

HDR



Montour Run Bridge No. 6 Replacement – ABC Using PBES

*North Fayette and Moon Townships,
Allegheny County*

ABCD Technical Conference - September 4, 2014

ABCD Susquehanna Chapter



DEPARTMENT OF PUBLIC WORKS
COUNTY OF ALLEGHENY



Montour Run Bridge No. 6



MT06 – Team Members

- Allegheny County
- PennDOT District 11-0
- Design – HDR, Raudenbush, TriState, Dawood
- Construction Inspection – Hill International
- Construction – Fay, Kard Bridge Products, LB Foster, DS Brown, AC Miller, Watson-Bowman-Acme, Alvarez, U-Company



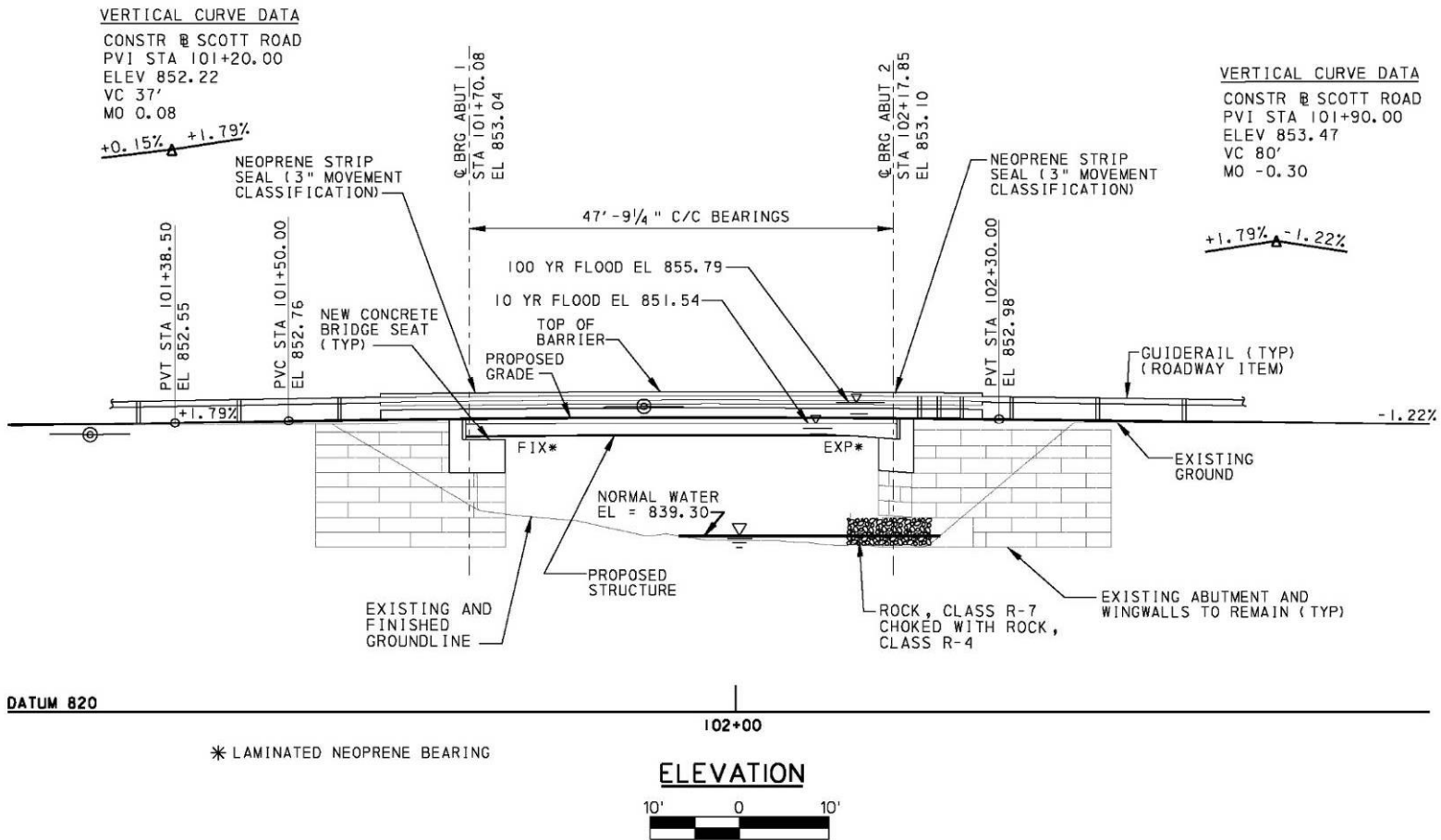
MT06 – Presentation Objectives

- Explain why ABC was necessary for the project
- Explain why various materials and components were used in the design
- Explain stakeholder coordination and project specifications employed in the project
- Present the preparation prior to construction
- Present the Contractor's construction schedule
- State differences between design and construction

MT06 – Why ABC Was Necessary

- Public Meeting – H&K Equipment moved 15 foot wide permit loads
- Moon Township pumping station and numerous utilities in NE side of bridge
- Sewer interceptor and business on west side of bridge
- No real feasible alternate location for the bridge – extensive property takes and costly approach work

MT06 – Bridge Elevation

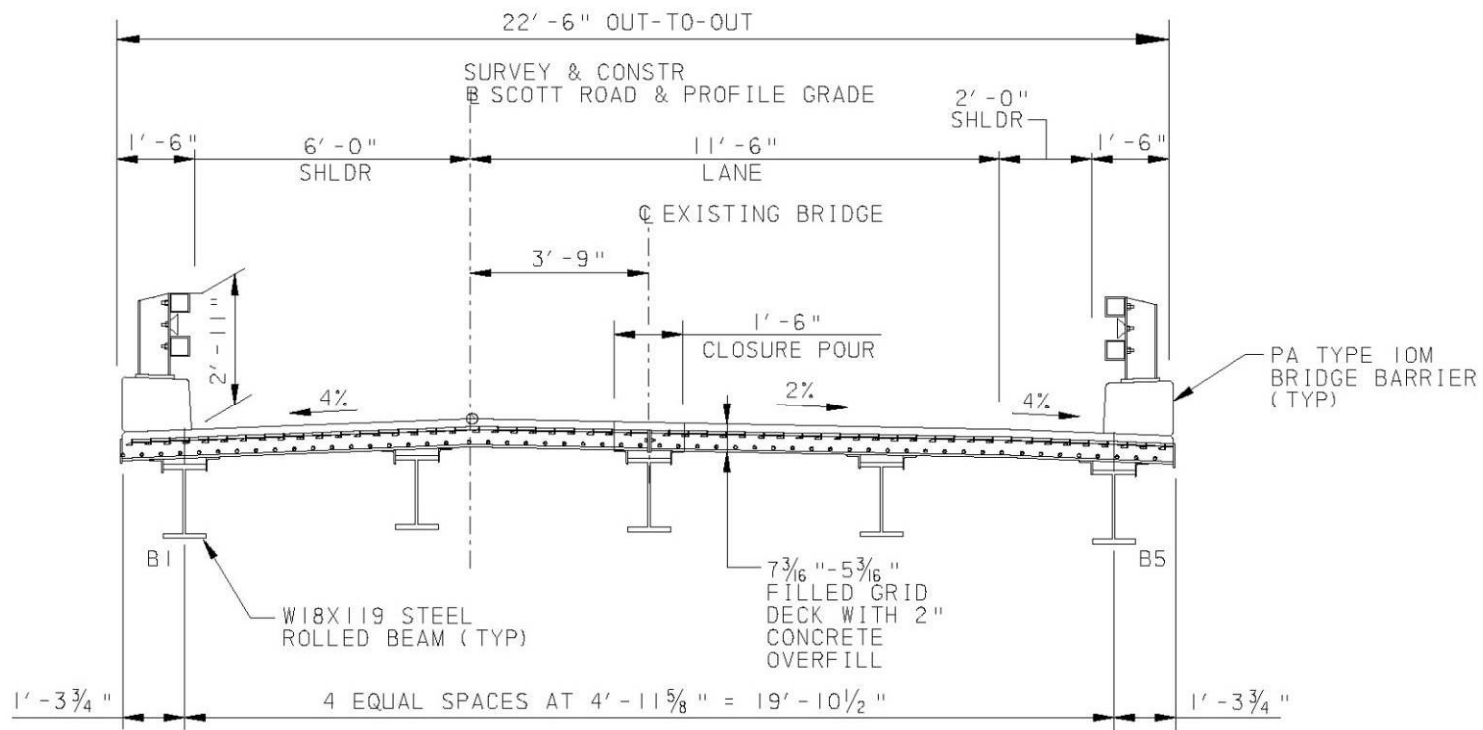


MT06 – Prefabricated Bridge Elements and Systems

- Bridge Superstructure
- Precast Abutment Caps
- Precast Moment Slabs



MT06 – Bridge Description



TYPICAL CROSS SECTION

NO SCALE

MT06 – PBES Superstructure

- Five Steel Beams
- Concrete Overfilled 5" Grid Deck
- PA Type 10M Bridge Barriers

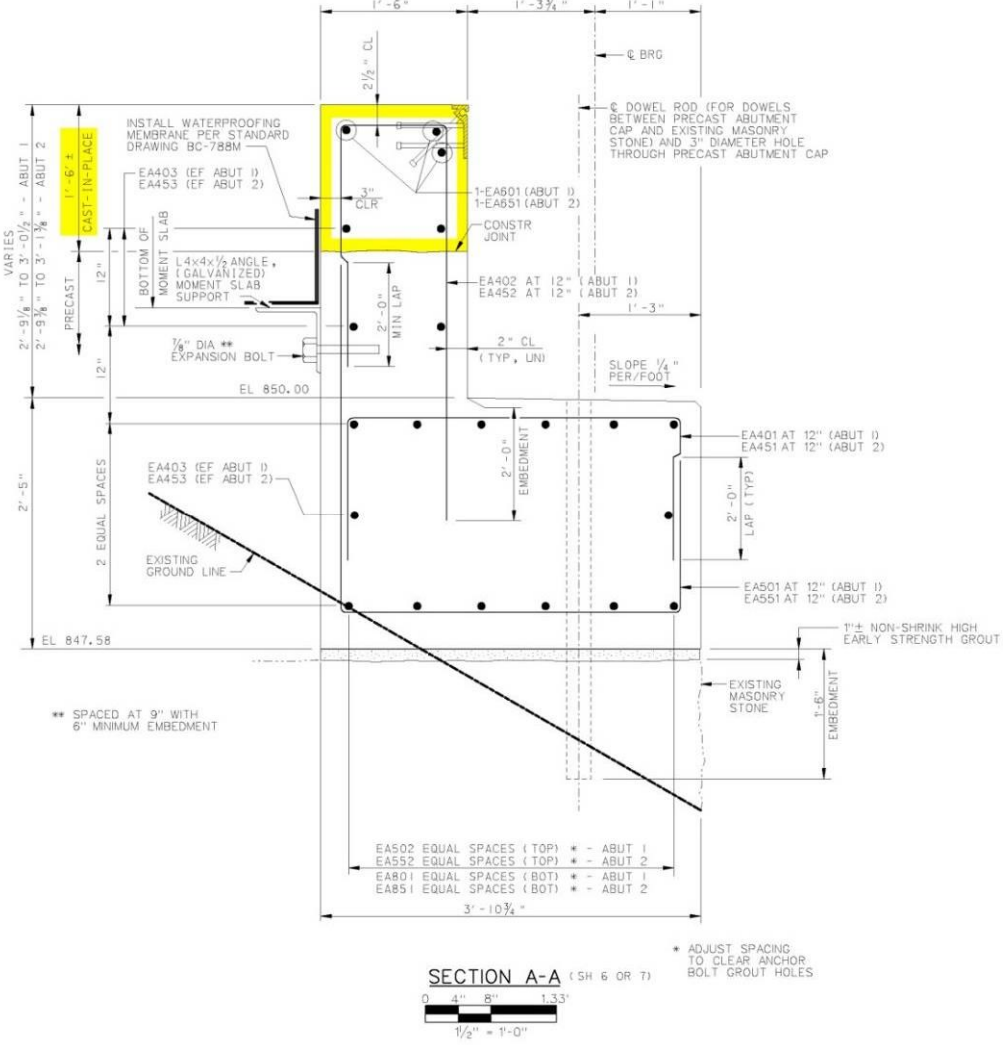


MT06 – PBES Superstructure

Contractor Alternate

- Superstructure Prefabricated Adjacent to Existing Bridge
- Used a Super Crane for the Erection
- Superstructure Erected in its Entirety – No Closure Pour
- Lightweight Concrete Used
- Deck Cured Undisturbed for over 28 Days

MT06 – Precast Abutment Cap Description



MT06 – Precast Abutment Caps

- Prefabricated Off-Site
- Set on Partially Demolished Masonry Stone Gravity Abutment
- Designed as a Beam
- Doweled to the Masonry Stone
- Leveled with Shims
- Non-Shrink Grout Under the Abutment Cap
- CIP HES Concrete Top of Backwall
- Angle Moment Slab Support

MT06 – Precast Moment Slabs

- Prefabricated Off-Site
- Set Adjacent to the Precast Abutment Caps
- Act as a Pseudo-Approach Slab
- Provide a Transition to the Roadway Guiderail
- Gravel Fill on Moment Slab in Fall of 2012
- Bituminous Pavement Placed In Spring 2013

MT06 – Stakeholder Coordination

- Numerous meetings to determine an acceptable solution
- Businesses concur that the current width meets their needs
- Businesses accept bridge replacement over holiday weekend
- Willingness to work with County

MT06 – Project Specifications

- Liquidated Damages
- H.E.S. Concrete Closure Pour and Backwall
- Precast Abutment Caps
- Precast Moment Slabs
- Mandatory Pre-Bid Meeting Attendance –
June 14, 2012
- Construction Schedule Requirements
- Construction Special Conditions



MT06 – Bidding Information

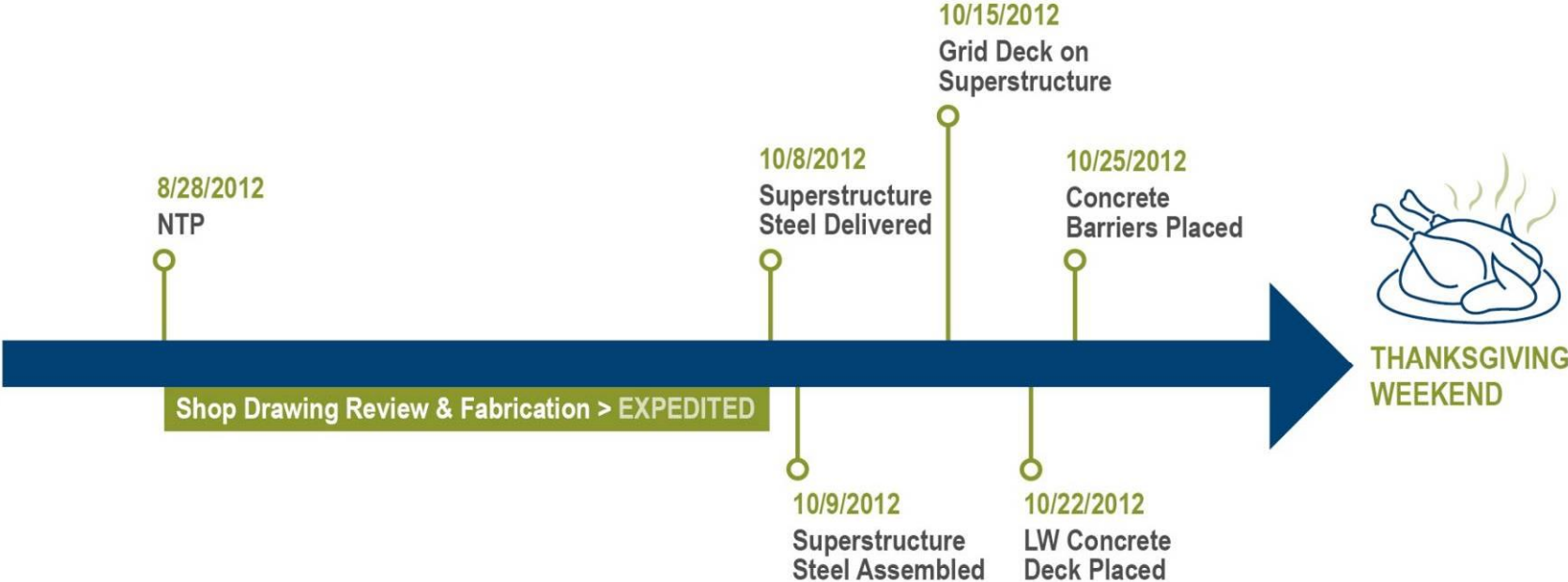
- Engineer's Estimate - \$ 748,725
- Seven bidders
- Low Bid Awarded - \$ 804,932
- Superstructure Cost \$390/SF
- Typical Superstructure Cost \$175/SF
- NTP – August 28, 2012
- Construction Schedule Requirements
 - Start 5:00 PM Wednesday, Nov. 21, 2012
 - Open to traffic – 6:00 AM Monday, Nov. 26, 2012
 - Complete approach pavement Spring 2013

MT06 – Construction Preparation

- Shop Drawing Coordination
- Superstructure Erection
- Deck Placement
- Construction Staging Area
- Utilities
- Contractor Crew Coordination
- Emergency Site Access



MT06 – Actual Construction Schedule

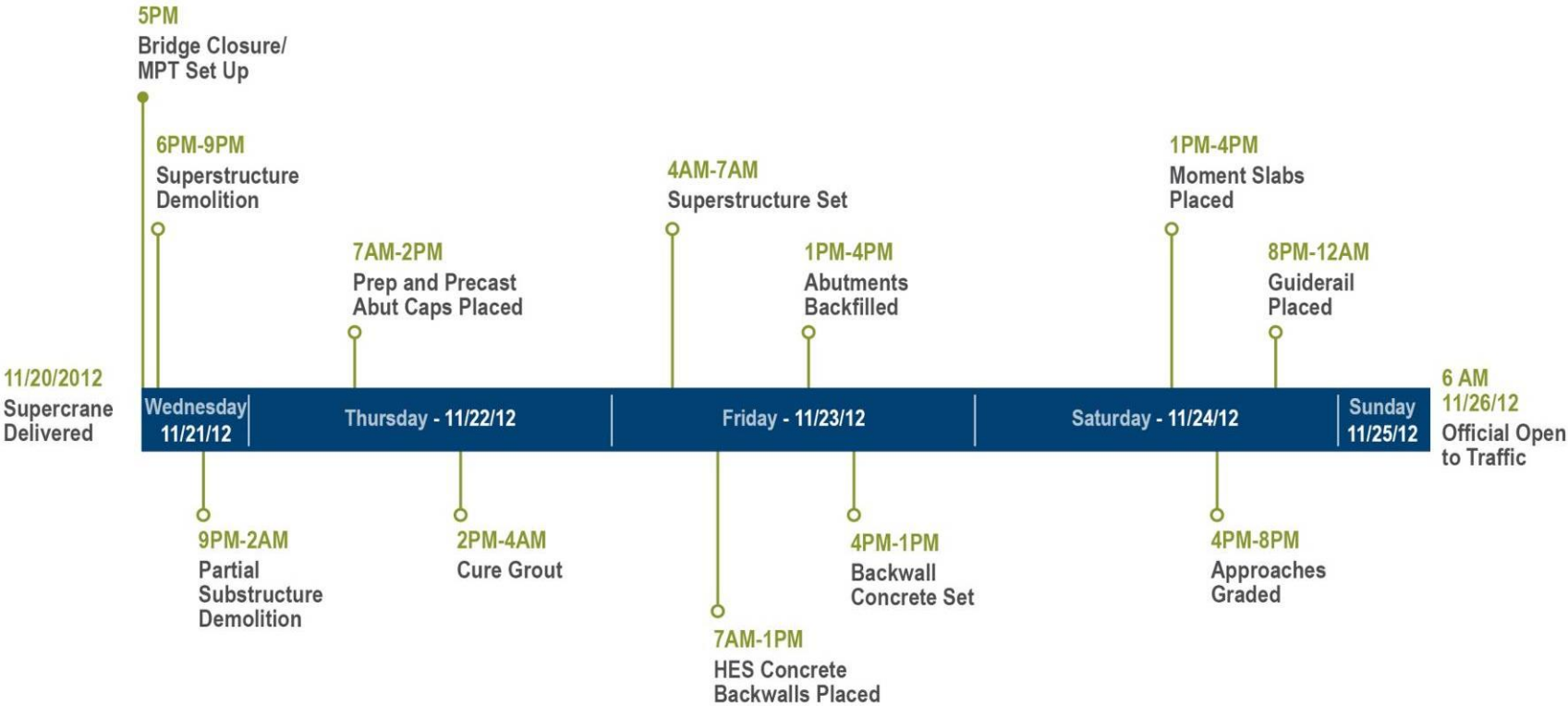


Shop Drawing Review & Fabrication > EXPEDITED

Approach Pavement - Business Side	4/5/2013 - 4/7/2013
Approach Pavement - Trail Side	4/12/2012 - 4/14/2013



MT06 – Thanksgiving Weekend Schedule



Montour Run Bridge No. 6



MT06 – Superstructure Framing



MT06 – Superstructure Grid Deck



MT06 – Superstructure Concrete Deck and Barriers



MT06 – Existing Bridge Demolition



MT06 – Existing Bridge Demolition



MT06 – Supercrane



MT06 – Supercrane Pick Weights

- 550 Ton Crane – Grove GMK7550 with Mega Wing Lift attachment and 352,700 lb. counterweight and 132' boom with a 175 ton block
- Precast Abutment – 46,000 lb.
- Superstructure - 177,000 lb. with barriers (54 Foot Radius)

MT06 – Lifting of Precast Abutment Cap



MT06 – Precast Abutment Cap Placement



MT06 – Set Precast Abutment Cap



MT06 – Superstructure Placement



MT06 – Heated Curing of HES Backwall



MT06 – Preparation for Moment Slab Placement







MT06 – Moment Slab Placement



MT06 – Completed Structure



MT06 – Roadway Construction Complete



MT06 – Keys to Project Success

- Well Thought Out Plans
- Contractor was Proactive
- Contractor Anticipated Possible Problems
- Cooperation between Owner, Contractor, Designer and Stakeholders





Questions?