

DUNLAP CREEK BRIDGE (CAST IRON BRIDGE)



District 12-0

TRANSYSTEMS

PUBLIC MEETING
November 28, 2023





District 12-0

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TRANSYSTEMS

Brian Krul, PE, PTOE

Project Manager



PROJECT TEAM

➤ TranSystems – Prime

TRANSYSTEMS

- **American Geotechnical & Environmental Services, Inc.** [Geotech]
- **Gibson-Thomas Engineering Company, Inc.** [MPT]
- **Heberling Associates, Inc.** [Cultural Resources]
- **Materials Conservation Company, LLC** [Material Testing]
- **Monaloh Basin Engineers** [Survey & ROW]
- **The Markosky Engineering** [NEPA Clearance]



American Geotechnical & Environmental Services, Inc.



**MATERIALS
CONSERVATION**



HISTORY QUIZ

- **WILLIAM HENRY HARRISON IS INAUGURATED AS PRESIDENT AND DIES ONE MONTH LATER**

1841

- **BATTLE OF FORT SUMTER BEGINS THE CIVIL WAR**

1861

- **DUNLAP CREEK BRIDGE IS CONSTRUCTED IN BROWNSVILLE, PA**

1839

- **FLORIDA AND TEXAS BECOME THE 27TH AND 28TH STATES OF THE UNION**

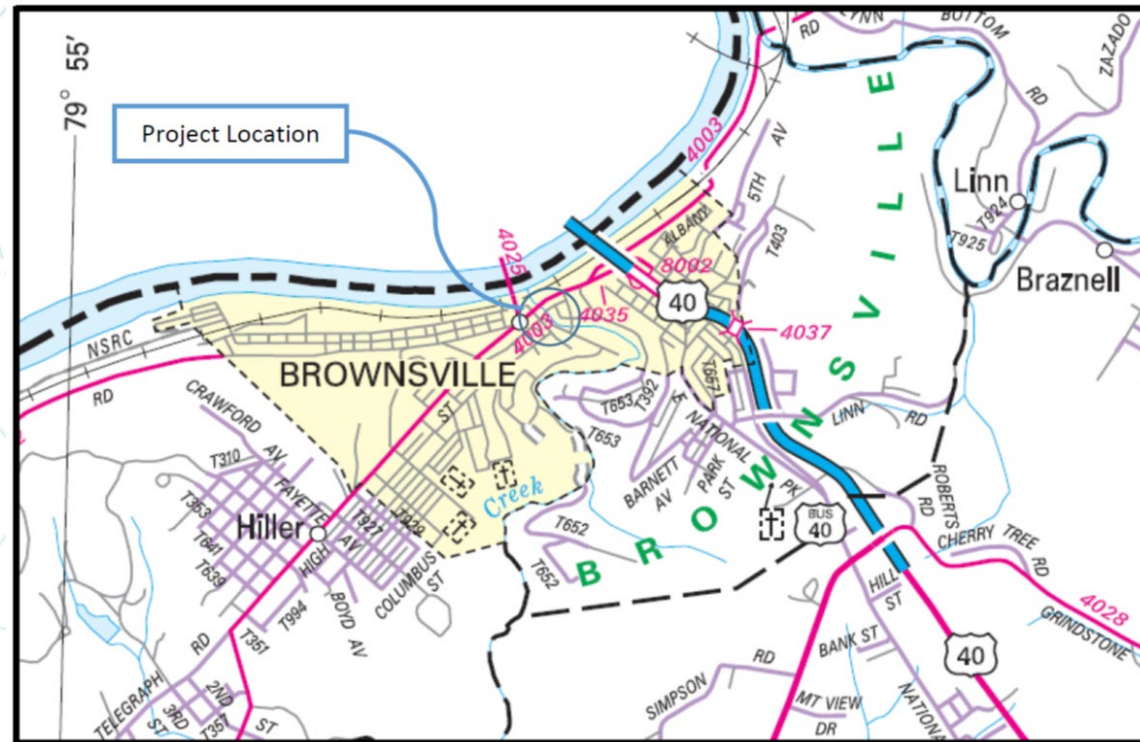
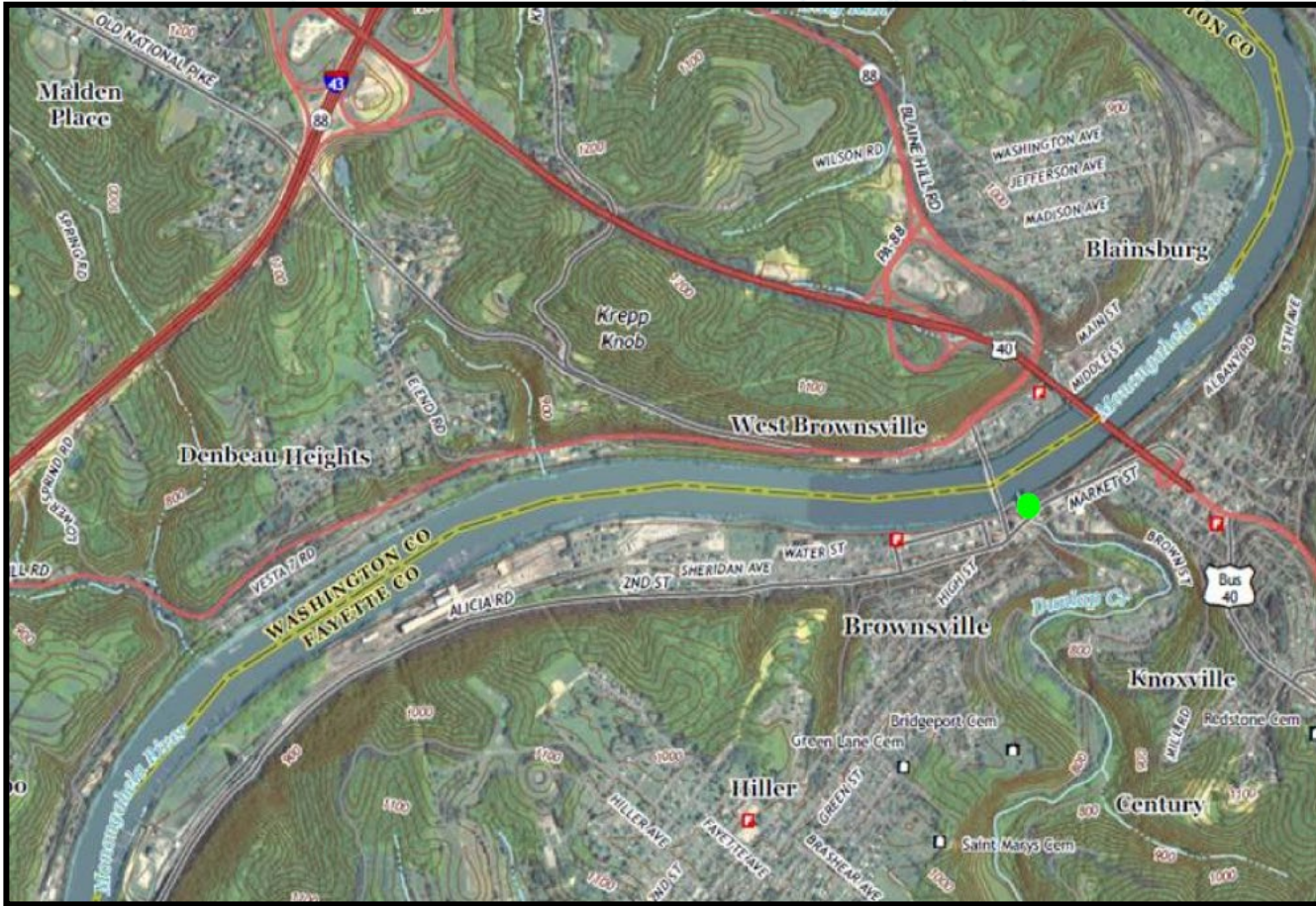
1845

- **PANAMA RAILROAD OPENS WITH THE FIRST TRAIN FROM THE ATLANTIC TO PACIFIC**

1855



PROJECT LOCATION



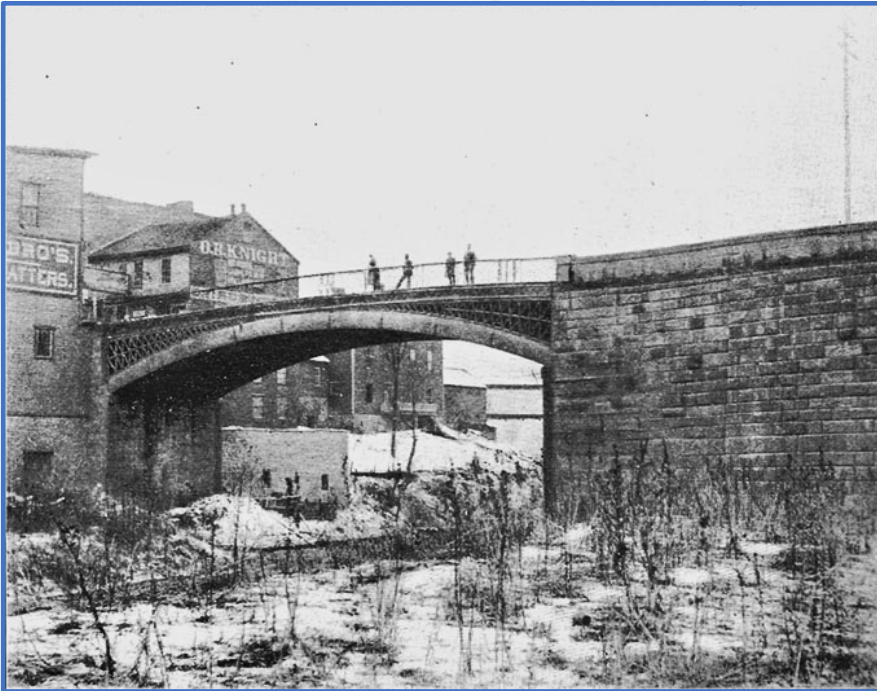
Fayette County Borough of Brownsville

HISTORICAL APPEARANCE

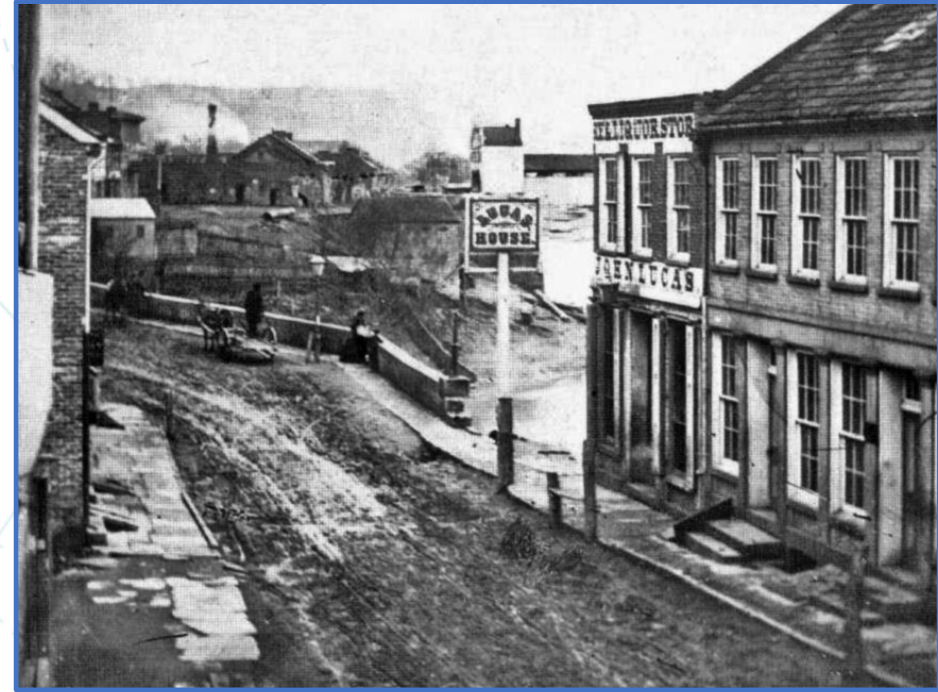


Dunlap Creek Bridge circa 1840's

HISTORICAL APPEARANCE

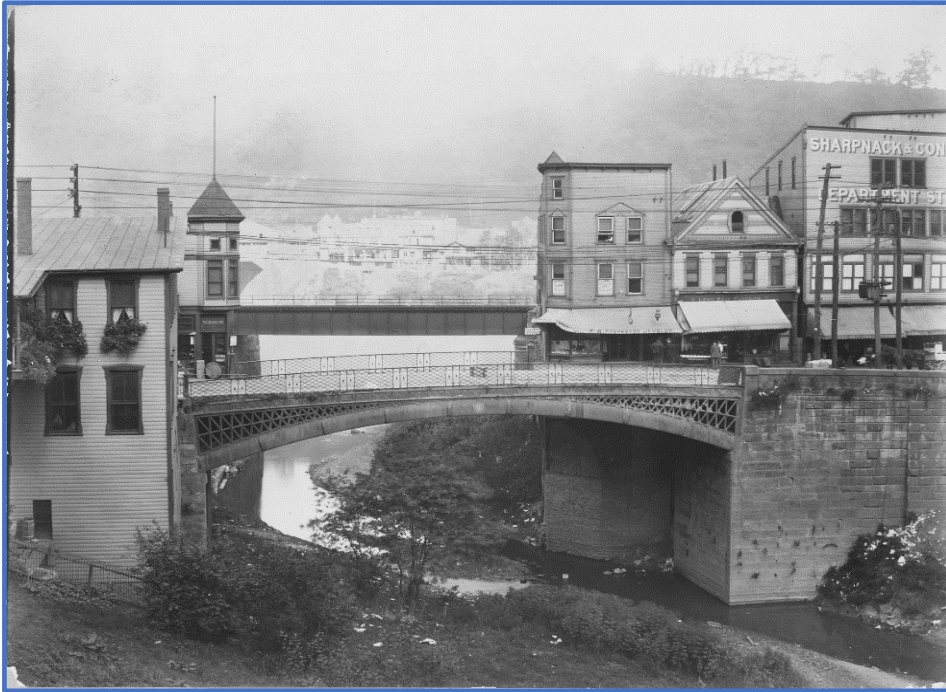


Dunlap Creek Bridge
circa 1894 *(left image)*



Dunlap Creek Bridge circa
1880's *(right image)*

HISTORICAL APPEARANCE

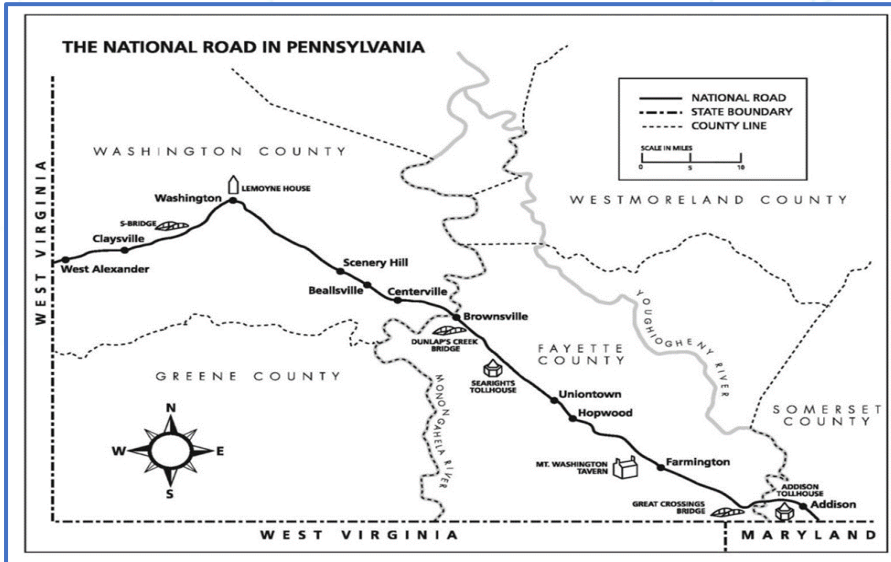


Dunlap Creek Bridge circa 1910
(left image)



Dunlap Creek Bridge circa 1904
(right image)

HISTORICAL APPEARANCE



“The Neck” Brownsville PA -

The Neck was the local nickname for the Brownsville center of business and commercial activity. It is the narrowest section of the entire National Road (former Cumberland Road). [1926 Route 40 construction began]

TODAY



PROJECT BACKGROUND

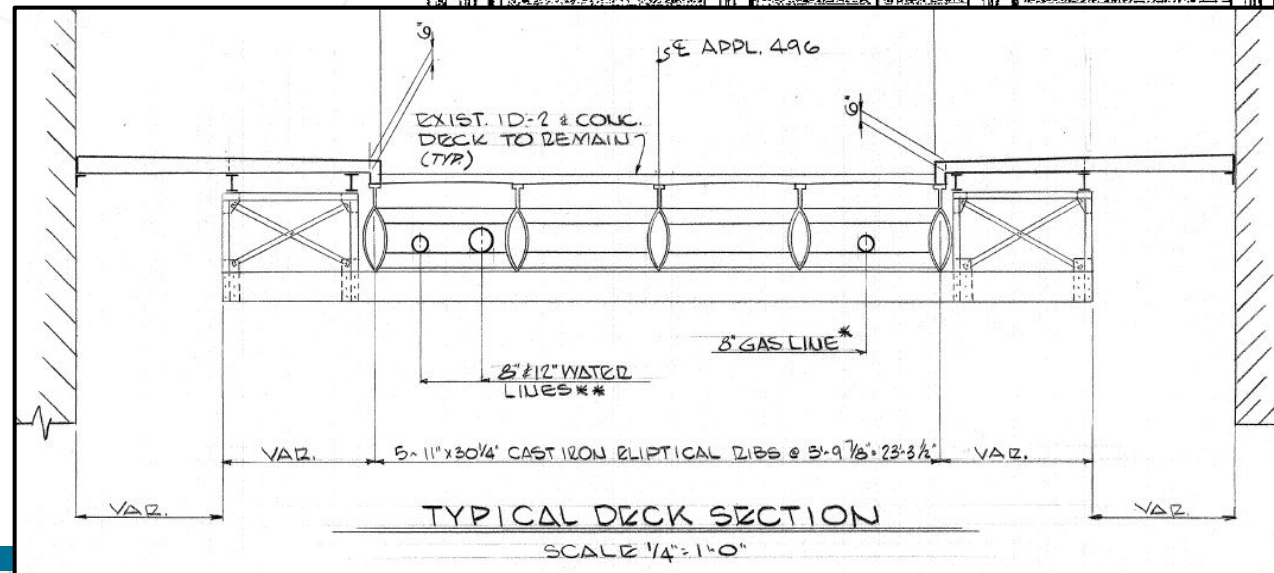
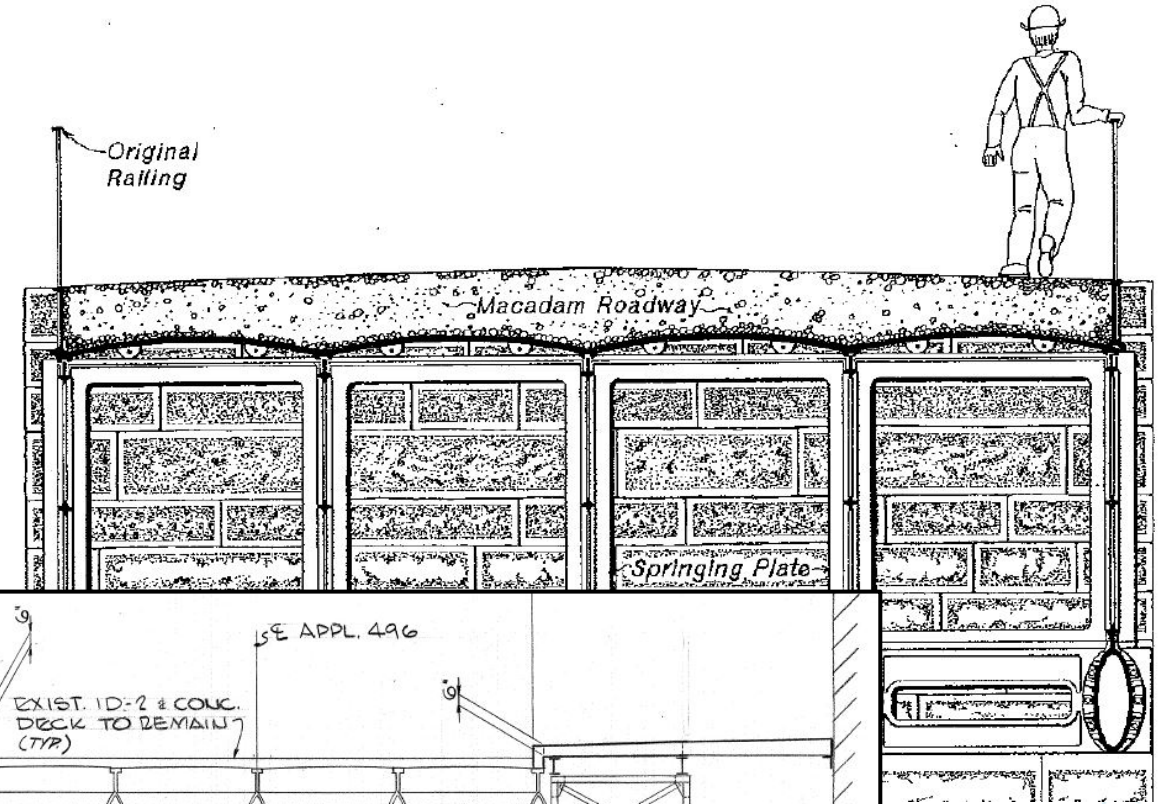
Original Bridge

- Constructed in 1839
- No sidewalks
- 23'-4" Roadway Width
- Decorative Railing

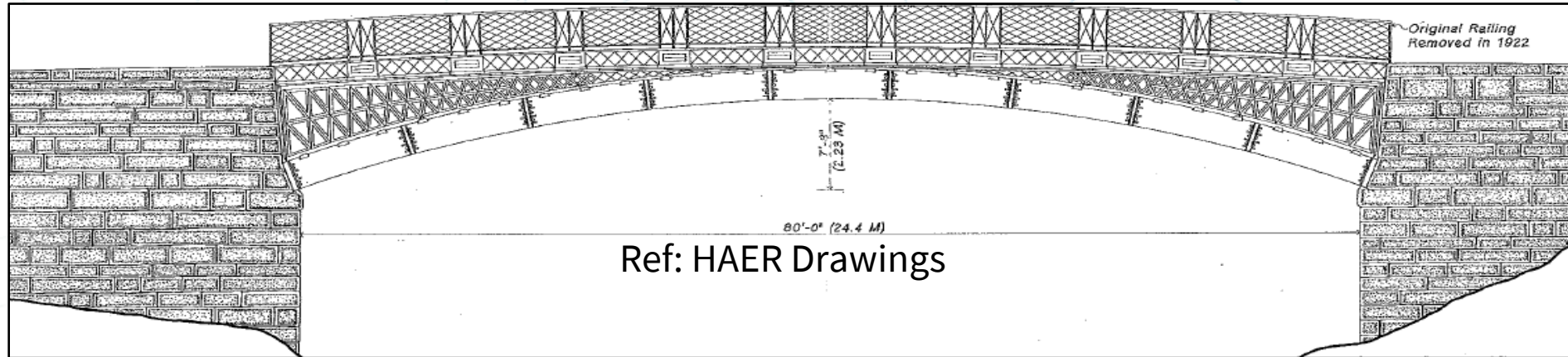
Rehabilitated Bridge

- Rehab in 1922 & 1980
- Deck Replaced
- Sidewalks Added
- Orig. Railings Replaced
- 22'-0" to 23'-0" Roadway Width

Historical Note



ORIGINAL BRIDGE ELEVATION



Ref: HAER Drawings



BRIDGE INSPECTION

- ❑ Structural Evaluation Condition Rating: 4
- ❑ Wearing Surface Condition Rating: 4
- ❑ Deck Condition Rating: 4
- ❑ Superstructure Condition Rating: 4
- ❑ Substructure Condition Rating: 5
- ❑ Channel Protection Condition Rating: 6
- ❑ Paint Condition Rating: 5
- ❑ Loading Rating Summary:
No Weight Restrictions Required

Scope of Work:

- Superstructure:
 - Remove existing sidewalk and pedestrian railing
 - Remove sidewalk support system
 - Clean superstructure components
 - Patch cast iron arch rib components using epoxy and stainless steel plates and install new segment bolts as required
 - Remove existing deck and wearing surface
 - Install new deck and bridge barrier
 - Barrier may be modified to consist of the PA Type 10M Bridge Barrier along the edge of shoulder to provide vehicular protection with a railing behind the PA Type 10M Bridge Barrier to provide a more historically accurate appearance when viewed from adjacent sidewalk structure
 - Paint entire structure
- Substructure
 - Repoint masonry abutments and wingwalls
 - Secure loose stone masonry with pinning and anchoring
 - Patch and fill voided areas in masonry units
 - Replace missing/broken stones as required
- Miscellaneous:
 - Relocate roadway drainage pipe (eliminate outlet through abutment)
 - Construct new independent pedestrian bridge¹ (or utilize the Charles Street Bridge for the permanent pedestrian crossing of Dunlap Creek²)
 - Install new ADA ramps and associated ADA facilities

The following table show the existing bridge load ratings:

Single Span Cast Iron Elliptical Arch Rib Existing ASD Load Ratings						
		P-82	HS20	H20	ML80	TK527
Inventory Rating	Location (STAAD Member)	-	44	50	48	48
	Rating Factor	-	0.97	1.14	0.76	0.82
Operating Rating	Location (STAAD Member)	48	44	50	48	48
	Rating Factor	1.03	1.58	1.89	1.25	1.35



SECTION 106 PROCESS



ProjectPATH (projectpath.org)

- APE (4/16)
- Phase IA – Arch. Recon. Report (8/16)
- Project Purpose & Need (8/16)
- Historic Structures Reconnaissance (9/16)
- Consulting Party Meeting Minutes
- CP Mtg #1(9/16), CP Mtg #2 (6/17),
- CP Mtg #3 (12/18), CP Mtg #4 (5/21)
- Determination of Effects (1/18)
- Effects Addendum (3/21)
- **SHPO Concurrence (8/21)**

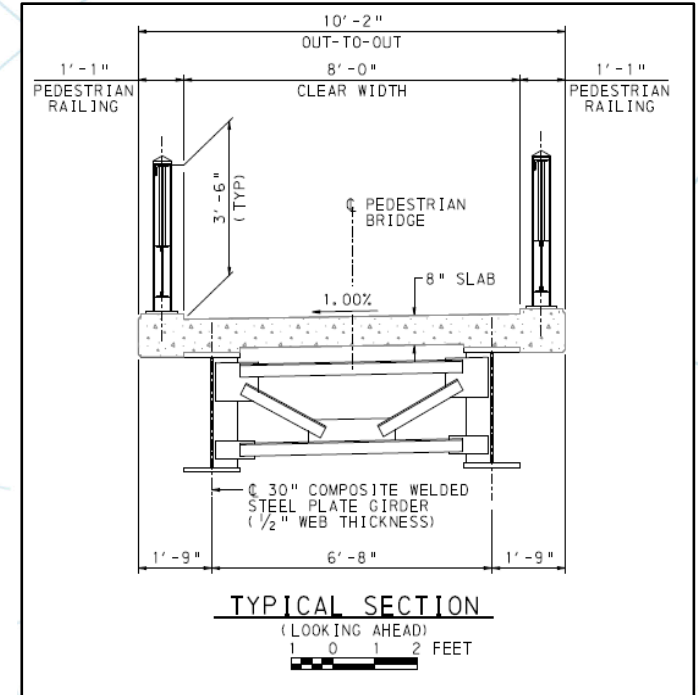
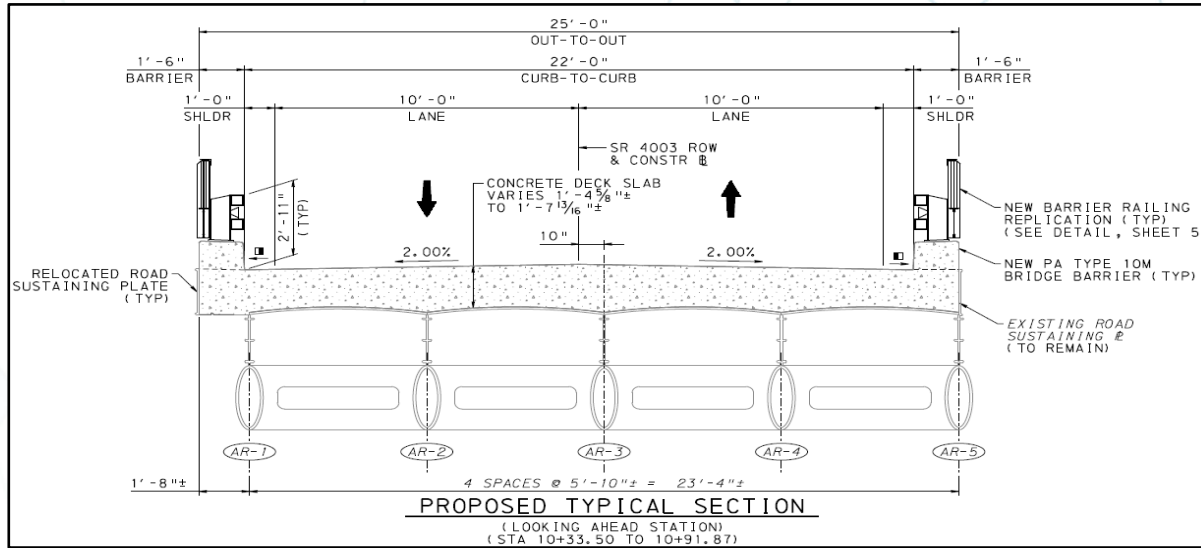


Summary of Effects

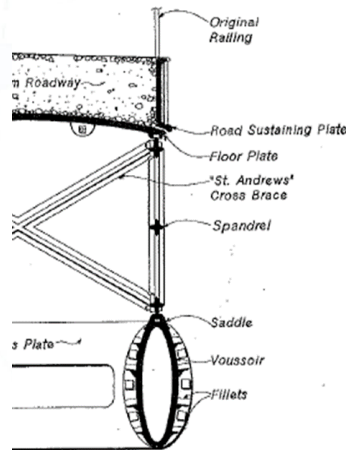
- Dunlap Creek Brdg – No Adverse Effect
- Brownsville Commercial Historic District – No Adverse Effect
- Brownsville / Intercounty Brdg – No Effect
- Monongahela Railroad – No Effect
- Monongahela River Navigation System – No Effect
- National Road Heritage Corridor – No Effect
- **Recommended Finding for Project – No Adverse Effect**
- **SHPO Concurrence – No Adverse Effect**

Environmental Clearance – Feb 2022

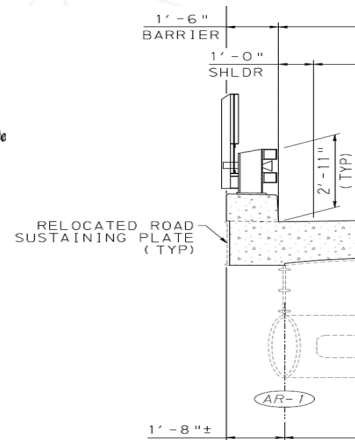
RECOMMENDED ALTERNATIVE



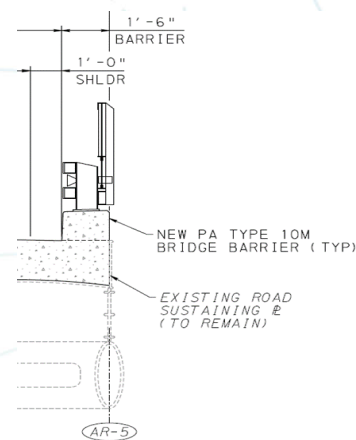
Original Road Sustaining Plate Layout



Downstream Side



Upstream Side



Upstream Sidewalk Structure Relocation



ROAD SUSTAINING PLATE



Road Sustaining Plate





Brownsville Central Park

Dunlap Creek Bridge – Downstream Side



Pedestrian Bridge – Upstream Side



Snowdon Square



Road Sustaining Plate

**PA Type 10M
Barrier w/
Decorative
Railing**

**Foundation
Extension**



PA Type 10M Bridge Barrier with Decorative Railing

PA Type
10M Barrier
w/
Decorative
Railing

Pedestrian
Bridge

Road Sustaining
Plate

Arch
Spandrel



HYDRAULIC DATA FOR DUNLAP CREEK
 DRAINAGE AREA 41.60 SQ. MILES
 10 YEAR EVENT:
 DISCHARGE = 3380 CFS
 EXISTING VELOCITY = 3.3 FPS
 PROPOSED VELOCITY = 3.3 FPS
 EXISTING WATER SURFACE ELEVATION = 165.41
 PROPOSED WATER SURFACE ELEVATION = 165.05
 100 YEAR EVENT:
 DISCHARGE = 6750 CFS
 EXISTING VELOCITY = 2.6 FPS
 PROPOSED VELOCITY = 2.6 FPS
 EXISTING WATER SURFACE ELEVATION = 174.37
 PROPOSED WATER SURFACE ELEVATION = 174.21

BM-1 ELEV = 776.70'
 39' LT STA. 9+59.04
 "X" CUT IN FH BOLT

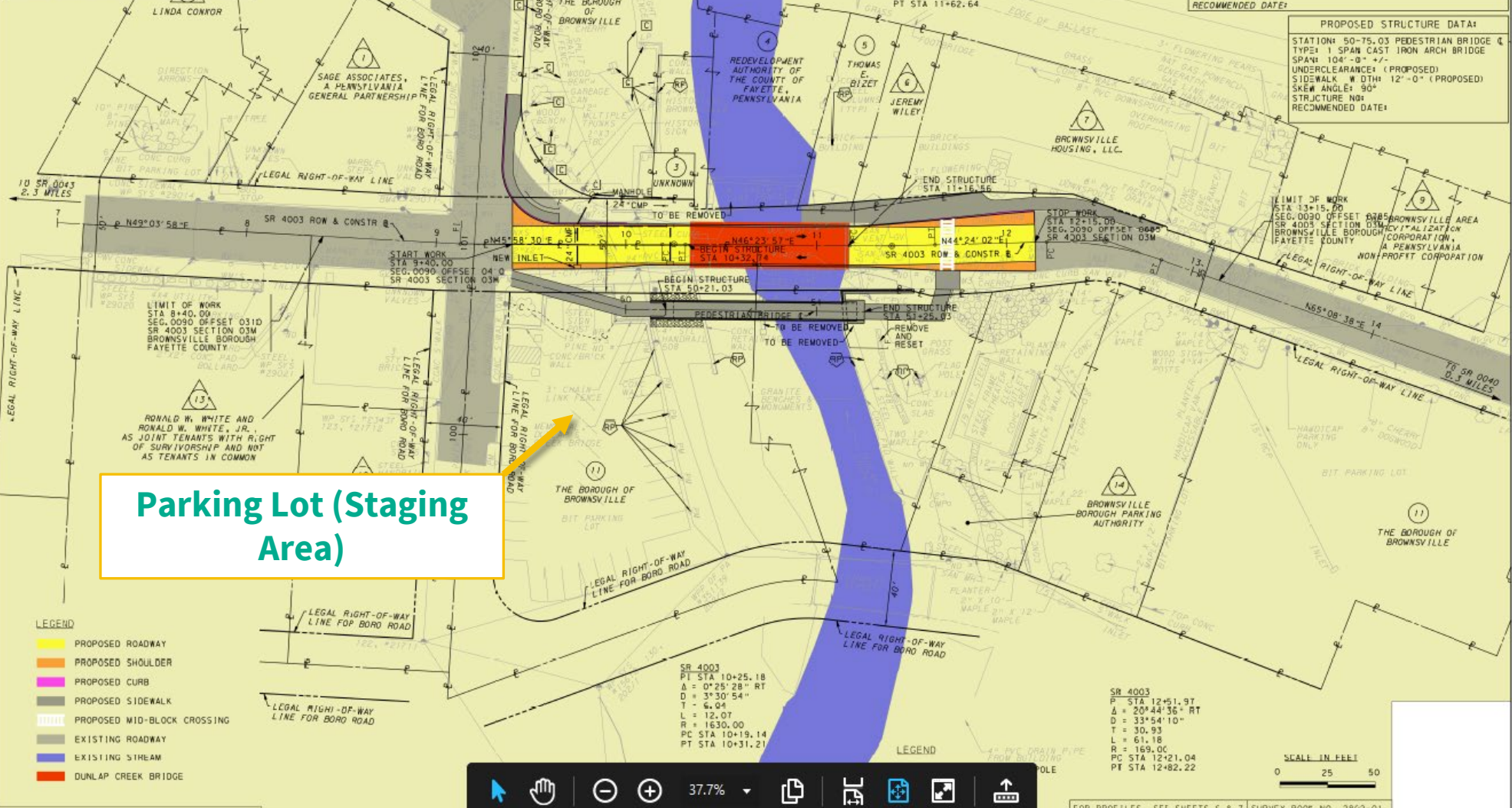
BM-3 ELEV = 7736.22'
 21' RT STA. 11+60.91
 "X" CUT IN FH BOLT

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
12-0	FAYETTE	4003	03M	5 OF 7

BROWNSVILLE BOROUGH			
REVISION NUMBER	REVISIONS	DATE	BY

EXISTING/PROPOSED STRUCTURE DATA:
 STATION: 10+90.00 SR 4003 SURVEY & ROW #2
 TYPE: 1 SPAN CAST IRON ARCH BRIDGE
 SPAN: 80'-0" +/-
 UNDERCLEARANCE: (EXISTING)
 CLEAR ROADWAY WIDTH VARIES 22'-6" TO 23'-0" (EXISTING)
 22'-0" (PROPOSED)
 SKEW ANGLE: 90°
 STRUCTURE NO:
 RECOMMENDED DATE:

PROPOSED STRUCTURE DATA:
 STATION: 50-75.03 PEDESTRIAN BRIDGE #4
 TYPE: 1 SPAN CAST IRON ARCH BRIDGE
 SPAN: 104'-0" +/-
 UNDERCLEARANCE: (PROPOSED)
 SIDEWALK WIDTH: 12'-0" (PROPOSED)
 SKEW ANGLE: 90°
 STRUCTURE NO:
 RECOMMENDED DATE:



Parking Lot (Staging Area)

- LEGEND
- PROPOSED ROADWAY
 - PROPOSED SHOULDER
 - PROPOSED CURB
 - PROPOSED SIDEWALK
 - PROPOSED MID-BLOCK CROSSING
 - EXISTING ROADWAY
 - EXISTING STREAM
 - DUNLAP CREEK BRIDGE

Navigation and scale controls: 37.7% zoom, pan, zoom in (+), zoom out (-), print, and other utility icons.

SCALE IN FEET: 0 25 50
 FOR PROFILES, SEE SHEETS 6 & 7 SURVEY BOOK NO. 2802-01

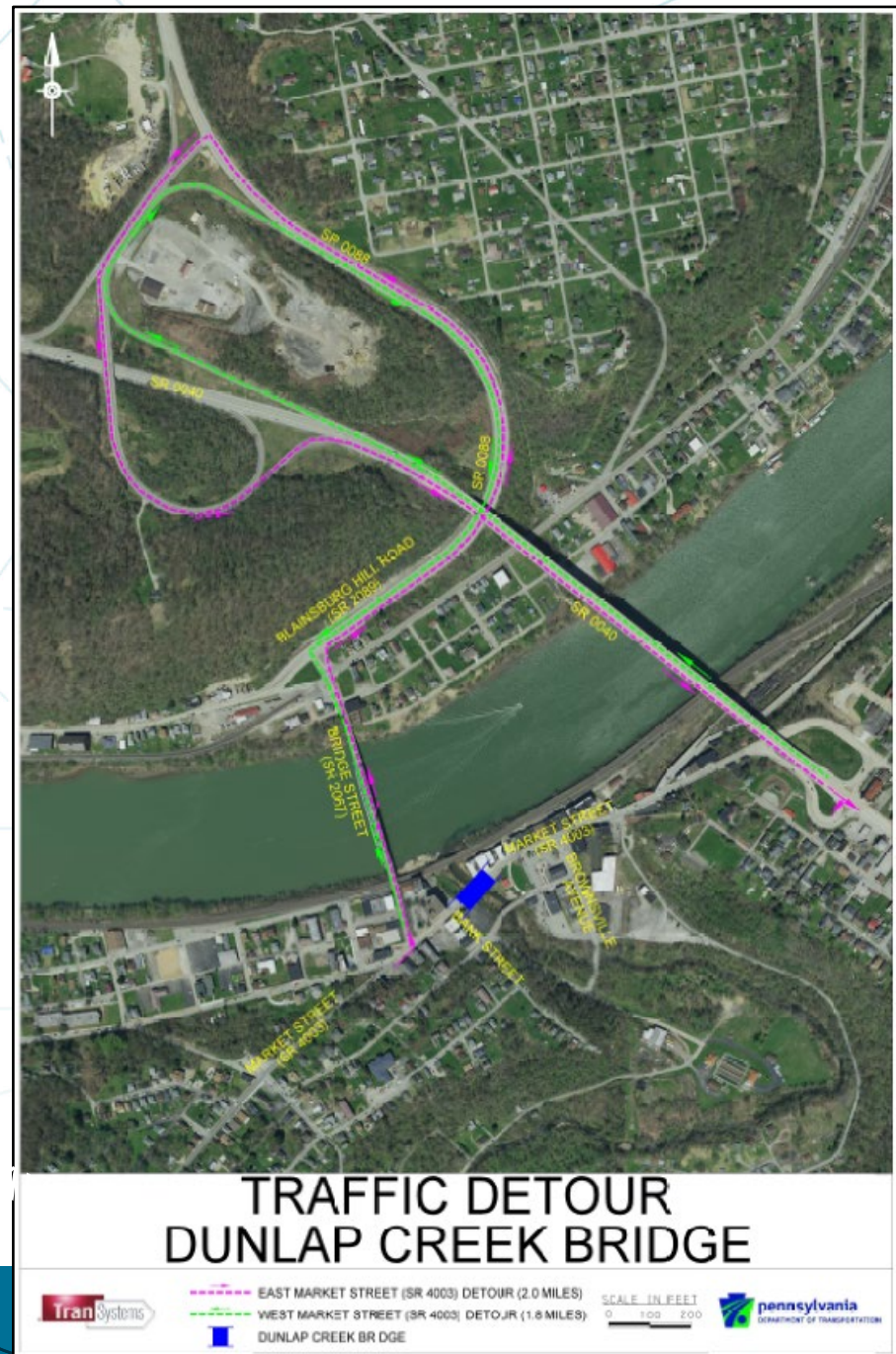


MID BLOCK CROSSING



TRAFFIC DETOUR

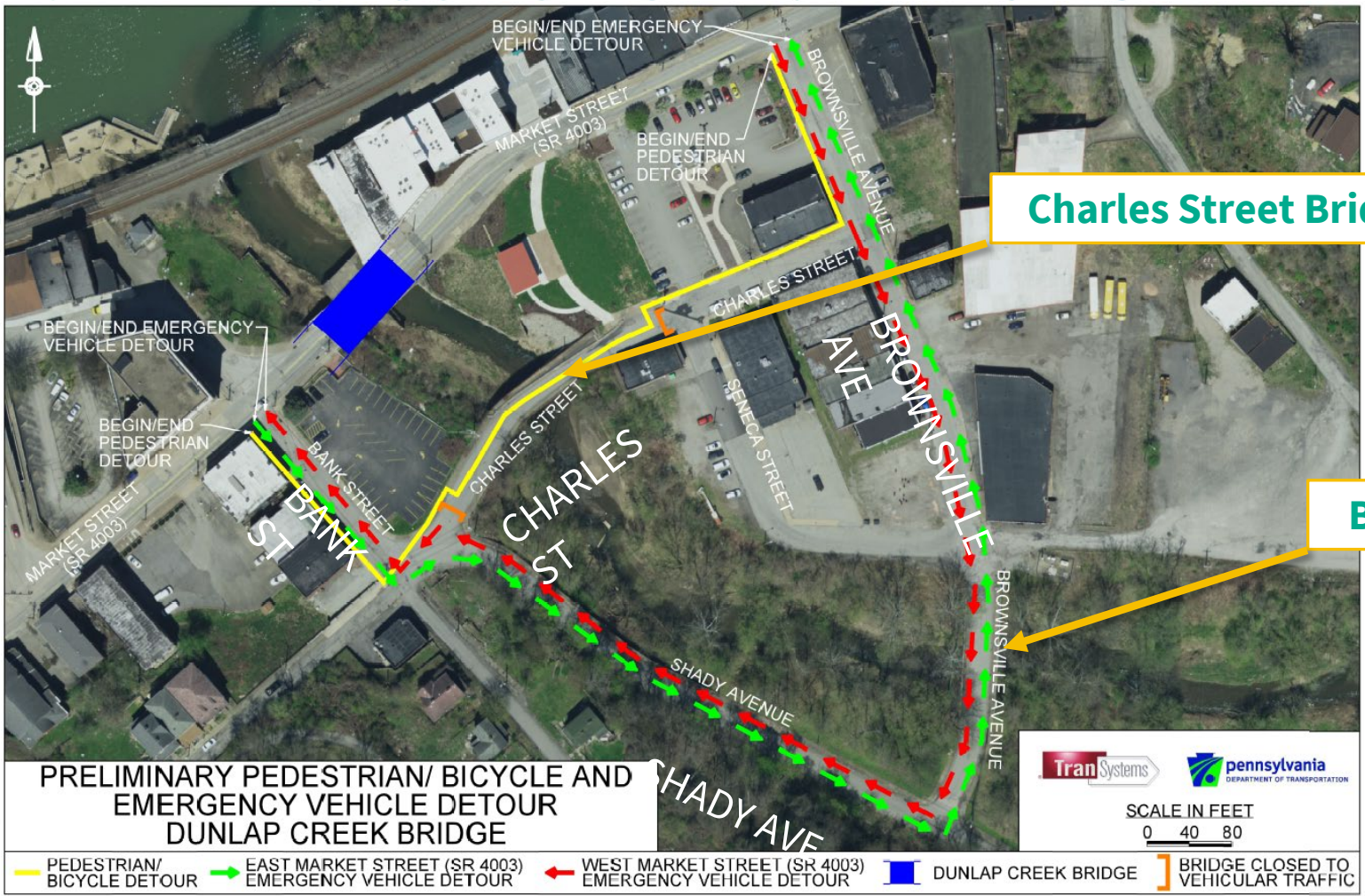
- **East Market Street Detour**
(2.0 miles | 4 minutes)
 - Market Street (SR 4003)
 - Bridge Street (SR 2067)
 - Blainsburg Hill Road (SR 2089 | SR 0088)
 - SR 0040
- **West Market Street Detour**
(1.8 miles | 4 minutes)
 - SR 0040
 - Blainsburg Hill Road (SR 0088 | SR 2089)
 - Bridge Street (SR 2067)
 - Market Street (SR 4003)



PEDESTRIAN / EMERGENCY VEHICLE DETOUR

Charles Street Bridge
(rehabilitated by Brownsville Boro)

Brownsville Ave Bridge
(rehabilitated by District under OE)



Charles Street Bridge

Brownsville Ave Bridge



DESIGN / CONSTRUCTION ISSUES

- Bridge Disassembly / Reassembly
- Bridge Repairs / Repair Techniques
- Foundation Extension Construction
- Basement Sidewalk Vault Abandonment
- Bridge Barrier Termination
- Foundation Wall Impacts / Foundation Removal
- Roadway Pavement Transition



BRIDGE DISASSEMBLY / REASSEMBLY

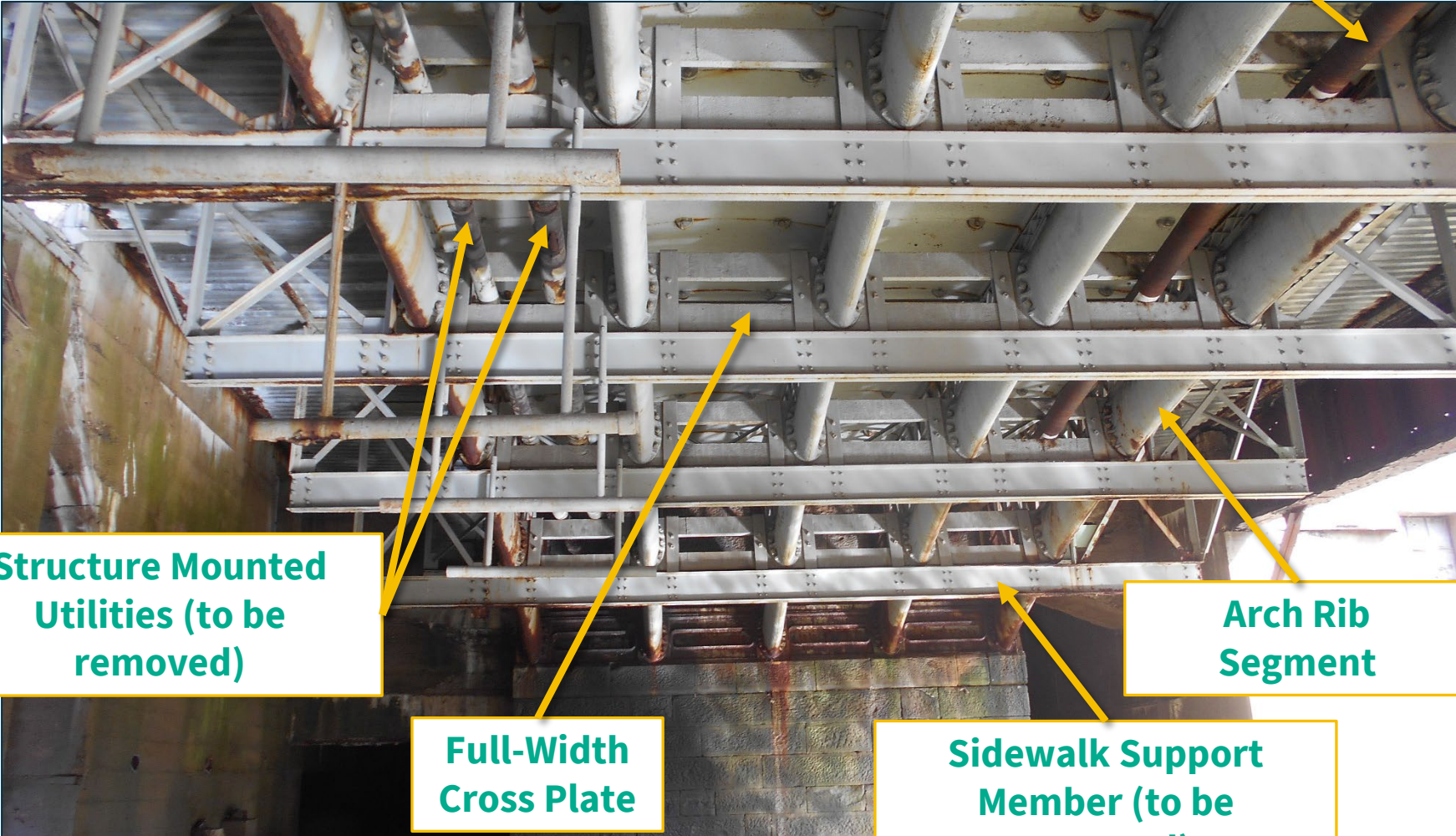
- To safely perform repairs in a controlled environment, disassembly of the bridge superstructure is required
- Disassembly will be intricate process due to the construction style of the existing bridge
 - ✓ Will require temporary support system to be in place during disassembly
 - ✓ Because entire bridge is interconnected, it is not be feasible to remove one arch line at a time
 - ✓ Each individual arch line consists of 9 arch segments. Each segment is attached to full-width transverse cross-plates (8 cross-plates total), connecting all 5 arch lines together.

Historical Note



BRIDGE DISASSEMBLY / REASSEMBLY

Structure Mounted Utility (to be removed)



Structure Mounted Utilities (to be removed)

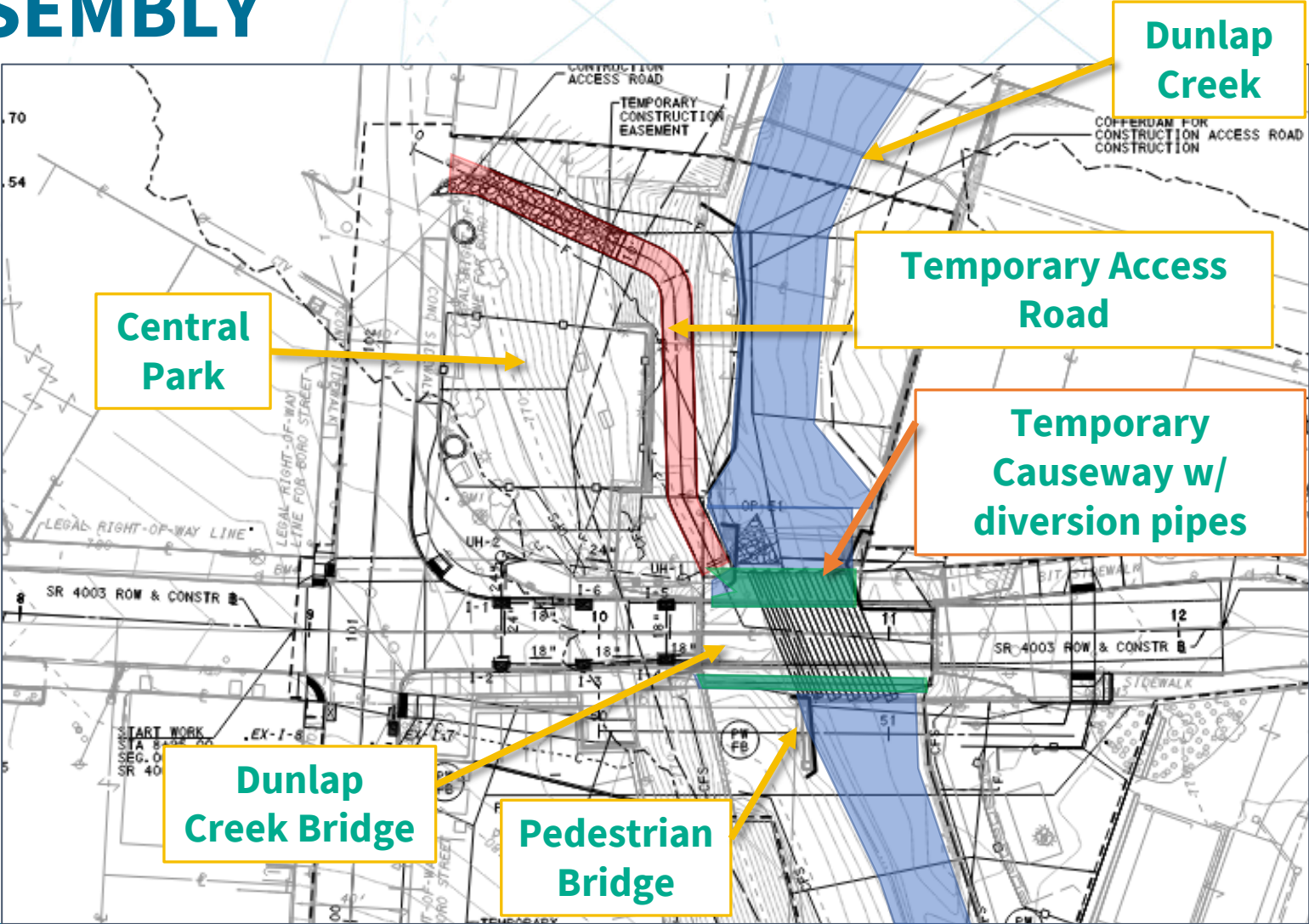
Full-Width Cross Plate

Arch Rib Segment

Sidewalk Support Member (to be removed)



BRIDGE DISASSEMBLY / REASSEMBLY



BRIDGE DISASSEMBLY / REASSEMBLY

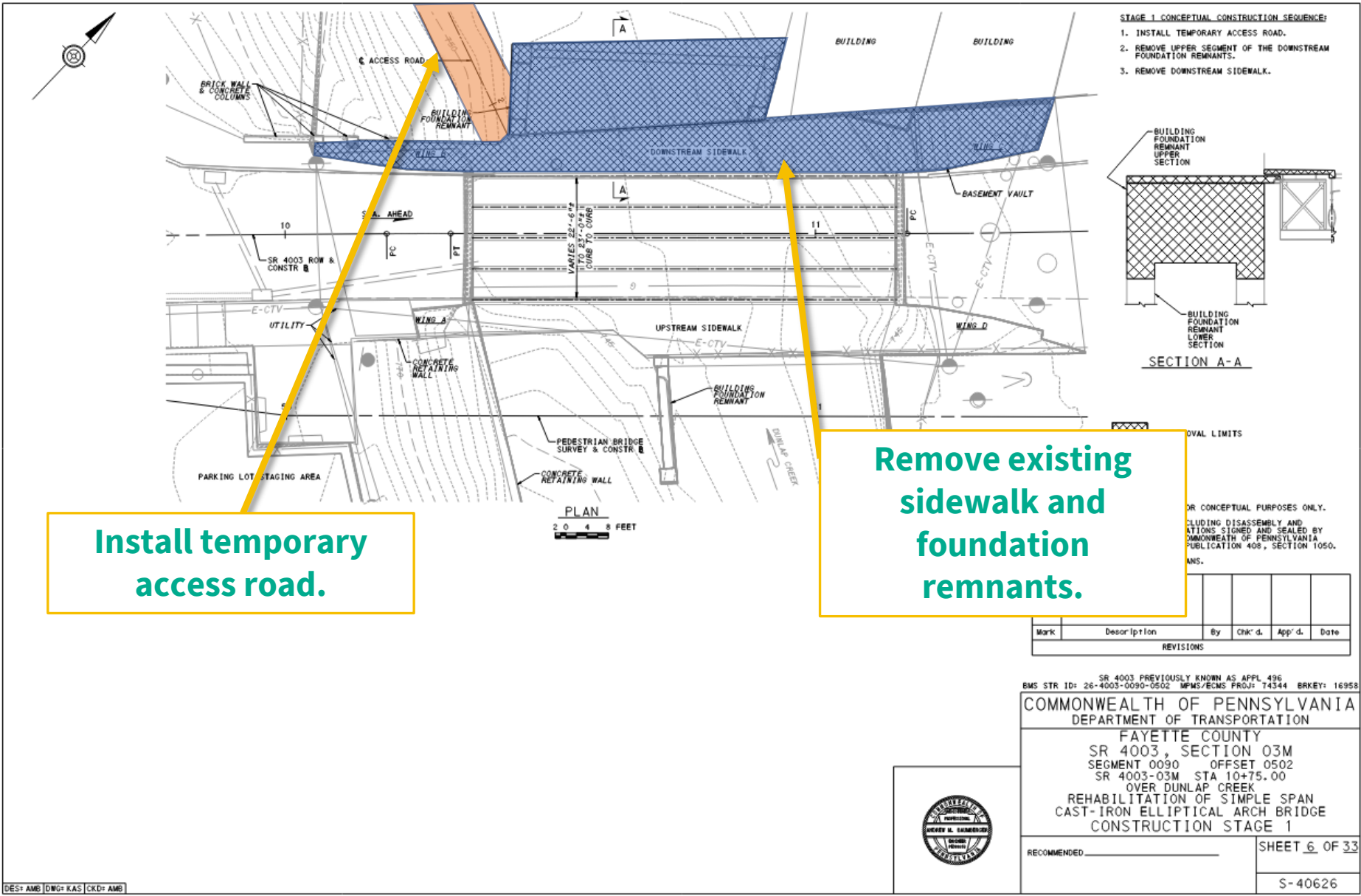
▪ Conceptual Construction Sequence:

1. Install temporary access road. Demolish downstream bridge sidewalk and portion of foundation remnants.
2. Install temporary diversion pipes, stream crossing, shoring and cofferdams. Remove downstream foundation remnants. Construct temporary support system for bridge disassembly.
3. Demo sidewalks and sidewalk supports. Carefully remove deck, road sustain plates, and deck plans. Remove cross-bracing and lattice spandrel elements.



CONSTRUCTION STAGE 1

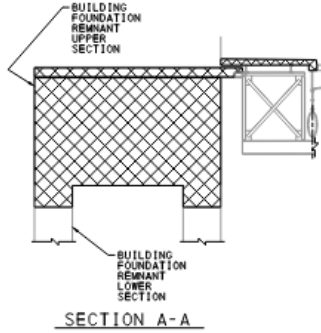
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Install temporary access road.

Remove existing sidewalk and foundation remnants.

- STAGE 1 CONCEPTUAL CONSTRUCTION SEQUENCE:
1. INSTALL TEMPORARY ACCESS ROAD.
 2. REMOVE UPPER SEGMENT OF THE DOWNSTREAM FOUNDATION REMNANTS.
 3. REMOVE DOWNSTREAM SIDEWALK.



FOR CONCEPTUAL PURPOSES ONLY. INCLUDING DISASSEMBLY AND ACTIONS SIGNED AND SEALED BY COMMONWEALTH OF PENNSYLVANIA PUBLICATION 408, SECTION 1050.

Mark	Description	By	Chk'd	App'd	Date
REVISIONS					

BMS STR ID: 26-4003-0090-0502 MPM/ECMS PROJ# 74344 BRKEY: 16958
SR 4003 PREVIOUSLY KNOWN AS APPL 496

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
FAYETTE COUNTY
SR 4003, SECTION 03M
SEGMENT 0090 OFFSET 0502
SR 4003-03M STA 10+75.00
OVER DUNLAP CREEK
REHABILITATION OF SIMPLE SPAN
CAST-IRON ELLIPTICAL ARCH BRIDGE
CONSTRUCTION STAGE 1



RECOMMENDED _____ SHEET 6 OF 33
S-40626



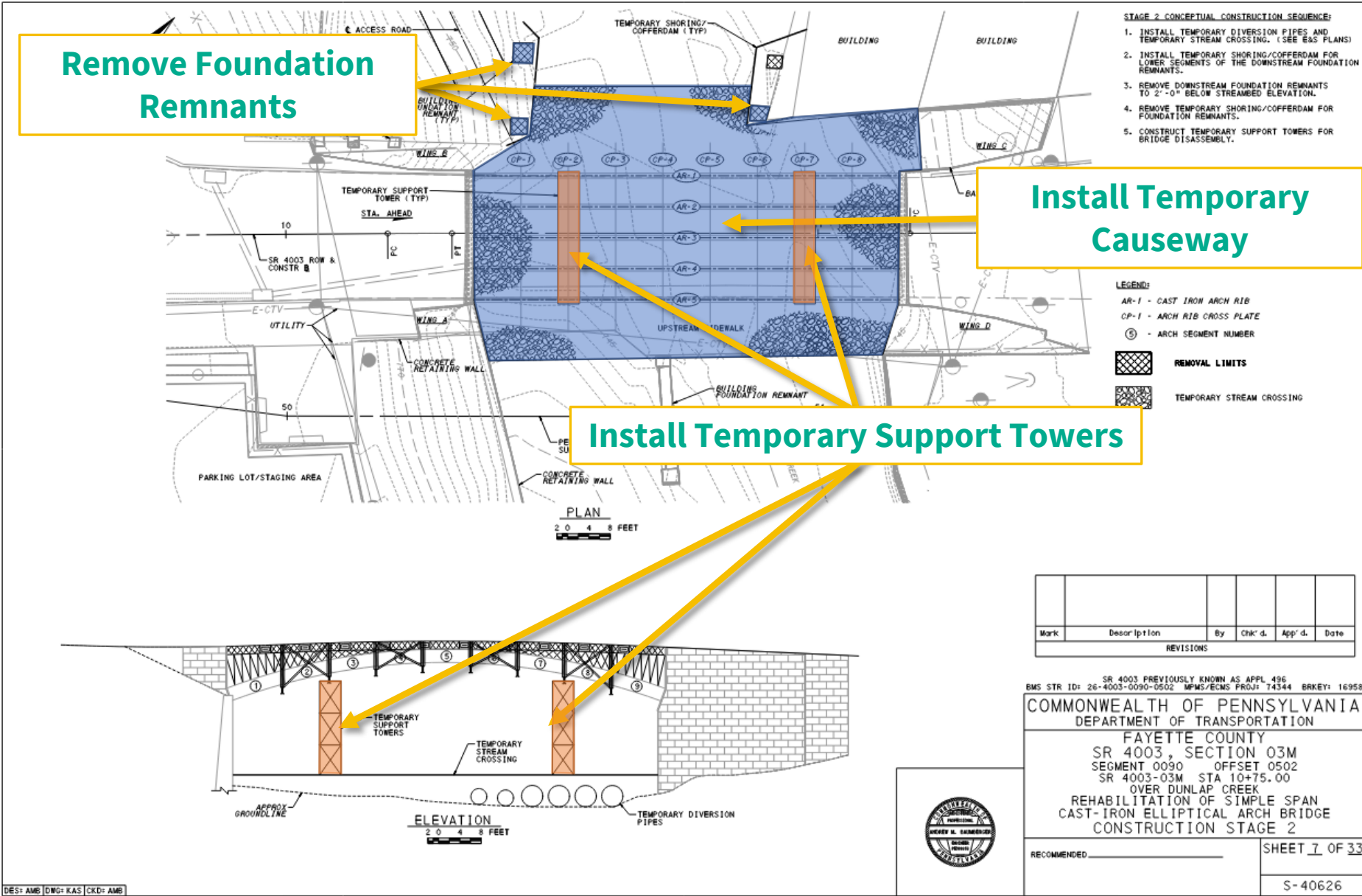
BRIDGE DISASSEMBLY / REASSEMBLY

▪ Conceptual Construction Sequence:

1. Install temporary access road. Demolish bridge sidewalks and foundation remnants.
2. Install temporary diversion pipes, stream crossing, shoring and cofferdams. Remove downstream foundation remnants. Construct temporary support system for bridge disassembly.
3. Demo sidewalks and sidewalk supports. Carefully remove deck, road sustain plates, and deck plans. Remove cross-bracing and lattice spandrel elements.



CONSTRUCTION STAGE 2



BRIDGE DISASSEMBLY / REASSEMBLY

▪ Conceptual Construction Sequence:

1. Install temporary access road. Demolish bridge sidewalks and foundation remnants.
2. Install temporary diversion pipes, stream crossing, shoring and cofferdams. Remove downstream foundation remnants. Construct temporary support system for bridge disassembly.
3. Demo sidewalks and sidewalk supports. Carefully remove deck, road sustain plates, and deck plans. Remove cross-bracing and lattice spandrel elements.

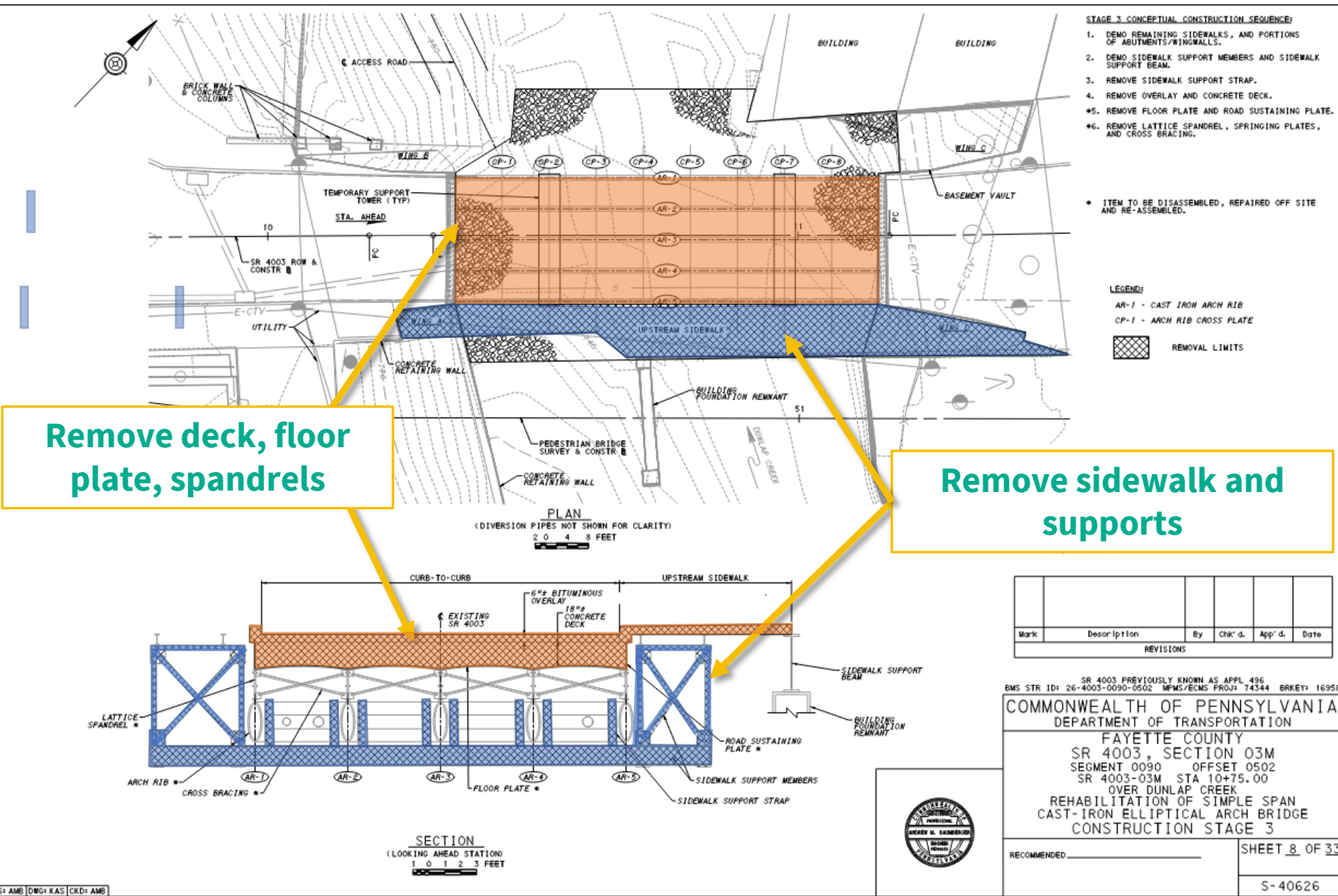


CONSTRUCTION STAGE 3

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 11/25/25

Remove deck, floor plate, spandrels

Remove sidewalk and supports



BRIDGE DISASSEMBLY / REASSEMBLY

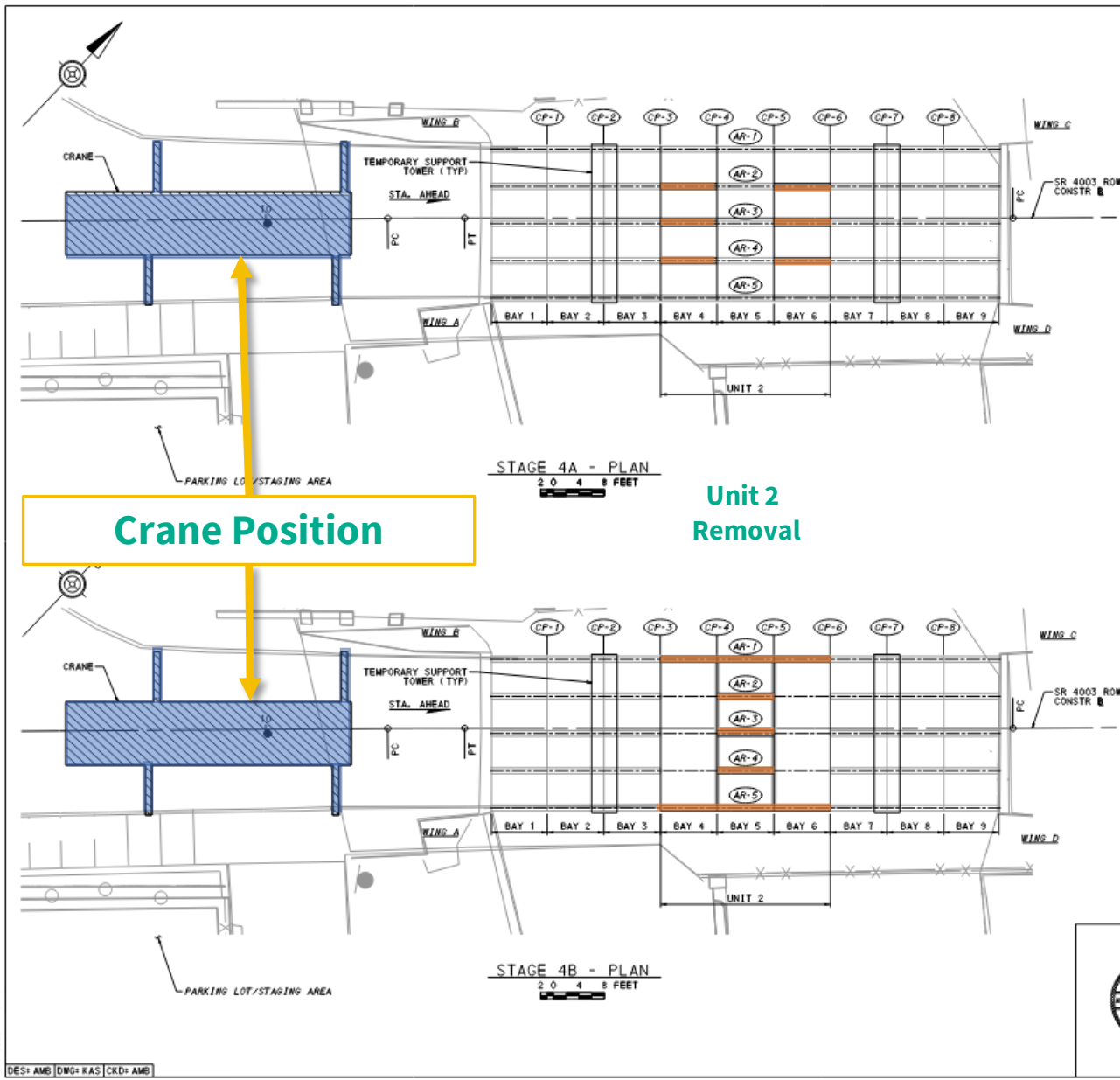
▪ Conceptual Construction Sequence:

4. For all subsections of this stage, members will be reconnected as necessary to maintain structural stability.
 - 4a. Remove internal arch segments in Bays 4 and 6 (Arch Segments (AR) 2, 3 & 4).
 - 4b. Remove remainder of Unit 2 (AR-2, AR-3 & AR-4 in Bay 5, AR-1 & AR-2 in Bays 4-6).
 - 4c. Remove entirety of Unit 1 and selected portions of Unit 3 (Crossplate 6, AR-1-5 in Bay 7).
 - 4d. Remove remainder of Unit 3.
5. Install temporary shoring for foundation extension construction, construct foundation extension, and remove upstream foundation remnants.



CONSTRUCTION STAGE 4A/4B

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- STAGE 4A CONCEPTUAL CONSTRUCTION SEQUENCE - CAST IRON BRIDGE DISASSEMBLY AND REASSEMBLED.**
1. ALL ITEMS IN THIS STAGE TO BE DISASSEMBLED, REPAIRED OFF SITE, AND REASSEMBLED.
 2. REMOVE AR-2, AR-3, & AR-4 IN BAY 4. REPLACE BOLTS, OR USE TEMPORARY BOLTS, TO RE-CONNECT CP-3 TO THE ARCH RIBS IN BAY 3.
 3. REMOVE AR-2, AR-3, & AR-4 IN BAY 6. REPLACE BOLTS, OR USE TEMPORARY BOLTS, TO RE-CONNECT CP-6 TO THE ARCH RIBS IN BAY 7.

- STAGE 4B CONCEPTUAL CONSTRUCTION SEQUENCE - CAST IRON BRIDGE DISASSEMBLY AND REASSEMBLED.**
1. ALL ITEMS IN THIS STAGE TO BE DISASSEMBLED, REPAIRED OFF SITE, AND REASSEMBLED.
 2. REMOVE BOLTS AT THE FOLLOWING CONNECTIONS: AR-1 TO CP-3; AR-1 TO CP-6; AR-5 TO CP-5; AR-5 TO CP-6.
 3. REMOVE THE REMAINING PORTIONS OF UNIT 2. THIS INCLUDES AR-1 AND AR-5 BETWEEN CP-3 & CP-6; CP-4; CP-5; AND AR-2, AR-3, & AR-4 IN BAY 5.
 4. REPLACE BOLTS, OR USE TEMPORARY BOLTS, TO RE-CONNECT AR-1 AND AR-5 TO CP-3.

NOTES:

ASSUMED CRANE - MANITOWOC 999 NO. 82 WITH 110' BOOM LENGTH.
 90% MAX ALLOWABLE CRANE CAPACITY.
 10,000 LB LIFTING CONFIGURATION.
 ONE CRANE LOCATED BEHIND ABUTMENT 1.
 PARKING LOT AT SOUTHWEST CORNER TO BE USED AS A STAGING AREA FOR BRIDGE COMPONENTS.

LEGEND:

AR-1 - CAST IRON ARCH RIB
 CP-1 - ARCH RIB CROSS PLATE
 - ITEM TO BE DISASSEMBLED

Mark	Description	By	Chk'd.	App'd.	Date
REVISIONS					

SR 4003 PREVIOUSLY KNOWN AS APPL 496
 BMS STR ID: 26-4003-0090-0502 MFMS/ECMS PROJ: 74344 BRKEY: 16958

COMMONWEALTH OF PENNSYLVANIA
 DEPARTMENT OF TRANSPORTATION
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 SR 4003, SECTION 03M
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 OVER DUNLAP CREEK
 REHABILITATION OF SIMPLE SPAN
 CAST-IRON ELLIPTICAL ARCH BRIDGE
 CONSTRUCTION STAGE 4A/4B

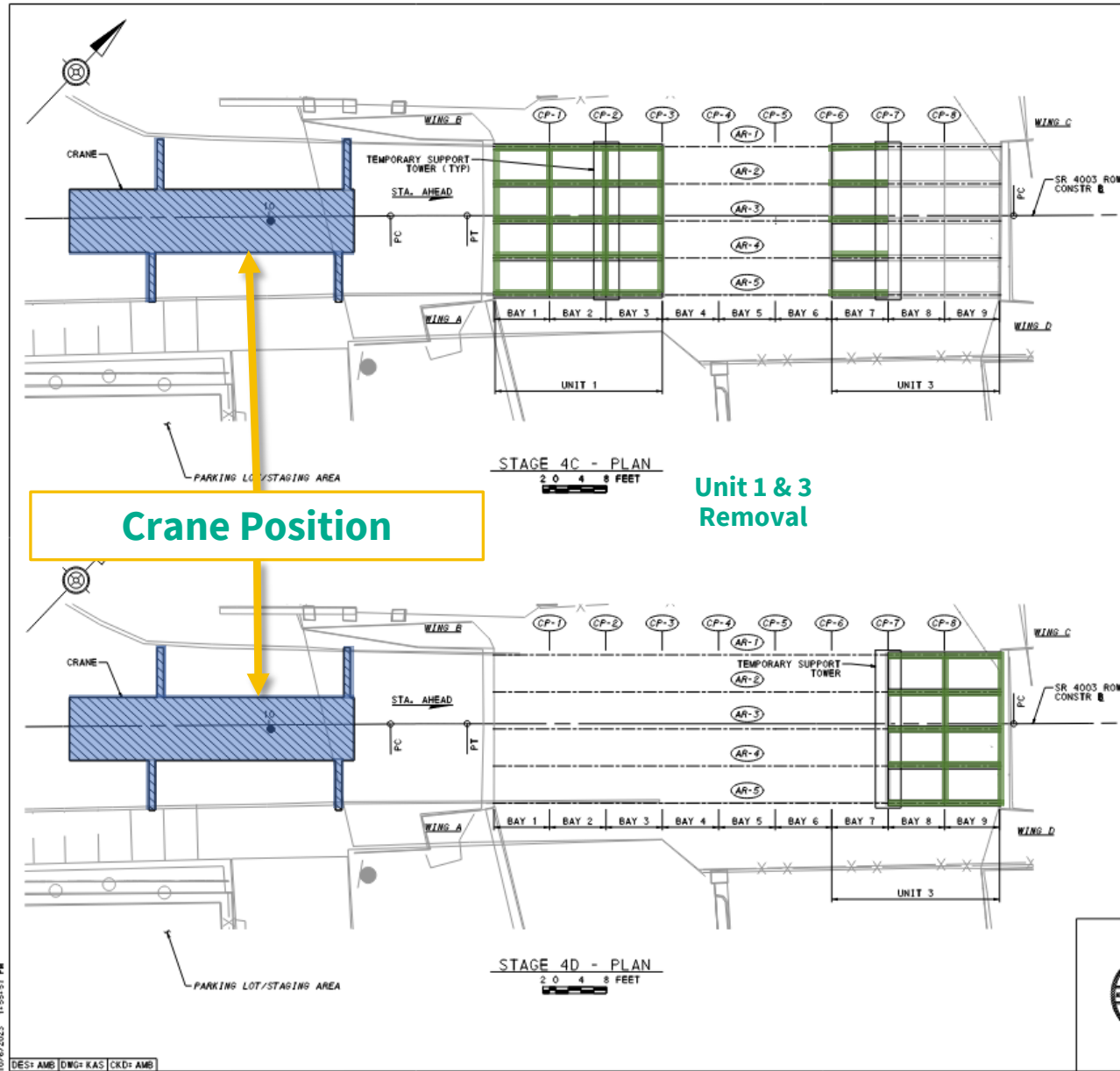
RECOMMENDED _____

SHEET 9 OF 33

S-40626



CONSTRUCTION STAGE 4C/4D



- STAGE 4C CONCEPTUAL CONSTRUCTION SEQUENCE - CAST IRON BRIDGE DISASSEMBLY**
1. ALL ITEMS IN THIS STAGE TO BE DISASSEMBLED, REPAIRED OFF SITE, AND REASSEMBLED.
 2. REMOVE UNIT 1. THIS INCLUDES AR-1 THROUGH AR-5 IN BAYS 1 THROUGH 3; CP-1; CP-2 & CP-3.
 3. REMOVE CP-6.
 4. REMOVE AR-1 THROUGH AR-5 BETWEEN CP-6 AND CP-7. REPLACE BOLTS, OR USE TEMPORARY BOLTS, TO RE-CONNECT CP-7 TO THE ARCH RIBS IN BAY 8.
 5. REMOVE SKEW BACK PLATE AT ABUTMENT 1.

- STAGE 4D CONCEPTUAL CONSTRUCTION SEQUENCE - CAST IRON BRIDGE DISASSEMBLY**
1. ALL ITEMS IN THIS STAGE TO BE DISASSEMBLED, REPAIRED OFF SITE, AND REASSEMBLED.
 2. REMOVE REMAINING PORTION OF UNIT 3. THIS INCLUDES AR-1 THROUGH AR-5 IN BAYS 8 & 9; CP-7, & CP-8.
 3. REMOVE SKEW BACK PLATE AT ABUTMENT 2.

NOTES:

ASSUMED CRANE - MANITOWOC 999 NO. 82 WITH 110' BOOM LENGTH.
 90% MAX ALLOWABLE CRANE CAPACITY.
 10,000 LB LIFTING CONFIGURATION.
 ONE CRANE LOCATED BEHIND ABUTMENT 1.
 PARKING LOT AT SOUTHWEST CORNER TO BE USED AS A STAGING AREA FOR BRIDGE COMPONENTS.

LEGEND:

AR-1 - CAST IRON ARCH RIB
 CP-1 - ARCH RIB CROSS PLATE
 - ITEM TO BE DISASSEMBLED

Mark	Description	By	Chk'd.	App'd.	Date
REVISIONS					

SR 4003 PREVIOUSLY KNOWN AS APPL 496
 BMS STR ID: 26-4003-0090-0502 MPM/ECMS PROJ: 74544 BRKEY: 16958

**COMMONWEALTH OF PENNSYLVANIA
 DEPARTMENT OF TRANSPORTATION**

FAYETTE COUNTY
 SR 4003, SECTION 03M
 SEGMENT 0090 OFFSET 0502
 SR 4003-03M STA 10+75.00
 OVER DUNLAP CREEK
 REHABILITATION OF SIMPLE SPAN
 CAST-IRON ELLIPTICAL ARCH BRIDGE
 CONSTRUCTION STAGE 4C/4D

RECOMMENDED: _____

SHEET 10 OF 33
 S-40626



BRIDGE DISASSEMBLY / REASSEMBLY

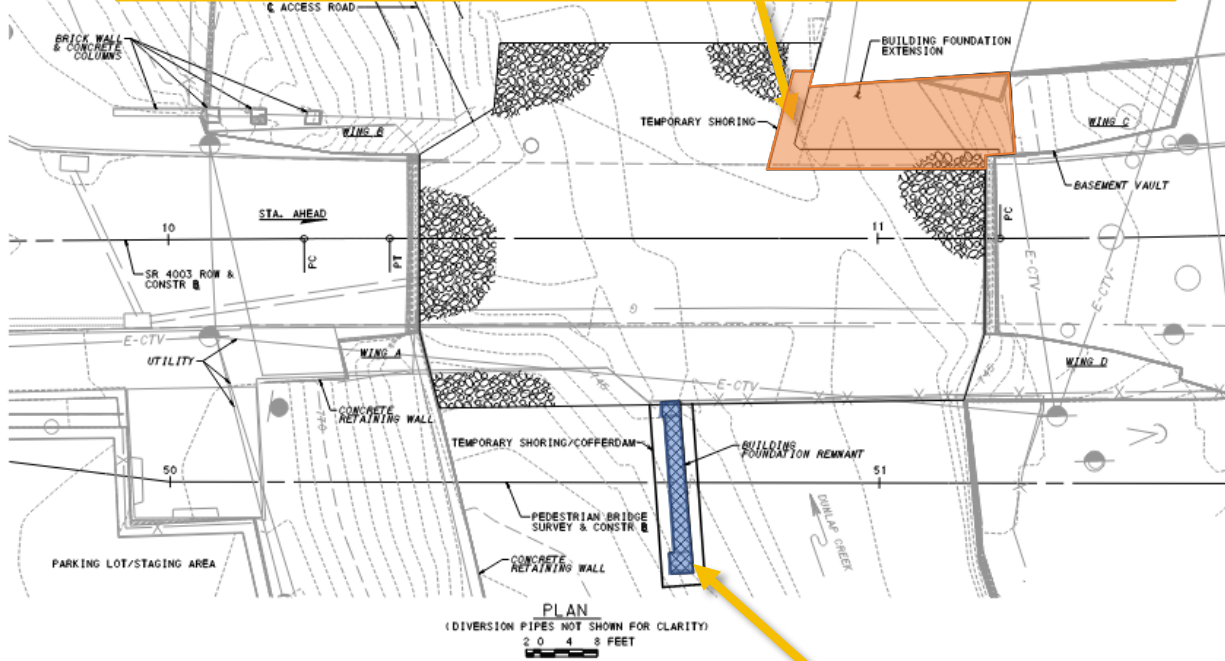
▪ Conceptual Construction Sequence :

4. For all subsections of this stage, members will be reconnected as necessary to maintain structural stability.
 - 4a. Remove internal arch segments in Bays 4 and 6 (Arch Segments (AR) 2, 3 & 4).
 - 4b. Remove remainder of Unit 2 (AR-2, AR-3 & AR-4 in Bay 5, AR-1 & AR-2 in Bays 4-6).
 - 4c. Remove entirety of Unit 1 and selected portions of Unit 3 (Crossplate 6, AR-1-5 in Bay 7).
 - 4d. Remove remainder of Unit 3.
5. Install temporary shoring for foundation extension construction, construct foundation extension, and remove upstream foundation remnants.

CONSTRUCTION STAGE 5

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 SR 4003 PREVIOUSLY KNOWN AS APPL 496
 BMS STR ID: 26-4003-0090-0502 MMS/ECMS PROJ: 74344 BRKEY: 16958
 COMMONWEALTH OF PENNSYLVANIA
 DEPARTMENT OF TRANSPORTATION
 FAYETTE COUNTY
 SR 4003, SECTION 03M
 SEGMENT 0090 OFFSET 0502
 SR 4003-03M STA 10+75.00
 OVER DUNLAP CREEK
 REHABILITATION OF SIMPLE SPAN
 CAST-IRON ELLIPTICAL ARCH BRIDGE
 CONSTRUCTION STAGE 5/6
 SHEET 11 OF 33
 S-40626

Temporary Shoring for foundation extension construction



Remove foundation remnant

- STAGE 5 CONCEPTUAL CONSTRUCTION SEQUENCE:**
1. INSTALL TEMPORARY SHORING FOR REMOVAL OF UPSTREAM BUILDING FOUNDATION REMNANT.
 2. REMOVE UPSTREAM BUILDING FOUNDATION REMNANTS TO 2'-0" BELOW STREAMED ELEVATION.
 3. INSTALL TEMPORARY SHORING FOR CONSTRUCTION OF BUILDING FOUNDATION EXTENSION.
 4. CONSTRUCT BUILDING FOUNDATION EXTENSION.
 5. PERFORM SUBSTRUCTURE REPAIRS.

- STAGE 6 CONCEPTUAL CONSTRUCTION SEQUENCE
CAST IRON BRIDGE RE-ASSEMBLY (STAGE NOT SHOWN):**
1. INSTALL TEMPORARY SUPPORT TOWERS.
 2. INSTALL ARCH RIBS, CROSS PLATES, & SKEW BACK PLATES.
 3. INSTALL LATTICE SPRINGING PLATES, LATTICE SPANDRELS, AND CROSS BRACING.
 4. INSTALL FLOOR PLATES AND ROAD SUSTAINING PLATES.

LEGEND:
 REMOVAL LIMITS

Mark	Description	By	Chk'd.	App'd.	Date
REVISIONS					



SR 4003 PREVIOUSLY KNOWN AS APPL 496
 BMS STR ID: 26-4003-0090-0502 MMS/ECMS PROJ: 74344 BRKEY: 16958
COMMONWEALTH OF PENNSYLVANIA
 DEPARTMENT OF TRANSPORTATION
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 CAST-IRON ELLIPTICAL ARCH BRIDGE
 CONSTRUCTION STAGE 5/6

RECOMMENDED _____ SHEET 11 OF 33
 S-40626



BRIDGE REPAIRS / REPAIR TECHNIQUES

- **Superstructure repairs:**

- Following disassembly, superstructure components will be transported off-site for repair. Cast iron repairs will be made using the braze welding process.
- Repairs to cast iron require controlled environment to avoid damaging the existing members due to excessive heating or rapid cooling.
- Questions that need to be figured out:
 - How many contractors can perform the welding process and have the necessary skills?
 - What facilities are available to accommodate bridge of this size?
 - What qualifications need to be specified for the rehabilitation work?



BRIDGE REPAIRS / REPAIR TECHNIQUES



▪ Braze Welding

- ✓ Repair process used to reconnect broken or cracked bridge members that uses filler metal that melts at a lower temperature than cast iron
- ✓ Safest approach is to disassemble the superstructure, perform repairs off-site in a controlled environment and reassemble on-site

▪ Surfacing Epoxy

- ✓ Repair process uses epoxy to fill imperfections in arch members which trap water; Large voids repaired using a combo of thin gauge stainless steel plates embedded in and covered by epoxy

▪ Abutments

- ✓ Disassembly of superstructure permits numerous repair options for existing abutments:
- ✓ Preferred Option - Rotate existing stones 180°

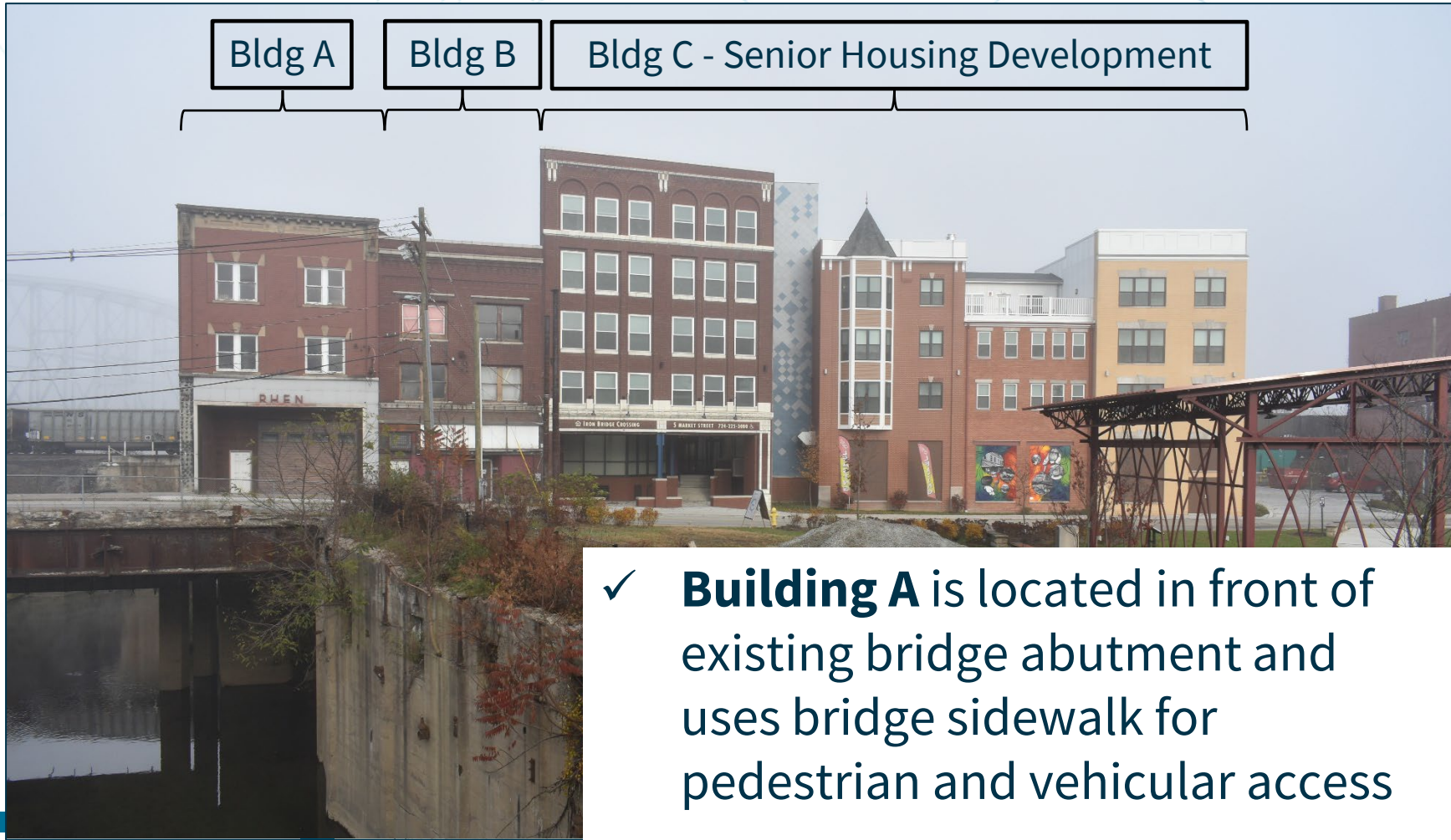
BRIDGE REPAIRS / REPAIR TECHNIQUES

Abutments

- ✓ Stone deterioration concentrated under existing stormwater drainage outfall
(drainage outfall will be eliminated and drainage will be diverted around abutment)



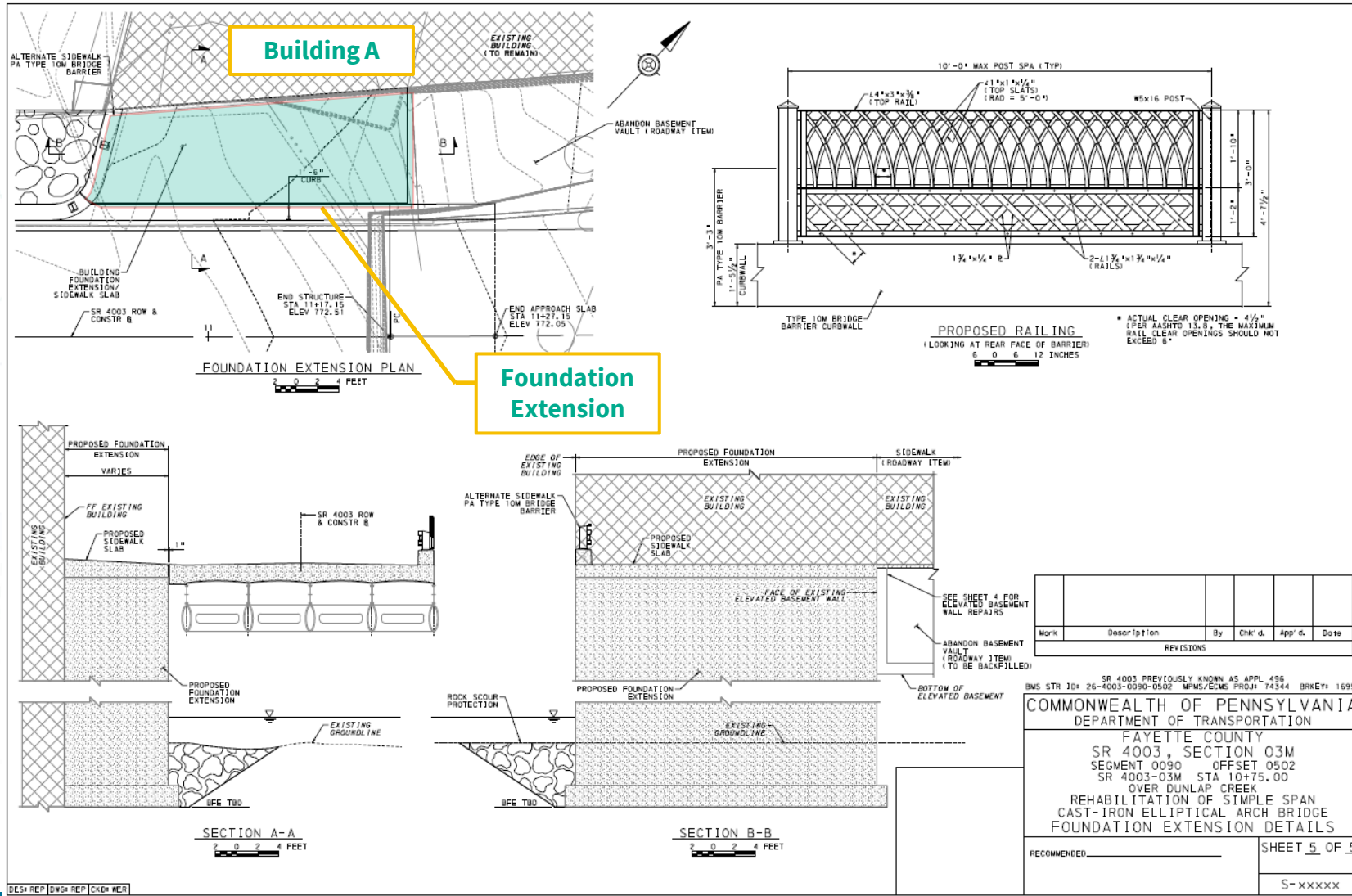
FOUNDATION EXTENSION CONSTRUCTION



FOUNDATION EXTENSION CONSTRUCTION



FOUNDATION EXTENSION CONSTRUCTION



Mark	Description	By	Chk'd	App'd	Date
REVISIONS					

SR 4003 PREVIOUSLY KNOWN AS APPL 496
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COMMONWEALTH OF PENNSYLVANIA
 DEPARTMENT OF TRANSPORTATION

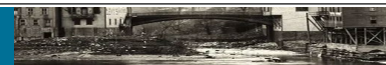
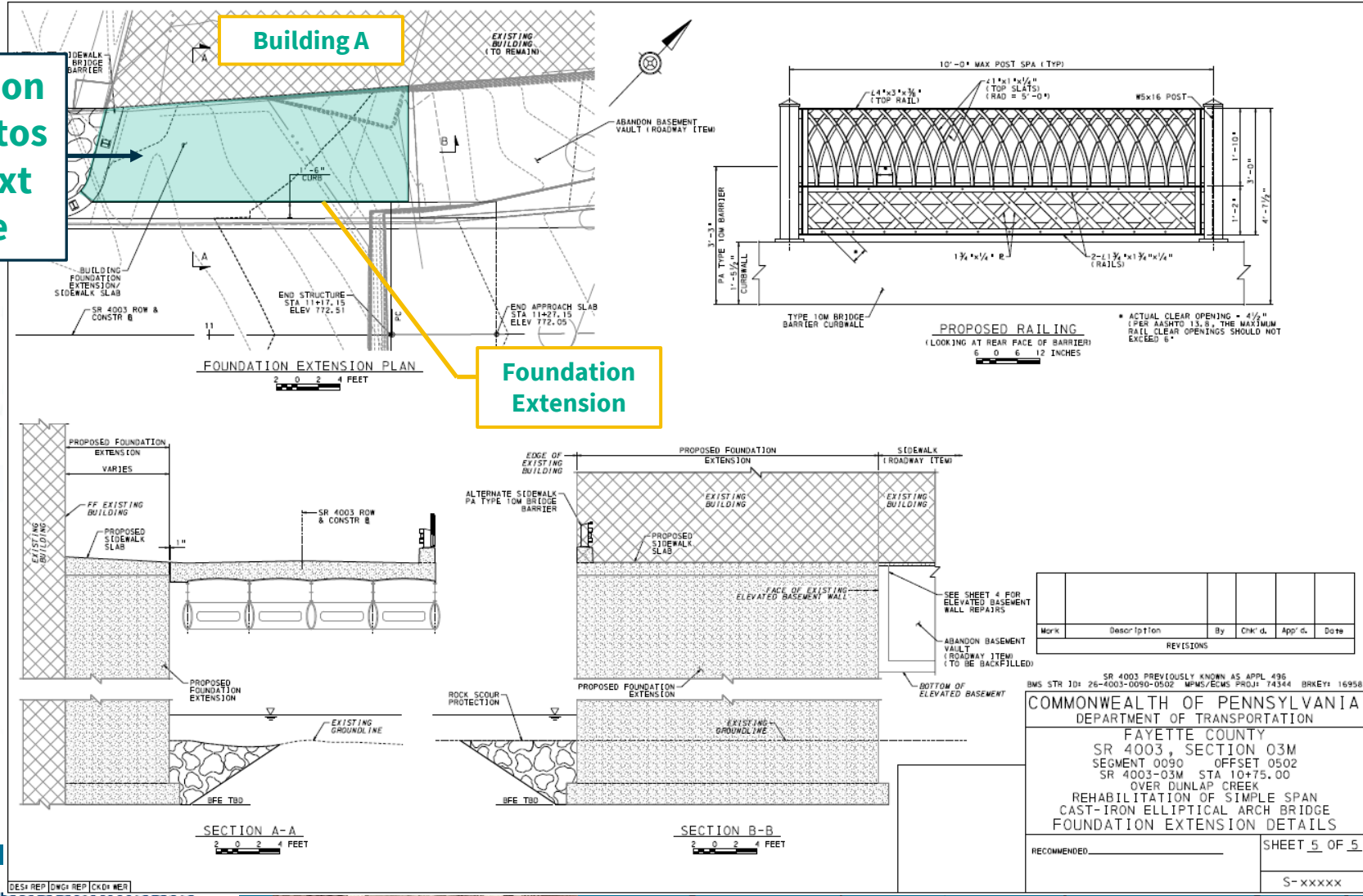
FAYETTE COUNTY
 SR 4003, SECTION 03M
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 OVER DUNLAP CREEK
 REHABILITATION OF SIMPLE SPAN
 CAST-IRON ELLIPTICAL ARCH BRIDGE
 FOUNDATION EXTENSION DETAILS

RECOMMENDED: _____ SHEET 5 OF 5
 S-xxxxxx



FOUNDATION EXTENSION CONSTRUCTION

Direction of Photos on Next Slide



FOUNDATION EXTENSION CONSTRUCTION

Underside of Sidewalk
in Front of Building A

Elevated Basement in
Front of Building B
(West Wall)



Building A

BASEMENT SIDEWALK VAULT ABANDONMENT

▪ Abandonment of Existing Basement Vault

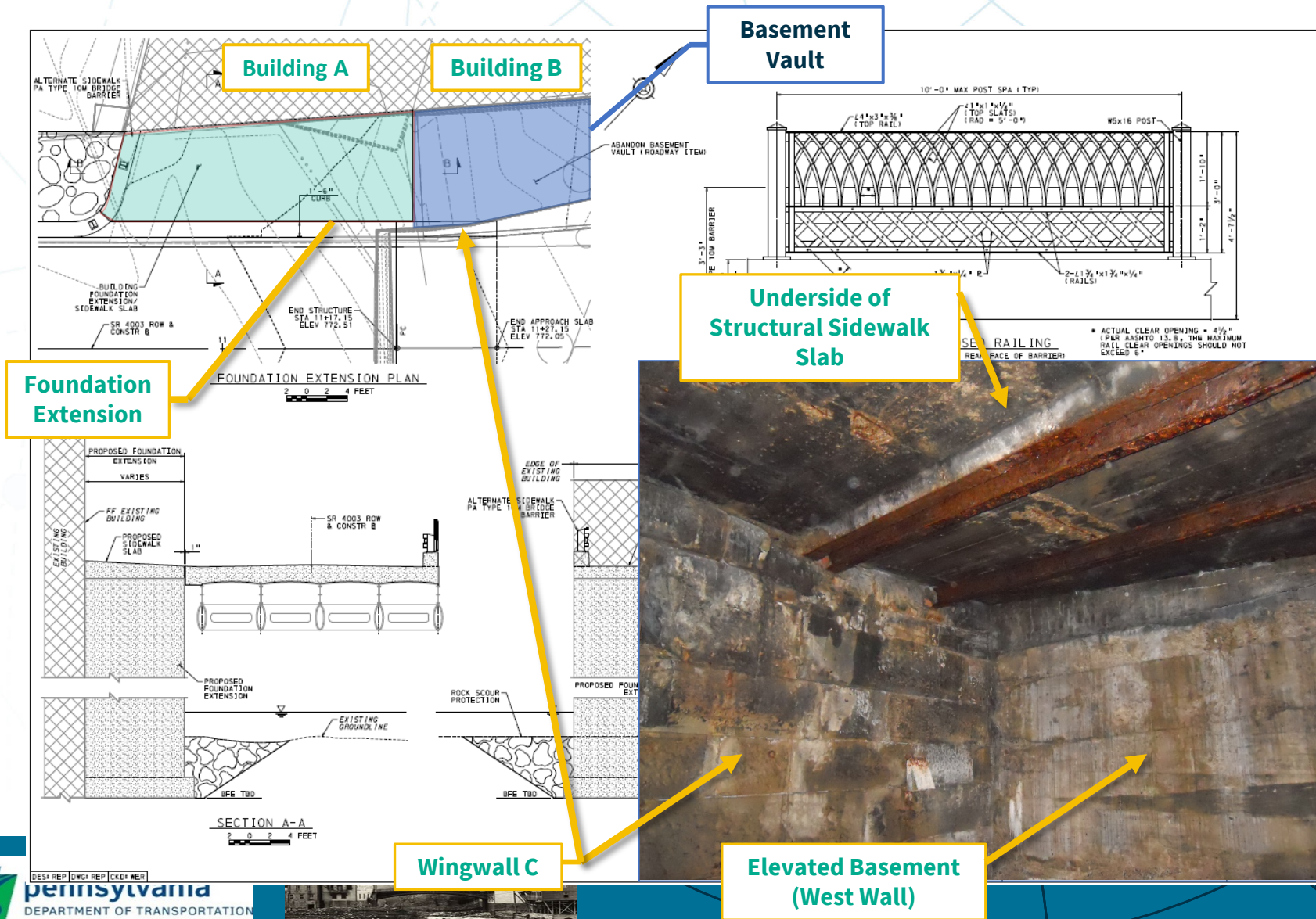
- Existing Building B basement extends underneath sidewalk along east side of Dunlap Creek Bridge
- Basement to be blocked off and backfilled
- In order to construct wall to block off the portion of basement under the sidewalk, access to building will be required
- TranSystems will work with the District and building owners to discuss building access for contractor during construction.



BASEMENT SIDEWALK VAULT ABANDONMENT

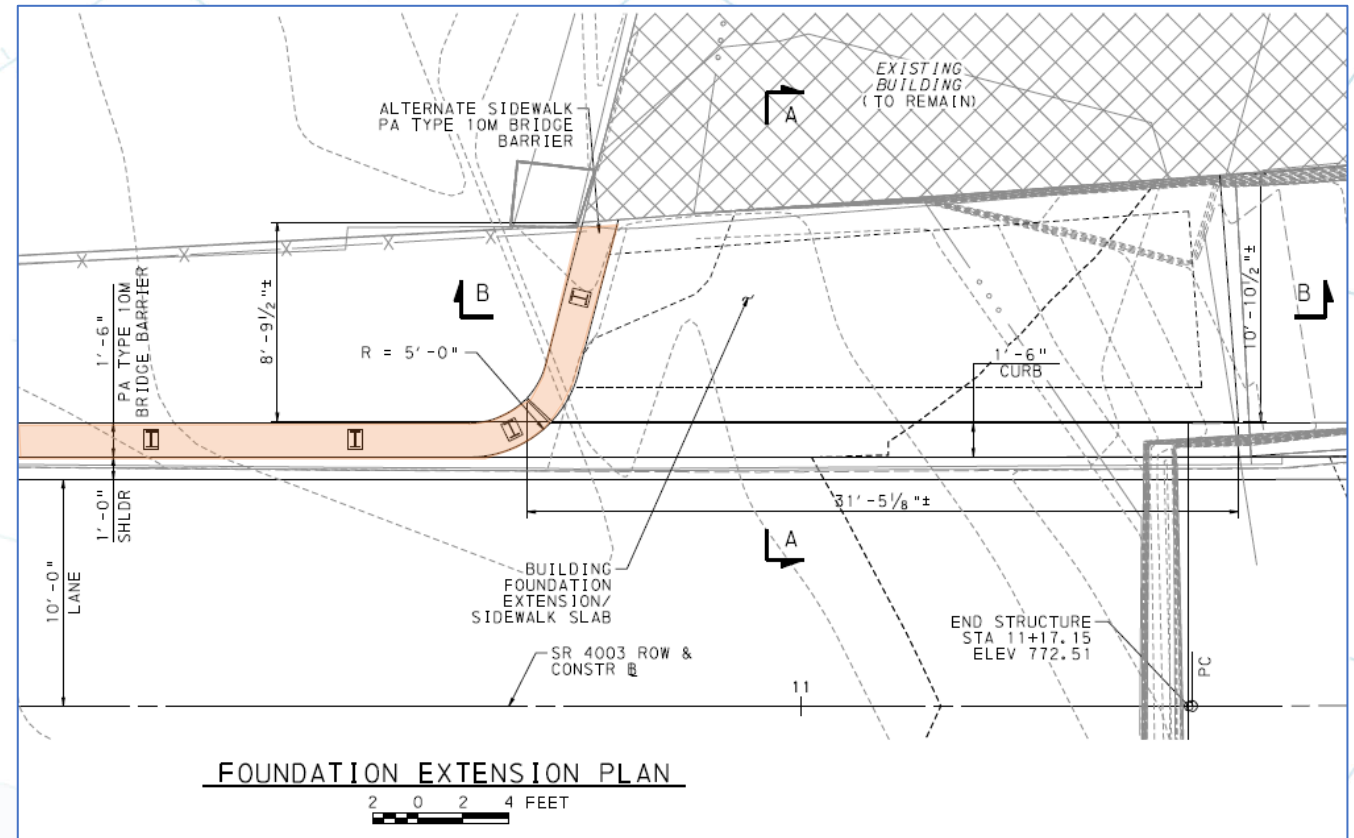


BASEMENT SIDEWALK VAULT ABANDONMENT



BRIDGE BARRIER TERMINATION

- Termination of PA Type 10M Bridge Barrier at foundation extension



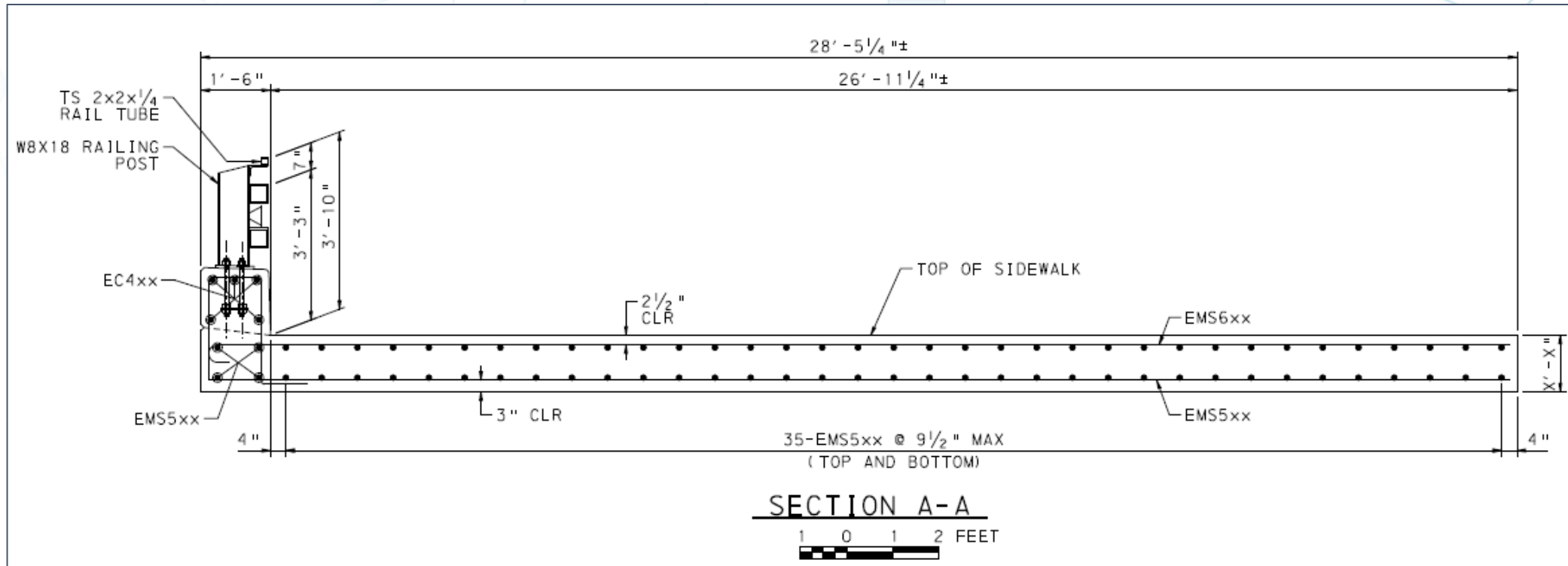
BRIDGE BARRIER TERMINATION



- Termination of PA Type 10M Bridge Barrier at foundation extension

BRIDGE BARRIER TERMINATION

- Termination of PA Type 10M Bridge Barrier at foundation extension



BRIDGE BARRIER TERMINATION



BRIDGE BARRIER TERMINATION



BRIDGE BARRIER TERMINATION



FOUNDATION WALL IMPACTS



Foundation Wall



FOUNDATION WALL IMPACTS

Foundation Wall Removal Area

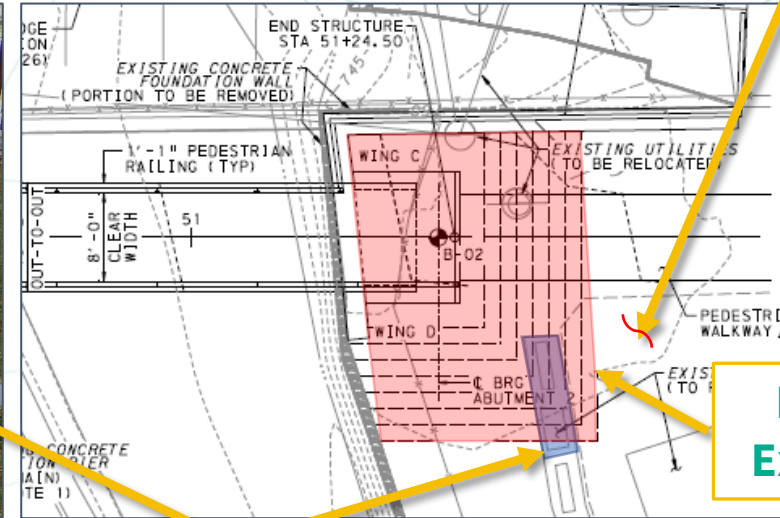


FOUNDATION WALL IMPACTS



FOUNDATION WALL IMPACTS

- **Snowdon Square War Memorial excavation impacts**
 - ✓ Abutment excavation will impact memorial
 - ✓ Portion to be temporarily stored and reinstalled

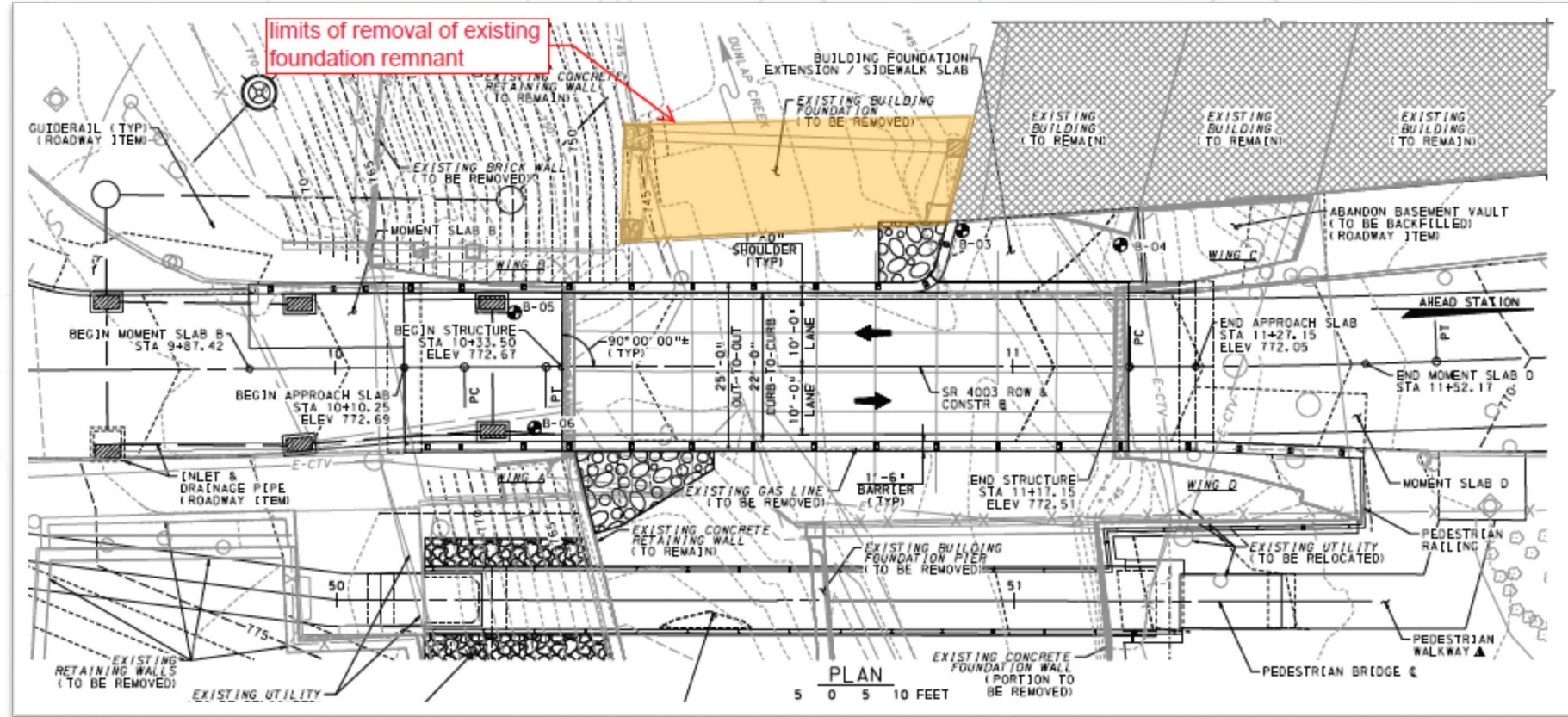


Snowdon Square

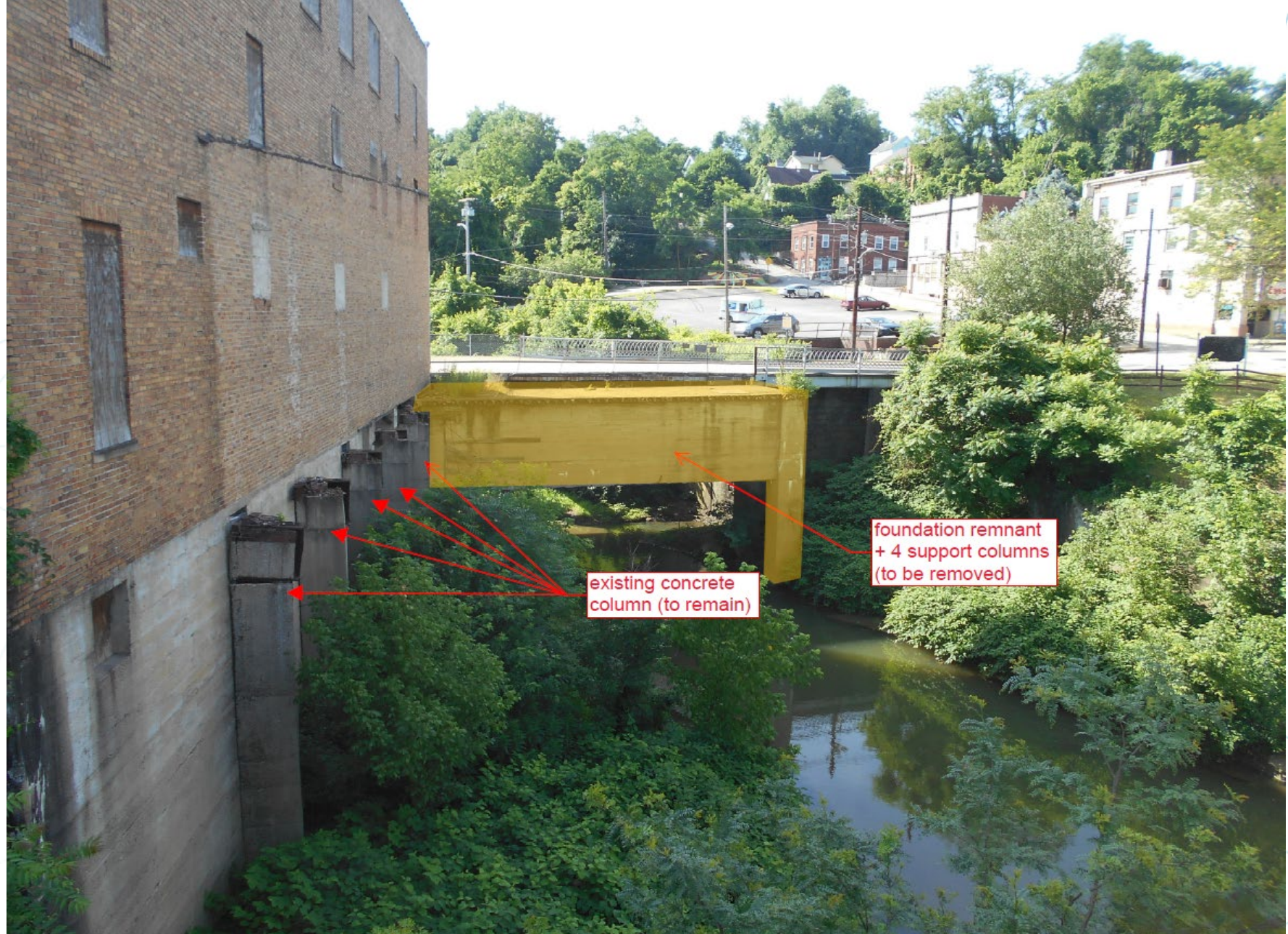
Limits of Excavation

Impacted Portion of War Memorial

FOUNDATION REMOVAL



FOUNDATION REMOVAL

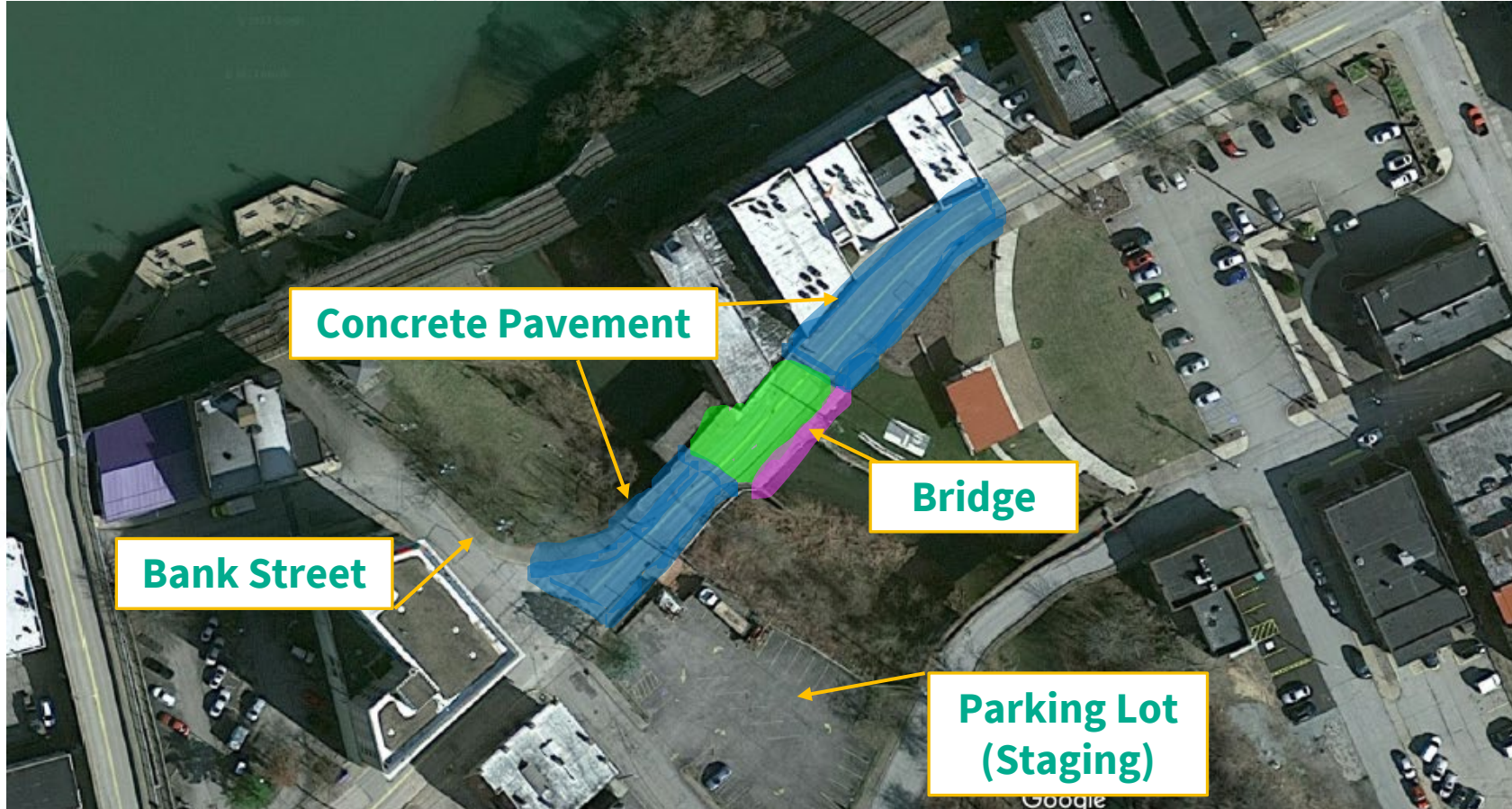


FOUNDATION REMOVAL



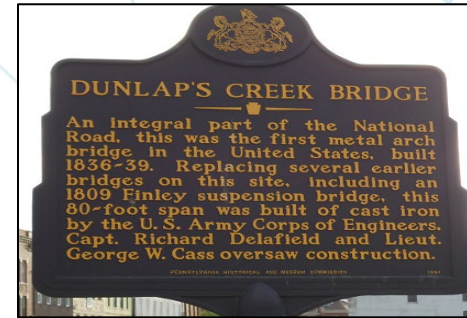
Foundation
remnant + 4
support columns (to
be removed)

ROADWAY PAVEMENT TRANSITION



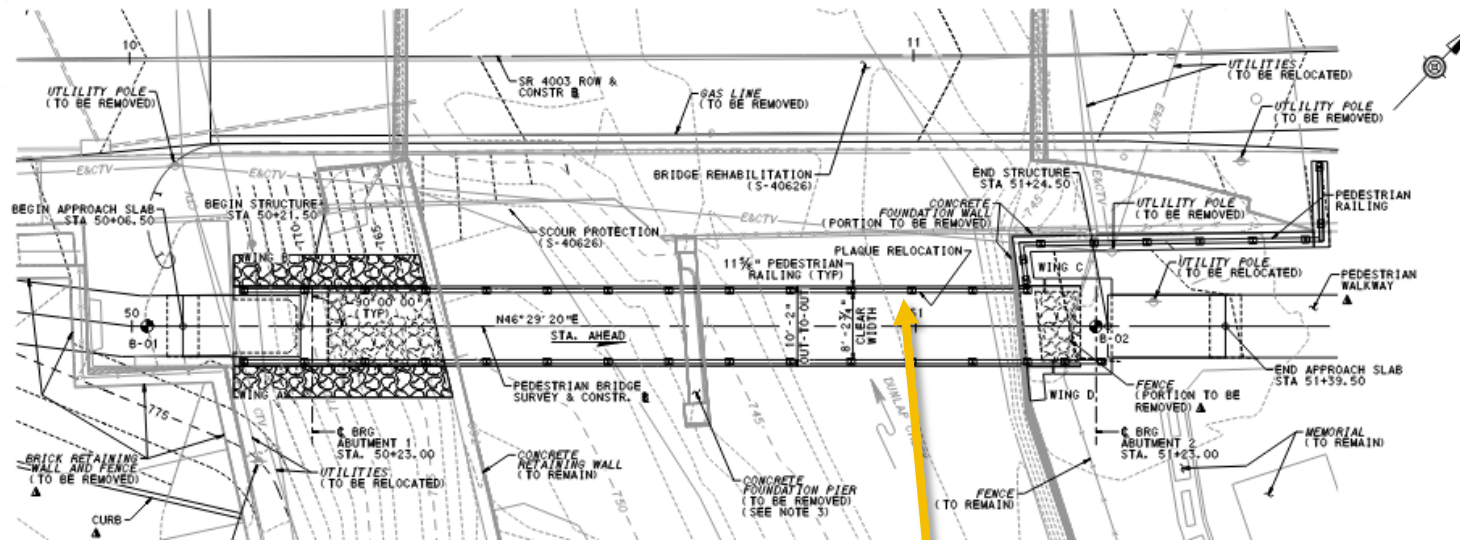
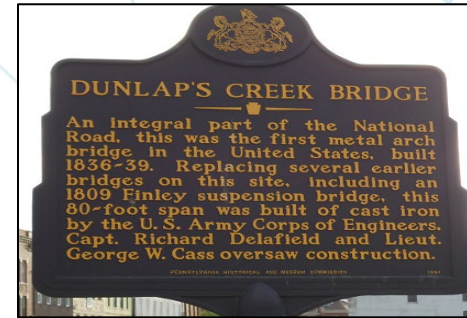
EXISTING BRIDGE PLAQUES

- Existing Bridge Plaque Relocations



EXISTING BRIDGE PLAQUES

Existing Bridge Plaque Relocations

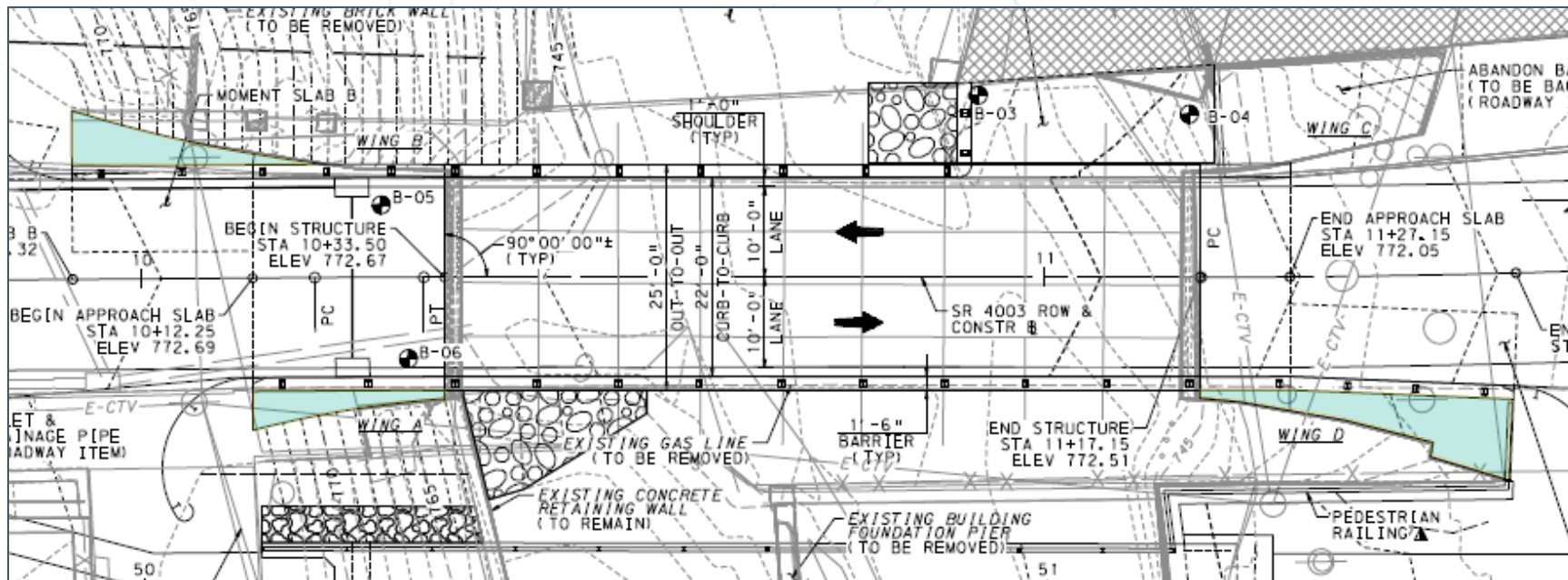


Relocation Site



AREA BETWEEN BARRIERS AND WINGWALLS

- Concrete cap to be placed over area between Approach Slab Barriers and Flared Wingwalls



AREA BETWEEN BARRIERS AND WINGWALLS



Wingwall D

Snowden Square Foundation Wall

Sidewalk SIP Forms



Snowden Square Foundation Wall

AREA BETWEEN BARRIERS AND WINGWALLS



Sidewalk
SIP Forms

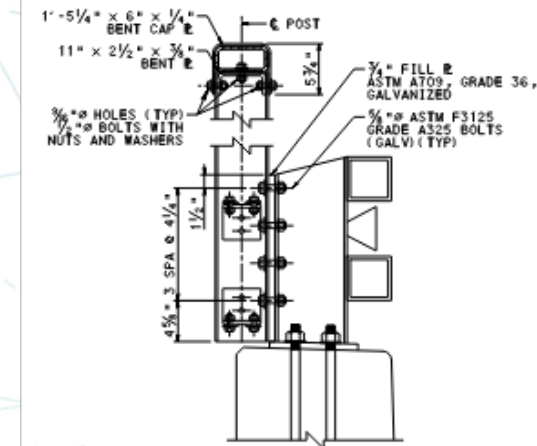
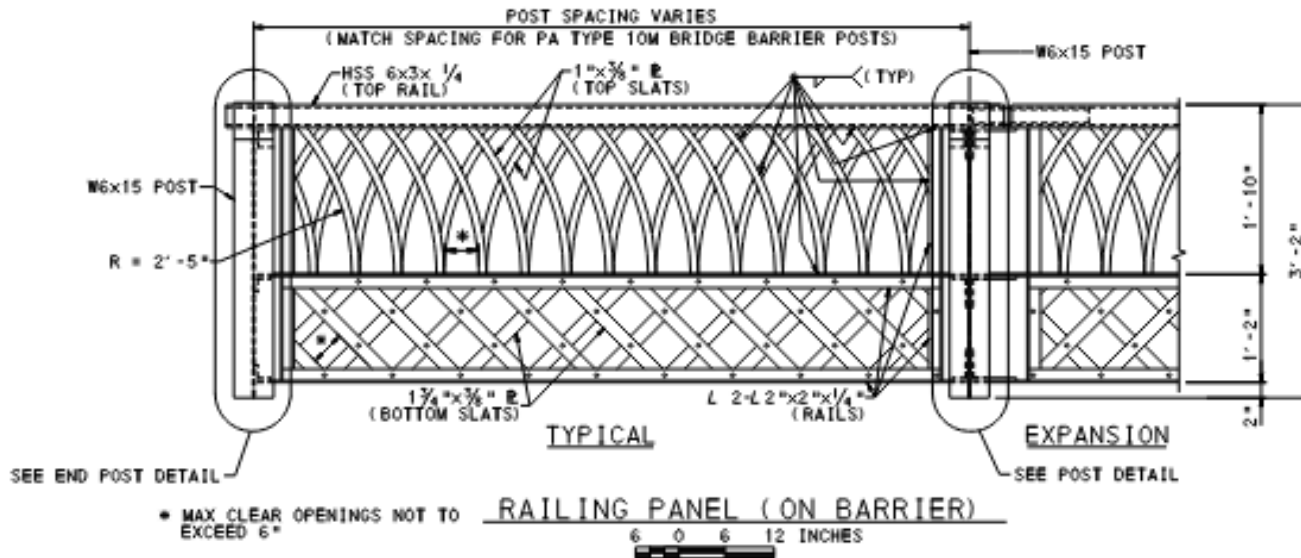
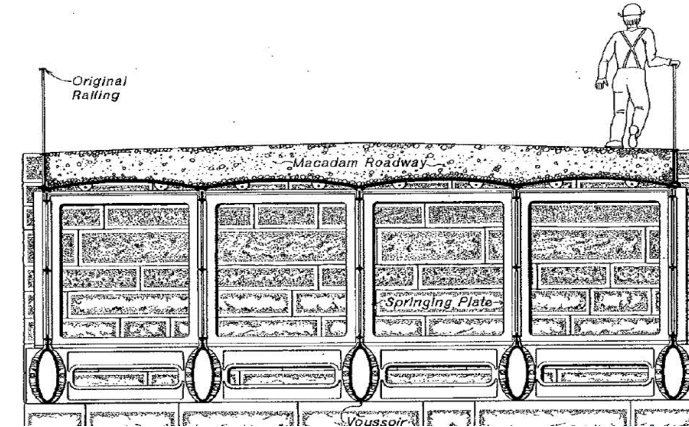


Wingwall D

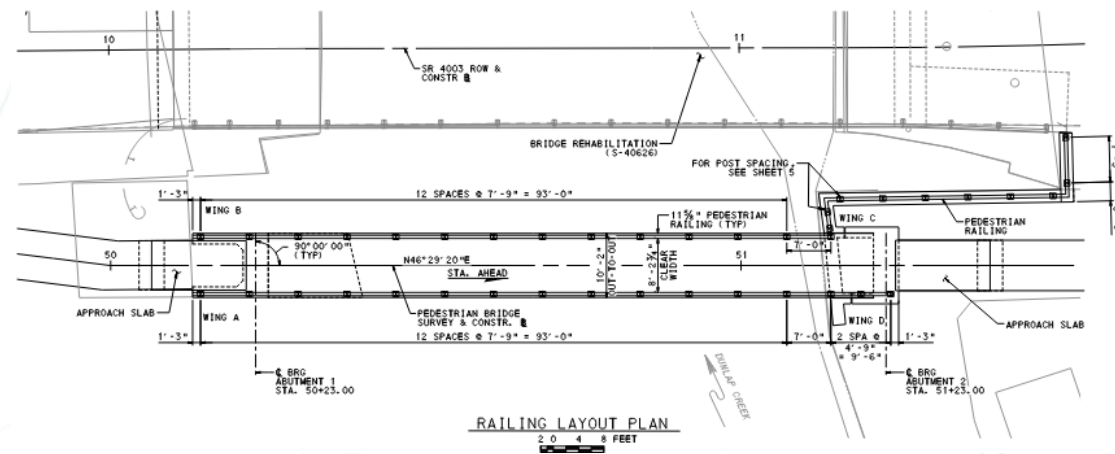
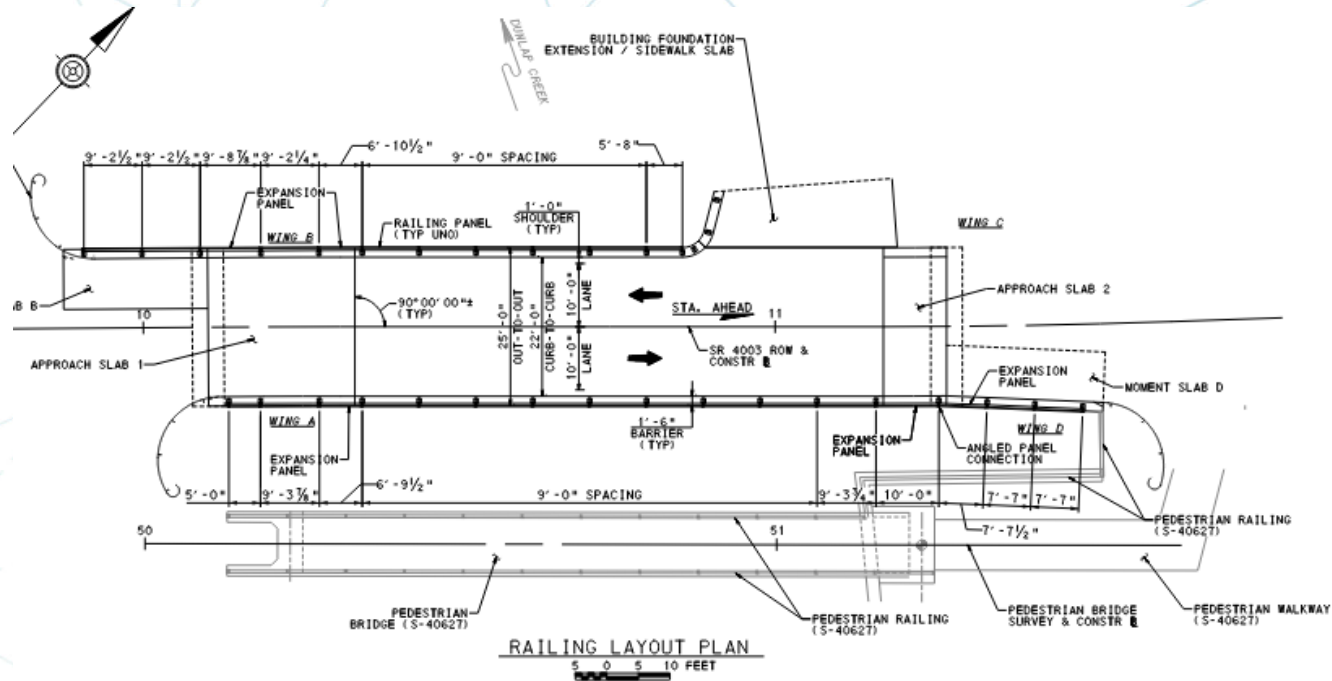
Snowden Square
Foundation Wall

HANDRAIL

- Decorative Railing placed in conjunction with Type 10M Bridge Barrier.



HANDRAIL





Road Sustaining Plate

PA Type 10M Barrier w/ Decorative Railing

Foundation Extension



UTILITIES

LIST OF PUBLIC UTILITIES

<u>C</u>	<u>TY</u>	BREEZELINE 320 BAILEY AVE UNIONTOWN, PA 15401 MR. ERIC TEETER ETEETER@BREEZELINE.COM (724) 439-1233	<u>TU</u>	FIRSTLIGHT 7890 LEHIGH CROSSING VICTOR, NY 14564 MR. ROLAND SITLER RSITLER@FIRSTLIGHT.NET (570) 866-1007
<u>E</u>		FIRST ENERGY 143 WEST PENN DRIVE JEANNETTE, PA 15644 MR. JACOB WILTROUT JWILTROUT@FIRSTENERGYCORP.COM (724) 523-7225	<u>W</u>	PA AMERICAN WATER 300 GALLEY ROAD MCMURRAY, PA 15317 MR. ADAM BROMLEY ADAM.BROMLEY@AMWATER.COM (412) 523-4259
<u>G</u>		COLUMBIA GAS OF PA 12 SANDSTONE WAY DUNBAR, PA 15431 MR. MATT OLEKSIK MOLEKSIK@SOURCE.COM (724) 912-9820	<u>TU</u>	VERIZON 27 WEST CHURCH STREET UNIONTOWN, PA 15401 MR. BRYAN LOUGHNER BRYAN.LOUGHNER.COM (412) 328-0879
<u>S</u>		BROWNSVILLE MUNICIPAL AUTHORITY 7 JACKSON STREET BROWNSVILLE, PA 15417 MR. GARY THOMAS BMAPLANT@GMAIL.COM (724) 785-4436		



UTILITIES



Abandoned water lines

Abandoned gas line



Verizon fiber lines (in pavement)



Remove Existing Steel Poles



BID ITEMS

5088 0001	PA TYPE 10M BRIDGE BARRIER, WITH DECORATIVE RAILING	◆
LF		
9000 0003	CAST IRON ARCH RIB VOID REPAIR	◆
SF		
9000 0004	CAST IRON ARCH RIB SADDLE REPAIR	◆
EACH		
9000 0005	CAST IRON ARCH RIB SPANDREL REPAIR	◆
EACH		
9000 0006	CAST IRON DIAPHRAGM REPAIR	◆
EACH		
9000 0020	BASEMENT VAULT CLOSURE AND BACKFILL	◆
LS		

9000 0014	DISASSEMBLE CAST IRON ARCH BRIDGE	◆
LS		
9000 0018	REASSEMBLE CAST IRON ARCH BRIDGE	◆
LS		
9000 0052	VIDEO MONITORING	◆
LS		

Outdoor camera to record a time-lapse video of construction activities.



NEXT STEPS

- ✓ **PROJECT ADVERTISEMENT** *[Winter 2023]*
- ✓ **PROJECT LETTING** *[Winter 2023]*
- ✓ **CONSTRUCTION** *[2024-2025]*

