

REPLACEMENT OF DIVINITY STREET CULVERT OVER UNNAMED BROOK City of Bristol



Prepared by: WSP USA

Prepared for: City of Bristol



30% Design Report

Date: September 2024

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Problem, Definition, Purpose and Need

WSP USA Inc. (WSP) was engaged by the City of Bristol (City) to provide engineering services for the complete replacement of a culvert on Divinity Street over an unnamed brook. The purpose of this report is to describe the design completed. In addition to this Design Report, plans and a cost estimate have been prepared associated with design completion.

The Divinity Street Culvert supports Divinity Street over an unnamed brook in Bristol, Connecticut. Divinity Street is generally an east-west roadway and is classified as an urban collector road with an average daily traffic of approximately 4,600 vehicles and a posted speed limit of 25 mph. The structure has a total width of 50 feet, curb-to-curb width of 30 feet and is located approximately 300 feet east of the intersection with Peck Lane. Existing culvert is a reinforced concrete slab supported by masonry walls providing approximately five feet by five feet opening, estimated to have been built in 1913.

The purpose and need for this project is to address the structural condition of the existing culvert. During a site visit, it was discovered that the footings are undermined in multiple locations but especially at the outlet of the culvert. There are failed repairs within the walls of the culvert and localized spalls were observed. Furthermore, there are exposed utilities in the streambed. The existing hydraulic capacity is inadequate and to the extent possible the hydraulic capacity will be increased. The roadway width, horizontal alignment, and vertical alignment of Divinity Street are adequate and therefore proposed to match existing conditions.

General

The project limits start approximately 200 feet east of the intersection of Divinity Street and Peck Lane and extend approximately 140 feet east. The total project length is 140 feet. It is noted that access will need to be maintained for three residential driveways within these limits throughout construction. Public access will be restricted between the Peck Lane and View Street intersections during the culvert demolition and reconstruction activities.

The Divinity Street Culvert shall be replaced in its entirety. This includes removing the existing 50 feet long culvert which is composed of stone masonry sides and a reinforced concrete slab.

Divinity Street is the only facility within the project limits. Divinity Street is generally an east-west roadway and is classified as a collector road. The existing roadway carries one travel lane in each direction which is proposed to remain for final condition as shown in the Typical Sections drawing.

For the length of the project, Divinity Street will be constructed to a 30 foot wide roadway with one 11 foot lane and four foot shoulder in each direction. The width slightly varies at the project limits to tie into the existing roadway geometry. Additionally, bituminous concrete curbing will be installed on either side of the roadway. On the northern side of Divinity Street, the existing five foot sidewalk will be extended across the proposed culvert with a four foot grass strip.

The proposed structure type is a 6 feet by 8 feet precast box culvert. Headwalls and wingwalls will be constructed of reinforced cast in place concrete. All roadway obstructions are proposed outside of the roadway clear zone and therefore no roadside safety measures are proposed.

Context and Design Controls

The Divinity Street Culvert carries an unnamed brook. Divinity Street is a collector road with an average daily traffic of 4,600 vehicles and a posted speed limit of 25 mph.

The topography within the project limits is relatively flat but a sag curve is present over the culvert. At the culvert, the drainage area is less than 1 square mile. Survey was provided by the City of Bristol, previously completed by Clark Land Surveying, LLC. No federal wetlands were determined to be located within the project limits.

The project is located within a residential neighborhood in Bristol, CT. Adjacent properties also serve a commercial business, Dollar General. As the existing conditions do not have sidewalk connectivity along Divinity Street, pedestrian traffic is minimal.

Geometric Design

Roadway design values are based on the City of Bristol’s Code of Ordinances (August 5, 1975, version May 12, 2020) and the 2003 edition of the CT DOT Highway Design Manual for a Collector Road with a design speed of 30 mph and a posted speed of 25 mph. In the event of conflicts between City and State standards, WSP will default to City standards as this is a local urban road and municipally funded project. Table 1 summarizes the proposed geometric details used for the project.

Classification	CT DOT Standard	City Standard	As Designed
Functional Classification	Urban Local Road	Local residential	Local residential
Design Speed	25-30 mph		30 mph
Travel Lane Width	10’-11’	30’ wide through street	11’
Shoulder Width	2’-4’		4’
Cross Slope Travel Lane	1.5%-2.0% (1.5%-3.0% with curbing)	4.5” constructed as parabolic curve	4.5” constructed as parabolic curve
Cross Slope Shoulder	4%-6%		
Sidewalk Width	5’ min	4’	5’ (<i>See note 1</i>)
Roadside Clear Zone	12’ (clear zone); 1.5’ (operational offset)		12’ (clear zone); 1.5’ (operational offset)
Stopping Sight Distance	200’		232.85’
Minimum Radius	230’	200’	1490’
Maximum Grade	10%	10%	1.4%
Minimum Grade	0.5%	1.0%	1.0%
Crest Vertical Curve (K Value)	19	30	N/A
Sag Vertical Curve (K Value)	37	30	44.62

Notes:

- 1) Although City standard is 4 feet wide sidewalk in residential areas, it is proposed to match the width of the existing sidewalk at the western limits of the project which is 5 feet.

Horizontal

The horizontal alignment for the project is proposed to match existing conditions along Divinity Street. The roadway is tangent through most of the project limits with a horizontal curve at the eastern project limits with a radius of 1490 feet.

Vertical

The vertical alignment for the project is proposed to match existing conditions along Divinity Street. There is minor adjustment to the profile to set a defined sag curve with the low point at the proposed catch basins. The vertical alignment consists of one sag vertical curve with a minimum grade of 1.0% and a maximum grade of 1.4%.

Traffic Control and Management

To perform the culvert replacement, a full road closure and detour is proposed as detailed in the Maintenance and Protection of Traffic drawing. The detour will be implemented via Tulip Street and Park Street. Signage will be placed along the detour route to direct passengers around the road closure. Closures needed for driveway reconstruction will be coordinated with the property owners.

Peak hour traffic data obtained from CT DOT's website reports an approximate Average Daily Traffic (ADT) volume of 4,600 vehicles per day. It was determined that travel time will approximately double due to the implementation of a detour as well as the delays at stop controlled intersection at Park Street and Tulip Street. It is recommended to install construction signs to inform the motorists in advance of the start of the construction for the motorist to plan and seek alternative routes.

There are no traffic control improvements proposed for this project.

Existing and Proposed Pavement Structure

Divinity Street is a City owned facility therefore the proposed pavement structure shall abide by the City of Bristol's Code of Ordinances (August 5, 1975, version May 12, 2020). The pavement structure subbase shall consist of eight inches of subbase. The base course shall be six inches of processed aggregate base meeting latest provisions of The Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 818, published by CT DOT. Finally, the surface course shall consist of three inches of bituminous concrete, also in accordance with Form 819, laid in two equal courses. This pavement structure is shown in the Typical Sections. It is assumed that the existing pavement structure is composed of the same materials and thickness as the proposed.

Illumination Conditions and Recommendations

Currently, one cobra head light is attached to the utility pole on the northern edge of Divinity Street within the project limits. The project proposes to keep the existing light.

Geotechnical

To investigate site conditions, four test borings (S-1 through S-3) were drilled by New England Boring Contractors, Inc. July 23 and 24, 2020. Subsurface investigation findings and foundation recommendations can be found in the Geotechnical Engineering Report prepared by Freeman Companies, LLC dated September 16, 2020.

ADA Compliance

Within the project limits, the existing sidewalk on the northern side of Divinity Street is proposed to be extended over the culvert. The proposed sidewalk clearances are designed as ADA compliant.

Pedestrian and Bicycle Accommodation

The project is proposing extension of the five-foot sidewalk on the north side of Divinity Street over the culvert. This is proposed at the request of the City for future sidewalk extension along the length of Divinity Street. Bicyclists are not a significant contributing transportation mode for this project, however four foot shoulders provided on either side of the roadway for travel.

Rights of Way

The project site is surrounded by four separate parcels, all privately owned. The existing culvert inlet and outlet are both on private properties. The culvert is located within a primarily residential neighborhood, three of the abutting properties are residential and one is a commercial store.

The existing right of way for the roadway is a minimum 49.5 feet wide. Due to the close proximity of driveways to the culvert, the construction work zone will be compact and a separate laydown area will be required during construction.

Property easements and rights are expected for this project. Easements required include slope easement, easement to construct and maintain retaining wall and easement to excavate channel, place riprap and remove, use or retain excavated material. Property right required include rights to grade, remove shrubs/trees, remove and replace fence, and drainage right-of-way. Three properties will have right of way impacts. These impacts are summarized in a “Schedule of Property Owners” contained in Appendix A.

Environmental Analysis and Permitting

The following permits are required for this project:

- Bristol Conservation Commission Inland Wetlands Agency Permit
 - o Although no wetlands are identified at the project site, the project does affect a local watercourse and therefore this permit is required.
 - o The permit was accepted by Bristol Inland Wetland Commission at the June 2024 meeting.
- U.S. Army Corps of Engineers Connecticut General Permit Pre-Construction Notification (GP 19)
 - o The existing structure does not allow for continuous flow of the 50-year frequency storm flows and there is no opportunity for the proposed structure to allow for continuous flow of the 50-year frequency storm flows. Continuous flow is defined as the road not being overtopped with water by the storm event Therefore, a Pre-Construction Notification GP 19 is required. As an additional note, the openness ratio of 0.82 feet, as recommended by the USACE Connecticut General Permit Stream Crossing Best Management Practices to be met to the extent practicable, is not met with either existing or proposed conditions.
 - o This permit application was submitted in May 2024 and is pending approval.

The project is not located in a historic district nor are any of the adjacent properties registered historical places. No historical or archaeological impacts are anticipated for this project.

Noise is only anticipated to increase during the construction of the project. The equipment and machinery used will meet all local, state and federal noise regulations. The area is mostly residential.

Bristol is part of the Greater Connecticut nonattainment zone (EPA). Impacts to air quality are only anticipated short-term during construction. Dust control methods, such as the use of water, will be utilized if deemed necessary in dry conditions.

Hydraulics, Drainage and Erosion Control

The Divinity St Culvert carries Divinity Street over an unnamed brook. Hydrologic and hydraulics studies have been performed for the replacement of the culvert by WSP. The results of each study are summarized as follows:

Discharges for the unnamed brook were developed in the Hydrology and Hydraulics Analysis Report dated March 2021. The 50-year discharge at Divinity Street is 753 cubic feet per second (cfs). Per the CTDOT Drainage Manual, the hydraulic design requirements for a Small Structure culvert is to provide a minimum freeboard of 1 foot during the 50-year flood event. The existing culvert with a 5 feet x5 feet hydraulic opening does not meet the hydraulic design requirements for a small structure. It is proposed to replace the existing culvert with a proposed culvert that will provide an 8 feet wide x 4.5 feet tall hydraulic opening (culvert is 8 feet x 6 feet with 1.5 feet of natural stream bed material placed at the bottom of the culvert). The proposed culvert will improve the hydraulic capacity, however, will not allow for the continuous uninterrupted flow of the 50-year flood event. The existing hydraulic model indicates that the road is overtopped with approximate 1.4 feet of water during the 50-year storm, whereas the proposed model indicates that the road is overtopped with approximately 1.2 feet of water.

A design exception, as discussed in ConnDOT Drainage Manual Section 9.3.9, will be required since this CTDOT hydraulic design criteria cannot be met. The reason that the 1 foot freeboard cannot be met is due to the topography at Divinity Street, including the adjacent driveways, and the underground utilities that limit a larger culvert being able to be proposed, but there is an improvement as compared to the existing conditions.

Minor drainage improvements are proposed for this project. Two catch basins are proposed to be replaced with Double Type “C” double grate type II catch basins to the east of the culvert. The existing storm drainage system will be removed and new pipe and catch basins are proposed to meet current design standards. There are currently two catch basins and three drainage pipes that outlet into the culvert. All drainage outlets will be redirected to the wingwalls of the outlet side of the culvert. The new closed drainage system will consist of Reinforced Concrete Pipe (RCP).

Soil erosion will be minimized during construction by limiting the amount of disturbed areas at any given time, utilizing proper erosion control measures and inlet protection.

Contaminated and Hazardous Materials

There are no properties adjacent to the project that are suspected to use hazardous materials. Therefore, contaminated materials are not anticipated on this project.

Utilities

There are several public service utilities that exist within the project corridor both underground and overhead. Overhead utilities (telephone, cable, and power lines) are present along the north side of Divinity Street. Underground utilities include a 6” gas main over the culvert, a 16” water main under the culvert, a 12” water main under the culvert, an 8” sanitary sewer line under the culvert, and an

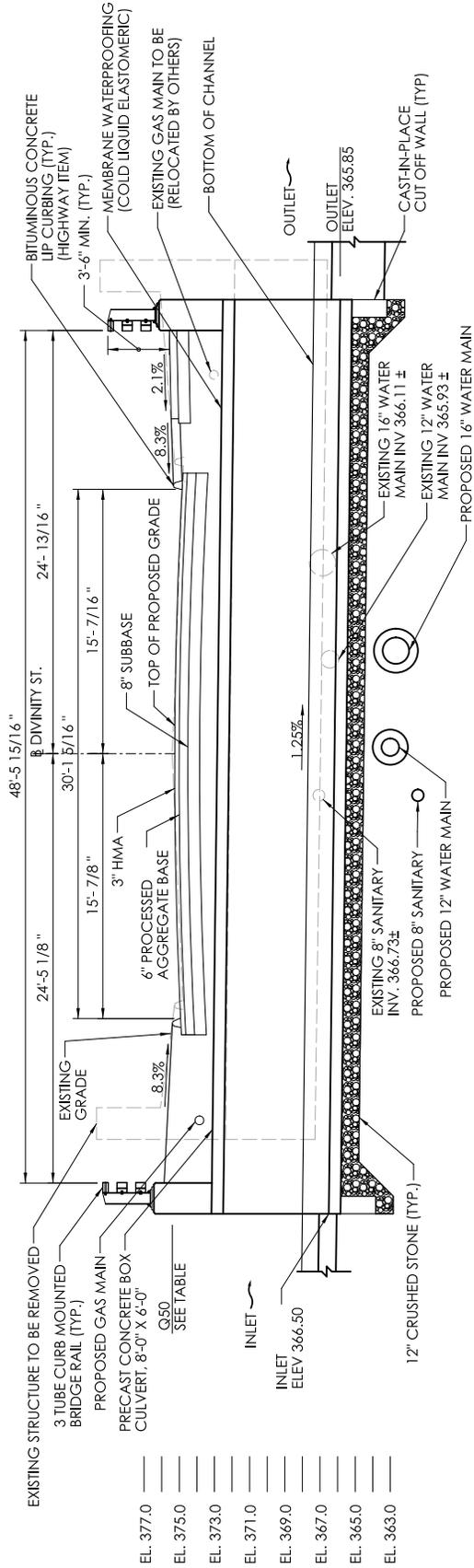
abandoned 6" gas main under the culvert. During a site visit, it was observed that the 16" water main and abandoned 6" gas main are exposed in the stream bed.

The 6" gas main over the bridge will be permanently relocated by others during construction. The abandoned 6" gas main is proposed to be removed within the project limits by others. The three remaining utilities below the structure require permanent relocation to clear the proposed structure. All three utilities will conflict with the bottom of a box culvert. The proposed culvert elevation showing approximate relocations is shown in Figure 1. The design of utility relocations will be completed by others.

A three sided culvert was evaluated to determine if utility relocation could be avoided. This alternative was eliminated for the following reasons:

- The existing 16" water main is exposed within the stream and will require relocation regardless for protection. An exposed main could be damaged by debris in the stream. It is anticipated that the existing 12" water is set at a similar invert and therefore very close to the stream bed and may be exposed overtime.
- A three sided culvert would require a footing set below the utilities and block outs in the culvert walls. The utilities would require temporary relocation at a minimum during this construction regardless.

Temporary relocation of overhead utilities is required in order to place the proposed pre-cast box culvert. Approximate temporary relocation limits are shown in the Design Plans.



PROPOSED CULVERT SECTION

SECTION ALONG ϕ OF CULVERT AT STA. 10+86.691

- EL. 377.0
- EL. 375.0
- EL. 373.0
- EL. 371.0
- EL. 369.0
- EL. 367.0
- EL. 365.0
- EL. 363.0

Structure

It is proposed to replace the Divinity Street Culvert with a precast reinforced concrete box culvert with a 6 feet tall by 8 feet wide opening. The structure bottom will be buried 1.5 feet below the stream bed with natural stream bed material. The culvert is proposed to be 52 feet long with cast-in-place reinforced concrete wingwalls on spread footings.

The precast concrete box culvert provides an accelerated construction phase and simplified construction methods. The culvert end and wingwalls will have a 42” metal bridge rail mounted on top to allow stream conveyance in the same alignment when the roadway is overtopped. The ends of the culvert are placed outside of the clear zone to eliminate safety concerns and the need for guiderail. Guiderail would be difficult to accommodate at the structure location due to driveways on either side of the structure.

Cost Estimate Summary

The replacement of the Divinity Street Culvert will be paid for by LOTCIP funding. The total project construction cost estimate for the project is \$1,240,000. A detailed breakdown of the construction cost is provided in Appendix B.

Construction Schedule

A construction schedule was prepared based on the anticipated construction activities for this project. It is anticipated that the construction activities will last approximately 27 weeks from April 2025 through October 2025. In-water construction activities are typically limited to June 1 through September 30 and therefore have been depicted as such on the schedule. The detailed construction schedule can be referenced in Appendix C.

Appendix

A) Schedule of Property Owners

SCHEDULE OF PROPERTY OWNERS

Replacement of Divinity Street Culvert over Unnamed Brook
 Bristol, CT
 Project No. L017-0004

September 2024

SERIAL NO.	OWNER	LOCATION	TAKING AREA (SQ. FT.)	EXCESS AREA	BUILDING PART.	TYPE OF SEARCH	TYPE OF TAKE	TAKE CLASS	REMARKS
1	Divinity Holdings	STA 10+63 LT			NO	FULL	RIGHT		See plans for rights.
2	Fransico & Anna Mendez	STA 10+85 LT	2529		NO	FULL	EASEMENT	D	Easement for general highway purposes.
3	Haberfeld Enterprises LLC	STA 11+00 RT	2365		NO	FULL	EASEMENT	D	Easement for general highway purposes.

TAKING CLASSES
 A = INDUSTRIAL AREA
 B = BUSINESS
 C = RESIDENTIAL (HOUSE)
 D = STRICTLY LAND

B) Cost Estimate

**DIVINITY STREET OVER UNNAMED BROOK
BRISTOL, CONNECTICUT
FINAL DESIGN COST ESTIMATE
SEPTEMBER 2024**

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
0201013 A	REMOVAL OF EXISTING FENCE	L.F.	60	\$29.00	\$1,730.94
0201020 A	REMOVE AND RESET WOOD FENCE	L.F.	15	\$80.00	\$1,200.00
0202000	EARTH EXCAVATION	C.Y.	240	\$65.18	\$15,643.20
0202100	ROCK EXCAVATION	C.Y.	5	\$133.14	\$665.70
0202216 A	EXCAVATION AND REUSE OF EXISTING CHANNEL BOTTOM MATERIAL	C.Y.	90	\$79.33	\$7,139.70
0202217 A	SUPPLEMENTAL STREAMBED CHANNEL MATERIAL	EST.	1	\$ 1,400.00	\$1,400.00
0202452 A	TEST PIT	EA.	2	\$ 2,118.15	\$4,236.30
0202529	CUT BITUMINOUS CONCRETE PAVEMENT	L.F.	200	\$7.10	\$1,420.00
0203202	STRUCTURE EXCAVATION - EARTH (EXCLUDING COFFERDAM AND DEWATERING)	C.Y.	970	\$33.04	\$32,048.80
0204151 A	HANDLING WATER	LS	1	\$25,000.00	\$25,000.00
0207000	BORROW	C.Y.	10	\$15.00	\$150.00
0209001	FORMATION OF SUBGRADE	S.Y.	520	\$10.06	\$5,231.20
0211000	ANTI-TRACKING PAD	S.Y.	70	\$47.46	\$3,322.20
0212000	SUBBASE	C.Y.	116	\$74.36	\$8,625.76
0216000	PERVIOUS STRUCTURE BACKFILL	C.Y.	670	\$71.74	\$48,065.80
0219001 A	SEDIMENTATION CONTROL SYSTEM	L.F.	250	\$6.93	\$1,732.50
0219011 A	SEDIMENT CONTROL SYSTEM AT CATCH BASIN	EA.	6	\$214.55	\$1,287.30
0286001.10	ROCK IN DRAINAGE TRENCH EXCAVATION 0'-10' DEEP	C.Y.	11	\$191.50	\$2,106.50
0304002	PROCESSED AGGREGATE BASE	C.Y.	88	\$90.97	\$8,005.36
0406171	HMA S0.5	TON	82	\$281.14	\$23,053.48
0406236	MATERIAL FOR TACK COAT	GAL.	60	\$29.54	\$1,772.40
0406999 A	ASPHALT ADJUSTMENT COST (ESTIMATED COST)	EST.	1	\$110.00	\$110.00
0586005.10	TYPE 'C' CATCH BASIN DOUBLE GRATE TYPE 2 - 0' - 10' DEEP	EA.	1	\$10,024.02	\$10,024.02
0586006.10	TYPE 'C' CATCH BASIN DOUBLE GRATE TYPE 2 (4' SUMP) - 0' - 10' DEEP	EA.	1	\$8,990.63	\$8,990.63
0586500.10	MANHOLE - 0' - 10' DEEP	EA.	3	\$5,698.23	\$17,094.69
0601062	FOOTING CONCRETE	C.Y.	100	\$801.25	\$80,125.00
0601064	ABUTMENT AND WALL CONCRETE	C.Y.	80	\$1,696.87	\$135,749.60
0601132 A	8' X 6' PRECAST CONCRETE BOX CULVERT	LS	1	\$70,000.00	\$70,000.00
0601502	1/2" PREFORMED EXPANSION JOINT FILLER FOR BRIDGES	S.F.	100	\$12.39	\$1,239.00
0602030	DEFORMED STEEL BARS - GALVANIZED	LB.	8730	\$4.13	\$36,054.90
0686000.18	18" R.C. PIPE - 0' - 10' DEEP	L.F.	5	\$156.51	\$782.55
0686000.24	24" R.C. PIPE - 0' - 10' DEEP	L.F.	7	\$2,324.58	\$16,272.06
0686000.30	30" R.C. PIPE - 0' - 10' DEEP	L.F.	88	\$221.89	\$19,526.32
0686230.24	24" HIGH DENSITY POLYETHYLENE PIPE - 0' - 10' DEEP	L.F.	5	\$130.00	\$650.00
0686900	CONCRETE PIPE CONNECTION	EA.	1	\$1,502.52	\$1,502.52
0686950.10	REMOVE EXISTING PIPE - 0' - 10' DEEP	L.F.	70	\$46.10	\$3,227.00
0703010	STANDARD RIPRAP	C.Y.	110	\$114.96	\$12,645.60
0703012	MODIFIED RIPRAP	C.Y.	30	\$133.50	\$4,005.00
0707009 A	MEMBRANE WATERPROOFING (COLD LIQUID ELASTOMERIC)	S.Y.	70	\$75.30	\$5,271.00
0708001	DAMPPROOFING	S.Y.	170	\$21.96	\$3,733.20
0716000	TEMPORARY EARTH RETAINING SYSTEM	S.F.	590	\$44.42	\$26,207.80
0728032	NO. 6 CRUSHED STONE	C.Y.	90	\$90.58	\$8,152.20
0755010	GEOTEXTILE (SEPARATION - MEDIUM SURVIVABILITY)	S.Y.	260	\$7.04	\$1,830.40
0815001	BITUMINOUS CONCRETE LIP CURBING	L.F.	240	\$20.66	\$4,958.40
0819002 A	PENETRATING SEALER PROTECTIVE COMPOUND	S.Y.	30	\$33.14	\$994.20
0822100.01	TEMPORARY TRAFFIC BARRIER	L.F.	70	\$74.78	\$5,234.60
0904051 A	3 TUBE CURB MOUNTED BRIDGE RAIL	L.F.	78	\$700.03	\$54,602.34
0905012 A	PVC PRIVACY FENCE	L.F.	58	\$250.00	\$14,500.00
0921001	CONCRETE SIDEWALK	S.F.	305	\$38.76	\$11,821.80
0922501	BITUMINOUS CONCRETE DRIVEWAY	S.Y.	60	\$99.68	\$5,980.80
0943001	WATER FOR DUST CONTROL	MGA	40	\$9.06	\$362.40
0944000	FURNISHING AND PLACING TOPSOIL	S.Y.	420	\$15.67	\$6,581.40
0950019 A	TURF ESTABLISHMENT - LAWN	S.Y.	320	\$5.76	\$1,843.20
0950039	EROSION CONTROL MATTING TYPE D	S.Y.	100	\$7.11	\$711.00
0950040 A	CONSERVATION SEEDING FOR SLOPES	S.Y.	60	\$3.20	\$192.00
0950043 A	WETLAND GRASS ESTABLISHMENT	S.F.	40	\$0.80	\$32.00
0952051 A	CONTROL AND REMOVAL OF INVASIVE VEGETATION	S.Y.	90	\$17.69	\$1,592.10
0970006	TRAFFICPERSON (UNIFORMED FLAGGER)	HR.	80	\$60.00	\$4,800.00
0974000	REMOVAL OF EXISTING MASONRY	C.Y.	130	\$50.00	\$6,500.00
0976002	BARRICADE WARNING LIGHTS - HIGH INTENSITY	DAY	510	\$1.24	\$632.40
0978002	TRAFFIC DRUM	EA.	30	\$71.61	\$2,148.30
0979003	CONSTRUCTION BARRICADE TYPE III	EA.	4	\$161.89	\$647.56
0979004	CONSTRUCTION BARRICADE DETECTABLE	EA.	1	\$273.77	\$273.77
0981100	42" TRAFFIC CONE	EA.	15	\$50.30	\$754.50
1208937 A	SIGN FACE - SHEET ALUMINUM (TYPE XI RETROREFLECTIVE SHEETING)	S.F.	18	\$100.13	\$1,802.34
1210102	4" YELLOW EPOXY RESIN PAVEMENT MARKINGS	L.F.	300	\$1.62	\$486.00
1220027	CONSTRUCTION SIGNS	S.F.	415	\$21.21	\$8,802.15
1403501 A	RESET MANHOLE (SANITARY SEWER)	EA.	1	\$1,265.09	\$1,265.09
TOTAL					\$794,548.98
0201001	CLEARING & GRUBBING (2% OF TOTAL CONTRACT ITEMS)	LS	1	\$17,955.91	\$17,955.91
0971001 A	MAINTENANCE & PROTECTION OF TRAFFIC (2% OF TOTAL CONTRACT ITEMS)	LS	1	\$17,955.91	\$17,955.91
0975004	MOBILIZATION AND PROJECT CLOSEOUT (6.5% OF TOTAL CONTRACT ITEMS)	LS	1	\$58,356.70	\$58,356.70
0980020	CONSTRUCTION SURVEYING (1% OF TOTAL CONTRACT ITEMS)	LS	1	\$8,977.95	\$8,977.95
TOTAL CONTRACT ITEMS					\$897,795.45
INCIDENTALS (25% OF TOTAL CONTRACT ITEMS)				25.0%	\$224,448.86
TOTAL CONTRACT ITEMS PLUS INCIDENTALS					\$1,123,000.00
CONSTRUCTION CONTINGENCIES (10% OF TOTAL CONTRACT ITEMS)				10.0%	\$112,300.00
TOTAL CONSTRUCTION COST					\$1,235,300.00
SAY \$1,240,000.00					

C) Construction Schedule

PROJECT NO. L017-0004
REPLACEMENT OF DIVINITY ST CULVERT OVER UNNAMED BROOK
BRISTOL, CONNECTICUT

ANTICIPATED DESIGN SCHEDULE

<u>Milestone</u>	<u>Completion Date</u>
Final Design (90%)	September 9, 2024
Design Completion Documents	October 15, 2024

ANTICIPATED CONSTRUCTION SCHEDULE

<u>Milestone</u>	<u>Completion Date</u>	Duration
Advertise	November 15, 2024	30
Bid Phase	December 15, 2024	30
Award	February 13, 2025	60
Notice to Proceed	March 30, 2025	45
Project Completion	October 6, 2025	

PRELIMINARY CONSTRUCTION SCHEDULE - 2025

Activity	1-Apr	8-Apr	15-Apr	22-Apr	29-Apr	6-May	13-May	20-May	27-May	3-Jun	10-Jun	17-Jun	24-Jun	1-Jul	8-Jul	15-Jul	22-Jul	29-Jul	5-Aug	12-Aug	19-Aug	26-Aug	2-Sep	9-Sep	16-Sep	23-Sep	30-Sep	7-Oct	14-Oct	21-Oct	28-Oct	
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26	Week 27	Week 28	Week 29	Week 30	Week 31	
Relocated overhead utilities	Active	Active	Active	Active	Active	Active																										
Remove under bridge utilities from service	Active	Active	Active	Active	Active	Active																										
Mobilize						Active																										
Clearing and grubbing							Active	Active																								
Install wetland, sedimentation, and construction protection								Active																								
Close roadway and detour traffic									Active																							
Install temporary water handling										Active																						
Demolish existing culvert											Active	Active																				
Install under culvert utilities												Active	Active	Active																		
Install proposed culvert														Active																		
Form, cure and strip wingwall footings															Active	Active	Active	Active	Active	Active												
Form, cure and strip wingwall stems																Active	Active	Active	Active	Active	Active											
Install streambed and embankment materials																						Active										
Remove water handling																							Active									
Reconnect over bridge utilities																								Active	Active							
Final paving of roadway																										Active						
Final striping of roadway																											Active					
Demobilize																												Active				

Active Construction
Typical In-water Construction Allowed