

TOWN OF KILLINGLY



TECHNICAL SPECIFICATIONS
FOR

**REPLACEMENT OF BRIDGE NO. 68-002
VALLEY ROAD OVER MASHENTUCK BROOK
State Project No. 9068-0002**

**REPLACEMENT OF BRIDGE NO. 68-003
VALLEY ROAD OVER WHETSTONE BROOK
State Project No. 9068-0003**

**REPLACEMENT OF BRIDGE NO. 68-009
VALLEY ROAD OVER UNNAMED BROOK
State Project No. 9068-0009**

KILLINGLY, CONNECTICUT

October 21, 2022



TABLE OF CONTENTS OF SPECIAL PROVISIONS

Note: This Table of Contents has been prepared for the convenience of those using this contract with the sole express purpose of locating quickly the information contained herein and no claims shall arise due to omissions, additions, deletions, etc., as this Table of Contents shall not be considered part of the contract.

TOWN OF KILLINGLY

**REPLACEMENT OF BRIDGE NO. 68-002
State Project No. 9068-0002**

**REPLACEMENT OF BRIDGE NO. 68-003
State Project No. 9068-0003**

**REPLACEMENT OF BRIDGE NO. 68-009
State Project No. 9068-0009**

KILLINGLY, CONNECTICUT

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NOTICE TO CONTRACTOR - CONTRACT DURATION

The Contractor is hereby notified that this is not to be considered an ordinary project by any means and that due to the inconvenience to the traveling public that it causes, extra manpower, equipment and work shifts may be required to complete the work in accordance within the specified contract time.

NOTICE TO CONTRACTOR – BEST MANAGEMENT PRACTICES

In constructing or maintaining the construction activities for this project, the Contractor shall employ Best Management Practices to control storm water discharges and erosion and sedimentation and prevent pollution. Such practices to be implemented by the Contractor at the construction Sites include, but not necessarily limited to the following:

1. Prohibiting dumping of any quantity of oil, chemicals or other deleterious material on the ground.
2. Immediately informing the DEEP's Oil and Chemical Spill Section at (860) 424-3338 and the Engineer of any adverse impact or hazard to the environment, including any discharges, spillage or loss of oil or petroleum or chemical liquids or solids, which occurs or is likely to occur as the direct or indirect result of the construction activities.
3. Separating staging areas at the Site from regulated areas by silt fences or haybales at all times.
4. Prohibiting storage of any fuel and refueling of equipment within 25 feet from any wetland or watercourse.
5. Preventing pollution of wetlands and watercourses in accordance with the document "Connecticut Guidelines for Soil Erosion and Sediment Control" as revised. Said controls shall be inspected by the Contractor with the Engineer for deficiencies at least once per week and immediately after each rainfall and at least daily during prolonged rainfall. The Contractor shall correct any such deficiencies to the Engineer within forty-eight (48) hours of said deficiencies being found.
6. Stabilizing disturbed soils in a timely fashion to minimize erosion. If a grading operation at the construction site will be suspended for a period of thirty (30) or more consecutive days, the Contractor shall, within the first seven (7) days of that suspension period, accomplish seeding and mulching or take such other appropriate measures to stabilize the soil involved in such grading operation. Within seven (7) days after establishing final grade in any grading operation at the construction site the Contractor shall seed and mulch the soil involved in such grading operation or take such other appropriate measures to stabilize such soil until the final seeding and mulching can be accomplished.
7. Prohibiting the storage of any materials at the site that are buoyant, hazardous, flammable, explosive, soluble, expansive, and radioactive or that could, in the event of a flood, be injurious to human, animal or plant life below the elevation of the five-hundred (500) year flood. Any other material or equipment stored at the site below said elevation by the Contractor must be firmly anchored, restrained or enclosed to prevent flotation. The quantity of fuel stored below such elevation for equipment used at the construction site shall not exceed the quantity of fuel that is expected to be used by such equipment in one day.

8. Immediately informing the District Environmental Coordinator and the Engineer of the occurrence of pollution or other environmental damage resulting from construction or maintenance of the authorized activity or any construction associated therewith in violation of the Inland Wetland and Watercourse Permit. The District Environmental Coordinator shall, no later than 48 hours after the Engineer learns of a violation of the Permit, report the same in writing to the OEP Commissioner. Such report shall contain the information that is outlined in the Permit. The OEP Commissioner shall inform DEEP's Inland Water Resources Division (IWRD) of the occurrence of pollution or other environmental damage resulting from construction or maintenance of the authorized activity or any construction associated therewith in violation of the Inland Wetland and Watercourse Permit.

There will be no direct payment for the above conditions but the cost shall be included in the general cost of the contract.

NOTICE TO CONTRACTOR – NCHRP REPORT 350 REQUIREMENTS FOR WORK ZONE TRAFFIC CONTROL DEVICES

Category 1 Devices (traffic cones, traffic drums, tubular markers, flexible delineator posts)

Prior to using the Category 1 Devices on the project, the **Public Works Department** shall submit to the Engineer a copy of the manufacturer's self-certification that the devices conform to NCHRP Report 350.

Category 2 Devices (construction barricades, construction signs and portable sign supports)

Prior to using Category 2 Devices on the project, the **Public Works Department** shall submit to the Engineer a copy of the Letter of Acceptance issued by the FHWA to the manufacturer documenting that the devices (both sign and portable support tested together) conform to NHRP Report 350 (TL-3).

Specific requirements for these devices are included in the Special Provisions.

Information regarding NCHRP Report 350 devices may be found at the following web sites:

FHWA: http://safety.fhwa.dot.gov/fourthlevel/pro_res_road_nchrp350.htm

ATSSA: <http://www.atssa.com/nchrp350.htm>

Note: The portable wooden sign supports that have been traditionally used by most contractors in the State of Connecticut do NOT meet NCHRP Report 350 criteria and shall not be utilized on any project advertised after October 1, 2000.

Category 3 Devices (Truck-Mounted Attenuators & Work Zone Crash Cushions)

Prior to using Category 3 Devices on the project, the **Public Works Department** shall submit to the Engineer a copy of the Letter of Acceptance issued by the FHWA to the Manufacturer documenting that the devices conform to NCHRP Report 350.

NOTICE TO CONTRACTOR – SITE NUMBERS

The proposed work on bridge structures and culverts included in this contract are assigned the following site designations:

- Site No. 1 – Bridge No. 68-002: Valley Road over Mashentuk Brook
- Site No. 2 – Bridge No. 68-003: Valley Road over Whetstone Brook
- Site No. 3 – Bridge No. 68-009: Bear Hill Road over Unnamed Brook

NOTICE TO CONTRACTOR – SITE CLEANLINESS

The Contractor is hereby notified that all areas utilized for construction activities including all onsite and offsite facilities shall be maintained so as to be free of rubbish, trash and deleterious construction debris at all times. The use of covered and secured trash receptacles is required. All receptacles will be regularly emptied and maintained.

There will be no direct payment for maintaining the site cleanliness of the construction areas under the contract.

**NOTICE TO CONTRACTOR – CONTRACTOR’S MAINTENANCE
RESPONSIBILITY DURING CONSTRUCTION DURATION**

The Contractor is hereby notified that the construction area will be maintained by the contractor throughout the duration of the project and will include all maintenance responsibilities with the exception of snow removal. There will be no payment for maintaining the construction area by the Contractor. The cost shall be included in the general cost of the project.

NOTICE TO CONTRACTOR – PROTECTION OF WATERWAY

The Contractor's operations shall conform to the following general conditions:

- 1) Positive means shall be taken to prevent any debris, tools, or construction material from entering the waterway.
- 2) During the progress of work, should any material, machinery or equipment be lost, dumped, thrown overboard, or sunk so as to obstruct, interfere with or hazard navigation, immediate notice shall be given to the Water Resources Unit of the Connecticut Department of Energy and Environmental Protection (CTDEEP) at 860-566-7220, and the object removed immediately. Until removal can be affected, the obstruction shall be properly marked in order to protect navigation. Notice to the Water Resources Unit shall give a description and location of any such object and the action taken to protect navigation.
- 3) Spillage of oil and hazardous substances is specifically prohibited by Section 311 of the Federal Water Pollution Control Act of 1972, as amended. Measures should be taken including: (1) proper maintenance of construction equipment, (2) arrangement of fuel/hazardous substances handling areas so as to ensure that any spills are contained before reaching navigable waterways or their adjoining shorelines, (3) instructions to personnel not to dispose of oil/hazardous substances into drains or the navigable waterways directly or onto adjoining shorelines, and (4) any other procedures to prohibit spillage. If in spite of such planning oil/hazardous substances are spilled into a navigable waterway or adjoining shoreline, the CTDEEP is to be notified immediately at 860-566-4924. A supply of an absorbent material should be retained so that it may be rapidly deployed to soak up any possible spillage, pending CTDEEP arrival on scene. The use of chemical dispersing agents and emulsifiers is not authorized without prior, specific CTDEEP approval.

NOTICE TO CONTRACTOR – VERIFICATION OF PLAN DIMENSIONS AND FIELD MEASUREMENTS

The Contractor is responsible for verifying all dimensions before any work is begun. Dimensions of the existing structures shown on the plans are for general reference only; they are not guaranteed. The Contractor shall take all field measurements necessary to assure proper fit of the finished work and shall assume full responsibility for their accuracy. When shop drawings and/or working drawings based on field measurements are submitted for approval and/or review, the field measurements shall also be submitted for reference by the reviewer.

In the field, the Contractor shall examine and verify all existing and given conditions and dimensions with those shown on the plans. If field conditions and dimensions differ from those shown on the plans, the Contractor shall use the field conditions and dimensions and make the appropriate changes to those shown on the plans as approved by the Engineer. All field conditions and dimensions shall be so noted on the drawings submitted for approval.

There shall be no claim made against the Town by the Contractor for work pertaining to modifications required by any difference between actual field conditions and those shown by the details and dimensions on the contract plans. The Contractor will be paid at the unit price bid for the actual quantities of materials used or for the work performed, as indicated by the various items in the contract.

NOTICE TO CONTRACTOR – VERIFICATION OF EXISTING CONDITIONS

Included in this contract is the reconstruction, modification, alteration, and/or addition to existing structures. The Contractor is cautioned that it is their responsibility to verify locations, conditions, and field dimensions of all existing features as actual conditions may vary from information shown on the design plans, the record plans or contained elsewhere in the Specifications.

The cost for this work and incorporation of information into the working drawings and shop drawings is part of the general cost of the work. Accordingly, no additional payment will be made for this work.

NOTICE TO CONTRACTOR - UTILITY SPECIFICATIONS

The contractor is hereby notified that all utility specifications contained elsewhere herein shall be made a part of this contract, and that the contractor shall be bound to comply with all requirements of such specifications. The requirements and conditions set forth in the subject specifications shall be binding on the contractor just as any other specification would be.

NOTICE TO CONTRACTOR – COORDINATION WITH UTILITY COMPANIES AND RELOCATION OF EXISTING UTILITIES

Existing utilities shall be maintained during construction operations. The Contractor shall verify the location of underground and overhead utilities and shall verify the conditions and field dimensions of all existing features as actual conditions may differ from the information shown on the plans or contained elsewhere in the specifications. Construction work within the vicinity of utilities shall be in accordance with current safety regulations.

Utility relocation work, by others, is required within the project limits. The Contractor shall schedule their operations in such a manner as to minimize interferences with utility relocation/protection activities. There are utility relocations for aerial utilities. The proposed pole relocations are shown on the roadway plan for information purposes only and are subject to change.

The contractor is hereby notified that the utility work schedules will have to be accommodated prior to proceeding. The Contractor shall coordinate with utility companies to accommodate their schedule with all utility company schedules. This includes, but is not limited to, providing access staging, and sequencing prior to proceeding. Any inconvenience or delay that may result from utility company work shall be included in the contract bid for the work. The work to repair or replace any damage to utilities caused by the Contractor's operations will be solely at the Contractor's expense, in accordance with Form 818, Section 1.07. The Contractor shall consider in their bid any inconvenience and work required to meet these conditions.

As required by State Law, the Contractor shall contact "Call Before You Dig." Telephone 1-800-922-4455 for the location of public underground facilities in accordance with Section 16-345 of the Regulations of the Department of Public Utility Control. The underground activities should be clearly delineated within all areas of proposed excavation prior to performing actual excavation. The notification of "Call Before You Dig" must be made at least 48 hours in advance.

Site No. 1: Bridge No. 68-002 – Valley Road over Mashentuck Brook

Overhead Utilities: A utility pole located on the south side of the road and southeasterly of the existing bridge shall be relocated further east beyond the limits of the proposed metal beam rail.

Subterranean Utilities: A subterranean water main traverses south of the proposed structure. Its location has been marked but no information on its depth is available. The Contractor shall perform a test pit to determine its depth and evaluate whether it will be impacted and/or impede with its operations. Consequently, the Contractor shall be responsible for the protection of this facility should its operation impact the facility and/or that the Connecticut Water Company (CT Water) deem it necessary.

Site No. 2: Bridge No. 68-003 – Valley Road over Whetstone Brook

Overhead Utilities: Due to the layout and complexity of relocating the overhead utilities at this Site, and without knowledge of the Contractor's means and methods and sequence of construction to demolish and replace the bridge, utility relocation cannot be determined beforehand. Therefore,

it is the Contractor's responsibility to coordinate with the utility companies providing service in this area to determine and develop a utility relocation and/or utility protection plan that conforms to the Contractor's means and methods and sequence of operation.

Subterranean Utilities: The Connecticut Water Company (CT Water) has an abandoned 10" cast iron pipe (CIP) along the north side of the bridge. This pipe has not been located; therefore, the Contractor shall verify its location to determine whether it impedes with its operation. This pipe can be removed if and as the Contractor finds it necessary and shall coordinate with CT Water accordingly.

Site No. 2: Bridge No. 68-003 – Valley Road over Whetstone Brook

Overhead Utilities: Overhead utility lines traverse diagonally over the road and directly above the proposed structure, which could restrict the Contractor's ability to excavate and erect the proposed concrete box culvert. Accordingly, the utility pole located on the northeast corner of the project limits will be relocated northwest of the project limits, further north and to the other side of the street, in order to relocate the overhead utility lines along the west side of Bear Hill Road.

NOTICE TO CONTRACTOR – PROTECTION OF EXISTING UTILITIES

The Contractor's attention is directed to the need for the protection of the existing utilities during the bridge reconstruction operations.

The Contractor shall be responsible for protecting existing utilities prior to and during construction operations. The Contractor shall be responsible for coordinating with utility companies providing services in the area for appropriate manner of protecting the utilities. A 10-foot minimum clearance is required from any unprotected overhead lines. The Contractor may and shall adjust its means and methods in order to conform to this requirement at no additional cost to the Town.

The Contractor shall be liable for damages and/or claims received or sustained by any persons, corporations, or property in consequence of damage to the existing utilities, their appurtenances, or other facilities caused directly or indirectly by the operations of the Contractor.

Damages to existing utilities shall be repaired including all materials, labor, etc., to the Engineer's satisfaction at no cost to the Town and/or to the utility companies.

NOTICE TO CONTRACTOR – UTILITY GENERATED SCHEDULE

After award, the Contractor shall conduct a utility coordination meeting(s) with utility companies providing services in the area to obtain the utility companies' anticipated schedule for relocating their facilities prior to submitting its baseline schedule to the Town.

The Contractor shall incorporate the scheduled utility relocation or utility relocation duration into its baseline schedule submittal. The baseline schedule shall include the predecessor and successor activities and construction operations to the utility work in such detail as acceptable to the Engineer.

NOTICE TO CONTRACTOR – PROCUREMENT OF MATERIALS

Upon award, the Contractor shall proceed with shop drawings, working drawings, procurement of materials, and all other submittals required to complete the work in accordance with the contract documents.

NOTICE TO CONTRACTOR – MINIMUM CONCRETE COMPRESSIVE STRENGTH

The concrete strength or allowable design stress specified in the General Notes is for design purposes only. The minimum compressive strength of concrete in constructed components shall comply with the requirements of Section 6.01 – Concrete for Structures.

NOTICE TO CONTRACTOR – MINIMUM CONCRETE COMPRESSIVE STRENGTH

SECTIONS 6.01 and M.03 MIX CLASSIFICATION EQUIVALENCY

Sections 6.01 *Concrete for Structures* and M.03 *Portland Cement Concrete* are herein revised to reflect changes to item names and nomenclature for standard Portland Cement Concrete (PCC) mix classifications. Other Special Provisions, standard specifications, plan sheets and select pay items in this Contract may not reflect this change. Refer to Concrete Mix Classifications Equivalency Table below to associate the Concrete Mix Classifications with Former Mix Classifications that may be present elsewhere in the Contract.

Concrete Mix Classification Equivalency Table

New Mix Classification (Class PCCXXXYX1)	Former Mix Classification
Class PCC03340	Class "A"
Class PCC03360	Class "C"
Class PCC04460 ²	Class "F"
Class PCC04460 ²	High Performance Concrete
Class PCC04481 Class PCC05581	Class "S"

Table Note:

1. See Table M.03.02-1, Standard Portland Cement Concrete Mixes, for the new Mix Classification naming convention.
2. Class PCC04462 (low permeability concrete) is to be used for the following cast-in-place bridge components: decks, bridge sidewalks, and bridge parapets.

Where called for in the Contract, **Low Permeability Concrete** shall be used as specified in Sections 6.01 and M.03. Please pay special attention to the requirements for Class PCC04462, including:

- Submittal of a mix design developed by the Contractor and a concrete supplier **at least 90 days prior to placing the concrete.**
- Testing and trial placement of the concrete mix to be developed and discussed with the Town.

The Town will not consider any request for change to eliminate the use of Low Permeability Concrete where called for on this Project.

**NOTICE TO CONTRACTOR - SECTION 4.06 AND M.04 MIX
DESIGNATION EQUIVALENCY AND PG BINDER EQUIVALENCY**

Sections 4.06 and M.04 have been replaced in their entirety with the Special Provisions included as part of this contract. These Special Provisions reflect changes in mix designations for various types of hot-mix asphalt (HMA) and include the removal of mixes designed and governed by the Marshall Mix Design method. The following table is to be used to associate mix designations noted on the plans with those in the contract specifications and related documents. Mix designations on each row are equivalent and refer to a single mix, which shall be subject to the requirements of the Section 4.06 and M.04 Special Provisions for the Official Mix Designation in the leftmost column of the corresponding row in the table.

Mix Designation Equivalency Table

Official Mix Designation	Equivalent Mix Designation (a)	Equivalent Mix Designation (b)
(c)	Superpave 1.5 inch	Superpave 37.5 mm
HMA S1	Superpave 1.0 inch	Superpave 25.0 mm
HMA S0.5	Superpave 0.5 inch	Superpave 12.5 mm
HMA S0.375	Superpave 0.375 inch	Superpave 9.5 mm
HMA S0.25	Superpave 0.25 inch	Superpave 6.25 mm
(c)	Superpave #4	Superpave #4
HMA S0.5 (d)	Bituminous Concrete Class 1 (e)	Bituminous Concrete Class 1 (e)
HMA S0.375 (d)	Bituminous Concrete Class 2 where it is specified in lifts 1.25 or thicker (e)	Bituminous Concrete Class 2 where it is specified in lifts 1.25 or thicker (e)
HMA S0.25 (d)	Bituminous Concrete Class 2 where it is specified in lifts 1.0 inches to less than 1.25 inches (e); Bituminous Concrete Class 12 (e)	Bituminous Concrete Class 2 where it is specified in lifts 1.0 inches to less than 1.25 inches (e); Bituminous Concrete Class 12 (e)
HMA S1 (d)	Bituminous Concrete Class 4 (e)	Bituminous Concrete Class 4 (e)
Curb Mix	Bituminous Concrete Class 3	Bituminous Concrete Class 3

Notes

(a) This mix designation is generally included with projects where the English measurement system is used. The mix designation may contain both the English measurement system

designation and the SI (metric) measurement system designation, one of which would be in parenthesis.

(b) This mix designation is generally included with projects where the SI (metric) measurement system is used. The mix designation may contain both the English measurement system designation and the SI measurement system designation, one of which would be in parenthesis.

(c) This mix is no longer in use except by contract-specific Special Provision; if this mix is called for in the Plans but no such Special Provision is included for this contract a suitable substitute must be approved by the Engineer.

(d) Unless approved by the Engineer, the Superpave Design Level for the Official Mix Designation bituminous concrete replacing a Marshall mix called for in the plans or other contract documents shall be Design Level 2 for mixes used on mainline or shoulders of state-maintained roadways and Design Level 1 elsewhere, including but not limited to driveways or sidewalks.

(e) All mixes designed under the Marshall mix-design method are no longer covered by the 4.06 Special Provision. Wherever they appear in Contract plans and documents they shall be substituted by the "Official Mix Designation" in the same row of the Mix Designation Equivalency Table. Unless approved by the Engineer, the Superpave Design Level shall be Level 1.

PG Binder Designation Equivalency Table

Official Binder Designation	Equivalent Binder Designation	Use
PG 64S-22	PG 64-22	Hot-Mix Asphalt (HMA S* pay items and pay items using HMA S* materials) (a),(b)
PG 64E-22	PG 76-22	Polymer-Modified Asphalt (PMA S* pay items and pay items using HMA S* materials) (a),(b)

Notes

- (a)** Use the Mix Designation Equivalency Table above to identify the Official Mix Designation for materials using the Marshall mix design method, i.e. “Bituminous Concrete Class *.”
- (b)** Refer to the NTC – Superpave Design Level for the Superpave Design Level to use for each mix on a project. The PG Binder Designation Equivalency Table can be used to obtain the Official Binder Designation for each mix identified in the NTC – Superpave Design Level.

NOTICE TO CONTRACTOR – ACCESS TO PRIVATE PROPERTIES

The Contractor shall maintain access to private properties adjacent to and within the project limits unless specified otherwise within these contract documents. The Contractor is responsible for coordinating with the property owners, through the Town, for the scheduling of work and access.

Access to and from private properties shall be maintained at all times. As shown on the contract plans and property maps prepared for this project, easements are obtained on portions of adjacent properties for the purposes of staging equipment, tools and materials and other construction operations called for on the plans.

Should a temporary driveway closure be required, the Contractor shall make every effort to minimize driveway closure durations. The work requiring driveway closures shall be coordinated with affected property owners and shall provide a 30-day notice to the property owners and to the Town prior to initiating driveway closures.

SECTION 1.05 – CONTROL OF THE WORK

Replace Article 1.05.02 with the following:

1.05.02—Contractor Submittals, Working Drawings, Shop Drawings, Product Data, Submittal Preparation and Processing - Review Timeframes, Department's Action:

- 1. Contractor Submittals:** The plans provided by the Town show the details necessary to give a comprehensive idea of the construction contemplated under the Contract. The plans will generally show the location, character, dimensions, and details necessary to complete the Project. If the plans do not show complete details, they will show the necessary dimensions and details, which when used along with the other Contract documents, will enable the Contractor to prepare working drawings, shop drawings or product data necessary to complete the Project.

The Contractor shall prepare submittals as Portable Document Format (PDF) files. The submittals shall be sent to the Town's reviewer(s), sufficiently in advance of the work detailed, to allow for their review in accordance with the review periods as specified herein (including any necessary revisions, resubmittal, and final review), and acquisition of materials, without causing delay of the Project.

- 2. Working Drawings:** When required by the Contract or when ordered to do so by the Engineer, the Contractor shall prepare and submit the working drawings, signed, sealed and dated by a qualified Professional Engineer licensed to practice in the State of Connecticut, for review. The drawings shall be delivered sufficiently in advance of the work detailed, to allow for their review in accordance with the review periods specified herein (including any necessary revisions, resubmittal, and final review).

There will be no direct payment for furnishing any working drawings, procedures or supporting calculations, but the cost thereof shall be considered as included in the general cost of the work.

The Contractor shall supply to the Engineer a certificate of insurance in accordance with 1.03.07 at the time that the working drawings for the Project are submitted.

The Contractor's designer, who prepares the working drawings, shall secure and maintain at no direct cost to the State a Professional Liability Insurance Policy for errors and omissions in the minimum amount of \$2,000,000 per error or omission. The Contractor's designer may elect to obtain a policy containing a maximum \$250,000 deductible clause, but if the Contractor's designer should obtain a policy containing such a clause, they shall be liable to the extent of at least the deductible amount. The Contractor's designer shall obtain the appropriate and proper endorsement of its Professional Liability Policy to cover the indemnification clause in this Contract, as the same relates to negligent acts, errors or omissions in the Project work performed by them. The Contractor's designer shall continue this liability insurance coverage for a period of three (3) years from the date of acceptance of

the work by the Engineer or three (3) years after the termination of Contract, whichever is earlier, subject to the commercial availability of such insurance.

3. **Shop Drawings:** When required by the Contract, or when ordered to do so by the Engineer, the Contractor shall prepare and deliver shop drawings to the Engineer for review. Review timeframes and submission locations are as specified herein.

There will be no direct payment for furnishing any shop drawings, but the cost thereof shall be considered as included in the general cost of the work.

4. **Product Data:** When required by the Contract, or when ordered to do so by the Engineer, the Contractor shall prepare and deliver product data.

The Contractor shall submit the product data in a single submittal for each element or group of elements of construction.

The Contractor shall mark each copy of the product data submittal to show applicable choices and options. Where product data includes information on several products that are not required, copies shall be marked to indicate the applicable information. Product data shall include the following information and confirmation of conformance with the Contract to the extent applicable: manufacturer's printed recommendations, compliance with recognized trade association standards, compliance with recognized testing agency standards, application of testing agency labels and seals, notation of coordination requirements, Contract item number, and any other information required by the individual Contract provisions.

There will be no direct payment for furnishing any product data, but the cost thereof shall be considered as included in the general cost of the work.

5. **Submittal Preparation and Processing – Review Timeframes:** The Contractor shall allow 30 calendar days for submittal review by the Town and the Engineer, from the date receipt is acknowledged by the Town and the Engineer. For any submittals marked with "Revise and Resubmit" or "Rejected," the Town and the Engineer are allowed an additional 20 calendar days for review of any resubmissions.

An extension of Contract time will not be authorized due to the Contractor's failure to transmit submittals in a timely manner and sufficiently in advance of the work to permit processing.

The furnishing of shop drawings, working drawings or product data, or any comments or suggestions by the Designer or Engineer concerning shop drawings, working drawings or product data, shall not relieve the Contractor of any of its responsibility for claims by the State or by third parties, as per 1.07.10.

The furnishing of the shop drawings, working drawings and product data shall not serve to relieve the Contractor of any part of its responsibility for the safety or the successful

completion of the Project construction.

- 6. Designer's Action:** The Designer or Engineer will review each submittal, mark each with a self-explanatory action stamp, and return the stamped submittal promptly to the Contractor. The Contractor shall not proceed with the part of the Project covered by the submittal until the submittal is marked "No Exceptions Noted" or "Exceptions as Noted" by the Designer or Engineer. The Contractor shall retain sole responsibility for compliance with all Contract requirements. The stamp will be marked as follows to indicate the action taken:
- a. If submittals are marked "No Exceptions Noted," the Designer or Engineer has not observed any statement or feature that appears to deviate from the Contract requirements. This disposition is contingent on being able to execute any manufacturer's written warranty in compliance with the Contract provisions.
 - b. If submittals are marked "Exceptions as Noted" the considerations or changes noted by the Designer's Action are necessary for the submittal to comply with Contract requirements. The Contractor shall review the required changes and inform the Designer or Engineer if they feel the changes violate a provision of the Contract or would lessen the warranty coverage.
 - c. If submittals are marked "Revise and Resubmit," the Contractor shall revise the submittals to address the deficiencies or provide additional information as noted by the Designer or Engineer. The Contractor shall allow an additional review period as specified in 1.05.02-5.
 - d. If submittals are marked "Rejected," the Contractor shall prepare and submit a new submittal in accordance with the Designer's or Engineer's notations. The resubmissions require an additional review and determination by the Designer or Engineer. The Contractor shall allow an additional review period as specified in 1.05.02-5.

Section 1.07 – LEGAL RELATIONS AND RESPONSIBILITIES

1.07.13 – Contractor’s Responsibility for Adjacent Property, Facilities and Services: *This article is supplemented as follows:*

The Contractor shall contact the following companies and their representatives to at least four (4) weeks prior to start of on-site construction operations to coordinate protection, temporary support, and/or relocation of their utilities.

Utility

Contact

Atlantic Broadband

Mr. Mark Giannattasio
Construction Supervisor
61 Myrock Ave
Waterford, CT 06385
(860) 629-6778
mgiannattasio@atlanticbb.com

Mr. Rick Daigle
(860) 625-5761
rdaigle@atlanticbb.com

Frontier

James Tourgee
1441 North Colony Rd
Meriden, CT 06450-4101
(203) 237-5517
James.tourgee@ftr.com

Eversource (Electric Distribution)

Ms. Irene R. Debernardo
Supervisor Field Engineering Design
63R Myrock Ave
Waterford, CT 06385
(860) 447-5713
irene.debernardo@eversource.com

Mr. Richard Arremony
richard.arremony@eversource.com

Mr. Scott Cormier
(860) 779-5680
scott.cormier@eversource.com

The Connecticut Water Company

Mr. Christopher Wojciak, PE
Infrastructure Rehabilitation Supervisor
446 Smith St
Middletown, CT 06457
(860) 292-2840
cwojciak@ctwater.com

Mr. Sean Smith
(203) 499-8901
smith@ctwater.com

Emergency Responder – Fire Department

Mr. Randy Burchard
Fire Marshall
172 Main St
Killingly, CT 06239
(860) 779-5318
rburchard@killinglyct.gov

Representatives of the various utility companies shall be allowed access to the project Sites at all times.

The Contractor shall be liable for damages and/or claims received or sustained by any persons, entities or properties in consequence of damages to the existing utilities, their appurtenances or other facilities caused directly or indirectly by the Contractor's operations.

SECTION 1.08 - PROSECUTION AND PROGRESS

Article 1.08.04 - Limitation of Operations: *Add the following:*

In order to provide for traffic operations as outlined in the Special Provision "Maintenance and Protection of Traffic," the Contractor will not be permitted to perform any work that will interfere with the described traffic operations on all project roadways as follows:

Valley Road and Bear Hill Road

Monday through Friday between 6:00 a.m. and 9:00 a.m. & between 3:00 p.m. and 6:00 p.m.
Saturday and Sunday between 10:00 a.m. and 6:00 p.m.

During the bridge replacement, the Contractor will be allowed to close Valley Road and Bear Hill Road and detour traffic in accordance with the Detour Plan. The length of the detour operation shall not exceed 60 days. Once the detour starts, the contractor shall continue working until the work is done to minimize duration of detour.

Both
Valley Rd
Bridges
cannot be
closed
simultaneo
usly

All Other Roadways

Monday through Friday between 6:00 a.m. and 9:00 a.m. & between 3:00 p.m. and 6:00 p.m.
Saturday and Sunday between 10:00 a.m. and 6:00 p.m.

Additional Lane Closure Restrictions

The Contractor shall be aware of adjacent projects, if any, that might be ongoing simultaneously with this project. If and as necessary, the Contractor shall anticipate coordination with those projects to maintain proper traffic flow at all times on all project roadways in a manner consistent with these specifications and acceptable to the Engineer.

The Contractor will not be allowed to perform any work that will interfere with traffic operations on a roadway when traffic operations are being restricted on that same roadway unless there is at least a one (1) mile clear area length where the entire roadway is open to traffic or the closures have been coordinated and are acceptable to the Engineer. The one (1) mile clear area length shall be measured from the end of the first work area to the beginning of the signing pattern for the next work area. It is anticipated that work on adjacent projects will be ongoing simultaneously with this project.

ITEM #0202217A – SUPPLEMENTAL STREAMBED CHANNEL MATERIAL

Description: This work shall consist of procuring, transporting and placing supplemental streambed channel material meeting the visual inspection requirements herein, along stream bank/channel improvement locations as shown on the plans or denoted on the Project's permit applications. This work shall also include necessary temporary protection and stockpiling of supplemental streambed channel material on the Site and removal and proper disposal of all unused material.

Materials: When a sufficient quantity of material is not available from the existing streambed channel within the permitted footprint of the Site, the Contractor shall furnish visually inspected and accepted supplemental streambed channel material from an off-site source.

The supplemental streambed channel material for this item shall be consistent with the existing naturally formed cobbles and rocks, gravel, and clean natural sediments found within the existing channel. Rock excavated from ledge (bedrock) formations, broken from larger boulders, broken concrete or angular material will not be accepted. Rock larger than 12 inches in diameter will not be accepted. Silts and clays will be accepted.

The visual inspection of the supplemental streambed channel material shall be performed by the Engineer at an off-site source prior to delivery of material to the Site. The Contractor shall notify the Engineer at least 10 days in advance of the need for inspection of proposed off-site material.

Construction Methods: At the start of construction, the Contractor shall prepare an area, approved by the Engineer, suitable in size and location for stockpiling the supplemental streambed channel material. The Contractor shall select an upland location where disruption to the stream channel or impact to wetland areas caused by moving the supplemental streambed channel material to and from the stockpile are minimized during placement of material. The stockpile shall be located where it can remain undisturbed for the duration of the stream channel construction and shall be protected using sedimentation control measures.

The stockpile area shall be cleared and cleaned adequately to prevent mixing with underlying soil or other materials, including the use of structural fabric if required. The stockpile area shall be adequately covered to protect the supplemental streambed channel material from erosion by rain or other forces. After the supplemental streambed channel bottom material and the excavated channel bottom material to be reused have been placed in the stockpile areas, no other excavated or off-site material shall be placed in the stockpiles.

The reused and supplemental streambed channel material shall be placed at the designated location(s) to the required thickness as shown on the plans or denoted on the permit application, or as directed by the Engineer. The Contractor's equipment and means and methods of placement shall prevent integration with surrounding material and shall keep the channel bottom material relatively homogenous. Reused and supplemental streambed channel material shall be placed in a manner that replicated the original condition of the channel prior to excavation.

The Contractor shall perform all containment, diversion, or other separation of the channel flow when placing the reused and supplemental streambed channel material to minimize sediment transport downstream.

The disposal of surplus or unsuitable material shall be in accordance with Section 2.02. Restore stockpile area as directed by the Engineer.

Method of Measurement: Work under this item shall be measured for payment as provided under Article 1.09.04 – Extra and Cost-Plus Work. [Should this be included in the box culvert installation?](#)

The sum of money shown on the estimate and the itemized proposal as “Estimated Cost” for this work will be considered the price bid even though payment will be made only for the actual work performed. The estimated cost figure is not to be altered in any manner by the bidder. Should the bidder alter the amount shown, the altered figures will be disregarded and the original price will be used to determine the total amount bid for the Contract.

Basis of Payment: This work will be paid for under Article 1.09.04 – Extra and Cost-Plus Work.

The payment for clearing and grubbing of the approved stockpile area will be included in the item “Clearing and Grubbing.”

Payment for excavation and reuse of existing channel bottom material will be included in the item “Excavation and Reused of Existing Channel Bottom Material.”

Payment for all containment, diversion, or other separation of stream flow from the excavation of channel material will be included in the item “Cofferdam and Dewatering” or the item “Handling Water (Site No. X).”

Pay Item

Supplemental Streambed Channel Material

Pay Unit

est.

ITEM #0202454A – SPECIAL TEST PIT – WATER MAIN

Description: Work under this item shall consist of the performance and completion of test pits for the purpose of locating an existing water main and to identify the occurrence, location, and dimensions of existing subsurface structures. Work under this section shall also include excavation, inspection, measurements of the pipe, and backfilling. Measurements of the pipe shall include but are not limited to depth from ground surface and from channel bed to top of pipe, pipe size, and type of pipe.

Work under this section shall also include but not limited to:

- furnishing, installing, operating, and maintaining temporary cofferdam and dewatering system required to perform the test pit within the channel;
- water handling system for test pit within the channel;
- furnishing, installing, and removal of support of excavation, if and as required; and
- backfilling and compaction of excavation.

Materials: Material to be used for backfilling test pits within the channel shall consist of natural streambed channel material as specified in these specifications. Excavated channel bottom material shall be reused as specified in these specifications.

If, in the opinion of the representative of The Connecticut Water Company (CT Water), the excavated material is unsuitable for backfill, it shall be removed and disposed of to such limits as directed by the CT Water Representative and a suitable backfill material conforming to the Standard Specifications shall be furnished and installed accordingly.

Construction Methods: Test pits shall be made in conformity with the requirements of the plans or as ordered by the Engineer. The Contractor shall furnish and employ such supports of excavation as may be necessary for the protection of property and adjacent facilities, and proper and safe completion of the work. All bracing and supports of excavation shall be removed after completion and backfill of the test pits, and when no longer required for the construction and safety of the work.

The Contractor shall design, furnish, and install temporary cofferdam, dewatering, and water handling systems required for the performance and completion of test pits within the limits of the channel. Water handling systems shall conform to hydraulic requirements as shown on the water handling plans. Dewatering operations and measures shall conform to dewatering requirements and provisions as specified within these specifications. Turbidity curtains shall be installed alongside and in conjunction with the temporary cofferdam. Sedimentation basins shall be installed in conjunction with the dewatering system.

The Contractor shall perform field surveys to establish the horizontal and vertical locations of the water main. The work shall be performed in accordance with the requirements of Section 9.80, Construction Staking. The Contractor shall furnish the Engineer copies of all test pit data.

All suitable material that was excavated during the performance of the test pit shall be used for backfilling, if required. All surplus or unsuitable material shall be removed and disposed of as directed by the Engineer. Should additional material be required for backfilling, it may be obtained from the Project's excavation or from borrow pits, gravel pits, or elsewhere as the Engineer may direct. Excavated channel bottom material shall be reused for backfilling test pits performed within the channel.

Method of Measurement: Work under this item shall be measured per each test pit performed and completed. Work incidental to the performance of this work including but not limited to temporary cofferdam, dewatering, water handling, support of excavation, and backfilling will not be measured for payment but the cost thereof shall be considered as included in the cost of the item "Special Test Pit – Water Main."

Basis of Payment: This work will be paid for at the Contract unit price per each of "Special Test Pit – Water Main," which price shall include excavation, documentation, backfilling, restoration, materials, tools, equipment, labor, work, and any related environmental controls used in the dewatering operations. Cost shall also include the design, furnishing, installation, and satisfactory removal of temporary cofferdams, dewatering measures, water handling systems, and supports of excavation.

The payment for clearing and grubbing will be included in the item "Clearing and Grubbing."

Cost of excavation and reuse of existing channel bottom material shall be included in the cost of the item "Special Test Pit – Water Main."

Payment for all containment, diversion, or other separation of stream flow from the excavation associated with the performance of test pits within the channel shall be included in the cost of the item "Special Test Pit – Water Main."

Pay Item

Special Test Pit – Water Main

Pay Unit

ea.

ITEM #0204111A – COFFERDAM AND DEWATERING

Cofferdam and Dewatering shall be in accordance with Section 2.04, supplemented as follows:

2.04.01 - Description: *Supplemented with the following:*

Work under this item shall also include the furnishing, placement, operation, and removal of dewatering measures to handle and treat intrusive water during construction operations where shown and noted on the plans or as ordered by the Engineer. Dewatering measures shall include dewatering receptacles, storage basins, furnishing and placing turbidity curtains and sedimentation basins or other measures available to remove sediment from water. At no time shall dewatering measures be placed beyond or impact areas beyond the right-of-way limits or designated limits of project site construction area. The dewatering measures are subject to the review and approval of the Engineer prior to placement and use.

2.04.03 - Construction Methods: *Add the following:*

Dewatering Measures: The Contractor shall be responsible for locating and sizing dewatering measures. The measures shall be sized to have a minimum retention time of two (2) hours and shall be inspected at least every two (2) hours during periods of use. Accumulated sediment shall be disposed of properly. Energy dissipation shall be provided at the treated water discharge point prior to re-entering the stream. After dewatering operations are completed, all materials shall be removed and the impacted areas restored to existing condition or better. The cofferdam shall be designed to properly retain existing facilities during excavation or fill for the placement of substructure or other facilities, if and as necessary.

Turbidity Curtain: Turbidity curtains shall be installed where shown on the plans and as shown on the attached details.

Sedimentation Basin: The Contractor shall be responsible for locating and sizing sedimentation basins.

2.04.04 - Methods of Measurement: *Replace with the following:*

There shall be no direct payment for dewatering measures and the item shall not be measured for payment, but the cost thereof shall be considered as included in the cost of the item “Cofferdam and Dewatering.”

Work under this item will be measured for payment based on a percent complete of the lump sum cost for this item.

2.04.05 - Basis of Payment: *Replace with the following:*

This work will be paid on a lump sum basis under the item “Cofferdam and Dewatering,” which price shall include all costs for design, materials, tools, equipment, labor, work, and any related environmental controls used in the dewatering operations, which are required for the construction of cofferdams shown on the plans, including cost of pumping and dewatering, dewatering

receptacles, repair, correction, adjustments, maintenance, reconstruction, and removal of such cofferdams required by and as shown on the plans. Cost shall also include furnishing, installation, removal of dewatering measures, and disposal of dewatering materials, wastewater and any debris collected, as well as removal of any related environmental controls used in the dewatering operations.

Pay Item

Pay Unit

Cofferdam and Dewatering

LS

ITEM #0204401A – HANDLING WATER (SITE NO. 1)

ITEM #0204403A – HANDLING WATER (SITE NO. 3)

2.04.01 Description: Work under this item shall consist of the construction of a temporary pipe, flow diversions, temporary cofferdams or other such protective facilities and methods as are necessary to convey stream flow through the existing culverts, the dewatering of the site on which the new structure is to be constructed, and the removal of all such temporary structures and facilities upon the completion of the permanent work. The handling of water shall be in accordance with the requirements of Section 1.10. The means of handling water shall be the Contractor's option but shall be in conformance with the Contract Drawings and approved by the Engineer and the Town. The handling of flood flows and the protection of existing structures and any or all of the finished construction during high water are included in the scope of work under this item.

2.04.03 Construction Methods: The Contractor shall investigate and verify existing stream conditions and evaluate the need for and the type of protection and facilities required. Before commencing construction, the Contractor shall furnish the Engineer with details of the plan and methods he proposes to use for handling water and accomplishing the work. The furnishing of such plans and methods shall not relieve the Contractor of any of his responsibility for the safety of the work and for the successful completion of the project.

The height or top of temporary cofferdams, flow diversions and barriers shall be in accordance with the plans. All such temporary structures shall be constructed to assure construction of all permanent work in the dry without interfering with the proposed work, forms, or inspection thereof. Any movement or failure of the temporary construction, which interferes with the permanent construction, shall be corrected at the sole expense of the Contractor.

Any pumping from the area of construction shall be done in such a manner as to prevent the possibility of movement of water through any fresh concrete. Pumping shall be done from a suitable sump, properly located and with sufficient pumping capacity to protect against damage from sudden rising of water. Any pumped water must be discharged in accordance with the requirements of Section 1.10. Unless otherwise provided, or directed, all such temporary work shall be removed and disposed of in an approved manner when no longer required.

2.04.04 Method of Measurement: This item, being paid for on a lump sum basis, will not be measured for payment. Temporary cofferdams, in addition to what is called out for on the plans and used for the purpose of handling water, will not be measured for payment but shall be included in the lump sum cost of the item "Handling Water (Site No. X)."

2.04.05 Basis of Payment: This work will be paid for at the contract lump sum price for "Handling Water (Site No. X)," complete and accepted, which price shall include all equipment, tools, labor, and materials incidental to the construction and reconstruction, if required, dewatering, including pumping and any related environmental controls used in Handling Water, handling of the stream flow during construction, maintenance, removal and disposal of all protective works and facilities, disposal of water removed from the construction, damages incurred by the Contractor, and any

damages to existing facilities and to the work in progress, materials or equipment from flows or high stages of the stream.

<u>Pay Item</u>	<u>Pay Unit</u>
Handling Water (Site No. 1)	1.s.
Handling Water (Site No. 3)	1.s.

ITEM #0210820A – WATER POLLUTION CONTROL (ESTIMATED COST-PLUS)

Water Pollution Control shall be in accordance with Section 2.10, supplemented as follows:

Article 2.10.01 - Description: *Replace with the following:*

This work shall consist of measures to control water pollution and soil erosion through the use of berms, dikes, dams, sediment basins, sediment tanks, erosion control matting, gravel, mulches, grasses, slope drains, ditches, channels, riprap, grading to control surface runoff and other erosion control devices or methods chosen by the Contractor or as directed by the Engineer.

If the Contractor proposes changes in construction or its scheduling that would affect the designed pollution controls, the Contractor shall submit plans before starting construction for revised pollution controls for the approval of the Engineer.

The Contractor shall submit a plan showing erosion and sedimentation controls above and beyond those called for in the plans and/or specifications, necessitated by the proposed sequence of operations and/or construction activities. The Contractor shall submit an additional plan beyond what is required for erosion and sedimentation controls showing the location and measures proposed for the treatment of intrusive water within the cofferdams. The construction shall not proceed until the erosion and sedimentation control plans have been approved by the Engineer. The Engineer may order additional control measures if the measures mentioned above prove insufficient.

Why is this cost plus? Should it be included with dewatering etc?

ITEM #0402401A – SAWING AND SEALING JOINTS IN BITUMINOUS CONCRETE PAVEMENT

Description: Work under this section shall consist of making a straight-line saw cut transversely across the final lift of HMA pavement directly over the edge of the new concrete box culvert. The sawing and sealing of joints shall be immediately cleaned and sealed with a joint seal material. The sawing and sealing shall commence within one week of the completion of the final lift of pavement and be a continuous operation until all joints have been completed.

Materials: Joint sealer shall conform to the requirements of AASHTO M324 Type II. Material that is heated or cooled beyond the manufacturer's recommended temperature range shall be discarded.

Equipment: All equipment necessary for the work shall meet the following requirements:

- a. Kettle: The unit shall be a combination melter and pressurized applicator of a double-boiler type with space between the inner and outer shells filled with oil or other material not having a flash point of less than 600° F. The kettle shall include a temperature control indicator and mechanical agitator. The kettle shall be capable of maintaining the material at a temperature within 15° F of the manufacturer's recommended temperature.
- b. Compressor: The compressor shall have a sufficient capacity and length of hose to enable a continuous sealing operation.
- c. Saw: The saw shall be capable of providing straight cut of uniform depth and width.

Construction Methods: Prior to the paving operation, the Contractor shall establish sufficient controls to locate each transverse joint. This work shall include setting markers at each joint to reference its location and alignment and having each of these markers tied and references. A written procedure for this work shall be submitted to the Engineer for review prior to commencement of such work.

The sawcut will be made using diamond saw blades with a gang blade arrangement in order to archive the joint detail shown on the plans. The sawcut will be in a straight line across the pavement directly over the edge of the concrete box culvert. The sawed joints shall be cleaned with compressed air to the satisfaction of the Engineer.

Immediately following the cleaning, the joint seal material shall be installed. When cooled, the top of the sealant material shall be recessed a minimum of $\frac{1}{16}$ inch but not greater than $\frac{1}{8}$ inch below the adjacent pavement surface. The roadway shall not be opened to traffic until the material has become tack free. Any depression in the sealer greater than $\frac{1}{8}$ inch shall be brought up to the specified limit by further addition of joint seal material. Care shall be taken during the sealing operation to ensure that overfilling and spilling of material is avoided.

Any reflective cracking attributable to the improper joint referencing or construction shall be repaired at the expense of the Contractor in a manner approved by the Engineer for a period of one (1) year from the date of completion on any sawed and sealed portion of final pavement.

Acceptance of Work: Work identified by the Engineer as not acceptable shall be re-done at the Contractor's expense. The Contractor shall notify the Engineer upon completion of required corrective work.

Method of Measurement: This work shall be measured by the total number of lineal feet of sawing and sealing joints in bituminous concrete as indicated in the Contract Plans and as measured, verified, and accepted by the Engineer.

Basis of Payment: The accepted quantity of sawing and sealing joints in bituminous concrete shall be paid for at the Contract unit price per lineal foot of "Sawing and Sealing Joints in Bituminous Concrete Pavement." The price shall include all materials, equipment, tools, and labor incidental thereto.

<u>Pay Item</u>	<u>Pay Unit</u>
Sawing and Sealing Joints in Bituminous Concrete Pavement	l.f.

ITEM #0406275A – FINE MILLING OF BITUMINOUS CONCRETE (0 TO 4 INCHES)

Description: This work shall consist of the milling, removal, and disposal of existing bituminous concrete pavement.

Construction Methods: The Contractor shall remove the bituminous concrete material using means acceptable to the Engineer. The pavement surface shall be removed to the line, grade, and existing or typical cross-section shown on the plans or as directed by the Engineer.

The bituminous concrete material shall be disposed of offsite by the Contractor at an approved disposal facility unless otherwise stated in the Contract.

Any milled surface, or portion thereof, that is exposed to traffic shall be paved within five (5) calendar days unless otherwise stated in the plans or Contract.

The equipment for milling the pavement surface shall be designed and built for milling bituminous concrete pavements. It shall be self-propelled with sufficient power, traction, and stability to maintain depth and slope and shall be capable of removing the existing bituminous concrete pavement.

The milling machine shall be equipped with a built-in automatic grade averaging control system that can control the longitudinal profile and the transverse cross-slope to produce the specified results. The longitudinal controls shall be capable of operating from any longitudinal grade reference, including string line, contact ski (30 feet minimum), non-contact ski (20 feet minimum), or mobile string line (30 feet minimum). The transverse controls shall have an automatic system for controlling cross-slope at a given rate. The Engineer may waive the requirement for automatic grade or slope controls where the situation warrants such action.

The machine shall be able to provide a 0 to 4-inch deep cut in one pass. The rotary drum of the machine shall use carbide or diamond tipped tools spaced not more than $\frac{5}{16}$ inches apart. The forward speed of the milling machine shall be limited to no more than 45 feet/minute. The tools on the revolving cutting drum must be continually maintained and shall be replaced as warranted to provide a uniform pavement texture.

The machine shall be equipped with an integral pickup and conveying device to immediately remove material being milled from the surface of the roadway and discharge the millings into a truck, all in one operation. The machine shall also be equipped with a means of effectively limiting the amount of dust escaping from the milling and removal operation.

When milling smaller areas or areas where it is impractical to use the above-described equipment, the use of a lesser equipped milling machine may be permitted when approved by the Engineer.

Protection shall be provided around existing catch basin inlets, manholes, utility valve boxes, and any similar structures. Any damage to such structures as a result of the milling operation is the Contractor's responsibility and shall be repaired at the Contractor's expense.

To prevent the infiltration of milled material into the storm drainage system, the Contractor shall take special care to prevent the milled material from falling into the inlet openings or inlet grates. Any milled material that has fallen into inlet openings or inlet grates shall be removed at the Contractor's expense.

Surface Tolerance: The milled surface shall provide a satisfactory riding surface with a uniform textured appearance. The milled surface shall be free from gouges, longitudinal grooves and ridges, oil film, and other imperfections that are a result of defective equipment, improper use of equipment, or poor workmanship. The Contractor, under the direction of the Inspector, shall perform random spot-checks with a Contractor supplied ten-foot straightedge to verify surface tolerances at a minimum of five (5) locations per day. The variation of the top of two ridges from the testing edge of the straightedge, between any two ridge contact points, shall not exceed $\frac{1}{4}$ inches. The variation of the top of any ridge to the bottom of the groove adjacent to that ridge shall not exceed $\frac{1}{4}$ inches. Any unsatisfactory surfaces produced are the responsibility of the Contractor and shall be corrected at the Contractor's expense and to the satisfaction of the Engineer.

The depth of removal will be verified by taking measurements every 250 feet per each pass of the milling machine, or as directed by the Engineer. These depth measurements shall be used to monitor the average depth of removal.

Where a surface delamination between bituminous concrete layers or a surface delamination of bituminous concrete on Portland cement concrete causes a non-uniform texture to occur, the depth of milling shall be adjusted in small increments to a maximum of $\frac{1}{2} \pm$ inches to eliminate the condition.

When removing bituminous concrete pavement entirely from an underlying Portland cement concrete pavement, all of the bituminous concrete pavement shall be removed leaving a uniform surface of Portland cement concrete, unless otherwise directed by the Engineer.

Any unsatisfactory surfaces produced by the milling operation are the Contractor's responsibility and shall be corrected at the Contractor's expense and to the satisfaction of the Engineer.

No vertical faces, transverse or longitudinal, shall be left exposed to traffic unless the requirements below are met. This shall include roadway structures (catch basins, manholes, utility valve boxes, etc.). If any vertical face is formed in an area exposed to traffic, a temporary paved transition shall be established according to the requirements shown on the plans. If the milling machine is used to form a temporary transition, the length of the temporary transition shall conform to Special Provision Section 4.06 – Bituminous Concrete, "Transitions for Roadway Surface," the requirements shown on the plans, or as directed by the Engineer. At all permanent limits of removal, a clean vertical face shall be established by saw cutting prior to paving.

Roadway structures shall not have a vertical face of greater than one (1) inch exposed to traffic as a result of milling. All structures within the roadway that are exposed to traffic and greater than one (1) inch above the milled surface shall receive a transition meeting the following requirements:

For roadways with a posted speed limit of 35 mph or less*:

1. Round structures with a vertical face of greater than 1 inch to 2.5 inches shall be transitioned with a hard rubber tapered protection ring of the appropriate inside diameter designed specifically to protect roadway structures.
2. Round structures with a vertical face greater than 2.5 inches shall receive a transition of bituminous concrete formed at a minimum 24 to 1 (24:1) taper in all directions.
3. All rectangular structures with a vertical face greater than 1 inch shall receive a transition of bituminous concrete formed at a minimum 24 to 1 (24:1) taper in all directions.

*Bituminous concrete tapers at a minimum 24 to 1 (24:1) taper in all directions may be substituted for the protection rings if approved by the Engineer.

For roadways with a posted speed limit of 40, 45 or 50 mph:

1. All structures shall receive a transition of bituminous concrete formed at a minimum 36 to 1 (36:1) taper in the direction of travel. Direction of travel includes both the leading and trailing side of a structure. The minimum taper shall be 24 to 1 (24:1) in all other directions.

For roadways with a posted speed limit of greater than 50 mph:

1. All structures shall receive a transition of bituminous concrete formed at a minimum 60 to 1 (60:1) taper in the direction of travel. Direction of travel includes both the leading and trailing side of a structure. The minimum taper shall be 24 to 1 (24:1) in all other directions.

All roadway structure edges and bituminous concrete tapers shall be clearly marked with fluorescent paint. The paint shall be maintained throughout the exposure to traffic.

The milling operation shall proceed in accordance with the requirements of the "Maintenance and Protection of Traffic" and "Prosecution and Progress" specifications, or other Contract requirements. The more stringent specification shall apply.

Prior to opening an area which has been milled to traffic, the pavement shall be thoroughly swept with a sweeper truck. The sweeper truck shall be equipped with a water tank and be capable of removing the millings and loose debris from the surface. The sweeper truck shall operate at a forward speed that allows for the maximum pickup of millings from the roadway surface. Other sweeping equipment may be provided in lieu of the sweeper truck where acceptable by the Engineer.

Any milled area that will not be exposed to live traffic for a minimum of 48 hours prior to paving shall require a vacuum sweeper truck in addition to, or in lieu of, mechanical sweeping. The vacuum sweeper truck shall have sufficient power and capacity to completely remove all millings from the roadway surface including any fine particles within the texture of the milled surface.

Vacuum sweeper truck hose attachments shall be used to clean around pavement structures or areas that cannot be reached effectively by the main vacuum. Compressed air may be used in lieu of vacuum attachments if approved by the Engineer.

Method of Measurement: This work will be measured for payment by the number of square yards of area from which the milling of asphalt has been completed and the work accepted. No area deductions will be made for minor unmilled areas such as catch basin inlets, manholes, utility boxes and any similar structures.

Basis of Payment: This work will be paid for at the Contract unit price per square yard for “Fine Milling of Bituminous Concrete (0 to 4 Inches).” This price shall include all equipment, tools, labor, and materials incidental thereto.

No additional payments will be made for multiple passes with the milling machine to remove the bituminous surface.

No separate payments will be made for cleaning the pavement prior to paving; providing protection and doing handwork removal of bituminous concrete around catch basin inlets, manholes, utility valve boxes and any similar structures; repairing surface defects as a result of the Contractors negligence; providing protection to underground utilities from the vibration of the milling operation; removal of any temporary milled or paved transition; removal and disposal of millings; furnishing a sweeper truck and sweeping after milling. The costs for these items shall be included in the Contract unit price.

Pay Item

Pay Unit

Fine Milling of Bituminous Concrete (0 to 4 Inches)

s.y.

ITEM #0503868A – REMOVAL OF EXISTING CULVERT (SITE NO. 3)

Work under this item shall conform to the requirements of Section 5.03 amended as follows:

5.03.01 - Description: *Add the following:*

This work shall consist of the complete removal and satisfactory disposal of the existing culvert structure.

This work shall also include the removal and satisfactory disposal of the existing headwalls and wingwalls.

5.03.03 - Construction Methods: *Add the following:*

All work shall proceed as directed by and to the satisfaction of the Engineer and in accordance with the details shown on the plans, or as ordered by the Engineer.

No record plans are available for the culvert covered in this pay item.

The existing culvert shall be demolished and removed in accordance with the methods proposed by the Contractor and reviewed by the Engineer. The Contractor's attention is drawn to the environmental sensitivity of stream and surrounding wetlands. The Contractor shall ensure to prevent debris, tools, and/or other materials from entering and/or dropping into the brook. Any demolition material, which accidentally falls into the waterway shall be promptly retrieved, removed from the waterway, and properly disposed of by the Contractor.

The demolition shall not result in damage to any adjoining property or brook area. If damage does occur, it shall be repaired by the Contractor to the satisfaction of the Engineer at no additional expense to the Town.

Prior to initiating work, the Contractor shall submit for review, plans and written documentation describing his methods of removal and the protection of environmentally sensitive areas and adjoining properties. The review of the Contractor's plans shall not be construed as relieving the Contractor of any of his responsibility. Working drawings and design computations showing (where appropriate) the Contractor's means and methods for sequencing the construction in conformance with the Maintenance and Protection of Traffic Plans shall be submitted to the Engineer in accordance with Section 1.05.02(2).

5.03.04 – Method of Measurement: *Replace the article with the following:*

This item, being paid for on a lump sum basis, will not be measured for payment. Removal and disposal of waste material from the culvert removal will not be measured for payment but shall be included in the cost of this item.

5.03.05 – Basis of Payment: *Replace the article with the following:*

This work shall be paid for at the contract lump sum price for “Removal of Existing Culvert (Site No. 3),” which price shall include all materials, equipment, tools, labor, and all work that are incidental for the removal and satisfactory disposal of the existing culvert, including headwalls and wingwalls. This item shall also include the satisfactory removal and disposal of all waste materials from the demolition.

Pay Item

Removal of Existing Culvert (Site No. 3)

Pay Unit

1.s.

ITEM #0503890A – REMOVAL OF EXISTING BRIDGE (SITE NO. 1)

ITEM #0503891A – REMOVAL OF EXISTING BRIDGE (SITE NO. 2)

Work under this item shall conform to the requirements of Section 5.03 amended as follows:

5.03.01 - Description: *Add the following:*

This work shall consist of the complete removal and satisfactory disposal of the existing bridge, abutments, wingwalls, parapets, and bridge rails as shown on the plans and as directed by the Engineer.

5.03.03 - Construction Methods: *Add the following:*

All work shall proceed in accordance with the details and approved water handling plans, shall conform to the item “Handling Water (Site No. X),” or as ordered by the Engineer, and shall be completed to the satisfaction of the Engineer

No record plans are available for the bridge structure covered in this pay item. Accordingly, the Contractor shall verify existing conditions, features, and dimensions of the existing structure.

The existing bridge shall be demolished and disposed of in such means and methods as the Contractor may propose, subject to the review and approval of the Engineer. Care shall be taken not to damage any permanent construction, to adjoining property and facilities, and/or to the brook area. If damage does occur, it shall be repaired by the Contractor to the satisfaction of the Engineer at no additional expense to the Town.

The Contractor’s attention is drawn to the environmental sensitivity of the stream and surrounding wetlands. The Contractor shall ensure to prevent debris, tools, and/or other materials from entering and/or dropping into the brook. Any demolition material, which accidentally falls into the waterway shall be promptly retrieved, removed from the waterway, and properly disposed of by the Contractor.

Prior to initiating work, the Contractor shall submit for review, plans and written documentation describing his methods of removal and the protection of environmentally sensitive areas and adjoining properties. The review of the Contractor’s plans shall not be construed as relieving the Contractor of any of his responsibility. Working drawings and design computations showing (where appropriate) the Contractor’s means and methods for sequencing the construction in conformance with the Maintenance and Protection of Traffic Plans shall be submitted to the Engineer in accordance with Section 1.05.02(2).

5.03.04 – Method of Measurement: *Replace the article with the following:*

This item, being paid for on a lump sum basis, will not be measured for payment. Removal and disposal of waste material from the bridge removal will not be measured for payment but shall be included in the cost of this item. Debris shields, temporary shoring, and other items incidental to this work will not be measured payment but shall be included in the cost of this item.

5.03.05 – Basis of Payment: *Replace the article with the following:*

This work shall be paid for at the contract lump sum price for “Removal of Existing Bridge (Site No. X),” which price shall include all materials, equipment, tools, labor, and all work that are incidental for the removal and satisfactory disposal of the existing bridge, including removal of abutment, wingwalls, parapets, and bridge rails. This item shall also include the satisfactory removal and disposal of all waste materials from the demolition.

<u>Pay Item</u>	<u>Pay Unit</u>
Removal of Existing Bridge (Site No. 1)	l.s.
Removal of Existing Bridge (Site No. 2)	l.s.

ITEM #0601088A – CONCRETE FORM LINERS

Description: This item shall consist of furnishing, staining, and coordinating with the approved precast concrete wingwall manufacturer for the casting of formed, textured concrete surfaces using form liners to closely resemble the appearance of natural stone of the type, size, and pattern as described herein and as called for on the plans, including accessories and hardware, as described by the Engineer, and in accordance with these specifications.

Materials: Materials shall conform to the following requirements:

1. **Design and Pattern:** The design and pattern of form lined concrete surfaces shall conform to the following:

Pattern:	1203 – New England Dry Stack
Relief:	1.50 inches
Liner Thickness:	2.75 inches

Manufacturer:	Customrock Formliner 2020 West 7 th Street St. Paul, MN 55116
Telephone:	(651) 699-1345
Email:	gbatt@customrock.com
Web Page:	www.customrock.com

Or approved equal.

2. **Form Liners:** Form liner material shall conform to the following:
 - a. Form liners shall be reusable elastomeric form liners, made of high-strength urethane and cuttable form liners, made of lower grade urethane, easily attachable to forms. The form liners shall leave crisp, sharp definition of the architectural surface. Recurring textural configurations exhibited by repeating, recognizable shadow patterns shall be prevented by proper casting of formliner patterns. The form liners shall not compress more than 6 mm when concrete is poured at a rate of three vertical meters per hour. The form liners shall be removable without causing deterioration of surface or underlying concrete. No substitutions will be permitted. The form liner shall conform to the pattern shown on the plans.
 - b. The form liner shall be designed to allow 180-degree rotation and interconnection with itself or another pattern liner of differing horizontal dimension. Maximum relief of pattern and the average relief shall be as shown on the contract plans. The simulated stone pattern shall vary in a random manner in the coursing parameters to prevent noticeable multiple duplicate pattern repetition and avoid stacked joints.

- c. In addition to orthogonal surfaces, the form liner shall be capable of forming curved and/or battered surfaces, if shown on the plans, while maintaining the dimensioned coursing and plumb vertical joints without distortion.

3. Color Stain: The color stain pattern shall be approved by the Town.

The color stain shall be a penetrating stain mix as provided by the manufacturer, shall achieve color variations present in the natural stone being simulated for the project, as approved by the Engineer and in accordance Items 1 and 2 above. The stain shall create a surface finish that is breathable (allowing water vapor transmission) and that resists deterioration from water, acid, alkali, fungi, sunlight, or weathering. The stain mix shall be a water borne, low V.O.C. material, less than 180 grams/liter and shall meet requirements for weathering resistance of 2000 hours accelerated exposure measured by weather-o-meter in accordance with ASTM G23 with 3-bulb. Scrub test 1000 revolutions. Abrasive resistance (Tabor-CF-10) of 500 cycles. Adhesion ASTM D3359 1.00 MM crosscuts on glass pass 3 or higher on a scale of 1 to 5. The Contractor shall supply information pertaining to chemical resistance in accordance with ASTM D1308.

4. Release Agent: If a form release agent is used, it must be of a non-staining type. The release agent shall be compatible with the stone masonry architectural treated surface as recommended by the manufacturer.
5. Form Ties: Form ties shall be designed to separate at least one inch back from finished surface, leaving only a neat hole that can be plugged with patching material. The Patching material shall be Tamms Speed-crete or equal mixed with latex or acrylic bonder, as approved by the manufacturer and Engineer

Construction Methods:

1. Show Drawings and Submittals: Before fabricating any materials, the Contractor shall submit shop drawings, product data sheets, samples, and mock-ups to the Engineer for approval in accordance with Article 1.05.02 for the materials listed in Item 3 below. These drawings and submittals shall include, but not limited to, the following information: manufacturer's name, listing of product compliance with referenced specification standards, complete details of the assemblies, material designations, nominal hardness of appropriate materials, design loads, quantities, and locations. The Engineer's drawings shall not be reproduced, traced, or used for show drawings or erection purposes.
2. Field Measurements: Prior to ordering or fabricating any materials, the Contractor shall take complete and accurate field measurements.
3. Submittals: Catalog cuts, manufacturer's literature and technical data for the materials specified herein, including but not limited to simulated stone mold pattern, form liner, release agent, concrete patching materials and color charts for staining of hardened concrete.

- a) Photographs: Color photographs of three (3) similar past projects of the manufacturer. Include project names, locations, and a telephone number of the previous projects Owner's representatives.
 - b) Samples: Form ties, sample, and description, showing method of separation when forms are removed.
 - c) Plan, elevation, and details to show overall pattern, joint locations, form tie locations and end, edge, and other special conditions.
 - d) Form Lined and Color Stained Concrete Mock-up: A mock-up sample concrete panel shall be provided by the approved precast concrete wingwall manufacturer and sent to the site at least four weeks before concrete work to be textured and colored starts, using same materials, methods and work force that will be used for the Project. Location on site for construction of mock-up shall be as approved by Engineer. Concrete shall be placed in the mock-up, texture constructed and construction procedure adjusted until a final texture and color is produced that complies with the color and texture of the Referee Panel.
 - i. Size: 50 s.f. or larger if needed to adequately illustrate the pattern and texture selected.
 - ii. Include an area to demonstrate simulated stone masonry butt joint, corner and if appropriate, continuation of pattern through expansion joint.
 - iii. If design includes stone texture across top of wall, include in mock-up.
 - iv. After concrete has cured sufficiently, the Contractor shall prepare the surface for color staining. After the Engineer has approved the prepared surface of the cast simulated stone masonry for color staining, the work of form lined cast-in-place concrete may proceed, except that color staining is not yet authorized.
 - v. After concrete work on mock-up is completed and cured and after surface is determined by the Engineer to be acceptable for forming and pouring, the Contractor shall proceed with mock-up as quality standard.
 - vi. After a 30-day cure of the mock-up and the date of last pour of architectural concrete the ample is to be stained. After coloring is determined to be acceptable by the Engineer, construction of the remaining work under this specification section may proceed, using mock-up as quality standard.
 - vii. The Contractor shall remove mock-up as directed by the Engineer.
4. Scheduling: Schedule color stain application after adjacent earthwork is completed, to avoid contaminating or damaging the surface. Place topsoil and establish turf after staining application is completed. Coordinate the work to prevent interference with other trades.

5. Installation:

a) Contractor's responsibilities:

- i. Furnish form liners & coordinate/ deliver formliners, as required, to the approved precast concrete wingwall manufacturer.
- ii. Apply manufacturer release agent.
- iii. Install concrete as specified elsewhere in the Specifications.
- iv. Remove form liner.
- v. Patching, grinding, and bush hammering of form liner seams as required.
- vi. Provide scaffolding and heat as required and clean water for power washing of the hardened concrete prior to the staining process.
- vii. Power washing and patching of form liners.
- viii. Return of form liners to manufacturer.

b) Manufacturer's responsibilities:

- i. Ship and supply form liners and release agent.
- ii. Technical information.
- iii. Power wash wall.
- iv. Apply the color staining process.

6. Liner to Form Attachment System: Securely attach form liners to forms with wood or sheet metal screws, threaded inserts added to the back of the form liner for bolts to fasten the form liner through the forms or bolted through the face of the form liner with flat head bolts inserted in a pattern joint and through the form liner and forming system. Construction adhesives may be used, but not on reusable forms. Place adjacent form liners with less than ¼ inch separation between form liners.
7. Release of Form Liners from Hardened Concrete: Only manufacturer recommended form release agents (Lark V or Orna Con) shall be utilized and shall be applied to the form liners before the concrete is poured. Release agents shall be applied in strict accordance with release agent manufacturer recommendations. Hand-charged sprayers will only be allowed if a thin uniform coating of release agent is obtained on the form liner.
8. Removal of Form Liner: Remove the form liner from the wall after 24 hours of pouring the concrete. The form liners shall be detached from the forms and then removed from the concrete or they may remain attached to the forms and the entire forming system removed from the concrete. Remove the form liners from the top down. Curing of concrete may be accomplished with form liners and forms placed back against the wall after the initial detachment. Other means of curing can also be used including curing blankets and/or plastic. Curing compounds shall not be used.
9. Care and Cleaning of Form Liner: Form liners shall be cleaned the same day they are removed from the wall with a power wash and mild detergent. Synthetic brushes with stiff bristles may be used on areas. Mild acid washes may also be used. Solvents shall not be

used. If necessary, patching of holes shall be performed with 100% clear silicone caulk. Form liners shall be stored inside or under a protective, non-transparent cover, in a vertical, upside-down position.

10. Wall Patching and Preparation: After form liners are removed from the hardened concrete, the textured uncolored surface shall be prepared for color staining. All concrete, the textured uncolored surface shall be prepared for color staining. All holes larger than $\frac{3}{4}$ " in greatest principal dimension shall be filled with concrete patching material such as Tammas Speedcrete or equal mixed with latex or acrylic bonder, as approved by the manufacturer and Engineer. All honeycombed areas shall be filled and textured to match surrounding areas. Seam lines and other unnatural protrusions shall be ground down to match adjacent areas with a hand-held power grinder using discs made for concrete. Grinding of seams shall be performed immediately after removal of the form liners. Perform final bush hammering to blend defects and ground areas into the final rock texture. In particular, the process of wall patching and preparation shall be subject to approval of the manufacturer and Engineer.
11. Color Staining (by Manufacturer): The hardened concrete shall be a minimum of 30 days old before color staining is applied. Power wash the wall to free it from latency, dirt, oil, and other objectionable materials. Do not sandblast. Preferred method to remove latency is pressure washing with water, minimum 3000 psi (a rate of three to four gallons per minute), using fan nozzle perpendicular to and at a distance of one (1) or two (2) feet from surface. Completed surface shall be free of blemishes, discoloration, surface voids, and unnatural form marks. After the wall has dried, the color staining process is applied in such a way that the stones shall have individual colorations from one to the other. Water-based stains shall be used in air temperatures between 50° F and 100° F. Solvent-based stains shall be used in air temperatures of 50° F and below but in no case when the temperature of the hardened concrete is 40° and falling.

During color staining operations the Contractor shall protect property, pedestrians, vehicular and other traffic upon, underneath, or in the vicinity of the bridge, or disfigurement from errant stain materials. Comply with all environmental regulations regarding surface cleaning, stain application, ground and watercourse protection and disposal protection of waste materials. Refer to Section 1.10 of the Specifications.

12. Simulated Stone Molds Preparation: Clean and make free of buildup prior to each pour. Inspect for blemishes and tears. Repair if needed following manufacturer's recommendations.

Method of Measurement: This work will be measured for payment by the number of square feet of surface area of accepted form liner, cast-in-place simulated stone masonry concrete, completed within the limits shown on the plans, or as ordered by the Engineer.

Basis of Payment: This Work will be paid for at the contract unit price per square feet for "Concrete Form Liner," complete in place, which price shall include all equipment, formwork, molds, liners, caulk, patching material, tools, and labor incidental thereto. This work shall also include the cost of furnishing and application of the color stain system to the simulated stone masonry surface.

Pay Item

Concrete Form Liner

Pay Unit

s.f.

ITEM #0601133A – 10’ X 7’ PRECAST CONCRETE BOX CULVERT

ITEM #0601159A – 15’ X 6’ PRECAST CONCRETE BOX CULVERT

ITEM #0601228A – 13’ X 8’ PRECAST CONCRETE BOX CULVERT

Description: Work under this item shall consist of designing, furnishing and installing a box culvert constructed of four-sided, steel reinforced, monolithically cast concrete box sections with open ends of the size and length as shown on the plans. This item shall include concrete baffles, steel reinforcement, dowel bar splicer system for concrete baffles, threaded inserts, lifting and seating fixtures, non-shrink grout, and all other necessary materials and equipment necessary to complete the work described herein.

Materials:

Concrete: The concrete shall conform to the requirements of the Subarticle M.14.01-1, as applicable except that the entrained air content requirement shall be eliminated when zero-slump concrete is used.

Reinforcement: Reinforcing steel shall be uncoated and shall conform to ASTM A615, Grade 60.

Welded Wire Fabric: Welded wire fabric, when used as reinforcement, shall be uncoated and conform to the requirements of Section M.06 of the Standard Specifications.

Threaded Inserts, Lifting Fixtures and Miscellaneous Hardware: All inserts, fixtures and hardware cast into precast concrete components shall have a corrosion-resistant coating or be fabricated from a non-corrosive material suitable for the intended use. The coating shall be either an epoxy material or galvanization, applied mechanically or by the hot-dip process. All hardware shall be as specified on the working drawings.

Gaskets: Gaskets shall be flexible, expanded rubber conforming to ASTM D1056.

Non-shrink Grout: Non-shrink grout shall conform to Article M.03.05.

Geotextile: Geotextile shall be “Separation (High Survivability)”, as listed in the Connecticut Department of Transportation’s Approved List for Geotextiles. Torn or punctured geotextiles shall not be used.

Construction Methods: The design and manufacture of the precast concrete box culvert shall conform to the requirements of the AASHTO LRFD Bridge Design Specifications 9th Edition (AASHTO LRFD) and the Connecticut Department of Transportation Bridge Design Manual (CTDOT BDM), as supplemented by ASTM C1433 with the following additions and revisions:

- 1. Working Drawings:** Prior to fabrication, the Contractor shall submit working drawings to the Engineer for review in accordance with Article 1.05.02.

Working drawings for all box culverts shall include but not be limited to the following:

- Layout plan of box culvert;
- Plans and cross-sections showing length, width, height and thickness of walls and slabs;
- Type, size, location and spacing of steel reinforcing and inserts for anchoring threaded deformed steel bars. Bending diagrams, material lists and catalog cuts for inserts shall be provided;
- Type, size and location of lifting holes and seating fixtures. All fixtures (inserts, etc.) cast permanently into the sections shall be recessed a minimum of $\frac{3}{4}$ ". No more than four lifting holes or fixtures shall be located in each box section;
- Location and size of all holes cast for grouting deformed steel bars or other reasons as noted on the plans;
- Complete details of the lap joints at the end of the box sections, which shall include the type, size and location of gaskets and additional steel reinforcement. Except where shown otherwise, the ends of the box sections shall have lap joints with not less than $1\frac{1}{2}$ " of concrete overlap. Each joint shall be provided with a preplaced gasket;
- Material designations.

Working drawings for all box sections shall be signed and sealed by a Professional Engineer licensed in the State of Connecticut. Each sheet of the working drawings shall be stamped.

After the working drawings have been reviewed and the Engineer's comments have been appropriately taken into account and implemented, the Contractor shall submit a final submission of working drawings. The final submission shall include one set of full size (approximately 22" x 34") mylar sheets, and three sets of half-scale paper copies, and an electronic copy in a portable document format (pdf) file. Two of the half-scale sets are intended for distribution to the Connecticut Department of Transportation (CTDOT) Office of Bridge Safety and Evaluation and the remaining half-scale and mylar sets are intended for the Town.

Erection drawings shall also be prepared and submitted for review by the Engineer.

- 2. Design Computations:** Together with the submission of working drawings, the Contractor shall also submit to the Engineer for review four sets of complete design computations for the box culvert. These computations shall be prepared, signed, and sealed by a Professional Engineer registered in the State of Connecticut.

The box culvert shall be designed in accordance with the Load and Resistance Factor Design (LRFD) as provided for in the AASHTO LRFD and ASTM specifications. The box culvert shall be designed for the AASHTO HL-93 design live load and the CTDOT permit vehicles,

as provided for in the BDM, and shall satisfy the required load combinations of applicable AASHTO limit states.

The maximum allowable bearing capacity of the soil shall be assumed to be 4 ksf unless otherwise shown on the plans. If additional soils information is required by the Contractor's designer, it must be obtained by the Contractor. The cost of obtaining additional geotechnical information shall be included in the cost of this item.

The Contractor shall perform load rating analyses of the box culvert based on the AASHTO Load and Resistance Factor Rating (AASHTO LRFR) as provided for in the AASHTO Manual for Bridge Evaluation (AASHTO MBE) and the CTDOT CE Memorandum 11-03 as amended by CTDOT CE Memorandum 12-01. The Contractor shall prepare and submit two sets of load rating report that summarizes the analyses results and includes calculations of the load rating analyses.

3. **Length of Sections:** The length of each precast box section shall be determined by the Contractor. When laid together, the culvert sections shall satisfy the total length of the box culvert shown on the plans.
4. **Forms and Forming Material:** Forms shall be mortar-tight and sufficiently strong to prevent misalignment of adjacent box sections. Forms shall be constructed to allow their removal without damage to the concrete. A positive means of supporting reinforcing cages in place during forming shall be required.

The forms shall not be removed until the concrete is sufficiently strong to avoid possible damage to the concrete. Forms shall not be removed without approval being granted by the Engineer.

All forming materials used for casting cylindrical openings for lifting holes or holes for grouting deformed steel bars shall be removed. All non-plastic material used as forms for casting weepholes shall also be removed.

5. **Mixture:** The Contractor shall design and submit to the Engineer for review a concrete mix that shall attain a minimum 28-day compressive strength (f'_c) as shown on the plans.
6. **Placing Concrete:** Concrete shall not be deposited in the forms until the Engineer has verified the presence and proper location of the reinforcing steel and other cast-in-place components and has given his approval thereof.

Concrete shall not be deposited into the forms when the ambient temperature is below 40°F or above 100° F unless adequate heating or cooling procedures are provided and have been previously approved by the Engineer. The concrete temperature shall be within the range of 60°F to 90°F at the time of placement.

Production during the winter season, from November 15 to March 15 inclusive, will be permitted only on beds located in a completely enclosed structure of suitable size and

dimension that provides a controlled atmosphere for the protection of both the casting operation and the product.

Outside concreting operations will not be permitted during rainfall unless the operation is completely under cover.

Void forms shall be held in place against uplift or lateral displacement during the pouring and vibrating of the concrete by substantial wire ties or other satisfactory means as approved by the Engineer.

The concrete shall be vibrated internally, or externally, or both, as ordered by the Engineer. The vibrating shall be done with care in such a manner as to avoid displacement of reinforcing steel, voids, forms, or other components. There shall be no interruption in the pouring of any of the sections. Concrete shall be carefully placed in the forms and sufficiently vibrated to produce a surface that is free from imperfections such as honeycombing, segregation, cracking, or checking. Any deficiencies noted in the sections may be cause for rejection.

7. **Test Cylinders:** During the casting of the sections, the Contractor shall make test cylinders under the supervision of a representative of the Department. A minimum of 4 cylinders shall be taken during each production run or as ordered by the Engineer. The dimensions and type of cylinder mold shall be as specified by the Engineer. Cylinders shall be cured under the requirements of ASTM C31 and shall be used to determine the 28-day compressive strength requirements (f'_c). Failure of any of the 28-day tests cylinders to meet 90% of the minimum compressive strength requirement may be cause for rejection. The Engineer also reserves the right to request and test core specimens from the sections to determine their adequacy.
8. **Repairs:** The Engineer shall evaluate the acceptability and the cause of the defects and the service condition of the box section. No repairs shall be done by the Contractor unless permission has been granted by the Engineer. The Contractor shall submit to the Engineer, for review, the proposed method and materials to be used in the repair operation. All repairs shall be sound and properly finished and cured before the box section is delivered to the job site. The Contractor shall bear the costs of all repair work.
9. **Finishing:** All exposed, outside surfaces of end sections shall be given a grout clean-down finish in accordance with Subarticle 6.01.03-10 except where concrete will be field cast against the section. Other formed surfaces need not be finished in any specific manner. All fins, runs, or mortar shall be removed from surfaces that will remain exposed. Form marks on exposed surfaces shall be smoothed by grinding.
10. **Handling and Storage:** Care shall be taken during storage, transporting, hoisting, and handling of all box sections to prevent damage. Sections damaged by improper storing, transporting, or handling shall be repaired or replaced by the Contractor, as directed by the Engineer and at no cost to the Town. All storage and handling operations shall be as directed by the Engineer.

The box sections shall not be removed from their casting beds until the concrete has attained a minimum compressive strength of 75% of the 28-day compressive strength. The box sections shall not be shipped to the job site until the 28-day compressive strength (f'_c) has been attained.

11. Installation: The installation of the precast concrete box culvert shall conform to the following requirements:

The installation of the precast concrete box culvert sections shall proceed as required by the sequence of construction, stage construction plans, and the special provisions entitled "Prosecution and Progress" and "Maintenance and Protection of Traffic."

The box sections shall be placed in a manner to best accommodate and facilitate the construction of the cast-in-place concrete headwalls, cut-off walls, wingwalls, etc. No box sections shall be set on cast-in-place concrete without the approval of the Engineer.

The box sections shall be set to the line and grade indicated on the plans or as directed by the Engineer. Placement of the sections shall not start until the Engineer has approved the depth of excavation and the suitability of the foundation material.

The lap joints shall be securely seated together to achieve a silt-tight joint all around. A silt-tight joint is defined as a joint in which the gasket is compressed to a minimum of one half of its uncompressed width. The gasket shall be uniformly compressed along all vertical and horizontal surfaces. A positive means, through the use of seating devices, shall be used for pulling one section against another to assure an adequate silt-tight joint.

Details for the seating method shall be submitted to the Engineer for review. The lap joints shall be seated such that they make a continuous line of sections with a smooth interior free from irregularities in the invert line.

The top portions of the horizontal lap joints for the roof and floor slabs and the outside face of the vertical lap joints (full height on each side) shall be neatly filled with non-shrink grout after seating the sections. The exposed portions of the lap joints within the haunches or fillets shall also be neatly filled with non-shrink grout. The finished surface shall be smooth and level with the adjacent concrete.

The box sections for multiple barrel culverts shall be placed as detailed on the plans. Slight mismatches along the 1" longitudinal joint may be tolerated by the Engineer provided that the vertical difference between the top surfaces of adjacent sections is 1" or less. The top 2" of the longitudinal joint shall be filled flush with non-shrink grout. The top surface of the non-shrink grout shall be sloped to form a smooth transition to correct any allowable mismatches.

Geotextile shall be placed over all vertical joints. Geotextile shall also be placed over the roof joints of culverts not receiving membrane waterproofing. The geotextile shall extend 6" to each side of the joint and be attached to the culvert using silicone caulk.

After its installation, any box section or joint that is not acceptable, as determined by the Engineer, in vertical or horizontal alignment for any reason, including but not limited to settlement, displacement, excess camber or misfit, shall be removed by the Contractor and correctly installed, as directed by the Engineer and at no additional cost to the Town.

All fixtures or holes cast into the sections for lifting or seating shall be neatly filled with non-shrink grout. The finished surface shall be smooth and level with the adjacent concrete.

The surface preparation, mixing, placing, curing, and finishing of the non-shrink grout shall conform to the written instructions provided by the manufacturer of the grout. The Contractor shall furnish the Engineer with copies of the instructions. The grout shall be cured at least 3 days unless determined otherwise by the Engineer.

Method of Measurement: This work will be measured for payment by the number of lineal feet of precast concrete box culvert, of the size indicated, completed and accepted, and measured in place along the floor at the centerline of culvert.

Basis of Payment: Payment for this work will be made at the Contract unit price per lineal foot for "(Size) Precast Concrete Box Culvert", of the size indicated, complete and accepted, which price shall include dowel bar splicer system for headwalls, threaded inserts, non-shrink grout, geotextile, gaskets, and all other materials, equipment, tools, and labor incidental thereto.

The contract unit price per lineal foot for "(Size) Precast Concrete Box Culvert" shall also include the costs of preparing and furnishing design computations, working drawings, and erection plans.

<u>Pay Item</u>	<u>Pay Unit</u>
10' x 7' Precast Concrete Box Culvert	l.f.
15' x 6' Precast Concrete Box Culvert	l.f.
13' x 8' Precast Concrete Box Culvert	l.f.

ITEM #0601407A – PRECAST CONCRETE WINGWALLS (SITE NO. 1)

ITEM #0601408A – PRECAST CONCRETE WINGWALLS (SITE NO. 2)

ITEM #0601409A – PRECAST CONCRETE WINGWALLS (SITE NO. 3)

Description: This item shall consist of the design, fabrication, furnishing, transportation, and installation of precast reinforced concrete wingwalls to the size and dimensions as shown on the plans. The precast concrete wingwalls shall be furnished and installed where shown on the plans and in accordance with these specifications. All wingwall sections shall be steel reinforced and monolithically cast concrete designed in a manner such that it can be supported on shallow foundation.

This item shall also include the concrete wall stem and foundation, steel reinforcement, dowel bars and dowel bar splicers, weepholes, lifting and seating fixtures, grout, gaskets, and other miscellaneous items and hardware that are integral and incidental to the design, fabrication, transportation, and installation of the precast concrete wingwalls.

Work under this item shall conform to applicable provisions under the Incidental Construction and Materials Section of the Standard Specifications and the specific requirements stipulated herein for various component parts of this item as noted below. For those component parts where no specific requirement is included here, the Standard Specifications shall apply except for measurement and payment.

Work under this item does not include concrete form liner. Where form liner is called for on the plans, work associated with and incidental to the furnishing and staining of form liners on precast concrete wingwalls shall be paid for under the item for “Concrete Form Liners.”

Materials: Materials shall conform to the following requirements:

1. **Concrete:** The concrete shall have a minimum 28-day compressive strength of 5,000 psi and shall conform to the requirements of Subarticle M14.01-1, as applicable except that the entrained air content requirement shall be eliminated when zero-slump concrete is used.
2. **Reinforcing:** Deformed steel bars shall be uncoated and shall conform to ASTM A615, Grade 60.
3. **Structural Steel:** Structural steel required for the precast concrete wingwall joints shall be per manufacturer’s specifications.
4. **Dowel Bar Splicers:** Dowel bar splicers shall be capable of fully developing the specified bars and shall be hot-dip galvanized in accordance with ASTM F2329 or mechanically galvanized in accordance with ASTM B695, Class 55.
5. **Threaded Inserts, Lifting and Seating Fixtures, and Miscellaneous Hardware:** All inserts, fixtures, and miscellaneous hardware cast into precast concrete components shall have a

corrosion-resistant coating or shall be fabricated from a non-corrosive material suitable for the intended use. The coating shall be either an epoxy material or galvanization, applied mechanically or by the hot-dip process. All hardware shall be as specified on the working drawings.

6. Non-Shrink Grout: Non-shrink grout shall conform to Subarticle M.03.05 or per material specifications of the manufacturer of or the designer of the precast concrete wingwalls. At exposed locations, the grout used for patching shall match the color of the adjacent surface.
6. Gaskets: Gaskets shall be flexible, expanded rubber conforming to ASTM D1056.
7. Weepholes: Shall be the size and at the locations as shown on the plans and shall consist of schedule 40 polyvinyl chloride pipe anchored in place to prevent movement.
8. Form Liner: Form liners shall be in accordance with the provisions for the item "Concrete Form Liners."

Construction Methods: The design and manufacture of the wingwall shall conform to the requirements of the CTDOT Bridge Design Manual and the AASHTO LRFD Bridge Design Specifications with the following additions and revisions:

1. Working Drawings: Before fabrication, the Contractor shall submit working drawings and design computations to the Engineer for review in accordance with Article 1.05.02 of the Standard Specifications.

Working drawings for the wingwall(s) shall include but not be limited to the following:

- a. Layout plan of the wingwall.
- b. Plans and cross-sections showing length, width, height and thickness of walls.
- c. Type, size, location and spacing of steel reinforcing and inserts for anchoring threaded deformed steel bars. Bending diagrams, material lists and catalog cuts for inserts shall be provided.
- d. Type, size and location of lifting holes and seating fixtures. All fixtures (inserts, etc.) cast permanently into the sections shall be recessed a minimum of $\frac{3}{4}$ ". No more than four lifting holes or fixtures shall be located in each wingwall section.
- e. Location and size of all holes cast for grouting deformed steel bars or other reasons as noted on the plans.
- f. The type and application method of the corrosive resistant coating.
- g. Material designations.

Working drawings for all wingwall sections shall be stamped by a Professional Engineer licensed in the State of Connecticut. Each sheet of the working drawings shall be stamped.

After the working drawings have been reviewed and the Engineer's comments have been appropriately taken into account and implemented, the Contractor shall submit a final submission of working drawings.

Erection drawings shall also be prepared and submitted for review by the Engineer.

2. Design Computations: With the submission of working drawings, the Contractor shall also submit to the Engineer for review four sets of complete design computations for the wingwall, and the connection of the wingwall to the pile cap, if applicable. These computations shall be stamped by a Professional Engineer licensed in Connecticut.

Unless otherwise noted, the wingwall shall be designed in accordance with the Load and Resistance Factor Design method (LRFD) described in the aforementioned AASHTO and ASTM specifications. The wingwall shall be designed for the applicable AASHTO LRFD Limit States.

The maximum allowable bearing capacity of the soil shall be assumed to be 4 ksf unless otherwise shown on the plans. If additional soils information is required by the Contractor's designer, it must be obtained by the Contractor. The cost of obtaining additional geotechnical information shall be included in the cost of this item.

3. Length of Sections: The length of each wingwall section shall be determined by the Contractor but approved by the Engineer. When laid together, the wingwall sections shall satisfy the total length of the wingwall shown on the plans.
4. Forms and Forming Material: Forms shall be mortar-tight and sufficiently strong to prevent misalignment of adjacent wingwall sections. Forms shall be constructed to allow their removal without damage to the concrete. A positive means of supporting reinforcing cages in place during forming shall be required.

The forms shall not be removed until the concrete is sufficiently strong to avoid possible damage to the concrete. Forms shall not be removed without approval being granted by the Engineer.

All forming materials used for casting cylindrical openings for lifting holes or holes for grouting deformed steel bars shall be removed. All non-plastic material used as forms for casting weepholes shall also be removed.

5. Mixture: The Contractor shall design and submit to the Engineer for review a concrete mix that shall attain a minimum 28-day strength (f'c) as shown on the plans.
6. Placing Concrete: Concrete shall not be deposited in the forms until the Engineer has verified the presence and proper location of the reinforcing steel and other cast-in-place components and has given his approval thereof.

Concrete shall not be deposited into the forms when the ambient temperature is below 40° F or above 100° F, unless adequate heating or cooling procedures are provided and have been previously approved by the Engineer. The concrete temperature shall be within the range of 60° F to 90° F at the time of placement.

Production during the winter season, from November 15 to March 15 inclusive, will be permitted only on beds located in a completely enclosed structure of suitable size and dimension that provides a controlled atmosphere for the protection of both the casting operation and the product.

Outside concreting operations will not be permitted during rainfall unless the operation is completely under cover.

Void forms shall be held in place against uplift or lateral displacement during the pouring and vibrating of the concrete by substantial wire ties or other satisfactory means as approved by the Engineer.

The concrete shall be vibrated internally, or externally, or both, as ordered by the Engineer. The vibrating shall be done with care in such a manner as to avoid displacement of reinforcing steel, voids, forms, or other components. There shall be no interruption in the pouring of any of the sections. Concrete shall be carefully placed in the forms and sufficiently vibrated to produce a surface that is free from imperfections such as honeycombing, segregation, cracking, or checking. Any deficiencies noted in the sections may be cause for rejection.

7. Test Cylinders: During the casting of the wingwall sections, the Contractor shall make test cylinders under the supervision of a representative of the Department. A minimum of 4 cylinders shall be taken during each production run or as ordered by the Engineer. The dimensions and type of cylinder mold shall be as specified by the Engineer. Cylinders shall be cured under the requirements of ASTM C31 and shall be used to determine the 28-day compressive strength requirements (f 'c). Failure of any of the 28-day tests cylinders to meet 90% of the minimum compressive strength requirement may be cause for rejection. The Engineer also reserves the right to request and test core specimens from the sections to determine their adequacy.
8. Repairs: The Engineer shall evaluate the acceptability and the cause of the defects and the service condition of the wingwall section. No repairs shall be done by the Contractor unless permission has been granted by the Engineer. The Contractor shall submit to the Engineer, for review, the proposed methods and materials to be used in the repair operation. All repairs shall be sound and properly finished and cured before the wingwall section is delivered to the job site. The Contractor shall bear the costs of all repair work.
9. Finishing: All exposed, outside surfaces of end sections shall be given a grout clean-down finish in accordance with Subarticle 6.01.03-10 except where concrete will be field cast against the section. Other formed surfaces need not be finished in any specific manner. All

fins, runs, or mortar shall be removed from surfaces that will remain exposed. Form marks on exposed surfaces shall be smoothed by grinding.

10. Handling and Storage: Care shall be taken during storage, transporting, hoisting and handling of all wingwall sections to prevent damage. Sections damaged by improper storing, transporting or handling shall be repaired or replaced by the Contractor, as directed by the Engineer and at no cost to the town. All storage and handling operations shall be as directed by the Engineer.

The wingwall sections shall not be removed from their casting beds until the concrete has attained a minimum compressive strength of 75% of the 28-day strength. The wingwall sections shall not be shipped to the job site until the 28-day strength (f'c) has been attained.

11. Installation: The installation of the precast concrete wingwall shall conform to the following requirements:

The installation of the wingwall sections shall proceed as required by the sequence of construction, stage construction plans, and the special provisions entitled "Prosecution and Progress" and "Maintenance and Protection of Traffic."

The wingwall sections shall be seated within the center of the both keyways and shimmed to the proper low-chord elevation. The wingwall stem shall be grouted securely within the keyways.

The wingwall sections shall be placed in a manner to best accommodate and facilitate the construction of the precast concrete headwalls, culvert, etc. No wingwall sections shall be set on cast-in-place concrete without the approval of the Engineer. The wingwall sections shall be grouted in place and fully bear on the pile caps.

The wingwall sections shall be set to the line and grade indicated on the plans or as directed by the Engineer. Placement of the sections shall not start until the Engineer has approved the compressive strength of the foundation material.

Slight mismatches may be tolerated provided that the vertical difference between the top surfaces and the horizontal difference between adjacent sections is less ½”.

The butted joints shall be securely seated together to achieve a silt-tight joint all around. A positive means, through the use of seating devices, shall be used for pulling one section against another to assure an adequate silt-tight joint.

Details for the seating method shall be submitted to the Engineer for review. The lap joints shall be seated such that they make a continuous line of sections with a smooth interior free from irregularities in the invert line.

After its installation, any wingwall section or joint that is, as determined by the Engineer, not acceptable in vertical or horizontal alignment for any reason, including but not limited to

settlement, displacement, excess misalignments or misfits, shall be removed by the Contractor and correctly installed, as directed by the Engineer and at no additional cost to the State.

All fixtures or holes cast into the sections for lifting or seating shall be neatly filled with non-shrink grout. The finished surface shall be smooth and level with the adjacent concrete.

The surface preparation, mixing, placing, curing, and finishing of the non-shrink grout shall conform to the written instructions provided by the manufacturer of the grout. The Contractor shall furnish the Engineer with copies of the instructions. The grout shall be cured at least 3 days unless determined otherwise by the Engineer.

Method of backfilling shall be in conformance with the requirements of the plans and Section 2.16 except that the fill placed around the wingwall sections shall be deposited on both sides to approximately the same elevation at the same time.

Method of Measurement: This item, being paid for on a lump sum basis, will not be measured for payment. Work incidental to the fabrication, furnishing, transportation, and installation of precast concrete wingwalls that are not specifically paid for under any other items, will not be measured for payment but shall be considered incidental to the work performed under this item.

Basis of Payment: This work will be paid for at the contract lump sum price for "Precast Concrete Wingwalls (Site No. X)," complete and accepted, which price shall include all equipment, tools, labor, and materials incidental to the fabrication, furnishing, transportation, and installation of the precast concrete wingwalls. The lump sum price shall include but not limited to steel reinforcement, dowel bars and dowel bar splicers, non-shrink grout, joint sealant, preformed expansion joint filler, and all other materials incidental thereto. The lump sum cost shall also include the cost of preparing and furnishing design computations, working drawings, shop drawings, and erection plans.

There shall be no direct payment for forming weepholes through the wall or for the pipe necessary for this purpose, but the cost thereof shall be considered as included in the general cost of the work. Cost of bagged stone behind the weepholes shall be included in the cost of the item "Pervious Structure Backfill."

<u>Pay Item</u>	<u>Pay Unit</u>
Precast Concrete Wingwalls (Site No. 1)	l.s.
Precast Concrete Wingwalls (Site No. 2)	l.s.
Precast Concrete Wingwalls (Site No. 3)	l.s.

ITEM #0602910A – DRILLING HOLES AND GROUTING DOWELS

Description: Work under this item shall consist of drilling holes in concrete and grouting dowels or anchor rods at the locations shown on the plans, in accordance with the plans, the manufacturer’s recommendations, and as directed by the Engineer.

Materials: The adhesive bonding material shall be a resin compound specially formulated to anchor steel bars in holes drilled into concrete for the purpose of resisting tension pull-out. The adhesive bonding material shall be selected from the Connecticut Department of Transportation Qualified Products List.

Certification: A Materials Certificate and Certificate of Compliance shall be required for the adhesive bonding material in accordance with Article 1.06.07, certifying the conformance of this material to the requirements stated herein.

Construction Methods: The Contractor shall drill holes into the concrete to the depth and at the locations shown on the plans. The Contractor shall submit the following to the Engineer for review: type of drill, diameter of bit, method of cleaning holes and method of placement of the adhesive bonding material. Specifications and recommendations for the aforementioned may be obtained from the manufacturer of the adhesive bonding material. The weight of the drill shall not exceed 20 pounds. The reinforcing dowels shall be able to develop a pull-out resistance of 90 percent of their nominal yield strength when bonded at the embedment depths provided. The Contractor shall provide the minimum cover for the dowels as shown on the plans. If the existing reinforcing steel is encountered during drilling, the holes may be relocated only if approved by the Engineer. Drilling methods shall not cause spalling, racking, or other damage to the concrete. Those areas damaged by the Contractor shall be repaired by the Contractor in a manner suitable to the Engineer and at no expense to the State. The Contractor shall take necessary precautions to prevent any materials from falling onto the river below. For the adhesive bonding materials, a Certificate of Compliance and a Materials Certificate will be required in accordance with Article 1.06.07, confirming the conformance of the adhesive bonding material to the requirements set forth these specifications.

Methods of Measurements: This work will be measured for payment by each number of drilled and grouted holes completed and accepted.

Basis of Payment: This work will be paid for at the contract unit price per each for “Drilling Holes and Grouting Dowels,” which price shall include drilling and preparing holes, and applying adhesive bonding material in the hole. It shall also include all materials, except dowels, and all equipment, tools, and labor incidental thereto.

Cost of dowels are not included in this item but shall be paid for under the item “Deformed Steel Bars.”

Pay Item

Drilling Holes and Grouting Dowels

Pay Unit

ea.

ITEM #0707009A – MEMBRANE WATERPROOFING (COLD LIQUID ELASTOMERIC)

Description: Work under this item consists of furnishing and installing a seamless elastomeric waterproofing membrane system applied to a concrete or steel surface as shown on the plans, in accordance with this specification and as directed by the Engineer. Work shall also include conditioning of the surface to be coated and all quality-control testing noted herein.

The completed membrane system shall be comprised of a primer coat followed by the membrane coating, which is applied in one or two layers for a minimum total thickness of 80 mil. This work shall also include an additional 40 mil membrane layer with aggregate broadcast into the material while still wet.

Materials: The Contractor shall select a waterproofing membrane system from the Department's current Qualified Product List (QPL) for Spray-Applied Membrane Waterproofing System. All materials incorporated in the works shall meet the Manufacturer's specification for the chosen system. The Engineer will reject any system that is not on the QPL.

Materials Certificate: The Contractor shall submit to the Engineer a Materials Certificate for the primer and membrane in accordance with the requirements of Article 1.06.07.

Construction Methods: At least ten days prior to installation of the membrane system, the Contractor shall submit to the Engineer, the manufacturer's recommended procedure for preparing the deck surface, pre-treatment or preparing at cracks and gaps, treatment at curbs, vertical surfaces, or discontinuities, application of the primer and membrane, and placement of aggregated coat. Procedures shall also include recommended repairs of system non-compliant issues identified during application. The system shall be applied to the prepared area(s) as defined in the plans strictly in accordance with the Manufacturer's recommendations.

A technical representative, in the direct employ of the manufacturer, shall be present on-site immediately prior to and during application of the membrane. The representative shall inspect and approve the surface prior to priming, and provide guidance on the handling, mixing and addition of components and observe application of the primer and membrane. The representative shall perform all required quality-control testing and remain on the Project site until the membrane has fully cured.

All quality-control testing, including verbal direction or observations on the day of the installation, shall be recorded and submitted to the Engineer for inclusion in the Project's records. A submittal of the quality-control testing data shall be received by project personnel prior to any paving over the finished membrane or within 24 hours following completion of any staged portion of the work.

1. **Applicator Approval:** The Contractor's membrane Applicator shall be fully trained and licensed by the membrane manufacturer and shall have successfully completed at least three spray membrane projects in the past five years. The Contractor shall furnish references from

those projects, including names of contact persons and the names, addresses and phone numbers of persons who supervised the projects. This information shall be submitted to the Engineer prior to the start of construction. The Engineer shall have sole authority to determine the adequacy and compliance of the submitted information. Inadequate proof of ability to perform the work will be grounds to reject proposed applicators.

2. Job Conditions:

- (a) Environmental Requirements: Air and substrate temperatures shall be between 32°F (0°C) and 104°F (40°C) providing the substrate is above the dew point. Outside of this range, the Manufacturer shall be consulted.

The Applicator shall be provided with adequate disposal facilities for non-hazardous waste generated during installation of the membrane system. The applicator shall follow safety instructions regarding respirators and safety equipment.

- (b) Safety Requirements: All open flames and spark producing equipment shall be removed from the work area prior to commencement of application.

“No Smoking” signs shall be visibly posted at the job site during application of the membrane waterproofing.

Personnel not involved in membrane application shall be kept out of the work area.

3. Delivery, Storage and Handling:

- (a) Packaging and Shipping: All components of the membrane system shall be delivered to the site in the Manufacturer’s packaging, clearly identified with the products type and batch number.

- (b) Storage and Protection: The Applicator shall be provided with a storage area for all components. The area shall be cool, dry, and out of direct sunlight and shall be in accordance with the Manufacturer’s recommendations and relevant health and safety regulations.

Copies of Material Safety Data Sheets (MSDS) for all components shall be kept on site for review by the Engineer or other personnel.

- (c) Shelf Life - Membrane Components: Packaging of all membrane components shall include a shelf-life date sealed by the Manufacturer. No membrane components whose shelf life has expired shall be used.

4. Surface Preparation:

- (a) Protection: The Applicator shall be responsible for the protection of equipment and adjacent areas from over spray or other contamination. Parapets and bridge joints shall be masked prior to application of the materials.

- (b) Surface Preparation: Sharp peaks and discontinuities shall be ground smooth. The surface profile of the prepared substrate is not to exceed ¼-inch (peak to valley) and areas of minor surface deterioration of ½-inch and greater in depth shall also be repaired. The extent and location of the surface patches require the approval of the Engineer before the membrane system is applied.

Surfaces shall be free of oil, grease, curing compounds, loose particles, moss, algae, growth, laitance, friable matter, dirt, bituminous products, and previous waterproofing materials. If required, degreasing shall be done by detergent washing in accordance with ASTM D4258.

The surface shall be abrasively cleaned, in accordance with ASTM D4259, to provide a sound substrate free from laitance.

Voids, honeycombed areas, and blow holes on vertical surfaces shall be repaired in the same manner.

All steel components to receive membrane waterproofing shall be blast cleaned in accordance with SSPC SP6 and coated with the membrane waterproofing system within the same work shift.

5. Inspection and Testing: Prior to priming of the surface, the Engineer, Applicator and Manufacturer's technical representative shall inspect and approve the prepared substrate.

- (a) Random tests for deck moisture content shall be conducted on the substrate by the Applicator at the job site using a "Sovereign Portable Electronic Moisture Master Meter," a "Tramex CMEXpertII Concrete Moisture Meter" or approved equal. The minimum frequency shall be one test per 1000 s.f. but not less than three tests per day per bridge. Additional tests may be required if atmospheric conditions change and retest of the substrate moisture content is warranted.

The membrane system shall not be installed on substrate with a moisture content greater than that recommended by the system's manufacturer, but shall not be greater than 6%, whichever is less.

- (b) Random tests for adequate tensile bond strength shall be conducted on the substrate using an adhesion tester in accordance with the requirements of ASTM D4541. The minimum frequency shall be one test per 5,000 s.f. but not less than three adhesion tests per bridge.

Adequate surface preparation will be indicated by tensile bond strengths of primer to the substrate greater than or equal to 150 psi or failure in a concrete surface and greater than or equal to 300 psi for steel surfaces.

If the tensile bond strength is lower than the minimum specified, the Engineer may request additional substrate preparation. Any primer not adequately applied shall be removed and a new primer applied at the Contractor's expense, as directed by Engineer.

(c) Cracks and grouted joints shall be treated in accordance with the Manufacturer's recommendations, as approved or directed by the Engineer.

6. Application:

(a) The System shall be applied in four distinct steps as follows:

- 1) Substrate preparation and gap/joint bridging preparation
- 2) Priming
- 3) Membrane application
- 4) Membrane with aggregate

(b) Immediately prior to the application of any components of the System, the surface shall be dry (see Section 5a of this specification) and any remaining dust or loose particles shall be removed using clean, dry oil-free compressed air or industrial vacuum.

(c) Where the area to be treated is bound by a vertical surface (e.g., curb or wall), the membrane system may be continued up the vertical, as shown on the plans or as directed by the Engineer.

(d) The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results, in accordance with the Manufacturer's recommendations or as approved or directed by the Engineer.

(e) A neat finish with well-defined boundaries and straight edges shall be provided by the Applicator.

(f) Primer: The primer shall consist of one coat with an overall coverage rate of 125 to 175 s.f./gal unless otherwise recommended in the manufacturer's written instructions.

All components shall be measured and mixed in accordance with the Manufacturer's recommendations.

The primer shall be spray applied using a single component spray system approved for use by the Manufacturer. If required by site conditions and allowed by the manufacturer, brush or roller application will be allowed.

The primer shall be allowed to cure tack-free for a minimum of 30 minutes or as required by the Manufacturer's instructions, whichever time is greater, prior to application of the first lift of waterproofing membrane.

Porous concrete (brick) may require a second coat of primer should the first coat be absorbed.

(g) Membrane: The waterproofing membrane shall consist of one or two coats for a total dry film thickness of 80 mils. If applied in two coats, the second coat shall be of a contrasting color to aid in quality assurance and inspection.

The membrane shall be comprised of Components A and B and a hardener powder which is to be added to Component B in accordance with the Manufacturer's recommendations.

The substrate shall be coated in a methodical manner.

Thickness checks: For each layer, checks for wet film thickness using a gauge pin or standard comb-type thickness gauge shall be carried out typically once every 100 s.f. Where rapid set time of the membrane does not allow for wet film thickness checks, ultrasonic testing (steel surfaces only), calibrated point-penetrating (destructive) testing, in-situ sampling (cutout of small sections for measuring thicknesses), or other methods approved by the Engineer shall be employed for determination of dry film thickness. The measured thickness of each and every individual test of the membrane shall be greater than or equal to the required thickness.

Bond Strength: Random tests for adequate tensile bond strength shall be conducted on the membrane in accordance with the requirements of ASTM D4541. The minimum test frequency shall be one test per 5,000 s.f. but no less than three adhesion tests per bridge. Adequate adhesion will be indicated by tensile bond strengths of the membrane to the substrate of greater than or equal to 150 psi or failure in a concrete surface and greater than or equal to 300 psi for steel surfaces.

Spark Testing: Following application of the membrane, test for pin holes in the cured membrane system over the entire application area in accordance with ASTM D4787 "Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates." Conduct the test at voltages recommended by the manufacturer to prevent damage to the membrane.

Repair the membrane system following destructive testing and correct any deficiencies in the membrane system or substrate noted during quality-control testing in accordance with the manufacturer's recommendations to the satisfaction of the Engineer at no additional cost to the State.

- (h) Repairs: If an area is left untreated or the membrane becomes damaged, a patch repair shall be carried out to restore the integrity of the system. The damaged areas shall be cut back to sound materials and wiped with solvent (e.g., acetone) up to a width of at least four inches on the periphery, removing any contaminants unless otherwise recommended by the manufacturer. The substrate shall be primed as necessary, followed by the membrane. A continuous layer shall be obtained over the substrate with a 4-inch overlap onto existing membrane.

Where the membrane is to be joined to existing cured material, the new application shall overlap the existing by at least four inches. Cleaning and surface preparation on areas to be lapped shall be as recommended in the manufacturer's written instructions.

(i) Aggregated Finish:

- 1) Apply an additional 40 mil thick layer of the membrane material immediately followed by an aggregate coating, before the membrane cures, at a rate to fully cover the exposed area. The membrane and aggregate shall be fully integrated after the aggregate has been applied and the membrane cured.
- 2) Localized areas not fully coated shall be touched-up with additional membrane and aggregate as needed.
- 3) Remove loose and excess aggregate from the surface to the satisfaction of the Engineer and dispose of properly after application prior to allowing traffic onto finished surface or application of tack coat.

(j) Tack Coat: Prior to application of a bituminous concrete overlay, the aggregated finish shall be coated with tack coat in accordance with Section 4.06.

7. Final Review: The Engineer and the Applicator shall jointly review the area(s) over which the completed System has been installed. Any irregularities or other items that do not meet the requirements of the Engineer shall be addressed at this time.

Method of Measurement: The quantity to be paid for under this item shall be the number of square yards (square meters) of waterproofed surface completed and accepted.

Basis of Payment: This item will be paid for at the contract unit price per square yard (square meter) of “Membrane Waterproofing (Cold Liquid Elastomeric),” complete in place, which price shall include all surface preparation, furnishing, storing and applying the system, technical representative and quality control tests, and any necessary repairs and remediation work as well as all materials, equipment, tools, labor incidental to this work.

Pay Item

Membrane Waterproofing (Cold Liquid Elastomeric)

Pay Unit

s.y.

ITEM #0950005A – TURF ESTABLISHMENT

Turf Establishment shall be constructed in accordance with Article 9.50, supplemented as follows:

Article 9.50.02 – Materials: *Delete Section M13.04 (a) and replace with the following:*

Coastal Salt Tolerant Seed Mix (New England Wetland Plants, Inc.; 413-548-8000; www.newp.com)

Article 9.50.03 – Construction Methods: *Replace the “calendar dates” in Section 2, Seeding Season, with the following:*

Spring – May 15 to June 15

Fall – August 15 to October 13, 2008

Replace the 1st paragraph in Section 3. Seeding Methods, with the following:

The grass seed mixture conforming Article M.13.04 shall be applied by any agronomically acceptable procedure. The rate of application shall be no less than 35 pounds per acre (1 pound per 1,250 square feet).

Payment method?

ITEM #0950043A - WETLAND GRASS ESTABLISHMENT

Description: The work included in this item shall consist of providing an accepted stand of established wetland grasses by furnishing and placing seed as shown on the plans, permits, or as directed by the Engineer within the Wetland Mitigation Area(s) or other areas when required.

Materials: All wetland grass mixture sources shall be locally obtained within the Northeast USA including New England, New York, Pennsylvania, New Jersey, Delaware, or Maryland in order to preserve and enhance the diversity of native wetland grass species.

The placement of fertilizer, mulch or bio-degradable erosion control matting will not be allowed within any wetland area.

All wetland seed mixture sources shall be approved by the Engineer prior to purchase.

Three (3) qualified wetland seed mixtures are as follows:

1. **New England Wet Mix (Wetland Seed Mix)**, New England Wetland Plants, Inc. 820 West Street Amherst, MA 01002, or equal. Rate shall be one (1) pound PLS per 2,500 sq. ft.
2. **OBL Wetland Mix**, Ernst Conservation Seeds, Inc. 8884 Mercer Pike, Meadville, PA 16335, or equal. Rate shall be one (1) pound PLS per 2,000 sq. ft.
3. **Vermont Wetland Shrub**, Vermont Wetland Plant Supply, LLC, P.O. Box 153, Orwell, VT 05760, or equal. Rate shall be one (1) pound PLS per 2,420 sq. ft.

All seed mixtures must be reviewed and approved by the Engineer prior to application. All seed Materials Certificates must have seed mixtures that shall not include any invasive species pursuant to Connecticut General Statute Sec. 22a-381d, or any State Threatened or State Endangered species known pursuant to Connecticut General Statute Sec. 26-303 which would be a violation of the Connecticut Endangered Species Act. The seed tags from the bags are to be removed by the Engineer upon delivery and attached to the Materials Certificate. No seeding shall occur if the requirements are not met.

All approved seed mixtures shall be obtained in sufficient quantities to meet the pure live seed (PLS) application rates as determined by the seed analysis of the mixture.

Construction Methods: Construction methods shall be those established as agronomically acceptable and feasible and approved by the Engineer.

Wetland grass establishment seeding for Wetland Mitigation Site(s): Seeding shall occur during the fall season immediately following construction of the wetland site(s). Fall seeding must occur from August 15th to October 31st.

Wetland grass establishment seeding for areas other than the Wetland Mitigation Site(s), when required: Seeding dates shall adhere to Form 817 Section 9.50 – Turf Establishment.

Seeding shall be applied to wetland areas that will not be routinely inundated. If seed is purchased in bulk rather than by PLS, the rate of application must be adjusted to meet the required PLS seeding rate. This seeding rate shall be increased by the appropriate percentage based on the information provided on the seed tags at delivery, as determined by the following formula:

$$(\text{Germination Percentage} \times \text{Purity Percentage})/100 = \text{Percentage PLS}$$

The Engineer shall verify that the seed is applied at a rate that will allow for 100% PLS.

Method of Measurement: This work will be measured for payment by the number of square feet of surface area of established wetland seed mixture, planted, and accepted as specified or by the number of square feet of surface area of seeding actually covered as specified.

Basis of Payment: This work shall be paid at the Contract unit price per square foot for “Wetland Grass Establishment,” which price shall include all materials maintenance, equipment, tools, labor, transportation, operations and all work incidental thereto. Partial payment of up to 50% may be made for work completed, but not accepted. Full payment shall not be made until the area has been accepted by the Engineer.

Pay Item

Wetland Grass Establishment

Pay Unit

s.f.

ITEM #0969060A – CONSTRUCTION FIELD OFFICE, SMALL

Description: Under this item, adequate weatherproof office quarters with related furnishings, materials, equipment, and other services, shall be provided by the Contractor for the duration of the work, and if necessary, for a close-out period, determined by the Engineer, for the exclusive use of the Engineer, Town forces, and others who may be engaged to augment Town forces with relation to the Contract.

The office, furnishings, materials, equipment, and services are for the exclusive use of the Engineer, Town forces, and others who may be engaged to augment Town forces with relation to this Contract.

The office quarters shall be located convenient to the work site and installed in accordance with Article 1.08.02; this office shall be separated from any office occupied by the Contractor. Ownership and liability of the office quarters shall remain with the Contractor.

Materials:

Furnishings/Materials/Supplies/Equipment: All furnishings, materials, equipment, and supplies shall be in like new condition for the purposes intended and approved by the Engineer.

Office Requirements: The Contractor shall furnish the office quarters and equipment as described below:

Description / Office Size	Small
Minimum Square-Footage of Floor Space Area (with a minimum ceiling height of 7 ft)	400 sf
Minimum number of exterior entrances	2
Minimum number of parking spaces	7

Office Layout: This office shall have a minimum square footage as indicated in the table above and shall be partitioned as shown on building floor plan as provided by the Engineer.

Tie-downs and Skirting: Modular offices shall be tied-down and fully skirted to ground level.

Windows and Entrances: Windows shall be of a type that will open and close conveniently, shall be sufficient in number and size to provide adequate light and ventilation, and shall be fitted with locking devices, blinds, and screens. The entrance shall be secure, screened, fitted with a lock for which four keys shall be furnished. All keys to the construction field office shall be furnished to the Town and will be kept in their possession while the office is being used by Town personnel. Any access to entrance ways shall meet applicable building codes with appropriate handrails. Stairways shall be ADA/ABA compliant and shall have non-skid tread surfaces.

Lavatory Facilities: The Contractor shall furnish lavatory and toilet facilities at a location convenient to the office quarters for the use of Town personnel and such assistants as they may engage. Each lavatory shall have hot and cold running water and flush-type toilets. The Contractor shall also supply lavatory and sanitary supplies as required.

Lighting: The Contractor shall equip the office interior with electric lighting that provides a minimum illumination level of 100 foot-candles at desk level height, and electric outlets for each desk and drafting table. The Contractor shall also provide exterior lighting that provides a minimum illumination level of 2 foot-candles throughout the parking area and for a minimum distance of 10 feet on each side of the field office. If the field office space provided is in a permanent commercial structure, the external illumination requirements will not apply.

The Contractor shall provide the following additional equipment, facilities, and/or services at the Field Office on this project to include at least the following to the satisfaction of the Engineer:

Parking Facility: Contractor shall provide adequate parking for four vehicles adjacent to the field office. Parking space shall be paved with drainage as necessary. If paved parking does not exist adjacent to the field office, the Contractor shall provide a parking area of sufficient size to accommodate seven vehicles. Construction of the parking area and driveway, if necessary, will consist of a minimum of 6" of processed aggregate base graded to drain. The base material will be extended to the office entrance.

Field Office Security: Physical Barrier Devices - This shall consist of physical means to prevent entry, such as:

- a. All windows shall be barred or security screens installed;
- b. All field office doors shall be equipped with dead bolt locks and regular day operated door locks; and
- c. Other devices as directed by the Engineer to suit existing conditions.

Electric Service: The field office shall be equipped with an electric service panel to serve the electrical requirements of the field office, including lighting, general outlets, computer outlets, calculators etc., and meet the following minimum specifications:

- a. 120/240 volt, 1-phase, 3-wire.
- b. Ampacity necessary to serve all equipment. Service shall be a minimum 100 amp dedicated to the construction field office.
- c. The electrical panel shall include a main circuit breaker and branch circuit breakers of the size and quantity required.
- d. Additional 120-volt, single phase, 20-amp, isolated ground dedicated power circuit with dual NEMA 5-20 receptacles shall be installed at each computer workstation location.
- e. Additional 120-volt, single phase, 20-amp, isolated ground dedicated power circuit with dual NEMA 5-20 receptacles shall be installed, for use by the Telephone Company.
- f. Additional 120-volt circuits and duplex outlets as required meeting National Electric Code requirements.

- g. One exterior (outside) wall mounted GFI receptacle, duplex, isolated ground, 120-volt, straight blade.
- h. Contact the City of Norwalk Department of Public Works for inspection after work is complete and prior to energizing.
- i. Prior to field office removal the CDOT Data Communications office must be notified to deactivate the communications equipment.

Heating, Ventilation, and Air Conditioning (HVAC): The field office shall be equipped with sufficient heating, air conditioning and ventilation equipment to maintain a temperature range of 65°-80° Fahrenheit within the field office.

Telephone Service: The Contractor shall provide telephone service with unlimited nation-wide calling plan. This shall consist of the installation of the following:

- 1 – Data communication lines (3 pairs, or 6 wires, are required).
- 2 – Telephone lines: one line for phone service and one line dedicated for the facsimile machine. The Contractor shall pay all charges except for toll calls made by Town personnel.

The data communication circuit shall be connected to the Town of Killingly Department of Public Works.

The Following Furnishings Shall Be Provided in The Field Office:

- 1 – Suitable office desk with drawers, locks, and matching desk chair that has pneumatic seat height adjustment and dual wheel casters on the legs or base;
- 1 – Office chair;
- 1 – Fire resistant cabinets (legal size/4 drawer), locking;
- 1 – Drafting, type table – 36” x 72” and supported by wall brackets and legs;
- 1 – Drafters’ stool;
- 1 – Personal computer table – 48” x 30” size and quality for the purpose intended;
- 1 – Hot and cold-water dispensing unit and supply of cups and bottled water shall be supplied by the Contractor for the duration of the project;
- 1 – Electronic office type printing calculators capable of addition, subtraction, multiplication and division with memory and a supply of printing paper;
- 1 – Telephone;
- 1 – Telephone answering machine;
- 1 – Plain paper facsimile (FAX) machine capable of transmitting via telephone credit card, as well as one (1) 5,000 sheet box of fax paper per calendar year or portion thereof and maintenance shall be provided by the Contractor;
- 1 – Computer systems as specified below under Computer Hardware and Software;

- 1 – Laser printer and supplies as specified below under Computer Hardware and Software;
- 2 – 5-gallon wastebaskets;
- 1 – Electric pencil sharpener;
- * – Fire extinguishers - provide and install type and number to meet applicable State and local codes for size of office indicated, including a fire extinguisher suitable for use on a computer terminal fire; and
- 1 – Vertical plan rack for 2 sets of 24” x 36” plans for each rack.

The furnishings and equipment required herein shall remain the property of the Contractor. Any supplies required to maintain or operate the above listed equipment or furnishings shall be provided by the Contractor for the duration of the project.

Computer Hardware and Software: Before ordering the computer hardware and software, the Contractor must provide a copy of their proposed PC specifications to the Town’s Project Engineer for review. If the specification meets or exceeds the minimum specifications listed below, then the Contractor will be notified that the order may be placed. All software, hardware and licenses listed below shall be clearly labeled, specifying the (1) Project No., (2) Contractor Name, (3) Project Engineer’s Name and (4) Project Engineer’s Phone No., and shall be delivered to the Town’s project field office. The Contractor shall provide the computer system with all the required maintenance and repairs (to include labor and parts) throughout the contract life. Once the Contract has been completed, the computer will remain the property of the Contractor. The computer system furnished shall have all software and hardware necessary for the complete installation of the latest versions of the software listed, and therefore supplements the minimum specifications below. The Engineer reserves the right to expand or relax the specification to adapt to the software and hardware limitations and availability to provide the Town with an operating system that can handle the needs of the project. This requirement is to ensure that the rapid changing environment that computer systems have experienced does not leave the needs of the project orphan to what has been specified. There will not be any price adjustment due to the change in the minimum system requirements.

The Contractor shall provide the Engineer with a licensed copy registered in the Town’s name of the latest versions of the software listed and maintain customer support services offered by each software producer for the duration of the project. The Contractor shall deliver to the Engineer all supporting documentation for the software and hardware including any instructions or manuals. The Contractor shall provide original backup media for the software.

A) Computer – Minimum Specification:

- Processor: Intel Pentium 4 processor 1.8GHz.
- Memory: 384 MB 133 MHz SDRAM.
- Monitor: 17-inch color monitor (16-inch viewable).
- Graphics Accelerator: AGP 16 MB Video Card.
- Hard Drive: 30 GB Ultra ATA hard drive (Western Digital, IBM or Seagate).

Floppy Drive:	3.5 inch 1.44MB diskette drive.
CD-RW:	12X Write min./8X Re-write min./32X Read min. (Standard CDROM acceptable, if CD-RW is also installed as additional/backup drive).
Multimedia Package:	Wavetable sound card and speakers.
Case:	Mid Tower.
Network Adapter:	3COM PCI 10/100 twisted pair Ethernet (Integrated is acceptable).
Keyboard:	104+ Keyboard.
Mouse:	Microsoft Intellimouse w/ Wheel.
Operating System:	MS Windows XP Pro.
Application Software:	MS Office XP, Professional Edition.
Additional Software:	Norton Anti-virus, Corporate Edition 7.51. Adobe Acrobat Standard or Pro Versions (not just reader)
Uninterrupted power supply:	APC Back-UPS 500

Notes: 1. All hardware components and software must be installed before delivery. All software documentation and CD-ROMs for both Microsoft Windows XP and Microsoft Office XP Professional Edition must be provided. Computer Brands limited to DELL and Gateway brands only. No other brands will be accepted.

2. No modems will be allowed to connect to network PC's.

B) Laser Printer – Minimum Specification:

Print speed – 8 ppm.

Resolution – 600 x 600 dpi.

Paper size – Up to 216 mm x 355 mm (8.5 in x 14 in).

RAM – 2 MB standard; expandable to 50 MB.

Must support HP PCL5.

Printer cable – 1.8 m (6 ft).

Note: 1. Laser printer brands limited to Hewlett-Packard, Epson, Cannon, and Lexmark brands only. No other brands will be accepted.

The Contractor is responsible for service and repairs to all computer hardware. All repairs must be performed with-in 24 hours. If the repairs require more than 24 hours, then a replacement must be provided.

First Aid Kit: The Contractor shall supply a first aid kit adequate for the number of personnel that is anticipated to be using the field office and shall keep the first aid kit stocked for the duration that the field office is in service.

Insurance Policy: The Contractor shall provide a separate insurance policy, with no deductible, in the amount of ten thousand dollars (\$10,000.00), in order to insure all Town-owned data equipment and supplies used in the office, against all losses. The Contractor shall be named insured on that policy, and the Town shall be an additional named insured on the policy. These losses shall include, but not be limited to theft, fire, and physical damage. The Town will be responsible for all maintenance costs of Town owned computer hardware. In the event of loss, the Contractor shall provide replacement equipment in accordance with current Town equipment specifications, within seven days of notice of the loss. If the Contractor is unable to provide the required replacement equipment within seven days, the Town may provide replacement equipment and deduct the cost of the equipment from monies due or which may become due the Contractor under the Contract or under any other contract. The Contractor's financial liability under this paragraph shall be limited to the amount of the insurance coverage required by this paragraph. If the cost of equipment replacement required by this paragraph should exceed the required amount of the insurance coverage, the Town will reimburse the Contractor for replacement costs exceeding the amount of the required coverage.

Maintenance: During the occupancy by the Town, the Contractor shall maintain all facilities and furnishings provided under the above requirements and shall maintain and keep the office quarters and surrounding area clean at all times. Exterior areas shall be mowed and cleaned of debris. A trash receptacle (dumpster) with weekly pickup (trash removal) shall be provided. Snow removal, sanding, and salting of all parking and walkway areas shall be accomplished during a storm if on a workday during work hours, immediately after a storm, and prior to the start of a workday. If snow removal, salting, and sanding are not completed by the specified time, the Town will provide the service and all costs incurred will be deducted from the next payment estimate.

Method of Measurement: The furnishing and maintenance of the construction field office will be measured for payment by the number of calendar months that the office is in place and in operation, measured to the nearest month.

There will be no price adjustment due to any change in the minimum computer related hardware and software requirements.

Basis of Payment: The furnishing and maintenance of the construction field office will be paid for at the Contract unit price per month for "Construction Field Office, Small", which price shall include all material, equipment, labor, service contracts, utility services, software, repair replacement of hardware and software, related supplies, parking area, external illumination, trash removal, snow and ice removal, and work incidental thereto, as well as any other costs to provide requirements of this specification.

The Town will process an invoice on a quarterly basis for this item. This item will be paid separately from the payment estimate that is processed for the remainder of the construction work.

The Town will be responsible for payment of data communication user fees and for toll calls by Town personnel.

Pay Item

Construction Field Office, Small

Pay Unit

mos.

Not sure where this will go?
Perhaps we don't need it?

ITEM NO. 0971001A – MAINTENANCE AND PROTECTION OF TRAFFIC

Article 9.71.01: *Description is supplemented by the following:*

The Contractor shall maintain and protect traffic as described by the following and as limited in the Special Provision "Prosecution and Progress":

Valley Road and Bear Hill Road

Valley Road and Bear Hill Road will be closed during and for the duration of construction operations to replace the bridge. The Contractor shall detour traffic as shown on the Detour Plans contained in the Contract Plans [Both Valley Road Bridges are not under construction simultaneously.](#)

The Contractor shall apply the final course of bituminous concrete for the full width and length of the roadway as a final operation.

The Contractor shall schedule operations so that roadway resurfacing shall be full width across the roadway section at the end of the workday, all transverse pavement height differentials shall be tapered enough to the satisfaction of the Engineer, so as to negate any “bump” to traffic.

All Other Roadways

The Contractor shall maintain and protect a minimum of one lane of traffic in each direction, each lane on a paved travel path not less than 11 feet in width.

Excepted therefrom will be those periods, during the allowable periods, when the Contractor is actively working, at which time the Contractor shall maintain and protect at least an alternating one-way traffic operation, on a paved travel path not less than 11 feet in width. The length of the alternating one-way traffic operation shall not exceed 300 feet and there shall be no more than one alternating one-way traffic operation within the project limits without prior approval of the Engineer.

Commercial and Residential Driveways

The Contractor shall maintain access to and egress from all commercial and residential driveways throughout the project limits. The Contractor will be allowed to close said driveways to perform the required work during those periods when the businesses are closed, unless permission is granted from the business owner to close the driveway during business hours. If a temporary closure of a residential driveway is necessary, the Contractor shall coordinate with the owner to determine the time period of the closure.

Article 9.71.03: *Construction Method is supplemented as follows:*

General

Unpaved travel paths will only be permitted for areas requiring full depth and full width reconstruction, in which case, the Contractor will be allowed to maintain traffic on processed aggregate for a duration not to exceed 10 calendar days. The unpaved section shall be the full

width of the road and perpendicular to the travel lanes. Opposing traffic lane dividers shall be used as a centerline.

The Contractor is required to delineate any raised structures within the travel lanes, so that the structures are visible day and night, unless there are specific contract plans and provisions to temporarily lower these structures prior to the completion of work.

The Contractor shall schedule operations so that pavement removal and roadway resurfacing shall be completed full width across a roadway (bridge) section by the end of a workday (work night), or as directed by the Engineer.

When the installation of all intermediate courses of bituminous concrete pavement is completed for the entire roadway, the Contractor shall install the final course of bituminous concrete pavement.

When the Contractor is excavating adjacent to the roadway, the Contractor shall provide a 3-foot shoulder between the work area and travel lanes, with traffic drums spaced every 50 feet. At the end of the workday, if the vertical drop-off exceeds 3 inches, the Contractor shall provide a temporary traversable slope of 4:1 or flatter that is acceptable to the Engineer.

The Contractor, during the course of active construction work on overhead signs and structures, shall close the lanes directly below the work area for the entire length of time overhead work is being undertaken. At no time shall an overhead sign be left partially removed or installed.

If applicable, when an existing sign is removed, it shall be either relocated or replaced by a new sign during the same working day.

The Contractor shall not store any material on-site which would present a safety hazard to motorists or pedestrians (e.g., fixed object or obstruct sight lines).

The field installation of a signing pattern shall constitute interference with existing traffic operations and shall not be allowed, except during the allowable periods.

Construction vehicles entering travel lanes at speeds less than the posted speed are interfering with traffic and shall not be allowed without a lane closure. The lane closure shall be of sufficient length to allow vehicles to enter or exit the work area at posted speeds, in order to merge with existing traffic.

Existing Signing

The Contractor shall maintain all existing overhead and side-mounted signs throughout the project limits during the duration of the project. The Contractor shall temporarily relocate signs and sign supports as many times as deemed necessary, and install temporary sign supports if necessary and as directed by the Engineer.

Requirements for Winter

The Contractor shall schedule a meeting with representatives from the Department including the offices of Maintenance and Traffic, and the Town/City to determine what interim traffic control measures the Contractor shall accomplish for the winter to provide safety to the motorists and permit adequate snow removal procedures. This meeting shall be held prior to October 31 of each year and will include, but not be limited to, discussion of the status and schedule of the following items: lane and shoulder widths, pavement restoration, traffic signal work, pavement markings, and signing.

Signing Patterns

The Contractor shall erect and maintain all signing patterns in accordance with the traffic control plans contained herein. Proper distances between advance warning signs and proper taper lengths are mandatory.

TRAFFIC CONTROL DURING CONSTRUCTION OPERATIONS

The following guidelines shall assist field personnel in determining when and what type of traffic control patterns to use for various situations. These guidelines shall provide for the safe and efficient movement of traffic through work zones and enhance the safety of work forces in the work area.

TRAFFIC CONTROL PATTERNS

Traffic control patterns shall be used when a work operation requires that all or part of any vehicle or work area protrudes onto any part of a travel lane or shoulder. For each situation, the installation of traffic control devices shall be based on the following:

- Speed and volume of traffic
- Duration of operation
- Exposure to hazards

Traffic control patterns shall be uniform, neat, and orderly so as to command respect from the motorist.

In the case of a horizontal or vertical sight restriction in advance of the work area, the traffic control pattern shall be extended to provide adequate sight distance for approaching traffic.

If a lane reduction taper is required to shift traffic, the entire length of the taper should be installed on a tangent section of roadway so that the entire taper area can be seen by the motorist.

Any existing signs that are in conflict with the traffic control patterns shall be removed, covered, or turned so that they are not readable by oncoming traffic.

When installing a traffic control pattern, a Buffer Area should be provided and this area shall be free of equipment, workers, materials, and parked vehicles.

Typical traffic control plans 19 through 25 may be used for moving operations such as line striping, pothole patching, mowing, or sweeping when it is necessary for equipment to occupy a travel lane.

Traffic control patterns will not be required when vehicles are on an emergency patrol type activity or when a short duration stop is made and the equipment can be contained within the shoulder. Flashing lights and appropriate traffic person shall be used when required.

Although each situation must be dealt with individually, conformity with the typical traffic control plans contained herein is required. In a situation not adequately covered by the typical traffic control plans, the Contractor must contact the Engineer for assistance prior to setting up a traffic control pattern.

PLACEMENT OF SIGNS

Signs must be placed in such a position to allow motorists the opportunity to reduce their speed prior to the work area. Signs shall be installed on the same side of the roadway as the work area. On multi-lane divided highways, advance warning signs shall be installed on both sides of the highway. On directional roadways (on-ramps, off-ramps, one-way roads), where the sight distance to signs is restricted, these signs should be installed on both sides of the roadway.

ALLOWABLE ADJUSTMENT OF SIGNS AND DEVICES SHOWN ON THE TRAFFIC CONTROL PLANS

The traffic control plans contained herein show the location and spacing of signs and devices under ideal conditions. Signs and devices should be installed as shown on these plans whenever possible.

The proper application of the traffic control plans and installation of traffic control devices depends on actual field conditions.

Adjustments to the traffic control plans shall be made only at the direction of the Engineer to improve the visibility of the signs and devices and to better control traffic operations. Adjustments to the traffic control plans shall be based on safety of work forces and motorists, abutting property requirements, driveways, side roads, and the vertical and horizontal curvature of the roadway.

The Engineer may require that the traffic control pattern be located significantly in advance of the work area to provide better sight line to the signing and safer traffic operations through the work zone.

Table I indicates the minimum taper length required for a lane closure based on the posted speed limit of the roadway. These taper lengths shall only be used when the recommended taper lengths shown on the traffic control plans cannot be achieved.

TABLE I – MINIMUM TAPER LENGTHS

POSTED SPEED LIMIT MILES PER HOUR	MINIMUM TAPER LENGTH IN FEET FOR A SINGLE LANE CLOSURE
30 OR LESS	180
35	250
40	320
45	540
50	600
55	660
65	780

SECTION 1. WORK ZONE SAFETY MEETINGS

- 1.a) Prior to the commencement of work, a work zone safety meeting will be conducted with representatives of DOT Construction, Connecticut State Police (Local Barracks), Municipal Police, the Contractor (Project Superintendent) and the Traffic Control Subcontractor (if different than the prime Contractor) to review the traffic operations, lines of responsibility, and operating guidelines which will be used on the project. Other work zone safety meetings during the course of the project should be scheduled as needed.
- 1.b) A Work Zone Safety Meeting Agenda shall be developed and used at the meeting to outline the anticipated traffic control issues during the construction of this project. Any issues that can't be resolved at these meetings will be brought to the attention of the District Engineer and the Office of Construction. The agenda should include:
- Review Project scope of work and time
 - Review Section 1.08, Prosecution and Progress
 - Review Section 9.70, Traffic persons
 - Review Section 9.71, Maintenance and Protection of Traffic
 - Review Contractor's schedule and method of operations.
 - Review areas of special concern: ramps, turning roadways, medians, lane drops, etc.
 - Open discussion of work zone questions and issues
 - Discussion of review and approval process for changes in contract requirements as they relate to work zone areas

SECTION 2. GENERAL

- 2.a) **If the required minimum number of signs and equipment (i.e. one High Mounted Internally Illuminated Flashing Arrow for each lane closed, two TMAs, Changeable Message Sign, etc.) are not available; the traffic control pattern shall not be installed.**

- 2.b) The Contractor shall have back-up equipment (TMAs, High Mounted Internally Illuminated Flashing Arrow, Changeable Message Sign, construction signs, cones/drums, etc.) available at all times in case of mechanical failures, etc. The only exception to this is in the case of sudden equipment breakdowns in which the pattern may be installed but the Contractor must provide replacement equipment within 24 hours.
- 2.c) Failure of the Contractor to have the required minimum number of signs, personnel and equipment, which results in the pattern not being installed, shall not be a reason for a time extension or claim for loss time.
- 2.d) In cases of legitimate differences of opinion between the Contractor and the Inspection staff, the Inspection staff shall err on the side of safety. The matter shall be brought to the District Office for resolution immediately or, in the case of work after regular business hours, on the next business day.

SECTION 3. INSTALLING AND REMOVING TRAFFIC CONTROL PATTERNS

- 3.a) Lane Closures shall be installed beginning with the advanced warning signs and proceeding forward toward the work area.
- 3.b) Lane Closures shall be removed in the reverse order, beginning at the work area, or end of the traffic control pattern, and proceeding back toward the advanced warning signs.
- 3.c) Stopping traffic may be allowed:
 - As per the contract for such activities as blasting, steel erection, etc.
 - During paving, milling operations, etc. where, in the middle of the operation, it is necessary to flip the pattern to complete the operation on the other half of the roadway and traffic should not travel across the longitudinal joint or difference in roadway elevation.
 - To move slow moving equipment across live traffic lanes into the work area.
- 3.d) Under certain situations when the safety of the traveling public and/or that of the workers may be compromised due to conditions such as traffic volume, speed, roadside obstructions, or sight line deficiencies, as determined by the Engineer and/or State Police, traffic may be briefly impeded while installing and/or removing the advanced warning signs and the first ten traffic cones/drums only. Appropriate measures shall be taken to safely slow traffic. If required, traffic slowing techniques may be used and shall include the use of Truck Mounted Impact Attenuators (TMAs) as appropriate, for a minimum of one mile in advance of the pattern starting point. Once the advanced warning signs and the first ten traffic cones/drums are installed/removed, the TMAs and sign crew shall continue to install/remove the pattern as described in Section 4c and traffic shall be allowed to resume their normal travel.

- 3.e) The Contractor must adhere to using the proper signs, placing the signs correctly, and ensuring the proper spacing of signs.
- 3.f) Additional devices are required on entrance ramps, exit ramps, and intersecting roads to warn and/or move traffic into the proper travel path prior to merging/exiting with/from the main line traffic. This shall be completed before installing the mainline pattern past the ramp or intersecting roadway.
- 3.g) Prior to installing a pattern, any conflicting existing signs shall be covered with an opaque material. Once the pattern is removed, the existing signs shall be uncovered.
- 3.h) On limited access roadways, workers are prohibited from crossing the travel lanes to install and remove signs or other devices on the opposite side of the roadway. Any signs or devices on the opposite side of the roadway shall be installed and removed separately.

SECTION 4. USE OF HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

- 4.a) On limited access roadways, one Flashing Arrow shall be used for each lane that is closed. The Flashing Arrow shall be installed concurrently with the installation of the traffic control pattern and its placement shall be as shown on the traffic control plan. For multiple lane closures, one Flashing Arrow is required for each lane closed. If conditions warrant, additional Flashing Arrows should be employed (i.e.: curves, major ramps, etc.).
- 4.b) On non-limited access roadways, the use of a Flashing Arrow for lane closures is optional. The roadway geometry, sight line distance, and traffic volume should be considered in the decision to use the Flashing Arrow.
- 4.c) The Flashing Arrow shall not be used on two lane, two-way roadways for temporary alternating one-way traffic operations.
- 4.d) The Flashing Arrow board display shall be in the “arrow” mode for lane closure tapers and in the “caution” mode (four corners) for shoulder work, blocking the shoulder, or roadside work near the shoulder. The Flashing Arrow shall be in the “caution” mode when it is positioned in the closed lane.
- 4.e) The Flashing Arrow shall not be used on a multi-lane roadway to laterally shift all lanes of traffic, because unnecessary lane changing may result.

SECTION 5. USE OF TRUCK MOUNTED IMPACT ATTENUATOR VEHICLES (TMAs)

- 5.a) For lane closures on limited access roadways, a minimum of two TMAs shall be used to install and remove traffic control patterns. If two TMAs are not available, the pattern shall not be installed.

- 5.b) On non-limited access roadways, the use of TMAs to install and remove patterns closing a lane(s) is optional. The roadway geometry, sight line distance, and traffic volume should be considered in the decision to utilize the TMAs.
- 5.c) Generally, to establish the advance and transition signing, one TMA shall be placed on the shoulder and the second TMA shall be approximately 1,000 feet ahead blocking the lane. The flashing arrow board mounted on the TMA should be in the “flashing arrow” mode when taking the lane. The sign truck and workers should be immediately ahead of the second TMA. In no case shall the TMA be used as the sign truck or a work truck. Once the transition is in place, the TMAs shall travel in the closed lane until all Changeable Message Signs, signs, Flashing Arrows, and cones/drums are installed. The flashing arrow board mounted on the TMA should be in the “caution” mode when traveling in the closed lane.
- 5.d) A TMA shall be placed prior to the first work area in the pattern. If there are multiple work areas within the same pattern, then additional TMAs shall be positioned at each additional work area as needed. The flashing arrow board mounted on the TMA should be in the “caution” mode when in the closed lane.
- 5.e) TMAs shall be positioned a sufficient distance prior to the workers or equipment being protected to allow for appropriate vehicle roll-ahead in the event that the TMA is hit, but not so far that an errant vehicle could travel around the TMA and into the work area. For additional placement and use details, refer to the specification entitled “Type ‘D’ Portable Impact Attenuation System”. Some operations, such as paving and concrete repairs, do not allow for placement of the TMA(s) within the specified distances. In these situations, the TMA(s) should be placed at the beginning of the work area and shall be advanced as the paving or concrete operations proceed.
- 5.f) TMAs should be paid in accordance with how the unit is utilized. When it is used as a TMA and is in the proper location as specified, and then it should be paid at the specified hourly rate for “Type ‘D’ Portable Impact Attenuation System”. When the TMA is used as a Flashing Arrow, it should be paid at the daily rate for “High Mounted Internally Illuminated Flashing Arrow”. If a TMA is used to install and remove a pattern and then is used as a Flashing Arrow, the unit should be paid as a “Type ‘D’ Portable Impact Attenuation System” for the hours used to install and remove the pattern, typically 2 hours (1 hour to install and 1 hour to remove), and is also paid for the day as a “High Mounted Internally Illuminated Flashing Arrow”.

SECTION 6. USE OF TRAFFIC DRUMS AND TRAFFIC CONES

- 6.a) Traffic drums shall be used for taper channelization on limited-access roadways, ramps, and turning roadways and to delineate raised catch basins and other hazards.
- 6.b) Traffic drums shall be used in place of traffic cones in traffic control patterns that are in effect for more than a 36-hour duration.

- 6.c) Traffic Cones less than 42 inches in height shall not be used on limited-access roadways or on non-limited access roadways with a posted speed limit of 45 mph and above.
- 6.d) Typical spacing of traffic drums and/or cones shown on the Traffic Control Plans in the Contract are maximum spacing and may be reduced to meet actual field conditions as required.

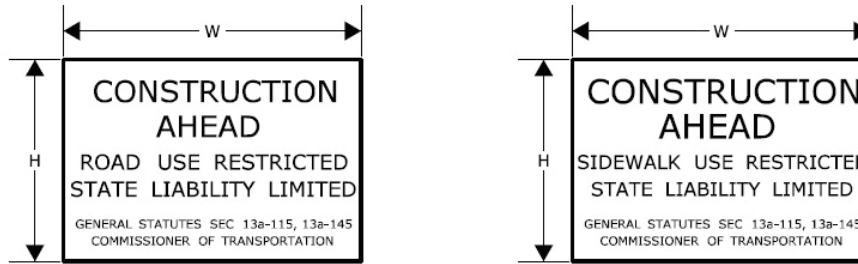
SECTION 7. USE OF (REMOTE CONTROLLED) CHANGEABLE MESSAGE SIGNS (CMS)

- 7.a) For lane closures on limited access roadways, one CMS shall be used in advance of the traffic control pattern. Prior to installing the pattern, the CMS shall be installed and in operation, displaying the appropriate lane closure information (i.e.: Left Lane Closed - Merge Right). The CMS shall be positioned ½ - 1 mile ahead of the lane closure taper. If the nearest Exit ramp is greater than the specified ½ - 1 mile distance, than an additional CMS shall be positioned a sufficient distance ahead of the Exit ramp to alert motorists to the work and therefore offer them an opportunity to take the exit.
- 7.b) CMS should not be installed within 1000 feet of an existing CMS.
- 7.c) On non-limited access roadways, the use of CMS for lane closures is optional. The roadway geometry, sight line distance, and traffic volume should be considered in the decision to use the CMS.
- 7.d) The advance CMS is typically placed off the right shoulder, 5 feet from the edge of pavement. In areas where the CMS cannot be placed beyond the edge of pavement, it may be placed on the paved shoulder with a minimum of five (5) traffic drums placed in a taper in front of it to delineate its position. The advance CMS shall be adequately protected if it is used for a continuous duration of 36 hours or more.
- 7.e) When the CMS are no longer required, they should be removed from the clear zone and have the display screen cleared and turned 90° away from the roadway.
- 7.f) The CMS generally should not be used for generic messages (ex: Road Work Ahead, Bump Ahead, Gravel Road, etc.).
- 7.g) The CMS should be used for specific situations that need to command the motorist's attention which cannot be conveyed with standard construction signs (Examples include: Exit 34 Closed Sat/Sun - Use Exit 35, All Lanes Closed - Use Shoulder, Workers on Road - Slow Down).
- 7.h) Messages that need to be displayed for long periods of time, such as during stage construction, should be displayed with construction signs. For special signs, please coordinate with the Office of Construction and the Division of Traffic Engineering for the proper layout/dimensions required.
- 7.i) The messages that are allowed on the CMS are as follows:

<u>Message No.</u>	<u>Frame 1</u>	<u>Frame 2</u>	<u>Message No.</u>	<u>Frame 1</u>	<u>Frame 2</u>
1	LEFT LANE CLOSED	MERGE RIGHT	9	LANES CLOSED AHEAD	REDUCE SPEED
2	2 LEFT LANES CLOSED	MERGE RIGHT	10	LANES CLOSED AHEAD	USE CAUTION
3	LEFT LANE CLOSED	REDUCE SPEED	11	WORKERS ON ROAD	REDUCE SPEED
4	2 LEFT LANES CLOSED	REDUCE SPEED	12	WORKERS ON ROAD	SLOW DOWN
5	RIGHT LANE CLOSED	MERGE LEFT	13	EXIT XX CLOSED	USE EXIT YY
6	2 RIGHT LANES CLOSED	MERGE LEFT	14	EXIT XX CLOSED USE YY	FOLLOW DETOUR
7	RIGHT LANE CLOSED	REDUCE SPEED	15	2 LANES SHIFT AHEAD	USE CAUTION
8	2 RIGHT LANES CLOSED	REDUCE SPEED	16	3 LANES SHIFT AHEAD	USE CAUTION

For any other message(s), approval must be received from the Office of Construction prior to their use. No more than two (2) displays shall be used within any message cycle.

SERIES 16 SIGNS



		W	H
16-E	80-1605	84" x 60"	
16-H	80-1608	60" x 42"	
16-M	80-1613	30" x 24"	

		W	H
16-S	80-1619	48" x 30"	

THE 16-S SIGN SHALL BE USED ON ALL PROJECTS THAT REQUIRE SIDEWALK RECONSTRUCTION OR RESTRICT PEDESTRIAN TRAVEL ON AN EXISTING SIDEWALK.

SERIES 16 SIGNS SHALL BE INSTALLED IN ADVANCE OF THE TRAFFIC CONTROL PATTERNS TO ALLOW MOTORISTS THE OPPORTUNITY TO AVOID A WORK ZONE. SERIES 16 SIGNS SHALL BE INSTALLED ON ANY MAJOR INTERSECTING ROADWAYS THAT APPROACH THE WORK ZONE. ON LIMITED-ACCESS HIGHWAYS, THESE SIGNS SHALL BE LOCATED IN ADVANCE OF THE NEAREST UPSTREAM EXIT RAMP AND ON ANY ENTRANCE RAMPS PRIOR TO OR WITHIN THE WORK ZONE LIMITS.

THE LOCATION OF SERIES 16 SIGNS CAN BE FOUND ELSEWHERE IN THE PLANS OR INSTALLED AS DIRECTED BY THE ENGINEER.

SIGNS 16-E AND 16-H SHALL BE POST-MOUNTED.

SIGN 16-E SHALL BE USED ON ALL EXPRESSWAYS.

SIGN 16-H SHALL BE USED ON ALL RAMPS, OTHER STATE ROADWAYS, AND MAJOR TOWN/CITY ROADWAYS.

SIGN 16-M SHALL BE USED ON OTHER TOWN ROADWAYS.

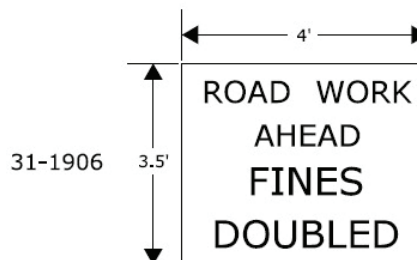
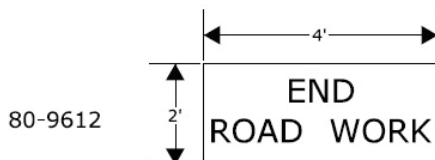
REGULATORY SIGN "ROAD WORK AHEAD, FINES DOUBLED"

THE REGULATORY SIGN "ROAD WORK AHEAD FINES DOUBLED" SHALL BE INSTALLED FOR ALL WORK ZONES THAT OCCUR ON ANY STATE HIGHWAY IN CONNECTICUT WHERE THERE ARE WORKERS ON THE HIGHWAY OR WHEN THERE IS OTHER THAN EXISTING TRAFFIC OPERATIONS.

THE "ROAD WORK AHEAD FINES DOUBLED" REGULATORY SIGN SHALL BE PLACED AFTER THE SERIES 16 SIGN AND IN ADVANCE OF THE "ROAD WORK AHEAD" SIGN.

"END ROAD WORK" SIGN

THE LAST SIGN IN THE PATTERN MUST BE THE "END ROAD WORK" SIGN.



SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN
REQUIRED SIGNS

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED

Charles S. Harlow
Charles S. Harlow
2012.06.05 11:35:43-04'00'
PRINCIPAL ENGINEER

NOTES FOR TRAFFIC CONTROL PLANS

1. IF A TRAFFIC STOPPAGE OCCURS IN ADVANCE OF SIGN (A), THEN AN ADDITIONAL SIGN (A) SHALL BE INSTALLED IN ADVANCE OF THE STOPPAGE.
2. SIGNS (AA), (A), AND (D) SHOULD BE OMITTED WHEN THESE SIGNS HAVE ALREADY BEEN INSTALLED TO DESIGNATE A LARGER WORK ZONE THAN THE WORK ZONE THAT IS ENCOMPASSED ON THIS PLAN.
3. SEE TABLE 1 FOR ADJUSTMENT OF TAPERS IF NECESSARY.
4. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 36 HOURS, THEN TRAFFIC DRUMS SHALL BE USED IN PLACE OF TRAFFIC CONES.
5. ANY LEGAL SPEED LIMIT SIGNS WITHIN THE LIMITS OF A ROADWAY / LANE CLOSURE AREA SHALL BE COVERED WITH AN OPAQUE MATERIAL WHILE THE CLOSURE IS IN EFFECT, AND UNCOVERED WHEN THE ROADWAY / LANE CLOSURE IS RE-OPENED TO ALL LANES OF TRAFFIC.
6. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 36 HOURS, THEN ANY EXISTING CONFLICTING PAVEMENT MARKINGS SHALL BE ERADICATED OR COVERED, AND TEMPORARY PAVEMENT MARKINGS THAT DELINEATE THE PROPER TRAVELPATHS SHALL BE INSTALLED.
7. DISTANCES BETWEEN SIGNS IN THE ADVANCE WARNING AREA MAY BE REDUCED TO 100' ON LOW-SPEED URBAN ROADS (SPEED LIMIT < 40 MPH).
8. IF THIS PLAN IS TO REMAIN IN OPERATION DURING THE HOURS OF DARKNESS, INSTALL BARRICADE WARNING LIGHTS - HIGH INTENSITY ON ALL POST-MOUNTED DIAMOND SIGNS IN THE ADVANCE WARNING AREA.
9. A CHANGEABLE MESSAGE SIGN SHALL BE INSTALLED ONE HALF TO ONE MILE IN ADVANCE OF THE LANE CLOSURE TAPER.
10. SIGN (P) SHALL BE MOUNTED A MINIMUM OF 7 FEET FROM THE PAVEMENT SURFACE TO THE BOTTOM OF THE SIGN.

TABLE 1 - MINIMUM TAPER LENGTHS

POSTED SPEED LIMIT (MILES PER HOUR)	MINIMUM TAPER LENGTH FOR A SINGLE LANE CLOSURE
30 OR LESS	180' (55m)
35	250' (75m)
40	320' (100m)
45	540' (165m)
50	600' (180m)
55	660' (200m)
65	780' (240m)

METRIC CONVERSION CHART (1" = 25mm)

ENGLISH	METRIC	ENGLISH	METRIC	ENGLISH	METRIC
12"	300mm	42"	1050mm	72"	1800mm
18"	450mm	48"	1200mm	78"	1950mm
24"	600mm	54"	1350mm	84"	2100mm
30"	750mm	60"	1500mm	90"	2250mm
36"	900mm	66"	1650mm	96"	2400mm



SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN NOTES

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

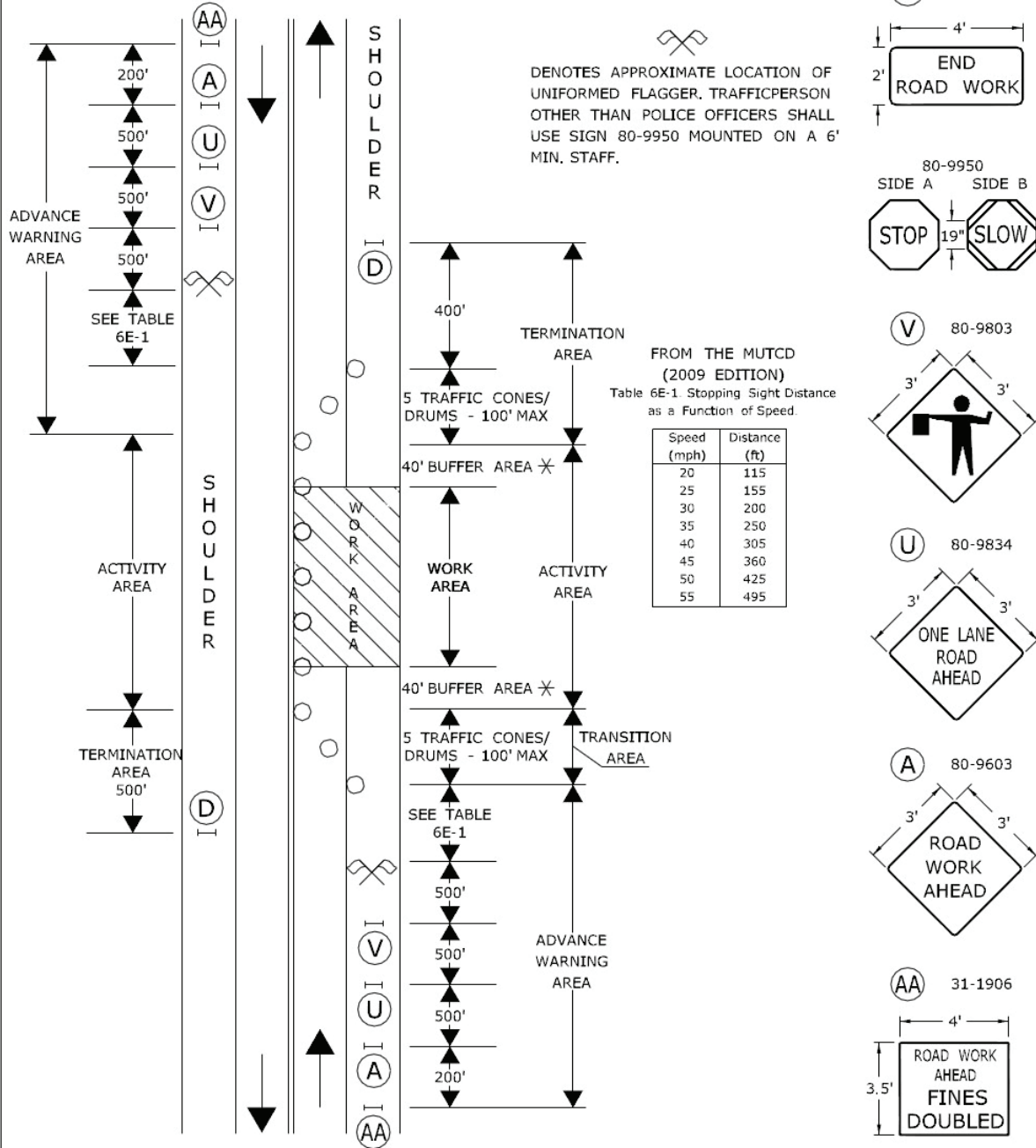
APPROVED

Charles S. Harlow
PRINCIPAL ENGINEER

Charles S. Harlow
2012.06.05 15:50:35-0400

WORK IN TRAVEL LANE AND SHOULDER TWO LANE HIGHWAY ALTERNATING ONE-WAY TRAFFIC OPERATIONS

SIGN FACE
108 SQ. FT (MIN.)



- TRAFFIC CONE **OR** TRAFFIC DRUM
- ✱ OPTIONAL ✕ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ← HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 13 - SHEET 1 OF 2
SEE NOTES 1, 2, 4, 6, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED *Charles S. Harlow* Charles S. Harlow
2012.06.05 15:55:23-04'00"
PRINCIPAL ENGINEER

WORK IN TRAVEL LANE AND SHOULDER TWO LANE HIGHWAY ALTERNATING ONE-WAY TRAFFIC OPERATIONS

SIGN FACE
108 SQ. FT (MIN.)

HAND SIGNAL METHODS TO BE USED BY UNIFORMED FLAGGERS

THE FOLLOWING METHODS FROM SECTION 6E.07, FLAGGER PROCEDURES, IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES," SHALL BE USED BY UNIFORMED FLAGGERS WHEN DIRECTING TRAFFIC THROUGH A WORK AREA. THE STOP/SLOW SIGN PADDLE (SIGN NO. 80-9950) SHOWN ON THE TRAFFIC STANDARD SHEET TR-1220 01 ENTITLED, "SIGNS FOR CONSTRUCTION AND PERMIT OPERATIONS" SHALL BE USED.

A. TO STOP TRAFFIC

TO STOP ROAD USERS, THE FLAGGER SHALL FACE ROAD USERS AND AIM THE STOP PADDLE FACE TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. THE FREE ARM SHALL BE HELD WITH THE PALM OF THE HAND ABOVE SHOULDER LEVEL TOWARD APPROACHING TRAFFIC.



B. TO DIRECT TRAFFIC TO PROCEED

TO DIRECT STOPPED ROAD USERS TO PROCEED, THE FLAGGER SHALL FACE ROAD USERS WITH THE SLOW PADDLE FACE AIMED TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. THE FLAGGER SHALL MOTION WITH THE FREE HAND FOR ROAD USERS TO PROCEED.



C. TO ALERT OR SLOW TRAFFIC

TO ALERT OR SLOW TRAFFIC, THE FLAGGER SHALL FACE ROAD USERS WITH THE SLOW PADDLE FACE AIMED TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. TO FURTHER ALERT OR SLOW TRAFFIC, THE FLAGGER HOLDING THE SLOW PADDLE FACE TOWARD ROAD USERS MAY MOTION UP AND DOWN WITH THE FREE HAND, PALM DOWN.



- TRAFFIC CONE **OR** TRAFFIC DRUM
- * OPTIONAL ⊗ TRAFFIC DRUM ⇨ PORTABLE SIGN SUPPORT
- ⇐ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 13 - SHEET 2 OF 2
SEE NOTES 1, 2, 4, 6, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

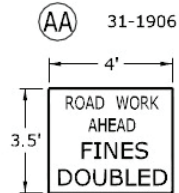
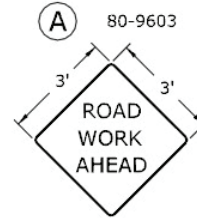
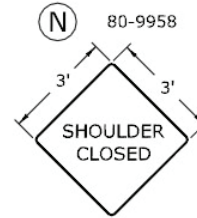
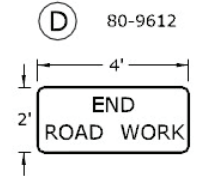
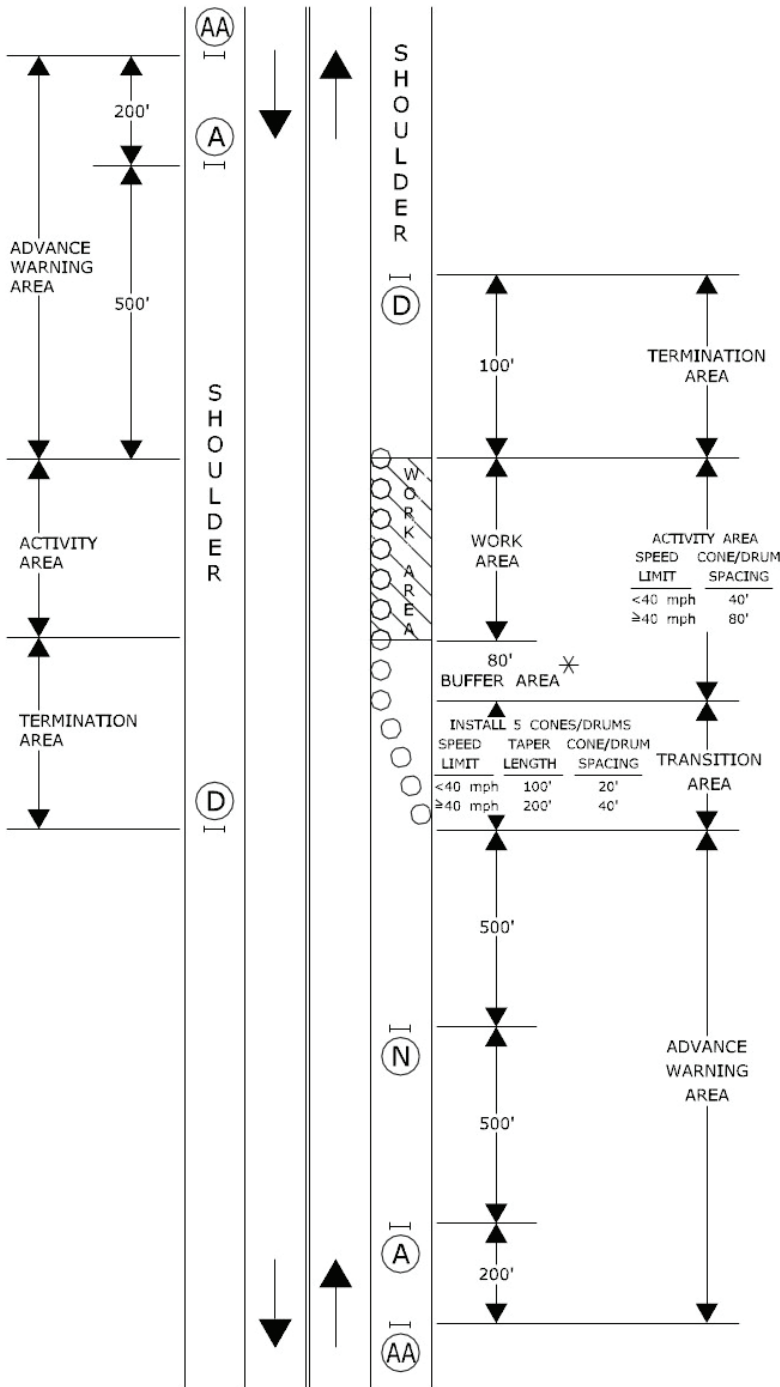
APPROVED

Charles S. Harlow
PRINCIPAL ENGINEER

Charles S. Harlow
2012.06.05 15:55:45-04'00"

WORK IN SHOULDER - TWO LANE HIGHWAY

SIGN FACE
71 SQ. FT (MIN.)



- TRAFFIC CONE **OR** TRAFFIC DRUM
- * OPTIONAL ⊗ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ← HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 14
SEE NOTES 1, 2, 4, 7, 8

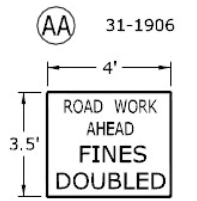
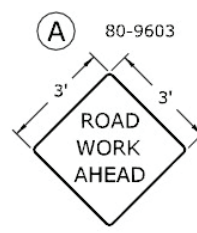
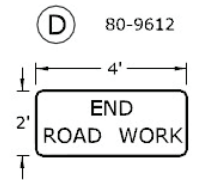
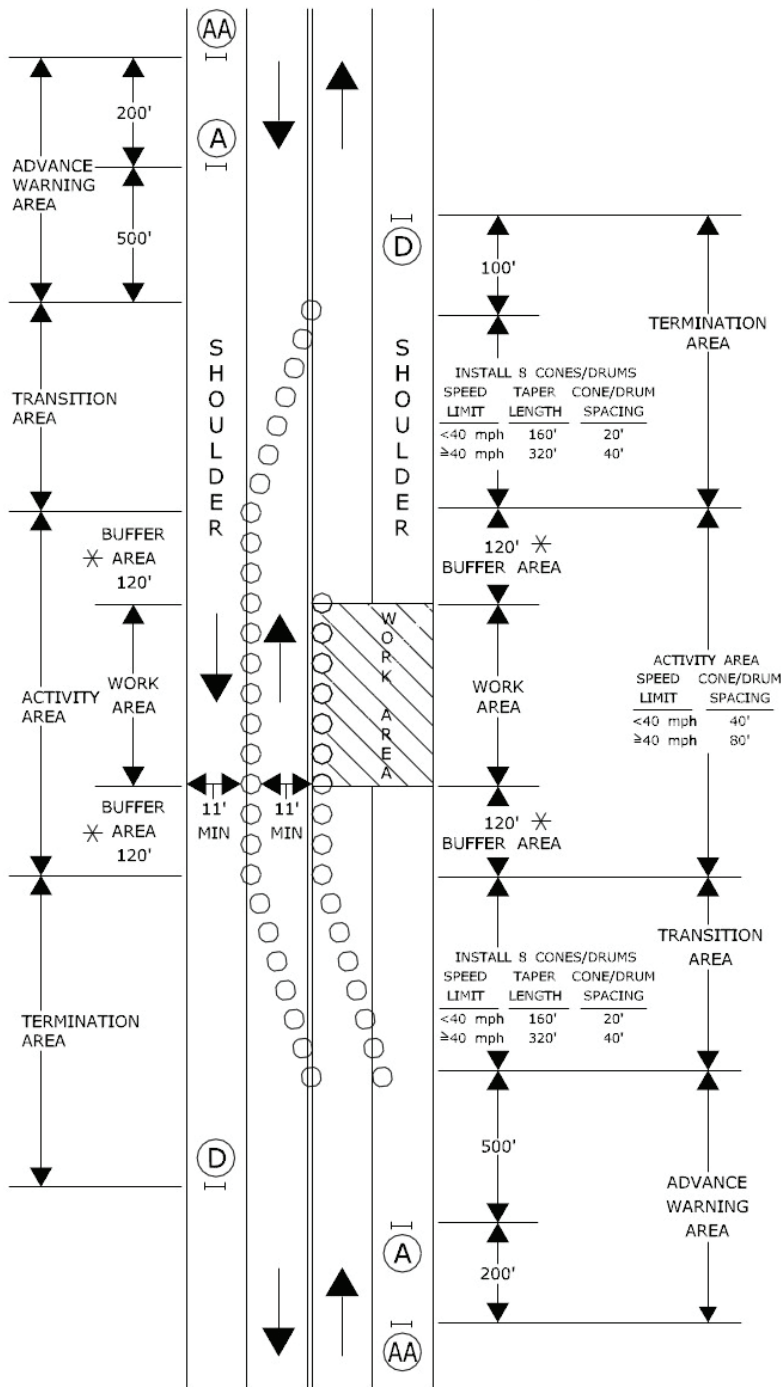
CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED

Charles S. Harlow
Charles S. Harlow
2012.08.05 15:56:09-04'00"
PRINCIPAL ENGINEER

WORK IN TRAVEL LANE AND SHOULDER TWO LANE HIGHWAY

SIGN FACE
62 SQ. FT (MIN.)



INSTALL 8 CONES/DRUMS

SPEED LIMIT	TAPER LENGTH	CONE/DRUM SPACING
<40 mph	160'	20'
≥40 mph	320'	40'

ACTIVITY AREA

SPEED LIMIT	CONE/DRUM SPACING
<40 mph	40'
≥40 mph	80'

INSTALL 8 CONES/DRUMS

SPEED LIMIT	TAPER LENGTH	CONE/DRUM SPACING
<40 mph	160'	20'
≥40 mph	320'	40'

- TRAFFIC CONE **OR** TRAFFIC DRUM
- ✱ OPTIONAL ⊗ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ← HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 15
SEE NOTES 1, 2, 4, 6, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED *Charles S. Harlow* Charles S. Harlow
2012.06.05 15:56:29-04'00"
PRINCIPAL ENGINEER

Article 9.71.05 – *Basis of Payment is supplemented by the following:*

The temporary relocation of signs and supports, and the furnishing, installation and removal of any temporary supports shall be paid for under the item “Maintenance and Protection of Traffic.” Temporary overhead sign supports and foundations shall be paid for under the appropriate item(s).

The cost of furnishing, installing, and removing the material for the 4H:1V traversable slope shall be paid for under the item “Maintenance and Protection of Traffic.”

ITEM #0980001A – CONSTRUCTION STAKING

Description: The work under this item shall consist of construction layout and reference staking necessary for the proper control and satisfactory completion of all work on the project.

Materials: All stakes used for control staking shall be of quality suitable for the intended purpose.

Construction Methods: The Town will furnish the Contractor such control points, benchmarks, and other data as may be necessary for the construction staking and layout by qualified engineering or surveying personnel as noted elsewhere herein.

The Contractor shall be responsible for the placement and preservation of adequate ties to all control points, necessary for the accurate re-establishment of all base lines, center lines, and all critical grades as shown on the plans.

All stakes, references, and batter boards which may be required for construction operations, signing and traffic control shall be furnished, set and properly referenced by the Contractor. The Contractor shall be solely and completely responsible for the accuracy of the line and grade of all features of the work. Any errors or apparent discrepancies found in previous surveys, plans, specifications, or special provisions shall be called to the Engineer's attention immediately for correction or interpretation prior to proceeding with the work.

During roadway construction (or site work), the Contractor shall provide and maintain for the periods needed, as determined by the Engineer, reference stakes at 100-foot intervals outside the slope limits. Further, the Contractor shall provide and maintain reference stakes at 50-foot intervals immediately prior to and during the formation of subgrade and the construction of all subsequent pavement layers. These stakes shall be properly marked as to station and offset and shall be referenced to the proposed grade, even if laser or GPS machine controls are used.

The Contractor shall provide and maintain reference stakes at drainage structures, including reference stakes for the determination of the structure alignments as may be needed for the proper construction of the drainage structure. The reference stakes shall be placed immediately prior to and maintained during the installation of the drainage structure. These stakes shall be properly marked as to station and offset and shall be referenced to the proposed grade.

The Contractor shall furnish copies of data used in setting and referencing stakes and other layout markings used by the Contractor after completion of each operation.

The Contractor shall provide safe facilities for convenient access to control points, batter boards, and references.

All staking shall be performed by qualified engineering or surveying personnel who are trained, experienced and skilled in construction layout and staking of the type required under the contract. Prior to start of work, the Contractor shall submit for review and comment the

qualifications of personnel responsible for construction staking on the project. Surveying shall be performed under the direct supervision of a Professional Surveyor licensed in the State of Connecticut. The submission shall include a description of the experience and training which the proposed staff possesses and a list of state projects the personnel have worked on previously. All field layout and staking required for the project shall be performed under the direct supervision of a person, or persons, of engineering background experienced in the direction of such work and acceptable to the Engineer. If the personnel responsible for construction staking change during the course of the project, then a revised submittal will be required.

The Town may check the control of the work, as established by the Contractor, at any time as the work progresses. The Contractor will be informed of the results of these checks, but the Town by so doing in no way relieves the Contractor of responsibility for the accuracy of the layout work.

The Contractor shall correct or replace, at the Contractor's own expense, any deficient layout and construction work which may be the result of the inaccuracies in the Contractor's staking operations or the failure to report such inaccuracies, or the Contractor's failure to report inaccuracies found in work done by the Town or by others. If, as a result of these inaccuracies, the Town is required to make further studies, redesign, or both, all expenses incurred by the Town due to such inaccuracies will be deducted from any monies due the Contractor.

The Contractor shall furnish all necessary personnel, engineering equipment and supplies, materials, transportation, and work incidental to the accurate and satisfactory completion of this work.

Method of Measurement: Construction staking will not be measured but shall be at the Contract lump sum for "Construction Staking."

Basis of Payment: Construction staking will be paid for at the Contract lump sum price for "Construction Staking," which price shall include all materials, tools, equipment, labor, and work incidental thereto. A schedule of values for payment shall be submitted to the Department for review and comment prior to payment.

Pay Item

Construction Staking

Pay Unit

l.s.

ITEM #1507000A – PROTECTION AND SUPPORT OF EXISTING UTILITIES

Description: Work under this item shall consist of protecting and providing temporary support to or relocating existing utilities located within and around the work zones of the new structure, as necessary, during excavation, and construction of the concrete box culverts and wingwalls, and as required or indicated on the plans.

Work under this item shall also include coordination with the utility owners, determination of actual location of the utilities, and assessment of actual condition of the utilities to determine required protection and appropriate temporary support for the existing utilities.

Construction Methods: The Contractor shall design and construct the temporary support system for the utilities necessary to complete the new structure and shall be solely responsible for the adequacy of his design and erection scheme. Should the Contractor propose to relocate utilities as an alternative in lieu of providing temporary support, the Contractor shall coordinate with and obtain full approval from the utility company. The relocation of the existing utilities will be accomplished in coordination with the utility company. The Contractor shall obtain all necessary permits for the performance of the work and shall assume all liabilities in connection therewith.

The Contractor shall coordinate all other construction activities with the utility company and allow them adequate time to perform whatever work, if any, is required of them. The Contractor shall insure that the utility service remains uninterrupted if and as required by the utility company.

The Contractor shall prepare and submit to the Engineer or any regulatory agency, working drawings showing the plan for construction of temporary support system or the plan for relocating utilities. Working drawings shall be developed and submitted in accordance with Article 1.05.02. These drawings shall bear the seal and signature of a Professional Engineer registered in the State of Connecticut. No work pertaining to the protection and temporary support or relocation of utilities shall be started until approval from the Engineer and the utility company has been obtained. Approval from the Engineer or the utility company shall not serve to relieve the Contractor of any responsibility for the adequacy and safety of the proposed means and method, and to carry out the work in full accordance with the plans and specifications.

All parts of any temporary structure(s) used in this work shall be removed and properly disposed of off the site after work requiring its use is completed.

Method of Measurement: Work on this item will be paid for on a lump sum basis and will not be measured for payment.

Basis of Payment: This work will be paid for at the contract lump sum price for “Protection and Support of Existing Utilities,” which price shall include all coordination, materials, equipment, tools, labor, and work incidental thereto for the protection and temporary support or relocation of

affected utilities during construction of the new structure. Work shall also include removal and proper disposal of any and all components of the constructed temporary support structures.

PERMITS AND/OR REQUIRED PROVISIONS

The following Permits and/or Required Provisions following this page are hereby made part of this Contract.

➤ **Permits and/or Permit Applications**

- CT DEEP USACE CT GP – Pre-Construction Notification Approval
License No. 202101368-PCN
Approved on August 11, 2021
- US Army Corp of Engineers CT General Permit #19
File No.: NAE-2021-371
Approved on August 19, 2021
- CT DEEP NDDB Final Determination No. 202101273
Issued on March 24, 2021
- Town of **New Milford** Inland Wetlands and Watercourse Commission Resolution for Application IWA-20-22
Issued on September 28, 2020

➤ **Geotechnical Report**

- Freeman Companies Geotechnical Engineering Memorandum dated November 19, 2019.

Regulatory and Enforcement Branch
U.S. Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

Attn: Kevin Kotelly, Chief, Permits and Enforcement Branch B

Re: 202065396-PCN, Concurrence of Eligibility
NAE-2021-00302
Valley Road over Mashentuck Brook, Killingly, CT 06239

Dear Mr. Kotelly:

The above-referenced Pre-Construction Notification (“PCN”) was submitted to the Connecticut Department of Energy and Environmental Protection (“DEEP”) on January 19, 2021 by The Town of Killingly and made complete on February 8, 2022, for eligibility screening under the Department of the Army Regional General Permit for the State of Connecticut (“CT RGP”) dated December 15, 2021, and authorized and conditioned pursuant to Section 401 of the Federal Clean Water Act.

Project: The applicant proposes activities in Waters of the United States which will result in the following impacts, as shown on attached plans titled “*Construction Plans for Replacement of Bridge No. 68-002 Valley Road over Mashentuck Brook,*” 13 sheets, prepared by Freeman Companies and title sheet dated September 4, 2018, sheet EX-1.1 dated December 15, 2017, sheets S-1.1, S-1.2, S-1.4, WL-1 dated February 3, 2020, sheets PRO-1.1, HWY-1.1, and C-1 through C-5 dated June 14, 2019:

1. Replace an existing 24’ long, 12’9” span with a 37’ long, 13’ wide and 8’ high box culvert filled with 1’ of natural streambed material;
2. Temporarily install cofferdams for water handling; and
3. Temporarily install two 48” bypass pipes and associated temporary rip rap at the inlet and outlets as depicted on plan sheet S-1.4 for water handling.

	<u>Waterway</u>	<u>Wetland</u>	<u>Total</u>
Temporary:	1,700 sf	0 sf	1,700 sf
Permanent:	850 sf	0 sf	850 sf
Total:	2,550 sf	0 sf	2,550 sf

Adaptive Best Management Practices. The Best Management Practices described in Attachment A included with this letter were found to be insufficient to protect existing and designated uses of waters such as propagation of fish, shellfish and wildlife, recreation, public water supply, and agriculture, industrial use and navigation, and the water quality necessary for their protection. Therefore, the following adaptive best management practices shall also be employed to protect water quality and designated uses of waters:

1. **Time-of-Year Restriction.** Unconfined in-water work is prohibited between June 1st and September 30th, inclusive, of any year in order to protect fisheries resources in the area.
2. **Road Barricade and Flood Warnings.** The Project Proponent shall post signage at both crossing approaches, warning that the road is subject to flooding. In the event that a significant storm event is forecast that is likely to cause road overtopping, the Project Proponent shall make provisions for barricading the road.

Staff of the Land & Water Resources Division (the “Division”) have reviewed the project and determined that the proposed regulated work is eligible for PCN coverage under CT RGP #19. Therefore, an individual application to DEEP is not required at this time, provided that the project receives approval from the U.S. Army Corps of Engineers under the CT RGP and that the authorized activities proceed as described in the PCN documentation provided to the Division in the above-referenced notification.

Please be advised that conducting regulated activities without the required state Section 401 Water Quality Certification (WQC) and federal Section 404 WQC is a violation of law and is subject to enforcement proceedings and legal action under 33 CFR Part 326 and citations thereunder.

If you have any questions or need additional information, please contact Farrah Ashe at 860-424-3169 or Farrah.Ashe@ct.gov.



Jeff Caiola, Assistant Director
Land and Water Resources Division
Bureau of Water Protection and Land Reuse

03/04/2022

Date

CC (via email):

David Capacchione, dcapacchione@killinglyct.gov

Jeff LeBeau, jlebeau@freemancos.com

ATTACHMENT A
GENERAL TERMS AND CONDITIONS

1. **Best Management Practices.** In constructing or maintaining the activities authorized herein, the permittee shall employ best management practices in accordance with Section 22a-426-1 of the Regulations for Connecticut State Agencies, consistent with the terms and conditions of this certificate, to control storm water discharges and erosion and sedimentation and to prevent pollution. Such practices to be implemented by the permittee at the site include, but are not necessarily limited to:
- a. Prohibiting dumping of any quantity of oil, chemicals or other deleterious material on the ground;
 - b. Immediately informing the Commissioner's Oil and Chemical Spill Response Division at (860) 424-3338 (24- hour phoneline) of any adverse impact or hazard to the environment, including any discharges, spillage, or loss of oil or petroleum or chemical liquids or solids, which occurs or is likely to occur as the direct or indirect result of the activities authorized herein;
 - c. Separating staging areas at the site from the regulated areas by silt fences or straw/hay bales at all times;
 - d. Prohibiting storage of any fuel and refueling of equipment within twenty-five (25) feet from any wetland or watercourse;
 - e. Preventing pollution of wetlands and watercourses in accordance with the document "Connecticut Guidelines for Soil Erosion and Sediment Control" as revised. Said controls shall be inspected by the permittee for deficiencies at least once per week and immediately after each rainfall and at least daily during prolonged rainfall. The permittee shall correct any such deficiencies within 48 hours of said deficiencies being found;
 - f. Stabilizing disturbed soils in a timely fashion to minimize erosion. If a grading operation at the site will be suspended for a period of thirty (30) or more consecutive days, the permittee shall, within the first seven (7) days of that suspension period, accomplish seeding and mulching or take such other appropriate measures to stabilize the soil involved in such grading operation. Within seven (7) days after establishing final grade in any grading operation at the site the permittee shall seed and mulch the soil involved in such grading operation or take such other appropriate measures to stabilize such soil until seeding and mulching can be accomplished.
 - g. Prohibiting the storage of any materials at the site which are buoyant, hazardous, flammable, explosive, soluble, expansive, radioactive, or which could in the event of a flood be injurious to human, animal or plant life, below the elevation of the five hundred (500) year flood. Any other material or equipment stored at the site below said elevation by the permittee or the permittee's contractor must be firmly anchored, restrained or enclosed to prevent flotation. The quantity of fuel stored below such elevation for equipment used at the site shall not exceed the quantity of fuel that is expected to be used by such equipment in one day.
 - h. Immediately informing the Commissioner's Land & Water Resources Division at (860) 424-3019 and the U.S. Army Corps of Engineers' Permit Compliance Section at (617) 647-8674, of the occurrence of pollution or other environmental damage resulting from construction or maintenance of the authorized activity or any construction associated therewith in violation of this certificate. The permittee shall, no later than 48 hours after the permittee learns of a violation of this certificate, report same in writing to the Commissioner. Such report shall contain the

following information:

- (i) the provision(s) of this certificate that has/have been violated;
- (ii) the date and time the violation(s) was first observed and by whom;
- (iii) the cause of the violation(s), if known
- (iv) if the violation(s) has ceased, the duration of the violation(s) and the exact date(s) and times(s) it was corrected;
- (v) if the violation(s) has not ceased, the anticipated date when it will be corrected;
- (vi) steps taken and steps planned to prevent a reoccurrence of the violation(s) and the date(s) such steps were implemented or will be implemented;
- (vii) the signatures of the permittee and of the individual(s) responsible for actually preparing such report, each of whom shall certify said report in accordance with condition 8 of this certificate.

For information and technical assistance, contact the Land & Water Resources Division at (860) 424-3019.

2. **Inspection of the Facility or Activity, Adaptive Best Management Practices & Compliance with Conditions.** The concurrence of eligibility letters for Pre- Construction Notifications will be considered the initial inspection of the facility or activity for the purpose of determining whether the discharge from the certified project may violate WQC-202108351 (Non-Tidal) of the Department of the Army Regional General Permit for the State of Connecticut. The concurrence of eligibility letters may also address the remedial actions necessary in order to be considered to be compliance with this certification.

In the event that Best Management Practices employed to maintain compliance with the conditions of this Water Quality Certificate, as described in paragraph 1 above, have been found to be insufficient to protect existing and designated uses of waters such as propagation of fish, shellfish and wildlife, recreation, public water supply, and agriculture, industrial use and navigation, and the water quality necessary for their protection, such permittee shall employ additional or alternative adaptive best management practices to protect water quality.

All work and all activities authorized herein conducted by the permittee at the site shall be consistent with the terms and conditions of this certificate. Upon initiation of the activities authorized herein, the permittee thereby accepts and agrees to comply with the terms and conditions of this Water Quality Certificate.

3. **Rights.** This certificate is subject to and does not derogate any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material nor any exclusive privileges and is further subject to any and all public and private rights and to any federal, state, or local laws or regulations pertinent to the property or activity affected hereby. This certification does not comprise the permits or approvals as may be required by Chapters 440, 446i, 446j and 446k of the Connecticut General Statutes.
4. **Expiration of Certificate.** The Section 401 Water Quality Certifications contained herein shall be valid until such time as the Department of the Army Regional General Permits for the State of Connecticut expires or is modified, suspended, revoked or reissued.
5. **Transfer of Certificate.** This authorization is not transferable without the written consent of the Commissioner

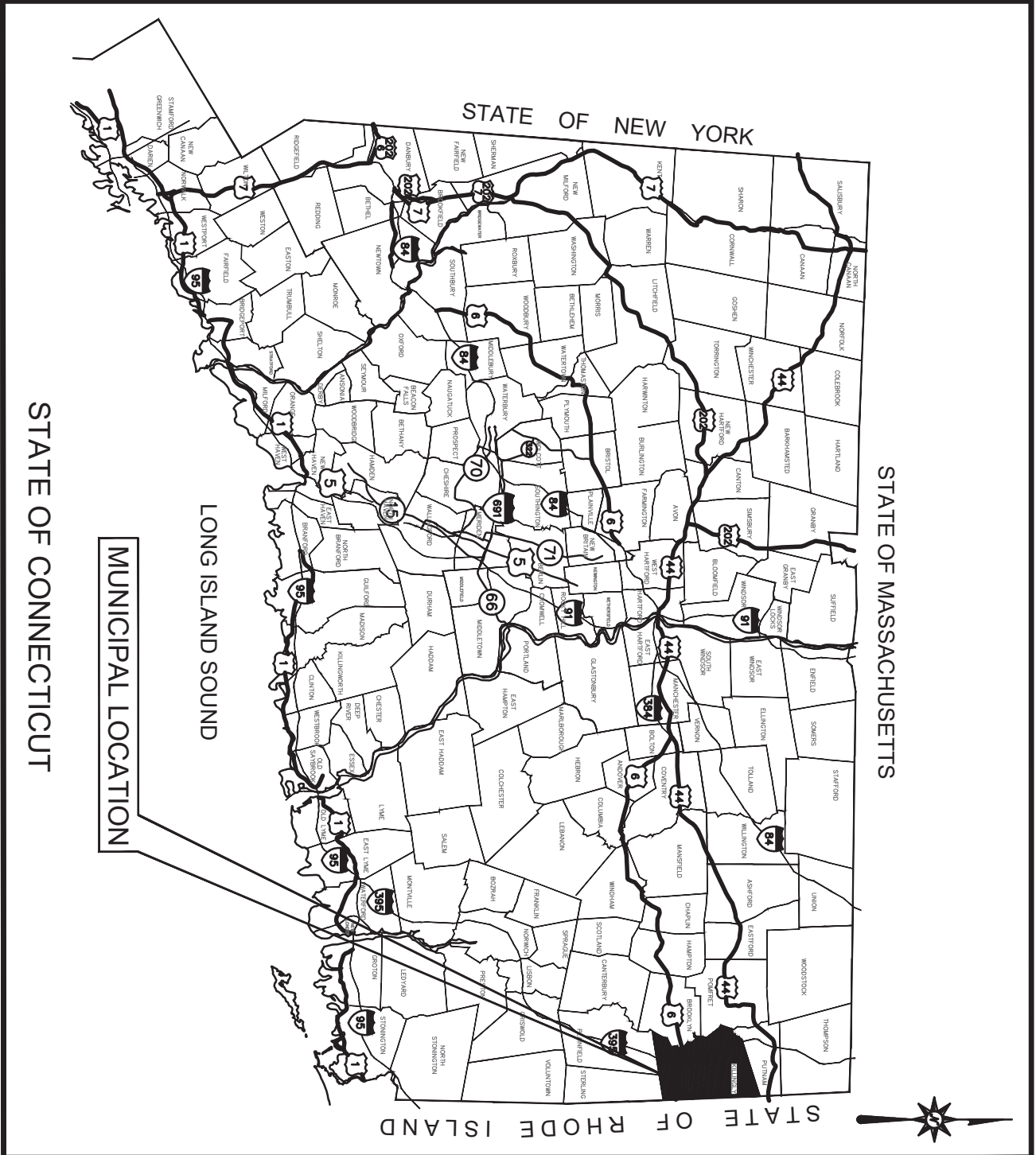
6. **Reliance on Application.** In evaluating the permittee's application, the Commissioner has relied on information provided by the permittee. If such information subsequently proves to be false, deceptive, and incomplete or inaccurate, this certificate may be modified, suspended or revoked.
7. **Installation and Removal of Confining Structures.** Confinement of a work area by cofferdam techniques using sandbag placement, sheet pile installation (vibratory method only), portadam, or similar confinement devices is allowed any time of the year unless specifically prohibited by a permit condition. The removal of such confinement devices is allowed any time of the year unless specifically prohibited by a permit condition. Once a work area has been confined, in-water work within the confined area is allowed any time of the year. The confinement technique used shall completely isolate and protect the confined area from all flowing water. The use of silt boom/curtain or similar technique as a means for confinement is prohibited.
8. **Certification of Documents.** Any document, including but not limited to any notice, which is required to be submitted to the Commissioner under this certificate shall be signed by the permittee, a responsible corporate officer of the permittee, a general partner of the permittee, or a duly authorized representative of the permittee and by the individual or individuals responsible for actually preparing such document, each of whom shall certify in writing as follows:

"I have personally examined and am familiar with the information submitted in this document and all attachments and certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief, and I understand that any false statement made in this document or its attachments may be punishable as a criminal offense in accordance with Section 22a-6 under Section 53a-157 of the Connecticut General Statutes."

9. **Submission of Documents.** The date of submission to the Commissioner of any document required by this certificate shall be the date such document is received by the Commissioner. Except as otherwise specified in this certificate, the word "day" as used in this certificate means the calendar day. Any document or action which falls on a Saturday, Sunday, or legal holiday shall be submitted or performed by the next business day thereafter.

Any document or notice required to be submitted to the Commissioner under this certificate shall, unless otherwise specified in writing by the Commissioner, be directed to:

Director, Land & Water Resources Division
Bureau of Water Protection and Land Reuse
Department of Energy & Environmental Protection
79 Elm Street
Hartford, Connecticut 06106-5127



LOCATION MAP
N.T.S.

CONSTRUCTION PLANS

FOR

REPLACEMENT OF BRIDGE NO.68-002 VALLEY ROAD OVER MASHENTUCK BROOK

REPLACEMENT OF BRIDGE NO.68-003 VALLEY ROAD OVER WHETSTONE BROOK

REPLACEMENT OF BRIDGE NO.68-009 BEAR HILL ROAD OVER UNNAMED BROOK

TOWN OF KILLINGLY, CT

FINAL DESIGN PLANS

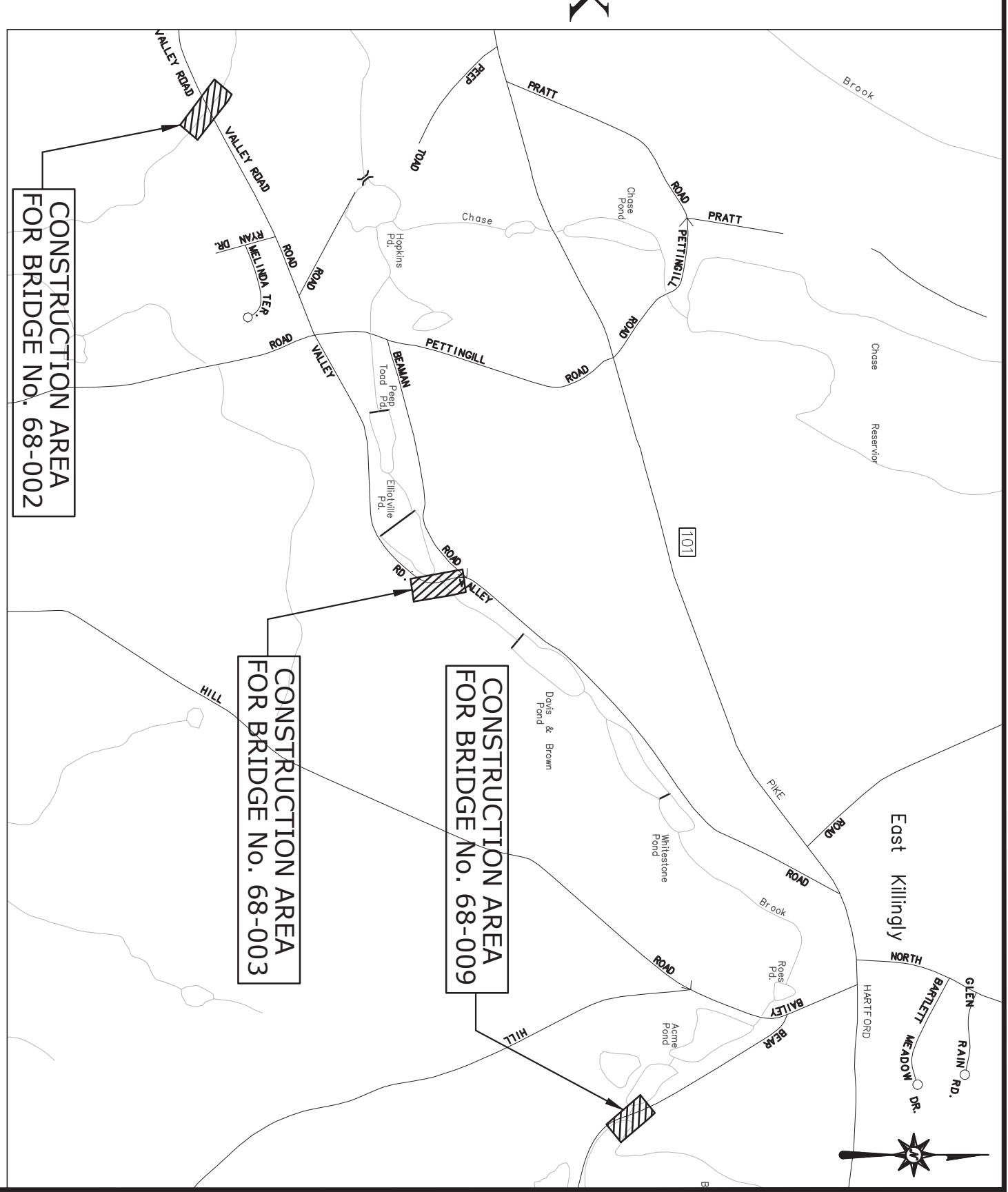
PREPARED FOR:
TOWN OF KILLINGLY
172 MAIN STREET
KILLINGLY, CONNECTICUT 06239

PREPARED BY:

FREEMAN
 C O M P A N I E S
LAND DEVELOPMENT | ENGINEERING DESIGN | CONSTRUCTION SERVICES

LAND DEVELOPMENT ENGINEERING DESIGN CONSTRUCTION SERVICES

36 JOHN STREET
 HARTFORD, CONNECTICUT 06106
 (860) 251-9550
 (860) 986-7161 Fax



VICINITY MAP
SCALE: 1"=1000'

GENERAL NOTES:

CONNECTICUT DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS FOR ROADS, BRIDGES AND INCIDENTAL CONSTRUCTION, FORM 817, DATED 2016; SUPPLEMENTAL SPECIFICATIONS, DATED JANUARY 2015; AND SPECIAL PROVISIONS.

ALL HORIZONTAL GEOMETRY ON THIS PROJECT IS BASED ON HORIZONTAL DATUM NAD83.

ALL ELEVATIONS ON THIS PROJECT BASED ON NAVD88.

DESIGN STANDARDS:
 TOWN OF KILLINGLY DESIGN STANDARDS
 CONNECTICUT DEPARTMENT OF TRANSPORTATION HIGHWAY DESIGN MANUAL, 2003 EDITION.

A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS 2011 EDITION, PUBLISHED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO).

CONNECTICUT DEPARTMENT OF TRANSPORTATION BRIDGE DESIGN MANUAL, 2003 EDITION.

AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

TOWN OF KILLINGLY, CONNECTICUT

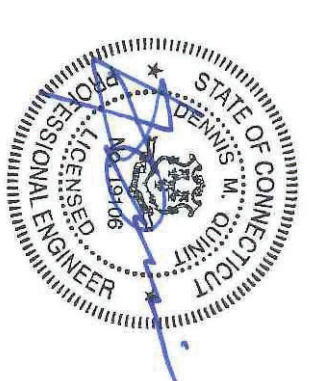
APPROVED BY: _____
 DAVID CAPACCHIONE, P.E.
 TOWN ENGINEER

DATE: _____

DESIGN BY: **FREEMAN**
LAND DEVELOPMENT | ENGINEERING DESIGN | CONSTRUCTION SERVICES

DENNIS M. QUINN, P.E.
 CT PROFESSIONAL ENGINEER REG. NO. 19106

DATE: 9/4/2018



DATES

ISSUE DATE: SEPTEMBER 04, 2018
 REVISION: _____

CONTENTS

TITLE SHEET

SUBSET - 01 BRIDGE NO. 68-002 (SITE NO.1)
 SUBSET - 02 BRIDGE NO. 68-003 (SITE NO.2)
 SUBSET - 03 BRIDGE NO. 68-009 (SITE NO.3)

MDS-1-3 MISCELLANEOUS DETAILS

STANDARD STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION DETAILS

HW-811_01 CONCRETE CURBING
 HW-815_01 BITUMINOUS CONCRETE CURBING
 HW-822_01 TEMPORARY PRECAST CONCRETE BARRIER CURB
 HW-910_01 W-BEAM METAL BEAM RAIL HARDWARE
 HW-910_02 METAL BEAM RAIL (TYPE R-B 350) GUIDERAIL
 HW-910_04 METAL BEAM RAIL (TYPE R-B 350) SYSTEMS 5, 5A & 6
 HW-910_05 METAL BEAM RAIL R-B 350 SPAN TYPE I, II, III SECTIONS
 HW-910_07 R-B 350 BRIDGE ATTACHMENT VERTICAL SHAPE PARAPET
 HW-910_09B MISCELLANEOUS GUIDERAIL TRANSITIONS SHEET 2
 HW-910_11 CURVED GUIDERAIL TREATMENT DETAIL
 HW-910_17 R-B TERMINAL SECTION
 HW-910_20 MASH W-BEAM HARDWARE
 HW-910_21 METAL BEAM RAIL (R-B MASH) GUIDERAIL
 HW-911_01 R-B END ANCHORAGE TYPE I AND II

SUBCONSULTANTS:

GIBSON ENVIRONMENTAL SERVICES

SURVEY NOTES

THIS SURVEY HAS BEEN PREPARED BY FREEMAN COMPANIES, LLC, IN ACCORDANCE WITH THE REGULATIONS OF CONNECTICUT STATE AGENCIES, SECTIONS 20c-300b-1 THRU 20c-300b-20 AND THE "STANDARDS FOR SURVEYING" AS SET FORTH IN THE "PRACTICE STANDARDS FOR THE PROFESSION OF SURVEYING" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996.

THE TYPE OF SURVEY IS A TOPOGRAPHIC SURVEY AND IS INTENDED TO DEPICT THE EXISTING CONDITIONS AND TOPOGRAPHIC FEATURES OF THE PROJECT SITE.

THE SURVEY ACCURACY CONFORMS TO HORIZONTAL CLASS A-2, AND VERTICAL CLASS D.

PROPERTY LINES DEPICTED ON THIS PLAN ARE COMPILED FROM OTHER MAPS, RECORD RESEARCH OR OTHER SOURCES OF INFORMATION.

NORTH ARROW REFERS TO THE CONNECTICUT COORDINATE SYSTEM (NAD83) AND IS BASED UPON GPS OBSERVATIONS PERFORMED BY FREEMAN COMPANIES.

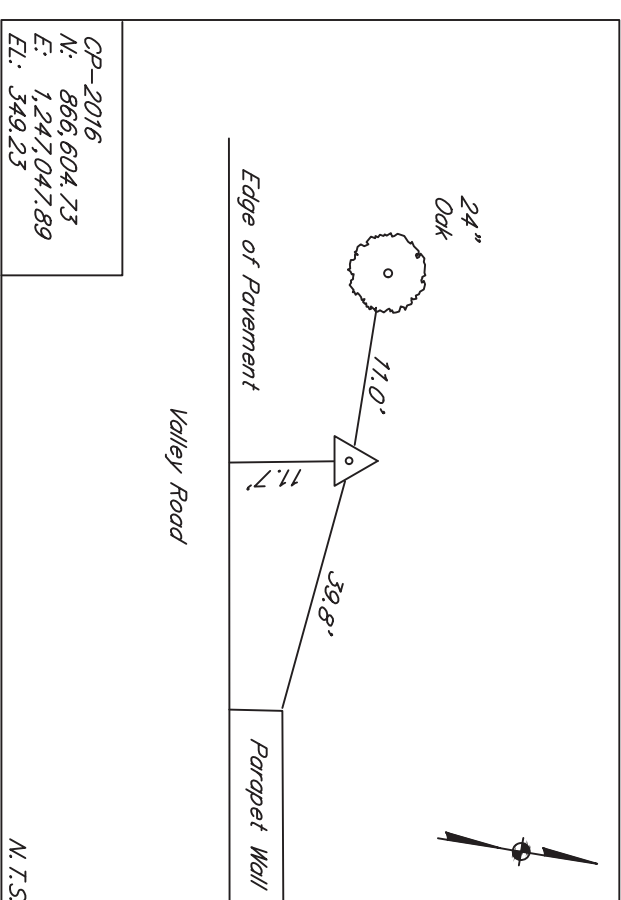
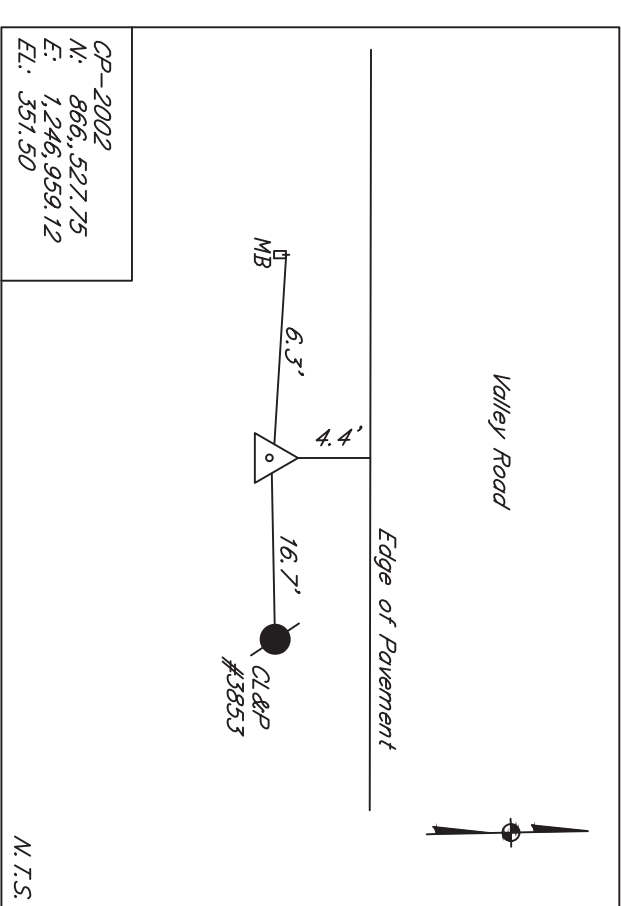
ELEVATIONS REFER TO NAVD83 AND ARE BASED ON GPS OBSERVATIONS PERFORMED BY FREEMAN COMPANIES.

THE UNDERGROUND FEATURES DEPICTED HEREON ARE THE RESULT OF A COMPILATION OF EXISTING RECORDS AND LOCATION OF UTILITY PIPES, APPROXIMATELY 18" TO 36" IN DIAMETER, WHICH ARE KNOWN TO BE APPROXIMATELY 18" TO 36" IN DEPTH. THESE UTILITIES MAY EXIST WHICH FREEMAN COMPANIES ARE UNAWARE OF. VERIFY INFORMATION IN THE FIELD BEFORE ANY DIGGING OR SITE EXCAVATION CALL "CALL BEFORE YOU DIG" 1-800-922-4433.

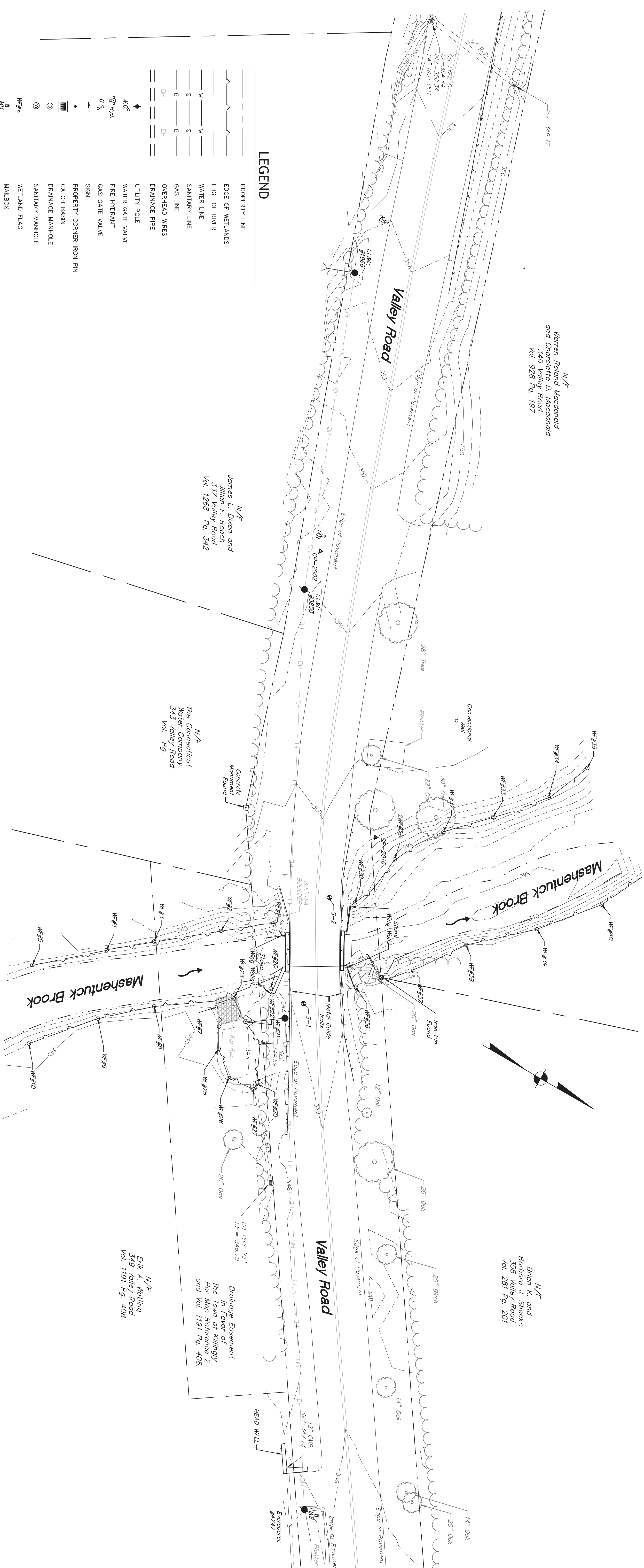
STREET SURFACE IS LOCATED IN FLOOD HAZARD AREA ZONE A2 AREAS OF 100-YEAR FLOOD. BASE FLOOD ELEVATIONS AND FLOOD HAZARD FACTORS ARE SHOWN ON THE FLOOD HAZARD MAP FOR THE TOWN OF KILLINGLY, COMMUNITY PANEL NUMBER 090136 0016 B, PANEL 16 OF 30, EFFECTIVE DATE: JANUARY 3, 1985.

MAP REFERENCES

- CONNECTICUT STATE HIGHWAY DEPARTMENT RIGHT OF WAY MAP TOWN OF KILLINGLY, EASTWILDE-EAST KILLINGLY ROAD FROM COOK ROAD EASTERLY ABOUT 7700 FEET. NUMBER 68-19 JUNE 30 1939
- PLAN TITLED (OAK VALLEY CREEK) DATED AUG. 20, 1984 SCALE 1"=20'
- PLAN TITLED (EASTWOOD HILLS SUBDIVISION KILLINGLY CONNECTICUT) DATED MARCH 2007 SCALE 1"=100'

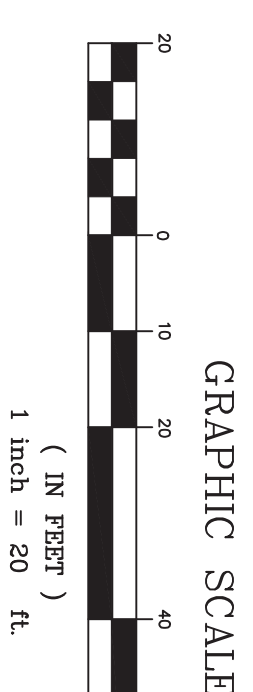


LOCATION MAP
NOT TO SCALE



LEGEND

- PROPERTY LINE
- EDGE OF WETLANDS
- EDGE OF RIVER
- WATER LINE
- SANITARY LINE
- GAS LINE
- OVERHEAD WIRES
- DRAINAGE PIPE
- UTILITY POLE
- WATER GATE VALVE
- FIRE HYDRANT
- GAS GATE VALVE
- SIGN
- PROPERTY CORNER IRON PIN
- CATCH BASIN
- DRAINAGE MANHOLE
- SANITARY MANHOLE
- WETLAND FLAG
- MALIBOX
- BORING
- BUSH
- DECIDUOUS TREE



TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

MICHAEL J. GATON L.S. #70366

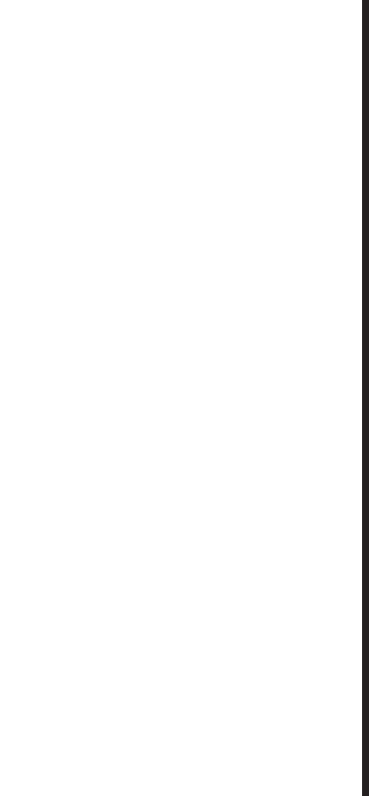
NO CERTIFICATION IS EXPRESSED OR IMPLIED UNLESS THIS MAP IS SEAL OF THE ABOVE NAMED LAND SURVEYOR.

FREEMAN COMPANIES, LLC
 60 N. MAIN ST. SUITE 200
 HARTFORD, CT 06103
 TEL: 860.233.5511
 FAX: 860.233.5510
 WWW.FREEMANCOMP.COM

PREPARED FOR:
 TOWN OF KILLINGLY
 340 VALLEY ROAD
 KILLINGLY, CT 06239

OWNER FOR:
 TOWN OF KILLINGLY
 BEAR HILL ROAD
 KILLINGLY, CT 06239

DATE: 12/15/2017



**REPLACEMENT OF BRIDGE NO. 68-002
 VALLEY ROAD OVER WASHENTUCK BROOK
 KILLINGLY, CONNECTICUT**

NO.	DATE	DESCRIPTION	REVISIONS

NO.	DATE	DESCRIPTION	REVISIONS

NO.	DATE	DESCRIPTION	REVISIONS

NO.	DATE	DESCRIPTION	REVISIONS

NO.	DATE	DESCRIPTION	REVISIONS

NO.	DATE	DESCRIPTION	REVISIONS

TITLE: **TOPOGRAPHIC SURVEY**
 SHEET NUMBER: **EX-1.1**

FREEMAN
 CONSULTING ENGINEERS
 1000 ROUTE 1
 KILLINGLY, CT 06239
 TEL: 860.339.9341
 WWW.FREEMAN-CT.COM

DESIGNED BY: J. J. BUCHEL
 CHECKED BY: J. J. BUCHEL
 APPROVED BY: J. J. BUCHEL

PROJECT NO.: 2017-0507
 DATE: 02/03/2020

SHEET NUMBER:
S-1.1

PROPOSED FOR:
 TOWN OF KILLINGLY
 KILLINGLY, CONNECTICUT 06239

OWNER FOR:
 TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY, CONNECTICUT 06239

DESIGNED BY: J. J. BUCHEL
 CHECKED BY: J. J. BUCHEL
 APPROVED BY: J. J. BUCHEL

PROJECT NO.: 2017-0507
 DATE: 02/03/2020

SHEET NUMBER:
S-1.1

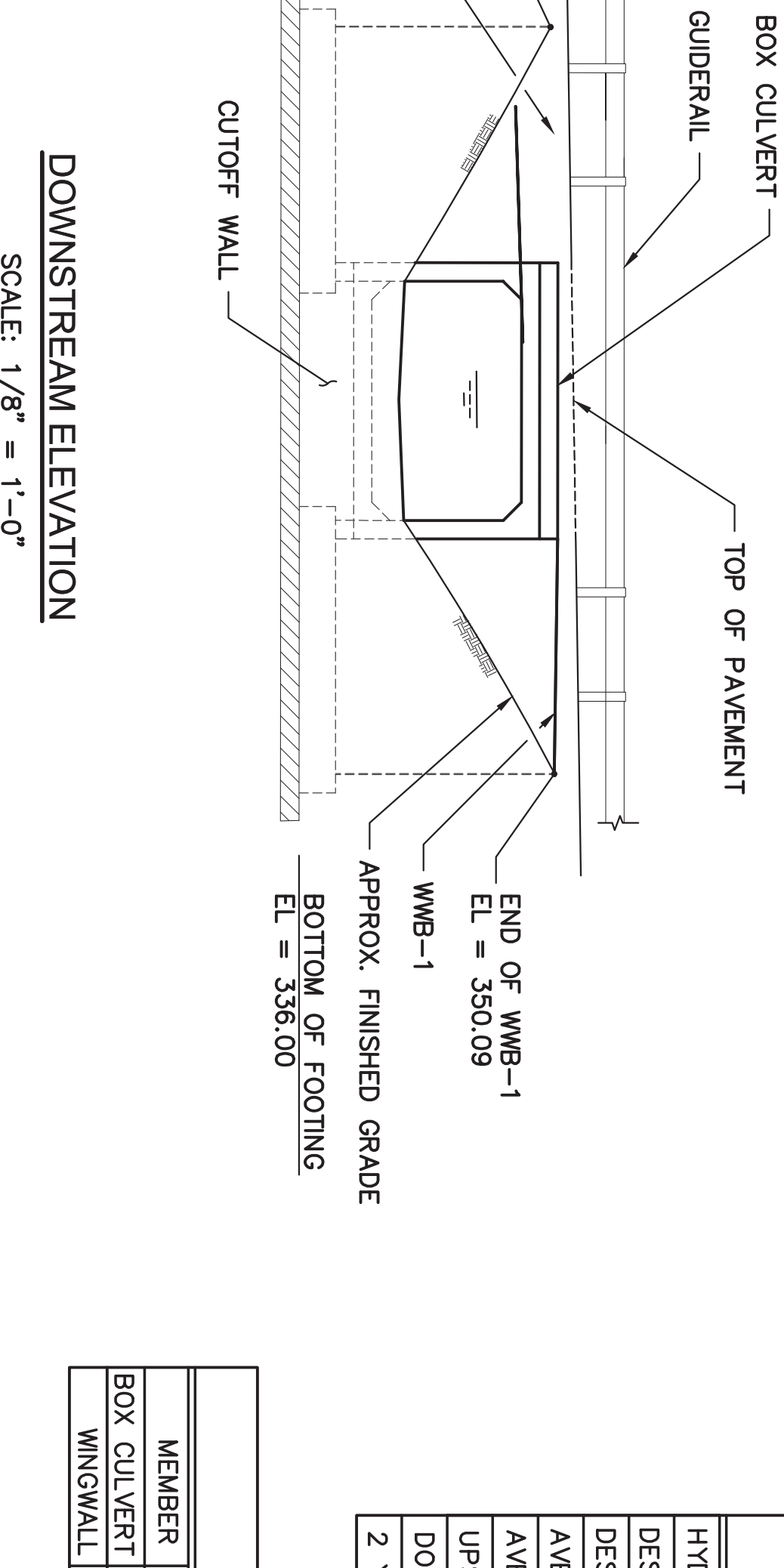
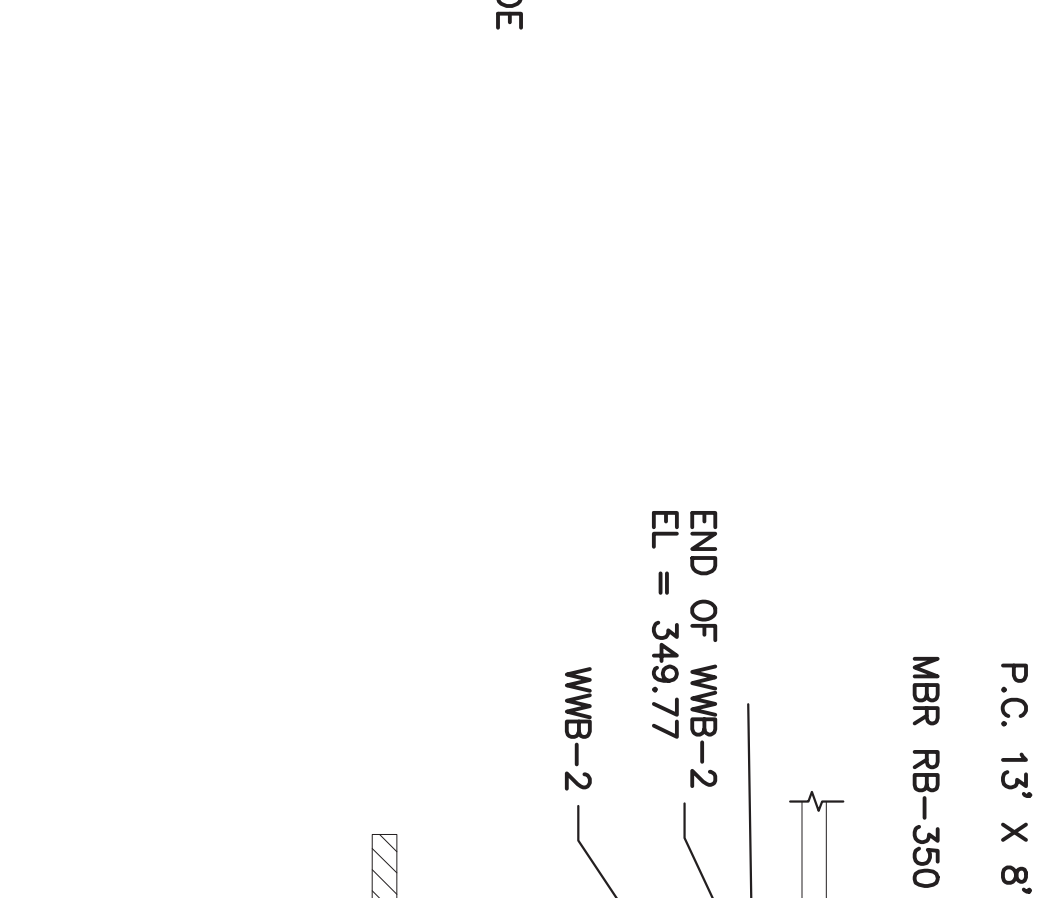
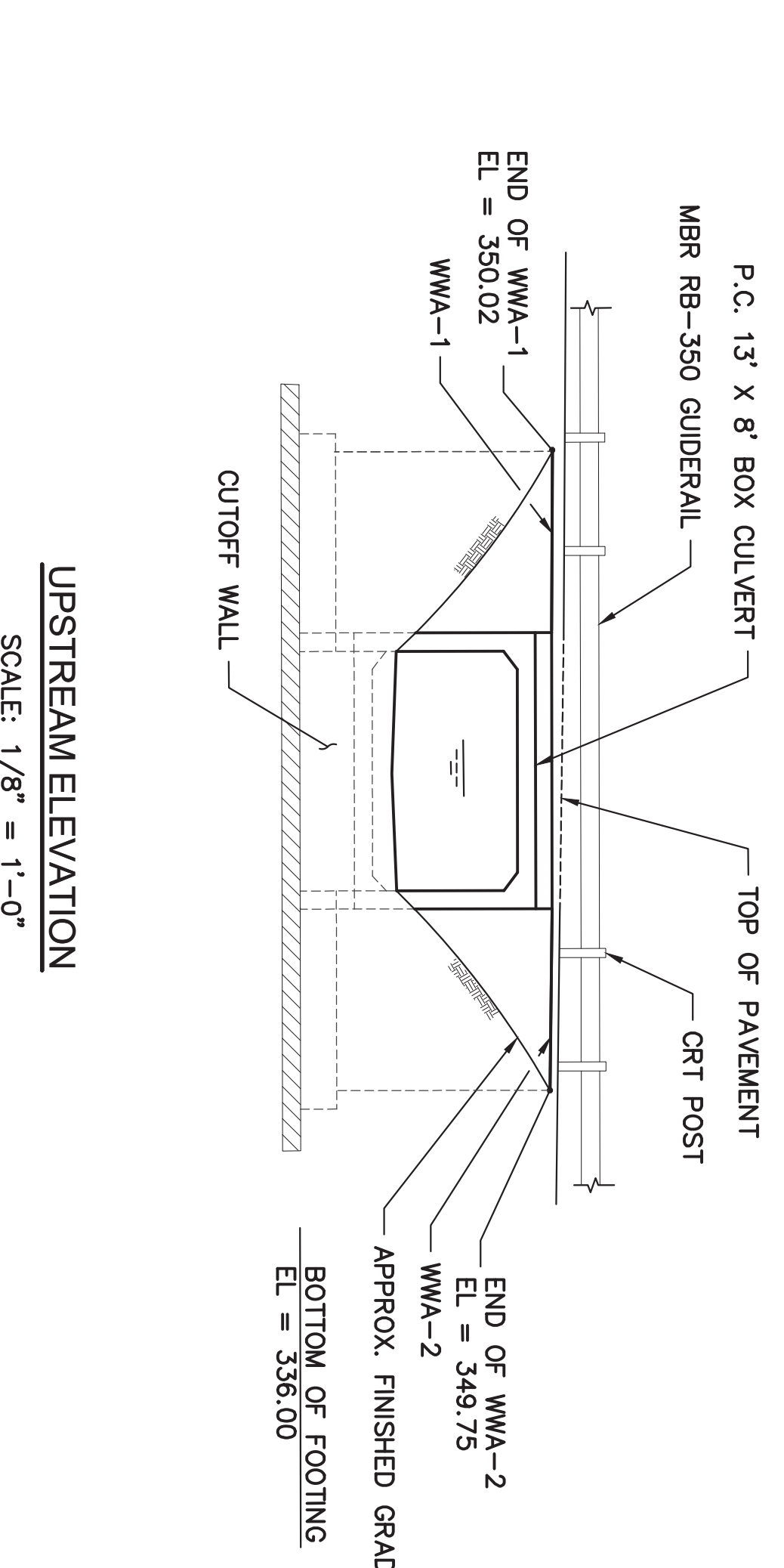
REPLACEMENT OF BRIDGE NO. 68-002
VALLEY ROAD OVER WASHENTUCK BROOK
KILLINGLY, CONNECTICUT

NO. DATE DESCRIPTION REVISIONS

DESIGNED: J. J. BUCHEL
 DRAWN: J. J. BUCHEL
 CHECKED: J. J. BUCHEL
 APPROVED: J. J. BUCHEL

PROJECT NO.: 2017-0507
 DATE: 02/03/2020

SHEET NUMBER:
S-1.1

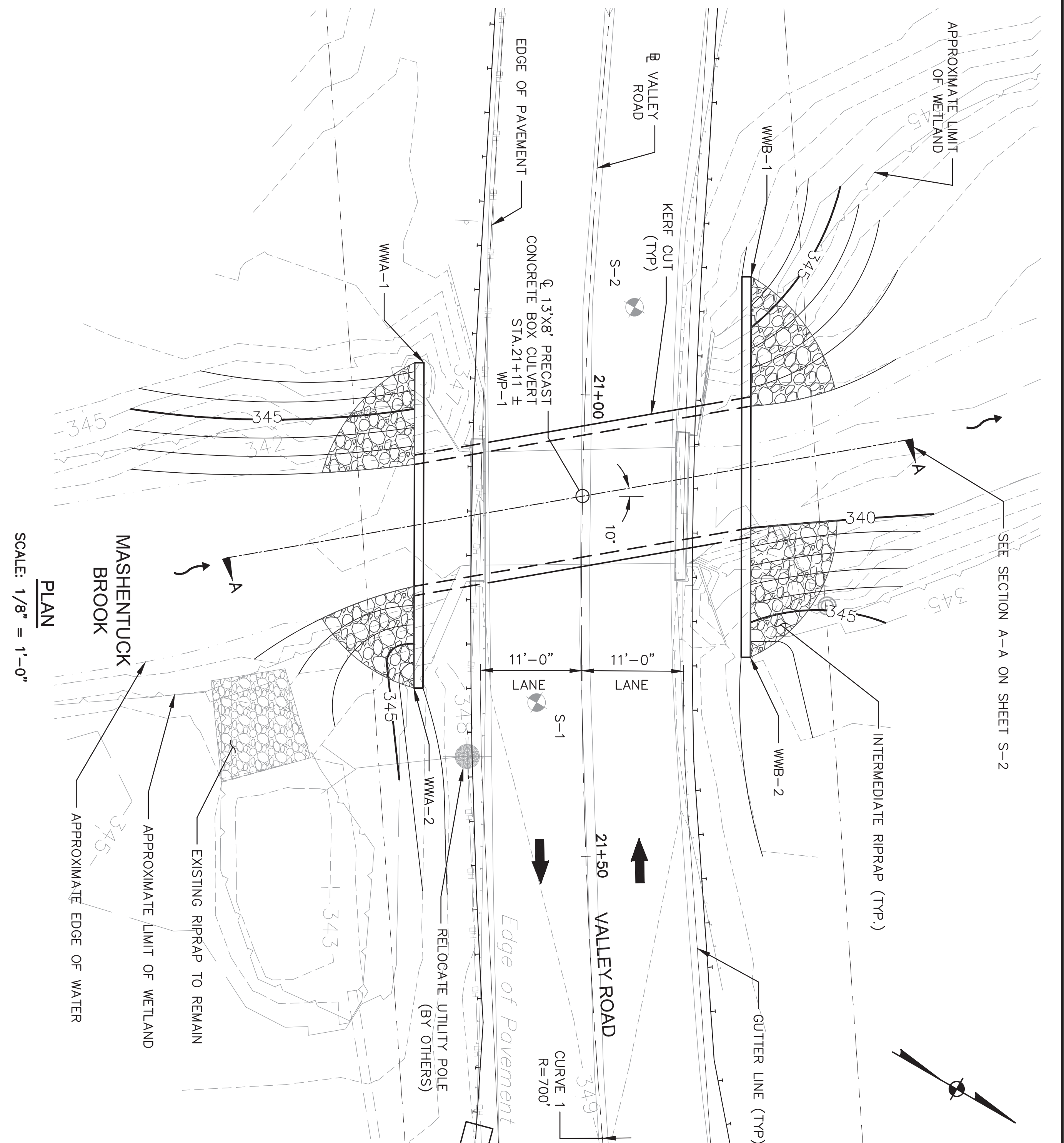


HYDRAULIC DATA

HYDRAULIC AREA	4.1 SQ MI
DESIGN FREQUENCY	100 YEAR
DESIGN DISCHARGE	920 CFS
AVERAGE DAILY FLOW	7.5 CFS
AVERAGE DAILY FLOW ELEVATION	341.69
UPSTREAM DESIGN WATER SURFACE ELEVATION	349.38
DOWN STREAM DESIGN WATER SURFACE ELEVATION	345.01
2 YEAR DESIGN STORM WATER ELEVATION	343.37

TRANSPORTATION DATA

MEMBER	SHIPPING LENGTH	SHIPPING HEIGHT	SHIPPING WIDTH	SHIPPING WEIGHT
BOX CULVERT	15'-0"	10'-0"	8'-0"	55,800 lbs
WINGWALL	15'-0"	10'-0"	8'-0"	24,000 lbs



UTILITY NOTES

1. THIS PROJECT INVOLVES THE PRESENCE OF OVERHEAD UTILITY LINES WITHIN THE LIMITS AND FOOTPRINT OF THE PROJECT. WHILE NO WORK INVOLVING OR IMPACTING THESE UTILITIES ARE ANTICIPATED, THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL WORK WITH THE APPROPRIATE UTILITY COMPANY (EVERSOURCE) AND FOR PROVIDING TEMPORARY PROTECTION AND/OR SUPPORT OF THESE UTILITIES IF AND AS REQUIRED BY THE UTILITY COMPANY.
2. THE CONTRACTOR SHALL DEVELOP ITS ERECTION SCHEME IN CONFORMANCE WITH LIMITATIONS AND RESTRICTIONS ASSOCIATED WITH THE OVERHEAD UTILITY LINES AND AS REQUIRED BY THE APPROPRIATE UTILITY COMPANY.
3. THE CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANY WITH REGARDS TO POTENTIAL RELOCATION OR TEMPORARY SUPPORT OF THEIR FACILITIES. THE CONTRACTOR SHALL IDENTIFY POTENTIAL UTILITY IMPACTS ASSOCIATED WITH THEIR WORK, IF ANY, PRIOR TO START OF CONSTRUCTION AND NOTIFY THE APPROPRIATE UTILITY COMPANY ACCORDINGLY.

NOTICE TO BRIDGE INSPECTORS

IT IS RECOMMENDED THAT CONDOT'S BRIDGE SAFETY PROCEDURES BE FOLLOWED WHEN INSPECTING THIS BRIDGE FOR, BUT NOT LIMITED TO, ALL APPROPRIATE COMPONENTS INDICATED IN THE GOVERNING MANUALS FOR BRIDGE INSPECTION. ATTENTION MUST BE GIVEN TO INSPECTING THE FOLLOWING SPECIAL COMPONENTS AND DETAILS. (THE LISTING OF COMPONENTS FOR SPECIFIC ATTENTION SHALL NOT BE CONSIDERED TO REDUCE THE IMPORTANCE OF INSPECTION OF ANY OTHER COMPONENT OF THE STRUCTURE.) THE FREQUENCY OF INSPECTION OF THIS STRUCTURE SHALL BE IN ACCORDANCE WITH THE GOVERNING MANUALS FOR BRIDGE INSPECTION, UNLESS OTHERWISE DIRECTED BY THE MANAGER OF BRIDGE SAFETY AND EVALUATIONS.

COMPONENT OR DETAIL	STRUCTURE SHEET REFERENCE
NONE	-

BORING LEGEND

S-1 APPROXIMATE BORING LOCATION

GENERAL NOTES

SPECIFICATIONS: CONNECTICUT DEPARTMENT OF TRANSPORTATION FORM 817, INCLUDING SUPPLEMENTAL SPECIFICATIONS DATED JANUARY, 2018 AND SPECIAL PROVISIONS.

DESIGN SPECIFICATIONS: AASHTO LRFD SPECIFICATIONS FOR HIGHWAY BRIDGES, 8TH EDITION AS SUPPLEMENTED BY THE CONNECTICUT DEPARTMENT OF TRANSPORTATION BRIDGE MANUAL (2003) EDITION WITH REVISIONS UP TO AND INCLUDING 2011.

ALLOWABLE DESIGN STRESSES:

CLASS "A" CONCRETE: $f_c = 3,000$ psi
 CLASS "50" CONCRETE: $f_c = 5,000$ psi
 REINFORCEMENT (ASTM 615 GRADE 60) $f_y = 60,000$ psi

LIVE LOAD:

STANDARD DESIGN VEHICLE: AASHTO HL-93 (8-AXLE)
 PERMIT (OVERLOAD) VEHICLES: CONNDOT P204 (8-AXLE)
 CONNDOT P380 (9-AXLE)

SALVAGE: NONE

DIMENSIONS AND ELEVATIONS: WHEN DECIMAL DIMENSIONS AND ELEVATIONS ARE GIVEN TO LESS THAN THREE DECIMAL PLACES, THE OMITTED DIGITS SHALL BE ASSUMED TO BE ZERO. ALL ELEVATIONS ARE GIVEN IN DECIMAL FEET AND ARE BASED ON NAVD 88.

EXISTING DIMENSIONS: DIMENSIONS OF THE EXISTING STRUCTURE SHOWN ON THESE PLANS ARE FOR GENERAL REFERENCE ONLY AND ARE NOT GUARANTEED. THE CONTRACTOR SHALL TAKE ALL FIELD MEASUREMENTS NECESSARY TO ASSURE PROPER FIT OF THE FINISHED WORK AND SHALL ASSUME FULL RESPONSIBILITY FOR THEIR ACCURACY. WHEN SHOP DRAWINGS BASED ON FIELD MEASUREMENTS ARE SUBMITTED FOR APPROVAL, THE FIELD MEASUREMENTS SHALL ALSO BE SUBMITTED FOR REFERENCE BY THE REVIEWER.

UTILITIES: THE CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES LOCATED WITHIN THE VICINITY OF THE SITE DURING CONSTRUCTION. THE METHOD OF SUPPORTING AND PROTECTING UTILITIES SELECTED BY THE CONTRACTOR MUST BE APPROVED BY THE UTILITY COMPANY. UTILITY MODIFICATIONS SHALL BE MADE BY THE RESPECTIVE UTILITY COMPANIES EXCEPT WHERE NOTED OTHERWISE.

CONCRETE NOTES

CLASS "A" CONCRETE: CLASS "A" CONCRETE SHALL BE USED FOR THE CUT-OFF WALLS, RETURN WALLS, HEADWALLS AND WINGWALL FOOTINGS.

CLASS "50" CONCRETE: CLASS "50" CONCRETE SHALL BE USED FOR THE PRECAST CONCRETE BOX CULVERT AND PRECAST CONCRETE WINGWALL STEMS.

REINFORCEMENT: ALL REINFORCEMENT SHALL BE ASTM A615 GRADE 60, UNLESS DIMENSIONED OTHERWISE.

EXPOSED EDGES: EXPOSED EDGES OF CONCRETE SHALL BE BEVELED 1" X 1", UNLESS DIMENSIONED OTHERWISE.

EPOXY COATED REINFORCEMENT BARS: ALL REINFORCEMENT IN THE PRECAST CONCRETE BOX CULVERT SHALL BE EPOXY COATED AND INCLUDED IN THE PAY ITEM "13'X8' PRECAST CONCRETE BOX CULVERT". ALL REINFORCEMENT IN THE PRECAST CONCRETE WINGWALLS SHALL BE EPOXY COATED AND INCLUDED IN THE PAY ITEM "PRECAST CONCRETE WINGWALLS". ALL REINFORCEMENT IN THE CUT-OFF WALLS AND RETURN WALLS SHALL BE PAID FOR IN THE PAY ITEM "DEFORMED STEEL BARS". ALL REINFORCEMENT IN THE HEADWALLS SHALL BE EPOXY COATED AND PAID FOR UNDER THE ITEM "DEFORMED STEEL BARS (EPOXY COATED)".

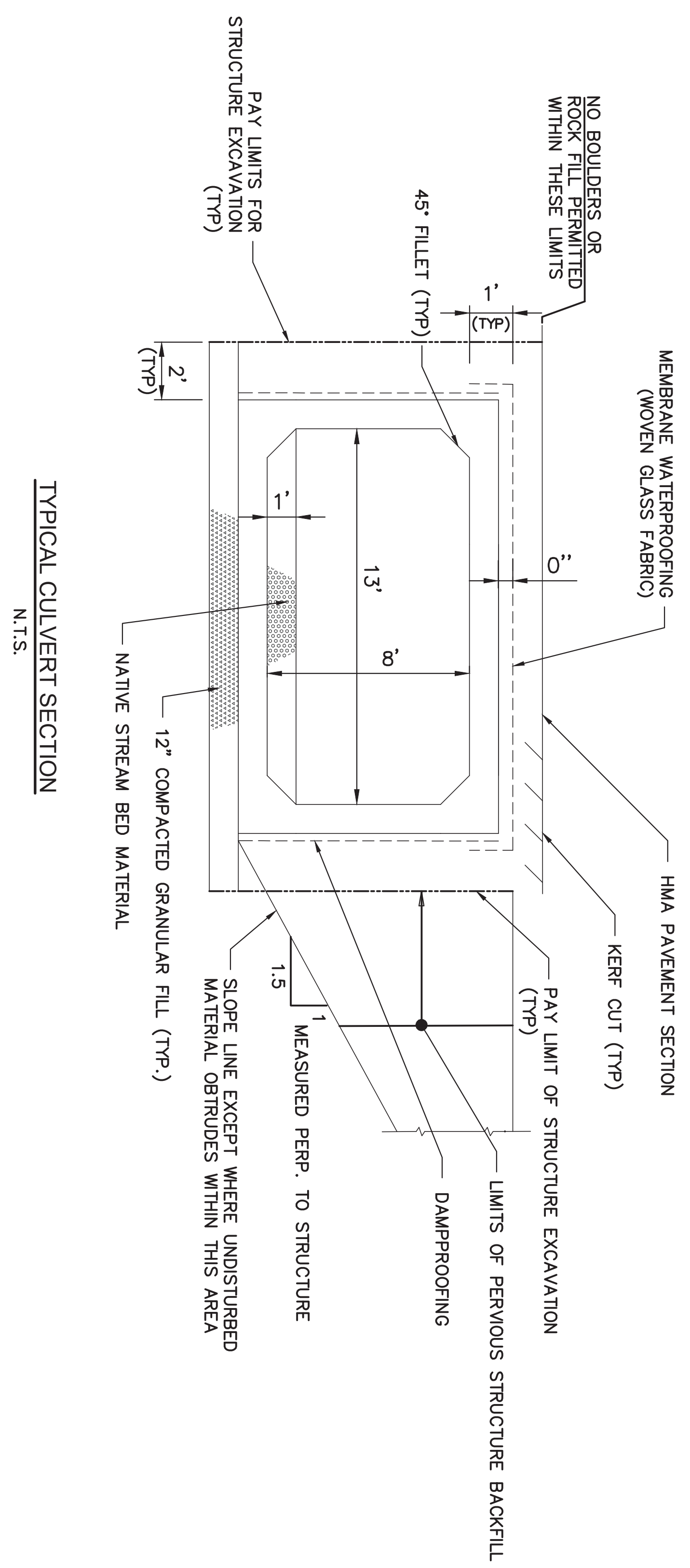
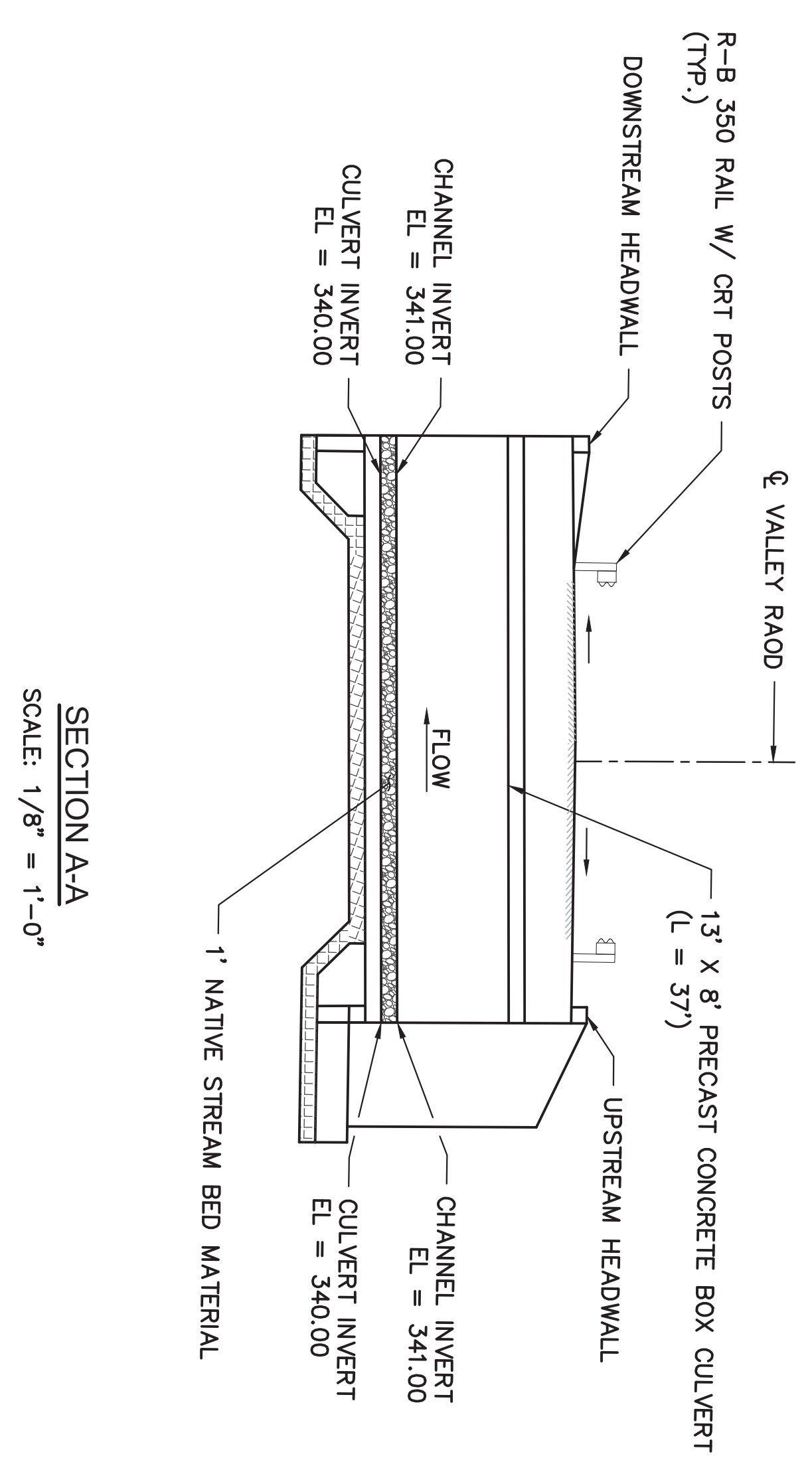
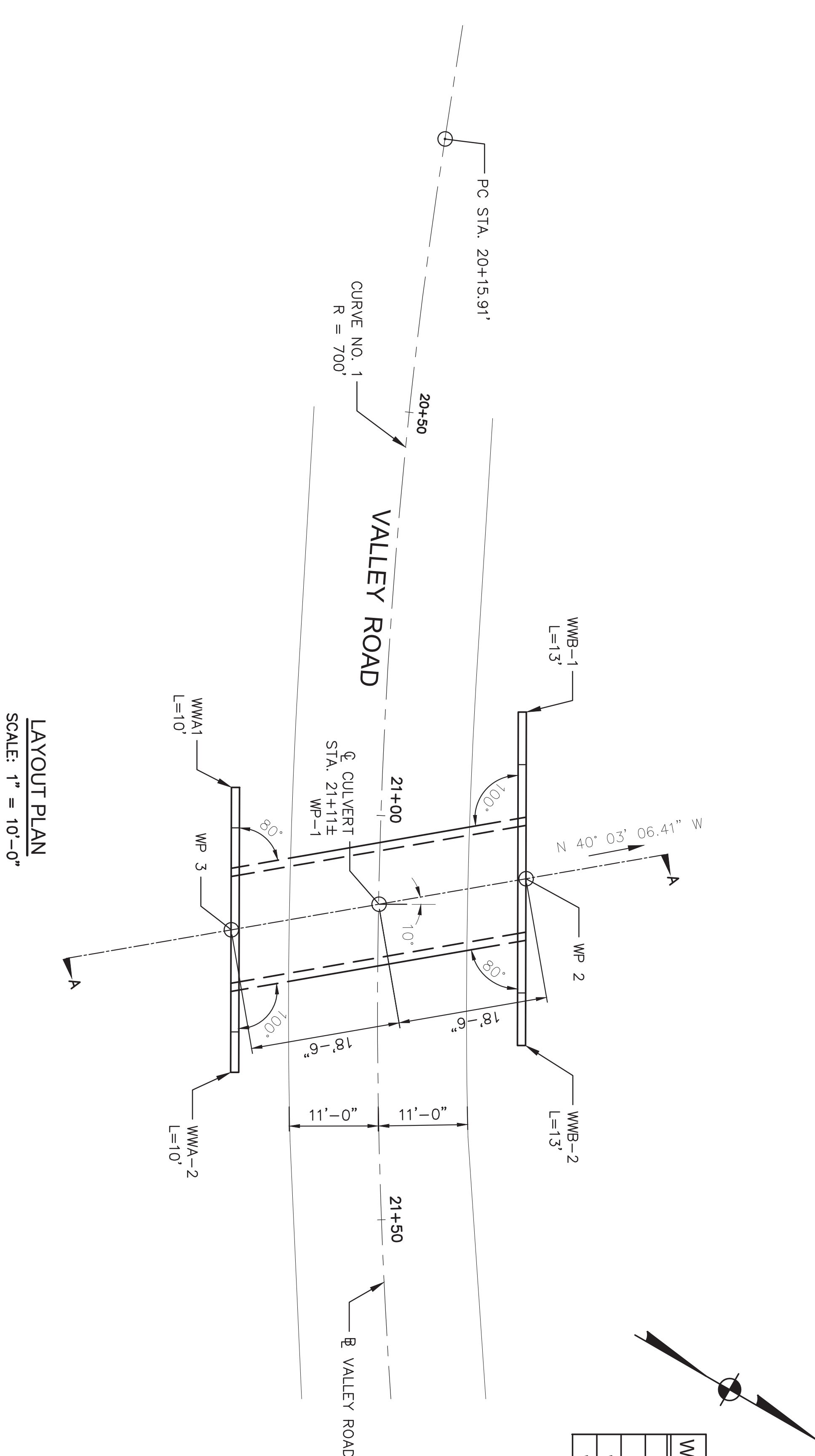
CONCRETE COVER: ALL REINFORCEMENT SHALL HAVE 2" COVER UNLESS DIMENSIONED OTHERWISE.

PREFORMED EXPANSION JOINT FILLER: THE COST OF FURNISHING AND INSTALLING PREFORMED EXPANSION JOINT FILLERS SHALL BE INCLUDED IN THE ITEM "CLASS 'A' CONCRETE".

WORKING POINT COORDINATES			
WP	NORTHING	EASTING	
WP-1	126971.8336	1513318.9746	
WP-2	126953.6666	1513322.1783	
WP-3	126935.3957	1513325.3999	

- NOTES:
- FOR COMPLETE BASELINE GEOMETRY, SEE SHEET NO. HW-1.
 - ROADWAY PROFILE TO MATCH EXISTING.
 - FOR WINGWALL SECTION DETAILS SEE SHEET MDS-3.
 - CUT BITUMINOUS OVERLAY WITH 3" WIDE BY 1 1/2" DEEP KERF AND FILL WITH POURABLE SEALANT. TO BE PAID FOR UNDER THE ITEM "SAWING AND SEALING JOINTS IN BITUMINOUS PAVEMENT."

QUANTITIES		
ITEM	UNITS	TOTALS
STRUCTURE EXCAVATION - EARTH (COMPLETE)	CY	450
STRUCTURE EXCAVATION - ROCK (COMPLETE)	CY	6
HANDLING WATER	LS	1
COMPACTED GRANULAR FILL	CY	30
PERVIOUS STRUCTURE BACKFILL	CY	375
SEDIMENTATION CONTROL SYSTEM	LF	100
SAWING AND SEALING JOINTS IN BIT. CONC. PAVEMENT	LF	70
REMOVAL OF EXISTING CULVERT	LS	1
CLASS 'A' CONCRETE	CY	14
PRECAST CONCRETE WINGWALL	EA	4
13' X 8' PRECAST CONCRETE BOX CULVERT	LF	37
DEFORMED STEEL BARS	LB	1,700
DEFORMED STEEL BARS (EPOXY COATED)	LB	500
DRILLING HOLES AND GROUTING DOWELS	EA	52
MEMBRANE WATERPROOFING (COLD LIQUID ELASTOMERIC)	SY	75
DAMP-PROOFING	SY	175



FREEMAN COMPANIES
 CIVIL ENGINEERING
 1000 WEST 1000 SOUTH
 FREEMAN COMPANIES, LLC
 WESTPORT, CT 06897
 TEL: 860.531.9500 FAX: 860.531.9501
 FREEMAN@FREEMAN.COM

DESIGNED BY: [Signature]
 CHECKED BY: [Signature]
 APPROVED BY: [Signature]

PROPOSED FOR:
 TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY,
 CONNECTICUT 06239

OWNER FOR:
 TOWN OF KILLINGLY
 VALLEY ROAD
 CONNECTICUT 06239

NO. 10028

**REPLACEMENT OF BRIDGE No. 68-002
 VALLEY ROAD OVER WASHENTUCK BROOK
 KILLINGLY, CONNECTICUT**

NO.	DATE	DESCRIPTION	BY	DATE	DESCRIPTION


DESIGNED: [Signature] YL
 DRAWN: [Signature] PJ
 CHECKED: [Signature] DO
 APPROVED: [Signature] PAR
 SCALE: AS NOTED
 PROJECT NO.: 2017-0507
 DATE: 02/03/2020
 CADD: HW_MSH_2017_0507_BRG002_ALN

TITLE: LAYOUT PLAN
 SHEET NUMBER: S-1.2

FREEMAN
 CONSULTANTS
 CIVIL, GEOTECHNICAL, SURVEY & ENVIRONMENTAL
 FREEMAN COMPANIES, LLC
 1480 ROUTE 100
 WASHINGTON, CT 06097
 TEL: 860.339.5141
 FAX: 860.339.5142

PROPOSED FOR:
 TOWN OF KILLINGLY
 KILLINGLY, CT
 CONNECTICUT 06239

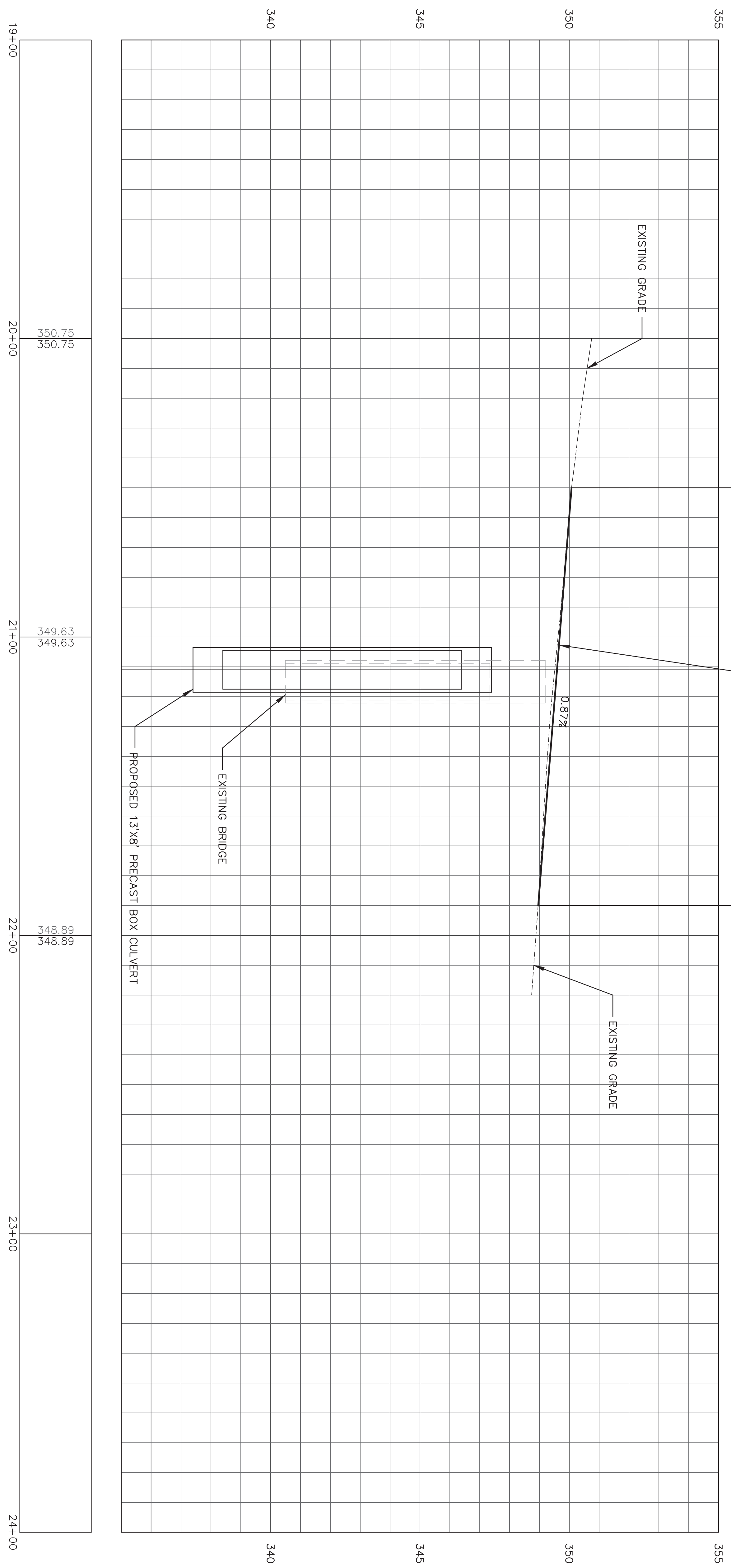
OWNER FOR:
 TOWN OF KILLINGLY
 VALLEY ROAD
 CONNECTICUT 06239



THESE DRAWINGS SHALL NOT BE UTILIZED BY ANY PERSON, FIRM OR CORPORATION WITHOUT THE SPECIFIC WRITTEN PERMISSION OF FREEMAN COMPANIES, LLC

REPLACEMENT OF BRIDGE No. 68-002 VALLEY ROAD OVER WASHENTUCK BROOK KILLINGLY, CONNECTICUT

VALLEY ROAD PROFILE
 H: 1"=10'
 V: 1"=2'



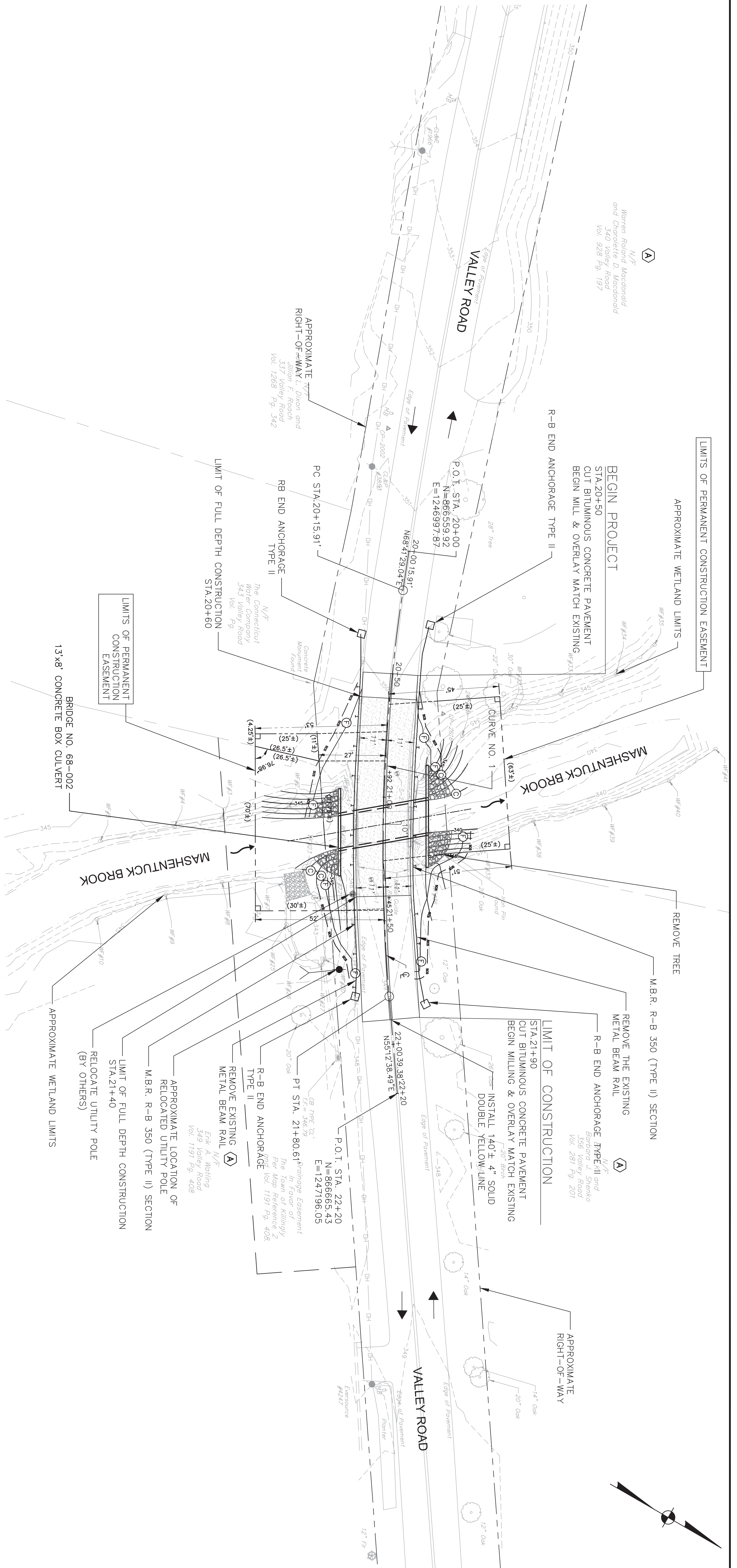
BEGIN PROJECT
 STA. 20+50
 CUT BITUMINOUS CONCRETE PAVEMENT
 BEGIN MILL & OVERLAY
 MATCH EXISTING
 EL=350.10

END PROJECT
 STA. 21+90
 CUT BITUMINOUS CONCRETE PAVEMENT
 END MILL & OVERLAY
 MATCH EXISTING
 EL=348.88

NO.	DATE	DESCRIPTION

DESIGNED:	Y.L.
DRAFTED:	P.T.
CHECKED:	D.O.
APPROVED:	P.A.R.
SCALE:	AS NOTED
PROJECT NO.:	2017-0507
DATE:	09/14/2019
COO:	HM_MSH_2017_0507_BRG002_PRO

TITLE:
ROADWAY PROFILE
 SHEET NUMBER:
PRO-1.1



NOTES

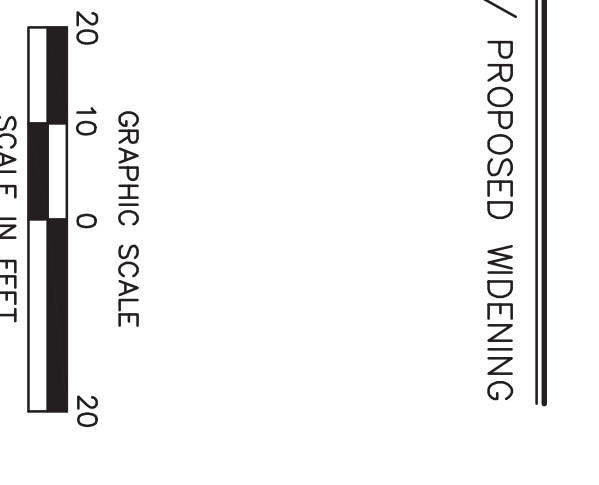
1. ALL SOIL DISTURBANCES SHALL BE TREATED WITH 4" TOP SOIL & TURF ESTABLISHMENT.
2. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL DIMENSIONS AND ELEVATIONS PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL COORDINATE WITH THE ENGINEER REGARDING THE LIMITS OF RESTORATION TO ENSURE A SMOOTH TRANSITION FROM NEW CONSTRUCTION TO EXISTING CONDITIONS.
4. CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" (CBYD) 1-800-922-4455 PRIOR TO COMMENCING CONSTRUCTION.
5. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE PLANS OR AS DIRECTED BY THE ENGINEER.
6. REFER TO STRUCTURAL (S SERIES) DRAWINGS FOR PROPOSED CULVERT DETAILS, GRADING, AND METAL BEAM RAIL POST DETAILS.
7. COST OF REMOVAL OF TREES AND OTHER VEGETATION SHALL BE INCLUDED IN THE COST OF THE ITEM "CLEARING AND GRUBBING".

CURVE DATA

No.	Northing	Easting	Delta(Δ)	Length	Radius
PC	866592.32	1247000.55	N13°28'51"E	164.70'	700.0'
PI	866631.50	1247071.44			
PT	866643.05	1247157.66			

SCHEDULE OF RIGHTS & EASEMENTS

- (A) CONSTRUCTION EASEMENT
- LEGEND**
- [Hatched Box] FULL DEPTH PAVEMENT RECONSTRUCTION / PROPOSED WIDENING
 - (F) FILL/CUT APPROXIMATE SLOPE LIMITS
 - SSS SEDIMENTATION CONTROL SYSTEM
 - ~ APPROXIMATE WETLAND LIMITS
 - - - EASEMENT LINE



FREEMAN
 CONSULTING ENGINEERS
 1000 MAIN STREET
 KILLINGLY, CT 06239
 TEL: 860.639.5141
 FAX: 860.639.5142
 WWW.FREEMAN-CT.COM

DESIGNED FOR: TOWN OF KILLINGLY, KILLINGLY, CT 06239
 OWNER FOR: TOWN OF KILLINGLY, VALLEY ROAD, KILLINGLY, CT 06239

PROJECT NO.: 2017-0507
 DATE: 09/14/2019

NO. DATE DESCRIPTION REVISIONS

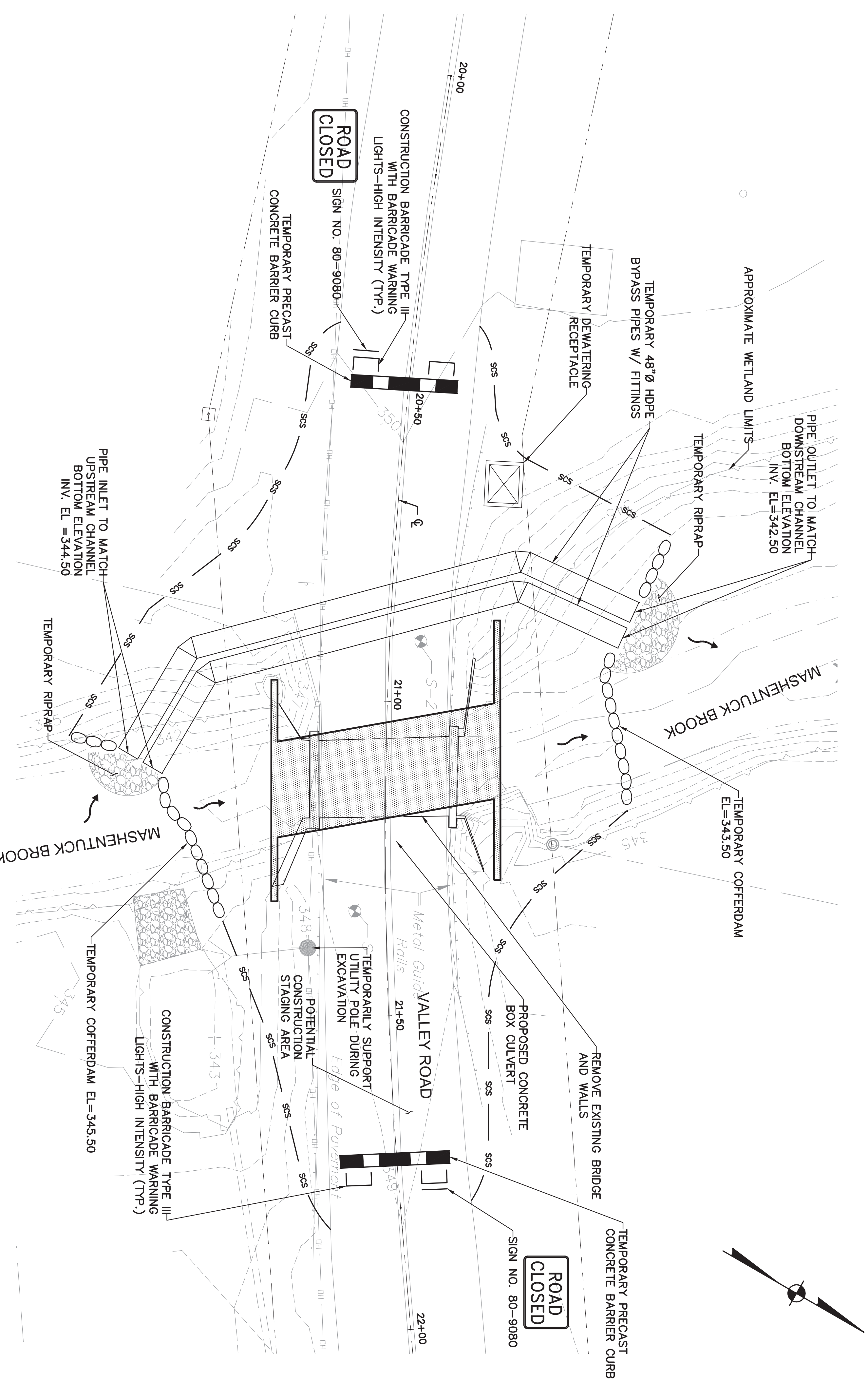
**REPLACEMENT OF BRIDGE NO. 68-002
 VALLEY ROAD OVER WASHENTUCK BROOK
 KILLINGLY, CONNECTICUT**

DESIGNED: YL
 DRAFTED: PT
 CHECKED: DO
 APPROVED: PAR

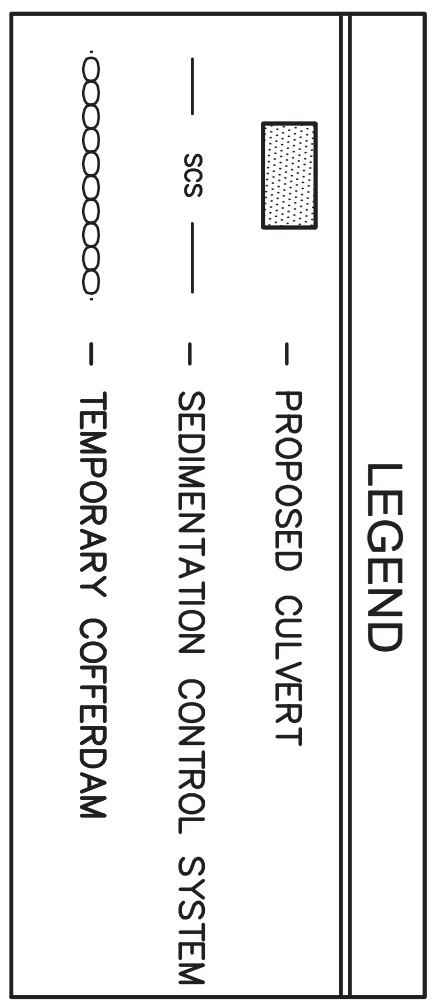
SCALE: AS NOTED

SHEET NUMBER: HWY-1.1

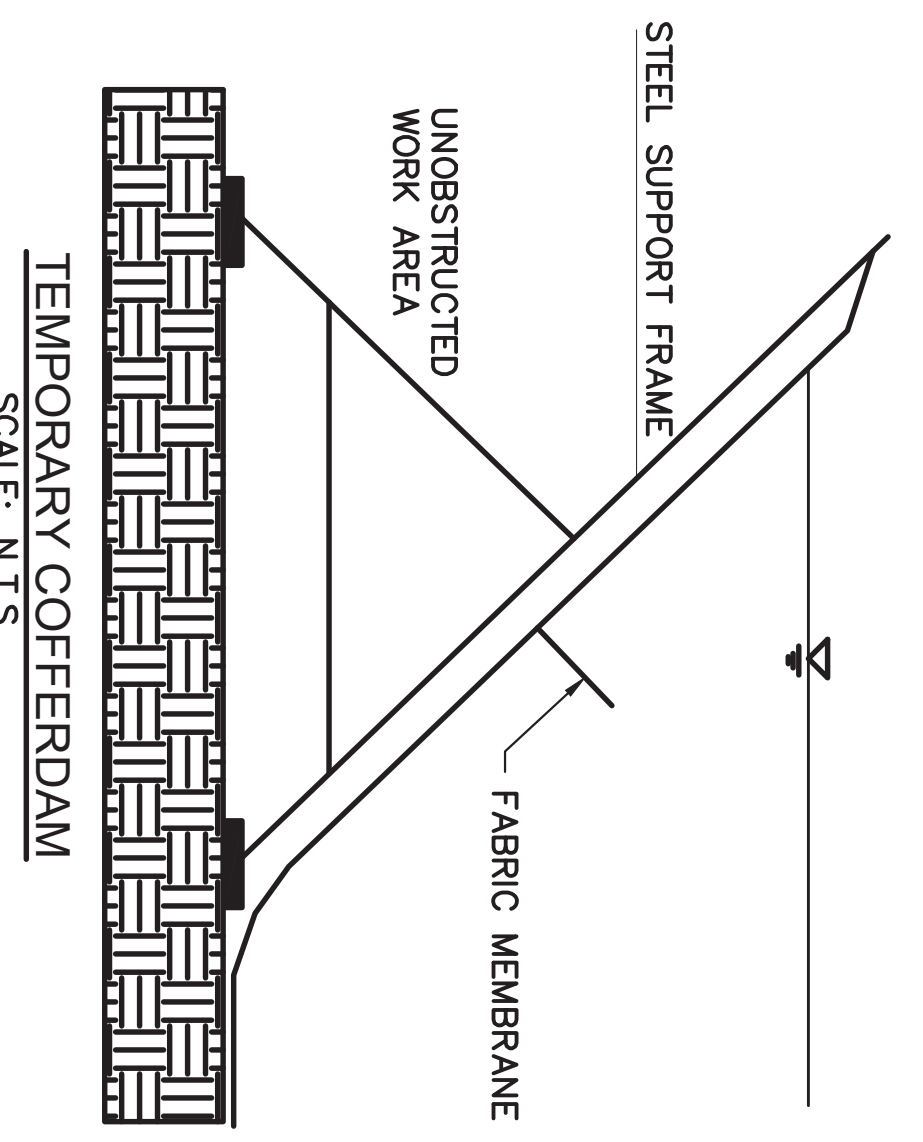
TITLE: ROADWAY PLAN



STAGE 1
SCALE: 1" = 10'-0"

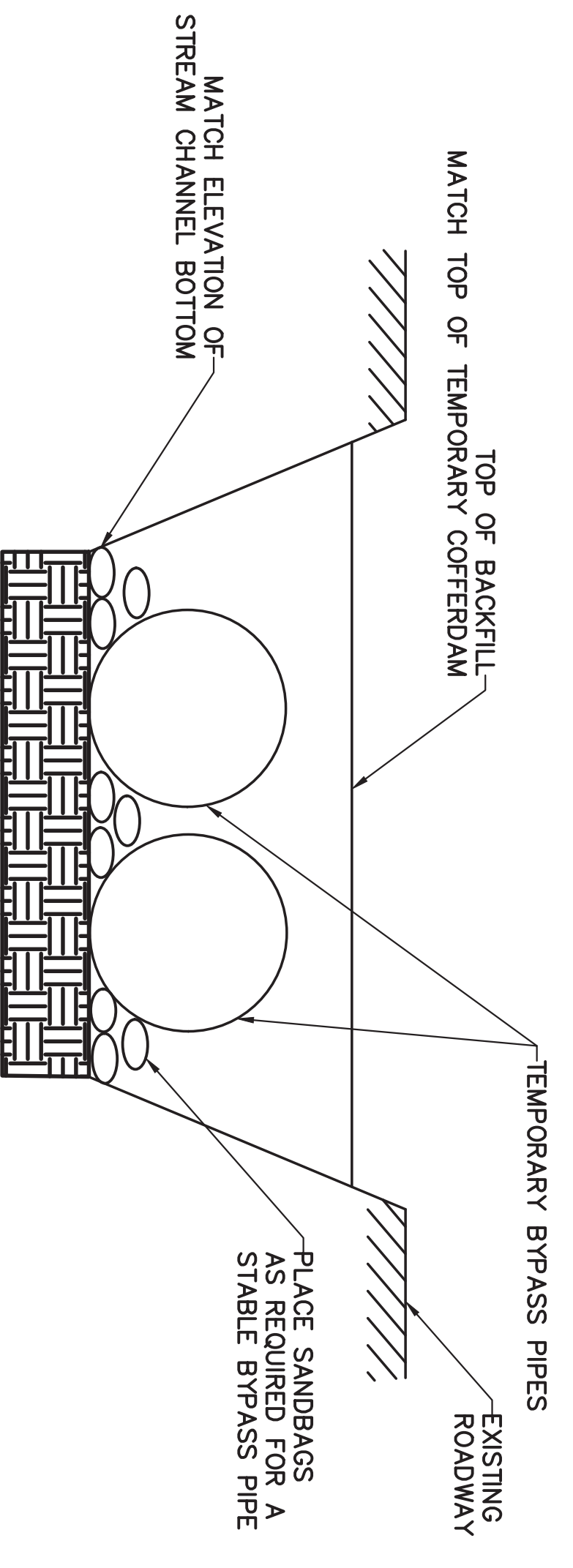


TEMPORARY HYDRAULIC DATA	
TEMPORARY DESIGN FREQUENCY	2-YEAR
TEMPORARY DESIGN DISCHARGE	184 CFS
AVERAGE DAILY FLOW	7.5 CFS
AVERAGE DAILY FLOW ELEVATION	341.69 FT
TEMPORARY WESEL UPSTREAM	345.03 FT
TEMPORARY WESEL DOWNSTREAM	343.08 FT



NOTES:

TEMPORARY COFFERDAM SHOWN ABOVE BASED ON PORTADAM SYSTEM. THE CONTRACTOR MAY CHOOSE TO PROVIDE A DIFFERENT TEMPORARY COFFERDAM SYSTEM AS APPROVED BY THE ENGINEER.



SCALE: N.T.S.

VALLEY ROAD OVER WASHENTUCK WATER HANDLING PLAN

GENERAL NOTES

- THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL A DETAILED PLAN AND NARRATIVE DESCRIBING ITS PROPOSED CONSTRUCTION SEQUENCE INCLUDING DETAILED INFORMATION RELATING TO THE WATER HANDLING.
- BEST MANAGEMENT PRACTICES (BMP) SHALL BE UTILIZED AS APPROPRIATE AND SHALL BE CONSISTENT WITH THE CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENTATION CONTROL.
- CONSTRUCTION ACTIVITIES SHALL CONFORM TO SECTION 1.10, ENVIRONMENTAL COMPLIANCE OF THE STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS, BRIDGES, AND INCIDENTAL CONSTRUCTION, FORM 817.
- DEWATERING, IF AND AS NEEDED, SHALL UTILIZE BMP'S AS APPLICABLE AND AS APPROVED AND ACCEPTABLE BY THE ENGINEER AND THE TOWN OF KILLINGLY.
- BASE STREAM FLOWS SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION. PROVISIONS TO ALLOW SAFE PASSAGE OF A 2-YEAR STORM EVENT SHALL ALSO BE IMPLEMENTED AS REQUIRED.
- MATERIAL EXCAVATED FROM THE RIVERBED SHALL BE STOCKPILED AND USED AS BACKFILL MATERIAL DURING RESTORATION OF THE RIVERBED.
- THE CONTRACTOR MAY PUMP THE BASE FLOW OF THE EXISTING WATERCOURSE AS DEPICTED ON THE PLANS OR INSTALL A GRAVITY FED BYPASS PIPE TO CONVEY FLOW.
- THE CONTRACTOR IS REQUIRED TO SUBMIT A PLAN AND EQUIPMENT SPECIFICATIONS FOR THE PUMP OR BYPASS PIPE FOR APPROVAL BY THE ENGINEER.
- REGARDLESS OF WATER HANDLING METHOD UTILIZED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING AND PROVIDING SAFE PASSAGE OF FLOW AT ALL TIMES INCLUDING INCLEMENT WEATHER.
- DETOUR SHALL BE ESTABLISHED BY THE TOWN.
- ALL MATERIAL EQUIPMENT AND PROCEDURES SHALL BE PRE APPROVED BY THE ENGINEER AND THE TOWN.

SUGGESTED SEQUENCE OF CONSTRUCTION

- PRE-CONSTRUCTION STAGE**
- CONTACT "CALL-BEFORE-YOU-DIG" AND PERFORM UTILITY MARK-OUTS IF AND AS NECESSARY.
 - CLOSE VALLEY ROAD. INSTALL CONSTRUCTION BARRICADES AND DETOUR TRAFFIC OVER TO LOCAL STREETS.
 - INSTALL SEDIMENTATION AND EROSION CONTROL MEASURES AS REQUIRED.
 - INSTALL TEMPORARY BYPASS PIPES.
 - INSTALL TEMPORARY COFFERDAMS AROUND PROPOSED CULVERT AND INSTALL TEMPORARY DEWATERING RECEPICLES AS SHOWN.

- STAGE 1**
- EXCAVATE SITE AND REMOVE EXISTING BRIDGE. DEWATER AS NECESSARY.
 - CONSTRUCT CUT-OFF WALLS AND RETURN WALLS.
 - INSTALL CONCRETE BOX CULVERT, PRECAST CONCRETE WINDWALLS, AND CONSTRUCT HEADWALLS.
 - APPLY MEMBRANE WATERPROOFING OVER TOP SLAB TO LIMITS SHOWN.
 - BACKFILL STRUCTURE AS SHOWN ON THE PLANS AND PER SPECIFICATIONS.
 - COMPLETE GRADE AROUND THE CULVERT AS SHOWN AND INSTALL RIPRAP TO LIMITS SHOWN ON THE PLANS.

- STAGE 2**
- REMOVE TEMPORARY COFFERDAM AND DIVERT WATER FLOW INTO NEW CULVERT.
 - REMOVE BYPASS PIPE AND BACKFILL.
 - CONSTRUCT ROADWAY APPROACHES AND OTHER ROADWAY ITEMS TO LIMITS SHOWN.
 - REPAVE VALLEY ROAD AND RE-ESTABLISH TURF.
 - REMOVE SEDIMENTATION AND EROSION CONTROL MEASURES.
 - PERFORM SITE CLEAN-UP, REMOVE CONSTRUCTION BARRICADES, AND OPEN ROAD TO TRAFFIC.

FREEMAN
CORPORATION
CIVIL ENGINEERS

ONE DICK LANE | SUITE 1000
KILLINGLY, CONNECTICUT 06239

OWNER FOR: TOWN OF KILLINGLY, CONNECTICUT

PROJECT NO.: 2017-0507

DATE: 02/03/2020

SHEET NUMBER: S-1.4

**REPLACEMENT OF BRIDGE NO. 68-002
VALLEY ROAD OVER WASHENTUCK BROOK
KILLINGLY, CONNECTICUT**

NO.	DATE	DESCRIPTION	BY	TITLE
1	02/03/2020	DESIGNED	YL	WATER HANDLING PLAN
2		DRAWN	PT	
3		CHECKED	DO	
4		APPROVED	PAR	

FREEMAN
 CONSULTANTS
 CIVIL, GEOTECHNICAL, SURVEY & ENVIRONMENTAL
 FREEMAN COMPANIES, LLC
 1400 ROUTE 100
 WASHINGTON, CT 06096
 TEL: 860.339.9341
 FAX: 860.339.9342

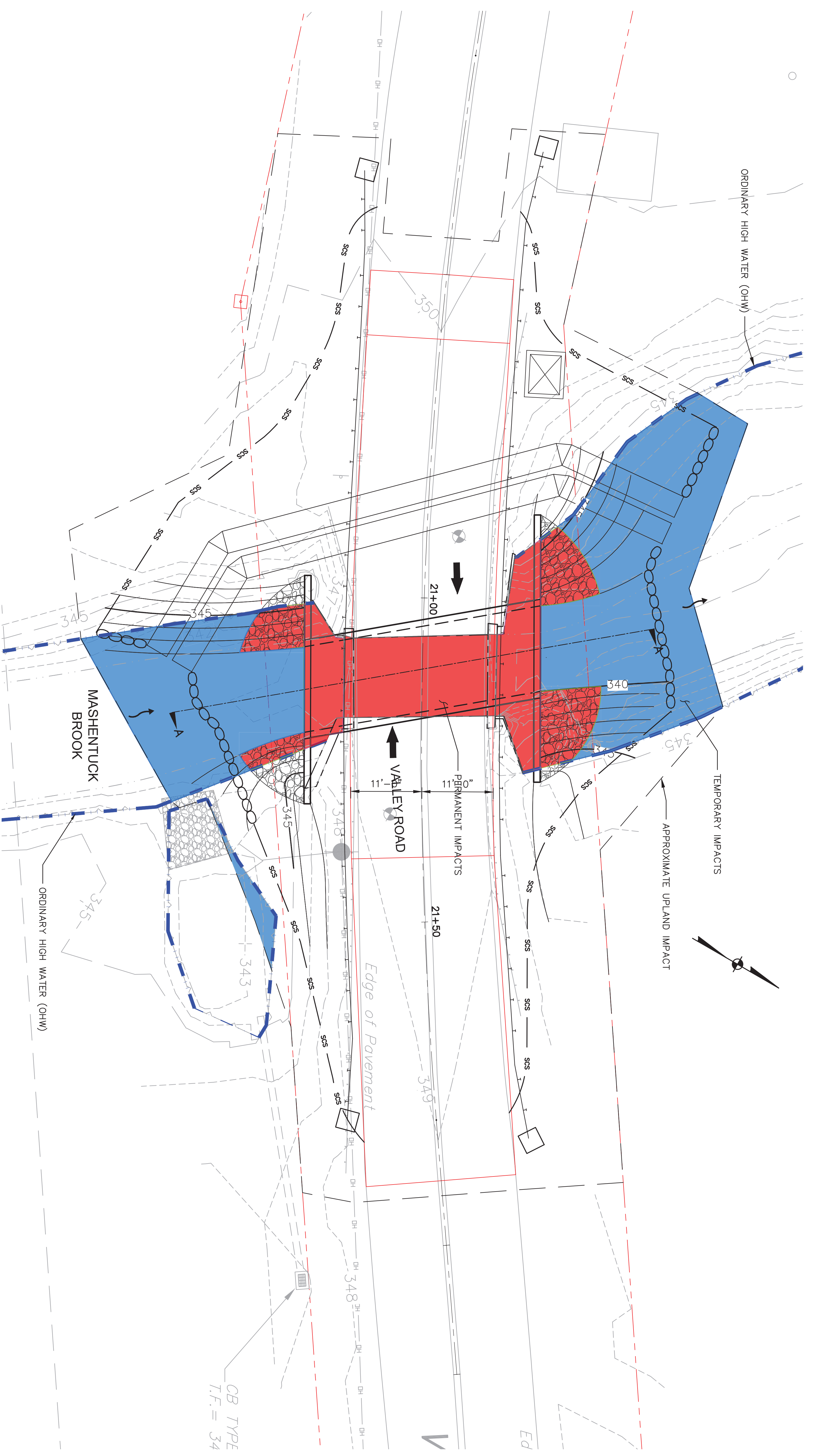
DESIGNED BY: JLB
 CHECKED BY: DO
 APPROVED BY: PAR
 SCALE: AS NOTED
 PROJECT NO.: 2017-0507
 DATE: 02/03/2020
 CAD: HM_MSH_2017_0507_BRG002_GEN (Impacts)

PREPARED FOR:
 TOWN OF KILLINGLY
 KILLINGLY, CT
 CONNECTICUT 06229

OWNER FOR:
 TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY, CT
 CONNECTICUT 06229

ISSUE NUMBER: 16
 DATE: 03.19.2021

REPLACEMENT OF BRIDGE No. 68-002 VALLEY ROAD OVER WASHENTUCK BROOK KILLINGLY, CONNECTICUT



PLAN
 SCALE: 1/8" = 1'-0"

PERMANENT IMPACTS	
WETLAND AREA	0 S.F.
WATERCOURSE AREA	850 S.F.
TOTAL:	850 S.F.

TEMPORARY IMPACTS	
WETLAND AREA	0 S.F.
WATERCOURSE AREA	1,700 S.F.
TOTAL:	1,700 S.F.

UPLANDS IMPACTS	
TOTAL:	8,050 S.F.

LEGEND

- PERMANENT IMPACTS
- TEMPORARY IMPACTS
- - - LIMIT OF DISTURBANCE
- - - ORDINARY HIGH WATER (OHW)

CB TYPE
 T.F. = 34

NO.	DATE	DESCRIPTION	REVISIONS

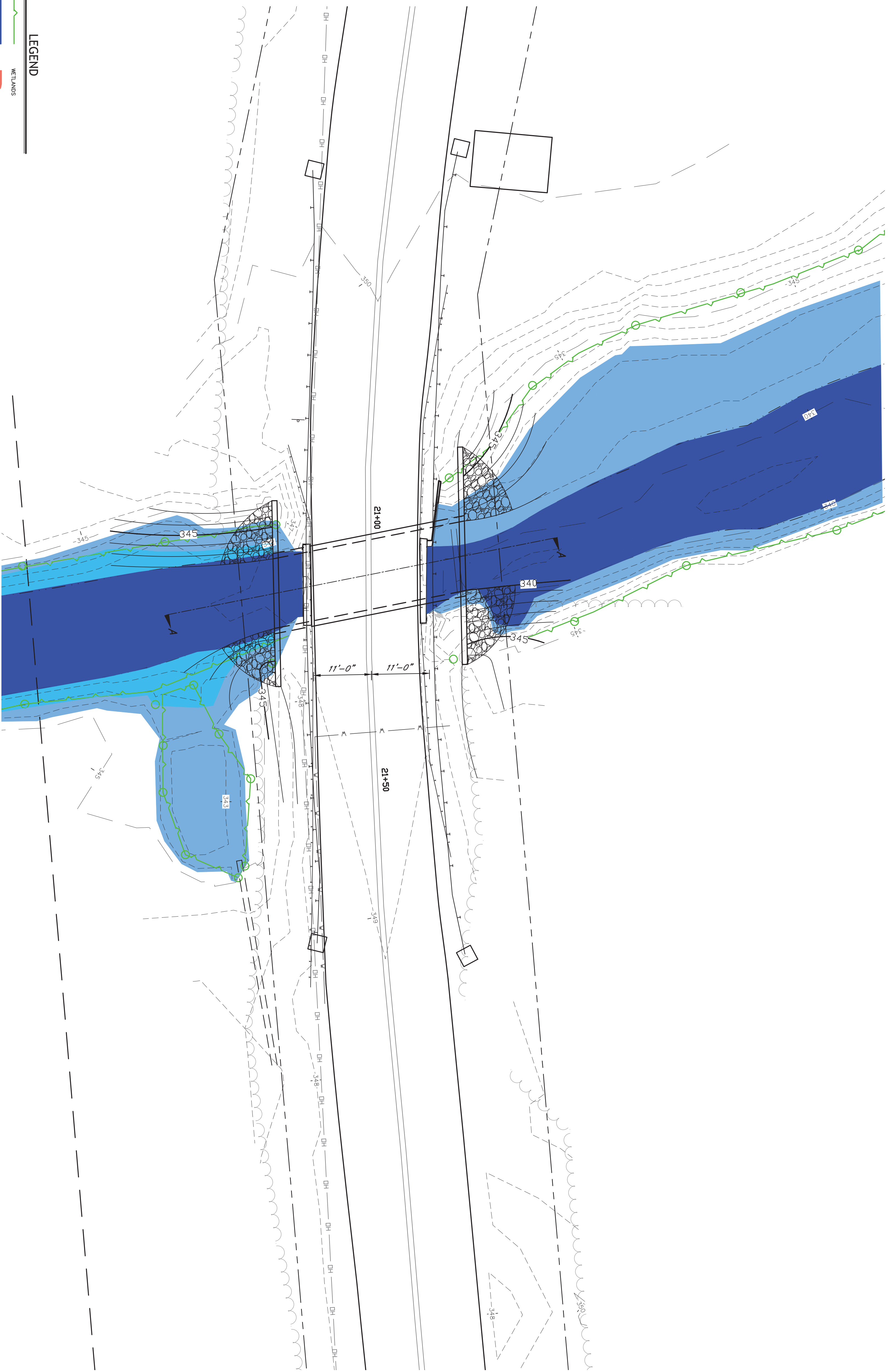
DESIGNED: JLB
 DRAFTER: PT
 CHECKER: DO
 APPROVED: PAR
 SCALE: AS NOTED
 PROJECT NO.: 2017-0507
 DATE: 02/03/2020
 CAD: HM_MSH_2017_0507_BRG002_GEN (Impacts)

TITLE: **IMPACTS**
 SHEET NUMBER: **WL-1**

LEGEND

-  WETLANDS
-  MASHENTUCK BROOK
-  PROPOSED DESIGN - LAND UNDER WATER
-  EXISTING CONDITION - LAND UNDER WATER

2 YEAR STORM CONDITIONS
SCALE: 1" = 10'-0"



FREEMAN COMPANIES
 REGISTERED PROFESSIONAL ENGINEERS
 1000 WEST MAIN STREET, SUITE 200
 WASHINGTON, CT 06097
 TEL: 860.233.9900
 FAX: 860.233.9901
 WWW.FREEMANCOMPANIES.COM

DESIGNED BY: JAMES M. KAYE, P.E.
 NO. 19128

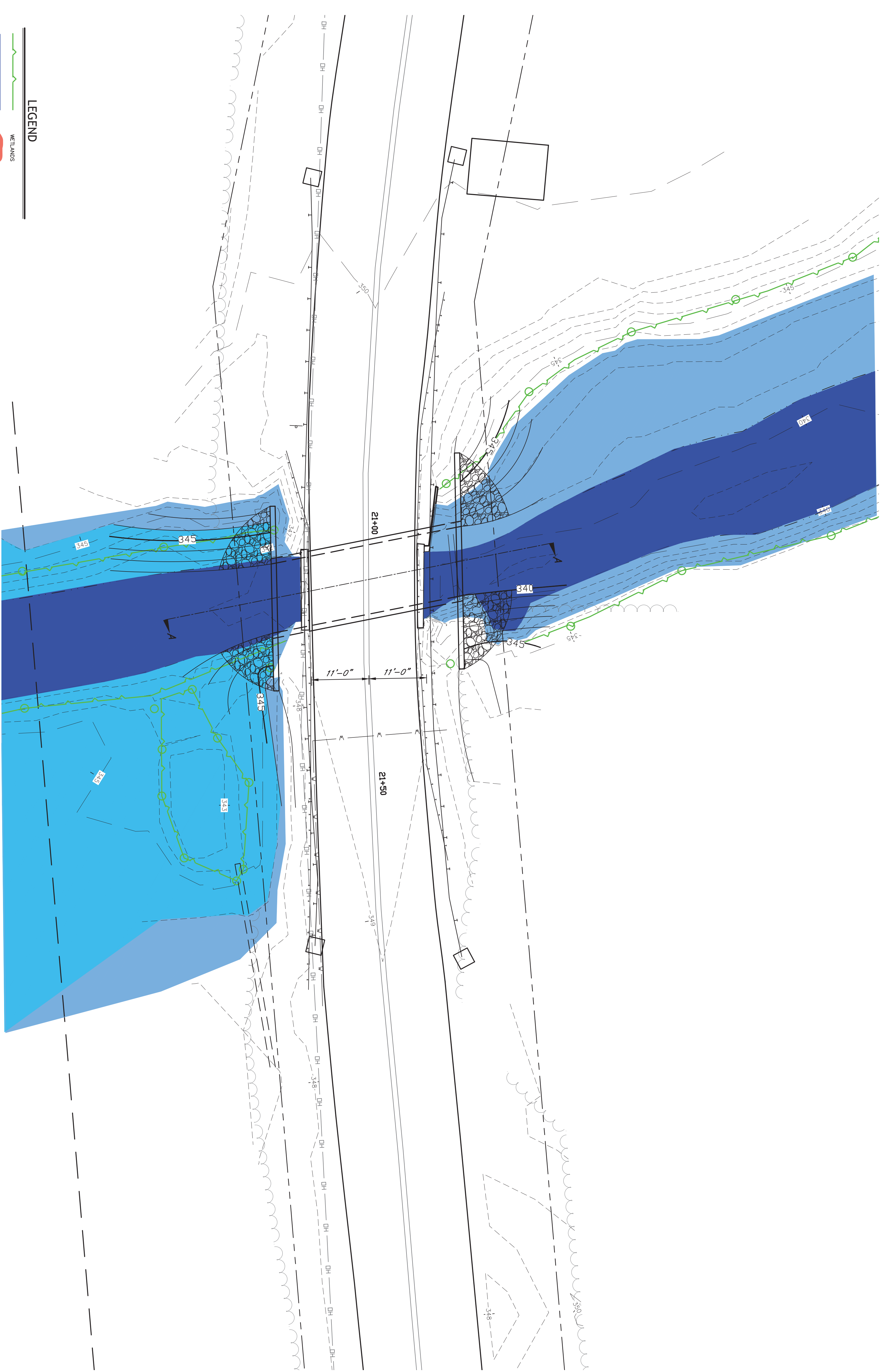
PREPARED FOR:
 TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY, CONNECTICUT 06239

OWNER FOR:
 TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY, CONNECTICUT 06239

STATE OF CONNECTICUT
 REGISTERED PROFESSIONAL ENGINEER
 JAMES M. KAYE, P.E.
 NO. 19128

**REPLACEMENT OF BRIDGE NO. 68-002
 VALLEY ROAD OVER MASHENTUCK BROOK
 KILLINGLY, CONNECTICUT**

NO.	DATE	DESCRIPTION	DESIGNED	BY	TITLE
1	06/14/2019	PROJECT NO. 2017-0507	CAD	PT	HYDRAULIC DATA
2		SCALE: NOT TO SCALE		DO	
3		DATE: 06/14/2019		PAR	
REVISIONS					SHEET NUMBER: C-1

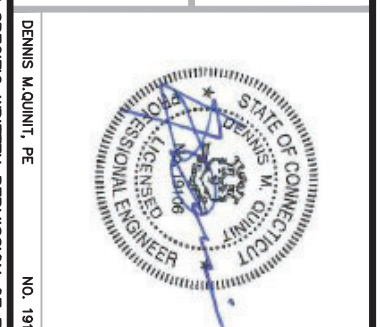


10 YEAR STORM CONDITIONS
SCALE: 1" = 10'-0"

REPLACEMENT OF BRIDGE NO. 68-002 VALLEY ROAD OVER MASHENTUCK BROOK KILLINGLY, CONNECTICUT

FREEMAN COMPANIES
 REGISTERED PROFESSIONAL ENGINEERS
 CIVIL
 FREEMAN COMPANIES, LLC
 1000 ROUTE 1
 WASHINGTON, CT 06097
 TEL: (860) 233-9900
 FAX: (860) 233-9901

PREPARED FOR:
 TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY, CT
 CONNECTICUT 06239



DESIGNED BY:
 DOUGLAS KOZMINT, P.E.
 NO. 19128

DATE: 06/14/2019

PROJECT NO.: 2017-0507

NO. DATE DESCRIPTION REVISIONS

DESIGNED: YL
 DRAWN: PT
 CHECKED: DO
 APPROVED: PAR
 SCALE: NOT TO SCALE
 PROJECT NO.: 2017-0507
 DATE: 06/14/2019

TITLE:
 HYDRAULIC DATA

SHEET NUMBER:
 C-2

PREPARED FOR:
 TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY, CT
 CONNECTICUT 06239

OWNER FOR:
 TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY, CT
 CONNECTICUT 06239

DESIGNED BY:
 DOUGLAS KOZMINT, P.E.
 NO. 19128

DATE: 06/14/2019

PROJECT NO.: 2017-0507

NO. DATE DESCRIPTION REVISIONS

DESIGNED: YL
 DRAWN: PT
 CHECKED: DO
 APPROVED: PAR
 SCALE: NOT TO SCALE
 PROJECT NO.: 2017-0507
 DATE: 06/14/2019

TITLE:
 HYDRAULIC DATA

SHEET NUMBER:
 C-2

PREPARED FOR:
 TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY, CT
 CONNECTICUT 06239

OWNER FOR:
 TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY, CT
 CONNECTICUT 06239

DESIGNED BY:
 DOUGLAS KOZMINT, P.E.
 NO. 19128

DATE: 06/14/2019

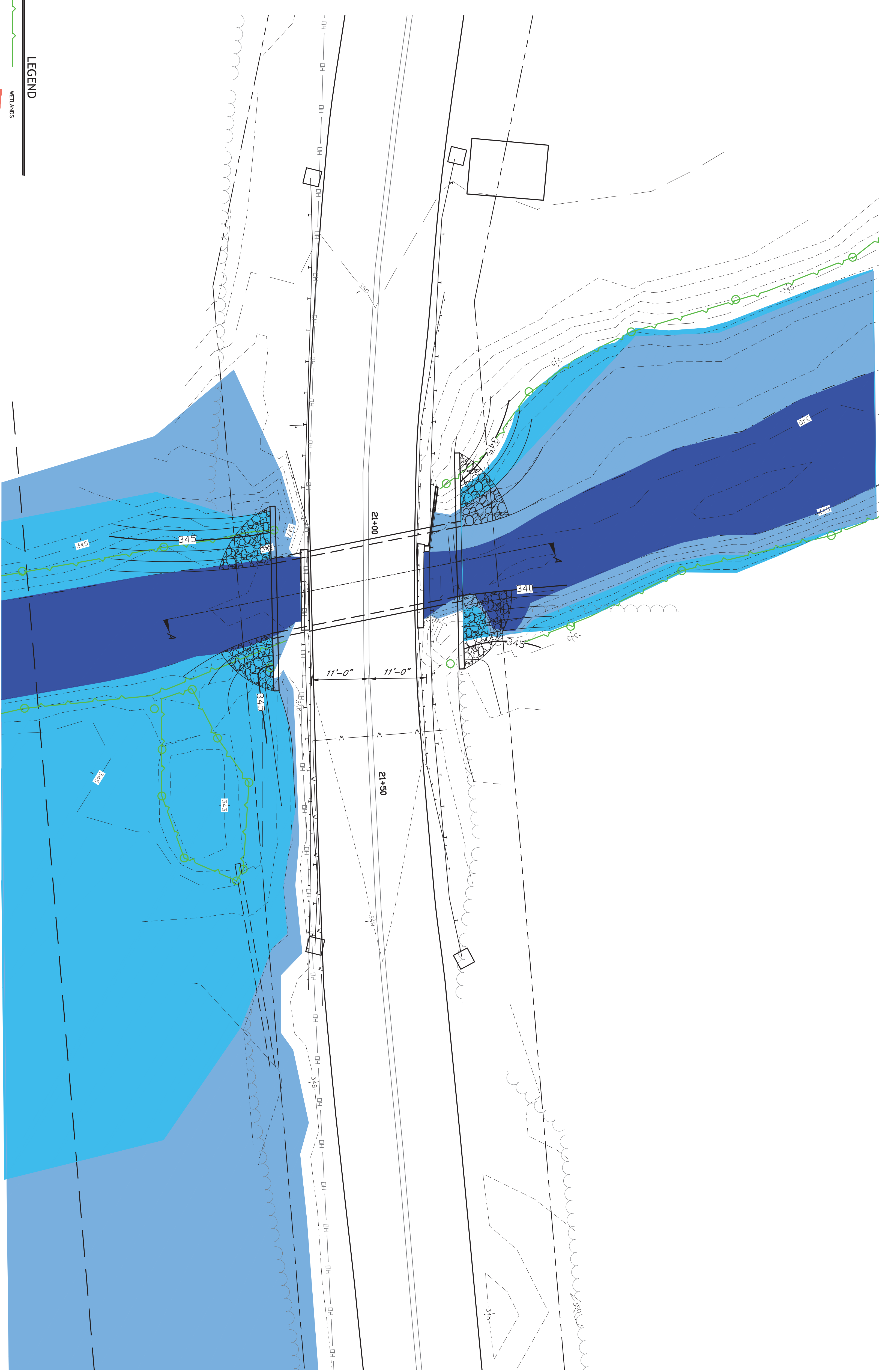
PROJECT NO.: 2017-0507

NO. DATE DESCRIPTION REVISIONS

DESIGNED: YL
 DRAWN: PT
 CHECKED: DO
 APPROVED: PAR
 SCALE: NOT TO SCALE
 PROJECT NO.: 2017-0507
 DATE: 06/14/2019

TITLE:
 HYDRAULIC DATA

SHEET NUMBER:
 C-2



25 YEAR STORM CONDITIONS
SCALE: 1" = 10'-0"

REPLACEMENT OF BRIDGE NO. 68-002
VALLEY ROAD OVER WASHENTUCK BROOK
KILLINGLY, CONNECTICUT

FREEMAN
COMPANIES
INCORPORATED
CIVIL
FREEMAN COMPANIES, LLC
1000 MAIN STREET
WATERBURY, CT 06705
TEL: 860.233.9950
FAX: 860.233.9951

PREPARED FOR:
TOWN OF KILLINGLY
VALLEY ROAD
KILLINGLY,
CONNECTICUT 06239

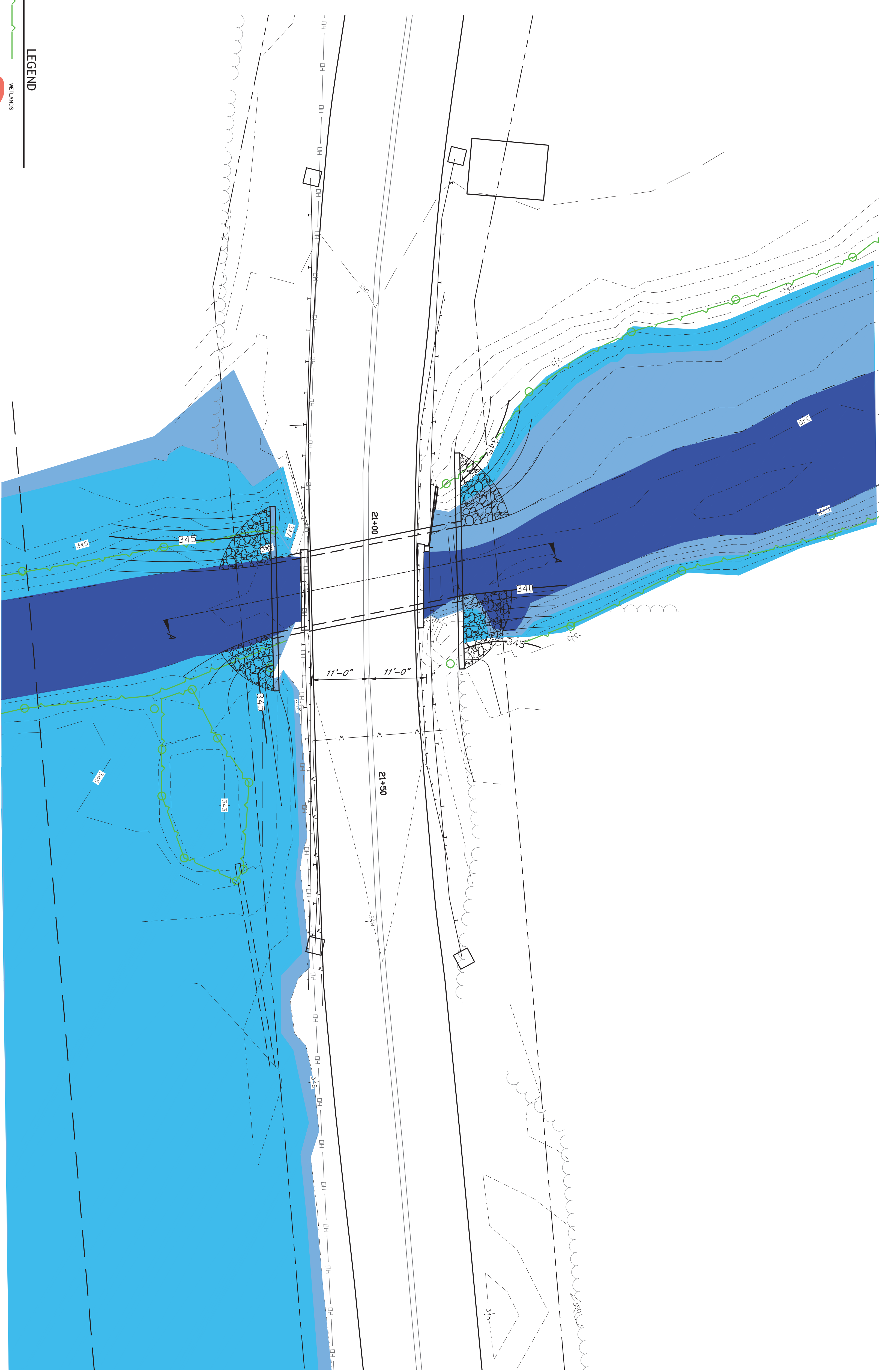
OWNER FOR:
TOWN OF KILLINGLY
VALLEY ROAD
KILLINGLY,
CONNECTICUT 06239



DOING BUSINESS AS:
NO. 19128

NO.	DATE	DESCRIPTION	REVISIONS

DESIGNED:	YI	TITLE:
DRAWN:	PT	HYDRAULIC DATA
CHECKED:	DO	
APPROVED:	PAR	
SCALE:	NOT TO SCALE	
PROJECT NO.:	2017-0507	
DATE:	06/14/2019	
		SHEET NUMBER:
		C-3



LEGEND

- WETLANDS
- DENMAN BROOK
- PROPOSED DESIGN - LAND UNDER WATER
- EXISTING CONDITION - LAND UNDER WATER

50 YEAR STORM CONDITIONS
 SCALE: 1" = 10'-0"

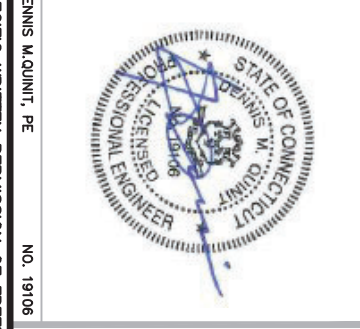
**REPLACEMENT OF BRIDGE NO. 68-002
 VALLEY ROAD OVER MASHENTUCK BROOK
 KILLINGLY, CONNECTICUT**

FREEMAN COMPANIES
 REGISTERED PROFESSIONAL ENGINEERS
 CIVIL ENGINEERING
 FREEMAN COMPANIES, LLC
 1000 STATE STREET
 SUITE 200
 KILLINGLY, CT 06239
 TEL: 860.233.9950
 FAX: 860.233.9951

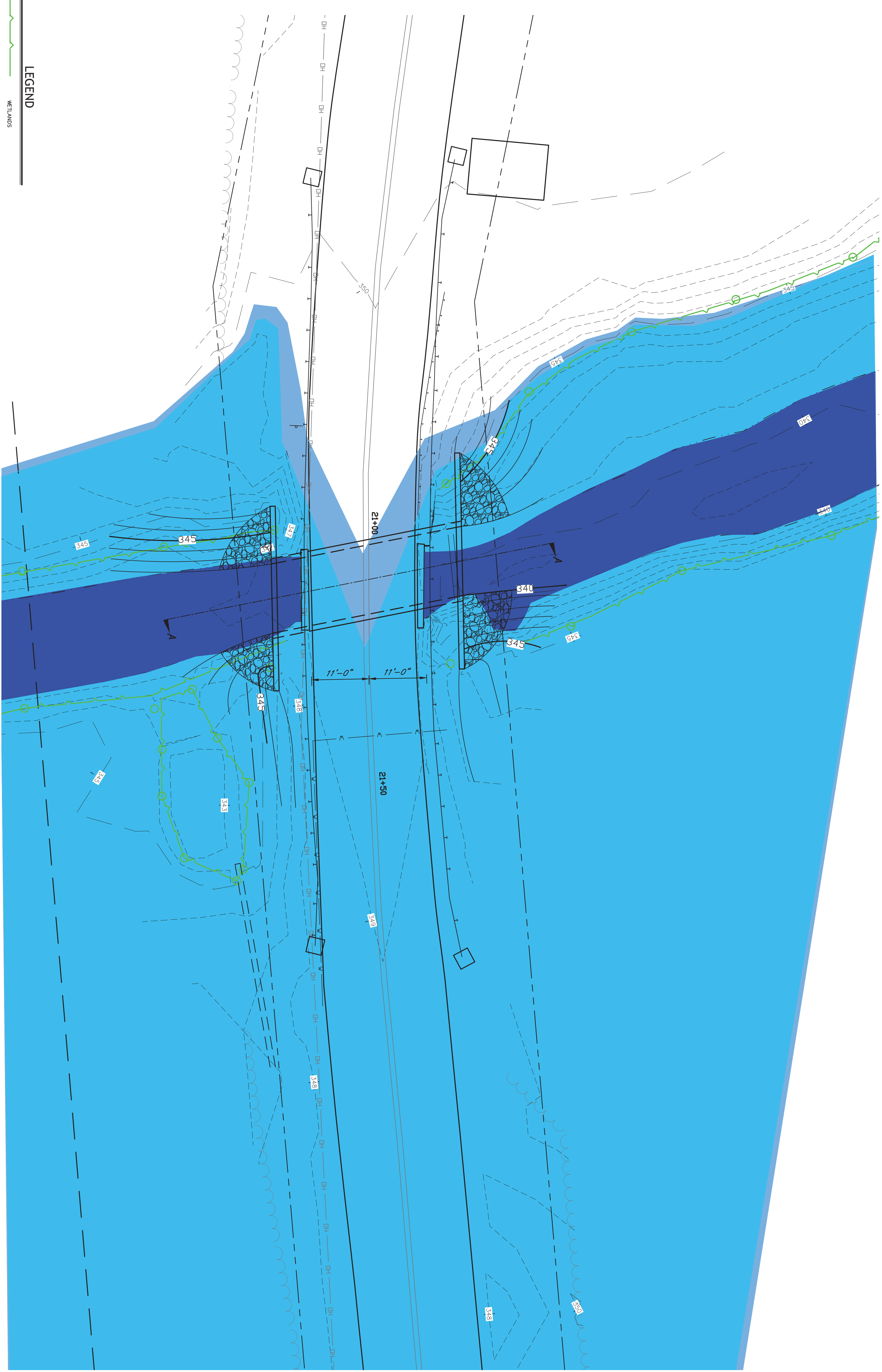
PREPARED FOR:
 TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY, CT 06239

OWNER FOR:
 TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY, CT 06239

DESIGN NUMBER: 68-002



NO.	DATE	DESCRIPTION	DESIGNED	PL	TITLE
1			PT	PT	HYDRAULIC DATA
2			DO	DO	
3			PAR	PAR	SHEET NUMBER: C-4
4			NOT TO SCALE	NOT TO SCALE	
PROJECT NO.: 2017-0507			DATE: 06/14/2019		
NO. DATE DESCRIPTION REVISIONS			CAD: 2017-0507 MASHENTUCK_HYDRAULIC2		



LEGEND

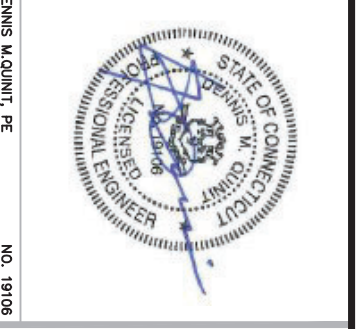
- WETLANDS
- DEEMAN BROOK
- PROPOSED DESIGN - LAND UNDER WATER
- EXISTING CONDITION - LAND UNDER WATER

100 YEAR STORM CONDITIONS
SCALE: 1" = 10'-0"

**REPLACEMENT OF BRIDGE NO. 68-002
VALLEY ROAD OVER WASHENTUCK BROOK
KILLINGLY, CONNECTICUT**

FREEMAN COMPANIES
INCORPORATED IN CONNECTICUT
1000 WEST MAIN STREET, SUITE 200
MIDDLETOWN, CT 06457
TEL: 860.233.9900
WWW.FREEMANCOMPANIES.COM

PREPARED FOR:
TOWN OF KILLINGLY
VALLEY ROAD
KILLINGLY, CT
CONNECTICUT 06239



OWNER FOR:
TOWN OF KILLINGLY
VALLEY ROAD
KILLINGLY, CT
CONNECTICUT 06239

DESIGNED BY:
PT
CHECKED BY:
DO
APPROVED BY:
PAB
SCALE:
PROJECT NO.:
DATE:

DESIGNED BY:
PT
CHECKED BY:
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APPROVED BY:
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PROJECT NO.:
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CHECKED BY:
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APPROVED BY:
PAB
SCALE:
PROJECT NO.:
DATE:

TITLE:
HYDRAULIC DATA
SHEET NUMBER:
C-5

NO. DATE DESCRIPTION REVISIONS

Regulatory and Enforcement Branch
U.S. Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

Attn: Kevin Kotelly, Chief Permits and Enforcement Branch B

Re: 202065402-PCN, Concurrence of Eligibility
NAE-2021-00304
Valley Road over Whetstone Brook, Killingly, CT 06241

Dear Mr. Kotelly:

The above-referenced Pre-Construction Notification (“PCN”) was submitted to the Connecticut Department of Energy and Environmental Protection (“DEEP”) on January 19, 2021 and made complete on March 9, 2022 by the Town of Killingly, for eligibility screening under the Department of the Army Regional General Permit for the State of Connecticut (“CT RGP”) dated December 15, 2021, and authorized and conditioned pursuant to Section 401 of the Federal Clean Water Act.

Project: The applicant proposes activities in Waters of the United States which will result in the following impacts, as shown on attached plans titled “*Construction Plans for Replacement of Bridge No. 68-003 Valley Road over Whetstone Brook Town of Killingly, CT Final Design Plans,*” 13 sheets, dated September 4, 2018, sheets S-2.1, S-2.2, and S-2.4 revised February 18, 2022, sheet HWY-2.1 and PRO-2.1 revised June 14, 2019, sheets WL-2, C-1, C-2, C-3, C-4, and C-5 revised October 5, 2020, and prepared by Freeman Companies:

1. Replace an existing 20’ long and 18” clear span with wingwalls with twin 35.5’ long, 10’ wide by 7’ high box culverts filled with 1’ of natural streambed material with four (4) new wingwalls; and
2. Temporarily install cofferdams for water handling.

	<u>Waterway</u>	<u>Wetland</u>	<u>Total</u>
Temporary:	2,275 sf	0 sf	2,275 sf
Permanent:	750 sf	0 sf	750 sf
Total:	3,025 sf	0 sf	3,025 sf

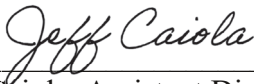
Adaptive Best Management Practices. The Best Management Practices described in Attachment A included with this letter were found to be insufficient to protect existing and designated uses of waters such as propagation of fish, shellfish and wildlife, recreation, public water supply, and agriculture, industrial use and navigation, and the water quality necessary for their protection. Therefore, the following adaptive best management practices shall also be employed to protect water quality and designated uses of waters:

- 1. Time-of-Year Restriction.** Any unconfined instream work within Whetstone Brook shall be restricted to the period from June 1 to September 30, inclusive.
- 2. Road Barricade and Flood Warnings.** The Project Proponent shall post signage at both crossing approaches, warning that the road is subject to flooding. In the event that a significant storm event is forecast that is likely to cause road overtopping, the Project Proponent shall make provisions for barricading the road.
- 3. Stormwater Maintenance.** Prior to the commencement of the proposed activities, the Project Proponent shall clear the stormwater drainage outlet directly upstream of the crossing on the eastern bank of the brook such that it is functioning as designed and free of debris and excess sediment.

Staff of the Land & Water Resources Division (the “Division”) have reviewed the project and determined that the proposed regulated work is eligible for PCN coverage under CT RGP #6 & 19. Therefore, an individual application to DEEP is not required at this time, provided that the project receives approval from the U.S. Army Corps of Engineers under the CT RGP and that the authorized activities proceed as described in the PCN documentation provided to the Division in the above-referenced notification.

Please be advised that conducting regulated activities without the required state Section 401 Water Quality Certification (WQC) and federal Section 404 WQC is a violation of law and is subject to enforcement proceedings and legal action under 33 CFR Part 326 and citations thereunder.

If you have any questions or need additional information, please contact Farrah Ashe at 860-424-3169 or Farrah.Ashe@ct.gov.



Jeff Caiola, Assistant Director
Land and Water Resources Division
Bureau of Water Protection and Land Reuse

5-12-2022
Date

CC (via email):

David Capacchione, Town of Killingly, dcapacchione@killinglyct.gov

Jeffery LeBeau, Freeman Companies, jlebeau@freemancos.com

Dennis Quinit, Freeman Companies, dquinit@freemancos.com

Peter Olmstead, USACE, Peter.D.Olmstead@usace.army.mil

Stacy Pappano, CT DEEP, Stacy.Pappano@ct.gov

ATTACHMENT A
GENERAL TERMS AND CONDITIONS

1. **Best Management Practices.** In constructing or maintaining the activities authorized herein, the permittee shall employ best management practices in accordance with Section 22a-426-1 of the Regulations for Connecticut State Agencies, consistent with the terms and conditions of this certificate, to control storm water discharges and erosion and sedimentation and to prevent pollution. Such practices to be implemented by the permittee at the site include, but are not necessarily limited to:
- a. Prohibiting dumping of any quantity of oil, chemicals or other deleterious material on the ground;
 - b. Immediately informing the Commissioner's Oil and Chemical Spill Response Division at (860) 424-3338 (24- hour phoneline) of any adverse impact or hazard to the environment, including any discharges, spillage, or loss of oil or petroleum or chemical liquids or solids, which occurs or is likely to occur as the direct or indirect result of the activities authorized herein;
 - c. Separating staging areas at the site from the regulated areas by silt fences or straw/hay bales at all times;
 - d. Prohibiting storage of any fuel and refueling of equipment within twenty-five (25) feet from any wetland or watercourse;
 - e. Preventing pollution of wetlands and watercourses in accordance with the document "Connecticut Guidelines for Soil Erosion and Sediment Control" as revised. Said controls shall be inspected by the permittee for deficiencies at least once per week and immediately after each rainfall and at least daily during prolonged rainfall. The permittee shall correct any such deficiencies within 48 hours of said deficiencies being found;
 - f. Stabilizing disturbed soils in a timely fashion to minimize erosion. If a grading operation at the site will be suspended for a period of thirty (30) or more consecutive days, the permittee shall, within the first seven (7) days of that suspension period, accomplish seeding and mulching or take such other appropriate measures to stabilize the soil involved in such grading operation. Within seven (7) days after establishing final grade in any grading operation at the site the permittee shall seed and mulch the soil involved in such grading operation or take such other appropriate measures to stabilize such soil until seeding and mulching can be accomplished.
 - g. Prohibiting the storage of any materials at the site which are buoyant, hazardous, flammable, explosive, soluble, expansive, radioactive, or which could in the event of a flood be injurious to human, animal or plant life, below the elevation of the five hundred (500) year flood. Any other material or equipment stored at the site below said elevation by the permittee or the permittee's contractor must be firmly anchored, restrained or enclosed to prevent flotation. The quantity of fuel stored below such elevation for equipment used at the site shall not exceed the quantity of fuel that is expected to be used by such equipment in one day.
 - h. Immediately informing the Commissioner's Land & Water Resources Division at (860) 424-3019 and the U.S. Army Corps of Engineers' Permit Compliance Section at (617) 647-8674, of the occurrence of pollution or other environmental damage resulting from construction or maintenance of the authorized activity or any construction associated therewith in violation of this certificate. The permittee shall, no later than 48 hours after the permittee learns of a violation of this certificate, report same in writing to the Commissioner. Such report shall contain the

following information:

- (i) the provision(s) of this certificate that has/have been violated;
- (ii) the date and time the violation(s) was first observed and by whom;
- (iii) the cause of the violation(s), if known
- (iv) if the violation(s) has ceased, the duration of the violation(s) and the exact date(s) and times(s) it was corrected;
- (v) if the violation(s) has not ceased, the anticipated date when it will be corrected;
- (vi) steps taken and steps planned to prevent a reoccurrence of the violation(s) and the date(s) such steps were implemented or will be implemented;
- (vii) the signatures of the permittee and of the individual(s) responsible for actually preparing such report, each of whom shall certify said report in accordance with condition 8 of this certificate.

For information and technical assistance, contact the Land & Water Resources Division at (860) 424-3019.

2. **Inspection of the Facility or Activity, Adaptive Best Management Practices & Compliance with Conditions.** The concurrence of eligibility letters for Pre- Construction Notifications will be considered the initial inspection of the facility or activity for the purpose of determining whether the discharge from the certified project may violate WQC-202108351 (Non-Tidal) of the Department of the Army Regional General Permit for the State of Connecticut. The concurrence of eligibility letters may also address the remedial actions necessary in order to be considered to be compliance with this certification.

In the event that Best Management Practices employed to maintain compliance with the conditions of this Water Quality Certificate, as described in paragraph 1 above, have been found to be insufficient to protect existing and designated uses of waters such as propagation of fish, shellfish and wildlife, recreation, public water supply, and agriculture, industrial use and navigation, and the water quality necessary for their protection, such permittee shall employ additional or alternative adaptive best management practices to protect water quality.

All work and all activities authorized herein conducted by the permittee at the site shall be consistent with the terms and conditions of this certificate. Upon initiation of the activities authorized herein, the permittee thereby accepts and agrees to comply with the terms and conditions of this Water Quality Certificate.

3. **Rights.** This certificate is subject to and does not derogate any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material nor any exclusive privileges and is further subject to any and all public and private rights and to any federal, state, or local laws or regulations pertinent to the property or activity affected hereby. This certification does not comprise the permits or approvals as may be required by Chapters 440, 446i, 446j and 446k of the Connecticut General Statutes.
4. **Expiration of Certificate.** The Section 401 Water Quality Certifications contained herein shall be valid until such time as the Department of the Army Regional General Permits for the State of Connecticut expires or is modified, suspended, revoked or reissued.
5. **Transfer of Certificate.** This authorization is not transferable without the written consent of the Commissioner

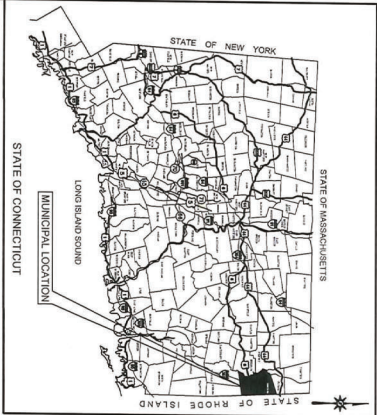
6. **Reliance on Application.** In evaluating the permittee's application, the Commissioner has relied on information provided by the permittee. If such information subsequently proves to be false, deceptive, and incomplete or inaccurate, this certificate may be modified, suspended or revoked.
7. **Installation and Removal of Confining Structures.** Confinement of a work area by cofferdam techniques using sandbag placement, sheet pile installation (vibratory method only), portadam, or similar confinement devices is allowed any time of the year unless specifically prohibited by a permit condition. The removal of such confinement devices is allowed any time of the year unless specifically prohibited by a permit condition. Once a work area has been confined, in-water work within the confined area is allowed any time of the year. The confinement technique used shall completely isolate and protect the confined area from all flowing water. The use of silt boom/curtain or similar technique as a means for confinement is prohibited.
8. **Certification of Documents.** Any document, including but not limited to any notice, which is required to be submitted to the Commissioner under this certificate shall be signed by the permittee, a responsible corporate officer of the permittee, a general partner of the permittee, or a duly authorized representative of the permittee and by the individual or individuals responsible for actually preparing such document, each of whom shall certify in writing as follows:

"I have personally examined and am familiar with the information submitted in this document and all attachments and certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief, and I understand that any false statement made in this document or its attachments may be punishable as a criminal offense in accordance with Section 22a-6 under Section 53a-157 of the Connecticut General Statutes."

9. **Submission of Documents.** The date of submission to the Commissioner of any document required by this certificate shall be the date such document is received by the Commissioner. Except as otherwise specified in this certificate, the word "day" as used in this certificate means the calendar day. Any document or action which falls on a Saturday, Sunday, or legal holiday shall be submitted or performed by the next business day thereafter.

Any document or notice required to be submitted to the Commissioner under this certificate shall, unless otherwise specified in writing by the Commissioner, be directed to:

Director, Land & Water Resources Division
Bureau of Water Protection and Land Reuse
Department of Energy & Environmental Protection
79 Elm Street
Hartford, Connecticut 06106-5127

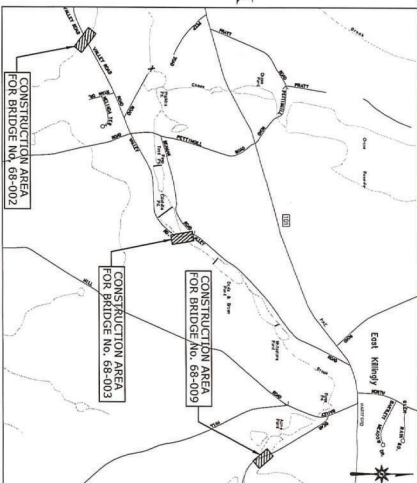


CONSTRUCTION PLANS FOR REPLACEMENT OF BRIDGE NO.68-002 VALLEY ROAD OVER MASHENTUCK BROOK REPLACEMENT OF BRIDGE NO.68-003 VALLEY ROAD OVER WHESTONE BROOK REPLACEMENT OF BRIDGE NO.68-009 BEAR HILL ROAD OVER UNNAMED BROOK

TOWN OF KILLINGLY, CT

FINAL DESIGN PLANS

PREPARED FOR:
TOWN OF KILLINGLY
172 MAIN STREET
KILLINGLY, CONNECTICUT 06239



GENERAL NOTES:

CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS, BRIDGES AND INCIDENTAL CONSTRUCTION, FORM 817, DATED 2016, SUPPLEMENTAL SPECIFICATIONS, DATED JANUARY 2016, AND SPECIAL PROVISIONS.
ALL HORIZONTAL GEOMETRY ON THIS PROJECT IS BASED ON HORIZONTAL DATUM
ALL ELEVATIONS ON THIS PROJECT BASED ON NAVD83.
DESIGN STANDARDS:
TOWN OF KILLINGLY DESIGN STANDARDS
CONNECTICUT DEPARTMENT OF TRANSPORTATION HIGHWAY DESIGN MANUAL, 2003 EDITION.
A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS 2011 EDITION, PUBLISHED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO).
CONNECTICUT DEPARTMENT OF TRANSPORTATION BRIDGE DESIGN MANUAL, 2003 EDITION.
AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

TOWN OF KILLINGLY, CONNECTICUT

APPROVED BY:

DAVID CAVACCHIONE, P.E.
TOWN ENGINEER

DATE

DESIGN BY:
FREEMAN
COMPANIES
LAND DEVELOPMENT ENGINEERING DESIGN CONSTRUCTION SERVICES

DENNIS M. QUINN, P.E.
CT PROFESSIONAL ENGINEER REG. NO. 19106
DATE: 04/20/18



DATES

ISSUE DATE: SEPTEMBER 04, 2018
REVISION:

SUBCONSULTANTS:

GIBSON ENVIRONMENTAL SERVICES

CONTENTS

TITLE SHEET
SUBSET - 01 BRIDGE NO. 68-002 (SITE NO.1)
SUBSET - 02 BRIDGE NO. 68-003 (SITE NO.2)
SUBSET - 03 BRIDGE NO. 68-009 (SITE NO.3)
MDS-1-3 MISCELLANEOUS DETAILS

STANDARD STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION DETAILS

HW-411.01 CONCRETE CURBING
HW-415.01 ENTAINMENTS CONCRETE CURBING
HW-422.01 TEMPORARY PRECAST CONCRETE BARRIER CURB
HW-510.01 WELDED METAL BEAM RAIL HARDWARE
HW-510.02 METAL BEAM RAIL (TYPE R-4.50) GUARDRAIL
HW-510.03 METAL BEAM RAIL (TYPE R-4.50) SYSTEMS 5, 5A & 6
HW-510.04 METAL BEAM RAIL R-4.50 SMALL TYPE II II SECTIONS
HW-510.05 R-4.50 BRIDGE ATTACHMENT VERTICAL SHOVE PARAPET
HW-510.06 MISCELLANEOUS GUARDRAIL TRANSITIONS SHEET 2
HW-510.07 CURVED GUARDRAIL TREATMENT DETAIL
HW-510.08 R-4.50 GUARDRAIL HARDWARE
HW-510.09 MASH WELDED HARDWARE
HW-510.20 METAL BEAM RAIL (R-4.50) GUARDRAIL
HW-510.21 METAL BEAM RAIL (R-4.50) GUARDRAIL
HW-511.01 R-8 END ANCHORAGE TYPE I/LAND II

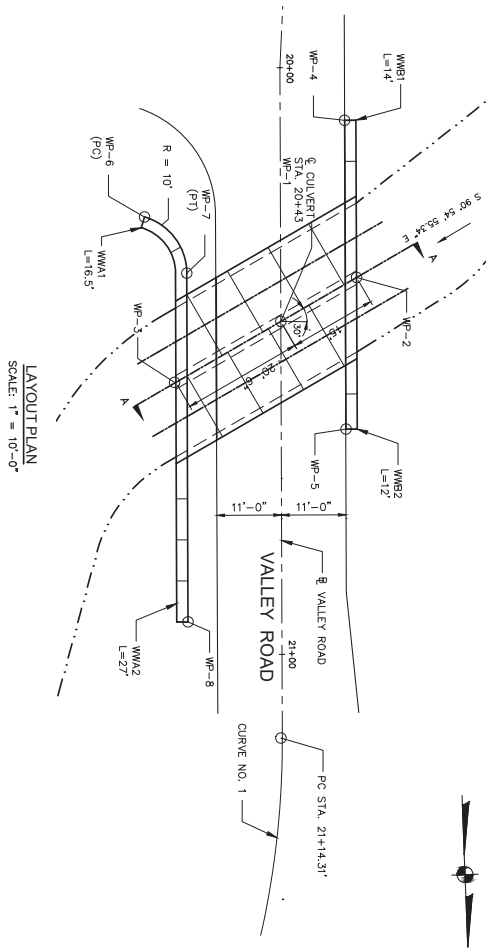
FREEMAN COMPANIES
 1000 STATE STREET
 SUITE 200
 WASHINGTON, CT 06097
 TEL: 860.439.3333
 FAX: 860.439.3334
 WWW.FREEMANCOMPANIES.COM

PROJECT INFORMATION
 PROJECT NO. 2017-0507
 SHEET NO. 5-2.2
 TITLE: LAYOUT PLAN
 DATE: 10/20/2020
 DRAWN BY: JLM
 CHECKED BY: JLM



REPLACEMENT OF BRIDGE No. 68-003 VALLEY ROAD OVER WHESTONE BROOK KILLINGLY, CONNECTICUT

NO.	DESCRIPTION	DATE	BY	CHKD.
1	02/18/22 ADDD CROSS-SECTION DATA & REVISION HYDRAULIC DATA	02/18/22	JLM	JLM



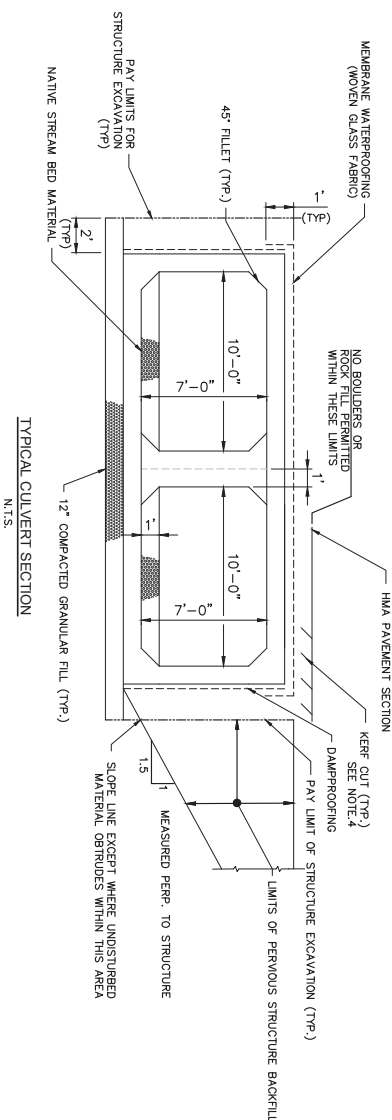
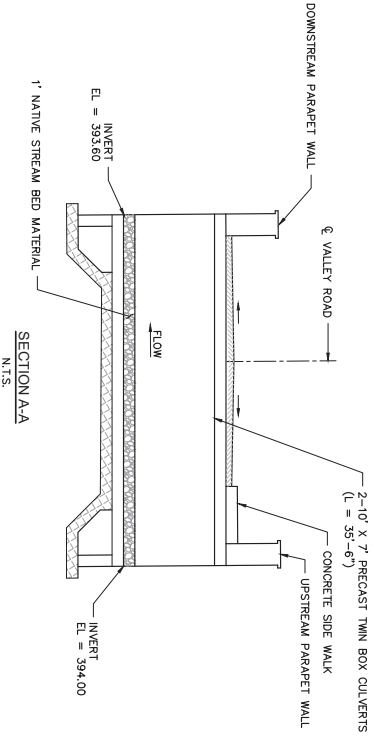
WORKING POINT COORDINATES

WP	NORTHING	EASTING
WP-1	868379.2226	1250594.5198
WP-2	868370.3781	1250590.4256
WP-3	868395.5243	1250615.5987
WP-4	868344.9940	1250592.2626
WP-5	868395.8103	1250585.5193
WP-6	868377.0778	1250618.5760
WP-7	868369.6815	1250627.9522
WP-8	868434.3781	1250603.1484

QUANTITIES

ITEM	UNITS	TOTALS
STRUCTURE EXCAVATION - EARTH (COMPLETE)	CY	300
STRUCTURE EXCAVATION - ROCK (COMPLETE)	CY	14
HANDLING WATER	LS	1
COMPACTED GRANULAR FILL	CY	40
PERVIOUS STRUCTURE BACKFILL	CY	350
SAWING AND SEALING JOINTS IN BIT. CONC. PAVEMENT	LF	100
REMOVAL OF EXISTING CULVERT	LS	1
CLASS 'A' CONCRETE	CY	20
CLASS 'F' CONCRETE	CY	25
PRECAST CONCRETE WINGWALL	EA	4
2-10' X 7' PRECAST CONCRETE BOX CULVERTS	LF	35.5
DEFORMED STEEL BARS	LB	2,200
DEFORMED STEEL BARS (EPOXY COATED)	LB	1500
DRILLING HOLES AND GRouting Dowels	EA	36
MEMBRANE WATERPROOFING (COLD LIQUID ELASTOMERIC)	SY	125
DAMP PROOFING	SY	175
CONCRETE FORM LINER	SF	1,350

- NOTES:**
- FOR COMPLETE BASELINE GEOMETRY, SEE SHEET NO. HWY-1.
 - ROADWAY PROFILE TO MATCH EXISTING
 - FOR WINGWALL SECTION DETAILS SEE SHEET MDS-3.
 - CUT BITUMINOUS OVERLAY WITH 1" WIDE BY 1 1/2" DEEP KEFF AND FILL WITH POURABLE SEALANT. TO BE PAID FOR UNDER THE ITEM "SAWING AND SEALING JOINTS IN BITUMINOUS PAVEMENT."



FREEMAN
COMPANIES
 CONSULTING ENGINEERS
 1000 MAIN STREET
 SUITE 200
 WASHINGTON, CT 06097
 TEL: 860.426.1200
 FAX: 860.426.1201
 WWW.FREEMAN-CT.COM

PROJECT NO. 68-003
 SHEET NO. PRO-2.1
 DATE 06/14/2019



REPLACEMENT OF BRIDGE No. 68-003
VALLEY ROAD OVER WHESTONE BROOK
KILLINGLY, CONNECTICUT

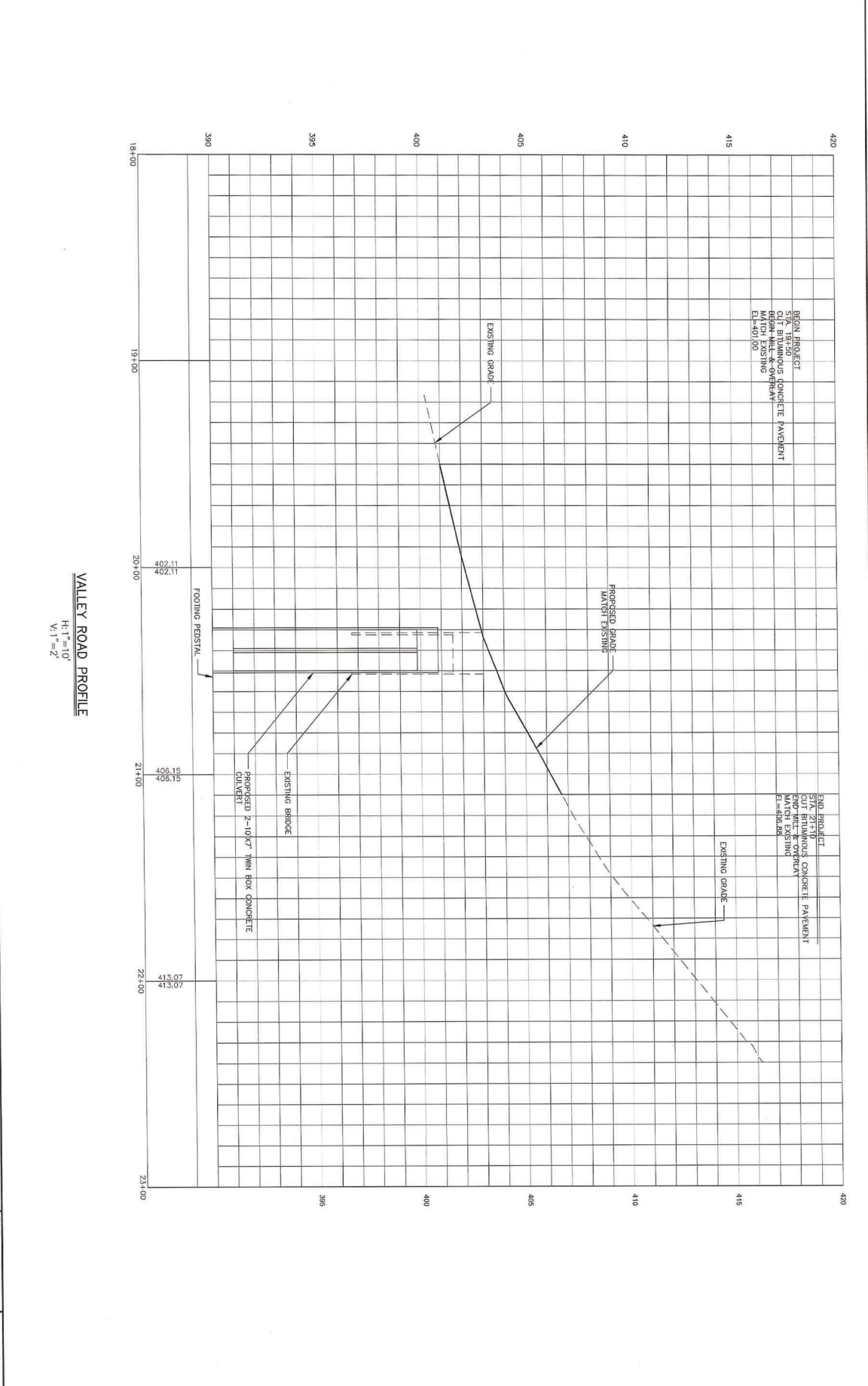
DESIGNED BY: GSK
 CHECKED BY: GSK
 DATE: 06/14/2019

SCALE: AS SHOWN
 PROJECT NO.: 68-003
 SHEET NUMBER: PRO-2.1

DATE: 06/14/2019
 DRAWN BY: GSK
 CHECKED BY: GSK

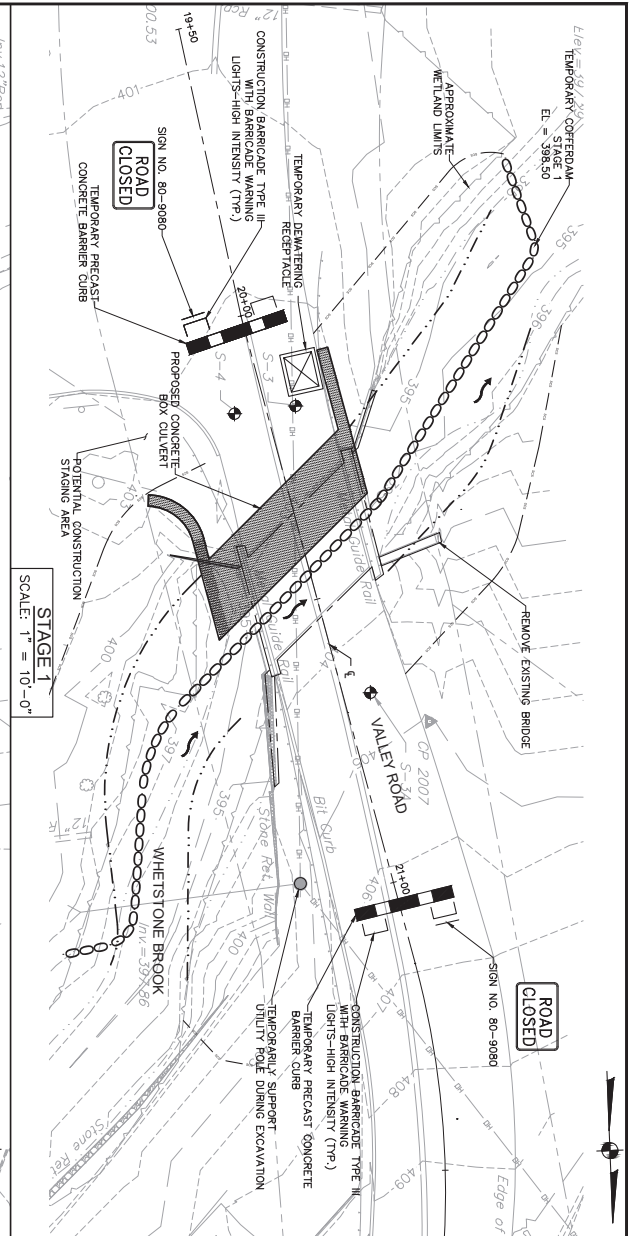
PROJECT NO.: 68-003
 SHEET NO.: PRO-2.1
 DATE: 06/14/2019

PROJECT TITLE: VALLEY ROAD PROFILE
 SHEET NUMBER: PRO-2.1



VALLEY ROAD PROFILE

H:1"=10'
 V:1"=2'



STAGE 1
SCALE: 1" = 10'-0"

GENERAL NOTES:

1. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL A DETAILED PLAN AND NARRATIVE DESCRIBING ITS PROPOSED CONSTRUCTION SEQUENCE INCLUDING DETAILED INFORMATION RELATING TO THE WATER HANDLING.
2. BEST MANAGEMENT PRACTICES (BMP) SHALL BE UTILIZED AS APPROPRIATE AND SHALL BE CONSISTENT WITH THE CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENTATION CONTROL.
3. CONSTRUCTION ACTIVITIES SHALL CONFORM TO SECTION 110. ENVIRONMENTAL COMPLIANCE OF THE STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS, BRIDGES, AND INFRASTRUCTURE CONSTRUCTION, FROM 817.
4. DE WATERING, IF AND AS NEEDED, SHALL UTILIZE BMP'S AS APPLICABLE AND AS APPROVED AND ACCEPTABLE BY THE ENGINEER AND THE TOWN OF KILLINGLY.
5. BASE STREAM FLOWS SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION. PROVISIONS TO ALLOW SAFE PASSAGE OF A 2-YEAR STORM EVENT SHALL ALSO BE IMPLEMENTED AS REQUIRED.
6. MATERIAL EXCAVATED FROM THE REVERBED SHALL BE STOCKPILED AND USED AS BACKFILL MATERIAL DURING RESTORATION OF THE REVERBED.
7. THE CONTRACTOR MAY PUMP THE BASE FLOW OF THE EXISTING WATERCOURSE AS DEPICTED ON THE PLANS OR INSTALL A GRAVITY FED BYPASS PIPE TO CONVEY FLOW.
8. THE CONTRACTOR IS REQUIRED TO SUBMIT A PLAN AND EQUIPMENT SPECIFICATIONS FOR THE PUMP OR BYPASS PIPE FOR APPROVAL BY THE ENGINEER.
9. REGARDLESS OF WATER HANDLING METHOD UTILIZED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING AND PROVIDING SAFE PASSAGE OF FLOW AT ALL TIMES INCLUDING INCLEMENT WEATHER.
10. DETOUR PLAN MUST BE ESTABLISHED BY THE TOWN.
11. ALL MATERIAL EQUIPMENT AND PROCEDURES SHALL BE PRE APPROVED BY THE ENGINEER AND THE TOWN.
12. REMOVAL OF EXISTING WALL SHALL BE PAID FOR UNDER THE BAY ITEM "REMOVAL OF EXISTING MASONRY".

SUGGESTED SEQUENCE OF CONSTRUCTION:

1. CONSTRUCT CONCRETE BRIDGE.
2. CLOSE VALLEY ROAD, INSTALL CONSTRUCTION BARRICADES, AND DETOUR TRAFFIC OVER LOCAL STREETS.
3. INSTALL SEDIMENTATION AND EROSION CONTROL MEASURES AS REQUIRED.

SUGGESTED SEQUENCE OF OPERATION:

PRE-CONSTRUCTION STAGE:

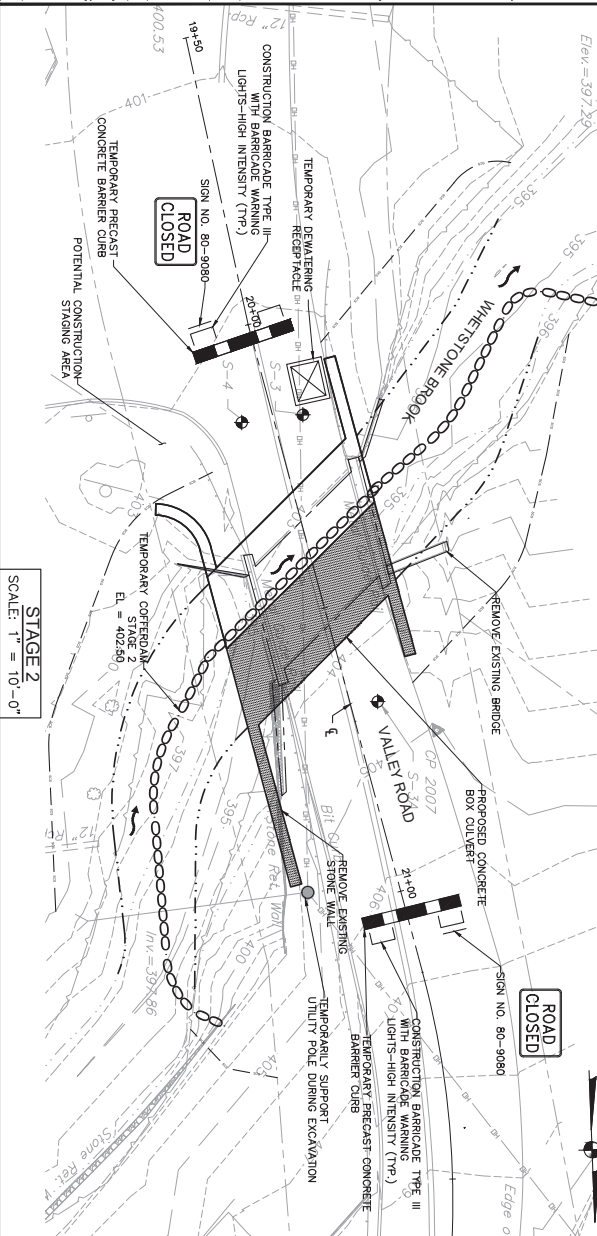
1. CONTACT CALL-BEFORE-YOU-DIG AND PERFORM UTILITY MARK-OUTS IF AND AS NECESSARY.
2. CLOSE VALLEY ROAD, INSTALL CONSTRUCTION BARRICADES, AND DETOUR TRAFFIC OVER LOCAL STREETS.
3. INSTALL SEDIMENTATION AND EROSION CONTROL MEASURES AS REQUIRED.

STAGE 1:

1. INSTALL DEMONS SHIELD AND REMOVE EXISTING BRIDGE DECK / SUPERSTRUCTURE.
2. INSTALL TEMPORARY COFFERDAM AND INSTALL TEMPORARY DEWATERING RECEPTACLE WHERE SHOWN ON THE PLANS.
3. PREPARE SUBGRADE FOUNDATION BENEATH CULVERT AND CONSTRUCT CUT-OFF WALLS AND RETURN WALLS.
4. PREPARE SUBGRADE FOUNDATION AND CONSTRUCT CUT-OFF WALLS AND RETURN WALLS.
5. PLACE GRANULAR FILL AND INSTALL CONCRETE BOX CULVERT.
6. CONSTRUCT CONCRETE WINGWALL FOOTINGS AND INSTALL PRECAST CONCRETE WINGWALLS.
7. PLACE TYPICAL STRENGTHED MATERIAL INSIDE BOX CULVERT AND INSTALL BARRIS ON THE TOP OF SLOPE.
8. PLACE PERVIOUS GRANULAR FILL BEHIND CULVERT WALL AND GRADE AROUND THE STRUCTURE AS SHOWN ON THE PLANS.

STAGE 2:

1. INSTALL STAGE 2 TEMPORARY COFFERDAM AS SHOWN ON THE PLANS AND INSTALL TEMPORARY DEWATERING RECEPTACLE WHERE SHOWN.
2. INSTALL SHUT UP PUMP AND DEMONSTRATE AS NECESSARY TO ESTABLISH A DRY WORK AREA. EXCAVATE AND REMOVE EXISTING ABUTMENT 2.
3. PREPARE SUBGRADE FOUNDATION AND CONSTRUCT CUT-OFF WALLS AND RETURN WALLS.
4. PLACE GRANULAR FILL AND INSTALL CONCRETE BOX CULVERT.
5. CONSTRUCT CONCRETE WINGWALL FOOTINGS AND INSTALL PRECAST CONCRETE WINGWALLS.
6. PLACE TYPICAL STRENGTHED MATERIAL INSIDE BOX CULVERT AND INSTALL BARRIS AT THE TOE OF SLOPE.
7. PLACE PERVIOUS GRANULAR FILL AROUND THE STRUCTURE AS SHOWN ON THE PLANS.
8. PLACE REMAINING WORKPILING AS SHOWN ON THE PLANS.
9. INSTALL PERVIOUS BASKET BEHIND CULVERT WALL AND COMPLETE GRADING AROUND THE NEW BRIDGE AS SHOWN ON THE PLANS.
10. PLACE REMAINING WORKPILING OVER THE CULVERT AND CONSTRUCT ROADWAY APPROACHES AND OTHER ROADWAY ITEMS TO LIMITS SHOWN.
11. REMOVE VALLEY ROAD AND RE-ESTABLISH TURF.
12. REMOVE SEDIMENTATION AND EROSION CONTROL MEASURES.
13. REMOVE VALLEY ROAD AND RE-ESTABLISH TURF.
14. REMOVE THE RESTRICTIONS, SITE CLEAN-UP, REMOVE CONSTRUCTION BARRICADES, AND OPEN ROAD TO TRAFFIC.



STAGE 2
SCALE: 1" = 10'-0"

TEMPORARY HYDRAULIC DATA

TEMPORARY DESIGN FREQUENCY	2-YEAR
TEMPORARY DESIGN DISCHARGE	241 CFS
TEMPORARY DAILY FLOW	101 CFS
AVERAGE DAILY FLOW ELEVATION	398.88 FT
AVERAGE WEEL UPSTREAM	40.96 FT
TEMPORARY WEEL DOWNSTREAM	38.97 FT

LEGEND

- PROPOSED CULVERT
- SEDIMENTATION CONTROL SYSTEM
- TEMPORARY COFFERDAM

TEMPORARY COFFERDAM

SCALE: 1" = 10'-0"

TEMPORARY COFFERDAM

SCALE: 1" = 10'-0"

LEGEND

- UNOBSERVED
- FABRIC MEMBRANE WORK AREA

TEMPORARY COFFERDAM

SCALE: 1" = 10'-0"

FREEMAN COMPANIES

REGISTERED PROFESSIONAL ENGINEER
STATE OF CONNECTICUT
NO. 3492

REGISTERED PROFESSIONAL SURVEYOR
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL LAND SURVEYOR
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL CIVIL ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL ELECTRICAL ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL MECHANICAL ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL CHEMICAL ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL METALLURGICAL ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL NUCLEAR ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL AERONAUTICAL ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL AGRICULTURAL ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL INDUSTRIAL ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL MARINE ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL MINING ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL PETROLEUM ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL TRANSPORTATION ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL WATER RESOURCES ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL WIND ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL ENVIRONMENTAL ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL SAFETY ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL SYSTEMS ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL SOFTWARE ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL TELECOMMUNICATIONS ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL TRANSPORTATION ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL WATER RESOURCES ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL WIND ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL ENVIRONMENTAL ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL SAFETY ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL SYSTEMS ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL SOFTWARE ENGINEER
STATE OF CONNECTICUT
NO. 1003

REGISTERED PROFESSIONAL TELECOMMUNICATIONS ENGINEER
STATE OF CONNECTICUT
NO. 1003



**REPLACEMENT OF BRIDGE No. 68-003
VALLEY ROAD OVER WHETSTONE BROOK
KILLINGLY, CONNECTICUT**

DATE: 10/20/2020
SCALE: 5/2.4

NO.	DATE	DESCRIPTION	BY	CHECKED	SCALE
1	02/19/22	ADD CROSS-SECTION DATA & REVED HYDRAULIC DATA	JL	AS NOTED	5/2.4
2	07/19/22	ADD CROSS-SECTION DATA & REVED HYDRAULIC DATA	JL	AS NOTED	5/2.4

FREEMAN
 CONSULTANTS, LLC
 1000 Valley Road
 Wallingford, CT 06495
 TEL: 203.261.1100
 FAX: 203.261.1101
 WWW.FREEMANCONSULTANTS.COM

PROJECT INFORMATION
 PROJECT NO: 2017-6507
 SHEET NO: WL-2

DATE
 10/06/2020

DESIGNED BY
 M. J. MURPHY

CHECKED BY
 M. J. MURPHY

APPROVED BY
 M. J. MURPHY

SCALE
 AS SHOWN

TITLE
 IMPACTS



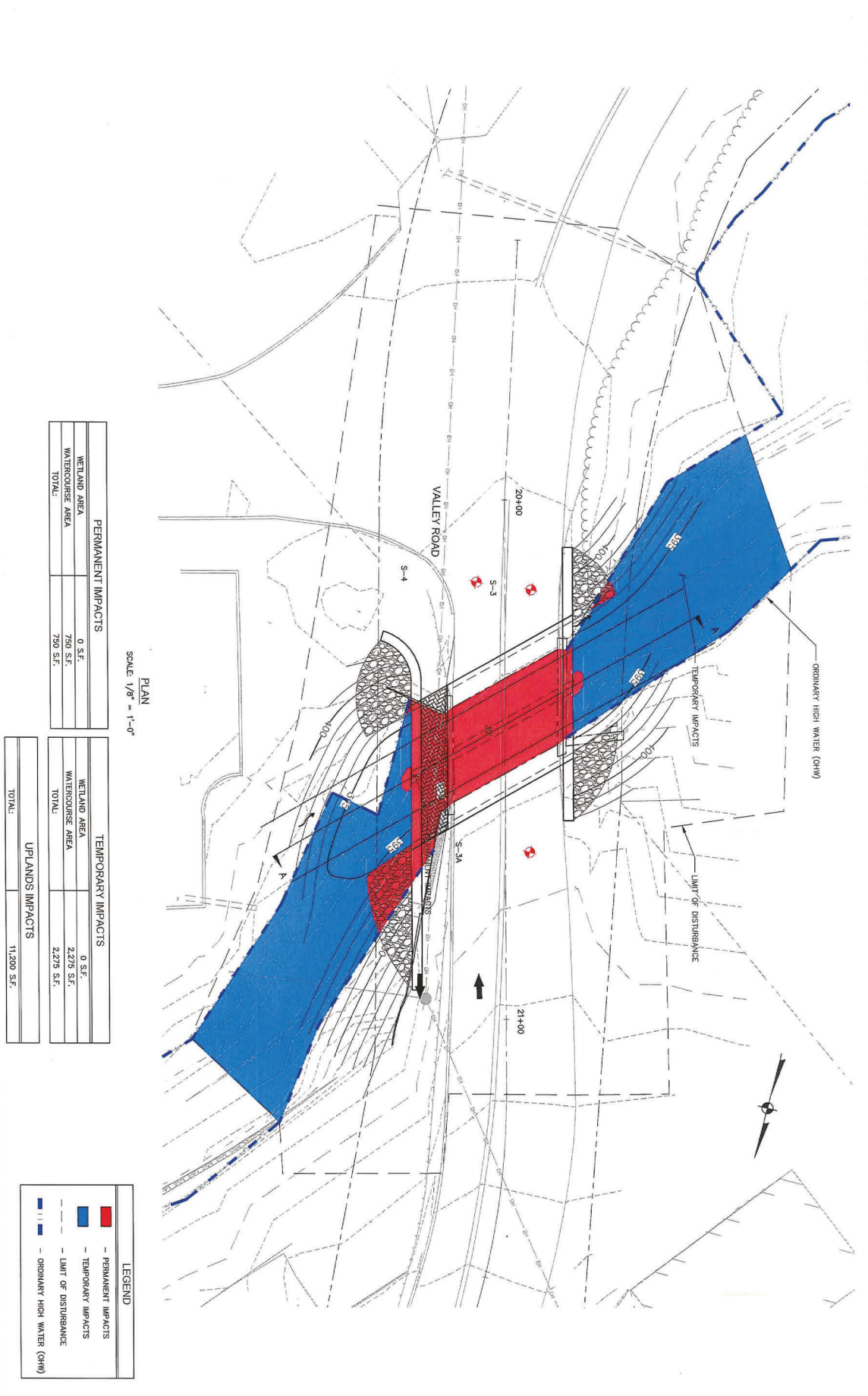
**REPLACEMENT OF BRIDGE No. 68-003
 VALLEY ROAD OVER WHESTONE BROOK
 KILLINGLY, CONNECTICUT**

PERMANENT IMPACTS		TEMPORARY IMPACTS	
WETLAND AREA	0 S.F.	WETLAND AREA	0 S.F.
WATERCOURSE AREA	750 S.F.	WATERCOURSE AREA	2,275 S.F.
TOTAL:	750 S.F.	TOTAL:	2,275 S.F.

UPLANDS IMPACTS	
TOTAL:	11,200 S.F.

LEGEND

- PERMANENT IMPACTS
- TEMPORARY IMPACTS
- - - LIMIT OF DISTURBANCE
- ORDINARY HIGH WATER (OHW)



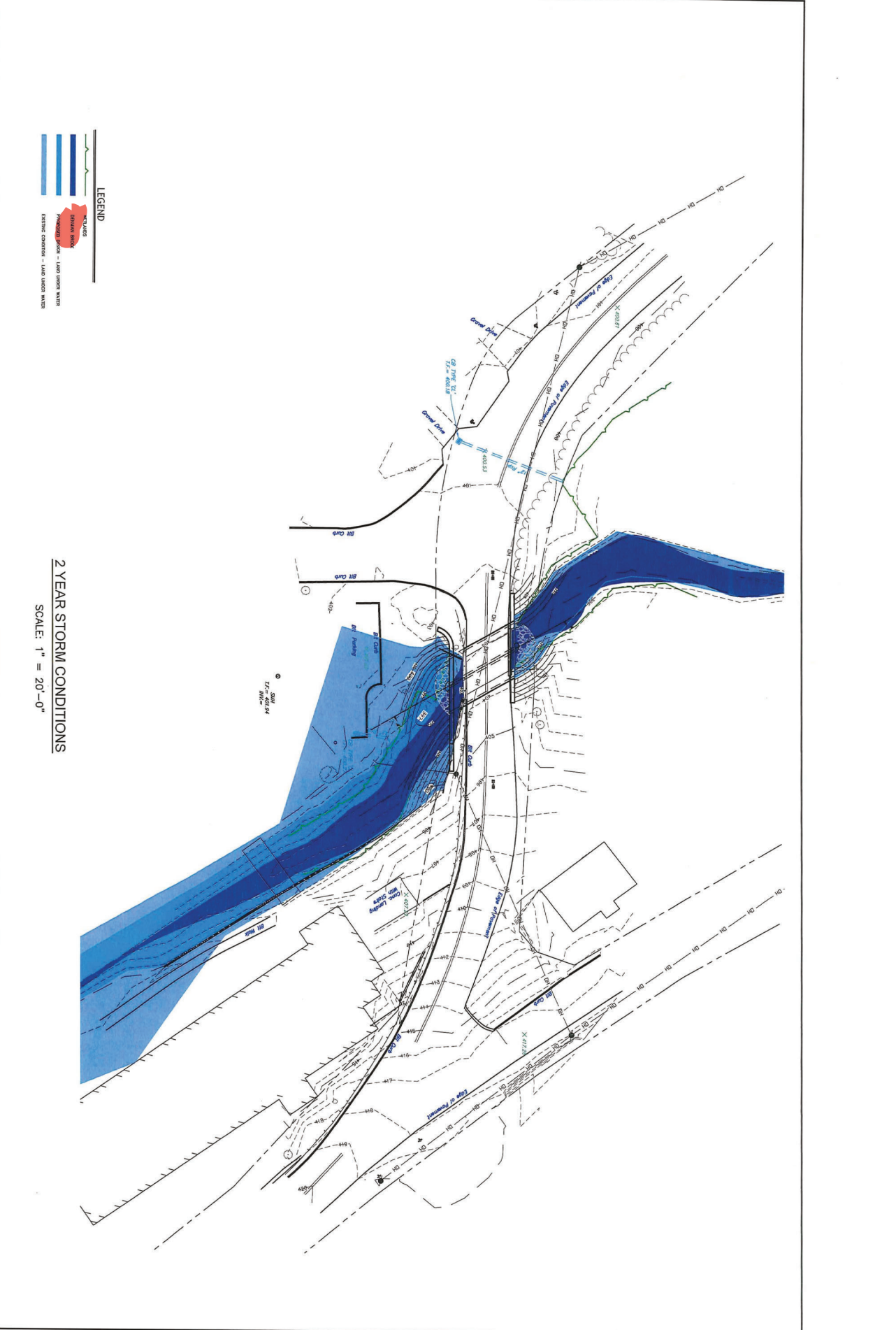
FREEMAN
COMPANIES, LLC
 100 MAIN STREET
 SUITE 200
 WASHINGTON, CT 06097
 TEL: 860-426-1000
 FAX: 860-426-1001
 WWW.FREEMANCOMPANIES.COM

PROJECT NO. 2017-0507
 SHEET NO. C-1

DESIGNED BY: [Signature]
 CHECKED BY: [Signature]
 DATE: 10/05/2020

**REPLACEMENT OF BRIDGE No. 68-003
 VALLEY ROAD OVER WHESTONE BROOK
 KILLINGLY, CONNECTICUT**

NO.	DATE	DESCRIPTION	DESIGNED BY	CHECKED BY	DATE
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FREEMAN COMPANIES, LLC
 1000 WEST MAIN STREET
 FARMINGTON, CT 06030
 TEL: 860.634.1100
 FAX: 860.634.1101
 WWW.FREEMAN-CT.COM

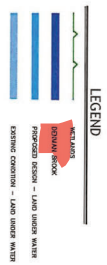
PROJECT NO. 68-003
 SHEET NO. C-2

DATE: 10/26/2020

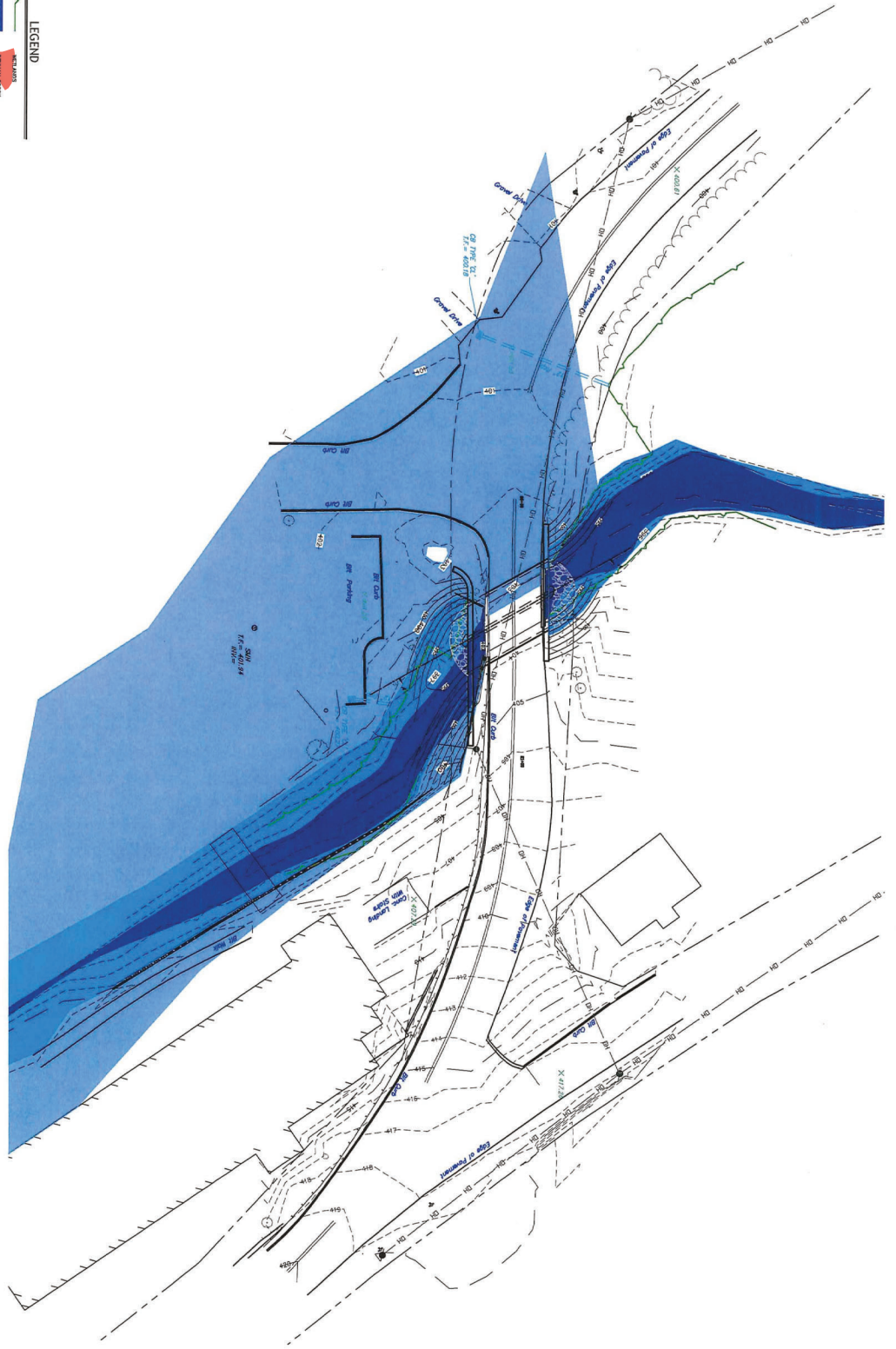


**REPLACEMENT OF BRIDGE No. 68-003
 VALLEY ROAD OVER WHESTONE BROOK
 KILLINGLY, CONNECTICUT**

NO.	DATE	DESCRIPTION	DESIGNED BY	CHECKED BY	TITLE
1	10/26/2020	ISSUED FOR PERMIT	AS NOTED	2017-0507	HYDRAULIC DATA
2	10/26/2020	REVISED	AS NOTED	2017-0507	HYDRAULIC DATA
3	10/26/2020	REVISED	AS NOTED	2017-0507	HYDRAULIC DATA



10 YEAR STORM CONDITIONS
 SCALE: 1" = 20'-0"



FREEMAN
COMPANIES
 THE FREDERICK LAMSON COMPANY
 1000 FREDERICK STREET
 FREDERICK, CONNECTICUT 06032
 TEL: 860-251-1000
 FAX: 860-251-1001
 WWW.FREEMANCOMPANIES.COM

PROJECT NO. 2017-0507
 SHEET NO. C-4

APPROVED FOR
 THE TOWN OF KILLINGLY
 COMMERCIAL DISTRICT
 1000 FREDERICK STREET
 FREDERICK, CONNECTICUT 06032

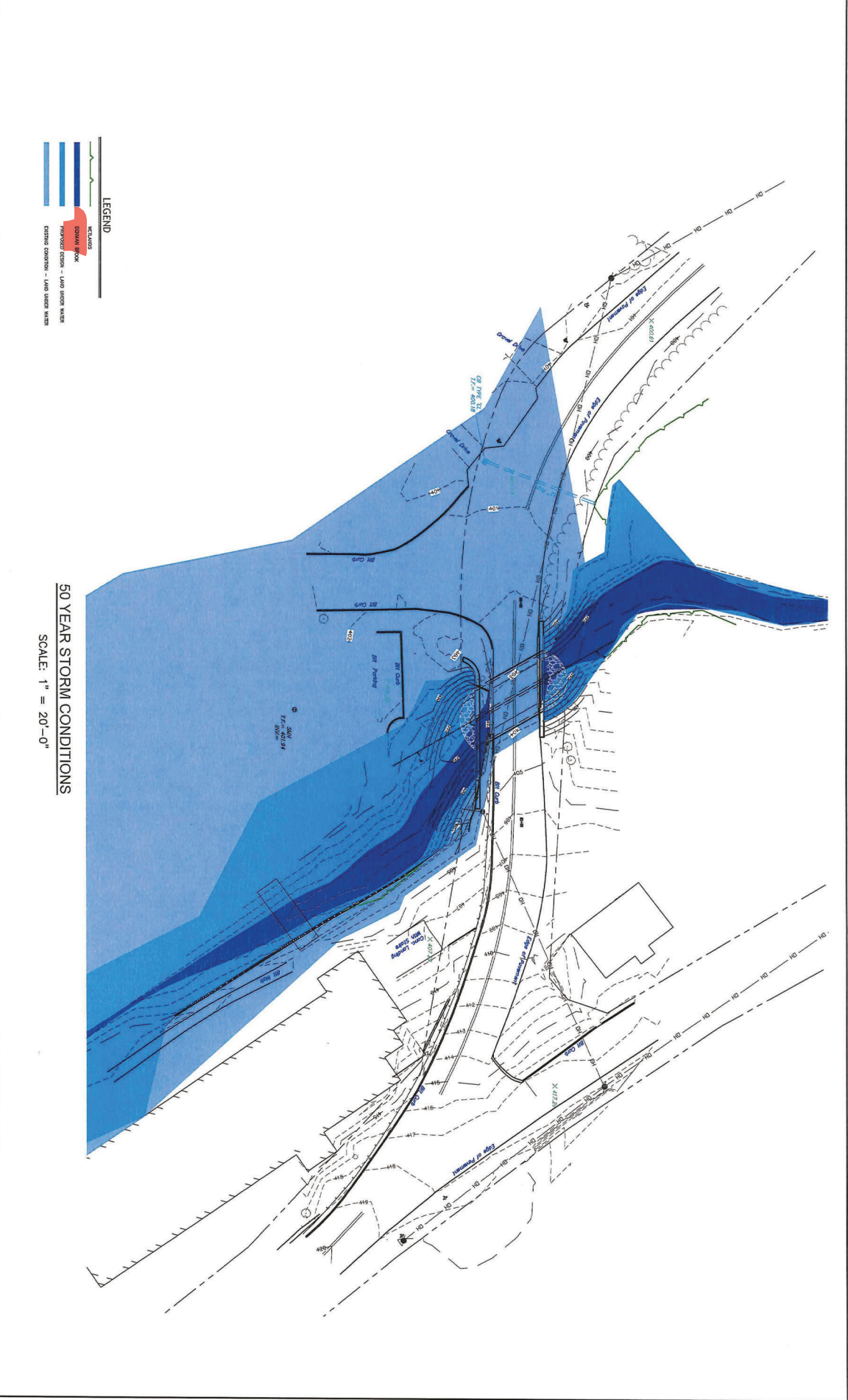
APPROVED FOR
 THE TOWN OF KILLINGLY
 COMMERCIAL DISTRICT
 1000 FREDERICK STREET
 FREDERICK, CONNECTICUT 06032



**REPLACEMENT OF BRIDGE NO. 68-003
 VALLEY ROAD OVER WHETSTONE BROOK
 KILLINGLY, CONNECTICUT**

50 YEAR STORM CONDITIONS
 SCALE: 1" = 20'-0"

NO.	DATE	REVISIONS	DESIGNED	IN CHARGE	APPROVED	SCALE	PROJECT NO.	DATE	TITLE
1							2017-0507	10/04/2020	HYDRAULIC DATA
2							2017-0507	10/04/2020	SHEET NUMBER
3							2017-0507	10/04/2020	C-4



FREEMAN
 ENGINEERS
 1000 WEST MAIN STREET
 SUITE 200
 WESTPORT, CONNECTICUT 06880
 TEL: 860.426.1000
 FAX: 860.426.1001
 WWW.FREEMAN-ENG.COM

PROJECT NO. 68-003
 SHEET NO. C-5
 DATE: 10/05/2020

DESIGNED BY: [Name]
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 APPROVED BY: [Name]

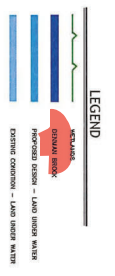
PROJECT TITLE: REPLACEMENT OF BRIDGE NO. 68-003
 VALLEY ROAD OVER WHETSTONE BROOK
 KILLINGLY, CONNECTICUT



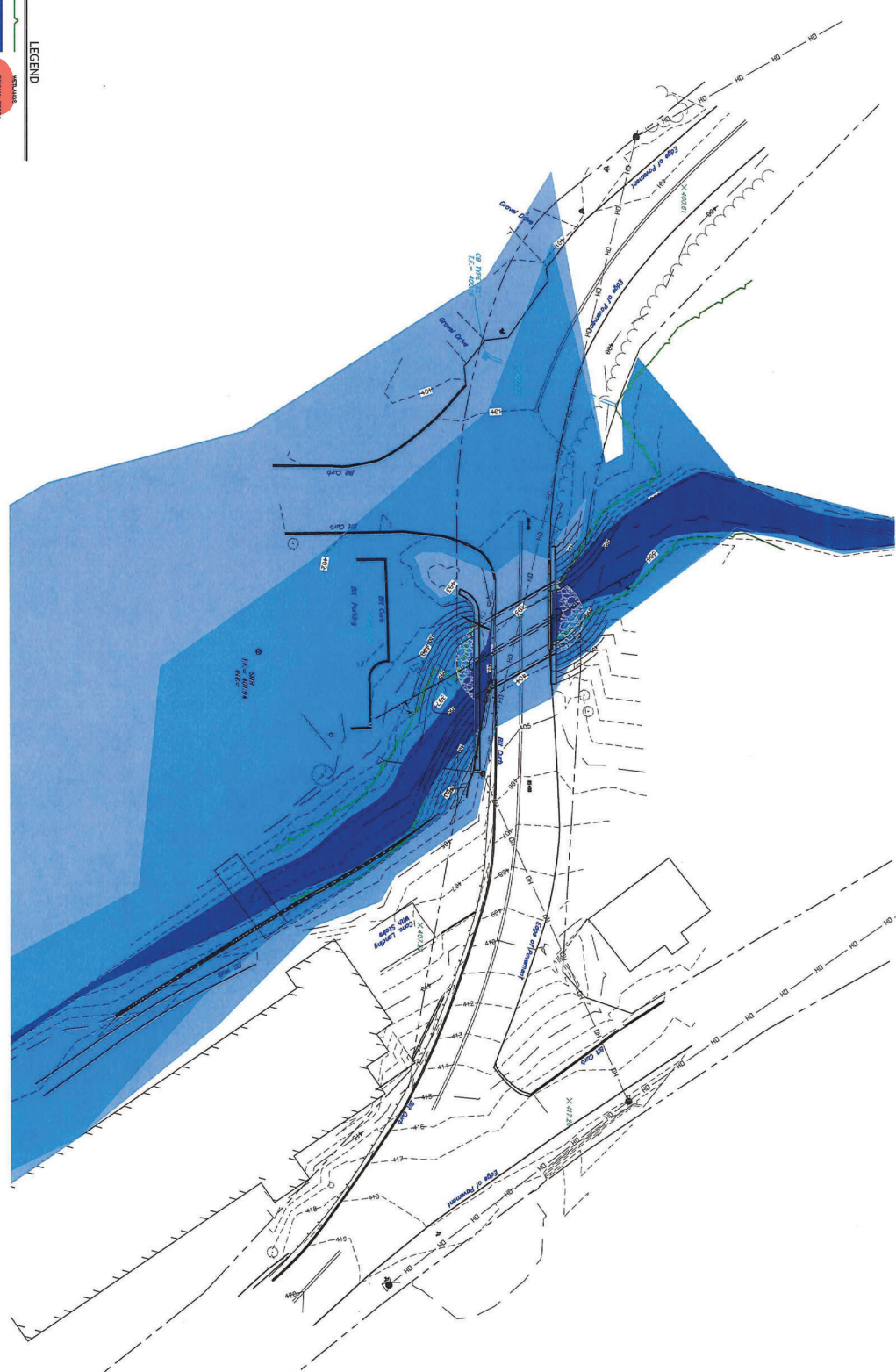
REPLACEMENT OF BRIDGE NO. 68-003 VALLEY ROAD OVER WHETSTONE BROOK KILLINGLY, CONNECTICUT

NO.	DATE	REVISIONS

DESIGNED BY	DATE	TITLE
[Name]	10/05/2020	HYDRAULIC DATA
[Name]	2017-0007	SHEET NUMBER
[Name]	10/05/2020	C-5



100 YEAR STORM CONDITIONS
 SCALE: 1" = 20'-0"



Regulatory and Enforcement Branch
U.S. Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

Attn: Kevin Kotelly, Chief Permits and Enforcement Branch B

Re: 202065399-PCN, Concurrence of Eligibility
NAE-2021-00306
Bear Hill Road over Bog Meadow Reservoir, Killingly, CT 06239

Dear Mr. Kotelly:

The above-referenced Pre-Construction Notification (“PCN”) was submitted to the Connecticut Department of Energy and Environmental Protection (“DEEP”) on January 19, 2021 and made complete on January 24, 2022 by the Town of Killingly, for eligibility screening under the Department of the Army Regional General Permit for the State of Connecticut (“CT RGP”) dated December 15, 2021, and authorized and conditioned pursuant to Section 401 of the Federal Clean Water Act.

Project: The applicant proposes activities in Waters of the United States which will result in the following impacts, as shown on attached plans titled “*Construction Plans for Replacement of Bridge No. 68-009 Bear Hill Road over Unnamed Brook, Town of Killingly, CT Final Design Plans,*” 13 sheets, dated September 4, 2018, sheets S-3.1 and S-3.2 revised December 23, 2021, sheets HWY-3.1, S-3.4, and WL-3 revised January 16, 2022, sheet PRO-3.1, C-1, C-2, C-3, C-4, and C-5 revised June 14, 2019, and prepared by Freeman Companies:

1. Install temporary water-handling cofferdams;
2. Install a 32’ long, 15’ wide by 6’ high box culvert with 1’ of natural streambed material approximately 40’ to the south of the existing twin corrugated metal pipes (CMPs) and associated headwalls, wingwalls, and cutoff walls; and
3. Remove existing twin 52’ long 60” diameter CMPs and associated trash racks and backfill.

	<u>Waterway</u>	<u>Wetland</u>	<u>Total</u>
Temporary:	2830 sf	0 sf	2830 sf
Permanent:	760 sf	0 sf	760 sf
Total:	3590 sf	0 sf	3590 sf

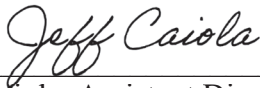
Adaptive Best Management Practices. The Best Management Practices described in Attachment A included with this letter were found to be insufficient to protect existing and designated uses of waters such as propagation of fish, shellfish and wildlife, recreation, public water supply, and agriculture, industrial use and navigation, and the water quality necessary for their protection. Therefore, the following adaptive best management practices shall also be employed to protect water quality and designated uses of waters:

1. **Time-of-Year Restriction.** Any unconfined instream work within Bog Meadow Reservoir shall be restricted to the period from June 1 to September 30, inclusive.
2. **Road Barricade and Flood Warnings.** The Project Proponent shall post signage at both crossing approaches, warning that the road is subject to flooding. In the event that a significant storm event is forecast that is likely to cause road overtopping, the Project Proponent shall make provisions for barricading the road.

Staff of the Land & Water Resources Division (the “Division”) have reviewed the project and determined that the proposed regulated work is eligible for PCN coverage under CT RGP #6 & 19. Therefore, an individual application to DEEP is not required at this time, provided that the project receives approval from the U.S. Army Corps of Engineers under the CT RGP and that the authorized activities proceed as described in the PCN documentation provided to the Division in the above-referenced notification.

Please be advised that conducting regulated activities without the required state Section 401 Water Quality Certification (WQC) and federal Section 404 WQC is a violation of law and is subject to enforcement proceedings and legal action under 33 CFR Part 326 and citations thereunder.

If you have any questions or need additional information, please contact Farrah Ashe at 860-860-424-3169 or Farrah.Ashe@ct.gov.



Jeff Caiola, Assistant Director
Land and Water Resources Division
Bureau of Water Protection and Land Reuse

6-02-2022

Date

CC (via email):

David Capacchione, Town of Killingly, dcapacchione@killinglyct.gov

Jeffery LeBeau, Freeman Companies, jlebeau@freemancos.com

Dennis Quinit, Freeman Companies, dquinit@freemancos.com

Peter Olmstead, USACE, Peter.D.Olmstead@usace.army.mil

Stacy Pappano, CT DEEP, Stacy.Pappano@ct.gov

ATTACHMENT A
GENERAL TERMS AND CONDITIONS

1. **Best Management Practices.** In constructing or maintaining the activities authorized herein, the permittee shall employ best management practices in accordance with Section 22a-426-1 of the Regulations for Connecticut State Agencies, consistent with the terms and conditions of this certificate, to control storm water discharges and erosion and sedimentation and to prevent pollution. Such practices to be implemented by the permittee at the site include, but are not necessarily limited to:
- a. Prohibiting dumping of any quantity of oil, chemicals or other deleterious material on the ground;
 - b. Immediately informing the Commissioner's Oil and Chemical Spill Response Division at (860) 424-3338 (24- hour phoneline) of any adverse impact or hazard to the environment, including any discharges, spillage, or loss of oil or petroleum or chemical liquids or solids, which occurs or is likely to occur as the direct or indirect result of the activities authorized herein;
 - c. Separating staging areas at the site from the regulated areas by silt fences or straw/hay bales at all times;
 - d. Prohibiting storage of any fuel and refueling of equipment within twenty-five (25) feet from any wetland or watercourse;
 - e. Preventing pollution of wetlands and watercourses in accordance with the document "Connecticut Guidelines for Soil Erosion and Sediment Control" as revised. Said controls shall be inspected by the permittee for deficiencies at least once per week and immediately after each rainfall and at least daily during prolonged rainfall. The permittee shall correct any such deficiencies within 48 hours of said deficiencies being found;
 - f. Stabilizing disturbed soils in a timely fashion to minimize erosion. If a grading operation at the site will be suspended for a period of thirty (30) or more consecutive days, the permittee shall, within the first seven (7) days of that suspension period, accomplish seeding and mulching or take such other appropriate measures to stabilize the soil involved in such grading operation. Within seven (7) days after establishing final grade in any grading operation at the site the permittee shall seed and mulch the soil involved in such grading operation or take such other appropriate measures to stabilize such soil until seeding and mulching can be accomplished.
 - g. Prohibiting the storage of any materials at the site which are buoyant, hazardous, flammable, explosive, soluble, expansive, radioactive, or which could in the event of a flood be injurious to human, animal or plant life, below the elevation of the five hundred (500) year flood. Any other material or equipment stored at the site below said elevation by the permittee or the permittee's contractor must be firmly anchored, restrained or enclosed to prevent flotation. The quantity of fuel stored below such elevation for equipment used at the site shall not exceed the quantity of fuel that is expected to be used by such equipment in one day.
 - h. Immediately informing the Commissioner's Land & Water Resources Division at (860) 424-3019 and the U.S. Army Corps of Engineers' Permit Compliance Section at (617) 647-8674, of the occurrence of pollution or other environmental damage resulting from construction or maintenance of the authorized activity or any construction associated therewith in violation of this certificate. The permittee shall, no later than 48 hours after the permittee learns of a violation of this certificate, report same in writing to the Commissioner. Such report shall contain the

following information:

- (i) the provision(s) of this certificate that has/have been violated;
- (ii) the date and time the violation(s) was first observed and by whom;
- (iii) the cause of the violation(s), if known
- (iv) if the violation(s) has ceased, the duration of the violation(s) and the exact date(s) and times(s) it was corrected;
- (v) if the violation(s) has not ceased, the anticipated date when it will be corrected;
- (vi) steps taken and steps planned to prevent a reoccurrence of the violation(s) and the date(s) such steps were implemented or will be implemented;
- (vii) the signatures of the permittee and of the individual(s) responsible for actually preparing such report, each of whom shall certify said report in accordance with condition 8 of this certificate.

For information and technical assistance, contact the Land & Water Resources Division at (860) 424-3019.

2. **Inspection of the Facility or Activity, Adaptive Best Management Practices & Compliance with Conditions.** The concurrence of eligibility letters for Pre- Construction Notifications will be considered the initial inspection of the facility or activity for the purpose of determining whether the discharge from the certified project may violate WQC-202108351 (Non-Tidal) of the Department of the Army Regional General Permit for the State of Connecticut. The concurrence of eligibility letters may also address the remedial actions necessary in order to be considered to be compliance with this certification.

In the event that Best Management Practices employed to maintain compliance with the conditions of this Water Quality Certificate, as described in paragraph 1 above, have been found to be insufficient to protect existing and designated uses of waters such as propagation of fish, shellfish and wildlife, recreation, public water supply, and agriculture, industrial use and navigation, and the water quality necessary for their protection, such permittee shall employ additional or alternative adaptive best management practices to protect water quality.

All work and all activities authorized herein conducted by the permittee at the site shall be consistent with the terms and conditions of this certificate. Upon initiation of the activities authorized herein, the permittee thereby accepts and agrees to comply with the terms and conditions of this Water Quality Certificate.

3. **Rights.** This certificate is subject to and does not derogate any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material nor any exclusive privileges and is further subject to any and all public and private rights and to any federal, state, or local laws or regulations pertinent to the property or activity affected hereby. This certification does not comprise the permits or approvals as may be required by Chapters 440, 446i, 446j and 446k of the Connecticut General Statutes.
4. **Expiration of Certificate.** The Section 401 Water Quality Certifications contained herein shall be valid until such time as the Department of the Army Regional General Permits for the State of Connecticut expires or is modified, suspended, revoked or reissued.
5. **Transfer of Certificate.** This authorization is not transferable without the written consent of the Commissioner

6. **Reliance on Application.** In evaluating the permittee's application, the Commissioner has relied on information provided by the permittee. If such information subsequently proves to be false, deceptive, and incomplete or inaccurate, this certificate may be modified, suspended or revoked.
7. **Installation and Removal of Confining Structures.** Confinement of a work area by cofferdam techniques using sandbag placement, sheet pile installation (vibratory method only), portadam, or similar confinement devices is allowed any time of the year unless specifically prohibited by a permit condition. The removal of such confinement devices is allowed any time of the year unless specifically prohibited by a permit condition. Once a work area has been confined, in-water work within the confined area is allowed any time of the year. The confinement technique used shall completely isolate and protect the confined area from all flowing water. The use of silt boom/curtain or similar technique as a means for confinement is prohibited.
8. **Certification of Documents.** Any document, including but not limited to any notice, which is required to be submitted to the Commissioner under this certificate shall be signed by the permittee, a responsible corporate officer of the permittee, a general partner of the permittee, or a duly authorized representative of the permittee and by the individual or individuals responsible for actually preparing such document, each of whom shall certify in writing as follows:

"I have personally examined and am familiar with the information submitted in this document and all attachments and certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief, and I understand that any false statement made in this document or its attachments may be punishable as a criminal offense in accordance with Section 22a-6 under Section 53a-157 of the Connecticut General Statutes."

9. **Submission of Documents.** The date of submission to the Commissioner of any document required by this certificate shall be the date such document is received by the Commissioner. Except as otherwise specified in this certificate, the word "day" as used in this certificate means the calendar day. Any document or action which falls on a Saturday, Sunday, or legal holiday shall be submitted or performed by the next business day thereafter.

Any document or notice required to be submitted to the Commissioner under this certificate shall, unless otherwise specified in writing by the Commissioner, be directed to:

Director, Land & Water Resources Division
Bureau of Water Protection and Land Reuse
Department of Energy & Environmental Protection
79 Elm Street
Hartford, Connecticut 06106-5127

CONSTRUCTION PLANS FOR

REPLACEMENT OF BRIDGE NO.68-002 VALLEY ROAD OVER MASHENTUCK BROOK
 REPLACEMENT OF BRIDGE NO.68-003 VALLEY ROAD OVER WHETSTONE BROOK
 REPLACEMENT OF BRIDGE NO.68-009 BEAR HILL ROAD OVER UNNAMED BROOK

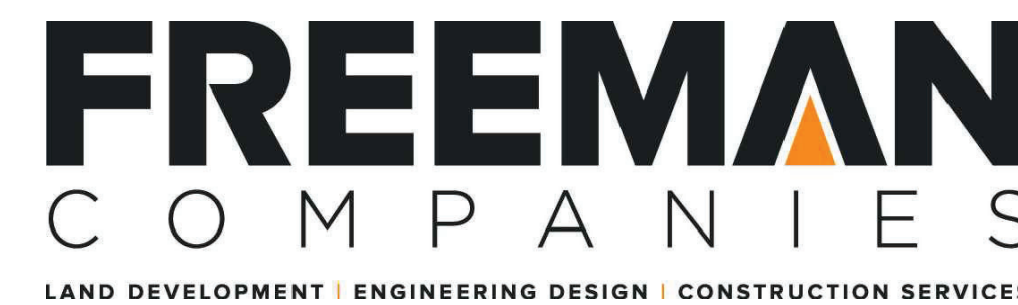
TOWN OF KILLINGLY, CT

FINAL DESIGN PLANS

PREPARED FOR:

**TOWN OF KILLINGLY
 172 MAIN STREET
 KILLINGLY, CONNECTICUT 06239**

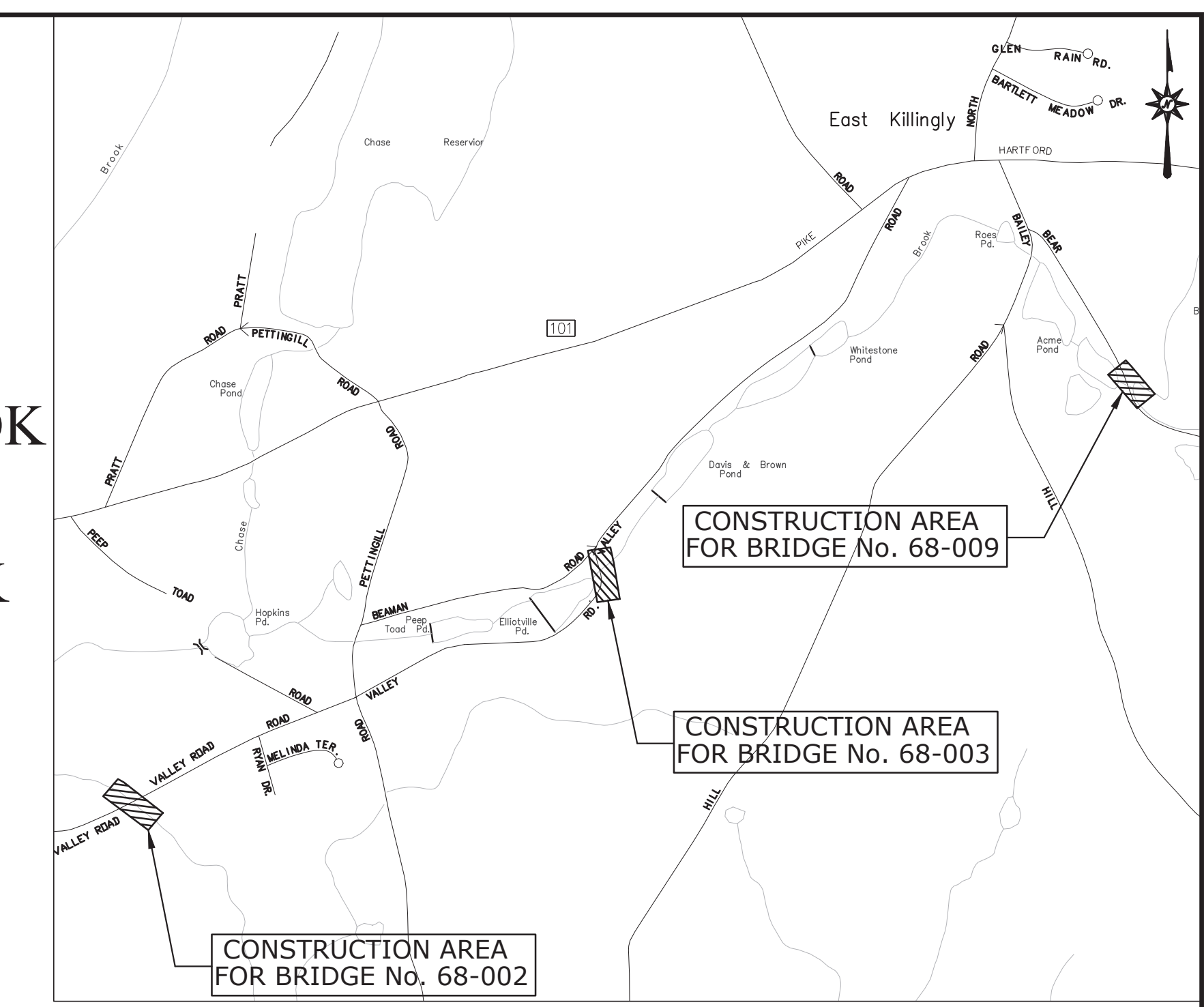
PREPARED BY:



LAND DEVELOPMENT | ENGINEERING DESIGN | CONSTRUCTION SERVICES

36 JOHN STREET
 HARTFORD, CONNECTICUT 06106
 (860) 251-9550
 (860) 986-7161 Fax

SUBCONSULTANTS:
 GIBSON ENVIRONMENTAL SERVICES



VICINITY MAP
 SCALE: 1"=1000'

GENERAL NOTES:

- CONNECTICUT DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS FOR ROADS, BRIDGES AND INCIDENTAL CONSTRUCTION, FORM 817, DATED 2016; SUPPLEMENTAL SPECIFICATIONS, DATED JANUARY 2015; AND SPECIAL PROVISIONS.
- ALL HORIZONTAL GEOMETRY ON THIS PROJECT IS BASED ON HORIZONTAL DATUM NAD83.
- ALL ELEVATIONS ON THIS PROJECT BASED ON NAVD88.
- DESIGN STANDARDS:
 TOWN OF KILLINGLY DESIGN STANDARDS
- CONNECTICUT DEPARTMENT OF TRANSPORTATION HIGHWAY DESIGN MANUAL, 2003 EDITION.
- A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS 2011 EDITION, PUBLISHED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO).
- CONNECTICUT DEPARTMENT OF TRANSPORTATION BRIDGE DESIGN MANUAL, 2003 EDITION.
- AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

TOWN OF KILLINGLY, CONNECTICUT
 APPROVED BY:

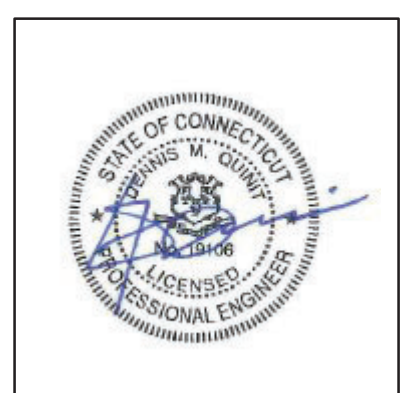
DAVID CAPACCHIONE, P.E.
 TOWN ENGINEER

DATE



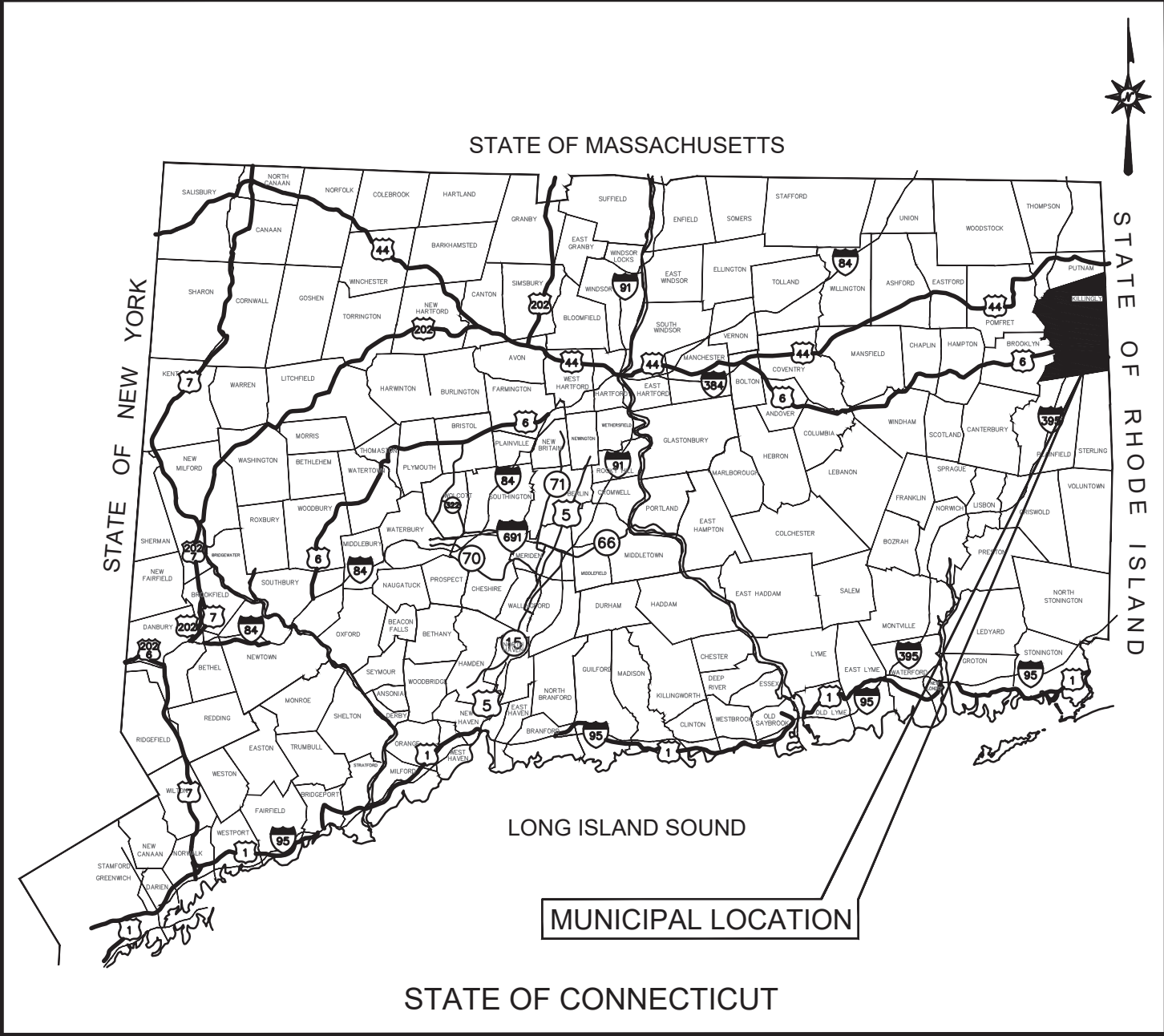
DENNIS M. QUINTI, P.E.
 CT. PROFESSIONAL ENGINEER REG. NO. 19106

DATE: 9/4/2018



DATES

ISSUE DATE: SEPTEMBER 04, 2018
 REVISION:



LOCATION MAP
 N.T.S.

CONTENTS

TITLE SHEET	
SUBSET - 01	BRIDGE NO. 68-002 (SITE NO.1)
SUBSET - 02	BRIDGE NO. 68-003 (SITE NO.2)
SUBSET - 03	BRIDGE NO. 68-009 (SITE NO.3)
MDS-1-3	MISCELLANEOUS DETAILS
STANDARD STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION DETAILS	
HW-811_01	CONCRETE CURBING
HW-815_01	BITUMINOUS CONCRETE CURBING
HW-822_01	TEMPORARY PRECAST CONCRETE BARRIER CURB
HW-910_01	W-BEAM METAL BEAM RAIL HARDWARE
HW-910_02	METAL BEAM RAIL (TYPE R-B 350) GUIDERAIL
HW-910_04	METAL BEAM RAIL (TYPE R-B 350) SYSTEMS 5, 5A & 6
HW-910_05	METAL BEAM RAIL R-B 350 SPAN TYPE I, II, III SECTIONS
HW-910_07	R-B 350 BRIDGE ATTACHMENT VERTICAL SHAPE PARAPET
HW-910_09b	MISCELLANEOUS GUIDERAIL TRANSITIONS SHEET 2
HW-910_11	CURVED GUIDERAIL TREATMENT DETAIL
HW-910_17	R-B TERMINAL SECTION
HW-910_20	MASH W-BEAM HARDWARE
HW-910_21	METAL BEAM RAIL (R-B MASH) GUIDERAIL
HW-911_01	R-B END ANCHORAGE TYPE I AND II

SURVEY NOTES

THIS SURVEY HAS BEEN PREPARED BY FREEMAN COMPANIES, LLC. IN ACCORDANCE WITH THE REGULATIONS OF CONNECTICUT STATE AGENCIES, SECTIONS 20-300b-1 THRU 20-300b-20 AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996.

THE TYPE OF SURVEY IS A TOPOGRAPHIC SURVEY AND IS INTENDED TO DEPICT THE EXISTING CONDITIONS AND TOPOGRAPHIC FEATURES OF THE PROJECT SITE.

THE SURVEY ACCURACY CONFORMS TO HORIZONTAL CLASS A-2, AND TOPOGRAPHIC ACCURACY CLASS T-2. PROPERTY LINES CONFORM TO HORIZONTAL CLASS D.

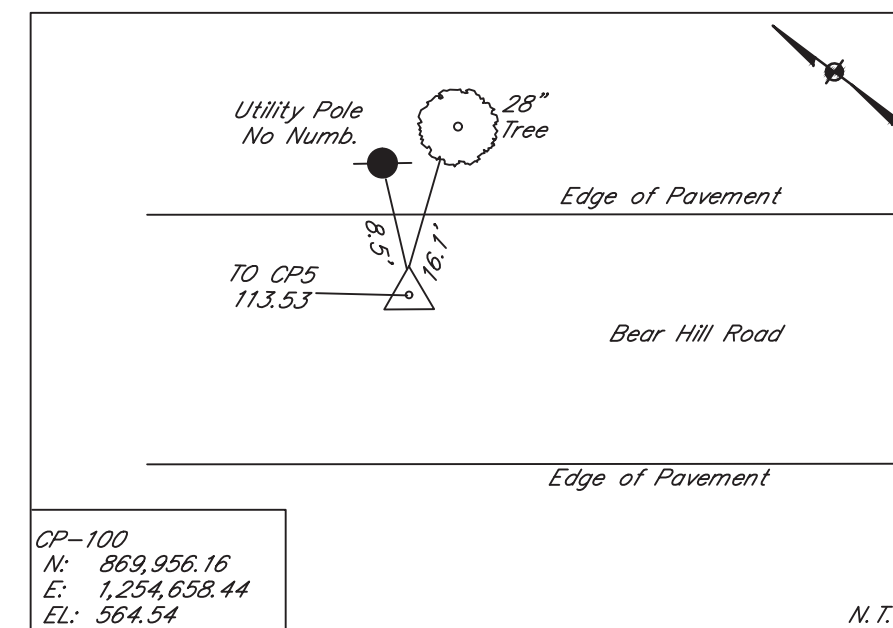
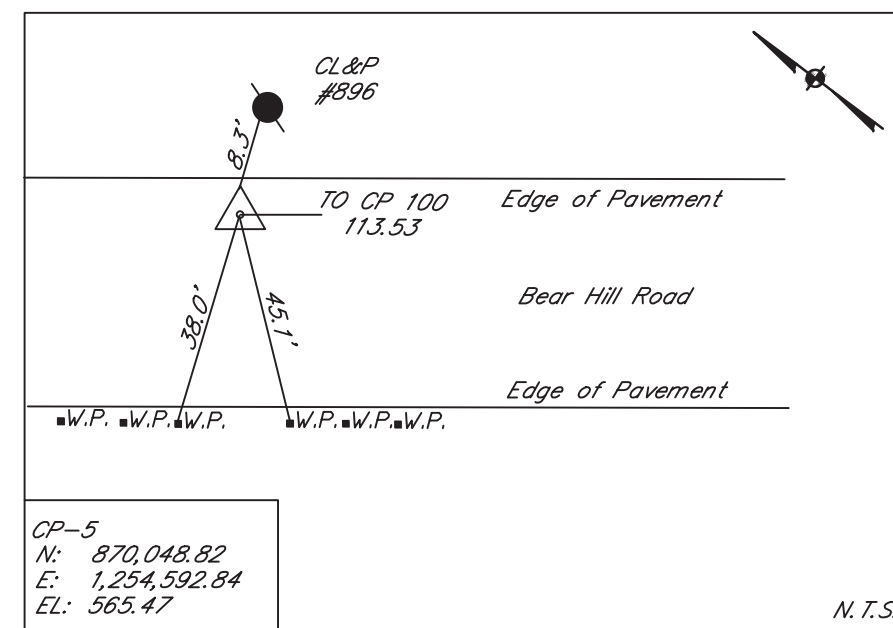
PROPERTY LINES DEPICTED ON THIS PLAN ARE COMPILED FROM OTHER MAPS, RECORD RESEARCH OR OTHER SOURCES OF INFORMATION.

NORTH ARROW REFERS TO THE CONNECTICUT COORDINATE SYSTEM (NAD83) AND IS BASED UPON GPS OBSERVATIONS PERFORMED BY FREEMAN COMPANIES.

ELEVATIONS REFER TO NAVD88 AND ARE BASED ON GPS OBSERVATIONS PERFORMED BY FREEMAN COMPANIES.

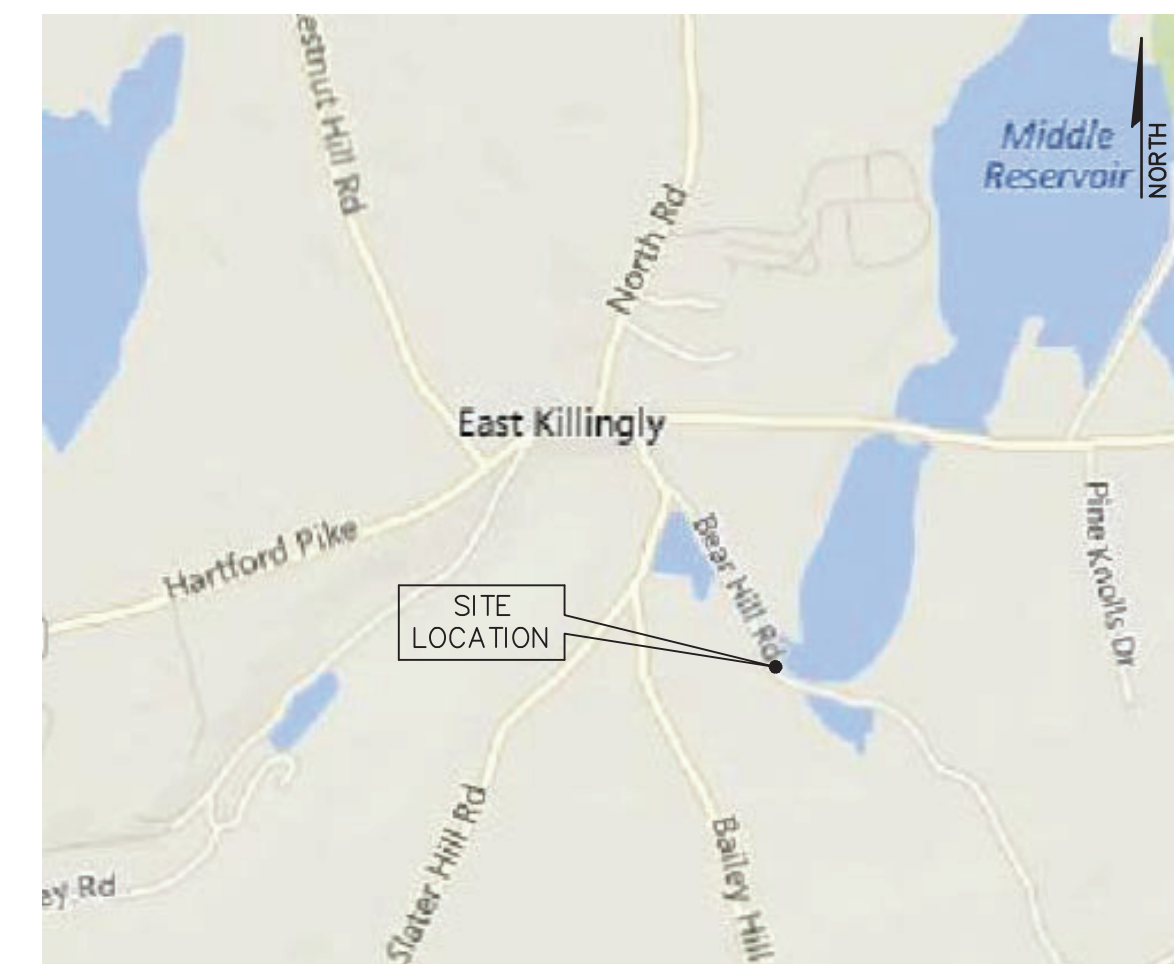
THE UNDERGROUND FEATURES DEPICTED HEREON ARE THE RESULT OF COMPILATION OF EXISTING MAPPING AND LOCATION OF UTILITY PAINT. ACTUAL LOCATION OF UNDERGROUND UTILITIES IS TO BE CONSIDERED TO BE APPROXIMATE AT BEST. OTHER UTILITIES MAY EXIST WHICH FREEMAN COMPANIES ARE UNAWARE OF. VERIFY INFORMATION IN THE FIELD BEFORE ANY DIGGING OR SITE EXCAVATION CALL "CALL BEFORE YOU DIG" 1-800-922-4455.

STREET SURFACE IS LOCATED IN FLOOD HAZARD AREA ZONE C 'AREAS OF MINIMAL FLOODING'. POND AREAS ARE LOCATED WITHIN FLOOD HAZARD AREA A 'AREAS OF 100-YEAR FLOOD; BASE FLOOD ELEVATIONS AND FLOOD HAZARD FACTORS NOT DETERMINED', AS DEPICTED ON FLOOD INSURANCE RATE MAP FOR THE TOWN OF KILLINGLY, COMMUNITY PANEL NUMBER 090136 0020 B, PANEL 20 OF 30, EFFECTIVE DATE: JANUARY 3, 1985.

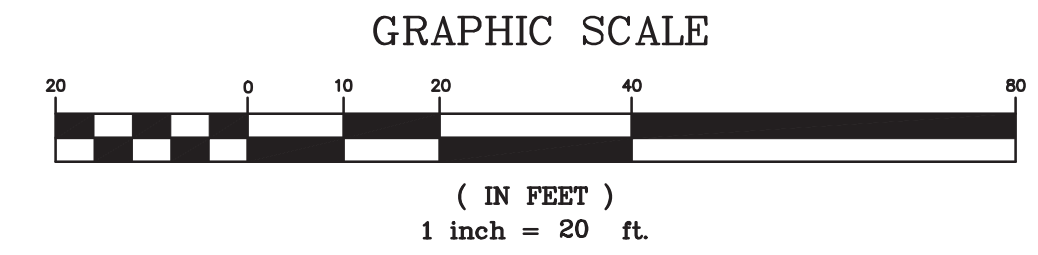
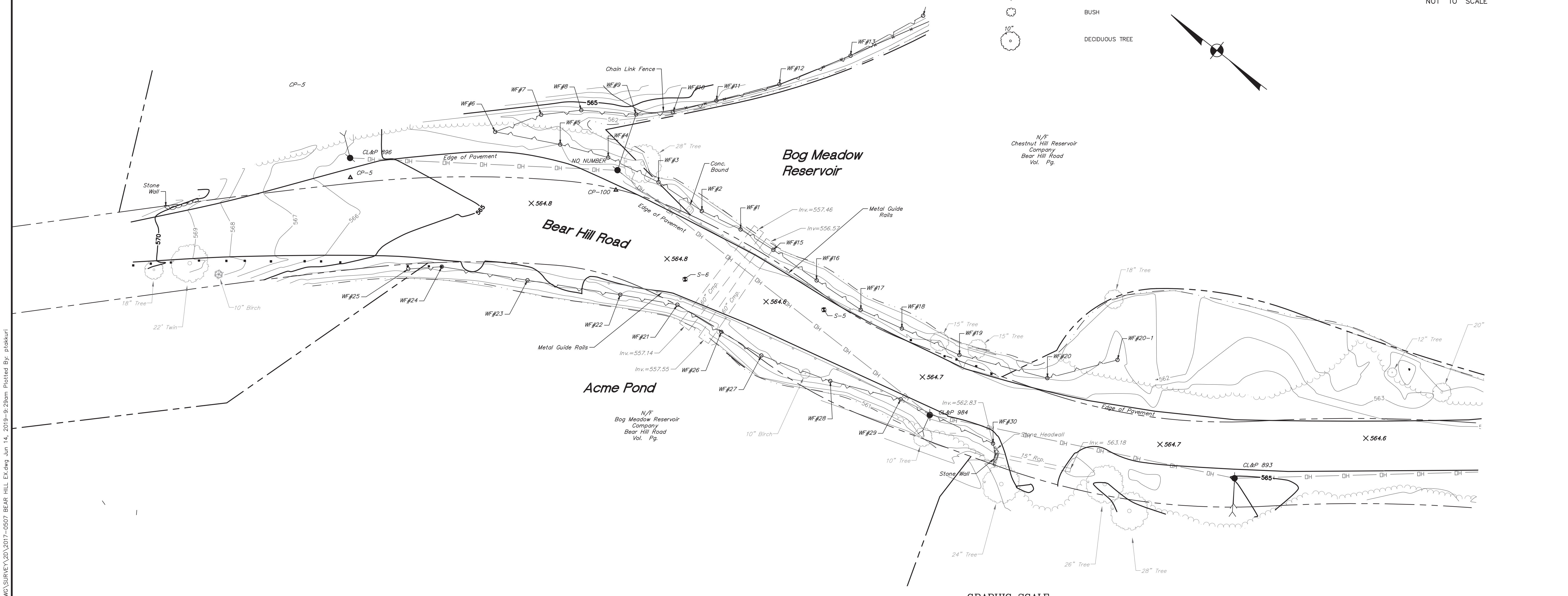


LEGEND

- PROPERTY LINE
- EDGE OF WETLANDS
- EDGE OF RIVER
- WATER LINE
- SANITARY LINE
- GAS LINE
- OVERHEAD WIRES
- DRAINAGE PIPE
- ◆ UTILITY POLE
- ◆ W.G.V. WATER GATE VALVE
- ◆ F.H. FIRE HYDRANT
- ◆ G.G.V. GAS GATE VALVE
- ◆ SIGN
- ◆ PROPERTY CORNER IRON PIN
- ◆ CATCH BASIN
- ◆ DRAINAGE MANHOLE
- ◆ SANITARY MANHOLE
- WF# WETLAND FLAG
- MAILBOX
- BORING
- BUSH
- 10" DECIDUOUS TREE



LOCATION MAP
NOT TO SCALE



TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

MICHAEL J. GARON L.S. #70366
NO CERTIFICATION IS EXPRESSED OR IMPLIED UNLESS THIS MAP BEARS THE ORIGINAL SIGNATURE AND EMBOSSED SEAL OF THE ABOVE NAMED LAND SURVEYOR.

Freeman Companies, LLC - R: 2017.2017-0507 - Killingly Bridges (DWG) SURVEY_2D_2017-0507 BEAR HILL EX.dwg Jun 14, 2019 - 9:29am Plotted By: plaskuri

FREEMAN COMPANIES
36 JOHN STREET
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BEAR HILL ROAD
KILLINGLY,
CONNECTICUT 06239

OWNER FOR
TOWN OF KILLINGLY
BEAR HILL ROAD
KILLINGLY,
CONNECTICUT 06239



**REPLACEMENT OF BRIDGE No. 68-009
BEAR HILL ROAD OVER UNNAMED BROOK
KILLINGLY, CONNECTICUT**

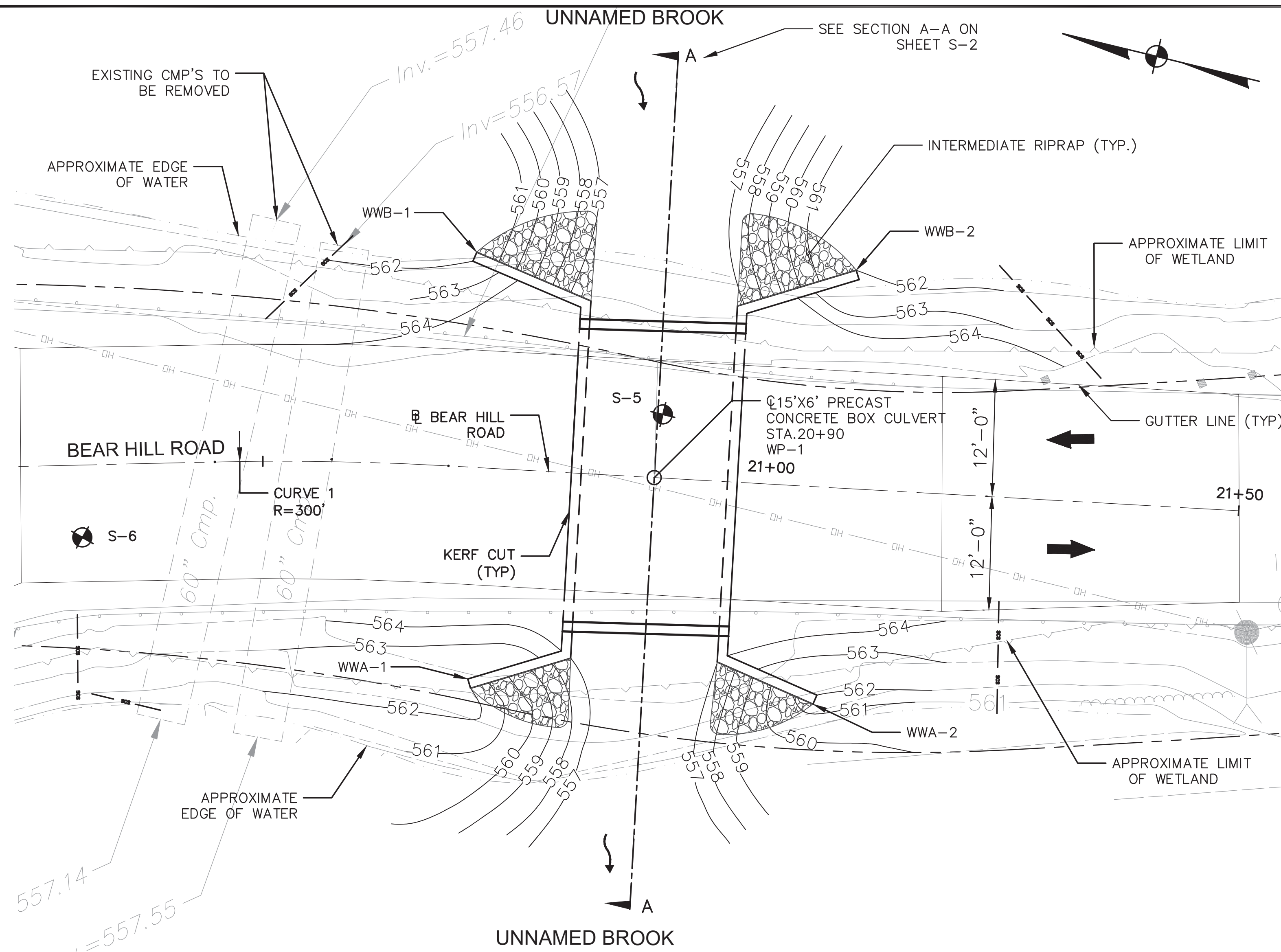
NO.	DATE	DESCRIPTION
REVISIONS		

SURVEYED:	R.J.C./N.J.C.
DRAFTED:	R.J.C.
CHECKED:	RG
APPROVED:	M.J.G.
SCALE:	1" = 20'
PROJECT NO.:	2017-0507
DATE:	09/15/2017
CAD:	2017-0507 BEAR HILL EX

TITLE:
TOPOGRAPHIC SURVEY

SHEET NUMBER:
EX-3.1

THESE DRAWINGS SHALL NOT BE UTILIZED BY ANY PERSON, FIRM OR CORPORATION WITHOUT THE SPECIFIC WRITTEN PERMISSION OF FREEMAN COMPANIES, LLC.



PLAN
SCALE: 1/8" = 1'-0"

BORING LEGEND	
	B-1 APPROXIMATE BORING LOCATION

UTILITY NOTES

- THIS PROJECT INVOLVES THE PRESENCE OF OVERHEAD UTILITY LINES WITHIN THE LIMITS AND FOOTPRINT OF THE PROJECT. WHILE NO WORK INVOLVING OR IMPACTING THESE UTILITIES ARE ANTICIPATED, THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL WORK WITH THE APPROPRIATE UTILITY COMPANY (EVER SOURCE) AND FOR PROVIDING TEMPORARY PROTECTION AND/OR SUPPORT OF THESE FACILITIES IF AND AS REQUIRED BY THE UTILITY COMPANY.
- THE CONTRACTOR SHALL DEVELOP ITS ERECTION SCHEME IN CONFORMANCE WITH LIMITATIONS AND RESTRICTIONS ASSOCIATED WITH THE OVERHEAD UTILITY LINES AND AS REQUIRED BY THE APPROPRIATE UTILITY COMPANY.
- THE CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANY WITH REGARDS TO POTENTIAL RELOCATION OR TEMPORARY SUPPORT OF THEIR FACILITIES. THE CONTRACTOR SHALL IDENTIFY POTENTIAL UTILITY IMPACTS ASSOCIATED WITH THEIR WORK, IF ANY, PRIOR TO START OF CONSTRUCTION AND NOTIFY THE APPROPRIATE UTILITY COMPANY ACCORDINGLY.

NOTICE TO BRIDGE INSPECTORS

IT IS RECOMMENDED THAT CONNDOT'S BRIDGE SAFETY PROCEDURES BE FOLLOWED WHEN INSPECTING THIS BRIDGE FOR, BUT NOT LIMITED TO, ALL APPROPRIATE COMPONENTS INDICATED IN THE GOVERNING MANUALS FOR BRIDGE INSPECTION. ATTENTION MUST BE GIVEN TO INSPECTING THE FOLLOWING SPECIAL COMPONENTS AND DETAILS. (THE LISTING OF COMPONENTS FOR SPECIFIC ATTENTION SHALL NOT BE CONSTRUED TO REDUCE THE IMPORTANCE OF INSPECTION OF ANY OTHER COMPONENT OF THE STRUCTURE.) THE FREQUENCY OF INSPECTION OF THIS STRUCTURE SHALL BE IN ACCORDANCE WITH THE GOVERNING MANUALS FOR BRIDGE INSPECTION, UNLESS OTHERWISE DIRECTED BY THE MANAGER OF BRIDGE SAFETY AND EVALUATIONS.

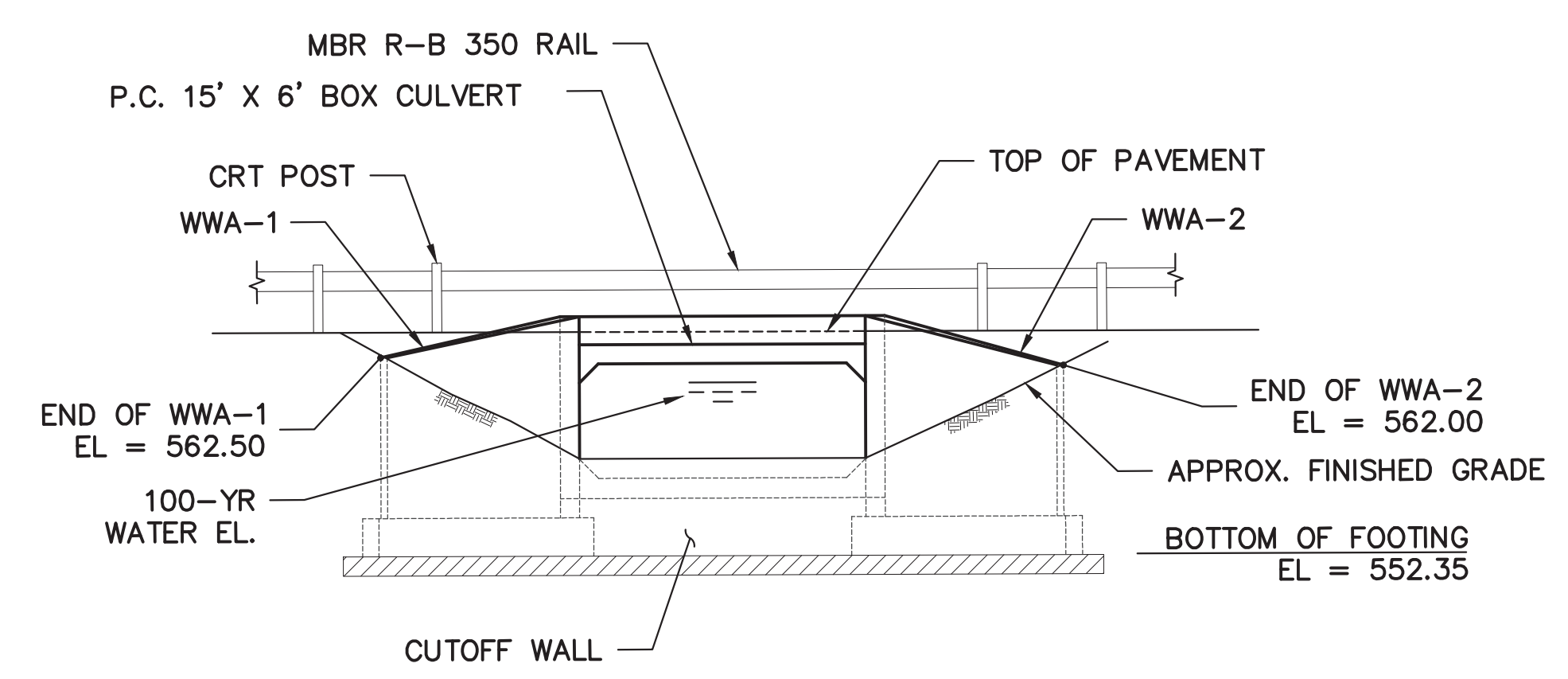
COMPONENT OR DETAIL	STRUCTURE SHEET REFERENCE
NONE	-

GENERAL NOTES

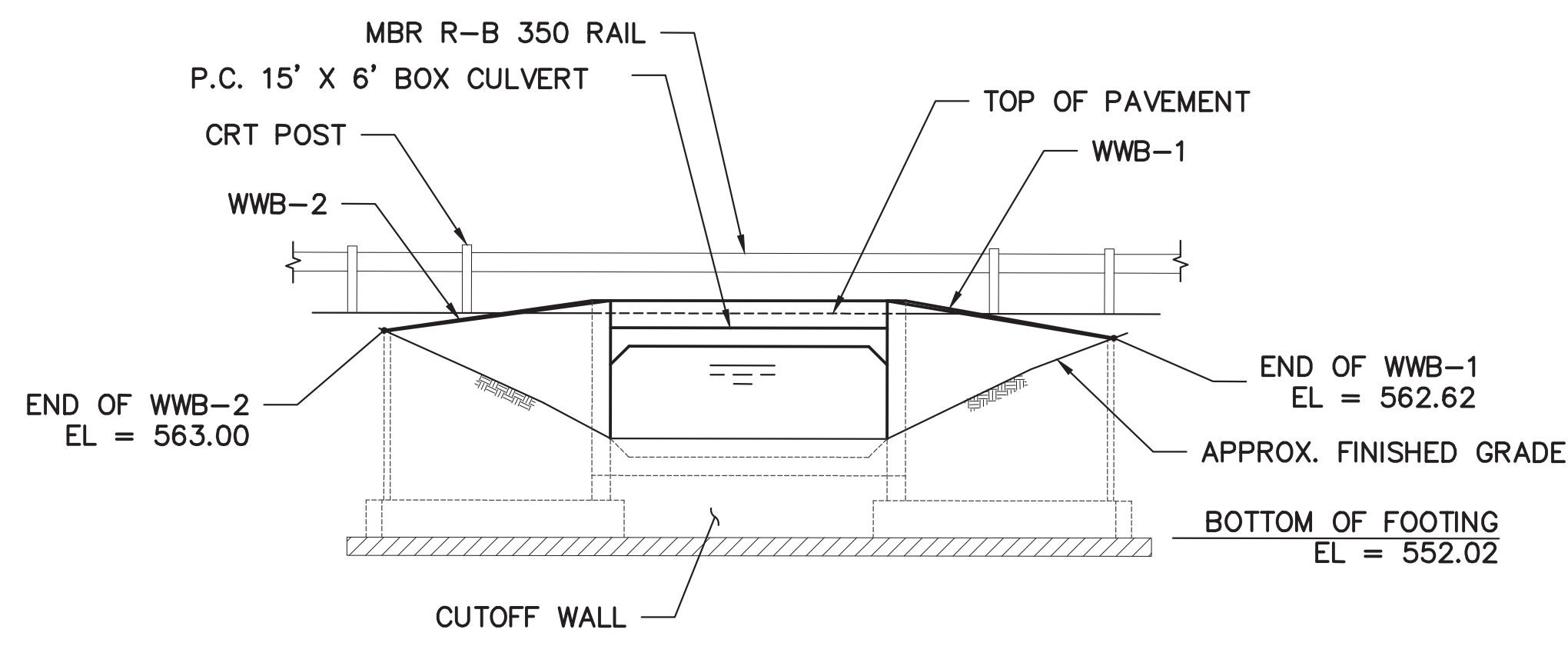
- SPECIFICATIONS:** CONNECTICUT DEPARTMENT OF TRANSPORTATION INCLUDING FORM 817, SUPPLEMENTAL SPECIFICATIONS DATED JANUARY, 2018 AND SPECIAL PROVISIONS.
- DESIGN SPECIFICATIONS:** AASHTO LRFD SPECIFICATIONS FOR HIGHWAY BRIDGES, 7TH EDITION (2013) AS SUPPLEMENTED BY THE CONNECTICUT DEPARTMENT OF TRANSPORTATION BRIDGE MANUAL (2003) EDITION WITH REVISIONS UP TO AND INCLUDING 2011.
- ALLOWABLE DESIGN STRESSES:**
- CLASS "A" CONCRETE: $f'_c = 3,000$ psi
 CLASS "50" CONCRETE: $f'_c = 5,000$ psi
 REINFORCEMENT (ASTM 615 GRADE 60) $f_y = 60,000$ psi
- LIVE LOAD:**
- STANDARD DESIGN VEHICLE: AASHTO HL-93
 PERMIT (OVERLOAD) VEHICLES: CONNDOT P204 (8-AXLE)
 CONNDOT P380 (19-AXLE)
- SALVAGE:** NONE
- DIMENSIONS AND ELEVATIONS:** WHEN DECIMAL DIMENSIONS AND ELEVATIONS ARE GIVEN TO LESS THAN THREE DECIMAL PLACES, THE OMITTED DIGITS SHALL BE ASSUMED TO BE ZERO. ALL ELEVATIONS ARE GIVEN IN DECIMAL FEET AND ARE BASED ON NAVD 88.
- EXISTING DIMENSIONS:** DIMENSIONS OF THE EXISTING STRUCTURE SHOWN ON THESE PLANS ARE FOR GENERAL REFERENCE ONLY AND ARE NOT GUARANTEED. THE CONTRACTOR SHALL TAKE ALL FIELD MEASUREMENTS NECESSARY TO ASSURE PROPER FIT OF THE FINISHED WORK AND SHALL ASSUME FULL RESPONSIBILITY FOR THEIR ACCURACY. WHEN SHOP DRAWINGS BASED ON FIELD MEASUREMENTS ARE SUBMITTED FOR APPROVAL, THE FIELD MEASUREMENTS SHALL ALSO BE SUBMITTED FOR REFERENCE BY THE REVIEWER.
- UTILITIES:** THE CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES LOCATED WITHIN THE VICINITY OF THE SITE DURING CONSTRUCTION. THE METHOD OF SUPPORTING AND PROTECTING UTILITIES SELECTED BY THE CONTRACTOR MUST BE APPROVED BY THE UTILITY COMPANY. UTILITY MODIFICATIONS SHALL BE MADE BY THE RESPECTIVE UTILITY COMPANIES EXCEPT WHERE NOTED OTHERWISE.

CONCRETE NOTES

- CLASS "A" CONCRETE:** CLASS "A" CONCRETE SHALL BE USED FOR THE CUT-OFF WALLS, RETURN WALLS, HEADWALLS AND WINGWALL FOOTINGS.
- CLASS "50" CONCRETE:** CLASS "50" CONCRETE SHALL BE USED FOR THE PRECAST CONCRETE BOX CULVERT AND PRECAST CONCRETE WINGWALL STEMS.
- REINFORCEMENT:** ALL REINFORCEMENT SHALL BE ASTM A615 GRADE 60.
- EXPOSED EDGES:** EXPOSED EDGES OF CONCRETE SHALL BE BEVELED 1" X 1", UNLESS DIMENSIONED OTHERWISE.
- EPOXY COATED REINFORCEMENT BARS:** ALL REINFORCEMENT IN THE PRECAST CONCRETE BOX CULVERT SHALL BE EPOXY COATED AND INCLUDED IN THE PAY ITEM "15'X6' PRECAST CONCRETE BOX CULVERT". ALL REINFORCEMENT IN THE PRECAST CONCRETE WINGWALLS SHALL BE EPOXY COATED AND INCLUDED IN THE PAY ITEM "PRECAST CONCRETE WINGWALLS". ALL REINFORCEMENT IN THE CUT-OFF WALLS, AND RETURN WALLS SHALL BE PAID FOR IN THE PAY ITEM "DEFORMED STEEL BARS". ALL REINFORCEMENT IN THE HEADWALLS SHALL BE EPOXY COATED AND PAID FOR UNDER THE ITEM "DEFORMED STEEL BARS (EPOXY COATED)".
- CONCRETE COVER:** ALL REINFORCEMENT SHALL HAVE 2" COVER UNLESS DIMENSIONED OTHERWISE.
- PREFORMED EXPANSION JOINT FILLER:** THE COST OF FURNISHING AND INSTALLING PREFORMED EXPANSION JOINT FILLERS SHALL BE INCLUDED IN THE ITEM "CLASS "A" CONCRETE".



UPSTREAM ELEVATION
SCALE: 1/8" = 1'-0"



DOWNSTREAM ELEVATION
SCALE: 1/8" = 1'-0"

HYDRAULIC DATA	
HYDRAULIC AREA	5.0 SQ MI
DESIGN FREQUENCY	100 YEAR
DESIGN DISCHARGE	950 CFS
AVERAGE DAILY FLOW	9.1 CFS
AVERAGE DAILY FLOW ELEVATION	558.30
UPSTREAM DESIGN WATER SURFACE ELEVATION	565.26
DOWN STREAM DESIGN WATER SURFACE ELEVATION	558.30
2 YEAR DESIGN STORM WATER ELEVATION	561.91

TRANSPORTATION DATA				
MEMBER	SHIPPING LENGTH	SHIPPING HEIGHT	SHIPPING WIDTH	SHIPPING WEIGHT
BOX CULVERT	17'-0"	8'-0"	8'-0"	55,800 lbs
WINGWALL	13'-0"	8'-0"	8'-0"	16,000 lbs

Freeman Companies, LLC - R: 2017.2017-0507 - Killingly Bridges VDW BRIDGE 68-009 Inv. 2017_0507_brg009_gen.dwg Jan 03, 2022 5:24pm Plotted By: JuleBou

FREEMAN COMPANIES
 30 JOHN STREET
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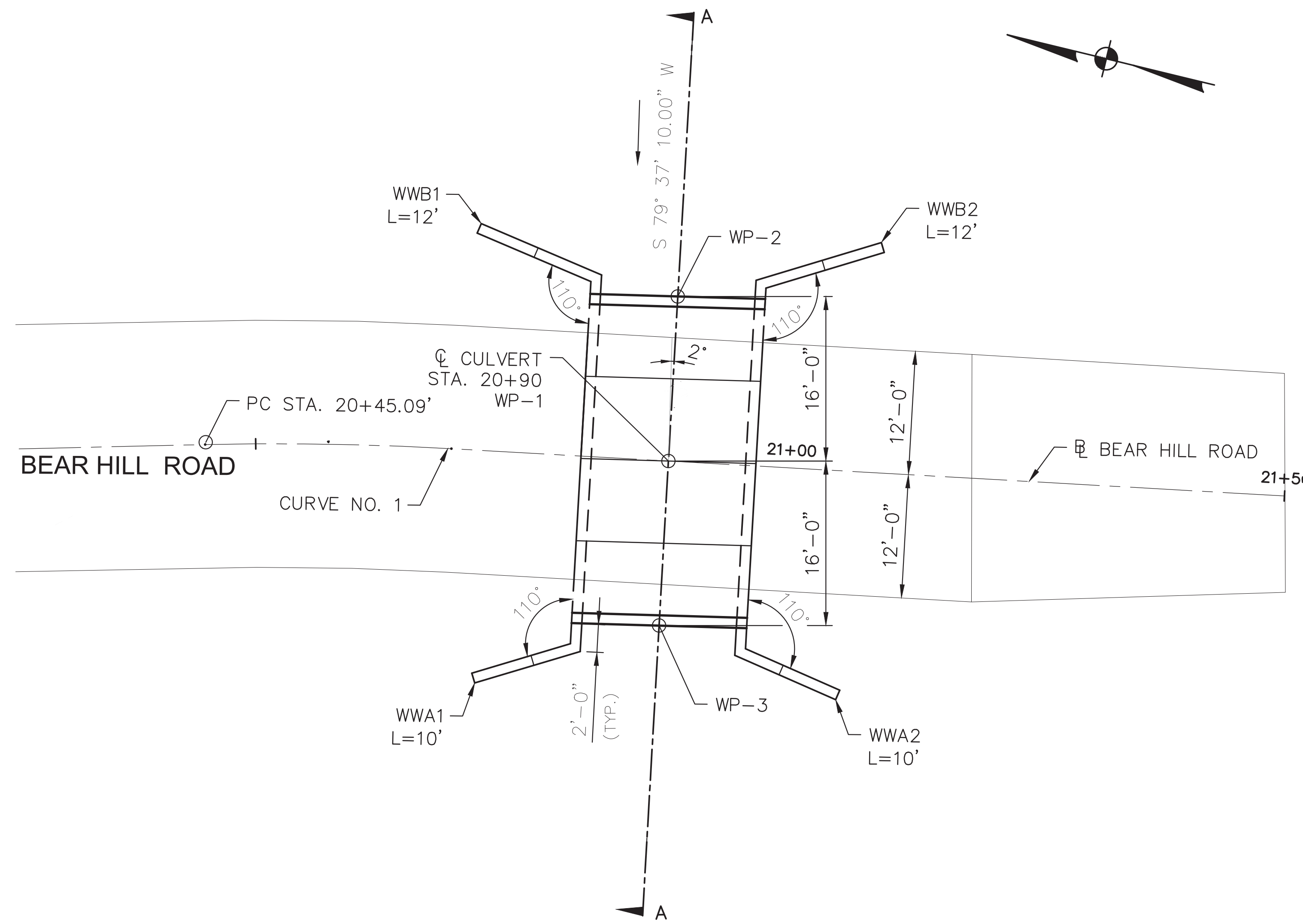
PREPARED FOR
 TOWN OF KILLINGLY
 BEAR HILL ROAD
 KILLINGLY,
 CONNECTICUT 06239

OWNER FOR
 TOWN OF KILLINGLY
 BEAR HILL ROAD
 KILLINGLY,
 CONNECTICUT 06239

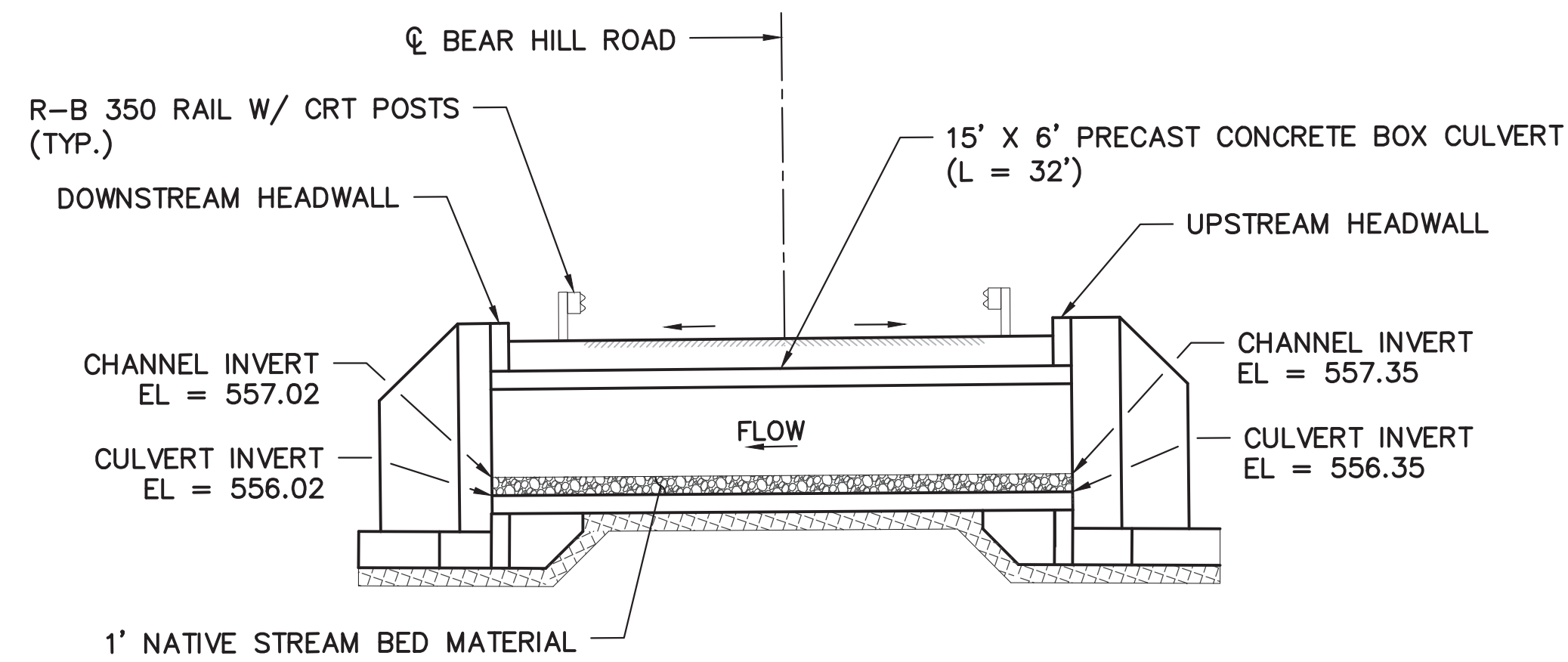
STATE OF CONNECTICUT
 PROFESSIONAL ENGINEER
 DENNIS M. GOURN, P.E.
 NO. 19106

**REPLACEMENT OF BRIDGE No. 68-009
 BEAR HILL ROAD OVER UNNAMED BROOK
 KILLINGLY, CONNECTICUT**

DESIGNED: YL	TITLE: GENERAL PLAN
DRAFTED: PT	
CHECKED: DO	
APPROVED: PAR	
SCALE: AS NOTED	SHEET NUMBER: S-3.1
PROJECT NO.: 2017-0507	
DATE: 02/05/2020	
CAD: fw_rms_2017_0507_brg009_gen	



LAYOUT PLAN
SCALE: 1/8" = 1'-0"



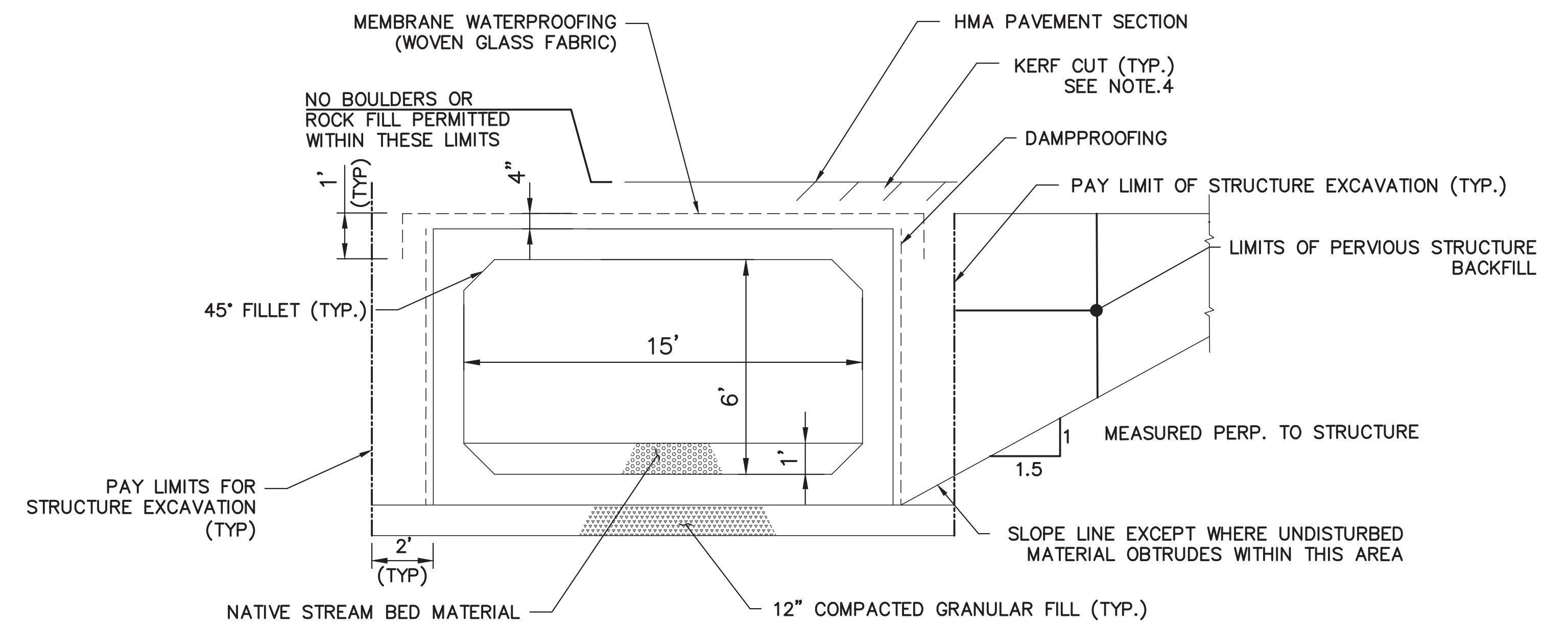
SECTION A-A
N.T.S.

WP	NORTHING	EASTING
WP-1	869851.0942	1254650.6114
WP-2	869856.8715	1254682.0981
WP-3	869853.9828	1254666.3548

NOTES:

- FOR COMPLETE BASELINE GEOMETRY, SEE SHEET NO. HWY-1.
- ROADWAY PROFILE TO MATCH EXISTING.
- FOR WINGWALL SECTION DETAILS SEE SHEET MDS-3.
- CUT BITUMINOUS OVERLAY WITH 3/8" WIDE BY 1 3/4" DEEP KERF AND FILL WITH POURABLE SEALANT. TO BE PAID FOR UNDER THE ITEM "SAWING AND SEALING JOINTS IN BITUMINOUS PAVEMENT."

QUANTITIES		
ITEM	UNITS	TOTALS
STRUCTURE EXCAVATION - EARTH (COMPLETE)	CY	450
STRUCTURE EXCAVATION - ROCK (COMPLETE)	CY	12
HANDLING WATER	LS	1
COMPACTED GRANULAR FILL	CY	30
PERVIOUS STRUCTURE BACKFILL	CY	260
SAWING AND SEALING JOINTS IN BIT. CONC. PAVEMENT	LF	70
REMOVAL OF EXISTING CULVERT	LS	1
CLASS 'A' CONCRETE	CY	20
PRECAST CONCRETE WINGWALL	EA	4
15' X 6' PRECAST CONCRETE BOX CULVERT	LF	32
DEFORMED STEEL BARS	LB	1,800
DEFORMED STEEL BARS (EPOXY COATED)	LB	500
DRILLING HOLES AND GROUTING DOWELS	EA	30
MEMBRANE WATERPROOFING (COLD LIQUID ELASTOMERIC)	SY	75
DAMPPROOFING	SY	150



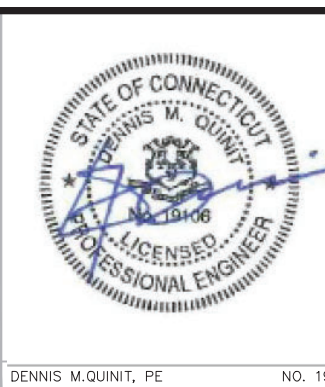
TYPICAL CULVERT SECTION
N.T.S.

REPLACEMENT OF BRIDGE No. 68-009 BEAR HILL ROAD OVER UNNAMED BROOK KILLINGLY, CONNECTICUT

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HARTFORD, CT 06106
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(860)351-9950
TOLL FREE: (800)964-5141
FAX: (860)964-7141
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KILLINGLY,
CONNECTICUT 06239

OWNER FOR
TOWN OF KILLINGLY
BEAR HILL ROAD
KILLINGLY,
CONNECTICUT 06239

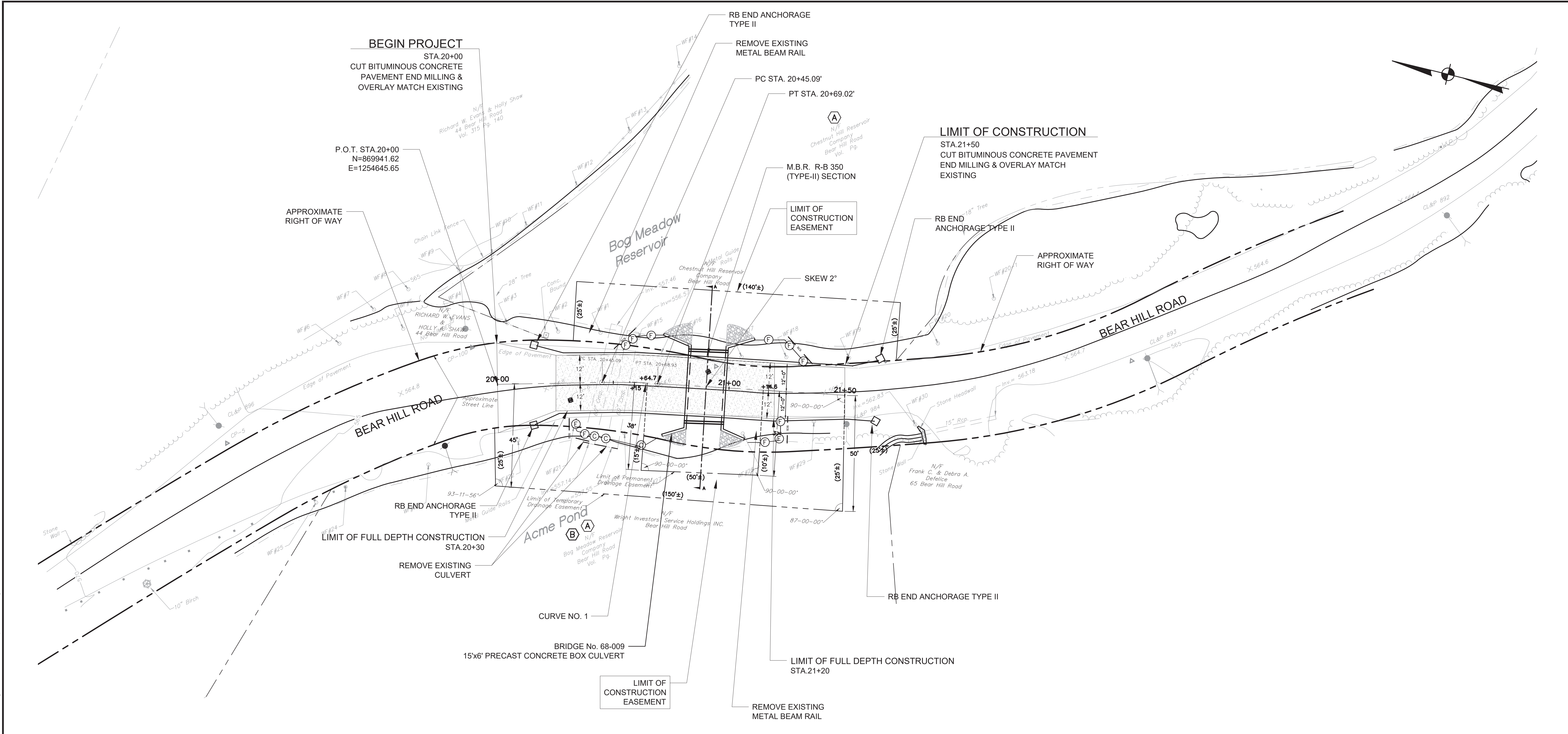


DESIGNED: YL
DRAFTED: PT
CHECKED: DQ
APPROVED: PAR
SCALE: AS NOTED
PROJECT NO.: 2017-0507
DATE: 02/05/2020
CAD: HW_MSH_2017_0507_BRG009_ALN

TITLE:
LAYOUT PLAN
SHEET NUMBER:
S-3.2

NO.	DATE	DESCRIPTION
1	12/23/21	GENERAL REVISIONS, FLOW ARROWS, HYDRAULIC INFO.
REVISIONS		

Freeman Companies, LLC - R: 2017\2017-0507 - Killingly Bridges\DWG\BRIDGE 68-009\HWY-3.1.dwg Job 19, 2022-4-27pm. Plotted By: jldneu



- NOTES**
1. ALL SOIL DISTURBANCES SHALL BE TREATED WITH 4" TOP SOIL & TUFF ESTABLISHMENT.
 2. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL DIMENSIONS AND ELEVATIONS PRIOR TO CONSTRUCTION.
 3. CONTRACTOR SHALL COORDINATE WITH THE ENGINEER REGARDING THE LIMITS OF RESTORATION TO ENSURE A SMOOTH TRANSITION FROM NEW CONSTRUCTION TO EXISTING CONDITIONS.
 4. CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" (CBYD) 1-800-922-4455 PRIOR TO COMMENCING CONSTRUCTION.
 5. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE PLANS OR AS DIRECTED BY THE ENGINEER.
 6. REFER TO STRUCTURAL (S SERIES) DRAWINGS FOR PROPOSED CULVERT DETAILS, GRADING, AND METAL BEAM RAIL POST DETAILS.

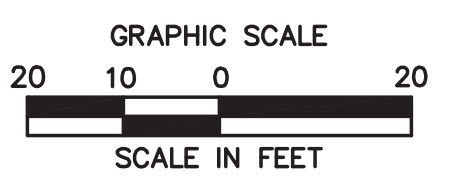
CURVE DATA						
No.		Northing	Easting	Delta(Δ)	Length	Radius
CURVE NO. 1	PC	869898.06	1254657.30	N04°34'8"E	23.923'	300.0'
	PI	869886.50	1254660.34			
	PT	869874.72	1254662.55			

SCHEDULE OF RIGHTS & EASEMENTS

- (A) CONSTRUCTION EASEMENT
- (B) EASEMENT TO INSTALL, CONSTRUCT & MAINTAIN METAL BEAM RAIL END ANCHORAGE

LEGEND

- [Hatched Box] FULL DEPTH PAVEMENT RECONSTRUCTION / PROPOSED WIDENING
- (C) (F) FILL/CUT APPROXIMATE SLOPE LIMITS
- scs --- SEDIMENTATION CONTROL SYSTEM
- - - - - APPROXIMATE WETLAND LIMITS
- - - - - EASEMENT LINE



FREEMAN COMPANIES
 LEAD DEVELOPER | ENGINEER | DESIGN | CONSTRUCTION SERVICES
 DBE | DAS | MBE | GNMSDC CERTIFIED
 CIVIL | GEOTECHNICAL | SURVEY | ENVIRONMENTAL
 FREEMAN COMPANIES, LLC
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 CONNECTICUT 06239

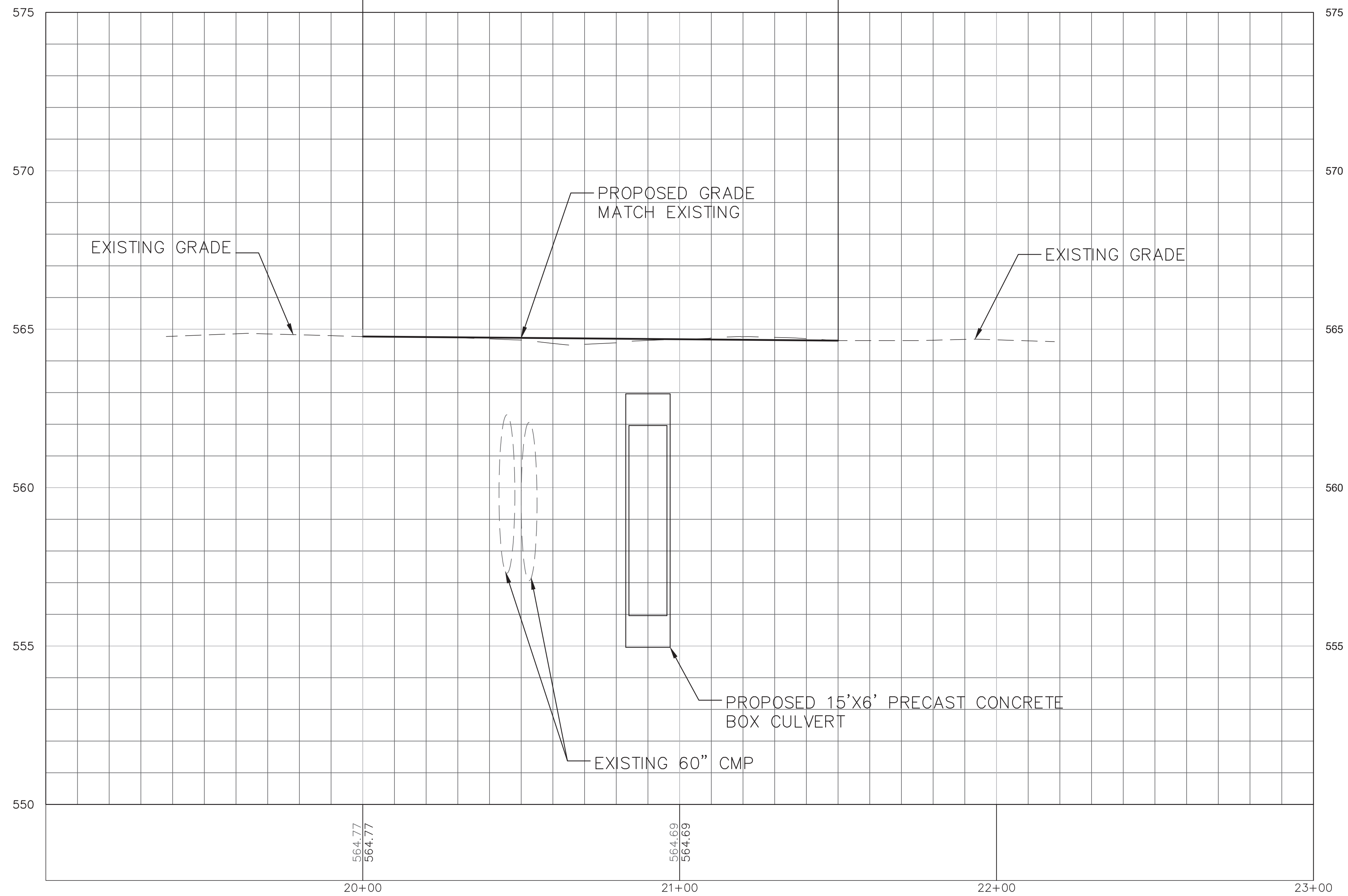
REPLACEMENT OF BRIDGE No. 68-009 BEAR HILL ROAD OVER UNNAMED BROOK KILLINGLY, CONNECTICUT

DESIGNED:	YL	TITLE:	ROADWAY PLAN
DRAFTED:	PT	CHECKED:	DO
APPROVED:	PAR	SCALE:	AS NOTED
PROJECT NO.:	2017-0507	DATE:	02/05/2020
CAD:	HW_MSH_2017_0507_BRG009_JHWY	SHEET NUMBER:	HWY-3.1
NO. DATE DESCRIPTION		REVISIONS	

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BEGIN PROJECT
 STA. 20+00
 CUT BITUMINOUS CONCRETE
 PAVEMENT
 BEGIN MILL & OVERLAY
 MATCH EXISTING
 EL=564.78

END PROJECT
 STA. 21+50
 CUT BITUMINOUS CONCRETE
 PAVEMENT
 END MILL & OVERLAY
 MATCH EXISTING
 EL=564.67



BEAR HILL ROAD PROFILE

H: 1"=10'
 V: 1"=2'

**REPLACEMENT OF BRIDGE No. 68-009
 BEAR HILL ROAD OVER UNNAMED BROOK
 KILLINGLY, CONNECTICUT**

**FREEMAN
 COMPANIES**

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OWNER FOR

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 KILLINGLY,
 CONNECTICUT 06239



DENNIS M. GUINET, P.E. NO. 19108

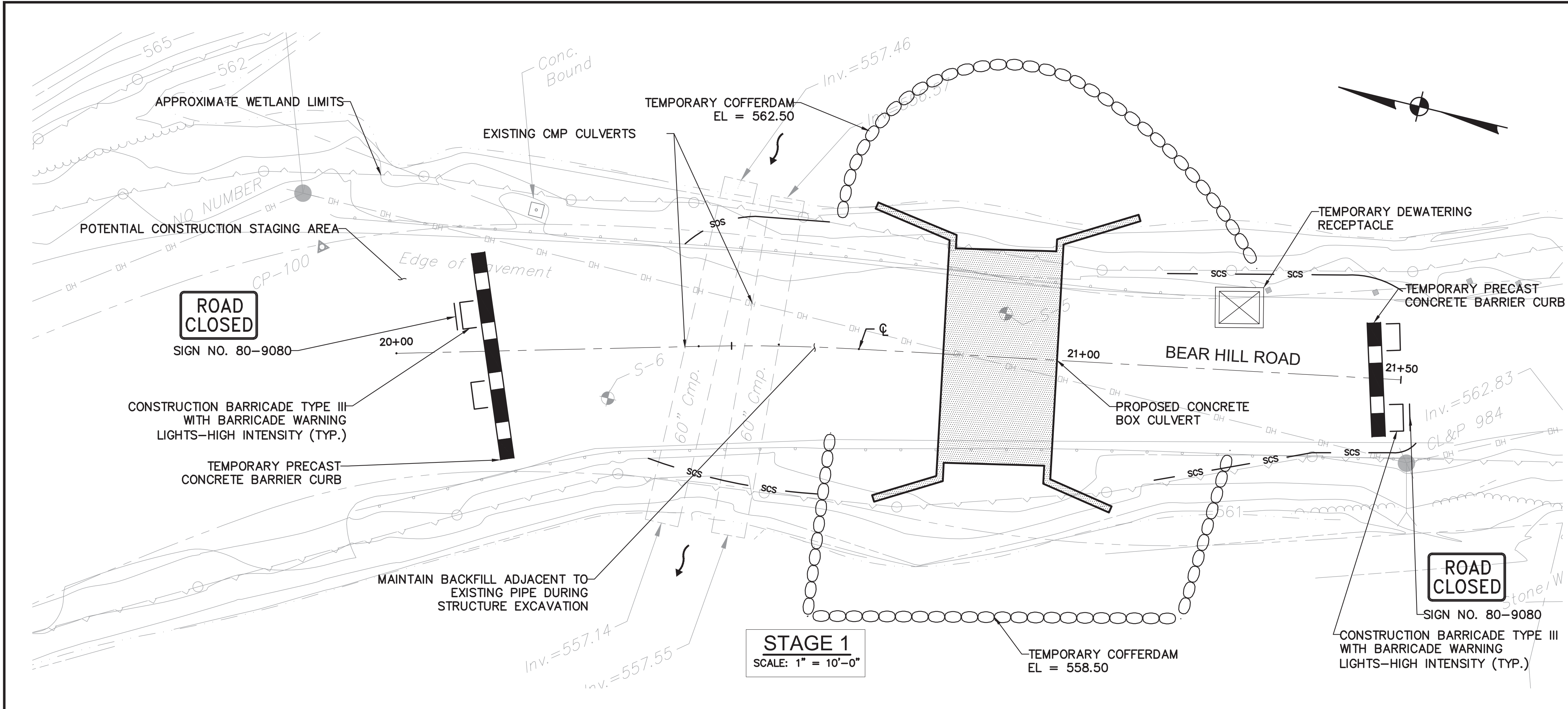
NO.	DATE	DESCRIPTION

DESIGNED:	YL
DRAFTED:	PT
CHECKED:	DQ
APPROVED:	PAR
SCALE:	AS NOTED
PROJECT NO.:	2017-0507
DATE:	06/14/2019
CAD:	HW_MSH_2017_0507_BRG009_PRO

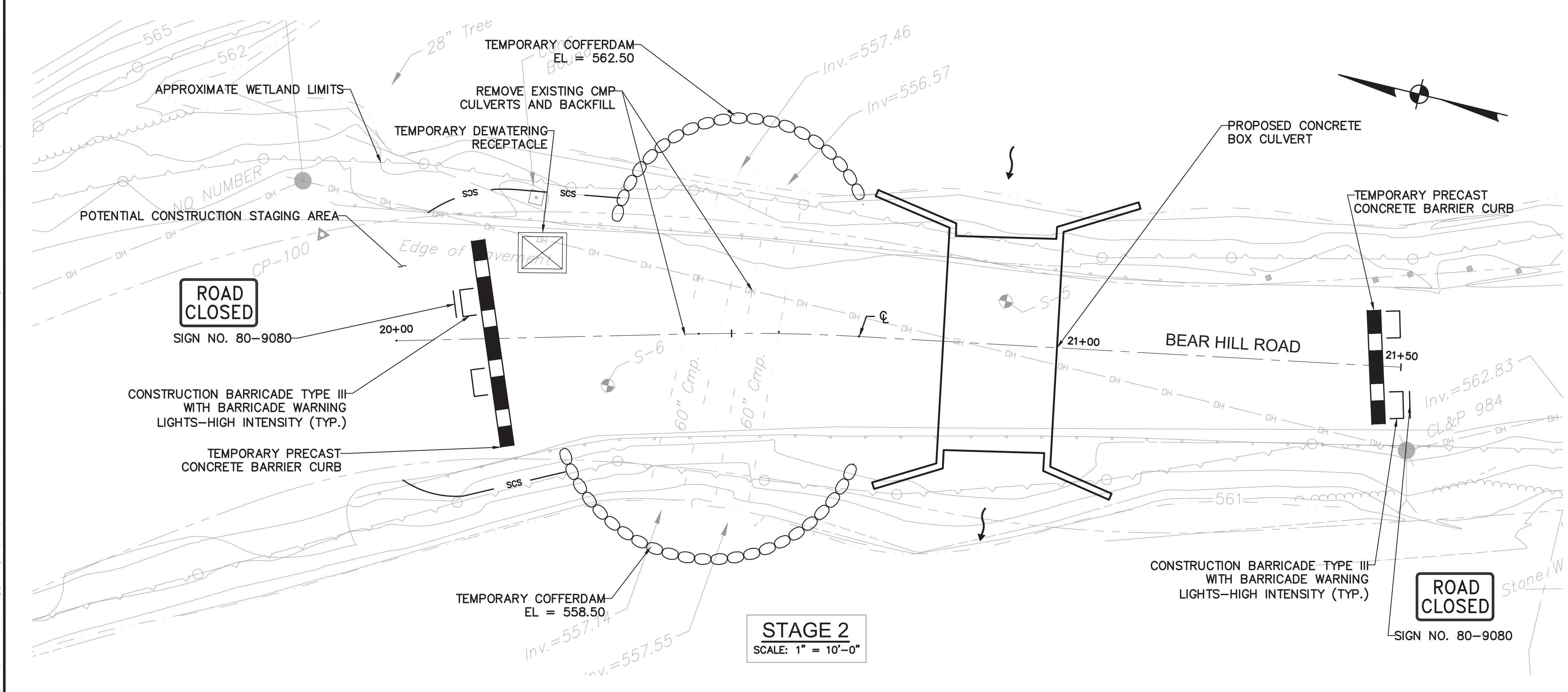
TITLE:	ROADWAY PROFILE
SHEET NUMBER:	PRO-3.1

Freeman Companies, LLC - R:\2017\2017-0507_Killingly_Bridges\DWG\Bridges\68-009\HW_MSH_2017_0507_BRG009_PRO.dwg Jun 19, 2019 - 3:11pm Plotted By: mskurki

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STAGE 1
SCALE: 1" = 10'-0"



STAGE 2
SCALE: 1" = 10'-0"

BEAR HILL ROAD WATER HANDLING PLAN

GENERAL NOTES

1. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL A DETAILED PLAN AND NARRATIVE DESCRIBING ITS PROPOSED CONSTRUCTION SEQUENCE INCLUDING DETAILED INFORMATION RELATING TO THE WATER HANDLING.
2. BEST MANAGEMENT PRACTICES (BMP) SHALL BE UTILIZED AS APPROPRIATE AND SHALL BE CONSISTENT WITH THE CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENTATION CONTROL.
3. CONSTRUCTION ACTIVITIES SHALL CONFORM TO SECTION 1.10, ENVIRONMENTAL COMPLIANCE OF THE STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS, BRIDGES, AND INCIDENTAL CONSTRUCTION, FORM 817.
4. DEWATERING, IF AND AS NEEDED, SHALL UTILIZE BMP'S AS APPLICABLE AND AS APPROVED AND ACCEPTABLE BY THE ENGINEER AND THE TOWN OF KILLINGLY.
5. FLOW WILL BE MAINTAINED THROUGH THE EXISTING PIPE CULVERTS DURING CONSTRUCTION OF THE PROPOSED REPLACEMENT CONCRETE BOX CULVERT. TRASH RACK TO BE PULLED FROM UPSTREAM END OF CULVERTS FOR BYPASS FLOWS AND DEWATERING.
6. DETOUR SHALL BE ESTABLISHED BY THE TOWN.

SUGGESTED SEQUENCE OF CONSTRUCTION

PRE-CONSTRUCTION STAGE

1. CONTACT "CALL-BEFORE-YOU-DIG" AND PERFORM UTILITY MARK-OUTS IF AND AS NECESSARY.
2. INSTALL SEDIMENTATION AND EROSION CONTROL MEASURES AS REQUIRED.
3. CLOSE BEAR HILL ROAD, INSTALL CONSTRUCTION BARRICADES, AND DETOUR TRAFFIC.
4. INSTALL TEMPORARY COFFER DAMS AROUND PROPOSED CULVERT AND INSTALL TEMPORARY DEWATERING RECEPTACLES AS SHOWN.

STAGE 1

1. EXCAVATE SITE AND DEWATER AS NECESSARY.
NOTE: THE CONTRACTOR IS ADVISED TO MAINTAIN BACKFILL ADJACENT TO THE PIPES TO MAINTAIN STABILITY OF CORRUGATED METAL PIPE.
2. CONSTRUCT CUT-OFF WALLS AND RETURN WALLS.
3. INSTALL CONCRETE BOX CULVERT, PRECAST CONCRETE WING WALLS, AND CONSTRUCT HEADWALLS.
4. INSTALL RIPRAP TO LIMITS SHOWN ON THESE PLANS.
5. APPLY MEMBRANE WATERPROOFING OVER TOP SLAB TO LIMITS SHOWN.
6. BACKFILL STRUCTURE AS SHOWN ON THESE PLANS AND PER SPECIFICATIONS.

STAGE 2

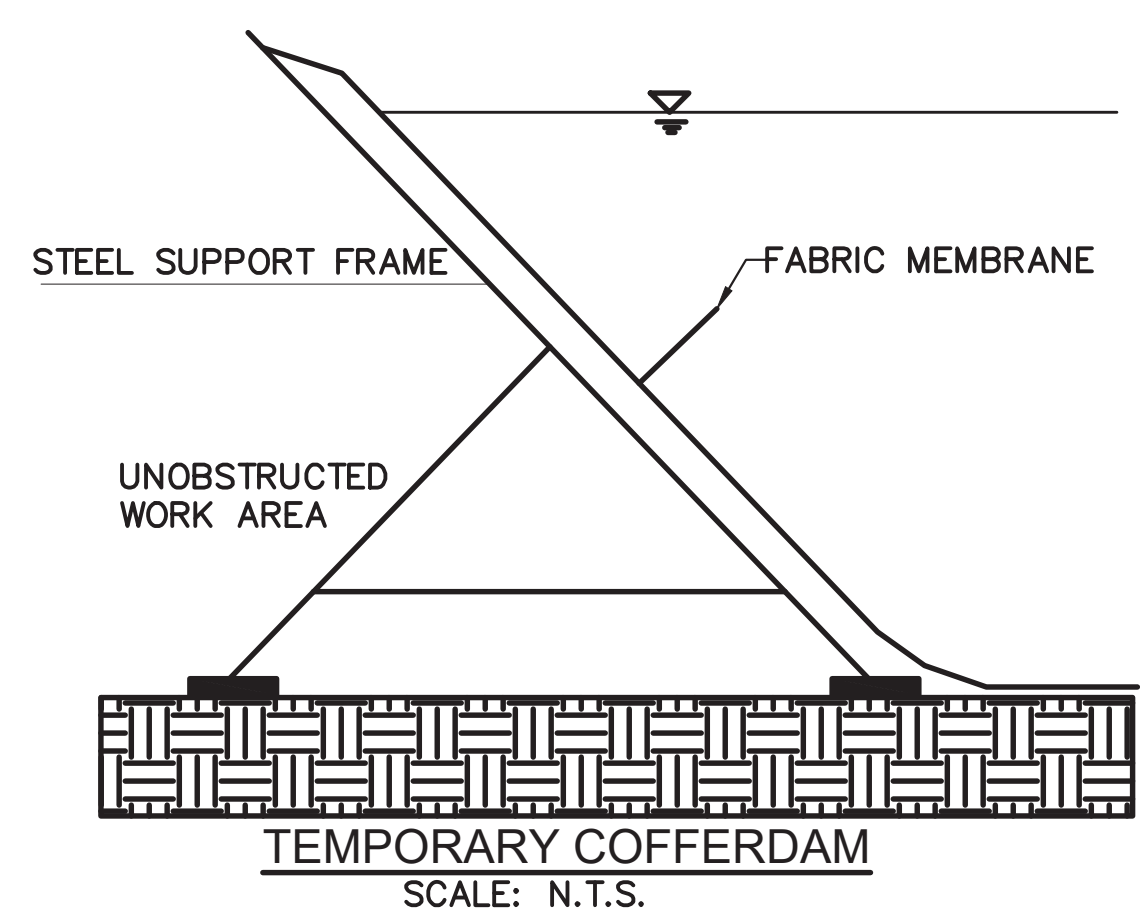
1. RELOCATE TEMPORARY COFFERDAM AROUND EXISTING CORRUGATED METAL PIPES AND DIVERT WATER FLOW INTO NEW CULVERT.
2. RELOCATED TEMPORARY DEWATERING RECEPTACLE AS SHOWN.
3. DEWATER SITE OF EXISTING CULVERT.
4. EXCAVATE AND REMOVE EXISTING CORRUGATED METAL PIPES.
5. BACKFILL AND REMOVE TEMPORARY COFFERDAM.
6. CONSTRUCT ROADWAY APPROACHES AND OTHER ROADWAY ITEMS TO LIMITS SHOWN.
7. REPAVE BEAR HILL ROAD AND RE-ESTABLISH TURF.
8. REMOVE SEDIMENTATION AND EROSION CONTROL MEASURES.
9. PERFORM SITE CLEAN-UP, REMOVE CONSTRUCTION BARRICADES, AND OPEN ROAD TO TRAFFIC.

LEGEND

	PROPOSED CULVERT
	SEDIMENTATION CONTROL SYSTEM
	TEMPORARY COFFERDAM

TEMPORARY HYDRAULIC DATA

TEMPORARY DESIGN FREQUENCY	2-YEAR
TEMPORARY DESIGN DISCHARGE	192 CFS
AVERAGE DAILY FLOW	9.1 CFS
AVERAGE DAILY FLOW ELEVATION	558.30 FT
TEMPORARY WSEL UPSTREAM	561.91 FT
TEMPORARY WSEL DOWNSTREAM	558.01 FT



NOTES:
TEMPORARY COFFERDAM SHOWN ABOVE BASED ON PORTADAM SYSTEM. THE CONTRACTOR MAY CHOOSE TO PROVIDE A DIFFERENT TEMPORARY COFFERDAM SYSTEM AS APPROVED BY THE ENGINEER.

Freeman Companies, LLC - R:\2017\2017-0507_Killingly_Bridges\DWG\BRIDGE_68-009\SB_MSH_2017_0507_BRG009_S10.dwg Jan 16, 2022 - 8:40pm. Plotted By: JcdBrew

FREEMAN COMPANIES
DBE | DAS | ABE | GNASDC CERTIFIED
CIVIL | GEOTECHNICAL | SURVEY | ENVIRONMENTAL
FREEMAN COMPANIES, LLC
34 JOHN STREET
HARTFORD, CT 06106
WWW.FREEMANCO.COM
860.511.9500
TOLL FREE: 800.604.5141
FAX: 860.604.7151
ELEVATE YOUR EXPECTATIONS

PREPARED FOR
TOWN OF KILLINGLY
BEAR HILL ROAD
KILLINGLY,
CONNECTICUT 06239

OWNER FOR
TOWN OF KILLINGLY
BEAR HILL ROAD
KILLINGLY,
CONNECTICUT 06239



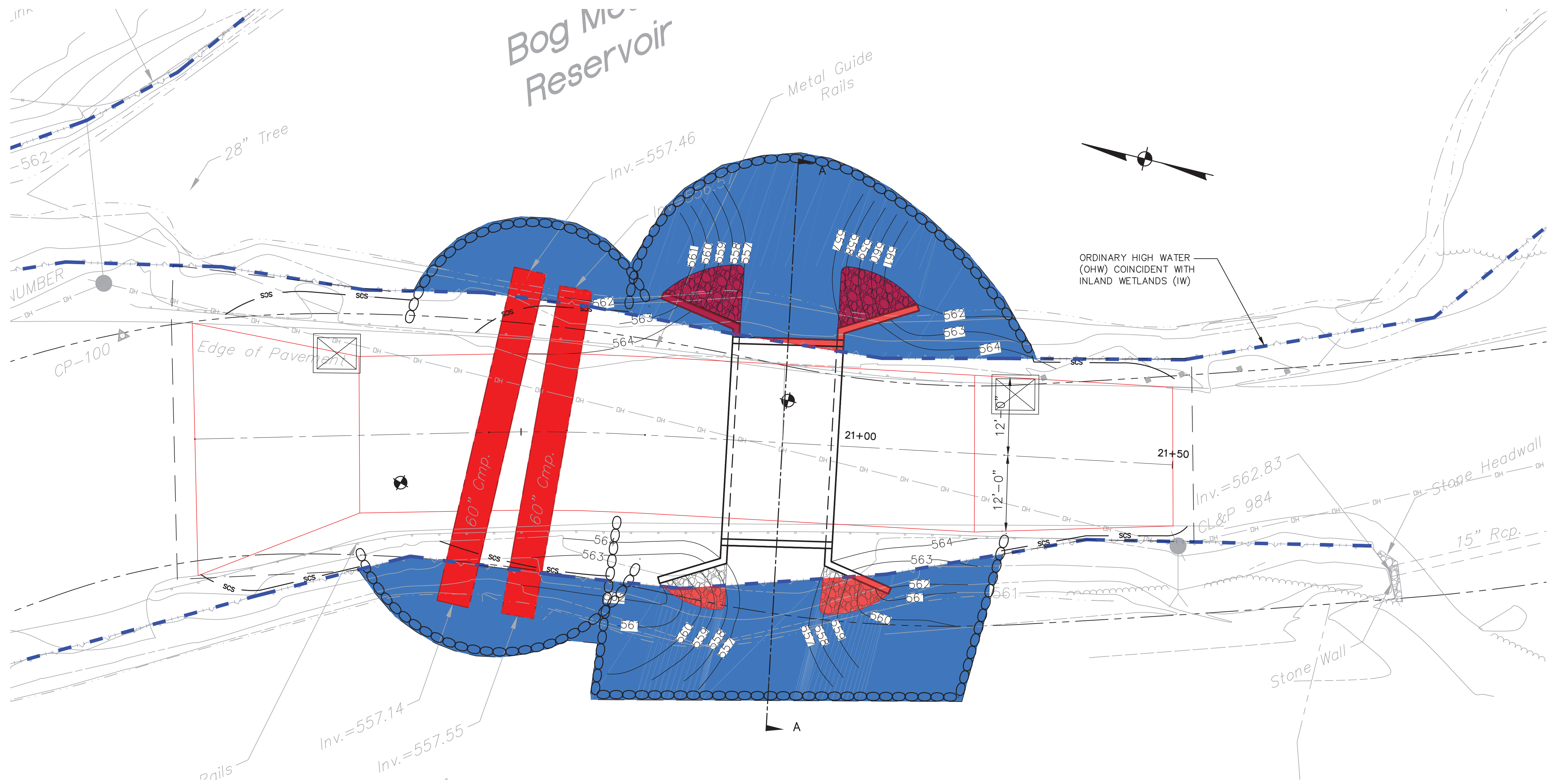
**REPLACEMENT OF BRIDGE No. 68-009
BEAR HILL ROAD OVER UNNAMED BROOK
KILLINGLY, CONNECTICUT**

DESIGNED:	YL	TITLE:	WATER HANDLING PLAN
DRAFTED:	PT	CHECKED:	DO
APPROVED:	PAR	SCALE:	AS NOTED
PROJECT NO.:	2017-0507	DATE:	02/05/2020
NO. DATE	DESCRIPTION	CAD:	SB_MSH_2017_0507_BRG009_S10
REVISIONS			

SHEET NUMBER:
S-3.4

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Freeman Companies, LLC - R:\2017\2017-0507_Killingly_Bridges\ENV\CDOT_Env_Review\Kevin_Killingly_Bridge - Power Point\Bridges 68-009\dwg\hw_msh_2017_0507_brg009_gen (Impacts).dwg Jan 19, 2022-2:01pm Plotted By: JLeBlou



PLAN
SCALE: 1/8" = 1'-0"

PERMANENT IMPACTS	
WETLAND AREA	0 S.F.
WATERCOURSE AREA	760 S.F.
TOTAL:	760 S.F.

TEMPORARY IMPACTS	
WETLAND AREA	0 S.F.
WATERCOURSE AREA	2,830 S.F.
TOTAL:	2,830 S.F.

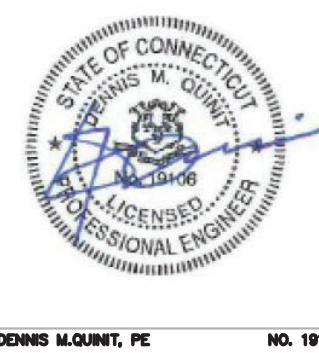
UPLANDS IMPACTS	
TOTAL:	5,502 S.F.

LEGEND	
	- PERMANENT IMPACTS
	- TEMPORARY IMPACTS
- - -	- LIMIT OF DISTURBANCE
- - - - -	- ORDINARY HIGH WATER (OHW)

FREEMAN COMPANIES
LEAD DEVELOPER | ENGINEER | DESIGNER | SURVEYOR
 DBE | DAS | ABE | GNASDC CERTIFIED
 CIVIL | GEOTECHNICAL | SURVEY | ENVIRONMENTAL
 30 JOHN STREET
 HARTFORD, CT 06106
 WWW.FREEMANCO.COM
 (860) 551-9500
 TOLL FREE: (800) 604-5141
 FAX: (860) 695-7151
 ELEVATE YOUR EXPECTATIONS

PREPARED FOR
TOWN OF KILLINGLY
 BEAR HILL ROAD
 KILLINGLY,
 CONNECTICUT 06239

OWNER FOR
TOWN OF KILLINGLY
 BEAR HILL ROAD
 KILLINGLY,
 CONNECTICUT 06239



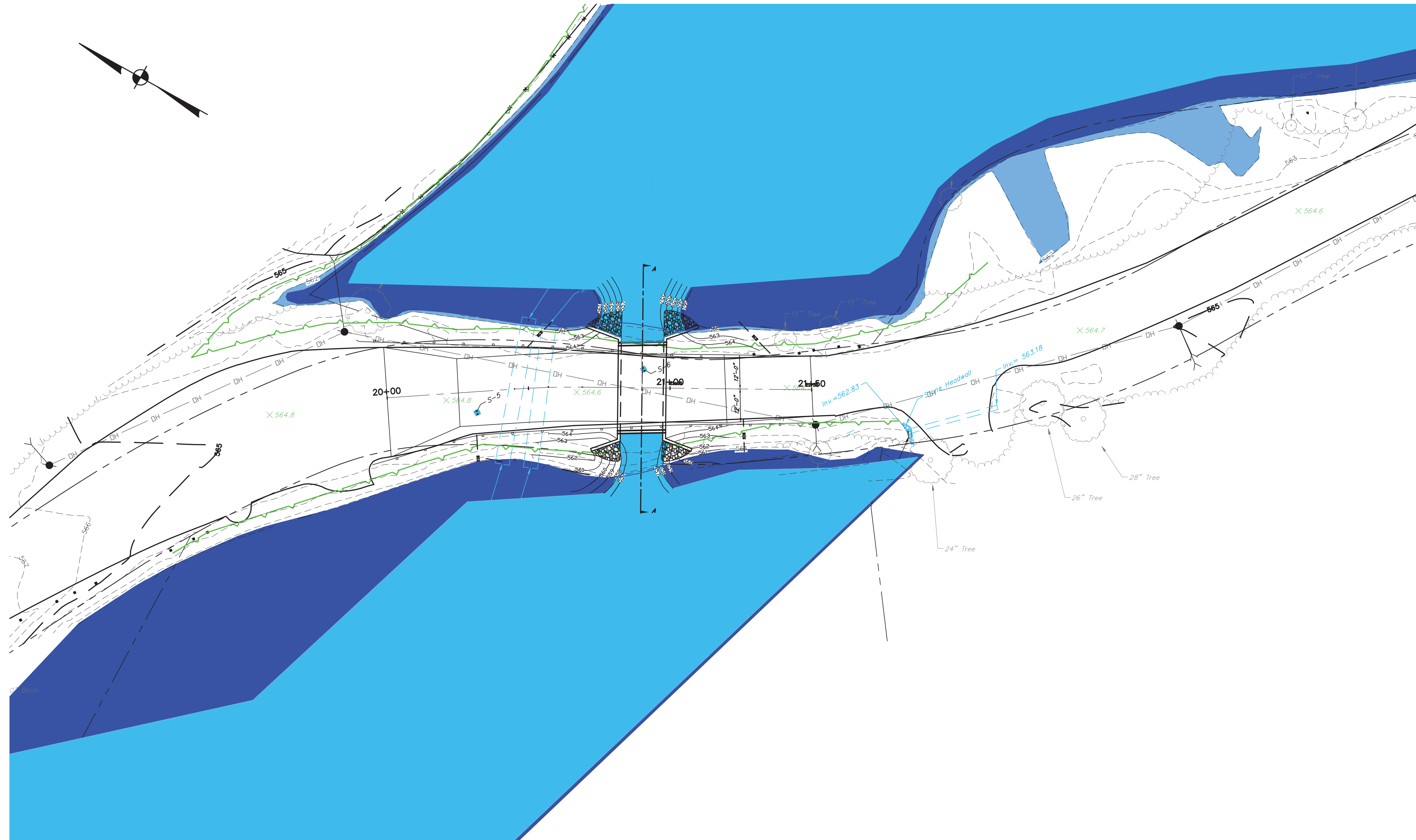
REPLACEMENT OF BRIDGE No. 68-009 BEAR HILL ROAD OVER UNNAMED BROOK KILLINGLY, CONNECTICUT

NO.	DATE	DESCRIPTION
1	01/16/22	GENERAL REVISIONS, FLOW ARROWS, HYDRAULIC INFO.
REVISIONS		

DESIGNED:	YL
DRAFTED:	PT
CHECKED:	DQ
APPROVED:	PAR
SCALE:	AS NOTED
PROJECT NO.:	2017-0507
DATE:	02/05/2020
CAD:	hw_msh_2017_0507_brg009_gen (Impacts)

TITLE:	IMPACTS
SHEET NUMBER:	WL-3

Freeman Companies, LLC - R: \2017\2017-0507 Killingly Bridges\DWG\BRIDGE_68-009_2017-0507 BEAR HILL HYDRAULICS.dwg Dec 31, 2020-11:47am Plotted By: Llauchel



LEGEND

	WETLANDS
	DENMAN BROOK
	PROPOSED DESIGN - LAND UNDER WATER
	EXISTING CONDITION - LAND UNDER WATER

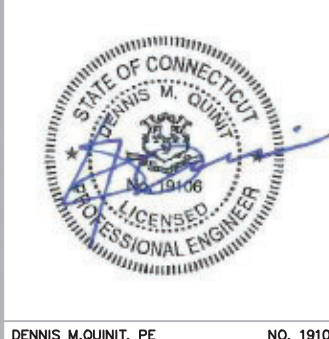
2 YEAR STORM CONDITIONS
SCALE: 1" = 20'-0"

**REPLACEMENT OF BRIDGE No. 68-009
BEAR HILL ROAD OVER UNNAMED BROOK
KILLINGLY, CONNECTICUT**



PREPARED FOR
TOWN OF KILLINGLY
BEAR HILL ROAD
KILLINGLY,
CONNECTICUT 06239

OWNER FOR
TOWN OF KILLINGLY
BEAR HILL ROAD
KILLINGLY,
CONNECTICUT 06239



NO.	DATE	DESCRIPTION

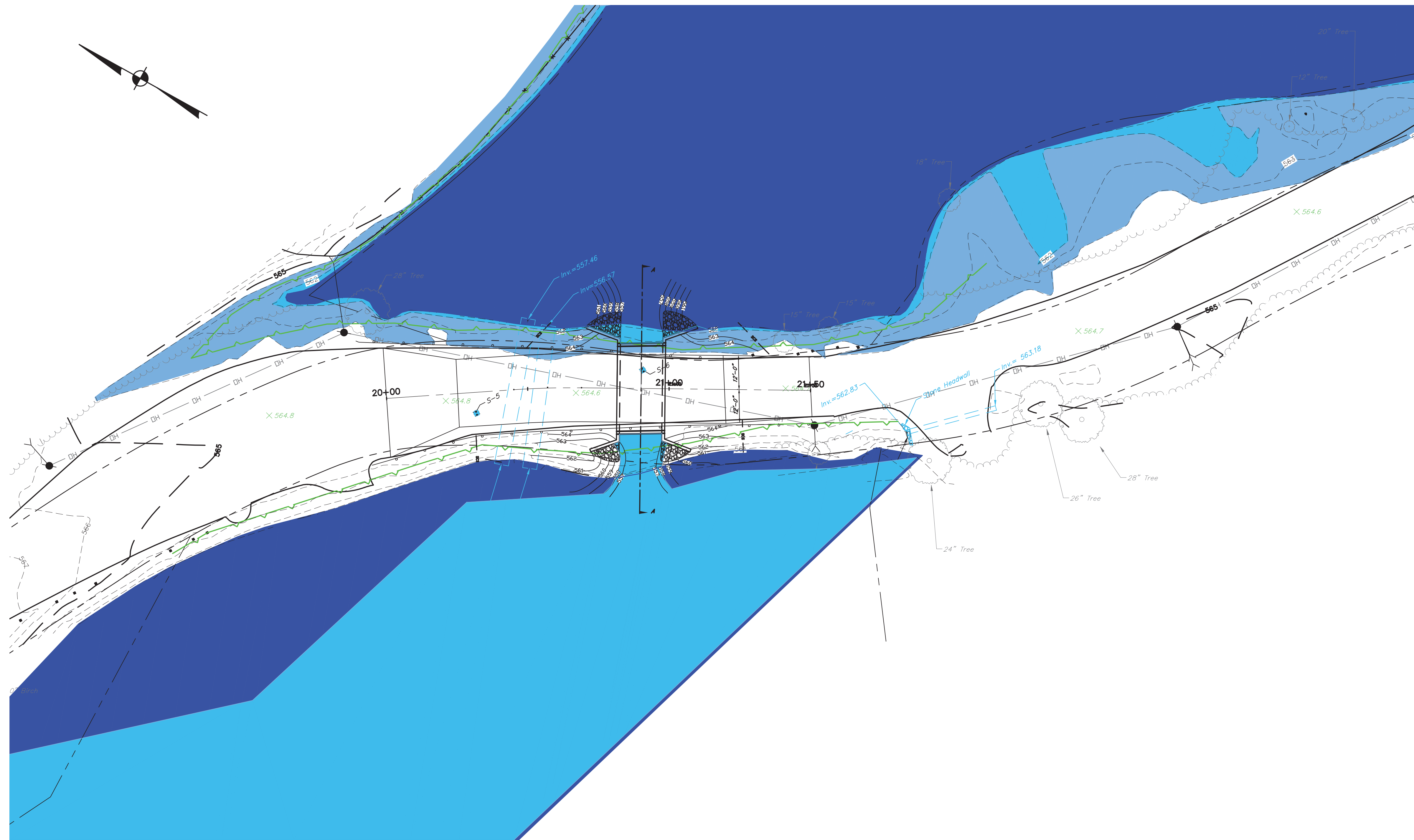
DESIGNED: YL
DRAFTED: PT
CHECKED: DQ
APPROVED: PAR
SCALE: NOT TO SCALE
PROJECT NO.: 2017-0507
DATE: 06/14/2019
CAD: 2017-0507 BEAR HILL HYDRAULICS

TITLE:
HYDRAULIC DATA

SHEET NUMBER:
C-1

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Freeman Companies, LLC - R: \2017\2017-0507 Killingly Bridges\DWG\BRIDGE 68-009\2017-0507 BEAR HILL HYDRAULICS.dwg Dec 31, 2020-11:52am Plotted By: Llauchel



LEGEND

	WETLANDS
	DENMAN BROOK
	PROPOSED DESIGN - LAND UNDER WATER
	EXISTING CONDITION - LAND UNDER WATER

10 YEAR STORM CONDITIONS

SCALE: 1" = 20'-0"

**REPLACEMENT OF BRIDGE No. 68-009
BEAR HILL ROAD OVER UNNAMED BROOK
KILLINGLY, CONNECTICUT**



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WWW.FREEMANCO.COM
(860)251-9550
TOLL FREE: (800)694-5141
FAX: (860)256-7341
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PREPARED FOR
TOWN OF KILLINGLY
BEAR HILL ROAD
KILLINGLY,
CONNECTICUT 06239

OWNER FOR
TOWN OF KILLINGLY
BEAR HILL ROAD
KILLINGLY,
CONNECTICUT 06239



DENNIS M. GURNIT, PE NO. 19106

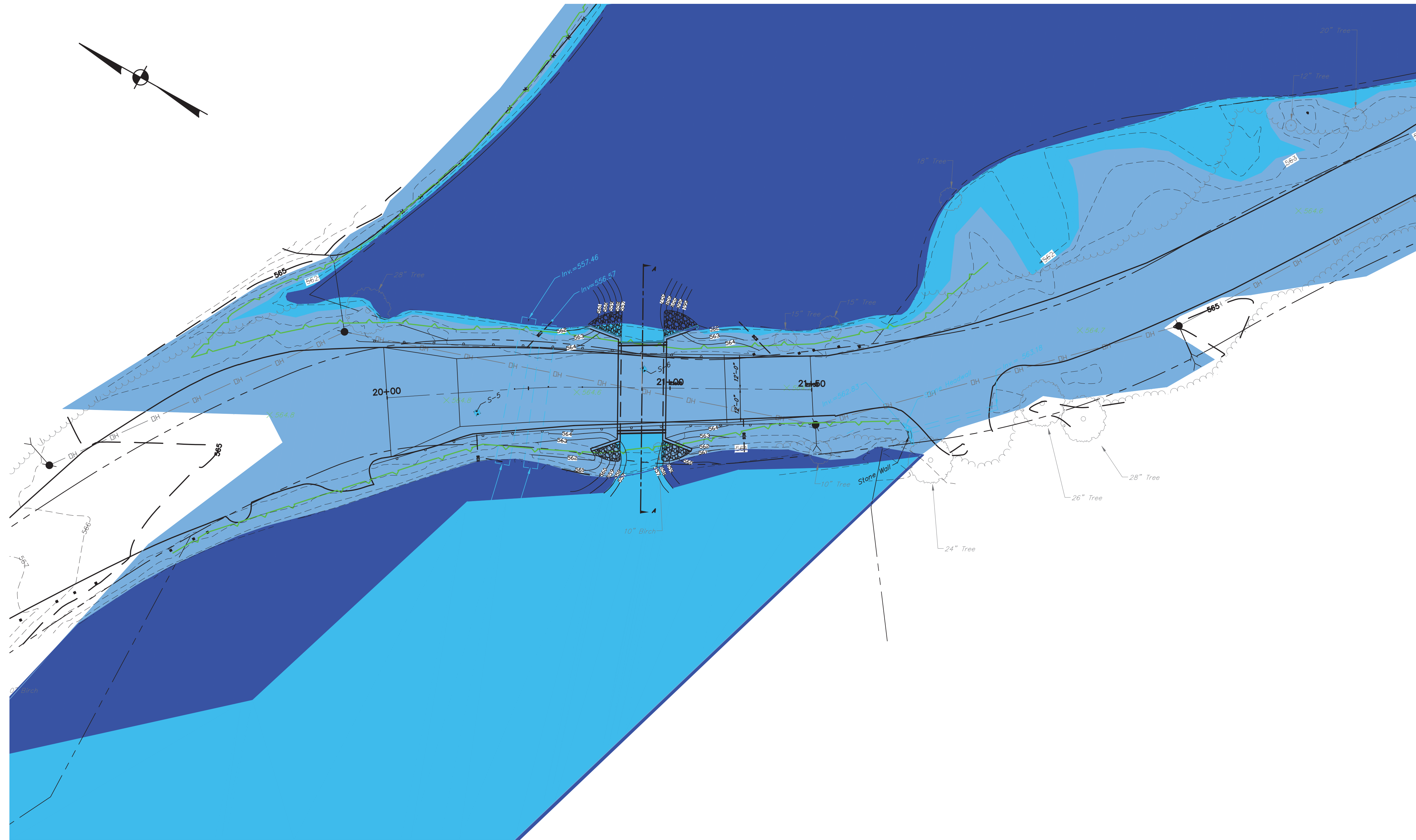
NO.	DATE	DESCRIPTION

DESIGNED: YL
DRAFTED: PT
CHECKED: DQ
APPROVED: PAR
SCALE: NOT TO SCALE
PROJECT NO.: 2017-0507
DATE: 06/14/2019
CAD: 2017-0507 BEAR HILL HYDRAULICS





TITLE:
HYDRAULIC DATA

SHEET NUMBER:
C-2

Freeman Companies, LLC - R: \2017\2017-0507 Killingly Bridges\DWG\BRIDGE 68-009\2017-0507 BEAR HILL HYDRAULICS.dwg Dec 31, 2020-11:52am Plotted By: Lbauchel



LEGEND

	WETLANDS
	DENMAN BROOK
	PROPOSED DESIGN - LAND UNDER WATER
	EXISTING CONDITION - LAND UNDER WATER

25 YEAR STORM CONDITIONS

SCALE: 1" = 20'-0"

**REPLACEMENT OF BRIDGE No. 68-009
BEAR HILL ROAD OVER UNNAMED BROOK
KILLINGLY, CONNECTICUT**



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BEAR HILL ROAD
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CONNECTICUT 06239



DENNIS M. GURNIT, PE NO. 19106

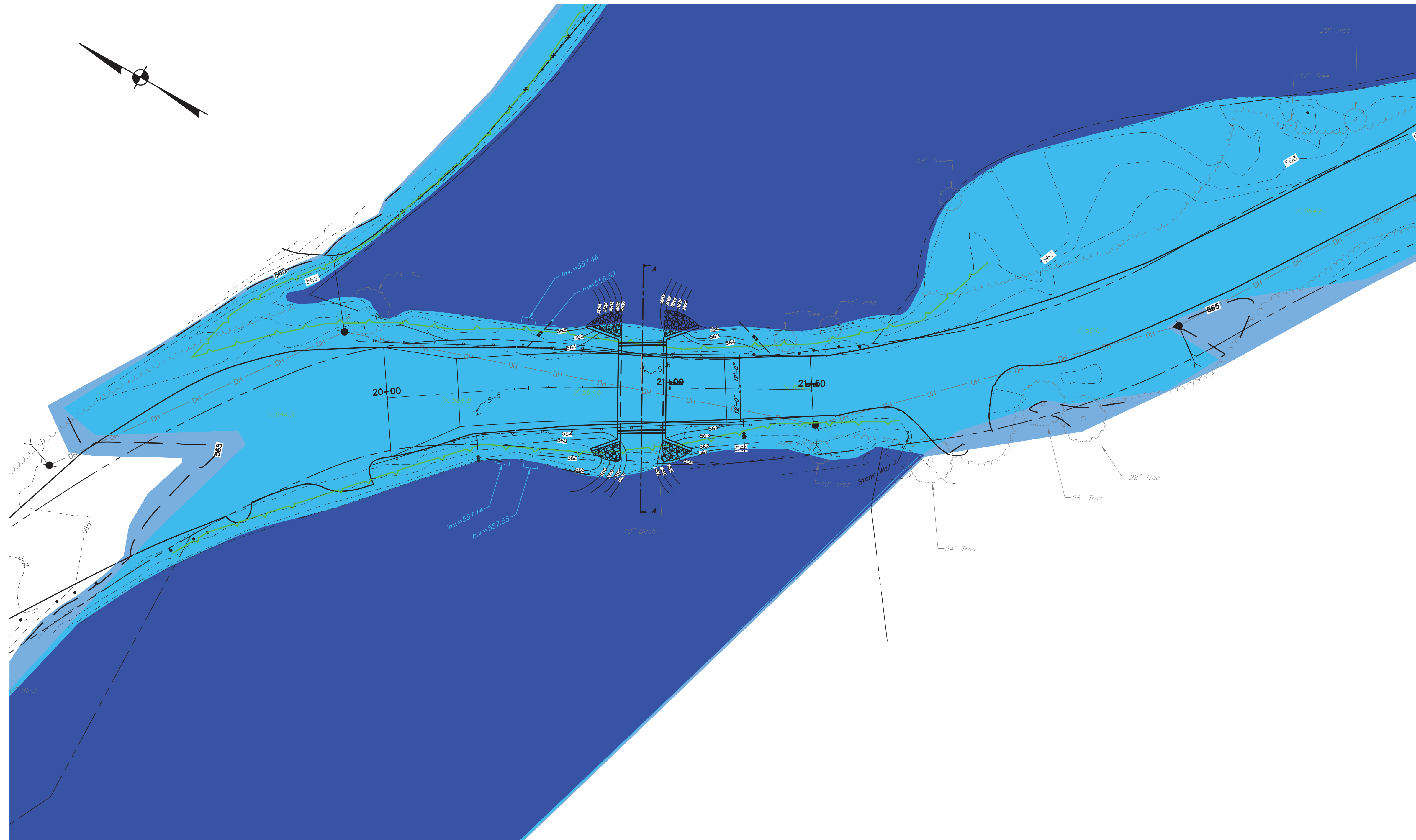
NO.	DATE	DESCRIPTION

DESIGNED: YL
DRAFTED: PT
CHECKED: DQ
APPROVED: PAR
SCALE: NOT TO SCALE
PROJECT NO.: 2017-0507
DATE: 06/14/2019
CAD: 2017-0507 BEAR HILL HYDRAULICS





TITLE:
HYDRAULIC DATA

SHEET NUMBER:
C-3

Freeman Companies, LLC - R:\2017\2017-0507 Killingly Bridges\DWG\BRIDGE 68-009\2017-0507 BEAR HILL HYDRAULICS.dwg Dec 31, 2020-11:53am Plotted By: Llauchel



LEGEND

	WETLANDS
	DENMAN BROOK
	PROPOSED DESIGN - LAND UNDER WATER
	EXISTING CONDITION - LAND UNDER WATER

50 YEAR STORM CONDITIONS

SCALE: 1" = 20'-0"

**REPLACEMENT OF BRIDGE No. 68-009
BEAR HILL ROAD OVER UNNAMED BROOK
KILLINGLY, CONNECTICUT**



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CIVIL | GEOTECHNICAL | SURVEY | ENVIRONMENTAL
FREEMAN COMPANIES, LLC
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WWW.FREEMANCOS.COM
(860)251-9530
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FAX: (860)256-7341
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CONNECTICUT 06239

OWNER FOR
TOWN OF KILLINGLY
BEAR HILL ROAD
KILLINGLY,
CONNECTICUT 06239



DENNIS M. GURNIT, PE NO. 19106

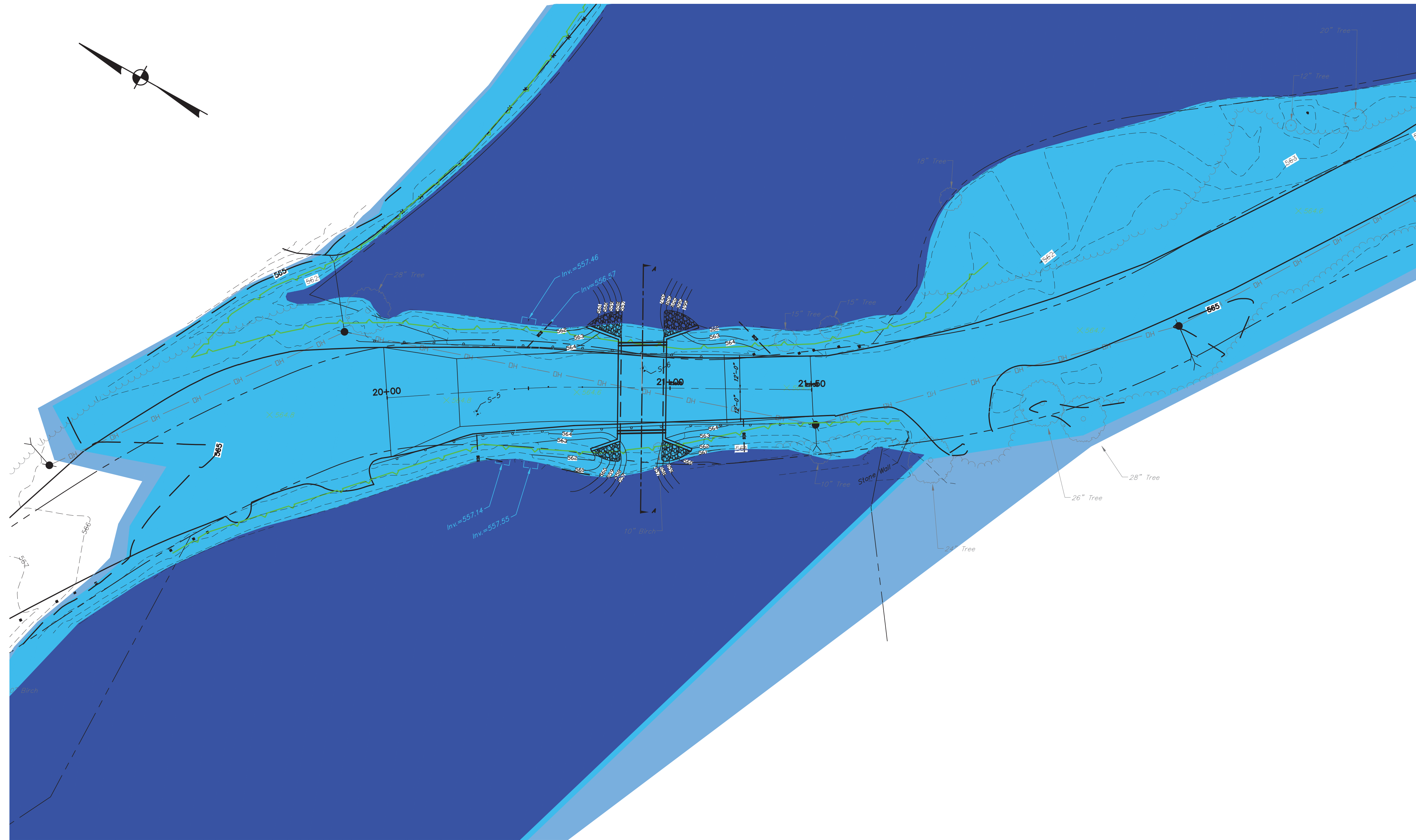
NO.	DATE	DESCRIPTION

DESIGNED: YL
DRAFTED: PT
CHECKED: DQ
APPROVED: PAR
SCALE: NOT TO SCALE
PROJECT NO.: 2017-0507
DATE: 06/14/2019
CAD: 2017-0507 BEAR HILL HYDRAULICS

TITLE:
HYDRAULIC DATA

SHEET NUMBER:
C-4

Freeman Companies, LLC - R:\2017\2017-0507 Killingly Bridges\DWG\BRIDGE 68-009\2017-0507 BEAR HILL HYDRAULICS.dwg Dec 31, 2020-11:54am Plotted By: Llauchel



LEGEND

	WETLANDS
	DENMAN BROOK
	PROPOSED DESIGN - LAND UNDER WATER
	EXISTING CONDITION - LAND UNDER WATER

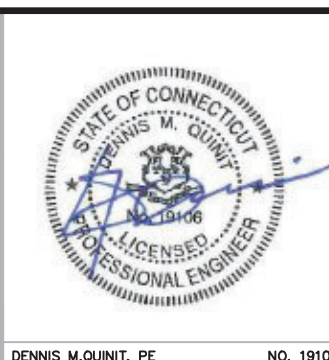
100 YEAR STORM CONDITIONS
 SCALE: 1" = 20'-0"

**REPLACEMENT OF BRIDGE No. 68-009
 BEAR HILL ROAD OVER UNNAMED BROOK
 KILLINGLY, CONNECTICUT**



PREPARED FOR
 TOWN OF KILLINGLY
 BEAR HILL ROAD
 KILLINGLY,
 CONNECTICUT 06239

OWNER FOR
 TOWN OF KILLINGLY
 BEAR HILL ROAD
 KILLINGLY,
 CONNECTICUT 06239



NO.	DATE	DESCRIPTION

DESIGNED: YL
 DRAFTED: PT
 CHECKED: DQ
 APPROVED: PAR
 SCALE: NOT TO SCALE
 PROJECT NO.: 2017-0507
 DATE: 06/14/2019
 CAD: 2017-0507 BEAR HILL HYDRAULICS

TITLE:
 HYDRAULIC DATA

SHEET NUMBER:
 C-5

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DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

August 9, 2022

Regulatory Division
File Number: NAE-2021-00302

David Capacchione, P.E.
Director of Engineering and Facilities
Town of Killingly
172 Main Street
Killingly, Connecticut 06239
(Via email: dcapacchione@killinglyct.gov)

Dear Mr. Capacchione:

The U.S. Army Corps of Engineers (USACE) has reviewed your application for the replacement of the existing bridge Number 68-002. This work will result in the permanent discharge of approximately 250 square-feet (sf) of rip rap and approximately 600sf of pre-cast box culvert measuring 8-feet wide by 13-feet long and the temporary discharge of approximately 1,700sf of temporary fill consisting of coffer dams, erosion control barriers, temporary bypass pipes and rip rap below the Ordinary High Water line (OHW) of Mashentuck Brook. This work is located on Valley Road over Mashentuck Brook in Killingly, Connecticut and is shown on the enclosed plans titled "REPLACEMENT OF BRIDGE No. 68-002 VALLEY ROAD OVER MASHENTUCK BROOK KILLINGLY, CONNECTICUT" on three sheets dated "DATE: 06/14/2019".

Based on the information you have provided, we verify that the activity is authorized under General Permits # 19 of the enclosed December 15, 2021, federal permit known as the Connecticut General Permits (GPs). This verification is subject to the following special condition:

This authorization requires you to complete and return the enclosed Work Start Notification Form to this office at least two weeks before the anticipated starting date. You must also complete and return the enclosed Compliance Certification Form within one month following the completion of the authorized work.

Please review the special conditions above and the enclosed GPs carefully, including its general conditions beginning on page 48, to be sure that you and whoever does the work understands this verification's requirements. A copy of the GPs and this verification letter shall be available at the project site throughout the time the work is underway. Performing work within our jurisdiction that is not specifically authorized by this determination, failing to comply with any special condition provided above or all the terms and conditions of the GPs may subject you to the enforcement provisions of our regulations.

This authorization presumes that the work as described above and as shown on your plans noted above is in waters of the U.S.

This authorization expires on December 15, 2026, unless the GPs are modified, suspended, or revoked before then. You must commence or have under contract to commence the work authorized herein by December 15, 2026 and complete the work by December 15, 2027. If not, you must contact this office to determine the need for further authorization before beginning or continuing the activity. We recommend that you contact us *before* this permit expires to discuss a permit reissuance. If you change the project plans or construction methods for work within our jurisdiction, please contact us immediately to discuss modification of this authorization. This office must approve any changes before you undertake them.

This authorization does not obviate the need to obtain other Federal, state, or local authorizations required by law.

The Connecticut Department of Energy & Environmental Protection (DEEP) has conditionally granted Water Quality Certification (WQC) for the 2021 CT GPs under Section 401 of the Clean Water Act. This verification that your project is authorized under the CT GPs is valid only after DEEP provides you with written concurrence of eligibility for use of that WQC under the GPs. Work authorized herein may not commence until you receive DEEP concurrence of eligibility. Any adaptive best management practices prescribed by DEEP in your written concurrence of eligibility are hereby incorporated by reference into this GP authorization and will remain in full force and effect. In the event the DEEP denies eligibility for the project above, this GP authorization becomes null and void.

We continually strive to improve our customer service. To better serve you, we would appreciate your completing our Customer Service Survey located at <https://regulatory.ops.usace.army.mil/customer-service-survey/>.

Please contact Mike Wierbonics of my staff, at (978) 318-8723 or at michael.s.wierbonics@usace.army.mil if you have any questions.

Sincerely,

Kevin R Kotelly

Kevin R. Kotelly, P.E.
Chief, Permits & Enforcement Branch
Regulatory Division

Enclosures

cc:

William Sigmund, CT DEEP, william.sigmund@ct.gov

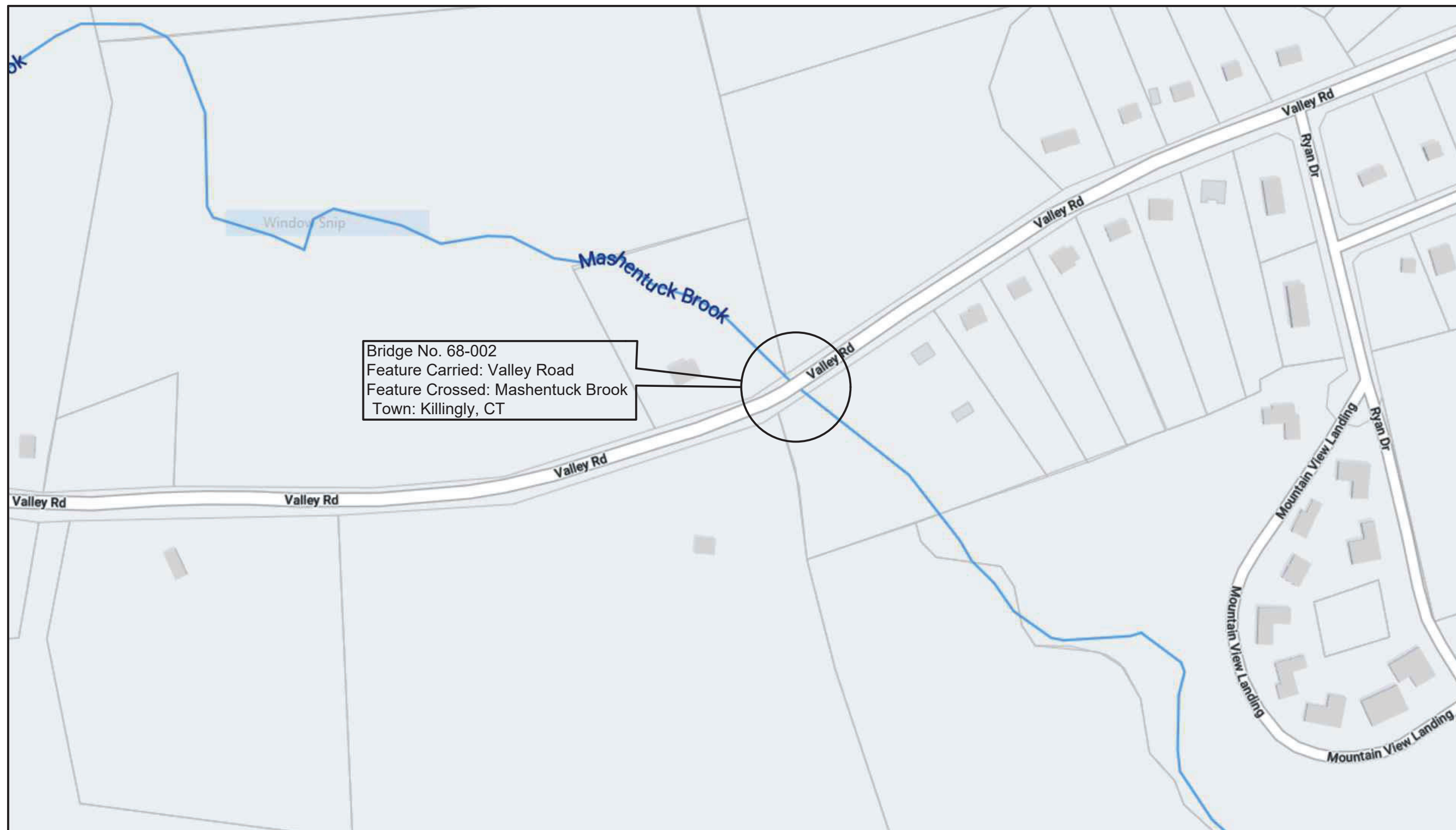
Nate Margason, U.S. EPA, Region 1, margason.nathan@epa.gov

Luis Bucheli, Freeman Companies, LLC, lbucheli@freemancos.com

Dennis Qunit, Freeman Companies, LLC, dquinit@freemancos.com

Jeffrey LeBeau, Freeman Companies, LLC, jlebeau@freemancos.com

Freeman Companies, LLC - R:\2017\2017-0507 Killingly Bridges\ENV\Permits\USACE and CT DEEP Permits\68-002\CON\Attachments\Attachment 14 - Project Plans\env\Location Map B\68-002.dwg Jan 05, 2021 - 3:18pm Plotted By: LBuchel



SITE LOCATION MAP

REPLACEMENT OF BRIDGE No. 68-002 VALLEY ROAD OVER MASHENTUCK BROOK KILLINGLY, CONNECTICUT

FREEMAN COMPANIES
 LAND DEVELOPMENT | ENGINEERING DESIGN | CONSTRUCTION SERVICES
 DBE | DAS | MBE | GWASDC CERTIFIED
 CIVIL | GEOTECHNICAL | SURVEY | ENVIRONMENTAL
 FREEMAN COMPANIES, LLC
 36 JOHN STREET
 HARTFORD, CT 06106
 WWW.FREEMANCS.COM
 (860)251-9550
 TOLL FREE (800)606-5141
 FAX: (860)256-7145
 ELEVATE YOUR EXPECTATIONS

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 TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY,
 CONNECTICUT 06239
 OWNER FOR
 TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY,
 CONNECTICUT 06239

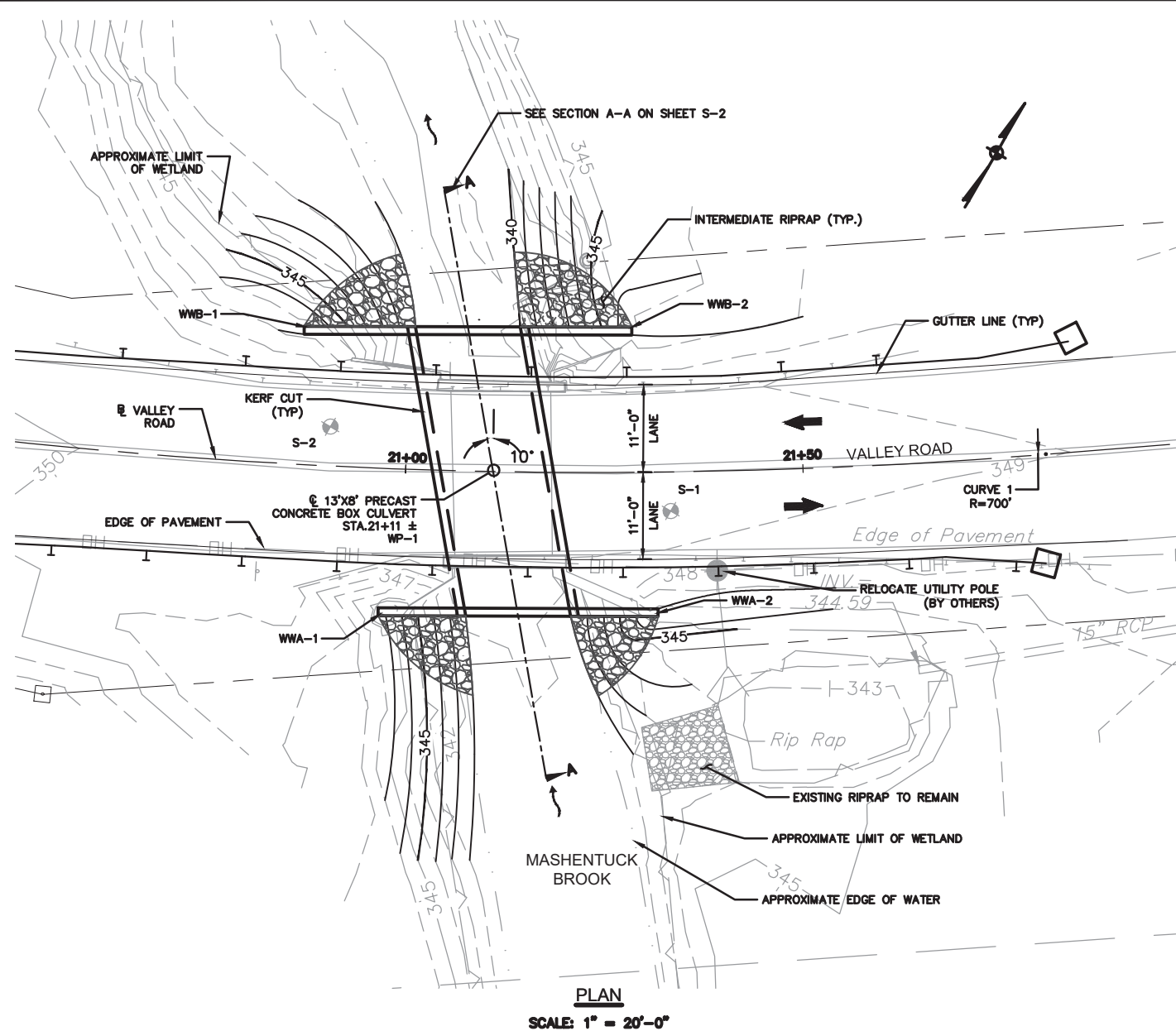
DESIGNER: M. QUINN, P.E.
 NO. 19103

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NO.	DATE	DESCRIPTION

DESIGNED: YL
 DRAFTED: PT
 CHECKED: DQ
 APPROVED: PAR
 SCALE: NOT TO SCALE
 PROJECT NO.: 2017-0507
 DATE: 06/14/2019
 CAD: Location Map B\68-002

TITLE:
 SHEET NUMBER:



PLAN
SCALE: 1" = 20'-0"

UTILITY NOTES

1. THIS PROJECT INVOLVES THE PRESENCE OF OVERHEAD UTILITY LINES WITHIN THE LIMITS AND FOOTPRINT OF THE PROJECT. WHILE NO WORK INVOLVING OR IMPACTING THESE UTILITIES ARE ANTICIPATED, THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL WORK WITH THE APPROPRIATE UTILITY COMPANY (EVERSOURCE) AND FOR PROVIDING TEMPORARY PROTECTION AND/OR SUPPORT OF THESE FACILITIES IF AND AS REQUIRED BY THE UTILITY COMPANY.
2. THE CONTRACTOR SHALL DEVELOP ITS ERECTION SCHEME IN CONFORMANCE WITH LIMITATIONS AND RESTRICTIONS ASSOCIATED WITH THE OVERHEAD UTILITY LINES AND AS REQUIRED BY THE APPROPRIATE UTILITY COMPANY.
3. THE CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANY WITH REGARDS TO POTENTIAL RELOCATION OR TEMPORARY SUPPORT OF THEIR FACILITIES. THE CONTRACTOR SHALL IDENTIFY POTENTIAL UTILITY IMPACTS ASSOCIATED WITH THEIR WORK, IF ANY, PRIOR TO START OF CONSTRUCTION AND NOTIFY THE APPROPRIATE UTILITY COMPANY ACCORDINGLY.

NOTICE TO BRIDGE INSPECTORS

IT IS RECOMMENDED THAT CONNDOT'S BRIDGE SAFETY PROCEDURES BE FOLLOWED WHEN INSPECTING THIS BRIDGE FOR, BUT NOT LIMITED TO, ALL APPROPRIATE COMPONENTS INDICATED IN THE GOVERNING MANUALS FOR BRIDGE INSPECTION. ATTENTION MUST BE GIVEN TO INSPECTING THE FOLLOWING SPECIAL COMPONENTS AND DETAILS. (THE LISTING OF COMPONENTS FOR SPECIFIC ATTENTION SHALL NOT BE CONSTRUED TO REDUCE THE IMPORTANCE OF INSPECTION OF ANY OTHER COMPONENT OF THE STRUCTURE.) THE FREQUENCY OF INSPECTION OF THIS STRUCTURE SHALL BE IN ACCORDANCE WITH THE GOVERNING MANUALS FOR BRIDGE INSPECTION, UNLESS OTHERWISE DIRECTED BY THE MANAGER OF BRIDGE SAFETY AND EVALUATIONS.

COMPONENT OR DETAIL	STRUCTURE SHEET REFERENCE
NONE	-

BORING LEGEND

S-1 APPROXIMATE BORING LOCATION

GENERAL NOTES

SPECIFICATIONS: CONNECTICUT DEPARTMENT OF TRANSPORTATION FORM 817, INCLUDING SUPPLEMENTAL SPECIFICATIONS DATED JANUARY, 2018 AND SPECIAL PROVISIONS.

DESIGN SPECIFICATIONS: AASHTO LRFD SPECIFICATIONS FOR HIGHWAY BRIDGES, 8TH EDITION AS SUPPLEMENTED BY THE CONNECTICUT DEPARTMENT OF TRANSPORTATION BRIDGE MANUAL (2003) EDITION WITH REVISIONS UP TO AND INCLUDING 2011.

ALLOWABLE DESIGN STRESSES:

CLASS "A" CONCRETE: $f'_c = 3,000$ psi
 CLASS "50" CONCRETE: $f'_c = 5,000$ psi
 REINFORCEMENT (ASTM 615 GRADE 60) $f_y = 60,000$ psi

LIVE LOAD:

STANDARD DESIGN VEHICLE: AASHTO HL-93
 PERMIT (OVERLOAD) VEHICLES: CONNDOT P204 (8-AXLE)
 CONNDOT P380 (19-AXLE)

SALVAGE: NONE

DIMENSIONS AND ELEVATIONS: WHEN DECIMAL DIMENSIONS AND ELEVATIONS ARE GIVEN TO LESS THAN THREE DECIMAL PLACES, THE OMITTED DIGITS SHALL BE ASSUMED TO BE ZERO. ALL ELEVATIONS ARE GIVEN IN DECIMAL FEET AND ARE BASED ON NAVD 88.

EXISTING DIMENSIONS: DIMENSIONS OF THE EXISTING STRUCTURE SHOWN ON THESE PLANS ARE FOR GENERAL REFERENCE ONLY AND ARE NOT GUARANTEED. THE CONTRACTOR SHALL TAKE ALL FIELD MEASUREMENTS NECESSARY TO ASSURE PROPER FIT OF THE FINISHED WORK AND SHALL ASSUME FULL RESPONSIBILITY FOR THEIR ACCURACY. WHEN SHOP DRAWINGS BASED ON FIELD MEASUREMENTS ARE SUBMITTED FOR APPROVAL, THE FIELD MEASUREMENTS SHALL ALSO BE SUBMITTED FOR REFERENCE BY THE REVIEWER.

UTILITIES: THE CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES LOCATED WITHIN THE VICINITY OF THE SITE DURING CONSTRUCTION. THE METHOD OF SUPPORTING AND PROTECTING UTILITIES SELECTED BY THE CONTRACTOR MUST BE APPROVED BY THE UTILITY COMPANY. UTILITY MODIFICATIONS SHALL BE MADE BY THE RESPECTIVE UTILITY COMPANIES EXCEPT WHERE NOTED OTHERWISE.

CONCRETE NOTES

CLASS "A" CONCRETE: CLASS "A" CONCRETE SHALL BE USED FOR THE CUT-OFF WALLS, RETURN WALLS, HEADWALLS AND WINGWALL FOOTINGS.

CLASS "50" CONCRETE: CLASS "50" CONCRETE SHALL BE USED FOR THE PRECAST CONCRETE BOX CULVERT AND PRECAST CONCRETE WINGWALL STEMS.

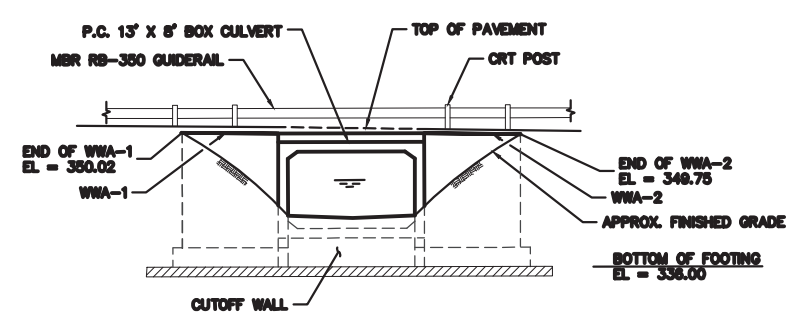
REINFORCEMENT: ALL REINFORCEMENT SHALL BE ASTM A615 GRADE 60.

EXPOSED EDGES: EXPOSED EDGES OF CONCRETE SHALL BE BEVELED 1" X 1", UNLESS DIMENSIONED OTHERWISE.

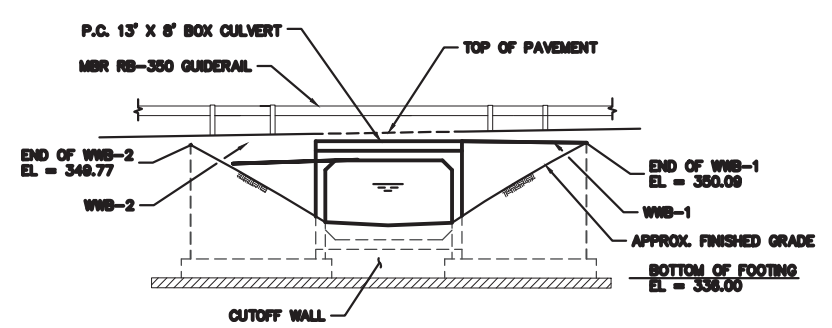
EPOXY COATED REINFORCEMENT BARS: ALL REINFORCEMENT IN THE PRECAST CONCRETE BOX CULVERT SHALL BE EPOXY COATED AND INCLUDED IN THE PAY ITEM "13'X8' PRECAST CONCRETE BOX CULVERT". ALL REINFORCEMENT IN THE PRECAST CONCRETE WINGWALLS SHALL BE EPOXY COATED AND INCLUDED IN THE PAY ITEM "PRECAST CONCRETE WINGWALLS". ALL REINFORCEMENT IN THE CUT-OFF WALLS, AND RETURN WALLS SHALL BE PAID FOR IN THE PAY ITEM "DEFORMED STEEL BARS". ALL REINFORCEMENT IN THE HEADWALLS SHALL BE EPOXY COATED AND PAID FOR UNDER THE ITEM "DEFORMED STEEL BARS (EPOXY COATED)".

CONCRETE COVER: ALL REINFORCEMENT SHALL HAVE 2" COVER UNLESS DIMENSIONED OTHERWISE.

PREFORMED EXPANSION JOINT FILLER: THE COST OF FURNISHING AND INSTALLING PREFORMED EXPANSION JOINT FILLERS SHALL BE INCLUDED IN THE ITEM "CLASS 'A' CONCRETE".



UPSTREAM ELEVATION
SCALE: 1" = 20'-0"



DOWNSTREAM ELEVATION
SCALE: 1" = 20'-0"

HYDRAULIC DATA	
HYDRAULIC AREA	4.1 SQ MI
DESIGN FREQUENCY	100 YEAR
DESIGN DISCHARGE	920 CFS
AVERAGE DAILY FLOW	7.5 CFS
AVERAGE DAILY FLOW ELEVATION	341.69
UPSTREAM DESIGN WATER SURFACE ELEVATION	349.38
DOWN STREAM DESIGN WATER SURFACE ELEVATION	345.01
2 YEAR DESIGN STORM WATER ELEVATION	343.37

TRANSPORTATION DATA				
MEMBER	SHIPPING LENGTH	SHIPPING HEIGHT	SHIPPING WIDTH	SHIPPING WEIGHT
BOX CULVERT	15'-0"	10'-0"	8'-0"	55,800 lbs
WINGWALL	15'-0"	10'-0"	8'-0"	24,000 lbs

FREEMAN COMPANIES
 DBE | DAS | MBE | GWBDC CERTIFIED
 CIVIL | GEOTECHNICAL | SURVEY | ENVIRONMENTAL
 FREEMAN COMPANIES, LLC
 16 JOHN STREET
 HARTFORD, CT 06106
 WWW.FREEMANCS.COM
 (860)251-9550
 TOLL FREE: (800)604-5141
 FAX: (860)251-7141
 ELEVATE YOUR EXPECTATIONS

PREPARED FOR
 TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY,
 CONNECTICUT 06239
 OWNER FOR
 TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY,
 CONNECTICUT 06239

**REPLACEMENT OF BRIDGE No. 68-002
 VALLEY ROAD OVER MASHENTUCK BROOK
 KILLINGLY, CONNECTICUT**

DESIGNED: YL	TITLE: GENERAL PLAN
DRAFTED: PT	SHEET NUMBER: S-1.1
CHECKED: DQ	
APPROVED: PAR	
SCALE: AS NOTED	
PROJECT NO.: 2017-0507	
DATE: 02/03/2020	
CAD: HW_MSH_2017_0507_BR0002_GEN	

THESE DRAWINGS SHALL NOT BE UTILIZED BY ANY PERSON, FIRM OR CORPORATION WITHOUT THE SPECIFIC WRITTEN PERMISSION OF FREEMAN COMPANIES, LLC

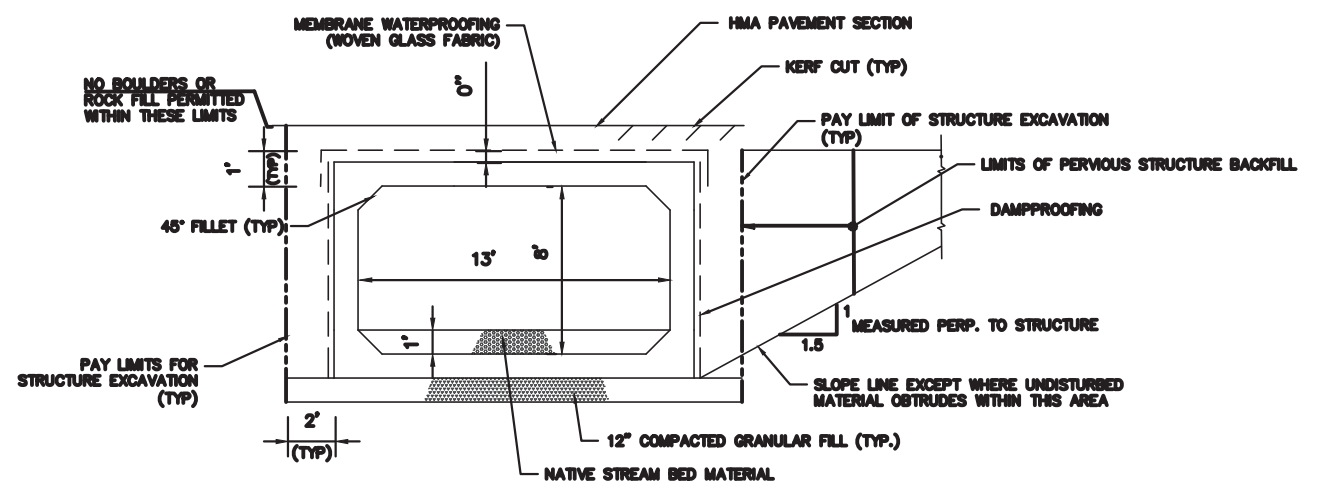
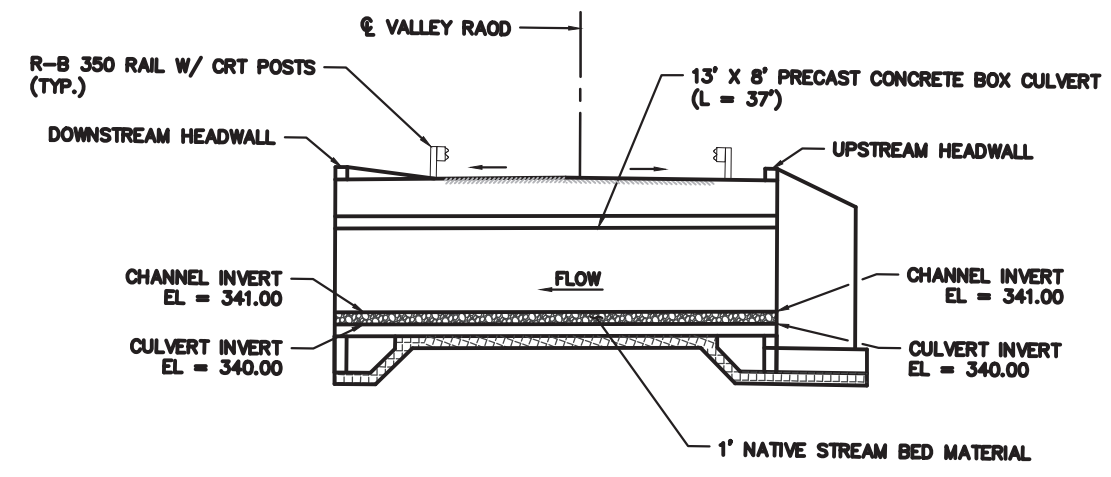
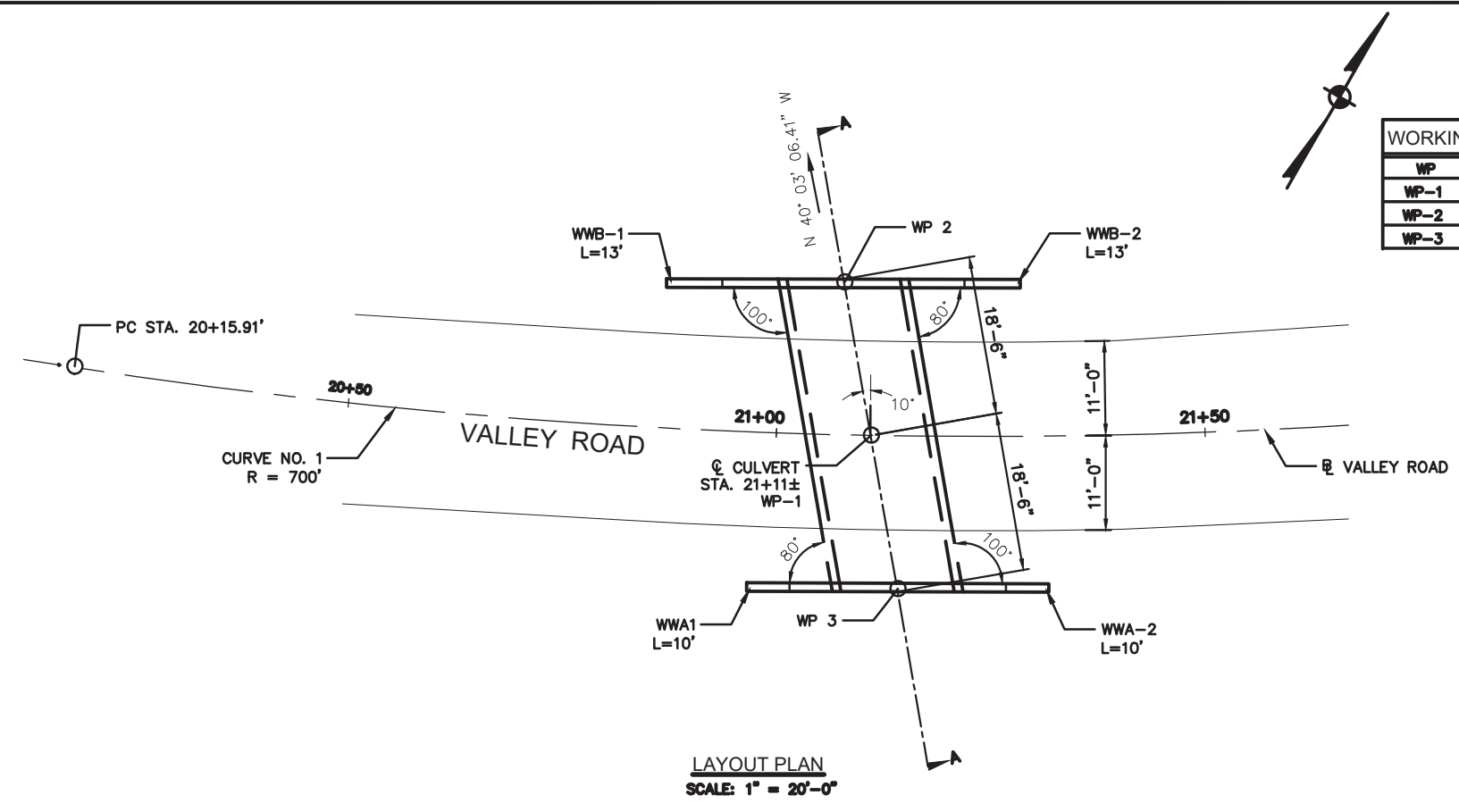
WORKING POINT COORDINATES

WP	NORTHING	EASTING
WP-1	126971.8336	1513318.9746
WP-2	126953.6666	1513322.1783
WP-3	126935.3957	1513325.3999

NOTES:

- FOR COMPLETE BASELINE GEOMETRY, SEE SHEET NO. HWY-1.
- ROADWAY PROFILE TO MATCH EXISTING.
- FOR WINGWALL SECTION DETAILS SEE SHEET MDS-3.
- CUT BITUMINOUS OVERLAY WITH 1/2" WIDE BY 1/2" DEEP KERF AND FILL WITH POURABLE SEALANT. TO BE PAID FOR UNDER THE ITEM "SAWING AND SEALING JOINTS IN BITUMINOUS PAVEMENT."

QUANTITIES		
ITEM	UNITS	TOTALS
STRUCTURE EXCAVATION - EARTH (COMPLETE)	CY	450
STRUCTURE EXCAVATION - ROCK (COMPLETE)	CY	6
HANDLING WATER	LS	1
COMPACTED GRANULAR FILL	CY	30
PERVIOUS STRUCTURE BACKFILL	CY	375
SEDIMENTATION CONTROL SYSTEM	LF	100
SAWING AND SEALING JOINTS IN BIT. CONC. PAVEMENT	LF	70
REMOVAL OF EXISTING CULVERT	LS	1
CLASS 'A' CONCRETE	CY	14
PRECAST CONCRETE WINGWALL	EA	4
13' X 8' PRECAST CONCRETE BOX CULVERT	LF	37
DEFORMED STEEL BARS	LB	1,700
DEFORMED STEEL BARS (EPOXY COATED)	LB	500
DRILLING HOLES AND GROUTING DOWELS	EA	52
MEMBRANE WATERPROOFING (COLD LIQUID ELASTOMERIC)	SY	75
DAMP PROOFING	SY	175



Freeman Companies, LLC - R:\2017\2017-0507 Killingly Bridge\DWG\BRIDGE 68-002\HW_MSH_2017_0507_BRG002_ALN.dwg Jan 05, 2021 - 1:37pm Plotted By: LBuchel

FREEMAN COMPANIES
36 JOHN STREET
HARTFORD, CT 06106
WWW.FREEMANCO.COM
860.231.9930
TOLL FREE: 800.964.5141
FAX: 860.958.7511
ELEVATE YOUR EXPECTATIONS

PREPARED FOR
TOWN OF KILLINGLY
VALLEY ROAD
KILLINGLY,
CONNECTICUT 06239

OWNER FOR
TOWN OF KILLINGLY
VALLEY ROAD
KILLINGLY,
CONNECTICUT 06239

DENNIS M. QUINN, PE NO. 19108

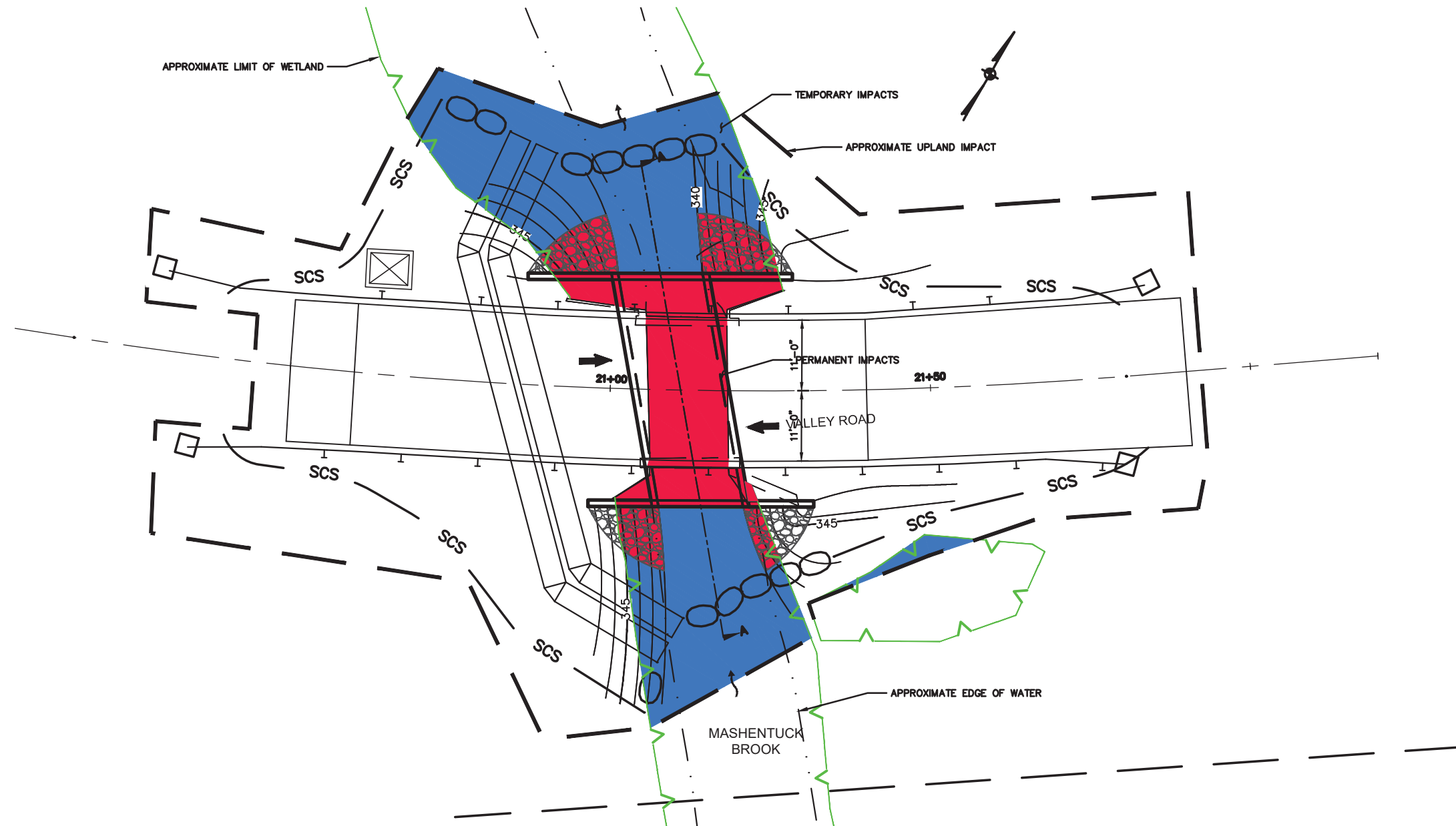
**REPLACEMENT OF BRIDGE No. 68-002
VALLEY ROAD OVER MASHENTUCK BROOK
KILLINGLY, CONNECTICUT**

NO.	DATE	DESCRIPTION

DESIGNED: YL	TITLE: LAYOUT PLAN
DRAFTED: PT	
CHECKED: DQ	
APPROVED: PAR	
SCALE: AS NOTED	
PROJECT NO.: 2017-0507	SHEET NUMBER: S-1.2
DATE: 02/03/2020	
CAD: HW_MSH_2017_0507_BRG002_ALN	

THESE DRAWINGS SHALL NOT BE UTILIZED BY ANY PERSON, FIRM OR CORPORATION WITHOUT THE SPECIFIC WRITTEN PERMISSION OF FREEMAN COMPANIES, LLC

Freeman Companies, LLC - R:\2017\2017-0507_Killingly Bridges\ENVI\Permits\USACE and CT DEEP Permits\68-02\PCN\Attachments\Attachment 14 - Project Plans\env\HW_MSH_2017_0507_BRG002_GEN (Impacts).dwg Jan 05 2021 11:57am Plotted By: LBuchel



PLAN
 SCALE: 1/8" = 1'-0"

PERMANENT IMPACTS	
RIPRAP	250 S.F.
EXISTING CULVERT FOOTPRINT	300 S.F.
PROPOSED CULVERT FOOTPRINT	300 S.F.
TOTAL:	850 S.F.

TEMPORARY IMPACTS	
TOTAL:	1700 S.F.
UPLANDS IMPACTS	
TOTAL:	8050 S.F.

FREEMAN COMPANIES
1000 WASHINGTON STREET, HARTFORD, CT 06103
DBE | DAS | MBE | GNISDC CERTIFIED
CIVIL | GEOTECHNICAL | SURVEY | ENVIRONMENTAL
 FREEMAN COMPANIES, LLC
36 JOHN STREET, HARTFORD, CT 06103
WWW.FREEMANCO.COM
(860) 231-9900
TOLL FREE: (800) 624-5141
FAX: (860) 236-7545
 ELEVATE YOUR EXPECTATIONS

PREPARED FOR
TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY,
 CONNECTICUT 06239

OWNER FOR
TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY,
 CONNECTICUT 06239

REPLACEMENT OF BRIDGE No. 68-002 VALLEY ROAD OVER MASHENTUCK BROOK KILLINGLY, CONNECTICUT

NO.	DATE	DESCRIPTION

DESIGNED:	YL	TITLE:	IMPACTS
DRAFTED:	PT	SHEET NUMBER:	
CHECKED:	DQ		
APPROVED:	PAR		
SCALE:	AS NOTED		
PROJECT NO.:	2017-0507		
DATE:	02/03/2020		
CAD:	HW_MSH_2017_0507_BRG002_GEN (Impacts)		

THESE DRAWINGS SHALL NOT BE UTILIZED BY ANY PERSON, FIRM OR CORPORATION WITHOUT THE SPECIFIC WRITTEN PERMISSION OF FREEMAN COMPANIES, LLC



**US Army Corps
of Engineers**®
New England District

WORK-START NOTIFICATION FORM
(Minimum Notice: Two weeks before work begins)

EMAIL TO: michael.s.wierbonics@usace.army.mil and cenae-r@usace.army.mil; or

MAIL TO: Mike Wierbonics
Regulatory Division
U.S. Army Corps of Engineers, New England District
696 Virginia Road
Concord, Massachusetts 01742-2751

Corps of Engineers Permit No. NAE-2021-00302 was issued to David Capacchione, P.E., Director of Engineering and Facilities, Town of Killingly, Connecticut on August 9, 2022. The permit authorizes the replacement of a deficient bridge (No. 68-002) carrying Valley Road over Mashentuck Brook in Killingly, Connecticut. The project will result in the discharge of approximately 850 square-feet of permanent fill and approximately 1,700 square-feet of temporary fill below the Ordinary High Water (OHW) line of Mashentuck Brook.

The people (e.g., contractor) listed below will do the work, and they understand the permit's conditions and limitations.

PLEASE PRINT OR TYPE

Name of Person/Firm: _____

Business Address: _____

Phone & email: () _____ () _____

Proposed Work Dates: Start: _____ Finish: _____

Permittee/Agent Signature: _____ Date: _____

Printed Name: _____ Title: _____

Date Permit Issued: _____ Date Permit Expires: _____

FOR USE BY THE CORPS OF ENGINEERS

PM: Mike Wierbonics Submittals Required: _____

Inspection Recommendation: _____



**US Army Corps
of Engineers**®
New England District

COMPLIANCE CERTIFICATION FORM
(Minimum Notice: Permittee must sign and return notification
within one month of the completion of work.)

Permit Number: NAE-2021-00302

Project Manager: Mike Wierbonics

Name of Permittee: David Capacchione, P.E., Town of Killingly, Connecticut

Permit Issuance Date: August 9, 2022

Please sign this certification and return it to our office upon completion of the activity.

```

***** *
* E-MAIL TO: cenae-r@usace.army.mil; or *
* * *
* MAIL TO: Permits and Enforcement Branch B *
* U.S. Army Corps of Engineers, New England District *
* Regulatory Division *
* 696 Virginia Road *
* Concord, Massachusetts 01742-2751 *
***** *

```

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit was completed in accordance with the terms and conditions of the above referenced permit, and any required mitigation was completed in accordance with the permit conditions.

Signature of Permittee

Date

Printed Name

Date of Work Completion

() _____
Telephone Number

() _____
Telephone Number



DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

August 9, 2022

Regulatory Division
File Number: NAE-2021-00304

David Capacchione, P.E.
Director of Engineering and Facilities
Town of Killingly
172 Main Street
Killingly, Connecticut 06239
(Via email: dcapacchione@killinglyct.gov)

Dear Mr. Capacchione:

The U.S. Army Corps of Engineers (USACE) has reviewed your application for the replacement of the existing bridge Number 68-003. This work will result in the permanent discharge of approximately 100 square-feet (sf) of rip rap and approximately 650sf of twin 35.5-foot-long by 10-foot wide by 7-foot high box culverts with associated wing walls and the temporary discharge of approximately 2,275sf of temporary fill consisting of coffer dams and erosion control barriers below the Ordinary High Water line (OHW) of Whetstone Brook. This work is located on Valley Road over Whetstone Brook in Killingly, Connecticut and is shown on the enclosed plans titled "REPLACEMENT OF BRIDGE No. 68-003 VALLEY ROAD OVER WHETSTONE BROOK KILLINGLY, CONNECTICUT" on four sheets dated "DATE: 10/5/2020".

Based on the information you have provided, we verify that the activity is authorized under General Permits # 19 of the enclosed December 15, 2021, federal permit known as the Connecticut General Permits (GPs). This verification is subject to the following special condition:

This authorization requires you to complete and return the enclosed Work Start Notification Form to this office at least two weeks before the anticipated starting date. You must also complete and return the enclosed Compliance Certification Form within one month following the completion of the authorized work.

Please review the special conditions above and the enclosed GPs carefully, including its general conditions beginning on page 48, to be sure that you and whoever does the work understands this verification's requirements. A copy of the GPs and this verification letter shall be available at the project site throughout the time the work is underway. Performing work within our jurisdiction that is not specifically authorized by this determination, failing to comply with any special condition provided above or all the terms and conditions of the GPs may subject you to the enforcement provisions of our regulations.

This authorization presumes that the work as described above and as shown on your plans noted above is in waters of the U.S.

This authorization expires on December 15, 2026, unless the GPs are modified, suspended, or revoked before then. You must commence or have under contract to commence the work authorized herein by December 15, 2026 and complete the work by December 15, 2027. If not, you must contact this office to determine the need for further authorization before beginning or continuing the activity. We recommend that you contact us *before* this permit expires to discuss a permit reissuance. If you change the project plans or construction methods for work within our jurisdiction, please contact us immediately to discuss modification of this authorization. This office must approve any changes before you undertake them.

This authorization does not obviate the need to obtain other Federal, state, or local authorizations required by law.

The Connecticut Department of Energy & Environmental Protection (DEEP) has conditionally granted Water Quality Certification (WQC) for the 2021 CT GPs under Section 401 of the Clean Water Act. This verification that your project is authorized under the CT GPs is valid only after DEEP provides you with written concurrence of eligibility for use of that WQC under the GPs. Work authorized herein may not commence until you receive DEEP concurrence of eligibility. Any adaptive best management practices prescribed by DEEP in your written concurrence of eligibility are hereby incorporated by reference into this GP authorization and will remain in full force and effect. In the event the DEEP denies eligibility for the project above, this GP authorization becomes null and void.

We continually strive to improve our customer service. To better serve you, we would appreciate your completing our Customer Service Survey located at <https://regulatory.ops.usace.army.mil/customer-service-survey/>.

Please contact Mike Wierbonics of my staff, at (978) 318-8723 or at michael.s.wierbonics@usace.army.mil if you have any questions.

Sincerely,

Kevin R Kotelly

Kevin R. Kotelly, P.E.
Chief, Permits & Enforcement Branch
Regulatory Division

Enclosures

cc:

William Sigmund, CT DEEP, william.sigmund@ct.gov

Nate Margason, U.S. EPA, Region 1, margason.nathan@epa.gov

Luis Bucheli, Freeman Companies, LLC, lbucheli@freemancos.com

Dennis Qunit, Freeman Companies, LLC, dqunit@freemancos.com

Jeffrey LeBeau, Freeman Companies, LLC, jlebeau@freemancos.com



US Army Corps
of Engineers®
New England District

WORK-START NOTIFICATION FORM
(Minimum Notice: Two weeks before work begins)

EMAIL TO: michael.s.wierbonics@usace.army.mil and cenae-r@usace.army.mil; or

MAIL TO: Mike Wierbonics
Regulatory Division
U.S. Army Corps of Engineers, New England District
696 Virginia Road
Concord, Massachusetts 01742-2751

Corps of Engineers Permit No. NAE-2021-00304 was issued to David Capacchione, P.E., Director of Engineering and Facilities, Town of Killingly, Connecticut on August 9, 2022. The permit authorizes the replacement of a deficient bridge (No. 68-003) carrying Valley Road over Whetstone Brook in Killingly, Connecticut. The project will result in the discharge of approximately 750 square-feet of permanent fill and approximately 2,275 square-feet of temporary fill below the Ordinary High Water (OHW) line of Whetstone Brook.

The people (e.g., contractor) listed below will do the work, and they understand the permit's conditions and limitations.

PLEASE PRINT OR TYPE

Name of Person/Firm: _____

Business Address: _____

Phone & email: () _____ () _____

Proposed Work Dates: Start: _____ Finish: _____

Permittee/Agent Signature: _____ Date: _____

Printed Name: _____ Title: _____

Date Permit Issued: _____ Date Permit Expires: _____

FOR USE BY THE CORPS OF ENGINEERS

PM: Mike Wierbonics Submittals Required: _____

Inspection Recommendation: _____



**US Army Corps
of Engineers**®
New England District

COMPLIANCE CERTIFICATION FORM
(Minimum Notice: Permittee must sign and return notification
within one month of the completion of work.)

Permit Number: NAE-2021-00304

Project Manager: Mike Wierbonics

Name of Permittee: David Capacchione, P.E., Dir. of Engineering and Facilities, Town of
Killingly, Connecticut

Permit Issuance Date: August 8, 2022

Please sign this certification and return it to our office upon completion of the activity.

```

*****
* E-MAIL TO: cenae-r@usace.army.mil; or *
* * *
* MAIL TO: Permits and Enforcement Branch B *
* U.S. Army Corps of Engineers, New England District *
* Regulatory Division *
* 696 Virginia Road *
* Concord, Massachusetts 01742-2751 *
*****

```

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit was completed in accordance with the terms and conditions of the above referenced permit, and any required mitigation was completed in accordance with the permit conditions.

Signature of Permittee

Date

Printed Name

Date of Work Completion

(_____)_____
Telephone Number

(_____)_____
Telephone Number

Freeman Companies, LLC - R. \2017\2017-0507 Killingly Bridges\ENV\Permits\USACE and CT DEP Permits\68-003\Permit Attachments\Attachment 14 - Project Plans\env\Location Map B#68-003.dwg Jan 06, 2021 - 12:44pm Plotted By: LBuchell



SITE LOCATION MAP

REPLACEMENT OF BRIDGE No. 68-003 VALLEY ROAD OVER WHETSTONE BROOK KILLINGLY, CONNECTICUT

FREEMAN COMPANIES
LAND DEVELOPMENT | INVESTIGATION SERVICES | GEOTECHNICAL SURVEYING
 DBE | DAS | MBE | GWSSDC CERTIFIED
 CIVIL | GEOTECHNICAL | SURVEY | ENVIRONMENTAL
 FREEMAN COMPANIES, LLC
 38 JOHN STREET
 HARTFORD, CT 06106
 WWW.FREEMANCO.COM
 (860)251-9550
 TOLL FREE: (800)645-5141
 FAX: (860)256-7141
 ELEVATE YOUR EXPECTATIONS

PREPARED FOR
**TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY,
 CONNECTICUT 06239**

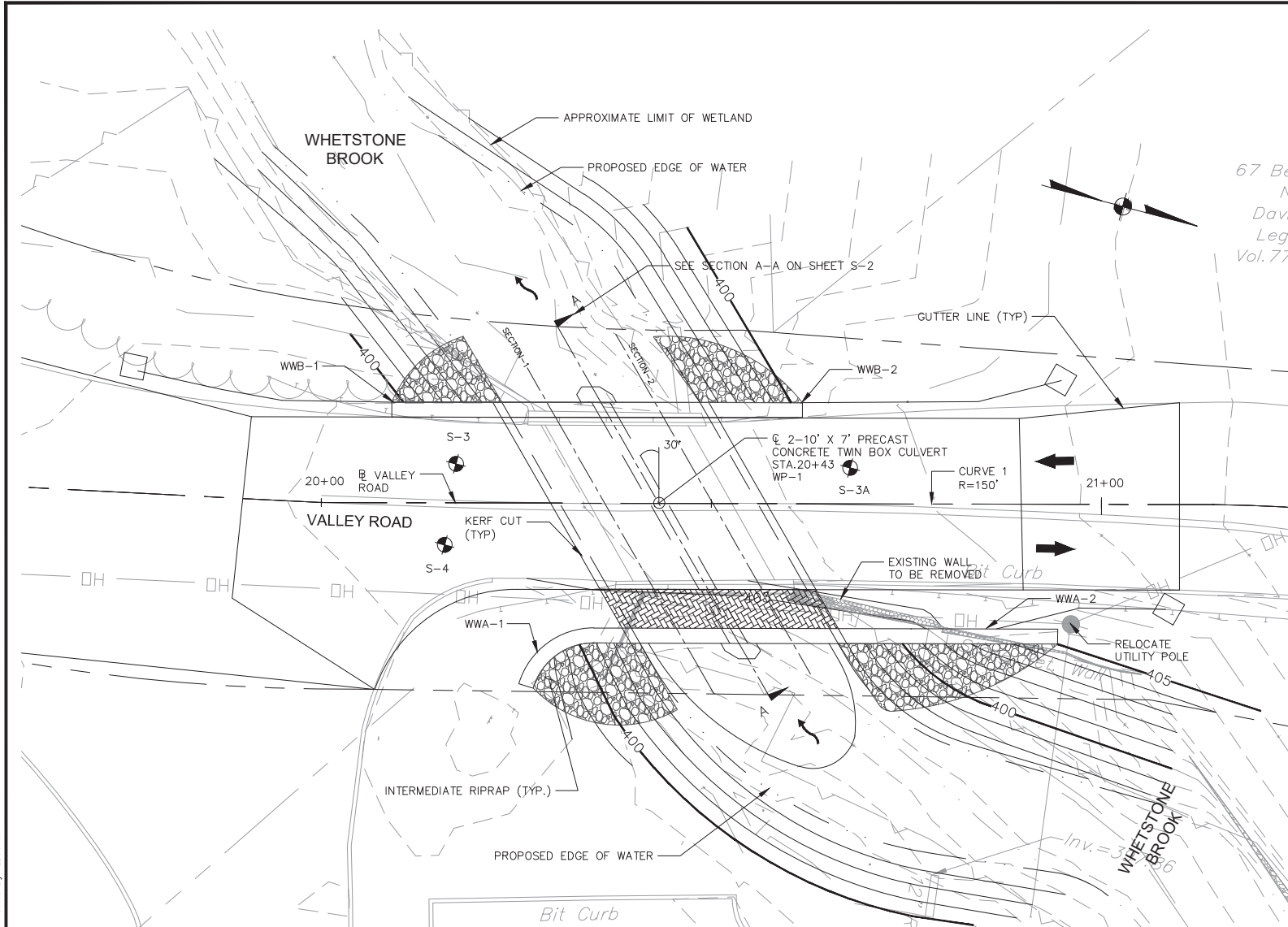
OWNER FOR
**TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY,
 CONNECTICUT 06239**

DESIGNED BY: JLB
 NO. 19109

NO.	DATE	DESCRIPTION

DESIGNED: YL
 DRAFTED: KM
 CHECKED: DQ
 APPROVED: PAR
 SCALE: AS NOTED
 PROJECT NO.: 2017-0507
 DATE: 10/05/2020
 CAD: Location Map B#68-003

TITLE:
 SHEET NUMBER:



PLAN
SCALE: 1" = 20'-0"

- UTILITY NOTES**
- THIS PROJECT INVOLVES THE PRESENCE OF OVERHEAD UTILITY LINES WITHIN THE LIMITS AND FOOTPRINT OF THE PROJECT. WHILE NO WORK INVOLVING OR IMPACTING THESE UTILITIES ARE ANTICIPATED, THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL WORK WITH THE APPROPRIATE UTILITY COMPANY (EVER SOURCE) AND FOR PROVIDING TEMPORARY PROTECTION AND/OR SUPPORT OF THESE FACILITIES IF AND AS REQUIRED BY THE UTILITY COMPANY.
 - THE CONTRACTOR SHALL DEVELOP ITS ERECTION SCHEME IN CONFORMANCE WITH LIMITATIONS AND RESTRICTIONS ASSOCIATED WITH THE OVERHEAD UTILITY LINES AND AS REQUIRED BY THE APPROPRIATE UTILITY COMPANY.
 - THE CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANY WITH REGARDS TO POTENTIAL RELOCATION OR TEMPORARY SUPPORT OF THEIR FACILITIES. THE CONTRACTOR SHALL IDENTIFY POTENTIAL UTILITY IMPACTS ASSOCIATED WITH THEIR WORK, IF ANY, PRIOR TO START OF CONSTRUCTION AND NOTIFY THE APPROPRIATE UTILITY COMPANY ACCORDINGLY.

- GENERAL NOTES**
- SPECIFICATIONS:** CONNECTICUT DEPARTMENT OF TRANSPORTATION FORM 817, INCLUDING SUPPLEMENTAL SPECIFICATIONS DATED JANUARY, 2018 AND SPECIAL PROVISIONS.
- DESIGN SPECIFICATIONS:** AASHTO LRFD SPECIFICATIONS FOR HIGHWAY BRIDGES, 8TH EDITION AS SUPPLEMENTED BY THE CONNECTICUT DEPARTMENT OF TRANSPORTATION BRIDGE MANUAL (2003) EDITION WITH REVISIONS UP TO AND INCLUDING 2011.
- ALLOWABLE DESIGN STRESSES:**
- CLASS "A" CONCRETE: $f'c = 3,000$ psi
 CLASS "50" CONCRETE: $f'c = 5,000$ psi
 REINFORCEMENT (ASTM 615 GRADE 60) $f_y = 60,000$ psi
- LIVE LOAD:**
- STANDARD DESIGN VEHICLE: AASHTO HL-93
 PERMIT (OVERLOAD) VEHICLES: CONNDOT P204 (8-AXLE)
 CONNDOT P380 (19-AXLE)
- SALVAGE:** NONE
- DIMENSIONS AND ELEVATIONS:** WHEN DECIMAL DIMENSIONS AND ELEVATIONS ARE GIVEN TO LESS THAN THREE DECIMAL PLACES, THE OMITTED DIGITS SHALL BE ASSUMED TO BE ZERO. ALL ELEVATIONS ARE GIVEN IN DECIMAL FEET AND ARE BASED ON NAVD 88.
- EXISTING DIMENSIONS:** DIMENSIONS OF THE EXISTING STRUCTURE SHOWN ON THESE PLANS ARE FOR GENERAL REFERENCE ONLY AND ARE NOT GUARANTEED. THE CONTRACTOR SHALL TAKE ALL FIELD MEASUREMENTS NECESSARY TO ASSURE PROPER FIT OF THE FINISHED WORK AND SHALL ASSUME FULL RESPONSIBILITY FOR THEIR ACCURACY. WHEN SHOP DRAWINGS BASED ON FIELD MEASUREMENTS ARE SUBMITTED FOR APPROVAL, THE FIELD MEASUREMENTS SHALL ALSO BE SUBMITTED FOR REFERENCE BY THE REVIEWER.
- UTILITIES:** THE CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES LOCATED WITHIN THE VICINITY OF THE SITE DURING CONSTRUCTION. THE METHOD OF SUPPORTING AND PROTECTING UTILITIES SELECTED BY THE CONTRACTOR MUST BE APPROVED BY THE UTILITY COMPANY. UTILITY MODIFICATIONS SHALL BE MADE BY THE RESPECTIVE UTILITY COMPANIES EXCEPT WHERE NOTED OTHERWISE.

NOTICE TO BRIDGE INSPECTORS

IT IS RECOMMENDED THAT CT DOT'S BRIDGE SAFETY PROCEDURES BE FOLLOWED WHEN INSPECTING THIS BRIDGE FOR, BUT NOT LIMITED TO, ALL APPROPRIATE COMPONENTS INDICATED IN THE GOVERNING MANUALS FOR BRIDGE INSPECTION. ATTENTION MUST BE GIVEN TO INSPECTING THE FOLLOWING SPECIAL COMPONENTS AND DETAILS. (THE LISTING OF COMPONENTS FOR SPECIFIC ATTENTION SHALL NOT BE CONSTRUED TO REDUCE THE IMPORTANCE OF INSPECTION OF ANY OTHER COMPONENT OF THE STRUCTURE.) THE FREQUENCY OF INSPECTION OF THIS STRUCTURE SHALL BE IN ACCORDANCE WITH THE GOVERNING MANUALS FOR BRIDGE INSPECTION, UNLESS OTHERWISE DIRECTED BY THE MANAGER OF BRIDGE SAFETY AND EVALUATIONS.

COMPONENT OR DETAIL	STRUCTURE SHEET REFERENCE
NONE	-

HYDRAULIC DATA

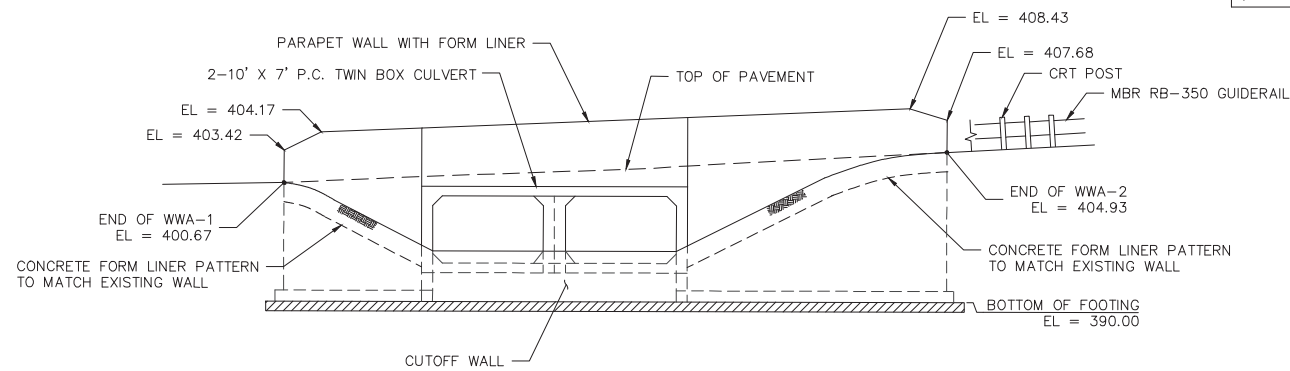
HYDRAULIC AREA	5.7 SQ MI
DESIGN FREQUENCY	100 YEAR
DESIGN DISCHARGE	1180 CFS
AVERAGE DAILY FLOW	10.4 CFS
AVERAGE DAILY FLOW ELEVATION	395.63
UPSTREAM DESIGN WATER SURFACE ELEVATION	402.49
DOWN STREAM DESIGN WATER SURFACE ELEVATION	399.70
2 YEAR DESIGN STORM WATER ELEVATION	397.59

TRANSPORTATION DATA

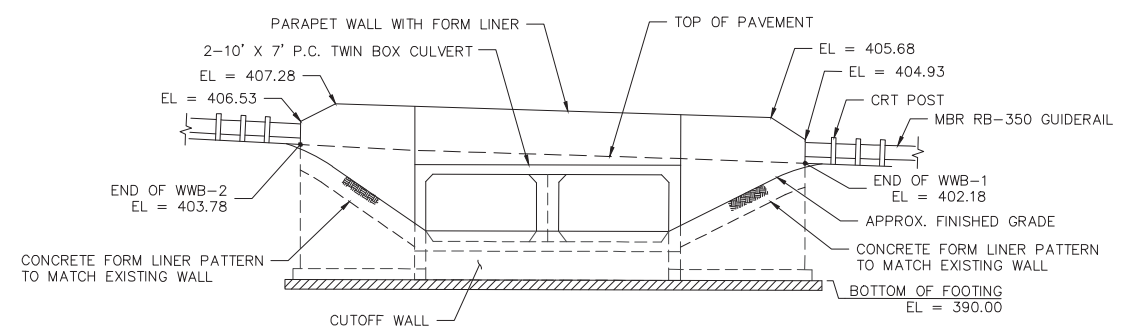
MEMBER	SHIPPING LENGTH	SHIPPING HEIGHT	SHIPPING WIDTH	SHIPPING WEIGHT
BOX CULVERT SECTION-1	12'-0"	8'-0"	9'-0"	46,500 lbs
BOX CULVERT SECTION-2	12'-0"	9'-0"	9'-0"	34,900 lbs
WINGWALL	13'-0"	7'-0"	9'-0"	37,000 lbs

BORING LEGEND

S-1 APPROXIMATE BORING LOCATION



UPSTREAM ELEVATION
SCALE: 1" = 20'-0"



DOWNSTREAM ELEVATION
SCALE: 1" = 20'-0"

FREEMAN COMPANIES
 DBE | DAS | MBE | GNMSDC CERTIFIED
 CIVIL | GEOTECHNICAL | SURVEY | ENVIRONMENTAL
 FREEMAN COMPANIES, LLC
 95 JOHN STREET
 HARTFORD, CT 06106
 WWW.FREEMANCO.COM
 860.251.9500
 TOLL FREE: 800.668.5141
 FAX: 860.988.7161
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OWNER FOR
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 VALLEY ROAD
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 CONNECTICUT 06239

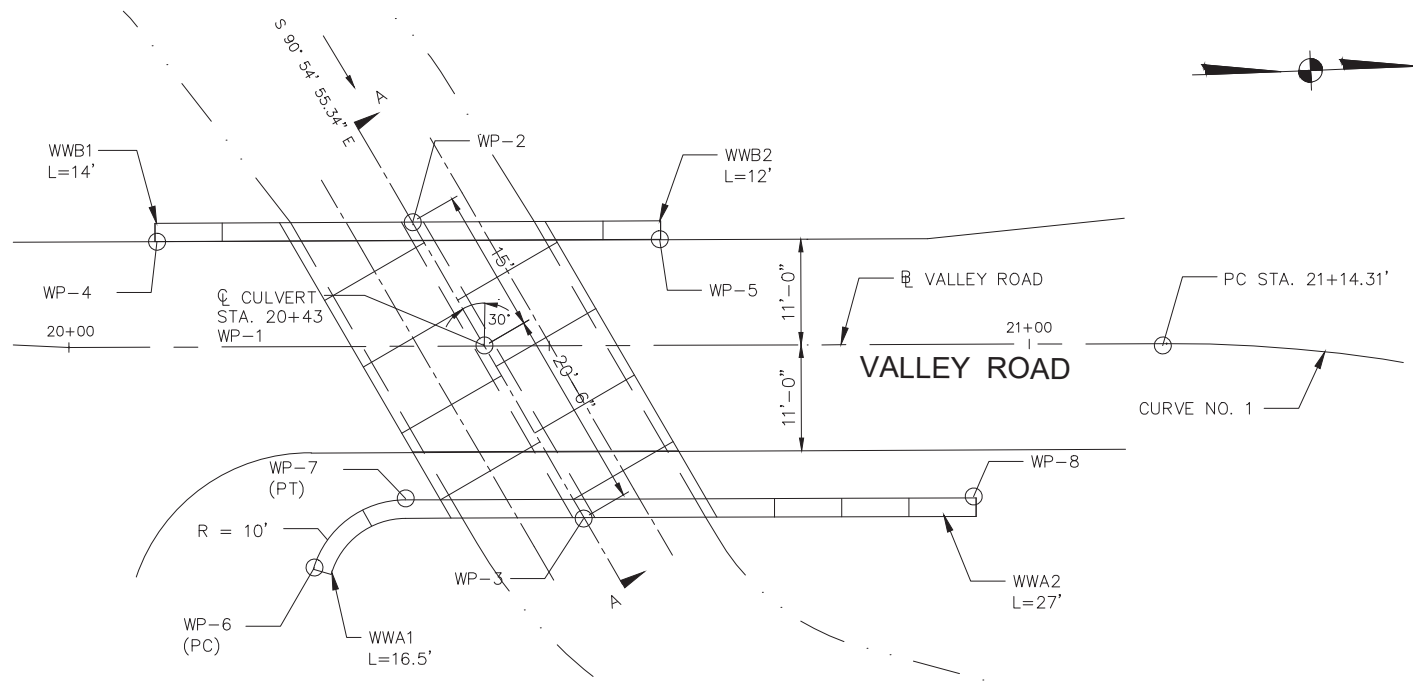
DENNIS MOURNET, PE NO. 19108

**REPLACEMENT OF BRIDGE No. 68-003
 VALLEY ROAD OVER WHETSTONE BROOK
 KILLINGLY, CONNECTICUT**

NO.	DATE	DESCRIPTION	DESIGNED:	Y.L.	TITLE:
-	-	-	DRAFTED:	K.M.	GENERAL PLAN
-	-	-	CHECKED:	D.O.	
-	-	-	APPROVED:	P.A.R.	SHEET NUMBER: S-2.1
-	-	-	SCALE:	AS NOTED	
-	-	-	PROJECT NO.:	2017-0507	CAD: HW_MSH_2017_0507_BR0003_GEN
-	-	-	DATE:	10/05/2020	
REVISIONS					

Freeman Companies, LLC - R:\2017\2017-0507_Killingly_Bridges\DWG\BRIDGE_68-003\Archive\HW_MSH_2017_0507_BR0003_GEN.dwg Jun 06, 2021 - 2:07pm Plotted By: LBuchel

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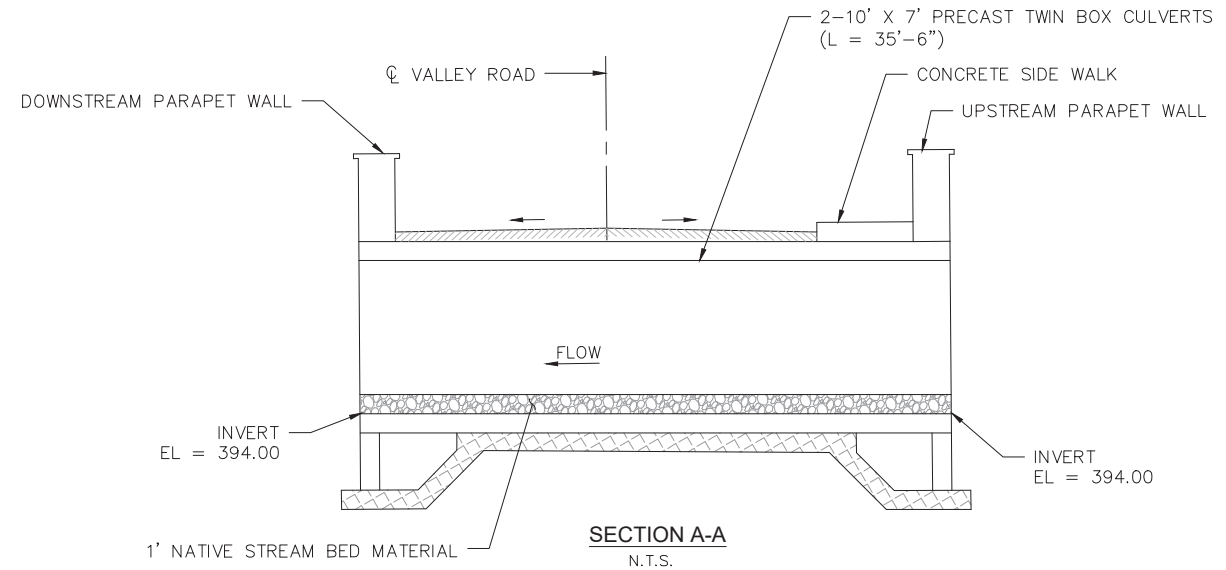
LAYOUT PLAN
SCALE: 1" = 20'-0"

WP	NORTHING	EASTING
WP-1	868379.2226	1250594.5198
WP-2	868370.3781	1250590.4256
WP-3	868395.5243	1250615.5987
WP-4	868344.9940	1250599.2626
WP-5	868395.8103	1250585.5193
WP-6	868377.0778	1250618.5760
WP-7	868369.6815	1250627.9522
WP-8	868434.3781	1250603.1484

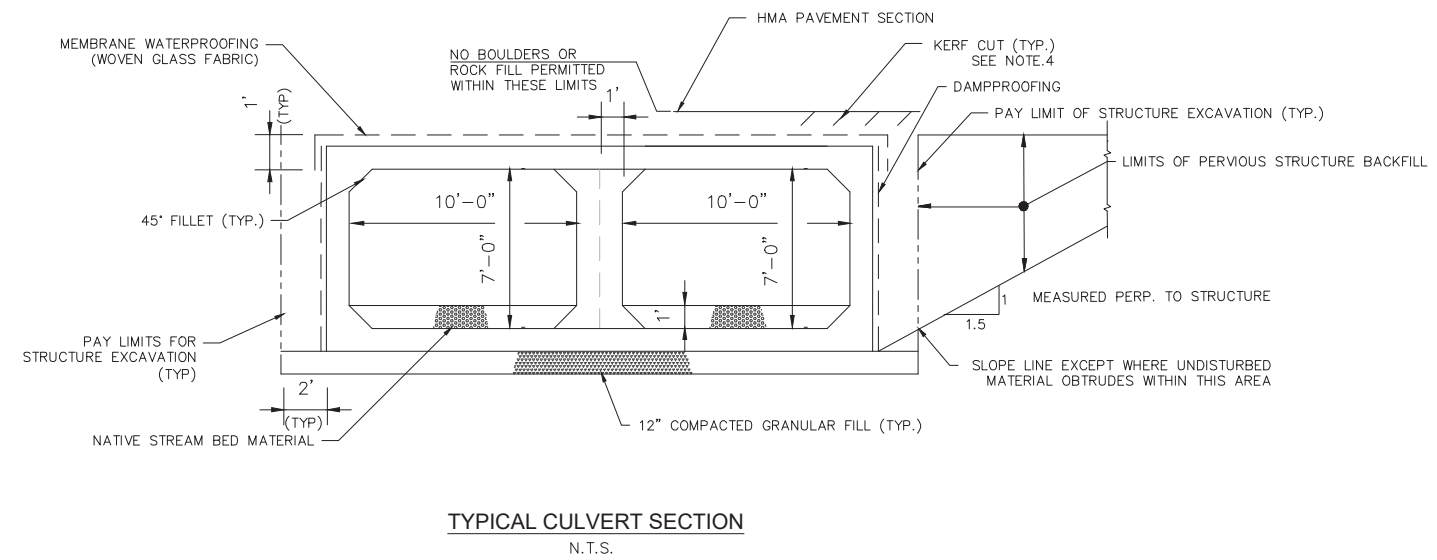
NOTES:

- FOR COMPLETE BASELINE GEOMETRY, SEE SHEET NO. HWY-1.
- ROADWAY PROFILE TO MATCH EXISTING.
- FOR WINGWALL SECTION DETAILS SEE SHEET MDS-3.
- CUT BITUMINOUS OVERLAY WITH 3/8" WIDE BY 1 1/2" DEEP KERF AND FILL WITH POURABLE SEALANT. TO BE PAID FOR UNDER THE ITEM "SAWING AND SEALING JOINTS IN BITUMINOUS PAVEMENT."

QUANTITIES		
ITEM	UNITS	TOTALS
STRUCTURE EXCAVATION - EARTH (COMPLETE)	CY	300
STRUCTURE EXCAVATION - ROCK (COMPLETE)	CY	14
HANDLING WATER	LS	1
COMPACTED GRANULAR FILL	CY	40
PERVIOUS STRUCTURE BACKFILL	CY	380
SAWING AND SEALING JOINTS IN BIT. CONC. PAVEMENT	LF	100
REMOVAL OF EXISTING CULVERT	LS	1
CLASS 'A' CONCRETE	CY	20
CLASS 'F' CONCRETE	CY	25
PRECAST CONCRETE WINGWALL	EA	4
2-10' X 7' PRECAST CONCRETE BOX CULVERTS	LF	35.5
DEFORMED STEEL BARS	LB	2,000
DEFORMED STEEL BARS (EPOXY COATED)	LB	1500
DRILLING HOLES AND GROUTING DOWELS	EA	36
MEMBRANE WATERPROOFING (COLD LIQUID ELASTOMERIC)	SY	125
DAMPPOOFING	SY	175
CONCRETE FORM LINER	SF	1350



SECTION A-A
N.T.S.



TYPICAL CULVERT SECTION
N.T.S.

Freeman Companies, LLC - R: 2017-0507 - 0507 - Killingly Bridges\DWG\BRIDGE 68-003\Archive\HW_MSH_2017_0507_BRG003_ALN.dwg - 06/20/2017 - 2:34pm Plotted By: Lbluett

FREEMAN COMPANIES
36 JOHN STREET
HARTFORD, CT 06106
WWW.FREEMANCO.COM
TOLL FREE (800) 424-3141
TEL: (860) 586-7143
FAX: (860) 586-7143
ELEVATE YOUR EXPECTATIONS

PREPARED FOR
TOWN OF KILLINGLY
VALLEY ROAD
KILLINGLY
CONNECTICUT 06239

OWNER FOR
TOWN OF KILLINGLY
VALLEY ROAD
KILLINGLY
CONNECTICUT 06239

DENNIS MCGINNIS, PE NO. 19106

REPLACEMENT OF BRIDGE No. 68-003 VALLEY ROAD OVER WHETSTONE BROOK KILLINGLY, CONNECTICUT

NO.	DATE	DESCRIPTION

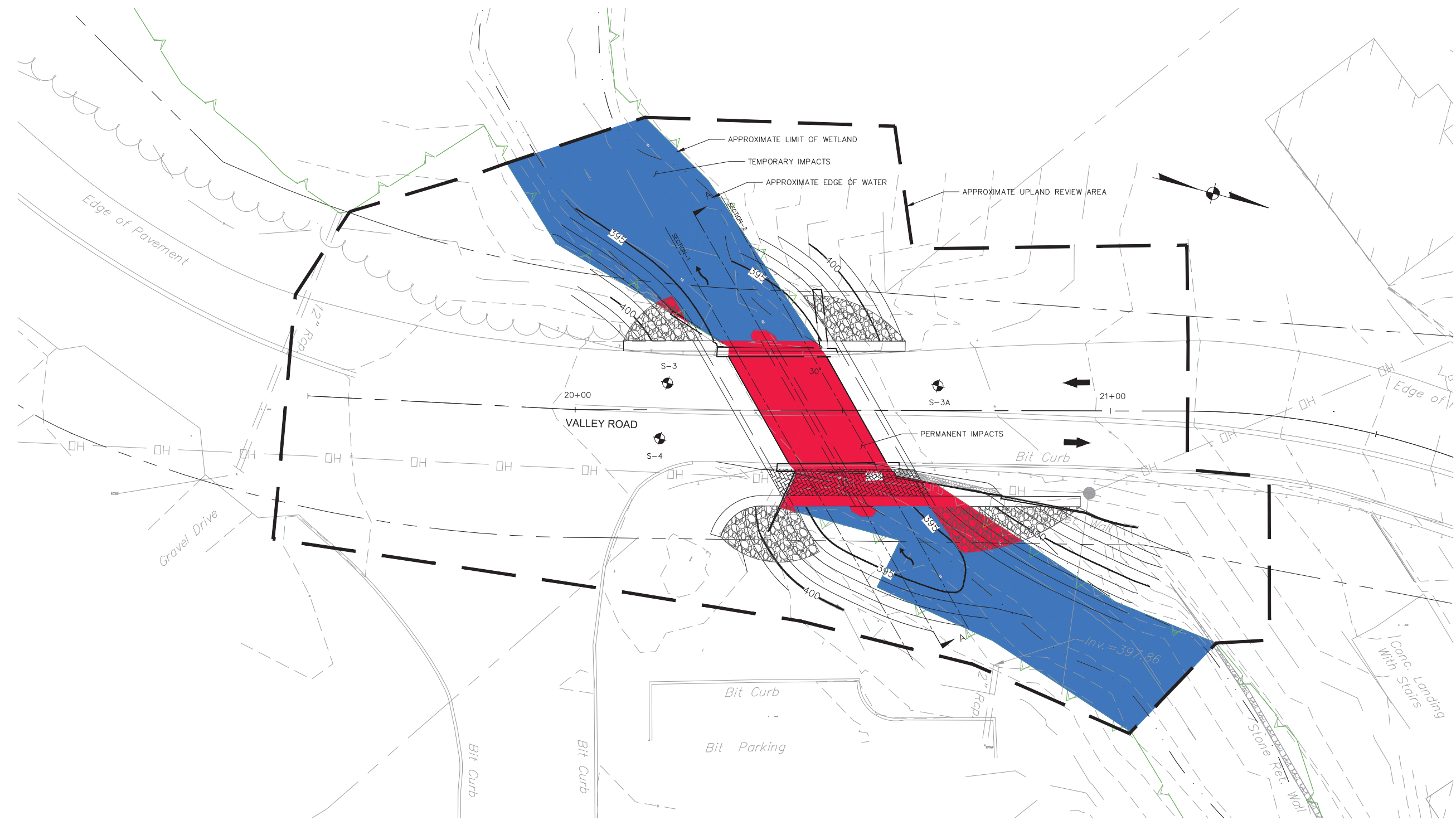
DESIGNED: YL
DRAFTED: KM
CHECKED: DO
APPROVED: PAR
SCALE: AS NOTED
PROJECT NO.: 2017-0507
DATE: 10/05/2020
CAD: HW_MSH_2017_0507_BRG003_ALN

TITLE:
LAYOUT PLAN

SHEET NUMBER:
S-2.2

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Freeman Companies, LLC - R:\2017\2017-0507 Killingly Bridges\ENV\Permits\USACE and CT DEEP Permits\68-003\PCN\Attachments\Attachment 14 - Project Plans\dwg\hw_msh_2017_0507_brg003_gen (Impacts).dwg Jan 05, 2021-2:46pm Plotted By: LBuchel



PERMANENT IMPACTS	
RIPRAP	100 S.F.
EXISTING CULVERT FOOTPRINT	425 S.F.
PROPOSED CULVERT FOOTPRINT	225 S.F.
TOTAL:	750 S.F.

TEMPORARY IMPACTS	
TOTAL:	2,275 S.F.

UPLANDS IMPACTS	
TOTAL:	11,200 S.F.

REPLACEMENT OF BRIDGE No. 68-003 VALLEY ROAD OVER WHETSTONE BROOK KILLINGLY, CONNECTICUT

FREEMAN COMPANIES
 ONE | SAS | ABE | GINQOC CERTIFIED
 CIVIL | GEOTECHNICAL | SURVEY | ENVIRONMENTAL
 FREEMAN COMPANIES, LLC
 34 JOHN STREET
 HARTFORD, CT 06108
 WWW.FREEMANCOS.COM
 (860)251-9550
 TOLL FREE: (800)654-5141
 FAX: (860)788-7161
 ELEVATE YOUR EXPECTATIONS

PREPARED FOR
 TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY,
 CONNECTICUT 06239

 OWNER FOR
 TOWN OF KILLINGLY
 VALLEY ROAD
 KILLINGLY,
 CONNECTICUT 06239

DENISE M. QUINCY, PE NO. 19106

NO.	DATE	DESCRIPTION

DESIGNED: YL
 DRAFTED: KM
 CHECKED: DQ
 APPROVED: PAR
 SCALE: AS NOTED
 PROJECT NO.: 2017-0507
 DATE: 10/05/2020
 CAD: hw_msh_2017_0507_brg003_gen (Impacts)

TITLE:
GENERAL PLAN
 SHEET NUMBER:
S-2.1

THESE DRAWINGS SHALL NOT BE UTILIZED BY ANY PERSON, FIRM OR CORPORATION WITHOUT THE SPECIFIC WRITTEN PERMISSION OF FREEMAN COMPANIES, LLC



DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

August 10, 2022

Regulatory Division
File Number: NAE-2021-00306

David Capacchione, P.E.
Director of Engineering and Facilities
Town of Killingly
172 Main Street
Killingly, Connecticut 06239
(Via email: dcapacchione@killinglyct.gov)

Dear Mr. Capacchione:

The U.S. Army Corps of Engineers (USACE) has reviewed your application for the replacement of the existing bridge Number 68-009. This work will result in the permanent discharge of approximately 200 square-feet (sf) of rip rap and approximately 575sf of pre-cast box culvert measuring 6-feet wide by 15-feet long and the temporary discharge of approximately 4,050sf of temporary fill consisting of coffer dams and erosion control barriers below the Ordinary High Water line (OHW) of an unnamed stream associated with Bog Meadow Reservoir. This work is located on Bear Hill Road over an unnamed brook in Killingly, Connecticut and is shown on the enclosed plans titled "REPLACEMENT OF BRIDGE No. 68-009 BEAR HILL ROAD OVER UNNAMED BROOK KILLINGLY, CONNECTICUT" on four sheets dated "DATE: 02/05/2020".

Based on the information you have provided, we verify that the activity is authorized under General Permits # 19 of the enclosed December 15, 2021, federal permit known as the Connecticut General Permits (GPs). This verification is subject to the following special condition:

This authorization requires you to complete and return the enclosed Work Start Notification Form to this office at least two weeks before the anticipated starting date. You must also complete and return the enclosed Compliance Certification Form within one month following the completion of the authorized work.

Please review the special conditions above and the enclosed GPs carefully, including its general conditions beginning on page 48, to be sure that you and whoever does the work understands this verification's requirements. A copy of the GPs and this verification letter shall be available at the project site throughout the time the work is underway. Performing work within our jurisdiction that is not specifically authorized by this determination, failing to comply with any special condition provided above or all the terms and conditions of the GPs may subject you to the enforcement provisions of our regulations.

This authorization presumes that the work as described above and as shown on your plans noted above is in waters of the U.S.

This authorization expires on December 15, 2026, unless the GPs are modified, suspended, or revoked before then. You must commence or have under contract to commence the work authorized herein by December 15, 2026 and complete the work by December 15, 2027. If not, you must contact this office to determine the need for further authorization before beginning or continuing the activity. We recommend that you contact us *before* this permit expires to discuss a permit reissuance. If you change the project plans or construction methods for work within our jurisdiction, please contact us immediately to discuss modification of this authorization. This office must approve any changes before you undertake them.

This authorization does not obviate the need to obtain other Federal, state, or local authorizations required by law.

The Connecticut Department of Energy & Environmental Protection (DEEP) has conditionally granted Water Quality Certification (WQC) for the 2021 CT GPs under Section 401 of the Clean Water Act. This verification that your project is authorized under the CT GPs is valid only after DEEP provides you with written concurrence of eligibility for use of that WQC under the GPs. Work authorized herein may not commence until you receive DEEP concurrence of eligibility. Any adaptive best management practices prescribed by DEEP in your written concurrence of eligibility are hereby incorporated by reference into this GP authorization and will remain in full force and effect. In the event the DEEP denies eligibility for the project above, this GP authorization becomes null and void.

We continually strive to improve our customer service. To better serve you, we would appreciate your completing our Customer Service Survey located at <https://regulatory.ops.usace.army.mil/customer-service-survey/>.

Please contact Mike Wierbonics of my staff, at (978) 318-8723 or at michael.s.wierbonics@usace.army.mil if you have any questions.

Sincerely,

Kevin R Kotelly

Kevin R. Kotelly, P.E.
Chief, Permits & Enforcement Branch
Regulatory Division

Enclosures

cc:

William Sigmund, CT DEEP, william.sigmund@ct.gov

Nate Margason, U.S. EPA, Region 1, margason.nathan@epa.gov

Luis Bucheli, Freeman Companies, LLC, lbucheli@freemancos.com

Dennis Qunit, Freeman Companies, LLC, dqunit@freemancos.com

Jeffrey LeBeau, Freeman Companies, LLC, jlebeau@freemancos.com

Freeman Companies, LLC - R:\2017\2017-0507 Killingly Bridges\ENV\Permits\USACE and CT DEEP Permits\68-009\POW\Attachments\Attachment 14 - Project Plans\Map\Location Map B#68-009.dwg Jan 05, 2021 - 4:55pm Plotted By: L.Buchal



SITE LOCATION MAP

REPLACEMENT OF BRIDGE No. 68-009 BEAR HILL ROAD OVER UNNAMED BROOK KILLINGLY, CONNECTICUT

FREEMAN COMPANIES
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 FREEMAN COMPANIES, LLC
 36 JOHN STREET
 HARTFORD, CT 06104
 WWW.FREEMANCS.COM
 (860)251-9950
 TOLL FREE: (800)604-5141
 FAX: (860)986-7561
 ELEVATE YOUR EXPECTATIONS

PREPARED FOR
 TOWN OF KILLINGLY
 BEAR HILL ROAD
 KILLINGLY
 CONNECTICUT 06239

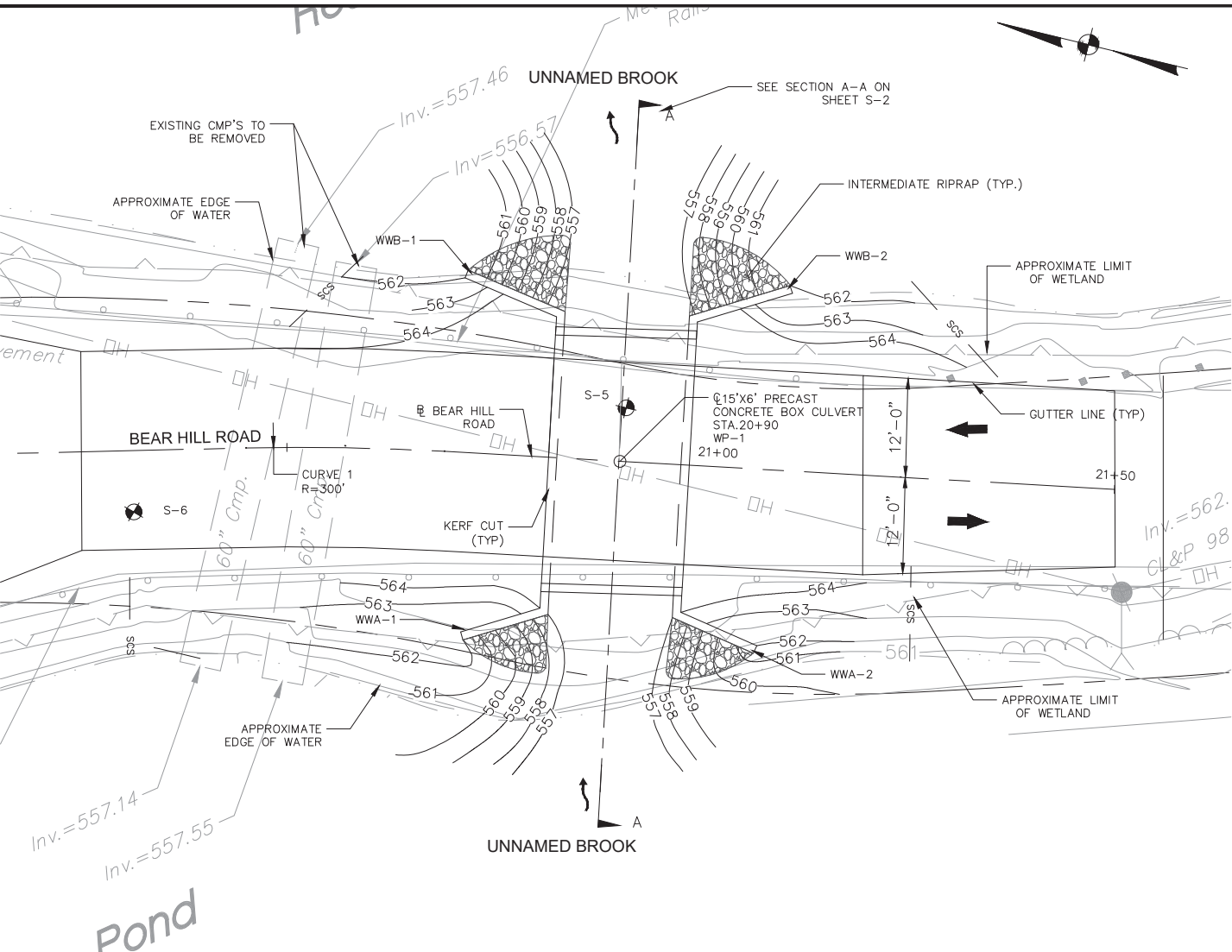
OWNER FOR
 TOWN OF KILLINGLY
 BEAR HILL ROAD
 KILLINGLY
 CONNECTICUT 06239

NO.	DATE	DESCRIPTION

DESIGNED: YL
 DRAFTED: PT
 CHECKED: DQ
 APPROVED: PAR
 SCALE: NOT TO SCALE
 PROJECT NO.: 2017-0507
 DATE: 06/14/2019
 CAD: Location Map B#68-009

TITLE:
 SHEET NUMBER:

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PLAN
SCALE: 1" = 20'-0"

BORING LEGEND	
⊕ B-1	APPROXIMATE BORING LOCATION

- UTILITY NOTES**
1. THIS PROJECT INVOLVES THE PRESENCE OF OVERHEAD UTILITY LINES WITHIN THE LIMITS AND FOOTPRINT OF THE PROJECT. WHILE NO WORK INVOLVING OR IMPACTING THESE UTILITIES ARE ANTICIPATED, THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL WORK WITH THE APPROPRIATE UTILITY COMPANY (EVER SOURCE) AND FOR PROVIDING TEMPORARY PROTECTION AND/OR SUPPORT OF THESE FACILITIES IF AND AS REQUIRED BY THE UTILITY COMPANY.
 2. THE CONTRACTOR SHALL DEVELOP ITS ERECTION SCHEME IN CONFORMANCE WITH LIMITATIONS AND RESTRICTIONS ASSOCIATED WITH THE OVERHEAD UTILITY LINES AND AS REQUIRED BY THE APPROPRIATE UTILITY COMPANY.
 3. THE CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANY WITH REGARDS TO POTENTIAL RELOCATION OR TEMPORARY SUPPORT OF THEIR FACILITIES. THE CONTRACTOR SHALL IDENTIFY POTENTIAL UTILITY IMPACTS ASSOCIATED WITH THEIR WORK, IF ANY, PRIOR TO START OF CONSTRUCTION AND NOTIFY THE APPROPRIATE UTILITY COMPANY ACCORDINGLY.

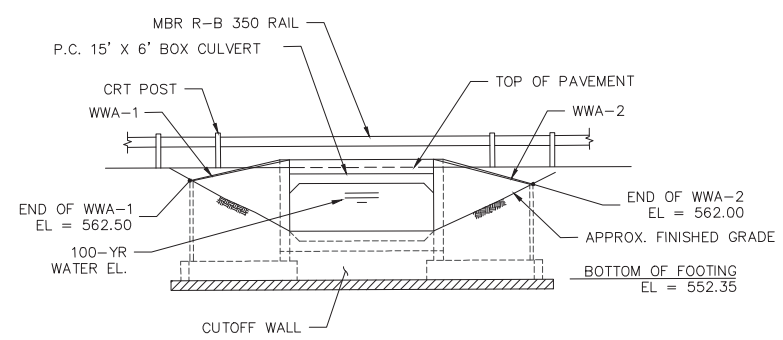
NOTICE TO BRIDGE INSPECTORS	
IT IS RECOMMENDED THAT CONNDOT'S BRIDGE SAFETY PROCEDURES BE FOLLOWED WHEN INSPECTING THIS BRIDGE FOR, BUT NOT LIMITED TO, ALL APPROPRIATE COMPONENTS INDICATED IN THE GOVERNING MANUALS FOR BRIDGE INSPECTION. ATTENTION MUST BE GIVEN TO INSPECTING THE FOLLOWING SPECIAL COMPONENTS AND DETAILS. (THE LISTING OF COMPONENTS FOR SPECIFIC ATTENTION SHALL NOT BE CONSTRUED TO REDUCE THE IMPORTANCE OF INSPECTION OF ANY OTHER COMPONENT OF THE STRUCTURE.) THE FREQUENCY OF INSPECTION OF THIS STRUCTURE SHALL BE IN ACCORDANCE WITH THE GOVERNING MANUALS FOR BRIDGE INSPECTION, UNLESS OTHERWISE DIRECTED BY THE MANAGER OF BRIDGE SAFETY AND EVALUATIONS.	
COMPONENT OR DETAIL	STRUCTURE SHEET REFERENCE
NONE	-
	-

- GENERAL NOTES**
- SPECIFICATIONS:** CONNECTICUT DEPARTMENT OF TRANSPORTATION INCLUDING FORM 817, SUPPLEMENTAL SPECIFICATIONS DATED JANUARY, 2018 AND SPECIAL PROVISIONS.
- DESIGN SPECIFICATIONS:** AASHTO LRFD SPECIFICATIONS FOR HIGHWAY BRIDGES, 7TH EDITION (2013) AS SUPPLEMENTED BY THE CONNECTICUT DEPARTMENT OF TRANSPORTATION BRIDGE MANUAL (2003) EDITION WITH REVISIONS UP TO AND INCLUDING 2011.
- ALLOWABLE DESIGN STRESSES:**
- CLASS "A" CONCRETE: $f'_c = 3,000$ psi
 CLASS "50" CONCRETE: $f'_c = 5,000$ psi
 REINFORCEMENT (ASTM 615 GRADE 60) $f_y = 60,000$ psi
- LIVE LOAD:**
- STANDARD DESIGN VEHICLE: AASHTO HL-93
 PERMIT (OVERLOAD) VEHICLES: CONNDOT P204 (8-AXLE)
 CONNDOT P380 (19-AXLE)
- SALVAGE:** NONE
- DIMENSIONS AND ELEVATIONS:** WHEN DECIMAL DIMENSIONS AND ELEVATIONS ARE GIVEN TO LESS THAN THREE DECIMAL PLACES, THE OMITTED DIGITS SHALL BE ASSUMED TO BE ZERO. ALL ELEVATIONS ARE GIVEN IN DECIMAL FEET AND ARE BASED ON NAVD 88.
- EXISTING DIMENSIONS:** DIMENSIONS OF THE EXISTING STRUCTURE SHOWN ON THESE PLANS ARE FOR GENERAL REFERENCE ONLY AND ARE NOT GUARANTEED. THE CONTRACTOR SHALL TAKE ALL FIELD MEASUREMENTS NECESSARY TO ASSURE PROPER FIT OF THE FINISHED WORK AND SHALL ASSUME FULL RESPONSIBILITY FOR THEIR ACCURACY. WHEN SHOP DRAWINGS BASED ON FIELD MEASUREMENTS ARE SUBMITTED FOR APPROVAL, THE FIELD MEASUREMENTS SHALL ALSO BE SUBMITTED FOR REFERENCE BY THE REVIEWER.
- UTILITIES:** THE CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES LOCATED WITHIN THE VICINITY OF THE SITE DURING CONSTRUCTION. THE METHOD OF SUPPORTING AND PROTECTING UTILITIES SELECTED BY THE CONTRACTOR MUST BE APPROVED BY THE UTILITY COMPANY. UTILITY MODIFICATIONS SHALL BE MADE BY THE RESPECTIVE UTILITY COMPANIES EXCEPT WHERE NOTED OTHERWISE.

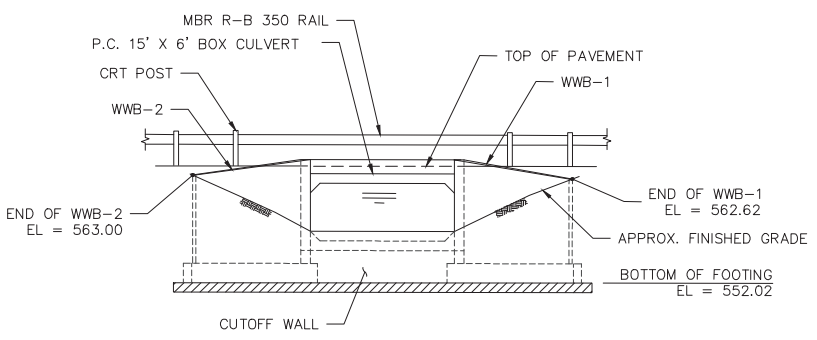
- CONCRETE NOTES**
- CLASS "A" CONCRETE:** CLASS "A" CONCRETE SHALL BE USED FOR THE CUT-OFF WALLS, RETURN WALLS, HEADWALLS AND WINGWALL FOOTINGS.
- CLASS "50" CONCRETE:** CLASS "50" CONCRETE SHALL BE USED FOR THE PRECAST CONCRETE BOX CULVERT AND PRECAST CONCRETE WINGWALL STEMS.
- REINFORCEMENT:** ALL REINFORCEMENT SHALL BE ASTM A615 GRADE 60.
- EXPOSED EDGES:** EXPOSED EDGES OF CONCRETE SHALL BE BEVELED 1" X 1", UNLESS DIMENSIONED OTHERWISE.
- EPOXY COATED REINFORCEMENT BARS:** ALL REINFORCEMENT IN THE PRECAST CONCRETE BOX CULVERT SHALL BE EPOXY COATED AND INCLUDED IN THE PAY ITEM "15'X6' PRECAST CONCRETE BOX CULVERT". ALL REINFORCEMENT IN THE PRECAST CONCRETE WINGWALLS SHALL BE EPOXY COATED AND INCLUDED IN THE PAY ITEM "PRECAST CONCRETE WINGWALLS". ALL REINFORCEMENT IN THE CUT-OFF WALLS, AND RETURN WALLS SHALL BE PAID FOR IN THE PAY ITEM "DEFORMED STEEL BARS". ALL REINFORCEMENT IN THE HEADWALLS SHALL BE EPOXY COATED AND PAID FOR UNDER THE ITEM "DEFORMED STEEL BARS (EPOXY COATED)".
- CONCRETE COVER:** ALL REINFORCEMENT SHALL HAVE 2" COVER UNLESS DIMENSIONED OTHERWISE.
- PREFORMED EXPANSION JOINT FILLER:** THE COST OF FURNISHING AND INSTALLING PREFORMED EXPANSION JOINT FILLERS SHALL BE INCLUDED IN THE ITEM "CLASS 'A' CONCRETE".

HYDRAULIC DATA	
HYDRAULIC AREA	5.0 SQ MI
DESIGN FREQUENCY	100 YEAR
DESIGN DISCHARGE	1070 CFS
AVERAGE DAILY FLOW	9.1 CFS
AVERAGE DAILY FLOW ELEVATION	558.30
UPSTREAM DESIGN WATER SURFACE ELEVATION	565.26
DOWN STREAM DESIGN WATER SURFACE ELEVATION	558.30
2 YEAR DESIGN STORM WATER ELEVATION	561.92

TRANSPORTATION DATA				
MEMBER	SHIPPING LENGTH	SHIPPING HEIGHT	SHIPPING WIDTH	SHIPPING WEIGHT
BOX CULVERT	17'-0"	8'-0"	8'-0"	55,800 lbs
WINGWALL	13'-0"	8'-0"	8'-0"	16,000 lbs



UPSTREAM ELEVATION
SCALE: 1" = 20'-0"



DOWNSTREAM ELEVATION
SCALE: 1" = 20'-0"

Freeman Companies, LLC - R. 20217\2017-0507 Killingly Bridges\DWG\Bridges\88-009\brg009_gen.dwg Jun 07, 2021 9:37am Plotted By: Lluichell

FREEMAN COMPANIES
 36 JOHN STREET
 HARTFORD, CT 06106
 WWW.FREEMANCO.COM
 (860)219-1950
 TOLL FREE (800)624-5141
 FAX (860)219-7161
 ELEVATE YOUR EXPECTATIONS

PREPARED FOR:
 TOWN OF KILLINGLY
 BEAR HILL ROAD
 KILLINGLY,
 CONNECTICUT 06239

OWNER FOR:
 TOWN OF KILLINGLY
 BEAR HILL ROAD
 KILLINGLY,
 CONNECTICUT 06239

REPLACEMENT OF BRIDGE No. 68-009 BEAR HILL ROAD OVER UNNAMED BROOK KILLINGLY, CONNECTICUT

DESIGNED:	YL	TITLE:	GENERAL PLAN
DRAFTED:	PT	SHEET NUMBER:	S-3.1
CHECKED:	DO		
APPROVED:	PAR		
SCALE:	AS NOTED		
PROJECT NO.:	2017-0507		
DATE:	02/05/2020		
CAD:	hw_msh_2017_0507_brg009_gen		
NO.	DATE	DESCRIPTION	
		REVISIONS	

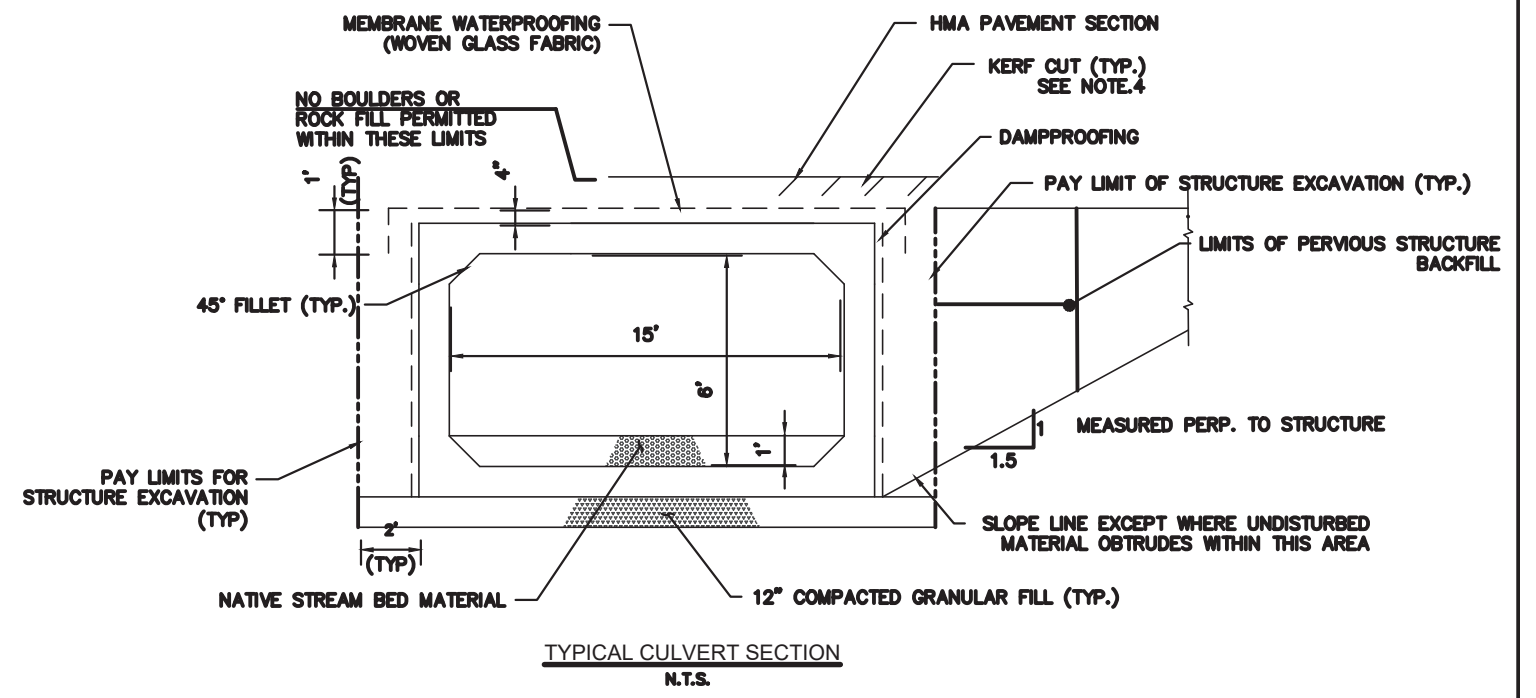
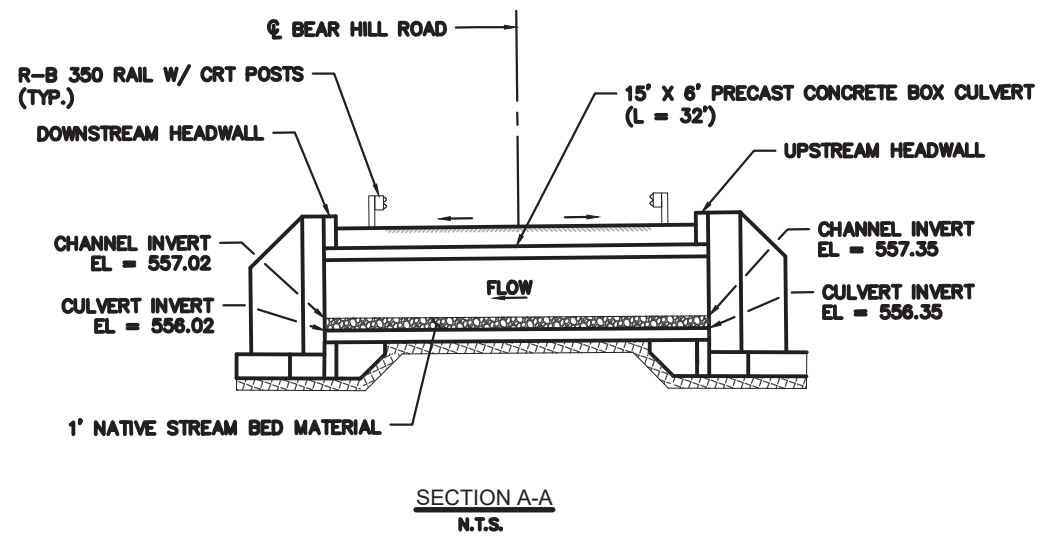
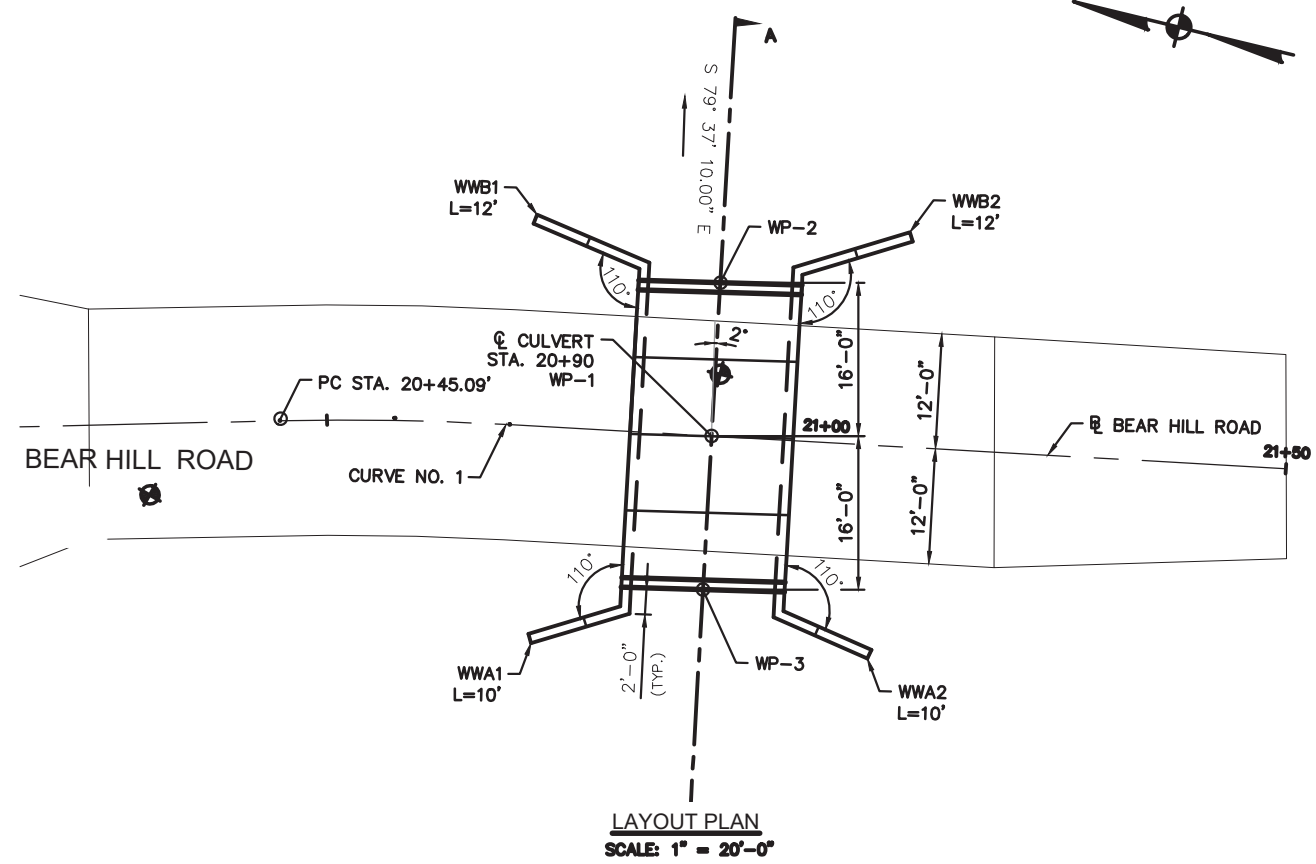
THESE DRAWINGS SHALL NOT BE UTILIZED BY ANY PERSON, FIRM OR CORPORATION WITHOUT THE SPECIFIC WRITTEN PERMISSION OF FREEMAN COMPANIES, LLC

WP	NORTHING	EASTING
WP-1	869851.0942	1254650.6114
WP-2	869856.8715	1254682.0981
WP-3	869853.9828	1254666.3548

NOTES:

- FOR COMPLETE BASELINE GEOMETRY, SEE SHEET NO. HWY-1.
- ROADWAY PROFILE TO MATCH EXISTING.
- FOR WINGWALL SECTION DETAILS SEE SHEET MDS-3.
- CUT BITUMINOUS OVERLAY WITH 3/8" WIDE BY 1 1/2" DEEP KERF AND FILL WITH POURABLE SEALANT. TO BE PAID FOR UNDER THE ITEM "SAWING AND SEALING JOINTS IN BITUMINOUS PAVEMENT."

QUANTITIES		
ITEM	UNITS	TOTALS
STRUCTURE EXCAVATION - EARTH (COMPLETE)	CY	450
STRUCTURE EXCAVATION - ROCK (COMPLETE)	CY	12
HANDLING WATER	LS	1
COMPACTED GRANULAR FILL	CY	30
PERVIOUS STRUCTURE BACKFILL	CY	260
SAWING AND SEALING JOINTS IN BIT. CONC. PAVEMENT	LF	70
REMOVAL OF EXISTING CULVERT	LS	1
CLASS 'A' CONCRETE	CY	20
PRECAST CONCRETE WINGWALL	EA	4
15' X 6' PRECAST CONCRETE BOX CULVERT	LF	32
DEFORMED STEEL BARS (EPOXY COATED)	LB	1,800
DRILLING HOLES AND GROUTING DOWELS	EA	30
MEMBRANE WATERPROOFING (COLD LIQUID ELASTOMERIC)	SY	75
DAMPPOOFING	SY	150



Freeman Companies, LLC . R : 2017\2017-0507_Killingly Bridge\UNNAMED BROOK\68-009 HWY_MSH_2017_0507_BRG009_ALN.dwg Jan 05, 2021 - 4:27pm Plotted By: LBuchell

FREEMAN COMPANIES
 30 JONAS STREET
 HARTFORD, CT 06106
 WWW.FREEMAN.CO.COM
 (860) 291-9500
 TOLL FREE: (800) 624-5141
 FAX: (860) 298-7161
 ELEVATE YOUR EXPECTATIONS

PREPARED FOR
 TOWN OF KILLINGLY
 BEAR HILL ROAD
 KILLINGLY,
 CONNECTICUT 06239

OWNER FOR
 TOWN OF KILLINGLY
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 CONNECTICUT 06239

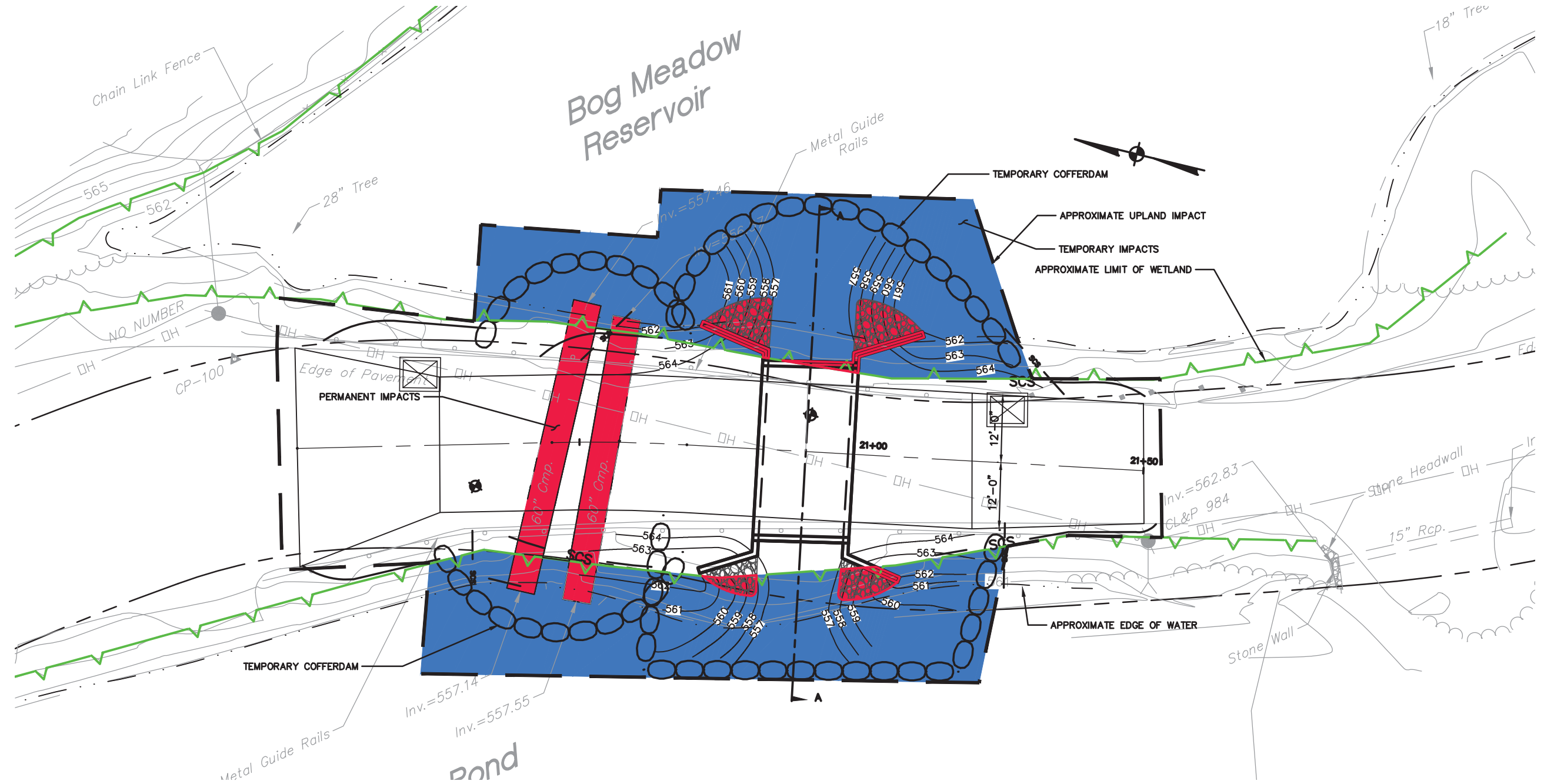
DOUGLAS M. QUINN, P.E.
 NO. 19104

REPLACEMENT OF BRIDGE No. 68-009 BEAR HILL ROAD OVER UNNAMED BROOK KILLINGLY, CONNECTICUT

DESIGNED:	YL	TITLE:	LAYOUT PLAN
DRAFTED:	PT	SHEET NUMBER:	S-3.2
CHECKED:	DQ		
APPROVED:	PAR		
SCALE:	AS NOTED		
PROJECT NO.:	2017-0507		
DATE:	02/05/2020		
CAD:	HW_MSH_2017_0507_BRG009_ALN		

THESE DRAWINGS SHALL NOT BE UTILIZED BY ANY PERSON, FIRM OR CORPORATION WITHOUT THE SPECIFIC WRITTEN PERMISSION OF FREEMAN COMPANIES, LLC

Freeman Companies, LLC - B:\2017\2017-0507 Killingly Bridges\ENV\Permits\USACE and CT DEEP Permits\68-009\PCN\Attachments\Attachment 14 - Project Plans\env\vw_msh_2017_0507_brg009_gen (Impacts).dwg Jan 05, 2021 - 4:43pm Plotted By: LBucheli



PERMANENT IMPACTS	
RIPRAP	200 S.F.
EXISTING CULVERT FOOTPRINT	525 S.F.
PROPOSED CULVERT FOOTPRINT	50 S.F.
TOTAL:	750 S.F.

TEMPORARY IMPACTS	
TOTAL:	4050 S.F.
UPLANDS IMPACTS	
TOTAL:	5450 S.F.

REPLACEMENT OF BRIDGE No. 68-009 BEAR HILL ROAD OVER UNNAMED BROOK KILLINGLY, CONNECTICUT

FREEMAN COMPANIES
1445 WASHINGTON STREET, HARTFORD, CT 06106
DBE | DAS | MBE | CM/DMC CERTIFIED
CIVIL | GEOTECHNICAL | SURVEY | ENVIRONMENTAL
 FREEMAN COMPANIES, LLC
36 JOHN STREET HARTFORD, CT 06106
WWW.FREEMANCOS.COM
(860)271-9950
TOLL FREE: (800)624-5141
FAX: (860)276-7145
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 BEAR HILL ROAD
 KILLINGLY,
 CONNECTICUT 06239

OWNER FOR
 TOWN OF KILLINGLY
 BEAR HILL ROAD
 KILLINGLY,
 CONNECTICUT 06239

DESIGN NUMBER: PE NO. 19104

NO.	DATE	DESCRIPTION

DESIGNED: YL
DRAFTED: PT
CHECKED: DQ
APPROVED: PAR

SCALE: AS NOTED
PROJECT NO.: 2017-0507
DATE: 02/05/2020
CAD: htw_msh_2017_0507_brg009_gen (Impacts)

TITLE: GENERAL PLAN

SHEET NUMBER:



**US Army Corps
of Engineers**®
New England District

WORK-START NOTIFICATION FORM
(Minimum Notice: Two weeks before work begins)

EMAIL TO: michael.s.wierbonics@usace.army.mil and cenae-r@usace.army.mil; or

MAIL TO: Mike Wierbonics
Regulatory Division
U.S. Army Corps of Engineers, New England District
696 Virginia Road
Concord, Massachusetts 01742-2751

Corps of Engineers Permit No. NAE-2021-00306 was issued to David Capacchione, Director of Engineering & Facilities, Town of Killingly, Connecticut on August 10, 2022. The permit authorizes the replacement of a deficient bridge (No. 68-009) carrying Bear Hill Road over an unnamed brook in Killingly, Connecticut. The project will result in the discharge of approximately 775 square-feet of permanent fill and approximately 4,050 square-feet of temporary fill below the Ordinary High Water (OHW) line of the unnamed brook associated with Bog Meadow Reservoir.

The people (e.g., contractor) listed below will do the work, and they understand the permit's conditions and limitations.

PLEASE PRINT OR TYPE

Name of Person/Firm: _____

Business Address: _____

Phone & email: () _____ () _____

Proposed Work Dates: Start: _____ Finish: _____

Permittee/Agent Signature: _____ Date: _____

Printed Name: _____ Title: _____

Date Permit Issued: _____ Date Permit Expires: _____

FOR USE BY THE CORPS OF ENGINEERS

PM: Mike Wierbonics Submittals Required: _____

Inspection Recommendation: _____



**US Army Corps
of Engineers**®
New England District

COMPLIANCE CERTIFICATION FORM
(Minimum Notice: Permittee must sign and return notification
within one month of the completion of work.)

Permit Number: NAE-2021-00306

Project Manager: Mike Wierbonics

Name of Permittee: David Capacchione, Director of Engineering & Facilities, Town of
Killingly, Connecticut

Permit Issuance Date: August 10, 2022

Please sign this certification and return it to our office upon completion of the activity.

* E-MAIL TO: cenae-r@usace.army.mil; or *
* * * * *
* MAIL TO: Permits and Enforcement Branch B *
* U.S. Army Corps of Engineers, New England District *
* Regulatory Division *
* 696 Virginia Road *
* Concord, Massachusetts 01742-2751 *

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit was completed in accordance with the terms and conditions of the above referenced permit, and any required mitigation was completed in accordance with the permit conditions.

Signature of Permittee

Date

Printed Name

Date of Work Completion

() _____
Telephone Number

() _____
Telephone Number

January 22, 2020

Mr. Dennis Qunit
Freeman Companies
36 John Street
Hartford, Connecticut 06106
dqunit@freemancos.com

Project: Replacement of Bridge no. 68-009, Bear Hill Road, Killingly, CT
NDDB determination No.: 202000471

Dear Mr. Qunit:

I have reviewed Natural Diversity Database (NDDB) maps and files regarding the area of work provided for the proposed replacement of a twin pipe culvert with a box culvert on Bear Hill Road in Killingly, Connecticut. According to our information, the State Species of Special Concern attenuated bluet damselfly occurs in the ponds west of this site. This damselfly prefers well-vegetated ponds, lakes and stream backwaters. This species is active in its adult from early June through early August; its larvae is aquatic and present year-round in ponds. Threats to this species include alterations to hydrology and water quality, herbicide/pesticide application, trampling or removal of pond shore vegetation and invasive species.

Protection for the attenuated bluet damselfly:

- Minimize the amount of shoreline that is covered with riprap. Riprap suppresses plant growth and changes the sediment composition of the waterbody, both of which could have a negative impact on this species.
- Minimize the amount of sediment and run-off released into the waterbody from project activities. This species is very sensitive to the degradation of its aquatic environment. It was noted in your application that work within the watercourse is proposed to be performed within coffer dammed areas and that multiple S&E measures will be used to protect the watercourse; we concur with these practices.
- Materials used for sediment and erosion control should NOT contain plastic netting/mesh. Products that have plastic mesh embedded in them have been documented to entangle reptiles, amphibians and even birds. Entanglements such as this lead to mortality. Additionally, plastic products that claim to be "degradable" or "biodegradable" have varying decomposition rates and continue to present entanglement hazards for many years after degrading. A better alternative would be erosion control products composed of 100% biodegradable plant-based netting material, such as jute (vegetable fibers), sisal (stiff agave fibers) or coir fiber (coconut husk fibers). Not only are these products truly biodegradable, but because the weave in these natural fiber nets is not fixed, as is the case in synthetic netting, it is easier for wildlife to freely move through the weave without getting entangled.
- Silt fencing and other erosion controls used for this project should be removed as soon as soils have stabilized to avoid impeding amphibian and reptile movements between wetlands and uplands.
- Any replanting should be with plants that are native to the northeastern United States.

The result of this review does not preclude the possibility that state-listed species (RCSA Sec. 26- 306) may be encountered on site and that additional action may be necessary to remain in compliance with certain state permits. This determination is good for two years. **Please re-submit a new NDDB Request for Review if the scope of work changes or if work has not begun on this project by January 22, 2022.**

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey, cooperating units of DEEP,

landowners, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the NDDDB should not be substitutes for on-site surveys necessary for a thorough environmental impact assessment. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the database as it becomes available. Please be aware that a more detailed review may be conducted as part of any subsequent environmental permit applications submitted to DEEP for the proposed site.

Please contact me if you have further questions at (860) 424-3101, or laura.saucier@ct.gov . Thank you for consulting the Natural Diversity Database.

Sincerely,

A handwritten signature in cursive script, appearing to read "Laura Saucier", followed by a horizontal flourish.

Laura Saucier
Wildlife Biologist

Date: September 15, 2017

To: David Capacchione, P.E.
Director of Engineering and Facilities
Town of Killingly
172 Main Street
Killingly, Connecticut 06239

From: Allison M. McCauliffe, P.E.
Nathan L. Whetten, P.E., D.GE., C.G.
Freeman Cos., LLC.

Subject: Preliminary Geotechnical Design Implications
Bridge 68-002 over Mashentuck Brook
Killingly, Connecticut

File No.: 2017-0507

1.0 SITE AND PROJECT DESCRIPTION

1.1 Site Description

Bridge No. 68-002 is located on Valley Road in Killingly, Connecticut as shown on Figure 1, Site Location Plan. The bridge is a 16-foot long by 21-foot wide, single span bridge supported on masonry abutments and carries one lane of traffic in each direction over Mashentuck Brook. The bridge is approximately 1-mile east of the intersection of Valley Road and Cook Hill Road. The structure was built in 1940 with no available as-built bridge plans.

1.2 Project Description

The existing single-span bridge will be replaced with a new precast box culvert. The wingwalls will be cast-in-place supported on spread footings.

2.0 EXPLORATIONS

2.1 Recent Subsurface Explorations

Two test borings (S-1 and S-2) were drilled by New England Borings of Glastonbury, Connecticut, on August 14, 2017. The borings were advanced using 4-inch diameter flush-joint casing to depths ranging from 13 feet to 31.6 feet. Standard Penetration Tests were conducted and soil samples were recovered at maximum 5-foot intervals in the borings.

Boring S-1 terminated at a depth of 31.6 feet in soil, and boring S-2 was upon roller bit refusal at a depth of 13 feet.

As-drilled locations were located by Freeman Companies. A Freeman Companies geotechnical engineer monitored the drilling, classified the soil samples, and prepared the test boring logs are attached.

2.2 Laboratory Testing

Grain size analyses (ASTM D422) were performed on three representative soil samples, two from the borings to confirm visual classification and one from the upstream bed for scour analysis, to aid in determining engineering properties.

Grain size analyses were conducted by Geotesting Express, Inc., of Acton, Massachusetts. Results of laboratory testing are attached.

3.0 SUBSURFACE CONDITIONS

3.1 Subsurface Conditions

Subsurface conditions encountered in the explorations consist of fill overlying Alluvium, as described below. Subsurface data are summarized on Table I included at the end of the report.

Based on our review of the previous test borings, generalized subsurface conditions are as follows:

THICKNESS (FT)	GENERALIZED DESCRIPTION
7 to 8	Fill – Asphalt (6 inches) and gravel base (12 inches) overlying mostly brown to tan coarse to fine SAND, little coarse to fine gravel, little to trace silt. Standard Penetration Test (SPT) N-Values ranged from 5 (loose) to 35 (dense) blows per foot (bpf).
Greater Than 23.6	Alluvium – Brown to gray, coarse to fine SAND and coarse to fine GRAVEL, trace silt, frequent cobbles and boulders, quartz and mica. SPT N-values were 87 to greater than 100 (very dense) bpf.

Groundwater – Ground water level is approximately 8.5 feet below the existing ground surface. Water levels are expected to be influenced primarily by water levels within the adjacent streambed, but will vary with season, precipitation, temperature, and other factors.

4.0 Preliminary Foundation Design Implications

Based on the data gathered in the subsurface exploration program, the subsurface conditions consist of fill and Alluvium. Our preliminary foundation recommendations and comments follow:

- The precast box culvert will bear in the naturally deposited Alluvium.
- The cast-in-place wingwalls will bear in the naturally deposited Alluvium on spread footing foundations.
- Both foundations should bear on a minimum 12 inch thick layer of crushed stone wrapped in a geotextile separation fabric.

5.0 Preliminary Construction Implications

- Excavation for construction of the proposed culvert will be below the Mashentuck Brook level. It is anticipated that water control will be difficult given the coarse nature of the natural deposit, a cofferdam with dewatering will likely be required. Water cutoff and dewatering methods will require design by a licensed engineer.

6.0 Closure

This memorandum was prepared based on information on subsurface conditions collected in the subsurface exploration program and on the design of the proposed structures. The subsurface data and preliminary recommendations provided herein are not sufficient for final design. We plan to provide design recommendations once culvert design has been established. Our professional services for this project have been performed in accordance with generally accepted engineering practices. No warranty, express or implied, is made.

Attachments

Table 1
Figures 1
Test Boring Logs
Lab Test Data

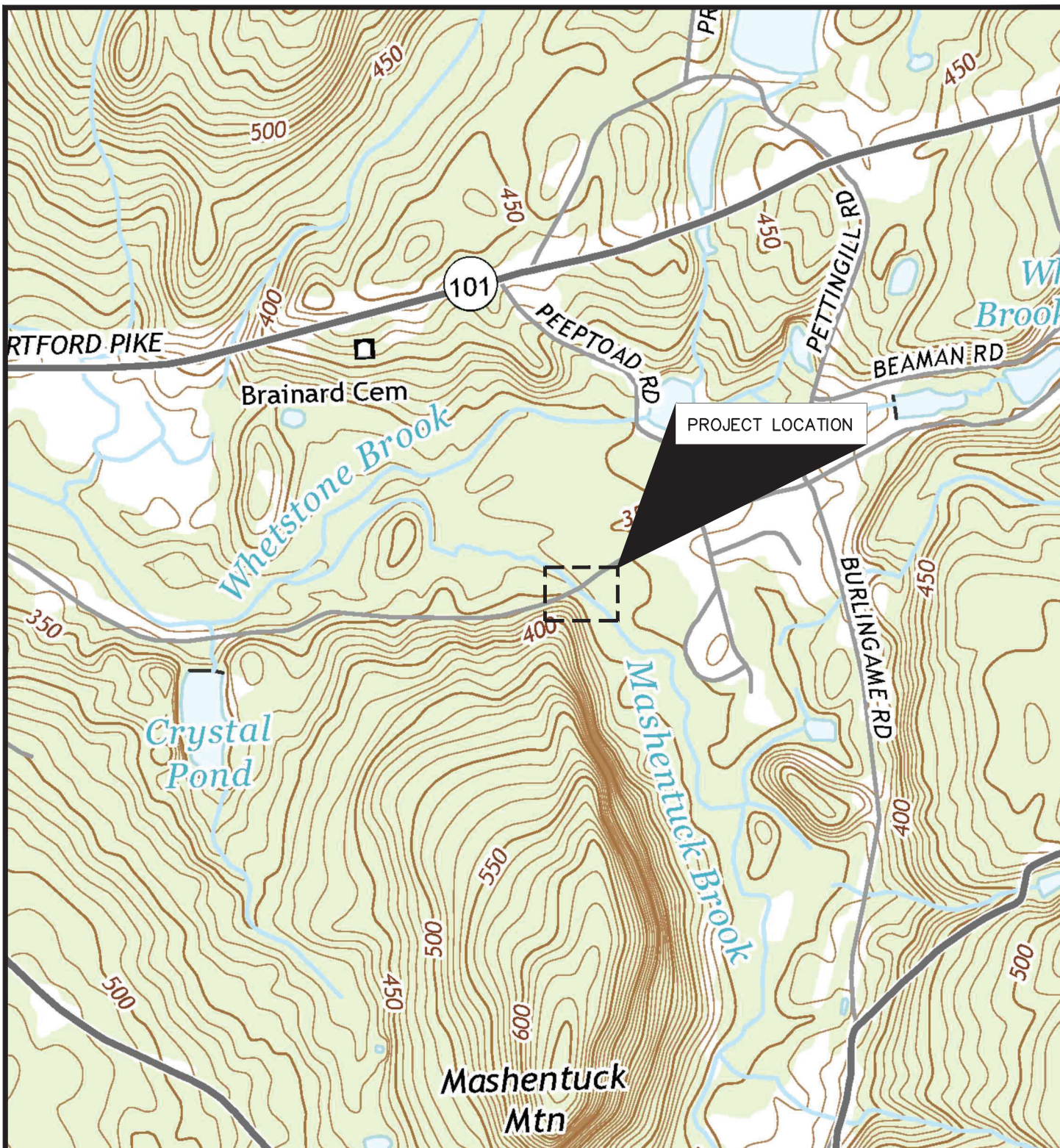
Table 1
Summary of Subsurface Explorations
Killingly Bridge 68-002
Killingly, CT

Boring No.	Ground Surface El.	Depth (ft.)			Groundwater		Bedrock	
			Fill	Alluvium	Depth (ft.)	Elevation	Depth (ft.)	Elevation
Bridge 68-002								
S-1	349.72	31.6	8.0	>23.6	8.5	341.22	--	--
S-2	349.25	13	7.0	6.0	8.5	340.75	--	--

Notes:

1. Ground surface elevations are based on the topographic information included on Figure 1.
2. Groundwater levels are approximate
3. ">" - Greater Than "--" - Not Encountered or Recorded

Freeman Companies, LLC - R:\2017\2017-0507 Killingly Bridges\DWG\GEO\Figure 1.dwg Sep 14, 2017-10:49am Plotted By: tto



USGS QUADRANGLE MAP
EAST KILLINGLY, CONNECTICUT
DATE 2015



FREEMAN
COMPANIES

LAND DEVELOPMENT | ENGINEERING DESIGN | CONSTRUCTION SERVICES
 36 JOHN STREET
 HARTFORD, CT 06106
 WWW.FREEMANCOS.COM
 TEL: (860) 251-9550
 FAX: (860) 986-7161
ELEVATE YOUR EXPECTATIONS

SITE LOCATION MAP
VALLEY ROAD OVER MASHENTUCK BROOK
BRIDGE NO. 68-002
KILLINGLY, CONNECTICUT

DRAFTED: T.T.
 CHECKED: A.M.
 APPROVED: A.M.
 SCALED: 1"=1000'
 PROJECT NO.: 2017-0507
 DATE: 08/21/2017

SHEET NO.

FIGURE 1

Driller: T. Roe	Connecticut DOT Boring Report		Hole No.: S-1
Inspector: Thiet Ta	Town: Killingly	Stat./Offset:	
Engineer: A. McCauliffe	Project No.: 2017-0507	Northing:	
Start Date: 8-14-17	Route No.: Valley Road over Mashentuck Brook	Easting:	
Finish Date: 8-14-17	Bridge No.: 68-002	Surface Elevation: 349.72	

Project Description: Valley Road and Bear Hill Road Over Brooks

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: 140lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @8.5 ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
0							Asphalt Base Fill	PAVEMENT (6") Dark brown to black c-f SAND, little c-f gravel, trace silt, (BASE) Brown to tan c-f SAND, little c-f gravel, trace silt	
	S-1	23	21	14	17	24	12		
	S-2	6	3	4	3	24	8		
5	S-3	WOR	2	3	3	24	2		
	S-4	8	8	39	62	24	8		
								Alluvium	
10	S-5	24	27	50/4"		16	14		
15	S-6	100/3'				4	3		
20	S-7	55	74	77	50/1"	19	14		
25	S-8	50/0"				0	0		
30	S-9	55	29	58	50/1"	19	14		

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 31ft Rock: ft	NOTES: After 15ft drilling did no resemble cobbles and boulders but possibly extremely weathered bedrock?	Sheet 1 of 2
No. of Soil Samples: 9 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: T. Roe	Connecticut DOT Boring Report		Hole No.: S-1
Inspector: Thiet Ta	Town: Killingly	Stat./Offset:	
Engineer: A. McCauliffe	Project No.: 2017-0507	Northing:	
Start Date: 8-14-17	Route No.: Valley Road over Mashentuck Brook	Easting:	
Finish Date: 8-14-17	Bridge No.: 68-002	Surface Elevation: 349.72	

Project Description: Valley Road and Bear Hill Road Over Brooks

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: 140lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @8.5 ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %			
35							END OF BORING 31.6ft	315
40								310
45								305
50								300
55								295
60								290

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 31ft Rock: ft	NOTES: After 15ft drilling did not resemble cobbles and boulders but possibly extremely weathered bedrock?	Sheet 2 of 2
No. of Soil Samples: 9 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: T. Roe	Connecticut DOT Boring Report		Hole No.: S-2
Inspector: Thiet Ta	Town: Killingly	Stat./Offset:	
Engineer: A. McCauliffe	Project No.: 2017-0507	Northing:	
Start Date: 8-14-17	Route No.: Valley Road over Mashentuck Brook	Easting:	
Finish Date: 8-14-17	Bridge No.: 68-002	Surface Elevation: 349.25	

Project Description: Valley Road and Bear Hill Road Over Brooks

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: 140lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @8.5 ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)		
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)
0							Asphalt Base Fill	PAVEMENT (6") Brown c-f SAND, little c-f gravel, trace silt, (BASE) Brown c-f SAND, little silt, trace f gravel		
	S-1	12	8	7	10	24	12			
	S-2	9	18	8	8	24	4			
5	S-3	3	6	8	24	24	6			
	S-4	41	45	50/4"		16	10	Alluvium	Brown to orange c-f GRAVEL and c-f SAND, trace silt	345
10	S-5	38	60	60	36	24	14		Casing refusal at 13 ft. Brown c-f SAND and c-f GRAVEL, trace silt	340
15									END OF BORING 13ft	335
20										330
25										325
30										320

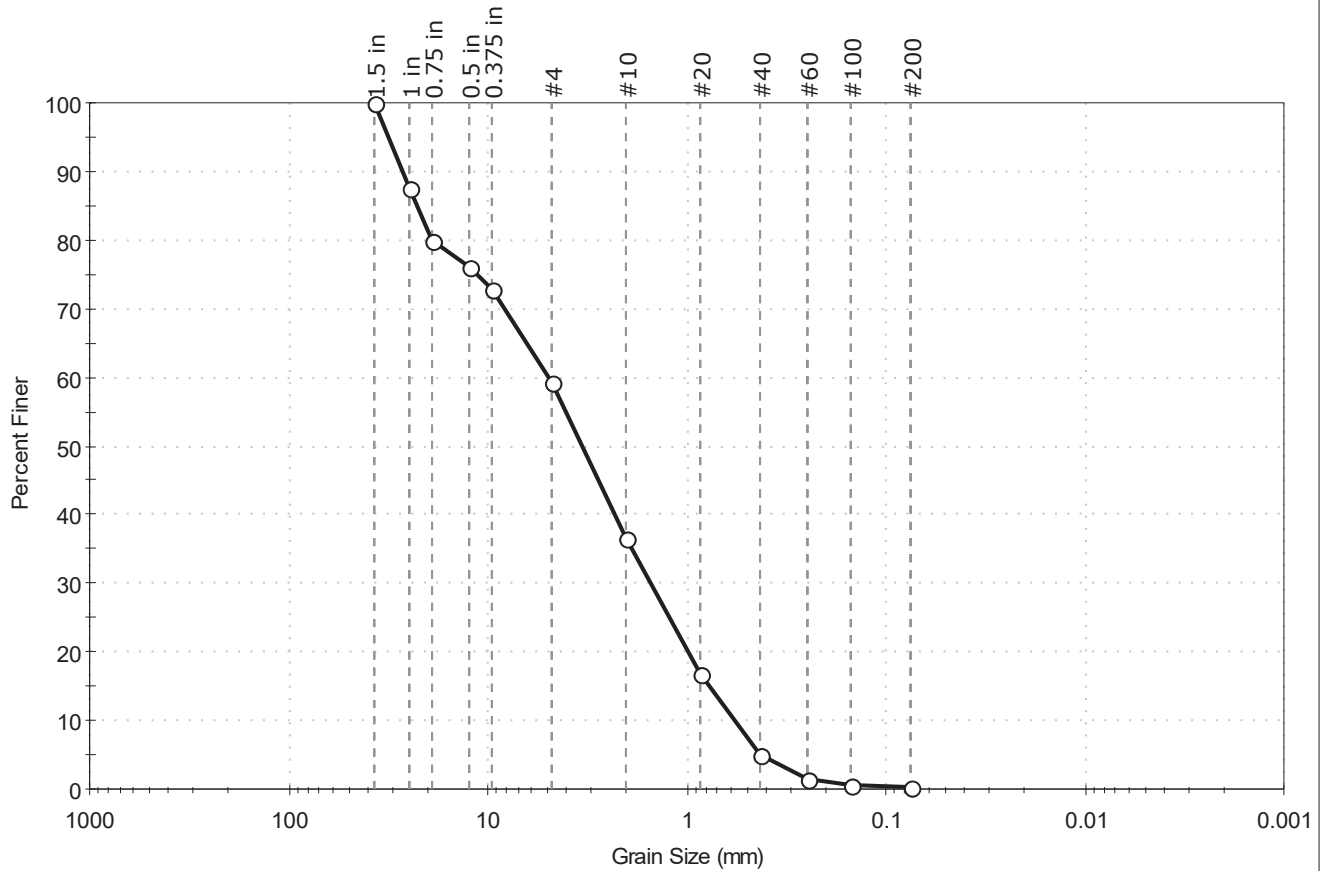
Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 12ft Rock: ft	NOTES:	Sheet 1 of 1
No. of Soil Samples: 5 No. of Core Runs: 0		SM-001-M REV. 1/02



Client: Freeman Companies, LLC	Project No: GTX-306915
Project: Killingly Bridges	
Location: Killingly, CT	
Boring ID: B-1	Sample Type: jar
Sample ID: Grab	Test Date: 08/31/17
Depth: Upstream	Test Id: 421919
Test Comment: ---	Tested By: jbr
Visual Description: Moist, very dark brown sand with gravel	Checked By: emm
Sample Comment: ---	

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	40.7	59.1	0.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	88		
0.75 in	19.00	80		
0.5 in	12.50	76		
0.375 in	9.50	73		
#4	4.75	59		
#10	2.00	36		
#20	0.85	17		
#40	0.42	5		
#60	0.25	2		
#100	0.15	1		
#200	0.075	0.2		

Coefficients	
D ₈₅ = 22.8090 mm	D ₃₀ = 1.5112 mm
D ₆₀ = 4.9161 mm	D ₁₅ = 0.7646 mm
D ₅₀ = 3.3386 mm	D ₁₀ = 0.5681 mm
C _u = 8.654	C _c = 0.818

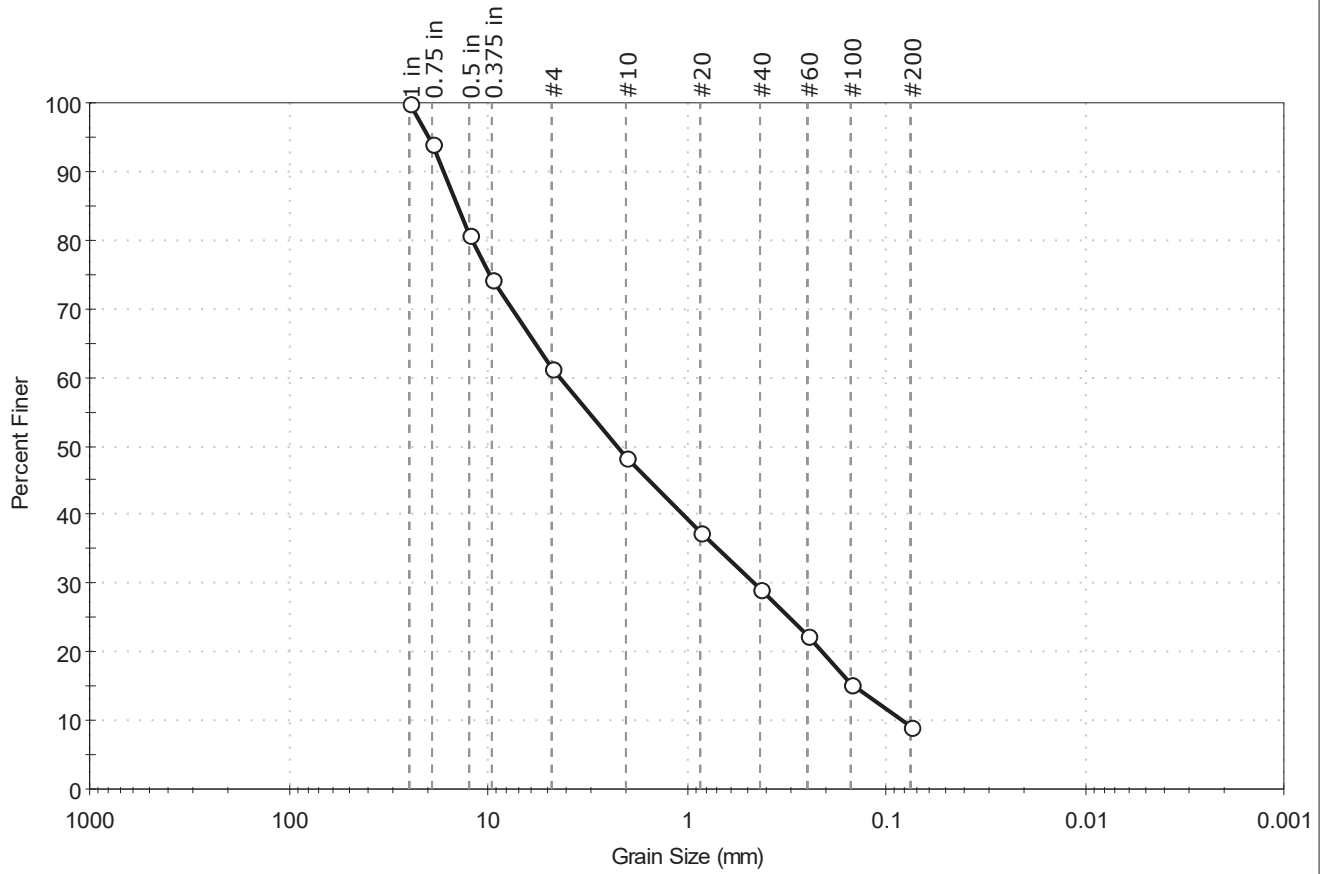
Classification	
ASTM	Poorly graded sand with gravel (SP)
AASHTO	Stone Fragments, Gravel and Sand (A-1-a (1))

Sample/Test Description
 Sand/Gravel Particle Shape : ANGULAR
 Sand/Gravel Hardness : HARD



Client: Freeman Companies, LLC	Project No: GTX-306915
Project: Killingly Bridges	
Location: Killingly, CT	
Boring ID: B-1	Sample Type: jar
Sample ID: S-5	Test Date: 08/31/17
Depth: 10-11.3 ft	Test Id: 421912
Test Comment: ---	Tested By: jbr
Visual Description: Moist, olive brown sand with silt and gravel	Checked By: emm
Sample Comment: ---	

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	38.5	52.3	9.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	94		
0.5 in	12.50	81		
0.375 in	9.50	74		
#4	4.75	61		
#10	2.00	48		
#20	0.85	37		
#40	0.42	29		
#60	0.25	22		
#100	0.15	15		
#200	0.075	9.2		

<u>Coefficients</u>	
D ₈₅ = 14.3141 mm	D ₃₀ = 0.4582 mm
D ₆₀ = 4.3308 mm	D ₁₅ = 0.1426 mm
D ₅₀ = 2.2444 mm	D ₁₀ = 0.0823 mm
C _u = 52.622	C _c = 0.589

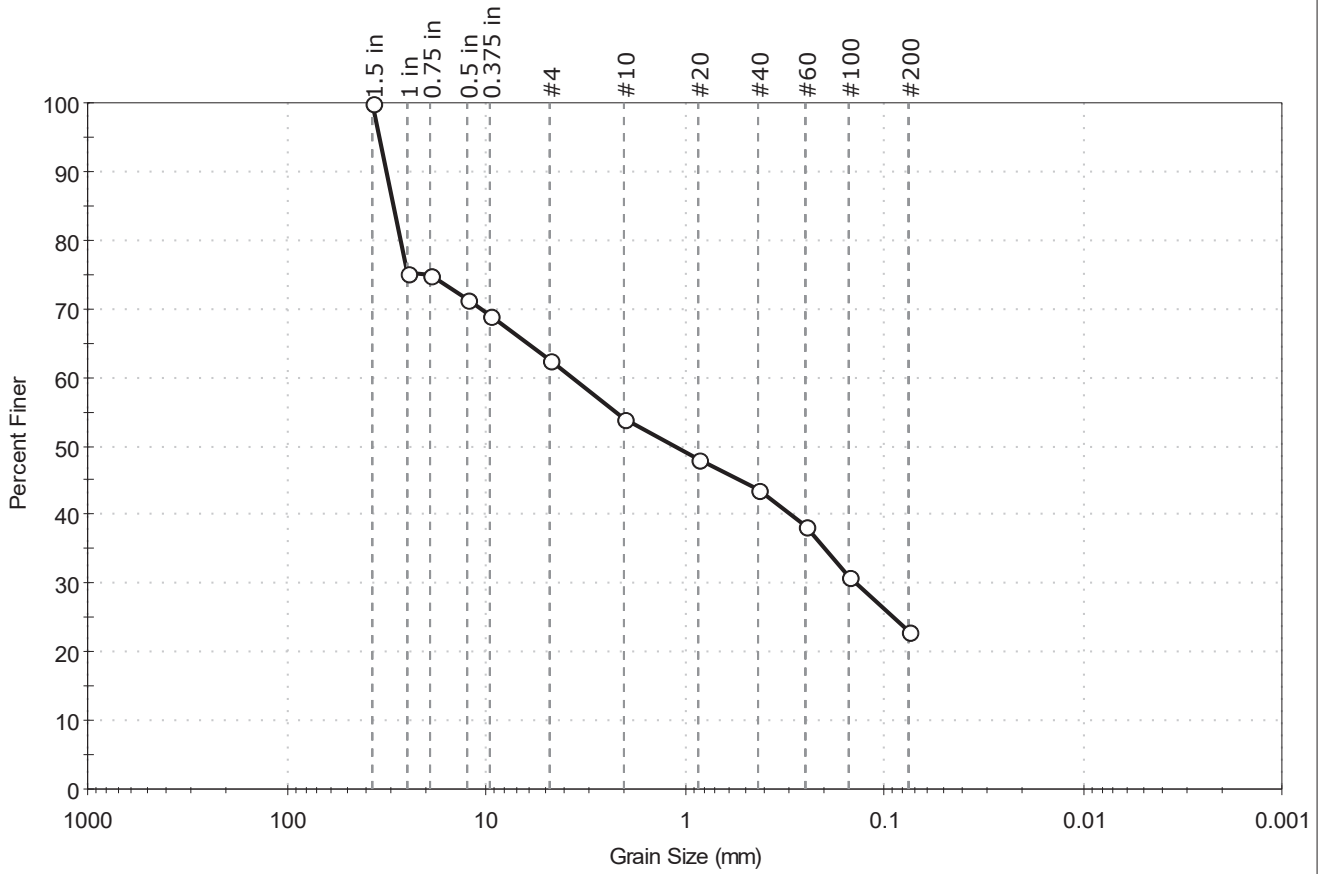
<u>Classification</u>	
ASTM	N/A
AASHTO	Stone Fragments, Gravel and Sand (A-1-a (1))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: Freeman Companies, LLC	Project No: GTX-306915
Project: Killingly Bridges	
Location: Killingly, CT	
Boring ID: B-2	Sample Type: jar
Sample ID: S-3	Test Date: 08/31/17
Depth: 5-7 ft	Test Id: 421913
Test Comment: ---	Tested By: jbr
Visual Description: Moist, grayish brown silty sand with gravel	Checked By: emm
Sample Comment: ---	

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	37.5	39.5	23.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	75		
0.75 in	19.00	75		
0.5 in	12.50	71		
0.375 in	9.50	69		
#4	4.75	62		
#10	2.00	54		
#20	0.85	48		
#40	0.42	44		
#60	0.25	38		
#100	0.15	31		
#200	0.075	23		

<u>Coefficients</u>	
D ₈₅ = 29.2966 mm	D ₃₀ = 0.1378 mm
D ₆₀ = 3.6941 mm	D ₁₅ = N/A
D ₅₀ = 1.1212 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

<u>Classification</u>	
ASTM	N/A
AASHTO	Stone Fragments, Gravel and Sand (A-1-b (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD