



S.R. 0522-16B over Tributary to Big Cove Creek

Extended Weekend Precast Culvert Installation



Project Specifics

S.R. 0522-16B Great Cove Road over Tributary to Big Cove Creek

Location	Ayr Township, Fulton County PA
Owner	PennDot District 9-0
Low Bid	\$441,301.33
Contractor	Wen-Brooke Contracting Inc.
Contracting Method	Design-Bid-Build
Contract Closure Time	4 Days (96 Hours)
Actual Closure Time	<p><u>Start</u> Friday August 17th 6:40 am</p> <p><u>End</u> Monday August 20th 5:40 pm</p>



Original Structure Information

- Single Span
- Concrete Slab Bridge
- Built in 1921
- Structurally Deficient
- Original roadway width 24.8'



As-Built Structure Information

- ABC techniques utilized
- 15'-0" x 5'-0" Precast Reinforced Concrete Box Culvert
- ≈ 250' Roadway Work
- Depressed = 1'-4"
- Effective rise = 3'-8"
- Out-to-out length 35'-9"
- Two (2) 11'-0" travel lanes
- 4'-0" outside shoulders
- Roadway Width = 30'-0"
- PA Structure Mounted Guide Rail

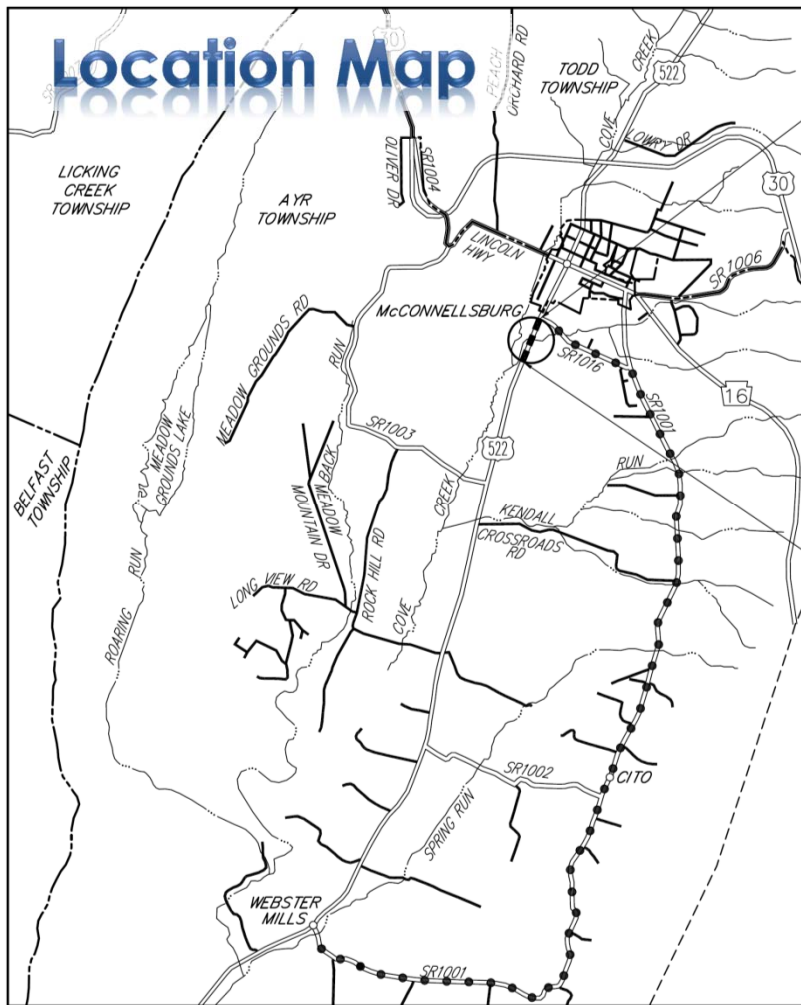


Why ABC Techniques?

- Project Constraints
 - Widen Roadway
 - Original - 24.8 feet
 - As-Built - 30 feet
 - Construction Travel Lane
 - 15 feet min. width
 - Farming Equipment
- ABC Technique Benefits
 - Safer Working Environment
 - Motorist
 - Construction Workers
 - Quality Product
 - Lessen Environmental Impact
 - Lessen Public Disturbance



Why ABC Techniques?



- Traffic Control Options
 - Detour
 - 5.8 mile detour
 - Less than optimal road conditions
 - Limit to Extended Weekend
 - 20.5 mile detour
 - Temporary Roadway
 - Significant Environmental Impacts
 - Costly
 - Phased Construction
 - Overbuild Structure (7 feet min.)
 - Significant Environmental Impacts
 - Costly

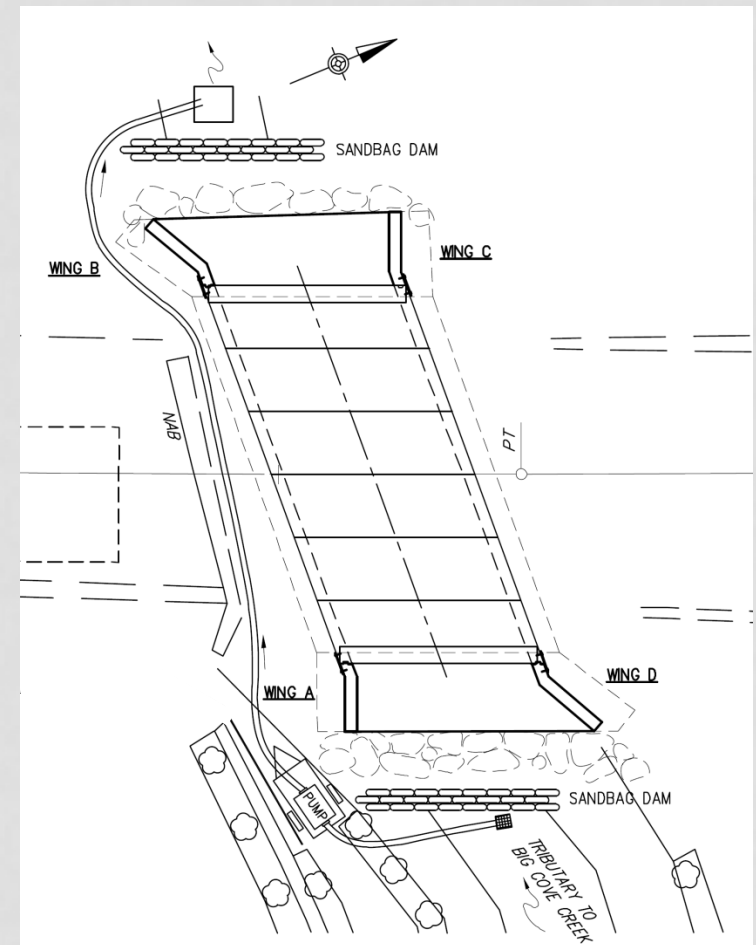
Design Challenges

- Four Day Construction Schedule
- Dolomite limestone
 - PennDOT District 9-0 waived 24 inches of bedding requirement
- Extensive Coordination
 - Local municipality
 - Fire Department
 - Ambulance
 - Police
 - School District
 - Post Office
 - Businesses (i.e. JLG Industries)
 - Property Owners
 - Contractor
 - PennDOT
- Best Weekend for Construction
 - Late July to mid-August.
 - Construction took place the weekend of August 17th, 2018.



Project Planning

- Two Considerations
 - Where is the structure in reference to the stream?
 - Shifted $\approx 8'$ to the north of the original structure
 - Better stream alignment
 - Reduced chance of scour
 - Abutment 1 to stay in place
 - Where is the structure in reference to the road?
 - Maintained existing roadway profile grade
- Reduced impacts to the site
 - Saved time
 - Saved money



Project Planning

- Remove time consuming site construction
 - Avoid the use of cast-in-place concrete.
 - Precast Box Segments including curbs, guide post anchors, baffles
 - Distribution slab requirement waived
 - Alternative cutoff wall



5 Step Construction

Step I – 7 Hours

- Close Road
- Begin Demolition
- Divert stream



5 Step Construction

Step II - 14 Hours

- Excavation
- Significant rain event
 - Flooding
 - 3.5 hour delay
- Site Preparation
 - Bedding material



5 Step Construction

Step III - 5 Hours

- Precast Box Culvert Segments
- Post-Tension Segments
- Membrane waterproofing



5 Step Construction

Step IV - 21 Hours

- End Sections
- Post tensioning and grouting
- Membrane waterproofing
- Backfill
- Rock protection with grout
- Stormwater Inlets and pipes
- Remove water diversion devices



5 Step Construction

Step V - 36 Hours

- Final grading
- Pavement markings
- Guide rail was installed
- Seeding and mulching
- Open roadway to traffic.



Construction Video

- Construction allotted for 96 hours
- Construction Completed 13 hours ahead of schedule



Construction Video

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- Construction Completed 13 hours ahead of schedule



Any Questions?

Special Thanks!

District 9-0

Wen-Brooke Contracting Inc.