

Town of Southbury

Replacement of Bridge No. 130009

Old Field Road over Bullet Hill Brook

January 29, 2025



Introduction

This project consists of the replacement of the Old Field Road (Bridge No. 130009) over Bullet Hill Brook in the Town of Southbury.

Old Field Road is located in the central part of the Town of Southbury and connects Heritage Road to the north and Main Street South (at the intersection with Peter Road) to the south. Bridge No 130-009 conveys Bullet Hill Brook under Old Field Road and is located 325 feet south of Heritage Road and 1,200-feet upstream with its confluence with the Pomperaug River.

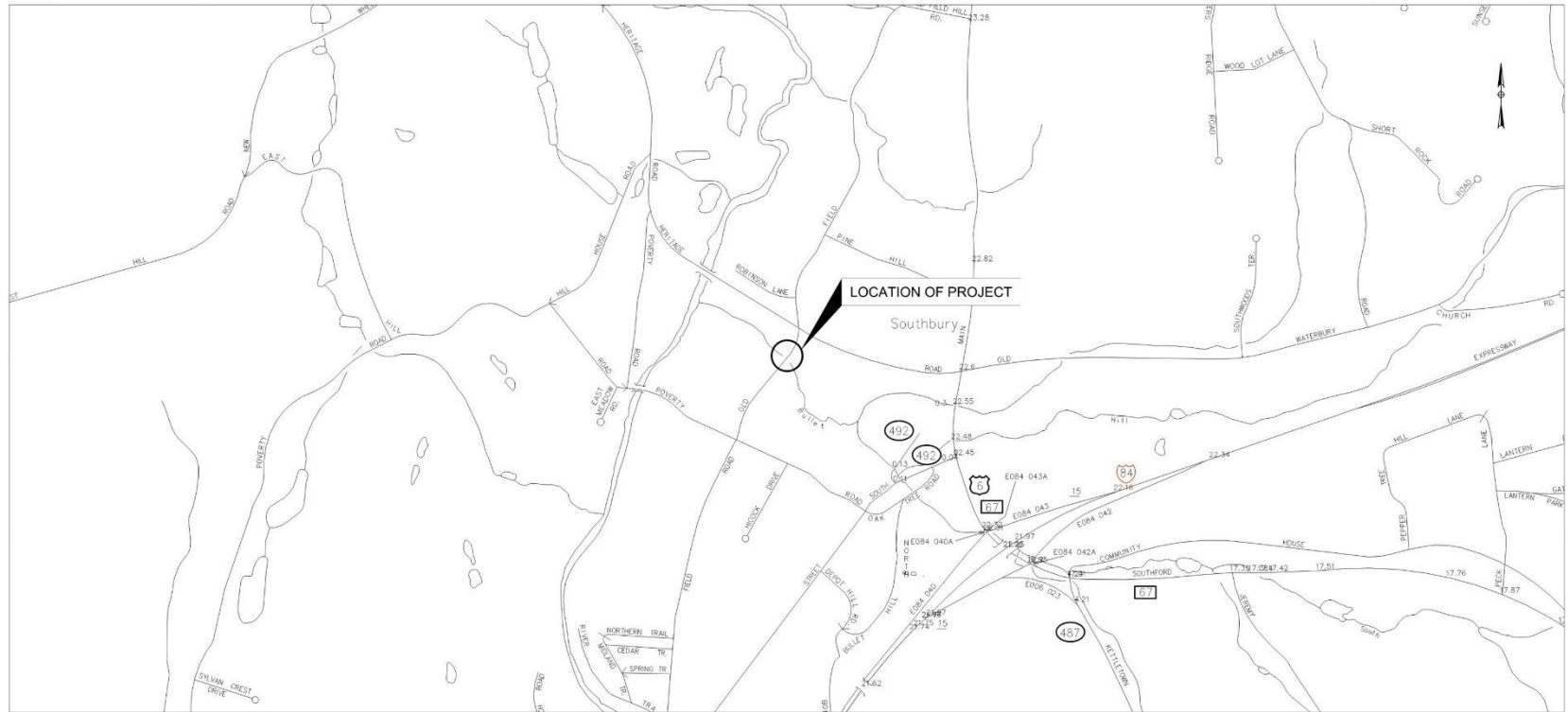


Roadway – Looking South (Pre-Flood)



Upstream Elevation – Looking West (Pre-Flood)

Location Plan



PROJECT LOCATION PLAN
NOT TO SCALE

OLD FIELD ROAD
OVER BULLET HILL BROOK

CARDINAL
ENGINEERING ASSOCIATES

180 RESEARCH PKWY | MERIDEN, CT 06450 | 203-238-1969
457 BANTAM RD | LITCHFIELD, CT 06769 | 860-597-9106

Existing Conditions



Upstream View – Deteriorated Walls (Pre-Flood)



Barrel-Wall Separation with Waterline Scaling (Pre-Flood)



Upstream View (Post-Flood Damage)

Existing Bridge

- Twin 72" Reinforced Concrete Pipes with Masonry Block Walls, built 1950
- Structure in critical condition
- Sufficiency Rating = 48.13%
- ADT : \approx 4200 vpd

Existing Conditions



Exposed Reinforcing



Misaligned Joints



Old Field Road looking South (Post Flood)



Old Field Road looking North (Post Flood)

Proposed Project

Existing Structure:

Pre Flood

- Twin 72-inch RCPs.
- Barrels of pipes in poor condition Deterioration of the pipes with exposed rebar and misalignment of joints.
- Headwalls and wingwalls are in serious condition with widespread advanced deterioration.
- Passes a 15-year flow prior to overtopping. Design standard is 100-year with one-foot of freeboard.

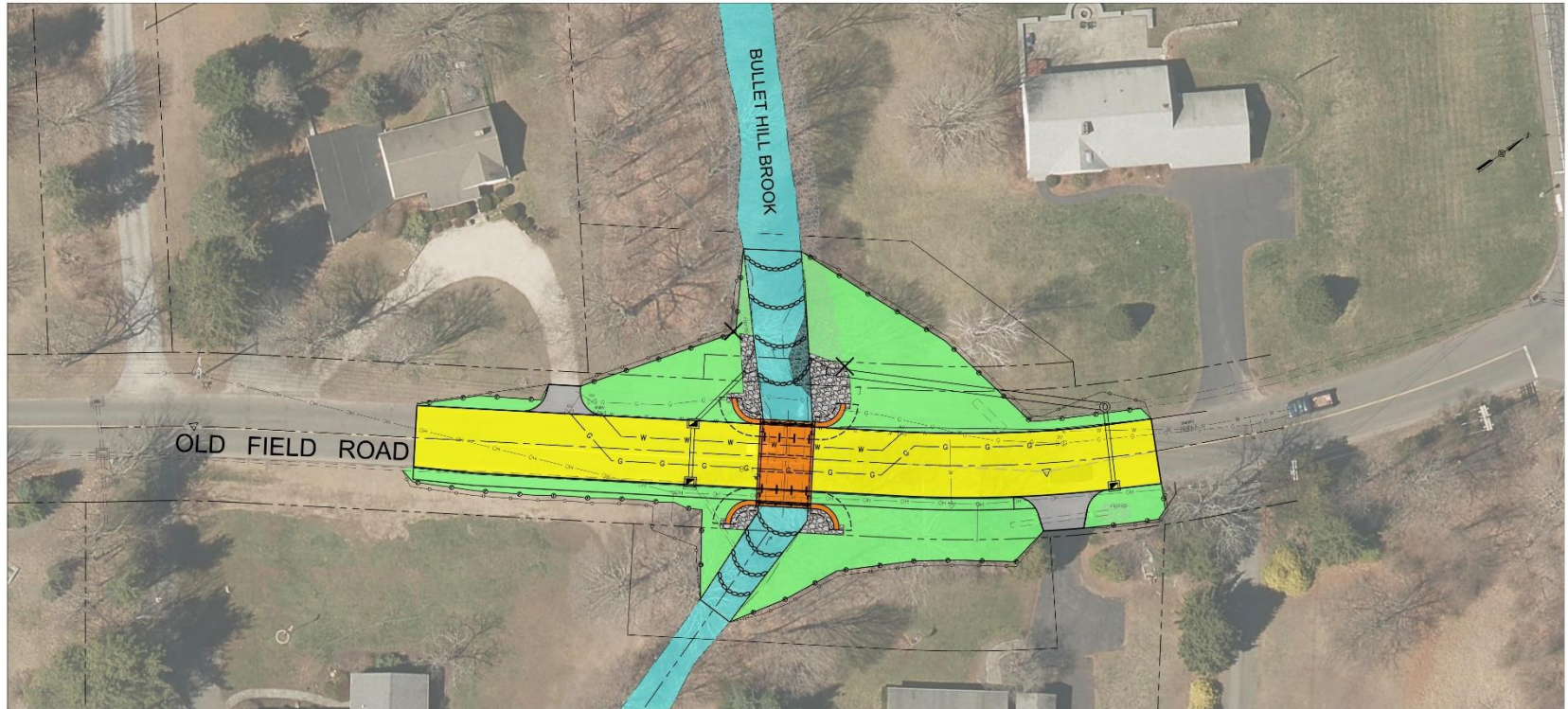
Post Flood

- RCPs seriously damaged
- Headwalls partially gone
- Roadway washed out

Proposed Structure:

- 20' x 9' Precast Concrete Box Culvert with cast in place wingwalls.
- Invert will be depressed 2' with Natural Streambed Material above the Invert
- Existing River Channel Remains in Natural Condition.
- Passes CTDOT Design Flow (100-year) with no Freeboard at Roadway Low point.
- Sidewalk added to upstream side of road.
- Curved Wingwalls with Simulated Stone.
- Gas & Water utilities relocated under new culvert.

Proposed Project

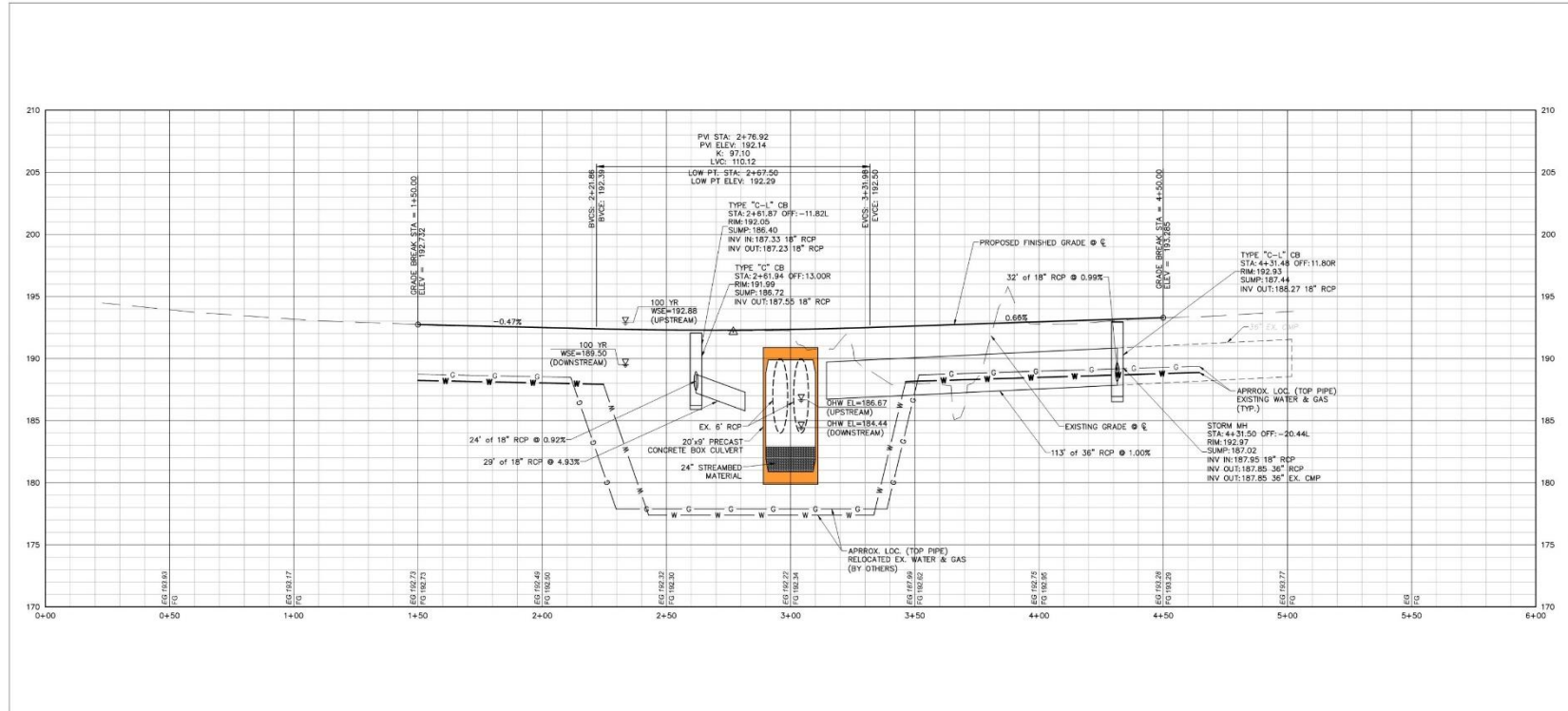


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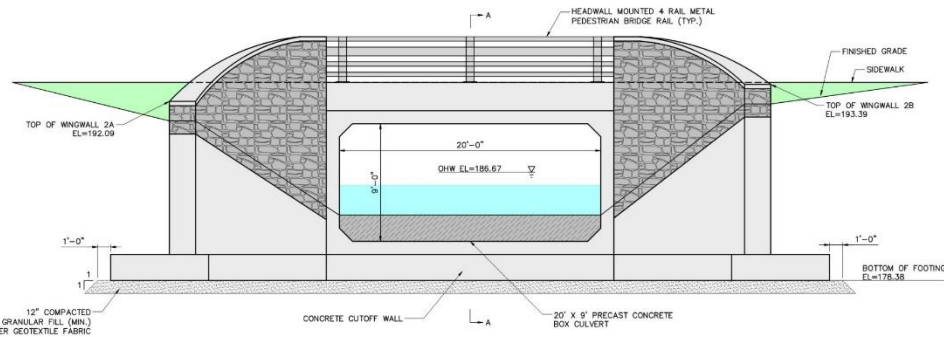


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Proposed Project

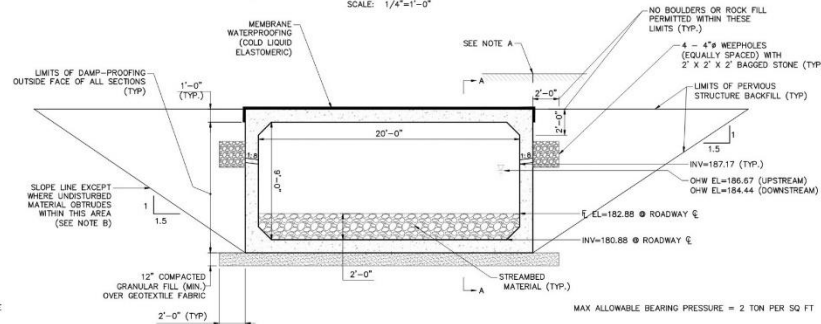


PROPOSED WEST/UPSTREAM ELEVATION
(EAST/DOWNSTREAM ELEVATION SIMILAR)

SCALE: 1/4"=1'-0"

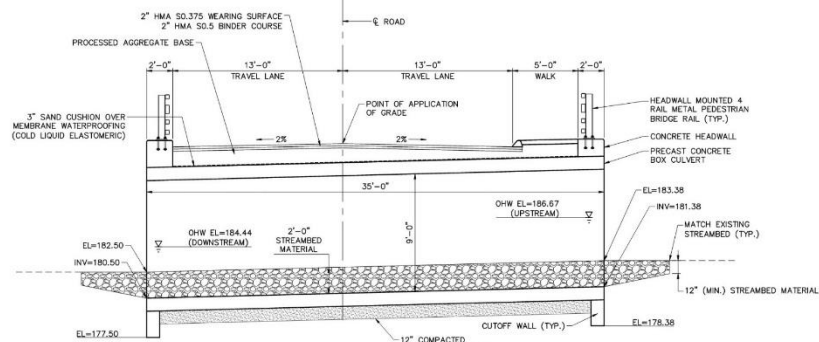
NOTES:

- CUT HMA SURFACE COURSE WITH A 3/4" X 2" DEEP KEF AND FILL WITH A POURABLE SEALANT WHEN COVER IS LESS THAN 2'-0" FROM TOP OF BOX TO FINISHED WEARING SURFACE. COST OF CUTTING AND SEALING TO BE INCLUDED IN THE CONTRACT UNIT PRICE FOR "SAWING AND SEALING JOINTS".
- THE COST OF ANY EXCAVATION AND BACKFILL OUTSIDE OF THE PAY LIMITS FOR THE ITEMS "STRUCTURE EXCAVATION-EARTH (EXCLUDING COFFERDAM AND DEWATERING)", "STRUCTURE EXCAVATION-ROCK (EXCLUDING COFFERDAM AND DEWATERING)" OR "PERVIOUS STRUCTURE BACKFILL" SHALL BE INCLUDED IN THE ITEM "COFFERDAM AND DEWATERING". MATERIAL FOR BACKFILL SHALL MEET THE REQUIREMENTS OF SECTION 2.10, "PERVIOUS STRUCTURE BACKFILL", OF THE STANDARD SPECIFICATIONS.



TYPICAL LONGITUDINAL SECTION

SCALE: 1/4"=1'-0"



TYPICAL TRANSVERSE SECTION A-A

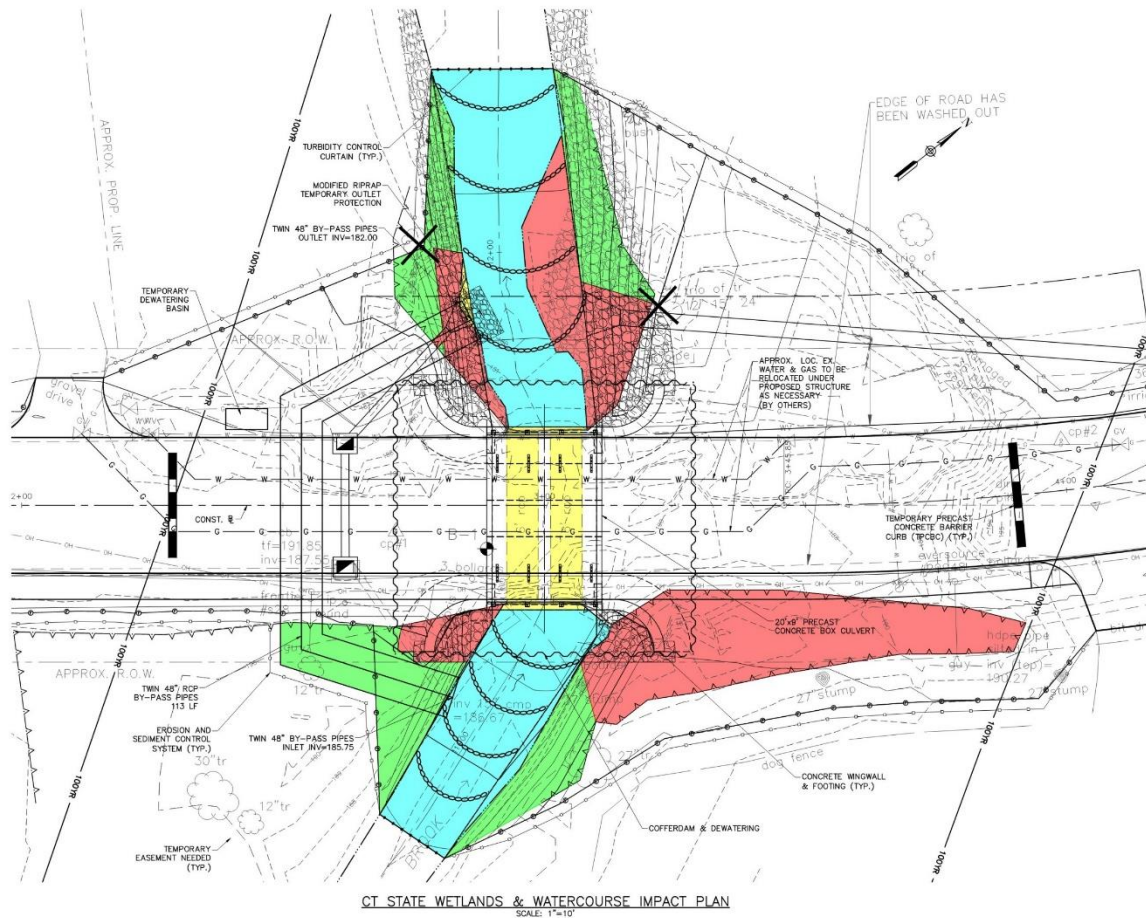
SCALE: 1/4"=1'-0"

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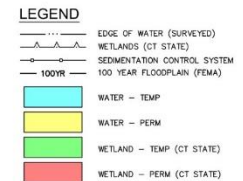
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Wetlands/Watercourse Impacts



WETLAND IMPACT TABLE			
	CT WETLAND IMPACTS	WATERWAY IMPACTS	TOTAL
TEMPORARY IMPACTS	1367 SF	2024 SF	3391 SF
PERMANENT IMPACTS	2008 SF	443 SF	2451 SF
TOTAL IMPACTS	3375 SF	2467 SF	5842 SF

NOTE: 120 LF OF BROOK WILL BE IMPACTED.

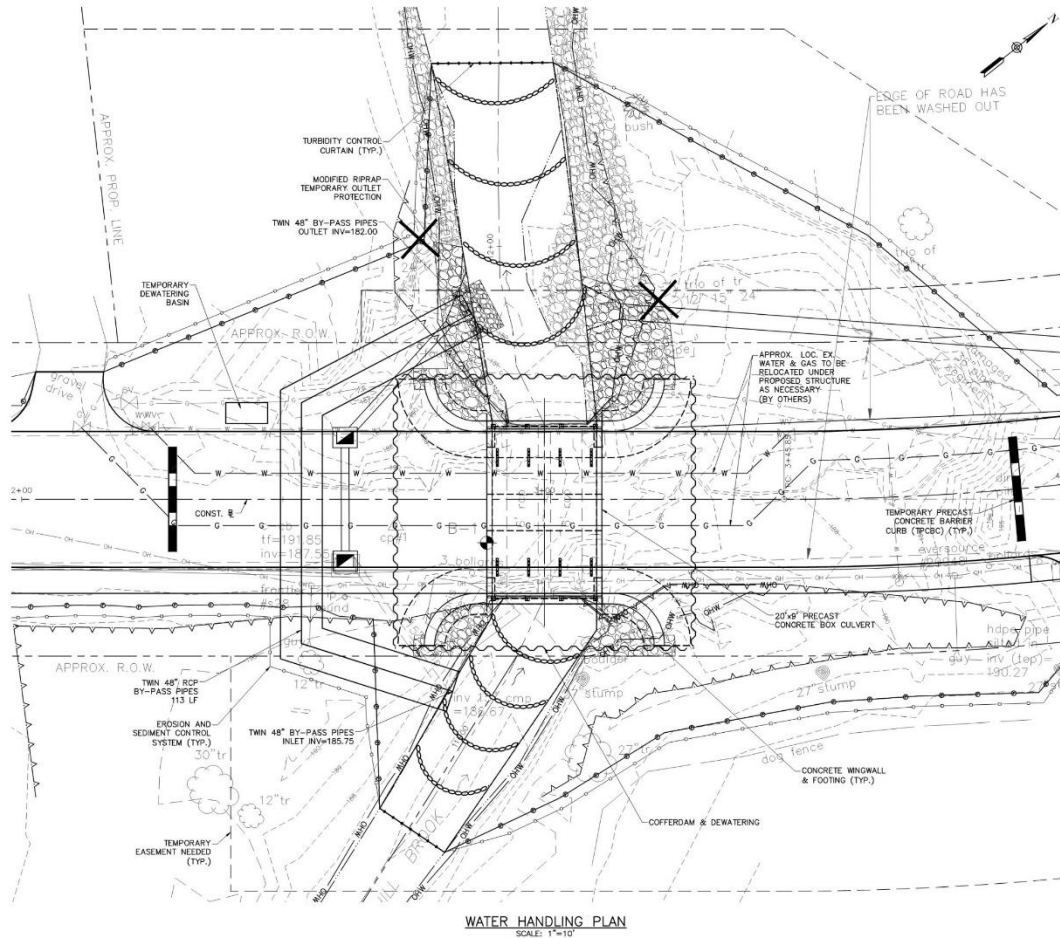


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Water Handling Plan



SUGGESTED CONSTRUCTION SEQUENCE NOTES

1. INSTALL EROSION & SEDIMENT CONTROL SYSTEM.
2. INSTALL TWIN 48" BY-PASS PIPES.
3. CONSTRUCT COFFERDAM AND DIVERT FLOW TO BY-PASS PIPE.
4. REMOVE THE EXISTING CULVERTS AND HEADWALLS.
5. INSTALL WINGWALL FOOTINGS, RETURN WALLS AND CUTOFF WALLS.
6. INSTALL PRECAST CONCRETE BOX CULVERT.
7. INSTALL WINGWALLS.
8. BACKFILL BOX CULVERT AND WINGWALLS, GRADE CHANNEL, REMOVE BY-PASS PIPE, COFFERDAMS AND DIRECT FLOW INTO NEW CULVERT.
9. PLACE BARRICADES, SAND BARREL ARRAY AND TRAFFIC DRUMS AS NECESSARY TO PROTECT THE REMAINING WORK AREAS ON THE BRIDGE AND REDIRECT TRAFFIC.
10. OPEN ROADWAY, CONSTRUCT REMAINING BRIDGE ELEMENTS (ALTERNATING ONE-WAY TRAFFIC IF REQUIRED).
11. CONSTRUCT THE REMAINING ROADWAY AND CULVERT IMPROVEMENTS UTILIZING ALTERNATING ONE-WAY TRAFFIC AS REQUIRED.






TEMPORARY HYDRAULIC DATA

AVERAGE DAILY FLOW	6.43 CFS
AVERAGE SPRING FLOW	12.6 CFS
1-YEAR FREQUENCY DISCHARGE	185 CFS
TEMPORARY DESIGN DISCHARGE	185 CFS
TEMPORARY DESIGN FREQUENCY	1 YEAR
TEMPORARY WATER SURFACE ELEVATION UPSTREAM	190.7
TEMPORARY WATER SURFACE ELEVATION DOWNSTREAM	182.0

CONSTRUCTION GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH BEST MANAGEMENT PRACTICES.
2. ANY UNCONFINED IN STREAM WORK WITHIN BULLET HILL BROOK SHOULD BE RESTRICTED TO THE PERIOD FROM JUNE 1 TO SEPTEMBER 30, INCLUSIVE.
3. SEQUENCE OF CONSTRUCTION NOTES SHALL BE USED IN CONJUNCTION WITH THE HIGHWAY CONSTRUCTION, MAINTENANCE AND PROTECTION OF TRAFFIC PLANS.
4. THE SUGGESTED STEPS ILLUSTRATE A SEQUENCE OF CONSTRUCTION THAT CONFORMS TO STAGING REQUIREMENTS. THE SEQUENCE MAY BE ALTERED, SUBJECT TO THE APPROVAL OF THE ENGINEER SO LONG AS THE OPERATION OF VEHICULAR TRAFFIC IS MAINTAINED.
5. NEITHER THE WORK NOR STEPS LISTED IN THE CONSTRUCTION SEQUENCE ARE INTENDED TO COVER ALL DETAILS OF THE WORK. THE CONTRACTOR SHALL PREPARE A DETAILED CONSTRUCTION SEQUENCE AND SCHEDULE FOR REVIEW AND APPROVAL BY THE ENGINEER.
6. THE TEMPORARY COFFERDAM SHALL CONSIST OF SHEETS OR ANY OTHER APPROVED SYSTEM THAT THE CONTRACTOR ELECTS TO USE WHICH WILL SAFELY CONVEY WATER FLOWS THROUGH THE CONSTRUCTION AREA, BE ABLE TO SUPPORT CONSTRUCTION ACTIVITY AND EXCAVATION AND SHALL CONFORM TO PERMITS.
7. THE CONTRACTOR IS HEREBY NOTIFIED THAT THE OVERHEAD ELECTRICAL FACILITIES WILL REMAIN LIVE THROUGHOUT THE DURATION OF CONSTRUCTION.

LEGEND

-  TEMPORARY PRECAST CONCRETE BARRIER CURB (TPCBC)
-  COFFERDAM
-  EROSION AND SEDIMENT CONTROL SYSTEM
-  TURBIDITY CONTROL CURTAIN
-  TEMPORARY EASEMENT

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Questions/Concerns?

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