



PennDOT District 3-0
February 15, 2018
Mid-Atlantic Quality Assurance Workshop
Dover, Delaware

Ted F. Deptula, P.E.

www.csvt.com



▶ Central Susquehanna Valley Transportation Project

Project History

1960's – Preliminary studies/design of CSVT

1978 – CSVT Studies Stopped

1994 – Studies restarted

2003 – Obtained environmental clearance

2006 – Northern Section final design initiated

2008 – Project placed on hold – funding issue

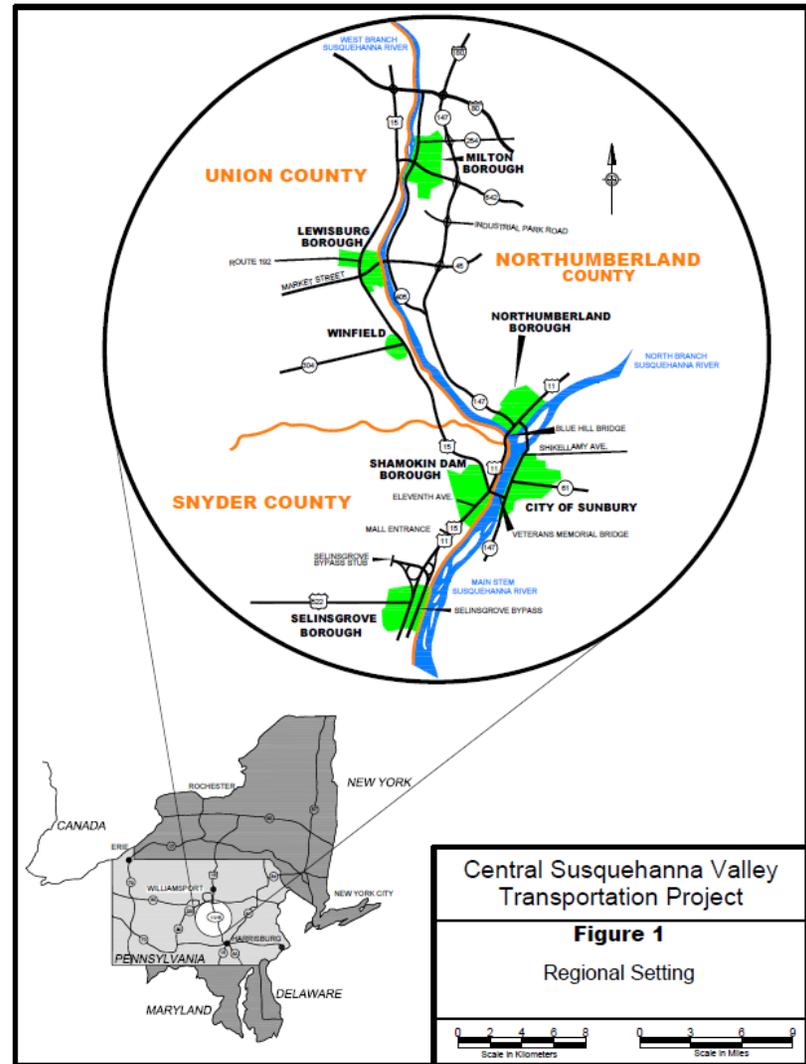
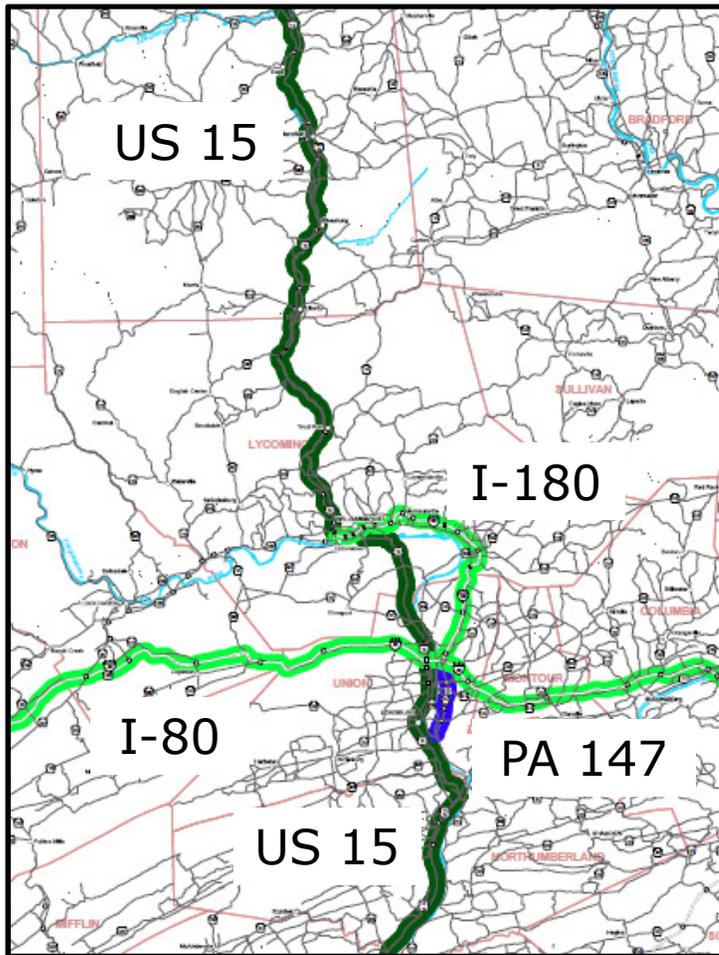
2013 – Act 89 passed (funding identified) and project reactivated

2015 – Southern Section final design initiated

2015 – Construction of the Northern Section started

Central Susquehanna Valley Transportation Project

Project Context



Central Susquehanna Valley Transportation Project

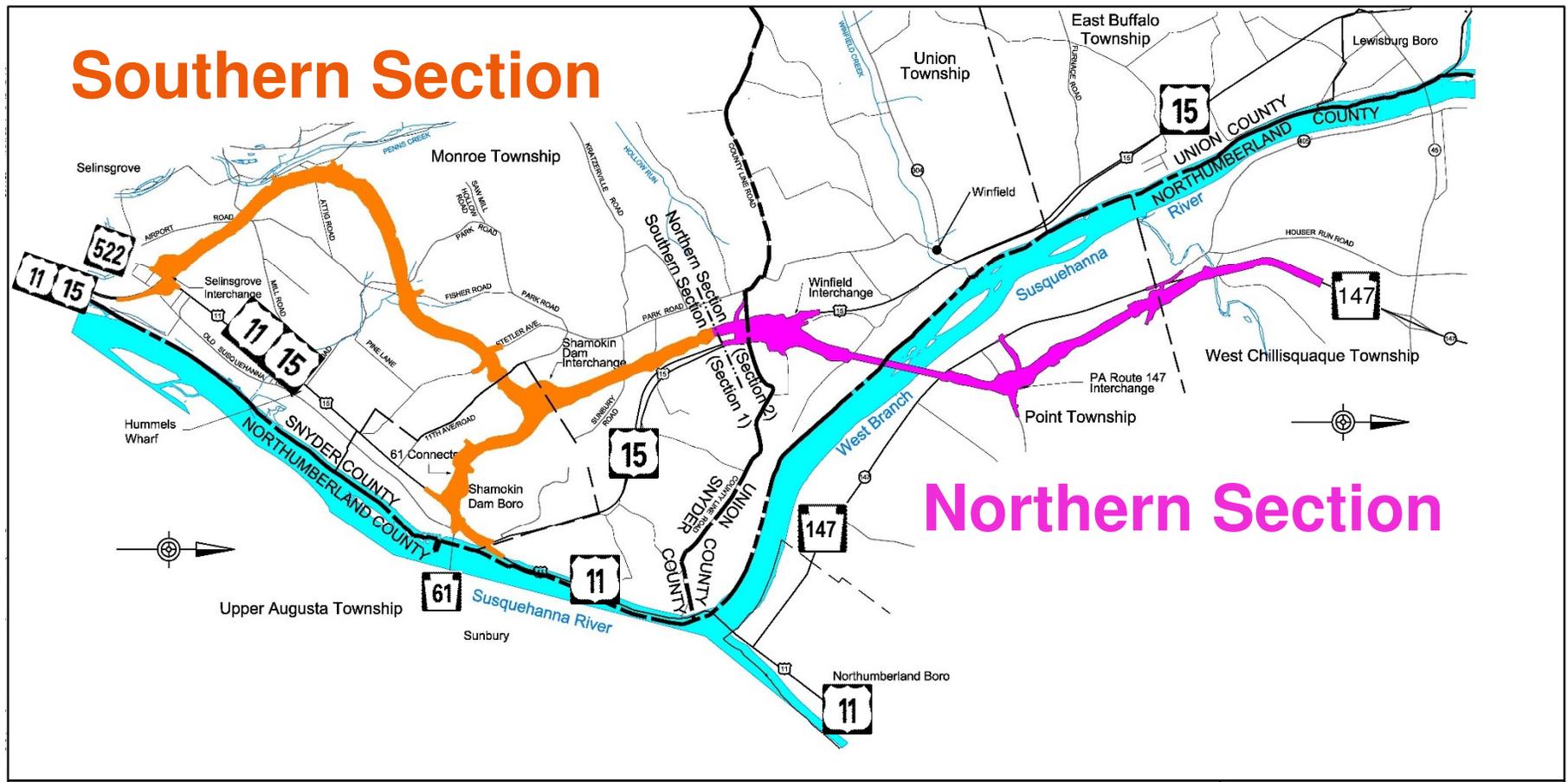
Project Purpose

- Separate Trucks and Through Traffic from Local Traffic
- Reduce Congestion and Accommodate Growth
- Improve Safety



Central Susquehanna Valley Transportation Project

Project Overview



▶ Central Susquehanna Valley Transportation Project

Project Facts

- 13 miles of new 4-lane, limited access highway
 - 9 million CY of earthwork
 - 21 highway structures
 - 4 interchanges
- \$670 million total estimated cost
- 7 construction contracts
- Completion and opening to traffic anticipated in 2024

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\$670 Million

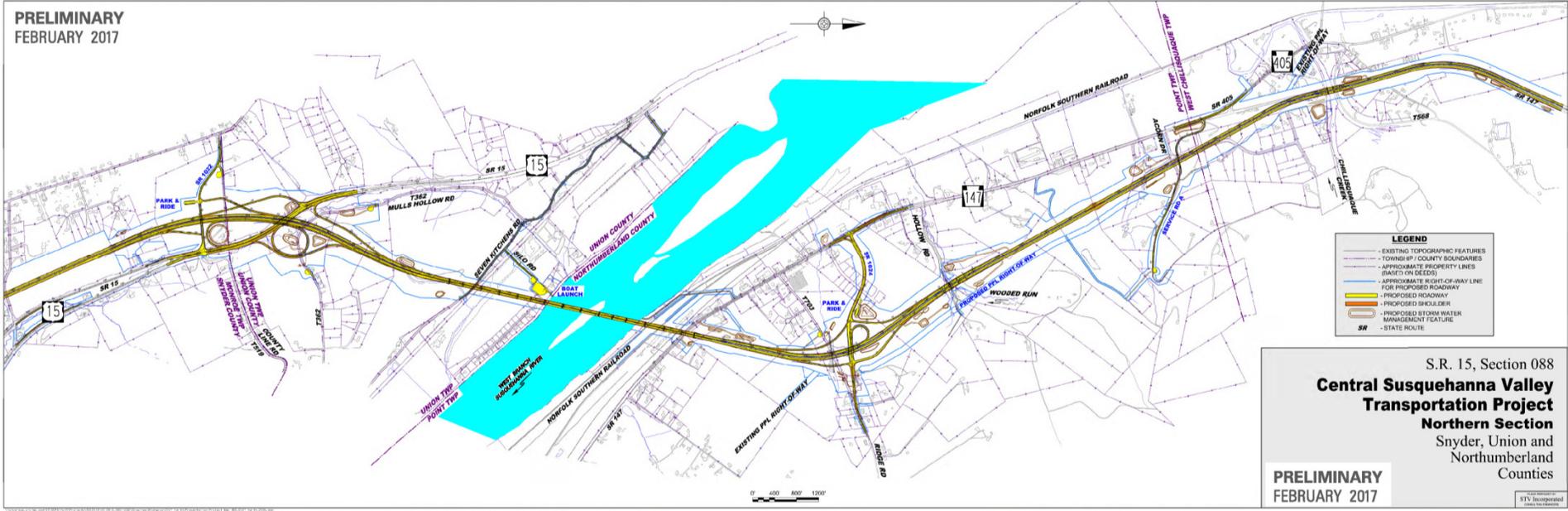


\$670 Million

Northern Section

CSVT – Northern Section

Northern Section Plan View



CSVT – Northern Section

Contracts

1. River Bridge
 1. \$156 M – Trumbull Corp.
 2. Time: 2015 – 2020
2. Earthwork & Structures – north of river
 1. \$61 M – Trumbull Corp.
 2. Time: 2016 – 2019
3. Earthwork & Structures – south of river
 1. \$37 M – New Enterprise Stone & Lime Co., Inc.
 2. Time: 2017 - 2019
4. Paving
 1. Bid Fall 2018
5. Total estimated construction cost = **\$350 M**

CSVT – Northern Section

Key Features

- 5 Million CY of Earthwork



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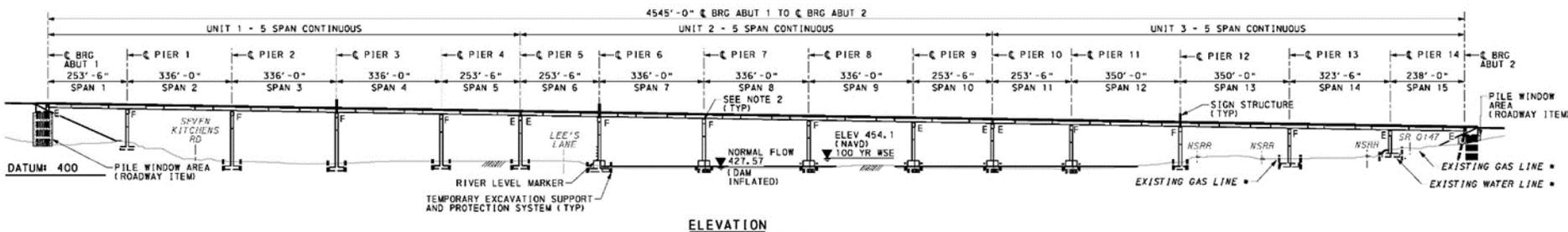
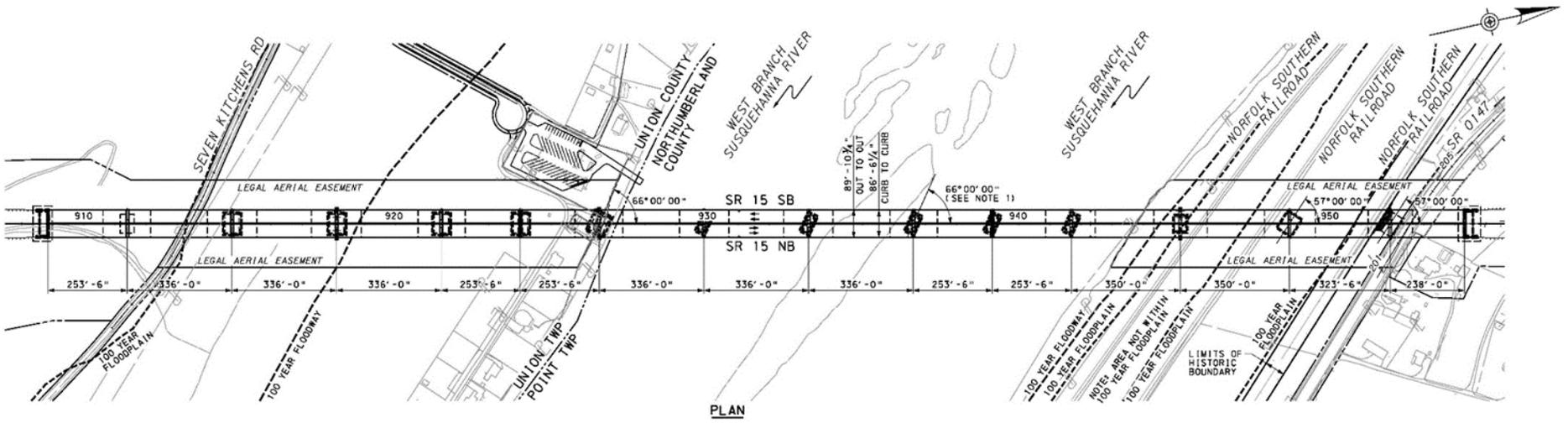
Key Features

- 9 Highway Bridges



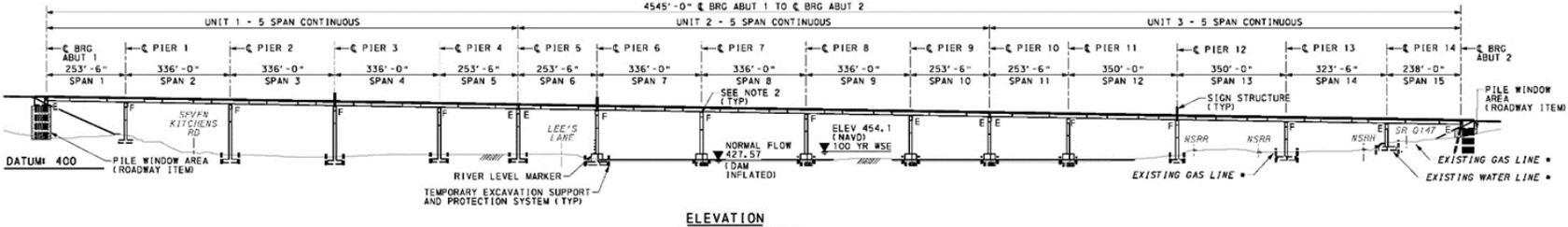
CSVT – Northern Section

Proposed River Bridge



CSVT – Northern Section

Proposed River Bridge



CSVT – Northern Section

River Bridge Piers

Rendering



CSVT – Northern Section

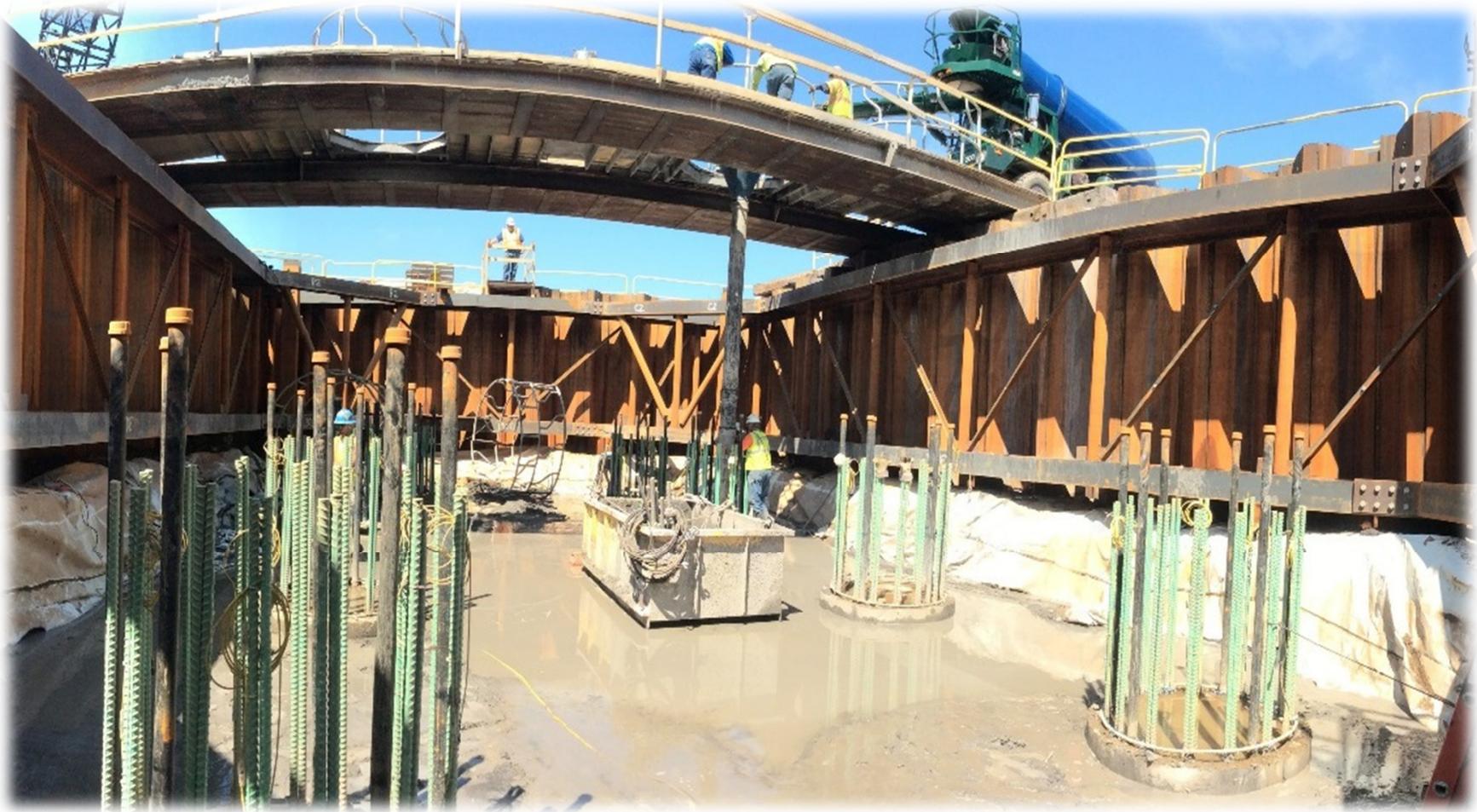
Bridge over the West Branch of the Susquehanna River

- 4,545 feet long
- 15 spans
- 60 to 180-foot-high piers
- 50,000 cubic yards of concrete
- 20,000 tons of steel



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River Bridge Construction – Pier Foundations



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River Bridge Construction –
O-Cell Testing for
Drilled Caissons



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Support of Excavation – Land Piers



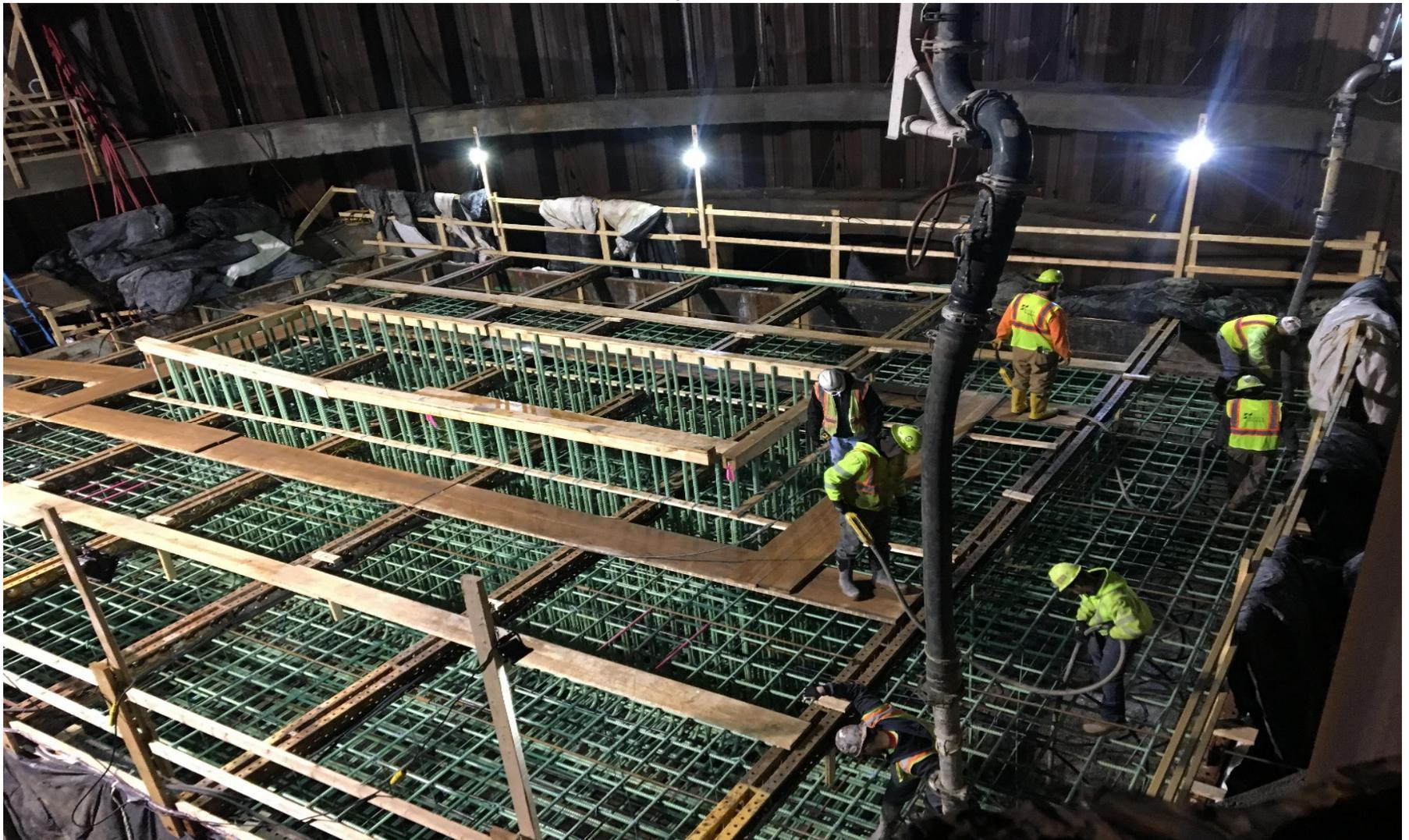
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Support of Excavation



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Mass Concrete: 1,000 cy Concrete Footer



CSVT – Northern Section

Mass Concrete: 1,000 cy Concrete Footer



CSVT – Northern Section

Mass Concrete Cooling Tubes



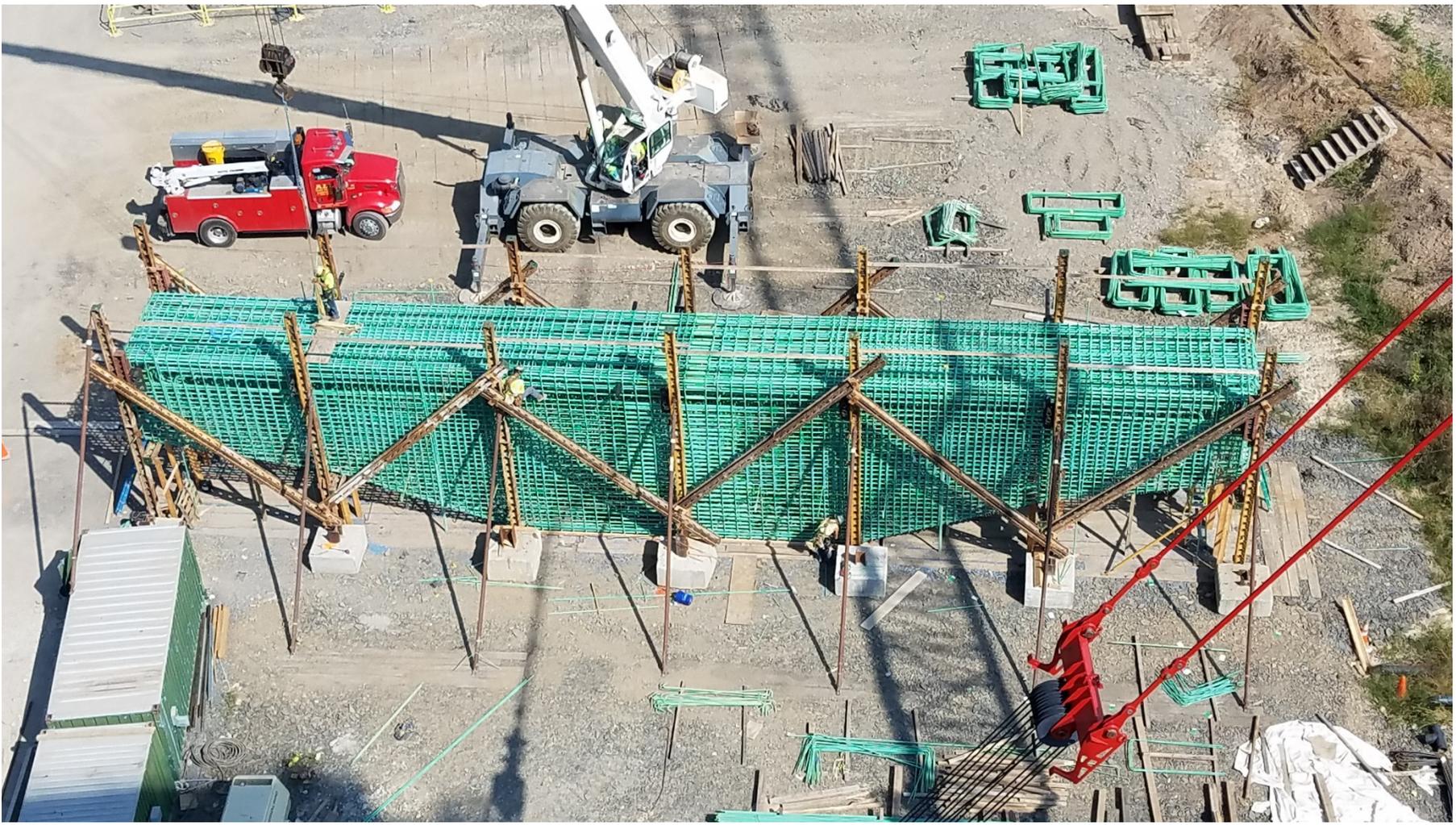
CSVT – Northern Section

River Bridge Construction



CSVT – Northern Section

River Bridge Construction

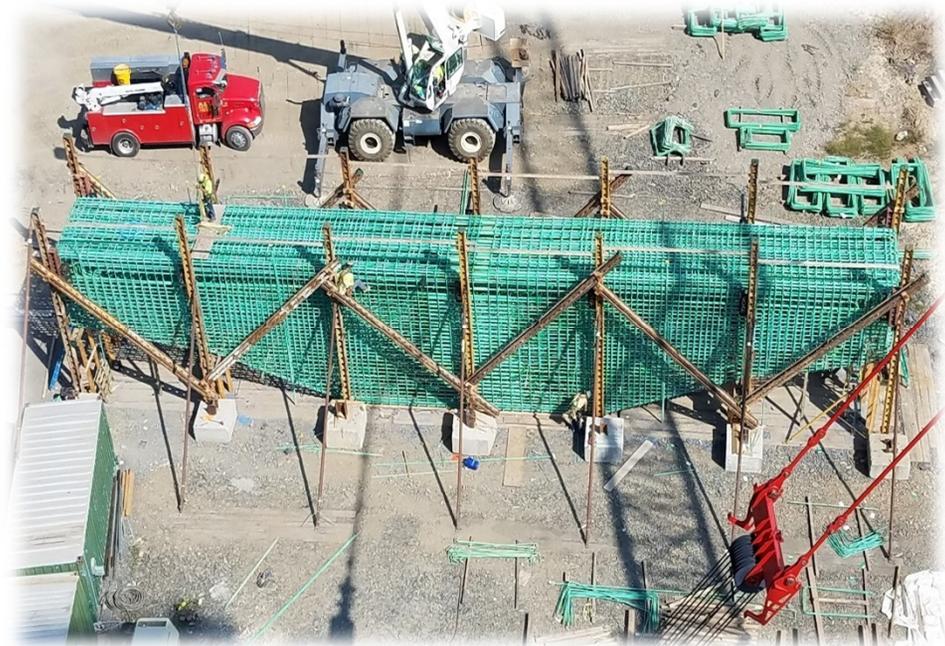


CSVT – Northern Section

River Bridge Construction – Pier Stems/Caps



Pier 4 – Stem & Temporary Towers



Pier 4 – Cap Steel Reinforcement

CSVT – Northern Section

River Bridge Construction



CSVT – Northern Section

River Bridge Construction



CSVT – Northern Section

Mechanical Couplers



CSVT – Northern Section

Mechanical Couplers -Importance



CSVT – Northern Section

Mechanical Couplers - Strength



CSVT – Northern Section

River Bridge Construction



CSVT – Northern Section

River Bridge Construction



CSVT – Northern Section

River Bridge Construction



CSVT – Northern Section

River Bridge Construction



▶ CSVT – Northern Section

River Bridge Construction



CSVT – Northern Section

Frozen River Bridge Construction



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140' Fill, 12 Month Quarantine, Abutment 1



CSVT – Northern Section

Earthwork



▶ CSVT – Northern Section

Earthwork



CSVT – Northern Section

Drilling



CSVT – Northern Section

Loading



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Blasting (Press Play)



▶ CSVT – Northern Section

Excavation



▶ CSVT – Northern Section

Excavation



CSVT – Northern Section

Excavation



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Excavation



CSVT – Northern Section

Embankment



CSVT – Northern Section

Sediment Basin



CSVT – Northern Section

Sediment Basin



CSVT – Northern Section

Filter sock



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Potential Acid Bearing Rock



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Pyritic Rock



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Geosynthetic Clay Liners



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Concrete Pipe



CSVT – Northern Section

Pipes



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Over-Excavation for Box Culvert



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700' Long Box Culvert



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Box Culvert, 700' long under 80' fill



▶ CSVT – Northern Section

Box Culvert, 700' long under 80' fill



CSVT – Northern Section

Inflatable Dam



CSVT – Northern Section

Inflatable Dam - Installation



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Inflatable Dam



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Inflatable Dam – Not Fool-Proof



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Micro-piles, Support of Excavation



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MSE Wall Piles



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Piers



➤ CSVT – Northern Section

Abutment:
Pre-Load and
Quarantine



➤ CSVT – Northern Section

Abutment: Pre-Load and Quarantine



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- Temporary Bridge Over Existing SR 15



CSVT – Northern Section

- Temporary Bridge Over Existing SR 15



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- Slow Decisions: Standby or...



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- Slow Decisions: Or Demobilize?



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- Big Brother Watching?

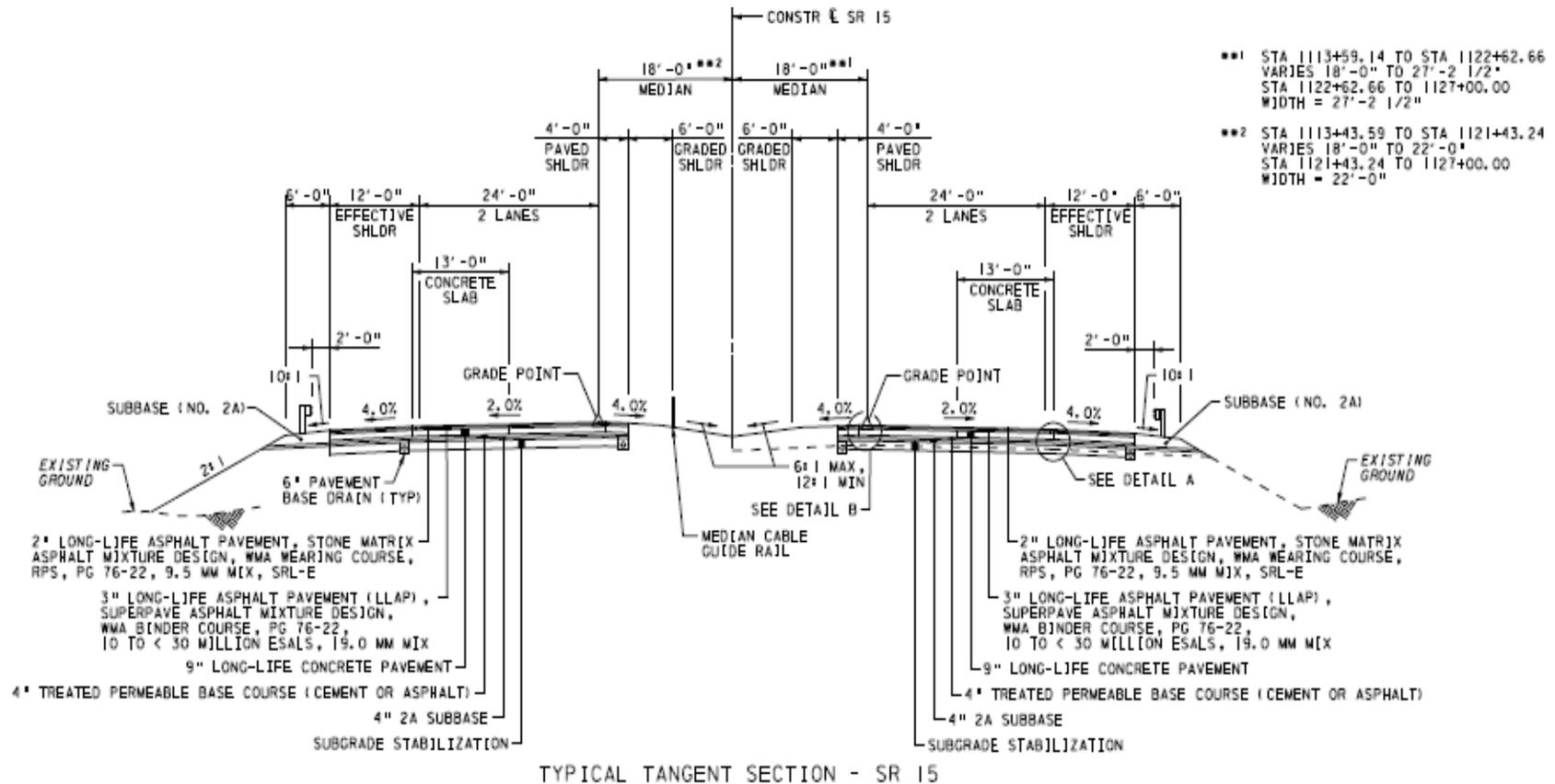


> CSVT – Northern Section

- Paving contract
 - 2" SMA
 - 3" Binder
 - 9" PCC
 - 4" Cement or Asphalt Treated Permeable Base
 - 4" 2A Subbase
 - Soil Stabilization (cement) as needed

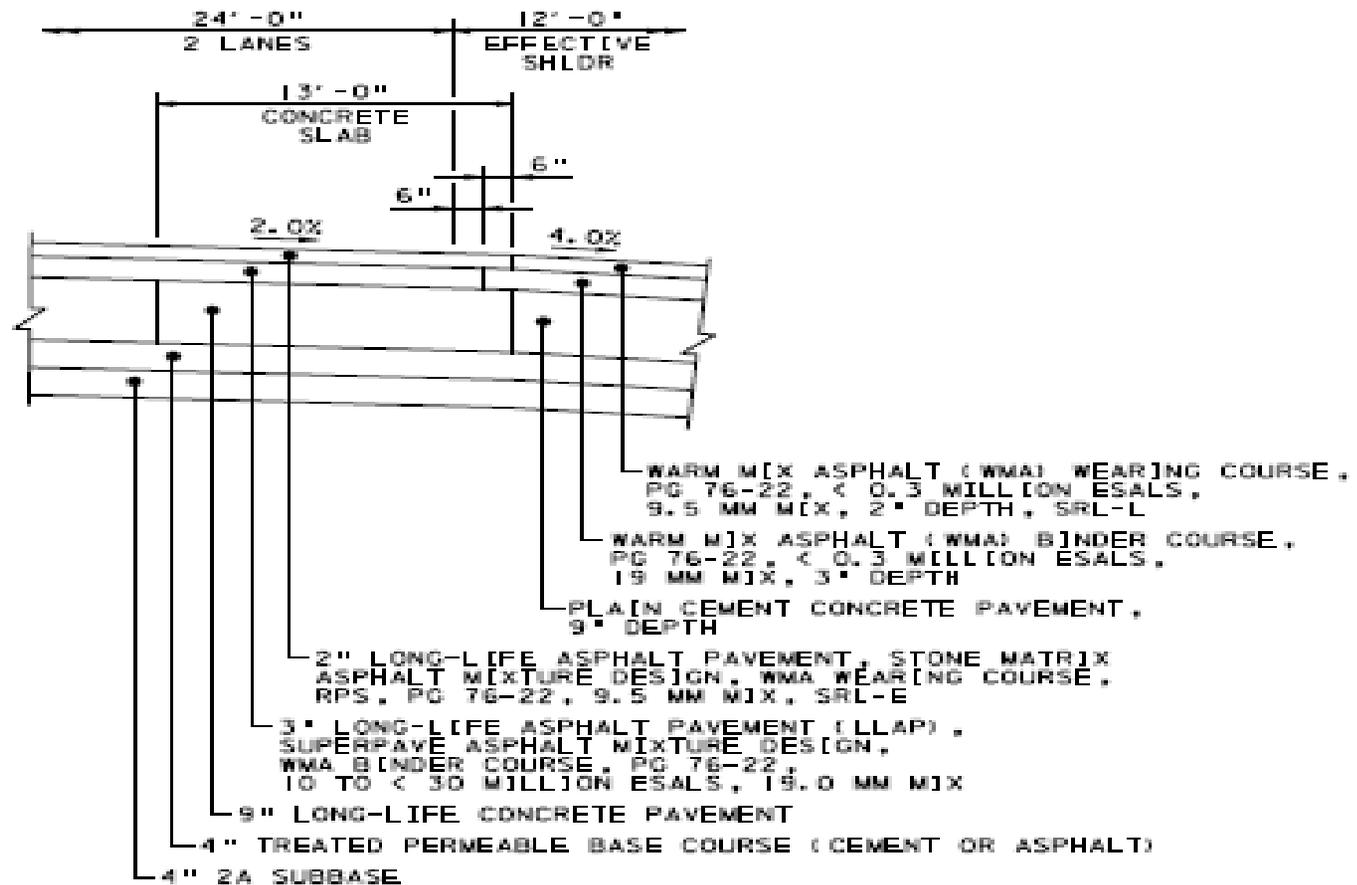
CSVT – Northern Section

- Paving contract



CSVT – Northern Section

- Paving contract



DETAIL A
NOT TO SCALE

> CSVT – Southern Section

Southern Section

Central Susquehanna Valley Transportation Project

Southern Section Construction

- 1st Contract – Earthwork/Structures
- 2nd Contract – Paving
- 3rd Contract – PA Route 61 Connector
- Construction anticipated to be completed in 2024
- Total estimated construction cost (including inflation) = \$220 million

Central Susquehanna Valley Transportation Project

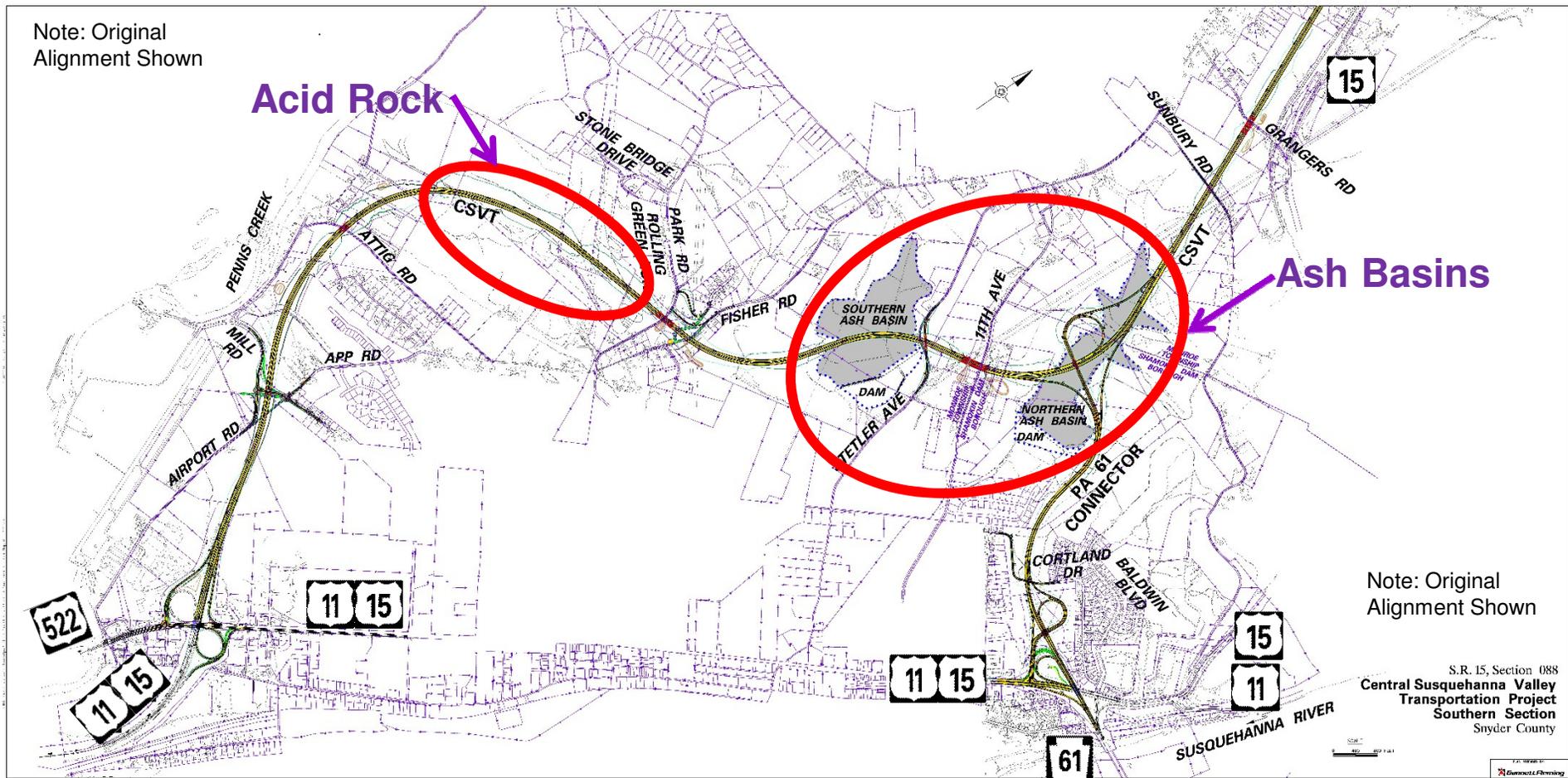
Southern Section Key Features and Design Challenges

- Approx. 4 Million CY of Earthwork
- 12 Highway Structures
- Approx. 110 Right-of-Way Claims
- Threatened and Endangered Species
 - Northern Long-Eared Bat
- Pyritic Material (Acid-Bearing Rock)
- Ash Basins
- Penn Valley Airport
- Aqua PA Water Supply Wells



CSVT – Southern Section

Engineering Challenges

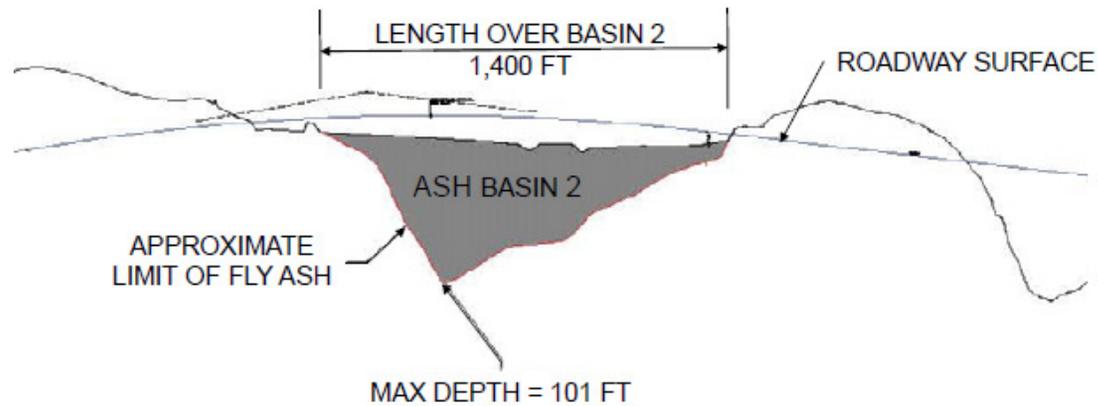


S.R. 15, Section 088
Central Susquehanna Valley
Transportation Project
Southern Section
Snyder County

CSVT – Southern Section

- CSVT was originally proposed on basins to re-use undeveloped lands

CSVT PROFILE THROUGH ASH BASIN AREA



CSVT – Southern Section

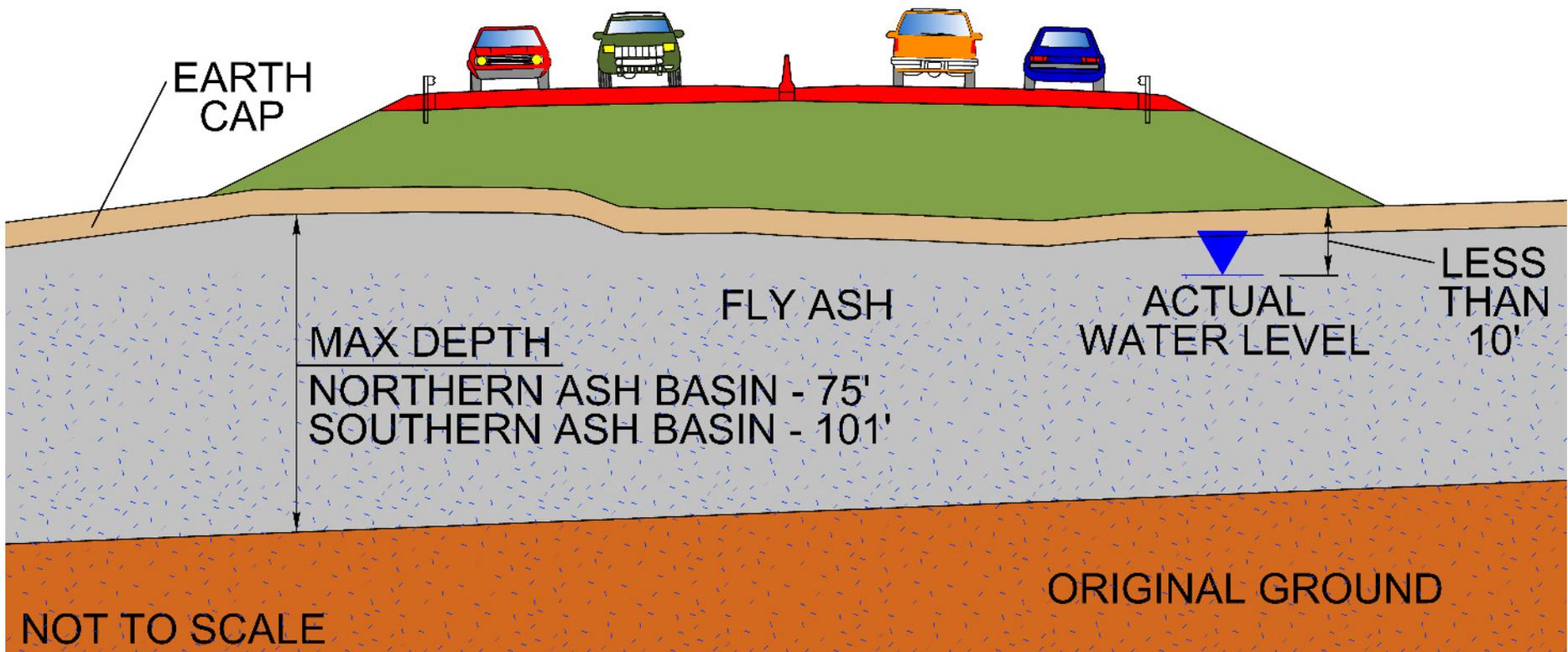
- Reason for alignment shift:
 - Saturated ash cannot support weight of highway
 - Risk of groundwater contamination
 - Change in regulatory requirements
 - Perpetual public liability for basins and their high-hazard dams

Fly Ash Sample



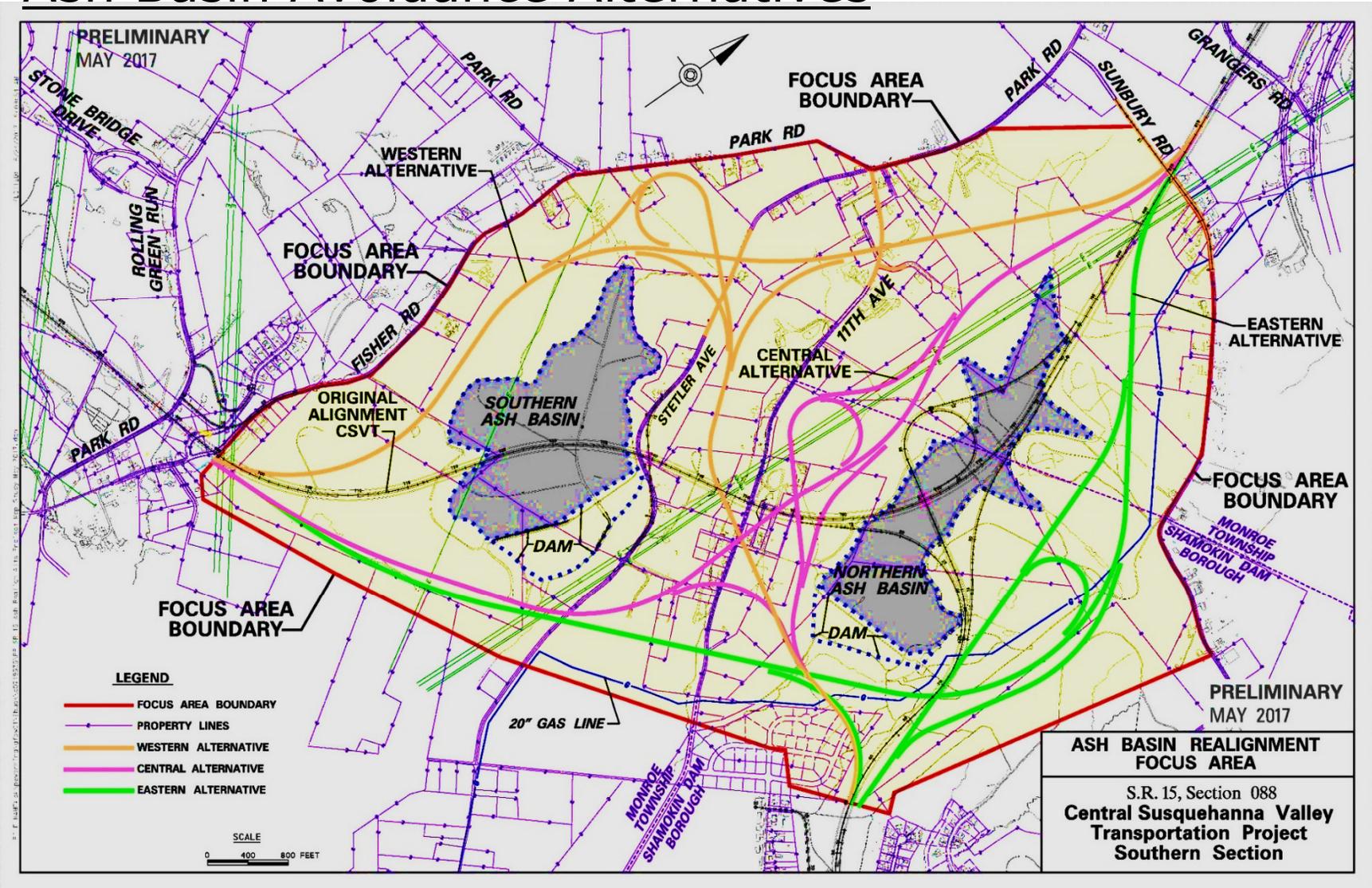
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Southern Section Ash Basin Challenge



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Ash Basin Avoidance Alternatives



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	WESTERN ALTERNATIVE	CENTRAL ALTERNATIVE	EASTERN ALTERNATIVE
EARTHWORK CUT FILL	2.21M CY 2.55M CY	1.91M CY 2.07M CY	1.88M CY 2.13M CY
ROADWAY LENGTH MAINLINE ¹ RAMPS AND SIDE ROADS	21,509 LF 16,845 LF	19,553 LF 15,152 LF	19,798 LF 16,669 LF
BRIDGE AREA	91K SF	191K SF	145K SF
ASH BASIN FOCUS AREA CONSTRUCTION COST	\$110M	\$127M	\$119M
UTILITY RELOCATION UGI GAS LINE PPL ELECTRIC TRANSMISSION LINE	350 LF 4,990 LF	350 LF 10,800 LF	3,500 LF 3,230 LF
ASH BASIN FOCUS AREA TOTAL COST²	\$118M	\$139M	\$131M
PA 61 CONNECTOR USAGE VS. ORIGINAL DESIGN	30% less traffic removed from existing road network	10% more traffic removed from existing road network	30% more traffic removed from existing road network
GEOTECHNICAL CONSIDERATIONS	<ul style="list-style-type: none"> • Potential for acid rock • Steepened slope below Northern Ash Basin dam • Blasting restrictions needed near ash dams 	<ul style="list-style-type: none"> • Steepened slope below Northern Ash Basin dam • Blasting restrictions needed near ash dams 	<ul style="list-style-type: none"> • Steepened slope below Northern Ash Basin dam • Realigned spillway channel below Northern Ash Basin dam • Blasting restrictions needed near ash dams

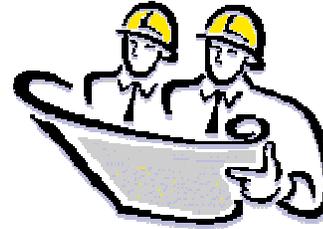
CSVT – Southern Section

			WESTERN ALTERNATIVE	CENTRAL ALTERNATIVE	EASTERN ALTERNATIVE
Total Area / Required Right-of-Way (Acres)			166	164	166
Farmlands	Agricultural Security Areas (Acres)		49	26	26
	Productive Farmlands (Acres)	Hummel Bros.	45	63	34
		Stump Valley	8	6	12
		J. Goedek	12	9	4
		Total	65	78	50
Natural Resources	Streams (Feet)		4,081	4,014	6,073
	Wetlands (Acres)		1.8	1.6	1.1
	Old Field Habitat (Acres)		11	10	13
	Forest Land Habitat (Acres)		62	71	94
	Threatened & Endangered Species Suitable Habitat		Northern Long-Eared Bat	Northern Long-Eared Bat	Northern Long-Eared Bat
Cultural Resources	High Prehistoric Archaeological Resource Potential (Acres)		0.7	0.8	1.9
	Historic Resources		0	0	0
Waste Sites			0	0	0
Recreational Areas/Section 4(f) Resources			0	0	0
Noise Impacted Residences			107	108	68
Residential Displacements	Needed — Not Yet Acquired		12	14	7
	Needed — Already Acquired		2	4	0
	Not Needed — Already Acquired		3	1	5
	Total		17	19	12
Planned Developments	Weatherfield Development (Acres)		0.8	0.8	1.1
	Grayston Property (Acres)		0	0	3.5
	Broscious Property (Acres)		13.7	13.7	12.8
	Total (Acres)		14.5	14.5	17.4
Public Opinion (volume of comments received)		Positive	Medium	Low	High
		Negative	Medium	Medium	High

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Next Steps

- Environmental clearance



- Final design

- Construction



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- Some people are happy with CSVT...

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- Some people are NOT happy with CSVT!

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Questions?



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