheduling, surveying and change order personnel. Also includes their subsistence and travel, vehicles, miscellaneous computer expenses, shop drawings, submittals and CPM-schedules, O&M manuals, and miscellaneous items. *)**									
			0.00	*0.00*	*0.00*	*0.00*		*11,000.00*	
020AADb Scheduling & Change Order Personnel	**1.00**	**EA**	**0**	**0**	**0**	**0**	**11,000**	**11,000**	
			0.00	*0.00*	*0.00*	*0.00*		*800.00*	
USR CPM-1 CPM Schedule Monthly Updates	10.00	MO	0	0	0	0	8,000	8,000	
USR CPM-2 CPM Computer Schedule Develop	1.00	LS	0	0	0	0	3,000	3,000	
			81,497.49	*18,378.13*	*0.00*	*0.00*		*99,875.63*	
020AADc Field Surveying	**1.00**	**EA**	**81,497**	**18,378**	**0**	**0**	**0**	**99,876**	
			8,149.75	*0.00*	*0.00*	*0.00*		*8,149.75*	
FOP FC-SURYR Surveyors	10.00	MO	81,497	0	0	0	0	81,497	
(Note: Assumed a Occupation Code of #99659 Survey Technician As of March 29, 2012)									
			0.00	*1,670.74*	*0.00*	*0.00*		*1,670.74*	
USR 015251115 4x2 Suburban (Monthly Cost) Assume 2/3-time Standby	5.00	MO	0	8,354	0	0	0	8,354	
			0.00	*1,002.44*	*0.00*	*0.00*		*1,002.44*	
USR 53 Survey Supplies & Equipment Cost Assume 10% of Labor cost.	10.00	MO	0	10,024	0	0	0	10,024	
			137,650.67	*0.00*	*4,756.00*	*99,121.30*		*262,027.97*	
02 0AA E QUALITY CONTROL AND TESTING	**1.00**	**MO**	**137,651**	**0**	**4,756**	**99,121**	**20,500**	**262,028**	
(Note: Includes personnel, vehicles, equipment, and supplies to produce all QC reports, QC inspections, and all other contract quality requirements. Also includes their subsistence and travel, vehicles, supplies and miscellaneous items. *)**									
			134,849.90	*0.00*	*0.00*	*0.00*		*137,349.90*	
020AAEa Quality Control Management	**1.00**	**EA**	**134,850**	**0**	**0**	**0**	**2,500**	**137,350**	
			13,484.99	*0.00*	*0.00*	*0.00*		*13,484.99*	
FOP FC-ENGQC Engineers, Quality Control	10.00	MO	134,850	0	0	0	0	134,850	
(Note: Assumed a Occupation Code of #29086 Engineer Technician III 100% allocation to job duration.)									
			0.00	*0.00*	*0.00*	*0.00*		*1,500.00*	
USR PSL Prepare Submittal List	1.00	EA	0	0	0	0	1,500	1,500	
			0.00	*0.00*	*0.00*	*0.00*		*1,000.00*	
USR PQC Prepare QC Plan	1.00	EA	0	0	0	0	1,000	1,000	
			2,800.77	*0.00*	*4,320.00*	*0.00*		*22,720.77*	
020AAEd Off-Site Testing	**1.00**	**EA**	**2,801**	**0**	**4,320**	**0**	**15,600**	**22,721**	
			700.19	*0.00*	*120.00*	*0.00*		*820.19*	
USR 013404112 Union Welder Cert., 2 Positions Cost range between $60 & $300	4.00	EA	2,801	0	480	0	0	3,281	
(Note: because of welding requirements& number of positions.)									

Labor ID: NLS2016 EQ ID: EP18R02 Currency in US dollars TRACES MII Version 4.4

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	C/O
			0.00	*0.00*	*50.00*	*0.00*		*50.00*	
USR OST-14 Weld Inspection - Visual, Steel outside lab testing fee	24.00	HR	0	0	1,200	0	0	1,200	
			0.00	*0.00*	*550.00*	*0.00*		*550.00*	
USR OST-2 Asphaltic Concrete Mix Design, Hveem or Marshall Method -	3.00	EA	0	0	1,650	0	0	1,650	
(Note: Aggr. Test NOT included, ASTMD1560, D1561 & D1559, Asphalticoutside lab testing fee)									
			0.00	*0.00*	*10.00*	*0.00*		*10.00*	
USR OST-3 Compressive Strength, Cylinder 6x12, ASTM C39, Molds included,	18.00	EA	0	0	180	0	0	180	
(Note: Concrete outside lab testing fee)									
			0.00	*0.00*	*270.00*	*0.00*		*270.00*	
USR OST-5 Concrete Mix Design (Compressive Strength), Aggr Tests NOT	3.00	EA	0	0	810	0	0	810	
(Note: included, Concrete outside labtesting fee)									
USR OST-6 Concrete testing	10.00	LS	0	0	0	0	15,000	15,000	
USR OST-7 Gradation Tests	2.00	LS	0	0	0	0	600	600	
			0.00	*0.00*	*436.00*	*99,121.30*		*101,957.30*	
020AAEe Project Monitoring	**1.00**	**EA**	**0**	**0**	**436**	**99,121**	**2,400**	**101,957**	
			0.00	*0.00*	*0.00*	*12.13*		*12.13*	
HTW 019413301111 Project Photo Documentation, photographs processing, color, 24 count, 3-1/2" x 5", includes film	10.00	EA	0	0	0	121	0	121	
			0.00	*0.00*	*436.00*	*0.00*		*436.00*	
HTW 029110104211 Meteorological monitoring stations, purchase, 5 weather readings, 11" x 17"	1.00	EA	0	0	436	0	0	436	
			0.00	*0.00*	*0.00*	*0.00*		*200.00*	
USR 01-Phot Photography Misc. Supplies	12.00	MO	0	0	0	0	2,400	2,400	
			0.00	*0.00*	*0.00*	*450.00*		*450.00*	
RSM 014523505900 Vibration monitoring, seismograph and technician	220.00	DAY	0	0	0	99,000	0	99,000	
			475,586.84	*80,104.91*	*134,548.51*	*1,059.40*		*711,327.66*	
02 0AA F SAFETY, TRAFFIC CONTROL, FIRST AID, FIRE	**1.00**	**MO**	**475,587**	**80,105**	**134,549**	**1,059**	**20,028**	**711,328**	
(Note: Safety, Traffic Control, First Aid, and Fire Prevention. Includes all personnel, supplies and vehicles needed for safety, traffic control, first aid, safety training and fire prevention. Also includes their subsistence and travel, vehicles, supplies and miscellaneous items will be allocated to the job. Assumes safety Engineer allocation at 50% of job duration.)									
			130,864.09	*7,398.52*	*375.00*	*0.00*		*140,537.60*	
020AAFa Safety Management	**1.00**	**EA**	**130,864**	**7,399**	**375**	**0**	**1,900**	**140,538**	
			0.00	*0.00*	*0.00*	*0.00*		*400.00*	
USR SM-1 Prepare Drug Free Plan	1.00	EA	0	0	0	0	400	400	
			0.00	*0.00*	*0.00*	*0.00*		*1,000.00*	
USR SM-2 Prepare Hazard Analysis Plan	1.00	EA	0	0	0	0	1,000	1,000	
			0.00	*0.00*	*0.00*	*0.00*		*500.00*	
USR SM-3 Prepare Safety Plan	1.00	EA	0	0	0	0	500	500	
			0.00	*1,479.70*	*0.00*	*0.00*		*1,479.70*	
USR 015251112 4x2 3/4T Pickup (Monthly Cost) Assume 2/3-time Standby	5.00	MO	0	7,399	0	0	0	7,399	
			75.28	*0.00*	*75.00*	*0.00*		*150.28*	
USR SM-4 Safety Engineer's Supplies Assume 2% of Labor cost.	5.00	MO	376	0	375	0	0	751	
			13,048.77	*0.00*	*0.00*	*0.00*		*13,048.77*	
FOP FD-SAENG Safety Engineers	10.00	MO	130,488	0	0	0	0	130,488	
(Note: Assumed a Occupation Code of #29086 Engineer Technician III 30083 As of March 29, 2012)									
			0.00	*0.00*	*1,339.20*	*0.00*		*1,339.20*	
020AAFb Field First Aid	**1.00**	**EA**	**0**	**0**	**1,339**	**0**	**0**	**1,339**	
			0.00	*0.00*	*54.56*	*0.00*		*54.56*	
HTW 019413201503 First aid kits, 30 ingredients	4.00	EA	0	0	218	0	0	218	

Currency in US dollars

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	C/O
			0.00	*0.00*	*280.24*	*0.00*		*280.24*	
HTW 019413201107 Eye and body wash stations, portable eye wash station, 6 gallon	4.00	EA	0	0	1,121	0	0	1,121	
			0.00	*0.00*	*0.00*	*1,059.40*		*1,059.40*	
020AAFd Safety Training	**1.00**	**EA**	**0**	**0**	**0**	**1,059**	**0**	**1,059**	
			0.00	*0.00*	*0.00*	*52.97*		*52.97*	
HTW 019413206101 Personnel Training, off-site, refresher course, 8 hours, cost per student	20.00	EA	0	0	0	1,059	0	1,059	
			0.00	*0.00*	*2,260.56*	*0.00*		*2,260.56*	
020AAFg Field Fire Protection	**1.00**	**EA**	**0**	**0**	**2,261**	**0**	**0**	**2,261**	
			0.00	*0.00*	*282.57*	*0.00*		*282.57*	
HTW 019413201202 Fire extinguisher, CO2, 10 lb	8.00	EA	0	0	2,261	0	0	2,261	
(Note: Assumes two per work area.)									
020AAFi Traffic Control	**1.00**	**LS**	**344,723**	**72,706**	**130,574**	**0**	**18,128**	**566,131**	
			999.04	*0.00*	*0.00*	*0.00*		*999.04*	
USR 015702112 Two Flagman Crew	150.00	DAY	149,855	0	0	0	0	149,855	
			62.44	*0.00*	*52.00*	*0.00*		*114.44*	
HNC 101453200560 Signs, stock, reflectorized, UTMCD standard, warning sign, 24" x 24", with posts	80.00	EA	4,995	0	4,160	0	0	9,155	
			0.00	*1.78*	*0.00*	*0.00*		*1.78*	
EP TC-6 Flashing Arrows, 25 Lamps, TRLR Solar Panels w/ Battery Charger	4,334.00	HR	0	7,699	0	0	0	7,699	
(Note: Quantity reflects 6 months of 24 hour usage. Based on 4.3 weeks in a month.)									
			0.00	*5.03*	*0.00*	*0.00*		*5.03*	
EP TC-5 Lite Set, 4L/1000W, 6KW-GEN,TRLR	8,668.80	HR	0	43,615	0	0	0	43,615	
			0.00	*0.00*	*70.00*	*0.00*		*70.00*	
USR TC-4 Median Warning Sign Reflective Sheeting w/ stand	16.00	EA	0	0	1,120	0	0	1,120	
			0.00	*0.00*	*44.00*	*0.00*		*52.00*	
USR TC-1 Type 2 w/ Two Striped Boards 24"Long A-Frame, Traffic Barrier	16.00	EA	0	0	704	0	128	832	
			0.00	*0.00*	*30.00*	*0.00*		*75.00*	
USR TC-2 Safety Barrels / Cones to 36" Tall Traffic Barriers	400.00	EA	0	0	12,000	0	18,000	30,000	
(Note: assumes some will be replaced during the course of construction.)									
RSM 344113101410 Control Plan Design	1.00	LS	18,578	2,169	20,400	0	0	41,147	
(Note: Traffic Controls)									
			6.30	*0.79*	*32.50*	*0.00*		*39.59*	
HNC 015623100200 Barricades, precast concrete barrier walls, stock units, buy, 10' sections	150.00	LF	945	119	4,875	0	0	5,939	
			37.06	*0.00*	*5.00*	*0.00*		*42.06*	
RSM 015623100150 Barricades, wood, movable, 3 rail, 5' high, 3 rail @ 2" x 8", movable	16.00	LF	593	0	80	0	0	673	
			133.30	*15.00*	*68.50*	*0.00*		*216.80*	
RSM 323236104500 Gabion retaining walls, stone filled gabions, stone delivered, galvanized, highway surcharge, 3' wide, 6' long, 3'-0" high, excludes excavation	1,273.50	LF	169,756	19,104	87,235	0	0	276,095	
(Note: Assumed to be for flood protection / permanent lane shift during construction.)									
			0.00	*0.00*	*1,650.00*	*17,028.00*		*18,678.00*	
02 0AA G SANITATION FAC & TEMP BLDGS	**1.00**	**MO**	**0**	**0**	**1,650**	**17,028**	**0**	**18,678**	
(Note: Includes sanitation facilities, misc. buildings, yards, and building costs not otherwise classified. But it does not include all utilities costs. *)**									
			0.00	*0.00*	*0.00*	*17,028.00*		*17,028.00*	
020AAGa Sanitation Facilities	**1.00**	**EA**	**0**	**0**	**0**	**17,028**	**0**	**17,028**	
			0.00	*0.00*	*0.00*	*99.00*		*99.00*	
HNC 224213406000 Water closet, chemical portable toilet, per week, note: (40 hours) per 10 people, per OSHA	172.00	WK	0	0	0	17,028	0	17,028	
(Note: Assumes one per work area.)									
			0.00	*0.00*	*1,650.00*	*0.00*		*1,650.00*	

Labor ID: NLS2016 EQ ID: EP18R02 Currency in US dollars TRACES MII Version 4.4

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	C/O
020AAGb Temporary Buildings	**1.00**	**EA**	**0**	**0**	**1,650**	**0**	**0**	**1,650**	
			0.00	*0.00*	*82.50*	*0.00*		*82.50*	
RSM 015213201250 Storage Boxes, rent per month, 20' x 8'	20.00	EA	0	0	1,650	0	0	1,650	
(Note: Assumes rental of two storage box.)									
			22,819.03	*27,942.32*	*0.00*	*0.00*		*50,761.35*	
02 0AA H GENERAL EQUIPMENT EXPENSES	**1.00**	**MO**	**22,819**	**27,942**	**0**	**0**	**0**	**50,761**	
(Note: Includes equipment not required by specific work items. Also includes testing and rental of equipment when not charged to a specific bid item or items of work. Inspection fees and permits are included in mob and demob items. ***)**									
			0.00	*0.00*	*0.00*	*0.00*		*0.00*	
020AAHa Hook Services	**1.00**	**EA**	**0**	**0**	**0**	**0**	**0**	**0**	
			0.00	*0.00*	*0.00*	*0.00*		*0.00*	
GEN C80Z2240 CRANE, HYDRAULIC, TRUCK MOUNTED, 14 TON (12.7 MT), 80' (24.4 M) BOOM, 6X4	0.00	HR	0	0	0	0	0	0	
			0.00	*0.00*	*0.00*	*0.00*		*0.00*	
020AAHb Crane Testing	**1.00**	**EA**	**0**	**0**	**0**	**0**	**0**	**0**	
			0.00	*0.00*	*0.00*	*0.00*		*0.00*	
USR 015252122 Crane Testing - 26 to 50 tons Allow two hours per test.	0.00	EA	0	0	0	0	0	0	
			22,819.03	*27,942.32*	*0.00*	*0.00*		*50,761.35*	
020AAHc Misc. Vehicles & Equipment	**1.00**	**EA**	**22,819**	**27,942**	**0**	**0**	**0**	**50,761**	
			2,535.45	*3,104.70*	*0.00*	*0.00*		*5,640.15*	
USR 015251123 Water Truck w/1/4 Oper,3,000 Gal Assumed 3/4-time Standby	9.00	MO	22,819	27,942	0	0	0	50,761	
			3,262.74	*0.00*	*17,000.00*	*4,000.00*		*29,262.74*	
02 0AA I PROJECT UTILITIES SITE & CLEANUP	**1.00**	**MO**	**3,263**	**0**	**17,000**	**4,000**	**5,000**	**29,263**	
(Note: Includes all project costs not otherwise classified. *)**									
			3,262.74	*0.00*	*0.00*	*0.00*		*3,262.74*	
020AAIa Site Cleanup	**1.00**	**EA**	**3,263**	**0**	**0**	**0**	**0**	**3,263**	
			81.57	*0.00*	*0.00*	*0.00*		*81.57*	
USR 83 Final Site Cleanup	40.00	HR	3,263	0	0	0	0	3,263	
020AAIb Misc Project Expenses	**1.00**	**LS**	**0**	**0**	**17,000**	**0**	**5,000**	**22,000**	
USR MPE-2 Protect Existing Property	5.00	LS	0	0	0	0	5,000	5,000	
			0.00	*0.00*	*34.00*	*0.00*		*34.00*	
RSM 015813500020 Project Signs, sign, high intensity reflectorized, buy, excl. posts	500.00	SF	0	0	17,000	0	0	17,000	
			0.00	*0.00*	*0.00*	*4,000.00*		*4,000.00*	
020AAIc Site Utility Usage Fees	**1.00**	**EA**	**0**	**0**	**0**	**4,000**	**0**	**4,000**	
			0.00	*0.00*	*0.00*	*1,000.00*		*1,000.00*	
USR SUF-1 Site UtilityUsageTelephone	1.00	EA	0	0	0	1,000	0	1,000	
			0.00	*0.00*	*0.00*	*1,000.00*		*1,000.00*	
USR SUF-2 Site Utility Usage Electrical	2.00	EA	0	0	0	2,000	0	2,000	
			0.00	*0.00*	*0.00*	*1,000.00*		*1,000.00*	
USR SUF-4 Site Utility Usage Water	1.00	EA	0	0	0	1,000	0	1,000	

Currency in US dollars

I-376 Bathtub Renovation, Raise Existing Floodwall, Alternate 1 Option 3

Estimated by	Shannon Landry, CEP, PSP, CCM, PMP
Designed by	
Prepared by	Shannon Landry
Preparation Date	7/7/2020
Effective Date of Pricing	7/7/2020
Estimated Construction Time	180 Days

Designed by

Estimated by
Shannon Landry, CEP, PSP, CCM, PMP
Prepared by
Shannon Landry

Design Document	
Document Date	7/6/2020
District	
Contact	Shannon Landry
Budget Year	2020
UOM System	Original

Direct Costs

LaborCost
EQCost
MatlCost
SubBidCost
UserCost1

Timeline/Currency

Preparation Date	7/7/2020
Escalation Date	7/7/2020
Eff. Pricing Date	7/7/2020
Estimated Duration	180 Day(s)
Currency	US dollars
Exchange Rate	1.000000

Costbook CB16EN: 2016 MII English Cost Book

Labor NLS2016: National Labor Library - Seattle 2016

Note: http://www.wdol.gov is the website for current Davis Bacon & Service Labor Rates. Fringes paid to the laborers are taxable. In a non-union job the whole fringes are taxable. In a union job, the vacation pay fringes are taxable.

Labor Rates

LaborCost1
LaborCost2
LaborCost3
LaborCost4

Equipment EP18R02: 2018_EP1110-1-8_Mii_Library_Region_02_R1

Region 02 - MIDEAST, (2018)

Sales Tax	5.90
Working Hours per Year	1,410
Labor Adjustment Factor	1.02
Cost of Money	3.50
Cost of Money Discount	25.00
Tire Recap Cost Factor	1.50
Tire Recap Wear Factor	1.80
Tire Repair Factor	0.15
Equipment Cost Factor	1.00
Standby Depreciation Factor	0.50

Fuel

Electricity	0.101
Gas	2.710
Diesel Off-Road	2.510
Diesel On-Road	3.020

Shipping Rates

Over 0 CWT	10.53
Over 240 CWT	7.72
Over 300 CWT	6.40
Over 400 CWT	5.57
Over 500 CWT	5.89
Over 700 CWT	5.89
Over 800 CWT	8.66

Currency in US dollars

Direct Cost Markups	Category	Method
Productivity	Productivity	Productivity
Overtime	Overtime	Overtime

	Days/Week	*Hours/Shift*	*Shifts/Day*	*1st Shift*	*2nd Shift*	*3rd Shift*
Standard	*5.00*	*8.00*	*1.00*	*8.00*	*0.00*	*0.00*
Actual	*5.00*	*8.00*	*1.00*	*8.00*	*0.00*	*0.00*

Day	*OT Factor*	*Working*	*OT Percent*	*FCCM Percent*
Monday	*1.50*	*Yes*	*0.00*	*0.00*
Tuesday	*1.50*	*Yes*		
Wednesday	*1.50*	*Yes*		
Thursday	*1.50*	*Yes*		
Friday	*1.50*	*Yes*		
Saturday	*1.50*	*No*		
Sunday	*2.00*	*No*		

Sales Tax	TaxAdj	Running % on Selected Costs
MatlCost		

Contractor Markups	Category	Method
JOOH (Small Tools)	Allowance	% of Labor
JOOH	JOOH	JOOH (Calculated)
HOOH	HOOH	Running %
Profit	Profit	Amount
Bond	Bond	Running %
Excise Tax	Excise	Running %

Owner Markups	Category	Method
Escalation	Escalation	Escalation

StartDate	*StartIndex*	*EndDate*	*EndIndex*	*Escalation*
7/6/2020	*920.40*	*6/1/2023*	*997.96*	*8.43*

Contingency	Contingency	Contract %
SIOH	SIOH	Running %

Currency in US dollars

Description	Quantity	UOM	CostToPrime	ContractCost	Contingency	ProjectCost
Project Cost Summary Report			**1,097,575**	**3,290,327**	**845,141**	**4,372,953**
			1,696.41	*5,085.51*		*6,758.81*
Estimated Cost at Award	**647.00**	**LF**	**1,097,575**	**3,290,327**	**845,141**	**4,372,953**
			167,218.16	*473,190.82*		*473,190.82*
Pavement Repair Allowance	**1.00**	**EA**	**167,218**	**473,191**	**0**	**473,191**
USR PRA1000 Pavement Repair Allowance	1.00	LS	167,218	473,191	0	473,191
(Note: Allowance for repair oconcrete adjacent to the construction area. 15% of base contract cost.)						
Contractor Mobilization	**1.00**	**LS**	**419,698**	**1,187,652**	**356,296**	**1,644,067**
			2,543.93	*7,198.77*	*30.00%*	*9,965.26*
RSM 015436501600 Mobilization or demobilization, delivery charge for equipment, hauled on 50-ton capacity towed trailer	12.00	EA	30,527	86,385	25,916	119,583
(Note: 6 Pieces Delivered For Mobilization; 6 Pieces Removed from Jobiste for Demobilization.)						
			2,000.00	*5,659.56*	*30.00%*	*7,834.53*
RSM 015213200890 Modular office building, delivery, each way	6.00	EA	12,000	33,957	10,187	47,007
(Note: Project Duration of 11-months. Includes demob of office trailers and on-site storage.)						
			11,293.25	*31,957.43*	*30.00%*	*44,238.67*
RSM 015113500890 Temporary electrical power equipment (pro-rated per job), connections, office trailer, 200 amp	1.00	EA	11,293	31,957	9,587	44,239
			11,293.25	*31,957.43*	*30.00%*	*44,238.67*
RSM 015113500040 Temporary electrical power equipment (pro-rated per job), overhead feed, 3 uses, 200 amp	1.00	EA	11,293	31,957	9,587	44,239
			56.41	*159.62*	*30.00%*	*220.97*
GEN G10Z3060 GENERATOR SET, SKID MOUNTED, 275 KW, 240/480V, 60HZ	2,889.60	HR	162,997	461,247	138,374	638,505
			12.49	*35.35*	*30.00%*	*48.94*
GEN L40Z4600 LOADER, FRONT END, WHEEL, SKID-STEER, 9-11 CF (0.2-0.3 M3), 60" (1.5 M) BUCKET {BOBCAT}, 13 CWT (590 KG)	2,889.60	HR	36,102	102,161	30,648	141,422
			12,957.02	*36,665.53*	*30.00%*	*50,756.09*
NLU 013113200880 Field Personnel, motor pools equipment operator	12.00	MO	155,484	439,986	131,996	609,073
(Note: Unit total represents two operators.)						
			0.00	*926.79*		*1,282.96*
Floodwall Demolition	**199.00**	**CY**	**0**	**184,431**	**55,329**	**255,308**
			0.00	*46.34*	*30.00%*	*64.14*
HNC 024113302345 Minor site demolition, concrete, rod reinforcing, to 6" thick, with hand held air equipment, sweep and remove, excludes hauling	3,039.00	SF	0	140,818	42,245	194,934
			0.00	*56.78*	*30.00%*	*78.60*
RSM 312323201106 Cycle hauling(wait, load, travel, unload or dump & return) time per cycle, excavated or borrow, loose cubic yards, 15 min load/wait/unload, 12 C.Y. truck, cycle 10 miles, 50 MPH, excludes loading equipment	253.50	LCY	0	14,393	4,318	19,924
			0.00	*74.00*	*30.00%*	*102.44*
RSM 024119200100 Selective demolition, dump charges, typical urban city, building construction materials, includes tipping fees only	394.88	TON	0	29,221	8,766	40,450
			675.02	*1,910.16*		*2,644.24*
Floodwall Construction	**647.00**	**LF**	**436,739**	**1,235,875**	**370,763**	**1,710,822**
			113.00	*319.77*	*30.00%*	*442.65*
RSM 033113350300 Structural concrete, ready mix, heavyweight, 4000 psi, includes local aggregate, sand, Portland cement (Type I) and water, delivered, excludes all additives and treatments	286.00	CY	32,318	91,453	27,436	126,598
			16.64	*47.10*	*30.00%*	*65.20*
RSM 031113859260 C.I.P. concrete forms, walls, steel framed plywood, over 8' to 16' high, based on 50 uses of purchased forms, 4 uses of bracing lumber, includes erecting, bracing, stripping and cleaning	12,364.00	SFC	205,774	582,297	174,689	806,073
			241.85	*684.38*	*30.00%*	*947.39*
GEN C55Z1960 CONCRETE PUMP, PUMP & BOOM, 117 CY/HR (89 M3/HR), 75' (23 M) BOOM, TRUCK MOUNTED	232.00	HR	56,109	158,776	47,633	219,794
			0.47	*1.32*	*30.00%*	*1.82*
NLU 099113660900 Paints & Coatings, vertical surfaces, application only, form poured concrete wall, 1 coat, spray	12,364.00	SF	5,755	16,284	4,885	22,542
(Note: Material Cost last updated 1 Jan 2010.)						
			2.52	*7.12*	*30.00%*	*9.85*
RSM 040519260060 Masonry reinforcing bars, #5 and #6 reinforcing steel bars, placed vertically, ASTM A615	50,050.00	LB	125,897	356,261	106,878	493,172

Labor ID: NLS2016 EQ ID: EP18R02 Currency in US dollars TRACES MII Version 4.4

Description	Quantity	UOM	CostToPrime	ContractCost	Contingency	ProjectCost
			435.00	*1,230.95*	*30.00%*	*1,704.01*
RSM 032116100100 Epoxy coating, for reinforcing steel, add to plain steel rebar pricing for epoxy-coated rebar	25.03	TON	10,886	30,805	9,241	42,643
Drainage Allowance	**1.00**	**LS**	**73,920**	**209,177**	**62,753**	**289,564**
			1,540.00	*4,357.86*	*30.00%*	*6,032.59*
HTW 026219116514 Contaminated groundwater recovery, product recovery pump, controls, pneumatic, shallow depths (<=20'), monthly rental	48.00	MO	73,920	209,177	62,753	289,564
(Note: Assumes one recovery system per reconstruction area.)						

Labor ID: NLS2016 EQ ID: EP18R02 Currency in US dollars TRACES MII Version 4.4

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	C/O
Job Office Overhead Direct Cost Report									
AA Prime Contractor									
			801,490.96	*157,942.53*	*161,728.51*	*98,677.70*		*1,273,767.69*	
02 AA OVERHEAD ITEMS	**1.00**	**MO**	**801,491**	**157,943**	**161,729**	**98,678**	**53,928**	**1,273,768**	
			0.00	*13,411.84*	*0.00*	*0.00*		*13,411.84*	
USR AAST Small Tools	1.00	EA	0	13,412	0	0	0	13,412	
			801,490.96	*144,530.69*	*161,728.51*	*98,677.70*		*1,260,355.86*	
02 0AA JOB OFFICE OVERHEAD	**1.00**	**MO**	**801,491**	**144,531**	**161,729**	**98,678**	**53,928**	**1,260,356**	
			224,906.64	*17,167.40*	*0.00*	*1,000.00*		*243,074.04*	
02 0AA A SUPERVISION AND MANAGEMENT	**1.00**	**MO**	**224,907**	**17,167**	**0**	**1,000**	**0**	**243,074**	
(Note: Includes all top field management personnel, superintendents and non-working foremen, and their subsistence, travel, vehicles, supplies and miscellaneous. *)**									
			224,906.64	*0.00*	*0.00*	*0.00*		*224,906.64*	
020AAAa Supervision Personnel	**1.00**	**EA**	**224,907**	**0**	**0**	**0**	**0**	**224,907**	
			12,228.28	*0.00*	*0.00*	*0.00*		*12,228.28*	
HNC 013113200320 Carpenter superintendent	6.00	MO	73,370	0	0	0	0	73,370	
			12,479.09	*0.00*	*0.00*	*0.00*		*12,479.09*	
HNC 013113200300 General superintendent	6.00	MO	74,875	0	0	0	0	74,875	
			12,777.06	*0.00*	*0.00*	*0.00*		*12,777.06*	
FOP FA-PROJM Project Managers	6.00	MO	76,662	0	0	0	0	76,662	
(Note: Used http://swz.salary.com/salarywizard/ and assumed median percentile of a Project Manager - Construction for Project Manager. Also assumed 30% of salary = full fringe As of March 14, 2012)									
			0.00	*17,167.40*	*0.00*	*0.00*		*17,167.40*	
020AAAb Management Vehicles	**1.00**	**EA**	**0**	**17,167**	**0**	**0**	**0**	**17,167**	
			0.00	*1,381.53*	*0.00*	*0.00*		*1,381.53*	
USR 015251111 Sedan/C-Pickup (Monthly Cost) Assume 2/3-time Standby	6.00	MO	0	8,289	0	0	0	8,289	
			0.00	*1,479.70*	*0.00*	*0.00*		*1,479.70*	
USR 015251112 4x2 3/4T Pickup (Monthly Cost) Assume 2/3-time Standby	6.00	MO	0	8,878	0	0	0	8,878	
			0.00	*0.00*	*0.00*	*1,000.00*		*1,000.00*	
020AAAc Management Subsistance and Travel	**1.00**	**EA**	**0**	**0**	**0**	**1,000**	**0**	**1,000**	
			0.00	*0.00*	*0.00*	*500.00*		*500.00*	
USR DS-2 Home Office Execs Travel to Job	2.00	EA	0	0	0	1,000	0	1,000	
			44,453.40	*8,289.18*	*4,434.00*	*1,300.00*		*59,076.58*	
02 0AA B ADMINISTRATION JOB OFFICE	**1.00**	**MO**	**44,453**	**8,289**	**4,434**	**1,300**	**600**	**59,077**	
(Note: Includes the field office and all field administrating, accounting purchasing inventory, security, and personnel. Also their subsistence and travel, offices, vehicles, supplies and miscellaneous items to run the field office are included here. See item {C} for warehouse and warehouse personnel. *)**									
			44,453.40	*8,289.18*	*0.00*	*0.00*		*52,742.58*	
020AABa Field Office Administration Personnel	**1.00**	**EA**	**44,453**	**8,289**	**0**	**0**	**0**	**52,743**	
			7,408.90	*0.00*	*0.00*	*0.00*		*7,408.90*	
HNC 013113200350 Field Personnel, contract administrator	6.00	MO	44,453	0	0	0	0	44,453	
			0.00	*1,381.53*	*0.00*	*0.00*		*1,381.53*	
USR 015251111 Sedan/Pickup (Monthly Cost) Assume 2/3-time Standby	6.00	MO	0	8,289	0	0	0	8,289	
			0.00	*0.00*	*4,434.00*	*1,000.00*		*6,034.00*	
020AABb Field Office Building & Supplies	**1.00**	**EA**	**0**	**0**	**4,434**	**1,000**	**600**	**6,034**	
			0.00	*0.00*	*0.00*	*0.00*		*100.00*	
USR FOF-1 Office Equipment & Furniture	6.00	MO	0	0	0	0	600	600	
			0.00	*0.00*	*500.00*	*0.00*		*500.00*	
USR FOF-2 Office - Supplies Assume 5% of Office Labor costs.	6.00	MO	0	0	3,000	0	0	3,000	

Currency in US dollars

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	C/O
			0.00	*0.00*	*239.00*	*0.00*		*239.00*	
RSM 015213200350 Office Trailer, furnished, rent per month, 32' x 8', excl. hookups	6.00	EA	0	0	1,434	0	0	1,434	
			0.00	*0.00*	*0.00*	*100.00*		*100.00*	
USR MS-1 Mailing, Shipping Drawing and Submittal cost	10.00	EA	0	0	0	1,000	0	1,000	
			0.00	*0.00*	*0.00*	*300.00*		*300.00*	
020AABf Field Office Utility Installation	**1.00**	**EA**	**0**	**0**	**0**	**300**	**0**	**300**	
			0.00	*0.00*	*0.00*	*100.00*		*100.00*	
USR INS-2 Install Electrical	1.00	EA	0	0	0	100	0	100	
			0.00	*0.00*	*0.00*	*100.00*		*100.00*	
USR INS-3 Install Sewer	1.00	EA	0	0	0	100	0	100	
			0.00	*0.00*	*0.00*	*100.00*		*100.00*	
USR INS-4 Install Water	1.00	EA	0	0	0	100	0	100	
			48,898.50	*11,026.88*	*0.00*	*0.00*		*67,725.38*	
02 0AA D ENGINEERING AND SURVEYING	**1.00**	**MO**	**48,898**	**11,027**	**0**	**0**	**7,800**	**67,725**	
(Note: Includes all engineering, drafting, scheduling, surveying and change order personnel. Also includes their subsistence and travel, vehicles, miscellaneous computer expenses, shop drawings, submittals and CPM-schedules, O&M manuals, and miscellaneous items. *)**									
			0.00	*0.00*	*0.00*	*0.00*		*7,800.00*	
020AADb Scheduling & Change Order Personnel	**1.00**	**EA**	**0**	**0**	**0**	**0**	**7,800**	**7,800**	
			0.00	*0.00*	*0.00*	*0.00*		*800.00*	
USR CPM-1 CPM Schedule Monthly Updates	6.00	MO	0	0	0	0	4,800	4,800	
USR CPM-2 CPM Computer Schedule Develop	1.00	LS	0	0	0	0	3,000	3,000	
			48,898.50	*11,026.88*	*0.00*	*0.00*		*59,925.38*	
020AADc Field Surveying	**1.00**	**EA**	**48,898**	**11,027**	**0**	**0**	**0**	**59,925**	
			8,149.75	*0.00*	*0.00*	*0.00*		*8,149.75*	
FOP FC-SURYR Surveyors	6.00	MO	48,898	0	0	0	0	48,898	
(Note: Assumed a Occupation Code of #99659 Survey Technician As of March 29, 2012)									
			0.00	*1,670.74*	*0.00*	*0.00*		*1,670.74*	
USR 015251115 4x2 Suburban (Monthly Cost) Assume 2/3-time Standby	3.00	MO	0	5,012	0	0	0	5,012	
			0.00	*1,002.44*	*0.00*	*0.00*		*1,002.44*	
USR 53 Survey Supplies & Equipment Cost Assume 10% of Labor cost.	6.00	MO	0	6,015	0	0	0	6,015	
			83,710.71	*0.00*	*4,756.00*	*81,121.30*		*190,088.01*	
02 0AA E QUALITY CONTROL AND TESTING	**1.00**	**MO**	**83,711**	**0**	**4,756**	**81,121**	**20,500**	**190,088**	
(Note: Includes personnel, vehicles, equipment, and supplies to produce all QC reports, QC inspections, and all other contract quality requirements. Also includes their subsistence and travel, vehicles, supplies and miscellaneous items. *)**									
			80,909.94	*0.00*	*0.00*	*0.00*		*83,409.94*	
020AAEa Quality Control Management	**1.00**	**EA**	**80,910**	**0**	**0**	**0**	**2,500**	**83,410**	
			13,484.99	*0.00*	*0.00*	*0.00*		*13,484.99*	
FOP FC-ENGQC Engineers, Quality Control	6.00	MO	80,910	0	0	0	0	80,910	
(Note: Assumed a Occupation Code of #29086 Engineer Technician III 100% allocation to job duration.)									
			0.00	*0.00*	*0.00*	*0.00*		*1,500.00*	
USR PSL Prepare Submittal List	1.00	EA	0	0	0	0	1,500	1,500	
			0.00	*0.00*	*0.00*	*0.00*		*1,000.00*	
USR PQC Prepare QC Plan	1.00	EA	0	0	0	0	1,000	1,000	
			2,800.77	*0.00*	*4,320.00*	*0.00*		*22,720.77*	
020AAEd Off-Site Testing	**1.00**	**EA**	**2,801**	**0**	**4,320**	**0**	**15,600**	**22,721**	
			700.19	*0.00*	*120.00*	*0.00*		*820.19*	
USR 013404112 Union Welder Cert., 2 Positions Cost range between $60 & $300	4.00	EA	2,801	0	480	0	0	3,281	
(Note: because of welding requirements& number of positions.)									

Currency in US dollars

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	C/O
			0.00	*0.00*	*50.00*	*0.00*		*50.00*	
USR OST-14 Weld Inspection - Visual, Steel outside lab testing fee	24.00	HR	0	0	1,200	0	0	1,200	
			0.00	*0.00*	*550.00*	*0.00*		*550.00*	
USR OST-2 Asphaltic Concrete Mix Design, Hveem or Marshall Method -	3.00	EA	0	0	1,650	0	0	1,650	
(Note: Aggr. Test NOT included, ASTMD1560, D1561 & D1559, Asphalticoutside lab testing fee)									
			0.00	*0.00*	*10.00*	*0.00*		*10.00*	
USR OST-3 Compressive Strength, Cylinder 6x12, ASTM C39, Molds included,	18.00	EA	0	0	180	0	0	180	
(Note: Concrete outside lab testing fee)									
			0.00	*0.00*	*270.00*	*0.00*		*270.00*	
USR OST-5 Concrete Mix Design (Compressive Strength), Aggr Tests NOT	3.00	EA	0	0	810	0	0	810	
(Note: included, Concrete outside labtesting fee)									
USR OST-6 Concrete testing	10.00	LS	0	0	0	0	15,000	15,000	
USR OST-7 Gradation Tests	2.00	LS	0	0	0	0	600	600	
			0.00	*0.00*	*436.00*	*81,121.30*		*83,957.30*	
020AAEe Project Monitoring	**1.00**	**EA**	**0**	**0**	**436**	**81,121**	**2,400**	**83,957**	
			0.00	*0.00*	*0.00*	*12.13*		*12.13*	
HTW 019413301111 Project Photo Documentation, photographs processing, color, 24 count, 3-1/2" x 5", includes film	10.00	EA	0	0	0	121	0	121	
			0.00	*0.00*	*436.00*	*0.00*		*436.00*	
HTW 029110104211 Meteorological monitoring stations, purchase, 5 weather readings, 11" x 17"	1.00	EA	0	0	436	0	0	436	
			0.00	*0.00*	*0.00*	*0.00*		*200.00*	
USR 01-Phot Photography Misc. Supplies	12.00	MO	0	0	0	0	2,400	2,400	
			0.00	*0.00*	*0.00*	*450.00*		*450.00*	
RSM 014523505900 Vibration monitoring, seismograph and technician	180.00	DAY	0	0	0	81,000	0	81,000	
			373,439.94	*80,104.91*	*134,548.51*	*1,059.40*		*609,180.76*	
02 0AA F SAFETY, TRAFFIC CONTROL, FIRST AID, FIRE	**1.00**	**MO**	**373,440**	**80,105**	**134,549**	**1,059**	**20,028**	**609,181**	
(Note: Safety, Traffic Control, First Aid, and Fire Prevention. Includes all personnel, supplies and vehicles needed for safety, traffic control, first aid, safety training and fire prevention. Also includes their subsistence and travel, vehicles, supplies and miscellaneous items will be allocated to the job. Assumes safety Engineer allocation at 50% of job duration.)									
			78,669.02	*7,398.52*	*375.00*	*0.00*		*88,342.53*	
020AAFa Safety Management	**1.00**	**EA**	**78,669**	**7,399**	**375**	**0**	**1,900**	**88,343**	
			0.00	*0.00*	*0.00*	*0.00*		*400.00*	
USR SM-1 Prepare Drug Free Plan	1.00	EA	0	0	0	0	400	400	
			0.00	*0.00*	*0.00*	*0.00*		*1,000.00*	
USR SM-2 Prepare Hazard Analysis Plan	1.00	EA	0	0	0	0	1,000	1,000	
			0.00	*0.00*	*0.00*	*0.00*		*500.00*	
USR SM-3 Prepare Safety Plan	1.00	EA	0	0	0	0	500	500	
			0.00	*1,479.70*	*0.00*	*0.00*		*1,479.70*	
USR 015251112 4x2 3/4T Pickup (Monthly Cost) Assume 2/3-time Standby	5.00	MO	0	7,399	0	0	0	7,399	
			75.28	*0.00*	*75.00*	*0.00*		*150.28*	
USR SM-4 Safety Engineer's Supplies Assume 2% of Labor cost.	5.00	MO	376	0	375	0	0	751	
			13,048.77	*0.00*	*0.00*	*0.00*		*13,048.77*	
FOP FD-SAENG Safety Engineers	6.00	MO	78,293	0	0	0	0	78,293	
(Note: Assumed a Occupation Code of #29086 Engineer Technician III 30083 As of March 29, 2012)									
			0.00	*0.00*	*1,339.20*	*0.00*		*1,339.20*	
020AAFb Field First Aid	**1.00**	**EA**	**0**	**0**	**1,339**	**0**	**0**	**1,339**	
			0.00	*0.00*	*54.56*	*0.00*		*54.56*	
HTW 019413201503 First aid kits, 30 ingredients	4.00	EA	0	0	218	0	0	218	

Currency in US dollars

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	C/O
			0.00	*0.00*	*280.24*	*0.00*		*280.24*	
HTW 019413201107 Eye and body wash stations, portable eye wash station, 6 gallon	4.00	EA	0	0	1,121	0	0	1,121	
			0.00	*0.00*	*0.00*	*1,059.40*		*1,059.40*	
020AAFd Safety Training	**1.00**	**EA**	**0**	**0**	**0**	**1,059**	**0**	**1,059**	
			0.00	*0.00*	*0.00*	*52.97*		*52.97*	
HTW 019413206101 Personnel Training, off-site, refresher course, 8 hours, cost per student	20.00	EA	0	0	0	1,059	0	1,059	
			0.00	*0.00*	*2,260.56*	*0.00*		*2,260.56*	
020AAFg Field Fire Protection	**1.00**	**EA**	**0**	**0**	**2,261**	**0**	**0**	**2,261**	
			0.00	*0.00*	*282.57*	*0.00*		*282.57*	
HTW 019413201202 Fire extinguisher, CO2, 10 lb	8.00	EA	0	0	2,261	0	0	2,261	
(Note: Assumes two per work area.)									
020AAFi Traffic Control	**1.00**	**LS**	**294,771**	**72,706**	**130,574**	**0**	**18,128**	**516,179**	
			999.04	*0.00*	*0.00*	*0.00*		*999.04*	
USR 015702112 Two Flagman Crew	100.00	DAY	99,904	0	0	0	0	99,904	
			62.44	*0.00*	*52.00*	*0.00*		*114.44*	
HNC 101453200560 Signs, stock, reflectorized, UTMCD standard, warning sign, 24" x 24", with posts	80.00	EA	4,995	0	4,160	0	0	9,155	
			0.00	*1.78*	*0.00*	*0.00*		*1.78*	
EP TC-6 Flashing Arrows, 25 Lamps, TRLR Solar Panels w/ Battery Charger	4,334.00	HR	0	7,699	0	0	0	7,699	
(Note: Quantity reflects 6 months of 24 hour usage. Based on 4.3 weeks in a month.)									
			0.00	*5.03*	*0.00*	*0.00*		*5.03*	
EP TC-5 Lite Set, 4L/1000W, 6KW-GEN,TRLR	8,668.80	HR	0	43,615	0	0	0	43,615	
			0.00	*0.00*	*70.00*	*0.00*		*70.00*	
USR TC-4 Median Warning Sign Reflective Sheeting w/ stand	16.00	EA	0	0	1,120	0	0	1,120	
			0.00	*0.00*	*44.00*	*0.00*		*52.00*	
USR TC-1 Type 2 w/ Two Striped Boards 24"Long A-Frame, Traffic Barrier	16.00	EA	0	0	704	0	128	832	
			0.00	*0.00*	*30.00*	*0.00*		*75.00*	
USR TC-2 Safety Barrels / Cones to 36" Tall Traffic Barriers	400.00	EA	0	0	12,000	0	18,000	30,000	
(Note: assumes some will be replaced during the course of construction.)									
RSM 344113101410 Control Plan Design	1.00	LS	18,578	2,169	20,400	0	0	41,147	
(Note: Traffic Controls)									
			6.30	*0.79*	*32.50*	*0.00*		*39.59*	
HNC 015623100200 Barricades, precast concrete barrier walls, stock units, buy, 10' sections	150.00	LF	945	119	4,875	0	0	5,939	
			37.06	*0.00*	*5.00*	*0.00*		*42.06*	
RSM 015623100150 Barricades, wood, movable, 3 rail, 5' high, 3 rail @ 2" x 8", movable	16.00	LF	593	0	80	0	0	673	
			133.30	*15.00*	*68.50*	*0.00*		*216.80*	
RSM 323236104500 Gabion retaining walls, stone filled gabions, stone delivered, galvanized, highway surcharge, 3' wide, 6' long, 3'-0" high, excludes excavation	1,273.50	LF	169,756	19,104	87,235	0	0	276,095	
(Note: Assumed to be for flood protection / permanent lane shift during construction.)									
			0.00	*0.00*	*990.00*	*10,197.00*		*11,187.00*	
02 0AA G SANITATION FAC & TEMP BLDGS	**1.00**	**MO**	**0**	**0**	**990**	**10,197**	**0**	**11,187**	
(Note: Includes sanitation facilities, misc. buildings, yards, and building costs not otherwise classified. But it does not include all utilities costs. *)**									
			0.00	*0.00*	*0.00*	*10,197.00*		*10,197.00*	
020AAGa Sanitation Facilities	**1.00**	**EA**	**0**	**0**	**0**	**10,197**	**0**	**10,197**	
			0.00	*0.00*	*0.00*	*99.00*		*99.00*	
HNC 224213406000 Water closet, chemical portable toilet, per week, note: (40 hours) per 10 people, per OSHA	103.00	WK	0	0	0	10,197	0	10,197	
(Note: Assumes one per work area.)									
			0.00	*0.00*	*990.00*	*0.00*		*990.00*	

Currency in US dollars

Description	Quantity	UOM	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUserCost	DirectCost	C/O
020AAGb Temporary Buildings	**1.00**	**EA**	**0**	**0**	**990**	**0**	**0**	**990**	
			0.00	*0.00*	*82.50*	*0.00*		*82.50*	
RSM 015213201250 Storage Boxes, rent per month, 20' x 8'	12.00	EA	0	0	990	0	0	990	
(Note: Assumes rental of two storage box.)									
			22,819.03	*27,942.32*	*0.00*	*0.00*		*50,761.35*	
02 0AA H GENERAL EQUIPMENT EXPENSES	**1.00**	**MO**	**22,819**	**27,942**	**0**	**0**	**0**	**50,761**	
(Note: Includes equipment not required by specific work items. Also includes testing and rental of equipment when not charged to a specific bid item or items of work. Inspection fees and permits are included in mob and demob items. ***)**									
			0.00	*0.00*	*0.00*	*0.00*		*0.00*	
020AAHa Hook Services	**1.00**	**EA**	**0**	**0**	**0**	**0**	**0**	**0**	
			0.00	*0.00*	*0.00*	*0.00*		*0.00*	
GEN C80Z2240 CRANE, HYDRAULIC, TRUCK MOUNTED, 14 TON (12.7 MT), 80' (24.4 M) BOOM, 6X4	0.00	HR	0	0	0	0	0	0	
			0.00	*0.00*	*0.00*	*0.00*		*0.00*	
020AAHb Crane Testing	**1.00**	**EA**	**0**	**0**	**0**	**0**	**0**	**0**	
			0.00	*0.00*	*0.00*	*0.00*		*0.00*	
USR 015252122 Crane Testing - 26 to 50 tons Allow two hours per test.	0.00	EA	0	0	0	0	0	0	
			22,819.03	*27,942.32*	*0.00*	*0.00*		*50,761.35*	
020AAHc Misc. Vehicles & Equipment	**1.00**	**EA**	**22,819**	**27,942**	**0**	**0**	**0**	**50,761**	
			2,535.45	*3,104.70*	*0.00*	*0.00*		*5,640.15*	
USR 015251123 Water Truck w/1/4 Oper,3,000 Gal Assumed 3/4-time Standby	9.00	MO	22,819	27,942	0	0	0	50,761	
			3,262.74	*0.00*	*17,000.00*	*4,000.00*		*29,262.74*	
02 0AA I PROJECT UTILITIES SITE & CLEANUP	**1.00**	**MO**	**3,263**	**0**	**17,000**	**4,000**	**5,000**	**29,263**	
(Note: Includes all project costs not otherwise classified. *)**									
			3,262.74	*0.00*	*0.00*	*0.00*		*3,262.74*	
020AAIa Site Cleanup	**1.00**	**EA**	**3,263**	**0**	**0**	**0**	**0**	**3,263**	
			81.57	*0.00*	*0.00*	*0.00*		*81.57*	
USR 83 Final Site Cleanup	40.00	HR	3,263	0	0	0	0	3,263	
020AAIb Misc Project Expenses	**1.00**	**LS**	**0**	**0**	**17,000**	**0**	**5,000**	**22,000**	
USR MPE-2 Protect Existing Property	5.00	LS	0	0	0	0	5,000	5,000	
			0.00	*0.00*	*34.00*	*0.00*		*34.00*	
RSM 015813500020 Project Signs, sign, high intensity reflectorized, buy, excl. posts	500.00	SF	0	0	17,000	0	0	17,000	
			0.00	*0.00*	*0.00*	*4,000.00*		*4,000.00*	
020AAIc Site Utility Usage Fees	**1.00**	**EA**	**0**	**0**	**0**	**4,000**	**0**	**4,000**	
			0.00	*0.00*	*0.00*	*1,000.00*		*1,000.00*	
USR SUF-1 Site UtilityUsageTelephone	1.00	EA	0	0	0	1,000	0	1,000	
			0.00	*0.00*	*0.00*	*1,000.00*		*1,000.00*	
USR SUF-2 Site Utility Usage Electrical	2.00	EA	0	0	0	2,000	0	2,000	
			0.00	*0.00*	*0.00*	*1,000.00*		*1,000.00*	
USR SUF-4 Site Utility Usage Water	1.00	EA	0	0	0	1,000	0	1,000	

Labor ID: NLS2016 EQ ID: EP18R02 Currency in US dollars TRACES MII Version 4.4

Description | **Page**

Appendix H:
Purpose and Need Statement
(Approved by FHWA)

Purpose and Need Statement

I-376 Parkway Central Bathtub Flooding Study
Allegheny County, Pennsylvania

Pennsylvania Department of Transportation, Engineering District 11-0
45 Thoms Run Road, Bridgeville, PA 15017

Agreement No. E03024 – Work Order 6

December 2019

pennsylvania
DEPARTMENT OF TRANSPORTATION

AECOM

Purpose and Need Statement
I-376 Parkway Central Bathtub Flooding Study
E03024 Work Order 6

INTRODUCTION:

The bathtub section of Interstate 376 is a 2,500-foot long portion of the interstate that lies between the Monongahela River and downtown Pittsburgh. This segment of three-lane highway (two through lanes and one auxiliary exit lane) is roughly 5 feet higher than the normal river stage of 16 feet and is currently protected by a variable height floodwall with a minimum height of approximately 4 feet. The "Parkway Central Bathtub" floods and is closed to traffic during flood events with river stages greater than 25 feet.

PURPOSE:

The purpose of this project is to maintain the movement of traffic, including freight vehicles, and emergency service providers along the Parkway Central during significant Monongahela River flood events and to improve response time to Parkway Central flood events.

NEED 1: Reduce Frequency of or Eliminate Flooding

The primary need of the I-376, Section A69 Parkway Central "Bathtub" Flooding project is to significantly reduce or eliminate the frequency of Monongahela River flooding of the Parkway Central, thereby eliminating as much as practical the potential closure of the highway and the detouring of traffic through the City during river flooding that exceeds the current flood wall height (river stage in excess of 25 feet).

- The existing floodwall was built in 1985 and can prevent flooding of the Parkway Central up to a 25-foot river stage. District 11-0 closes the Parkway Central when floodwaters are within 12 inches of the top of the floodwall (24-foot river stage);
- The height of the current floodwall is limited by the hydrostatic uplift pressure on the Parkway Central concrete roadway slabs;
- The Parkway Central has been closed due to high waters sixteen times since the floodwall was built in 1985; four times since 2018 (See historic flooding data in Appendix A);
- The flooding of the 2500 ft stretch of the "Parkway Central Bathtub" requires detouring of I-376 eastbound traffic 3.3 miles and I-376 westbound traffic 0.8 miles through the downtown streets of Pittsburgh due to low points located along the route. (See Bathtub Closure Procedures in Appendix B).

NEED 2: Improve Inadequate Maintenance Response Time

The secondary need of this project is to improve the response time needed to close the Parkway Central, establish the detour, pump out the flood water and clean-up debris from the roadway, and reopen to traffic following a flood event that exceeds the flood wall height.

- The closure and detour of the Parkway Central are currently accomplished via Fort Pitt Tunnel and Allegheny County maintenance crews and the City of Pittsburgh Police. This is inefficient, expensive, and ties up resources from responding to other emergencies (See Bathtub Closure Procedures in Appendix B);
- After flooding of the Parkway Central occurs, it takes about 12 hours to pump out the water and cleanup the flood debris using the two 4-inch permanent pumps supplemented by two 8-inch pumps that are supplied by a Contractor that is on standby. The cost of cleanup is approximately $100K;
- During the Parkway Central closures, sawhorse and barrel type barriers are used due to their portability. However, these barrier types do not always prevent motorists from trying to drive through the flooded portion of the Parkway Central which is a safety hazard. Two motorists had to be rescued from their vehicles after the January 13, 2018 flood event;
- Detouring traffic within the City of Pittsburgh causes substantial additional delays/congestion and increased emergency service provider response times and safety concerns;
- The cleanup operations to remove mud and debris result in additional wear and tear on the Parkway Central pavement.

E03024 WO6 - I-376 Parkway Central Bathtub Flood Study
Purpose and Need - Historical Flood Data

All flood events	Flood events resulting in closure	Flood Events (River Stage and Date)
1		46.00 ft on 03/18/1936
2		38.50 ft on 03/15/1907
3		36.60 ft on 12/31/1942
4		35.82 ft on 06/24/1972
5		35.40 ft on 03/01/1902
6		35.10 ft on 04/27/1937
7	1	34.60 ft on 01/20/1996
8		34.50 ft on 01/26/1937
9		34.30 ft on 01/09/1913
10		33.40 ft on 03/07/1945
11		32.90 ft on 01/23/1937
12		32.40 ft on 10/16/1954
13		31.60 ft on 03/11/1964
14	2	31.00 ft on 09/18/2004
15		30.60 ft on 03/26/1936
16		29.80 ft on 04/15/1948
17		29.70 ft on 01/28/1952
18		29.23 ft on 01/22/1959
19		29.20 ft on 02/28/1936
20		28.60 ft on 02/14/1966
21	3	28.43 ft on 01/06/2005
22		27.60 ft on 03/06/1964
23	4	27.49 ft on 02/17/2018
24	5	27.20 ft on 12/31/1990
25	6	27.08 ft on 09/11/2018
26		26.70 ft on 03/20/1963
27	7	26.65 ft on 03/12/2011
28	8	26.19 ft on 11/06/1985
29	9	25.80 ft on 01/26/2010
30		25.80 ft on 03/13/1936
31		25.71 ft on 03/06/1979
32	10	25.69 ft on 11/20/2003
33	11	25.64 ft on 01/09/1998
34		25.60 ft on 04/03/1970
35	12	25.31 ft on 01/13/2018
36	13	25.25 ft on 12/02/2010
37		25.00 ft on 03/07/1967
38	14	24.93 ft on 02/06/1986
39	15	24.70 ft on 12/19/1990
40	16	24.43 ft on 02/09/2019
41		24.42 ft on 02/21/1981
42		24.27 ft on 02/26/1979

(43) 23.93 ft on 03/16/2007
(44) 23.73 ft on 11/29/1985
(45) 23.70 ft on 02/20/2000
(46) 23.59 ft on 02/15/1984
(47) 23.40 ft on 02/17/1976
(48) 23.30 ft on 03/06/1963

Greyed out data represents flooding that occurred prior to lock and dam installation and/or subsequent flood wall construction in 1985

Per D11-0 Closure Procedures, Parkway is closed when water level is within 12" of the top of the floodwall (= 24 foot river stage)

Data obtained from:
https://water.weather.gov/ahps2/crests.php?wfo=pbz&gage=pttp1&crest_type=historic

Assume events below this line did not result in closure.

PennDOT Allegheny County

<u>10th Street Bypass</u>

<u>Bathtub/Interstate Connector</u>

Emergency Closure Procedure

Updated: 3/11/2019

Bathtub/Interstate Connector Flooding Plan

Hydrograph Report from the National Weather Service:
https://water.weather.gov/ahps2/hydrograph.php?gage=pttp1&wfo=pbz

Bathtub (I-376 WB) – Interstate Connector (I-279 SB to I-376 EB)

- Bathtub and Interstate Connector flood when river water levels reach 25.0'

- Once 10th Street Bypass is closed, alert should be raised to potential Bathtub flooding
  - If Incident Command Center (ICC) is operating, the Incident Commander will take place of Assistant in scenario described below.

- 18.0' River Level: Sluice gates to be closed by Tunnel personnel
  - If problems occur with sluice gate pumps, Electrical Maintenance Contract should be contacted (Primary: ACM-Bill Lester, 412-861-6268 – Backup: IIC-Nick Warner, 412-292-9343)

- 22.0' River Level and Rising:
  - County Manager to assign an individual to be stationed in the Mon Wharf Parking/Bathtub area to frequently monitor and report water levels on backside of barrier separating Bathtub and Mon Wharf Parking area
  - TMC to contact County Manager to inform of river level

- 23.0' River Level:
  - Emergency Management Coordinator to contact Press Officer informing of potential closure
  - Assistant to ensure Sign Crew is prepared to close Bathtub and Interstate Connector
  - Crash trucks to begin to accessing staging locations
  - **Detour routes are attached**
  - Assistant/ Incident Commander (IC) to contact State Police to be on-scene for initial closure
    - State Police: 412-787-2000
  - Assistant/IC to contact City of Pittsburgh Police to be informed of potential Bathtub closure. If Bathtub is closed, Pittsburgh Police must be stationed on Ft. Pitt Boulevard to facilitate flow of traffic. ADE-Maintenance must be contacted in event Pittsburgh Police are not responsive.
    - City of Pittsburgh Police – Commander Trapp: 412-475-5339
    - City of Pittsburgh – Wendell Hissrich: 412-738-1192

- River Level 12" below top of Mon Wharf wall and Rising:
  - ***County Manager makes call to close I-376 WB immediately***
  - Incident Command Center (ICC) should stand-up
  - County Manager/Assistant to contact TMC and Press Office to notify of closure

- Seven access areas need closed (in order of priority). **Closure plans are attached.**
  - I-376 WB before Grant Street off-ramp
  - Ramp from Grant Street to I-376 WB – ***Tunnels to initially close with cones
  - Ramp from 5th Ave/Boulevard of the Allies to I-376 WB near Oakland
  - I-279 SB to I-376 EB on Portal Bridge – ***Tunnels to initially close with crash truck and cones
  - Access from Point State Park to I-376 EB
    - Assistant/IC to contact Point State Park to notify of closure (Jake Weiland, Park Manager, 412-560-5123)
  - Ramp from Stanwix Street to I-376 EB – ***Tunnels to initially close with cones
  - Ramp from Market Street to I-376 EB – ***Tunnels to initially close with cones
  - Ramp from Wood Street to I-376 EB – ***Tunnels to initially close with cones

- Tunnels crash trucks to be used during I-376 initial WB closure, if necessary. County Manager to contact Tunnel Manager (Ben DeVore, 412-292-8874) if needed.

- Once Bathtub is closed, pumping cannot occur until water recedes back behind barrier

- Once Bathtub is flooded, Incident Commander should contact Electrical Maintenance Contract to turn off sluice gate pumps (Primary: ACM-Bill Lester, 412-861-6268 – Backup: IIC-Nick Warner, 412-292-9343)

- Tow-behind pumps from Rental Equipment ITQ should be used to remove water from Bathtub. Sluice gate pumps should not be used to remove water from Bathtub.

- County Manager/Assistant to contact contractors for pump availability to remove waters, if necessary

- Flooding relief pipe, located on top of barrier near Stanwix Street on ramp, should be utilized and connected to pump

- County Manager/Assistant to ensure equipment necessary for cleanup is available and positioned at the North Shore stockpile

    - Types and quantities of equipment may change based upon cleanup needs, but ensure the following equipment is available for cleanup efforts:
        - (2) Brooms
        - (2-4) Tankers/Flushers
        - (1) Vac Truck
        - (1) Rubber Blade Grader
        - (2) Loaders

- 24’ River Level and **Decreasing**:
    - If all flood debris is removed from the roadway, Incident Commander and County Manager should make call to open Bathtub and Interstate Connector
    - County Manager/IC should contact TMC
    - ICC should stand-down

Bathtub/Interstate Connector

Traffic Control Plan
Emergency Closure Plan

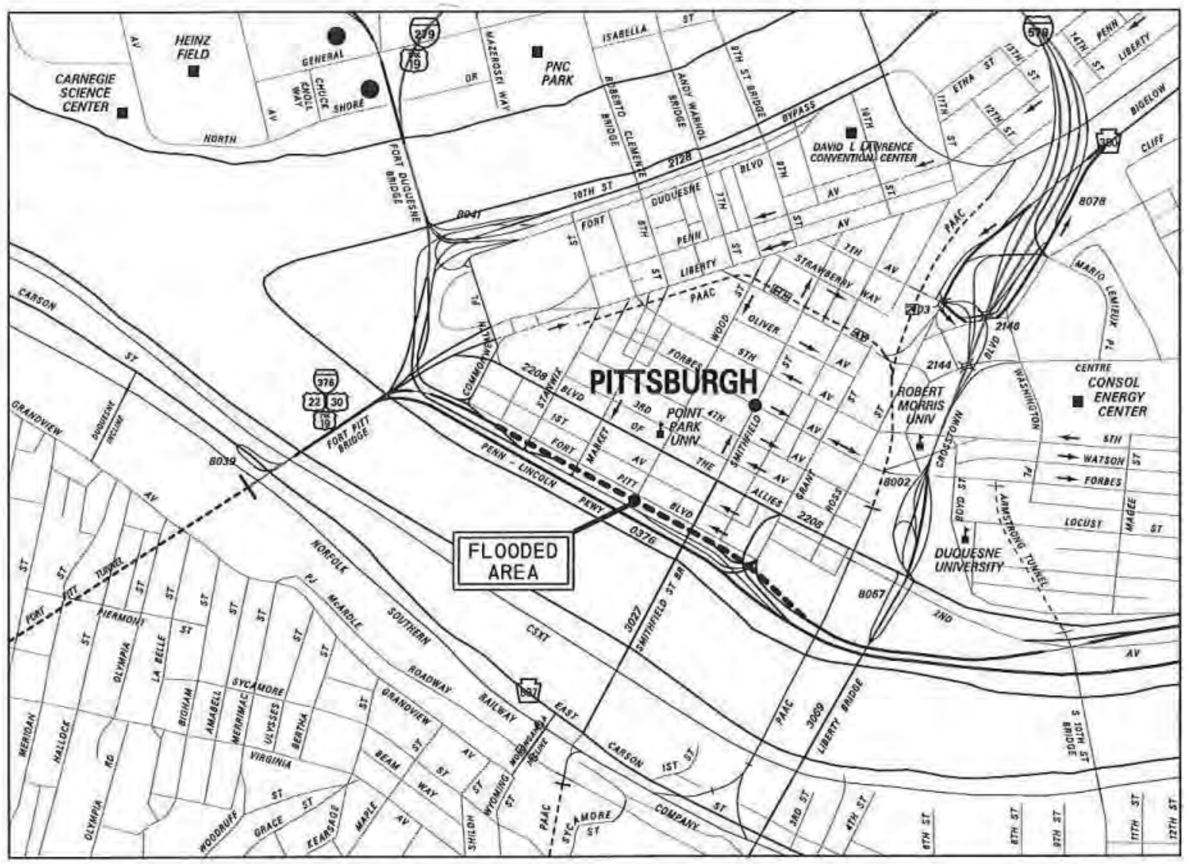
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	376	---	1 OF 9
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY

PLOTTED:06-FEB-2019 08:30

OPERATOR: JOSH GRIMM
FILE NAME: J:\Maintenance\Traffic\Work Zone Traffic Control Section\MPT\JOBS FOLDER\MAINTENANCE\Bathtub Detour\Bathtub Detour TCP.dgn

I-376 BATHTUB FLOODING EMERGENCY CLOSURE



TRAFFIC CONTROL SIGNS

SIGN DESIGNATION	DESCRIPTION	SIZE	MIN QTY
R11-2	ROAD CLOSED	48"X30"	14
W20-3*	ROAD CLOSED	48"X48"	2
W4-2R*	RIGHT LANE ENDS	48"X48"	2
W20-5AR*	RIGHT TWO LANES CLOSED	48"X48"	2
W20-3*	ROAD CLOSED	36"X36"	12
W30-1-6*	DISTANCE (AHEAD) (PANEL)	30"X10"	1
W30-1-4*	DISTANCE (1/2 MILE) (PANEL)	30"X10"	1
W30-1-5*	DISTANCE (1 MILE) (PANEL)	30"X10"	1
W30-1-5 (MOD)*	DISTANCE (2 MILES) (PANEL)	30"X10"	1
1	I-376 EB DETOUR STRAIGHT	42"X72"	1
2	I-376 EB DETOUR ADVANCE 45° RIGHT	42"X72"	2
3	I-376 EB DETOUR 45° RIGHT	42"X78"	2
4	I-376 EB DETOUR ADVANCE 45° LEFT	42"X72"	1
5	I-376 EB DETOUR 45° LEFT	36"X66"	2
A	I-376 WB DETOUR STRAIGHT	36"X66"	4
B	I-376 WB DETOUR ADVANCE RIGHT	36"X66"	2
C	I-376 WB DETOUR RIGHT	36"X66"	2
D	I-376 WB DETOUR ADVANCE LEFT	36"X66"	3
E	I-376 WB DETOUR LEFT	36"X66"	3
	CHANNELIZER		147
	B POST SIGN		24
	TYPE III BARRICADE		18

* USE PINK BACKGROUND WITH BLACK LETTERING

TABLE OF CONTENTS

RECOMMENDED DATE: 2/7/19

JST

JEFFREY S. THOMPSON, P.E.
ASST. DISTRICT TRAFFIC ENGR.

DISTRICT 11-0
TRAFFIC UNIT

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
TODD MICHAEL KRAVITS
ENGINEER
PE-035816-E

TODD MICHAEL KRAVITS, P.E.
DISTRICT TRAFFIC ENGINEER
DATE: 2/7 2019

TRAFFIC CONTROL PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	376	---	2 OF 9
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY

PLOTTED:16-JAN-2019 14:38

OPERATOR: JOSH GRIMM
FILE NAME: J:\Maintenance\Traffic\Work Zone Traffic Control Section\MPT\JOBS FOLDER\MAINTENANCE\Bathtub Detour\Bathtub Detour TCP.dgn

NOT TO SCALE

MAP

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
TODD MICHAEL KRAVITS
ENGINEER
PE-039886-E

TRAFFIC CONTROL PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	376	---	3 OF 9
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY

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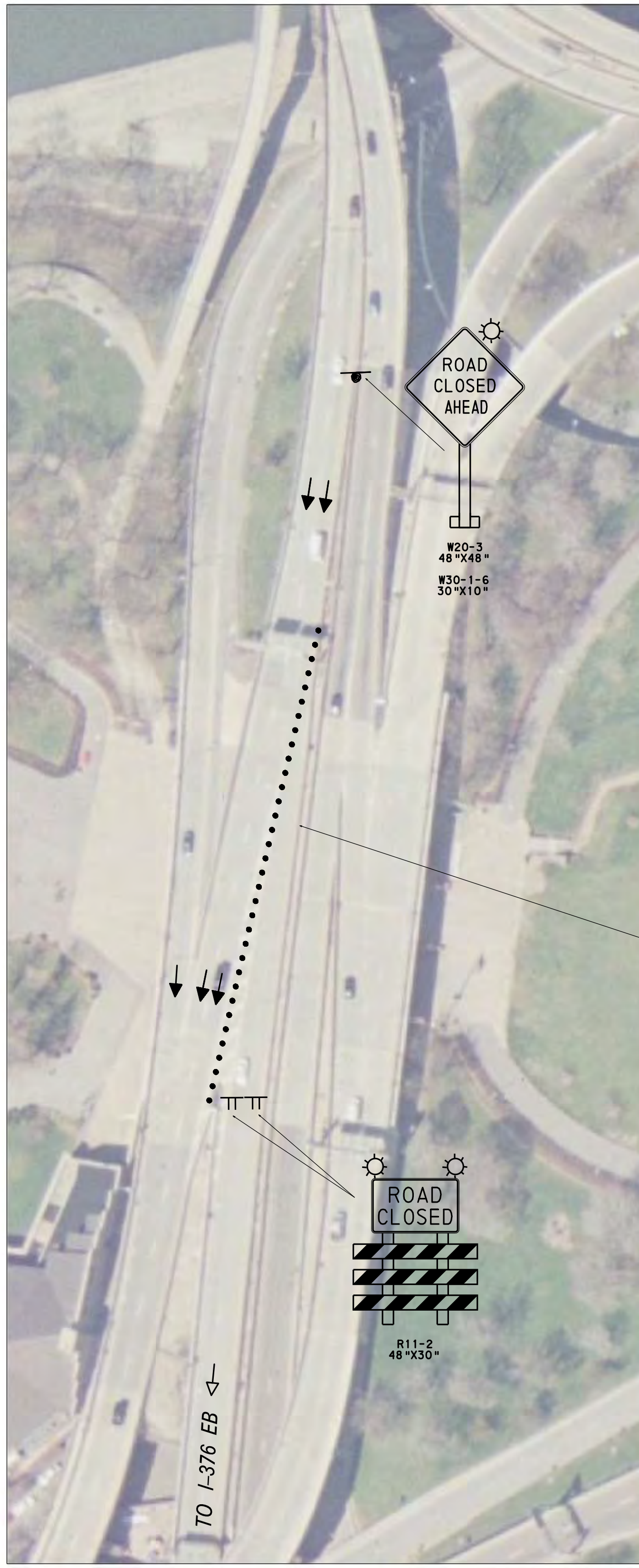

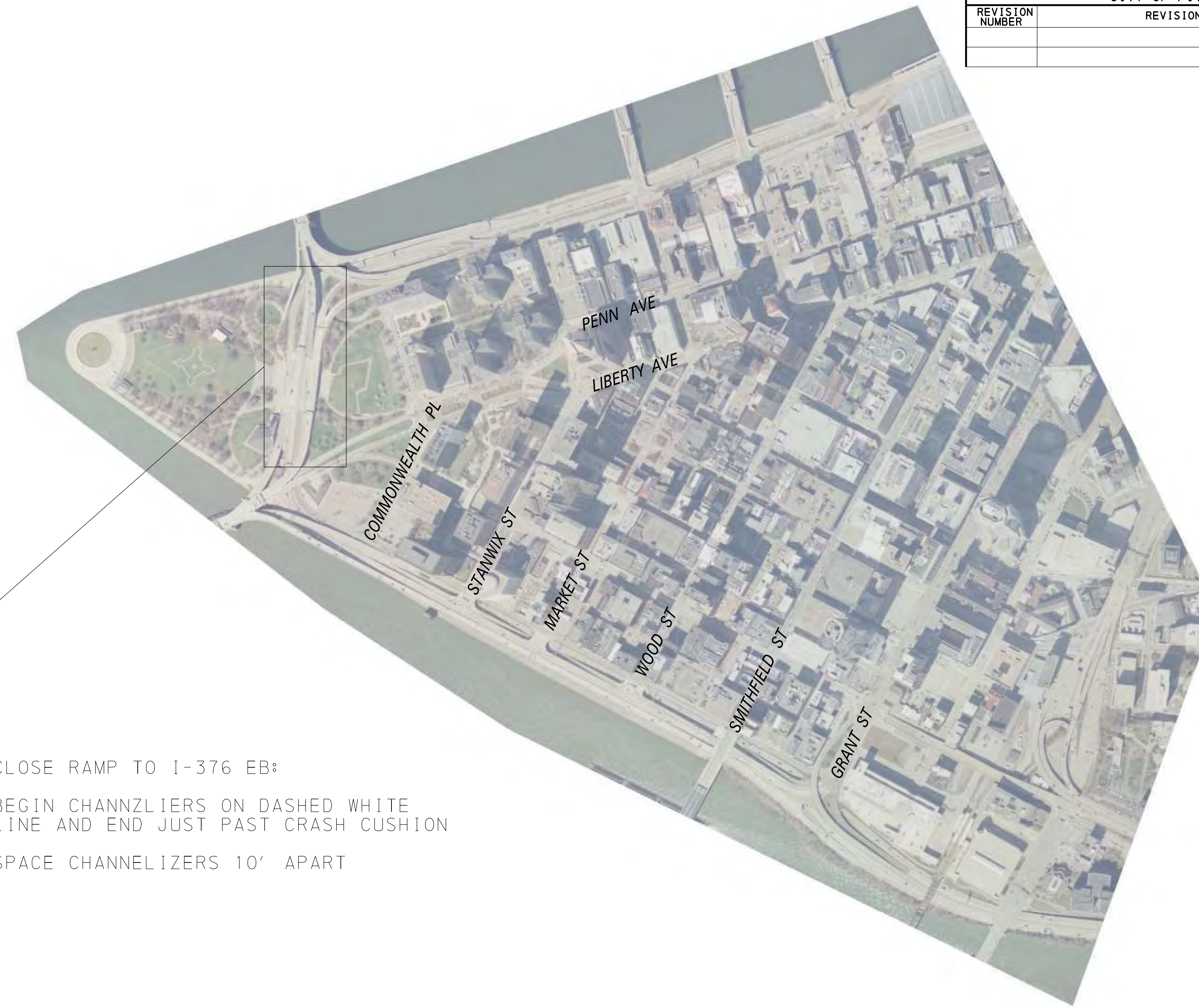

CLOSE RAMP TO I-376 EB:

BEGIN CHANNZLIERS ON DASHED WHITE LINE AND END JUST PAST CRASH CUSHION

SPACE CHANNELIZERS 10' APART

NOT TO SCALE

LEGEND

- POST MOUNTED SIGN
- TYPE III BARRICADE
- CHANNELIZER
- TYPE B FLASHING LIGHT

OPERATOR: JOSH GRIMM
FILE NAME: J:\Maintenance\Traffic\Work Zone Traffic Control Section\MPT\JOBS FOLDER\MAINTENANCE\Bathtub Detour\Bathtub Detour TCP.dgn

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
TODD MICHAEL KRAVITS
ENGINEER

I-279 SB CONNECTOR TO I-376 EB

TRAFFIC CONTROL PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	376	---	4 OF 9
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY

PLOTTED:16-JAN-2019 14:42

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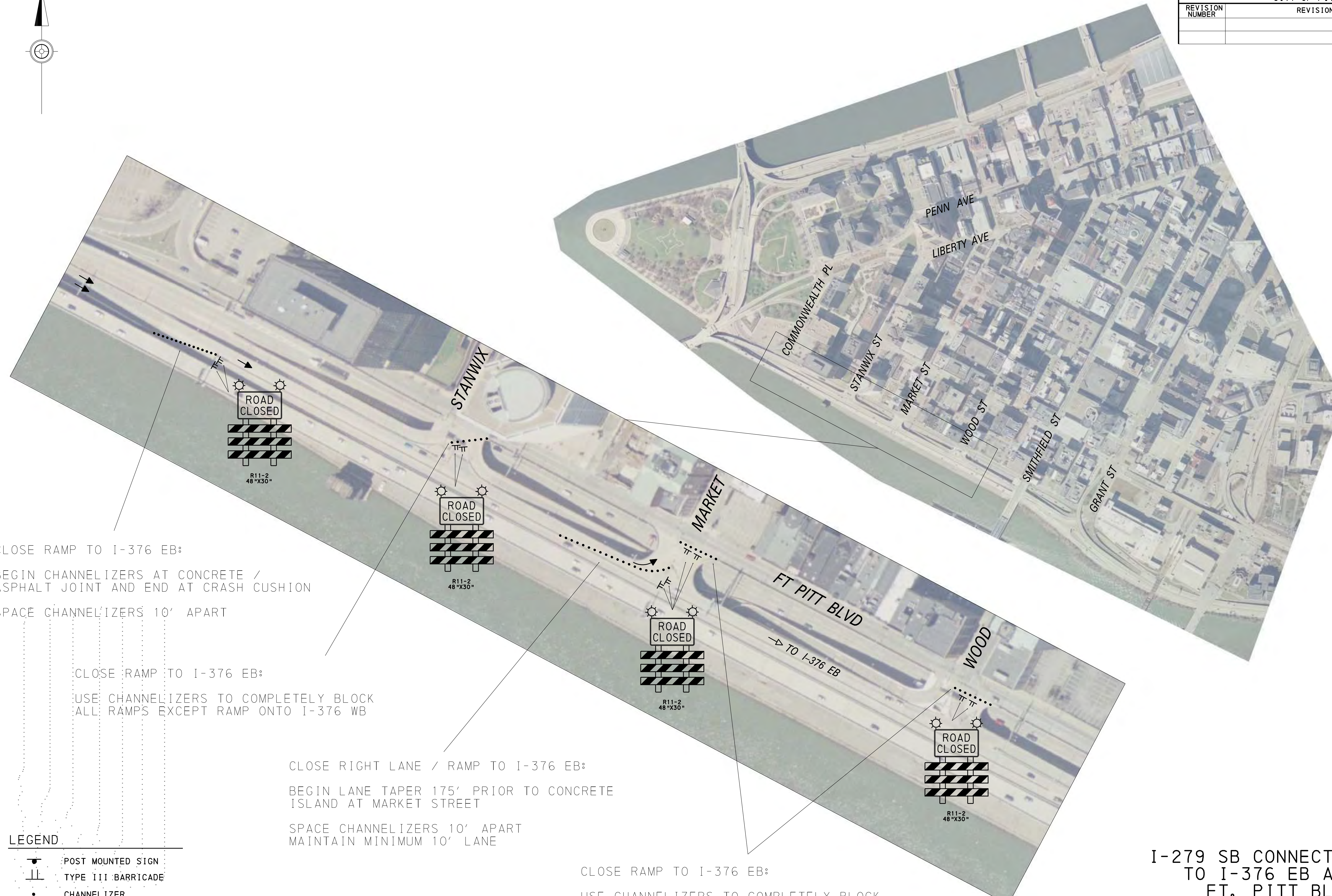


CLOSE RAMP TO I-376 EB:

BEGIN CHANNELIZERS AT CONCRETE / ASPHALT JOINT AND END AT CRASH CUSHION

SPACE CHANNELIZERS 10' APART

CLOSE RAMP TO I-376 EB:

USE CHANNELIZERS TO COMPLETELY BLOCK ALL RAMPS EXCEPT RAMP ONTO I-376 WB

CLOSE RIGHT LANE / RAMP TO I-376 EB:

BEGIN LANE TAPER 175' PRIOR TO CONCRETE ISLAND AT MARKET STREET

SPACE CHANNELIZERS 10' APART
MAINTAIN MINIMUM 10' LANE

CLOSE RAMP TO I-376 EB:

USE CHANNELIZERS TO COMPLETELY BLOCK ENTRANCE TO FORT PITT BOULEVARD

LEGEND

- POST MOUNTED SIGN
- TYPE III BARRICADE
- CHANNELIZER
- TYPE B FLASHING LIGHT

NOT TO SCALE

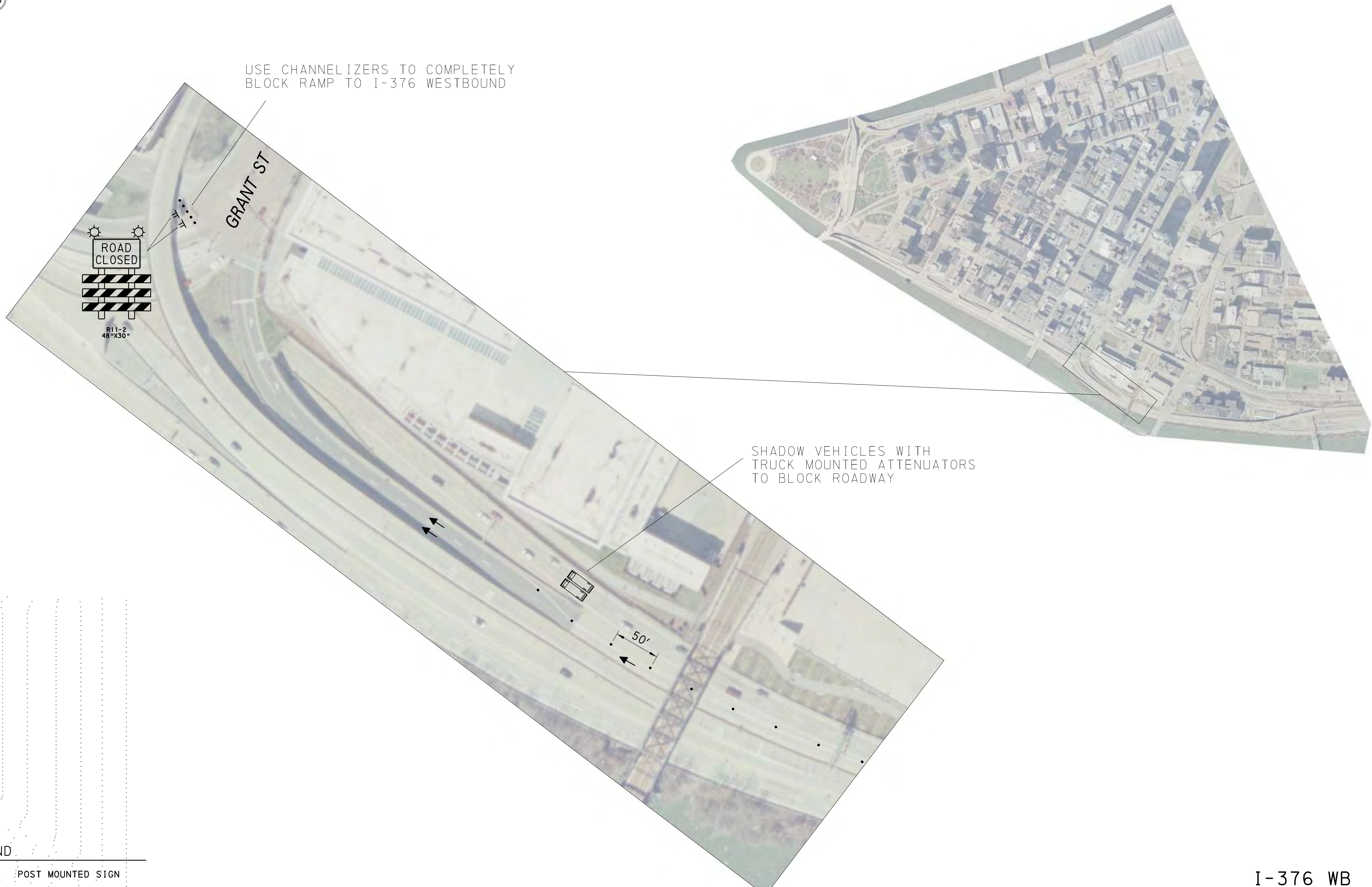
COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
TODD MICHAEL KRAVITS
ENGINEER
PE-039886-E

I-279 SB CONNECTOR TO I-376 EB AND FT. PITT BLVD

TRAFFIC CONTROL PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	376	---	5 OF 9
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY



NOT TO SCALE

LEGEND

- POST MOUNTED SIGN
- TYPE III BARRICADE
- CHANNELIZER
- TYPE B FLASHING LIGHT
- SHAWDOW VEHICLE W/ ATTENUATORS

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
TODD MICHAEL KRAVITS
ENGINEER
PE-039886-E

I-376 WB AND GRANT ST EXIT

TRAFFIC CONTROL PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	376	---	6 OF 9
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY

NOT TO SCALE

LEGEND

- POST MOUNTED SIGN
- TYPE III BARRICADE
- CHANNELIZER
- TYPE B FLASHING LIGHT
- ARROW BOARD

I-376 WB BETWEEN 2ND AVE EXIT AND GRANT ST EXIT

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
TODD MICHAEL KRAVITS
ENGINEER
PE-039886-E

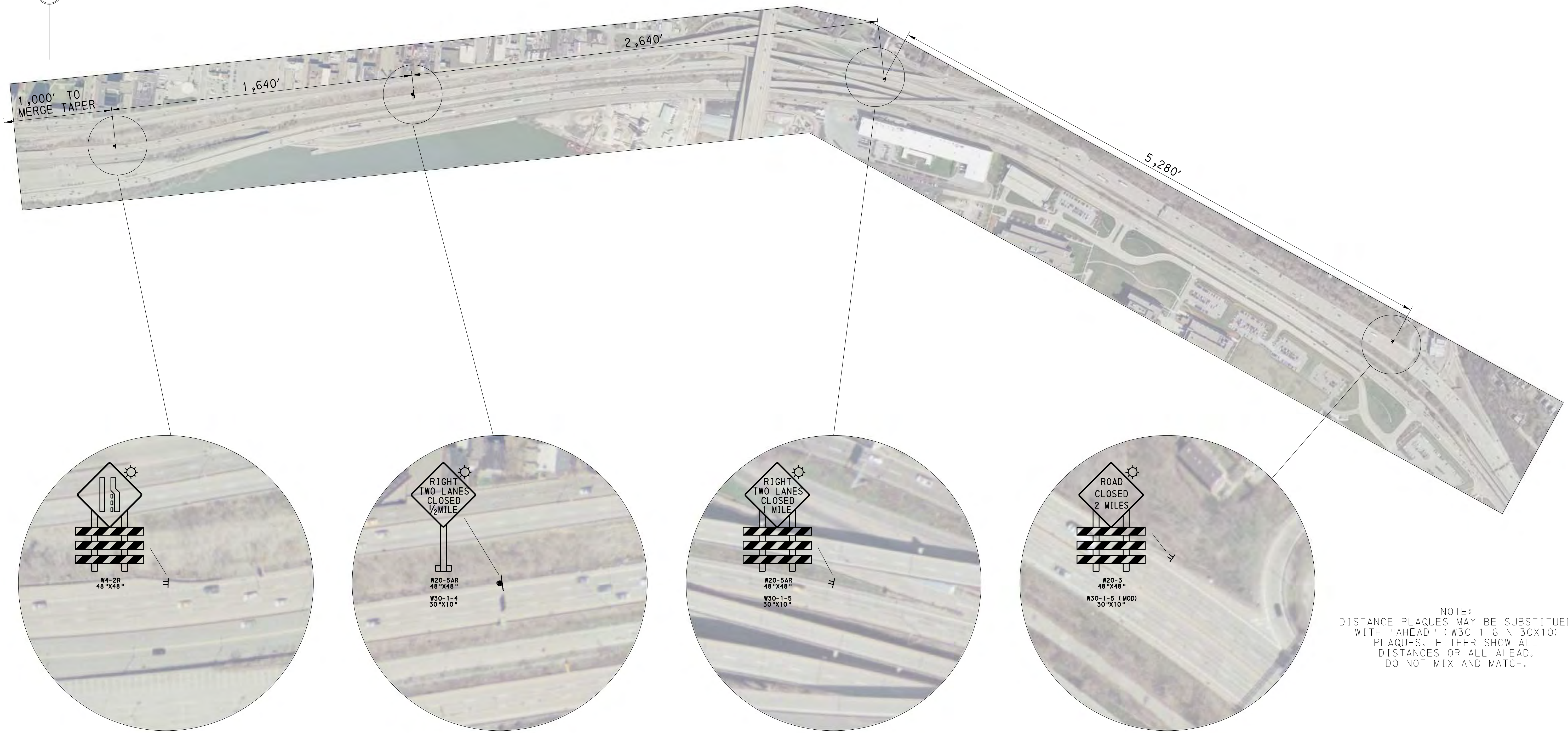
TRAFFIC CONTROL PLAN

PLOTTED:16-JAN-2019 14:44

OPERATOR: JOSH GRIMM
FILE NAME: J:\Maintenance\Traffic\Work Zone Traffic Control Section\MPT\JOBS FOLDER\MAINTENANCE\Bathtub Detour\Bathtub Detour TCP.dgn

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	376	---	7 OF 9
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY



PLACE SIGN AT BEGINNING OF EMERGENCY PULL-OFF

PLACE SIGN AT "PITTSBURGH EXITS" SIGN

PLACE SIGN AT JUST PAST "EXIT 72B" SIGN

PLACE SIGN AT JUST PAST "EXIT 73A"

NOTE:
DISTANCE PLAQUES MAY BE SUBSTITUED WITH "AHEAD" (W30-1-6 \ 30X10) PLAQUES. EITHER SHOW ALL DISTANCES OR ALL AHEAD. DO NOT MIX AND MATCH.

NOT TO SCALE

LEGEND

- POST MOUNTED SIGN
- TYPE III BARRICADE
- CHANNELIZER
- TYPE B FLASHING LIGHT

I-376 WB BETWEEN BATES ST EXIT AND 2ND AVE EXIT

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL TODD MICHAEL KRAVITS ENGINEER PE-039886-E

TRAFFIC CONTROL PLAN

PLOTTED:16-JAN-2019 14:45

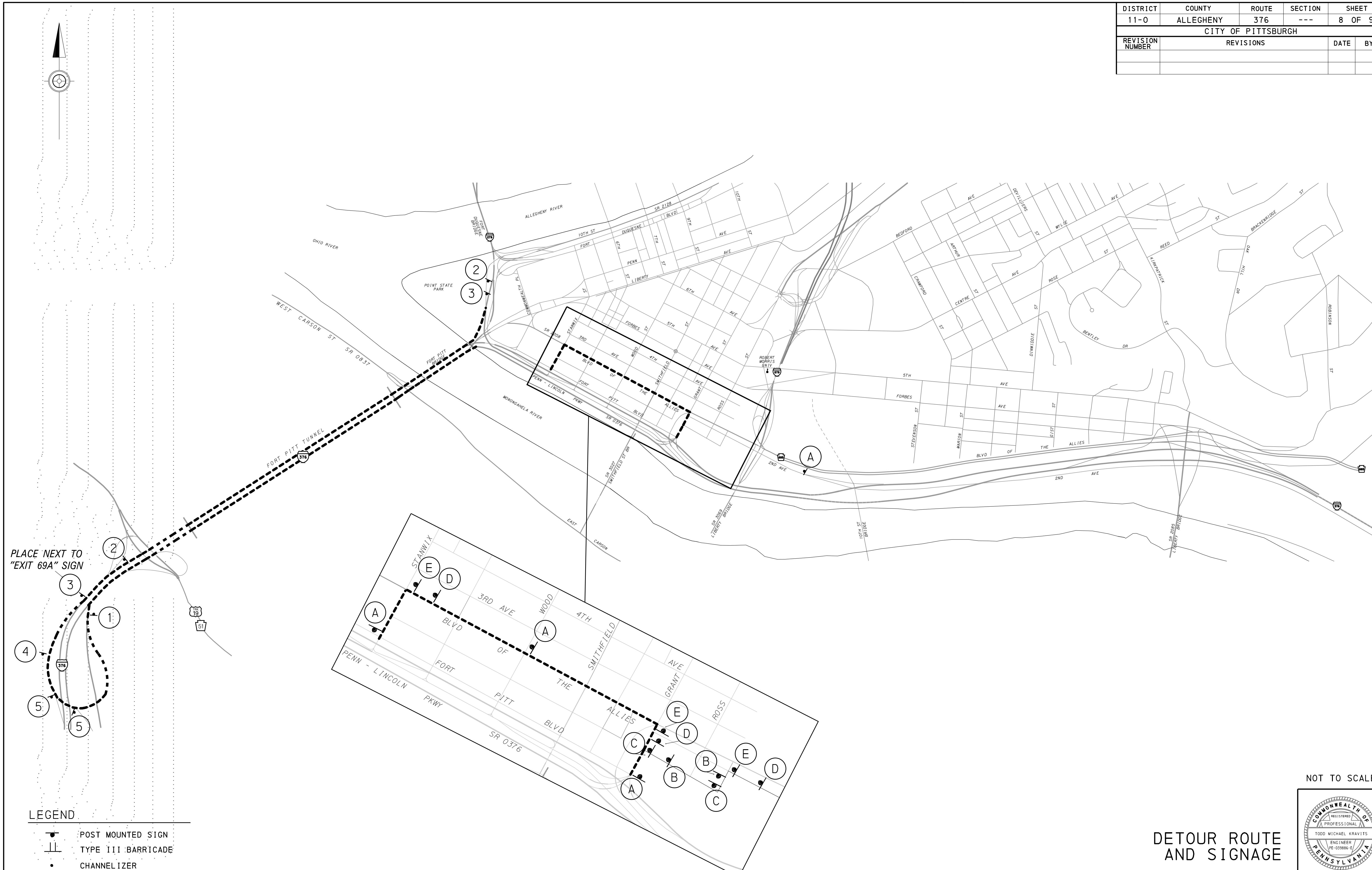
OPERATOR: JOSH GRIMM
FILE NAME: J:\Maintenance\Traffic\Work Zone Traffic Control Section\MPT\JOBS FOLDER\MAINTENANCE\Bathtub Detour\Bathtub Detour TCP.dgn

PLOTTED:16-JAN-2019 14:47

OPERATOR: JOSH GRIMM
FILE NAME: J:\Maintenance\Traffic\Work Zone Traffic Control Section\MPT\JOBS FOLDER\MAINTENANCE\Bathtub Detour\Bathtub Detour TCP.dgn

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	376	---	8 OF 9
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY



NOT TO SCALE

LEGEND

- POST MOUNTED SIGN
- TYPE III BARRICADE
- CHANNELIZER
- TYPE B FLASHING LIGHT
- DETOUR ROUTE

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
TODD MICHAEL KRAVITS
ENGINEER
PE-039886-E

DETOUR ROUTE AND SIGNAGE

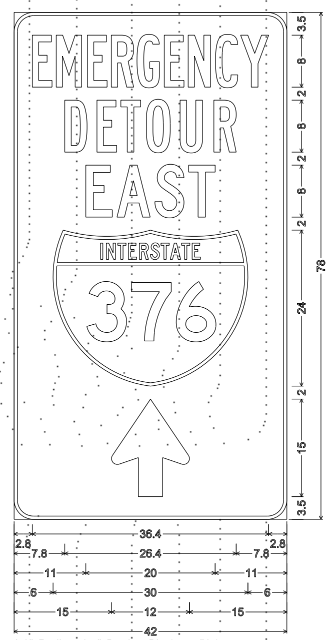
TRAFFIC CONTROL PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	376	---	9 OF 9
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY

PLOTTED:28-JAN-2019 09:23

1



3.0" Radius, 0.5" Border, Black on Pink;
"EMERGENCY" B 2K 50% spacing;
"DETOUR" B 2K; "EAST" C 2K;
Arrow Custom - 15.0" 90°;
Table of widths and spaces.

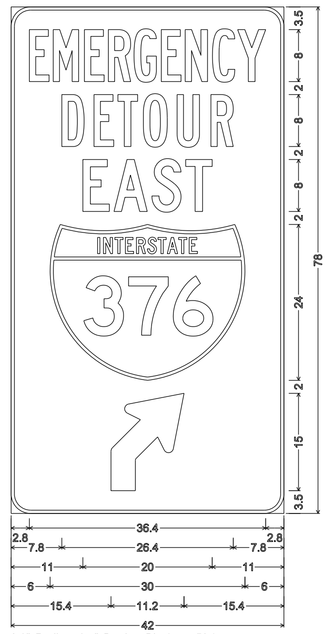
	E		M		E		R		G		E		N		C		Y	
2.8	3.0	0.7	3.9	0.9	3.0	0.7	3.4	0.5	3.5	0.7	3.1	0.6	3.4	0.8	3.4	0.5	4.3	2.8

	D		E		T		O		U		R	
7.8	3.4	1.6	3.0	0.6	3.1	0.9	3.6	1.6	3.4	1.8	3.4	7.8

	E		A		S		T	
11.0	4.1	0.7	5.2	0.7	4.5	0.7	4.1	11.0

6.0	30.0	6.0
15.0	12.0	15.0

2



3.0" Radius, 0.5" Border, Black on Pink;
"EMERGENCY" B 2K 50% spacing;
"DETOUR" B 2K; "EAST" C 2K;
45 Deg Advance Turn Arrow Custom 11.3" X 15.0";
Table of widths and spaces.

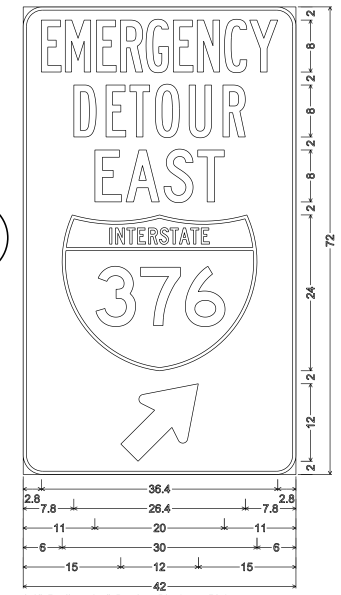
	E		M		E		R		G		E		N		C		Y	
2.8	3.0	0.7	3.9	0.9	3.0	0.7	3.4	0.5	3.5	0.7	3.1	0.6	3.4	0.8	3.4	0.5	4.3	2.8

	D		E		T		O		U		R	
7.8	3.4	1.6	3.0	0.6	3.1	0.9	3.6	1.6	3.4	1.8	3.4	7.8

	E		A		S		T	
11.0	4.1	0.7	5.2	0.7	4.5	0.7	4.1	11.0

6.0	30.0	6.0
15.4	11.2	15.4

3



3.0" Radius, 0.5" Border, Black on Pink;
"EMERGENCY" B 2K 50% spacing;
"DETOUR" B 2K; "EAST" C 2K;
Arrow Custom - 15.0" 45°;
Table of widths and spaces.

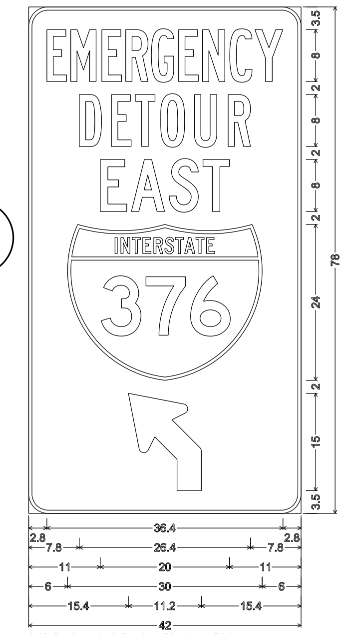
	E		M		E		R		G		E		N		C		Y	
2.8	3.0	0.7	3.9	0.9	3.0	0.7	3.4	0.5	3.5	0.7	3.1	0.6	3.4	0.8	3.4	0.5	4.3	2.8

	D		E		T		O		U		R	
7.8	3.4	1.6	3.0	0.6	3.1	0.9	3.6	1.6	3.4	1.8	3.4	7.8

	E		A		S		T	
11.0	4.1	0.7	5.2	0.7	4.5	0.7	4.1	11.0

6.0	30.0	6.0
15.0	12.0	15.0

4



3.0" Radius, 0.5" Border, Black on Pink;
"EMERGENCY" B 2K 50% spacing;
"DETOUR" B 2K; "EAST" C 2K;
45 Deg Advance Turn Arrow Custom 11.3" X 15.0";
Table of widths and spaces.

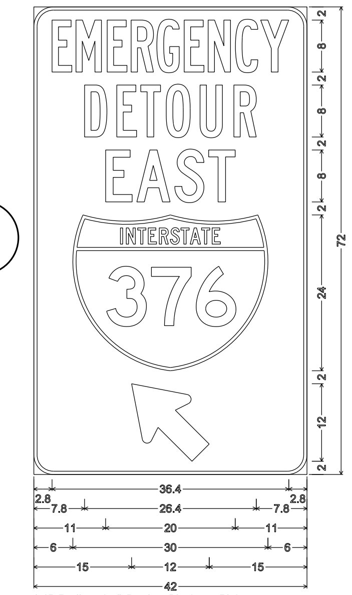
	E		M		E		R		G		E		N		C		Y	
2.8	3.0	0.7	3.9	0.9	3.0	0.7	3.4	0.5	3.5	0.7	3.1	0.6	3.4	0.8	3.4	0.5	4.3	2.8

	D		E		T		O		U		R	
7.8	3.4	1.6	3.0	0.6	3.1	0.9	3.6	1.6	3.4	1.8	3.4	7.8

	E		A		S		T	
11.0	4.1	0.7	5.2	0.7	4.5	0.7	4.1	11.0

6.0	30.0	6.0
15.4	11.2	15.4

5



3.0" Radius, 0.5" Border, Black on Pink;
"EMERGENCY" B 2K 50% spacing;
"DETOUR" B 2K; "EAST" C 2K;
Arrow Custom - 15.0" 135°;
Table of widths and spaces.

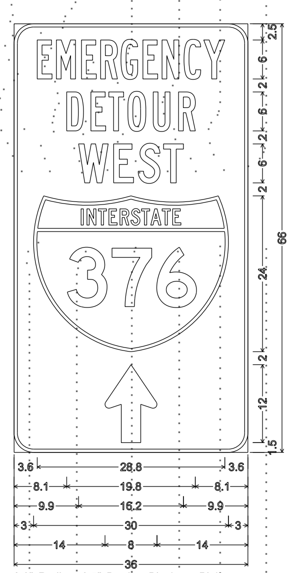
	E		M		E		R		G		E		N		C		Y	
2.8	3.0	0.7	3.9	0.9	3.0	0.7	3.4	0.5	3.5	0.7	3.1	0.6	3.4	0.8	3.4	0.5	4.3	2.8

	D		E		T		O		U		R	
7.8	3.4	1.6	3.0	0.6	3.1	0.9	3.6	1.6	3.4	1.8	3.4	7.8

	E		A		S		T	
11.0	4.1	0.7	5.2	0.7	4.5	0.7	4.1	11.0

6.0	30.0	6.0
15.0	12.0	15.0

A



3.0" Radius, 0.5" Border, Black on Pink;
"EMERGENCY" B 2K 70% spacing;
"DETOUR" B 2K; "WEST" C 2K;
Arrow K - 12.0" 90°;
Table of widths and spaces.

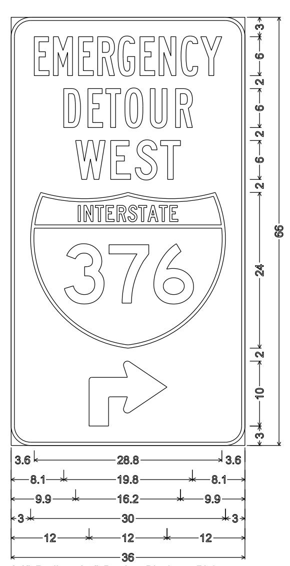
	E		M		E		R		G		E		N		C		Y	
3.6	2.2	0.7	2.9	1.0	2.3	0.6	2.6	0.6	2.5	0.8	2.3	0.7	2.6	0.8	2.5	0.5	3.2	3.6

	D		E		T		O		U		R	
8.1	2.6	1.1	2.3	0.5	2.3	0.6	2.8	1.1	2.6	1.3	2.6	8.1

	W		E		S		T	
9.9	4.6	0.8	3.1	0.7	3.4	0.5	3.1	9.9

3.0	30.0	3.0
14.0	8.0	14.0

B



3.0" Radius, 0.5" Border, Black on Pink;
"EMERGENCY" B 2K 70% spacing;
"DETOUR" B 2K; "WEST" C 2K;
90 Deg Advance Turn Arrow Custom 12.0" X 10.0";
Table of widths and spaces.

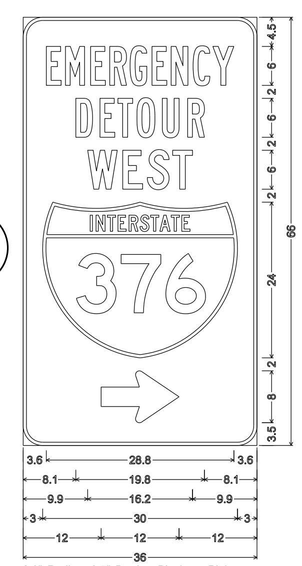
	E		M		E		R		G		E		N		C		Y	
3.6	2.2	0.7	2.9	1.0	2.3	0.6	2.6	0.6	2.5	0.8	2.3	0.7	2.6	0.8	2.5	0.5	3.2	3.6

	D		E		T		O		U		R	
8.1	2.6	1.1	2.3	0.5	2.3	0.6	2.8	1.1	2.6	1.3	2.6	8.1

	W		E		S		T	
9.9	4.6	0.8	3.1	0.7	3.4	0.5	3.1	9.9

3.0	30.0	3.0
12.0	12.0	12.0

C



3.0" Radius, 0.5" Border, Black on Pink;
"EMERGENCY" B 2K 70% spacing;
"DETOUR" B 2K; "WEST" C 2K;
Arrow K - 12.0" 0°;
Table of widths and spaces.

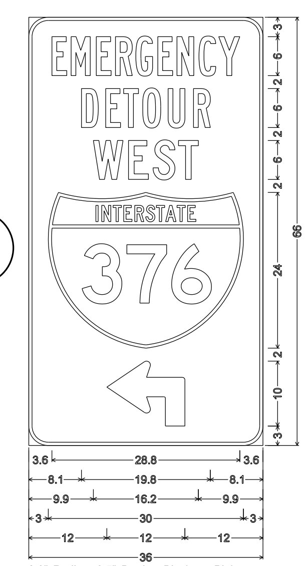
	E		M		E		R		G		E		N		C		Y	
3.6	2.2	0.7	2.9	1.0	2.3	0.6	2.6	0.6	2.5	0.8	2.3	0.7	2.6	0.8	2.5	0.5	3.2	3.6

	D		E		T		O		U		R	
8.1	2.6	1.1	2.3	0.5	2.3	0.6	2.8	1.1	2.6	1.3	2.6	8.1

	W		E		S		T	
9.9	4.6	0.8	3.1	0.7	3.4	0.5	3.1	9.9

3.0	30.0	3.0
12.0	12.0	12.0

D



3.0" Radius, 0.5" Border, Black on Pink;
"EMERGENCY" B 2K 70% spacing;
"DETOUR" B 2K; "WEST" C 2K;
90 Deg Advance Turn Arrow Custom 12.0" X 10.0";
Table of widths and spaces.

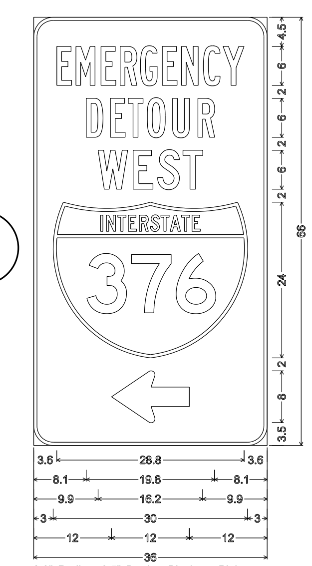
	E		M		E		R		G		E		N		C		Y	
3.6	2.2	0.7	2.9	1.0	2.3	0.6	2.6	0.6	2.5	0.8	2.3	0.7	2.6	0.8	2.5	0.5	3.2	3.6

	D		E		T		O		U		R	
8.1	2.6	1.1	2.3	0.5	2.3	0.6	2.8	1.1	2.6	1.3	2.6	8.1

	W		E		S		T	
9.9	4.6	0.8	3.1	0.7	3.4	0.5	3.1	9.9

3.0	30.0	3.0
12.0	12.0	12.0

E



3.0" Radius, 0.5" Border, Black on Pink;
"EMERGENCY" B 2K 70% spacing;
"DETOUR" B 2K; "WEST" C 2K;
Arrow K - 12.0" 180°;
Table of widths and spaces.

	E		M		E		R		G		E		N		C		Y	
3.6	2.2	0.7	2.9	1.0	2.3	0.6	2.6	0.6	2.5	0.8	2.3	0.7	2.6	0.8	2.5	0.5	3.2	3.6

	D		E		T		O		U		R	
8.1	2.6	1.1	2.3	0.5	2.3	0.6	2.8	1.1	2.6	1.3	2.6	8.1

	W		E		S		T	
9.9	4.6	0.8	3.1	0.7	3.4	0.5	3.1	9.9

3.0	30.0	3.0
12.0	12.0	12.0

OPERATOR: JOSH GRIMM
FILE NAME: J:\Maintenance\Traffic\Work Zone Traffic Control Section\MPT\JOBS FOLDER\MAINTENANCE\Bathtub Detour\Bathtub Detour TCP.dgn

NOT TO SCALE

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
TODD MICHAEL KRAVITS
ENGINEER
PE-039886-E

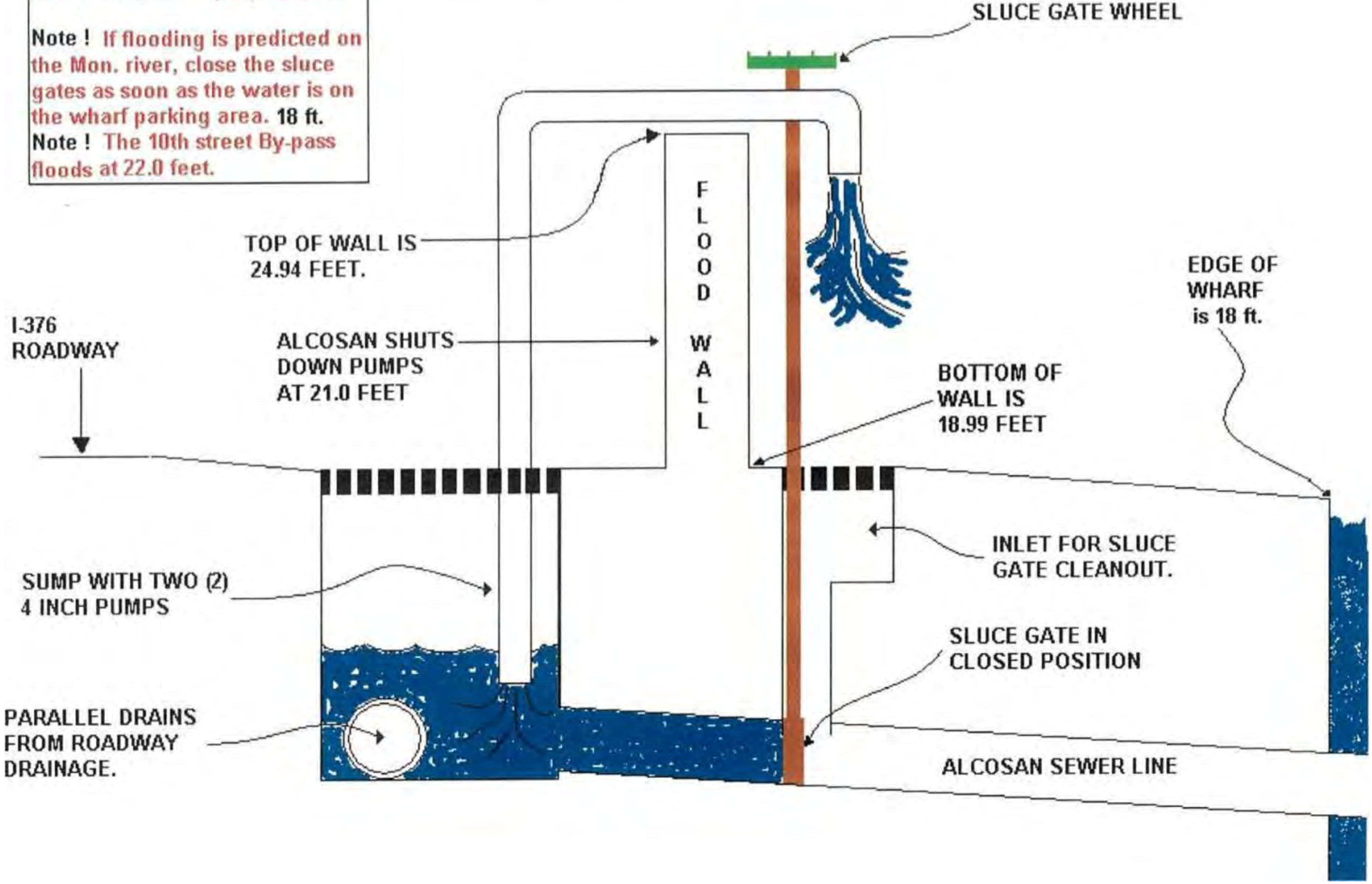
SIGNING INFORMATION

TRAFFIC CONTROL PLAN

GATES AND PUMP SYSTEM AT THE MON WHARF

EMSWORTH DAM (412) 766-6213
RIVER GAUGE (412) 644-4816

Note ! If flooding is predicted on the Mon. river, close the sluce gates as soon as the water is on the wharf parking area. **18 ft.**
Note ! The 10th street By-pass floods at 22.0 feet.



From: Rampulla, Brian <brrampulla@pa.gov>
Sent: Monday, December 30, 2019 9:29 AM
To: Rodgers, Steve
Cc: Ruzzi, Louis
Subject: FW: [External] RE: (11-0) - P&N - I-376 (A69)

Steve,

See below for FHWAs one comment. I don't believe you need to resubmit since she was going to pull from your supplied document.

Thanks,
Brian

Brian P. Rampulla, PE | Bridge Inspection Squad Leader
Phone: 412.429.4911
www.dot.state.pa.us | brrampulla@pa.gov

From: Young, Mark
Sent: Monday, December 30, 2019 6:46 AM
To: Rampulla, Brian <brrampulla@pa.gov>
Cc: Ruzzi, Louis <LRUZZI@pa.gov>; DeFazio, Victor <VDEFAZIO@pa.gov>; Crouch, Todd <tcrouch@pa.gov>; Krobot, Nicholas <nikrobot@pa.gov>
Subject: FW: [External] RE: (11-0) - P&N - I-376 (A69)

Brian – the subject document has been approved with one comment relating to an attachment. Please pass onto the consultant. As we have discussed, alternatives moving forward must meet the P&N along with other engineering and environmental considerations deemed relevant. Let me know if you have any questions – thanks.

Mark J. Young | District Environmental Planning Manager
PA Department of Transportation | Engineering District 11-0
45 Thoms Run Road | Bridgeville, PA 15017
Phone: 412.429.4858 | Mobile: 412.861.6271
penndot.gov

From: Otto, Camille (FHWA) <camille.otto@dot.gov>
Sent: Thursday, December 26, 2019 8:12 AM
To: Bucher, Jeffrey <JEBUCHER@pa.gov>
Cc: Mento, Tony (FHWA) <tony.mento@dot.gov>; Young, Mark <MARKYOUNG@pa.gov>
Subject: [External] RE: (11-0) - P&N - I-376 (A69)

ATTENTION: *This email message is from an external sender. Do not open links or attachments from unknown sources. To report suspicious email, forward the message as an attachment to CWOPA_SPAM@pa.gov.*

Jeff – I concur with the P&N as prepared. I would suggest in the future that you ask that consultant not to include their QA/QC page in the final document. I feel that is for their benefit, but shouldn't be part of the final document. I am going to remove that page from my file.

Thanks!
Cam

Camille A. Otto
FHWA PA Division Office
Acting Director of Technical Services
717-221-2238

From: Bucher, Jeffrey [mailto:JEBUCHER@pa.gov]
Sent: Tuesday, December 10, 2019 2:25 PM
To: Otto, Camille (FHWA) <camille.otto@dot.gov>
Cc: Mento, Tony (FHWA) <tony.mento@dot.gov>; Young, Mark <MARKYOUNG@pa.gov>
Subject: (11-0) - P&N - I-376 (A69)

Cam,

Attached is the Purpose & Need Statement for the Parkway Central "Bathtub" project.

I previously reviewed it and provided comments, which have been addressed in the attached version.

Please review it and provide us with any comments you may have.

Once you're good with it, we will request P&N concurrence.

Thanks,

Jeff Bucher, P.E.
Project Development Engineer & Roundabout Coordinator
PA Department of Transportation | Bureau of Project Delivery
Highway Delivery Division | Highway Design and Technology Section
400 North Street, 7th Floor | Harrisburg, PA 17120
Phone: 717.783.4586 | Fax: 717.705.2379
www.state.pa.us

Appendix I:

Existing Plans

(Key sheets redlined with photos)

DRAWING INDEX

SHEET NO.	DESCRIPTION
1	DRAWING INDEX, GENERAL NOTES & QUANTITIES
2	WALL LOCATION PLAN, GEOMETRIC LAYOUT, VERTICAL CURVE DATA
3	PANEL LAYOUT PLAN
4	GENERAL PLAN & SECTION, STA. 9+75 TO 12+75
5	GENERAL PLAN & SECTION, STA. 12+75 TO 15+75
6	GENERAL PLAN & SECTION, STA. 15+75 TO 18+75
7	GENERAL PLAN & SECTION, STA. 18+75 TO 21+75
8	GENERAL PLAN & SECTION, STA. 21+75 TO 24+75
9	GENERAL PLAN & SECTION, STA. 24+75 TO 27+75
10	GENERAL PLAN & SECTION, STA. 27+75 TO 646+75 ℄ RAMP D
11	GENERAL PLAN & SECTION, STA. 646+75 ℄ RAMP D TO 649+00 ℄ RP.D
12	GENERAL PLAN & SECTION, STA. 649+00 ℄ RAMP D TO 651+00 ℄ RP.D
13	GENERAL SECTIONS
14	GENERAL ELEVATIONS, WALL A, STA. 11+23.50 TO 20+03.00
15	GENERAL ELEVATIONS, WALL A, STA. 20+03.00 TO 26+24.00
16	GENERAL ELEVATIONS, WALL A, STA. 26+24.00 TO 646+62.52
17	GENERAL ELEVATIONS, WALL B, STA. 17+37.50 TO 11+23.50
18	GENERAL ELEVATIONS, WALL C, STA. 646+63.49 TO 23+54.00
19	GENERAL ELEVATIONS, WALL C, STA. 23+54.00 TO 17+37.50
20	GENERAL ELEVATIONS, WALL D, STA. 650+03.00 TO 644+09.00
21	GENERAL ELEVATIONS, WALL E, STA. 644+09.00 TO 650+03.00
22	FOUNDATION PLAN, PANELS 1 TO 6
23	FOUNDATION PLAN, PANELS 6 TO 12
24	FOUNDATION PLAN, PANELS 13 TO 18
25	FOUNDATION PLAN, PANELS 19 TO 24
26	FOUNDATION PLAN, PANELS 25 TO 30
27	FOUNDATION PLAN, PANELS 31 TO 36
28	FOUNDATION PLAN, PANELS 37 TO 42
29	FOUNDATION PLAN, PANELS 43 TO 48
30	FOUNDATION PLAN, PANELS 49 TO 54
31	FOUNDATION PLAN, PANELS 55 TO 60
32	FOUNDATION PLAN, PANELS 61 TO 64 & 70 TO 73
33	FOUNDATION PLAN, PANELS 65 TO 69 & 74 TO 77
34	FOUNDATION PLAN, PANELS 78 TO 83
35	FOUNDATION PLAN, PANELS 84 TO 87
36	FOUNDATION PLAN, PANELS 88 TO 91
37	FOUNDATION CROSS SECTIONS
38	FOUNDATION CROSS SECTIONS
39	FOUNDATION CROSS SECTIONS
40	FOUNDATION CROSS SECTIONS
41	FOUNDATION CROSS SECTIONS
42	FOUNDATION CROSS SECTIONS
43	FOUNDATION CROSS SECTIONS
44	SUMP REINFORCING, PANEL 10S
45	SUMP DRAINAGE & DETAILS, PANEL 10S
46	SUMP REINFORCING, PANEL 47S
47	SUMP DRAINAGE AND DETAILS, PANEL 47S
48	FOUNDATION DETAILS
49	FOUNDATION DETAILS
50	FOUNDATION DETAILS & ROADWAY ELEVATIONS
51	FOUNDATION REINFORCEMENT BAR SCHEDULE
52	FOUNDATION REINFORCEMENT BAR SCHEDULE
53	ELEVATION, WALL A, PANELS 1 TO 5
54	ELEVATION, WALL A, PANELS 5 TO 10
55	ELEVATION, WALL A, PANELS 11 TO 15
56	ELEVATION, WALL A, PANELS 16 TO 20
57	ELEVATION, WALL A, PANELS 21 TO 25
58	ELEVATION, WALL A, PANELS 26 TO 30
59	ELEVATION, WALL A, PANELS 31 TO 35
60	ELEVATION, WALL A, PANELS 36 TO 40
61	ELEVATION, WALL A, PANELS 41 TO 45
62	ELEVATION, WALL A, PANELS 46 TO 51
63	ELEVATION, WALL A, PANELS 52 TO 56
64	ELEVATION, WALL A, PANELS 57 TO 61
65	ELEVATION, WALL A, PANELS 62 TO 66
66	ELEVATION, WALL A, PANELS 67 TO 70
67	WALL A, SECTIONS & DETAILS
68	WALL A DETAILS
69	WALL A REINFORCEMENT BAR SCHEDULE
70	ELEVATION, WALL B, PANELS 1 TO 5
71	ELEVATION, WALL B, PANELS 6 TO 10
72	ELEVATION, WALL B, PANELS 11 TO 16
73	ELEVATION, WALL B, PANELS 17 TO 20
74	ELEVATION, WALL B, PANELS 21 TO 25
75	ELEVATION, WALL B, PANELS 25 TO 30
76	WALL B SECTIONS
77	WALL B CATWALK & STAIR DETAILS
78	WALL B CATWALK & STAIR DETAILS
79	WALL B REINFORCEMENT BAR SCHEDULE
80	ELEVATION, WALL C, PANELS 1 TO 5
81	ELEVATION, WALL C, PANELS 6 TO 10
82	ELEVATION, WALL C, PANELS 11 TO 15
83	ELEVATION, WALL C, PANELS 16 TO 19
84	ELEVATION, WALL C, PANELS 20 TO 24
85	ELEVATION, WALL C, PANELS 25 TO 30
86	ELEVATION, WALL C, PANELS 31 TO 35
87	ELEVATION, WALL C, PANELS 36 TO 40
88	ELEVATION, WALL C, PANELS 41 TO 45
89	ELEVATION, WALL C, PANELS 46 TO 48
90	WALL C SECTIONS
91	WALL C SECTIONS & CATWALK DETAILS
92	WALL C CATWALK & STAIR DETAILS
93	WALL C REINFORCEMENT BAR SCHEDULE
94	ELEVATION, WALL D, PANELS 1 TO 5
95	ELEVATION, WALL D, PANELS 6 TO 10
96	ELEVATION, WALL D, PANELS 11 TO 15
97	ELEVATION, WALL D, PANELS 16 TO 20
98	ELEVATION & SECTIONS, WALL D, PANELS 21 TO 22
99	WALL D REINFORCEMENT BAR SCHEDULE
100	ELEVATION, WALL E, PANELS 1 TO 5
101	ELEVATION, WALL E, PANELS 6 TO 10
102	ELEVATION, WALL E, PANELS 11 TO 15
103	ELEVATION, WALL E, PANELS 16 TO 20
104	ELEVATION & SECTION, WALL E, PANELS 21 TO 22
105	WALL E REINFORCEMENT BAR SCHEDULE
106	BORING LOGS, U-1 AND U-2
107	BORING LOGS, U-3 AND U-4
108	BORING LOGS, U-5 AND U-6
109	BORING LOGS, O-2, O-1 AND S-1
110	BORING LOGS, S-2 AND S-3
111	BORING LOGS, S-4, S-5 AND S-11
112	BORING LOGS, S-12 AND S-6
113	BORING LOGS, O-4, O-3, S-7 AND S-8
114	BORING LOGS, S-9 AND S-10

*QUANTITIES SHOWN ARE APPROXIMATE

ESTIMATE OF QUANTITIES *

ITEM	DESCRIPTION	UNIT	TOTAL
703-0006	NO. 2B COARSE AGGREGATE	C.Y.	280
704-0001	CLASS AA CEMENT CONCRETE	C.Y.	3,870
704-0002	CLASS A CEMENT CONCRETE	C.Y.	10,580
1002-0001	REINFORCEMENT BARS	LBS.	588,000
1002-0053	REINFORCING BARS, EPOXY COATED	LBS.	151,490
1019-0002	PROTECTIVE COATING FOR REINFORCED CONCRETE SURFACES	S.Y.	4,780
2000-0100	CLASS AA CEMENT CONCRETE, SPECIAL	C.F.	100
2000-0128	CRACK REPAIR, EPOXY INJECTION	C.F.	20
2000-0129	CRACK REPAIR, TYPE A	L.F.	50
2000-0200	WEEPHOLE RELOCATION	EACH	300
2000-0201	SLUICE GATE	EACH	2
2000-0202	CATWALK, STAIR RAILING, AND PROTECTIVE RAILING, WALL B	L.S.	L.S.
2000-0203	CATWALK, STAIR RAILING, AND PROTECTIVE RAILING, WALL (	L.S.	L.S.

REFERENCE DRAWINGS **

1. COUNTY OF ALLEGHENY
RECONSTRUCTION AND WIDENING
WATER STREET
CITY OF PITTSBURGH
DATED 1939 NO. 1723 AND 1723A

2. CONSTRUCTION PLAN
SUBSTRUCTURE AND ROADWAYS ON GRADE
WATER STREET
CITY OF PITTSBURGH
DATED NO. 1723A

3. PENNSYLVANIA DEPARTMENT OF HIGHWAYS
L.R. 764 - SEC. 10, ALLEGHENY COUNTY
DOWNTOWN INTERCHANGE
EASTBOUND AND WESTBOUND PARKWAYS
RAMPS A, B, C, D, E, F & M
DATED OCT. 1951 NO. S-1785

4. PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
CONSTRUCTION OF A PORTION OF THE
DOWNTOWN INTERCHANGE
PENN LINCOLN PARKWAY
L.R. 764, SEC. 10
ALLEGHENY COUNTY
DATED 1955

5. PENNSYLVANIA DEPARTMENT OF HIGHWAYS
L.R. 764 - SECS 10 & 11 - ALLEGHENY COUNTY
DOWNTOWN INTERCHANGE
PARKWAY AND RAMPS A, B, C, D, E AND F
DATED 1951

6. PENNSYLVANIA DEPARTMENT OF HIGHWAYS
L.R. 766, SEC 3E - ALLEGHENY COUNTY
POINT HIGHWAY PROJECT
POINT INTERCHANGE
SUBSTRUCTURE
DATED APRIL 1956 NO. S-1904

** THESE DRAWINGS ARE AVAILABLE AT THE DEPARTMENT OFFICE FOR INSPECTION UPON REQUEST

INLETS	RC34	SEPT. 8, 1981
STANDARD MANHOLES	RC39 (SHEET 2)	JAN. 31, 1977
CONSTRUCTION & EXPANSION JOINT DETAILS	BC335 A	NOV. 4, 1981
REINFORCEMENT BAR FABRICATION SCHEDULE	BC336A	NOV. 4, 1981
OVERHEAD SIGN STRUCTURES CATWALK DETAILS	TC-7717 (SHEET 9)	MARCH 15,1974

SUPPLEMENT DRAWINGS

DESCRIPTION	DWG. NO.	APPR. DATE

GENERAL NOTES

1. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH PENNSYLVANIA DEPARTMENT OF TRANSPORTATION SPECIFICATION FORM 408/1976, FORM 409/1973, AWS/1980, ALL CURRENT SUPPLEMENTS, AND SPECIAL PROVISIONS.
2. DESIGN SPECIFICATIONS: DESIGN DIVISION OF 1977 AASHTO, "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" (INCLUDING 1978 TO 1981 INTERIM SPECIFICATIONS) AND AS SUPPLEMENTED BY THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION'S DESIGN MANUAL, PART 4, STRUCTURES (INCLUDING SEPTEMBER 1976 REVISIONS).
3. LIVE LOADS - HS20-44 LOADING AND ALTERNATE LOADING (2 AXLES OF 24 KIPS EACH AT 4'-0" C/C, 2 WHEELS OF 12 KIPS EACH AT 6'-0" C/C).
4. CONCRETE:
   A. CLASS AA CONCRETE SHALL BE USED IN ALL WALLS, END DAMS, AND IN FOUNDATIONS AS NOTED.
   B. CLASS A CONCRETE SHALL BE USED IN FOUNDATIONS AS NOTED.
   C. EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 1" X 1" EXCEPT AS NOTED.
5. REINFORCING STEEL:
   A. ALL REINFORCING BARS SHALL BE GRADE 60 STEEL.
   B. A MINIMUM LAP OF 30 BAR DIAMETERS SHALL BE USED UNLESS NOTED OTHERWISE.
   C. EPOXY COATED BARS ARE DESIGNATED BY THE SUFFIX E ON THE BAR MARK.
   D. 2" CONCRETE COVER SHALL BE PROVIDED ON ALL REINFORCING BARS UNLESS NOTED OTHERWISE.
6. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS OF EXISTING STRUCTURES IN THE FIELD.
7. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL, HIS CONSTRUCTION SEQUENCE, CALCULATIONS, METHOD, SCHEME, AND THE POTENTIAL IMPACT ON MAINTAINING THE STABILITY OF THE ADJACENT EXISTING STRUCTURES.
8. THE CONTRACTOR SHALL REPAIR EXISTING STRUCTURES AS SPECIFIED AND SHOWN ON SHEET 67. THE LOCATIONS OF THE REPAIR SHALL BE DIRECTED BY THE ENGINEER.
9. EXISTING STRUCTURES DEPICTED ON THE DRAWINGS HAVE BEEN TAKEN FROM PREVIOUS DESIGN DRAWINGS. NO ATTEMPT HAS BEEN MADE TO VERIFY THEIR DIMENSIONS OR EXISTENCE.

Mark	Description	By	Chk'd	App'd.	Date

REVISIONS

DESIGNED BY
MICHAEL BAKER, JR., INC.
Consulting Engineers
4301 Dutch Ridge Road
Beaver, Pennsylvania 15009

William E. Fusetti
WILLIAM E. FUSETTI
PROJECT MANAGER
REG. PROF. ENG.
PENNA. 011554-E
DATE July 30, 1982

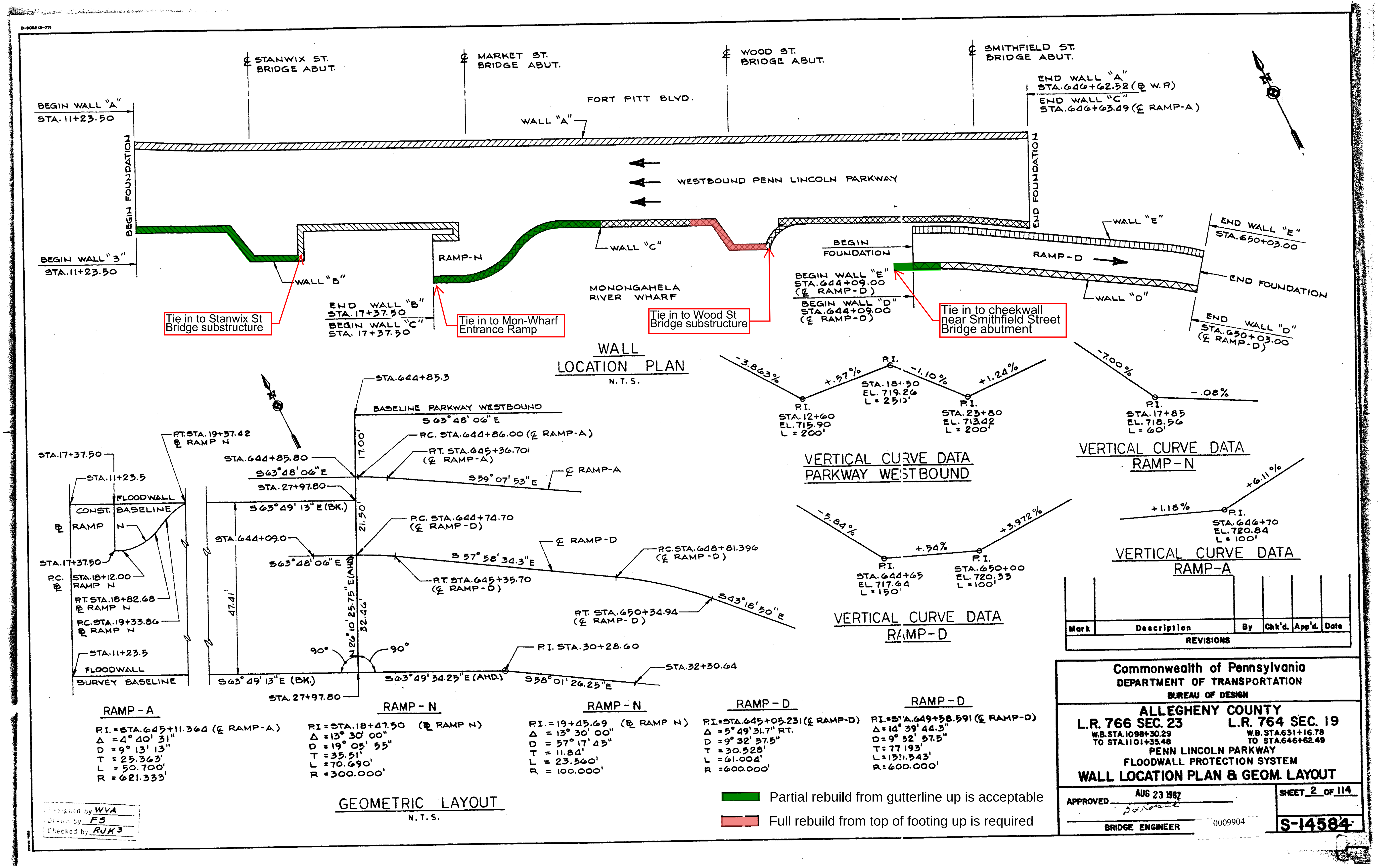
RJK/JLW
CLL
RJK

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

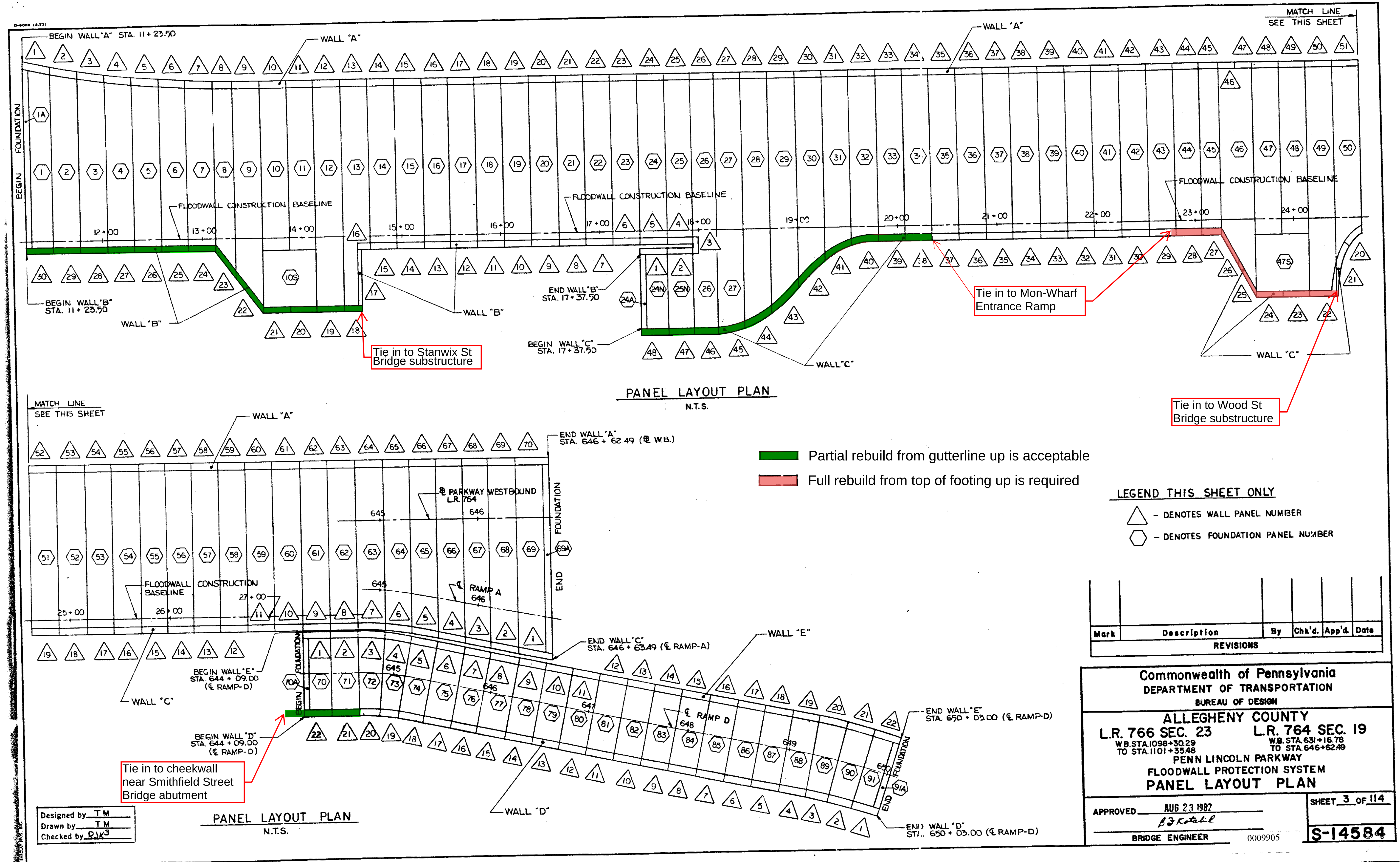
ALLEGHENY COUNTY
L.R. 766 SEC. 23 — W.B. STA. 1098+30.29 TO STA. 1101+35.48
L.R. 764 SEC. 19 — W.B. STA. 631+16.78 TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL NOTES & QUANTITIES

APPROVED AUG 23 1982
0009903
BRIDGE ENGINEER

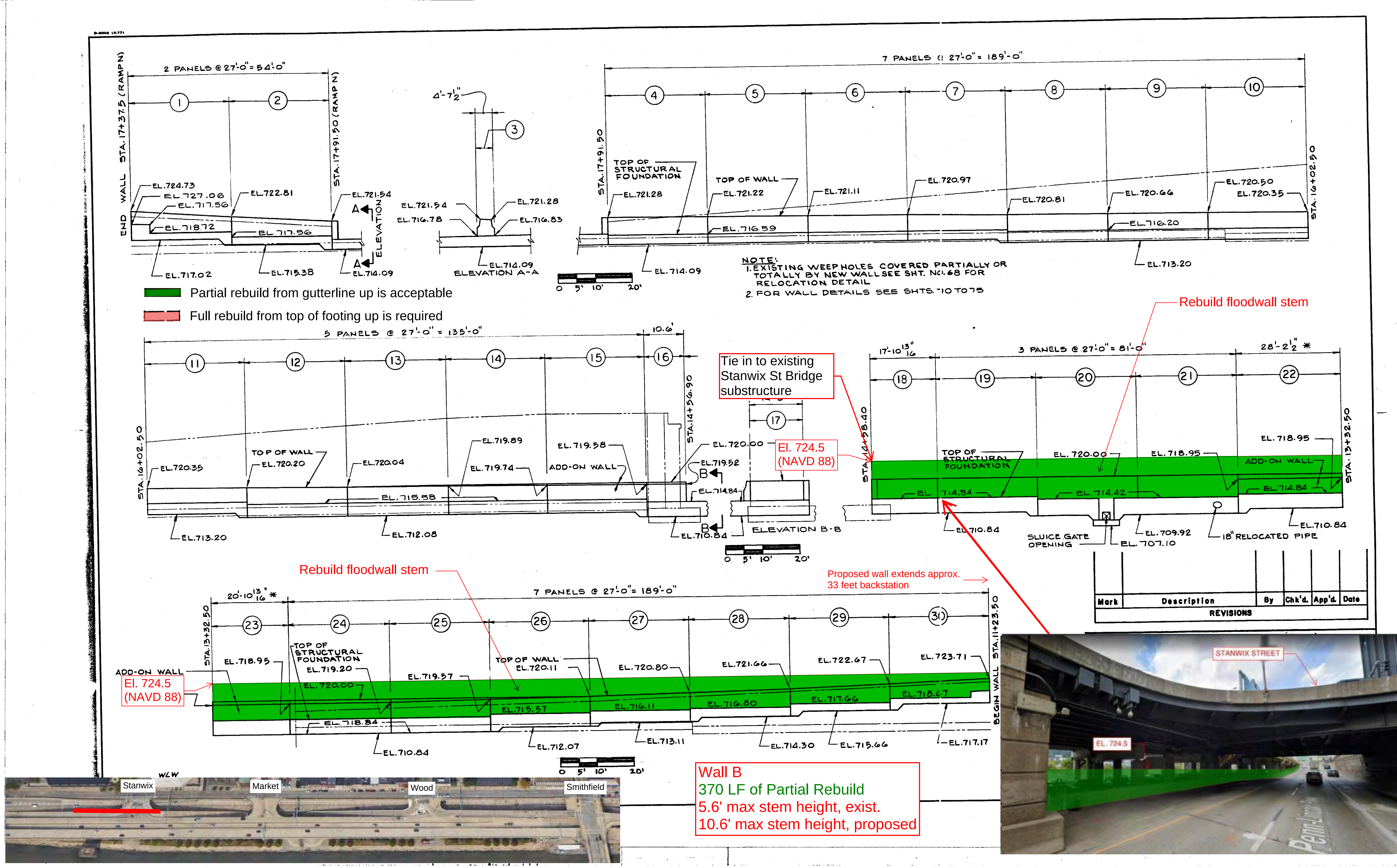
SHEET 1 OF 114 PLUS SUPPLEMENTAL DRAWINGS.
S- 14584



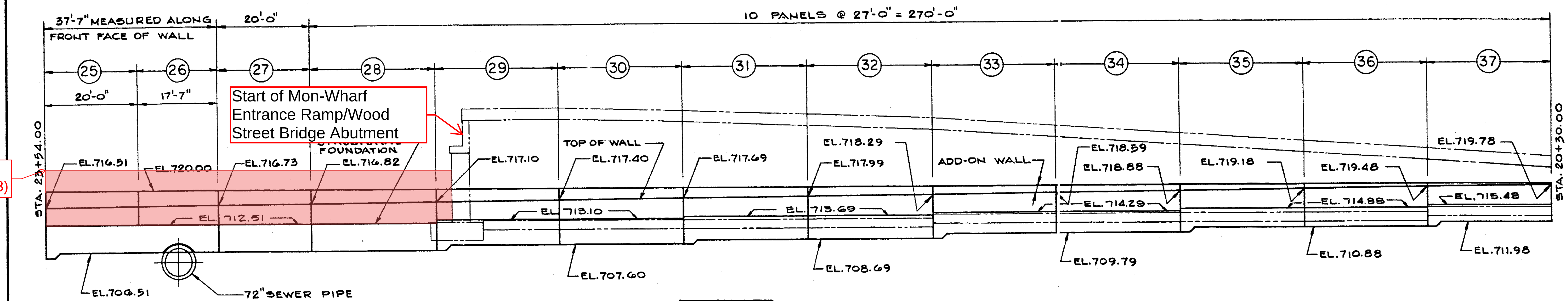
STANWIX ST. BRIDGE ABUT.
MARKET ST. BRIDGE ABUT.
WOOD ST. BRIDGE ABUT.
SMITHFIELD ST. BRIDGE ABUT.
BEGIN WALL "A" STA. 11+23.50
FORT PITT BLVD.
WALL "A"
END WALL "A" STA. 646+62.52 (℄ W.P.)
END WALL "C" STA. 646+63.49 (℄ RAMP-A)
BEGIN FOUNDATION
END FOUNDATION
WESTBOUND PENN LINCOLN PARKWAY
BEGIN WALL "B" STA. 11+23.50
WALL "B"
RAMP-N
WALL "C"
WALL "E"
END WALL "E" STA. 650+03.00
RAMP-D
END FOUNDATION
WALL "D"
MONONGAHELA RIVER WHARF
END WALL "B" STA. 17+37.50
BEGIN WALL "C" STA. 17+37.50
BEGIN WALL "E" STA. 644+09.00 (℄ RAMP-D)
BEGIN WALL "D" STA. 644+09.00 (℄ RAMP-D)
END WALL "D" STA. 650+03.00 (℄ RAMP-D)
Tie in to Stanwix St Bridge substructure
Tie in to Mon-Wharf Entrance Ramp
Tie in to Wood St Bridge substructure
Tie in to cheekwall near Smithfield Street Bridge abutment
WALL LOCATION PLAN
N.T.S.
-3.863%
+.57%
-1.10%
+1.24%
P.I. STA. 12+60 EL. 715.90 L = 200'
P.I. STA. 18+50 EL. 719.26 L = 250'
P.I. STA. 23+80 EL. 713.42 L = 200'
VERTICAL CURVE DATA PARKWAY WESTBOUND
-7.00%
-.08%
P.I. STA. 17+85 EL. 718.56 L = 60'
VERTICAL CURVE DATA RAMP-N
+1.18%
+6.11%
P.I. STA. 646+70 EL. 720.84 L = 100'
VERTICAL CURVE DATA RAMP-A
-5.84%
+.54%
+3.972%
P.I. STA. 644+65 EL. 717.64 L = 150'
P.I. STA. 650+00 EL. 720.33 L = 100'
VERTICAL CURVE DATA RAMP-D
STA. 644+85.3
BASELINE PARKWAY WESTBOUND
S 63° 48' 06" E
P.C. STA. 644+86.00 (℄ RAMP-A)
P.T. STA. 645+36.701 (℄ RAMP-A)
STA. 644+85.80
S63°48'06"E
S 59° 07' 53" E
℄ RAMP-A
STA. 27+97.80
S63°49'13"E (BK.)
P.T. STA. 19+57.42 ℙ RAMP N
STA. 17+37.50
STA. 11+23.5
FLOODWALL
CONST. BASELINE
℄ RAMP N
17.00'
21.50'
P.C. STA. 644+74.70 (℄ RAMP-D)
STA. 644+09.0
S63°48'06" E
℄ RAMP-D
S 57° 58' 34.3" E
P.C. STA. 648+81.396 (℄ RAMP-D)
P.T. STA. 645+35.70 (℄ RAMP-D)
S43°18'50"E
P.T. STA. 650+34.94 (℄ RAMP-D)
STA. 17+37.50
P.C. ℄ STA. 18+12.00 RAMP N
P.T. STA. 18+82.68 ℄ RAMP N
P.C. STA. 19+33.86 ℄ RAMP N
47.41'
N 26°10'25.75" E (AHD)
32.46'
90°
90°
STA. 11+23.5
FLOODWALL
SURVEY BASELINE
S63° 49' 13"E (BK.)
S63°49'34.25"E (AHD.)
S58°01'26.25"E
P.I. STA. 30+28.60
STA. 32+30.64
STA. 27+97.80
RAMP-A
P.I. = STA. 645+11.364 (℄ RAMP-A)
Δ = 4° 40' 31"
D = 9° 13' 13"
T = 25.363'
L = 50.700'
R = 621.333'
RAMP-N
P.I. = STA. 18+47.50 (℄ RAMP N)
Δ = 13° 30' 00"
D = 19° 05' 55"
T = 35.51'
L = 70.690'
R = 300.000'
RAMP-N
P.I. = 19+45.69 (℄ RAMP N)
Δ = 13° 30' 00"
D = 57° 17' 45"
T = 11.84'
L = 23.560'
R = 100.000'
RAMP-D
P.I. = STA. 645+05.231 (℄ RAMP-D)
Δ = 5° 49' 31.7" RT.
D = 9° 32' 57.5"
T = 30.528'
L = 61.004'
R = 600.000'
RAMP-D
P.I. = STA. 649+58.591 (℄ RAMP-D)
Δ = 14° 39' 44.3"
D = 9° 32' 57.5"
T = 77.193'
L = 153.543'
R = 600.000'
GEOMETRIC LAYOUT
N.T.S.
Partial rebuild from gutterline up is acceptable
Full rebuild from top of footing up is required
Designed by WVA
Drawn by FS
Checked by RJK3
Mark | Description | By | Chk'd. | App'd. | Date
REVISIONS
Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN
ALLEGHENY COUNTY
L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48
L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
WALL LOCATION PLAN & GEOM. LAYOUT
APPROVED AUG 23 1982
BRIDGE ENGINEER
SHEET 2 OF 114
S-14584
0009904



MATCH LINE
SEE THIS SHEET
BEGIN WALL "A" STA. 11+23.50
WALL "A"
BEGIN FOUNDATION
FLOODWALL CONSTRUCTION BASELINE
BEGIN WALL "B" STA. 11+23.50
WALL "B"
Tie in to Stanwix St Bridge substructure
END WALL "B" STA. 17+37.50
BEGIN WALL "C" STA. 17+37.50
WALL "C"
Tie in to Mon-Wharf Entrance Ramp
Tie in to Wood St Bridge substructure
PANEL LAYOUT PLAN
N.T.S.
END WALL "A" STA. 646+62.49 (℄ W.B.)
℄ PARKWAY WESTBOUND L.R. 764
END FOUNDATION
℄ RAMP A
END WALL "C" STA. 646+63.49 (℄ RAMP-A)
BEGIN WALL "E" STA. 644+09.00 (℄ RAMP-D)
WALL "E"
℄ RAMP D
END WALL "E" STA. 650+03.00 (℄ RAMP-D)
BEGIN WALL "D" STA. 644+09.00 (℄ RAMP-D)
WALL "D"
END WALL "D" STA. 650+03.00 (℄ RAMP-D)
Tie in to cheekwall near Smithfield Street Bridge abutment
PANEL LAYOUT PLAN
N.T.S.
Partial rebuild from gutterline up is acceptable
Full rebuild from top of footing up is required
LEGEND THIS SHEET ONLY
– DENOTES WALL PANEL NUMBER
– DENOTES FOUNDATION PANEL NUMBER
Mark | Description | By | Chk'd. | App'd. | Date
REVISIONS
Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN
ALLEGHENY COUNTY
L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48
L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
PANEL LAYOUT PLAN
APPROVED AUG 23 1982
BRIDGE ENGINEER
SHEET 3 OF 114
S-14584
0009905
Designed by T M
Drawn by T M
Checked by RJK



2 PANELS @ 27'-0" = 54'-0"
END WALL STA. 17+37.5 (RAMP N)
STA. 17+91.50 (RAMP N)
EL. 724.73
EL. 727.06
EL. 717.56
EL. 722.81
EL. 718.72
EL. 717.56
EL. 721.54
EL. 717.02
EL. 715.38
EL. 714.09
ELEVATION A-A
4'-7½"
EL. 721.54
EL. 716.78
EL. 721.28
EL. 716.83
EL. 714.09
7 PANELS @ 27'-0" = 189'-0"
STA. 17+91.50
TOP OF STRUCTURAL FOUNDATION
EL. 721.28
TOP OF WALL
EL. 721.22
EL. 716.59
EL. 721.11
EL. 720.97
EL. 720.81
EL. 720.66
EL. 716.20
EL. 720.50
EL. 720.35
STA. 16+02.50
EL. 714.09
EL. 713.20
NOTE:
1. EXISTING WEEP HOLES COVERED PARTIALLY OR TOTALLY BY NEW WALL SEE SHT. NO. 68 FOR RELOCATION DETAIL
2. FOR WALL DETAILS SEE SHTS. 70 TO 75
0 5' 10' 20'
Partial rebuild from gutterline up is acceptable
Full rebuild from top of footing up is required
Rebuild floodwall stem
5 PANELS @ 27'-0" = 135'-0"
10.6'
STA. 16+02.50
EL. 720.35
TOP OF WALL
EL. 720.20
EL. 720.04
EL. 719.89
EL. 719.74
EL. 719.58
ADD-ON WALL
EL. 715.58
EL. 713.20
EL. 712.08
STA. 14+56.90
EL. 720.00
EL. 719.52
EL. 714.84
EL. 710.84
ELEVATION B-B
Tie in to existing Stanwix St Bridge substructure
El. 724.5 (NAVD 88)
17'-10 13/16"
3 PANELS @ 27'-0" = 81'-0"
28'-2½" *
STA. 14+58.40
TOP OF STRUCTURAL FOUNDATION
EL. 714.84
EL. 720.00
EL. 714.42
EL. 718.95
EL. 718.95
ADD-ON WALL
EL. 714.84
STA. 13+32.50
EL. 710.84
SLUICE GATE OPENING
EL. 709.92
EL. 707.10
18" RELOCATED PIPE
EL. 710.84
Mark | Description | By | Chk'd. | App'd. | Date
REVISIONS
Rebuild floodwall stem
Proposed wall extends approx. 33 feet backstation
20'-10 13/16" *
7 PANELS @ 27'-0" = 189'-0"
STA. 13+32.50
ADD-ON WALL
El. 724.5 (NAVD 88)
EL. 718.95
TOP OF STRUCTURAL FOUNDATION
EL. 719.20
EL. 720.00
EL. 718.84
EL. 719.57
TOP OF WALL
EL. 720.11
EL. 715.57
EL. 720.80
EL. 716.11
EL. 721.66
EL. 716.80
EL. 722.67
EL. 717.66
EL. 723.71
EL. 718.67
BEGIN WALL STA. 11+23.50
EL. 710.84
EL. 712.07
EL. 713.11
EL. 714.30
EL. 715.66
EL. 717.17
WLW
Stanwix
Market
Wood
Smithfield
STANWIX STREET
EL. 724.5
Wall B
370 LF of Partial Rebuild
5.6' max stem height, exist.
10.6' max stem height, proposed



El. 724.5 (NAVD 88)

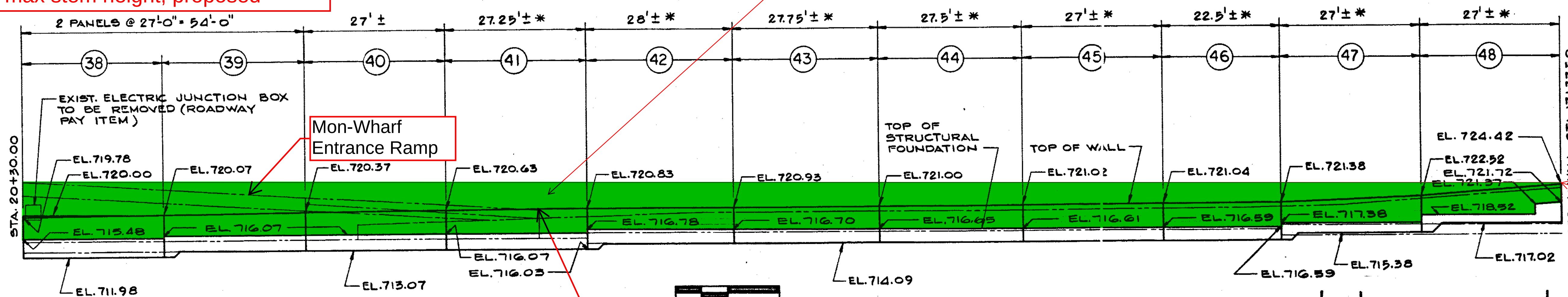
Start of Mon-Wharf Entrance Ramp/Wood Street Bridge Abutment

Wall C, Wood Street - (Panels 22 to 28)
169 LF of Full Rebuild
8.1' max stem height, exist.
13.1' max stem height, proposed

Partial rebuild from gutterline up is acceptable

Full rebuild from top of footing up is required

New floodwall to tie Mon Wharf Entrance barrier with floodwall beneath Market Street



Mon-Wharf Entrance Ramp

El. 725.0 (NAVD 88)

rk	Description	By	Chk'd.	App'd.	Date

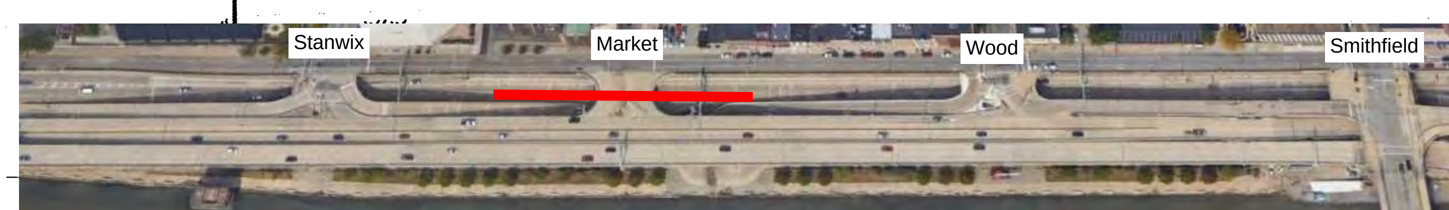
REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23 W.B. STA. 1098+30.29 TO STA. 1101+33.48
L.R. 764 SEC. 19 W.B. STA. 631+16.78 TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL ELEVATIONS WALL C

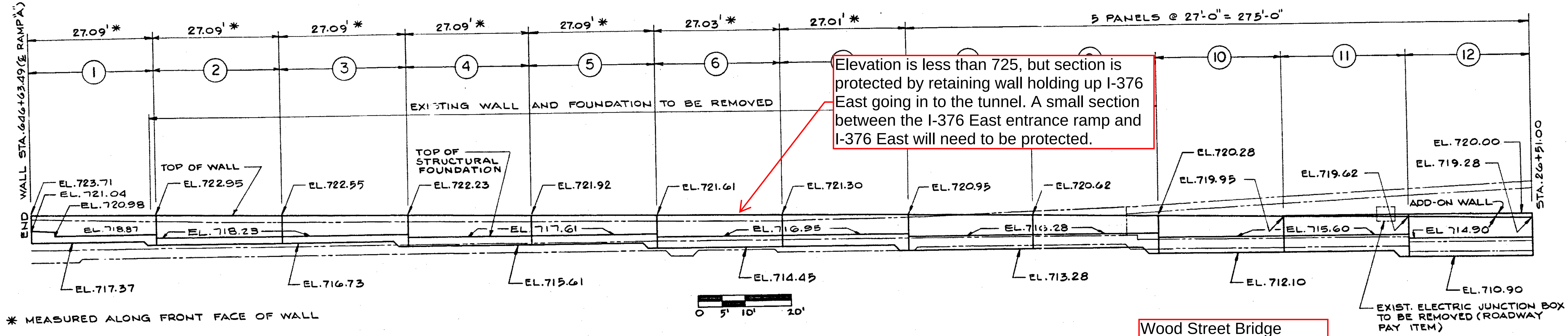
APPROVED AUG 23 1982
BRIDGE ENGINEER

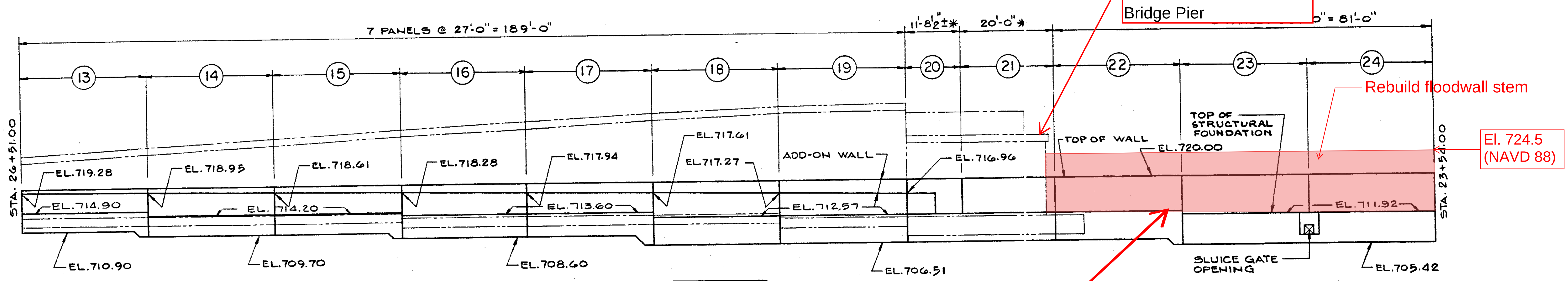
SHEET 19 OF 114
S-14584



Wall C - (Panels 38 to 48)
295 LF of Partial Rebuild
5.0' max stem height, exist.
9.5' max stem height, proposed

0009921





Full rebuild from top of footing up is required

Wall C, Wood Street - (Panels 22 to 28)
169 LF of Full Rebuild
8.1' max stem height, exist.
13.1' max stem height, proposed

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

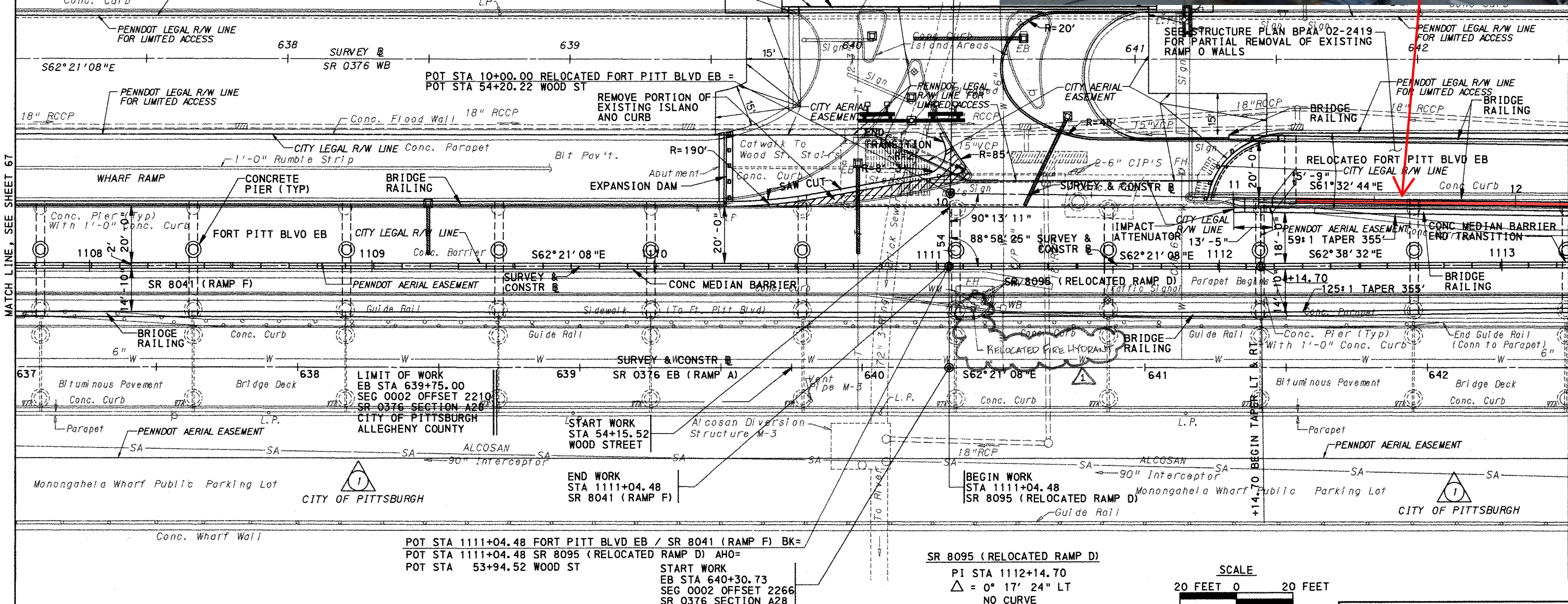
Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48
L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL ELEVATIONS WALL C

APPROVED AUG 23 1982
BRIDGE ENGINEER

SHEET 18 OF 114
S-14584

0009920



WOOD STREET STRUCTURE DATA

	EXISTING	PROPOSED
STATION	-	54+50.28
TYPE	STEEL GIRDER	REHABILITATION OF STEEL GIRDER

NOTE: CONSTRUCT BRIDGE APPROACH SLAB, MODIFIED TO THE NEAREST LONGITUDINAL AND TRANSVERSE JOINTS.

SEE STRUCTURE PLAN BPAA 02-2418 FOR RECONSTRUCTION DETAILS FOR WOOD STREET STRUCTURE.

SEE MISCELLANEOUS DETAILS FOR CONCRETE CURB CONSTRUCTION AROUND EXISTING AND PROPOSED PIERS.

FOR TEMPORARY CONSTRUCTION EASEMENTS SEE SR 0279 SECTION A58 AND SR 0376 SECTION A25 RIGHT OF WAY PLAN.

SURVEY BOOK NOS 47067 & 0023

ENDED

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL ENGINEER
JAMES F. WEBER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

SCALE: AS SHOWN
SHEET NO 68 OF 85
ACCESSION NO
DATE: 12/01/2001
CASE NO

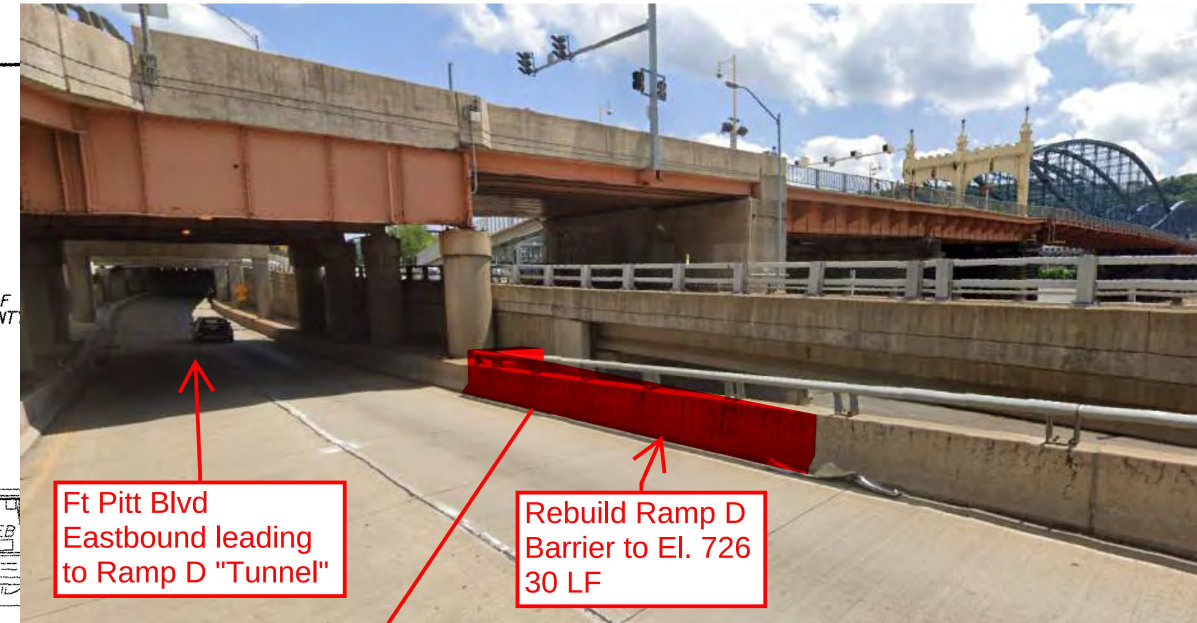
h:\projects\station\0042\Roadway\cnplnO5.dgn 12/01/2001

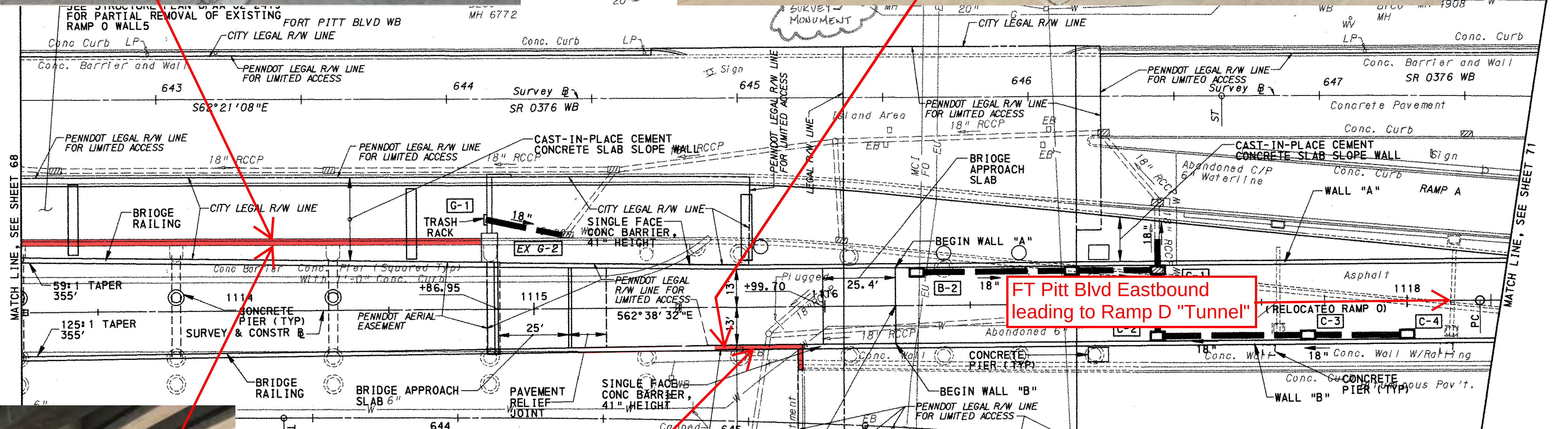
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	69 OF 85

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

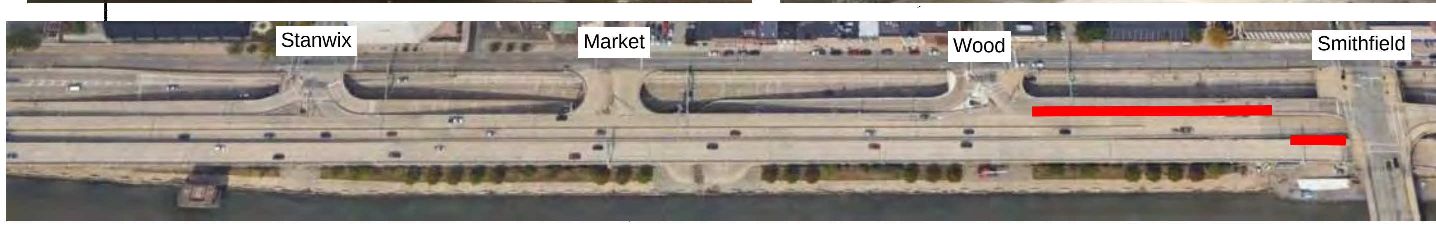
LOWER LEVEL





RAISE MON-WHARF WALL (VIEW FROM PARKING LOT) (254 LF)

RAISE RAMP D BARRIER (LOOKING EAST FROM MON-WHARF PARKING LOT) (30 LF)



SR 0376 WB
PI STA 649+38.58
Δ = 11°59'46" RT
Δc = 1°45'53"
Dc = 4°05'33.2" (CHORD)
Rc = 1400.00'
Lc = 43.12' (CHORD)
Θs = 5°06'56.5"
Ls = 250.00'
Ts = 272.26'
Es = 9.48'
k = 124.97'
p = 1.86'
Xc = 249.80'
Yc = 7.44'
LT = 166.74'
ST = 83.40'
LC = 249.91'
TS STA = 646+66.32
SC STA = 649+16.32
CS STA = 649+59.44
ST STA = 652+09.44

SR 0376 (RAMP A)
PI STA 646+34.11
Δ = 11°04'36" RT
Δc = 5°20'50"
Dc = 2°51'53"
Rc = 2000.00'
Lc = 186.65'
Θs = 2°51'53"
Ls = 200.00'
Ts = 294.00'
Es = 10.22'
K = 99.99
P = 0.833
Xs = 199.95'
Ys = 3.33'
LT = 133.35'
ST = 66.68'
LC = 199.98'
TS STA = 643+40.11
SC STA = 645+40.11
CS STA = 647+26.76
ST STA = 649+26.76

SR 8095 (RELOCATED RAMP D)
PI STA 1118+92.90
Δ = 6° 06' 34" RT
D = 4° 30' 45"
T = 67.76'
L = 135.39'
R = 1269.68'
E = 1.81'
PC STA = 1118+25.14
PCC STA = 1119+60.53
SE = 4.38%

RECORD DRAWINGS

NOTES: FOR TEMPORARY CONSTRUCTION EASEMENTS SEE SR 0279 SECTION A58 AND SR 0376 SECTION A25 RIGHT OF WAY PLAN.

SEE MISCELLANEOUS DETAILS FOR CONCRETE CURB CONSTRUCTION AROUND EXISTING AND PROPOSED PIERS.

SURVEY BOOK NOS 47067 & 0023

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER JAMES F. WEMER ENGINEER NO. 48831-E

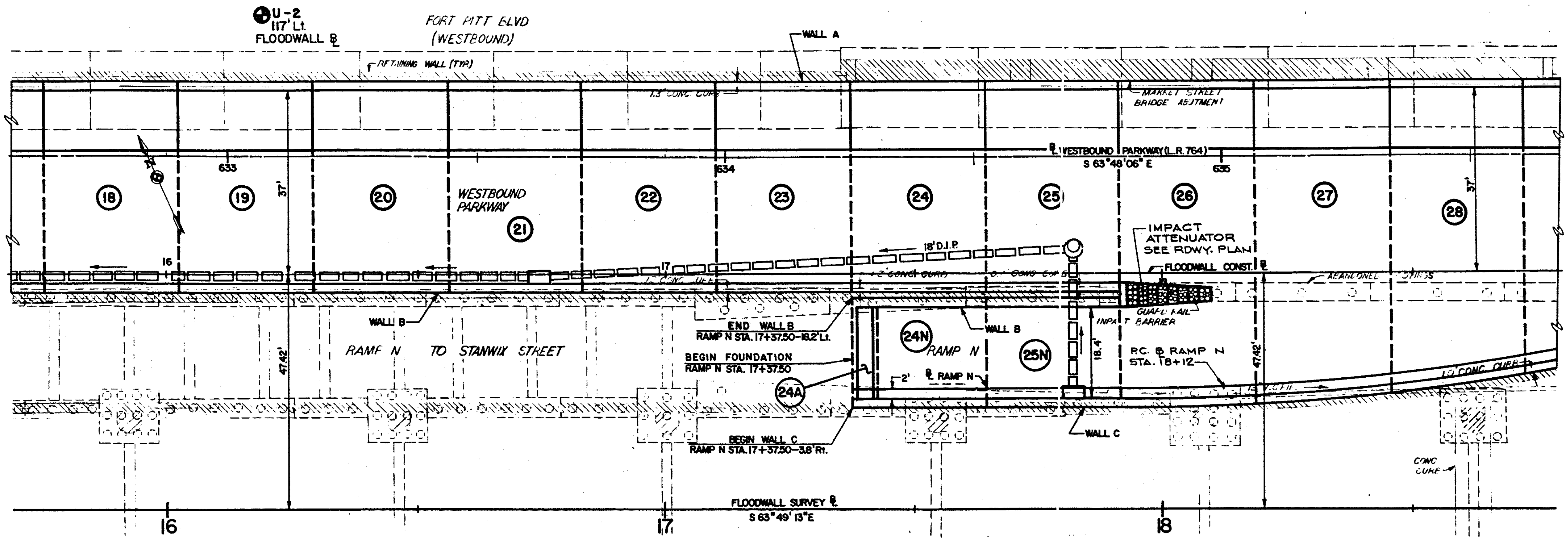
D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

SCALE: AS SHOWN | SHEET NO 69 OF 85 | ACCESSION NO
DATE: 12/01/2001 | CASE NO

h:\projects\station\0042\Roadway\cnp1n06.dgn 12/01/2001



GENERAL PLAN

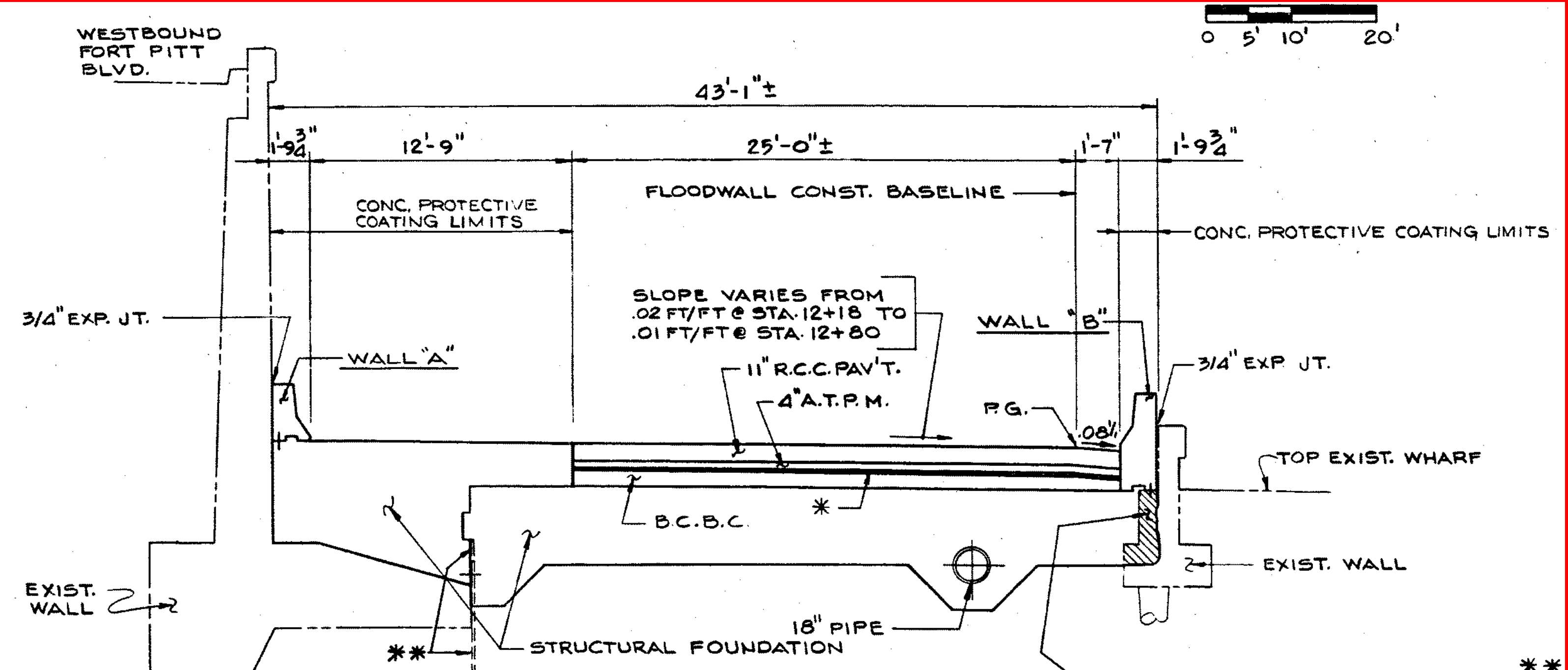
0 5' 10' 20'

LEGEND

(1) DENOTES FOUNDATION PANEL NUMBER

NOTES:

1. FOR CROSS SECTIONS ON THIS PLAN SEE SHT. NOS. 8, 9 & 10
2. FOR ABBREVIATION SEE SHT. 5



GENERAL CROSS SECTION (LOOKING UP STA.)

STA. 12+31.5 (SHOWN) STA. 12+11.5 TO STA. 13+12.5 (SIMILAR)

0 1' 2' 3' 4' 5' 10'

Fdn Panel 4 - 7

Typical Existing Floodwall Cross-Section

** POSSIBLE EXISTING STEEL SHEET PILING TO BE CUT AS REQUIRED ABOVE EXISTING-FOOTING ONLY

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL PLAN & SECTION

APPROVED AUG 23 1982

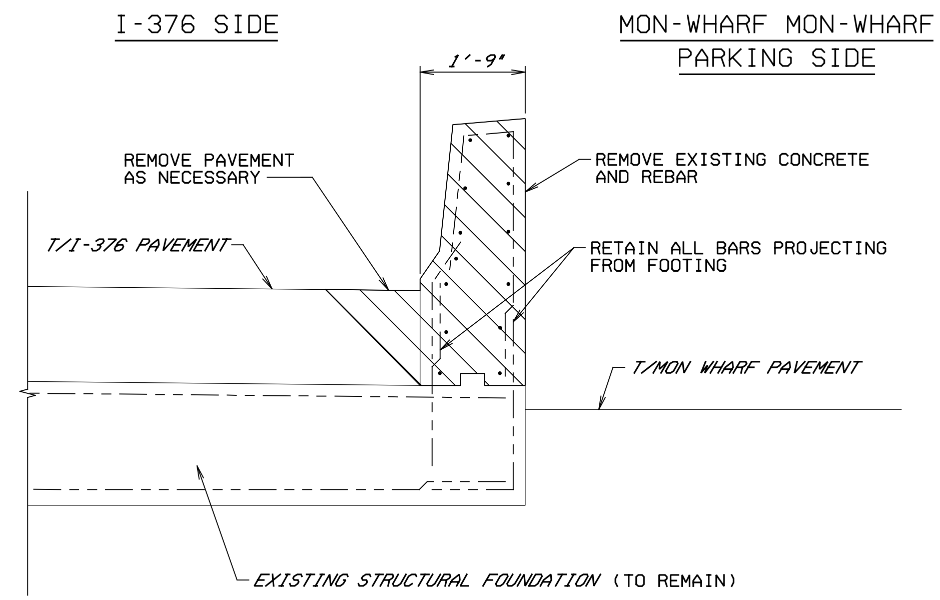
BRIDGE ENGINEER

SHEET 6 OF 114

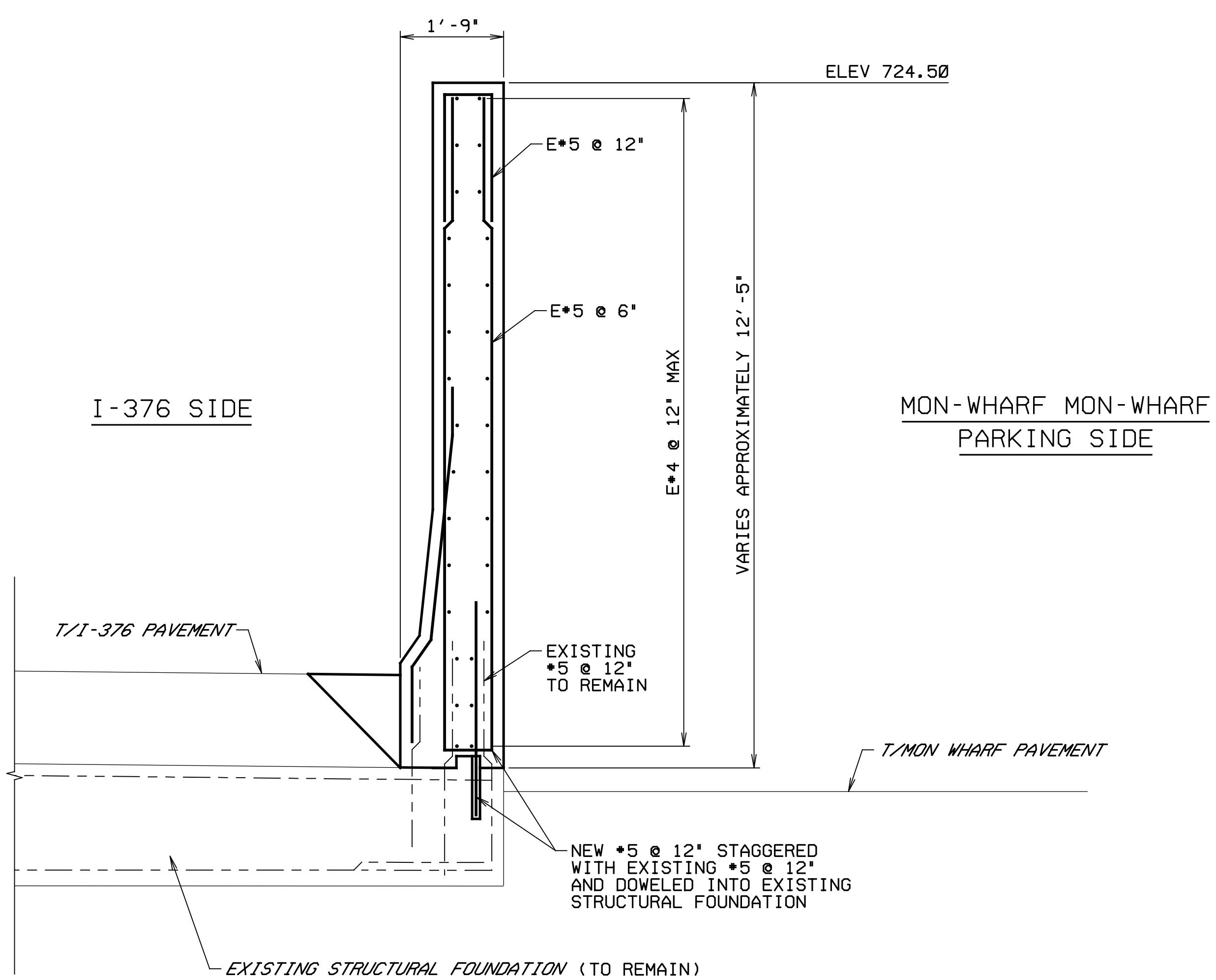
S-14584

Designed by RAH
Drawn by FS
Checked by RJH

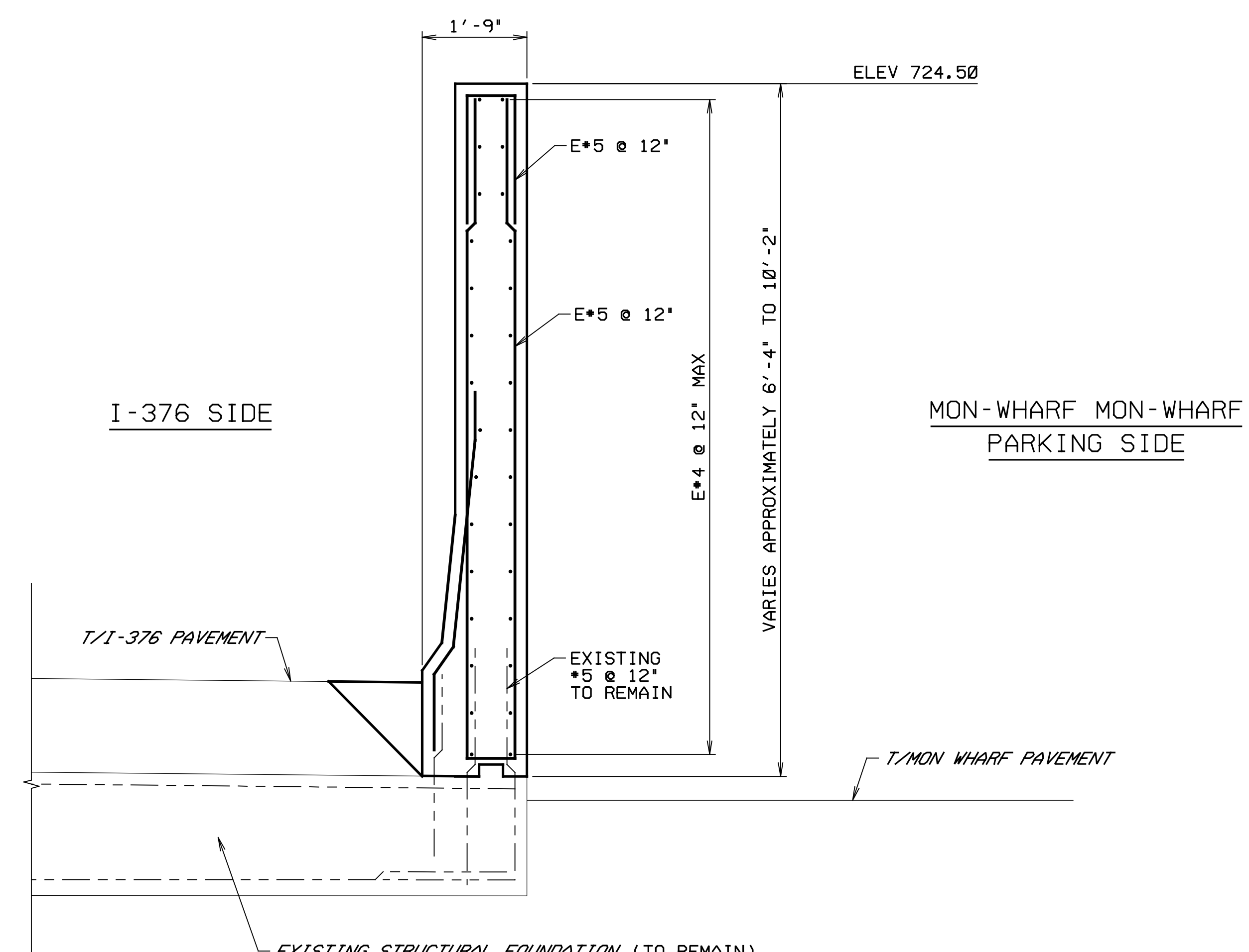
0009908



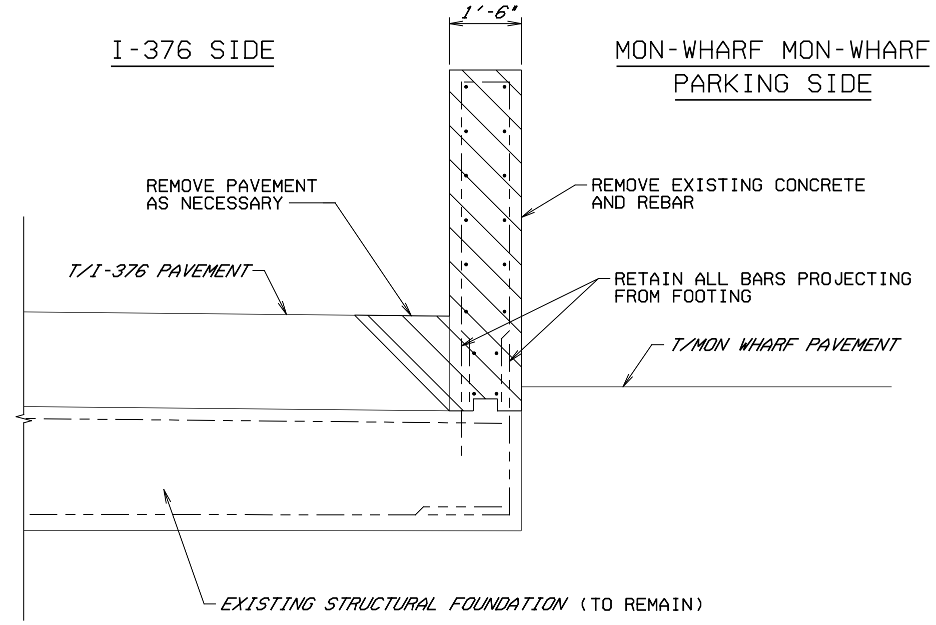
EXISTING FLOODWALL DEMOLITION (SAFETY SHAPE)
FULL STEM REBUILD
NTS



PROPOSED FLOODWALL (SAFETY SHAPE)
FULL STEM REBUILD WITH DOWELS
NTS



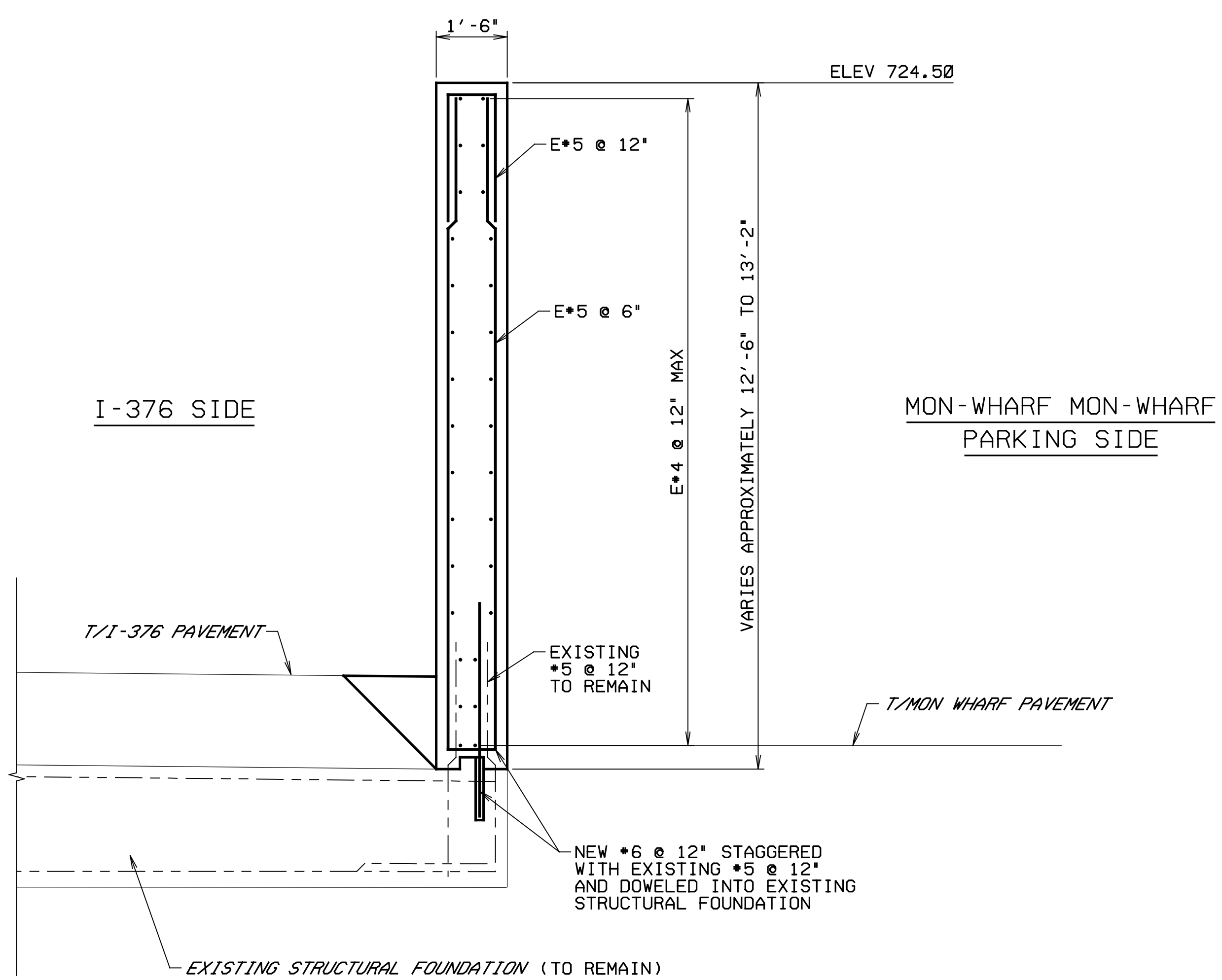
PROPOSED FLOODWALL (SAFETY SHAPE)
FULL STEM REBUILD WITHOUT DOWELS
NTS



EXISTING FLOODWALL DEMOLITION (SUMP AREA)

FULL STEM REBUILD

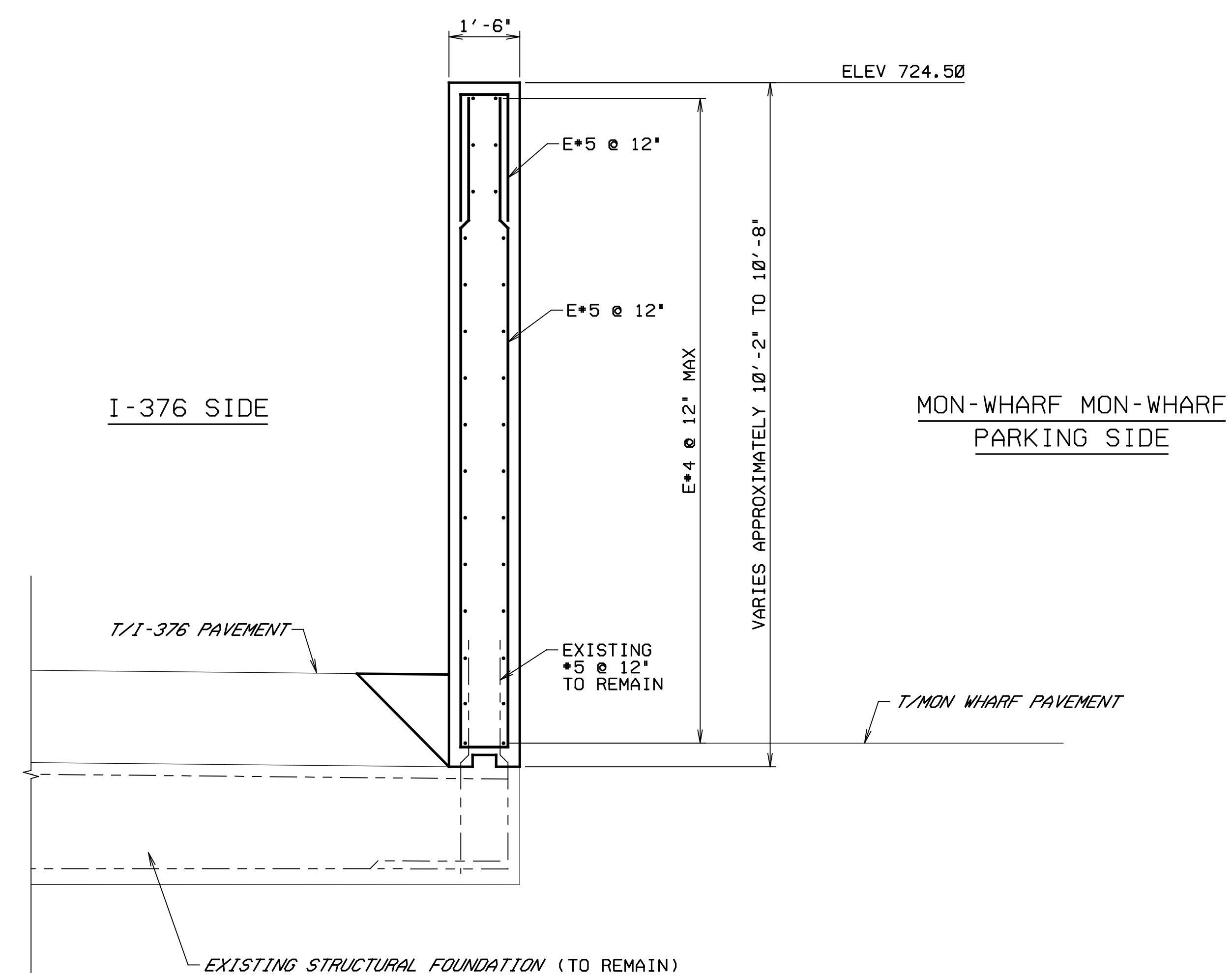
NTS



PROPOSED FLOODWALL (SUMP AREA)

FULL STEM REBUILD WITH DOWELS

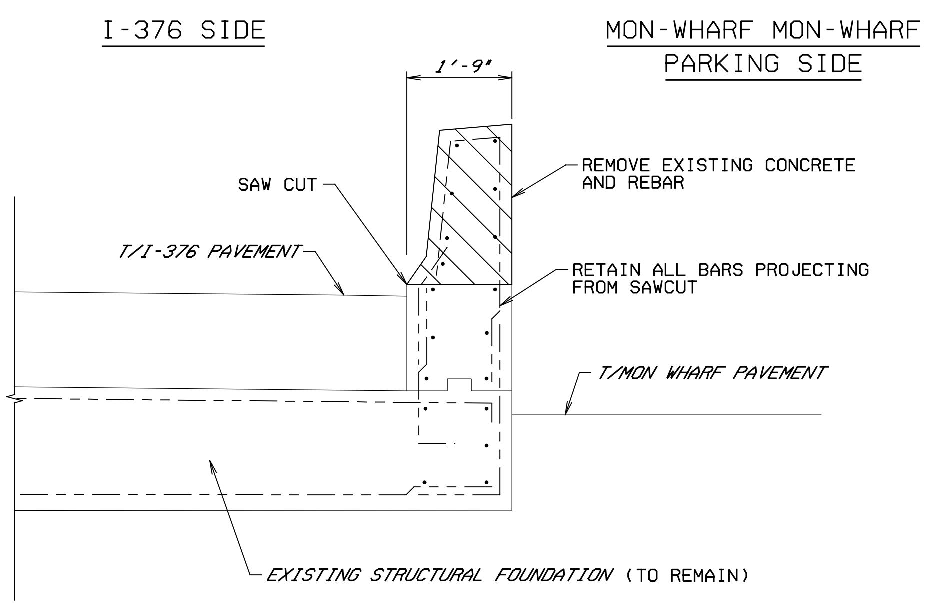
0 1 2 3 FEET



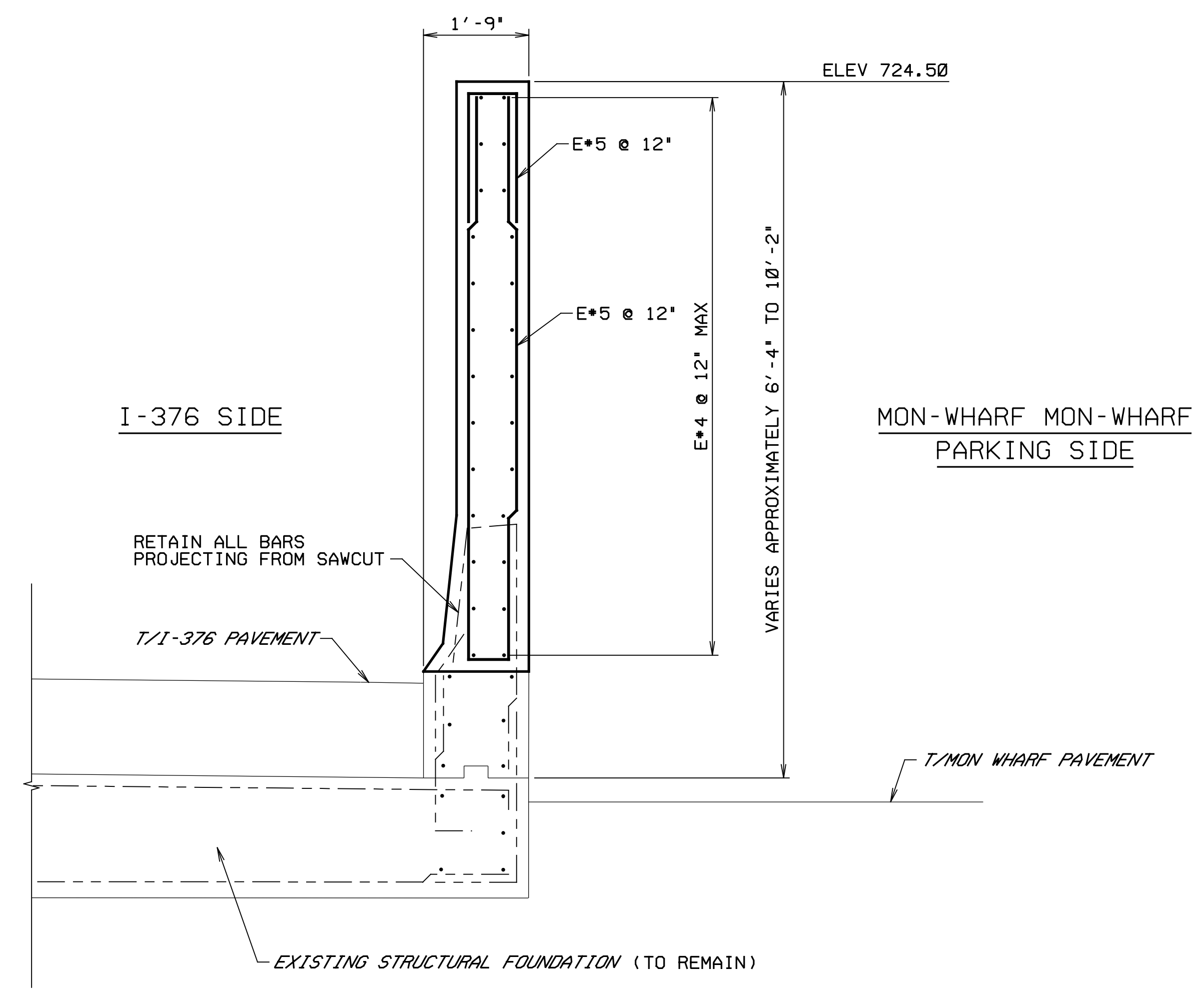
PROPOSED FLOODWALL (SUMP AREA)

FULL STEM REBUILD WITHOUT DOWELS

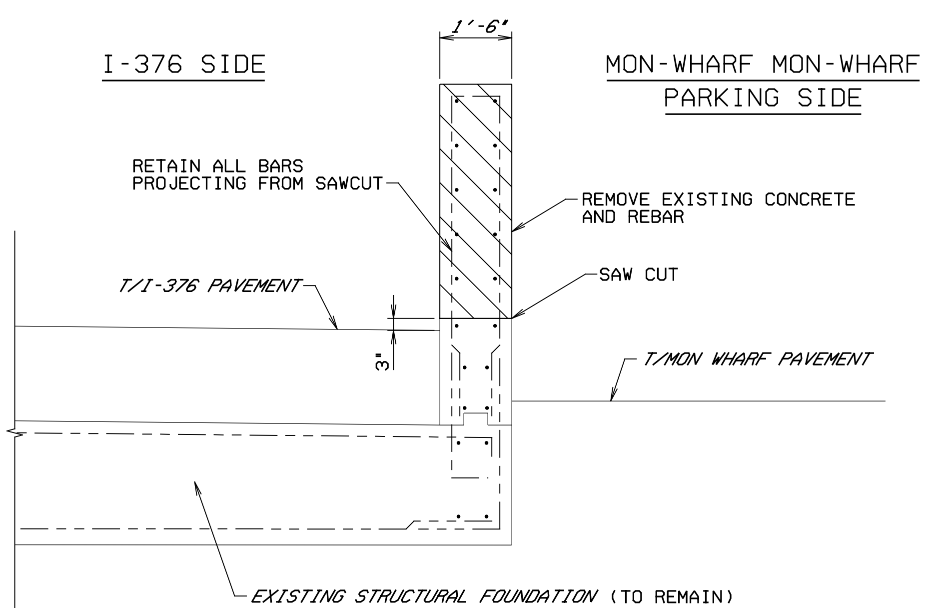
0 1 2 3 FEET



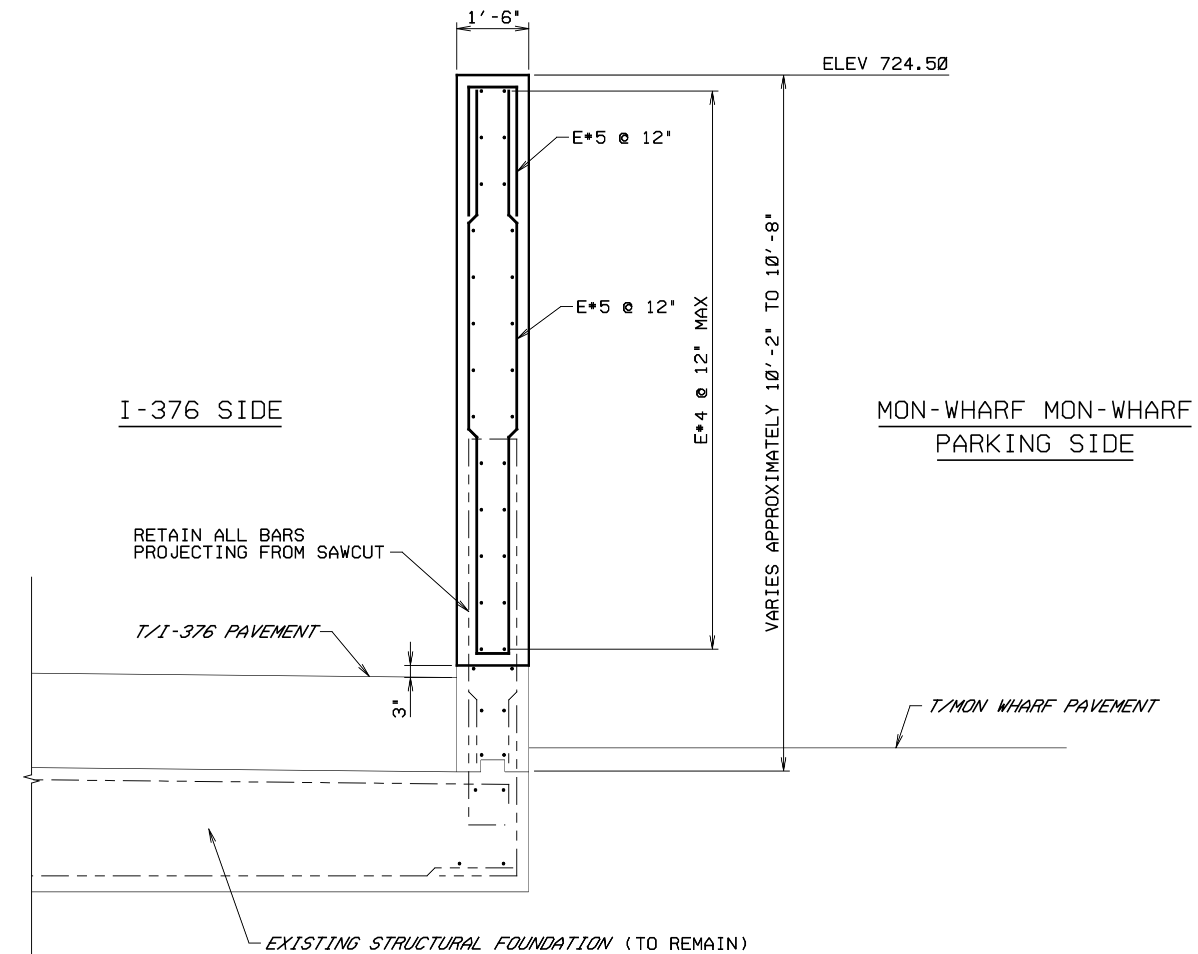
EXISTING FLOODWALL DEMOLITION (SAFETY SHAPE)
PARTIAL STEM REBUILD
NTS



PROPOSED FLOODWALL (SAFETY SHAPE)
PARTIAL STEM REBUILD
NTS



EXISTING FLOODWALL DEMOLITION (SUMP AREA)
PARTIAL STEM REBUILD
NTS



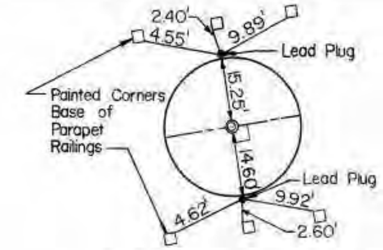
PROPOSED FLOODWALL (SUMP AREA)
PARTIAL STEM REBUILD
NTS

Appendix J:
Existing Utility and ROW Plan

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	766 & 764	23 & 19	56 of 76
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY

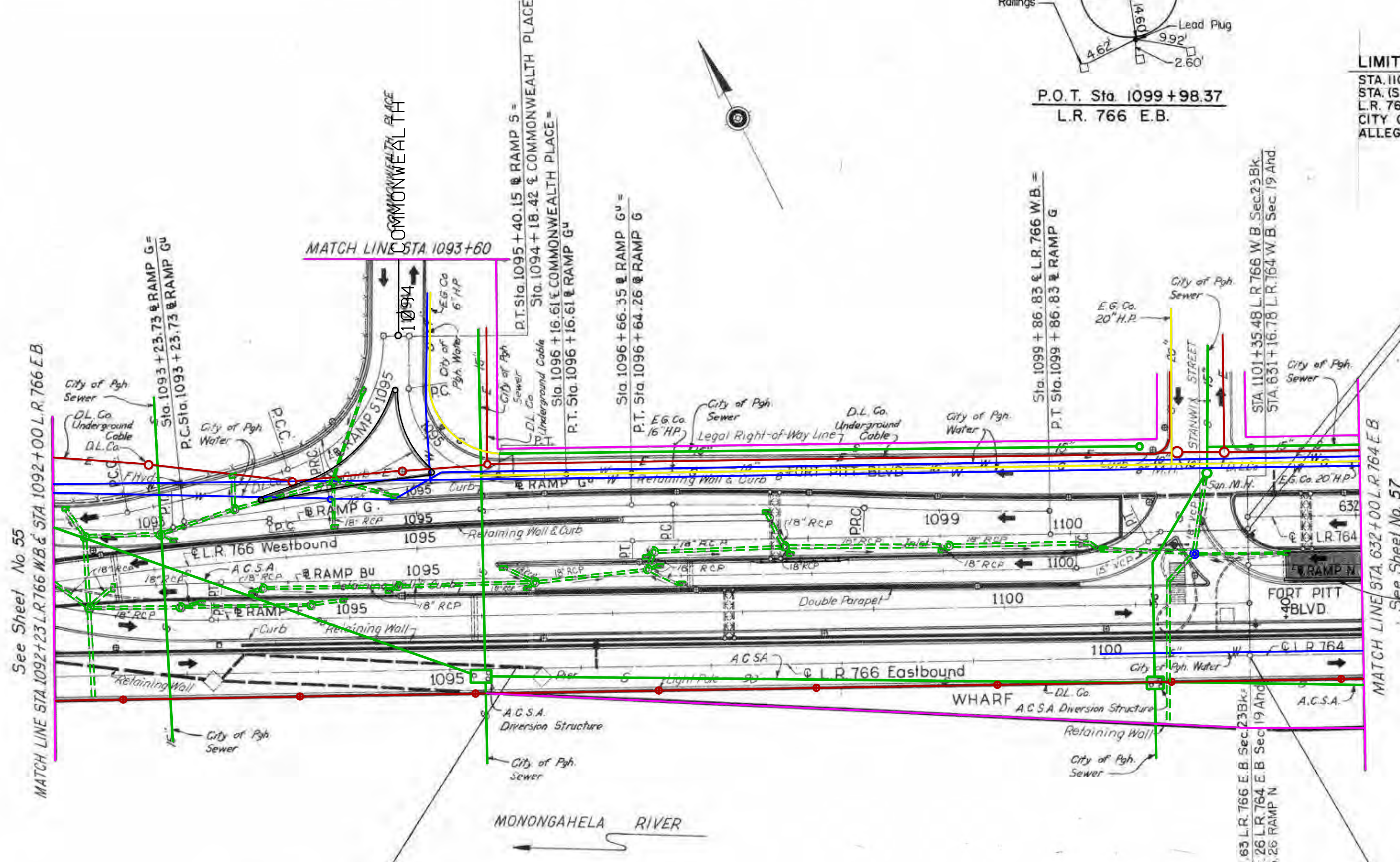
B.M. Elevation 740.39
Lead Plug in Concrete Curb
15' Rt. of Sta. 630+00 (E.B.)



P.O.T. Sta. 1099+98.37
L.R. 766 E.B.

LIMIT OF WORK
STA. 1101 + 35.48 W.B.
STA. (S.L.D.) 535 + 80
L.R. 766, SEC. 23
CITY OF PITTSBURGH
ALLEGHENY COUNTY

LIMIT OF WORK
STA. 631 + 16.78 W.B.
STA. (S.L.D.) 535 + 80
L.R. 764, SEC. 19
CITY OF PITTSBURGH
ALLEGHENY COUNTY



LIMIT OF WORK
STA. 1095 + 50.00 E.B.
STA. (S.L.D.) 530 + 18
L.R. 766, SEC. 23
CITY OF PITTSBURGH
ALLEGHENY COUNTY

FOR LEGEND SEE SHEET 55
FOR RAMP N PROFILE SEE SHEET 75

LIMIT OF WORK
STA. 1101 + 11.63 E.B.
STA. (S.L.D.) 535 + 80
L.R. 766, SEC. 23
CITY OF PITTSBURGH
ALLEGHENY COUNTY

LIMIT OF WORK
STA. 631 + 13.26 E.B.
STA. (S.L.D.) 535 + 80
L.R. 764, SEC. 19
CITY OF PITTSBURGH
ALLEGHENY COUNTY

SCALE IN FEET
50 0 50

PLAN STA. 1092+00 to STA. 632+00 E.B.

TRACED BY
FINAL BY

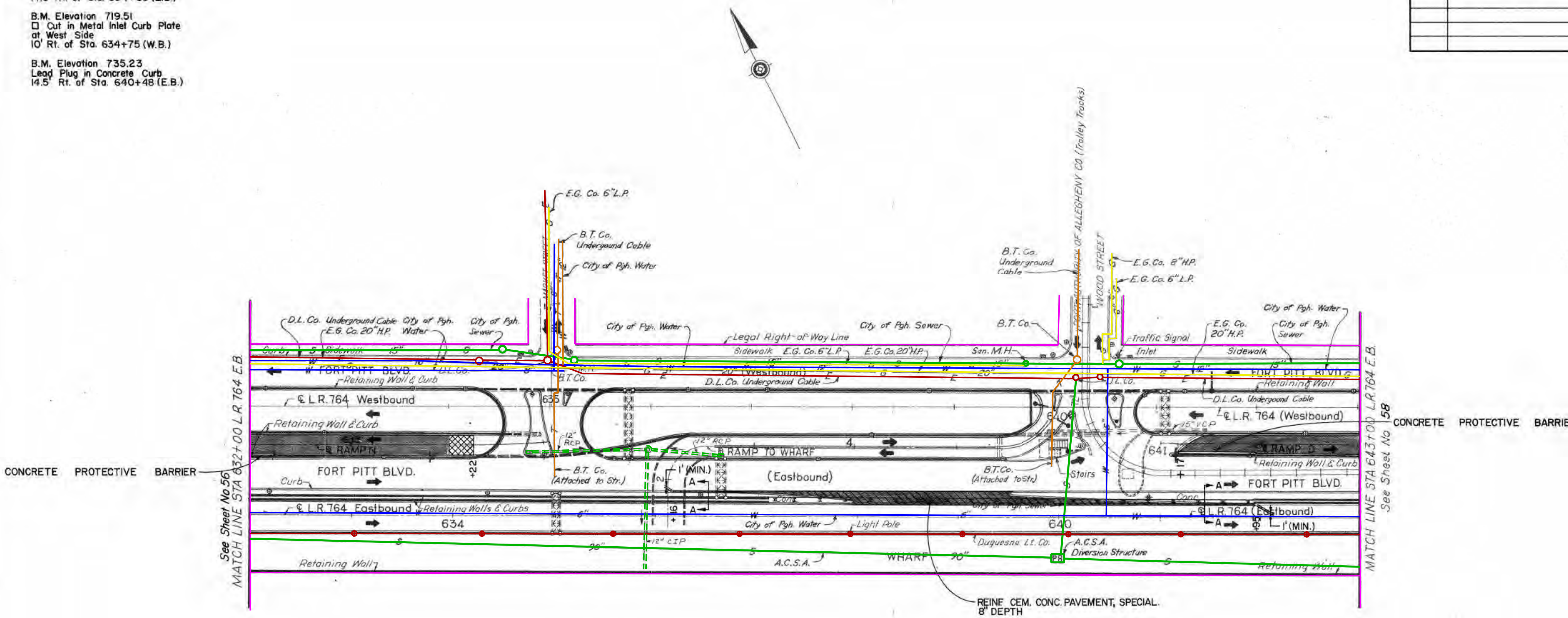
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	57 of 76
	CITY OF PITTSBURGH			

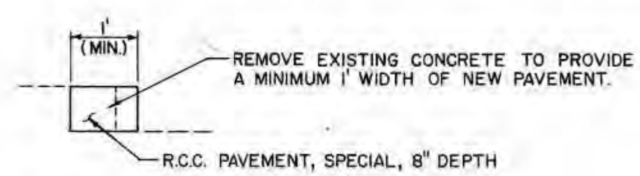
REVISION NUMBER	REVISIONS	DATE	BY

B.M. Elevation 737.96
Lead Plug in Concrete Curb
14.5' Rt. of Sta. 634+85 (E.B.)

B.M. Elevation 719.51
☐ Cut in Metal Inlet Curb Plate at West Side
10' Rt. of Sta. 634+75 (W.B.)

B.M. Elevation 735.23
Lead Plug in Concrete Curb
14.5' Rt. of Sta. 640+48 (E.B.)





SECTION A-A
SCALE: NONE

SCALE IN FEET
50 0 50

FOR LEGEND SEE SHEET 55
FOR RAMPS N & D PROFILES SEE SHEET 75

PLAN STA. 632+00 to STA. 643+00 E.B.

TRACED BY
FINAL BY

CITY OF PITTSBURGH

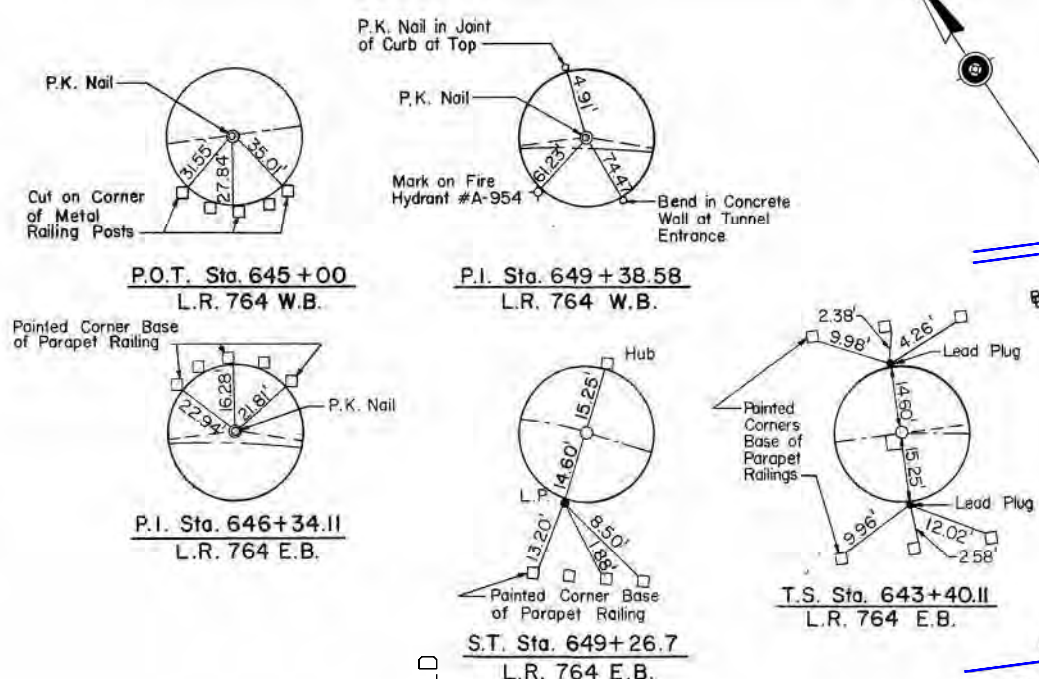
REVISION NUMBER	REVISIONS	DATE	BY

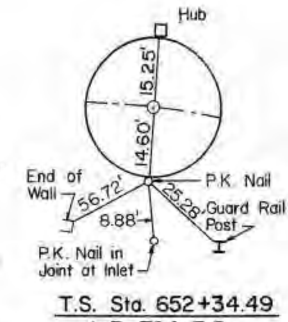
B.M. Elevation 727.24
Lead Plug in W.B. Ramp "A" Lt. Curb
27' Rt. of Sta. 647+62 (W.B.)

B.M. Elevation 733.21
Lead Plug in Concrete Median (Between E.B. & Ramp "C")
16.5' Lt. of Sta. 647+75 (E.B.)

B.M. Elevation 746.58
USGS Disc on Top of Wall at Underpass
18' Lt. of Sta. 652+70 (W.B.)

B.M. Elevation 737.61
Lead Plug in Concrete Curb
14.5' Lt. of Sta. 654+00 (E.B.)





℄ L.R. 764-Eastbound

P.I. Sta. 646+34.114
Δ = 11° 04' 36" Rt.
Δ_c = 5° 20' 49.52"
D_c = 2° 51' 53.24" (Chord)
R_c = 2000'
L_c = 186.65' (Chord)
θ_s = 2° 51' 53.24"
L_s = 200.00'
T_s = 249.00'
E_s = 38.81'
K = 99.99'
P = 0.83'
X_c = 199.94'
Y_c = 3.33'
LT = 133.35'
ST = 66.68'
LC = 199.98'
Superelevate 0.07 ft./ft.
T.S. Sta. 643+40.113
S.C. Sta. 645+40.113
C.S. Sta. 647+26.761
S.T. Sta. 649+26.761

℄ Ramp F

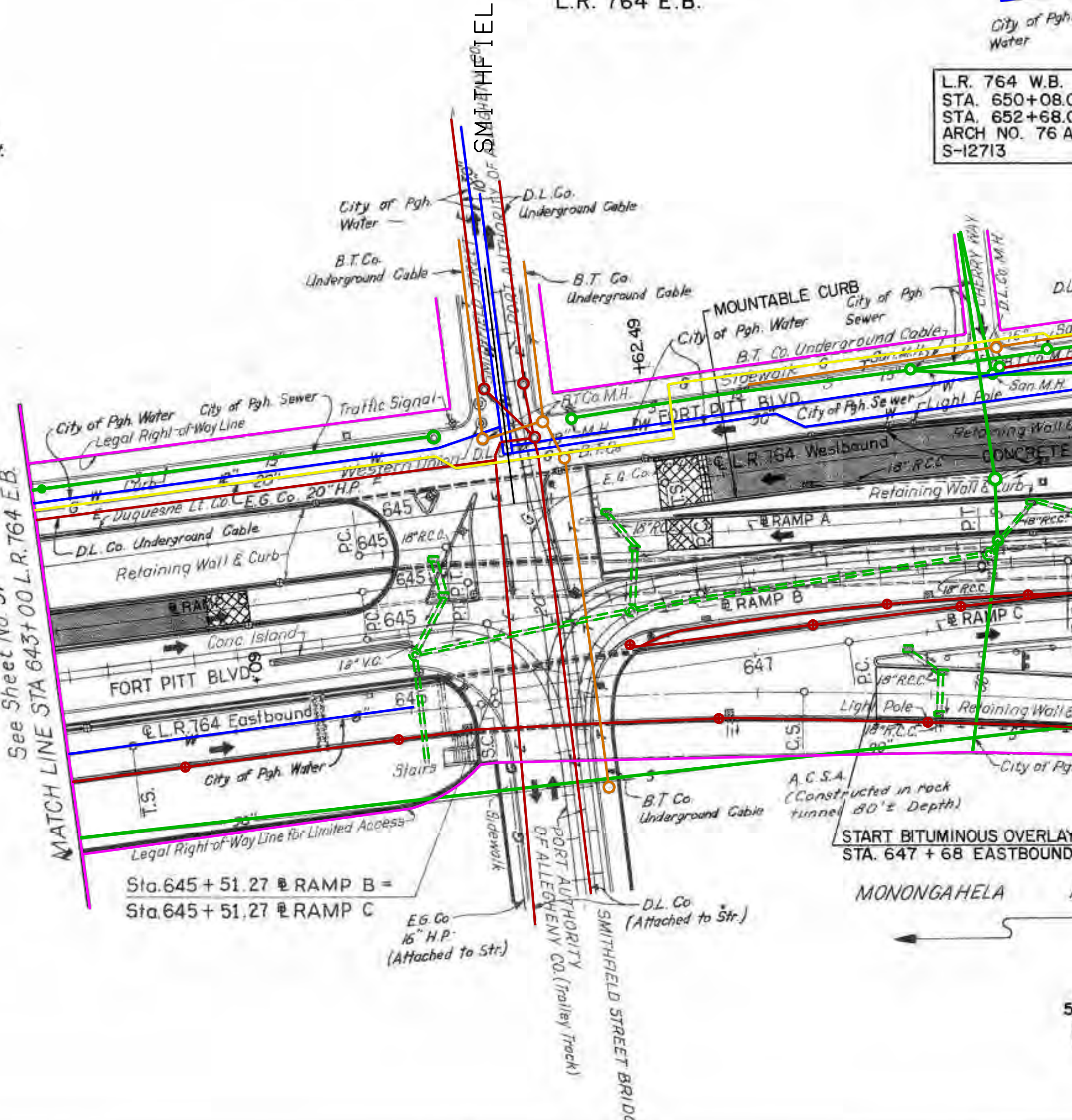
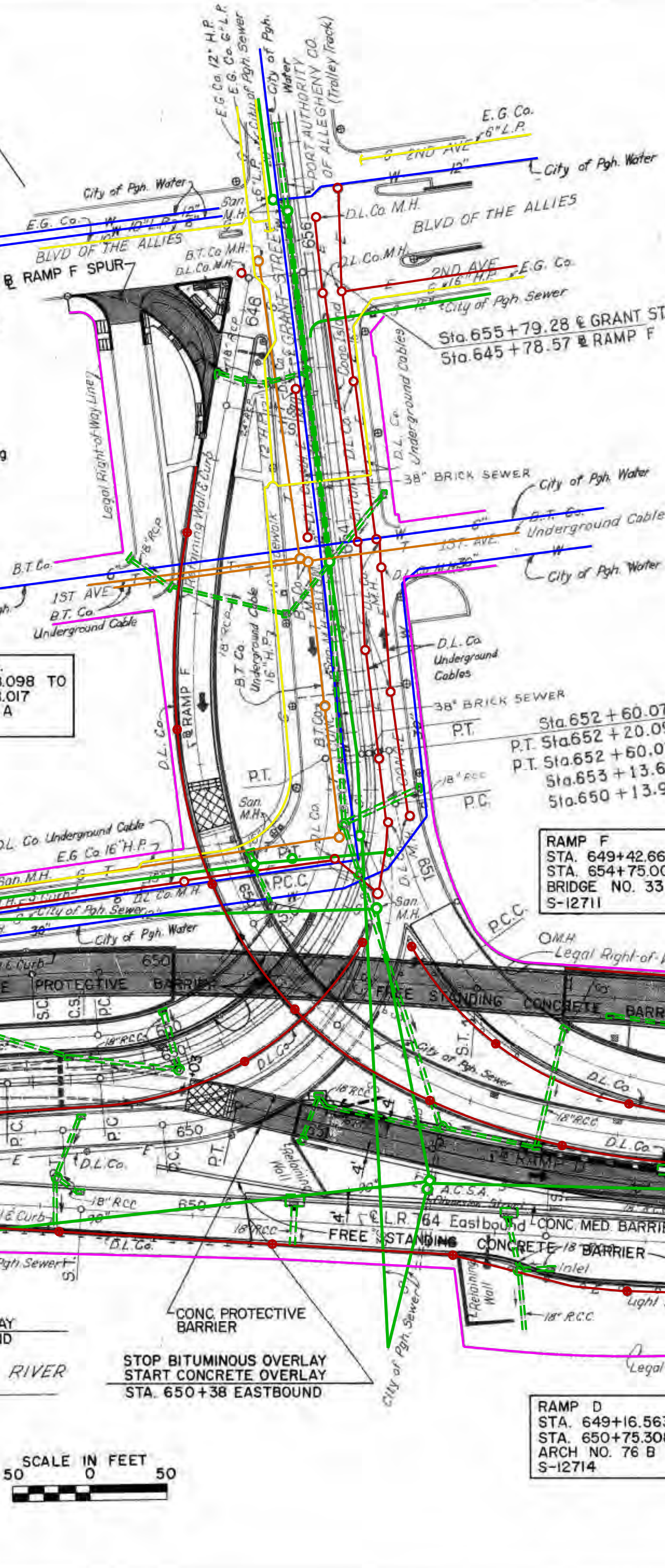
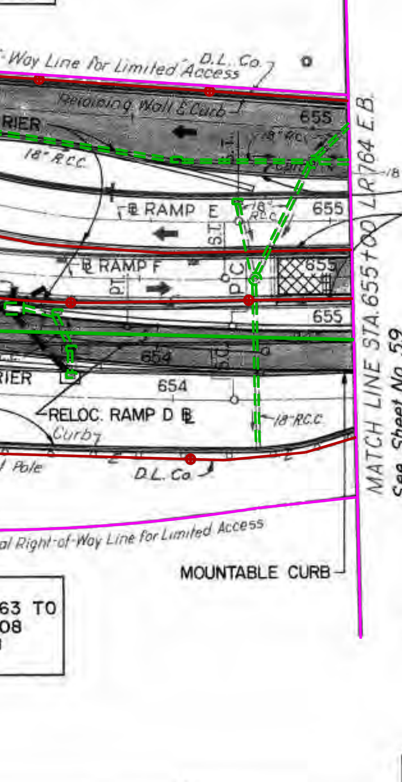
P.I. Sta. 651+56.609
Δ = 100° 10' 00" Lt.
Δ_c = 19° 57' 10"
D_c = 22° 55' 05.92" (Chord)
R_c = 250.00'
L_c = 87.06' (Chord)
θ_s = 40° 06' 25"
L_s = 350.00'
T_s = 494.99'
E_s = 170.87'
K = 172.18'
P = 20.06'
X_c = 333.23'
Y_c = 78.85'
LT = 239.62'
ST = 122.40'
LC = 342.44'
Superelevate 0.07 ft./ft.
T.S. Sta. 646+61.624
S.C. Sta. 650+11.624
C.S. Sta. 650+98.684
S.T. Sta. 654+48.684

℄ L.R. 764-Eastbound

P.I. Sta. 659+19.563
Δ = 32° 36' 00" Lt.
Δ_c = 26° 52' 13.52"
D_c = 2° 51' 53.24" (Chord)
R_c = 2000.00'
L_c = 937.96' (Chord)
θ_s = 2° 51' 53.24"
L_s = 200.00'
T_s = 685.71'
E_s = 84.62'
K = 99.99'
P = 0.83'
X_c = 99.94'
Y_c = 3.33'
LT = 133.35'
ST = 66.68'
LC = 199.98'
Superelevate 0.07 ft./ft.
T.S. Sta. 652+34.487
S.C. Sta. 654+34.487
C.S. Sta. 663+72.442
S.T. Sta. 665+72.442

℄ L.R. 764-Westbound

P.I. Sta. 649+38.578
Δ = 11° 59' 46" Rt.
Δ_c = 1° 45' 53"
D_c = 4° 05' 33.2" (Chord)
R_c = 1400.00'
L_c = 43.12' (Chord)
θ_s = 5° 06' 56.5"
L_s = 250.00'
T_s = 272.26'
E_s = 9.48'
K = 124.97'
P = 1.86'
X_c = 249.80'
Y_c = 7.44'
LT = 166.74'
ST = 83.40'
LC = 249.91'
Superelevate 0.07 ft./ft.
T.S. Sta. 646+66.317
S.C. Sta. 649+16.317
C.S. Sta. 649+59.437
S.T. Sta. 652+09.437

FOR LEGEND SEE SHEET 55
FOR L.R. 764 W.B. PROFILE SEE SHEET 72
FOR RAMP D PROFILE SEE SHEET 75
FOR RAMP F & F SPUR PROFILE SEE SHEET 76
FOR CONTOUR, GRADING, & GEOMETRY DRAWINGS SEE SHEETS 69 THRU 71

PLAN STA.643+00 to STA.655+00 E.B.

TRACED BY
FINAL BY

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	59 of 76
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY

B.M. Elevation 735.93
Top of S.W. Bolt at End of Guard Rail at Corner of B. & O. Building 17.5' Lt. of Sta. 658+40 (W.B.)

B.M. Elevation 735.59
Lead Plug in Concrete Curb 14.5' Rt. of Sta. 660+02 (E.B.)

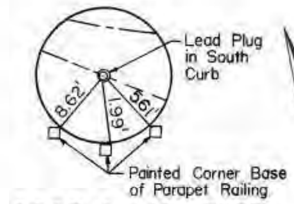
B.M. Elevation 731.97
Lead Plug in Concrete Curb 14.5' Rt. of Sta. 665+00 (E.B.)

℄ L.R. 764-Westbound

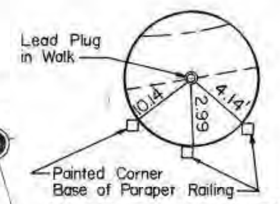
P.I. Sta. 660+70.278
Δ = 33° 31' 10" Lt.
Δ_c = 23° 17' 17"
D_c = 4° 05' 33.2" (Chord)
R_c = 1400.00'
L_c = 569.03' (Chord)
θ_s = 5° 06' 56.5"
L_s = 250.00'
T_s = 547.14'
E_s = 63.96'
K = 124.97'
P = 1.86'
X_c = 249.80'
Y_c = 7.44'
L.T. = 166.74'
S.T. = 83.40'
L.C. = 249.91'
Superelevate 0.07 ft./ft.
T.S. Sta. 655+23.139
S.C. Sta. 657+73.139
C.S. Sta. 663+42.173
S.T. Sta. 665+92.173

℄ L.R. 764-Eastbound

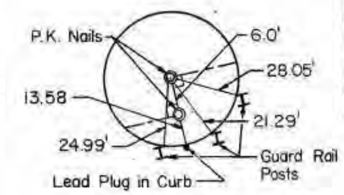
P.I. Sta. 659+19.563
Δ = 32° 36' 00" Lt.
Δ_c = 26° 52' 13.52"
D_c = 2° 51' 53.24" (Chord)
R_c = 2000.00'
L_c = 937.96' (Chord)
θ_s = 2° 51' 53.24"
L_s = 200.00'
T_s = 685.71'
E_s = 84.62'
K = 99.99'
P = 0.83'
X_c = 199.94'
Y_c = 3.33'
L.T. = 133.35'
S.T. = 66.68'
L.C. = 199.98'
Superelevate 0.07 ft./ft.
T.S. Sta. 652+34.487
S.C. Sta. 654+34.487
C.S. Sta. 663+72.442
S.T. Sta. 665+72.442



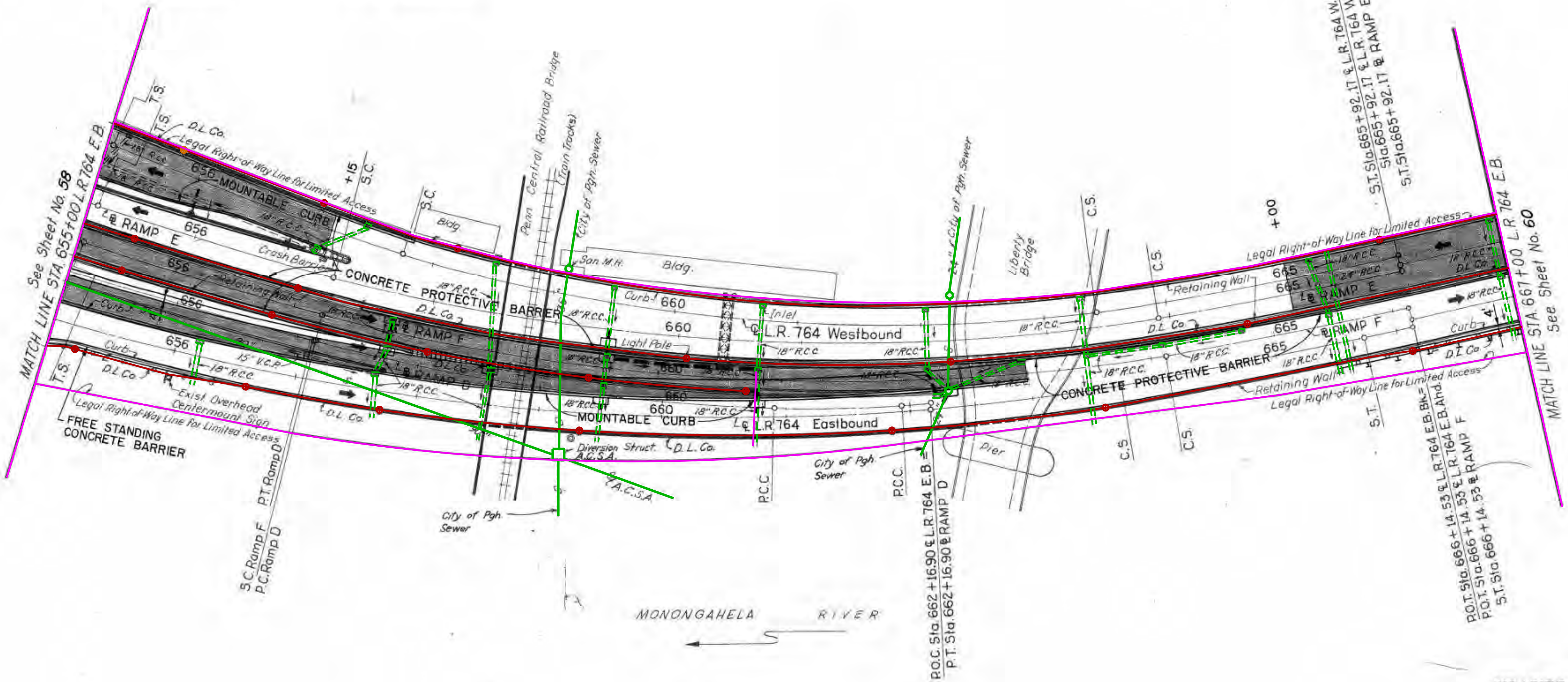
P.O.S.T. Sta. 659+57.79
L.R. 764 W.B.



P.O.S.T. Sta. 662+26.33
L.R. 764 W.B.



P.O.T. Sta. 666+14.53
L.R. 764 E.B.



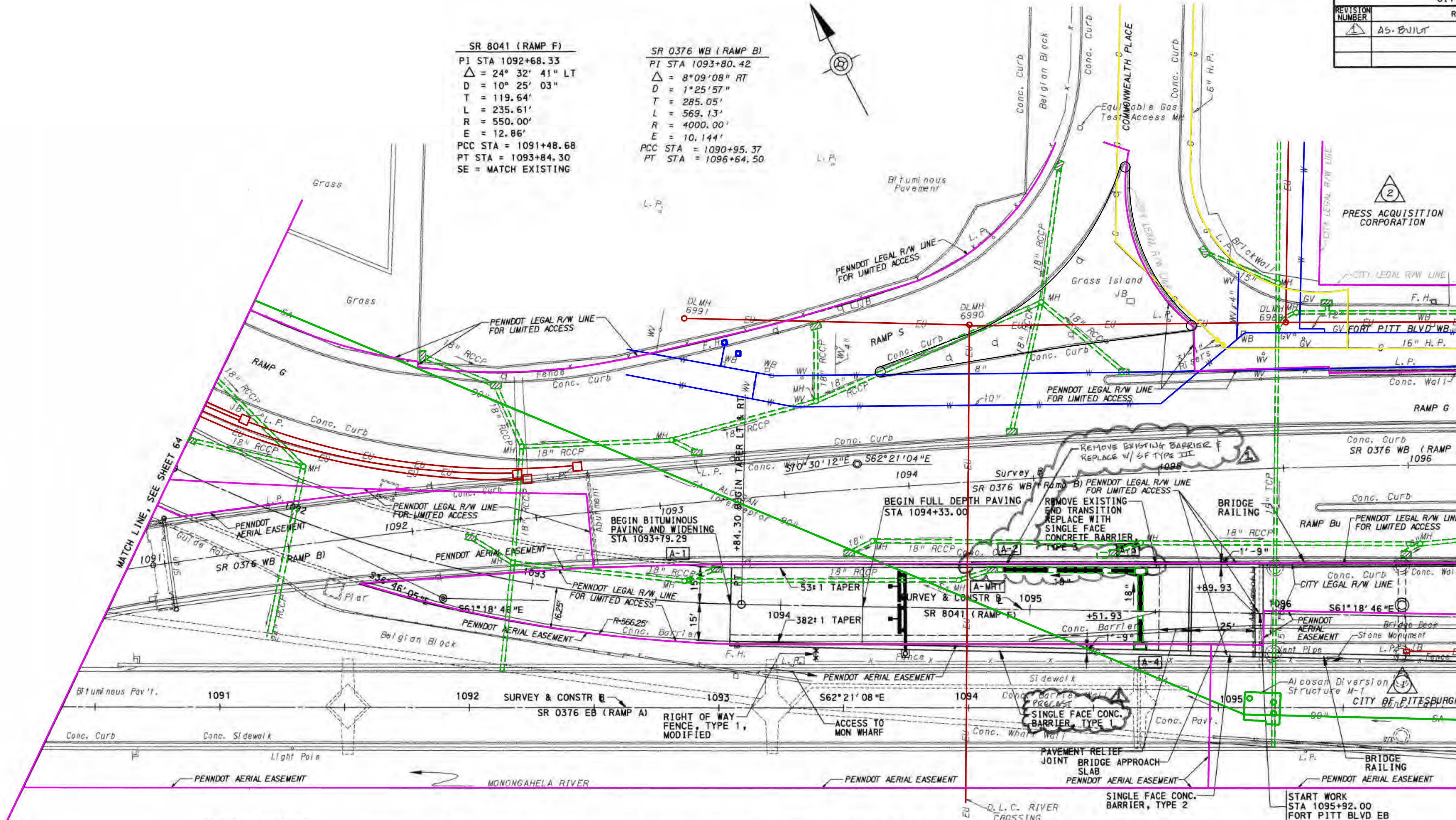
FOR LEGEND SEE SHEET 55
FOR RAMP F PROFILE SEE SHEET 76
FOR L.R. 764 W.B. PROFILE SEE SHEETS 72 & 73
FOR CONTOUR, GRADING, & GEOMETRY DRAWINGS SEE SHEETS 69 THRU 71

SCALE IN FEET
50 0 50

PLAN STA. 655+00 to STA. 667+00 E.B.

TRACED BY
FINAL BY

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



SR 0376 WB (RAMP B)
PI STA 1089+42.12
Δ = 52°53'03" RT
D = 15°54'56"
T = 179.04'
L = 332.28'
R = 360.00'
E = 42.06'
PC STA = 1087+63.09
PCC STA = 1090+95.37

FORT PITT BLVD EB / INTERSTATE CONNECTOR STRUCTURE DATA	EXISTING	PROPOSED
STATION	1105+37.62	1105+37.62
TYPE	GIRDER, FLOORBEAM, STRINGER	PRESTRESSED CONCRETE I-BEAM, MULTIGIRDER
SPAN	2022'-10" (1-32' SPAN 36-54' SPANS, 1-46'-10" SPAN)	1892'-6" (34-54' SPANS 1-56'-6" SPAN)
CLEARANCE	14'-3"±	15'-4"±
ROADWAY WIDTH	30'±	36'-10"
SKEW	90°	90°
STRUCTURE NO	N/A	S-24389 RECOMMENDED

NOTES: SEE STRUCTURE PLAN S-24389 FOR RECONSTRUCTION DETAILS FOR FORT PITT BLVD EB / INTERSTATE CONNECTOR

SEE MISCELLANEOUS DETAILS FOR CONCRETE CURB CONSTRUCTION AROUND EXISTING AND PROPOSED PIERS.

FOR TEMPORARY CONSTRUCTION EASEMENTS SEE SR 0279 SECTION A58 AND SR 0376 SECTION A25 RIGHT OF WAY PLAN.

SCALE: 20 FEET 0 20 FEET

RECORD DRAWINGS

SURVEY BOOK NO 47067

FOR PROFILE, SEE SHEET 76

DRAWN BY	JES
CHECKED BY	JFW

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER JAMES F. WEMER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN DETAIL PLAN

SCALE: AS SHOWN SHEET NO ACCESSION NO
DATE: 12/01/2001 65 OF 85 CASE NO

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	66 OF 85

CITY OF PITTSBURGH

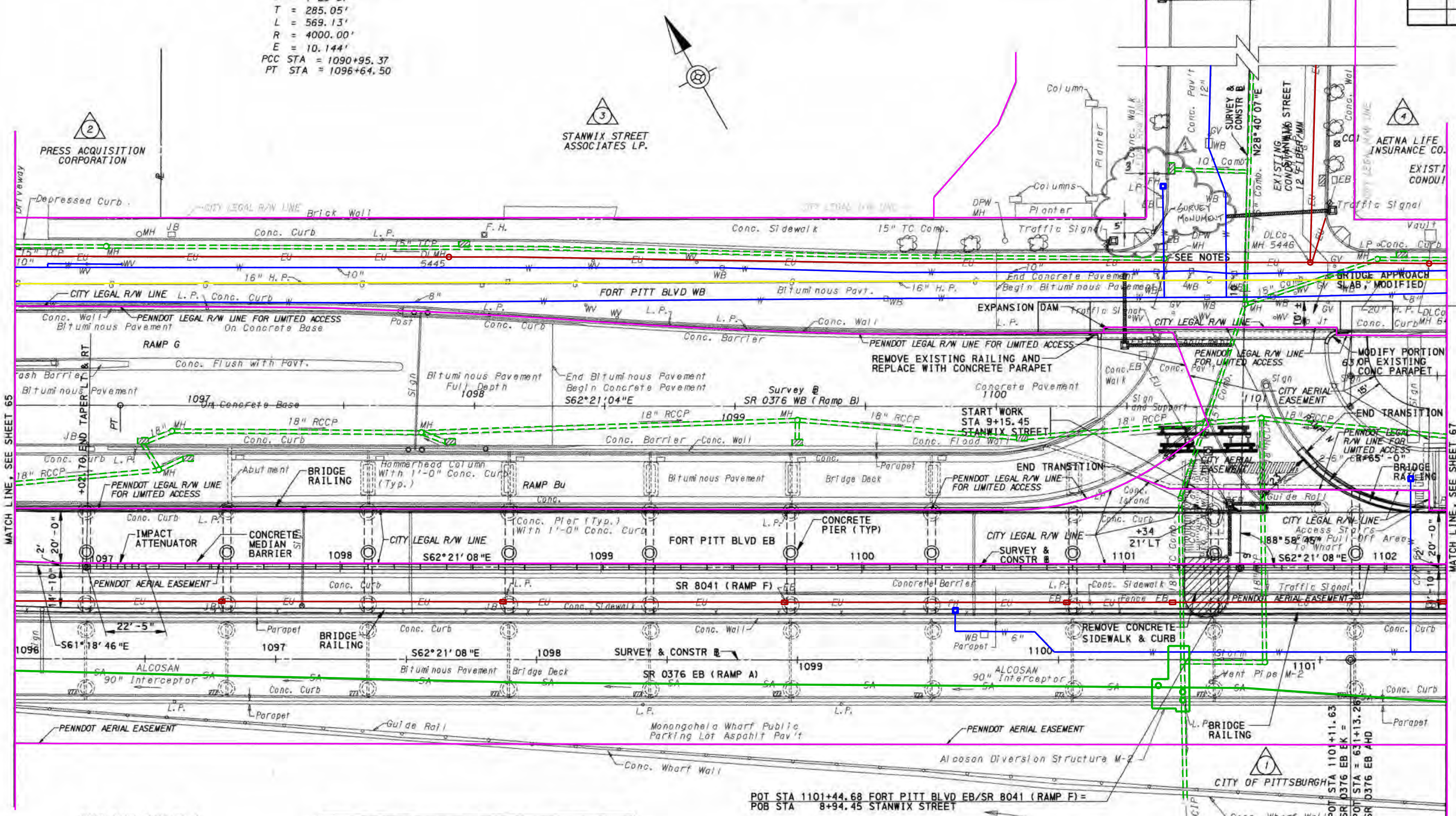
REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

* 0279 & 0376
** A33 & A28

SR 0376 WB (RAMP B)
PI STA 1093+80.42
Δ = 8°09'08" RT
D = 1°25'57"
T = 285.05'
L = 569.13'
R = 4000.00'
E = 10.144'
PCC STA = 1090+95.37
PT STA = 1096+64.50

BENCH MARK 206 ELEVATION 738.23'
X CUT ON BOLT ON BASE OF SIGN
I-279 SB FORT PITT BRIDGE, AIRPORT
STANWIX STREET STATION 9+43.64
14.72' LT, BK 47058, PG 15.

STOP WORK
STA 11+85.00
STANWIX STREET



FORT PITT BLVD EB / SR 8041 (RAMP F)
PI STA 1097+02.70
Δ = 1° 02' 22" LT
NO CURVE

SCALE
20 FEET 0 20 FEET

STANWIX STREET STRUCTURE DATA

	EXISTING	PROPOSED
STATION	9+49.70	9+49.70
TYPE	MULTI-GIRDER FLOORBEAM SYSTEM	MULTI-GIRDER FLOORBEAM SYSTEM
SPAN	66'-2"	66'-2"
CLEARANCE	14'-3½"	14'-3½"
ROADWAY WIDTH	VARIES	VARIES
SKEW	90°	90°
STRUCTURE NO	N/A	BPAA 02-2416 RECOMMENDED

NOTES: SEE STRUCTURES PLAN BPAA 02-2416 FOR RECONSTRUCTION DETAILS FOR STANWIX STREET STRUCTURE

SEE MISCELLANEOUS DETAILS FOR CONCRETE CURB CONSTRUCTION AROUND EXISTING AND PROPOSED PIERS.

CONSTRUCT BRIDGE APPROACH SLAB, MODIFIED TO THE NEAREST LONGITUDINAL AND TRANSVERSE JOINTS.

FOR TEMPORARY CONSTRUCTION EASEMENTS SEE SR 0279 SECTION A58 AND SR 0376 SECTION A25 RIGHT OF WAY PLAN.

SURVEY BOOK NOS 47067 & 0023

RECORD DRAWINGS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER JAMES F. WEMER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

SCALE: AS SHOWN　SHEET NO　ACCESSION NO ______
DATE: 12/01/2001　66 OF 85　CASE NO ______

DRAWN BY	JES
CHECKED BY	JFW

FOR PROFILE, SEE SHEET 77

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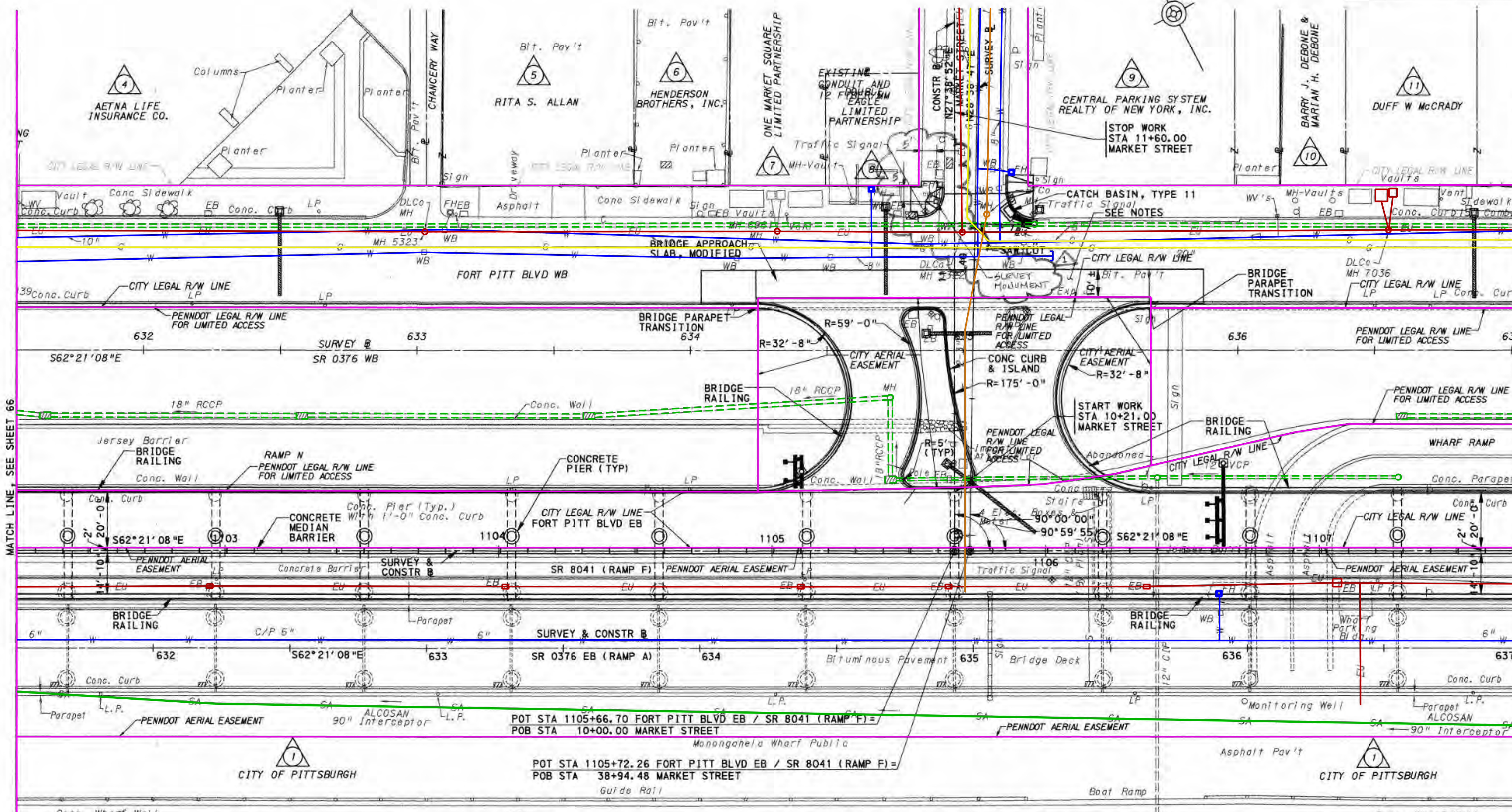
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	67 OF 85

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAE

* 0279 & 0376
** A33 & A28

BENCH MARK 300 ELEVATION 745.09'
CENTER DPW MONUMENT WEST CORNER OF
MARKET STREET AND BLVD OF THE ALLIES
BK 0023, PG 43.



FORT PITT BOOULEVARD WB RETAINING WALL (WALL A) STRUCTURE DATA

	EXISTING	PROPOSED
STATION	1096+18.60 TO 1103+96.18	1096+18.60 TO 1103+96.18
TYPE	R.C. RETAINING WALL	REHABILITATION OF R.C. WALL
SPAN	N/A	N/A
CLEARANCE	N/A	N/A
ROADWAY WIDTH	N/A	N/A
SKEW	N/A	N/A
STRUCTURE NO	N/A	BPAA 02-2420 RECOMMENDED

FOR PROFILES, SEE SHEETS 78 & 83

MARKET STREET STRUCTURE DATA

	EXISTING	PROPOSED
STATION	10+55.90	10+55.90
TYPE	MULTI-GIRDER FLOORBEAM SYSTEM	COMPOSITE STEEL MULTI-I-BEAM
SPAN	67'-2"	67'-10"
CLEARANCE	16'-9½"	16'-9½"
ROADWAY WIDTH	VARIES	VARIES
SKEW	90°	90°
STRUCTURE NO	N/A	BPAA 02-2417 RECOMMENDED

NOTES: CONSTRUCT BRIDGE APPROACH SLAB, MODIFIED TO THE NEAREST LONGITUDINAL AND TRANSVERSE JOINTS.

SEE STRUCTURE PLAN BPAA 02-2417 FOR RECONSTRUCTION DETAILS FOR MARKET STREET STRUCTURE

SEE MISCELLANEOUS DETAILS FOR CONCRETE CURB CONSTRUCTION AROUND EXISTING AND PROPOSED PIERS.

FOR TEMPORARY CONSTRUCTION EASEMENTS SEE SR 0279 SECTION A58 AND SR 0376 SECTION A25 RIGHT OF WAY PLAN.

SCALE 20 FEET 0 20 FEET

SURVEY BOOK NOS 47067 & 0023

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEMER ENGINEER

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

DRAWN BY	JES
CHECKED BY	JFW

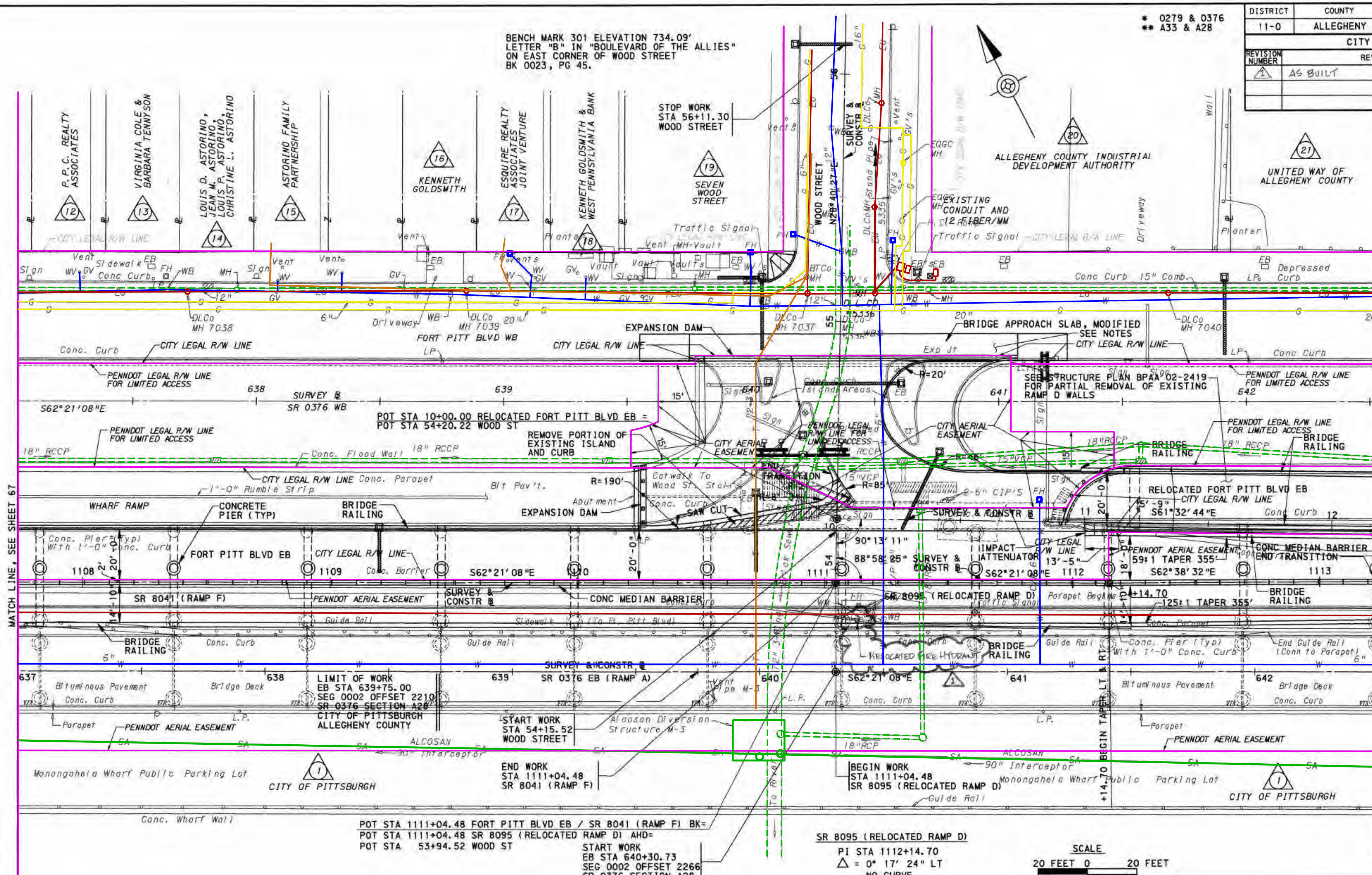
SCALE: AS SHOWN SHEET NO 67 OF 85 ACCESSION NO
DATE: 12/01/2001 CASE NO

h:\projects\usstation\0042\Roadway\cnpln04.dgn 12/01/2001

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS BUILT	10/1/03	SAI

* 0279 & 0376
** A33 & A28



WOOD STREET STRUCTURE DATA		
	EXISTING	PROPOSED
STATION	-	54+50.28
TYPE	STEEL GIRDER	REHABILITATION OF STEEL GIRDER
SPAN	67'-2"	67'-2"
UNDER CLEARANCE	14'-5" (MIN.)	14'-5" (MIN.)
ROADWAY WIDTH	VARIES	VARIES
SKEW	90°	90°
STRUCTURE NO	N/A	BPAA 02-2418 RECOMMENDED

NOTE: CONSTRUCT BRIDGE APPROACH SLAB, MODIFIED TO THE NEAREST LONGITUDINAL AND TRANSVERSE JOINTS.

SEE STRUCTURE PLAN BPAA 02-2418 FOR RECONSTRUCTION DETAILS FOR WOOD STREET STRUCTURE

SEE MISCELLANEOUS DETAILS FOR CONCRETE CURB CONSTRUCTION AROUND EXISTING AND PROPOSED PIERS.

FOR TEMPORARY CONSTRUCTION EASEMENTS SEE SR 0279 SECTION A58 AND SR 0376 SECTION A25 RIGHT OF WAY PLAN.

SURVEY BOOK NOS 47067 & 0023

FOR PROFILES, SEE SHEETS 79 & 84

DRAWN BY	JES
CHECKED BY	JFW

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER JAMES F. WEINER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

SCALE: AS SHOWN SHEET NO 68 OF 85 ACCESSION NO
DATE: 12/01/2001 CASE NO

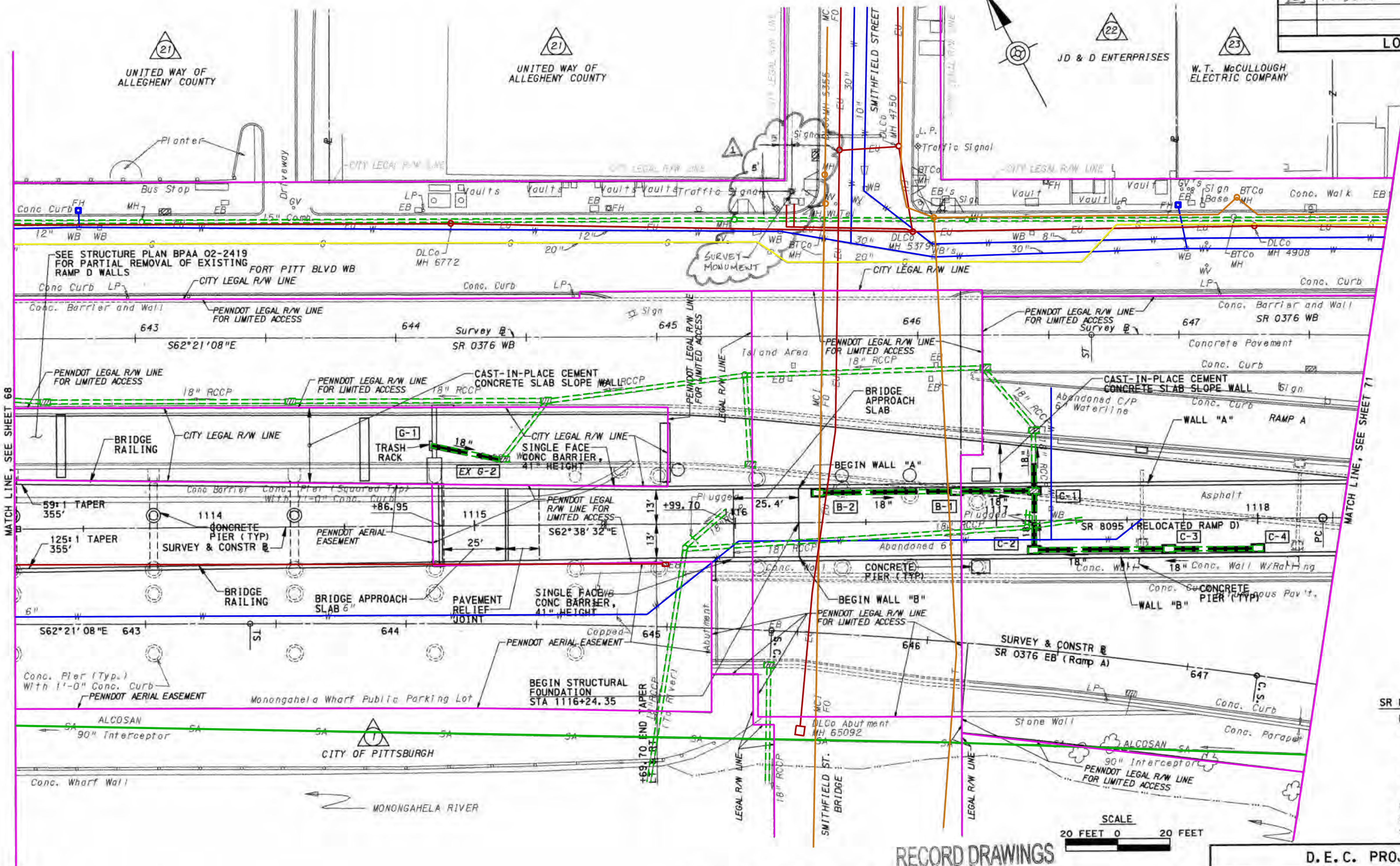
* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	69 OF 85

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

LOWER LEVEL



SR 0376 WB

PI STA 649+38.58
Δ = 11°59'46" RT
Δ_c = 1°45'53"
D_c = 4°05'33.2" (CHORD)
R_c = 1400.00'
L_c = 43.12' (CHORD)
Θ_s = 5°06'56.5"
L_s = 250.00'
T_s = 272.26'
E_s = 9.48'
k = 124.97'
p = 1.86'
X_c = 249.80'
Y_c = 7.44'
LT = 166.74'
ST = 83.40'
LC = 249.91'
TS STA = 646+66.32
SC STA = 649+16.32
CS STA = 649+59.44
ST STA = 652+09.44

SR 0376 (RAMP A)

PI STA 646+34.11
Δ = 11°04'36" RT
Δ_c = 5°20'50"
D_c = 2°51'53"
R_c = 2000.00'
L_c = 186.65'
Θ_s = 2°51'53"
L_s = 200.00'
T_s = 294.00'
E_s = 10.22'
K = 99.99
p = 0.833
X_c = 199.95'
Y_c = 3.33'
LT = 133.35'
ST = 66.68'
LC = 199.98'
TS STA = 643+40.11
SC STA = 645+40.11
CS STA = 647+26.76
ST STA = 649+26.76

SR 8095 (RELOCATED RAMP D)

PI STA 1118+92.90
Δ = 6° 06' 34" RT
D = 4° 30' 45"
T = 67.76'
L = 135.39'
R = 1269.68'
E = 1.81'
PC STA = 1118+25.14
PCC STA = 1119+60.53
SE = 4.38%

SCALE
20 FEET 0 20 FEET

RECORD DRAWINGS

NOTES: FOR TEMPORARY CONSTRUCTION EASEMENTS SEE SR 0279 SECTION A58 AND SR 0376 SECTION A25 RIGHT OF WAY PLAN.

SEE MISCELLANEOUS DETAILS FOR CONCRETE CURB CONSTRUCTION AROUND EXISTING AND PROPOSED PIERS.

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEMER ENGINEER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

SCALE: AS SHOWN
SHEET NO 69 OF 85
ACCESSION NO
DATE: 12/01/2001
CASE NO

DRAWN BY	JES
CHECKED BY	JFW

FOR PROFILE, SEE SHEET 80

FOR RELOCATED FORT PITT BLVD EB AND RAMP B ALIGNMENT, SEE SHEET 70

SURVEY BOOK NOS 47067 & 0023

12/01/2001

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	70 OF 85

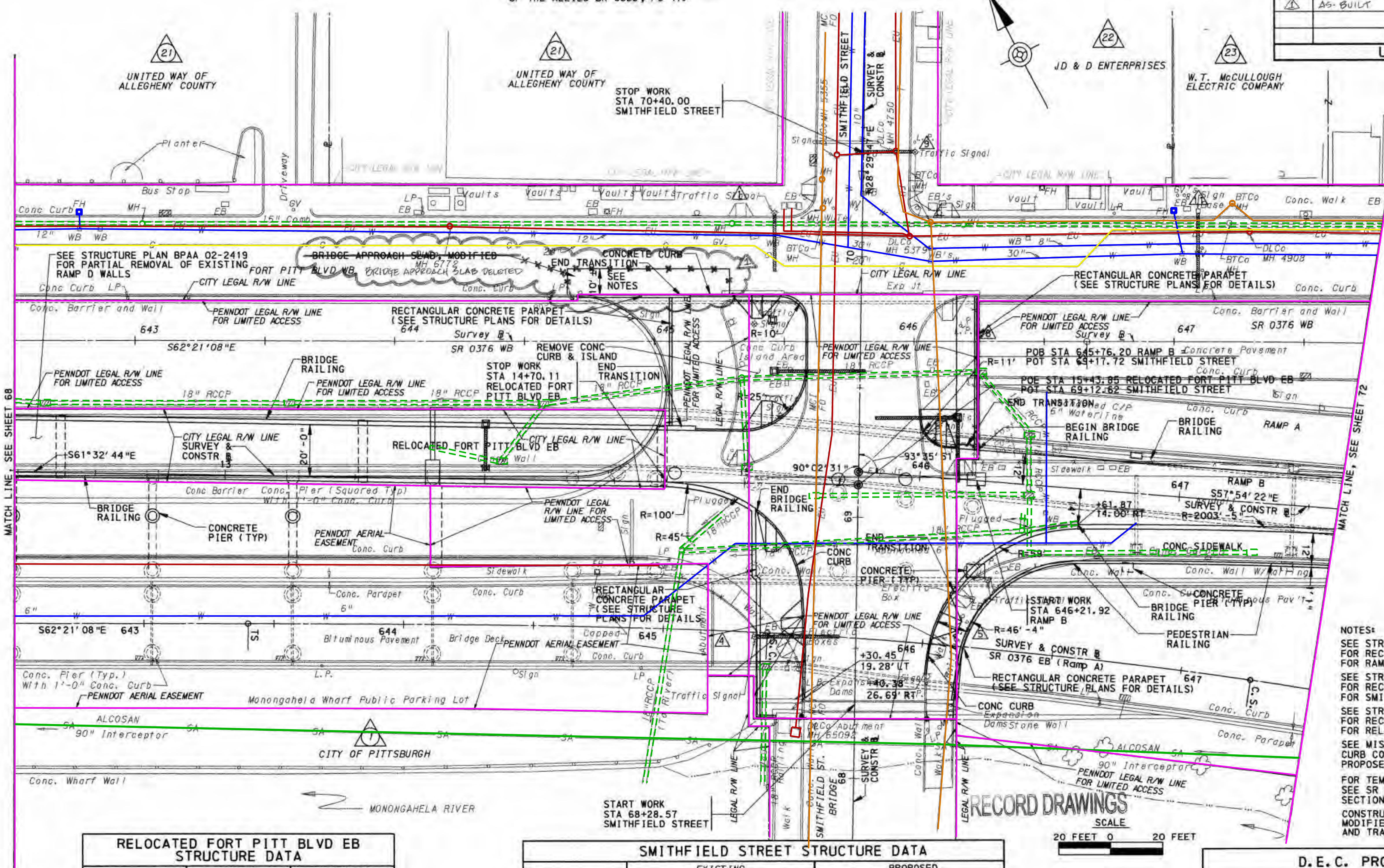
* 0279 & 0376
** A33 & A28

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

UPPER LEVEL

BENCH MARK 302 ELEVATION 747.22'
CENTER DPW MONUMENT WEST CORNER
OF SMITHFIELD STREET AND BOULEVARD
OF THE ALLIES BK 0023, PG 47.



SR 0376 WB

PI STA 649+38.578
Δ = 11°59'47" RT
Δ_c = 1°45'53"
D_c = 4°05'33" (CHORD)
R_c = 1400.00'
L_c = 43.12' (CHORD)
Θ_s = 5°06'57"
L_s = 250.00'
T_s = 272.26'
E_s = 9.48'
k = 124.97'
p = 1.86'
X_c = 249.80'
Y_c = 7.44'
LT = 166.74'
ST = 83.40'
LC = 249.91'
TS STA = 646+66.317
SC STA = 649+16.317
CS STA = 649+59.437
ST STA = 652+09.437

SR 0376 (RAMP A)

PI STA 646+34.11
Δ = 11°04'36" RT
Δ_c = 5°20'50"
D_c = 2°51'53"
R_c = 2000.00'
L_c = 186.65'
Θ_s = 2°51'53"
L_s = 200.00'
T_s = 294.00'
E_s = 10.22'
K = 99.99
P = 0.833
X_c = 199.95'
Y_c = 3.33'
LT = 133.35'
ST = 66.68'
LC = 199.98'
TS STA = 643+40.11
SC STA = 645+40.11
CS STA = 647+26.76
ST STA = 649+26.76

NOTES:

SEE STRUCTURE PLAN S-24319 FOR RECONSTRUCTION DETAILS FOR RAMP B STRUCTURE

SEE STRUCTURE PLAN S-24390 FOR RECONSTRUCTION DETAILS FOR SMITHFIELD STREET STRUCTURE

SEE STRUCTURE PLAN BPAA 02-2419 FOR RECONSTRUCTION DETAILS FOR RELOCATED FORT PITT BLVD EB

SEE MISCELLANEOUS DETAILS FOR CONCRETE CURB CONSTRUCTION AROUND EXISTING AND PROPOSED PIERS.

FOR TEMPORARY CONSTRUCTION EASEMENTS SEE SR 0279 SECTION A58 AND SR 0376 SECTION A25 RIGHT OF WAY PLAN.

CONSTRUCT BRIDGE APPROACH SLAB, MODIFIED TO THE NEAREST LONGITUDINAL AND TRANSVERSE JOINTS.

RELOCATED FORT PITT BLVD EB STRUCTURE DATA

	EXISTING	PROPOSED
STATION	N/A	11+19.20
TYPE	N/A	3 SPAN PRESTRESSED CONC. OR STEEL
SPAN	N/A	3-113.33' SPANS
CLEARANCE	N/A	N/A
ROADWAY WIDTH	N/A	20'
SKEW	N/A	89°11'31"
STRUCTURE NO.	N/A	BPAA 02-2419 RECOMMENDED________

SMITHFIELD STREET STRUCTURE DATA

	EXISTING	PROPOSED
STATION	68+28.57	68+28.57
TYPE	STEEL GIRDER	REHAB. OF STEEL GIRDER
SPAN	1-48.10' SPAN, 1-27.16' SPAN, 1-76.78' SPAN	1-48.10' SPAN, 1-34.26' SPAN, 1-69.67' SPAN
CLEARANCE	14'-5"	14'-5"
ROADWAY WIDTH	41'-4"	41'-4"
SKEW	90°,90°,90°,90°	90°,90°,90°,90°
STRUCTURE NO	S-20765	S-24390 RECOMMENDED________

FOR PROFILES, SEE SHEETS 84 & 85

FOR SR 8095 (RELOCATED RAMP D) ALIGNMENT, SEE SHEET 69

SURVEY BOOK NOS 47067 & 0023

DRAWN BY	JES
CHECKED BY	JFW

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEMER ENGINEER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

SCALE: AS SHOWN SHEET NO 70 OF 85 ACCESSION NO ________
DATE : 12/01/2001 CASE NO ________

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DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	71 OF 85

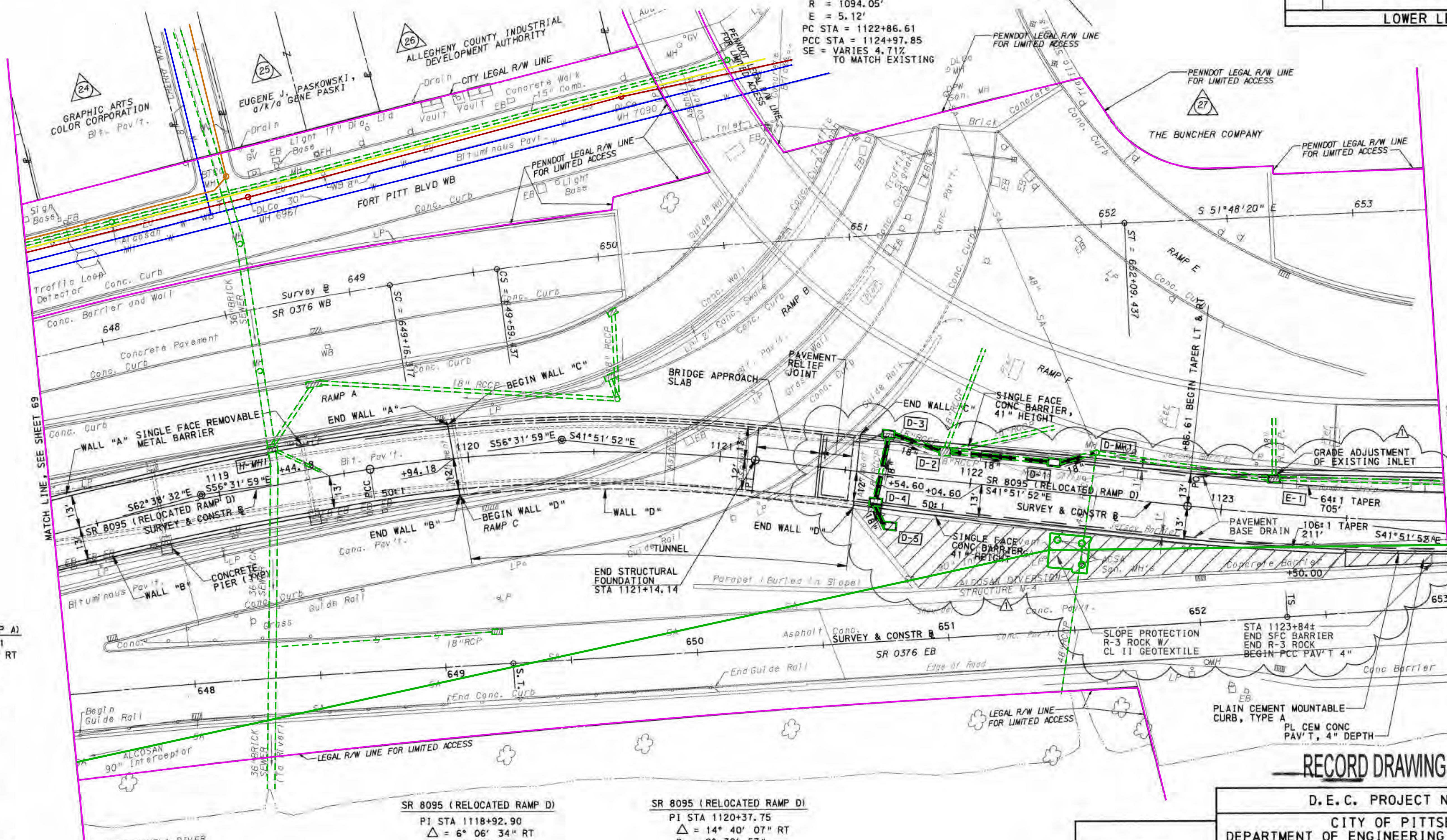
CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

LOWER LEVEL

* 0279 & 0376
** A33 & A28

SR 8095 (RELOCATED RAMP D)
PI STA 1123+92.56
△ = 11° 03' 46" LT
D = 5° 14' 13"
T = 105.95'
L = 211.24'
R = 1094.05'
E = 5.12'
PC STA = 1122+86.61
PCC STA = 1124+97.85
SE = VARIES 4.71% TO MATCH EXISTING



SR 0376 WB
PI STA 649+38.578
△ = 11°59'47" RT
△c = 1°45'53"
Dc = 4°05'33" (CHORD)
Rc = 1400.00'
Lc = 43.12' (CHORD)
Θs = 5°06'57"
Ls = 250.00'
Ts = 272.26'
Es = 9.48'
k = 124.97'
p = 1.86'
Xc = 249.80'
Yc = 7.44'
LT = 166.74'
ST = 83.40'
LC = 249.91'
TS STA = 646+66.317
SC STA = 649+16.317
CS STA = 649+59.437
ST STA = 652+09.437

SR 0376 EB
PI STA 659+19.56
△ = 32°36'00" LT
△c = 26°52'14"
Dc = 2°51'53"
Rc = 2000.00'
Lc = 937.96'
Θs = 2°51'53"
Ls = 200.00'
Ts = 685.08'
Es = 84.62'
k = 99.99
p = 0.833
Xc = 199.95'
Yc = 3.33'
LT = 133.35'
ST = 66.68'
LC = 199.98'
TS STA = 652+34.49
SC STA = 654+34.49
CS STA = 663+72.44
ST STA = 665+72.44

SR 0376 EB (RAMP A)
PI STA 646+34.11
△ = 11°04'36" RT
△c = 5°20'50"
Dc = 2°51'53"
Rc = 2000.00'
Lc = 186.65'
Θs = 2°51'53"
Ls = 200.00'
Ts = 294.00'
Es = 10.22'
k = 99.99
p = 0.833
Xc = 199.95'
Yc = 3.33'
LT = 133.35'
ST = 66.68'
LC = 199.98'
TS STA = 643+40.11
SC STA = 645+40.11
CS STA = 647+26.76
ST STA = 649+26.76

SR 8095 (RELOCATED RAMP D)
PI STA 1118+92.90
△ = 6° 06' 34" RT
D = 4° 30' 45"
T = 67.76'
L = 135.39'
R = 1269.68'
E = 1.81'
PC STA = 1118+25.14
PCC STA = 1119+60.53
SE = 4.38%

SR 8095 (RELOCATED RAMP D)
PI STA 1120+37.75
△ = 14° 40' 07" RT
D = 9° 32' 57"
T = 77.23'
L = 153.61'
R = 600.00'
E = 4.95'
PCC STA = 1119+60.53
PT STA = 1121+14.14
SE = 5.86%

NOTE: FOR TEMPORARY CONSTRUCTION EASEMENTS SEE SR 0279 SECTION A58 AND SR 0376 SECTION A25 RIGHT OF WAY PLAN.

SCALE
20 FEET 0 20 FEET

SURVEY BOOK NOS 47067 & 0023

RECORD DRAWINGS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER JAMES F. WEMER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

SCALE: AS SHOWN | SHEET NO 71 OF 85 | ACCESSION NO
DATE : 12/01/2001 | CASE NO

DRAWN BY	JES
CHECKED BY	JFW

FOR PROFILE, SEE SHEET 81

FOR RAMP B ALIGNMENT, SEE SHEET 72

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DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	72 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
⚠	AS-BUILT	10/1/03	SAI

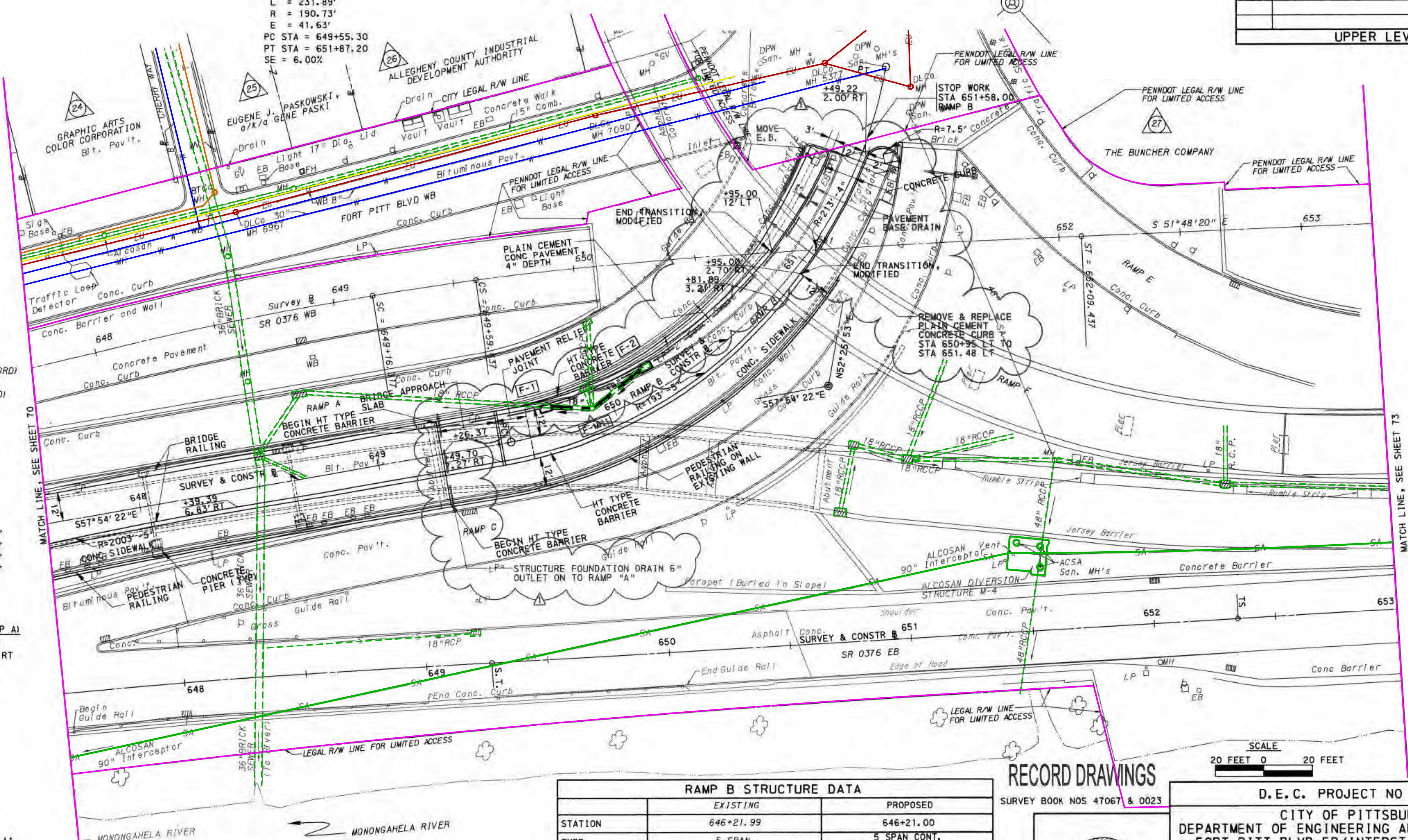
UPPER LEVEL

* 0279 & 0376
** A33 & A28

RAMP B
PI STA 650+88.02
△ = 69° 39′ 45″ LT
D = 30° 02′ 27″
T = 132.71′
L = 231.89′
R = 190.73′
E = 41.63′
PC STA = 649+55.30
PT STA = 651+87.20
SE = 6.00%

BENCH MARK 303 ELEVATION 756.12′
LETTER "R" IN "BOULEVARD OF THE ALLIES"
ON THE NORTH CORNER OF GRANT STREET
AND BOULEVARD OF THE ALLIES
BK 0023, PG 49.

BENCH MARK 304 ELEVATION 747.69′
VERTICAL DISK ON NORTH SIDE
CONCRETE PIER AT FORT PITT BLVD
AND GRANT STREET BK 0023, PG 45.



SR 0376 WB
PI STA 649+38.578
△ = 11°59′47″ RT
△c = 1°45′53″
Dc = 4°05′33″ (CHORD)
Rc = 1400.00′
Lc = 43.12′ (CHORD)
Θs = 5°06′57″
Ls = 250.00′
Ts = 272.26′
Es = 9.48′
k = 124.97′
p = 1.86′
Xc = 249.80′
Yc = 7.44′
LT = 166.74′
ST = 83.40′
LC = 249.91′
TS STA = 646+66.317
SC STA = 649+16.317
CS STA = 649+59.437
ST STA = 652+09.437

SR 0376 EB (RAMP A)
PI STA 646+34.11
△ = 11°04′36″ RT
△c = 5°20′50″
Dc = 2°51′53″
Rc = 2000.00′
Lc = 186.65′
Θs = 2°51′53″
Ls = 200.00′
Ts = 294.00′
Es = 10.22′
k = 99.99
p = 0.833
Xc = 199.95′
Yc = 3.33′
LT = 133.35′
ST = 66.68′
LC = 199.98′
TS STA = 643+40.11
SC STA = 645+40.11
CS STA = 647+26.76
ST STA = 649+26.76

SR 0376 EB
PI STA 659+19.56
△ = 32°36′00″ LT
△c = 26°52′14″
Dc = 2°51′53″
Rc = 2000.00′
Lc = 937.96′
Θs = 2°51′53″
Ls = 200.00′
Ts = 685.08′
Es = 84.62′
k = 99.99′
p = 0.833′
Xc = 199.95′
Yc = 3.33′
LT = 133.35′
ST = 66.68′
LC = 199.98′
TS STA = 652+34.49
SC STA = 654+34.49
CS STA = 663+72.44
ST STA = 665+72.44

SCALE
20 FEET 0 20 FEET

NOTES: SEE STRUCTURE PLAN S-24391 FOR RECONSTRUCTION DETAILS FOR RAMP B STRUCTURE

FOR TEMPORARY CONSTRUCTION EASEMENTS SEE SR 0279 SECTION A58 AND SR 0376 SECTION A25 RIGHT OF WAY PLAN.

RAMP B STRUCTURE DATA		
	EXISTING	PROPOSED
STATION	646+21.99	646+21.00
TYPE	5 SPAN STEEL GIRDER	5 SPAN CONT. STEEL OR P/S CONC.
SPAN	1-59.13′ SPAN, 1-60.08′ SPAN, 2-59.96′ SPAN, 1-60.05′ SPAN,	1-58.93′ SPAN, 1-60.28′ SPAN, 1-60.86′ SPAN, 1-59.28′ SPAN, 1-60.64′ SPAN
CLEARANCE	14′-6″ @ TUNNEL	14′-6″ @ TUNNEL
ROADWAY WIDTH	VARIES	28′ TO 24′
SKEW	VARIES	VARIES
STRUCTURE NO	N/A	S-24391 RECOMMENDED______

RECORD DRAWINGS
SURVEY BOOK NOS 47067 & 0023

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES F. WEIMER
ENGINEER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

DRAWN BY	JES
CHECKED BY	JFW

FOR PROFILES, SEE SHEET 85

FOR SR 8095 (RELOCATED RAMP D) ALIGNMENT, SEE SHEET 71

SCALE: AS SHOWN SHEET NO ACCESSION NO ______
DATE: 12/01/2001 72 OF 85 CASE NO ______

H:\Projects\Station\0042\ASBUILT\dbonpin09.dgn 12/29/2003

Appendix K:

Existing Plans:

LR 764 (1982) and SR 279-A33 (2001) Full Sets

7530-2350-0170(4235A)

		FEDERAL PROJECT NO. I-376-1(38)0					
	DISTRICT	COUNTY	CITY	BOROUGH	ROUTE	SECTION	TOTAL SHEETS
FAI	11-0	ALLEGHENY	PITTSBURGH		764	19	76
					763	20	
					766	23	

STATE PROJECT NUMBER

SYS	L.R. or W.O.	SPUR	PHA	SECTION	DIST.	CO.
1	7 6 4	0	7	0 1 9	1 1	1

COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF TRANSPORTATION

DRAWINGS
FOR
CONSTRUCTION
OF

LEG. ROUTE 764 SECTION 19

IN ALLEGHENY COUNTY

From Sta. 631+16.78 W.B. To Sta. 769+56.16 ℄
From Sta. 631+13.26 E.B. To Sta. 769+56.16 ℄ Length 13,842.90 Ft. 2.622 Mi.

LEG. ROUTE 763 SECTION 20

From Sta. 769+56.16 To Sta. 784+00.00 Length 1,443.84 Ft. 0.273 Mi.

LEG. ROUTE 766 SECTION 23

From Sta. 1095+50.00 E.B. To Sta. 1101+11.63 E.B.
From Sta. 1090+50.00 W.B. To Sta. 1101+35.48 W.B. Length 1,085.48 Ft. 0.206 Mi.

TOTAL LENGTH
16,372.22 Ft.
3.101 Mi.

ALSO

LEG. ROUTE 120 SECTION 75

From Sta. 721+15.00 To Sta. 733+20.00

ALSO INCLUDED:

3 SHEETS OF DELINEATOR PLANS
15 SHEETS OF ROCK SLOPE STABILIZATION PLANS
324 SHEETS OF MAINTENANCE AND PROTECTION OF TRAFFIC
90 SHEETS OF SIGNING AND SIGN LIGHTING PLANS
29 SHEETS OF HIGHWAY LIGHTING PLANS
4 SHEETS OF PAVEMENT MARKING PLANS
26 SHEETS OF FLOODWALL PROTECTION SYSTEM PLANS
114 SHEETS OF FLOODWALL STRUCTURE PLANS S-14584
61 SHEETS OF STRUCTURE PLANS S-12702 -BR. 35
38 SHEETS OF STRUCTURE PLANS S-12703 -BR. 13
19 SHEETS OF STRUCTURE PLANS S-12704 -BR. 12
16 SHEETS OF STRUCTURE PLANS S-12705 -BR. 11
34 SHEETS OF STRUCTURE PLANS S-12706 -BR. 10
11 SHEETS OF STRUCTURE PLANS S-12707 -BR. 9
16 SHEETS OF STRUCTURE PLANS S-12708 -BR. 34
10 SHEETS OF STRUCTURE PLANS S-12709 -BR. 8
19 SHEETS OF STRUCTURE PLANS S-12710 -BR. 7
13 SHEETS OF STRUCTURE PLANS S-12711 -BR. 33
2 SHEETS OF STRUCTURE PLANS S-12712 -BR. 76B
2 SHEETS OF STRUCTURE PLANS S-12713 -BR. 76B
24 SHEETS OF STRUCTURE PLANS S-14203 -BR. 79
20 SHEETS OF STRUCTURE PLANS S-14204 -BR. 78
7 SHEETS OF STRUCTURE PLANS S-14647

216 SHEETS OF CROSS SECTIONS (UPON REQUEST)
4 SHEETS OF TRANSPORTATION SYSTEM MANAGEMENT CRAFT AVE.
9 SHEETS OF TRANSPORTATION SYSTEM MANAGEMENT FT. PITT. BLVD.
7 SHEETS OF TRANSPORTATION SYSTEM MANAGEMENT BLVD. OF THE ALLIES
13 SHEETS OF ERECTION OF SIGNS AND SIGNALS

SCALE

HORIZONTAL 0 50 100 / 0 25 50

VERTICAL 0 5 10

DESIGN DESIGNATION

CLASS OF HIGHWAY – PRINC'L-DOWNTOWN
DESIGN SPEED – 60 M.P.H.
PAVEMENT SECTION – 4 TO 6-12' LANES
MEDIAN WIDTH
MAX. – 200'
MIN. – 4'

A.D.T. – 81,000 (1982)
A.D.T. – 95,600 (2002)
D.H.V.
D – 50%
T – 5%

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL RICHARD M. COLEMAN ENGINEER #15696-E

Richard M. Coleman
RICHARD M. COLEMAN P.E.

PLANS PREPARED BY
SANDERS AND THOMAS, INC.
CONSULTING ENGINEERS
POTTSTOWN, PENNA.

HUGO W. BUDA, P.E. Vice President
7/19/82
Date

RECOMMENDED Aug 16, 1982 19
DISTRICT ENGINEER

RECOMMENDED August 24 19 82
David C. Sims
DEPUTY SECRETARY

APPROVED August 24 19 82
SECRETARY OF TRANSPORTATION

APPROVED Sept. 3 19 82
GOVERNOR

BRUNING 44-260 15135

RECORD OF EXISTING ROAD TYPES
STRAIGHT LINE DIAGRAM STATIONS

L.R. 764 Westbound
Limit of Work

Adjacent to S.L.D. Sta. 535+80	40' R.C.C. Slab on Gravel Subgrade
S.L.D. Sta. 535+80 to S.L.D. Sta. 549+05	40' R.C.C. Slab on Gravel Subgrade
S.L.D. Sta. 549+05 to S.L.D. Sta. 551+15	40' to 28' R.C.C. Slab on Special Subgrade
S.L.D. Sta. 551+15 to S.L.D. Sta. 562+26	28' R.C.C. Slab on Special Subgrade
S.L.D. Sta. 562+26 to S.L.D. Sta. 570+92	28' to 40' R.C.C. Slab on Special Subgrade
S.L.D. Sta. 570+92 to S.L.D. Sta. 573+34	40' R.C.C. Slab on Special Subgrade
S.L.D. Sta. 573+34 to S.L.D. Sta. 590+77	40' Wide x 9" R.C. Conc. Deck Floor Slab
S.L.D. Sta. 590+77 to S.L.D. Sta. 624+84	40' R.C.C. Slab on Special Subgrade
S.L.D. Sta. 624+84 to S.L.D. Sta. 626+37	40' to 28' R.C.C. Slab on Special Subgrade
S.L.D. Sta. 626+37 to S.L.D. Sta. 640+40	28' R.C.C. Slab on Special Subgrade
S.L.D. Sta. 640+40 to S.L.D. Sta. 645+58	28' to 38' R.C.C. Slab on Special Subgrade
S.L.D. Sta. 645+58 to S.L.D. Sta. 651+11	38' R.C.C. Slab on Special Subgrade

L.R. 764

S.L.D. Sta. 651+58 to S.L.D. Sta. 671+05	38' R.C.C. Slab on Special Subgrade, Lt. & Rt., With 4' Conc. Divisor
S.L.D. Sta. 671+05 to S.L.D. Sta. 674+49	38' to 44' R.C.C. Slab on Special Subgrade, Lt. & Rt., With 4' Conc. Divisor

L.R. 764
Limit of Work

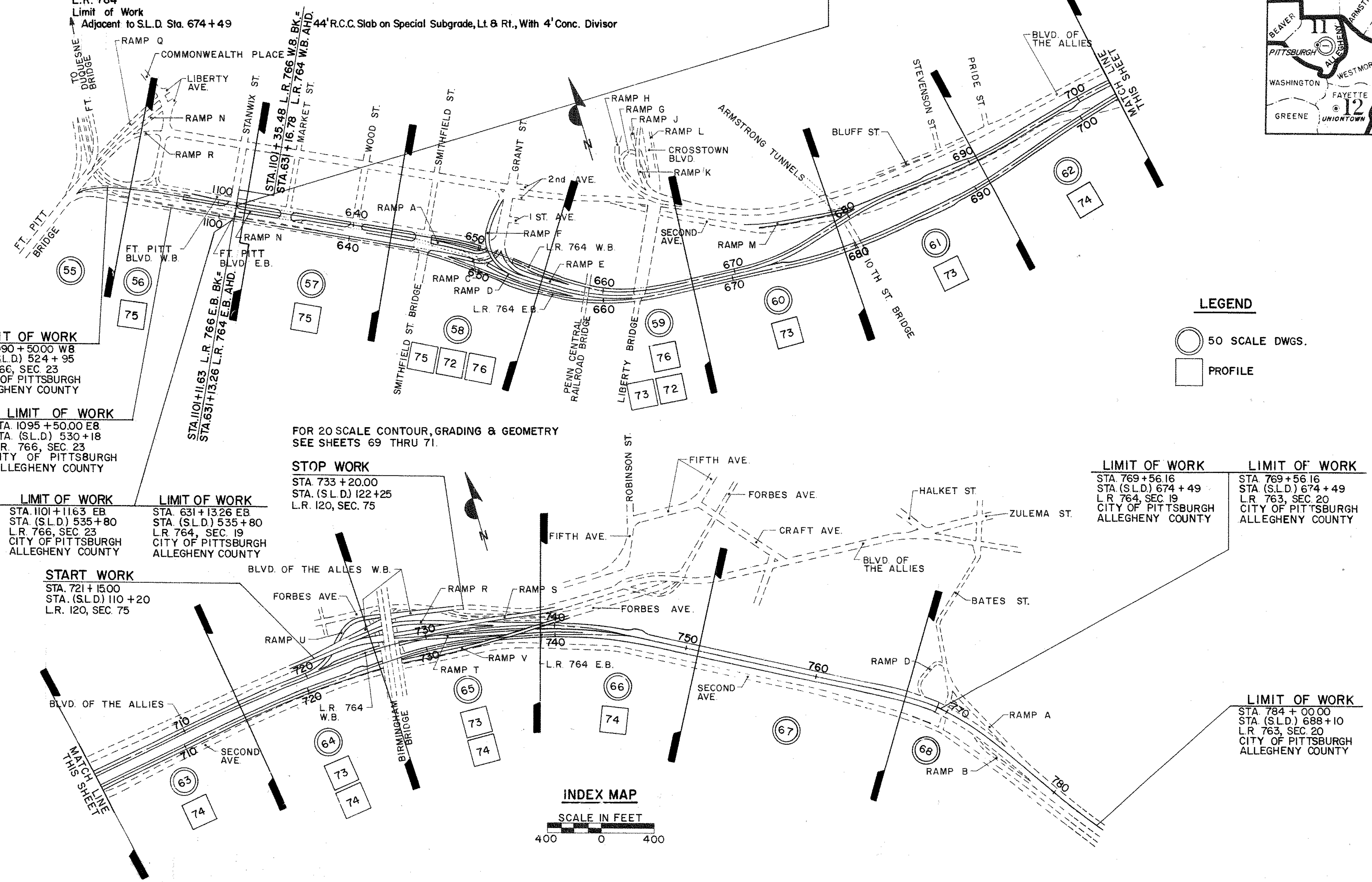
Adjacent to S.L.D. Sta. 674+49	44' R.C.C. Slab on Special Subgrade, Lt. & Rt., With 4' Conc. Divisor

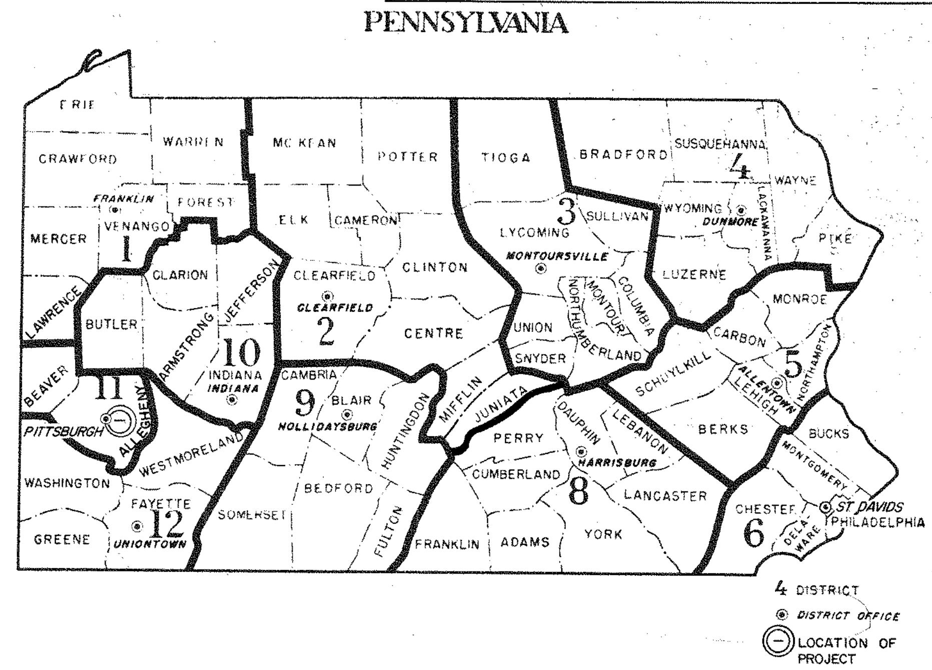
L.R. 764 Eastbound
Limit of Work

Adjacent to S.L.D. Sta. 535+80	28' Wide 9" R.C. Conc. Deck Floor Slab
S.L.D. Sta. 535+80 to S.L.D. Sta. 550+18	28' Wide 9" R.C. Conc. Deck Floor Slab
S.L.D. Sta. 550+18 to S.L.D. Sta. 562+76	28' Wide 9" R.C. Conc. Deck Floor Slab
S.L.D. Sta. 562+76 to S.L.D. Sta. 571+17	28' to 40' R.C.C. Slab on Special Subgrade
S.L.D. Sta. 571+17 to S.L.D. Sta. 628+98	40' R.C.C. Slab on Special Subgrade
S.L.D. Sta. 628+98 to S.L.D. Sta. 632+11	40' to 28' R.C.C. Slab on Special Subgrade
S.L.D. Sta. 632+11 to S.L.D. Sta. 644+96	28' Wide 9" R.C. Conc. Deck Floor Slab
S.L.D. Sta. 644+96 to S.L.D. Sta. 651+58	28' to 38' R.C.C. Slab on Special Subgrade

LIMIT OF WORK
STA. 1101+35.48 WB.
STA. (S.L.D.) 535+80
L.R. 766, SEC. 23
CITY OF PITTSBURGH
ALLEGHENY COUNTY

LIMIT OF WORK
STA. 631+16.78 WB.
STA. (S.L.D.) 535+80
L.R. 764, SEC. 19
CITY OF PITTSBURGH
ALLEGHENY COUNTY





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S-12711	1 THRU 13
S-12712	1 THRU 2
S-12713	1 THRU 2
S-14203	1 THRU 24
S-14204	1 THRU 20
FLOODWALL STRUCTURE S-14584	1 THRU 114
STRUCTURE S-14647	1 THRU 7
TRANSPORTATION SYSTEM MANAGEMENT CRAFT AVE.	1 THRU 4
TRANSPORTATION SYSTEM MANAGEMENT FT. PITT BLVD.	1 THRU 9
TRANSPORTATION SYSTEM MANAGEMENT BLVD. OF THE ALLIES	1 THRU 7

7530-2360-0140 K&E 19 1153 12-72 2763*

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764,766,763	19, 23, 20	3 of 76
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY

LIST OF PUBLIC UTILITIES

BELL TELEPHONE COMPANY OF PENNSYLVANIA
201 Stonwix Street
Pittsburgh, Pa. 15222
Attention: Mr. L. Moreau

PENN CENTRAL TRANSPORTATION COMPANY
Room 600
Six Penn Center Plaza
Philadelphia, Pa. 19104
Attention: Desk 2 Mr. J.T. Sullivan

COLUMBIA GAS OF PENNSYLVANIA, INC.
220 Washington Road
Pittsburgh, Pa. 15216
Attention: Mr. Paul M. Allen

WESTERN PENNSYLVANIA WATER COMPANY
410 Cooke Lane
Pittsburgh, Pa. 15234
Attention: Mr. R.L. Amman

PITTSBURGH & LAKE ERIE RAILROAD COMPANY
Terminal Building
508 Smithfield Street
Pittsburgh, Pa. 15219
Attention: Mr. T.C. Netherton

CITY OF PITTSBURGH
Bureau of Roads and Sewers
Room 444 City-County Building
Pittsburgh, Pa. 15219
Attention: Mr. Louis Gaetano

DUQUESNE LIGHT COMPANY
435 Sixth Avenue
Pittsburgh, Pa. 15219
Attention: Mr. Raymond Wiehagen

CITY OF PITTSBURGH WATER DEPARTMENT
Room 416 City-County Building
Pittsburgh, Pa. 15219
Attention: Mr. John Miller

PEOPLES NATURAL GAS COMPANY
2 Gateway Center
Pittsburgh, Pa. 15222
Attention: Mr. D. R. Ulmer

EQUITABLE GAS COMPANY
420 Boulevard of the Allies
Pittsburgh, Pa. 15219
Attention: Mr. R. H. Barrett

ALCOSAN
3300 Preble Ave.
Pittsburgh, Pa. 15233
Attention: Mr. William C. Drefz

EARTHWORK SUMMARY ENTIRE PROJECT

The following information on the estimated amounts of earthwork has been used by the Pennsylvania Department of Transportation in its preliminary estimate for this project and shall not be taken or used as a waiver of any provisions of Specifications & Contracts.
Quantities shown are approximate.

CUBIC YARDS OF EXCAVATION									CUBIC YARDS OF COMPLETED EMBANKMENT	CUBIC YARDS OF SELECT BORROW EXC., STR. B'FILL	CU. YDS. OF SEL. BORROW EXC. STR. B'FILL (APPROX.)
SPEC. EXC.	CLASS 1	CL. 1 SPEC.	CLASS 2	CLASS 3	CL. 3 SPEC.	CL. 3 SPEC. (APPROX.)	CLASS 4	CLASS 5			
20,458	15,605	8,496	371	1,043	114	9,050	1,386	1,200	1,620	680	9,242

COMPUTATION OF CONSTRUCTION AND OVERALL LENGTH

	L.R.	SECTION	STATION TO STATION	LENGTH IN FEET	LENGTH IN MILES
	764	19	631 + 13.26 EB. – 769 + 56.16 ℄	13,842.90	2.622
			631 + 16.78 WB. – 769 + 56.16 ℄		
*	763	20	769 + 56.16 – 784 + 00.00	1,443.84	0.273
**	766	23	1095 + 50.00 EB. – 1101 + 11.63 EB.		
			1090 + 50.00 WB. – 1101 + 35.48 WB.	1,085.48	0.206
			TOTAL LENGTH	16,372.22	3.101

* CONSISTS OF CONSTRUCTION FOR MAINTENANCE & PROTECTION OF TRAFFIC
** CONSISTS OF APPROX. 400' OF ROADWAY CONSTRUCTION. THE REMAINING LENGTH IS FOR MAINTENANCE AND PROTECTION OF TRAFFIC AND SIGNING

LIMIT OF WORK
STA. 1101 + 11.63 EB.
STA. (S.L.D.) 535 + 80
L.R. 766, SEC. 23
CITY OF PITTSBURGH
ALLEGHENY COUNTY

LIMIT OF WORK
STA. 631 + 13.26 EB.
STA. (S.L.D.) 535 + 80
L.R. 764, SEC. 19
CITY OF PITTSBURGH
ALLEGHENY COUNTY

LIMIT OF WORK
STA. 1101 + 35.48 WB.
STA. (S.L.D.) 535 + 80
L.R. 766, SEC. 23
CITY OF PITTSBURGH
ALLEGHENY COUNTY

LIMIT OF WORK
STA. 631 + 16.78 WB.
STA. (S.L.D.) 535 + 80
L.R. 764, SEC. 19
CITY OF PITTSBURGH
ALLEGHENY COUNTY

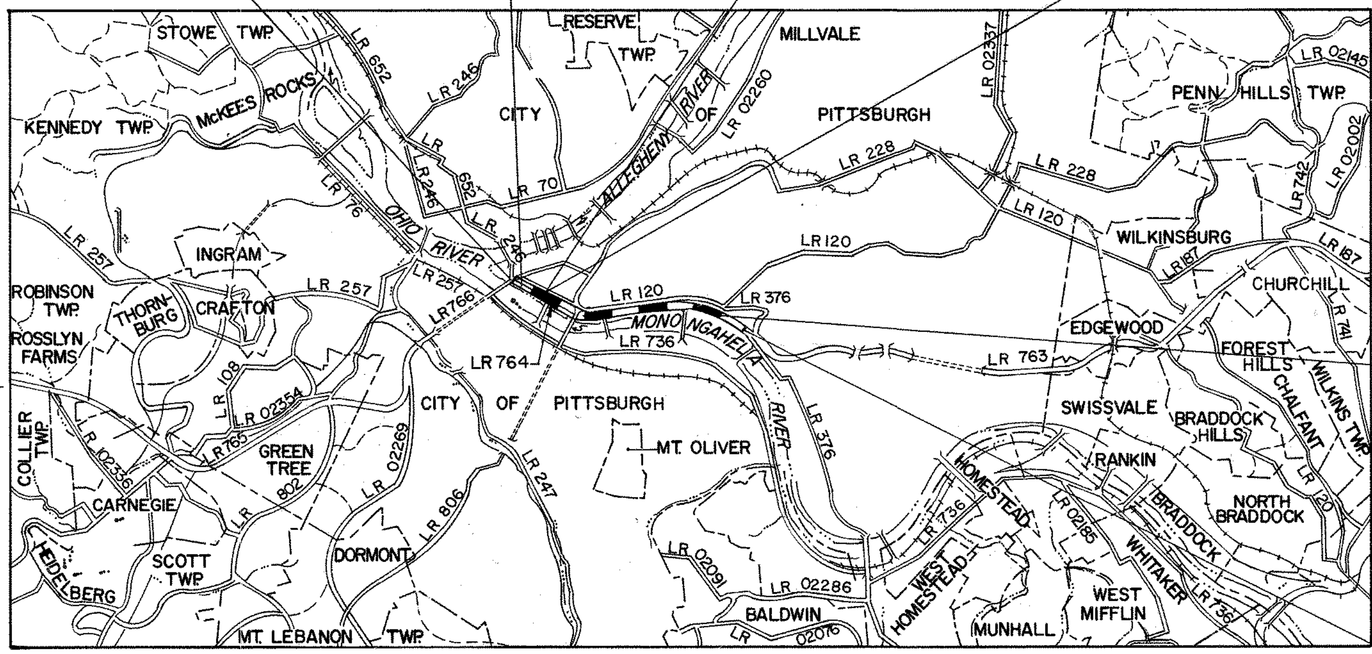
LIMIT OF WORK
STA. 1095 + 50.00 EB.
STA. (S.L.D.) 530 + 18
L.R. 766, SEC. 23
CITY OF PITTSBURGH
ALLEGHENY COUNTY

LIMIT OF WORK
STA. 1090 + 50.00 WB.
STA. (S.L.D.) 524 + 95
L.R. 766, SEC. 23
CITY OF PITTSBURGH
ALLEGHENY COUNTY

EQUALITIES
NONE

LIMIT OF WORK
STA. 769 + 56.16
STA. (S.L.D.) 674 + 49
L.R. 764, SEC. 19
CITY OF PITTSBURGH
ALLEGHENY COUNTY

LIMIT OF WORK
STA. 769 + 56.16
STA. (S.L.D.) 674 + 49
L.R. 763, SEC. 20
CITY OF PITTSBURGH
ALLEGHENY COUNTY



LIMIT OF WORK
STA. 784 + 00.00
STA. (S.L.D.) 688 + 10
L.R. 763, SEC. 20
CITY OF PITTSBURGH
ALLEGHENY COUNTY

LOCATION MAP
SCALE IN MILES
1 0 1

NO DETOUR

LEGEND
CONSTRUCTION
STATE HIGHWAY
COUNTY ROADS

GENERAL NOTES (CONT.)

The Legal Right of Way on L.R. 763 from Station 769 + 50 to Station 784 + 00 is 120 feet based on the plan of L.R. 763, Section 2B, signed by the Governor on October 27, 1949 and recorded in the Allegheny County Recorders Office in Plan Book Volume 2, Pages 77 to 99 inclusive.

The Legal Right of Way on L.R. 766 from Station 1090 + 50 to Station 1101 + 13.26 is variable in width based on the plan of L.R. 766; Section 3E, signed by the Governor on April 30, 1957 and recorded on May 23, 1957 in the Allegheny County Recorders Office in Plan Book Volume 16, pages 10 to 40 inclusive.

The Legal Right of Way on L.R. 120 from Station 721 + 15 to Station 733 + 20 is variable based in width based on the plan of L.R. 120, Section 24.

GENERAL NOTES

The Legal Right of Way on L.R. 764 between Sta. 631 + 13 and Sta. 766+68 is variable in width based on the unrecorded plans of L.R. 764, Section 6 signed by the Governor on June 16, 1954, L.R. 764, Section 10 signed by the Governor on October 11, 1955, and the plan of L.R. 764, Section 12 signed by the Governor on July 16, 1952 and recorded on July 21, 1952 in the Allegheny County Recorders Office in Plan Book Volume 9, pages 65 to 70, inclusive.

The Legal Right of Way on L.R. 764, is variable 120 feet minimum to 130 feet maximum from Station 766 + 68 to Station 769 + 56, based on plan of L.R. 764, Section 12, signed by the Governor on July 16, 1952, and recorded on July 21, 1952, in the Allegheny County Recorders Office in Plan Book Volume 9, pages 65 to 70, inclusive.

This project shall be constructed in accordance with the Specifications, Form 408, dated 1976, and Form 409, dated 1973.

The contractor shall in no way interfere with the operation of any fire hydrant, fire call box or police call box.

This is a Federal Aid Project and as such is subject to inspection by representatives of the Federal Highway Administration.

Elevation datum is U. S. G. S.

The Department of Transportation does not guarantee the accuracy of the locations for the existing subsurface utility structures, nor does the Department guarantee that all subsurface structures are shown.

All curve data is based on the arc definition unless otherwise noted on the plan.

Construction Details other than those shown on these drawings, shall conform to the attached standard drawings:

RC - 40	NOV 15,1977
RC - 10	NOV 15,1977
RC - 13	SEPT 8,1981
RC - 20 (2 SHEETS)	SEPT. 8,1981
RC - 21	MAY 31,1979
RC - 23 (2 SHEETS)	MAY 6,1982
RC - 24	SEPT 8,1981
RC - 25 (SHEETS 1&3)	MAY 6,1982
RC - 26 (SHEETS 1&2)	MAY 6,1982
RC - 30	MAY 6,1982
RC - 31	MAY 31,1979
RC - 32	MAY 6,1982
RC - 33	NOV 15,1977
RC - 34 (6 SHEETS)	SEPT 8,1981
RC - 39 (2 SHEETS)	MAY 6,1982
RC - 50	MAY 1,1978
RC - 52 (SHT'S.1,2,3,5&6)	SEPT 8,1981
RC - 54 (3 SHEETS)	MAY 1,1978
RC - 57 (2 SHEETS)	MAY 6,1982
RC - 64	SEPT 1,1978
RC - 65	SEPT 1,1978
RC - 66	MAY 31,1979
RC - 70 (SHEET 2)	SEPT 1,1978
RC - 80 (SHEET 1)	JULY 16,1980
RC - 81	JULY 16,1980
RC - 82	JULY 16,1980
RC - 83 (2 SHEETS)	JULY 16,1980
RC - 84	JULY 16,1980
BC - 338A	NOV 4,1981
BC - 316A	MARCH 2,1981
BC - 321A	JUNE 20,1980
BC - 322A	JUNE 20,1980
BC - 332B	JUNE 21,1982
BC - 334A	MARCH 2,1981
BC - 335A	NOV. 4,1981
BC - 336A	NOV. 4,1981
BC - 337A	MARCH 2,1981
BC - 351	JULY 1,1970
BC - 352	APRIL 1,1971
BC - 355A	NOV. 10,1980
BC - 361	JULY 1,1970
BC - 362	JULY 1,1970
BC - 363	OCT. 20,1970

TRACED BY
FINAL BY

D-9012 (10-80)

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764	19	4 of 76
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY

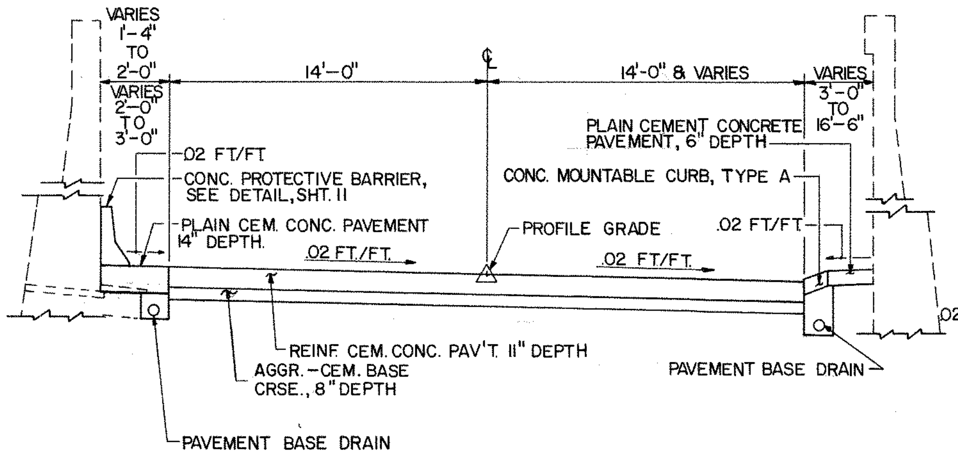
LEGEND

—·—·— BIT. SURFACE TREATMENT, SRL-L

xxxxxxxxx SEEDING - FORMULA "D" ON SLOPES LESS THAN 3:1. FORMULA "C" ON SLOPES GREATER THAN 3:1.

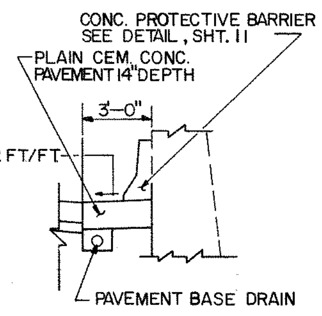
NOTES:

1. DOWELED JOINTS SHALL CONFORM TO ROADWAY STANDARD RC-20; SEE DETAIL FOR DOWEL LOCATION.
2. THE SHOULDER ON THE LOW SIDE OF SUPERELEVATED SECTION SHALL BE SLOPED AT THE SAME RATE AS THE PAVEMENT, WHEN THE RATE OF PAVEMENT SLOPE EXCEEDS THE REQUIRED SHOULDER SLOPE OF .04 FT./FT.
3. SLOPE SHOULDER AT .02 FT./FT. WHEN PAVEMENT SUPERELEVATION IS GREATER THAN .02 FT./FT. WHEN PAVEMENT SUPERELEVATION IS GREATER THAN .05 FT./FT. ROUNDING IS REQUIRED, SEE DETAILS A & B FOR SHOULDER ROUNDING THIS SHEET.

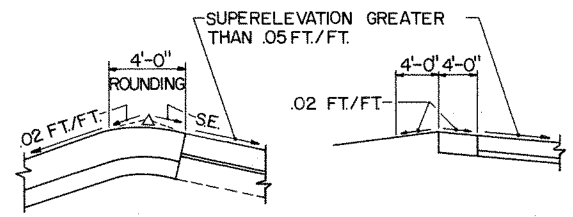


WESTBOUND PARKWAY

STA. 646 + 62 TO STA. 652 + 09 (TRANSITION & SUPERELEVATION)
STA. 652 + 09 TO STA. 654 + 74 (NORMAL SLOPE - AS SHOWN)
STA. 654 + 74 TO STA. 657 + 15 (TRANSITION)



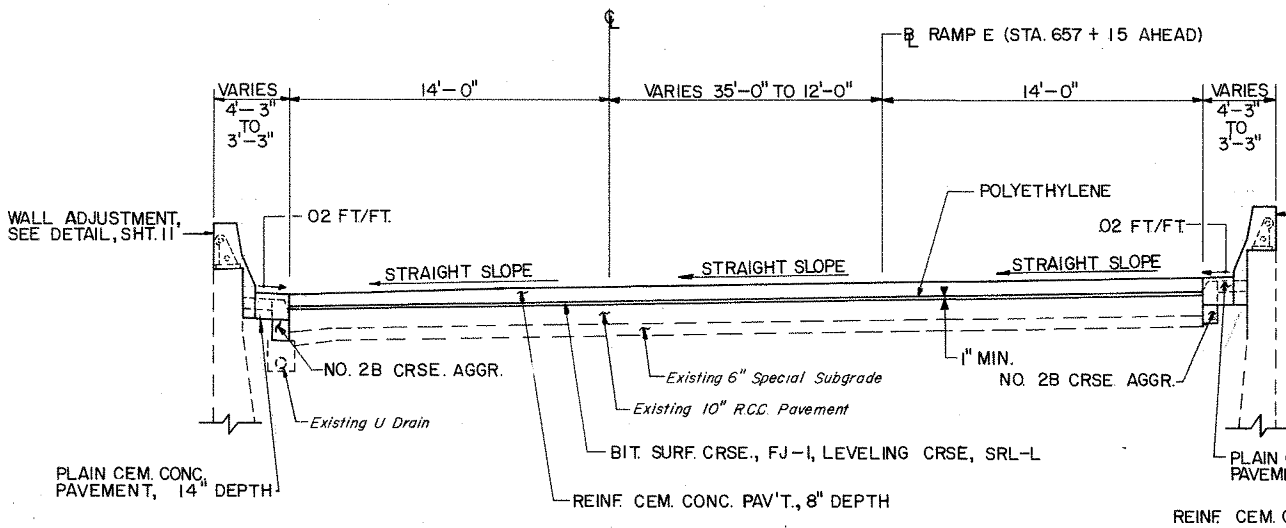
STA. 650 + 08 TO STA. 652+68



DETAIL A

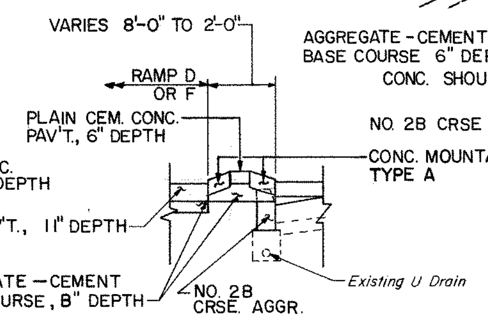
DETAIL B

TYPICAL SHOULDER ROUNDING DETAILS

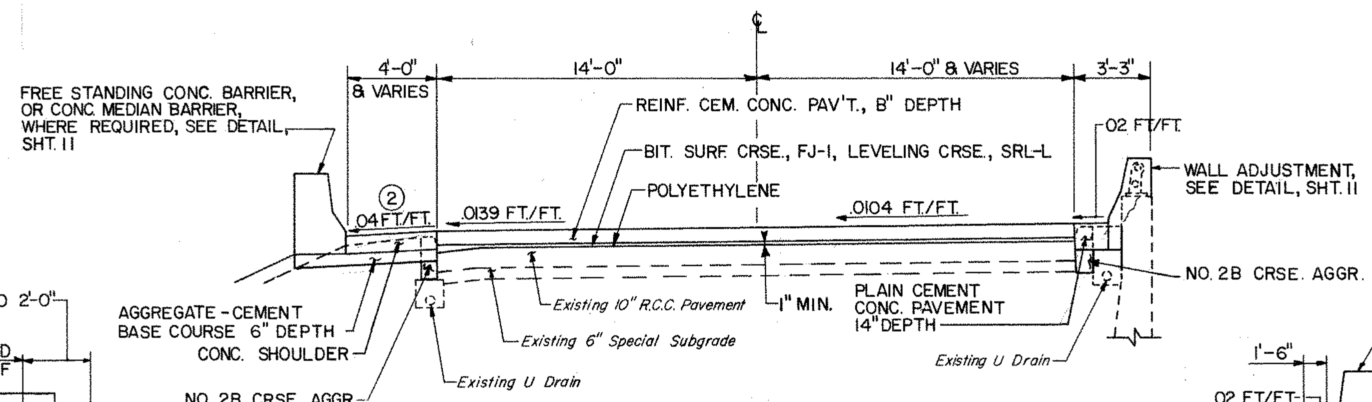


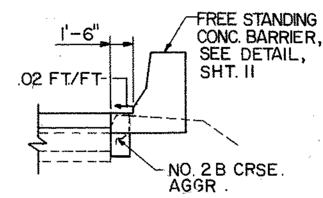
WESTBOUND PARKWAY

STA. 657+15 TO STA. 665 + 00 (TRANSITION & SUPERELEVATION)



STA. 653 + 60 TO STA. 662 + 94

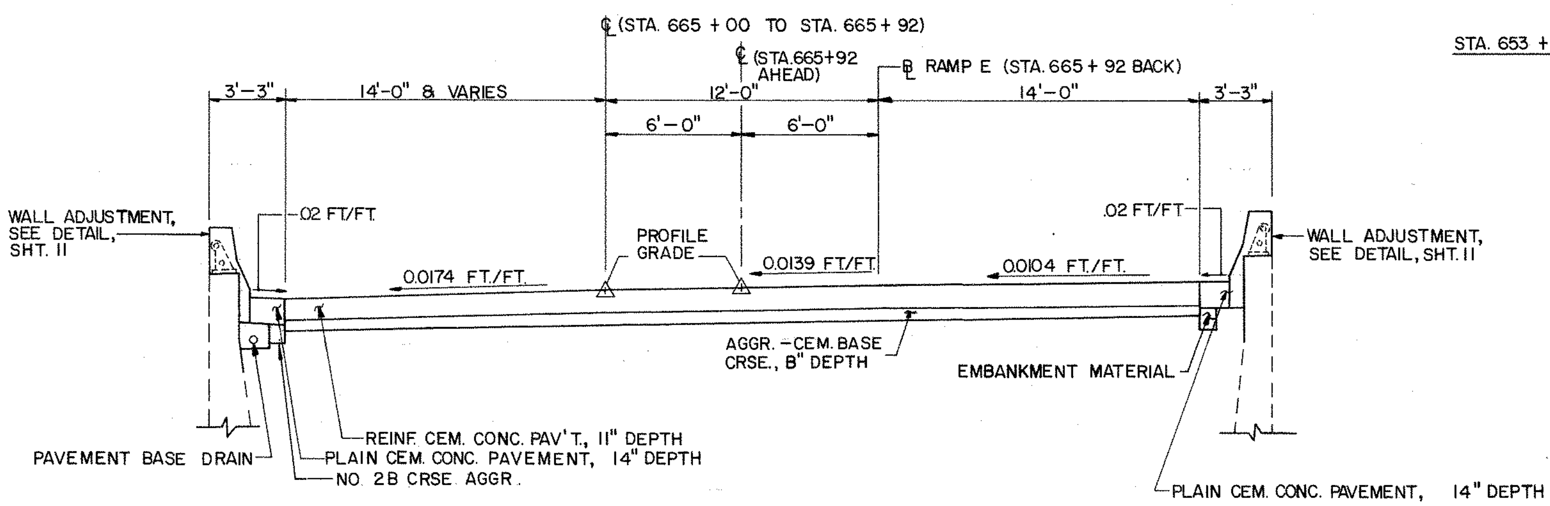




STA. 651 + 78 TO STA. 656 + 37

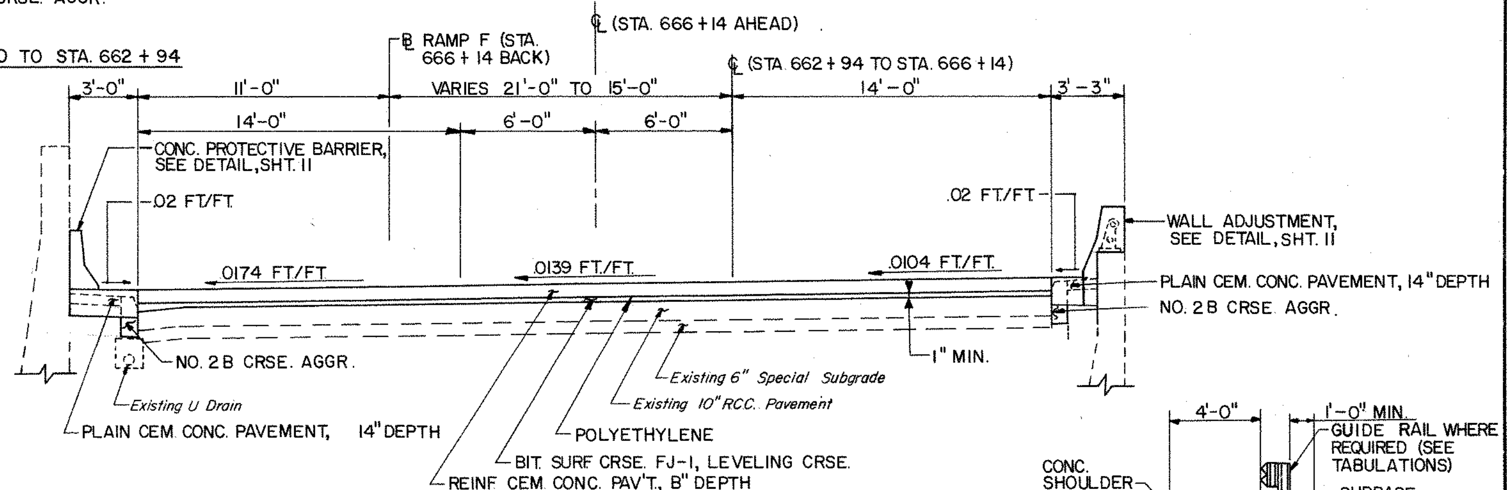
EASTBOUND PARKWAY

STA. 650 + 38 TO STA. 652 + 34 (NORMAL SLOPE-AS SHOWN)
STA. 652 + 34 TO STA. 662 + 94 (TRANSITION & SUPERELEVATION)



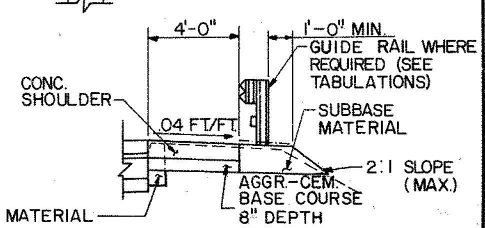
WESTBOUND PARKWAY

STA. 665 + 00 TO STA. 665 + 92 (TRANSITION)
STA. 665 + 92 TO STA. 668 + 31 (NORMAL SLOPE-AS SHOWN)
STA. 685 + 77 TO STA. 689 + 00 (TRANSITION & SUPERELEVATION)



EASTBOUND PARKWAY

STA. 662 + 94 TO STA. 666 + 14 (SUPERELEVATION & TRANSITION)
STA. 666 + 14 TO STA. 668 + 57 (NORMAL SLOPE - AS SHOWN)



STA. 665+ 44 TO STA. 668+57

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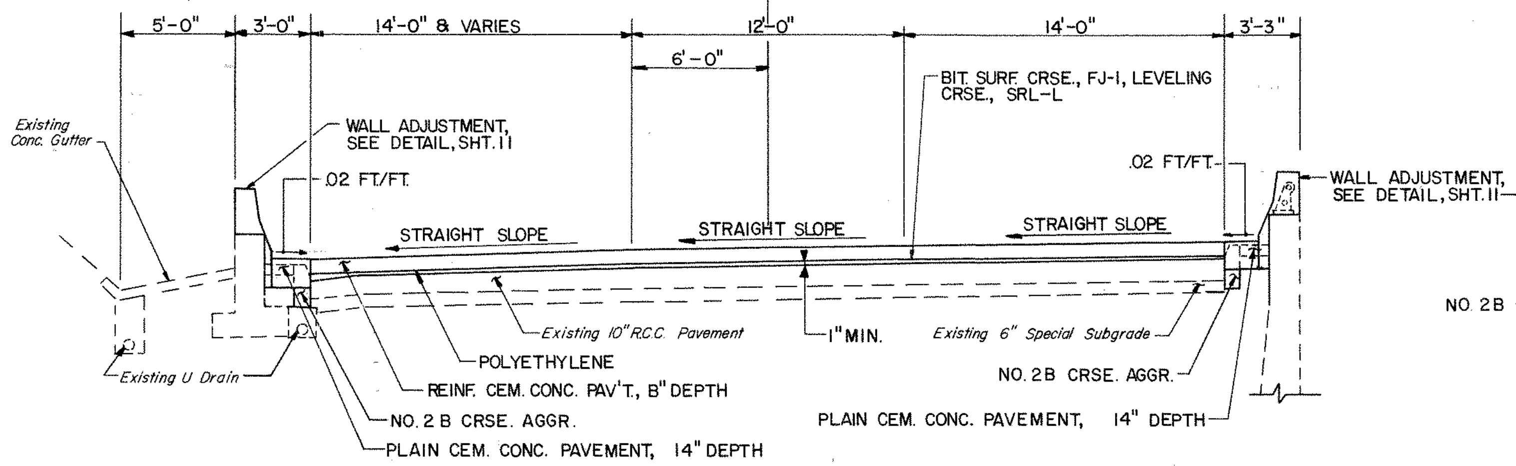
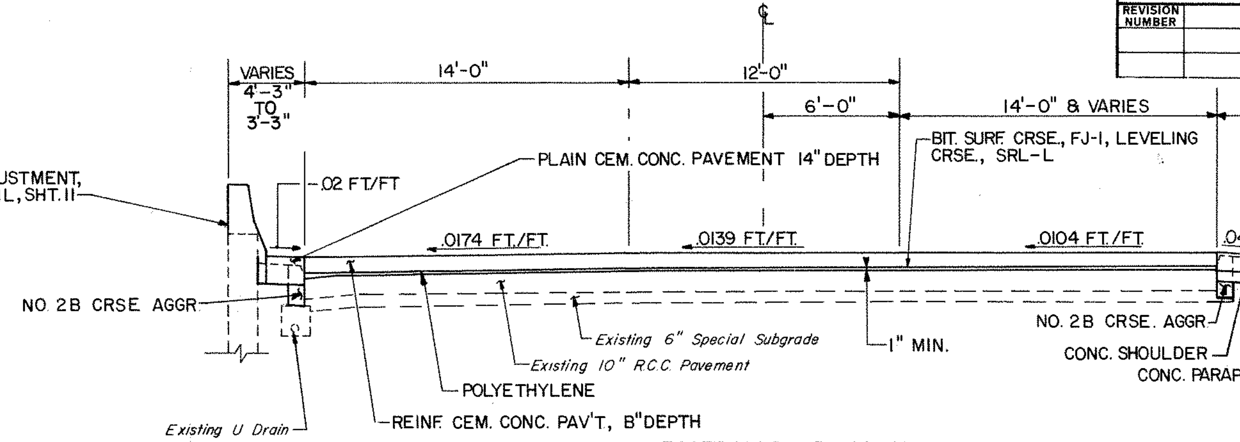


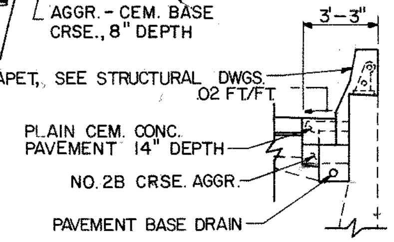
WESTBOUND PARKWAY

STA. 689 + 00 TO STA. 696 + 60 (TRANSITION & SUPERELEVATION)
STA. 696 + 60 TO STA. 697 + 00 (NORMAL SLOPE – AS SHOWN BELOW)

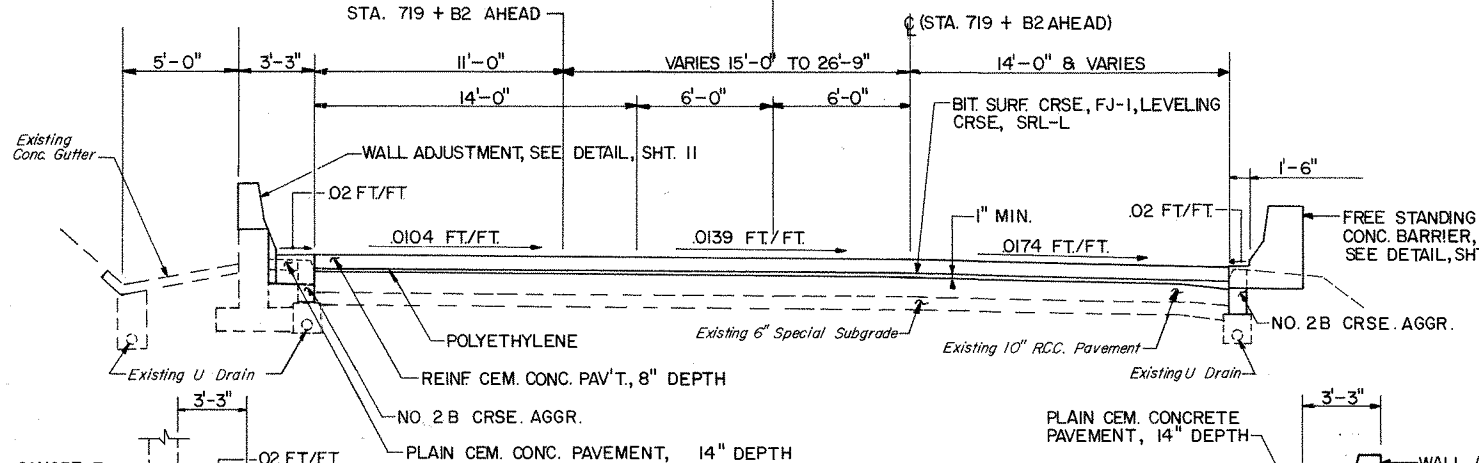


EASTBOUND PARKWAY

STA. 668 + 57 TO STA. 673 + 53 (NORMAL SLOPE – AS SHOWN)
STA. 673 + 53 TO STA. 684 + 82 (TRANSITION & SUPERELEVATION)
STA. 684 + 82 TO STA. 686 + 45 (NORMAL SLOPE – AS SHOWN)
STA. 686 + 45 TO STA. 691 + 50 (TRANSITION & SUPERELEVATION)

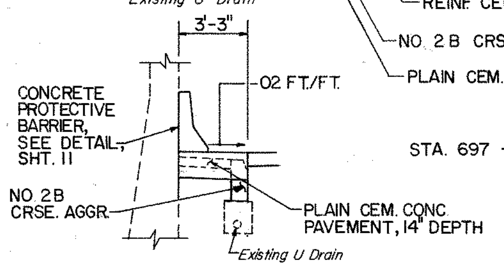


STA. 689 + 60 TO STA. 691 + 50

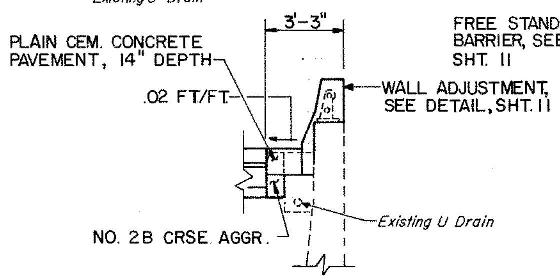


WESTBOUND PARKWAY

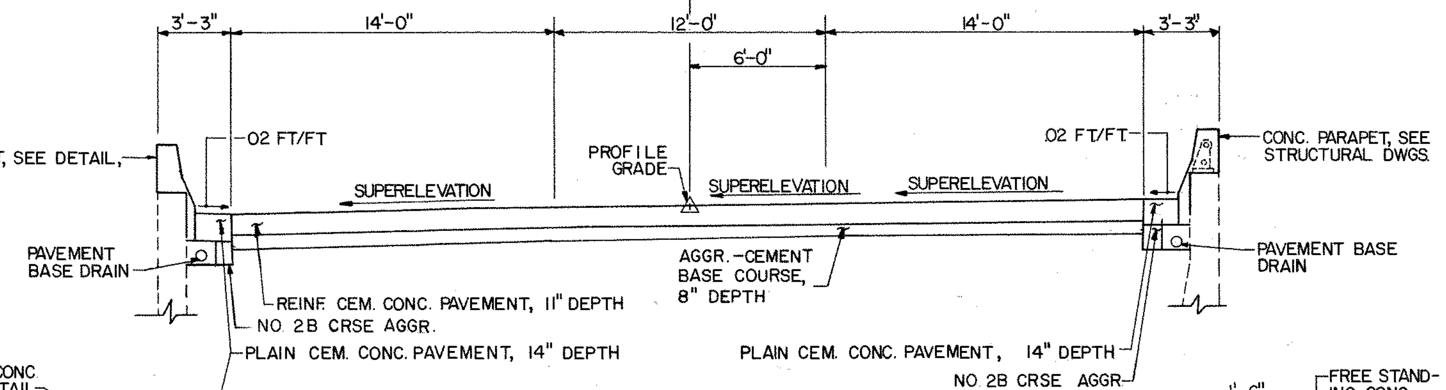
STA. 697 + 00 TO STA. 721 + 38 (NORMAL SLOPE – AS SHOWN)



STA. 711 + 00 TO STA. 721 + 60

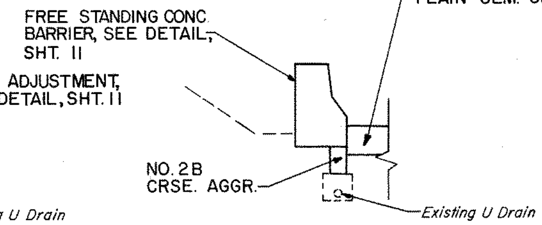


STA. 713 + 23 TO STA. 721 + 38

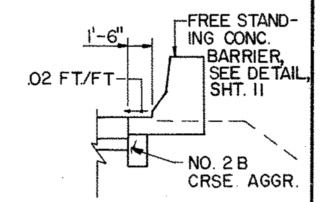


EASTBOUND PARKWAY

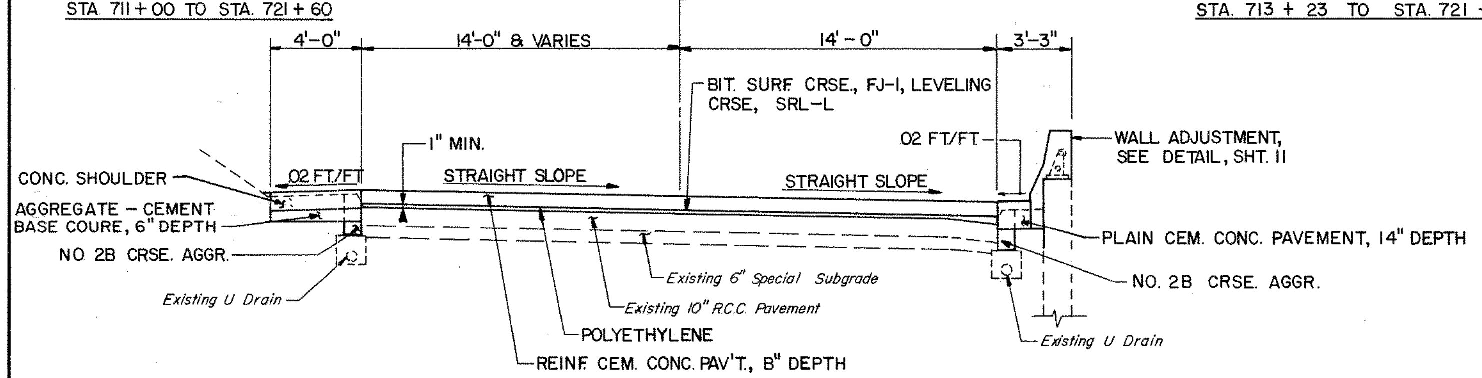
STA. 691 + 50 TO STA. 695 + 04 (TRANSITION & SUPERELEVATION)
STA. 702 + 66 TO STA. 706 + 00 (NORMAL SLOPE – AS SHOWN BELOW)



STA. 702 + 66 TO STA. 706 + 00

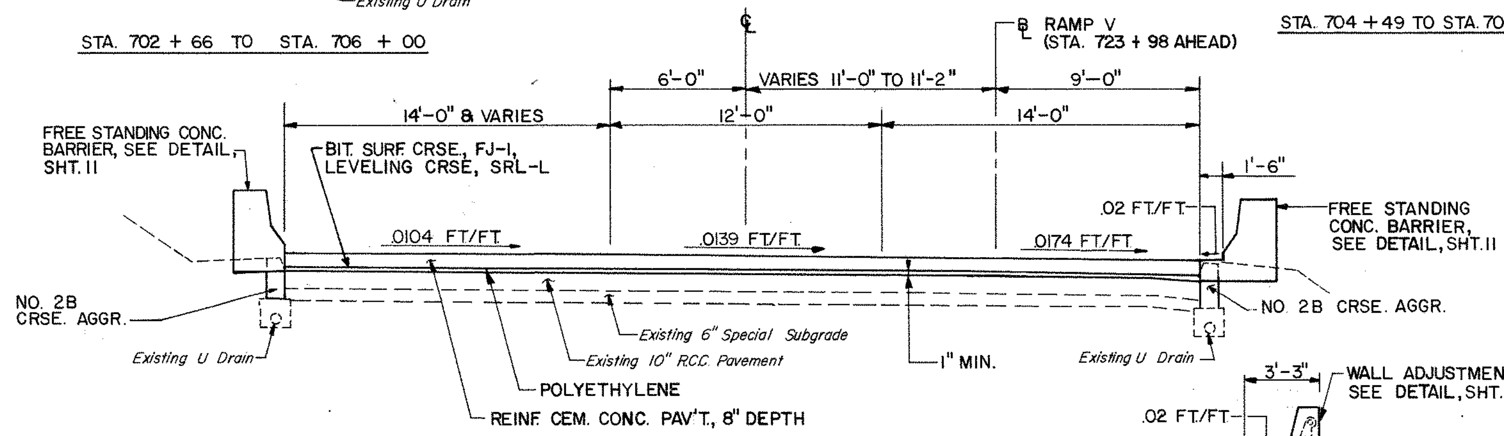


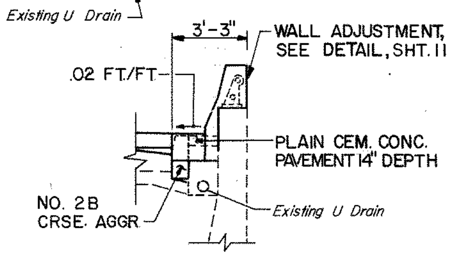
STA. 704 + 49 TO STA. 706 + 00



WESTBOUND PARKWAY

STA. 721 + 38 TO STA. 725 + 40 (TRANSITION & SUPERELEVATION)
STA. 731 + 30 TO STA. 735 + 02 (SUPERELEVATION)





STA. 720 + 35 TO STA. 724 + 30

NOTE:
FOR LEGEND, GENERAL NOTES, AND SHOULDER ROUNDING DETAILS, SEE SHEET 4

EASTBOUND PARKWAY

STA. 706 + 00 TO STA. 724 + 30 (NORMAL SLOPE – AS SHOWN)

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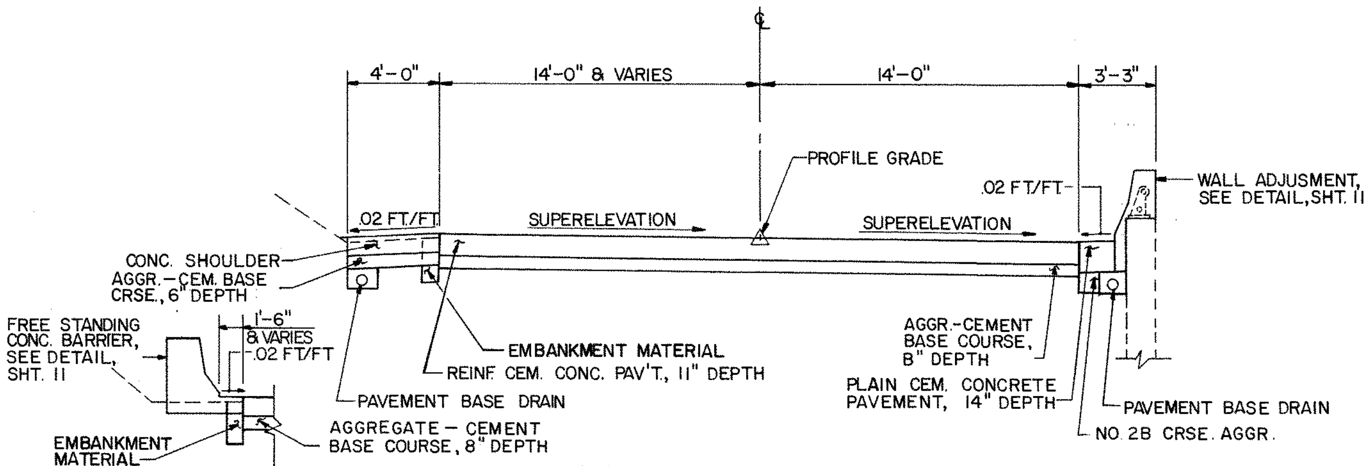
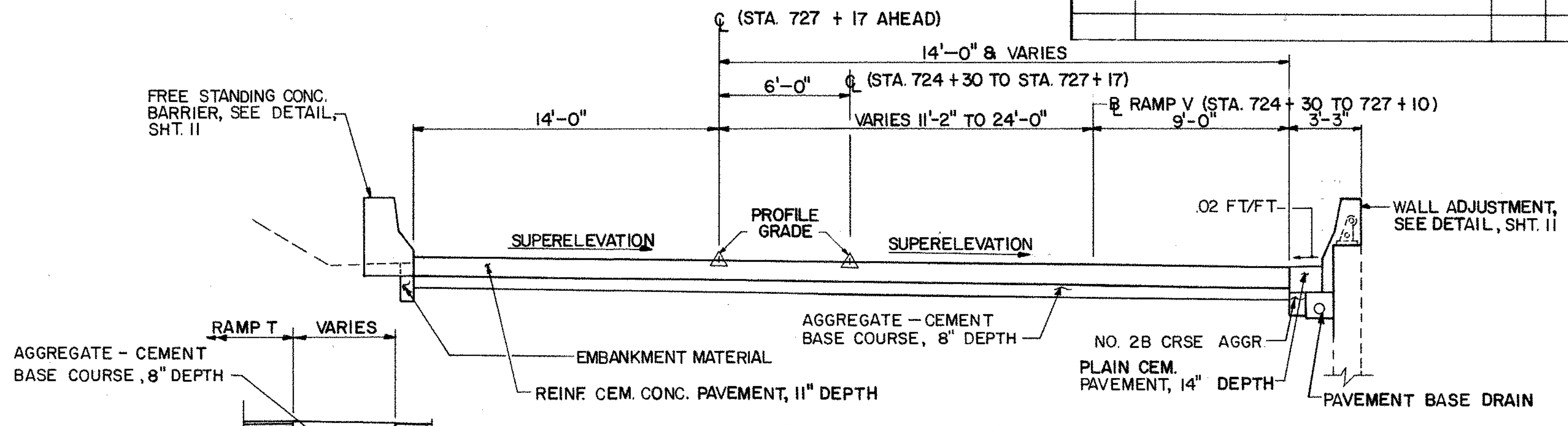


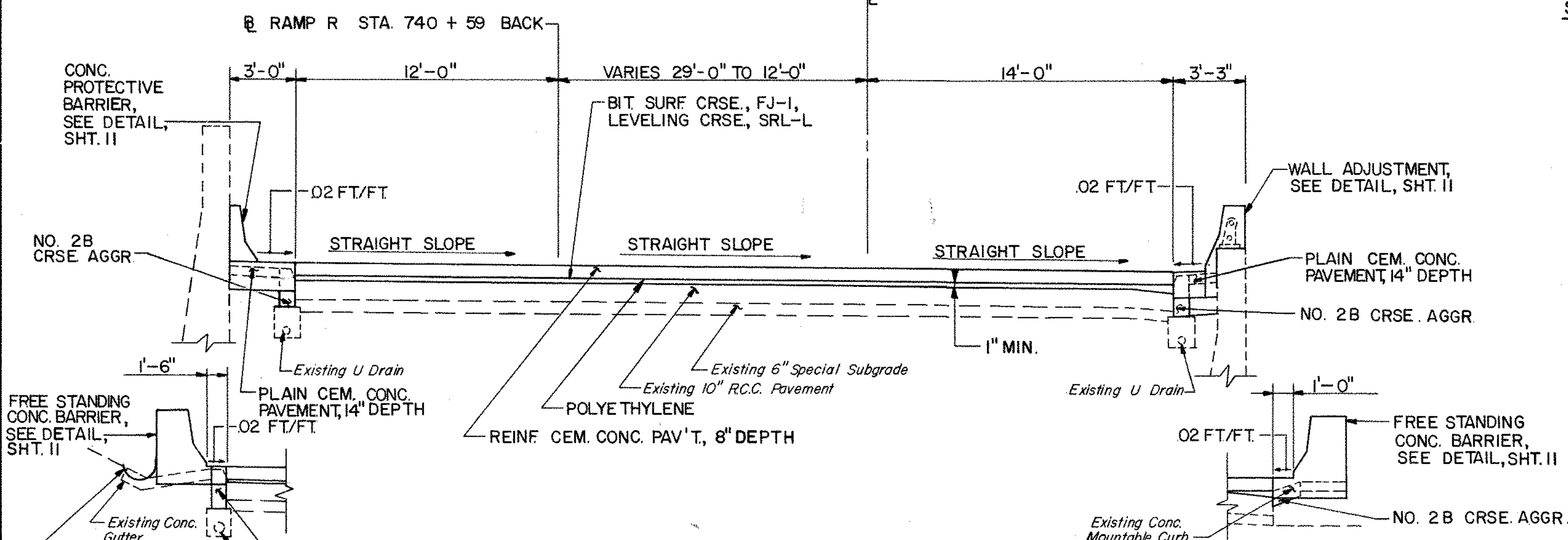
WESTBOUND PARKWAY

STA. 725 + 40 TO STA. 727 + 38 (SUPERELEVATION)
STA. 727 + 92 TO STA. 731 + 30 (SUPERELEVATION)



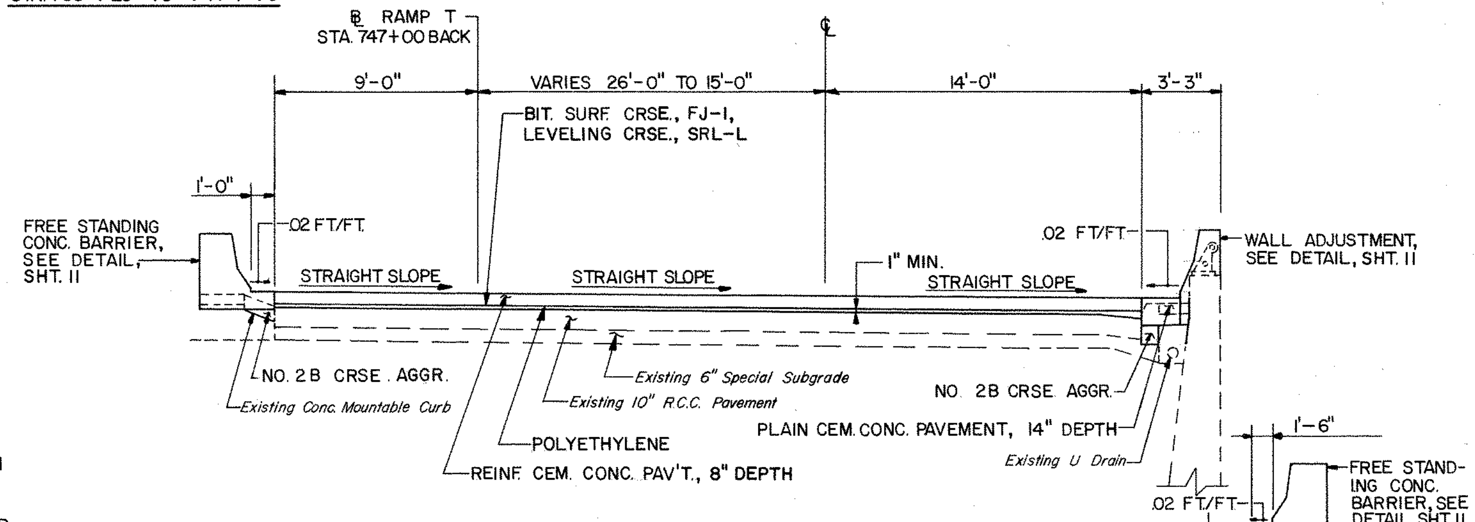
EASTBOUND PARKWAY

STA. 724 + 30 TO STA. 727 + 68 (TRANSITION & SUPERELEVATION)
STA. 739 + 23 TO STA. 741 + 76 (SUPERELEVATION)



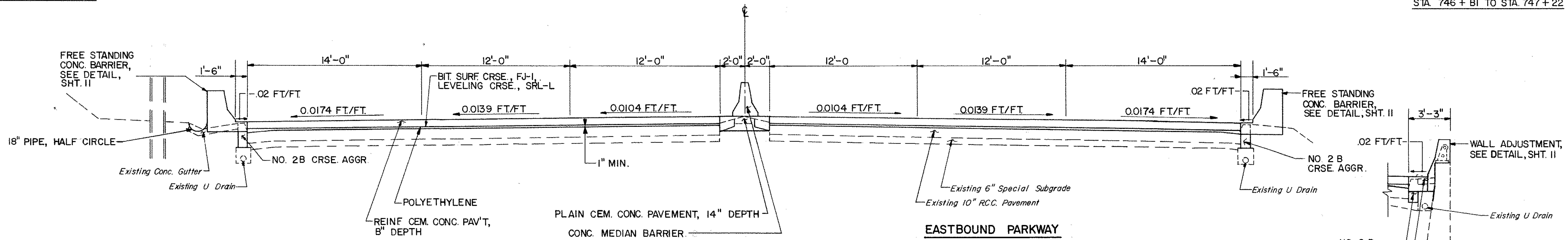
WESTBOUND PARKWAY

STA. 735 + 02 TO STA. 746 + 99 (SUPERELEVATION & TRANSITION)



EASTBOUND PARKWAY

STA. 741 + 76 TO STA. 747 + 22 (SUPERELEVATION)



WESTBOUND PARKWAY

STA. 746 + 99 TO STA. 750 + 48 (TRANSITION)
STA. 750 + 48 TO STA. 763 + 50 (NORMAL SLOPE—AS SHOWN)
STA. 763 + 50 TO STA. 768 + 15 (TRANSITION & SUPERELEVATION)

EASTBOUND PARKWAY

STA. 747 + 22 TO STA. 750 + 22 (TRANSITION)
STA. 750 + 22 TO STA. 763 + 50 (NORMAL SLOPE—AS SHOWN)
STA. 763 + 50 TO STA. 768 + 15 (TRANSITION & SUPERELEVATION)

NOTE:
FOR LEGEND, GENERAL NOTES, AND GENERAL ROUNDING DETAILS, SEE SHEET 4

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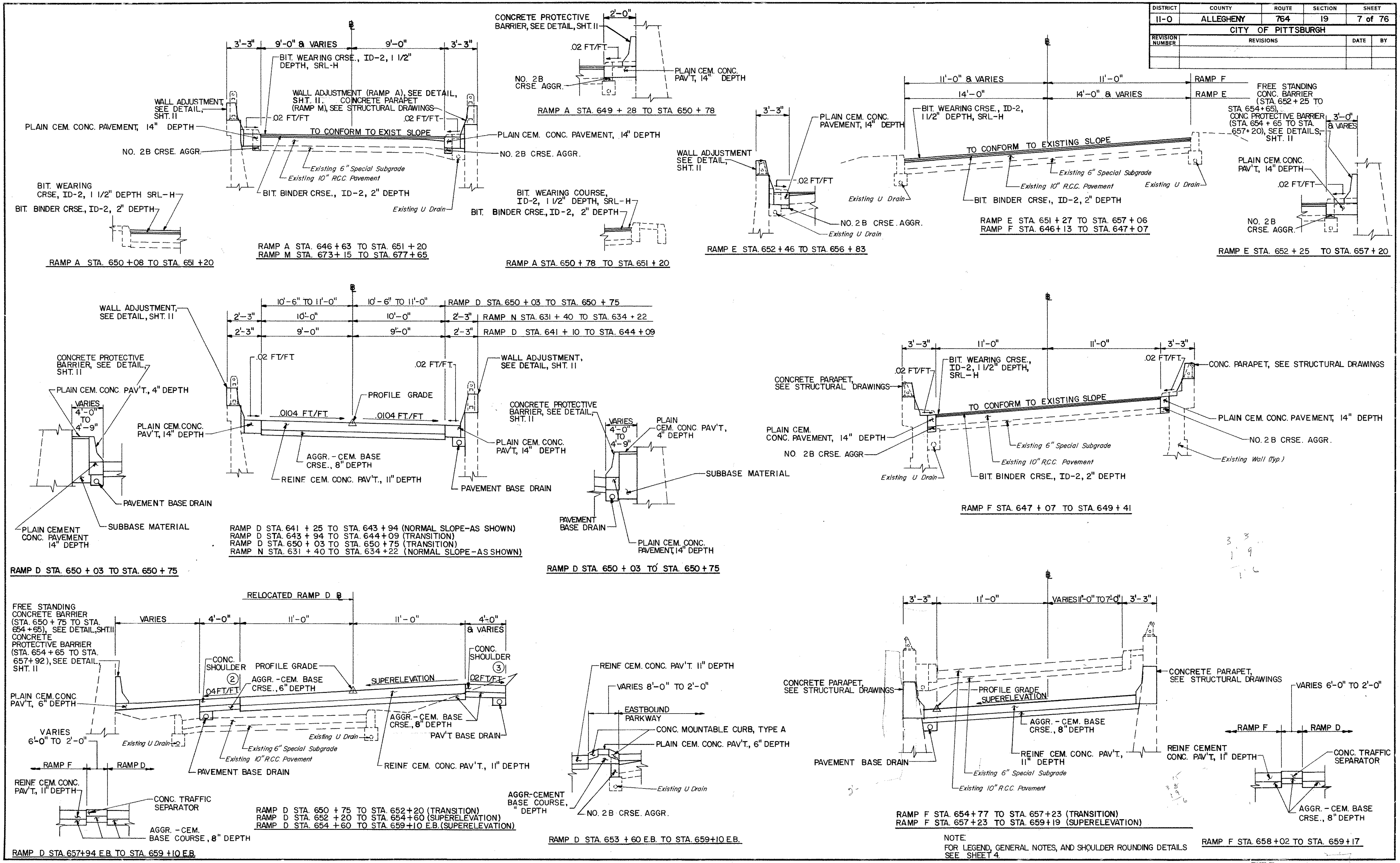

NOTE:
FOR LEGEND, GENERAL NOTES, AND SHOULDER ROUNDING DETAILS SEE SHEET 4.

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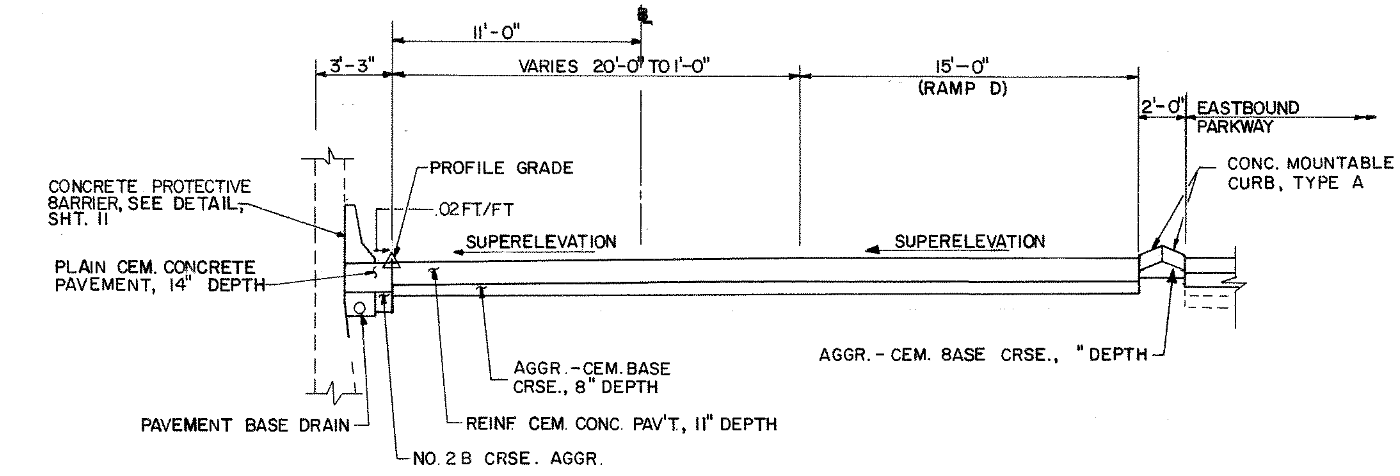
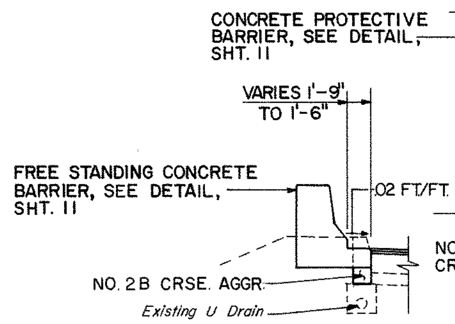
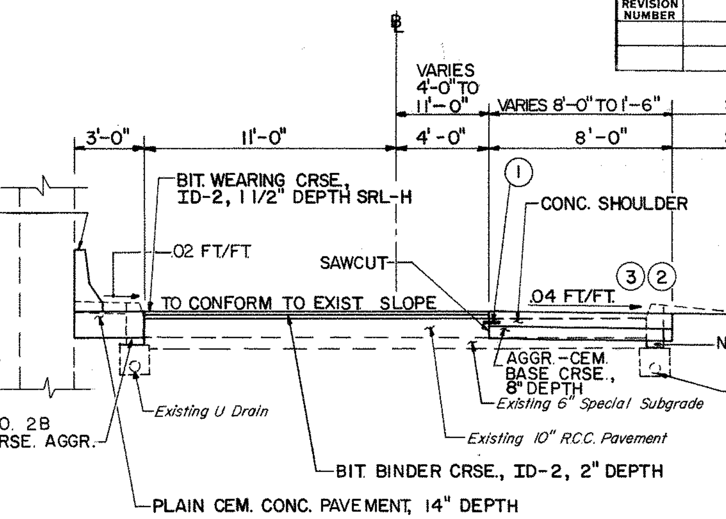


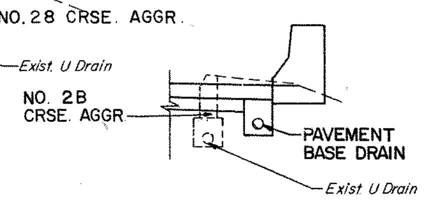
RAMP F STA. 659 + 19 TO STA. 662 + 95 (SUPERELEVATION)



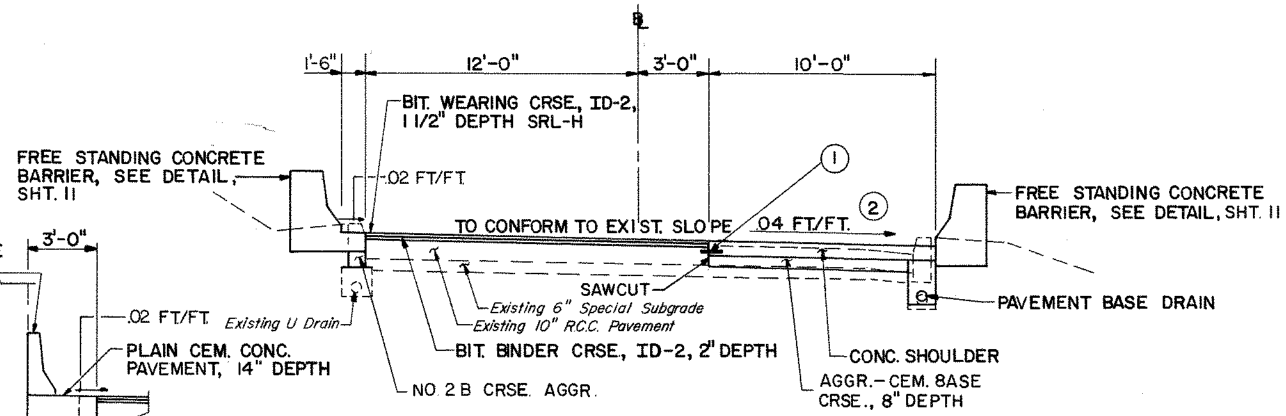
RAMP U STA. 724 + 03 TO STA. 725 + 61



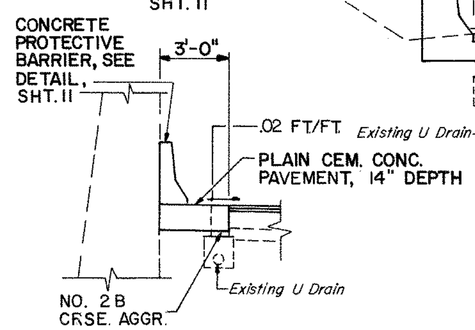
RAMP U STA. 721 + 60 TO STA. 726 + 17



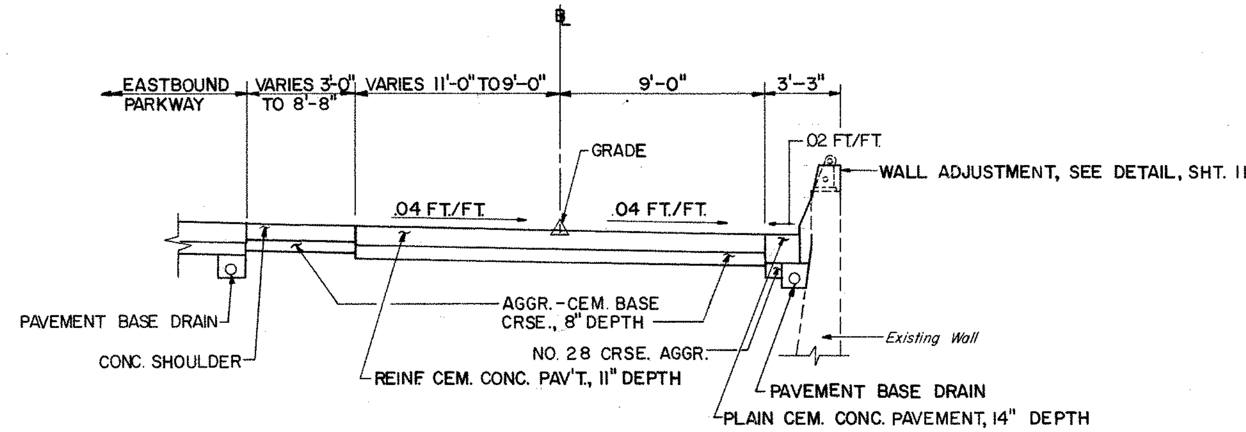
RAMP U STA. 722 + 50 TO STA. 725 + 88



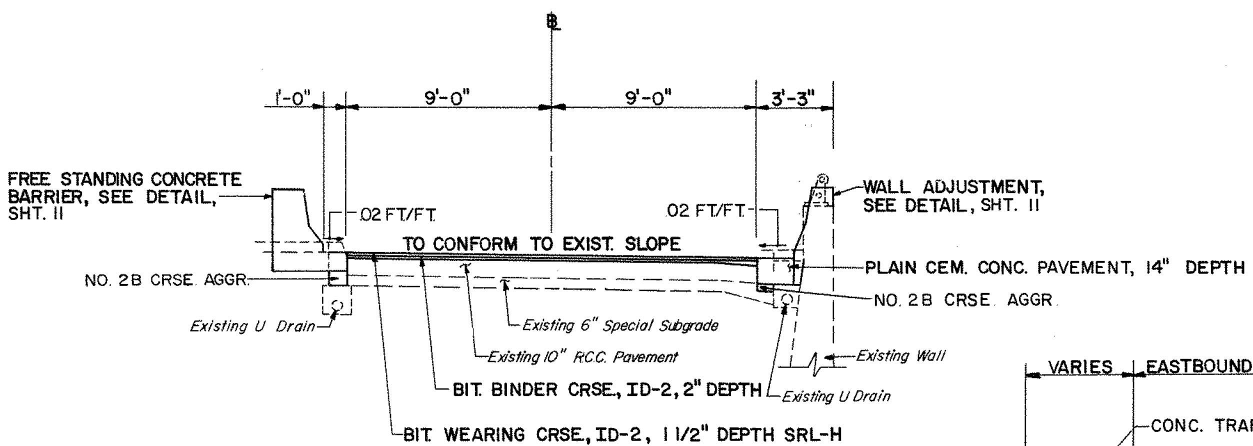
RAMP R STA. 727 + 95 TO STA. 735 + 02



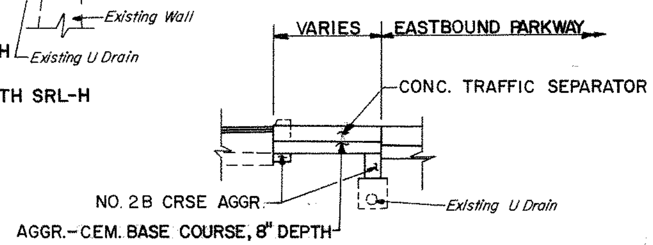
RAMP R STA. 732 + 25 TO STA. 735 + 02



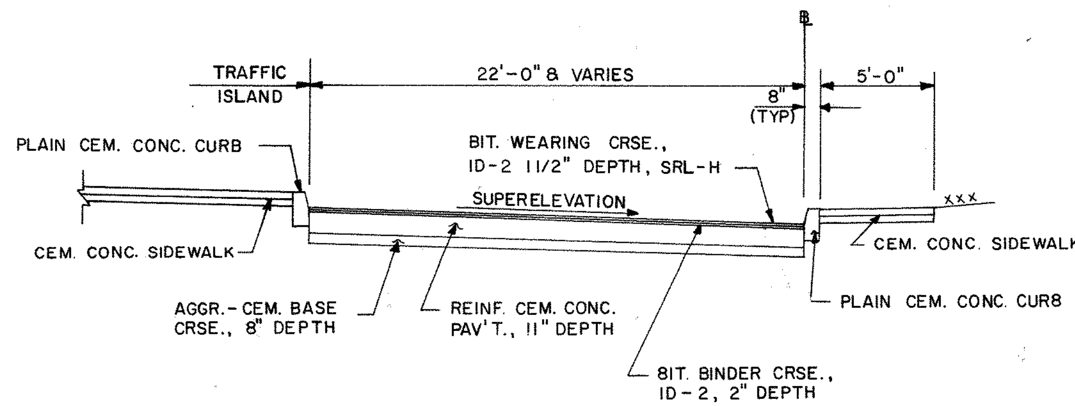
RAMP V STA. 727 + 10 TO STA. 727 + 68 (SUPERELEVATION)



RAMP T STA. 736 + 78 TO STA. 741 + 73



RAMP T STA. 739 + 14 TO STA. 741 + 73



RAMP F SPUR STA. 0 + 00 TO STA. 1 + 51 (SUPERELEVATION & TRANSITION)

NOTE:
FOR LEGEND, GENERAL NOTES, AND SHOULDER ROUNDING DETAILS, SEE SHEET 4.

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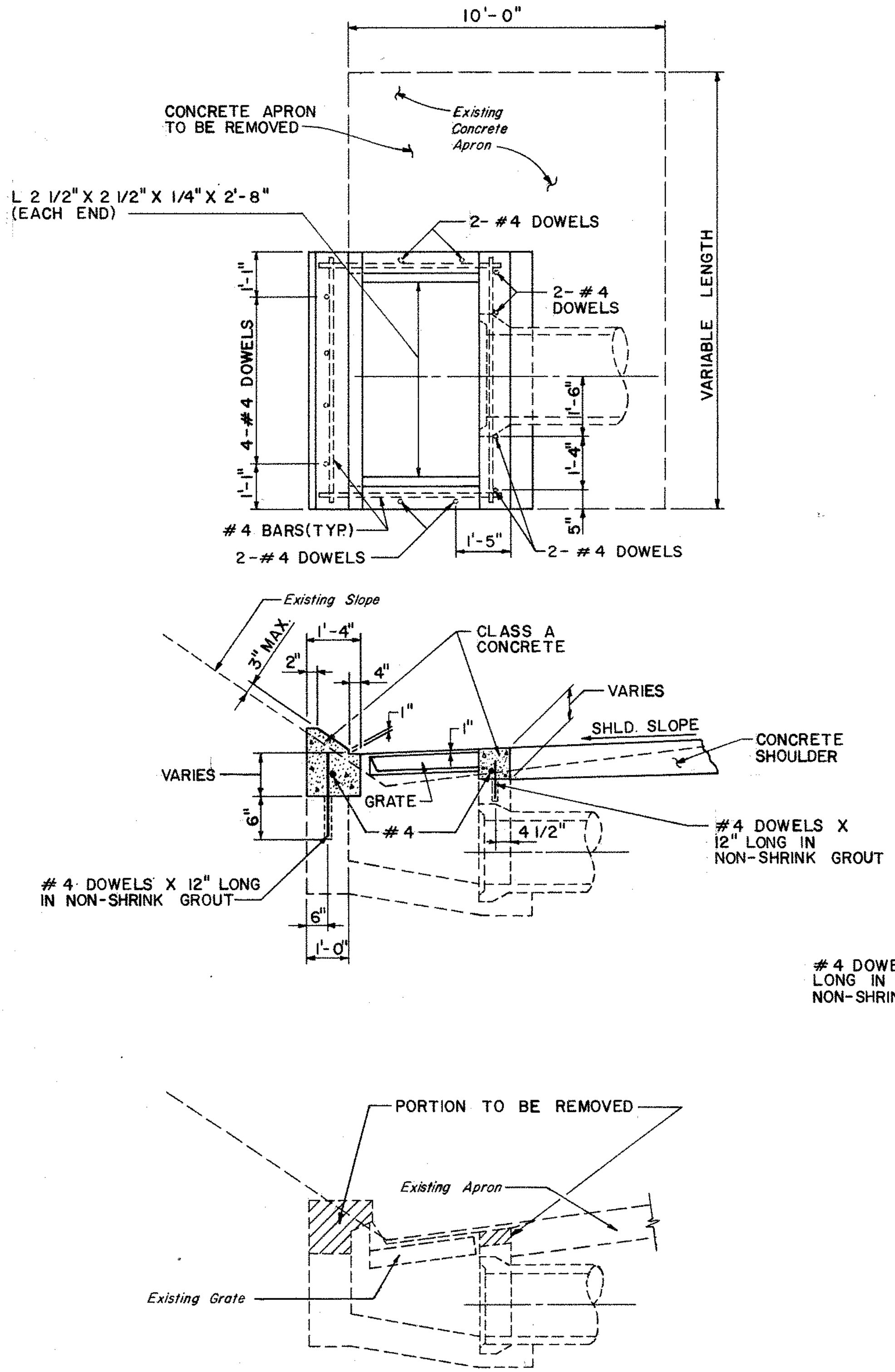
* NOTE:

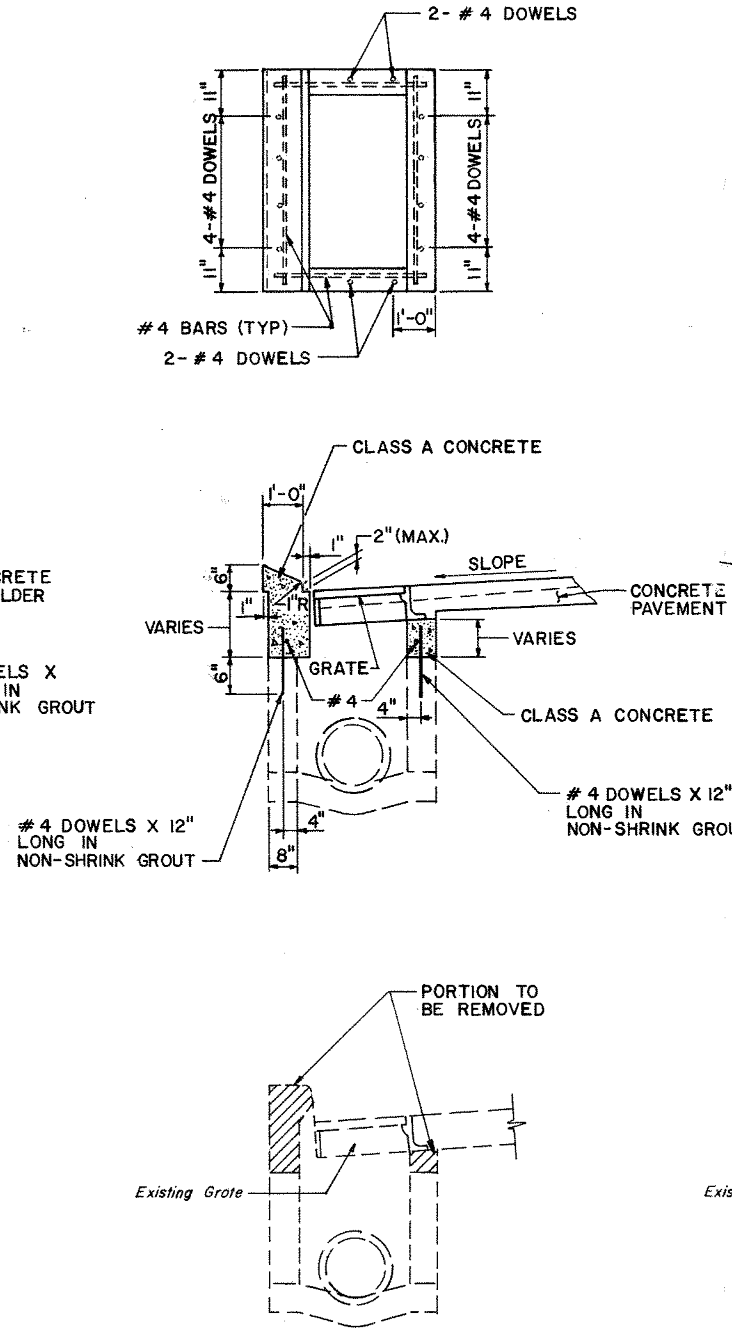
6-#4 DOWELS FOR 6' SPECIAL INLET, SPECIAL

4-#4 DOWELS FOR 4' SPECIAL INLET, SPECIAL



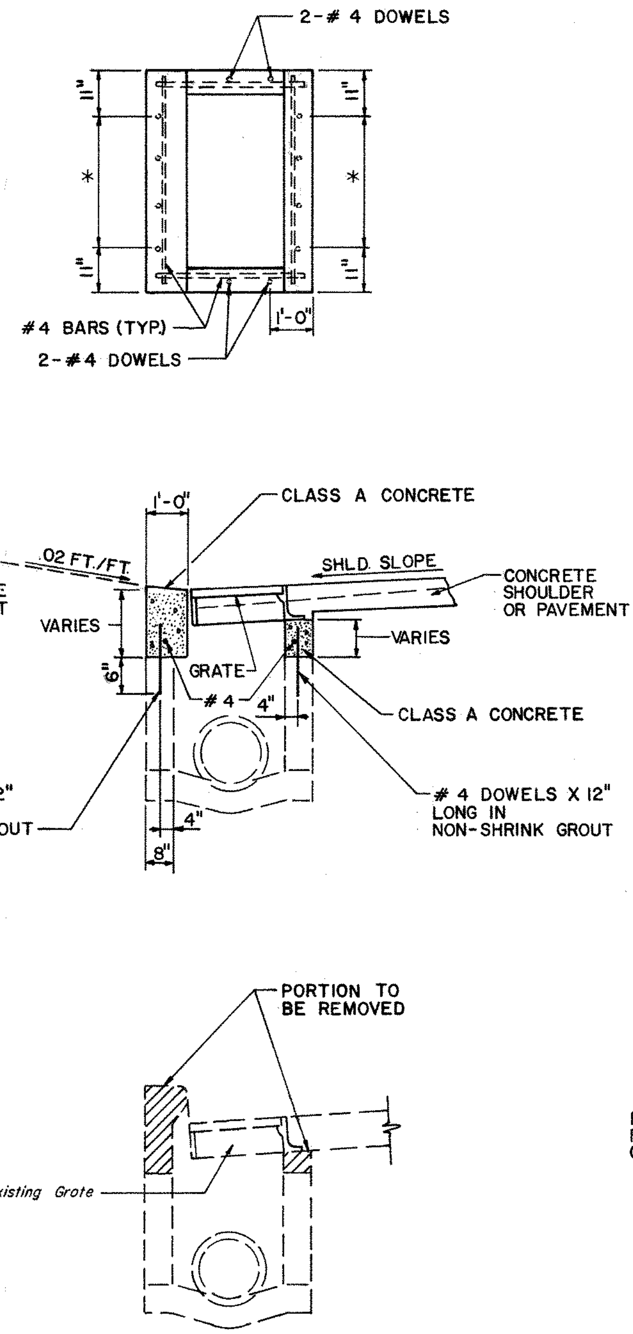
REBUILT TYPE H INLET

NO SCALE



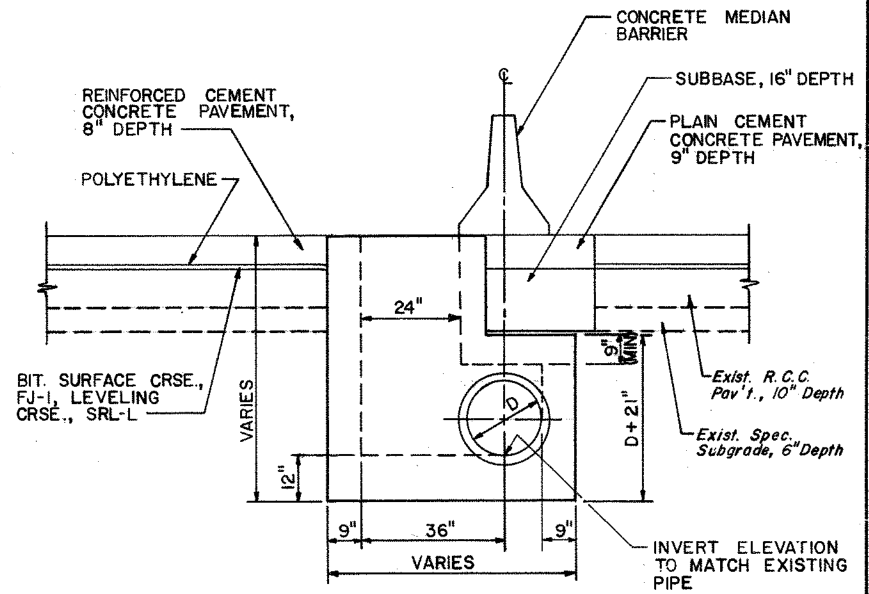
REBUILT 4' SPECIAL INLET, MODIFIED

NO SCALE



REBUILT 4' & 6' SPECIAL INLET, SPECIAL

NO SCALE



TYPE M INLET, MODIFIED, TYPE I, SPECIAL

SCALE: 1/2"=1'-0"

NOTE:
ALL DIMENSIONS AND DETAILS NOT SHOWN SHALL BE THE SAME AS SHOWN ON RC-34.

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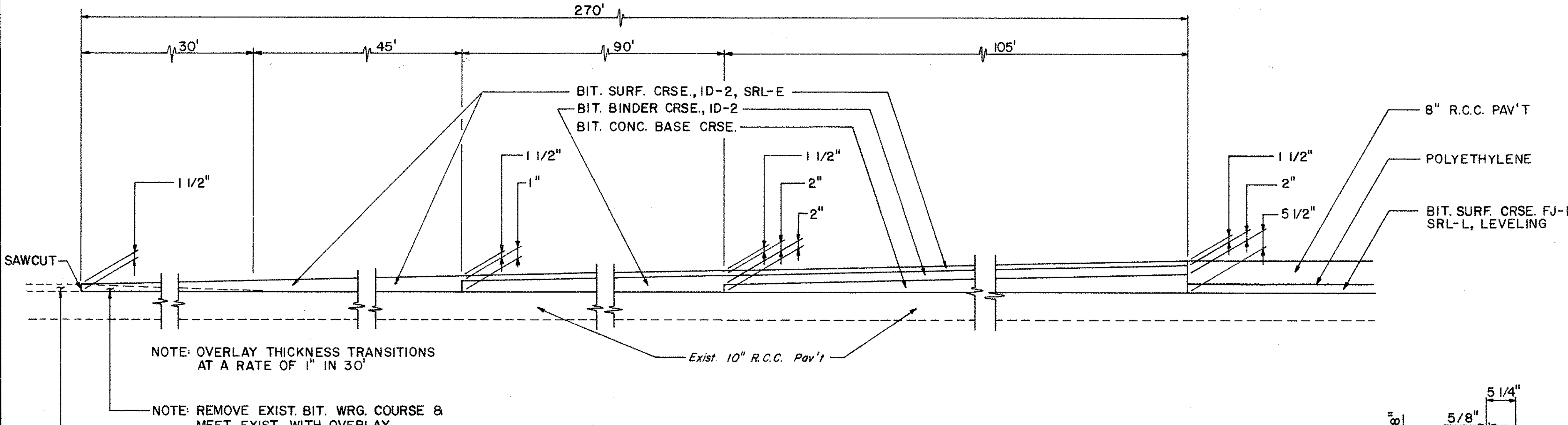
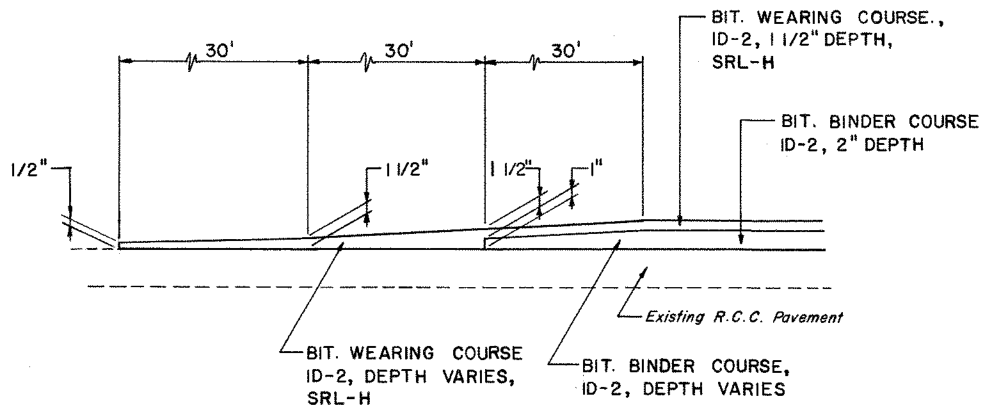
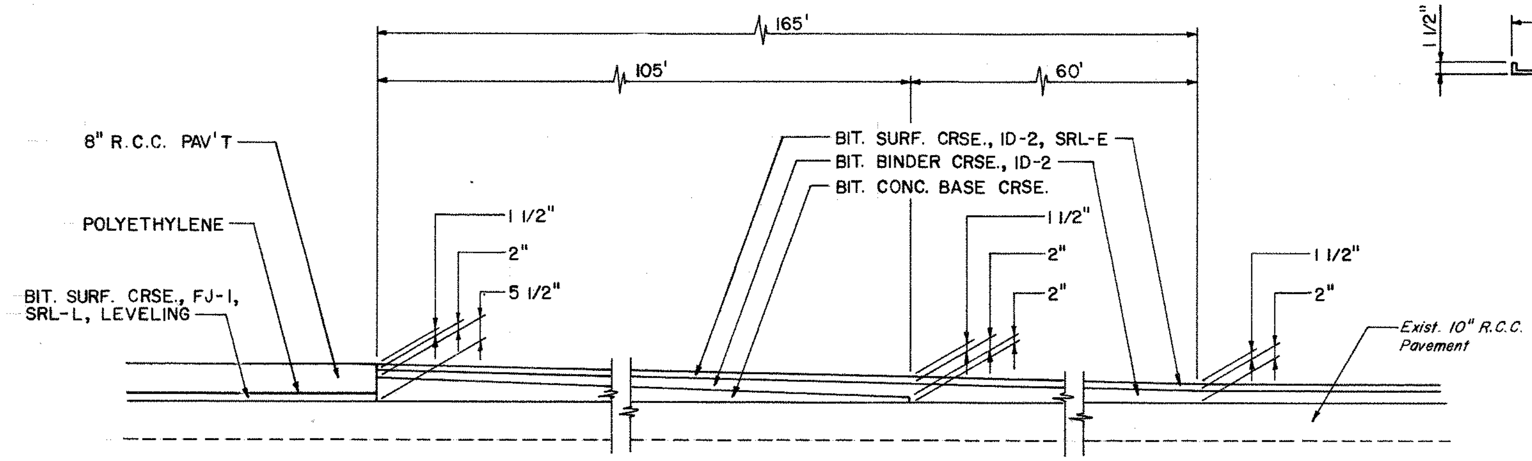


OVERLAY TRANSITION - L.R. 764



DETAIL OF SURFACE ADJUSTMENT - RAMPS

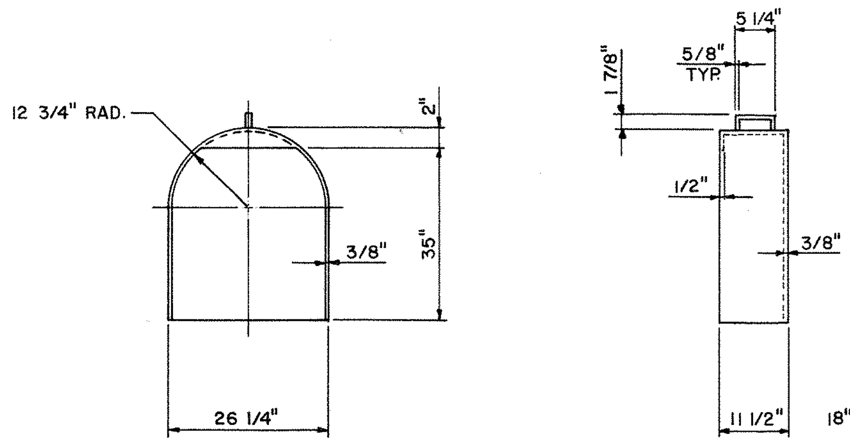
NO SCALE



TYPICAL OVERLAY TRANSITION

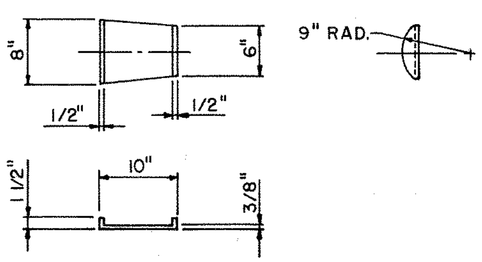
MAINLINE TO RAMP

NOTE: OVERLAY THICKNESS TRANSITIONS AT A RATE OF 1" IN 30'



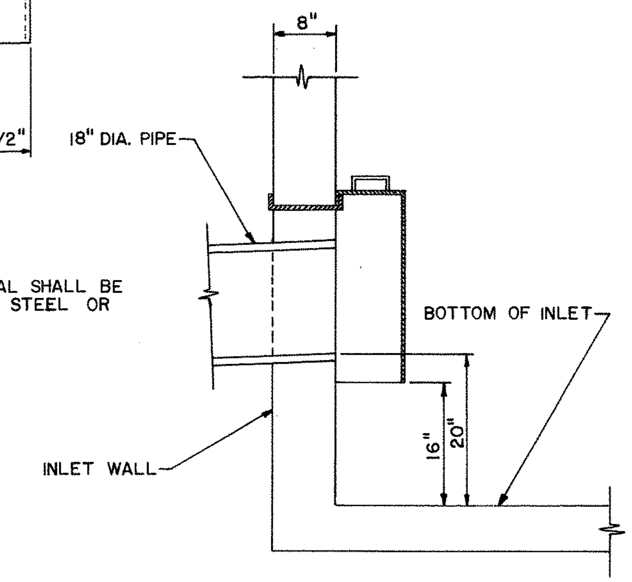
TRAP DETAIL

NO SCALE



HOOK DETAIL

NO SCALE



NOTE:
ALL MATERIAL SHALL BE STRUCTURAL STEEL OR CAST IRON.

TRAP PLACEMENT IN INLET

NO SCALE

STENCH CHAMBER DETAILS

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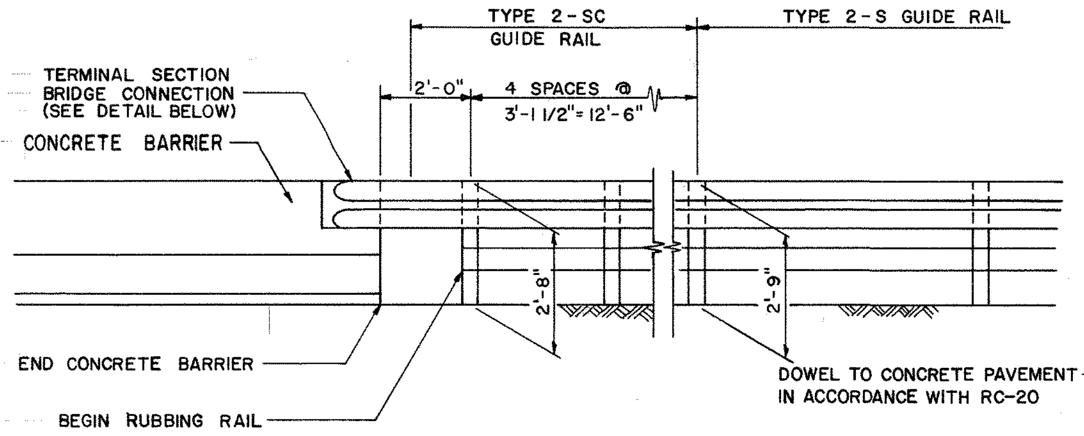
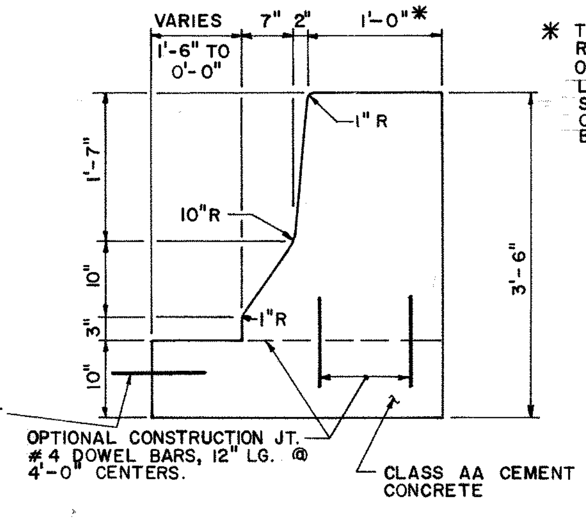


DETAIL OF GUIDE RAIL CONNECTION TO CONCRETE BARRIER

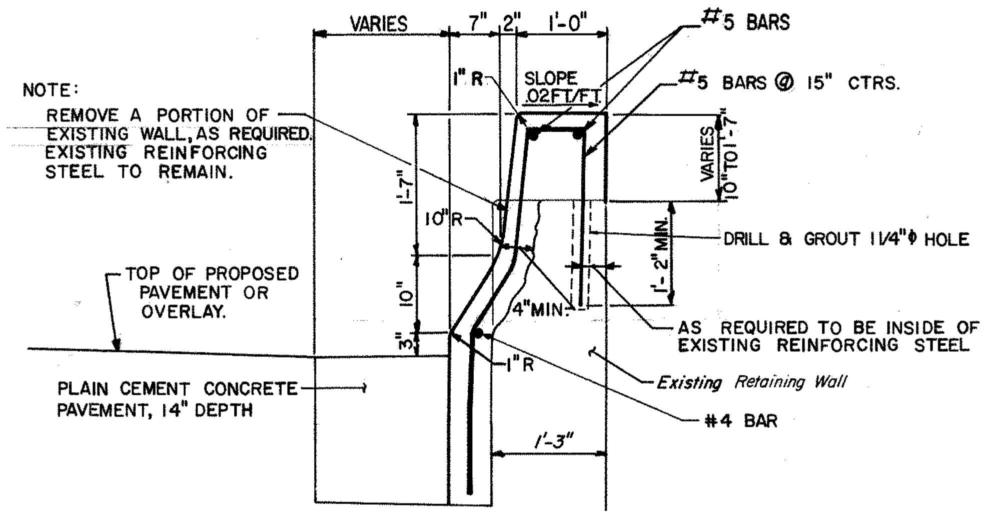
NO SCALE



FREE STANDING CONCRETE BARRIER

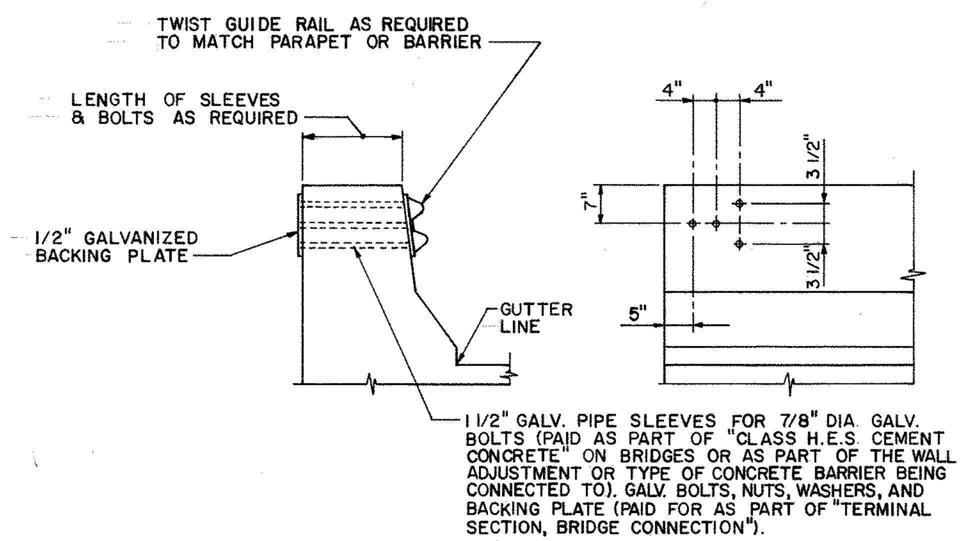
SCALE: 1"=1'-0"

* THIS DIMENSION MAY BE REDUCED TO 6" TO CLEAR OBSTRUCTIONS (I.E. INLETS, LIGHT STANDARDS, SIGN STRUCTURES, ETC). LENGTH OF REDUCED WIDTH NOT TO EXCEED 6" BEYOND OBSTRUCTION.



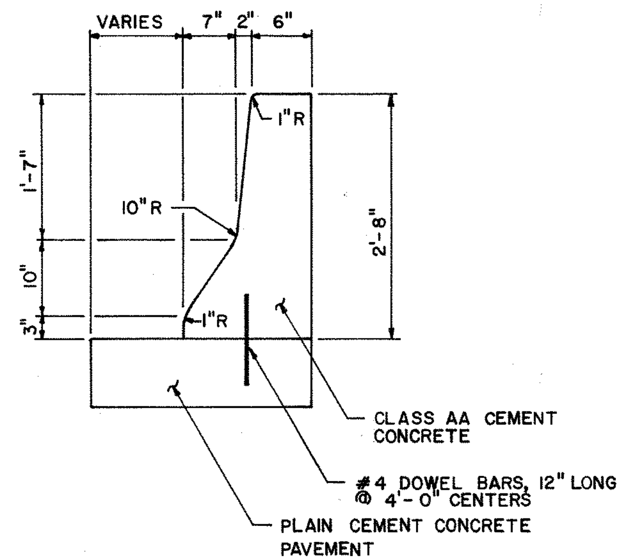
WALL ADJUSTMENT

SCALE: 1"=1'-0"



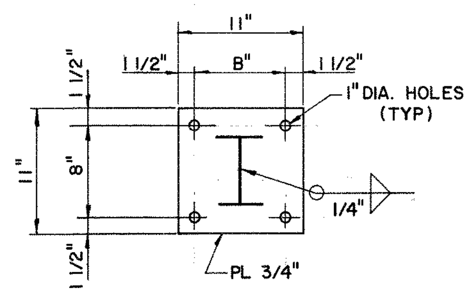
TERMINAL SECTION, BRIDGE CONNECTION

NO SCALE



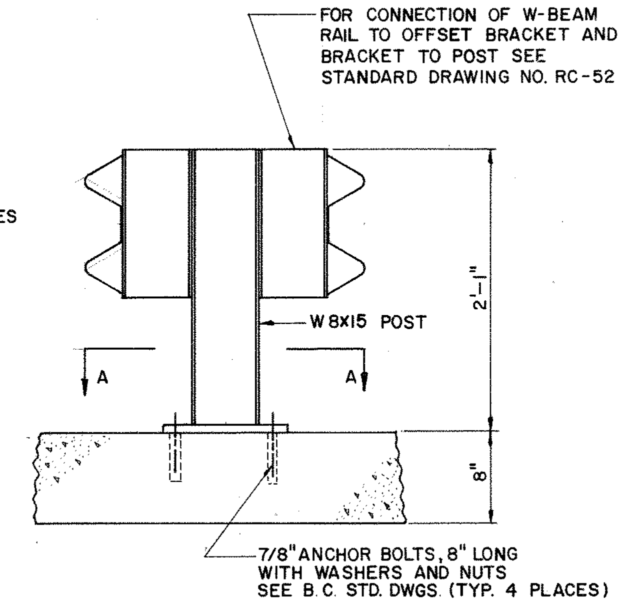
CONCRETE PROTECTIVE BARRIER

SCALE: 1"=1'-0"



SECTION A-A

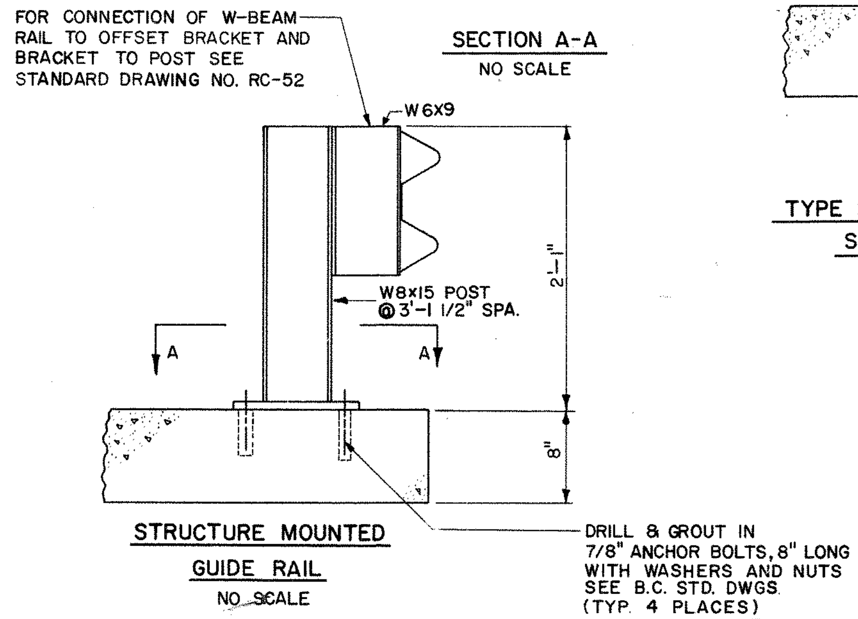
NO SCALE



TYPE 2-S MEDIAN BARRIER

STRUCTURE MOUNTED

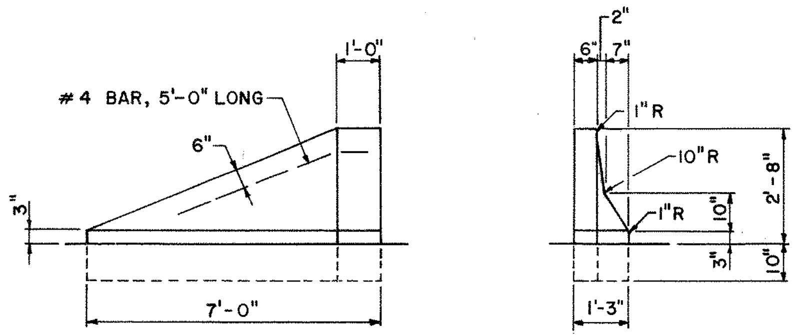
NO SCALE



STRUCTURE MOUNTED

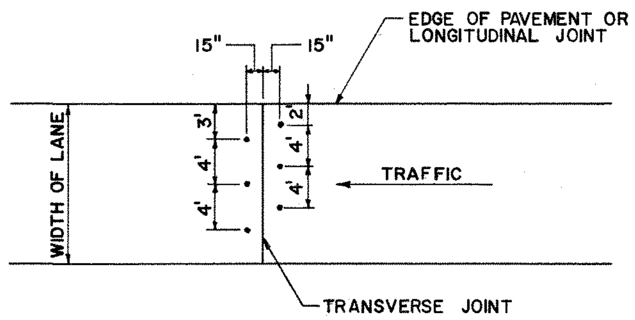
GUIDE RAIL

NO SCALE



CONCRETE PROTECTIVE BARRIER END TRANSITION

NO SCALE



HOLE LOCATIONS FOR PRESSURE GROUTING

NO SCALE

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764	19	12 of 76

CITY OF PITTSBURGH

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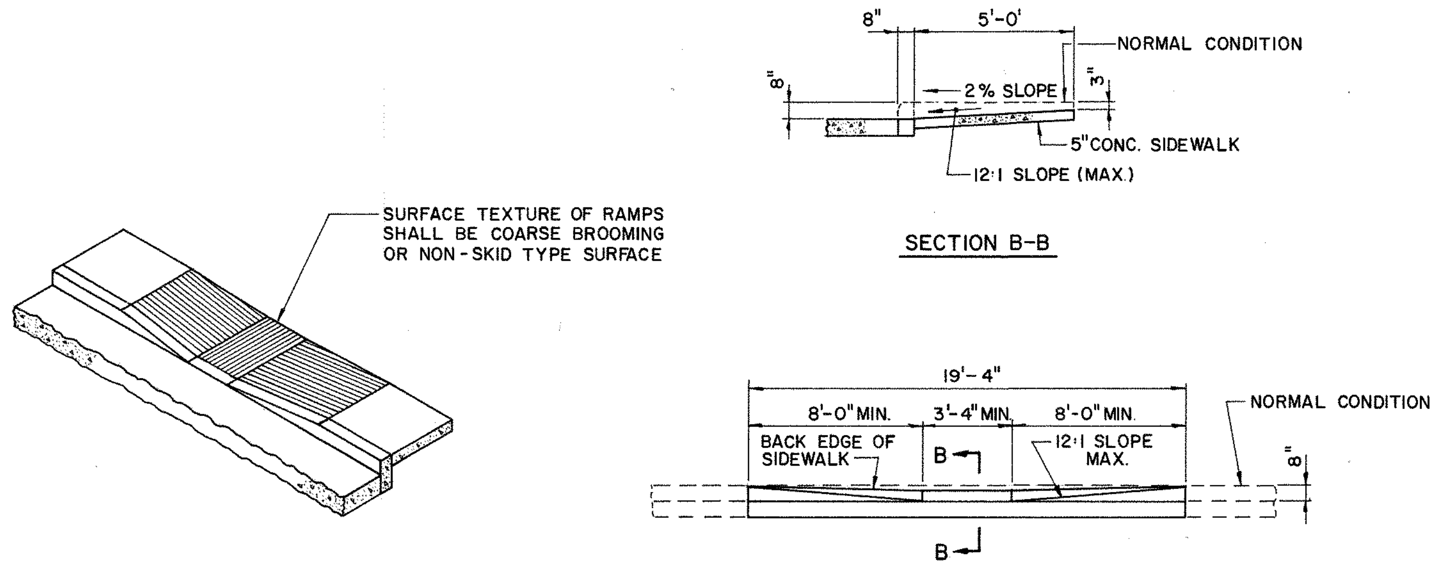
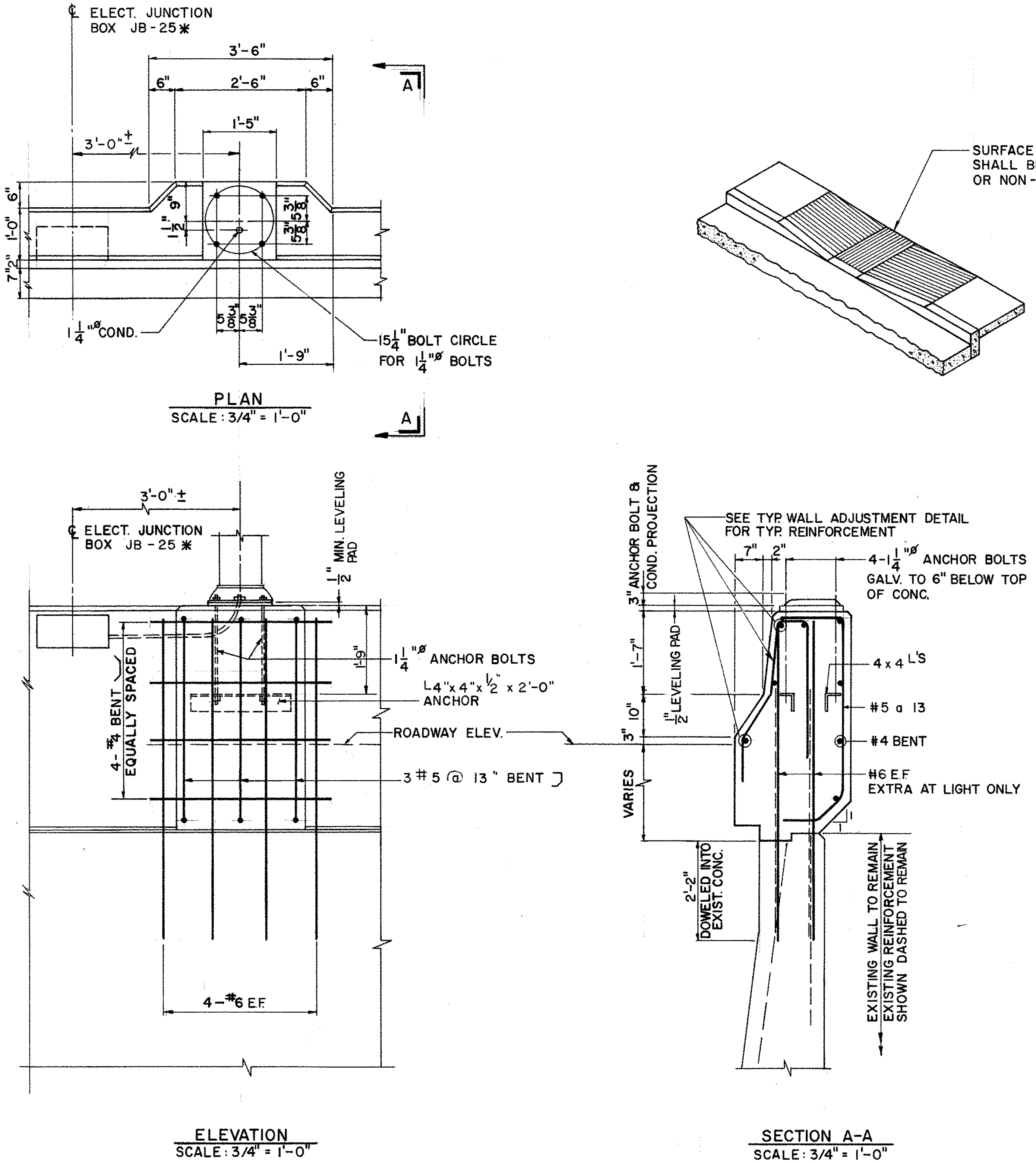


DETAIL - SIDEWALK RAMP



✱ SEE HIGHWAY LIGHTING PLANS FOR JUNCTION BOX PLACEMENT AT RAMP D, STA. 644+00 LIGHTING POLE ANCHORAGE.

DETAIL- LIGHTING POLE ANCHORAGE ON WALL ADJUSTMENT
SCALE: 3/4" = 1'-0"

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	CITY OF PITTSBURGH			

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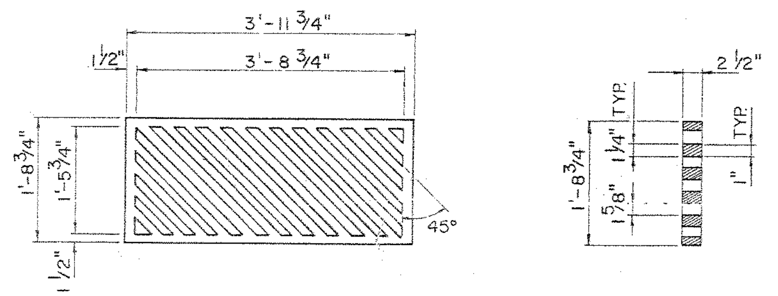
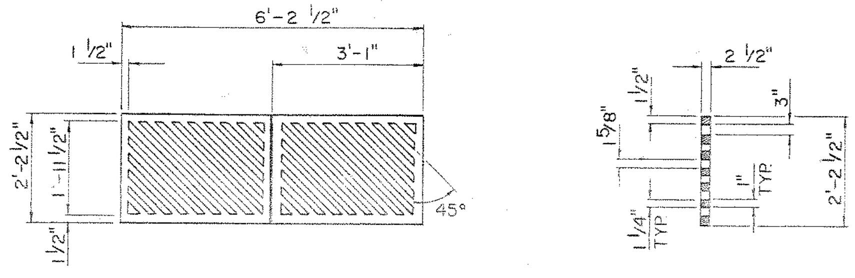
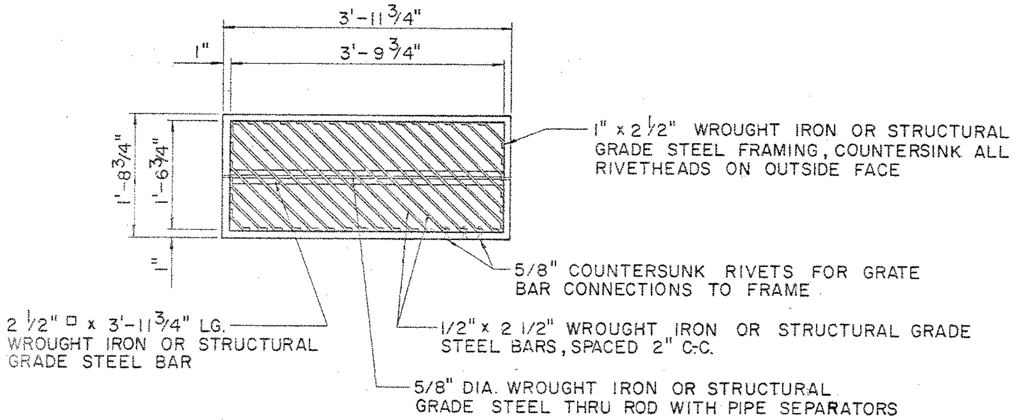


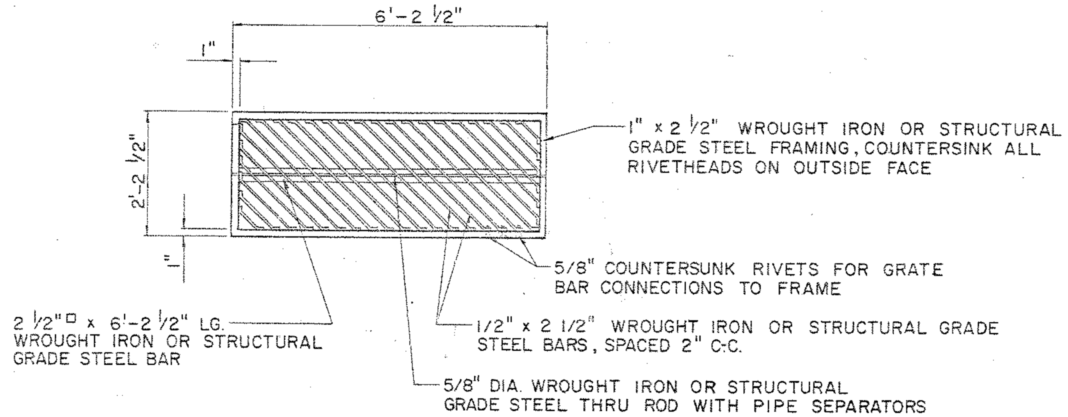
TYPE J INLET-CAST IRON GRATE



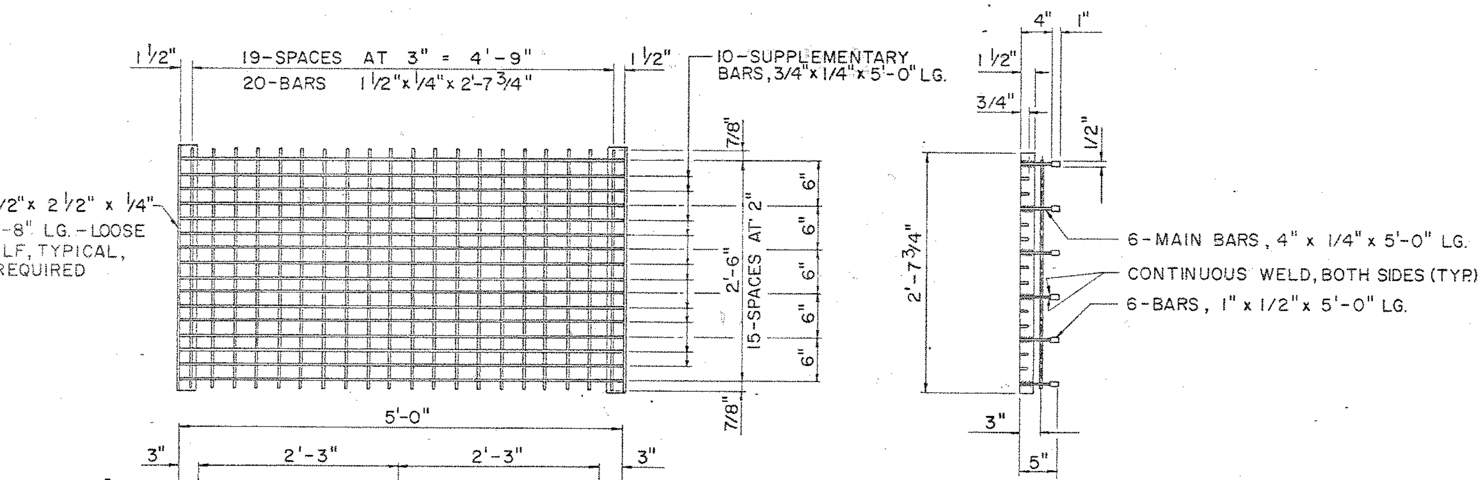
TYPE 6' SPECIAL INLET-CAST IRON GRATE

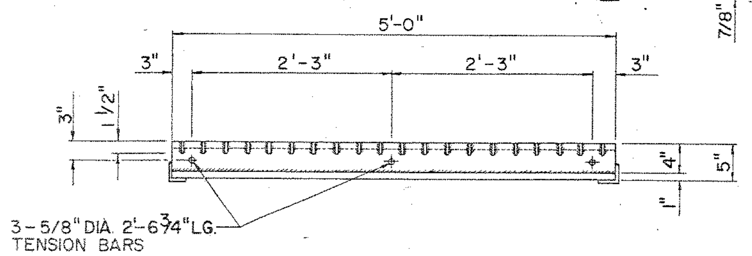


TYPE J INLET – STRUCTURAL STEEL GRATE



TYPE 6' SPECIAL INLET-STRUCTURAL STEEL GRATE





SPECIFICATIONS:

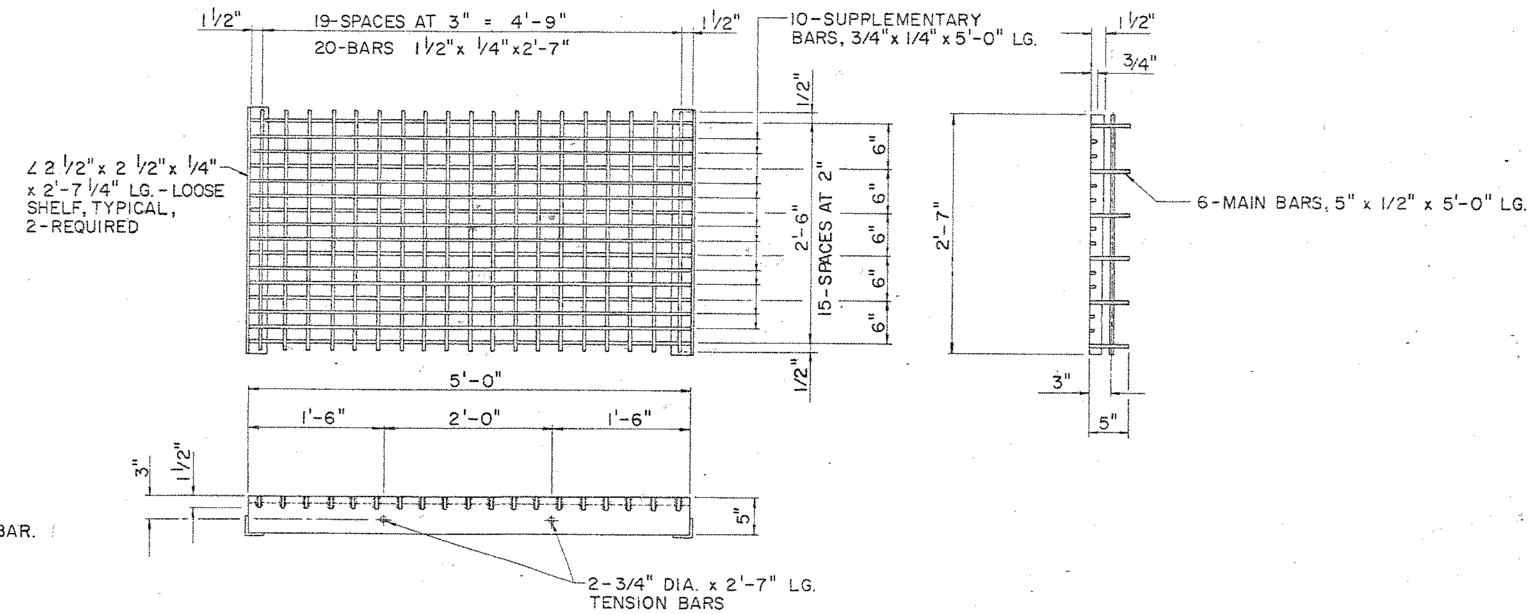
ALL MAIN BARS SHALL BE WELDED TO THE END CROSS BEAMS WITH A 1/4" FILLET WELD 1 1/2" LONG, CLOSE TO THE END OF THE BAR.

THE MAIN BAR ALONG THE OUTER EDGE OF THE FLOORING SHALL BE WELDED TO EACH CROSS BEAM WITH A 1 1/2" LONG FILLET WELD.

ALL INTERIOR MAIN BARS SHALL BE WELDED TO EVERY 4th CROSS BEAM WITH A 1/4" FILLET WELD 1 1/2" LONG AND WELDS SO STAGGERED THAT AT EACH CROSS BEAM EVERY 4th MAIN BAR WILL BE WELDED TO THE CROSS BEAM.

PAINT: ONE COAT OF RED LEAD AND ONE COAT OF BLACK ASPHALTIC PAINT.

TYPE H INLET-STRUCTURAL STEEL GRATE



TYPE H INLET-STRUCTURAL STEEL GRATE (ALTERNATE)

GENERAL NOTES:

1. GRATES SHALL BE DUCTILE OR MALLEABLE CAST IRON OR STRUCTURAL GRADE STEEL. GRATES MANUFACTURED FROM GRAY CAST IRON SHALL BE SUBMITTED FOR APPROVAL.
2. ALL WELDING REQUIRED FOR THE FABRICATED GRATES SHALL BE ACCOMPLISHED BY A WELDER CERTIFIED AS REQUIRED IN SEC. 1053.21, FORM 409.
3. THIS DRAWING DEPICTS THE DIMENSIONS REQUIRED FOR UNIFORMITY & INTERCHANGEABILITY. IT IS NOT INTENDED TO SHOW THE VARIOUS DETAILS REQUIRED FOR FABRICATION OR MANUFACTURING. ONLY THOSE ITEMS WHICH ARE SUPPLIED BY AN APPROVED MANUFACTURER AS LISTED IN BULLETIN NO.15 WILL BE PERMITTED. ANY MANUFACTURER DESIRING TO BE LISTED IN BULLETIN NO.15 FOR THESE UNITS SHALL SUBMIT A 22" x 36" (559 mm x 914 mm) SHOP DRAWING TO THE BUREAU OF MATERIALS TESTING & RESEARCH FOR APPROVAL. THE SHOP DRAWING MUST SHOW ALL DETAILS INCLUDING DIMENSIONS, TOLERANCES, WELDING SYMBOLS, CASTING FILLETS, ECT.

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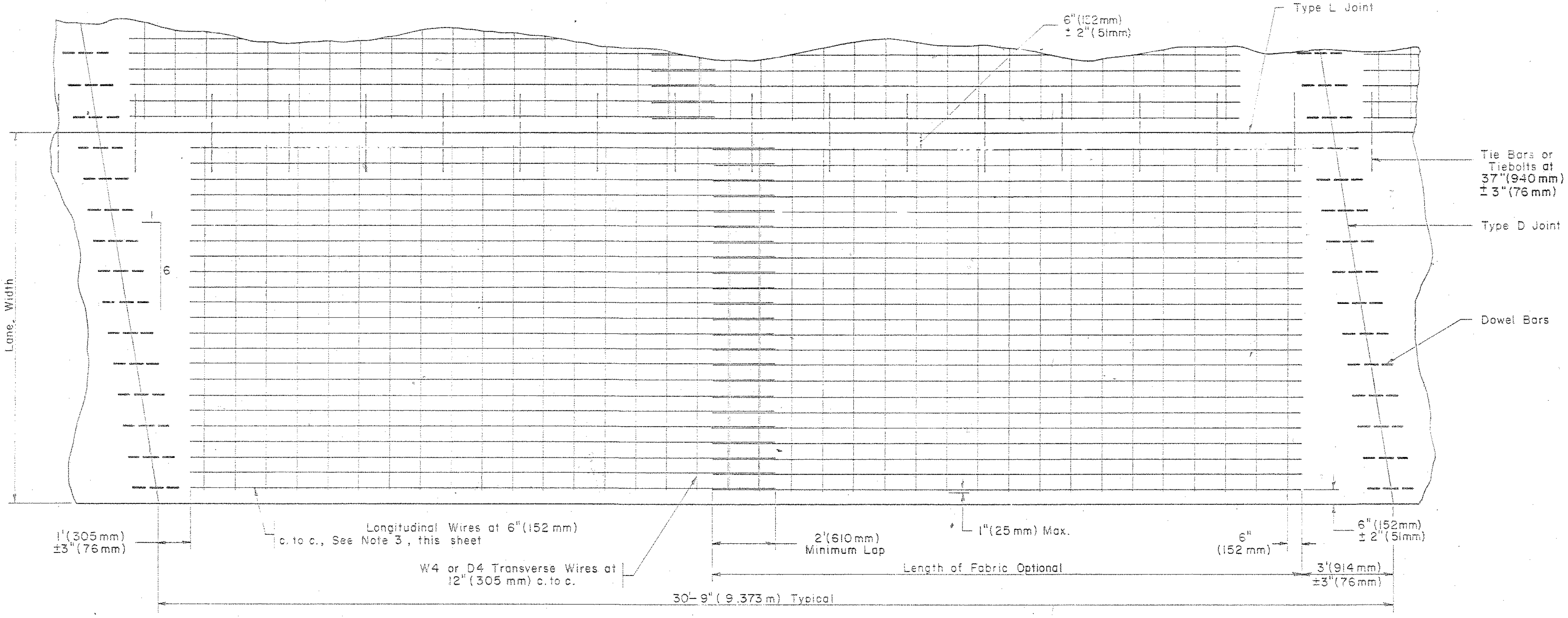
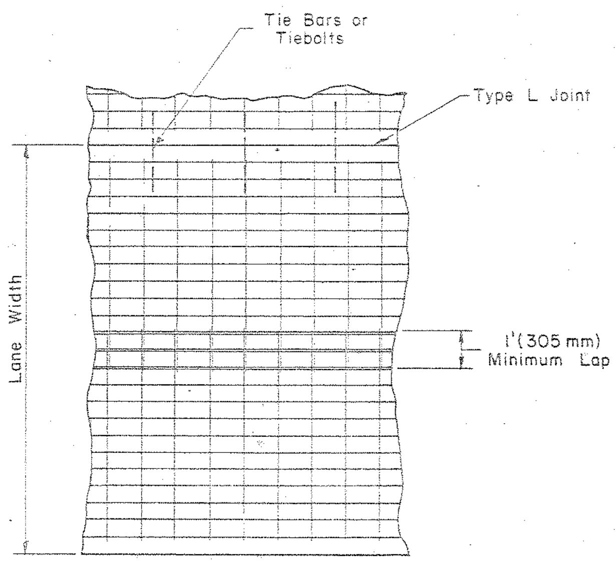
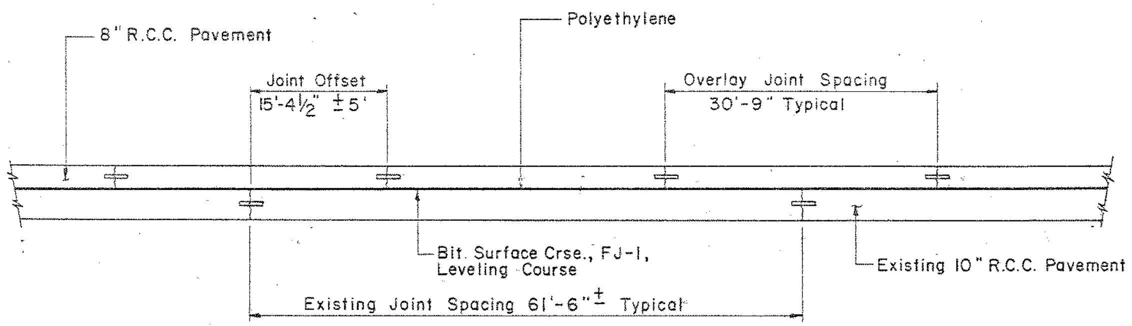


WIRE FABRIC REINFORCEMENT



ALTERNATE LAPPED FABRIC



TYPICAL JOINT LAYOUT

NOTES

1. For variable width pavement the reinforcement shall be cut as required.
2. Wire fabric reinforcement may be placed with transverse wires above or below longitudinal wires.
3. Longitudinal wires for wire fabric reinforcement shall be of the following minimum sizes:

Pav't. Depth	Min. Long. Wire Size
8" (203mm)	W 5.5 or D 5

4. Hinged fabric reinforcement may be used. Hinge detail must be approved by the engineer.
5. All longitudinal and transverse laps of wire fabric reinforcement shall be securely tied.
6. Wire fabric reinforcement may be constructed of smooth wire (sizes designated by W) or deformed wire (sizes designated by D) or a combination of both.
7. See RC-20 for joint details.
8. Depth for placement of wire fabric reinforcement, measured from top of pavement to top of fabric shall be a minimum of 2½" (64 mm) to a maximum of one half the pavement depth minus ½" (13mm).

TYPICAL DETAIL - REINFORCED CEMENT CONCRETE PAVEMENT - 8" DEPTH

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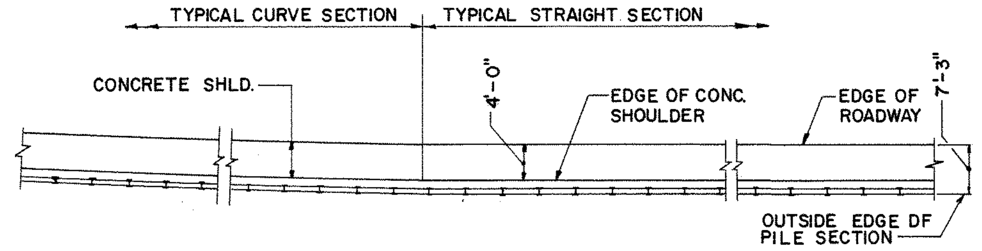
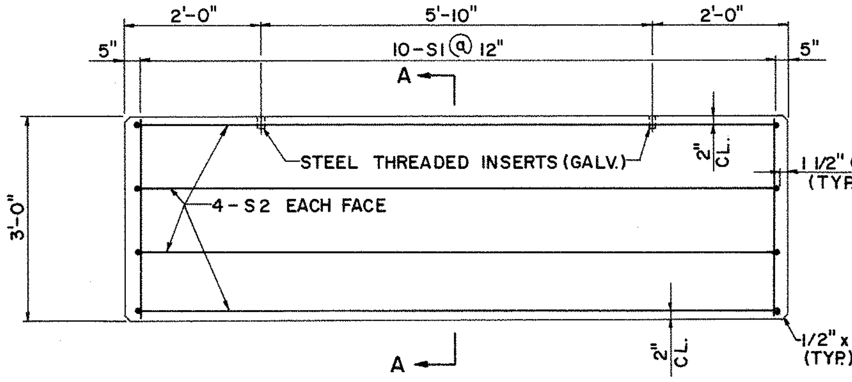
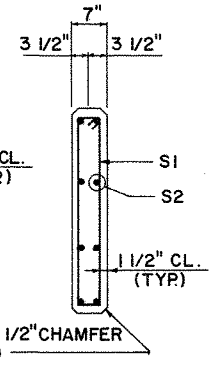


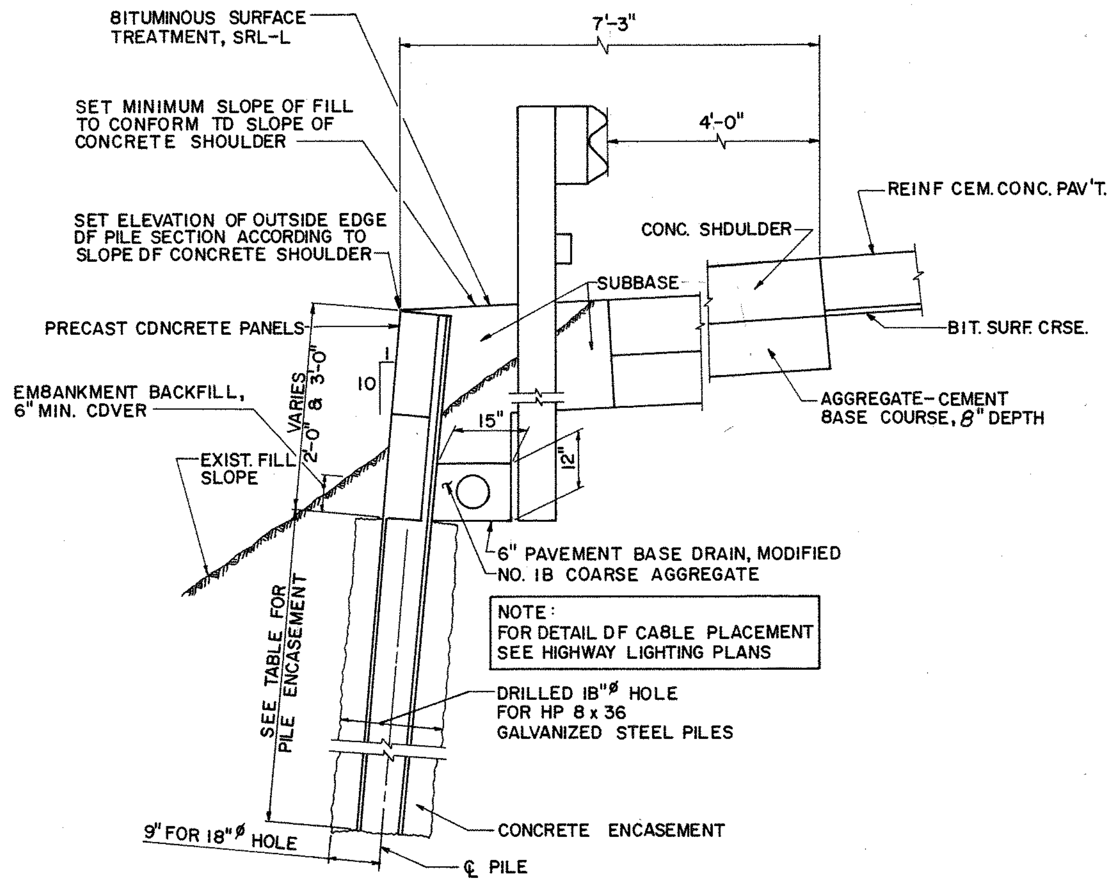
TYPICAL PLAN
SCALE: 1" = 25'



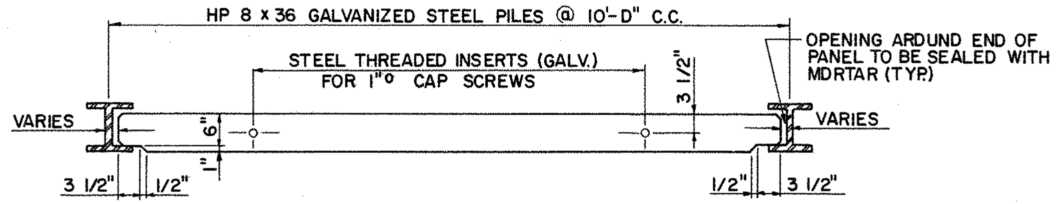
TYPICAL ELEVATION – 3' PRECAST PANEL FOR FILL SHOULDER WIDENING – TYPE 2
SCALE: 3/4" = 1'-0"



SECTION A-A
SCALE 3/4" = 1'-0"

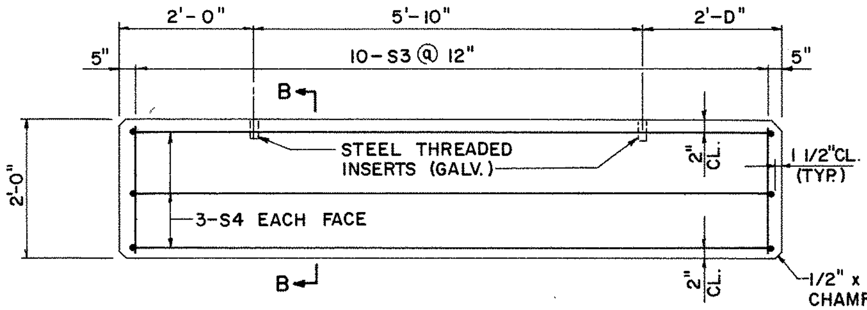


TYPICAL CROSS SECTION – FILL SHOULDER WIDENING
SCALE: 3/4" = 1'-0"

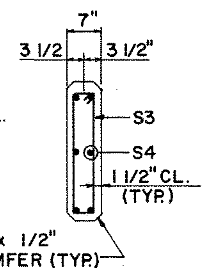


PLAN FOR FILL SHOULDER WIDENING – TYPES 1 AND 2
SCALE: 3/4" = 1'-0"

NOTE:
CAP SCREWS WITH WASHERS SHALL BE PROVIDED FOR EACH TOP PANEL ONLY FOR PLUGGING THE INSERTS AFTER SETTING PRECAST PANELS IN PLACE. HOLES AT INSERTS IN ALL OTHER PANELS SHALL BE MORTARED.



TYPICAL ELEVATION – 2' PRECAST PANEL FOR FILL SHOULDER WIDENING – TYPE 1
SCALE: 3/4" = 1'-0"



SECTION B-B
SCALE: 3/4" = 1'-0"

GENERAL PROCEDURE

1. DRILL 18"Ø HOLES FOR PILES, AS REQUIRED.
2. POSITION PILES IN HOLES.
3. POUR CONCRETE IN HOLES UP TO THE ELEVATION OF THE BOTTOM OF THE LOWEST CONCRETE PANEL FOR EACH PILE.
4. EXCAVATE AND PLACE CONCRETE PANELS.
5. PLACE 6" PAVEMENT BASE DRAIN, MODIFIED.
6. BACKFILL BEHIND WALL WITH SUBBASE MATERIAL.
7. EMBANKMENT SHALL BE PLACED AND SEEDED.

GENERAL NOTES

MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH SPECIFICATION FORMS 408/76, 409/73 AND THE SPECIAL PROVISIONS IN THE PROPOSAL.

STRUCTURAL STEEL SHALL CONFORM TO ASTM DESIGNATION A-36

DESIGN SPECIFICATIONS:
DESIGN DIVISION OF 1977 AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES.

CLASS AA CEMENT CONCRETE SHALL BE USED IN PRECAST PANELS.

CLASS C CEMENT CONCRETE SHALL BE USED FOR PILE ENCASEMENT.

REINFORCEMENT BAR SCHEDULE

MARK	SIZE	TYPE	LENGTH	REMARKS
S1	3	I	6'-6"	10 PER PANEL
S2	4	II	10'-7"	8 PER PANEL
S3	3	I	4'-6"	10 PER PANEL
S4	5	II	10'-9"	6 PER PANEL

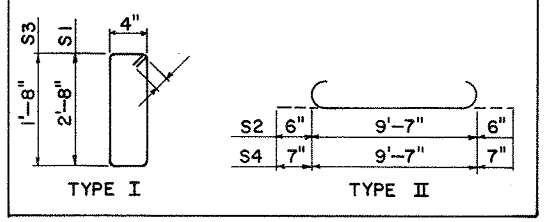


TABLE OF INFORMATION — FILL SHOULDER WIDENING

TYPE	HEIGHT OF PANEL WALL	NO. OF PANELS	WIDTH OF PANELS	PILES	LENGTH OF PILE ENCASEMENT EXIST. FILL SLOPE
1	2'-0"	1	2'-0"	HP 8x36	15'
2	3'-0"	1	3'-0"	HP 8x36	18'

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LEGEND

(A) SEE SPECIAL PROVISIONS
(B) SEE MAINTENANCE AND PROTECTION OF TRAFFIC PLANS
(C) SEE HIGHWAY LIGHTING PLANS
(D) SEE PAVEMENT MARKING PLANS
(E) SEE SIGNING AND SIGN LIGHTING PLANS
(F) SEE FLOODWALL PROTECTION SYSTEM PLANS
(G) SEE DELINEATOR PLANS
(H) SEE ROCK SLOPE STABILIZATION PLANS
(a) PREDETERMINED PRICE IN PROPOSAL
(I) TRANSPORTATION SYSTEM MANAGEMENT CRAFT AVE.
(J) TRANSPORTATION SYSTEM MANAGEMENT FORT PITT BLVD.
(K) TRANSPORTATION SYSTEM MANAGEMENT BLVD. OF THE ALLIES
(L) ERECTION OF SIGNS AND SIGNALS

SUMMARY SHEET

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ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
201 — 0001	———	L.S.	CLEARING AND GRUBBING		NO TAB (A)
2201 — 0001	——	L.S.	CLEARING AND GRUBBING, ROCK SLOPE		(H) (A)
2201 — 0100	1	ACRE	CLEARING AND GRUBBING, SIGNING		(E)(A)
203 — 0001	15,605	C.Y.	CLASS 1 EXCAVATION		43,46 (H) (F)
203 — 0002	8,496	C.Y.	CLASS 1 EXCAVATION, SPECIAL		43,45 (F)(A)(E)
204 — 0001	371	C.Y.	CLASS 2 EXCAVATION		33 (F)
204 — 0100	1,043	C.Y.	CLASS 3 EXCAVATION		47 (E)
2204 — 0100	114	C.Y.	CLASS 3 EXCAVATION, SPECIAL		(E) (A)
2204 — 0101	——	L.S.	CLASS 3 EXCAVATION, SPECIAL, STA.668+33 TO STA.685+77(APPROX. 1,400 C.Y.)		47 (A)
2204 — 0102	——	L.S.	CLASS 3 EXCAVATION, SPECIAL, STA.677+68 TO STA.680+44(APPROX. 175 C.Y.)		47 (A)
2204 — 0103	——	L.S.	CLASS 3 EXCAVATION, SPECIAL, STA.727+38 TO STA.727+92(APPROX. 2254 C.Y.)		47 (A)
2204 — 0104	——	L.S.	CLASS 3 EXCAVATION, SPECIAL, L.R.120 & RAMP 'U'(APPROX. 550 C.Y.)		47 (A)
2204 — 0105	——	L.S.	CLASS 3 EXCAVATION, SPECIAL, STA.727+68 TO STA.739+23(APPROX. 2050 C.Y.)		47 (A)
2204 — 0106	——	L.S.	CLASS 3 EXCAVATION, SPECIAL, STA.727+67 TO STA.739+77(APPROX. 800 C.Y.)		47 (A)
2204 — 0107	——	L.S.	CLASS 3 EXCAVATION, SPECIAL, L.R.120 & RAMP 'R'(APPROX. 117 C.Y.)		47 (A)
2204 — 0108	——	L.S.	CLASS 3 EXCAVATION, SPECIAL, STA.649+43 TO STA.654+75(APPROX. 391 C.Y.)		47 (A)
2204 — 0109	——	L.S.	CLASS 3 EXCAVATION, SPECIAL, STA.695+04 TO STA.702+64(APPROX. 855 C.Y.)		47 (A)
2204 — 0110	——	L.S.	CLASS 3 EXCAVATION, SPECIAL L.R.120 & RAMPS 'R' 'S' & 'T'(APPROX 370 C.Y.)		47 (A)
2204 — 0111	——	L.S.	CLASS 3 EXCAVATION, SPECIAL, STA.726+26 TO STA.737+50(APPROX. 13 C.Y.)		47 (A)
2204 — 0112	——	L.S.	CLASS 3 EXCAVATION, SPECIAL, STA.728+89 TO STA.732+58(APPROX. 75 C.Y.)		47 (A)
204 — 0150	1,386	C.Y.	CLASS 4 EXCAVATION		33 (F)
2204 — 0175	1,200	C.Y.	CLASS 5 EXCAVATION		46(A)
2205 — 0207	400	C.Y.	SELECTED BORROW EXCAVATION —— STRUCTURE BACKFILL		47(A)
205 — 0350	——	L.S.	SELECTED BORROW EXCAVATION—STR. B'FILL STA.668+33 TO STA.685+77(APPROX. 1740 C.Y.)		47 (A)
205 — 0351	——	L.S.	SELECTED BORROW EXCAVATION—STR. B'FILL STA.677+68 TO STA.680+44(APPROX. 200 C.Y.)		47 (A)
205 — 0352	——	L.S.	SELECTED BORROW EXCAVATION—STR. B'FILL STA.727+38 TO STA.727+92(APPROX. 2250 C.Y.)		47 (A)
205 — 0353	——	L.S.	SELECTED BORROW EXCAVATION—STR. B'FILL L.R. 120 & RAMP 'U' (APPROX. 550 C.Y.)		47 (A)
205 — 0354	——	L.S.	SELECTED BORROW EXCAVATION—STR. B'FILL STA.727+68 TO STA.739+23(APPROX. 1920 C.Y.)		47 (A)
205 — 0355	——	L.S.	SELECTED BORROW EXCAVATION—STR. B'FILL STA.727+67 TO STA.739+77(APPROX. 800 C.Y.)		47 (A)
205 — 0356	——	L.S.	SELECTED BORROW EXCAVATION—STR. B'FILL L.R.120 & RAMP 'R'(APPROX. 111 C.Y.)		47 (A)
205 — 0357	——	L.S.	SELECTED BORROW EXCAVATION—STR. B'FILL STA.649+43 TO STA.654+75(APPROX. 391 C.Y.)		47 (A)
205 — 0358	——	L.S.	SELECTED BORROW EXCAVATION—STR. B'FILL STA.695+04 TO STA.702+64(APPROX. 855 C.Y.)		47 (A)
205 — 0359	——	L.S.	SELECTED BORROW EXCAVATION—STR. B'FILL L.R.120 & RAMPS 'R' 'S' & 'T'(APPROX. 337 C.Y.)		47 (A)

ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
205 — 0360	——	L.S.	SELECTED BORROW EXCAVATION— STR. B'FILL STA.726+26 TO STA.737+50(APPROX. 13 C.Y.)		47 (A)
205 — 0361	——	L.S.	SELECTED BORROW EXCAVATION— STR. B'FILL STA.728+89 TO STA.732+58(APPROX. 75 C.Y.)		47 (A)
305 — 0015	396	S.Y.	BITUMINOUS CONCRETE BASE COURSE, 10" DEPTH		(F)
305 — 0200	1,747	TONS	BITUMINOUS CONCRETE BASE COURSE		43,(F)
2306 — 0003	7,526	S.Y.	ASPHALT TREATED PERMEABLE MATERIAL, 4" DEPTH		(F),(A)
2321 — 0108	32,909	S.Y.	AGGREGATE -CEMENT BASE COURSE, 8" DEPTH		45,43,(A)(F)
350 — 0001	12	S.Y.	SUBBASE, 6" DEPTH		(E)
350 — 0050	1,076	C.Y.	SUBBASE MATERIAL		43, (F)
420 — 0283	1,252	S.Y.	BITUMINOUS WEARING COURSE, ID-2, 1 1/2" DEPTH, SRL-E		43,(F)
420 — 0303	7,440	S.Y.	BITUMINOUS WEARING COURSE, ID-2, 1 1/2" DEPTH, SRL-H		43
421 — 0202	8,296	S.Y.	BITUMINOUS BINDER COURSE, ID-2, 2" DEPTH		43
2422 — 0145	5,587	TONS	BITUMINOUS SURFACE COURSE, FJ-1, LEVELING COURSE, SRL-L		45, 43,(A)
422 — 0230	7,526	S.Y.	BITUMINOUS SURFACE COURSE, FJ-1, 1" DEPTH, WEARING COURSE, SRL-L		(F),(A)
480 — 0013	809	S.Y.	BITUMINOUS SURFACE TREATMENT, SRL-L		43
490 — 0001	33,725	S.Y.	REMOVAL OF EXISTING BITUMINOUS SURFACE COURSE		43,(A)
2500 — 0001	74,475	S.Y.	POLYETHYLENE		45,43,(A)
501 — 0020	279	S.Y.	PLAIN CEMENT CONCRETE PAVEMENT, 4" DEPTH		43,(F)
501 — 0024	1,566	S.Y.	PLAIN CEMENT CONCRETE PAVEMENT, 6" DEPTH		43(A)
501 — 0034	491	S.Y.	PLAIN CEMENT CONCRETE PAVEMENT, 11" DEPTH		(F)
2501 — 0038	5,710	S.Y.	PLAIN CEMENT CONCRETE PAVEMENT, 14" DEPTH		43
501 — 0200	74,441	S.Y.	REINFORCED CEMENT CONCRETE PAVEMENT, 8" DEPTH		43(A),(F)
2501 — 0200	360	S.Y.	REINFORCED CEMENT CONCRETE PAVEMENT, 8" DEPTH, SPECIAL		43,(A)
501 — 0202	8,312	S.Y.	REINFORCED CEMENT CONCRETE PAVEMENT, 10" DEPTH		43,(E)
501 — 0203	25,786	S.Y.	REINFORCED CEMENT CONCRETE PAVEMENT, 11" DEPTH		43,(F)
2503 — 0001	111,937	S.Y.	PROTECTIVE COATING FOR CEMENT CONCRETE PAVEMENTS & SHOULDERS		43,45 (F),(A)

ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
504 — 0001	615	LF	PAVEMENT RELIEF JOINT		45
505 — 0001	1,882	SY	BRIDGE APPROACH SLAB		45,48
2505 — 0001	74	C.Y.	BRIDGE APPROACH SLAB, SPECIAL		48 (A)
601 — 0052	709	LF	18" REINFORCED CEMENT CONCRETE PIPE, CLASS III		33,(F)
601 — 0054	80	LF	24" REINFORCED CEMENT CONCRETE PIPE, CLASS III		33
601 — 0642	64	LF	8" VITRIFIED CLAY PIPE		33
EITHER 601 — 0667	32	LF	18" EXTRA STRENGTH VITRIFIED CLAY PIPE	2	33
OR 601 — 0015	32	LF	18" PLAIN CEMENT CONCRETE PIPE, CLASS III		
2601 — 0875	68	LF	10" CORR. GALV. STEEL PIPE, TYPE I, (2 2/3" x 1/2" CORR.), 14 GAGE		(A),(F)
EITHER 2601 — 3642	1,862	LF	18" CORR. GALV. STEEL PIPE, HALF CIRCLE, (2 2/3" x 1/2" CORRUGATIONS), 16 GAGE	3	33 (A)
OR 2601 — 4442	1,862	LF	18" CORR. ALUMINUM ALLOY PIPE, HALF CIRCLE, (2 2/3" x 1/2" CORRUGATIONS) 16 GAGE		(A)
601 — 5400	722	C.Y.	COARSE AGGREGATE FOR PIPE TRENCH BACKFILL		33,(F)
601 — 5900	15,125	LF	CLEANING EXISTING PIPE CULVERTS		33

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FOR LEGEND SEE SHEET 16

SHEET 2 OF 7

ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
604— 0102	356	L.F.	18" REINFORCED CEMENT CONCRETE PIPE, CLASS III, (OPEN JOINTS)		33
605 — 1300	4	EA.	TYPE A MANHOLE		F
2605— 1301	5	EA.	TYPE A MANHOLE, SPECIAL		F, A
605— 2001	1	EA.	TYPE C INLET		33
605— 2060	24	EA.	TYPE M INLET		33, F
2605— 2061	19	EA.	TYPE M INLET, SPECIAL		F, A
2605— 2065	1	EA.	TYPE M INLET, W/STENCH CHAMBER		33, A
2605— 2101	15	EA.	TYPE M INLET, MODIFIED TYPE I BOX, SPECIAL		33, A
605— 2180	2	EA.	TYPE S INLET		33
2605— 2184	2	EA.	TYPE S INLET W/STENCH CHAMBER		33, A
2606— 0053	5	SETS	GRADE ADJUSTMENT OF TYPE 4' SPECIAL INLET		33, A, F
606— 0150	1	SETS	GRADE ADJUSTMENT OF EXISTING MANHOLES		F
2607— 0007	6	EA.	REBUILT TYPE H INLET		33, A
2607— 0008	10	EA.	REBUILT TYPE J INLET		33, A
2607— 0009	143	EA.	REBUILT TYPE 4' SPEC. INLET, SPECIAL		33, A
2607— 0013	3	EA.	REBUILT TYPE 6' SPEC. INLET, SPECIAL		33, A
2607— 0015	5	EA.	REBUILT TYPE 4' SPEC. INLET, MODIFIED		33, A
2607— 0205	8	EA.	REBUILT MANHOLE		33, A
608— 0001	——	L.S.	MOBILIZATION		NO TAB
609— 0002	——	L.S.	INSPECTORS FIELD OFFICE AND INSPECTION FACILITIES, TYPE A		NO TAB
610— 7000	6,148	L.F.	PAVEMENT BASE DRAIN		40
610— 7002	1,851	L.F.	6" PAVEMENT BASE DRAIN		40
2610— 7002	580	L.F.	6" PAVEMENT BASE DRAIN, MODIFIED		40, A

ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
612— 0001	6,200	L.F.	SUBGRADE DRAINS		45
615— 0020	86	L.F.	SUBSURFACE DRAIN OUTLETS		40
615— 0022	24	L.F.	6" SUBSURFACE DRAIN OUTLETS		40
620— 0402	13	EA	TERMINAL SECTION, BRIDGE CONNECTION		37, A, E
620— 0501	9,133	L.F.	REMOVE EXISTING GUIDE RAIL		37, A
620— 0595	175	L.F.	STRUCTURE MOUNTED GUIDE RAIL		37, A
620— 1075	2,325	L.F.	TYPE 2–S GUIDE RAIL		37, A
620— 1100	275	L.F.	TYPE 2–SC GUIDE RAIL		37, A, E
620— 1150	275	L.F.	TYPE 2–S MODIFIED GUIDE RAIL		37, A
620— 1175	25	L.F.	TYPE 2–SC MODIFIED GUIDE RAIL		37, A
620— 1250	1	EA.	TYPE 2 STRONG POST END TREATMENT		37, A
2621 — 0001	438	L.F.	TYPE 2–S MEDIAN BARRIER, STRUCTURE MOUNTED		37, A
621— 0301	1,310	L.F.	REMOVE EXISTING MEDIAN BARRIER		37, A
623— 0001	2,815	L.F.	CONCRETE MEDIAN BARRIER		37, A
2623— 0001	5,620	L.F.	CONCRETE PROTECTIVE BARRIER		37, A
2623— 0002	3	EA.	CONCRETE PROTECTIVE BARRIER, END TRANSITION		37, A
2623— 0003	13,905	L.F.	FREE STANDING CONCRETE BARRIER		37, A
2623— 0004	1,305	L.F.	REMOVE EXISTING CONCRETE MEDIAN BARRIER		37, A
2623— 0102	2	EA.	END TRANSITION FOR CONCRETE MEDIAN BARRIER		F, A
2626— 0030	60	C.Y.	CORROSION RESISTANT GABIONS, TYPE B		H, A
627— 0001	5,940	L.F.	TEMPORARY CONCRETE BARRIER		B, A
628—0001	12,800	L.F.	RESET TEMPORARY CONCRETE BARRIER		B
629—0101	425	S.Y.	CONCRETE TRAFFIC SEPARATOR		45, A
630— 0001	390	L.F.	PLAIN CEMENT CONCRETE CURB		45, E

ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
633 — 0200	2,626	L.F.	PLAIN CONCRETE MOUNTABLE CURB, TYPE A		45
633 — 0225	91	L.F.	PLAIN CONCRETE MOUNTABLE CURB, TYPE B		F
2658— 0001	3,129	S.Y.	CONCRETE SHOULDERS		43, A
676— 0001	203	S.Y.	CEMENT CONCRETE SIDEWALK		45
2676— 0003	15	S.Y.	CEMENT CONC. SIDEWALK, SPECIAL		E, A
679— 0200	2,500	EA.	HOLES DRILLED-SUBSEALING		45, A
2681— 0026	2,500	BAGS	PRESSURE GROUTING CONCRETE PAVEMENT		45, A
685— 0001	——	L.S.	NETWORK SCHEDULE, CRITICAL PATH METHOD		NO TAB A
703 — 0006	1,078	C.Y.	NO. 2B COARSE AGGREGATE		33, 48, 43
704 — 0001	4,061	C.Y.	CLASS AA CEMENT CONCRETE		48, E
704 — 0002	11,343	C.Y.	CLASS A CEMENT CONCRETE		40,48 E, F, 33
2704 — 0100	——	L.S.	CLASS AA CEMENT CONCRETE, STA.668+33 TO STA.685+77 (APPROX. 3100 C.Y.)		48, A
2704 — 0101	——	L.S.	CLASS AA CEMENT CONCRETE, STA.677+68 TO STA.680+44 (APPROX. 400 C.Y.)		48, A
2704 — 0102	——	L.S.	CLASS AA CEMENT CONCRETE, STA.727+38 TO STA.727+92 (APPROX. 152 C.Y.)		48, A
2704 — 0103	——	L.S.	CLASS AA CEMENT CONCRETE, L.R. 120 & RAMP 'U' (APPROX. 605 C.Y.)		48, A
2704 — 0104	——	L.S.	CLASS AA CEMENT CONCRETE, STA.727+68 TO STA.739+23 (APPROX. 1530 C.Y.)		48, A
2704 — 0105	——	L.S.	CLASS AA CEMENT CONCRETE, STA.727+67 TO STA.739+77 (APPROX. 1275 C.Y.)		48, A
2704 — 0106	——	L.S.	CLASS AA CEMENT CONCRETE, L.R. 120 & RAMP 'R' (APPROX. 882 C.Y.)		48, A
2704 — 0107	——	L.S.	CLASS AA CEMENT CONCRETE, STA.649+43 TO STA.654+75 (APPROX. 742 C.Y.)		48, A
2704 — 0108	——	L.S.	CLASS AA CEMENT CONCRETE, STA.695+04 TO STA.702+64 (APPROX. 1503 C.Y.)		48, A
2704 — 0109	——	L.S.	CLASS AA CEMENT CONCRETE, L.R. 120 & RAMPS R, S & T (APPROX. 1900 C.Y.)		48, A
2704 — 0110	——	L.S.	CLASS AA CEMENT CONCRETE, STA.726+26 TO STA.737+50 (APPROX. 1250 C.Y.)		48, A
2704 — 0111	——	L.S.	CLASS AA CEMENT CONCRETE, STA.728+89 TO STA.732+58 (APPROX. 634 C.Y.)		48, A

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D-9012 70-80

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ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
802—0001	134	C.Y.	TOPSOIL FURNISHED AND PLACED		45
804—0004	622	S.Y.	SEEDING AND SOIL SUPPLEMENTS—FORMULA C		45
2804—0004	——	L.S.	SEEDING AND SOIL SUPPLEMENTS—FORMULA C (APPROX. 19,360 S.Y.)		H A
804—0005	565	S.Y.	SEEDING AND SOIL SUPPLEMENTS — FORMULA D		45
805—0001	1,187	S.Y.	MULCHING-HAY		45
2805—0003	——	L.S.	MULCHING—WOOD CELLULOSE (APPROX. 19,360 S.Y.)		H A
845—0001	——	—	UNFORSEEN PROJECT WATER POLLUTION CONTROL (SOIL EROSION) (a)		NO TAB
855—0001	4,000	L.F.	BALED STRAW BARRIER		45 H
901—0001	——	L.S.	MAINTENANCE AND PROTECTION OF TRAFFIC DURING CONSTRUCTION		NO TAB B A
901—0055	——	—	RAILROAD CONSTRUCTION INSPECTION AND PROJECT COORDINATION SERVICES FOR BALTIMORE & OHIO RAILROAD (a)		A
901—0200	12	EA.	FLASHING ARROW BOARD		B A
2901—0200	4	EA.	CHANGEABLE MESSAGE SIGN		B A
2901—0001	116,640	L.F.	TEMPORARY PAVEMENT MARKING TAPE—YELLOW		B A
2901—0002	27,390	L.F.	TEMPORARY PAVEMENT MARKING TAPE—WHITE		B A
2901—0003	28,000	HRS.	OFF-DUTY UNIFORMED POLICEMAN		B A
2903—0550	——	L.S.	TEMPORARY CONNECTION NO. 1		B A
2903—0551	——	L.S.	TEMPORARY CONNECTION NO. 2		B A
2903—0552	——	L.S.	TEMPORARY CONNECTION NO. 3		B A
2903—0553	——	L.S.	TEMPORARY CONNECTION NO. 4		B A
2903—0554	——	L.S.	TEMPORARY CONNECTION NO. 5		B A
2903—0555	——	L.S.	TEMPORARY CONNECTION NO. 6		B A
2903—0556	——	L.S.	TEMPORARY CONNECTION NO. 7		B A
910—0001	45	EA.	JUNCTION BOXES, JB-1		C
910—0002	2	EA.	JUNCTION BOXES, JB-2		C
910—0004	1	EA.	JUNCTION BOXES, JB-11		C
910—0006	106	EA.	JUNCTION BOXES, JB-25		4B C
2910—0007	26	EA.	JUNCTION BOX, GALV. STEEL, SURFACE MOUNTED		C A

ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
2910-0146	1	EA.	POLE MOUNTING, TYPE SR-SP1		C A
2910—0147	1	EA.	POLE MOUNTING, TYPE SR-SP2		C A
2910—0148	4	EA.	POLE MOUNTING, TYPE BR-SP		C A
2910—0149	13	EA.	POLE MOUNTING, TYPE RW-SP		C A
2910—0150	13	EA.	POLE FOUNDATION, TYPE F-SP		C A
2910—0151	6	EA.	POLE FOUNDATION, TYPE C-SP		C A
910—0154	23	EA.	POLE FOUNDATION, TYPE FC		C
910—0322	17	EA	STEEL LIGHTING POLE WITH 6' BRACKET ARM (40' MH) TYPE A		C
910—0324	4	EA.	STEEL LIGHTING POLE WITH 8' BRACKET ARM (40'MH) TYPE A		C
910—0330	3	EA.	STEEL LIGHTING POLE WITH 15' BRACKET ARM (40'MH) TYPE A		C
910—0352	1	EA.	STEEL LIGHTING POLE WITH 20' BRACKET ARM (40'MH) TYPE S		C A
910—0350	1	EA.	STEEL LIGHTING POLE WITH 15' BRACKET ARM (40'MH) TYPE S		C A
910—0406	62	EA.	STEEL LIGHTING POLE WITH 10' BRACKET ARM (50'MH) TYPE A		C
2910—0407	1	EA.	STEEL LIGHTING POLE WITH TWIN BRACKET ARMS, TYPE A, SPECIAL		C A
910—0408	16	EA	STEEL LIGHTING POLE WITH 12' BRACKET ARM (50'MH) TYPE A		C
910—0410	6	EA.	STEEL LIGHTING POLE WITH 15' BRACKET ARM (50'MH) TYPE A		C
910—0412	7	EA.	STEEL LIGHTING POLE WITH 20' BRACKET ARM (50'MH) TYPE A		C
910—0413	1	EA	STEEL LIGHTING POLE WITH 25' BRACKET ARM (50'M.H.) TYPE A		C
910—0414	2	EA.	STEEL LIGHTING POLE WITH 30' BRACKET ARM (50'M.H.) TYPE A		C
910—0432	2	EA	STEEL LIGHTING POLE WITH 20' BRACKET ARM (50'MH) TYPE S		C A

ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
910—2828	47	EA.	250 WATT HIGH PRESSURE SODIUM LUMINAIRE, ARM MOUNT		C A
910—2830	77	EA.	400 WATT HIGH PRESSURE SODIUM LUMINAIRE, ARM MOUNT		C A
910—3091	29	EA.	150 WATT HIGH PRESSURE SODIUM UNDERPASS LUMINAIRE, OVERHEAD MOUNT		C A
910—4103	52,650	L.F.	AWG. 2 DIRECT BURIAL COPPER CABLE, 1 CONDUCTOR		C
910—4104	51,400	L.F.	AWG. 4 DIRECT BURIAL COPPER CABLE, 1 CONDUCTOR		C
910—4105	57,300	L.F.	AWG. 6 DIRECT BURIAL COPPER CABLE, 1 CONDUCTOR		C
910—4106	17,450	L.F.	AWG. 8 DIRECT BURIAL COPPER CABLE, 1 CONDUCTOR		C
910—5055	22,450	L.F.	2" DIRECT BURIAL CONDUIT		C
910—5172	1,800	L.F.	1 1/4" EXPOSED CONDUIT		C
910—5175	6,800	L.F.	2" EXPOSED CONDUIT		C A
910—5252	254	L.F.	1 1/4" CONDUIT IN STRUCTURE		4B
910—5255	23,952	L.F.	2" CONDUIT IN STRUCTURE		4B C A
910—5302	300	L.F.	1 1/4" WATERTIGHT FLEXIBLE GALV. STEEL CONDUIT		C
910—5305	350	L.F.	2" WATERTIGHT FLEXIBLE GALV. STEEL CONDUIT		C

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ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
910—5500	3	EA.	BURIED CABLE AND CONDUIT MARKER		C
910—6000	21,440	L.F.	TRENCH		C
910—7025	—	L.S.	COMPLETE POWER SUPPLY SYSTEM		C
910—7100	—	L.S.	COMPLETE TESTING OF ENTIRE POWER SUPPLY SYSTEM AND CONNECTIONS		C
910—7200	—	L.S.	COMPLETE TESTING OF ENTIRE LIGHTING SYSTEM AND CONNECTIONS		C
2910—7600	—	L.S.	REMOVE EXISTING LIGHTING SYSTEM		C, A
920—0001	—	L.S.	SIGN LIGHTING—ENTIRE PROJECT		E
2920—7600	—	L.S.	REMOVAL OF EXISTING SIGN LIGHTING, CABLE AND CONDUIT SYSTEM		E, A
EITHER 930—0002	65	S.F.	POST MOUNTED EXTRUDED ALUMINUM CHANNEL SIGNS, TYPE A, TYPE I	4	E
OR 930—0012	65	S.F.	FLAT SHEET ALUMINUM SIGNS WITH STIFFENERS, TYPE A, TYPE I		
2930—0001	500	EA.	TRAFFIC GUIDE POSTS, INSTALL & REMOVE		B, A
2930—0002	3,600	EA.	TRAFFIC GUIDE POST REPLACEMENT		B, A
931—0001	645	S.F.	POST MOUNTED SIGNS, TYPE B		G, E
2931—0001	24	S.F.	POST MOUNTED SIGNS, TYPE B, SPECIAL		E, A
2931—0002	24	S.F.	POST MOUNTED SIGNS, TYPE B, MODIFIED		E, A
2931—0003	2,000	S.F.	TRAFFIC CONTROL SIGNS, AS DIRECTED		B, A
931—0100	1	EA.	STEEL FLANGED CHANNEL BAR POSTS, 2.5 LBS.		E, A

ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
933—0001	203	S.F.	POST MOUNTED SIGNS, TYPE D		E
934—0001	161	S.F.	POST MOUNTED EXTRUDED ALUMINUM CHANNEL SIGNS, TYPE E		E
2934—0001	35	S.F.	POST MOUNTED EXTRUDED ALUMINUM CHANNEL SIGNS, TYPE E, MODIFIED		E, A
EITHER 936—0001	7600	S.F.	STRUCTURE MOUNTED EXTRUDED ALUMINUM CHANNEL SIGNS	5	E
OR 936—0200	7600	S.F.	STRUCTURE MOUNTED FLAT SHEET ALUMINUM SIGNS		
EITHER 2936—0001	1470	S.F.	STRUCTURE MOUNTED EXTRUDED ALUMINUM CHANNEL SIGNS	6	E, A
OR 2936—0200	1470	S.F.	STRUCTURE MOUNTED FLAT SHEET ALUMINUM SIGNS		
937—0001	18	EA.	REFLECTIVE UNITS—WHITE		G
937—0060	25	EA.	REFLECTIVE UNITS—AMBER		G
2937—0001	211	EA.	REFLECTIVE UNITS—WHITE, BARRIER MOUNTED		G, A
2937—0060	207	EA.	REFLECTIVE UNITS—AMBER, BARRIER MOUNTED		G, A
938—0001	1	EA.	MILEAGE MARKER UNITS		E
2938—0001	2	EA.	MILEAGE MARKER UNITS, SPECIAL		E, A
940—0260	305	LBS	STEEL S OR W BEAM POSTS, BREAKAWAY, TYPE I		E
941—0050	43	EA.	STEEL FLANGED CHANNEL BAR POSTS, 1.12 LB.		G
2947—0200	—	L.S.	REMOVE ALUMINUM SIGN STRUCTURE-SPAN, L.R.766 STA.1097+70 W.B.		E, A
2947—0201	—	L.S.	REMOVE ALUMINUM SIGN STRUCTURE-SPAN, L.R.764 STA.635+70 W.B.		E, A
2947—0202	—	L.S.	REMOVE ALUMINUM SIGN STRUCTURE-SPAN, L.R.764 STA.660+45 W.B.		E, A
2947—0203	—	L.S.	REMOVE ALUMINUM SIGN STRUCTURE-SPAN, L.R.764 STA.669+95 W.B.		E, A

ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
948—0001	—	L.S.	STEEL SIGN STRUCTURE—SPAN, L.R.766, STA.1097+76.12 W.B.		E
2948—0001	—	L.S.	STEEL SIGN STRUCTURE—SPAN, L.R.764, STA.631+40.40 W.B.		E, A
948—0002	—	L.S.	STEEL SIGN STRUCTURE—SPAN, L.R.764, STA.635+77.50 W.B.		E
2948—0002	—	L.S.	STEEL SIGN STRUCTURE—SPAN, L.R.764, STA.660+56.50 W.B.		E, A
948—0003	—	L.S.	STEEL SIGN STRUCTURE—SPAN, L.R.764, STA.641+16.75 W.B.		E
2948—0003	—	L.S.	STEEL SIGN STRUCTURE—SPAN, L.R.764, STA.681+01.14 W.B.		E, A
948—0004	—	L.S.	STEEL SIGN STRUCTURE—SPAN, L.R.764, STA.726+00 E.B.		E
948—0005	—	L.S.	STEEL SIGN STRUCTURE—SPAN, L.R.764, STA.725+49 RAMP S		E
948—0006	—	L.S.	STEEL SIGN STRUCTURE—SPAN, L.R.764, STA.739+96.50 W.B.		E
948—0007	—	L.S.	STEEL SIGN STRUCTURE—SPAN, L.R.764, STA 752+.19		E
2948—0200	—	L.S.	REMOVE STEEL SIGN STRUCTURE—SPAN, L.R.764, STA.631+45 W.B.		E, A
2948—0201	—	L.S.	REMOVE STEEL SIGN STRUCTURE—SPAN, L.R.764, STA.641+14 W.B.		E, A
2948—0202	—	L.S.	REMOVE STEEL SIGN STRUCTURE—SPAN, L.R.764, STA.725+97.5 E.B.		E, A
2948—0203	—	L.S.	REMOVE STEEL SIGN STRUCTURE—SPAN, L.R.764, STA 740+15 W.B.		E, A
948—0300	—	L.S.	STEEL SIGN STRUCTURE—CANTILEVER, L.R.766, STA.1100+76, RAMP B4		E
948—0301	—	L.S.	STEEL SIGN STRUCTURE—CANTILEVER, L.R.764, STA.646+25 RAMP F		E
948—0302	—	L.S.	STEEL SIGN STRUCTURE—CANTILEVER, L.R.764, STA.652+11.5 E.B.		E
948—0303	—	L.S.	STEEL SIGN STRUCTURE—CANTILEVER, L.R.764, STA.655+89.5 W.B.		E
948—0304	—	L.S.	STEEL SIGN STRUCTURE—CANTILEVER, L.R.764, STA.670+07 E.B.		E
948—0305	—	L.S.	STEEL SIGN STRUCTURE—CANTILEVER, L.R.764, STA.673+96.5 W.B.		E
948—0306	—	L.S.	STEEL SIGN STRUCTURE—CANTILEVER, L.R.764, STA.676+11 E.B.		E
948—0307	—	L.S.	STEEL SIGN STRUCTURE—CANTILEVER, L.R.764, STA.684+80 E.B.		E
948—0308	—	L.S.	STEEL SIGN STRUCTURE—CANTILEVER, L.R.764, STA.685+83 BLVD. OF ALLIES		E
948—0309	—	L.S.	STEEL SIGN STRUCTURE—CANTILEVER, L.R.764, STA.690+90.5 W.B.		E
948—0310	—	L.S.	STEEL SIGN STRUCTURE—CANTILEVER, L.R.764, STA.700+13 W.B.		E
948—0311	—	L.S.	STEEL SIGN STRUCTURE—CANTILEVER, L.R.764, STA.699+65 E.B.		E
948—0312	—	L.S.	STEEL SIGN STRUCTURE—CANTILEVER, L.R.764, STA.707+01.5 W.B.		E
948—0313	—	L.S.	STEEL SIGN STRUCTURE—CANTILEVER, L.R.764, STA.711+76 E.B.		E

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ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
948—0314	——	L.S.	STEEL SIGN STRUCTURE — CANTILEVER, L.R.764 STA.734+00 BLVD. OF ALLIES W.B		E
948—0315	——	L.S.	STEEL SIGN STRUCTURE — CANTILEVER, L.R.764 STA.747+13 LT.		E
948—0316	——	L.S.	STEEL SIGN STRUCTURE — CANTILEVER, L.R.764 STA.759+97 LT.		E
2948—0500	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CANTILEVER, L.R.766 STA.1100+76 RAMP Bu		E, A
2948—0501	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CANTILEVER, L.R.764 STA.631+25 W.B. LT.		E, A
2948—0502	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CANTILEVER, L.R.764 STA.646+25 RAMP F		E, A
2948—0503	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CANTILEVER, L.R.764 STA.652+00.5 E.B.		E, A
2948—0504	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CANTILEVER, L.R.764 STA.655+89.5 W.B.		E, A
2948—0505	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CANTILEVER, L.R.764 STA.671+26.50 E.B.		E, A
2948—0506	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CANTILEVER, L.R.764 STA.684+90.50 E.B.		E, A
2948—0507	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CANTILEVER, L.R.764 STA.695+10 W.B.		E, A
2948—0508	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CANTILEVER, L.R.764 STA.699+81.5 W.B.		E, A
2948—0509	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CANTILEVER, L.R.764 STA.728+00 W.B.		E, A
2948—0510	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CANTILEVER, L.R.764. STA.747+28 LT.		E, A
2948—0511	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CANTILEVER, L.R.764 STA.749+90 LT.		E, A
948—0600	——	L.S.	STEEL SIGN STRUCTURE — CENTERMOUNT, L.R.764 STA.723+74.5 E.B.		E
948—0601	——	L.S.	STEEL SIGN STRUCTURE — CENTERMOUNT, L.R.764 STA.729+83.50 W.B.		E
2948—0800	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CENTERMOUNT, L.R.764 STA.651+50 RAMP E		E, A
2948—0801	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CENTERMOUNT, L.R.764 STA.653+82 RAMP E		E, A
2948—0802	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CENTERMOUNT, L.R.764 STA.656+75 RAMP E		E, A
2948—0803	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CENTERMOUNT, L.R.764 STA.656+00 E.B.		E, A
2948—0804	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CENTERMOUNT, L.R.764 STA.672+95 E.B.		E, A
2948—0805	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CENTERMOUNT, L.R.764 STA.706+90 W.B.		E, A
2948—0806	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CENTERMOUNT, L.R.764 STA.712+70 E.B.		E, A
2948—0807	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CENTERMOUNT, L.R.764 STA.723+74.50 E.B.		E, A
2948—0808	——	L.S.	REMOVE STEEL SIGN STRUCTURE — CENTERMOUNT, L.R.764 STA.761+88 LT.		E, A

Traffic Lines change on all sheets

ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
2950—0001	——	L.S.	TRAFFIC SIGNAL — TEMPORARY		B, A
2960—0003	63,581	L.F.	6" WHITE EPOXY RESIN PAVEMENT MARKER		D, A
2960—0004	39,011	L.F.	6" YELLOW EPOXY RESIN PAVEMENT MARKER		D, A
2960—0011	1,770	L.F.	12" WHITE EPOXY RESIN PAVEMENT MARKER		D, A
2960—0015	817	L.F.	24" WHITE EPOXY RESIN PAVEMENT MARKER		D, A
2960—0050	11	EA.	WHITE EPOXY RESIN PAVEMENT LEGEND, STRAIGHT ARROW, 9'-4" x 3'-8"		D, A
2960—0054	1	EA.	WHITE EPOXY RESIN PAVEMENT LEGEND, THRU AND LEFT ARROW, 13'-4" x 8'-0"		D, A
1001—0500	39	EA.	LIGHTING POLE ANCHORAGE		48
1001—0611	585	L.F.	6" STRUCTURE FOUNDATION DRAIN		48
1002—0001	613,189	LBS.	REINFORCEMENT BARS		49, E
1002—0002	——	L.S.	REINFORCEMENT BARS, STA.728+89 TO STA. 732+58 (APPROX. 2,410 LBS.)		49
1002—0003	——	L.S.	REINFORCEMENT BARS, L.R.120 & RAMPS 'R','S', & 'T' (APPROX. 4,365 LBS.)		49
1002—0004	——	L.S.	REINFORCEMENT BARS, STA.727+38 TO STA. 727+92 (APPROX. 21,460 LBS.)		49
1002—0053	167,271	LBS.	REINFORCEMENT BARS, EPOXY COATED		49, E A
1002—0054	——	L.S.	REINFORCEMENT BARS, EPOXY COATED, STA.668+33 TO STA.685+77 (APPROX. 690,000 LBS.)		49, A
1002—0055	——	L.S.	REINFORCEMENT BARS, EPOXY COATED, STA.677+68 TO STA.680+44 (APPROX. 63,700 LBS.)		49, A
1002—0056	——	L.S.	REINFORCEMENT BARS, EPOXY COATED, STA.727+38 TO STA.727+92 (APPROX. 20,093 LBS.)		49, A
1002—0057	——	L.S.	REINFORCEMENT BARS, EPOXY COATED, L.R.120 & RAMP 'U' (APPROX. 111,500 LBS.)		49, A
1002—0058	——	L.S.	REINFORCEMENT BARS, EPOXY COATED, STA.727+68 TO STA. 739+23 (APPROX. 296,831 LBS.)		49, A
1002—0059	——	L.S.	REINFORCEMENT BARS, EPOXY COATED, STA.727+67 TO STA. 739+77 (APPROX. 249,200 LBS.)		49, A
1002—0060	——	L.S.	REINFORCEMENT BARS, EPOXY COATED, L.R.120 & RAMP 'R' (APPROX. 145,462 LBS.)		49, A
1002—0061	——	L.S.	REINFORCEMENT BARS, EPOXY COATED, STA.649+43 TO STA. 654+75 (APPROX. 141,600 LBS.)		49, A
1002—0062	——	L.S.	REINFORCEMENT BARS, EPOXY COATED, STA.695+04 TO STA. 702+64 (APPROX. 311,200 LBS.)		49, A
1002—0063	——	L.S.	REINFORCEMENT BARS, EPOXY COATED, L.R.120 & RAMPS 'R','S', & 'T' (APPROX. 425,863 LBS.)		49, A
1002—0064		L.S.	REINFORCEMENT BARS, EPOXY COATED, STA.726+26 TO STA.737+50 (APPROX. 249,910 LBS.)		49, A
1002—0065	——	L.S.	REINFORCEMENT BARS, EPOXY COATED, STA.728+89 TO STA.732+58 (APPROX. 103,150 LBS.)		49, A
1003—0002	24	EA.	DOWEL HOLES, 6" DEPTH		E
1003—0003	48	EA.	DOWEL HOLES, 8" DEPTH		E

ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
1003—0005	775	EA.	DOWEL HOLES, 12" DEPTH		49 E
1003—0006	8	EA.	DOWEL HOLES, 14" DEPTH		E
1003—0008	1,349	EA.	DOWEL HOLES, 18" DEPTH		49, E
1003—0011	86	EA.	DOWEL HOLES, 24" DEPTH		49, E
2003—0012	16	EA.	DOWEL HOLES, 26" DEPTH		E A
2003—0014	65	EA.	DOWEL HOLES, 30" DEPTH		49, E A
2003—0019	77	EA.	DOWEL HOLES, 40" DEPTH		49, A
2003—0027	8	EA.	DOWEL HOLES, 56" DEPTH		E A
1012—0001	511	L.F.	PEDESTRIAN RAILING		49
2018—0150	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUPERSTRUCTURE, STA.668+33 TO STA.685+77		50, A
2018—0151	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUPERSTRUCTURE, STA.677+68 TO STA.680+44		50, A
2018—0152	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUPERSTRUCTURE, STA.727+38 TO STA.727+92		50, A
2018—0153	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUPERSTRUCTURE, L.R.120 & RAMP 'U'		50, A
2018—0154	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUPERSTRUCTURE, STA.727+68 TO STA.739+23		50, A
2018—0155	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUPERSTRUCTURE, STA.727+67 TO STA.739+77		50, A
2018—0156	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUPERSTRUCTURE, L.R.120 & RAMP 'R'		50, A
2018—0157	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUPERSTRUCTURE, STA.649+43 TO STA.654+75		50, A
2018—0158	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUPERSTRUCTURE, STA.695+04 TO STA.702+64		50, A
2018—0159	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUPERSTRUCTURE, L.R.120 & RAMPS 'R','S', & 'T'		50, A
2018—0160	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUPERSTRUCTURE, STA.726+26 TO STA.737+50		50, A
2018—0161	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUPERSTRUCTURE, STA.728+89 TO STA.732+58		50, A
2018—0162	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUPERSTRUCTURE, L.R.766 STA.1097+76.12 W.B.		E, A
2018—0163	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUPERSTRUCTURE, L.R.766 STA.1100+76 RAMP Bu		E, A
2018—0175	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUBSTRUCTURE, STA.668+33 TO STA.685+77		50, A
2018—0176	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUBSTRUCTURE, STA.677+68 TO STA.680+44		50, A
2018—0177	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUBSTRUCTURE, STA.727+38 TO STA.727+92		50, A
2018—0178	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUBSTRUCTURE, L.R.120 & RAMP 'U'		50, A

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ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
2018—0179	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUBSTRUCTURE, STA.727+68 TO 739+23		50, Ⓐ
2018—0180	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUBSTRUCTURE, STA.727+67. TO STA. 739+77.		50, Ⓐ
2018—0181	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUBSTRUCTURE, L.R. 120 & RAMP 'R'		50, Ⓐ
2018—0182	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUBSTRUCTURE, STA.649+43 TO STA.654+75.		50, Ⓐ
2018—0183	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUBSTRUCTURE, STA.695+04 TO STA. 702+64		50, Ⓐ
2018—0184	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUBSTRUCTURE, L.R.120 & RAMPS 'R' 'S' & 'T'		50, Ⓐ
2018—0185	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUBSTRUCTURE, STA.726+26 TO STA.737+50		50, Ⓐ
2018—0186	——	L.S.	REMOVAL OF PORTION OF EXISTING BRIDGE SUBSTRUCTURE, STA.728+89 TO STA.732+58		50, Ⓐ
2018—0425	——	L.S.	REMOVAL OF PORTION OF EXISTING MISC. STRUCTURE, L.R.764 STA.646+25 RAMP F		Ⓔ, Ⓐ
2018—0475	——	L.S.	REMOVAL OF PORTION OF EXISTING RET'G WALLS, STA.655+04 TO STA.660+76.66 RAMP F		50, Ⓐ
2018—0476	——	L.S.	REMOVAL OF PORTION OF EXISTING RETAINING WALL, L.R.766 STA.1097+76.12 W.B.		Ⓔ, Ⓐ
2018—0477	——	L.S.	REMOVAL OF PORTION OF EXISTING RETAINING WALL, L.R.764 STA.631+40.4 W.B.		Ⓔ, Ⓐ
2018—0478	——	L.S.	REMOVAL OF PORTION OF EXISTING RETAINING WALL, L.R.764 STA.641+16.75 W.B.		Ⓔ, Ⓐ
2018—0479	——	L.S.	REMOVAL OF PORTION OF EXISTING RETAINING WALL, L.R.764 STA.655+89.5 W.B		Ⓔ, Ⓐ
2018—0480	——	L.S.	REMOVAL OF PORTION OF EXISTING RETAINING WALL, L.R.764 STA.660+56.5 W.B., RT.		Ⓔ, Ⓐ
2018—0481	——	L.S.	REMOVAL OF PORTION OF EXISTING RETAINING WALL, L.R.764 STA.726+00 E.B.		Ⓔ, Ⓐ
2018—0482	——	L.S.	REMOVAL OF PORTION OF EXISTING RETAINING WALL, L.R.764 STA.660+56.5 W.B., LT.		Ⓔ, Ⓐ
1019—0002	57,307	S.Y.	PROTECTIVE COATING FOR REINFORCED CONCRETE SURFACES (a)		50
1021—0002	1,027	L.F.	ARMORED PREFORMED NEOPRENE COMPRESSION DAM, 1" MOVEMENT		51, Ⓐ
1021—0003	2,086	L.F.	AROMORED PREFORMED NEOPRENE COMPRESSION DAM, 1 1/2" MOVEMENT		51, Ⓐ
1021—0004	356	L.F.	ARMORED PREFORMED NEOPRENE COMPRESSION DAM, 2" MOVEMENT		51, Ⓐ

ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
1056—0001	——	L.S.	FABRICATED STRUCTURAL STEEL, STA.668+33 TO STA. 685+77 (APPROX. 17,000 LBS.)		51, Ⓐ
1056—0002	——	L.S.	FABRICATED STRUCTURAL STEEL, STA.677+68 TO STA. 680+44 (APPROX. 4,500 LBS.)		51, Ⓐ
1056—0003	——	L.S.	FABRICATED STRUCTURAL STEEL, STA.727+38 TO STA. 727+92 (APPROX. 1,000 LBS.)		51, Ⓐ
1056—0004	——	L.S.	FABRICATED STRUCTURAL STEEL, L.R. 120 & RAMP "U" (APPROX. 17,300 LBS.)		51, Ⓐ
1056—0005	——	L.S.	FABRICATED STRUCTURAL STEEL, STA.727+68 TO STA.739+23 (APPROX. 2,310 LBS.)		51, Ⓐ
1056—0006	——	L.S.	FABRICATED STRUCTURAL STEEL, STA.727+67 TO STA. 739+77 (APPROX. 23,000 LBS.)		51, Ⓐ
1056—0007	——	L.S.	FABRICATED STRUCTURAL STEEL, L.R. 120 & RAMP "R" (APPROX. 11,300 LBS.)		51, Ⓐ
1056—0008	——	L.S.	FABRICATED STRUCTURAL STEEL, STA.649+43 TO STA. 654+75 (APPROX. 1,100 LBS.)		51, Ⓐ
1056—0009	——	L.S.	FABRICATED STRUCTURAL STEEL, STA.695+04 TO STA.702+64 (APPROX. 7,500 LBS.)		51, Ⓐ
1056—0010	——	L.S.	FABRICATED STRUCTURAL STEEL, L.R. 120 & RAMPS "R", "S" & "T" (APPROX. 17,216 LBS.)		51, Ⓐ
1056—0011	——	L.S.	FABRICATED STRUCTURAL STEEL, STA.726+26 TO STA.737+50 (APPROX. 7,800 LBS.)		51, Ⓐ
1056—0012	——	L.S.	FABRICATED STRUCTURAL STEEL, STA. 728+89 TO STA. 732+58 (APPROX. 19,080 LBS.)		51, Ⓐ
1056—0100	53,305	LBS.	FABRICATED STRUCTURAL STEEL		Ⓔ, Ⓐ
2056—0360	3,958	L.F.	DOWNSPOUTING, SPECIAL		51, Ⓐ
2056—0425	2,560	EA.	RIVET HEAD BUILD-UP		51, Ⓐ
1075—0001	——	L.S.	PAINTING EXISTING BRIDGE, STA.668+33 TO STA. 685+77		51, Ⓐ
1075—0002	——	L.S.	PAINTING EXISTING BRIDGE, STA.677+68 TO STA. 680+44		51, Ⓐ
1075—0003	——	L.S.	PAINTING EXISTING BRIDGE, STA. 727+38 TO STA. 727+92		51, Ⓐ
1075—0004	——	L.S.	PAINTING EXISTING BRIDGE, L.R. 120 & RAMP "U"		51, Ⓐ
1075—0005	——	L.S.	PAINTING EXISTING BRIDGE, STA.727+68 TO STA.739+23		51, Ⓐ
1075—0006	——	L.S.	PAINTING EXISTING BRIDGE, STA.727+67 TO STA.739+77		51, Ⓐ
1075—0007	——	L.S.	PAINTING EXISTING BRIDGE, L.R. 120 & RAMP "R"		51, Ⓐ
1075—0008	——	L.S.	PAINTING EXISTING BRIDGE, STA.649+43 TO STA.654+75		51, Ⓐ
1075—0009	——	L.S.	PAINTING EXISTING BRIDGE, STA.695+04 TO STA.702+64		51, Ⓐ
1075—0010	——	L.S.	PAINTING EXISTING BRIDGE, L.R. 120 & RAMPS "R", "S" & "T"		52, Ⓐ
1075—0011	——	L.S.	PAINTING EXISTING BRIDGE, STA.726+26 TO STA.737+50		52, Ⓐ
1075—0012	——	L.S.	PAINTING EXISTING BRIDGE, STA.728+89 TO STA.732+58		52, Ⓐ

ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
1090—0050	72	EA.	RESET EXPANSION BEARINGS		52, Ⓐ
1090—0060	53	EA.	REPLACE EXPANSION BEARINGS		52, Ⓐ
1090—0074	6	EA.	RESET FIXED BEARINGS		52, Ⓐ
1090—0076	118	EA.	REPLACE FIXED BEARINGS		52, Ⓐ
2000—0001	11,678	TONS	BLOCK TRIMMING AND SCALING EXISTING SLOPES		Ⓗ, Ⓐ
2000—0002	30	C.Y.	DENTAL CONCRETE		Ⓗ, Ⓐ
2000—0003	1,584	S.Y.	CONCRETE BAND		Ⓗ, Ⓐ
2000—0004	225	S.Y.	WIRE MESH SLOPE TREATMENT		Ⓗ, Ⓐ
2000—0005	1,165	L.F.	ROCK PROTECTION FENCE		Ⓗ, Ⓐ
2000—0006	50	EA.	ROCK BOLTS		Ⓗ, Ⓐ
2000—0008	4,049	S.Y.	SLOPE TRIMMING BY SMOOTH-WALL BLASTING		Ⓗ, Ⓐ
2000—0009	——	L.S.	SMOOTH-WALL BLASTING TEST		Ⓗ, Ⓐ
2000—0011	16,965	L.F.	WALL ADJUSTMENT		39, Ⓐ
2000—0012	23	EA.	LIGHTING POLE ANCHORAGE ON WALL ADJUSTMENT		39, Ⓐ
2000—0030	——	L.S.	REPAIR OF EXISTING FACILITIES		NO TAB Ⓐ
2000—0090	——	L.S.	REPAIR SHEETING WALL		NO TAB Ⓐ
2000—0098	530	L.F.	FILL SHOULDER WIDENING, TYPE 1		45, Ⓐ
2000—0099	50	L.F.	FILL SHOULDER WIDENING, TYPE 2		45, Ⓐ

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ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
2000—0100	2,515	C.F.	CLASS AA CEMENT CONCRETE, SPECIAL		52 Ⓐ
2000—0101	——	L.S.	REMOVE, STORE & RESET IMPACT ATTENUATOR, STA.680+75		52 Ⓐ
2000—0102	——	L.S.	REMOVE, STORE & RESET IMPACT ATTENUATOR, STA.727+00		52 Ⓐ
2000—0103	——	L.S.	REMOVE, STORE & RESET IMPACT ATTENUATOR, STA.727+45		52 Ⓐ
2000—0104	——	L.S.	REMOVE, STORE & RESET IMPACT ATTENUATOR, STA.726+50		52 Ⓐ
2000—0105	——	L.S.	REMOVE, STORE & RESET IMPACT ATTENUATOR, STA.657+ W.B.		45 Ⓐ
2000—0106	7	EA.	STRINGER SHORTENING		52 Ⓐ
2000—0107	5	EA.	HINGE CLEANING AND PAINTING		52 Ⓐ
2000—0108	1,900	EA.	REMOVAL OF TACK WELDS, STA.668+33 TO STA.685+77		52 Ⓐ
2000—0109	200	EA.	REMOVAL OF TACK WELDS, STA.677+68 TO STA.680+44		52 Ⓐ
2000—0110	800	EA.	REMOVAL OF TACK WELDS, STA.727+68 TO STA.739+23		52 Ⓐ
2000—0111	700	EA.	REMOVAL OF TACK WELDS, STA.727+67 TO STA.739+77		52 Ⓐ
2000—0112	500	EA.	REMOVAL OF TACK WELDS, STA.695+04 TO STA.702+64		52 Ⓐ
2000—0113	1,560	EA.	REMOVAL OF TACK WELDS, L.R.120 & RAMPS 'R', 'S' & 'T'		53 Ⓐ
2000—0114	1,560	EA.	REMOVAL OF TACK WELDS, STA.726+26 TO STA.737+50		53 Ⓐ
2000—0115	370	L.F.	JOINT REPAIRS		53 Ⓐ
2000—0116	20,000	LBS.	FABRICATED STR. STEEL REPAIRS, STA.668+33 TO STA.685+77		53 Ⓐ
2000—0117	2,000	LBS.	FABRICATED STR. STEEL REPAIRS, STA.677+68 TO STA.680+44		53 Ⓐ
2000—0118	1,000	LBS.	FABRICATED STR. STEEL REPAIRS, STA.727+38 TO STA.727+92		53 Ⓐ
2000—0119	3,000	LBS.	FABRICATED STR. STEEL REPAIRS, L.R.120 & RAMP 'U'		53 Ⓐ
2000—0120	7,000	LBS.	FABRICATED STR. STEEL REPAIRS, STA.727+68 TO STA.739+23		53 Ⓐ
2000—0121	9,000	LBS.	FABRICATED STR. STEEL REPAIRS, STA.727+67 TO STA.739+77		53 Ⓐ
2000—0122	2,300	LBS.	FABRICATED STR. STEEL REPAIRS, L.R. 120 & RAMP 'R'		53 Ⓐ
2000—0123	4,000	LBS.	FABRICATED STR. STEEL REPAIRS, STA.649+43 TO STA.654+75		53 Ⓐ
2000—0124	9,000	LBS.	FABRICATED STR. STEEL REPAIRS, STA.695+04 TO STA.702+64		53 Ⓐ
2000—0125	3,500	LBS.	FABRICATED STR. STEEL REPAIRS, L.R.120 & RAMPS 'R', 'S' & 'T'		53 Ⓐ
2000—0126	1,600	LBS.	FABRICATED STR. STEEL REPAIRS, STA.726+26 TO STA.737+50		53 Ⓐ

ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
2000—0127	3,800	LBS.	FABRICATED STR. STEEL REPAIRS, STA.728+89 TO STA.732+58		53 Ⓐ
2000—0128	45	C.F.	CRACK REPAIR, EPOXY INJECTION		53 Ⓐ
2000—0129	135	L.F.	CRACK REPAIR, TYPE A		53 Ⓐ
2000—0130	4	EA.	RESET BEARING		53 Ⓐ
2000—0200	300	EA.	WEEPHOLE RELOCATION		53 Ⓐ
2000—0201	2	EA.	SLUICE GATE		53 Ⓐ
2000—0202	——	L.S.	CATWALK, STAIR RAILING AND PROTECTIVE RAILING, WALL B		53 Ⓐ
2000—0203	——	L.S.	CATWALK, STAIR RAILING AND PROTECTIVE RAILING, WALL C		54 Ⓐ
2000—0131	2,560	EA.	REPLACE RIVETS WITH HIGH STRENGTH BOLTS		54 Ⓐ
2000—0210	132	L.F.	6" DUCTILE IRON PIPE, FOR POTABLE WATER		Ⓕ Ⓐ
2000—0211	209	L.F.	6" DUCTILE IRON PIPE, FOR STORM SEWERS		40 Ⓕ Ⓐ
2000—0212	1,864	L.F.	18" DUCTILE IRON PIPE, FOR STORM SEWERS		Ⓕ Ⓐ
2000—0213	——	L.S.	STANWIX STREET SUMP		Ⓕ Ⓐ
2000—0214	——	L.S.	WOOD STREET SUMP		Ⓕ Ⓐ
2000—0215	2	EA.	6"x6" TAPPING TEE WITH 6" GATE VALVE AND BOX		Ⓕ Ⓐ
2000—0216	2	EA.	FIRE HYDRANT		Ⓕ Ⓐ
2000—0217	2	EA.	STORM PUMP WITH TRAILER		Ⓕ Ⓐ
2000—0218	391	L.F.	REMOVE EXISTING MALLEABLE IRON RAILING		Ⓕ Ⓐ
2000—0219	3	EA.	ENERGY ABSORBING CRASH BARRIER, TYPE 2		54, 45 Ⓕ Ⓐ
2000—0220	20,458	C.Y.	SPECIAL EXCAVATION, (FLOODWALL)		Ⓕ Ⓐ
2000—0300	——	L.S.	REMOVE EXISTING SECONDARY SIGNING		Ⓔ Ⓐ
2000—0301	——	L.S.	VARIABLE MESSAGE SIGN (ROTATING DRUM) — L.R.764 STA.660+56 W.B.-FAB. & ERECT. OF SIGNS, ELECTRICAL COMPONENTS & CONTROL CONSOLE		Ⓔ Ⓐ
2000—0302	——	L.S.	VARIABLE MESSAGE SIGN (ROTATING DRUM) — L.R.764 STA.681+01 W.B.-FAB. & ERECT. OF SIGNS, ELECTRICAL COMPONENTS & CONTROL CONSOLE		Ⓔ Ⓐ
2000—0303	——	L.S.	VAR. MESSAGE SIGN — SPARE PARTS KIT		Ⓔ Ⓐ
2000—0304	93	S.F.	FLAT SHEET ALUMINUM SIGN OVERLAY		Ⓔ Ⓐ
2000—0305	——	L.S.	REPLACE EXISTING CENTERMOUNT STRUTS, L.R.764 STA.633+75 RAMP 'N'		Ⓔ Ⓐ
2000—0306	——	L.S.	CUT & CAP EXISTING CANTILEVER STRUTS, L.R.764 STA.641+15 RAMP D		Ⓔ Ⓐ
2000—0307	——	L.S.	REMOVE BRIDGE ATTACHED SIGN, L.R.764 STA.646+25 W.B.		Ⓔ Ⓐ
2000—0308	——	L.S.	REMOVE BRIDGE ATTACHED SIGNS, L.R.764 STA.652+69 W.B.		Ⓔ Ⓐ
2000—0309	——	L.S.	REMOVE ALTER & REPLACE EXISTING STEEL RAILING, L.R.766 STA.1097+76.12 W.B.		Ⓔ Ⓐ
2000—0310	——	L.S.	REMOVE ALTER & REPLACE EXISTING STEEL RAILING, L.R.764 STA.631+40.4 W.B.		Ⓔ Ⓐ

ITEM NO.	QTY.	UNIT	DESCRIPTION	ALT.	TAB ON SHEET
2000—0311	——	L.S.	REMOVE, ALTER & REPLACE EXISTING STEEL RAILING, L.R.764 STA.641+16.75 W.B.		Ⓔ Ⓐ
2000—0312	——	L.S.	REMOVE, AND REPLACE EXISTING STEEL RAILING, L.R.764 STA.652+69 W.B.		Ⓔ Ⓐ
2000—0313	——	L.S.	SIGN STRUCTURE FOUNDATION L.R.764 STA.700+13 W.B.		Ⓔ Ⓐ
2000—0400	16	EA.	EACH MANUAL CORD		Ⓑ Ⓐ
2000—0401	7	EA.	TEMPORARY IMPACT ATTENUATORS		Ⓑ Ⓐ
2000—0402	——	——	REPAIR TEMPORARY IMPACT ATTENUATORS		Ⓑ Ⓐ
2000—0403	14	EA.	RESET TEMPORARY IMPACT ATTENUATORS		Ⓑ Ⓐ
2000—0410	4	EA.	CONST. ZONE-G.R.E.A.T. IMPACT ATTENUATORS		Ⓑ Ⓐ
2000—0411	——	——	REPAIR OF CONSTRUCTION ZONE — G.R.E.A.T. IMPACT ATTENUATORS		Ⓑ Ⓐ
2000—0413	2	EA.	RESET CONSTRUCTION ZONE-G.R.E.A.T. IMPACT ATTENUATORS		Ⓑ Ⓐ
2000—0500	——	L.S.	TRANSPORTATION SYSTEM MANAGEMENT IMPROVEMENTS		Ⓛ Ⓐ
2000—0501	——	L.S.	TRANSPORTATION SYSTEM MANAGEMENT CRAFT AVE.		Ⓐ
2000—0502	——	L.S.	TRANSPORTATION SYSTEM MANAGEMENT FT. PITT BLVD.		Ⓐ
2000—0503	——	L.S.	TRANSPORTATION SYSTEM MANAGEMENT BLVD. OF THE ALLIES		Ⓐ
2999—9999	33,000	HRS.	TRAINEES		NO TAB

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DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764	19	23 of 76
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY

TABULATION OF DRAINAGE ITEMS

SHEET 1 OF 11

PLAN SHEET NUMBER	ITEM NUMBERS		18" RCCP CLASS III	24" RCCP CLASS III	8" VITRIFIED CLAY PIPE	PIPE ALTERNATE (2)	PIPE ALTERNATE (3)	CLEANING EXISTING PIPE CULVERTS	18" RCCP CLASS III (OPEN JOINTS)	CLASS A CEMENT CONC.
			0052	601 0054	0642	601 0667 0015	2601 3642 4442	601 5900	604 0102	704 0002
	UNIT		L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	C.Y.
	LR. 764 WESTBOUND									
58	647 + 50 RT.	TYPE 4' SPEC. INLET								
58	648 + 84 RT.	TYPE 4' SPEC. INLET								
58	653 + 00 RT.	TYPE 4' SPEC. INLET								
58	654 + 24 RT.	TYPE 4' SPEC. INLET								
58	655 + 00 RT.	TYPE A MANHOLE								
59	655 + 33 LT.	TYPE 4' SPEC. INLET								
59	656 + 98 RT.	TYPE A MANHOLE								
59	657 + 40 LT.	TYPE 4' SPEC. INLET								
59	658 + 46 LT.	TYPE 4' SPEC. INLET								
59	659 + 50 LT.	TYPE 4' SPEC. INLET								
59	660 + 67 LT.	TYPE 4' SPEC. INLET								
59	662 + 00 LT.	TYPE 4' SPEC. INLET								
59	663 + 34 LT.	TYPE 4' SPEC. INLET								
59	665 + 17 LT.	TYPE 4' SPEC. INLET								
59	666 + 75 LT.	TYPE 4' SPEC. INLET								
61	687 + 66 LT.	TYPE 4' SPEC. INLET								
61	689 + 40 LT.	TYPE 4' SPEC. INLET								
61	690 + 80 LT.	TYPE 4' SPEC. INLET								
62	692 + 09 LT.	TYPE 4' SPEC. INLET								
62	693 + 09 LT.	TYPE 4' SPEC. INLET								
62	694 + 21 LT.	TYPE 4' SPEC. INLET								
62	695 + 00 LT.	TYPE 4' SPEC. INLET								
62	695 + 76 LT.	TYPE 4' SPEC. INLET								
62	697 + 16 – 697 + 40 RT.	REMOVAL PIPE CULVERT & TYPE 4' SPEC. INLET								
62	697 + 36 RT.	REMOVAL OF TYPE A MANHOLE								
62	697 + 23 – 697 + 40 RT.	TYPE M INLET & PIPE CULVERT	19							
	SUB-TOTAL		19							

ITEM NUMBERS	CLASS OF BEDDING	CLASS 2 EXCAVATION	CLASS 4 EXCAVATION	CRSE. AGGR. FOR PIPE TRENCH B'FILL	NO. 2B COARSE AGGREGATE	TYPE M INLET	TYPE M INLET MODIFIED, TYPE I BOX SPEC.	TYPE M INLET W/ STENCH CHAMBER	TYPE S INLET	TYPE S INLET W/ STENCH CHAMBER	REBUILT MANHOLE	TYPE C INLET	GRADE ADJ. OF 4' SPEC. INLET	REBUILT TYPE H INLET	REBUILT TYPE J INLET	REBUILT TYPE 4' SPEC. INLET, SPECIAL	REBUILT TYPE 6' SPEC. INLET, SPECIAL	REBUILT TYPE 4' SPEC. INLET, MODIFIED	EMBANKMENT (FOR INFO ONLY)
		204 0001	0150	601 5400	703 0006	605 2060	2605 2101	2065	605 2180	2605 2184	2607 0205	605 2001	2606 0053	2607 0007	0008	0009	0013	2607 0015	
UNIT		C.Y.	C.Y.	C.Y.	C.Y.	E.A.	E.A.	E.A.	E.A.	E.A.	E.A.	E.A.	SETS	E.A.	E.A.	E.A.	E.A.	E.A.	
647 + 50 RT.																		1	
648 + 84 RT.																		1	
653 + 00 RT.																1			
654 + 24 RT.																1			
655 + 00 RT.											1								
655 + 33 LT.																1			
656 + 98 RT.											1								
657 + 40 LT.																1			
658 + 46 LT.																1			
659 + 50 LT.																1			
660 + 67 LT.																1			
662 + 00 LT.																1			
663 + 34 LT.																1			
665 + 17 LT.																1			
666 + 75 LT.																1			
687 + 66 LT.																1			
689 + 40 LT.																1			
690 + 80 LT.																1			
692 + 09 LT.																1			
693 + 09 LT.																1			
694 + 21 LT.																1			
695 + 00 LT.																1			
695 + 76 LT.																1			
697 + 16 – 697 + 40 RT.		5																	5
697 + 36 RT.		13																	13
697 + 23 – 697 + 40 RT.	C		23	6		1													15
SUB-TOTAL		18	23	6		1					2					19		2	33

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DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764	19	24 of 76
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY

TABULATION OF DRAINAGE ITEMS

SHEET 2 OF 11

PLAN SHEET NUMBER	18" RCCP CLASS III	24" RCCP CLASS III	8" VITRIFIED CLAY PIPE	PIPE ALTERNATE (2)	PIPE ALTERNATE (3)	CLEANING EXISTING PIPE CULVERTS	18" RCCP CLASS III (OPEN JOINTS)	CLASS A CEMENT CONC.			CLASS OF BEDDING	CLASS 2 EXCAVATION	CLASS 4 EXCAVATION	CRSE. AGGR. FOR PIPE TRENCH B'FILL	NO. 2B COARSE AGGREGATE	TYPE M INLET	TYPE M INLET MODIFIED, TYPE I BOX,SPEC.	TYPE M INLET W/ STENCH CHAMBER	TYPE S INLET	TYPE S INLET W/ STENCH CHAMBER	REBUILT MANHOLE	TYPE C INLET	GRADE ADJ. OF 4' SPEC. INLET	REBUILT TYPE H INLET	REBUILT TYPE J INLET	REBUILT TYPE 4' SPEC. INLET, SPECIAL	REBUILT TYPE 6' SPEC. INLET, SPECIAL	REBUILT TYPE 4' SPEC. INLET, MODIFIED	EMBANKMENT (FOR INFO. ONLY)
	601 0052	601 0054	601 0642	601 0667 0015	2601 3642 4442	601 5900	604 0102	704 0002	ITEM NUMBERS			204 0001	204 0150	601 5400	703 0006	605 2060	2605 2101	2605 2065	605 2180	2605 2184	2607 0205	605 2001	2606 0053	2607 0007	2607 0008	2607 0009	2607 0013	2607 0015	
	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	C.Y.	UNIT			C.Y.	C.Y.	C.Y.	C.Y.	EA.	EA.	EA.	EA.	EA.	EA.	EA.	SETS	EA.	EA.	EA.	EA	EA.	
									LR. 764 WESTBOUND																				
62									699 + 21 RT.	TYPE 4' SPEC. INLET																1			
62									699 + 24 RT.	TYPE A MANHOLE											1								
62									701 + 22 RT.	TYPE 4' SPEC. INLET																1			
62									702 + 40 RT.	TYPE 4' SPEC. INLET																1			
62									703 + 00 RT.	TYPE 4' SPEC. INLET																1			
									703 + 60 RT.	TYPE 4' SPEC. INLET																1			
63									704 + 84 RT.	TYPE 4' SPEC. INLET																1			
63									706 + 25 RT.	TYPE 4' SPEC. INLET																1			
63									707 + 65 RT.	TYPE 4' SPEC. INLET																1			
63									709 + 06 RT.	TYPE 4' SPEC. INLET																1			
63									710 + 45 RT.	TYPE 4' SPEC. INLET																1			
63									711 + 94 RT.	TYPE 4' SPEC. INLET																1			
63									713 + 22 RT.	TYPE 4' SPEC. INLET																1			
63									715 + 00 RT.	TYPE 4' SPEC. INLET																1			
64									716 + 50 RT.	TYPE 4' SPEC. INLET																1			
64									718 + 00 RT.	TYPE 4' SPEC. INLET																1			
64									719 + 50 RT.	TYPE 4' SPEC. INLET																1			
64									721 + 08 RT.	TYPE 4' SPEC. INLET																1			
64									723 + 28 RT.	TYPE 4' SPEC. INLET																1			
64,65							156		725 + 06 – 726 + 66 RT.	PIPE CULVERT & INLETS	C		48		11	1										1			20
65									728 + 03 RT.	TYPE 6' SPEC. INLET																	1		
							156		SUB-TOTAL				48		11	1					1					19	1		20

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DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764	19	25 of 76
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY

TABULATION OF DRAINAGE ITEMS

SHEET 3 OF 11

LR. 764 WESTBOUND

PLAN SHEET NUMBER	18" RCCP CLASS III	24" RCCP CLASS III	8" VITRIFIED CLAY PIPE	PIPE ALTERNATE (2)	PIPE ALTERNATE (3)	CLEANING EXISTING PIPE CULVERTS	18" RCCP CLASS III (OPEN JOINTS)	CLASS A CEMENT CONC.	ITEM NUMBERS	
ITEM NO.	601 0052	601 0054	601 0642	601 0667 0015	2601 3642 4442	601 5900	604 0102	704 0002		
UNIT	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	C.Y.		
65	8			32					728 + 30 - 728 + 62 LT.	PIPE CULVERTS & INLETS
65									729 + 76 LT.	TYPE H INLET
65									730 + 84 LT.	TYPE H INLET
65									731 + 00 RT.	TYPE 4' SPEC. INLET
65									731 + 79 LT.	TYPE H INLET
65									733 + 25 LT.	TYPE A MANHOLE
65									733 + 50 RT.	TYPE 4' SPEC. INLET
65									734 + 87 LT.	TYPE A MANHOLE
65									735 + 25 RT.	TYPE 4' SPEC. INLET
65									736 + 00 RT.	TYPE 4' SPEC. INLET
65									736 + 75 RT.	TYPE 4' SPEC. INLET
65									738 + 20 RT.	TYPE 4' SPEC. INLET
66									739 + 24 RT.	TYPE 4' SPEC. INLET
66									740 + 50 RT.	TYPE J INLET
66									741 + 87 RT.	TYPE J INLET
66									743 + 61 RT.	TYPE J INLET
66					263				741 + 99 - 744 + 62 LT.	HALF CIRCLE PIPE
66		16							744 + 56 - 744 + 62 LT.	PIPE CULVERTS & INLET
66									745 + 50 RT.	TYPE J INLET
66									746 + 71 LT.	TYPE 4' SPEC. INLET
									721 + 65 LT.	TYPE H INLET
									722 + 56 LT.	TYPE 4' SPEC. INLET
									723 + 45 LT.	TYPE H INLET
									724 + 78 LT.	TYPE 4' SPEC. INLET
	8	16		32	263				SUB-TOTAL	

STATION	CLASS OF BEDDING	CLASS 2 EXCAVATION	CLASS 4 EXCAVATION	CRSE. AGGR. FOR PIPE TRENCH B'FILL	NO. 2B COARSE AGGREGATE	TYPE M INLET	TYPE M INLET MODIFIED, TYPE I BOX, SPEC	TYPE M INLET W/ STENCH CHAMBER	TYPE S INLET	TYPE S INLET W/ STENCH CHAMBER	REBUILT MANHOLE	TYPE C INLET	GRADE ADJ. OF 4' SPEC. INLET	REBUILT TYPE H INLET	REBUILT TYPE J INLET	REBUILT TYPE 4' SPEC. INLET, SPECIAL	REBUILT TYPE 6' SPEC. INLET, SPECIAL	REBUILT TYPE 4' SPEC. INLET, MODIFIED	EMBANKMENT (FOR INFO ONLY)
ITEM NO.		204 0001	204 0150	601 5400	703 0006	605 2060	2605 2101	2605 2065	605 2180	2605 2184	2607 0205	605 2001	2606 0053	2607 0007	2607 0008	2607 0009	2607 0013	2607 0015	
UNIT		C.Y.	C.Y.	C.Y.	C.Y.	EA.	EA.	EA.	EA.	EA.	EA.	EA.	SETS	EA.	EA.	EA.	EA.	EA.	
728 + 30 - 728 + 62 LT.	C		52	13						1									35
729 + 76 LT.														1					
730 + 84 LT.														1					
731 + 00 RT.																1			
731 + 79 LT.														1					
733 + 25 LT.											1								
733 + 50 RT.																1			
734 + 87 LT.											1								
735 + 25 RT.																1			
736 + 00 RT.																1			
736 + 75 RT.																1			
738 + 20 RT.																1			
739 + 24 RT.																1			
740 + 50 RT.															1				
741 + 87 RT.															1				
743 + 61 RT.															1				
741 + 99 - 744 + 62 LT.	C	9																	
744 + 56 - 744 + 62 LT.	C		27	7					1										18
745 + 50 RT.															1				
746 + 71 LT.																1			
721 + 65 LT.														1					
722 + 56 LT.																1			
723 + 45 LT.														1					
724 + 78 LT.																1			
SUB-TOTAL		9	79	20					1	1	2			5	4	10			53

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TABULATION OF DRAINAGE ITEMS

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764	19	26 of 76
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY

SHEET 4 OF 11

PLAN SHEET NUMBER	18" RCCP CLASS III	24" RCCP CLASS III	8" VITRIFIED CLAY PIPE	PIPE ALTERNATE (2)	PIPE ALTERNATE (3)	CLEANING EXISTING PIPE CULVERTS	18" RCCP CLASS III (OPEN JOINTS)	CLASS A CEMENT CONC.	ITEM NUMBERS	
	0052	601 0054	0642	601 0667 0015	2601 3642 4442	601 5900	604 0102	704 0002		
	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	C.Y.	UNIT	
									LR. 764 EASTBOUND	
58									648 + 00 RT.	TYPE 4' SPEC. INLET
58									648 + 05 LT.	TYPE 4' SPEC. INLET
58									649 + 21 LT.	TYPE 4' SPEC. INLET
58	8								650 + 60 LT.	TYPE S INLET, PIPE CULVERT & REMOVAL
58	8								652 + 00 LT.	TYPE M INLET, PIPE CULVERT & REMOVAL
58									652 + 30 RT.	TYPE 4' SPEC. INLET
58	40								653 + 30 LT. TO 653 + 23 LT. RELOC. RAMP D	TYPE M INLET, PIPE CULVERT & REMOVAL
59									656 + 13 LT.	TYPE 4' SPEC. INLET
59								0.1	656 + 90 LT. TO 657 + 68 LT.	PIPE CULVERT, TYPE E INLET REMOVAL & PLUG PIPE
59									657 + 68 LT.	TYPE 4' SPEC. INLET
59	6								657 + 68 FAR LT.	TYPE M INLET, PIPE CULVERT & REMOVAL
59	8								658 + 55 FAR LT.	TYPE M INLET & PIPE CULVERTS
59	4								659 + 50 LT.	TYPE M INLET, PIPE CULVERT & REMOVAL
59	12								660 + 75 LT.	TYPE M INLET, PIPE CULVERT & REMOVAL
59									662 + 14 LT.	TYPE 4' SPECIAL INLET
59	20								662 + 14 LT. TO 662 + 15 LT. RAMP F	PIPE CULVERT & PIPE AND INLET REMOVAL
59	8	8							662 + 25 LT.	TYPE M INLET, PIPE CULVERTS & REMOVAL
59									662 + 77 FAR LT.	TYPE 4' SPEC. INLET
59									663 + 50 LT.	TYPE 4' SPEC. INLET
59									664 + 10 LT.	TYPE 4' SPEC. INLET
59									664 + 75 LT.	TYPE 4' SPEC. INLET
	114	8						0.1	SUB-TOTAL	

ITEM NUMBERS	CLASS OF BEDDING	CLASS 2 EXCAVATION	CLASS 4 EXCAVATION	CRSE. AGGR. FOR PIPE TRENCH B'FILL	NO. 2B COARSE AGGREGATE	TYPE M INLET	TYPE M INLET MODIFIED, TYPE I BOX, SPEC.	TYPE M INLET W/STENCH CHAMBER	TYPE S INLET	TYPE S INLET W/ STENCH CHAMBER	REBUILT MANHOLE	TYPE C INLET	GRADE ADJ. OF 4' SPEC. INLET	REBUILT TYPE H INLET	REBUILT TYPE J INLET	REBUILT TYPE 4' SPEC. INLET, SPECIAL	REBUILT TYPE 6' SPEC. INLET, SPECIAL	REBUILT TYPE 4' SPEC. INLET, MODIFIED	EMBANKMENT (FOR INFO. ONLY)
		204 0001	204 0150	601 5400	703 0006	605 2060	2605 2101	2605 2065	605 2180	2605 2184	2607 0205	605 2001	2606 0053	2607 0007	2607 0008	2607 0009	2607 0013	2607 0015	
UNIT		C.Y.	C.Y.	C.Y.	C.Y.	E.A.	E.A.	EA.	EA.	EA.	EA.	EA.	SETS	EA.	EA.	EA.	EA.	EA.	
648 + 00 RT.													1						
648 + 05 LT.													1						
649 + 21 LT.													1						
650 + 60 LT.	C	3	4	3					1										3
652 + 00 LT.	C	3	5	3		1													4
652 + 30 RT.																1			
653 + 30 LT. TO 653 + 23 LT. RELOC. RAMP D	C	19	33	13		1													35
656 + 13 LT.																		1	
656 + 90 LT. TO 657 + 68 LT.		51																	51
657 + 68 LT.																		1	
657 + 68 FAR LT.	C	1	3	2		1													1
658 + 55 FAR LT.	C	1	4	2		1													2
659 + 50 LT.	C	22	3	1		1													23
660 + 75 LT.	C	1	9	4		1													5
662 + 14 LT.																		1	
662 + 14 LT. TO 662 + 15 LT. RAMP F	C	2	13	6															7
662 + 25 LT.	C	21	20	6			1												33
662 + 77 FAR LT.																1			
663 + 50 LT.																1			
664 + 10 LT.																1			
664 + 75 LT.																1			
SUB-TOTAL		124	94	40		6	1		1				3			5		3	164

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DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764	19	27 of 76

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY

TABULATION OF DRAINAGE ITEMS

SHEET 5 OF 11

PLAN SHEET NUMBER	18" RCCP CLASS III 601 0052 L.F.	24" RCCP CLASS III 601 0054 L.F.	8" VITRIFIED CLAY PIPE 601 0642 L.F.	PIPE ALTERNATE (2) 601 0667 0015 L.F.	PIPE ALTERNATE (3) 2601 3642 4442 L.F.	CLEANING EXISTING PIPE CULVERTS 601 5900 L.F.	18" RCCP CLASS III (OPEN JOINTS) 604 0102 L.F.	CLASS A CEMENT CONC. 704 0002 C.Y.	ITEM NUMBERS	UNIT	CLASS OF BEDDING	CLASS 2 EXCAVATION 204 0001 C.Y.	CLASS 4 EXCAVATION 204 0150 C.Y.	CRSE. AGGR. FOR PIPE TRENCH B'FILL 601 5400 C.Y.	NO. 2B COARSE AGGREGATE 703 0006 C.Y.	TYPE M INLET 605 2060 EA.	TYPE M INLET MODIFIED, TYPE I BOX, SPEC. 2605 2101 EA.	TYPE M INLET W/ STENCH CHAMBER 2605 2065 EA.	TYPE S INLET 605 2180 EA.	TYPE S INLET W/ STENCH CHAMBER 2605 2184 EA.	REBUILT MANHOLE 2607 0205 EA.	TYPE C INLET 605 2001 EA.	GRADE ADJ. OF 4' SPEC. INLET 2606 0053 SETS	REBUILT TYPE H INLET 2607 0007 EA.	REBUILT TYPE J INLET 2607 0008 EA.	REBUILT TYPE 4' SPEC. INLET, SPECIAL 2607 0009 EA.	REBUILT TYPE 6' SPEC. INLET, SPECIAL 2607 0013 EA.	REBUILT TYPE 4' SPEC. INLET, MODIFIED 2607 0015 EA.	EMBANKMENT (FOR INFO. ONLY)
									LR. 764 EASTBOUND																				
59									665 + 40 LT.	TYPE 4' SPEC. INLET																1			
59									667 + 00 LT.	TYPE 4' SPEC. INLET																1			
60									668 + 65 LT.	TYPE 4' SPEC. INLET																1			
60									669 + 91 LT.	TYPE 4' SPEC. INLET																1			
60									671 + 20 LT.	TYPE 4' SPEC. INLET																1			
60									672 + 50 LT.	TYPE 4' SPEC. INLET																1			
60									673 + 74 LT.	TYPE 4' SPEC. INLET																1			
60									675 + 00 LT.	TYPE 4' SPEC. INLET																1			
60									676 + 28 LT.	TYPE 4' SPEC. INLET																1			
60									677 + 50 LT.	TYPE 4' SPEC. INLET																1			
60									678 + 69 LT.	TYPE 4' SPEC. INLET																1			
61									679 + 85 LT.	TYPE 4' SPEC. INLET																1			
61									681 + 05 LT.	TYPE 4' SPEC. INLET																1			
61									682 + 28 LT.	TYPE 4' SPEC. INLET																1			
61									683 + 57 LT.	TYPE 4' SPEC. INLET																1			
61									684 + 78 LT.	TYPE 4' SPEC. INLET																1			
61									685 + 66 RT.	TYPE 4' SPEC. INLET																1			
61									685 + 76 LT	TYPE 4' SPEC. INLET																1			
61									686 + 79 LT.	TYPE 4' SPEC. INLET																1			
61									688 + 16 LT.	TYPE 4' SPEC. INLET																1			
61									689 + 55 LT.	TYPE 4' SPEC. INLET																1			
62									691 + 15 LT.	TYPE 4' SPEC. INLET																1			
62									692 + 79 LT.	TYPE 4' SPEC. INLET																1			
62									694 + 36 RT.	TYPE 4' SPEC. INLET																1			
63									704 + 00 RT.	TYPE 4' SPEC. INLET																1			
									SUB-TOTAL																	25			

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764	19	28 of 76
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REVISION NUMBER	REVISIONS	DATE	BY

TABULATION OF DRAINAGE ITEMS

SHEET 6 OF 11

PLAN SHEET NUMBER	18" RCCP CLASS III	24" RCCP CLASS III	8" VITRIFIED CLAY PIPE	PIPE ALTERNATE (2)	PIPE ALTERNATE (3)	CLEANING EXISTING PIPE CULVERTS	18" RCCP CLASS III (OPEN JOINTS)	CLASS A CEMENT CONC.	ITEM NUMBERS		CLASS OF BEDDING	CLASS 2 EXCAVATION	CLASS 4 EXCAVATION	CRSE. AGGR. FOR PIPE TRENCH B'FILL	NO. 2B COARSE AGGREGATE	TYPE M INLET	TYPE M INLET MODIFIED, TYPE I BOX, SPEC	TYPE M INLET W/ STENCH CHAMBER	TYPE S INLET	TYPE S INLET w/ STENCH CHAMBER	REBUILT MANHOLE	TYPE C INLET	GRADE ADJ. OF 4' SPEC. INLET	REBUILT TYPE H INLET	REBUILT TYPE J INLET	REBUILT TYPE 4' SPEC. INLET, SPECIAL	REBUILT TYPE 6' SPEC. INLET, SPECIAL	REBUILT TYPE 4' SPEC. INLET, MODIFIED	EMBANKMENT (FOR INFO. ONLY)
	601 0052	601 0054	601 0642	601 0667 0015	2601 3642 4442	601 5900	604 0102	704 0002				204 0001	204 0150	601 5400	703 0006	605 2060	2605 2101	2605 2065	605 2180	2605 2184	2607 0205	605 2001	2606 0053	2607 0007	2607 0008	2607 0009	2607 0013	2607 0015	
	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	C.Y.	UNIT			C.Y.	C.Y.	C.Y.	C.Y.	E.A.	EA.	EA.	EA.	EA.	EA.	EA.	SETS	EA.	EA	EA.	EA.	EA	
									LR. 764 EASTBOUND																				
63									705 + 40 RT.	TYPE 4' SPEC. INLET																1			
63									706 + 80 RT	TYPE 4' SPEC. INLET																1			
63									708 + 20 RT.	TYPE 4' SPEC. INLET																1			
63									709 + 65 RT.	TYPE 4' SPEC. INLET																1			
63									711 + 00 RT.	TYPE 4' SPEC. INLET																1			
63									712 + 50 RT.	TYPE 4' SPEC. INLET																1			
63									714 + 00 RT.	TYPE 4' SPEC. INLET																1			
64									715 + 62 RT.	TYPE 4' SPEC. INLET																1			
64									717 + 00 RT.	TYPE 4' SPEC. INLET																1			
64									718 + 50 RT.	TYPE 4' SPEC. INLET																1			
64									719 + 64 RT,	TYPE 4' SPEC. INLET																1			
64									720 + 50 RT.	TYPE 4' SPEC. INLET																1			
64									721 + 50 RT.	TYPE 4' SPEC. INLET																1			
64									723 + 00 RT.	TYPE 4' SPEC. INLET																1			
64									724 + 20 LT.	TYPE 4' SPEC. INLET & TYPE A MANHOLE											1					1			
64									724 + 90 LT.	TYPE A MANHOLE											1								
64									725 + 00 RT.	TYPE 4' SPEC. INLET																1			
65									727 + 32 RT.	TYPE 4' SPEC. INLET																1			
66									740 + 27 RT.	TYPE 4' SPEC. INLET																1			
66									741 + 64 RT.	TYPE 4' SPEC. INLET																1			
66									743 + 43 RT.	TYPE 4' SPEC. INLET																1			
66									745 + 17 RT.	TYPE 4' SPEC. INLET																1			
66									746 + 91 RT.	TYPE 4' SPEC. INLET																1			
									SUB-TOTAL												2					22			

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DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764	19	29 of 76
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY

TABULATION OF DRAINAGE ITEMS

SHEET 7 OF 11

PLAN SHEET NUMBER	18" RCCP CLASS III	24" RCCP CLASS III	8" VITRIFIED CLAY PIPE	PIPE ALTERNATE (2)	PIPE ALTERNATE (3)	CLEANING EXISTING PIPE CULVERTS	18" RCCP CLASS III (OPEN JOINTS)	CLASS A CEMENT CONC.			CLASS OF BEDDING	CLASS 2 EXCAVATION	CLASS 4 EXCAVATION	CRSE. AGGR. FOR PIPE TRENCH B'FILL	NO. 2B COARSE AGGREGATE	TYPE M INLET	TYPE M INLET MODIFIED, TYPE I BOX, SPEC.	TYPE M INLET W/ STENCH CHAMBER	TYPE S INLET	TYPE S INLET W/ STENCH CHAMBER	REBUILT MANHOLE	TYPE C INLET	GRADE ADJ. OF 4' SPEC. INLET	REBUILT TYPE H INLET	REBUILT TYPE J INLET	REBUILT TYPE 4' SPEC. INLET, SPECIAL	REBUILT TYPE 6' SPEC. INLET, SPECIAL	REBUILT TYPE 4' SPEC. INLET, MODIFIED	EMBANKMENT (FOR INFO. ONLY)
	601 0052	601 0054	601 0642	601 0667 0015	2601 3642 4442	5900	604 0102	704 0002	ITEM NUMBERS			204 0001	204 0150	601 5400	703 0006	605 2060	2605 2101	2605 2065	605 2180	2605 2184	2607 0205	605 2001	2606 0053	2607 0007	2607 0008	2607 0009	2607 0013	2607 0015	
	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	C.Y.	UNIT			C.Y.	C.Y.	C.Y.	C.Y.	EA.	EA.	EA.	EA.	EA.	EA.	EA.	SETS	EA.	EA.	EA.	EA.	EA.	
									LR. 764 EASTBOUND & WESTBOUND																				
66					508				746 +90 TO 751 +98 LT.	HALF CIRCLE PIPE	C	17																	
66									747 + 35 LT., MEDIAN	TYPE J INLET															1				
66									748 + 65 RT.	TYPE 4' SPEC. INLET																1			
66	12								748 + 75 MEDIAN	TYPE M INLET & PIPE CULVERT	C		8	4			1												3
66									749 + 35 LT., MEDIAN	TYPE J INLET															1				
66	16								747 + 05 MEDIAN	TYPE M INLET & PIPE CULVERT	C		13	5			1												6
66									750 + 43 RT.	TYPE 4' SPEC. INLET																1			
66									750 + 65 LT.	TYPE 4' SPEC. INLET																1			
66	12	4							750 + 65 MEDIAN	TYPE M INLET & PIPE CULVERT	C		14	6			1												7
67									751 + 70 RT.	TYPE 4' SPEC. INLET																1			
67	4								752 + 00 LT.	INLETS & PIPE CULVERTS	C		5	1		1										1			3
67	12	8							752 + 00 MEDIAN	TYPE M INLET & PIPE CULVERT	C		35	7			1												24
67					18				752+02 TO 752+20 LT.	HALF CIRCLE PIPE	C	1																	
67					38				752 +30 TO 752 + 68 LT.	HALF CIRCLE PIPE	C	1																	
67									752 + 70 RT.	TYPE 4' SPEC. INLET																1			
67	8								752 + 70 LT.	TYPE M INLETS & PIPE CULVERTS	C		9	3		2													5
67	8	8							752 + 70 MEDIAN	TYPE M INLET & PIPE CULVERT	C		26	6			1												19
67					551				752 +72 TO 758 +23 LT.	HALF CIRCLE PIPE	C	18																	
67									753 + 50 RT.	TYPE 4' SPEC. INLET																1			
67									753 + 50 LT.	TYPE 4' SPEC. INLET																1			
67	8	8							753 + 50 MEDIAN	TYPE M INLET & PIPE CULVERTS	C		24	6			1												16
67									754 + 50 RT.	TYPE 4' SPEC. INLET																1			
67									754 + 50 LT.	TYPE 4' SPEC. INLET																1			
67	8	8							754 + 50 MEDIAN	TYPE M INLET & PIPE CULVERTS	C		24	6			1												16
67									755 + 73 RT.	TYPE 4' SPEC. INLET																1			
67									755 + 73 LT.	TYPE 4' SPEC. INLET																1			
	88	36			1115				SUB-TOTAL			37	158	44		3	7								2	12			99

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DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764	19	30 of 76

CITY OF PITTSBURGH

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TABULATION OF DRAINAGE ITEMS

SHEET 8 OF 11

PLAN SHEET NUMBER	18" RCCP CLASS III	24" RCCP CLASS III	8" VITRIFIED CLAY PIPE	PIPE ALTERNATE (2)	PIPE ALTERNATE (3)	CLEANING EXISTING PIPE CULVERTS	18" RCCP CLASS III (OPEN JOINTS)	CLASS A CEMENT CONC.			CLASS OF BEDDING	CLASS 2 EXCAVATION	CLASS 4 EXCAVATION	CRSE. AGGR. FOR PIPE TRENCH B'FILL	NO. 2B COARSE AGGREGATE	TYPE M INLET	TYPE M INLET MODIFIED, TYPE I, BOX, SPEC	TYPE M INLET W/ STENCH CHAMBER	TYPE S INLET	TYPE S INLET W/ STENCH CHAMBER	REBUILT MANHOLE	TYPE C INLET	GRADE ADJ. OF 4' SPEC. INLET	REBUILT TYPE H INLET	REBUILT TYPE J INLET	REBUILT TYPE 4' SPEC. INLET, SPECIAL	REBUILT TYPE 6' SPEC. INLET, SPECIAL	REBUILT TYPE 4' SPEC. INLET, MODIFIED	EMBANKMENT (FOR INFO. ONLY)
	601 0052	601 0054	0642	601 0667 0015	2601 3642 4442	601 5900	604 0102	704 0002	ITEM NUMBERS			204 0001	0150	601 5400	703 0006	605 2060	2605 2101	2065	605 2180	2605 2184	2607 0205	605 2001	2606 0053	2607 0007	0008	0009	0013	2607 0015	
	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	C.Y.	UNIT			C.Y.	C.Y.	C.Y.	C.Y.	EA.	EA.	EA.	EA.	EA.	EA.	EA.	SETS	EA.	EA.	EA.	EA.	EA.	
									LR. 764 EASTBOUND & WESTBOUND																				
67	8	8							755 + 73 MEDIAN	TYPE M INLET & PIPE CULVERTS	C		21	6			1												14
67									756 + 00 RT	TYPE 4' SPEC. INLET																1			
67									757 + 13 RT.	TYPE 4' SPEC. INLET																1			
67									757 + 13 LT.	TYPE 4' SPEC. INLET																1			
67	8	8							757 + 13 MEDIAN	TYPE M INLET & PIPE CULVERTS	C		20	6			1												12
67	8								758 + 25 LT.	TYPE M INLETS & PIPE CULVERTS	C		7	3		2													4
67									758 + 25 RT.	TYPE 4' SPEC. INLET																1			
67	12	4							758 + 25 MEDIAN	TYPE M INLET & PIPE CULVERTS	C		18	6			1												11
67					169				758 + 27 – 759 + 96 LT.	HALF CIRCLE PIPE	C	6																	
67									759 + 50 RT.	TYPE 4' SPEC. INLET																1			
67									759 + 50 LT.	TYPE 4' SPEC. INLET																1			
67	16								759 + 50 MEDIAN	TYPE M INLET & PIPE CULVERTS	C		16	5			1												9
67					69				760 + 04 – 760 + 73 LT.	HALF CIRCLE PIPE	C	2																	
67	4								760 + 75 LT.	INLETS & PIPE CULVERTS	C		3	1		1										1			1
67									760 + 75 RT.	TYPE 4' SPEC. INLET																1			
67	16								760 + 75 MEDIAN	TYPE M INLET & PIPE CULVERTS	C		15	5			1												8
67					246				760 + 77 – 763 + 23 LT.	HALF CIRCLE PIPE	C	8																	
67									762 + 00 LT.	TYPE 4' SPEC. INLET																1			
67									762 + 00 RT.	TYPE 4' SPEC. INLET																1			
67	16								762 + 00 MEDIAN	TYPE M INLET & PIPE CULVERTS	C		15	5			1												8
67	8								763 + 25 LT.	TYPE M INLETS & PIPE CULVERTS	C		6	3		2													3
67									763 + 25 RT.	TYPE 4' SPEC. INLET																1			
67	16								763 + 25 MEDIAN	TYPE M INLET & PIPE CULVERTS	C		13	5			1												6
67									764 + 50 MEDIAN	TYPE J INLET															1				
67									764 + 50 RT.	TYPE 4' SPEC. INLET																1			
67									765 + 75 RT.	TYPE 4' SPEC. INLET																1			
67									765 + 75 MEDIAN	TYPE J INLET															1				
	112	20			484				SUB-TOTAL			16	134	45		5	7								2	13			76

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CITY OF PITTSBURGH				

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TABULATION OF DRAINAGE ITEMS

SHEET 9 OF 11

PLAN SHEET NUMBER	18" RCCP CLASS III	24" RCCP CLASS III	8" VITRIFIED CLAY PIPE	PIPE ALTERNATE (2)	PIPE ALTERNATE (3)	CLEANING EXISTING PIPE CULVERTS	18" RCCP CLASS III (OPEN JOINTS)	CLASS A CEMENT CONC.			CLASS OF BEDDING	CLASS 2 EXCAVATION	CLASS 4 EXCAVATION	CRSE. AGGR. FOR PIPE TRENCH B'FILL	NO. 2B COARSE AGGREGATE	TYPE M INLET	TYPE M INLET MODIFIED, TYPE I BOX, SPEC.	TYPE M INLET W/STENCH CHAMBER	TYPE S INLET	TYPE S INLET W/ STENCH CHAMBER	REBUILT MANHOLE	TYPE C INLET	GRADE ADJ. OF 4' SPEC. INLET	REBUILT TYPE H INLET	REBUILT TYPE J INLET	REBUILT TYPE 4' SPEC. INLET, SPECIAL	REBUILT TYPE 6' SPEC. INLET, SPECIAL	REBUILT TYPE 4' SPEC. INLET, MODIFIED	EMBANKMENT (FOR INFO ONLY)
	0052	601 0054	0642	601 0667 0015	2601 3642 4442	601 5900	604 0102	704 0002	ITEM NUMBERS			204 0001	204 0150	601 5400	703 0006	605 2060	2605 2101	2605 2065	605 2180	2605 2184	2607 0205	605 2001	2606 0053	2607 0007	2607 0008	2607 0009	2607 0013	2607 0015	
	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	C.Y.	UNIT			C.Y.	C.Y.	C.Y.	C.Y.	E.A.	E.A.	E.A.	E.A.	E.A.	EA.	EA.	SETS	EA.	EA.	EA.	EA.	EA.	
68									767 + 06 MEDIAN	TYPE J INLET															1				
68									767 + 06 RT.	TYPE 4' SPEC. INLET																1			
									RAMP 'A'																				
58									648 + 75 LT.	TYPE 6' SPEC. INLET																	1		
58									649 + 97 LT.	TYPE 4' SPEC. INLET																1			
									RAMP 'D'																				
58									650 + 83 RT.	TYPE H INLET														1					
58	26								650 + 83 LT. TO 651 + 07 LT.	TYPE M INLET, PIPE CULVERTS & REMOVAL	C	13	15	8		1													17
58	32		28						651 + 07 LT. TO 651 + 45 LT.	TYPE M INLET, PIPE CULVERTS & REMOVAL	C	21	34	15		1													36
58									651 + 70 LT.	TYPE C MANHOLE											1								
58	12		4				80		652 + 40 LT TO 653 + 23 LT.	TYPE M INLET, PIPE CULVERTS & REMOVAL	C	53	71	5	22			1											88
58			32						653 + 23 LT.	TYPE M INLET, PIPE CULVERTS & REMOVAL	C	26	19	6		1													39
									RAMP 'E'																				
58									652 + 50 LT.	TYPE 4' SPEC. INLET																1			
58									654 + 50 LT.	TYPE 4' SPEC. INLET																1			
59									657 + 00 LT.	TYPE 4' SPEC. INLET																1			
59	4								659 + 45 RT.	TYPE M INLET & PIPE CULVERT	C		6	1		1													4
									RAMP 'F'																				
59	20								657 + 79 LT.	TYPE M INLET & PIPE CULVERT	C		5	3		1													
59							120		659 + 55 LT. TO 660 + 80 LT.	TYPE M INLET & PIPE CULVERT	C		60		19	1													28
59									660 + 80 LT.	TYPE 4' SPEC. INLET																1			
59									662 + 15 LT.	TYPE 4' SPEC. INLET																1			
58									646 + 43 LT.	TYPE 4' SPEC. INLET													1						
									RAMP 'F' SPUR																				
58	24								0 + 93 ℄	TYPE C INLET, PIPE CULVERT & REMOVAL	C	2	7	4								1							2
	118		64				200		SUB-TOTAL			115	217	42	41	6		1			1	1	1	1	1	7	1		214

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TABULATION OF DRAINAGE ITEMS

SHEET 10 OF 11

PLAN SHEET NUMBER	18" RCCP CLASS III	24" RCCP CLASS III	8" VITRIFIED CLAY PIPE	PIPE ALTERNATE (2)	PIPE ALTERNATE (3)	CLEANING EXISTING PIPE CULVERTS	18" RCCP CLASS III (OPEN JOINTS)	CLASS A CEMENT CONC.	ITEM NUMBERS		CLASS OF BEDDING	CLASS 2 EXCAVATION	CLASS 4 EXCAVATION	CRSE. AGGR. FOR PIPE TRENCH B'FILL	NO. 2B COARSE AGGREGATE	TYPE M INLET	TYPE M INLET MODIFIED, TYPE I BOX, SPEC.	TYPE M INLET W/ STENCH CHAMBER	TYPE S INLET	TYPE S INLET W/ STENCH CHAMBER	REBUILT MANHOLE	TYPE C INLET	GRADE ADJ. OF 4' SPEC. INLET	REBUILT TYPE H INLET	REBUILT TYPE J INLET	REBUILT TYPE 4' SPEC. INLET, SPECIAL	REBUILT TYPE 6' SPEC. INLET, SPECIAL	REBUILT TYPE 4' SPEC. INLET, MODIFIED	EMBANKMENT (FOR INFO. ONLY)
	601 0052	0054	0642	601 0667 0015	2601 3642 4442	601 5900	604 0102	704 0002				204 0001	0150	601 5400	703 0006	605 2060	2605 2101	2065	605 2180	2605 2184	2607 0205	605 2001	2606 0053	2607 0007	0008	0009	0013	2607 0015	
	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	C.Y.	UNIT			C.Y.	C.Y.	C.Y.	C.Y.	EA.	EA.	EA.	EA.	EA.	EA.	EA.	SETS	EA.	EA.	EA.	EA.	EA.	
									RAMP 'M'																				
60									673 + 00 LT.	TYPE 4' SPEC. INLET																1			
60									675 + 30 LT.	TYPE 4' SPEC. INLET																1			
									RAMP 'R'																				
64									721 + 68 RT. & LT.	TYPE 4' SPEC. INLET & TYPE J INLET															1	1			
65									733 + 00 RT.	TYPE 4' SPEC. INLET																1			
65	6								734 + 90 RT.	TYPE M INLET, PIPE CULVERT & REMOVAL	C	1	4	2		1													2
65									730 + 50 RT.	TYPE 4' SPEC. INLET																1			
									RAMP 'S'																				
65									737 + 69 LT.	TYPE 4' SPEC. INLET																1			
									RAMP 'T'																				
64									722 + 08 RT.	TYPE 4' SPEC. INLET																1			
66									739 + 10 RT.	TYPE 4' SPEC. INLET																1			
66									741 + 73 RT.	TYPE 4' SPEC. INLET																1			
									RAMP 'U'																				
64									721 + 40 LT.	TYPE 6' SPEC. INLET																	1		
64	10								723 + 37 TO 723 + 47 RT.	TYPE S INLET, PIPE CULVERT & REMOVAL	C	7	4	2						1									7
64									723 + 75 RT.	TYPE 4' SPEC. INLET																1			
									RAMP 'V'																				
65									727 + 35 RT.	TYPE 4' SPEC. INLET																1			
AS DIRECTED BY THE ENGINEER																													
	16								SUB-TOTAL			8	8	4		1				1					1	11	1		9

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TABULATION OF DRAINAGE ITEMS

SUMMARY

SHEET 11 OF 11

ITEM NUMBERS	18" RCCP CLASS III	24" RCCP CLASS III	8" VITRIFIED CLAY PIPE	PIPE ALTERNATE (2)	PIPE ALTERNATE (3)	CLEANING EXISTING PIPE CULVERTS	18" RCCP CLASS III (OPEN JOINTS)	CLASS A CEMENT CONC.
	601 0052	601 0054	0642	601 0667 0015	2601 3642 4442	601 5900	604 0102	704 0002
UNIT	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	C.Y.
TOTAL (SHEET 1)	19							
TOTAL (SHEET 2)							156	
TOTAL (SHEET 3)	8	16		32	263			
TOTAL (SHEET 4)	114	8						0.1
TOTAL (SHEET 5)								
TOTAL (SHEET 6)								
TOTAL (SHEET 7)	88	36			1,115			
TOTAL (SHEET 8)	112	20			484			
TOTAL (SHEET 9)	118		64				200	
TOTAL (SHEET 10)	16							
AS DIRECTED BY ENGINEER						15,125		
TOTALS	475	80	64	32	1,862	15,125	356	0.1

ITEM NUMBERS	CLASS OF BEDDING	CLASS 2 EXCAVATION	CLASS 4 EXCAVATION	CRSE. AGGR. FOR PIPE TRENCH B'FILL	NO. 2B COARSE AGGREGATE	TYPE M INLET	TYPE M INLET MODIFIED, TYPE I BOX SPEC	TYPE M INLET W/ STENCH CHAMBER	TYPE S INLET	TYPE S INLET W/ STENCH CHAMBER	REBUILT MANHOLE	TYPE C INLET	GRADE ADJ. OF 4' SPEC. INLET	REBUILT TYPE H INLET	REBUILT TYPE J INLET	REBUILT TYPE 4' SPEC. INLET, SPECIAL	REBUILT TYPE 6' SPEC. INLET, SPECIAL	REBUILT TYPE 4' SPEC. INLET, MODIFIED	EMBANKMENT (FOR INFO ONLY)
		204 0001	0150	601 5400	703 0006	605 2060	2605 2101	2065	605 2180	2605 2184	2607 0205	605 2001	2606 0053	2607 0007	0008	0009	0013	2607 0015	
UNIT		C.Y.	C.Y.	C.Y.	C.Y.	EA.	EA.	EA.	EA.	EA.	EA.	EA.	SETS	EA.	EA.	EA.	EA.	EA.	
TOTAL (SHEET 1)		18	23	6		1					2					19		2	33
TOTAL (SHEET 2)			48		11	1					1					19	1		20
TOTAL (SHEET 3)		9	79	20					1	1	2			5	4	10			53
TOTAL (SHEET 4)		124	94	40		6	1		1				3			5		3	164
TOTAL (SHEET 5)																25			
TOTAL (SHEET 6)											2					22			
TOTAL (SHEET 7)		37	158	44		3	7								2	12			99
TOTAL (SHEET 8)		16	134	45		5	7								2	13			76
TOTAL (SHEET 9)		115	217	42	41	6		1			1	1	1	1	1	7	1		214
TOTAL (SHEET 10)		8	8	4		1				1					1	11	1		9
TOTALS		327	761	201	52	23	15	1	2	2	8	1	4	6	10	143	3	5	668

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DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764	19	34 of 76

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TABULATION OF GUIDE RAIL AND BARRIER QUANTITIES

SHEET 1 OF 4

ROUTE	STATIONS	SIDE	TERMINAL SECTION, BRIDGE CONNECTION	REMOVE EXISTING GUIDE RAIL	STRUCTURE MOUNTED GUIDE RAIL	TYPE 2-S GUIDE RAIL	TYPE 2-SC GUIDE RAIL	TYPE 2-S MODIFIED GUIDE RAIL	TYPE 2-SC MODIFIED GUIDE RAIL	TYPE 2-STRONG POST END TREATMENT	REMOVE EXISTING MEDIAN BARRIER	TYPE 2S MEDIAN BARRIER, STRUCTURE MOUNTED	CONCRETE MEDIAN BARRIER	CONCRETE PROTECTIVE BARRIER	CONC. PROTECTIVE BARRIER, END TRANSITION	FREE STANDING CONCRETE BARRIER	REMOVE EXISTING CONCRETE MEDIAN BARRIER	REMARKS
	ITEM NUMBER		620 0402	620 0501	620 0595	620 1075	620 1100	620 1150	620 1175	620 1250	621 0301	2621 0001	623 0001	2623 0001	2623 0002	2623 0003	2623 0004	
	UNIT		EA.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	EA.	L.F	LF	L.F	L.F	EA.	L.F	L.F	
L.R. 764	**WESTBOUND**																	
	646 + 62 TO 657 + 78	LT.												1,116				TOP VARIES-1'-0" TO 0"-6" 646+62 - TO 646+90 MEET FLOOD WALL BARRIER MEET WALL ADJUSTMENT
	650 + 08 TO 652 + 68	RT.												260				MEET FREE STANDING CONC. BARRIER
	652 + 68 TO 654 + 70	RT.														213		MEET CONCRETE PROTECTIVE BARRIER
	697 + 00 TO 713 + 23	RT.														1,623		MEET WALL ADJUSTMENT BOTH ENDS
	699 + 00 TO 713 + 23	RT.		1,423														
	711 + 00 TO 721 + 60 (RAMP U)	LT.												1,060				MEET WALL ADJUSTMENT
	726 + 05 TO 726 + 99	LT.														100		MEET CONCRETE PARAPET
	726 + 30 TO 726 + 99	LT.		69														
	728 + 32 TO 730 + 00	LT.														170		MEET CONCRETE PARAPET
	735 + 02 (RAMP R) TO 738 + 05	LT.												303				MEET FREE STANDING CONC. BARRIER
	738 + 05 TO 739 + 65	LT.														160		MEET CONCRETE PROTECTIVE BARRIER BOTH ENDS
	739 + 65 TO 741 + 99	LT.												234				MEET FREE STANDING CONC. BARRIER BOTH ENDS
	739 + 25 TO 743 + 50	RT.														425		MEET CONCRETE PARAPET
	741 + 99 TO 746 + 99	LT.														515		MEET CONCRETE PROTECTIVE BARRIER
	744 + 85 TO 746 + 45	LT.		165														
	743 + 50 TO 746 + 00	RT.											250					MEET FREE STANDING CONC. BARRIER TRANSITION TO CONC. MEDIAN BARRIER
	746 + 00 TO 746 + 99	RT.											99					MEET CONC. MEDIAN BARRIER TRANSITION
	SUB-TOTAL			1,657									349	2,973		3,206		

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TABULATION OF GUIDE RAIL AND BARRIER QUANTITIES

SHEET 2 OF 4

ROUTE	STATIONS	SIDE	TERMINAL SECTION, BRIDGE CONNECTION	REMOVE EXISTING GUIDE RAIL	STRUCTURE MOUNTED GUIDE RAIL	TYPE 2-S GUIDE RAIL	TYPE 2-SC GUIDE RAIL	TYPE 2-S MODIFIED GUIDE RAIL	TYPE 2-SC MODIFIED GUIDE RAIL	TYPE 2-STRONG POST END TREATMENT	REMOVE EXISTING MEDIAN BARRIER	TYPE 2S MEDIAN BARRIER, STRUCTURE MOUNTED	CONCRETE MEDIAN BARRIER	CONCRETE PROTECTIVE BARRIER	CONC. PROTECTIVE BARRIER, END TRANSITION	FREE STANDING CONCRETE BARRIER	REMOVE EXISTING CONCRETE MEDIAN BARRIER	REMARKS
	ITEM		620	620	620	620	620	620	620	620	621	2621	623	2623	2623	2623	2623	
	NUMBER		0402	0501	0595	1075	1100	1150	1175	1250	0301	0001	0001	0001	0002	0003	0004	
	UNIT		EA.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	EA.	L.F.	L.F.	L.F.	L.F.	EA.	L.F.	L.F.	
L.R. 764	EASTBOUND																	
	637 + 10 TO 641 + 98	LT	4		100							4375						
	647 + 68 TO 650 + 38	RT.	2					275										CONNECT TO EXIST RETAINING WALL CONNECT TO WALL ADJUSTMENT
	649 + 75 TO 652 + 00	LT.														260		FLARE INTO SLOPE
	652 + 00 TO 654 + 50	LT.											250					
	651 + 78 TO 656 + 37	RT.		464												464		MEET WALL ADJUSTMENT BOTH ENDS
	662 + 94 TO 668 + 57	LT.												563				MEET WALL ADJUSTMENT
	665 + 44 TO 689 + 60	RT.	2	2,419		2,325	100											CONNECT TO WALL ADJUSTMENT CONNECT TO STRUCTURE BARRIER
	702 + 66 TO 727 + 33	LT.		270												2,467		MEET STRUCTURE BARRIER BOTH ENDS
	704 + 49 TO 720 + 35	RT.		1,586												1,586		MEET STRUCTURE BARRIER MEET WALL ADJUSTMENT
	739 + 25 TO 740 + 30	LT.		105														
	741 + 76 TO 743 + 53	LT.														177		MEET CONCRETE MEDIAN BARRIER TRANSITION (W.B.)
	742 + 00 TO 746 + 99	LT.									499							
	746 + 81 TO 746 + 99	RT.		18												18		MEET WALL ADJUSTMENT
	℄ (EASTBOUND & WESTBOUND)																	
	746 + 99 TO 767 + 30	LT.														2,032		FLARE INTO SLOPE
	746 + 99 TO 755 + 10	℄									811		811					
	755 + 10 TO 768 + 15	℄											1,305				1,305	MEET EXIST. CONC. MEDIAN BARRIER
	746 + 99 TO 748 + 20	RT.		121												121		MEET WALL ADJUSTMENT
	751 + 70 TO 754 + 65	RT.		295												295		MEET WALL ADJUSTMENT BOTH ENDS
	761 + 85 TO 769 + 58	RT.		773												773		MEET WALL ADJUSTMENT MEET STRUCTURE BARRIER
SUB-TOTAL			8	6,051	100	2,325	100	275			1,310	4375	2,366	563		8,193	1,305	

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TABULATION OF GUIDE RAIL AND BARRIER QUANTITIES

SHEET 3 OF 4

ROUTE	STATIONS	SIDE	TERMINAL SECTION, BRIDGE CONNECTION	REMOVE EXISTING GUIDE RAIL	STRUCTURE MOUNTED GUIDE RAIL	TYPE 2-S GUIDE RAIL	TYPE 2-SC GUIDE RAIL	TYPE 2-S MODIFIED GUIDE RAIL	TYPE 2-SC MODIFIED GUIDE RAIL	TYPE 2-STRONG POST END TREATMENT	REMOVE EXISTING MEDIAN BARRIER	TYPE 2S MEDIAN BARRIER STRUCTURE MOUNTED	CONCRETE MEDIAN BARRIER	CONCRETE PROTECTIVE BARRIER	CONC. PROTECTIVE BARRIER, END TRANSITION	FREE STANDING CONCRETE BARRIER	REMOVE EXISTING CONCRETE MEDIAN BARRIER	REMARKS
	ITEM NUMBER		620 0402	620 0501	620 0595	620 1075	620 1100	620 1150	620 1175	620 1250	621 0301	2621 0001	623 0001	2623 0001	2623 0002	2623 0003	2623 0004	
	UNIT		EA.	L.F.	L.F	L.F.	L.F.	L.F.	L.F.	EA.	L.F.	L.F	L.F.	L.F.	EA.	L.F.	L.F	
L.R. 764	RAMP A																	
	649 + 28 TO 650 + 85	RT.												150	1			MEET WALL ADJUSTMENT
	650 + 08 TO 650 + 71	LT.	1						25	1								CONNECT TO WALL ADJUSTMENT
	RAMP C																	
	651 + 42 TO 651 + 92	RT.		50														
	RAMP D																	
	641 + 17 TO 641 + 95	RT.												71	1			MEET WALL ADJUSTMENT
	650 + 03 TO 650 + 75	RT.												72				MEET FLOOD WALL BARRIER
	650 + 03 TO 650 + 75	LT.												72				MEET FLOOD WALL BARRIER MEET FREE STANDING CONC. BARRIER
	650 + 75 TO 654 + 65	LT.														390		MEET CONCRETE PROTECTIVE BARRIER BOTH ENDS
	654 + 65 TO 657 + 92	LT.												327				MEET FREE STANDING CONC. BARRIER
	RAMP E																	
	651 + 30 TO 652 + 30	RT.		100														
	652 + 25 TO 654 + 65	RT.														260		MEET CONC. PROTECTIVE BARRIER
	654 + 65 TO 657 + 20	RT.												255				MEET FREE STANDING CONC. BARRIER MEET NEW RETAINING WALL
	RAMP F																	
	657 + 54 TO 662 + 94 (E.B.)	LT.												540				MEET NEW RETAINING WALL
	RAMP N																	
	631 + 40 TO 632 + 24	RT.												77	1			MEET WALL ADJUSTMENT
SUB-TOTAL			1	150					25	1				1,564	3	650		

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TABULATION OF GUIDE RAIL AND BARRIER QUANTITIES

SHEET 4 OF 4

ROUTE	STATIONS	SIDE	TERMINAL SECTION, BRIDGE CONNECTION	REMOVE EXISTING GUIDE RAIL	STRUCTURE MOUNTED GUIDE RAIL	TYPE 2-S GUIDE RAIL	TYPE 2-SC GUIDE RAIL	TYPE 2-S MODIFIED GUIDE RAIL	TYPE 2-SC MODIFIED GUIDE RAIL	TYPE 2-STRONG POST END TREATMENT	REMOVE EXISTING MEDIAN BARRIER	TYPE 2S MEDIAN BARRIER, STRUCTURE MOUNTED	CONCRETE MEDIAN BARRIER	CONCRETE PROTECTIVE BARRIER	CONC. PROTECTIVE BARRIER, END TRANSITION	FREE STANDING CONCRETE BARRIER	REMOVE EXISTING CONCRETE MEDIAN BARRIER	REMARKS
	ITEM NUMBER		620 0402	620 0501	620 0595	620 1075	620 1100	620 1150	620 1175	620 1250	621 0301	2621 0001	623 0001	2623 0001	2623 0002	2623 0003	2623 0004	
	UNIT		EA.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	EA.	L.F.	L.F.	L.F.	L.F.	EA.	L.F.	L.F.	
L.R. 764	RAMP R																	
	728 + 14 TO 732 + 25	LT.		230												411		TOP VARIES-1'-6" TO 0'-6" 631+90 TO 632+25 MEET STRUCTURE BARRIER MEET CONC. PROTECTIVE BARRIER
	728 + 14 TO 734 + 00	RT.		640												579		MEET STRUCTURE BARRIER
	732 + 25 TO 735 + 02	LT.												277				MEET FREE STANDING CONC. BARRIER
	734 + 00 TO 735 + 00	RT.											100					
	RAMP T																	
	738 + 03 TO 741 + 73	LT.														370		MEET STRUCTURE BARRIER
	739 + 18 TO 740 + 25	RT.		107														
	RAMP U																	
	721 + 60 TO 724 + 03	LT.												243				MEET FREE STANDING CONC. BARRIER
	722 + 50 TO 725 + 88	RT.		140												338		MEET STRUCTURE BARRIER
	724 + 03 TO 725 + 61	LT.		158												158		MEET CONC. PROTECTIVE BARRIER MEET STRUCTURE BARRIER
L.R. 766	RAMP B_U																	
	1097 + 55 TO 1098 + 30	LT.	2		75													
	TOTAL (THIS SHEET)		2	1,275	75								100	520		1,856		
	TOTAL (SHEET 1)			1,657									349	2,973		3,206		
	TOTAL (SHEET 2)		8	6,051	100	2,325	100	275			1,310	437.5	2,366	563		8,193	1,305	
	TOTAL (SHEET 3)		1	150					25	1				1,564	3	650		
TOTAL			11	9,133	175	2,325	100	275	25	1	1,310	437.5	2,815	5,620	3	13,905	1,305	

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TABULATION OF WALL ADJUSTMENT QUANTITIES

SHEET 1 OF 2

ROUTE	STATIONS	SIDE	WALL ADJUSTMENT	LIGHTING POLE ANCHORAGE ON WALL ADJUSTMENT		REMARKS
	ITEM NUMBER		2000 0011	2000 0012		
	UNIT		L.F	EA.		
L.R. 764	WESTBOUND					
	657 + 78 TO 667 + 98	LT.	1020			TOP-1'-9", 657+78 TO 658+50 TOP VARIES-1'-9" TO 1'-0", 658+50 TO 659+00
	659 + 75	LT.		1		
	661 + 47	LT.		1		
	664 + 75	LT.		1		
	667 + 25	LT.		1		
	659 + 67 TO 667 + 98	RT.	831			
	686 + 11 TO 711 + 00	LT.	2489			TOP VARIES-1'-0" TO 1'-9", 710+50 TO 711+00
	686 + 11 TO 697 + 00	RT.	1089			TOP VARIES-1'-0" TO 1'-9", 696+50 TO 697+00
	691 + 35	RT.		1		
	696 + 99	RT.		1		
SUB-TOTAL			5429	6		

ROUTE	STATIONS	SIDE	WALL ADJUSTMENT	LIGHTING POLE ANCHORAGE ON WALL ADJUSTMENT		REMARKS
	ITEM NUMBER		2000 0011	2000 0012		
	UNIT		L.F.	EA.		
L.R. 764	WESTBOUND					
	713 + 23 TO 726 + 47	RT.	1324			
	713 + 99	RT.		1		
	719 + 65	RT.		1		
	725 + 20	RT.		1		
	728 + 28 TO 739 + 25	RT.	1097			
	734 + 90	RT.		1		
L.R. 764	EASTBOUND					
	650 + 38 TO 651 + 78	RT.	140			
	656 + 37 TO 665 + 44	RT.	907			
	657 + 60	RT.		1		
	659 + 80	RT.		1		
	661 + 65	RT.		1		
	664 + 00	RT.		1		
	668 + 57 TO 695 + 03	LT.	2646			TOP-1'-9", 668+57 TO 671+00 TOP VARIES-1'-9" TO 1'-0", 671+00 TO 671+50
SUB-TOTAL			6114	8		

ROUTE	STATIONS	SIDE	WALL ADJUSTMENT	LIGHTING POLE ANCHORAGE ON WALL ADJUSTMENT		REMARKS
	ITEM NUMBER		2000 0011	2000 0012		
	UNIT		L.F.	EA.		
L.R. 764	EASTBOUND					
	676 + 55	LT.		1		
	681 + 30	LT.		1		
	686 + 77	LT.		1		
	692 + 31	LT.		1		
	720 + 35 TO 727 + 38	RT.	703			
	722 + 51	RT.		1		
	739 + 58 TO 746 + 81	RT.	723			
	741 + 90	RT.		1		
	745 + 95	RT.		1		
TOTAL (THIS COLUMN)			1426	7		
TOTAL (COLUMN 1)			5429	6		
TOTAL (COLUMN 2)			6114	8		
TOTALS			12969	21		

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TABULATION OF WALL ADJUSTMENT QUANTITIES

SHEET 2 OF 2

ROUTE	STATIONS	SIDE	WALL ADJUSTMENT	LIGHTING POLE ANCHORAGE ON WALL ADJUSTMENT		REMARKS
	ITEM NUMBER		2000 0011	2000 0012		
	UNIT		L.F.	EA.		
℄ (EASTBOUND & WESTBOUND)						
L.R. 764	748 + 20 TO 751 + 70	RT.	350			
	754 + 65 TO 761 + 85	RT.	720			
	RAMP A					
	646 + 63 TO 649 + 28	RT.	265			TOP VARIES - 1'-0" TO 1'-9" 648 + 75 TO 649 + 28
	646 + 74 TO 650 + 08	LT.	334			
	RAMP D					
	641 + 95 TO 644 + 09	RT.	214			TOP VARIES - 1'-9" TO 1'-0" 641 + 95 TO 642 + 45
	641 + 45 TO 644 + 09	LT.	264			
	644 + 00	LT.		1		FOR JUNCTION BOX JB-25 PLACEMENT SEE HIGHWAY LIGHTING PLANS
	RAMP E					
	652 + 46 TO 656 + 83	LT.	437			
	653 + 75	LT.		1		
SUB-TOTAL			2584	2		

ROUTE	STATIONS	SIDE	WALL ADJUSTMENT	LIGHTING POLE ANCHORAGE ON WALL ADJUSTMENT		REMARKS
	ITEM NUMBER		2000 0011	2000 0012		
	UNIT		L.F.	EA.		
	RAMP M					
	671 + 74 TO 677 + 65	LT.	591			
	RAMP N					
	631 + 40 TO 634 + 22	LT.	282			STA. 634 + 22 (RAMP N) = STA. 17 + 50 (FLOOD WALL ℄)
	632 + 24 TO 634 + 22	RT.	198			STA. 634 + 22 (RAMP N) = STA. 17 + 50 (FLOOD WALL ℄)
	RAMP T					
	736 + 88 TO 738 + 03	LT.	115			
	736 + 88 TO 739 + 14	RT.	226			
SUB-TOTAL			1412	—		

ROUTE	STATIONS	SIDE	WALL ADJUSTMENT	LIGHTING POLE ANCHORAGE ON WALL ADJUSTMENT		REMARKS
	ITEM NUMBER		2000 0011	2000 0012		
	UNIT		L.F.	EA.		
TOTAL (SHEET 1)			12969	21		
TOTAL (COLUMN 1)			2584	2		
TOTAL (COLUMN 2)			1412	—		
TOTALS			16965	23		

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TABULATION OF PAVEMENT BASE DRAIN QUANTITIES

ROUTE	STATIONS	SIDE	PAVEMENT BASE DRAIN	6" PAVEMENT BASE DRAIN	6" PAVEMENT BASE DRAIN, MODIFIED			SUBSURFACE DRAIN OUTLETS	6" SUBSURFACE DRAIN OUTLETS	6" DUCTILE IRON PIPE, FOR STORM SEWERS	CLASS A CEMENT CONC.(OUTLET ENDWALL)	REMARKS
	ITEM NUMBER		610 7000	610 7002	2610 7002			615 0020	615 0022	2000 0211	704 0002	
	UNIT		L.F.	L.F.	L.F.			L.F.	L.F.	L.F.	C.Y.	
LR 764 WB	646 + 62 TO 647 + 48	RT	86									OUTLET TO INLET
	646 + 62 TO 647 + 50	LT TO RT	63					38				OUTLET TO INLET RT
	647 + 50 TO 647 + 75	RT TO LT						38				OUTLET TO INLET RT
	647 + 52 TO 648 + 82	RT	130									OUTLET TO INLET
	647 + 75 TO 655 + 31	LT	756									OUTLET TO INLET RT
	648 + 86 TO 652 + 98	RT	412									OUTLET TO INLET
	653 + 02 TO 654 + 22	RT	120									OUTLET TO INLET
	654 + 26 TO 656 + 30	RT	204									OUTLET TO INLET
	655 + 35 TO 657 + 15	LT		180								OUTLET TO INLET AND CONN. TO EXIST U'DRAIN
	665 + 19 TO 666 + 73	LT	154									OUTLET TO INLET
	666 + 77 TO 668 + 25	LT	148									OUTLET TO INLET
	685 + 84 TO 687 + 64	LT	180									OUTLET TO INLET
	687 + 68 TO 689 + 00	LT		132								OUTLET TO EXIST. U'DRAIN
	725 + 40 TO 726 + 75	LT		135								OUTLET TO EXIST. U'DRAIN
	726 + 67 TO 727 + 32	RT	65									OUTLET TO INLET
	728 + 06 TO 730 + 98	RT	292									OUTLET TO INLET
	729 + 78 TO 730 + 82	LT	104									OUTLET TO INLET
	730 + 86 TO 731 + 30	LT		44								OUTLET TO INLET AND CONN. TO EXIST U'DRAIN
LR 764 WB	731 + 02 TO 731 + 30	RT		28								OUTLET TO INLET AND CONN. TO EXIST U'DRAIN
LR 764 EB	689 + 60 TO 694 + 30	RT		470								OUTLET TO EXIST. U'DRAIN
	691 + 50 TO 692 + 77	LT		127								OUTLET TO EXIST. U'DRAIN
	692 + 81 TO 695 + 00	LT	219									OUTLET TO INLET
	694 + 38 TO 695 + 00	RT	62									OUTLET TO INLET
	702 + 73 TO 703 + 98	RT	125									OUTLET TO INLET
	704 + 02 TO 705 + 38	RT	136									OUTLET TO INLET
	705 + 42 TO 706 + 00	RT		58								OUTLET TO EXIST. U'DRAIN
	724 + 30 TO 724 + 98	RT		68								OUTLET TO EXIST. U'DRAIN
	725 + 02 TO 727 + 37	RT	235									OUTLET TO INLET
	727 + 34 TO 727 + 63	RT	29									OUTLET TO INLET
	739 + 30 TO 740 + 25	RT	95									OUTLET TO INLET
	740 + 29 TO 741 + 62	RT	133									OUTLET TO INLET
	741 + 66 TO 741 + 76	RT		10								OUTLET TO EXIST. U'DRAIN
	676 + 20 TO 676 + 80	RT			60				6		0.3	OUTLET TO ENDWALL
	678 + 20 TO 679 + 30	RT			110				6		0.3	OUTLET TO ENDWALL
	681 + 20 TO 684 + 80	RT			360				6		0.3	OUTLET TO ENDWALL
LR 764 EB	685 + 25 TO 685 + 75	RT			50				6		0.3	OUTLET TO ENDWALL
SUB-TOTAL			3,748	1,252	580			76	24		1.2	

ROUTE	STATIONS	SIDE	PAVEMENT BASE DRAIN	6" PAVEMENT BASE DRAIN	6" PAVEMENT BASE DRAIN, MODIFIED			SUBSURFACE DRAIN OUTLETS	6" SUBSURFACE DRAIN OUTLETS	6" DUCTILE IRON PIPE, FOR STORM SEWERS	CLASS A CEMENT CONC.(OUTLET ENDWALL)	REMARKS
	ITEM NUMBER		610 7000	610 7002	2610 7002			615 0020	615 0022	2000 0211	704 0002	
	UNIT		L.F.	L.F.	L.F.			L.F.	L.F.	L.F.	C.Y.	
RAMP A	646 + 63 TO 647 + 00	RT								37		CONN. TO D.I.P. IN FLOODWALL
RAMP D	641 + 25 TO 643 + 75	RT		250								CONNECT TO D.I.P.
	643 + 75 TO 644 + 09	RT								34		CONN. TO D.I.P. IN FLOODWALL
	650 + 85 TO 652 + 50	RT	165									OUTLET TO INLET
	651 + 09 TO 652 + 36	LT	127									OUTLET TO INLET
	653 + 25 TO 655 + 50 E.B.	FAR LT.	225									OUTLET TO INLET
RAMP D	655 + 52 E.B. TO 657 + 66 E.B.	FAR LT.	214									OUTLET TO INLET
RAMP F	655 + 05 TO 657 + 77	LT	272									OUTLET TO INLET
	657 + 83 TO 659 + 53	LT	170									OUTLET TO INLET
	659 + 59 TO 660 + 78	LT	119									OUTLET TO INLET
	660 + 84 TO 662 + 13	LT	129									OUTLET TO INLET
RAMP F	662 + 19 TO 662 + 78	LT	59									OUTLET TO INLET
RAMP N	631 + 40 TO 633 + 96	RT		256								CONNECT TO D.I.P.
RAMP N	633 + 96 TO 634 + 22	RT								26		CONN. TO D.I.P. IN FLOOD WALL
RAMP R	728 + 00 TO 730 + 48	RT	248									OUTLET TO INLET
	730 + 55 TO 732 + 98	RT	243									OUTLET TO INLET
	733 + 05 TO 734 + 88	RT	183									OUTLET TO INLET
RAMP R	734 + 92 TO 735 + 02	RT	10									OUTLET TO INLET
RAMP U	721 + 60 TO 723 + 70	RT	210					10				OUTLET TO INLET
RAMP U	723 + 77 TO 724 + 70	RT		93								OUTLET TO INLET AND CONN. TO EXIST U'DRAIN
RAMP V	727 + 37 TO 727 + 63	RT	26									CONN. TO EB PAV'T & DRAIN
TOTAL	(THIS COLUMN)		2,400	599				10		97		
TOTAL	(COLUMN 1)		3,748	1,252	580			76	24		1.2	
TOTAL			6,148	1,851	580			86	24	97	1.2	

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11-0	ALLEGHENY	764	19	41 of 76
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY

TABULATION OF ROADWAY QUANTITIES

SHEET 1 OF 3

✱ SEE REMARKS

ROUTE	STATION	SIDE	CLASS 1 EXCAVATION	CLASS 1 EXCAVATION, SPEC.	BITUMINOUS CONC BASE COURSE	AGGREGATE-CEMENT BASE COURSE, 6" DEPTH	SUBBASE MATERIAL	NO. 2B COARSE AGGREGATE	BIT. WEARING COURSE, ID-2, 1 1/2" DEPTH, SRL-E	BIT. WEARING COURSE, ID-2, 1 1/2" DEPTH, SRL-H	BIT. BINDER COURSE, ID-2, 2" DEPTH	BIT. SURFACE CRSE. FJ-1, LEVELING CRSE., SRL-L	BIT. SURFACE TREATMENT, SRL-L	REMOVAL OF EXIST. BIT. SURFACE COURSE	POLYETHYLENE	PLAIN CEMENT CONC. PAVEMENT, 4" DEPTH	PLAIN CEMENT CONC. PAVEMENT, 6" DEPTH	PLAIN CEMENT CONC. PAVEMENT, 14" DEPTH	REINF. CEMENT CONC. PAVEMENT, 8" DEPTH	REINF. CEMENT CONC. PAVEMENT, 8" DEPTH, SPECIAL	REINF. CEMENT CONC. PAVEMENT, 10" DEPTH	REINF. CEMENT CONC. PAVEMENT, 11" DEPTH	PROT. COATING FOR CEM. CONC. PAV'TS & SHLDS.	CONCRETE SHOULDERS	REMARKS
	ITEM		203	203	305	2321	350	703	420	420	421	2422	480	490	2500	501	501	2501	501	2501	501	501	2503	2658	
	NUMBER		0001	0002	0200	0104	0050	0006	0283	0303	0202	0145	0013	0001	0001	0020	0024	0038	0200	0200	0202	0203	0001	0001	
	UNIT		CY	CY	TONS	S.Y.	C.Y.	CY	SY	SY	SY	TONS	SY	SY	SY	S.Y.	SY	SY	SY	SY	SY	SY	SY	S.Y.	
LR 764 E8	636 + 16 TO 641 + 95																			360			360		SLIP RAMP
	647 + 68 TO 650 + 38				73.5				856		856			856											
	650 + 38 TO 651 + 78					✱62		5				32.7		436	436			23	436				521	✱62	LEFT SIDE SHOULDER
	651 + 78 TO 653 + 60	LT				✱46																		✱46	LEFT SIDE SHOULDER
	651 + 78 TO 656 + 37							20				133.4		1779	1779				1779				1779		
	656 + 37 TO 662 + 94.03							23				153.3		2044	2044			110	2044				2154		
	662 + 94.03 TO 665 + 44							10				89.6		1194	1194			125	1194				1319		
	665 + 44 TO 668 + 56.92						203	11										104					104		
	665 + 44 TO 689 + 60					✱1074						863.3	✱809	11,511	11,511				11,511				12585	✱1074	RIGHT SIDE SHOULDER
	668 + 56.92 TO 689 + 60						867	74										389					389		
	689 + 60 TO 691 + 50							8				63.3		844	844			63	844				907		
	691 + 50 TO 694 + 74.98			437		1573		6										108				1444	1552		
	702 + 9501 TO 704 + 49			226		81.4		3										51				684	735		
	704 + 49 TO 706 + 00			186		671		3										25				671	696		
	706 + 00 TO 720 + 35							81				478.4		6378	6378				6378				6378		
	720 + 35 TO 724 + 30							19				134.9		1798	1798			66	1798				1864		
	724 + 30 TO 727 + 37.40			527		1896		3										51				1786	1837		
	739 + 54.40 TO 741 + 76			217		780		5										37				689	726		
LR 764 E8	741 + 76 TO 747 + 21.92							19				197.9			2639			84	2639				2723		
LR 764 W8	646 + 62.49 TO 650 + 08			299		1075											570	90				985	1645		
	650 + 08 TO 652 + 68			225		809												173				809	982		
	652 + 68 TO 657 + 15			478		1720											664	149				1720	2533		
	657 + 15 TO 665 + 00							30				338.8		4517	4517			296	4517				4813		
	665 + 00 TO 668 + 01.5			408		1469		4										101				1340	1441		
	686 + 08 TO 689 + 00			493		1776		3										97				1647	1744		
	689 + 00 TO 697 + 00							30				275.8			3677			244	3677				3921		
	697 + 00 TO 713 + 23							74				556.0			7413			314	7413				7727		
	713 + 23 TO 721 + 38							31										430					430		
	713 + 23 TO 721 + 63			5								284.2			3789				3789				3789		
	721 + 38 TO 725 + 40							15										75					75		
	721 + 40 TO 725 + 40	LT				✱173																	173	✱173	LEFT SIDE SHOULDER
	721 + 63 TO 725 + 40											118.3			1577				1577				1577		
	725 + 40 TO 727 + 02.46			210		820		2										27				654	745	✱64	LEFT SIDE SHOULDER
	728 + 27.73 TO 731 + 30			290		1141		12										50				940	1087	✱97	LEFT SIDE SHOULDER
LR 764 WB	731 + 30 TO 735 + 02					✱166		14				87.8			1170			62	1170				1398	✱166	LEFT SIDE SHOULDER
SUB-TOTAL				4,001	73.5	16,065	1,070	505	856		856	3,807.7	809	31,357	50,766		1,234	3,344	50,766	360		13,369	70,709	1,682	

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FINAL BY ____________

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764	19	42 of 76
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY

TABULATION OF ROADWAY QUANTITIES

SHEET 2 OF 3 ✱ SEE REMARKS

ROUTE	STATION	SIDE	CLASS I EXCAVATION	CLASS I EXCAVATION, SPEC.	BITUMINOUS CONC BASE COURSE	AGGREGATE-CEMENT BASE COURSE, 6" DEPTH	SUBBASE MATERIAL	NO. 2B COARSE AGGREGATE	BIT. WEARING COURSE, ID-2, 1 1/2" DEPTH, SRL-E	BIT. WEARING COURSE, ID-2, 1 1/2" DEPTH, SRL-H	BIT. BINDER COURSE, ID-2, 2" DEPTH	BIT. SURFACE CRSE, FJ-1, LEVELING CRSE, SRL-L	BIT. SURFACE TREATMENT, SRL-L	REMOVAL OF EXIST. BIT. SURFACE COURSE	POLYETHYLENE	PLAIN CEMENT CONC. PAVEMENT 4" DEPTH	PLAIN CEMENT CONC. PAVEMENT, 6" DEPTH	PLAIN CEMENT CONC. PAVEMENT, 14" DEPTH	REINF. CEMENT CONC. PAVEMENT, 8" DEPTH	REINF. CEMENT CONC. PAVEMENT, 8" DEPTH, SPECIAL	REINF. CEMENT CONC. PAVEMENT, 10" DEPTH	REINF. CEMENT CONC. PAVEMENT, 11" DEPTH	PROT. COATING FOR CEM. CONC. PAV'TS & SHLDS.	CONCRETE SHOULDERS	REMARKS
	ITEM NUMBER		203 0001	203 0002	305 0200	2321 0104	350 0050	703 0006	420 0283	420 0303	421 0202	2422 0145	480 0013	490 0001	2500 0001	501 0020	501 0024	2501 0038	501 0200	2501 0200	501 0202	501 0203	2503 0001	2658 0001	
	UNIT		C.Y.	C.Y.	TONS	S.Y.	C.Y.	C.Y.	S.Y.	S.Y.	S.Y.	TONS	S.Y.	S.Y.	S.Y.	S.Y.	S.Y.	S.Y.	S.Y.	S.Y.	S.Y.	S.Y.	S.Y.	S.Y.	
L.R. 764 W.B.	735+02 TO 739+25							16				155.1			2068			212	2068				2280		
	739+25 TO 741+99							10				88.4			1179			91	1179				1270		
L.R. 764 W.B.	741+99 TO 746+99.17							22				175.5			2340				2340				2340		
L.R. 764	746+99.17 TO 768+15	LT.						57				672.6			8968			940	8968				9908		
	747+21.92 TO 748+20	RT.						3				31.1			414				414				414		
	748+20 TO 751+70	RT.						7				110.9			1478			58	1478				1536		
	751+70 TO 754+65	RT.						8				93.5			1246				1246				1246		
	754+65 TO 761+85	RT.						14				228.0			3040			120	3040				3160		
	761+85 TO 768+15	RT.						17				203.6			2714				2714				2714		
	765+45 TO 768+15	RT.												1194											
	765+45 TO 768+15	LT.												1174											
L.R. 764	766+87.37 TO 768+24	LT.		25		83																83	83		
RAMP A	646+63.49 TO 650+08							5		642	642							119					119		
	650+08 TO 650+78							1		159	159							16					16		
RAMP A	650+78 TO 651+20									102	102														
RAMP D	641+25 TO 644+09			144		518												32				518	550		
	650+03 TO 650+75			32		115										✱50		20				115	185		RT. & LT.
	650+75 TO 653+50	RT.				✱112																	112	✱112	RIGHT SIDE SHOULDER
	650+75 TO 654+60.44			262		942																942	942		
	650+75 TO 657+90 E.B.	LT.				✱316																	316	✱316	LEFT SIDE SHOULDER
	653+26 TO 657+92 E.B.																332						332		
RAMP D	654+60.44 TO 659+09.42			254		915																915	915		
RAMP E	651+27 TO 652+46									375	375														
	652+25 TO 652+46							1										7					7		
	652+46 TO 656+83							7										219					219		
	652+46 TO 657+06.09				77.0					1451	1451														
RAMP E	656+83 TO 657+20							1										12					12		
RAMP F	646+13 TO 647+07									248	248														
	647+07 TO 649+10.35							3		497	497							15					15		
	655+06.25 TO 659+19.35			275		989																918	918		
RAMP F	659+19.35 TO 662+94.67			295		1063		7										83				1063	1146		
RAMP M	673+15 TO 677+36.68									843	843														
RAMP M	673+15 TO 677+65							7										150					150		
RAMP N	631+40 TO 634+22			159		571		11										31				571	602		
	SUB - TOTAL			1,446	77.0	5,624		197		4,317	4,317	1,758.7		2,368	23,447	50	332	2,125	23,447			5,125	31,507	428	

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11-0	ALLEGHENY	764	19	43 of 76
CITY OF PITTSBURGH				

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TABULATION OF ROADWAY QUANTITIES

SHEET 3 OF 3

✱ SEE REMARKS

ROUTE	STATION	SIDE	CLASS 1 EXCAVATION	CLASS 1 EXCAVATION, SPEC.				BITUMINOUS CONC. BASE COURSE			AGGREGATE-CEMENT BASE COURSE, 6" DEPTH		SUBBASE MATERIAL	NO. 2B COARSE AGGREGATE		BIT. WEARING COURSE, ID-2, 1 1/2" DEPTH, SRL-E	BIT. WEARING COURSE, ID-2, 1 1/2" DEPTH, SRL-H		BIT. BINDER COURSE, ID-2, 2" DEPTH	BIT. SURFACE CRSE. FJ-1 LEVELING CRSE., SRL-L	BIT. SURFACE TREATMENT, SRL-L	REMOVAL OF EXIST. BIT. SURFACE COURSE		POLYETHYLENE	PLAIN CEMENT CONC. PAVEMENT, 4" DEPTH	PLAIN CEMENT CONC. PAVEMENT, 6" DEPTH	PLAIN CEMENT CONC. PAVEMENT, 14" DEPTH	REINF. CEMENT CONC. PAVEMENT, 8" DEPTH	REINF. CEMENT CONC. PAVEMENT, 8" DEPTH, SPECIAL	REINF. CEMENT CONC. PAVEMENT, 10" DEPTH	REINF. CEMENT CONC. PAVEMENT, 11" DEPTH		PROT. COATING FOR CEM. CONC. PAV'TS & SHLDS.	CONCRETE SHOULDERS		REMARKS
	ITEM NUMBER		203	203				305			2321		350	703		420	420		421	2422	480	490		2500	501	501	2501	501	2501	501	501		2503	2658		
			0001	0002				0200			0108		0050	0006		0283	0303		0202	0145	0013	0001		0001	0020	0024	0038	0200	0200	0202	0203		0001	0001		
	UNIT		C.Y.	C.Y.				TONS			S.Y.		C.Y.	C.Y.		S.Y.	S.Y.		S.Y.	TONS	S.Y.	S.Y.		S.Y.	S.Y.	S.Y.	S.Y.	S.Y.	S.Y.	S.Y.	S.Y.		S.Y.	S.Y.		
RAMP R	727 + 95 TO 732 + 25													7																						
	728 + 20.62 TO 731 + 00	RT									✱311																						311	✱311		RIGHT SIDE SHOULDER
	728 + 24.62 TO 731 + 00			78													459		459																	
	731 + 00 TO 735 + 02			112				39.4			✱447						670		670														447	✱447		RIGHT SIDE SHOULDER
RAMP R	732 + 25 TO 735 + 02													2													92						92			
RAMP T	736 + 78 TO 739 + 14													6													39						39			
	737 + 07.25 TO 739 + 25																436		436																	
	739 + 14 TO 741 + 73													11																						
RAMP T	739 + 25 TO 741 + 73							47.3									496		496																	
RAMP U	721 + 60 TO 724 + 03																										81						81			
	721 + 60 TO 722 + 25			14				28.7			✱58						108		108														58	✱58		RIGHT SIDE SHOULDER
	721 + 60 TO 722 + 50													2																						
	722 + 25 TO 724 + 00			37				10.7									294		294																	
	722 + 25 TO 725 + 18.01	RT									✱203																						203	✱203		RIGHT SIDE SHOULDER
	722 + 50 TO 724 + 03													2																						
	724 + 00 TO 725 + 83.83			10													413		413																	
	724 + 03 TO 725 + 61													4																						
RAMP U	725 + 61 TO 726 + 17													1													19						19			
RAMP V	727 + 10 TO 727 + 68													2													10						10			
RAMP F SPUR	0 + 00 TO 1 + 51.33			34							247						247		247												247		247			
	AS DIRECTED BY ENGINEER		1,385	2,305							8,300																			8,300						PATCHING
	TOTAL (THIS SHEET)		1,385	2,590				126.1			9,566			37			3,123		3,123								241			8,300	247		1,507	1,019		
	TOTAL (SHEET 1)			4,001				73.5			16,065		1,070	505		856			856	3,807.7	809	31,357		50,766		1,234	3,344	50,766	360		13,369		70,709	1,682		
	TOTAL (SHEET 2)			1,446				77.0			5,624			197			4,317		4,317	1,758.7		2,368		23,447	50	332	2,125	23,447			5,125		31,507	428		
	TOTALS		1,385	8,037				276.6			31,255		1,070	739		856	7,440		8,296	5,566.4	809	33,725		74,213	50	1,566	5,710	74,213	360	8,300	18,741		103,723	3,129		

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CITY OF PITTSBURGH

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TABULATION OF MISCELLANEOUS QUANTITIES

✱ DRAINS LOCATED AT PATCHES, SEE RC-26

SHEET 1 OF 2

ROUTE	STATION	SIDE	CLASS I EXCAVATION, SPEC.	AGGREGATE–CEMENT BASE COURSE, 6" DEPTH	PROT. COATING FOR CEM. CONC. PAV'TS. & SHLDS.	BIT. SURFACE CRSE., FJ-1, LEVELING CRSE., SRL-L	PAVEMENT RELIEF JOINT	BRIDGE APPROACH SLAB	POLYETHYLENE	SUBGRADE DRAINS ✱	CONC. TRAFFIC SEPARATOR	PLAIN CONC. CURB	PLAIN CONCRETE MOUNTABLE CURB, TYPE A
	ITEM NUMBER		203 0002	2321 0106	2503 0001	2422 0145	504 0001	505 0001	2500 0001	612 0001	629 0101	630 0001	633 0200
	UNIT		C.Y.	S.Y.	S.Y.	TONS	L.F.	S.Y.	S.Y.	L.F.	S.Y.	L.F.	L.F.
LR 764 EB	650 + 75 TO 653 + 60	LT											
	653 + 60 TO 663 + 00	LT											940
	676 + 20 TO 676 + 80	RT											
	678 + 20 TO 679 + 30	RT											
	681 + 20 TO 684 + 80	RT											
	685 + 25 TO 685 + 75	RT											
	694 + 77						40						
	702 + 93						40						
	727 + 39.4						28						
LR 764 EB	739 + 52.4						28						
LR 764 WB	646 + 62.49 TO 646 + 87.49							78					
	646 + 62.49 TO 650 + 08	RT											346
	646 + 87.50						28						
	654 + 25 TO 657 + 15	RT											290
	657 + 00												
	668 + 03.5						40						
	686 + 06						40						
	721 + 60 TO 735 + 00	LT											
	727 + 02.5						31						
	728 + 25.7						31						
LR 764 WB	735 + 10												
RAMP A	646 + 63.49 TO 646 + 88.49		15	54	54			54					
RAMP D	643 + 84 TO 644 + 09		14	50	50			50					
	650 + 30						20						
	652 + 50 TO 663 + 00	RT											1,050
RAMP D	650 + 03 TO 650 + 28		17	61	61			61					
RAMP E	651 + 99 TO 652 + 25	RT										26	
RAMP E	652 + 24 TO 652 + 39	LT										15	
RAMP F	649 + 10.35 TO 649 + 40.41		20	73									
	646 + 86 TO 647 + 06	RT										20	
	646 + 97 TO 647 + 08	LT										11	
	649 + 12.4						25						
	655 + 04.3						25						
	658 + 03 TO 659 + 17.43	RT		53							53		
RAMP F	654 + 77.25 TO 655 + 06.25		20	71									
RAMP F SPUR	0 + 65 TO 1 + 51	RT											
	0 + 00 TO 0 + 44	RT										54	
	0 + 52 TO 1 + 51.33	RT										123	
RAMP F SPUR	0 + 60 TO 0 + 92	LT										112	
	SUB – TOTAL		86	362	165		376	243			53	361	2,626

ROUTE	STATION	SIDE	CEMENT CONC. SIDEWALK	HOLES DRILLED-SUBSEALING	PRESSURE GROUTING CONC. PAV'T.	TOPSOIL FURNISHED AND PLACED	SEEDING & SOIL SUPPLEMENTS – FORMULA C	SEEDING & SOIL SUPPLEMENTS – FORMULA D	MULCHING – HAY	BALED STRAW BARRIER	FILL SHOULDER WIDENING, TYPE 1	FILL SHOULDER WIDENING, TYPE 2	REMOVE, STORE & RESET IMPACT ATTR. STA. 657+WB	ENERGY ABSORBING CRASH BARRIER, TYPE 2	REMARKS
	ITEM NUMBER		676 0001	679 0200	2681 0026	802 0001	804 0004	804 0005	805 0001	855 0001	2000 0098	2000 0099	2000 0105	2000 0219	
	UNIT		S.Y.	EA.	BAGS	C.Y.	S.Y.	S.Y.	S.Y.	L.F.	L.F.	L.F.	L.S.	EA.	
LR 764 EB	650 + 75 TO 653 + 60	LT				44	392		392						
	653 + 60 TO 663 + 00	LT													
	676 + 20 TO 676 + 80	RT									60				
	678 + 20 TO 679 + 30	RT									110				
	681 + 20 TO 684 + 80	RT									360				
	685 + 25 TO 685 + 75	RT										50			
	694 + 77														
	702 + 93														
	727 + 39.4														
LR 764 EB	739 + 52.4														
LR 764 WB	646 + 62.49 TO 646 + 87.49														
	646 + 62.49 TO 650 + 08	RT													
	646 + 87.50														
	654 + 25 TO 657 + 15	RT													
	657 + 00												L.S.		
	668 + 03.5														
	686 + 06														
	721 + 60 TO 735 + 00	LT				69	230	381	611						
	727 + 02.5														
	728 + 25.7														
LR 764 WB	735 + 10													1	
RAMP A	646 + 63.49 TO 646 + 88.49														
RAMP D	643 + 84 TO 644 + 09														
	650 + 30														
	652 + 50 TO 663 + 00	RT													
RAMP D	650 + 03 TO 650 + 28														
RAMP E	651 + 99 TO 652 + 25	RT													
RAMP E	652 + 24 TO 652 + 39	LT													
RAMP F	649 + 10.35 TO 649 + 40.41														FOR BRIDGE APPROACH SLAB
	646 + 86 TO 647 + 06	RT													
	646 + 97 TO 647 + 08	LT													
	649 + 12.4														
	655 + 04.3														
	658 + 03 TO 659 + 17.43	RT													
RAMP F	654 + 77.25 TO 655 + 06.25														FOR BRIDGE APPROACH SLAB
RAMP F SPUR	0 + 65 TO 1 + 51	RT				14		123	123						
	0 + 00 TO 0 + 44	RT	63												
	0 + 52 TO 1 + 51.33	RT	68												
RAMP F SPUR	0 + 60 TO 0 + 92	LT	72												
	SUB – TOTAL		203			127	622	504	1,126		530	50	L.S.	1	

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TABULATION OF MISCELLANEOUS QUANTITIES

* DRAINS LOCATED AT PATCHES, SEE RC-26

SHEET 2 OF 2

ROUTE	STATION	SIDE	CLASS I EXCAVATION, SPEC	AGGREGATE-CEMENT BASE COURSE, 8" DEPTH	PROTECT. COAT'G. FOR CEMENT CONC. PAVEMENT & SHOULDERS	BIT SURFACE CRSE., FJ-1, LEVELING CRSE., SRL-L	PAVEMENT RELIEF JOINT	BRIDGE APPROACH SLAB	POLYETHYLENE	SUBGRADE DRAINS *	CONC. TRAFFIC SEPARATOR	PLAIN CEMENT CONC. CURB	PLAIN CONCRETE MOUNTABLE CURB, TYPE A	CEMENT CONC. SIDEWALK	HOLES DRILLED-SUBSEALING	PRESSURE GROUTING CONC. PAV'T.	TOPSOIL FURNISHED AND PLACED	SEEDING & SOIL SUPPLEMENTS - FORMULA C	SEEDING & SOIL SUPPLEMENTS - FORMULA D	MULCHING - HAY	BALED STRAW BARRIER	FILL SHOULDER WIDENING, TYPE 1	FILL SHOULDER WIDENING, TYPE 2	REMOVE, STORE & RESET IMPACT ATT'R, STA.657+WB	ENERGY ABSORBING CRASH BARRIER, TYPE 2	REMARKS
	ITEM NUMBER		203 0002	2321 0108	2503 0001	2422 0145	504 0001	505 0001	2500 0001	612 0001	629 0101	630 0001	633 0200	676 0001	679 0200	2681 0026	802 0001	804 0004	804 0005	805 0001	855 0001	2000 0098	2000 0099	2000 0105	2000 0219	
	UNIT		C.Y.	S.Y.	S.Y.	TONS	L.F.	S.Y.	S.Y.	L.F.	S.Y.	L.F.	L.F.	S.Y.	EA.	BAGS	C.Y.	S.Y.	S.Y.	S.Y.	L.F.	L.F.	L.F.	L.S.	EA.	
RAMP M	677 + 36.68 TO 677 + 65.68		16	58																						FOR BRIDGE APPROACH SLAB
RAMP M	673 + 15 TO 673 + 30	RT										15														
RAMP M	677 + 38.7						21																			
RAMP N	633 + 97 TO 634 + 22		16	56	56			56																		
RAMP R	727 + 95.62 TO 728 + 24.62		21	77																						FOR BRIDGE APPROACH SLAB
	728 + 22.6						24																			
RAMP R	735 + 02 TO 737 + 00	RT				17			231		231															
RAMP S	737 + 52.25 TO 737 + 81.25		21	77																						FOR BRIDGE APPROACH SLAB
RAMP S	737 + 79.3						25																			
RAMP T	736 + 78.25 TO 737 + 07.25		16	58																						FOR BRIDGE APPROACH SLAB
RAMP T	737 + 05.3						21																			
RAMP T	739 + 16 TO 740 + 80	RT		110							110															
RAMP U	725 + 83.83 TO 726 + 15.25		21	77																						FOR BRIDGE APPROACH SLAB
	721 + 00 TO 721 + 37	RT				3			31		31															
	721 + 40 TO 722 + 50	RT															7		61	61						
RAMP U	725 + 85.2						23																			
RAMP V	727 + 36.05 TO 727 + 65.05		16	58																						FOR BRIDGE APPROACH SLAB
	727 + 38						21																			
	740 + 06.6						21																			
RAMP V	739 + 79.56 TO 740 + 08.56		16	58																						FOR BRIDGE APPROACH SLAB
LR 120 WB	721 + 46.97 TO 721 + 75.97		48	174																						FOR BRIDGE APPROACH SLAB
	721 + 49						54																			
	732 + 87.6						29																			
LR 120 WB	732 + 60.61 TO 732 + 89.61		26	93																						FOR BRIDGE APPROACH SLAB
	AS DIRECTED BY ENGINEER									6,200					2,500	2,500					1,500					
	TOTAL (THIS SHEET)		217	896	56	20	239	56	262	6,200	372	15			2,500	2,500	7		61	61	1,500					
	TOTAL (SHEET 1)		86	362	165		376	243			53	361	2,626	203			127	622	504	1,126		530	50	L.S.	1	
	TOTAL		303	1258	221	20	615	299	262	6,200	425	376	2,626	203	2,500	2,500	134	622	565	1,187	1,500	530	50	L.S.	1	

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764	19	46 of 76
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY

TABULATION OF QUANTITIES

TABULATION OF GRADING SECTIONS (INFORMATION ONLY)

ROUTE	STATION TO STATION	EXCAVATION C.Y.	EMBANKMENT C.Y.
L.R. 764 E.B.	STA. 649+75 TO STA. 660+00	1,061	433
	STA. 660+00 TO STA. 670+00	572	54
	STA. 670+00 TO STA. 680+00	545	0
	STA. 680+00 TO STA. 690+00	425	0
	STA. 690+00 TO STA. 695+03.98	225	13
	STA. 702+65.9 TO STA. 710+00	188	13
	STA. 710+00 TO STA. 720+00	211	0
	STA. 720+00 TO STA. 727+66.4	345	22
L.R. 764 E.B.	STA. 739+25.4 TO STA. 746+50	246	9
L.R. 764 W.B.	STA. 646+62.49 TO STA. 650+00	588	0
	STA. 650+00 TO STA. 660+00	1,117	0
	STA. 660+00 TO STA. 668+30.5	337	0
	STA. 685+79 TO STA. 690+00	96	0
	STA. 690+00 TO STA. 700+00	174	0
	STA. 700+00 TO STA. 710+00	219	0
	STA. 710+00 TO STA. 720+00	210	0
	STA. 720+00 TO STA. 730+00	472	8
	STA. 730+00 TO STA. 740+00	329	4
L.R. 764 W.B.	STA. 740+00 TO STA. 746+50	182	20
SUB-TOTAL		7,542	576

ROUTE	STATION TO STATION	EXCAVATION C.Y.	EMBANKMENT C.Y.
L.R. 764	STA. 746+50 TO STA. 750+00	130	2
L.R. 764	STA. 750+00 TO STA. 760+00	352	0
L.R. 764	STA. 760+00 TO STA. 769+56.16	334	4
RAMP A	STA. 646+63.49 TO STA. 650+78	93	0
RAMP D	STA. 641+25 TO STA. 644+09	148	0
RAMP D	STA. 650+03 TO STA. 654+60	315	366
RAMP E	STA. 652+25 TO STA. 657+20	140	0
RAMP F	STA. 647+07 TO STA. 649+40.41	40	0
RAMP F	STA. 654+77.25 TO STA. 658+00	1,271	0
RAMP F SPUR	STA. 0+00 TO STA. 1+51.34	181	0
RAMP M	STA. 673+15 TO STA. 677+65.68	103	0
RAMP N	STA. 631+40 TO STA. 634+22	194	0
SUB-TOTAL		3,301	372

ROUTE	STATION TO STATION	EXCAVATION C.Y.	EMBANKMENT C.Y.
RAMP R	STA. 727+95.62 TO STA. 730+00	113	0
RAMP R	STA. 730+00 TO STA. 735+00	232	3
RAMP S	STA. 737+52.25 TO STA. 737+81.25	26	0
RAMP T	STA. 736+78.25 TO STA. 739+00	62	0
RAMP U	STA. 722+00 TO STA. 726+15.25	180	1
RAMP V	STA. 739+79.56 TO STA. 740+08.56	19	0
L.R. 120	STA. 721+46.97 TO STA. 721+75.97	58	0
L.R. 120	STA. 732+60.61 TO STA. 732+89.61	31	0
SUB-TOTAL		721	4

ROUTE	STATION TO STATION	EXCAVATION C.Y.	EMBANKMENT C.Y.
TOTAL	(COLUMN 1)	7,542	576
TOTAL	(COLUMN 2)	3,301	372
TOTAL	(COLUMN 3)	721	4
TOTALS		11,564	952

TABULATION OF SPECIAL EARTHWORK (INFORMATION ONLY)

ROUTE	STATION TO STATION	CLASS 5 EXCAVATION C.Y.	EMBANKMENT C.Y.	REMARKS
L.R. 764	STA. 760+00 TO STA. 766+50	1,200		AS DIRECTED BY ENGINEER
TOTALS		1,200		

TRACED BY

FINAL BY

TABULATION OF STRUCTURE QUANTITIES

SHEET 1 OF 8

REVISION NUMBER	REVISION	DATE	BY

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	766 764	23 19	47 of 76
CITY OF PITTSBURGH				

ROUTE	STATIONS	Class 3 Excavation, Special: Sta. 668+33 To Sta. 685+77 (Approx. 1,400 C.Y.)	Sta. 677+68 To Sta. 680+44 (Approx. 175 C.Y.)	Sta. 727+38 To Sta. 727+92 (Approx. 2,254 C.Y.)	L.R. 120 & Ramp "U" (Approx. 550 C.Y.)	Sta. 727+68 To Sta. 739+23 (Approx. 2,050 C.Y.)	Sta. 727+67 To Sta. 739+77 (Approx. 800 C.Y.)	L.R. 120 & Ramp "R" (Approx. 117 C.Y.)	Sta. 649+43 To Sta. 654+75 (Approx. 391 C.Y.)	Sta. 695+04 To Sta. 702+64 (Approx. 855 C.Y.)	L.R. 120 & Ramps "R", "S" & "T" (Approx. 370 C.Y.)	Sta. 726+26 To Sta. 737+50 (Approx. 13 C.Y.)	Sta. 728+89 To Sta. 732+58 (Approx. 75 C.Y.)	Class 3 Excavation	Selected Borrow Excavation – Structure Backfill
ITEM		2204-												204-	2205-
NUMBER		0101	0102	0103	0104	0105	0106	0107	0108	0109	0110	0111	0112	0100	0207
UNIT		L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	C.Y.	C.Y.
L.R. 764	668+33 To 685+77	L.S.													
Ramp "M" To Second Ave.	677+68 To 680+44		L.S.												
L.R. 764	727+38 To 727+92			L.S.											
L.R. 120 & Ramp "U"	727+25 To 728+89 726+18 To 730+20				L.S.										
L.R. 764	727+68 To 739+23					L.S.									
Ramp "V" To Forbes Ave.	727+67 To 739+77						L.S.								
L.R. 120 & Ramp "R"	724+08 To 727+25 724+03 To 727+93							L.S.							
Ramp "F" From Grant St.	649+43 To 654+75								L.S.						
L.R. 764	695+04 To 702+64									L.S.					
L.R. 120 & Ramps "R", "S" & "T"	*See Sheet #8 For Stations										L.S.				
L.R. 764	650+08 To 652+68														
Ramp "D"	649+17 To 650+75														
Ramp "S"	726+26 To 737+50											L.S.			
L.R. 120	728+89 To 732+58												L.S.		
L.R. 764 & L.R. 766	631+17 To 646+62 1098+30 To 1101+35														
Ramp "F"	655+04.25 TO 660+76.66													580	400
TOTALS		L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S	L.S	L.S.	L.S.	580	400

ROUTE	STATIONS	Selected Borrow Excavation – Structure Backfill: Sta. 668+33 To Sta. 685+77 (Approx. 1,740 C.Y.)	Sta. 677+68 To Sta. 680+44 (Approx. 200 C.Y.)	Sta. 727+38 To Sta. 727+92 (Approx. 2,250 C.Y.)	L.R. 120 & Ramp "U" (Approx. 550 C.Y.)	Sta. 727+68 To Sta. 739+23 (Approx. 1,920 C.Y.)	Sta. 727+67 To Sta. 739+77 (Approx. 800 C.Y.)	L.R. 120 & Ramp "R" (Approx. 111 C.Y.)	Sta. 649+43 To Sta. 654+75 (Approx. 391 C.Y.)	Sta. 695+04 To Sta. 702+64 (Approx. 855 C.Y.)	L.R. 120 & Ramps "R", "S" & "T" (Approx. 337 C.Y.)	Sta. 726+26 To Sta. 737+50 (Approx. 13 C.Y.)	Sta. 728+89 To Sta. 732+58 (Approx. 75 C.Y.)		REMARKS
ITEM		205-													
NUMBER		0350	0351	0352	0353	0354	0355	0356	0357	0358	0359	0360	0361		
UNIT		L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S	L.S.	L.S.		
L.R. 764	668+33 To 685+77	L.S.												S-12710	12-Span Steel Multi-Girder Structure Over B & O R.R.
Ramp "M" To Second Ave.	677+68 To 680+44		L.S.											S-12709	2-Span Steel Multi-Girder Structure Carrying Ramp "M"
L.R. 764	727+38 To 727+92			L.S.										S-12707	Simple Span Steel Structure Over Brady St.
L.R. 120 & Ramp "U"	727+25 To 728+89 726+18 To 730+20				L.S.									S-12708	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "U"
L.R. 764	727+68 To 739+23					L.S								S-12705	15-Span Steel Multi-Girder Structure Over Brady St.
Ramp "V" To Forbes Ave.	727+67 To 739+77						L.S.							S-12704	10-Span Steel Multi-Girder Structure Carrying Ramp "V"
L.R. 120 & Ramp "R"	724+08 To 727+25 724+03 To 727+93							L.S.						S-12703	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "R"
Ramp "F" From Grant St.	649+43 To 654+75								L.S.					S-12711	Simple Span Steel I-Beam Structure Carrying Ramp "F"
L.R. 764	695+04 To 702+64									L.S.				S-12708	7-Span Steel Multi-Girder Structure Over Second Ave.
L.R. 120 & Ramps "R", "S" & "T"	*See Sheet #8 For Stations										L.S.			S-12702	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramps "R", "S" & "T"
L.R. 764	650+08 To 652+68													S-12713	Concrete Rigid-Frame Arch Under Grant St.
Ramp "D"	649+17 To 650+75													S-12712	Concrete Rigid-Frame Arch Under Grant St.
Ramp "S"	726+26 To 737+50											L.S.		S-14204	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "S"
L.R. 120	728+89 To 732+58												L.S.	S-14203	Steel Multi-Girder Structure Carrying Blvd. Of Allies
L.R. 764 & L.R. 766	631+17 To 646+62 1098+30 To 1101+35													S-14584	Parkway Floodwall Protection System
Ramp "F"	655+04.25 TO 660+76.66													S-14647	Retaining Wall – Ramp "F"
TOTALS		L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S	L.S.	L.S.	L.S.	L.S.		

REORDER NO. A-1829-1

REVISION NUMBER	REVISION	DATE	BY

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	766 764	23 19	48 of 76
CITY OF PITTSBURGH				

TABULATION OF STRUCTURE QUANTITIES

SHEET 2 OF 8

ROUTE	STATIONS	Bridge Approach Slab	Bridge Approach Slab, Special	No. 2B Coarse Aggregate	Class AA Cement Concrete	Class A Cement Concrete
ITEM NUMBER		505-0001	2505-0001	703-0006	704-0001	704-0002
UNIT		S.Y.	C.Y.	C.Y.	C.Y.	C.Y.
L.R.764	668+33 To 685+77	240				
Ramp "M" To Second Ave.	677+68 To 680+44	70				
L.R.764	727+38 To 727+92	209				323
L.R 120 & Ramp "U"	727+25 To 728+89 726+18 To 730+20	72				
L.R. 764	727+68 To 739+23	200				
Ramp "V" To Forbes Ave.	727+67 To 739+77	138				
L.R. 120 & Ramp "R"	724+08 To 727+25 724+03 To 727+93	67				
Ramp "F" From Grant St.	649+43 To 654+75	139				
L.R.764	695+04 To 702+64	240				
L.R. 120 & Ramps "R," "S" & "T"	*See Sheet #8 For Stations	58	74			74
L.R. 764	650+08 To 652+68					
Ramp "D"	649+17 To 650+75					
Ramp "S"	726+26 To 737+50	68				
L.R. 120	728+89 To 732+58	82				
L.R.764 & L.R. 766	631+17 To 646+62 1098+30 To 1101+35			280	3,870	10,580
Ramp "F"	655+04.25 TO 660+76.66			7	145	180
TOTALS		1,583	74	287	4,015	11,157

ROUTE	Class AA Cement Concrete: Sta. 668+33 To Sta. 685+77 (Approx. 3,100 C.Y.)	Sta. 677+68 To Sta. 680+44 (Approx. 400 C.Y.)	Sta. 727+38 To Sta. 727+92 (Approx. 152 C.Y.)	L.R. 120 & Ramp "U" (Approx. 605 C.Y.)	Sta. 727+68 To Sta. 739+23 (Approx. 1,530 C.Y.)	Sta. 727+67 To Sta. 739+77 (Approx. 1,275 C.Y.)	L.R. 120 & Ramp "R" (Approx. 882 C.Y.)	Sta. 649+43 To Sta. 654+75 (Approx. 742 C.Y.)	Sta. 695+04 To Sta. 702+64 (Approx. 1,503 C.Y.)	L.R. 120 & Ramps "R," "S" & "T" (Approx. 1,900 C.Y.)	Sta. 726+26 To Sta. 737+50 (Approx. 1,250 C.Y.)	Sta. 728+89 To Sta. 732+58 (Approx. 634 C.Y.)
ITEM NUMBER	2704-0100	0101	0102	0103	0104	0105	0106	0107	0108	0109	0110	0111
UNIT	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.
L.R.764	L.S.											
Ramp "M" To Second Ave.		L.S.										
L.R.764			L.S.									
L.R 120 & Ramp "U"				L.S.								
L.R. 764					L.S.							
Ramp "V" To Forbes Ave.						L.S.						
L.R. 120 & Ramp "R"							L.S.					
Ramp "F" From Grant St.								L.S.				
L.R.764									L.S.			
L.R. 120 & Ramps "R," "S" & "T"										L.S.		
L.R. 764												
Ramp "D"												
Ramp "S"											L.S.	
L.R. 120												L.S.
L.R.764 & L.R. 766												
Ramp "F"												
TOTALS	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.

ROUTE	Junction Boxes JB-25	1 1/4" Conduit In Structure	2" Conduit In Structure	Lighting Pole Anchorages	6" Structure Foundation Drain		REMARKS
ITEM NUMBER	910-0006	910-5252	910-5255	1001-0500	1001-0611		
UNIT	Each	L.F.	L.F.	Each	L.F.		
L.R.764	11	35	3,750	7		S-12710	12-Span Steel Multi-Girder Structure Over B & O R.R.
Ramp "M" To Second Ave.	1	5	305	1		S-12709	2-Span Steel Multi-Girder Structure Carrying Ramp "M"
L.R.764	1	3	132		105	S-12707	Simple Span Steel Structure Over Brady St.
L.R 120 & Ramp "U"	8	25	707	2	105	S-12706	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "U"
L.R. 764	6	30	1,200	5	35	S-12705	15-Span Steel Multi-Girder Structure Over Brady St.
Ramp "V" To Forbes Ave.	7	30	1290	4	55	S-12704	10-Span Steel Multi-Girder Structure Carrying Ramp "V"
L.R. 120 & Ramp "R"	7	20	556	3	50	S-12703	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "R"
Ramp "F" From Grant St.	5	25	820	4		S-12711	Simple Span Steel I-Beam Structure Carrying Ramp "F"
L.R.764	6	20	2250	3		S-12708	7-Span Steel Multi-Girder Structure Over Second Ave.
L.R. 120 & Ramps "R," "S" & "T"	10	30	1,638	5	147	S-12702	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramps "R," "S" & "T"
L.R. 764						S-12713	Concrete Rigid-Frame Arch Under Grant St.
Ramp "D"						S-12712	Concrete Rigid-Frame Arch Under Grant St.
Ramp "S"	6	25	1025	4	28	S-14204	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "S"
L.R. 120	3	6	389	1	60	S-14203	Steel Multi-Girder Structure Carrying Blvd. Of Allies
L.R.764 & L.R. 766						S-14584	Parkway Floodwall Protection System
Ramp "F"	1		280			S-14647	Retaining Wall - Ramp "F"
TOTALS	72	254	14,342	39	585		

REVISION NUMBER	REVISION	DATE	BY

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
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CITY OF PITTSBURGH				

TABULATION OF STRUCTURE QUANTITIES

SHEET 3 OF B

ROUTE	STATIONS	Reinforcement Bars: Sta. 728+89 To Sta. 732+58 (Approx. 2,410 Lbs.)	Reinforcement Bars: L.R. 120 & Ramps "R","S" & "T" (Approx. 4,365 Lbs.)	Reinforcement Bars: Sta. 727+38 To Sta. 727+92 (Approx. 21,460 Lbs.)	Reinforcement Bars	Reinforcement Bars, Epoxy Coated		Reinforcement Bars, Epoxy Coated: Sta. 668+33 To Sta. 685+77 (Approx. 690,000 Lbs.)	Reinforcement Bars, Epoxy Coated: Sta. 677+68 To Sta. 680+44 (Approx. 63,700 Lbs.)	Reinforcement Bars, Epoxy Coated: Sta. 727+38 To Sta. 727+92 (Approx. 20,093 Lbs.)	Reinforcement Bars, Epoxy Coated: L.R. 120 & Ramp "U" (Approx. 111,500 Lbs.)	Reinforcement Bars, Epoxy Coated: Sta. 727+68 To Sta. 739+23 (Approx. 296,831 Lbs.)	Reinforcement Bars, Epoxy Coated: Sta. 727+67 To Sta. 739+77 (Approx. 249,200 Lbs.)	Reinforcement Bars, Epoxy Coated: L.R. 120 & Ramp "R" (Approx. 145,462 Lbs.)	Reinforcement Bars, Epoxy Coated: Sta. 649+43 To Sta. 654+75 (Approx. 141,800 Lbs.)	Reinforcement Bars, Epoxy Coated: Sta. 695+04 To Sta. 702+64 (Approx. 311,200 Lbs.)	Reinforcement Bars, Epoxy Coated: L.R. 120 & Ramps "R","S" & "T" (Approx. 425,863 Lbs.)	Reinforcement Bars, Epoxy Coated: Sta. 726+26 To Sta. 737+50 (Approx. 249,910 Lbs.)	Reinforcement Bars, Epoxy Coated: Sta. 728+89 To Sta. 732+58 (Approx. 103,150 Lbs.)		Dowel Holes 12" Depth	Dowel Holes 18" Depth	Dowel Holes 24" Depth	Dowel Holes 30" Depth	Dowel Holes 40" Depth		Pedestrian Railing				REMARKS
	ITEM NUMBER	1002-			1002-	1002-		1002-													1003-		2003-				1012-				
		0002	0003	0004	0001	0053		0054	0055	0056	0057	0058	0059	0060	0061	0062	0063	0064	0065		0005	0008	0011	0014	0019		0001				
	UNIT	L.S.	L.S.	L.S.	Lbs.	Lbs.		L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.		Each	Each	Each	Each	Each		L.F.				
L.R.764	668+33 To 685+77							L.S.													4	94								S-12710	12-Span Steel Multi-Girder Structure Over B & O R.R.
Ramp "M" To Second Ave.	677+68 To 680+44								L.S.												4	22								S-12709	2-Span Steel Multi-Girder Structure Carrying Ramp "M"
L.R. 764	727+38 To 727+92			L.S.						L.S.											419			59	77					S-12707	Simple Span Steel Structure Over Brady St.
L.R 120 & Ramp "U"	727+25 To 728+89 726+18 To 730+20										L.S.											114								S-12706	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "U"
L.R.764	727+68 To 739+23											L.S.										250								S-12705	15-Span Steel Multi-Girder Structure Over Brady St.
Ramp "V" To Forbes Ave.	727+67 To 739+77												L.S.									102								S-12704	10-Span Steel Multi-Girder Structure Carrying Ramp "V"
L.R. 120 & Ramp "R"	724+08 To 727+25 724+03 To 727+93													L.S.								84					271			S-12703	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "R"
Ramp "F" From Grant St.	649+43 To 654+75														L.S.							80								S-12711	Simple Span Steel I-Beam Structure Carrying Ramp "F"
L.R 764	695+04 To 702+64															L.S.						122								S-12708	7-Span Steel Multi-Girder Structure Over Second Ave.
L.R. 120 & Ramps "R","S" & "T"	*See Sheet #8 For Stations		L.S.														L.S.					245	82				240			S-12702	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramps "R","S" & "T"
L.R. 764	650+08 To 652+68																													S-12713	Concrete Rigid-Frame Arch Under Grant St.
Ramp "D"	649+17 To 650+75																													S-12712	Concrete Rigid-Frame Arch Under Grant St.
Ramp "S"	726+26 To 737+50																	L.S.												S-14204	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "S"
L.R. 120	728+89 To 732+58	L.S.																	L.S			223								S-14203	Steel Multi-Girder Structure Carrying Blvd Of Allies
L.R.764 & L.R. 766	631+17 To 646+62 1098+30 To 1101+35				588,000	151,490																								S-14584	Parkway Floodwall Protection System
Ramp "F"	655+04.25 TO 660+76.66				11,500	13,900															105									S-14647	Retaining Wall-Ramp "F"
TOTALS		L.S.	L.S.	L.S.	599,500	165,390		L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.		532	1,336	82	59	77		511				

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TABULATION OF STRUCTURE QUANTITIES

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ROUTE	STATIONS	Removol Of Portion Of Existing Bridge Superstructure: Sta. 668+33 To Sta. 685+77	Sta. 677+68 To Sta. 680+44	Sta. 727+38 To Sta. 727+92	L.R. 120 & Ramp "U"	Sta. 727+68 To Sta. 739+23	Sta. 727+67 To Sta. 739+77	L.R. 120 & Ramp "R"	Sta. 649+43 To Sta. 654+75	Sta. 695+04 To Sta. 702+64	L.R. 120 & Ramps "R", "S" & "T"	Sta. 726+26 To Sta. 737+50	Sta. 728+89 To Sta. 732+58
	ITEM NUMBER	2018- 0150	0151	0152	0153	0154	0155	0156	0157	0158	0159	0160	0161
	UNIT	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.
L.R. 764	668+33 To 685+77	L.S.											
Ramp "M" To Second Ave.	677+68 To 680+44		L.S.										
L.R. 764	727+38 To 727+92			L.S.									
L.R. 120 & Ramp "U"	727+25 To 728+89 726+18 To 730+20				L.S.								
L.R. 764	727+68 To 739+23					L.S.							
Romp "V" To Forbes Ave.	727+67 To 739+77						L.S.						
L.R. 120 & Ramp "R"	724+08 To 727+25 724+03 To 727+93							L.S.					
Ramp "F" From Grant St.	649+43 To 654+75								L.S.				
L.R. 764	695+04 To 702+64									L.S.			
L.R. 120 & Ramps "R", "S" & "T"	*See Sheet #8 For Stations										L.S.		
L.R. 764	650+08 To 652+68												
Ramp "D"	649+17 To 650+75												
Romp "S"	726+26 To 737+50											L.S.	
L.R. 120	728+89 To 732+58												L.S.
L.R. 764 & L.R. 766	631+17 To 646+62 1098+30 To 1101+35												
Ramp "F"	655+04.25 TO 660+76.66												
TOTALS		L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.

ROUTE	Removal Of Portian Of Existing Bridge Substructure: Sta. 668+33 To Sta. 685+77	Sta. 677+68 To Sta. 680+44	Sta. 727+38 To Sta. 727+92	L.R. 120 & Ramp "U"	Sta. 727+68 To Sta. 739+23	Sta. 727+67 To Sta. 739+77	L.R. 120 & Ramp "R"	Sta. 649+43 To Sta. 654+75	Sta. 695+04 To Sta. 702+64	L.R. 120 & Ramps "R", "S" & "T"	Sta. 726+26 To Sta. 737+50	Sta. 728+89 To Sta. 732+58	Removal Of Portion Of Existing Retaining Walls	Protective Coating For Reinforced Concrete Surfaces			REMARKS
ITEM NUMBER	2018- 0175	0176	0177	0178	0179	0180	0181	0182	0183	0184	0185	0186	2018- 0475	1019- 0002			
UNIT	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	S.Y.			
L.R. 764	L.S.													11,000		S-12710	12-Span Steel Multi-Girder Structure Over B & O R.R.
Ramp "M" To Second Ave.		L.S.												1,250		S-12709	2-Span Steel Multi-Girder Structure Carrying Ramp "M"
L.R. 764			L.S.											359		S-12707	Simple Spon Steel Structure Over Brady St.
L.R. 120 & Ramp "U"				L.S.										2,200		S-12706	Steel Multi-Girder Structure Corrying Blvd. Of Allies & Ramp "U"
L.R. 764					L.S.									6,000		S-12705	15-Span Steel Multi-Girder Structure Over Brady St.
Romp "V" To Forbes Ave.						L.S.								5,100		S-12704	10-Span Steel Multi-Girder Structure Carrying Ramp "V"
L.R. 120 & Ramp "R"							L.S.							3,206		S-12703	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "R"
Ramp "F" From Grant St.								L.S.						2,862		S-12711	Simple Spon Steel I-Beom Structure Carrying Ramp "F"
L.R. 764									L.S.					5,490		S-12708	7-Span Steel Multi-Girder Structure Over Second Ave.
L.R. 120 & Ramps "R", "S" & "T"										L.S.				7,859		S-12702	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramps "R," "S" & "T"
L.R. 764																S-12713	Concrete Rigid-Frame Arch Under Grant St.
Ramp "D"																S-12712	Concrete Rigid-Frome Arch Under Grant St.
Romp "S"											L.S.			4,931		S-14204	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "S"
L.R. 120												L.S.		1,940		S-14203	Steel Multi-Girder Structure Carrying Blvd. Of Allies
L.R. 764 & L.R. 766														4,780		S-145B4	Parkway Floodwall Protection System
Ramp "F"													L.S.	330		S-14647	Retoining Wall-Ramp "F"
TOTALS	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	57,307			

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TABULATION OF STRUCTURE QUANTITIES

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ROUTE	STATIONS	Armored Preformed Neoprene Compression Dom, 1" Movement	Armored Preformed Neoprene Compression Dom, 1 1/2" Movement	Armored Preformed Neoprene Compression Dom, 2" Movement	Fabricated Structural Steel: Sta. 668+33 To Sta. 685+77 (Approx. 17,000 Lbs.)	Sta. 677+68 To Sta. 680+44 (Approx. 4,500 Lbs.)	Sta. 727+38 To Sta. 727+92 (Approx. 1,000 Lbs.)	L.R. 120 & Ramp "U" (Approx. 17,300 Lbs.)	Sta. 727+68 To Sta. 739+23 (Approx. 2,310 Lbs.)	Sta. 727+67 To Sta. 739+77 (Approx. 23,000 Lbs.)	L.R. 120 & Ramp "R" (Approx. 11,300 Lbs.)	Sta. 649+43 To Sta. 654+75 (Approx. 1,100 Lbs.)	Sta. 695+04 To Sta. 702+64 (Approx. 7,500 Lbs.)	L.R. 120 & Ramps "R" "S" & "T" (Approx. 17,216 Lbs.)	Sta. 726+26 To Sta. 737+50 (Approx. 7,800 Lbs.)	Sta. 728+89 To Sta. 732+58 (Approx. 19,080 Lbs.)
	ITEM NUMBER	1021-0002	1021-0003	1021-0004	1056-0001	1056-0002	1056-0003	1056-0004	1056-0005	1056-0006	1056-0007	1056-0008	1056-0009	1056-0010	1056-0011	1056-0012
	UNIT	L.F.	L.F.	L.F.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.
L.R. 764	668+33 To 685+77	279		93	L.S.											
Ramp "M" To Second Ave.	677+68 To 680+44	48				L.S.										
L.R. 764	727+38 To 727+92	62					L.S.									
L.R 120 & Ramp "U"	727+25 To 728+89 726+18 To 730+20	54	239					L.S.								
L.R 764	727+68 To 739+23	33	492						L.S.							
Ramp "V" To Forbes Ave.	727+67 To 739+77	50	172	25						L.S.						
L.R. 120 & Ramp "R"	724+08 To 727+25 724+03 To 727+93		301								L.S.					
Ramp "F" From Grant St.	649+43 To 654+75	212		26.5								L.S.				
L.R. 764	695+04 To 702+64	44.5	178	133.5									L.S.			
L.R. 120 & Ramps "R," "S" & "T"	*See Sheet #8 For Stations	115	374	23										L.S.		
L.R. 764	650+08 To 652+68															
Ramp "D"	649+17 To 650+75															
Ramp "S"	726+26 To 737+50	83	192	55											L.S.	
L.R. 120	728+89 To 732+58	46	138													L.S
L.R. 764 & L.R. 766	631+17 To 646+62 1098+30 To 1101+35															
Ramp "F"	655+04.25 TO 660+76.66															
TOTALS		1,026.5	2,086	356	L.S.	L.S.	L.S	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.

ROUTE	Downspouting Special	Rivet Head Build-Up	Painting Existing Bridge: Sta. 668+33 To Sta. 685+77	Sta. 677+68 To Sta. 680+44	Sta. 727+38 To Sta. 727+92	L.R. 120 & Ramp "U"	Sta. 727+68 To Sta. 739+23	Sta. 727+67 To Sta. 739+77	L.R. 120 & Ramp "R"	Sta. 649+43 To Sta. 654+75	Sta. 695+04 To Sta. 702+64		REMARKS
ITEM NUMBER	2056-0360	2056-0425	1075-0001	1075-0002	1075-0003	1075-0004	1075-0005	1075-0006	1075-0007	1075-0008	1075-0009		
UNIT	L.F.	Each	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.		
L.R. 764	647		L.S.									S-12710	12-Span Steel Multi-Girder Structure Over B & O R.R.
Ramp "M" To Second Ave.	90			L.S.								S-12709	2-Span Steel Multi-Girder Structure Carrying Ramp "M"
L.R. 764	40				L.S.							S-12707	Simple Span Steel Structure Over Brady St.
L.R 120 & Ramp "U"	125	360				L.S.						S-12706	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "U"
L.R 764	130						L.S.					S-12705	15-Span Steel Multi-Girder Structure Over Brady St.
Ramp "V" To Forbes Ave.	400							L.S.				S-12704	10-Span Steel Multi-Girder Structure Carrying Ramp "V"
L.R. 120 & Ramp "R"	609	900							L.S.			S-12703	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "R"
Ramp "F" From Grant St.	32									L.S.		S-12711	Simple Span Steel I-Beam Structure Carrying Ramp "F"
L.R. 764	260										L.S.	S-12708	7-Span Steel Multi-Girder Structure Over Second Ave.
L.R. 120 & Ramps "R," "S" & "T"	950	650										S-12702	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramps "R," "S" & "T"
L.R. 764												S-12713	Concrete Rigid-Frame Arch Under Grant St.
Ramp "D"												S-12712	Concrete Rigid-Frame Arch Under Grant St.
Ramp "S"	515											S-14204	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "S"
L.R. 120	160	650										S-14203	Steel Multi-Girder Structure Carrying Blvd Of Allies
L.R. 764 & L.R. 766												S-14584	Parkway Floodwall Protection System
Ramp "F"												S-14647	Retaining Wall-Ramp "F"
TOTALS	3,958	2,560	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.		

TABULATION OF STRUCTURE QUANTITIES

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DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	766 764	23 19	52 of 76
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ROUTE	STATIONS	Painting Existing Bridge: L.R. 120 & Ramps "R", "S" & "T"	Painting Existing Bridge: Sta 726+26 To Sta. 737+50	Painting Existing Bridge: Sta 728+89 To Sta 732+58	Reset Expansion Bearings	Replace Expansion Bearings	Reset Fixed Bearings	Replace Fixed Bearings	Class AA Cement Concrete Special
ITEM NUMBER		1075-0010	1075-0011	1075-0012	1090-0050	1090-0060	1090-0074	1090-0076	2000-0100
UNIT		L.S.	L.S.	L.S.	Each	Each	Each	Each	C.F.
L.R.764	668+33 To 685+77				16				80
Ramp "M" To Second Ave.	677+68 To 680+44								
L.R.764	727+38 To 727+92				6		6		
L.R 120 & Ramp "U"	727+25 To 728+89 726+18 To 730+20				6	9		26	150
L.R.764	727+68 To 739+23				12				200
Ramp "V" To Forbes Ave.	727+67 To 739+77				3				45
L.R. 120 & Ramp "R"	724+08 To 727+25 724+03 To 727+93				9	27		47	59
Ramp "F" From Grant St.	649+43 To 654+75				12				145
L.R.764	695+04 To 702+64				8				70
L.R. 120 & Ramps "R", "S" & "T"	*See Sheet #8 For Stations	L.S.				16		45	460
L.R. 764	650+08 To 652+68								179
Ramp "D"	649+17 To 650+75								137
Ramp "S"	726+26 To 737+50		L.S.			1			830
L.R. 120	728+89 To 732+58			L.S.					60
L.R.764 & L.R.766	631+17 To 646+62 1098+30 To 1101+35								100
Ramp "F"	655+04.25 To 660+76.66								
TOTALS		L.S.	L.S.	L.S.	72	53	6	118	2515

ROUTE	Remove, Store & Reset Impact Attenuator: Sta. 680+75	Remove, Store & Reset Impact Attenuator: Sta. 727+00	Remove, Store & Reset Impact Attenuator: Sta. 727+45	Remove, Store & Reset Impact Attenuator: Sta. 726+50	Stringer Shortening	Hinge Cleaning & Painting	Removal Of Tack Welds: Sta 668+33 To Sta. 685+77	Removal Of Tack Welds: Sta 677+68 To Sta. 680+44	Removal Of Tack Welds: Sta. 727+68 To Sta. 739+23	Removal Of Tack Welds: Sta. 727+67 To Sta. 739+77	Removal Of Tack Welds: Sta. 695+04 To Sta. 702+64		REMARKS
ITEM NUMBER	2000-0101	2000-0102	2000-0103	2000-0104	2000-0106	2000-0107	2000-0108	2000-0109	2000-0110	2000-0111	2000-0112		
UNIT	L.S.	L.S.	L.S.	L.S.	Each	Each	Each	Each	Each	Each	Each		
L.R.764	L.S.						1,900					S-12710	12-Span Steel Multi-Girder Structure Over B&O R.R.
Ramp "M" To Second Ave.								200				S-12709	2-Span Steel Multi-Girder Structure Carrying Ramp "M"
L.R.764												S-12707	Simple Span Steel Structure Over Brady St.
L.R 120 & Ramp "U"		L.S.										S-12706	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "U"
L.R.764			L.S.						800			S-12705	15-Span Steel Multi-Girder Structure Over Brady St.
Ramp "V" To Forbes Ave.					4					700		S-12704	10-Span Steel Multi-Girder Structure Carrying Ramp "V"
L.R. 120 & Ramp "R"												S-12703	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "R"
Ramp "F" From Grant St.												S-12711	Simple Span Steel I-Beam Structure Carrying Ramp "F"
L.R.764											500	S-12708	7-Span Steel Multi-Girder Structure Over Second Ave.
L.R. 120 & Ramps "R", "S" & "T"				L.S.								S-12702	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramps "R", "S" & "T"
L.R. 764												S-12713	Concrete Rigid-Frame Arch Under Grant St.
Ramp "D"												S-12712	Concrete Rigid-Frame Arch Under Grant St.
Ramp "S"					3	5						S-14204	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "S"
L.R. 120												S-14203	Steel Multi-Girder Structure Carrying Blvd. Of Allies
L.R.764 & L.R.766												S-14584	Parkway Floodwall Protection System
Ramp "F"												S-14647	Retaining Wall– Ramp "F"
TOTALS	L.S.	L.S.	L.S.	L.S.	7	5	1,900	200	800	700	500		

TABULATION OF STRUCTURE QUANTITIES

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ROUTE	STATIONS	Removal Of Tack Welds: L.R.120 & Ramps "R","S"&"T"	Removal Of Tack Welds: Sta. 726+26 To Sta. 737+50	Joint Repairs	Fabricated Structural Steel Repairs: Sta. 668+33 To Sta. 685+77	Sta. 677+68 To Sta. 680+44	Sta. 727+38 To Sta. 727+92	L.R. 120 & Ramp "U"	Sta. 727+68 To Sta. 739+23	Sta. 727+67 To Sta. 739+77	L.R. 120 & Ramp "R"	Sta. 649+43 To Sta. 654+75	Sta. 695+04 To Sta. 702+64	L.R. 120 & Ramps "R","S"&"T"	Sta. 726+26 To Sta. 737+50	Sta. 728+89 To Sta. 732+58	Crack Repair, Epoxy Injection	Crack Repair, Type "A"	Reset Bearing	Weephole Relocation	Sluice Gate	Catwalk Stair Railing & Protective Railing Wall "B"		REMARKS
ITEM NUMBER		2000-0113	2000-0114	2000-0115	2000-0116	0117	0118	0119	0120	0121	0122	0123	0124	0125	0126	0127	2000-0128	2000-0129	2000-0130	2000-0200	2000-0201	2000-0202		
UNIT		Each	Each	L.F.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	C.F.	L.F.	Each	Each	Each	L.S.		
L.R.764	668+33 To 685+77				20,000																		S-12710	12-Span Steel Multi-Girder Structure Over B & O R.R.
Ramp "M" To Second Ave.	677+68 To 680+44					2,000																	S-12709	2-Span Steel Multi-Girder Structure Carrying Ramp "M"
L.R.764	727+38 To 727+92						1,000																S-12707	Simple Span Steel Structure Over Brady St.
L.R 120 & Ramp "U"	727+25 To 728+89 726+18 To 730+20							3,000										20					S-12706	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "U"
L.R.764	727+68 To 739+23			50					7,000														S-12705	15-Span Steel Multi-Girder Structure Over Brady St.
Ramp "V" To Forbes Ave.	727+67 To 739+77			70						9,000								40					S-12704	10-Span Steel Multi-Girder Structure Carrying Ramp "V"
L.R. 120 & Ramp "R"	724+08 To 727+25 724+03 To 727+93										2,300												S-12703	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "R"
Ramp "F" From Grant St.	649+43 To 654+75											4,000											S-12711	Simple Span Steel I-Beam Structure Carrying Ramp "F"
L.R.764	695+04 To 702+64												9,000										S-12708	7-Span Steel Multi-Girder Structure Over Second Ave.
L.R. 120 & Ramps "R","S"&"T"	*See Sheet #8 For Stations	1,560												3,500			25						S-12702	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramps "R","S"&"T"
L.R. 764	650+08 To 652+68			190																			S-12713	Concrete Rigid-Frame Arch Under Grant St.
Ramp "D"	649+17 To 650+75			60																			S-12712	Concrete Rigid-Frame Arch Under Grant St.
Ramp "S"	726+26 To 737+50		1,560												1,600								S-14204	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "S"
L.R. 120	728+89 To 732+58															3,800		25	4				S-14203	Steel Multi-Girder Structure Carrying Blvd. Of Allies
L.R.764 & L.R. 766	631+17 To 646+62 1098+30 To 1101+35																20	50		300	2	L.S	S-14584	Parkway Floodwall Protection System
Ramp "F"	655+04.25 To 660+76.66																						S-14647	Retaining Wall-Ramp "F"
TOTALS		1,560	1,560	370	20,000	2,000	1,000	3,000	7,000	9,000	2,300	4,000	9,000	3,500	1,600	3,800	45	135	4	300	2	L.S		

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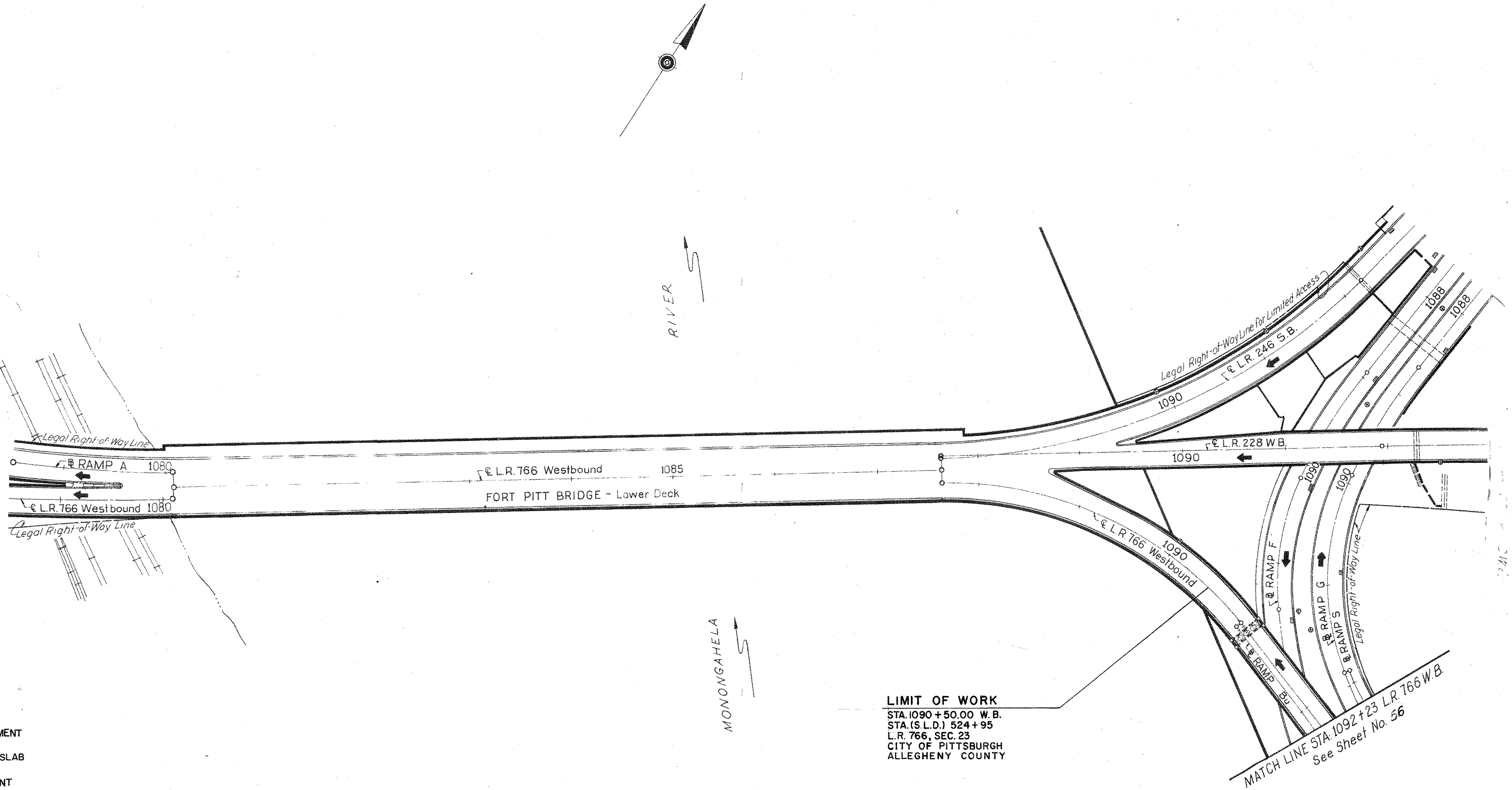
ROUTE	STATIONS	Catwalk, Stair Railing & Protective Railing Wall "C"		Energy Absorbing Crash Barrier, Type 2		Replace Rivets With High Strength Bolts		REMARKS
	ITEM NUMBER	2000- 0203		2000- 0219		2000- 0131		
	UNIT	L.S.		Each		Each		
L.R. 764	668+33 To 685+77						S-12710	12-Span Steel Multi-Girder Structure Over B & O R.R.
Ramp "M" To Second Ave.	677+68 To 680+44						S-12709	2-Span Steel Multi-Girder Structure Carrying Ramp "M"
L.R. 764	727+38 To 727+92						S-12707	Simple Span Steel Structure Over Brady St.
L.R 120 & Ramp "U"	727+25 To 728+89 726+18 To 730+20					360	S-12706	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "U"
L.R. 764	727+68 To 739+23						S-12705	15-Span Steel Multi-Girder Structure Over Brady St.
Ramp "V" To Forbes Ave.	727+67 To 739+77						S-12704	10-Span Steel Multi-Girder Structure Carrying Ramp "V"
L.R. 120 & Ramp "R"	724+08 To 727+25 724+03 To 727+93					900	S-12703	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "R"
Ramp "F" From Grant St.	649+43 To 654+75						S-12711	Simple Span Steel I-Beam Structure Carrying Ramp "F"
L.R. 764	695+04 To 702+64						S-12708	7-Span Steel Multi-Girder Structure Over Second Ave.
L.R. 120 & Ramps "R," "S" & "T"	*See Sheet #8 For Stations					650	S-12702	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramps "R," "S" & "T"
L.R. 764	650+08 To 652+68						S-12713	Concrete Rigid-Frame Arch Under Grant St.
Ramp "D"	649+17 To 650+75						S-12712	Concrete Rigid-Frame Arch Under Grant St.
Ramp "S"	726+26 To 737+50						S-14204	Steel Multi-Girder Structure Carrying Blvd. Of Allies & Ramp "S"
L.R. 120	728+89 To 732+58					650	S-14203	Steel Multi-Girder Structure Carrying Blvd. Of Allies
L.R. 764 & L.R. 766	631+17 To 646+62 1098+30 To 1101+35	L.S.					S-14584	Parkway Floodwall Protection System
L.R. 120 & Ramps "R," "S" & "T"	*L.R 120 721+78 To 724+08 Ramp "R" 721+72 To 724+03 Ramp "S" 722+16 To 726+26 Ramp "T" 722+17 To 736+76							
Ramp "F"	655+04.25 TO 660+76.66						S-14647	Retaining Wall-Ramp "F"
TOTALS		L.S.		1		2,560		

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	766	23	55 of 76
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY



LEGEND

- NEW PAVEMENT
- APPROACH SLAB
- RELIEF JOINT
- TRAFFIC SEPARATOR
- FILL SHOULDER WIDENING

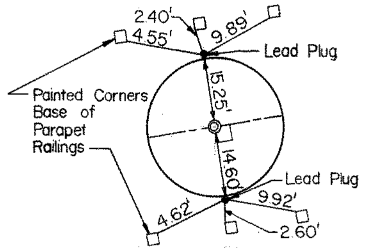
PLAN STA. 1080+00 to STA. 1092+00

TRACED BY

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	766 & 764	23 & 19	56 of 76
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY

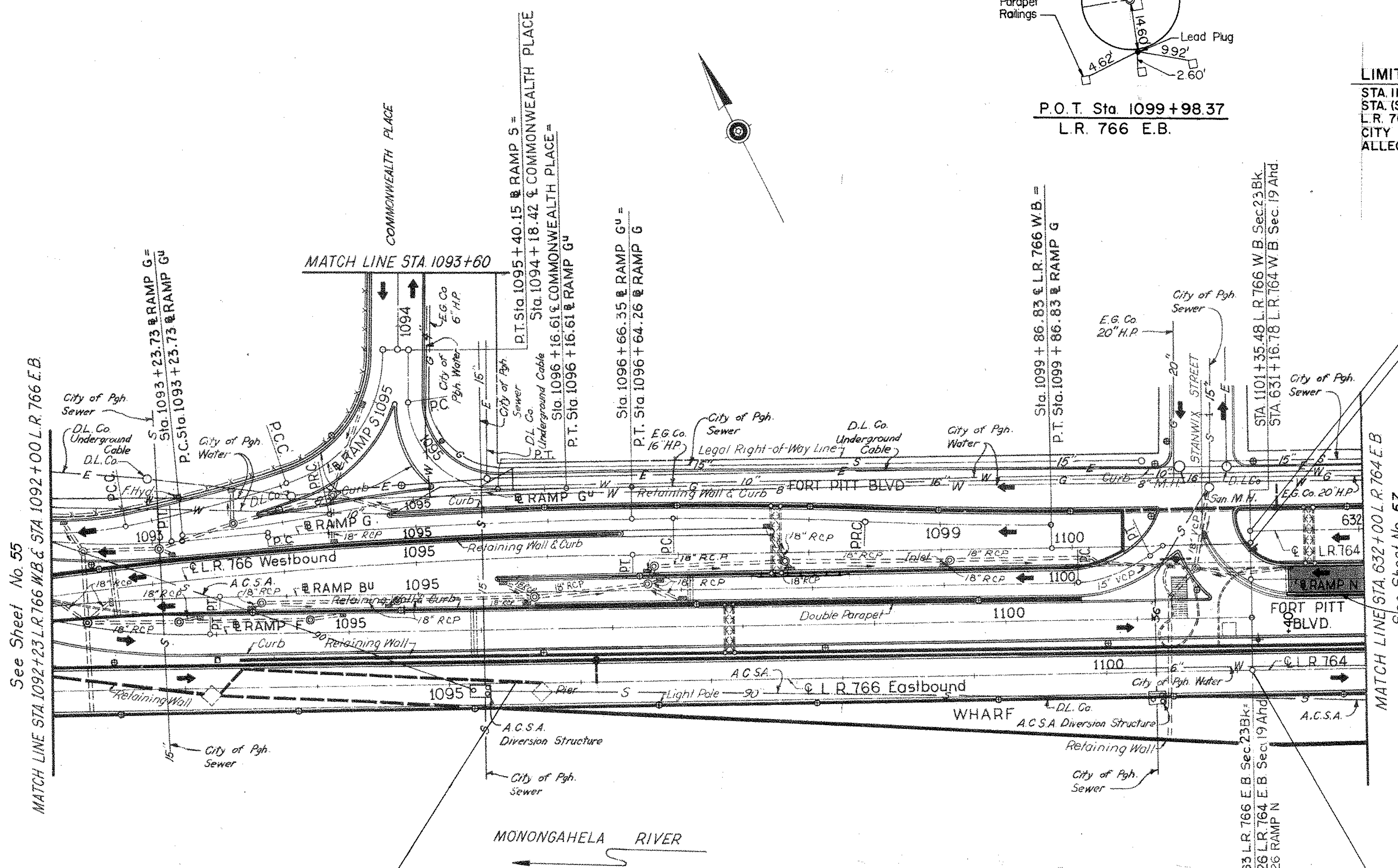
B.M. Elevation 740.39
Lead Plug in Concrete Curb
15' Rt. of Sta. 630+00 (E.B.)



P.O.T. Sta. 1099+98.37
L.R. 766 E.B.

LIMIT OF WORK
STA. 1101 + 35.48 W.B.
STA. (S.L.D.) 535 + 80
L.R. 766, SEC. 23
CITY OF PITTSBURGH
ALLEGHENY COUNTY

LIMIT OF WORK
STA. 631 + 16.78 W.B.
STA. (S.L.D.) 535 + 80
L.R. 764, SEC. 19
CITY OF PITTSBURGH
ALLEGHENY COUNTY



CONCRETE PROTECTIVE BARRIER

LIMIT OF WORK
STA. 1095 + 50.00 E.B.
STA. (S.L.D.) 530 + 18
L.R. 766, SEC. 23
CITY OF PITTSBURGH
ALLEGHENY COUNTY

FOR LEGEND SEE SHEET 55
FOR RAMP N PROFILE SEE SHEET 75

LIMIT OF WORK
STA. 1101 + 11.63 E.B.
STA. (S.L.D.) 535 + 80
L.R. 766, SEC. 23
CITY OF PITTSBURGH
ALLEGHENY COUNTY

LIMIT OF WORK
STA. 631 + 13.26 E.B.
STA. (S.L.D.) 535 + 80
L.R. 764, SEC. 19
CITY OF PITTSBURGH
ALLEGHENY COUNTY

SCALE IN FEET
50 0 50

PLAN STA. 1092+00 to STA. 632+00 E.B.

TRACED BY

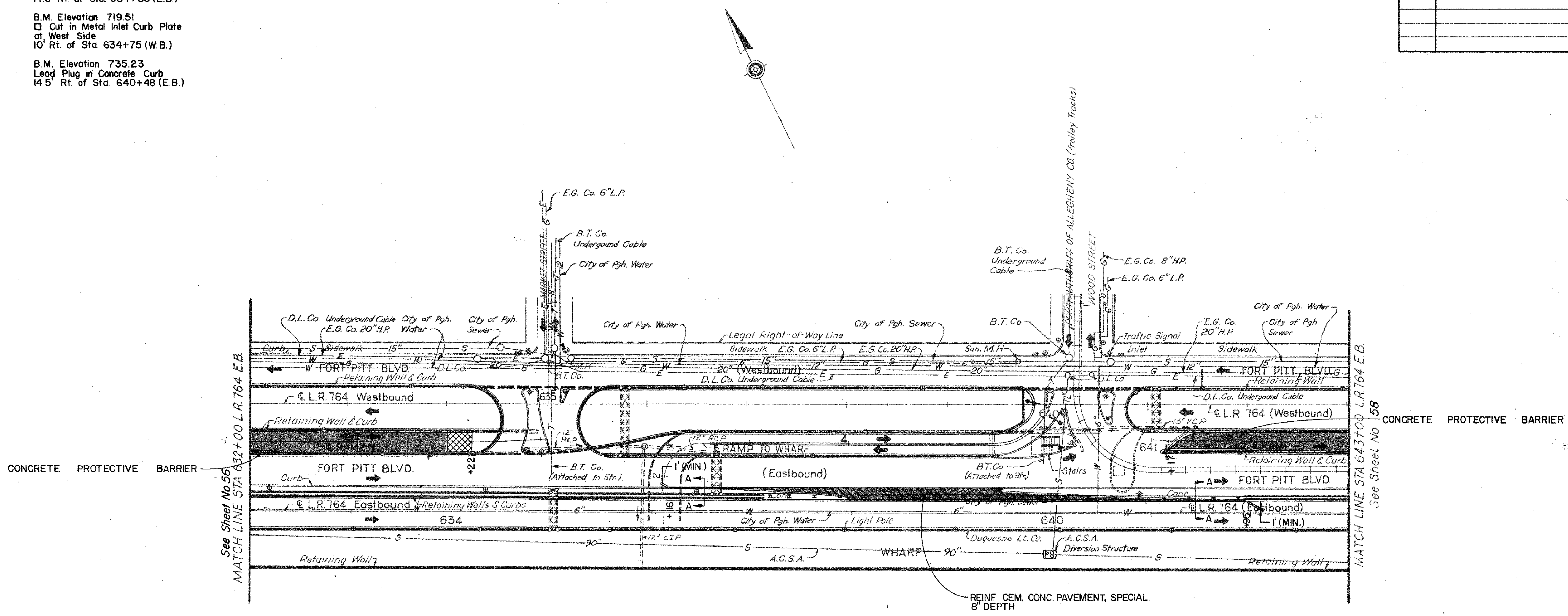
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	57 of 76
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY

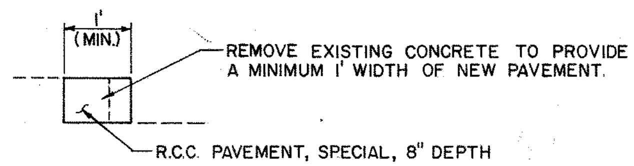
B.M. Elevation 737.96
Lead Plug in Concrete Curb
14.5' Rt. of Sta. 634+85 (E.B.)

B.M. Elevation 719.51
☐ Cut in Metal Inlet Curb Plate at West Side
10' Rt. of Sta. 634+75 (W.B.)

B.M. Elevation 735.23
Lead Plug in Concrete Curb
14.5' Rt. of Sta. 640+48 (E.B.)



MONONGAHELA RIVER



SECTION A-A
SCALE: NONE

SCALE IN FEET
50 0 50

FOR LEGEND SEE SHEET 55
FOR RAMPS N&D PROFILES SEE SHEET 75

PLAN STA. 632+00 to STA. 643+00 E.B.

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	58 of 76
	CITY OF PITTSBURGH			

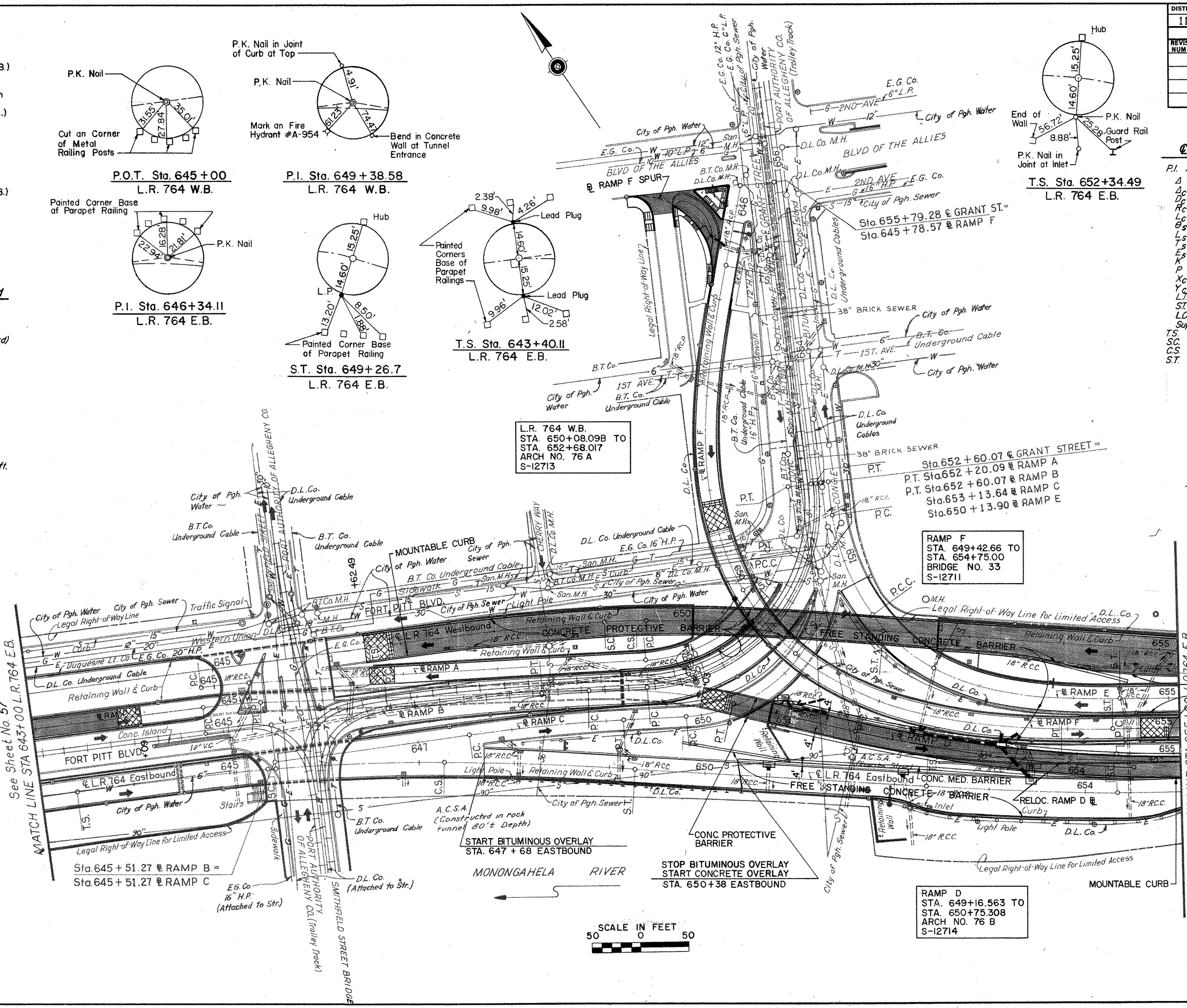
REVISION NUMBER	REVISIONS	DATE	BY

B.M. Elevation 727.24
Lead Plug in W.B. Ramp "A" Lt. Curb
27' Rt. of Sta. 647+62 (W.B.)

B.M. Elevation 733.21
Lead Plug in Concrete Median (Between E.B. & Ramp "C")
16.5' Lt. of Sta. 647+75 (E.B.)

B.M. Elevation 746.58
USGS Disc on Top of Wall at Underpass
18' Lt. of Sta. 652+70 (W.B.)

B.M. Elevation 737.61
Lead Plug in Concrete Curb
14.5' Lt. of Sta. 654+00 (E.B.)



℄ L.R. 764-Eastbound

P.I. Sta. 646+34.114
Δ = 11° 04' 36" Rt.
Δ_c = 5° 20' 49.52"
D_c = 2° 51' 53.24" (Chord)
R_c = 2000'
L_c = 186.65' (Chord)
θ_s = 2° 51' 53.24"
L_s = 200.00'
T_s = 249.00'
E_s = 38.81'
K = 99.99'
P = 0.83'
X_c = 199.94'
Y_c = 3.33'
L.T. = 133.35'
S.T. = 66.68'
L.C. = 199.98'
Superelevate 0.07 ft./ft.
T.S. Sta. 643+40.113
S.C. Sta. 645+40.113
C.S. Sta. 647+26.761
S.T. Sta. 649+26.761

℄ Ramp F

P.I. Sta. 651+56.609
Δ = 100° 10' 00" Lt.
Δ_c = 19° 57' 10"
D_c = 22° 55' 05.92" (Chord)
R_c = 250.00'
L_c = 87.06' (Chord)
θ_s = 40° 06' 25"
L_s = 350.00'
T_s = 494.99'
E_s = 170.87'
K = 172.18'
P = 20.06'
X_c = 333.23'
Y_c = 78.85'
L.T. = 239.62'
S.T. = 122.40'
L.C. = 342.44'
Superelevate 0.07 ft./ft.
T.S. Sta. 646+61.624
S.C. Sta. 650+11.624
C.S. Sta. 650+98.684
S.T. Sta. 654+48.684

℄ L.R. 764-Eastbound

P.I. Sta. 659+19.563
Δ = 32° 36' 00" Lt.
Δ_c = 26° 52' 13.52"
D_c = 2° 51' 53.24" (Chord)
R_c = 2000.00'
L_c = 937.96' (Chord)
θ_s = 2° 51' 53.24"
L_s = 200.00'
T_s = 685.71'
E_s = 84.62'
K = 99.99'
P = 0.83'
X_c = 99.94'
Y_c = 3.33'
L.T. = 133.35'
S.T. = 66.68'
L.C. = 199.98'
Superelevate 0.07 ft./ft.
T.S. Sta. 652+34.487
S.C. Sta. 654+34.487
C.S. Sta. 663+72.442
S.T. Sta. 665+72.442

℄ L.R. 764-Westbound

P.I. Sta. 649+38.578
Δ = 11° 59' 46" Rt.
Δ_c = 1° 45' 53"
D_c = 4° 05' 33.2" (Chord)
R_c = 1400.00'
L_c = 43.12' (Chord)
θ_s = 5° 06' 56.5"
L_s = 250.00'
T_s = 272.26'
E_s = 9.48'
K = 124.97'
P = 1.86'
X_c = 249.80'
Y_c = 7.44'
L.T. = 166.74'
S.T. = 83.40'
L.C. = 249.91'
Superelevate 0.07 ft./ft.
T.S. Sta. 646+66.317
S.C. Sta. 649+16.317
C.S. Sta. 649+59.437
S.T. Sta. 652+09.437

FOR LEGEND SEE SHEET 55
FOR L.R. 764 W.B. PROFILE SEE SHEET 72
FOR RAMP D PROFILE SEE SHEET 75
FOR RAMP F & F SPUR PROFILE SEE SHEET 76
FOR CONTOUR, GRADING, & GEOMETRY DRAWINGS SEE SHEETS 69 THRU 71

PLAN STA. 643+00 to STA. 655+00 E.B.

TRACED BY
FINAL BY

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	59 of 76
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY

B.M. Elevation 735.93
Top of S.W. Bolt at End of Guard Rail at Corner of B. & O. Building 17.5' Lt. of Sta. 658+40 (W.B.)

B.M. Elevation 735.59
Lead Plug in Concrete Curb 14.5' Rt. of Sta. 660+02 (E.B.)

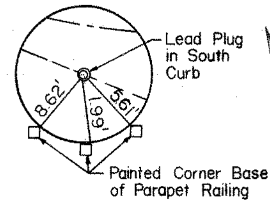
B.M. Elevation 731.97
Lead Plug in Concrete Curb 14.5' Rt. of Sta. 665+00 (E.B.)

℄ L.R. 764-Westbound

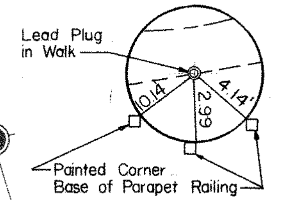
P.I. Sta. 660+70.278
Δ = 33° 31' 10" Lt.
Δ_c = 23° 17' 17"
D_c = 4° 05' 33.2" (Chord)
R_c = 1400.00'
L_c = 569.03' (Chord)
θ_s = 5° 06' 56.5"
L_s = 250.00'
T_s = 547.14'
E_s = 63.96'
K = 124.97'
P = 1.86'
X_c = 249.80'
Y_c = 7.44'
L.T. = 166.74'
S.T. = 83.40'
L.C. = 249.91'
Superelevate 0.07 ft./ft.
T.S. Sta. 655+23.139
S.C. Sta. 657+73.139
C.S. Sta. 663+42.173
S.T. Sta. 665+92.173

℄ L.R. 764-Eastbound

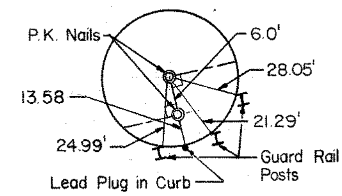
P.I. Sta. 659+19.563
Δ = 32° 36' 00" Lt.
Δ_c = 26° 52' 13.52"
D_c = 2° 51' 53.24" (Chord)
R_c = 2000.00'
L_c = 937.96' (Chord)
θ_s = 2° 51' 53.24"
L_s = 200.00'
T_s = 685.71'
E_s = 84.62'
K = 99.99'
P = 0.83'
X_c = 199.94'
Y_c = 3.33'
L.T. = 133.35'
S.T. = 66.68'
L.C. = 199.98'
Superelevate 0.07 ft./ft.
T.S. Sta. 652+34.487
S.C. Sta. 654+34.487
C.S. Sta. 663+72.442
S.T. Sta. 665+72.442



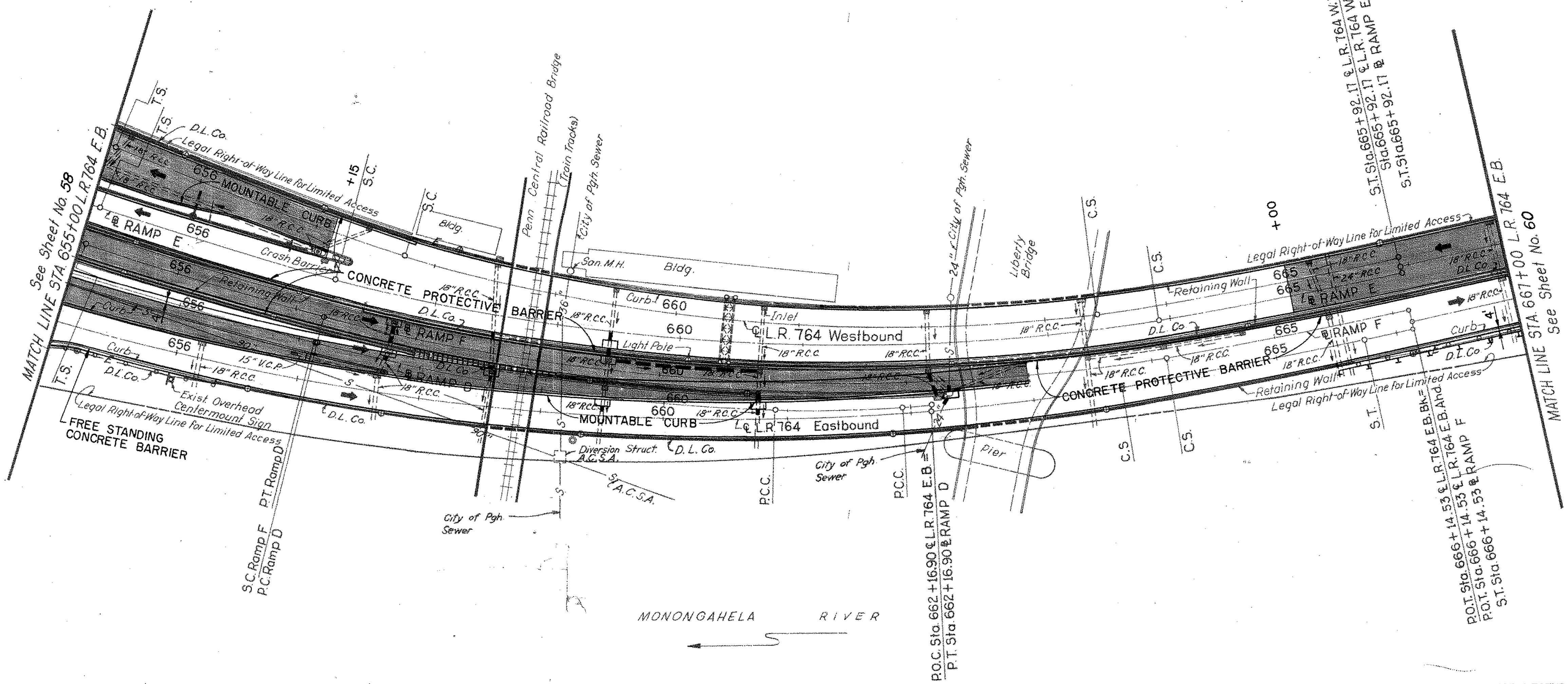
P.O.S.T. Sta. 659+57.79
L.R. 764 W.B.



P.O.S.T. Sta. 662+26.33
L.R. 764 W.B.



P.O.T. Sta. 666+14.53
L.R. 764 E.B.



SCALE IN FEET
50 0 50

FOR LEGEND SEE SHEET 55
FOR RAMP F PROFILE SEE SHEET 76
FOR L.R. 764 W.B. PROFILE SEE SHEETS 72 & 73
FOR CONTOUR, GRADING, & GEOMETRY DRAWINGS SEE SHEETS 69 THRU 71

PLAN STA. 655+00 to STA. 667+00 E.B.

TRACED BY

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	60 of 76
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY

B.M. Elevation 761.34
Top of N.W. Bolt on Guard Rail Base
22.5' Rt. of Sta. 668+26 (W.B.)

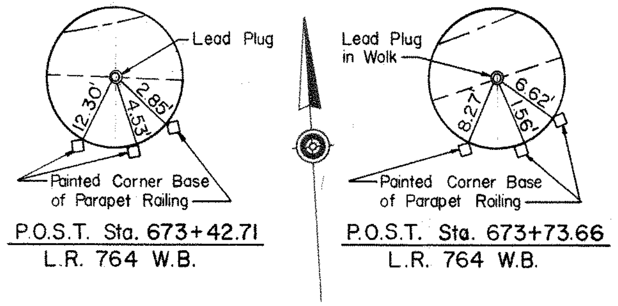
B.M. Elevation 733.42
Lead Plug in Concrete Curb
20.5' Rt. of Sta. 671+63 (E.B.)

B.M. Elevation 735.70
Lead Plug in Concrete Curb
20.5' Rt. of Sta. 675+25 (E.B.)

B.M. Elevation 785.10
Top of N.W. Bolt on Guard Rail Base
22.5' Rt. of Sta. 677+38 (W.B.)

℄ L.R. 764-Westbound

P.I. Sta. 673+61.084
Δ = 19° 31' 00" Lt.
$Δ_c$ = 11° 52' 38"
D_c = 3° 49' 11" (Chord)
R_c = 1500.00'
L_c = 310.95' (Chord)
$θ_s$ = 3° 49' 11"
L_s = 200.00'
T_s = 358.15'
E_s = 23.15'
K = 99.99'
P = 0.89'
X_c = 199.94'
Y_c = 3.57'
L.T. = 133.35'
S.T. = 66.68'
L.C. = 199.97'
Superelevate 0.07 ft./ft.
T.S. Sta. 670+02.935
S.C. Sta. 672+02.935
C.S. Sta. 675+13.880
S.T. Sta. 677+13.880

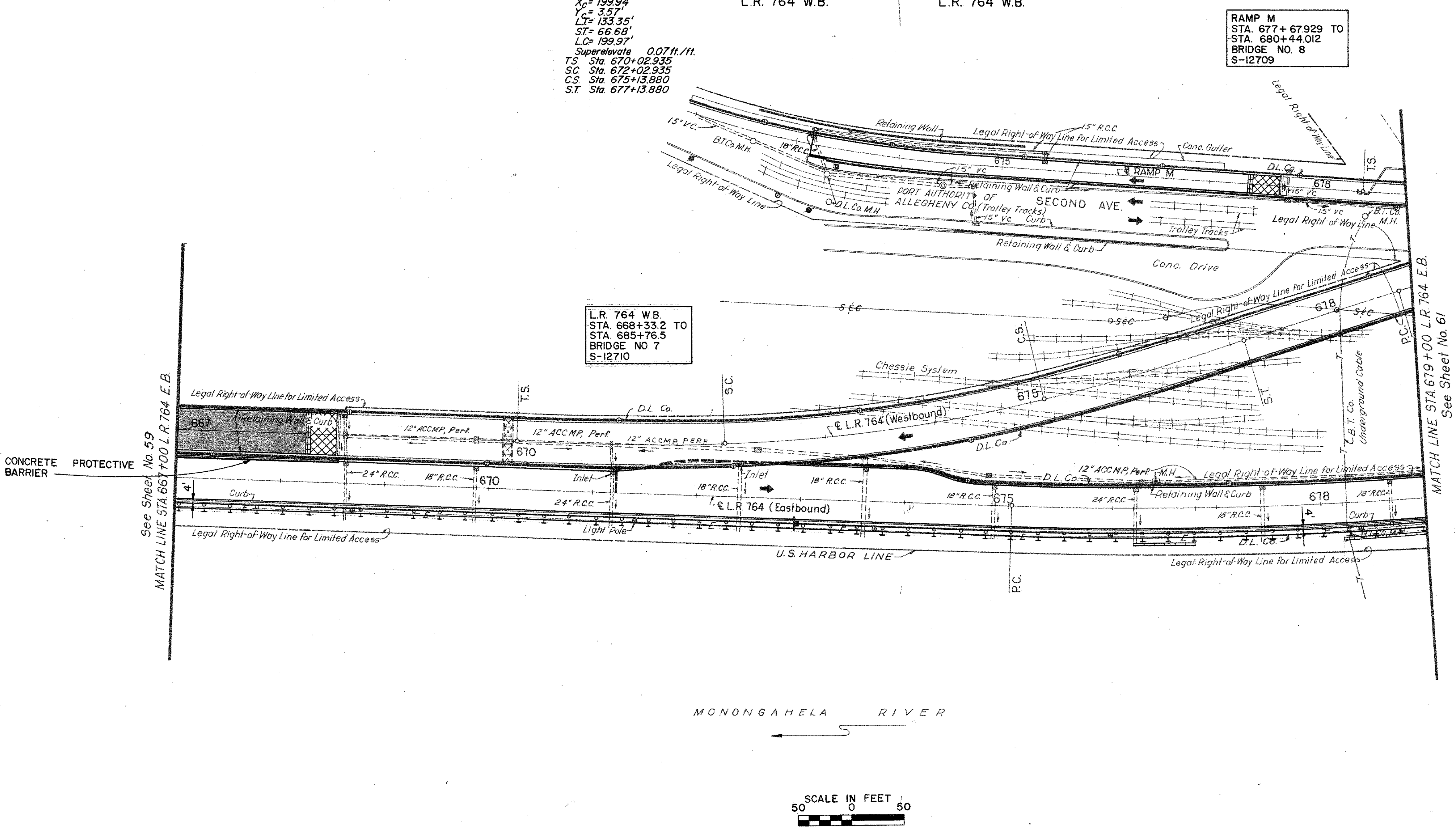


℄ L.R. 764-Westbound

P.I. Sta. 681+44.132
Δ = 10° 25' 00" Rt.
D = 1° 54' 35.5"
T = 273.46'
L = 545.42'
R = 3000.00'
E = 12.44'
Superelevate 0.04 ft./ft. About ℄
P.C. Sta. 678+70.671
P.T. Sta. 684+16.090

℄ L.R. 764-Eastbound

P.I. Sta. 679+19.37
Δ = 12° 30' 20" Lt.
D = 1° 30' 28"
T = 416.35'
L = 829.40'
R = 3800.00'
E = 22.74'
Superelevate 0.04 ft./ft. About ℄
P.C. Sta. 675+03.016
P.T. Sta. 683+32.416



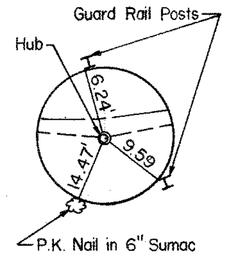
FOR L.R. 764 W.B. PROFILE SEE SHEET 73
FOR LEGEND SEE SHEET 55

PLAN STA. 667+00 to STA. 679+00 E.B.

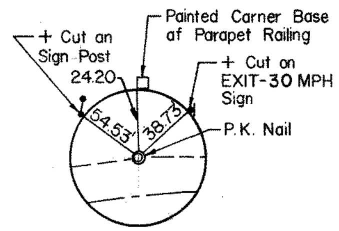
B.M. Elevation 739.58
Lead Plug in Concrete Curb
20.5' Rt. of Sta. 683+33 (E.B.)

B.M. Elevation 776.93
Lead Plug in Concrete Curb
21' Lt. of Sta. 684+16.09 (W.B.)

B.M. Elevation 742.36
Lead Plug in Concrete Curb at
End of Refuge Bay
22' Rt. of Sta. 688+50 (E.B.)



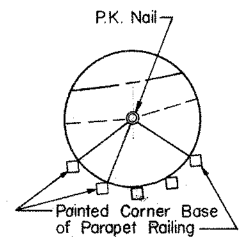
P.I. Sta. 679+19.37
L.R. 764 E.B.



P.I. Sta. 681+44.13
L.R. 764 W.B.

℄ L.R. 764-Eastbound

P.I. Sta. 679+19.37
Δ = 12° 30' 20" Lt.
D = 1° 30' 28" (Chord)
T = 416.35'
L = 829.40'
R = 3800.00'
E = 22.74
Superelevate 0.04 ft./ft. About ℄
P.C. Sta. 675+03.016
P.T. Sta. 683+32.416



P.I. Sta. 690+41.20
L.R. 764 E.B.

℄ L.R. 764-Eastbound

P.I. Sta. 690+41.202
Δ = 9° 22' 50" Lt.
D = 1° 54' 35.5" (Chord)
T = 246.13'
L = 491.17'
R = 3000.00'
E = 10.08'
Superelevate 0.04 ft./ft. About ℄
P.C. Sta. 687+95.070
P.T. Sta. 692+86.235

℄ L.R. 764-Westbound

P.I. Sta. 690+77.942
Δ = 9° 49' 50" Lt.
D = 1° 54' 35.5" (Chord)
T = 258.00'
L = 514.73'
R = 3000.00'
E = 11.07'
Superelevate 0.04 ft./ft. About ℄
P.C. Sta. 688+19.945
P.T. Sta. 693+34.672

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	61 of 76
	CITY OF PITTSBURGH			

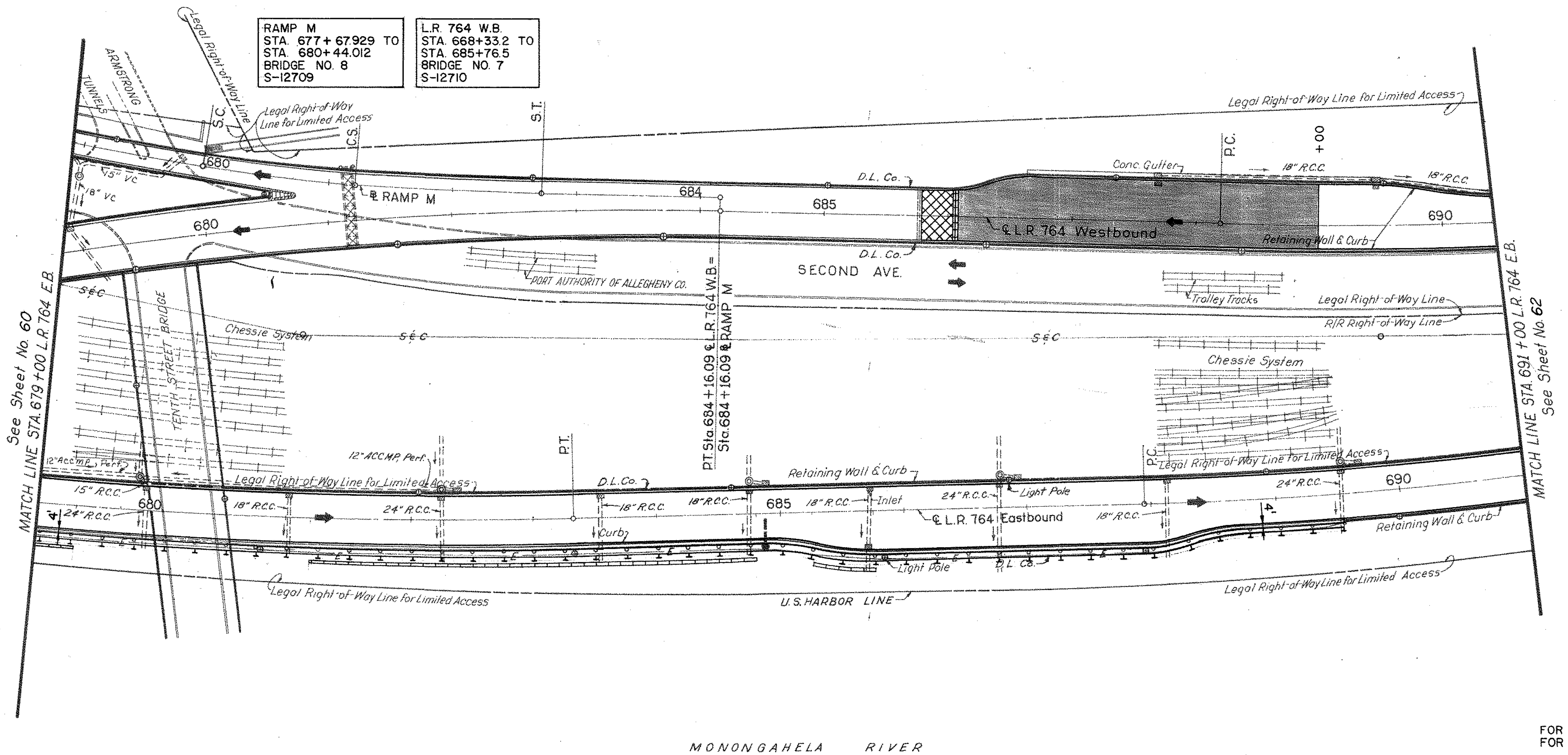
REVISION NUMBER	REVISIONS	DATE	BY

℄ L.R. 764-Westbound

P.I. Sta. 681+44.132
Δ = 10° 25' 00" Rt.
D = 1° 54' 35.5" (Chord)
T = 273.46'
L = 545.42'
D = 1° 54' 35.5"
R = 3000.00'
Superelevate 0.04 ft./ft. About ℄
P.C. Sta. 678+70.671
P.T. Sta. 684+16.090

RAMP M
STA. 677+67.929 TO
STA. 680+44.012
BRIDGE NO. 8
S-12709

L.R. 764 W.B.
STA. 668+33.2 TO
STA. 685+76.5
BRIDGE NO. 7
S-12710



SCALE IN FEET
50 0 50

FOR L.R. 764 W.B. PROFILE SEE SHEET 73
FOR LEGEND SEE SHEET 55

PLAN STA. 679+00 to STA. 691+00 E.B.

TRACED BY

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	62 of 76
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY

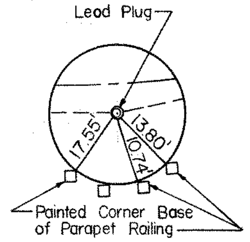
B.M. Elevation 757.90
Lead Plug in Concrete Curb
20.5' Rt. of Sta. 693+34.67 (W.B.)

B.M. Elevation 748.98
PDH Plate in Concrete Curb
21' Lt. of Sta. 695+05 (E.B.)

B.M. Elevation 751.13
Lead Plug in Concrete Curb
21' Lt. of Sta. 699+07 (E.B.)

B.M. Elevation 753.25
Lead Plug in Concrete Curb
20.5' Rt. of Sta. 700+47.73 (W.B.)

B.M. Elevation 752.67
USGS Disc in Concrete 1' From End of Wall on Bridge Over Second Avenue
44' Rt. of Sta. 700+00± (W.B.)



P.I. Sta. 690+77.94
L.R. 764 W.B.

℄ L.R. 764-Westbound

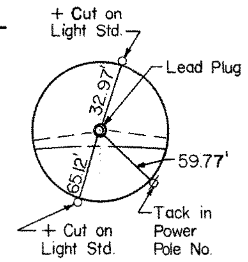
P.I. Sta. 690+77.942
Δ = 9° 49' 50" Lt.
D = 1° 54' 35.5" (Chord)
T = 258.00'
L = 514.73'
R = 3000.00'
E = 11.07'
Superelevate 0.04 ft./ft. About ℄
P.C. Sta. 688+19.945
P.T. Sta. 693+34.672

℄ L.R. 764-Westbound

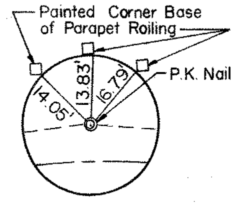
P.I. Sta. 698+53.784
Δ = 4° 26' 50" Rt.
D = 1° 08' 45.3" (Chord)
T = 194.15'
L = 388.09'
R = 5000.00'
E = 3.77'
No Superelevation
P.C. Sta. 696+59.639
P.T. Sta. 700+47.733

℄ L.R. 764-Eastbound

P.I. Sta. 701+49.326
Δ = 6° 56' 30" Rt.
D = 1° 08' 45.3" (Chord)
T = 303.26'
L = 605.78'
R = 5000.00'
E = 9.19'
No Superelevation
P.C. Sta. 698+46.067
P.T. Sta. 704+51.842



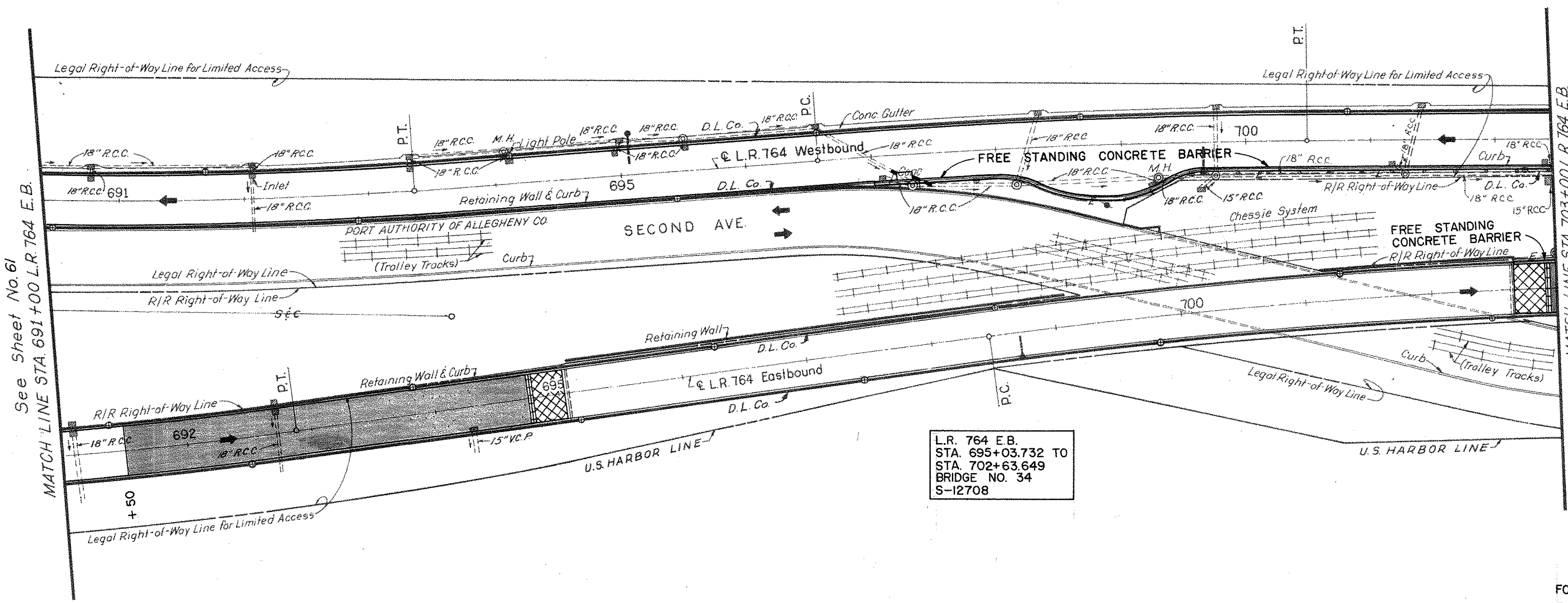
P.I. Sta. 698+53.78
L.R. 764 W.B.



P.I. Sta. 701+49.33
L.R. 764 E.B.

℄ L.R. 764-Eastbound

P.I. Sta. 690+41.202
Δ = 9° 22' 50" Lt.
D = 1° 54' 35.5" (Chord)
T = 246.13'
L = 491.17'
R = 3000.00'
E = 10.08'
Superelevate 0.04 ft./ft. About ℄
P.C. Sta. 687+95.070
P.T. Sta. 692+86.235



FOR LEGEND SEE SHEET 55
FOR L.R. 764 E.B. PROFILE SEE SHEET 74

MONONGAHELA RIVER

SCALE IN FEET
50 0 50

PLAN STA 691+00 to STA 703+00 E.B.

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	63 of 76
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY

B.M. Elevation 747.64
Lead Plug in Concrete Roadway
19.5' Lt. of Sta. 704+51(E.B.)

B.M. Elevation 757.28
Top of Bolt in Overhead Sign Base
29' Left of Sta. 707+00 (W.B.)

B.M. Elevation 744.49
Lead Plug in Concrete Roadway
19.5' Lt. of Sta. 710+85(E.B.)

B.M. Elevation 756.25
Lead Plug in Concrete Curb
20' Rt. of Sta. 711+86.68(W.B.)

℄ L.R. 764-Eastbound

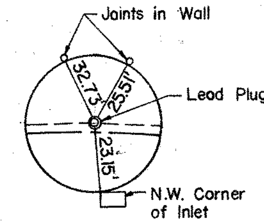
P.I. Sta. 701+49.326
Δ = 6° 56' 30" Rt.
D = 1° 08' 45.3" (Chord)
T = 303.26'
L = 605.78'
R = 5000.00'
E = 9.19'
No Superelevation
P.C. Sta. 698+46.067
P.T. Sta. 704+51.842

℄ L.R. 764-Eastbound

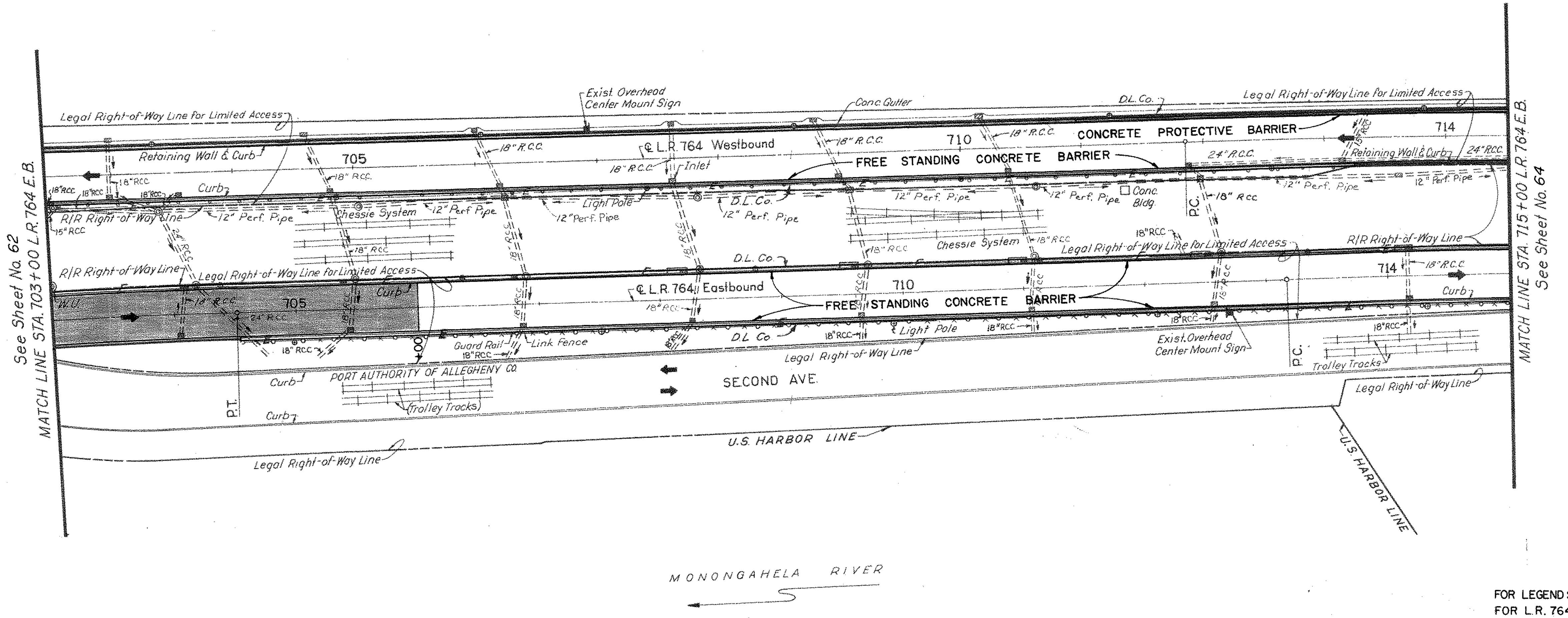
P.I. Sta. 718+43.233
Δ = 7° 31' 30" Rt.
D = 0° 42' 58.3" (Chord)
T = 526.10'
L = 1050.69'
R = 8000.00'
E = 17.28'
No Superelevation
P.C. Sta. 713+17.132
P.T. Sta. 723+67.820

℄ L.R. 764-Westbound

P.I. Sta. 714+92.448
Δ = 3° 30' 10" Rt.
D = 0° 34' 22.6" (Chord)
T = 305.77'
L = 611.35'
R = 10,000.00'
E = 4.67'
No Superelevation
P.C. Sta. 711+86.677
P.T. Sta. 717+98.027



P.I. Sta. 714+92.45
L.R. 764 W.B.



SCALE IN FEET
50 0 50

FOR LEGEND SEE SHEET 55
FOR L.R. 764 E.B. PROFILE SEE SHEET 74

PLAN STA. 703+00 to STA. 715+00 E.B.

TRACED BY
FINAL BY

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	64 of 76
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY

B.M. Elevation 741.41
Lead Plug in Concrete Roadway
19.5' Lt. of Sta. 717+00(E.B.)

B.M. Elevation 743.85
Lead Plug in Concrete Roadway
19.5' Lt. of Sta. 722+80(E.B.)

B.M. Elevation 762.02
Lead Plug in Concrete Roadway
15' Lt. of Sta. 723+04.48(W.B.)

B.M. Elevation 759.25
Lead Plug in Concrete Roadway
20' Rt. of Sta. 717+98.03(W.B.)

℄ L.R. 764-Westbound

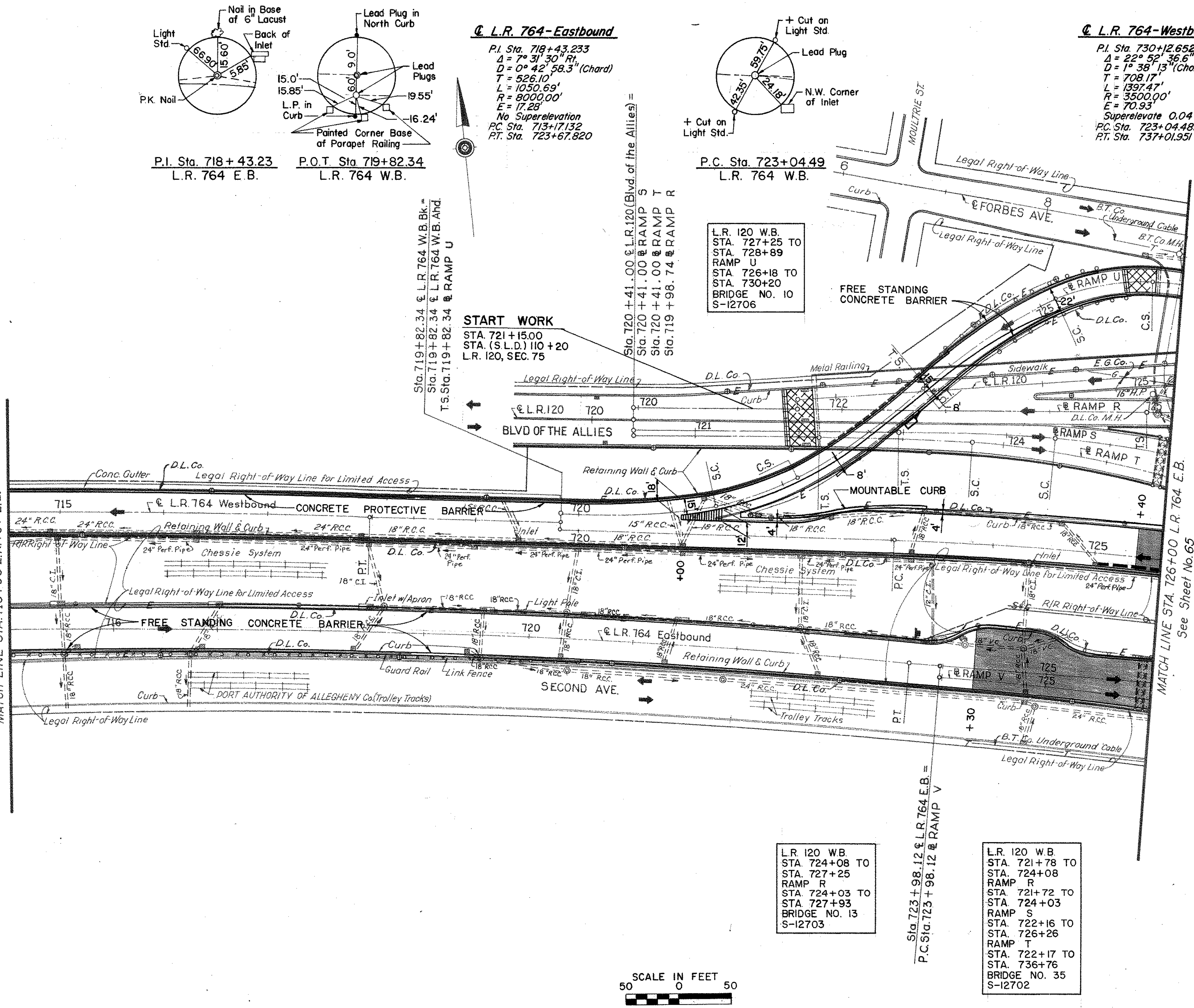
P.I. Sta. 714+92.448
Δ = 3° 30' 10" Rt.
D = 0° 34' 22.6" (Chord)
T = 305.77'
L = 611.35'
R = 10,000.00'
E = 4.67'
No Superelevation
P.C. Sta. 711+86.677
P.T. Sta. 717+98.027

℄ L.R. 764-Eastbound

P.I. Sta. 718+43.233
Δ = 7° 31' 30" Rt.
D = 0° 42' 58.3" (Chord)
T = 526.10'
L = 1050.69'
R = 8000.00'
E = 17.28'
No Superelevation
P.C. Sta. 713+17.132
P.T. Sta. 723+67.820

℄ L.R. 764-Westbound

P.I. Sta. 730+12.652
Δ = 22° 52' 36.6" Rt.
D = 1° 38' 13" (Chord)
T = 708.17'
L = 1397.47'
R = 3500.00'
E = 70.93'
Superelevate 0.04 ft./ft.
P.C. Sta. 723+04.485
P.T. Sta. 737+01.951



FOR LEGEND SEE SHEET 55
FOR L.R. 764 W.B. PROFILE SEE SHEET 73
FOR L.R. 764 E.B. PROFILE SEE SHEET 74

PLAN STA. 715+00 to STA. 726+00 E.B.

REVISION NUMBER	REVISIONS	DATE	BY

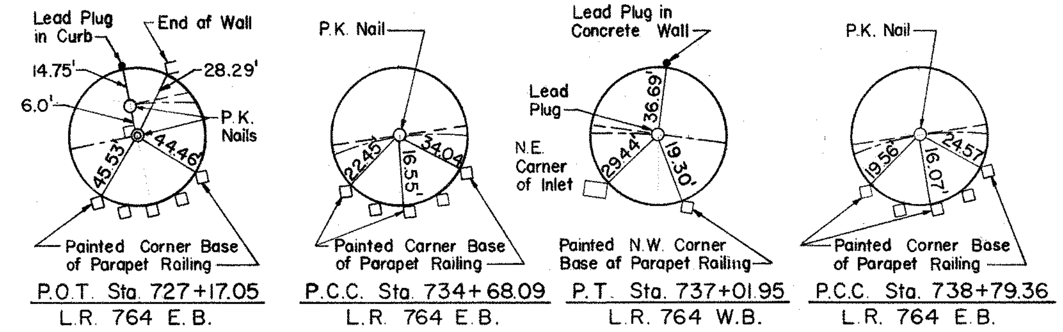
B.M. Elevation 766.32
Lead Plug in Concrete Curb
14.5' Lt. of Sta. 728+63 (E.B.)

B.M. Elevation 774.05
Southeast Back Corner of
Inlet Near A-101
20' Lt. of Sta. 730+86 (W.B.)

B.M. Elevation 782.48
Lead Plug in Concrete Curb
14.5' Lt. of Sta. 734+09

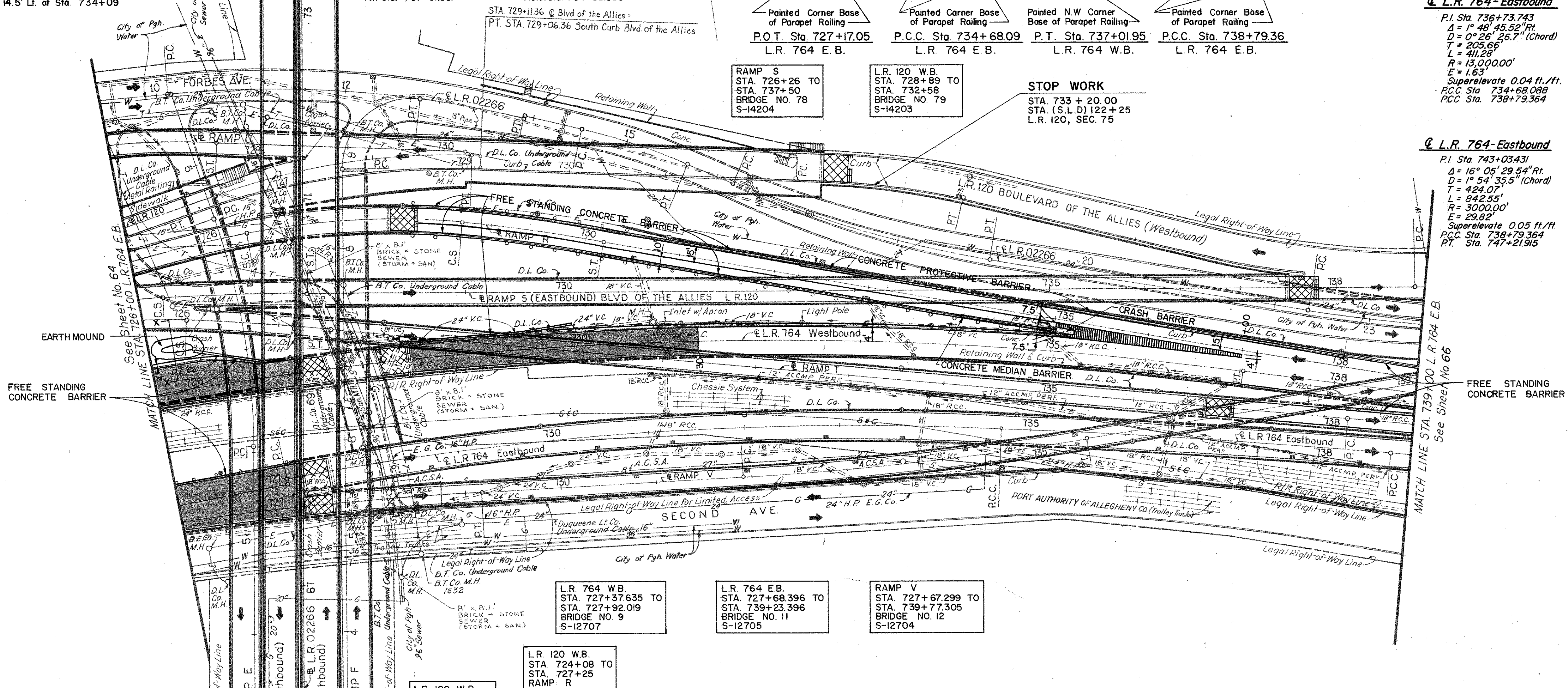
℄ L.R. 764-Westbound
P.I. Sta. 730+12.652
Δ = 22° 52' 36.6" Rt.
D = 1° 38' 13.3" (Chord)
T = 708.17'
L = 1397.47'
R = 3500.00'
E = 70.93'
Superelevate 0.04 ft./ft.
P.C. Sta. 723+04.485
P.T. Sta. 737+01.951

℄ L.R. 764-Eastbound
P.I. Sta. 730+94.544
Δ = 14° 20' 37.24" Rt.
D = 1° 54' 35.5" (Chord)
T = 377.49'
L = 751.03'
R = 3000.00'
E = 23.66'
Superelevate 0.04 ft./ft.
P.C. Sta. 727+17.054
P.C.C. Sta. 734+68.088



℄ L.R. 764-Eastbound
P.I. Sta. 736+73.743
Δ = 1° 48' 45.52" Rt.
D = 0° 26' 26.7" (Chord)
T = 205.66'
L = 411.28'
R = 13,000.00'
E = 1.63'
Superelevate 0.04 ft./ft.
P.C.C. Sta. 734+68.088
P.C.C. Sta. 738+79.364

℄ L.R. 764-Eastbound
P.I. Sta. 743+03.431
Δ = 16° 05' 29.54" Rt.
D = 1° 54' 35.5" (Chord)
T = 424.07'
L = 842.55'
R = 3000.00'
E = 29.82'
Superelevate 0.05 ft./ft.
P.C.C. Sta. 738+79.364
P.T. Sta. 747+21.915



RAMP S STA. 726+26 TO STA. 737+50 BRIDGE NO. 78 S-14204

L.R. 120 W.B. STA. 728+89 TO STA. 732+58 BRIDGE NO. 79 S-14203

L.R. 764 W.B. STA. 727+37.635 TO STA. 727+92.019 BRIDGE NO. 9 S-12707

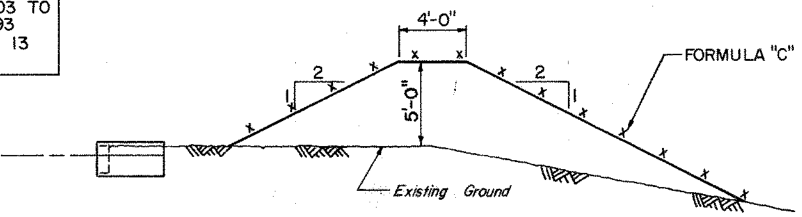
L.R. 764 E.B. STA. 727+68.396 TO STA. 739+23.396 BRIDGE NO. 11 S-12705

RAMP V STA. 727+67.299 TO STA. 739+77.305 BRIDGE NO. 12 S-12704

L.R. 120 W.B. STA. 724+08 TO STA. 727+25 RAMP R STA. 724+03 TO STA. 727+93 BRIDGE NO. 13 S-12703

L.R. 120 W.B. STA. 721+78 TO STA. 724+08 RAMP R STA. 721+72 TO STA. 724+03 RAMP S STA. 722+16 TO STA. 726+26 RAMP T STA. 722+17 TO STA. 736+76 BRIDGE NO. 35 S-12702

L.R. 120 W.B. STA. 727+25 TO STA. 728+89 RAMP U STA. 726+18 TO STA. 730+20 BRIDGE NO. 10 S-12706



SECTION X - X
SCALE: 3/16"=1'-0"

FOR L.R. 764 W.B. PROFILE SEE SHEET 73
FOR L.R. 764 E.B. PROFILE SEE SHEET 74
FOR LEGEND SEE SHEET 55.

SCALE IN FEET
50 0 50

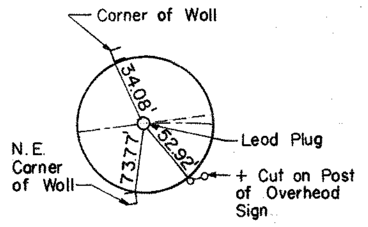
PLAN STA. 726+00 to STA. 739+00 E.B.

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	66 of 76
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY

B.M. Elevation 783.46
Lead Plug in Concrete Median (Between E.B. & Ramp "T")
16' Lt. of Sta. 739+10 (E.B.)

B.M. Elevation 766.34
Lead Plug in Concrete Median
16' Lt. of Sta. 746+98.92 (℄)



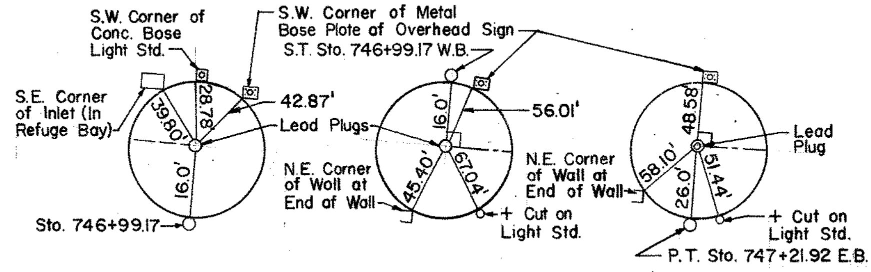
P.C. Sta. 739+73.47
L.R. 764 W.B.

℄ L.R. 764-Westbound

P.I. Sta. 730+12.652
Δ = 22° 52' 36.6" Rt.
D = 1° 38' 13.3" (Chord)
T = 708.17'
L = 1397.47'
R = 3500.00'
E = 70.93'
Superelevate 0.04 ft./ft.
P.C. Sta. 723+04.485
P.T. Sta. 737+01.951

℄ L.R. 764-Eastbound

P.I. Sta. 743+03.431
Δ = 16° 05' 29.54" Rt.
D = 1° 54' 35.5" (Chord)
T = 424.07'
L = 842.55'
R = 3000.00'
E = 29.82'
Superelevate 0.05 ft./ft.
P.C.C. Sta. 738+79.364
P.T. Sta. 747+21.915



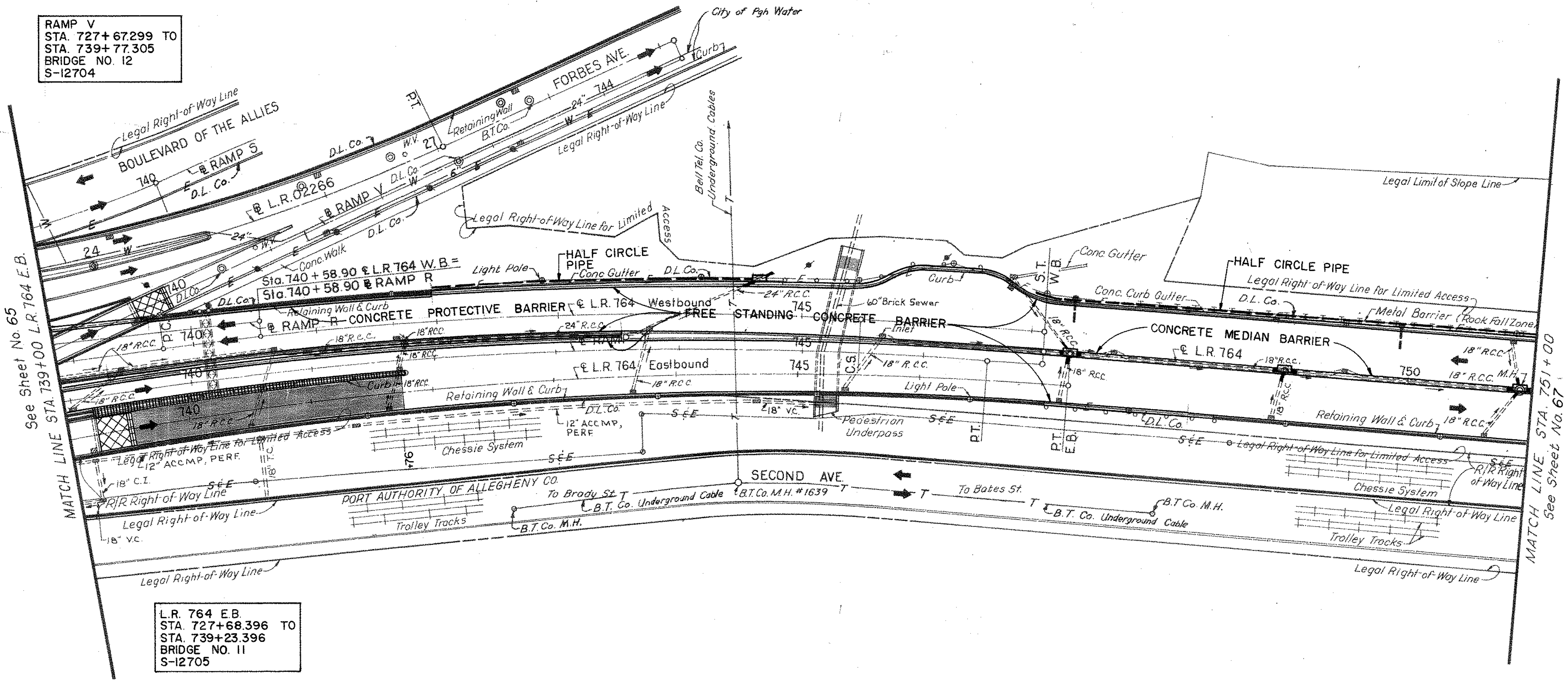
S.T. Sta. 746+99.17
L.R. 764 W.B.

Sta. 746+99.17
L.R. 764

P.O.T. Sta. 747+21.92
L.R. 764

℄ L.R. 764-Westbound

P.I. Sta. 743+01.442
Δ = 12° 55' 55.7" Rt.
Δ_c = 11° 25' 48.5"
D_c = 1° 59' 20" (Chord)
R_c = 2880.79'
L_c = 574.70' (Chord)
θ_s = 1° 30' 07.2"
L_s = 151.00'
T_s = 400.55'
E_s = 18.61'
K = 75.50'
P = 0.33'
X_c = 150.99'
Y_c = 1.32'
LT = 100.67'
ST = 50.34'
LC = 150.99'
Superelevate 0.05 ft./ft.
P.C. Sta. 739+73.467
C.S. Sta. 745+48.166
S.T. Sta. 746+99.166



SCALE IN FEET
50 0 50

FOR LEGEND SEE SHEET 55
FOR L.R 764 E.B. PROFILE SEE SHEET 74

PLAN STA. 739+00 to STA. 751+00 E.B.

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	67 of 76
CITY OF PITTSBURGH				

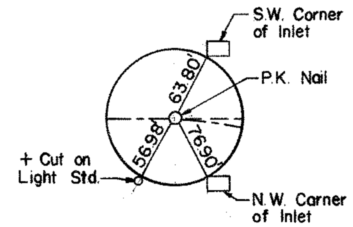
REVISION NUMBER	REVISIONS	DATE	BY

B.M. Elevation 760.59
Southwest Corner of Concrete
Light Standard Base
44.5' Lt. of Sta. 757+45

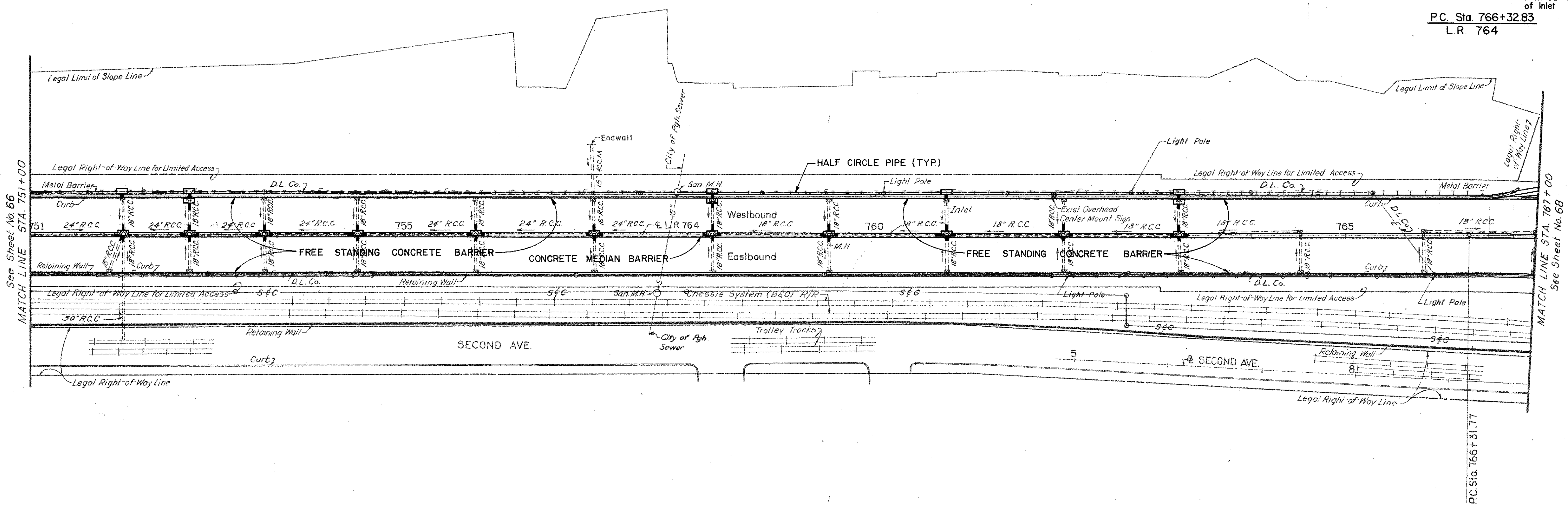
B.M. Elevation 761.77
Lead Plug in Concrete Roadway
at Bottom of Curb
41' Rt. of Sta. 766+31

℄ L.R. 763 & L.R. 764

P.I. Sta. 770+47.64
Δ = 24° 33' 56.87" Rt.
D = 3° 00' 00" (Chord)
T = 415.87'
L = 818.87'
R = 1910.08'
E = 44.75'
Superelevate 0.0313 ft/ft.
P.C. Sta. 766+31.77
P.T. Sta. 774+47.64



P.C. Sta. 766+32.83
L.R. 764



FOR LEGEND SEE SHEET 55

SCALE IN FEET
50 0 50

PLAN STA. 751+00 to STA. 767+00

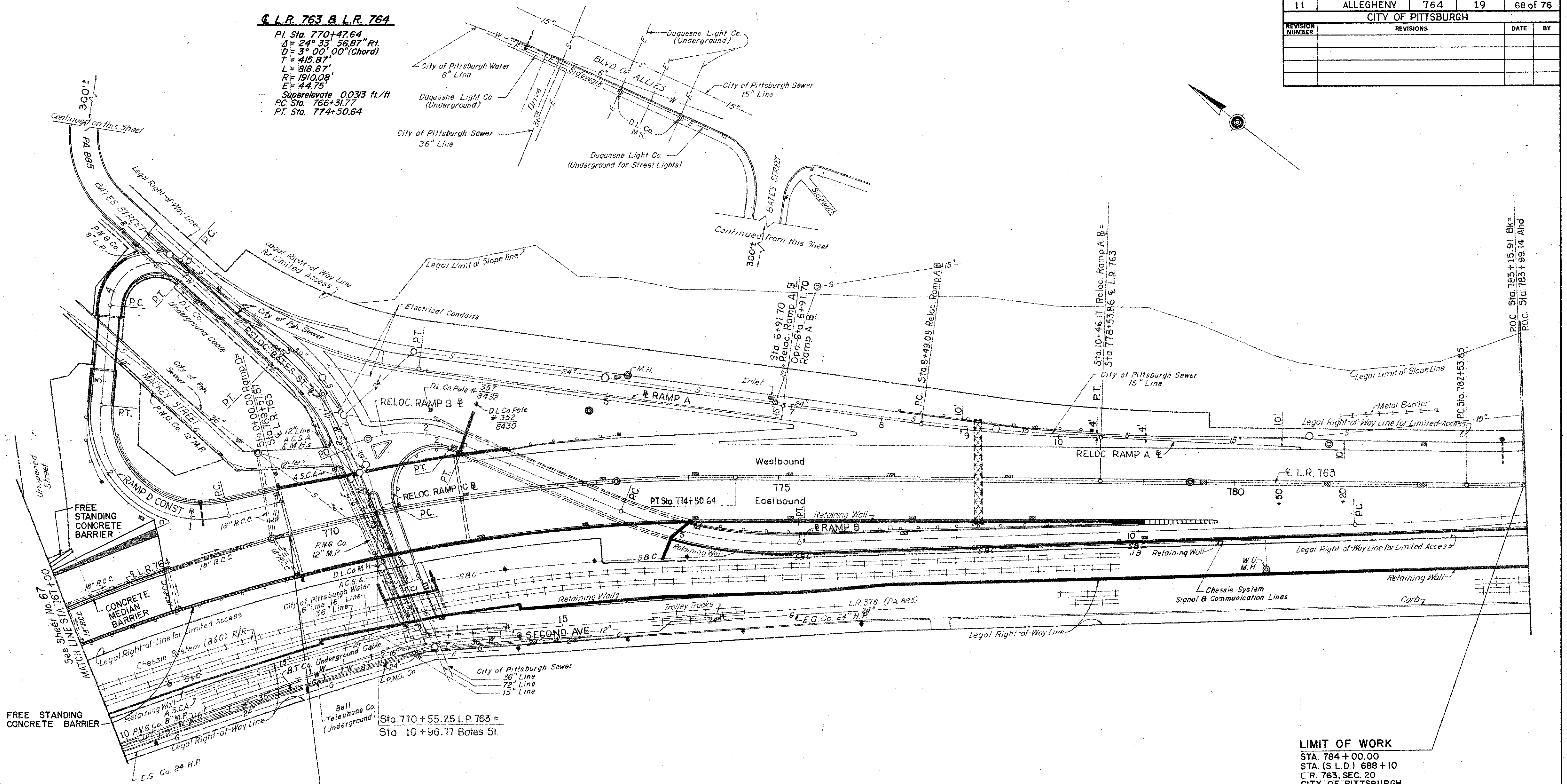
TRACED BY R.L.G. 4/15/80

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	68 of 76
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY

℄ L.R. 763 & L.R. 764

P.I. Sta. 770+47.64
Δ = 24° 33′ 56.87″ Rt.
D = 3° 00′ 00″ (Chord)
T = 415.87′
L = 818.87′
R = 1910.08′
E = 44.75′
Superelevate 0.0313 ft./ft.
P.C. Sta. 766+31.77
P.T. Sta. 774+50.64



LIMIT OF WORK

STA. 769+56.16
STA. (S.L.D.) 674+49
L.R. 764, SEC. 19
CITY OF PITTSBURGH
ALLEGHENY COUNTY

LIMIT OF WORK

STA. 769+56.16
STA. (S.L.D.) 674+49
L.R. 763, SEC. 20
CITY OF PITTSBURGH
ALLEGHENY COUNTY

SCALE IN FEET
50 0 50

LIMIT OF WORK

STA. 784+00.00
STA. (S.L.D.) 688+10
L.R. 763, SEC. 20
CITY OF PITTSBURGH
ALLEGHENY COUNTY

FOR LEGEND SEE SHEET 55

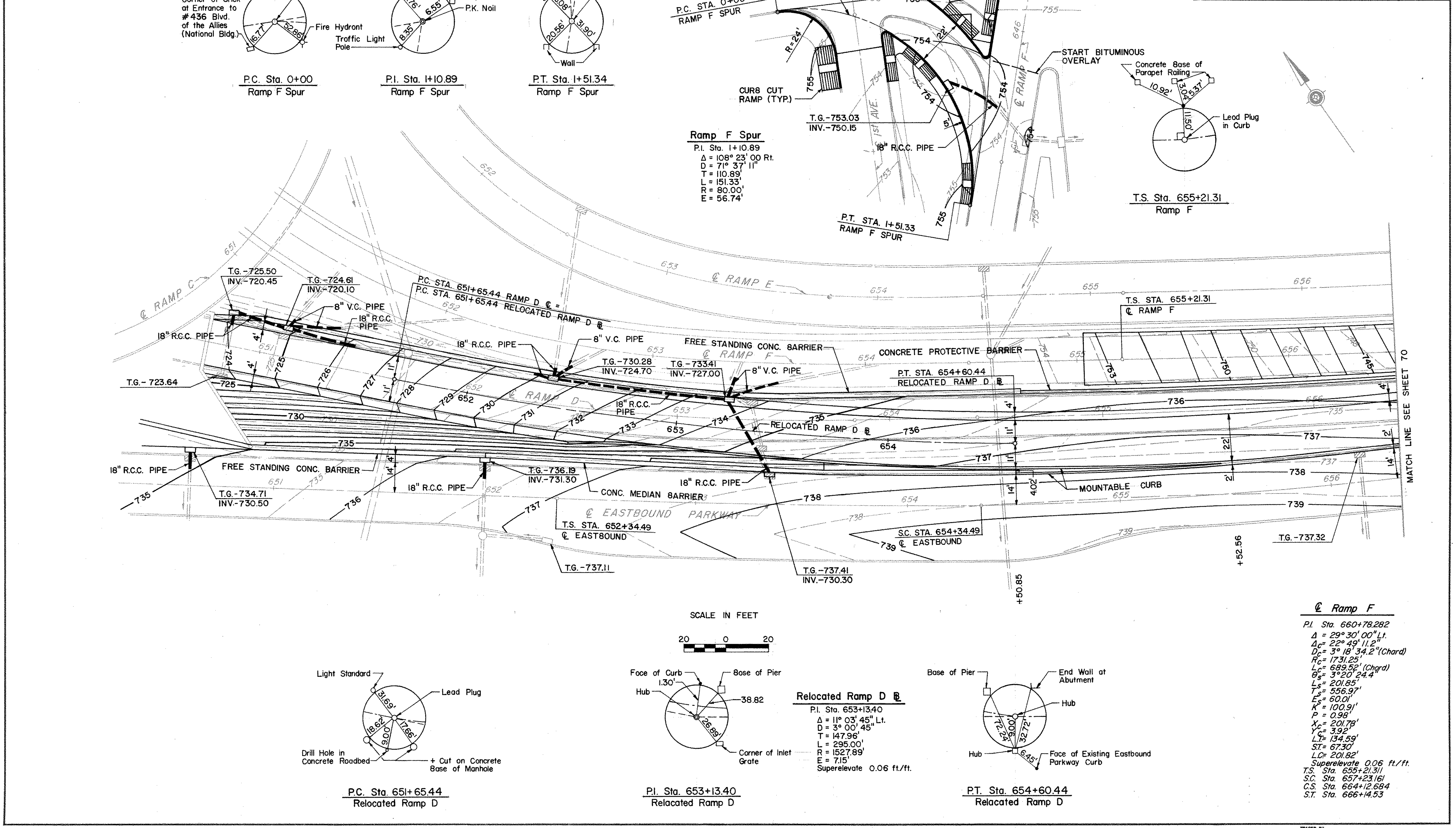
PLAN STA. 767+00 to STA. 784+00

TRACED BY R.L.G. 4/15/80

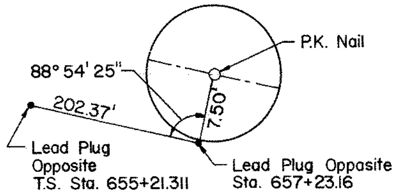
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764	19	69 of 76

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY



TRACED BY
FINAL BY



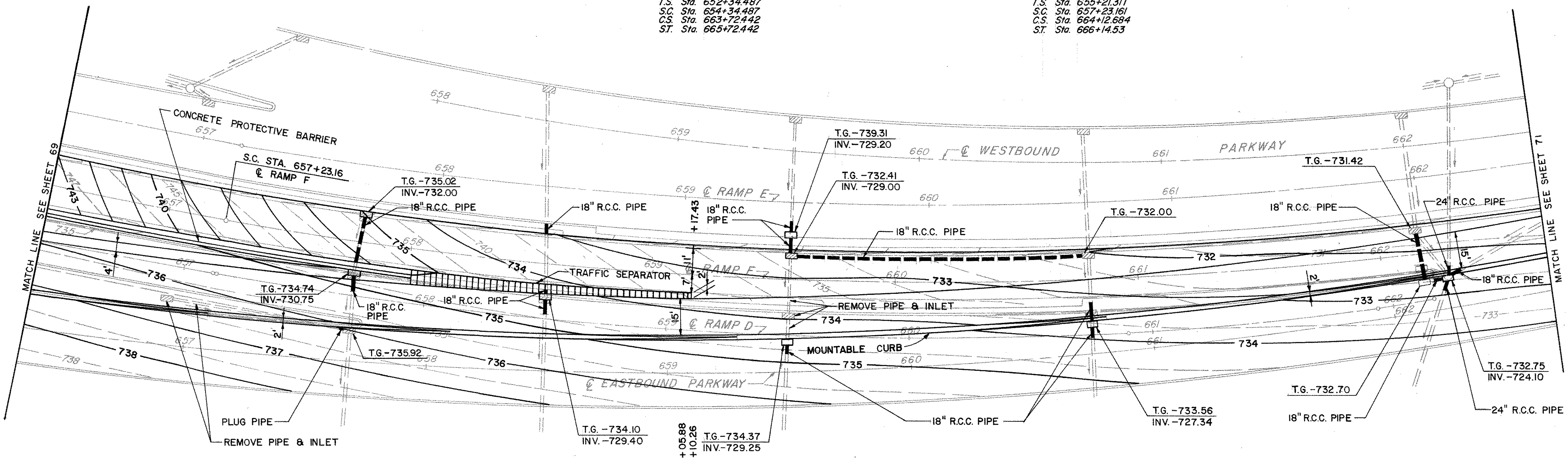
S.C. Sta. 657+23.16
Ramp F

℄ L.R. 764-Eastbound

P.I. Sta. 659+19.563
Δ = 32° 36' 00" Lt.
$Δ_c$ = 26° 52' 13.52"
D_c = 2° 51' 53.24" (Chord)
R_c = 2000.00'
L_c = 937.96' (Chord)
$θ_s$ = 2° 51' 53.24"
L_s = 200.00'
T_s = 685.71'
E_s = 84.62'
K = 99.99'
P = 0.83'
X_c = 99.94'
Y_c = 3.33'
L.T. = 133.35'
S.T. = 66.68'
L.C. = 199.98'
Superelevate 0.07 ft./ft.
T.S. Sta. 652+34.487
S.C. Sta. 654+34.487
C.S. Sta. 663+72.442
S.T. Sta. 665+72.442

℄ Ramp F

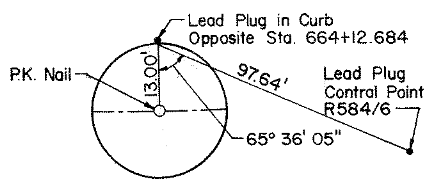
P.I. Sta. 660+78.282
Δ = 29° 30' 00" Lt.
$Δ_c$ = 22° 49' 11.2"
D_c = 3° 18' 34.2" (Chord)
R_c = 1731.25'
L_c = 689.52' (Chord)
$θ_c$ = 3° 20' 24.4"
L_s = 201.85'
T_s = 556.97'
E_s = 60.01'
K = 100.91'
P = 0.98'
X_c = 201.78'
Y_c = 3.92'
L.T. = 134.59'
S.T. = 67.30'
L.C. = 201.82'
Superelevate 0.06 ft./ft.
T.S. Sta. 655+21.311
S.C. Sta. 657+23.161
C.S. Sta. 664+12.684
S.T. Sta. 666+14.53



SCALE IN FEET

20 0 20

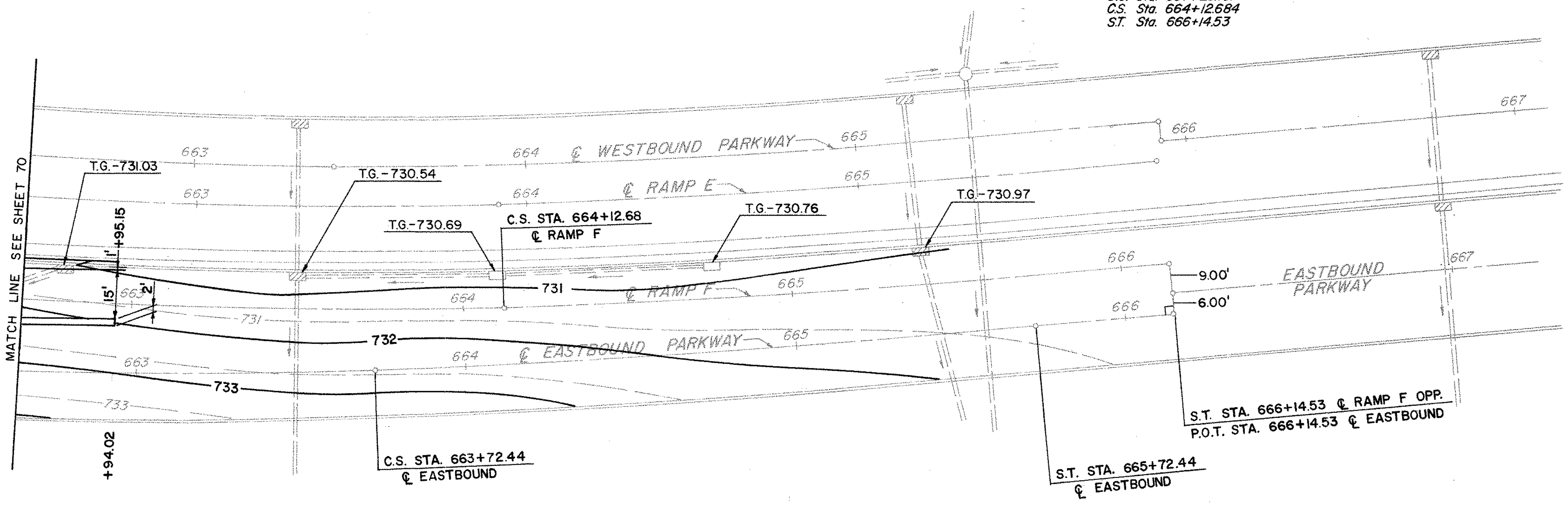
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764	19	71 of 76
CITY OF PITTSBURGH				
REVISION NUMBER	REVISIONS		DATE	BY



C.S. Sta. 664+12.684
Ramp F

℄ Ramp F

P.I. Sta. 660+78.282
Δ = 29° 30' 00" Lt.
Δ_c = 22° 49' 11.2"
D_c = 3° 18' 34.2" (Chord)
R_c = 1731.25'
L_c = 689.52' (Chord)
θ_s = 3° 20' 24.4"
L_s = 201.85'
T_s = 556.97'
E_s = 60.01'
K = 100.91'
P = 0.98'
X_c = 201.78'
Y_c = 3.92'
L.T. = 134.59'
S.T. = 67.30'
L.C. = 201.82'
Superelevate 0.07 ft./ft.
T.S. Sta. 655+21.311
S.C. Sta. 657+23.161
C.S. Sta. 664+12.684
S.T. Sta. 666+14.53



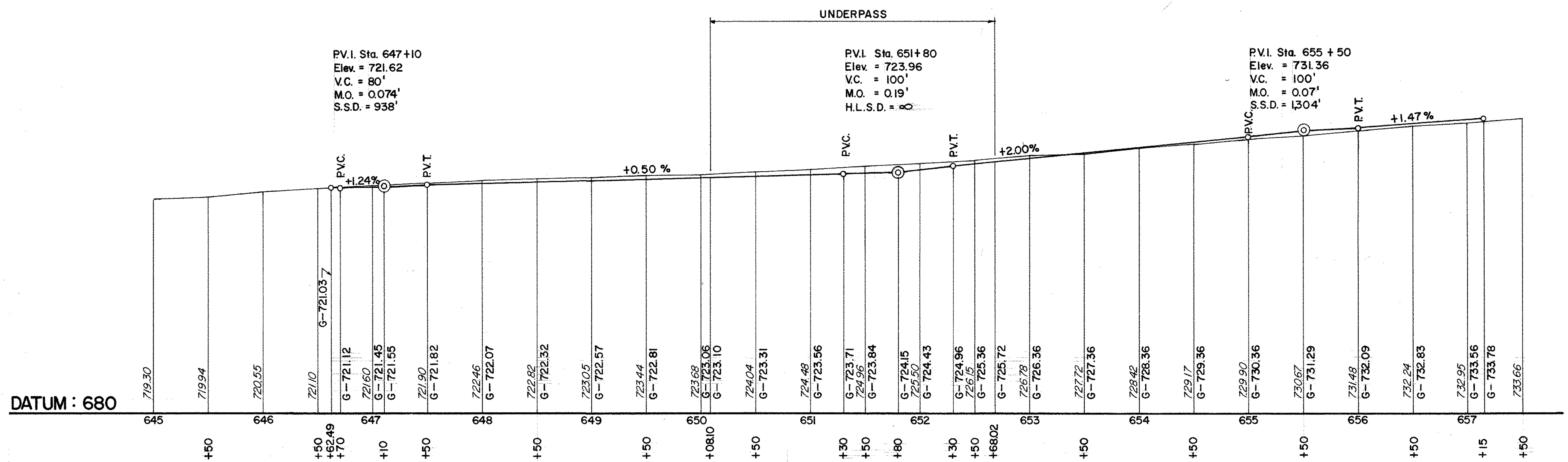
SCALE IN FEET

20 0 20

TRACED BY
FINAL BY

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764	19	72 of 76
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY



L.R. 764 — WESTBOUND

FOR PLAN SHEETS, SEE SHEETS 58 & 59.

SCALE IN FEET

HORIZ. 50 0 50

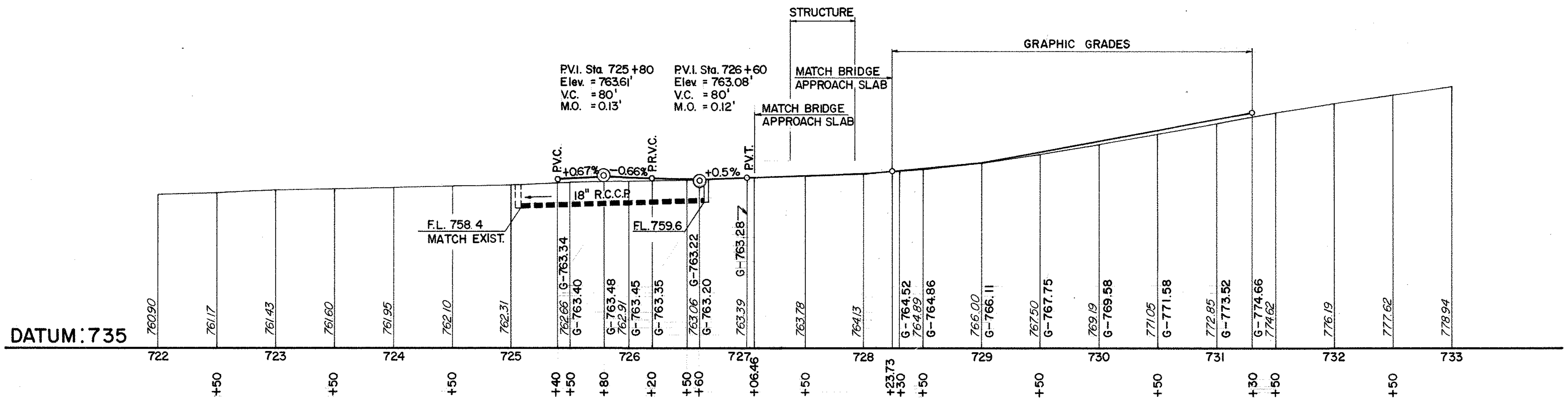
VERT. 10 0 10

TRACED BY

FINAL BY

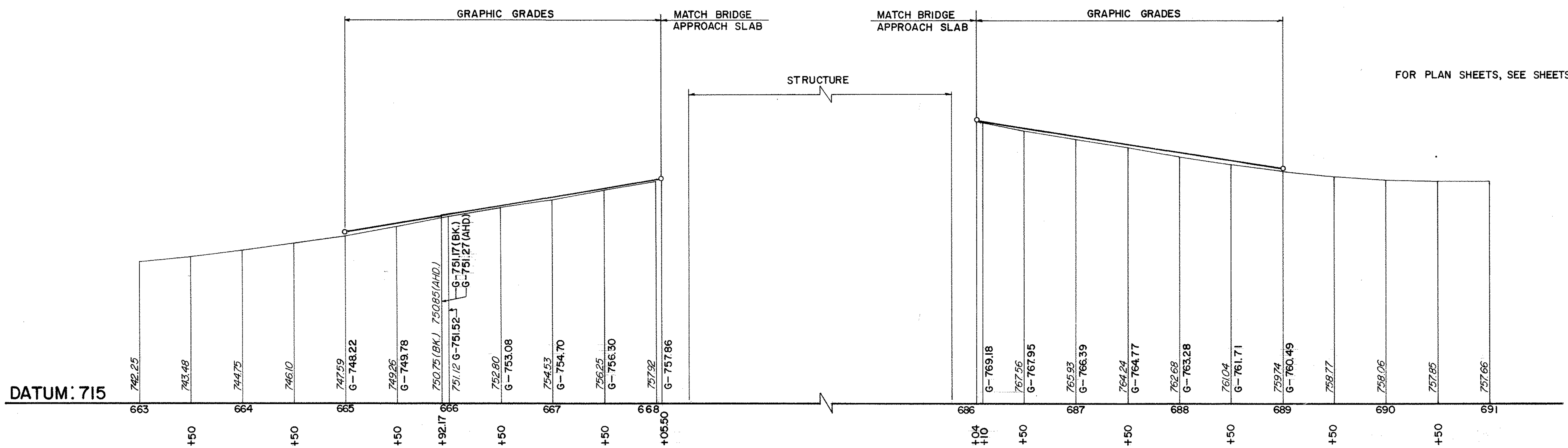
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764	19	73 of 76
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY



L.R. 764 — WESTBOUND

FOR PLAN SHEETS, SEE SHEETS 64 & 65.



FOR PLAN SHEETS, SEE SHEETS 59, 60 & 61.

L.R. 764 — WESTBOUND

SCALE IN FEET

HORIZ. 50 0 50

VERT. 10 0 10

OGILVIE PRESS

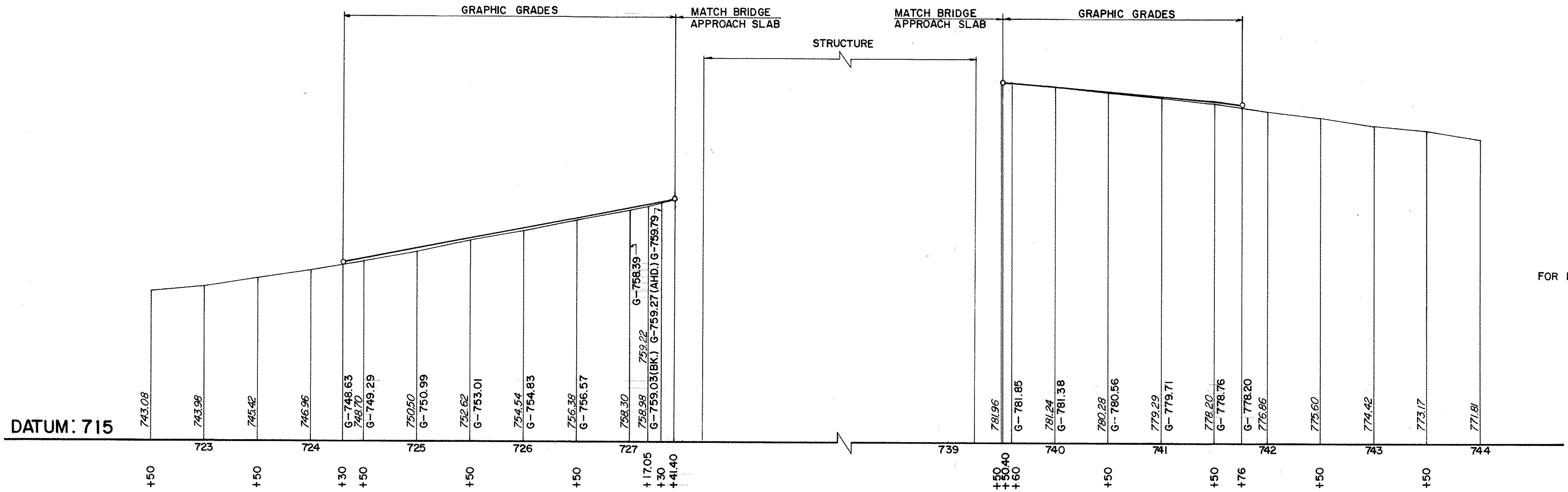
TRACED BY

FINAL BY

D-9012 (10-80)

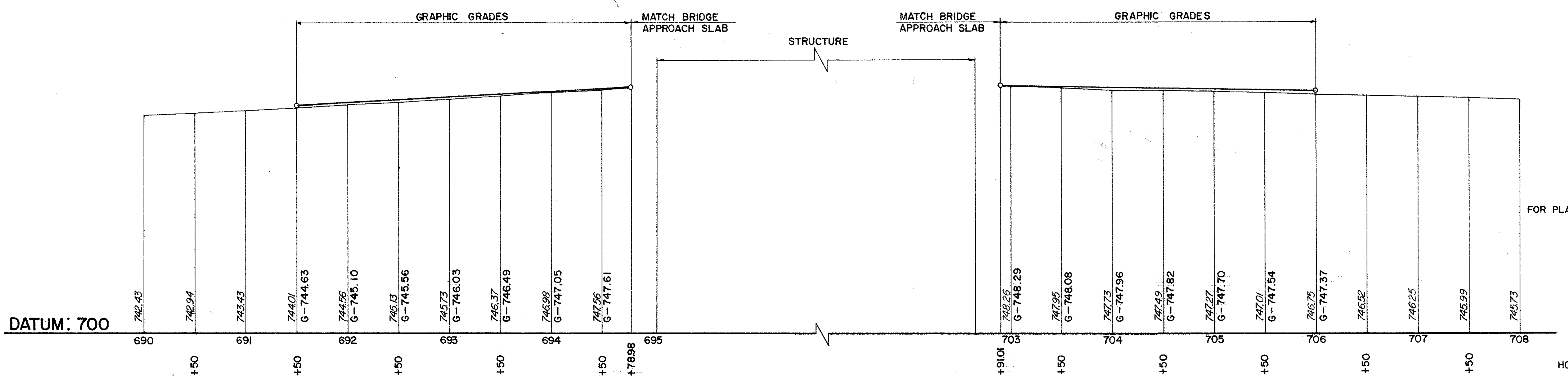
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764	19	74 of 76
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY



FOR PLAN SHEETS, SEE SHEETS 64, 65 & 66.

L.R. 764 — EASTBOUND



FOR PLAN SHEETS, SEE SHEETS 62 & 63.

L.R. 764 — EASTBOUND

SCALE IN FEET

HORIZ. 50 0 50

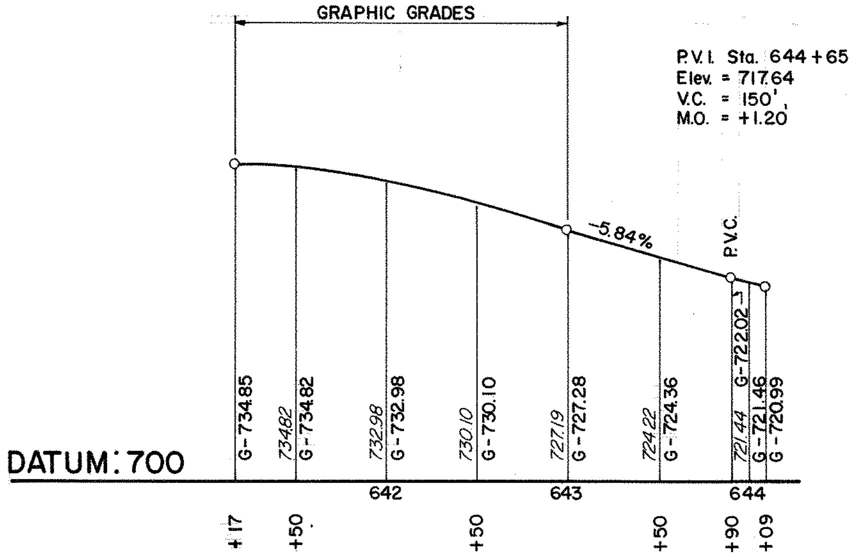
VERT. 10 0 10

OGILVIE PRESS

TRACED BY
FINAL BY

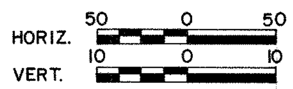
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764	19	75 of 76
CITY OF PITTSBURGH				

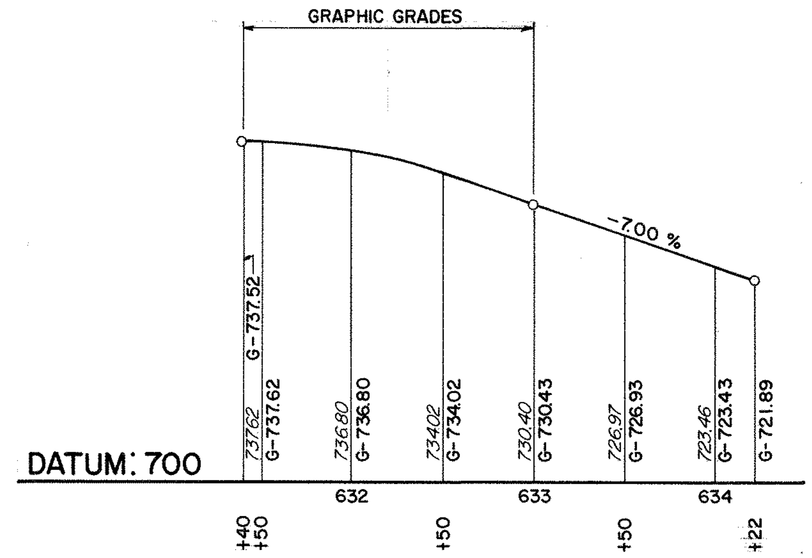
REVISION NUMBER	REVISIONS	DATE	BY



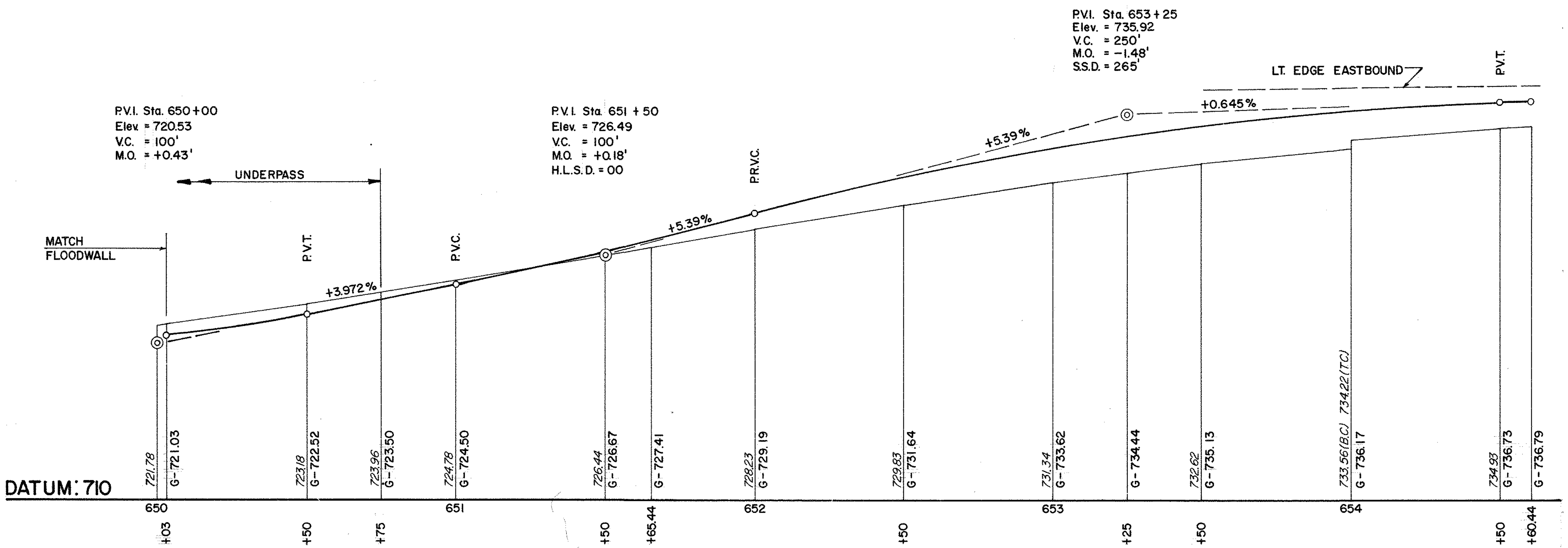
RAMP D

SCALE IN FEET





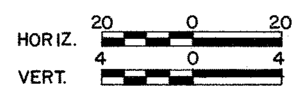
RAMP N



RAMP D

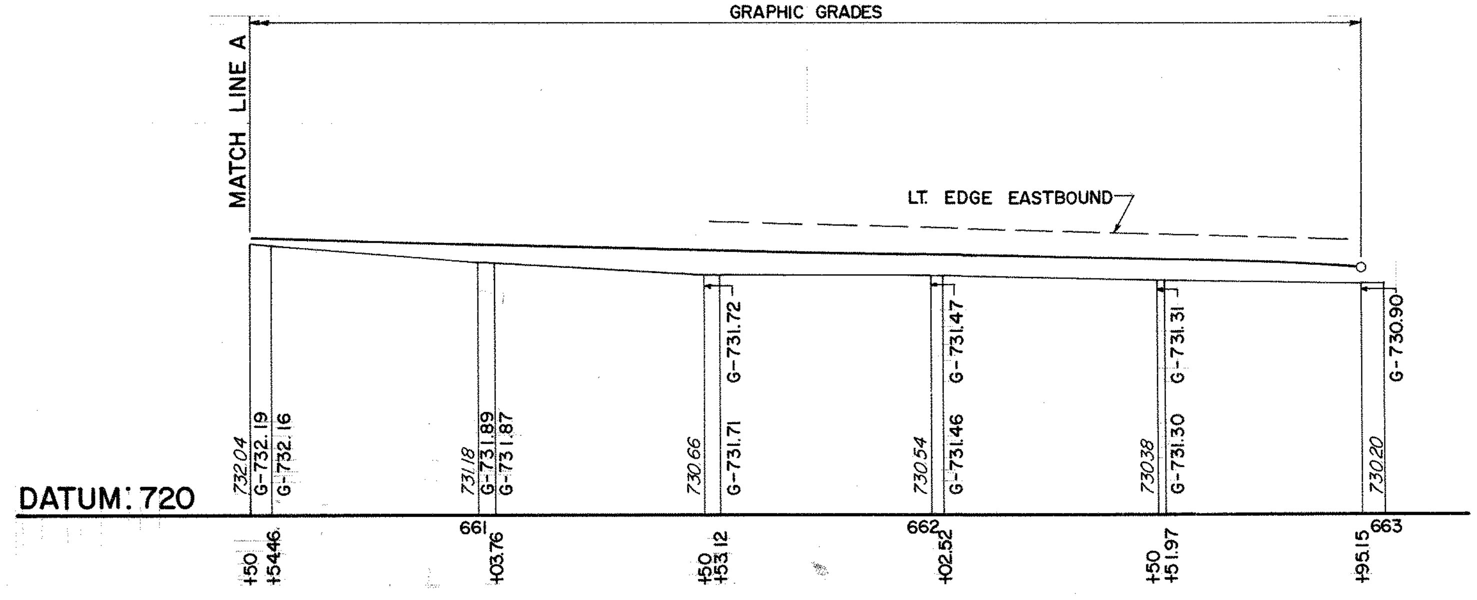
FOR RAMP D, SEE PLAN SHEETS 57 & 58.
FOR RAMP N, SEE PLAN SHEETS 56 & 57.

SCALE IN FEET

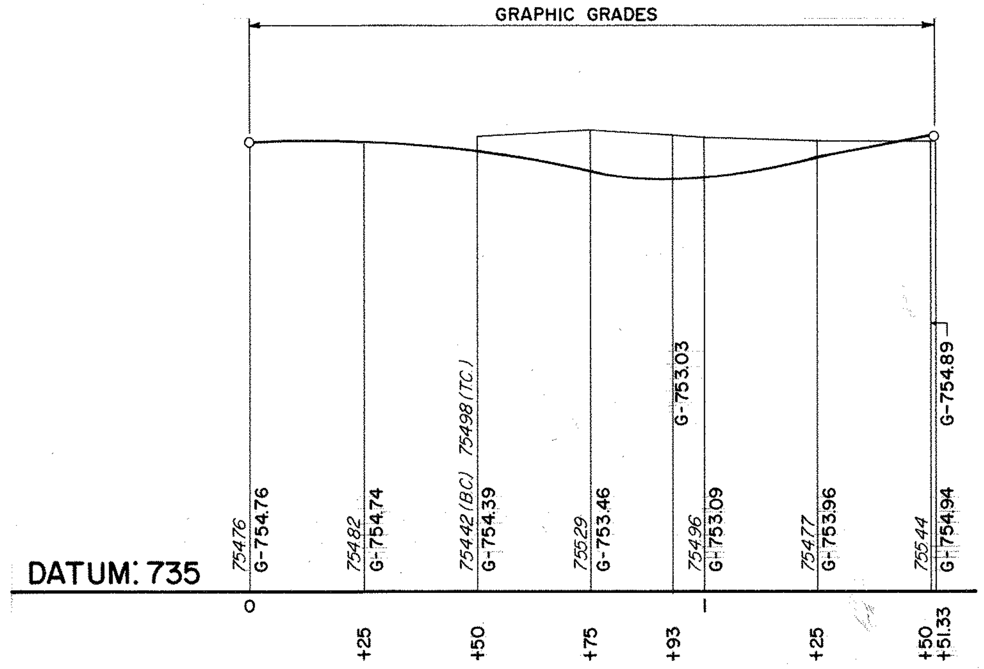


D-9012 60-801

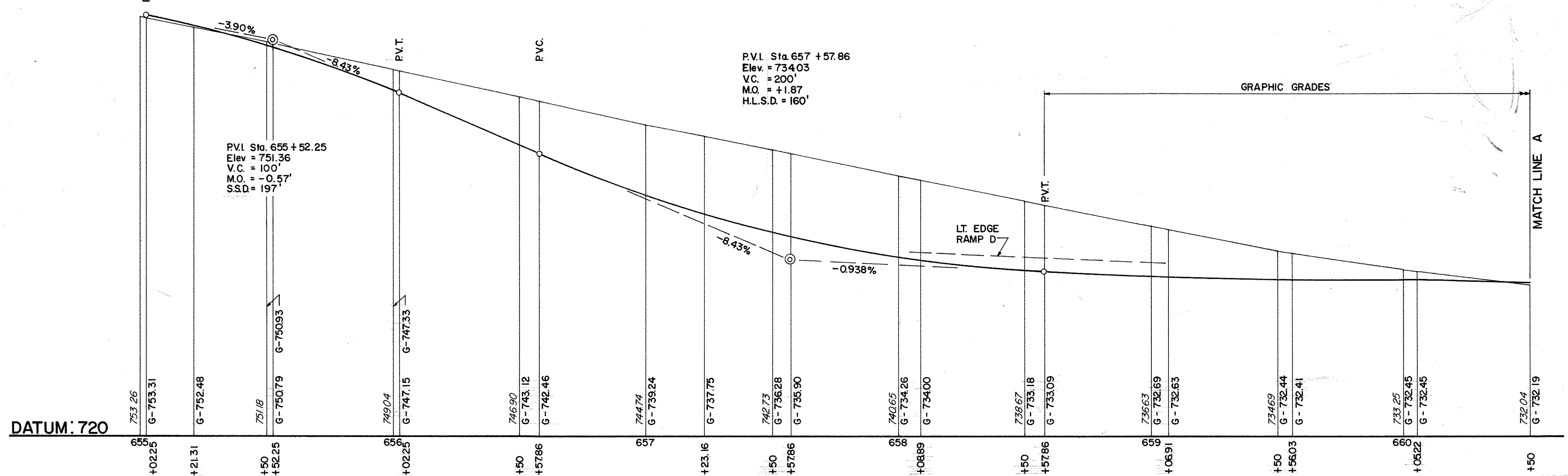
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	764	19	76 of 76
	CITY OF PITTSBURGH			
REVISION NUMBER	REVISIONS		DATE	BY



RAMP F (LEFT EDGE)

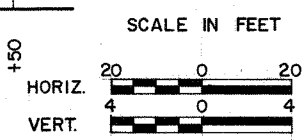


RAMP F SPUR



RAMP F (LEFT EDGE)

FOR RAMP F, SEE PLAN SHEETS 58 & 59.
FOR RAMP F SPUR, SEE PLAN SHEET 58.



OGILVIE PRESS

TRACED BY
FINAL BY

D- 4237 (3-75)

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	766 & 764	23 & 19	1 of 26
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY

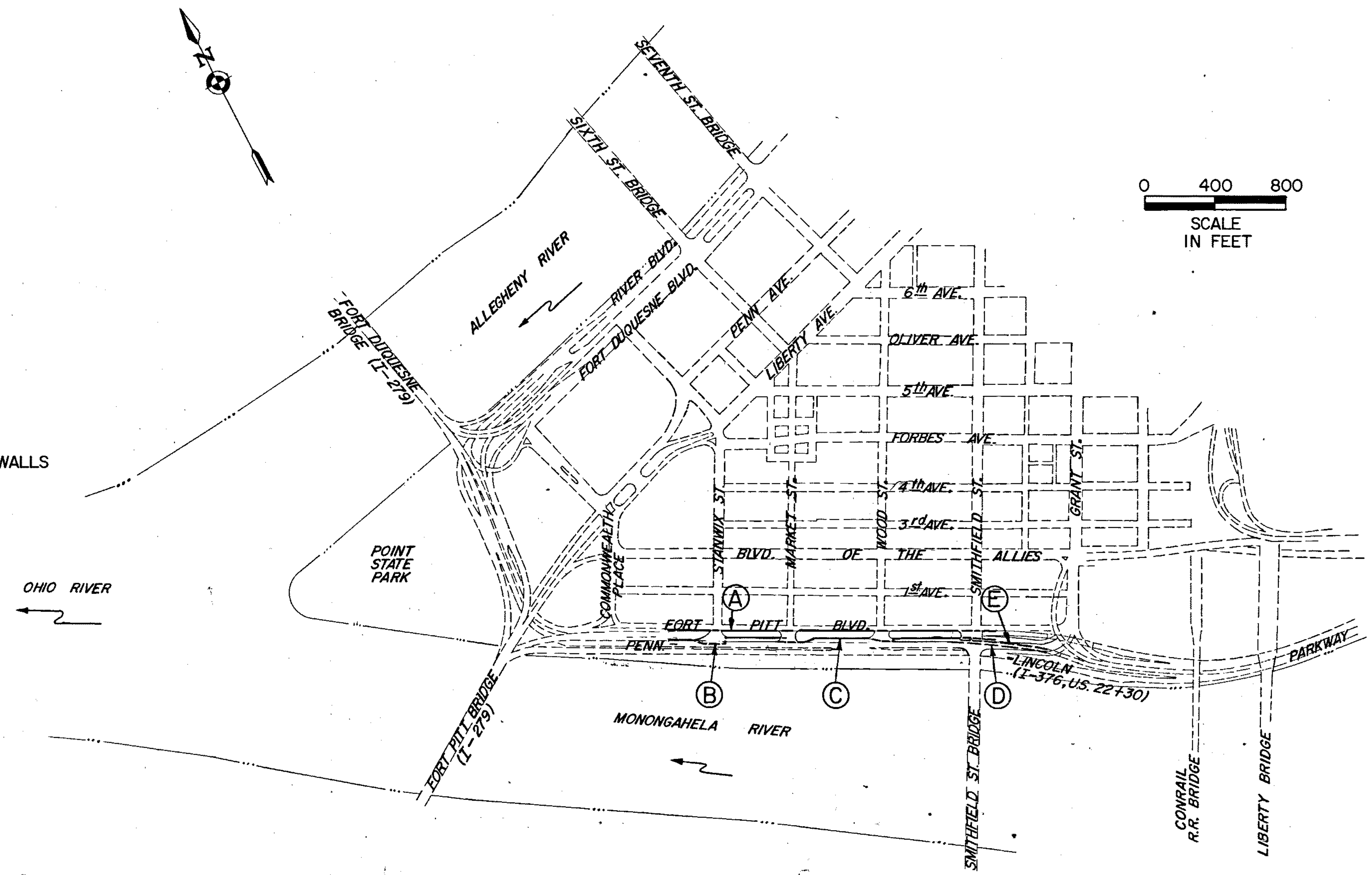
PENN - LINCOLN PARKWAY

L. R. 766 SECTION 23 & L. R. 764 SECTION 19

PITTSBURGH, PENNSYLVANIA

FLOODWALL PROTECTION SYSTEM

INDEX OF DRAWINGS	SHEET
TYPICAL SECTIONS	2-3
SPECIAL DETAILS	4-6
SUMMARY SHEET	7
TABULATION OF ROADWAY ITEMS	8-9
TABULATION OF DRAINAGE ITEMS	10-12
PLANS	13-22
PROFILES	23-26
CROSS SECTIONS (UPON REQUEST)	41
STRUCTURE DRAWING	S-14584



LEGEND

(A) PROPOSED FLOODWALLS

SCALE IN FEET

PLANS 10 0 10

PROFILE 20 0 20 HORIZONTAL

5 0 5 VERTICAL

Designed by
MICHAEL BAKER, JR., INC.
Consulting Engineers
4301 Dutch Ridge Road
Beaver, Pennsylvania 15009

William E. Fusetti
WILLIAM E. FUSETTI
REG. PROF. ENGINEER
Pennsylvania 011554 E
Date *July 6, 1982*

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
WILLIAM E. FUSETTI
ENGINEER

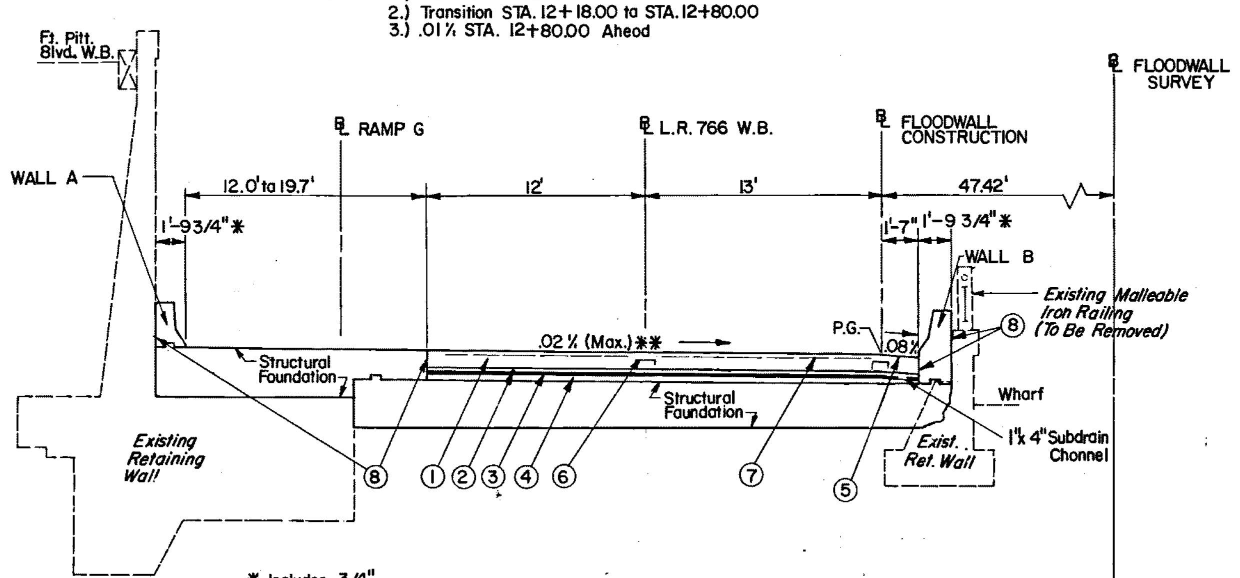
TRACED BY *PLB 5-11-82*
FINAL BY *W.V.A., D.C.K., WEF 5-11-82*

D-4237 (3-75)

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	766 764	23 19	2 of 26
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY

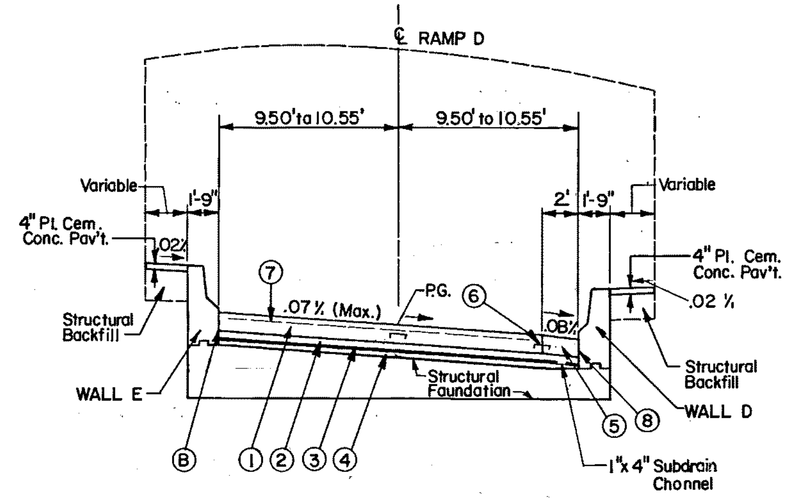
NOTE: ** 1.) .02% STA. 11+23.50 to STA. 12+18.00
2.) Transition STA. 12+18.00 to STA. 12+80.00
3.) .01% STA. 12+80.00 Ahead



* Includes 3/4" Premolded Expansion Joint Filler

PARKWAY TYPICAL SECTION

FLOODWALL STA. 11+23.50 (BEGIN STRUCTURAL FOUNDATION) TO STA. 13+12.50

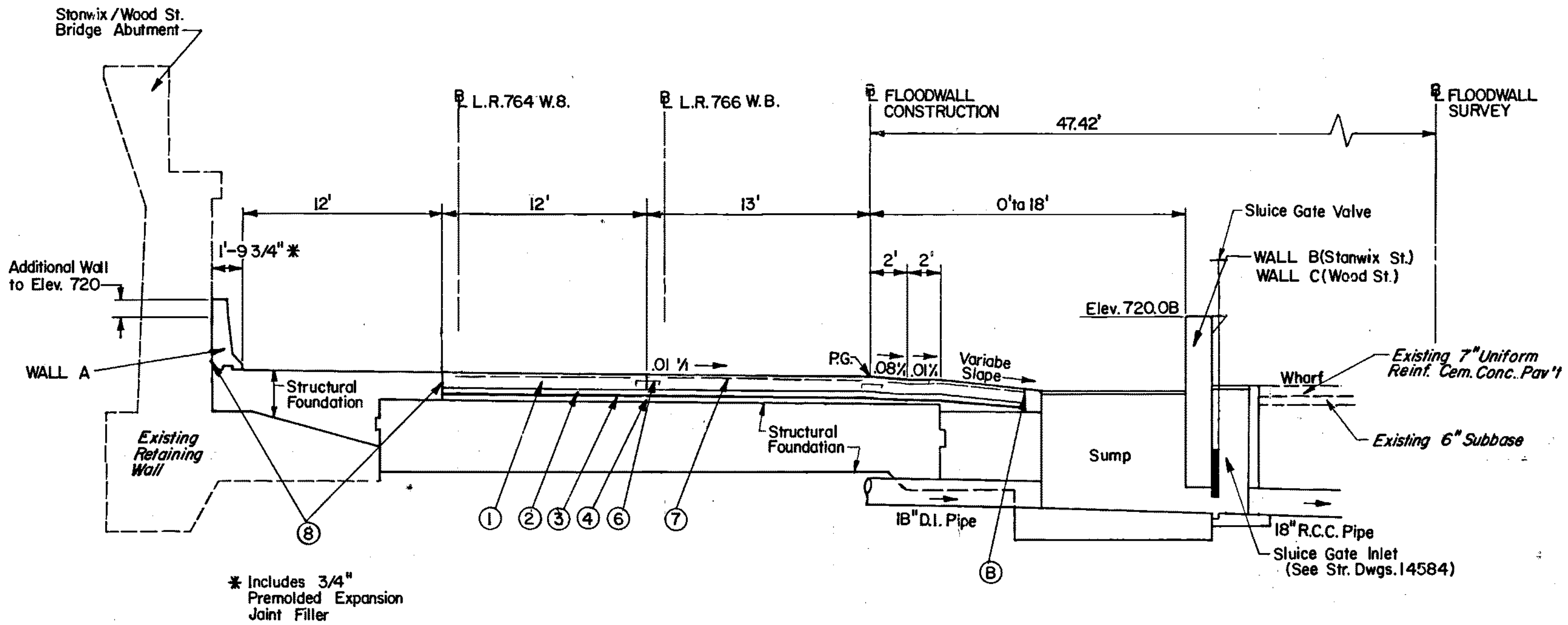


TYPICAL SECTION
RAMP D THRU UNDERPASS

RAMP D STA. 649+14.30 TO STA. 650+03.00 (END STRUCTURAL FOUNDATION)

LEGEND

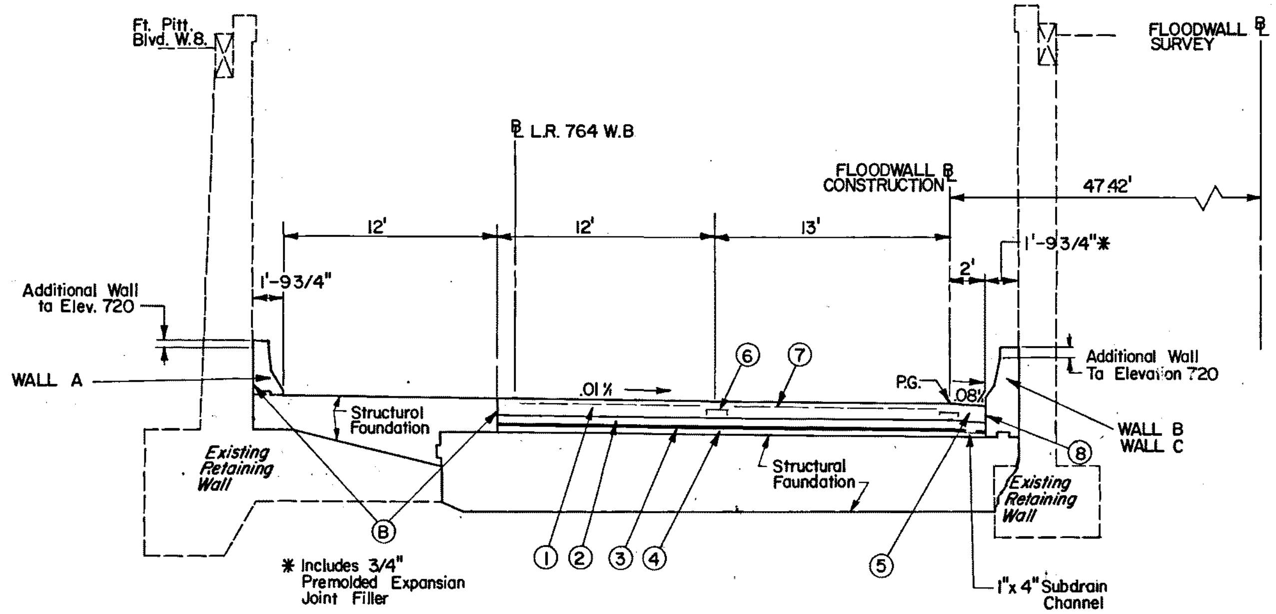
1. Reinforced Cement Concrete Pavement, 11" Depth
2. Asphalt Treated Permeable Material, 4" Depth
3. Bituminous Wearing Course, FJ-1, 1" Depth, SRL-L
4. Bituminous Concrete Base Course, Variable Depth
5. Plain Cement Concrete Pavement, 11" Depth
6. Dowelled Longitudinal Joints
7. Reinforcement
8. 3/4" Premolded Expansion Joint Filler



* Includes 3/4" Premolded Expansion Joint Filler

PARKWAY PUMPING PULL-OFF AREAS TYPICAL SECTION
UNDER STANWIX & WOOD STREET BRIDGES

STA. 13+12.50 TO STA. 14+58.40 (STANWIX STREET)
STA. 23+20.00 TO STA. 24+62.00 (WOOD STREET)



* Includes 3/4" Premolded Expansion Joint Filler

PARKWAY
TYPICAL SECTION

STA. 14+58.40 TO STA. 17+37.50 (WALL B)
STA. 19+55.50 TO STA. 23+20.00 (WALL C)
STA. 24+62.00 TO STA. 27+32.10 (WALL C)

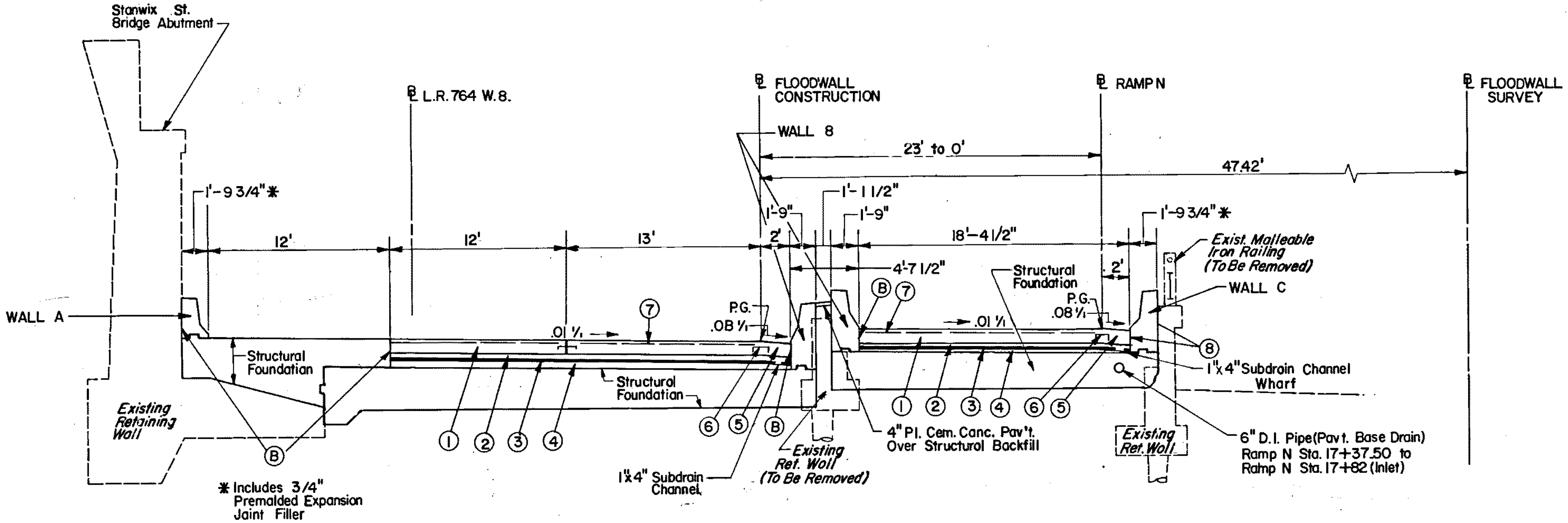
TYPICAL SECTIONS

TRACED BY BLB 5-14-82
FINAL BY WVA, DCK, WEF 5-14-82

D- 4237 (3-75)

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	3 of 26
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY



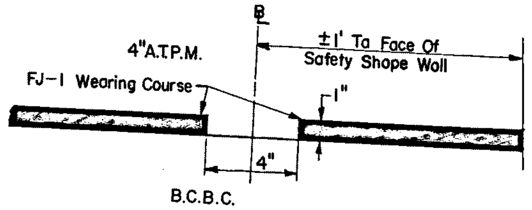
TYPICAL SECTION

FLOODWALL STA. 17+37.50 TO STA. 19+55.14
WALL B ENDS AT STA. 17+91.50

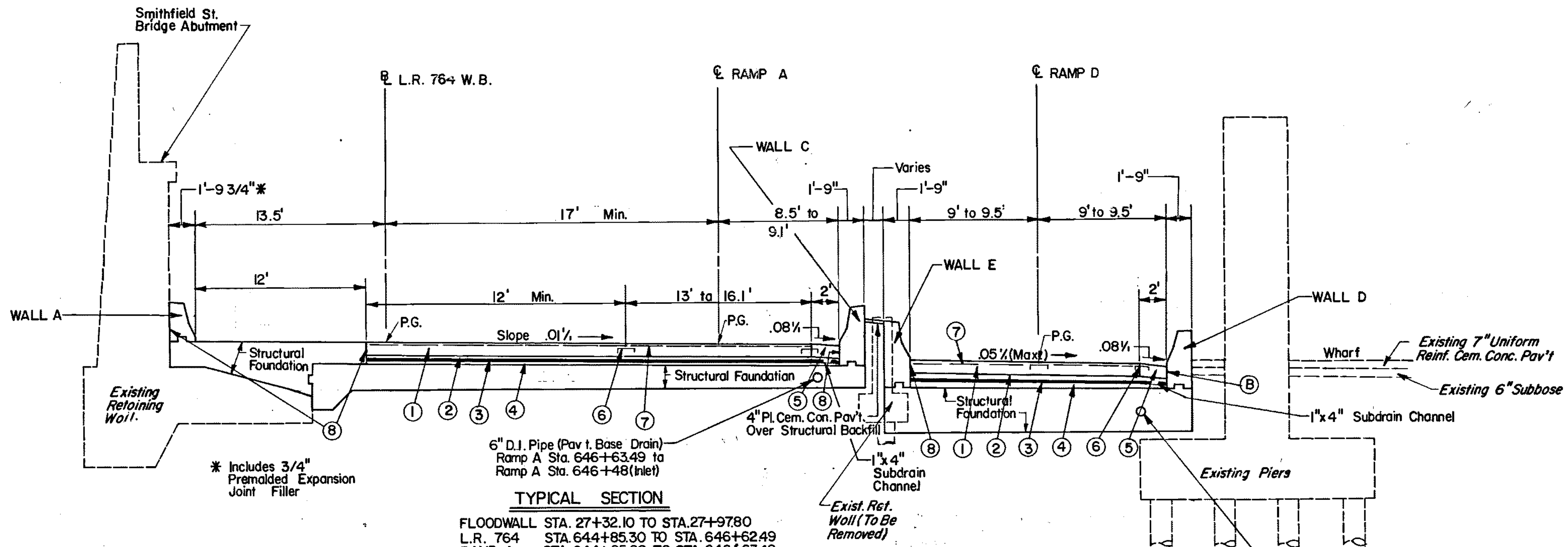
RAMP N

STA. 17+37.50 TO
STA. 19+57.41

FOR LEGEND SEE SHEET NO. 2



1"x4" SUBDRAIN CHANNEL



TYPICAL SECTION

FLOODWALL STA. 27+32.10 TO STA. 27+97.80
L.R. 764 STA. 644+85.30 TO STA. 646+62.49
RAMP A STA. 644+85.80 TO STA. 646+63.49

RAMP D

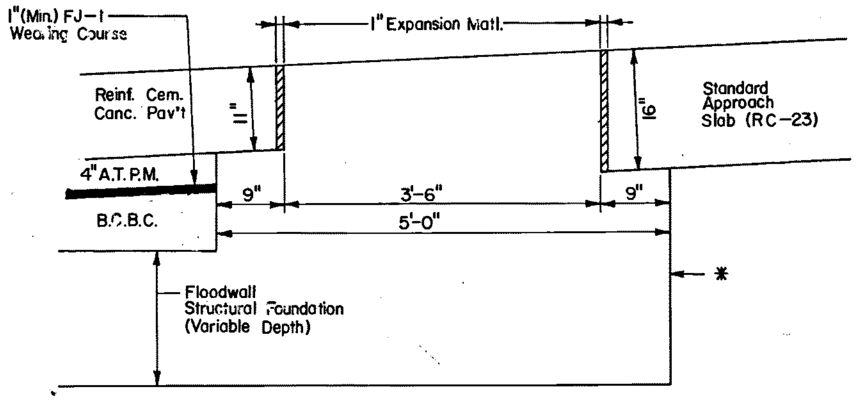
STA. 644+09.00 To
STA. 649+14.30

TYPICAL SECTIONS

TRACED BY BLB 5-14-82
FINAL BY

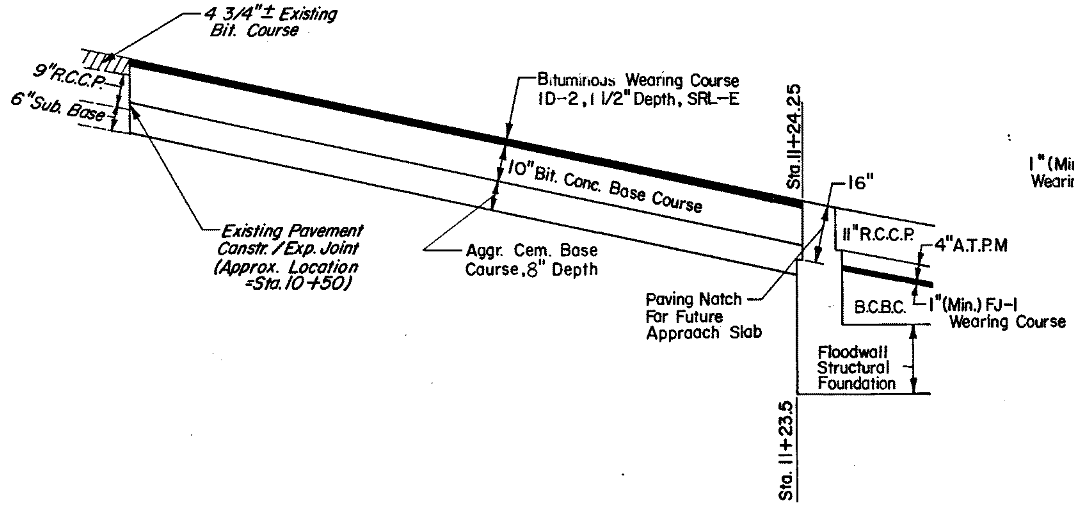
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	766 764	23 19	4 of 26
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY



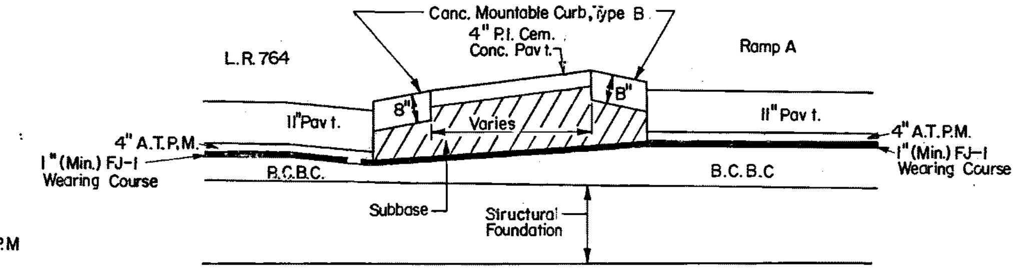
BEGINNING/END OF STRUCTURAL FOUNDATION

* FLOODWALL ℄ STA. 11+23.50
RAMP N ℄ STA. 17+37.50
L.R. 764 ℄ STA. 646+62.49
RAMP A ℄ STA. 646+63.49
RAMP D ℄ STA. 644+09.00
RAMP D ℄ STA. 650+03.00

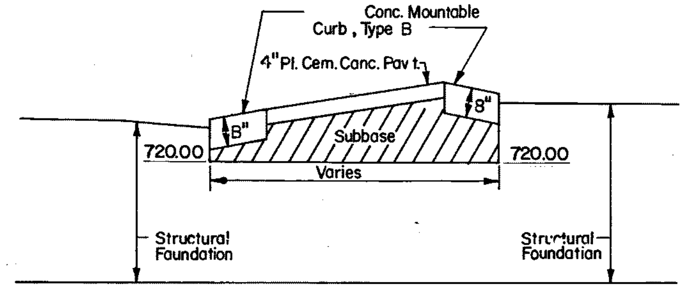


FLEXIBLE PAVEMENT TRANSITION DETAIL

FLOODWALL ℄ STA. 10+50 to 11+24.5

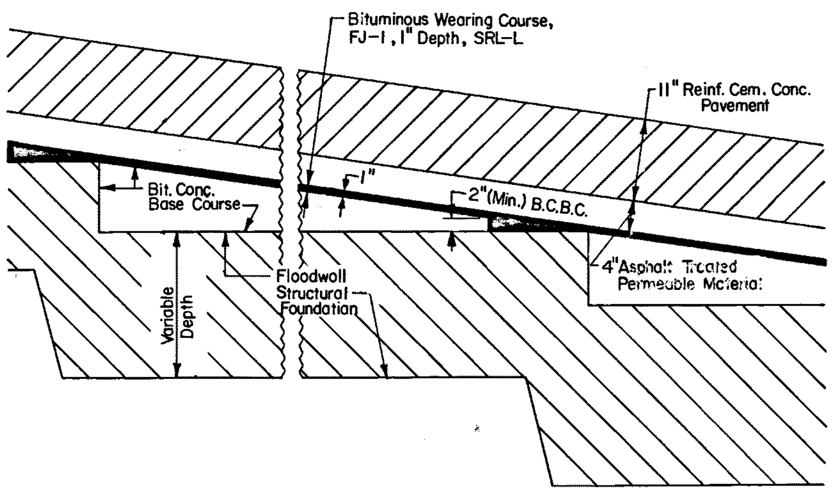


L.R. 764 STA. 646+18.0 to
L.R. 764 STA. 646+57.49

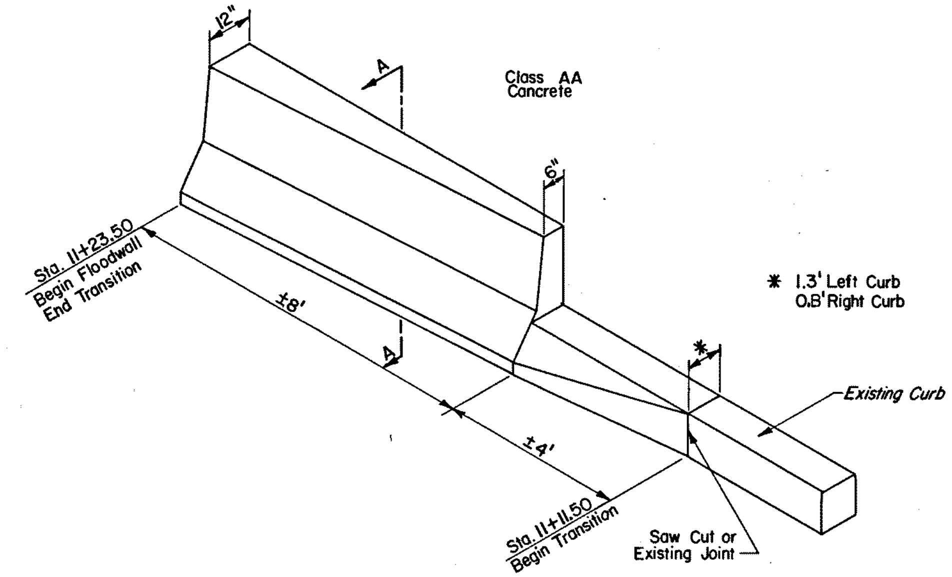


L.R. 764 STA. 646+57.49 to
L.R. 764 STA. 646+62.49

L.R. 764 W.B.—RAMP A GORE AREA

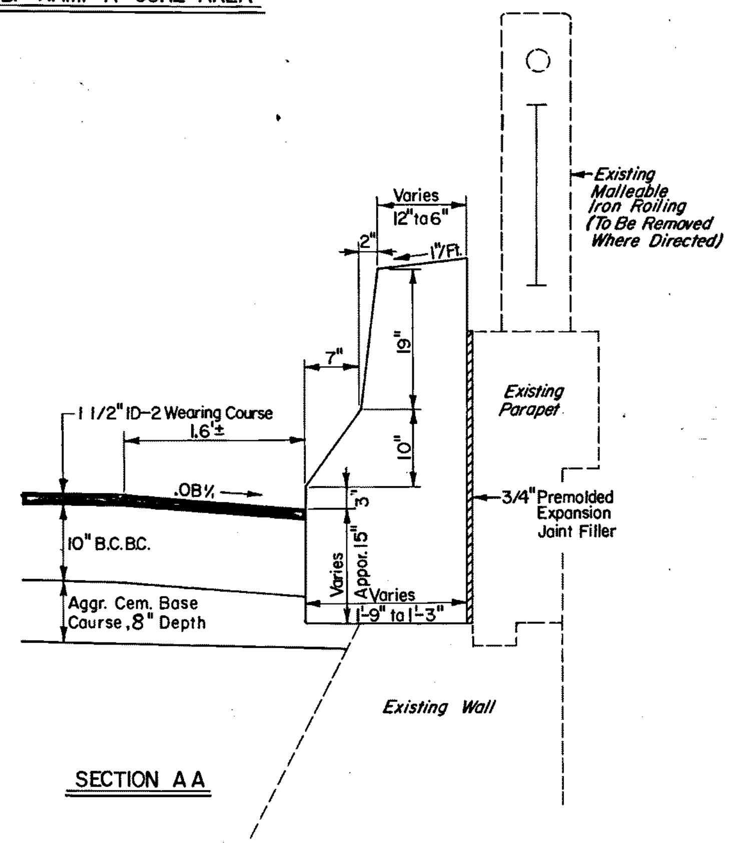


PAVEMENT DETAIL ABOVE FLOODWALL STRUCTURAL FOUNDATION



END TRANSITION DETAIL EXISTING BARRIER CURB TO FLOODWALL SAFETY SHAPE PARAPET WALL

FLOODWALL ℄ STA. 11+11.50 to STA. 11+23.50 (Lt. & Rt.)
ITEM NO. 2623-0102



SECTION A A

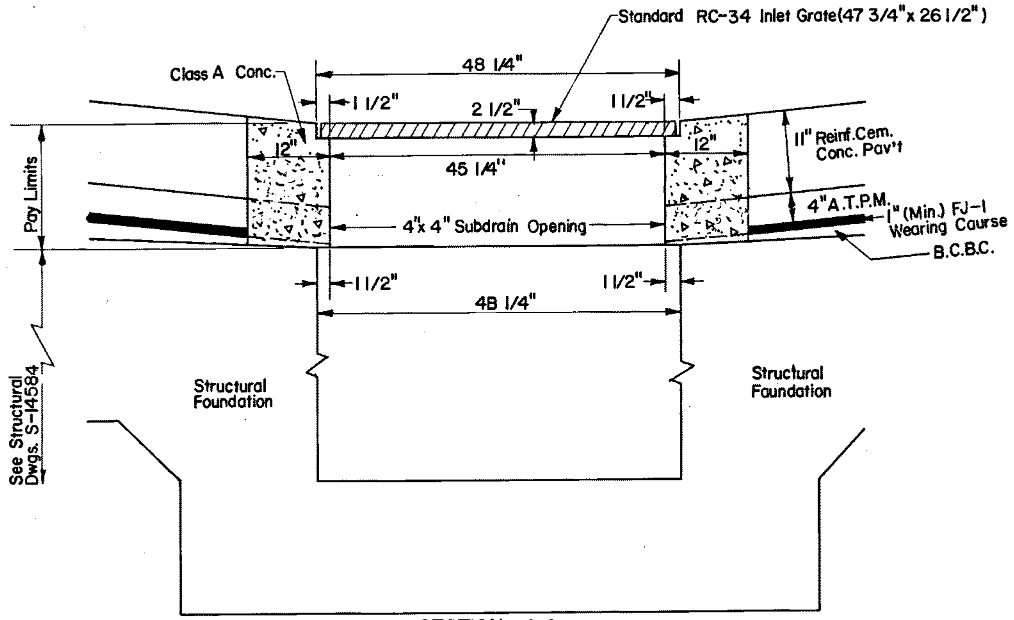
SPECIAL DETAILS

TRACED BY B.L.D. 5-11-82
FINAL BY WVA, DCK, WEF 5-11-82

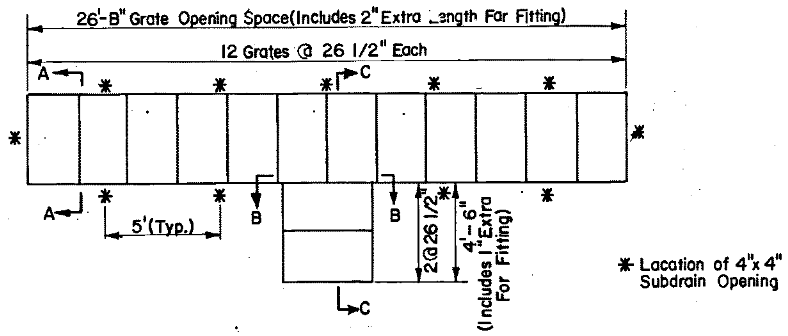
D- 4237 (3-75)

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	766 764	23 19	5 of 26
	CITY OF PITTSBURGH			

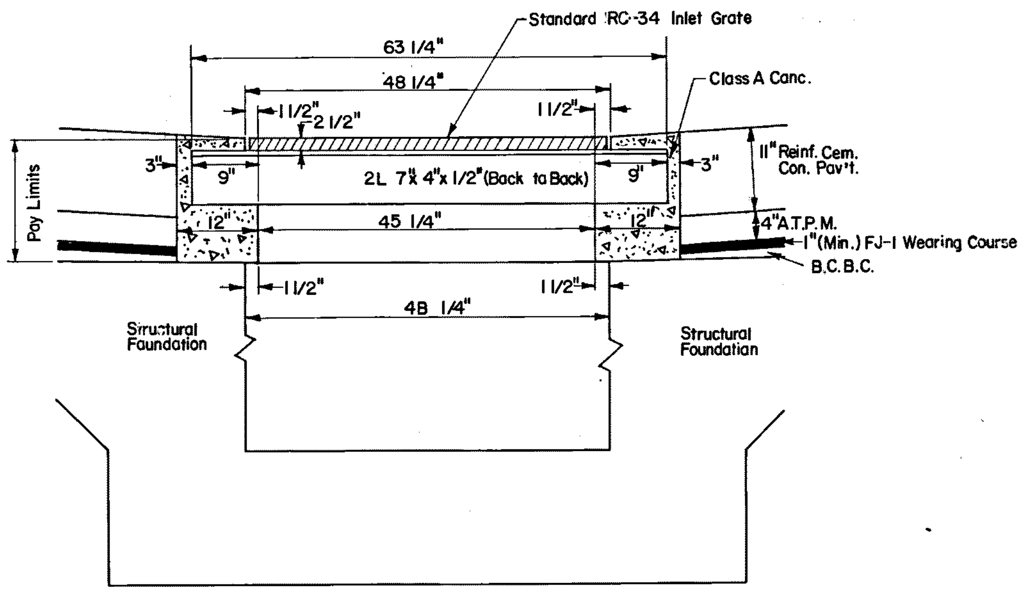
REVISION NUMBER	REVISIONS	DATE	BY



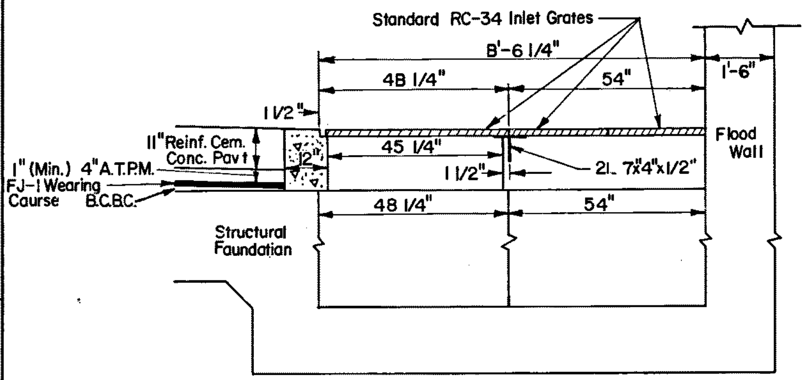
SECTION A-A



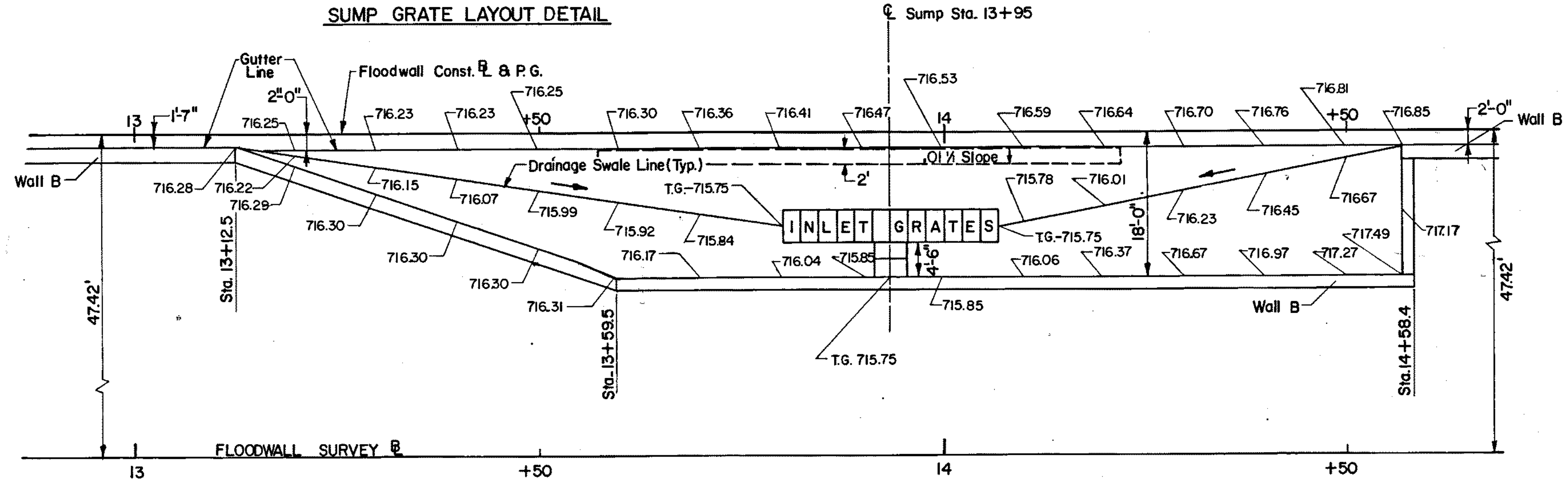
SUMP GRATE LAYOUT DETAIL



SECTION B-B



SECTION C-C



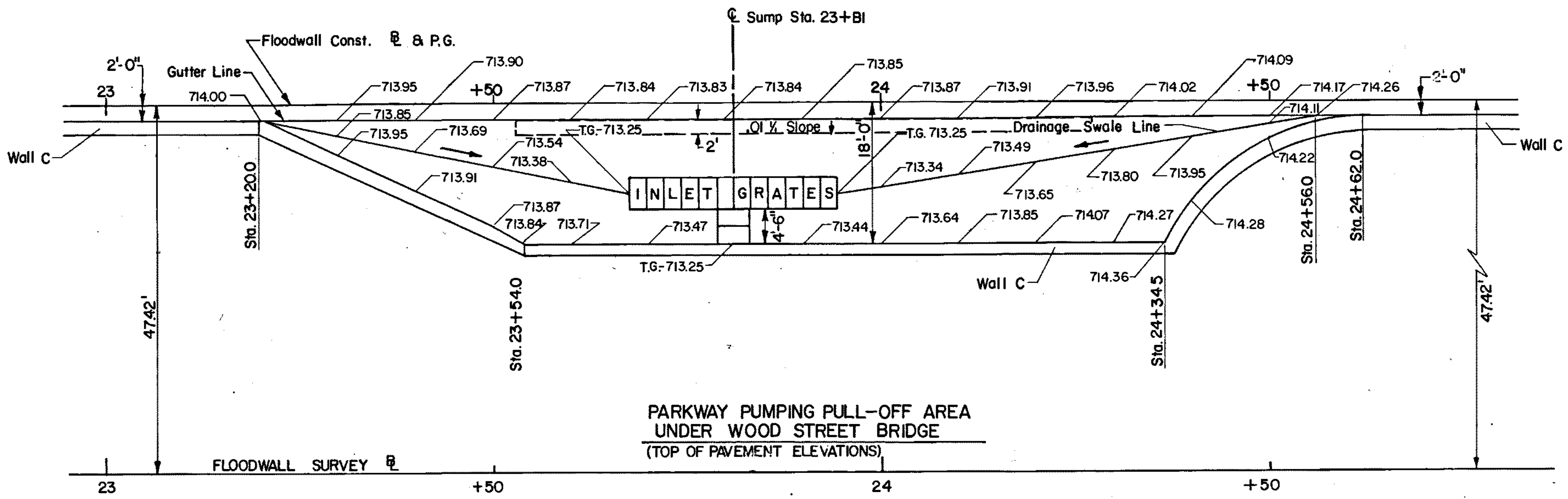
PARKWAY PUMPING PULL-OFF AREA UNDER STANWIX STREET BRIDGE

(TOP OF PAVEMENT ELEVATIONS)

NOTE: Elevations Shown at Even 10' Foot Station Intervals e.g., 13+20, 13+30, 13+40 etc.

SCALE IN FEET 0 10 20

NOTE: For Pull-Off Area Walls, Steps, Catwalk, Sluice Grate, etc. Details See Structural Drawing S-14584



PARKWAY PUMPING PULL-OFF AREA UNDER WOOD STREET BRIDGE

(TOP OF PAVEMENT ELEVATIONS)

PUMPING AREA DETAILS

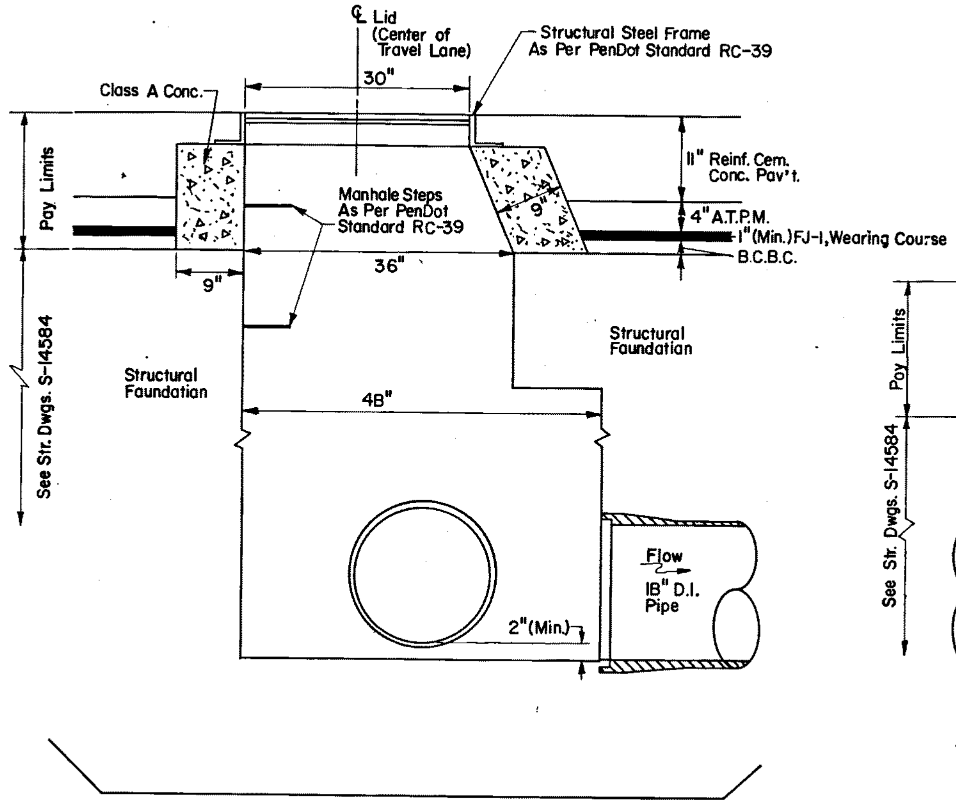
TRACED BY BLB 5-14-62

FINAL BY WVA, DCK, WEF 5-14-62

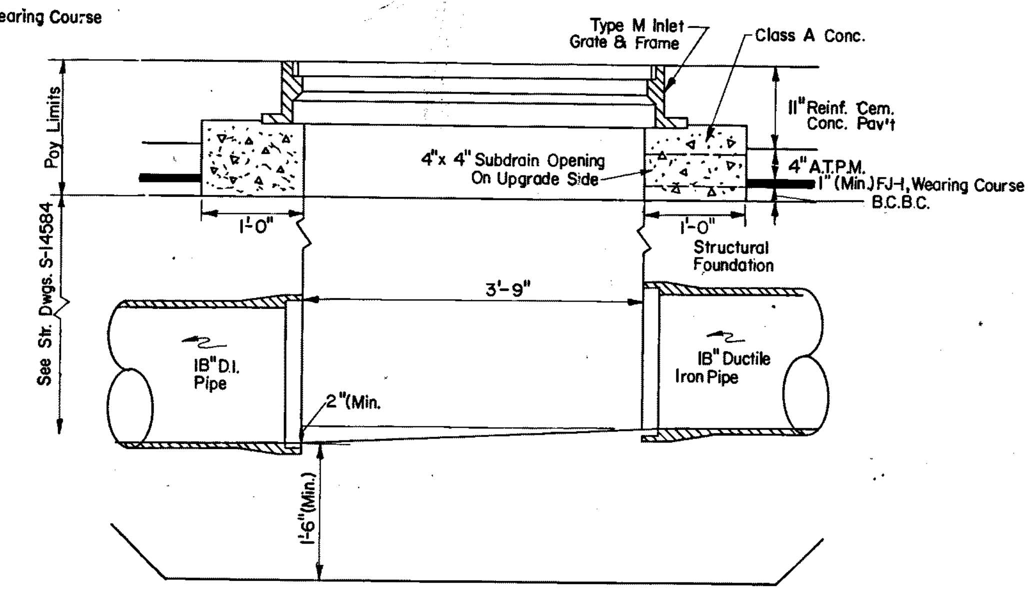
D- 4237 (3-75)

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	766 764	23 19	6 of 26
	CITY OF PITTSBURGH			

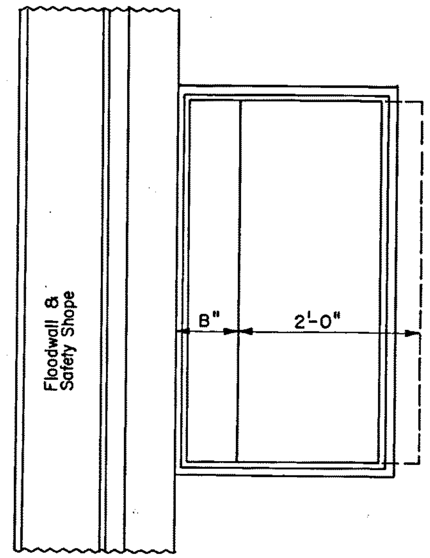
REVISION NUMBER	REVISIONS	DATE	BY



TYPE A MANHOLE, SPECIAL
(ABOVE STRUCTURAL FOUNDATION)

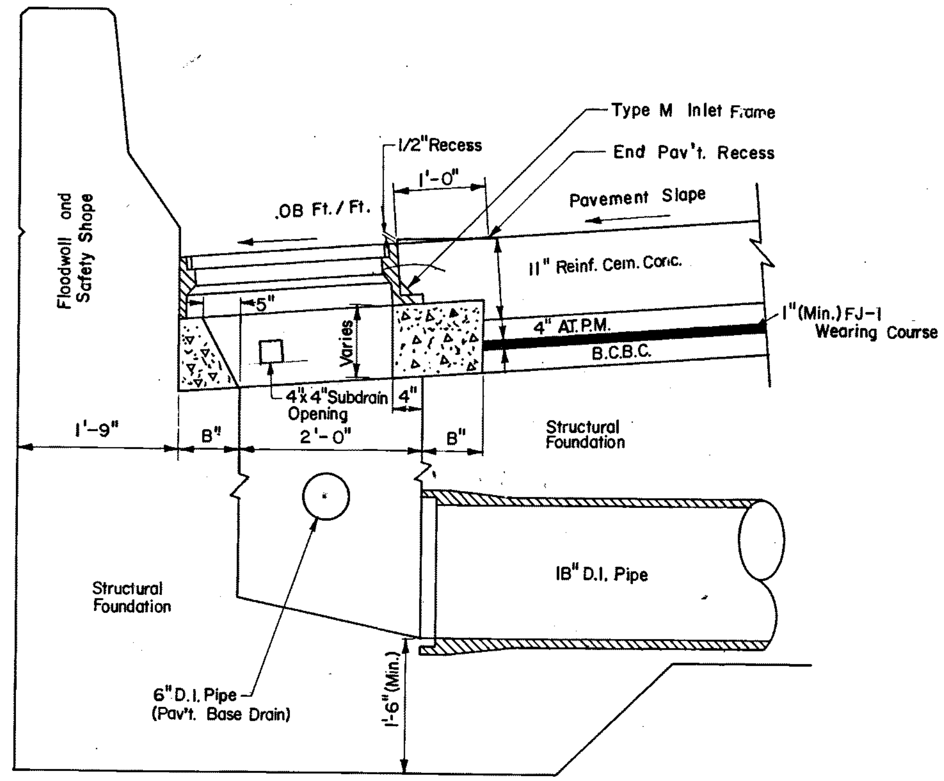


TYPE M INLET, SPECIAL
FRONT VIEW
(ABOVE STRUCTURAL FOUNDATION)

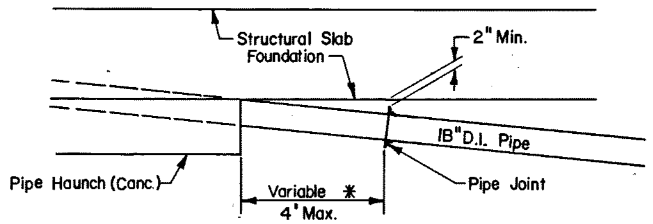


TYPE M INLET, SPECIAL
TOP VIEW

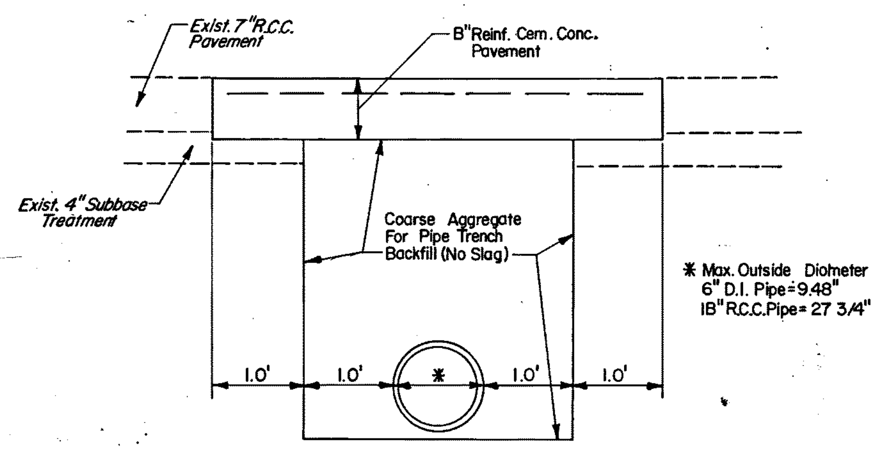
Note: All Other Dimensions And Details Same As For Type M Inlet. See RC-34



TYPE M INLET, SPECIAL
SIDE VIEW
(ABOVE STRUCTURAL FOUNDATION)



✱ If 2" Min. Clearance Cannot be Obtained In 4 Feet or Less, a Joint Shall be Provided at 4 Feet With an Indentation in the Bottom of the Structural Slab Foundation to Allow For Movement at the Joint Due to Differential Settlement of the Foundation/Pipe. The 2" Indentation May be Formed by Any Suitable Permanently Flexible Material, Including Soil.



✱ Max. Outside Diameter
6" D.I. Pipe = 9.48"
18" R.C.C. Pipe = 27 3/4"

WHARF PAVEMENT REPLACEMENT DETAIL

SPECIAL DETAILS

TRACED BY GLB 5-11-82
FINAL BY WVA, DCK, WEF 5-14-82

REVISION NUMBER	REVISION	DATE	BY

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	766 764	23 19	7 of 26

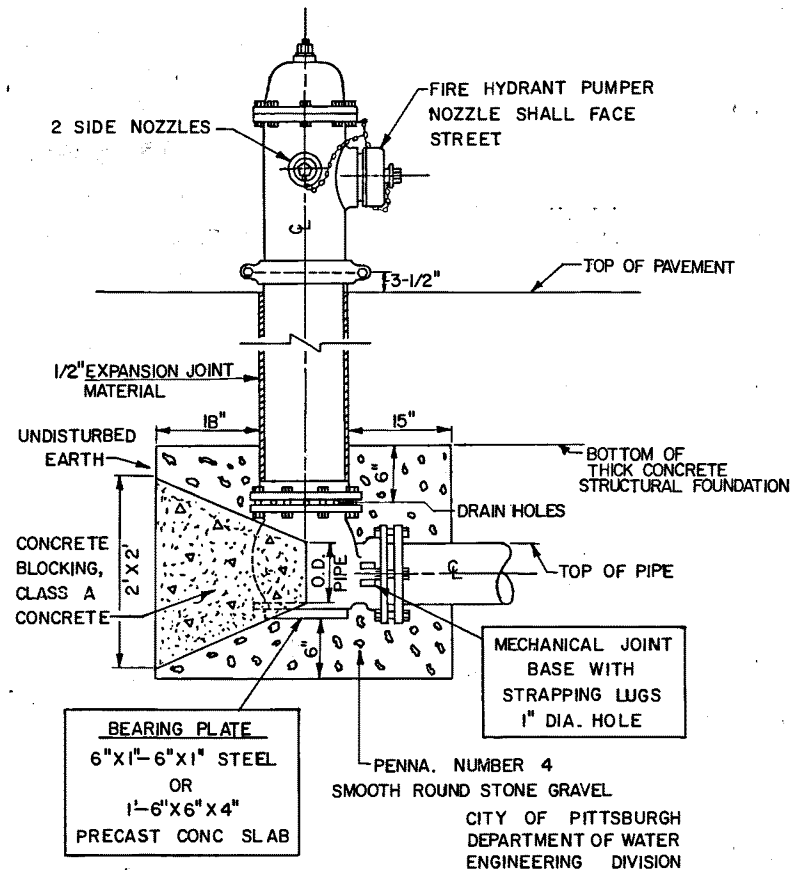
FLOODWALL SUMMARY SHEET (For Information Only)

SHEET 1 OF 1

ITEM NO.	QTY.	UNIT	DESCRIPTION		TAB ON SHEET
203-0001	66	C.Y.	CLASS 1 EXCAVATION		9
203-0002	152	C.Y.	CLASS 1 EXCAVATION, SPECIAL	S.P.	9
204-0001	44	C.Y.	CLASS 2 EXCAVATION		12
204-0150	625	C.Y.	CLASS 4 EXCAVATION		
305-0015	396	S.Y.	BITUMINOUS CONCRETE BASE COURSE, 10" DEPTH		9
305-0200	1,470	TONS	BITUMINOUS CONCRETE BASE COURSE		9
2306-0003	7,526	S.Y.	ASPHALT TREATED PERMEABLE MATERIAL, 4" DEPTH	S.P.	9
2321-0108	396	S.Y.	AGGREGATE-CEMENT BASE COURSE, 8" DEPTH		9
350-0050	6	C.Y.	SUBBASE MATERIAL		9
420-0283	396	S.Y.	BIT. WEARING COURSE, ID-2, 1-1/2" DEPTH, SRL-E		9
422-0230	7,526	S.Y.	BIT. SURFACE COURSE, FJ-1, 1" DEPTH, WEARING COURSE, SRL-L	S.P.	9
501-0020	229	S.Y.	PLAIN CEMENT CONCRETE PAVEMENT, 4" DEPTH		9
501-0034	491	S.Y.	PLAIN CEMENT CONCRETE PAVEMENT, 11" DEPTH		9
501-0200	228	S.Y.	REINFORCED CEMENT CONCRETE PAVEMENT, 8" DEPTH		9
501-0203	7,045	S.Y.	REINFORCED CEMENT CONCRETE PAVEMENT, 11" DEPTH		9
2503-0001	7,993	S.Y.	PROTECTIVE COATING FOR CEMENT CONCRETE PAVEMENT AND SHOULDERS	S.P.	9
601-0052	234	L.F.	18" REINFORCED CEMENT CONCRETE PIPE, CLASS III		12
601-0875	68	L.F.	10" CORR. GALV. STEEL PIPE, TYPE I (2-2/3" X 1/2" CORRS.), 14 GAGE	S.P.	12
601-5400	521	C.Y.	COARSE AGGREGATE FOR PIPE TRENCH BACKFILL		12
605-1300	4	EACH	TYPE A MANHOLE		12
2605-1301	5	EACH	TYPE A MANHOLE, SPECIAL	S.P.	12
605-2060	1	EACH	TYPE M INLET		12
2605-2061	19	EACH	TYPE M INLET, SPECIAL	S.P.	12
2606-0053	1	SETS	GRADE ADJUSTMENT OF TYPE 4FT. SPECIAL INLETS	S.P.	12
606-0150	1	SETS	GRADE ADJUSTMENT OF EXISTING MANHOLES		12
2623-0102	2	EACH	END TRANSITION FOR CONCRETE MEDIAN BARRIER	S.P.	9

ITEM NO.	QTY.	UNIT	DESCRIPTION		TAB ON SHEET
633-0225	91	L.F.	PLAIN CONCRETE MOUNTABLE CURB, TYPE B		9
704-0002	1	C.Y.	CLASS A CEMENT CONCRETE		12
2000-0210	132	L.F.	6" DUCTILE IRON PIPE FOR POTABLE WATER	S.P.	12
2000-0211	112	L.F.	6" DUCTILE IRON PIPE FOR STORM SEWERS	S.P.	12
2000-0212	1,864	L.F.	18" DUCTILE IRON PIPE FOR STORM SEWERS	S.P.	12
2000-0213	L.S.	L.S.	STANWIX STREET SUMP	S.P.	12
2000-0214	L.S.	L.S.	WOOD STREET SUMP	S.P.	12
2000-0215	2	EACH	6" X 6" TAPPING TEE WITH 6-INCH GATE VALVE AND BOX	S.P.	12
2000-0216	2	EACH	FIRE HYDRANT	S.P.	12
2000-0217	2	EACH	STORM PUMP WITH TRAILER	S.P.	12
2000-0218	391	L.F.	REMOVE EXISTING MALLEABLE IRON RAILING	S.P.	9
2000-0219	1	EACH	ENERGY ABSORBING CRASH BARRIER, TYPE 2	S.P.	9
2000-0220	20,458	C.Y.	SPECIAL EXCAVATION (FLOODWALL)	S.P.	9

S.P. = SEE SPECIAL PROVISIONS



FIRE HYDRANT INSTALLATION

AMERICAN DARLING B-50-B QUIK-FIX (TRAFFIC TYPE)

NO SCALE

REORDER NO. A-1829-2

TABULATION OF ROADWAY ITEMS

SHEET 1 OF 2

REVISION NUMBER	REVISION	DATE	BY

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	766 764	23 19	8 of 26

ROUTE	STATIONS	CLASS I EXCAVATION	CLASS I EXCAVATION, SPECIAL			BITUMINOUS CONCRETE BASE COURSE, 10" DEPTH	BITUMINOUS CONCRETE BASE COURSE	ASPHALT TREATED PERMEABLE MATERIAL, 4" DEPTH	AGGREGATE-CEMENT BASE COURSE 8" DEPTH		SUBBASE MATERIAL	BIT. WEARING COURSE, ID-2, 1-1/2" DEPTH, SRL-E	BITUMINOUS SURFACE COURSE, FJ-1, 1" DEPTH WEARING COURSE, SRL-L		PLAIN CEMENT CONCRETE PAVEMENT, 4" DEPTH	PLAIN CEMENT CONCRETE PAVEMENT, 11" DEPTH	REINFORCED CEMENT CONCRETE PAVEMENT, 8" DEPTH	REINFORCED CEMENT CONCRETE PAVEMENT, 11" DEPTH	PROTECTIVE COATING FOR CEMENT CONC. PAVEMENT AND SHOULDERS	END TRANSITION FOR CONCRETE MEDIAN BARRIER	PLAIN CONCRETE MOUNTABLE CURB, TYPE B				REMOVE EXISTING MALLEABLE IRON RAILING	ENERGY ABSORBING CRASH BARRIER TYPE 2	SPECIAL EXCAVATION (FLOODWALL)				REMARKS
	ITEM	203	203			305	305	2306	321		350	420	422		501	501	501	501	2503	2623	633				2000	2000	2000				
	NUMBER	0001	0002			0015	0200	0003	0108		0050	0283	0230		0020	0034	0200	0203	0001	0102	0225				0218	0219	0220				
	UNIT	C.Y.	C.Y.			S.Y.	TONS	S.Y.	S.Y.		C.Y.	S.Y.	S.Y.		S.Y.	S.Y.	S.Y.	S.Y.	S.Y	EACH	L.F.				L.F.	EACH	C.Y.				
L.R. 766	10+50 TO 11+24.25	66	152			396			396			396																			
	11+11.50 TO 11+23.50																			2											LT + RT
	11+15.50 TO 13+11																								195						RIGHT
L.R766/L.R764	11+23.50 TO W8646+62.49																										18,017				INCLUDES RAMP A AND RAMP N
L.R. 766	11+27.75 TO 13+12.50															33			33												RIGHT
L.R. 766/L.R764	11+27.75 TO W8646+58.24																	5,983	5,983												INCLUDES RAMP A AND RAMP N
L.R766/L.R.764	11+28.50 TO W8646+57.49						1,227	6,338					6,338																		INCLUDES RAMP A AND RAMP N
L.R. 766	13+65 TO 13+95																18		18												18" PIPE - 86' RT
	13+95																44		44												18" PIPE (19.5' TO 86' RT.)
L.R. 764	14+52																35		35												6" WATERLINE 19.5' TO 85' RT.
	14+56.90 TO 17+93.00															75			75												RIGHT
	17+37.50 TO 17+91.50														7				7						54						WALL B
	RAMP N 17+37.50 TO 18+15																								78						WALL C
	RAMP N 17+41.75 TO 19+57.41															48			48												RIGHT
	17 + 93																									1					WALL B
	19+55.14 TO 23+20															81			81												RIGHT
	23+27 TO 23+81																35		35												18" PIPE - 111' RT.
SUB-TOTAL (1)		66	152			396	1,227	6,338	396			396	6,338		7	237	132	5,983	6,359	2					327	1	18,017				

Continued on Sheet No. 9

TABULATION OF ROADWAY ITEMS

SHEET 2 OF 2

REVISION NUMBER	REVISION	DATE	BY

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	766 764	23 19	9 of 26

ROUTE	STATIONS	CLASS I EXCAVATION	CLASS I EXCAVATION, SPECIAL			BITUMINOUS CONCRETE BASE COURSE, 10" DEPTH	BITUMINOUS CONCRETE BASE COURSE	ASPHALT TREATED PERMEABLE MATERIAL, 4" DEPTH	AGGREGATE-CEMENT BASE COURSE, 8" DEPTH		SUBBASE MATERIAL	BIT. WEARING COURSE, ID-2, 1-1/2" DEPTH, SRL-E	BITUMINOUS SURFACE COURSE, FJ-1, 1" DEPTH WEARING COURSE, SRL-L		PLAIN CEMENT CONCRETE PAVEMENT, 4" DEPTH	PLAIN CEMENT CONCRETE PAVEMENT, 11" DEPTH	REINFORCED CEMENT CONCRETE PAVEMENT, 8" DEPTH	REINFORCED CEMENT CONCRETE PAVEMENT, 11" DEPTH	PROTECTIVE COATING FOR CEMENT CONC. PAVEMENT AND SHOULDERS	END TRANSITION FOR CONCRETE MEDIAN BARRIER	PLAIN CONCRETE MOUNTABLE CURB, TYPE B				REMOVE EXISTING MALLEABLE IRON RAILING	ENERGY ABSORBING CRASH BARRIER TYPE 2	SPECIAL EXCAVATION (FLOODWALL)				REMARKS
	ITEM NUMBER	203	203			305	305	2306	321		350	420	422		501	501	501	501	2503	2623	633				2000	2000	2000				
		0001	0002			0015	0200	0003	0108		0050	0283	0230		0020	0034	0200	0203	0001	0102	0225				0218	0219	0220				
	UNIT	C.Y.	C.Y.			S.Y.	TONS	S.Y.	S.Y.		C.Y.	S.Y.	S.Y.		S.Y.	S.Y.	S.Y.	S.Y.	S.Y.	EACH	L.F.				L.F.	EACH	C.Y.				
L.R. 764	23 + 81																61		61												18" PIPE 19.5' TO 107' RT.
	24 + 27.50																35		35												6" WATERLINE 19.5' TO 85' RT.
	24 + 56 TO RAMP A 646+59.24															115			115												RIGHT
	WB646+17.50 TO WB646+62.49										6				12				12		91										RAMP A-NOSE
	WB646+18 TO WB646+58.24															9			9												RIGHT
	RAMP A 646+55 TO 646+63.50																								9						WALL E
RAMP D	644+09 TO 644+64.50																								55						WALL D
	644+09 TO 650+03														185				185												WALL D
	644 + 09 TO 650+03																										2,441				
	644 + 13.25 TO 649 + 98.75															130		1,062	1,192												
	644 + 14 TO 649 + 98						243	1,188					1,188																		
	649 + 14 TO 650 + 03														25				25												WALL D
SUB-TOTAL (2)							243	1,188			6		1,188		222	254	96	1,062	1,634		91				64		2441				
SUB-TOTAL (1)		66	152			396	1,227	6,338	396			396	6,338		7	237	132	5,983	6,359	2					327	1	18,017				
TOTALS		66	152			396	1,470	7,526	396		6	396	7,526		229	491	228	7,045	7,993	2	91				391	1	20,458				

REVISION NUMBER	REVISIONS	DATE	BY

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	766 764	23 19	10 of 26

TABULATION OF DRAINAGE ITEMS

SHEET 1 OF 3

CL. 2 EXCAVATION	CL. 4 EXCAVATION	18" REINFORCED CEMENT CONCRETE PIPE, CLASS III	10" C.G.S. PIPE, TYPE I (2-2/3" x 1/2" CORRS.) 14 GA.	COARSE AGGREGATE FOR PIPE TRENCH BACKFILL	TYPE A MANHOLE	TYPE A MANHOLE, SPECIAL	TYPE M INLET	TYPE M INLET, SPECIAL	GRADE ADJUSTMENT OF TYPE 4 SPECIAL INLET	STATION	PLAN SHEET NO.	REMARKS	CLASS OF BEDDING	GRADE ADJUSTMENT OF EXISTING MANHOLES	CLASS A CEMENT CONCRETE	6" DUCTILE IRON PIPE FOR POTABLE WATER	6" DUCTILE IRON PIPE FOR STORM SEWERS	18" DUCTILE IRON PIPE FOR STORM SEWERS	STANWIX STREET SUMP	WOOD STREET SUMP	6" x 6" TAPPING TEE WITH 6-INCH GATE VALVE & BOX	FIRE HYDRANT	STORM PUMP WITH TRAILER
204		601			605	2605	605	2605	2606					606	704	2000							
0001	0150	0052	0875	5400	1300	1301	2060	2061	0053	ITEM NUMBERS				0150	0002	0210	0211	0212	0213	0214	0215	0216	0217
C.Y.	C.Y.	L.F.	L.F.	C.Y.	EACH	EACH	EACH	EACH	SETS	UNIT				SETS	C.Y.	L.F.	L.F.	L.F.	L.S.	L.S.	EACH	EACH	EACH
										L.R. 766													
6										10+58(LT)	14	REMOVE EXIST. INLET											
19										10+58 TO 10+72	14	REMOVE EXIST. 18" PIPE											
										10+72	14	PLUG EXIST. PIPE		1	0.1								
	87			76						10+72 TO 12+02.50	14	INCLUDES REMOVAL OF EXIST. 18" PIPE	C										
										10+72 TO 12+15	14							140					
									1	10+84(RT)	14												
						1		1		12+15	14							4					
	4			3						12+15 TO 12+29.50	14		C										
										12+15 TO 13+03	14, 15							84					
								1		13+03	15												
										13+03 TO 13+95	15							90					
					1					13+64	15	21' RT.											
										13+64 TO 13+83	15	RELOCATE AND REPLACE 18" PIPE UNDER PARKWAY						54					
					1					13+65	15												
	26	28		20						13+65 TO 13+95	15	18" PIPE - 86' RT.	C										
	74	62		60	1	1				13+95	15	7' LT. TO 86' RT.	C					16	L.S.				1
										L.R. 766/ L.R. 764													
										13+95 TO 14+76	15							78					
										L.R. 764	15												
	37			32						14+52	15	16' RT. TO 83' RT.	C			66					1	1	
								1		14+76	15												
										14+76 TO 15+67	15							88					
								1		15+67	15												
										15+67 TO 16+75	15,16							104					
	7			5						15+77.50 TO 16+00	16		C										
25	235	90		196	3	2		4	1	SUB-TOTAL THIS SHEET 1				1	0.1	66		658	L.S.		1	1	1
										TOTAL													

Continued on Sheet No. 11

REORDER NO. A-1829-4

REVISION NUMBER	REVISIONS	DATE	BY

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	766 / 764	23 / 19	11 of 26

TABULATION OF DRAINAGE ITEMS

SHEET 2 OF 3

CL. 2 EXCAVATION	CL. 4 EXCAVATION	18" REINFORCED CEMENT CONCRETE PIPE, CLASS III	10" C.G.S. PIPE, TYPE I (2-2/3" x 1/2" CORR.) 14 GA.	COARSE AGGREGATE FOR PIPE TRENCH BACKFILL	TYPE A MANHOLE	TYPE A MANHOLE, SPECIAL	TYPE M INLET	TYPE M INLET, SPECIAL	GRADE ADJUSTMENT OF TYPE 4' SPECIAL INLET	STATION	PLAN SHEET NO.	REMARKS	CLASS OF BEDDING	GRADE ADJUSTMENT OF EXISTING MANHOLES	CLASS A CEMENT CONCRETE	6" DUCTILE IRON PIPE FOR POTABLE WATER	6" DUCTILE IRON PIPE FOR STORM SEWERS	18" DUCTILE IRON PIPE FOR STORM SEWERS	STANWIX STREET SUMP	WOOD STREET SUMP	6" x 6" TAPPING TEE WITH 6-INCH GATE VALVE & BOX	FIRE HYDRANT	STORM PUMP WITH TRAILER
204		601			605	2605	605	2605	2606	ITEM NUMBERS				606	704	2000							
0001	0150	0052	0875	5400	1300	1301	2060	2061	0053					0150	0002	0210	0211	0212	0213	0214	0215	0216	0217
C.Y.	C.Y.	L.F.	L.F.	C.Y.	EACH	EACH	EACH	EACH	SETS	UNIT				SETS	C.Y.	L.F.	L.F.	L.F.	L.S.	L.S.	EACH	EACH	EACH
										L.R. 764													
								1		16 + 75	16												
										16 + 75 TO 17 + 82	16							104					
	23			17						16 + 85.50 TO 17 + 64.50	16		C										
										RAMP N 17 + 37.50 TO 17 + 82	16						44						
	8			6		1		1		17 + 82	16	6.5' LT. TO 25' RT.	C					28					
1										RAMP N 17 + 91	16	REMOVE EXIST. INLET											
6										RAMP N 17+91 TO 18 + 70	16	REMOVE EXIST. 12" PIPE											
										18 + 80	17	PLUG EXIST. PIPE - 23' RT.			0.1								
								1		19 + 68	17												
										19 + 68 TO 20 + 97	17							126					
								1		20 + 97	17												
										20 + 97 TO 22 + 53	17,18							152					
								1		22 + 53	18												
										22 + 53 TO 23 + 73	18							116					
1										23+15 (RT.)	18	REMOVE EXIST. INLET											
	68	56		56						23 + 23 TO 23 + 81	18	18" PIPE - 111' RT.	C										
										23 + 28	18	PLUG EXIST. PIPE - 4' RT.			0.1								
										23 + 35	18	PLUG EXIST. PIPE - 4' RT.			0.1								
								1		23 + 73	18							8					
										23 + 73 TO 24 + 70	18							94					
	94	88		76	1					23 + 81	18	19.5 TO 111' RT.	C							L.S.			1
	43			39						24+27.50	18	16' TO 83' RT.	C			66					1	1	
						1		1		24 + 70	18							4					
										24 + 70 TO 25 + 78	18,19							116					
								1		25 + 78	19												
										25 + 78 TO 25 + 70	19							88					
8	236	144		194	1	2		8		SUB-TOTAL THIS SHEET ②					0.3	66	44	836		L.S.	1	1	1
										TOTAL													

Continued on Sheet No. 12

REORDER NO. A-1829-4

REVISION NUMBER	REVISIONS	DATE	BY

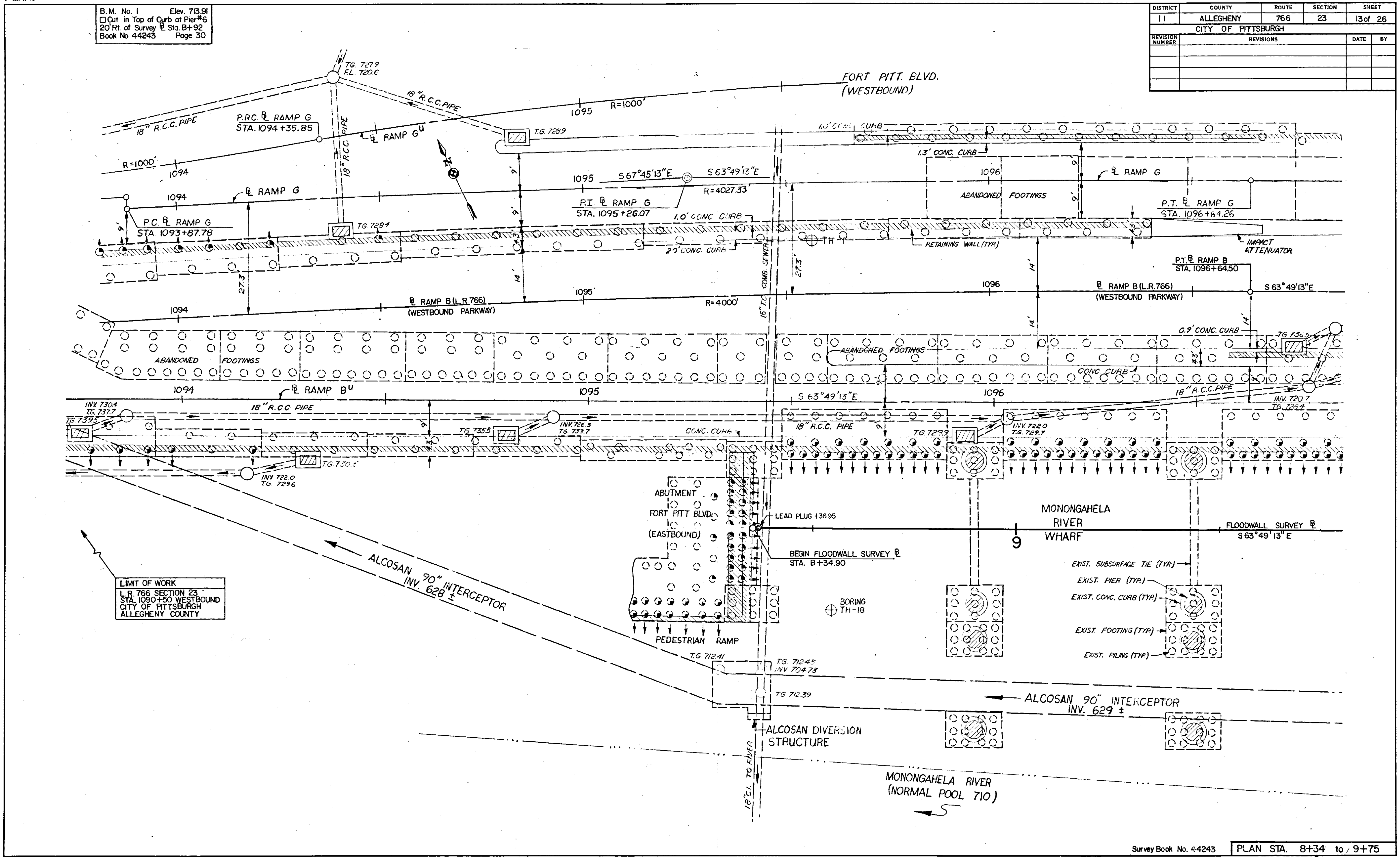
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	766 / 764	23 / 19	12 of 26

TABULATION OF DRAINAGE ITEMS

SHEET 3 OF 3

CL. 2 EXCAVATION	CL. 4 EXCAVATION	18" REINFORCED CEMENT CONCRETE PIPE, CLASS III	10" C.G.S. PIPE, TYPE I, (2-2/3" x 1/2" CORR.) 14 GA.	2A COARSE AGGREGATE FOR PIPE TRENCH BACKFILL	TYPE A MANHOLE	TYPE A MANHOLE, SPECIAL	TYPE M INLET	TYPE M INLET, SPECIAL	GRADE ADJUSTMENT OF TYPE 4' SPECIAL INLET	STATION	PLAN SHEET NO.	REMARKS	CLASS OF BEDDING	GRADE ADJUSTMENT OF EXISTING MANHOLES	CLASS A CEMENT CONCRETE	6" DUCTILE IRON PIPE FOR POTABLE WATER	6" DUCTILE IRON PIPE FOR STORM SEWERS	16" DUCTILE IRON PIPE FOR STORM SEWERS	STANWIX STREET SUMP	WOOD STREET SUMP	6" x 6" TAPPING TEE WITH 6-INCH GATE VALVE & BOX	FIRE HYDRANT	STORM PUMP WITH TRAILER
204		601			605	2605	605	2605	2606	ITEM NUMBERS				606	704	2000							
0001	0150	0052	0875	5400	1300	1301	2060	2061	0053					0150	0002	0210	0211	0212	0213	0214	0215	0216	0217
C.Y.	C.Y.	L.F.	L.F.	C.Y.	EACH	EACH	EACH	EACH	SETS	UNIT				SETS	C.Y.	L.F.	L.F.	L.F.	L.S.	L.S.	EACH	EACH	EACH
										L.R. 764													
								1		26+70	19												
										26+70 TO 27+78	19,20							104					
										RAMP O 644+09 TO 644+28	20						18						
	16			12						27+34 TO 27+78	20		C										
								1		RAMP O 644+28	20												
	14			12						RAMP O 644+28 TO 27+78	20		C					34					
								1		27+78	20												
	34			28						27+78 TO RAMP A 645+36	20		C					66					
										RAMP D 645+03	20	PLUG EXIST. PIPE-40'RT.			0.1								
						1				RAMP A 645+36	20												
	3			3						RAMP A 645+36 TO RAMP O 645+26	20		C					28					
								1		RAMP D 645+26	20												
	52			45						RAMP A 645+36 TO W.B. 646+25	20		C					86					
								1		W.B. 646+25	20												
	17			15						W.B. 646+25 TO RAMP A 646+48	20	INCLUDES REMOVAL OF EXIST. PIPE	C					30					
										W.B. 646+25 TO 646+62.49	20						36						
										RAMP O 645+34	20	PLUG EXIST. PIPES-20'RT.			0.2								
								1		RAMP A 646+48	20												
								1		RAMP D 646+35	20							22					
										RAMP A 646+48 TO 646+63.49	20						14						
10										RAMP D 647+00 TO 647+80	21	REMOVE EXIST. PIPE											
1										RAMP O 648+39	21	REMOVE EXIST. MANHOLE											
							1			RAMP O 648+44	21												
	18		68	16						RAMP D 648+44 TO 649+12	21,22	INCLUDES REMOVAL OF EXIST. PIPE	C										
25	240	98		201	3	2		4	1			SUB-TOTALS 1		1	0.1	66		658	L.S.		1	1	1
8	236	144		194	1	2		8				SUB-TOTALS 2			0.3	66	44	836		L.S.	1	1	1
11	154		68	131		1	1	7		SUB-TOTAL THIS SHEET 3					0.3		68	370					
44	625	234	68	521	4	5	1	19	1	TOTAL				1	0.7	132	112	1864	L.S.	L.S.	2	2	2

REORDER NO. A-1829-4

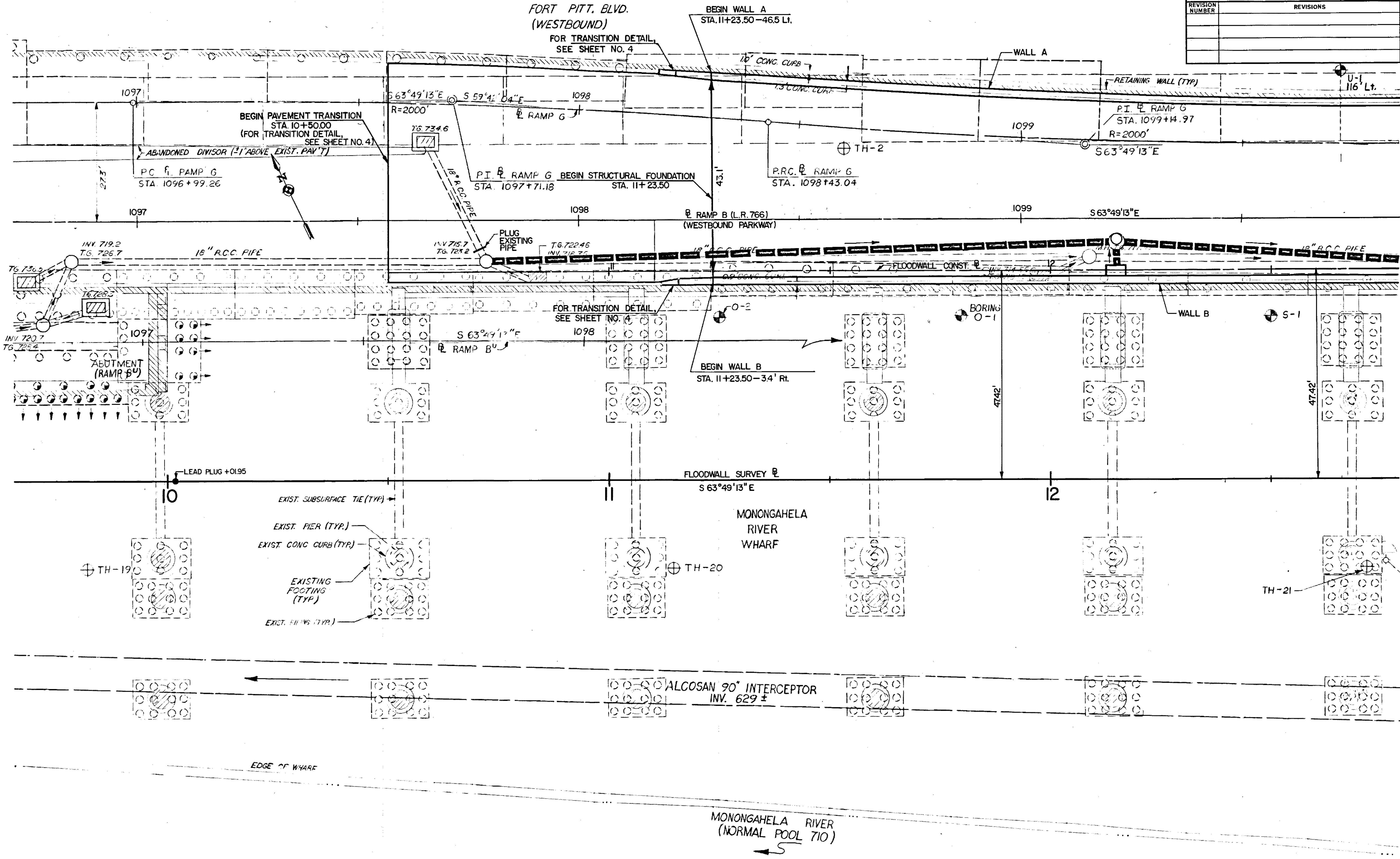


D-4237 (3-75)
B.M. No. 1 Elev. 713.91
□ Cut in Top of Curb at Pier #6
20' Rt. of Survey ℄ Sta. B+92
Book No. 44243 Page 30
DISTRICT 11
COUNTY ALLEGHENY
ROUTE 766
SECTION 23
SHEET 13 of 26
CITY OF PITTSBURGH
REVISION NUMBER
REVISIONS
DATE
BY
FORT PITT BLVD. (WESTBOUND)
T.G. 727.9
F.L. 720.6
18" R.C.C. PIPE
P.R.C. ℄ RAMP G
STA. 1094+35.85
℄ RAMP Gᵁ
R=1000'
1094
1095
T.G. 728.9
1.3' CONC. CURB
S 67°45'13"E
S 63°49'13"E
R=4027.33'
P.I. ℄ RAMP G
STA. 1095+26.07
℄ RAMP G
P.C. ℄ RAMP G
STA. 1093+87.78
T.G. 728.4
1.0' CONC. CURB
2.0' CONC. CURB
ABANDONED FOOTINGS
1096
P.T. ℄ RAMP G
STA. 1096+64.26
RETAINING WALL (TYP.)
IMPACT ATTENUATOR
TH-1
COMB. SEWER
15" T.C.
27.3'
14'
℄ RAMP B (L.R. 766)
(WESTBOUND PARKWAY)
R=4000'
P.T. ℄ RAMP B
STA. 1096+64.50
S 63°49'13"E
0.9' CONC. CURB
T.G. 736.5
CONC. CURB
℄ RAMP Bᵁ
18" R.C.C. PIPE
INV. 730.4
T.G. 737.7
T.G. 739.5
T.G. 735.5
INV. 726.3
T.G. 733.7
T.G. 730.5
INV. 722.0
T.G. 729.6
T.G. 729.9
INV. 722.0
T.G. 729.7
INV. 720.7
T.G. 728.4
ABUTMENT
FORT PITT BLVD.
(EASTBOUND)
LEAD PLUG +36.95
BEGIN FLOODWALL SURVEY ℄
STA. B+34.90
MONONGAHELA RIVER WHARF
9
FLOODWALL SURVEY ℄
S 63°49'13"E
EXIST. SUBSURFACE TIE (TYP.)
EXIST. PIER (TYP.)
EXIST. CONC. CURB (TYP.)
EXIST. FOOTING (TYP.)
EXIST. PILING (TYP.)
BORING TH-18
PEDESTRIAN RAMP
LIMIT OF WORK
L.R. 766 SECTION 23
STA. 1090+50 WESTBOUND
CITY OF PITTSBURGH
ALLEGHENY COUNTY
ALCOSAN 90" INTERCEPTOR
INV. 628 ±
T.G. 712.41
T.G. 712.45
INV. 704.73
T.G. 712.39
ALCOSAN 90" INTERCEPTOR
INV. 629 ±
ALCOSAN DIVERSION STRUCTURE
18" C.I. TO RIVER
MONONGAHELA RIVER
(NORMAL POOL 710)
Survey Book No. 44243
PLAN STA. 8+34 to 9+75
TRACED BY HLB 5-14-62
FINAL BY WYA, DCK, WEP 5-14-62

D-4237 (3-75)

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	766	23	14 of 26
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY



For Profile See Sheet 23

Survey Book No. 44243

PLAN STA. 9+75 to 12+75

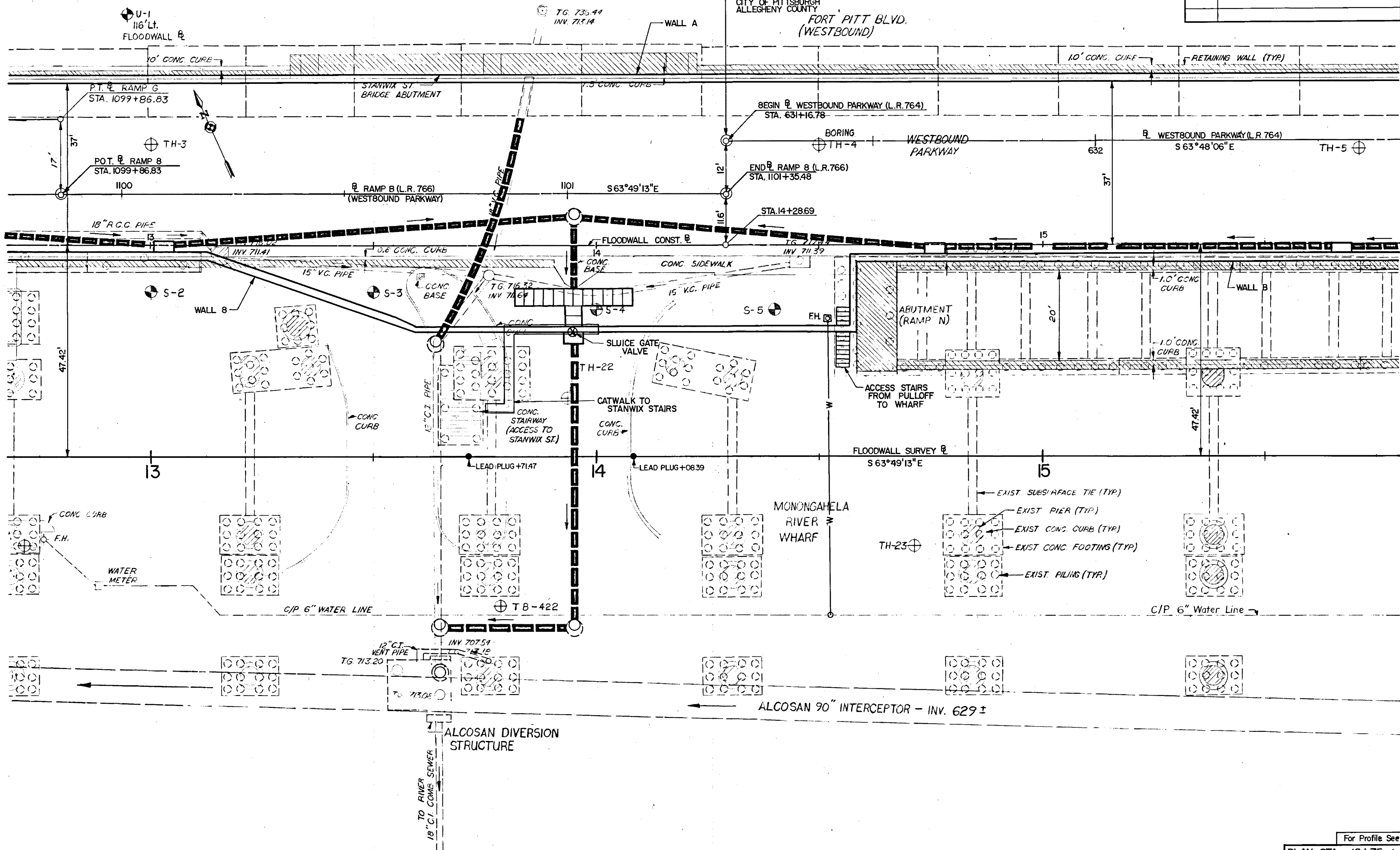
TRACED BY BLH 5-14-82
FINAL BY WVA, DCK, WEF

D-4237 (3-75)

B.M. No. 1A Elev. 716.69
☐ Cut in Top of Curb 32.5' Lt. of Survey ℄ Sta. 13+32
Book No. 44243 Page 32

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	766 / 764	23 / 19	15 of 26
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY



For Profile See Sheet 23

Survey Book Nos. 44243 & 44244

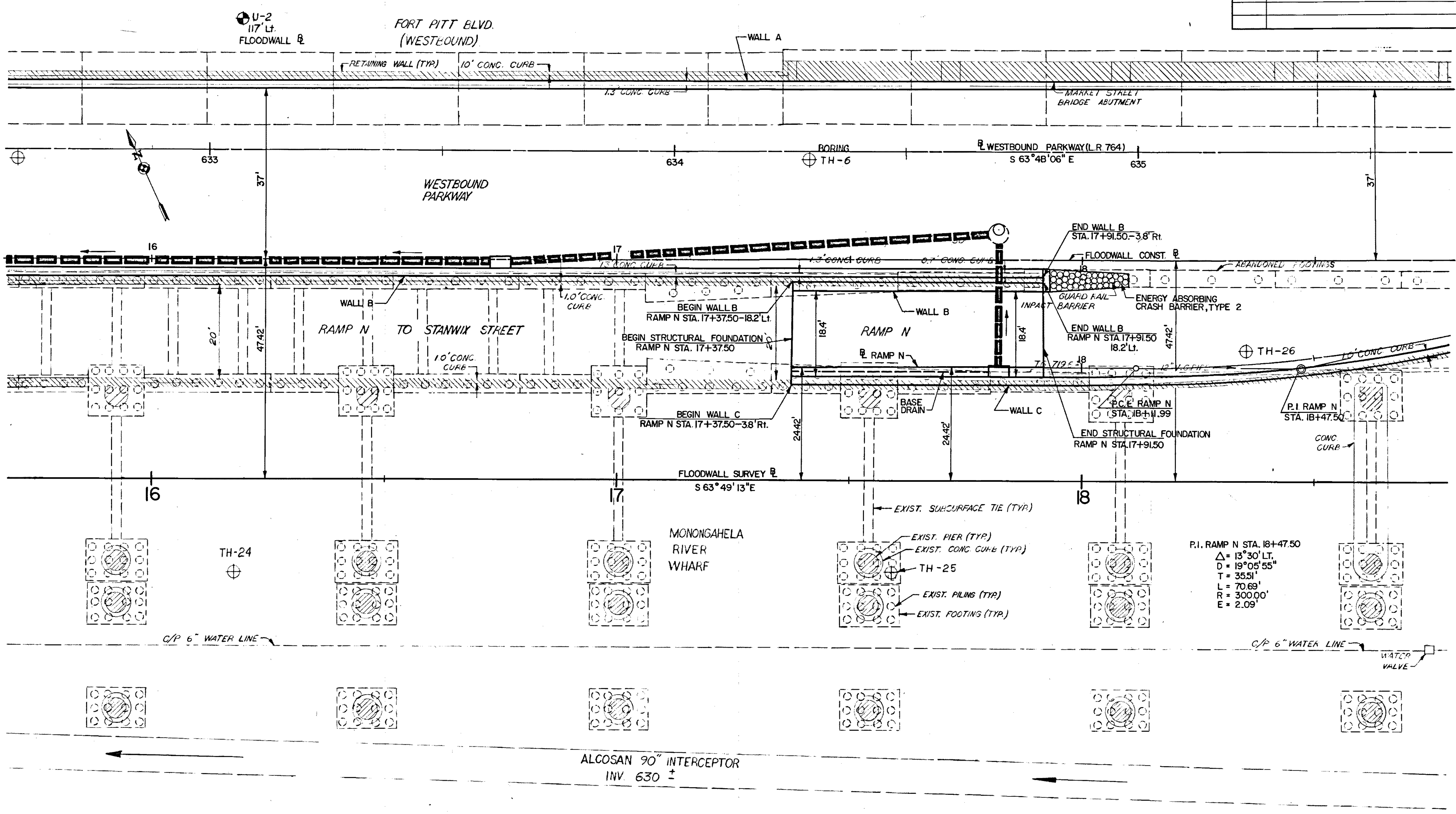
PLAN STA. 12+75 to 15+75

TRACED BY BLB 5-14-82
FINAL BY WVA, DCK, WEF 5-14-82

D- 4237 (3-75)

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	16 of 26
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY



For Ramp N Profile See Sheet 26
For Profile See Sheet 23

Survey Book No. 44244

PLAN STA. 15+75 to 18+75

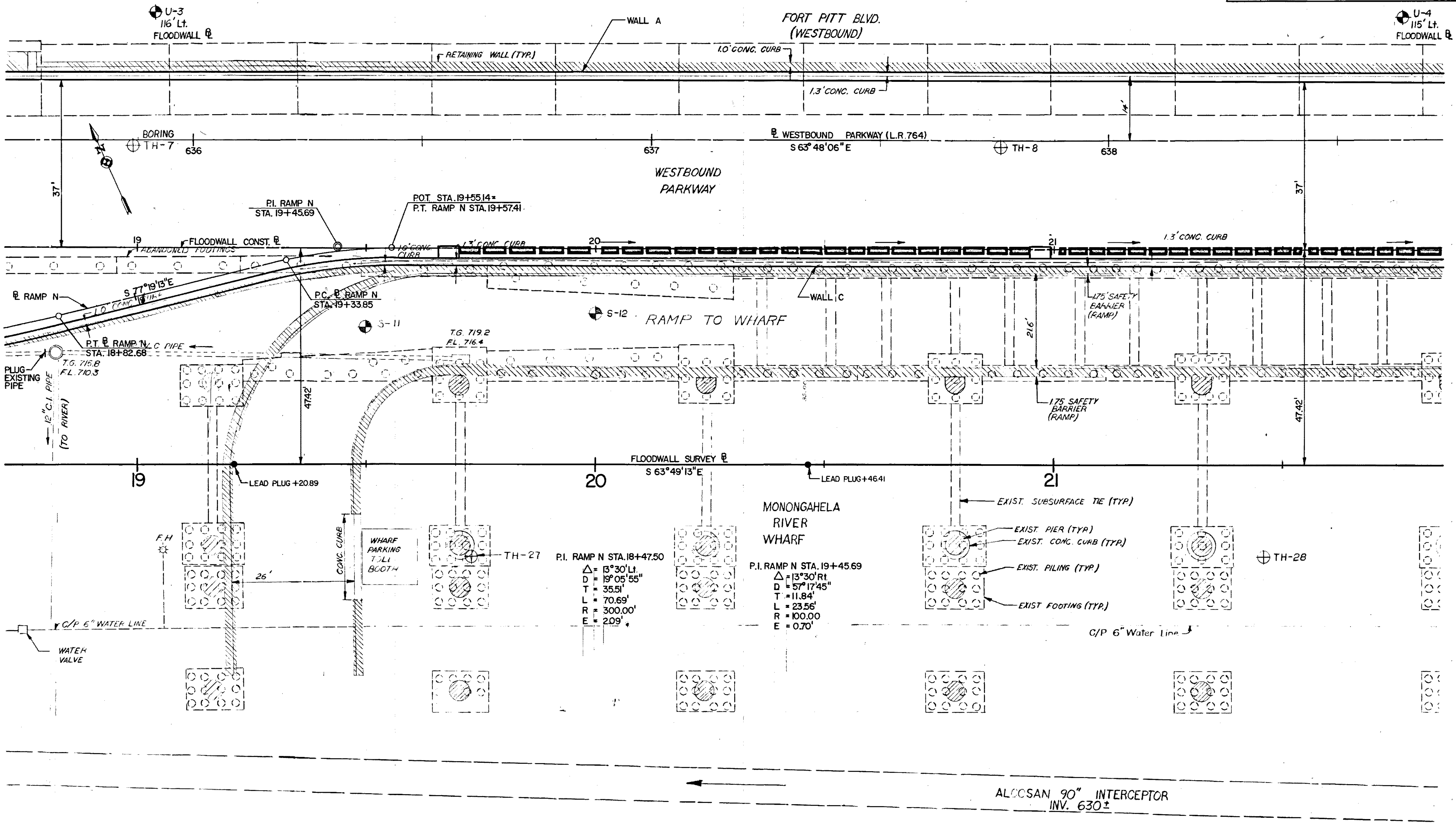
TRACED BY
FINAL BY

D- 4237 (3-75)

B.M. No. 2 Elev. 714.73
□ Cut in Top of Curb 14' Rt. of
Survey ℄ Sta. 18+98.5
Book No. 44243 Page 30

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	17 of 26
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY



P.I. RAMP N STA. 18+47.50
Δ = 13° 30' Lt.
D = 19° 05' 55"
T = 35.51'
L = 70.69'
R = 300.00'
E = 2.09'

P.I. RAMP N STA. 19+45.69
Δ = 13° 30' Rt.
D = 57° 17' 45"
T = 11.84'
L = 23.56'
R = 100.00
E = 0.70'

For Profile See Sheets 23, 24

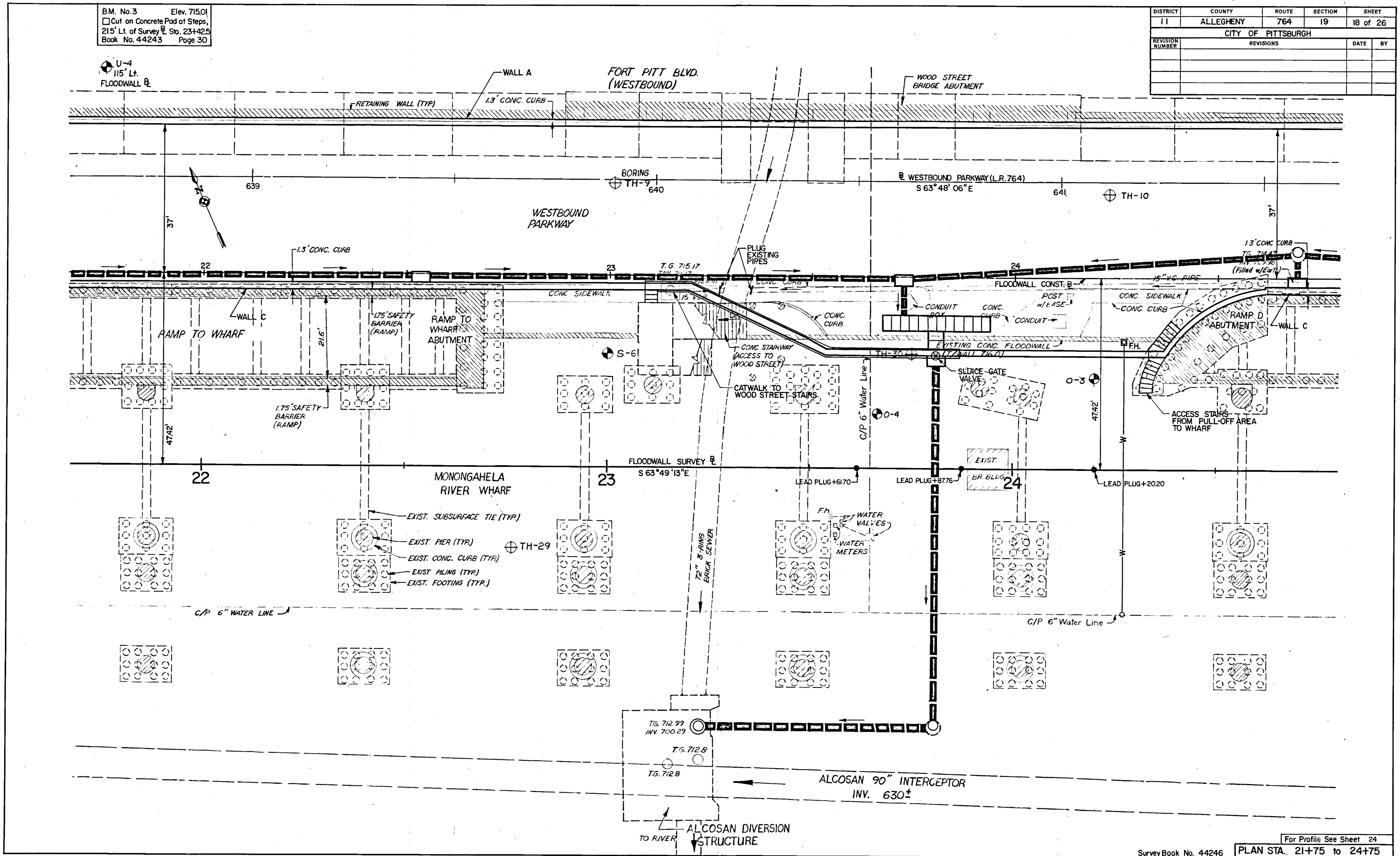
Survey Book No. 44244

PLAN STA. 18+75 to 21+75

TRACED BY HLB 5-14-62
FINAL BY WVA, DCK, WEF 5-14-62

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	18 of 26
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY



For Profile See Sheet 24

Survey Book No. 44246

PLAN STA. 21+75 to 24+75

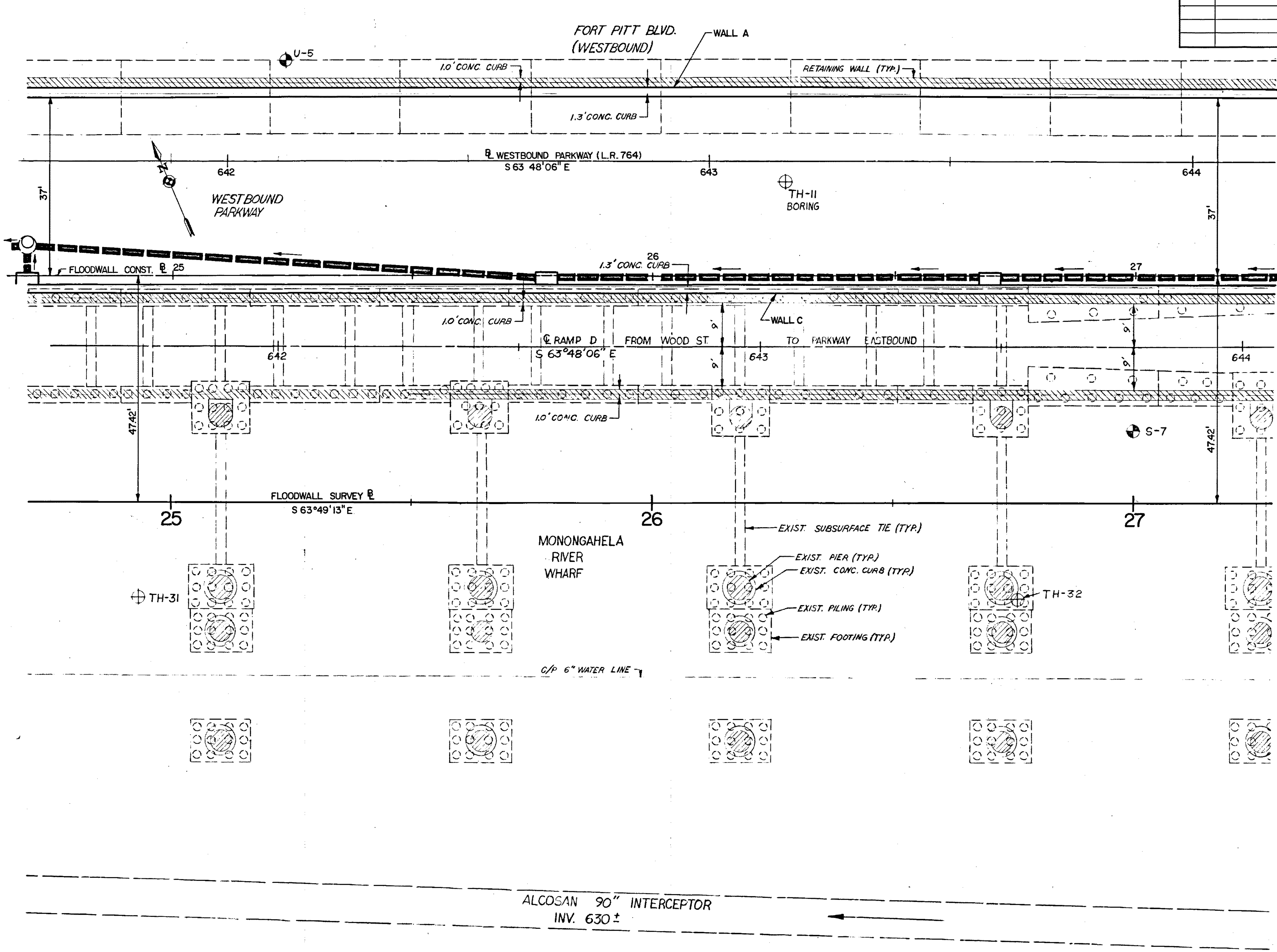
TRACED BY BLB

FINAL BY WVA, DCK, WEF

D-4237 (3-75)

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	19 of 26
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY



Survey Book No. 44245

For Romp D Profile See Sheet 25
For Profile See Sheet 24

PLAN STA. 24+75 to 27+25

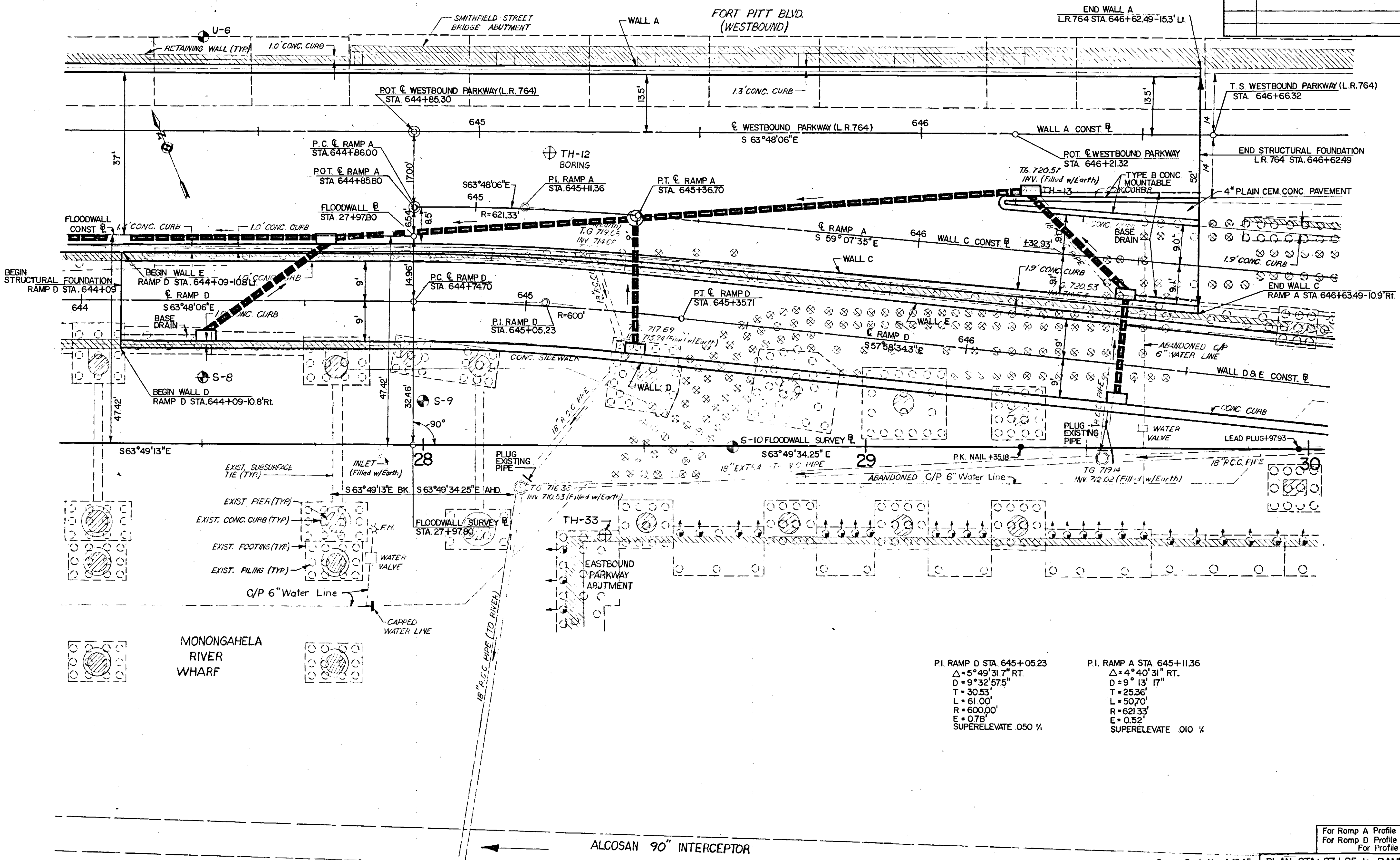
TRACED BY BLB 5-14-82
FINAL BY WVA, DCK, WEF 5-11-82

D-4237 (3-75)

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	20 of 26
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY

B.M. No. 4 Elev. 717.00
□ Cut in Top of Curb at Pier #42
14.5' Rt. of Survey ℄ Sta. 28+12.5
Book No. 44243 Page 30



P.I. RAMP D STA. 645+05.23
Δ = 5°49'31.7" RT.
D = 9°32'57.5"
T = 30.53'
L = 61.00'
R = 600.00'
E = 0.78'
SUPERELEVATE .050 ⅟

P.I. RAMP A STA. 645+11.36
Δ = 4°40'31" RT.
D = 9° 13' 17"
T = 25.36'
L = 50.70'
R = 621.33'
E = 0.52'
SUPERELEVATE .010 ⅟

For Ramp A Profile See Sheet 26
For Ramp D Profile See Sheet 25
For Profile See Sheet 24

Survey Book No. 44245

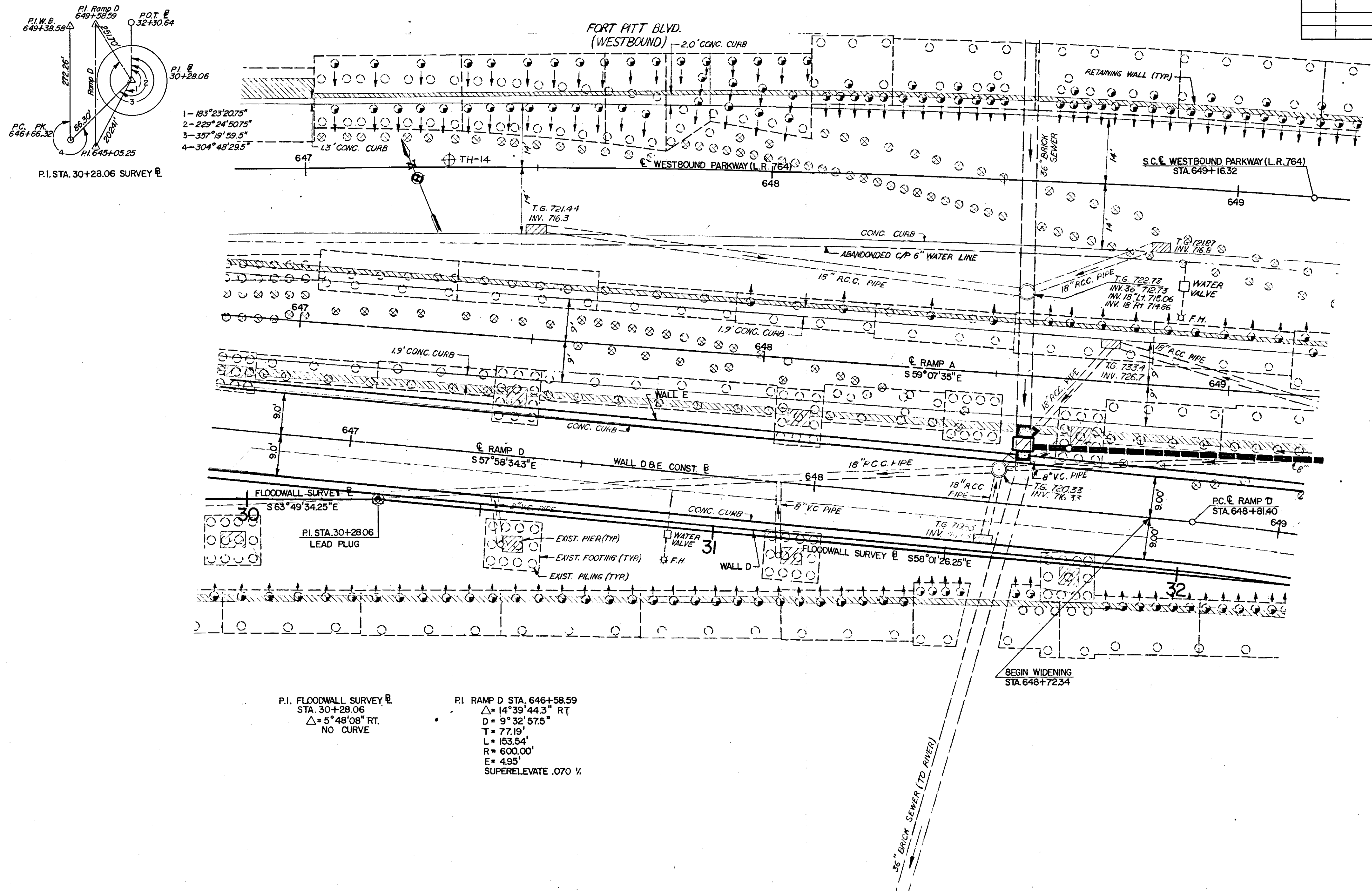
PLAN STA: 27+25 to RAMP D STA. 646+75

TRACED BY BLB 5-14-62
FINAL BY H.V.A., DCK, WEF 5-14-62

D-4237 (3-75)

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	21 of 26
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY



For Ramp A Profile See Sheet 26
For Ramp D Profile See Sheet 25
For Profile See Sheet 24

Survey Book No. 44245

PLAN RAMP D STA. 646+75 to 649+00

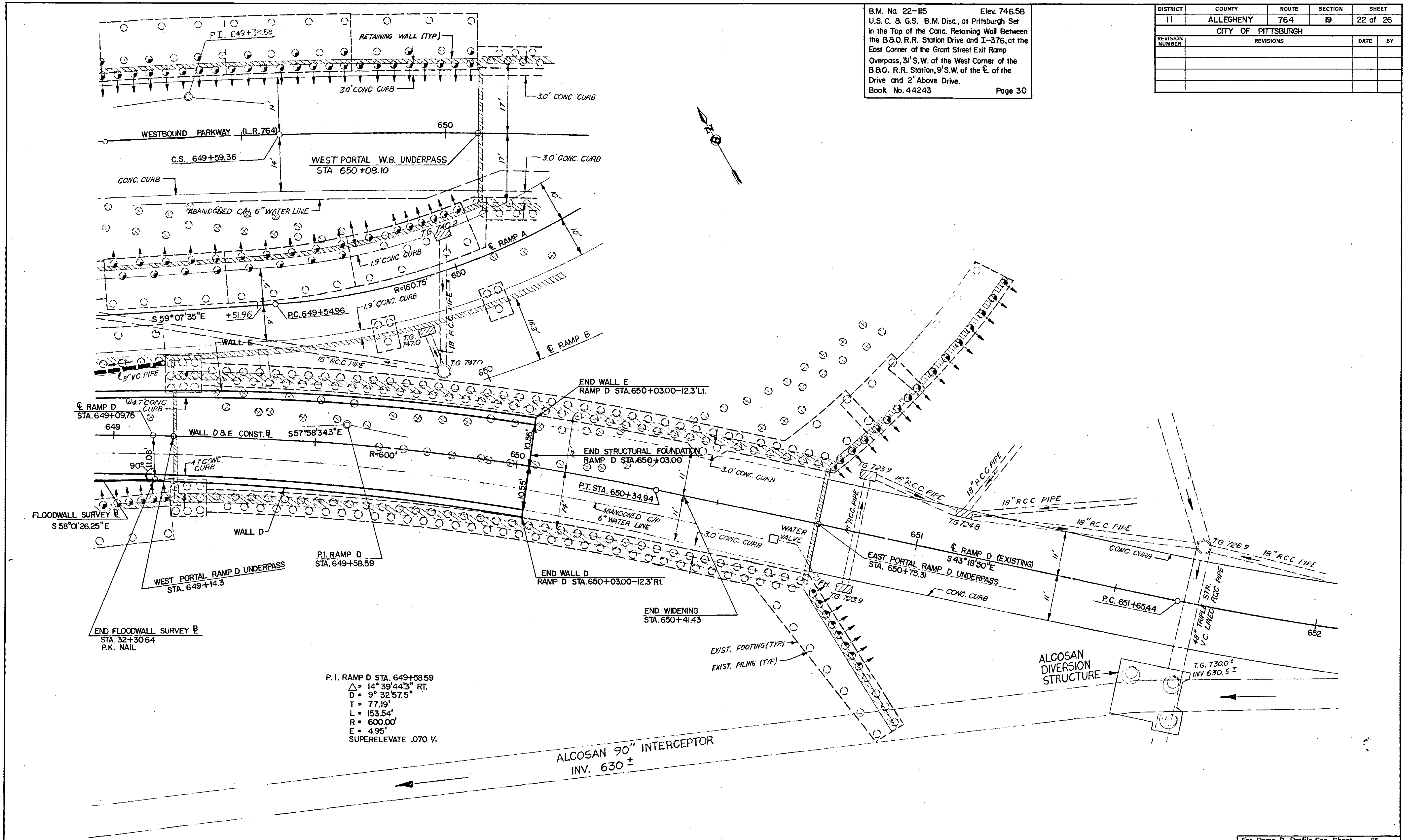
TRACED BY DLB 5-17-82
FINAL BY WVA, DCK, WEF 5-14-82

D- 4237 (3-75)

B.M. No. 22-115 Elev. 746.58
U.S.C. & G.S. B.M. Disc., at Pittsburgh Set in the Top of the Conc. Retaining Wall Between the B.&O. R.R. Station Drive and I-376, at the East Corner of the Grant Street Exit Ramp Overpass, 31' S.W. of the West Corner of the B.&O. R.R. Station, 9' S.W. of the ℄ of the Drive and 2' Above Drive.
Book No. 44243 Page 30

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	22 of 26
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY



For Ramp D Profile See Sheet 25

Survey Book No. 44245

PLAN RAMP D STA. 649+00 to 652+00

TRACED BY BLR 5-14-82
FINAL BY WJA, DCK, WEF 5-14-82

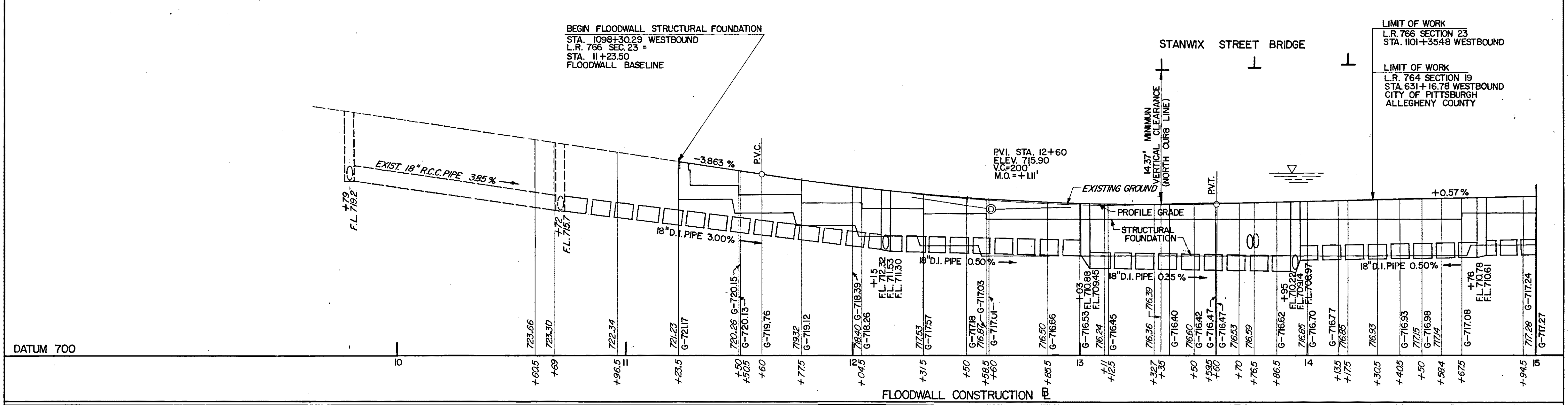
D-4237 (3-75)

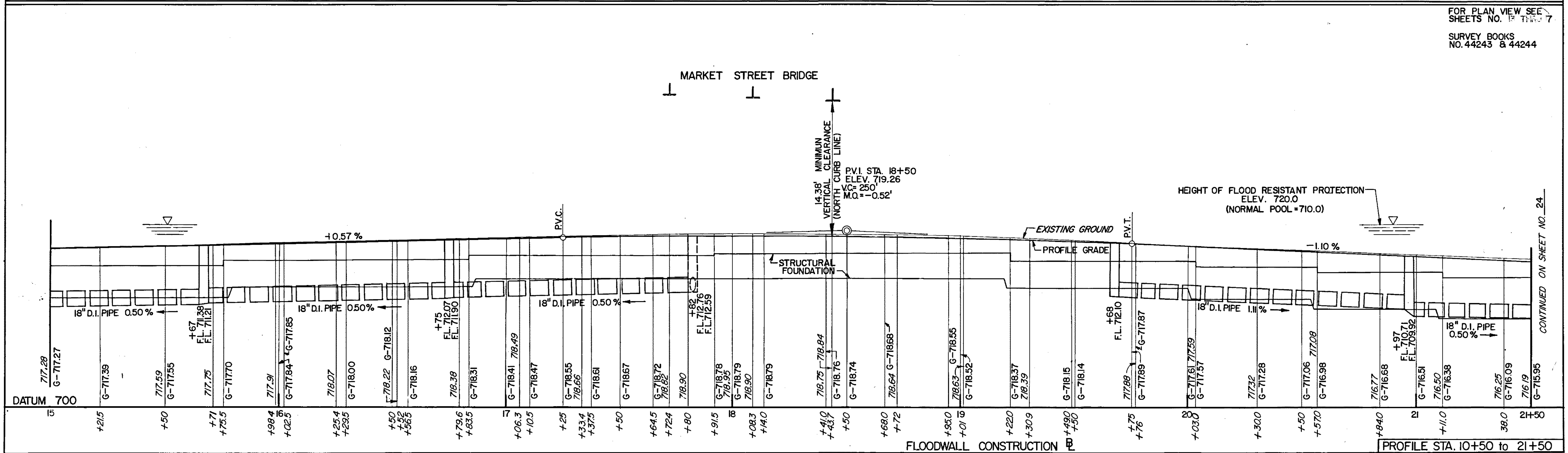
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	766 / 764	23 / 19	23 of 26
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY

LIMIT OF WORK
L.R. 766 SECTION 23
STA. 1090+50.00 WESTBOUND
CITY OF PITTSBURGH
ALLEGHENY COUNTY

SCALE IN FEET
5'
20'





CONTINUED ON SHEET NO. 24

PROFILE STA. 10+50 to 21+50

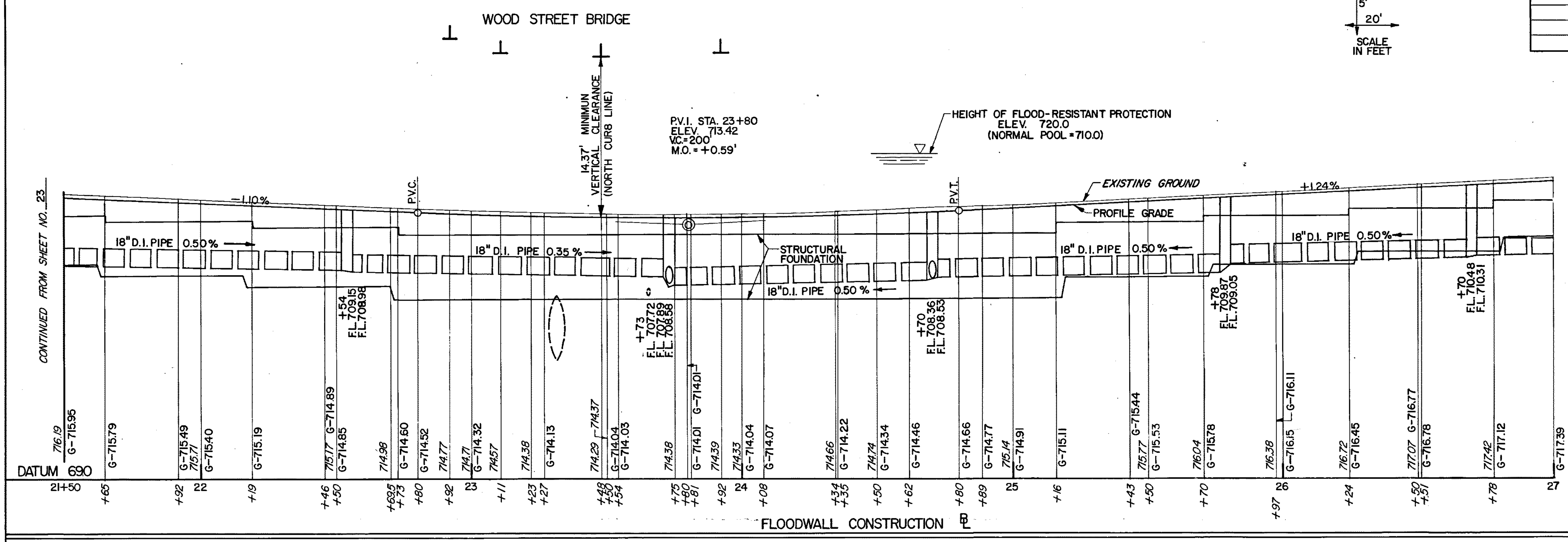
TRACED BY GLH 5-14-82
FINAL BY WVA, DCK, WEF 5-14-82

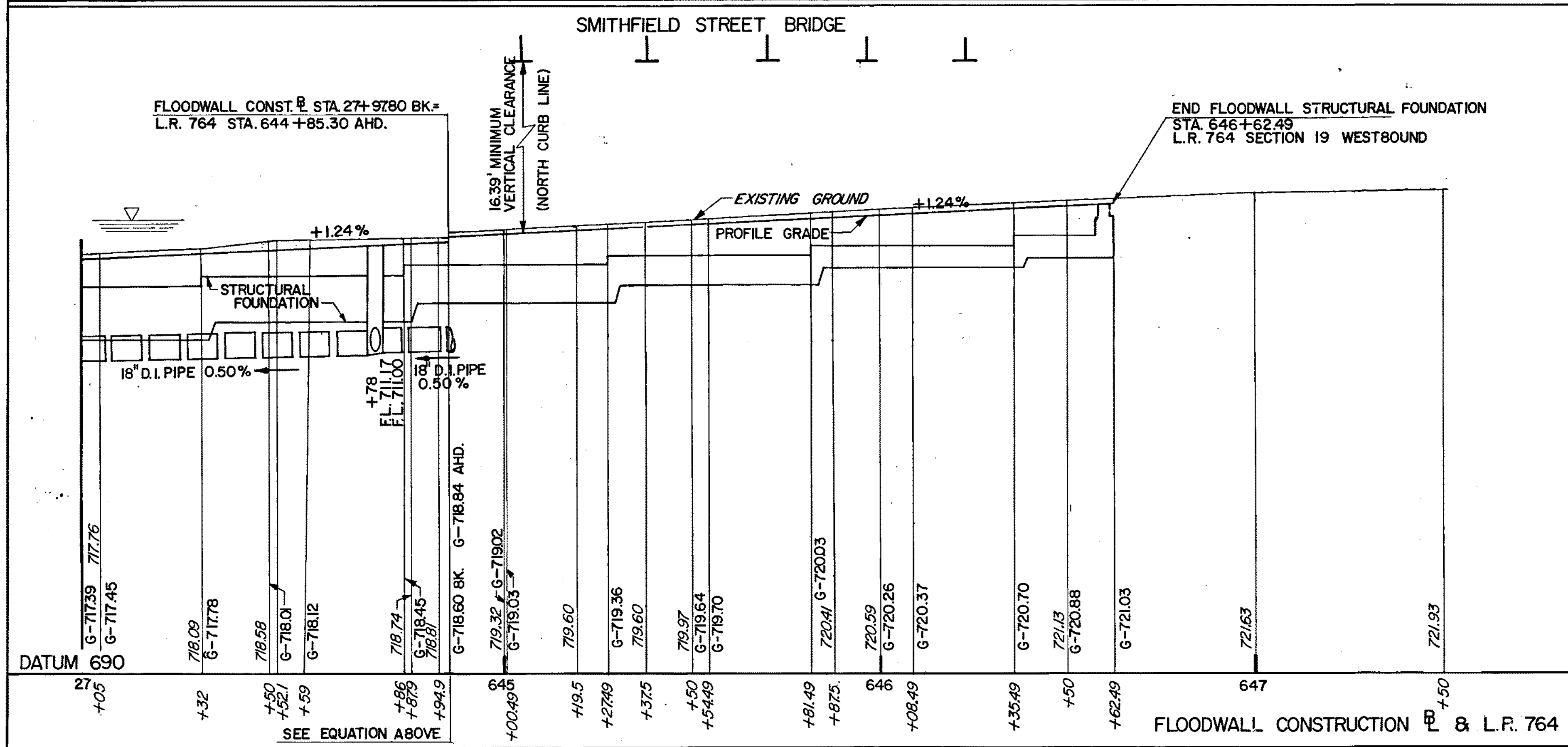
D-4237 (3-75)

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	24 of 26
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY

SCALE IN FEET
5'
20'





SEE L.R. 764 SEC. 19 ROADWAY CONSTRUCTION PLANS FOR CONTINUED WORK AHEAD OF STA. 646+62.49

FOR PLAN VIEW SEE SHEETS NO. 17 THRU 21

SURVEY BOOK NOS. 44245 & 44246

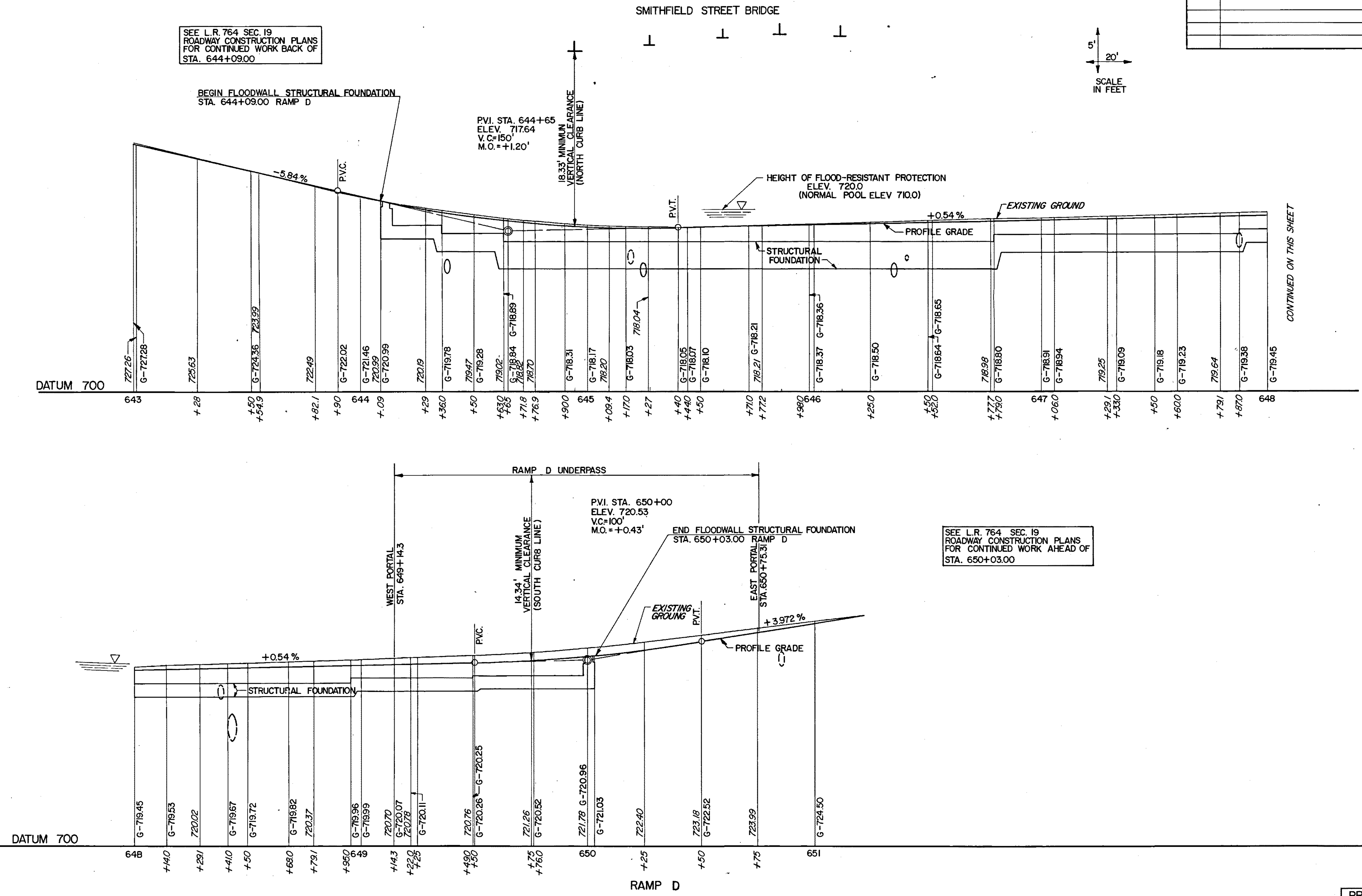
PROFILE STA. 21+50 to 27+97.80, STA. 644+85.30 to 646+62.49

TRACED BY BLB 5-14-82
FINAL BY JWA, DCK, WEF 5-14-82

D-4237 (3-75)

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	25 of 26
	CITY OF PITTSBURGH			

REVISION NUMBER	REVISIONS	DATE	BY



FOR PLAN VIEW SEE SHEETS NO. 19 THRU 22

SURVEY BOOK NO. 44245

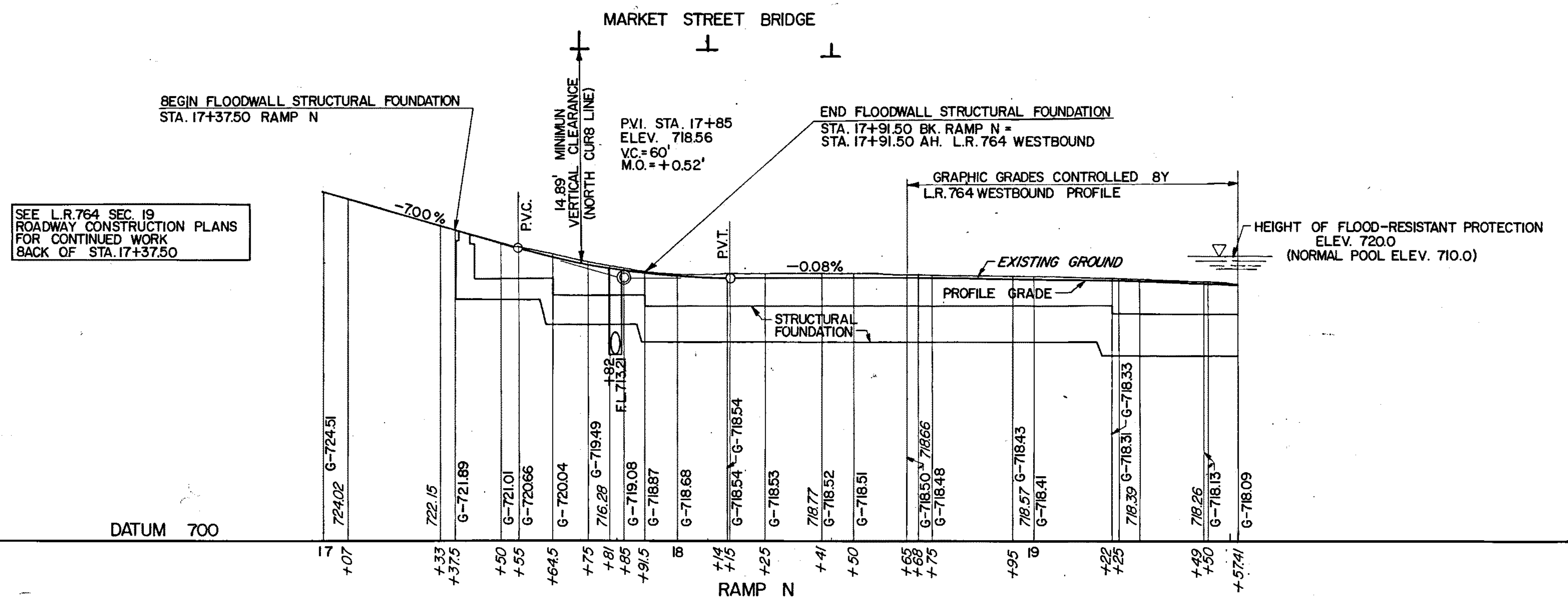
PROFILE RAMP D

TRACED BY GLH 5-14-62
FINAL BY WVA, DCK, WEF 5-14-62

D-4237 (3-75)

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11	ALLEGHENY	764	19	26 of 26
	CITY OF PITTSBURGH			

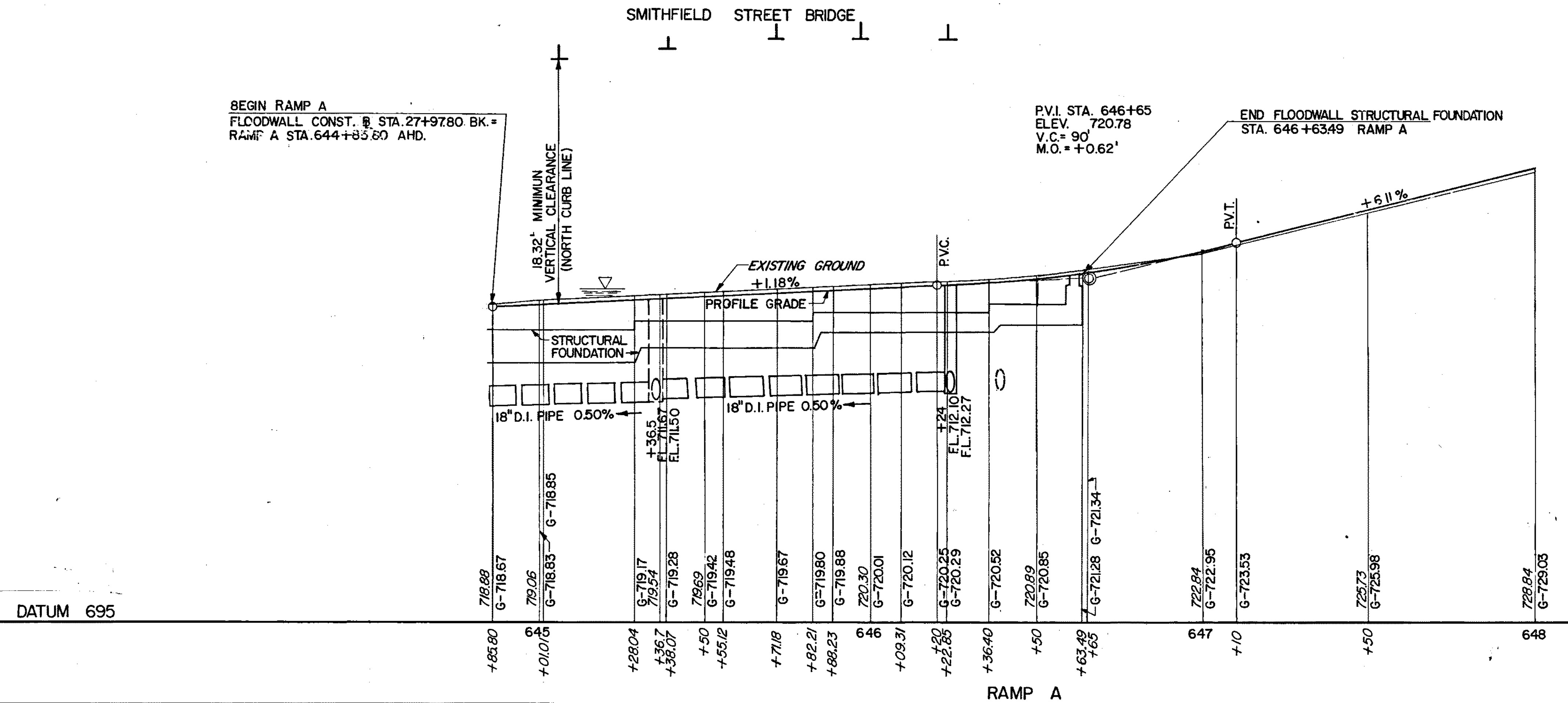
REVISION NUMBER	REVISIONS	DATE	BY



FOR PLAN VIEW SEE SHEETS NO. 16 & 17

SURVEY BOOK NO. 44244

PROFILE RAMP N



FOR PLAN VIEW SEE SHEETS NO. 20 & 21

SURVEY BOOK NO. 44245

PROFILE RAMP A

PROFILE RAMPS A & N

TRACED BY B.L.B. 5-14-82
FINAL BY W.V.A., D.C.K., W.E.C. 5-14-82

DRAWING INDEX

SHEET NO.	DESCRIPTION
1	DRAWING INDEX, GENERAL NOTES & QUANTITIES
2	WALL LOCATION PLAN, GEOMETRIC LAYOUT, VERTICAL CURVE DATA
3	PANEL LAYOUT PLAN
4	GENERAL PLAN & SECTION, STA. 9+75 TO 12+75
5	GENERAL PLAN & SECTION, STA. 12+75 TO 15+75
6	GENERAL PLAN & SECTION, STA. 15+75 TO 18+75
7	GENERAL PLAN & SECTION, STA. 18+75 TO 21+75
8	GENERAL PLAN & SECTION, STA. 21+75 TO 24+75
9	GENERAL PLAN & SECTION, STA. 24+75 TO 27+75
10	GENERAL PLAN & SECTION, STA. 27+75 TO 646+75 ℄ RAMP D
11	GENERAL PLAN & SECTION, STA. 646+75 ℄ RAMP D TO 649+00 ℄ RP.D
12	GENERAL PLAN & SECTION, STA. 649+00 ℄ RAMP D TO 651+00 ℄ RP.D
13	GENERAL SECTIONS
14	GENERAL ELEVATIONS, WALL A, STA. 11+23.50 TO 20+03.00
15	GENERAL ELEVATIONS, WALL A, STA. 20+03.00 TO 26+24.00
16	GENERAL ELEVATIONS, WALL A, STA. 26+24.00 TO 646+62.52
17	GENERAL ELEVATIONS, WALL B, STA. 17+37.50 TO 11+23.50
18	GENERAL ELEVATIONS, WALL C, STA. 646+63.49 TO 23+54.00
19	GENERAL ELEVATIONS, WALL C, STA. 23+54.00 TO 17+37.50
20	GENERAL ELEVATIONS, WALL D, STA. 650+03.00 TO 644+09.00
21	GENERAL ELEVATIONS, WALL E, STA. 644+09.00 TO 650+03.00
22	FOUNDATION PLAN, PANELS 1 TO 6
23	FOUNDATION PLAN, PANELS 6 TO 12
24	FOUNDATION PLAN, PANELS 13 TO 18
25	FOUNDATION PLAN, PANELS 19 TO 24
26	FOUNDATION PLAN, PANELS 25 TO 30
27	FOUNDATION PLAN, PANELS 31 TO 36
28	FOUNDATION PLAN, PANELS 37 TO 42
29	FOUNDATION PLAN, PANELS 43 TO 48
30	FOUNDATION PLAN, PANELS 49 TO 54
31	FOUNDATION PLAN, PANELS 55 TO 60
32	FOUNDATION PLAN, PANELS 61 TO 64 & 70 TO 73
33	FOUNDATION PLAN, PANELS 65 TO 69 & 74 TO 77
34	FOUNDATION PLAN, PANELS 78 TO 83
35	FOUNDATION PLAN, PANELS 84 TO 87
36	FOUNDATION PLAN, PANELS 88 TO 91
37	FOUNDATION CROSS SECTIONS
38	FOUNDATION CROSS SECTIONS
39	FOUNDATION CROSS SECTIONS
40	FOUNDATION CROSS SECTIONS
41	FOUNDATION CROSS SECTIONS
42	FOUNDATION CROSS SECTIONS
43	FOUNDATION CROSS SECTIONS
44	SUMP REINFORCING, PANEL 10S
45	SUMP DRAINAGE & DETAILS, PANEL 10S
46	SUMP REINFORCING, PANEL 47S
47	SUMP DRAINAGE AND DETAILS, PANEL 47S
48	FOUNDATION DETAILS
49	FOUNDATION DETAILS
50	FOUNDATION DETAILS & ROADWAY ELEVATIONS
51	FOUNDATION REINFORCEMENT BAR SCHEDULE
52	FOUNDATION REINFORCEMENT BAR SCHEDULE
53	ELEVATION, WALL A, PANELS 1 TO 5
54	ELEVATION, WALL A, PANELS 5 TO 10
55	ELEVATION, WALL A, PANELS 11 TO 15
56	ELEVATION, WALL A, PANELS 16 TO 20
57	ELEVATION, WALL A, PANELS 21 TO 25
58	ELEVATION, WALL A, PANELS 26 TO 30
59	ELEVATION, WALL A, PANELS 31 TO 35
60	ELEVATION, WALL A, PANELS 36 TO 40
61	ELEVATION, WALL A, PANELS 41 TO 45
62	ELEVATION, WALL A, PANELS 46 TO 51
63	ELEVATION, WALL A, PANELS 52 TO 56
64	ELEVATION, WALL A, PANELS 57 TO 61
65	ELEVATION, WALL A, PANELS 62 TO 66
66	ELEVATION, WALL A, PANELS 67 TO 70
67	WALL A, SECTIONS & DETAILS
68	WALL A DETAILS
69	WALL A REINFORCEMENT BAR SCHEDULE
70	ELEVATION, WALL B, PANELS 1 TO 5
71	ELEVATION, WALL B, PANELS 6 TO 10
72	ELEVATION, WALL B, PANELS 11 TO 16
73	ELEVATION, WALL B, PANELS 17 TO 20
74	ELEVATION, WALL B, PANELS 21 TO 25
75	ELEVATION, WALL B, PANELS 25 TO 30
76	WALL B SECTIONS
77	WALL B CATWALK & STAIR DETAILS
78	WALL B CATWALK & STAIR DETAILS
79	WALL B REINFORCEMENT BAR SCHEDULE
80	ELEVATION, WALL C, PANELS 1 TO 5
81	ELEVATION, WALL C, PANELS 6 TO 10
82	ELEVATION, WALL C, PANELS 11 TO 15
83	ELEVATION, WALL C, PANELS 16 TO 19
84	ELEVATION, WALL C, PANELS 20 TO 24
85	ELEVATION, WALL C, PANELS 25 TO 30
86	ELEVATION, WALL C, PANELS 31 TO 35
87	ELEVATION, WALL C, PANELS 36 TO 40
88	ELEVATION, WALL C, PANELS 41 TO 45
89	ELEVATION, WALL C, PANELS 46 TO 48
90	WALL C SECTIONS
91	WALL C SECTIONS & CATWALK DETAILS
92	WALL C CATWALK & STAIR DETAILS
93	WALL C REINFORCEMENT BAR SCHEDULE
94	ELEVATION, WALL D, PANELS 1 TO 5
95	ELEVATION, WALL D, PANELS 6 TO 10
96	ELEVATION, WALL D, PANELS 11 TO 15
97	ELEVATION, WALL D, PANELS 16 TO 20
98	ELEVATION & SECTIONS, WALL D, PANELS 21 TO 22
99	WALL D REINFORCEMENT BAR SCHEDULE
100	ELEVATION, WALL E, PANELS 1 TO 5
101	ELEVATION, WALL E, PANELS 6 TO 10
102	ELEVATION, WALL E, PANELS 11 TO 15
103	ELEVATION, WALL E, PANELS 16 TO 20
104	ELEVATION & SECTION, WALL E, PANELS 21 TO 22
105	WALL E REINFORCEMENT BAR SCHEDULE
106	BORING LOGS, U-1 AND U-2
107	BORING LOGS, U-3 AND U-4
108	BORING LOGS, U-5 AND U-6
109	BORING LOGS, 0-2, 0-1 AND S-1
110	BORING LOGS, S-2 AND S-3
111	BORING LOGS, S-4, S-5 AND S-11
112	BORING LOGS, S-12 AND S-6
113	BORING LOGS, 0-4, 0-3, S-7 AND S-8
114	BORING LOGS, S-9 AND S-10

*QUANTITIES SHOWN ARE APPROXIMATE

ESTIMATE OF QUANTITIES *

ITEM	DESCRIPTION	UNIT	TOTAL
703-0006	NO. 2B COARSE AGGREGATE	C.Y.	280
704-0001	CLASS AA CEMENT CONCRETE	C.Y.	3,870
704-0002	CLASS A CEMENT CONCRETE	C.Y.	10,580
1002-0001	REINFORCEMENT BARS	LBS.	588,000
1002-0053	REINFORCING BARS, EPOXY COATED	LBS.	151,490
1019-0002	PROTECTIVE COATING FOR REINFORCED CONCRETE SURFACES	S.Y.	4,780
2000-0100	CLASS AA CEMENT CONCRETE, SPECIAL	C.F.	100
2000-0128	CRACK REPAIR, EPOXY INJECTION	C.F.	20
2000-0129	CRACK REPAIR, TYPE A	L.F.	50
2000-0200	WEEPHOLE RELOCATION	EACH	300
2000-0201	SLUICE GATE	EACH	2
2000-0202	CATWALK, STAIR RAILING, AND PROTECTIVE RAILING, WALL I	L.S.	L.S.
2000-0203	CATWALK, STAIR RAILING, AND PROTECTIVE RAILING, WALL (	L.S.	L.S.

REFERENCE DRAWINGS **

1. COUNTY OF ALLEGHENY
RECONSTRUCTION AND WIDENING
WATER STREET
CITY OF PITTSBURGH
DATED 1939 NO. 1723 AND 1723A

2. CONSTRUCTION PLAN
SUBSTRUCTURE AND ROADWAYS ON GRADE
WATER STREET
CITY OF PITTSBURGH
DATED NO. 1723A

3. PENNSYLVANIA DEPARTMENT OF HIGHWAYS
L.R. 764 - SEC. 10, ALLEGHENY COUNTY
DOWNTOWN INTERCHANGE
EASTBOUND AND WESTBOUND PARKWAYS
RAMPS A, B, C, D, E, F & M
DATED OCT. 1951 NO. S-1785

4. PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
CONSTRUCTION OF A PORTION OF THE
DOWNTOWN INTERCHANGE
PENN LINCOLN PARKWAY
L.R. 764, SEC. 10
ALLEGHENY COUNTY
DATED 1955

5. PENNSYLVANIA DEPARTMENT OF HIGHWAYS
L.R. 764 - SECS 10 & 11 - ALLEGHENY COUNTY
DOWNTOWN INTERCHANGE
PARKWAY AND RAMPS A, B, C, D, E AND F
DATED 1951

6. PENNSYLVANIA DEPARTMENT OF HIGHWAYS
L.R. 766, SEC 3E - ALLEGHENY COUNTY
POINT HIGHWAY PROJECT
POINT INTERCHANGE
SUBSTRUCTURE
DATED APRIL 1956 NO. S-1904

** THESE DRAWINGS ARE AVAILABLE AT THE DEPARTMENT OFFICE FOR INSPECTION UPON REQUEST

INLETS	RC34	SEPT. 8, 1981
STANDARD MANHOLES	RC39 (SHEET 2)	JAN. 31, 1977
CONSTRUCTION & EXPANSION JOINT DETAILS	BC335 A	NOV. 4, 1981
REINFORCEMENT BAR FABRICATION SCHEDULE	BC336A	NOV. 4, 1981
OVERHEAD SIGN STRUCTURES CATWALK DETAILS	TC-7717 (SHEET 9)	MARCN 15,1974

SUPPLEMENT DRAWINGS

DESCRIPTION	DWG. NO.	APPR. DATE

GENERAL NOTES

1. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH PENNSYLVANIA DEPARTMENT OF TRANSPORTATION SPECIFICATION FORM 408/1976, FORM 409/1973, AWS/1980, ALL CURRENT SUPPLEMENTS, AND SPECIAL PROVISIONS.
2. DESIGN SPECIFICATIONS: DESIGN DIVISION OF 1977 AASHTO, "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" (INCLUDING 1978 TO 1981 INTERIM SPECIFICATIONS) AND AS SUPPLEMENTED BY THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION'S DESIGN MANUAL, PART 4, STRUCTURES (INCLUDING SEPTEMBER 1976 REVISIONS).
3. LIVE LOADS - HS20-44 LOADING AND ALTERNATE LOADING (2 AXLES OF 24 KIPS EACH AT 4'-0" C/C, 2 WHEELS OF 12 KIPS EACH AT 6'-0" C/C).
4. CONCRETE:
   A. CLASS AA CONCRETE SHALL BE USED IN ALL WALLS, END DAMS, AND IN FOUNDATIONS AS NOTED.
   B. CLASS A CONCRETE SHALL BE USED IN FOUNDATIONS AS NOTED.
   C. EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 1" X 1" EXCEPT AS NOTED.
5. REINFORCING STEEL:
   A. ALL REINFORCING BARS SHALL BE GRADE 60 STEEL.
   B. A MINIMUM LAP OF 30 BAR DIAMETERS SHALL BE USED UNLESS NOTED OTHERWISE.
   C. EPOXY COATED BARS ARE DESIGNATED BY THE SUFFIX E ON THE BAR MARK.
   D. 2" CONCRETE COVER SHALL BE PROVIDED ON ALL REINFORCING BARS UNLESS NOTED OTHERWISE.
6. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS OF EXISTING STRUCTURES IN THE FIELD.
7. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL, HIS CONSTRUCTION SEQUENCE, CALCULATIONS, METHOD, SCHEME, AND THE POTENTIAL IMPACT ON MAINTAINING THE STABILITY OF THE ADJACENT EXISTING STRUCTURES.
8. THE CONTRACTOR SHALL REPAIR EXISTING STRUCTURES AS SPECIFIED AND SHOWN ON SHEET 67. THE LOCATIONS OF THE REPAIR SHALL BE DIRECTED BY THE ENGINEER.
9. EXISTING STRUCTURES DEPICTED ON THE DRAWINGS HAVE BEEN TAKEN FROM PREVIOUS DESIGN DRAWINGS. NO ATTEMPT HAS BEEN MADE TO VERIFY THEIR DIMENSIONS OR EXISTENCE.

Mark	Description	By	Chk'd	App'd.	Date

REVISIONS

DESIGNED BY
MICHAEL BAKER, JR., INC.
Consulting Engineers
4301 Dutch Ridge Road
Beaver, Pennsylvania 15009

William E. Fusetti
WILLIAM E. FUSETTI
PROJECT MANAGER
REG. PROF. ENG.
PENNA. 011554-E
DATE July 30, 1982

BJK / WCW
CLL
RJK

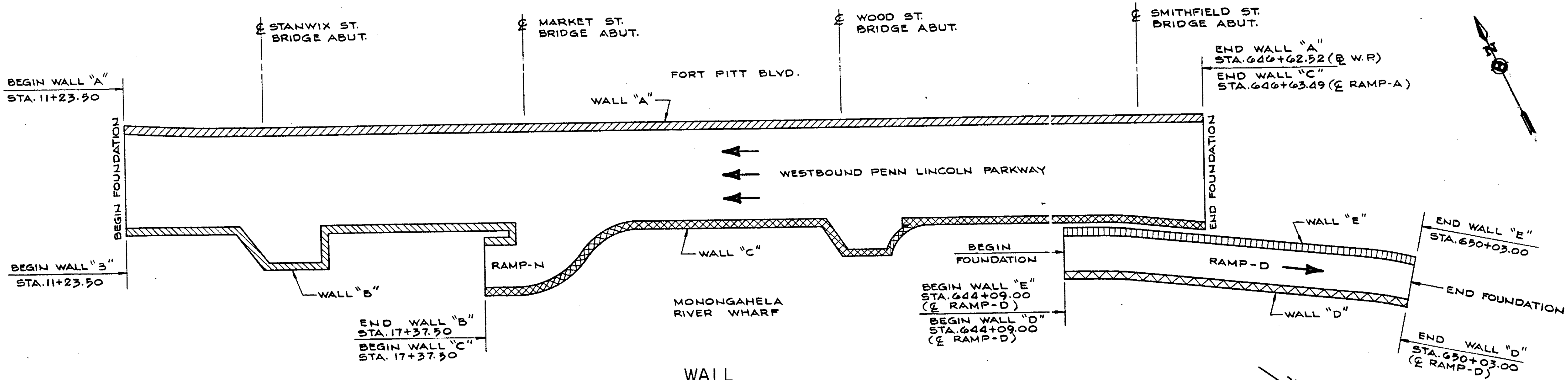
Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48
L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL NOTES & QUANTITIES

APPROVED AUG 23 1982
BRIDGE ENGINEER
0009903

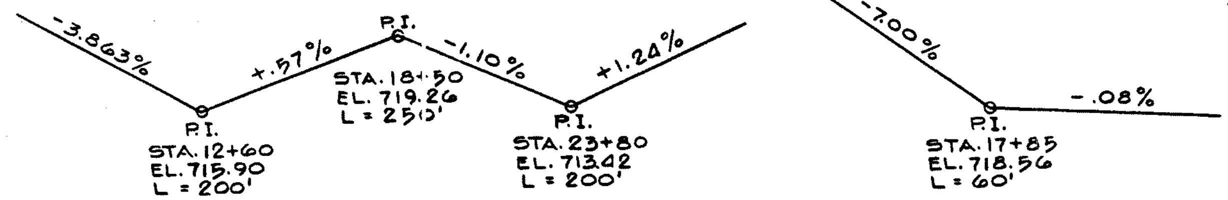
SHEET 1 OF 114 PLUS SUPPLEMENTAL DRAWINGS.
S- 14584

D-9002 (3-77)



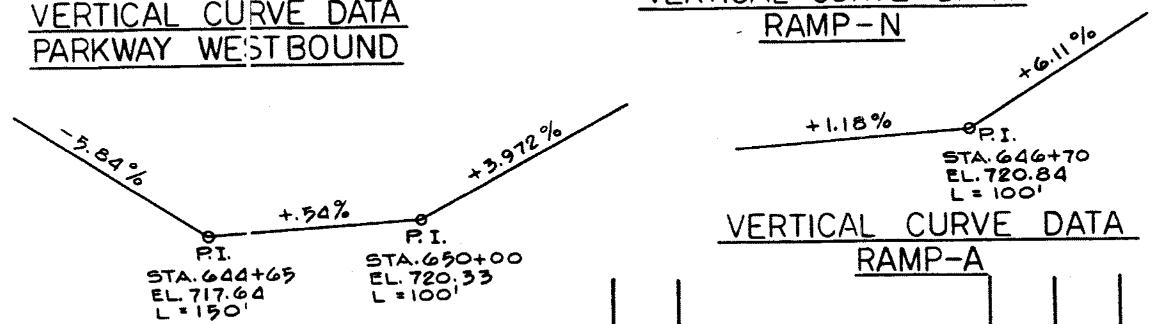
WALL LOCATION PLAN

N.T.S.



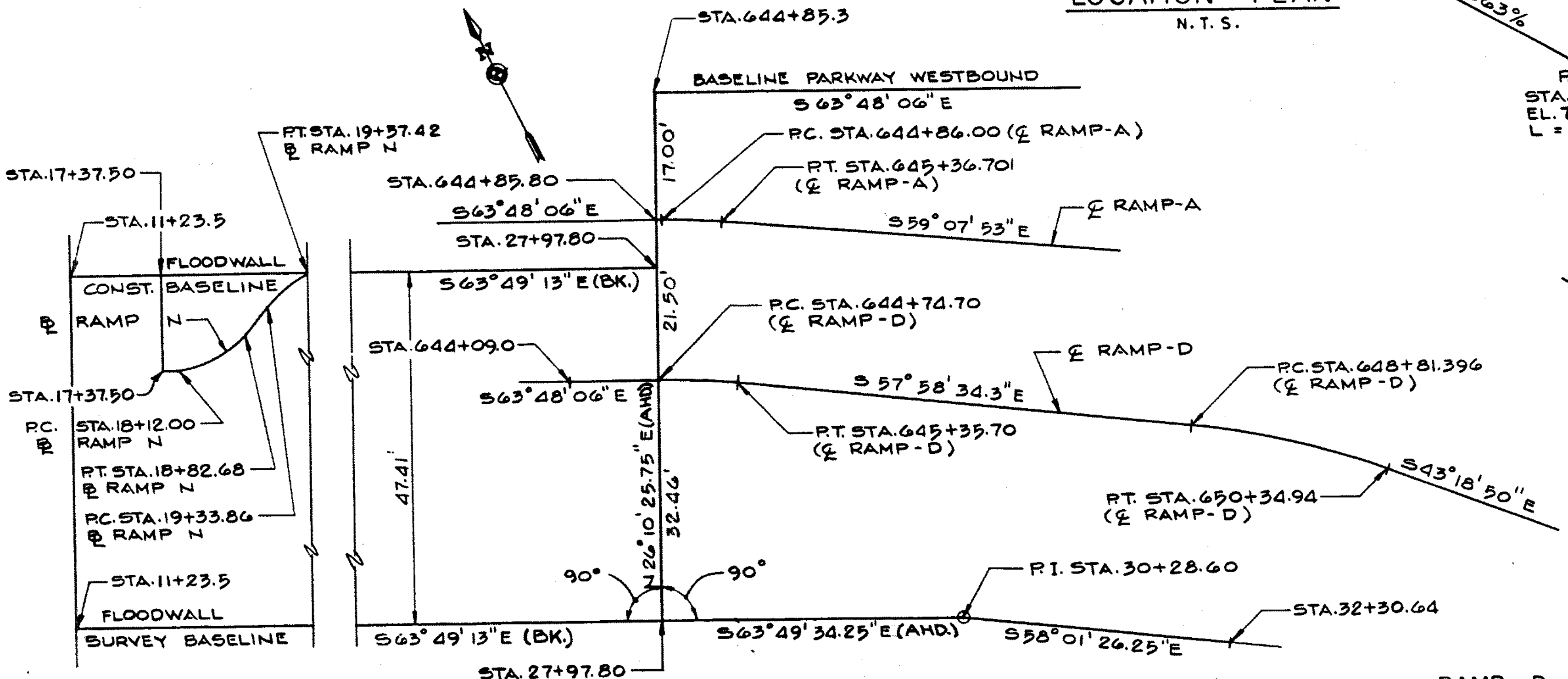
VERTICAL CURVE DATA PARKWAY WESTBOUND

VERTICAL CURVE DATA RAMP-N



VERTICAL CURVE DATA RAMP-A

VERTICAL CURVE DATA RAMP-D



RAMP-A	RAMP-N	RAMP-N	RAMP-D	RAMP-D
P.I. = STA.645+11.364 (℄ RAMP-A)	P.I. = STA.18+47.50 (℄ RAMP N)	P.I. = 19+45.69 (℄ RAMP N)	P.I. = STA.645+05.231 (℄ RAMP-D)	P.I. = STA.649+58.591 (℄ RAMP-D)
Δ = 4° 40' 31"	Δ = 13° 30' 00"	Δ = 13° 30' 00"	Δ = 5° 49' 31.7" RT.	Δ = 14° 39' 44.3"
D = 9° 13' 13"	D = 19° 05' 55"	D = 57° 17' 45"	D = 9° 32' 57.5"	D = 9° 32' 57.5"
T = 25.363'	T = 35.51'	T = 11.84'	T = 30.528'	T = 77.193'
L = 50.700'	L = 70.690'	L = 23.560'	L = 61.004'	L = 153.543'
R = 621.333'	R = 300.000'	R = 100.000'	R = 600.000'	R = 600.000'

GEOMETRIC LAYOUT

N.T.S.

Designed by WVA
Drawn by FS
Checked by RJK3

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23 W.B.STA.1098+30.29 TO STA.1101+35.48

L.R. 764 SEC. 19 W.B.STA.631+16.78 TO STA.646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

WALL LOCATION PLAN & GEOM. LAYOUT

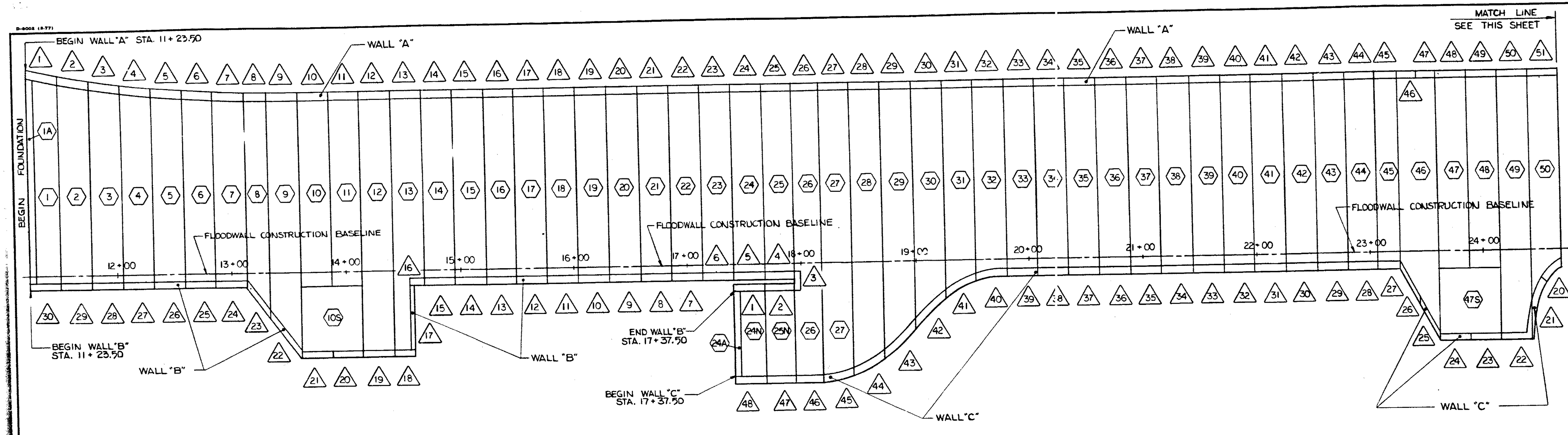
APPROVED AUG 23 1982

BRIDGE ENGINEER 0009904

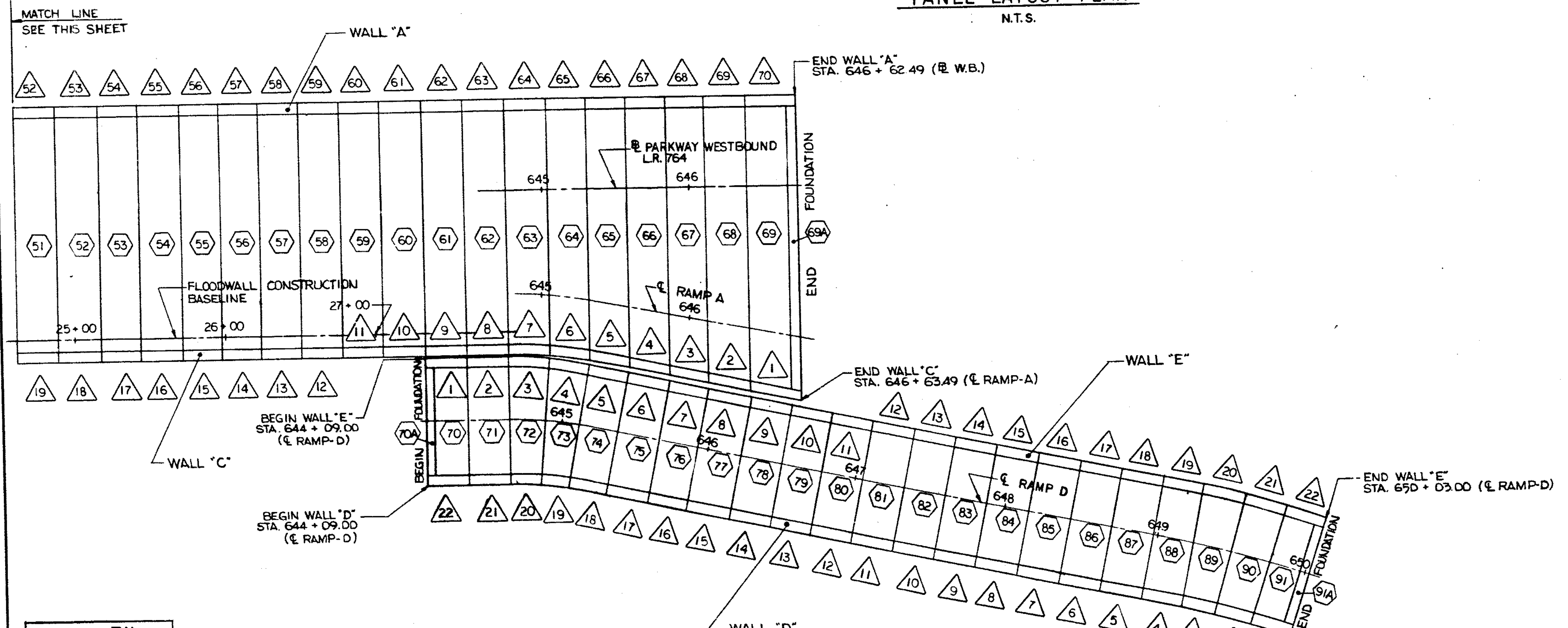
SHEET 2 OF 114

S-14584

D-4003 (8-77)



PANEL LAYOUT PLAN
N.T.S.



PANEL LAYOUT PLAN
N.T.S.

LEGEND THIS SHEET ONLY

△ - DENOTES WALL PANEL NUMBER

⬡ - DENOTES FOUNDATION PANEL NUMBER

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
PANEL LAYOUT PLAN

APPROVED AUG 23 1982

B J Kotalik

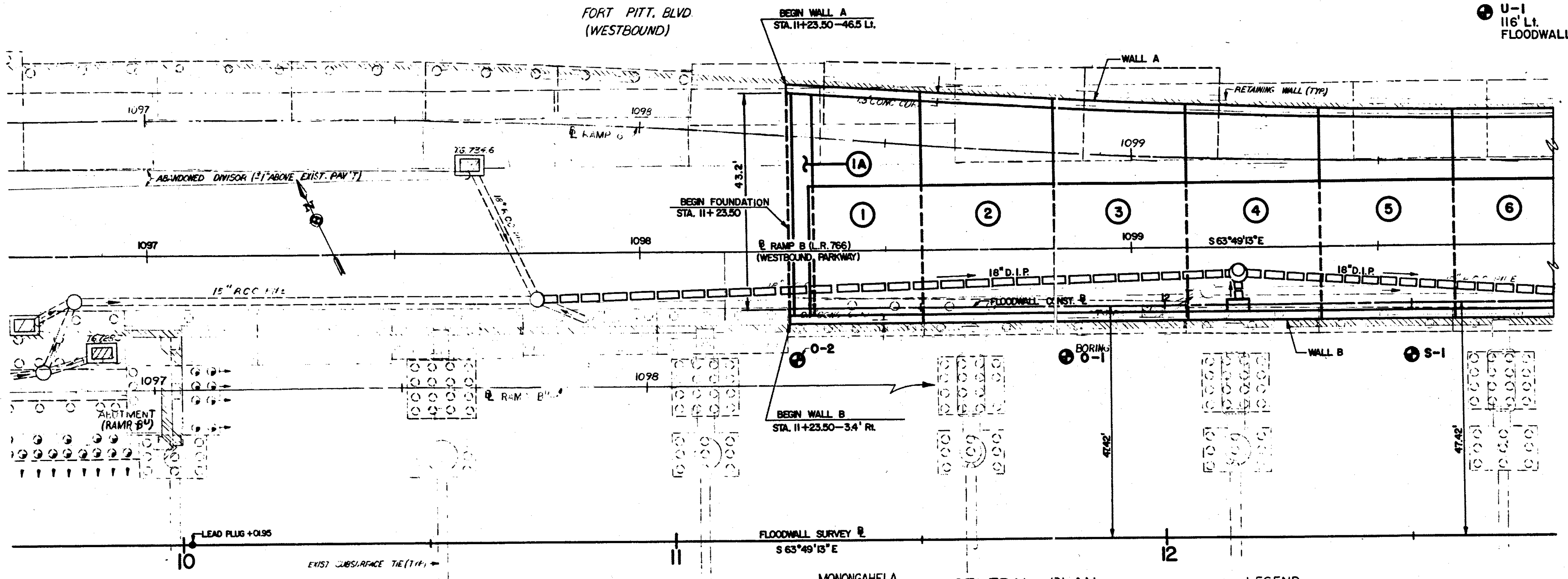
BRIDGE ENGINEER

0009905

SHEET 3 OF 114

S-14584

Designed by TM
Drawn by TM
Checked by RJK



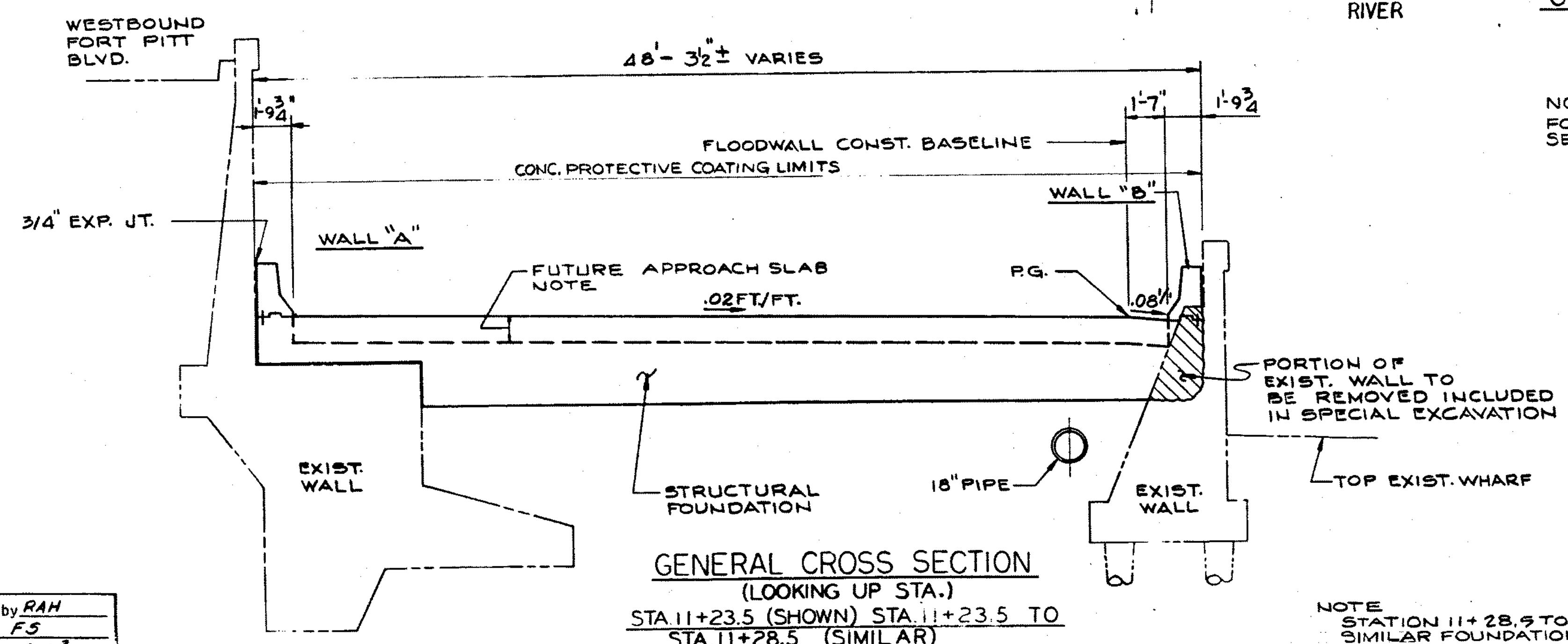
GENERAL PLAN

0 5' 10' 20'

LEGEND

1 DENOTES FOUNDATION PANEL NUMBER

NOTES:
FOR CROSS SECTIONS ON THIS PLAN SEE THIS SHEET AND SH. NOS. 5 & 6



GENERAL CROSS SECTION

(LOOKING UP STA.)
STA. 11+23.5 (SHOWN) STA. 11+23.5 TO STA. 11+28.5 (SIMILAR)

0 1' 2' 3' 4' 5' 10'

NOTE
STATION 11+28.5 TO 11+57.5 EXISTING WALL SIMILAR FOUNDATION SIMILAR TO SECTION SHT. 5

Designed by RAH
Drawn by FS
Checked by RJK³

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

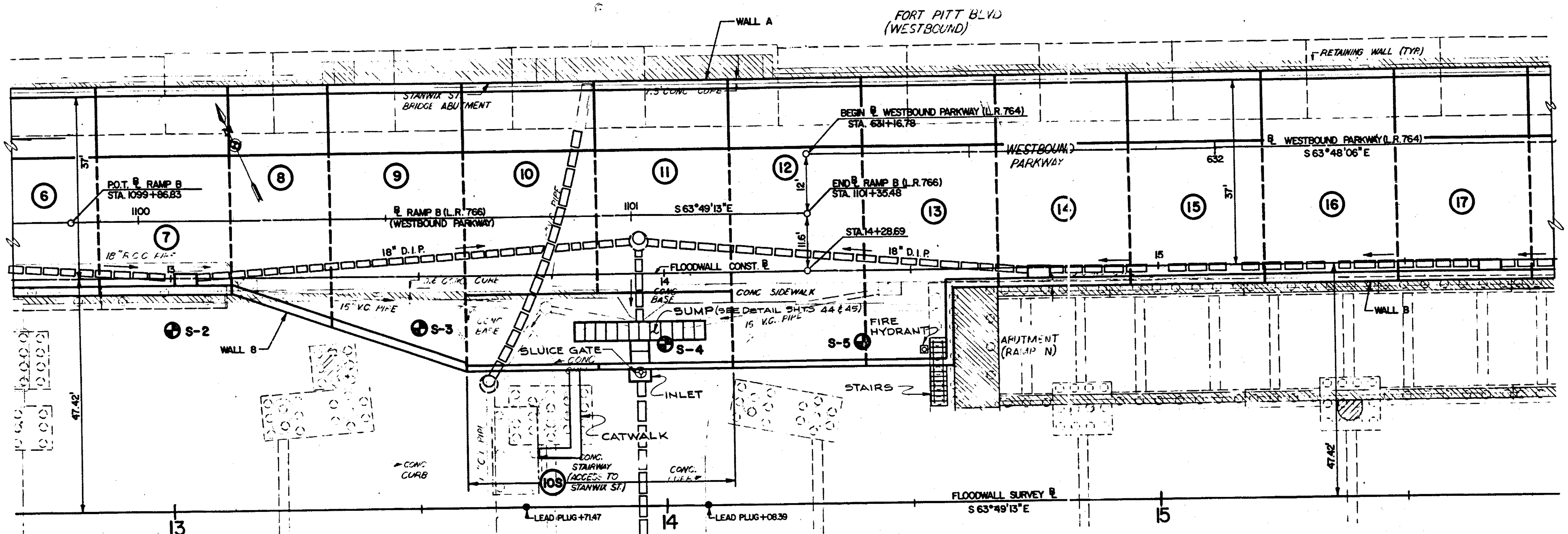
Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48
L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL PLAN & SECTION

APPROVED AUG 23 1982
B.F. Kotalik
BRIDGE ENGINEER

SHEET 4 OF 114
S-14584

0009906



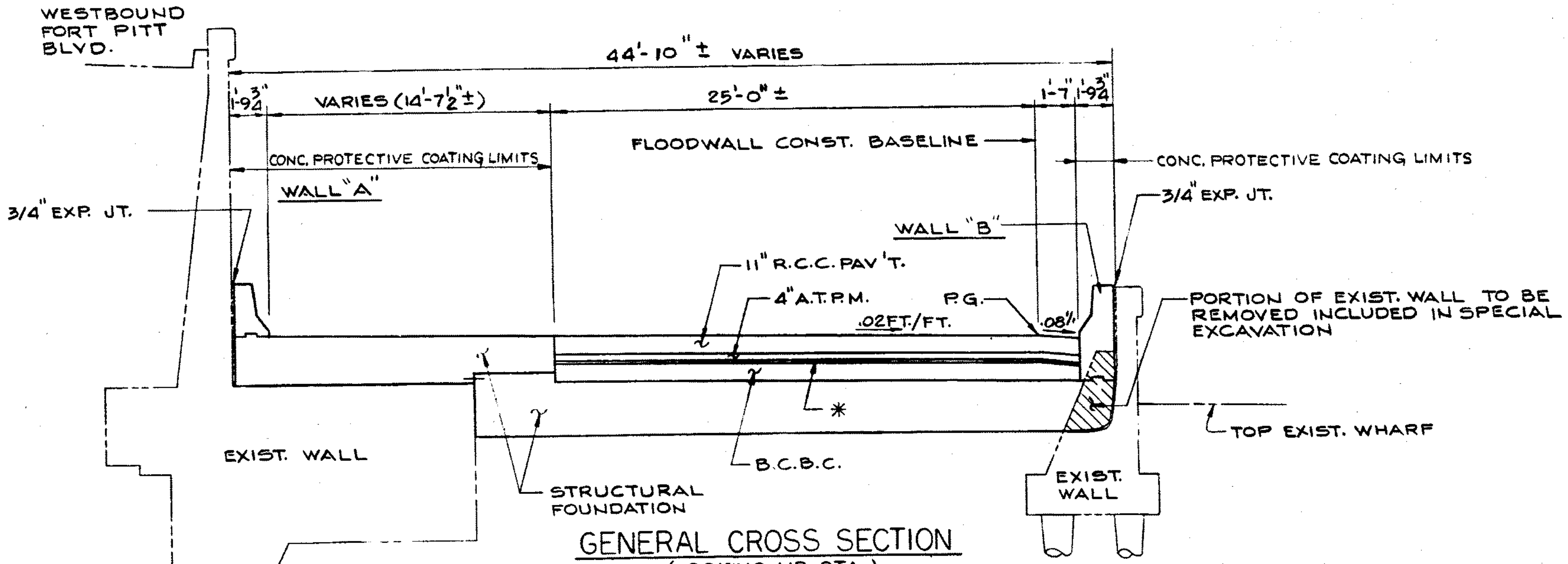
GENERAL PLAN

0 5' 10' 20'

LEGEND

(1) DENOTES FOUNDATION PANEL NUMBER

NOTES:
FOR CROSS SECTIONS ON THIS PLAN SEE SHT. NOS. 6, 7 & 8



GENERAL CROSS SECTION
(LOOKING UP STA.)
STA. 11+77.5 (SHOWN) STA. 11+57.5 TO STA. 12+11.5 (SIMILAR)

0 1' 2' 3' 4' 5' 10'

* 1" BIT. WEARING CRSE. OVERLAY AFTER PLACING B.C.B.C.

ABREVIATIONS
R.C.C. PAV'T - REINFORCED CONCRETE PAVEMENT
ATPM - ASPHALT TREATED PERMEABLE MATERIAL
BCBC - BITUMINOUS CONCRETE BASE COURSE

Designed by RAH
Drawn by FS
Checked by RJK3

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

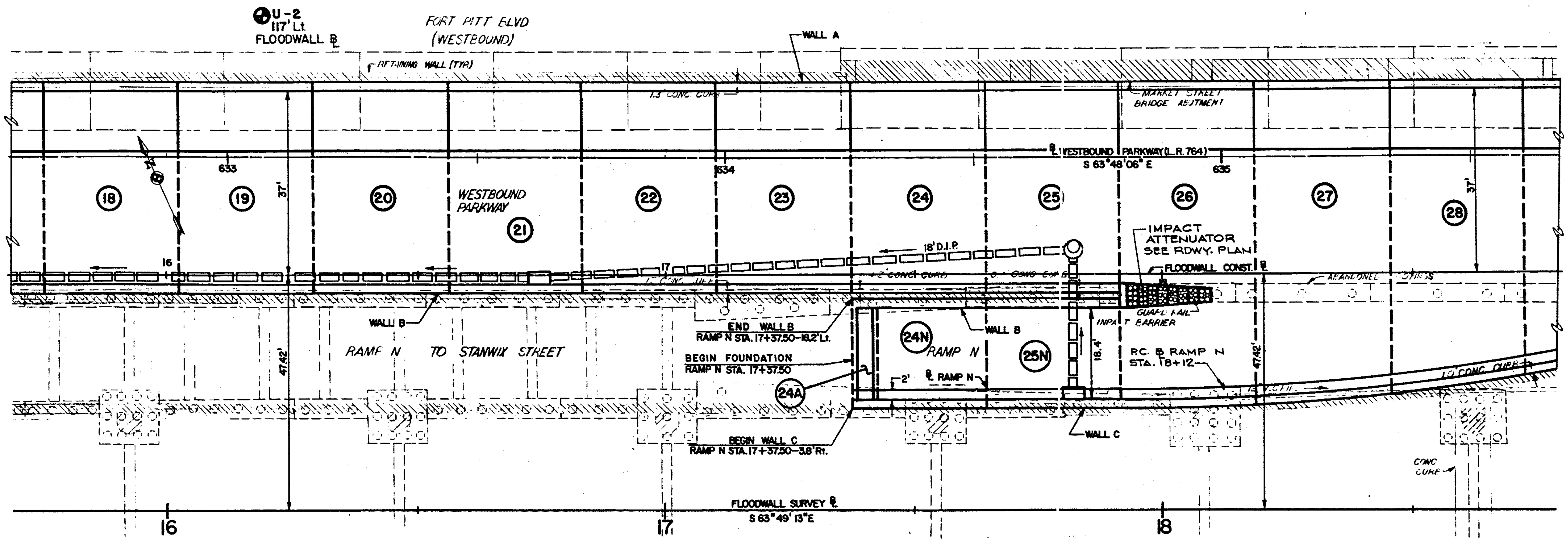
ALLEGHENY COUNTY
L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48
L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL PLAN & SECTION

APPROVED AUG 23 1982
B.J. Kotelchuk
BRIDGE ENGINEER

SHEET 5 OF 114

S-14584

0009907



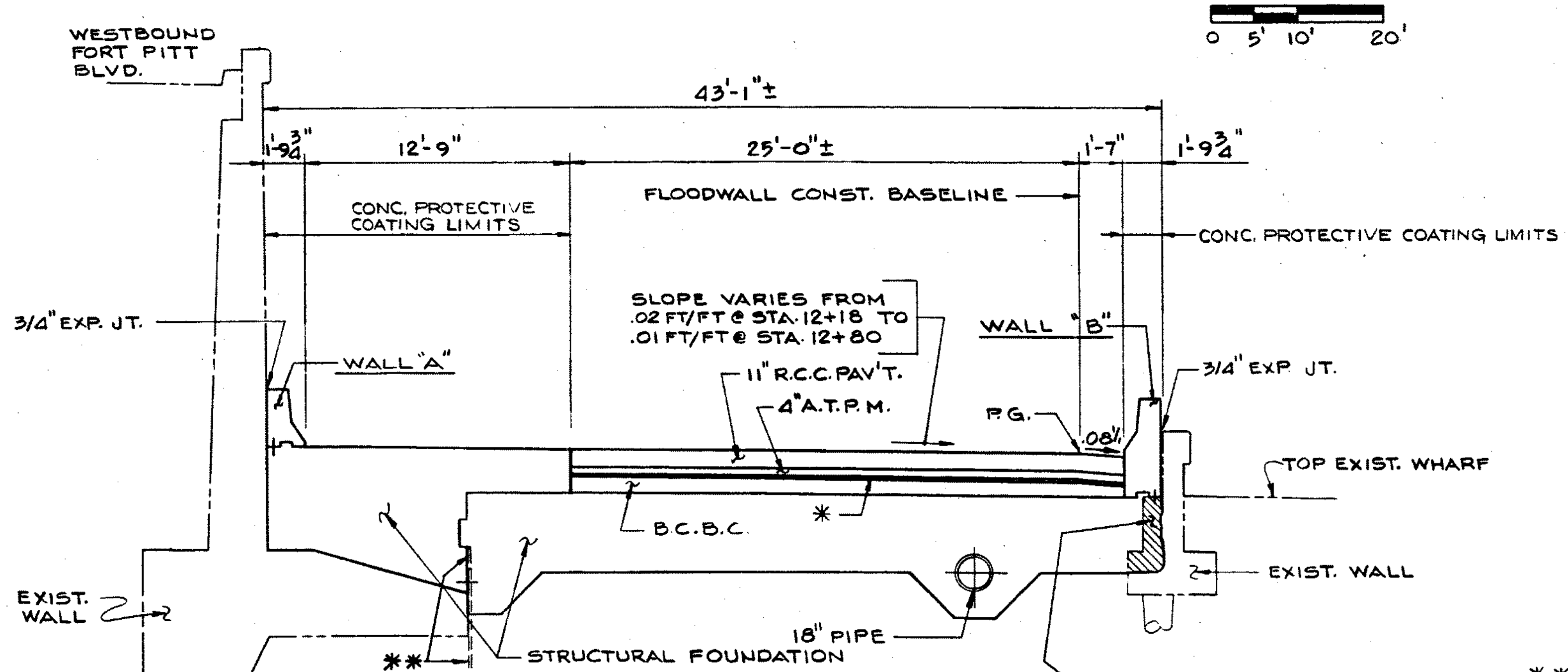
GENERAL PLAN

0 5' 10' 20'

LEGEND

(1) DENOTES FOUNDATION PANEL NUMBER

NOTES:
1. FOR CROSS SECTIONS ON THIS PLAN SEE SHT. NOS. 8, 9 & 10
2. FOR ABBREVIATION SEE SHT. 5



GENERAL CROSS SECTION (LOOKING UP STA.)

STA. 12+31.5 (SHOWN) STA. 12+11.5 TO STA. 13+12.5 (SIMILAR)

0 1' 2' 3' 4' 5' 10'

PORTION OF EXIST. WALL TO BE REMOVED INCLUDED IN SPECIAL EXCAVATION

* 1" BIT. WEARING CRSE. OVERLAY AFTER PLACING B.C.B.C.

** POSSIBLE EXISTING STEEL SHEET PILING TO BE CUT AS REQUIRED ABOVE EXISTING FOOTING ONLY

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL PLAN & SECTION

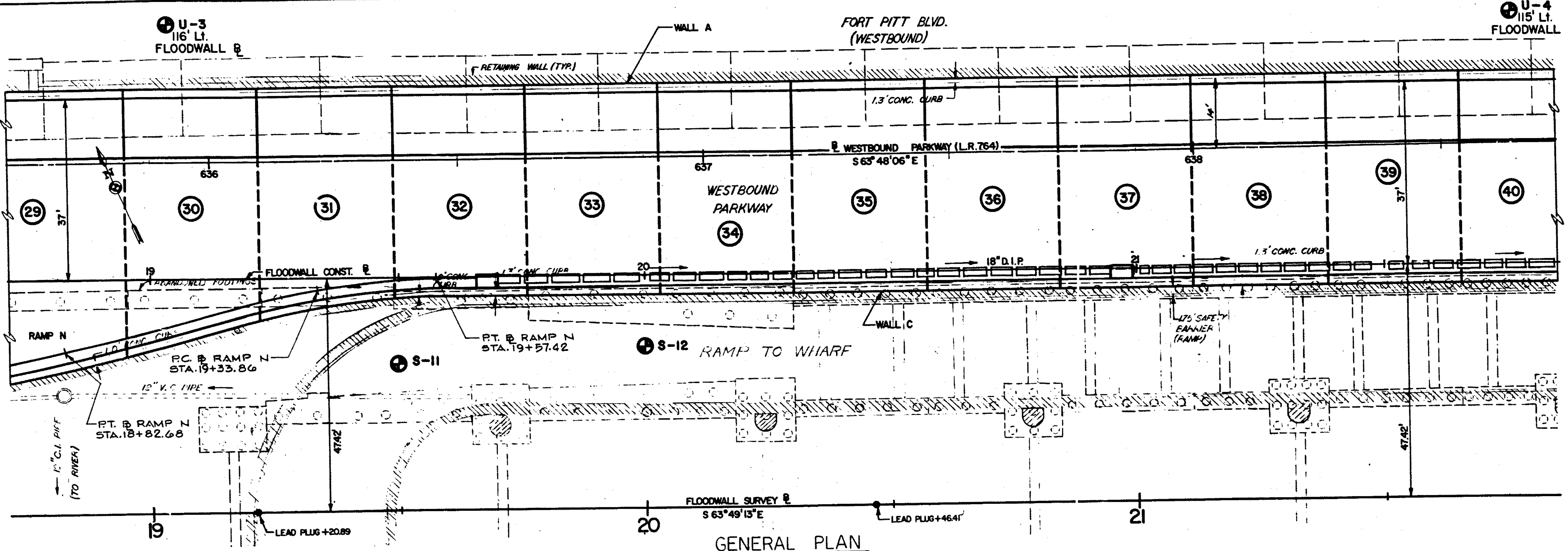
APPROVED AUG 23 1982
B. Z. Kotalik
BRIDGE ENGINEER

SHEET 6 OF 114

S-14584

Designed by RAH
Drawn by FS
Checked by RJK3

0009908

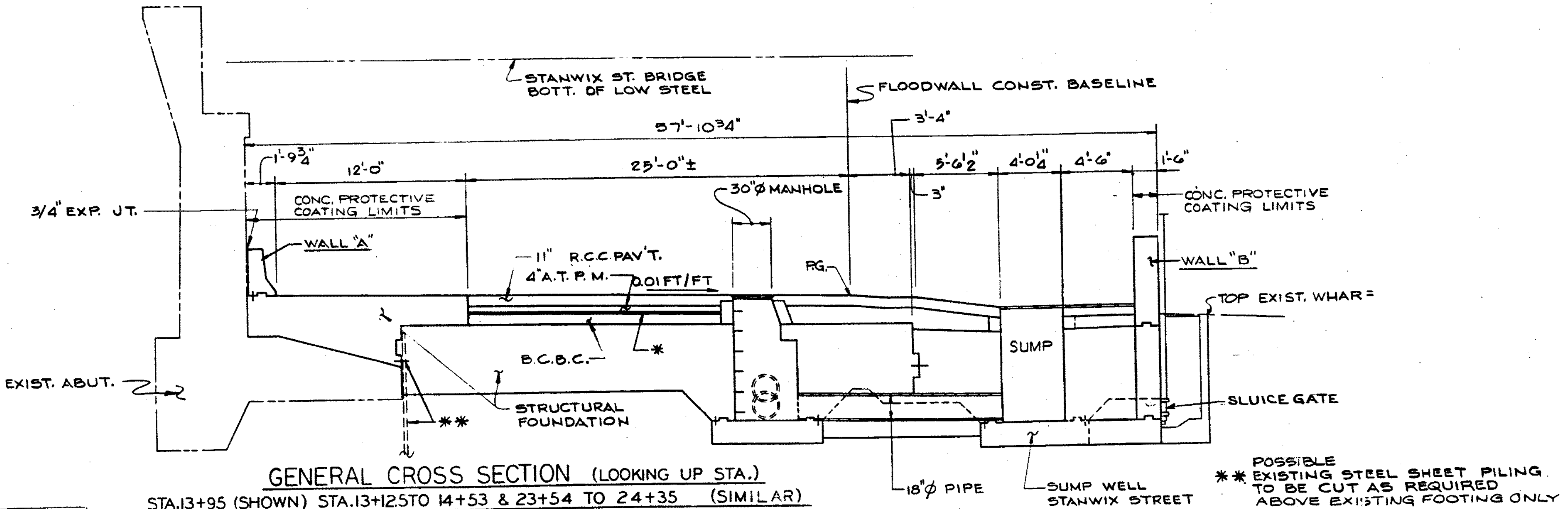


GENERAL PLAN

0 5' 10' 20'

LEGEND
(1) DENOTE FOUNDATION PANEL NUMBER

1. NOTES:
FOR CROSS SECTIONS ON THIS PLAN SEE SHEET NOS. 10, 11 & 12
2. FOR ABBREVIATION SEE SHT. 5



GENERAL CROSS SECTION (LOOKING UP STA.)

STA. 13+95 (SHOWN) STA. 13+12.5 TO 14+53 & 23+54 TO 24+35 (SIMILAR)

0 1' 2' 3' 4' 5' 10'

** POSSIBLE EXISTING STEEL SHEET PILING TO BE CUT AS REQUIRED ABOVE EXISTING FOOTING ONLY

* 1" BIT. WEARING CRSE. OVERLAY AFTER PLACING B.C.B.C.

Designed by RAH
Drawn by FS
Checked by RJK

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL PLAN & SECTIONS

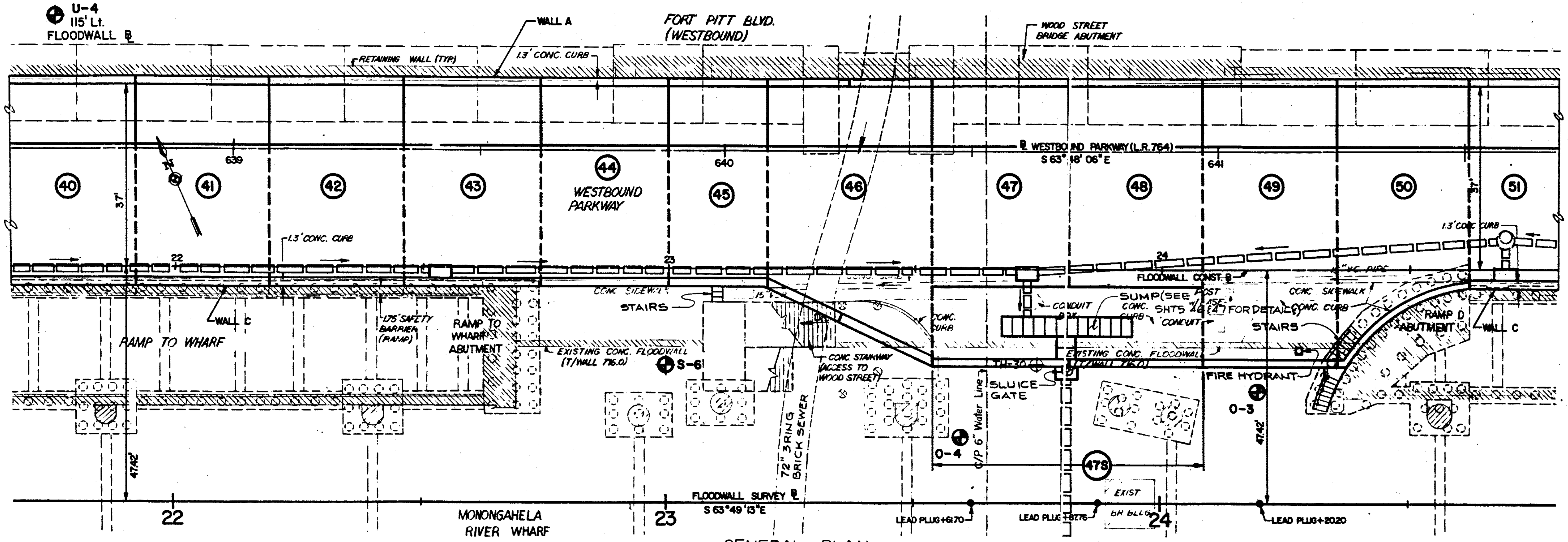
APPROVED AUG 23 1982

BRIDGE ENGINEER

SHEET 7 OF 114

S-14584

0009909



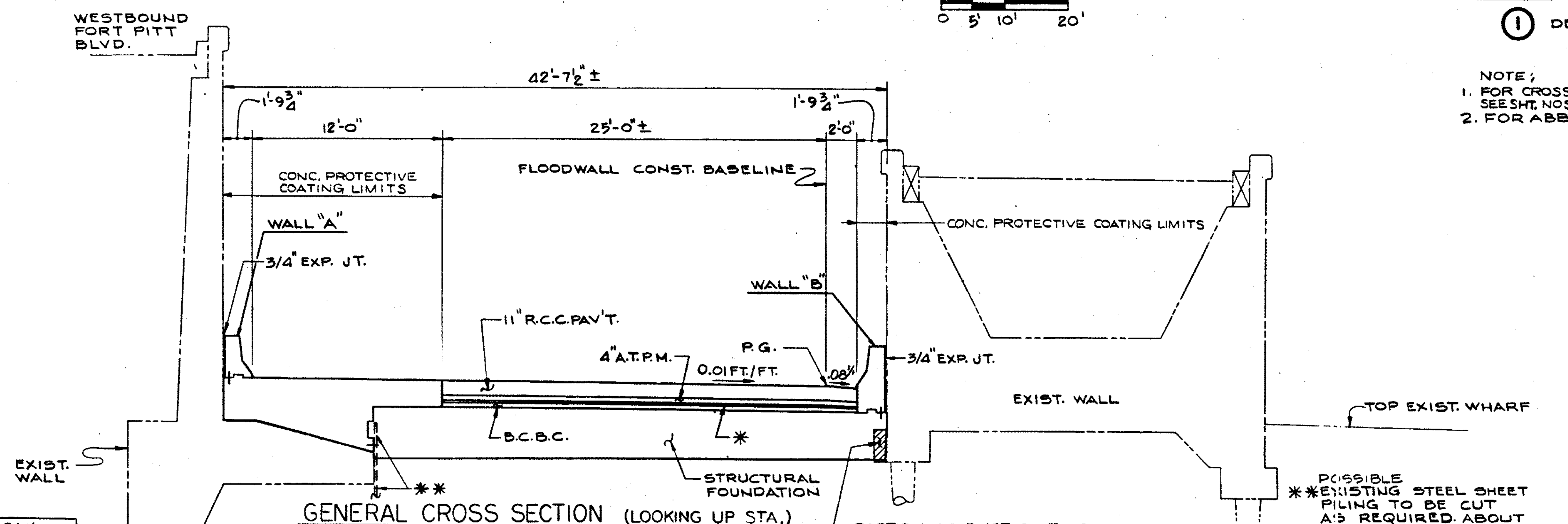
GENERAL PLAN

0 5' 10' 20'

LEGEND

(1) DENOTES FOUNDATION PANEL NUMBER

NOTE;
1. FOR CROSS SECTIONS ON THIS PLAN SEE SHT. NOS. 7 & 12
2. FOR ABBREVIATIONS SEE SHT. 5



GENERAL CROSS SECTION (LOOKING UP STA.)

STA. 16+02.50 (SHOWN) STA. 14+53 TO STA. 17+37.5 (SIMILAR)

0 1' 2' 3' 4' 5' 10'

** POSSIBLE EXISTING STEEL SHEET PILING TO BE CUT AS REQUIRED. ABOUT EXISTING FOOTING ONLY

* 1" BIT. WEARING CRSE. OVERLAY AFTER PLACING B.C.B.C.

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Designed by RAH
Drawn by FS
Checked by RJK3

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

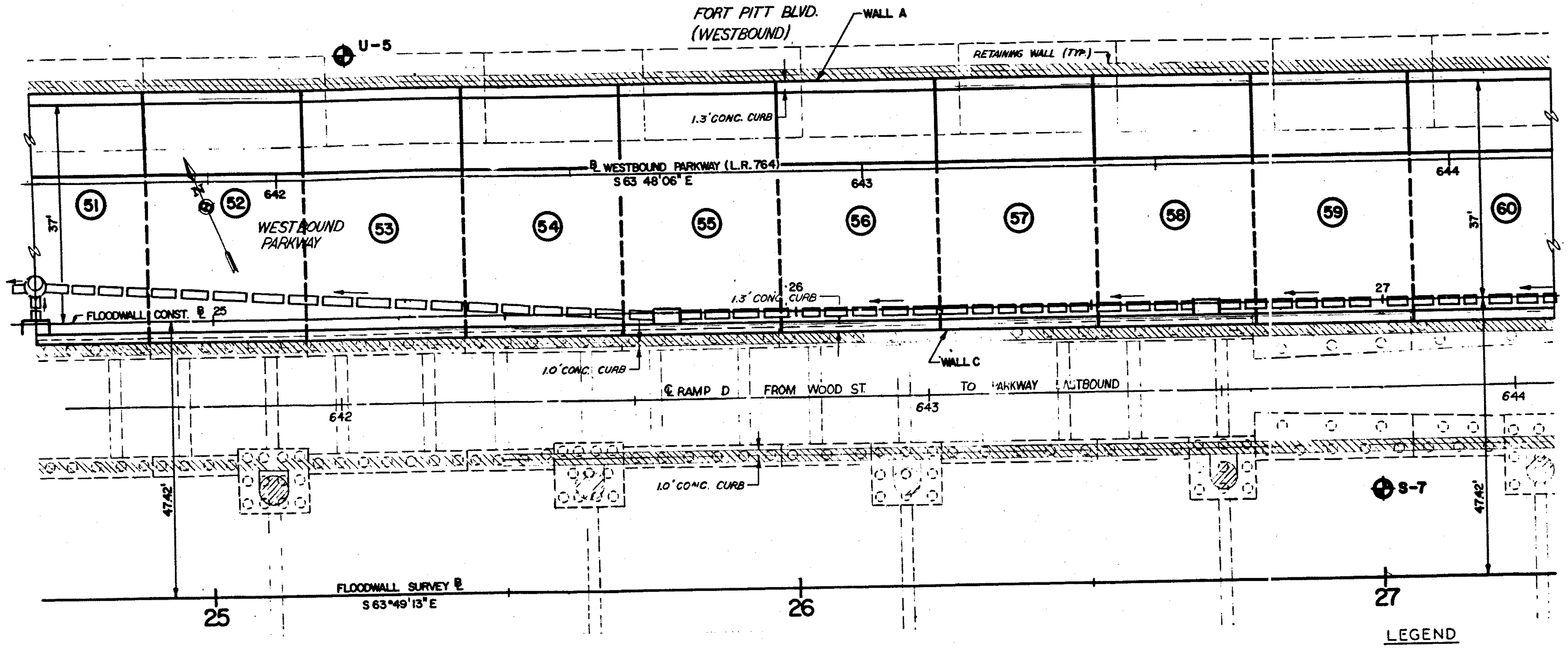
ALLEGHENY COUNTY
L.R. 766 SEC. 23 — W.B. STA. 1098+30.29 TO STA. 1101+35.48
L.R. 764 SEC. 19 — W.B. STA. 631+16.78 TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL PLAN & SECTION

APPROVED AUG 23 1982
BRIDGE ENGINEER

SHEET 8 OF 114

S-14584

0009910



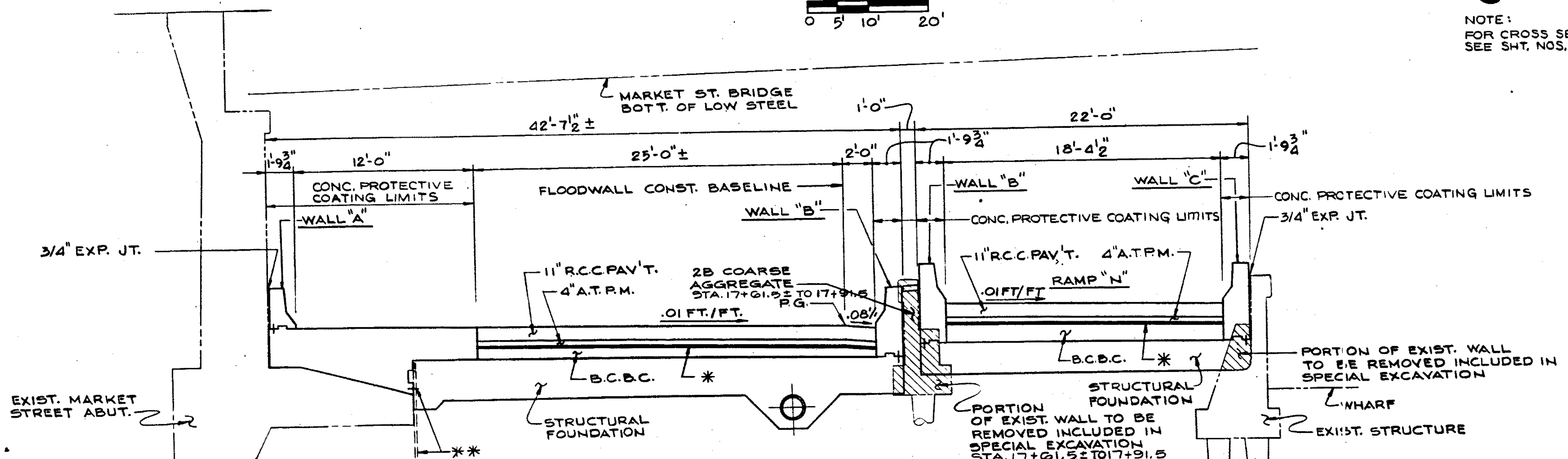
GENERAL PLAN

0 5' 10' 20'

LEGEND

(1) DENOTES FOUNDATION PANEL NUMBER

NOTE:
FOR CROSS SECTIONS ON THIS PLAN SEE SHT. NOS. 11 & 12



GENERAL CROSS SECTION (LOOKING UP STA.)
STA. 17+64.50 (SHOWN) STA. 17+37.50 TO STA. 17+91.50 (SIMILAR)

0 1' 2' 3' 4' 5' 10'

** POSSIBLE EXISTING STEEL SHEET PILING TO BE CUT AS REQUIRED ABOVE EXISTING FOOTING ONLY

* 1" BIT. WEARING CRSE. OVERLAY AFTER PLACING B.C.B.C

Designed by RAH
Drawn by FS
Checked by RJK3

Mark	Description	By	Chk'd.	App'd.	Date
REVISIONS					

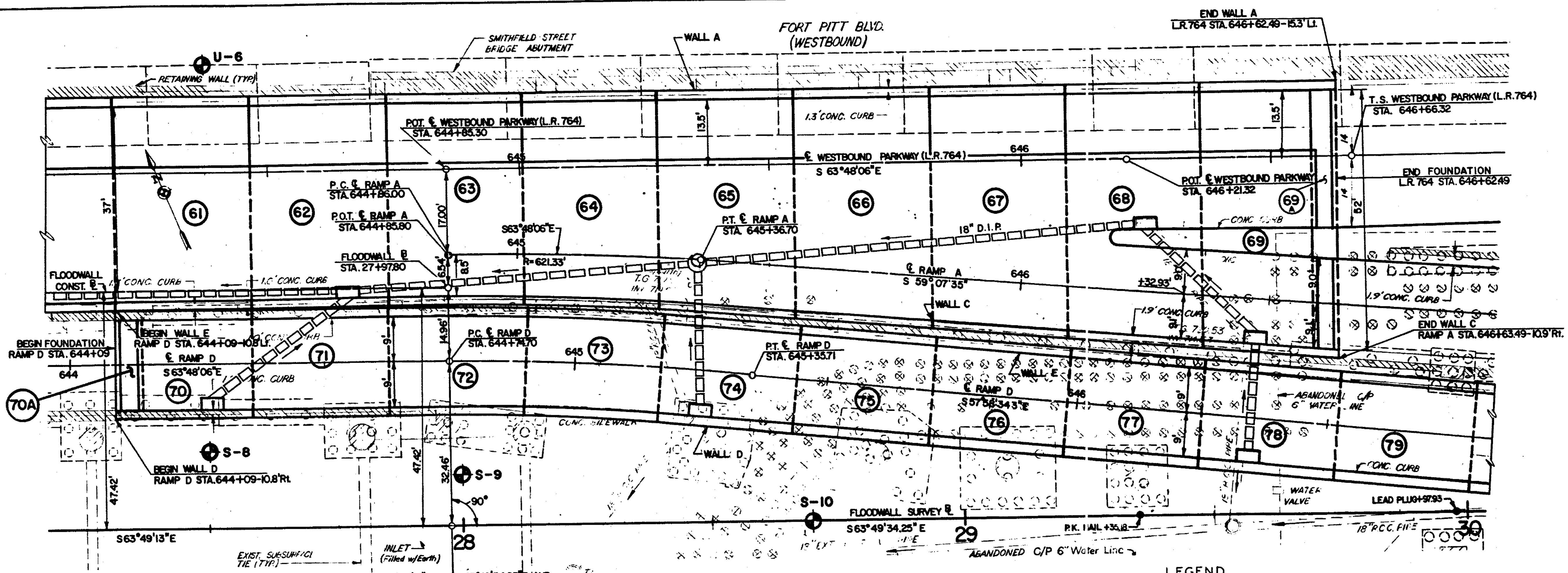
Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23 — W.B. STA. 1098+30.29 TO STA. 1101+35.48
L.R. 764 SEC. 19 — W.B. STA. 631+16.78 TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL PLAN & SECTION

APPROVED AUG 23 1982
BRIDGE ENGINEER

SHEET 9 OF 114
S-14584

0009911



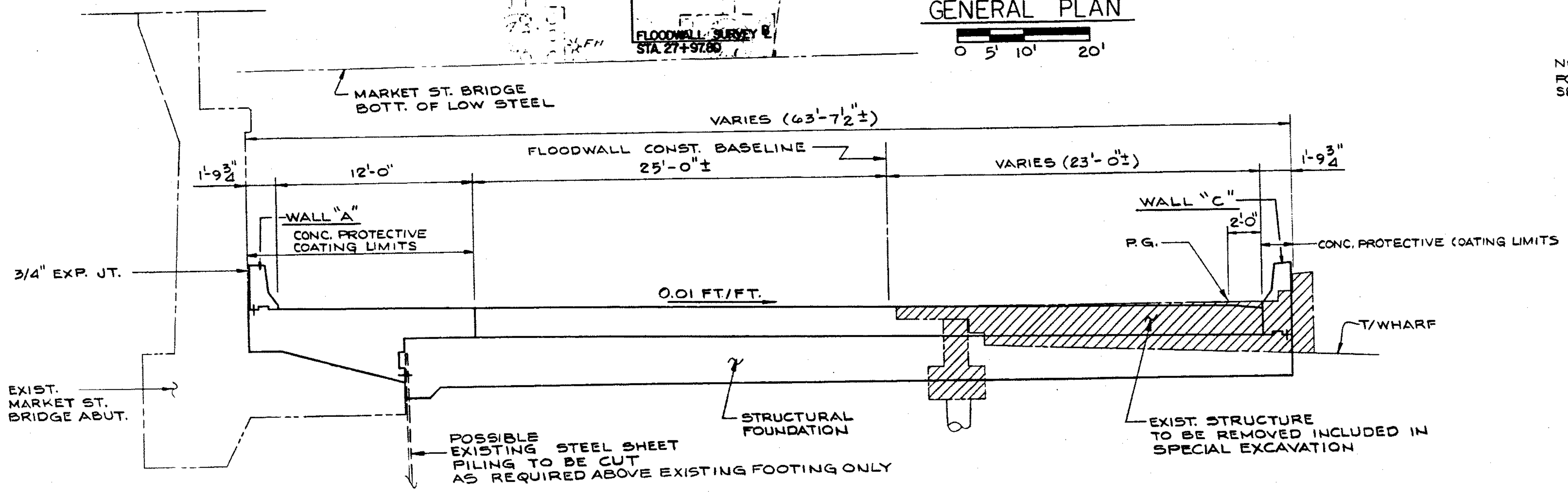
GENERAL PLAN

0 5' 10' 20'

LEGEND

(1) DENOTES FOUNDATION PANEL NUMBER

NOTE:
FOR CROSS SECTIONS ON THIS PLAN
SEE SHT. NOS. 11 & 12



GENERAL CROSS SECTION (LOOKING UP STA.)

STA. 18+41 (SHOWN) STA. 17+91.50 TO STA. 19+76 (SIMILAR)

0 1' 2' 3' 4' 5' 10'

Designed by RAH
Drawn by FS
Checked by RJK

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

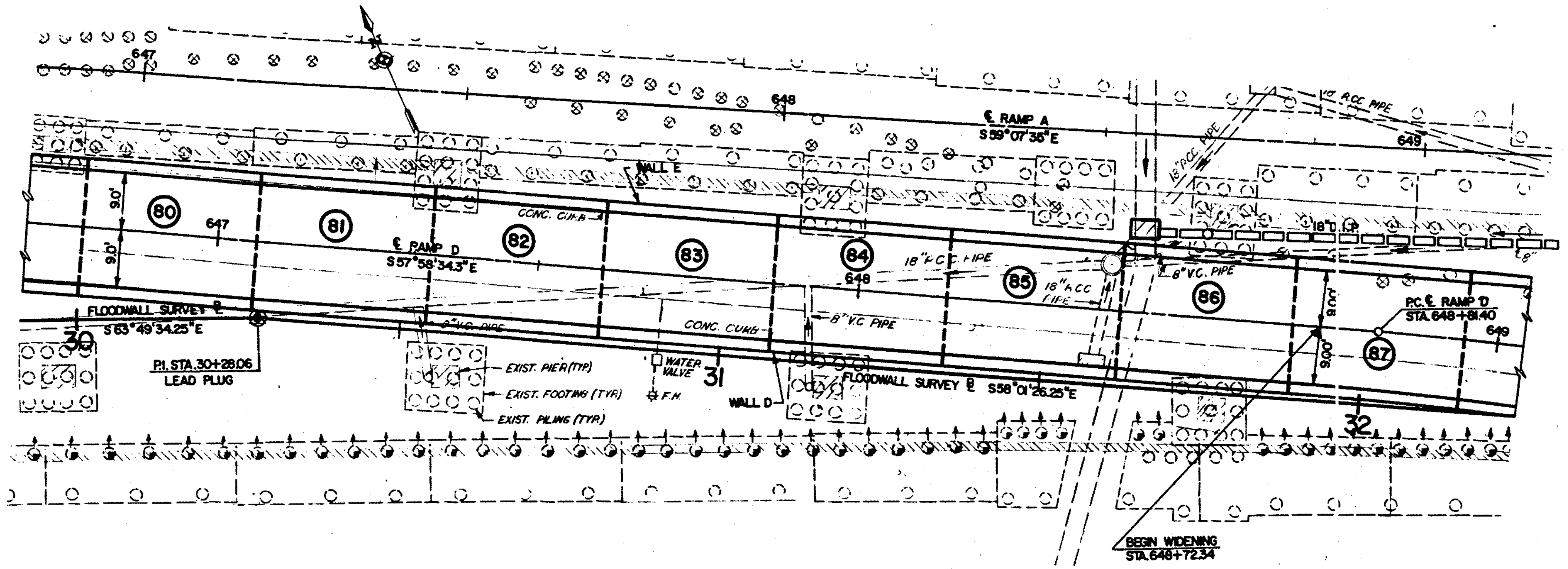
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL PLAN & SECTION

APPROVED AUG 23 1982
BRIDGE ENGINEER

SHEET 10 OF 114

S-14584

0009912



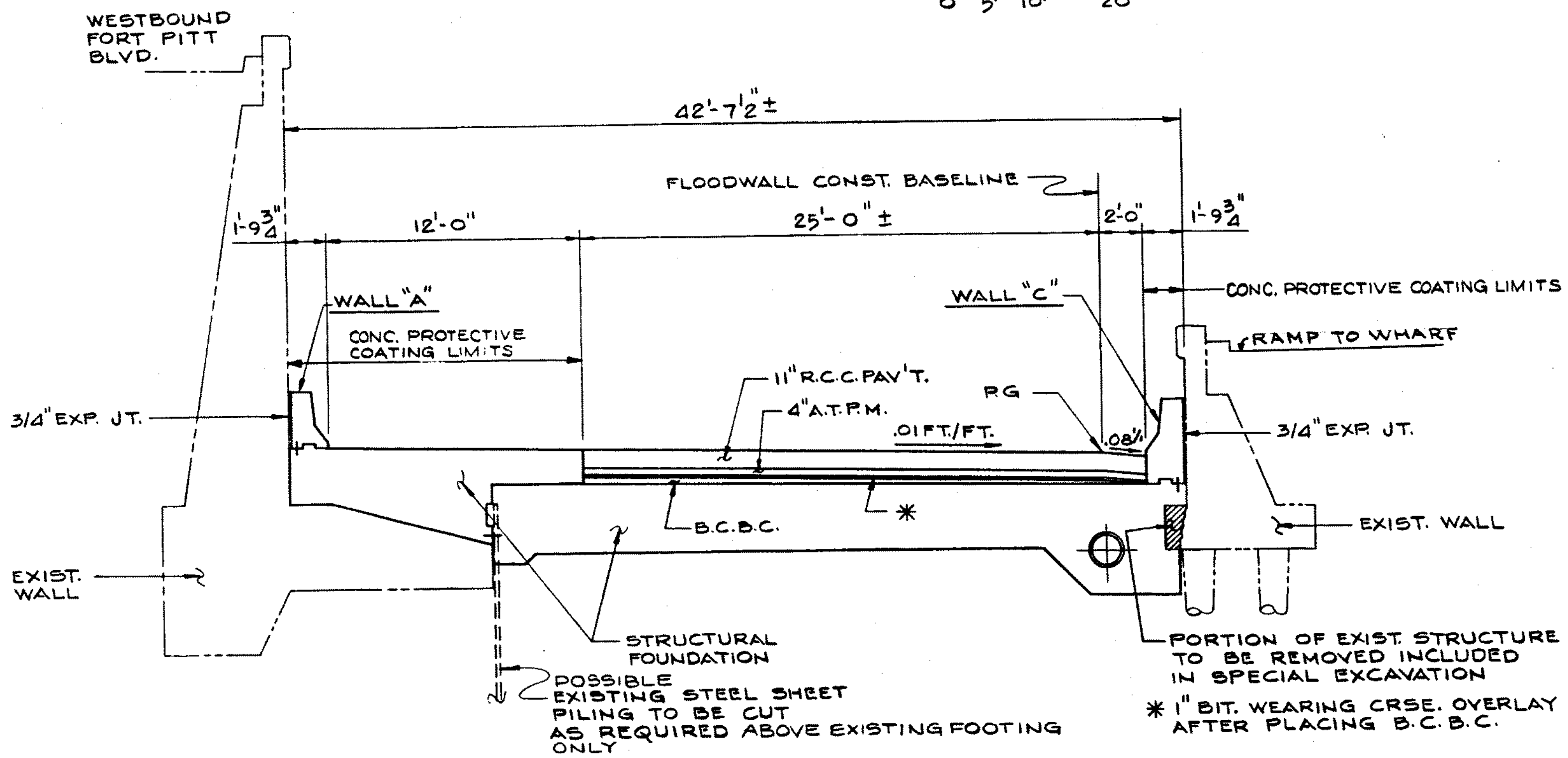
GENERAL PLAN

0 5' 10' 20'

LEGEND

(1) DENOTES FOUNDATION PANEL NUMBER

NOTE:
FOR CROSS SECTIONS ON THIS PLAN
SEE SHT. NO. 13



GENERAL CROSS SECTION (LOOKING UP STA.)

STA. 20+00 (SHOWN) STA. 19+76 TO STA. 20+30 (SIMILAR)

0 1' 2' 3' 4' 5' 10'

Designed by RAH
Drawn by FS
Checked by RJK³

Mark	Description	By	Chk'd.	App'd.	Date
REVISIONS					

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA.1098+30.29
TO STA.1101+35.48

L.R. 764 SEC. 19
W.B. STA.631+16.78
TO STA.646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL PLAN & SECTION

APPROVED AUG 23 1992

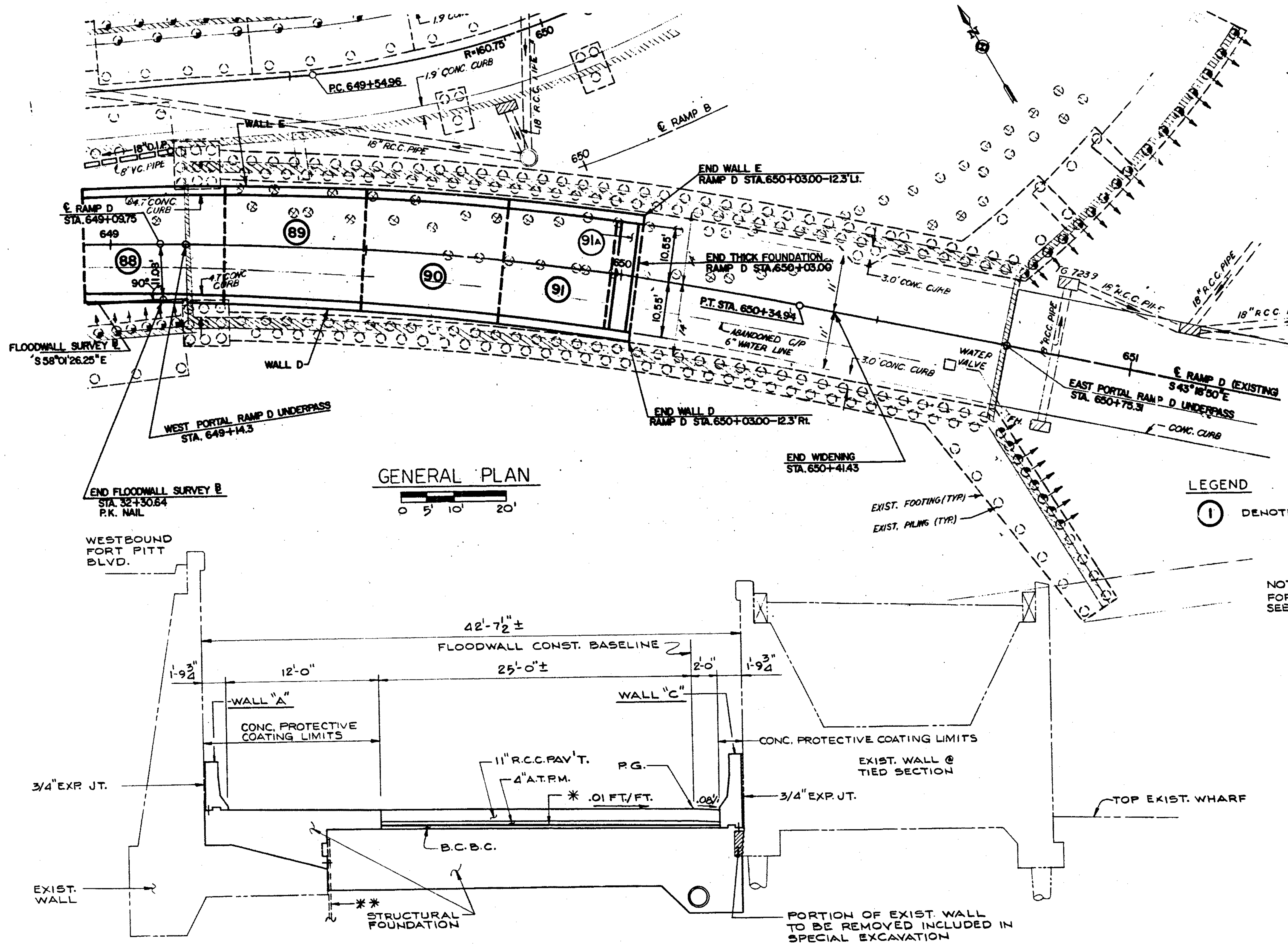
BRIDGE ENGINEER

SHEET 11 OF 114

S-14584

0009913

B.M. No. 22-115 Elev. 746.58
U.S.C. & G.S. B.M. Disc., at Pittsburgh Set in the Top of the Conc. Retaining Wall Between the B.&O. R.R. Station Drive and I-376, at the East Corner of the Grant Street Exit Ramp Overpass, 31' S.W. of the West Corner of the B.&O. R.R. Station, 9' S.W. of the ℄ of the Drive and 2' Above Drive.
Book No. Page 30



GENERAL PLAN

GENERAL CROSS SECTION (LOOKING UP STA.)
STA.21+60 (SHOWN) STA.20+30 TO 22+75 &
STA.24+63 TO STA.27+32 (SIMILAR)

LEGEND

(1) DENOTES FOUNDATION PANEL NUMBER

NOTE:
FOR CROSS SECTIONS ON THIS PLAN SEE SHT. NO. 13

✱ 1" BIT. WEARING CRSE. OVERLAY AFTER PLACING B.C.B.C. POSSIBLE

✱✱ EXISTING STEEL SHEET PILING TO BE CUT AS REQUIRED ABOVE EXISTING FOOTING ONLY

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Designed by RAH
Drawn by FS
Checked by RJH

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23 — W.B. STA.1098+30.29 TO STA.1101+35.48
L.R. 764 SEC. 19 — W.B. STA.631+16.78 TO STA.646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL PLAN & SECTION

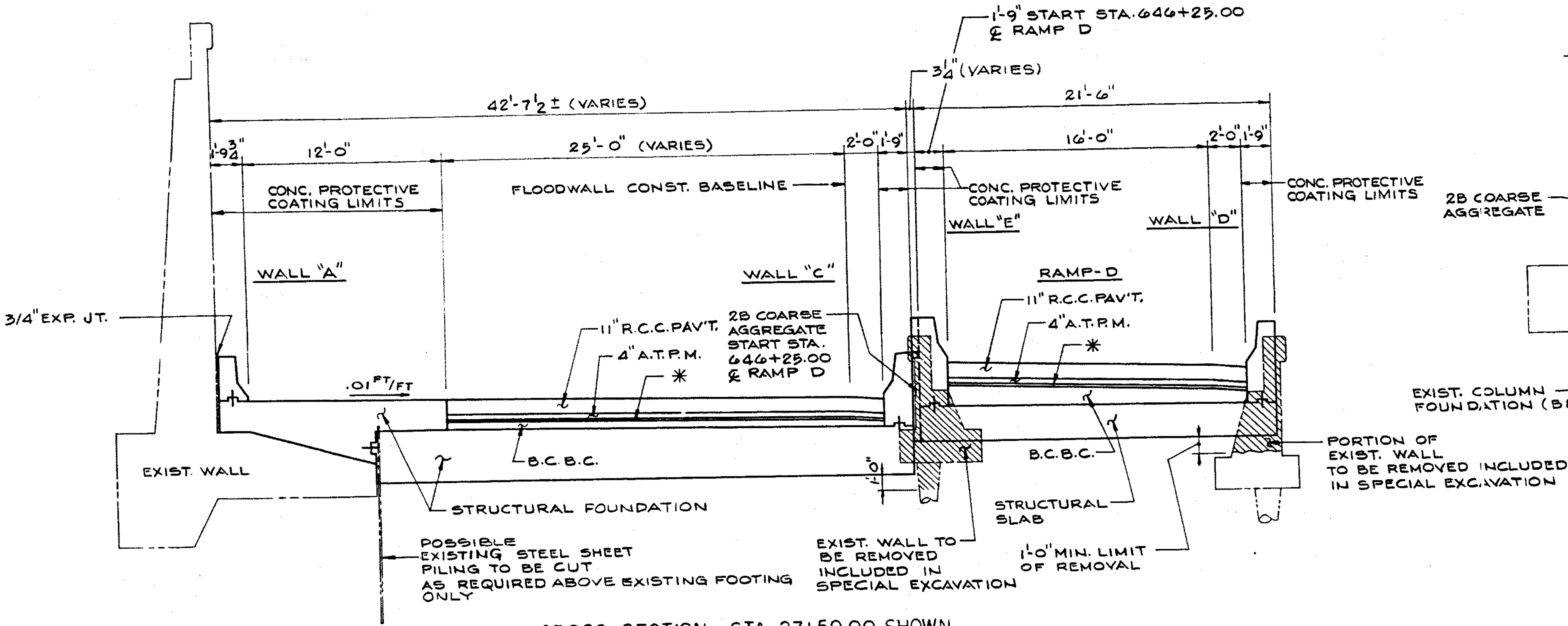
APPROVED AUG 23 1982
B.J. Kotalik
BRIDGE ENGINEER

SHEET 12 OF 114

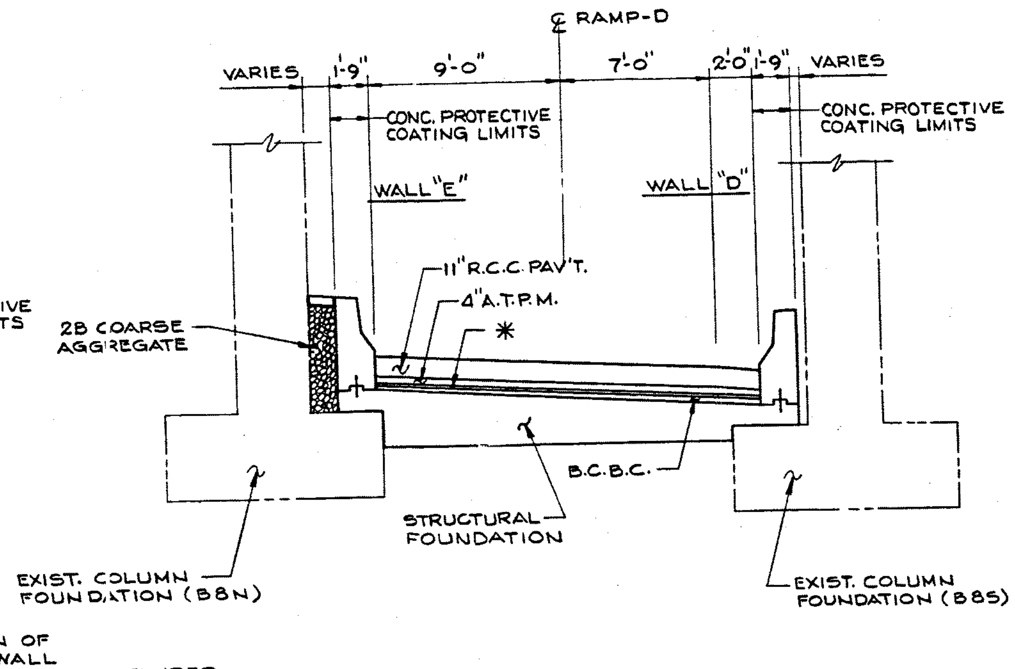
S-14584

0009914

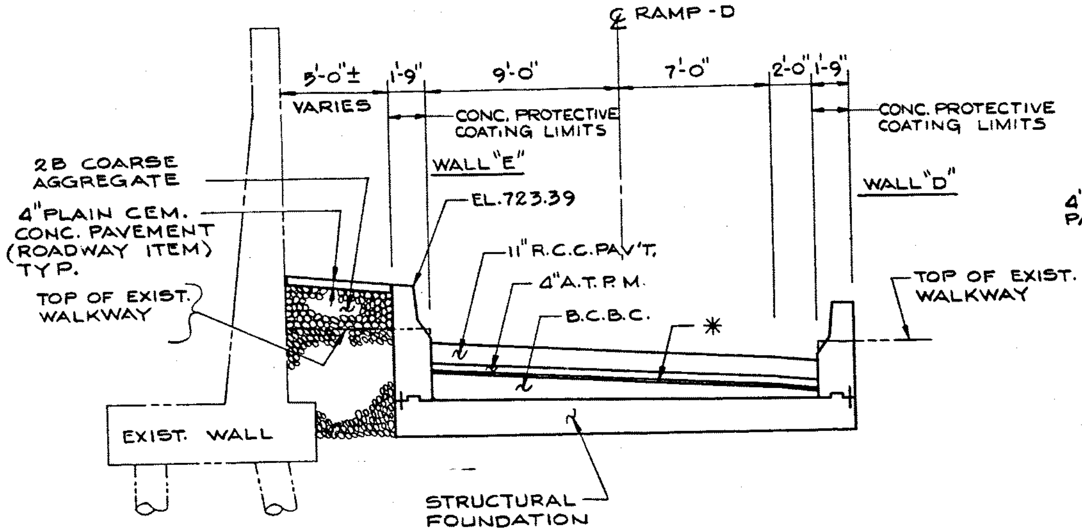
D-9006 (6-77)



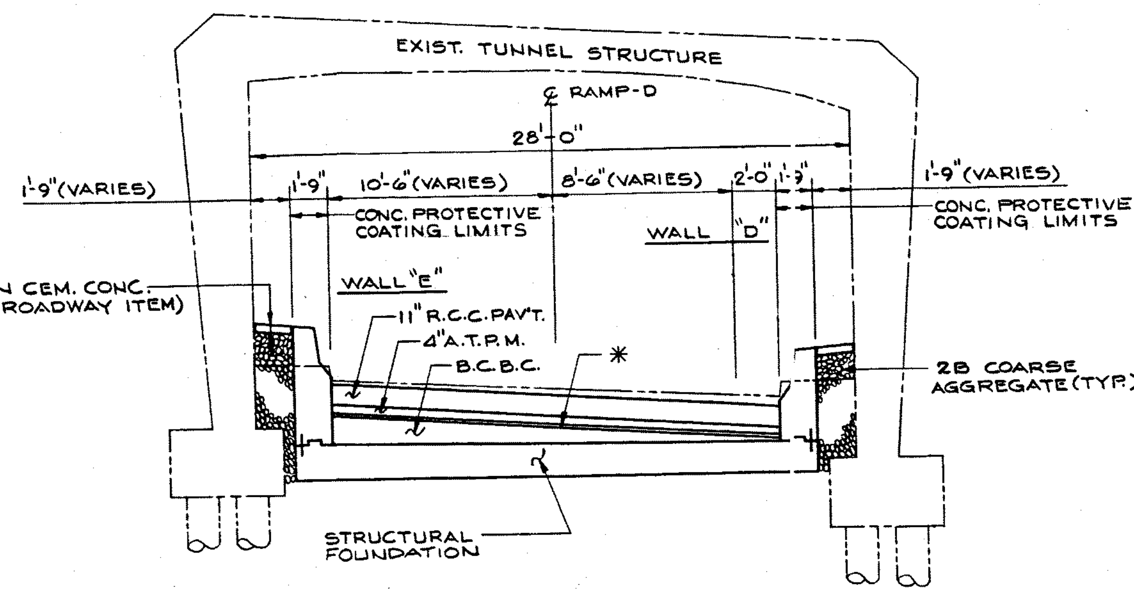
CROSS SECTION - STA. 27+59.00 SHOWN
STA. 27+32.00 TO STA. 29+48.00 SIMILAR



CROSS SECTION - STA. 648+54.50 SHOWN
TYP. BETWEEN EXIST COLUMN FOUNDATIONS



CROSS SECTION - STA. 648+68.00 SHOWN
STA. 646+25.00 TO STA. 649+14± SIMILAR



CROSS SECTION - STA. 649+76.00 SHOWN
STA. 649+14± TO STA. 650+03.00 SIMILAR

* 1" BIT. WEARING CRSE. OVERLAY AFTER PLACING B.C.B.C.

RAH
FS
RJK3

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

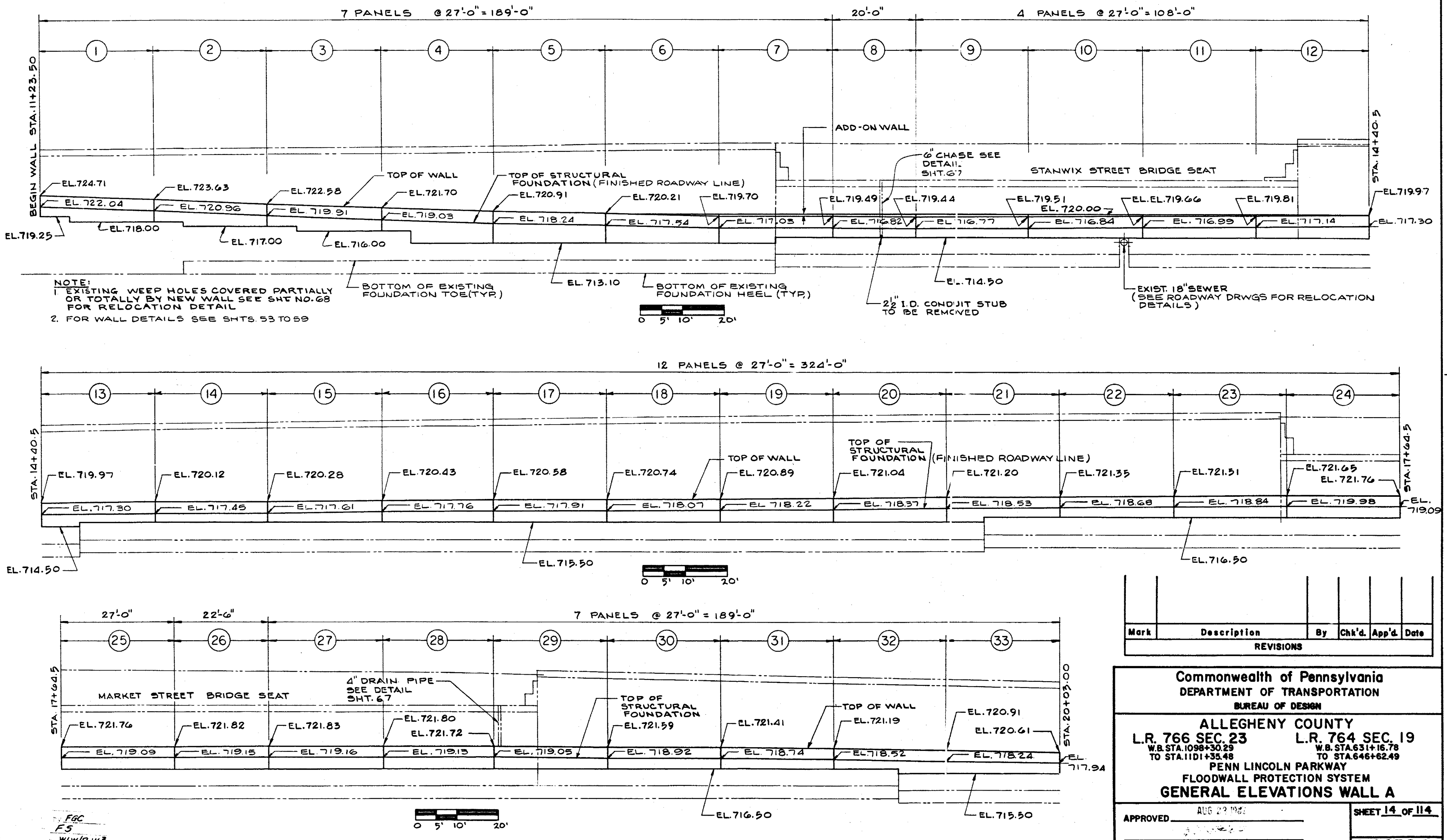
ALLEGHENY COUNTY
L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48
L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL SECTIONS

APPROVED AUG 23 1982
B.J. Kotalik
BRIDGE ENGINEER

SHEET 13 OF 114

S-14584

D-8002 (3-77)



FGC
FS
WLW/RJK

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL ELEVATIONS WALL A

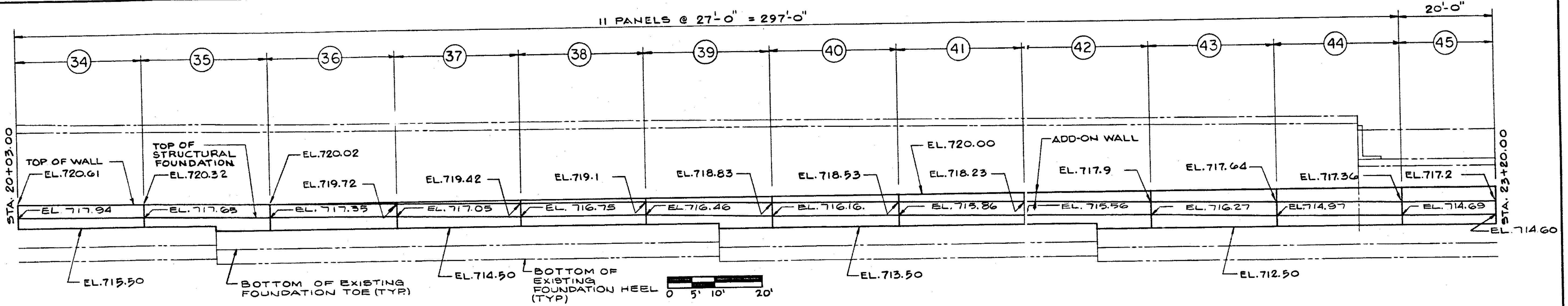
APPROVED AUG 23 1983

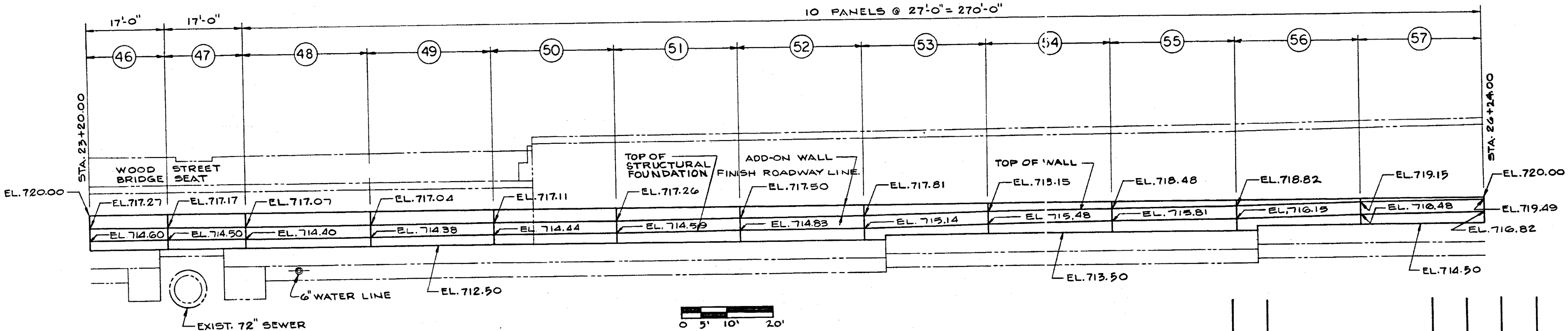
BRIDGE ENGINEER

SHEET 14 OF 114

S-14584

0009916





NOTE:
1. EXISTING WEEP HOLES COVERED PARTIALLY OR TOTALLY BY NEW WALL SEE SHT. NO. 68 FOR RELOCATION DETAIL
2. FOR DETAILS SEE SHTS. 59 TO 64

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23
W.B. STA.1098+30.29 TO STA.1101+35.48
L.R. 764 SEC. 19
W.B. STA.631+16.78 TO STA.646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL ELEVATIONS WALL A

APPROVED ______
BRIDGE ENGINEER

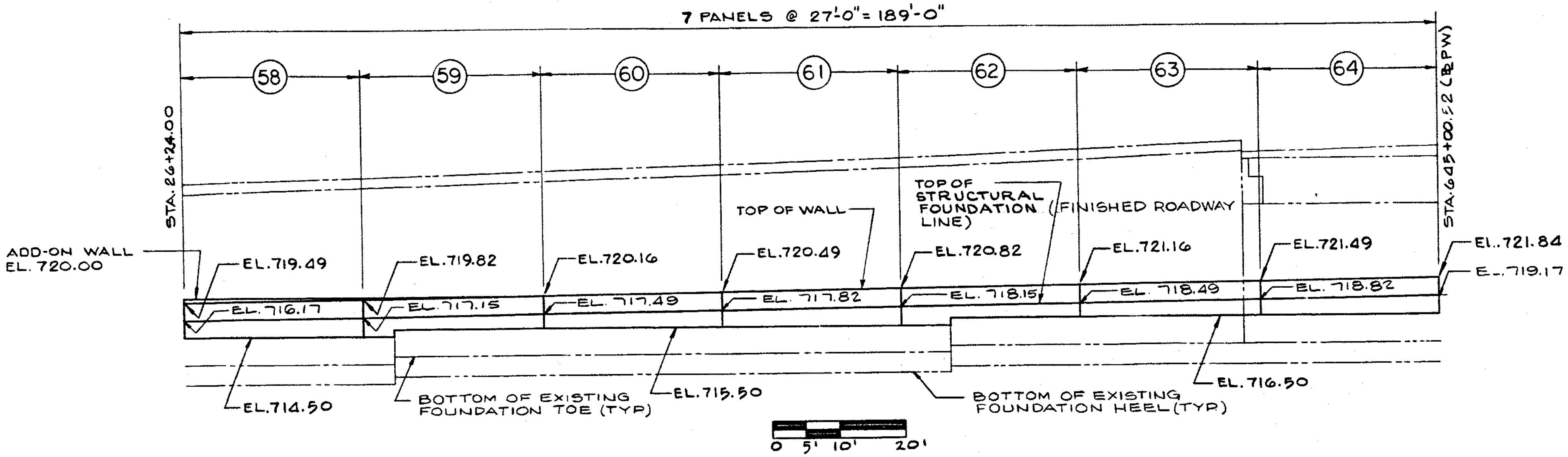
SHEET 15 OF 114

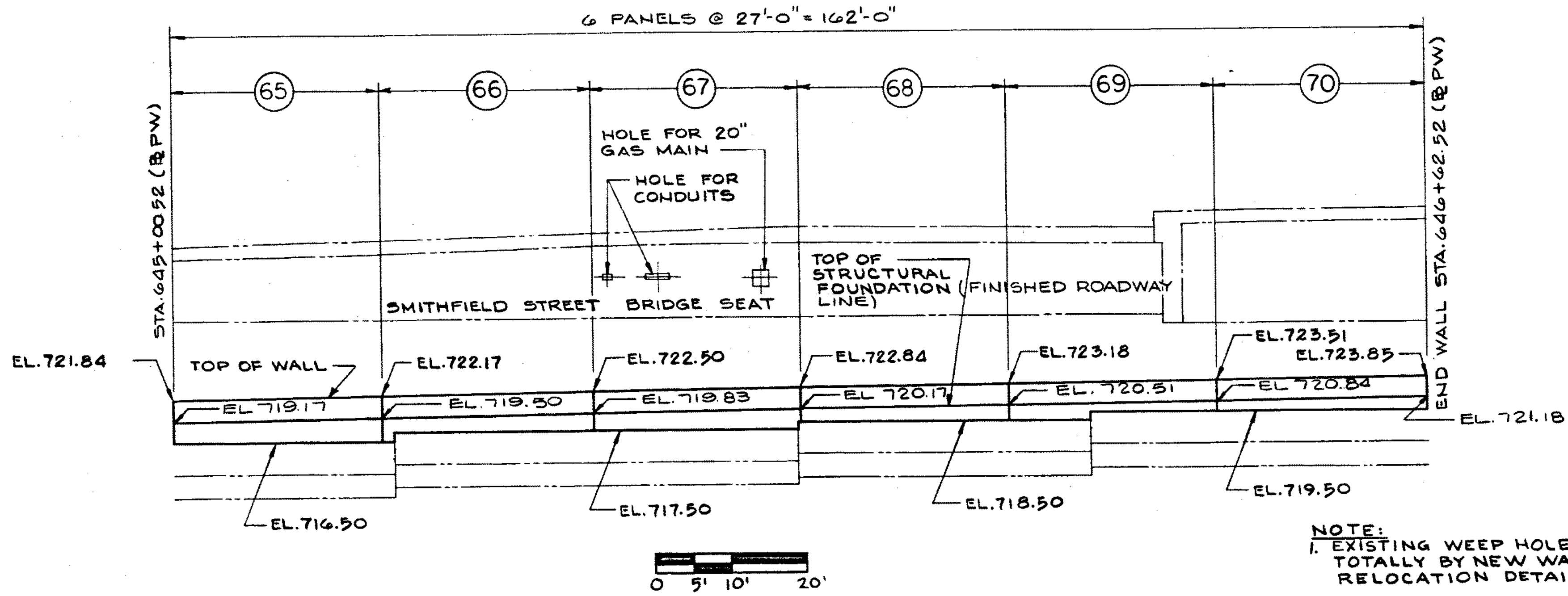
S-14584

FGC
FS
WLW/RJK

0009917

D-9003 (3-77)





NOTE:
1. EXISTING WEEP HOLES COVERED PARTIALLY OR TOTALLY BY NEW WALL SEE SHT. NO. 66 FOR RELOCATION DETAIL
2. FOR WALL DETAILS SEE SHTS 64 TO 66

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL ELEVATIONS WALL A

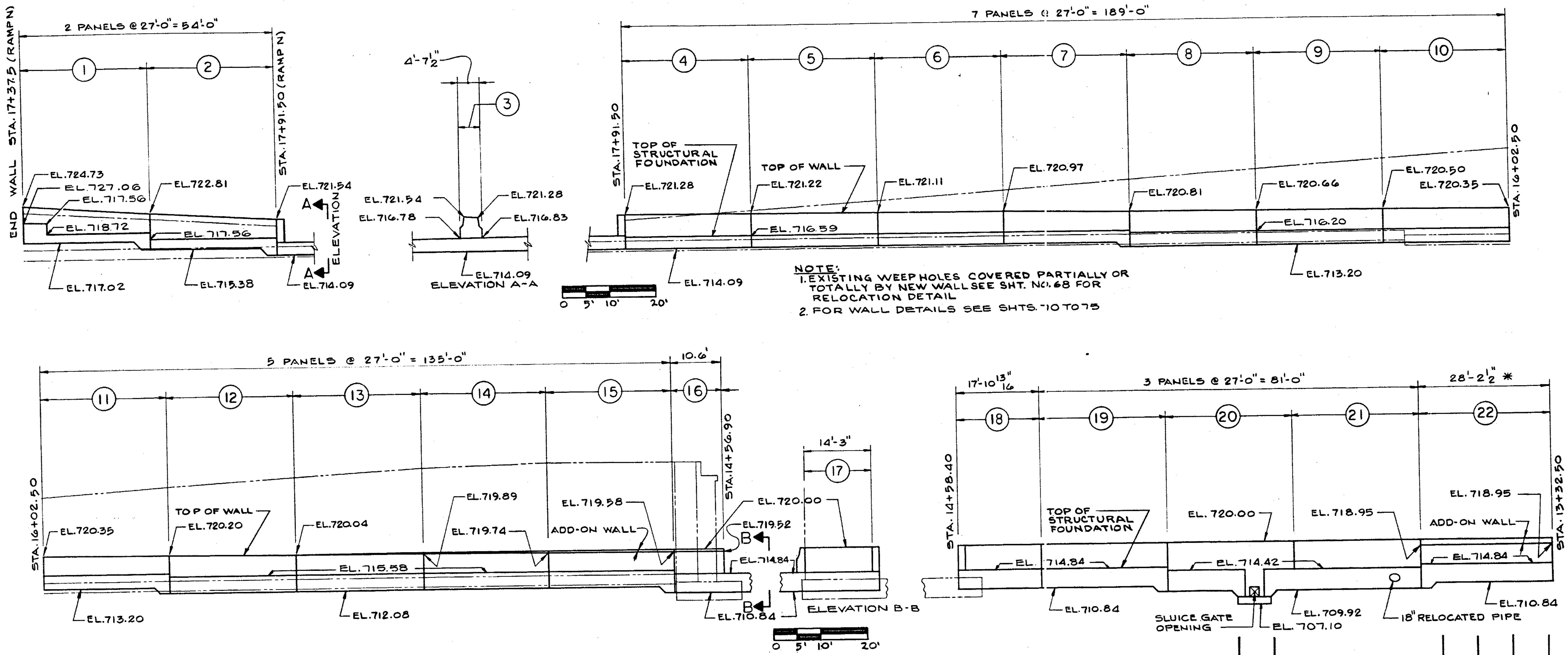
APPROVED AUG 23 1987

BRIDGE ENGINEER

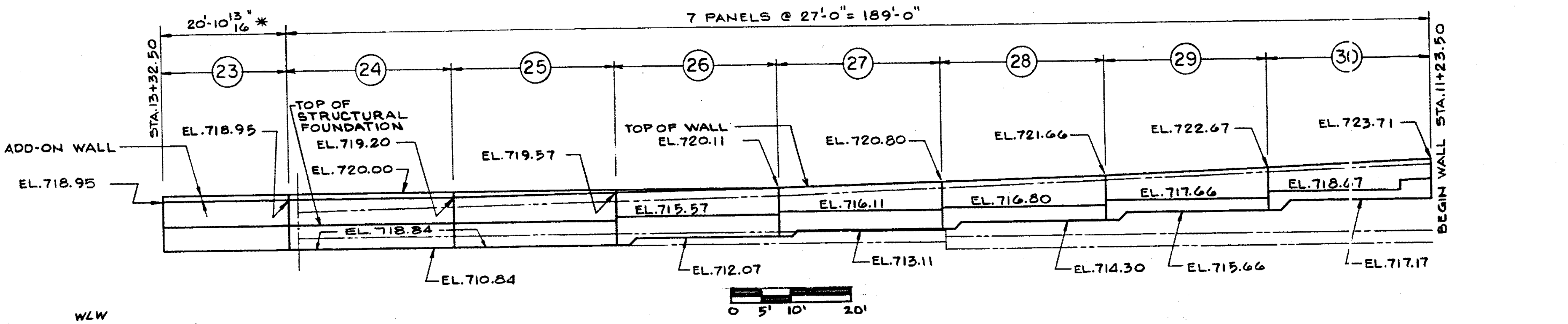
SHEET 16 OF 114

S-14584

FGC
FS
WLW/RJK[3]



NOTE:
1. EXISTING WEEP HOLES COVERED PARTIALLY OR TOTALLY BY NEW WALL SEE SHT. NO. 68 FOR RELOCATION DETAIL
2. FOR WALL DETAILS SEE SHTS. 70 TO 75



WLW
FS
WLW/RJH

* MEASURED ALONG FRONT FACE OF WALL.

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

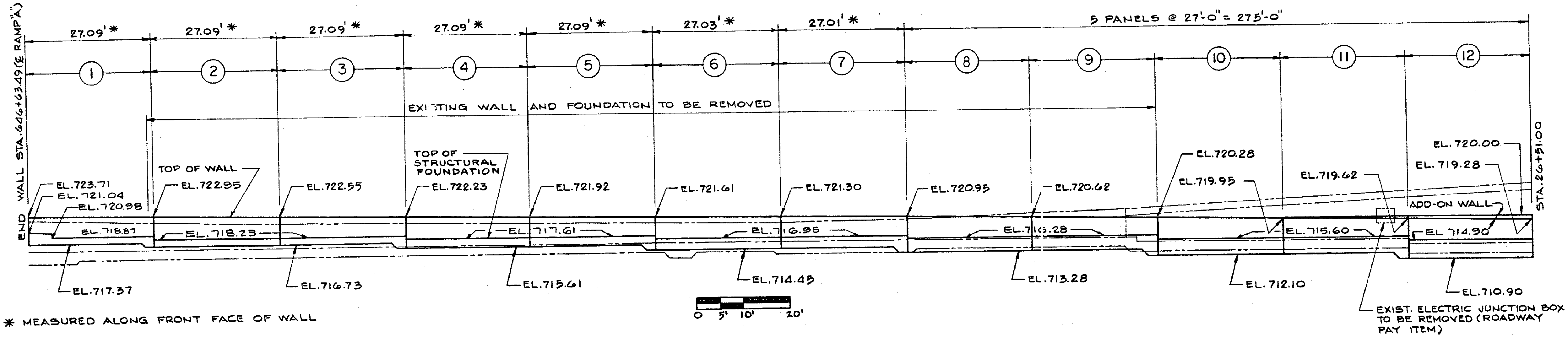
Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23 — W.B. STA. 1098+30.29 TO STA. 1101+35.48
L.R. 764 SEC. 19 — W.B. STA. 631+16.78 TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL ELEVATIONS WALL B

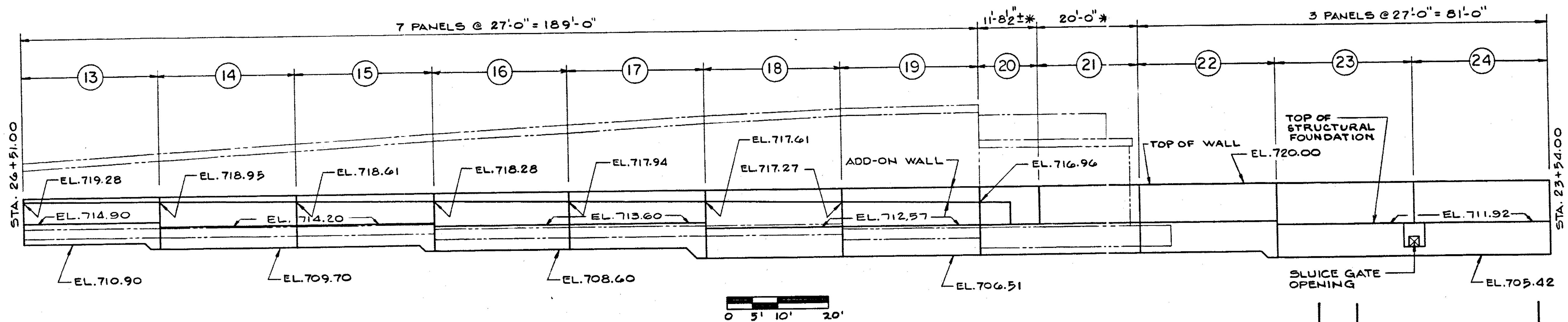
APPROVED ____
BRIDGE ENGINEER

SHEET 17 OF 114
S-14584

0009919



* MEASURED ALONG FRONT FACE OF WALL



NOTE:
1. EXISTING WEEP HOLES COVERED PARTIALLY OR TOTALLY BY NEW WALL SEE SHT. NO. 68 FOR RELOCATION DETAIL
2. FOR WALL DETAILS SEE SHTS. 80 TO 84

Mark	Description	By	Chk'd.	App'd.	Date
REVISIONS					

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

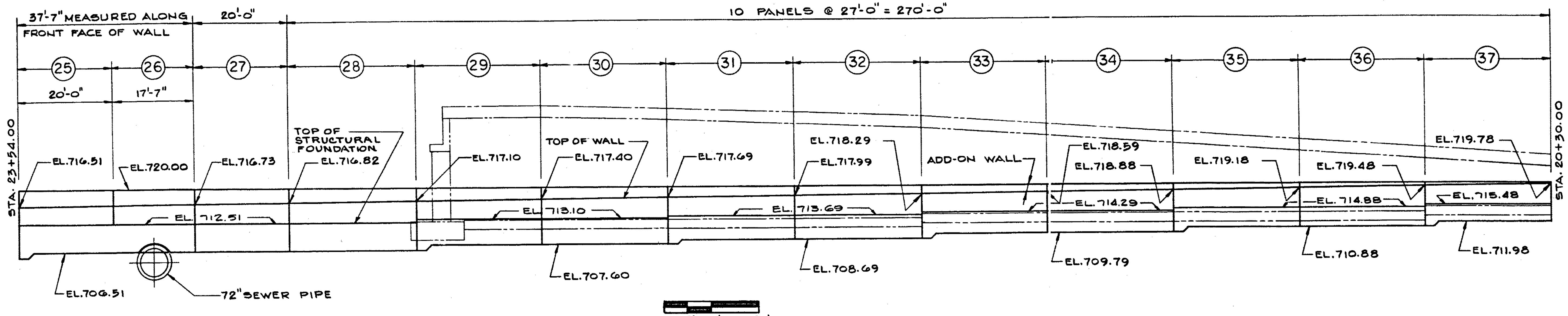
ALLEGHENY COUNTY
L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48
L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL ELEVATIONS WALL C

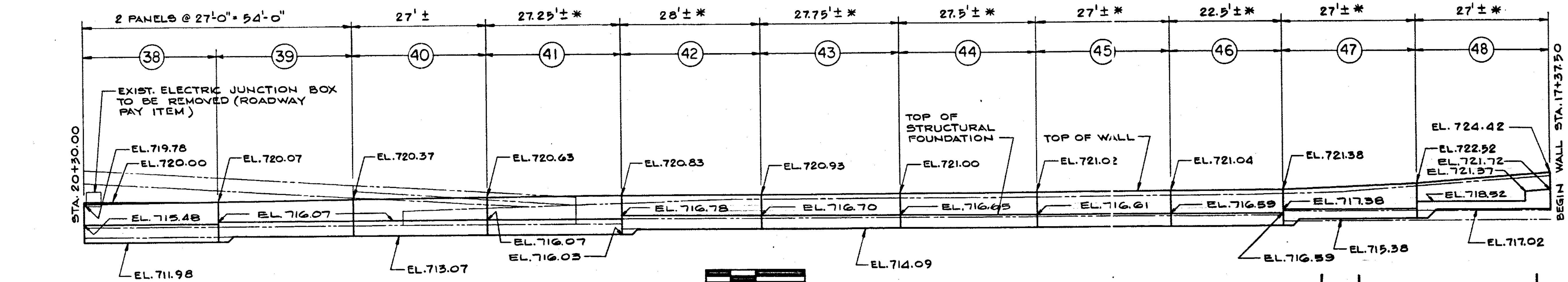
APPROVED AUG 23 1982
BRIDGE ENGINEER

SHEET 18 OF 114
S-14584

WLW
FS
WLW/RJK³

0009920





* MEASURED ALONG FRONT FACE OF WALL

NOTE:
1. EXISTING WEEP HOLES COVERED PARTIALLY OR TOTALLY BY NEW WALL SEE SHT. NO. 68 FOR RELOCATION DETAIL
2. FOR WALL DETAILS SEE SHTS. 85 TO 89

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA.1098+30.29 TO STA.1101+33.48

L.R. 764 SEC. 19
W.B. STA.631+16.78 TO STA.646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL ELEVATIONS WALL C

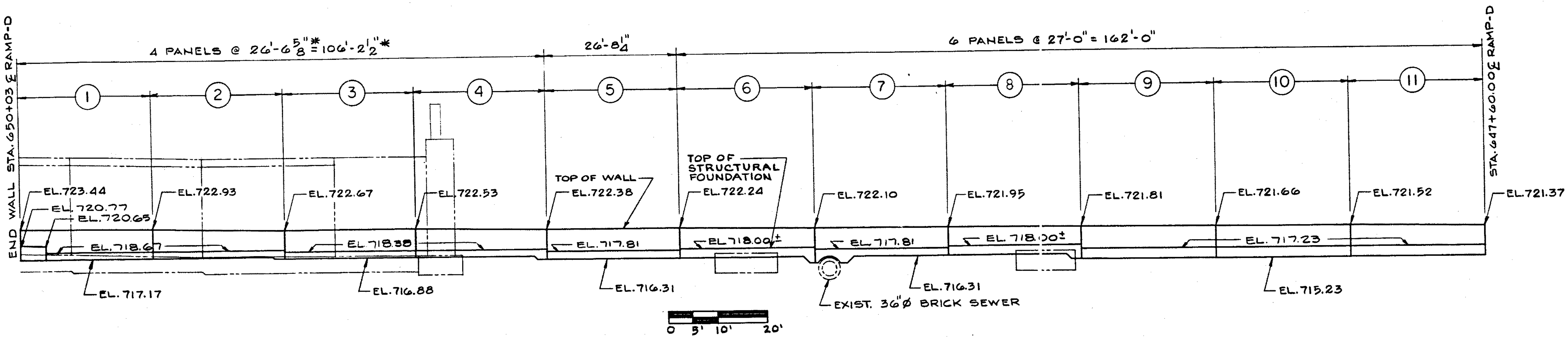
APPROVED AUG 23 1982
BRIDGE ENGINEER

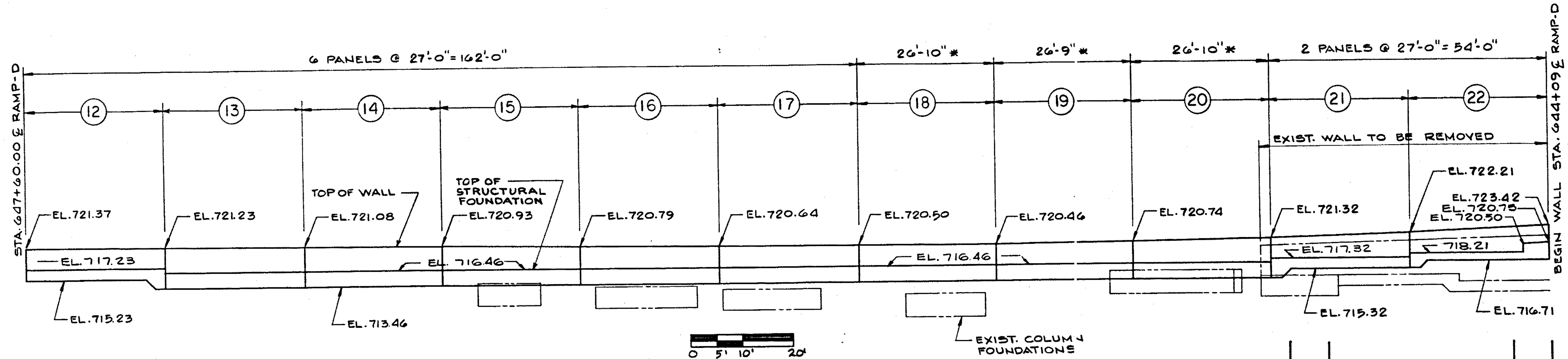
SHEET 19 OF 114

S-14584

WLW
FS
WLW/RJK3

0009921





*- MEASURED ALONG FRONT FACE OF WALL

NOTE
1. FOR WALL DETAILS SEE SHTS. 94. TO 98

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA.1098+30.29
TO STA.1101+35.48

L.R. 764 SEC. 19
W.B. STA.631+16.78
TO STA.646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL ELEVATIONS WALL D

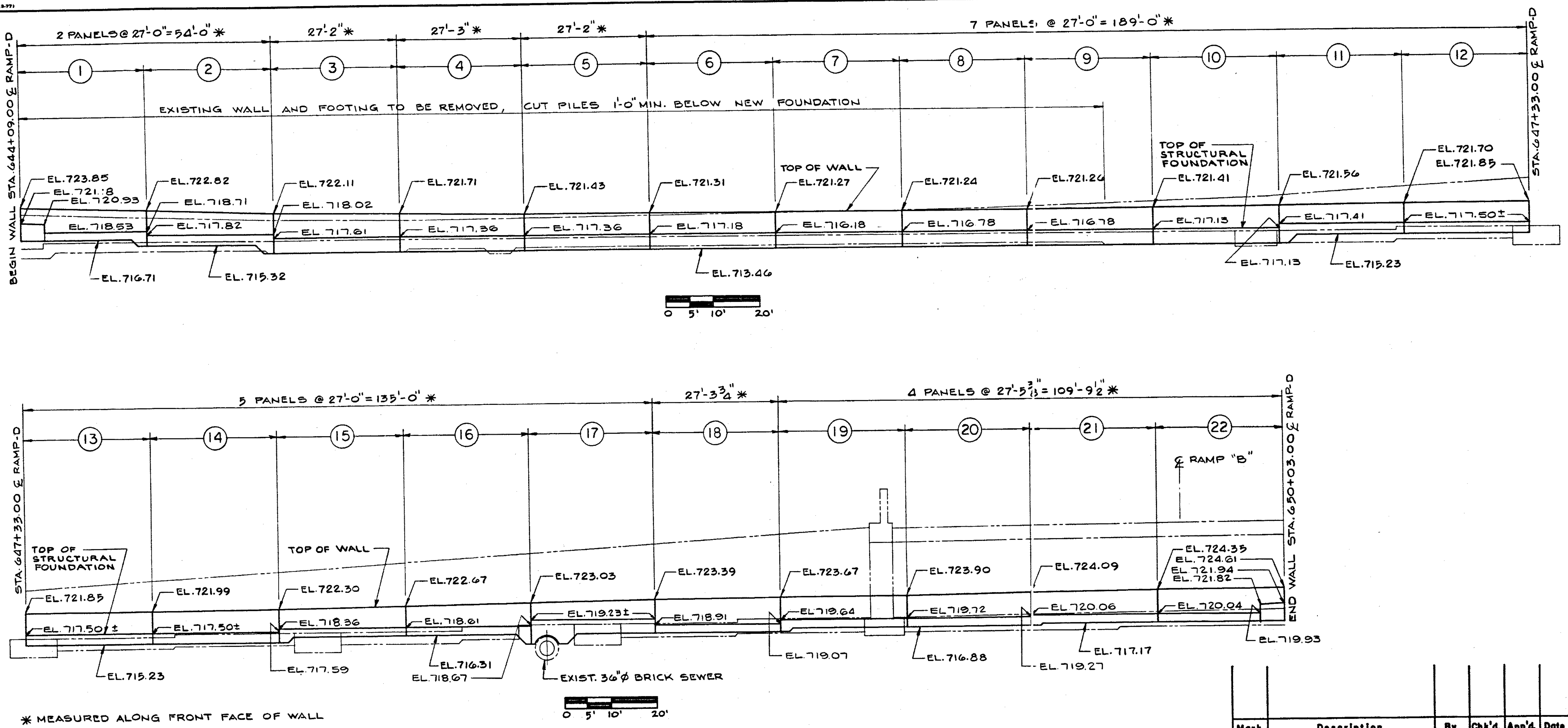
APPROVED AUG. 23 1982
B.J. Kotelk
BRIDGE ENGINEER

SHEET 20 OF 114

S-14584

WLW
FS
WLW/RJK3

0009922



* MEASURED ALONG FRONT FACE OF WALL

NOTE
1. FOR WALL DETAILS SEE SHTS. 100 TO 104

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+33.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
GENERAL ELEVATIONS WALL E

APPROVED AUG 23 1982

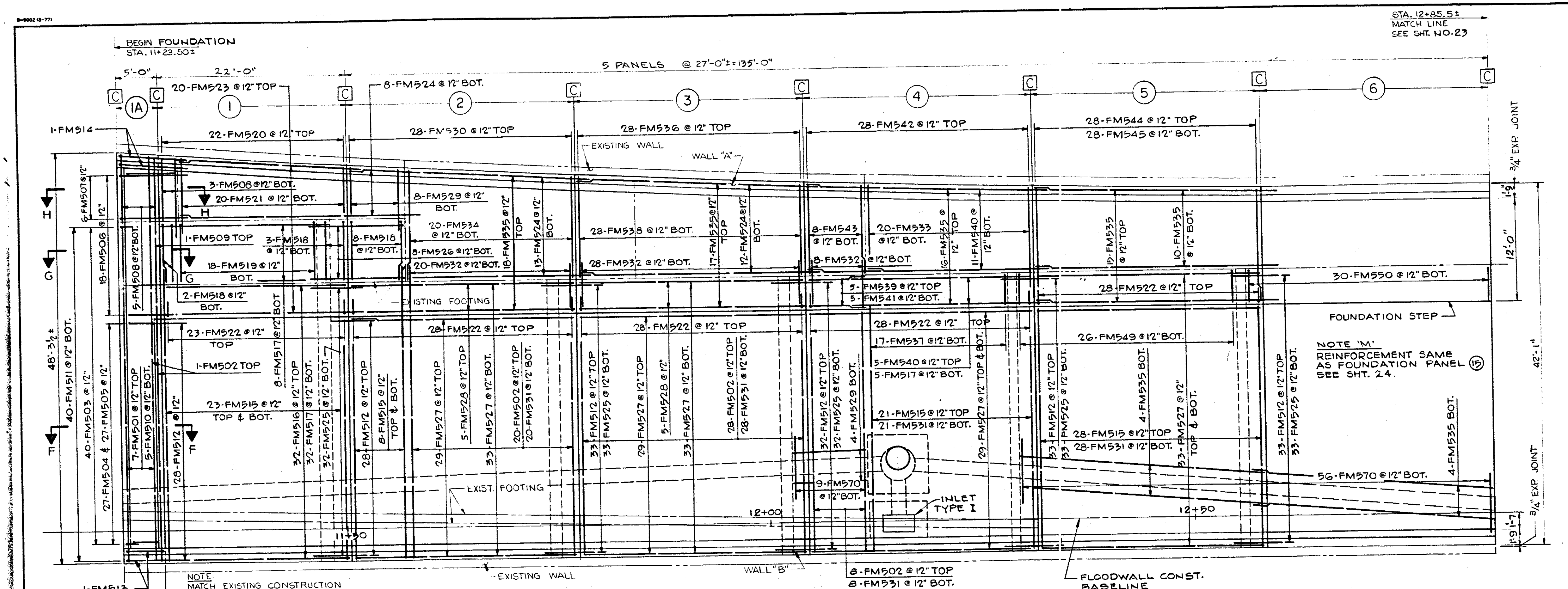
BRIDGE ENGINEER

SHEET 21 OF 114

S-14584

RAH
FS
WLW/RJK

0009923



FOUNDATION PLAN

0 1 2 3 4 5 10'

NOTES:

1. FOR CROSS SECTIONS SEE SHT. NO. 37 & 38
2. FOR INLET AND MANHOLE SEE SHT. NO. 49
3. FOR FOUNDATION ELEVATIONS SEE SHT. NO. 50
4. FOR CONSTRUCTION JOINT STEP DETAILS SEE WALL B SHT. NO. 74 & 75 AND 48
5. FOR CUT OFF WALL SECTIONS F, G & H SEE SHT. 48
6. FOR DOWELS SEE WALL A SHT. NO. 53 & 54, AND WALL B SHT. NO. 74 AND 75
7. FOR LOCATION SEE SHT. NO. 4 AND 5
8. FOR DRAINAGE PIPE HAUNCH SEE SHT. NO. 50
9. CUT REINFORCEMENT IN FIELD AS REQUIRED TO FIT AT MANHOLES AND INLETS.

LEGEND

(1) DENOTES FOUNDATION PANEL NUMBER

[C] DENOTES CONSTRUCTION JOINTS

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+50.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.52

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION PLAN PANELS 1 - 6

APPROVED AUG 23 1982

BRIDGE ENGINEER

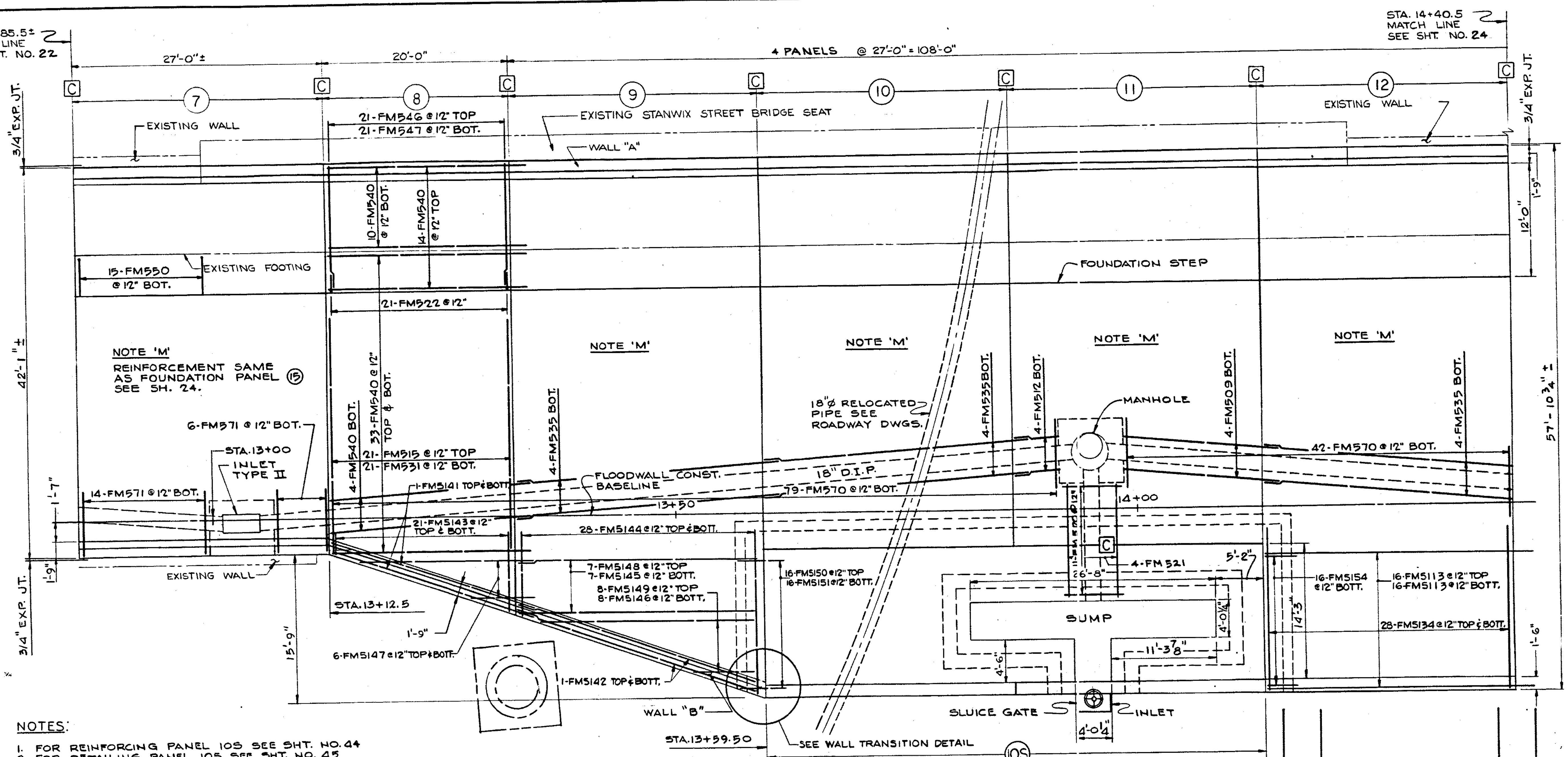
SHEET 22 OF 114

S-14584

JM / WLW
CLL / CLM
RJK

0009924

D-9002 (3-77)

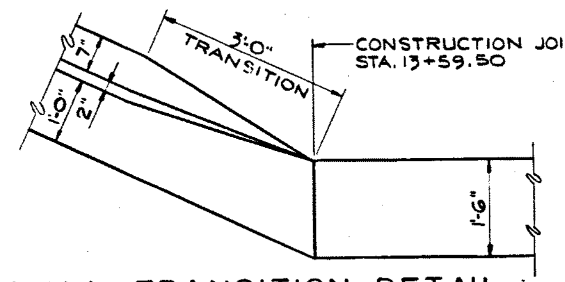


FOUNDATION PLAN

0 1' 2' 3' 4' 5' 10'

NOTES:

1. FOR REINFORCING PANEL 105 SEE SHT. NO. 44
2. FOR DETAILING PANEL 105 SEE SHT. NO. 45
3. FOR INLET AND MANHOLE DETAILS SEE SHT. NO. 49
4. FOR CROSS SECTIONS SEE SHT. NO. 38 AND 39
5. FOR FOUNDATION ELEVATIONS SEE SHT. NO. 45 AND 50
6. FOR CONSTRUCTION JOINT STEP DETAIL SEE SHT. NO. 45 AND 48 AND FOR WALL B SEE SHT. NO. 73 AND 74
7. FOR DOWELS SEE WALL A SHT. NO. 54 AND 55 FOR WALL B SEE SHT. NO. 73 AND 74
8. FOR LOCATION SEE SHT. NO. 5
9. FOR PIPE HAUNCH DETAIL SEE SHT. NO. 50
10. CUT REINFORCEMENT IN FIELD AS REQUIRED TO FIT FOR MANHOLES AND INLETS.



WALL TRANSITION DETAIL

0 1' 2' 3'

LEGEND

(1) DENOTES FOUNDATION PANEL NUMBER

[C] DENOTES CONSTRUCTION JOINTS

Mark	Description	By	Chk'd.	App'd.	Date
	REVISIONS				

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.52

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION PLAN PANELS 7-12

APPROVED [illegible]
BRIDGE ENGINEER

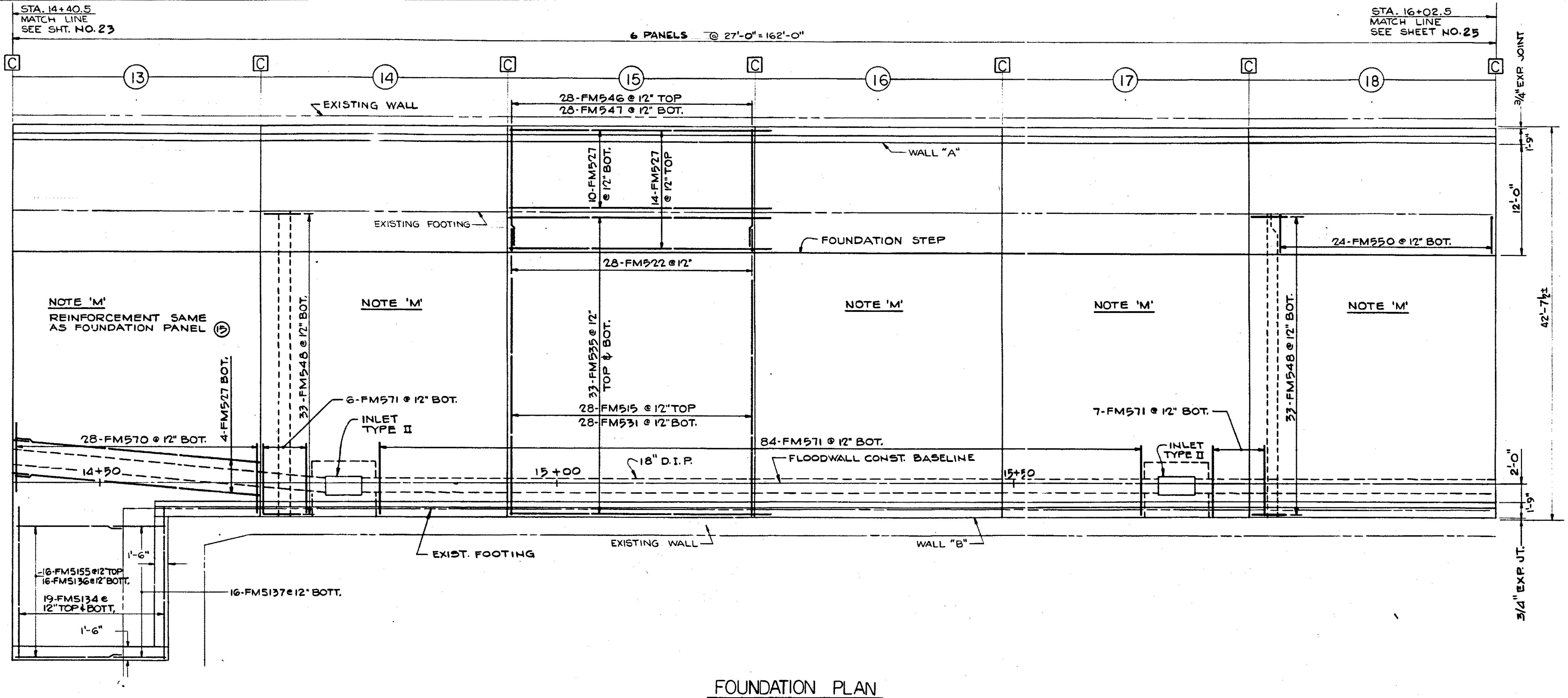
SHEET 23 OF 114

S-14584

JM/WLW
CLL/CLM
RJK

0009925

B-8002 (3-77)



FOUNDATION PLAN

0 1 2 3 4 5 10'

NOTES:

1. FOR INLET DETAILS SEE SHT. NO. 49
2. FOR CROSS SECTIONS SEE SHT. NO. 39
3. FOR FOUNDATION ELEVATIONS SEE SHT. NO. 50
4. FOR CONSTRUCTION JOINT STEP DETAIL SEE SHT. NO. 48 FOR WALL B SEE SHT. NO. 72 AND 73
5. FOR DOWELS SEE WALL A SHT. NO. 55 AND 56 FOR WALL B SEE SHT. NO. 72 AND 73
6. FOR LOCATION SEE SHT. NO. 5
7. FOR PIPE HAUNCH DETAIL SEE SHT. NO. 50
8. CUT REINFORCEMENT IN FIELD AS REQUIRED TO FIT FOR MANHOLES AND INLETS

LEGEND

(1) DENOTES FOUNDATION PANEL NUMBER

[C] DENOTES CONSTRUCTION JOINTS

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+50.29 TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.52

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION PLAN PANELS 13-18

APPROVED AUG 23 1982

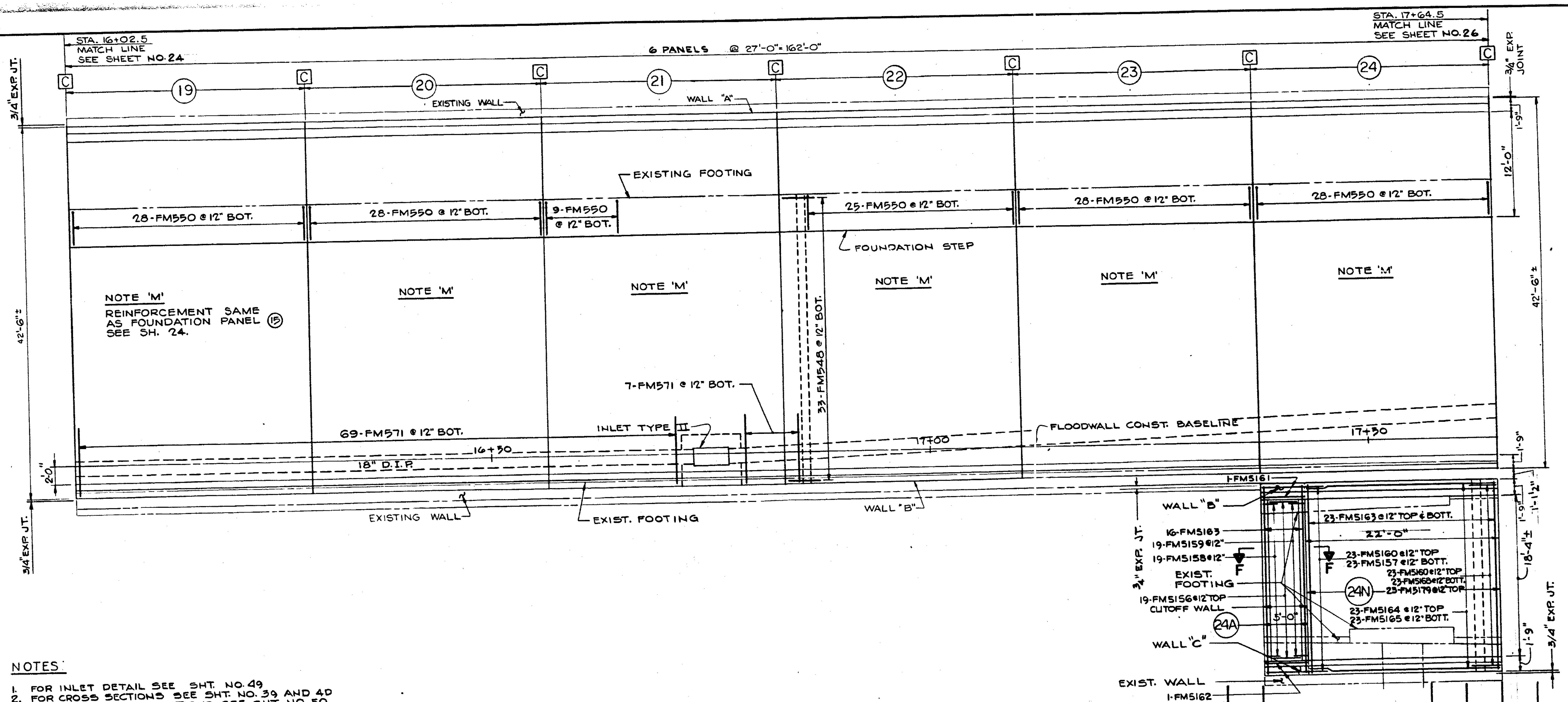
BRIDGE ENGINEER

SHEET 24 OF 114

S-14584

UM/WLW
FSI/RJK
RJK

0009926



NOTES:

1. FOR INLET DETAIL SEE SHT. NO. 49
2. FOR CROSS SECTIONS SEE SHT. NO. 39 AND 40
3. FOR FOUNDATION ELEVATIONS SEE SHT. NO. 50
4. FOR CONSTRUCTION JOINT STEP SEE WALL B SHT. NO. 70 AND 71, FOR WALL C SEE SHT. NO. 48 AND 89
5. FOR CUTOFF WALL DETAIL SEE SHT. NO. 48
6. FOR DOWELS SEE WALL A SHT. NO. 56 AND 57 FOR WALL B SEE SHT. NO. 70 AND 71 AND FOR WALL C SEE SHT. NO. 89
7. FOR LOCATION SEE SHT. NO. 6
8. FOR PIPE HAUNCH DETAIL SEE SHT. NO. 50
9. CUT REINFORCEMENT IN FIELD AS REQUIRED TO FIT FOR MANHOLES AND INLETS.

FOUNDATION PLAN

0 1' 2' 3' 4' 5' 10'

LEGEND

(1) DENOTES FOUNDATION PANEL NUMBER

[C] DENOTES CONSTRUCTION JOINTS

Mark	Description	By	Chk'd.	App'd.	Date
REVISIONS					

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.52

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION PLAN PANELS 19-24

APPROVED [illegible]

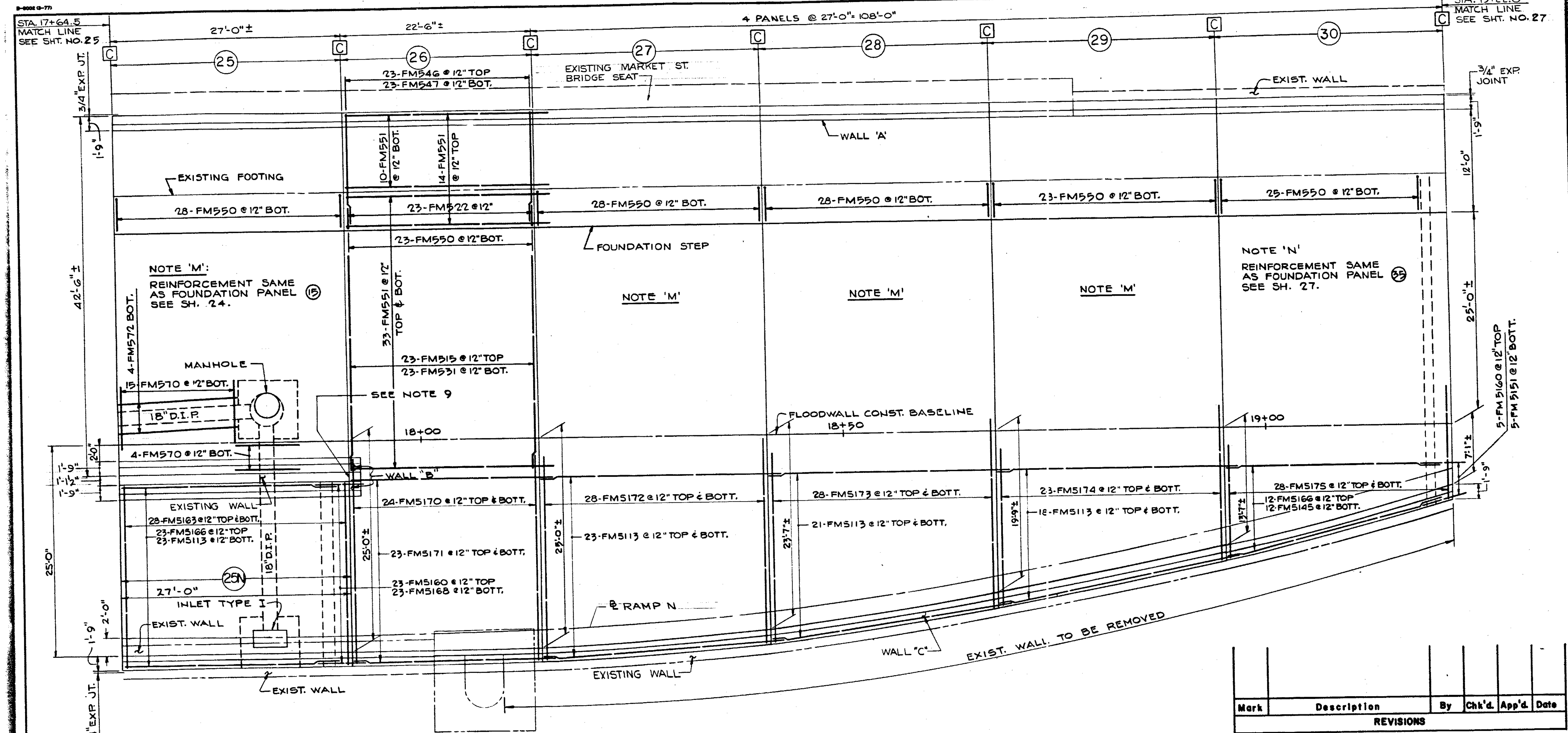
BRIDGE ENGINEER

SHEET 25 OF 114

S-14584

JM/WLW
FS/RJK
RJK3

0009927



FOUNDATION PLAN

0 1 2 3 4 5 10'

NOTES:

1. FOR MANHOLE AND INLET DETAILS SEE SHT. NO. 49
2. FOR CROSS SECTIONS SEE SHT. NO. 40 AND 41
3. FOR FOUNDATION ELEVATIONS SEE SHT. NO. 50
4. FOR CONSTRUCTION JOINT STEP SEE WALL B SHT. NO. 70 FOR WALL C SEE SHT. NO. 88 AND 89 AND SHT. NO. 48
5. FOR DOWELS SEE WALL A SHT. NO. 57 AND 58 FOR WALL B SEE SHT. NO. 70 AND FOR WALL C SEE SHT. NO. 89
6. FOR LOCATION SEE SHT. NO. 6 AND 7
7. FOR PIPE HAUNCH DETAIL SEE SHT. NO. 50
8. CUT REINFORCEMENT IN FIELD AS REQUIRED TO FIT FOR MANHOLES AND INLETS
9. STA. 17+91.5 END EXIST. WALL, EXIST. 2½' x 2' CONC. BLOCK TO BE REMOVED. REMOVE EXIST. WALL BACK TO STA. 17+61.5 OR FIRST CONSTRUCTION JOINT.

JH/WLW
FS/RJK
RJK3

LEGEND
(1) DENOTES FOUNDATION PANEL NUMBER
[C] DENOTES CONSTRUCTION JOINTS

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48
L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.52
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION PLAN PANELS 25-30

APPROVED AUG 23 1982
BRIDGE ENGINEER

SHEET 26 OF 114

S-14584

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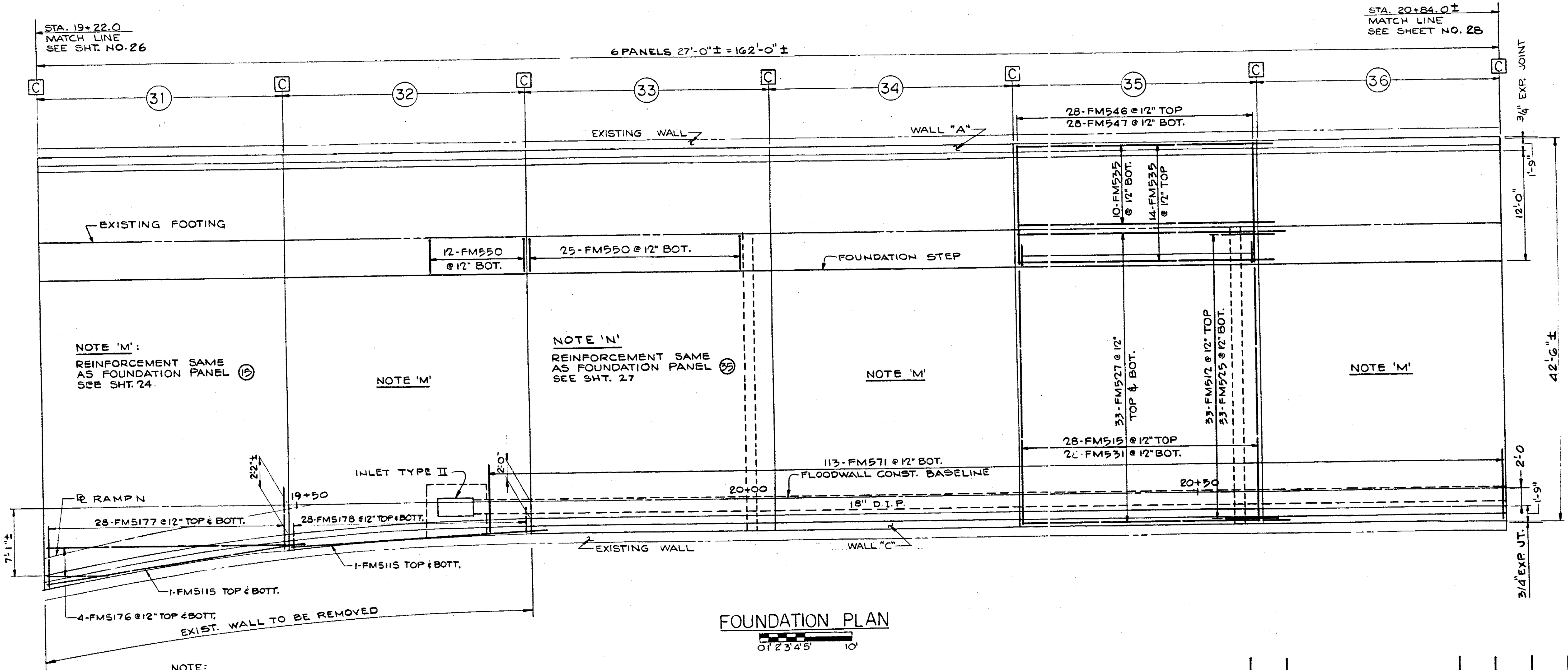
D-8002 (3-77)



FOUNDATION PLAN

NOTE:
1. MATCH EXISTING CONSTRUCTION JOINTS WALL "C" STA. 19+76± TO STA. 22+46±
2. FOR INLET DETAIL SEE SHT. NO. 49
3. FOR CROSS SECTIONS SEE SHT. NO. 40 AND 41
4. FOR FOUNDATION ELEVATIONS SEE SHT. NO. 50
5. FOR CONSTRUCTION JOINT STEP DETAIL SEE WALL C SHT. NO. 87 AND 88 AND SHT. NO. 48
6. FOR DOWELS SEE WALL A SHT. NO. 59 AND 60, FOR WALL C SEE SHT. NO. 87 AND 88
7. FOR LOCATION SEE SHT. NO. 7
8. FOR PIPE HAUNCH DETAIL SEE SHT. NO. 50
9. CUT REINFORCEMENT IN FIELD AS REQUIRED TO FIT FOR MANHOLES AND INLETS.

LEGEND
(1) DENOTES FOUNDATION PANEL NUMBER
[C] DENOTES CONSTRUCTION JOINTS

Mark	Description	By	Chk'd.	App'd.	Date
	REVISIONS				

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

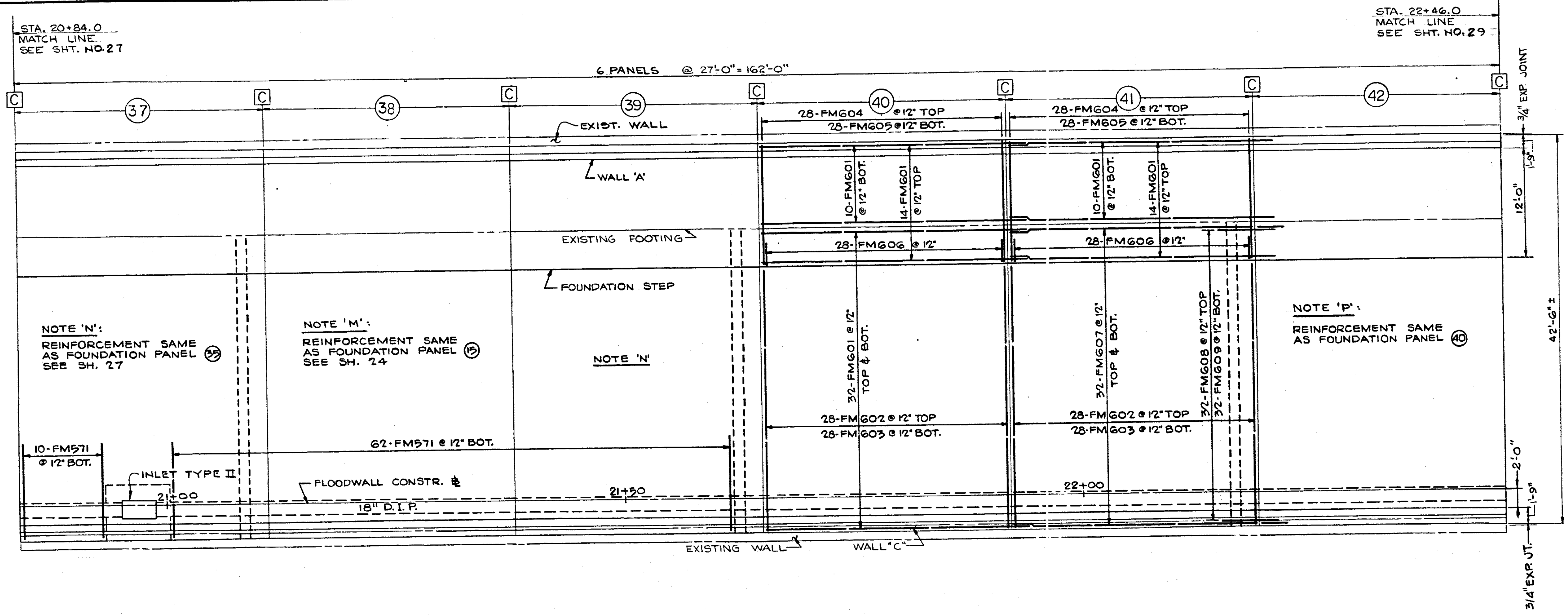
ALLEGHENY COUNTY
L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48
L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.52
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION PLAN PANELS 31-36

APPROVED AUG 23 1982
BRIDGE ENGINEER

SHEET 27 OF 114
S-14584

JM/WLW
FS/RJK
RJK3

0009929



FOUNDATION PLAN

0 1 2 3 4 5 10'

NOTES:

1. FOR CROSS SECTIONS SEE SHT. NO. 41
2. FOR INLET DETAILS SEE SHT. NO. 49
3. FOR FOUNDATION ELEVATIONS SEE SHT. NO. 50
4. FOR CONSTRUCTION JOINT STEP DETAIL SEE WALL C SHT. NO. 85, 86 AND 49
5. FOR DOWELS SEE WALL A SHT. NO. 60 AND 61 FOR WALL C SEE SHT. NO. 85 AND 86
6. FOR LOCATION SEE SHT. NO. 7 AND 8
7. FOR PIPE HAUNCH DETAIL SEE SHT. NO. 50
8. CUT REINFORCEMENT IN FIELD AS REQUIRED TO FIT FOR MANHOLE AND INLETS

LEGEND

(1) DENOTES FOUNDATION PANEL NUMBER

[C] DENOTES CONSTRUCTION JOINTS

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Designed by JM/WLW
Drawn by FS/RJK
Checked by RJK

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.52

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION PLAN PANELS 37-42

APPROVED ____
BRIDGE ENGINEER

SHEET 28 OF 114

S-14584

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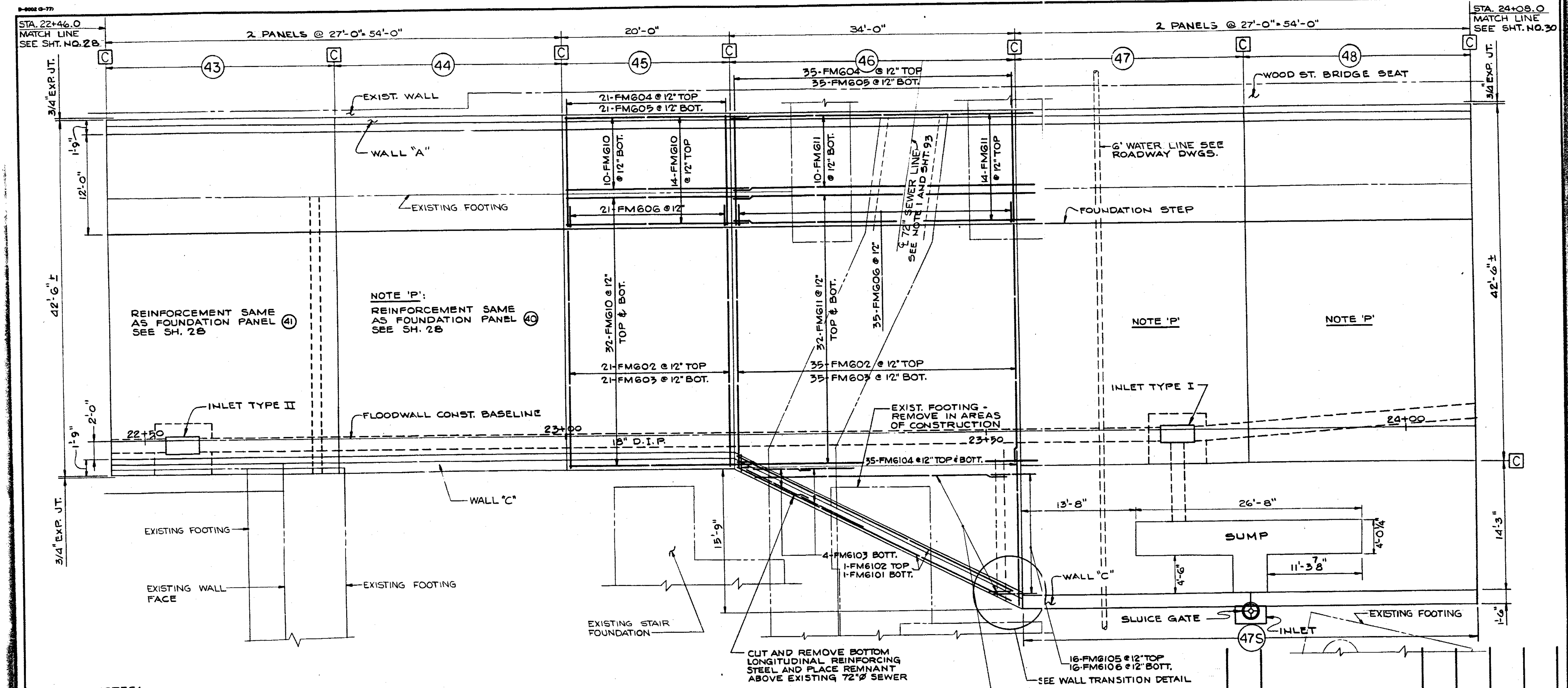


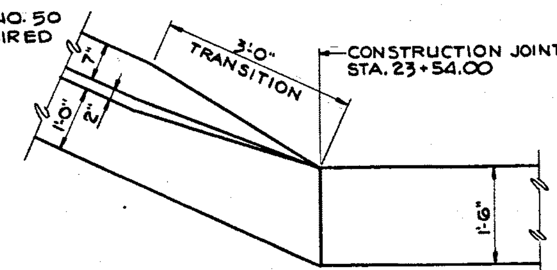
FOUNDATION PLAN

0 1 2 3 4 5 10'

NOTES:

1. APPROXIMATE LOCATION OF 72" SEWER LINE SHOWN. THIS IS A 3 RING BRICK SEWER. THE APPROXIMATE ELEVATION OF THE TOP OF THE SEWER LINE AT WALL "A" IS 708.50. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION AND ELEVATION AND REPORT THEM TO THE ENGINEER. THE CONTRACTOR SHALL TAKE CARE NOT TO DAMAGE THE SEWER LINE IN ANY WAY. ANY DAMAGE TO THE SEWER LINE SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE TO THE SATISFACTION OF THE CITY OF PITTSBURGH AND THE ENGINEER.
2. FOR REINFORCING PANEL 47S SEE SHT. NO. 46
3. FOR DETAILING PANEL 47S SEE SHT. 47
4. FOR INLET AND MANHOLE DETAIL SEE SHT. 49
5. FOR CROSS SECTIONS SEE SHT. NO. 42
6. FOR FOUNDATION ELEVATIONS SEE SHT. NO. 47 AND 50
7. FOR CONSTRUCTION JOINT STEP DETAIL SEE WALL C SHT. NO. 84 AND 85 AND 48
8. FOR DOWELS SEE WALL A SHT. NO. 61 AND 62, FOR WALL C SHT. NO. 85 AND 89
9. FOR LOCATION SEE SHT. NO. 8
10. FOR PIPE HAUNCH DETAIL SEE SHT. NO. 50
11. CUT REINFORCEMENT IN FIELD AS REQUIRED TO FIT FOR MANHOLE AND INLETS.

JM/WLW
FS/RJK
RJK3



WALL TRANSITION DETAIL

0 1' 2' 3'

LEGEND

(1) DENOTES FOUNDATION PANEL NUMBER

[C] DENOTES CONSTRUCTION JOINTS

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.52

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION PLAN PANELS 43-48

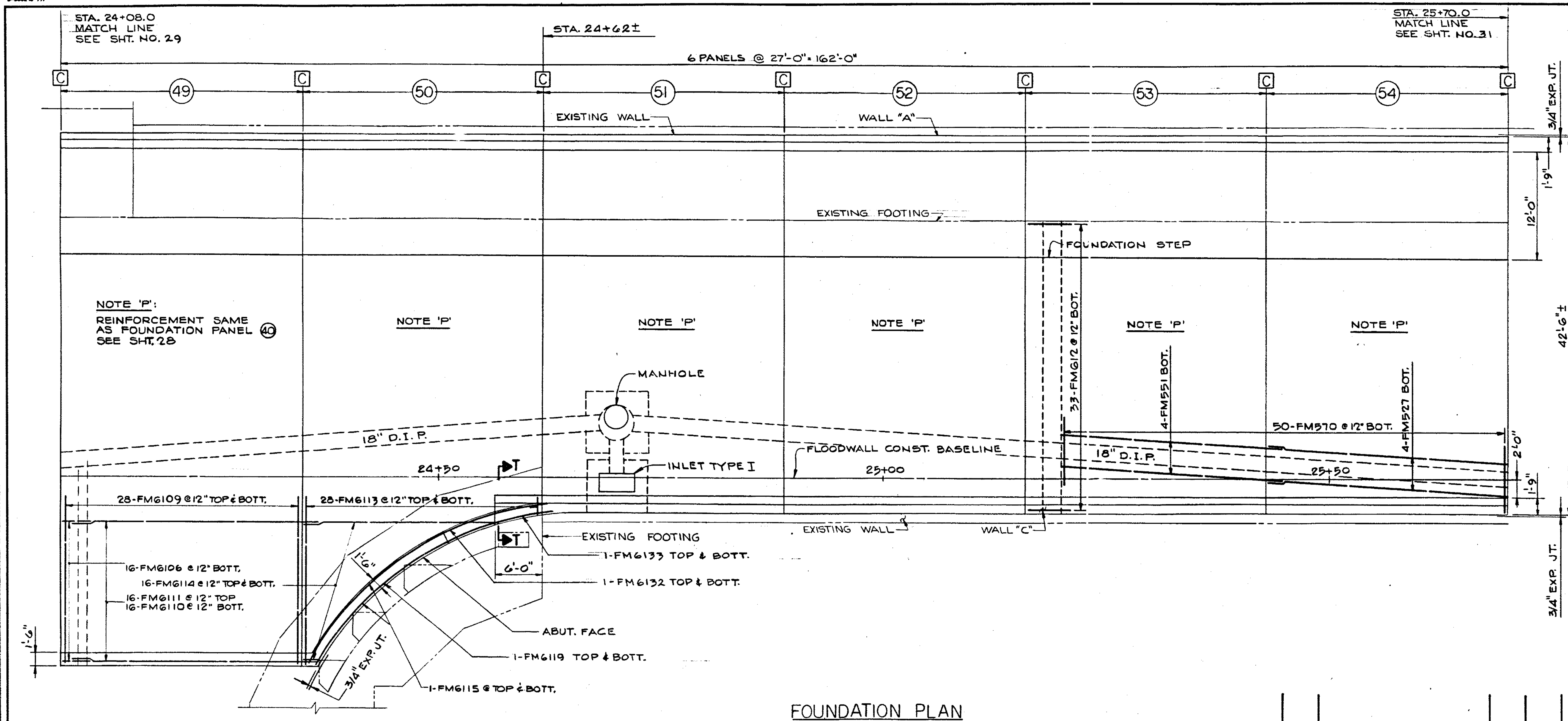
APPROVED AUG. 23 1982
BRIDGE ENGINEER

SHEET 29 OF 114

S-14584

000993

8-6002 (3-77)



FOUNDATION PLAN

0 1' 2' 3' 4' 5' 10'

NOTE:
1. MATCH EXISTING CONSTRUCTION JOINT STA. 24+62± TO STA. 25+70± WALL "C"
2. FOR INLET AND MANHOLE DETAIL SEE SHT. NO. 49
3. FOR CROSS SECTIONS SEE SHT. NO. 39 AND 41
4. FOR FOUNDATION ELEVATIONS SEE SHT. NO. 47 AND 50
5. FOR CONSTRUCTION JOINT STEP DETAILS SEE WALL C SHT. NO. 83 AND 84, AND SHT. NO. 48
6. FOR DOWELS SEE WALL A SHT. NO. 62 AND 63 AND FOR WALL C SEE SHT. NO. 83 AND 84
7. FOR LOCATION SEE SHT. NO. 8 AND 9
8. FOR SECTION T-T SEE SHT. NO. 91
9. FOR PIPE HAUNCH DETAIL SEE SHT. NO. 50

LEGEND
(1) DENOTES FOUNDATION PANEL NUMBER
[C] DENOTE CONSTRUCTION JOINTS

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

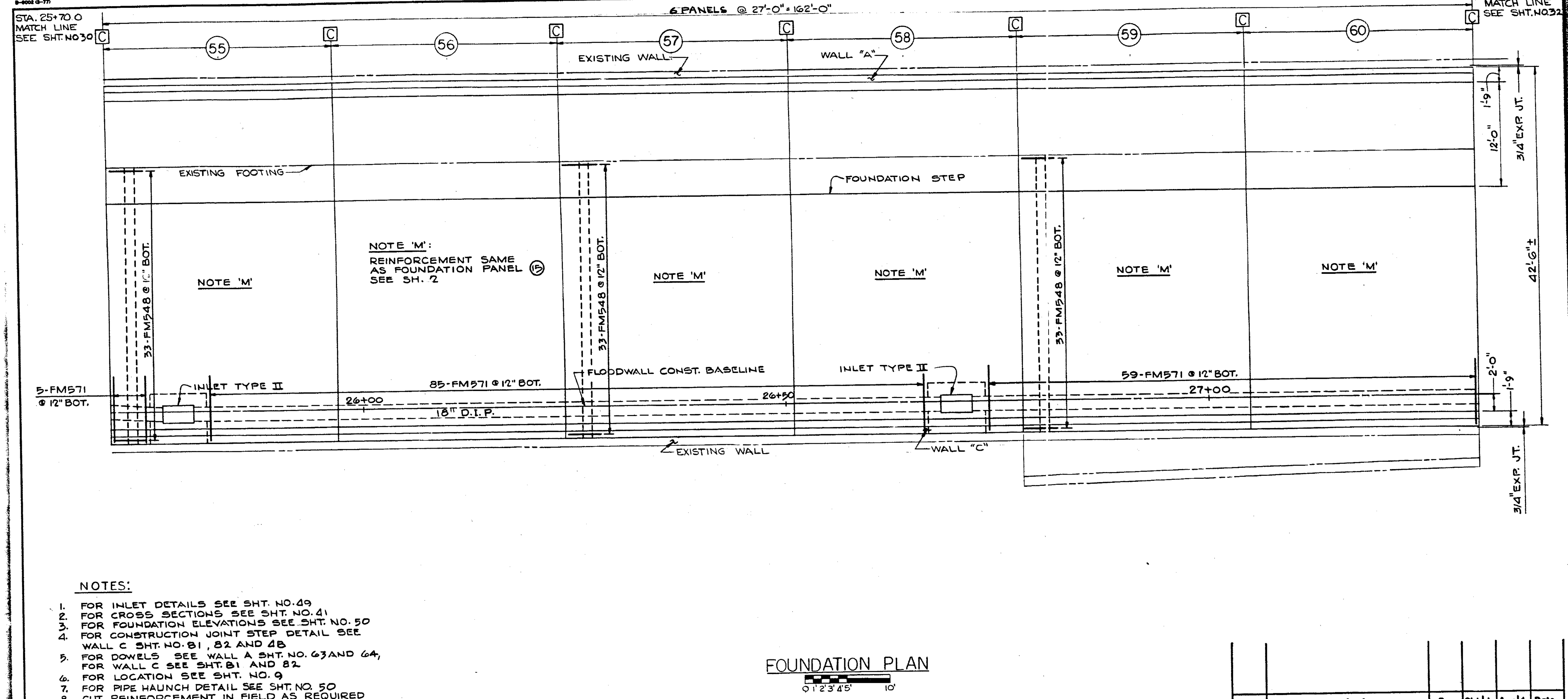
ALLEGHENY COUNTY
L.R. 766 SEC. 23 — W.B. STA. 1098+30.29 TO STA. 1101+35.48
L.R. 764 SEC. 19 — W.B. STA. 631+16.78 TO STA. 646+62.52
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION PLAN PANELS 49-54

APPROVED AUG 13 1987
0009932
BRIDGE ENGINEER

SHEET 30 OF 114

S-14584

JM/WLW
FS/RJH
RJK³



NOTES:

1. FOR INLET DETAILS SEE SHT. NO. 49
2. FOR CROSS SECTIONS SEE SHT. NO. 41
3. FOR FOUNDATION ELEVATIONS SEE SHT. NO. 50
4. FOR CONSTRUCTION JOINT STEP DETAIL SEE WALL C SHT. NO. 81, 82 AND 48
5. FOR DOWELS SEE WALL A SHT. NO. 63 AND 64, FOR WALL C SEE SHT. 81 AND 82
6. FOR LOCATION SEE SHT. NO. 9
7. FOR PIPE HAUNCH DETAIL SEE SHT. NO. 50
8. CUT REINFORCEMENT IN FIELD AS REQUIRED TO FIT FOR MANHOLES AND INLETS

LEGEND

(1) DENOTES FOUNDATION PANEL NUMBER

[C] DENOTES CONSTRUCTION JOINTS

Mark	Description	By	Chk'd.	App'd.	Date
REVISIONS					

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.52

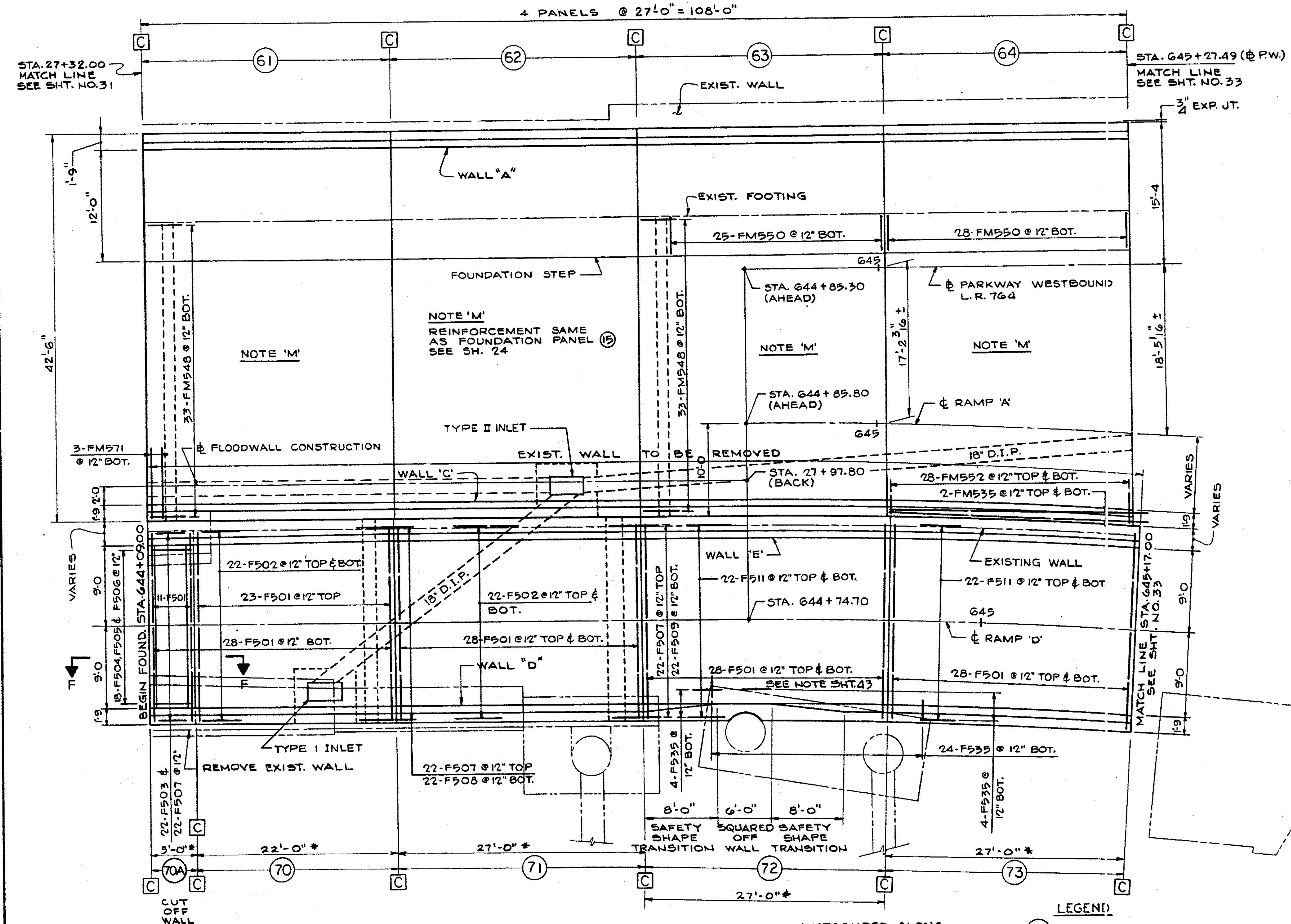
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION PLAN PANELS 55-60

APPROVED AUG 23 1982
0009933
BRIDGE ENGINEER

SHEET 31 OF 114

S-14584

JM/WLW
FS/RJK
RJK3



FOUNDATION PLAN

0 1 2 3 4 5 10'

* MEASURED ALONG ℄ RAMP D

LEGEND

(1) DENOTES FOUNDATION PANEL NUMBER

[C] DENOTES CONSTRUCTION JOINTS.

NOTES

1. CUT REINFORCEMENT IN FIELD AS REQUIRED TO FIT FOR MANHOLES AND INLETS
2. FOR PIPE HAUNCH DETAIL SEE SHT. NO. 50
3. FOR SECTION F-F SEE SHT. NO. 48
4. FOR CUTOFF WALL SECTION SEE SHT. 48
5. FOR INLET DETAILS SEE SHT. 49
6. FOR CROSS SECTIONS SEE SHT. 42
7. FOR FOUNDATION ELEVATIONS SEE SHT. 50, FOR WALL E SEE SHT. 100 FOR WALL D SEE SHT. 97 & 98
8. FOR CONSTRUCTION JOINT STEP DETAILS SEE WALL D SHT. 97 & 98 FOR WALL C SHT. 48 & 81
9. FOR DOWELS SEE WALL A SHT. 65, WALL C SHT. WALL D SHT. 97 & 98 AND WALL E SHT. 100
10. FOR LOCATION SEE SHT. 9 & 10

Mark	Description	By	Chk'd.	App'd.	Date
	REVISIONS				

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23 W.B. STA. 1098+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19 W.B. STA. 631+16.78 TO STA. 646+62.52

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION PLAN PANELS 61-64

APPROVED AUG 23 1982

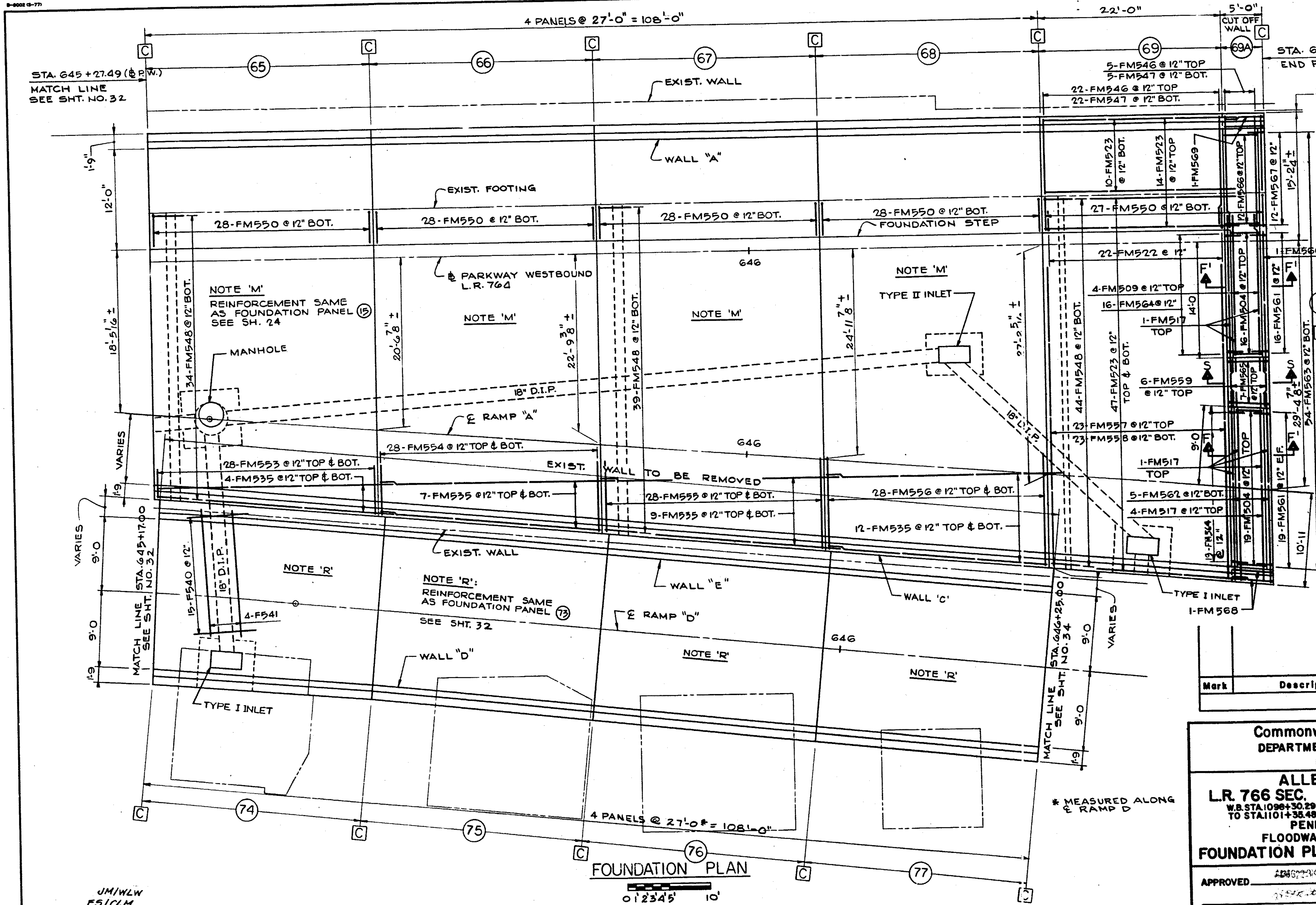
0009934

BRIDGE ENGINEER

SHEET 32 OF 114

S-14584

UM/WLW
FS/CLM
RJK³



LEGEND

(1) DENOTES FOUNDATION PANEL NUMBER

[C] DENOTES CONSTRUCTION JOINTS

E.F. DENOTES EACH FACE

NOTES:

1. CUT REINFORCEMENT IN FIELD AS REQUIRED TO FIT FOR MANHOLES AND INLETS.
2. FOR CUT OFF WALL SECTION SEE SHT. 48 & 49
3. FOR CROSS SECTIONS SEE SHT. NO. 42
4. FOR INLET AND MANHOLE DETAILS SEE SHT. NO. 49
5. FOR FOUNDATION ELEVATIONS SEE SHT. NO. 50, FOR WALL 'D' SHT. NO. 96 & 97 AND FOR WALL 'E' SHT. NO. 100 & 101
6. FOR CONSTRUCTION JOINT STEP DETAILS SEE WALL 'C' SHT. NO. 80, WALL 'D' SHT. NO. 96, 97 AND 48
7. FOR DOWELS SEE WALL 'A' SHT. NO. 65 & 66, WALL 'C' SHT. NO. 80, WALL 'D' SHT. NO. 96 & 97 AND FOR WALL 'E' SHT. NO. 100 AND 101
8. FOR LOCATION SEE SHT. NO. 10

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1096+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.52

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

FOUNDATION PLAN PANELS 65-69 & 74-77

SHEET 33 OF 114

APPROVED ____

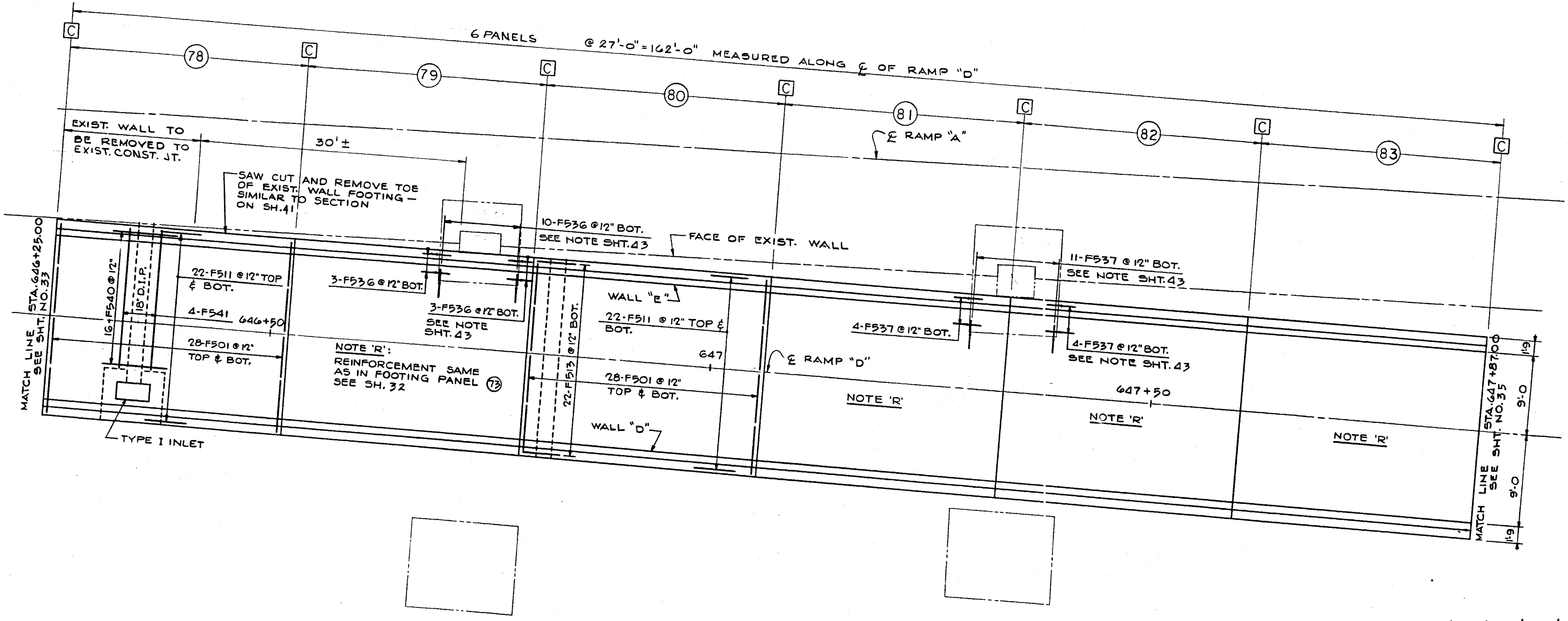
0009935

BRIDGE ENGINEER

S-14584

JM/WLW
FS/CLM
RJK

B-6002 (3-77)



FOUNDATION PLAN

0 1' 2' 3' 4' 5' 10'

LEGEND

(1) DENOTES FOUNDATION PANEL NUMBER

[C] DENOTES CONSTRUCTION JOINTS

NOTES

1. FOR PIPE HAUNCH DETAIL SEE SHT. NO. 50
2. FOR CROSS SECTIONS SEE SHT. NO. 43
3. FOR INLET DETAILS SEE SHT. NO. 49
4. FOR FOUNDATION ELEVATIONS AND DOWELS SEE WALLS D & E SHT. NO. 95, 96, 101 AND 102
5. FOR CONSTRUCTION JOINT STEPS DETAILS SEE WALL D SHT. NO. 95, 96 AND 48
6. FOR LOCATION SEE SHT. NO. 10 AND 11

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA.1098+30.29 TO STA.1101+35.48

L.R. 764 SEC. 19
W.B. STA.631+16.78 TO STA.646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION PLAN PANELS 78-83

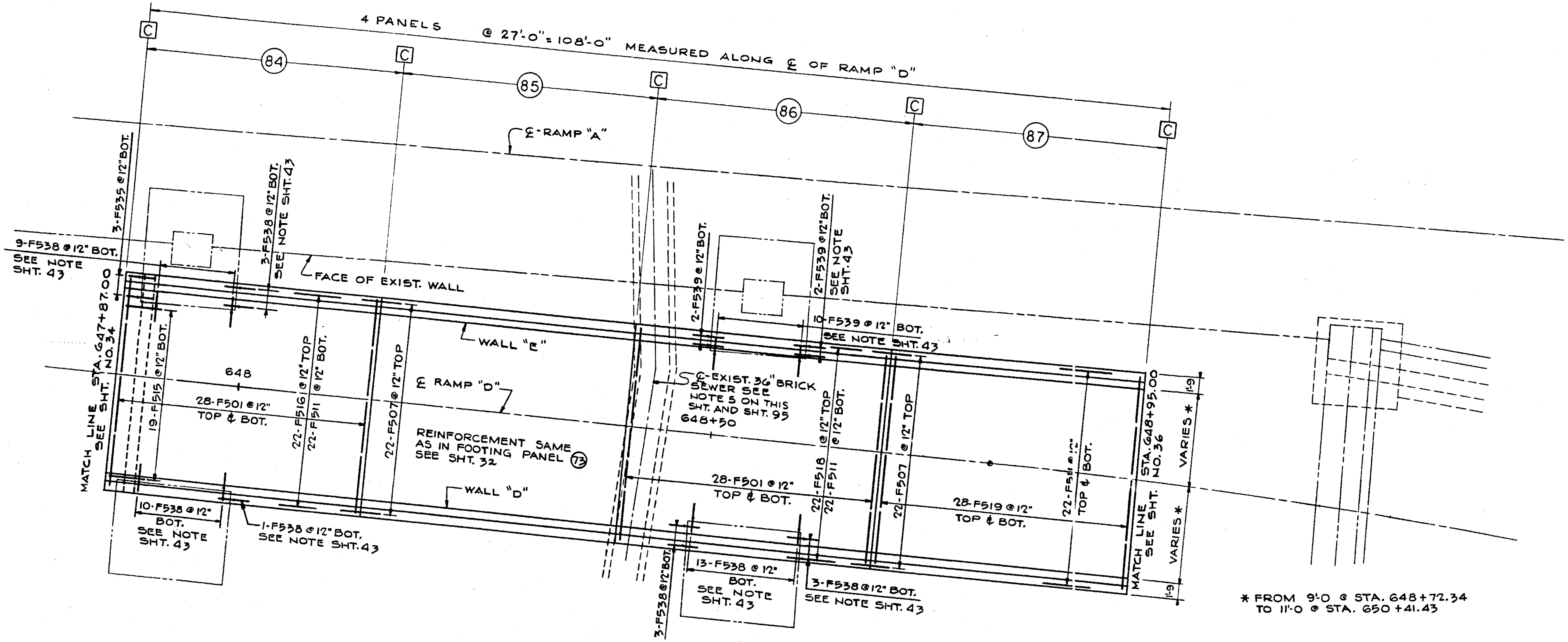
APPROVED AUG 23 1982

BRIDGE ENGINEER 0009936

SHEET 34 OF 114

S-14584

Designed by JM/WLW
Drawn by FS/CLM
Checked by RJK3



FOUNDATION PLAN

0 1 2 3 4 5' 10'

LEGEND

(1) DENOTES FOUNDATION PANEL NUMBER

[C] DENOTES CONSTRUCTION JOINTS

NOTES

1. FOR CONSTRUCTION JOINT STEPS DETAILS SEE WALL D SHT. NO. 94, 95 AND 48
2. FOR CROSS SECTIONS SEE SHT. NO. 43
3. FOR FOUNDATION ELEVATIONS AND DOWELS SEE WALL D SHT. NO. 94 AND 95, AND WALL E SHT. NO. 102 AND 103
4. FOR LOCATION SEE SHT. NO. 11
5. APPROXIMATE LOCATION OF 36" SEWER LINE SHOWN. THIS IS A 2 RING BRICK SEWER. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION AND ELEVATION AND REPORT THEM TO THE ENGINEER. THE CONTRACTOR SHALL TAKE CARE NOT TO DAMAGE THE SEWER LINE IN ANY WAY. ANY DAMAGE TO THE SEWER LINE SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE, TO THE SATISFACTION OF THE CITY OF PITTSBURGH AND THE ENGINEER.

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Designed by JM/WLW
Drawn by FS/CLM
Checked by RSK

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23 W.B. STA. 1098+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19 W.B. STA. 631+16.78 TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION PLAN PANELS 84-87

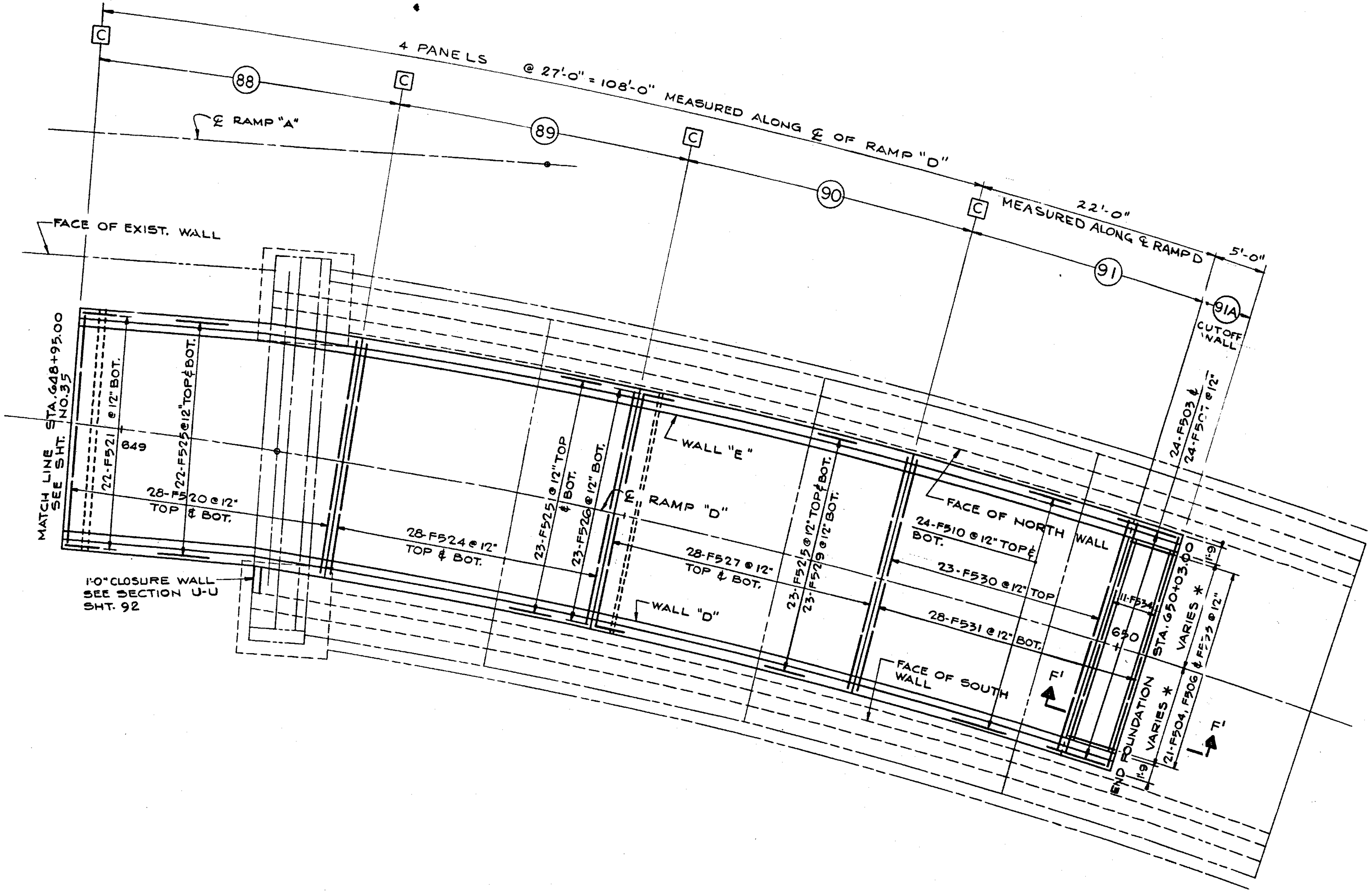
APPROVED AUG 23 1977

BRIDGE ENGINEER

0009937

SHEET 35 OF 114

S-14584



* FROM 9'-0 @ STA. 648+72.34 TO 11-0 @ STA. 650+41.43

FOUNDATION PLAN

0 1' 2' 3' 4' 5' 10'

LEGEND

(1) DENOTES FOUNDATION PANEL NUMBER

[C] DENOTES CONSTRUCTION JOINTS

NOTES

1. FOR SECTION F-F SEE SHT. 48
2. FOR CROSS SECTIONS SEE SHT. 43
3. FOR FOUNDATION ELEVATIONS AND DOWELS SEE WALL D SHT. NO. 94, AND WALL E SHT. NO. 103 & 104
4. FOR CONSTRUCTION JOINTS STEPS SEE WALL D SHT. NO. 94 AND 48
5. FOR LOCATION SEE SHT. NO. 11 AND 12
6. FOR CLOSURE WALL SEE SECTION U-U ON SHT. NO. 94

Mark	Description	By	Chk'd.	App'd.	Date
REVISIONS					

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23 W.B. STA. 1098+30.29 TO STA. 1101+35.48
L.R. 764 SEC. 19 W.B. STA. 631+16.78 TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION PLAN PANELS 88-91

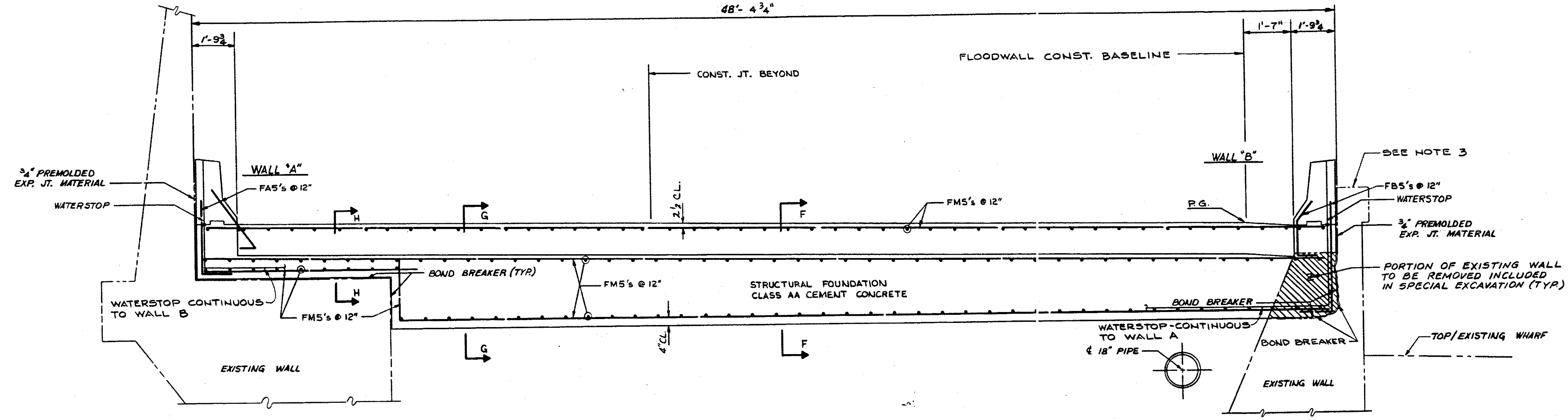
APPROVED AUG 23 1982
BRIDGE ENGINEER 0009938

SHEET 36 OF 114

S-14584

Designed by UM/WLW
Drawn by FS/CLM
Checked by RJK3

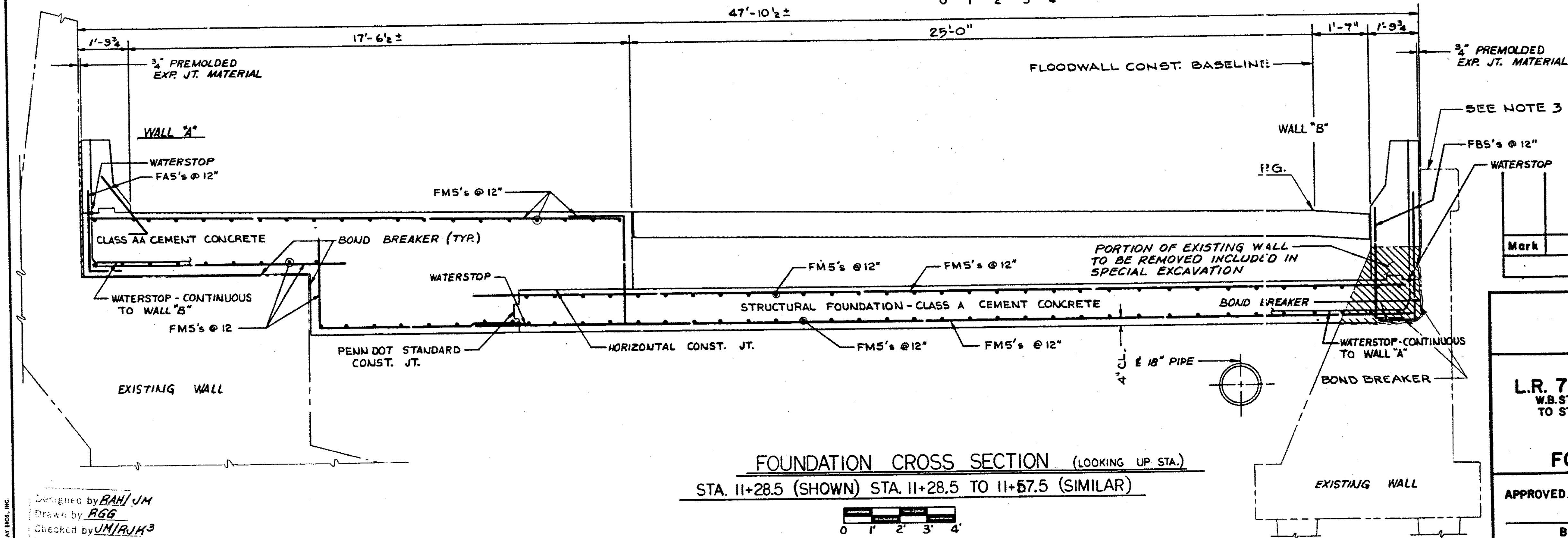
D-4008 (3-77)



FOUNDATION CROSS SECTION (LOOKING UP STA.)
STA. 11+23.5 (SHOWN) STA. 11+23.5 TO 11+28.5 (SIMILAR)

0 1' 2' 3' 4'

NOTE:
1. FOR SECTIONS F-F, G-G, AND H-H SEE SHT. 48
2. FOR JOINT DETAILS SEE SHT. 68
3. MAY BE REMOVED AND REPLACED IN KIND AT THE OPTION OF THE CONTRACTOR WITH APPROVAL OF THE ENGINEER AT NO ADDITIONAL COST.



FOUNDATION CROSS SECTION (LOOKING UP STA.)
STA. 11+28.5 (SHOWN) STA. 11+28.5 TO 11+57.5 (SIMILAR)

0 1' 2' 3' 4'

Designed by RAH/JM
Drawn by RGG
Checked by JM/RJK

Mark	Description	By	Chk'd.	App'd.	Date
	REVISIONS				

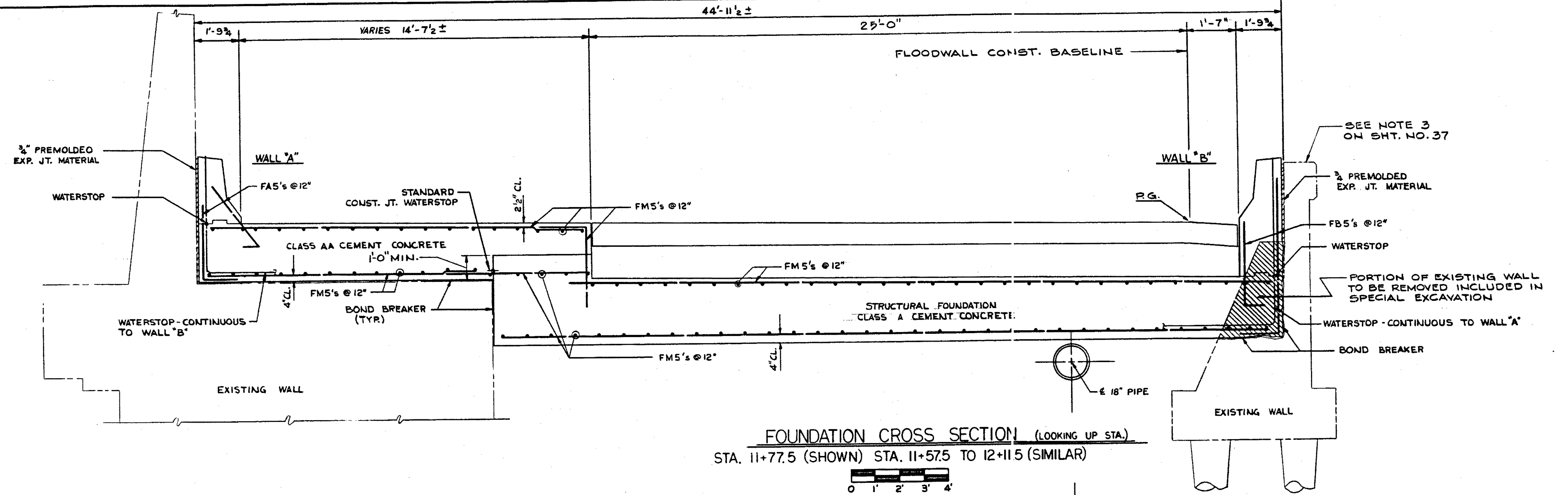
Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23
W.B. STA.1098+30.29 TO STA.1101+35.48
L.R. 764 SEC. 19
W.B. STA.631+16.78 TO STA.646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION CROSS SECTIONS

APPROVED AUG 23 1987
0009939
BRIDGE ENGINEER

SHEET 37 OF 114

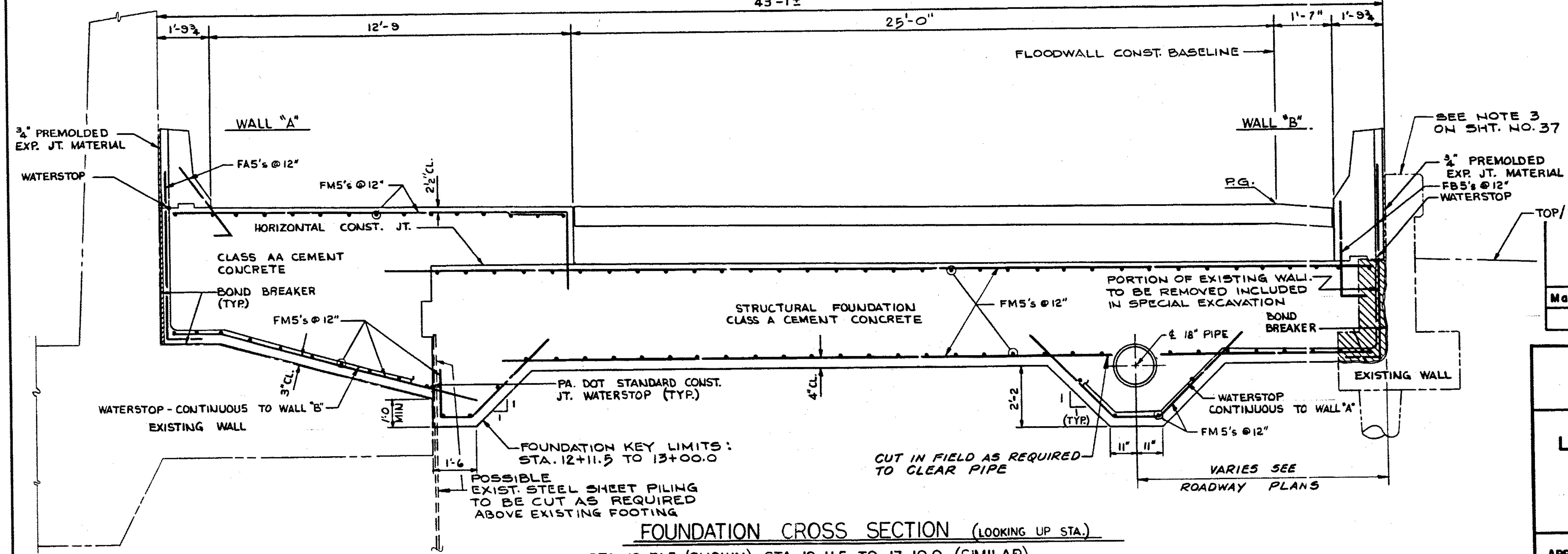
S-14584



FOUNDATION CROSS SECTION (LOOKING UP STA.)

STA. 11+77.5 (SHOWN) STA. 11+57.5 TO 12+11.5 (SIMILAR)

0 1' 2' 3' 4'



FOUNDATION CROSS SECTION (LOOKING UP STA.)

STA. 12+31.5 (SHOWN) STA. 12+11.5 TO 13+10.0 (SIMILAR)

0 1' 2' 3' 4'

NOTE:

1. FOR JOINT DETAILS SEE SHT. 68

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION CROSS SECTIONS

APPROVED AUG 23 1982

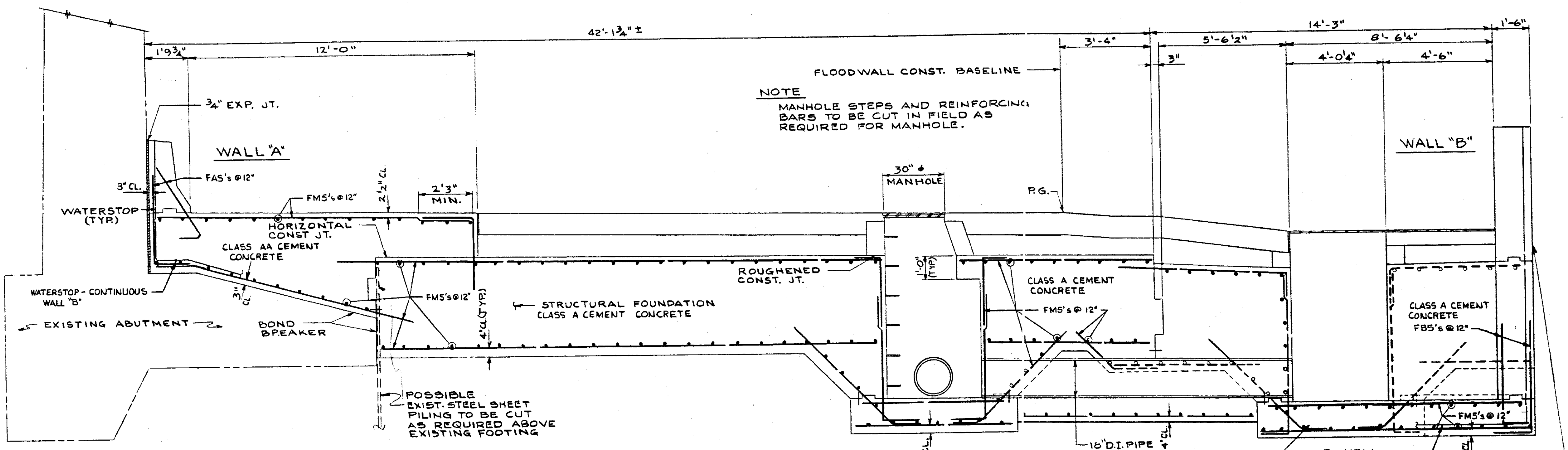
0009940

BRIDGE ENGINEER

SHEET 38 OF 114

S-14584

Designed by RAH/JM
Drawn by RGG
Checked by JM/RJK



FOUNDATION CROSS SECTION (LOOKING UP STA.)

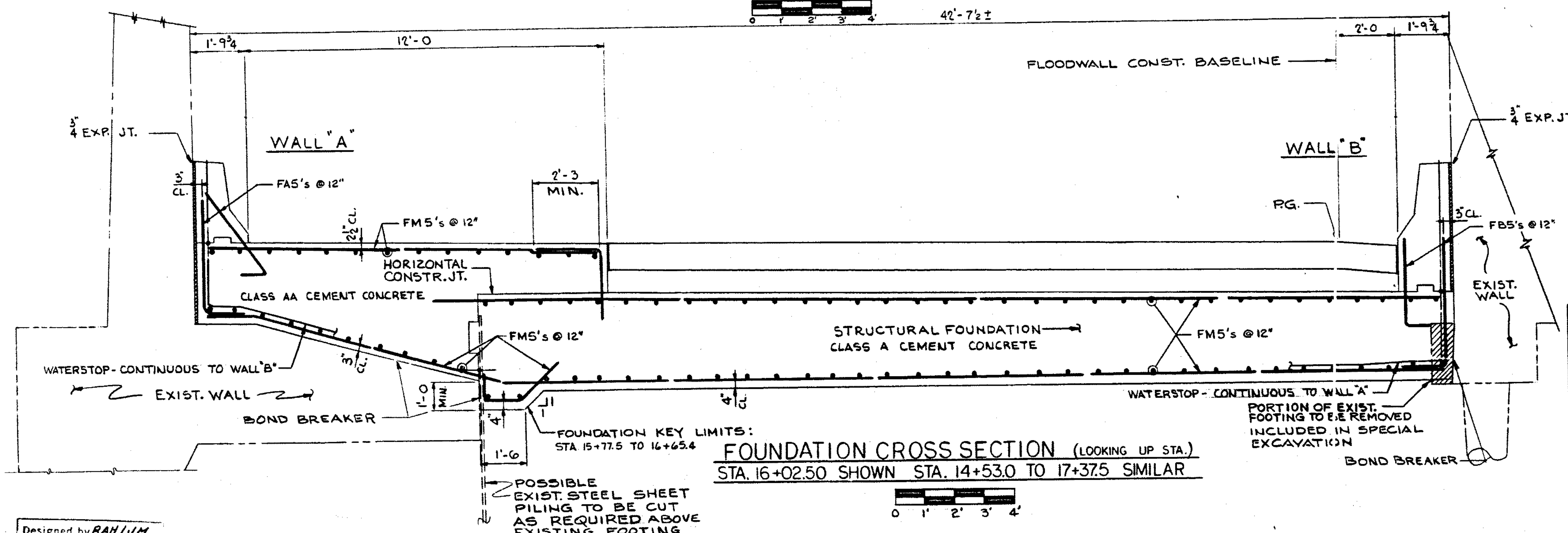
STA. 13+95 (SHOWN) STA. 13+10.0 TO 14+53.0 & 23+54.0 TO 24+35.0 (SIMILAR)

0 1' 2' 3' 4'

WALL WALK, SLUICE GATE AND INLET NOT SHOWN SEE SHT. 48

NOTE

1. FOR JOINT DETAILS SEE SHT. 68



FOUNDATION CROSS SECTION (LOOKING UP STA.)

STA. 16+02.50 SHOWN STA. 14+53.0 TO 17+37.5 SIMILAR

0 1' 2' 3' 4'

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania

DEPARTMENT OF TRANSPORTATION

BUREAU OF HIGHWAY DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23 W.B. STA. 1098+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19 W.B. STA. 631+16.78 TO STA. 646+62.49

PENN LINCOLN PARKWAY

FLOODWALL PROTECTION SYSTEM

FOUNDATION CROSS SECTIONS

APPROVED AUG

0009941

BRIDGE ENGINEER

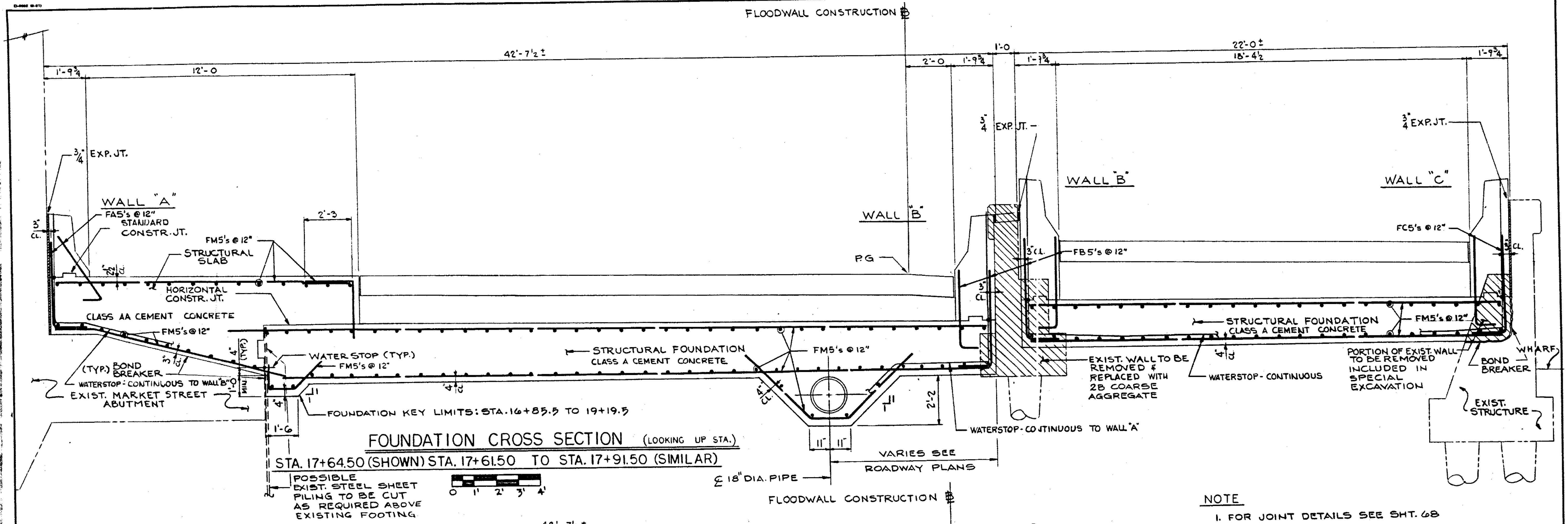
SHEET 39 OF 114

S-14584

Designed by RAH/JM

Drawn by RGG

Checked by JM/RJK

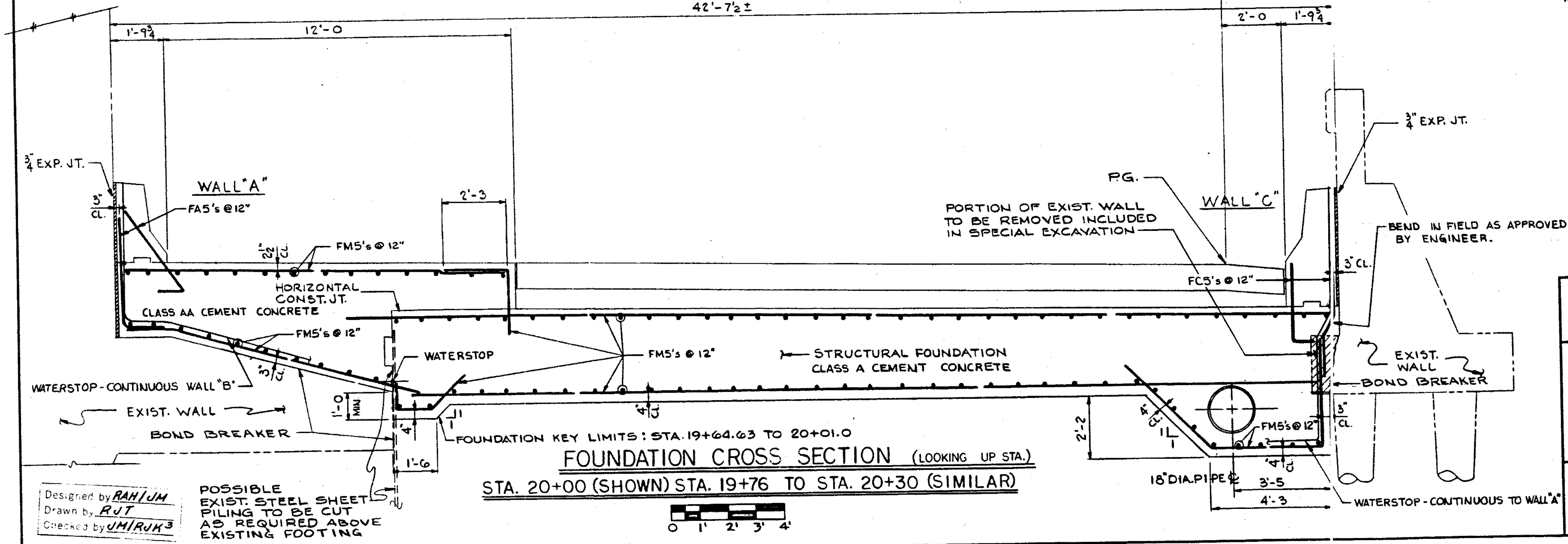


FOUNDATION CROSS SECTION (LOOKING UP STA.)

STA. 17+64.50 (SHOWN) STA. 17+61.50 TO STA. 17+91.50 (SIMILAR)

NOTE

1. FOR JOINT DETAILS SEE SHT. 68



FOUNDATION CROSS SECTION (LOOKING UP STA.)

STA. 20+00 (SHOWN) STA. 19+76 TO STA. 20+30 (SIMILAR)

Designed by RAH/JM
Drawn by RJT
Checked by JM/RJK3

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION CROSS SECTIONS

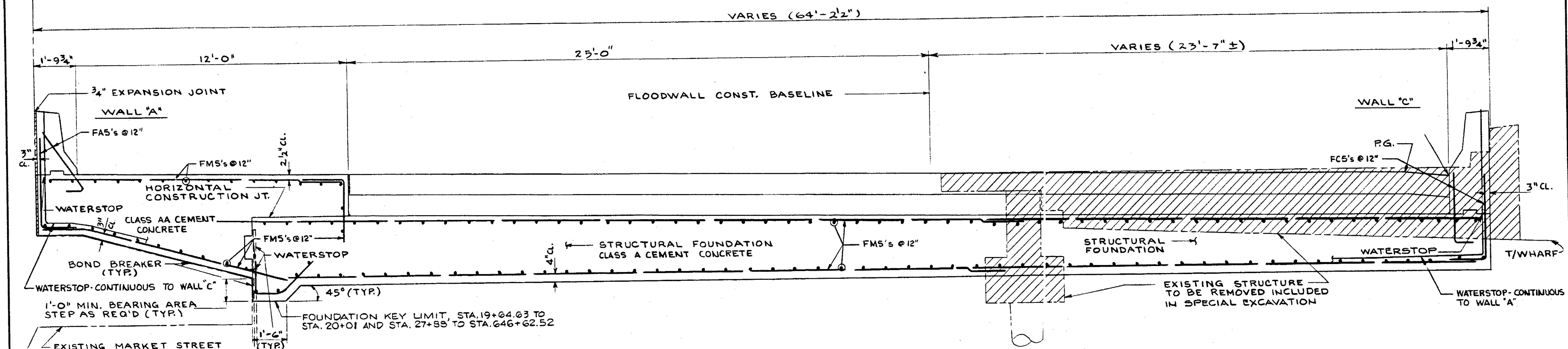
APPROVED AUG 23 1982

BRIDGE ENGINEER

SHEET 40 OF 114

0009942

S- 14584



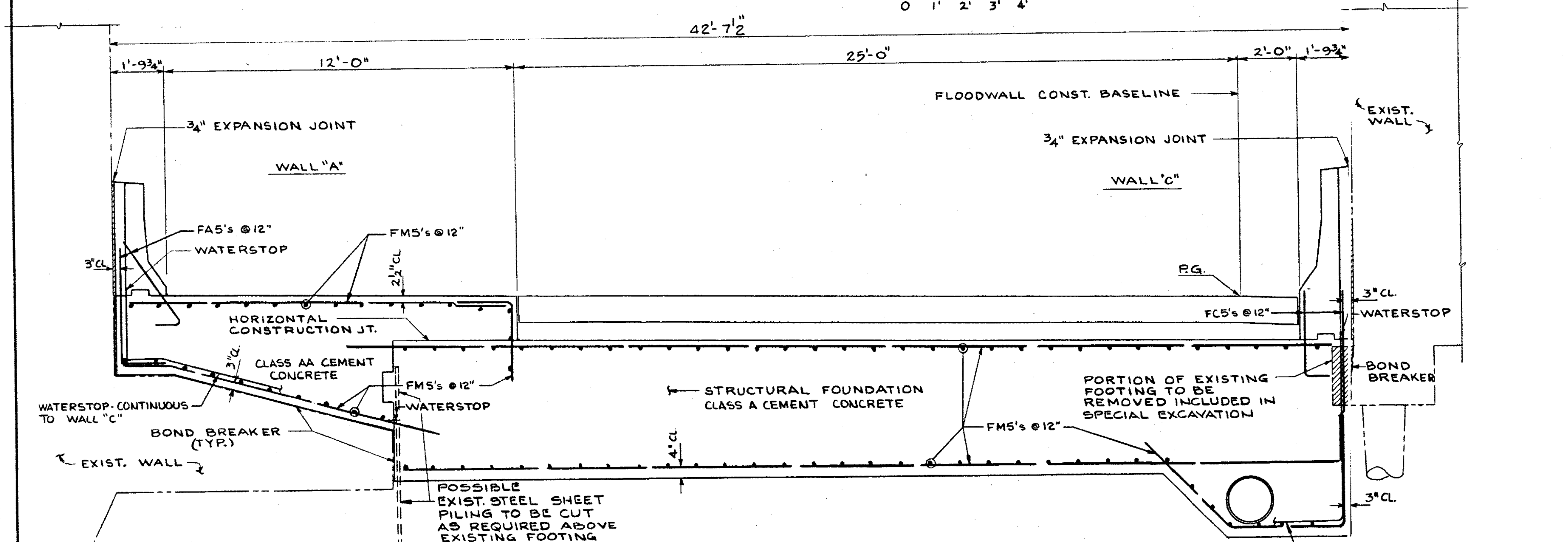
FOUNDATION CROSS SECTION (LOOKING UP STA.)

STA. 18+41 (SHOWN) STA. 17+91.5 TO STA. 19+76 (SIMILAR)

0 1' 2' 3' 4'

NOTE

1. FOR JOINT DETAILS SEE SHT. 68



FOUNDATION CROSS SECTION (LOOKING UP STA.)

STA. 21+60 (SHOWN) STA. 20+30 TO STA. 22+75
AND STA. 24+63 TO STA. 27+32 (SIMILAR)

0 1' 2' 3' 4'

Designed by RAH/JH
Drawn by M.A.H.
Checked by JM/RJK

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

ALLEGHENY COUNTY

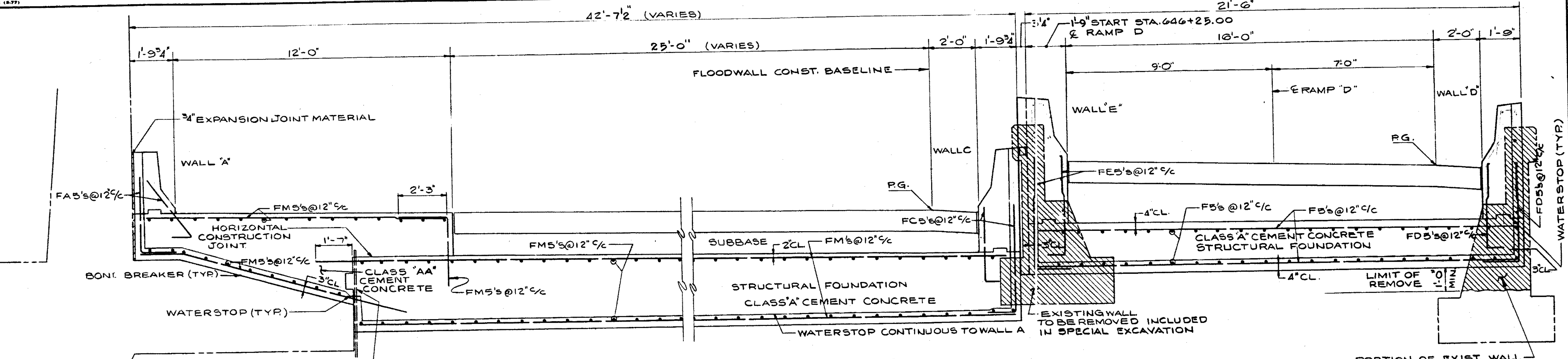
L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION CROSS SECTIONS

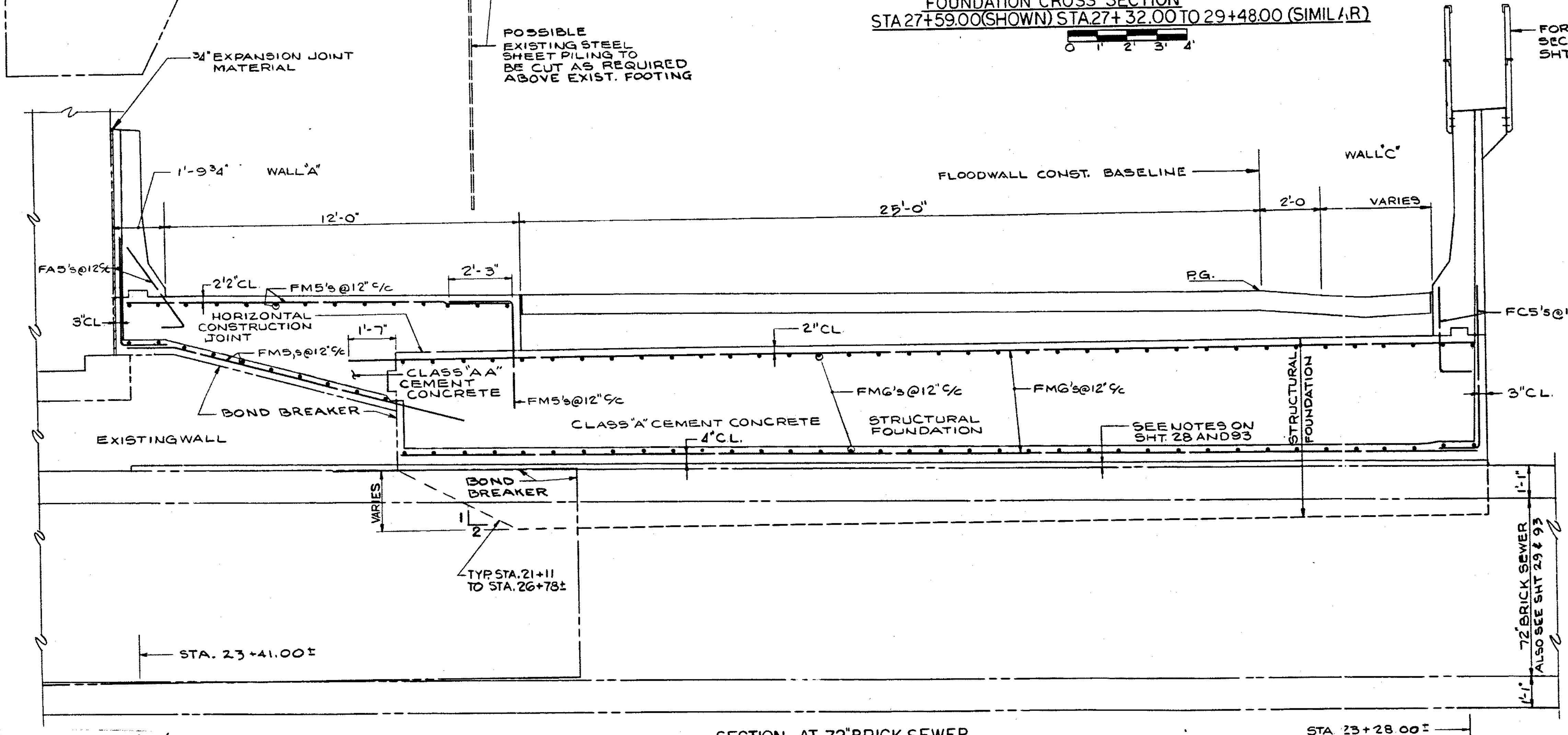
APPROVED AUG 23 1982
BRIDGE ENGINEER

SHEET 41 OF 114
0009943
S- 14584



FOUNDATION CROSS SECTION
STA 27+59.00 (SHOWN) STA 27+32.00 TO 29+48.00 (SIMILAR)

0 1' 2' 3' 4'



SECTION AT 72" BRICK SEWER

0 1' 2' 3' 4'

NOTE
1. FOR JOINT DETAILS SEE SHT. 68

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

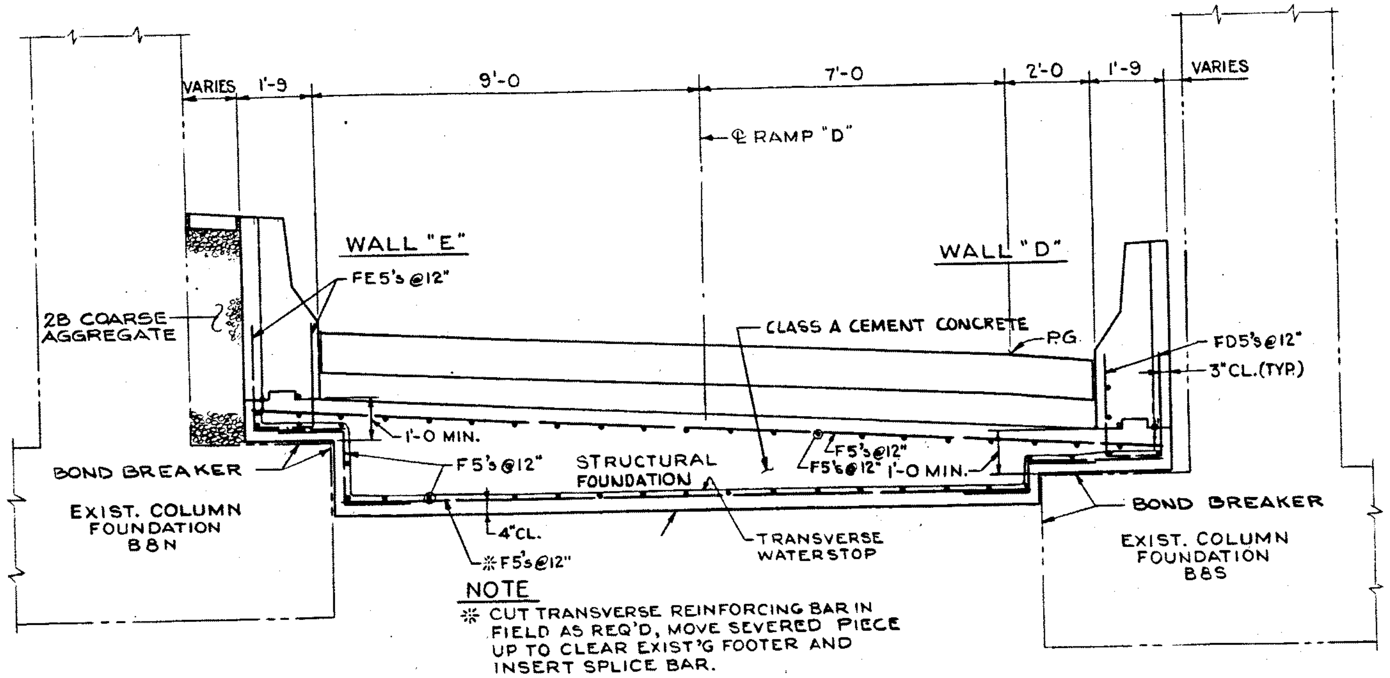
Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48
L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION CROSS SECTIONS

APPROVED
BRIDGE ENGINEER

SHEET 42 OF 114
0009944
S-14584

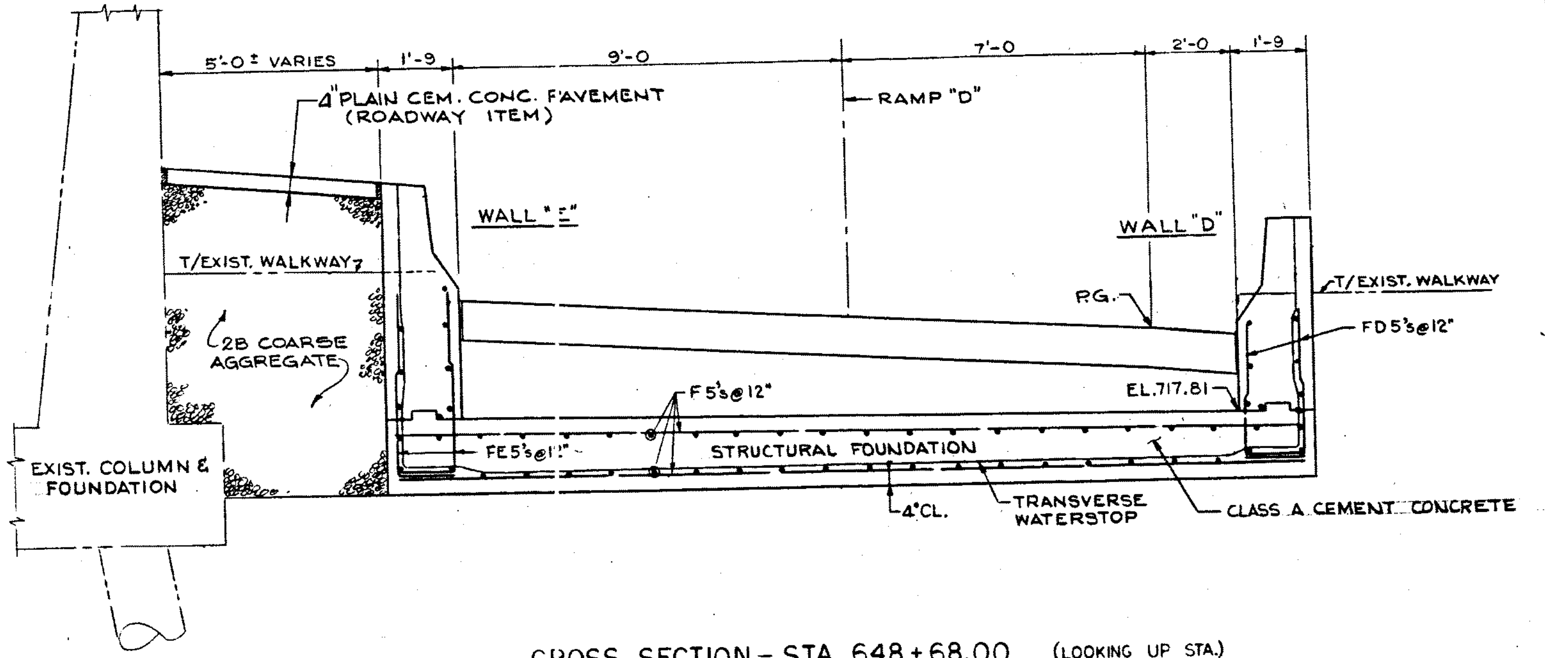
RAH/JH
JBA/CLL
RJK



CROSS SECTION - STA.648+54.50 (LOOKING UP STA)

TYPICAL BETWEEN EXISTING COLUMN FOUNDATIONS

0' 1' 2' 3'



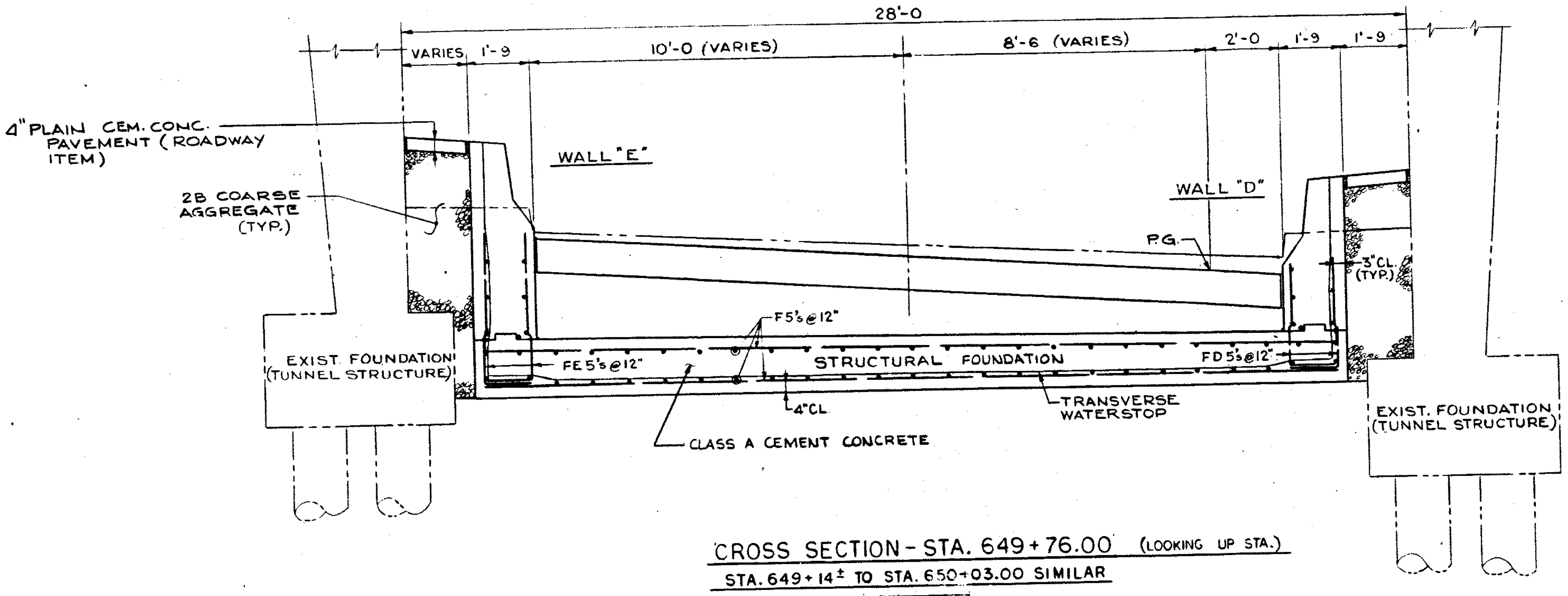
CROSS SECTION - STA. 648+68.00 (LOOKING UP STA.)

STA. 646+25.00 TO STA. 649+14± SIMILAR

0' 1' 2' 3'

NOTE

1. FOR JOINT DETAILS SEE SHT. 68



CROSS SECTION - STA. 649+76.00 (LOOKING UP STA.)

STA. 649+14± TO STA. 650+03.00 SIMILAR

0' 1' 2 3

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania

DEPARTMENT OF TRANSPORTATION

BUREAU OF HIGHWAY DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA.1098+30.29
TO STA.1101+35.48

L.R. 764 SEC. 19
W.B. STA.631+16.78
TO STA.646+62.49

PENN LINCOLN PARKWAY

FLOODWALL PROTECTION SYSTEM

FOUNDATION CROSS SECTIONS

APPROVED AUG 23 1982

B.Z. Kotalik

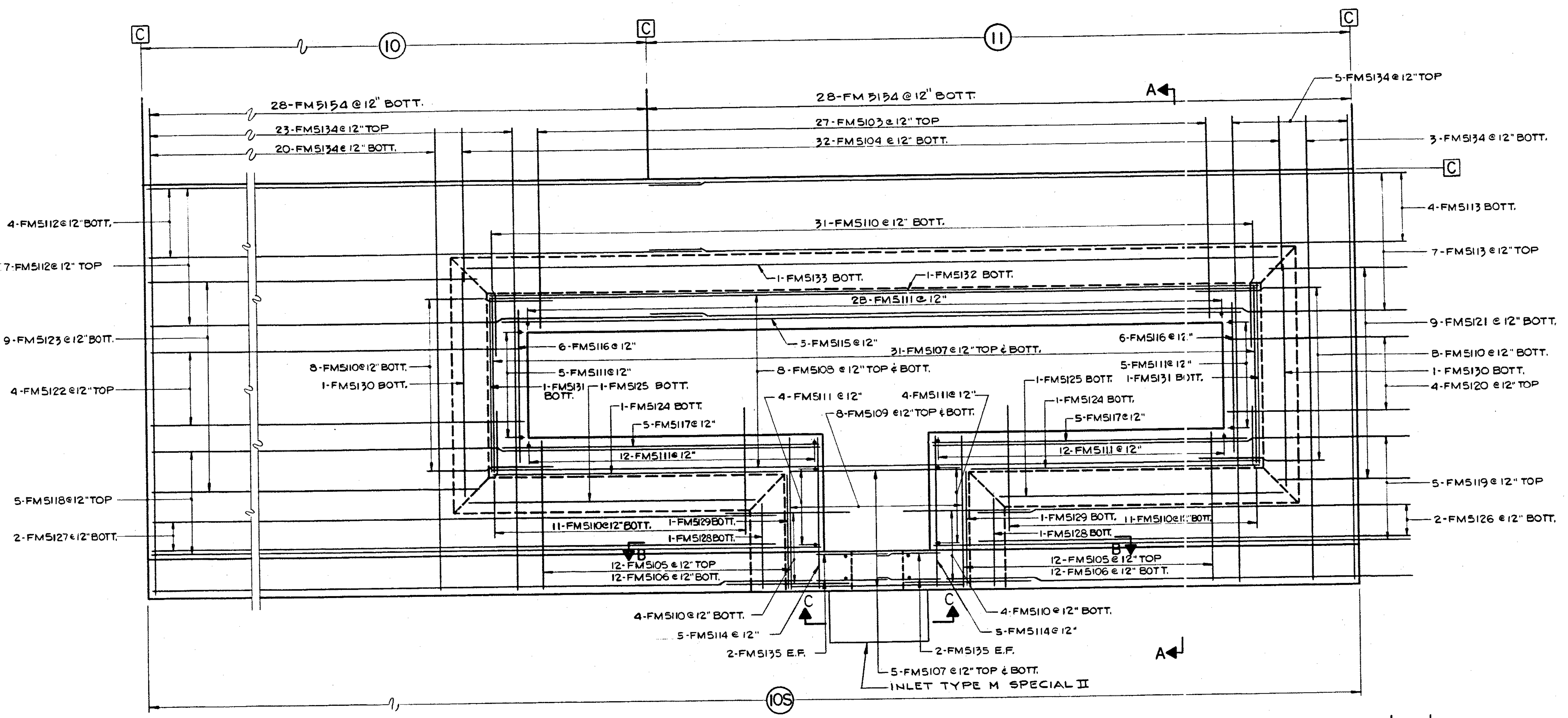
BRIDGE ENGINEER

SHEET 43 OF 114

0009945

S- 14584

Designed by RAH/UM
Drawn by PH
Checked by UM/RUK



SUMP REINFORCING STANWIX ST. PULL-OFF

0 1' 2' 4'

NOTES:
1. FOR ADDITIONAL WALL REINFORCING OF WALL B IN AREA OF SUMP SEE SHT. NO. 73
2. FOR SECTIONS A-A AND B-B SEE SHT. NO. 45
3. FOR DIMENSIONS AND ELEVATIONS OF SUMP AREA SEE SHT. NO. 45
4. FOR SECTION C-C SEE SHT. NO. 48

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

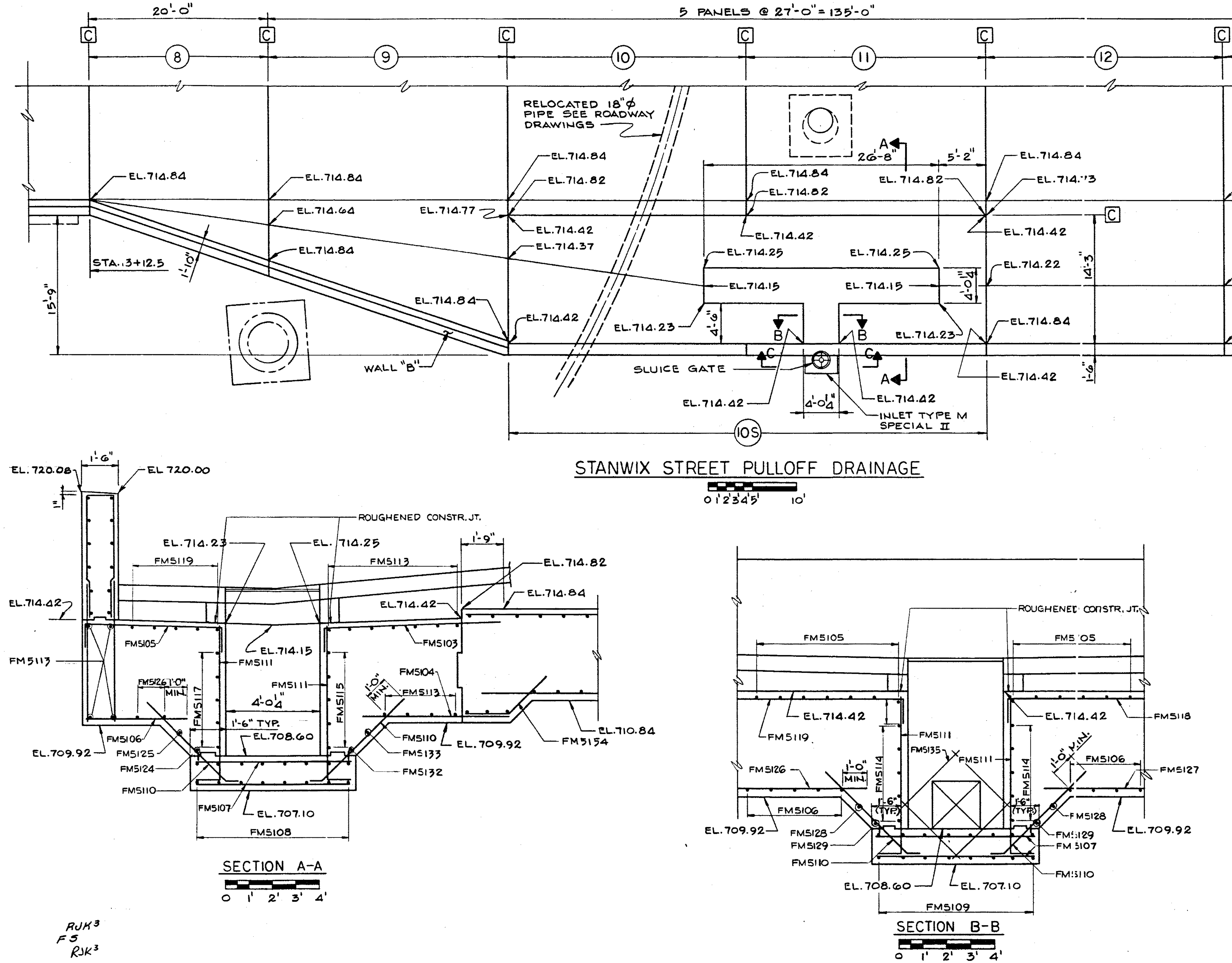
Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48
L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
SUMP REINFORCING, PANEL 10S

APPROVED AUG 23 1982
BRIDGE ENGINEER

SHEET 44 OF 114
0009946
S-14584

Designed by JM
Drawn by RJK
Checked by RJK



NOTE:

1. FOR SECTION C-C SEE SHT. NO. 48
2. FOR JOINT DETAILS SEE SHT. NO. 68

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

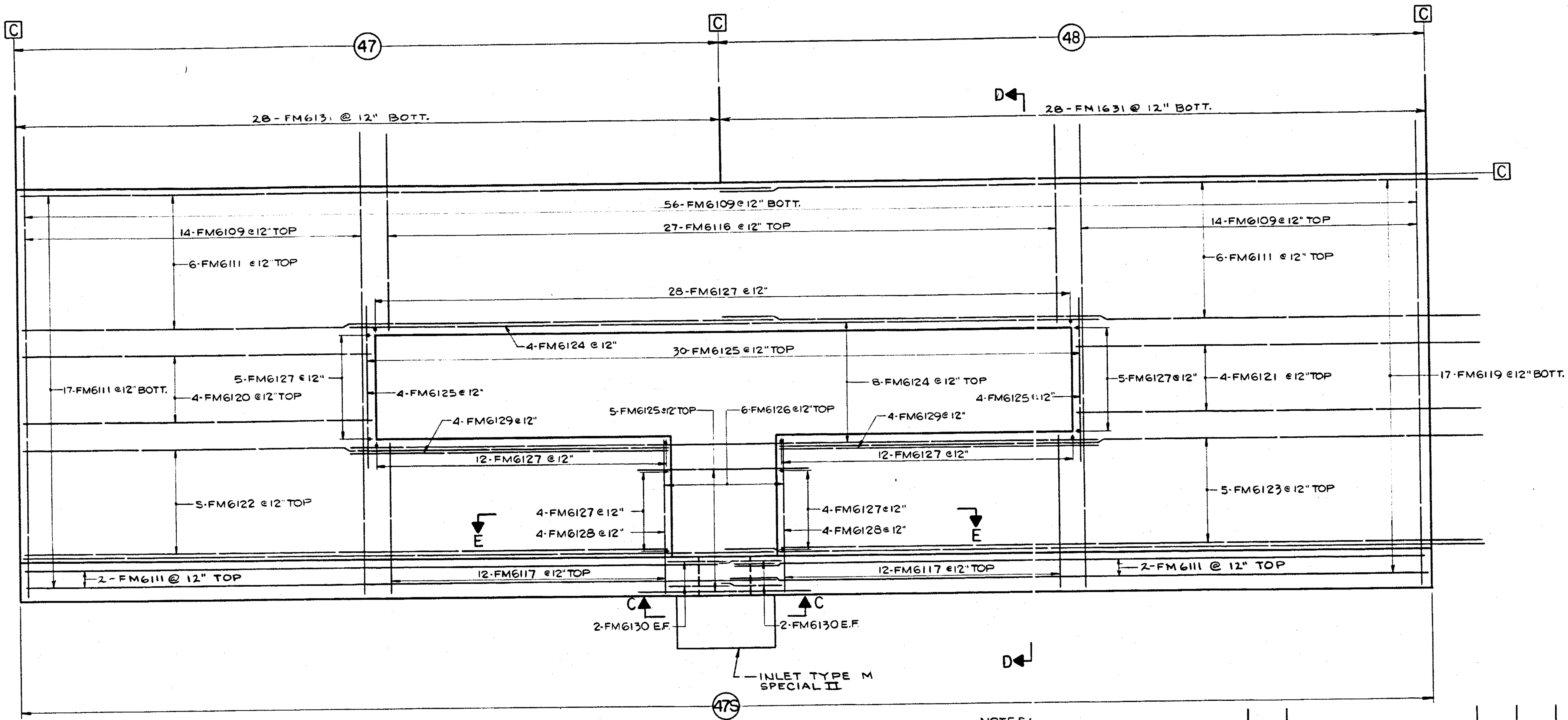
L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
SUMP DRAINAGE & DETAILS, PANEL 10S

APPROVED ____________
BRIDGE ENGINEER

SHEET 45 OF 114
0009947
S-14584



SUMP REINFORCING WOOD ST. PULL-OFF

0 1' 2' 4'

NOTES:

1. FOR ADDITIONAL WALL REINFORCING OF WALL C IN AREA OF SUMP SEE SHT. NO. 84.
2. FOR SECTIONS D-D AND E-E SEE SHT. NO. 47
3. FOR DIMENSIONS AND ELEVATIONS OF SUMP AREA SEE SHT. NO. 47
4. FOR SECTION C-C SEE SHT. NO. 48

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

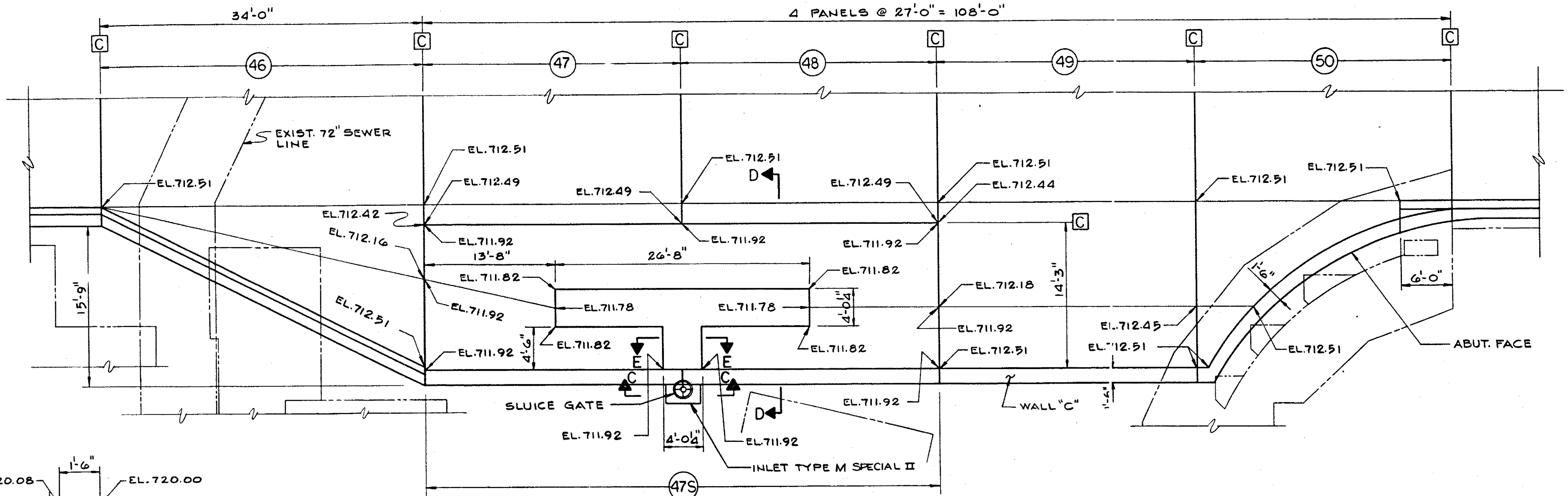
L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
SUMP REINFORCING, PANEL 47S

APPROVED AUG 23 1982
B. F. Kotalik
BRIDGE ENGINEER

SHEET 46 OF 114
0009948
S- 14584

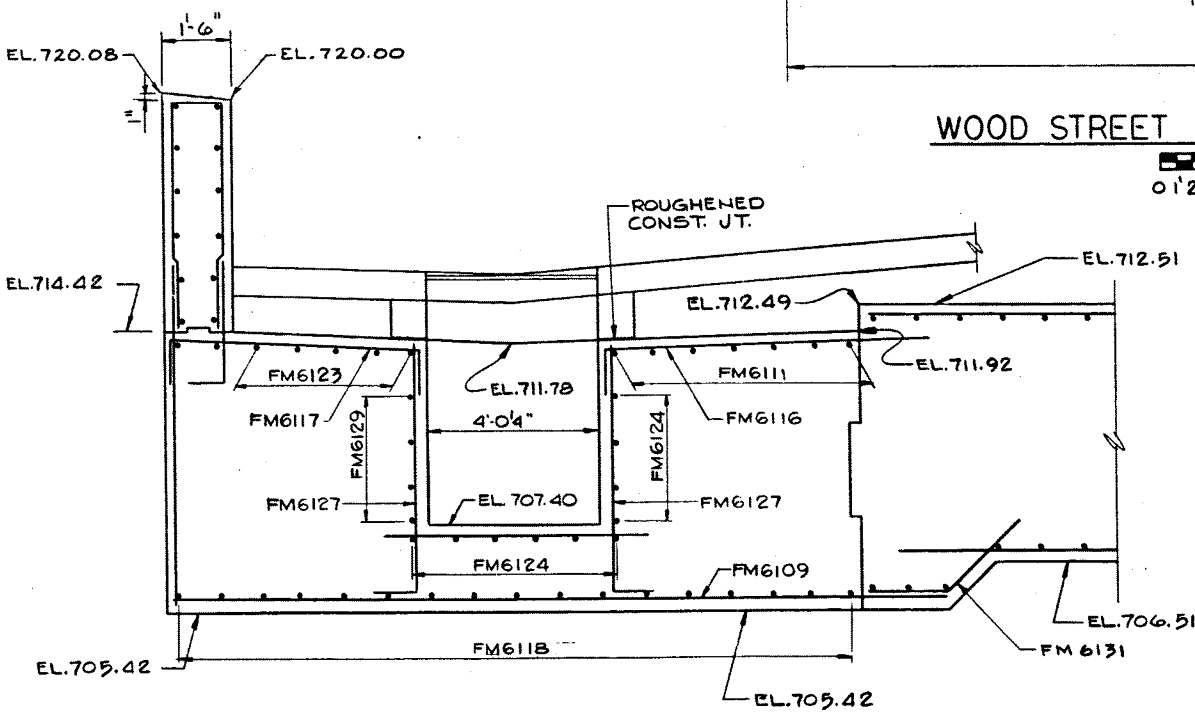
Designed by JM
Drawn by RJM
Checked by RJK



WOOD STREET PULLOFF DRAINAGE

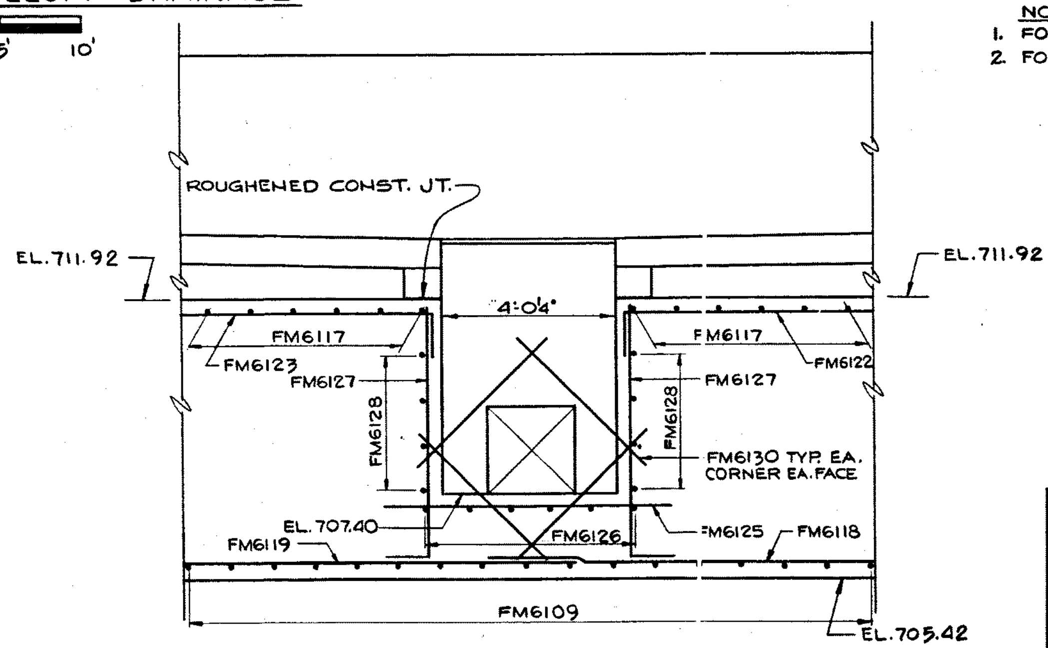
0 1' 2' 3' 4' 5' 10'

NOTE:
1. FOR SECTION C-C SEE SHT. NO. 48
2. FOR JOINT DETAILS SEE SHT. NO. 68



SECTION D-D

0 1' 2' 3' 4'



SECTION E-E

0 1' 2' 3' 4'

Mark	Description	By	Chk'd.	App'd.	Date
	REVISIONS				

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23	L.R. 764 SEC. 19
W.B. STA.1098+30.29 TO STA.1101+35.48	W.B. STA.631+16.78 TO STA.646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

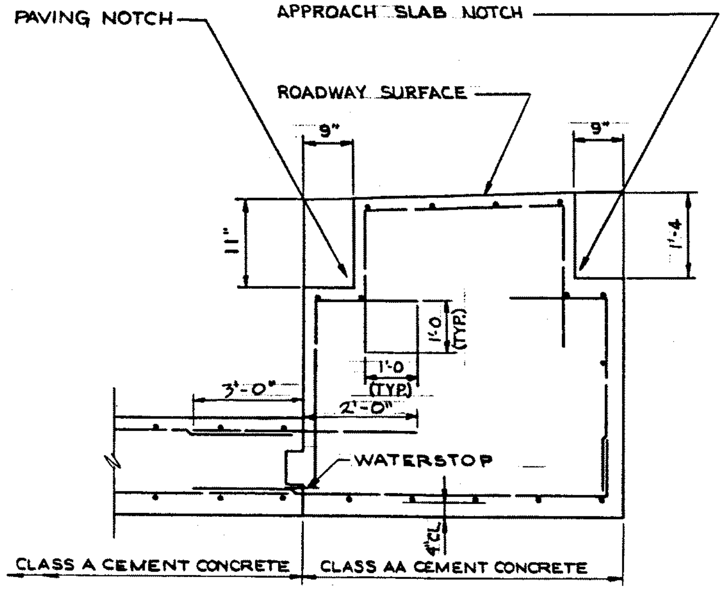
SUMP DRAINAGE & DETAILS, PANEL 47S

APPROVED
BRIDGE ENGINEER

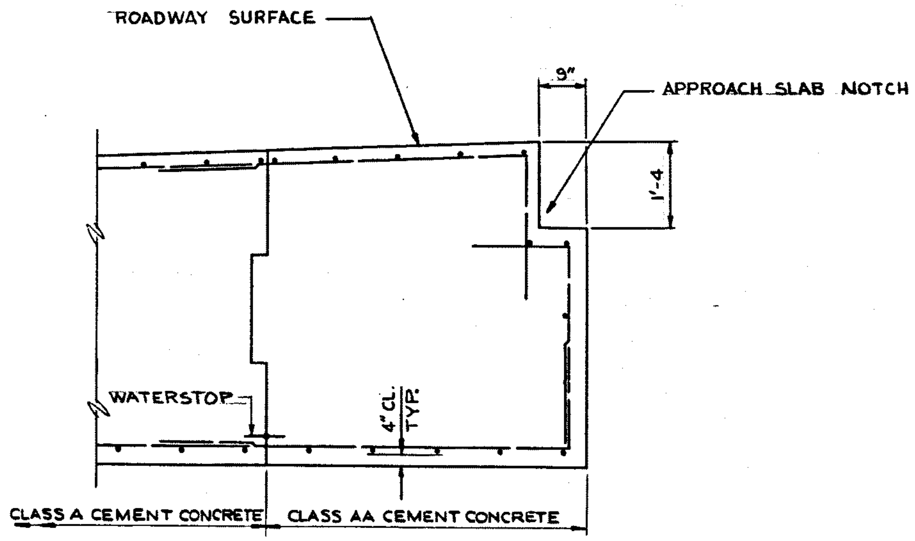
SHEET 47 OF 114
0009949

S-14584

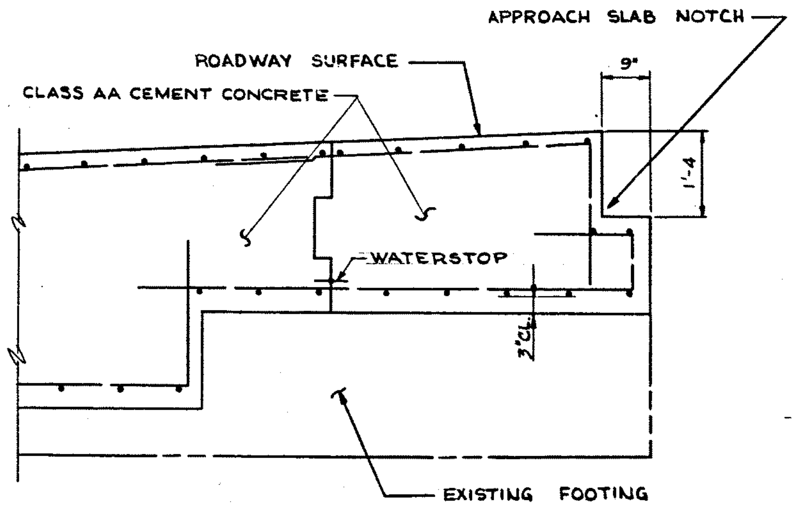
RJK³
FS
RJK³



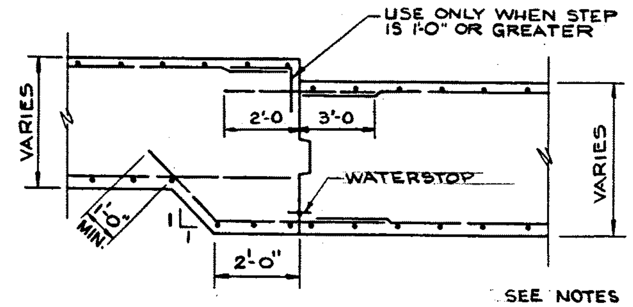
SECTION F-F
CUTOFF WALL
N.T.S.
SECTION F'-F' SIMILAR



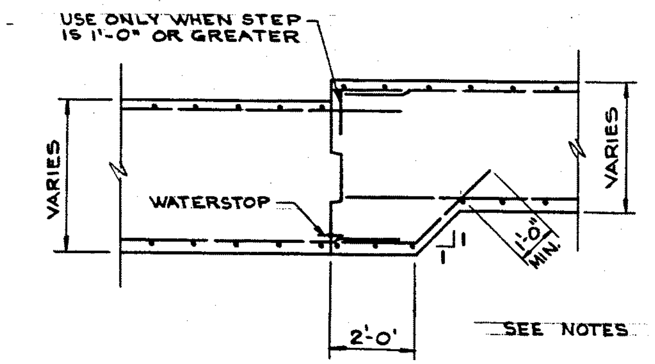
SECTION G-G
CUTOFF WALL
N.T.S.



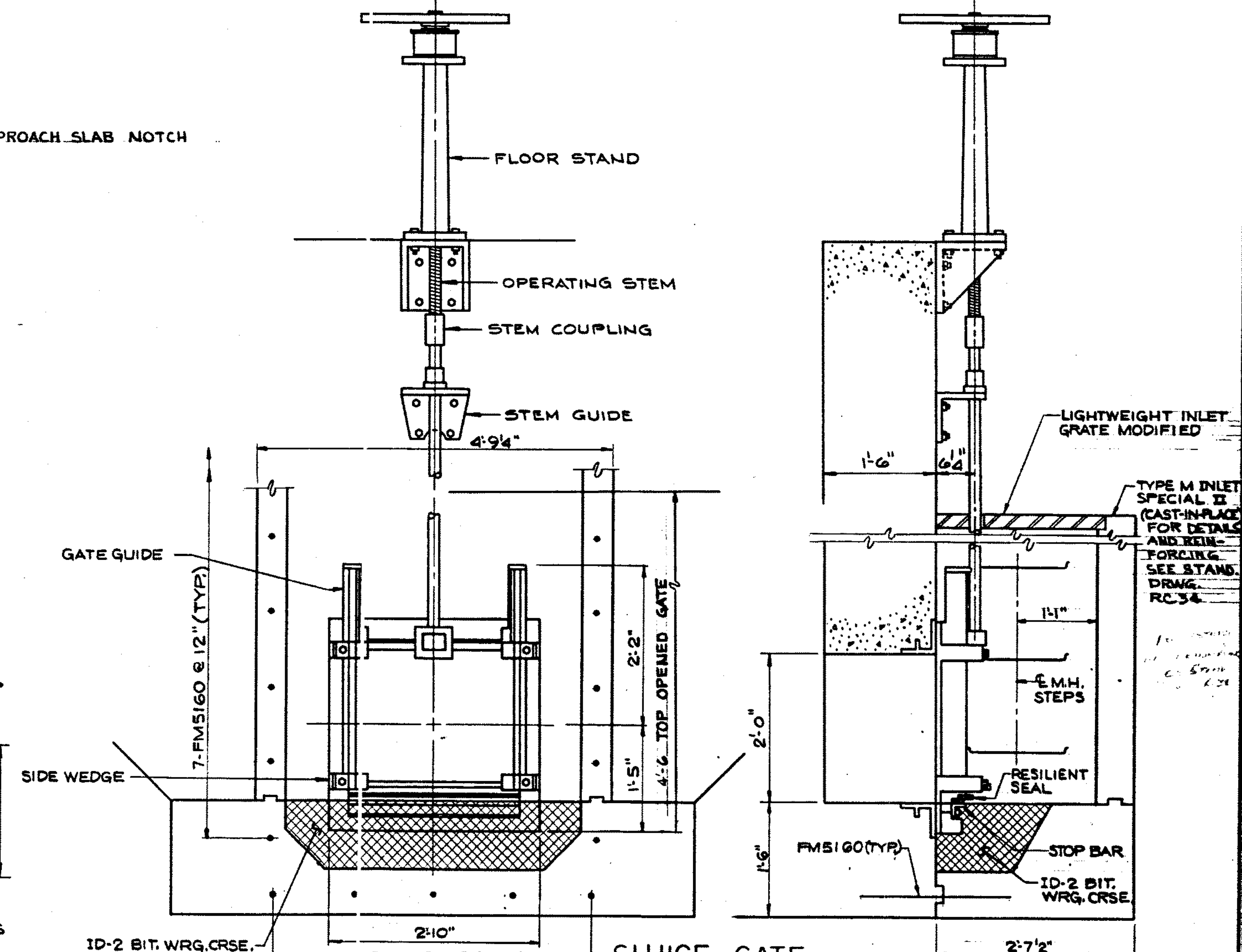
SECTION H-H
CUTOFF WALL
N.T.S.



CONSTRUCTION JOINT STEP DOWN
0 1' 2' 3' 4'



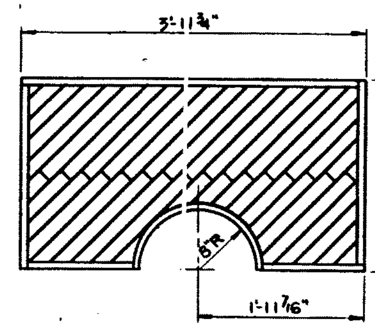
CONSTRUCTION JOINT STEP UP
0 1' 2' 3' 4'



FRONT VIEW

SLUICE GATE
0 1' 2' 3'

SIDE VIEW



INLET GRATE MODIFICATION
0 1' 2'

NOTES:
1. FOR CONSTRUCTION JOINT DETAIL SEE SHT. 68
2. FOR WATER STOP DETAIL SEE SHEET NO. 68
3. SEE SPECIAL PROVISIONS FOR SLUICE GATE MATERIAL ETC.
4. FOR CUTOFF WALL SECTIONS SEE SHEET NOS. 22, 25, 33 & 36.
5. FOR SLUICE GATE LOCATIONS SEE SHT. NOS. 23 & 29
6. FOR CONSTRUCTION JOINT STEPS SEE FOUNDATION PLANS AND WALL ELEVATIONS

Designed by JM/RAH
Drawn by FS/RJK
Checked by RJK

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

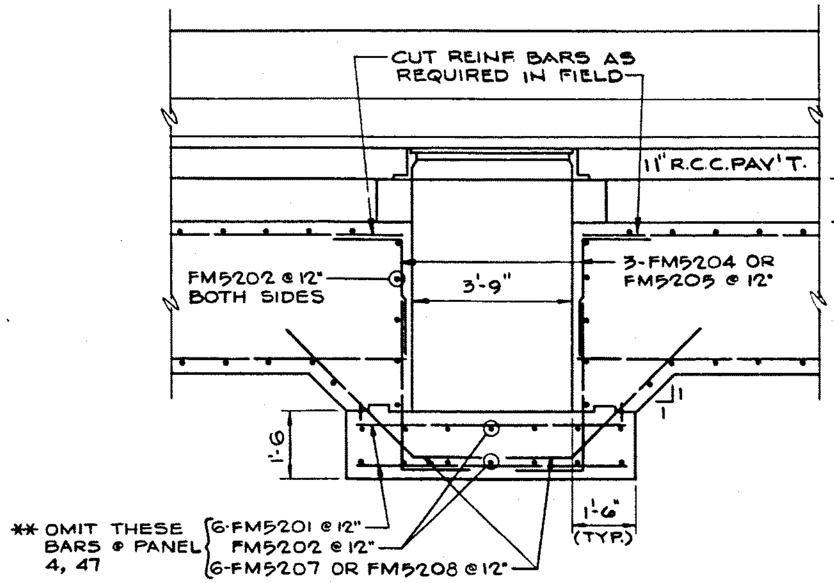
Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23 W.B. STA. 1098+30.29 TO STA. 1101+35.48
L.R. 764 SEC. 19 W.B. STA. 631+16.78 TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION DETAILS

APPROVED AUG 23 1982
BRIDGE ENGINEER

SHEET 48 OF 114
0009950
S-14584

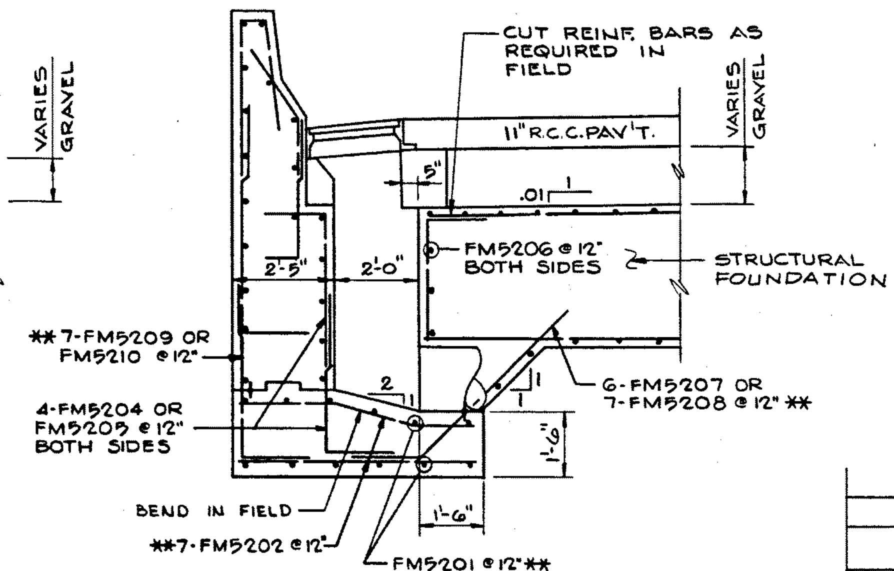
B-6002 (3-77)



ELEVATION INLET TYPE I

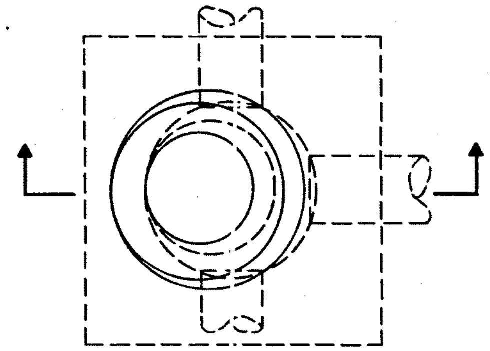
0 1' 2' 3' 4'

SEE ROADWAY DRAWINGS FOR EXACT LOCATION



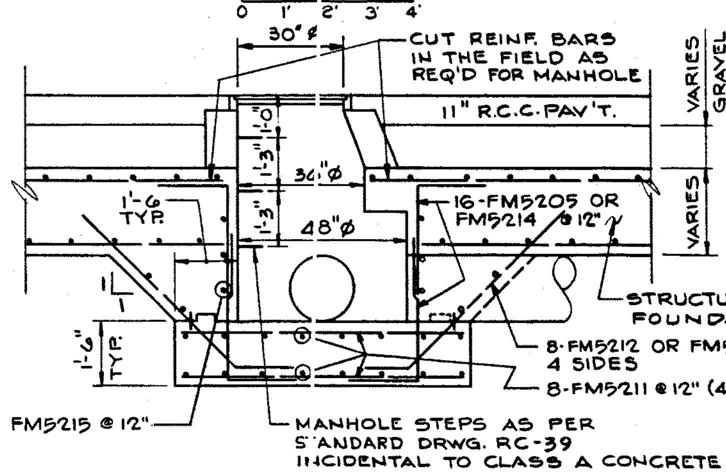
SECTION INLET TYPE I

0 1' 2' 3' 4'



PLAN TYPICAL MANHOLE

0 1' 2' 3' 4'



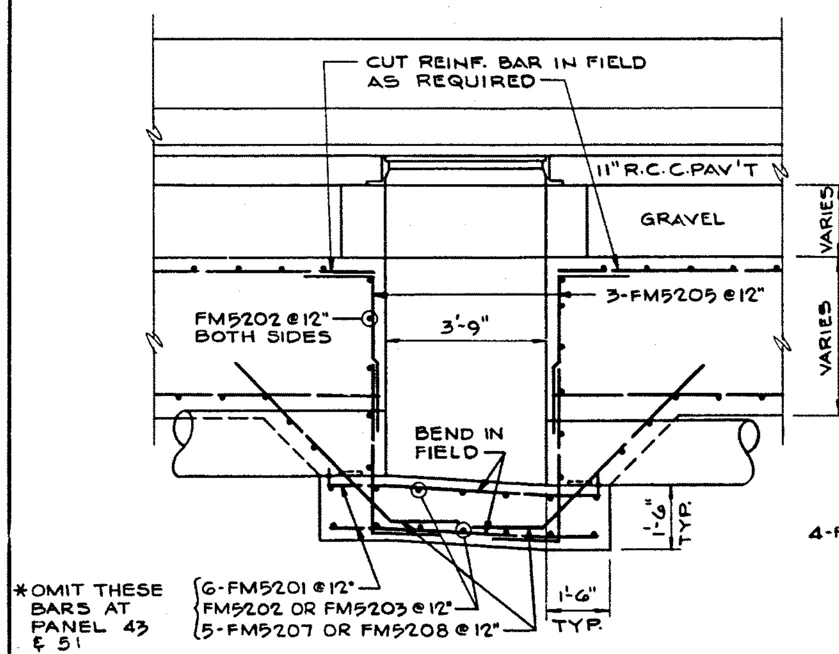
SECTION - TYPICAL MANHOLE

0 1' 2' 3' 4'

SEE ROADWAY DRAWINGS FOR EXACT LOCATION

NOTE:

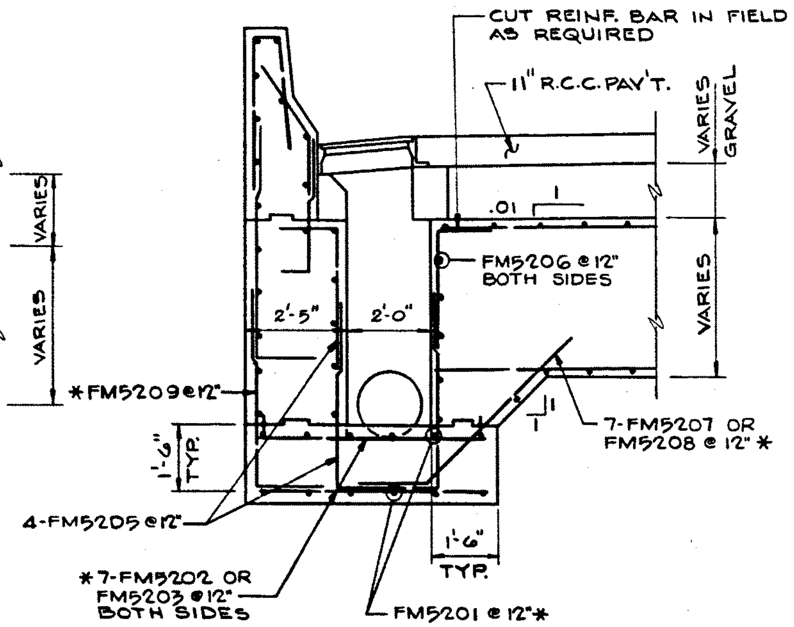
1. FOR CUT-OFF WALL SECTION SEE SHT. NO. 33
2. FOR JOINT DETAILS SEE SHT. NO. 68



ELEVATION INLET TYPE II

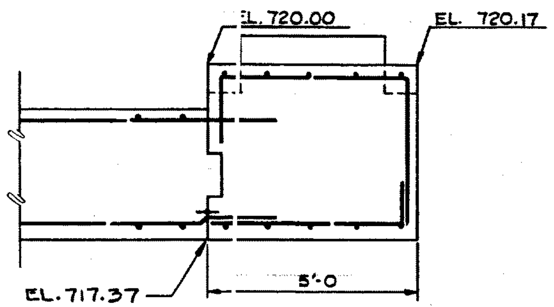
0 1' 2' 3' 4'

SEE ROADWAY DRAWINGS FOR EXACT LOCATION



SECTION INLET TYPE II

0 1' 2' 3' 4'



SECTION S-S
CUTOFF WALL
N.T.S.

Designed by RJK3
Drawn by FS
Checked by RJK3

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

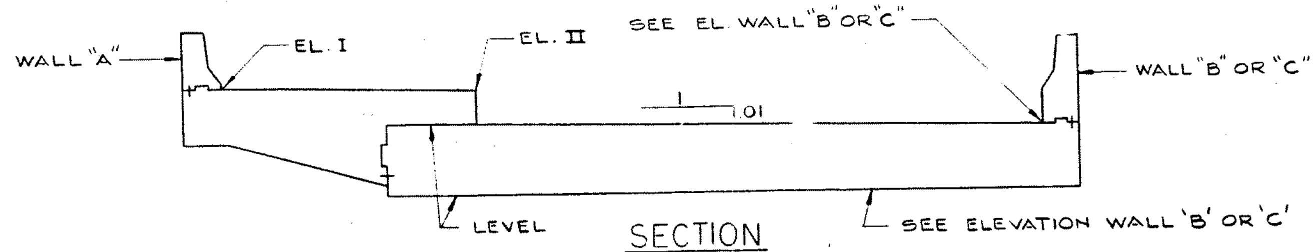
L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION DETAILS

APPROVED AUG 23 1982
BRIDGE ENGINEER

SHEET 49 OF 114
0009951
S-14584



SECTION
(MAINLINE PARKWAY)

NOTE: FOR FOUNDATION ELEVATION OF RAMP 'D' SEE ELEVATIONS WALL 'D' & 'E'

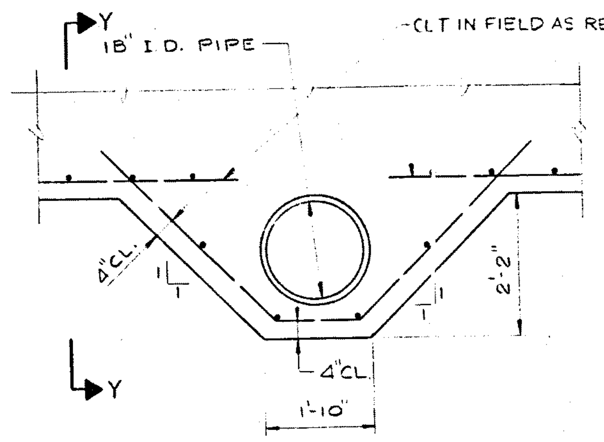
ROADWAY ELEVATIONS

STATION	ELEV. I	ELEV. II	STATION	ELEV. I	ELEV. II	STATION	ELEV. I	ELEV. II	STATION	ELEV. I	ELEV. II
11+23.500	722.04	721.67	12.30.000	718.29	718.05	13+30.000	716.77	716.65	14+30.000	717.24	717.12
11+30.000	721.78	721.41	12+31.500	718.24	718.01	13+32.500	716.76	716.64	14+40.000	717.29	717.17
11+40.000	721.38	721.03	12+40.000	718.00	717.79	13+40.000	716.77	716.65	14+40.500	717.29	717.17
11+50.000	720.98	720.64	12+50.000	717.74	717.55	13+50.000	716.79	716.67	14+50.000	717.35	717.23
11+50.500	720.96	720.62	12+58.500	717.54	717.37	13+59.500	716.83	716.71	14+60.000	717.41	717.29
11+60.000	720.58	720.26	12+60.000	717.50	717.33	13+60.000	716.84	716.72	14+67.500	717.45	717.33
11+70.000	720.19	719.88	12+70.000	717.28	717.14	13+70.000	716.89	716.77	14+70.000	717.46	717.34
11+77.500	719.91	719.61	12+80.000	717.09	716.97	13+80.000	716.95	716.83	14+80.000	717.52	717.40
11+80.000	719.82	719.53	12+85.500	717.03	716.91	13+86.500	716.99	716.87	14+90.000	717.58	717.46
11+90.000	719.48	719.20	12+90.000	716.98	716.86	13+90.000	717.01	716.89	14+94.500	717.60	717.48
12+00.000	719.17	718.89	13+00.000	716.89	716.77	14+00.000	717.06	716.94	15+00.000	717.63	717.51
12+04.500	719.03	718.76	13+10.000	716.83	716.71	14+10.000	717.12	717.00	15+10.000	717.69	717.57
12+10.000	718.87	718.60	13+12.500	716.82	716.70	14+13.500	717.14	717.02	15+20.000	717.75	717.63
12+20.000	718.59	718.33	13+20.000	716.79	716.67	14+20.000	717.18	717.06	15+21.500	717.76	717.64

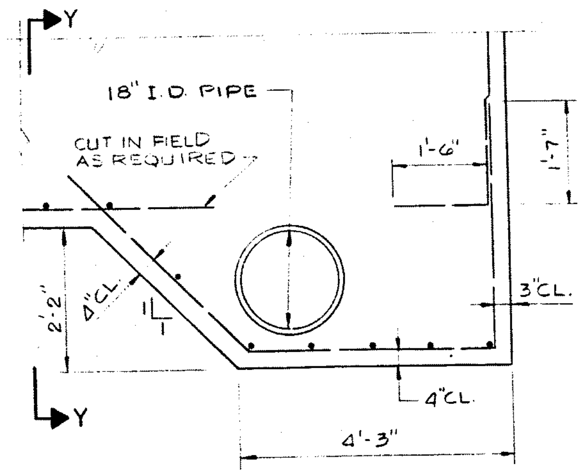
STATION	ELEV. I	ELEV. II	STATION	ELEV. I	ELEV. II	STATION	ELEV. I	ELEV. II
15+30.000	717.80	717.68	17+37.500	718.98	718.86	19+40.000	718.59	718.47
15+40.000	717.86	717.74	17+40.000	718.99	718.87	19+49.000	718.51	718.39
15+48.500	717.91	717.79	17+50.000	719.04	718.92	19+50.000	718.50	718.38
15+50.000	717.92	717.80	17+60.000	719.07	718.95	19+60.000	718.41	718.29
15+60.000	717.98	717.86	17+64.500	719.09	718.97	19+70.000	718.30	718.18
15+70.000	718.03	717.91	17+70.000	719.10	718.98	19+76.000	718.24	718.12
15+75.500	718.06	717.94	17+80.000	719.13	719.01	19+30.000	718.19	718.07
15+80.000	718.09	717.97	17+90.000	719.14	719.02	19+90.000	718.08	717.96
15+90.000	718.15	718.03	17+91.500	719.15	719.03	20+00.000	717.97	717.85
16+00.000	718.20	718.08	18+00.000	719.15	719.03	20+03.000	717.94	717.82
16+02.500	718.22	718.10	18+10.000	719.16	719.04	20+10.000	717.86	717.74
16+10.000	718.26	718.14	18+14.000	719.16	719.04	20+20.000	717.75	717.63
16+20.000	718.32	718.20	18+20.000	719.15	719.03	20+30.000	717.64	717.52
16+29.500	718.37	718.25	18+30.000	719.14	719.02	20+40.000	717.53	717.41
16+30.000	718.37	718.25	18+40.000	719.13	719.01	20+50.000	717.42	717.30
16+40.000	718.43	718.31	18+41.000	719.13	719.01	20+57.000	717.35	717.23
16+50.000	718.49	718.37	18+50.000	719.10	718.98	20+60.000	717.31	717.19
16+56.500	718.53	718.41	18+60.000	719.07	718.95	20+70.000	717.20	717.08
16+60.000	718.54	718.42	18+68.000	719.05	718.93	20+80.000	717.09	716.97
16+70.000	718.60	718.48	18+70.000	719.04	718.92	20+84.000	717.05	716.93
16+80.000	718.66	718.54	18+80.000	718.99	718.87	20+90.000	716.98	716.86
16+83.500	718.68	718.56	18+90.000	718.94	718.82	21+00.000	716.87	716.75
16+90.000	718.72	718.60	18+95.000	718.92	718.80	21+10.000	716.76	716.64
17+00.000	718.77	718.65	19+00.000	718.89	718.77	21+11.000	716.75	716.63
17+10.000	718.83	718.71	19+10.000	718.82	718.70	21+20.000	716.65	716.53
17+10.500	718.83	718.71	19+20.000	718.75	718.63	21+30.000	716.54	716.42
17+20.000	718.89	718.77	19+22.000	718.74	718.62	21+38.000	716.45	716.33
17+30.000	718.94	718.82	19+30.000	718.68	718.56	21+40.000	716.43	716.31

STATION	ELEV. I	ELEV. II	STATION	ELEV. I	ELEV. II
21+50.000	716.32	716.20	23+70.000	714.37	714.25
21+60.000	716.21	716.09	23+80.000	714.37	714.25
21+65.000	716.16	716.04	23+81.000	714.37	714.25
21+70.000	716.10	715.98	23+90.000	714.39	714.27
21+80.000	715.99	715.87	24+00.000	714.41	714.29
21+90.000	715.88	715.76	24+08.000	714.44	714.32
21+92.000	715.86	715.74	24+10.000	714.45	714.33
22+00.000	715.77	715.65	24+20.000	714.49	714.37
22+10.000	715.66	715.54	24+30.000	714.55	714.43
22+19.000	715.56	715.44	24+35.000	714.59	714.47
22+20.000	715.55	715.43	24+40.000	714.62	714.50
22+30.000	715.44	715.32	24+50.000	714.71	714.59
22+40.000	715.33	715.21	24+60.000	714.80	714.68
22+46.000	715.26	715.14	24+62.000	714.82	714.70
22+50.000	715.22	715.10	24+70.000	714.91	714.79
22+60.000	715.11	714.99	24+80.000	715.03	714.91
22+70.000	715.00	714.88	24+89.000	715.14	715.02
22+73.000	714.97	714.85	24+90.000	715.15	715.03
22+80.000	714.89	714.77	25+00.000	715.28	715.16
22+90.000	714.78	714.66	25+10.000	715.40	715.28
23+00.000	714.69	714.57	25+16.000	715.47	715.35
23+10.000	714.61	714.49	25+20.000	715.52	715.40
23+20.000	714.54	714.42	25+30.000	715.65	715.53
23+30.000	714.48	714.36	25+40.000	715.77	715.65
23+40.000	714.44	714.32	25+43.000	715.81	715.69
23+50.000	714.40	714.28	25+50.000	715.90	715.78
23+54.000	714.39	714.27	25+60.000	716.02	715.90
23+60.000	714.38	714.26	25+70.000	716.14	716.02

STATION	ELEV. I	ELEV. II	STATION	ELEV. I	ELEV. II
25+80.000	716.27	716.15	27+86.000	718.82	718.70
25+90.000	716.39	716.27	27+90.000	718.87	718.75
25+97.000	716.48	716.36	27+97.800	718.97	718.85
26+00.000	716.52	716.40	644+85.300	718.97	718.85
26+10.000	716.64	716.52	644+87.500	719.00	718.88
26+20.000	716.76	716.64	644+97.500	719.12	719.00
26+24.000	716.81	716.69	645+07.500	719.25	719.13
26+30.000	716.89	716.77	645+17.500	719.37	719.25
26+40.000	717.01	716.89	645+27.500	719.50	719.38
26+50.000	717.14	717.02	645+37.500	719.62	719.50
26+51.000	717.15	717.03	645+47.500	719.74	719.62
26+60.000	717.26	717.14	645+57.500	719.87	719.75
26+70.000	717.38	717.26	645+67.500	719.99	719.87
26+78.000	717.48	717.36	645+77.500	720.12	720.00
26+80.000	717.51	717.39	645+87.500	720.24	720.12
26+90.000	717.63	717.51	645+97.500	720.36	720.24
27+00.000	717.76	717.64	646+07.500	720.49	720.37
27+05.000	717.82	717.70	646+17.500	720.61	720.49
27+10.000	717.88	717.76	646+27.500	720.74	720.62
27+20.000	718.00	717.88	646+37.500	720.86	720.74
27+30.000	718.13	718.01	646+47.500	720.98	720.86
27+32.000	718.15	718.03	646+57.500	721.11	720.99
27+40.000	718.25	718.13	646+62.500	721.17	721.05
27+50.000	718.38	718.26			
27+59.000	718.49	718.37			
27+60.000	718.50	718.38			
27+70.000	718.62	718.50			
27+80.000	718.75	718.63			



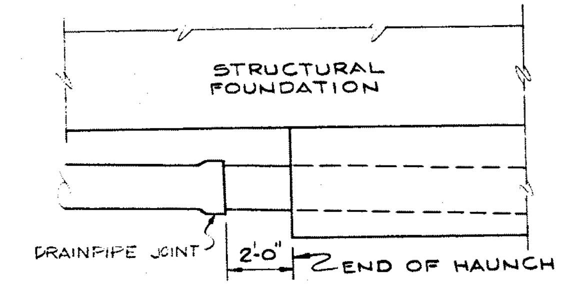
SECTION TYPE - A



SECTION TYPE - B

DRAIN PIPE HAUNCH

HAUNCH TYPE AND LOCATION							
STATION	TYPE	STATION	TYPE	STATION	TYPE	RAMP -"D"	
						STATION	TYPE
12+02.5 TO 12+13.0	A	14+67.5 TO 14+74.0	B	19+70.0 TO 20+95.0	B	645+24.9 (℄ RAMP-D) 645+24.9 (℄ RAMP-D)	A
12+29.5 TO 12+85.5	A	14+78.0 TO 15+65.0	B	20+99.0 TO 21+63.0	B		
12+85.5 TO 13+01.0	B	15+69.0 TO 15+77.5	B	25+18.0 TO 25+70.0	A		
13+05.0 TO 13+12.5	B	16+00.0 TO 16+85.5	B	25+70.0 TO 25+76.0	B	646+33.4 (℄ RAMP-D) 646+35.4 (℄ RAMP-D)	A
13+12.5 TO 13+93.5	A	17+64.5 TO 17+79.0	A	25+80.0 TO 26+68.0	B		
13+97.0 TO 14+67.5	A	17+82 TO 17+82.0	A	26+72.0 TO 27+34.0	B		
13+95.0 TO 13+95.0	A						



SECTION Y-Y
N.T.S.

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

JM/RAH
F.S.
RJK3

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23
W.B. STA.1098+30.29
TO STA.1101+35.48
L.R. 764 SEC. 19
W.B. STA.631+16.78
TO STA.646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION DETAILS & ROADWAY ELEV.

APPROVED AUG 23 1982
BRIDGE ENGINEER

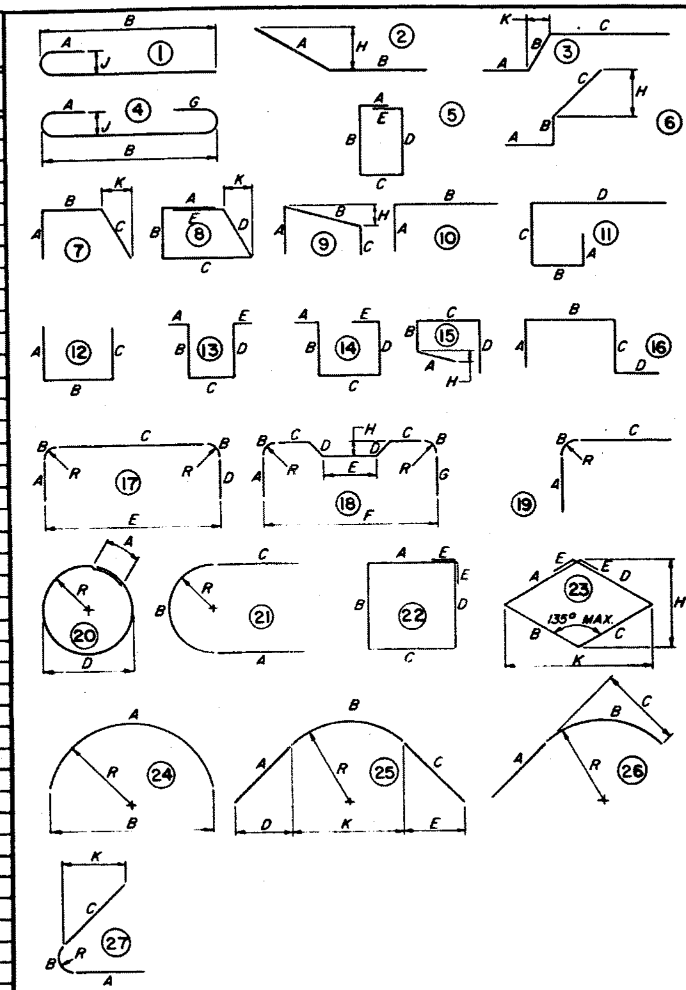
SHEET 50 OF 114
0009952
S- 14584

7530-2350-0210

REINFORCEMENT BAR SCHEDULE

MARK	SIZE	LENGTH	NO.	TYPE	A	B	C	D	E	F	G	H	J	K	R	REMARKS
		MAIN LINE														
FM501	5	47'-9"	7	STR												
FM502	5	30'-3"	56	STR												
FM503	5	3'-7"	39	10	1'-9"	1'-10"										
FM504	5	7'-8"	62	12	2'-4"	3'-0"	2'-4"									
FM505	5	3'-3"	27	10	1'-6"	1'-9"										
FM506	5	7'-9"	18	10	2'-0"	5'-9"										
FM507	5	9'-10"	6	12	8'-0"	4"	1'-6"									
FM508	5	10'-0"	8	STR												
FM509	5	17'-3"	9	STR												
FM510	5	41'-3"	5	10	2'-3"	39'-0"										
FM511	5	8'-4"	40	10	1'-10"	6'-6"										
FM512	5	5'-0"	349	STR												
FM513	5	10'-8"	2	12	3'-2"	4'-6"	3'-0"									
FM514	5	16'-3"	2	12	8'-0"	1'-9"	6'-6"									
FM515	5	34'-3"	1438	STR												
FM516	5	23'-5"	32	10	1'-8"	21'-9"										
FM517	5	19'-6"	51	STR												
FM518	5	10'-6"	12	10	3'-3"	7'-3"										
FM519	5	9'-0"	17	10	1'-9"	7'-3"										
FM520	5	18'-10" TO 18'-0"	22	STR												VARY BY 1/2" ±
FM521	5	9'-6"	22	STR												
FM522	5	5'-0"	1485	10	2'-3"	2'-9"										
FM523	5	23'-9"	138	STR												
FM524	5	30'-9"	33	10	2'-3"	28'-6"										
FM525	5	7'-0"	320	2	3'-3"	3'-9"							2'-3 1/2"				
FM526	5	14'-3"	8	7	2'-4"	8'-9"	3'2"								2'-3"		
FM527	5	26'-9"	504	STR												
FM528	5	28'-9"	8	10	2'-0"	26'-9"										
FM529	5	8'-6"	11	STR												
FM530	5	17'-11" TO 16'-9"	27	STR												VARY BY 1/2" ±
FM531	5	32'-3"	1434	STR												
FM532	5	5'-9"	54	STR												
FM533	5	13'-0" TO 12'-2"	20	2	1'-9"	[illegible]						5 3/8"				VARY 'C' BY 1/2" ±
FM534	5	13'-9" TO 12'-11"	20	STR												VARY BY 1/2" ±
FM535	5	28'-9"	3892	STR												
FM536	5	16'-9" TO 15'-7"	27	STR												VARY BY 1/2" ±
FM537	5	8'-9"	17	7	2'-0"	1'-0"	5'-9"							4'-0 3/4"		
FM538	5	12'-10" TO 11'-9"	27	STR												VARY BY 1/2" ±
FM539	5	6'-10"	4	STR												
FM540	5	21'-9"	175	STR												
FM541	5	8'-10"	4	STR												
FM542	5	15'-7" TO 14'-5"	27	STR												VARY BY 1/2" ±
FM543	5	11'-8" TO 11'-5"	7	STR												VARY BY 1/2" ±
FM544	5	14'-5" TO 12'-3"	28	STR												VARY BY 1/2" ±
FM545	5	12'-2" TO 11'-0"	28	2	1'-9"	10'-5" TO 9'-3"						5 3/8"				VARY 'C' BY 1/2" ±
FM546	5	13'-3"	1359	STR												
FM547	5	11'-0"	1359	2	1'-9"	9'-3"						5 3/8"				
FM548	5	4'-6"	373	2	1'-9"	2'-9"						1'-11"				
FM549	5	7'-3"	26	7	2'-0"	1'-0"	4'-3"						3'-0"			
FM550	5	5'-6"	604	7	2'-0"	1'-0"	2'-6"						1'-9 1/4"			
FM551	5	24'-6"	94	STR												
FM552	5	2'-3" TO 3'-6"	56	STR												2 SETS OF 28 VARY BY 9/16" ±
FM553	5	3'-6" TO 6'-0"	56	STR												2 SETS OF 28 VARY BY 1/8" ±
FM554	5	6'-0" TO 8'-6"	56	STR												2 SETS OF 28 VARY BY 1/8" ±
FM555	5	8'-6" TO 11'-0"	56	STR												2 SETS OF 28 VARY BY 1/8"
FM556	5	11'-0" TO 13'-6"	56	STR												2 SETS OF 28 VARY BY 1/8" ±
FM557	5	46'-3" TO 48'-3"	22	STR												VARY BY 1 1/8" ±
FM558	5	44'-3" TO 46'-3"	22	STR												VARY BY 1 1/8" ±
FM559	5	7'-0"	6	STR												
FM560	5	30'-9"	1	STR												
FM561	5	2'-10"	54	10	1'-1"	1'-9"										
FM562	5	46'-0"	5	STR												
FM563	5	5'-10"	54	10	1'-1"	4'-9"										
FM564	5	3'-2"	16	10	1'-5"	1'-9"										
FM565	5	10'-0"	7	12	2'-9"	4'-6"	2'-9"									
FM566	5	6'-4"	12	10	2'-4"	4'-0"										
FM567	5	2'-9" TO 5'-6"	12	10	1'-9"	1'-0" TO 3'-9"										VARY 'b' BY 3"
FM568	5	14'-0"	2	11	2'-4"	4'-6"	2'-5"	4'-9"								
FM569	5	14'-8"	2	11	2'-4"	4'-6"	3'-1"	4'-9"								
FM570	5	9'-6"	283	18				4'-0"	1'-6"			2'-10"				
FM571	5	11'-6"	530	7	3'-9"	3'-9"	4'-0"							2'-10"		
FM572	5	14'-0"	4	STR												
FM601	6	29'-0"	1016	STR												
FM602	6	34'-6"	420	STR												
FM603	6	32'-3"	420	STR												
FM604	6	13'-3"	420	STR												
FM605	6	11'-0"	420	2	1'-9"	9'-3"						5 3/8"				
FM606	6	5'-0"	420	10	2'-3"	2'-9"										

MARK	SIZE	LENGTH	NO.	TYPE	A	B	C	D	E	F	G	H	J	K	R	REMARKS
		MAIN LINE (Cont.)														
FM607	6	26'-9"	128	STR												
FM608	6	5'-0"	64	STR												
FM609	6	6'-9"	64	2	2'-9"	4'-0"						2'-3 1/2"				
FM610	6	22'-0"	88	STR												
FM611	6	36'-0"	88	STR												
FM612	6	5'-9"	33	2	4'-0"	1'-9"										
FM5103	5	8'-11"	27	10	1'-7"	7'-4"										
FM5104	5	6'-0"	32	STR												
FM5105	5	8'-9"	24	12	1'-7"	5'-7"	1'-7"									
FM5106	5	4'-2"	24	STR												
FM5107	5	6'-6"	72	STR												
FM5108	5	29'-2"	16	STR												NEED TO LAP WITH FM5107
FM5109	5	6'-2"	16	STR												
FM5110	5	5'-8"	77	2	1'-0"	4'-8"						8 1/2"				
FM5111	5	7'-6"	70	10	1'-0"	6'-6"										
FM5112	5	28'-7"	11	STR												
FM5113	5	28'-9"	194	STR												
FM5114	5	5'-6"	10	STR												
FM5115	5	29'-0"	9	STR												
FM5116	5	6'-4"	12	STR												
FM5117	5	12'-4"	10	STR												
FM5118	5	34'-11"	5	10	1'-7"	33'-4"										
FM5119	5	19'-8"	5	10	1'-7"	18'-1"										
FM5120	5	8'-4"	4	10	1'-7"	6'-9"										
FM5121	5	5'-2"	9	STR												
FM5122	5	23'-5"	4	10	1'-7"	21'-10"										
FM5123	5	20'-3"	9	STR												
FM5124	5	12'-4"	2	STR												
FM5125	5	11'-0"	2	STR												
FM5126	5	16'-6"	2	STR												
FM5127	5	31'-6"	2	STR												
FM5128	5	3'-3"	2	STR												
FM5129	5	4'-6"	2	STR												
FM5130	5	8'-3"	2	STR												
FM5131	5	6'-8"	2	STR												
FM5132	5	29'-0"	1	STR												
FM5133	5	30'-3"	1	STR												
FM5134	5	17'-3"	145	STR												
FM5135	5	4'-0"	8	STR												
FM5136	5	15'-11"	16	10	3'-6	12'-5"										
FM5137	5	6'-0"	16	STR												
FM5141	5	22'-6"	4	STR												
FM5142	5	28'-3"	4	STR												
FM5143	5	8'-2" TO 1'-7"	42	STR												VAR. 2 EA. BY 4"
FM5144	5	17'-2" TO 8'-2"	56	STR												VAR. 2 EA. BY 4"
FM5145	5	29'-0"	19	STR												
FM5146	5	25'-8" TO 5'-8"	8	STR												VAR. 1 EA. BY 2'-10"
FM5147	5	18'-7" TO 4'-5"	12	STR												VAR. 2 EA. BY 2'-10"
FM5148	5	26'-8"	7	STR												
FM5149	5	23'-8" TO 3'-8"	8	STR	23'-8" TO 3'-8"											1 EA. VAR. BY 2'-10"
FM5150	5	5'-0"	16	STR												
FM5151	5	5'-3"	21	2	1'-11"	3'-4"						1'-4 1/4"				
FM5154	5	4'-8"	72	2	1'-11"	2'-9"						1'-4 1/4"				
FM5155	5	17'-9	16	STR												
FM5156	5	7'-8"	19	9	2'-4"	3'-0"	2'-4"					2"				
FM5157	5	8'-4"	23	10	2'-0"	6'-4"										
FM5158	5	4'-5"	19	10	1'-9"	2'-8"										
FM5159	5	4'-3"	19	10	1'-9"	2'-6"										
FM5160	5	5'-0"	74	STR												
FM5161	5	11'-5"	2	9	3'-6"	4'-8"	3'-3"					2"				
FM5162	5	10'-7"	2	9	3'-2"	4'-8"	2'-9"					3"				
FM5163	5	21'-4"	118	STR												
FM5164	5	21'-10"	23	STR	21'-10"											
FM5165	5	24'-0"	23	STR												
FM5166	5	26'-10"	35	STR	26'-10"											
FM5168	5	5'-6"	46	2	1'-11"	3'-7"						1'-4 1/2"				
FM5170	5	24'-7"	48	STR												
FM5171	5	24'-1"	46	STR												
FM5172	5	24'-6"	56	STR												
FM5173	5	22'-7"	56	STR												
FM5174	5	19'-1"	56	STR												
FM5175	5	13'-4"	56	STR												
FM5176	5	28'-7" TO 8'-0"	8	STR												VAR. 2 EA. BY 7'-6"
FM5177	5	6'-7"	56	STR												
FM5178	5	2'-4"	56	STR												
FM5179	5	3'-5"	23	10	1'-7"	1'-10"										
FM6101	6	39'-4"	2	STR												
FM6102	6	37'-4"	2	STR	37'-4"											



Designed by CLM/RJK
Drawn by JLS
Checked by RJK[3]

- "J" Dimensions on 180° hooks to be shown only where necessary to restrict hook size, otherwise standard hooks are to be used.
- All dimensions are out to out of bar except "A" and "G" on standard 135° and 180° hooks, and "R" which is shown to the inside of the bar.
- For Reinforcement Bar Fabrication Details, refer to Standard Drawing BC-336A
- Figures in circles show types.

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23 — W.B. STA.1098+30.29 TO STA.1101+35.48
L.R. 764 SEC. 19 — W.B. STA.631+16.78 TO STA.646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION REINF. BAR SCHEDULE

APPROVED AUG [illegible]
BRIDGE ENGINEER

SHEET 51 OF 114
0009958 [illegible]

S-14584

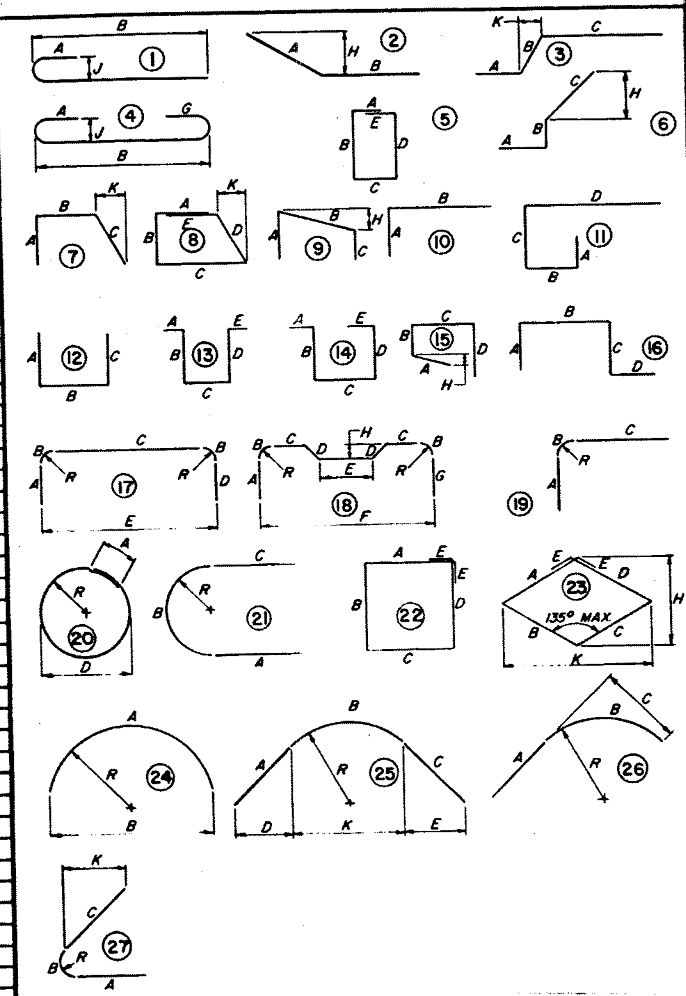
ROBERT H. WALTON CO.

7530-2350-0210

REINFORCEMENT BAR SCHEDULE

MARK	SIZE	LENGTH	NO.	TYPE	A	B	C	D	E	F	G	H	J	K	R	REMARKS
		MAIN LINE (Cont.)														
FM6103	6	8'-0"	4	2	5'-0"	3'-0"						3'-10"				
FM6104	6	17'-9" TO 2'-0"	70	STR												VAR. 2 EA. 8Y 5'-2"
FM6105	6	5'-0"	16	STR												
FM6106	6	5'-8"	32	2	1'-11"	3'-9"						1'-4 1/4"				
FM6107	6	32'-0" TO 2'-0"	16	STR	32'-0" TO 2'-0"											VAR. 1 EA. 8Y 2'-0"
FM6108	6	34'-0" TO 4'-0"	16	STR												VAR. 1 EA. 8Y 2'-0"
FM6109	6	17'-6"	140	STR												
FM6110	6	27'-0"	16	STR												
FM6111	6	29'-0"	49	STR	29'-0"											
FM6113	6	17'-6" TO 2'-6"	56	STR												
FM6114	6	22'-0" TO 2'-0"	32	STR												VAR. 2 EA. 8Y 1'-4"
FM6115	6	20'-8"	2	24	20'-8"										33'-5"	
FM6116	6	9'-7"	27	10	1'-11"	7'-8"										
FM6117	6	9'-5"	24	12	1'-11"	5'-7"	1'-11"									
FM6118	6	28'-11"	17	STR												
FM6119	6	20'-8"	2	24	20'-8"										32'-3"	
FM6120	6	15'-3	4	10	1'-11"	13'-4"										
FM6121	6	17'-6"	4	10	1'-11"	15'-7"										
FM6122	6	26'-7"	5	10	1'-11"	24'-8"										
FM6123	6	28'-10	5	10	1'-11"	26'-11"										
FM6124	6	29'-2"	10	STR												
FM6125	6	7'-6"	43	STR												
FM6126	6	5'-7"	6	STR												
FM6127	6	6'-10	70	10	1'-0"	5'-10"										
FM6128	6	5'-7"	8	STR												
FM6129	6	12'-4"	8	STR												
FM6130	6	4'-0"	8	STR												
FM6131	6	4'-11"	56	2	1'-11"	3'-0"						1'-4 1/4"				
FM6132	6	11'-5"	2	24	11'-5"										33'-5"	
FM6133	6	11'-5"	2	24	11'-5"										32'-3"	
		RAMP D														
F501	5	21'-0"	958	STR												
F502	5	21'-8"	88	STR												
F503	5	8'-1"	46	10	6'-6"	1'-7"										
F504	5	7'-10"	39	12	2'-5"	3'-0"	2'-5"									
F505	5	3'-9"	18	10	2'-0	1'-9"										
F506	5	3'-3"	39	10	1'-6"	1'-9"										
F507	5	5'-0"	134	STR												
F508	5	6'-9"	22	2	3'-9"	3'-0"						2'-8"				
F509	5	7'-5"	22	2	3'-9"	3'-8"						2'-8"				
F510	5	22'-1"	48	STR												
F511	5	28'-9"	660	STR												
F513	5	5'-4"	22	2	3'-6"	1'-10"						2'-5 1/2"				
F515	5	4'-4"	19	2	2'-6"	1'-10"						1'-9 1/2"				
F516	5	26'-8"	22	STR												
F518	5	30'-7"	22	12	1'-11"	26'-9"	1'-11"									
F519	5	21'-0 TO 21'-6"	56	STR												2 SETS OF 28 VARY BY 1/4"±
F520	5	21'-6" TO 22'-2"	56	STR												2 SETS OF 28 VARY BY 5/16"±
F521	5	3'-8"	22	2	1'-10"	1'-10"						1'-3 1/2"				
F524	5	22'-2" TO 22'-10	56	STR												2 SETS OF 28 VARY BY 5/16"±
F525	5	29'-3	46	STR												
F526	5	3'-3"	23	2	1'-10"	1'-5"						1'-3 1/2"				
F527	5	22'-10" TO 23'-5"	56	STR												2 SETS OF 28 VARY BY 1/4"±
F530	5	23'-5" TO 24'-0"	23	STR												VARY 8Y 5/16"±
F531	5	23'-5" TO 24'-1"	28	STR												VARY 8Y 5/16"±
F533	5	3'-4" TO 4'-7"	21	10	1'-7 TO 2'-10	1'-9"										VARY 'A' 8Y 3/4"±
F534	5	24'-1"	11	STR												
F535	5	5'-0"	35	3	1'-7"	1'-10"	1'-7"									
F536	5	5'-9"	16	3	1'-7"	2'-7"	1'-7"									
F537	5	4'-5"	19	3	1'-7"	1'-3"	1'-7"									
F538	5	3'-10"	42	3	1'-7"	8"	1'-7"									
F539	5	4'-10	14	3	1'-7"	1'-8"	1'-7"									
F540	5	9'-6"	31	18				4'-1"	1'-4"			2'-10"				
F541	5	16'-0"	8	STR												
		INLETS														
FM5201	5	6'-1"	142	STR												
FM5202	5	5'-3"	284	STR												PANEL 68
FM5203	5	4'-4"	14	STR												PANEL 4
FM5204	5	5'-9	14	13	1'-7"	2'-7"	1'-7"									PANEL 11 & 65 (MANHOLE)
FM5205	5	6'-0"	484	10	1'-7"	4'-5"										
FM5206	5	7'-0"	130	STR												
FM5207	5	8'-0"	172	2	1'-7"	6'-5"						1'-1 1/2"				PANEL 68 & 69
FM5208	5	11'-9"	43	2	1'-7"	10'-2"						1'-1 1/2"				
FM5209	5	7'-0"	70	10	1'-7"	5'-5"										PANEL 69
FM5210	5	9'-9"	7	10	1'-7"	8'-2"										

MARK	SIZE	LENGTH	NO.	TYPE	A	B	C	D	E	F	G	H	J	K	R	REMARKS
		INLETS (Cont.)														
F5201	5	6'-1"	36	STR												INLET ON RAMP D
F5202	5	5'-3"	66	STR												INLET ON RAMP D
F5203	5	7'-10"	42	13	1'-7"	4'-8"	1'-7"									INLET ON RAMP D
F5204	5	7'-0"	21	10	1'-7"	5'-5"										INLET ON RAMP D
F5205	5	7'-0"	24	STR												INLET ON RAMP D
F5206	5	8'-0	54	2	1'-7"	6'-5"						1'-1 1/2"				INLET ON RAMP D
		MANHOLES														
FM5211	5	6'-4"	128	STR												
FM5212	5	7'-7"	96	2	1'-7"	6'-0"						1'-1 1/2"				PANEL 65
FM5213	5	10'-9"	32	2	1'-7"	9'-2"						1'-1 1/2"				PANELS 4 & 25
FM5214	5	5'-3"	64	10	1'-7"	3'-8"										
FM5215	5	16'-3"	29	20	1'-7"			4'-8"							2'-4"	



CLm/RJK
JLS
RJK³

- "J" Dimensions on 180° hooks to be shown only where necessary to restrict hook size, otherwise standard hooks are to be used.
- All dimensions are out to out of bar except "A" and "G" on standard 135° and 180° hooks, and "R" which is shown to the inside of the bar.
- For Reinforcement Bar Fabrication Details, refer to Standard Drawing BC-336A
- Figures in circles show types.

Mark	Description	By	Chk'd.	App'd.	Date
REVISIONS					

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA.1098+30.29
TO STA.1101+35.48

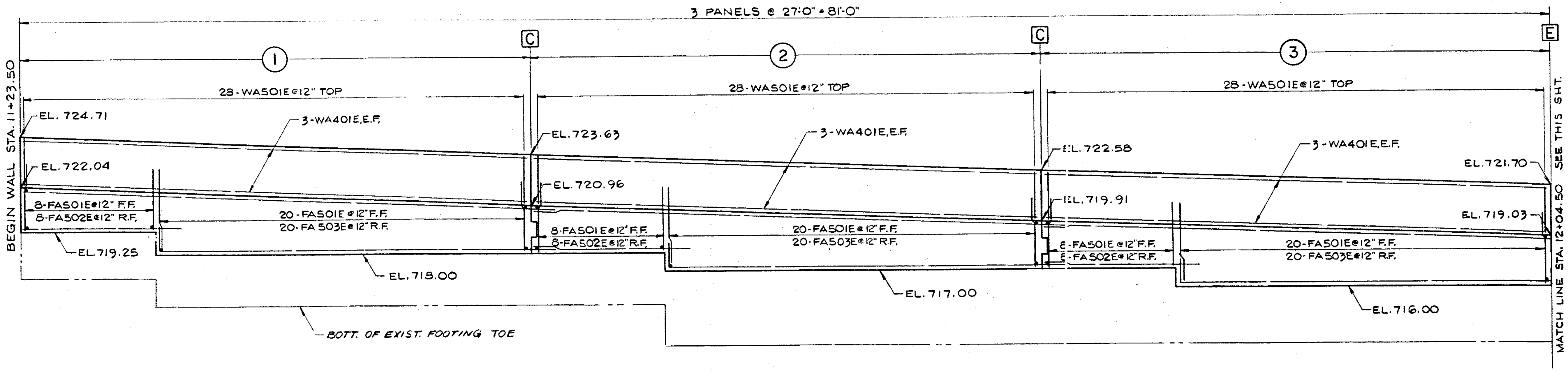
L.R. 764 SEC. 19
W.B. STA.631+16.78
TO STA.646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
FOUNDATION REINF. BAR SCHEDULE

APPROVED AUG 23 1982
[signature]
BRIDGE ENGINEER

SHEET 52 OF 114
0009954
S-14584

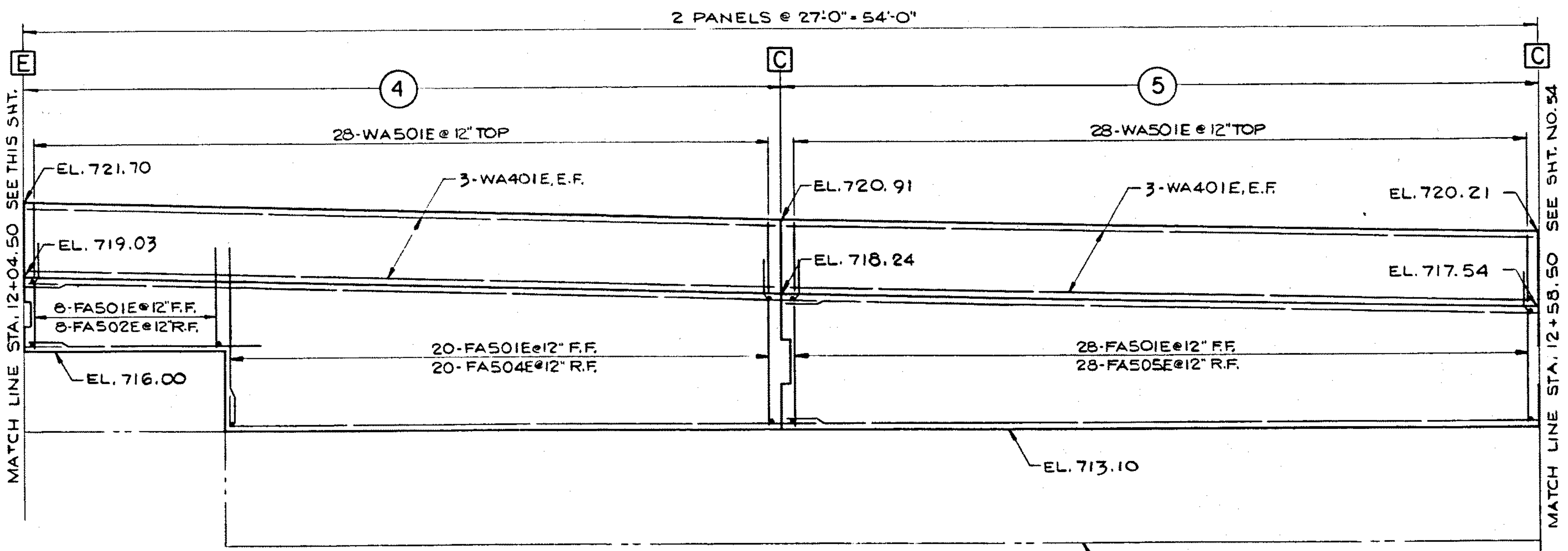
D-8008 (8-77)



ELEVATION

0 1' 2' 4'

NOTES:
1. FOR WALL LOCATION SEE SHT. NOS. 4 & 14
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT NO. 69
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NO. 22
7. FOR SECTIONS SEE SHT. 67



ELEVATION

0 1' 2' 4'

LEGEND
(3) DENOTES PANEL NUMBER (WALL ONLY)
[C] DENOTES CONSTRUCTION JT.
[E] DENOTES EXPANSION JT.
F.F. = FRONT FACE
R.F. = REAR FACE
E.F. = EACH FACE

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL A PANELS 1 – 5

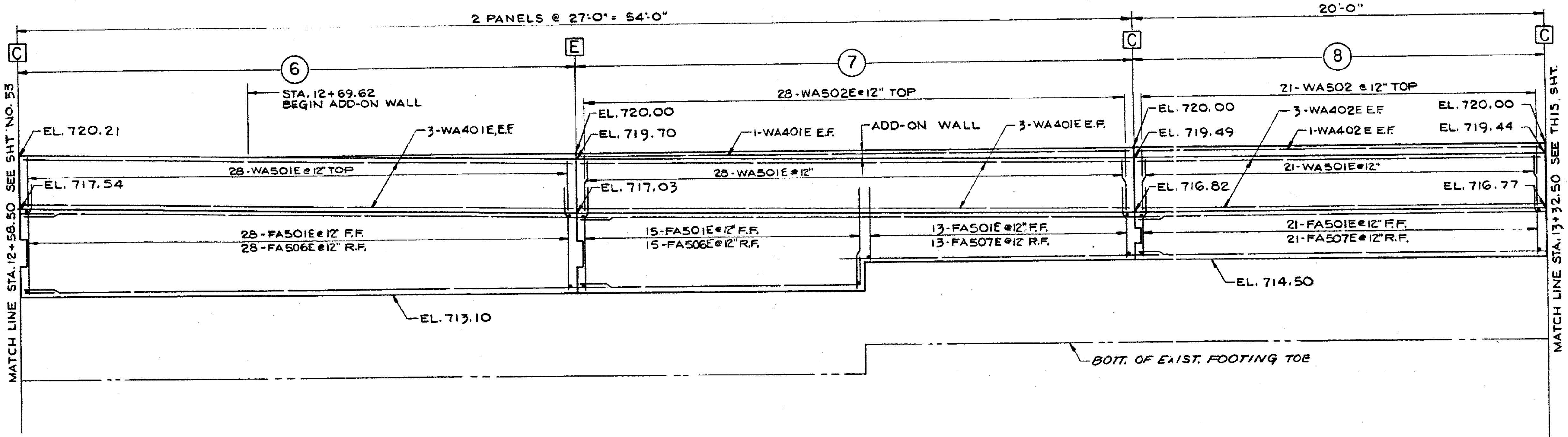
APPROVED ________
BRIDGE ENGINEER

SHEET 53 OF 114
0009955

S-14584

FGC/RJK3
RJK
RJK3

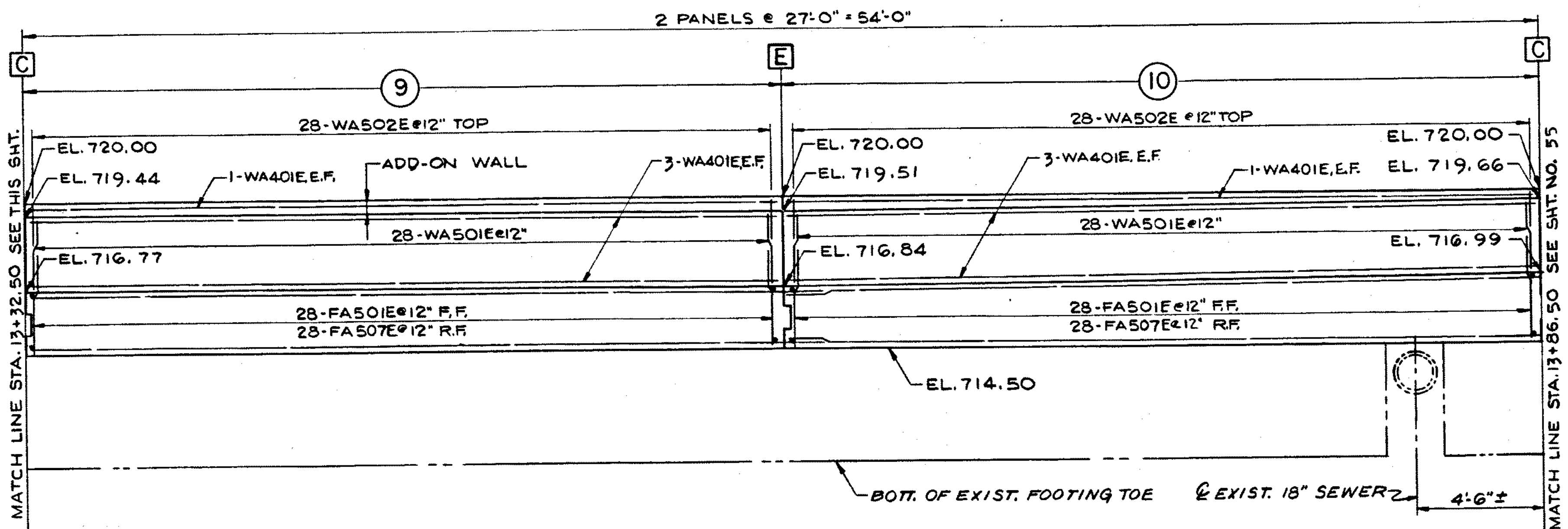
D-9002 (3-77)



ELEVATION

0 1' 2' 4'

NOTES:
1. FOR WALL LOCATION SEE SHT. NOS. 4, 5-14
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT NO. 69
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT NOS. 22 & 23
7. FOR LEGEND SEE SHT. NO. 53
8. FOR SECTIONS SEE SHT. NO 67



ELEVATION

0 1' 2' 4'

FGC/RJK3
RJK
RJK3

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

ELEVATION WALL A PANELS 6-10

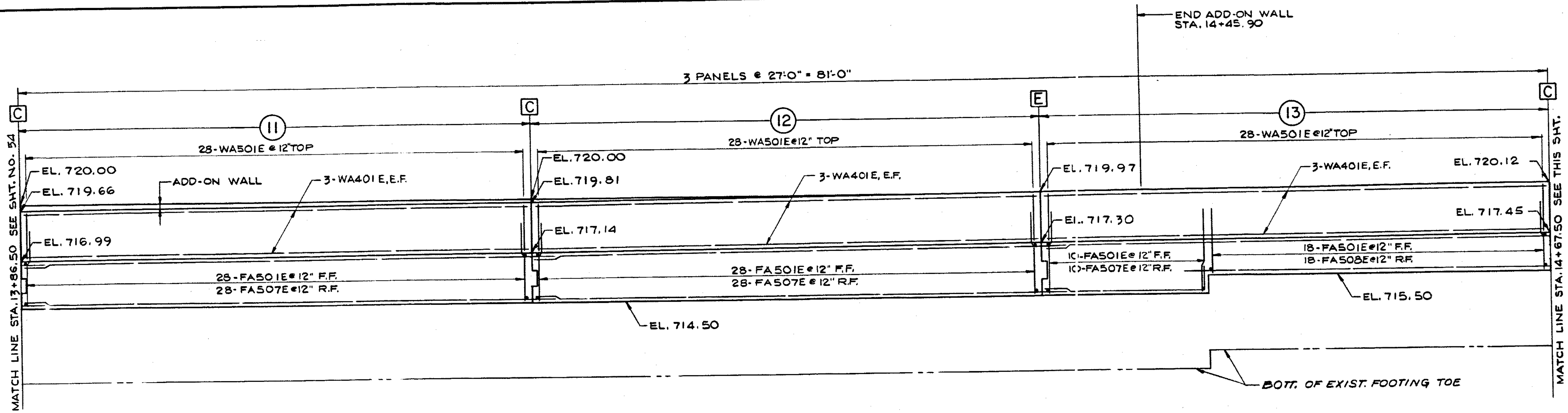
APPROVED AUG 23 1982 [signature]

BRIDGE ENGINEER

SHEET 54 OF 114

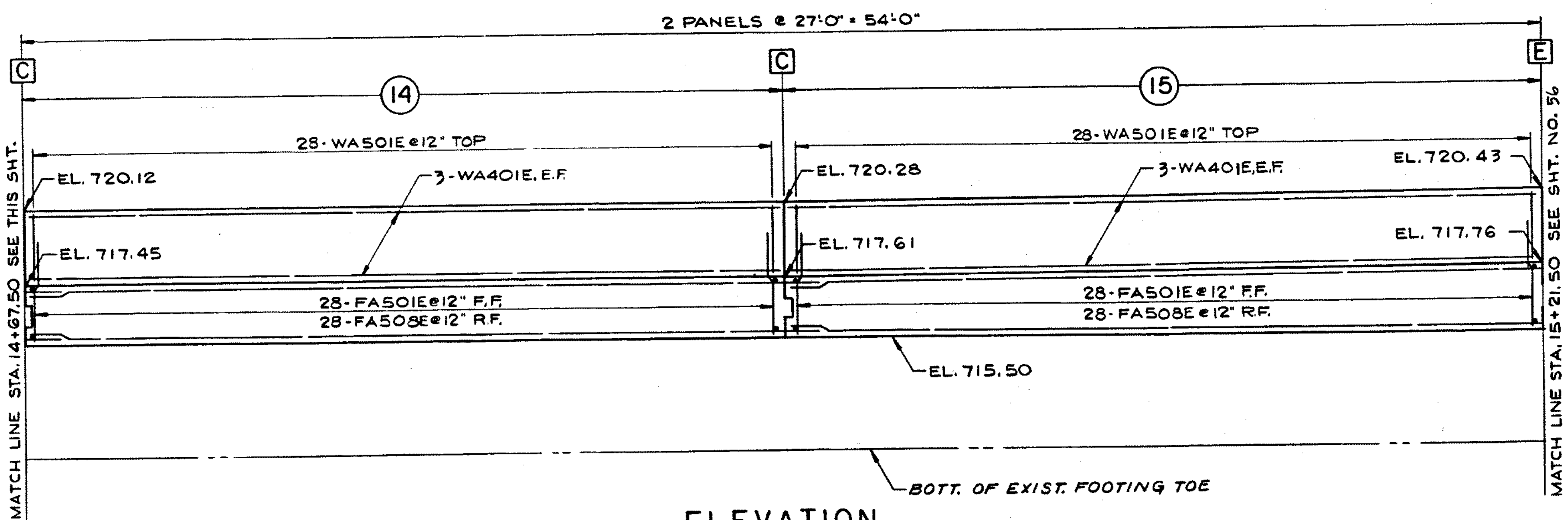
0009956

S-14584



ELEVATION

0 1' 2' 4'



ELEVATION

0 1' 2' 4'

NOTES:

1. FOR WALL LOCATION SEE SHT. NOS. 5 & 14
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 69
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NOS. 23 & 24
7. FOR LEGEND SEE SHT. NO. 53
8. FOR SECTIONS SEE SHT. 67

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

ELEVATION WALL A PANELS 11-15

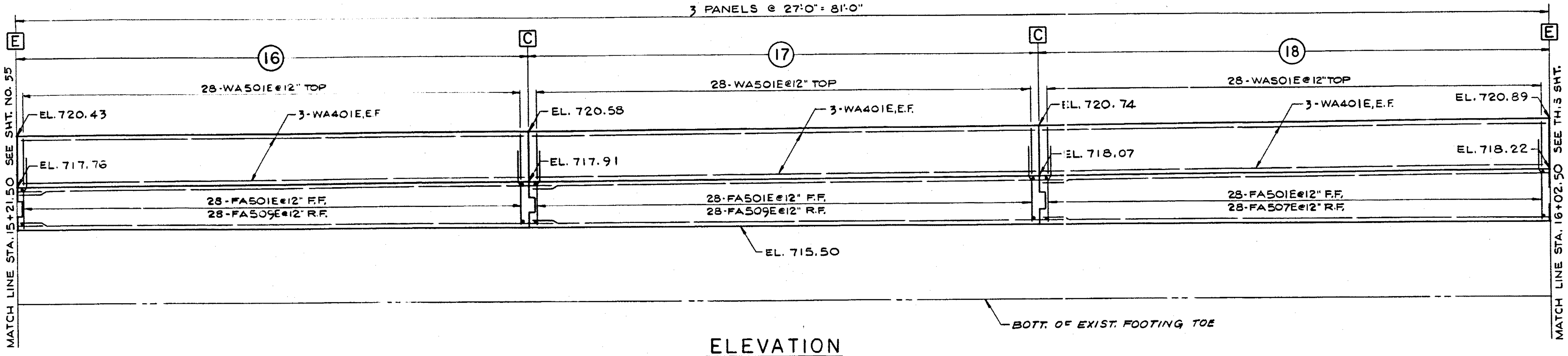
APPROVED AUG 23 1987
BRIDGE ENGINEER

SHEET 55 OF 114
0009957

S-14584

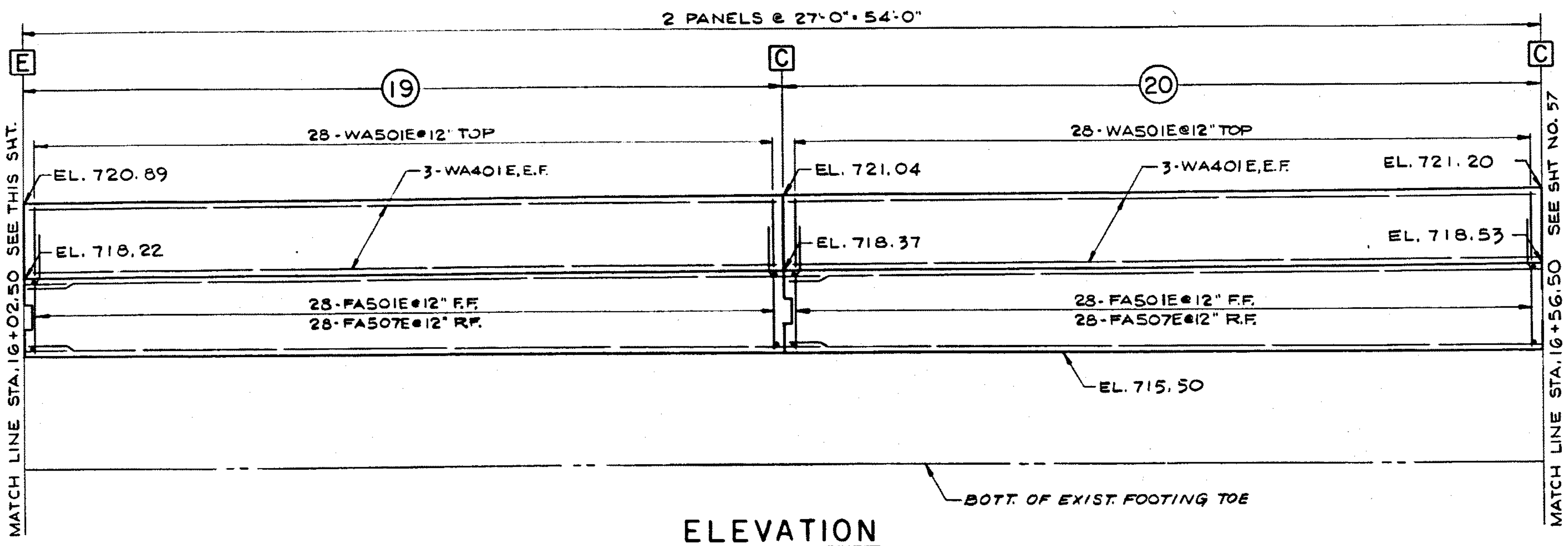
Designed by FGC/RJK3
Drawn by RJK
Checked by RJK3

7530-2350-0200



ELEVATION

0 1' 2' 4'



ELEVATION

0 1' 2' 4'

NOTES:
1. FOR WALL LOCATION SEE SHT. NOS. 6 & 14
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 69
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NOS. 24 & 25
7. FOR LEGEND SEE SHT. NO. 53
8. FOR SECTIONS SEE SHT. NO. 67

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

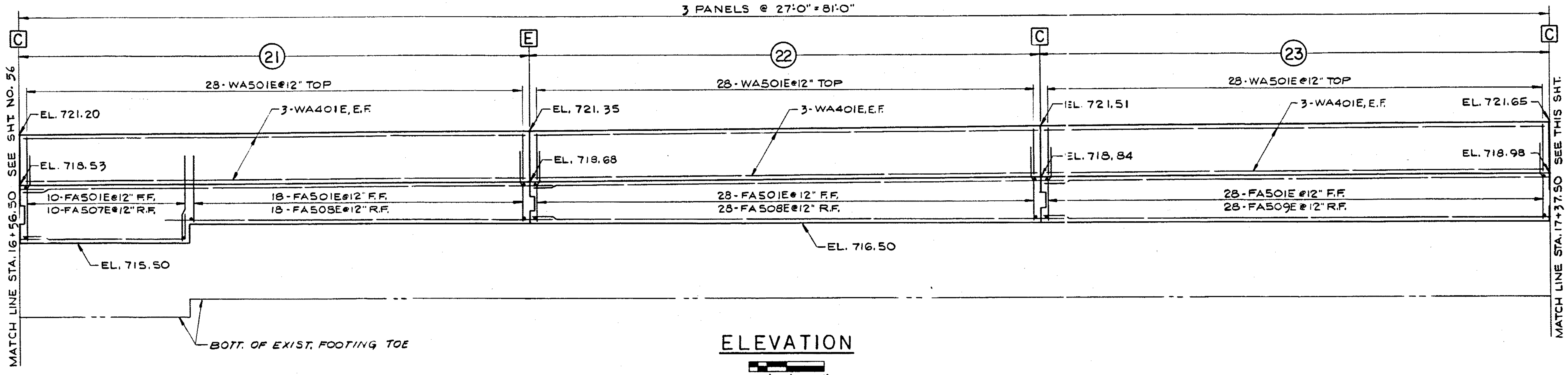
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL A PANELS 16-20

APPROVED AUG 23 1982
B J Kotalik
BRIDGE ENGINEER

SHEET 56 OF 114
0009958
S-14584

FGC/RJK[3]
RJK
RJK[3]

KOKE 19 1200 10-26 W0001



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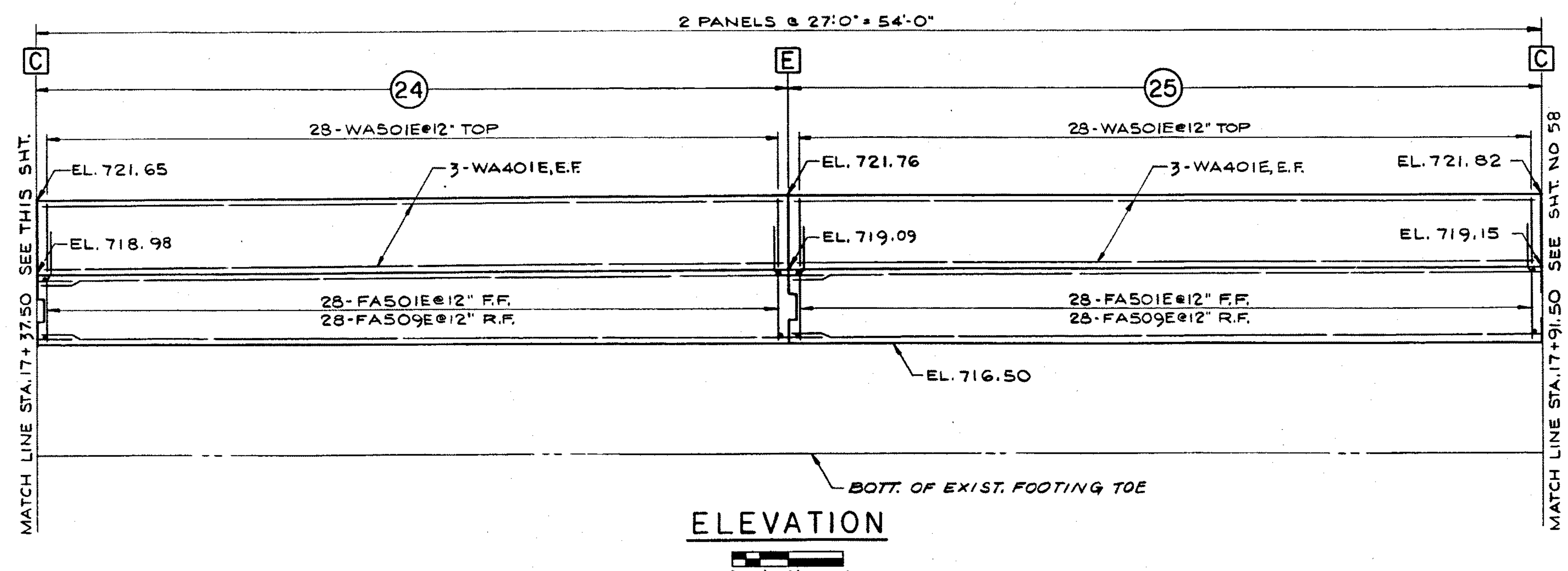


ELEVATION

NOTES:
1. FOR WALL LOCATION SEE SHT. NOS. 6 & 14
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SHT. NO. 68
4. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
5. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NOS. 25 & 26
6. FOR LEGEND SEE SHT. NO. 53
7. FOR SECTIONS SEE SHT. NO. 67

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

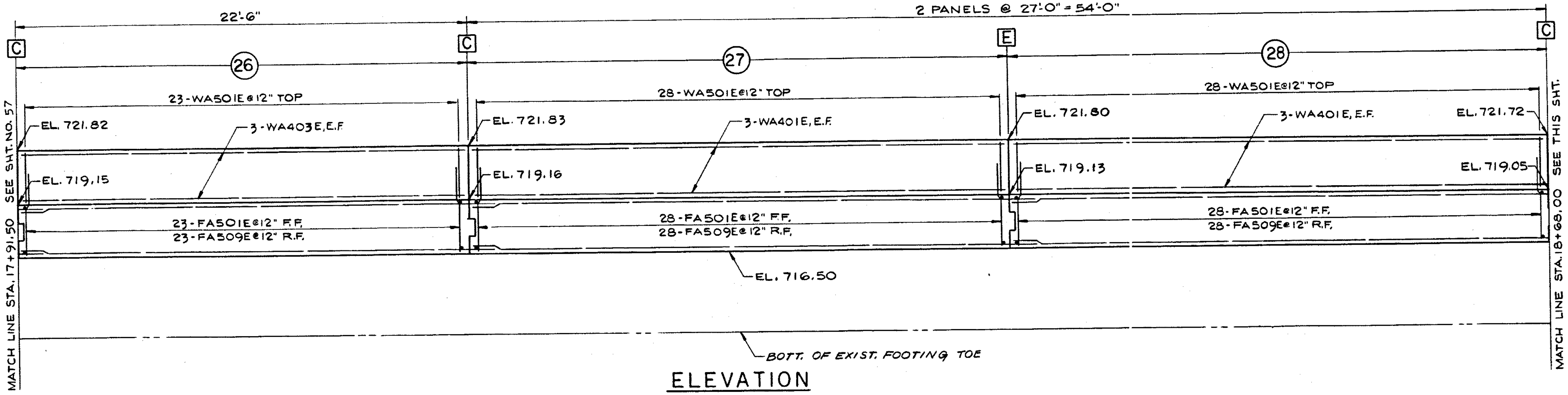
Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23 W.B. STA. 1098+30.29 TO STA. 1101+35.48
L.R. 764 SEC. 19 W.B. STA. 631+16.78 TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL A PANELS 21-25

APPROVED AUG 28 1987
BRIDGE ENGINEER

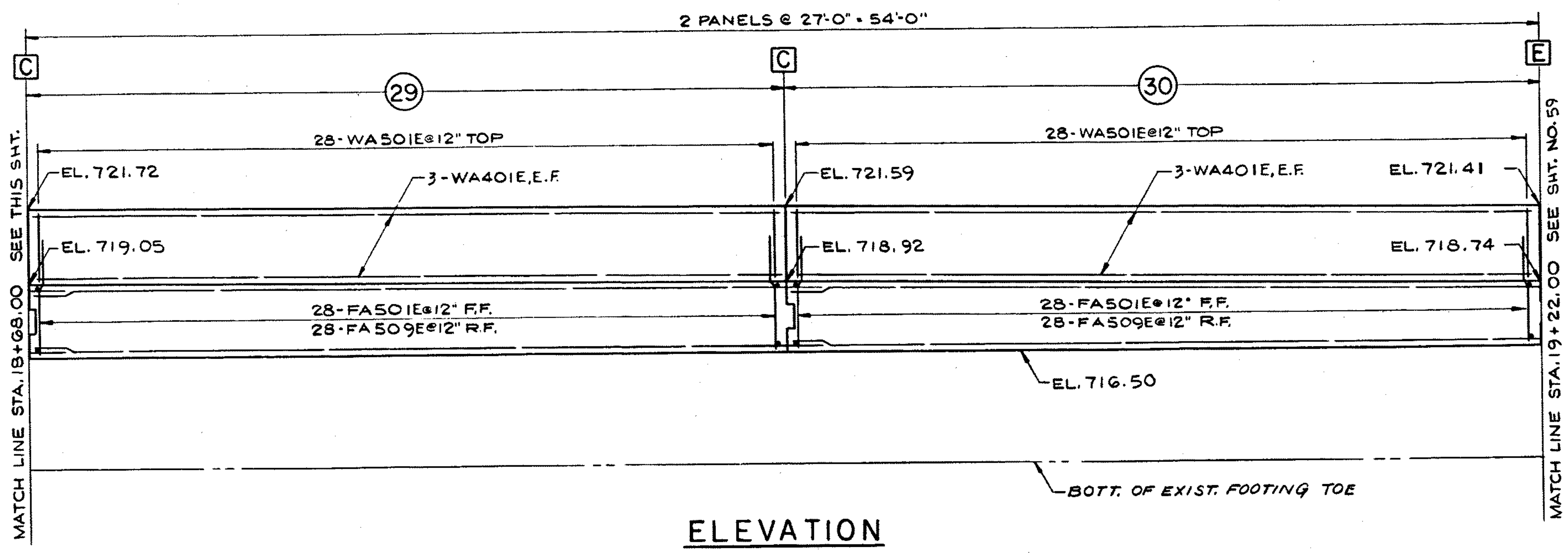
SHEET 57 OF 114
0009959
S-14584

FGC/RJK³
RJK
RJK³



ELEVATION

0 1' 2' 4'



ELEVATION

0 1' 2' 4'

NOTES:
1. FOR WALL LOCATION SEE SHT. NOS. 6, 7 & 14
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 69
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NO. 26
7. FOR LEGEND SEE SHT. NO. 53
8. FOR SECTIONS SEE SHT. NO. 67

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA 1098+30.29
TO STA. 1101+35.48

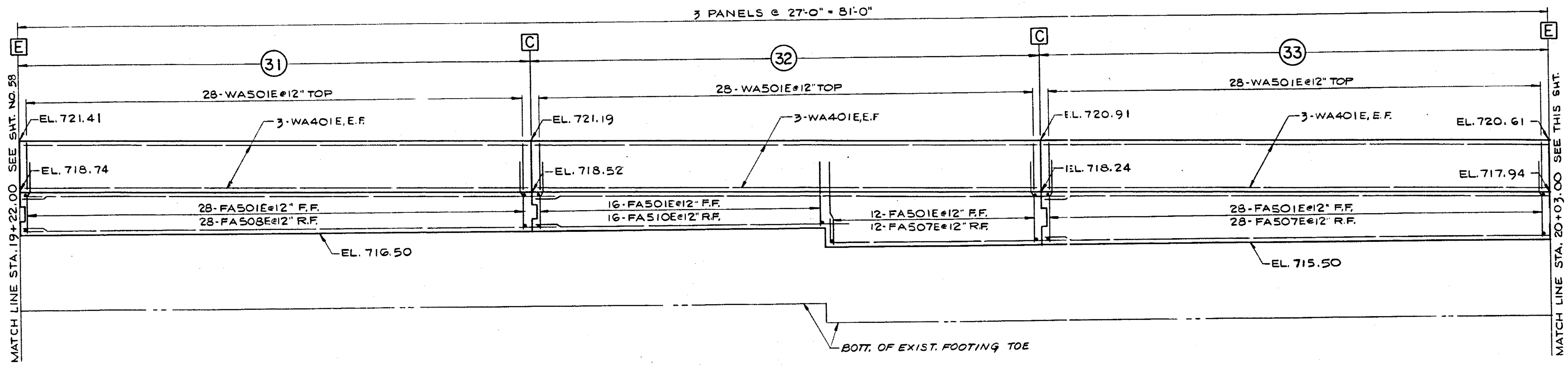
L.R. 764 SEC. 19
W.B. STA 631+16.78
TO STA 646+62.49

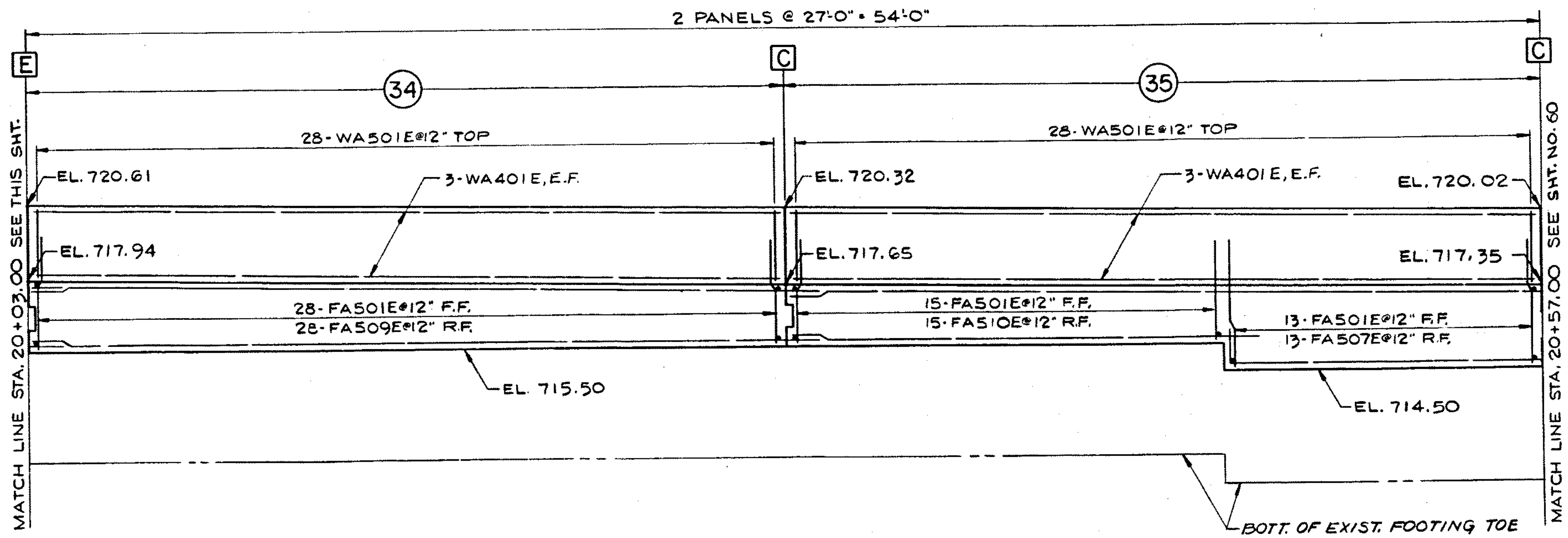
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL A PANELS 26-30

APPROVED AUG 23 19__
BRIDGE ENGINEER

SHEET 58 OF 114
0009960
S-14584

FGC/RJK³
RJK
RJK³





NOTES:
1. FOR WALL LOCATION SEE SHT. NOS. 7, 14 & 15
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 69
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NO. 27
7. FOR LEGEND SEE SHT. NO. 53
8. FOR SECTIONS SEE SHT. NO. 67

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

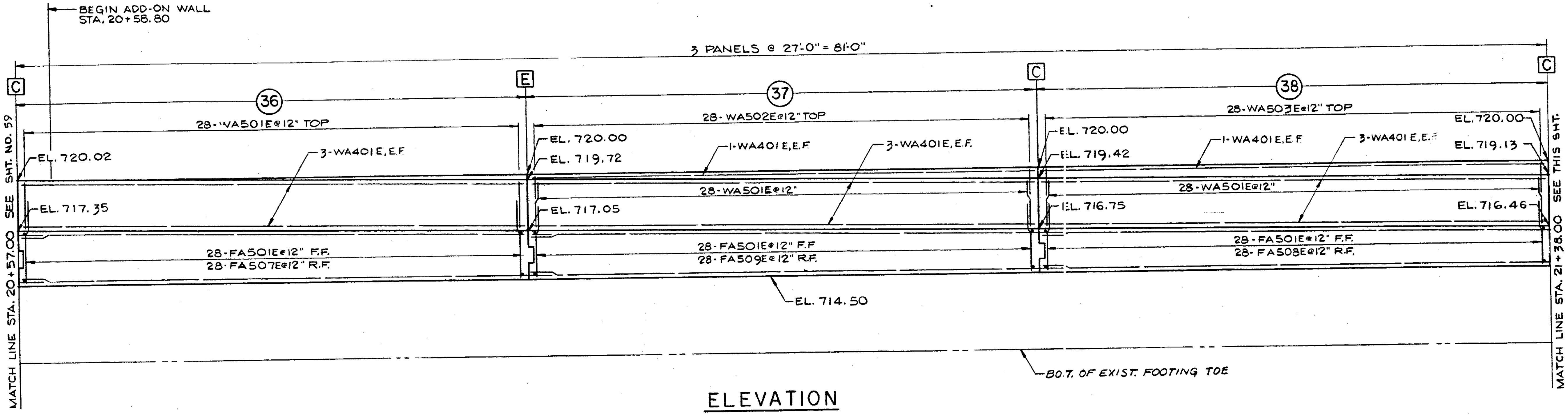
ELEVATION WALL A PANELS 31-35

APPROVED AUG 23 1982
B. J. Kotalik
BRIDGE ENGINEER

SHEET 59 OF 114
0009961
S-14584

FGC/RJK³
RJK
RJK³

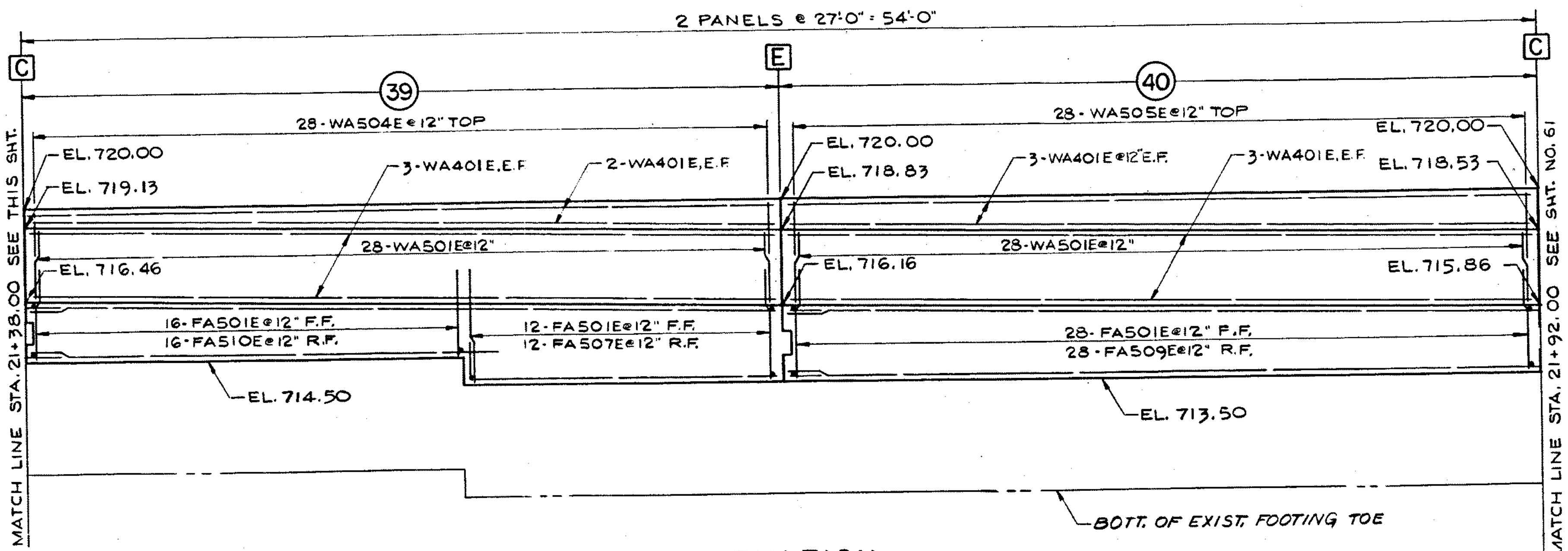
D-9002 (8-77)



ELEVATION

0 1' 2' 4'

NOTES:
1. FOR WALL LOCATION SEE SHT. NOS. 7, 8 & 15
2. FOR GENERAL NOTES SEE SHT NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 69
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NOS. 27 & 28
7. FOR LEGEND SEE SHT. NO. 53
8. FOR SECTIONS SEE SHT. NO. 67



ELEVATION

0 1' 2' 4'

FGC/RJK3
RJK
RJK3

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL A PANELS 36-40

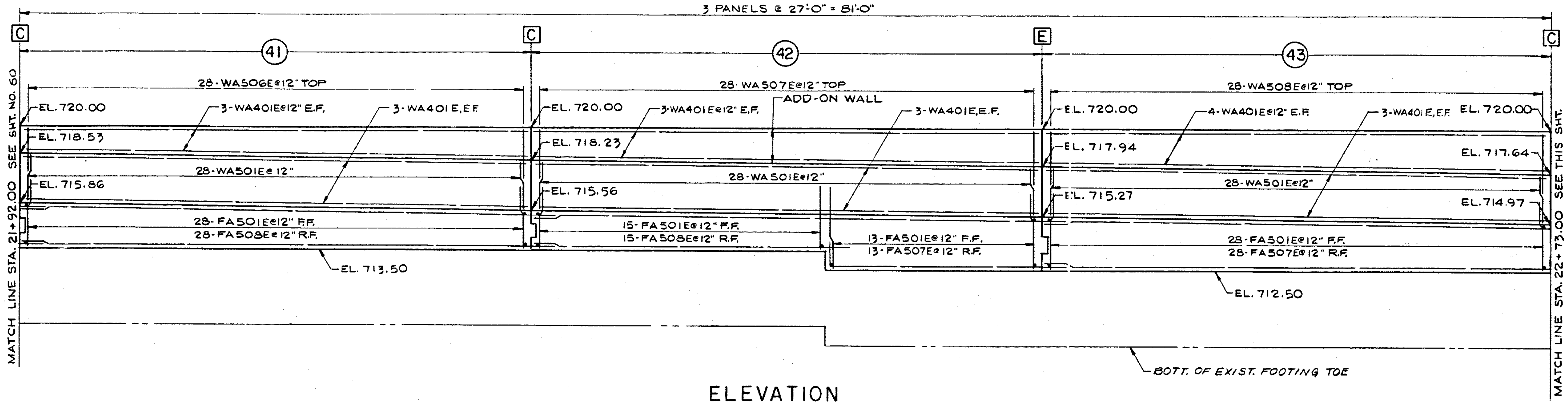
APPROVED [illegible]
BRIDGE ENGINEER

SHEET 60 OF 114
0909962

S-14584

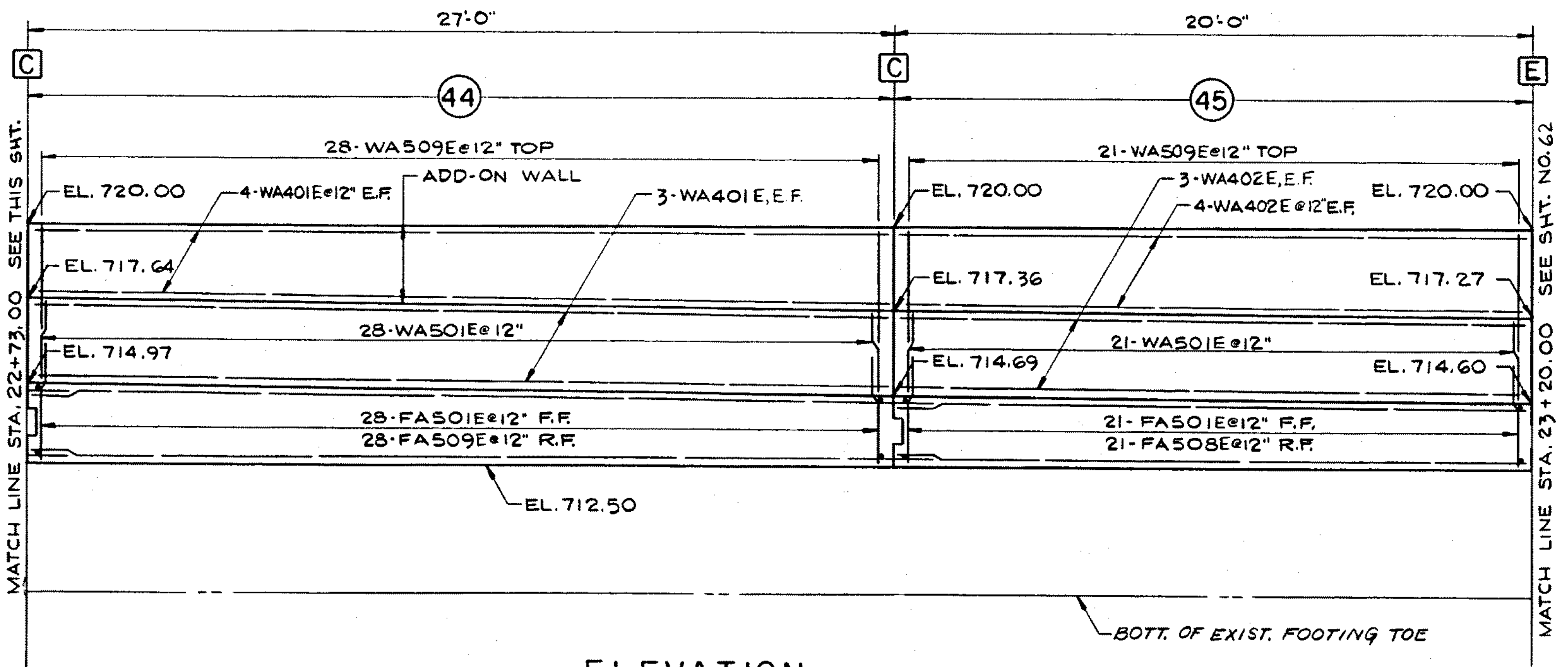
BARCLAY BROS. INC.

D-4002 (3-77)



ELEVATION

0 1' 2' 4'



ELEVATION

0 1' 2' 4'

NOTES:
1. FOR WALL LOCATION SEE SHT. NOS. 8 & 15
2. FOR GENERAL NOTES SEE SHT NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 69
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NOS. 28 & 29
7. FOR LEGEND SEE SHT. NO. 53
8. FOR SECTIONS SEE SHT. NO. 67

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

FGC/RJK³
RJK
RJK³

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL A PANELS 41-45

APPROVED AUG 1983

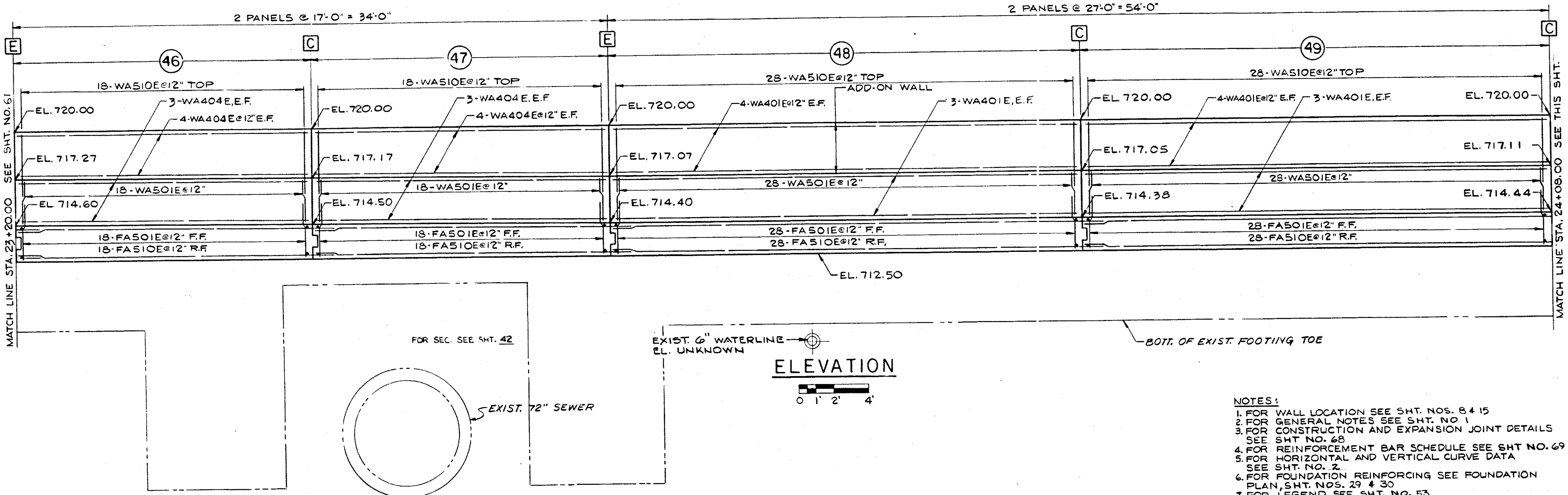
BRIDGE ENGINEER

SHEET 61 OF 114

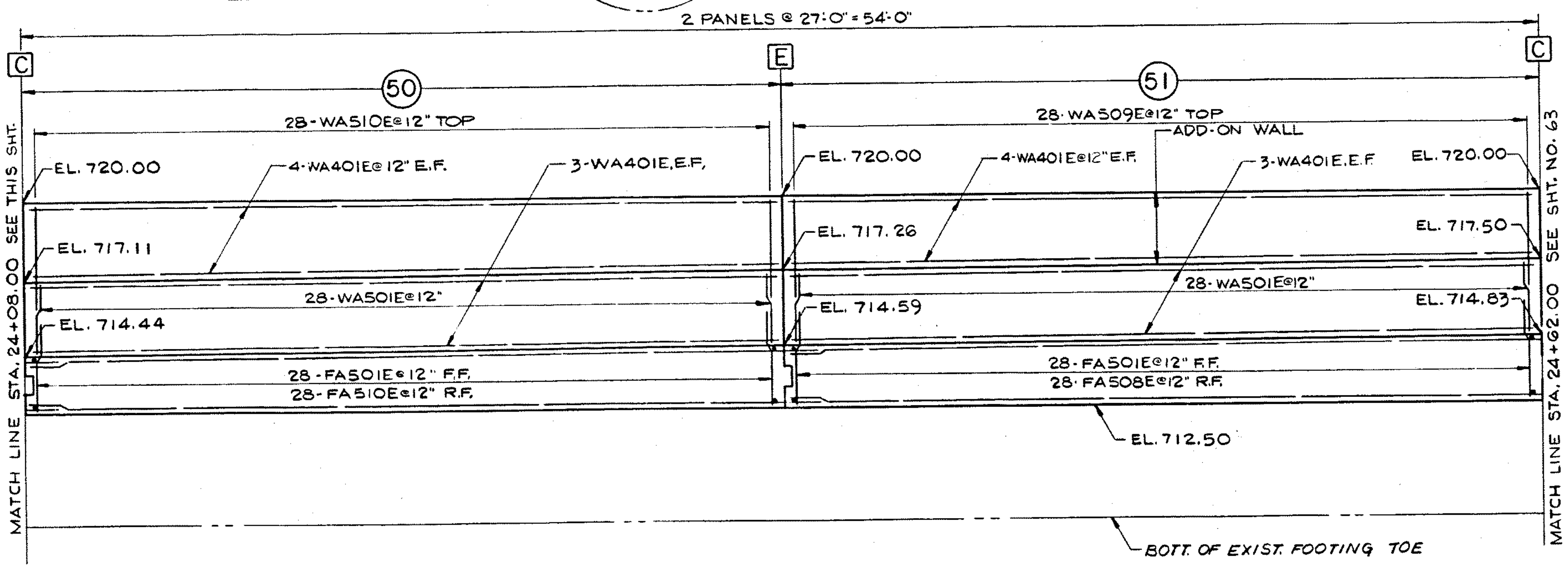
0009963

S-14584

BARCLAY BROS. INC.



ELEVATION



ELEVATION

0 1' 2' 4'

NOTES:
1. FOR WALL LOCATION SEE SHT. NOS. 8 & 15
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT NO. 69
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NOS. 29 & 30
7. FOR LEGEND SEE SHT. NO. 53
8. FOR SECTIONS SEE SHT. NO. 67

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

FGC/RJK3
RJK
RJK3

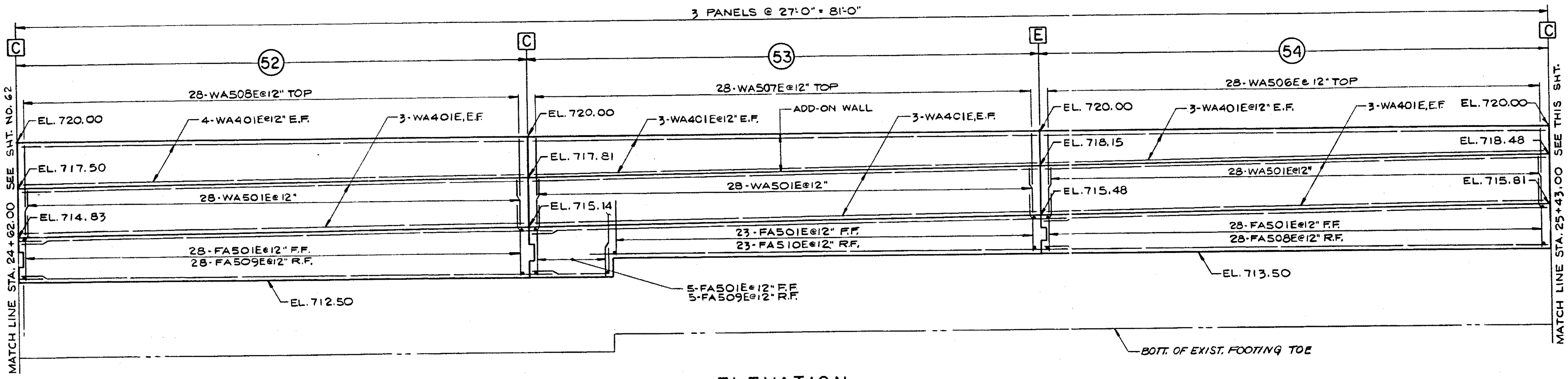
Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23 — W.B. STA. 1098+30.29 TO STA. 1101+35.48
L.R. 764 SEC. 19 — W.B. STA. 631+16.78 TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL A PANELS 46-51

APPROVED ___ 1992
BRIDGE ENGINEER

SHEET 62 OF 114
0009964
S-14584

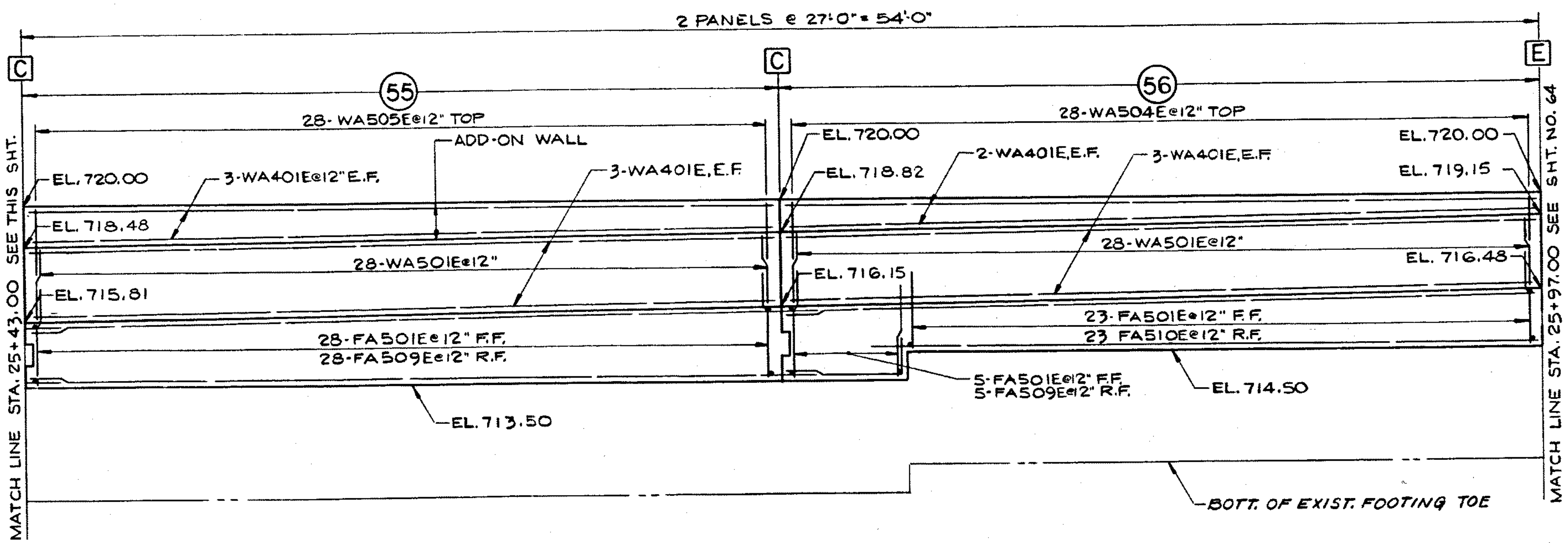
D-6002 (3-77)



ELEVATION

0 1' 2' 4'

NOTES:
1. FOR WALL LOCATION SEE SHT. NOS. 8, 7 & 14
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 69
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NOS. 30 & 31
7. FOR LEGEND SEE SHT. NO. 53
8. FOR SECTIONS SEE SHT. NO. 61



ELEVATION

0 1' 2' 4'

Mark	Description	By	Chk'd.	App'd.	Date
	REVISIONS				

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL A PANELS 52-56

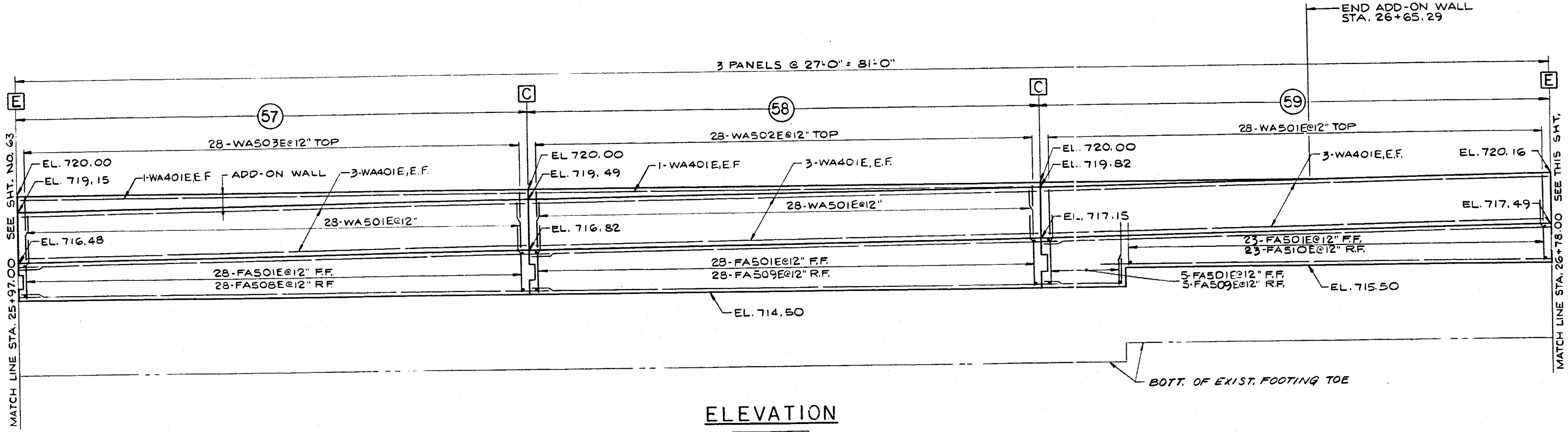
APPROVED AUG [illegible] 1982
[illegible signature]
BRIDGE ENGINEER

SHEET 63 OF 114
0009965
S-14584

FGC/RJK3
RJK
RJK3

BARCLAY BROS., INC.

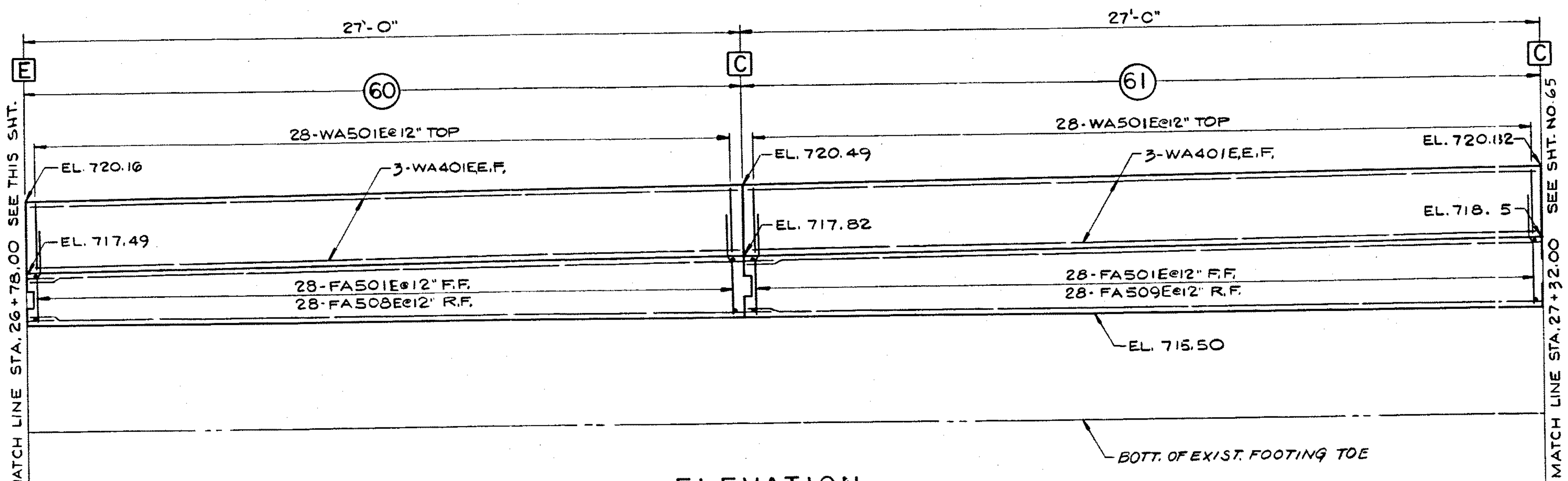
D-8008 (3-77)



ELEVATION

0 1' 2' 4'

NOTES:
1. FOR WALL LOCATION SEE SHT. NOS. 9, 15 & 16
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 69
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NO. 31
7. FOR LEGEND SEE SHT. NO. 53
8. FOR SECTIONS SEE SHT. NO. 67



ELEVATION

0 1' 2' 4'

FGC/RJK³
RJK
RJK³

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

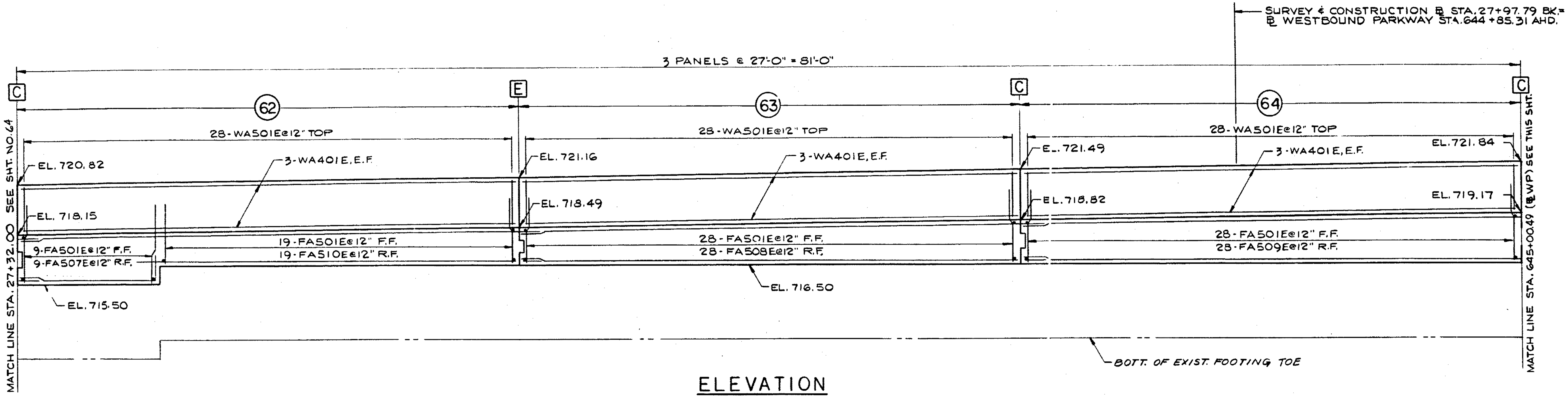
ELEVATION WALL A PANELS 57-61

APPROVED AUG [illegible]
BRIDGE ENGINEER

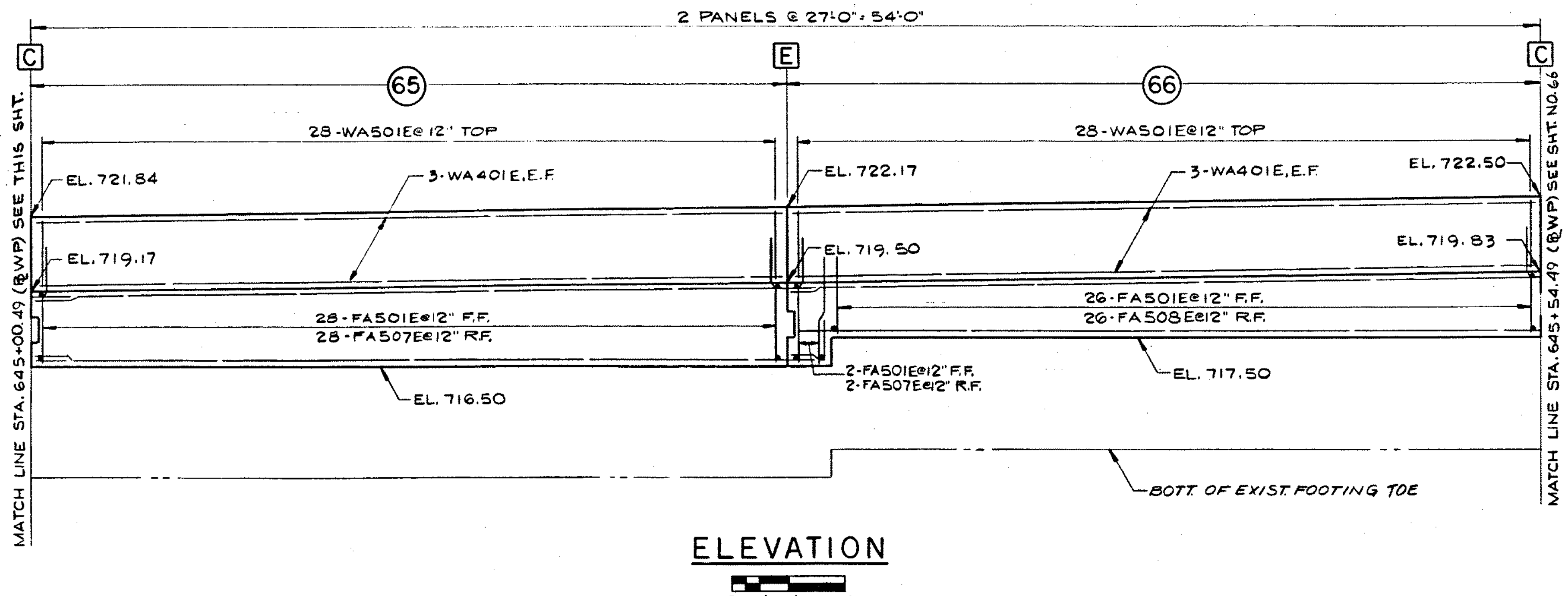
SHEET 64 OF 114
0009966

S-14584

D-9002 (6-77)



ELEVATION



ELEVATION

NOTES:
1. FOR WALL LOCATION SEE SHT. NOS. 9, 10 & 16
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 69
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCEMENT SEE FOUNDATION PLAN, SHT. NOS. 32 & 33
7. FOR LEGEND SEE SHT. NO. 53
8. FOR SECTIONS SEE SHT. NO. 67

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

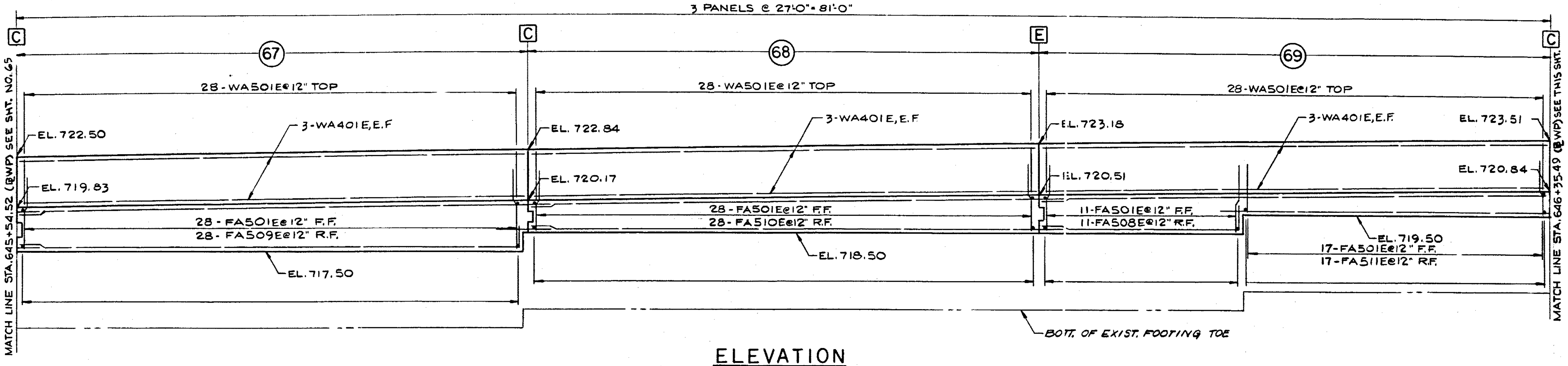
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL A PANELS 62-66

APPROVED AUG 25 1981
BRIDGE ENGINEER

SHEET 65 OF 114
0009967
S-14584

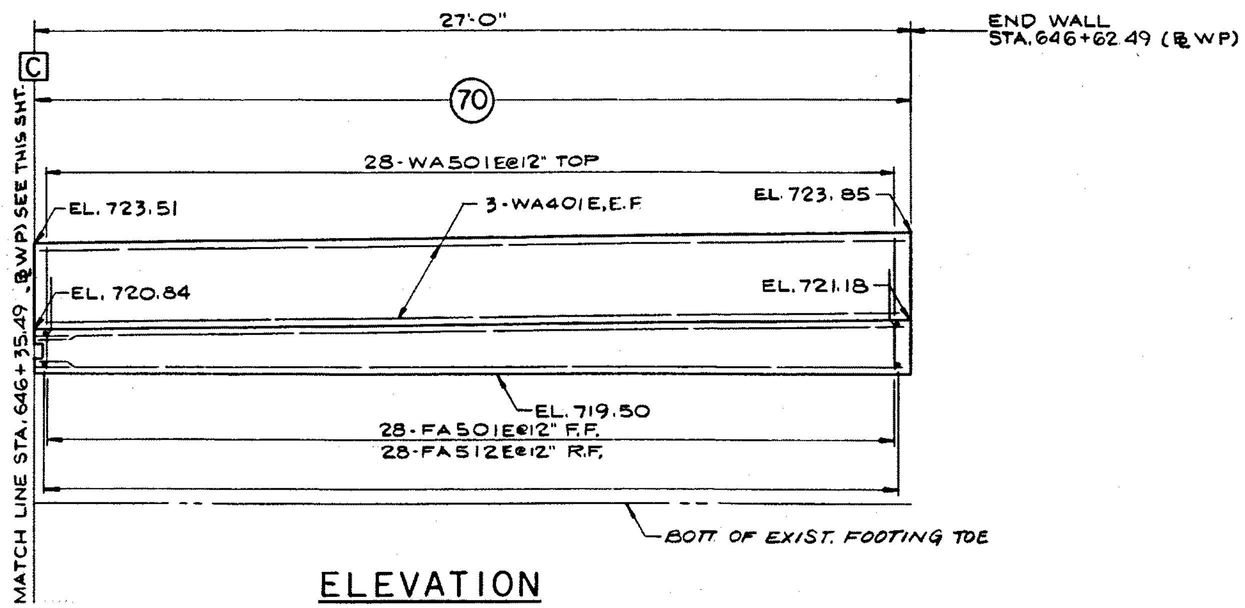
FGC/RJK3
RJK
RJK3

BARCLAY BROS., INC.



ELEVATION

0 1' 2' 4'



ELEVATION

0 1' 2' 4'

NOTES:

1. FOR WALL LOCATION SEE SHT. NOS. 10 & 16
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 69
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NO. 33.
7. FOR LEGEND SEE SHT. NO. 53
8. FOR SECTIONS SEE SHT. NO. 67

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

ELEVATION WALL A PANELS 67-70

APPROVED AUG 23 1982

BRIDGE ENGINEER

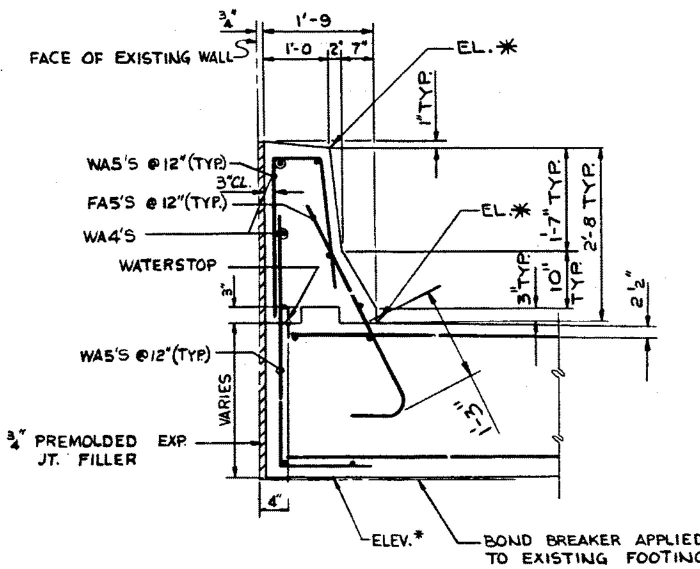
SHEET 66 OF 114

0009968

S-14584

FGC/RJK
RJK
RJK

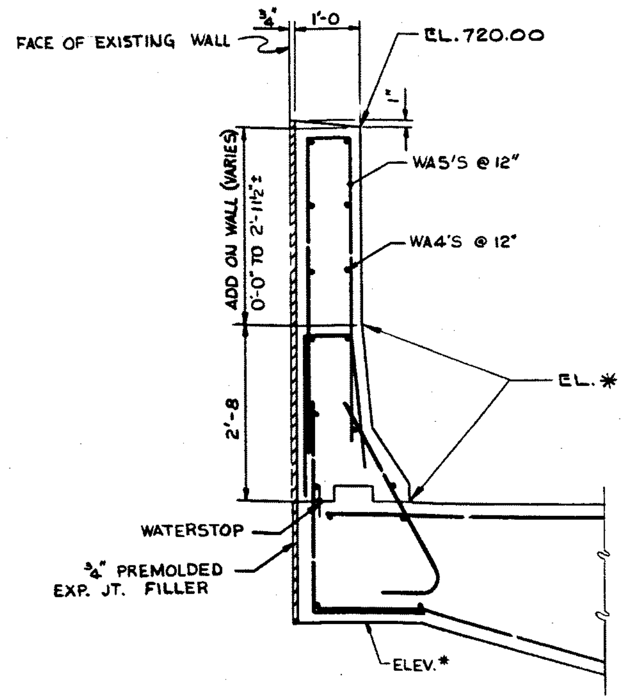
D-6002 (5-77)



* ELEVATIONS GIVEN TO THIS POINT SEE SHEETS 53 TO 66

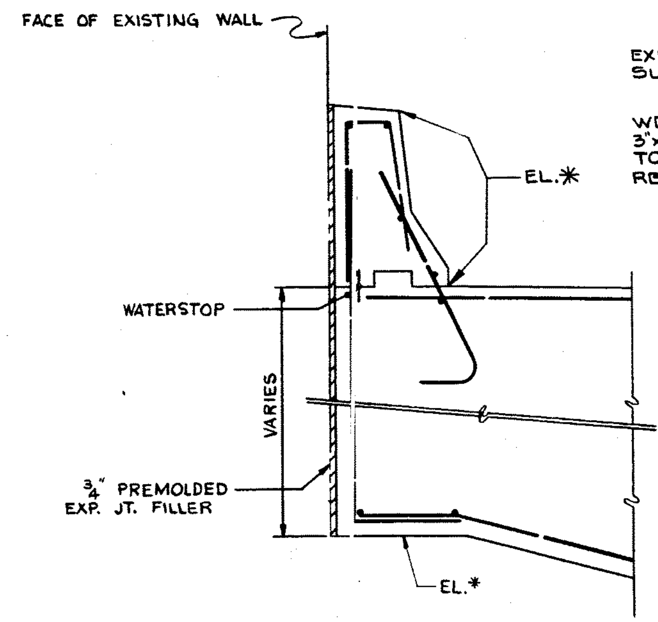
WALL "A" STA. 11+23.5 TO 12+17.67 ± (TYP.)

0 1' 2' 3'



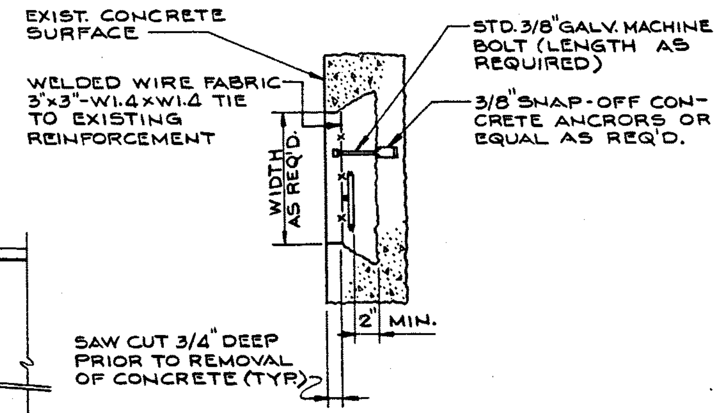
WALL "A" STA. 12+69.62 TO 14+45.9 & 20+58.8 TO 26+65.29 (TYP.)

0 1' 2' 3'



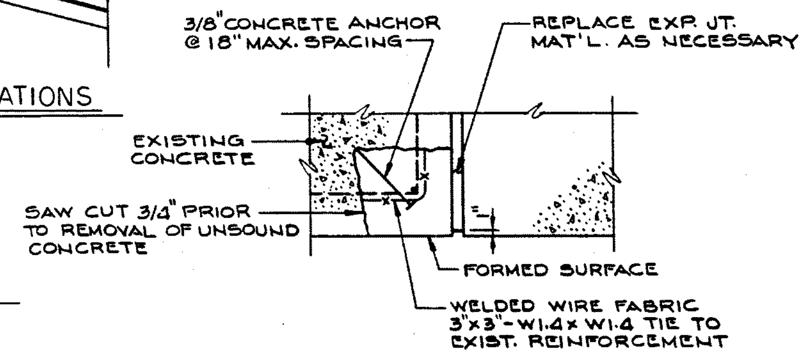
WALL "A" ALL OTHER STATIONS

0 1' 2' 3'



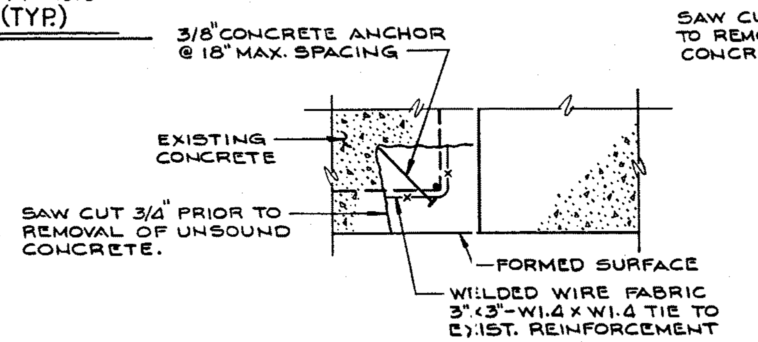
CONCRETE REPAIR DETAIL TYP.

(N.T.S.)



CONCRETE REPAIR DETAIL AT EXP. JT.

(N.T.S.)

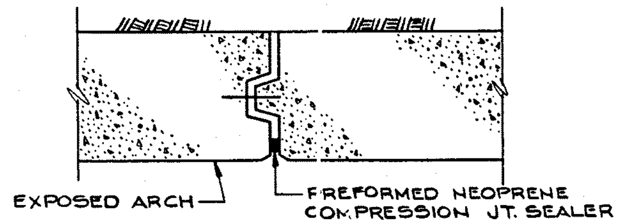


CONCRETE REPAIR DETAIL AT CONST. JT.

(N.T.S.)

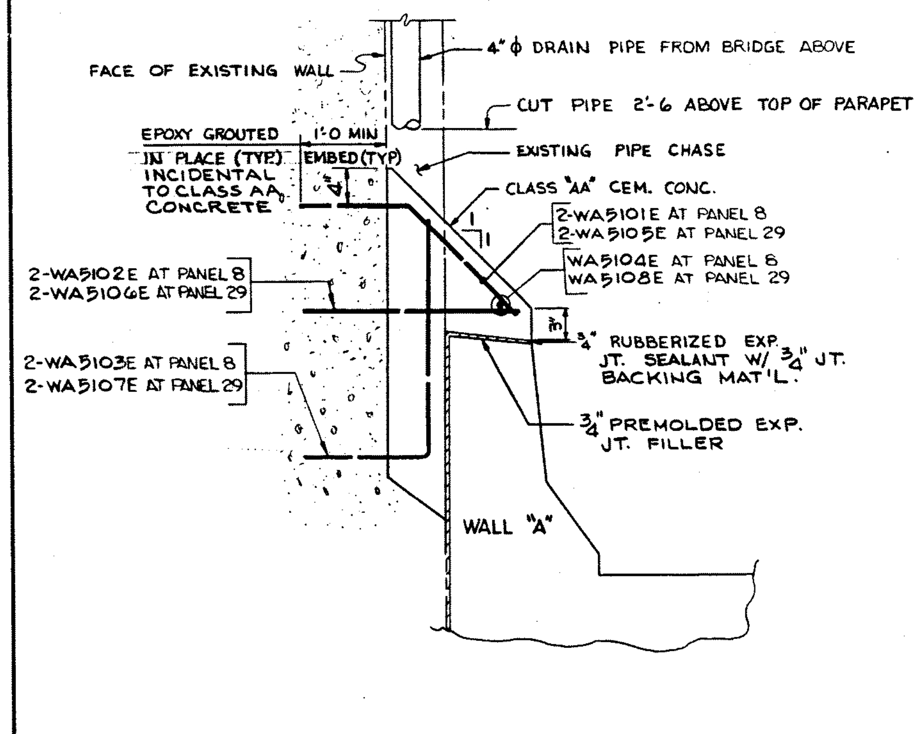
NOTE:

1. FOR JOINT DETAILS SEE SHT. NO. 68



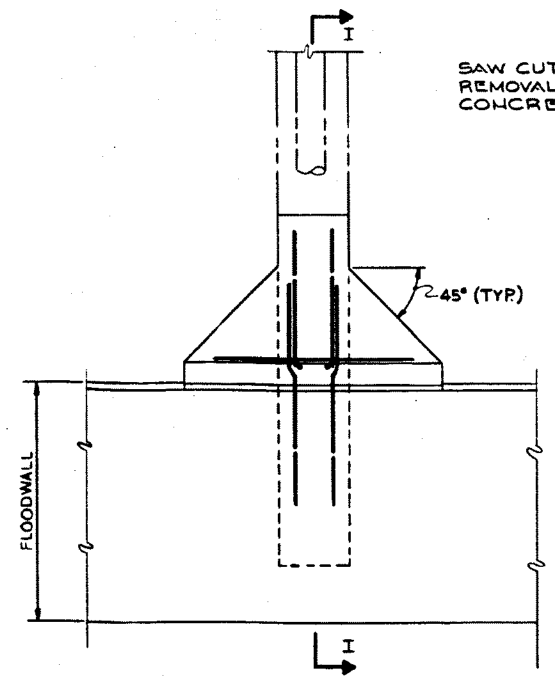
EXP. JT. MATERIAL REPLACEMENT

(N.T.S.)



SECTION I-I

0 3" 6" 9" 1' 2'



SEE SHEET 14 PANEL 8 AND 9 FOR LOCATION

PIPE CHASE DETAIL

0 3" 6" 9" 1' 2'

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Designed by FGC/RJK[3]
Drawn by RGG
Checked by RJK[3]

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

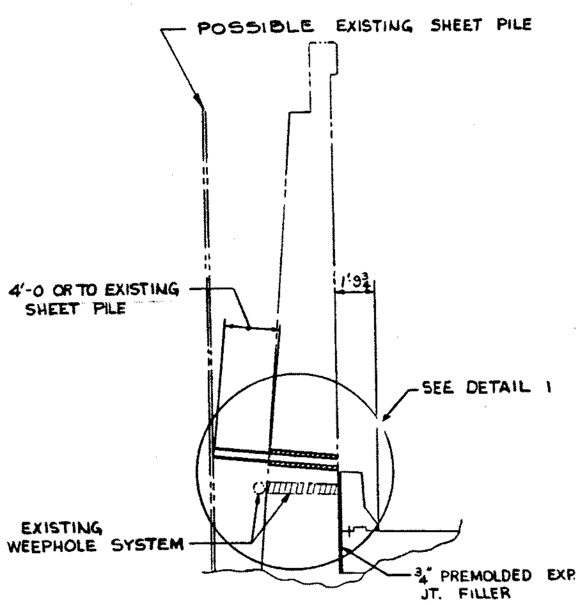
WALL A SECTIONS & DETAILS

APPROVED AUG 23 1982
B.J. Kotar
BRIDGE ENGINEER

SHEET 67 OF 114
0009969

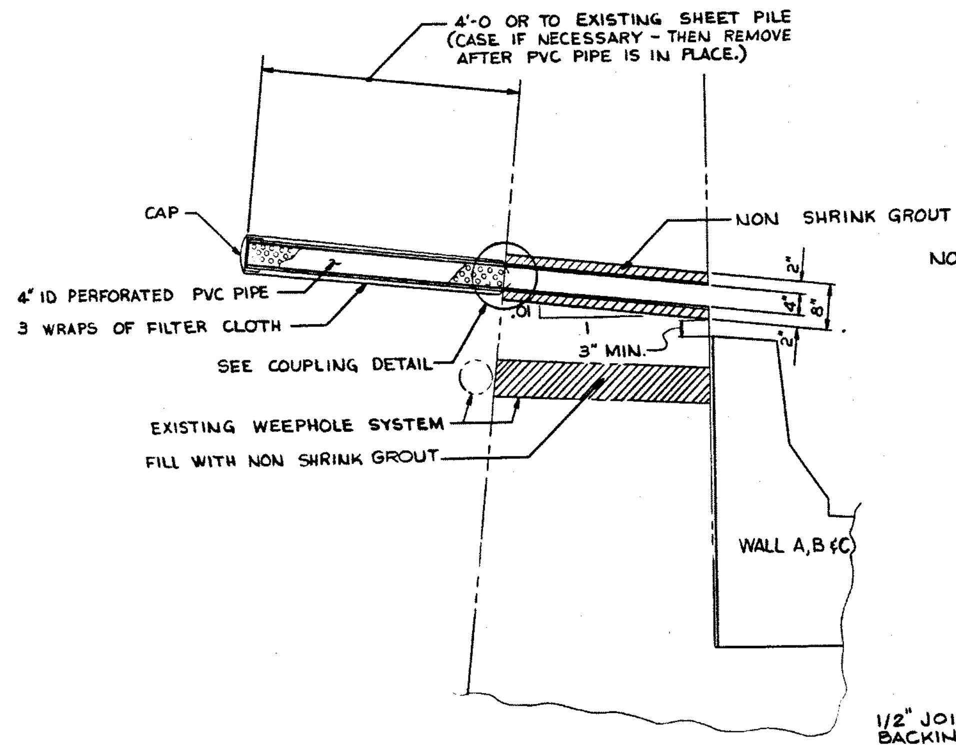
S-14584

D-8008 (6-77)



WEEPHOLE RELOCATION

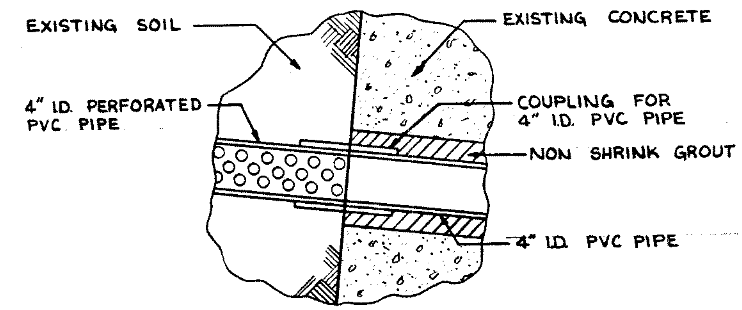
0 1' 2' 3' 4' 5' 6'



DETAIL 1

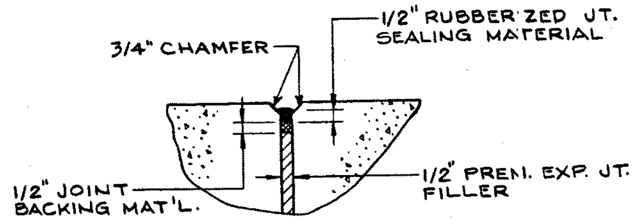
0 1' 2' 3'

NOTES:
1. DRILL THROUGH EXISTING CONCRETE AND 4'-0 INTO EXISTING MATERIAL OR TO EXISTING SHEET PILE. USE CASING IF REQUIRED
2. PLACE PLASTIC PERFORATED PIPE, WITH 3 WRAPS OF FILTER CLOTH, INTO HOLE AND REMOVE ANY TEMPORARY CASING.
3. THE SPACE BETWEEN THE CONCRETE AND PLASTIC PIPE SHALL BE BACK-FILLED WITH NON SHRINK GROUT.



COUPLING DETAIL

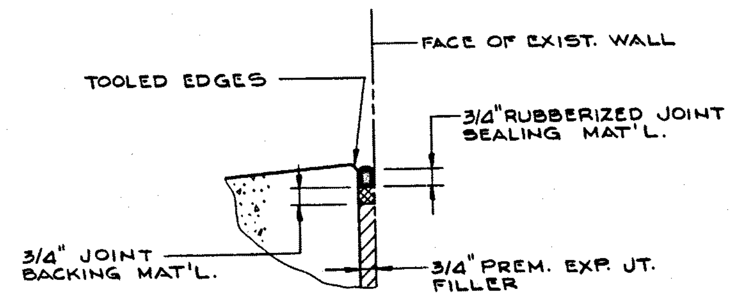
N. T. S.



SECTION X-X

TYP. NEW WALL TO NEW WALL EXPANSION JT.

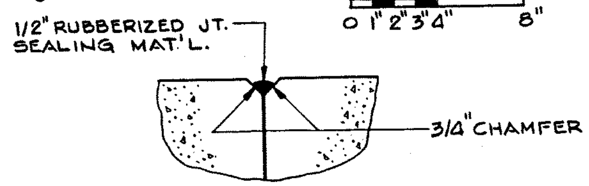
0 1" 2" 3" 4" 8"



DETAIL - 6

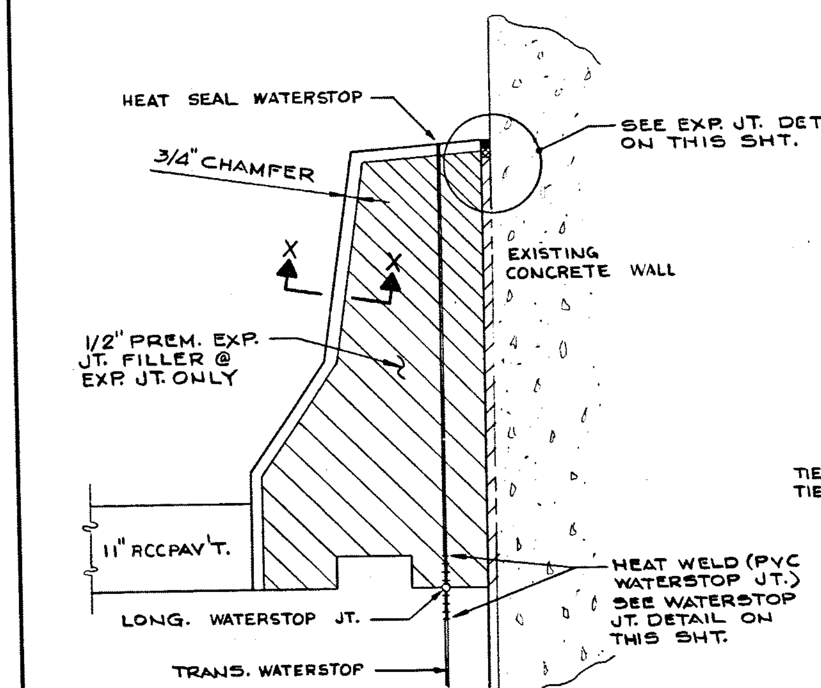
NEW WALL TO EXISTING WALL EXPANSION JT.

0 1" 2" 3" 4" 8"



TYPICAL CONSTRUCTION JOINT

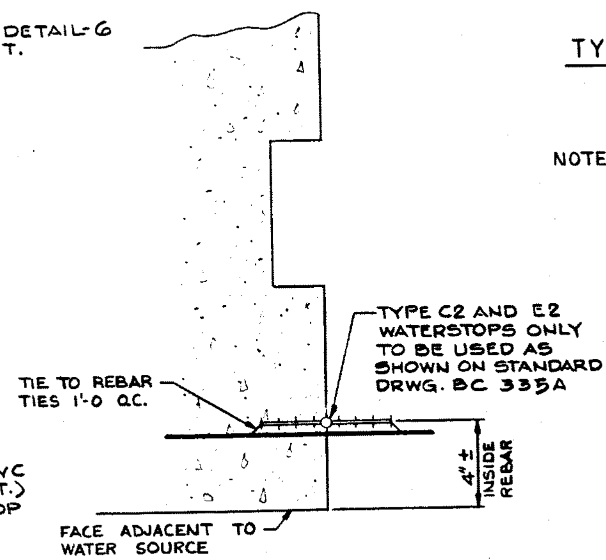
0 1" 2" 3" 4" 8"



RJK³/WLW
RGG
RJK³

PARAPET DETAIL AT CONST. OR EXP. JT.

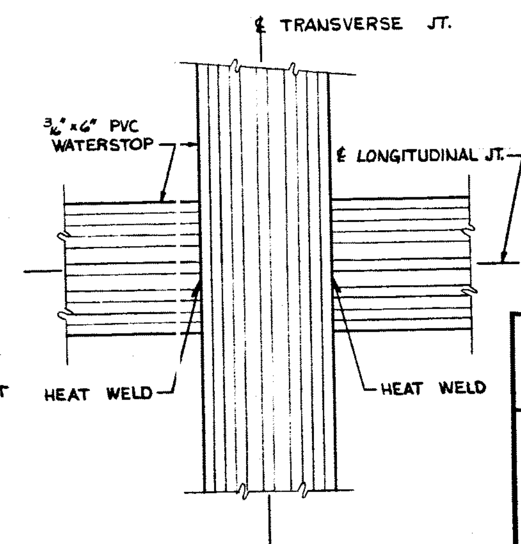
N. T. S.



TYPICAL JOINT DETAIL

N.T.S.

NOTES:
1. ALL PVC WATERSTOP MUST HAVE UNBROKEN CONTINUITY.
2. LAPS AND JOINTS OTHER THAN HEAT WELDS WILL NOT BE PERMITTED.
3. ALL PVC WATERSTOPS ARE TO BE TIED BACK TO REBAR TO PREVENT BUCKLING OF WATERSTOP DURING POUR.
4. FOR CONSTRUCTION JOINT AND EXPANSION JOINT DETAILS SEE STANDARD DRAWING BC 335.
5. THE WATERSTOP MANUFACTURER'S REPRESENTATIVE MUST BE PRESENT TO INSTRUCT THE CONTRACTOR IN THE PROPER PROCEDURE FOR SPLICING THE WATERSTOP TO OBTAIN A WATERPROOF WELD.



WATERSTOP JOINT DETAIL

N.T.S.

Mark	Description	By	Chk'd.	App'd.	Date
	REVISIONS				

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
WALL A DETAILS

APPROVED AUG 23 1982
B J Kotalik
BRIDGE ENGINEER

SHEET 68 OF 114
0009970

S-14584

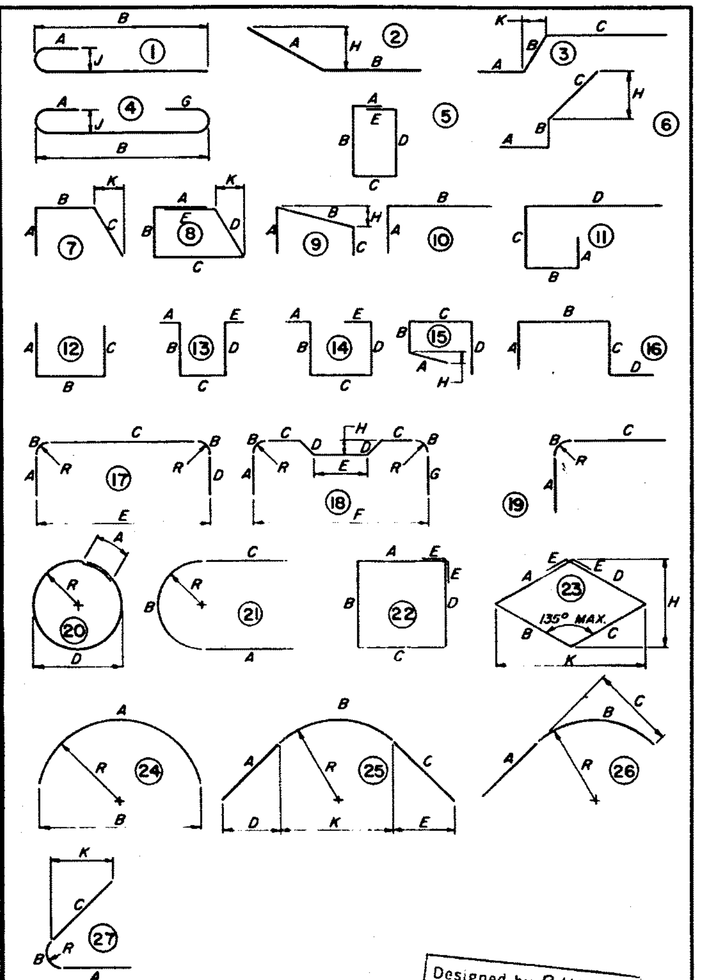
BARCLAY BROS. INC

7530-2350-0210

REINFORCEMENT BAR SCHEDULE

MARK	SIZE	LENGTH	NO.	TYPE	A	B	C	D	E	F	G	H	J	K	R	REMARKS
		DOWELS														
FA501E	5	4'-2 1/2"	1921	27	7"	7 1/2"	3'-0"							1'-5"	3"	
FA502E	5	5'-11"	32	10	1'-6"	4'-5"										
FA503E	5	6'-7"	60	10	1'-6"	5'-1"										
FA504E	5	8'-7"	20	10	1'-6"	7'-1"										
FA505E	5	8'-1"	28	10	1'-6"	6'-7"										
FA506E	5	7'-3"	43	10	1'-6"	5'-9"										
FA507E	5	6'-0"	423	10	1'-6"	4'-6"										
FA508E	5	5'-4"	417	10	1'-6"	3'-10"										
FA509E	5	5'-8"	570	10	1'-6'	4'-2"										
FA510E	5	5'-0"	283	10	1'-6"	3'-6"										
FA511E	5	4'-3"	17	10	1'-6"	2'-9"										
FA512E	5	4'-7"	28	10	1'-6"	3'-1"										
		WALL BARS														
WA401E	4	26'-8"	504	STR												
WA402E	4	19'-8"	22	STR												
WA403E	4	22'-2"	6	STR												
WA404E	4	16'-8"	28	STR												
WA501E	5	5'-4"	1921	7	2'-6"	7"	2'-3"									
WA502E	5	4'-11"	161	12	2'-2"	7"	2'-2"									
WA503E	5	5'-5"	56	12	2'-5"	7"	2'-5"									
WA504E	5	6'-1"	56	12	2'-9"	7"	2'-9"									
WA505E	5	6'-9"	56	12	3'-1"	7"	3'-1"									
WA506E	5	7'-5"	56	12	3'-5"	7"	3'-5"									
WA507E	5	8'-1"	56	12	3'-9"	7"	3'-9"									
WA508E	5	8'-9"	56	12	4'-1"	7"	4'-1"									
WA509E	5	9'-3"	77	12	4'-4"	7"	4'-4"									
WA510E	5	9'-7"	120	12	4'-6"	7"	4-6"									
WA5101E	5	3'-3"	2	2	2'-1"	1'-2"						1'-6"				STANWIX PIPE CHASE
WA5102E	5	2'-8"	2	STR												STANWIX PIPE CHASE
WA5103E	5	6'-2"	2	10	1'-8"	4'-6"										STANWIX PIPE CHASE
WA5104E	5	2'-2"	1	STR												STANWIX PIPE CHASE
WA5105E	5	2'-7"	2	2	1'-9"	1'-2"						1'-3"				MARKET PIPE CHASE
WA5106E	5	2'-5"	2	STR												MARKET PIPE CHASE
WA5107E	5	3'-1"	2	10	1'-5"	1'-8"										MARKET PIPE CHASE
WA5108E	5	2'-6"	1	STR												MARKET PIPE CHASE

MARK	SIZE	LENGTH	NO.	TYPE	A	B	C	D	E	F	G	H	J	K	R	REMARKS



Designed by RJK
Drawn by K.M.B.
Checked by RJK3

- All Bars This Sheet to be Epoxy Coated.
- "J" Dimensions on 180° hooks to be shown only where necessary to restrict hook size, otherwise standard hooks are to be used.
- All dimensions are out to out of bar except "A" and "G" on standard 135° and 180° hooks, and "R" which is shown to the inside of the bar.
- For Reinforcement Bar Fabrication Details, refer to Standard Drawing BC-336A
- Figures in circles show types.

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23 — W.B. STA.1098+30.29 TO STA.1101+35.48
L.R. 764 SEC. 19 — W.B. STA.631+16.78 TO STA.646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

WALL A REINFORCEMENT BAR SCHEDULE

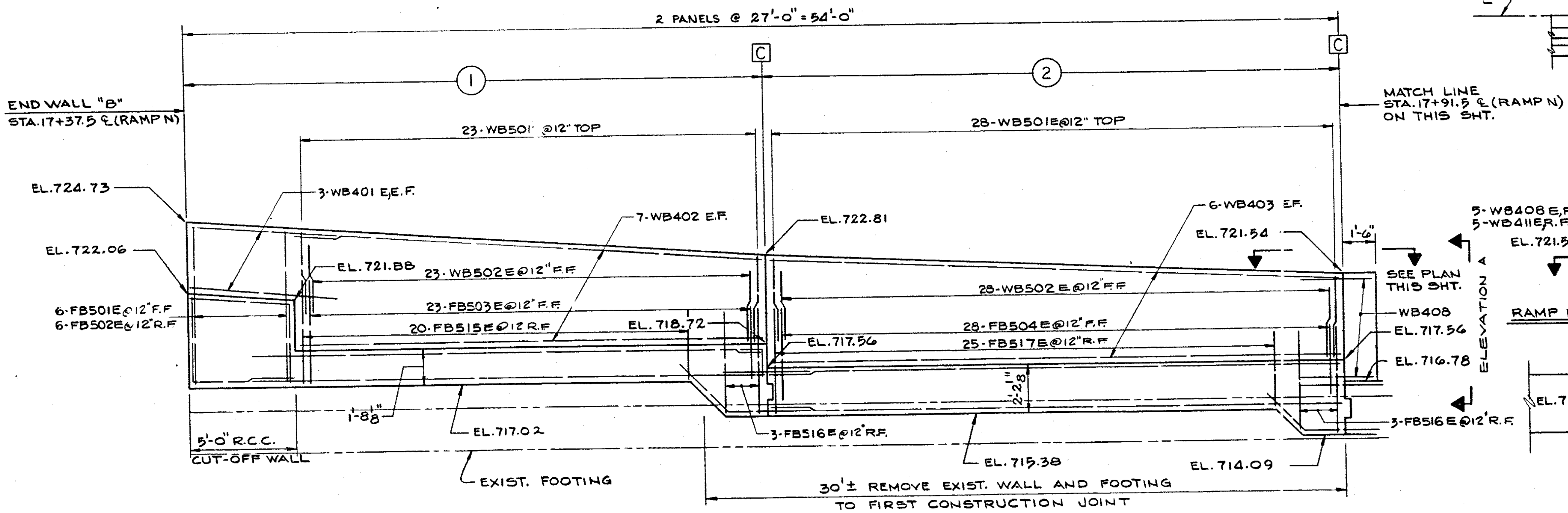
APPROVED AUG 23 1982
B.J. Kotalik
BRIDGE ENGINEER

SHEET 69 OF 114
0009971

S-14584

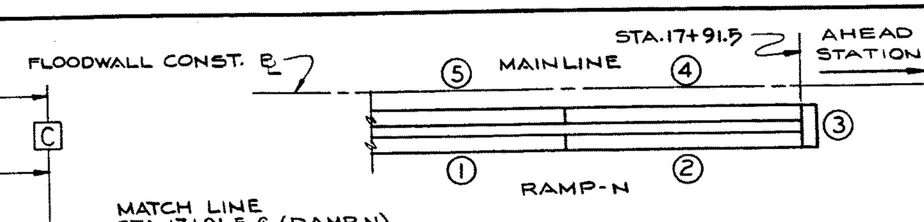
ROBERT H. WALTON CO.

D-6002 (3-77)



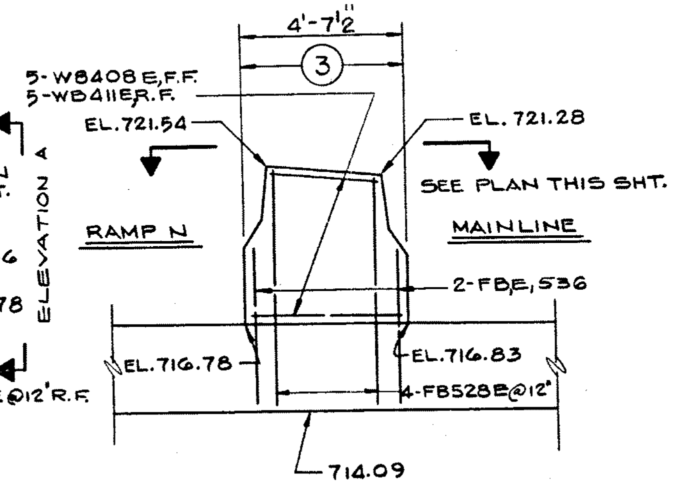
ELEVATION

0 1' 2' 3' 4' 5'



PLAN

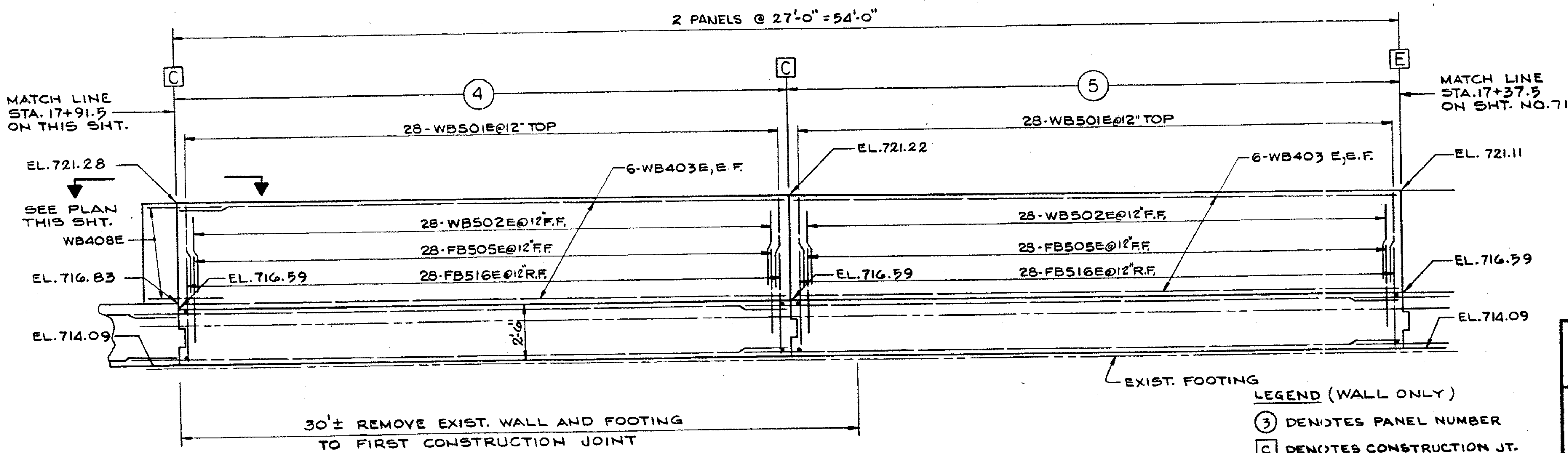
PANELS 1 THRU 5
N.T.S.



ELEVATION A

0 1' 2' 3' 4' 5'

NOTES:
1. FOR WALL LOCATION SEE SHT. NOS. 6 & 17
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 79
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NOS. 25 & 26
7. FOR SECTIONS SEE SHT. 76



ELEVATION

0 1 2 3 4 5

LEGEND (WALL ONLY)
(3) DENOTES PANEL NUMBER
[C] DENOTES CONSTRUCTION JT.
[E] DENOTES EXPANSION JT.
F.F. = FRONT FACE
R.F. = REAR FACE
E.F. = EACH FACE

WLW/RJK³
RJK
RJK³

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B.STA.1098+30.29
TO STA.1101+35.48

L.R. 764 SEC. 19
W.B.STA.631+16.78
TO STA.646+62.49

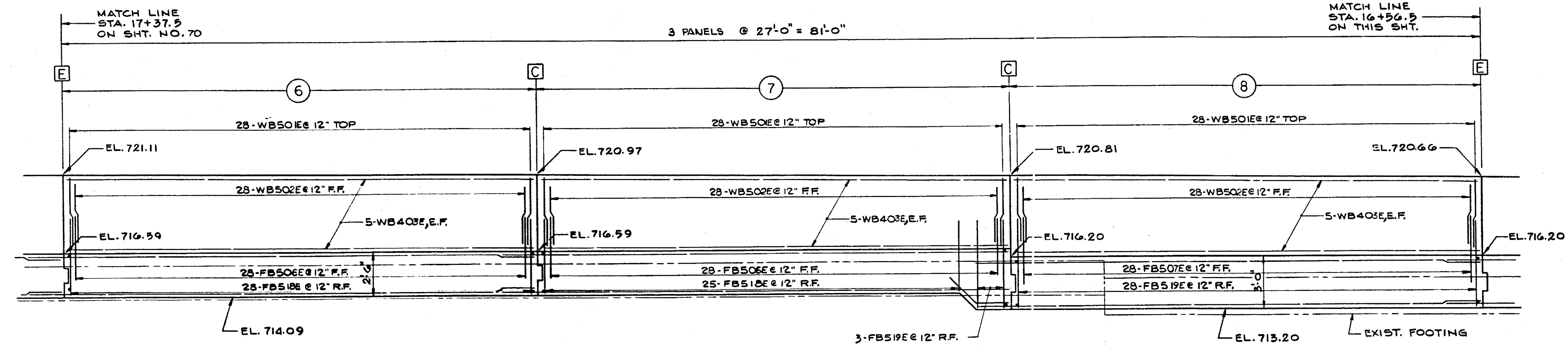
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL B PANELS 1 – 5

APPROVED AUG
B.J. Koz...
BRIDGE ENGINEER

SHEET 70 OF 114
0009972

S-14584

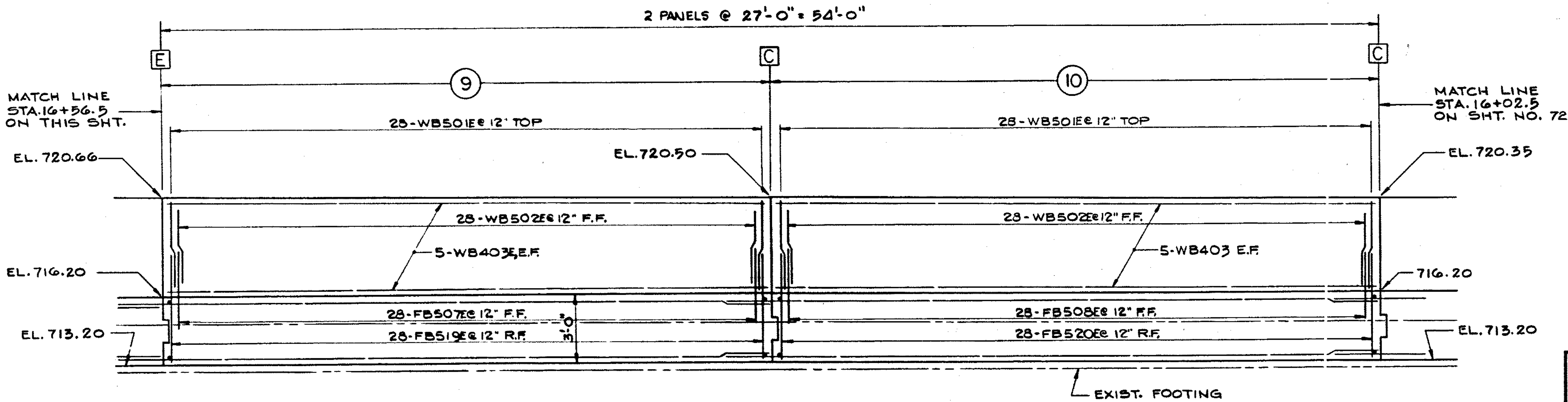
B-0002 (3-77)



ELEVATION

0 1' 2' 3' 4' 5'

NOTES:
1. FOR WALL LOCATION SEE SHT. NOS. 6 & 17.
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 79
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NO. 25
7. FOR LEGEND SEE SHT. NO. 70
8. FOR SECTIONS SEE SHT. 76



ELEVATION

0 1' 2' 3' 4' 5'

WLW/RJK³
RJK
RJK³

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL B PANELS 6-10

APPROVED AUG 2_ 19__

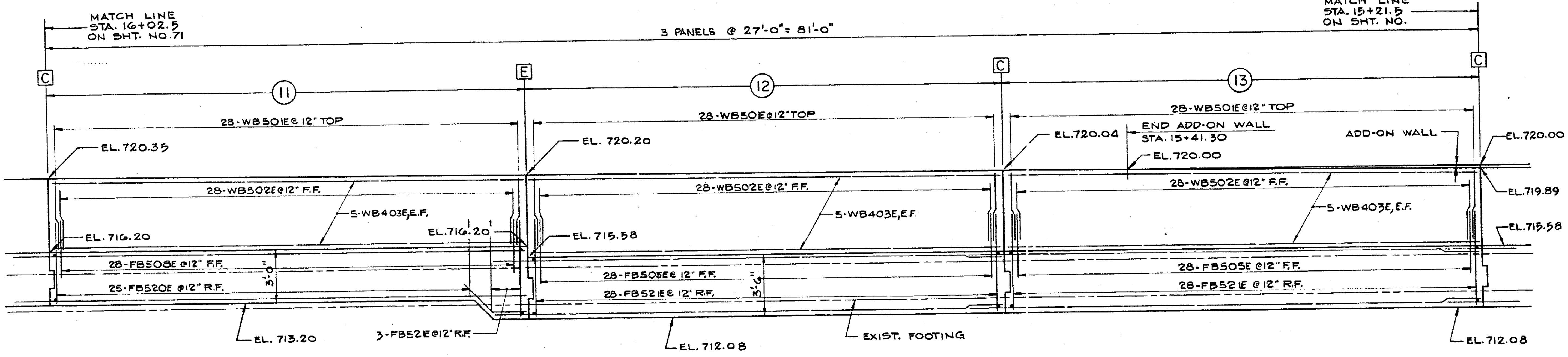
BRIDGE ENGINEER

SHEET 71 OF 114

0009973

S-14584

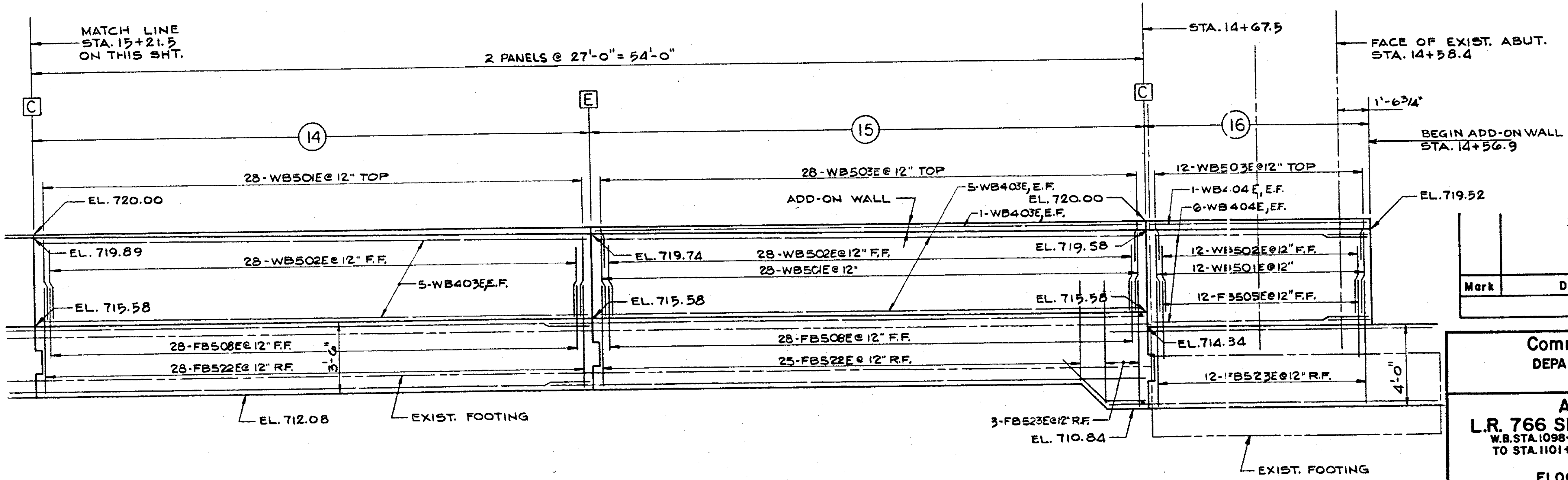
B-9002 (3-77)



ELEVATION

0 1' 2' 3' 4' 5'

NOTES:
1. FOR WALL LOCATION SEE SHT. NOS. 5, 6 & 17
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 79
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NO. 24
7. FOR LEGEND SEE SHT. NO. 70
8. FOR SECTIONS SEE SHT NO. 76



ELEVATION

0 1' 2' 3' 4' 5'

WLW/RJK3
RJK
RJK3

Mark	Description	By	Chk'd.	App'd.	Date
	REVISIONS				

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

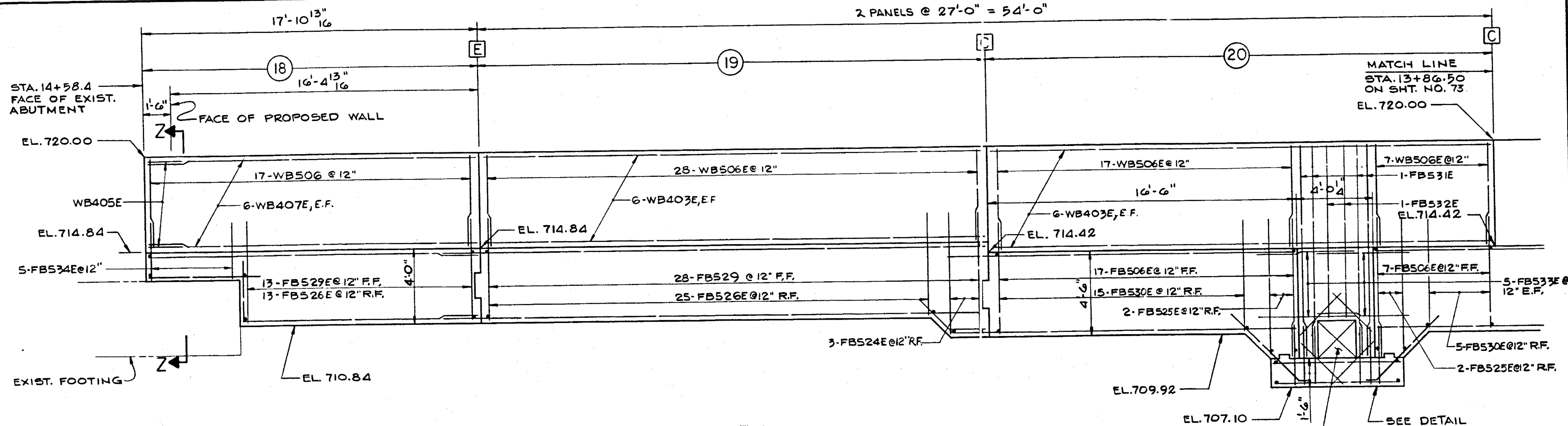
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL B PANELS 11-16

APPROVED AUG 23 1982
B. J. Kotalic
BRIDGE ENGINEER

SHEET 72 OF 114
0509974

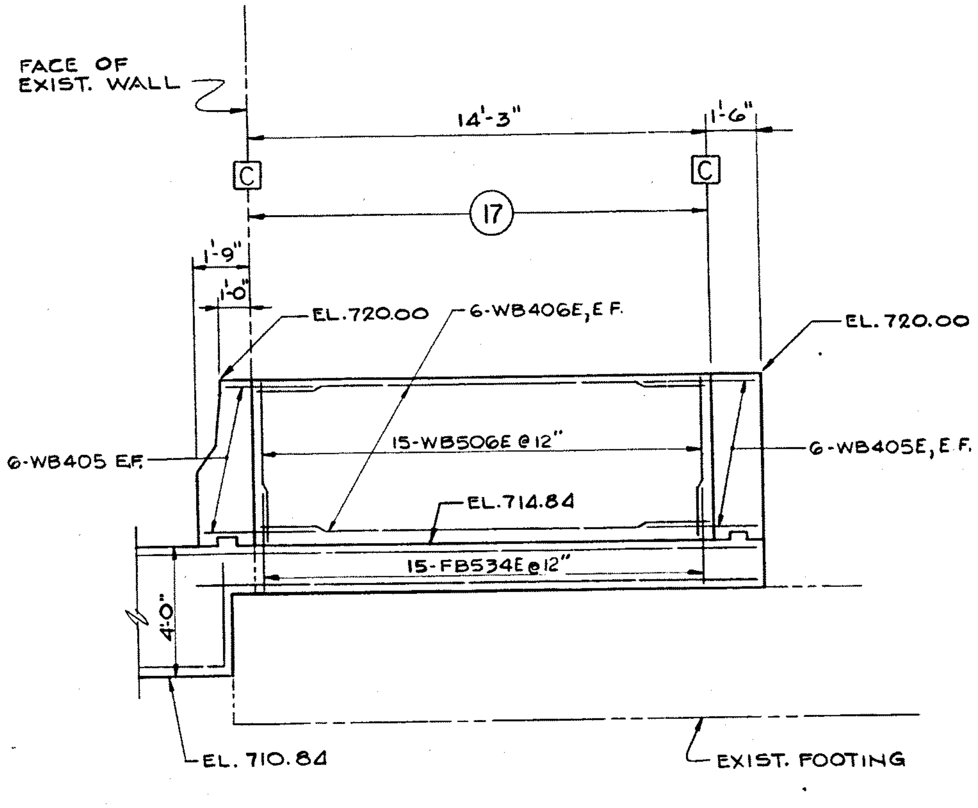
S-14584

D-8002 (3-77)



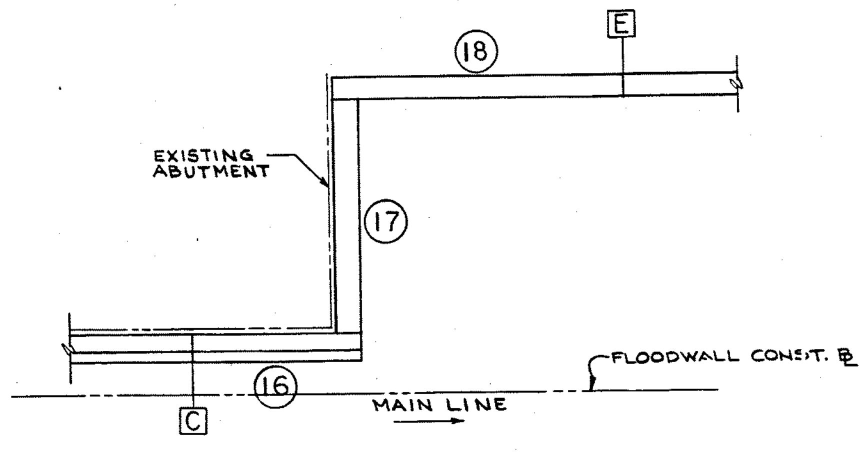
ELEVATION

0 1' 2' 3' 4' 5'



SECTION Z-Z

0 1' 2' 3' 4' 5'



PLAN
PANELS 16, 17 & 18

0 2' 4' 6' 8'

NOTES:
1. FOR WALL LOCATION SEE SHT NOS. 5 & 17
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 79
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NOS. 23 & 24
7. FOR LEGEND SEE SHT. NO. 70
8. FOR SECTIONS SEE SHT NO. 76

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

ELEVATION WALL B PANELS 17-20

APPROVED AUG 23 1982

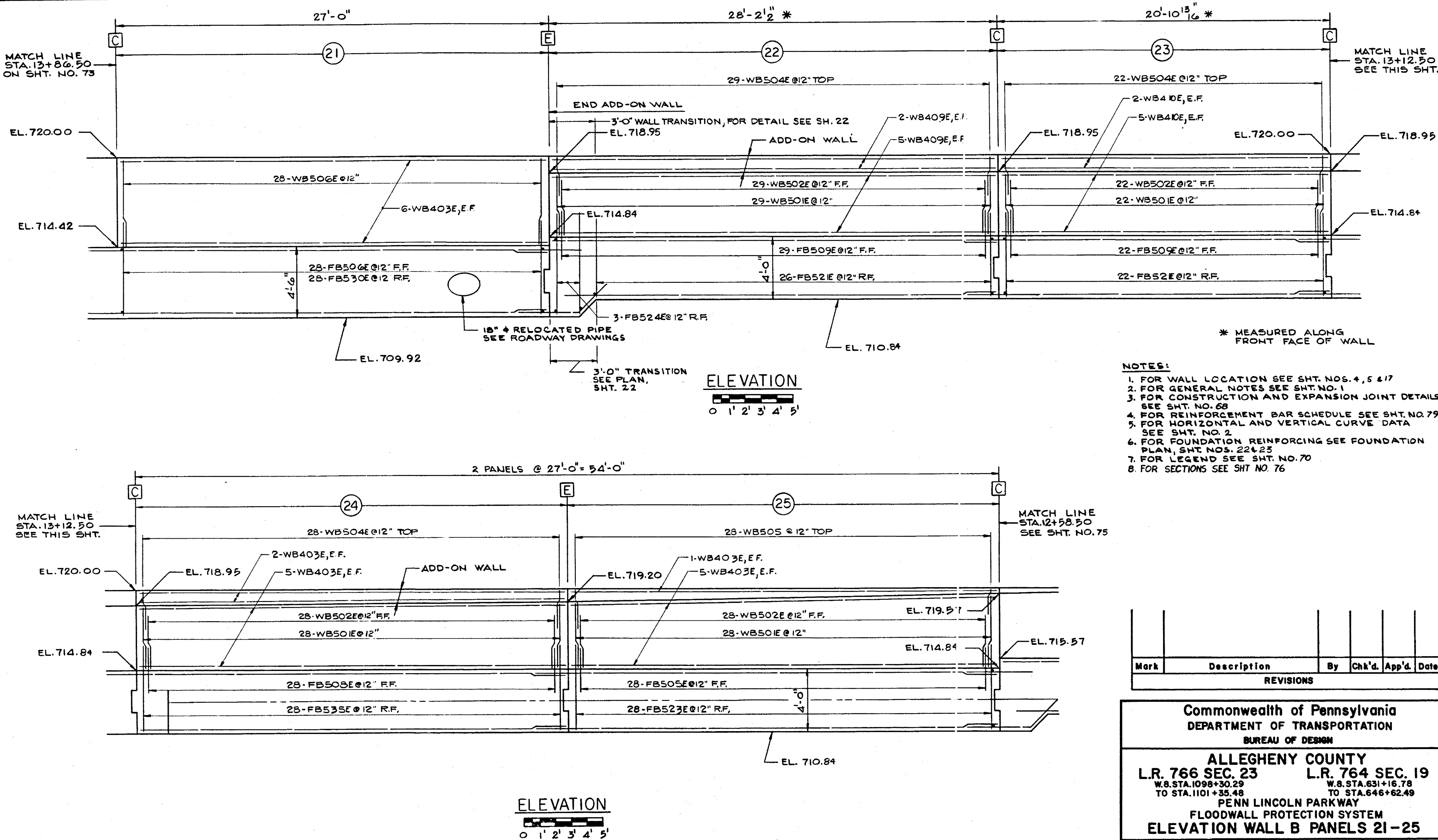
BRIDGE ENGINEER

SHEET 73 OF 114

0609975

S-14584

WLW/RJK3
RJK
RJK3



* MEASURED ALONG FRONT FACE OF WALL

NOTES:

1. FOR WALL LOCATION SEE SHT. NOS. 4, 5 & 17
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 79
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NOS. 22 & 23
7. FOR LEGEND SEE SHT. NO. 70
8. FOR SECTIONS SEE SHT NO. 76

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
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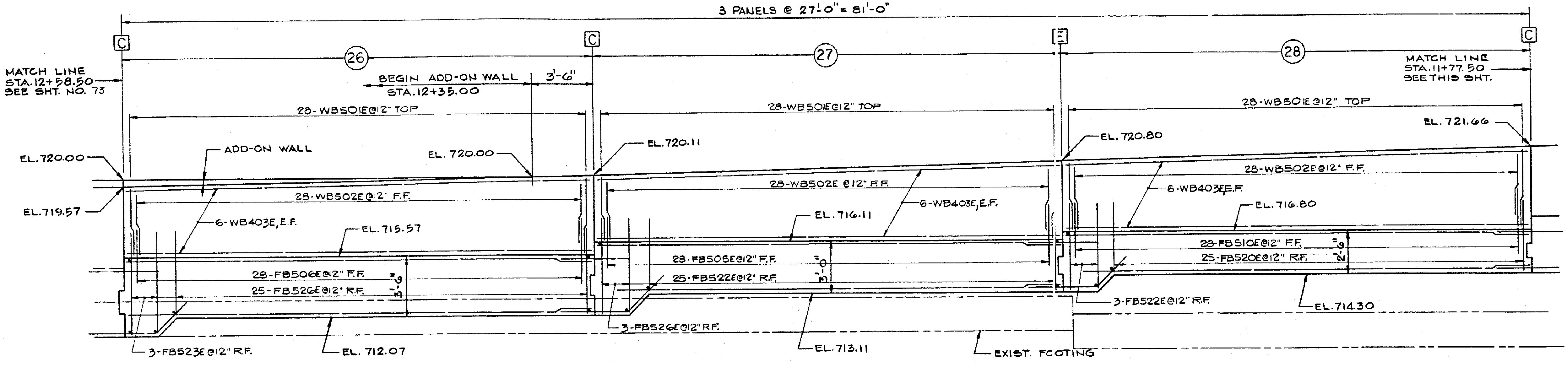
ALLEGHENY COUNTY
L.R. 766 SEC. 23 W.B. STA. 1098+30.29 TO STA. 1101+35.48
L.R. 764 SEC. 19 W.B. STA. 631+16.78 TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL B PANELS 21-25

APPROVED AUG 23 1967
BRIDGE ENGINEER

SHEET 74 OF 114
0009976
S-14584

WLW/RJK³
RJK
RJK³

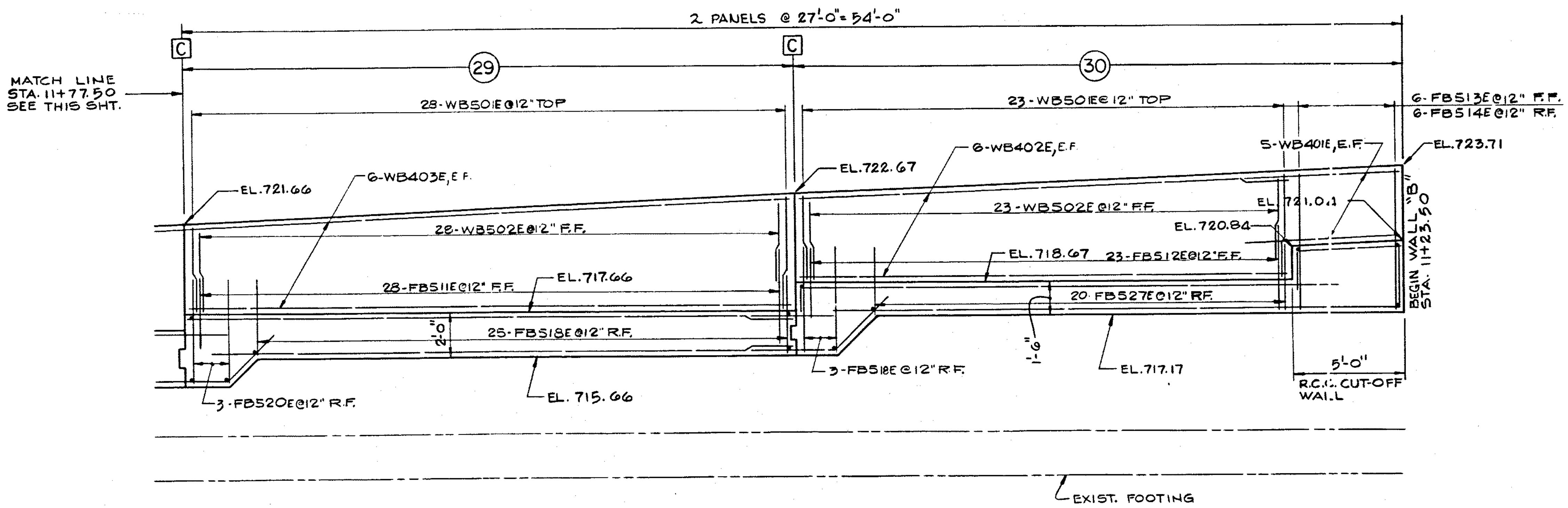


ELEVATION

0 1' 2' 3' 4' 5'

NOTES:

1. FOR WALL LOCATIONS SEE SHT. NOS. 4 & 17
2. FOR GENERAL NOTES SEE SHT NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 79
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NO. 22
7. FOR LEGEND SEE SHT. NO. 70
8. FOR SECTIONS SEE SHT. NO. 76



ELEVATION

0 1' 2' 3' 4' 5'

WLW/RJK3
RJK
RJK3

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

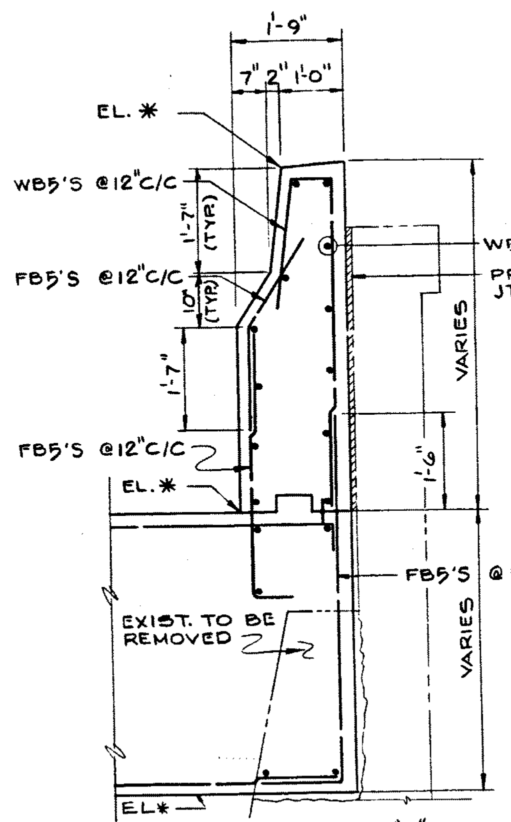
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL B PANELS 25-30

APPROVED AUG 23 1977

BRIDGE ENGINEER

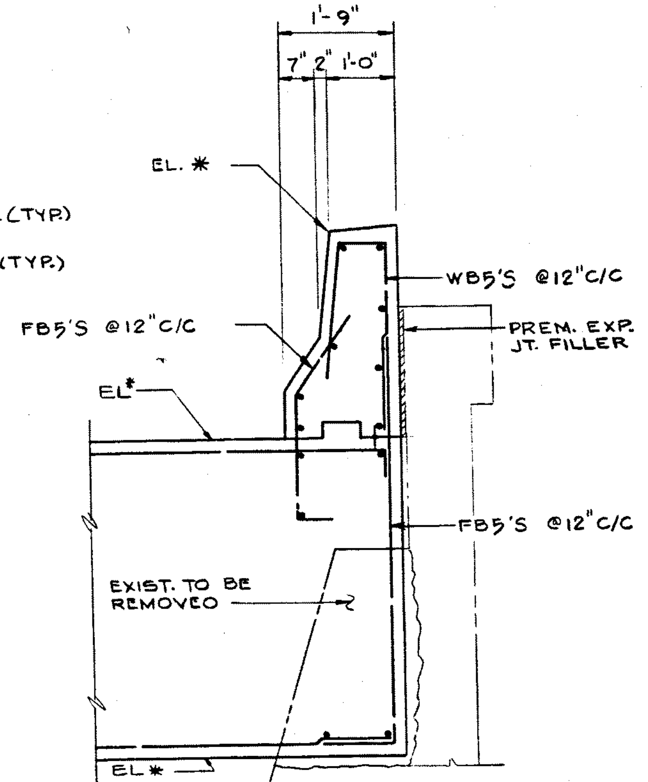
SHEET 75 OF 114
0009971

S-14584



SECTION WALL "B"
STA.11+28.5 TO 12+35.0 AND
STA.17+37.5 TO 17+61.5

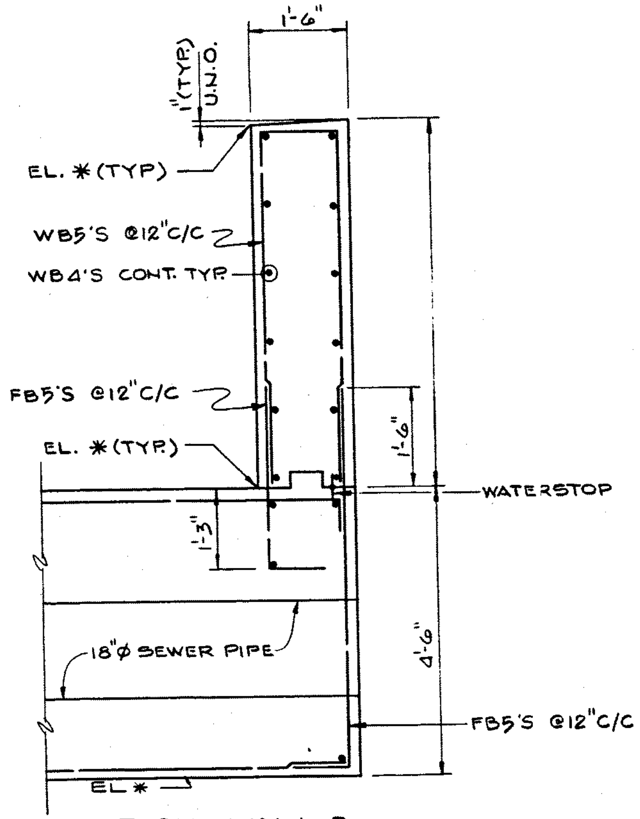
0 1' 2' 3' 4'



SECTION WALL "B"
STA.11+23.5 TO 11+28.5

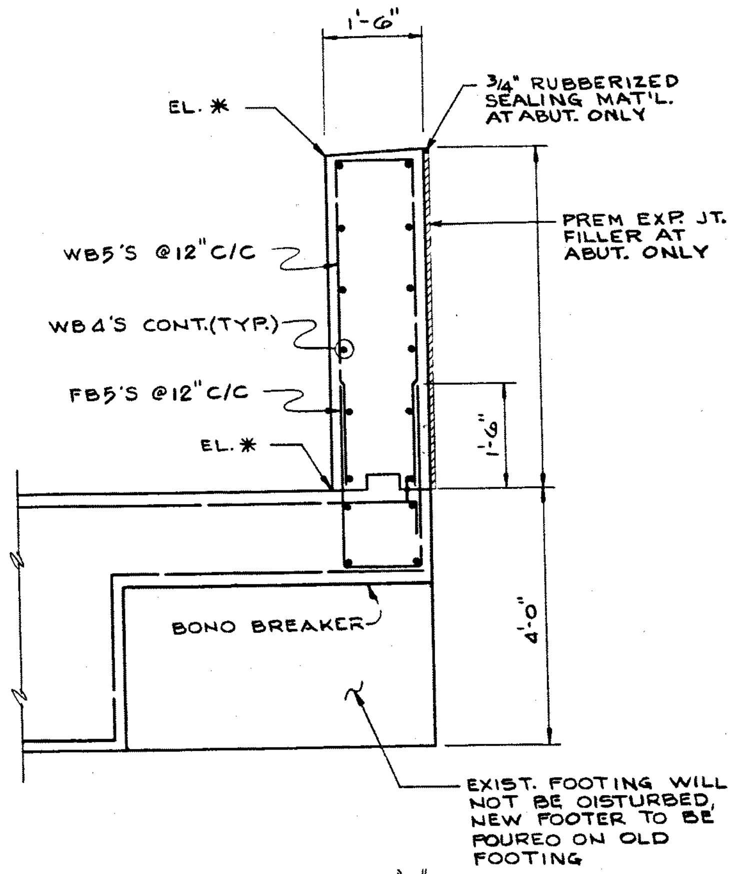
0 1' 2' 3' 4'

4" PLAN CEMENT CONCRETE PA'T (ROADWAY ITEM)



SECTION WALL B
STA.13+59.5 TO 14+53.4 ±
SIMILAR W/OUT PIPE
FOR WALL MODIFICATION
STA. 13+79.02 TO 14+00.76
SEE SHT NO. 78

0 1' 2' 3' 4'

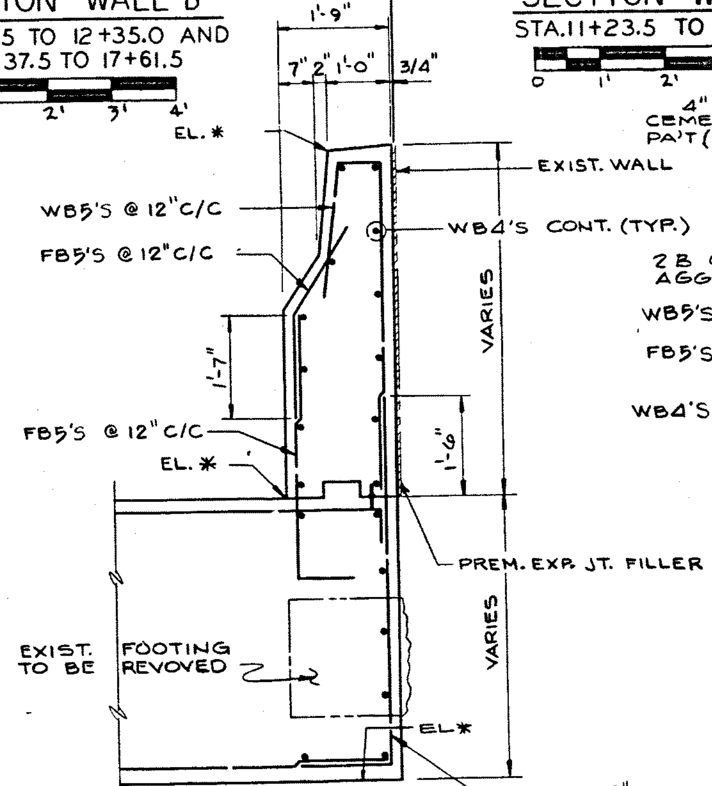


SECTION WALL "B"
STA.14+56.4± TO 14+58.4

0 1' 2' 3' 4'

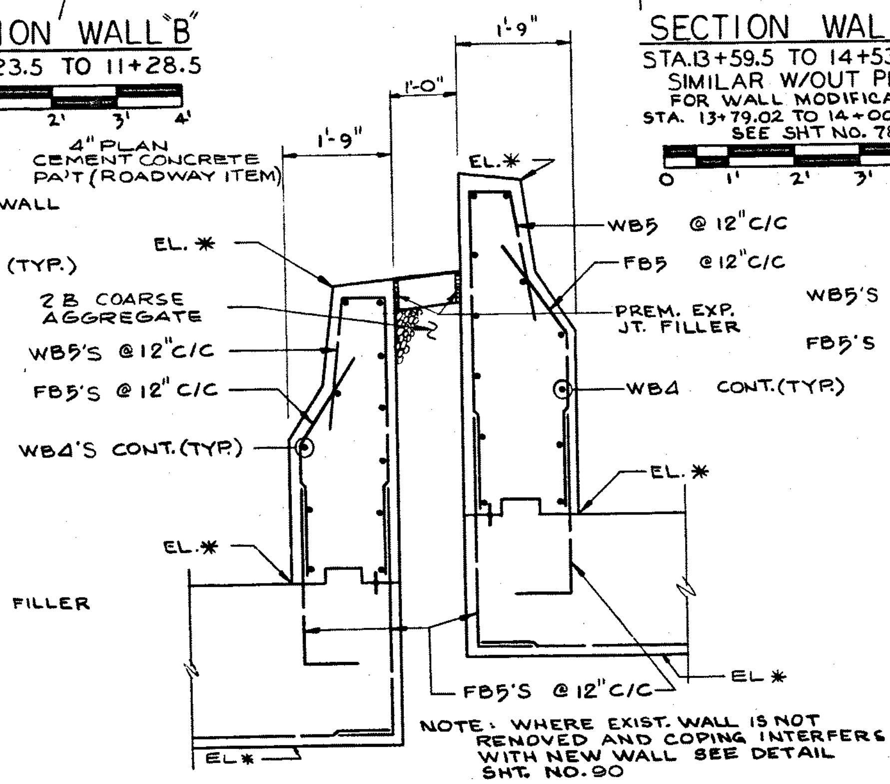
* ELEVATIONS GIVEN TO THIS POINT SEE SHTS. 70 TO 75

NOTE:
1. FOR JOINT DETAILS SEE SHT 68



SECTION WALL 'B'
STA. 14+58.4 TO 17+61.5 ±
AND RAMP N
STA. 17+42.5 TO 17+61.5 ±

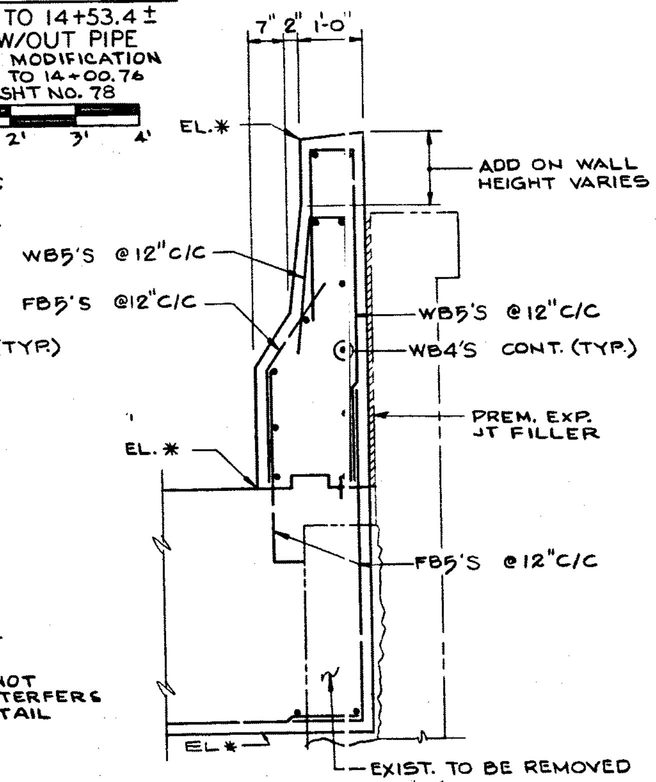
0 1' 2' 3' 4'



NOTE: WHERE EXIST. WALL IS NOT REMOVED AND COPING INTERFERES WITH NEW WALL SEE DETAIL SHT. NO. 90

SECTION WALL 'B'
STA.17+61.5 TO 17+91.5

0 1' 2' 3' 4'



SECTION WALL 'B'
STA. 12+35± TO 13+59.5

0 1' 2' 3' 4'

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

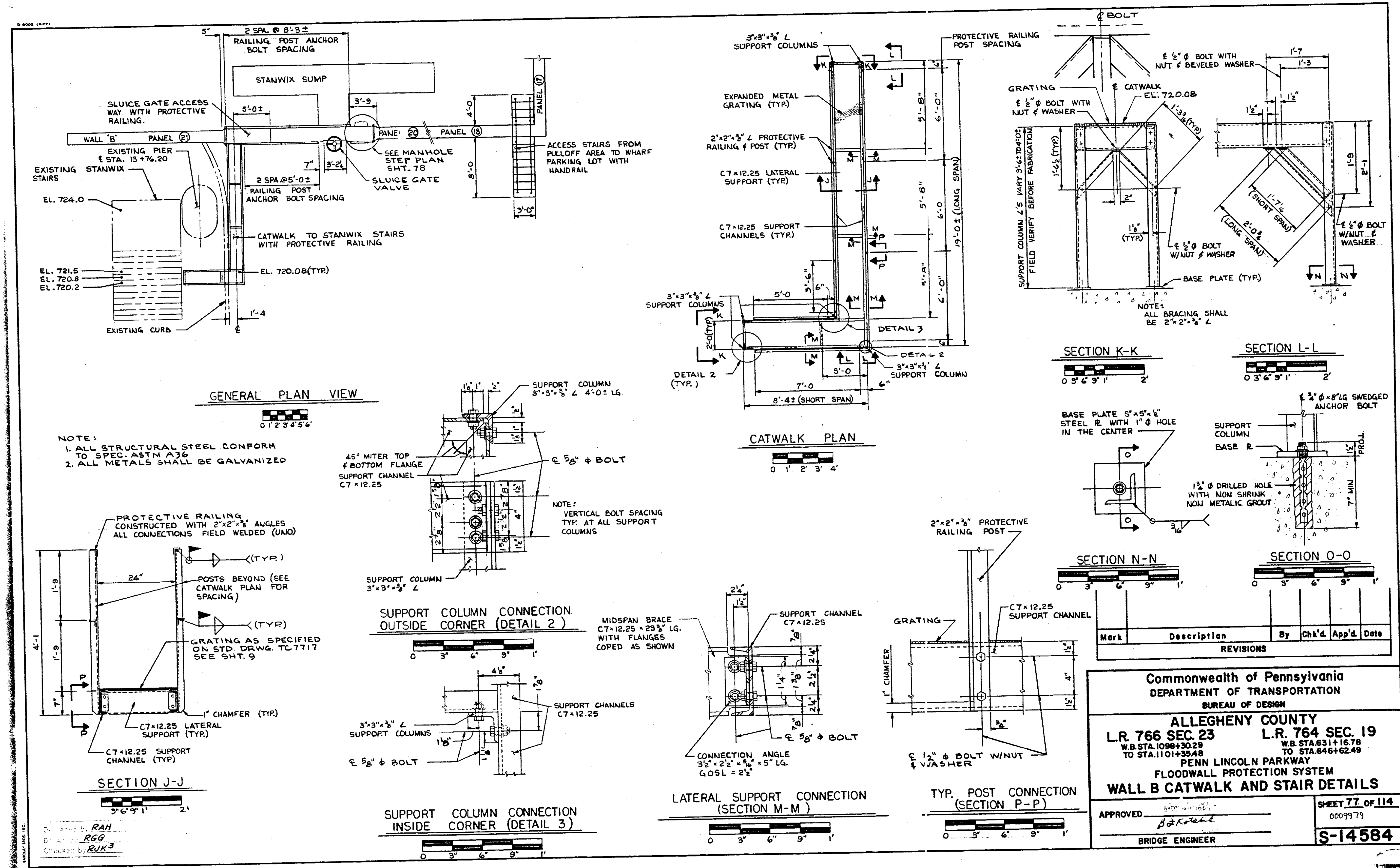
ALLEGHENY COUNTY
L.R. 766 SEC. 23 — W.B. STA.1098+30.29 TO STA.1101+35.48
L.R. 764 SEC. 19 — W.B. STA.631+16.78 TO STA.646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
WALL B SECTIONS

APPROVED AUG 23 1982
B J Kotal
BRIDGE ENGINEER

SHEET 76 OF 114
0009978
S-14584

Designed by FGC
Drawn by MAH
Checked by RJK3



2 SPA. @ 8'-3 ±
RAILING POST ANCHOR BOLT SPACING
STANWIX SUMP
SLUICE GATE ACCESS WAY WITH PROTECTIVE RAILING.
WALL "B" PANEL 21
PANEL 20 PANEL 18
PANEL 17
EXISTING PIER ℄ STA. 13+76.20
EXISTING STANWIX STAIRS
EL. 724.0
SEE MANHOLE STEP PLAN SHT. 78
SLUICE GATE VALVE
2 SPA.@5'-0 ± RAILING POST ANCHOR BOLT SPACING
ACCESS STAIRS FROM PULLOFF AREA TO WHARF PARKING LOT WITH HANDRAIL
CATWALK TO STANWIX STAIRS WITH PROTECTIVE RAILING
EL. 721.5
EL. 720.8
EL. 720.2
EL. 720.08(TYP.)
EXISTING CURB
GENERAL PLAN VIEW
NOTE:
1. ALL STRUCTURAL STEEL CONFORM TO SPEC. ASTM A36
2. ALL METALS SHALL BE GALVANIZED
3"×3"×3/8" ∠ SUPPORT COLUMNS
PROTECTIVE RAILING POST SPACING
EXPANDED METAL GRATING (TYP.)
2"×2"×3/8" ∠ PROTECTIVE RAILING & POST (TYP.)
C7×12.25 LATERAL SUPPORT (TYP.)
C7×12.25 SUPPORT CHANNELS (TYP.)
19'-0 ± (LONG SPAN)
DETAIL 3
DETAIL 2
DETAIL 2 (TYP.)
3"×3"×3/8" ∠ SUPPORT COLUMN
8'-4± (SHORT SPAN)
CATWALK PLAN
℄ BOLT
GRATING
℄ 1/2" ϕ BOLT WITH NUT & WASHER
℄ CATWALK
EL. 720.08
℄ 1/2" ϕ BOLT WITH NUT & BEVELED WASHER
SUPPORT COLUMN ∠'S VARY 3'-6± TO 4'-0± FIELD VERIFY BEFORE FABRICATION
℄ 1/2" ϕ BOLT W/NUT & WASHER
BASE PLATE (TYP.)
NOTE: ALL BRACING SHALL BE 2"×2"×3/8" ∠
(SHORT SPAN)
(LONG SPAN)
SECTION K-K
SECTION L-L
BASE PLATE 5"×5"×1/2" STEEL ℞ WITH 1" ϕ HOLE IN THE CENTER
℄ 3/4" ϕ × 8" LG SWEDGED ANCHOR BOLT
SUPPORT COLUMN
BASE ℞
1 3/4" ϕ DRILLED HOLE WITH NON SHRINK NON METALIC GROUT
SECTION N-N
SECTION O-O
SUPPORT COLUMN 3"×3"×3/8" ∠ 4'-0± LG.
45° MITER TOP & BOTTOM FLANGE
SUPPORT CHANNEL C7×12.25
℄ 5/8" ϕ BOLT
NOTE: VERTICAL BOLT SPACING TYP. AT ALL SUPPORT COLUMNS
SUPPORT COLUMN 3"×3"×3/8" ∠
SUPPORT COLUMN CONNECTION OUTSIDE CORNER (DETAIL 2)
PROTECTIVE RAILING CONSTRUCTED WITH 2"×2"×3/8" ANGLES ALL CONNECTIONS FIELD WELDED (UNO)
POSTS BEYOND (SEE CATWALK PLAN FOR SPACING)
GRATING AS SPECIFIED ON STD. DRWG. TC 7717 SEE SHT. 9
1" CHAMFER (TYP.)
C7×12.25 LATERAL SUPPORT (TYP.)
C7×12.25 SUPPORT CHANNEL (TYP.)
SECTION J-J
SUPPORT CHANNELS C7×12.25
3"×3"×3/8" ∠ SUPPORT COLUMNS
SUPPORT COLUMN CONNECTION INSIDE CORNER (DETAIL 3)
MIDSPAN BRACE C7×12.25 × 23 3/8" LG. WITH FLANGES COPED AS SHOWN
SUPPORT CHANNEL C7×12.25
CONNECTION ANGLE 3 1/2"×2 1/2"×5/16"×5" LG. GOSL = 2 1/2"
LATERAL SUPPORT CONNECTION (SECTION M-M)
2"×2"×3/8" PROTECTIVE RAILING POST
GRATING
C7×12.25 SUPPORT CHANNEL
1" CHAMFER
℄ 1/2" ϕ BOLT W/NUT & WASHER
TYP. POST CONNECTION (SECTION P-P)
Mark | Description | By | Chk'd. | App'd. | Date
REVISIONS
Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN
ALLEGHENY COUNTY
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W.B. STA. 1098+30.29 TO STA. 1101+35.48
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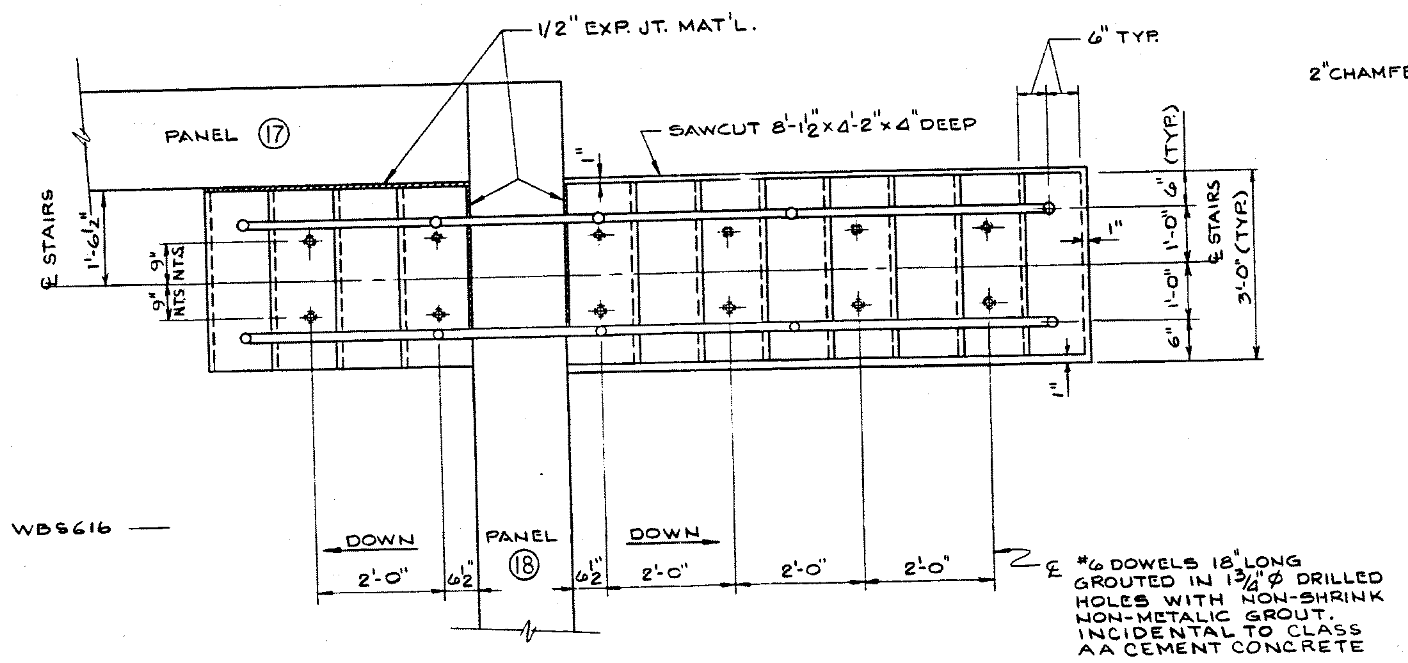
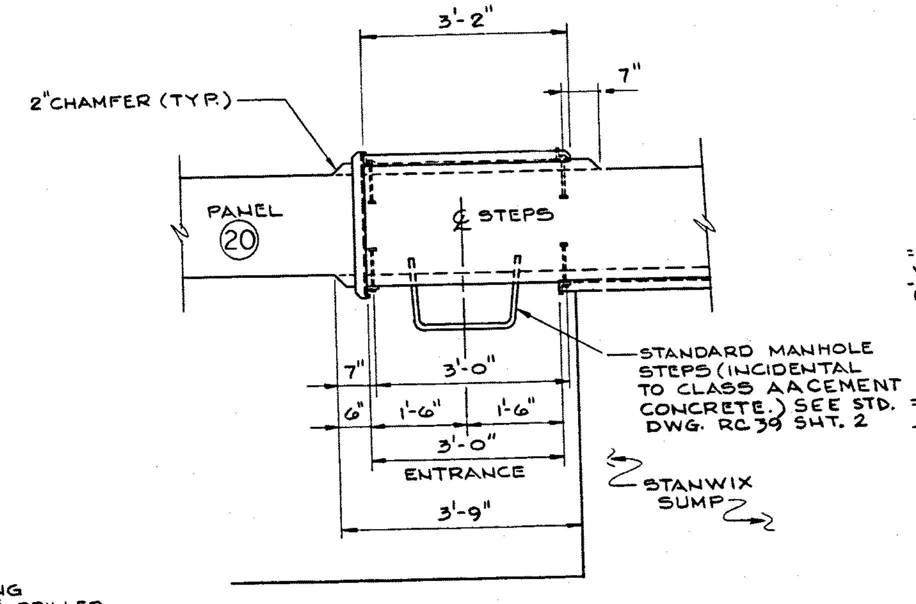
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
WALL B CATWALK AND STAIR DETAILS
APPROVED
BRIDGE ENGINEER
SHEET 77 OF 114
0009979
S-14584
Designed by RAH
Drawn by RGG
Checked by RJK



PLAN

STAIRWAY AT STANWIX SUMP

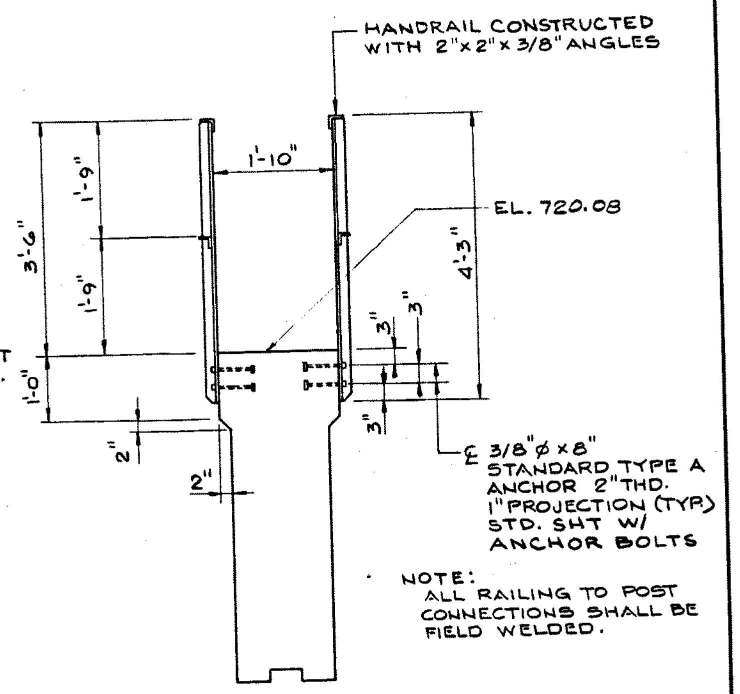
0 1' 2' 3'



PLAN

MAN HOLE STEPS AND WALKWAY ENTRANCE AT STANWIX SUMP

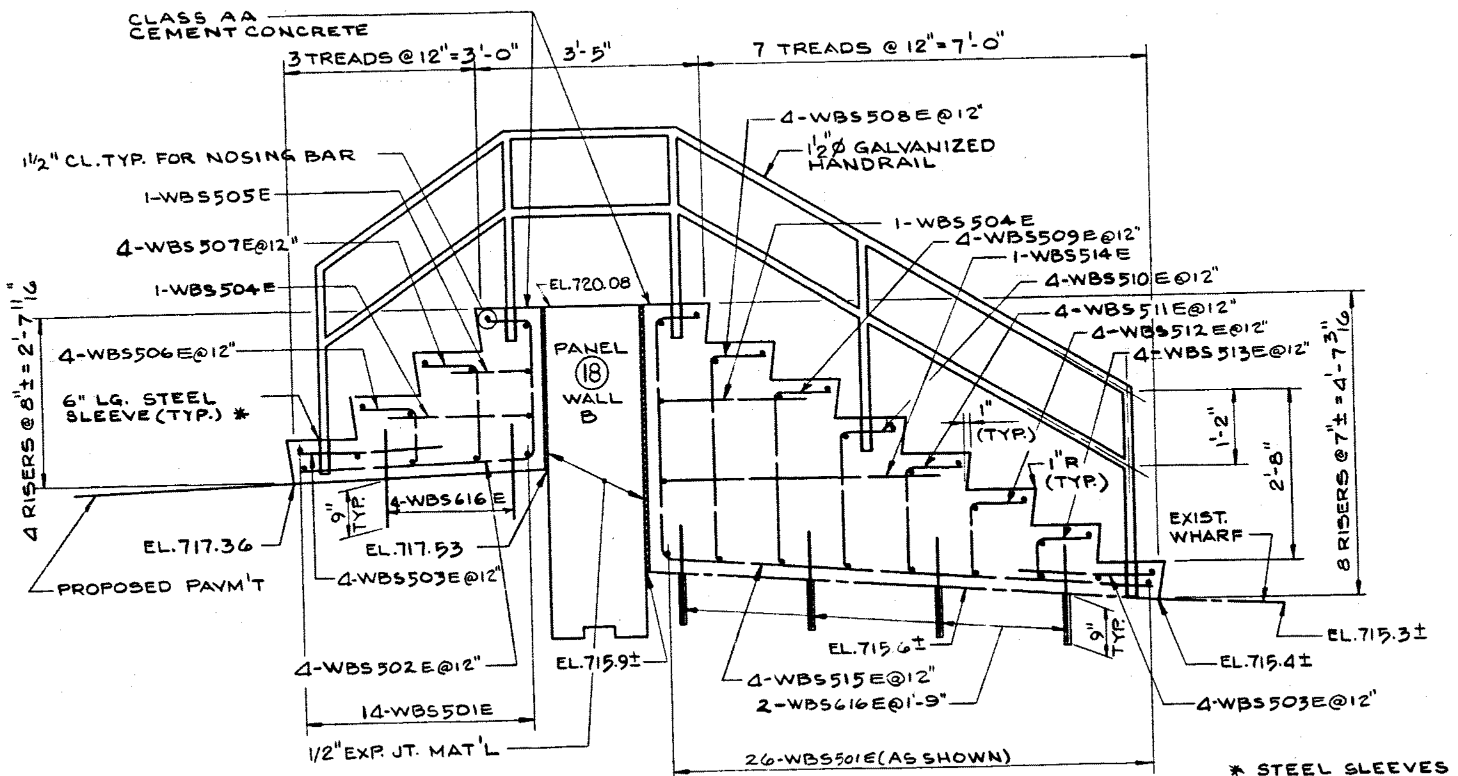
0 1' 2' 3'



TYPICAL SECTION

SLIDE GATE ACCESS WAY

0 1' 2' 3'

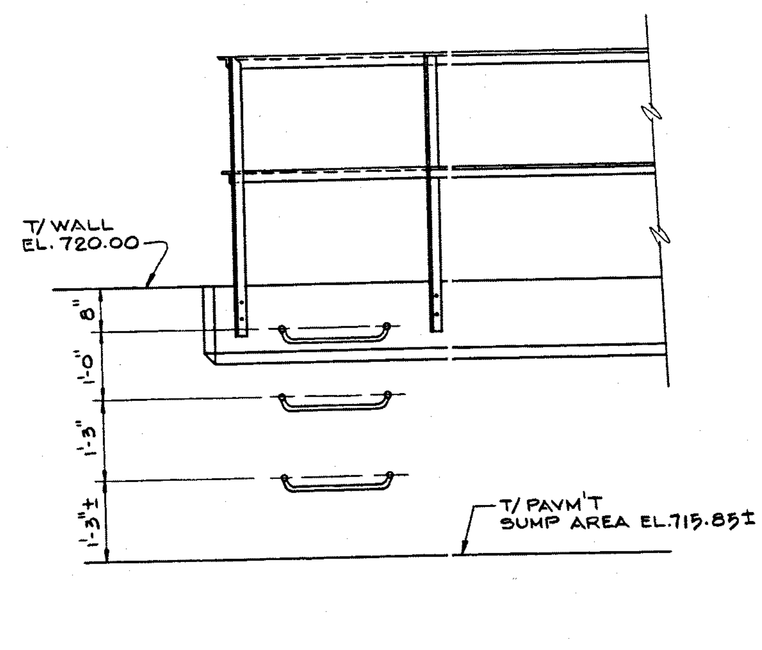


SECTION

STAIRWAY AT STANWIX SUMP

0 1' 2' 3'

* STEEL SLEEVES SHALL BE PLUGGED WITH STYROFOAM UNTILL HANDRAIL PLACEMENT AND FILLED W/MOLTEN LEAD AFTER RAIL POST INSERTION



ELEVATION

MAN HOLE STEPS AND WALKWAY ENTRANCE AT STANWIX SUMP

0 1' 2' 3'

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

ALLEGHENY COUNTY

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W.B. STA.1098+30.29 TO STA.1101+35.48

L.R. 764 SEC. 19
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PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

WALL B CATWALK AND STAIR DETAILS

APPROVED AUG 23 1982

BRIDGE ENGINEER

SHEET 78 OF 114
0009980

S- 14584

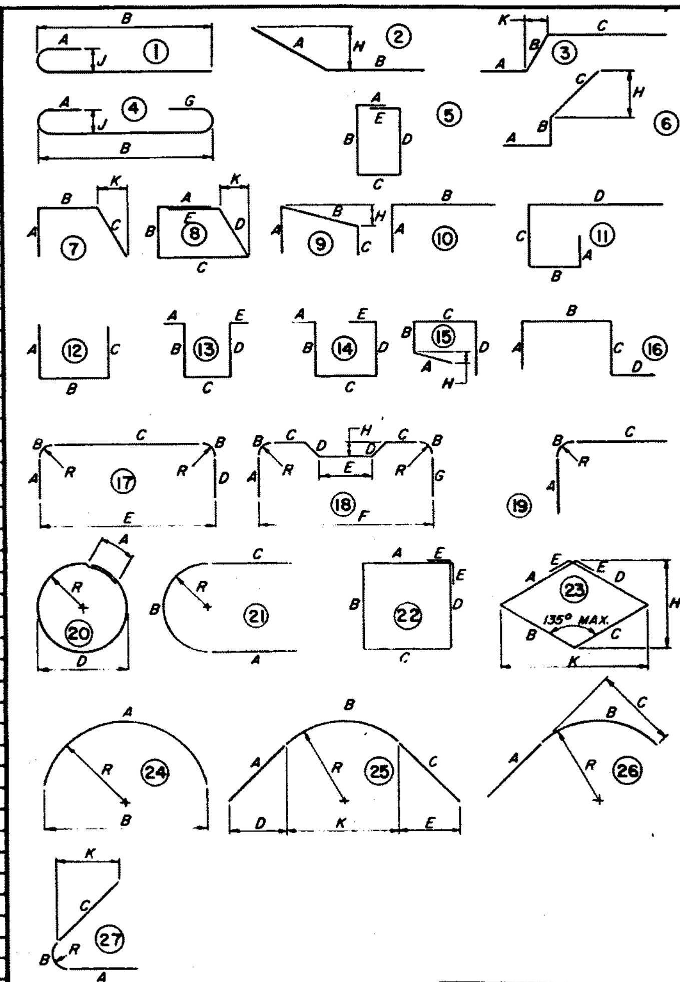
Designed by RAH
Drawn by FS
Checked by RJK3

7530-2350-0210

REINFORCEMENT BAR SCHEDULE

MARK	SIZE	LENGTH	NO.	TYPE	A	B	C	D	E	F	G	H	J	K	R	REMARKS
		DOWELS														
FB501E	5	7'-9" to 7'-5"	6	7	10	4'-11" to 4'-7"	2'-0"									1 Ea. Var. B By 7/8"
FB502E	5	11'-1/2" to 10'-8 1/2"	6	15	2'-4 1/2"	7"	7'-3" to 6'-11"	10"						1'-7 5/8"		1 Ea. Var. C By 7/8"
FB503E	5	5'-4" to 3'-9"	23	10	10"	4'-6" to 2'-11"						3"				1 Ea. Var. B By 7/8"
FB504E	5	4'-11" to 3'-8"	28	10	10"	4'-1" to 2'-10"										1 Ea. Var. B By 1/2"
FB505E	5	4'-4"	180	10	10"	3'-6"										
FB506E	5	4'-2"	136	10	10"	3'-4"										
FB507E	5	4'-3"	56	10	10"	3'-5"										
FB508E	5	4'-0"	140	10	10"	3'-2"										
FB509E	5	3'-10"	51	10	10"	3'-0"										
FB510E	5	4'-6"	28	10	10"	3'-8"										
FB511E	5	4'-8" to 3'-8"	28	10	10"	3'-10" to 2'-10"										1 Ea. Var. B By 7/6
FB512E	5	4'-3" to 3'-8"	23	10	10"	3'-5" to 2'-10"										1 Ea. Var. B By 7/6
FB513E	5	5'-0"	6	7	10"	1'-6"	2'-0"									
FB514E	5	9'-10 1/2" to 9'-8 1/2"	6	15	2'-4 1/2"	7"	6'-1" to 5'-11"	10"								1 Ea. Var. C By 1/2"
FB515E	5	6'-2" to 4'-7"	20	10	1'-6"	4'-8" to 3'-1"										1 Ea. Var. B By 1"
FB516E	5	6'-4"	62	10	1'-6"	4'-10"										
FB517E	5	6'-3" to 5'-0"	25	10	1'-6"	4'-9" to 3'-6"										1 Ea. Var. B By 5/8"
FB518E	5	5'-10"	81	10	1'-6"	4'-4"										
FB519E	5	6'-5"	59	10	1'-6"	4'-11"										
FB520E	5	6'-2"	81	10	1'-6"	4'-8"										
FB521E	5	7'-0"	107	10	1'-6"	5'-6"										
FB522E	5	6'-8"	84	10	1'-6"	5'-2"										
FB523E	5	7'-7"	46	10	1'-6"	6'-1"										
FB524E	5	7'-10"	6	10	1'-6"	6'-4"										
FB525E	5	9'-4"	4	10	1'-6"	7'-10"										
FB526E	5	6'-10"	66	10	1'-6"	5'-4"										
FB527E	5	5'-2"	20	10	1'-6"	3'-8"										
FB528E	5	14'-6"	4	12	6'-8"	1'-2"	6'-8"									
FB529E	5	3'-8"	41	10	10"	2'-10"										
FB530E	5	7'-8"	48	10	1'-6"	6'-2"										
FB531E	5	23'-8"	4	12	11'-3"	1'-2"	11'-3"									
FB532E	5	19'-8"	2	12	9'-3"	1'-2"	9'-3"									
FB533E	5	6'-0"	20	STR												
FB534E	5	7'-4"	20	12	3'-1"	1'-2"	3'-1"									
FB535E	5	7'-2"	28	10	1'-6"	5'-8"										
FB536E	5	9'-8"	2	12	4'-3"	1'-2"	4'-3"									
		WALL BARS														
WB401E	4	7'-0"	16	STR												
WB402E	4	21'-8"	14	STR												
WB403E	4	26'-8"	248	STR												
WB404E	4	10'-2"	14	STR												
WB405E	4	8'-0"	24	10	4'-0"	4'-0"										
WB406E	4	13'-11"	12	STR												
WB407E	4	16'-0"	12	STR												
WB408E	4	11'-3" to 9'-9"	5	12	3'-6"	4'-3" to 2'-9"	3'-6"									1 Ea. Var. B By 9 3/4" Vary B To Match Existing Longitudinal Parapet Bars.
WB409E	4	27'-10"	14	STR												
WB410E	4	20'-7"	14	STR												
WB411E	4	5'-5"	5	12	2'-0"	1'-6"	2'-0"									
WB501E	5	6'-9 1/2"	641	7	3'-10"	7"	2'-4 1/2"							3"		
WB502E	5	3'-7"	641	2	2'-0"	1'-7"						1'-2"				
WB503E	5	4'-7"	40	12	2'-0"	7"	2'-0"									
WB504E	5	5'-11"	79	12	2'-8"	7"	2'-8"									
WB505E	5	5'-5"	28	12	2'-5"	7"	2'-5"									
WB506E	5	11'-2"	112	12	5'-0"	1'-2"	5'-0"									
		SUMP AREA STAIR BARS														
WBS501E	5	2'-8"	40	STR												
WBS502E	5	6'-6"	4	12	0'-8"	2'-2"	3'-8"					0'-1"				
WBS503E	5	2'-0"	8	2	0'-10"	1'-2"										
WBS504E	5	7'-4"	2	12	2'-4"	2'-8"	2'-4"									
WBS505E	5	5'-4"	1	12	1'-4"	2'-8"	1'-4"									
WBS506E	5	1'-9"	4	10	0'-10"	0'-11"										
WBS507E	5	2'-4"	4	10	0'-10"	1'-6"										
WBS508E	5	4'-0"	4	10	0'-10"	3'-2"										
WBS509E	5	3'-6"	4	10	0'-10"	2'-8"										
WBS510E	5	3'-0"	4	10	0'-10"	2'-2"										
WBS511E	5	2'-6"	4	10	0'-10"	1'-8"										
WBS512E	5	2'-0"	4	10	0'-10"	1'-2"										
WBS513E	5	1'-6"	4	10	0'-10"	0'-8"										
WBS514E	5	11'-4"	1	12	4'-4"	2'-8"	4'-4"									
WBS515E	5	12'-1"	4	12	0'-8"	3'-9"	7'-8"									
WBS616E	6	1'-6"	12	STR												

MARK	SIZE	LENGTH	NO.	TYPE	A	B	C	D	E	F	G	H	J	K	R	REMARKS



Designed by RJK
Drawn by [illegible]
Checked by RJK

- All Bars This Sheet to be Epoxy Coated.
- "J" Dimensions on 180° hooks to be shown only where necessary to restrict hook size, otherwise standard hooks are to be used.
- All dimensions are out to out of bar except "A" and "G" on standard 135° and 180° hooks, and "R" which is shown to the inside of the bar.
- For Reinforcement Bar Fabrication Details, refer to Standard Drawing BC-336A
- Figures in circles show types.

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA.1098+30.29
TO STA.1101+35.48

L.R. 764 SEC. 19
W.B. STA.631+16.78
TO STA.646+62.49

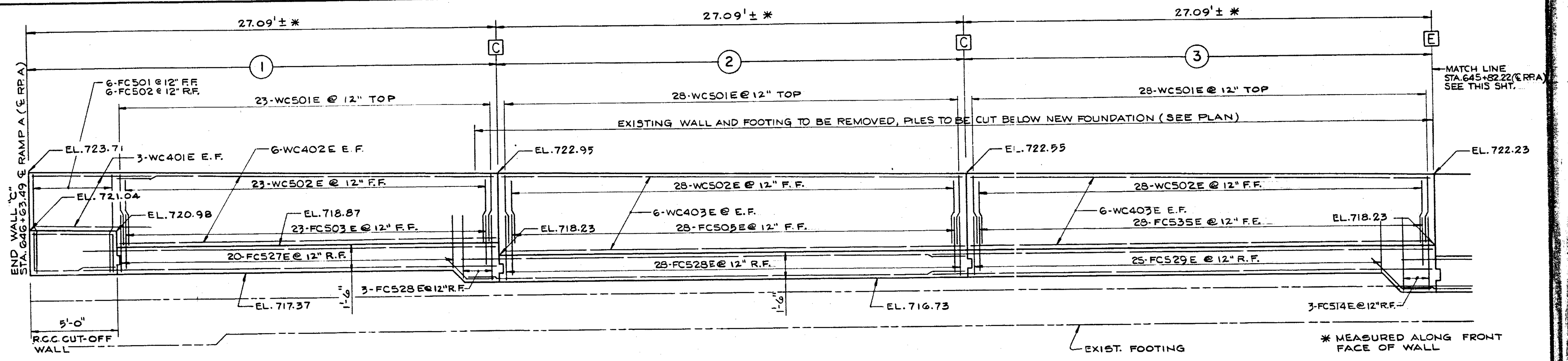
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
WALL B REINFORCEMENT BAR SCHEDULE

APPROVED AUG 23 1982
[illegible signature]
BRIDGE ENGINEER

SHEET 79 OF 114
0909981

S-14584

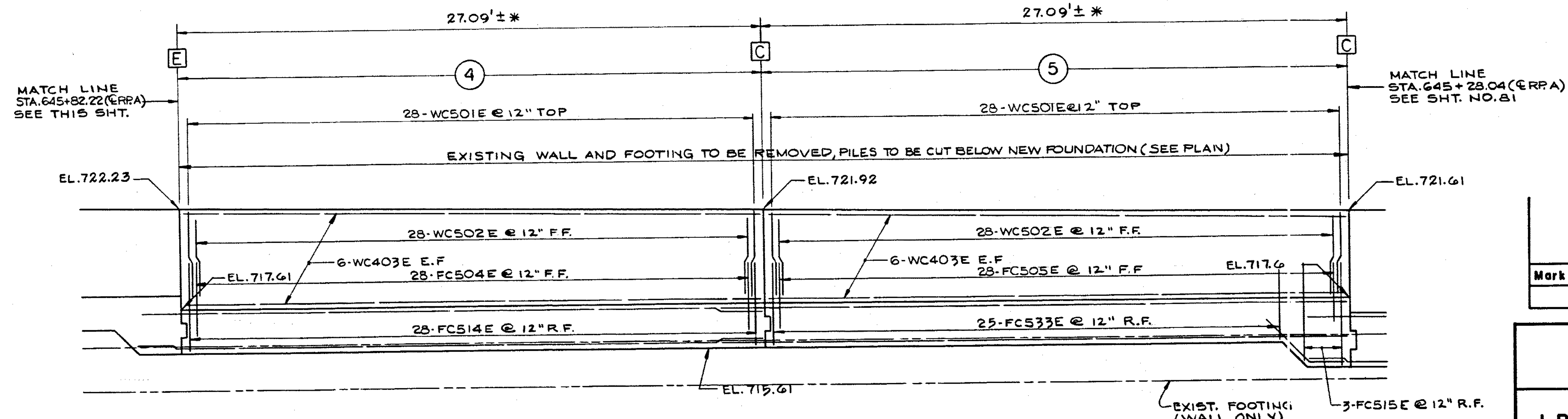
D-6002 (9-77)



ELEVATION

0 1' 2' 3' 4' 5'

NOTES:
1. FOR WALL LOCATION SEE SHT. NOS. 10 & 18
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 93
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NO. 33
7. FOR SECTIONS SEE SHT. NOS. 90 & 91



ELEVATION

0 1' 2' 3' 4' 5'

LEGEND
(3) DENOTES PANEL NUMBER
[C] DENOTES CONSTRUCTION JT.
[E] DENOTES EXPANSION JT.
F.F. = FRONT FACE
R.F. = REAR FACE
E.F. = EACH FACE

WLW/RJK³
RJK
RJK³

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

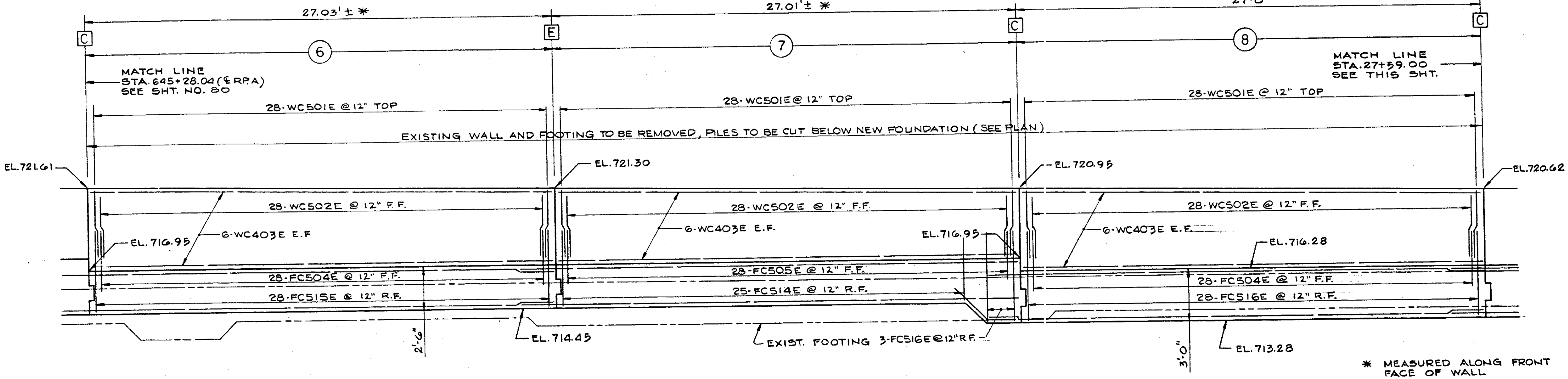
Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23
W.B.STA.1098+30.29
TO STA.1101+35.48
L.R. 764 SEC. 19
W.B.STA.631+16.78
TO STA.646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL C PANELS 1 - 5

APPROVED AUG 2 3 1982
BRIDGE ENGINEER

SHEET 80 OF 114
0009982
S-14584

D-9005 (8-77)

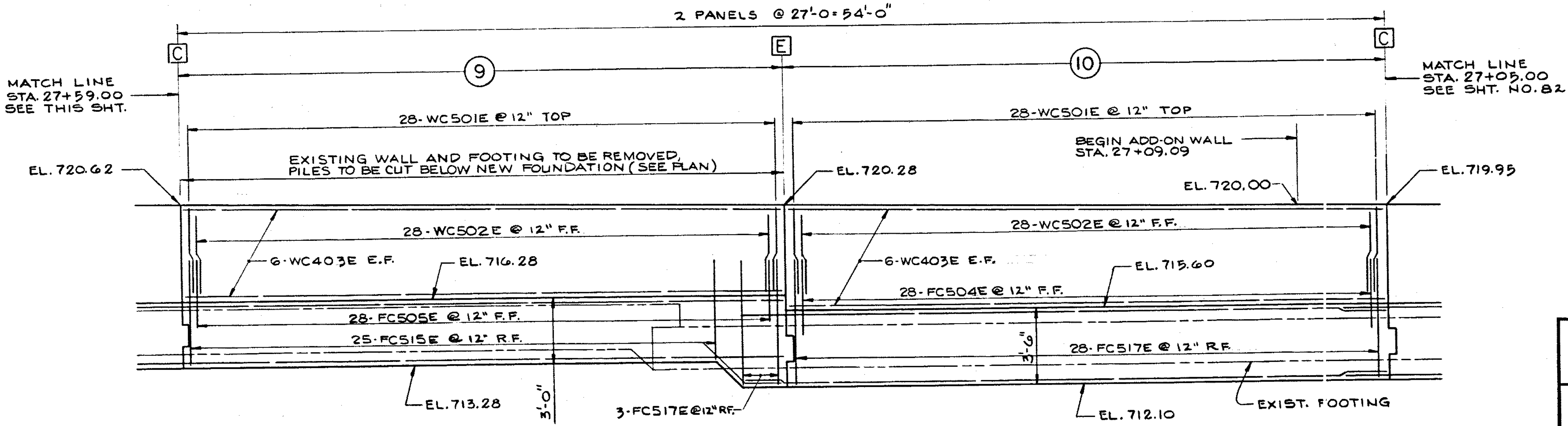


ELEVATION

0 1' 2' 3' 4' 5'

NOTES:

1. FOR WALL LOCATION SEE SHT. NOS. 9, 10 & 18
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 93
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN SEE SHT. NOS. 31 & 32
7. FOR LEGEND SEE SHT. NO. 80
8. FOR SECTIONS SEE SHT. NOS. 90 & 91



ELEVATION

0 1' 2' 3' 4' 5'

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL C PANELS 6 - 10

APPROVED AUG 23 1982
B.J. Kotalik
BRIDGE ENGINEER

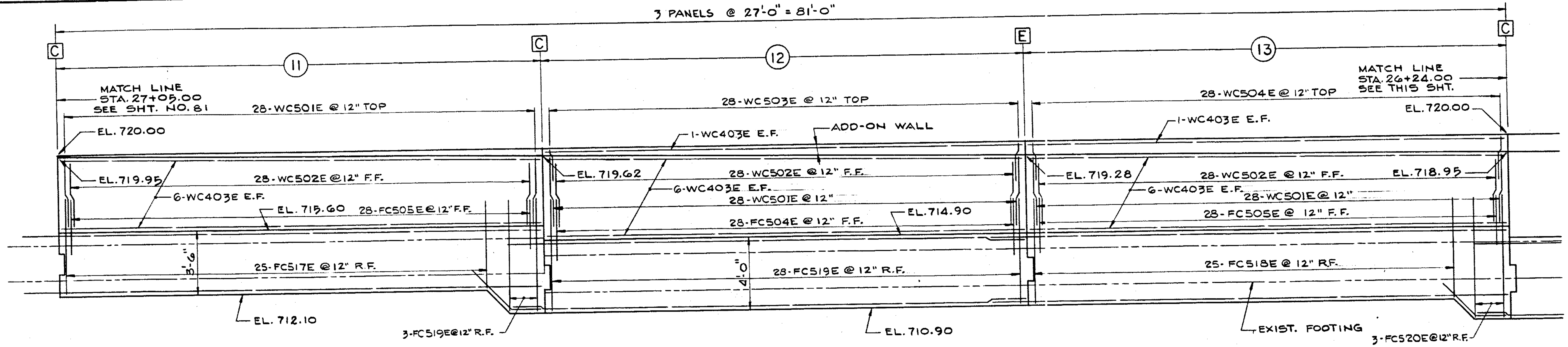
SHEET 81 OF 114
0909983

S-14584

WLW/RJK3
RJK
RJK3

BARCLAY BROS. INC.

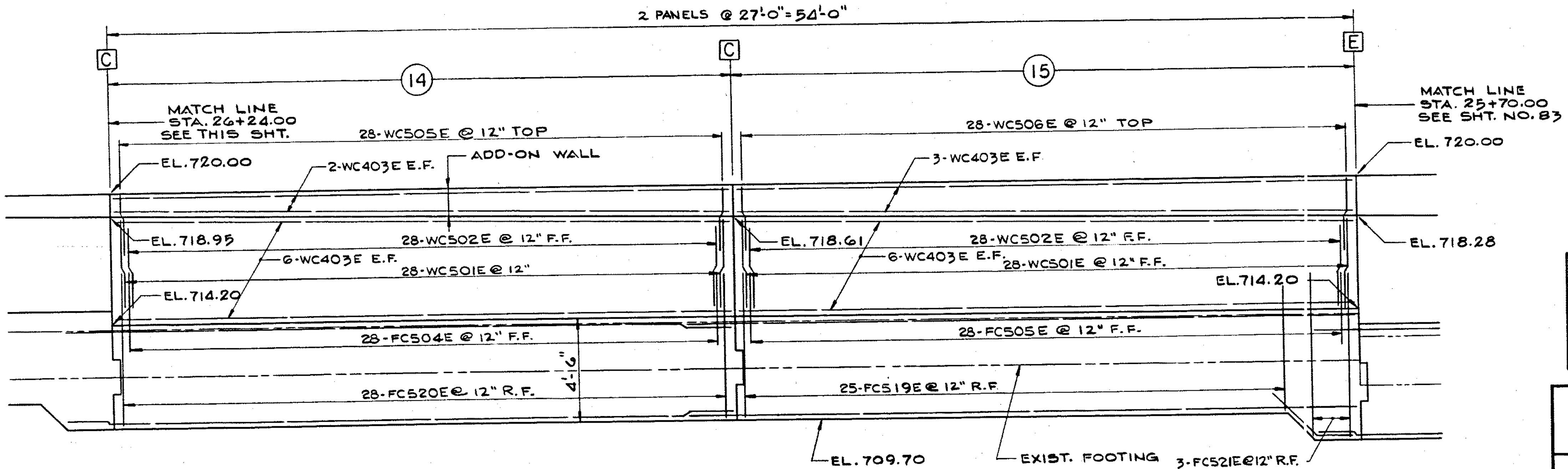
D-8002 (3-77)



ELEVATION

0 1' 2' 3' 4' 5'

NOTES:
1. FOR WALL LOCATIONS SEE SHT. NOS. 9 & 18
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 93
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SEE SHT. NO. 31
7. FOR LEGEND SEE SHT. NO. 79
8. FOR SECTIONS SEE SHT NOS. 90 & 91



ELEVATION

0 1' 2' 3' 4' 5'

WLW/RJK³
RJK
RJK³

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL C PANELS 11-15

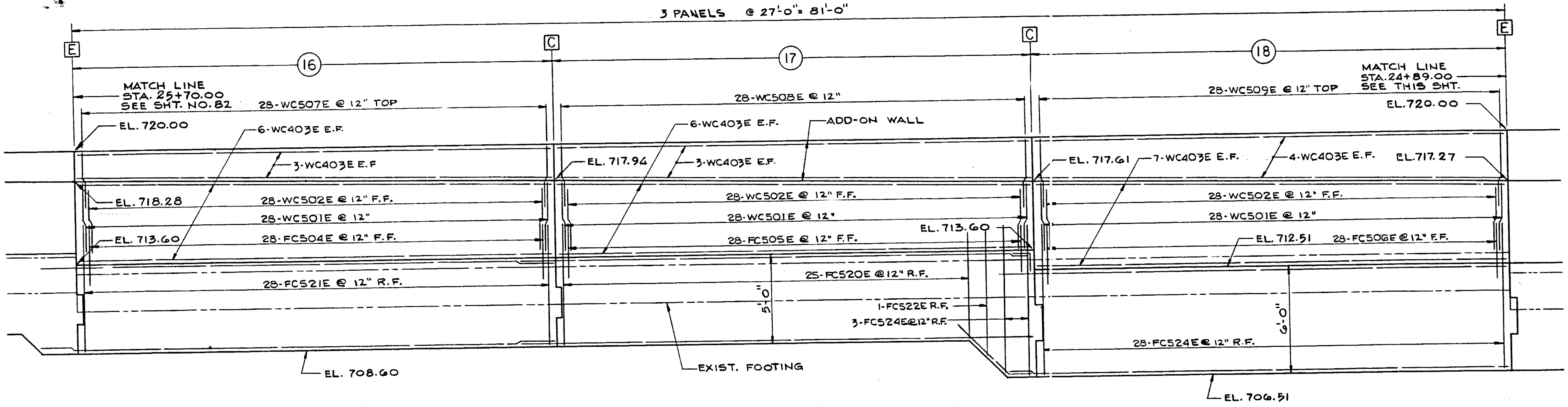
APPROVED AUG 23 1982

BRIDGE ENGINEER

SHEET 82 OF 114
0099984

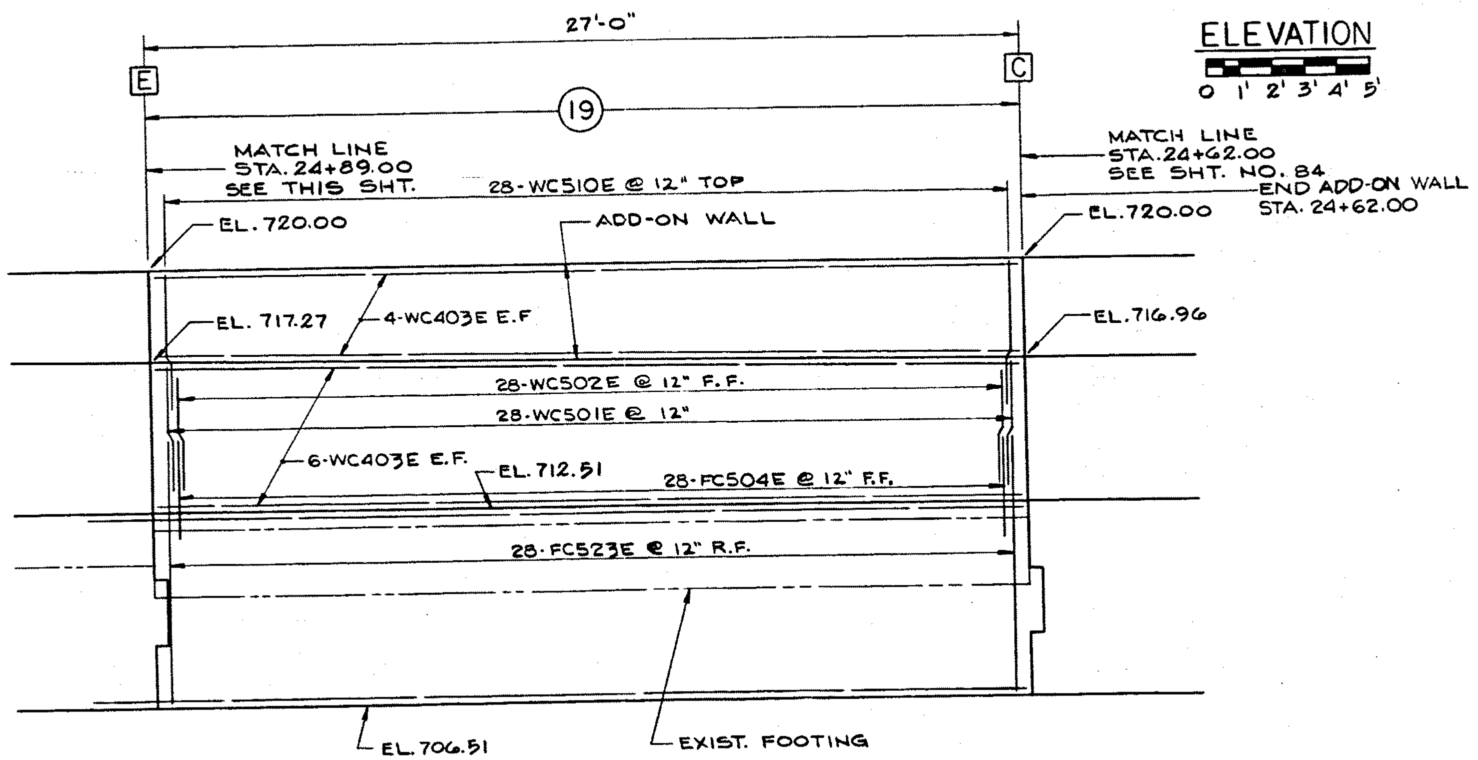
S-14584

B-6002 (3-77)



ELEVATION

0 1' 2' 3' 4' 5'



ELEVATION

0 1' 2' 3' 4' 5'

NOTES:
1. FOR WALL LOCATION SEE SHT NOS. 8, 9 & 19
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 93
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SEE SHT. NO. 30
7. FOR LEGEND SEE SHT. 80
8. FOR SECTIONS SEE SHT. NOS. 90 & 91

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1096+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL C PANELS 16-19

APPROVED AUG 23 1982

B. J. Kotchik

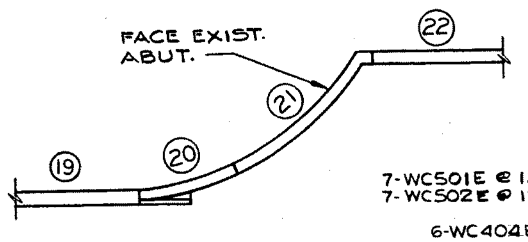
BRIDGE ENGINEER

SHEET 83 OF 114

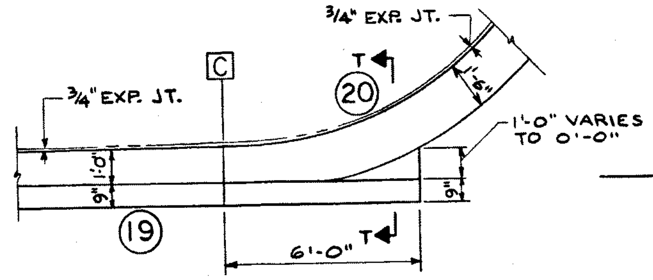
0009985

S-14584

WLW/RJK[3]
RJK
RJK[3]

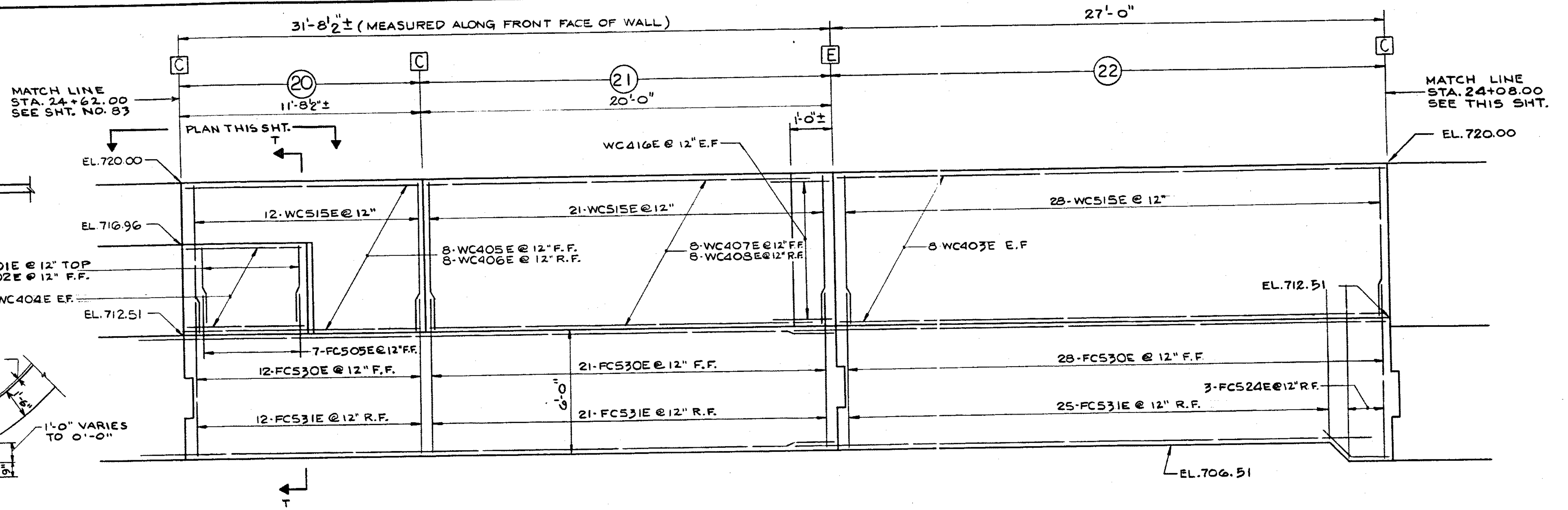


PLAN
N.T.S.



PLAN
PANELS 19 & 20

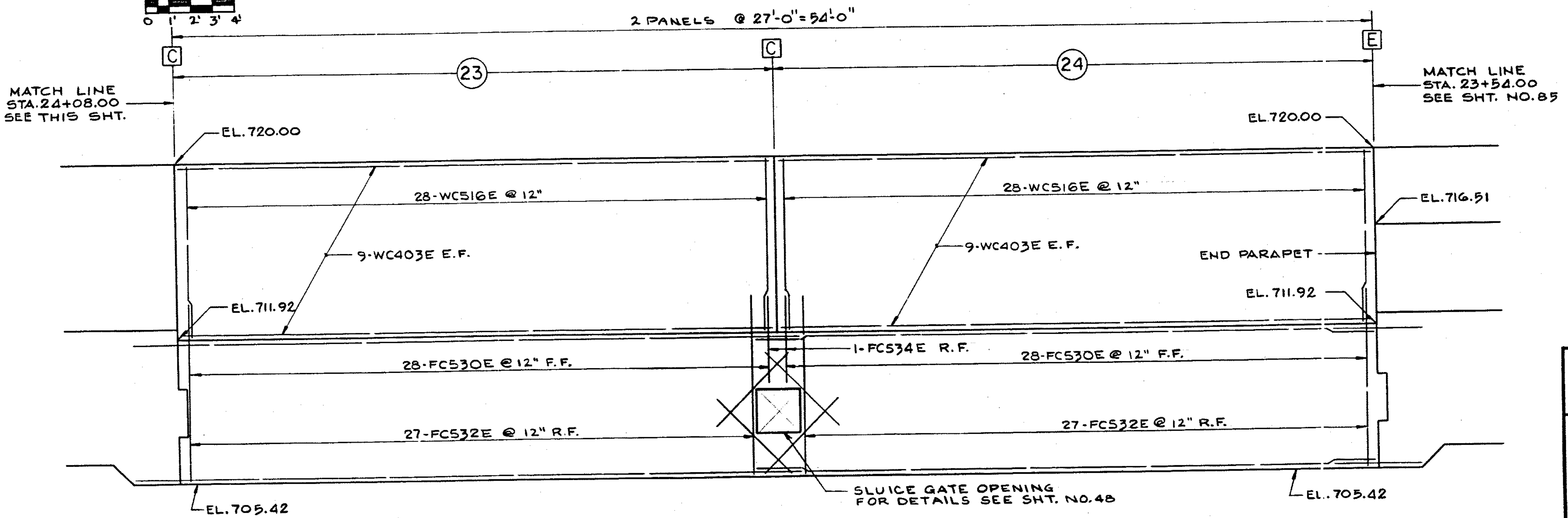
0 1' 2' 3' 4'



ELEVATION

0 1' 2' 3' 4' 5'

NOTES:
1. FOR WALL LOCATION SEE SHT. NOS. 8 & 18
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 93
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NOS. 29 & 30
7. FOR LEGEND SEE SHT NO. 80
8. FOR SECTION T-T SEE SHT. NO. 91
9. FOR SECTIONS SEE SHT NOS. 90 & 91



ELEVATION

0 1' 2' 3' 4' 5'

WLW/RJK³
RJK
RJK³

Mark	Description	By	Cnk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL C PANELS 20-24

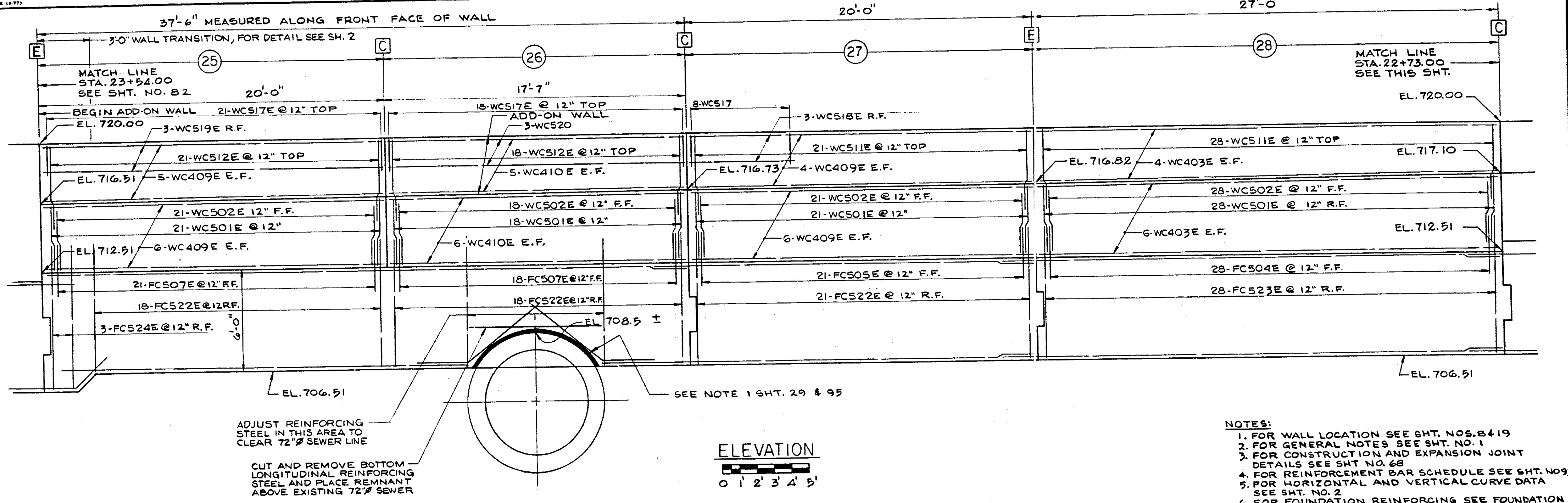
APPROVED AUG 23 1967

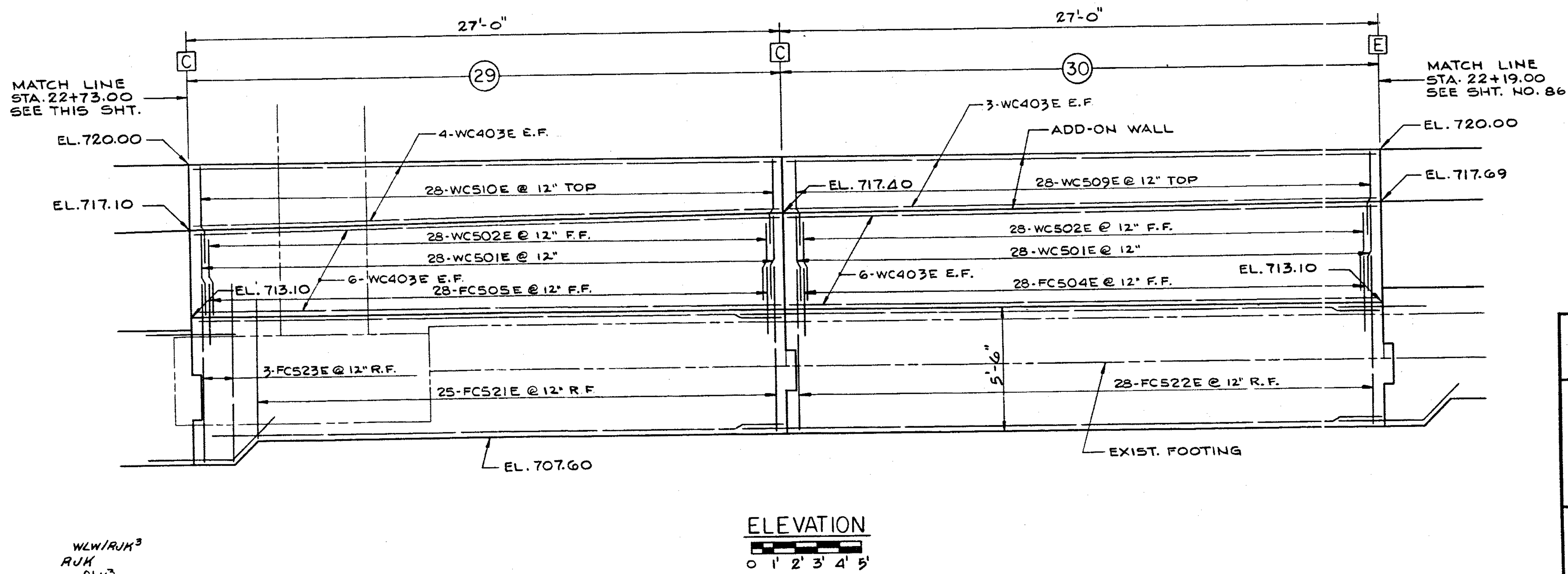
BRIDGE ENGINEER

SHEET 84 OF 114
0009986

S-14584

D-6002 (3-77)





NOTES:

1. FOR WALL LOCATION SEE SHT. NOS. 8 & 19
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO 93
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, PLAN NOS. 28 & 29
7. FOR LEGEND SEE SHT. NO. 80
8. FOR SECTIONS SEE SHT NOS. 90 & 91

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

ELEVATION WALL C PANELS 25-30

APPROVED AUG 23 1982

BRIDGE ENGINEER

SHEET 85 OF 114

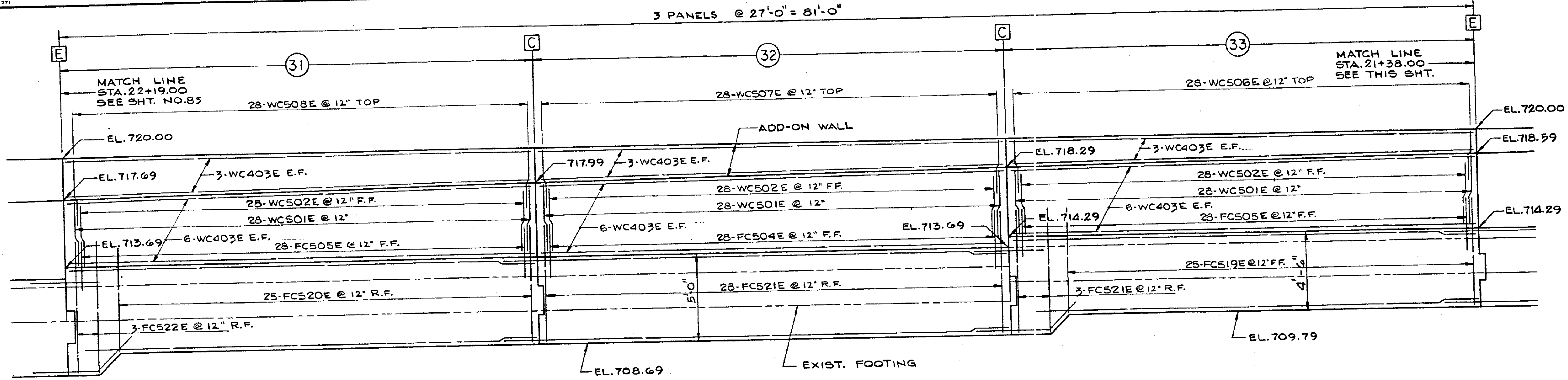
0009987

S-14584

WLW/RJK³
RJK
RJK³

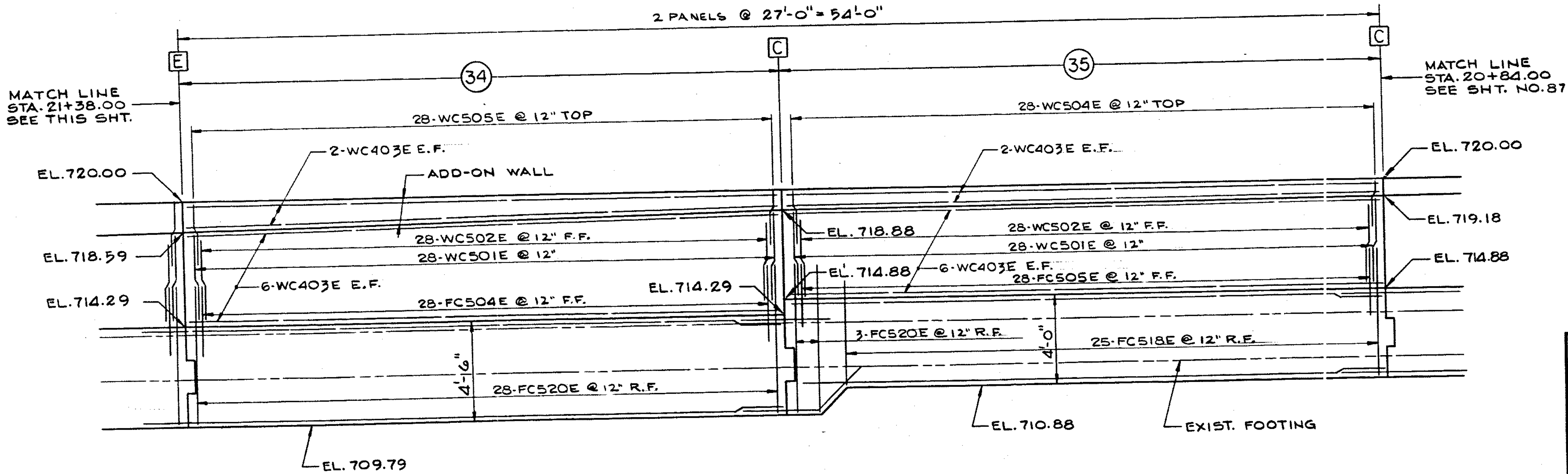
BARCLAY BROS. INC.

D-6002 (2-77)



ELEVATION

0 1' 2' 3' 4' 5'



ELEVATION

0 1' 2' 3' 4' 5'

NOTES

1. FOR FOUNDATION REINFORCEMENT SEE SHT. 28
2. FOR TYPICAL WALL SECTION SEE SHT. 98
3. FOR CONSTRUCTION & EXPANSION JOINT DETAILS SEE SHT. 68
4. FOR REINFORCEMENT SCHEDULE SEE SHT. 93
5. FOR GENERAL NOTES SEE SHT. 1
6. FOR HORIZONTOL & VERTICAL CURVE DATA SEE SHT. 2
7. FOR WALL LOCATION SEE SHT. 7, 8 & 19
8. FOR LEGEND SEE SHT. 80
9. FOR SECTION SEE SHEET 90 & 91

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

ELEVATION WALL C PANELS 31-35

APPROVED AUG 23 1982

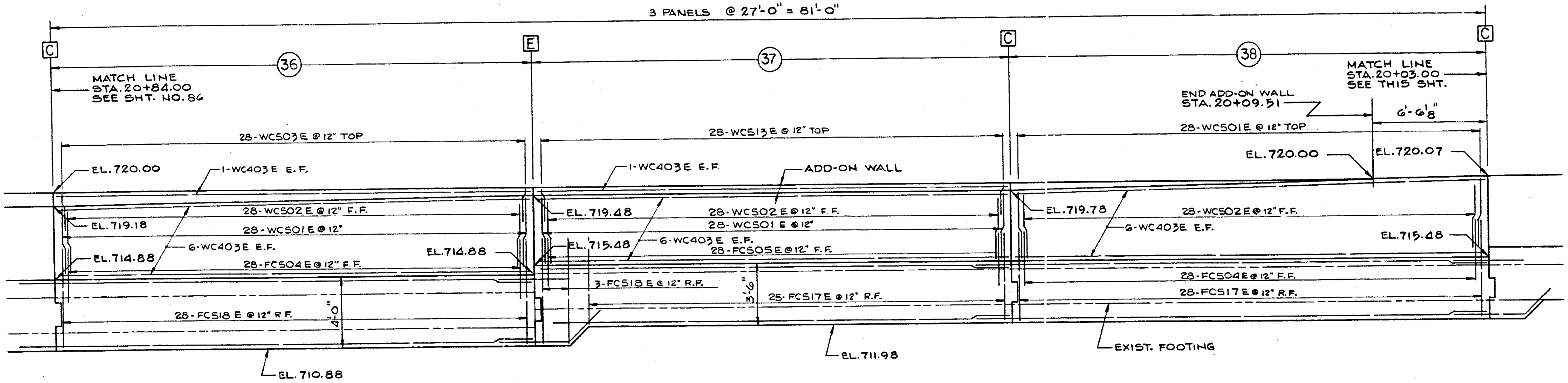
BRIDGE ENGINEER

SHEET 86 OF 114

0009988

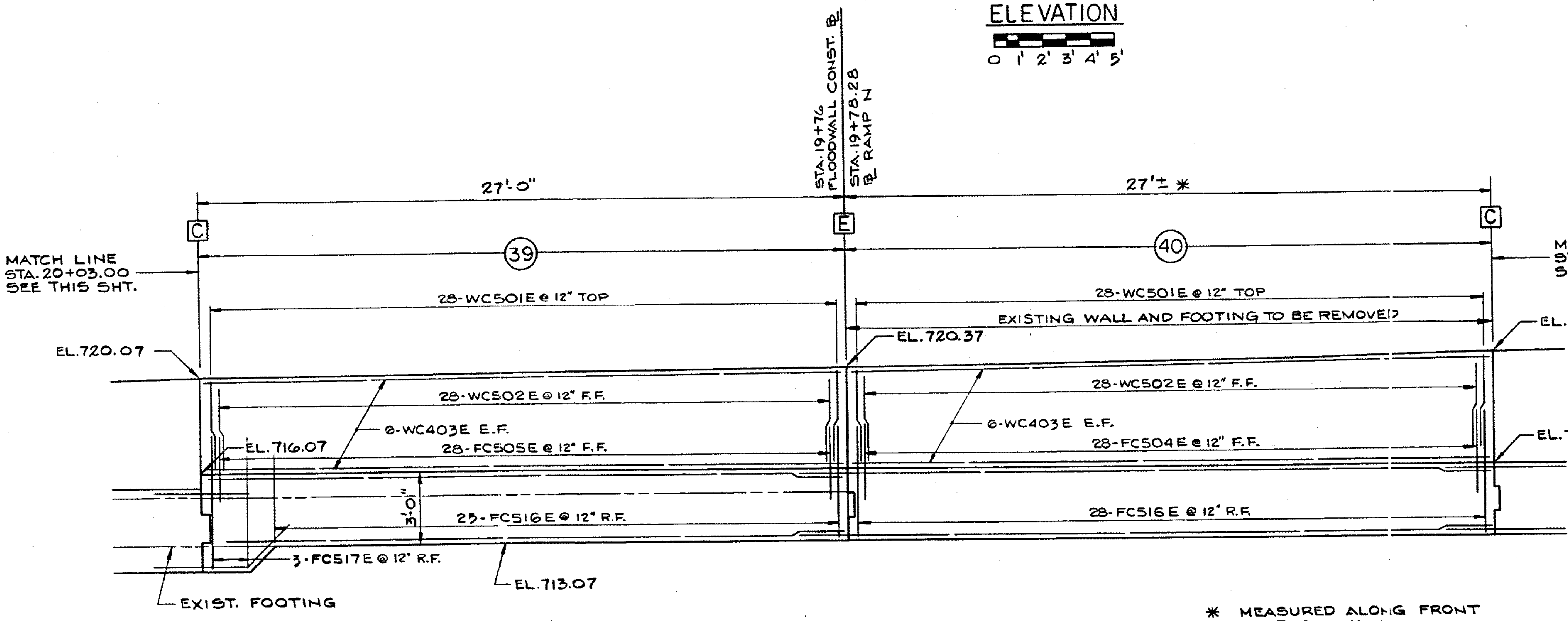
S-14584

WLW/RJK3
RJK
RJK3



ELEVATION

0 1' 2' 3' 4' 5'



✱ MEASURED ALONG FRONT FACE OF WALL.

ELEVATION

0 1' 2' 3' 4' 5'

NOTES

1. FOR FOUNDATION REINFORCEMENT SEE SHT. 27
2. FOR TYPICAL WALL SECTION SEE SHT. 98
3. FOR CONSTRUCTION & EXPANSION JOINT DETAILS SEE SHT. 68
4. FOR REINFORCEMENT SCHEDULE SEE SHT. 93
5. FOR GENERAL NOTES SEE SHT. 1
6. FOR HORIZONTAL & VERTICAL CURVE DATA SEE SHT. 2
7. FOR WALL LOCATION SEE SHT. 7 & 19
8. FOR LEGEND SEE SHT. 80
9. FOR SECTIONS SEE SHTS. 90 & 91

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

ELEVATION WALL C PANELS 36-40

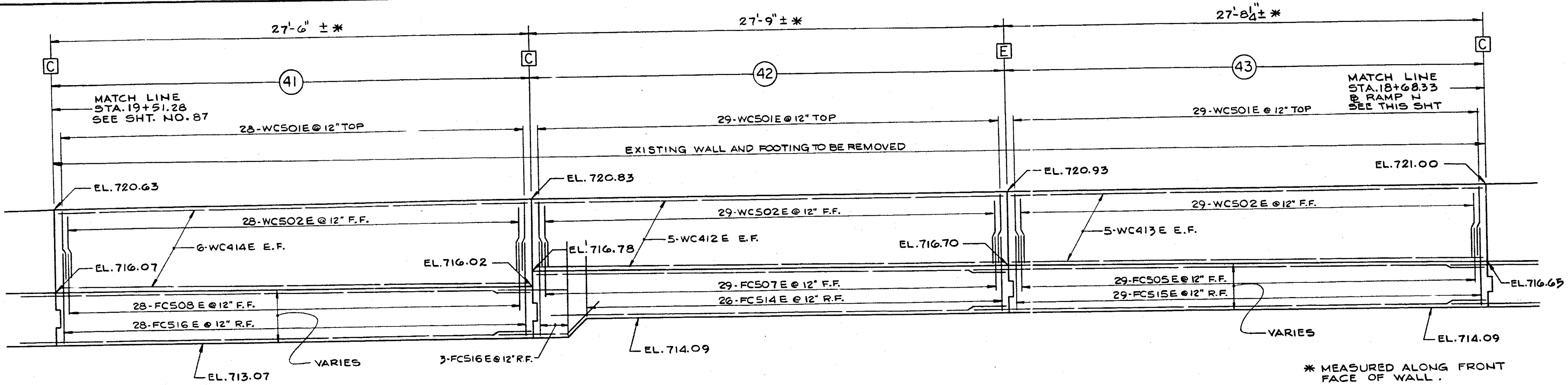
APPROVED AUG 23 1982
B. J. Kotalik
BRIDGE ENGINEER

SHEET 87 OF 114
0099989

S-14584

WLW/RJK³
RJK
RJK³

D-4008 (8-77)

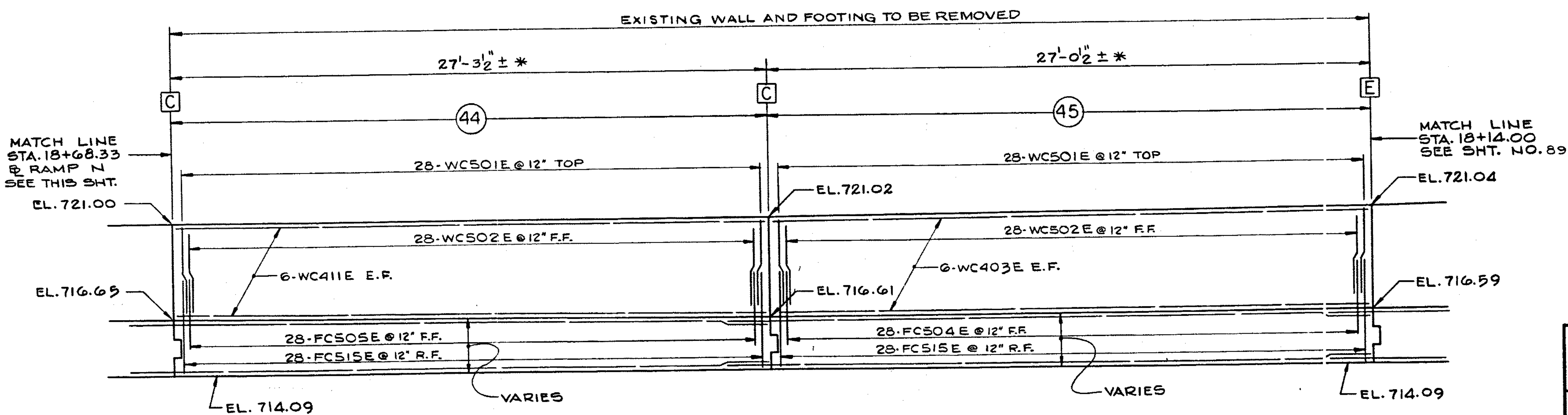


ELEVATION

0 1' 2' 3' 4' 5'

* MEASURED ALONG FRONT FACE OF WALL.

NOTES:
1. FOR WALL LOCATION SEE SHT. NOS. 6, 7 & 19
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO 93
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SHT. NOS. 26 & 27
7. FOR LEGEND SEE SHT. NO. 80
8. FOR SECTIONS SEE SHT. NOS. 90 & 91



ELEVATION

0 1' 2' 3' 4' 5'

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

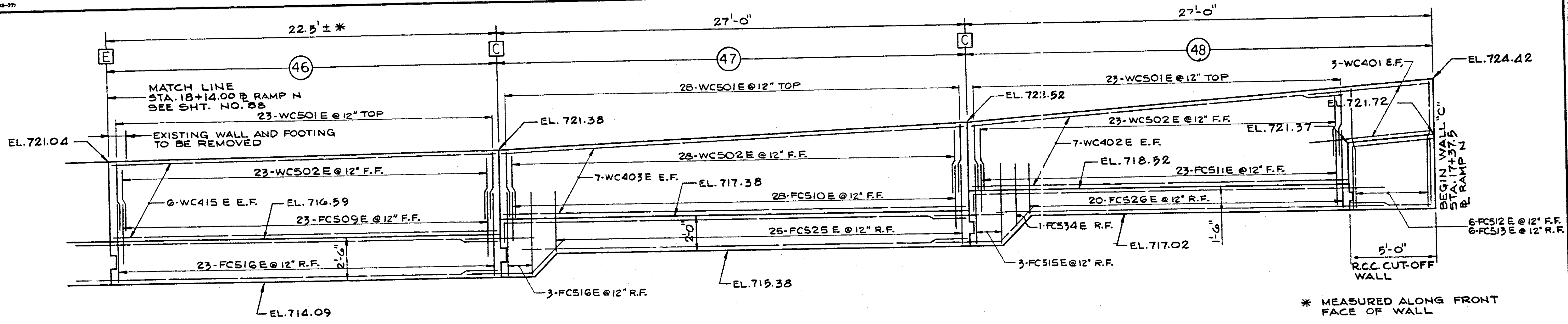
L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL C PANELS 41-45

APPROVED APR 23 1992
B J Kotalik
BRIDGE ENGINEER

SHEET 88 OF 114
0009990
S-14584

WLW/RJK3
RJK
RJK3



* MEASURED ALONG FRONT FACE OF WALL

ELEVATION

0 1' 2' 3' 4' 5'

NOTES:
1. FOR WALL LOCATION SEE SHT. NOS. 6 & 19
2. FOR GENERAL NOTES SEE SHT. NO. 1
3. FOR CONSTRUCTION AND EXPANSION JOINT DETAILS SEE SHT. NO. 68
4. FOR REINFORCEMENT BAR SCHEDULE SEE SHT. NO. 93
5. FOR HORIZONTAL AND VERTICAL CURVE DATA SEE SHT. NO. 2
6. FOR FOUNDATION REINFORCING SEE FOUNDATION PLAN, SEE SHT. NOS. 25 & 26
7. FOR LEGEND SEE SHT. NO. 80
8. FOR SECTIONS SEE SHT. NOS. 90 & 91

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

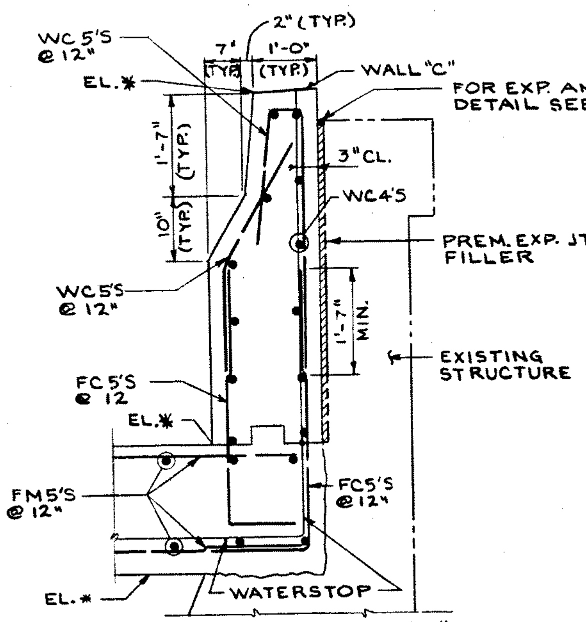
ELEVATION WALL C PANELS 46-48

APPROVED AUG 23 1982
B.J. Kotalik
BRIDGE ENGINEER

SHEET 89 OF 114
0009991

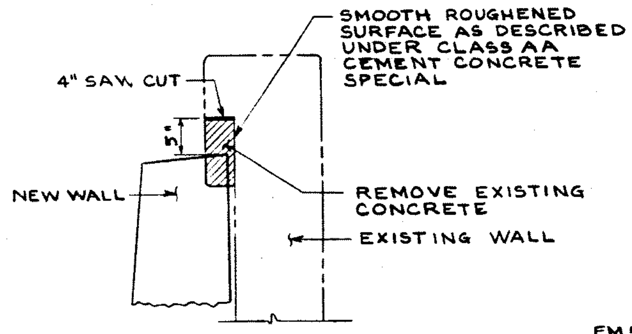
S-14584

WLW/RJK³
RJK
RJK³



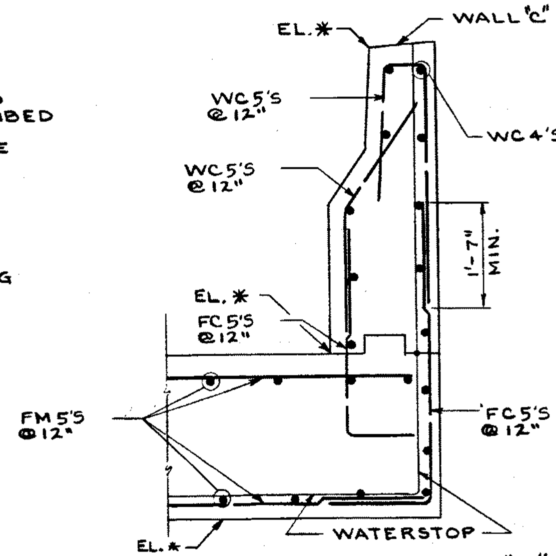
TYPICAL SECTION WALL "C"

STA. 17+37.5 TO STA. 17+91.5



NOTE: COST INCIDENTAL TO CLASS AA CEMENT CONCRETE SPECIAL

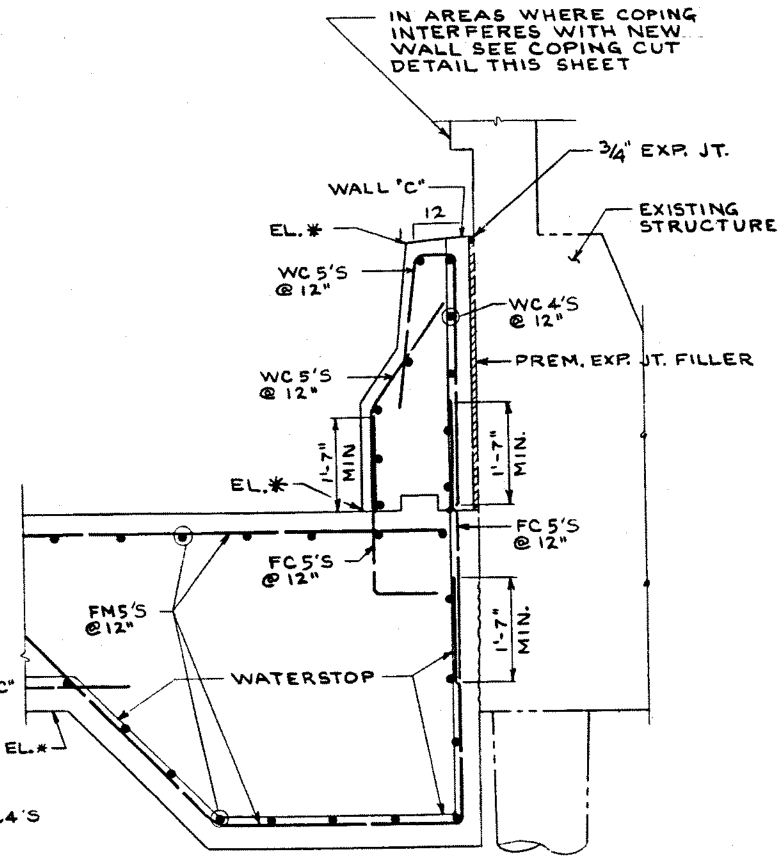
COPING CUT DETAIL



TYPICAL SECTION WALL "C"

STA. 17+91.5 TO STA. 19+76 &

STA. 27+32 TO STA. 29+75



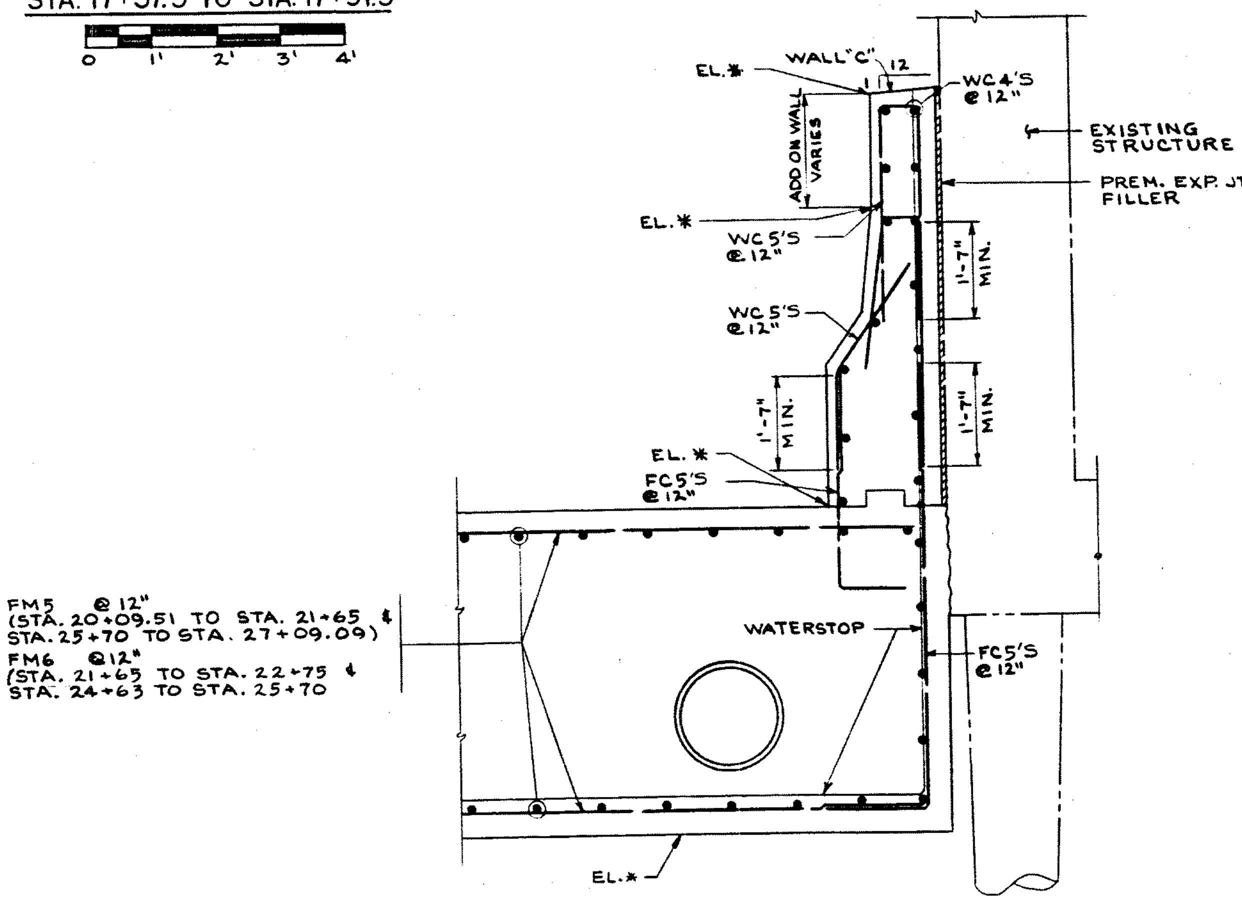
TYPICAL SECTION WALL "C"

STA. 19+76 TO STA. 20+09.51 &

STA. 27+09.09 TO STA. 27+32

NOTE:
FOR JOINT DETAILS SEE SHT. 68

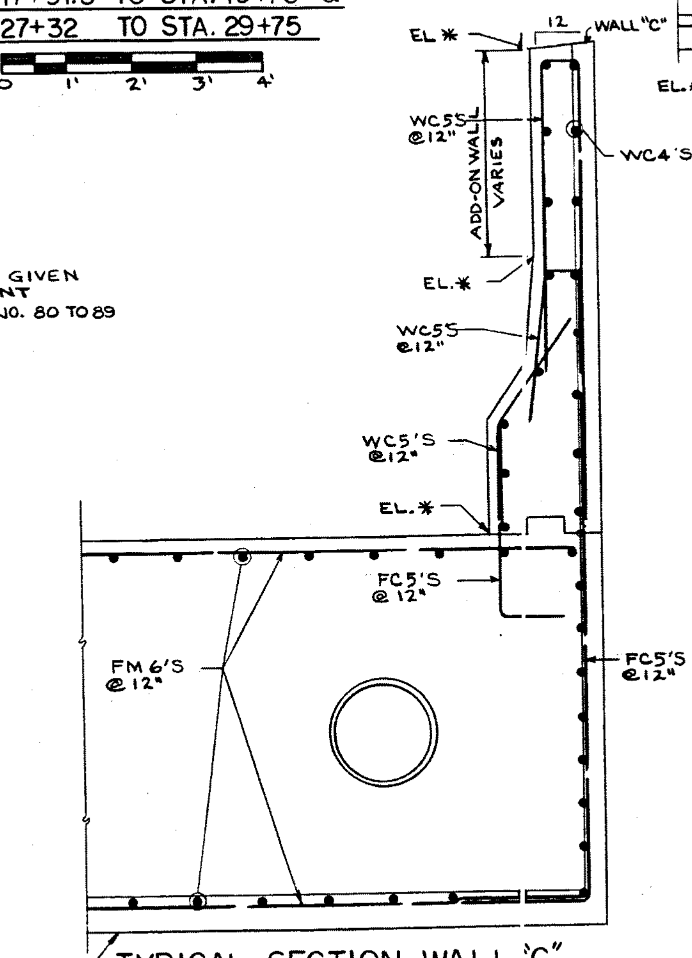
✱ ELEVATIONS GIVEN TO THIS POINT SEE SHEETS NO. 80 TO 89



TYPICAL SECTION WALL "C"

STA. 20+09.51 TO STA. 22+75 &

STA. 24+63 TO STA. 27+09.09



TYPICAL SECTION WALL "C"

STA. 22+75 TO STA. 23+54

Designed by JM
Drawn by M.A.H.
Checked by RJK 3

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.49

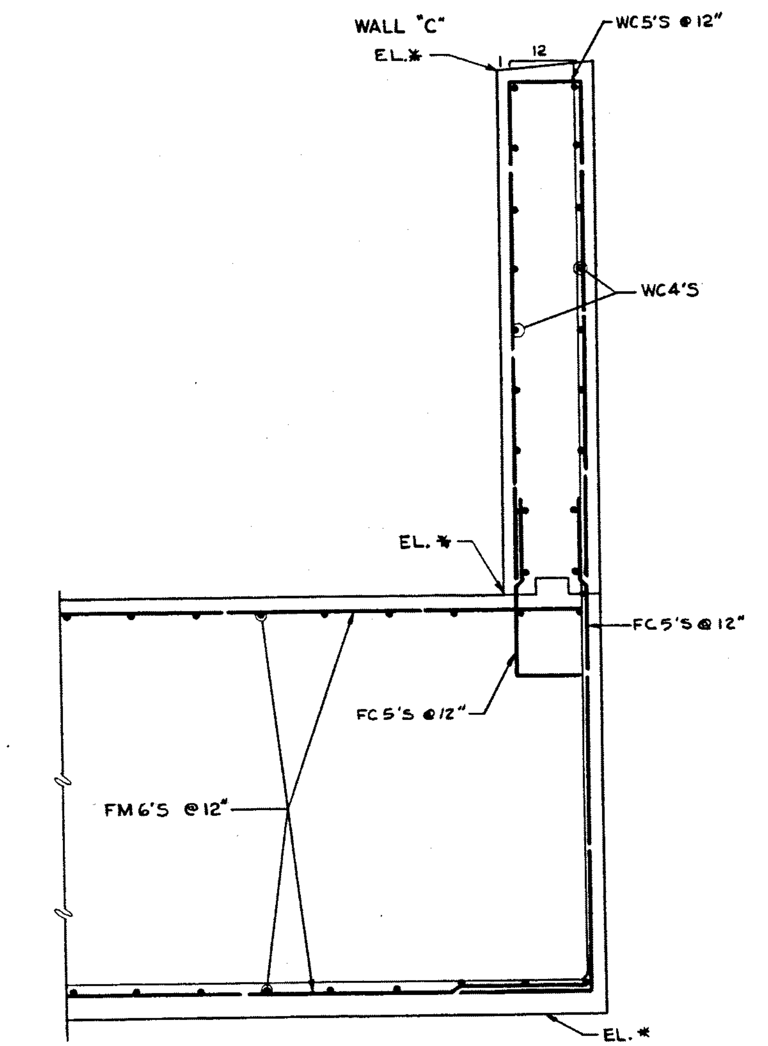
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
WALL C SECTIONS

APPROVED AUG 23 1982
BJ Kotalik
BRIDGE ENGINEER

SHEET 90 OF 114
0009992

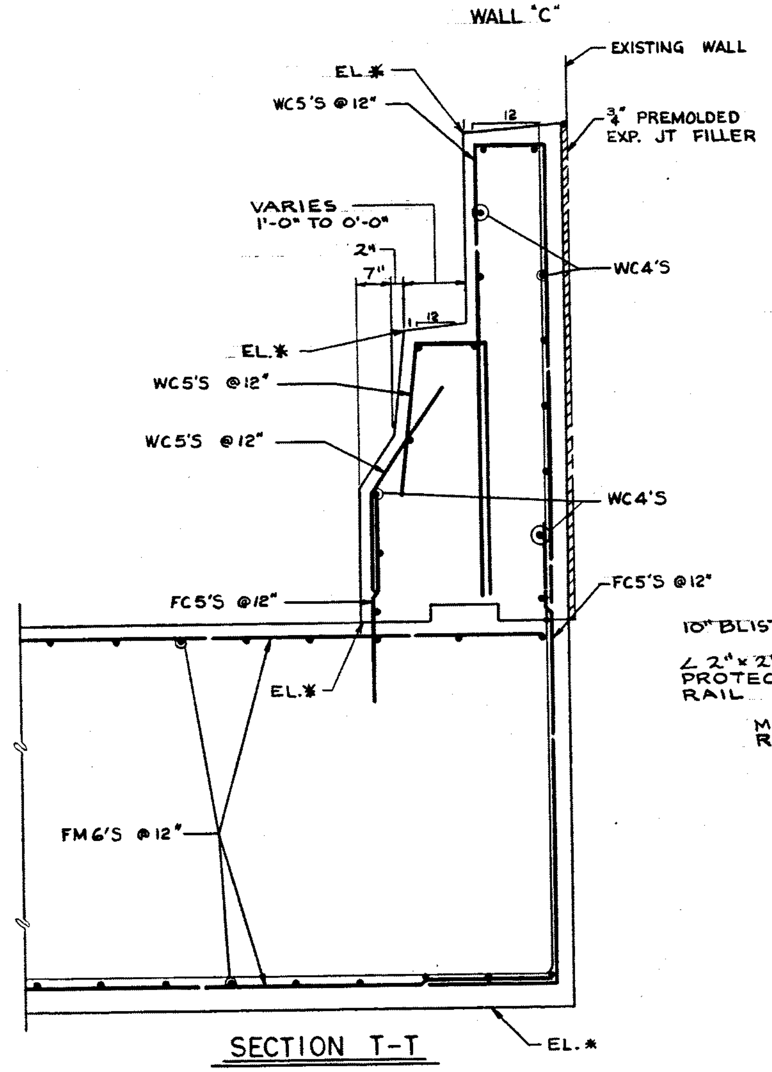
S-14584

B-9002 (3-77)



SECTION WALL "C" STA. 23+54.0 TO 24+56.0

0 1' 2' 3'

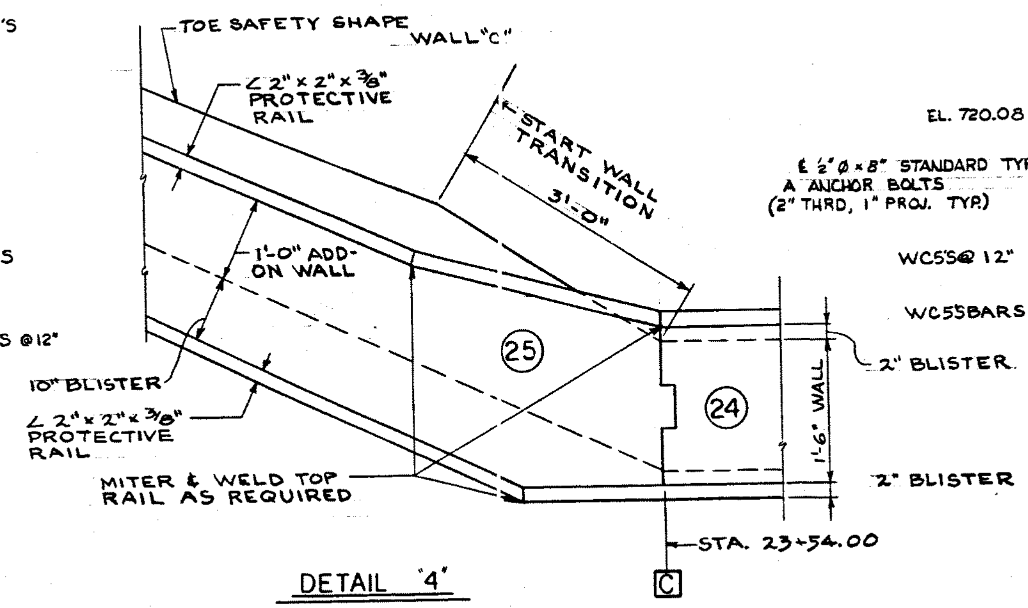


SECTION T-T

SECTION WALL "C" STA. 24+56.0 TO 24+62.0

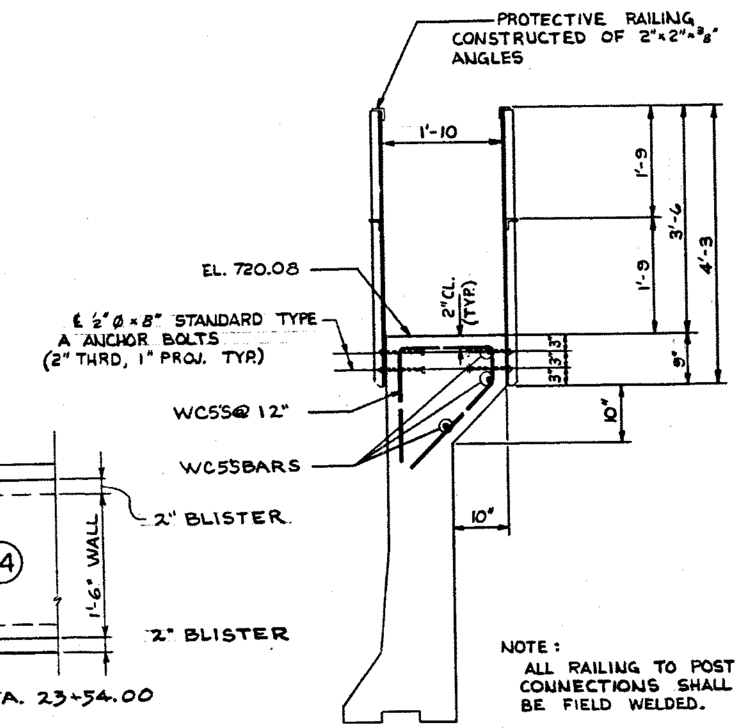
0 1' 2' 3'

NOTE:
1. FOR PLAN SEE SHT. 30
2. FOR ELEVATION SEE SHT. 84



DETAIL "4"

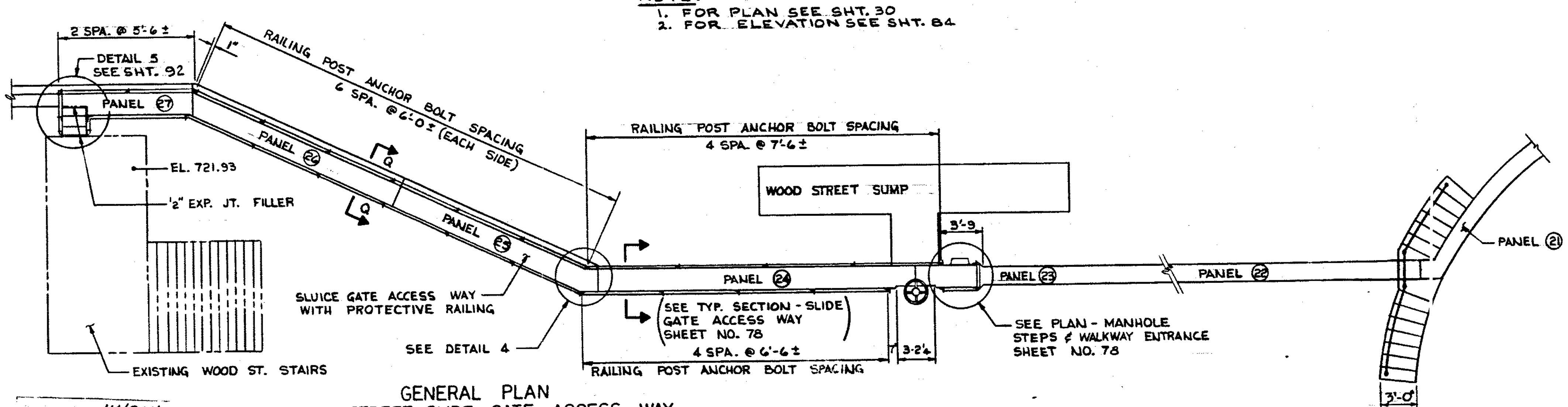
0 3" 6" 9" 1' 2'



SECTION Q-Q

0 1' 2' 3'

* ELEVATIONS GIVEN TO THIS POINT SEE SHEETS NO. 80 TO 89



GENERAL PLAN
WOOD STREET SLIDE GATE ACCESS WAY

0 1 2 3 4 5 6

Designed by UM/RAH
Drawn by RGG
Checked by RJK[3]

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23 — W.B. STA. 1098+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19 — W.B. STA. 631+16.78 TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

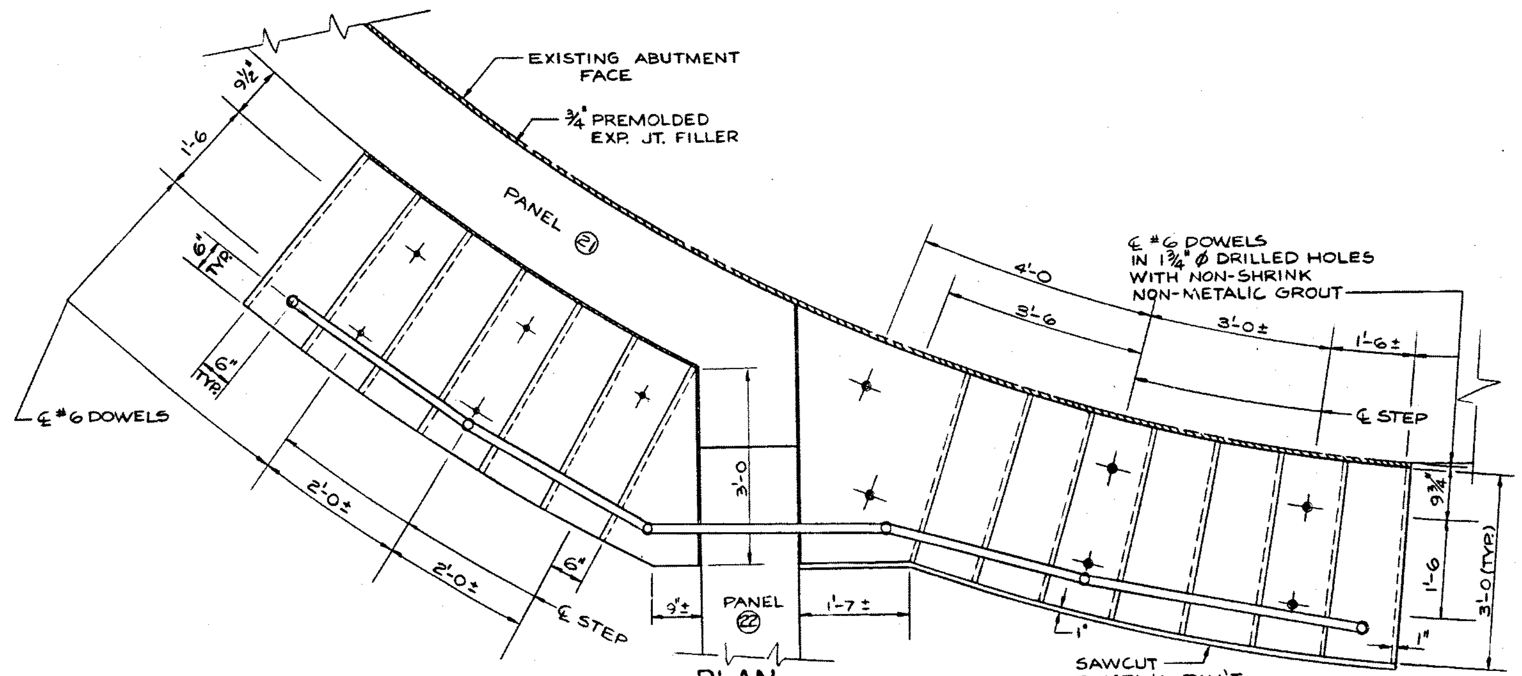
WALL C SECTIONS & CATWALK DETAILS

APPROVED AUG 23 1982

BRIDGE ENGINEER

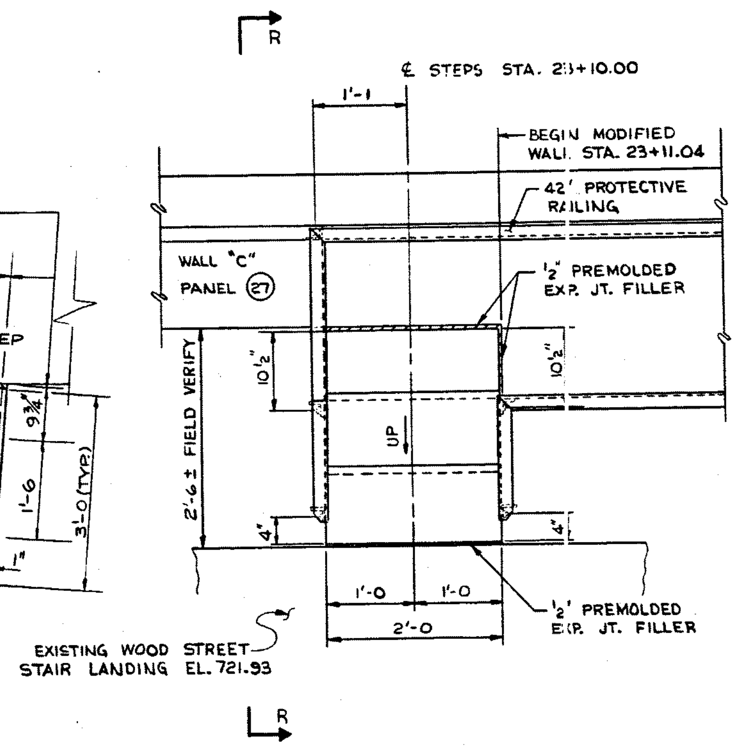
SHEET 91 OF 114
0009993

S-14584



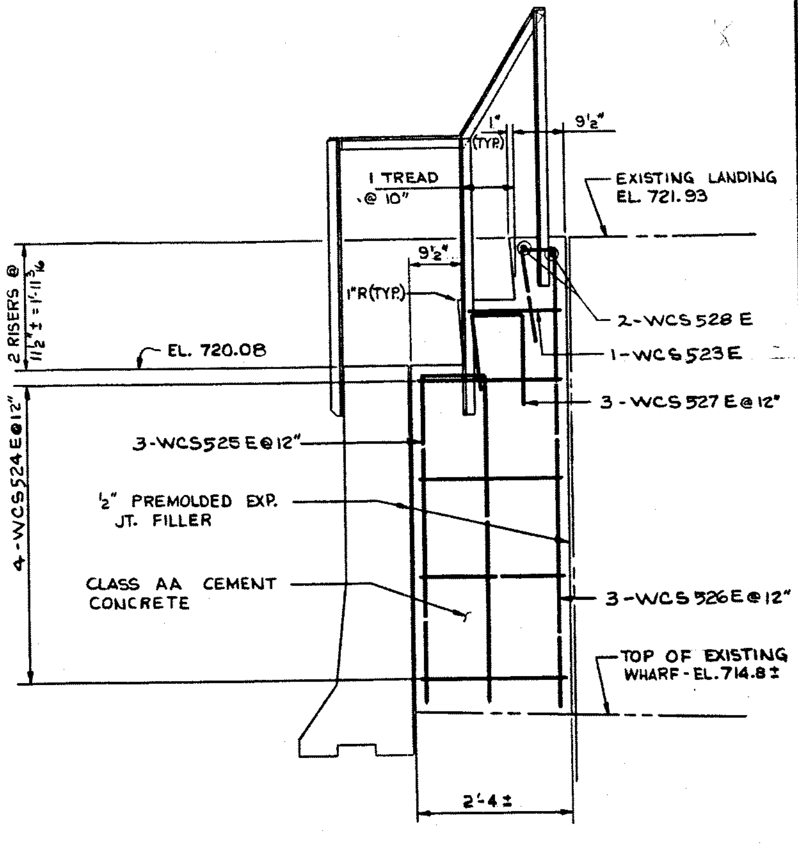
PLAN
STAIRWAY AT WOOD STREET SUMP

0 1' 2' 3'



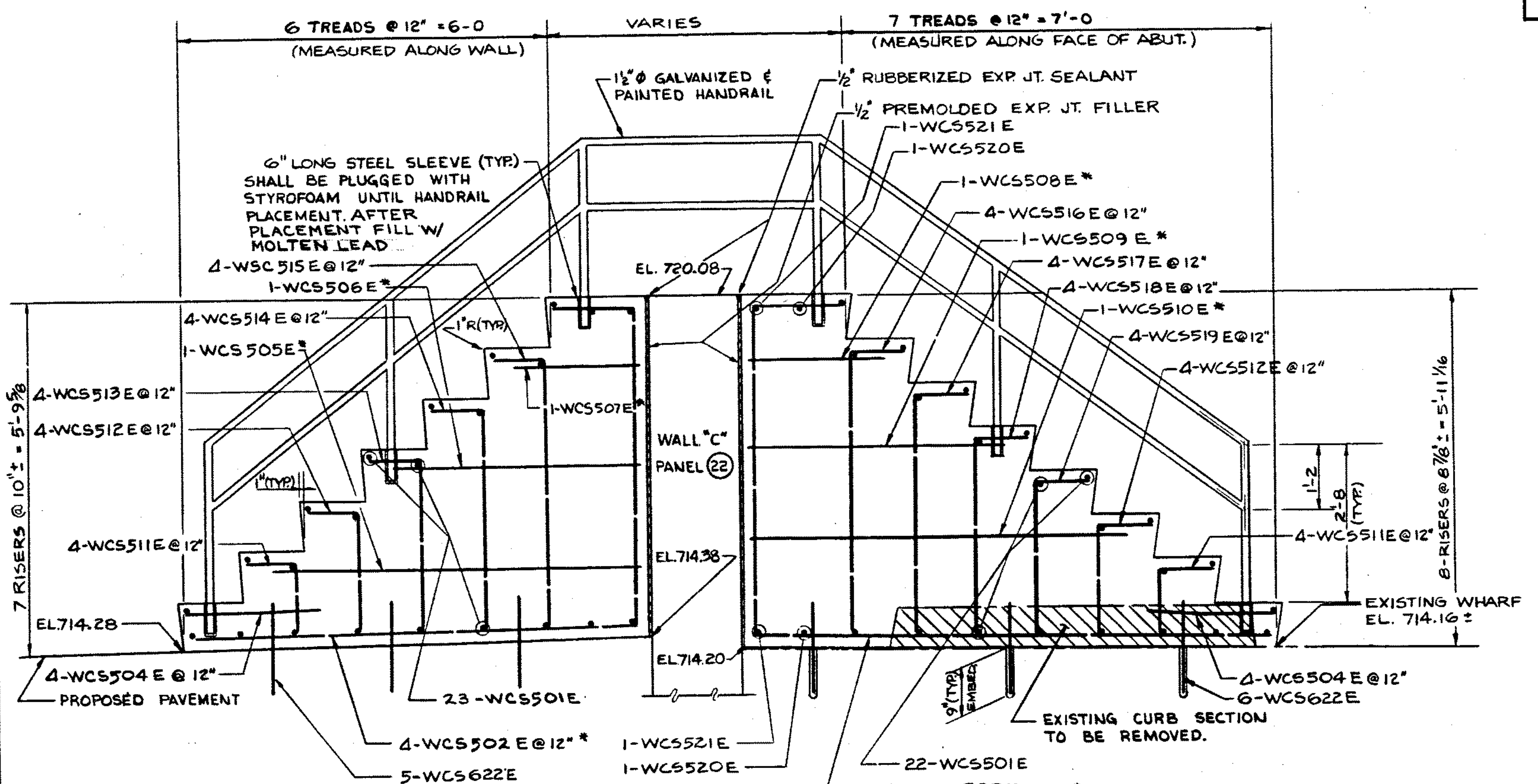
DETAIL 5 (SEE SHT. 91)

0 3" 6" 9" 1' 2'



SECTION R-R

0 1' 2' 3'



Designed by RAH
Drawn by RGG/RAH
Checked by RJK3

SECTION
STAIRWAY AT WOOD STREET SUMP

0 1' 2' 3'

* BEND BARS IN FIELD AS REQUIRED TO MATCH CURVATURE OF STAIRS

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23	L.R. 764 SEC. 19
W.B. STA. 1098+30.29 TO STA. 1101+35.48	W.B. STA. 631+16.78 TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
WALL C CATWALK AND STAIR DETAILS

APPROVED AUG 23 1982
BRIDGE ENGINEER

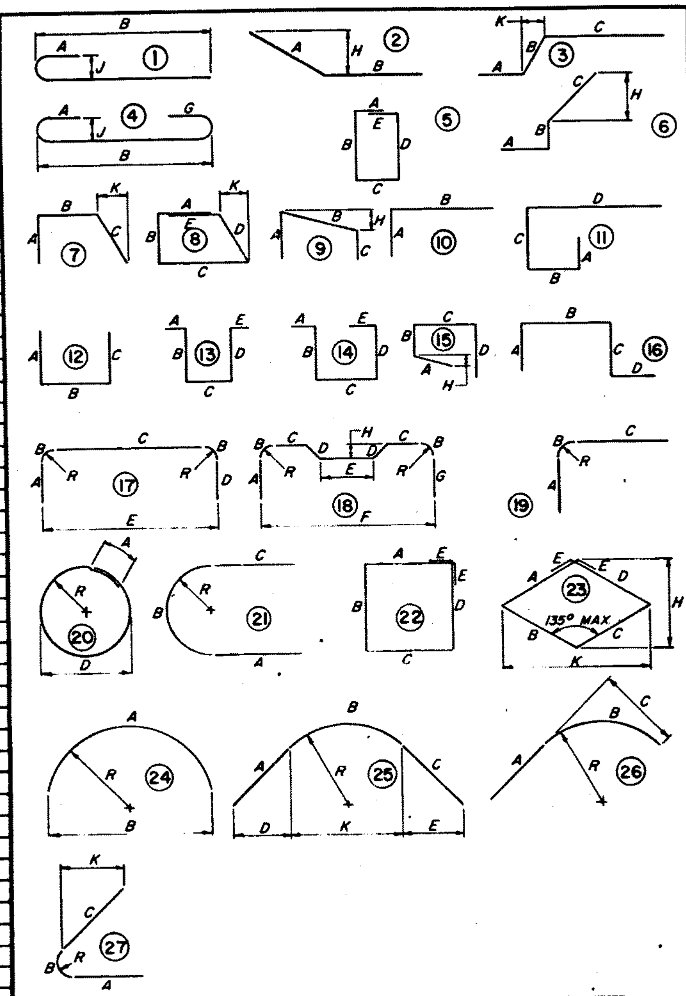
SHEET 92 OF 114
0009994

S- 14584

7530-2350-0210

REINFORCEMENT BAR SCHEDULE

MARK	SIZE	LENGTH	NO.	TYPE	A	B	C	D	E	F	G	H	J	K	R	REMARKS
		DOWELS														
FC501E	5	5'-0"	6	7	10"	2'-2"	2'-0"							1'-7 5/8"		
FC502E	5	9'-8 1/2"	6	15	2'-4 1/2"	7"	5'-5"	1'-6"				3"				
FC503E	5	3'-7"	23	10	10"	2'-9"										
FC504E	5	4'-4"	448	10	10"	3'-6"										
FC505E	5	4'-0"	477	10	10"	3'-2"										
FC506E	5	4'-9"	28	10	10"	3'-11"										
FC507E	5	3'-10"	68	10	10"	3'-0"										
FC508E	5	4'-6"	28	10	10"	3'-8"										
FC509E	5	4'-1" to 4'-6"	23	10	10"	3'-3" to 3'-8"										1 Ea. Var. 8 By 1/4"
FC510E	5	3'-8" to 4'-10"	28	10	10"	2'-10" to 4'-0"										1 Ea. Var. 8 By 1/2"
FC511E	5	3'-5" to 4'-11"	23	10	10"	2'-7" to 4'-1"										1 Ea. Var. 8 By 3/4"
FC512E	5	5'-1"	6	7	10"	2'-3"	2'-0"							3"		
FC513E	5	11'-1 1/2" to 11'-5 1/2"	6	15	2'-4 1/2"	7"	6'-8" to 7'-0"	1'-6"				1'-2"				1 Ea. Var. C By 3/4"
FC514E	5	5'-8"	82	10	1'-6"	4'-2"										
FC515E	5	6'-0"	144	10	1'-6"	4'-6"										
FC516E	5	6'-7"	141	10	1'-6"	5'-1"										
FC517E	5	7'-0"	1/2"	10	1'-6"	5'-6"										
FC518E	5	7'-5"	81	10	1'-6"	5'-11"										
FC519E	5	7'-9"	56	10	1'-6"	6'-3"										
FC520E	5	8'-3"	112	10	1'-6"	6'-9"										
FC521E	5	8'-8"	87	10	1'-6"	7'-2"										
FC522E	5	9'-2"	89	10	1'-6"	7'-8"										
FC523E	5	9'-7"	59	10	1'-6"	8'-1"										
FC524E	5	9'-11"	37	10	1'-6"	8'-5"										
FC525E	5	5'-0" to 6'-0"	25	10	1'-6"	3'-6" to 4'-6"										1 Ea. Var. 8 By 1/2"
FC526E	5	4'-7" to 5'-11"	20	10	1'-6"	3'-1" to 4'-5"										1 Ea. Var. 8 By 13/16"
FC527E	5	4'-7"	20	10	1'-6"	3'-1"										
FC528E	5	5'-0"	31	10	1'-6"	3'-6"										
FC529E	5	4'-8"	25	10	1'-6"	3'-2"										
FC530E	5	3'-8"	117	10	10"	2'-0"										
FC531E	5	8'-10"	58	10	1'-6"	7'-4"										
FC532E	5	9'-4"	54	10	1'-6"	7'-10"										
FC533E	5	5'-2"	25	10	1'-6"	3'-8"										
FC534E	5	5'-4"	3	10	1'-6"	3'-10"										
FC535E	5	3'-10"	28	10	10"	2'-10"										
		WALL BARS														
WC401E	4	7'-0"	1/2	STR												
WC402E	4	21'-8"	26	STR												
WC403E	4	26'-8"	546	STR												
WC404E	4	5'-8"	12	STR												
WC405E	4	11'-5"	8	24	11'-5"										32'-3"	
WC406E	4	11'-5"	8	24	11'-5"										33'-5"	
WC407E	4	18'-8"	8	24	18'-8"										32'-3"	
WC408E	4	18'-8"	8	24	18'-8"										33'-5"	
WC409E	4	19'-8"	42	STR												
WC410E	4	17'-3"	22	STR												
WC411E	4	26'-11"	12	STR												
WC412E	4	27'-5"	10	STR												
WC413E	4	27'-4"	10	STR												
WC414E	4	27'-2"	12	STR												
WC415E	4	22'-2"	12	STR												
WC416E	4	3'-1"	16	10	1'-0"	2'-1"										
WC501E	5	6'-9 1/2"	1174	7	3'-10"	7"	2'-4 1/2"									
WC502E	5	3'-7"	1174	2	2'-0"	1'-7"						1'-2"				
WC503E	5	5'-5"	56	12	2'-5"	7"	2'-5"									
WC504E	5	5'-11"	56	12	2'-8"	7"	2'-8"									
WC505E	5	6'-7"	56	12	3'-0"	7"	3'-0"									
WC506E	5	7'-3"	56	12	3'-4	7"	3'-4"									
WC507E	5	7'-11"	56	12	3'-8"	7"	3'-8"									
WC508E	5	8'-7"	56	12	4'-0"	7"	4'-0"									
WC509E	5	9'-3"	56	12	4'-4"	7"	4'-4"									
WC510E	5	9'-11"	56	12	4'-8"	7"	4'-8"									
WC511E	5	10'-3"	49	12	4'-10"	7"	4'-10"									
WC512E	5	10'-9"	39	12	5'-1"	7"	5'-1"									
WC513E	5	4'-11"	28	12	2'-2"	7"	2'-2"									
WC5~~1~~5E	5	15'-10"	61	12	7'-4"	1'-2"	7'-4"									
WC516E	5	17'-0"	56	12	7'-11"	1'-2"	7'-11"									
WC517E	5	5'-7"	47	28	2'-0"	5"	1'-6"	1'-8"				1'-5"				
WC518E	5	6'-0"	3	STR												
WC519E	5	19'-8"	3	STR												
WC520E	5	17'-3"	3	STR												
		SUMP AREA STAIR BARS														
WCS501E	5	2'-8"	45	STR												
WCS502E	5	11'-0" to 13'-0"	4	12	0'-0" to 1'-0"	5'-4"	5'-8" to 7'-6"									Vary A By 4", Vary C By 7"
WCS503E	5	16'-5" to 17'-5"	4	12	1'-8" to 2'-5"	5'-6"	9'-3" to 9'-6"									Vary A By 3", Vary C By 1"
WCS504E	5	2'-0"	8	2	10"	1'-2"						0'-1"				
WCS505E	5	14'-0"	1	9	6'-0"	2'-8"	5'-10"					1'-3"				
WCS506E	5	9'-0"	1	9	3'-10"	2'-8"	2'-6"					1'-3"				
WCS507E	5	5'-0"	1	9	1'-10"	2'-8"	6"					1'-3"				
WCS508E	5	8'-8	1	9	3'-2"	3'-3"	2'-3"					1'-3"				
WCS509E	5	12'-9"	1	9	5'-2"	3'-3"	4'-4"					1'-3"				
WCS510E	5	16'-10	1	9	7'-2"	3'-3"	6'-5"					1'-3"				
WCS511E	5	1'-11"	8	10	10"	1'-1"										
WCS512E	5	2'-8"	8	10	10"	1'-10"										
WCS513E	5	3'-8"	4	10	10"	2'-10"										
WCS514E	5	4'-6"	4	10	10"	3'-8"										
WCS513E	5	5'-3"	4	10	10"	4'-5"										
WCS516E	5	5'-6"	4	10	10"	4'-8"										
WCS517E	5	4'-9"	4	10	10"	3'-11"										
WCS518E	5	4'-1"	4	10	10"	3'-3"										
WCS519E	5	3'-5"	4	10	10"	2'-7"										
WCS520E	5	3'-2"	2	STR												
WCS521E	5	3'-6"	2	STR												
WCS622E	6	1'-6"	11	STR												
WCS523E	5	6'-6"	1	22	1'-3"	1'-8"	1'-3"	1'-8"	4"							
WCS524E	5	8'-0"	4	22	2'-0"	1'-8"	2'-0"	1'-8"	4"							
WCS525E	5	10'-10"	3	12	4'-11"	1'-0"	4'-11"							1 1/2"		
WCS526E	5	8'-9"	3	8	0	6'-9"	6"	1'-6"						1 1/2"		
WCS527E	5	3'-10"	3	8	0	1'-6"	6"	1'-6"								
WCS528E	5	1'-8"	2	STR												



Designed by RJK
Drawn by BB
Checked by RJK

- All Bars This Sheet to be Epoxy Coated.
- "J" Dimensions on 180° hooks to be shown only where necessary to restrict hook size, otherwise standard hooks are to be used.
- All dimensions are out to out of bar except "A" and "G" on standard 135° and 180° hooks, and "R" which is shown to the inside of the bar.
- For Reinforcement Bar Fabrication Details, refer to Standard Drawing BC-336A
- Figures in circles show types.

Mark	Description	By	Chk'd.	App'd.	Date
REVISIONS					

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA.1098+30.29
TO STA.1101+35.48

L.R. 764 SEC. 19
W.B. STA.631+16.78
TO STA.646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

WALL C REINFORCEMENT BAR SCHEDULE

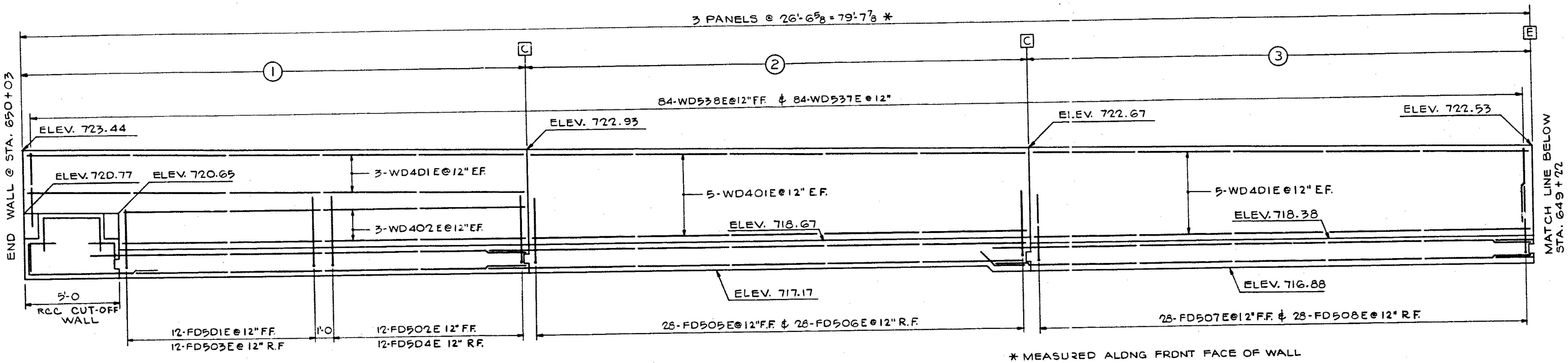
APPROVED AUG 23 1982
B J Kotalik
BRIDGE ENGINEER

SHEET 93 OF 114
0009995

S-14584

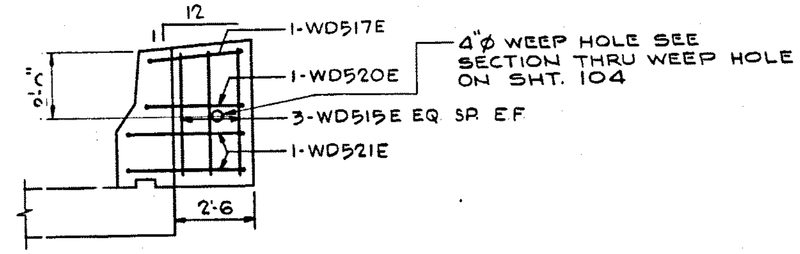
ROBERT H. WALTON CO.

D-4002 (5-77)



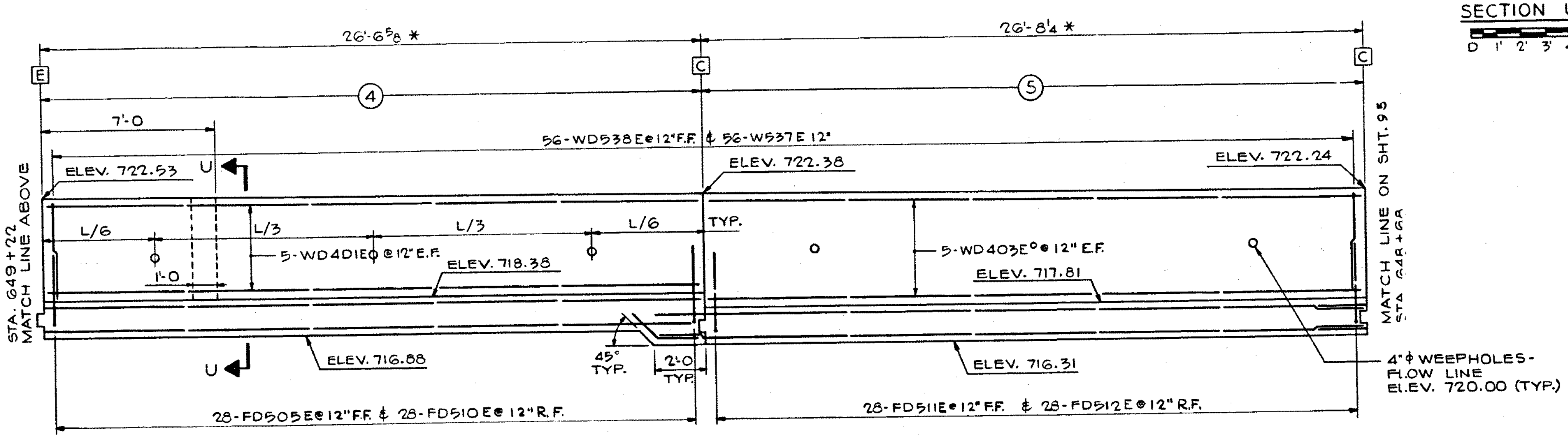
ELEVATION

0 1' 2' 3' 4' 5'



SECTION U-U

0 1' 2' 3' 4' 5'



ELEVATION

0 1' 2' 3' 4' 5'

NOTES

1. FOR FOUNDATION REINFORCEMENT SEE SHT. 35 & 36
2. FOR TYPICAL WALL SECTION SEE SHT. 98
3. FOR CONSTUCTION & EXPANSION JOINT DETAILS SEE SHT. 68
4. FOR REINFORCEMENT SCHEDULE SEE SHT. 98
5. FOR GENERAL NOTES SEE SHT. 1
6. CUT REINFORCING BARS IN FIELD AS REQUIRED TO FIT.
7. FOR HORIZONTAL & VERTICAL CURVE DATA SEE SHT. 2
8. FOR WALL LOCATION SEE SHT. 11, 12 & 20

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

LEGEND (WALL ONLY)

C - DENOTES CONSTRUCTION JOINT
E - DENOTES EXPANSION JOINT
1 - DENOTES WALL PANEL NUMBER
F.F. - DENOTES FRONT FACE
R.F. - DENOTES REAR FACE
E.F. - DENOTES EACH FACE

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

ELEVATION WALL D PANELS 1 – 5

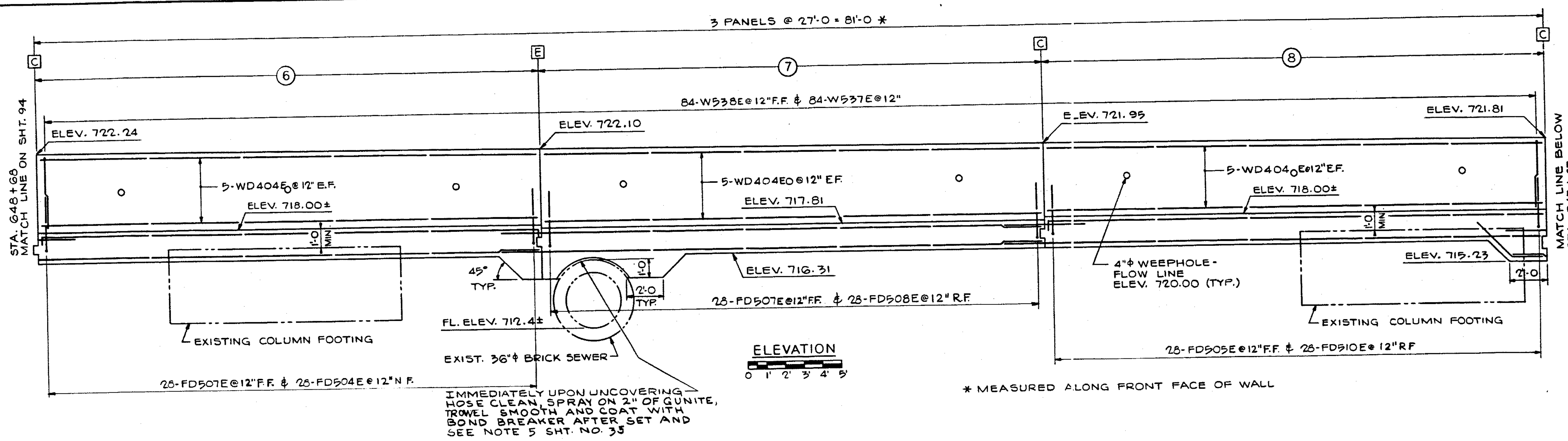
APPROVED AUG 23 1982
B J Kotalik
BRIDGE ENGINEER

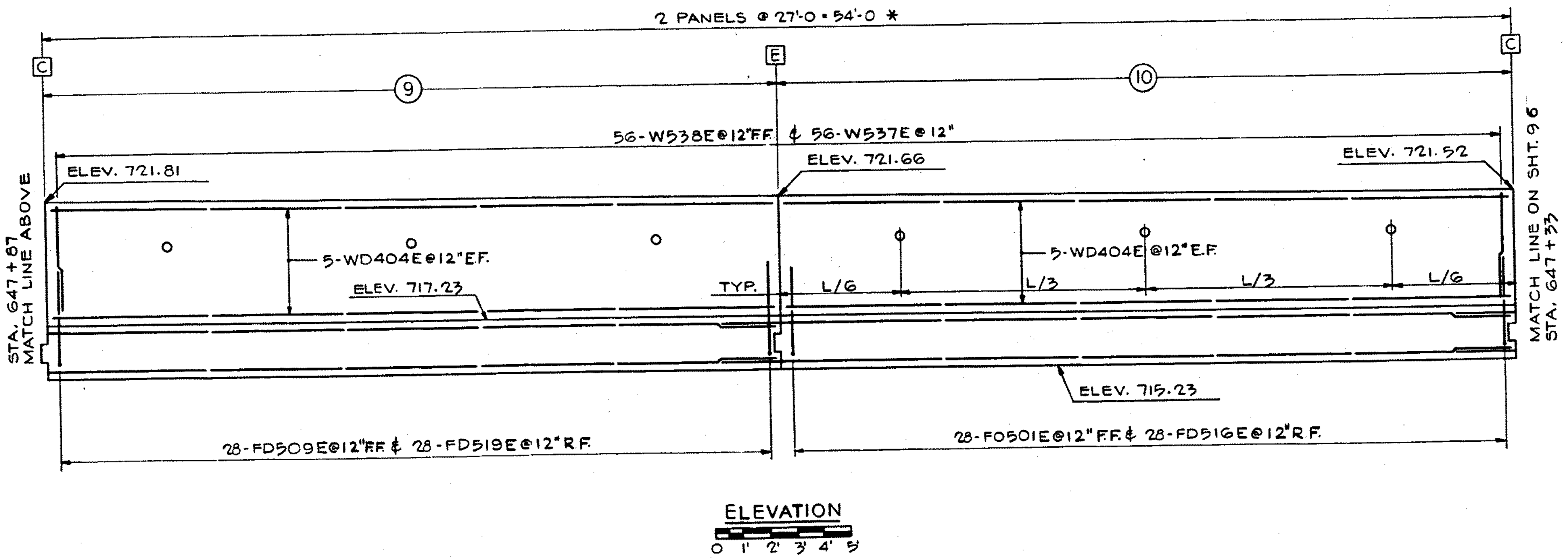
SHEET 94 OF 114
0009996

S-14584

WLW/RJK3
CLM
RJK3

BARCLAY BROS. INC.





NOTES

1. FOR FOUNDATION REINFORCEMENT SEE SHT. 34 & 35
2. FOR TYPICAL WALL SECTION SEE SHT. 98
3. FOR CONSTRUCTION & EXPANSION JOINT DETAILS SEE SHT. 68
4. FOR REINFORCEMENT SCHEDULE SEE SHT. 99
5. FOR GENERAL NOTES SEE SHT. 1
6. FOR HORIZONTAL & VERTICAL CURVE DATA SEE SHT. 2
7. FOR WALL LOCATION SEE SHT. 11 & 12
8. FOR LEGEND SEE SHT. 94

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA.1098+30.29
TO STA.1101+35.48

L.R. 764 SEC. 19
W.B. STA.631+16.78
TO STA.646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

ELEVATION WALL D PANELS 6 - 10

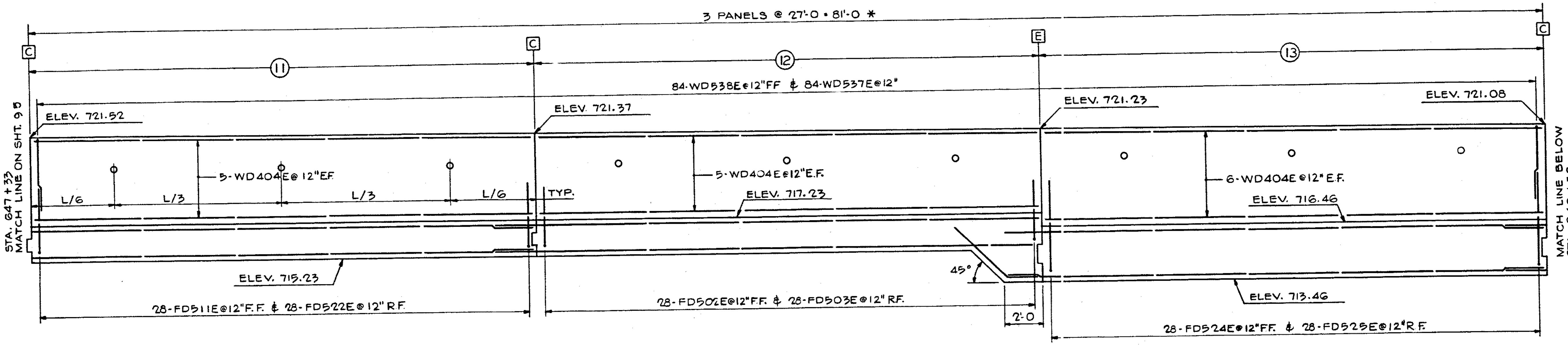
APPROVED ____
BRIDGE ENGINEER

SHEET 95 OF 114
0009997

S-14584

WLW/RJK[3]
CLM
RJK[3]

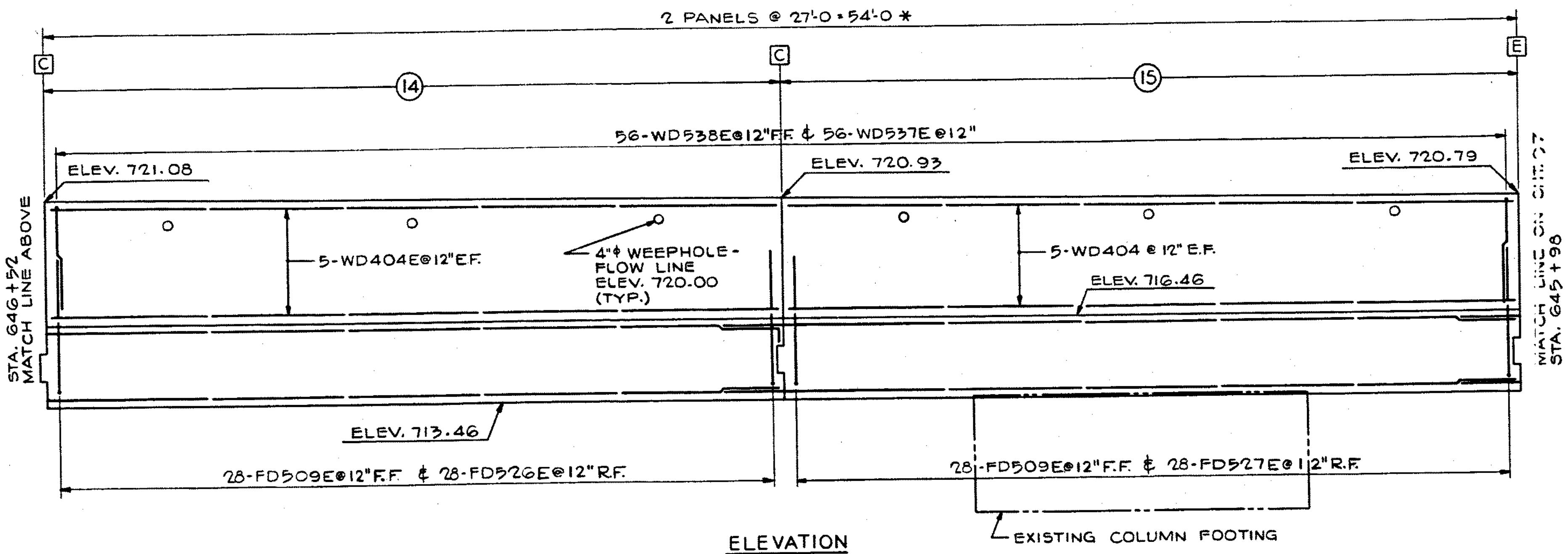
D-8002 (3-77)



ELEVATION

0 1' 2' 3' 4' 5'

* MEASURED ALONG FRONT FACE OF WALL



ELEVATION

0 1' 2' 3' 4' 5'

NOTES

1. FOR FOUNDATION REINFORCEMENT SEE SHT. 33 & 34
2. FOR TYPICAL WALL SECTION SEE SHT. 98
3. FOR CONSTRUCTION & EXPANSION JOINT DETAILS SEE SHT. 68
4. FOR REINFORCEMENT SCHEDULE SEE SHT. 99
5. FOR GENERAL NOTES SEE SHT. 1
6. FOR HORIZONTAL & VERTICAL CURVE DATA SEE SHT. 2
7. FOR WALL LOCATION SEE SHT. 10, 11, & 20
8. FOR LEGEND SEE SHT. 94

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

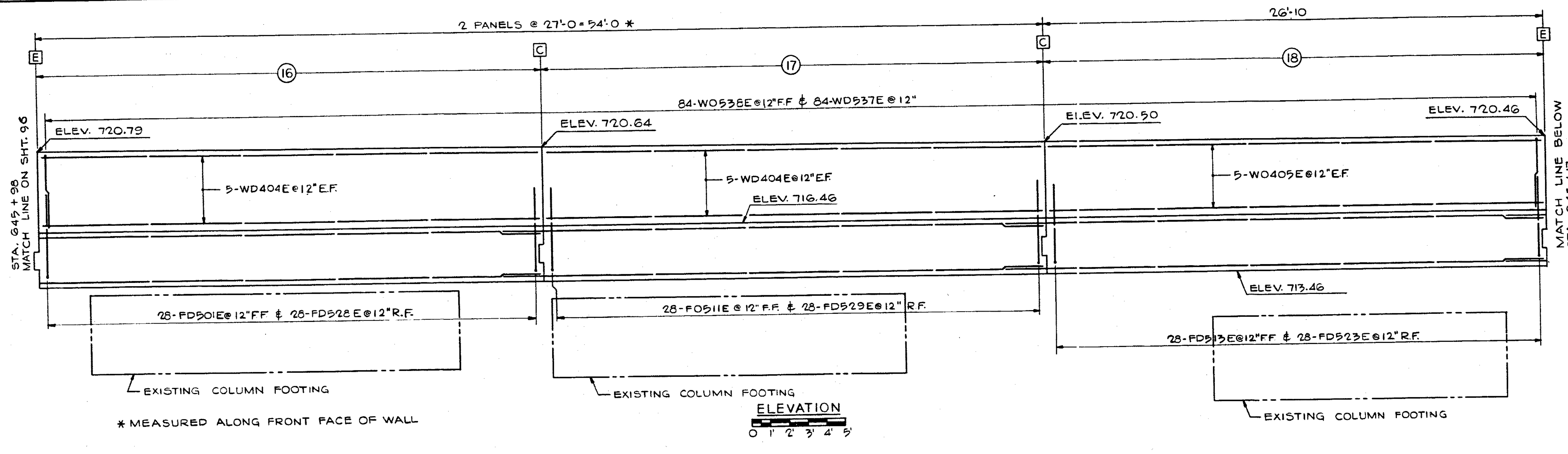
ELEVATION WALL D PANELS 11-15

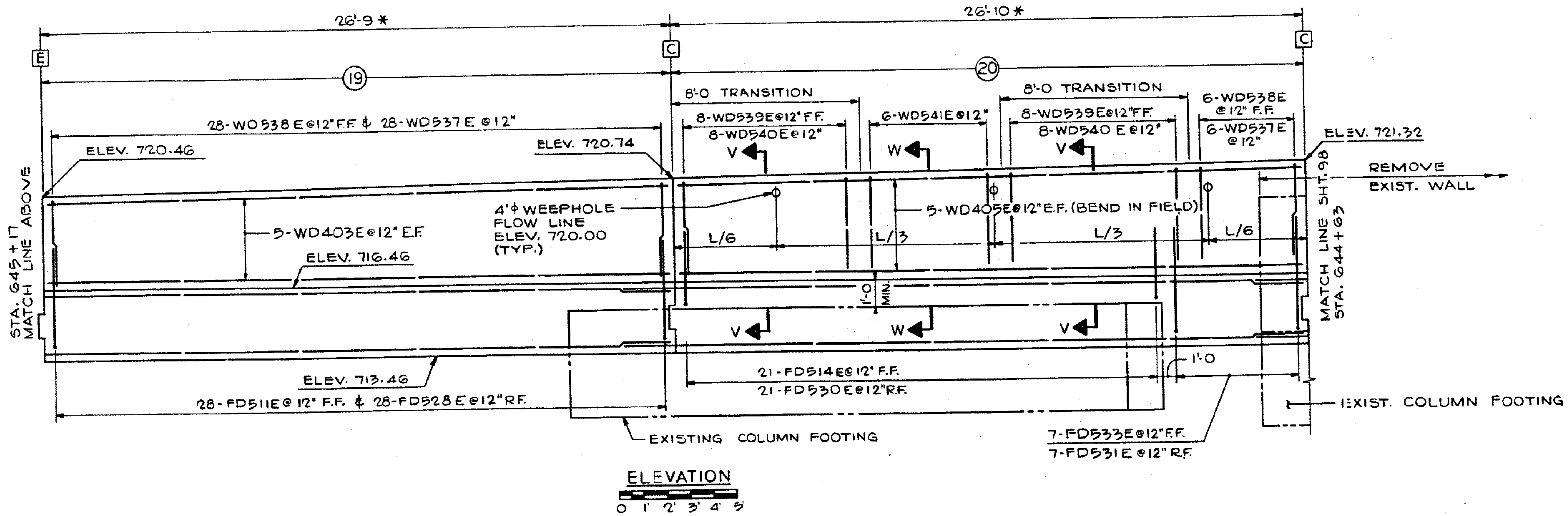
APPROVED AUG 23 1993
B. J. Kotalik
BRIDGE ENGINEER

SHEET 96 OF 114
0009998

S-14584

WLW/RJK3
CLM
RJK3





NOTES

1. FOR FOUNDATION REINFORCEMENT SEE SHT. 32 & 33
2. FOR SECTIONS V-V, W-W & TYPICAL WALL SECTION SEE SHT. 98
3. FOR CONSTRUCTION & EXPANSION JOINT DETAILS SEE SHT. 68
4. FOR REINFORCEMENT SCHEDULE SEE SHT. 99
5. FOR GENERAL NOTES SEE SHT. 1
6. FOR HORIZONTAL & VERTICAL CURVE DATA SEE SHT. 2
7. FOR WALL LOCATION SEE SHT. 10 & 20
8. FOR LEGEND SEE SHT. 94

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

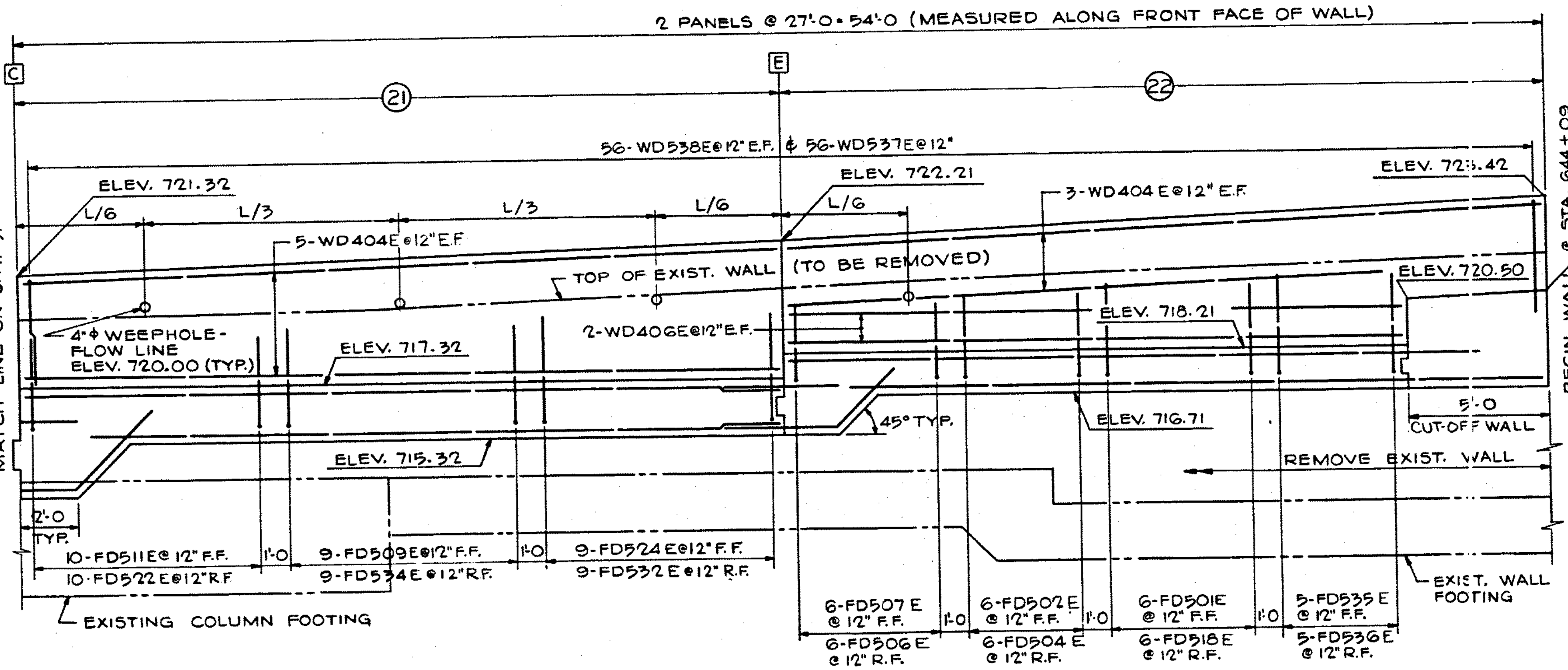
ELEVATION WALL D PANELS 16-20

APPROVED AUG [illegible]
B. J. Kotchel
BRIDGE ENGINEER

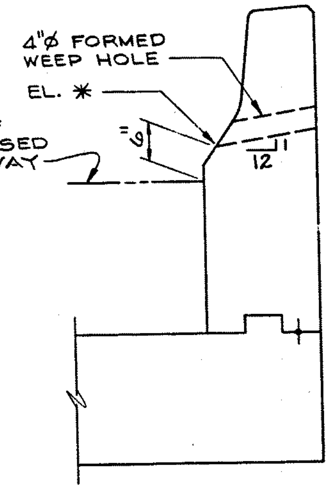
SHEET 97 OF 114
0009999
S-14584

WLW/RJK³
CLM
RJK³

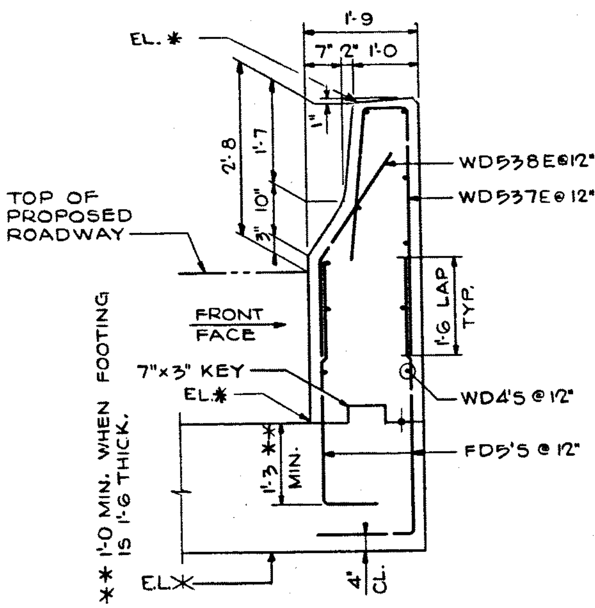
D-6005 (3-77)



ELEVATION

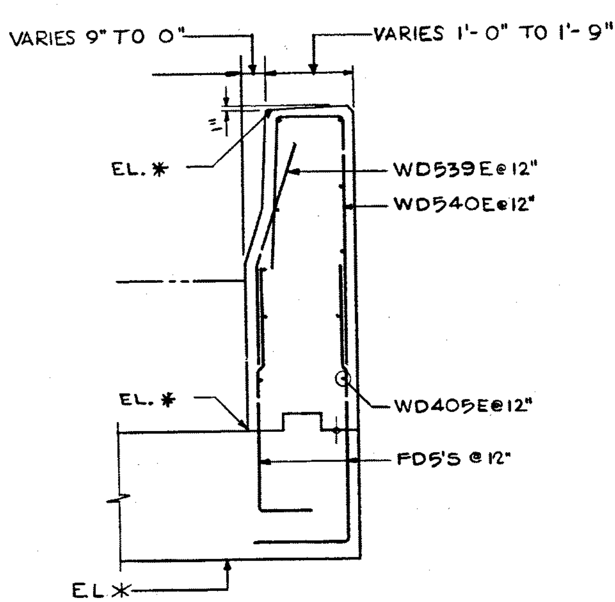


SECTION THRU WEEP HOLE

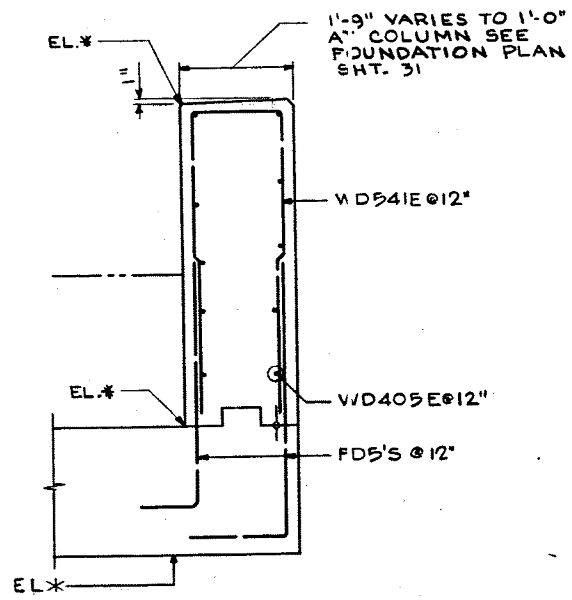


TYPICAL SECTION
(EXCEPT PANEL #20)

*NOTE ELEVATION GIVEN AT THIS POINT SEE SHTS 94 TO 98



SECTION V-V (SHT.97)



SECTION W-W (SHT.97)

NOTES

1. FOR FOUNDATION REINFORCEMENT SEE SHT. 32
2. FOR CONSTRUCTION & EXPANSION JOINT DETAILS SEE SHT. 68
3. FOR REINFORCEMENT SCHEDULE SEE SHT. 99
4. FOR GENERAL NOTES SEE SHT. 1
5. FOR HORIZONTAL & VERTICAL CURVE DATA SEE SHT. 2
6. FOR WALL LOCATION SEE SHT 10 & 20
7. FOR LEGEND SEE SHT. 94

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

ELEV. & SEC. WALL D PANELS 21 & 22

APPROVED AUG 22 1962
BRIDGE ENGINEER

SHEET 98 OF 114
0010000

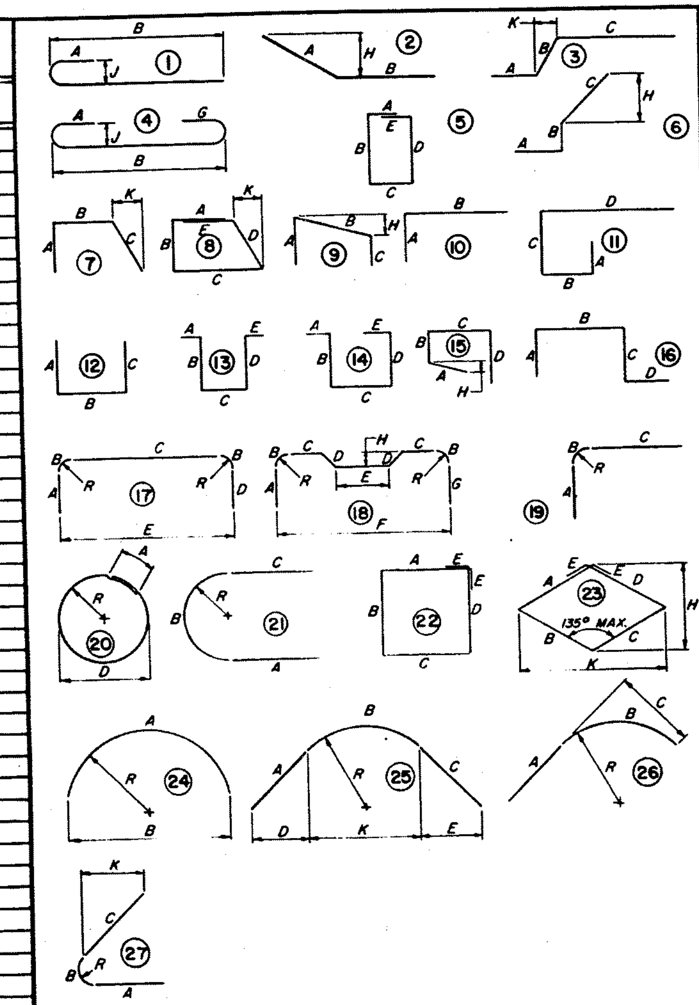
S-14584

WLW/RJK[3]
CLM
RJK[3]

7530-2350-0210

REINFORCEMENT BAR SCHEDULE

MARK	SIZE	LENGTH	NO.	TYPE	A	B	C	D	E	F	G	H	J	K	R	REMARKS
		DOWELS														
FD501E	5	4'-0"	74	10	3'-2	10"										
FD502E	5	3'-9"	46	10	2'-11"	10"										
FD503E	5	4'-11"	40	10	3'-5"	1'-6"										
FD504E	5	4'-9"	46	10	3'-3"	1'-6"										
FD505E	5	3'-6"	84	10	2'-8"	10"										
FD506E	5	4'-6"	34	10	3'-0"	1'-6"										
FD507E	5	3'-8"	90	10	3'-10"	10"										
FD508E	5	4'-7"	56	10	3'-1"	1'-6"										
FD509E	5	4'-3"	93	10	3'-5"	10"										
FD510E	5	4'-5"	56	10	2'-11"	1'-6"										
FD511E	5	3'-11"	122	10	3'-1"	10"										
FD512E	5	4'-10"	28	10	3'-4"	1'-6"										
FD513E	5	3'-8"	28	10	2'-10"	10"										
FD514E	5	4'-6"	42	10	3'-0"	1'-6"										
FD516E	5	5'-2"	28	10	3'-8"	1'-6"										
FD518E	5	5'-0"	6	10	3'-6"	1'-6"										
FD519E	5	5'-4"	28	10	3'-10"	1'-6"										
FD522E	5	5'-1"	38	10	3'-7"	1'-6"										
FD523E	5	5'-10"	28	10	4'-4"	1'-6"										
FD524E	5	4'-6"	37	10	3'-8"	10"										
FD525E	5	6'-7"	28	10	5'-1"	1'-6"										
FD526E	5	6'-5"	28	10	4'-11"	1'-6"										
FD527E	5	6'-3"	28	10	4'-9"	1'-6"										
FD528E	5	6'-1"	56	10	4'-7"	1'-6"										
FD529E	5	5'-11"	28	10	4'-5"	1'-6"										
FD530E	5	4'-6"	21	10	3'-0"	1'-6"										
FD531E	5	6'-8"	7	10	5'-2"	1'-6"										
FD532E	5	5'-8"	9	10	4'-2"	1'-6"										
FD533E	5	4'-5"	7	10	3'-7"	10"										
FD534E	5	5'-5"	9	10	3'-11"	1'-6"										
FD535E	5	4'-4"	5	10	3'-6"	10"										
FD536E	5	5' 3"	5	10	3'-9"	1'-6"										
		WALL BARS														
WD401E	4	26'-3"	36	STR												
WD402E	4	21'-3"	6	STR												
WD403E	4	26'-5"	20	STR												
WD404E	4	26'-9"	138	STR												
WD405E	4	26'-7"	20	STR												
WD406E	4	21'-9"	4	STR												
WD515E	5	3'-9"	6	STR												
WD517E	5	9'-4"	1	13	1'-6"	2'-11"	6"	2'-11"	1'-6"							
WD520E	5	9'-8"	1	13	1'-6"	3'-1"	6"	3'-1"	1'-6"							
WD521E	5	10'-10"	2	13	1'-6"	3'-8"	6"	3'-8"	1'-6"					3"		
WD537E	5	6'-9"	594	7	3'-10"	7"	2'-4"					10 1/2"				
WD538E	5	3'-6"	594	2	2'-10"	1'-6"						0"to10-1/2"				2 SETS OF 8 VARY 'C' BY 1 1/2"
WD539E	5	3' 6"	16	2	2' 0"	1' 6"								3" to 0"		2 SETS OF 8 VARY 'B' BY 1 1/4"±, VARY 'D' BY 7/16"±
WD540E	5	6'-9" to 7'-6"	16	7	3'-10"	7" to 1'-4"	2'-4"							0		VARY 'B' BY 1 3/4"±
WD541E	5	9'-1" to 9'-10"	6	7	4'-3"	7" to 1'-4"	4'-3"									



Designed by CLM
Drawn by B.B.
Checked by RJK

- All Bars This Sheet to be Epoxy Coated
- "J" Dimensions on 180° hooks to be shown only where necessary to restrict hook size, otherwise standard hooks are to be used.
- All dimensions are out to out of bar except "A" and "G" on standard 135° and 180° hooks, and "R" which is shown to the inside of the bar.
- For Reinforcement Bar Fabrication Details, refer to Standard Drawing BC-336A
- Figures in circles show types.

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

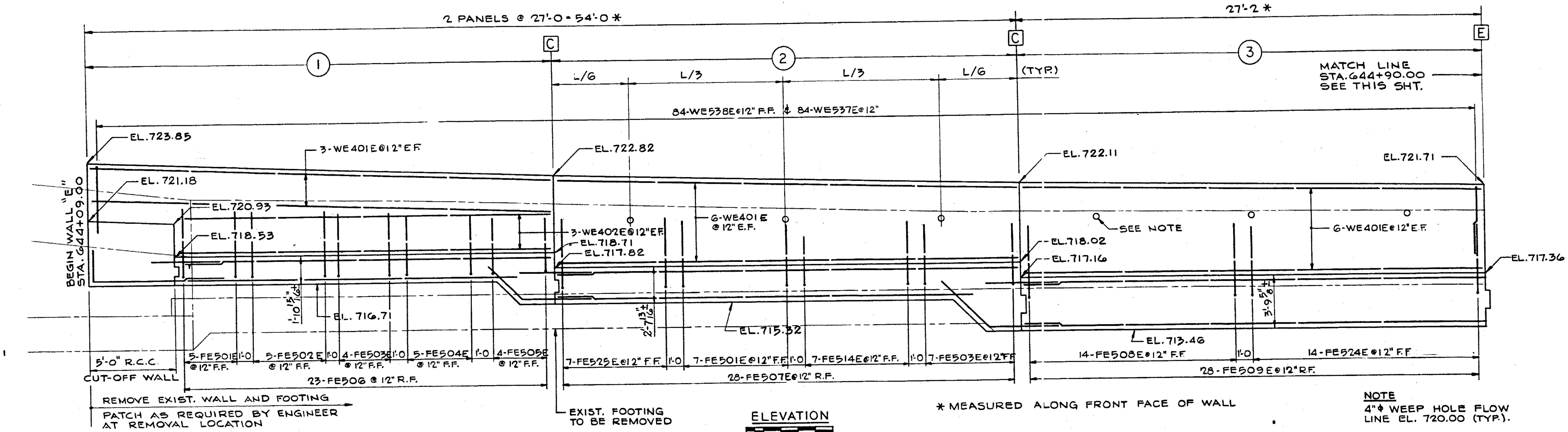
ALLEGHENY COUNTY
L.R. 766 SEC. 23
W.B. STA.1098+30.29
TO STA.1101+35.48
L.R. 764 SEC. 19
W.B. STA.631+16.78
TO STA.646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
WALL D REINFORCEMENT BAR SCHEDULE

APPROVED AUG 23 1982
B.B. [signature]
BRIDGE ENGINEER

SHEET 99 OF 114
0010001

S-14584

ROBERT H. WALTON CO.



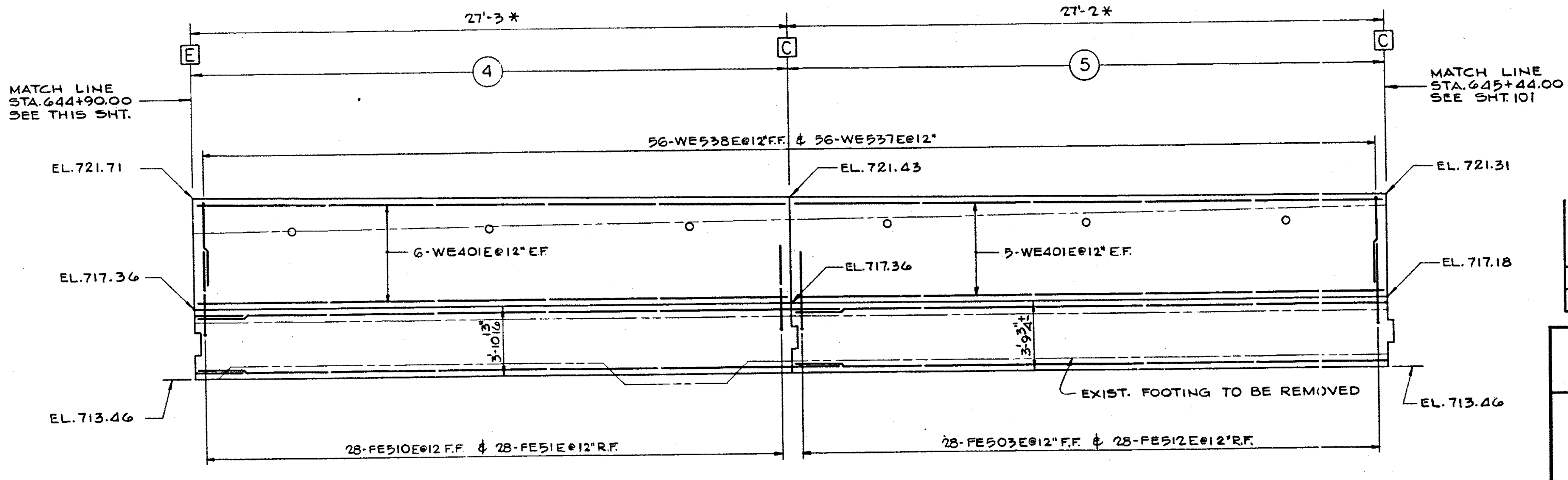
ELEVATION

0 1' 2' 3' 4' 5'

* MEASURED ALONG FRONT FACE OF WALL

NOTE

4"Φ WEEP HOLE FLOW LINE EL. 720.00 (TYP.).



ELEVATION

0 1' 2' 3' 4' 5'

LEGEND (WALL ONLY)

- C - DENOTES CONSTRUCTION JOINT
- E - DENOTES EXPANSION JOINT
- 1 - DENOTES WALL PANEL NUMBER
- F.F. - DENOTES FRONT FACE
- R.F. - DENOTES REAR FACE
- E.F. - DENOTES EACH FACE

NOTES

1. CUT REINFORCING BARS IN FIELD AS REQ'D. TO FIT.
2. FOR FOUNDATION REINFORCEMENT SEE SHT. 32 & 33
3. FOR TYPICAL WALL SECTION SEE SHT. 104
4. FOR CONSTRUCTION & EXPANSION JOINT DETAILS SEE SHT. 68
5. FOR REINFORCEMENT SCHEDULE SEE SHT. 105
6. FOR GENERAL NOTES SEE SHT. 1
7. FOR WALL LOCATION SEE SHT. 10 & 21

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL E PANELS 1-5

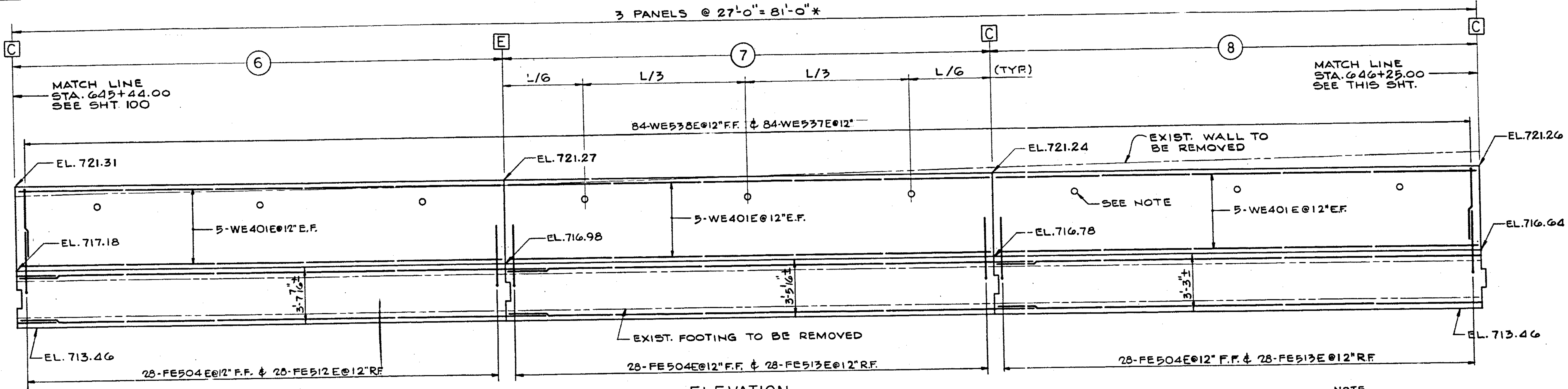
APPROVED
BRIDGE ENGINEER

SHEET 100 OF 114
0010002

S-14584

RAH/RJK³
FS/CLM
RJK³

D-8002 (3-77)



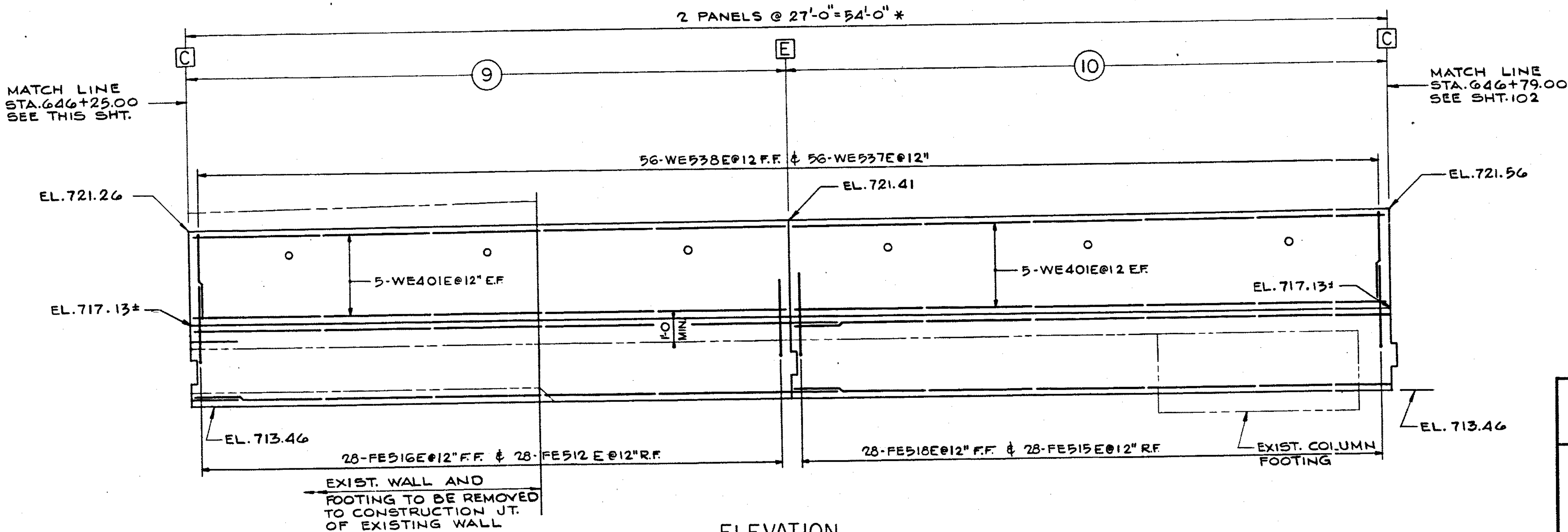
ELEVATION

0 1' 2' 3' 4' 5'

*MEASURED ALONG FRONT FACE OF WALL

NOTE

4"ϕ WEEPHOLE FLOW LINE EL. 720.00 (TYP.)



ELEVATION

0 1' 2' 3' 4' 5'

RAH/RJK³
FJ/CLM
RJK³

NOTES

1. FOR LEGEND SEE SHT. 100
2. FOR HORIZONTAL & CURVE DATA SEE SHT. 2.
3. FOR FOUNDATION REINFORCEMENT SEE SHT. 33 & 34
4. FOR TYPICAL WALL SECTION SEE SHT. 104
5. FOR CONSTRUCTION & EXPANSION JOINT DETAILS SEE SHT. 68
6. FOR REINFORCEMENT SCHEDULE SEE SHT. 105
7. FOR GENERAL NOTES SEE SHT. 1

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

ELEVATION WALL E PANELS 6-10

APPROVED AUG 23 1982

B. J. Kotch

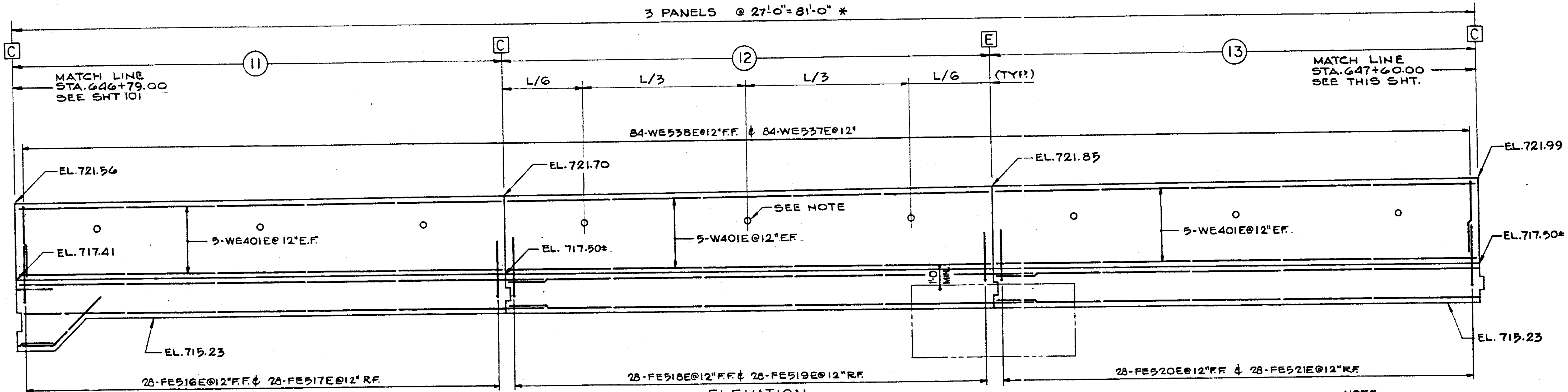
BRIDGE ENGINEER

SHEET 101 OF 114

0010003

S-14584

D-9002 (3-77)

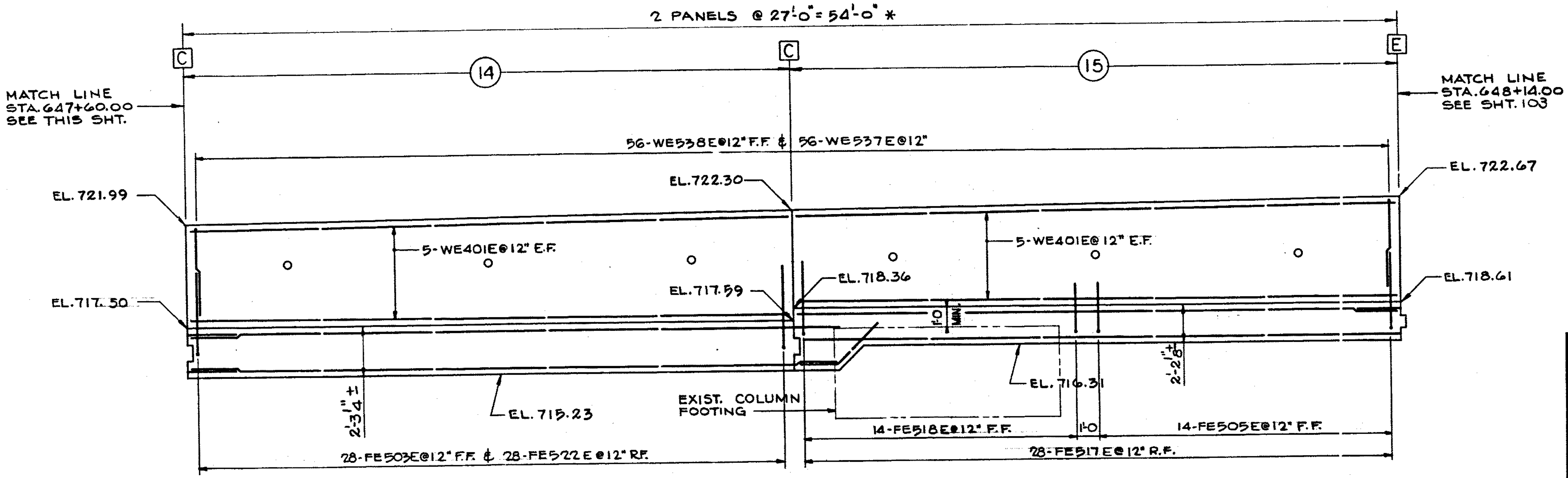


ELEVATION

0 1' 2' 3' 4' 5'

* MEASURED ALONG FRONT FACE OF WALL

NOTE
4" φ WEEPHOLE FLOW LINE EL. 720.00 (TYP.)



ELEVATION

0 1' 2' 3' 4' 5'

NOTES

1. FOR LEGEND SEE SHT. 100
2. FOR WALL LOCATION SEE SHT. 11 & 12
3. FOR FOUNDATION REINFORCEMENT SEE SHT. 34 & 35
4. FOR TYPICAL WALL SECTION SEE SHT. 104
5. FOR CONSTRUCTION & EXPANSION JOINT DETAILS SEE SHT. 68
6. FOR REINFORCEMENT SCHEDULE SEE SHT. 105
7. FOR GENERAL NOTES SEE SHT. 1

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23 W.B. STA. 1098+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19 W.B. STA. 631+16.78 TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL E PANELS 11 - 15

APPROVED AUG 23 1982

B. J. Kotchel

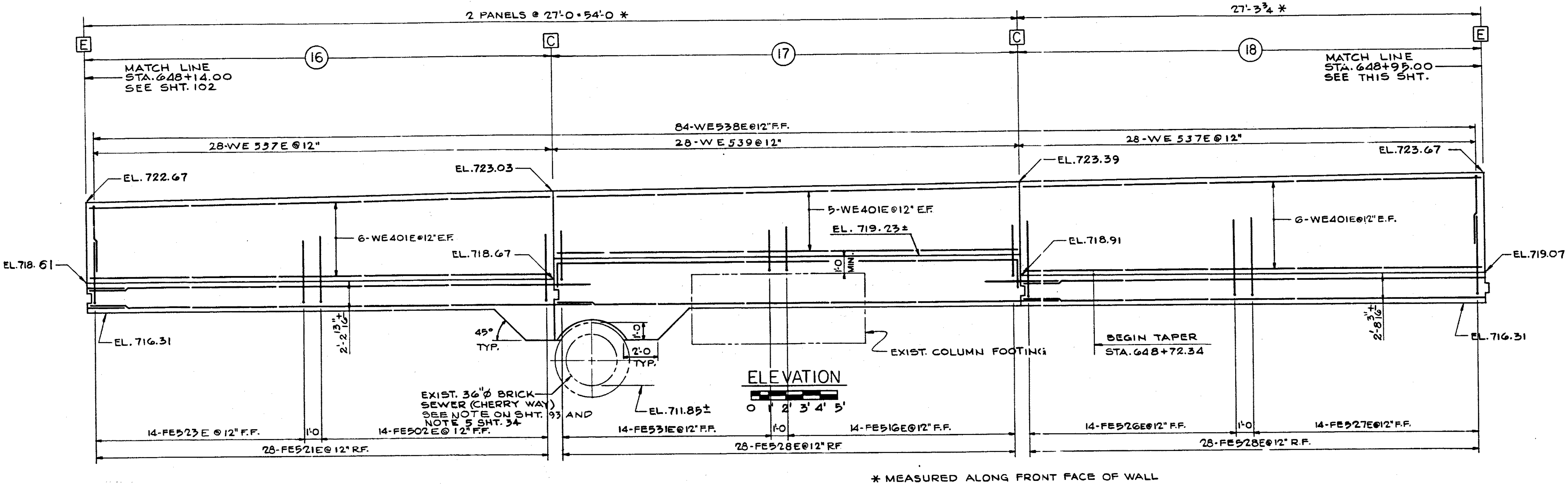
BRIDGE ENGINEER

SHEET 102 OF 114

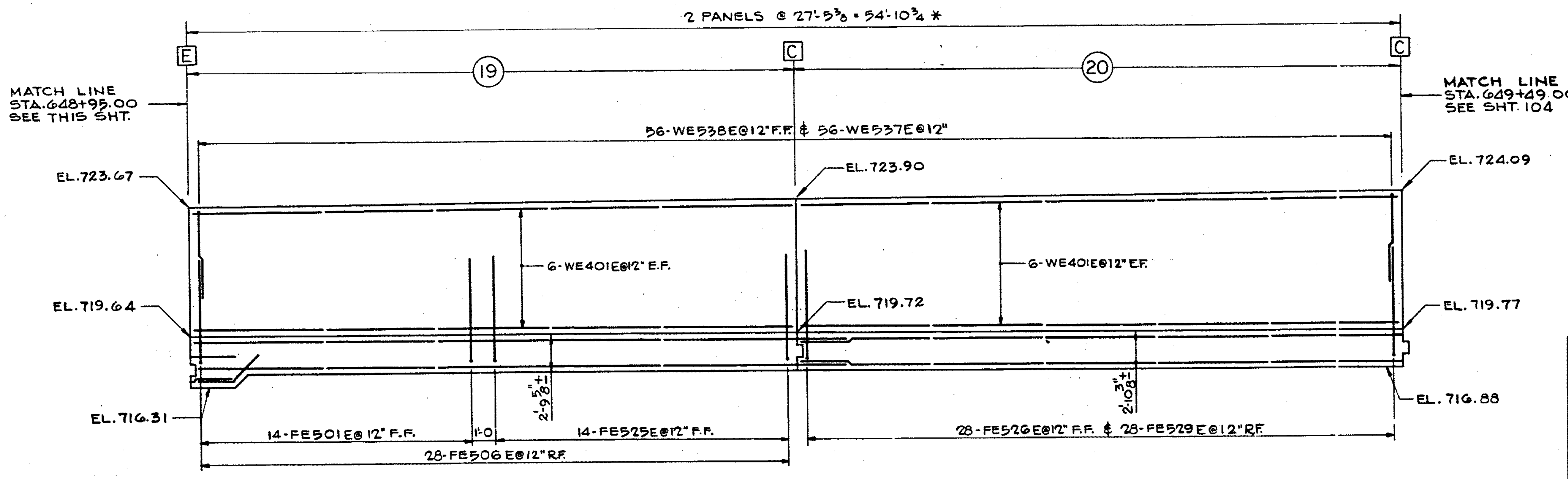
0010004

S-14584

RAH/RJH³
FS/CLM
RJK³



* MEASURED ALONG FRONT FACE OF WALL



ELEVATION

0 1' 2' 3' 4' 5'

NOTES

1. FOR LEGEND SEE SHT. 100
2. FOR WALL LOCATION SEE SHT. 11, 12 & 21
3. FOR HORIZONTAL & CURVE DATA SEE SHT. 2
4. FOR FOUNDATION REINFORCEMENT SEE SHT. 35 & 36
5. FOR TYPICAL WALL SECTION SEE SHT. 104
6. FOR CONSTRUCTION & EXPANSION JOINT DETAILS SEE SHT. 68
7. FOR REINFORCEMENT SCHEDULE SEE SHT. 105
8. FOR GENERAL NOTES SEE SHT. 1

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.49

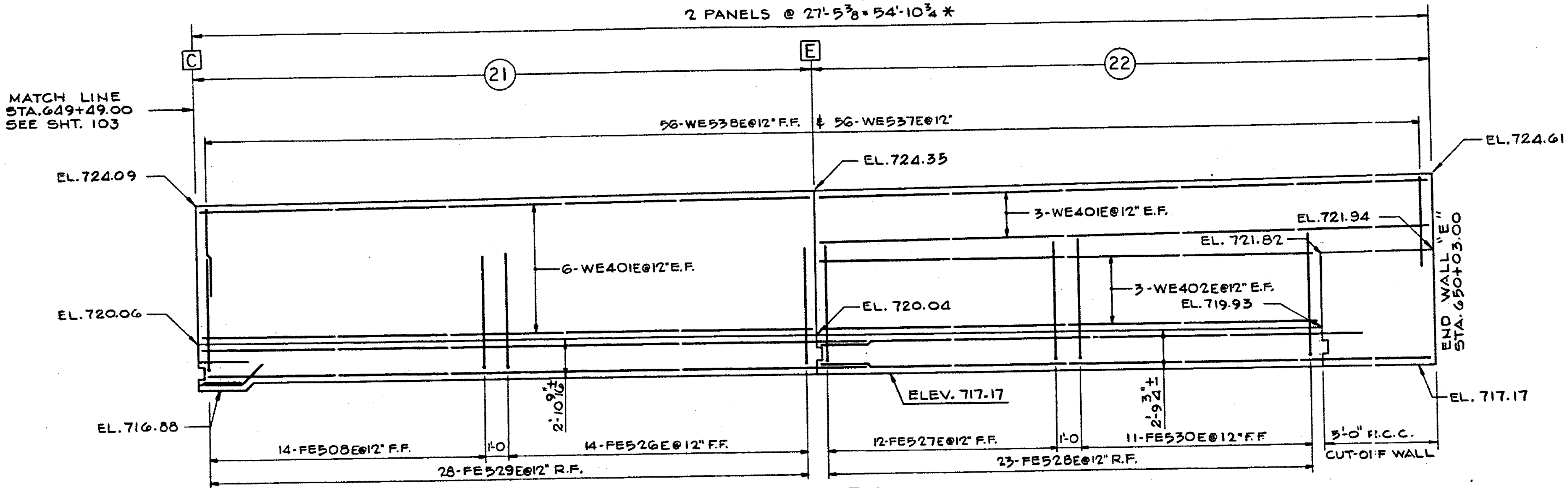
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEVATION WALL E PANELS 16-20

APPROVED AUG 23 1982
B. Z. Kohl
BRIDGE ENGINEER

SHEET 103 OF 114
0010005
S-14584

RAH/RJK³
FS/CLM
RJK³

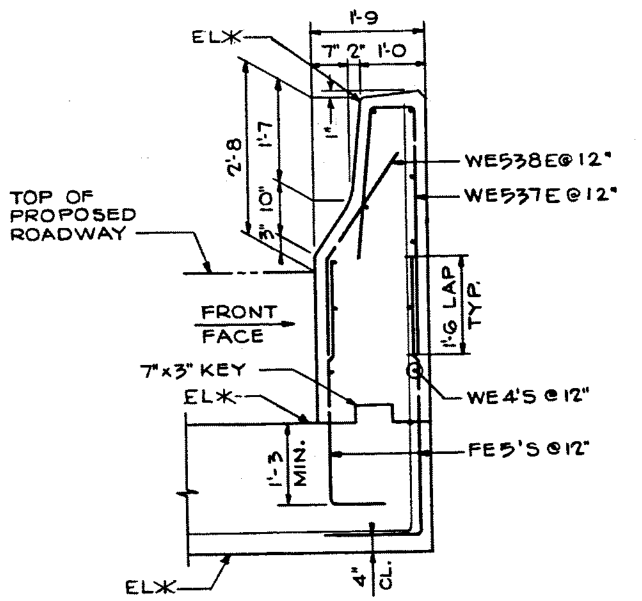
B-6002 (3-77)



ELEVATION

0 1' 2' 3' 4' 5'

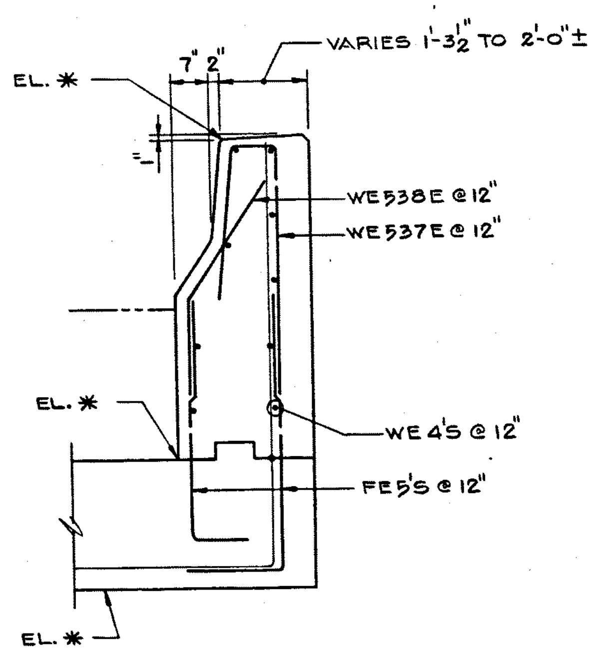
* MEASURED ALONG FRONT FACE OF WALL.



TYPICAL SECTION

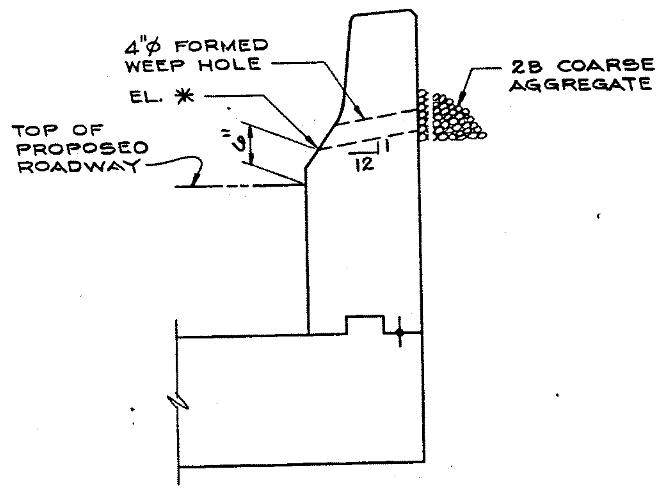
0 6" 1' 2' 3' 4'

STA. 646+25.00 TO
STA. 650+03.00



STA. 644+09.00 TO
STA. 646+25.00

0 6" 1' 2' 3'



SECTION THRU WEEP HOLE

0 6" 1' 2' 3' 4'

NOTE
* ELEVATION GIVEN TO THIS POINT
SEE SHTS. 100 TO 104

RAH/RJK3
FS/CLM
RJK3

NOTES
1. FOR LEGEND SEE SHT. 100
2. FOR WALL LOCATION SEE SHT. 12 & 21
3. FOR FOUNDATION REINFORCEMENT SEE SHT. 36
4. FOR CONSTRUCTION & EXPANSION JOINT DETAILS SEE SHT. 68
5. FOR REINFORCEMENT SCHEDULE SEE SHT. 105
6. FOR GENERAL NOTES SEE SHT. 1
7. FOR HORIZONTAL & VERTICAL SEE SHT. 2

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23
W.B. STA. 1098+30.29
TO STA. 1101+35.48
L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
ELEV. & SEC. WALL E PANELS 21 & 22

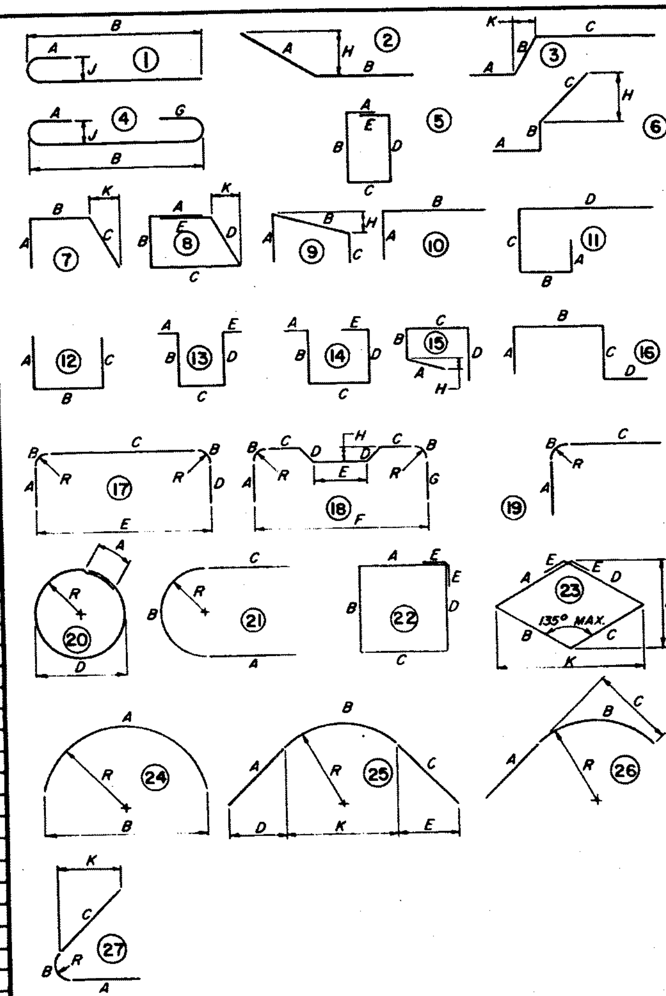
APPROVED AUG 23 1982
B J Kotalik
BRIDGE ENGINEER

SHEET 104 OF 114
0010006
S-14584

7530-2350-0210

REINFORCEMENT BAR SCHEDULE

MARK	SIZE	LENGTH	NO.	TYPE	A	B	C	D	E	F	G	H	J	K	R	REMARKS
		DOWELS														
FE501E	5	4'-10"	26	10	4'-0"	10"										
FE502E	5	4'-8"	19	10	3'-10"	10"										
FE503E	5	4'-6"	67	10	3'-8"	10"										
FE504E	5	4'-4"	89	10	3'-6"	10"										
FE505E	5	4'-2"	18	10	3'-4"	10"										
FE506E	5	5'-9"	51	10	4'-3"	1'-6"										
FE507E	5	6'-3"	28	10	4'-9"	1'-6"										
FE508E	5	5'-1"	28	10	4'-3"	10"										
FE509E	5	7'-5"	28	10	5' 11"	1'-6"										
FE510E	5	4'-9"	28	10	3'-11"	10"										
FE511E	5	7'-10"	28	10	5'-6"	1'-6"										
FE512E	5	6'-9"	84	10	5'-3"	1'-6"										
FE513E	5	6'-7"	56	10	5'-1"	1'-6"										
FE514E	5	4'-7"	7	10	3'-9"	10"										
FE515E	5	6'-10"	28	10	5'-4"	1'-6"										
FE516E	5	3'-11"	70	10	3'-1"	10"										
FE517E	5	5'-3"	56	10	3'-9"	1'-6"										
FE518E	5	4'-1"	70	10	3'-3"	10"										
FE519E	5	5'-5"	28	10	3'-11"	1'-6"										
FE520E	5	4'-2"	28	10	3'-4"	10"										
FE521E	5	5'-6"	56	10	4'-0"	1'-6"										
FE522E	5	5'-10"	56	10	4'-4"	1'-6"										
FE523E	5	4'-5"	14	10	3'-7"	10"										
FE524E	5	4'-11"	14	10	4'-1"	10"										
FE525E	5	5'-0"	21	10	4'-2"	10"										
FE526E	5	5'-2"	56	10	4'-4"	10"										
FE527E	5	5'-3"	26	10	4'-5"	10"										
FE528E	5	6'-2"	51	10	4'-8"	1'-6"										
FE529E	5	6'-0"	56	10'	4'-6"	1'-6"										
FE530E	5	5'-5"	11	10	4'-7"	10"										
FE531E	5	3'-7"	14	10	2'-9"	10"										
		WALL BARS														
WE401E	4	26'-9"	228	STR.												
WE402E	4	21'-9"	12	STR.												
WE537E	5	6'-9"	616	7	3'-10"	7"	2'-4"							3"		
WE538E	5	3'-6"	616	2	2'-0"	1'-6"						10-1/2"				



Designed by CLM
Drawn by K.M.B.
Checked by RJK3

- "J" Dimensions on 180° hooks to be shown only where necessary to restrict hook size, otherwise standard hooks are to be used.
- All dimensions are out to out of bar except "A" and "G" on standard 135° and 180° hooks, and "R" which is shown to the inside of the bar.
- For Reinforcement Bar Fabrication Details, refer to Standard Drawing BC-336A
- Figures in circles show types.
- All Bars This Sheet to be Epoxy Coated.

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA.1098+30.29
TO STA.1101+35.48

L.R. 764 SEC. 19
W.B. STA.631+16.78
TO STA.646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
WALL E REINFORCEMENT BAR SCHEDULE

APPROVED AUG 23 1982
B. J. Kotalik
BRIDGE ENGINEER

SHEET 105 OF 114
0010007

S-14584

B-0002 (8-77)

BORING NO. U-1
STA. 12+66, 116' LT.

G.E. 734.5'

A	B	C	D
	11.5	4	
	16.5	8	
	21.5	10	
	26.5	16	
	31.5	13	
	36.5	5	
	41.5	5	
	46.5	7	
	51.5	14	
	56.5	16	
	61.5	22	
	66.5	22	

- 0.0'-3.0' GRAY HARD CONCRETE — 731.5'
- 2.0'-9.0' BROWN SOFT WET SILT, TRACE FINE SAND — 725.5'
- 9.0'-13.0' BROWN SOFT MOIST SILT, SOME FINE SAND — 721.5'
- 13.0'-33.0' BROWN & GRAY LOOSE DAMP MEDIUM SAND & GRAVEL — 701.5'
- 33.0'-51.0' DARK BROWN LOOSE MOIST MEDIUM TO COARSE SAND — 683.5'
- 51.0'-63.0' BROWN MEDIUM DENSE MOIST MEDIUM SAND & GRAVEL — 671.5'
- 63.0'-72.4' BROWNISH GRAY MEDIUM DENSE WET MEDIUM SAND & GRAVEL

704.5' 3/7/82 during drilling

BORING NO. U-1 (CONT'D.)

A	B	C	D
	71.5	25	
	72.7	50/2"	
	74.5	83%	0%
	84.5	91%	25%
	90.5	100%	58%
	99.5	97%	87%
	109.5	100%	94%
	119.5	96%	93%

- 662.1'
- 72.4'-72.7' GRAY HARD VERY FINE SANDSTONE — 661.8'
- 72.7'-80.6' GRAY MEDIUM HARD SLIGHTLY WEATHERED CLOSE FRACTURED SANDY SILTSTONE — 653.9'
- 80.6'-86.0' DARK GRAY MEDIUM HARD FRESH CLOSE TO MODERATE FRACTURED SILTSTONE — 648.5'
- 86.0'-87.6' GRAY HARD FRESH WIDE FRACTURED LIMESTONE W/ TRACE SILTSTONE LENSES — 646.9'
- 87.6'-89.6' LIGHT GRAY TO GRAY SOFT TO MEDIUM HARD SLIGHTLY WEATHERED SILTSTONE — 644.9'
- 89.6'-91.6' GRAY MEDIUM HARD FRESH SANDY SILTSTONE — 642.9'
- 91.6'-96.9' LIGHT GRAY HARD FRESH SANDSTONE — 637.6'
- 96.9'-97.4' GRAY HARD SANDY SILTSTONE — 637.1'
- 97.4'-119.5' LIGHT GRAY HARD WIDE FRACTURED MASSIVE MEDIUM SANDSTONE W/ TRACE SILTSTONE LAMINATIONS — 615.0'

END OF BORING AT 119.5'

BORING NO. U-2
STA. 16+23, 117' LT.

G.E. 739.0'

A	B	C	D
	11.5	5	
	16.5	4	
	21.5	16	
	26.5	25	
	31.5	41	
	36.5	49	
	41.5	15	
	46.5	25	
	51.5	11	
	56.5	12	
	61.5	17	
	66.5	22	

- 0.0'-1.1' GRAY HARD CONCRETE — 737.9'
- 1.1'-14.0' BROWN MEDIUM DENSE DAMP SILT AND FINE SAND, W/ SCATTERED RUBBLE AND SLAG — 725.0'
- 14.0'-23.0' BROWN LOOSE DAMP FINE SAND, TRACE SLAG & ROCK FRAGMENTS — 716.0'
- 23.0'-41.0' DARK BROWN MEDIUM DENSE DAMP SAND & GRAVEL — 698.0'
- 41.0'-45.6' DARK BROWN MEDIUM DENSE MOIST MEDIUM SAND — 693.4'
- 45.6'-46.3' DARK BROWN MEDIUM DENSE MOIST SAND & GRAVEL — 692.7'
- 46.3'-54.0' DARK BROWN MEDIUM DENSE MOIST MEDIUM SAND — 685.0'
- 54.0'-61.0' DARK BROWN MEDIUM DENSE DAMP MEDIUM TO COARSE SAND — 678.0'
- 61.0'-75.0' BROWN MEDIUM DENSE DAMP MEDIUM SAND & GRAVEL, TRACE SILT

714.0' 3/7/82 0 HRS.

BORING NO. U-2 (CONT'D.)

A	B	C	D
	71.5	40	
	75.3	50/.3'	
	84.5	92%	15%
	94.5	100%	67%
	104.5	100%	68%
	114.5	100%	95%
	124.5	100%	91%

- 664.0'
- 75.0'-75.3' GRAY MEDIUM HARD WEATHERED SILTSTONE — 663.7'
- 75.3'-95.2' GRAY MEDIUM HARD SLIGHTLY WEATHERED CLOSE FRACTURED SANDY SILTSTONE, W/ TRACE SANDSTONE LAMINATIONS — 643.8'
- 95.2'-99.7' DARK GRAY MEDIUM HARD FRESH MODERATELY FRACTURED SILTSTONE — 639.3'
- 99.7'-101.3' GRAY HARD FRESH MODERATELY FRACTURED LIMESTONE, W/TRACE SILTSTONE LENSES — 637.7'
- 101.3'-102.5' GRAY MEDIUM HARD FRESH CLOSE FRACTURED SILTSTONE — 636.5'
- 102.5'-110.6' GRAY MEDIUM HARD TO HARD FRESH THIN BEDDED MODERATELY FRACTURED SANDY SILTSTONE, W/SOME SANDSTONE LAMINATIONS — 628.4'
- 110.6'-113.3' GRAY TO LIGHT GRAY HARD FRESH THIN BEDDED WIDE FRACTURED CROSS BEDDED FINE SANDSTONE, W/LITTLE SILTSTONE LAMINATIONS — 625.7'
- 113.3'-124.5' LIGHT GRAY HARD FRESH THIN BEDDED CROSS BEDDED MEDIUM SANDSTONE W/TRACE SILTSTONE LAMINATIONS, MUSCOVITE IN BEDDING PLANES — 614.5'

END OF BORING AT 124.5'

—GENERAL NOTES—

COLUMN "A" DENOTES BLOWS PER FOOT ON CASING.

COLUMN "B" DENOTES DEPTH OF LOWER LIMIT OF SPOON SAMPLE OR BOTTOM OF CORE RUN AND RQD INTERVAL.

COLUMN "C" DENOTES BLOWS FOR LAST 12 INCHES (EXCEPT AS NOTED) ON SPOON SAMPLER OR PERCENT OF CORE RECOVERY.

COLUMN "D" DENOTES ROCK QUALITY DESIGNATION (RQD) IN PERCENT.

SIZE OF CASING	4 INCHES O.D.
WEIGHT OF HAMMER ON CASING	300 POUNDS
DROP OF HAMMER ON CASING	18 INCHES
SIZE OF SAMPLING SPOON	2 INCHES O.D.
WEIGHT OF HAMMER ON SPOON	140 POUNDS
DROP OF HAMMER ON SPOON	30 INCHES
SIZE OF CORE	2-1/8 INCHES

G.E. INDICATES GROUND ELEVATION

VERTICAL SCALE: = 4'

1028.3 5/5/81 24 HRS. INDICATES GROUND WATER ELEVATION ON 5/5/81, 24 HOURS AFTER COMPLETION OF BORING

Designed by JRR
Drawn by WES
Checked by JRR

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23 — W.B. STA. 1098+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19 — W.B. STA. 631+16.78 TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
BORING LOGS

APPROVED — BRIDGE ENGINEER

SHEET 106 OF 114

0010008

S-14584

D-5004 (3-77)

BORING NO. U-3
STA. 19+05, 116' LT.

A	B	C	D	
				G.E. 737.7'
				0.0'-0.9' GRAY HARD CONCRETE 736.8'
				0.9'-7.0' BROWNISH GRAY LOOSE WET SILT & FINE SAND 730.7'
				7.0'-15.4' BROWN MEDIUM DENSE DAMP FINE SAND LITTLE SILT 722.3'
	11.0	12		
	16.0	4		15.4'-17.0' BROWN LOOSE DAMP MEDIUM SAND 720.7'
				17.0'-38.0' BROWN DENSE TO MEDIUM DENSE DAMP TO MOIST MEDIUM SAND & GRAVEL 699.7'
	21.0	42		
	26.0	33		
	31.0	42		
	36.0	14.0		
	41.0	37		38.0'-55.5' BROWN MEDIUM DENSE MOIST MEDIUM SAND AND GRAVEL, TRACE SILT 682.2'
	46.0	13		
	51.0	25		
	56.0	15		55.5'-58.0' GRAY MEDIUM STIFF MOIST SILT, LITTLE CLAY 679.7'
				58.0'-62.0' BROWN DENSE WET FINE TO MEDIUM SAND, SOME GRAVEL 675.7'
	61.0	40		
	66.0	36		62.0'-73.8' BROWN DENSE DAMP MEDIUM SAND & GRAVEL

Water level: 706.5' 3/14/82 0 HRS.

Elevations: 740, 730, 720, 710, 700, 690, 680, 670

BORING NO. U-3 (CONT'D.)

A	B	C	D	
	71.0	30		
	73.8	50/.0		663.9'
				73.8'-89.7' GRAY MEDIUM HARD FRESH MODERATELY FRACTURED SANDY SILTSTONE 648.0'
	81.5	100%	45%	
	91.5	100%	85%	89.7'-90.1' GRAY HARD FRESH MODERATELY FRACTURED MEDIUM SANDSTONE AND SILTSTONE INTERBEDDED 647.6'
				90.1'-96.5' GRAY MEDIUM HARD FRESH MODERATELY FRACTURED SANDY SILTSTONE 641.2'
				96.5'-101.4' DARK GRAY MEDIUM HARD FRESH MODERATELY FRACTURED SILTSTONE 636.3'
	101.5	100%	94%	101.4'-102.7' GRAY HARD FRESH MASSIVE LIMESTONE 635.0'
				102.7'-109.1' GRAY SOFT TO MEDIUM HARD SLIGHTLY WEATHERED CLOSE FRACTURED SILTSTONE 628.6'
	109.5	100%	46%	109.1'-115.1' GRAY MEDIUM HARD TO HARD FRESH WIDE FRACTURED SILTSTONE & SANDSTONE INTERBEDDED 622.6'
	119.5	100%	97%	115.1'-119.5' LIGHT GRAY HARD FRESH MODERATE TO WIDE FRACTURED MEDIUM SANDSTONE, MUSCOVITE IN BEDDING PLANES 618.2'

END OF BORING AT 119.5'

Elevations: 660, 650, 640, 630, 620, 610

BORING NO. U-4
STA. 21+77, 115' LT.

A	B	C	D	
				G.E. 734.5'
				0.0'-1.2' GRAY HARD CONCRETE 733.3'
				1.2'-8.0' BROWNISH GRAY LOOSE WET SILT & FINE SAND, SOME GRAVEL 726.5'
				8.0'-13.0' BROWN VERY SOFT WET SILT, LITTLE CLAY TRACE FINE SAND 721.5'
	11.5	2		
	16.5	2		13.0'-20.7' BROWN VERY LOOSE DAMP FINE SAND, LITTLE SILT 713.8'
	21.5	28		20.7'-34.0' DARK BROWN MEDIUM DENSE DAMP FINE TO MEDIUM SAND & GRAVEL 700.5'
	26.5	32		
	31.5	10		
	36.5	25		34.0'-43.0' BROWN MEDIUM DENSE WET GRAVEL, SOME FINE SAND, LITTLE SILT 691.5'
	41.5	36		
	46.5	14		43.0'-50.5' GRAY MEDIUM STIFF DAMP SILT, TRACE CLAY 684.0'
	51.5	9		50.5'-53.0' BROWN MEDIUM DENSE MOIST SAND & GRAVEL 681.5'
				53.0'-58.0' BROWNISH GRAY MEDIUM DENSE DAMP SILT, SOME FINE SAND 676.5'
	56.5	13		
	61.5	41		58.0'-64.0' GRAY DENSE DAMP MEDIUM SAND & GRAVEL TRACE SILT 670.5'
	66.5	30		64.0'-70.8' GRAYISH BROWN MEDIUM DENSE DAMP MEDIUM SAND

Water level: 709.5' 3/14/82 0 HRS.

Elevations: 740, 730, 720, 710, 700, 690, 680, 670

BORING NO. U-4 (CONT'D.)

A	B	C	D	
	71.0	70/.5'		663.7'
				70.8'-71.0' GRAY MEDIUM HARD SLIGHTLY WEATHERED SANDY SILTSTONE 663.5'
				71.0'-72.8' GRAY MEDIUM HARD FRESH SILTSTONE 661.7'
				72.8'-72.9' GRAY VERY SOFT CLAY SEAM 661.6'
				72.9'-74.3' LIGHT GRAY HARD FRESH MEDIUM SANDSTONE 660.2'
	79.0	100%	0%	74.3'-98.0' GRAY MEDIUM HARD FRESH CLOSE FRACTURED SANDY SILTSTONE
	89.0	100%	53%	
				636.5'
	99.0	100%	23%	98.0'-103.1' DARK GRAY MEDIUM HARD FRESH MODERATELY FRACTURED SILTSTONE 631.4'
				103.1'-105.1' GRAY HARD FRESH MASSIVE LIMESTONE 629.4'
				105.1'-108.1' GRAY SOFT TO MEDIUM HARD SLIGHTLY WEATHERED CLOSE FRACTURED SILTSTONE 626.4'
	109.0	100%	35%	108.1'-112.1' GRAY MEDIUM HARD FRESH CLOSE TO MODERATELY FRACTURED SANDY SILTSTONE 622.4'
				112.1'-117.0' GRAY HARD FRESH MODERATELY FRACTURED INTERBEDDED SILTSTONE & SANDSTONE 617.5'
	119.0	100%	94%	117.0'-119.0' LIGHT GRAY HARD FRESH MODERATELY FRACTURED SANDSTONE 615.5'

END OF BORING AT 109.0'

Elevations: 660, 650, 640, 630, 620, 610

Designed by JRR
Drawn by WES
Checked by JRR

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23
W.B. STA.1098+30.29 TO STA.1101+35.48
L.R. 764 SEC. 19
W.B. STA.631+16.78 TO STA.646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
BORING LOGS

APPROVED AUG 23 1982
BRIDGE ENGINEER

SHEET 107 OF 114
0010009
S-14584

BORING NO. U-5
STA. 25+24, 91' LT.

Elevation scale: 740 – 670

G.E. 734.9'

A	B	C	D
	11.5	7	
	16.5	7	
	21.5	4	
	26.0	7	
	29.5	11	
	31.0	9	
	32.5	14	
	36.5	19	
	41.5	23	
	46.5	17	
	51.5	18	
	56.5	12	
	61.5	49	
	66.5	38	

Water level: 703.4 3/27/82 0 HRS.

- 0.0'-1.6' GRAY HARD CONCRETE — 733.3'
- 1.6'-8.0' DARK BROWN LOOSE MOIST MEDIUM SAND & GRAVEL, TRACE SLAG — 726.9'
- 8.0'-13.0' REDDISH BROWN LOOSE DAMP SAND, TRACE ROCK FRAGMENTS — 721.9'
- 13.0'-17.0' LIGHT BROWN LOOSE DAMP VERY FINE SAND SOME SILT — 717.9'
- 17.0'-23.0' BROWN LOOSE MOIST MEDIUM SAND — 711.9'
- 23.0'-26.5' LIGHT BROWN SOFT DAMP VERY FINE SAND & SILT — 708.4'
- 26.5'-35.5' BROWN MEDIUM DENSE MOIST MEDIUM SAND, TRACE FINE GRAVEL — 699.4'
- 35.5'-38.0' LIGHT BROWN STIFF DAMP VERY FINE SAND & SILT — 696.9'
- 38.0'-43.0' BROWN MEDIUM DENSE WET MEDIUM SAND — 691.9'
- 43.0'-48.0' LIGHT BROWN MEDIUM DENSE DAMP VERY FINE SAND, SOME SILT — 686.9'
- 48.0'-63.0' DARK BROWN MEDIUM DENSE TO DENSE MOIST TO DAMP MEDIUM SAND, LITTLE MEDIUM GRAVEL — 671.9'
- 63.0'-69.0' BROWN & GRAY DENSE DAMP MEDIUM SAND & GRAVEL — 665.9'

BORING NO. U-5 (CONT'D.)

Elevation scale: 660 – 610

A	B	C	D
	70.2	50/2	
	80.0	98%	48%
	90.0	100%	73%
	100.0	100%	100%
	110.0	100%	90%
	120.0	99%	66%

- 69.0'-70.2' GRAY SOFT HIGHLY WEATHERED CLOSE FRACTURED SILTSTONE, TRACE FINE SAND — 70.2'
- 70.2'-99.4' GRAY MEDIUM HARD SLIGHTLY WEATHERED TO FRESH SILTSTONE — 635.5'
- 99.4'-104.4' DARK GRAY HARD FRESH WIDE FRACTURED SILTSTONE — 630.5'
- 104.4'-105.7' GRAY HARD FRESH LIMESTONE — 629.2'
- 105.7'-109.8' LIGHT GRAY TO GRAY SOFT SLIGHTLY WEATHERED MASSIVE MODERATELY FRACTURED SILTSTONE — 625.1'
- 109.8'-113.1' GRAY MEDIUM HARD FRESH MASSIVE MODERATELY FRACTURED SILTSTONE 621.8'
- 113.1'-114.5' LIGHT GRAY MEDIUM HARD FRESH MASSIVE MODERATELY FRACTURED SILTSTONE 620.4'
- 114.5'-119.0' GRAY MEDIUM HARD TO HARD FRESH WIDE FRACTURED SILTSTONE, TRACE SANDY LAMINATIONS — 615.9'
- 119.0'-120.0' LIGHT GRAY HARD FRESH THIN BEDDED WIDE FRACTURED FINE TO MEDIUM SANDSTONE TRACE SILTSTONE LAMINATIONS — 614.9'

END OF BORING AT 120.0'

BORING NO. U-6
STA. 27+50, 92' LT.

Elevation scale: 740 – 670

G.E. 739.5'

A	B	C	D
	11.0	13	
	16.0	13	
	21.0	2	
	26.0	2	
	31.5	10	
	33.0	6	
	34.5	20	
	36.0	22	
	41.0	12	
	46.0	20	
	51.0	28	
	56.5	23	
	61.0	38	
	66.0	21	

Water level: 705.5 3/28/82 0 HRS.

- 0.0'-1.0' GRAY HARD CONCRETE — 738.5'
- 1.0'-13.0' VERY LIGHT BROWN MEDIUM DENSE DRY COARSE SAND — 726.5'
- 13.0'-23.0' BROWN, LIGHT BROWN & GRAY MOTTLED MEDIUM DENSE DAMP COARSE TO MEDIUM SAND, TRACE SILT — 716.5'
- 23.0'-29.0' BROWN & GRAY MOTTLED VERY LOOSE MOIST FINE SAND — 710.5'
- 29.0'-32.2' LIGHT BROWN MEDIUM STIFF DAMP SILT, SOME VERY FINE SAND — 707.3'
- 32.2'-38.0' BROWN MEDIUM DENSE MOIST TO WET MEDIUM SAND, SOME GRAVEL — 701.5'
- 38.0'-48.0' BROWN MEDIUM DENSE DAMP FINE SAND, TRACE GRAVEL — 691.5'
- 48.0'-58.0' BROWN & GRAY MEDIUM DENSE DAMP MEDIUM SAND, SOME GRAVEL — 681.5'
- 58.0'-63.0' BROWNISH GRAY DENSE DAMP MEDIUM SAND & GRAVEL — 676.5'
- 63.0'-68.0' GRAY MEDIUM DENSE MOIST FINE TO MEDIUM SAND — 671.5'
- 68.0'-73.0' BROWNISH GRAY

BORING NO. U-6 (CONT'D.)

Elevation scale: 660 – 610

A	B	C	D
	71.0	25	
	74.2	50/.0	
	81.0	87%	66%
	91.0	100%	90%
	101.0	100%	100%
	111.0	100%	67%
	121.0	100%	32%

- MEDIUM DENSE DAMP FINE SAND, LITTLE GRAVEL, TRACE SILT — 666.5'
- 73.0'-74.2' GRAY SOFT HIGHLY WEATHERED SANDY SILTSTONE — 665.3'
- 74.2'-101.8' GRAY MEDIUM HARD TO HARD FRESH MODERATELY TO WIDE FRACTURED SILTSTONE, SOME SANDY ZONES — 637.7'
- 101.8'-108.9' DARK GRAY MEDIUM HARD FRESH CLOSE TO MODERATELY FRACTURED SILTSHALE — 630.6'
- 108.9'-110.0' GRAY HARD FRESH WIDE FRACTURED LIMESTONE — 629.5'
- 110.0'-121.0' GRAY SOFT SLIGHTLY WEATHERED MASSIVE CLOSE FRACTURED SILTSTONE — 618.5'

END OF BORING AT 121.0'

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

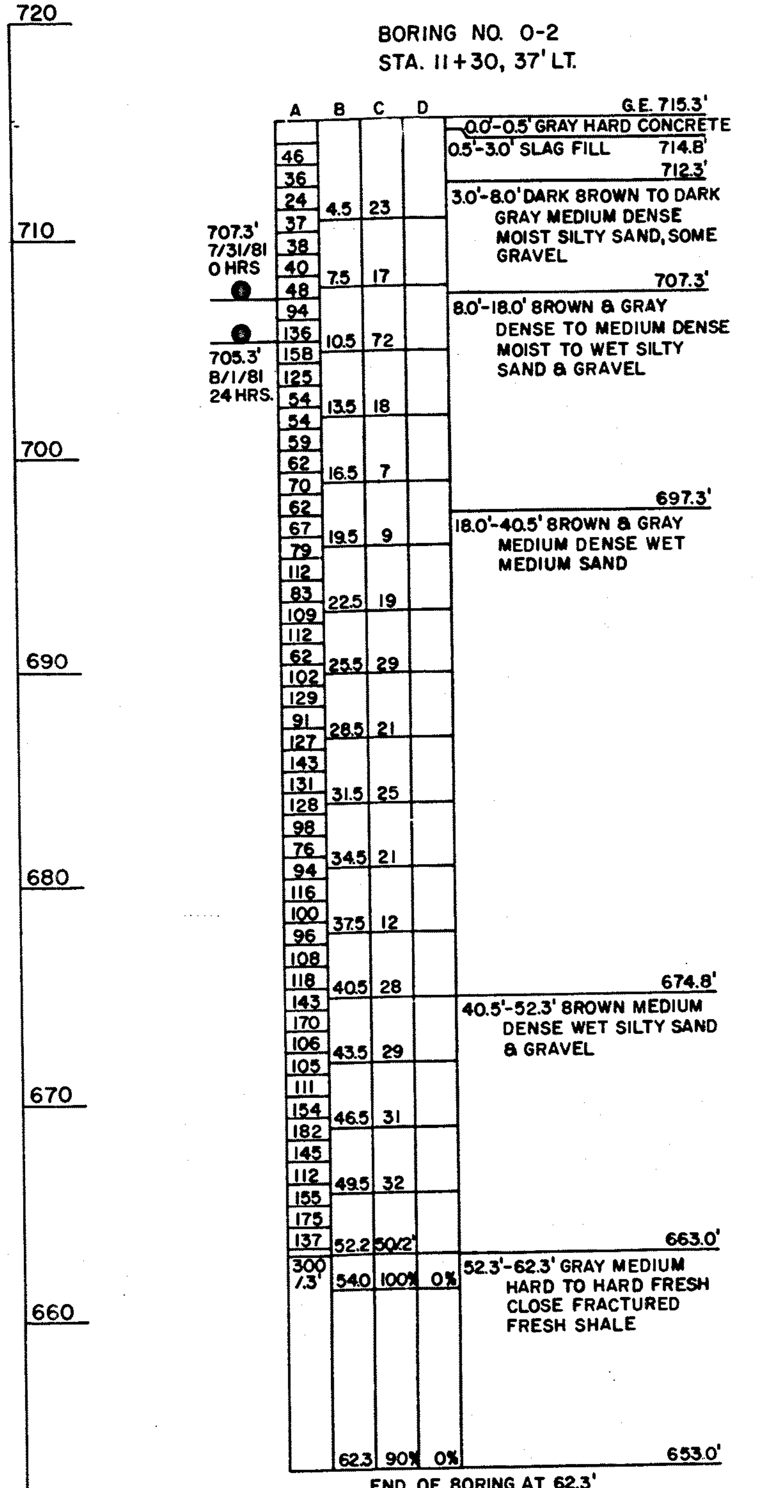
L.R. 766 SEC. 23	L.R. 764 SEC. 19
W.B. STA.1098+30.29 TO STA.1101+35.48	W.B. STA.631+16.78 TO STA.646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
BORING LOGS

APPROVED [illegible]
BRIDGE ENGINEER

SHEET 108 OF 114
0010010
S-14584

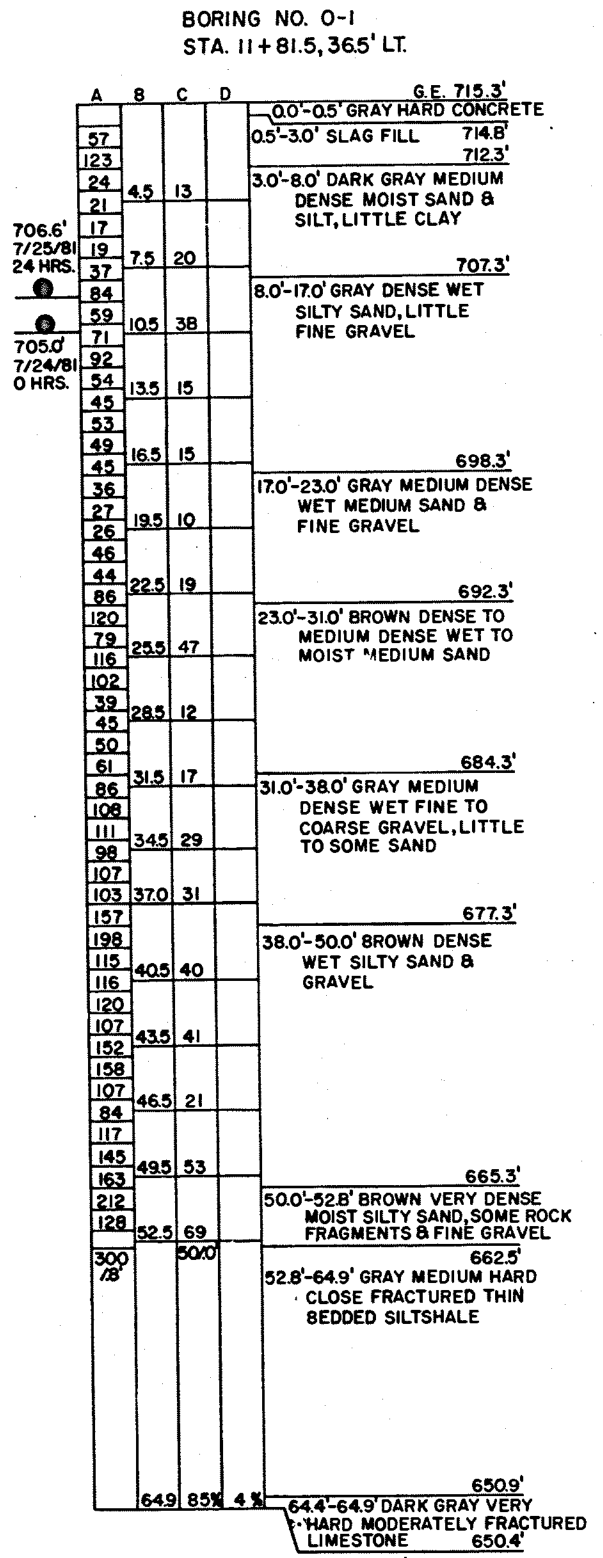
URR
URR



END OF BORING AT 62.3'

OBSERVATION WELL INSTALLED 7/31/81

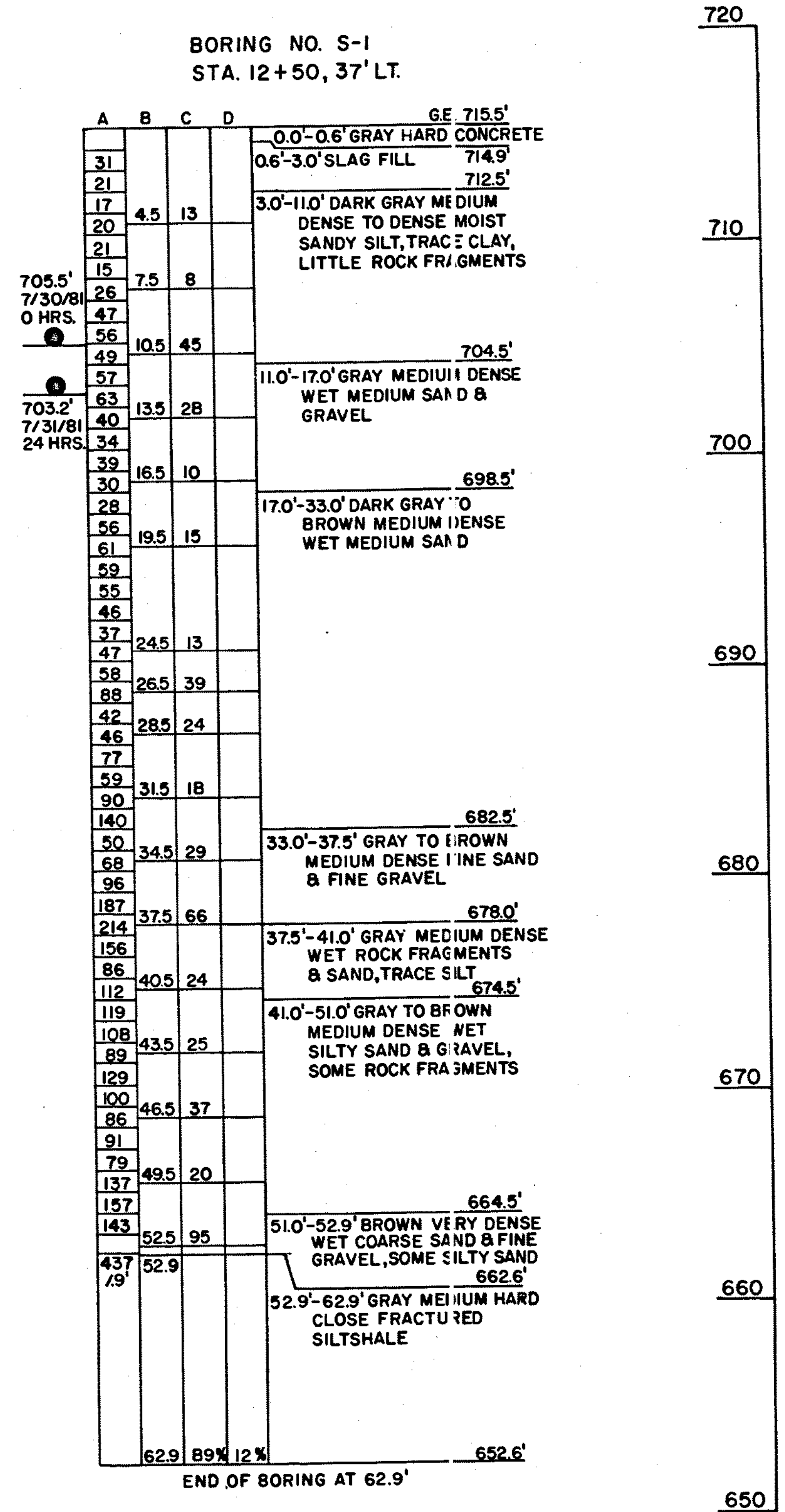
DATE	ELEV. OF WATER LEVEL IN WELL	RIVER ELEV.
8/3/81	705.3'	710.4'
8/4/81	705.7'	710.5'
8/6/81	706.3'	710.2'
8/25/81	707.7'	710.9'
11/2/81	708.3'	710.7'
3/28/82	707.7'	710.2'



END OF BORING AT 64.9'

OBSERVATION WELL INSTALLED 7/24/81

SEE WATER LEVEL DATA AT RIGHT SIDE OF SHEET



END OF BORING AT 62.9'

BORING NO. O-1
STA. 11+81.5, 36.5' LT.

OBSERVATION WELL INSTALLED 7/24/81

DATE	ELEV. OF WATER LEVEL IN WELL	ELEV. OF RIVER
7/29/81	706.6'	710.3'
8/3/81	705.9'	710.4'
8/4/81	706.6'	710.5'
8/6/81	706.8'	710.2'
8/25/81	708.5'	710.9'
9/9/81	708.1'	710.6'
11/2/81	709.0'	710.7'
3/28/82	708.0'	710.2'

JRR
WES
JRR

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23 — W.B. STA. 1098+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19 — W.B. STA. 631+16.78 TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

BORING LOGS

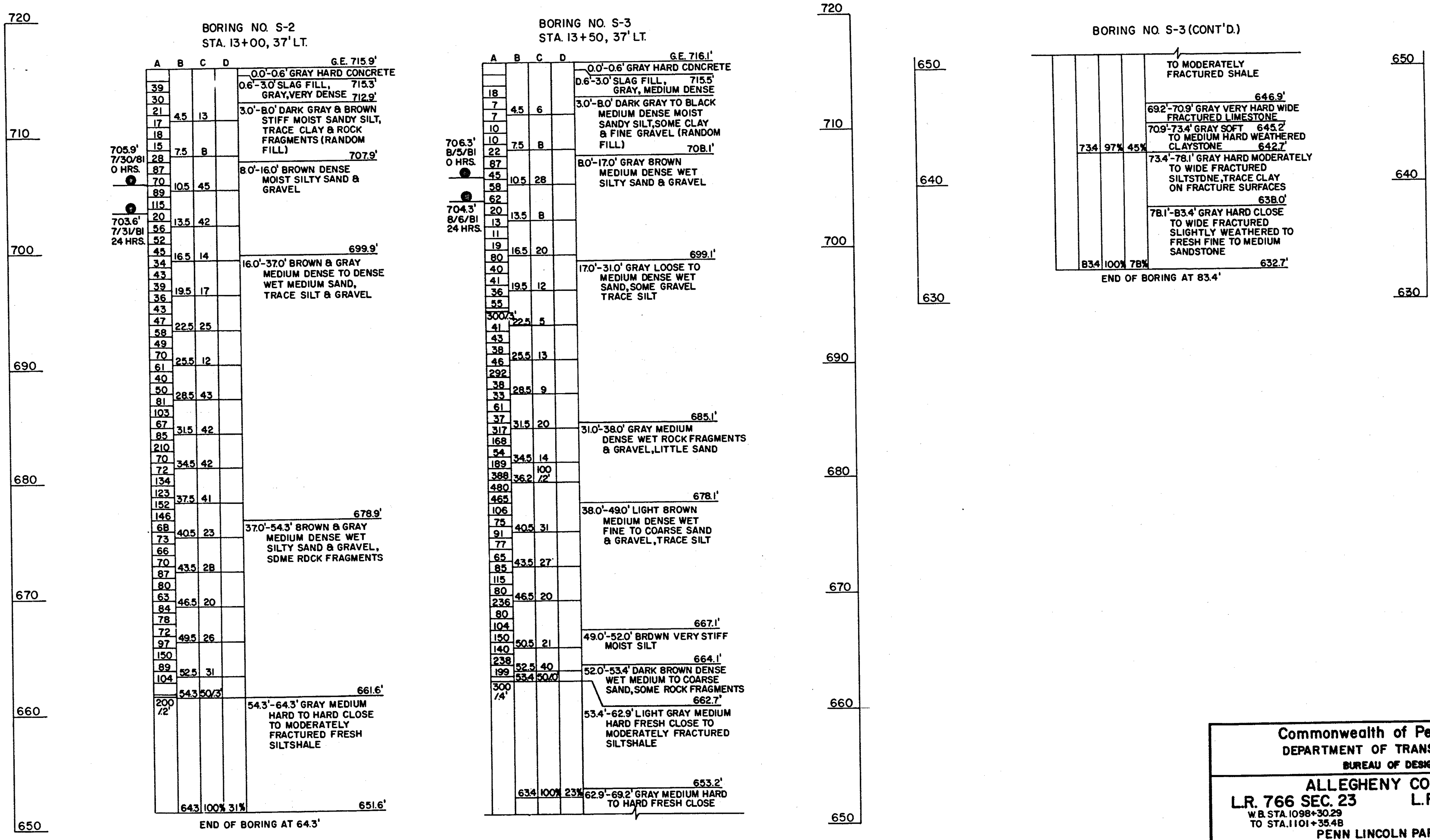
APPROVED AUG 23 1982

BRIDGE ENGINEER

SHEET 109 OF 114

0010011

S-14584



Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
BORING LOGS

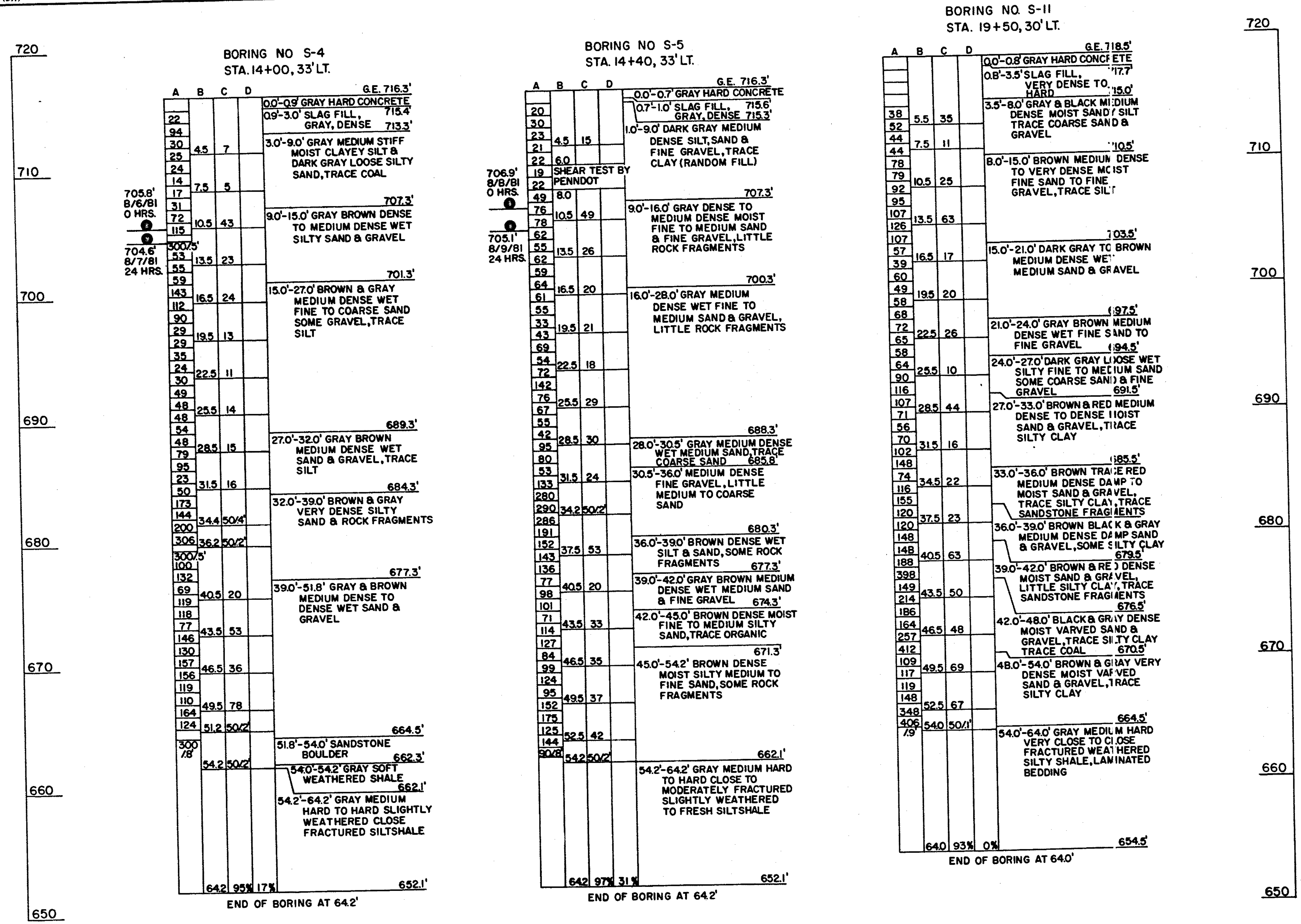
APPROVED

BRIDGE ENGINEER

SHEET 110 OF 114

0010012

S-14584



Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY
L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48
L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.49
PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
BORING LOGS

APPROVED
BRIDGE ENGINEER

SHEET 111 OF 114

S-14584

JRR
WES
JRR

D-4008 (3-77)

BORING NO. S-12
STA. 20+00, 33' LT.

A	B	C	D	Elevation	Description
				G.E. 722.0'	0.0'-0.8' GRAY HARD CONCRETE
				721.2'	0.8'-6.6' SLAG FILL, VERY DENSE TO HARD
18, 42	8.5	40		715.4'	6.6'-11.5' DARK GREEN TO GRAY MEDIUM DENSE TO DENSE MOIST FINE SANDY SILT LITTLE COARSE SAND & ROCK FRAGMENTS
46, 29, 33	11.5	13		710.5'	11.5'-25.0' BROWN & DARK GRAY MEDIUM DENSE MOIST TO WET MEDIUM SAND & GRAVEL TRACE FINE SAND & SILT
86, 147, 59	14.5	27			
45, 70, 60	17.5	24			
74, 66, 54	20.5	30			
74, 259, 84	23.5	18			
54, 60, 128	26.5	21		697.0'	25.0'-28.0' DARK GRAY MEDIUM DENSE WET MEDIUM SAND, TRACE COARSE SAND
363, 136, 49	29.5	28		694.0'	28.0'-37.0' BROWN MEDIUM DENSE WET FINE TO MEDIUM SAND, SOME ROCK FRAGMENTS, TRACE SILT
84, 73, 435	32.5	18			
127, 103, 75	35.5	22			
108, 138, 75	38.5	27		685.0'	37.0'-40.0' BROWN MEDIUM DENSE WET TO MOIST FINE TO MEDIUM SAND, LITTLE COARSE SAND & SILTY CLAY
132, 149, 84	41.5	20		682.0'	40.0'-43.0' DARK GRAY & ORANGE STIFF MOIST TO WET CLAYEY SILT
137, 217, 128	44.5	61		679.0'	43.0'-45.0' BROWN VERY DENSE WET FINE SAND & GRAVEL
213, 195, 1471	47.5	30		677.0'	45.0'-49.0' BROWN DENSE WET FINE TO MEDIUM SAND LITTLE COARSE SAND
234, 295, 117	50.5	35		673.0'	49.0'-58.1' BROWN DENSE WET SAND & GRAVEL, SOME SANDSTONE FRAGMENTS
133, 207, 109	53.5	24			
125, 114, 116	56.5	55			
245, 270	58.1	50/.1'		663.9'	58.1'-84.1' GRAY MEDIUM HARD WEATHERED TO SLIGHTLY WEATHERED SILTSHALE

Water level: 706.5' 8/23/81 0 HRS.

Elevations: 730, 720, 710, 700, 690, 680, 670, 660

BORING NO. S-12 (CONT'D.)

A	B	C	D	Elevation	Description
	68.1	100%	88%		
	78.1	100%	95%		
				637.9'	84.1'-88.1' VERY DARK GRAY & BLACK IMPURE HARD SILTY LIMESTONE
	88.1	100%	95%	633.9'	

END OF BORING AT 88.1'

Elevations: 650, 640, 630

BORING NO. S-6
STA. 22+93.3, 28' LT.

A	B	C	D	Elevation	Description
				G.E. 714.7'	0.0'-14.0' GRAY & BROWN MEDIUM STIFF TO STIFF MOIST TO WET SILT, TRACE CLAY
32, 11	4.5	6			
12, 19, 31	7.5	20			
41, 33, 24	10.5	17			
26, 23, 31	13.5	12		700.7'	14.0'-24.5' BROWN & GRAY MEDIUM DENSE TO DENSE WET SILTY SAND, TRACE CLAY & FINE GRAVEL
37, 68, 43	16.5	17			
68, 55, 49	19.5	18			
74, 71, 89	22.5	49			
92, 80, 60	25.5	20		690.2'	24.5'-26.0' DARK BROWN TO OLIVE GREEN VERY STIFF WET SILT
85, 97, 98	28.5	21		688.7'	26.0'-33.0' BROWN MEDIUM DENSE TO DENSE WET SILT
123, 168, 106	31.5	37			
134, 128, 82	34.5	15		681.7'	33.0'-35.0' BROWN & GRAY STIFF MOIST CLAYEY SILT TRACE FINE SAND
100, 141, 103	37.5	44		679.7'	35.0'-45.0' DARK GRAY VERY DENSE WET SILTY MEDIUM TO COARSE SAND
156, 222, 95	40.5	56			
138, 171, 112	43.5	44			
127, 127, 102	46.5	32		669.7'	45.0'-50.8' DARK BROWN & GRAY DENSE WET COARSE SAND TO FINE GRAVEL
88, 102, 82	49.5	41			
167, 300/.8'	50.8			663.9'	50.8'-58.4' GRAY MEDIUM HARD VERY CLOSE TO MODERATELY FRACTURED SILTSTONE
					58.4'-67.9' GRAY HARD MODERATELY

Water levels: 708.6' 8/20/81 24 HRS.; 707.9' 8/19/81 0 HRS.

Elevations: 720, 710, 700, 690, 680, 670, 660

BORING NO. S-6 (CONT'D.)

A	B	C	D	Elevation	Description
	60.8	100%	52%		FRACTURED FINE SANDSTONE
				646.8'	67.9'-80.8' GRAY HARD MODERATELY FRACTURED SILTSHALE
	70.8	100%	82%		
	80.8	94%	94%	633.9'	

END OF BORING AT 80.8'

Elevations: 650, 640, 630

Mark	Description	By	Chk'd.	App'd.	Date

REVISIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
W.B. STA. 1098+30.29 TO STA. 1101+35.48

L.R. 764 SEC. 19
W.B. STA. 631+16.78 TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM

BORING LOGS

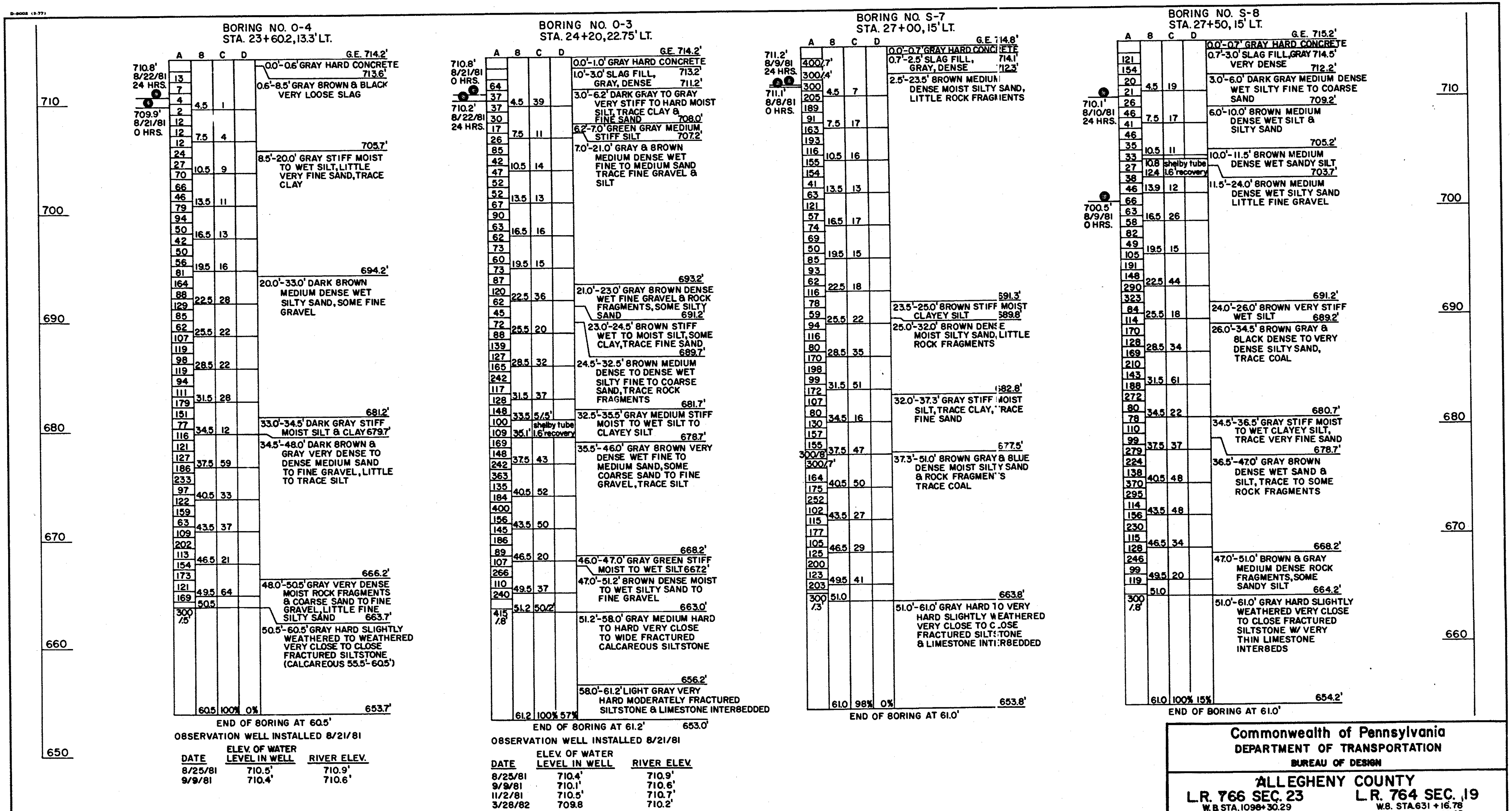
APPROVED AUG 23 1984
B. J. Kotalik
BRIDGE ENGINEER

SHEET 112 OF 114
0610014

S-14584

JRR
WES
JRR

BARCLAY BROS. INC.



Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ALLEGHENY COUNTY

L.R. 766 SEC. 23
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W.B. STA. 631+16.78 TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
BORING LOGS

APPROVED ____

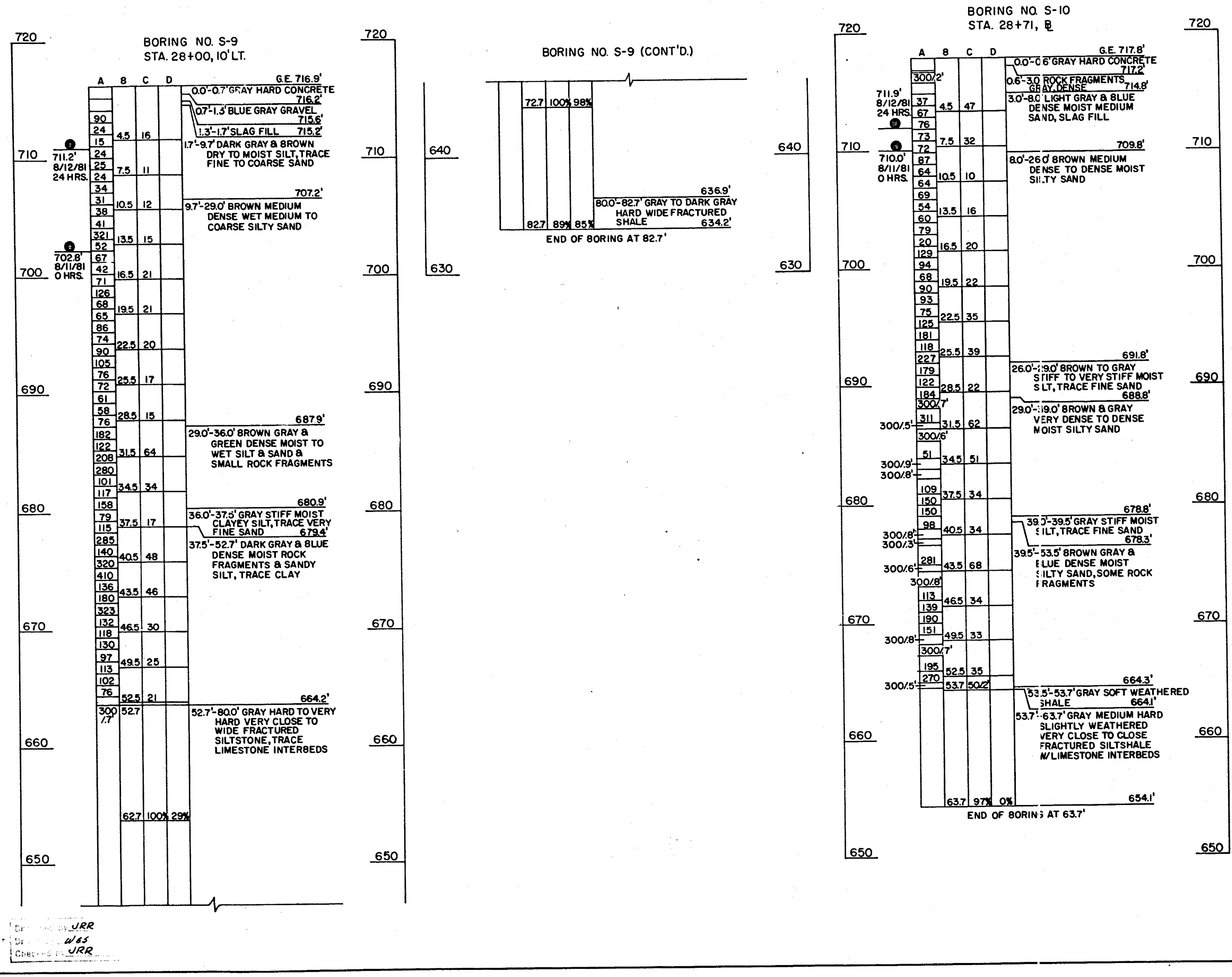
BRIDGE ENGINEER

SHEET 113 OF 114

0010015

S-14584

URA
WES
URA



Commonwealth of Pennsylvania
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ALLEGHENY COUNTY

L.R. 766 SEC. 23
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L.R. 764 SEC. 19
W.B. STA. 631+16.78
TO STA. 646+62.49

PENN LINCOLN PARKWAY
FLOODWALL PROTECTION SYSTEM
BORING LOGS

APPROVED AUG 23 19__
BRIDGE ENGINEER

SHEET 114 OF 114
0610016
S-14584

FEDERAL PROJECT NO. Q40-X111-294

CAQ	DISTRICT	COUNTY	CITY	BOROUGH	ROUTE	SECTION	TOTAL SHEETS
	11-0	ALLEGHENY	PITTSBURGH	———	0279	A33	85
		ALLEGHENY	PITTSBURGH	———	0376	A28	

STATE PROJECT NUMBER

SYS	S.R. or W.O.	SPUR	PHA	SECTION	DIST.	CO.
A	- 0 2 7 9	0	7	A 3 3	11	1
A	- 0 3 7 6	0	7	A 2 8	11	1

CMS NO. 111662

S.R. 0279 PREVIOUSLY KNOWN AS L.R. 766 AND L.R. 264
S.R. 0376 PREVIOUSLY KNOWN AS L.R. 766 ANO L.R. 764

COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF TRANSPORTATION

AND

CITY OF PITTSBURGH

DEPARTMENT OF ENGINEERING AND CONSTRUCTION

DRAWINGS

FOR

CONSTRUCTION

OF

FORT PITT BOULEVARD EASTBOUND/ INTERSTATE CONNECTOR

STATE ROUTE 0279 **SECTION** A33
IN ALLEGHENY COUNTY

FROM SB STA. 1082+50.00 TO SB STA. 1089+00.00 LENGTH 838.37 FT. 0.159 MI.
FROM SEG. 0061 OFFSET 1331 TO SEG. 0061 OFFSET 2231

AND

STATE ROUTE 0376 **SECTION** A28
IN ALLEGHENY COUNTY

FROM EB STA. 639+75.00 TO EB STA. 664+50.00 LENGTH 2341.71 FT. 0.444 MI.
FROM SEG. 0002 OFFSET 2210 TO SEG. 0004 OFFSET 1779

TOTAL LENGTH 3180.08 FT. 0.602 MI.

ALSO

FORT PITT BOULEVARD EASTBOUND
FROM STA. 1095+92.00 TO STA. 14+70.11

STATE ROUTE 8041

STATE ROUTE 8095

D.E.C. PROJECT NO. 84225

RECORD DRAWINGS

EXISTING PLANS (UPON REQUEST)

OWG. NO.	DATE	OESCRIPTION	SHEET NO.
16800 - 16880	1939	RECONSTRUCTION & WIDENING WATER STREET	65 SHEETS
17201 - 17286	1939	RECONSTRUCTION & WIOENING WATER STREET	42 SHEETS
1920S - 19465	1939	RECONSTRUCTION OF WATER STREET (SHOP ORAWINGS)	67 SHEETS
———	1978	REHABILITATION OF STANWIX STREET BRIOGE OVER PENN-LINCOLN PARKWAY	2S SHEETS
———	1979	REHABILITATION OF WOOO STREET BRIDGE OVER PENN-LINCOLN PARKWAY	41 SHEETS
S-1783	1951	L.R. 764 SEC. 10 & 11 OOWNTOWN INTERCHANGE (RAMP B)	39 SHEETS
S-178S	19S1	L.R. 764 SEC. 10 DOWNTOWN INTERCHANGE (RAMP B)	S5 SHEETS
———	1982	L.R. 766 SEC. 23 & L.R. 764 SEC. 19 ROAOWAY LIGHTING	29 SHEETS
———	2001	OEMOLITION OF FORT PITT BOULEVARO EASTBOUNO BRIDGE ANO MARKET STREET BRIOGE	49 SHEETS
———	1982	L.R. 766 SEC. 23 & L.R. 764 SEC. 19 FLOOOWALL PROTECTION SYSTEM	26 SHEETS
S-14584	1982	L.R. 766 SEC. 23 & L.R. 764 SEC. 19 FLOOOWALL PROTECTION SYSTEM (STRUCTURE PLAN)	114 SHEETS
S-14584	1982	L.R. 766 SEC. 23 & L.R. 764 SEC. 19 EXISTING MECHANICAL AND ELECTRICAL SUMP OETAILS	1 SHEET
E-2	1962	ELECTRICAL PLAN - POINT STATE PARK MAINTENANCE BUILOING	1 SHEET
———	1982	L.R. 766 SEC. 23 & L.R. 764 SEC. 19 ORAWINGS FOR THE ERECTION OF SIGNS AND SIGN LIGHTING	12 SHEETS
———	198S	L.R. 764 RAMP D TUNNEL LIGHTING	3 SHEETS
———	2001	SR 0279 SEC. AS8 ANO SR 0376 SEC. A25 RIGHT OF WAY PLAN	1S SHEETS
S-1903	19S5	L.R. 766 SEC. 3D, & L.R. 766 SEC. 3E POINT HIGHWAY PROJECT (RAMP Bu)	12 SHEETS
S-1904	1956	L.R. 766 SEC. 3E POINT HIGHWAY PROJECT (RAMP Bu & RAMP F)	16 SHEETS
S-2076S	1993	S.R. 3027 SEC. A03 10-SPAN STEEL GIROER ANO TRUSS BRIOGE REHABILITATION (SMITHFIELD STREET BRIOGE)	37 SHEETS
S-23982	2001	S.R. 0376 SEC. 25 REHABILITATION OF 6-SPAN STEEL I-BEAM BRIDGE (RAMP Bu)	53 SHEETS
———	——	SUBSURFACE PROFILE	65 SHEETS

SCALE
HORIZONTAL 20 FEET 0 20 FEET

SCALE
VERTICAL 4 FEET 0 4 FEET

DESIGN DESIGNATION

S.R. 0279 SB
HIGHWAY CLASSIFICATION - URBAN INTERSTATE
OESIGN SPEED - 50 MPH
PAVEMENT WIOTH - 2 - 12' LANES
SHOULDER WIDTH - 3'-6"

TRAFFIC DATA
CURRENT A.D.T. - 6920D (2002) *
DESIGN YEAR A.D.T. - 69200 (2022) *
O.H.V. - 4600
D - N/A
T - 11%

S.R. 0376 EB
HIGHWAY CLASSIFICATION - URBAN INTERSTATE
DESIGN SPEED - SO MPH
PAVEMENT WIDTH - 2 - 12' LANES
SHOULDER WIDTH - 3'-6"

TRAFFIC DATA
CURRENT A.D.T. - 33760 (2002) *
DESIGN YEAR A.D.T. - 33760 (2022) *
D.H.V. - 2S60
O - N/A
T - 8%

FORT PITT BOULEVARD EB /INTERSTATE CONNECTOR
HIGHWAY CLASSIFICATION - URBAN COLLECTOR / RAMP
OESIGN SPEEO - 40 MPH
PAVEMENT WIOTH - 2 - 10' LANES / 1 - 14'-10" LANE
SHOULDER WIDTH - N/A

TRAFFIC DATA
CURRENT A.D.T. - 9590 / 6660 (2002)
DESIGN YEAR A.D.T. - 11270 / 8270 (2022)
O.H.V. - 1127 / 827
O - N/A
T - 7%

* MAXIMUM CAPACITY

ALSO INCLUDEO:

CROSS SECTIONS (UPON REQUEST)	18 SHTS
TRAFFIC CONTROL PLANS	27 SHTS
TRAFFIC SIGNAL PLAN	26 SHTS
SIGNING ANO SIGN LIGHTING PLAN	20 SHTS
PAVEMENT MARKING ANO DELINEATOR PLAN	10 SHTS
HIGHWAY LIGHTING PLAN	10 SHTS
PITTSBURGH PARKING AUTHORITY CONOUIT PLAN	4 SHTS
EROSION AND SEDIMENT POLLUTION CONTROL PLAN	14 SHTS
STRUCTURE PLAN S-24389	97 SHTS
STRUCTURE PLAN BPAA 02-2419	59 SHTS
STRUCTURE PLAN S-24391	83 SHTS
STRUCTURE PLAN BPAA 02-2417	42 SHTS
STRUCTURE PLAN BPAA 02-2416	29 SHTS
STRUCTURE PLAN BPAA 02-2418	34 SHTS
STRUCTURE PLAN S-24390	64 SHTS
STRUCTURE PLAN BPAA 02-2420	6 SHTS
EXISTING PLANS (UPON REQUEST)	SEE THIS SHEET

STANOARO ORAWINGS (UPON REQUEST):

CITY OF PITTSBURGH STANDARD CONSTRUCTION ORAWINGS	25 SHTS

CONTRACTOR - BRAYMAN CONSTRUCTION CO.
PROJECT COMP. DATE -
DATE OPENED TO TRAFFIC:
MS-1 INTERSTATE CONNECTOR - DEC. 5, 2002
MS-4 FORT PITT BLVD. - RELOCATED } DEC., 2002
MS-5 ALL OTHER BRIDGES/ ROADWAYS }
MS-6 RAMP N - JAN, 2003

ESTABLISHEO AS A LIMITEO ACCESS HIGHWAY FROM STATION 948+40 TO STATION 1101+08.2S BY PLAN OF LEGISLATIVE ROUTE 766 SECTION APPROVEO FEBRUARY, 1950.

ESTABLISHED AS A LIMITEO ACCESS HIGHWAY FROM STATION 1080+27.83 RAMP F TO STATION 1092+00.00 RAMP F PLAN OF LEGISLATIVE ROUTE 766 SECTION 17 APPROVED ON APRIL 29 1960.

PLAN SHEET 11 OF 8S WAS PREPARED BY MONALOH BASIN ENGINEERS, INC.

STRUCTURE PLANS BPAA 02-2419, S-24391 AND S-24390 WERE PREPAREO BY MICHAEL BAKER JR. INC.

STRUCTURE PLANS BPAA 02-2417, BPAA 02-2416 ANO BPAA 02-2420 WERE PREPARED BY TRI-STATE OESIGN AND OEVELOPMENT, INC.

PLANS PREPARED BY:
SAI CONSULTING ENGINEERS, Inc.
DESIGN • INSPECTION • CONSTRUCTION MANAGEMENT
PITTSBURGH, PA.

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL GLENN D. STICKEL ENGINEER 34393-E

Glenn D. Stickel
REG. PROF. ENGINEER PENNA. NO. 34393-E
DATE: DEC. 3, 2001

CITY OF PITTSBURGH

APPROVED	OATE:
BRIDGE & MISC. STRUCTURES OIVISION	12/4/01
STREETS OIVISION	12/4/01
LIGHTING OIVISION (DPW)	12-05-01
TRAFFIC OIVISION	12.4.01
ASSISTANT OIRECTOR OF ENGINEERING	12.4.01
OIRECTOR	12-4-01

RECOMMENDED DATE: 12/5/01
OISTRICT ENGINEER

RECOMMENDED DATE: 12-6-01
OEPUTY SECRETARY

APPROVED DATE: 12-6-01
SECRETARY OF TRANSPORTATION (ON BEHALF OF THE GOVERNOR AS WELL AS HIMSELF)

12/01/2001

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EXISTING PLANS (UPON REQUEST)

DWG. NO.	DATE	DESCRIPTION	SHEET NO.
16800-16880	1939	RECONSTRUCTION & WIDENING WATER STREET	65 SHTS
17201-17286	1939	RECONSTRUCTION & WIDENING WATER STREET	42 SHTS
19205-19465	1939	RECONSTRUCTION OF WATER STREET (SHOP DRAWINGS)	67 SHTS
———	1978	REHABILITATION OF STANWIX STREET BRIDGE OVER PENN-LINCOLN PARKWAY	25 SHTS
———	1979	REHABILITATION OF WOOD STREET BRIDGE OVER PENN-LINCOLN PARKWAY	41 SHTS
S-1783	1951	L.R. 764 SEC. 10 & 11 DOWNTOWN INTERCHANGE (RAMP B)	39 SHTS
S-1785	1951	L.R. 764 SEC. 10 DOWNTOWN INTERCHANGE (RAMP B)	55 SHTS
———	1982	L.R. 766 SEC. 23 & L.R. 764 SEC. 19 ROADWAY LIGHTING	29 SHTS
———	2001	DEMOLITION OF FORT PITT BOULEVARD EASTBOUND BRIDGE AND MARKET STREET BRIDGE	49 SHTS
———	1982	L.R. 766 SEC. 23 & L.R. 764 SEC. 19 FLOODWALL PROTECTION SYSTEM	26 SHTS
S-14584	1982	L.R. 766 SEC. 23 & L.R. 764 SEC. 19 FLOODWALL PROTECTION SYSTEM (STRUCTURE PLAN)	114 SHTS
S-14584	1982	L.R. 766 SEC. 23 & L.R. 764 SEC. 19 EXISTING MECHANICAL AND ELECTRICAL SUMP DETAILS	1 SHT
E-2	1962	ELECTRICAL PLAN - POINT STATE PARK MAINTENANCE BUILDING	1 SHT
———	1982	L.R. 766 SEC. 23 & L.R. 764 SEC. 19 DRAWINGS FOR THE ERECTION OF SIGNS AND SIGN LIGHTING	12 SHTS
———	1985	L.R. 764 RAMP D TUNNEL LIGHTING	3 SHTS

EXISTING PLANS (UPON REQUEST) (CONT.)

DWG. NO.	DATE	DESCRIPTION	SHEET NO.
———	2001	S.R. 0279 SECTION A58 AND S.R. 0376 SECTION A25 RIGHT OF WAY PLAN	15 SHTS
S-1903	1955	L.R. 766 SEC. 30, & L.R. 766 SEC. 3E POINT HIGHWAY PROJECT (RAMP Bu)	12 SHTS
S-1904	1956	L.R. 766 SEC. 3E POINT HIGHWAY PROJECT (RAMP Bu & RAMP F))	16 SHTS
S-20765	1993	S.R. 3027 SEC. A03 10-SPAN STEEL GIRDER AND TRUSS BRIDGE REHABILITATION (SMITHFIELD STREET BRIDGE)	37 SHTS
S-23982	2001	S.R. 0376 SECTION 25 REHABILITATION OF 6-SPAN STEEL I-BEAM BRIDGE (RAMP Bu)	53 SHTS
———	———	SUBSURFACE PROFILE	65 SHTS

PROPERTY OWNERS

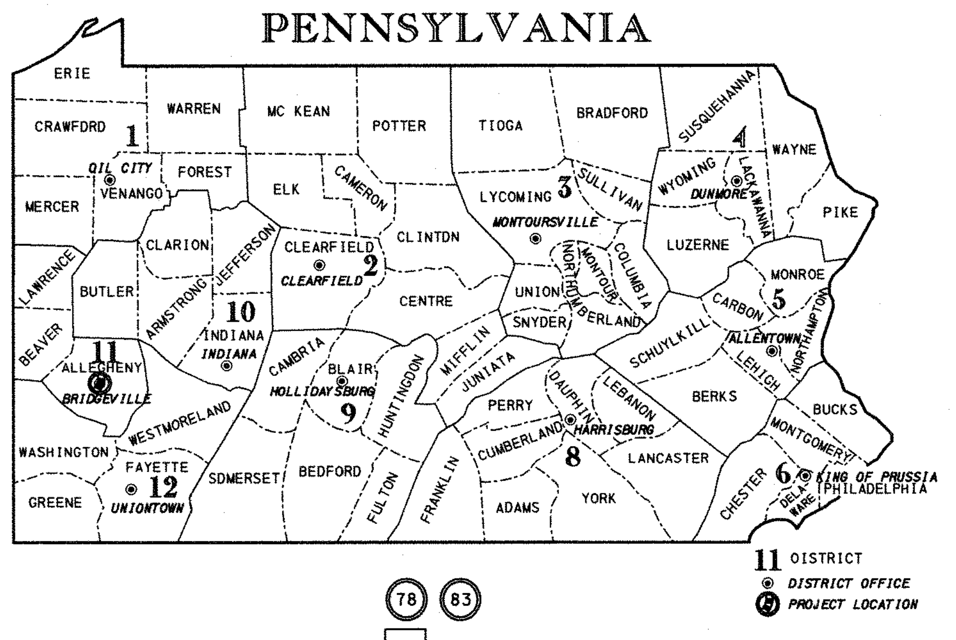
1. CITY OF PITTSBURGH
2. PRESS ACQUISITION CORPORATION
3. STANWIX STREET ASSOCIATES, LP.
4. AETNA LIFE INSURANCE CO.
5. RITA S. ALLAN
6. HENDERSON BROTHERS, INC.
7. ONE MARKET SQUARE LIMITED PARTNERSHIP
8. DOUBLE EAGLE LIMITED PARTNERSHIP
9. CENTRAL PARKING SYSTEM REALTY OF NEW YORK, INC.
10. BARRY J. DEBONE & MARIAN H. DEBONE
11. DUFF W. McCRADY

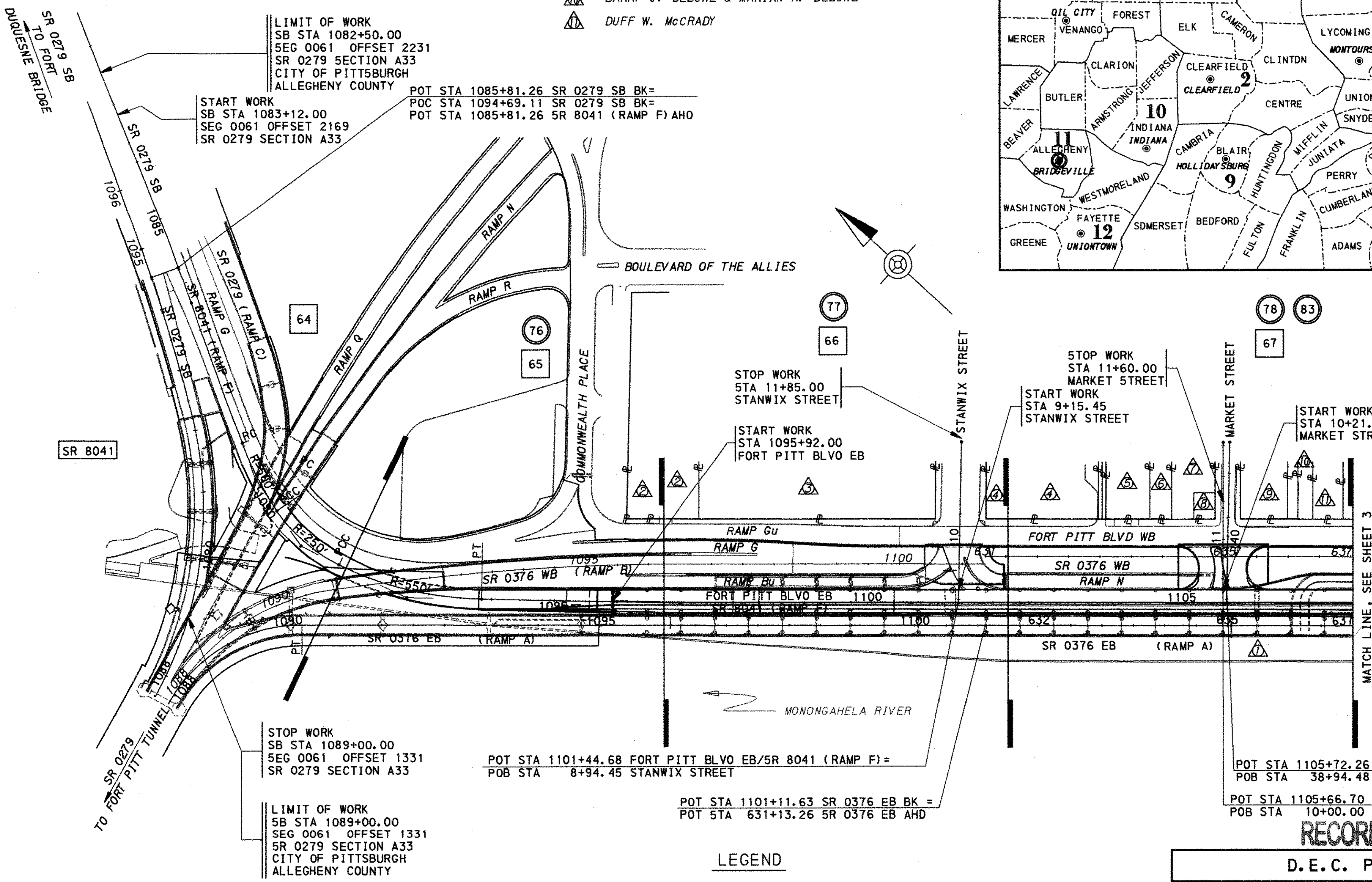
* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	2 OF 85

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10-1-08	SAT





INDEX MAP

SCALE
100 FEET 0 100 FEET

LEGEND

PARCEL IDENTIFICATION NO. (NO TAKE)

PROFILE SHEET NO.

PLAN SHEET NO.

SHEET LIMITS

RECORD DRAWINGS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER JAMES F. WEIMER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
INDEX MAP

SCALE: AS SHOWN SHEET NO 2 OF 85 ACCESSION NO ______
DATE: 12/01/2001 CASE NO ______

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DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	3 OF 85
CITY OF PITTSBURGH				

* 0279 & 0376
** A33 & A28

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

PROPERTY OWNERS

1. CITY OF PITTSBURGH
12. P.P.C. REALTY ASSOCIATES
13. VIRGINIA COLE & BARBARA TENNYSON
14. LOUIS D. ASTORINO, JEAN M. ASTORINO, LOUIS P. ASTORINO, CHRISTINE L. ASTORINO
15. ASTORINO FAMILY PARTNERSHIP
16. KENNETH GOLDSMITH
17. ESQUIRE REALTY ASSOCIATES JOINT VENTURE
18. KENNETH GOLDSMITH & WEST PENNSYLVANIA BANK
19. SEVEN WOOD STREET
20. ALLEGHENY COUNTY INDUSTRIAL DEVELOPMENT AUTHORITY
21. UNITED WAY OF ALLEGHENY COUNTY
22. JD & D ENTERPRISES
23. W.T. McCULLOUGH ELECTRIC COMPANY
24. GRAPHIC ARTS COLOR CORPORATION
25. EUGENE J. PASKOWSKI, a/k/a GENE PASKI
26. ALLEGHENY COUNTY INDUSTRIAL DEVELOPMENT AUTHORITY
27. THE BUNCHER COMPANY

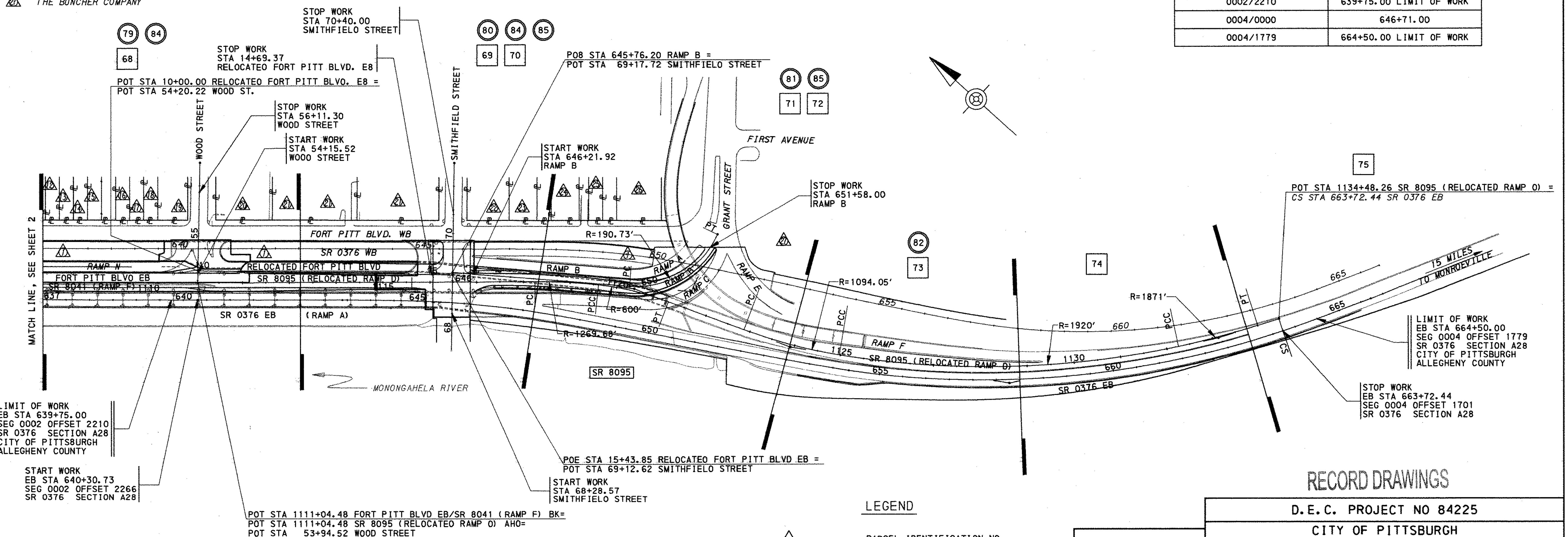
RECORD OF EXISTING TYPES OF ROADWAY PAVEMENT

RAMP 8	3" BIT. SURF. CRSE. JA-1 9" P.C.C. BASE CRSE. - A 9" R.C.C. BASE CRSE. - A
SR 8041 (RAMP F)	3½" BIT. SURF. CRSE. 9" PL. CEM. CONC. BASE CRSE. 6" SUBBASE
SR 8095 (RELOCATED RAMP O) (FLOODWALL AREA):	REINF. CEM. CONC. PAV'T, 11" OEPTH ASPHALT TREATEO PERMEABLE 8ASE CRSE., 4" DEPTH BIT. WEARING COURSE, FJ-1, 1" DEPTH BIT. CONC. 8ASE CRSE., VARIA8LE OEPTH ON STRUCTURAL SLAB
SR 8095 (RELOCATED RAMP O) (OUTSIOE FLOODWALL AREA):	REINF. CEM. CONC. PAV'T., 11" OEPTH SUBBASE, 8" OEPTH

NOTE: THE OEPTHS OF MATERIALS SHOWN ARE FOR OESIGN PURPOSES ONLY. ANY RISK OF UNANTICIPATED COSTS ASSOCIATEO WITH OIFFERENCES BETWEEN THE LISTED OEPTHS ANO THE ACTUAL OEPTHS SHALL BE ACCEPTEO BY THE CONTRACTOR.

TABULATION OF SEGMENT EQUALITIES

SEGMENT/OFFSET	STATION
SR 0279 SB SECTION A33	
0061/2231	1082+50.00 LIMIT OF WORK
0061/1900	1085+81.26
0061/1331	1089+00.00 LIMIT OF WORK
SR 0376 EB SECTION A28	
0002/2210	639+75.00 LIMIT OF WORK
0004/0000	646+71.00
0004/1779	664+50.00 LIMIT OF WORK



LEGEND

- PARCEL IDENTIFICATION NO. (NO TAKE)
- PROFILE SHEET NO.
- PLAN SHEET NO.
- SHEET LIMITS

INDEX MAP CONT.

SCALE
100 FEET 0 100 FEET

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
INDEX MAP

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER JAMES F. WEMER

DRAWN BY	JES
CHECKED BY	JFW

SCALE: AS SHOWN SHEET NO 3 OF 85 ACCESSION NO
DATE: 11/28/2001 CASE NO

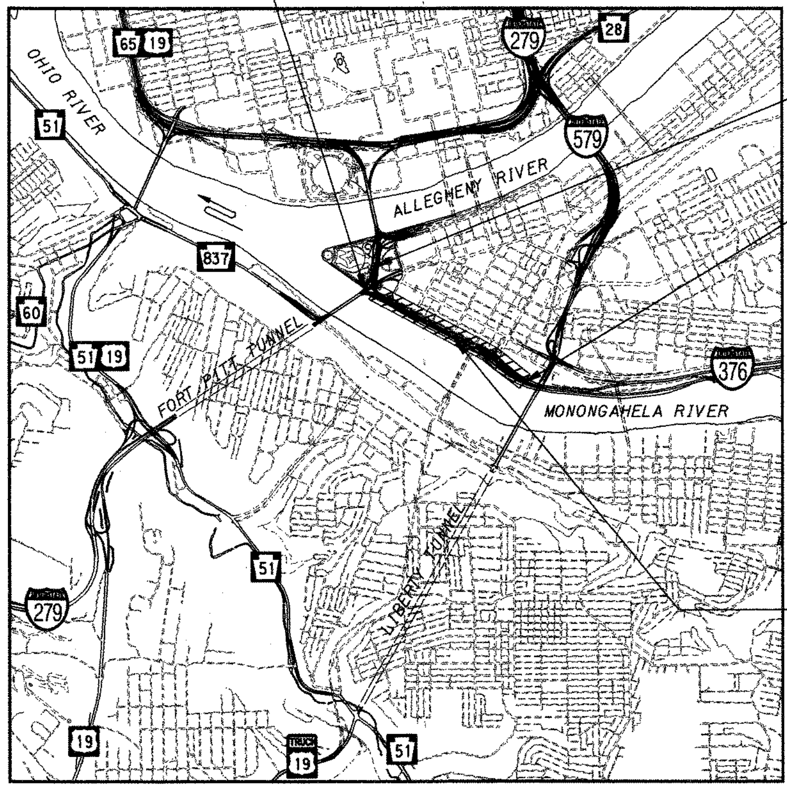
h:\projects\ustation\0042\Roadway\cnind02.dgn 11/28/2001

* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	4 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

LIMIT OF WORK
SB STA 1089+00.00
SEG 0061 OFFSET 1331
S.R. 0279 SEC. A33
CITY OF PITTSBURGH
ALLEGHENY COUNTY



LIMIT OF WORK
SB STA 1082+50.00
SEG 0061 OFFSET 2231
S.R. 0279 SEC. A33
CITY OF PITTSBURGH
ALLEGHENY COUNTY

LIMIT OF WORK
EB STA 664+50.00
SEG 0004 OFFSET 1779
S.R. 0376 SEC. A28
CITY OF PITTSBURGH
ALLEGHENY COUNTY

LIMIT OF WORK
EB STA 639+75.00
SEG 0002 OFFSET 2210
S.R. 0376 SEC. A28
CITY OF PITTSBURGH
ALLEGHENY COUNTY

LOCATION MAP

LEGEND

STATE ROUTE
LOCAL ROAD
PROJECT
SEE TRAFFIC CONTROL PLAN FOR DETOUR INFORMATION

SCALE

0 1000 2000 FT

SYMBOL	PUBLIC UTILITIES		
——SA——	ALLEGHENY COUNTY SANITARY AUTHDRITY (ALCOSAN) 330D PREBLE AVENUE PITTSBURGH, PA 15233	ATTN: MR. TIM PREBOST	(412) 734-8731
——FO——	MCI WORLDCOM 3710 SASSAFRAS WAY PITTSBURGH, PA 15201	ATTN: MR. JEFF MARTZ	(412) 261-9378
——EU——	DUQUESNE LIGHT COMPANY 411 SEVENTH AVENUE PITTSBURGH, PA 15222	ATTN: MR. LEN ZAPF	(412) 393-6315
—— W —— === S ===	PITTSBURGH WATER AND SEWER AUTHORITY 441 SMITHFIELD STREET PITTSBURGH, PA 15222	ATTN: MR. DON WALOORF	(412) 25S-8682
—— T ——	VERIZON 201 STANWIX STREET TENTH FLOOR PITTSBURGH, PA 15222	ATTN: MR. JON C. GAUNT	(412) 633-3843
—— G ——	EQUITABLE GAS COMPANY 200 ALLEGHENY CENTER MALL PITTSBURGH, PA 15212-5352	ATTN: MR. GEORGE POZZUTO	(412) 395-3127

PA ONE CALL SYSTEM, INC PHONE NO 1-800-242-1776

OESIGNER SERIAL NUMBERS: 0180500

GENERAL NOTES

THE LEGAL RIGHT OF WAY ON S.R. D279 ANO S.R. 0376 FROM STATION 1082+50.00 TO STATION 664+5D.00 IS VARIABLE BASE ON PLAN FOR S.R. 0279 SECTION A58 ANO S.R. D376 SECTION A2S SIGNED ON AUGUST 15, 2001 ANO RECORDED ON AUGUST 20, 2001 IN THE ALLEGHENY COUNTY RECORDER'S OFFICE IN STATE HIGHWAY PLAN BOOK VOLUME 121 PAGES 79-93.

THE LEGAL RIGHT- OF-WAY ON S.R. 0279 FROM STATION 1082+50.00 TO STATION 1089+00.00 IS VARIABLE BASED ON PLAN FOR S.R. 0279, SIGNEO ON FEBRUARY 3, 1999 AND RECOROED ON MARCH 30, 1999 IN THE ALLEGHENY COUNTY RECOROER'S OFFICE IN STATE HIGHWAY PLAN BOOK VOLUME 117, PAGES 80 - 106.

THE LEGAL RIGHT OF WAY ON S.R. 0376 FORMERLY L.R. 766 AND L.R. 764 FROM STATION 639+75.00 TO STATION 664+50.00 IS VARIABLE BASEO ON PLAN FOR L.R. 764 SIGNEO ON AUGUST 29, 1952 AND RECORDED ON SEPTEMBER 8, 1952, IN THE ALLEGHENY COUNTY RECORDER'S OFFICE IN STATE HIGHWAY PLAN BOOK VOLUME 10, PAGES 28 - 41, AND PLAN FOR L.R. 766 SIGNEO ON APRIL 30, 1957 ANO RECORDEO ON MAY 23, 1957, IN THE ALLEGHENY COUNTY RECORDER'S OFFICE IN STATE HIGHWAY PLAN BOOK VOLUME 16, PAGES 1D - 40

CONSTRUCT PROJECT IN ACCORDANCE WITH PUBLICATION 408 SPECIFICATIONS, DATED 2000, UNLESS OTHERWISE NOTED.

COORDINATES ARE BASED ON PRDJECT CONTROL ANO TIEO TO STATE PLANE COORDINATES. SCALE FACTOR ANO/OR COMBINEO FACTOR HAS NOT BEEN APPLIEO.

ALL ELEVATIONS ARE ESTABLISHEO USING USGS DATUM. EXISTING PLANS MAY HAVE DIFFERENT DATUM.

ALL CURVE OATA IS BASEO ON THE ARC OEFINITION.

THIS IS A FEOERAL-AID PROJECT AND AS SUCH IS SUBJECT TO INSPECTION BY REPRESENTATIVES OF THE FEDERAL HIGHWAY ADMINISTRATION, THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION, AND THE CITY OF PITTSBURGH.

REFERENCE TO THE "DIRECTOR" MEANS THE OIRECTOR, DEPARTMENT OF ENGINEERING ANO CONSTRUCTION, CITY OF PITTSBURGH.

THE PROJECT AREA HAS BEEN OISTURBEO BY CONSTRUCTION ACTIVITIES FROM A PREVIOUS CONTRACT. THE PLANS OO NOT REFLECT THE CHANGEO CONDITIONS PERFORMED BY THE PREVIOUS CONTRACT.

THE EXISTING GROUND CONTOURS SHOWN ON THESE PLANS ARE ONLY MEANT TO BE A GRAPHIC REPRESENTATION OF THE EXISTING TERRAIN. FIELD VERIFY ALL STRUCTURE ELEVATIONS, DRAINAGE STRUCTURE INVERTS AND OITCH/CHANNEL ELEVATIONS.

STATION ANO OFFSETS ARE MEASUREO TO GUTTER LINE, ALONG CURBS OR BARRIERS FOR ROAOWAY INLETS ANO TO THE CENTER OF BOX OR MANHOLE FOR OTHER ORAINAGE STRUCTURES.

OO NOT INTERFERE WITH THE OPERATION OF ANY FIRE HYORANT, FIRE CALL BOX OR POLICE CALL BOX, UNLESS AUTHORIZEO BY THE ENGINEER.

THE LOCATION OF UNOERGROUNO UTILITIES SHOWN ON THE PLANS HAVE BEEN OBTAINED BY FIELD SURVEY AND SEARCHES OF AVAILABLE RECORDS. THE CITY OF PITTSBURGH O.E.C. OOES NOT GUARANTEE THEIR ACCURACY OR COMPLETENESS. LOCATIONS AND DEPTHS MUST BE VERIFIED BY THE CONTRACTOR.

TEMPORARY CONSTRUCTION EASEMENTS ARE REQUIREO ONLY UNTIL THE CONSTRUCTION OR WORK INOICATED BY THE PLAN IS COMPLETED UNLESS SOONER RELINQUISHED IN WRITING BY THE DEPARTMENT.

DO NOT CONSIOER ANY OF THE DATA ON THE EXISTING STRUCTURE SUPPLIED IN THE ORIGINAL OESIGN DRAWINGS OR MADE AVAILABLE TO YOU BY THE DEPARTMENT DR ITS AUTHORIZED AGENTS AS POSITIVE REPRESENTATIONS OF ANY OF THE CONOITIONS THAT YOU WILL ENCOUNTER IN THE FIELO.

THE INFORMATION SHOWN ON THE PLANS FOR THE EXISTING BRIDGE IS NOT PART OF THE PLANS, PROPOSAL, OR CONTRACT ANO IS NOT TO BE CONSIDERED A BASIS FOR COMPUTATION OF THE UNIT PRICES USED FOR BIDDING PURPOSES. THERE IS NO EXPRESSEO OR IMPLIED AGREEMENT THAT INFORMATION IS CORRECTLY SHOWN. THE BIOOER IS NOT TO RELY ON THIS INFORMATION, BUT IS TO ASSUME THE POSSIBILITY THAT CONDITIONS AFFECTING THE COST AND/OR QUANTITIES OF WORK TO BE PERFORMEO MAY DIFFER FROM THOSE INDICATED.

GENERAL NOTES CONTINUED ON NEXT SHEET

LIST OF EQUATIONS

SR 0279 SB SECTION A33

STA. 108S+81.26 BK = STA. 1094+69.11 BK

OVERALL LENGTH OF PROJECT

SR 0279 SB SECTION A33
SB STA. 1082+50.DO TO SB STA. 108S+81.26 = 331.26 FT
SB STA. 1089+0D.00 TO SB STA. 1094+69.11 = 569.11 FT
SR 0376 EB SECTION A28
EB STA. 639+75.00 TO EB STA. 664+50.00 = 247S.00 FT
TOTAL = 3375.37 FT = 0.639 MILES

CONSTRUCTION LENGTH OF PROJECT

SR D279 SB SECTION A33
SB STA. 1083+12.00 TO SB STA. 1085+81.26 = 269.26 FT
SB STA. 1089+00.00 TO SB STA. 1094+69.71 = 569.11 FT
SR 0376 EB SECTION A28
EB STA. 640+30.73 TO EB STA. 663+72.44 = 2341.71 FT
TOTAL = 3180.08 FT = 0.602 MILES

EARTHWORK SUMMARY ENTIRE PROJECT

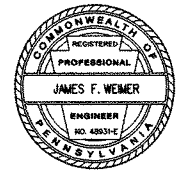
THE INFORMATION ON ESTIMATEO AMOUNTS OF EARTHWORK HAS BEEN USEO IN THE PRELIMINARY ESTIMATE. OO NOT USE AS A WAIVER OF ANY PROVISIONS OF THE SPECIFICATIONS AND CONTRACTS.

CU. YDS. OF EXCAVATIDN							CUBIC YDS. OF FOREIGN BORROW ***	CUBIC YDS. OF COMPLETEO EMBANKMENT *	CUBIC YDS. OF SEL BORROW EXC., STR. B'FILL **	CUBIC YDS. OF SEL BORROW EXC., COARSE AGG., NO. 57	CUBIC YDS. OF WASTE □
CLASS 1	CLASS 1 SPECIAL	CLASS 1A	CLASS 1B	CLASS 2	CLASS 3 **	CLASS 4					
S178	745	150	22S8	118	9219	13	3283	9892	3118	S55	14745

* INCLUDES ALL SELECTEO BORROW ITEMS
** 8137 CY INCLUOED IN LUMP SUM STRUCTURE ITEMS
*** FDR INFORMATION ONLY (FOR USE WITH ALTERNATE 1 IN ITEM NO. 900-0203)
□ INCLUOES 8600 CY OF NON-HAZARDOUS WASTE

DRAWN BY	JES
CHECKED BY	JFW

RECORD DRAWINGS



D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
LOCATION MAP AND GENERAL NOTES

SCALE: AS SHOWN SHEET NO ACCESSION NO
OATE : 12/03/2001 4 OF 8S CASE NO

h:\projects\ustation\0042\Roadway\cngen01.dgn 12/03/2001

* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	5 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

GENERAL NOTES CONTINUED

THE EXISTING BRIDGE HAS BEEN REVIEWED FOR THE EXISTENCE OF LEAD PAINT, AND OTHER TOXIC MATERIALS SUCH AS CADMIUM AND CHROMIUM. LEAD BASED PAINT, CADMIUM AND CHROMIUM HAVE BEEN FOUND ON THESE STRUCTURE.

GIRDERS ARE VARIABLE DEPTH, CANTILEVERED, WITH DROP-IN-SPANS.

MAINTENANCE OF PROJECT AREA

KEEP PROJECT AREA CLEAN TO THE SATISFACTION OF THE ENGINEER DURING CONSTRUCTION. THE CONTRACTOR IS REQUIRED TO CLEAN ALL OF THE ADJACENT ROADWAYS AND WHARF AREA AND ADJACENT STORE FRONT WINDOWS WITHIN THE LIMITS OF WORK WHEN REQUESTED BY THE ENGINEER AND AT THE COMPLETION OF THE CONTRACT. PAYMENT WILL BE INCLUDED IN THE ITEM FOR MOBILIZATION.

CITY MONUMENTS

NOTIFY THE DEPARTMENT OF ENGINEERING AND CONSTRUCTION (MR. LEONARO RECKER AT (412) 255-2733 AT LEAST FORTY-EIGHT (48 HOURS IN ADVANCE OF ANY CONSTRUCTION WHICH MAY INVOLVE STREET MONUMENTS OR BENCHMARKS.

PARKING METERS

NOTIFY THE PARKING AUTHORITY OF PITTSBURGH (412) 560-2531 AT LEAST (7) DAYS IN ADVANCE OF ANY CONSTRUCTION WHICH MAY INVOLVE PARKING METERS.

STREET SIGNS

REMOVE AND STORE EXISTING CITY STREET SIGNS ON SITE, AND THEN NOTIFY THE TRAFFIC DIVISION, WHO WILL DIRECT THEIR DISPOSAL OR DELIVERY TO THE CITY SIGN SHOP AT NO ADDITIONAL PAYMENT.

SAW CUTTING

SAW CUT THE EXISTING SIDEWALK AND STREET PAVEMENT TO FULL DEPTH AND TO THE APPROVAL OF THE ENGINEER. PAYMENT FOR THE SAW-CUTTING IS INCIDENTAL TO THE VARIOUS ITEMS OF WORK.

RE-USABLE MATERIALS

DETERMINATION OF REUSABLE MATERIALS IS AT THE SOLE DISCRETION OF THE ENGINEER.

STOCKPILE AND SECURE ON SITE ONLY THE REUSABLE MATERIALS AS DESIGNATED BY THE ENGINEER. PROMPTLY REMOVE ALL NON-USABLE MATERIALS FROM THE WORK SITE UNLESS OTHERWISE DIRECTED.

CONTRACTOR IS TO COORDINATE WITH THE CITY THE REMOVAL OF RE-USABLE STOCKPILED ITEMS FROM THE PROJECT SITE. CONTRACTOR IS TO LOAD STOCKPILED ITEMS ONTO CITY TRUCKS.

OBTAIN RECEIPTS FOR ALL SALVAGED MATERIALS ACCEPTED BY THE CITY.

EXISTING BASEMENT AND UTILITY VAULT STRUCTURES

DETERMINE THE EXACT LOCATION OF WORK RELATIVE TO THE EXISTING BASEMENT WALLS AND UTILITY VAULT STRUCTURES. IN THE EVENT THE LOCATION OF THE EXISTING STRUCTURES INTERFERES WITH THE PROPOSED CONSTRUCTION, OR THE PROPOSED CONSTRUCTION ADVERSELY AFFECTS THE BASEMENT WALL OR VAULT, CONTACT THE ENGINEER IMMEDIATELY FOR DIRECTION.

MEETING EXISTING CURB

CONSTRUCT CURB TO MATCH EXISTING SIDE STREET CURB. DO NOT CONSTRUCT SIDEWALK HIGHER THAN RETURNS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

EXISTING ELECTRICAL CONDUIT

ALWAYS ASSUME THE EXISTING ELECTRICAL CONDUITS ARE ACTIVE AND CONTAIN HIGH VOLTAGE ENERGIZED CABLE. CONTACT DUQUESNE LIGHT COMPANY FOR COORDINATION AND DIRECTION BEFORE STARTING WORK.

WATER LINE WORK

THE OPERATION OF VALVES ON THE WATER SYSTEM WILL BE DONE ONLY BY PWSA FORCES.

CONTACT THE EXECUTIVE DIRECTOR OF THE PWSA A MINIMUM OF SEVENTY-TWO (72) HOURS PRIOR TO NEEDING VALVES TO BE OPERATED. THE EXECUTIVE DIRECTOR OF THE PWSA WILL MAKE ARRANGEMENTS TO HAVE THE WORK PERFORMED.

CLEAN ALL WATER BOXES AND MANHOLES AFTER PAVING IS COMPLETED. PAYMENT IS INCIDENTAL TO THE WATERLINE ITEMS OF WORK.

STREET LIGHTING INSTALLATION

FOR JUNCTION BOX, SPLICE BOX, GROUND WIRE ASSEMBLY AND OTHER MISCELLANEOUS DETAILS, SEE CITY STREET LIGHTING DRAWINGS.

TRAFFIC SIGNAL INSTALLATION

FOR JUNCTION BOX, SPLICE BOX, AND OTHER MISCELLANEOUS DETAILS, SEE CITY TRAFFIC SIGNAL DRAWINGS.

UTILITY ADJUSTMENT AND REMOVAL

ADJUST ALL OF THE EXISTING CITY PWSA OWNED MANHOLES, VAULTS, BOXES, ETC. THAT ARE TO REMAIN IN PLACE TO NEW GRADE. REMOVE EXISTING SEWER, CATCH BASINS, STORM INLETS, AND SEWER MANHOLES THAT INTERFERE WITH NEW CONSTRUCTION AT OR NEAR THE SAME LOCATIONS. ALL PRIVATELY OWNED MANHOLES, VAULTS, FRAMES AND CASTINGS THAT REMAIN IN PLACE WILL BE ADJUSTED BY AND AT THE EXPENSE OF THE OWNERS.

GENERAL NOTES CONTINUED

RIGHT-OF-WAY LIMITS

CONFINE OPERATIONS WITHIN THE CITY'S AND PA DOT'S RIGHT-OF-WAY CONSTRUCTION EASEMENTS LIMITS UNLESS OTHERWISE NOTED IN THE CONTRACT PLAN OR APPROVED BY THE ENGINEER.

SANITARY CONVENIENCES

PROVIDE AND MAINTAIN NECESSARY SANITARY CONVENIENCES, PROPERLY SECLUDED FOR THE EXCLUSIVE USE OF WORKMEN, PENNSYLVANIA DEPARTMENT OF TRANSPORTATION EMPLOYEES AND CITY OF PITTSBURGH FORCES.

SIDEWALK RAMPS

CONSTRUCT SIDEWALK RAMPS AT EACH CORNER OF ALL INTERSECTIONS WITHIN THE PROJECT LIMITS UNLESS OTHERWISE DIRECTED. SEE DETAILS ON THESE CONTRACT DRAWINGS. SEE THE SPECIAL SUPPLEMENTAL SPECIFICATIONS FOR ITEM DESCRIPTION.

PROTECTION OF EXISTING UTILITY SERVICES AND TEMPORARY INSTALLATIONS

RETAIN AND PROTECT ALL OF THE EXISTING STREET LIGHTING, TRAFFIC SIGNAL, WATER, STORM AND SANITARY SEWER SERVICES UNTIL THE COMPLETION AND OPERATION OF NEW INSTALLATIONS. IMMEDIATELY REPAIR ANY DAMAGES OR INTERRUPTION OF EXISTING SERVICES AT OWN EXPENSE.

INSTALL AND MAINTAIN TEMPORARY SERVICES AS APPROVED BY THE ENGINEER AT NO ADDITIONAL PAYMENT.

LOCATIONS OF NEW POLE FOUNDATIONS, TRAFFIC CONTROLLER FOUNDATIONS, JUNCTION BOXES, CROSS WALKS, AND INLETS

INSTALL FACILITIES IN STRICT CONFORMANCE TO THE LOCATIONS SHOWN ON THESE CONTRACT DRAWINGS, UNLESS OTHERWISE APPROVED BY THE ENGINEER. IN THE EVENT OF ANY INCONSISTENCIES BETWEEN THESE CONTRACT DRAWINGS AND THE CONTRACT SPECIFICATIONS INSTALL THE FACILITIES AT THE LOCATION INDICATED ON THE CONTRACT DRAWINGS.

EXISTING PUBLIC FACILITIES AND UTILITIES (PA ONE-CALL)

NOTIFY THE UTILITY COMPANIES OR OWNERS AT LEAST 3 DAYS IN ADVANCE OF ANY EXCAVATION OR OTHER ACTIVITIES WHICH MAY AFFECT AERIAL OR UNDERGROUND FACILITIES IN OR NEAR THE PROJECT AREA.

EXISTING UNDERGROUND ELECTRICAL, TELEPHONE, AND TELEGRAPH LINES ARE SHOWN SINGLE LINE ON DETAIL PLAN SHEETS. FOR APPROXIMATE WIDTH OF CONDUITS, REFER TO CROSS SECTIONS, OR PROFILES.

PROTECT EXISTING FIBER OPTIC CABLE ON SMITHFIELD STREET BRIDGE AND I.T.S. CONDUIT AND CAMERAS MOUNTED ON THE FORT PITT BLVD WB RETAINING WALL. METHOD OF PROTECTION MUST BE APPROVED BY DOMINIC MUNIZZA OF PENNDOT DISTRICT 11-0 AT (412) 429-6034.

UNFORESEEN WATER POLLUTION CONTROL

EXERCISE EXTREME CARE TO PREVENT THE DISCHARGE OF ANY WATER CONTAINING CONCENTRATION OF SILT, MUD OR OTHER TYPE OF MATERIAL WHICH MIGHT SETTLE IN THE SEWER. FOR CONTROL MEASURES AND DEVICES, COMPLY WITH SECTION 845.

DO NOT ALLOW CONSTRUCTION MATERIAL OR DEBRIS TO REMAIN IN OR TO BE WASHED INTO THE SEWER SYSTEM, WHICH COULD CAUSE MALFUNCTIONING OF THE CONTROL GATES IN THE PITTSBURGH WATER AND SEWER AUTHORITY OR ALCOSAN STRUCTURES.

THE CITY WILL MONITOR THE CONSTRUCTION FOR ANY DISCHARGE OF MATERIAL OTHER THAN THAT WHICH WOULD NORMALLY ENTER THE SEWERS. ANY MATERIAL DISCHARGED TO THE SEWER SYSTEM WILL BE BILLED TO THE CONTRACTOR. REPAIR, AT OWN EXPENSE, ANY DAMAGES RESULTING FROM THE LACK OF, OR POOR EROSION AND WATER POLLUTION CONTROL.

POWER SOURCES FOR STREET LIGHTING AND TRAFFIC SIGNALS

COORDINATE WORK WITH DUQUESNE LIGHT COMPANY.

INSTALL STREET LIGHTING AND TRAFFIC SIGNAL CABLES WITH ADEQUATE SLACK TO THE DESIGNATED DUQUESNE LIGHT MANHOLES AS SHOWN ON THESE CONTRACT DRAWINGS.

CONTACT DUQUESNE LIGHT TO MAKE THE SECONDARY SERVICE CONNECTIONS INSIDE THE MANHOLES. ONLY DUQUESNE LIGHT CAN MAKE THESE CONNECTIONS. THE CONTRACTOR WILL BE BILLED BY DUQUESNE LIGHT FOR THIS SERVICE.

DO NOT USE THESE MANHOLES AS PULL POINTS. PAYMENT WILL BE INCLUDED IN THE ITEM FOR THE DIRECT BURIAL CONDUIT, CONCRETE ENCASED.

REMOVAL AND REPLACEMENT OF UNSUITABLE MATERIAL

REMOVE UNSUITABLE MATERIAL BELOW SUBGRADE AS DIRECTED BY THE ENGINEER. PAYMENT FOR REMOVAL OF UNSUITABLE MATERIAL WILL BE MADE UNDER THE ITEM "CLASS 1 EXCAVATION". REPLACE UNSUITABLE MATERIAL FOR STABILIZATION OF SUBGRADE, CONFORMING TO THE SPECIFICATIONS FOR SUBBASE TREATMENT. PAYMENT FOR FURNISHING AND PLACING THE MATERIALS WILL BE MADE UNDER THE ITEM "FOREIGN BORROW EXCAVATION".

TROLLEY TRACK REMOVAL

REMOVE ALL EXISTING TROLLEY TRACKS, RAIL TIES, AND BALLAST BENEATH NEW PAVEMENT LIMITS. PAYMENT IS INCLUDED IN THE ITEM FOR CLASS 1 EXCAVATION.

EXPLOSIVES

THE USE OF EXPLOSIVES WILL NOT BE PERMITTED.

GENERAL NOTES CONTINUED

REMOVAL AND DISPOSAL OF OLD MATERIALS

ALL OLD MATERIAL REMOVED UNDER THIS CONTRACT NOT RE-USED NOR WANTED BY THE CITY OF PITTSBURGH, UNLESS OTHERWISE NOTED, SHALL BECOME THE RESPONSIBILITY OF THE CONTRACTOR AND MUST BE REMOVED IMMEDIATELY FROM THE SITE AT NO ADDITIONAL PAYMENT.

SALVAGED MATERIAL

AT NO TIME DURING THE CONTRACT WILL THE CONTRACTOR DELAY PROGRESS TO PERFORM SALVAGE OPERATIONS.

CLEANING STREETS, SIDEWALK AND PAVEMENT CASTINGS

THE CONTRACTOR IS RESPONSIBLE FOR CLEANING ALL ROADWAYS AND SIDEWALKS ALONG THE PROJECT LIMITS DURING THE LIFE OF THE PROJECT AT NO ADDITIONAL PAYMENT. THE CONTRACTOR IS RESPONSIBLE FOR CLEANING ALL GAS AND WATER BOXES, MANHOLES, STORM INLETS, ETC. BOTH DURING AND AFTER WORK IS COMPLETED AT NO ADDITIONAL PAYMENT.

RECORD DRAWINGS

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES F. WEMER
ENGINEER
NO. 48039-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
LOCATION MAP AND GENERAL NOTES

SCALE: AS SHOWN	SHEET NO	ACCESSION NO
DATE : 12/01/2001	5 OF 85	CASE NO

DRAWN BY	JES
CHECKED BY	JFW

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DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-D	ALLEGHENY	*	**	6 OF B5
CITY OF PITTSBURGH				

* 0279 & D376
** A33 & A28

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

GENERAL NOTES CONTINUED

FLOODWALL STRUCTURAL SLAB:
PROVIOE MATERIALS AND PERFORM WORK IN ACCOROANCE WITH SPECIFICATIONS, PUBLICATIDN 408/2000 AND CONTRACT SPECIAL PROVISIONS

OESIGN SPECIFICATIONS:
AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECOND EDITION, 199B ANO AS SUPPLEMENTED BY DESIGN MANUAL, PART 4, APRIL 2000

DESIGN LIVE LOADS:
PHL93 OR P82 (204 K PERMIT LOAO).

CONCRETE:
A. CLASS AA CONCRETE - USED IN ALL WALLS, ENO DAMS, AND IN FOUNDATIDNS AS NOTED.
B. CLASS A CDNCRETE - USEO IN FOUNDATIONS AS NOTED.
C. EXPDSED CONCRETE EDGES - CHAMFERED 1"X1" EXCEPT AS NOTED.

REINFORCING STEEL:
A. ALL REINFDRCING 8ARS - GRADE 60 STEEL.
8. A MINIMUM LAP OF 3D BAR DIAMETERS - USED UNLESS NOTEO OTHERWISE.
C. EPOXY CDATED 8ARS ARE DESIGNATEO BY THE SUFFIX E ON THE BAR MARK.
D. PRDVIDE 2" CDNCRETE COVER DN ALL REINFDRCING BARS UNLESS NDTED OTHERWISE.

THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS OF EXISTING STRUCTURES IN THE FIELO.

EXISTING STRUCTURES DEPICTED ON THE DRAWINGS HAVE BEEN TAKEN FRDM PREVIOUS DESIGN DRAWINGS. NO ATTEMPT HAS 8EEN MADE TO VERIFY THEIR DIMENSIONS OR EXISTENCE.

OETAILS OTHER THAN THOSE INDICATED, ARE DN THE FDLLOWING STANDARD DRAWINGS:

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
STANDARDS FOR CDNSTRUCTION

RC-10M	APRIL 2B, 2DDO
RC-11M	APRIL 2B, 200D
RC-12M	APRIL 28, 20DO
RC-13M	APRIL 28, 20DD
RC-20M	APRIL 2B, 2DDD
RC-21M	APRIL 2B, 2DDD
RC-23M	APRIL 2B, 200D
RC-24M	APRIL 16, 2001
RC-25M	APRIL 28, 2000
RC-26M	APRIL 2B, 200D
RC-27M	APRIL 2B, 200D
RC-2BM	APRIL 16, 2001
RC-30M	APRIL 28, 2000
RC-32M	APRIL 28, 200D
RC-34M	APRIL 16, 2D01
RC-57M	APRIL 16, 2001
RC-5BM	APRIL 16, 2001
RC-60M	APRIL 2B, 2000
RC-64M	APRIL 2B, 2000
RC-65M	APRIL 2B, 2000
RC-67M	APRIL 2B, 2000
RC-7DM	APRIL 2B, 20DD
RC-BOM	APRIL 2B, 2000
RC-B1M	APRIL 16, 20D1
RC-83M	APRIL 2B, 20D0
RC-84M	APRIL 28, 2000

TC-76DO	MAY 1B,199B
TC-76D2	MAY 18,199B
TC-7604	DEC. 15,1999
TC-7802	JUNE 3D,1989
TC-7BD4	JUNE 3D,1989
TC-78D5	JUNE 3D,1989
TC-7BD6	JUNE 30,1989
TC-B700C	AUG. 1, 1997
TC-B701D	AUG. 1, 1997
TC-B701E	AUG. 1, 1997
TC-B702B	AUG. 1, 1997
TC-87020	AUG. 1, 1997
TC-B715	AUG. 1, 1997
TC-B716	OCT. 2, 2DD0
BC-716M	DEC. 24, 1999
BC-720M	DEC. 24, 1999
BC-721M	JULY 11, 20D1
BC-722M	DEC. 24, 1999
8C-731M	DEC. 24, 1999
BC-732M	DEC. 29, 20DD
BC-734M	OEC. 24, 1999
BC-735M	OEC. 29, 2000
BC-736M	DEC. 24, 1999
BC-739M	JULY 11, 2D01
BC-751M	JULY 11, 2001
BC-752M	OEC. 24, 1999
8C-753M	DEC. 29, 2000
8C-754M	DEC. 24, 1999
8C-755M	JUNE 30, 20D0
8C-757M	DEC. 29, 2000
BC-767M	JULY 11, 2D01
BC-775M	JULY 11, 2001
8C-7B3M	DEC. 29, 2D00
8C-788M	DEC. 29, 2000
BD-621M	DEC. 24, 1999 (ERRATA JULY 11, 2D01)
BO-643M	JULY 11, 2D01

CITY OF PITTSBURGH CENTRAL BUSINESS DISTRICT
TRAFFIC SIGNAL DRAWINGS

TRAFFIC SIGNAL (SPECIAL ZONES)	SS-105	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZDNES)	SS-1D6	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZONES)	SS-1D7	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZDNES)	SS-110	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZDNES)	SS-2D2	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZONES)	SS-2D3	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZDNES)	SS-2D4	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZONES)	SS-2D5	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZDNES)	SS-2D6	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZDNES)	SS-2O7-1	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZONES)	SS-208	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZDNES)	SS-2D8-1	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZONES)	SS-22D-1	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZONES)	SS-221	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZONES)	SS-221-1	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZONES)	SS-222	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZONES)	SS-223	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZDNES)	SS-301	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZONES)	SS-302	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZDNES)	SS-303	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZONES)	SS-304	JULY 1, 1993
TRAFFIC SIGNAL (SPECIAL ZONES)	SS-305	JULY 1, 1993
TRAFFIC SIGNAL (STANDARD ZONES)	ST-103	JULY 1, 1993
TRAFFIC SIGNAL (STANDARO ZONES)	ST-104	JULY 1, 1993

CITY OF PITTS8URGH
STANDARDS FDR CDNSTRUCTION
#45 CATCH BASIN, TYPE 11
#46 HANDICAP SIDEWALK RAMP

LEGEND OF EROSION AND SEDIMENT POLLUTION CONTRDL ITEMS
NONE

ORAWN 8Y	JES
CHECKEO BY	JFW

RECORD DRAWINGS

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES F. WEMER
ENGINEER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
LOCATION MAP AND GENERAL NOTES

SCALE: AS SHOWN	SHEET NO	ACCESSION NO
OATE : 12/01/2001	6 OF 85	CASE NO

h:\projects\ustation\0042\Roadway\cngen03.dgn 12/01/2001

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	7 OF 85
CITY OF PITTSBURGH				

* 0279 & 0376
** A33 & A28

REVISION NUMBER	REVISIONS	DATE	BY
△	AS-BUILT	10/1/03	SAI

ABBREVIATIONS

AGG	AGGREGATE
AHD	AHEAD
APPROX	APPROXIMATE
ASPH	ASPHALT
BIT	BITUMINOUS
BK	BACK
B̵	BASELINE
BLVD	BOULEVARD
BLDG	BUILDING
BTCO	VERIZON
C	CONDUIT
℄	CENTER LINE
CL	CLASS
CEM	CEMENT
CIP	CAST IRON PIPE
CONC	CONCRETE
CONSTR	CONSTRUCTION
CRSE	COURSE
CS	CURVE TO SPIRAL POINT
D	DEGREE OF CURVATURE
Dc	DEGREE OF CURVATURE OF CIRCULAR CURVE
D.E.C.	DEPARTMENT OF ENGINEERING AND CONSTRUCTION
D.P.W.	DEPARTMENT OF PUBLIC WORKS
DYPM	DOUBLE YELLOW PAVEMENT MARKING (PAINT)
DLCO	DUQUESNE LIGHT COMPANY
DLMH	DUQUESNE LIGHT MANHOLE
E	EXTERNAL DISTANCE
EB	ELECTRIC BOX / EAST BOUND
ELEV	ELEVATION
Es	EXTERNAL SPIRAL DISTANCE
EU	ELECTRIC LINE UNDERGROUND
EXC	EXCAVATION
EXP	EXPANSION
EXT	EXTENSION
FDN	FOUNDATION
FH	FIRE HYDRANT
FP	FIRE PROTECTION LINE
FT	FOOT
G	GAS / GRADE
GV	GAS VALVE
HLSD	HEAD LIGHT SIGHT DISTANCE
HP	HIGH PRESSURE / HIGH POINT
INV	INVERT
JB	JUNCTION BOX
JNT	JOINT
K	SIMPLE CURVE CO-ORDINATE (ABSCISSA)
L	LENGTH OF CURVE
Lc	LENGTH OF CIRCULAR CURVE
LC	LONG CHORD
LF	LINEAR FOOT
LP	LIGHT POLE / LOW POINT
LR	LEGISTRATIVE ROUTE
Ls	LENGTH OF SPIRAL
Lt	LIGHT
LT	LEFT / LONG TANGENT
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
MO	MIDDLE ORDINATE
NB	NORTH BOUND
NO	NUMBER
P	SIMPLE CURVE CO-ORDINATE (ORDINATE)
PAV'T	PAVEMENT
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVE
PG	PAGE
PI	POINT OF INTERSECTION
P̵	PROPERTY LINE
PL	PLAIN
POB	POINT OF BEGINNING
POE	POINT OF END
POT	POINT ON TANGENT
PROP	PROPOSED
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENT
PWSA	PITTSBURGH WATER AND SEWER AUTHORITY
R	RADIUS
Rc	RADIUS OF CIRCULAR CURVE
RCCP	REINFORCED CEMENT CONCRETE PIPE
REINF	REINFORCED
REQ'D	REQUIRED
RT	RIGHT
R/W	RIGHT-OF-WAY
SA	SANITARY SEWER
SB	SOUTH BOUND
SC	SPIRAL TO CURVE POINT
SE	SUPER ELEVATION
SEG	SEGMENT
S'WALK	SIDEWALK
SIG	SIGNAL
SR	STATE ROUTE
SSD	STOPPING SIGHT DISTANCE
ST	STREET / SHORT TANGENT / SPIRAL TO TANGENT POINT
STA	STATION
T	TELECOMMUNICATION / TANGENT DISTANCE
TCP	TERRA COTTA PIPE
TG	TOP OF GRATE
Ts	TANGENT DISTANCE
TS	TANGENT TO SPIRAL POINT
TYP	TYPICAL
USGS	UNITED STATES GEOLOGICAL SURVEY
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
W	WATER
WB	WATER BOX / WEST BOUND
WPM	WHITE PAVEMENT MARKER
WV	WATER VALVE
Xc	TANGENT DISTANCE FOR SC
Yc	TANGENT OFFSET OF THE SC
YPM	YELLOW PAINTED MARKER
Δ	DELTA ANGLE
Δc	CENTRAL ANGLE BETWEEN THE SC AND CS
θs	SPIRAL ANGLE

LEGEND (EXISTING)

- *Fence*
- *Concrete Pad*
- *Tree*
- *Sidewalk Ramp (Typical)*
- *Sidewalk Ramp (Tangent)*
- *Inlets*
- *Manhole*
- *Drain*
- *Concrete Curb*
- *Guide Rail*
- *Light Pole*
- *Sign Pole*
- *Vault*
- *Water Box*
- *Water Valve*
- *Gas Valve*
- *Junction Box*
- *Sign Post*
- *Fire Hydrant*
- *Concrete Pier*
- *Traffic Signal*

LEGEND (PROPOSED)

- SIDEWALK RAMP (TYPICAL)
- SIDEWALK RAMP (TANGENT)

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
LEGEND / ABBREVIATIONS

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES F. WEBER
ENGINEER

DRAWN BY	JES
CHECKED BY	JFW

SCALE: AS SHOWN SHEET NO ACCESSION NO

DATE : 11/28/2001 7 OF 85 CASE NO

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* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	8 OF 85

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

TABULATION OF PROJECT COORDINATES

BASED ON STATE PLANE COORDINATE SYSTEM

RTE	STATION	POINT	COORDINATE NORTH	COORDINATE EAST	BEARING
SR 0279	1082+50.00	LOW	411903.43	1371239.77	
	1085+81.26	POT	411575.00	1371196.55	S 7°29′49" W
	1094+69.11	POC	411580.94	1371151.42	BASELINE SHIFT
	1092+22.10	PCC	411338.53	1371104.53	
	1090+03.92	PI	411104.626	1371047.17	S 13°46′45" W
	1089+00.00	LOW	411059.51	1370951.09	S 56°36′45" W
	1087+63.09	PC	410972.10	1370846.08	
SR 0376 EB	631+13.26	POT	410458.91	1372071.14	
	640+30.73	POT	410033.17	1372883.85	S 62°21′08" E
	643+40.11	TS	409889.61	1373157.90	
	645+40.11	SC	409793.87	1373333.48	
	646+33.51	PI	409746.45	1373413.94	S 62°21′08" E
	647+26.76	CS	409691.74	1373489.63	S 51°16′32" E
	649+26.76	ST	409569.26	1373647.70	
	652+34.49	TS	409376.75	1373887.78	
	654+34.49	SC	409254.27	1374045.86	
	659+12.25	PI	408974.39	1374433.07	S 51°16′32" E
	663+72.44	CS	408899.74	1374904.97	S 83°52′32" E
	665+72.44	ST	408875.10	1375103.42	
	666+14.53	POT	408870.61	1375145.27	S 83°52′32" E
SR 8041 (RAMP F)	1085+81.26	POB	411575.00	1371196.55	
	1088+94.48	PC	411264.45	1371155.68	S 7°29′49" W
	1089+55.85	PI	411203.61	1371147.68	
	1090+16.60	PCC	411142.64	1371154.62	S 6°29′47" E
	1090+84.22	PI	411075.46	1371162.27	
	1091+48.68	PCC	411021.29	1371202.75	S 36°46′05" E
	1092+68.33	PI	410925.44	1371274.36	
	1093+84.30	PT	410868.01	1371379.32	S 61°18′46" E
	1095+92.00	POT	410768.31	1371561.53	S 61°18′46" E
FORT PITT BLVD EB/ SR 8041 (RAMP F)	1095+92.00	POT	410768.31	1371561.53	
	1097+02.70	PI	410715.17	1371658.64	S 61°18′46" E
	1101+44.68	POT	410510.08	1372050.15	S 62°21′08" E
	1105+66.70	POT	410314.25	1372423.99	
	1105+72.26	POT	410311.67	1372428.91	
	1111+04.48	POE	410064.70	1372900.36	
RELOCATED FORT PITT BOULEVARD EB	10+00.00	POB	410087.25	1372912.69	
	15+43.85	POE	409828.13	1373390.84	S 61°32′44" E

RTE	STATION	POINT	COORDINATE NORTH	COORDINATE EAST	BEARING
SR 8095 (RELOCATED RAMP D)	1111+04.48	POB	410064.70	1372900.36	
	1112+14.70	PI	410013.55	1372998.00	S 62°21′08" E
	1118+25.14	PC	409733.03	1373540.16	S 62°38′32" E
	1118+92.90	PI	409701.89	1373600.34	
	1119+60.53	PCC	409664.53	1373656.86	S 56°31′59" E
	1120+37.75	PI	409621.94	1373721.29	
	1121+14.14	PT	409564.43	1373772.83	S 41°51′52" E
	1122+86.61	PC	409435.98	1373887.93	
	1123+92.56	PI	409357.08	1373958.64	
	1124+97.85	PCC	409293.21	1374043.17	S 52°55′38" E
	1128+65.94	PI	409071.31	1374336.86	
	1132+25.21	PCC	408973.76	1374691.79	S 74°37′57" E
	1133+12.73	PI	408950.57	1374776.18	
	1134+00.11	PT	408935.36	1374862.36	S 79°59′19" E
	1134+48.26	POE	408926.99	1374909.78	
RAMP B	645+76.20	POB	409832.61	1373393.28	
	649+55.30	PC	409631.19	1373714.44	S 57°54′22" E
	650+88.02	PI	409560.68	1373826.88	
	651+87.20	PT	409641.60	1373932.07	N 52°25′53" E
STANWIX STREET	8+94.45	POB	410510.08	1372050.15	
	11+50.00	POE	410734.30	1372172.75	N 28°40′07" E
MARKET STREET (CONSTR)	10+00.00	POB	410314.25	1372423.99	
	12+55.00	POE	410540.13	1372542.31	N 27°38′52" E
MARKET STREET (SURVEY)	38+94.48	POB	410311.67	1372428.91	
	41+50.00	POE	410535.91	1372551.41	N 28°38′47" E
WOOD STREET	53+94.52	POB	410064.70	1372900.36	
	54+20.22	POT	410087.25	1372912.69	N 28°40′27" E
	56+50.00	POE	410288.85	1373022.94	
SMITHFIELD STREET	67+52.28	POT	409687.22	1373314.34	
	69+02.28	POT	409819.04	1373385.91	
	69+12.62	POT	409828.13	1373390.84	N 28°29′47" E
	69+17.72	POT	409832.61	1373393.28	
	71+50.00	POE	410036.75	1373504.10	

LEGEND

- POB - POINT OF BEGINNING
- PC - POINT OF CURVE
- PCC - POINT OF COMPOUND CURVE
- POE - POINT OF END
- PI - POINT OF INTERSECTION
- PT - POINT OF TANGENT
- POT - POINT ON TANGENT
- LOW - LIMIT OF WORK

RECORD DRAWINGS

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES F. WEMER
ENGINEER
NO. 48931-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
SUMMARY OF PROJECT COORDINATES

SCALE: AS SHOWN SHEET NO 8 OF 85 ACCESSION NO
DATE : 11/28/2001 CASE NO

DRAWN BY	RAK
CHECKED BY	JFW

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DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	9 OF 85
CITY OF PITTSBURGH				

* 0279 & 0376
** A33 & A28

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

SR 8041 (RAMP F)
CURVE DATA

PI STA 1089+55.85
Δ = 13° 59' 36" LT
D = 11° 27' 33"
T = 61.36'
L = 122.12'
R = 500.00'
E = 3.75'
PC STA = 1088+94.48
PCC STA = 1090+16.60

SR 8041 (RAMP F)
CURVE DATA

PI STA 1090+84.22
Δ = 30° 16' 18" LT
D = 22° 55' 09"
T = 67.62'
L = 132.08'
R = 250.00'
E = 8.67'
PCC STA = 1090+16.60
PCC STA = 1091+48.68

FORT PITT BLVD EB/SR 8041 (RAMP F)
CURVE DATA

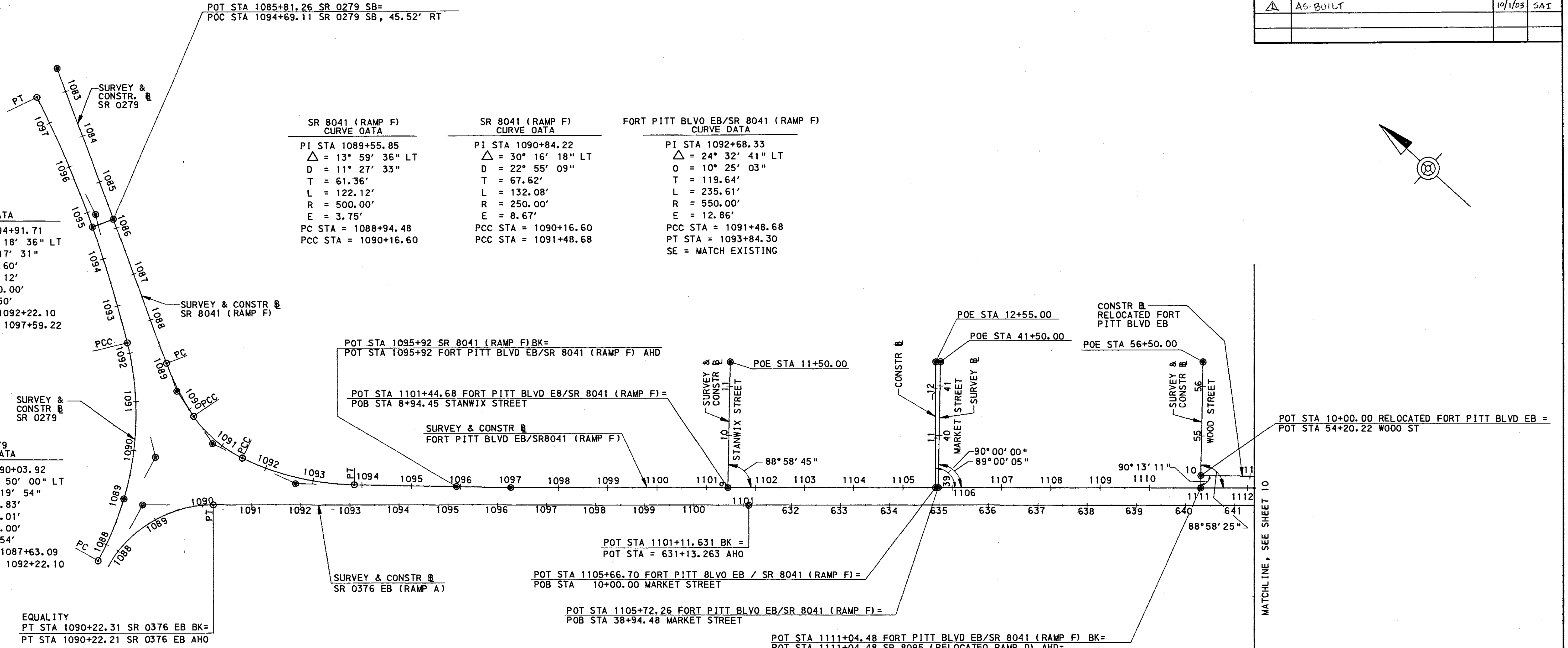
PI STA 1092+68.33
Δ = 24° 32' 41" LT
D = 10° 25' 03"
T = 119.64'
L = 235.61'
R = 550.00'
E = 12.86'
PCC STA = 1091+48.68
PT STA = 1093+84.30
SE = MATCH EXISTING

SR 0279
CURVE DATA

PI STA 1094+91.71
Δ = 12° 18' 36" LT
D = 2° 17' 31"
T = 269.60'
L = 537.12'
R = 2500.00'
E = 14.50'
PC STA = 1092+22.10
PCC STA = 1097+59.22

SR 0279
CURVE DATA

PI STA 1090+03.92
Δ = 42° 50' 00" LT
D = 9° 19' 54"
T = 240.83'
L = 459.01'
R = 614.00'
E = 45.54'
PC STA = 1087+63.09
PCC STA = 1092+22.10



SR 0376 EB (RAMP A)

PI STA 1089+06.53
Δ = 61°02'07" RT
D = 23°32'42"
T = 143.44'
L = 259.23'
R = 243.345'
E = 39.13'
PC STA = 1087+63.09
PT STA = 1090+22.22

FORT PITT BLVD EB/SR 8041 (RAMP F)
CURVE DATA

PI STA 1097+02.70
Δ = 1° 02' 22" LT
NO CURVE

SCALE
100 FEET 0 100 FEET

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
GEOMETRIC PLAN

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER JAMES F. WEIMER

DRAWN BY	RAK
CHECKED BY	JFW

SCALE: AS SHOWN SHEET NO ACCESSION NO
DATE : 11/28/2001 9 OF 85 CASE NO

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DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	10 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

* 0279 & 0376
** A33 & A28

POE STA 15+43.85 RELOCATED FORT PITT BLVD. EB =
POT STA 69+12.62 SMITHFIELD STREET

POE STA 71+50.00

RAMP B
CURVE DATA
PI STA 650+88.02
△ = 69° 39' 45" LT
D = 30° 02' 27"
T = 132.71'
L = 231.89'
R = 190.73'
E = 41.63'
PC STA = 649+55.30
PT STA = 651+87.20
SE = 6.00 %

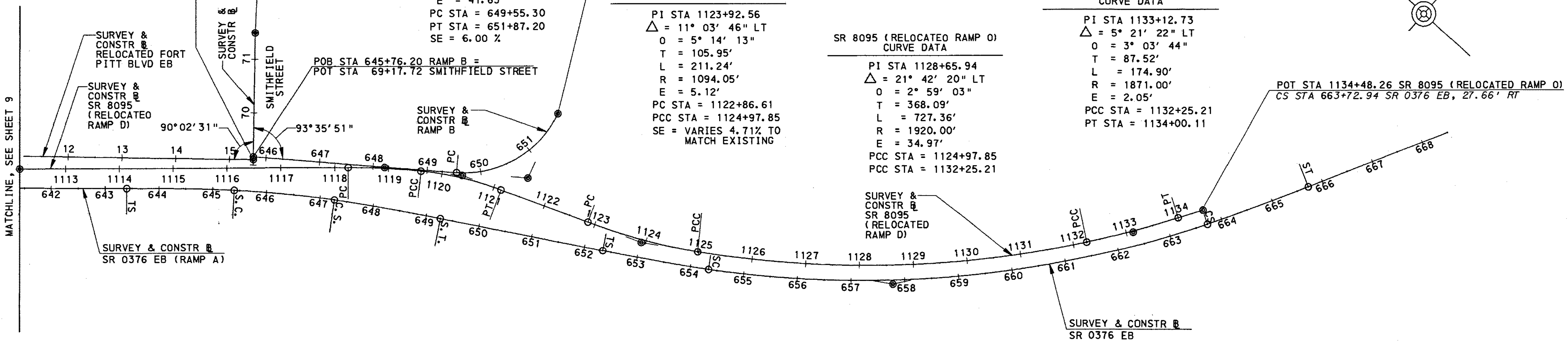
PT STA 651+87.20 RAMP B =
POC STA 651+84.05 RAMP B, 4.72' LT

SR 8095 (RELOCATED RAMP D)
CURVE DATA
PI STA 1123+92.56
△ = 11° 03' 46" LT
D = 5° 14' 13"
T = 105.95'
L = 211.24'
R = 1094.05'
E = 5.12'
PC STA = 1122+86.61
PCC STA = 1124+97.85
SE = VARIES 4.71% TO MATCH EXISTING

SR 8095 (RELOCATED RAMP D)
CURVE DATA
PI STA 1128+65.94
△ = 21° 42' 20" LT
D = 2° 59' 03"
T = 368.09'
L = 727.36'
R = 1920.00'
E = 34.97'
PCC STA = 1124+97.85
PCC STA = 1132+25.21

SR 8095 (RELOCATED RAMP D)
CURVE DATA
PI STA 1133+12.73
△ = 5° 21' 22" LT
D = 3° 03' 44"
T = 87.52'
L = 174.90'
R = 1871.00'
E = 2.05'
PCC STA = 1132+25.21
PT STA = 1134+00.11

POT STA 1134+48.26 SR 8095 (RELOCATED RAMP D)
CS STA 663+72.94 SR 0376 EB, 27.66' RT



SR 8095 (RELOCATED RAMP D)
CURVE DATA
PI STA 1112+14.70
△ = 0° 17' 24" LT
NO CURVE

SR 8095 (RELOCATED RAMP D)
CURVE DATA
PI STA 1118+92.90
△ = 6° 06' 34" RT
D = 4° 30' 45"
T = 67.76'
L = 135.39'
R = 1269.68'
E = 1.81'
PC STA = 1118+25.14
PCC STA = 1119+60.53
SE = 4.38%

SR 8095 (RELOCATED RAMP D)
CURVE DATA
PI STA 1120+37.75
△ = 14° 40' 07" RT
D = 9° 32' 57"
T = 77.23'
L = 153.61'
R = 600.00'
E = 4.95'
PCC STA = 1119+60.53
PT STA = 1121+14.14
SE = 5.86%

SR 0376 (RAMP A)
PI STA 646+34.11
△ = 11°04'36" RT
△c = 5°20'50"
Dc = 2°51'53"
Rc = 2000.00'
Lc = 186.65'
Θs = 2°51'53"
Ls = 200.00'
Ts = 294.00'
Es = 10.22'
K = 99.99
p = 0.833
Xc = 199.95'
Yc = 3.33'
LT = 133.35'
ST = 66.68'
LC = 199.98'
TS STA = 643+40.11
SC STA = 645+40.11
CS STA = 647+26.76
ST STA = 649+26.76

SR 0376 EB
PI STA 659+19.56
△ = 32°36'00" LT
△c = 26°52'14"
Dc = 2°51'53"
Rc = 2000.00'
Lc = 937.96'
Θs = 2°51'53"
Ls = 200.00'
Ts = 685.08'
Es = 84.62'
K = 99.99
p = 0.833
Xc = 199.95'
Yc = 3.33'
LT = 133.35'
ST = 66.68'
LC = 199.98'
TS STA = 652+34.49
SC STA = 654+34.49
CS STA = 663+72.44
ST STA = 665+72.44

SCALE
100 FEET 0 100 FEET

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
GEOMETRIC PLAN

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER JAMES F. WEIMER NO. 48631-E

DRAWN BY	RAK
CHECKED BY	JFW

SCALE: AS SHOWN SHEET NO ACCESSION NO
DATE : 11/28/2001 10 OF 85 CASE NO

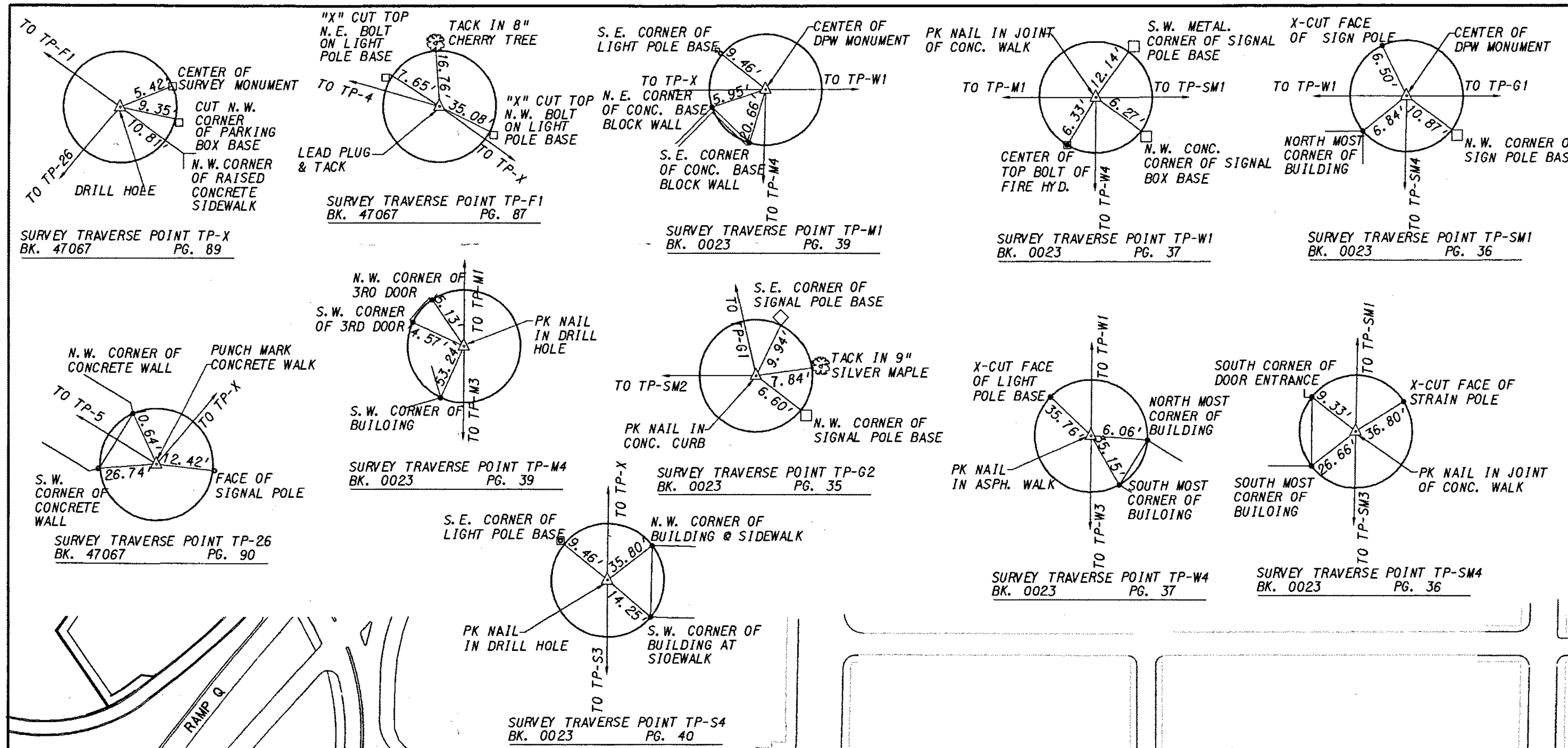
h:\projects\usstation\0042\Roadway\cncor03.dgn 11/28/2001

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	11 OF 85

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

* 0279 & 0376
** A33 & A28



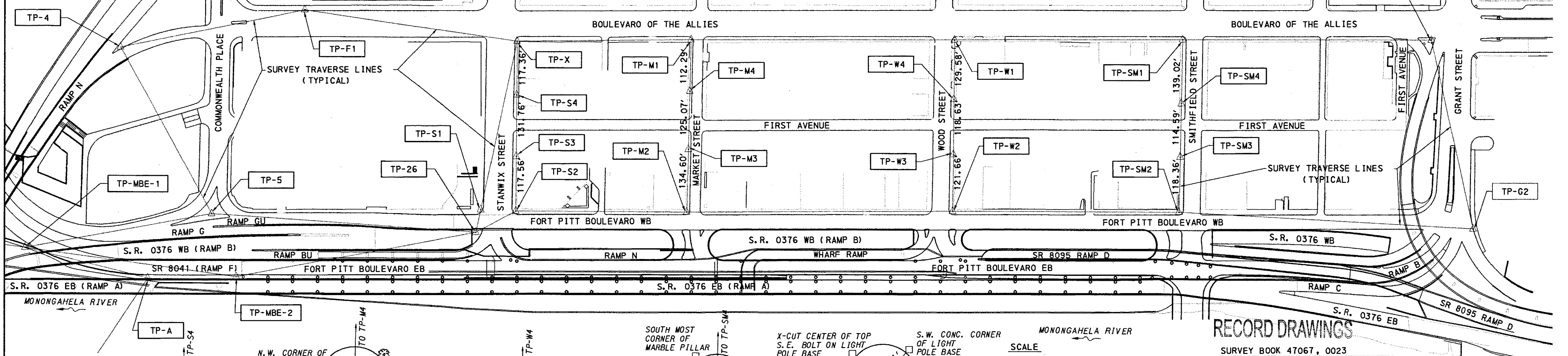
PROJECT COOROINATES FOR SURVEY CONTROL

POINT	NORTHING	EASTING
TP-X	410928.3659	1372319.5456
TP-M1	410756.3465	1372654.8875
TP-W1	410490.9516	1373160.5418
TP-SM1	410262.4489	1373597.9081
TP-G1	410011.9527	1374074.4404
TP-G2	409609.2440	1373966.1193
TP-SM2	409936.5465	1373418.6113
TP-W2	410165.0615	1372985.9225
TP-M2	410431.2471	1372474.1527
TP-S2	410604.9260	1372146.8143
TP-26	410604.4045	1372048.6865
TP-5	410905.9571	1371560.4545
TP-4	411316.1893	1371552.2673
TP-F1	411203.0346	1371943.3400
TP-MBE-1	411028.2861	1371168.1453
TP-MBE-2	410759.6891	1371543.8270
TP-S1	410643.0254	1372081.0065
TP-S3	410708.6221	1372202.1920
TP-S4	410824.8469	1372264.2605
TP-M3	410548.8901	1372539.5548
TP-M4	410658.2033	1372600.3260
TP-W3	410272.2532	1373043.1569
TP-W4	410376.7784	1373099.2601
TP-SM3	410040.2463	1373475.6623
TP-SM4	410140.6453	1373530.8973

THE COOROINATES ARE ON A PROJECT OATUM TIEO TO U.S. COAST ANO GEOOETIC SURVEY MONUMENT "POINT" ANO MONUMENT "P44", CITY OF PITTSBURGH CONTROL POINTS AS OF 1-14-87. NO CORRECTIONS WERE PERFORMEO TO REOUCE DISTANCES TO GRIO OATUM.

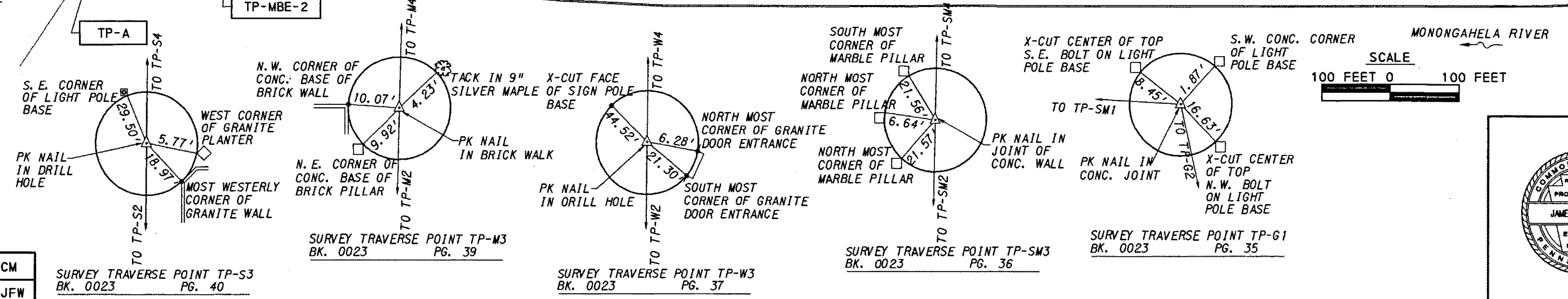
AOJUSTEO SURVEY TRAVERSE LINE OATA

TP-X TO TP-M1 S62°50′35"E 376.89′
TP-M1 TO TP-W1 S62°18′25"E 571.07′
TP-W1 TO TP-SM1 S62°24′54"E 493.46′
TP-SM1 TO TP-G1 S62°16′14"E 538.36′
TP-G1 TO TP-G2 S15°03′19"W 417.02′
TP-G2 TO TP-SM2 N59°07′44"W 637.88′
TP-SM2 TO TP-W2 N62°10′36"W 489.59′
TP-W2 TO TP-M2 N62°30′22"W 576.59′
TP-M2 TO TP-S2 N62°03′02"W 370.56′
TP-S2 TO TP-26 S89°41′44"W 98.13′
TP-26 TO TP-X N39°53′53"E 422.27′
TP-26 TO TP-5 N58°17′56"W 573.85′
TP-5 TO TP-4 N01°08′36"W 410.31′
TP-4 TO TP-F1 S73°51′45"E 407.11′
TP-F1 TO TP-X S53°52′01"E 465.80′
TP-5 TO TP-MBE-1 N72°40′54"W 410.94′
TP-MBE-1 TO TP-MBE-2 S54°26′12"E 461.82′
TP-MBE-2 TO TP-26 S72°54′11"E 528.20′
TP-X TO TP-S2 S28°06′14"W 366.68′
TP-M1 TO TP-M2 S29°04′17"W 371.96′
TP-W1 TO TP-W2 S28°13′28"W 369.87′
TP-SM1 TO TP-SM2 S28°49′03"W 371.97′



RECORD DRAWINGS

SURVEY BOOK 47067, 0023



SCALE

100 FEET 0 100 FEET

DRAWN BY	CM
CHECKEO BY	JFW

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER JAMES F. WEMER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

TRAVERSE PLAN AND REFERENCES

SCALE: AS SHOWN SHEET NO 11 OF 85 ACCESSION NO

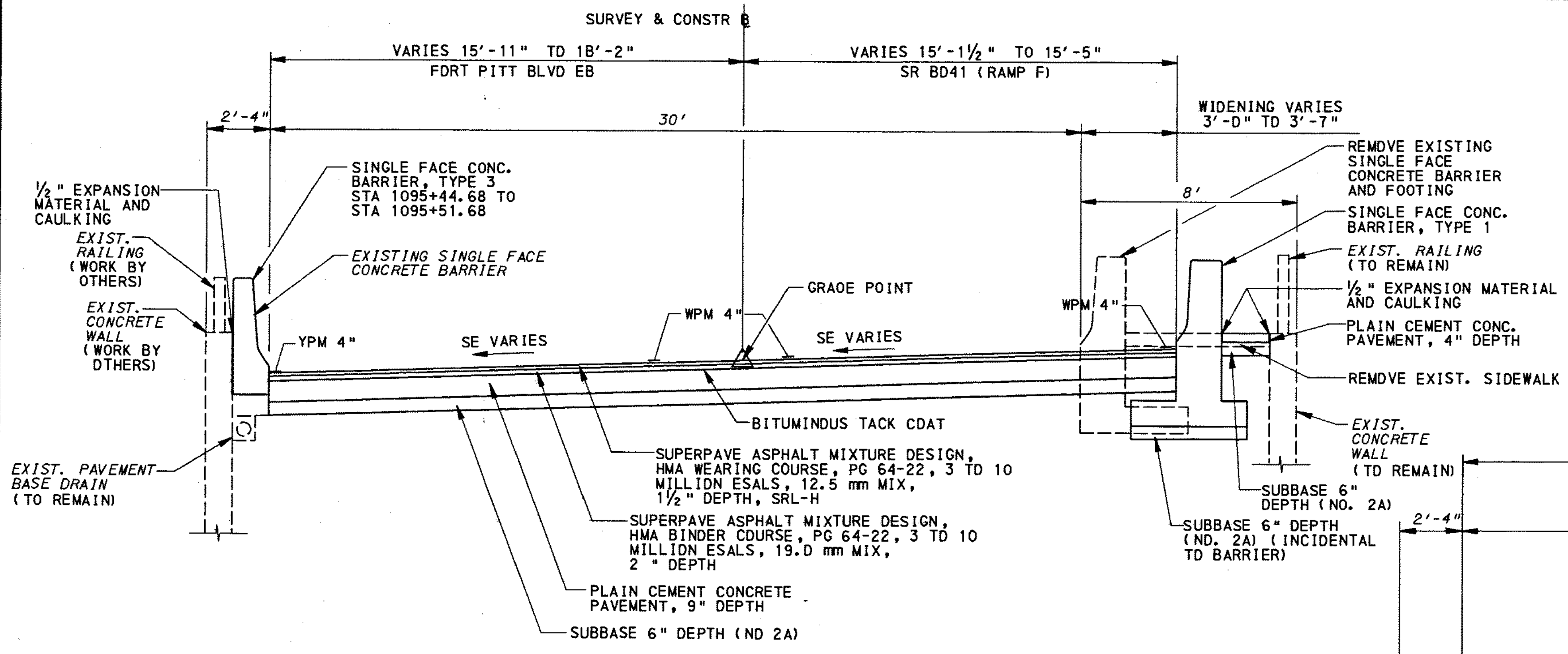
OATE : 11/30/2001 CASE NO

h:\projects\ustation\0042\Roadway\a58trav2.dgn 11/30/2001

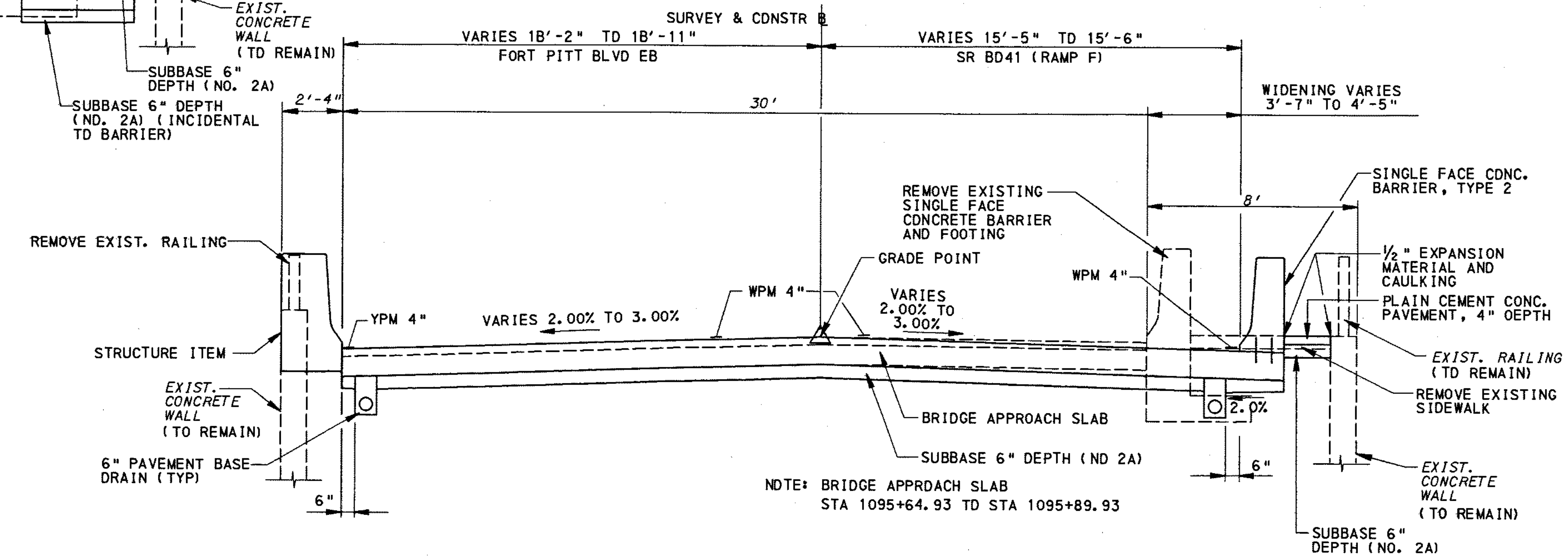
* D279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	12 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/3/03	SAI



SR 8041 (RAMP F)
TYPICAL SUPERELEVATED SECTION
NOT TO SCALE
STA 1094+33.00 TO STA 1095+51.93

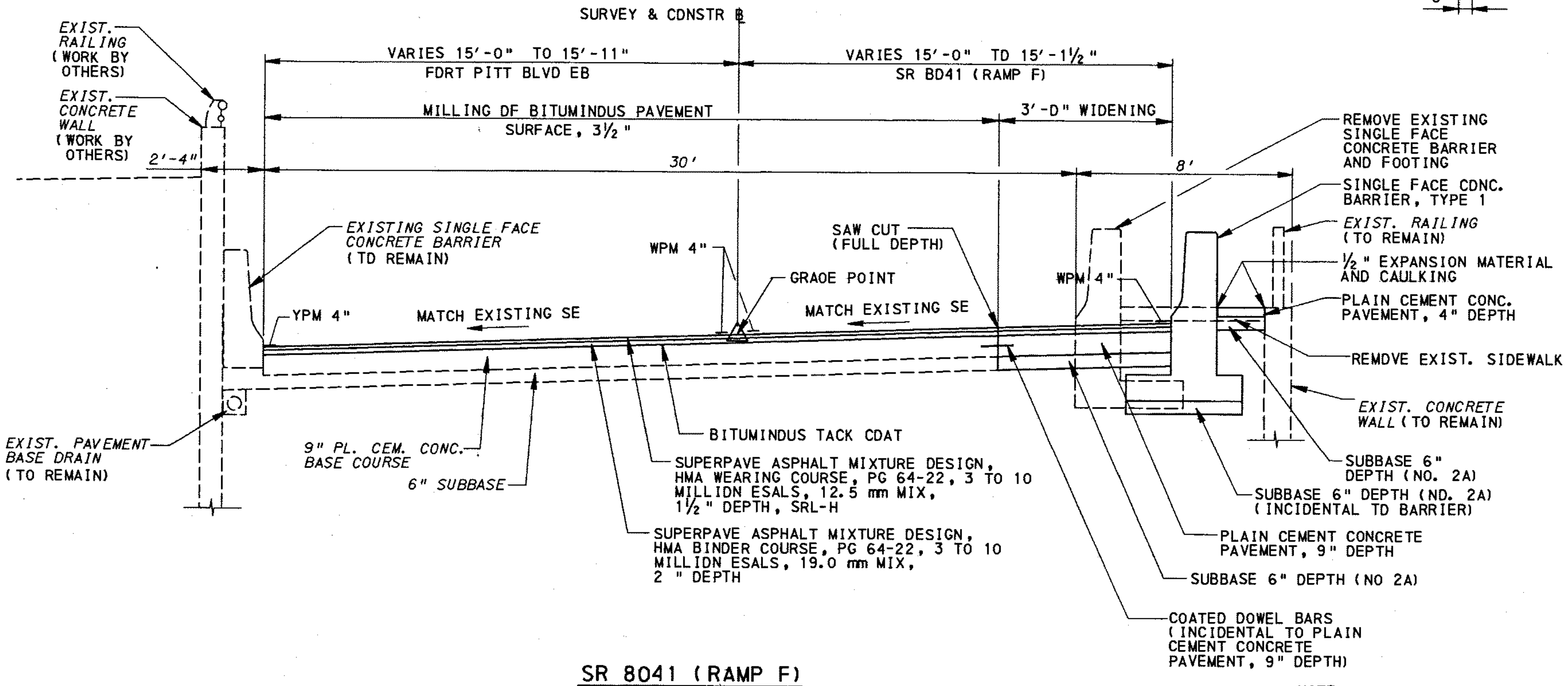


NOTE: BRIDGE APPROACH SLAB
STA 1095+64.93 TO STA 1095+89.93

SR 8041 (RAMP F)
TYPICAL TANGENT SECTION
NOT TO SCALE
STA 1095+51.93 TO STA 1095+89.93

LEGEND

WPM, 4" - WHITE PAVEMENT MARKING, WIDTH
YPM, 4" - YELLOW PAVEMENT MARKING, WIDTH
BWPM, 4" - BROKEN WHITE PAVEMENT MARKING, WIDTH
DWPM, 4" - DOTTED WHITE PAVEMENT MARKING, WIDTH

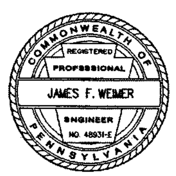


SR 8041 (RAMP F)
TYPICAL SUPERELEVATED SECTION
NOT TO SCALE
STA 1093+79.29 TO STA 1094+33.00

NOTE:
SEE STRUCTURE PLAN S- 24389 FOR FORT PITT BLVD EB / SR 8041 (RAMP F) TYPICAL SECTION FROM STA 1095+94.56 TO STA 1111+04.48

DRAWN BY	AJH
CHECKED BY	JFW

RECORD DRAWINGS



D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
TYPICAL SECTIONS

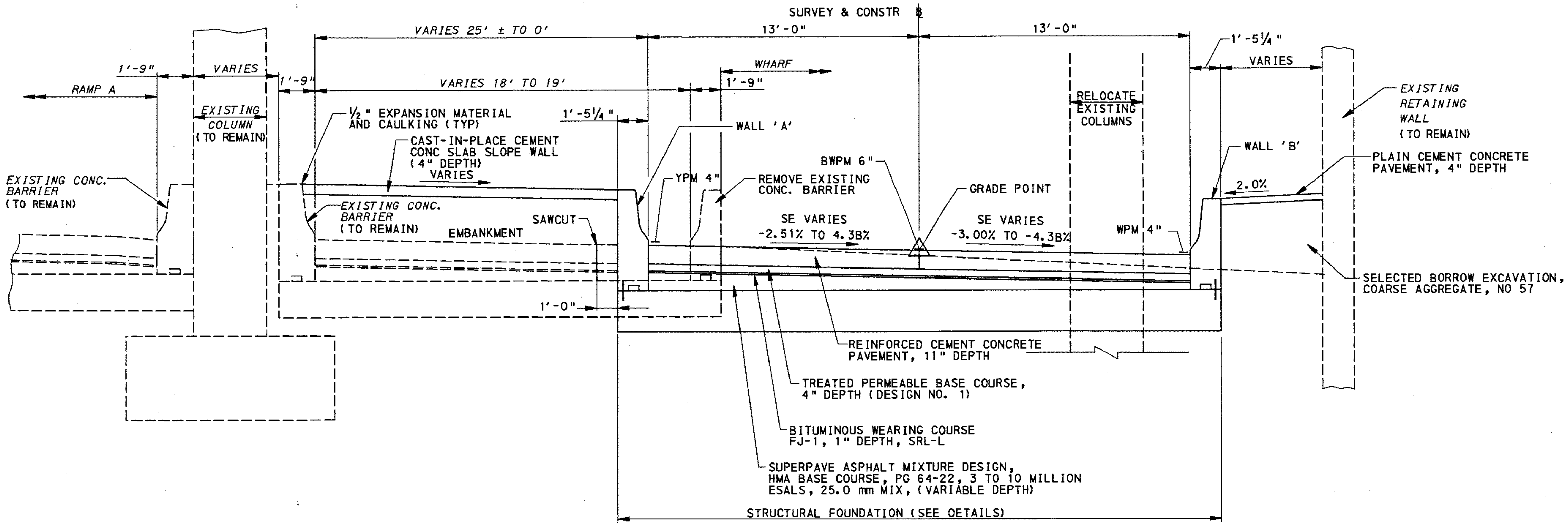
SCALE: AS SHOWN | SHEET NO 12 OF 85 | ACCESSION NO
DATE : 11/28/2001 | CASE NO

h:\projects\ustation\0042\Roadway\CNTYP1.dgn 11/28/2001

* 0279 & 0376
** A33 & A28

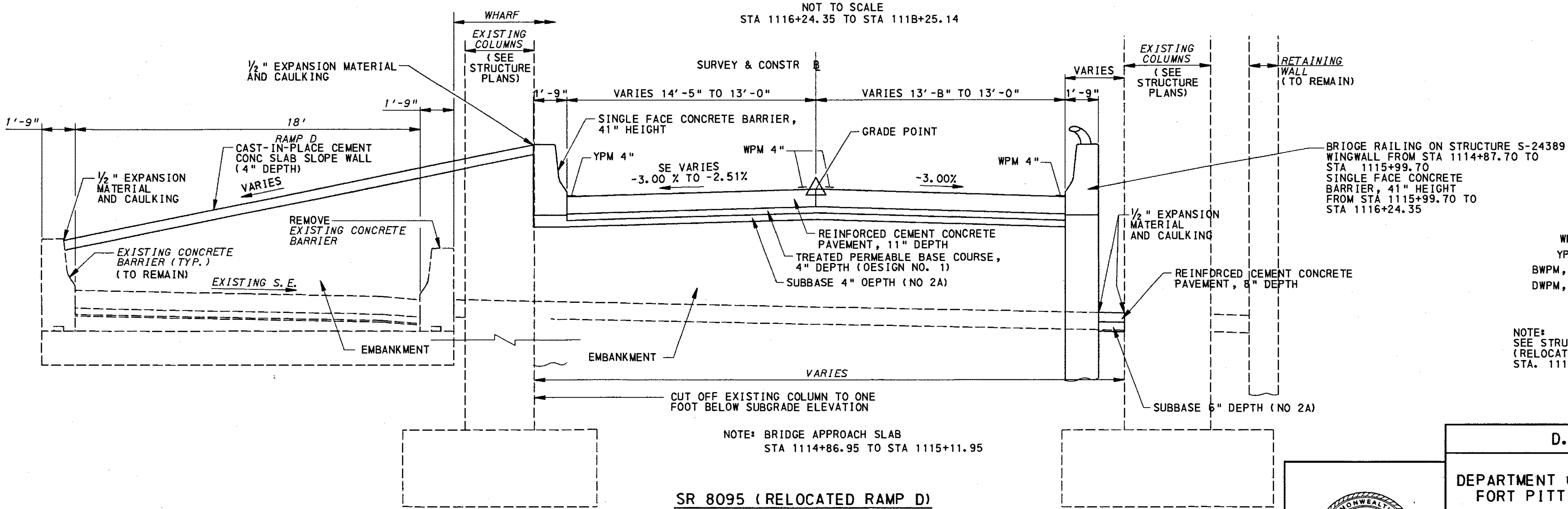
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	13 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



SR 8095 (RELOCATED RAMP D)
TYPICAL SUPERELEVATED SECTION

NOT TO SCALE
STA 1116+24.35 TO STA 1118+25.14



NOTE: BRIDGE APPROACH SLAB
STA 1114+86.95 TO STA 1115+11.95

SR 8095 (RELOCATED RAMP D)
TYPICAL TANGENT SECTION

NOT TO SCALE
STA 1114+86.95 TO STA 1116+24.35

LEGEND

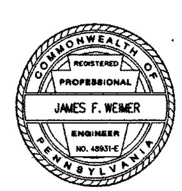
WPM, 4" - WHITE PAVEMENT MARKING, WIDTH
YPM, 4" - YELLOW PAVEMENT MARKING, WIDTH
BWPM, 4" - BROKEN WHITE PAVEMENT MARKING, WIDTH
DWPM, 4" - DOTTED WHITE PAVEMENT MARKING, WIDTH

NOTE:
SEE STRUCTURE PLAN S-24389 FOR SR 8095 (RELOCATED RAMP D) TYPICAL SECTION FROM STA. 1111+04.48 TO STA 1114+87.70

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2



CONSTRUCTION PLAN
TYPICAL SECTIONS

SCALE: AS SHOWN
SHEET NO 13 OF 85
ACCESSION NO ________
DATE : 11/28/2001
CASE NO ________

DRAWN BY	AJH
CHECKED BY	JSS

h:\projects\ustation\0042\Roadway\CNTYP2.dgn 11/28/2001

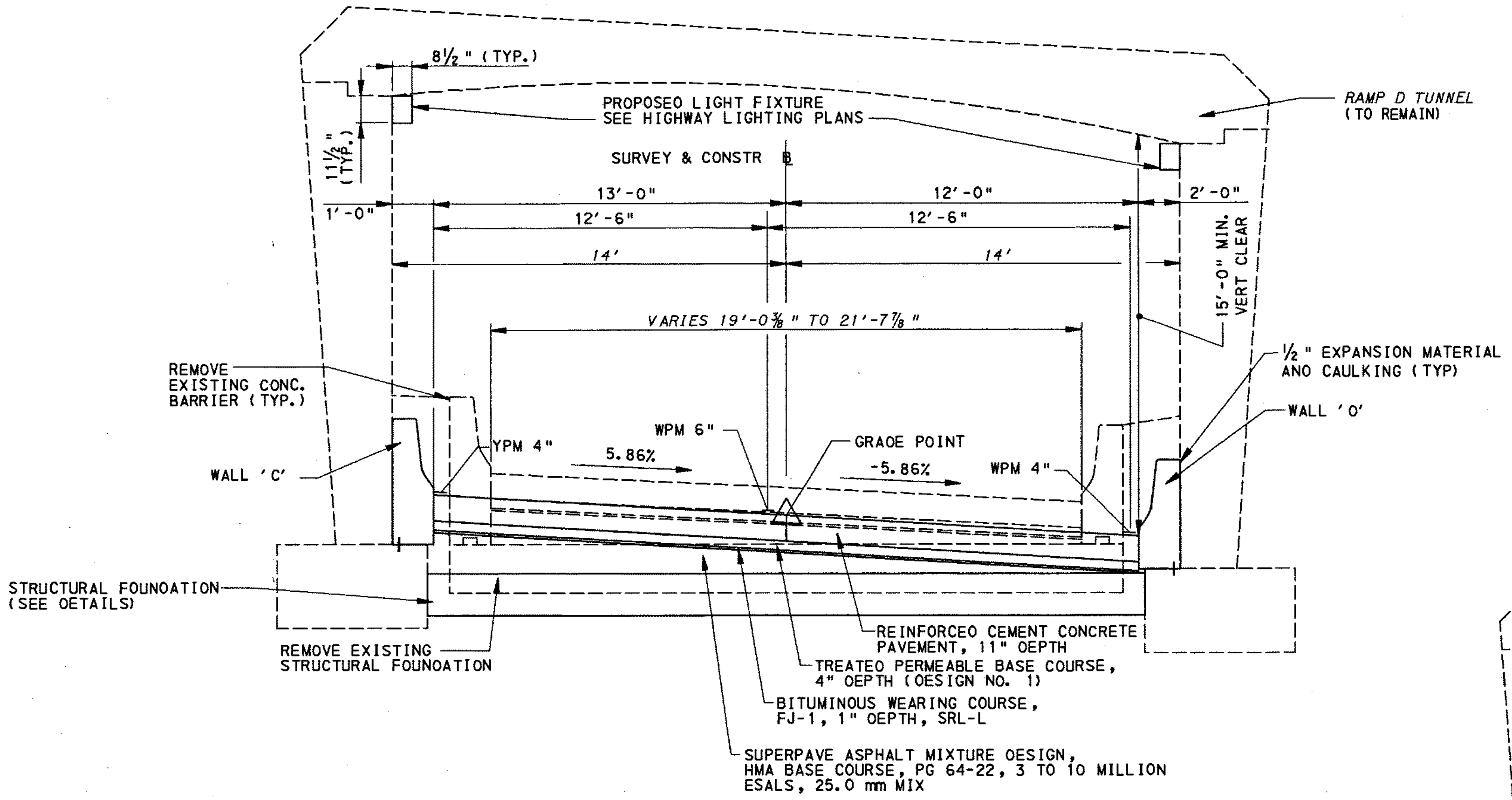
* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	14 OF 85
CITY OF PITTSBURGH				

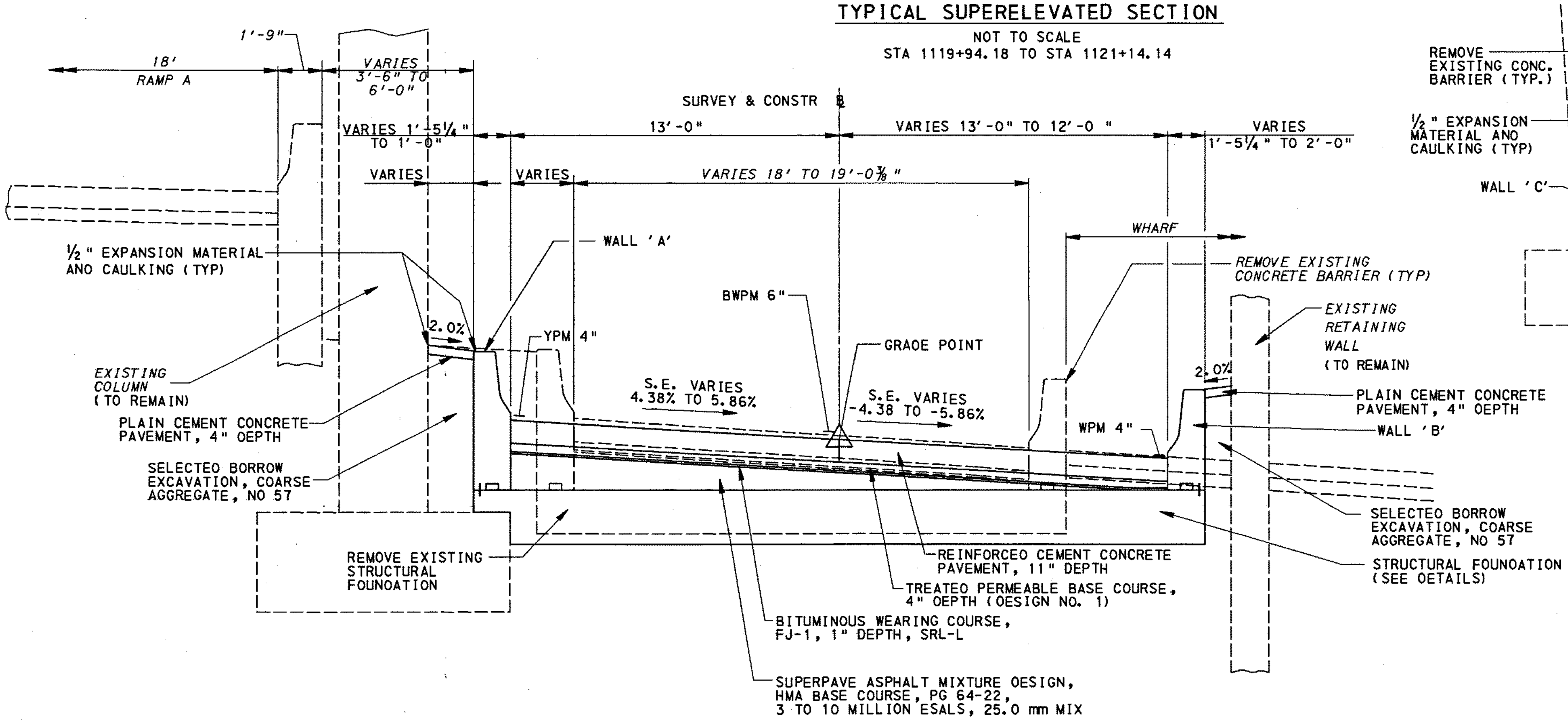
REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

LEGEND

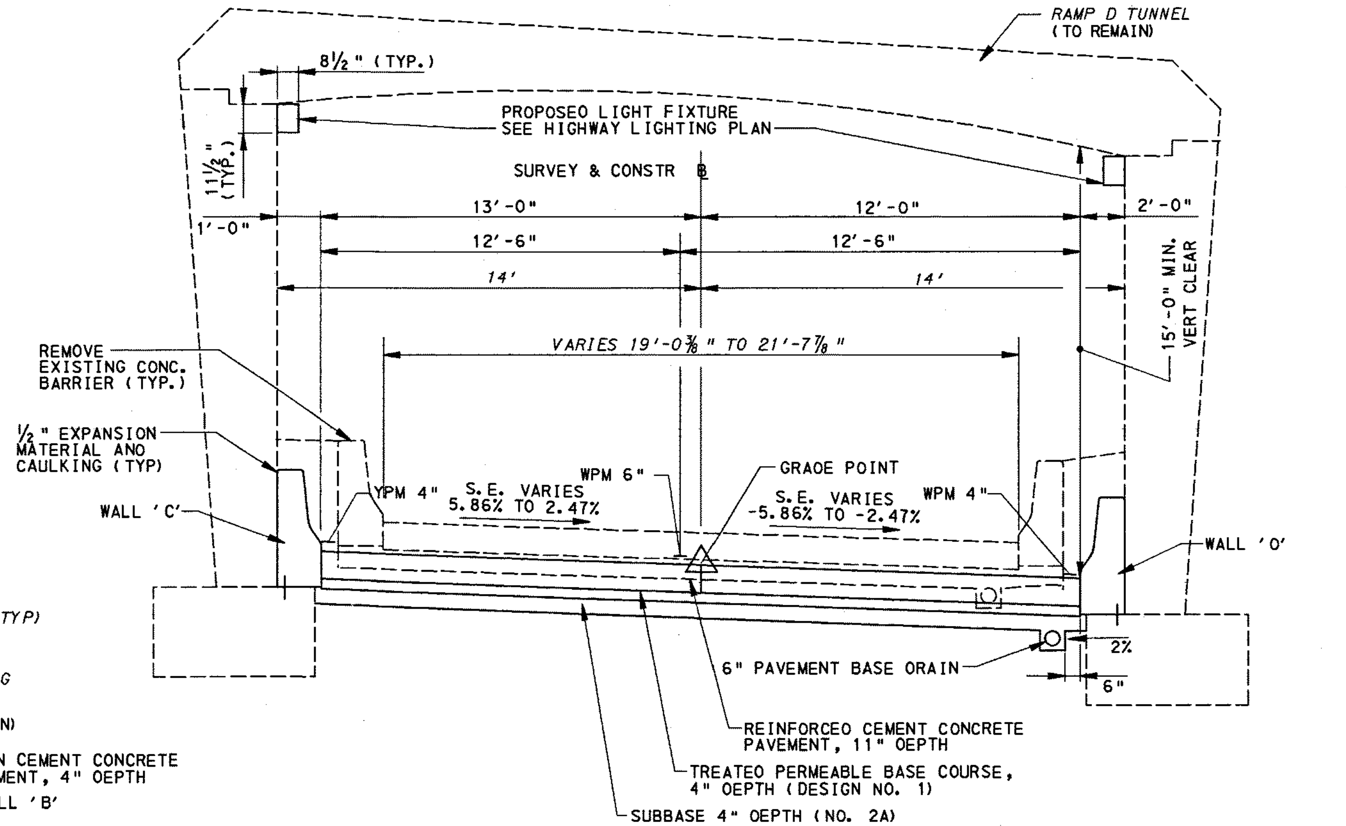
WPM, 4" - WHITE PAVEMENT MARKING, WIOTH
YPM, 4" - YELLOW PAVEMENT MARKING, WIOTH
BWPM, 4" - BROKEN WHITE PAVEMENT MARKING, WIOTH
OWPM, 4" - OOTTEO WHITE PAVEMENT MARKING, WIOTH



S.R. 8095 (RELOCATED RAMP D)
TYPICAL SUPERELEVATED SECTION
NOT TO SCALE
STA 1119+94.18 TO STA 1121+14.14



S.R. 8095 (RELOCATED RAMP D)
TYPICAL SUPERELEVATED SECTION
NOT TO SCALE
STA 1118+25.14 TO STA 1119+94.18



S.R. 8095 (RELOCATED RAMP D)
TYPICAL SUPERELEVATED SECTION
NOT TO SCALE
STA 1121+14.14 TO STA 1121+54.60

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
TYPICAL SECTIONS

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL ENGINEER — JAMES F. WEIMER — NO. 48931-E

ORAWN BY	AJH
CHECKEO BY	JSS

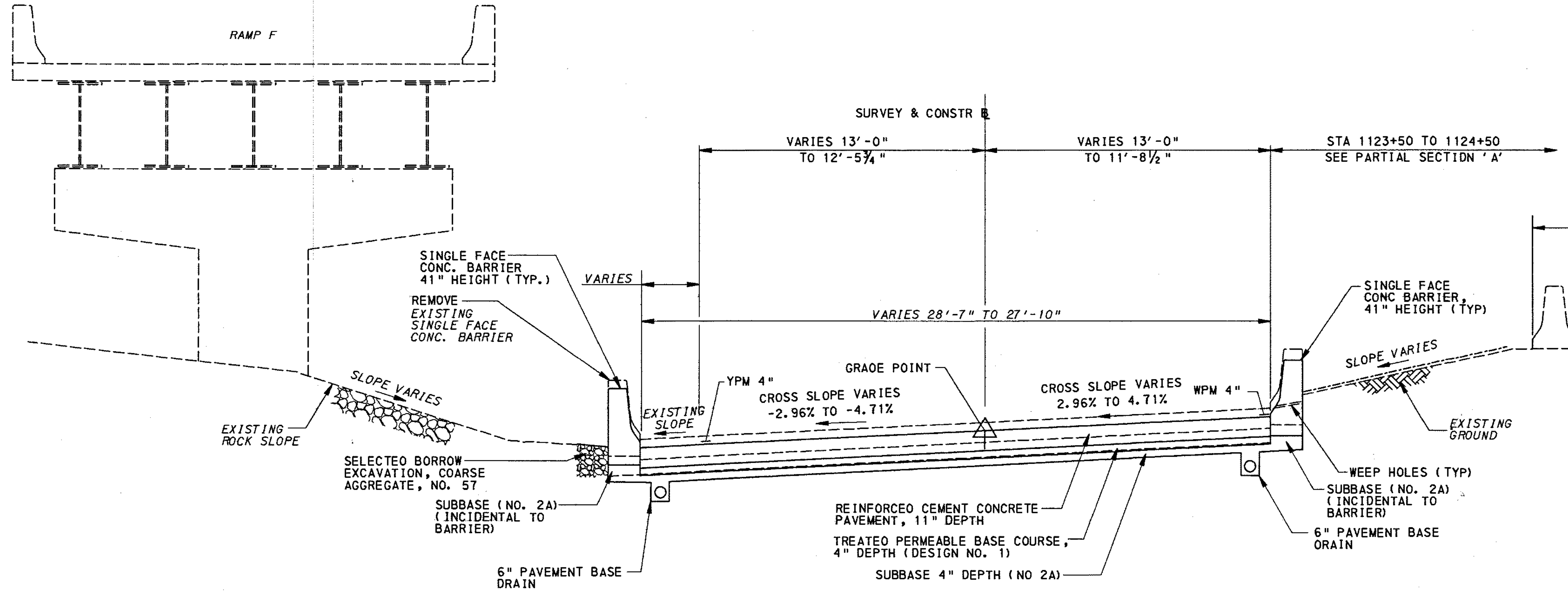
SCALE: AS SHOWN — SHEET NO 14 OF 85 — ACCESSION NO ______
OATE: 11/28/2001 — CASE NO ______

h:\projects\ustation\0042\Roadway\CNTYP3.dgn 11/28/2001

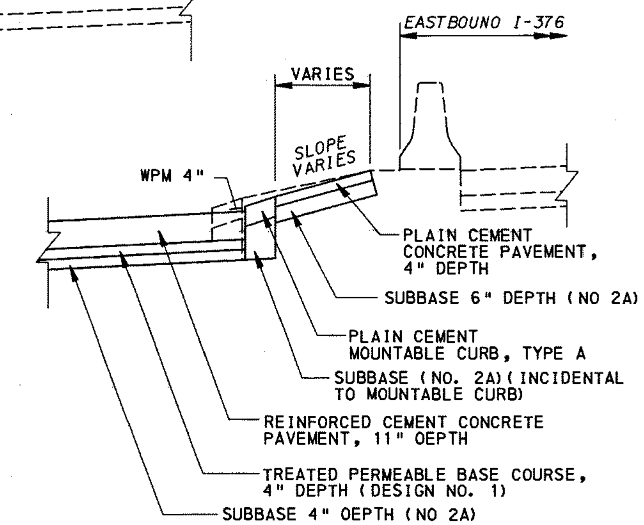
* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	15 OF 85
	CITY OF PITTSBURGH			

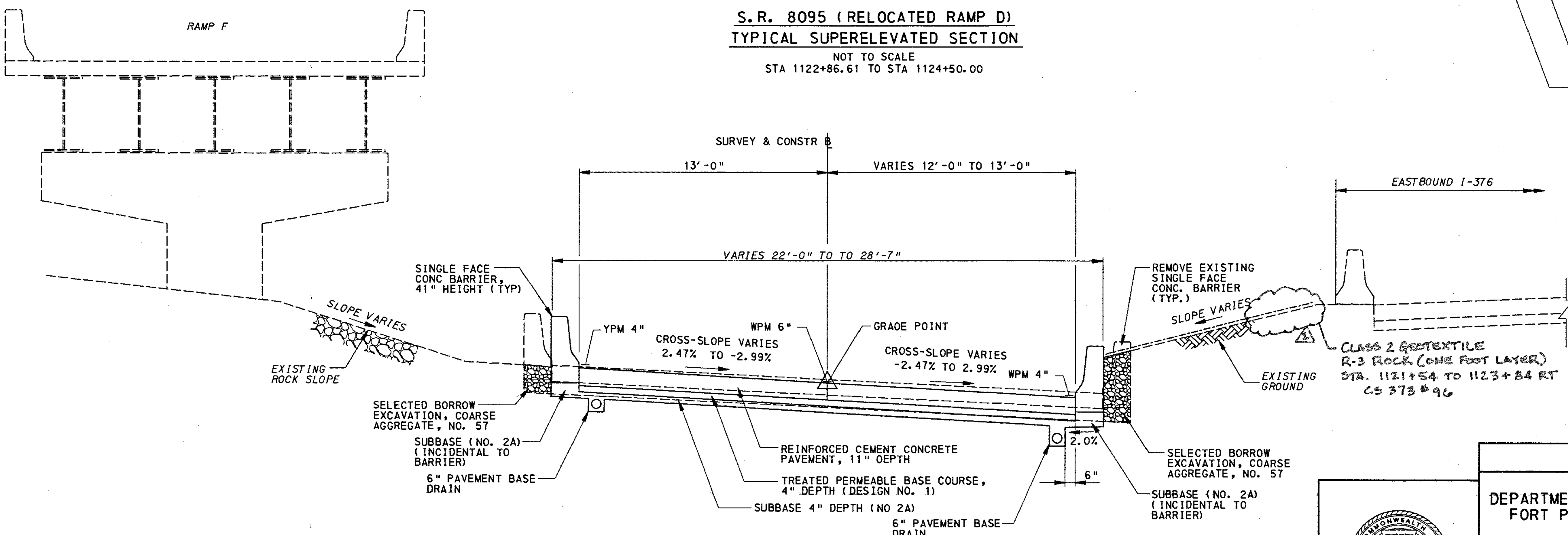
REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



S.R. 8095 (RELOCATED RAMP D)
TYPICAL SUPERELEVATED SECTION
NOT TO SCALE
STA 1122+86.61 TO STA 1124+50.00



PARTIAL SECTION 'A'
NOT TO SCALE
STA 1123+50 TO STA 1124+50



S.R. 8095 (RELOCATED RAMP D)
TYPICAL SUPERELEVATED SECTION
NOT TO SCALE
STA 1121+54.60 TO STA 1122+86.61

LEGEND

WPM, 4" - WHITE PAVEMENT MARKING, WIDTH
YPM, 4" - YELLOW PAVEMENT MARKING, WIDTH
BWPM, 4" - BROKEN WHITE PAVEMENT MARKING, WIDTH
DWPM, 4" - DOTTED WHITE PAVEMENT MARKING, WIDTH

SEEDING LEGEND

FORMULA D MIXTURE

RECORD DRAWINGS

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES F. WEMER
ENGINEER
NO. 48931-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
TYPICAL SECTIONS

SCALE: AS SHOWN | SHEET NO 15 OF 85 | ACCESSION NO
DATE: 11/28/2001 | CASE NO

DRAWN BY	AJH
CHECKED BY	JFW

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* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	16 OF 85
CITY OF PITTSBURGH				

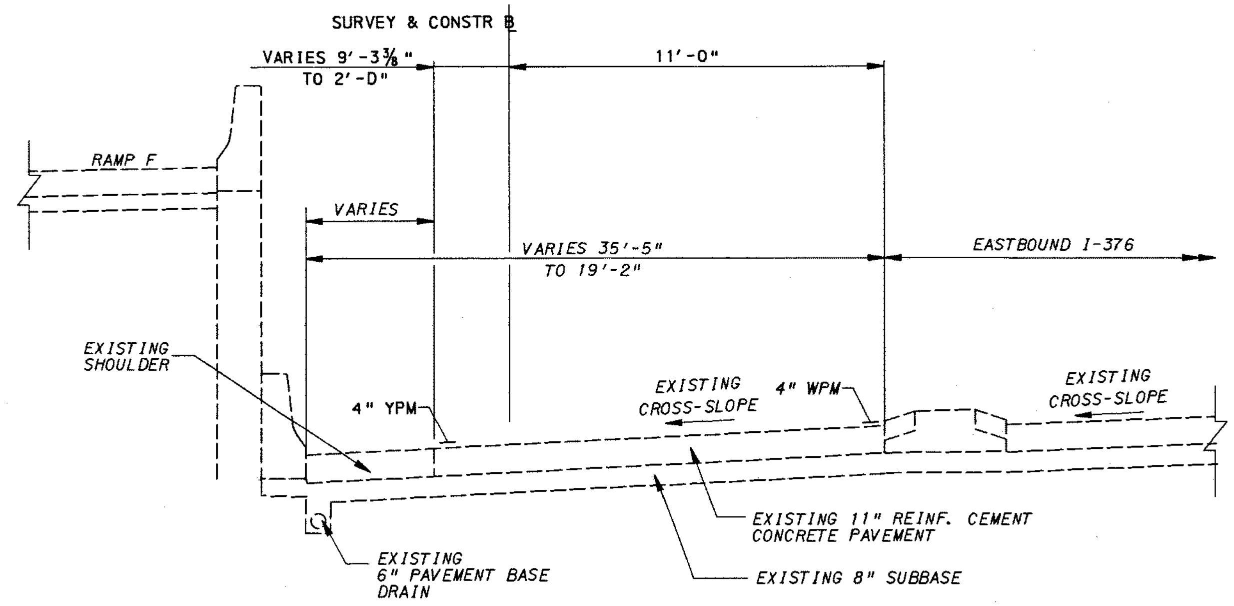
REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

LEGEND

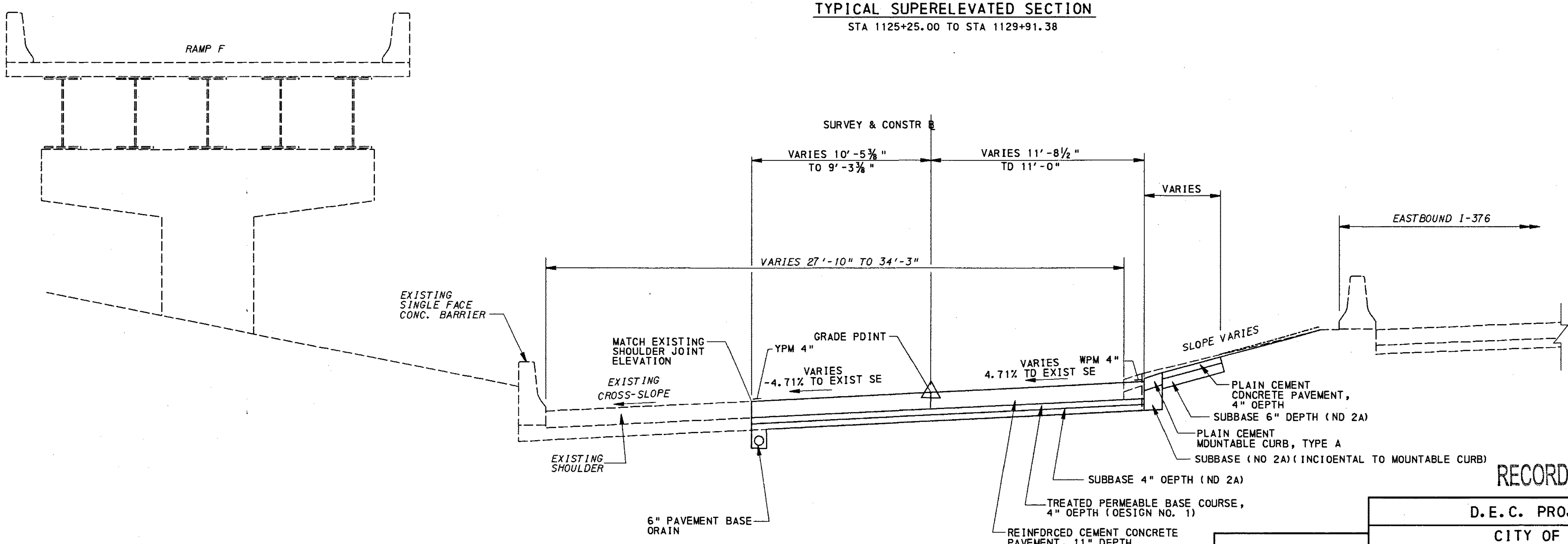
WPM, 4" - WHITE PAVEMENT MARKING, WIDTH
YPM, 4" - YELLOW PAVEMENT MARKING, WIDTH
BWPM, 4" - BROKEN WHITE PAVEMENT MARKING, WIDTH
DWPM, 4" - DOTTED WHITE PAVEMENT MARKING, WIDTH

SEEDING LEGEND

FORMULA D MIXTURE

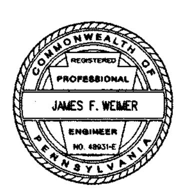


S.R. 8095 (RELOCATED RAMP D)
TYPICAL SUPERELEVATED SECTION
STA 1125+25.00 TO STA 1129+91.38



S.R. 8095 (RELOCATED RAMP D)
TYPICAL SUPERELEVATED SECTION
STA 1124+50 TO STA 1125+25.00

RECORD DRAWINGS



D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
TYPICAL SECTIONS

SCALE: AS SHOWN	SHEET NO	ACCESSION NO
DATE: 11/28/2001	16 OF 85	CASE NO

DRAWN BY	AJH
CHECKED BY	JFW

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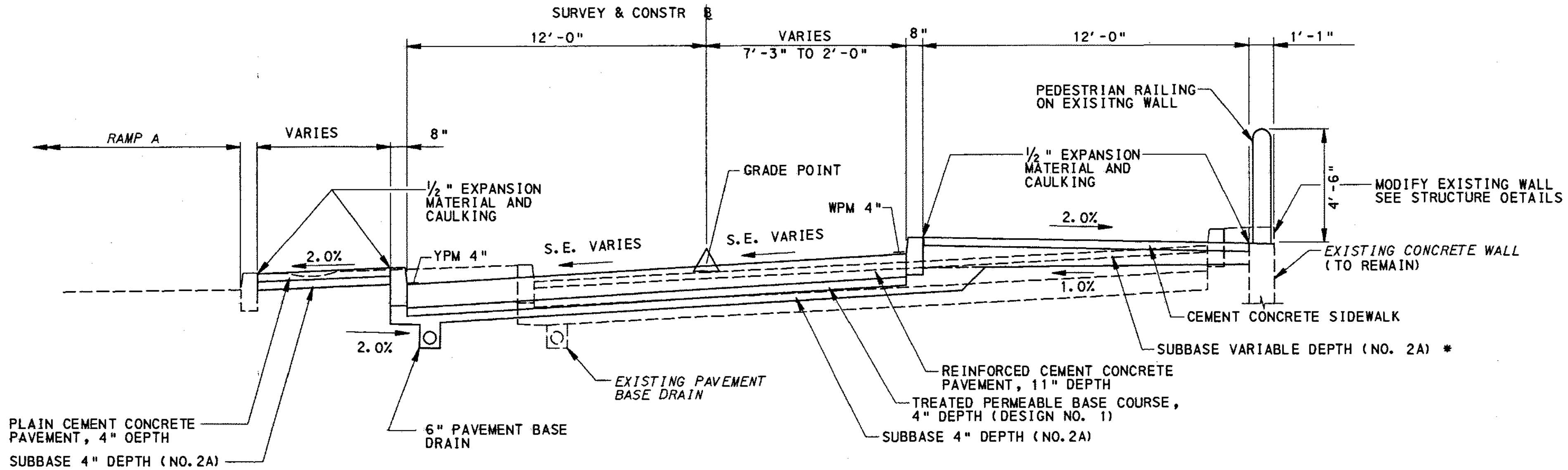
* 0279 & 0376
** A33 & A28

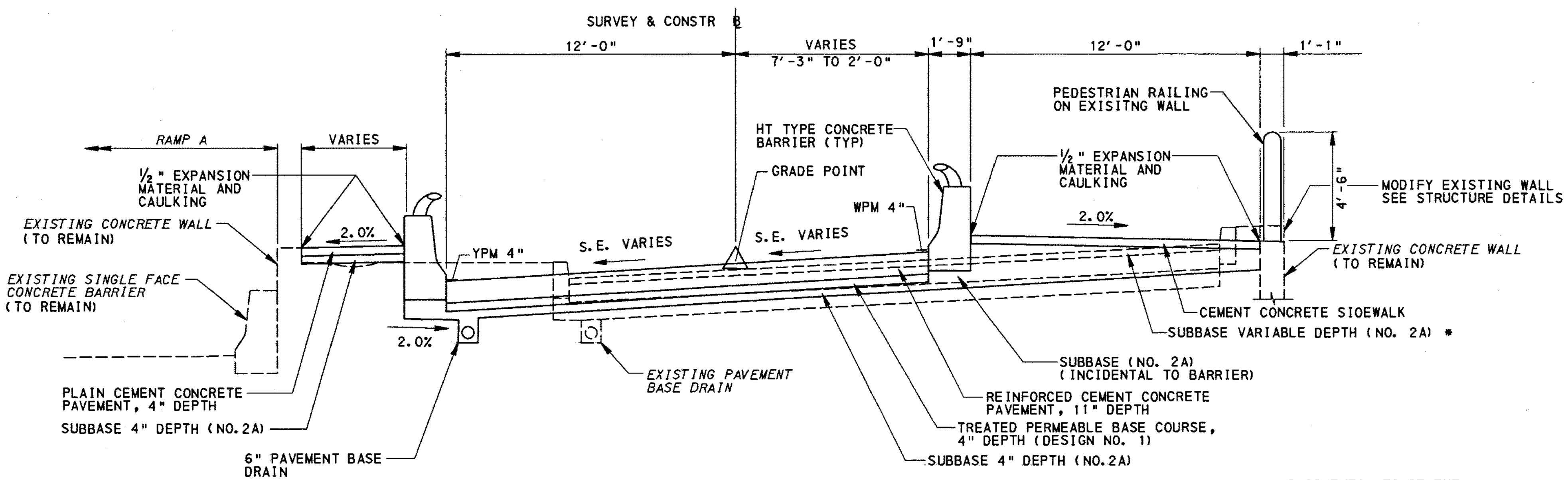
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	17 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
⚠	AS-BUILT	10/1/03	SAI



RAMP B
TYPICAL SUPERELEVATED SECTION
STA 650+95.00 TO STA 651+46.00

* INCIDENTAL TO CEMENT CONCRETE SIDEWALK.



* INCIDENTAL TO CEMENT CONCRETE SIDEWALK.

RAMP B
TYPICAL SUPERELEVATED SECTION
STA 649+24.25 TO STA 650+95.00

LEGEND

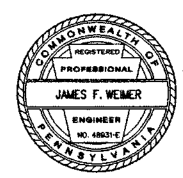
WPM, 4" - WHITE PAVEMENT MARKING, WIDTH
YPM, 4" - YELLOW PAVEMENT MARKING, WIDTH
BWPM, 4" - BROKEN WHITE PAVEMENT MARKING, WIDTH
DWPM, 4" - DOTTED WHITE PAVEMENT MARKING, WIDTH

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
TYPICAL SECTIONS



DRAWN BY	AJH
CHECKED BY	JFW

SCALE: AS SHOWN
SHEET NO 17 OF 85
ACCESSION NO
DATE : 11/28/2001
CASE NO

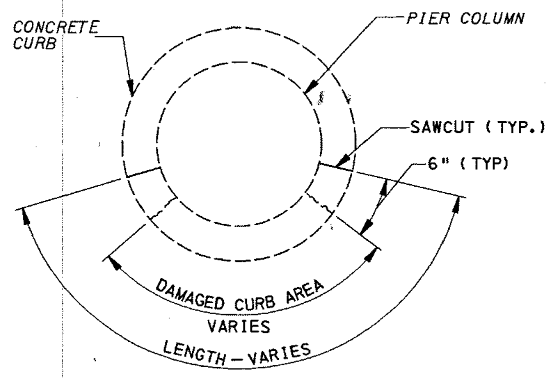
h:\projects\ustation\0042\Roadway\CNTYP6.dgn 11/28/2001

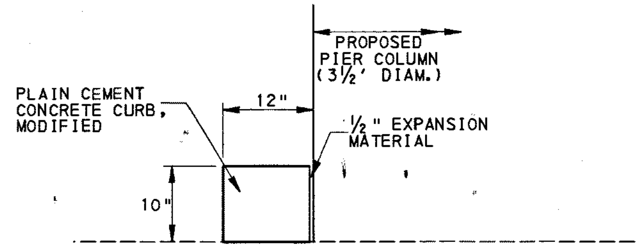
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	18 OF 85

* 0279 & 0376
** A33 & A28

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

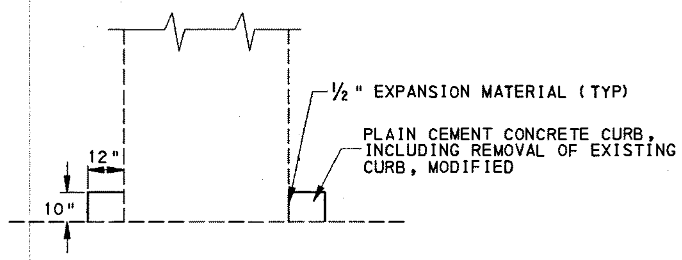




DETAIL - PLAIN CEMENT CONCRETE CURB, MODIFIED

ITEM 4630-0001

PIER LOCATIONS - C14, C16, C17, C18, C19, C20, C21, C22
C23, C25, C26, C27, C28, C29, C30, C31
C32, C33, D34, C35, C36, C37, C38, C39
AND AT ALL NEW PIER LOCATIONS

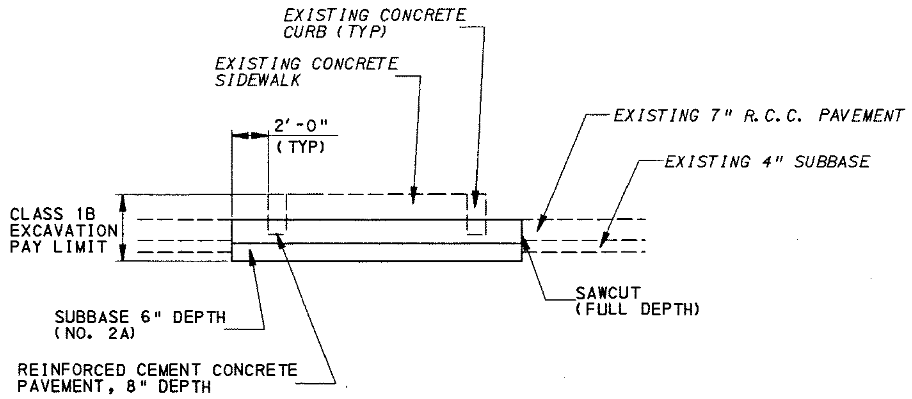


PIER LOCATION	LENGTH (FT)
D5	4
C6	2
D8	3
D9	6
D11	6
C12	2
D14	3

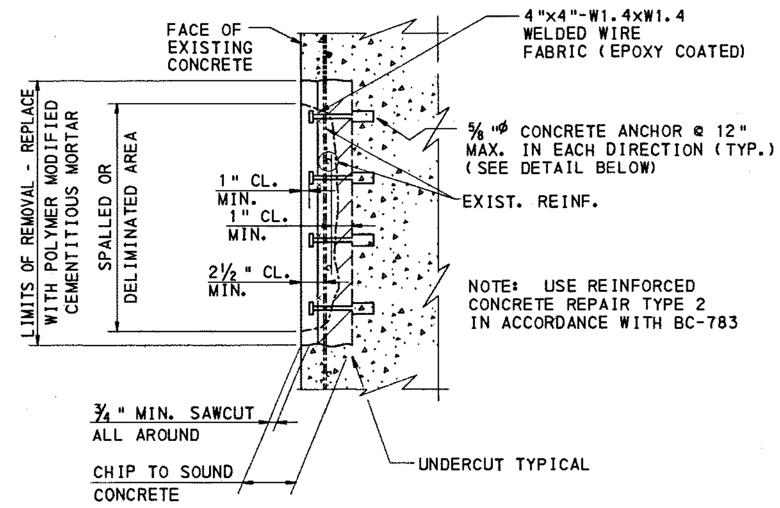
PIER LOCATION	LENGTH (FT)
D15	4
D16	4
D22	7
D28	2
D29	3
D37	2

DETAIL - PLAIN CEMENT CONCRETE CURB, INCLUDING REMOVAL OF EXISTING CURB, MODIFIED

ITEM 4630-0010

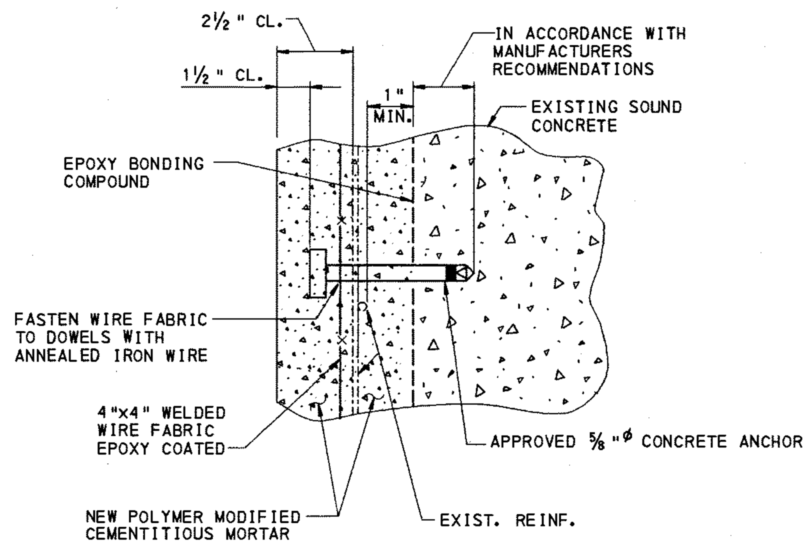


DETAIL - MON WHARF SIDEWALK REMOVAL



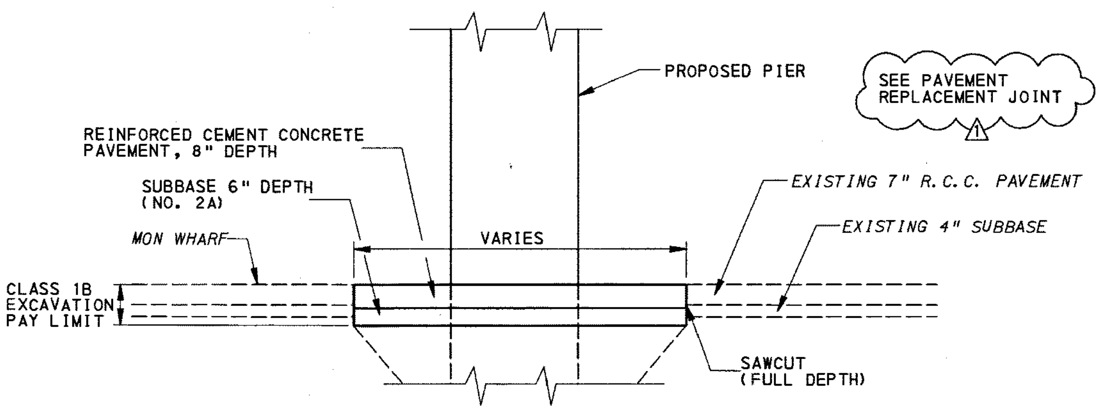
DETAIL - CONCRETE SPALL REPAIR

NO TO SCALE

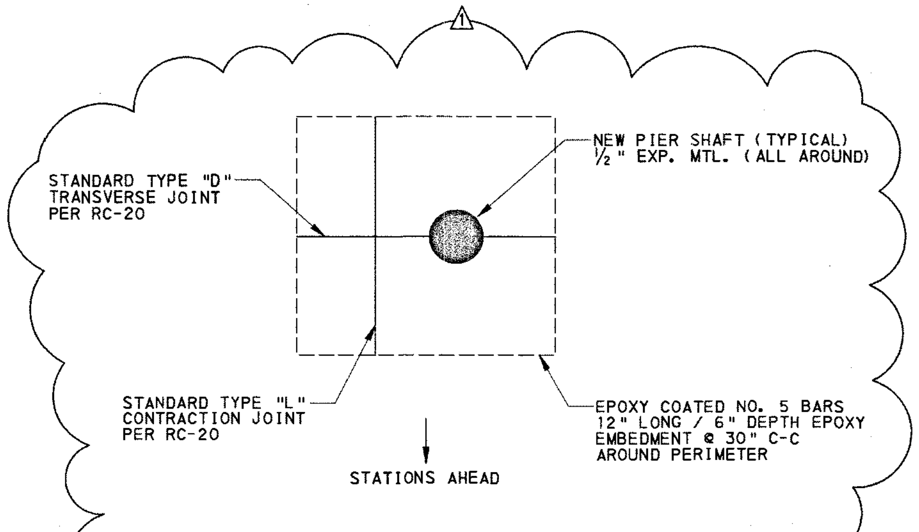


DETAIL - CONCRETE ANCHOR

NO TO SCALE



DETAIL - MON WHARF PAVEMENT REPLACEMENT



DETAIL - PAVEMENT REPLACEMENT JOINT

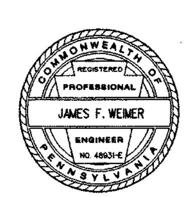
NOTE: SEE STRUCTURES PLAN S-24399 FOR PIER LOCATIONS.

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS



SCALE: AS SHOWN	SHEET NO	ACCESSION NO
DATE: 12/01/2001	18 OF 85	CASE NO

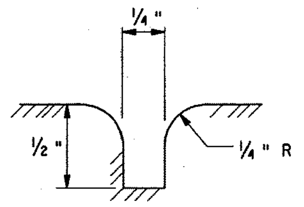
DRAWN BY	CM
CHECKED BY	JFW

H:\Projects\Ustation\0042\ASBUILT\abcndet18.dgn 12/29/2003

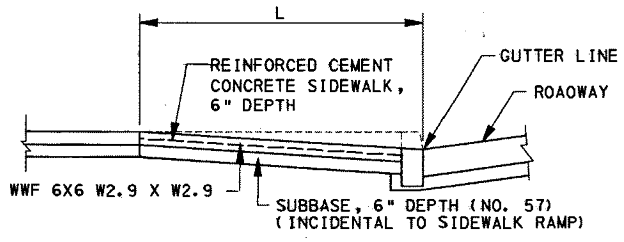
*	0279 & 0376
**	A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	19 OF 85
CITY OF PITTSBURGH				

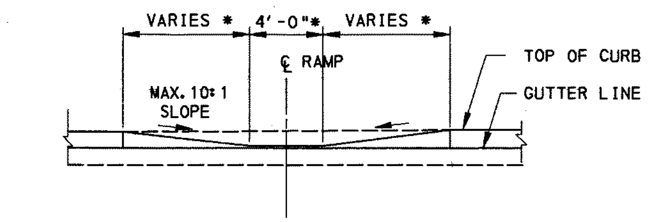
REVISION NUMBER	REVISIONS	DATE	BY
⚠1	AS-BUILT	10/1/03	SAI



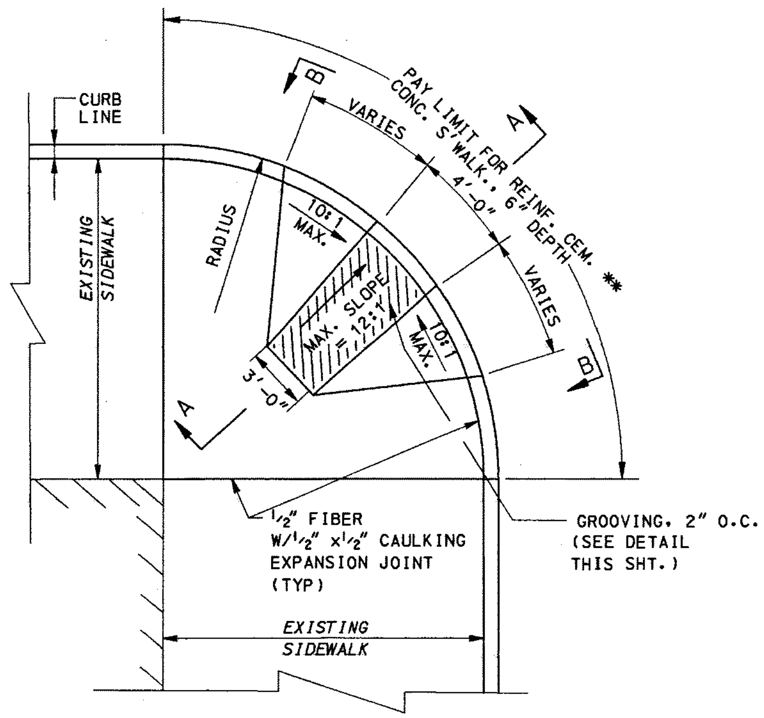
DETAIL-TYPICAL GROOVING
AT SIDEWALK RAMPS
NO SCALE



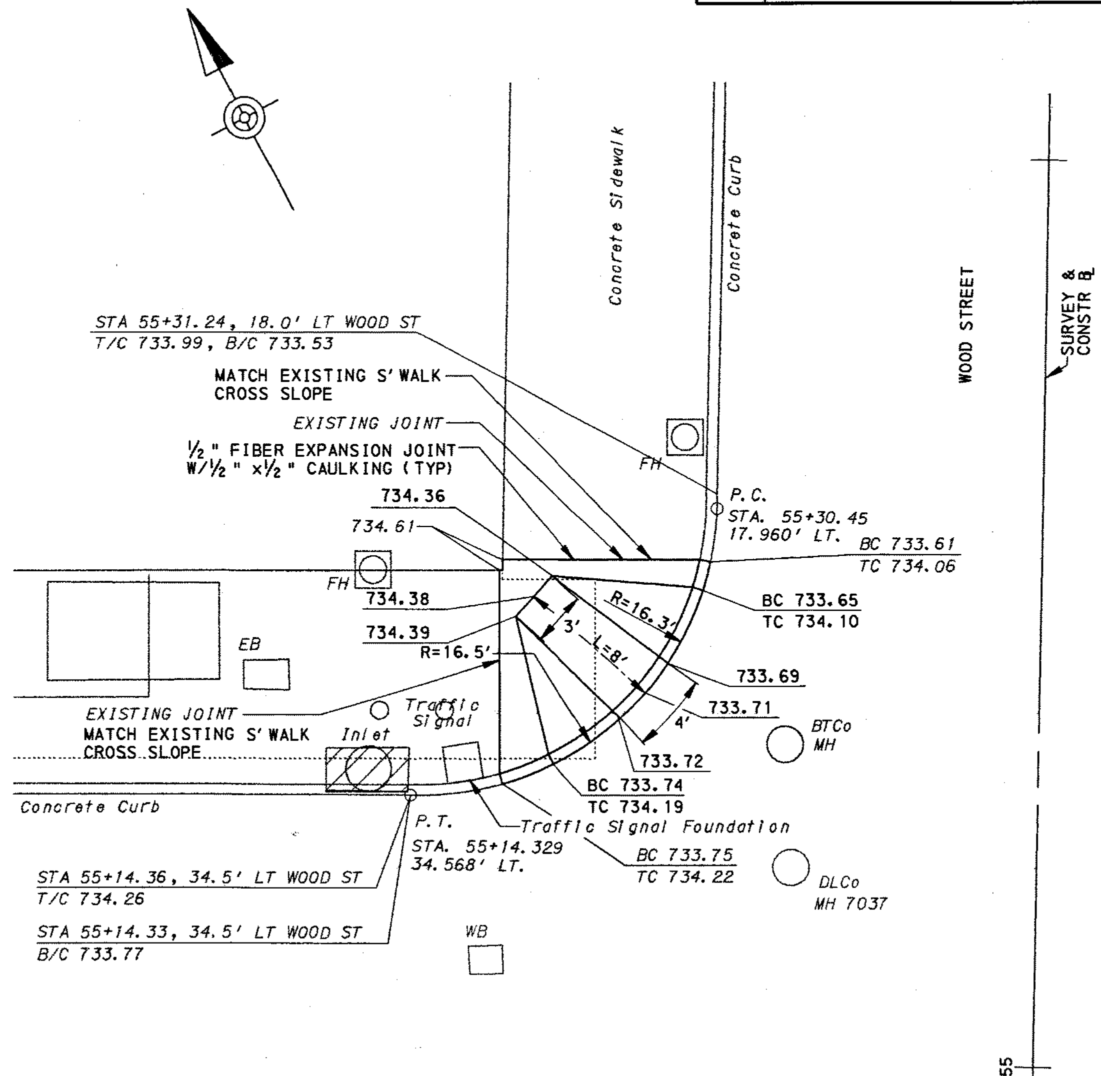
SECTION A-A
NO SCALE



SECTION B-B
NO SCALE
* SEE SIDEWALK RAMP ELEVATION DETAILS FOR ACTUAL DIMENSIONS



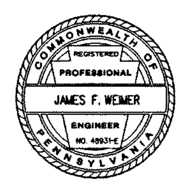
DETAIL - SIDEWALK RAMP
NO SCALE
ITEM NO. 9000-0103
** SEE DETAILS OF SIDEWALK PLAN FOR ACTUAL LIMITS



WOOD STREET
SIDEWALK RAMP ELEVATIONS

SCALE
5 FEET 0 5 FEET

RECORD DRAWINGS



D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

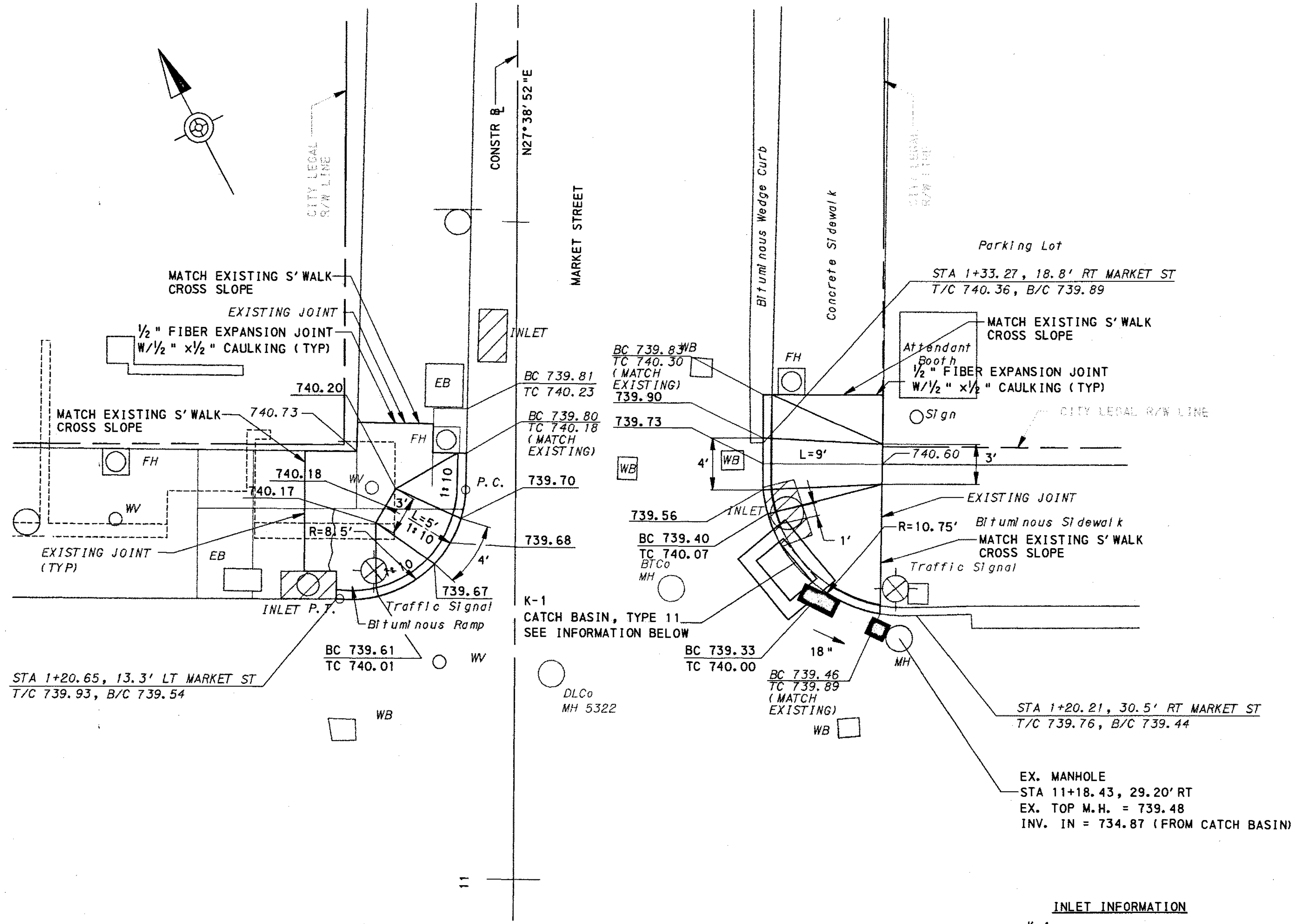
SCALE: AS SHOWN | SHEET NO 19 OF 85 | ACCESSION NO ________
DATE : 11/28/2001 | CASE NO ________

DRAWN BY	AJH
CHECKED BY	JFW

* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	20 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



INLET INFORMATION

K-1
CATCH BASIN, TYPE 11
STA. 11+24.22, 21.31' RT
T.C. = 740.00
T.G. = 739.33
INV. OUT = 735.08 (TO EX. MH)
BOT. INLET = 733.42

MARKET STREET
SIDEWALK RAMP ELEVATIONS

SCALE
5 FEET 0 5 FEET

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

SEE SHEET 19
FOR TYPICAL SIDEWALK RAMP DETAILS

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES F. WEIMER
ENGINEER

DRAWN BY	AJH
CHECKED BY	JFW

SCALE: AS SHOWN   SHEET NO 20 OF 85   ACCESSION NO ________
DATE : 11/28/2001   CASE NO ________

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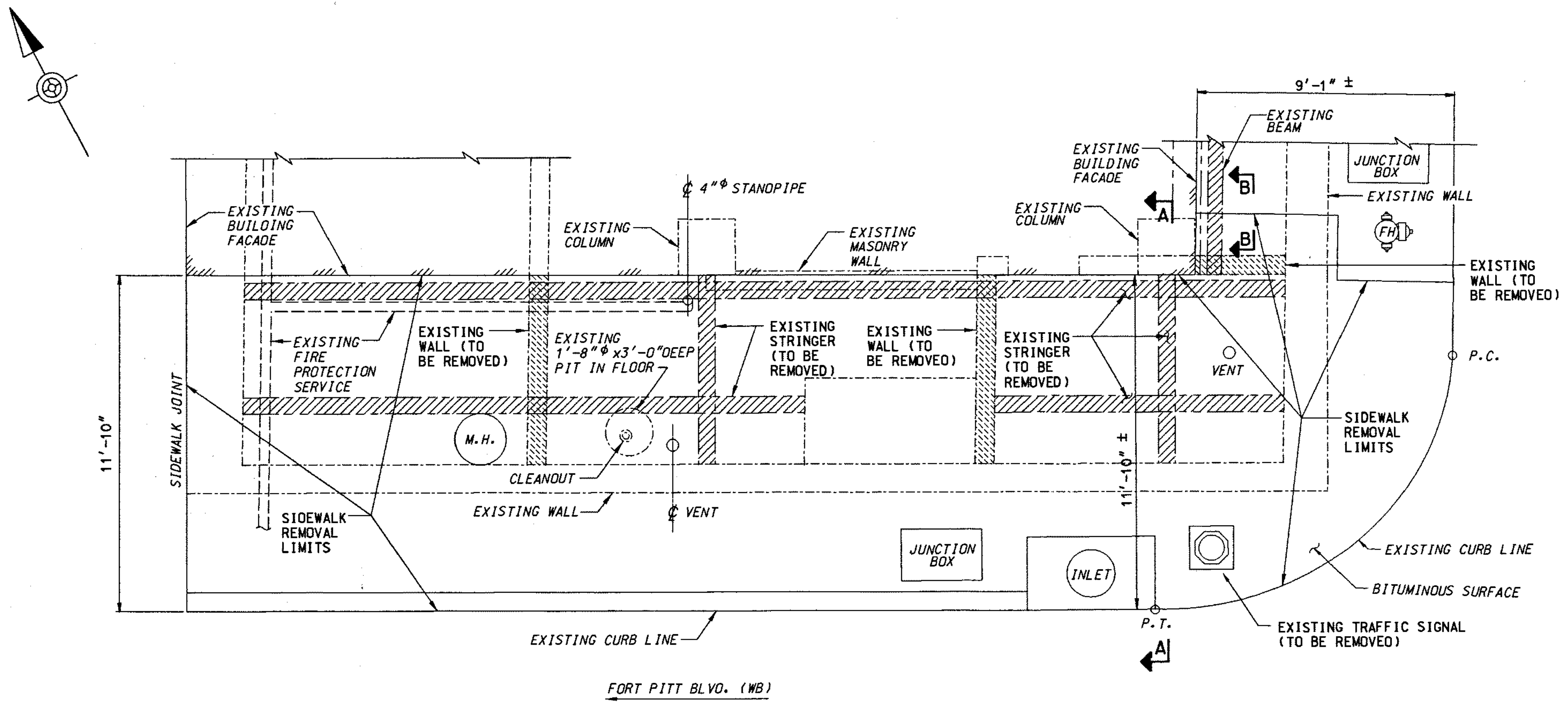
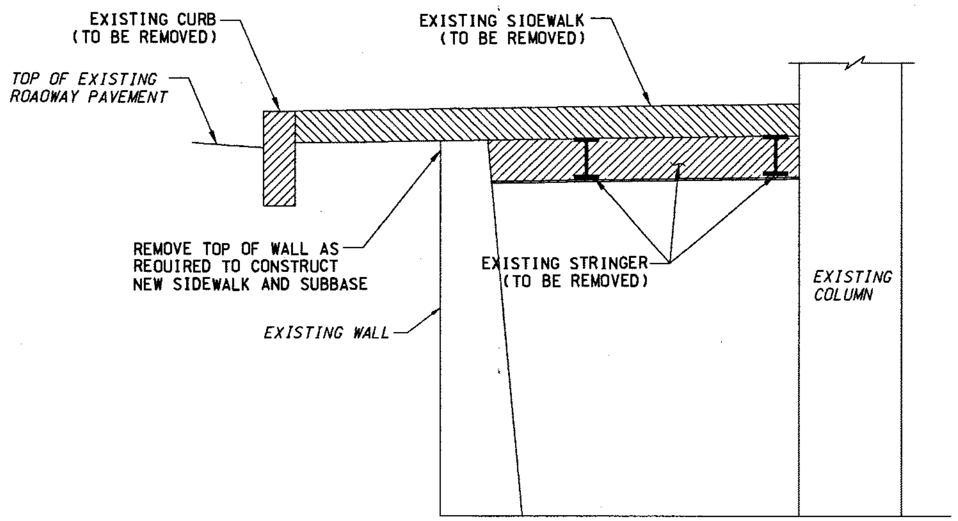
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	21 OF 85
CITY OF PITTSBURGH				

* 0279 & 0376
** A33 & A2B

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



PLAN



SECTION A-A
REMOVAL LIMITS

GENERAL NOTES

- PRIOR TO STARTING WORK, VERIFY EXISTING FUNCTIONAL UTILITIES WITHIN THE BUILDING VAULTS AND COORDINATE ALL WORK ASSOCIATED WITH UTILITIES WITH PROPERTY OWNERS/OPERATORS AND UTILITY OWNER. PROTECT EXISTING UTILITIES DURING ALL OPERATIONS.
- PRIOR TO SIDEWALK REMOVAL, INVESTIGATE THE EXISTING SIDEWALK AND BUILDING SUPPORT SYSTEMS FOR EACH BUILDING. IDENTIFY AND LOCATE THE SIDEWALK SUPPORT SYSTEM REMOVAL LIMITS THAT WILL NOT DISTURB THE STRUCTURAL INTEGRITY OF THE EXISTING BUILDING SUPPORT SYSTEM.
- IMMEDIATELY UPON REMOVAL OF EXISTING SIDEWALK AND THE EXPOSURE OF BASEMENT ACCESS, INITIATE THE SECURITY/PROTECTION PROGRAM TO PREVENT UNAUTHORIZED ENTRY INTO EXISTING BASEMENTS.
- REPAIR/REPLACE DAMAGED EXISTING BUILDING FACADE, COLUMNS, BEAMS, WALLS, FOOTINGS, UTILITY VAULTS, UTILITIES, OR OTHER FACILITIES RESULTING DIRECTLY OR INDIRECTLY FROM OPERATIONS TO THE SATISFACTION OF THE ENGINEER AND OWNER AT NO ADDITIONAL PAYMENT.
- EXISTING VAULT PARTITION WALLS REMAIN IN PLACE, REMOVAL SHALL BE AS SHOWN OR AS DIRECTED BY THE ENGINEER. DO NOT DISTURB OR DAMAGE EXISTING FOUNDATION OR BEARING WALLS REQUIRED FOR BUILDING SUPPORT. IF THERE IS ANY DOUBT REGARDING IMPACT ON THE STRUCTURAL INTEGRITY OF THE BUILDING, STOP WORK, AND CONSULT THE ENGINEER.
- PROVIDE A CLEAN AND SMOOTH JOINT LINE AT THE BUILDING FACADE, UTILIZING SAWCUT OR OTHER APPROVED METHODS TO ALLOW FOR CONTINUOUS FIT BETWEEN THE EXPANSION JOINT FILLER MATERIAL AND SIDEWALK MATERIAL AT NO ADDITIONAL COST. SUBMIT THE METHOD OF PREPARING THE FACADE AND INCLUDE CONCRETE AND CONCRETE REPAIR AS NECESSARY.
- SEAL JOINTS USING APPROVED 1/4 INCH PREMOULDED EXPANSION JOINT FILLER AND CAULKING COMPOUND. IF THE WIDTH OF A JOINT IS GREATER THAN 1/4 INCH, USE A FOAM BACKER ROD AS RECOMMENDED BY THE SEALANT MANUFACTURER.
- MODIFY SIDEWALK FLASHING DETAILS AS REQUIRED TO MEET EXISTING CONDITIONS AND TO ENSURE PROPER SEAL.
- REMOVE ALL EXISTING CONCRETE FLOORS FROM LIMITS OF EXCAVATION TO THE EXISTING VAULT WALLS.
- REMOVE UNSUITABLE MATERIAL, AS DIRECTED BY THE ENGINEER, BELOW PROPOSED BOTTOM OF WALL FOOTING AND REPLACE WITH AASHTO NO.57 AGGREGATE.
- REMOVE THE VAULT FLOOR A MINIMUM OF 6 INCHES FOR PLACEMENT OF NEW FOOTING.
- CONSTRUCT BLOCK WALLS AS SHOWN AND IN ACCORDANCE WITH APPROPRIATE CHAPTERS OF ACI 530-99/ASCE 6-99, BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.
- WHERE UTILITIES PENETRATE CONCRETE BLOCK WALLS, NEITHER SLEEVES NOR CONDUIT SHALL TOUCH THE REINFORCING STEEL.
- LIMITS OF AND DIMENSIONS SHOWN FOR CONCRETE BLOCK WALLS ARE BASED ON BEST AVAILABLE DATA INCLUDING FIELD SURVEY OF VAULT AREAS. AFTER REMOVING EXISTING SIDEWALK AND WALLS, VERIFY EXACT DIMENSIONS. LOCATE CONCRETE BLOCK WALLS 4" FROM EXISTING BUILDING COLUMNS, BEAMS, FOOTING OR WALLS WHICHEVER EXTENDS FARTHEST INTO VAULT, OR AS INDICATED. ADJUST ACTUAL DIMENSIONS OF THE CONCRETE BLOCK WALLS AS NECESSARY TO FIT FIELD CONDITIONS.
- FOR NEW WALL AND SIDEWALK DETAILS SEE SHEETS 21A, 21B, 22 & 23.
- FOR SECTION B-B SEE SHEET 22.
- SPRINT PCS
  CONTACT: BRADLEY IRWIN 412-401-9568

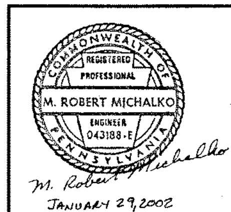
* SUMMARY OF ESTIMATED QUANTITIES		
DESCRIPTION	UNIT	TOTAL
REMOVAL OF EXISTING SLAB	SY	54
EXCAVATION	CF	85
CLASS A CEMENT CONCRETE	CY	14
12" MASONRY BLOCK	SF	250
WATERPROOF MEMBRANE	SF	300
REINFORCEMENT	LBS	1320
NO. 57 AGGREGATE	CY	28
STRUCTURAL SLAB	SF	55
FLASHING	LF	38
SIDEWALK SLAB	SY	45
4" DRAIN PIPE	LF	13
CLEANOUT	EACH	1
VENTS	EACH	1
* FOR INFORMATION ONLY		

DETAIL - SIDEWALK RAMP, MARKET STREET

ITEM NO. 9000-0901
(SHEET 1 OF 5)

3' 2' 1' 0' 3'
SCALE: 3/8" = 1'-0"

RECORD DRAWINGS



D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

DRAWN BY	TP
CHECKED BY	MRM

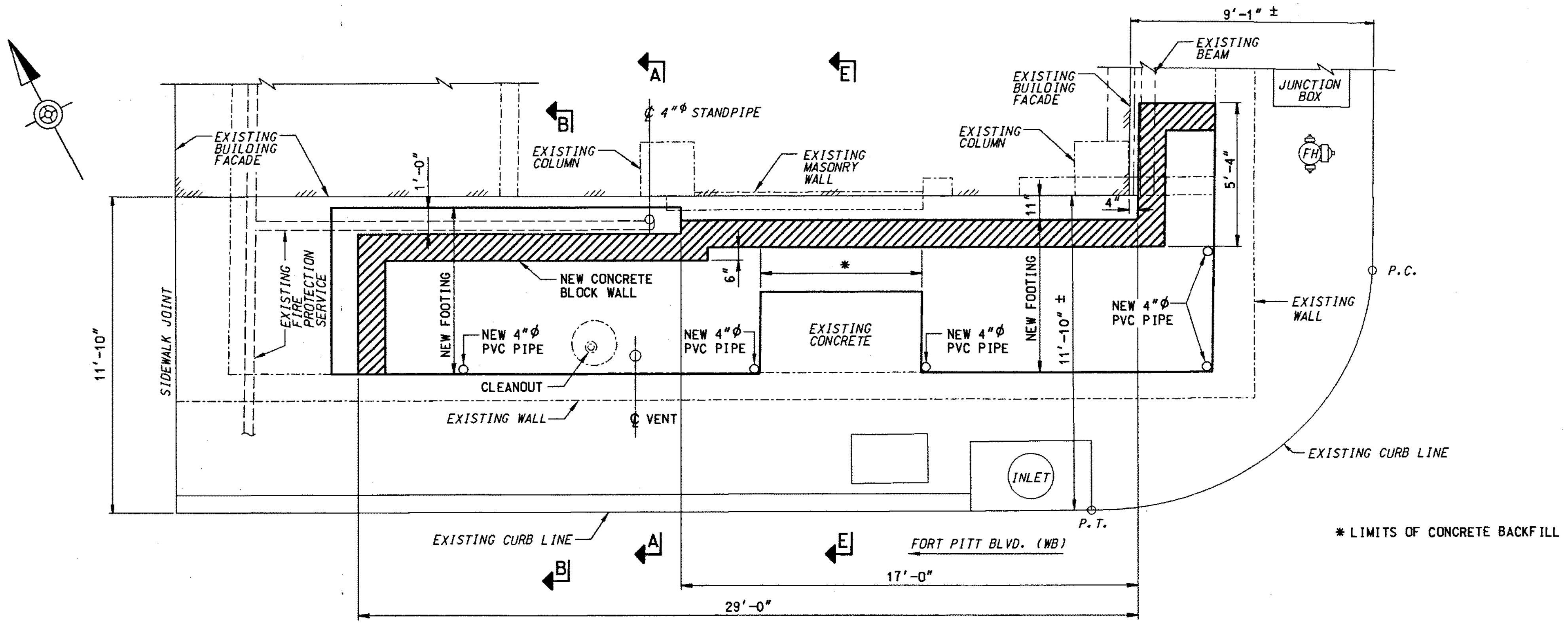
SCALE: AS SHOWN
SHEET NO 21 OF 85
ACCESSION NO
DATE : 01/29/2002
CASE NO

H:\projects\ustation\0042\Roadway\hramp04.dgn 01/29/2002

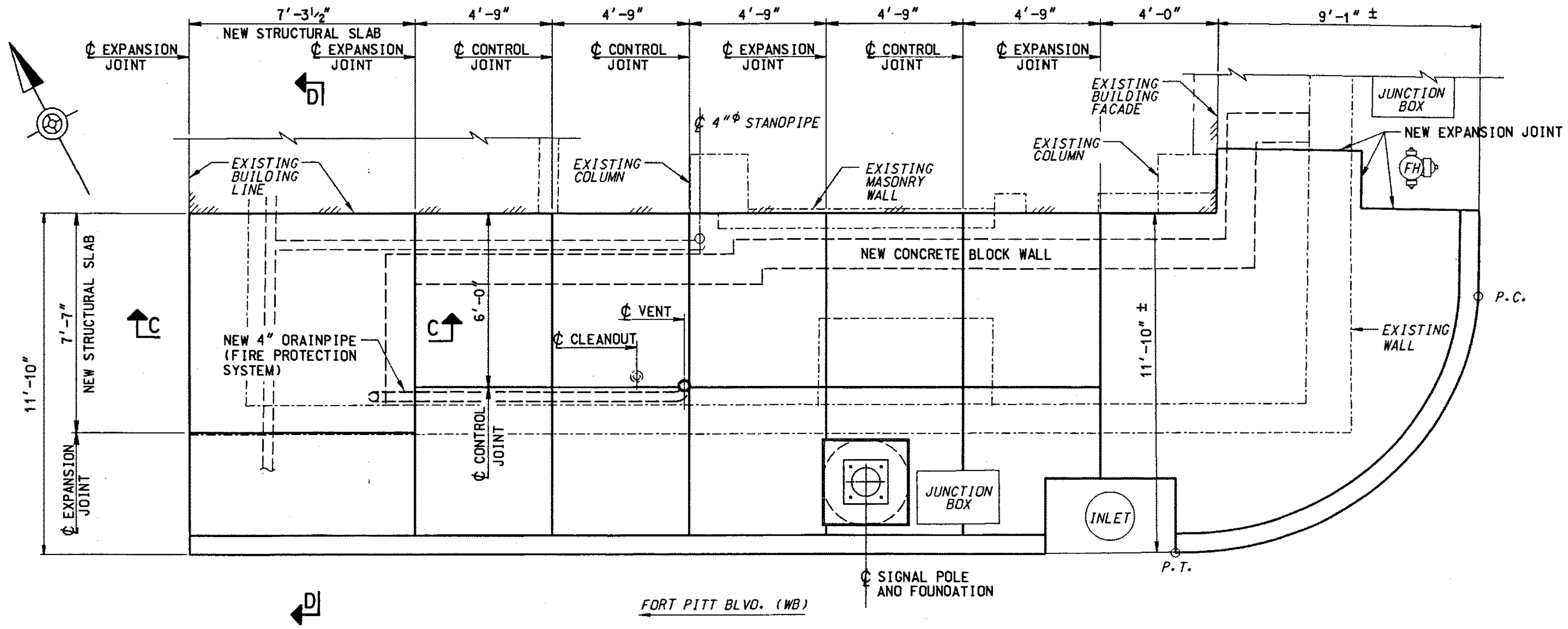
* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	21A OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



WALL AND FOOTING PLAN



SIDEWALK LAYOUT PLAN

NOTES

- FOR SIDEWALK RAMP DETAILS SEE SHEETS 19 & 20.
- FOR GENERAL NOTES AND DEMOLITION DETAILS SEE SHEET 21.
- FOR SECTIONS A-A, B-B, C-C, D-D, E-E AND EXPANSION JOINT DETAIL SEE SHEET 21B.
- FOR NEW CONCRETE BLOCK WALL DETAILS SEE SHEETS 22 AND 23.
- FOR NEW 4"ϕ PVC PIPE DETAILS SEE SHEET 22.

RECORD DRAWINGS

DETAIL - SIDEWALK RAMP, MARKET STREET

ITEM NO. 9000-0901
(SHEET 2 OF 5)

3' 2' 1' 0' 3'
SCALE: 3/8" = 1'-0"

DRAWN BY	TP
CHECKED BY	MRM

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL M. ROBERT MICHALKO ENGINEER NO. 043189-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

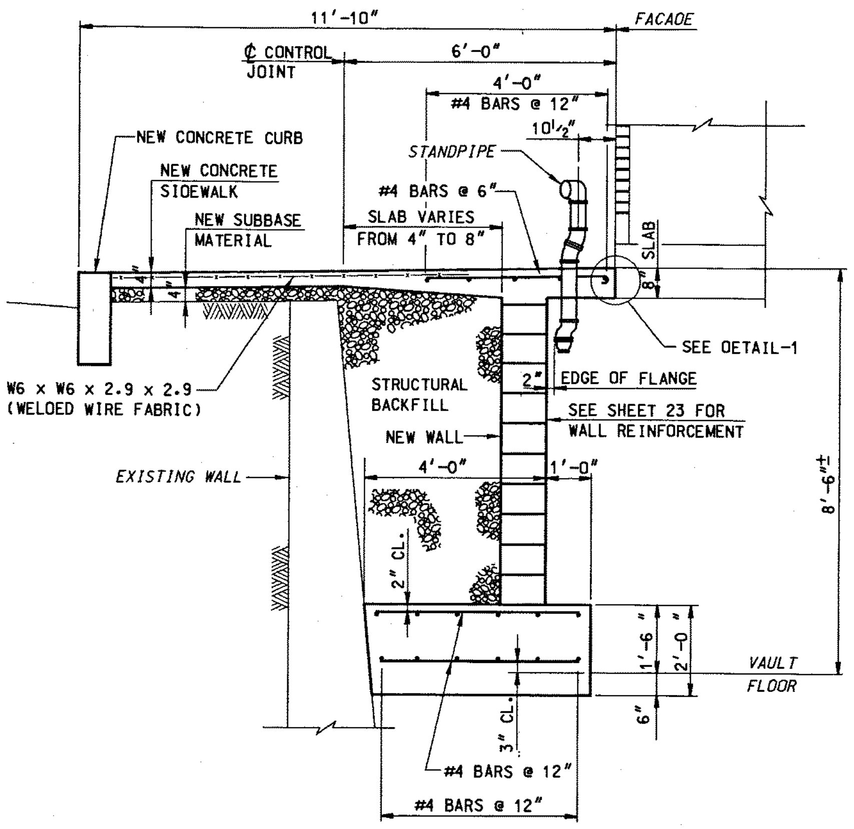
SCALE: AS SHOWN | SHEET NO | ACCESSION NO
DATE : 01/29/2002 | 21A OF 85 | CASE NO

h:\projects\ustation\0042\Roadway\hramp07.dgn 01/29/2002

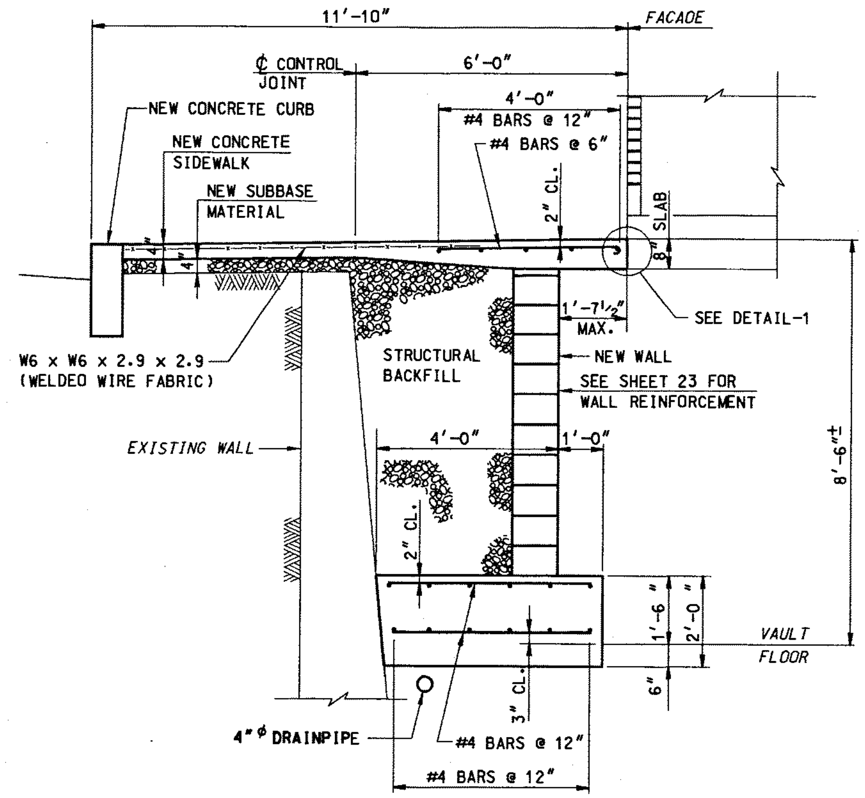
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	21B OF 85
CITY OF PITTSBURGH				

* 0279 & 0376
** A33 & A2B

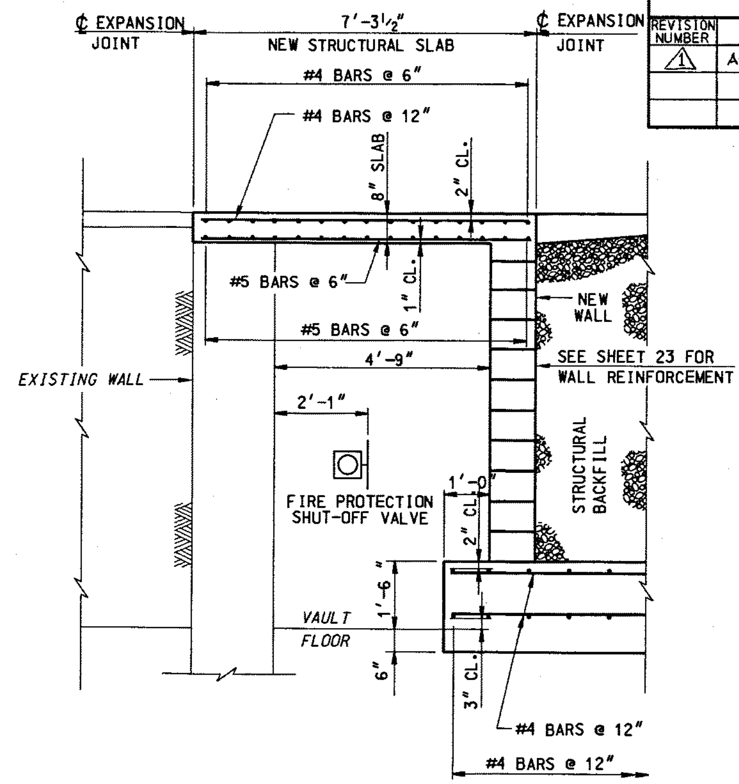
REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



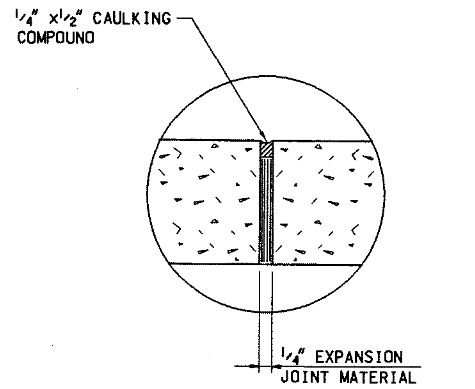
SECTION A-A



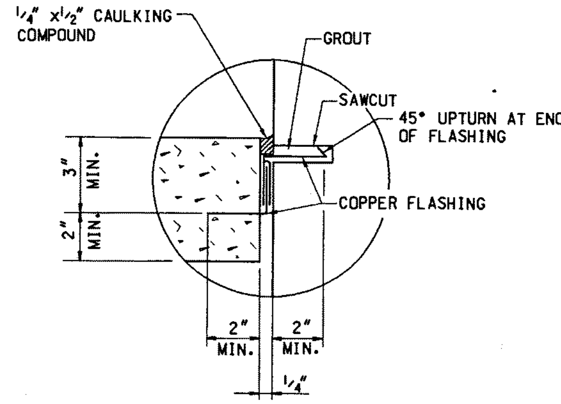
SECTION B-B



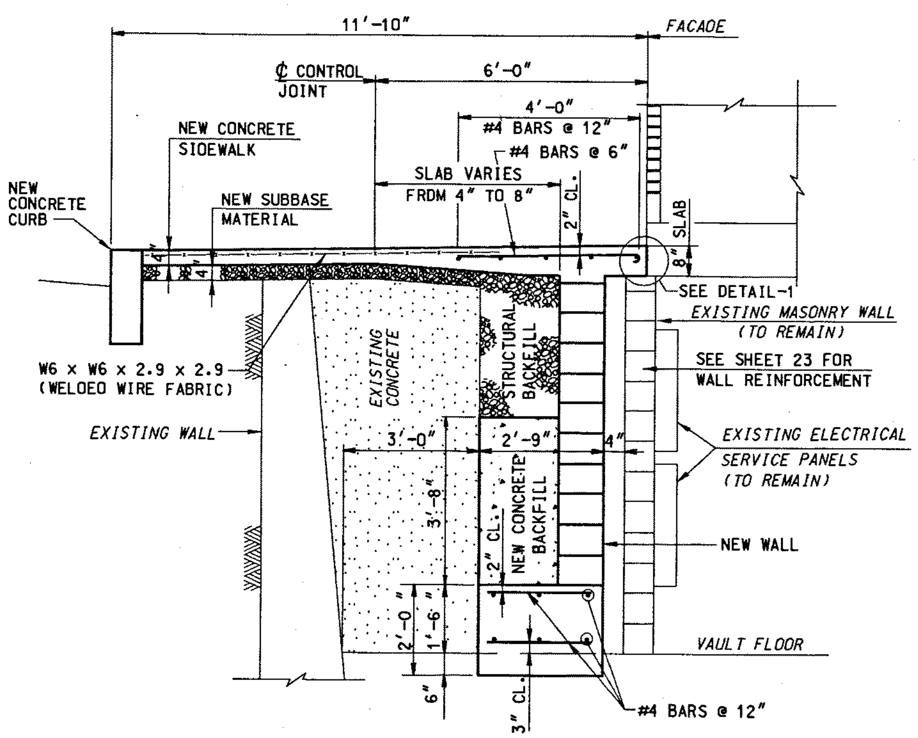
SECTION C-C



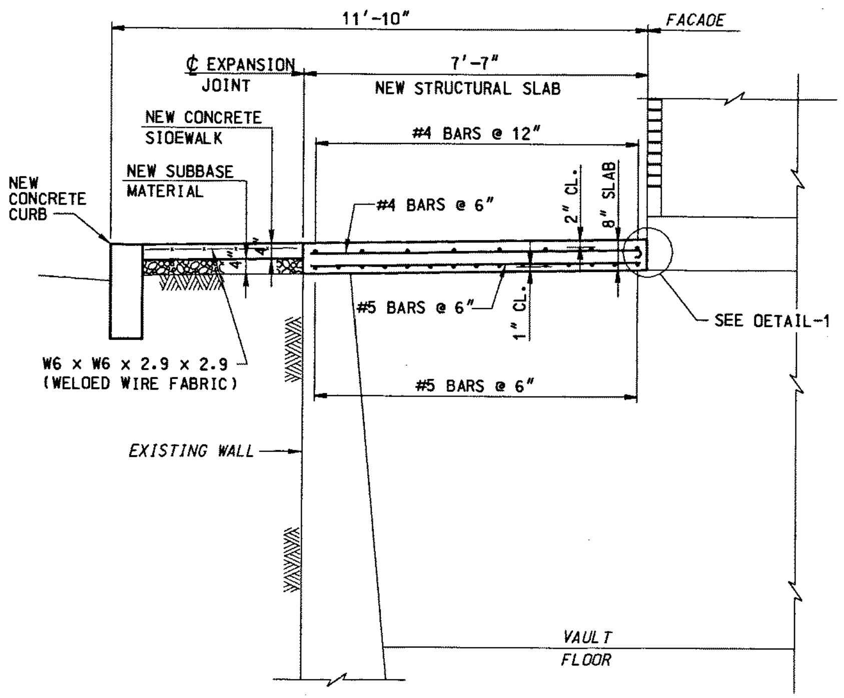
EXPANSION JOINT DETAIL



DETAIL-1



SECTION E-E



SECTION D-D

NOTES:

- FOR GENERAL NOTES SEE SHEET 21.
- FOR LOCATION OF SECTIONS SEE SHEET 21A.
- FOR WALL REINFORCEMENT SEE SHEET 23.
- FOR SIDEWALK RAMP DETAILS SEE SHEETS 19 & 20.

RECORD DRAWINGS

DETAIL - SIDEWALK RAMP, MARKET STREET

ITEM NO. 9000-0901
(SHEET 3 OF 5)

DRAWN BY	TP
CHECKED BY	MRM

2' 1' 0' 2'
SCALE: ½" = 1'-0"

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL ENGINEER
M. ROBERT MICHALKO
NO. 043699-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

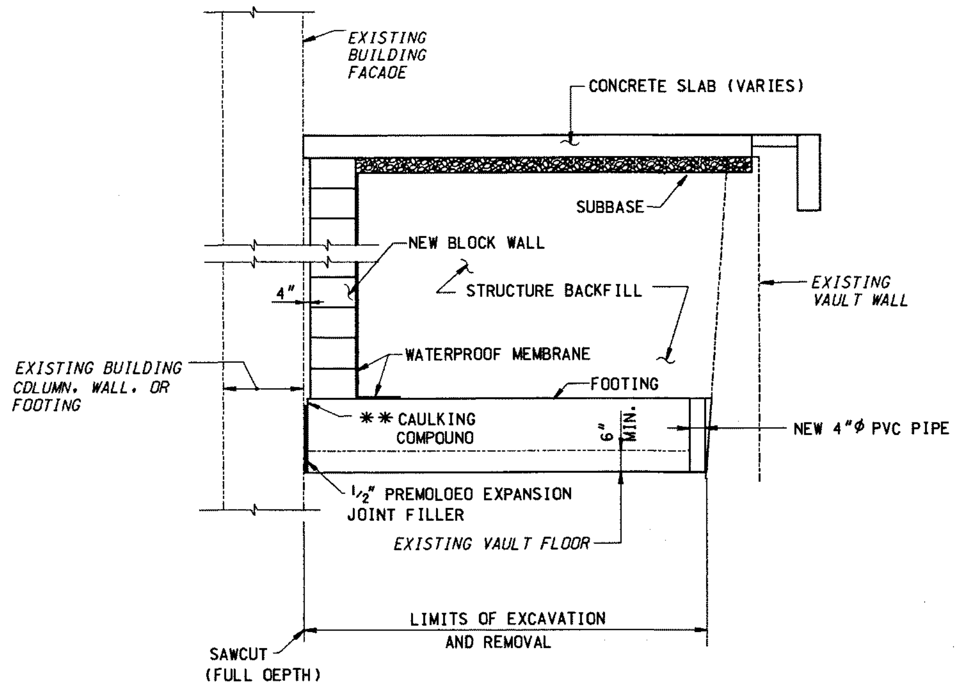
SCALE: AS SHOWN	SHEET NO	ACCESSION NO
DATE: 01/29/2002	21B OF 85	CASE NO

h:\projects\ustation\0042\Roadway\hramp08.dgn 01/29/2002

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	22 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

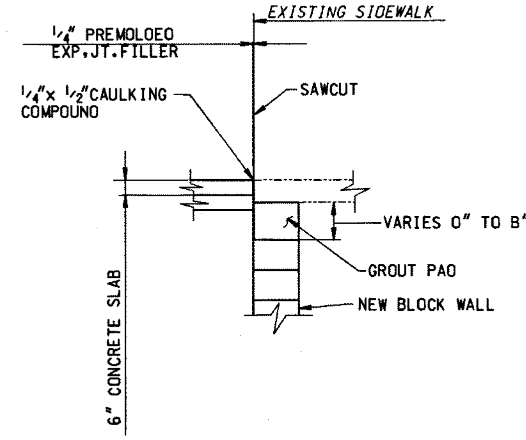
* 0279 & 0376
** A33 & A2B



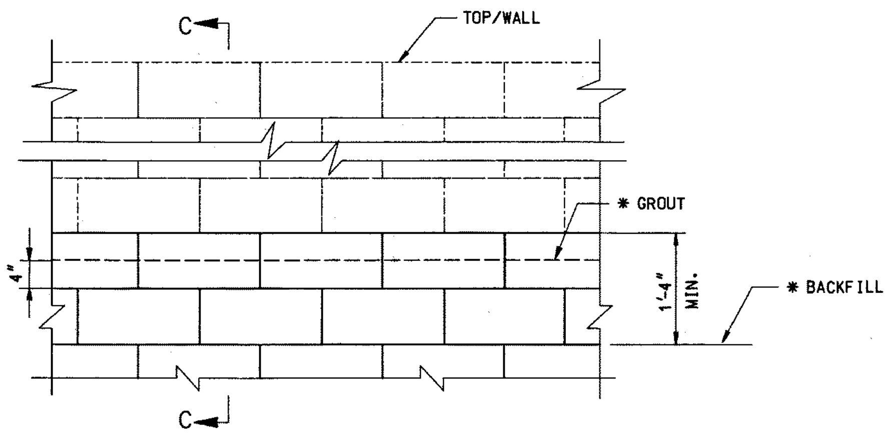
TYPICAL VAULT ABANDONMENT DETAIL

NOT TO SCALE

** CAULK HORIZONTAL AND VERTICAL EDGES OF 1/2" PREMOLDED EXPANSION JOINT FILLER

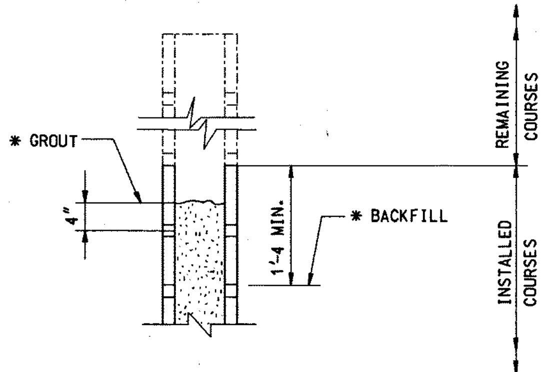


SECTION B-B



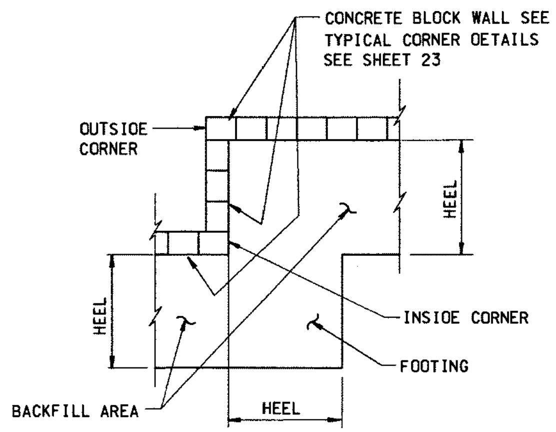
STAGED WALL CONSTRUCTION

* IF WALL IS BUILT IN STAGES, PLACE GROUT HALFWAY UP TO THE TOP OF THE LAST COURSE PLACED. IF BACKFILLED BETWEEN STAGES, PLACE BACKFILL MATERIAL UP TO ONE FULLY GROUTED COURSE FROM TOP OF WALL.



SECTION C-C

NOT TO SCALE



TYPICAL FOOTING DETAIL AT WALL CORNERS

NOT TO SCALE

NOTES:

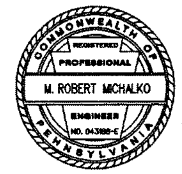
- WATERPROOF MEMBRANE TO EXTEND FROM TOP OF WALL TO BOTTOM OF WALL PLUS 1 FOOT ON TOP OF FOOTING .
- EXTEND WATERPROOF MEMBRANE 2 FEET ONTO ADJACENT WALLS.
- FOR LOCATION OF SECTIONS B-B SEE SHEET 21.
- FOR LOCATION OF 4"ϕ PVC PIPE SEE SHEET 21A.
- FILL 4"ϕ PVC PIPE WITH STRUCTURAL BACKFILL MATERIAL.

RECORD DRAWINGS

DETAIL - SIDEWALK RAMP, MARKET STREET

ITEM NO. 9000-0901
(SHEET 4 OF 5)

DRAWN BY	TP
CHECKED BY	MRM



D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

SCALE: AS SHOWN | SHEET NO | ACCESSION NO
DATE : 01/29/2002 | 22 OF 85 | CASE NO

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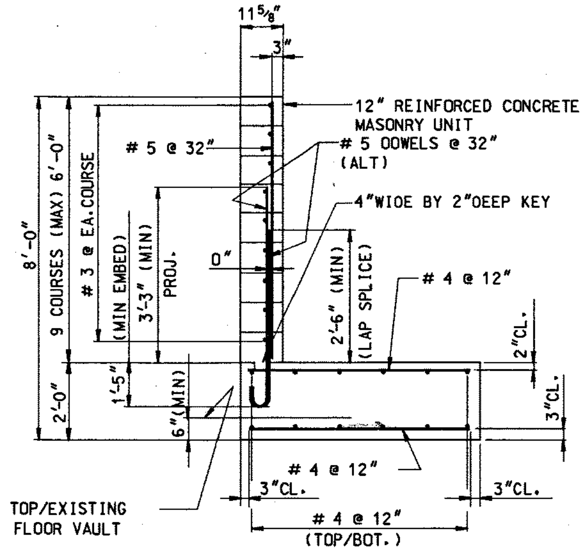
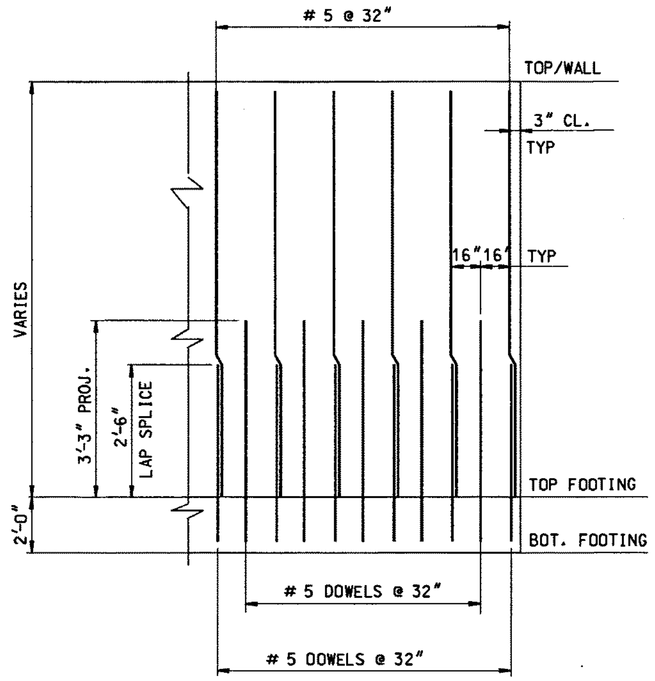
* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	23 OF 85
CITY OF PITTSBURGH				

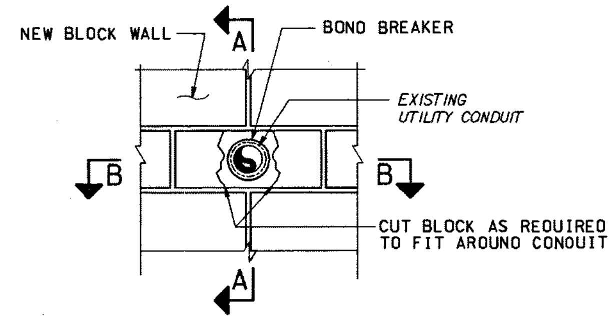
REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



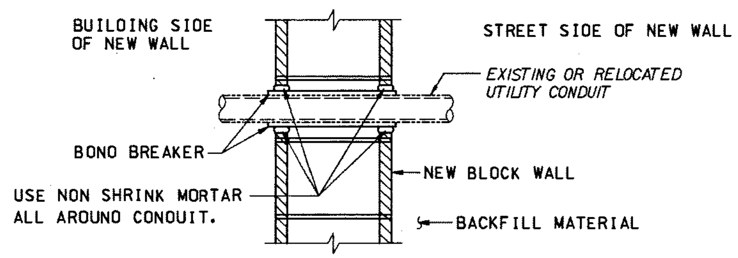
TYPICAL WALL SECTION
NOT TO SCALE



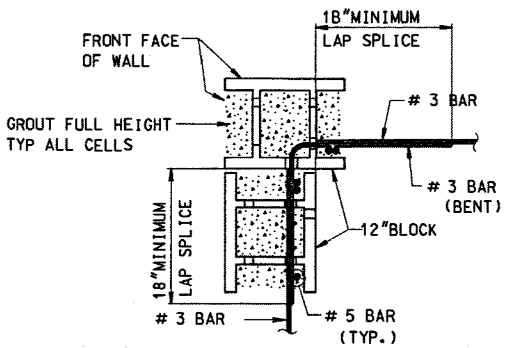
TYPICAL WALL ELEVATION
NOT TO SCALE



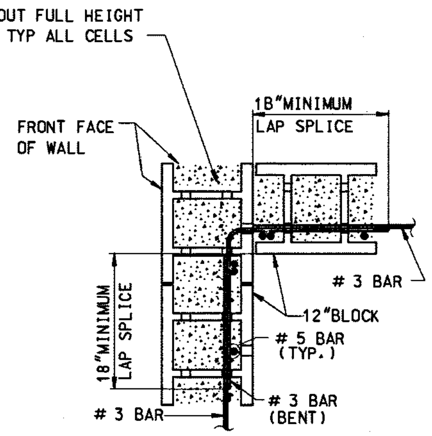
UTILITY DETAIL -1
NOT TO SCALE



SECTION A-A
NOT TO SCALE

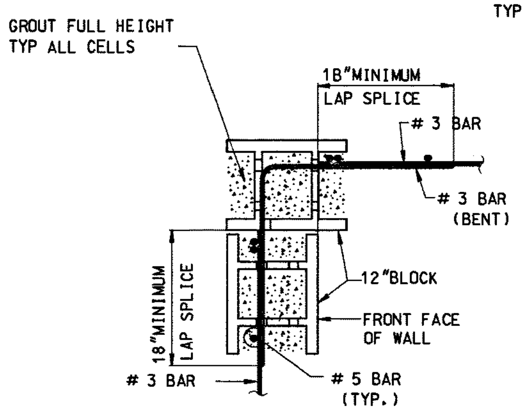


FIRST COURSE

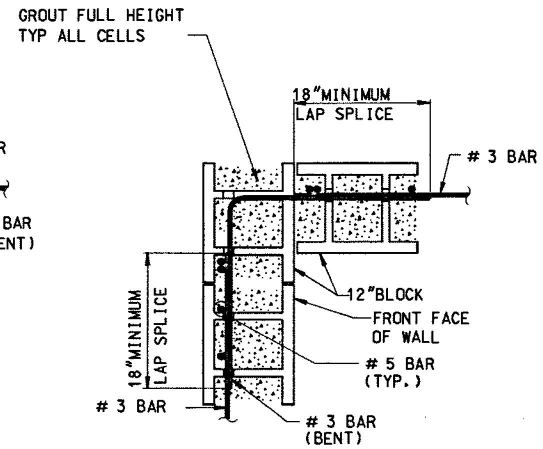


SECOND COURSE

OUTSIDE CORNER



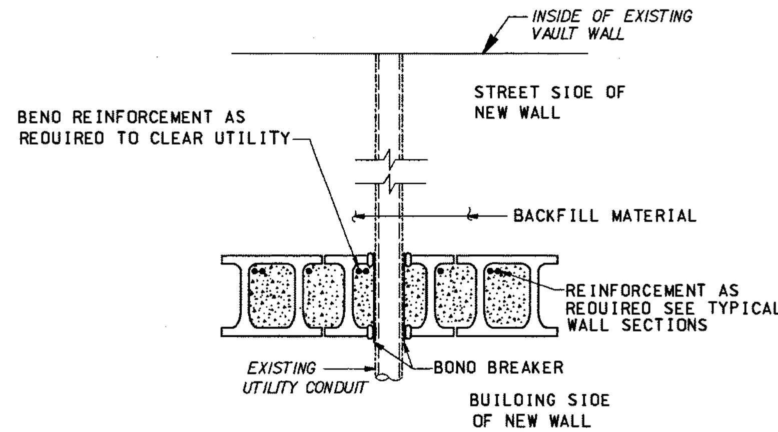
FIRST COURSE



SECOND COURSE

INSIDE CORNER

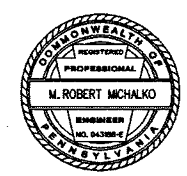
TYPICAL CORNER DETAILS
NOT TO SCALE



SECTION B-B
NOT TO SCALE

RECORD DRAWINGS

DETAIL - SIDEWALK RAMP, MARKET STREET
ITEM NO. 9000-0901
(SHEET 5 OF 5)



D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

SCALE: AS SHOWN	SHEET NO	ACCESSION NO
DATE : 01/29/2002	23 OF 85	CASE NO

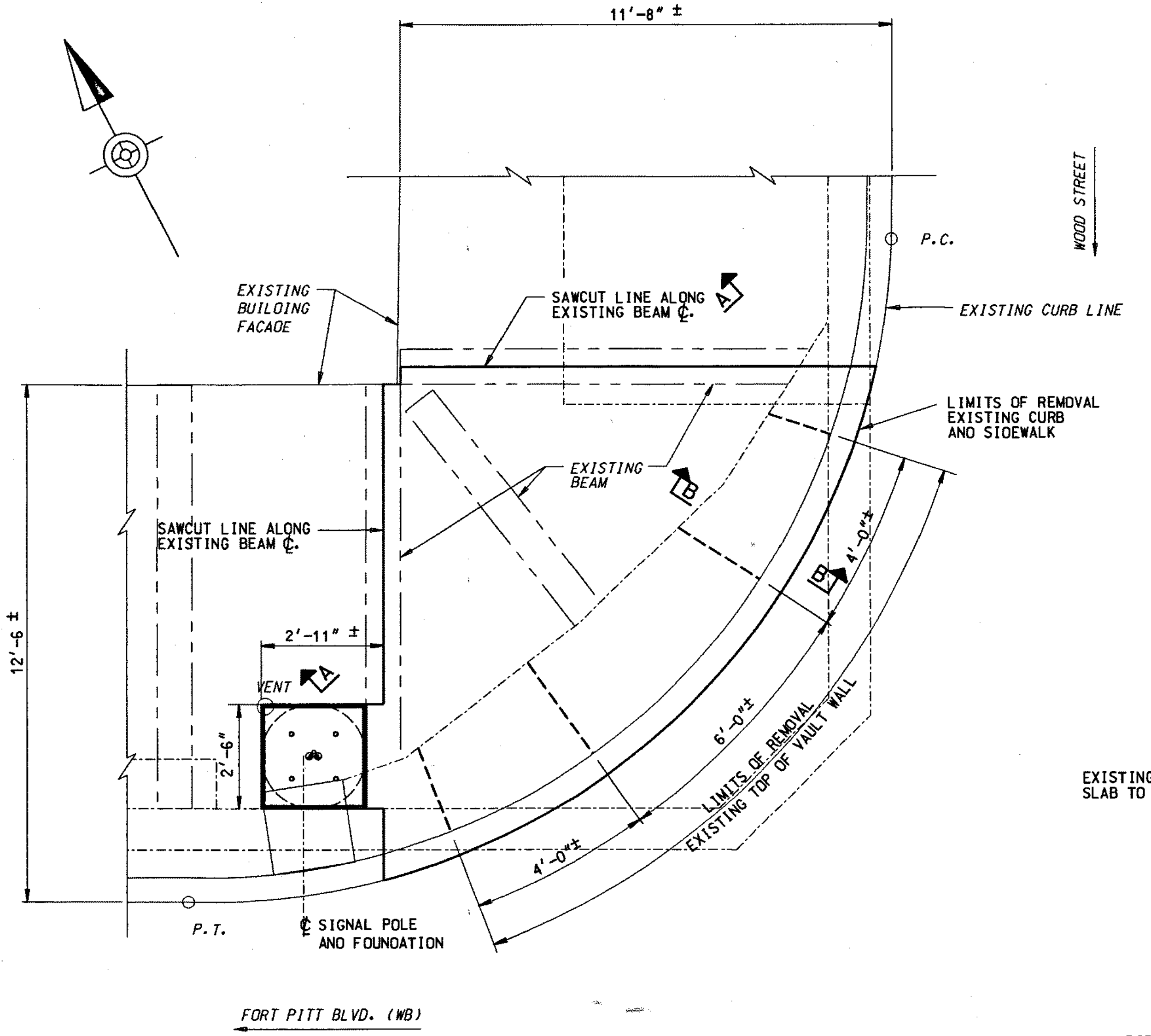
DRAWN BY	TP
CHECKED BY	MRM

h:\projects\ustation\0042\Roadway\hramp05.dgn 01/29/2002

* 0279 & 0376
** A33 & A2B

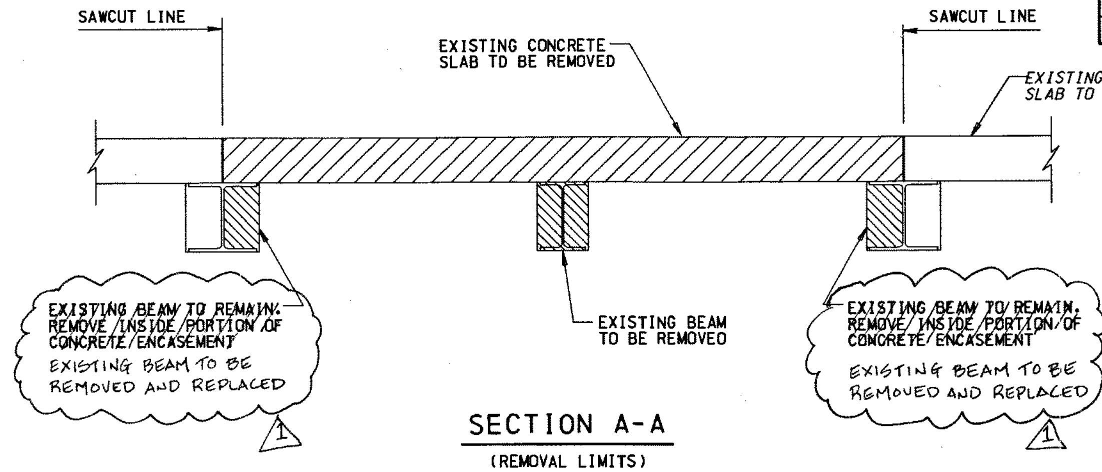
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	24 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



PLAN

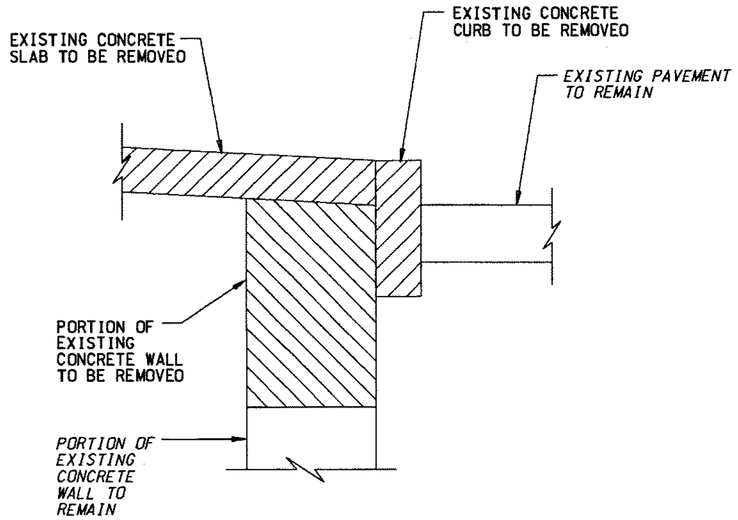
SCALE: 1/2" = 1'-0"



SECTION A-A

(REMOVAL LIMITS)

SCALE: 3/4" = 1'-0"



SECTION B-B

(REMOVAL LIMITS)

SCALE: 3/4" = 1'-0"

GENERAL NOTES

- PRIOR TO STARTING WORK, VERIFY EXISTING FUNCTIONAL UTILITIES WITHIN THE BUILDING VAULTS AND COORDINATE ALL WORK ASSOCIATED WITH UTILITIES WITH PROPERTY OWNERS/ OPERATORS AND UTILITY OWNER. PROTECT EXISTING UTILITIES DURING ALL OPERATIONS.
- PRIOR TO SIDEWALK REMOVAL, INVESTIGATE THE EXISTING SIDEWALK AND BUILDING SUPPORT SYSTEM. IDENTIFY AND LOCATE THE SIDEWALK SUPPORT SYSTEM REMOVAL LIMITS THAT WILL NOT DISTURB THE STRUCTURAL INTEGRITY OF THE EXISTING BUILDING SUPPORT SYSTEM.
- IMMEDIATELY UPON REMOVAL OF EXISTING SIDEWALK AND THE EXPOSURE OF BASEMENT ACCESS, INITIATE THE SECURITY/PROTECTION PROGRAM TO PREVENT UNAUTHORIZED ENTRY INTO EXISTING BASEMENTS.
- REPAIR/REPLACE DAMAGED EXISTING BUILDING FACADE, COLUMNS, BEAMS, WALLS, FOOTINGS, UTILITY VAULTS, UTILITIES, OR OTHER FACILITIES RESULTING DIRECTLY OR INDIRECTLY FROM OPERATIONS TO THE SATISFACTION OF THE ENGINEER AND OWNER AT NO ADDITIONAL PAYMENT.
- EXISTING VAULT PARTITION WALLS REMAIN IN PLACE. REMOVAL SHALL BE AS SHOWN OR AS DIRECTED BY THE ENGINEER. DO NOT DISTURB OR DAMAGE EXISTING FOUNDATION OR BEARING WALLS REQUIRED FOR BUILDING SUPPORT. IF THERE IS ANY DOUBT REGARDING IMPACT ON THE STRUCTURAL INTEGRITY OF THE BUILDING, STOP WORK, AND CONSULT THE ENGINEER.
- PROVIDE A CLEAN AND SMOOTH JOINT LINE AT THE BUILDING FACADE, UTILIZING SAWCUT OR OTHER APPROVED METHODS TO ALLOW FOR CONTINUOUS FIT BETWEEN THE EXPANSION JOINT FILLER MATERIAL AND SIDEWALK MATERIAL AT NO ADDITIONAL COST. SUBMIT THE METHOD OF PREPARING THE FACADE AND INCLUDE CONCRETE AND CONCRETE REPAIRS AS NECESSARY.
- SEAL JOINTS USING APPROVED 1/4 INCH PREMOULDED EXPANSION JOINT FILLER AND CAULKING COMPOUND. IF THE WIDTH OF A JOINT IS GREATER THAN 1/4 INCH, USE A FOAM BACKER ROD AS RECOMMENDED BY THE SEALANT MANUFACTURER.
- FOR MATERIALS SEE SPECIAL PROVISIONS

RECORD DRAWINGS

DETAIL - SIDEWALK RAMP, WOOD STREET

ITEM NO. 9000-0902
(SHEET 1 OF 3)

DRAWN BY	TP
CHECKED BY	MRM

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER M. ROBERT MICHALKO

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

SCALE: AS SHOWN | SHEET NO 24 OF 85 | ACCESSION NO
DATE: 11/30/2001 | CASE NO

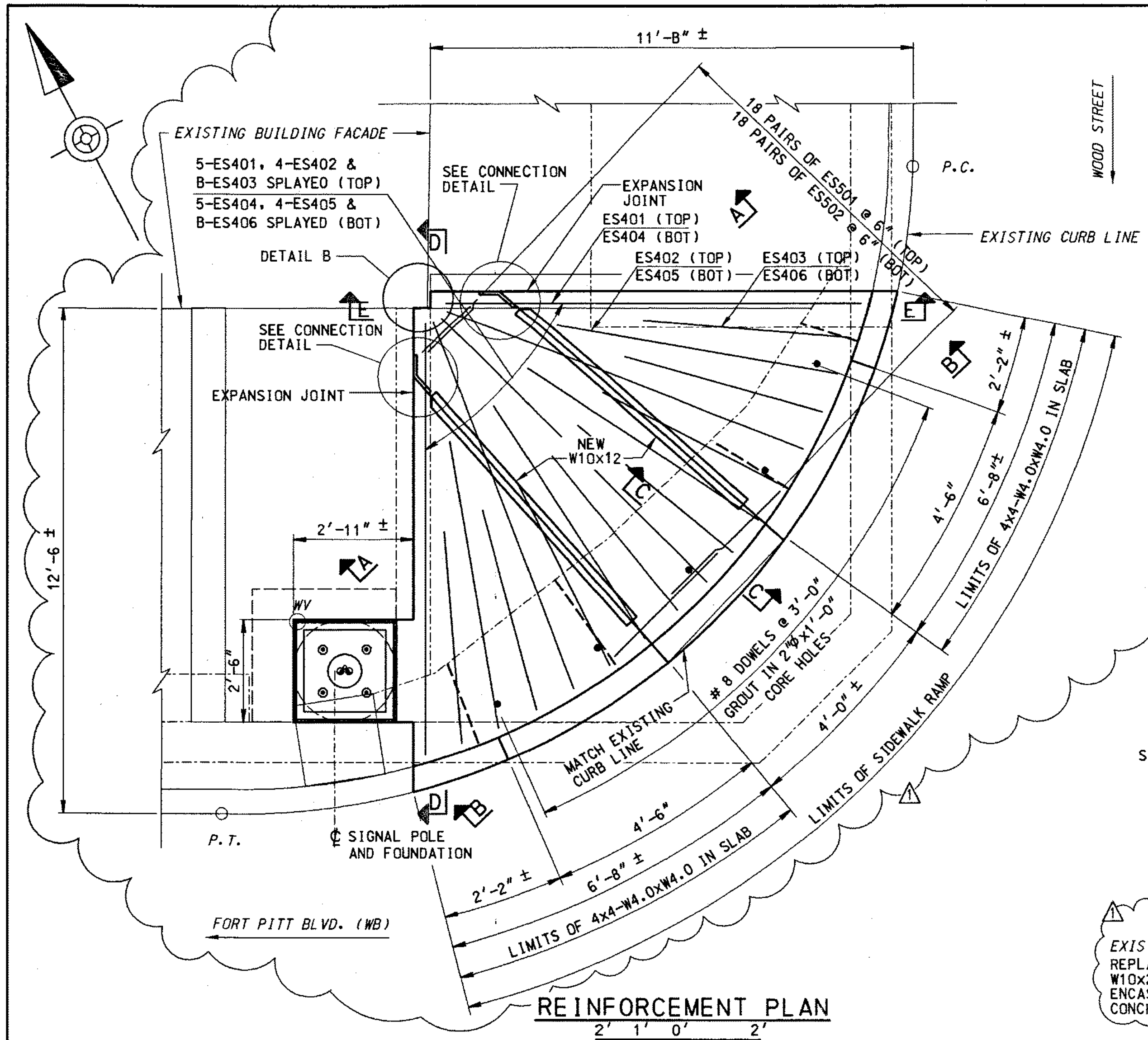
h:\projects\ustation\0042\Roadway\hramp01.dgn 11/30/2001

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	25 OF 85

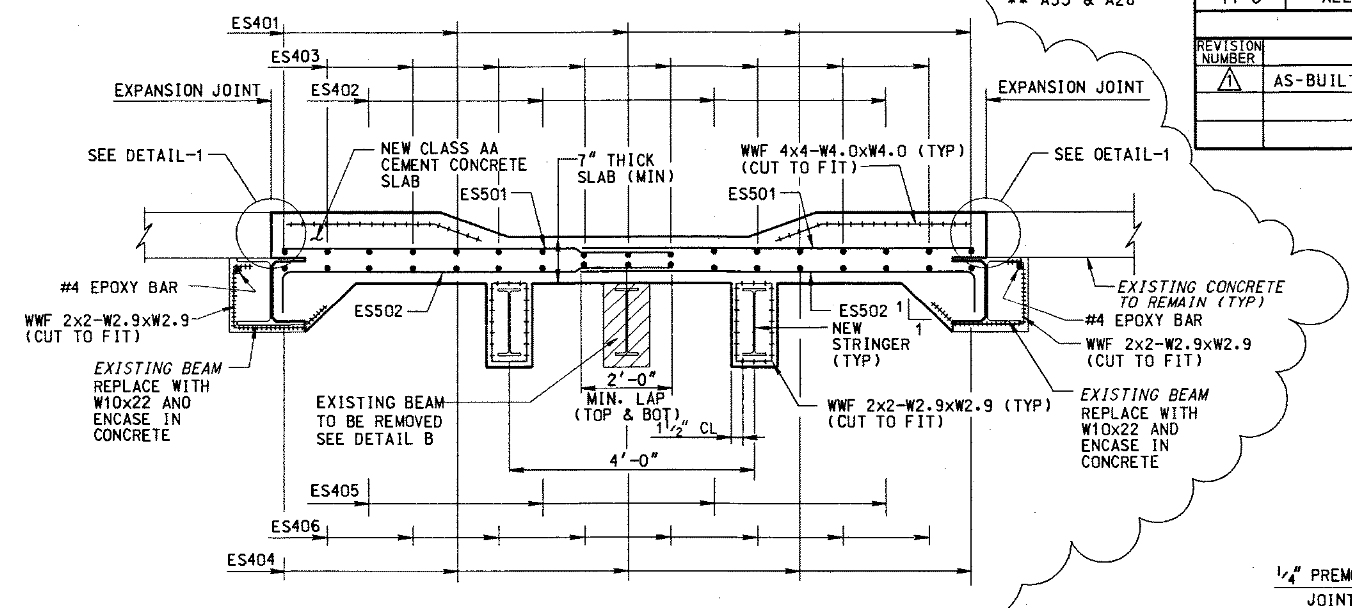
* 0279 & 0376
** A33 & A28

CITY OF PITTSBURGH

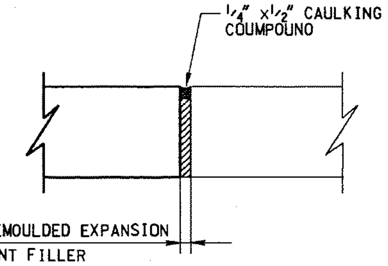
REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



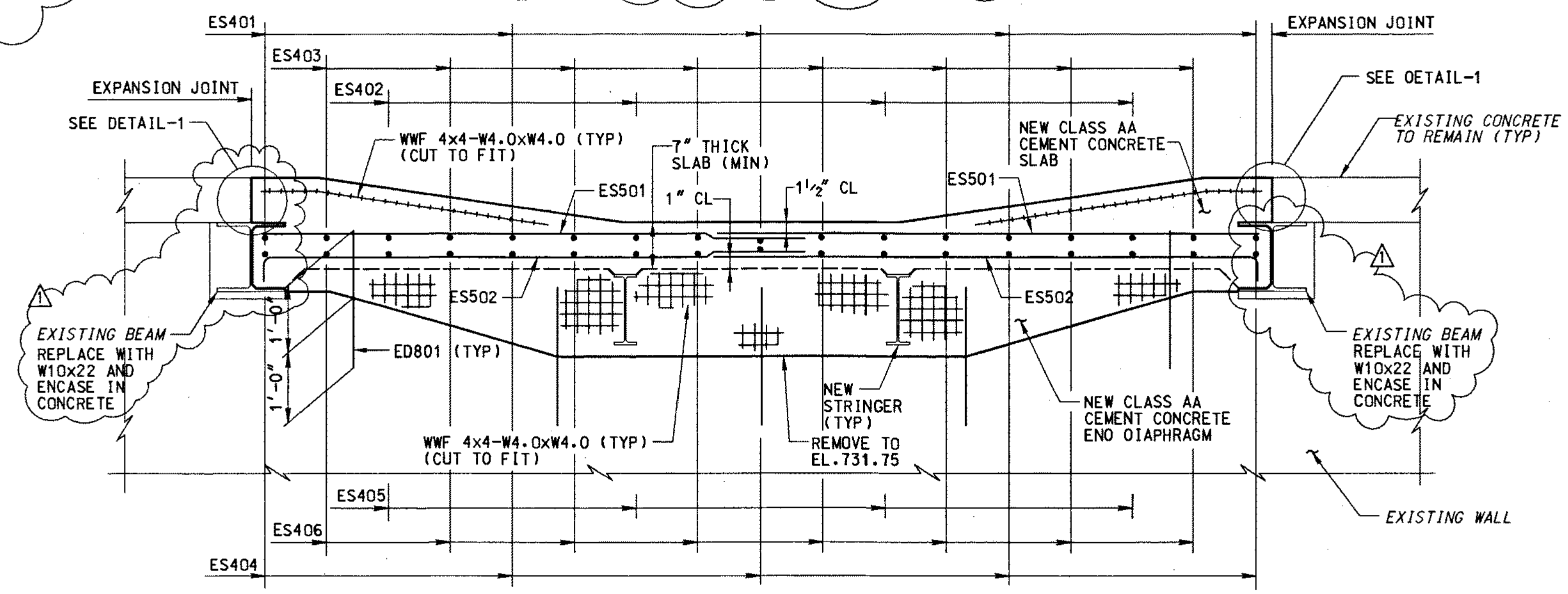
REINFORCEMENT PLAN
SCALE: 1/2" = 1'-0"



SECTION A-A



DETAIL-1

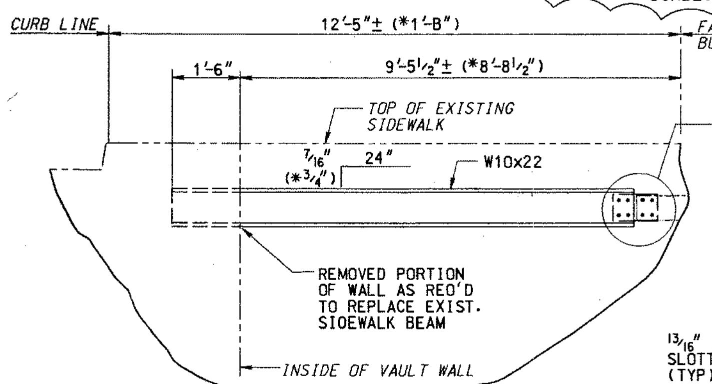


VIEW B-B

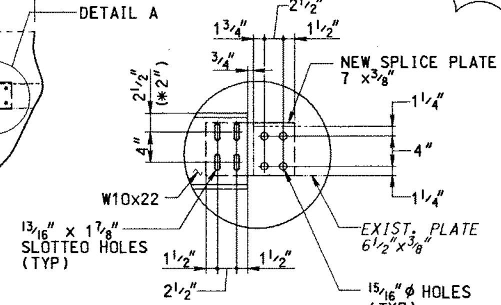
DETAIL - SIDEWALK RAMP, WOOD STREET
ITEM NO. 9000-0902
(SHEET 2 OF 3)

NOTE

- FOR SECTION C-C AND CONNECTION DETAIL SEE SHEET 26.

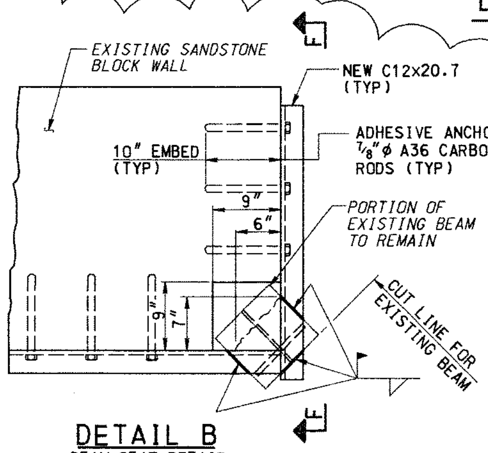


SECTION D-D SHOWN
SECTION E-E OPPOSITE HAND

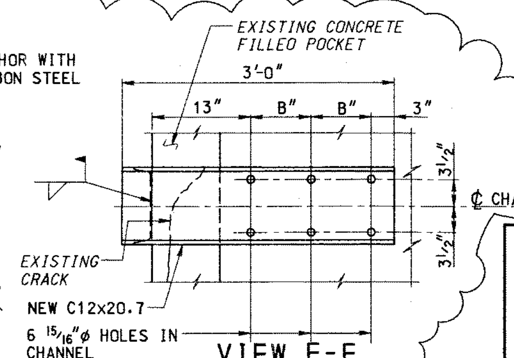


DETAIL A

NOTE:
* FOR SECTION E-E



DETAIL B
BEAM SEAT REPAIR



VIEW F-F
EXISTING BEAM NOT SHOWN FOR CLARITY
SCALE: 3/4" = 1'-0"

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER M. ROBERT MICHALKO

DRAWN BY	TP
CHECKED BY	MRM

SCALE: AS SHOWN
SHEET NO 25 OF 85
ACCESSION NO
DATE : 12/29/2003
CASE NO

H:\Projects\Ustation\0042\ASBUILT\hramp02.dgn 12/29/2003

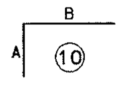
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	26 OF 85
CITY OF PITTSBURGH				

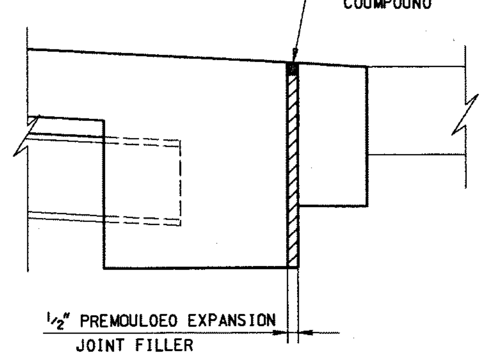
* 0279 & 0376
** A33 & A28

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

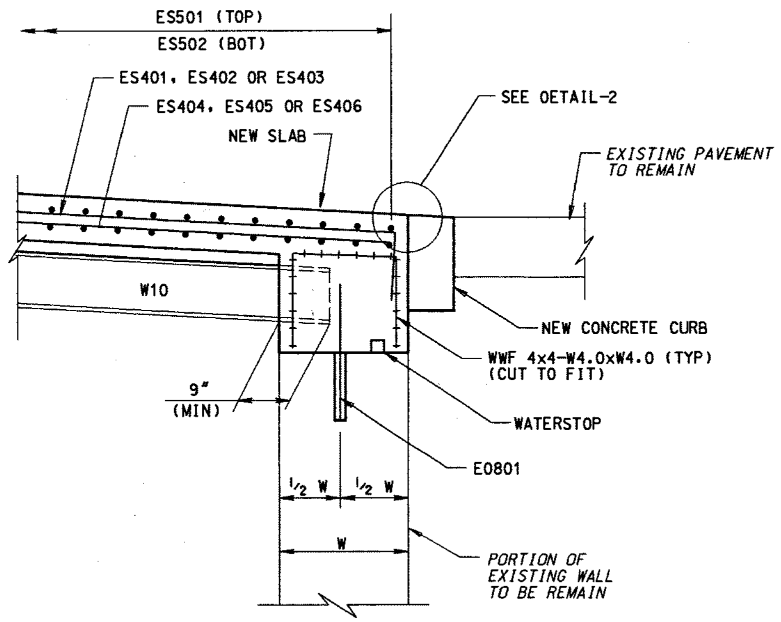
REINFORCEMENT BAR SCHEDULE

MARK	SIZE	LENGTH	NO.	TYPE	A	B	C	REMARKS
ES401	5	11'-3"	5	10	10'-3"	1'-0"		CUT AS REQUIREO TO FIT
ES402	5	B'-3"	4	10	7'-3"	1'-0"		CUT AS REQUIREO TO FIT
ES403	5	6'-6"	B	10	5'-6"	1'-0"		CUT AS REQUIREO TO FIT
ES404	6	10'-3"	5	STR				CUT AS REQUIREO TO FIT
ES405	6	7'-3"	4	STR				CUT AS REQUIREO TO FIT
ES406	6	5'-6"	8	STR				CUT AS REQUIREO TO FIT
ES501	6	8'-9"	36	STR				CUT AS REQUIREO TO FIT
ES502	6	9'-9"	36	10	B'-9"	1'-0"		CUT AS REQUIREO TO FIT
E0B01	B	2'-0"	5	STR				



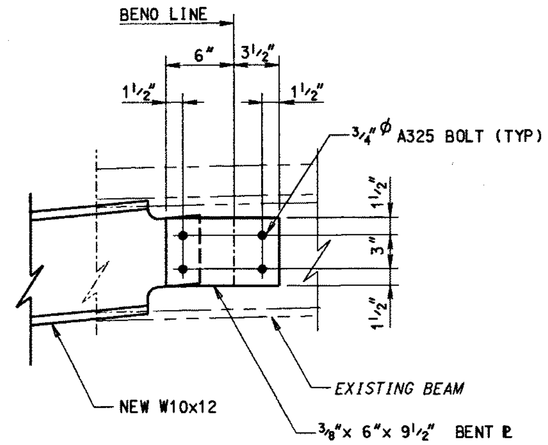


DETAIL-2
NTS

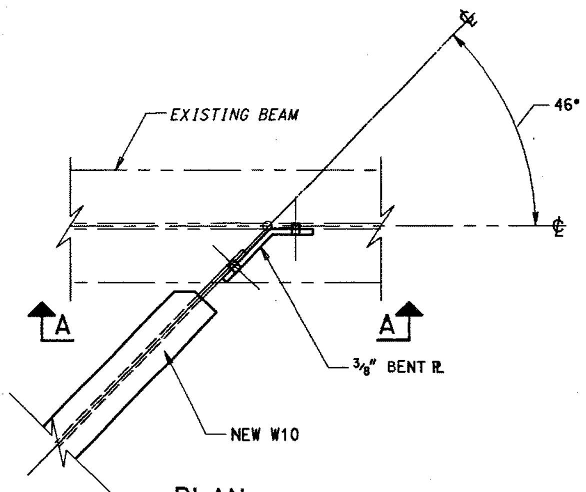


SECTION C-C

3' 2' 1' 0' 3'
SCALE: 3/8" = 1'-0"



SECTION A-A



PLAN

CONNECTION DETAIL

2' 1' 0' 2'
SCALE: 3/4" = 1'-0"

DETAIL - SIDEWALK RAMP, WOOD STREET

ITEM NO. 9000-0902
(SHEET 3 OF 3)

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL M. ROBERT MICHALKO ENGINEER NO. 043155-E

CONSTRUCTION PLAN
DETAILS

SCALE: AS SHOWN
SHEET NO 26 OF 85
ACCESSION NO
DATE : 11/30/2001
CASE NO

DRAWN BY	TP
CHECKED BY	MRM

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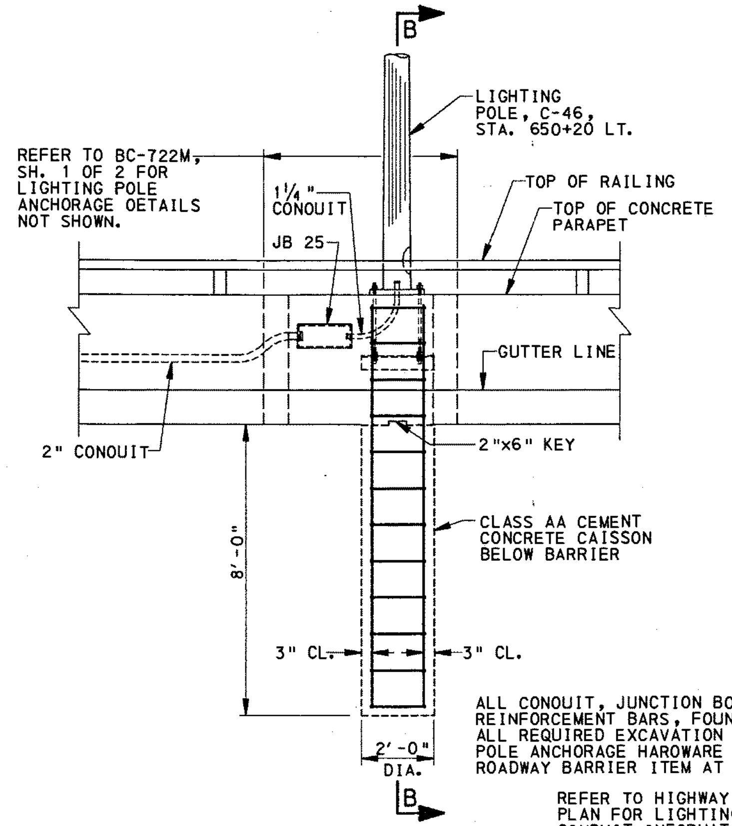
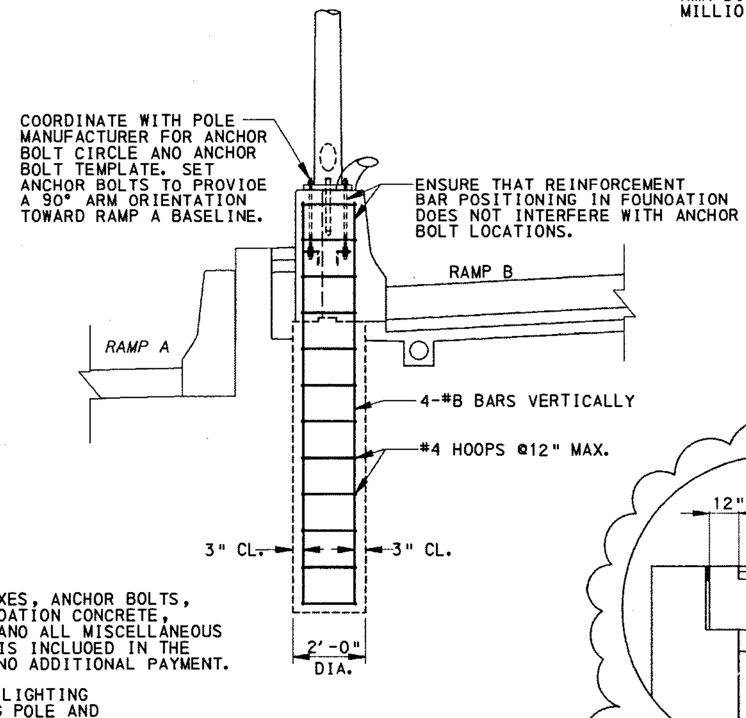
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	27 OF 85
CITY OF PITTSBURGH				

* 0279 & 0376
** A33 & A28

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



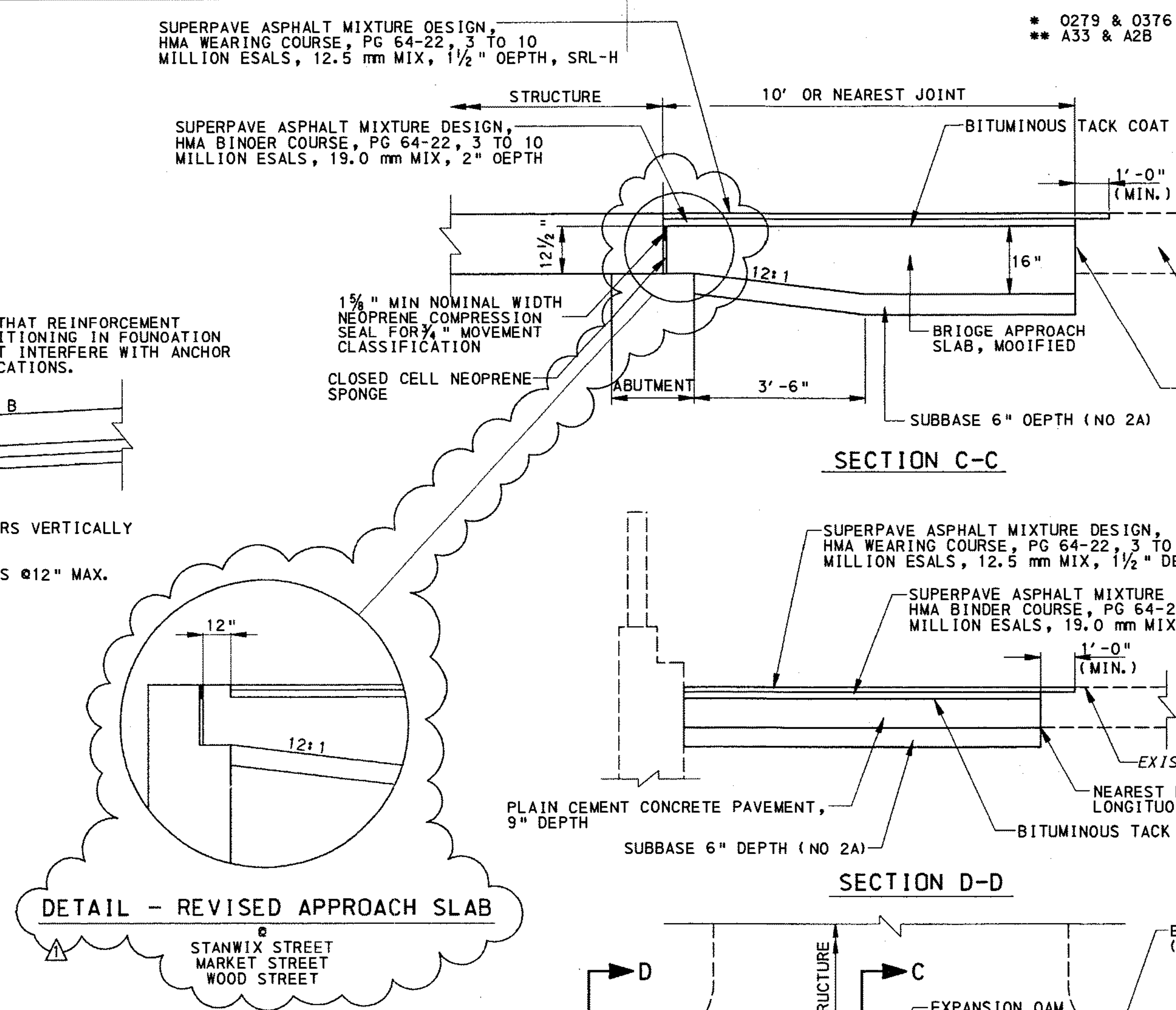
SECTION A-A



ALL CONDUIT, JUNCTION BOXES, ANCHOR BOLTS, REINFORCEMENT BARS, FOUNDATION CONCRETE, ALL REQUIRED EXCAVATION AND ALL MISCELLANEOUS POLE ANCHORAGE HARDWARE IS INCLUDED IN THE ROADWAY BARRIER ITEM AT NO ADDITIONAL PAYMENT.

REFER TO HIGHWAY LIGHTING PLAN FOR LIGHTING POLE AND CONDUIT INFORMATION NOT SHOWN.

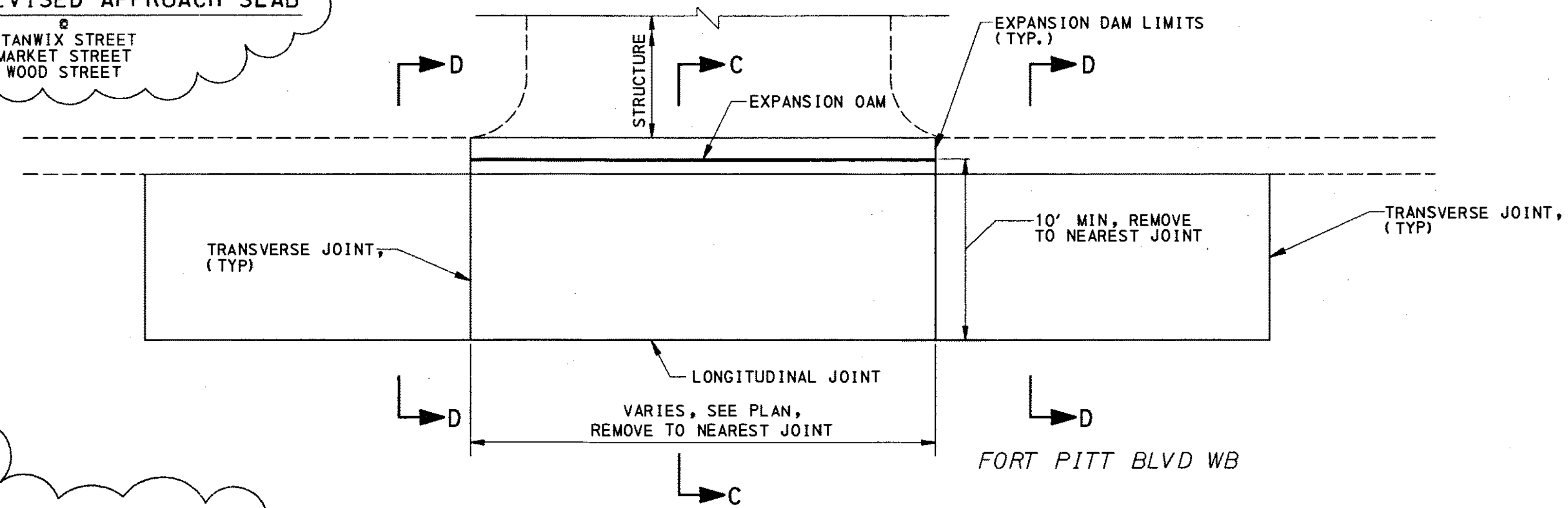
SECTION B-B



SECTION D-D

NOTES: REFER TO RC-20M FOR CONSTRUCTION OF PAVEMENT JOINTS.

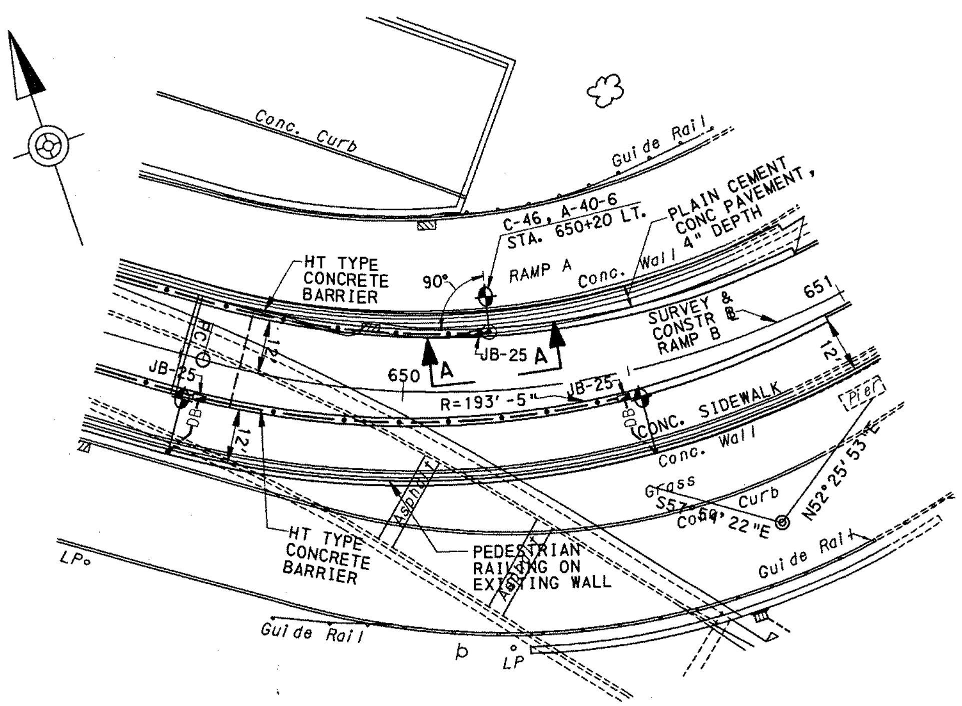
REFER TO RC-23M FOR REINFORCEMENT OF BRIDGE APPROACH SLAB.



PLAN VIEW

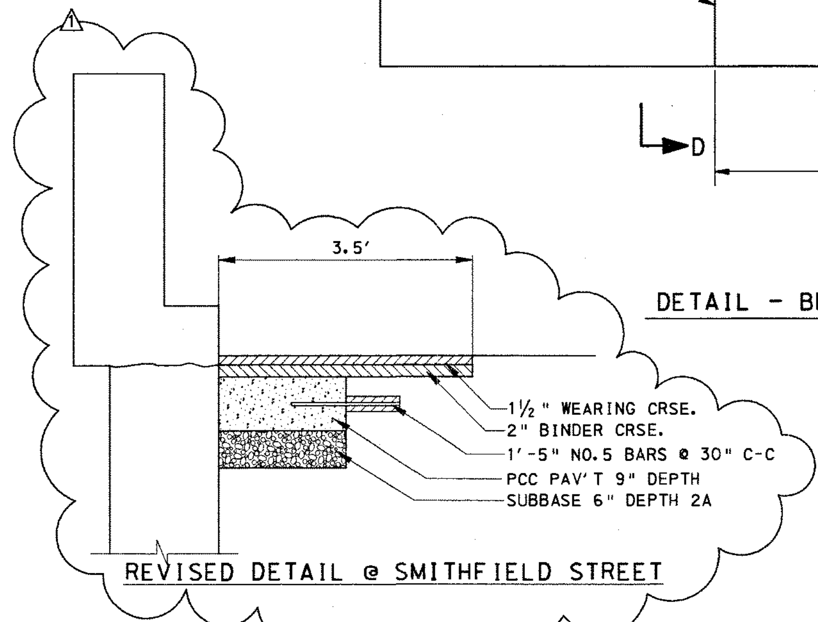
DETAIL - BRIDGE APPROACH SLAB, MODIFIED

NO SCALE
ITEM NO 4505-0001



DETAIL - LIGHT POLE FOUNDATION

RAMP B, STA. 650+20 LT.
NO SCALE



REVISED DETAIL @ SMITHFIELD STREET

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

SCALE: AS SHOWN	SHEET NO	ACCESSION NO
DATE: 12/01/2001	27 OF 85	CASE NO

DRAWN BY	AJH
CHECKED BY	JFW

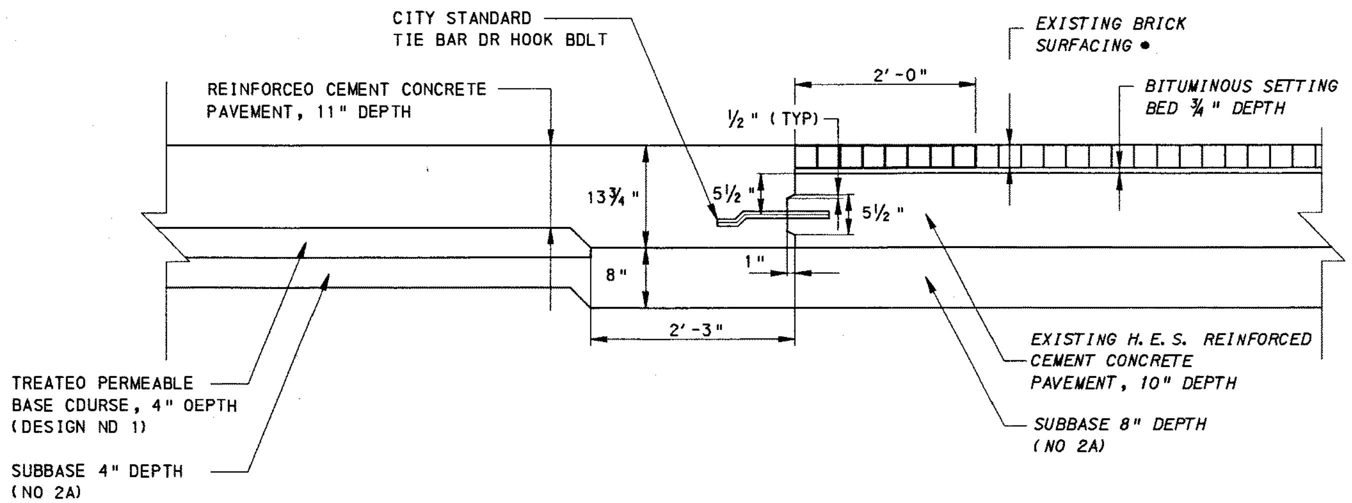
H:\Projects\Ustation\0042\ASBUILT\abcnde109.dgn 12/29/2003

* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-D	ALLEGHENY	*	**	28 OF 85

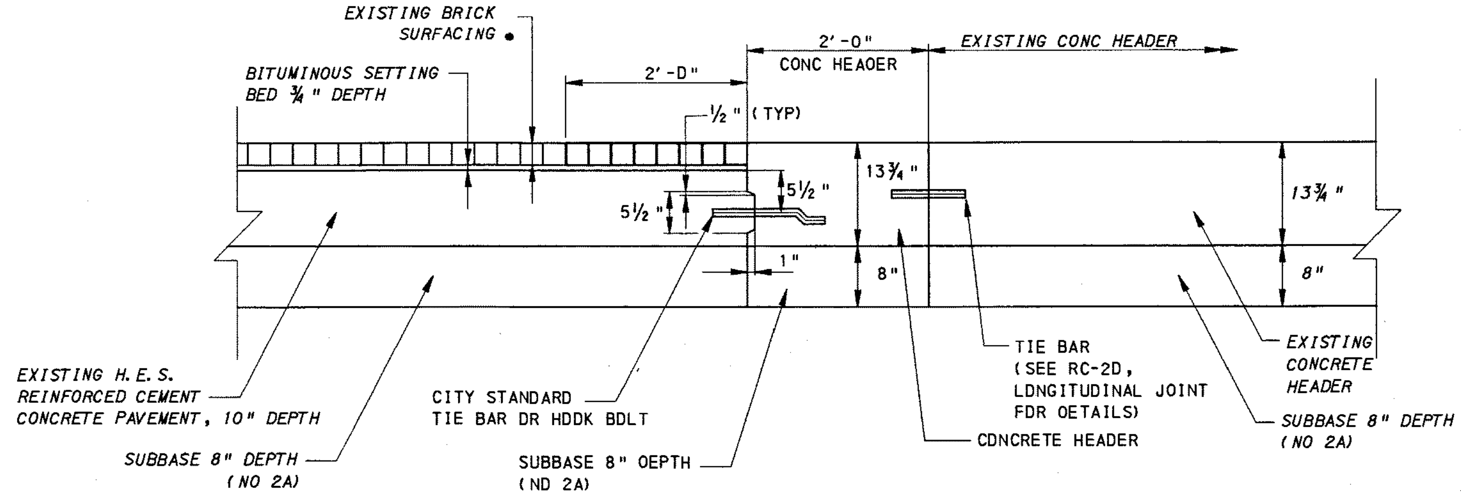
CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



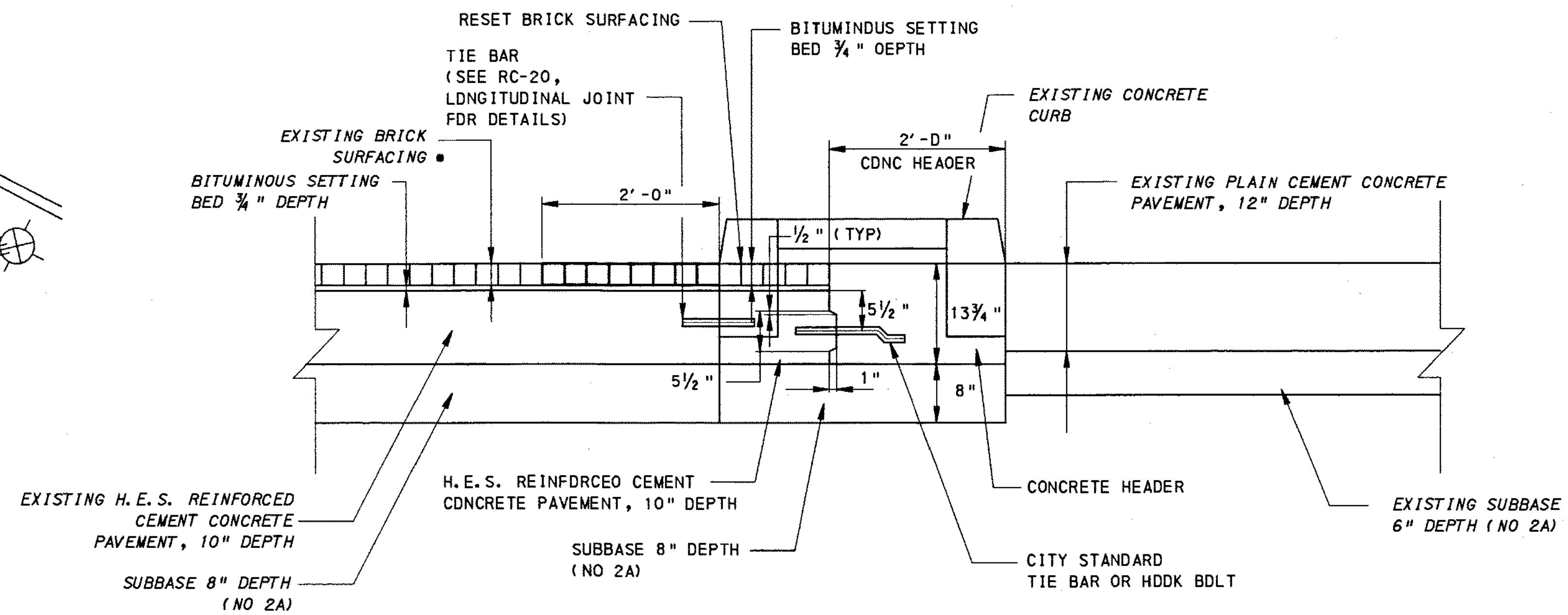
SECTION A-A

NO SCALE



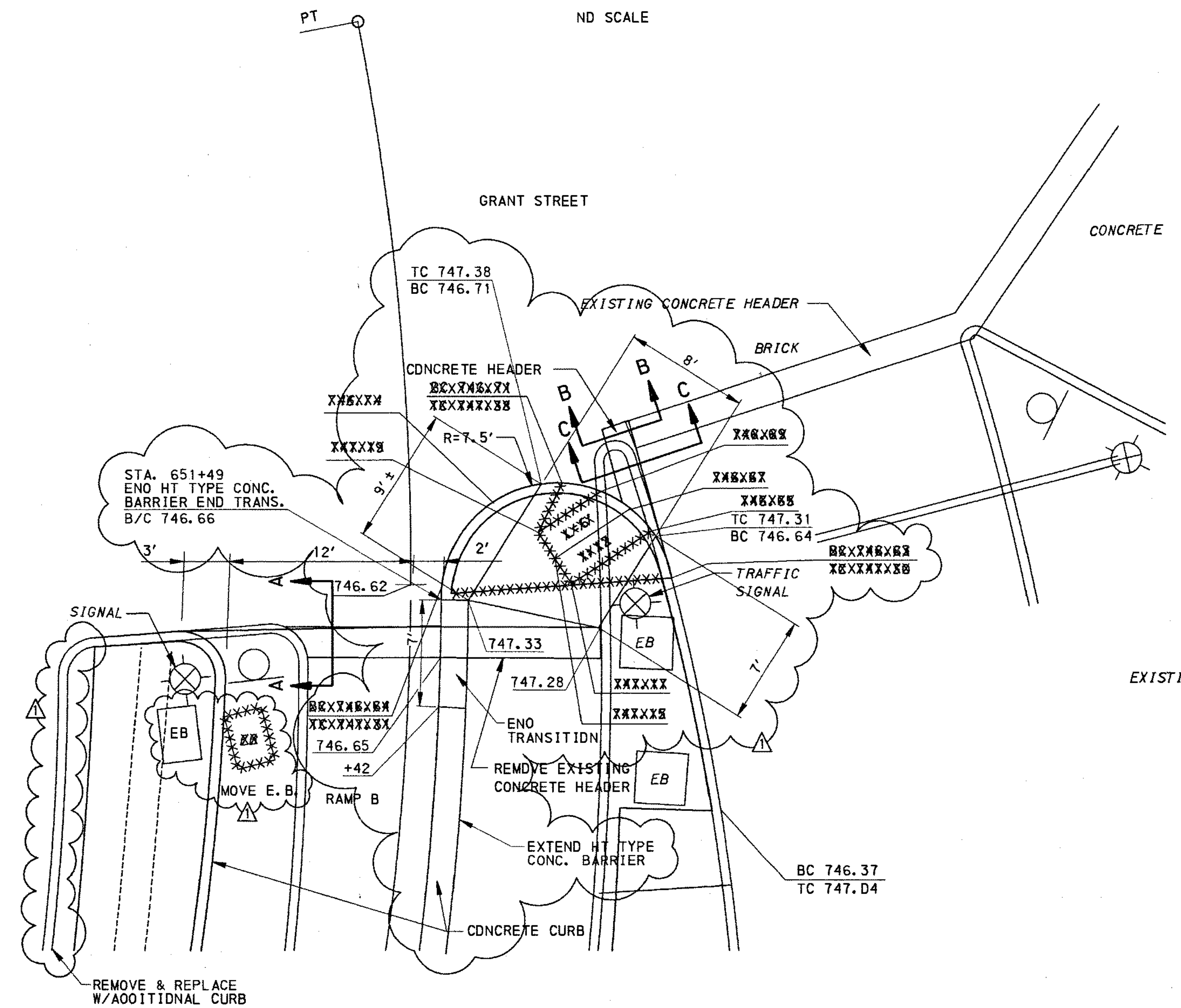
SECTION B-B

NO SCALE



SECTION C-C

NO SCALE



PLAN VIEW

NO SCALE

• ALL EXISTING BRICK REMOVED TO COMPLETE THESE ITEMS OF WORK IS TO BE REPLACED WITH NEW BRICK.

DRAWN BY	AJH
CHECKED BY	JFW

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

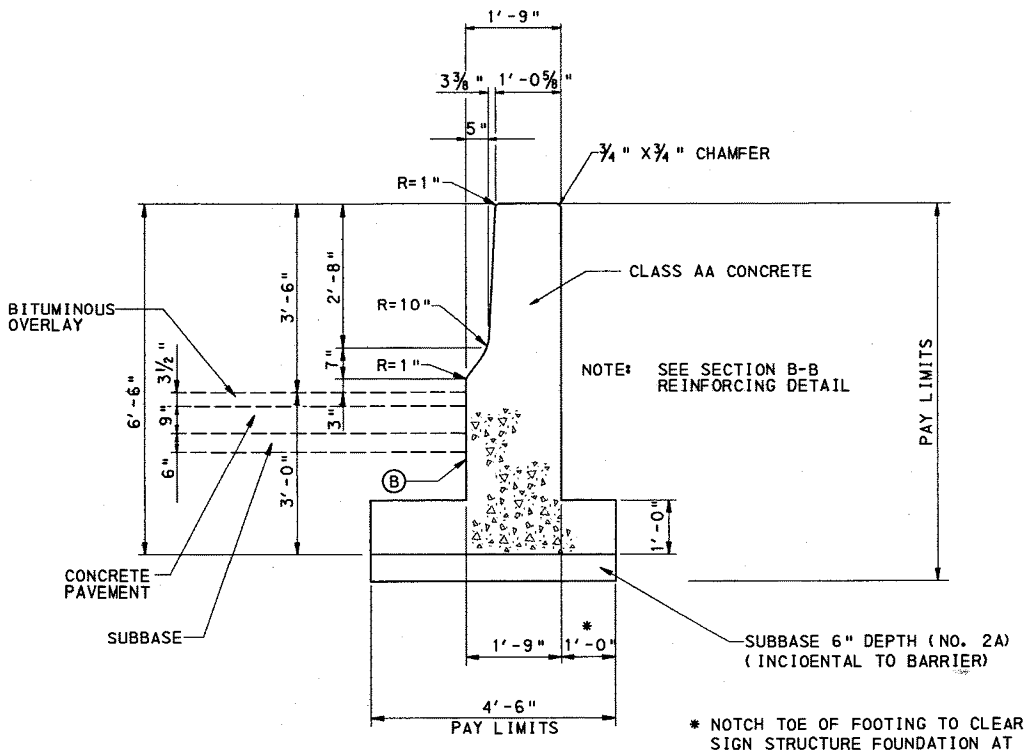
CONSTRUCTION PLAN
DETAILS

SCALE: AS SHOWN | SHEET NO 28 OF 85 | ACCESSION NO
DATE: 12/01/2001 | CASE NO

* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	29 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

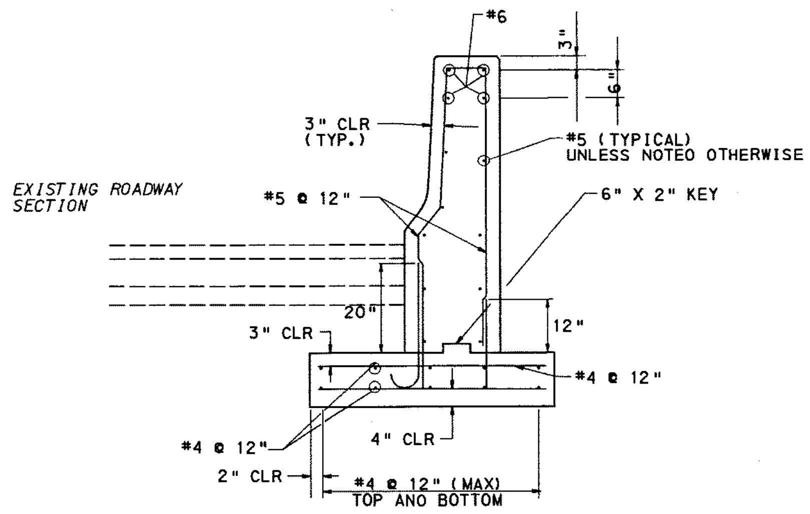


* NOTCH TOE OF FOOTING TO CLEAR SIGN STRUCTURE FOUNDATION AT STA. 1094+50.00.

SECTION A-A
NO SCALE

Ⓐ PROVIDE REINFORCEMENT MEETING THE REQUIREMENTS OF PUBLICATION 408 SPECIFICATION, SECTION 709 WITH A MINIMUM CONCRETE COVER OF 1½". KEEP WIRE FABRIC OR BAR LIMITS AT 5½" MINIMUM FOR PRECAST BARRIER WITH PLATE CONNECTIONS. REINFORCING IS INCIOENTAL TO ITEM.

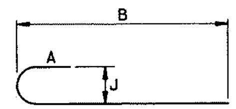
Ⓑ POUR CONCRETE FLUSH AGAINST SUBGRADE AND PAVEMENT FACES. INCIOENTAL TO BARRIER OR BARRIER ENO TRANSITION.



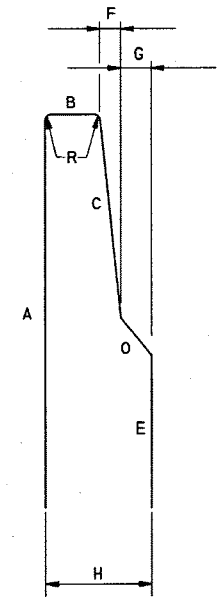
SECTION B-B REINFORCING
NO SCALE

NOTES:

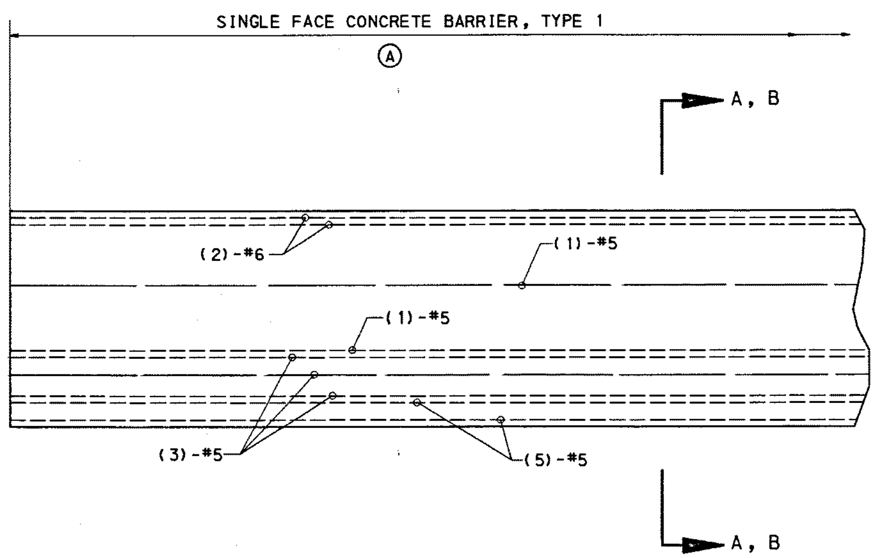
1. ALL REBAR GRAOE 60 EPOXY COATED.
2. ENO 10' OF BARRIER AOJACENT TO JOINT (EXP) SHOULO HAVE REBAR IN PARAPET OF ½ THAT SHOWN.
3. SPLICE LENGTHS:
   #5 - 2'-0"
   #6 - 2'-6"
4. PLACE EXPANSION JOINT IN WALL AT 90' MAX.
5. USE FLUSH EXPANSION JOINT PER BC-735.
6. USE V-GROOVE OETAIL PER BC-752 AT 20' MAX (IN WALL).



A	B	J	TOTAL LENGTH
7"	2'-4"	5"	2'-11"



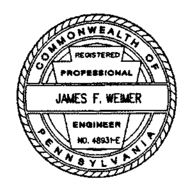
A	B	C	O	E	F	G	H	R	TOTAL LENGTH
5'-4"	9"	2'-8"	8"	2'-1"	3½"	5"	1'-5½"	1"	11'-6"



SINGLE FACE CONCRETE BARRIER, TYPE 1
NO SCALE
STA 1093+79.29 TO STA 1095+64.95 RT SR 8041 (RAMP F)
ITEM NO. 9623-0052

ORAWN BY	JES
CHECKED BY	JFW

RECORD DRAWINGS



D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

SCALE: AS SHOWN | SHEET NO 29 OF 85 | ACCESSION NO
DATE: 11/28/2001 | CASE NO

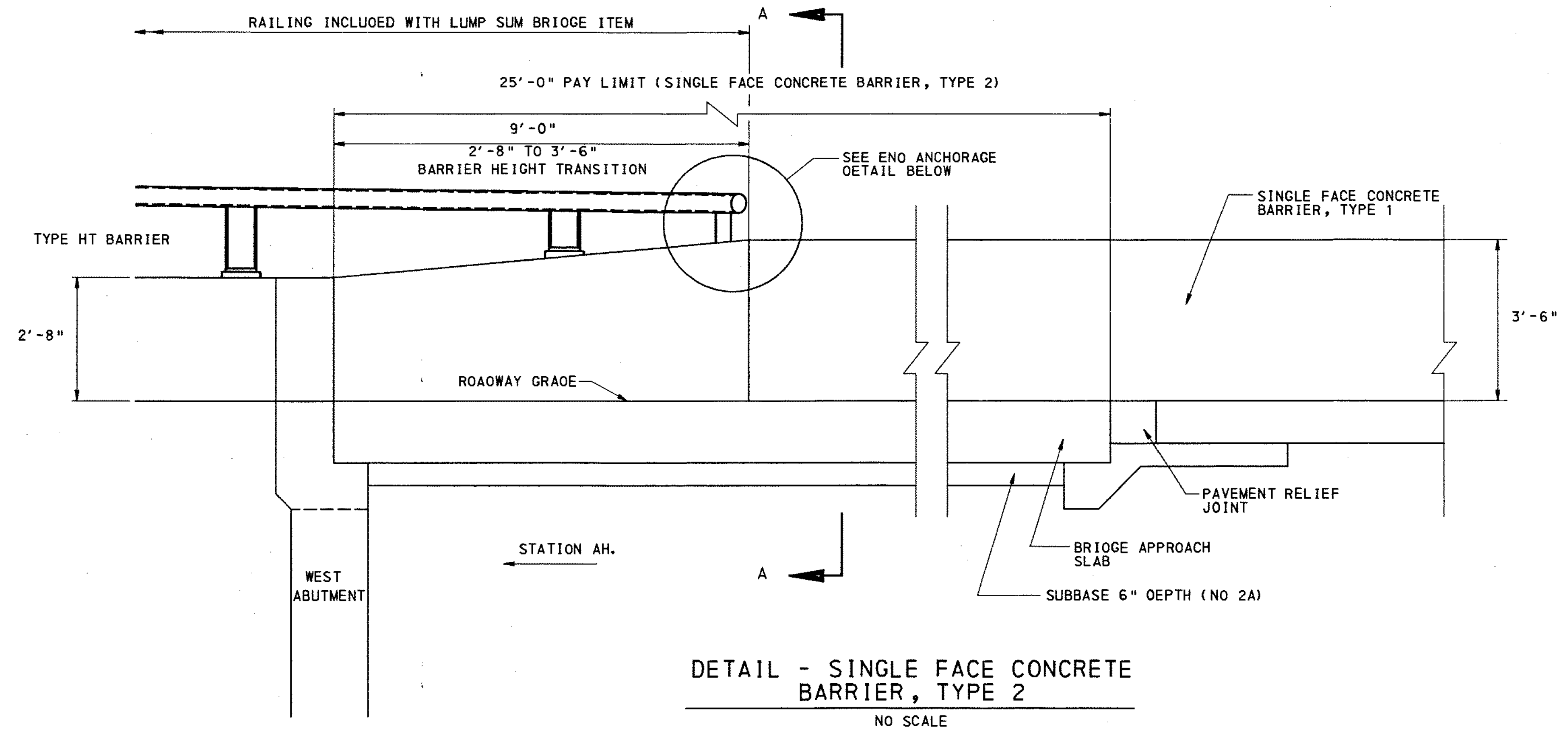
h:\projects\ustation\0042\Roadway\cndet01.dgn 11/28/2001

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	30 OF 85

CITY OF PITTSBURGH

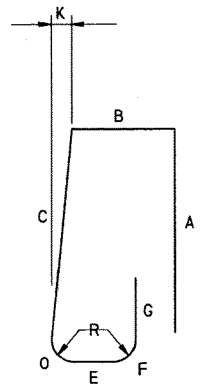
* 0279 & 0376
** A33 & A28

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

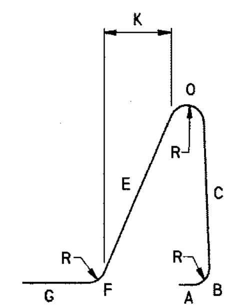


DETAIL - SINGLE FACE CONCRETE BARRIER, TYPE 2

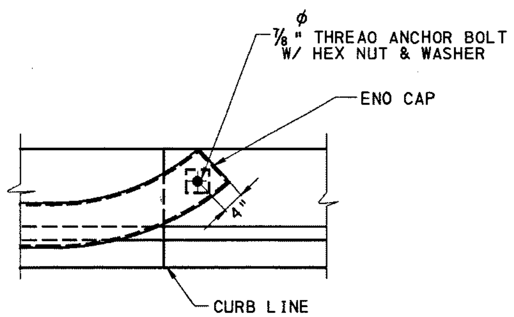
NO SCALE
ITEM NO 9623-0053
STATION 1095+64.95 TO STATION 1095+89.95 RT SR 8041 (RAMP F)



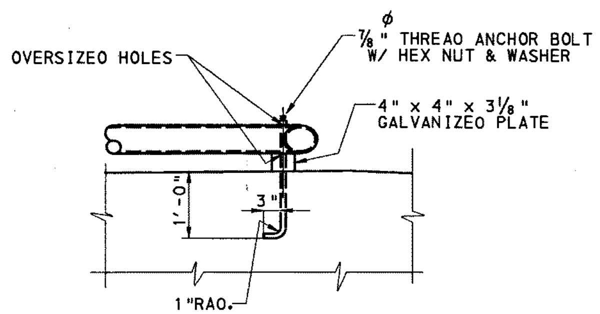
A	B	C	D	E	F	G	K	R	TOTAL LENGTH
3'-1"	9½"	2'-10"	5½"	4"	5½"	4"	3½"	3"	8'-6½"



A	B	C	D	E	F	G	K	R	TOTAL LENGTH
4"	5½"	1'-7"	8¾"	2'-4"	3¾"	1'-0½"	1'-0"	3"	6'-10"

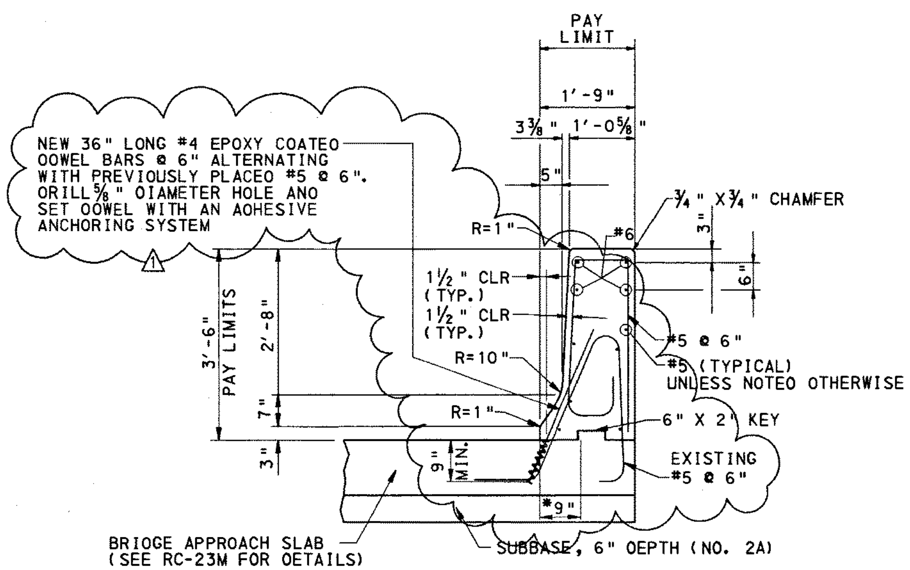


PLAN



DETAIL - END ANCHORAGE

NO SCALE



- ALL REINFORCING BARS ARE TO BE EPOXY COATED.
- ALL REINFORCING BARS SHOWN ARE ~~INCIDENTAL TO ITEM NO. 9623-0053.~~

* BASED ON FIELD MEASUREMENT PROVIDED BY FIELD OFFICE.

SECTION A-A

NO SCALE

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

DRAWN BY	AJH
CHECKED BY	JFW

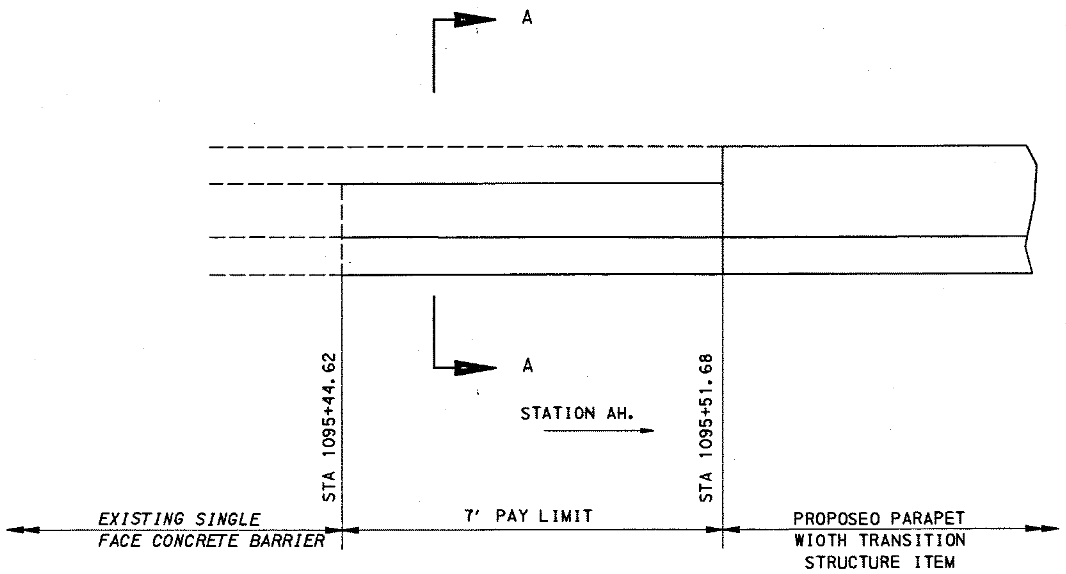
SCALE: AS SHOWN
SHEET NO 30 OF 85
ACCESSION NO
DATE: 12/01/2001
CASE NO

H:\Projects\Ustation\0042\ASBUILT\abcndet13.dgn 12/29/2003

* 0279 & 0376
** A33 & A28

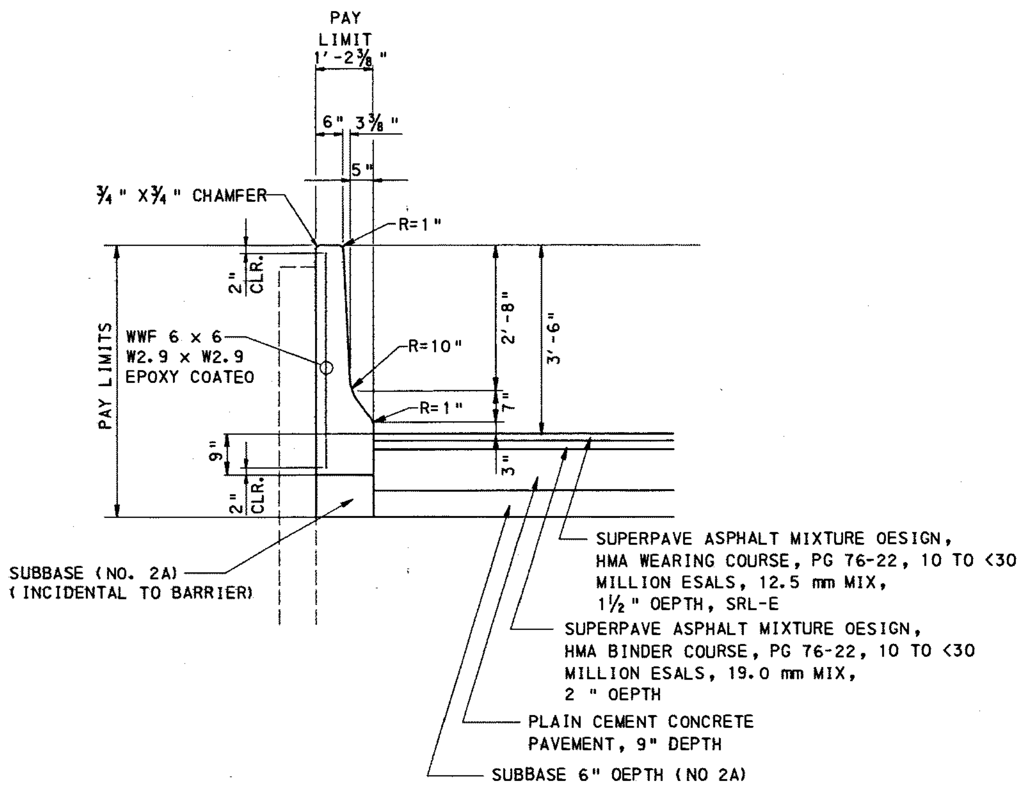
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	31 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



DETAIL - SINGLE FACE CONCRETE BARRIER TYPE 3

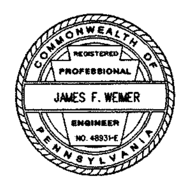
NO SCALE
ITEM NO 9623-0054
STATION 1095+44.68 TO STATION 1095+51.68 LT SR 8041 (RAMP F)



SECTION A-A

NO SCALE

ORAWN BY	AJH
CHECKEO BY	JFW



RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

SCALE: AS SHOWN | SHEET NO 31 OF 85 | ACCESSION NO ________

OATE : 11/28/2001 | CASE NO ________

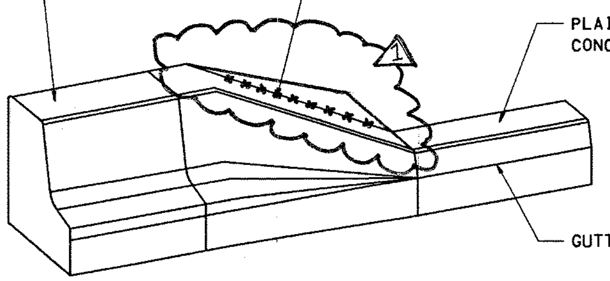
h:\projects\ustation\0042\Roadway\cndet14.dgn 11/28/2001

* 0279 & 0376
** A33 & A28

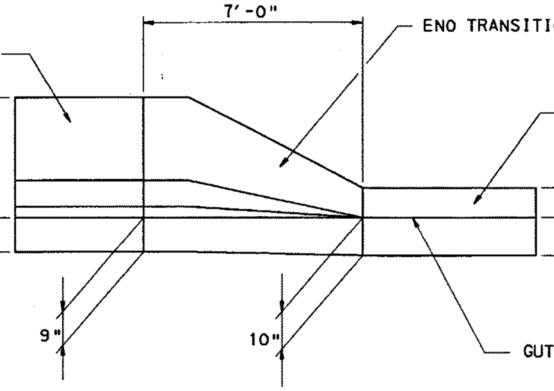
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	32 OF 85

CITY OF PITTSBURGH

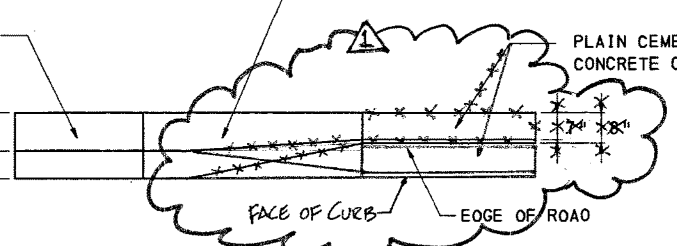
REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



ISOMETRIC VIEW



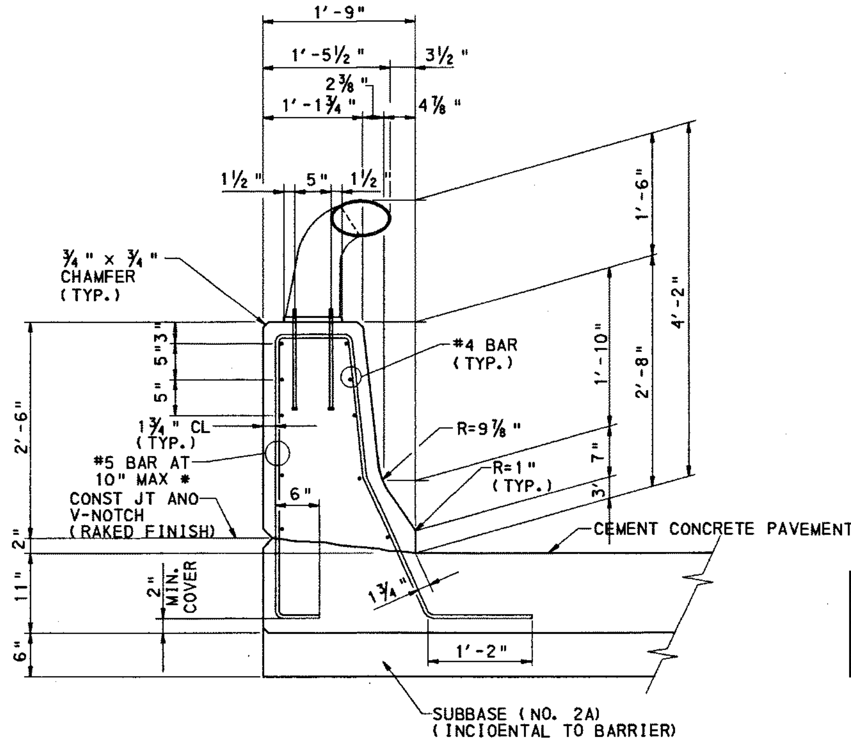
FRONT VIEW



TOP VIEW

DETAIL - END TRANSITION, MODIFIED

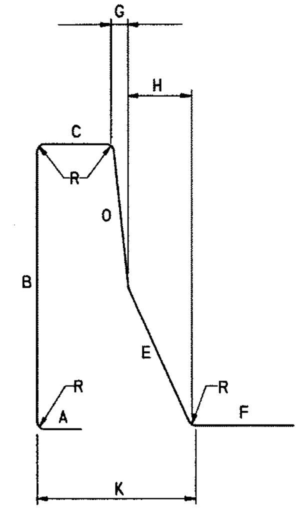
NO SCALE
ITEM NO 4623-0110
STA 650+88 TO STA 650+95 RAMP B LT & RT



* #5 BARS AT 6" MAX. WITHIN 14 FEET OF A OISCONTINUITY IN BARRIER.

DETAIL - HT TYPE CONCRETE BARRIER

NO SCALE
ITEM NO 9623-0056
STATION 649+26.41 TO STATION 650+88 RAMP B (LT & RT)



A	B	C	O	E	F	G	H	K	R	TOTAL LENGTH
6"	3'-1"	10¼"	1'-8"	1'-5¾"	1'-2"	2'-4"	6¾"	1'-7¼"	1"	8'-9"

NOTE:

- ALL REINFORCEMENT BARS TO BE EPOXY COATEO
- ALL REINFORCEMENT BARS SHOWN INCIOENTAL TO ITEM NO 9623-0058

RECORD DRAWINGS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER JAMES F. WEMER NO. 40631-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

SCALE: AS SHOWN
SHEET NO 32 OF 85
ACCESSION NO
OATE : 12/01/2001
CASE NO

ORAWN BY	AJH
CHECKEO BY	JFW

n:\projects\usration\0042\Roadway\cndet15.dgn 12/01/2001

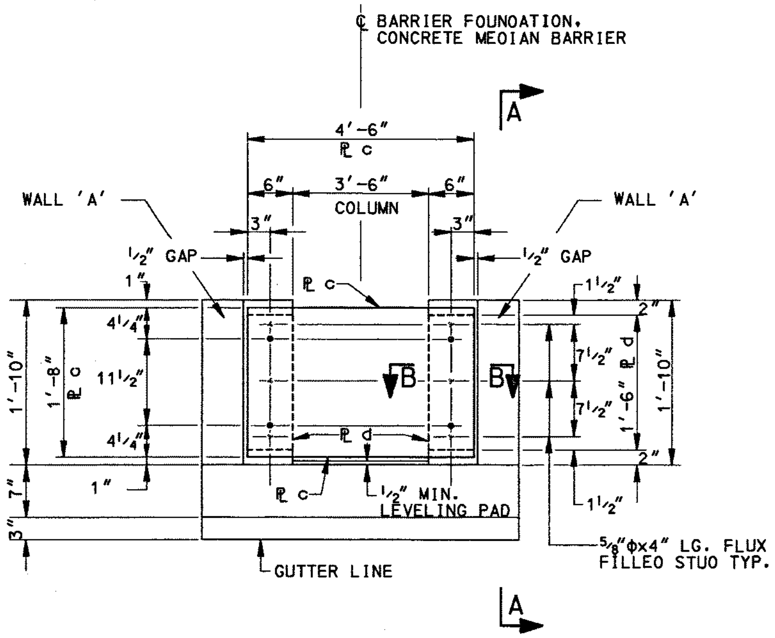
* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	33 OF 8S
CITY OF PITTSBURGH				

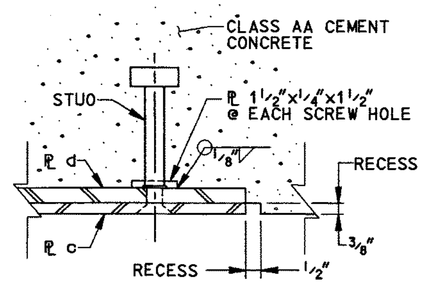
REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

NOTES

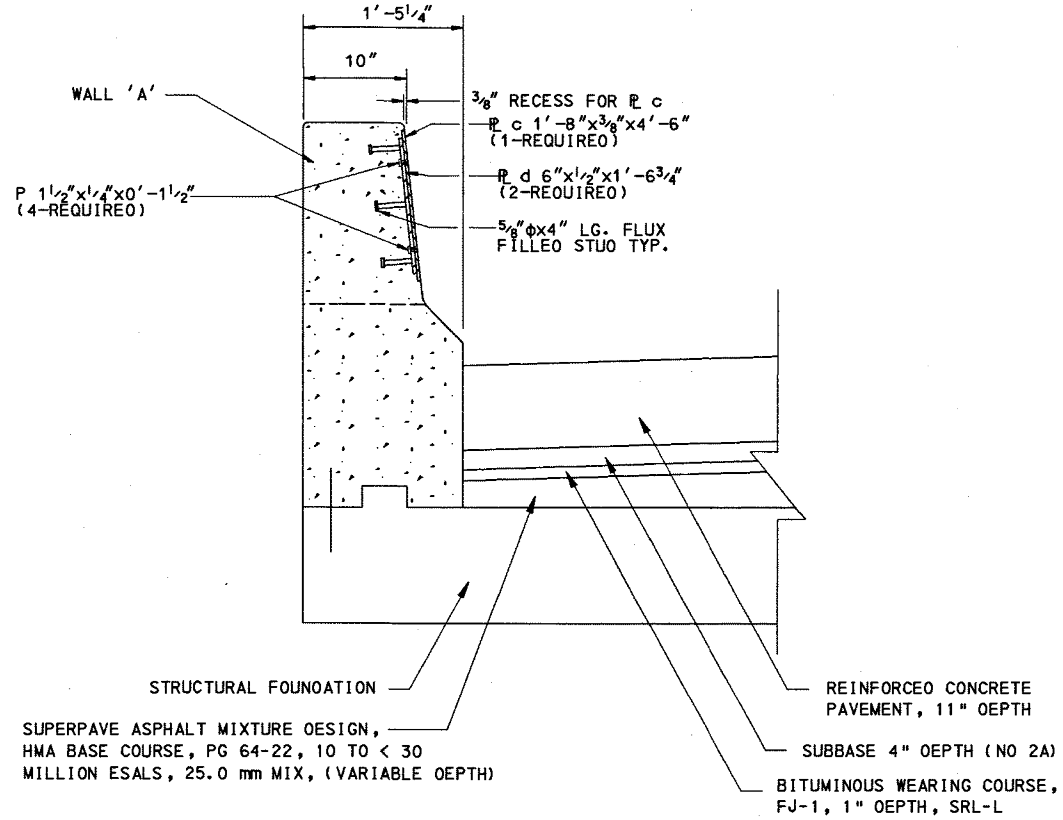
1.	ALL PLATES ANO ANCHOR BOLTS SHALL BE A36 GALVANIZEO STEEL.
2.	ALL MACHINE SCREWS SHALL BE TYPE 304 STAINLESS STEEL OR MONEL.
3.	COOROINATE THIS WORK WITH CONCRETE BARRIER CONSTRUCTION WHICH IS INCLUOEO IN OTHER PORTIONS OF THIS CONTRACT.
4.	REFER TO RC-57M FOR ALL CONCRETE BARRIER REINFORCING ANO OETAILS NOT SHOWN.



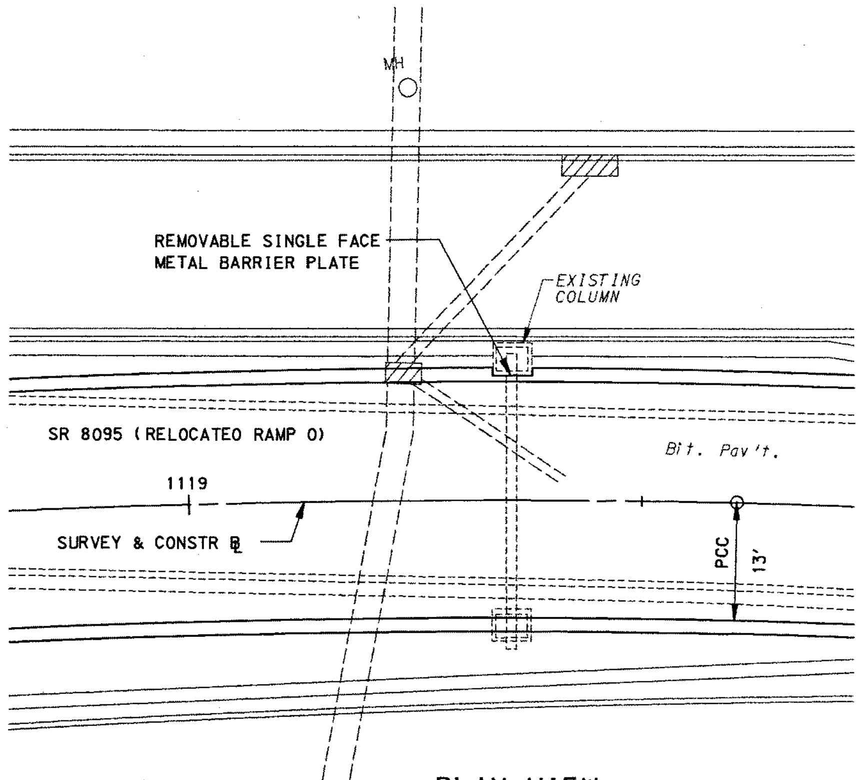
FRONT VIEW
NO SCALE



SECTION B-B
NO SCALE



SECTION A-A
NO SCALE



PLAN VIEW
NO SCALE

REMOVABLE SINGLE FACE METAL BARRIER PLATE
STA 1119+33.50 TO STA 1119+37.75 LT SR 8095 (RELOCATED RAMP D)
ITEM NO 9000-0104

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER JAMES F. WEMER

ORAWN BY	AJH
CHECKED BY	JFW

SCALE: AS SHOWN | SHEET NO 33 OF 8S | ACCESSION NO
OATE: 11/30/2001 | CASE NO

h:\projects\ustation\0042\Roadway\cndet19.dgn 11/30/2001

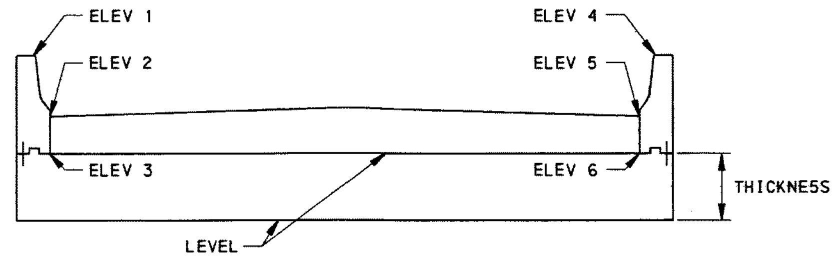
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	34 OF 85
CITY OF PITTSBURGH				

* 0279 & 0376
** A33 & A28

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

ROADWAY ELEVATIONS

STATION	ELEV 1	ELEV 2	ELEV 3	ELEV 4	ELEV 5	ELEV 6	THICKNESS
1116+24.35	723.34	720.67	---	723.28	720.61	---	---
1116+25.00	723.31	720.65	719.06	723.25	720.58	719.06	1.5
1116+29.35	723.14	720.48	719.06/718.13	723.06	720.39	719.06/718.13	1.5/2
1116+30.00	723.12	720.45	718.13	723.03	720.36	718.13	2
1116+40.00	722.75	720.08	718.13	722.62	719.95	718.13	2
1116+50.00	722.42	719.75	718.13	722.24	719.57	718.13	2
1116+53.00	722.32	719.65	718.13/717.28	722.13	719.46	718.13/717.28	2/2.5
1116+60.00	722.11	719.44	717.28	721.89	719.22	717.28	2.5
1116+70.00	721.83	719.17	717.28	721.57	718.90	717.28	2.5
1116+75.00	721.71	719.04	717.28	721.42	718.75	717.28	2.5
1116+80.00	721.59	718.92	717.28/716.67	721.28	718.61	717.28/716.67	2.5
1116+90.00	721.38	718.72	716.67	721.03	718.36	716.67	2.5
1117+00.00	721.21	718.54	716.67	720.81	718.14	716.67	2.5
1117+07.00	721.10	718.43	716.67/716.12	720.67	718.00	716.67/716.12	2.5/3
1117+10.00	721.06	718.40	716.12	720.62	717.95	716.12	3
1117+20.00	720.94	718.27	716.12	720.45	717.78	716.12	3
1117+25.00	720.90	718.23	716.12	720.39	717.72	716.12	3
1117+30.00	720.86	718.19	716.12	720.33	717.66	716.12	3
1117+34.00	720.83	718.16	716.12	720.28	717.61	716.12	3
1117+40.00	720.81	718.14	716.12	720.23	717.56	716.12	3
1117+50.00	720.78	718.11	716.12	720.16	717.49	716.12	3
1117+60.00	720.80	718.13	716.12	720.13	717.46	716.12	3
1117+61.00	720.80	718.13	716.12	720.13	717.46	716.12	3
1117+65.93	720.81	718.15	716.12	720.12	717.45	716.12	3
1117+70.00	720.84	718.17	716.12	720.13	717.46	716.12	3
1117+75.00	720.87	718.21	716.12	720.14	717.47	716.12	3
1117+80.00	720.90	718.24	716.12	720.15	717.48	716.12	3
1117+88.00	720.99	718.32	716.12	720.18	717.52	716.12	3
1117+90.00	721.01	718.34	716.12	720.18	717.52	716.12	3
1118+00.00	721.11	718.45	716.12	720.20	717.53	716.12	3
1118+10.00	721.22	718.55	716.12	720.22	717.55	716.12	3
1118+15.00	721.27	718.60	716.12	720.22	717.56	716.12	3
1118+20.00	721.32	718.66	716.12	720.23	717.56	716.12	3
1118+25.00	721.38	718.71	716.12	720.24	717.57	716.12	3
1118+30.00	721.41	718.74	716.12	720.27	717.60	716.12	3
1118+40.00	721.47	718.80	716.12	720.33	717.66	716.12	3
1118+42.00	721.48	718.81	716.12	720.34	717.67	716.12	3
1118+50.00	721.53	718.86	716.12	720.39	717.72	716.12	3
1118+60.00	721.59	718.92	716.12	720.45	717.78	716.12	3
1118+69.00	721.64	718.97	716.12	720.50	717.83	716.12	3
1118+70.00	721.65	718.98	716.12	720.51	717.84	716.12	3
1118+75.00	721.68	719.01	716.12	720.54	717.87	716.12	3
1118+80.00	721.71	719.04	716.12	720.57	717.90	716.12	3
1118+90.00	721.77	719.10	716.12	720.63	717.96	716.12	3
1118+96.00	721.81	719.14	716.12	720.67	718.00	716.12	3
1119+00.00	721.83	719.16	716.12	720.69	718.02	716.12	3
1119+05.00	721.86	719.19	716.12	720.72	718.05	716.12	3
1119+10.00	721.89	719.22	716.12	720.75	718.08	716.12	3
1119+20.00	721.95	719.28	716.12	720.81	718.14	716.12	3
1119+23.00	721.97	719.30	716.12	720.83	718.16	716.12	3
1119+25.00	721.98	719.31	716.12	720.84	718.17	716.12	3
1119+30.00	722.03	719.36	716.12	720.84	718.18	716.12	3
1119+40.00	722.15	719.48	716.12	720.85	718.18	716.12	3/2.5
1119+50.00	722.26	719.59	716.12/716.86	720.86	718.19	716.12/716.86	2.5
1119+60.00	722.38	719.71	716.86	720.88	718.21	716.86	2.5
1119+70.00	722.44	719.77	716.86	720.95	718.28	716.86	2.5
1119+75.00	722.47	719.80	716.86	720.98	718.31	716.86	2.5
1119+77.00	722.48	719.81	716.86	720.99	718.33	716.86	2.5
1119+80.00	722.50	719.83	716.86	721.02	718.35	716.86	2.5
1119+90.00	722.56	719.89	716.86	721.09	718.42	716.86	2.5
1120+00.00	722.62	719.95	716.86	721.15	718.49	716.86	2.5
1120+04.00	722.65	719.98	716.86	721.18	718.52	716.86	2.5
1120+10.00	722.69	720.02	716.86	721.22	718.56	716.86	2.5
1120+20.00	722.78	720.11	716.86	721.31	718.65	716.86	2.5
1120+25.00	722.83	720.16	716.86	721.36	718.70	716.86	2.5
1120+30.00	722.88	720.21	716.86	721.41	718.75	716.86	2.5
1120+31.00	722.89	720.22	716.86	721.42	718.76	716.86	2.5
1120+40.00	723.00	720.33	716.86	721.53	718.87	716.86	2.5
1120+50.00	723.15	720.48	716.86	721.68	719.02	716.86	2.5/2
1120+58.00	723.27	720.60	716.86/717.80	721.80	719.14	716.86/717.80	2
1120+60.00	723.30	720.63	717.8	721.83	719.17	717.8	2
1120+70.00	723.48	720.81	717.8	722.01	719.35	717.8	2
1120+75.00	723.57	720.90	717.8	722.13	719.46	717.8	2
1120+80.00	723.64	720.97	717.8	722.25	719.58	717.8	2/1.5
1120+85.00	723.71	721.04	717.80/718.38	722.38	719.71	717.80/718.38	1.5
1120+90.00	723.80	721.13	718.38	722.51	719.84	718.38	1.5
1121+00.00	723.97	721.30	718.38	722.79	720.12	718.38	1.5
1121+09.14	724.15	721.48	718.38	723.07	720.40	718.38	1.5
1121+10.00	724.17	721.50	718.38	723.09	720.42	718.38	
1121+14.14	724.26	721.59	---	723.22	720.55	---	



SECTION
SR 8095 (RELOCATED RAMP O)

DRAWN BY	AJH
CHECKED BY	JFW

RECORD DRAWINGS

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES F. WEIMER
ENGINEER
NO. 45831-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

SCALE: AS SHOWN
SHEET NO 34 OF 85
ACCESSION NO
DATE : 11/28/2001
CASE NO

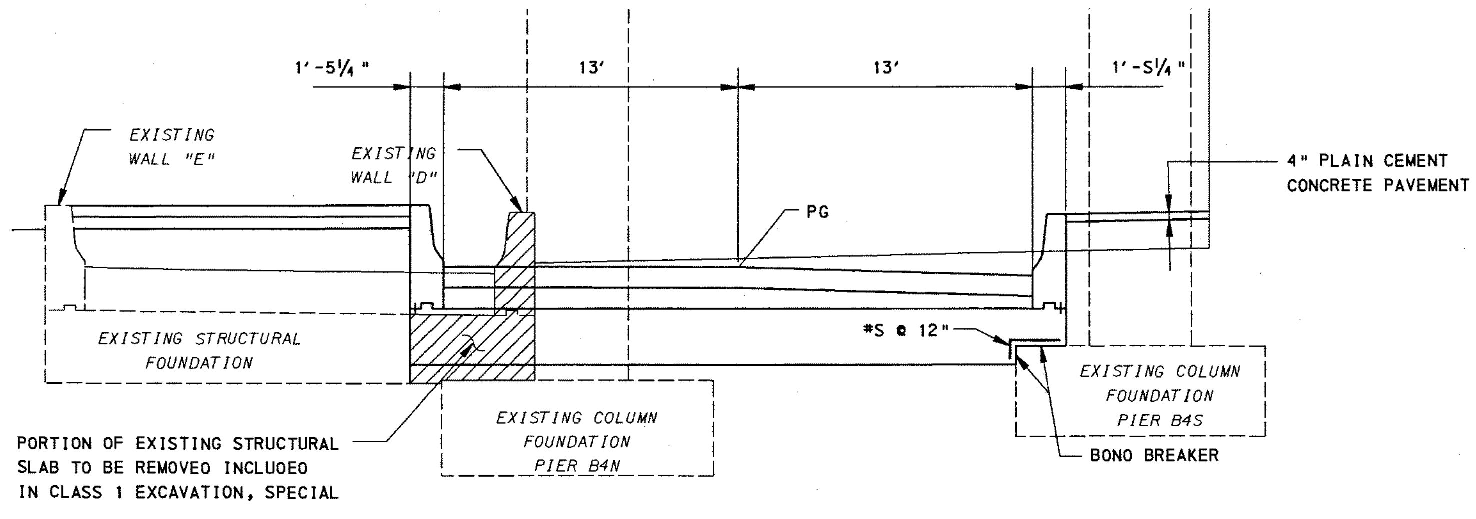
h:\projects\ustation\0042\Roadway\cndet02.dgn 11/28/2001

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	35 OF 85

* 0279 & 0376
** A33 & A28

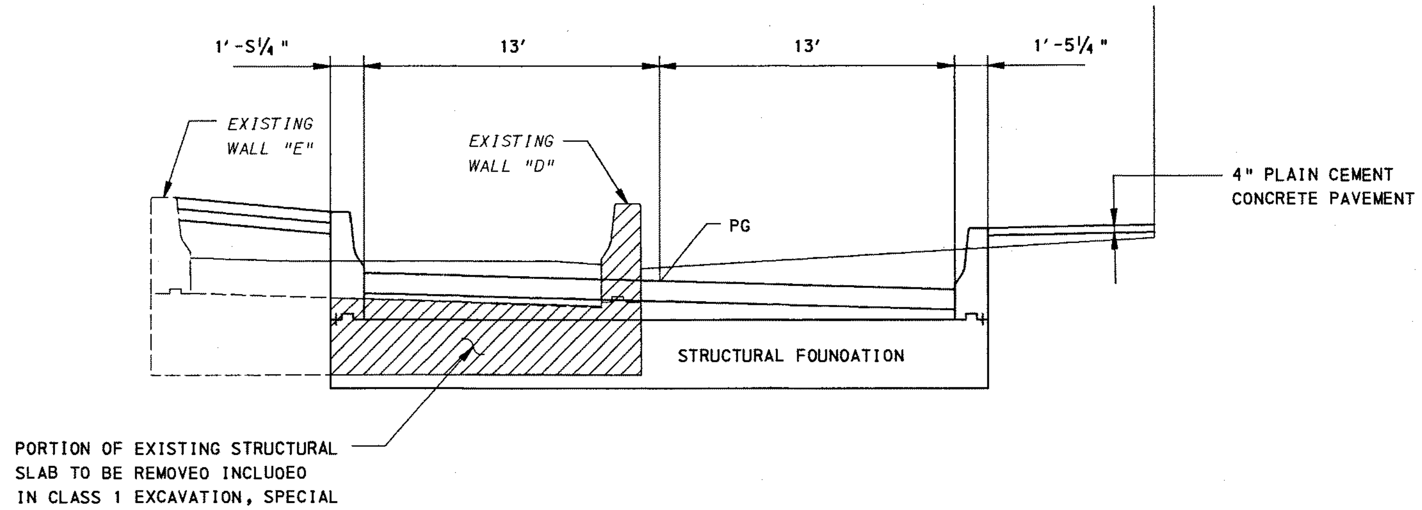
CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



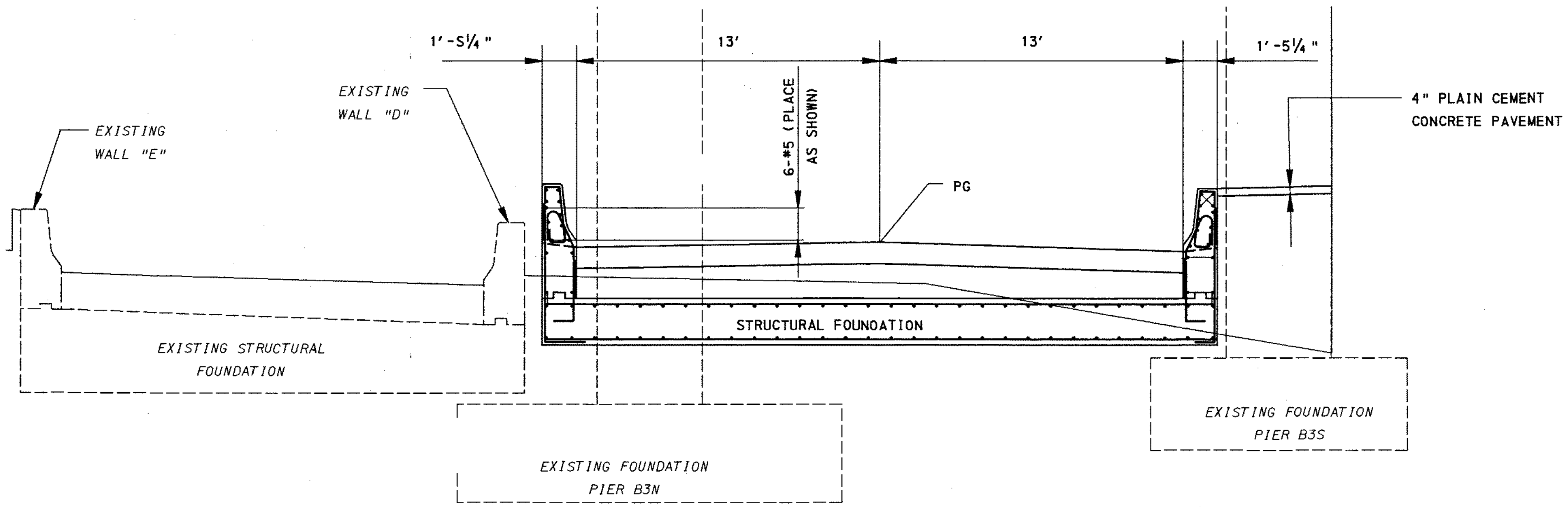
CROSS SECTION - STA 1117+00 SR 8095 (RELOCATED RAMP D) (LOOKING UP STA.)

NO SCALE
TYPICAL BETWEEN EXISTING FOUNDATIONS



CROSS SECTION - STA 1117+75 SR 8095 (RELOCATED RAMP D) (LOOKING UP STA.)

NO SCALE
STA 1116+50 TO STA 1117+00 SIMILAR
STA 1117+00 TO STA 1118+25 SIMILAR



CROSS SECTION - STA 1116+50 SR 8095 (RELOCATED RAMP D) (LOOKING UP STA.)

NO SCALE
STA 1116+29.35 TO STA 1116+50 SIMILAR
(TYPICAL STRUCTURAL SLAB REINFORCEMENT)

NOTES:

- STRUCTURAL FOUNDATION REINFORCEMENT TO BE #5 @ 12" (PLAIN) EACH WAY. ALL OTHER REINFORCEMENT TO BE #5 @ 12" (EPOXY COATED) UNLESS NOTED.
- EPOXY COAT ALL PARAPET AND WALL REINFORCEMENT
- FOR PARAPET REINFORCING AND STRUCTURAL FOUNDATION DETAILS SEE WALL 'C' DETAIL ON SHEET

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER JAMES F. WEMER NO. 48931-E

DRAWN BY	AJH
CHECKED BY	JFW

SCALE: AS SHOWN
SHEET NO 35 OF 85
ACCESSION NO
DATE : 11/28/2001
CASE NO

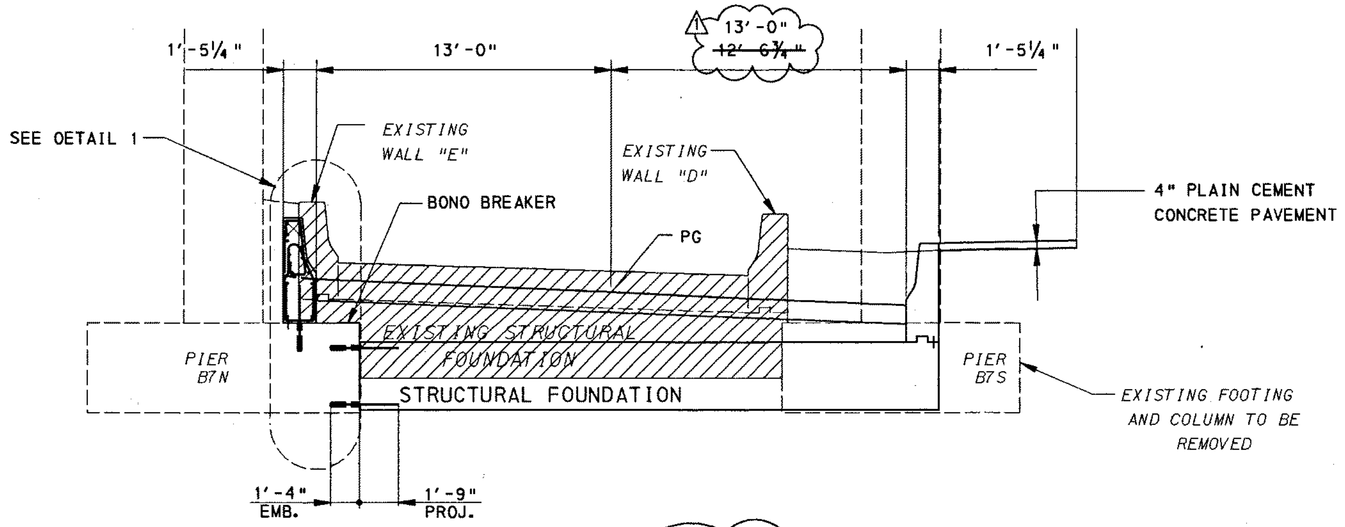
n:\projects\ustation\0042\Roadway\cndet03.dgn 11/28/2001

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	36 OF 85

* 0279 & 0376
** A33 & A28

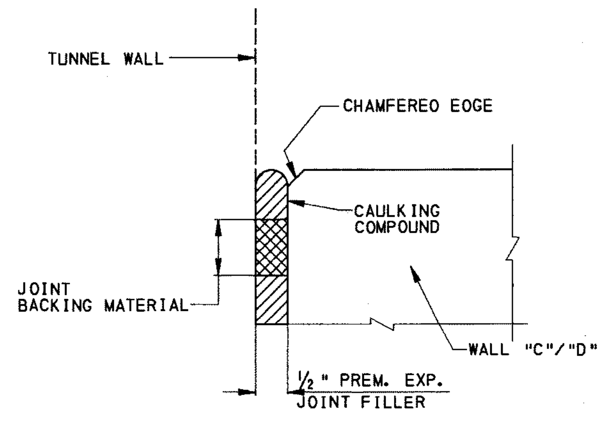
CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



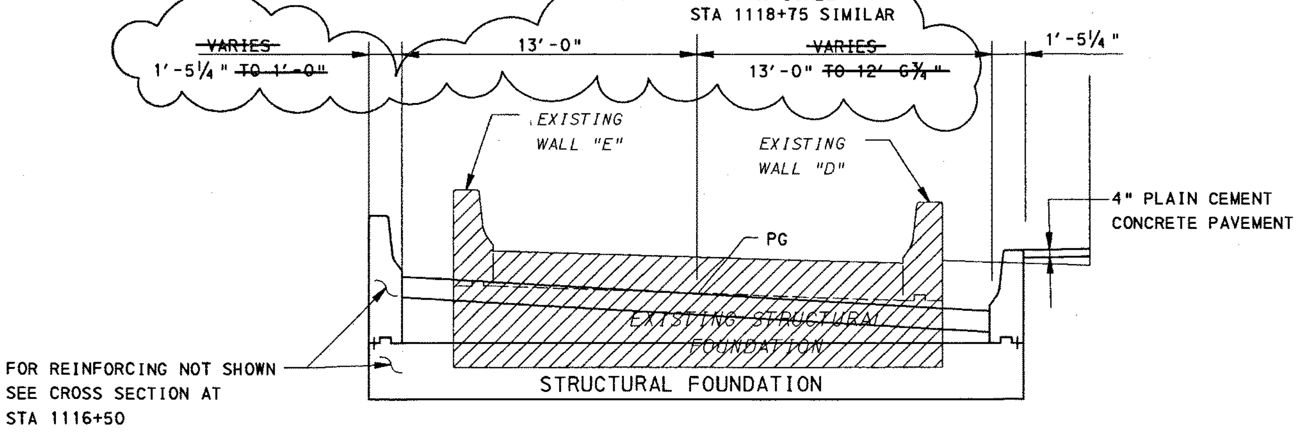
CROSS SECTION - STA 1119+25 SR 8095 (RELOCATED RAMP D) (LOOKING UP STA.)

NO SCALE
STA 1118+75 SIMILAR



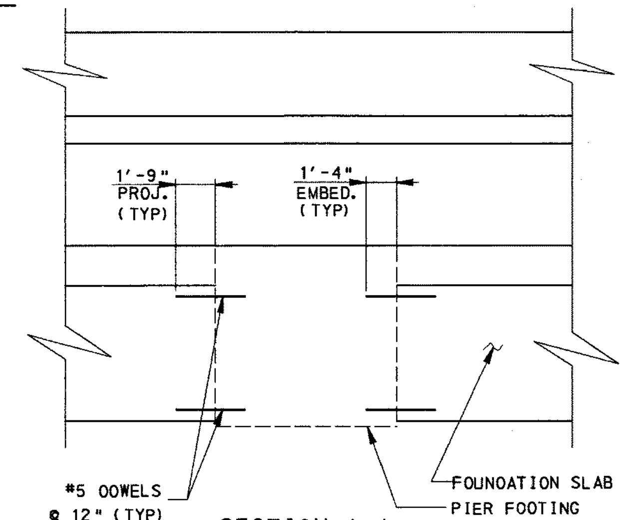
DETAIL - JOINT

NO SCALE



CROSS SECTION - STA 1119+75 SR 8095 (RELOCATED RAMP D) (LOOKING UP STA.)

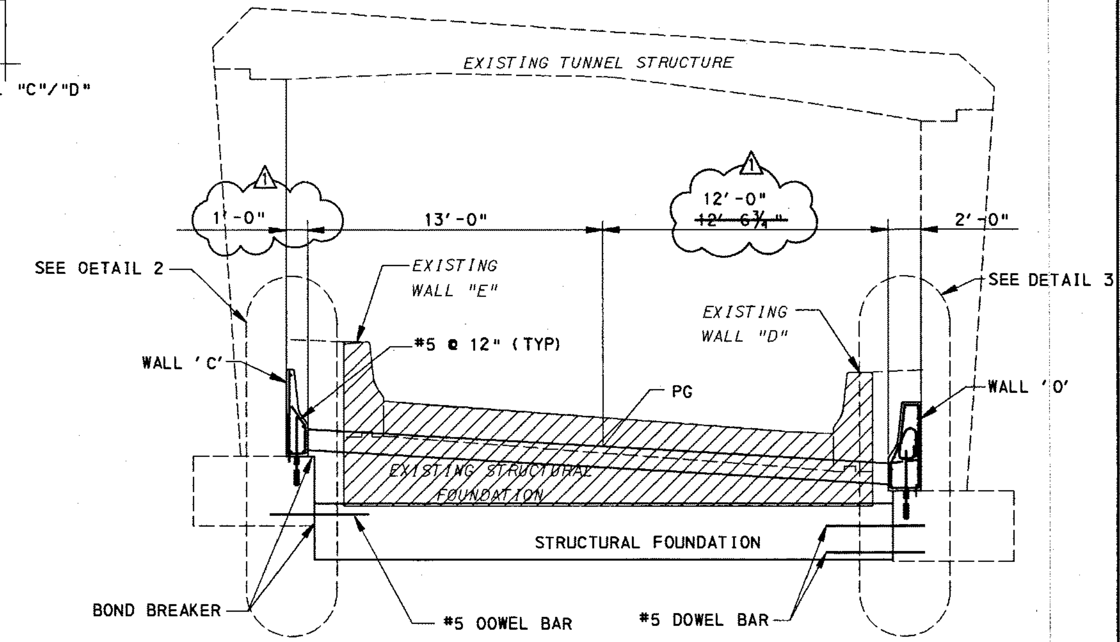
NO SCALE
STA 1118+25 TO STA 1118+75 SIMILAR
STA 1118+75 TO STA 1119+25 SIMILAR
STA 1119+25 TO STA 1119+94.18 SIMILAR



SECTION A-A

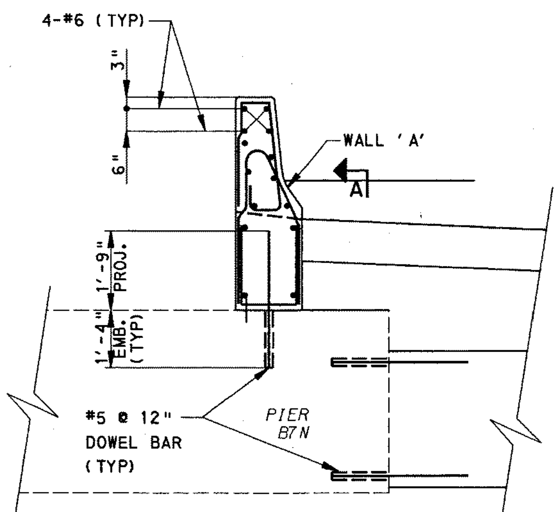
NO SCALE

NOTE:
ONLY LONGITUDINAL DOWELS IN PIER FOOTING ARE SHOWN



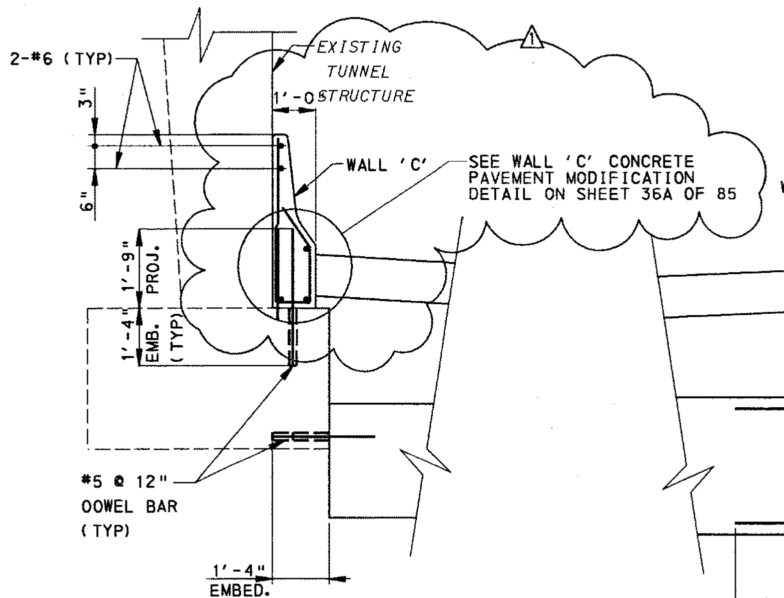
CROSS SECTION - STA 1120+25 SR 8095 (RELOCATED RAMP D) (LOOKING UP STA.)

NO SCALE
STA 1119+94.18 TO STA 1121+14.14 SIMILAR



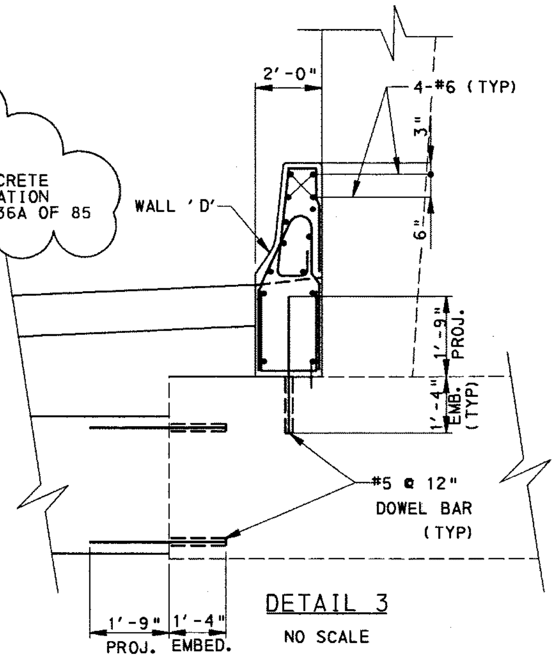
DETAIL 1

NO SCALE



DETAIL 2

NO SCALE



DETAIL 3

NO SCALE

NOTE

- STRUCTURAL FOUNOATION REINFORCEMENT TO BE #5 @ 12" (PLAIN) EACH WAY. ALL OTHER REINFORCEMENT TO BE #5 @ 12" (EPOXY COATED) UNLESS NOTEO.
- EPOXY COAT ALL PARAPET AND WALL REINFORCMENT
- FOR ADDITIONAL PARAPET AND STRUCTURAL FOUNDATION REINFORCING NOT SHOWN SEE OETAILS AT WALLS 'A', 'B', 'C' AND 'D' ON SHEET

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER JAMES F. WEIMER NO. 48931-E

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

SCALE: AS SHOWN | SHEET NO 36 OF 85 | ACCESSION NO
DATE : 12/01/2001 | CASE NO

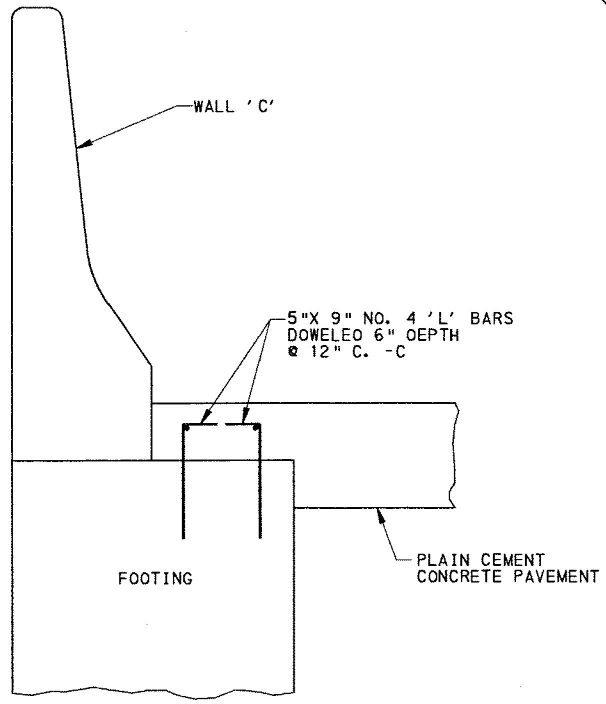
DRAWN BY	AJH
CHECKEO BY	JFW

H:\Projects\Ustation\0042\ASBUILT\abcndet04.dgn 12/29/2003

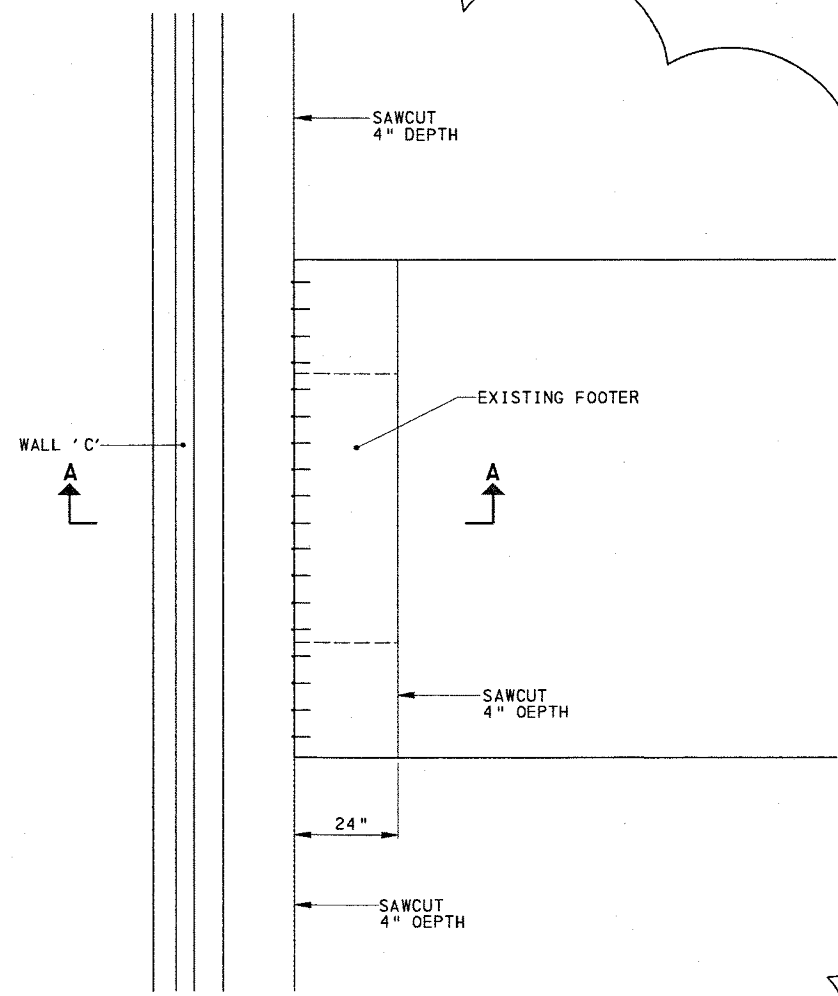
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	36A OF 85
CITY OF PITTSBURGH				

* 0279 & 0376
** A33 & A28

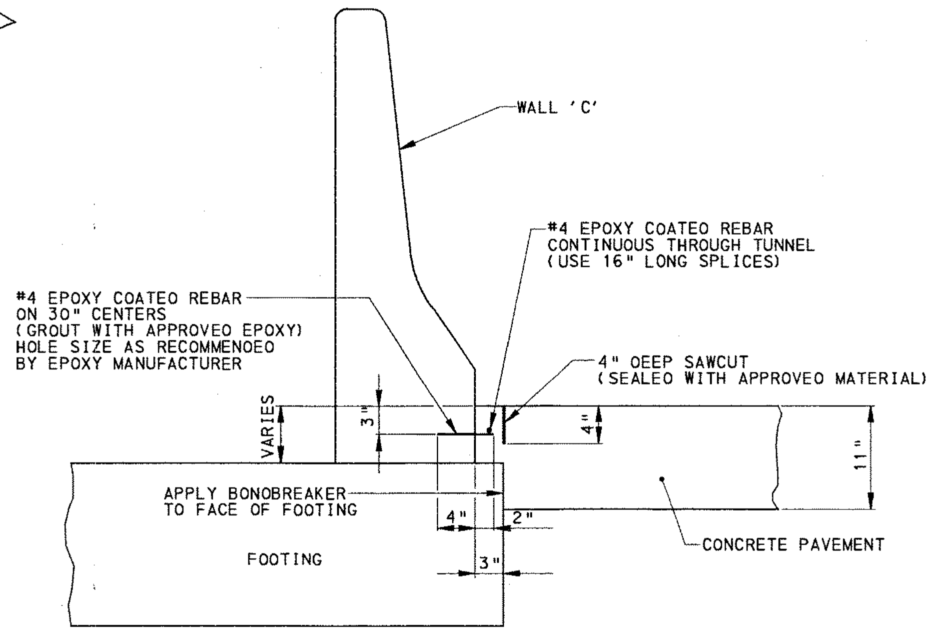
REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



SECTION A-A
NO SCALE



DETAIL - PORTAL FOOTER
NO SCALE



NOTE: EMPLOY THIS DETAIL FOR THE ENTIRE LENGTH OF WALL 'C' THROUGH THE THE TUNNEL.

DETAIL - WALL 'C' CONCRETE PAVEMENT MODIFICATION
NO SCALE

DRAWN BY	AJH
CHECKED BY	JFW

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEIMER ENGINEER

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

SCALE: AS SHOWN SHEET NO ACCESSION NO ________
DATE : 11/14/03 36A OF 85 CASE NO ________

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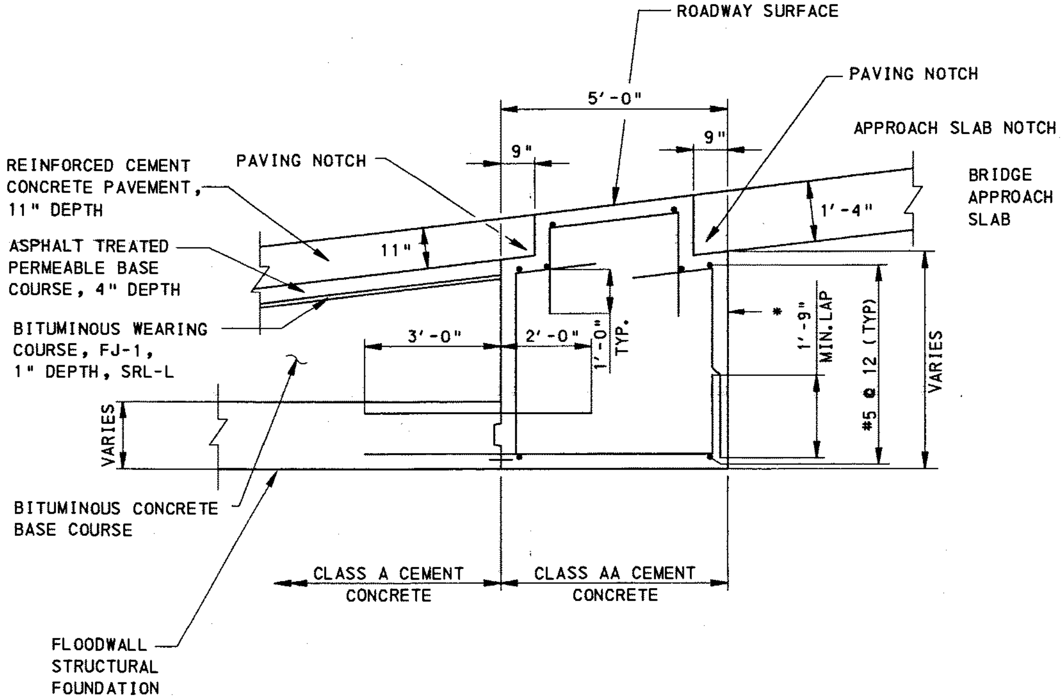
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	37 OF 85

* 0279 & 0376
** A33 & A28

CITY OF PITTSBURGH

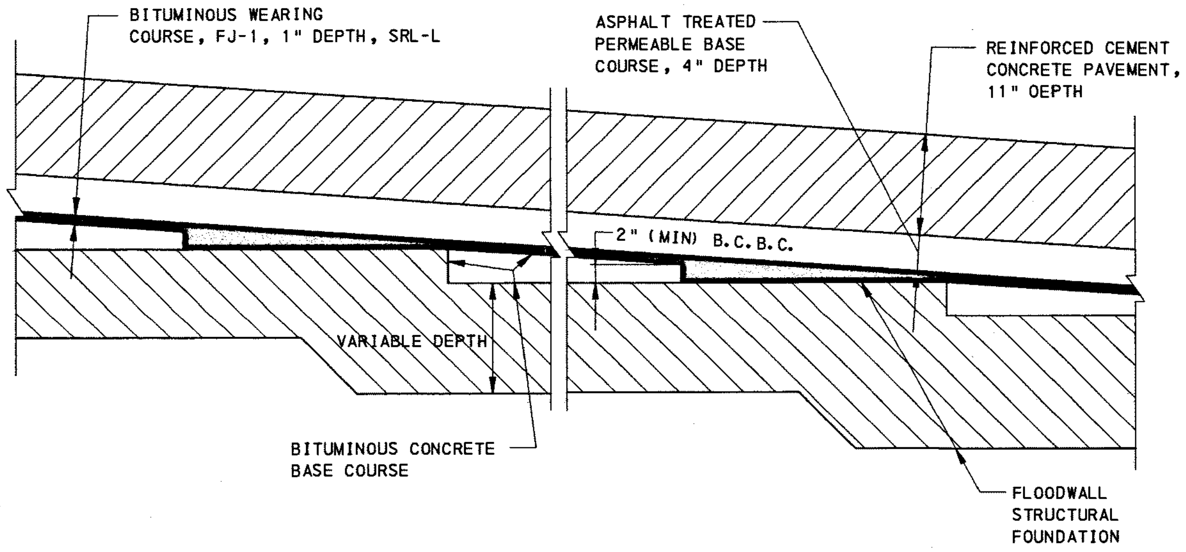
REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



CUTOFF WALL

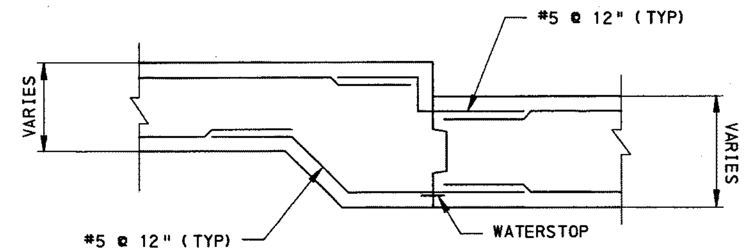
NO SCALE

* STA 1116+24.35 SR 8095 (RELOCATED RAMP D)
STA 1121+14.14 SR 8095 (RELOCATED RAMP D)



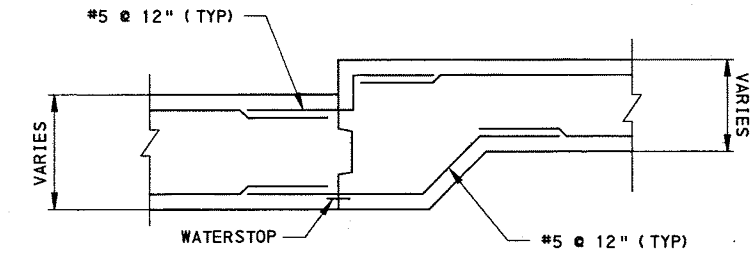
PAVEMENT DETAIL ABOVE FLOODWALL STRUCTURAL FOUNDATION

NO SCALE



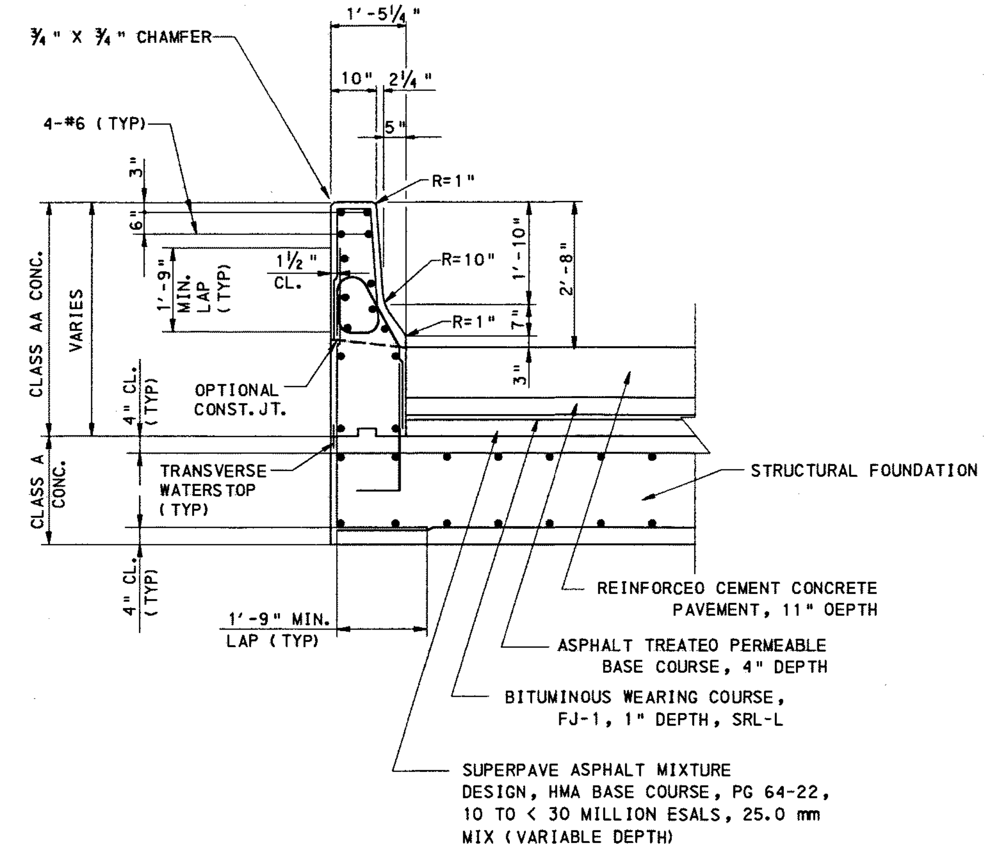
CONSTRUCTION JOINT STEP DOWN

NO SCALE



CONSTRUCTION JOINT STEP UP

NO SCALE



WALL 'A' AND WALL 'B'

NO SCALE

WALL 'A' STA 1116+25.10 TO STA 1119+94.18 SR 8095 (RELOCATED RAMP D)
WALL 'B' STA 1116+25.10 TO STA 1121+13.39 SR 8095 (RELOCATED RAMP D)

NOTE

STRUCTURAL FOUNDATION REINFORCEMENT TO BE #5 @ 12" (PLAIN) EACH WAY.
ALL OTHER REINFORCEMENT TO BE #5 @ 12" (EPOXY COATED) UNLESS NOTED.

- EPOXY COAT ALL PARAPET AND WALL REINFORCEMENT
- WORK THIS SHEET WITH SHEETS

RECORD DRAWINGS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEIMER ENGINEER NO. 48931-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

SCALE: AS SHOWN	SHEET NO	ACCESSION NO
DATE : 11/28/2001	37 OF 85	CASE NO

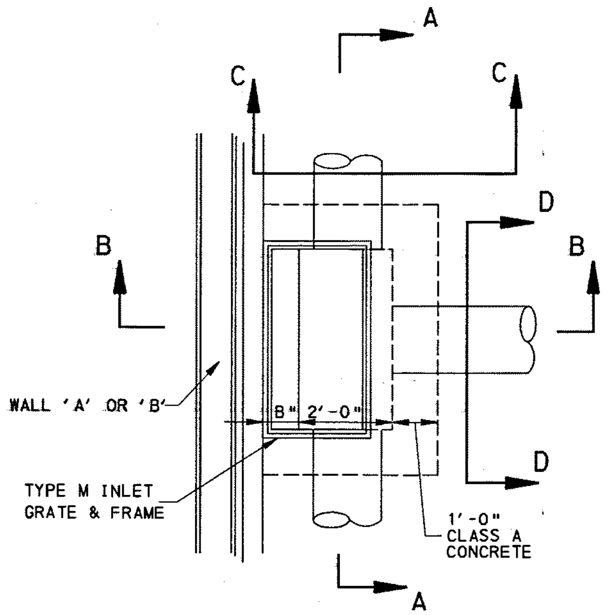
DRAWN BY	AJH
CHECKED BY	JFW

h:\projects\ustation\0042\Roadway\cndet05.dgn 11/28/2001

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	38 OF 85
CITY OF PITTSBURGH				

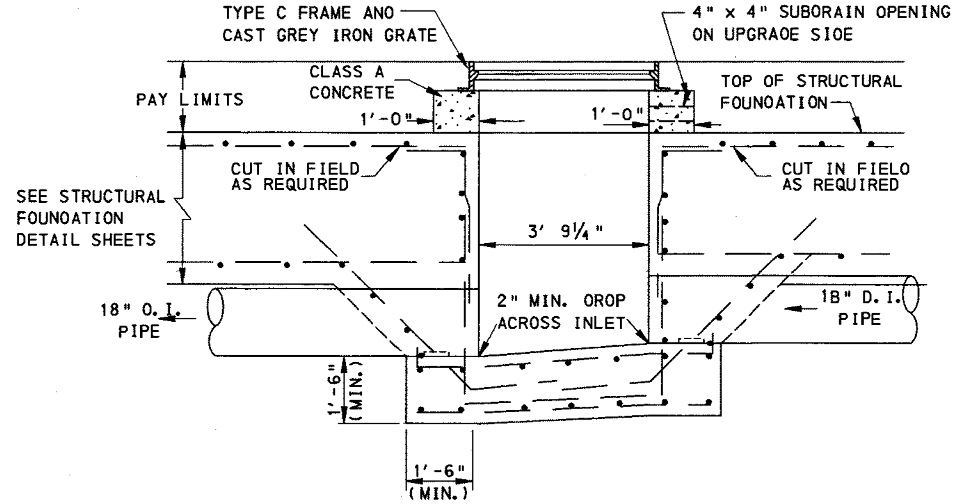
* 0279 & 0376
** A33 & A28

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

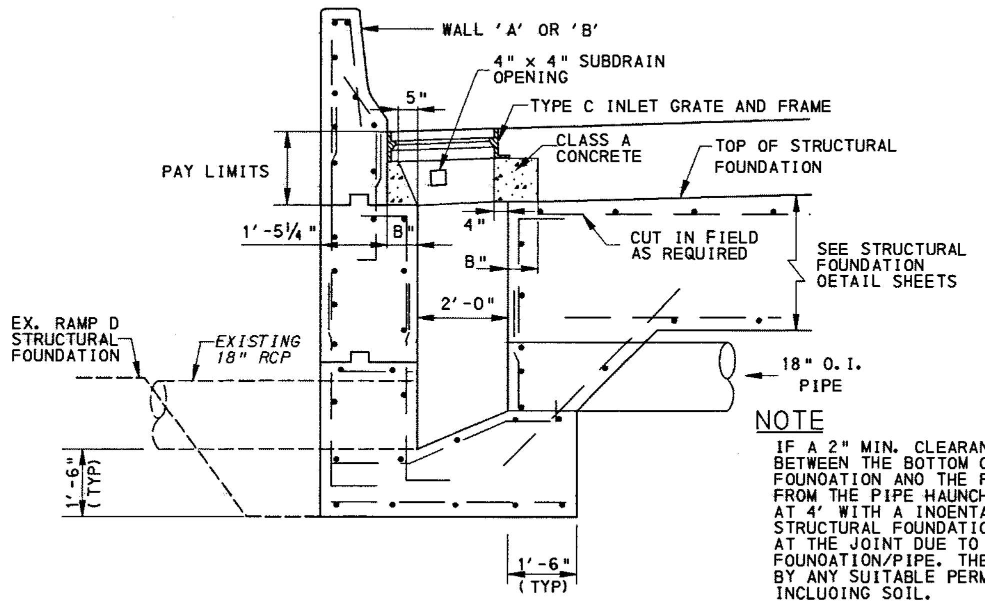


PLAN

FOR PIPE HAUNCH DETAIL SEE SECTION C-C AND D-D BELOW



SECTION A-A (LONGITUDINAL PIPE)



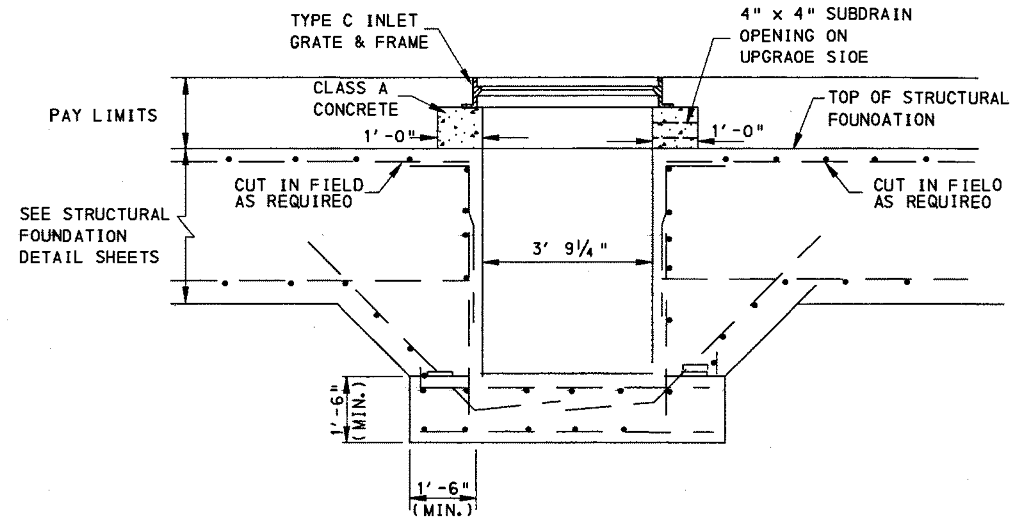
SECTION B-B (CROSS PIPE)

DETAIL-TYPE C INLET, SPECIAL

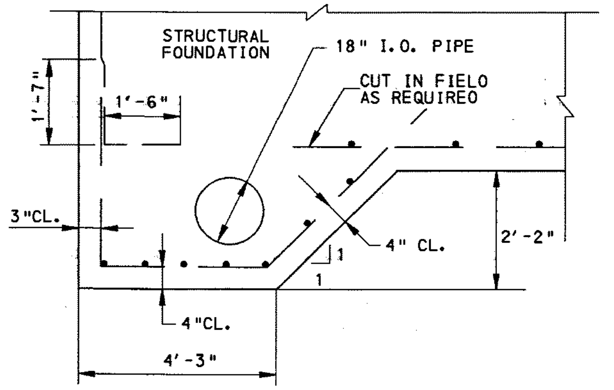
(TOP VIEW)
ITEM NO. 9605-0001

NOTE

IF A 2" MIN. CLEARANCE CANNOT BE OBTAINED BETWEEN THE BOTTOM OF THE STRUCTURAL FOUNDATION AND THE PIPE JOINT IN 4' OR LESS FROM THE PIPE HAUNCH, A JOINT SHALL BE PROVIDED AT 4' WITH A INDENTATION IN THE BOTTOM OF THE STRUCTURAL FOUNDATION TO ALLOW FOR MOVEMENT AT THE JOINT DUE TO DIFFERENTAL SETTLEMENT OF THE FOUNDATION/PIPE. THE 2" INDENTATION MAY BE FORMED BY ANY SUITABLE PERMANENTLY FLEXIBLE MATERIAL, INCLUDING SOIL.

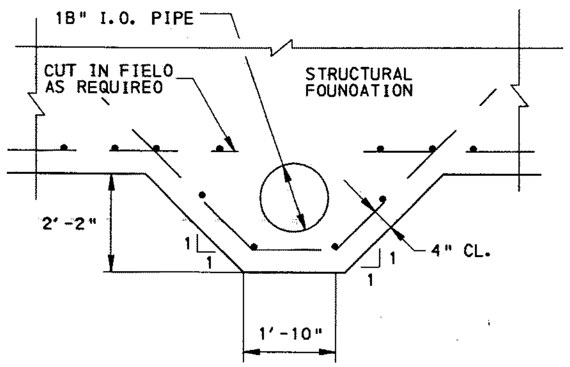


SECTION A-A (CROSS PIPE)



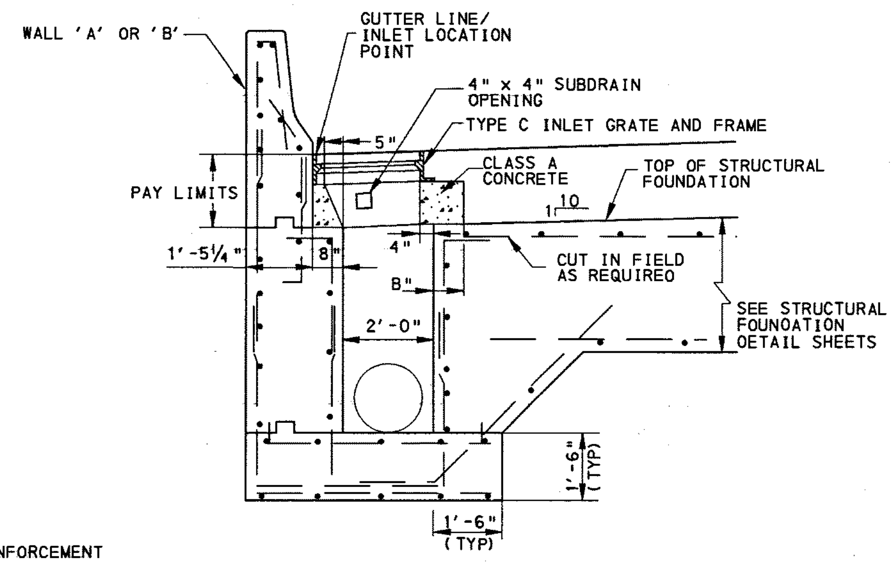
SECTION C-C

(PIPE HAUNCH)

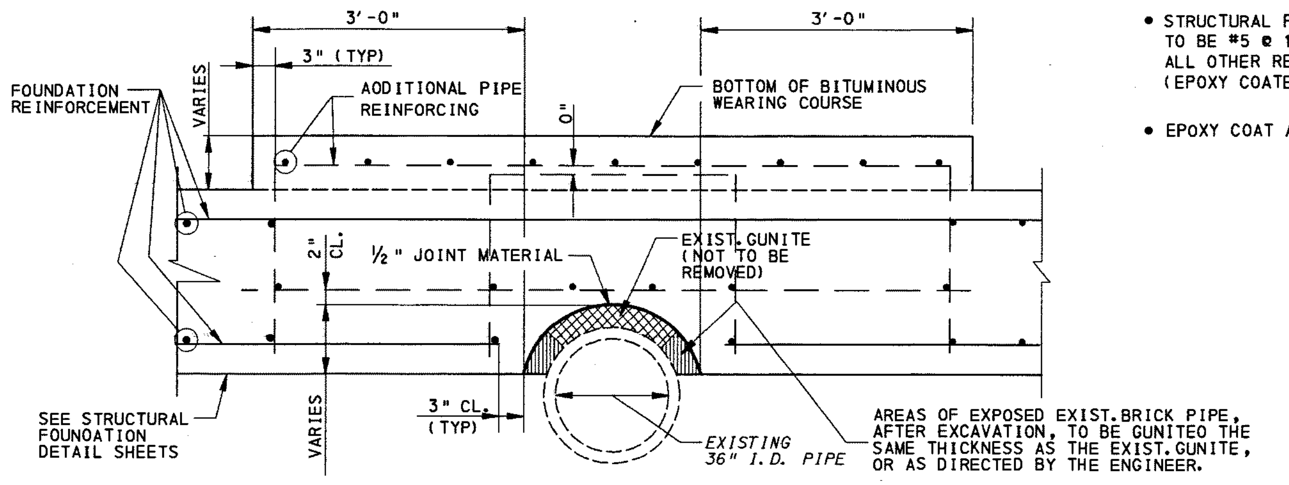


SECTION D-D

(PIPE HAUNCH)



SECTION B-B (LONGITUDINAL PIPE)



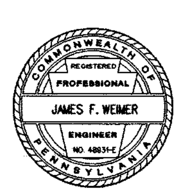
EXISTING 36" BRICK SEWER

NO SCALE
STA 1119+23.52 SR 8095 (RELOCATED RAMP D)

NOTE

- STRUCTURAL FOUNDATION REINFORCEMENT TO BE #5 @ 12" (PLAIN) EACH WAY. ALL OTHER REINFORCEMENT TO BE #5 @ 12" (EPOXY COATED) UNLESS NOTED.
- EPOXY COAT ALL PARAPET AND WALL REINFORCEMENT

RECORD DRAWINGS



D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

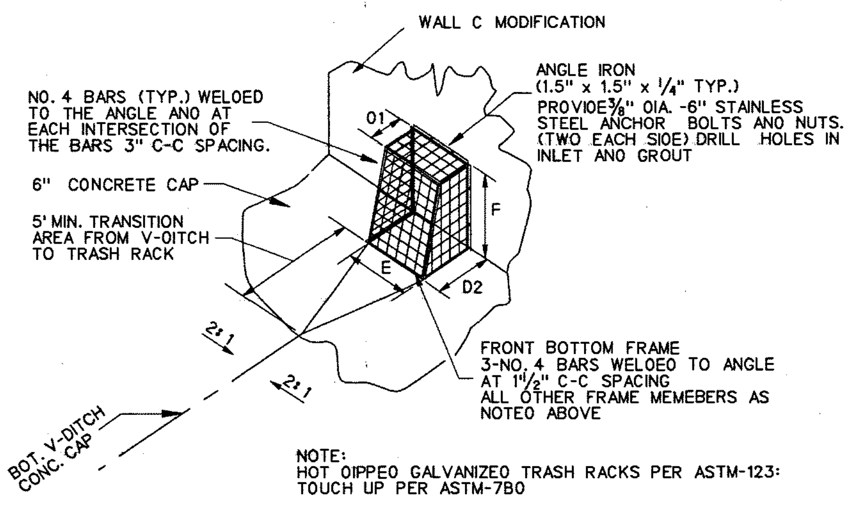
SCALE: AS SHOWN	SHEET NO	ACCESSION NO
DATE: 11/28/2001	38 OF 85	CASE NO

DRAWN BY	JH
CHECKED BY	JFW

* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	39 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

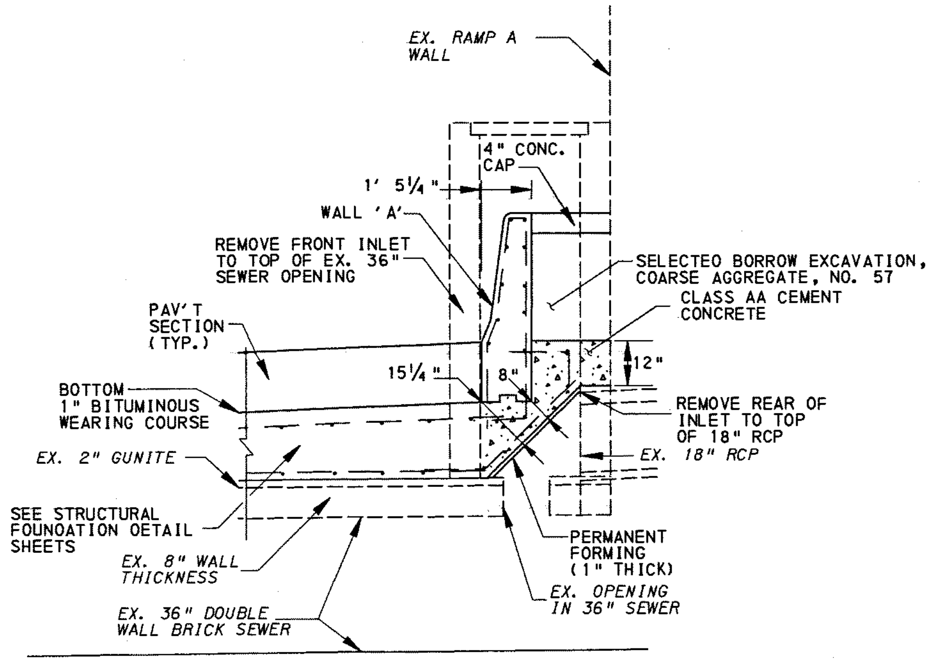


NOTE:
HOT DIPPED GALVANIZED TRASH RACKS PER ASTM-123:
TOUCH UP PER ASTM-780

TRASH RACK INFORMATION

LOCATION	E	D1	D2	F
G-1	30"	12"	18"	30"

DETAIL-TRASH RACK
ITEM NO. 9000-0110
STA. 1114+83.95 SR 8095 (RELOCATED RAMP D)



REINFORCEMENT TO BE
#5 @ 12" (PLAIN) EACH WAY,
UNLESS NOTED.

STA 1119+23.84 SR 8095 (RELOCATED RAMP D)

CONCRETE CAP OF EXISTING INLET
ITEM NO. 9605-0002

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEMER ENGINEER NO. 48931-E

DRAWN BY	RAK
CHECKED BY	JFW

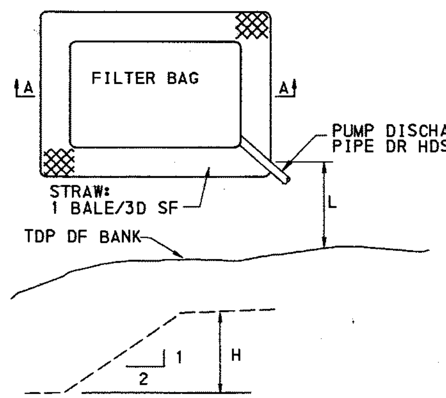
SCALE: AS SHOWN SHEET NO ACCESSION NO
DATE : 11/28/2001 39 OF 85 CASE NO

h:\projects\ustation\0042\Roadway\cndet07.dgn 11/28/2001

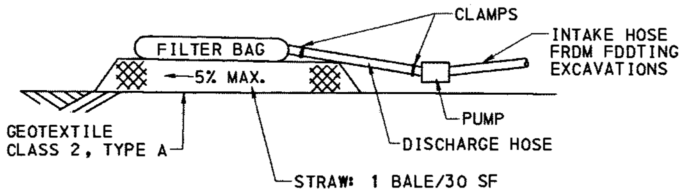
* D279 & D376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	4D DF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
⚠	AS-BUILT	10/1/03	SAI



CONOITION OF GROUNO SUPPORTING AND ADJACENT TO FILTER BAG	L (FT)
DENSE GRASS	10
SPARSE GROUND COVER OR BARE GROUND	20



SECTION A-A

FILTER BAG SHALL BE MADE FROM NON-WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH, DOUBLE STICHED "J" TYPE SEAMS. THE SHALL BE CAPABLE DF TRAPPING PARTICLES LARGER THAN 15D MICRONS.

PLACE SEDIMENT FILTER BAG ON A STABILIZED AREA OVER A BED OF STRAW AT 1 BALE / 30 SF. DO NOT PLACE SEDIMENT FILTER BAG IN WETLANDS DR ALLDW DISCHARGE TD FLDW INTD THE WORK ZDNE.

BAGS SHALL BE LOCATEO IN WELL-VEGETATEO (GRASSY) AREA, AND OISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE FLOW PATH SHALL BE PROVIDEO. BAGS SHALL NOT BE PLACED DN SLDPES GREATER THAN 5%.

INSTALL SILT BARRIER FENCE AS INDICATED TD PRDTECT STREAMS AND ADJACENT PRDPERTIES FRDM RUPTURED SEOIMENT BAG. STRAW BALE BARRIERS CAN BE USED IN PLACE OF THE SILT BARRIER FENCE WHEN EXISTING SURFACE IS CONCRETE OR BITUMINOUS PAVING.

THE PUMPING RATE SHALL BE NO GREATER THAN 75D GPM OR ½ THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHOULD BE FLOATING AND SCREENED.

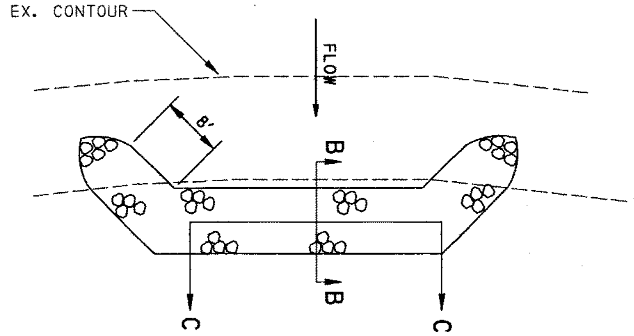
DOUBLE CLAMP THE PUMP DISCHARGE HOSE FIRMLY TO THE BAG. MONITOR AND EVALUATE THE ENTIRE PUMPING OPERATION TO ENSURE THAT THE BAG CONTINUES TO FUNCTION PRDPERLY.

REPLACE THE BAG WHEN THE CDNTAINED SILT REDUCES THE BAGS' FLDW TD APPROXIMATELY 5D PERCENT DF THE RATE DF THE INITIAL DISCHARGE, OR WHEN DIRECTED BY THE INSPECTDR-IN-CHARGE. PRDPERLY DISPDSE DF THE SEDIMENT AND THE COARSE AGGREGATE BED IN A MANNER SATISFACTORY TO THE ENGINEER. PRDVIDE A NEW STRAW BED FOR EACH SEDIMENT BAG.

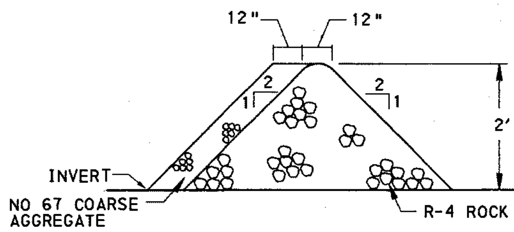
FILTER BAG SHALL BE INSPECTED DAILY. IF ANY PRDBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NDT RESUME UNTIL THE PRDBLEM IS CORRECTED.

SEDIMENT FILTER BAG

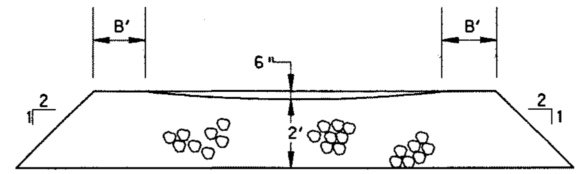
ITEM NO. 9B5B-ODD1



PLAN VIEW

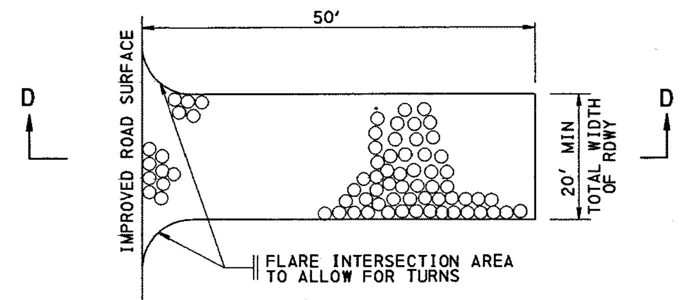


SECTION B-B

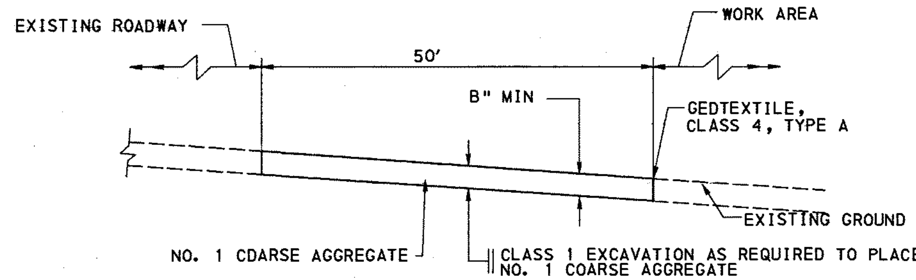


SECTION C-C

MODIFIED ROCK BARRIER



PLAN VIEW



SECTION D-D

NOTES:

1. PROVIDE GEDTEXTILE MATERIAL MEETING THE REQUIREMENTS DF PUBLICATION 4D8 SPECIFICATIONS, SECTIDN 735 AND FURNISH AND INSTALL IN ACCDRDANCE WITH SECTIDN 212.
2. PROVIDE GEOTEXTILE MATERIAL ALONG ALL INTERFACE AREAS WITH GROUND CONTACT.
3. FOR ROCK CONSTRUCTION ENTRANCE LOCATED AT SR 8041 RAMP F STA 1107+00.00 PLACE NO. 1 COARSE AGGREGATE AND GEOTEXTILE, CLASS 4, TYPE A DIRECTLY DN EXISTING WHARF RAMP TO REMAIN.

ROCK CONSTRUCTION ENTRANCE

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEMER ENGINEER NO. 48931-E

DRAWN BY	JES
CHECKED BY	RAK

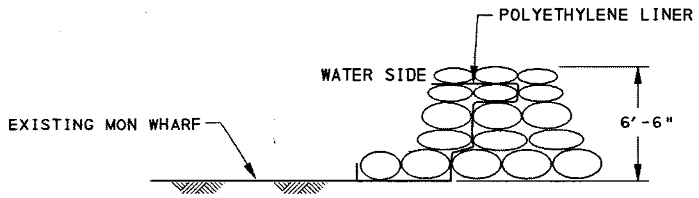
SCALE: AS SHOWN | SHEET ND 4D OF B5 | ACCESSIDN ND
DATE : 11/2B/20D1 | | CASE ND

h:\projects\ustation\0042\Roadway\cnesdet01.dgn 11/28/2001

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	41 OF 85
CITY OF PITTSBURGH				

* 0279 & 0376
** A33 & A28

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



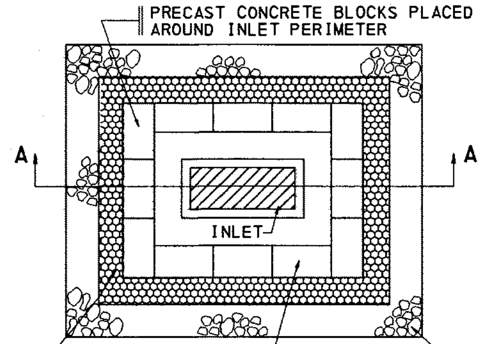
DETAIL

USING SANDBAGS AS A WATER DIVERSION DEVICE

NOTE:
CONTRACTOR TO ENSURE STABILITY OF WATER DIVERSION DEVICE.

WATER DIVERSION DEVICE

ITEM NO. 9000-0111

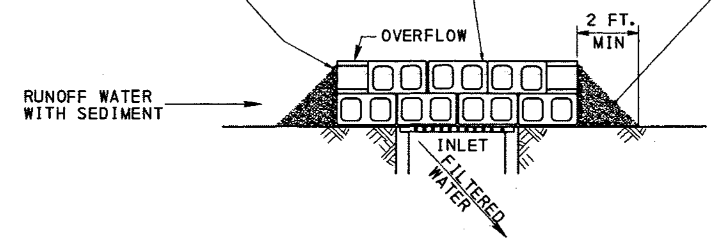


PLAN

WIRE SCREEN, 1/4" MAXIMUM OPENING PLACED AROUND CONCRETE BLOCK PERIMETER

PRECAST CONCRETE BLOCKS STACKED 2 HIGH

GRAVEL FILTER, AASHTO NO 57 COARSE AGGREGATE PLACED TO TOP OF CONCRETE BLOCKS ON ALL SIDES



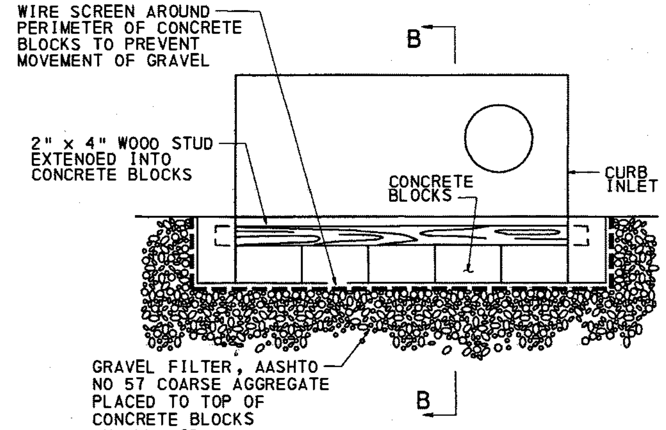
SECTION A-A

GRAVEL FILTER FOR AREA INLET

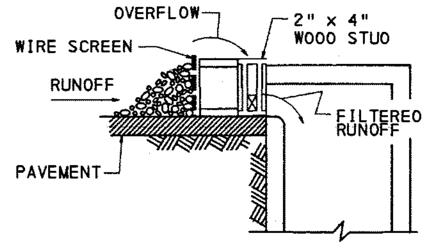
ITEM NO. 9858-0002

GRAVEL FILTER NOTES:

1. GRAVEL FILTERS MAY BE USED ON PAVEMENT OR BARE GROUND.
2. ALL GRAVEL FILTERS INSTALLED AROUND AREA DRAINS SHOULD BE INSPECTED AND REPAIRED AFTER EACH RUNOFF EVENT. SEDIMENT SHOULD BE REMOVED WHEN MATERIAL IS WITHIN FOUR INCHES OF THE TOP OF THE CONCRETE BLOCKS. PERIODICALLY, THE GRAVEL SHOULD BE RAKED TO INCREASE INFILTRATION AND FILTERING OF RUNOFF WATERS.
3. SEDIMENT SHOULD BE REMOVED IMMEDIATELY FROM ANY TRAVELED WAY OF ROADS AND STREETS.



PLAN



SECTION B-B

GRAVEL FILTER FOR CURB INLET

ITEM NO. 9858-0003

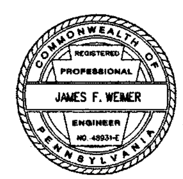
GRAVEL FILTER NOTES:

1. GRAVEL FILTERS MAY BE USED ON PAVEMENT OR BARE GROUND.
2. ALL GRAVEL FILTERS INSTALLED AROUND CURB INLETS AND AREA DRAINS SHOULD BE INSPECTED AND REPAIRED AFTER EACH RUNOFF EVENT. SEDIMENT SHOULD BE REMOVED WHEN MATERIAL IS WITHIN FOUR INCHES OF THE TOP OF THE CONCRETE BLOCKS. PERIODICALLY, THE GRAVEL SHOULD BE RAKED TO INCREASE INFILTRATION AND FILTERING OF RUNOFF WATERS.
3. SEDIMENT SHOULD BE REMOVED IMMEDIATELY FROM ANY TRAVELED WAY OF ROADS AND STREETS.

GRAVEL FILTERS FOR AREA AND CURB INLETS

ROUTE	STATION	SIDE	FILTER TYPE	REMARKS
S.R. 8041 (RAMP F)	1093+74.41	LT	CURB	EXISTING INLET
S.R. 8041 (RAMP F)	1094+85.30	LT	CURB	EXISTING INLET
S.R. 8095 (RELOCATED RAMP D)	1115+14.51	LT	CURB	EXISTING INLET
S.R. 8095 (RELOCATED RAMP D)	1116+06.41	LT	CURB	EXISTING INLET
S.R. 8095 (RELOCATED RAMP D)	1117+14.51	LT	CURB	EXISTING INLET
S.R. 8095 (RELOCATED RAMP D)	1117+14.51	LT	CURB	PROPOSED INLET
S.R. 8095 (RELOCATED RAMP D)	1117+65.93	RT	CURB	PROPOSED INLET
S.R. 8095 (RELOCATED RAMP D)	1118+10.39	RT	CURB	EXISTING INLET
S.R. 8095 (RELOCATED RAMP D)	1119+23.87	LT	AREA	EXISTING INLET
S.R. 8095 (RELOCATED RAMP D)	1121+63.34	RT	CURB	EXISTING INLET
S.R. 8095 (RELOCATED RAMP D)	1121+63.34	RT	CURB	PROPOSED INLET
S.R. 8095 (RELOCATED RAMP D)	1121+65.70	LT	CURB	EXISTING INLET
S.R. 8095 (RELOCATED RAMP D)	1121+65.70	LT	CURB	PROPOSED INLET
S.R. 8095 (RELOCATED RAMP D)	1121+70.00	RT	AREA	PROPOSED INLET
S.R. 8095 (RELOCATED RAMP D)	1121+88.94	LT	CURB	EXISTNG INLET
S.R. 8095 (RELOCATED RAMP D)	1122+32.15	LT	CURB	PROPOSED INLET
S.R. 8095 (RELOCATED RAMP D)	1123+20.00	LT	CURB	EXISTING INLET
RAMP B	649+91.93	LT	CURB	EXISTING INLET

RECORD DRAWINGS



D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

SCALE: AS SHOWN	SHEET NO	ACCESSION NO
DATE : 11/28/2001	41 OF 85	CASE NO

DRAWN BY	JES
CHECKED BY	RAK

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DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	42 OF 85

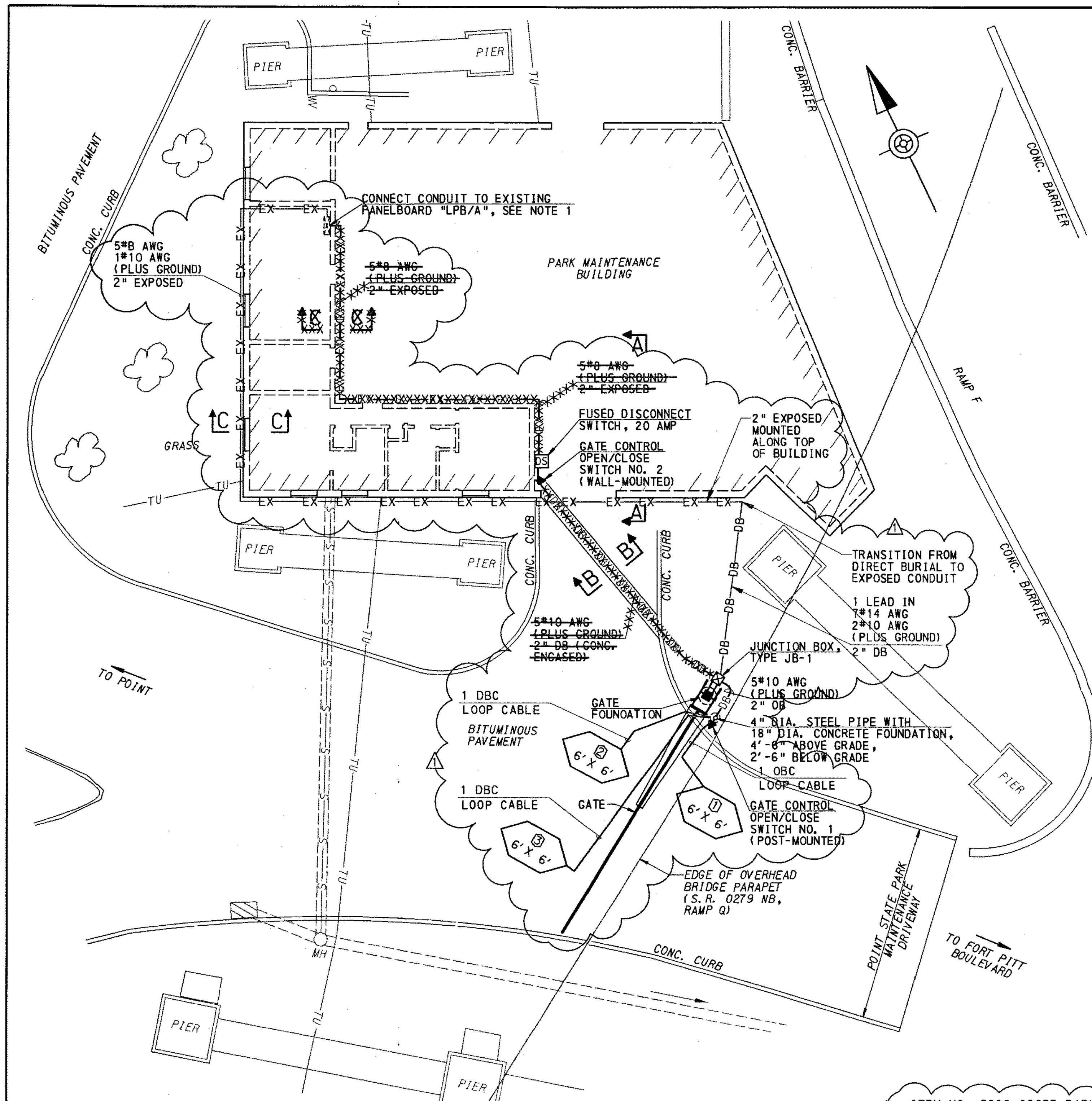
CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

* 0279 & 0376
** A33 & A2B

GENERAL NOTES

1. CONSTRUCTION DETAILS NOT SHOWN ON THE DRAWINGS SHALL CONFORM TO THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS:
   RC-81M DATED 04-16-01
   RC-84M DATED 04-28-00
2. THE STANDARD SPECIFICATIONS FOR THIS PROJECT ARE THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION PUBLICATION 408/2000.
3. THE CONTRACTOR SHALL WORK IN STRICT COORDINATION WITH LOCAL UTILITY COMPANIES TO ASCERTAIN THE EXACT LOCATION AND FUNCTION OF ALL EXISTING UNDERGROUND AND OVERHEAD UTILITY LINES PRIOR TO COMMENCEMENT OF THIS WORK.
4. UNDER ACT 187, MAINTAIN A MINIMUM DISTANCE OF 18 INCH CLEARANCE FROM ALL UNDERGROUND UTILITIES.
5. PENNSYLVANIA ONE CALL TELEPHONE NUMBER IS 1-800-242-1776. DESIGNER'S SERIAL NUMBER IS 01B0500.



PLAN
POINT STATE PARK ACCESS GATE

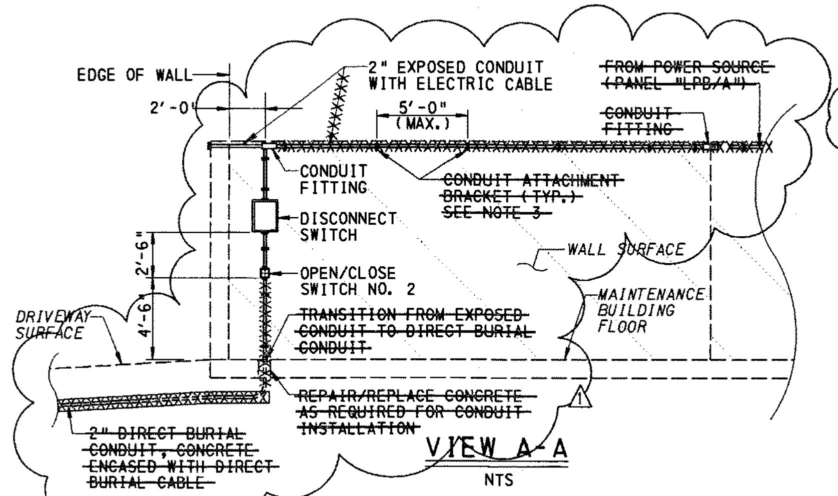
SCALE 10' 0' 10'

ACCESS GATE LEGEND

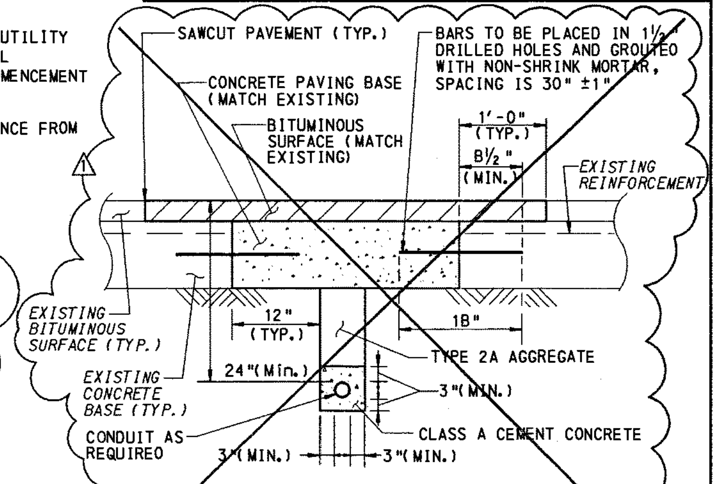
Symbol	Description
⊠	JUNCTION BOX, TYPE JB-1
◆	GATE CONTROL OPEN/CLOSE SWITCH
DS	WALL-MOUNTED, FUSED DISCONNECT SWITCH, 20 AMP
—DB—DB—DB—	2" DIRECT BURIAL (DB) CONDUIT IN TRENCH, CONCRETE ENCASED, WITH DIRECT BURIAL CABLE
—EX—EX—EX—	2" EXPOSED CONDUIT, WALL-MOUNTED, WITH DIRECT BURIAL CABLE

NUMBER OF CONDUCTORS — COPPER — SIZE OF CONDUCTORS
4#10 AWG — AMERICAN WIRE GAGE

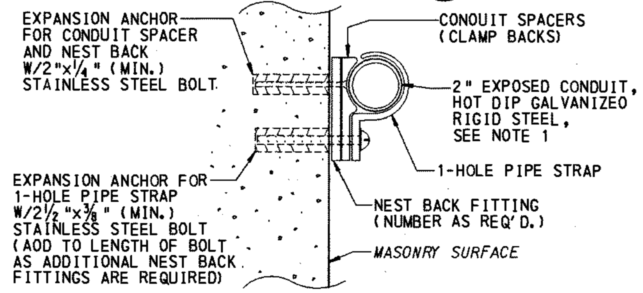
DRAWN BY	TLL
CHECKED BY	KOF



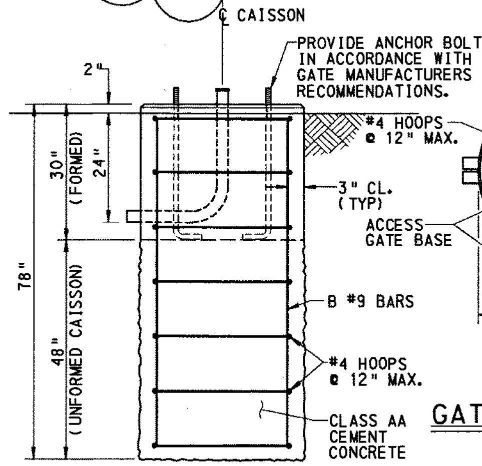
VIEW A-A
NTS



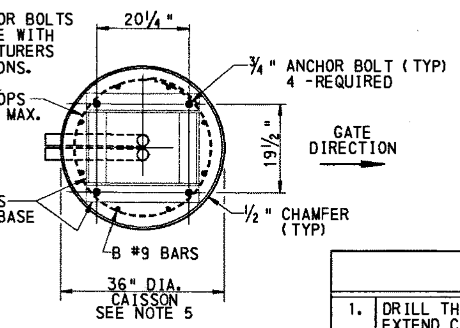
SECTION B-B
BITUMINOUS ROADWAY REPAIR
(FOR CONDUIT PLACEMENT BENEATH ROADWAY AND SHOULDERS)
NTS



SECTION C-C
ATTACHMENT OF EXPOSED CONDUIT
NTS



ELEVATION
GATE FOUNDATION
NTS



PLAN
GATE FOUNDATION
NTS

RECORD DRAWINGS

NOTES

1.	DRILL THROUGH EXISTING WALL APPROXIMATELY 6" BELOW CEILING OR AS DIRECTED. EXTEND CONDUIT THROUGH WALL AND CONNECT TO EXISTING PANELBOARD "LPB/A". INSTALL 20 AMP CIRCUIT BREAKER INTO SPARE SLOT. INSTALL CIRCUIT CONDUCTORS AND CONNECT TO NEW CIRCUIT BREAKER. REFER TO EXISTING ELECTRICAL PLANS AND DETAILS FOR "MAINTENANCE BUILDING AND MAIN SEWER LINE DRAWINGS", PROJECT NO. G.S.A.-107-2, DRAWING NO. E-2 DATED OCTOBER 26, 1962 FOR ADDITIONAL ELECTRICAL AND BUILDING INFORMATION. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL INFORMATION SHOWN.
2.	SUITABLY GROUND ALL EQUIPMENT AS INDICATED IN PUBLICATION 408, SECTION 910.3(q), AND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
3.	ALL REQUIRED CONDUIT ATTACHMENT HARDWARE AND FITTINGS ARE INCLUDED IN THIS WORK AT NO ADDITIONAL PAYMENT.
4.	ALSO INCLUDED IN THIS WORK IS THE FURNISHING AND INSTALLING OF ALL POWER, CONTROL AND OVERCURRENT PROTECTION EQUIPMENT AS RECOMMENDED BY THE ACCESS GATE MANUFACTURER.
5.	THE CONTRACTOR SHALL COORDINATE AND VERIFY ALL DIMENSIONS CONCERNING THE GATE FOUNDATION WITH THE ACCESS GATE MANUFACTURER PRIOR TO CONSTRUCTION OF THE FOUNDATION. THIS WORK INCLUDES ALL REQUIRED EXCAVATION/AUGERING FOR THE FOUNDATION AND THE SATISFACTORY OFF-SITE REMOVAL OF ALL EXCESS MATERIAL.

ITEM NO. 9999-0063E PARK GATE COMPONENT MODIFICATIONS (LS) - 1.0 LS
ITEM NO. 0956-0101 LOOP SENSOR (LF) - 125 LF

POINT STATE PARK ACCESS GATE - ITEM NO. 9000-0101
LUMP SUM (ALL QUANTITIES ARE SHOWN FOR INFORMATION ONLY)

	AUTOMATIC ACCESS GATE, 40 FOOT LENGTH	GATE FOUNDATION	JUNCTION BOXES J.B.-1	FUSED DISCONNECT SWITCH, 20 AMP, IN NEMA 4 ENCLOSURE	GATE CONTROL OPEN/ CLOSE SWITCH, WALL-MOUNTED	GATE CONTROL OPEN/ CLOSE SWITCH, POST-MOUNTED	AWG 8 DIRECT BURIAL COPPER CABLE, 1 CONDUCTOR	AWG 10 DIRECT BURIAL COPPER CABLE, 1 CONDUCTOR	~~2" DIRECT BURIAL CONDUIT, CONCRETE ENCASED~~	2" EXPOSED CONDUIT	2" DIRECT BURIAL CONDUIT	TRENCH	TESTING OF ENTIRE GATE CONTROL SYSTEM
UNIT	EACH	EACH	EACH	EACH	EACH	EACH	LF	LF	LF	LF	LF	LF	LS
TOTALS	1	1	1	1	1	1	660	520	~~35~~	105	20	55	LS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEIMER ENGINEER NO. 48931-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
MISCELLANEOUS DETAILS

SCALE: AS SHOWN — SHEET NO 42 OF 85 — ACCESSION NO
DATE: 12/01/2001 — CASE NO

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POA - PREOETERMINEO AMOUNT
(A) - SEE SPECIAL PROVISIONS
B - TRAFFIC CONTROL PLAN
C - TRAFFIC SIGNAL PLAN
D - SIGNING AND SIGN LIGHTING PLAN
E - HIGHWAY LIGHTING PLAN
F - PAVEMENT MARKING ANO DELINEATOR PLAN
G - PITTSBURGH PARKING AUTHORITY CONDUIT PLAN
H - STRUCTURE PLAN S-243B9
I - STRUCTURE PLAN BPAA 02-2419
J - STRUCTURE PLAN S-24391
K - STRUCTURE PLAN BPAA 02-2417
L - STRUCTURE PLAN BPAA 02-2416
M - STRUCTURE PLAN BPAA 02-241B
N - STRUCTURE PLAN S-24390
O - STRUCTURE PLAN BPAA 02-2420

* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	43 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

SUMMARY OF QUANTITIES

SHEET 1 OF 6

QUANTITY	ITEM NO. / UNIT	OESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET
---	0201 0001 LS	CLEARING ANO GRUBBING		NO TAB
5178	0203 0001 CY	CLASS 1 EXCAVATION		53, 63
745	4203 0001 CY	CLASS 1 EXCAVATION, SPECIAL (A)		53
150	0203 0003 CY	CLASS 1A EXCAVATION		S3
2258	0203 0004 CY	CLASS 1B EXCAVATION		S3
11B	0204 0001 CY	CLASS 2 EXCAVATION		60
1229	0204 0100 CY	CLASS 3 EXCAVATION		O, L M, N
13	0204 01S0 CY	CLASS 4 EXCAVATION		60
SSS	020S 02BS CY	SELECTEO BORROW EXCAVATION, COARSE AGGREGATE, NO. 57		S3
73B	0212 0001 LF	GEOTEXTILE, CLASS 1		60
S2	0212 0014 SY	GEOTEXTILE, CLASS 4, TYPE A		63
7S2	0309 0537 TON	SUPERPAVE ASPHALT MIXTURE OESIGN, HMA BASE COURSE, PG 64-22, 3 TO <10 MILLION ESALS, 2S.0 MM MIX		S3
1869	0350 0104 SY	SUBBASE 4" OEPTH (NO. 2A)		53
4425	03S0 0106 SY	SUBBASE 6" OEPTH (NO. 2A)		53
28B	0350 0108 SY	SUBBASE B" OEPTH (NO. 2A)		53
EITHER 300S	0360 0001 SY	ASPHALT TREATEO PERMEABLE BASE COURSE, 4" OEPTH	1	53
OR 3005	0303 0001 SY	CEMENT TREATED PERMEABLE BASE COURSE, 4" OEPTH		
1390	0409 0542 SY	SUPERPAVE ASPHALT MIXTURE DESIGN, HMA WEARING COURSE, PG 64-22, 3 TO <10 MILLION ESALS, 12.5 MM MIX, 1½" DEPTH, SRL-H		53
1326	0409 6540 SY	SUPERPAVE ASPHALT MIXTURE OESIGN, HMA BINDER COURSE, PG 64-22, 3 TO <10 MILLION ESALS, 19.0 MM MIX, 2" DEPTH		S3
1376	0422 0230 SY	BITUMINOUS WEARING COURSE, FJ-1, 1" OEPTH, SRL-L		53
1288	0460 0001 SY	BITUMINOUS TACK COAT		53
21S	0491 0067 SY	MILLING OF BITUMINOUS PAVEMENT SURFACE, 3½" OEPTH		S3
633	0501 0020 SY	PLAIN CEMENT CONCRETE PAVEMENT, 4" OEPTH		S3
644	0501 0030 SY	PLAIN CEMENT CONCRETE PAVEMENT, 9" OEPTH		53

QUANTITY	ITEM NO. / UNIT	DESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET
2983	0501 0200 SY	REINFORCEO CEMENT CONCRETE PAVEMENT, 8" OEPTH		53
3005	0501 0203 SY	REINFORCED CEMENT CONCRETE PAVEMENT, 11" OEPTH		53
2	0501 0814 EACH	CONCRETE PAVEMENT CORES, 11" OEPTH		53
7B29	0S03 0001 SY	PROTECTIVE COATING FOR CEMENT CONCRETE PAVEMENTS ANO SHOULOERS		53
111	0504 0001 LF	PAVEMENT RELIEF JOINT		53
383	0S0S 0001 SY	BRIOGE APPROACH SLAB		53
4BS	4S0S 0001 SY	BRIOGE APPROACH SLAB, MOOIFIEO (A)		53
172	4601 0763 LF	18" OUCTILE IRON PIPE, MOOIFIED (A)		60
4	0601 S430 CY	CLASS A CEMENT CONCRETE FOR MISCELLANEOUS ORAINAGE		60
152	4601 7014 LF	18" REINFORCEO CONCRETE PIPE, TYPE A, 1S' - 2' FILL, MOOIFIEO (A)		60
114	4604 7014 LF	18" REINFORCED CONCRETE PIPE, TYPE A, (OPEN JOINT) 1S'-2' FILL, MOOIFIEO (A)		60
3	060S 2060 EACH	TYPE M INLET		60
5	0605 2066 EACH	TYPE M INLET, TYPE 1 BOX		60
2	060S 2401 SET	MANHOLE FRAME ANO COVER		60
2	0606 0050 SET	GRADE ADJUSTMENT OF EXISTING INLETS		60
1	0606 0150 SET	GRAOE AOJUSTMENT OF EXISTING MANHOLES		60
3	0607 0009 VF	REBUILT TYPE 4' INLET		60
14	0607 0010 VF	REBUILT TYPE 4' SPECIAL INLET		60
15	0607 0200 VF	REBUILT MANHOLE		60
---	0608 0001 LS	MOBILIZATION (A)		NO TAB
---	0609 0002 LS	INSPECTOR'S FIELD OFFICE AND INSPECTION FACILITIES, TYPE A		NO TAB
738	0610 7002 LF	6" PAVEMENT BASE ORAIN		60
13	0610 7400 CY	AOOITIONAL COARSE AGGREGATE FOR EXTRA DEPTH PAVEMENT BASE ORAIN		60
16	0615 0023 LF	B" SUBSURFACE DRAIN OUTLETS		60
1	0619 0600 EACH	PERMANENT IMPACT ATTENUATING DEVICE, TYPE V (STANOARO), TEST LEVEL 2		55

QUANTITY	ITEM NO. / UNIT	OESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET
1	0619 0610 EACH	PERMANENT IMPACT ATTENUATING OEVICE, TYPE V (STANOARO), TEST LEVEL 3		55
649	0623 0051 LF	SINGLE FACE CONCRETE BARRIER, 41" HEIGHT		57
1	0623 0110 EACH	ENO TRANSITION		57
2	4623 0110 EACH	END TRANSITION, MOOIFIEO (A)		S7
6	4624 0001 LF	RIGHT-OF-WAY FENCE, TYPE 1, MOOIFIEO (A)		SS
3930	0627 0001 LF	TEMPORARY CONCRETE BARRIER		B
S80	4627 0001 LF	TEMPORARY CONCRETE BARRIER, MOOIFIEO (A)		B
2	0627 0011 EACH	TEMPORARY ENO TRANSITION		B
2	4627 0011 EACH	TEMPORARY ENO TRANSITION, MOOIFIEO (A)		B
29S	4627 0021 LF	TEMPORARY CONCRETE BARRIER, STRUCTURE MOUNTEO, SPECIAL (A)		B
1B20	062B 0001 LF	RESET TEMPORARY CONCRETE BARRIER		B
S	062B 0010 EACH	RESET TEMPORARY ENO TRANSITION		B
405	4628 0011 LF	RESET TEMPORARY CONCRETE BARRIER, STRUCTURE MOUNTEO, SPECIAL (A)		B
224	0630 0001 LF	PLAIN CEMENT CONCRETE CURB		55
916	4630 0001 LF	PLAIN CEMENT CONCRETE CURB, MOOIFIEO (A)		55
48	4630 0010 LF	PLAIN CEMENT CONCRETE CURB, INCLUDING REMOVAL OF EXISTING CURB, MODIFIED (A)		55
175	4633 0200 LF	PLAIN CONCRETE MOUNTABLE CURB, TYPE A, MODIFIED (A)		55
661	0673 0100 SY	CAST-IN-PLACE CEMENT CONCRETE SLAB SLOPE WALL		53
357	0676 0001 SY	CEMENT CONCRETE SIOEWALK		S5
---	0686 0030 LS	CONSTRUCTION SURVEYING, TYPE B, MOOIFIEO		NO TAB
---	4686 0050 LS	CONSTRUCTION SURVEYING, TYPE O, S-24389 (A)		NO TAB
---	4686 0051 LS	CONSTRUCTION SURVEYING, TYPE O, BPAA 02-2419 (A)		NO TAB

QUANTITY	ITEM NO. / UNIT	DESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET
---	4686 0052 LS	CONSTRUCTION SURVEYING, TYPE O, S-24391 (A)		NO TAB
---	46B6 0060 LS	CONSTRUCTION SURVEYING, TYPE O, MOOIFIEO, BPAA 02-2417 (A)		NO TAB
---	4686 0061 LS	CONSTRUCTION SURVEYING, TYPE O, MODIFIED, S-24390 (A)		NO TAB
---	06BB 0002 LS	MICROCOMPUTER WITH BATTERY BACKUP SYSTEM, TYPE A		NO TAB
---	468B 0002 LS	MICROCOMPUTER WITH BATTERY BACKUP SYSTEM, TYPE A, SPECIAL (A)		NO TAB
1	0696 0600 EACH	TEMPORARY IMPACT ATTENUATING OEVICE, TYPE V (STANDARO), TEST LEVEL 2		B
1	0696 0639 EACH	TEMPORARY IMPACT ATTENUATING OEVICE, TYPE V (STANDARO), TEST LEVEL 3		B
2S2	0703 0020 CY	NO. 1 COARSE AGGREGATE		63
23	0703 0023 CY	NO. 67 COARSE AGGREGATE		63
B	0703 002S CY	NO. S7 COARSE AGGREGATE		L, M
59	4804 0013 LB	SEEOING AND SOIL SUPPLEMENTS - FORMULA O, INCLUOES HAY MULCH (A)		63
26	4B04 0014 LB	SEEOING - FORMULA E, INCLUOES HAY MULCH (A)		63
---	0B4S 0002 PDA	UNFORESEEN WATER POLLUTION CONTROL		NO TAB
11S	0850 0032 CY	ROCK, CLASS R-4		63
---	0901 0001 LS	MAINTENANCE AND PROTECTION OF TRAFFIC OURING CONSTRUCTION		NO TAB
120	0901 0231 OAY	AOOITIONAL WARNING LIGHTS, TYPE B		B
180	0901 0232 OAY	ADDITIONAL WARNING LIGHTS, TYPE C		B
2000	0901 0240 SF	AOOITIONAL TRAFFIC CONTROL SIGNS		B
610	0901 030B LF	STANOARO PAVEMENT MARKINGS, PAINT & BEAOS, YELLOW		B
6S5	0901 0309 LF	STANOARO PAVEMENT MARKINGS, PAINT & BEAOS, WHITE		B

RECORD DRAWINGS

THE QUANTITIES LISTED ON THIS SHEET MAY NOT MATCH
THE QUANTITIES FOR THIS AS-BUILT PLAN REVISIONS.

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES F. WEIMER
ENGINEER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
SUMMARY OF QUANTITIES

SCALE: AS SHOWN	SHEET NO	ACCESSION NO
OATE : 12/03/2001	43 OF 85	CASE NO

DRAWN BY	JES
CHECKEO BY	JFW

h:\projects\ustation\0042\Roadway\CNSUM01.dgn 12/03/2001

PDA - PREDETERMINEO AMOUNT
Ⓐ - SEE SPECIAL PROVISIONS
B - TRAFFIC CONTROL PLAN
C - TRAFFIC SIGNAL PLAN
O - SIGNING ANO SIGN LIGHTING PLAN
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L - STRUCTURE PLAN BPAA 02-2416
M - STRUCTURE PLAN BPAA 02-2418
N - STRUCTURE PLAN S-24390
O - STRUCTURE PLAN BPAA 02-2420

SUMMARY OF QUANTITIES

SHEET 2 OF 6

* 0279 & 0376
** A33 & A2B

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	44 OF BS

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
△	AS-BUILT	10/1/03	SAI

QUANTITY	ITEM NO.	UNIT	OESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET
3	0910 0006	EACH	JUNCTION BOXES J.B.-2S		L, M
4	0910 0322	EACH	STEEL LIGHTING POLE WITH 6-FOOT BRACKET ARM (40-FOOT MOUNTING HEIGHT) TYPE A		E
3	0910 0326	EACH	STEEL LIGHTING POLE WITH 10-FOOT BRACKET ARM (40-FOOT MOUNTING HEIGHT) TYPE A		E
47	0910 2828	EACH	250-WATT HIGH PRESSURE SODIUM LUMINAIRE, ARM MOUNT		E
10	4910 3060	EACH	100-WATT HIGH PRESSURE SODIUM LUMINAIRE, WALL MOUNT, SPECIAL Ⓐ		E
16	4910 3063	EACH	200-WATT HIGH PRESSURE SOOIUM LUMINAIRE, WALL MOUNT, SPECIAL Ⓐ		E
10	0910 3072	EACH	100-WATT HIGH PRESSURE SODIUM LUMINAIRE, OVER-HEAO MOUNT		E
6	0910 3074	EACH	200-WATT HIGH PRESSURE SOOIUM LUMINAIRE, OVER-HEAD MOUNT		E
4260	0910 40S7	LF	AWG 10 ELECTRICAL CABLE, COPPER, 1 CONOUCTOR		E
B470	0910 4105	LF	AWG 6 OIRECT BURIAL COPPER CABLE, 1 CONOUCTOR		E
10200	0910 4106	LF	AWG 8 DIRECT BURIAL COPPER CABLE, 1 CONDUCTOR		E
30	0910 S0S2	LF	1-¼" DIRECT BURIAL CONDUIT		E
70	0910 5055	LF	2" DIRECT BURIAL CONDUIT		E
340	4910 S0S5	LF	2" DIRECT BURIAL CONOUIT, CONCRETE ENCASEO Ⓐ		E
1004	4910 S059	LF	3" OIRECT BURIAL CONDUIT, CONCRETE ENCASEO Ⓐ		C
905	0910 S172	LF	1-¼" EXPOSEO CONDUIT		E
233S	0910 S17S	LF	2" EXPOSEO CONOUIT		E, G
1710	0910 5177	LF	2-½" EXPOSED CONOUIT		G
15B5	0910 5179	LF	3" EXPOSEO CONDUIT		C, E
173	0910 5255	LF	2" CONDUIT IN STRUCTURE		L, M, N
70	0910 5302	LF	1-¼" WATERTIGHT FLEXIBLE GALVANIZEO STEEL CONOUIT		E
30	0910 5305	LF	2" WATERTIGHT FLEXIBLE GALVANIZED STEEL CONOUIT		E
S20	0910 6000	LF	TRENCH		E, G

QUANTITY	ITEM NO.	UNIT	OESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET
---	0910 7210	LS	TESTING OF ENTIRE LIGHTING SYSTEM		E
---	0920 0001	LS	SIGN LIGHTING - ENTIRE PROJECT		O
110	0931 0001	SF	POST MOUNTED SIGNS, TYPE B		O
55	4931 0001	SF	POST MOUNTED SIGNS, TYPE B, SPECIAL Ⓐ		C, O
29	0933 0001	SF	POST MOUNTED SIGNS, TYPE D		C, D
1S0	4935 0001	SF	POST MOUNTED SIGNS, TYPE F, SPECIAL Ⓐ		C, O
1SB7	0936 0001	SF	STRUCTURE MOUNTEO EXTRUDED ALUMINUM CHANNEL SIGNS		D
3B4	4936 0200	SF	STRUCTURE MOUNTEO FLAT SHEET ALUMINUM SIGNS, SPECIAL Ⓐ		C
11B	0937 0062	EACH	BARRIER MOUNT OELINEATORS - WHITE		F
143	0937 0063	EACH	BARRIER MOUNT OELINEATORS - YELLOW		F
---	4948 0051	LS	STEEL SIGN STRUCTURE - SPAN, WITH SINGLE PLANE TRUSS, SPECIAL Ⓐ		D
---	494B 0300	LS	STEEL SIGN STRUCTURE - CANTILEVER, SPECIAL Ⓐ		O
---	4948 0301	LS	STEEL SIGN STRUCTURE - CANTILEVER, SPECIAL Ⓐ		D
---	494B 0302	LS	STEEL SIGN STRUCTURE - CANTILEVER, SPECIAL Ⓐ		D
---	494B 0303	LS	STEEL SIGN STRUCTURE - CANTILEVER, SPECIAL Ⓐ		O
---	494B 0600	LS	STEEL SIGN STRUCTURE - CENTERMOUNT, SPECIAL Ⓐ		D
47	0954 0012	LF	2 INCH CONOUIT		C
277	0954 0013	LF	3 INCH CONDUIT		C
175	49S4 01S2	LF	TRENCH ANO BACKFILL, TYPE II, MODIFIED Ⓐ		C
519	0954 0154	LF	TRENCH AND BACKFILL, TYPE IV		C
6140	09S4 0202	LF	SIGNAL CABLE, 14 AWG, 5 CONDUCTOR		C
10	49S4 0301	EACH	JUNCTION BOX, JB-26, MOOIFIEO Ⓐ		C, N
1	4954 0403	EACH	ELECTRICAL SERVICE, TYPE C, SPECIAL Ⓐ		C
24	49SS 1203	EACH	VEHICULAR SIGNAL HEAD, THREE 12" SECTIONS, SPECIAL Ⓐ		C

QUANTITY	ITEM NO.	UNIT	DESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET
16	49SS 1S03	EACH	OPTICALLY PROGRAMMEO SIGNAL HEAO, THREE 12" SECTIONS, SPECIAL Ⓐ		C
21	4955 1721	EACH	PEOESTRIAN SIGNAL HEAO, TYPE B, SPECIAL Ⓐ		C
100	0956 0001	LF	OETECTOR LEAD IN CABLE		C
102	0956 0101	LF	LOOP SENSOR		C
1	09S6 0131	EACH	LOOP AMPLIFIER, 2 CHANNEL RACK MOUNTED		C
1	09S6 0141	EACH	LOOP AMPLIFIER, 2 CHANNEL RACK MOUNTEO WITH TIMER		C
3251	4962 0623	LF	12" WHITE TRAFFIC ZONE PAINT, TYPE II, MODIFIED Ⓐ		B
366B	4962 0643	LF	12" YELLOW TRAFFIC ZONE PAINT, TYPE II, MODIFIEO Ⓐ		B
4	0962 0703	EACH	WHITE TRAFFIC ZONE PAINT LEGENO, "LEFT ARROW", 12'-0" x 3'-0"		B
2	0962 0704	EACH	WHITE TRAFFIC ZONE PAINT LEGENO, "THRU ANO RIGHT ARROW", 20'-0" x 3'-7"		B
1850	0963 0001	SF	PAVEMENT MARKING REMOVAL		B, F
1	0966 0003	EACH	SNOWPLOWABLE RAISEO PAVEMENT MARKER (ONE WAY Y/B)		F
50	0966 0004	EACH	SNOWPLOWABLE RAISEO PAVEMENT MARKER (ONE WAY W/B)		F
47	1001 0000	CY	CLASS AAA CEMENT CONCRETE		L, M
514	1001 0001	CY	CLASS AA CEMENT CONCRETE		5S, L, M, N
1773	1001 0010	CY	CLASS A CEMENT CONCRETE		5S, O, L, M, N
2	1001 0500	EACH	LIGHTING POLE, ANCHORAGE		L, M
325	1001 0730	CY	SELECTEO BORROW EXCAVATION, STRUCTURE BACKFILL		L, M

QUANTITY	ITEM NO.	UNIT	DESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET
731B3	1002 0001	LB	REINFORCEMENT BARS		5S, N
172919	1002 0053	LB	REINFORCEMENT BARS, EPOXY COATED		5S, O, L, M, N
233	1003 0002	EACH	OOWEL HOLES, 6" OEPTH		L
243	5003 0002	EACH	DOWEL HOLES, 6" OEPTH, SPECIAL Ⓐ		M
S27	1003 000S	EACH	DOWEL HOLES, 12" OEPTH		L, M, N
3B7	1003 0006	EACH	OOWEL HOLES, 14" OEPTH		M
45	S003 0006	EACH	DOWEL HOLES, 14" DEPTH, SPECIAL Ⓐ		N
1702	1003 0007	EACH	OOWEL HOLES, 16" DEPTH		5S, M
1B	5003 0007	EACH	OOWEL HOLES, 16" OEPTH, SPECIAL Ⓐ		N
34	1003 000B	EACH	OOWEL HOLES, 18" DEPTH		N
B0	1003 0009	EACH	OOWEL HOLES, 20" DEPTH		N
53	1003 0011	EACH	DOWEL HOLES, 24" DEPTH		M
127	5003 0011	EACH	OOWEL HOLES, 24" DEPTH, SPECIAL Ⓐ		N
17S	1012 0001	LF	PEOESTRIAN RAILING		55
---	5018 0051	LS	REMOVAL OF PORTION OF EXISTING BRIOGE, S-24389 Ⓐ		H
---	501B 0052	LS	REMOVAL OF PORTION OF EXISTING BRIOGE, BPAA 02-2419 Ⓐ		I
---	501B 0053	LS	REMOVAL OF PORTION OF EXISTING BRIOGE, S-24391 Ⓐ		J
---	S01B 0054	LS	REMOVAL OF PORTION OF EXISTING BRIDGE, BPAA 02-2417 Ⓐ		K
---	501B 0055	LS	REMOVAL OF PORTION OF EXISTING BRIDGE, BPAA 02-2416 Ⓐ		L
---	5018 00S6	LS	REMOVAL OF PORTION OF EXISTING BRIOGE, BPAA 02-2418 Ⓐ		M
---	501B 0057	LS	REMOVAL OF PORTION OF EXISTING BRIDGE, S-24390 Ⓐ		N

RECORD DRAWINGS

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THE QUANTITIES FOR THIS AS-BUILT PLAN REVISIONS.

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES F. WEMER
ENGINEER
NO. 46931-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
SUMMARY OF QUANTITIES

ORAWN BY	JES
CHECKED BY	JFW

SCALE: AS SHOWN
SHEET NO 44 OF 85
ACCESSION NO ________
DATE : 12/04/01
CASE NO ________

n:\projects\ustation\0042\Roadway\CNSUM02.dgn 12/04/01

POA - PREDETERMINEO AMOUNT
A - SEE SPECIAL PROVISIONS
B - TRAFFIC CONTROL PLAN
C - TRAFFIC SIGNAL PLAN
O - SIGNING ANO SIGN LIGHTING PLAN
E - HIGHWAY LIGHTING PLAN
F - PAVEMENT MARKING ANO OELINEATOR PLAN
G - PITTSBURGH PARKING AUTHORITY CONOUIT PLAN
H - STRUCTURE PLAN S-24389
I - STRUCTURE PLAN 8PAA 02-2419
J - STRUCTURE PLAN S-24391
K - STRUCTURE PLAN BPAA 02-2417
L - STRUCTURE PLAN BPAA 02-2416
M - STRUCTURE PLAN 8PAA 02-2418
N - STRUCTURE PLAN S-24390
O - STRUCTURE PLAN 8PAA 02-2420

SUMMARY OF QUANTITIES

SHEET 3 OF 6

* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	45 OF 85

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

QUANTITY	ITEM NO.	UNIT	OESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET
3040	1019 0010	SY	PROTECTIVE COATING FOR REINFORCEO CONCRETE SURFACES (BOILEO LINSEEO OIL)		L, M, N
612	1019 0030	SY	PROTECTIVE COATING FOR REINFORCEO CONCRETE SURFACES (PENETRATING SEALERS)		L, M, N
6S7	1026 0015	LF	NEOPRENE STRIP SEAL DAM, (3" MOVEMENT)		L, M
24	1026 0017	LF	NEOPRENE STRIP SEAL DAM, (4" MOVEMENT)		N
7162	1050 0020	LB	FA8RICATEO STRUCTURAL STEEL		N
---	5051 0001	LS	OOWNSPOUTING, MOOIFIEO A		M
137S	10S6 0100	L8	FABRICATED STRUCTURAL STEEL		L
4276	10S6 0130	LB	FABRICATED STRUCTURAL STEEL, REPAIRS A		N
2	S0S6 0556	EACH	SCUPPER, TYPE 1, SPECIAL A		M
---	S090 010S	LS	JACKING BRIOGE SUPERSTRUCTURE, BPAA 02-2416 A		L
---	S090 0106	LS	JACKING BRIOGE SUPERSTRUCTURE, BPAA 02-2418 A		M
---	S090 0107	LS	JACKING BRIDGE SUPERSTRUCTURE, S-24390 A		N
321	1090 0600	CF	CLASS AA CEMENT CONCRETE REPAIRS A		H, J, K L, M, N
4000	S090 0600	CF	CLASS AA CEMENT CONCRETE REPAIRS, BPAA 02-2420 A		O
3200	1091 0331	LF	EPOXY INJECTION CRACK SEAL		H, I, J, K, N,
1S00	5091 0331	LF	EPOXY INJECTION CRACK SEAL, BPAA 02-2420 A		O
2000	1999 9999	HOUR	TRAINEES A		NO TA8

QUANTITY	ITEM NO.	UNIT	OESCRIPTION	OESIGN NO.	FOR TAB. SEE SHEET
EITHER ---	8030 0001	LS	8RIOGE STRUCTURE AS OESIGNEO, S-24389 A		
AND 1303070	1002 0053	LB	REINFORCEMENT BARS, EPOXY COATED		
ANO 8497	900S 1001	LF	STEEL 8EAM 8EARING PILES, HP12X84 A		
ANO 184	9005 1002	EACH	STEEL BEAM PILE TIP REINFORCEMENT, HP12X84 A		
ANO 6	900S 1003	EACH	DYNAMIC PILE LOAD TESTING A		
OR ---	8000 0001	LS	PRESTRESSEO CONCRETE 8RIOGE STRUCTURE A		
ANO (---)	9005 1011	LF	STEEL BEAM BEARING PILES, HP12X84 A	2	H
ANO (---)	900S 1012	EACH	STEEL BEAM PILE TIP REINFORCEMENT, HP12X84 A		
ANO (---)	9005 1013	EACH	OYNAMIC PILE LOAO TESTING A		
OR ---	8100 0001	LS	STEEL BRIDGE STRUCTURE A		
ANO (---)	900S 1021	LF	STEEL BEAM BEARING PILES, HP12X84 A		
AND (---)	9005 1022	EACH	STEEL BEAM PILE TIP REINFORCEMENT, HP12X84 A		
ANO (---)	9005 1023	EACH	OYNAMIC PILE LOAD TESTING A		

QUANTITY	ITEM NO.	UNIT	OESCRIPTION	OESIGN NO.	FOR TA8. SEE SHEET
EITHER ---	8030 0002	LS	8RIOGE STRUCTURE, AS DESIGNEO, BPAA 02-2419 A		
ANO 21170	1002 0001	LB	REINFORCEMENT BARS		
ANO 154178	1002 0053	LB	REINFORCEMENT BARS, EPOXY COATED		
AND 1207	9000 2810	LF	PIN PILES, 7" DIAMETER A		
ANO 1	9000 2811	EACH	STATIC PILE LOAO TEST A		
AND 3086	900S 2001	LF	STEEL 8EAM BEARING PILES, HP12X84 A		
ANO 69	900S 2002	EACH	STEEL 8EAM PILE TIP REINFORCEMENT, HP12X84 A		
AND 3	900S 2003	EACH	DYNAMIC PILE LOAD TESTING A		
OR ---	8000 0002	LS	PRESTRESSEO CONCRETE BRIDGE STRUCTURE A		
AND (---)	9000 2820	LF	PIN PILES, 7" OIAMETER A	3	I
ANO (---)	9000 2821	EACH	STATIC PILE LOAD TEST A		
ANO (---)	900S 2011	LF	STEEL 8EAM BEARING PILES, HP12X84 A		
AND (---)	900S 2012	EACH	STEEL 8EAM PILE TIP REINFORCEMENT, HP12X84 A		
ANO (---)	900S 2013	EACH	DYNAMIC PILE LOAD TESTING A		
OR ---	8100 0002	LS	STEEL BRIDGE STRUCTURE A		
AND (---)	9000 2830	LF	PIN PILES, 7" DIAMETER A		
ANO (---)	9000 2831	EACH	STATIC PILE LOAD TEST A		
ANO (---)	9005 2021	LF	STEEL BEAM BEARING PILES, HP12X84 A		
AND (---)	9005 2022	EACH	STEEL BEAM PILE TIP REINFORCEMENT, HP12X84 A		
ANO (---)	9005 2023	EACH	OYNAMIC PILE LOAD TESTING A		

QUANTITY	ITEM NO.	UNIT	OESCRIPTION	OESIGN NO.	FOR TAB. SEE SHEET
EITHER ---	8110 0003	LS	8RIOGE STRUCTURE, AS OESIGNED, S-24391 A		
AND 13S88	1002 0001	L8	REINFORCEMENT BARS		
AND 207780	1002 0053	LB	REINFORCEMENT BARS, EPOXY COATED		
AND 3811	9000 3810	LF	PIN PILES, 7" OIAMETER A		
ANO 2	9000 3811	EACH	STATIC PILE LOAD TEST A		
OR ---	8000 0003	LS	PRESTRESSED CONCRETE BRIDGE STRUCTURE A	4	J
ANO (---)	9000 3820	LF	PIN PILES, 7" OIAMETER A		
AND (---)	9000 3821	EACH	STATIC PILE LOAD TEST A		
OR ---	8100 0003	LS	STEEL BRIDGE STRUCTURE A		
AND (---)	9000 3830	LF	PIN PILES, 7" OIAMETER A		
AND (---)	9000 3831	EACH	STATIC PILE LOAD TEST A		
EITHER ---	8110 0004	LS	BRIOGE STRUCTURE, AS OESIGNEO, BPAA 02-2417 A		
AND 134744	1002 0053	LB	REINFORCEMENT BARS, EPOXY COATED		
ANO 2392	900S 4001	LF	STEEL BEAM BEARING PILES, HP12X84 A		
ANO S4	9005 4002	EACH	STEEL BEAM PILE TIP REINFORCEMENT, HP12X84 A		
AND 1	9005 4003	EACH	DYNAMIC PILE LOAD TESTING A	S	K
OR ---	8100 0004	LS	STEEL BRIDGE STRUCTURE A		
AND (---)	9005 4011	LF	STEEL BEAM BEARING PILES, HP12X84 A		
ANO (---)	900S 4012	EACH	STEEL 8EAM PILE TIP REINFORCEMENT, HP12X84 A		
ANO (---)	900S 4013	EACH	OYNAMIC PILE LOAO TESTING A		

RECORD DRAWINGS

THE QUANTITIES LISTED ON THIS SHEET MAY NOT MATCH
THE QUANTITIES FOR THIS AS-BUILT PLAN REVISIONS.

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES F. WEMER
ENGINEER
NO. 40831-E

DRAWN BY	JES
CHECKED BY	JFW

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
SUMMARY OF QUANTITIES

SCALE: AS SHOWN   SHEET NO 45 OF 85   ACCESSION NO ________
DATE : 12/04/01   CASE NO ________

POA - PREDETERMINED AMOUNT
(A) - SEE SPECIAL PROVISIONS
B - TRAFFIC CONTROL PLAN
C - TRAFFIC SIGNAL PLAN
D - SIGNING AND SIGN LIGHTING PLAN
E - HIGHWAY LIGHTING PLAN
F - PAVEMENT MARKING AND DELINEATOR PLAN
G - PITTSBURGH PARKING AUTHORITY CONDUIT PLAN

H - STRUCTURE PLAN S-24389
I - STRUCTURE PLAN BPAA 02-2419
J - STRUCTURE PLAN S-24391
K - STRUCTURE PLAN BPAA 02-2417
L - STRUCTURE PLAN BPAA 02-2416
M - STRUCTURE PLAN BPAA 02-2418
N - STRUCTURE PLAN S-24390
O - STRUCTURE PLAN BPAA 02-2420

* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	46 OF 85

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAT

SUMMARY OF QUANTITIES

SHEET 4 OF 6

QUANTITY	ITEM NO.	UNIT	DESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET
32	9000-0001	HOUR	TEMPORARY TIMING REVISIONS (A)		B
445	9000-0004	LF	PROTECTIVE FENCE (A)		B
1	9000-0005	EACH	TRAFFIC SIGNAL REVISIONS (A)		B
104	9000-0006	HOUR	MAINTENANCE OF TEMPORARILY REVISED SIGNAL TIMES (A)		B
2	9000-0010	EACH	TRAFFIC SIGNAL SUPPORT, 20'-6" LENGTH WITH 40'-0" MAST ARM (A)		C
5	9000-0011	EACH	TRAFFIC SIGNAL SUPPORT, 20'-6" PEDESTAL (A)		C
1	9000-0012	EACH	TRAFFIC SIGNAL SUPPORT, 30'-0" LENGTH WITH DUAL 27'-0" MAST ARM, 40'-0" MAST ARM (A)		C
1	9000-0013	EACH	TRAFFIC SIGNAL SUPPORT, 20'-6" LENGTH WITH DUAL 19'-0" MAST ARM, 34'-0" MAST ARM (A)		C
1	9000-0014	EACH	TRAFFIC SIGNAL SUPPORT, 20'-6" LENGTH WITH 35'-0" MAST ARM (A)		C
229	9000-0015	SF	STREET NAME SIGNS (A)		C
25	9000-0016	EACH	SIGN MOUNTING STRAIGHT BRACKET "A" (A)		C, D
22	9000-0017	EACH	SIGN MOUNTING SQUARE POLE BRACKET "C" (A)		C
6	9000-0018	EACH	SIGN MOUNTING SQUARE POLE BRACKET "D" (A)		C
5	9000-0019	EACH	CITY STANDARD CONCRETE JUNCTION BOX, JB-2 (A)		C
3	9000-0020	EACH	REPROGRAM TRAFFIC SIGNAL CONTROLLER (A)		C
1	9000-0021	EACH	TRAFFIC SIGNAL SUPPORT, 30'-0" LENGTH WITH 23'-0" MAST ARM (A)		C
2	9000-0022	EACH	TRAFFIC SIGNAL SUPPORT, 20'-6" LENGTH WITH 31'-0" MAST ARM (A)		C
2	9000-0023	EACH	TRAFFIC SIGNAL SUPPORT, 30'-0" PEDESTAL (A)		C
1	9000-0025	EACH	BASE MOUNTED CONTROLLER CABINET (A)		C
1	9000-0026	EACH	FOUNDATION FOR BASE MOUNTED CONTROLLER CABINET (A)		C
2	9000-0027	EACH	FABRICATION AND INSTALLATION OF NEW WAYFINDER SIGNS (A)		C

QUANTITY	ITEM NO.	UNIT	DESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET
1	9000-0028	EACH	TRAFFIC SIGNAL SUPPORT, 30'-0" LENGTH WITH DUAL 17'-0" MAST ARM, 28'-0" MAST ARM (A)		C
1	9000-0030	EACH	CONCRETE JUNCTION BOX, SPECIAL (A)		C
1	9000-0031	EACH	TRAFFIC SIGNAL SUPPORT, 30'-0" LENGTH WITH 34'-0" MAST ARM (A)		C
2	9000-0032	EACH	TRAFFIC SIGNAL SUPPORT, 20'-6" LENGTH WITH 18'-0" MAST ARM (A)		C
1	9000-0033	EACH	TRAFFIC SIGNAL SUPPORT, 30'-0" LENGTH WITH DUAL 31'-0" MAST ARM, 24'-0" MAST ARM (A)		C
1	9000-0034	EACH	REMOVAL AND SALVAGE OF EXISTING WAYFINDER SIGN (A)		C
4	9000-0035	EACH	REMOVAL OF EXISTING SIGNS (A)		C
3	9000-0036	EACH	TRAFFIC SIGNAL SUPPORT, 20'-6" LENGTH WITH 30'-0" MAST ARM (A)		C
1	9000-0037	EACH	TRAFFIC SIGNAL SUPPORT, 20'-6" LENGTH WITH 34'-0" MAST ARM (A)		C
1	9000-0038	EACH	TRAFFIC SIGNAL SUPPORT, 20'-6" LENGTH WITH 22'-0" MAST ARM (A)		C
300	9000-0039	LF	FIBER OPTIC CABLE, 6 FIBER SINGLEMODE (A)		C
50	9000-0040	LF	FIBER OPTIC CABLE, 12 FIBER MULTIMODE (A)		C
1	9000-0041	EACH	TRAFFIC SIGNAL SUPPORT, 20'-6" LENGTH WITH 38'-0" MAST ARM (A)		C
4	9000-0100	EACH	SURVEY MONUMENT (A)		55
---	9000-0101	LS	POINT STATE PARK ACCESS GATE (A)		55
28	9000-0103	SY	SIDEWALK RAMP (A)		55
1	9000-0104	EACH	REMOVABLE SINGLE FACE METAL BARRIER PLATE (A)		57
16	9000-0105	SY	BRICK SURFACING AND CONCRETE HEADER (A)		55
1580	9000-0106	LF	REMOVAL OF EXISTING CONCRETE BARRIER (A)		57
1	9000-0110	EACH	TRASH RACK (A)		60
205	9000-0111	LF	WATER DIVERSION DEVICE (A)		63
1	9000-0112	EACH	ABANDONMENT OF EXISTING CATCH BASIN (A)		60
---	9000-0201	LS	VIBRATION MONITORING AND CONTROL (A)		NO TAB
8600	9000-0203	CY	NON-HAZARDOUS WASTE (A)		NO TAB
500	9000-0204	HOUR	ARCHAEOLOGICAL MONITORING (A)		NO TAB

QUANTITY	ITEM NO.	UNIT	DESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET
450	9000-0300	SF	RAMP D TUNNEL SPALL REPAIR (A)		55
65	9000-0301	LF	RAMP D TUNNEL JOINT REPAIR (A)		55
1200	9000-0801	LF	EXPLORATORY DRILLING (A)		H, I, J, K, N
45	9000-0802	CY	EXPLORATORY TEST PITS (A)		H, I, J, K, N
1550	9000-0803	LF	PREDRILLING HOLES FOR PILE INSTALLATION (A)		H, I, K
---	9000-0804	POA	STRUCTURE DESIGN SERVICES DURING CONSTRUCTION (A)		NO TAB
2142	9000-0810	LF	PIN PILES, 7" DIAMETER (A)		N
2	9000-0811	EACH	STATIC PILE LOAD TEST (A)		N
---	9000-0901	LS	SIDEWALK RAMP, MARKET STREET (A)		55
---	9000-0902	LS	SIDEWALK RAMP, WOOD STREET (A)		55
1	9000-0903	EACH	PEDESTAL POLE FOUNDATION, TYPE P-1 (A)		C
1	9000-0904	EACH	PEDESTAL POLE FOUNDATION, TYPE P-2 (A)		C
1	9000-0905	EACH	PEDESTAL POLE FOUNDATION, TYPE P-3 (A)		C
1	9000-0906	EACH	TRAFFIC SIGNAL POLE FOUNDATION, TYPE A-1 (A)		C
1	9000-0907	EACH	TRAFFIC SIGNAL POLE FOUNDATION, TYPE A-2 (A)		C
1	9000-0908	EACH	TRAFFIC SIGNAL POLE FOUNDATION, TYPE A-3 (A)		C
1	9000-0909	EACH	TRAFFIC SIGNAL POLE FOUNDATION, TYPE A-4 (A)		C

QUANTITY	ITEM NO.	UNIT	DESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET
1	9000-0911	EACH	PROTECTION OF EXISTING PROPERTIES AT MARKET STREET (A)		55
1	9000-0912	EACH	PROTECTION OF EXISTING PROPERTIES AT WOOD STREET (A)		55
---	9000-0913	LS	RELOCATION OF SEWER LINES (A)		55
1	9000-0914	EACH	TRAFFIC SIGNAL POLE FOUNDATION, TYPE A-5 (A)		C
1	9000-0915	EACH	TRAFFIC SIGNAL POLE FOUNDATION, TYPE A-6 (A)		C
1	9000-0916	EACH	TRAFFIC SIGNAL POLE FOUNDATION, TYPE A-7 (A)		C
1	9000-0917	EACH	TRAFFIC SIGNAL POLE FOUNDATION, TYPE A-8 (A)		C
1	9000-5000	EACH	REPLACE FIXED BEARING WITH HIGH LOAD MULTI-ROTATIONAL BEARING, BPAA 02-2416 (A)		L
3	9000-5001	EACH	REPLACE EXPANSION BEARING WITH HIGH LOAD MULTI-ROTATIONAL BEARING, BPAA 02-2416 (A)		L
6	9000-5010	EACH	REPLACE EXPANSION BEARING WITH NEOPRENE BEARING PAD, BPAA 02-2416 (A)		L
25	9000-5050	SF	DECK SURFACING, BPAA 02-2416 (A)		L
1	9000-5100	EACH	TRAFFIC SIGN POLE ANCHORAGE, BPAA 02-2416 (A)		L
2	9000-5110	EACH	TRAFFIC SIGNAL POLE ANCHORAGE, TYPES S-1 AND S-2 (A)		L
1	9000-5120	EACH	PEDESTAL SIGNAL POLE ANCHORAGE, TYPE S-3 (A)		L
2	9000-5200	EACH	RELOCATE EXISTING RAILING POST, BPAA 02-2416 (A)		L

RECORD DRAWINGS

THE QUANTITIES LISTED ON THIS SHEET MAY NOT MATCH THE QUANTITIES FOR THIS AS-BUILT PLAN REVISIONS.

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL ENGINEER
JAMES F. WEMER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
SUMMARY OF QUANTITIES

DRAWN BY	JES	
CHECKED BY	JFW	

SCALE: AS SHOWN | SHEET NO | ACCESSION NO
DATE : 12/04/2001 | 46 OF 85 | CASE NO

n:\projects\station\0042\Roadway\CNSUM04.dgn 12/04/2001

POA - PREDETERMINED AMOUNT
Ⓐ - SEE SPECIAL PROVISIONS
B - TRAFFIC CONTROL PLAN
C - TRAFFIC SIGNAL PLAN
D - SIGNING AND SIGN LIGHTING PLAN
E - HIGHWAY LIGHTING PLAN
F - PAVEMENT MARKING AND DELINEATOR PLAN
G - PITTSBURGH PARKING AUTHORITY CONDUIT PLAN
H - STRUCTURE PLAN S-24389
I - STRUCTURE PLAN BPAA 02-2419
J - STRUCTURE PLAN S-24391
K - STRUCTURE PLAN BPAA 02-2417
L - STRUCTURE PLAN BPAA 02-2416
M - STRUCTURE PLAN BPAA 02-2418
N - STRUCTURE PLAN S-24390
O - STRUCTURE PLAN BPAA 02-2420

SUMMARY OF QUANTITIES

SHEET 5 OF 6

* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	47 OF 85

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

QUANTITY	ITEM NO. / UNIT	DESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET
1	9000 6000 EACH	REPLACE FIXED BEARING WITH HIGH LOAD MULTI-ROTATIONAL BEARING, BPAA 02-2418 Ⓐ		M
4	9000 6001 EACH	REPLACE EXPANSION BEARING WITH HIGH LOAD MULTI-ROTATIONAL BEARING, BPAA 02-2418 Ⓐ		M
11	9000 6010 EACH	REPLACE EXPANSION BEARING WITH NEOPRENE BEARING PAD, BPAA 02-2418 Ⓐ		M
157	9000 6050 SF	DECK SURFACING, BPAA 02-2418 Ⓐ		M
4444	9000 6060 SF	PAINTING OF CONCRETE SURFACES Ⓐ		M
1	9000 6100 EACH	TRAFFIC SIGN POLE ANCHORAGE, BPAA 02-2418 Ⓐ		M
2	9000 6110 EACH	TRAFFIC SIGNAL POLE ANCHORAGE, TYPES W-1 AND W-2 Ⓐ		M
2	9000 6120 EACH	PEDESTAL SIGNAL POLE ANCHORAGE, TYPE W-3 Ⓐ		M
1	9000 6130 EACH	TRAFFIC SIGNAL POLE ANCHORAGE, TYPE W-4 Ⓐ		M
1	9000 6200 EACH	RELOCATE EXISTING RAILING POST, BPAA 02-2418 Ⓐ		M
5	9000 7000 EACH	REPLACE FIXED BEARING WITH HIGH LOAD MULTI-ROTATIONAL BEARING, S-24390 Ⓐ		N
1	9000 7001 EACH	REPLACE EXPANSION BEARING WITH HIGH LOAD MULTI-ROTATIONAL BEARING, S-24390 Ⓐ		N
1	9000 7100 EACH	TRAFFIC SIGNAL POLE ANCHORAGE, TYPE SM-1 Ⓐ		N
1	9000 7101 EACH	TRAFFIC SIGNAL POLE ANCHORAGE, TYPE SM-2 Ⓐ		N
1	9000 7102 EACH	PEDESTAL SIGNAL POLE ANCHORAGE, TYPE SM-3 Ⓐ		N

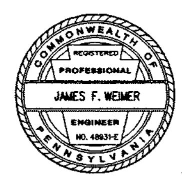
QUANTITY	ITEM NO. / UNIT	DESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET
208	9001 0000 CY	CLASS AAA CEMENT CONCRETE, LIGHTWEIGHT Ⓐ		N
146	9001 0001 CY	CLASS AA CEMENT CONCRETE, LIGHTWEIGHT Ⓐ		N
182	9014 0001 LF	STEEL BRIDGE RAILING, SPECIAL Ⓐ		L, M, N
115	9014 0002 LF	STEEL BRIDGE RAILING, MODIFIED Ⓐ		M
170	9026 0013 LF	NEOPRENE STRIP SEAL DAM, (3" MOVEMENT), SPANS N1, N2 AND RAMP B Ⓐ		N
121	9026 0023 LF	NEOPRENE STRIP SEAL DAM, (3" MOVEMENT), NORTH APPROACH ABUTMENT Ⓐ		N
---	9040 0003 LS	CONCRETE BRIDGE DECK REPAIR Ⓐ		M
---	9071 0001 LS	PAINTING EXISTING STRUCTURAL STEEL USING ORGANIC ZINC-RICH SYSTEMS, S-24389 Ⓐ		H
---	9071 0005 LS	PAINTING EXISTING STRUCTURAL STEEL USING ORGANIC ZINC-RICH SYSTEMS, BPAA 02-2416 Ⓐ		L
---	9071 0006 LS	PAINTING EXISTING STRUCTURAL STEEL USING ORGANIC ZINC-RICH SYSTEMS, BPAA 02-2418 Ⓐ		M
---	9071 0007 LS	PAINTING EXISTING STRUCTURAL STEEL USING ORGANIC ZINC-RICH SYSTEMS, S-24390 Ⓐ		N

QUANTITY	ITEM NO. / UNIT	DESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET
---	9073 0001 LS	DISPOSAL OF BRIDGE WASTE, S-24389 Ⓐ		H
---	9073 0005 LS	DISPOSAL OF BRIDGE WASTE, BPAA 02-2416 Ⓐ		L
---	9073 0006 LS	DISPOSAL OF BRIDGE WASTE, BPAA 02-2418 Ⓐ		M
---	9073 0007 LS	DISPOSAL OF BRIDGE WASTE, S-24390 Ⓐ		N
---	9075 0001 LS	CONTAINMENT, S-24389 Ⓐ		H
---	9075 0005 LS	CONTAINMENT, BPAA 02-2416 Ⓐ		L
---	9075 0006 LS	CONTAINMENT, BPAA 02-2418 Ⓐ		M
---	9075 0007 LS	CONTAINMENT, S-24390 Ⓐ		N
---	9077 0001 LS	WORKER HEALTH AND SAFETY, S-24389 Ⓐ		H
---	9077 0005 LS	WORKER HEALTH AND SAFETY, BPAA 02-2416 Ⓐ		L
---	9077 0006 LS	WORKER HEALTH AND SAFETY, BPAA 02-2418 Ⓐ		M
---	9077 0007 LS	WORKER HEALTH AND SAFETY, S-24390 Ⓐ		N

QUANTITY	ITEM NO. / UNIT	DESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET
---	9108 0001 LS	CRITICAL PATH METHOD (CPM) SCHEDULE Ⓐ		NO TAB
---	9203 0101 LS	TEMPORARY EXCAVATION SUPPORT AND PROTECTION SYSTEM, S-24389 Ⓐ		H
---	9203 0104 LS	TEMPORARY EXCAVATION SUPPORT AND PROTECTION SYSTEM, BPAA 02-2417 Ⓐ		K
---	9203 0105 LS	TEMPORARY EXCAVATION SUPPORT AND PROTECTION SYSTEM, BPAA 02-2416 Ⓐ		L
---	9203 0106 LS	TEMPORARY EXCAVATION SUPPORT AND PROTECTION SYSTEM, BPAA 02-2418 Ⓐ		M

RECORD DRAWINGS

THE QUANTITIES LISTED ON THIS SHEET MAY NOT MATCH THE QUANTITIES FOR THIS AS-BUILT PLAN REVISIONS.



D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
SUMMARY OF QUANTITIES

SCALE: AS SHOWN — SHEET NO 47 OF 85 — ACCESSION NO
DATE: 12/03/2001 — CASE NO

DRAWN BY	JES
CHECKED BY	JFW

h:\projects\station0042\Roadway\CNSUM05.dgn 12/03/2001

PDA - PREDETERMINED AMOUNT
(A) - SEE SPECIAL PROVISIONS
B - TRAFFIC CONTROL PLAN
C - TRAFFIC SIGNAL PLAN
D - SIGNING AND SIGN LIGHTING PLAN
E - HIGHWAY LIGHTING PLAN
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* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	48 OF 85

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

SUMMARY OF QUANTITIES

SHEET 6 OF 6

QUANTITY	ITEM NO.	UNIT	DESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET
6	9605 0001	EACH	TYPE C INLET, SPECIAL (A)		60
1	9605 0002	EACH	CONCRETE CAP OF EXISTING INLET (A)		60
1	9605 0003	EACH	CATCH BASIN, TYPE 11 (A)		60
186	9623 0052	LF	SINGLE FACE CONCRETE BARRIER, TYPE 1 (A)		57
25	9623 0053	LF	SINGLE FACE CONCRETE BARRIER, TYPE 2 (A)		57
7	9623 0054	LF	SINGLE FACE CONCRETE BARRIER, TYPE 3 (A)		57
324	9623 0056	LF	HT TYPE CONCRETE BARRIER (A)		57
9	9858 0001	EACH	SEDIMENT FILTER BAG (A)		63
2	9858 0002	EACH	GRAVEL FILTER FOR AREA INLET (A)		63
16	9858 0003	EACH	GRAVEL FILTER FOR CURB INLET (A)		63
579	9901 0001	SF	COVER EXISTING SIGNS (A)		B
33800	9901 0002	HOUR	OFF-DUTY UNIFORMED POLICE OFFICERS (A)		B
6	9901 0003	EACH	FLOODLIGHTS (A)		B
6	9901 0004	EACH	ARROW PANEL (A)		B

QUANTITY	ITEM NO.	UNIT	DESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET
6	9910 0321	EACH	STEEL LIGHTING POLE WITH TWIN 6-FOOT BRACKET ARMS, (40-FOOT MOUNTING HEIGHT), TYPE A (A)		E
11	9910 0323	EACH	STEEL LIGHTING POLE WITH DOUBLE BRACKET ARMS, (40-FOOT MOUNTING HEIGHT), TYPE A (A)		E
2	9910 0325	EACH	STEEL LIGHTING POLE WITH 6-FOOT AND 10-FOOT BRACKET ARMS, (40-FOOT MOUNTING HEIGHT), TYPE A (A)		E
1	9910 0327	EACH	STEEL LIGHTING POLE WITH 6-FOOT AND 15-FOOT BRACKET ARMS, (40-FOOT MOUNTING HEIGHT), TYPE A (A)		E
19	9910 0700	EACH	CAST IRON JUNCTION BOX, 10"x6"x4" (A)		E
21	9910 0701	EACH	CAST IRON JUNCTION BOX, 12"x8"x8" (A)		E, G
2	9910 0702	EACH	CITY STANDARD CONCRETE JUNCTION BOX (A)		E, G
1	9910 0703	EACH	LIGHTING POLE FOUNDATION, TYPE S (A)		E
10	9910 0704	EACH	250-WATT HIGH PRESSURE SODIUM SHOEBOX LUMINAIRE (A)		E
2	9910 0705	EACH	STEEL LIGHTING POLE, (30-FOOT MOUNTING HEIGHT) TYPE A (A)		E
4770	9910 0706	LF	1/4" NYLON PULL ROPE (A)		G
6	9910 0707	EACH	CAST IRON JUNCTION BOX, 12"x18"x12" (A)		E
80	9910 5063	LF	4" DIRECT BURIAL CONDUIT, CONCRETE ENCASED (A)		G
520	9910 5183	LF	4" EXPOSED CONDUIT (A)		G
30	9910 5309	EACH	3" WATERTIGHT FLEXIBLE GALVANIZED STEEL CONDUIT (A)		E
---	9910 7020	LS	TUNNEL LIGHTING POWER SUPPLY (A)		E
---	9910 8000	LS	TEMPORARY LIGHTING (A)		E
---	9910 8001	LS	REMOVAL OF EXISTING LIGHTING (A)		E

QUANTITY	ITEM NO.	UNIT	DESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET
---	9948 0012	LS	REMOVAL OF EXISTING SIGN STRUCTURE (A)		D
9705	9962 0001	LF	6" WHITE EPOXY RESIN PAVEMENT MARKING PAINT (A)		F
1705	9962 0002	LF	8" WHITE EPOXY RESIN PAVEMENT MARKING PAINT (A)		F
6574	9962 0003	LF	12" WHITE EPOXY RESIN PAVEMENT MARKING PAINT (A)		F
805	9962 0004	LF	24" WHITE EPOXY RESIN PAVEMENT MARKING PAINT (A)		F
7616	9962 0005	LF	4" YELLOW EPOXY RESIN PAVEMENT MARKING PAINT (A)		F
5602	9962 0006	LF	12" YELLOW EPOXY RESIN PAVEMENT MARKING PAINT (A)		F
166	9962 0007	LF	24" YELLOW EPOXY RESIN PAVEMENT MARKING PAINT (A)		F
19	9962 0008	EACH	WHITE EPOXY RESIN PAINT LEGEND, "STRAIGHT ARROW", 12'-0" x 1'-8" (A)		F
2	9962 0009	EACH	WHITE EPOXY RESIN PAINT LEGEND, "STRAIGHT ARROW", 12'-0" x 2'-5", MODIFIED (A)		F
6	9962 0010	EACH	WHITE EPOXY RESIN PAINT LEGEND, "RIGHT ARROW", 12'-0" x 3'-0" (A)		F
2	9962 0011	EACH	WHITE EPOXY RESIN PAINT LEGEND, "RIGHT ARROW", 12'-0" x 6'-0", MODIFIED (A)		F
4	9962 0012	EACH	WHITE EPOXY RESIN PAINT LEGEND, "LEFT ARROW", 12'-0" x 3'-0" (A)		F
4	9962 0013	EACH	WHITE EPOXY RESIN PAINT LEGEND, "LEFT ARROW", 20'-0" x 6'-0", SPECIAL (A)		F
2	9962 0014	EACH	WHITE EPOXY RESIN PAINT LEGEND, "THRU AND RIGHT ARROW", 20'-0" x 3'-7" (A)		F
6	9962 0015	EACH	WHITE EPOXY RESIN PAINT LEGEND, "THRU AND LEFT ARROW", 20'-0" x 3'-7" (A)		F
12	9962 0016	EACH	WHITE EPOXY RESIN PAINT LEGEND, "ONLY", 8'-0" (A)		F
1	9962 0017	EACH	WHITE EPOXY RESIN PAINT LEGEND, "RIGHT ARROW", 20'-0" x 6'-0", SPECIAL (A)		F
10	9999 0001	EACH	PORTABLE THREE LINE CHANGEABLE MESSAGE SIGN (A)		B

QUANTITY	ITEM NO.	UNIT	DESCRIPTION	DESIGN NO.	FOR TAB. SEE SHEET

RECORD DRAWINGS

THE QUANTITIES LISTED ON THIS SHEET MAY NOT MATCH THE QUANTITIES FOR THIS AS-BUILT PLAN REVISIONS.

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES F. WEMER
ENGINEER
NO. 40931-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
SUMMARY OF QUANTITIES

DRAWN BY	JES
CHECKED BY	JFW

SCALE: AS SHOWN
SHEET NO 48 OF 85
ACCESSION NO
DATE : 12/03/2001
CASE NO

h:\projects\station\0042\Roadway\CNSUM06.dgn 12/03/2001

* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	49 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

TABULATION OF ROADWAY QUANTITIES

SHEET 1 OF 5

⊕ SEE SUMMARY SHEET FOR ITEM DESCRIPTION

CLASS 1 EXCAVATION 0203 0001 CY	CLASS 1 EXCAVATION, SPECIAL 4203 0001 CY	CLASS 1A EXCAVATION 0203 0003 CY	CLASS 1B EXCAVATION 0203 0004 CY		SELECTED BORROW EXCAVATION, COARSE AGGREGATE, NO. 57 0205 0285 CY	EMBANKMENT (FOR INFORMATION ONLY) CY	SUPERPAVE ASPHALT MIXTURE DESIGN, HMA BASE COURSE, PG 64-22, 3 TO <10 MILLION ESALS, 25.0 MM MIX 0309 0537 TON	SUBBASE 4" DEPTH (NO. 2A) 0350 0104 SY	SUBBASE 6" DEPTH (NO. 2A) 0350 0106 SY	SUBBASE 8" DEPTH (NO. 2A) 0350 0108 SY	DESIGN NO. 1 ⊕ SY	SUPERPAVE ASPHALT MIXTURE DESIGN, HMA WEARING COURSE, PG 64-22, 3 TO <10 MILLION ESALS, 12.5 MM MIX, 1½" DEPTH, SRL-H 0409 0542 SY	SUPERPAVE ASPHALT MIXTURE DESIGN, HMA BINDER COURSE, PG 64-22, 3 TO <10 MILLION ESALS, 19.0 MM MIX, 2" DEPTH 0409 6540 SY	BITUMINOUS WEARING COURSE, FJ-1, 1" DEPTH, SRL-L 0422 0230 SY	BITUMINOUS TACK COAT 0460 0001 SY	MILLING OF BITUMINOUS PAVEMENT SURFACE, 3½" DEPTH 0491 0067 SY	PLAIN CEMENT CONCRETE PAVEMENT, 4" DEPTH 0501 0020 SY	PLAIN CEMENT CONCRETE PAVEMENT, 9" DEPTH 0501 0030 SY		REINFORCED CEMENT CONCRETE PAVEMENT, 8" DEPTH 0501 0200 SY	REINFORCED CEMENT CONCRETE PAVEMENT, 11" DEPTH 0501 0203 SY	CONCRETE PAVEMENT CORES, 11" DEPTH 0501 0814 EACH		PROTECTIVE COATING FOR CEMENT CONCRETE PAVEMENTS AND SHOULDERS 0503 0001 SY	PAVEMENT RELIEF JOINT 0504 0001 LF	BRIDGE APPROACH SLAB 0505 0001 SY	BRIDGE APPROACH SLAB, MODIFIED 4505 0001 SY		CAST-IN-PLACE CEMENT CONCRETE SLOPE WALL 0673 0100 SY	SIDE	REMARKS	STATION	ROUTE
																															ITEM NUMBER UNIT		
			60																												EARTHWORK	1093+79.29 TO 1094+33.00	SR 8041 (RAMP F)
																180																1093+79.29 TO 1094+33.00	
									18									18													PAVEMENT WIDENING	1093+79.29 TO 1094+33.00	
												610	610		610																	1093+79.29 TO 1094+51.93	
									103								103							103								1093+79.29 TO 1095+89.93	
									428									428														1094+33.00 TO 1095+51.93	
566						96																									EARTHWORK	1094+33.00 TO 1095+92.00	
																								49	34						PAVEMENT RELIEF JOINT	1095+51.93 TO 1095+64.93	
									95															95		95					BRIDGE APPROACH SLAB	1095+64.93 TO 1095+89.93	
566	---	---	60		---	96	---	---	644	---	---	610	610	---	610	180	103	446		---	---	---		247	34	95	---		---		SHEET 1 TOTALS		

RECORD DRAWINGS

THE QUANTITIES LISTED ON THIS SHEET MAY NOT MATCH THE QUANTITIES FOR THIS AS-BUILT PLAN REVISIONS.

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEMER ENGINEER NO. 48931-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
TABULATION OF QUANTITIES

DRAWN BY	JES
CHECKED BY	JFW

SCALE: AS SHOWN | SHEET NO 49 OF 85 | ACCESSION NO ______
DATE: 12/01/2001 | CASE NO ______

* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	50 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

TABULATION OF ROADWAY QUANTITIES

SHEET 2 OF 5

⊕ SEE SUMMARY SHEET FOR ITEM DESCRIPTION

0203 0001 CY CLASS 1 EXCAVATION	4203 0001 CY CLASS 1 EXCAVATION, SPECIAL	0203 0003 CY CLASS 1A EXCAVATION	0203 0004 CY CLASS 1B EXCAVATION		0205 0285 CY SELECTED BORROW EXCAVATION, COARSE AGGREGATE, NO. 57	CY EMBANKMENT (FOR INFORMATION ONLY)	0309 0537 TON SUPERPAVE ASPHALT MIXTURE DESIGN, HMA BASE COURSE, PG 64-22, 3 TO <10 MILLION ESALS, 25.0 MM MIX	0350 0104 SY SUBBASE 4" DEPTH (NO. 2A)	0350 0106 SY SUBBASE 6" DEPTH (NO. 2A)	0350 0108 SY SUBBASE 8" DEPTH (NO. 2A)	⊕ SY DESIGN NO. 1	0409 0542 SY SUPERPAVE ASPHALT MIXTURE DESIGN, HMA WEARING COURSE, PG 64-22, 3 TO <10 MILLION ESALS, 12.5 MM MIX, 1½" DEPTH, SRL-H	0409 6540 SY SUPERPAVE ASPHALT MIXTURE DESIGN, HMA BINDER COURSE, PG 64-22, 3 TO <10 MILLION ESALS, 19.0 MM MIX, 2" DEPTH	0422 0230 SY BITUMINOUS WEARING COURSE, FJ-1, 1" DEPTH, SRL-L	0460 0001 SY BITUMINOUS TACK COAT	0491 0067 SY MILLING OF BITUMINOUS PAVEMENT SURFACE, 3½" DEPTH	0501 0020 SY PLAIN CEMENT CONCRETE PAVEMENT, 4" DEPTH	0501 0030 SY PLAIN CEMENT CONCRETE PAVEMENT, 9" DEPTH		0501 0200 SY REINFORCED CEMENT CONCRETE PAVEMENT, 8" DEPTH	0501 0203 SY REINFORCED CEMENT CONCRETE PAVEMENT, 11" DEPTH	0501 0814 EACH CONCRETE PAVEMENT CORES, 11" DEPTH		0503 0001 SY PROTECTIVE COATING FOR CEMENT CONCRETE PAVEMENTS AND SHOULDERS	0504 0001 LF PAVEMENT RELIEF JOINT	0505 0001 SY BRIDGE APPROACH SLAB	4505 0001 SY BRIDGE APPROACH SLAB, MODIFIED		0673 0100 SY CAST-IN-PLACE CEMENT CONCRETE SLAB SLOPE WALL	SIDE	REMARKS (ITEM NUMBER / UNIT)	STATION	ROUTE
			1496						2755											2755				2755							PIER PAVEMENT REPLACEMENT	1095+89.93 TO 1114+87.70	SR 8041 (RAMP F)/ FORT PITT BLVD EB
			32						56											56				56							WHARF ISLAND REMOVAL/REPLACEMENT	1101+23.00 TO 1101+40.00	
												35	35			35														LT	MON WHARF RAMP	1108+69.00 TO 1110+25.00	
												3	3					3												LT	MON WHARF RAMP	1106+78.00	
																																	SR 8095 (RELOCATED RAMP D)
304																															EARTHWORK PAVEMENT REMOVAL	1112+00.00 TO 1114+87.70	
			266																													1114+70.00 TO 1115+99.70	
3077						990																									EARTHWORK	1114+87.70 TO 1125+25.00	
										80														80		80					BRIDGE APPROACH SLAB	1114+86.95 TO 1115+11.95	
								133			133										133			133								1115+24.95 TO 1115+69.70	
									172											172				172						RT		1114+87.70 TO 1115+99.70	
3381	---		1794		---	990	---	133	2983	80	133	38	38	---	---	35	---	3		2983	133	---		3196	---	80	---		---		SHEET 2 TOTALS		

RECORD DRAWINGS

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COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEMER ENGINEER NO. 46931-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
TABULATION OF QUANTITIES

SCALE: AS SHOWN SHEET NO ACCESSION NO
DATE : 12/03/2001 50 OF 85 CASE NO

DRAWN BY	JES
CHECKED BY	JFW

h:\projects\ustation\0042\Roadway\cnr tb02.dgn 12/03/2001

* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	51 OF 85

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

TABULATION OF ROADWAY QUANTITIES

SHEET 3 OF 5

⊕ SEE SUMMARY SHEET FOR ITEM DESCRIPTION

CLASS 1 EXCAVATION 0203 0001 CY	CLASS 1 EXCAVATION, SPECIAL 4203 0001 CY	CLASS 1A EXCAVATION 0203 0003 CY	CLASS 1B EXCAVATION 0203 0004 CY		SELECTED BORROW EXCAVATION, COARSE AGGREGATE, NO. 57 0205 0285 CY	EMBANKMENT (FOR INFORMATION ONLY) CY	SUPERPAVE ASPHALT MIXTURE DESIGN, HMA BASE COURSE, PG 64-22, 3 TO (10 MILLION ESALS, 25.0 MM MIX 0309 0537 TON	SUBBASE 4" DEPTH (NO. 2A) 0350 0104 SY	SUBBASE 6" DEPTH (NO. 2A) 0350 0106 SY	SUBBASE 8" DEPTH (NO. 2A) 0350 0108 SY	DESIGN NO. 1 ⊕ SY	SUPERPAVE ASPHALT MIXTURE DESIGN, HMA WEARING COURSE, PG 64-22, 3 TO (10 MILLION ESALS, 12.5 MM MIX, 1 1/2" DEPTH, SRL-H 0409 0542 SY	SUPERPAVE ASPHALT MIXTURE DESIGN, HMA BINDER COURSE, PG 64-22, 3 TO (10 MILLION ESALS, 19.0 MM MIX, 2" DEPTH 0409 6540 SY	BITUMINOUS WEARING COURSE, FJ-1, 1" DEPTH, SRL-L 0422 0230 SY	BITUMINOUS TACK COAT 0460 0001 SY	MILLING OF BITUMINOUS PAVEMENT SURFACE, 3 1/2" DEPTH 0491 0067 SY	PLAIN CEMENT CONCRETE PAVEMENT, 4" DEPTH 0501 0020 SY	PLAIN CEMENT CONCRETE PAVEMENT, 9" DEPTH 0501 0030 SY		REINFORCED CEMENT CONCRETE PAVEMENT, 8" DEPTH 0501 0200 SY	REINFORCED CEMENT CONCRETE PAVEMENT, 11" DEPTH 0501 0203 SY	CONCRETE PAVEMENT CORES, 11" DEPTH 0501 0814 EACH		PROTECTIVE COATING FOR CEMENT CONCRETE PAVEMENTS AND SHOULDERS 0503 0001 SY	PAVEMENT RELIEF JOINT 0504 0001 LF	BRIDGE APPROACH SLAB 0505 0001 SY	BRIDGE APPROACH SLAB, MODIFIED 4505 0001 SY		CAST-IN-PLACE CEMENT CONCRETE SLAB SLOPE WALL 0673 0100 SY	SIDE	REMARKS (ITEM NUMBER UNIT)	STATION	ROUTE
																																	SR 8095 (RELOCATED RAMP D)
																								187					187	LT		1114+87.70 TO 1115+50.00	
																								41	28						PAVEMENT RELIEF JOINT	1115+11.95 TO 1115+24.95	
																								474					474	LT		1115+50.00 TO 1118+25.00	
								87			87										87			87								1115+69.70 TO 1115+99.70	
								80		74														74		74					BRIDGE APPROACH SLAB	1115+99.70 TO 1116+25.10	
					442												221							221						RT		1115+99.70 TO 1119+94.18	
867	745																														STRUCTURAL SLAB EARTHWORK	1116+24.35 TO 1120+79	
		150																													AS DIRECTED	1116+75.00 TO 1121+14.14	
							752				1376			1376							1376			1376								1116+28.60 TO 1121+09.89	
					58												80							80						LT		1118+25.00 TO 1119+94.18	
										70														70		70					BRIDGE APPROACH SLAB	1121+13.39 TO 1121+38.39	
867	745	150	---		500	---	752	167	---	144	1463	---	---	1376	---	---	301	---		---	1463	---		2610	28	144	---		661		SHEET 3 TOTALS		

RECORD DRAWINGS

THE QUANTITIES LISTED ON THIS SHEET MAY NOT MATCH
THE QUANTITIES FOR THIS AS-BUILT PLAN REVISIONS.

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES F. WEBER
ENGINEER
NO. 48631-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
TABULATION OF QUANTITIES

DRAWN BY	JES
CHECKED BY	JFW

SCALE: AS SHOWN SHEET NO ACCESSION NO ________
DATE : 12/01/2001 51 OF 85 CASE NO ________

H:\projects\ustation\0042\Roadway\cnr1b03.dgn 12/01/2001

* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-D	ALLEGHENY	*	**	52 OF 85

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

TABULATION OF ROADWAY QUANTITIES

SHEET 4 OF 5

⊕ SEE SUMMARY SHEET FOR ITEM DESCRIPTION

CLASS 1 EXCAVATION 0203 0001 CY	CLASS 1 EXCAVATION, SPECIAL 4203 0001 CY	CLASS 1A EXCAVATION 0203 0003 CY	CLASS 1B EXCAVATION 0203 0004 CY		SELECTED BORROW EXCAVATION, COARSE AGGREGATE, NO. 57 0205 0285 CY	EMBANKMENT (FOR INFORMATION ONLY) CY	SUPERPAVE ASPHALT MIXTURE DESIGN, HMA BASE COURSE, PG 64-22, 3 TO <10 MILLION ESALS, 25.0 MM MIX 0309 0537 TON	SUBBASE 4" DEPTH (NO. 2A) 0350 0104 SY	SUBBASE 6" DEPTH (NO. 2A) 0350 0106 SY	SUBBASE 8" DEPTH (NO. 2A) 0350 0108 SY	DESIGN NO. 1 ⊕ SY	SUPERPAVE ASPHALT MIXTURE DESIGN, HMA WEARING COURSE, PG 64-22, 3 TO <10 MILLION ESALS, 12.5 MM MIX, 1½" DEPTH, SRL-H 0409 0542 SY	SUPERPAVE ASPHALT MIXTURE DESIGN, HMA BINDER COURSE, PG 64-22, 3 TO <10 MILLION ESALS, 19.0 MM MIX, 2" DEPTH 0409 6540 SY	BITUMINOUS WEARING COURSE, FJ-1, 1" DEPTH, SRL-L 0422 0230 SY	BITUMINOUS TACK COAT 0460 0001 SY	MILLING OF BITUMINOUS PAVEMENT SURFACE, 3½" DEPTH 0491 0067 SY	PLAIN CEMENT CONCRETE PAVEMENT, 4" DEPTH 0501 0020 SY	PLAIN CEMENT CONCRETE PAVEMENT, 9" DEPTH 0501 0030 SY		REINFORCED CEMENT CONCRETE PAVEMENT, 8" DEPTH 0501 0200 SY	REINFORCED CEMENT CONCRETE PAVEMENT, 11" DEPTH 0501 0203 SY	CONCRETE PAVEMENT CORES, 11" DEPTH 0501 0814 EACH		PROTECTIVE COATING FOR CEMENT CONCRETE PAVEMENTS AND SHOULDERS 0503 0001 SY	PAVEMENT RELIEF JOINT 0504 0001 LF	BRIDGE APPROACH SLAB 0505 0001 SY	BRIDGE APPROACH SLAB, MODIFIED 4505 0001 SY		CAST-IN-PLACE CEMENT CONCRETE SLAB SLOPE WALL 0673 0100 SY	SIDE	REMARKS (ITEM NUMBER / UNIT)	STATION	ROUTE
																																	SR 8095 (RELOCATED RAMP D)
																								38	26						PAVEMENT RELIEF JOINT	1121+38.39 TO 1121+51.39	
								1072			1072										1072			1072								1121+51.39 TO 1125+25.00	
					8																									RT		1121+54.60 TO 1122+00.00	
					47																									LT		1122+54.60 TO 1123+25.00	
									69								69							69						RT		1123+50.00 TO 1125+25.00	
																																	RELOCATED FT PITT BLVD
			25																												REMOVE EXISTING BRIDGE APPROACH SLAB	10+92.50 TO 11+16.00	
																																	RAMP B
338						4																									EARTHWORK	649+26.41 TO 651+50.00	
										64														64		64					BRIDGE APPROACH SLAB	649+26.37 TO 649+51.37	
								160									160							160						LT		649+26.41 TO 651+48.00	
																								36	23						PAVEMENT RELIEF JOINT	649+51.37 TO 649+64.37	
								337			337										337			337								649+64.37 TO 651+48.00	
																																AS DIRECTED	ENTIRE PROJECT
338	---	---	25		55	4	---	1569	69	64	1409	---	---	---	---	---	229	---		---	1409	---		1776	49	64	---		---		SHEET 4 TOTALS		

RECORD DRAWINGS

THE QUANTITIES LISTED ON THIS SHEET MAY NOT MATCH
THE QUANTITIES FOR THIS AS-BUILT PLAN REVISIONS.

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES F. WEBER
ENGINEER
NO. 48931-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
TABULATION OF QUANTITIES

DRAWN BY	JES
CHECKED BY	JFW

SCALE: AS SHOWN SHEET NO ACCESSION NO

DATE : 12/01/2001 52 OF 85 CASE NO

n:\projects\ustation\0042\Roadway\cnrtb04.dgn 12/01/2001

* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	53 OF 85

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

TABULATION OF ROADWAY QUANTITIES

SHEET 5 OF 5

⊕ SEE SUMMARY SHEET FOR ITEM DESCRIPTION

CLASS 1 EXCAVATION (0203 0001 CY)	CLASS 1 EXCAVATION, SPECIAL (4203 0001 CY)	CLASS 1A EXCAVATION (0203 0003 CY)	CLASS 1B EXCAVATION (0203 0004 CY)		SELECTED BORROW EXCAVATION, COARSE AGGREGATE- NO. 57 (0205 0285 CY)	EMBANKMENT (FOR INFORMATION ONLY) (CY)	SUPERPAVE ASPHALT MIXTURE DESIGN, HMA BASE COURSE, PG 64-22, 3 TO <10 MILLION ESALS, 25.0 MM MIX (0309 0537 TON)	SUBBASE 4" DEPTH (NO. 2A) (0350 0104 SY)	SUBBASE 6" DEPTH (NO. 2A) (0350 0106 SY)	SUBBASE 8" DEPTH (NO. 2A) (0350 0108 SY)	DESIGN NO. 1 (⊕ SY)	SUPERPAVE ASPHALT MIXTURE DESIGN, HMA WEARING COURSE, PG 64-22, 3 TO <10 MILLION ESALS, 12.5 MM MIX, 1½" DEPTH, SRL-H (0409 0542 SY)	SUPERPAVE ASPHALT MIXTURE DESIGN, HMA BINDER COURSE, PG 64-22, 3 TO <10 MILLION ESALS, 19.0 MM MIX, 2" DEPTH (0409 6540 SY)	BITUMINOUS WEARING COURSE, FJ-1, 1" DEPTH, SRL-L (0422 0230 SY)	BITUMINOUS TACK COAT (0460 0001 SY)	MILLING OF BITUMINOUS PAVEMENT SURFACE, 3½" DEPTH (0491 0067 SY)	PLAIN CEMENT CONCRETE PAVEMENT, 4" DEPTH (0501 0020 SY)	PLAIN CEMENT CONCRETE PAVEMENT, 9" DEPTH (0501 0030 SY)		REINFORCED CEMENT CONCRETE PAVEMENT, 8" DEPTH (0501 0200 SY)	REINFORCED CEMENT CONCRETE PAVEMENT, 11" DEPTH (0501 0203 SY)	CONCRETE PAVEMENT CORES, 11" DEPTH (0501 0814 EACH)		PROTECTIVE COATING FOR CEMENT CONCRETE PAVEMENTS AND SHOULDERS (0503 0001 SY)	PAVEMENT RELIEF JOINT (0504 0001 LF)	BRIDGE APPROACH SLAB (0505 0001 SY)	BRIDGE APPROACH SLAB, MODIFIED (4505 0001 SY)		CAST-IN-PLACE CEMENT CONCRETE SLAB SLOPE WALL (0673 0100 SY)	SIDE	REMARKS (ITEM NUMBER UNIT)	STATION	ROUTE
			93						152			167	152		152			45									107				PAVEMENT REPLACEMENT AT STANWIX STREET	9+86.60 TO 9+96.60	STANWIX STREET
			125						205			225	204		204			45									160				PAVEMENT REPLACEMENT AT MARKET STREET	10+91.83 TO 11+01.83	MARKET STREET
									37			37	37		37			37														11+19.00 TO 11+30.00	
			118						193			212	192		192			45									148				PAVEMENT REPLACEMENT AT WOOD STREET	54+85.17 TO 54+95.17	WOOD STREET
			43						93			101	92		92			23									70				PAVEMENT REPLACEMENT AT SMITHFIELD STREET	69+86.06 TO 69+96.06	SMITHFIELD STREET
																						2									AS DIRECTED	ENTIRE PROJECT	
---	---	---	379		---	---	---	---	680	---	---	742	678	---	678	---	---	195		---	---	2		---	---	---	485		---		SHEET 5 TOTALS		
338	---	---	25		55	4	---	1569	69	64	1409	---	---	---	---	---	229	---		---	1409	---		1776	49	64	---		---		SHEET 4 TOTALS		
867	745	150	---		500	---	752	167	---	144	1463	---	---	1376	---	---	301	---		---	1463	---		2610	28	144	---		661		SHEET 3 TOTALS		
3381	---	---	1794		---	990	---	133	2983	80	133	38	38	---	---	35	---	3		2983	133	---		3196	---	80	---		---		SHEET 2 TOTALS		
566	---	---	60		---	96	---	---	693	---	---	610	610	---	610	180	103	446		---	---	---		247	34	95	---		---		SHEET 1 TOTALS		
5152	745	150	2258		555	1090	752	1869	4425	288	3005	1390	1326	1376	1288	215	633	644		2983	3005	2		7829	111	383	485		661		TOTALS		

THE QUANTITIES LISTED ON THIS SHEET MAY NOT MATCH THE QUANTITIES FOR THIS AS-BUILT PLAN REVISIONS.

RECORD DRAWINGS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEBER ENGINEER NO. 46931-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
TABULATION OF QUANTITIES

DRAWN BY	JES
CHECKED BY	JFW

SCALE: AS SHOWN　SHEET NO 53 OF 85　ACCESSION NO
DATE : 12/03/2001　CASE NO

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* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	54 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

TABULATION OF MISCELLANEOUS QUANTITIES

SHEET 1 OF 2

	PERMANENT IMPACT ATTENUATING DEVICE, TYPE V (STANDARD), TEST LEVEL 2 0619 0600 EACH	PERMANENT IMPACT ATTENUATING DEVICE, TYPE V (STANDARD), TEST LEVEL 3 0619 0610 EACH	RIGHT-OF-WAY FENCE, TYPE 1, MODIFIED 4624 0001 LF	PLAIN CEMENT CONCRETE CURB 0630 0001 LF	PLAIN CEMENT CONCRETE CURB, MODIFIED 4630 0001 LF	PLAIN CEMENT CONCRETE CURB, INCLUDING REMOVAL OF EXISTING CURB, MODIFIED 4630 0010 LF	PLAIN CONCRETE MOUNTABLE CURB, TYPE A, MODIFIED 4633 0200 LF	CEMENT CONCRETE SIDEWALK 0676 0001 SY		CLASS AA CEMENT CONCRETE 1001 0001 CY	CLASS A CEMENT CONCRETE 1001 0010 CY	REINFORCEMENT BARS 1002 0001 LB	REINFORCEMENT BARS, EPOXY COATED 1002 0053 LB	DOWEL HOLES, 16" DEPTH 1003 0007 EACH	PEDESTRIAN RAILING 1012 0001 LF		SURVEY MONUMENT 9000 0100 EACH	POINT STATE PARK ACCESS GATE 9000 0101 LS		SIDEWALK RAMP 9000 0103 SY	BRICK SURFACING AND CONCRETE HEADER 9000 0105 SY	RAMP D TUNNEL SPALL REPAIR 9000 0300 SF	RAMP D TUNNEL JOINT REPAIR 9000 0301 LF	SIDEWALK RAMP, MARKET STREET 9000 0901 LS	SIDEWALK RAMP, WOOD STREET 9000 0902 LS		PROTECTION OF EXISTING PROPERTIES AT MARKET STREET 9000 0911 EACH	PROTECTION OF EXISTING PROPERTIES AT WOOD STREET 9000 0912 EACH	RELOCATION OF SEWER LINES 9000 0913 LS	SIDE	REMARKS (ITEM NUMBER UNIT)	STATION	ROUTE
																		1													POINT STATE PARK GATE		SR 8041 (RAMP F)
			6																											RT		1094+14.00	
					304																										EXISTING PIER LOCATIONS	1095+89.93 TO 1114+86.95	
					612																										PROPOSED PIER LOCATIONS	1095+89.93 TO 1114+86.95	
						48																									REPAIR EXISTING CURB AT PIERS	1095+89.93 TO 1114+86.95	
		1																														1097+02.70 TO 1097+25.12	
																																	SR 8095 (RELOCATED RAMP D)
										244	1373	67440	42800																		STRUCTURAL SLAB AND BARRIER WALLS	1116+24.35 TO 1121+14.14	
										12			3400																		BARRIER WALLS	1121+14.14 TO 1121+54.60	
														1700								450	65								TUNNEL	1119+94.18 TO 1121+54.60	
							175																									1123+50.00 TO 1125+25.00	
	1																															11+00.00 TO 11+13.42	RELOCATED FORT PITT BLVD
								309																						RT		649+26.37 TO 651+49.50	RAMP B
															175															RT		649+26.37 TO 651+00.00	
	1	1	6	---	916	48	175	309		256	1373	67440	46200	1700	175		---	1		---	---	450	65	---	---		---	---	---		SHEET 1 TOTALS		

RECORD DRAWINGS

THE QUANTITIES LISTED ON THIS SHEET MAY NOT MATCH
THE QUANTITIES FOR THIS AS-BUILT PLAN REVISIONS.

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL ENGINEER
JAMES F. WEIMER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
TABULATION OF QUANTITIES

DRAWN BY	JES
CHECKED BY	JFW

SCALE: AS SHOWN SHEET NO 54 OF 85 ACCESSION NO

DATE : 12/01/2001 CASE NO

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* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	55 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

TABULATION OF MISCELLANEOUS QUANTITIES

SHEET 2 OF 2

	PERMANENT IMPACT ATTENUATING DEVICE, TYPE V (STANDARD), TEST LEVEL 2 0619 0600 EACH	PERMANENT IMPACT ATTENUATING DEVICE, TYPE V (STANDARD), TEST LEVEL 3 0619 0610 EACH	RIGHT-OF-WAY FENCE, TYPE 1, MODIFIED 4624 0001 LF	PLAIN CEMENT CONCRETE CURB 0630 0001 LF	PLAIN CEMENT CONCRETE CURB, MODIFIED 4630 0001 LF	PLAIN CEMENT CONCRETE CURB, INCLUDING REMOVAL OF EXISTING CURB, MODIFIED 4630 0010 LF	PLAIN CONCRETE MOUNTABLE CURB, TYPE A, MODIFIED 4633 0200 LF	CEMENT CONCRETE SIDEWALK 0676 0001 SY		CLASS AA CEMENT CONCRETE 1001 0001 CY	CLASS A CEMENT CONCRETE 1001 0010 CY	REINFORCEMENT BARS 1002 0001 LB	REINFORCEMENT BARS, EPOXY COATED 1002 0053 LB	DOWEL HOLES, 16" DEPTH 1003 0007 EACH	PEDESTRIAN RAILING 1012 0001 LF		SURVEY MONUMENT 9000 0100 EACH	POINT STATE PARK ACCESS GATE 9000 0101 LS		SIDEWALK RAMP 9000 0103 SY	BRICK SURFACING AND CONCRETE HEADER 9000 0105 SY	RAMP D TUNNEL SPALL REPAIR 9000 0300 SF	RAMP D TUNNEL JOINT REPAIR 9000 0301 LF	SIDEWALK RAMP, MARKET STREET 9000 0901 LS	SIDEWALK RAMP, WOOD STREET 9000 0902 LS		PROTECTION OF EXISTING PROPERTIES AT MARKET STREET 9000 0911 EACH	PROTECTION OF EXISTING PROPERTIES AT WOOD STREET 9000 0912 EACH	RELOCATION OF SEWER LINES 9000 0913 LS	SIDE	REMARKS (ITEM NUMBER UNIT)	STATION	ROUTE
				60																										LT		650+95.00 TO 651+48.00	RAMP B
				80																										RT		650+95.00 TO 651+58.00	
																				10										RT		651+49.50	
																					16									RT		651+48.00 TO 651+58.00	
								11																						LT		10+20.00	STANWIX STREET
								4																						RT	173' RT	10+21.00	
								9																						RT		10+35.00	
								4																						RT	185' RT	11+23.00	MARKET STREET
				14																18										RT		11+25.00	
				52																				1			1			LT		11+25.00	
				18																					1			1	1	LT		55+20.00	WOOD STREET
								8																						RT		55+20.00	
								4																						RT	155' RT	55+20.00	
								4																						LT	20.5' LT	56+12.00	
								4																						LT		70+20.00	SMITHFIELD STREET
																	4														AS DIRECTED	ENTIRE PROJECT	
	---	---	---	224	---	---	---	48		---	---	---	---	---	---		4	---		28	16	---	---	1	1		1	1	1		SHEET 2 TOTALS		
	1	1	6	---	916	48	175	309		256	1373	67440	42800	1700	175		---	1		---	---	450	65	---	---		---	---	---		SHEET 1 TOTALS		
	1	1	6	224	916	48	175	357		256	1373	67440	42800	1700	175		4	1		28	16	450	65	1	1		1	1	1		TOTALS		

RECORD DRAWINGS

THE QUANTITIES LISTED ON THIS SHEET MAY NOT MATCH THE QUANTITIES FOR THIS AS-BUILT PLAN REVISIONS.

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES F. WEIMER
ENGINEER
NO. 40631-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
TABULATION OF QUANTITIES

SCALE: AS SHOWN | SHEET NO 55 OF 85 | ACCESSION NO ______
DATE : 12/01/2001 | CASE NO ______

DRAWN BY	JES
CHECKED BY	JFW

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* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	56 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

TABULATION OF CONCRETE BARRIER QUANTITIES

SHEET 1 OF 2

0623 0051 LF SINGLE FACE CONCRETE BARRIER, 41" HEIGHT	0623 0110 EACH END TRANSITION	4623 0110 EACH END TRANSITION, MODIFIED	9000 0104 EACH REMOVABLE SINGLE FACE METAL BARRIER PLATE	9000 0106 LF REMOVAL OF EXISTING CONCRETE BARRIER	9623 0052 LF SINGLE FACE CONCRETE BARRIER, TYPE 1	9623 0053 LF SINGLE FACE CONCRETE BARRIER, TYPE 2	9623 0054 LF SINGLE FACE CONCRETE BARRIER, TYPE 3	9623 0056 LF HT TYPE CONCRETE BARRIER	SIDE	REMARKS (ITEM NUMBER UNIT)	STATION	ROUTE
												SR 8041 (RAMP F)
				215					RT		1093+79.29 TO 1095+89.93	
					186				RT		1093+79.29 TO 1095+64.93	
				50					LT		1095+44.68 TO 1095+89.93	
							7		LT		1095+44.68 TO 1095+51.68	
						25			RT		1095+64.93 TO 1095+89.93	
												SR 8095 (RELOCATED RAMP O)
138									LT		1114+87.70 TO 1116+25.10	
26									RT		1115+99.70 TO 1116+25.10	
				685					LT/RT		1116+50.00 TO 1123+35.00	
				630					LT		1118+25.00 TO 1124+50.00	
			1						LT		1119+33.50 TO 1119+37.75	
189	1								RT		1121+54.60 TO 1123+50.00	
353	1	---	1	1580	186	25	7	---		SHEET 1 TOTALS		

RECORD DRAWINGS

THE QUANTITIES LISTED ON THIS SHEET MAY NOT MATCH THE QUANTITIES FOR THIS AS-BUILT PLAN REVISIONS.

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEIMER ENGINEER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
TABULATION OF QUANTITIES

SCALE: AS SHOWN | SHEET NO 56 OF 85 | ACCESSION NO
DATE : 12/01/2001 | CASE NO

DRAWN BY	JES
CHECKED BY	JFW

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* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	57 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

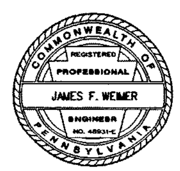
TABULATION OF CONCRETE BARRIER QUANTITIES

SHEET 2 OF 2

SINGLE FACE CONCRETE BARRIER, 41" HEIGHT	END TRANSITION	END TRANSITION, MODIFIED	REMOVABLE SINGLE FACE METAL BARRIER PLATE	REMOVAL OF EXISTING CONCRETE BARRIER	SINGLE FACE CONCRETE BARRIER, TYPE 1	SINGLE FACE CONCRETE BARRIER, TYPE 2	SINGLE FACE CONCRETE BARRIER, TYPE 3	HT TYPE CONCRETE BARRIER	SIDE	REMARKS	STATION	ROUTE
0623 0051 LF	0623 0110 EACH	4623 0110 EACH	9000 0104 EACH	9000 0106 LF	9623 0052 LF	9623 0053 LF	9623 0054 LF	9623 0056 LF		ITEM NUMBER / UNIT		
296									LT		1121+54.60 TO 1124+50.00	SR 8095 (RELOCATED RAMP D)
												RAMP B
		1						162	RT		649+26.37 TO 650+95.00	
		1						162	LT		649+26.37 TO 650+95.00	
296	---	2	---	---	---	---	---	324		SHEET 2 TOTALS		
353	1	---	1	1580	186	25	7	---		SHEET 1 TOTALS		
649	1	2	1	1580	186	25	7	324		TOTALS		

RECORD DRAWINGS

THE QUANTITIES LISTED ON THIS SHEET MAY NOT MATCH THE QUANTITIES FOR THIS AS-BUILT PLAN REVISIONS.



D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
TABULATION OF QUANTITIES

SCALE: AS SHOWN | SHEET NO | ACCESSION NO
DATE : 12/01/2001 | 57 OF 85 | CASE NO

DRAWN BY	JES
CHECKED BY	JFW

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DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	58 OF 85
CITY OF PITTSBURGH				

* 0279 & 0376
** A33 & A28

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

TABULATION OF DRAINAGE QUANTITIES

SHEET 1 OF 3

CLASS 2 EXCAVATION 0204 0001 CY	CLASS 4 EXCAVATION 0204 0150 CY	GEOTEXTILE, CLASS 1 0212 0001 LF		18" DUCTILE IRON PIPE, MODIFIED 4601 0763 LF	CLASS A CEMENT CONCRETE FOR MISCELLANEOUS DRAINAGE 0601 5430 CY	18" REINFORCED CONCRETE PIPE, TYPE A, 15'-2' FILL, MODIFIED 4601 7014 LF	18" REINFORCED CONCRETE PIPE, TYPE A, (OPEN JOINT) 15'-2' FILL, MODIFIED 4604 7014 LF		TYPE M INLET 0605 2060 EACH	TYPE M INLET, TYPE 1 BOX 0605 2066 EACH	MANHOLE FRAME AND COVER 0605 2401 SET	GRADE ADJUSTMENT OF EXISTING INLETS 0606 0050 SET	GRADE ADJUSTMENT OF EXISTING MANHOLES 0606 0150 SET		REBUILT TYPE 4' INLET 0607 0009 VF	REBUILT TYPE 4' SPECIAL INLET 0607 0010 VF	REBUILT MANHOLE 0607 0200 VF		6" PAVEMENT BASE DRAIN 0610 7002 LF	ADDITIONAL COARSE AGGREGATE FOR EXTRA DEPTH PAVEMENT BASE DRAIN 0610 7400 CY		8" SUBSURFACE DRAIN OUTLETS 0615 0023 LF		TRASH RACK 9000 0110 EACH	ABANDONMENT OF EXISTING CATCH BASIN 9000 0112 EACH	TYPE C INLET, SPECIAL 9605 0001 EACH	CONCRETE CAP OF EXISTING INLET 9605 0002 EACH	CATCH BASIN, TYPE 11 9605 0003 EACH	EMBANKMENT (FOR INFORMATION ONLY) CY	SIDE	REMARKS (ITEM NUMBER / UNIT)	STATION	ROUTE
													1																	LT	LOWER MANHOLE A-MH1	1094+71.35	S.R. 8041 (RAMP F)
												1																		LT	GRADE ADJUST INLET A-2	1094+85.3	
							55		1																				21	LT	INLET A-2 TO INLET A-3	1094+85.30 TO 1095+44.00	
						28			1																				8	RT/LT	INLET A-4 TO INLET A-3	1095+44.00 TO 1095+44.00	
		19																	19											LT	PAV'T BASE DRAIN OUTLET TO INLET	1095+45.89 TO 1095+64.93	
		19																	19											RT	PAV'T BASE DRAIN OUTLET TO INLET	1095+45.89 TO 1095+64.93	
						22										8.4								1					18	LT	G-1 TO INLET EX G-2 REBUILD	1114+83.95 TO 1115+11.81	S.R. 8095 (RELOCATED RAMP D)
32					1																								32	RT	REMOVE EX. M.H., 6' OF EX. PIPES, AND PLUG EX. PIPES	1115+80.72	
2					1																								2	LT	REMOVE EX. INLET AND PLUG EX. PIPE	1116+12.00	
				49																						1				LT	INLET B-2 TO INLET B-1	1116+31.74 TO 1116+85.00	
14					1																								14	RT	REMOVE EX. M.H., EX. PIPE, AND PLUG EX. PIPES	1116+60.00 TO 1117+12.00	
				25																						1				LT	INLET B-1 TO INLET C-1	1116+85.00 TO 1117+14.51	
																						16								LT	8" SUBSURFACE DRAIN OUTLET FROM STRUCT. 2% MIN SLOPE TO B-1	1116+85.00 TO 1116+95.00	
					1	4																				1				LT	INLET C-1 CONNECT TO EX.	1117+14.51	
				20																						1				RT/LT	INLET C-2 TO INLET C-1	1117+14.51	
				48																						1				RT	INLET C-2 TO INLET C-3	1117+14.51 TO 1117+65.93	
				30																						1				RT	INLET C-3 TO INLET C-4	1117+65.93 TO 1118+00.00	
48	---	38		172	4	54	55		2	---	---	1	1		---	8.4	---		38	---		16		1	---	6	---	---	95		SHEET 1 TOTALS		

RECORD DRAWINGS

THE QUANTITIES LISTED ON THIS SHEET MAY NOT MATCH THE QUANTITIES FOR THIS AS-BUILT PLAN REVISIONS.

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES F. WEBER
ENGINEER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
TABULATION OF QUANTITES

SCALE: AS SHOWN
SHEET NO 58 OF 85
ACCESSION NO
DATE : 12/01/2001
CASE NO

DRAWN BY	JES
CHECKED BY	JFW

n:\projects\ustation\0042\Roadway\cndtb01.dgn 12/01/2001

* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	59 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

TABULATION OF DRAINAGE QUANTITIES

SHEET 2 OF 3

CLASS 2 EXCAVATION 0204 0001 CY	CLASS 4 EXCAVATION 0204 0150 CY	GEOTEXTILE, CLASS 1 0212 0001 LF		18" DUCTILE IRON PIPE, MODIFIED 4601 0763 LF	CLASS A CEMENT CONCRETE FOR MISCELLANEOUS DRAINAGE 0601 5430 CY	18" REINFORCED CONCRETE PIPE, TYPE A, 15'-2' FILL, MODIFIED 4601 7014 LF	18" REINFORCED CONCRETE PIPE, TYPE A, (OPEN JOINT) 15'-2' FILL, MODIFIED 4604 7014 LF		TYPE M INLET 0605 2060 EACH	TYPE M INLET, TYPE 1 BOX 0605 2066 EACH	MANHOLE FRAME AND COVER 0605 2401 SET	GRADE ADJUSTMENT OF EXISTING INLETS 0606 0050 SET	GRADE ADJUSTMENT OF EXISTING MANHOLES 0606 0150 SET		REBUILT TYPE 4' INLET 0607 0009 VF	REBUILT TYPE 4' SPECIAL INLET 0607 0010 VF	REBUILT MANHOLE 0607 0200 VF		6" PAVEMENT BASE DRAIN 0610 7002 LF	ADDITIONAL COARSE AGGREGATE FOR EXTRA DEPTH PAVEMENT BASE DRAIN 0610 7400 CY		8" SUBSURFACE DRAIN OUTLETS 0615 0023 LF		TRASH RACK 9000 0110	ABANDONMENT OF EXISTING CATCH BASIN 9000 0112 EACH	TYPE C INLET, SPECIAL 9605 0001 EACH	CONCRETE CAP OF EXISTING INLET 9605 0002 EACH	CATCH BASIN, TYPE 11 9605 0003 EACH	EMBANKMENT (FOR INFORMATION ONLY) CY	SIDE	REMARKS (ITEM NUMBER / UNIT)	STATION	ROUTE
																5.5											1			LT	REMOVE GRATE, LOWER AND CAP EX. INLET H-MH1	1119+23.84	S.R. 8095 (RELOCATED RAMP D)
	1	7																	7	1										RT	PAV'T BASE DRAIN EXTRA DEPTH	1121+54.60 TO 1121+61.46	
	1	10																	10	1										LT	PAV'T BASE DRAIN EXTRA DEPTH	1121+54.60 TO 1121+63.82	
						25			1																				10	RT/LT	INLET D-4 TO INLET D-3	1121+63.34 TO 1121+65.70	
		185																	185											RT	PAV'T BASE DRAIN	1121+65.22 TO 1124+50	
11																													11	RT/LT	REMOVE EX. INLET AND PIPE	1121+63.34 TO 1121+65.70	
							20			1																			8	LT	INLET D-3 TO INLET D-2	1121+65.70 TO 1121+88.82	
9																													9	LT	REMOVE EX. INLET AND PIPE	1121+65.70 TO 1121+88.82	
						9				1																			9	RT	INLET D-5 TO INLET D-4	1121+63.34 TO 1121+70.00	
							39								1.2														41	LT	INLET D-2 TO INLET D-1	1121+88.82 TO 1122+32.15	
52																													52	LT	REMOVE EX. PIPE	1121+88.82 TO 1122+48.51	
						15				1	1						7.0												54	LT	INLET D-1 TO REBUILT D-MH1	1122+32.15 TO 1122+48.51	
		85																	85											LT	PAV'T BASE DRAIN	1122+34.04 TO 1123+18.12	
															1															LT	INLET E-1	1123+20.00	
		80																	80											LT	PAV'T BASE DRAIN	1123+21.89 TO 1124+01.69	
72	2	367		---	---	49	59		1	3	1	---	---		2.2	5.5	7.0		367	2		---		---	---	---	1	---	194		SHEET 2 TOTALS		

RECORD DRAWINGS

THE QUANTITIES LISTED ON THIS SHEET MAY NOT MATCH
THE QUANTITIES FOR THIS AS-BUILT PLAN REVISIONS.

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEMER ENGINEER NO. 48931-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
TABULATION OF QUANTITES

SCALE: AS SHOWN | SHEET NO 59 OF 85 | ACCESSION NO
DATE : 12/01/2001 | CASE NO

DRAWN BY	JES
CHECKED BY	JFW

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* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	60 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

TABULATION OF DRAINAGE QUANTITIES

SHEET 3 OF 3

CLASS 2 EXCAVATION 0204 0001 CY	CLASS 4 EXCAVATION 0204 0150 CY	GEOTEXTILE, CLASS 1 0212 0001 LF		18" DUCTILE IRON PIPE, MODIFIED 4601 0763 LF	CLASS A CEMENT CONCRETE FOR MISCELLANEOUS DRAINAGE 0601 5430 CY	18" REINFORCED CONCRETE PIPE, TYPE A, 15'-2' FILL, MODIFIED 4601 7014 LF	18" REINFORCED CONCRETE PIPE, TYPE A, (OPEN JOINT) 15'-2' FILL, MODIFIED 4604 7014 LF		TYPE M INLET 0605 2060 EACH	TYPE M INLET, TYPE 1 BOX 0605 2066 EACH	MANHOLE FRAME AND COVER 0605 2401 SET	GRADE ADJUSTMENT OF EXISTING INLETS 0606 0050 SET	GRADE ADJUSTMENT OF EXISTING MANHOLES 0606 0150 SET		REBUILT TYPE 4' INLET 0607 0009 VF	REBUILT TYPE 4' SPECIAL INLET 0607 0010 VF	REBUILT MANHOLE 0607 0200 VF		6" PAVEMENT BASE DRAIN 0610 7002 LF	ADDITIONAL COARSE AGGREGATE FOR EXTRA DEPTH PAVEMENT BASE DRAIN 0610 7400 CY		8" SUBSURFACE DRAIN OUTLETS 0615 0023 LF		TRASH RACK 9000 0110 EACH	ABANDONMENT OF EXISTING CATCH BASIN 9000 0112 EACH	TYPE C INLET, SPECIAL 9605 0001 EACH	CONCRETE CAP OF EXISTING INLET 9605 0002 EACH	CATCH BASIN, TYPE 11 9605 0003 EACH	EMBANKMENT (FOR INFORMATION ONLY) CY	SIDE	REMARKS (ITEM NUMBER UNIT)	STATION	ROUTE
												1																		LT	INLET E-2	1124+03.57	S.R. 8095 (RELOCATED RAMP D)
		120																	120											LT	PAV'T BASE DRAIN	1124+05.46 TO 1125+25.00	
	11	45																	45	11										LT	PAV'T BASE DRAIN EXTRA DEPTH	649+26.41 TO 649+71.11	RAMP B
						17				1																			15	LT	INLET F-1 TO F-MH1	649+72.99 TO 649+91.00	
		43																	43											LT	PAV'T BASE DRAIN	649+74.88 TO 650+18.12	
											1						7.3												26	LT	REBUILD F-MH1	649+91.00	
						25				1																			8	LT	INLET F-2 TO F-MH1	649+91.00 TO 650+20.00	
		125																	125											LT	PAV'T BASE DRAIN	650+21.88 TO 651+46.00	
						7																						1	4	RT	PROP. CATCH BASIN TO EX. MH	11+18.43 TO 11+24.22	MARKET ST.
																									1					RT	REMOVAL OF EX. INLET, PIPE AND PLUG PIPE	11+24.22	
---	11	333		---	---	49	---		---	2	1	1	---		---	---	7.3		333	11		---		---	1	---	---	1	53		SHEET 3 TOTALS		
72	2	367		---	---	49	59		1	3	1	---	---		2.2	5.5	7.0		367	2		---		---	---	---	1	---	194		SHEET 2 TOTALS		
48	---	38		172	4	54	55		2	---	---	1	1		---	8.4	---		38	---		16		1	---	6	---	---	95		SHEET 1 TOTALS		
118	13	738		172	4	152	114		3	5	2	2	1		2.2	13.9	14.3		738	13		16		1	1	6	1	1	342		TOTALS		

RECORD DRAWINGS

THE QUANTITIES LISTED ON THIS SHEET MAY NOT MATCH
THE QUANTITIES FOR THIS AS-BUILT PLAN REVISIONS.

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES F. WEINER
ENGINEER
NO. 48631-E

DRAWN BY	JES
CHECKED BY	JFW

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
TABULATION OF QUANTITES

SCALE: AS SHOWN | SHEET NO | ACCESSION NO ____
DATE : 12/01/2001 | 60 OF 85 | CASE NO ____

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* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	61 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

TABULATION OF SEEDING AND EROSION AND SEDIMENT POLLUTION CONTROL QUANTITIES

SHEET 1 OF 3

CLASS 1, EXCAVATION 0203 0001 CY	GEOTEXTILE, CLASS 4, TYPE A 0212 0014 SY	NO. 1 COARSE AGGREGATE 0703 0020 CY	NO. 67 COARSE AGGREGATE 0703 0023 CY	SEEDING AND SOIL SUPPLEMENTS - FORMULA D, INCLUDES HAY MULCH 4804 0013 LB	SEEDING - FORMULA E, INCLUDES HAY MULCH 4804 0014 LB	ROCK, CLASS R-4 0850 0032 CY	WATER DIVERSION DEVICE 9000 0111 LF	SEDIMENT FILTER BAG 9858 0001 EACH	GRAVEL FILTER FOR AREA INLET 9858 0002 EACH	GRAVEL FILTER FOR CURB INLET 9858 0003 EACH	SIDE	REMARKS (ITEM NUMBER UNIT)	STATION	ROUTE
										1	LT	EXISTING INLET	1093+74.41	S.R. 8041 (RAMP F)
										1	LT	EXISTING INLET	1094+85.30	
			23			115					RT	MODIFIED ROCK BARRIER	1095+50 TO 1116+06.00	
								1			RT		1096+68.33	
								1			RT		1099+03.31	
								1			RT		1101+73.26	
								1			RT		1104+25.46	
							205				RT		1104+81.66 TO 1106+42.80	
	26	126									RT	ROCK CONSTRUCTION ENTRANCE	1107+00.00	
								1			RT		1107+49.64	
								1			RT		1110+25.35	
								1			RT		1112+50.51	S.R. 8095 (RELOCATED RAMP D)
---	26	126	23	---	---	115	205	7	---	2		SHEET 1 TOTALS		

RECORD DRAWINGS

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THE QUANTITIES FOR THIS AS-BUILT PLAN REVISIONS.

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEINER ENGINEER NO. 49931-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
TABULATION OF QUANTITIES

SCALE: AS SHOWN — SHEET NO 61 OF 85 — ACCESSION NO ________
DATE: 12/01/2001 — CASE NO ________

DRAWN BY RAK
CHECKED BY JFW

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* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	62 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

TABULATION OF SEEDING AND EROSION AND SEDIMENT POLLUTION CONTROL QUANTITIES

SHEET 2 OF 3

		CLASS 1. EXCAVATION 0203 0001 CY	GEOTEXTILE, CLASS 4, TYPE A 0212 0014 SY		NO. 1 COARSE AGGREGATE 0703 0020 CY	NO. 67 COARSE AGGREGATE 0703 0023 CY			SEEDING AND SOIL SUPPLEMENTS - FORMULA O, INCLUDES HAY MULCH 4804 0013 LB	SEEDING - FORMULA E, INCLUDES HAY MULCH 4804 0014 LB		ROCK, CLASS R-4 0850 0032 CY	WATER DIVERSION DEVICE 9000 0111 LF			SEDIMENT FILTER BAG 9858 0001 EACH	GRAVEL FILTER FOR AREA INLET 9858 0002 EACH			GRAVEL FILTER FOR CURB INLET 9858 0003 EACH										SIDE	REMARKS (ITEM NUMBER / UNIT)	STATION	ROUTE
																1														RT		1114+51.50	S.R. 8095 (RELOCATED RAMP D)
																				1										LT	EXISTING INLET	1115+14.51	
																1														RT		1115+99.57	
																				1										LT	EXISTING INLET	1116+06.41	
																				1										LT	EXISTING INLET	1117+14.51	
																				1										LT	PROPOSED INLET	1117+14.51	
																				1										RT	PROPOSED INLET	1117+65.93	
																				1										RT	EXISTING INLET	1118+10.39	
																	1													LT	EXISTING INLET	1119+23.87	
									59																					RT		1121+57.00 TO 1123+50.00	
																				1										RT	EXISTING INLET	1121+63.34	
																				1										RT	PROPOSED INLET	1121+63.34	
																				1										LT	EXISTING INLET	1121+65.70	
		---	---		---	---			59	---		---	---			2	1			9											SHEET 2 TOTALS		

RECORD DRAWINGS

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL ENGINEER
JAMES F. WEMER

THE QUANTITIES LISTED ON THIS SHEET MAY NOT MATCH
THE QUANTITIES FOR THIS AS-BUILT PLAN REVISIONS.

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
TABULATION OF QUANTITIES

SCALE: AS SHOWN | SHEET NO | ACCESSION NO ____
DATE: 12/01/2001 | 62 OF 85 | CASE NO ____

DRAWN BY	RAK
CHECKED BY	JFW

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* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	63 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

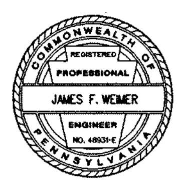
TABULATION OF SEEDING AND EROSION AND SEDIMENT POLLUTION CONTROL QUANTITIES

SHEET 3 OF 3

CLASS 1, EXCAVATION 0203 0001 CY	GEOTEXTILE, CLASS 4, TYPE A 0212 0014 SY	NO. 1 COARSE AGGREGATE 0703 0020 CY	NO. 67 COARSE AGGREGATE 0703 0023 CY	SEEDING AND SOIL SUPPLEMENTS - FORMULA D, INCLUDES HAY MULCH 4804 0013 LB	SEEDING - FORMULA E, INCLUDES HAY MULCH 4804 0014 LB	ROCK, CLASS R-4 0850 0032 CY	WATER DIVERSION DEVICE 9000 0111 LF	SEDIMENT FILTER BAG 9858 0001 EACH	GRAVEL FILTER FOR AREA INLET 9858 0002 EACH	GRAVEL FILTER FOR CURB INLET 9858 0003 EACH	SIDE	REMARKS (ITEM NUMBER UNIT)	STATION	ROUTE
										1	LT	PROPOSED INLET	1121+65.70	S.R. 8095 (RELOCATED RAMP D)
									1		RT	PROPOSED INLET	1121+70.00	
										1	LT	EXISTNG INLET	1121+88.94	
										1	LT	PROPOSED INLET	1122+32.15	
										1	LT	EXISTING INLET	1123+20.00	
26	26	126									CL	ROCK CONSTRUCTION ENTRANCE	1125+25.00	
										1	LT	EXISTING INLET	649+91.93	RAMP B
					26							AS DIRECTED		ENTIRE PROJECT
26	26	126	---	---	26	---	---	---	1	5		SHEET 3 TOTALS		
---	---	---	---	59	---	---	---	2	1	9		SHEET 2 TOTALS		
---	26	126	23	---	---	115	205	7	---	2		SHEET 1 TOTALS		
26	52	252	23	59	26	115	205	9	2	16		TOTAL		

RECORD DRAWINGS

THE QUANTITIES LISTED ON THIS SHEET MAY NOT MATCH THE QUANTITIES FOR THE AS-BUILT PLAN REVISIONS.



D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
TABULATION OF QUANTITIES

SCALE: AS SHOWN | SHEET NO 63 OF 85 | ACCESSION NO
DATE : 12/01/2001 | CASE NO

DRAWN BY	RAK
CHECKED BY	JFW

h:\projects\ustation\0042\Roadway\cnect01.dgn 12/01/2001

* 0279 & 0376
** A33 & A28

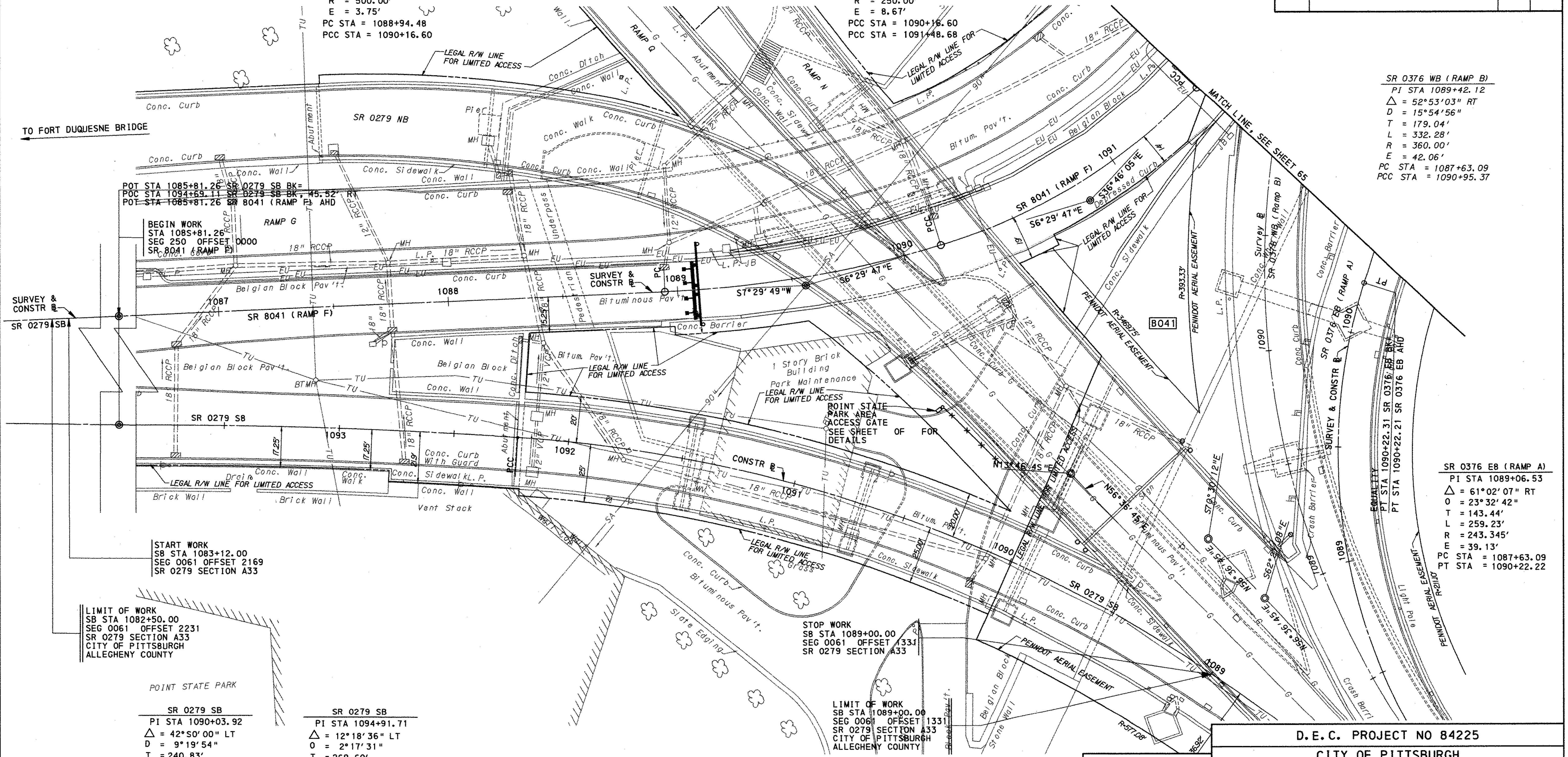
CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
△	AS-BUILT	10/1/03	SAI

SR 8041 (RAMP F)
PI STA 1089+55.85
△ = 13° 59' 36" LT
D = 11° 27' 33"
T = 61.36'
L = 122.12'
R = 500.00'
E = 3.75'
PC STA = 1088+94.48
PCC STA = 1090+16.60

SR 8041 (RAMP F)
PI STA 1090+84.22
△ = 30° 16' 18" LT
D = 22° 55' 09"
T = 67.62'
L = 132.08'
R = 250.00'
E = 8.67'
PCC STA = 1090+16.60
PCC STA = 1091+48.68

SR 0376 WB (RAMP B)
PI STA 1089+42.12
△ = 52°53'03" RT
D = 15°54'56"
T = 179.04'
L = 332.28'
R = 360.00'
E = 42.06'
PC STA = 1087+63.09
PCC STA = 1090+95.37



SR 0376 EB (RAMP A)
PI STA 1089+06.53
△ = 61°02'07" RT
D = 23°32'42"
T = 143.44'
L = 259.23'
R = 243.345'
E = 39.13'
PC STA = 1087+63.09
PT STA = 1090+22.22

SR 0279 SB
PI STA 1090+03.92
△ = 42°50'00" LT
D = 9°19'54"
T = 240.83'
L = 459.01'
R = 614.00'
E = 45.54'
PC STA = 1087+63.09
PCC STA = 1092+22.10

SR 0279 SB
PI STA 1094+91.71
△ = 12°18'36" LT
D = 2°17'31"
T = 269.60'
L = 537.12'
R = 2500.00'
E = 14.50'
PCC STA = 1092+22.10
PT STA = 1097+59.22

FOR TEMPORARY CONSTRUCTION EASEMENTS SEE SR 0279 SECTION A58 AND SR 0376 SECTION A25 RIGHT OF WAY PLAN.

RECORD DRAWINGS

SCALE
20 FEET 0 20 FEET

SURVEY BOOK NO 47067

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEIMER ENGINEER NO. 48931-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

DRAWN BY	JES
CHECKED BY	JFW

SCALE: AS SHOWN | SHEET NO | ACCESSION NO
DATE: 11/30/2001 | 64 OF 85 | CASE NO

h:\projects\ustation\0042\Roadway\cnpln01.dgn 11/30/2001

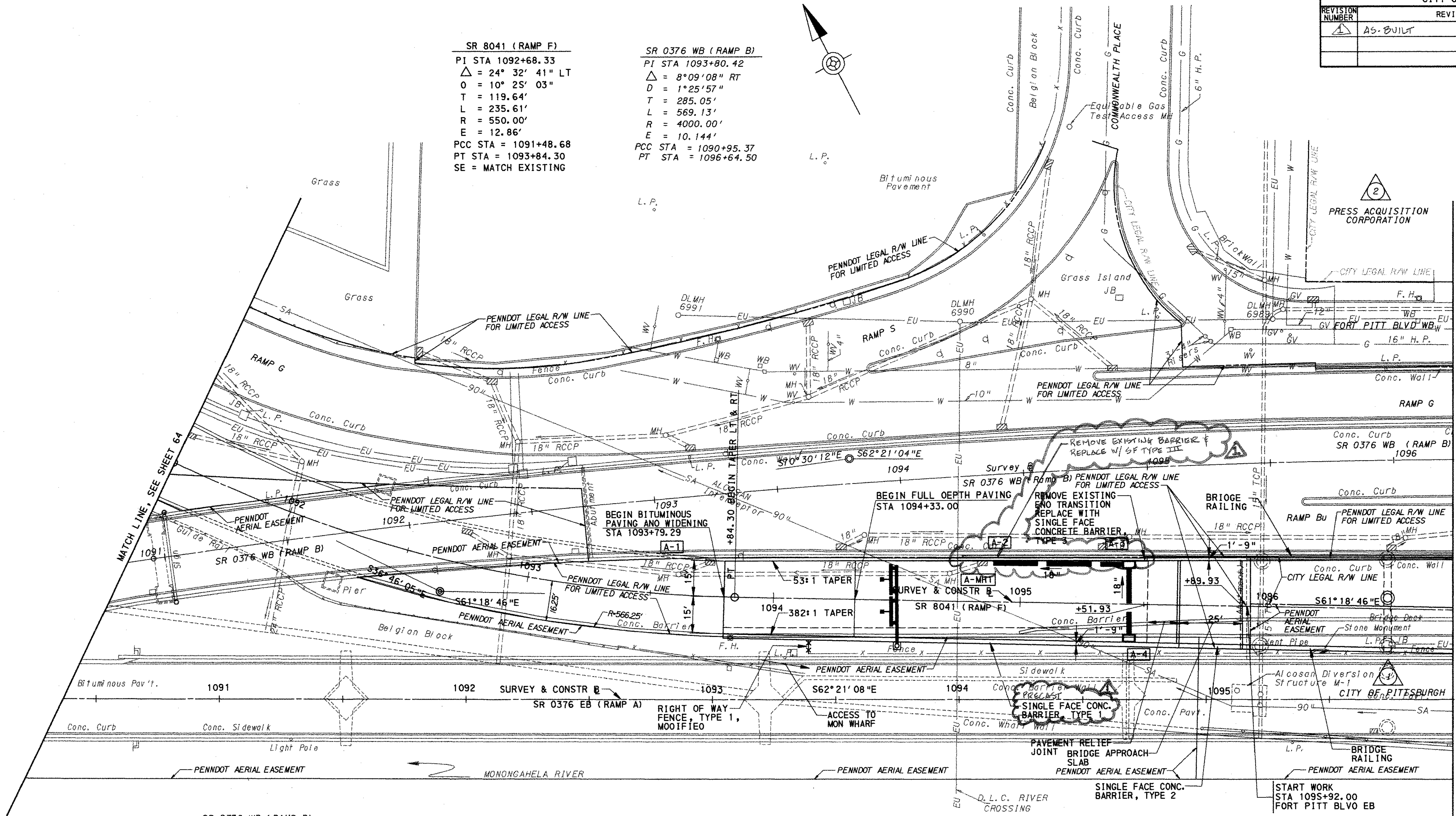
* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	65 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

SR 8041 (RAMP F)
PI STA 1092+68.33
Δ = 24° 32' 41" LT
D = 10° 25' 03"
T = 119.64'
L = 235.61'
R = 550.00'
E = 12.86'
PCC STA = 1091+48.68
PT STA = 1093+84.30
SE = MATCH EXISTING

SR 0376 WB (RAMP B)
PI STA 1093+80.42
Δ = 8°09'08" RT
D = 1°25'57"
T = 285.05'
L = 569.13'
R = 4000.00'
E = 10.144'
PCC STA = 1090+95.37
PT STA = 1096+64.50



SR 0376 WB (RAMP B)
PI STA 1089+42.12
Δ = 52°53'03" RT
D = 15°54'56"
T = 179.04'
L = 332.28'
R = 360.00'
E = 42.06'
PC STA = 1087+63.09
PCC STA = 1090+95.37

FORT PITT BLVD EB / INTERSTATE CONNECTOR STRUCTURE DATA

	EXISTING	PROPOSED
STATION	1105+37.62	1105+37.62
TYPE	GIRDER, FLOORBEAM, STRINGER	PRESTRESSED CONCRETE I-BEAM, MULTIGIRDER
SPAN	2022'-10" (1-32' SPAN 36-54' SPANS, 1-46'-10" SPAN)	1892'-6" (34-54' SPANS 1-56'-6" SPAN)
CLEARANCE	14'-3"±	15'-4"±
ROADWAY WIDTH	30'±	36'-10"
SKEW	90°	90°
STRUCTURE NO	N/A	S-24389 RECOMMENDED

NOTES: SEE STRUCTURE PLAN S-24389 FOR RECONSTRUCTION DETAILS FOR FORT PITT BLVD EB / INTERSTATE CONNECTOR

SEE MISCELLANEOUS DETAILS FOR CONCRETE CURB CONSTRUCTION AROUND EXISTING AND PROPOSED PIERS.

FOR TEMPORARY CONSTRUCTION EASEMENTS SEE SR 0279 SECTION A58 AND SR 0376 SECTION A28 RIGHT OF WAY PLAN.

SCALE
20 FEET 0 20 FEET

SURVEY BOOK NO 47067

RECORD DRAWINGS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER JAMES F. WEMER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

SCALE: AS SHOWN	SHEET NO	ACCESSION NO
DATE: 12/01/2001	65 OF 85	CASE NO

DRAWN BY	JES
CHECKED BY	JFW

FOR PROFILE, SEE SHEET 76

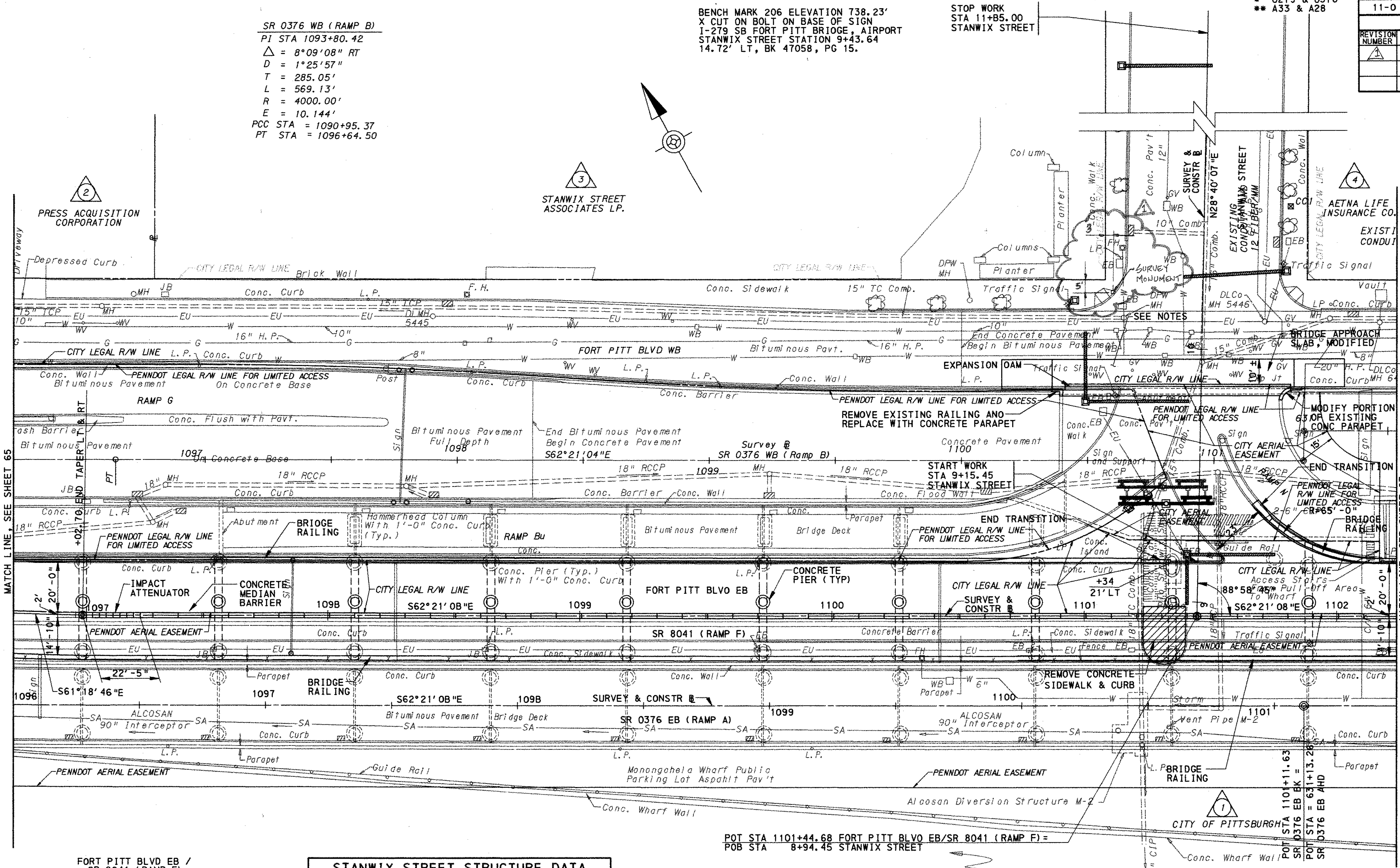
h:\projects\ustation\0042\Roadway\cnpln02.dgn 12/01/2001

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	66 OF 85

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

* 0279 & 0376
** A33 & A28



FORT PITT BLVD EB / SR 8041 (RAMP F)

PI STA 1097+02.70
△ = 1° 02' 22" LT
NO CURVE

STANWIX STREET STRUCTURE DATA		
	EXISTING	PROPOSED
STATION	9+49.70	9+49.70
TYPE	MULTI-GIRDER FLOORBEAM SYSTEM	MULTI-GIRDER FLOORBEAM SYSTEM
SPAN	66'-2"	66'-2"
CLEARANCE	14'-3½"	14'-3½"
ROADWAY WIDTH	VARIES	VARIES
SKEW	90°	90°
STRUCTURE NO	N/A	BPAA 02-2416 RECOMMENDED

NOTES:

SEE STRUCTURES PLAN BPAA 02-2416 FOR RECONSTRUCTION DETAILS FOR STANWIX STREET STRUCTURE

SEE MISCELLANEOUS DETAILS FOR CONCRETE CURB CONSTRUCTION AROUND EXISTING AND PROPOSED PIERS.

CONSTRUCT BRIDGE APPROACH SLAB, MODIFIED TO THE NEAREST LONGITUDINAL AND TRANSVERSE JOINTS.

FOR TEMPORARY CONSTRUCTION EASEMENTS SEE SR 0279 SECTION A58 AND SR 0376 SECTION A25 RIGHT OF WAY PLAN.

SURVEY BOOK NOS 47067 & 0023

RECORD DRAWINGS

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL ENGINEER
JAMES F. WEIMER

DRAWN BY	JES
CHECKED BY	JFW

FOR PROFILE, SEE SHEET 77

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

SCALE: AS SHOWN | SHEET NO | ACCESSION NO ____

DATE : 12/01/2001 | 66 OF 85 | CASE NO ____

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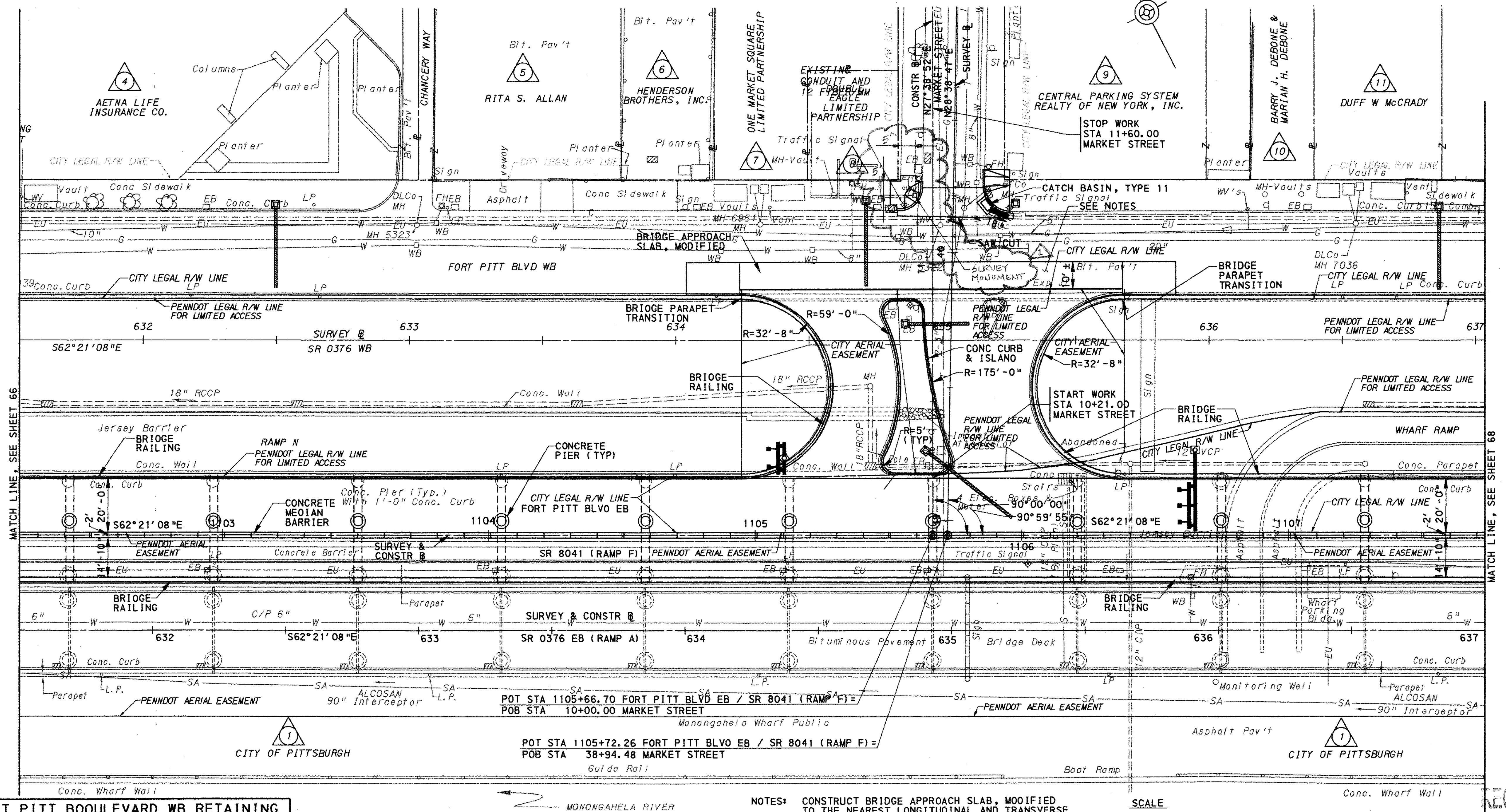
* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	67 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAT

BENCH MARK 300 ELEVATION 745.09'
CENTER OPW MONUMENT WEST CORNER OF
MARKET STREET AND BLVD OF THE ALLIES
BK 0023, PG 43.



FORT PITT BOULEVARD WB RETAINING WALL (WALL A) STRUCTURE DATA

	EXISTING	PROPOSED
STATION	1096+18.60 TO 1103+96.18	1096+18.60 TO 1103+96.18
TYPE	R.C. RETAINING WALL	REHABILITATION OF R.C. WALL
SPAN	N/A	N/A
CLEARANCE	N/A	N/A
ROADWAY WIDTH	N/A	N/A
SKEW	N/A	N/A
STRUCTURE NO	N/A	BPAA 02-2420 RECOMMENDED

MARKET STREET STRUCTURE DATA

	EXISTING	PROPOSED
STATION	10+55.90	10+55.90
TYPE	MULTI-GIRDER FLOORBEAM SYSTEM	COMPOSITE STEEL MULTI-I-BEAM
SPAN	67'-2"	67'-10"
CLEARANCE	16'-9½"	16'-9½"
ROADWAY WIDTH	VARIES	VARIES
SKEW	90°	90°
STRUCTURE NO	N/A	BPAA 02-2417 RECOMMENDED

NOTES:

CONSTRUCT BRIDGE APPROACH SLAB, MODIFIED TO THE NEAREST LONGITUDINAL AND TRANSVERSE JOINTS.

SEE STRUCTURE PLAN BPAA 02-2417 FOR RECONSTRUCTION DETAILS FOR MARKET STREET STRUCTURE

SEE MISCELLANEOUS DETAILS FOR CONCRETE CURB CONSTRUCTION AROUND EXISTING AND PROPOSED PIERS.

FOR TEMPORARY CONSTRUCTION EASEMENTS SEE SR 0279 SECTION A58 AND SR 0376 SECTION A25 RIGHT OF WAY PLAN.

SCALE
20 FEET 0 20 FEET

RECORD DRAWINGS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEMER ENGINEER NO. 46931-E

DRAWN BY	JES
CHECKED BY	JFW

FOR PROFILES, SEE SHEETS 78 & 83

SURVEY BOOK NOS 47067 & 0023

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

SCALE: AS SHOWN | SHEET NO | ACCESSION NO
DATE: 12/01/2001 | 67 OF 85 | CASE NO

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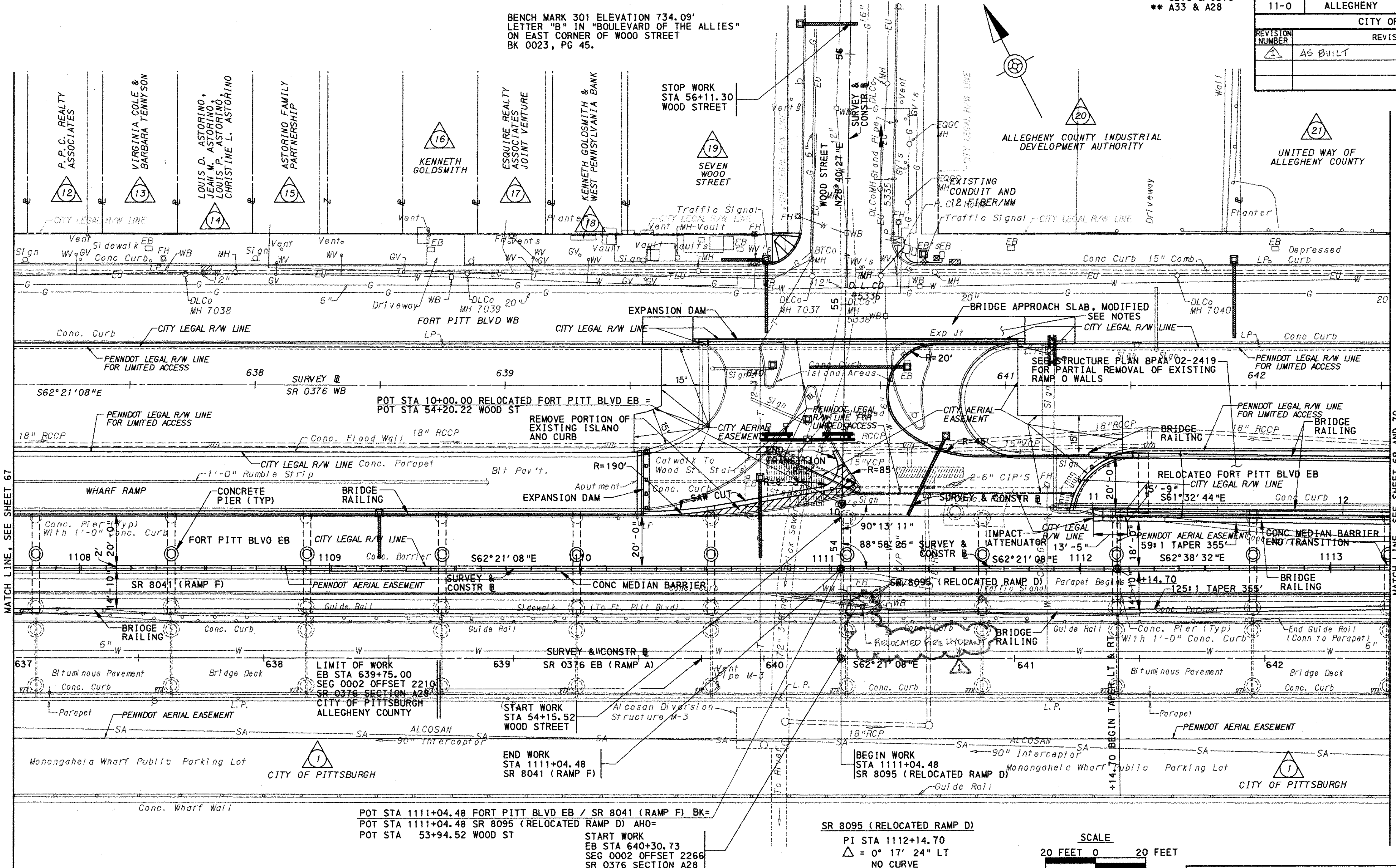
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	68 OF 85

* 0279 & 0376
** A33 & A28

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS BUILT	10/1/03	SAI



WOOD STREET STRUCTURE DATA		
	EXISTING	PROPOSED
STATION	-	54+50.28
TYPE	STEEL GIRDER	REHABILITATION OF STEEL GIRDER
SPAN	67'-2"	67'-2"
UNDER CLEARANCE	14'-5" (MIN.)	14'-5" (MIN.)
ROADWAY WIDTH	VARIES	VARIES
SKEW	90°	90°
STRUCTURE NO	N/A	BPAA 02-2418 RECOMMENDED

NOTE: CONSTRUCT BRIDGE APPROACH SLAB, MODIFIED TO THE NEAREST LONGITUDINAL AND TRANSVERSE JOINTS.

SEE STRUCTURE PLAN BPAA 02-2418 FOR RECONSTRUCTION DETAILS FOR WOOD STREET STRUCTURE

SEE MISCELLANEOUS DETAILS FOR CONCRETE CURB CONSTRUCTION AROUND EXISTING AND PROPOSED PIERS.

FOR TEMPORARY CONSTRUCTION EASEMENTS SEE SR 0279 SECTION A58 AND SR 0376 SECTION A25 RIGHT OF WAY PLAN.

SURVEY BOOK NOS 47067 & 0023

FOR PROFILES, SEE SHEETS 79 & 84

DRAWN BY	JES
CHECKED BY	JFW

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER JAMES F. WEIMER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

SCALE: AS SHOWN | SHEET NO | ACCESSION NO

DATE: 12/01/2001 | 68 OF 85 | CASE NO

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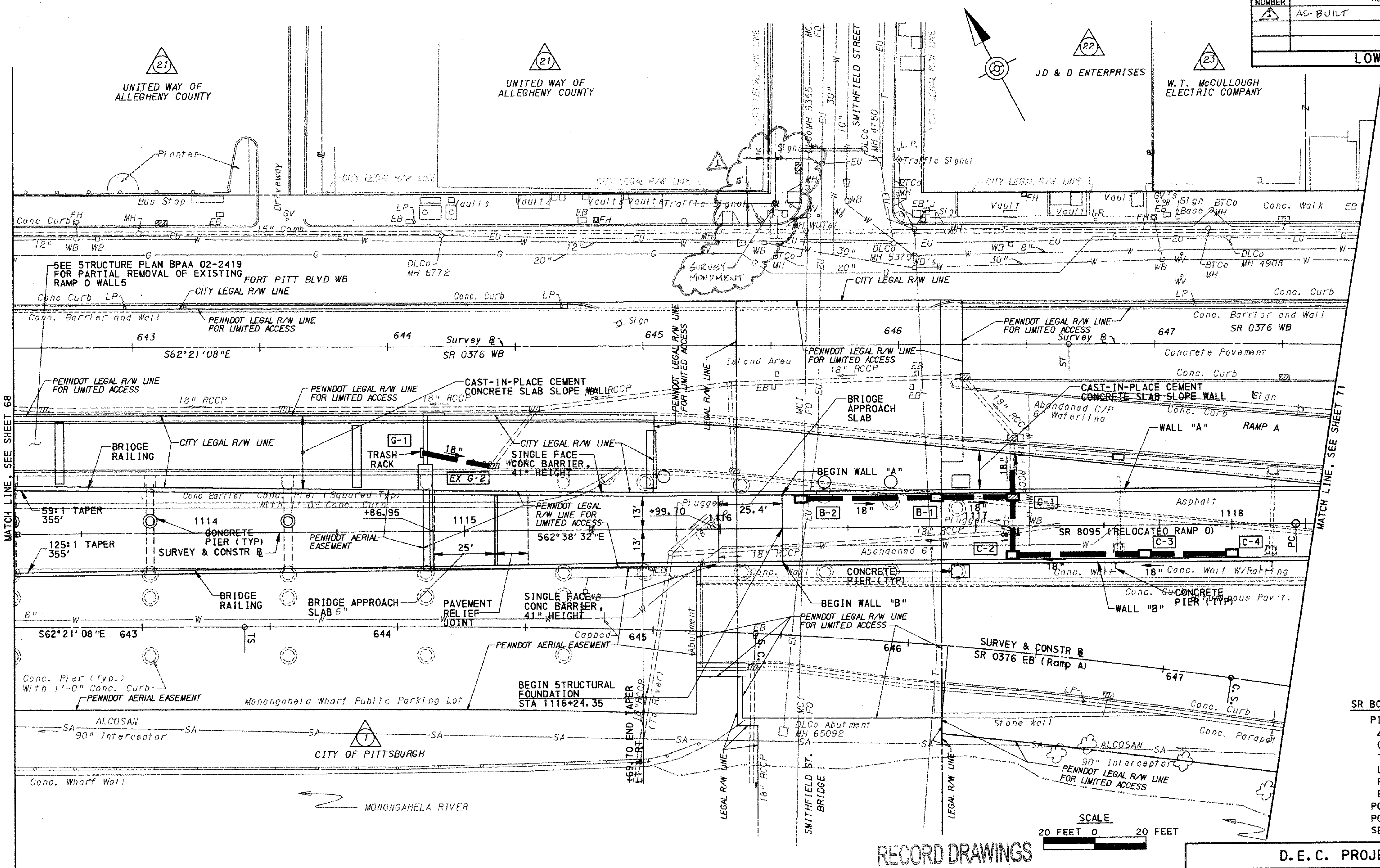
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	69 OF 85

* 0279 & 0376
** A33 & A28

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

LOWER LEVEL



SR 0376 WB
PI STA 649+38.58
Δ = 11°59'46" RT
Δ_c = 1°45'53"
Dc = 4°05'33.2" (CHORD)
Rc = 1400.00'
Lc = 43.12' (CHORD)
θ_s = 5°06'56.5"
Ls = 250.00'
Ts = 272.26'
Es = 9.48'
k = 124.97'
p = 1.86'
Xc = 249.80'
Yc = 7.44'
LT = 166.74'
ST = 83.40'
LC = 249.91'
TS STA = 646+66.32
SC STA = 649+16.32
CS STA = 649+59.44
ST STA = 652+09.44

SR 0376 (RAMP A)
PI STA 646+34.11
Δ = 11°04'36" RT
Δ_c = 5°20'50"
D_c = 2°51'53"
R_c = 2000.00'
L_c = 186.65'
θ_s = 2°51'53"
L_s = 200.00'
T_s = 294.00'
E_s = 10.22'
K = 99.99
P = 0.833
X_c = 199.95'
Y_c = 3.33'
LT = 133.35'
ST = 66.68'
LC = 199.98'
TS STA = 643+40.11
SC STA = 645+40.11
CS STA = 647+26.76
ST STA = 649+26.76

SR 8095 (RELOCATED RAMP O)
PI STA 1118+92.90
Δ = 6° 06' 34" RT
D = 4° 30' 45"
T = 67.76'
L = 135.39'
R = 1269.68'
E = 1.81'
PC STA = 1118+25.14
PCC STA = 1119+60.53
SE = 4.38%

SCALE
20 FEET 0 20 FEET

RECORD DRAWINGS

NOTES: FOR TEMPORARY CONSTRUCTION EASEMENTS SEE SR 0279 SECTION A58 AND SR 0376 SECTION A25 RIGHT OF WAY PLAN.

SEE MISCELLANEOUS DETAILS FOR CONCRETE CURB CONSTRUCTION AROUND EXISTING AND PROPOSED PIERS.

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER JAMES F. WEMER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

SCALE: AS SHOWN | SHEET NO 69 OF 85 | ACCESSION NO
DATE: 12/01/2001 | CASE NO

DRAWN BY	JES
CHECKED BY	JFW

FOR PROFILE, SEE SHEET 80

FOR RELOCATED FORT PITT BLVD EB AND RAMP B ALIGNMENT, SEE SHEET 70

SURVEY BOOK NOS 47067 & 0023

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	70 OF 85

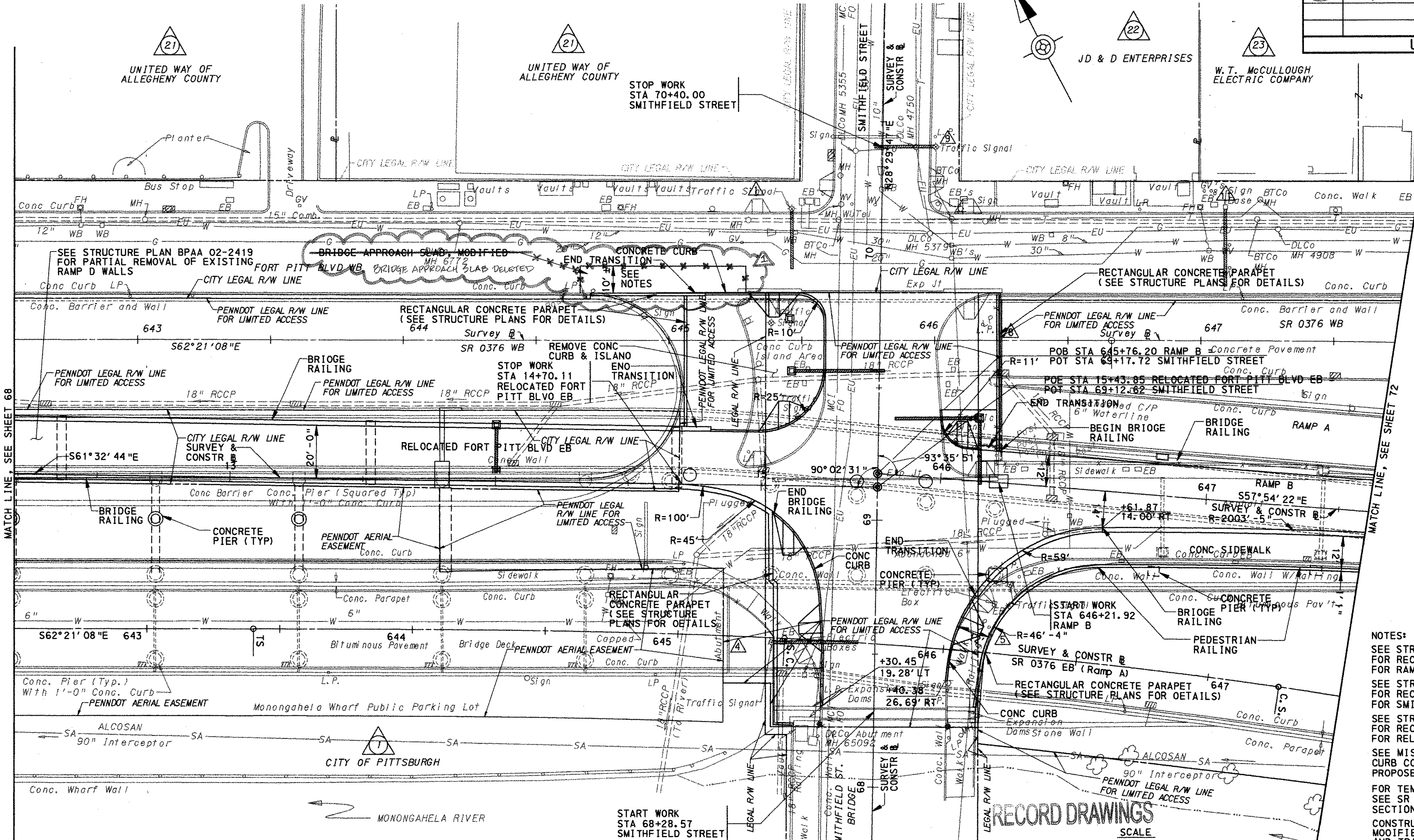
* 0279 & 0376
** A33 & A28

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

UPPER LEVEL

BENCH MARK 302 ELEVATION 747.22'
CENTER DPW MONUMENT WEST CORNER
OF SMITHFIELD STREET AND BOULEVARD
OF THE ALLIES BK 0023, PG 47.



SR 0376 WB
PI STA 649+38.578
Δ = 11°59'47" RT
Δc = 1°45'53"
Dc = 4°05'33" (CHORD)
Rc = 1400.00'
Lc = 43.12' (CHORD)
Θs = 5°06'57"
Ls = 250.00'
Ts = 272.26'
Es = 9.48'
k = 124.97'
p = 1.86'
Xc = 249.80'
Yc = 7.44'
LT = 166.74'
ST = 83.40'
LC = 249.91'
TS STA = 646+66.317
SC STA = 649+16.317
CS STA = 649+59.437
ST STA = 652+09.437

SR 0376 (RAMP A)
PI STA 646+34.11
Δ = 11°04'36" RT
Δc = 5°20'50"
Dc = 2°51'53"
Rc = 2000.00'
Lc = 186.65'
Θs = 2°51'53"
Ls = 200.00'
Ts = 294.00'
Es = 10.22'
K = 99.99
P = 0.833
Xc = 199.95'
Yc = 3.33'
LT = 133.35'
ST = 66.68'
LC = 199.98'
TS STA = 643+40.11
SC STA = 645+40.11
CS STA = 647+26.76
ST STA = 649+26.76

NOTES:

SEE STRUCTURE PLAN S-24319 FOR RECONSTRUCTION DETAILS FOR RAMP B STRUCTURE

SEE STRUCTURE PLAN S-24390 FOR RECONSTRUCTION DETAILS FOR SMITHFIELD STREET STRUCTURE

SEE STRUCTURE PLAN BPAA 02-2419 FOR RECONSTRUCTION DETAILS FOR RELOCATED FORT PITT BLVD EB

SEE MISCELLANEOUS DETAILS FOR CONCRETE CURB CONSTRUCTION AROUND EXISTING AND PROPOSED PIERS.

FOR TEMPORARY CONSTRUCTION EASEMENTS SEE SR 0279 SECTION A58 AND SR 0376 SECTION A25 RIGHT OF WAY PLAN.

CONSTRUCT BRIDGE APPROACH SLAB, MODIFIED TO THE NEAREST LONGITUDINAL AND TRANSVERSE JOINTS.

RELOCATED FORT PITT BLVD EB STRUCTURE DATA

	EXISTING	PROPOSED
STATION	N/A	11+19.20
TYPE	N/A	3 SPAN PRESTRESSED CONC. OR STEEL
SPAN	N/A	3-113.33' SPANS
CLEARANCE	N/A	N/A
ROADWAY WIDTH	N/A	20'
SKEW	N/A	89°11'31"
STRUCTURE NO.	N/A	BPAA 02-2419 RECOMMENDED

SMITHFIELD STREET STRUCTURE DATA

	EXISTING	PROPOSED
STATION	68+28.57	68+28.57
TYPE	STEEL GIRDER	REHAB. OF STEEL GIRDER
SPAN	1-48.10' SPAN, 1-27.16' SPAN, 1-76.78' SPAN	1-48.10' SPAN, 1-34.26' SPAN, 1-69.67' SPAN
CLEARANCE	14'-5"	14'-5"
ROADWAY WIDTH	41'-4"	41'-4"
SKEW	90°,90°,90°,90°	90°,90°,90°,90°
STRUCTURE NO	S-20765	S-24390 RECOMMENDED

DRAWN BY	JES
CHECKED BY	JFW

FOR PROFILES, SEE SHEETS 84 & 85

FOR SR 8095 (RELOCATED RAMP O) ALIGNMENT, SEE SHEET 69

SURVEY BOOK NOS 47067 & 0023

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEIMER ENGINEER NO. 42931-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

SCALE: AS SHOWN | SHEET NO | ACCESSION NO ______

DATE: 12/01/2001 | 70 OF 85 | CASE NO ______

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* 0279 & 0376
** A33 & A28

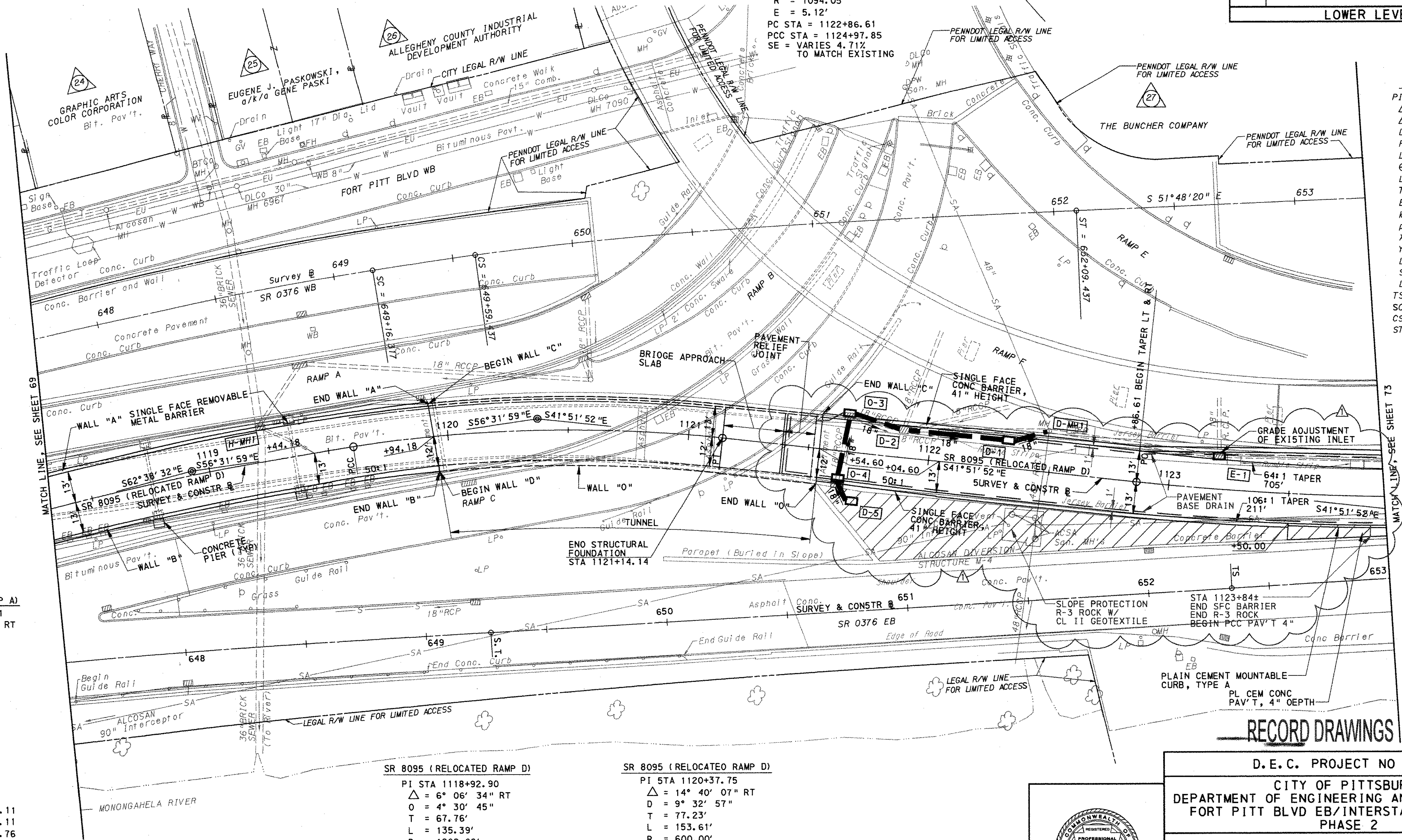
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	71 OF 85

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

LOWER LEVEL

SR 8095 (RELOCATED RAMP D)
PI STA 1123+92.56
△ = 11° 03' 46" LT
D = 5° 14' 13"
T = 105.95'
L = 211.24'
R = 1094.05'
E = 5.12'
PC STA = 1122+86.61
PCC STA = 1124+97.85
SE = VARIES 4.71% TO MATCH EXISTING



SR 0376 WB
PI STA 649+38.578
△ = 11°59'47" RT
△c = 1°45'53"
Dc = 4°05'33" (CHORD)
Rc = 1400.00'
Lc = 43.12' (CHORD)
Θs = 5°06'57"
Ls = 250.00'
Ts = 272.26'
Es = 9.48'
k = 124.97'
p = 1.86'
Xc = 249.80'
Yc = 7.44'
LT = 166.74'
ST = 83.40'
LC = 249.91'
TS STA = 646+66.317
SC STA = 649+16.317
CS STA = 649+59.437
ST STA = 652+09.437

SR 0376 EB
PI STA 659+19.56
△ = 32°36'00" LT
△c = 26°52'14"
Dc = 2°51'53"
Rc = 2000.00'
Lc = 937.96'
Θs = 2°51'53"
Ls = 200.00'
Ts = 685.08'
Es = 84.62'
K = 99.99
p = 0.833
Xc = 199.95'
Yc = 3.33'
LT = 133.35'
ST = 66.68'
LC = 199.98'
TS STA = 652+34.49
SC STA = 654+34.49
CS STA = 663+72.44
ST STA = 665+72.44

SR 0376 EB (RAMP A)
PI STA 646+34.11
△ = 11°04'36" RT
△c = 5°20'50"
Dc = 2°51'53"
Rc = 2000.00'
Lc = 186.65'
Θs = 2°51'53"
Ls = 200.00'
Ts = 294.00'
Es = 10.22'
K = 99.99
p = 0.833
Xc = 199.95'
Yc = 3.33'
LT = 133.35'
ST = 66.68'
LC = 199.98'
TS STA = 643+40.11
SC STA = 645+40.11
CS STA = 647+26.76
ST STA = 649+26.76

NOTE: FOR TEMPORARY CONSTRUCTION EASEMENTS SEE SR 0279 SECTION A58 AND SR 0376 SECTION A25 RIGHT OF WAY PLAN.

SR 8095 (RELOCATED RAMP D)
PI STA 1118+92.90
△ = 6° 06' 34" RT
D = 4° 30' 45"
T = 67.76'
L = 135.39'
R = 1269.68'
E = 1.81'
PC STA = 1118+25.14
PCC STA = 1119+60.53
SE = 4.38%

SR 8095 (RELOCATED RAMP D)
PI STA 1120+37.75
△ = 14° 40' 07" RT
D = 9° 32' 57"
T = 77.23'
L = 153.61'
R = 600.00'
E = 4.95'
PCC STA = 1119+60.53
PT STA = 1121+14.14
SE = 5.86%

SCALE
20 FEET 0 20 FEET

SURVEY BOOK NOS 47067 & 0023

DRAWN BY	JES
CHECKED BY	JFW

FOR PROFILE, SEE SHEET 81

FOR RAMP B ALIGNMENT, SEE SHEET 72

RECORD DRAWINGS

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL ENGINEER
JAMES F. WEIMER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

SCALE: AS SHOWN
SHEET NO 71 OF 85
ACCESSION NO ______
DATE: 12/01/2001
CASE NO ______

H:\Projects\Ustation\0042\ASBUILT\abcnpln08.dgn 12/29/2003

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	72 OF 85
CITY OF PITTSBURGH				

* 0279 & 0376
** A33 & A28

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

UPPER LEVEL

RAMP B
PI STA 650+88.02
△ = 69° 39' 45" LT
D = 30° 02' 27"
T = 132.71'
L = 231.89'
R = 190.73'
E = 41.63'
PC STA = 649+55.30
PT STA = 651+87.20
SE = 6.00%

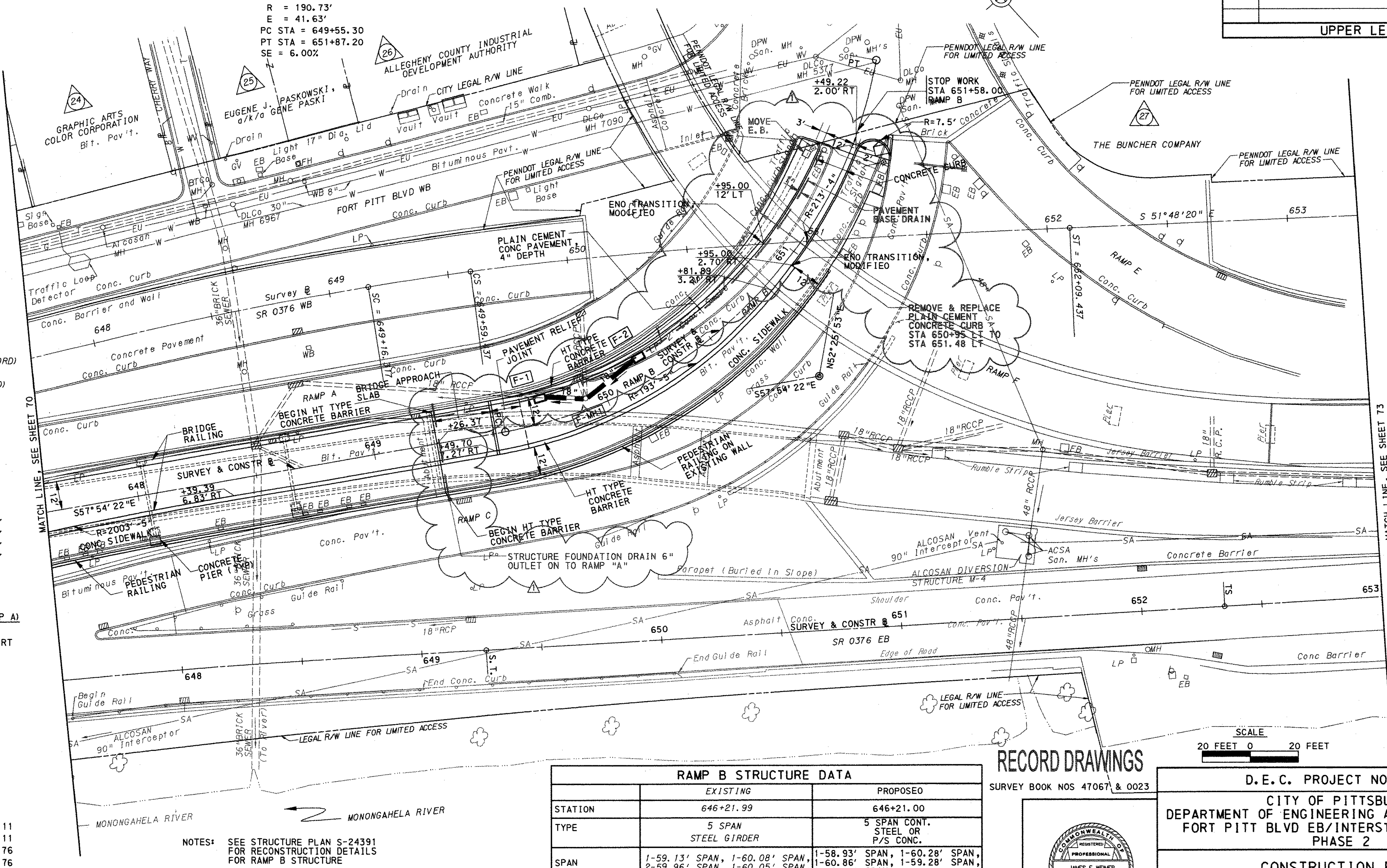
BENCH MARK 303 ELEVATION 756.12'
LETTER "R" IN "BOULEVARD OF THE ALLIES" ON THE NORTH CORNER OF GRANT STREET AND BOULEVARD OF THE ALLIES
BK 0023, PG 49.

BENCH MARK 304 ELEVATION 747.69'
VERTICAL DISK ON NORTH SIDE CONCRETE PIER AT FORT PITT BLVD AND GRANT STREET BK 0023, PG 45.

SR 0376 WB
PI STA 649+38.578
△ = 11°59'47" RT
△c = 1°45'53"
Dc = 4°05'33" (CHORD)
Rc = 1400.00'
Lc = 43.12' (CHORD)
Θs = 5°06'57"
Ls = 250.00'
Ts = 272.26'
Es = 9.48'
k = 124.97'
p = 1.86'
Xc = 249.80'
Yc = 7.44'
LT = 166.74'
ST = 83.40'
LC = 249.91'
TS STA = 646+66.317
SC STA = 649+16.317
CS STA = 649+59.437
ST STA = 652+09.437

SR 0376 EB (RAMP A)
PI STA 646+34.11
△ = 11°04'36" RT
△c = 5°20'50"
Dc = 2°51'53"
Rc = 2000.00'
Lc = 186.65'
Θs = 2°51'53"
Ls = 200.00'
Ts = 294.00'
Es = 10.22'
k = 99.99
p = 0.833
Xc = 199.95'
Yc = 3.33'
LT = 133.35'
ST = 66.68'
LC = 199.98'
TS STA = 643+40.11
SC STA = 645+40.11
CS STA = 647+26.76
ST STA = 649+26.76

SR 0376 EB
PI STA 659+19.56
△ = 32°36'00" LT
△c = 26°52'14"
Dc = 2°51'53"
Rc = 2000.00'
Lc = 937.96'
Θs = 2°51'53"
Ls = 200.00'
Ts = 685.08'
Es = 84.62'
k = 99.99'
p = 0.833'
Xc = 199.95'
Yc = 3.33'
LT = 133.35'
ST = 66.68'
LC = 199.98'
TS STA = 652+34.49
SC STA = 654+34.49
CS STA = 663+72.44
ST STA = 665+72.44



NOTES: SEE STRUCTURE PLAN S-24391 FOR RECONSTRUCTION DETAILS FOR RAMP B STRUCTURE

FOR TEMPORARY CONSTRUCTION EASEMENTS SEE SR 0279 SECTION A58 AND SR 0376 SECTION A25 RIGHT OF WAY PLAN.

RAMP B STRUCTURE DATA

	EXISTING	PROPOSED
STATION	646+21.99	646+21.00
TYPE	5 SPAN STEEL GIRDER	5 SPAN CONT. STEEL OR P/S CONC.
SPAN	1-59.13' SPAN, 1-60.08' SPAN, 2-59.96' SPAN, 1-60.05' SPAN,	1-58.93' SPAN, 1-60.28' SPAN, 1-60.86' SPAN, 1-59.28' SPAN, 1-60.64' SPAN
CLEARANCE	14'-6" @ TUNNEL	14'-6" @ TUNNEL
ROADWAY WIDTH	VARIES	28' TO 24'
SKEW	VARIES	VARIES
STRUCTURE NO	N/A	S-24391 RECOMMENDED

RECORD DRAWINGS
SURVEY BOOK NOS 47067 & 0023

SCALE
20 FEET 0 20 FEET

JAMES F. WEIMER, REGISTERED PROFESSIONAL ENGINEER, COMMONWEALTH OF PENNSYLVANIA

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

SCALE: AS SHOWN | SHEET NO 72 OF 85 | ACCESSION NO
DATE: 12/01/2001 | CASE NO

DRAWN BY	JES
CHECKED BY	JFW

FOR PROFILES, SEE SHEET 85
FOR SR 8095 (RELOCATED RAMP 0) ALIGNMENT, SEE SHEET 71

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DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	73 OF 85
CITY OF PITTSBURGH				

* 0279 & 0376
** A33 & A28

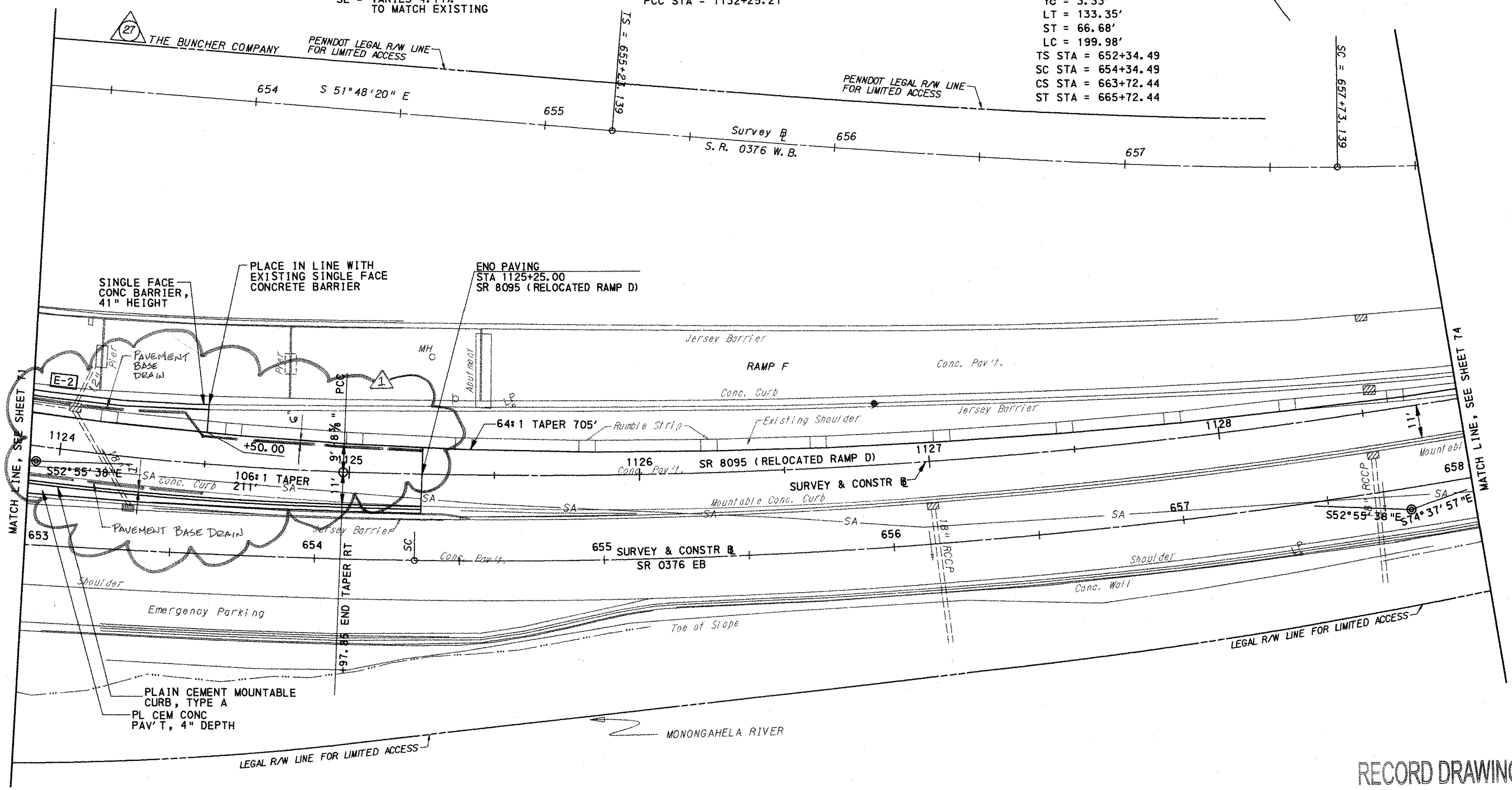
REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

SR 0376 WB
PI STA 660+70.278
Δ = 33°31'10" LT
Δc = 23°17'17"
Dc = 4°05'33.2"
Rc = 1400.00'
Lc = 569.03'
Θs = 5°06'56.5"
Ls = 250.00'
Ts = 547.139'
Es = 64.05'
k = 124.97
p = 1.86'
Xc = 249.80'
Yc = 7.44'
LT = 166.74'
ST = 83.40'
LC = 249.91'
TS STA = 655+23.139
SC STA = 657+73.139
CS STA = 663+42.173
ST STA = 665+92.173

SR 8095 (RELOCATED RAMP D)
PI STA 1123+92.56
Δ = 11° 03' 46" LT
D = 5° 14' 13"
T = 105.95'
L = 211.24'
R = 1094.05'
E = 5.12'
PC STA = 1122+86.61
PCC STA = 1124+97.85
SE = VARIES 4.71% TO MATCH EXISTING

SR 8095 (RELOCATED RAMP D)
PI STA 1128+65.94
Δ = 21° 42' 20" LT
D = 2° 59' 03"
T = 368.09'
L = 727.36'
R = 1920.00'
E = 34.97'
PCC STA = 1124+97.85
PCC STA = 1132+25.21

SR 0376 EB
PI STA 659+19.56
Δ = 32°36'00" LT
Δc = 26°52'14"
Dc = 2°51'53"
Rc = 2000.00'
Lc = 937.96'
Θs = 2°51'53"
Ls = 200.00'
Ts = 685.08'
Es = 84.62'
k = 99.99
p = 0.833
Xc = 199.95'
Yc = 3.33'
LT = 133.35'
ST = 66.68'
LC = 199.98'
TS STA = 652+34.49
SC STA = 654+34.49
CS STA = 663+72.44
ST STA = 665+72.44



RECORD DRAWINGS

SCALE
20 FEET 0 20 FEET

SURVEY BOOK NOS 47067 & 0023

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER JAMES F. WEIMER

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

SCALE: AS SHOWN
SHEET NO 73 OF 85
ACCESSION NO
DATE : 11/30/2001
CASE NO

DRAWN BY	JES
CHECKED BY	JFW

FOR PROFILE, SEE SHEET 82

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	74 OF 85

* 0279 & 0376
** A33 & A28

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

SR 0376 WB

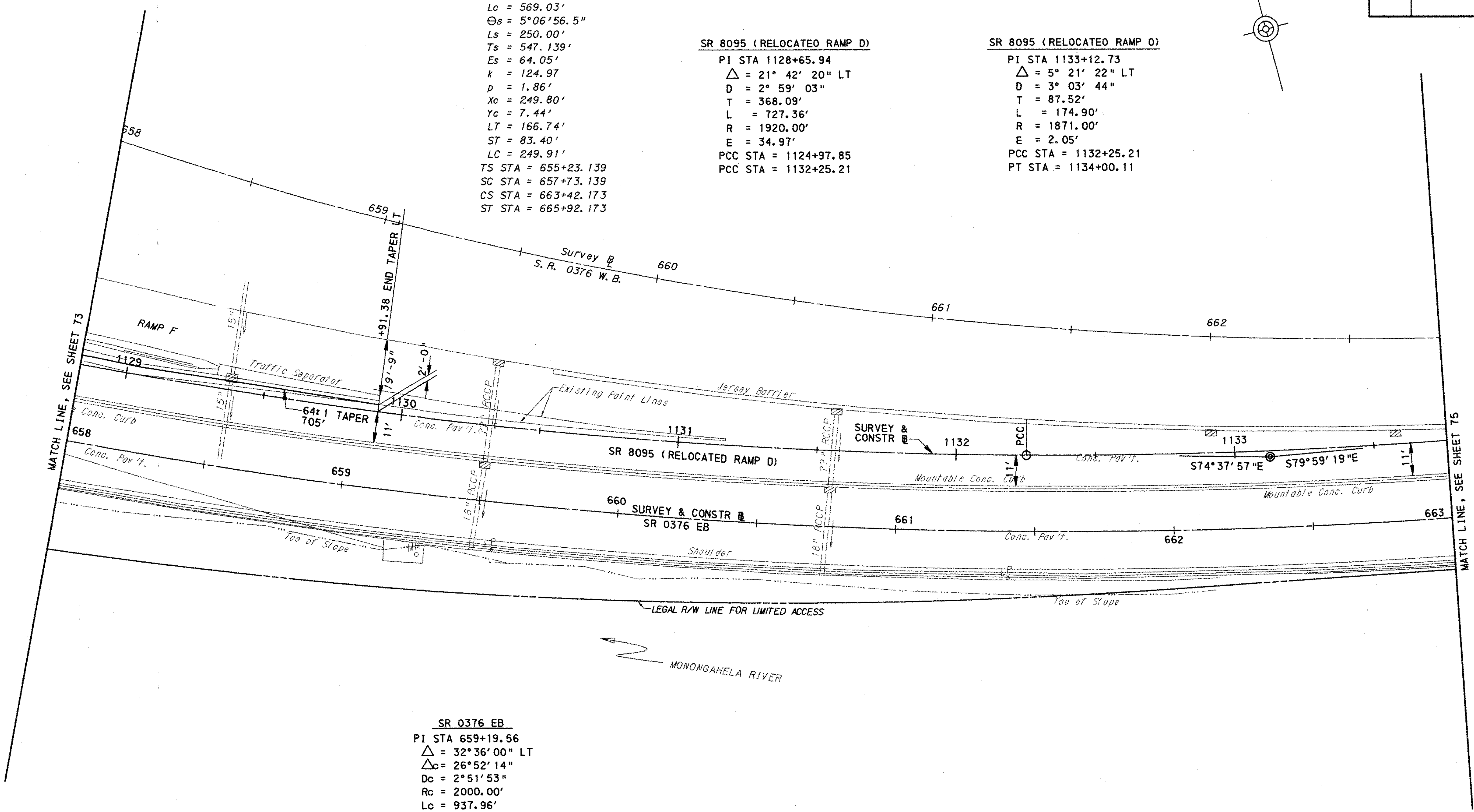
PI STA 660+70.278
Δ = 33°31'10" LT
Δ_c = 23°17'17"
Dc = 4°05'33.2"
Rc = 1400.00'
Lc = 569.03'
Θ_s = 5°06'56.5"
Ls = 250.00'
Ts = 547.139'
Es = 64.05'
k = 124.97
p = 1.86'
Xc = 249.80'
Yc = 7.44'
LT = 166.74'
ST = 83.40'
LC = 249.91'
TS STA = 655+23.139
SC STA = 657+73.139
CS STA = 663+42.173
ST STA = 665+92.173

SR 8095 (RELOCATED RAMP D)

PI STA 1128+65.94
Δ = 21° 42' 20" LT
D = 2° 59' 03"
T = 368.09'
L = 727.36'
R = 1920.00'
E = 34.97'
PCC STA = 1124+97.85
PCC STA = 1132+25.21

SR 8095 (RELOCATED RAMP D)

PI STA 1133+12.73
Δ = 5° 21' 22" LT
D = 3° 03' 44"
T = 87.52'
L = 174.90'
R = 1871.00'
E = 2.05'
PCC STA = 1132+25.21
PT STA = 1134+00.11



SR 0376 EB

PI STA 659+19.56
Δ = 32°36'00" LT
Δ_c = 26°52'14"
Dc = 2°51'53"
Rc = 2000.00'
Lc = 937.96'
Θ_s = 2°51'53"
Ls = 200.00'
Ts = 685.08'
Es = 84.62'
k = 99.99
p = 0.833
Xc = 199.95'
Yc = 3.33'
LT = 133.35'
ST = 66.68'
LC = 199.98'
TS STA = 652+34.49
SC STA = 654+34.49
CS STA = 663+72.44
ST STA = 665+72.44

SCALE
20 FEET 0 20 FEET

SURVEY BOOK NOS 47067 & 0023

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES F. WEIMER
ENGINEER
NO. 48931-E

SCALE: AS SHOWN | SHEET NO | ACCESSION NO ______
DATE : 11/30/2001 | 74 OF 85 | CASE NO ______

DRAWN BY	JES
CHECKED BY	JFW

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* 0279 & 0376
** A33 & A28

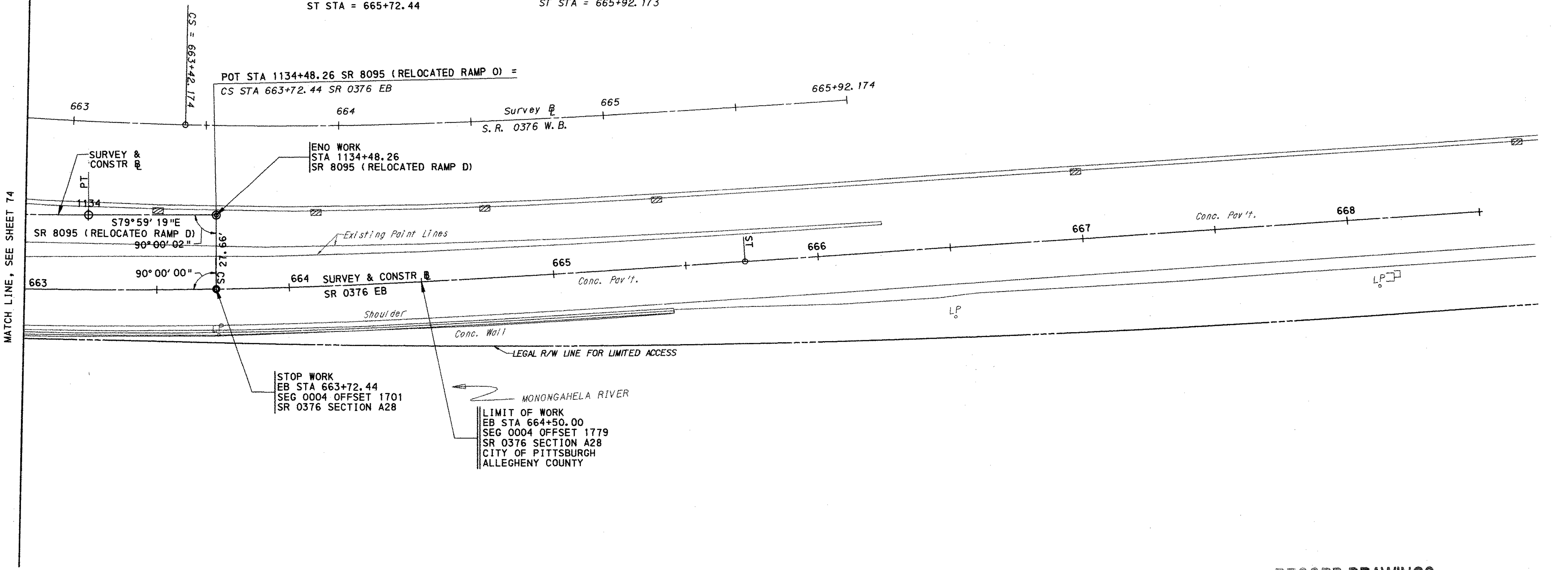
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	75 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI

SR 8095 (RELOCATED RAMP D)
PI STA 1133+12.73
△ = 5° 21′ 22″ LT
D = 3° 03′ 44″
T = 87.52′
L = 174.90′
R = 1871.00′
E = 2.05′
PCC STA = 1132+25.21
PT STA = 1134+00.11

SR 0376 EB
PI STA 659+19.56
△ = 32°36′00″ LT
△c = 26°52′14″
Dc = 2°51′53″
Rc = 2000.00′
Lc = 937.96′
Θs = 2°51′53″
Ls = 200.00′
Ts = 685.08′
Es = 84.62′
K = 99.99
p = 0.833
Xc = 199.95′
Yc = 3.33′
LT = 133.35′
ST = 66.68′
LC = 199.98′
TS STA = 652+34.49
SC STA = 654+34.49
CS STA = 663+72.44
ST STA = 665+72.44

SR 0376 WB
PI STA 660+70.278
△ = 33°31′10″ LT
△c = 23°17′17″
Dc = 4°05′33.2″
Rc = 1400.00′
Lc = 569.03′
Θs = 5°06′56.5″
Ls = 250.00′
Ts = 547.139′
Es = 64.05′
k = 124.97
p = 1.86′
Xc = 249.80′
Yc = 7.44′
LT = 166.74′
ST = 83.40′
LC = 249.91′
TS STA = 655+23.139
SC STA = 657+73.139
CS STA = 663+42.173
ST STA = 665+92.173



RECORD DRAWINGS

SCALE
20 FEET 0 20 FEET

SURVEY BOOK NOS 47067 & 0023

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES F. WEIMER
ENGINEER
NO. 40931-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
DETAIL PLAN

SCALE: AS SHOWN
DATE : 11/30/2001
SHEET NO 75 OF 85
ACCESSION NO ________
CASE NO ________

DRAWN BY	JES
CHECKED BY	JFW

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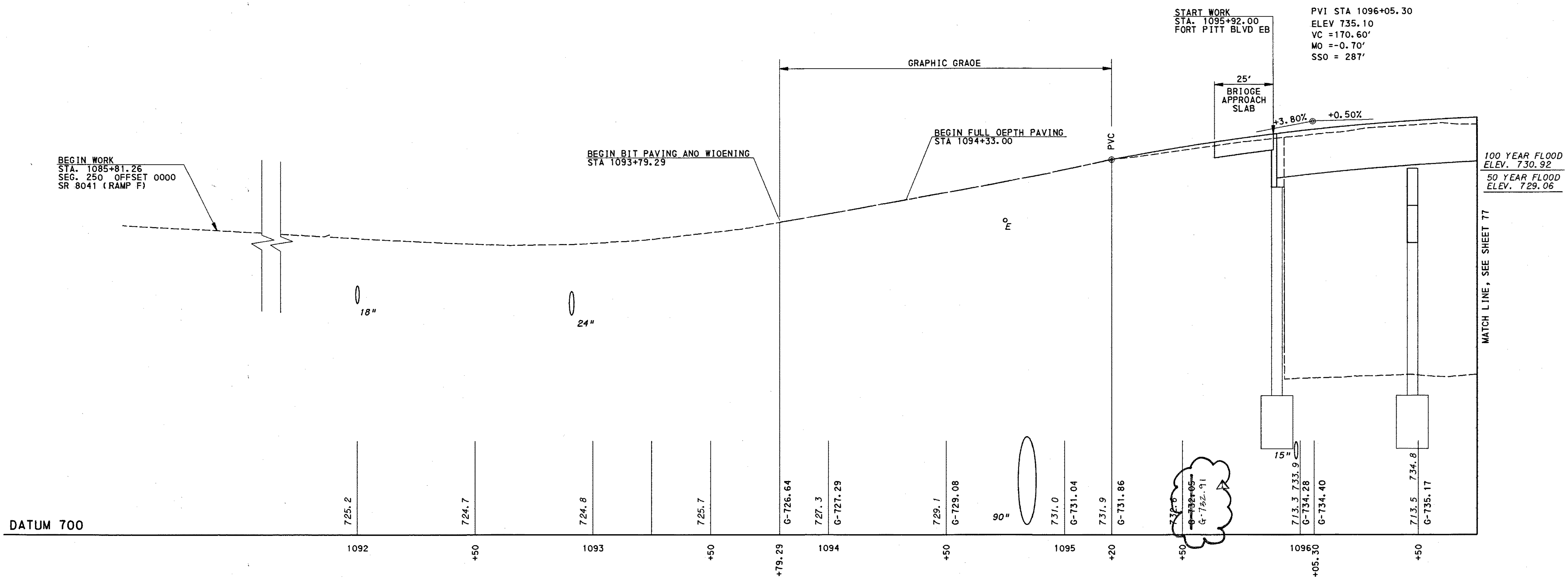
* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	76 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



PROFILE - FORT PITT BLVD EB / SR 8041 (RAMP F)

SCALE
HORIZONTAL 20 FEET 0 20 FEET
VERTICAL 4 FEET 0 4 FEET

DRAWN BY	AJH
CHECKED BY	JFW

FOR PLAN, SEE SHEET 65

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEMER ENGINEER

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
PROFILES

SCALE: AS SHOWN
SHEET NO 76 OF 85
ACCESSION NO
DATE : 11/28/2001
CASE NO

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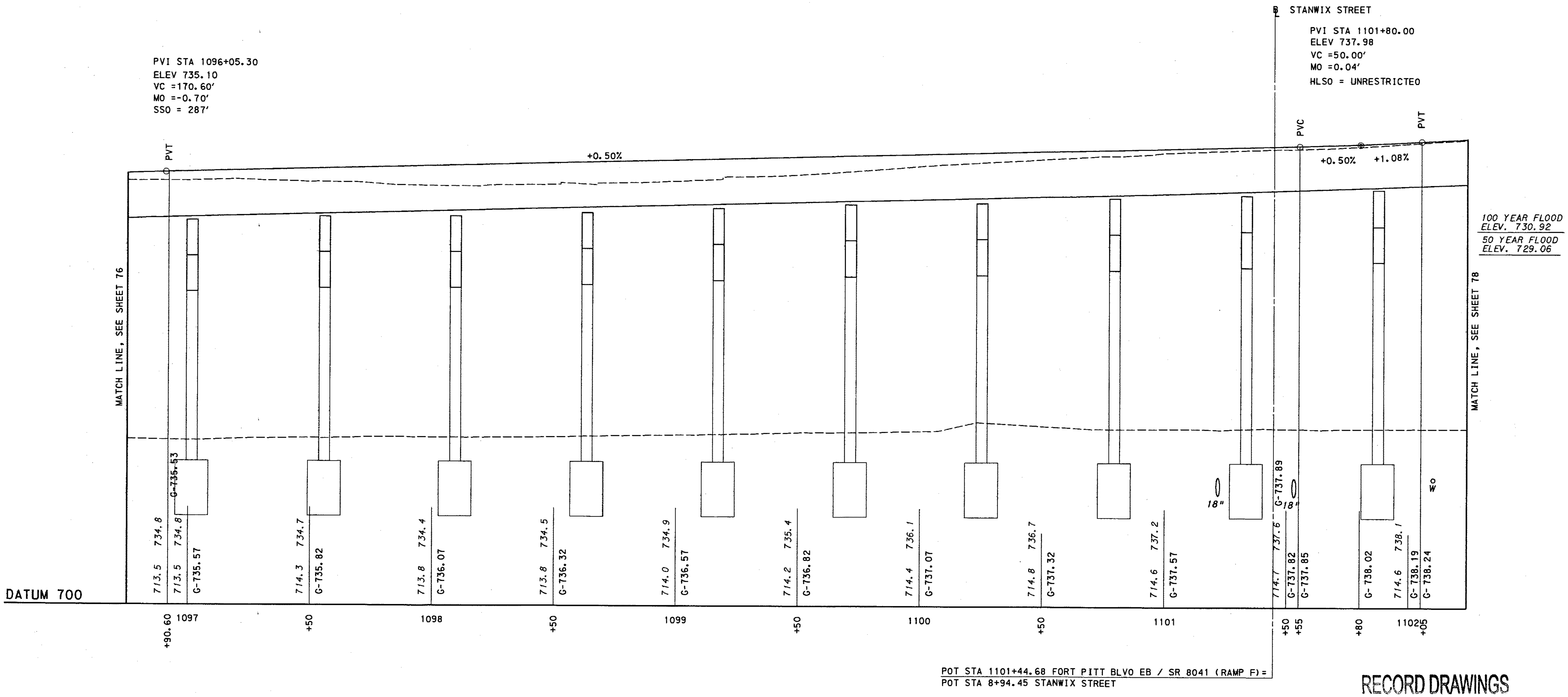
* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	77 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
⚠	AS-BUILT	10/1/03	SAI



PROFILE - FORT PITT BLVD EB / SR 8041 (RAMP F)

SCALE
HORIZONTAL 20 FEET 0 20 FEET
VERTICAL 4 FEET 0 4 FEET

DRAWN BY	AJH
CHECKED BY	JFW

FOR PLAN, SEE SHEET 66

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEBER ENGINEER NO. 48931-E

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
PROFILES

SCALE: AS SHOWN SHEET NO 77 OF 85 ACCESSION NO
DATE: 11/28/2001 CASE NO

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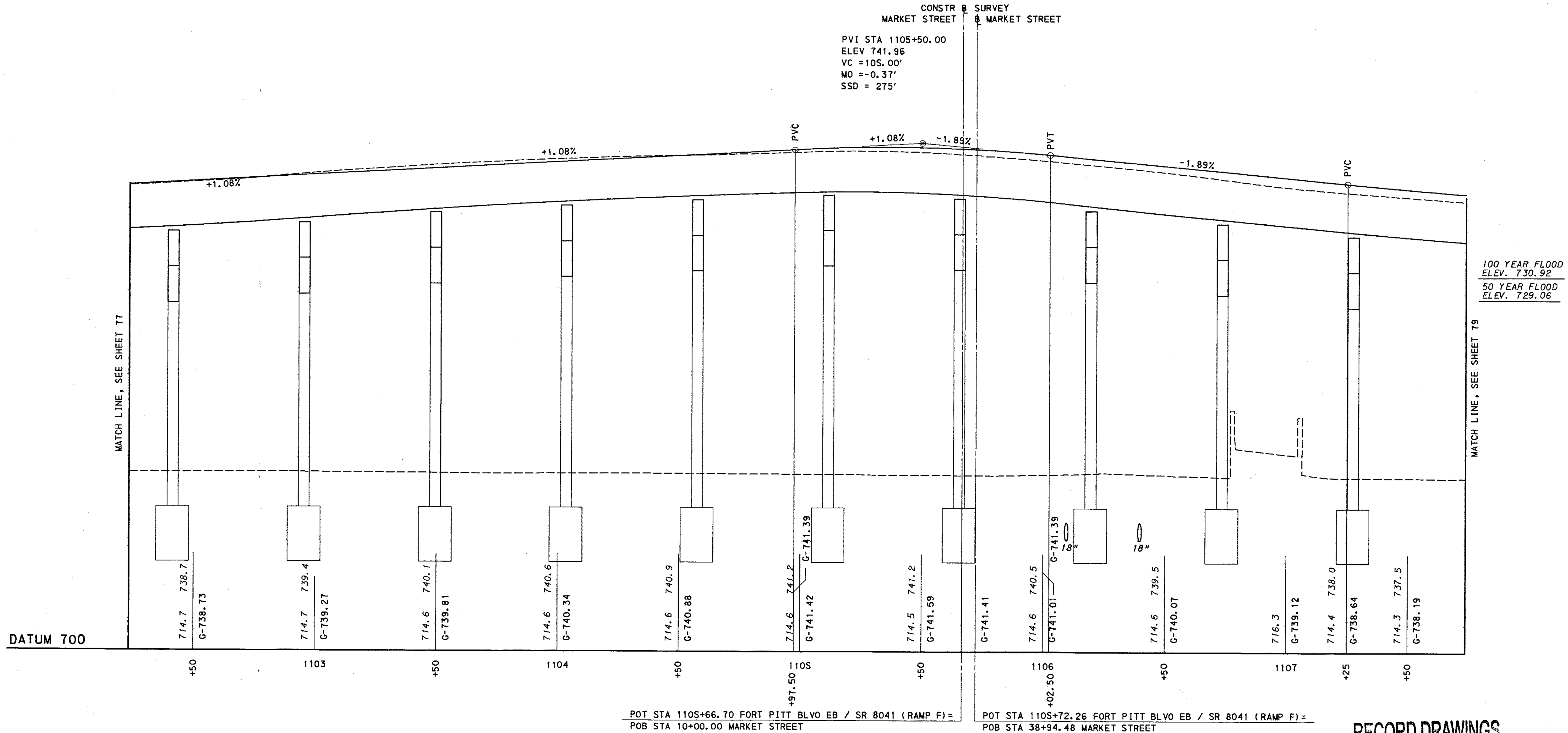
* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	78 OF 85

CITY OF PITTSBURGH

REVISION NUMBER	REVISIONS	DATE	BY
1	~~AS~~-BUILT	10/1/03	SAI



PROFILE - FORT PITT BLVD EB / SR 8041 (RAMP F)

SCALE
HORIZONTAL 20 FEET 0 20 FEET
VERTICAL 4 FEET 0 4 FEET

DRAWN BY	AJH
CHECKED BY	JFW

FOR PLAN, SEE SHEET 67

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER JAMES F. WEIMER

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
PROFILES

SCALE: AS SHOWN
SHEET NO 78 OF 85
ACCESSION NO
DATE: 11/28/2001
CASE NO

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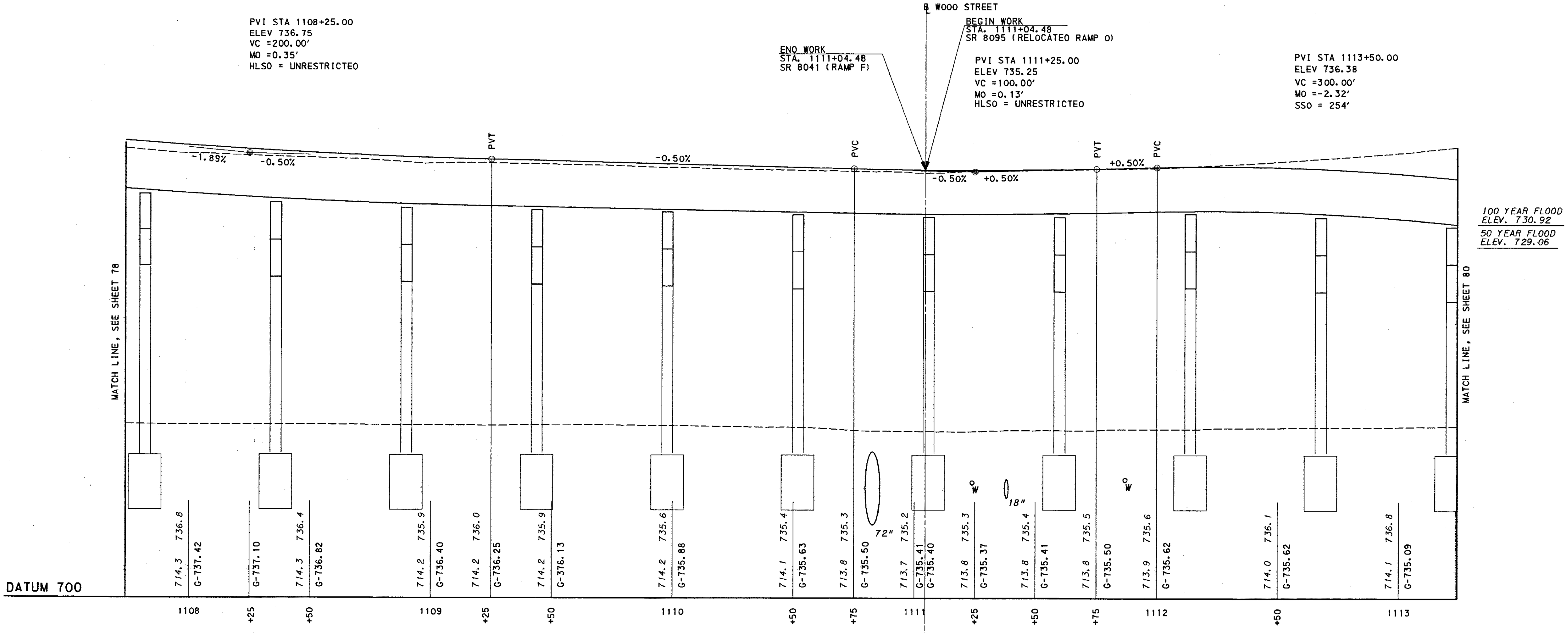
* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	79 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
⚠	AS-BUILT	10/1/03	SAI



POT STA 1111+04.48 FORT PITT BLVO EB / SR 8041 (RAMP F) BK=
POT STA 1111+04.48 SR 8095 (RELOCATEO RAMP O) AHO=
POT STA 53+94.52 WOOO STREET

PROFILE - FORT PITT BLVD EB / SR 8041 (RAMP F) AND SR 8095 (RELOCATED RAMP D)

SCALE

HORIZONTAL 20 FEET 0 20 FEET

VERTICAL 4 FEET 0 4 FEET

ORAWN BY	AJH
CHECKEO BY	JFW

FOR PLAN, SEE SHEET 68

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEIMER ENGINEER

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
PROFILES

SCALE: AS SHOWN | SHEET NO 79 OF 85 | ACCESSION NO
OATE : 11/28/2001 | CASE NO

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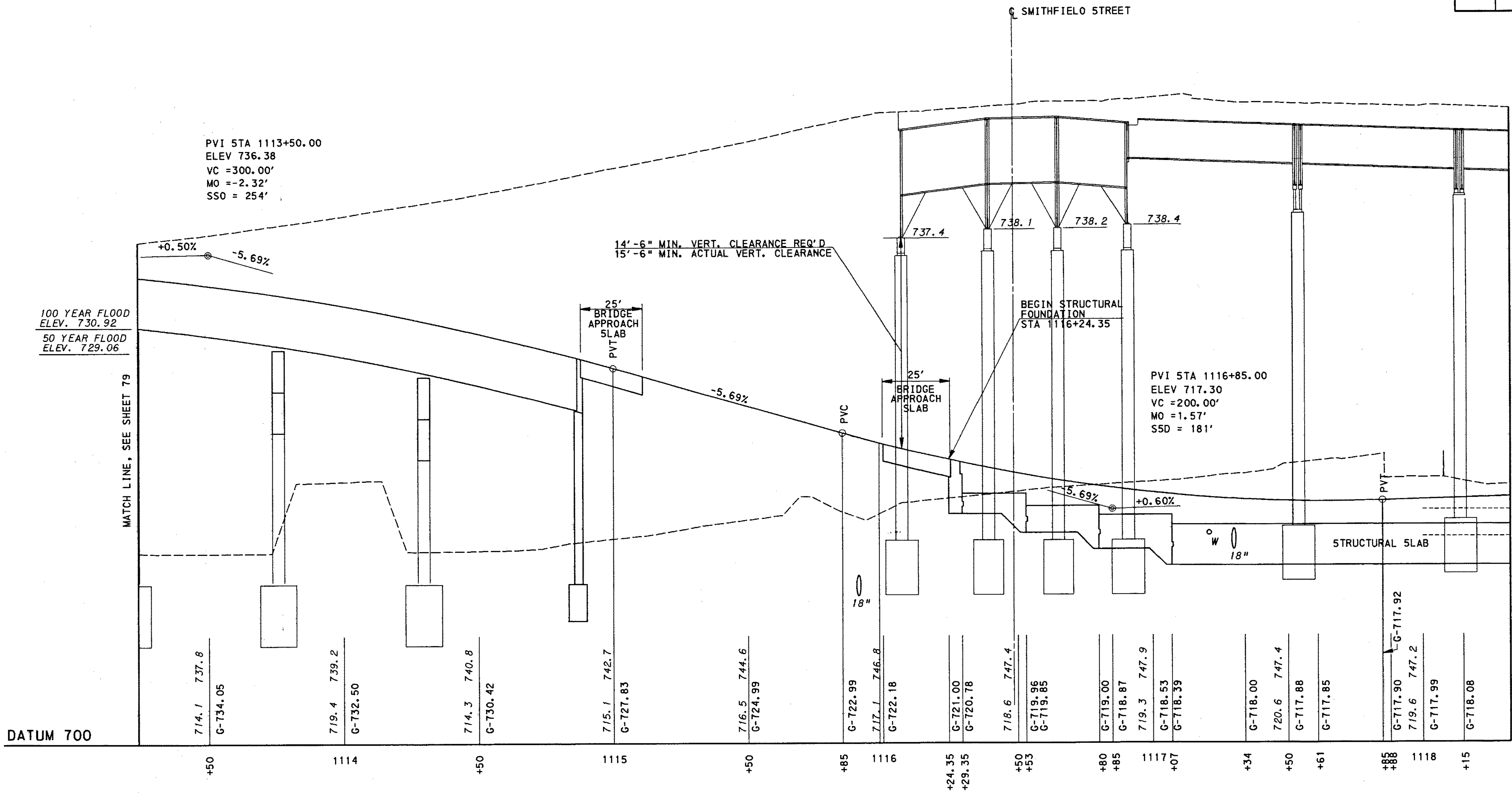
* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	80 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



PROFILE - SR 8095 (RELOCATED RAMP D)

SCALE

HORIZONTAL 20 FEET 0 20 FEET

VERTICAL 4 FEET 0 4 FEET

NOTE: SEE SHEETS 34 THRU 37 FOR STRUCTURAL SLAB DETAILS

FOR PLAN, SEE SHEET 69

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
PROFILES

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEMER ENGINEER

DRAWN BY	AJH
CHECKED BY	JFW

SCALE: AS SHOWN — SHEET NO 80 OF 85 — ACCESSION NO ____

DATE : 11/28/2001 — CASE NO ____

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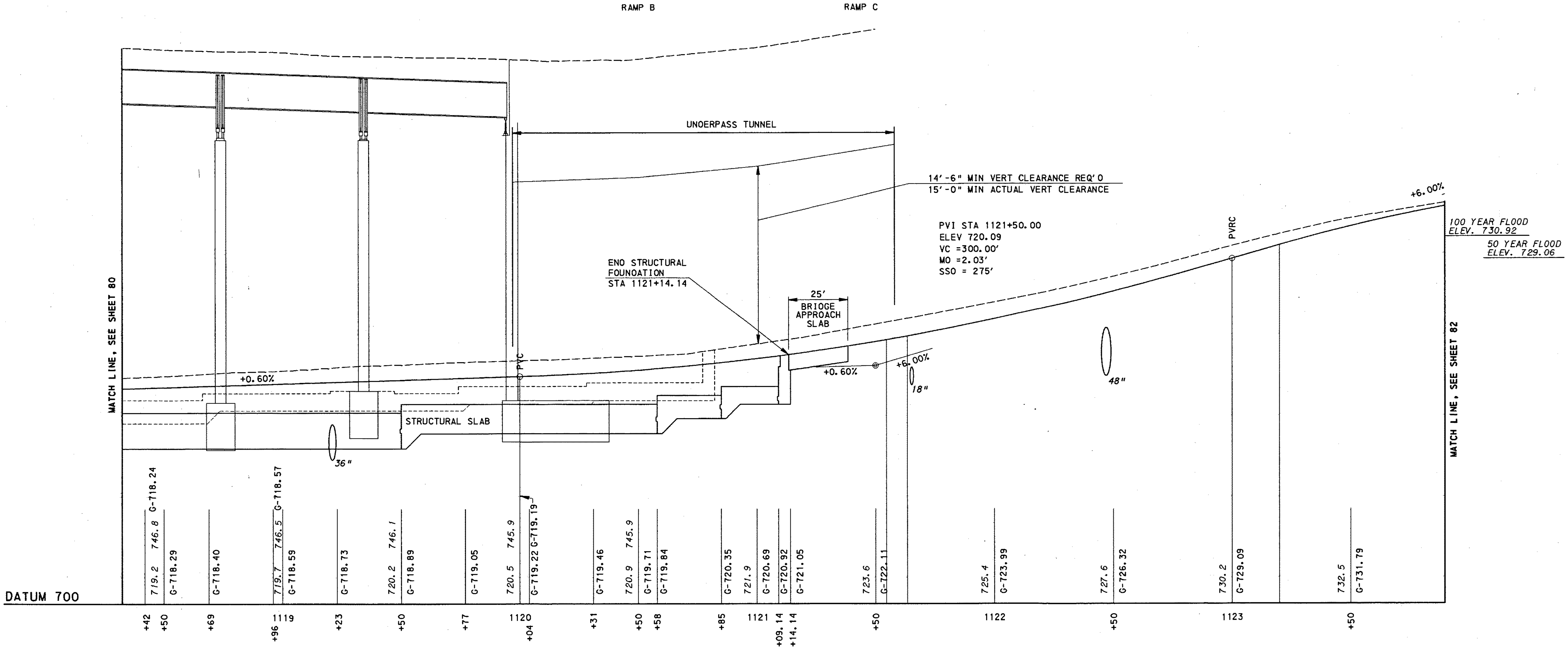
* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	81 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



PROFILE - SR 8095 (RELOCATED RAMP D)

SCALE

HORIZONTAL 20 FEET 0 20 FEET

VERTICAL 4 FEET 0 4 FEET

NOTE: SEE SHEETS 34 THRU 37 FOR STRUCTURAL SLAB DETAILS

FOR PLAN, SEE SHEET 71

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEMER ENGINEER NO. 48631-E

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
PROFILES

DRAWN BY	AJH
CHECKED BY	JFW

SCALE: AS SHOWN   SHEET NO   ACCESSION NO

DATE : 11/28/2001   81 OF 85   CASE NO

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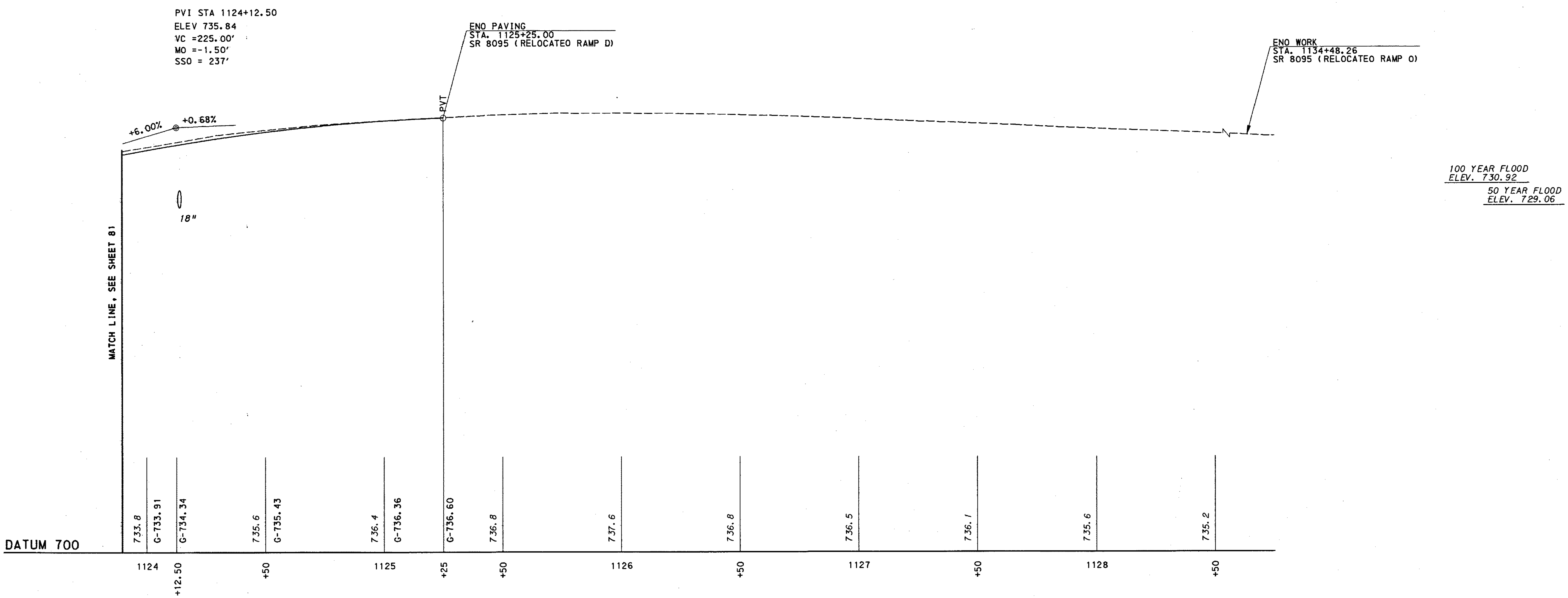
* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	82 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



PROFILE - SR 8095 (RELOCATED RAMP D)

SCALE
HORIZONTAL 20 FEET 0 20 FEET
VERTICAL 4 FEET 0 4 FEET

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
PROFILES

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEIMER ENGINEER NO. 45631-E

SCALE: AS SHOWN SHEET NO ACCESSION NO ________
DATE : 11/28/2001 82 OF 85 CASE NO ________

DRAWN BY	AJH
CHECKED BY	JFW

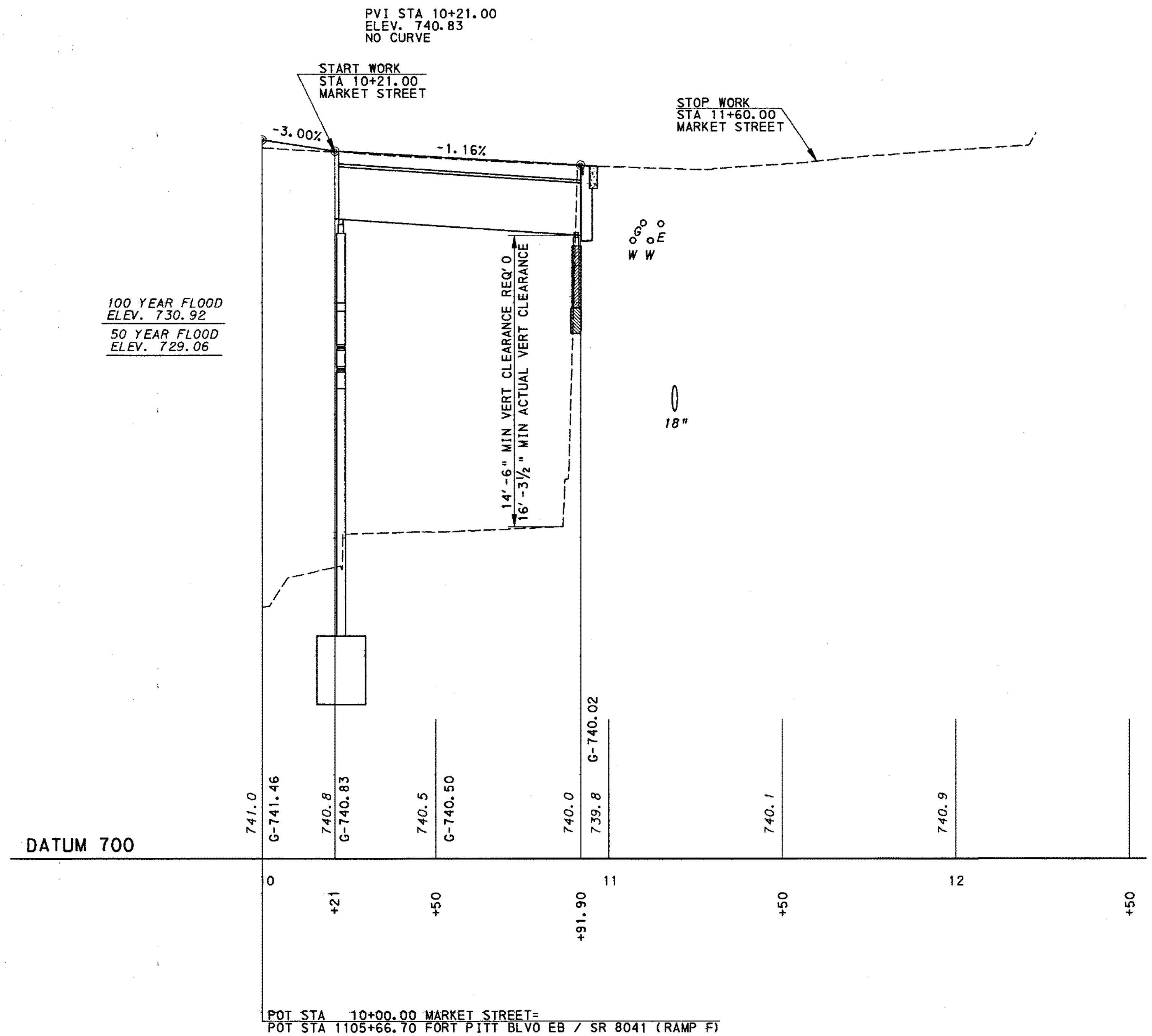
FOR PLAN, SEE SHEET 73

n:\projects\ustation\0042\Roadway\CNPR008.dgn 11/28/2001

* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	83 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



PROFILE - MARKET STREET

SCALE
HORIZONTAL 20 FEET 0 20 FEET
VERTICAL 4 FEET 0 4 FEET

RECORD DRAWINGS

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
PROFILES

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEIMER ENGINEER

DRAWN BY	AJH
CHECKED BY	JFW

FOR PLAN, SEE SHEET 67

SCALE: AS SHOWN SHEET NO ACCESSION NO
DATE : 11/28/2001 83 OF 85 CASE NO

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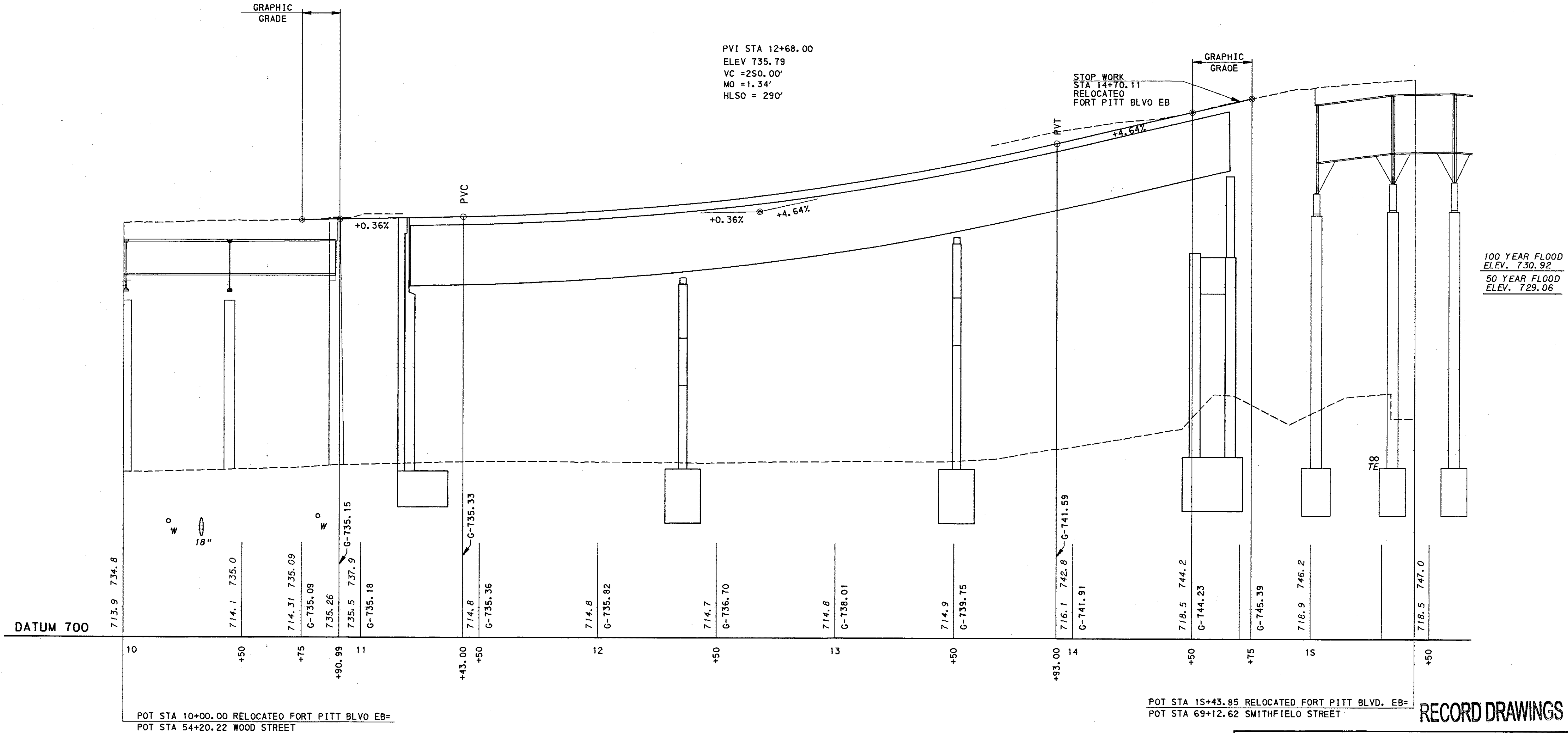
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	84 OF 85
CITY OF PITTSBURGH				

* 0279 & 0376
** A33 & A28

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



RECORD DRAWINGS

PROFILE - RELOCATED FORT PITT BOULEVARD EB

SCALE
HORIZONTAL 20 FEET 0 20 FEET
VERTICAL 4 FEET 0 4 FEET

FOR PLAN, SEE SHEET 68 & 70

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
PROFILES

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JAMES F. WEIMER ENGINEER NO. 48631-E

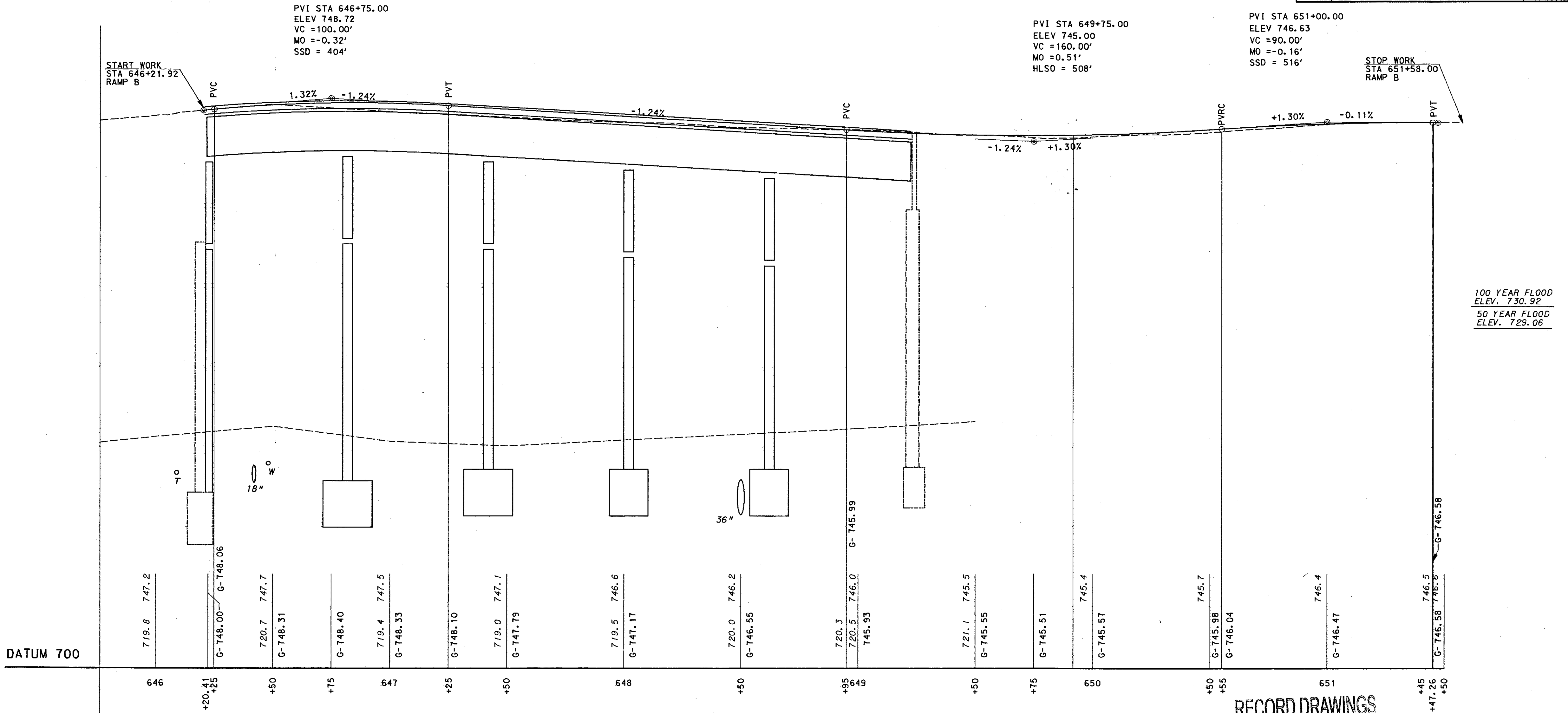
DRAWN BY	AJH
CHECKED BY	JFW

SCALE: AS SHOWN SHEET NO ACCESSION NO
DATE : 11/28/2001 84 OF 85 CASE NO

* 0279 & 0376
** A33 & A28

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
11-0	ALLEGHENY	*	**	85 OF 85
CITY OF PITTSBURGH				

REVISION NUMBER	REVISIONS	DATE	BY
1	AS-BUILT	10/1/03	SAI



RECORD DRAWINGS

PROFILE - RAMP B

STA 645+76.20 RAMP B=
STA 69+17.72 SMITHFIELD STREET

SCALE

HORIZONTAL 20 FEET 0 20 FEET

VERTICAL 4 FEET 0 4 FEET

DRAWN BY	AJH
CHECKED BY	JFW

FOR PLAN, SEE SHEET 70 & 72

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES F. WEIMER
ENGINEER
NO. 49031-E

D.E.C. PROJECT NO 84225

CITY OF PITTSBURGH
DEPARTMENT OF ENGINEERING AND CONSTRUCTION
FORT PITT BLVD EB/INTERSTATE CONNECTOR
PHASE 2

CONSTRUCTION PLAN
PROFILES

SCALE: AS SHOWN | SHEET NO 85 OF 85 | ACCESSION NO ______
DATE : 11/28/2001 | CASE NO ______

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