ADDENDUM NO. 1

2015 - Installation of 3 Precast Concrete Bridges

Essex County, NY

May 28, 2015

TO ALL HOLDERS OF BIDDING DOCUMENTS:

This Addendum, issued to bid document holders of record, indicates clarifications to the bid documents for the 2015 - Installation of 3 Precast Concrete Bridges project. All clarifications described herein shall be incorporated into the Contractor's bid proposal. This Addendum is part of the Contract Documents. Adjustments required by each item shall be understood to apply to all document references affected by the clarifications described.

1. **General:** A Pre-Bid meeting was held for the project at the Project A (Algonquin Lane) site on May 26, 2015 at 9:30 AM. Minutes from the meeting are enclosed and are a part of this Addendum and the Contract Documents.

2. **General:** Additional soil borings were taken at the sites for Projects B & C. Revised Geotechnical Reports for these sites are attached to this Addendum.

3. **Drawings - Project B:** Drawing B/C-1 Rev. 3 is attached to this Addendum and shall replace Drawing B/C-1 Rev. 2 included in the original Bidding Documents.

4. **Drawings - Project C:** Drawings C/C-1, C/C-2, C/COE-1, C/S-1 and C/S-2, all Rev. 3, are attached to this Addendum and shall replace Drawings C/C-1, C/C-2, C/COE-1, C/S-1 and C/S-2, all Rev. 2 included in the original Bidding Documents.

END OF ADDENDUM NO. 1
(attachments)

SCHODER RIVERS ASSOCIATES
Consulting Engineers, P.C.

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PRE-BID MEETING MINUTES

Report Date: May 27, 2015

Project: 2015 Installation of 3 Precast Concrete Bridges

Attending: Carl B. Schoder, PE - Schoder Rivers Assoc.
Joseph Leuci - Schoder Rivers Assoc.
Kirk Bassarab, PE - Essex Co. DPW
Gary Olcott - Peckham Road Corporation
Greg Ball - Harrison & Burrowes Bridge Constructors
Jason Westover - Prime Highway Contractors

Distribution: Via posting on the Essex County Website as a part of Addendum No. 1 for access by all holders of bidding documents.

A scheduled pre-bid meeting was held for the above referenced project on May 26, 2015 at 9:30 AM at the Algonquin Road project site in the Town of North Elba, NY. The following items were discussed:

1. Schoder reviewed bidding and construction requirements for the project and similar items as stated in the bidding documents.

2. Bassarab and Schoder noted that the project schedule dates included in the bidding documents for Projects B & C of the overall project are controlled by scheduled dates for sport events which must utilize these structures and by requirements for completion of all work within the stream channels by the NYS Department of Environmental Conservation. These dates must be adhered to by the contractor. Schoder noted that the dates indicated for the precast concrete materials to be available from the precast concrete materials supplier (under a separate contract) were established to coincide with the required completion dates for the installation of the structures.

3. Bassarab noted that negotiations are ongoing to arrange for detour access to the south side of the bridge at the Project A (Algonquin Road) site and that the start date for work at this site only may be delayed by several weeks. The date for completion of all work within the stream channel of October 1, 2015, as required by the NYS Department of Environmental Conservation, must be met for this project.
4. Bassarab noted that the Project C site (Holcomb Pond Outlet Brook) is surrounded by state land and that the County has obtained a Temporary Revocable Permit to complete the work indicated. The contractor must limit construction activities to the extents of regrading indicated on the drawings. The contractor shall also keep the gravel parking area at the southeast corner of the site open for parking by individuals accessing the adjoining hiking trails.

5. Schoder noted that the geotechnical reports and subsurface information included for Projects B and C have been revised as a result of the installation of additional soil borings at the project sites. The revised geotechnical reports will be included in Addendum No. 1 for the project.

6. Attached is a copy of the Pre-Bid Meeting Attendance Sheet for contact information for the attendees.

The meeting adjourned at 10:30 AM.

Respectfully submitted:

Carl B. Schoder, PE
Principal

PREBID MEETING ATTENDANCE SHEET

Project: Precast Concrete Bridge Projects - Essex County Date: 5/26/15 Job No. 12-474.33, .36½, .37

NAME	COMPANY	PHONE	EMAIL
Carl Schoder	Schoder Rivers Associates	518 761-0417	carl@sraengineers.com
Joe Leuci	"	"	joe@sraengineers.com
Jason Nestover	Prime Highway Contractors	518-354-2192	j.nestover@primehighway.com
GREG BALL	HARRISON & BURROWES BRIDGE CONSTRUCTORS	518-469-1121	gball@harrisonburrowes.com
Kirk Bassarab	Essex Co. DPW	518-873-3739	kirkbassarab@co.essex.ny.us
Gary Olcott	P.R.C.	518-572-8806	golcottjr@gmail.com

PRECAST CONCRETE BRIDGE PROJECTS
APRIL, 2015

****

REVISED GEOTECHNICAL INVESTIGATION REPORTS

PROJECTS B AND C

The following copies of Geotechnical Reports for the sites located at Projects B and C included in this project are provided to the bidders for reference only. These reports are provided for informational purposes and shall not be considered to be part of the contract documents. If distributed to others by the bidder or contractor, the reports must be delivered in their entirety only. These revised reports include additional information regarding subsurface conditions at the indicated project sites.

It is the bidder's responsibility to determine if the information contained in these geotechnical reports is adequate for bidding purposes. The bidders may make their own investigations, tests and analyses for use in bid preparation if additional information is required. Contractors will not be relieved of any of their obligations for performance of the work for the project, nor shall they be entitled to any additional compensation on the premise of differing subsurface conditions or soils types which may be encountered.

Individual subsurface boring logs were prepared based upon the visual classifications and laboratory testing. The individual subsurface logs and keys explaining the terms used in their preparation are presented in the geotechnical reports and should be reviewed for a description of the conditions encountered at the specific test boring locations. It should be understood that conditions are only known at the specific depths and locations sampled. Conditions at other depths and locations may differ. Determinations of earthwork quantities for bidding must not rely solely on the soil strata thicknesses measured at the discrete test boring locations completed for these investigations. The bidder should perform their own explorations as needed to obtain representative thicknesses of soil layers and strata as required to prepare their bids for the work.

REVISED GEOTECHNICAL REPORT FOR

PROJECT B

(Rev. 5/26/15)

****

RIVER RD. (CR21) OVER ROARING BROOK
BRIDGE REPLACEMENT

TOWN OF NORTH ELBA, NY

GEOTECHNICAL EVALUATION
ROARING BROOK BRIDGE
LAKE PLACID, NEW YORK
(Revision No. 1)

Dente File No. FDE-14-256

Prepared For:

ESSEX COUNTY DPW
8053 Route 9
Elizabethtown, NY 12932

Prepared By:

DENTE ENGINEERING, P.C.
Watervliet, New York

May 26, 2015

Important Information About Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one - not even you* - should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from alight industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes - even minor ones - and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ-sometimes significantly from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual subsurface conditions revealed during construction. The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the express purpose of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in-this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely on Your ASFE-Member Geotechnical Engineer For Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
The Best People on Earth

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APPENDICES

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GEOTECHNICAL EVALUATION
ROARING BROOK BRIDGE
LAKE PLACID, NEW YORK

Dente File No. FDE-14-256

I. INTRODUCTION

This report presents the results of our Geotechnical Evaluation completed for the bridge replacement project at the River Road crossing over Roaring Brook in Lake Placid, New York. The evaluation was conducted in general accord with our proposal dated November 20, 2014 which was approved by the Essex County Department of Public Works. In general, the evaluation included the following:

- Layout and completion of two test borings in February 2015 and three supplemental borings in May 2015,
- Site reconnaissance by a Geotechnical Engineer,
- Laboratory testing to determine the gradation of representative soil samples,
- Evaluation of the data collected and the preparation of this report to assist in planning for the geotechnical related aspects of the project.

This report and the recommendations contained within it were developed for specific application to the site and construction planned, as we currently understand it. Corrections in our understanding, changes in the structure locations, grades, loads, etc. should be brought to our attention so that we may evaluate their effect, if any, upon the recommendations offered.

A sheet entitled *"Important Information about your Geotechnical Engineering Report"* prepared by the Association of Engineering Firms Practicing in the Geosciences is presented following the title page of this report. This sheet should never be separated from the report and it should be carefully reviewed as it sets the only context within which this report should be used.

It should be understood that this report was prepared, in part, on the basis of a limited number of test borings performed for the field exploration. The borings were advanced at discrete locations and the overburden soils sampled at specific depths. Conditions are only known at the locations and through the depths investigated. Conditions at other locations and depths may be different, and these differences may impact on the conclusions reached and the recommendations offered.

II. PROJECT AND SITE DESCRIPTION

The bridge site is located at the River Road crossing over Roaring Brook in Lake Placid, New York as shown on the USGS topographic map presented in Appendix A. The map is provided to assist the reader in locating the site and reviewing the overall topography in the project area.

The replacement structure will be a precast 3-sided bridge supported on new cast in place concrete footings. The bridge will have a 28 foot clear travel way and 20 foot wide waterway opening. The existing and proposed road surface on the bridge is about 8 feet above the stream bed.

At the time of our initial investigation the area was covered with deep layers of snow as shown on the site photographs in Appendix A. Due to the presence of this snow cover it was not possible to visually observe the areas immediately surrounding the bridge for bedrock outcrops or other features which may impact upon planning for design and construction. It was possible to observe that the stream bed on the downstream side of the bridge consisted of sand, gravel, cobbles and boulders.

III. SITE INVESTIGATIONS

The site's subsurface conditions were investigated through the completion of two test borings (B-1 and B-2) and three probes to auger refusal (B-2A, B-2B, and B-2C) in February 2015 and three supplemental borings (B-3, 4, and 5) in May 2015. The approximate test locations are shown on the Subsurface Investigation Plan presented in Appendix B.

The borings were made using a standard rotary drill rig equipped with hollow stem augers. As the augers were advanced, the overburden soils were sampled and their relative density determined through the Standard Method for Penetration Test and Split-Barrel Sampling of Soils, ASTM D-1586. Representative portions of the soil samples recovered from the test borings were transported to our office for visual classification by a Geotechnician or Geotechnical Engineer. Individual subsurface logs were prepared for the borings based on the visual classifications. The logs are provided in Appendix C along with a key to the terms used for their preparation.

The borings first penetrated through about 3.5 to 6 inches of asphaltic concrete followed by 2 to 4 inches of base course material. This pavement section was underlain by a sequence of sand and gravel which contained cobbles, possible boulders, and trace to little amounts of silt. Based on laboratory gradation testing, these soils are categorized under the Unified Soil Classification System groups GW-GM and GP-GM. Portions of the sand and gravel were likely placed as backfill for the existing structure. Based upon the standard penetration "N" values recorded as the sample spoon was driven, these soils were judged to be of an overall firm relative density. Higher densities and "N" values were noted, however, they were likely influenced by the presence of cobbles and boulders blocking penetration of the sample spoon.

At the southwest corner of the bridge (west abutment), the upper sequence of sand and gravel extended to a depth of about 12 to 15 feet in test boring B-1 and here was underlain by glacial till soils. The till was comprised of very compact fine sand with some silt and little coarse sand and gravel. Occasional cobbles were also noted in the till. Test boring B-1 was ended when sample spoon refusal was met in the till at a depth of 26.7 feet.

At the northwest corner of the bridge (west abutment) test boring B-3 initially met auger refusal in two attempts at a depth of 15 feet before the boring finally penetrated to its termination depth of 35 feet. Here the upper sequence of sand and gravel extended to a depth of 16 feet and it was underlain by very compact glacial till similar to that encountered in test boring B-1.

At the southeast corner of the bridge test (east abutment) boring B-2 did not fully penetrate through the upper sequence of sand and gravel. Rather it met sample refusal in these materials at a depth of 10.0 feet. Three probes were then made at distances of about 5 feet, 10 feet and 14 feet northeast from the original test boring. These probes met auger refusal at depths of 10.3, 9.7, and 9.1 feet, respectively. Refusal was also met in the supplemental boring B-4 at depths of 7.5, 10.0 and 15.0 feet before the auger penetrated to a depth of 45 feet where the boring was ended. This deep test boring found that the upper sequence of sand and gravel extended to a depth of about 16 feet and was underlain by a compact to very compact layer of silt and fine sand with interbedded layers of sand and/or gravel. Very compact glacial till, similar to that found in test boring B-1, was found at a depth of 40 feet.

At the northeast corner of the bridge (east abutment) test boring B-5 initially met refusal at depths of 8 and 13 feet before it was possible to extend the boring to its final depth of 22 feet. No soil sampling was done in this location until a depth of 20 feet was reached. At this depth the soils consisted of relatively compact fine to medium sand with some silt and partings of silt and clay.

Based on the depth where the soils changed from “moist” to “wet”, it appears that groundwater was present about 7 to 9 feet below the road surface at the time of investigation. It should be assumed that the groundwater depths will vary seasonally and generally mirror the water levels in Roaring Brook.

IV. CONCLUSIONS AND RECOMMENDATIONS

A. GENERAL

Overburden soils were found extending to depths of at least 22 to 45 feet below the road surface at the boring and probe locations. Shallower auger refusals on the order of 7 to 15 feet were met in a number of initial attempts to extend the borings to their final depths. On this basis it appears that many boulders are present within the upper sequence of the overburden soils. If scour protection can be provided consideration may be given to supporting the structure on spread foundations bearing within the overburden soils, without piles, as currently planned.

The following report sections provide recommendations to assist in planning for design and construction of foundations and culvert walls. We should review final plans and specifications prior to their release for bidding to confirm that our recommendations were properly interpreted and applied and to allow us to refine our recommendations if necessary based on the final design.

B. SEISMIC DESIGN

Based on the available subsurface information Site Class D, Dense Soil profile, should be assumed for seismic design purposes in accord with the AASHTO Guide Specifications for Seismic Bridge Design.

C. EARTHWORK

The sides of temporary excavations in the embankment fills and native soils should be sloped no steeper than one vertical on 1.5 horizontal (1V:1.5H) as required by OSHA for a Type C soil.

All excavations should be completed so as not to undermine roads, utilities, and/or foundations of adjacent structures. In general, excavations should not encroach within a zone of influence defined by a line extending out and down from the existing structures at an inclination of one vertical on 1.5 horizontal. Excavations that encroach within this zone should be sheeted, shored and braced to support the soil and adjacent structure loads, or the structure should be underpinned to establish bearing at a deeper level.

Backfill materials and placement methods for the bridge structure should conform to the requirements, if any, specified by the precast concrete manufacturer. The following fill and backfill recommendations should be adjusted, if required, based on the manufacturer’s specifications.

The on-site soils in the upper 10 to 12 feet should generally consist of sand or sand and gravel which typically can be reused at least for portions of the backfill work provided that cobbles and boulders greater than about four inches in size are removed. If imported fills are required, they should consist of processed sand and gravel which meets the requirements for Type 4 material as detailed in Section 304 of the NYSDOT Standard Specifications for Construction and Materials.

The fill should be placed in loose layers no more than eight inches thick in the zone extending at least four feet from the bridge structure. Outside this zone the lift thickness may be increased to twelve inches if heavy compaction equipment is employed. Each lift of backfill should be compacted to not less than 95 percent of the maximum dry density for the material determined through the procedures of ASTM D-1557, the Modified Proctor Compaction test.

D. FOUNDATIONS

As previously discussed, conventional spread foundations may be used if adequate scour protection is provided. The foundations should be seated at least five feet below final adjoining grades for frost protection and at least two feet below expected scour lines, whichever is deeper. If boulders are found protruding above the plan bearing elevation they should be removed in their entirety or reduced in size to at least 12 inches below the bearing elevation.

To establish a more stable base for construction and assist in dewatering, a minimum 12 inch thick base of clean crushed stone should be planned beneath the spread foundations. The stone should be an equal blend of No. 1 and No. 2 size aggregate and it should be wrapped in a filter fabric (Mirafi 180N or eq.). Prior to excavating for foundations the stream should be diverted and dewatering conducted as required to lower the water level at least one foot below the subgrade elevation. Dewatering should be performed on a continuous basis until the foundations are constructed and adequate load is applied to resist hydrostatic uplift.

Using the LRFD design procedures, the foundations may be proportioned for a factored bearing resistance equal to 4.0 kips per square foot (ksf) and nominal (ultimate) bearing resistance equal to 12.0 ksf.

Assuming that standard care is employed in preparing the bearing grades for construction, settlement of the soil bearing foundations should be less than one inch. The settlements should occur quickly as the bridge is constructed and backfilled. Foundations seated on bedrock, if present, should experience negligible settlement.

E. ABUTMENT WALLS

The design of abutment walls may proceed using the following parameters. The design parameters assume backfill consists of on-site sand and gravel or imported Structural Fill (NYSDOT Section 304, Type 4 material).

- Soils Angle of Internal Friction (φ_f) . . . . 30 degrees
- Coefficient of At-Rest Earth Pressure 0.50
- Coefficient of Active Earth Pressure 0.33
- Coefficient of Passive Earth Pressure 3.00
- Total Unit Weight of Compacted Soil . . . . 120 pcf
- Coefficient of Sliding Friction Soil ($\tan\varphi_f$) 0.58
- Resistance Factor for Passive Resistance (φ_{ep}) 0.50
- Resistance Factor for Shear Resistance (φ_τ) 0.80

Foundation drains and/or weep holes should be installed as specified by the precast arch manufacturer to prevent groundwater from becoming trapped in the backfill soils.

G. CONSTRUCTION MONITORING

It should be understood that the actual subsurface conditions that exist across this site will only be known when the site is excavated. The presence of the Geotechnical Engineer during the earthwork and foundation construction phases will allow validation of the subsurface conditions assumed to exist for this study and the design recommended in this report. We believe this construction sequence observation and testing should be provided by the Geotechnical Engineer of record as a consultant to the Owner, Architect or Construction Manager. We do not believe these services should be provided through the general or earthwork contractor.

V. CLOSURE

This report was prepared for specific application to the project site and the construction planned using methods and practices common to Geotechnical Engineering in the area at the time, no other warranties expressed or implied are made.

Dente Engineering should be retained to review plans and specifications prior to their release for bidding to confirm that the recommendations contained herein were properly understood and applied. Dente Engineering should also be retained during construction to validate that the actual site conditions are similar to those assumed for development of the recommendations contained in this report.

We appreciate the opportunity to be of service. Should questions arise or if we may be of any other service, please contact us at your convenience.

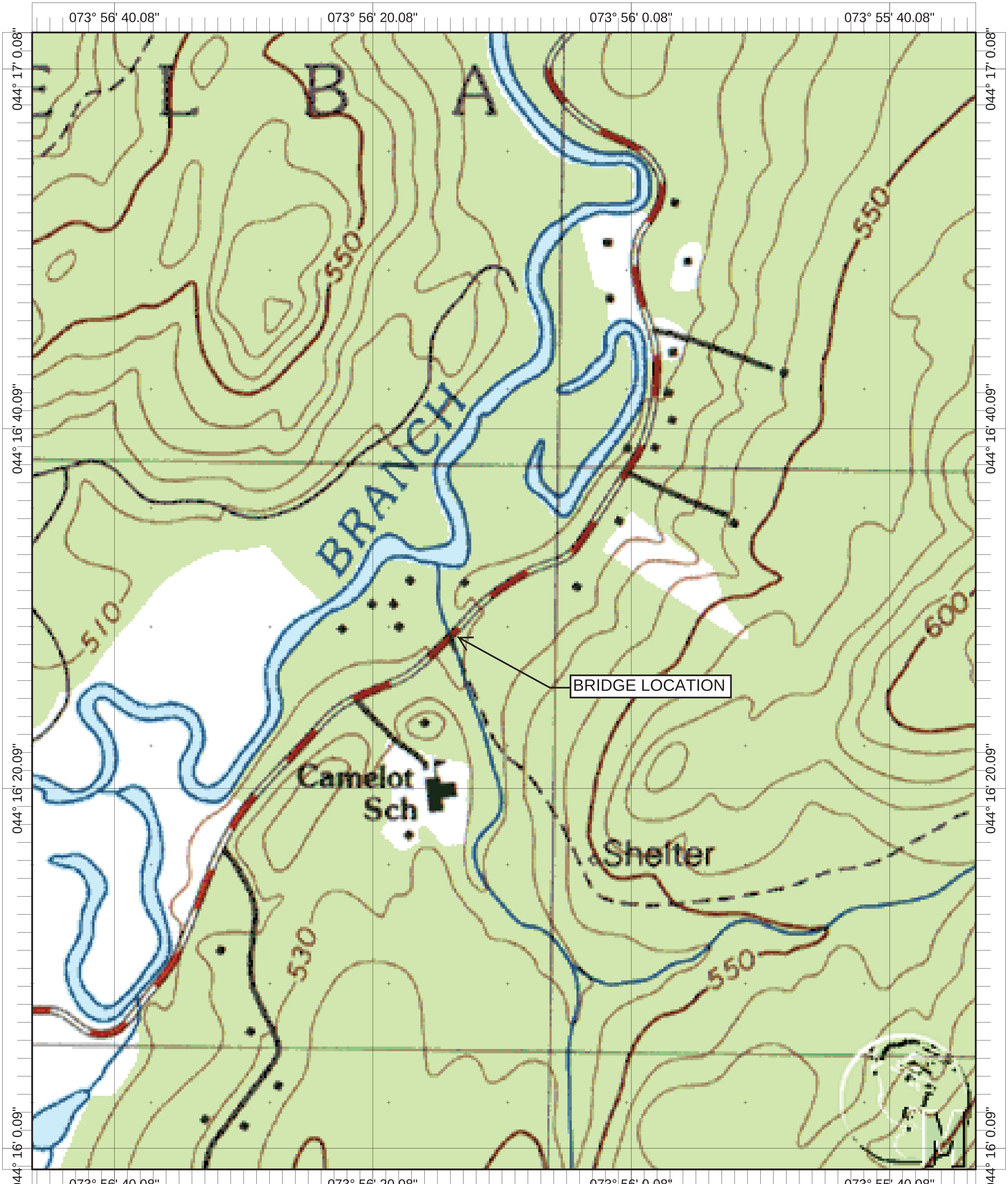
Prepared By:
Dente Engineering, P.C.

Edward C. Gravelle, P.E.
Vice President

Fred A. Dente, P.E.
President

APPENDIX A
USGS TOPOGRAPHIC MAP
AND SITE PHOTOGRAPHS

Roaring Brook Bridge
Lake Placid, New York

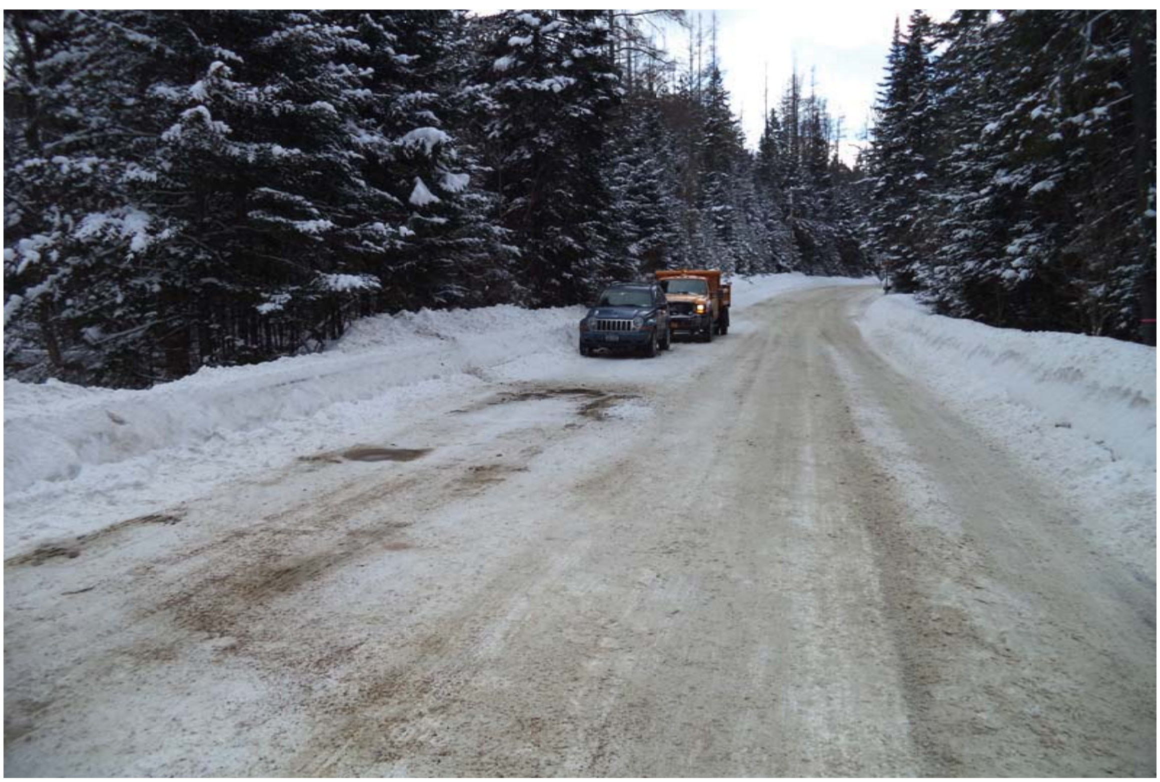


Name: LAKE PLACID
Date: 2/11/115
Scale: 1 inch equals 666 feet

Location: 044° 16' 30.5" N 073° 56' 10.0" W
Caption: ROARING BROOK CULVERT
LAKE PLACID, NEW YORK
FDE-14-256

View northeast toward B-2 locations

View southwest toward area of B-1

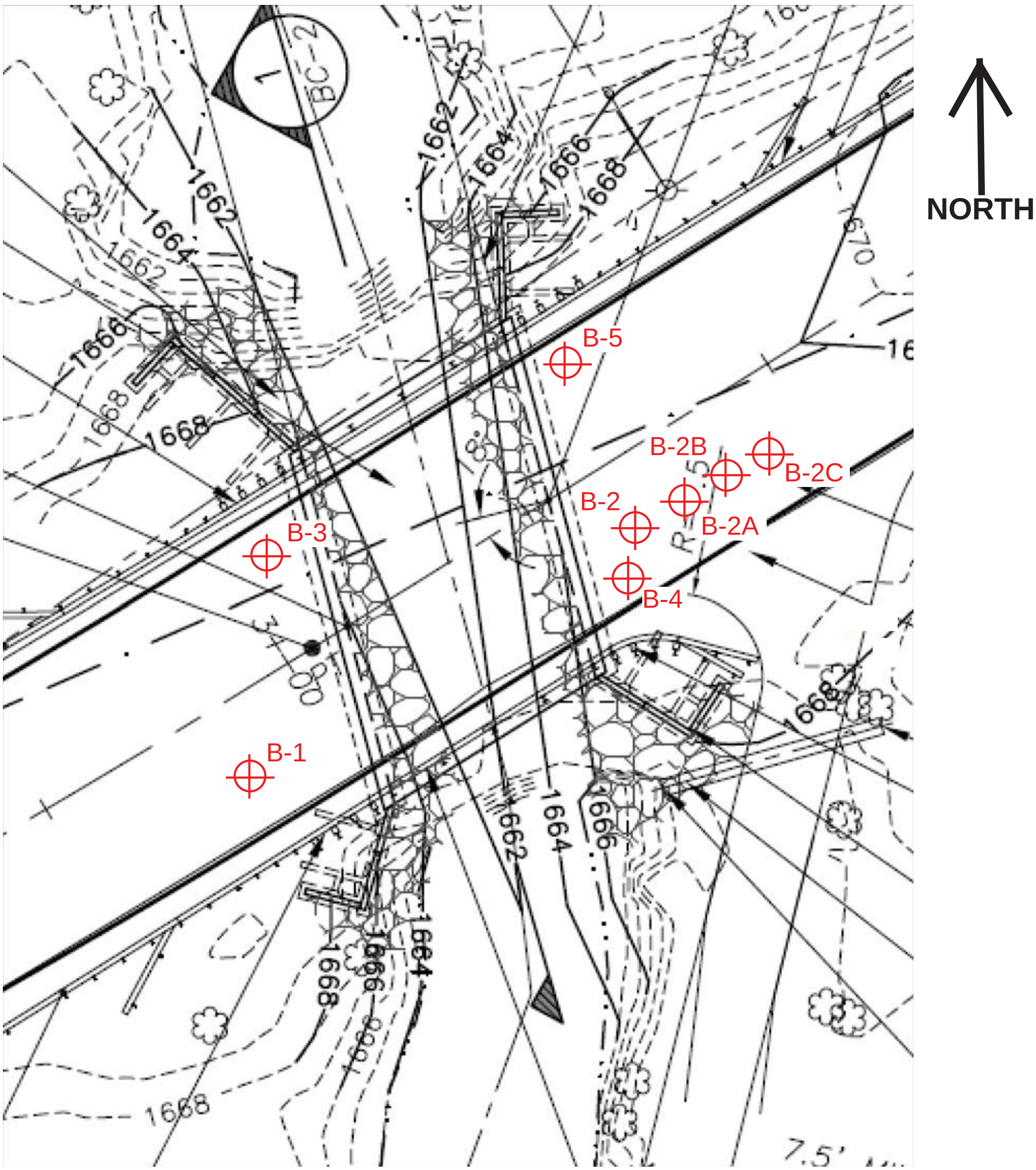


View of upstream bridge elevation

View of downstream bridge elevation

APPENDIX B
SUBSURFACE INVESTIGATION PLAN

Roaring Brook Bridge
Lake Placid, New York



LEGEND

⊕ B- Approximate Test Boring Location

DENTE ENGINEERING, P. C. 594 Broadway - Watervliet, New York 12189 Voice 518-266-0310 Fax 518-266-9238		
Scale: N.T.S.	**SUBSURFACE INVESTIGATION PLAN** *Roaring Brook Bridge Replacement* *Lake Placid, New York*	Drawn By: NA
Date: 5/14/2015		Drawing No. 1

APPENDIX C
SUBSURFACE LOGS AND KEY

Roaring Brook Bridge
Lake Placid, New York

INTERPRETATION OF SUBSURFACE LOGS

The Subsurface Logs present observations and the results of tests performed in the field by the Driller, Technicians, Geologists and Geotechnical Engineers as noted. Soil/Rock Classifications are made visually, unless otherwise noted, on a portion of the materials recovered through the sampling process and may not necessarily be representative of the materials between sampling intervals or locations.

The following defines some of the terms utilized in the preparation of the Subsurface Logs.

SOIL CLASSIFICATIONS

Soil Classifications are visual descriptions on the basis of the Unified Soil Classification ASTM D-2487 and USBR, 1973 with additional comments by weight of constituents by BUHRMASTER. The soil density or consistency is based on the penetration resistance determined by ASTM METHOD D1586. Soil Moisture of the recovered materials is described as DRY, MOIST, WET or SATURATED.

SIZE DESCRIPTION		RELATIVE DENSITY/CONSISTENCY (basis ASTM D1586)			
SOIL TYPE	PARTICLE SIZE	GRANULAR SOIL		COHESIVE SOIL	
BOULDER	> 12	DENSITY	BLOWS/FT.	CONSISTENCY	BLOWS/FT.
COBBLE	3" - 12"	LOOSE	< 10	VERY SOFT	< 3
GRAVEL-COARSE	3" - 3/4"	FIRM	11 - 30	SOFT	4 - 5
GRAVEL - FINE	3/4" - #4	COMPACT	31 - 50	MEDIUM	6 - 15
SAND - COARSE	#4 - #10	VERY COMPACT	50 +	STIFF	16 - 25
SAND - MEDIUM	#10 - #40			HARD	25 +
SAND - FINE	#40 - #200				
SILT/NONPLASTIC	< #200				
CLAY/PLASTIC	< #200				

SOIL STRUCTURE		RELATIVE PROPORTION OF SOIL TYPES	
STRUCTURE	DESCRIPTION	DESCRIPTION	% OF SAMPLE BY WEIGHT
LAYER	6" THICK OR GREATER	AND	35 - 50
SEAM	6" THICK OR LESS	SOME	20 - 35
PARTING	LESS THAN 1/4" THICK	LITTLE	10 - 20
VARVED	UNIFORM HORIZONTAL PARTINGS OR SEAMS	TRACE	LESS THAN 10

Note that the classification of soils or soil like materials is subject to the limitations imposed by the size of the sampler, the size of the sample and its degree of disturbance and moisture.

ROCK CLASSIFICATIONS

Rock Classifications are visual descriptions on the basis of the Driller's, Technician's, Geologist's or Geotechnical Engineer's observations of the coring activity and the recovered samples applying the following classifications.

CLASSIFICATION TERM	DESCRIPTION
VERY HARD	NOT SCRATCHED BY KNIFE
HARD	SCRATCHED WITH DIFFICULTY
MEDIUM HARD	SCRATCHED EASILY
SOFT	SCRATCHED WITH FINGERNAIL
VERY WEATHERED	DISINTEGRATED WITH NUMEROUS SOIL SEAM
WEATHERED	SLIGHT DISINTEGRATION, STAINING, NO SEAMS
SOUND	NO EVIDENCE OF ABOVE
MASSIVE	ROCK LAYER GREATER THAN 36" THICK
THICK BEDDED	ROCK LAYER 12" - 36"
BEDDED	ROCK LAYER 4" - 12"
THIN BEDDED	ROCK LAYER 1" - 4"
LAMINATED	ROCK LAYER LESS THAN 1"
FRACTURES	NATURAL BREAKS AT SOME ANGLE TO BEDS

Core sample recovery is expressed as percent recovered of total sampled. The ROCK QUALITY DESIGNATION (RQD) is the total length of core sample pieces exceeding 4" length divided by the total core sample length for N size cored.

GENERAL

- Soil and Rock classifications are made visually on samples recovered. The presence of Gravel, Cobbles and Boulders will influence sample recovery classification density/consistency determination.
- Groundwater, if encountered, was measured and its depth recorded at the time and under the conditions as noted.
- Topsoil or pavements, if present, were measured and recorded at the time and under the conditions as noted.
- Stratification Lines are approximate boundaries between soil types. These transitions may be gradual or distinct and are approximated.

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-1**

PROJECT: Roaring Brook Bridge	**DATE**	START: 2/4/15	FINISH: 2/4/15

LOCATION: Lake Placid, New York	**METHODS:** 3-1/4" Hollow Stem Augers
CLIENT: Essex County DPW	with ASTM D1586 Drilling Methods
JOB NUMBER: FDE-14-256	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C	**CLASSIFICATION:** O. Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
							± 6" Asphalt, ± 4" Base Material
	1	50/.1'				REF	Brown F-C SAND and GRAVEL, trace silt,
							cobbles noted, Moist
	2	38	50/.4'			50+	Similar
5'	3	48	12				Similar
				12	7	24	
	4	12	38				Similar, Becomes Wet
				29	27	67	
10'	5	7	12				Grades Little Silt
				12	19	24	
							(MOIST TO WET, V. COMPACT TO FIRM)
15'	6	27	50/.4'			50+	**GLACIAL TILL**: Brown Fine SAND and
							SILT, Little M-C Sand and Gravel
20'	7	50/.4'				REF	Similar with cobbles noted
25'	8	45	40				Similar
				48	50/.2'	88	**(WET, VERY COMPACT)**
							Boring Ended at 26.7' with Spoon Refusal
							Groundwater in augers at 8.9' depth below
							grade after sample #5 was obtained.

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DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-2**

PROJECT: Roaring Brook Bridge	**DATE**	START: 2/4/15	FINISH: 2/4/15

LOCATION: Lake Placid, New York	**METHODS:** 3-1/4" Hollow Stem Augers
CLIENT: Essex County DPW	with ASTM D1586 Drilling Methods
JOB NUMBER: FDE-14-256	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C	**CLASSIFICATION:** O. Burns

SAMPLE		**BLOWS ON SAMPLER**					**CLASSIFICATION / OBSERVATIONS**
DEPTH	#	6"	12"	18"	24"	N	
							± 5" Asphalt, ± 4" Base Material
	1	50/.1'				REF	Cobble blocking sample spoon
	2	50	38				Brown F-C SAND and GRAVEL, trace silt,
				24	19	62	Cobbles notes, Moist
5'	3	13	9				Similar
				5	4	14	
	4	3	4				Similar, Becomes Wet
				18	24	22	
							(MOIST TO WET, VERY COMPACT TO FIRM)
10'	5	50/.0'				REF	Boring Ended at 10.0' with Spoon Refusal
							Driller moved boring location northeast from
							original location 5' and met auger refusal in
							boring B-2A at 10.3' depth; moved another 5'
15'							northeast and met refusal in boring B-2B at
							9.7' depth; moved another 4' northeast
							and met refusal in B-2C at 9.1' depth.
							Groundwater first encountered about 8'
20'							below grade based on recovery of wet soils.
25'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-3.1**

PROJECT: Roaring Brook Bridge	**DATE**	START: 5/13/15	FINISH: 5/13/15

LOCATION: Lake Placid, New York	**METHODS:** 3-1/4" Hollow Stem Augers
CLIENT: Essex County DPW	with ASTM D1586 Drilling Methods
JOB NUMBER: FDE-14-256	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle, P.E.

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
							± 3.5" Asphalt, ± 3" Base Material
	1	15	20				**FILL:** Brown F-C SAND and GRAVEL, trace
				12	12	32	silt
	2	10	10				Same, with Some Asphalt
				10	8	20	**(MOIST, COMPACT TO FIRM)**
5'	3	37	8				Brown F-C SAND and GRAVEL, trace silt,
				18	18	26	Moist
	4	16	20				Similar
				16	28	36	
10'	5	50	24				Similar, Wet
				21	19	45	
							(MOIST TO WET, FIRM TO COMPACT)
15'	6	48	50/.4'			50/.4'	**GLACIAL TILL:** Brown F-C SAND, Some
							Silt, Little Gravel, Wet
20'	7	50/.4'				REF	Similar, Moist
25'	8	50/.3'				REF	Similar, Poor Sample Recovery
							(WET TO MOIST, VERY COMPACT)

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DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-3.2**

PROJECT: Roaring Brook Bridge	**DATE**	START: 5/13/15	FINISH: 5/13/15

LOCATION: Lake Placid, New York	**METHODS:** 3-1/4" Hollow Stem Augers
CLIENT: Essex County DPW	with ASTM D1586 Drilling Methods
JOB NUMBER: FDE-14-256	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle, P.E.

SAMPLE		**BLOWS ON SAMPLER**					**CLASSIFICATION / OBSERVATIONS**
DEPTH	#	6"	12"	18"	24"	N	
	9	32	48				Orange Brown Fine SAND, Some Silt
				50/.3'		98/.8'	**(WET, VERY COMPACT)**
35'							Boring Ended at 35.0'
							Boring was ended with running sand in augers at 35' depth.
40'							Groundwater in augers at 8.1' below grade after Sample #5 was obtained.
45'							Auger refusal was initially met in 2 separate attempts at a depth of 15 feet. Boring was moved a few feet and extended to 35 feet termination depth.
50'							
55'							

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DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-4.1**

PROJECT: Roaring Brook Bridge	**DATE**	START: 5/14/15	FINISH: 5/14/15

LOCATION: Lake Placid, New York	**METHODS:** 3-1/4" Hollow Stem Augers
CLIENT: Essex County DPW	with ASTM D1586 Drilling Methods
JOB NUMBER: FDE-14-256	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle, P.E.

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
							± 5" Asphalt, ± 2" Base Material
	1	17	19				**FILL:** Brown F-C SAND and GRAVEL, trace
				11	12	30	silt
	2	8	4				Similar
				2	2	6	
5'	3	5	3				Similar
				5	9	8	
	4	4	1				**(MOIST, COMPACT TO LOOSE)**
				1	4	2	4" Seam Black SILT & Fine SAND, Becomes
							Brown F-M SAND, trace Silt **(WET, LOOSE)**
10'	5	52	38				Grayish Brown GRAVEL and F-C SAND,
				36	22	74	trace silt
15'	6	19	16				**(WET, VERY COMPACT)**
				10	17	26	Brown/Gray SILT, Some Fine Sand
20'	7	4	20				Grades Light Grayish Brown SILT and Fine
				18	23	38	SAND
							(WET, FIRM TO COMPACT)
25'	8	22	50/.4'			50/.4'	Brown F-C SAND and GRAVEL, trace silt
							(WET, VERY COMPACT)

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DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-4.2**

PROJECT: Roaring Brook Bridge	**DATE**	START: 5/14/15	FINISH: 5/14/15

LOCATION: Lake Placid, New York	**METHODS:** 3-1/4" Hollow Stem Augers
CLIENT: Essex County DPW	with ASTM D1586 Drilling Methods
JOB NUMBER: FDE-14-256	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle, P.E.

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	9	38	50/.4'			50/.4'	Orange Brown Fine SAND and SILT
35'	10	50/.4'				REF	Grades Orange Brown F-C SAND, Some to Little Silt **(WET, VERY COMPACT)**
40'	11	50/.4'				REF	**GLACIAL TILL:** Brown Fine SAND, Some Silt, trace coarse sand and fine gravel
45'	12	50/.3'				REF	**(MOIST, VERY COMPACT)**
							Boring Ended at 45.3' with Spoon Refusal
50'							Groundwater first encountered at about 8' depth based on recovery of wet soils. Auger refusal was initially met at depths of 7.5, 10.0, and 15.0 feet in 3 closely spaced borings before reaching final depth of 45.3 feet.
55'							

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DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-5**

PROJECT: Roaring Brook Bridge	**DATE**	START: 5/14/15	FINISH: 5/14/15

LOCATION: Lake Placid, New York	**METHODS:** 3-1/4" Hollow Stem Augers
CLIENT: Essex County DPW	with ASTM D1586 Sampling
JOB NUMBER: FDE-14-256	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle, P.E.

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
							Augered to 20' depth with no soil sampling.
5'							
10'							
15'							
20'	1	12	14				Brown F-M SAND, Some Silt, Partings Silt
				22	36	36	and Clay **(WET, COMPACT)**
							Boring Ended at 22.0'
							No groundwater measurement obtained.
25'							Auger refusal was initially met at depths of 8 and 13 feet in 2 closely spaced borings before reaching final depth of 22 feet.

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APPENDIX D
LABORATORY TEST RESULTS

Roaring Brook Bridge
Lake Placid, New York

Roaring Brook Culvert

Lake Placid, NY

Moisture Content Results - ASTM D2216

Boring No.	B-1	B-1				
Sample No.	865/S3	866/S5				
Sample Depth	5'-7'	10'-12'				
Tare Weight	404.60	403.10				
W_S + Tare	653.60	755.00				
W_D + Tare	648.40	727.20				
W_{WATER}	5.20	27.80				
$W_{DRY\ SOIL}$	243.80	324.10				
% Moisture (W_W / W_D)	2.1	8.6				

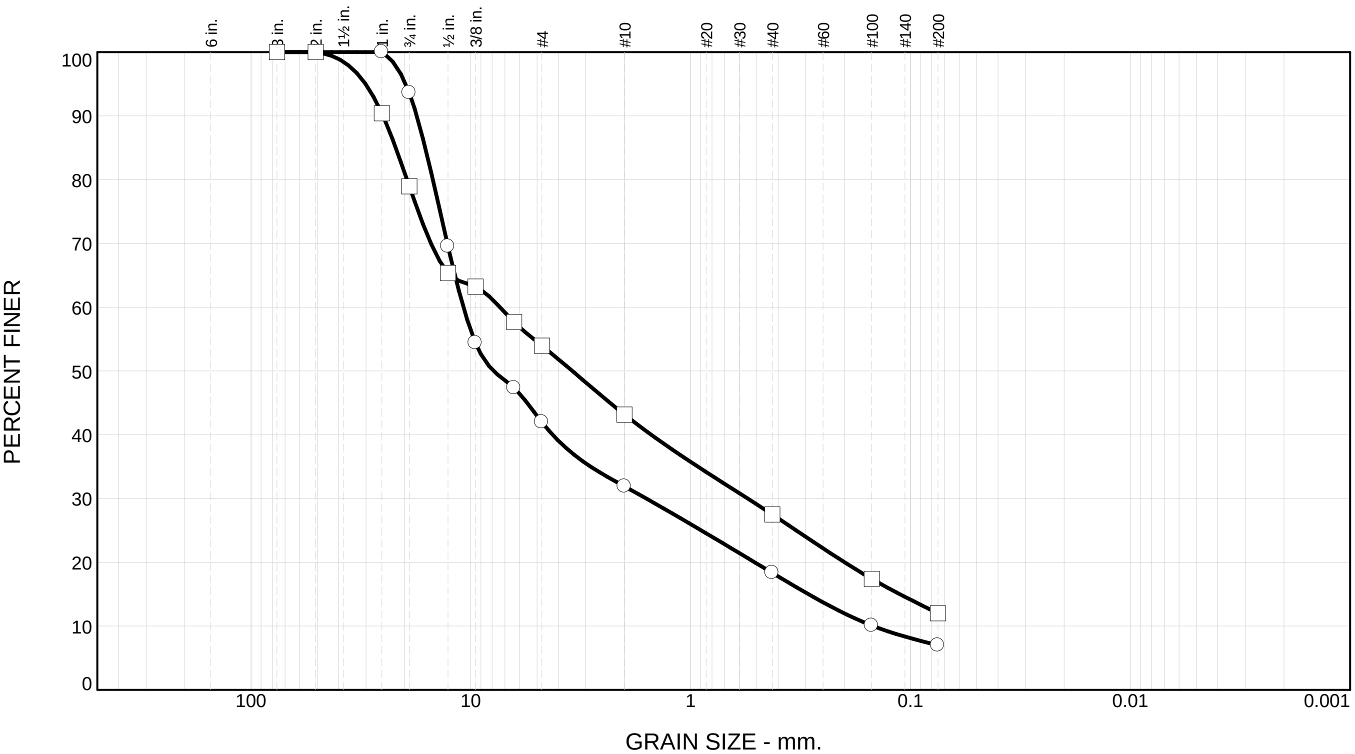
Boring No.						
Sample No.						
Sample Depth						
Tare Weight						
W_S + Tare						
W_D + Tare						
W_{WATER}						
$W_{DRY\ SOIL}$						
% Moisture (W_W / W_D)						

Boring No.						
Sample No.						
Sample Depth						
Tare Weight						
W_S + Tare						
W_D + Tare						
W_{WATER}						
$W_{DRY\ SOIL}$						
% Moisture (W_W / W_D)						

DENTE ENGINEERING
594 Broadway
Watervliet, NY 12189
Ph. 518-266-0310
Fax 518-266-9238

Client: Essex Co DPW
File No. FDE-14-256
Date: February 11, 2015

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	58.0	35.0	7.0		GW-GM	A-1-a	NP	NP
□	0.0	46.0	42.0	12.0		GP-GM	A-1-a	NP	NP

SIEVE inches size	PERCENT FINER ○	□	
3	100.0	100.0	
2	100.0	100.0	
1	100.0	90.4	
.75	93.6	79.0	
.5	69.5	65.4	
.375	54.4	63.2	
.25	47.3	57.7	
	GRAIN SIZE		
D_{60}	10.8132	7.3724	
D_{30}	1.5916	0.5507	
D_{10}	0.1477		
	COEFFICIENTS		
C_c	1.59		
C_u	73.22		

SIEVE number size	PERCENT FINER ○	□	
#4	42.0	54.0	
#10	31.9	43.2	
#40	18.3	27.5	
#100	10.1	17.4	
#200	7.0	12.0	

Material Description

○ GRAVEL and M-F-C SAND, trace Silt

□ GRAVEL and M-F-C SAND, little Silt

REMARKS:

○ Per ASTM D422 Washed

□ Per ASTM D422 Washed

○ Source of Sample: Borings Depth: 5'-7' Sample Number: 865: B-1/S3

□ Source of Sample: Borings Depth: 10'-12' Sample Number: 866: B-1/S5

EVERGREEN TESTING, INC.
Watervliet, NY

Client: Essex Co DPW

Project: Roaring Brook Culvert
Lake Placid, NY

Project No.: FDE-14-256 Figure 865-866

Tested By: EM **Checked By:** EG

REVISED GEOTECHNICAL REPORT FOR

PROJECT C

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(Rev. 5/26/15)

RIVER RD. (CR21) OVER HOLCOMB POND OUTLET BROOK BRIDGE REPLACEMENT

TOWN OF NORTH ELBA, NY

GEOTECHNICAL EVALUATION
HOLCOMB POND BROOK BRIDGE
LAKE PLACID, NEW YORK
(Revision No. 1)

Dente File No. FDE-15-007

Prepared For:

ESSEX COUNTY DPW
8053 Route 9
Elizabethtown, NY 12932

Prepared By:

DENTE ENGINEERING, P.C.
Watervliet, New York

May 26, 2015

Important Information About Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one - not even you* - should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from alight industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes - even minor ones - and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ-sometimes significantly from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual subsurface conditions revealed during construction. The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the express purpose of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in-this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely on Your ASFE-Member Geotechnical Engineer For Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
The Best People on Earth

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IIGER06045.0M

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GEOTECHNICAL EVALUATION
HOLCOMB POND BROOK BRIDGE
LAKE PLACID, NEW YORK

Dente File No. FDE-15-007

I. INTRODUCTION

This report presents the results of our Geotechnical Evaluation completed for the bridge replacement project at the River Road crossing over Holcomb Pond Brook in Lake Placid, New York. The evaluation was conducted in general accord with our proposal dated November 20, 2014 which was approved by the Essex County Department of Public Works. In general, the evaluation included the following:

- Layout and completion of two test borings and four probes to auger refusal in January 2015 and three supplemental borings in May 2015,
- Site reconnaissance by a Geotechnical Engineer,
- Laboratory testing to determine the soil's moisture and organic contents,
- Evaluation of the data collected and the preparation of this report to assist in planning for the geotechnical related aspects of the project.

This report and the recommendations contained within it were developed for specific application to the site and construction planned, as we currently understand it. Corrections in our understanding, changes in the structure locations, grades, loads, etc. should be brought to our attention so that we may evaluate their effect, if any, upon the recommendations offered.

A sheet entitled *"Important Information about your Geotechnical Engineering Report"* prepared by the Association of Engineering Firms Practicing in the Geosciences is presented following the title page of this report. This sheet should never be separated from the report and it should be carefully reviewed as it sets the only context within which this report should be used.

It should be understood that this report was prepared, in part, on the basis of a limited number of test borings performed for the field exploration. The borings were advanced at discrete locations and the overburden soils sampled at specific depths. Conditions are only known at the locations and through the depths investigated. Conditions at other locations and depths may be different, and these differences may impact on the conclusions reached and the recommendations offered.

II. PROJECT AND SITE DESCRIPTION

The bridge site is located at the River Road crossing over Holcomb Pond Brook in Lake Placid, New York as shown on the USGS topographic map presented in Appendix A. The map is provided to assist the reader in locating the site and reviewing the overall topography in the project area.

The replacement structure will be a precast 3-sided bridge supported on new cast in place concrete footings. The bridge will have an approximate 27.3 foot clear travel way and 16 foot wide waterway opening. The existing and proposed road surface on the bridge is about 8 feet above the stream bed.

The existing bridge is a jack arch culvert on concrete footings on the east side of the road and with a CMP culvert extending from the jack arch beneath the road as shown on the site photographs in Appendix A. At the time of our investigation the area was covered with deep layers of snow. Due to the presence of this snow cover it was not possible to visually observe the areas immediately surrounding the bridge for bedrock outcrops or other features which may impact upon planning for design and construction. However, it did appear that the stream bed was bedrock beneath the jack arch culvert portion of the existing bridge.

III. SITE INVESTIGATIONS

The site's subsurface conditions were investigated through the completion of two test borings (B-1 and B-2) and four probes to auger refusal (B-1A, B-1B, B-2A, and B-2B) in January 2015 and three borings (B-3, 4, and 5) in May 2015. The approximate boring locations are shown on the Subsurface Investigation Plan presented in Appendix B.

The borings were made using a standard rotary drill rig equipped with hollow stem augers. As the augers were advanced, the overburden soils were sampled and their relative density determined through the Standard Method for Penetration Test and Split-Barrel Sampling of Soils, ASTM D-1586. In two borings coring was performed in accord with ASTM D2113 to confirm the presence of bedrock.

The rock cores and representative portions of the soil samples recovered from the test borings were transported to our office for visual classification by a Geotechnician and Geotechnical Engineer. Individual subsurface logs were prepared for the borings based on the visual classifications. The logs are provided in Appendix C along with a key to the terms used for their preparation.

The borings first penetrated through about four to five feet of loose to firm density sand and gravel fill material which contained cobbles, possible boulders, and trace amounts of silt. The native soils beneath the fills generally consisted of sand or sand and gravel with trace to some silt. The soils were initially of a firm to compact relative density and they became very compact at depths of about 10 to 15 feet below grade. A thin layer of loose/soft, black silt with trace amounts of organic matter separated the fills from the native sand and gravel soils in two boring locations and in one location a thin layer of silt and clay was present between the bottom of the sand and gravel soil sequence and the bedrock surface.

Near the northeast corner of the bridge auger refusal was met in three closely spaced borings/probes at depths ranging between 7.4 and 8.0 feet below grade and in a fourth boring at a depth of 13.5 feet. Coring was done at the deepest refusal depth revealing bedrock composed of hard granitic gneiss. On this basis it is suspected that the shallower refusal depths encountered in the nearby borings/probes were due to the presence of boulders.

Near the southeast corner the refusal depths were between 6.0 and 6.5 feet. A few granite rock fragments were recovered at the refusal depth in one of the test borings. The refusal depths roughly correspond with the streambed elevation on the east side of the bridge where it appeared that bedrock was present.

Near the southwest corner of the bridge the refusal depth was at 23.0 feet. The presence of hard granitic gneiss bedrock was confirmed through coring at this location. At the northwest corner refusal was met at 14.1 feet.

No groundwater was encountered within the maximum 8 foot depth explored in test boring B-1. In boring B-2 a layer of trapped groundwater appeared to be present between depths of about 2 and 4 feet below grade based on the recovery of “wet” soil samples. In borings B-3 and B-4 groundwater was encountered at depths of about 12.4 and 6.7 feet, respectively. It should be assumed that the groundwater depths will vary seasonally and generally mirror the water levels in Holcomb Pond Brook.

IV. CONCLUSIONS AND RECOMMENDATIONS

A. GENERAL

Based upon the results of the test borings, it appears that bearing grade conditions near the expected foundation bearing depth for the new bridge may vary significantly. Near the northeast and southwest corners of the bridge the presence of bedrock was confirmed through rock coring at depths of about 13.5 feet and 23.0 feet below the road surface, respectively. At the other bridge corners, auger refusals were met at depths of about 6 and 14 feet below grade. The cause of refusal, i.e., boulders or bedrock, was not determined at these locations.

Considering that bedrock is known to be relatively deep at the southwest corner of the bridge and variable elsewhere, we recommend that the new bridge foundations be conservatively designed for bearing on soil. It should be understood that it may be necessary to remove bedrock and/or boulders to establish a relatively level surface at the planned bearing elevation.

The following report sections provide recommendations to assist in planning for design and construction of foundations and culvert walls. We should review final plans and specifications prior to their release for bidding to confirm that our recommendations were properly interpreted and applied and to allow us to refine our recommendations if necessary based on the final design.

B. SEISMIC DESIGN

Based on the available subsurface information Site Class B should be assumed for seismic design purposes in accord with the AASHTO Guide Specifications for Seismic Bridge Design.

C. EARTHWORK

The sides of temporary excavations in the embankment fills and native soils should be sloped no steeper than one vertical on 1.5 horizontal (1V:1.5H) as required by OSHA for a Type C soil.

All excavations should be completed so as not to undermine roads, utilities, and/or foundations of adjacent structures. In general, excavations should not encroach within a zone of influence defined by a line extending out and down from the existing structures at an inclination of one vertical on 1.5 horizontal. Excavations that encroach within this zone should be sheeted, shored and braced to support the soil and adjacent structure loads, or the structure should be underpinned to establish bearing at a deeper level.

Backfill materials and placement methods for the bridge structure should conform to the requirements, if any, specified by the precast concrete manufacturer. The following fill and backfill recommendations should be adjusted, if required, based on the manufacturer's specifications.

The existing on-site fill soils should generally consist of sand or sand and gravel which typically can be reused at least for portions of the backfill work provided that cobbles and boulders greater than about four inches in size are removed. The native soils underlying the fills may contain organic matter, and for planning purposes it should be assumed that they cannot be reused. If imported fills are required, they should consist of processed sand and gravel meeting the requirements for Type 4 material as detailed in Section 304 of the NYSDOT Standard Specifications for Construction and Materials.

The fill should be placed in loose layers no more than eight inches thick in the zone extending at least four feet from the bridge structure. Outside this zone the lift thickness may be increased to twelve inches if heavy compaction equipment is employed. Each lift of backfill should be compacted to not less than 95 percent of the maximum dry density for the material determined through the procedures of ASTM D-1557, the Modified Proctor Compaction test.

D. FOUNDATIONS

For planning purposes it should be assumed that the new bridge foundations will bear on soil. The soil bearing foundations should be seated at least five feet below final adjoining grades for frost protection and at least two feet below expected scour lines, whichever is deeper. If boulders are found protruding above the plan bearing elevation they should be removed in their entirety or reduced in size as required to establish the plan grade. If bedrock is encountered the foundation can be seated on sound rock above the standard frost depth provided that any fractures in the rock are cleaned out to the five foot depth and grouted full.

To establish a more stable base for construction of soil bearing foundations and assist in dewatering, a minimum 12 inch thick base of clean crushed stone should be planned beneath the spread foundations. The stone should be an equal blend of No. 1 and No. 2 size aggregate and it should be wrapped in a filter fabric (Mirafi 180N or eq.). Prior to excavating for foundations the stream should be diverted and dewatering conducted as required to lower the water level at least one foot below the subgrade elevation. Dewatering should be performed on a continuous basis until the foundations are constructed and adequate load is applied to resist hydrostatic uplift.

Using the LRFD design procedures, the foundations may be proportioned for a factored soil bearing resistance equal to 4.0 kips per square foot (ksf) and nominal (ultimate) bearing resistance equal to 12.0 ksf.

Assuming that standard care is employed in preparing the bearing grades for construction, settlement of the soil bearing foundations should be less than one inch. The settlements should occur quickly as the bridge is constructed and backfilled.

E. ABUTMENT WALLS

The design of abutment walls may proceed using the following parameters. The design parameters assume backfill consists of on-site sand and gravel or imported Structural Fill (NYSDOT Section 304, Type 4 material).

- Soils Angle of Internal Friction (φ_f) . . . . 30 degrees
- Coefficient of At-Rest Earth Pressure 0.50
- Coefficient of Active Earth Pressure 0.33
- Coefficient of Passive Earth Pressure 3.00
- Total Unit Weight of Compacted Soil . . . . 120 pcf
- Coefficient of Sliding Friction Soil ($\tan\varphi_f$) 0.58
- Resistance Factor for Passive Resistance (φ_{ep}) 0.50
- Resistance Factor for Shear Resistance (φ_τ) 0.80

Foundation drains and/or weep holes should be installed as specified by the precast arch manufacturer to prevent groundwater from becoming trapped in the backfill soils.

F. CONSTRUCTION MONITORING

It should be understood that the actual subsurface conditions that exist across this site will only be known when the site is excavated. The presence of the Geotechnical Engineer during the earthwork and foundation construction phases will allow validation of the subsurface conditions assumed to exist for this study and the design recommended in this report.

We believe this construction sequence observation and testing should be provided by the Geotechnical Engineer of record as a consultant to the Owner, Architect or Construction Manager. We do not believe these services should be provided through the general or earthwork contractor.

V. CLOSURE

This report was prepared for specific application to the project site and the construction planned using methods and practices common to Geotechnical Engineering in the area at the time, no other warranties expressed or implied are made.

Dente Engineering should be retained to review plans and specifications prior to their release for bidding to confirm that the recommendations contained herein were properly understood and applied. Dente Engineering should also be retained during construction to validate that the actual site conditions are similar to those assumed for development of the recommendations contained in this report.

We appreciate the opportunity to be of service. Should questions arise or if we may be of any other service, please contact us at your convenience.

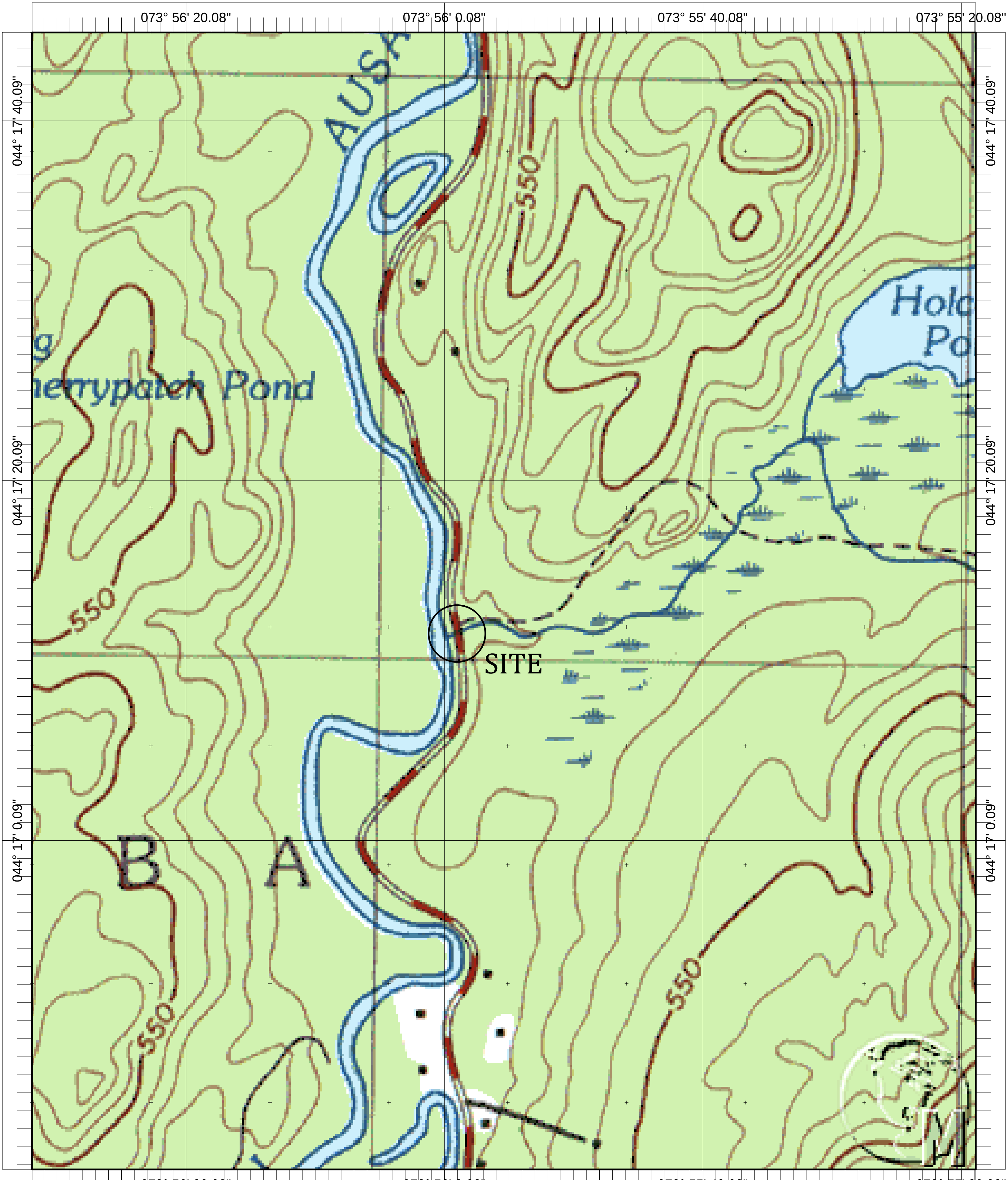
Prepared By:
Dente Engineering, P.C.

Edward C. Gravelle, P.E.
Vice President

Fred A. Dente, P.E.
President

APPENDIX A
USGS TOPOGRAPHIC MAP
AND SITE PHOTOGRAPHS

Holcomb Pond Brook Bridge
Lake Placid, New York



Name: LAKE PLACID
Date: 2/11/115
Scale: 1 inch equals 666 feet

Location: 044° 17' 13.4" N 073° 55' 55.5" W
Caption: HOLCOMB POND OUTLET
LAKE PLACID, NEW YORK
FDE-15-07

View south across culvert/bridge area

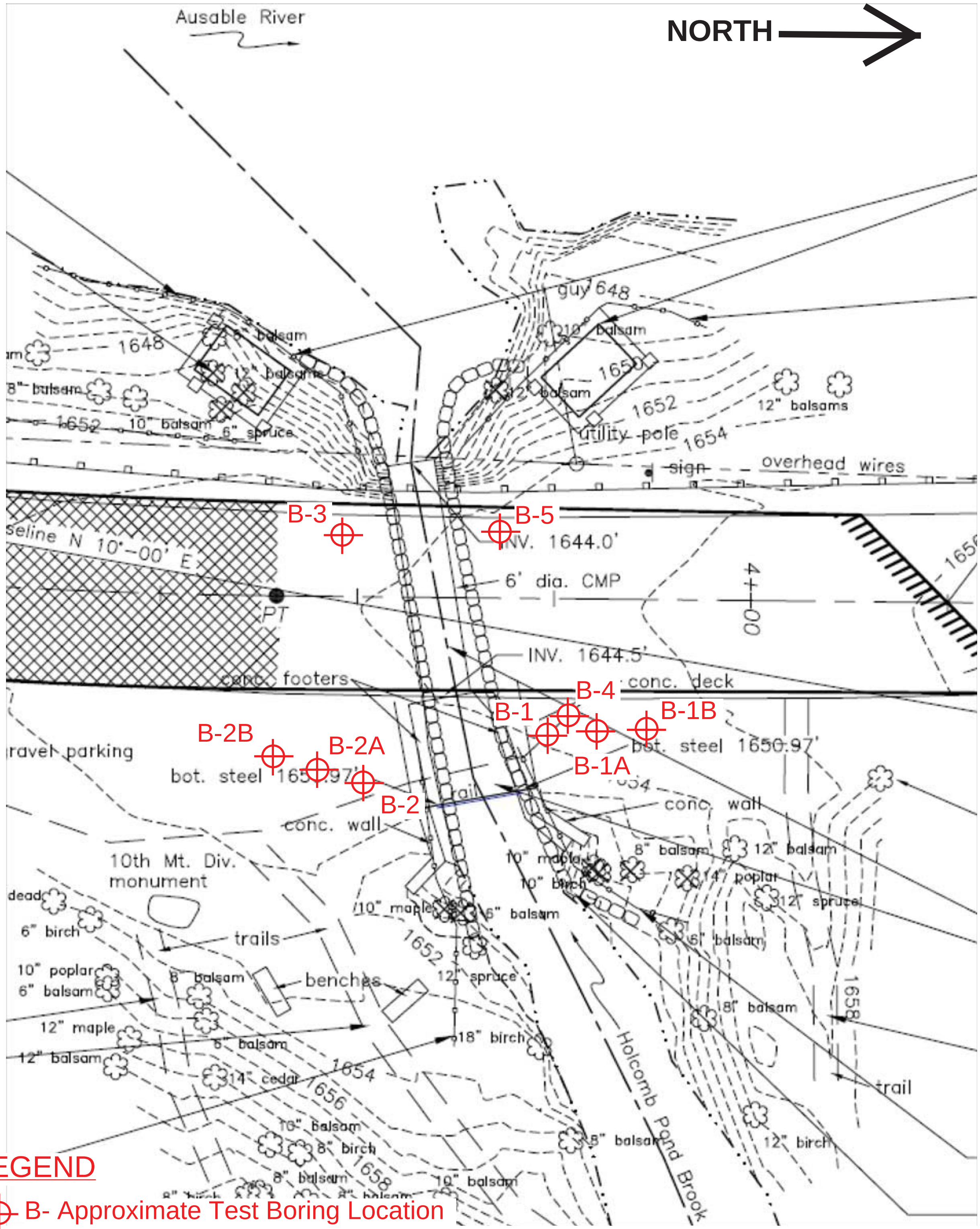
View north toward area of B-1 locations

View of upstream side of bridge

Looking downstream through culvert

APPENDIX B
SUBSURFACE INVESTIGATION PLAN

Holcomb Pond Brook Bridge
Lake Placid, New York



LEGEND

B- Approximate Test Boring Location

DENTE ENGINEERING, P.C.
594 Broadway - Watervliet, New York 12189
Voice 518-266-0310 Fax 518-266-9238

Scale: N.T.S.	**SUBSURFACE INVESTIGATION PLAN** ***Holcomb Pond Outlet Bridge Replacement*** ***Lake Placid, New York***	**Drawn By:** NA
Date: 5/12/2015		**Drawing No.** 1

APPENDIX C
SUBSURFACE LOGS AND KEY

Holcomb Pond Brook Bridge
Lake Placid, New York

INTERPRETATION OF SUBSURFACE LOGS

The Subsurface Logs present observations and the results of tests performed in the field by the Driller, Technicians, Geologists and Geotechnical Engineers as noted. Soil/Rock Classifications are made visually, unless otherwise noted, on a portion of the materials recovered through the sampling process and may not necessarily be representative of the materials between sampling intervals or locations.

The following defines some of the terms utilized in the preparation of the Subsurface Logs.

SOIL CLASSIFICATIONS

Soil Classifications are visual descriptions on the basis of the Unified Soil Classification ASTM D-2487 and USBR, 1973 with additional comments by weight of constituents by BUHRMASTER. The soil density or consistency is based on the penetration resistance determined by ASTM METHOD D1586. Soil Moisture of the recovered materials is described as DRY, MOIST, WET or SATURATED.

SIZE DESCRIPTION		RELATIVE DENSITY/CONSISTENCY (basis ASTM D1586)			
SOIL TYPE	PARTICLE SIZE	GRANULAR SOIL		COHESIVE SOIL	
BOULDER	> 12	DENSITY	BLOWS/FT.	CONSISTENCY	BLOWS/FT.
COBBLE	3" - 12"	LOOSE	< 10	VERY SOFT	< 3
GRAVEL-COARSE	3" - 3/4"	FIRM	11 - 30	SOFT	4 - 5
GRAVEL - FINE	3/4" - #4	COMPACT	31 - 50	MEDIUM	6 - 15
SAND - COARSE	#4 - #10	VERY COMPACT	50 +	STIFF	16 - 25
SAND - MEDIUM	#10 - #40			HARD	25 +
SAND - FINE	#40 - #200				
SILT/NONPLASTIC	< #200				
CLAY/PLASTIC	< #200				

SOIL STRUCTURE		RELATIVE PROPORTION OF SOIL TYPES	
STRUCTURE	DESCRIPTION	DESCRIPTION	% OF SAMPLE BY WEIGHT
LAYER	6" THICK OR GREATER	AND	35 - 50
SEAM	6" THICK OR LESS	SOME	20 - 35
PARTING	LESS THAN 1/4" THICK	LITTLE	10 - 20
VARVED	UNIFORM HORIZONTAL PARTINGS OR SEAMS	TRACE	LESS THAN 10

Note that the classification of soils or soil like materials is subject to the limitations imposed by the size of the sampler, the size of the sample and its degree of disturbance and moisture.

ROCK CLASSIFICATIONS

Rock Classifications are visual descriptions on the basis of the Driller's, Technician's, Geologist's or Geotechnical Engineer's observations of the coring activity and the recovered samples applying the following classifications.

CLASSIFICATION TERM	DESCRIPTION
VERY HARD	NOT SCRATCHED BY KNIFE
HARD	SCRATCHED WITH DIFFICULTY
MEDIUM HARD	SCRATCHED EASILY
SOFT	SCRATCHED WITH FINGERNAIL
VERY WEATHERED	DISINTEGRATED WITH NUMEROUS SOIL SEAM
WEATHERED	SLIGHT DISINTEGRATION, STAINING, NO SEAMS
SOUND	NO EVIDENCE OF ABOVE
MASSIVE	ROCK LAYER GREATER THAN 36" THICK
THICK BEDDED	ROCK LAYER 12" - 36"
BEDDED	ROCK LAYER 4" - 12"
THIN BEDDED	ROCK LAYER 1" - 4"
LAMINATED	ROCK LAYER LESS THAN 1"
FRACTURES	NATURAL BREAKS AT SOME ANGLE TO BEDS

Core sample recovery is expressed as percent recovered of total sampled. The ROCK QUALITY DESIGNATION (RQD) is the total length of core sample pieces exceeding 4" length divided by the total core sample length for N size cored.

GENERAL

- Soil and Rock classifications are made visually on samples recovered. The presence of Gravel, Cobbles and Boulders will influence sample recovery classification density/consistency determination.
- Groundwater, if encountered, was measured and its depth recorded at the time and under the conditions as noted.
- Topsoil or pavements, if present, were measured and recorded at the time and under the conditions as noted.
- Stratification Lines are approximate boundaries between soil types. These transitions may be gradual or distinct and are approximated.

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-1**

PROJECT: Holcomb Pond Outlet Bridge	**DATE**	START: 1/29/15	FINISH: 1/29/15

LOCATION: Lake Placid, New York	**METHODS:** 3-1/4" Hollow Stem Augers
CLIENT: Essex County DPW	with ASTM D1586 Sampling Methods
JOB NUMBER: FDE-15-007	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C	**CLASSIFICATION:** O. Burns

SAMPLE		**BLOWS ON SAMPLER**					**CLASSIFICATION / OBSERVATIONS**
DEPTH	#	6"	12"	18"	24"	N	
	1	40	50				**FILL**: Brown F-C SAND and GRAVEL, trace
				68	48	118	silt, cobbles and boulders noted
	2	38	11				Grades Little Silt, trace organics
				8	7	19	**(MOIST, VERY COMPACT TO FIRM)**
5'	3	2	3				Dark Brown F-C SAND, Some Silt, Little
				9	3	12	Gravel, trace organic matter
	4	9	16				
				8	8	24	**(MOIST, FIRM)**
							Boring Ended at 8.0' with Auger Refusal
10'							
							Auger refusal was met at 8.0' depth, driller
							then moved boring location 6' and met auger
							refusal at 7.4' depth in B-1A, boring was
							moved another 6' and refusal again met at
15'							7.4' depth in B-1B.
							No measurable groundwater in augers at
							completion of drilling and sampling.
20'							
25'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-2**

PROJECT: Holcomb Pond Outlet Bridge	**DATE**	START: 1/29/15	FINISH: 1/29/15

LOCATION: Lake Placid, New York	**METHODS:** 3-1/4" Hollow Stem Augers
CLIENT: Essex County DPW	with ASTM D1586 Sampling Methods
JOB NUMBER: FDE-15-007	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C	**CLASSIFICATION:** O. Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	40	25				**FILL**: Brown F-C SAND and GRAVEL, trace
				13	7	38	silt, Moist
	2	6	5				Becomes Wet
				3	2	8	**(MOIST TO WET, COMPACT TO LOOSE)**
	3	3	16				Brown F-C SAND and GRAVEL, Little Silt,
5'				7	12	23	roots noted **(MOIST, FIRM)**
	4	34	50/.0'			REF	Granite fragments at 6.5'
							Boring Ended at 6.5' with Auger Refusal
10'							Auger refusal was met at 6.5' depth, driller then moved boring 6' and met refusal at 6.5' depth in B-2A, boring was moved another 6' and refusal was met at 6.0' depth in B-2B.
15'							No measurable groundwater in augers at completion of drilling and sampling.
20'							
25'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-3**

PROJECT: Holcomb Pond Outlet Bridge	**DATE**	START: 5/11/15	FINISH: 5/11/15

LOCATION: Lake Placid, New York	**METHODS:** 3-1/4" Hollow Stem Augers
CLIENT: Essex County DPW	with ASTM D1586 and D2113 Sampling
JOB NUMBER: FDE-15-007	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle, P.E.

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
							± 5" Asphalt and ± 4" Base Material
	1	12	12				**FILL:** Brown F-C SAND, Some Gravel, trace
				9	8	21	silt, Cobbles Noted
	2	4	4				**(MOIST, FIRM TO LOOSE)**
				2	4	6	Black SILT and Fine SAND, trace rootlets
5'	3	2	1				Becomes Brown F-M SAND, Little Silt
				1	7	2	**(MOIST, LOOSE)**
	4	8	22				Brown F-C SAND and GRAVEL, trace silt,
				18	18	40	Moist
10'	5	10	10				Similar
				8	10	18	
15'	6	12	29				Similar, with thin seam Fine Sand and Silt,
				50/.4'		79/.9'	Wet
20'	7	5	9				**(MOIST TO WET, FIRM TO VERY COMPACT)**
				11	15	20	Gray Varved SILT
							(WET, STIFF)
		Rock Core Run #1					Gray Granitic GNEISS, Hard, Bedded,
		23.0' to 27.5'					Slightly Weathered, Vertical Fracture 23.0'
25'		Recovery = 100%					to 23.5', Fractured Layer at 25' to 26'
		RQD = 60%					
							Boring Ended at 27.5'

Groundwater in augers at 12.4' below grade after Sample #6 was obtained.

DENTE ENGINEERING, P.C. | SUBSURFACE LOG **B-4**

PROJECT: Holcomb Pond Outlet Bridge | **DATE** START: 5/12/15 FINISH: 5/12/15

LOCATION: Lake Placid, New York | **METHODS:** 3-1/4" Hollow Stem Augers with ASTM D1586 and D2113 Sampling

CLIENT: Essex County DPW

JOB NUMBER: FDE-15-007 | **SURFACE ELEVATION:**

DRILL TYPE: CME 45C | **CLASSIFICATION:** E. Gravelle, P.E.

SAMPLE		BLOWS ON SAMPLER				
DEPTH	#	6"	12"	18"	24"	N
	1	5	6			
				8	8	14
	2	7	3			
				3	2	6
	3	3	2			
5'				1	2	3
	4	1	6			
				10	10	16
	5	8	11			
				14	14	25
10'	6	9	24			
				37	29	61
15'		Rock Core Run #1 13.5' to 18.5' Recovery = 94% RQD = 83%				
20'						
25'						

CLASSIFICATION / OBSERVATIONS

FILL: Brown F-C SAND and GRAVEL, trace silt

Grades Brown F-M SAND, Some to Little Silt, Little Gravel

(MOIST, FIRM TO LOOSE)

Black SILT, trace organic matter

(MOIST TO WET, SOFT)

Brown GRAVEL and F-C SAND, trace silt

Becomes Grayish Brown

(WET, FIRM TO VERY COMPACT)

Gray Granitic GNEISS, Very Hard, Sound, Bedded to Thick Bedded

Boring Ended at 18.5'

Groundwater in augers at 6.7' below grade after Sample #5 was obtained.

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-5**		
PROJECT: Holcomb Pond Outlet Bridge	**DATE**	START: 5/12/15	FINISH: 5/12/15

LOCATION: Lake Placid, New York	**METHODS:** 3-1/4" Hollow Stem Augers
CLIENT: Essex County DPW	Probe to Refusal with No Sampling
JOB NUMBER: FDE-15-007	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle, P.E.

SAMPLE		**BLOWS ON SAMPLER**					**CLASSIFICATION / OBSERVATIONS**
DEPTH	#	6"	12"	18"	24"	N	
							Auger to refusal with no soil sampling.
5'							
10'							
							Boring Ended at 14.1' with Auger Refusal
15'							Auger refusal was initially met at a depth of 5.0 feet. The boring location was moved a few feet and refusal was met at 14.1 feet.
20'							
25'							

APPENDIX D
LABORATORY TEST RESULTS

Holcomb Pond Brook Bridge
Lake Placid, New York

Holcomb Pond Outlet Culvert

Lake Placid, NY

Moisture Content Results - ASTM D2216

Boring No.	B-1	B-1				
Sample No.	863/S3	864/S4				
Sample Depth	4'-6'	6'-8'				
Tare Weight	403.30	411.10				
W_S + Tare	686.20	579.50				
W_D + Tare	614.70	531.30				
W_{WATER}	71.50	48.20				
$W_{DRY\ SOIL}$	211.40	120.20				
% Moisture (W_W / W_D)	33.8	40.1				

Boring No.						
Sample No.						
Sample Depth						
Tare Weight						
W_S + Tare						
W_D + Tare						
W_{WATER}						
$W_{DRY\ SOIL}$						
% Moisture (W_W / W_D)						

Boring No.						
Sample No.						
Sample Depth						
Tare Weight						
W_S + Tare						
W_D + Tare						
W_{WATER}						
$W_{DRY\ SOIL}$						
% Moisture (W_W / W_D)						

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594 Broadway
Watervliet, NY 12189
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Fax 518-266-9238

Client: Essex Co. DPW
File No. FDE-15-07
Date: February 11, 2015

Holcomb Pond Outlet Culvert

Lake Placid, New York

Organic Content Results ASTM D2974

Boring No.	B-1	B-1				
Sample No.	863/S3	864/S4				
Sample Depth	4'-6'	6'-8'				
Tare Weight	69.42	74.50				
W_S + Tare	79.42	84.49				
W_A + Tare	78.52	83.54				
W_S	10.00	9.99				
W_A	9.10	9.04				
%ASH = W_A / W_S	91.0	90.5				
%ORGANICS	9.0	9.5				

Boring No.						
Sample No.						
Sample Depth						
Tare Weight						
W_S + Tare						
W_A + Tare						
W_S						
W_A						
%ASH = W_A / W_S						
%ORGANICS						

Boring No.						
Sample No.						
Sample Depth						
Tare Weight						
W_S + Tare						
W_A + Tare						
W_S						
W_A						
%ASH = W_A / W_S						
%ORGANICS						

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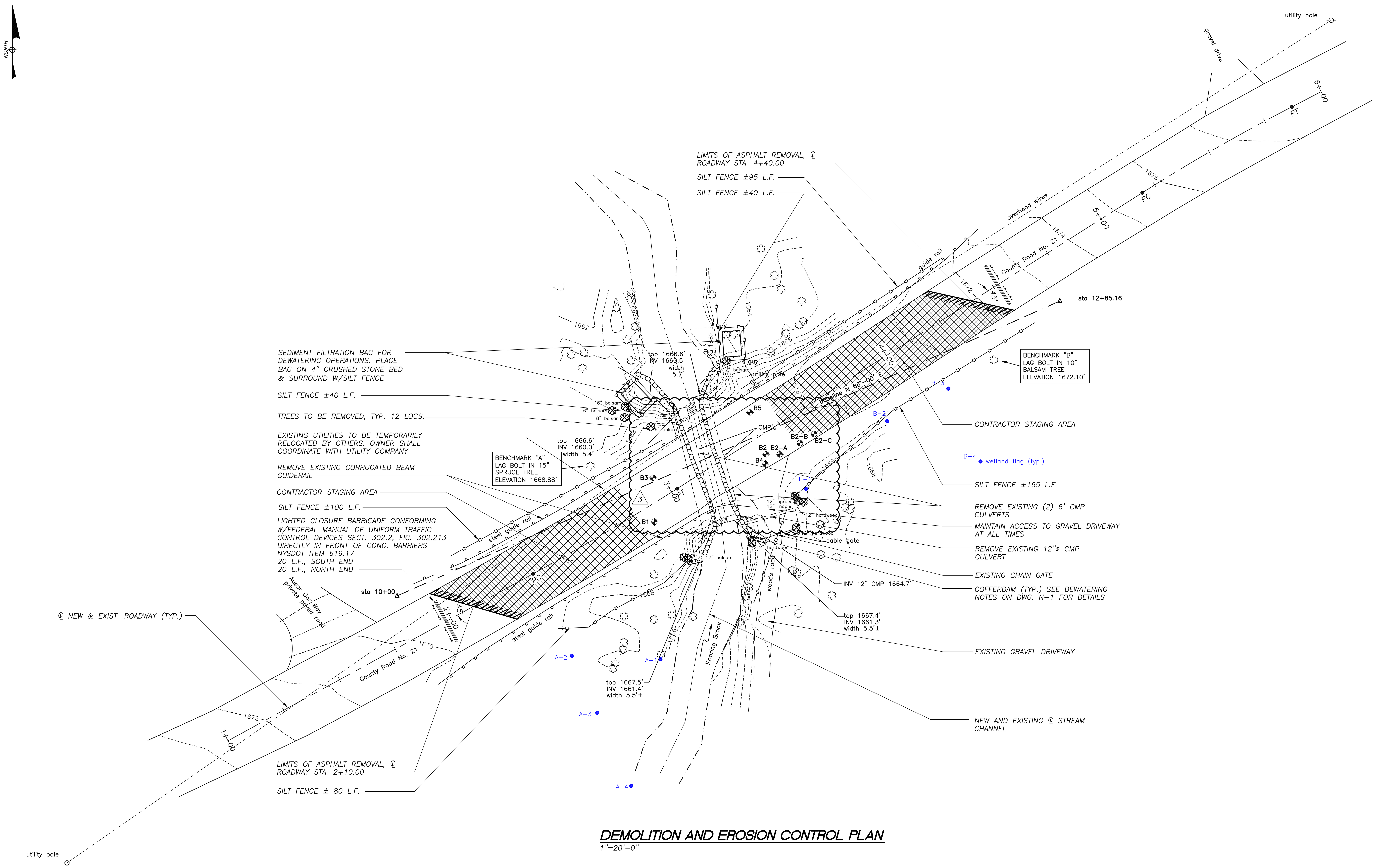
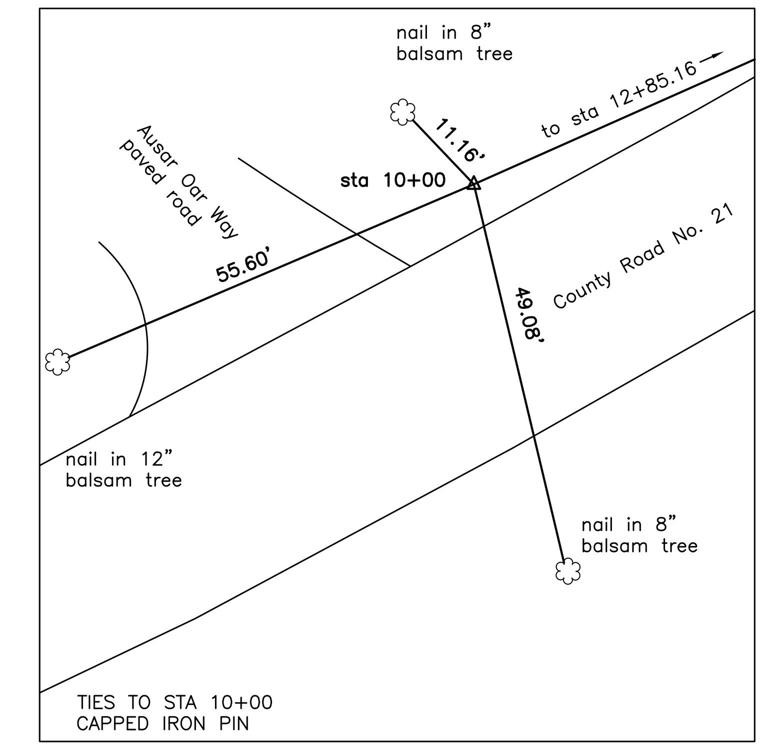
Fax 518-266-9238

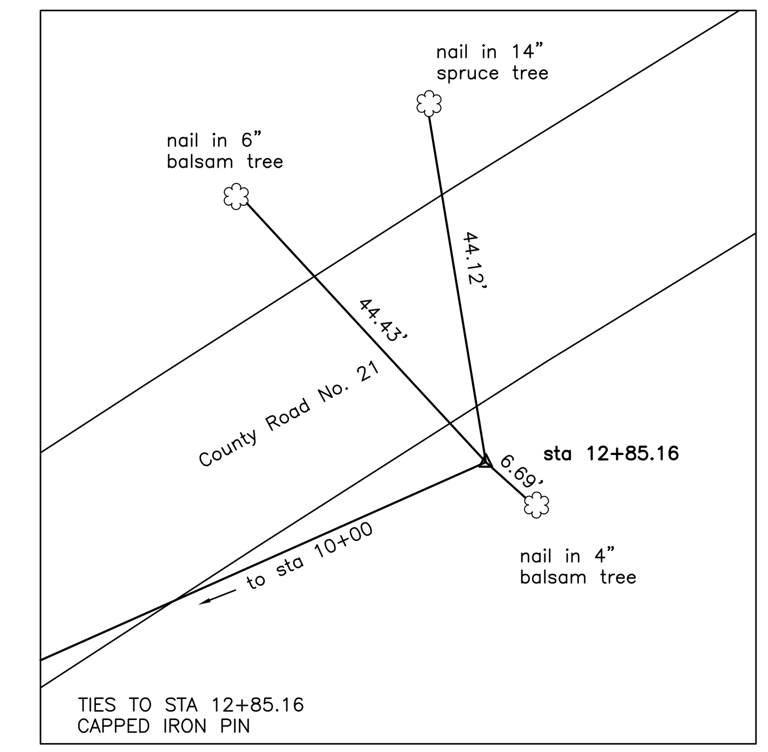
Client: Essex Co. DPW
File No. FDE-15-07
Date: February 11, 2015



DEMOLITION AND EROSION CONTROL PLAN

1"=20'-0"





BASELINE STATION TIES

N.T.S.

LEGEND

- ----98---- EXISTING CONTOUR.
- — — — EXISTING OVERHEAD UTILITY.
- —o—o— SILT FENCE.
- —··—··— EDGE OF STREAM.
- ——— CONSTRUCTION BASELINE
- B2 SOIL BORING
- A-3 ● WETLAND FLAG

SURVEYED BY
DAVID F. BARRASS
LAND SURVEYOR
5 MAPLE STREET
CORINTH, NEW YORK

REVISIONS		
REV.	DATE	DESCRIPTION
0	1/19/15	ISSUED FOR REVIEW
1	2/9/15	MODS. PER TNC REVIEW
2	4/27/15	BID AND CONSTRUCTION
3	5/27/15	ADDTL. BORING LOCATIONS

STATE OF NEW YORK — CARL B. SCHODER — No. 62971 — LICENSED PROFESSIONAL ENGINEER

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DOCUMENT IS A VIOLATION OF SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

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(518) 761-0417, FAX: (518) 761-0513

SCALE:	AS SHOWN	DRAWN BY:	SRA
DATE:	4/27/15	ENG. BY:	JGL
PROJ. NO:	12-474.37	CHK'D BY:	CBS

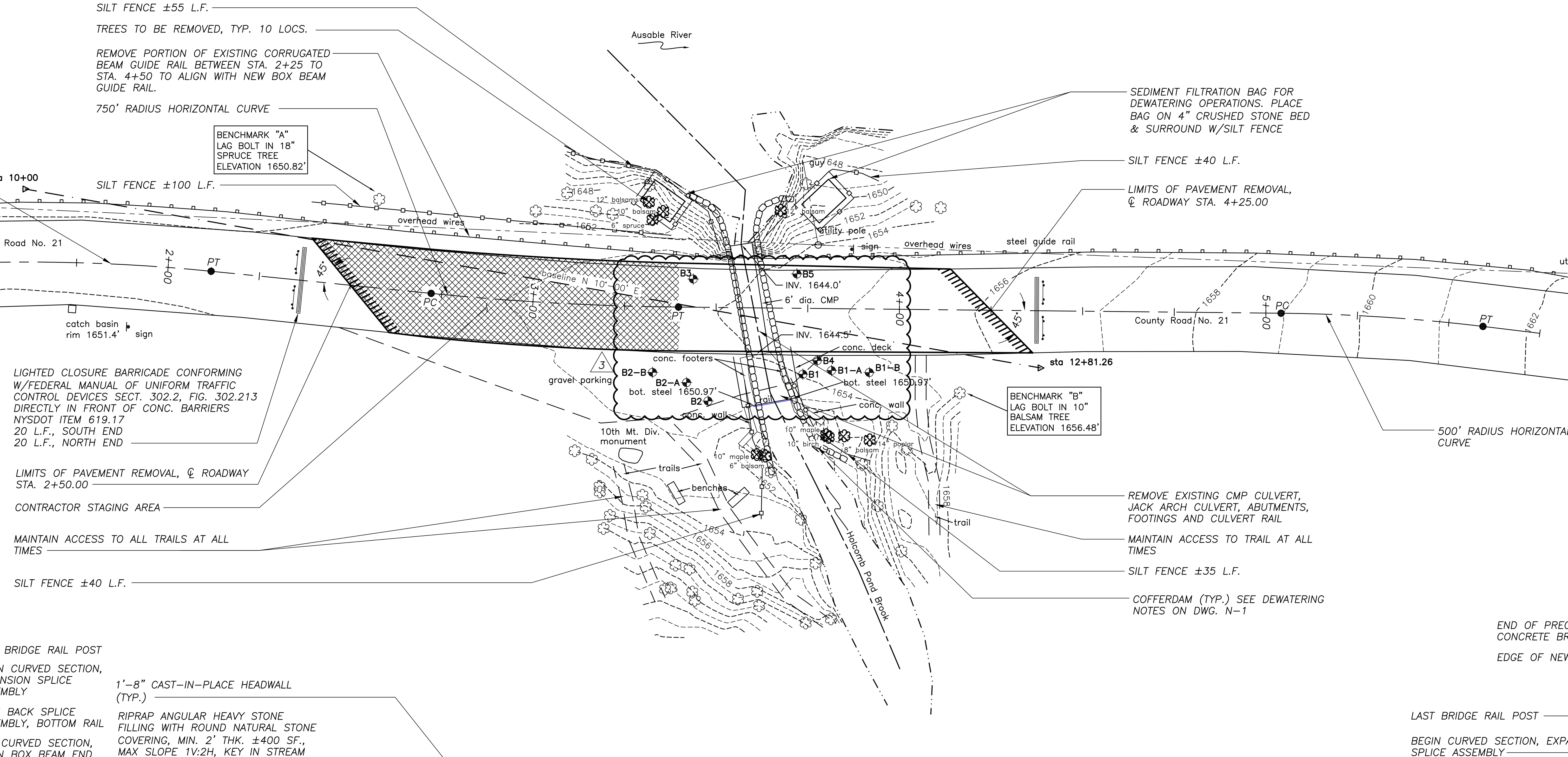
CLIENT NAME
ESSEX COUNTY DEPARTMENT OF PUBLIC WORKS
Elizabethtown, NY

DRAWING TITLE
PRECAST CONCRETE BRIDGE PROJECTS
FEBRUARY, 2015
– PROJECT B –
DEMOLITION & EROSION CONTROL PLAN

DRAWING NO. B/C-1

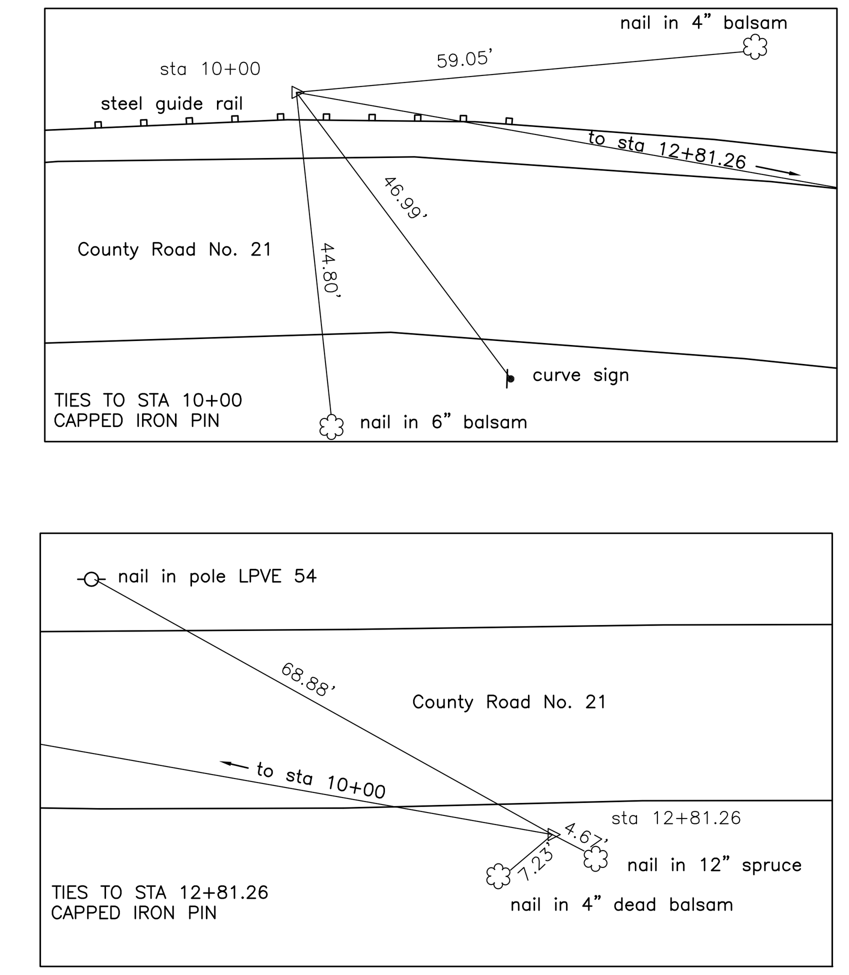
SHT. 10 OF 21

REV. 2



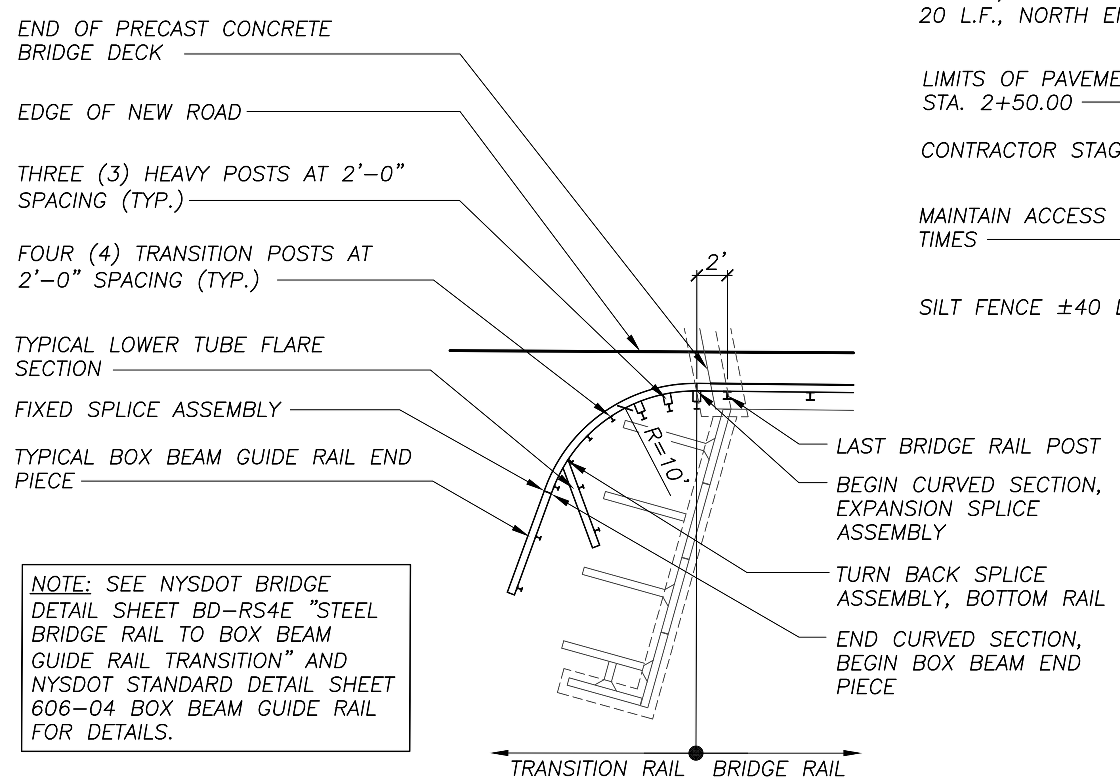
DEMOLITION AND EROSION CONTROL PLAN

1"=20'-0"



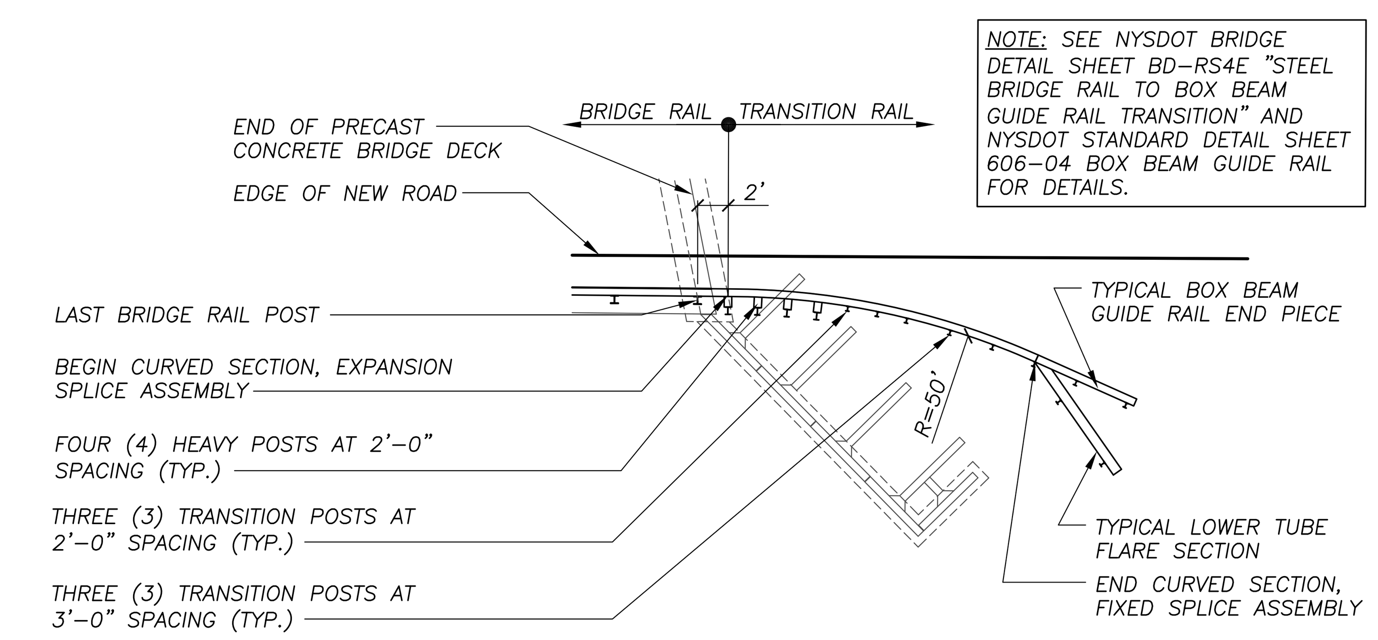
SURVEY BASELINE TIES

N.T.S.



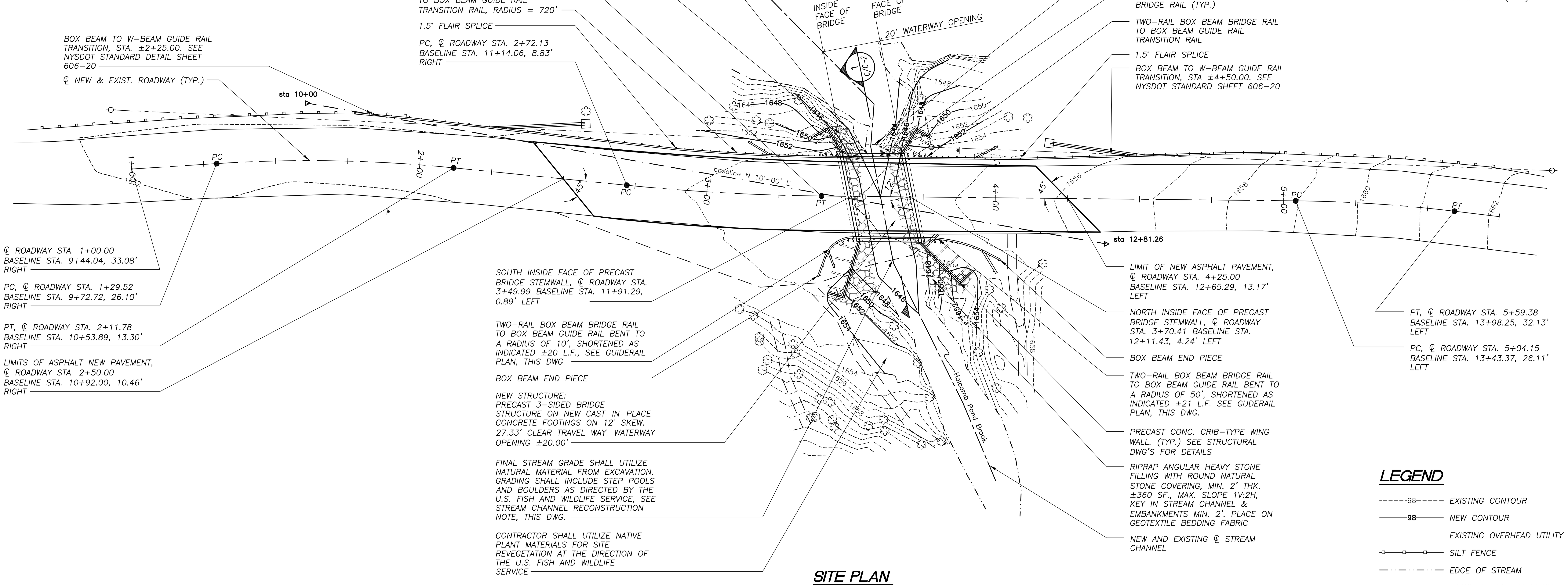
SOUTH EAST TRANSITION RAIL PLAN

1"=10'-0"



NORTH EAST TRANSITION RAIL PLAN

1"=10'-0"



SITE PLAN

1"=20'-0"

LEGEND

----98----	EXISTING CONTOUR
——98——	NEW CONTOUR
— — — —	EXISTING OVERHEAD UTILITY
—o—o—o—	SILT FENCE
—··—··—	EDGE OF STREAM
— — —	CONSTRUCTION BASELINE
B2	SOIL BORING

SURVEYED BY
DAVID F. BARRASS
LAND SURVEYOR
5 MAPLE STREET
CORINTH, NEW YORK

REVISIONS		
REV.	DATE	DESCRIPTION
0	1/19/15	ISSUED FOR REVIEW
1	2/9/15	MODS. PER TNC REVIEW
2	4/27/15	BID AND CONSTRUCTION
3	5/27/15	ADDTL. BORING LOCATIONS

STATE OF NEW YORK · CARL B. SCHODER · No. 62971 · LICENSED PROFESSIONAL ENGINEER

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SCALE: AS SHOWN	DRAWN BY: SRA
DATE: 4/27/15	ENG. BY: JGL
PROJ. NO: 12-474.36	CHK'D BY: CBS

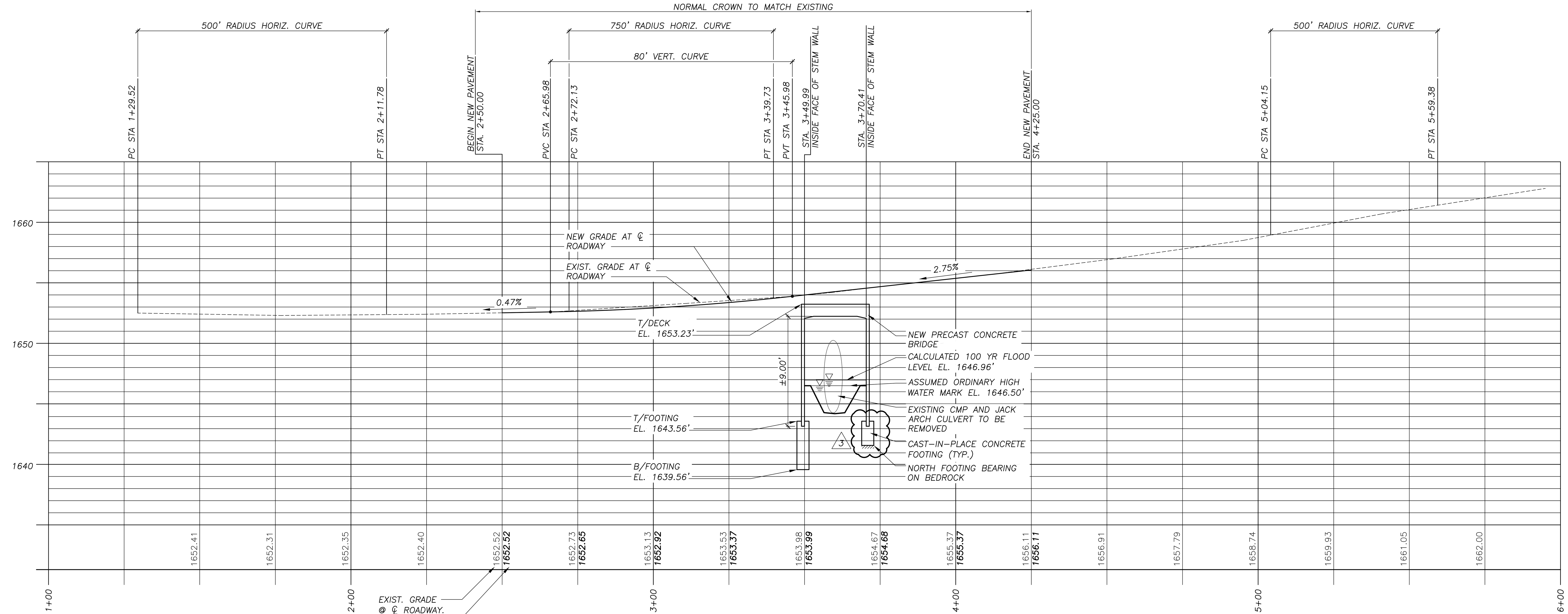
CLIENT NAME
ESSEX COUNTY DEPARTMENT OF PUBLIC WORKS
Elizabethtown, NY

DRAWING TITLE
PRECAST CONCRETE BRIDGE PROJECTS
FEBRUARY, 2015
– PROJECT C –
DEMOLITION & EROSION CTRL PLAN & SITE PLAN

DRAWING NO. C/C-1

SHT. 16 OF 21

REV. 2

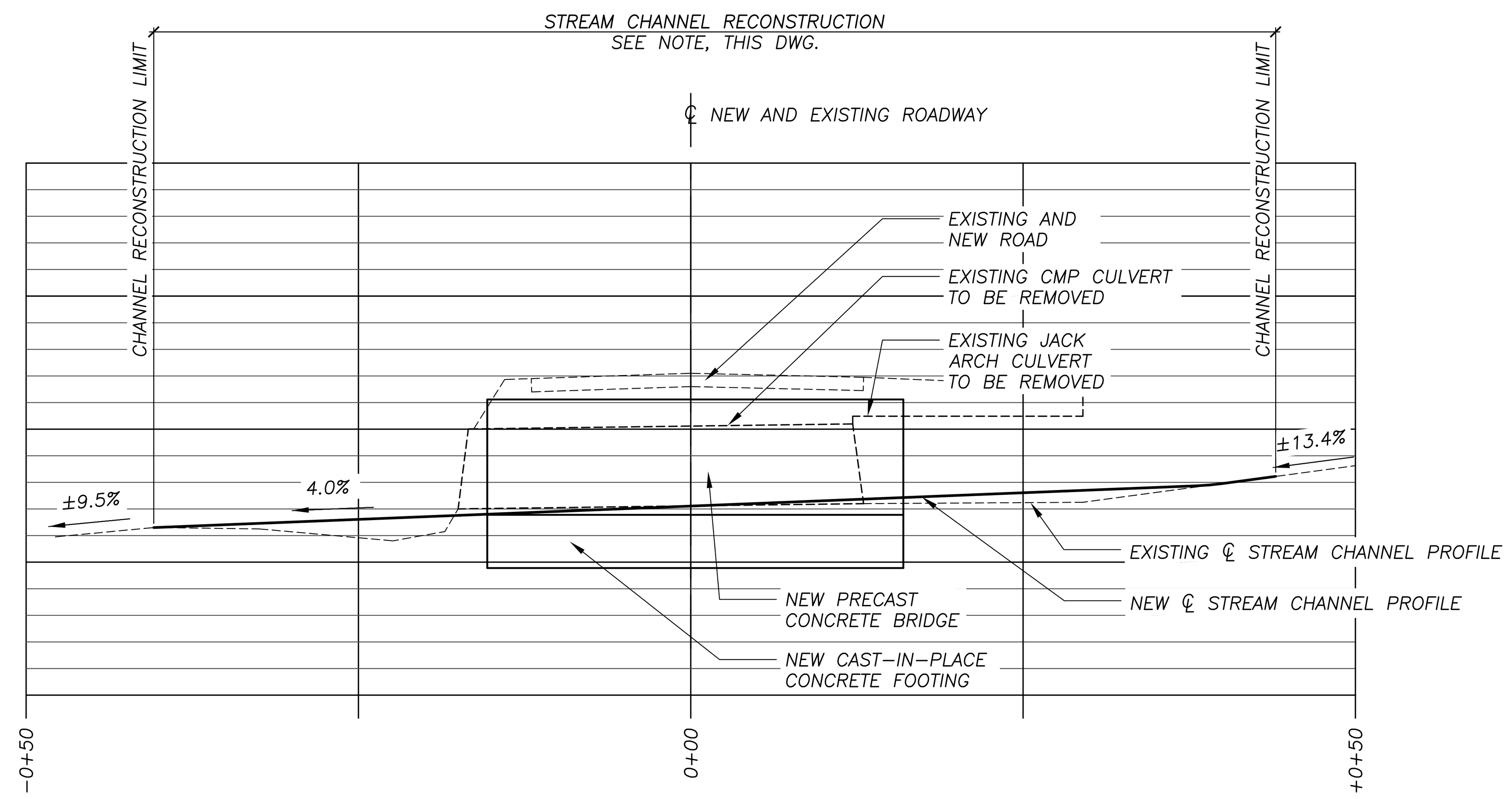


ROADWAY CENTERLINE PROFILE

1"=20' HORIZ.
1"=5' VERT.

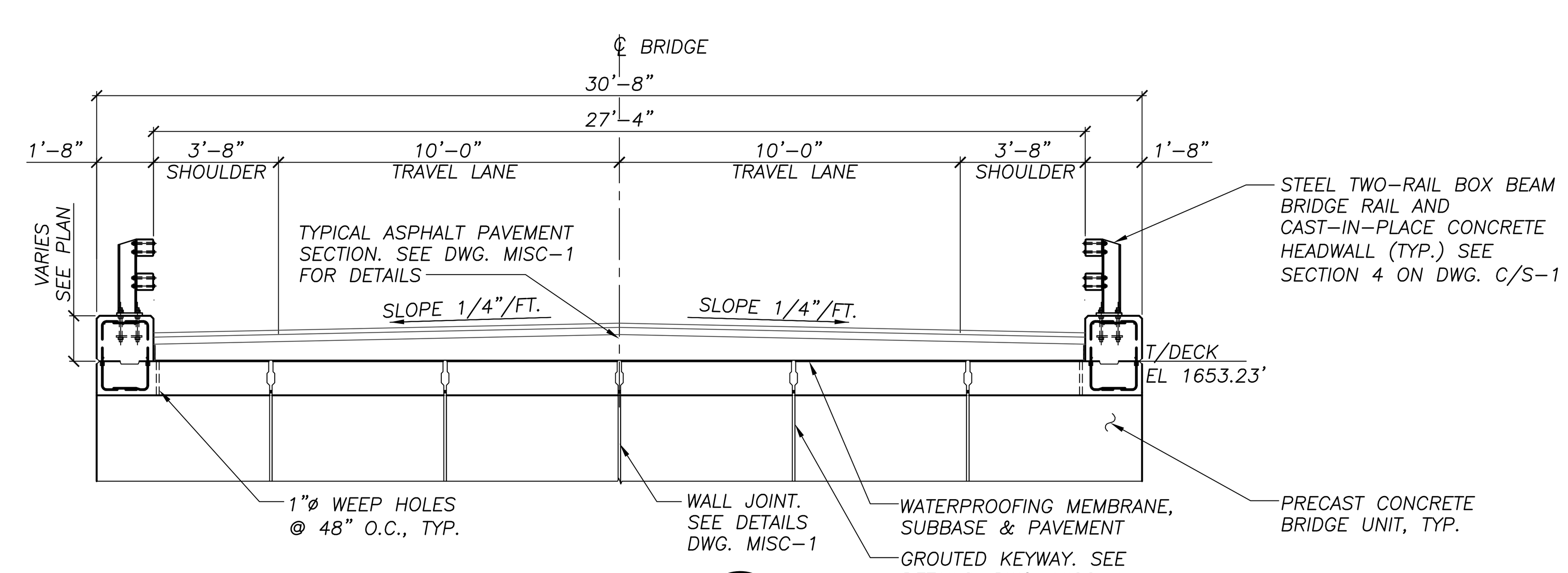
STREAM CHANNEL RECONSTRUCTION NOTE

1. THE CONTRACTOR SHALL INCLUDE IN HIS BID THE COST FOR REGRADING OF THE STREAM CHANNEL WITHIN THE LIMITS INDICATED. FINAL DESIGN FOR CHANNEL RECONSTRUCTION SHALL BE PROVIDED BY THE U.S. FISH AND WILDLIFE SERVICE AND SHALL INCLUDE THE INSTALLATION OF UP TO SIX (6) SHALLOW STEP POOLS AND UP TO (5) LARGE (3/4 CU. YD.) NATURAL ROUNDED STONE BOULDERS IN THE RECONSTRUCTED REACH. SEE TYPICAL CHANNEL SECTION, THIS DWG.



STREAM CHANNEL PROFILE

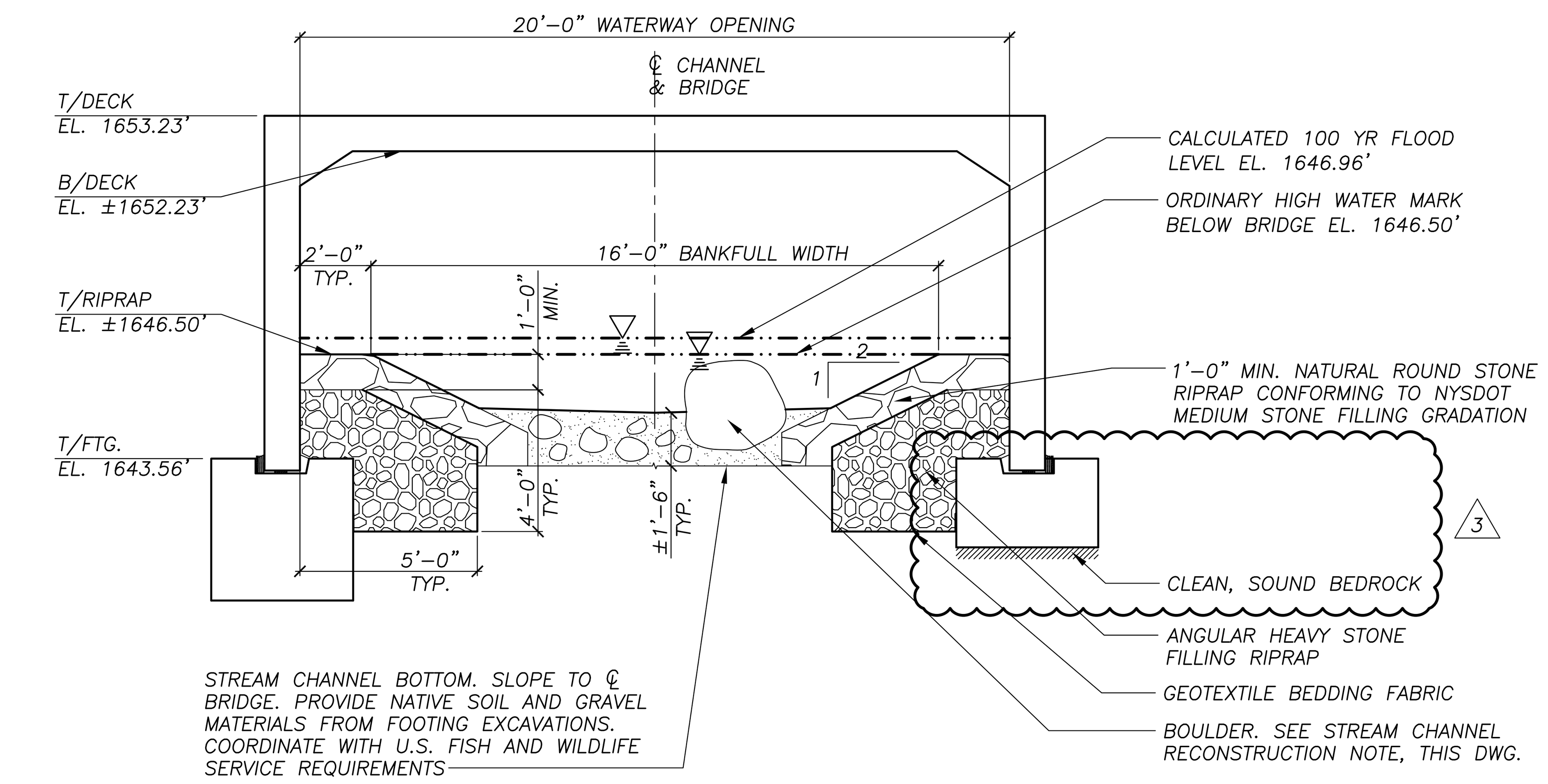
1"=10'



SECTION

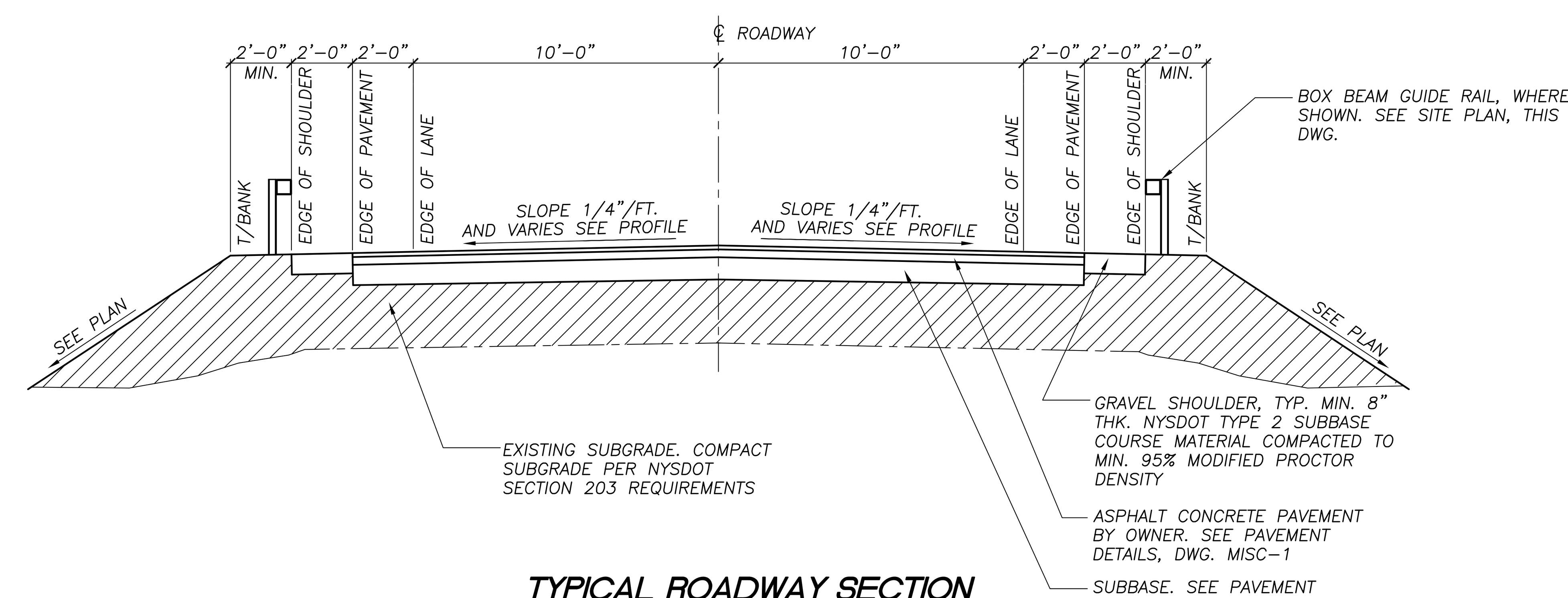
1"=4'

1
C/C-2



STREAM CHANNEL SECTION AT BRIDGE

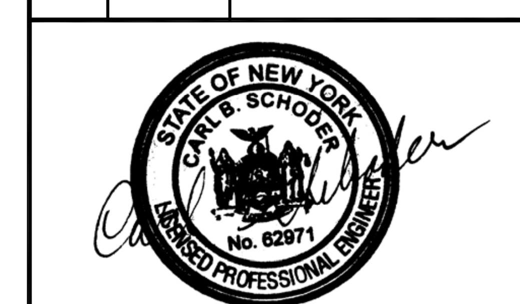
1"=4'



TYPICAL ROADWAY SECTION

1"=4'

REVISIONS		
REV.	DATE	DESCRIPTION
0	1/19/15	ISSUED FOR REVIEW
1	2/9/15	MODS. PER TNC REVIEW
2	4/27/15	BID AND CONSTRUCTION
3	5/27/15	MODS. TO NORTH FOOTING



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Elizabethtown, NY

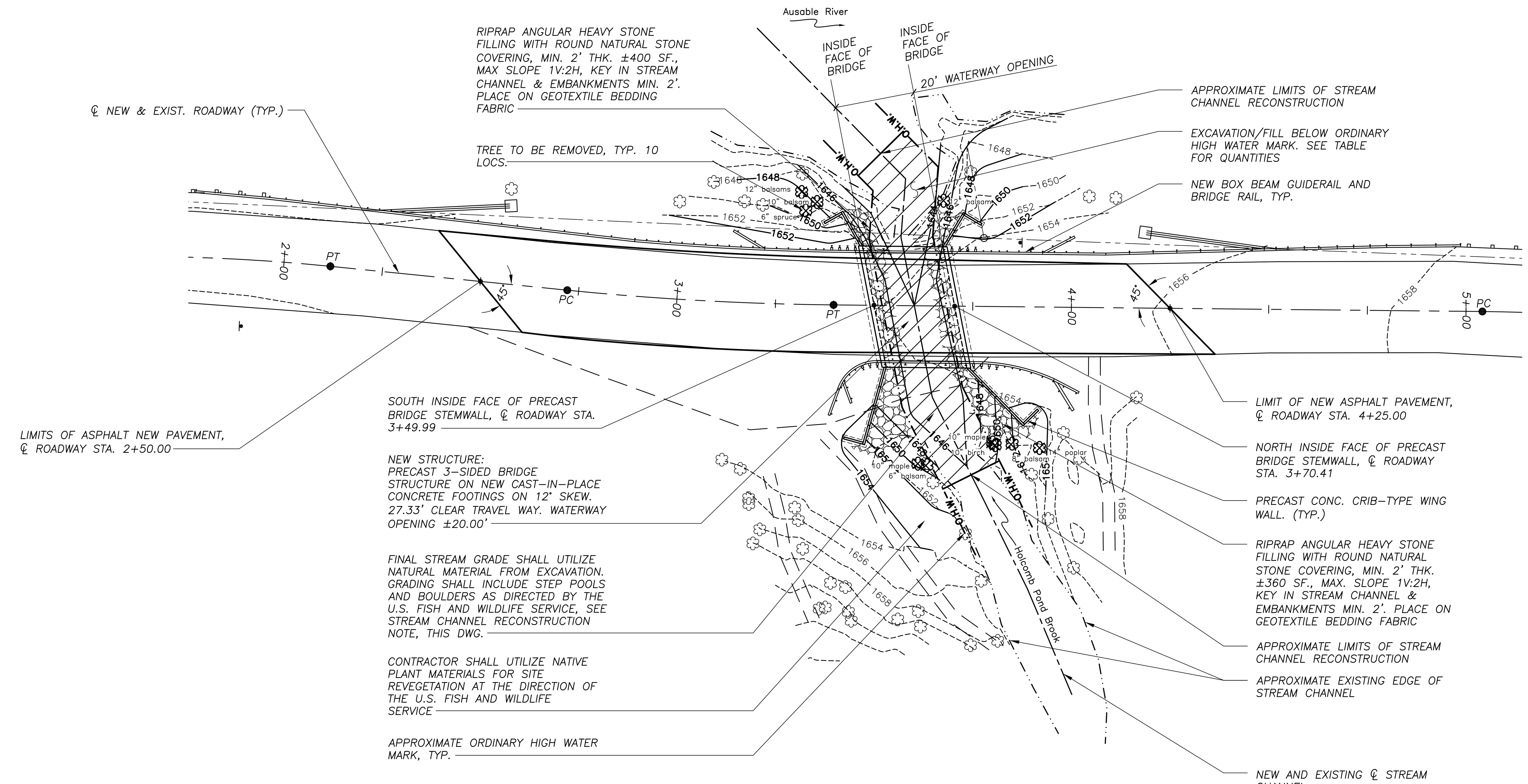
DRAWING TITLE
PRECAST CONCRETE BRIDGE PROJECTS
FEBRUARY, 2015
– PROJECT B –

PROFILES & SECTIONS

DRAWING NO.
C/C-2

SHT. 17 OF 21
REV. 2

NORTH



SITE PLAN

1"=20'-0"

WETLAND PROTECTION NOTE

1. THE PROJECT SITE WAS VISITED BY ADIRONDACK PARK AGENCY STAFF ON 9/26/14. STAFF NOTED THAT THERE ARE NO WETLANDS PRESENT AT THE SITE.

STREAM CHANNEL RECONSTRUCTION NOTE

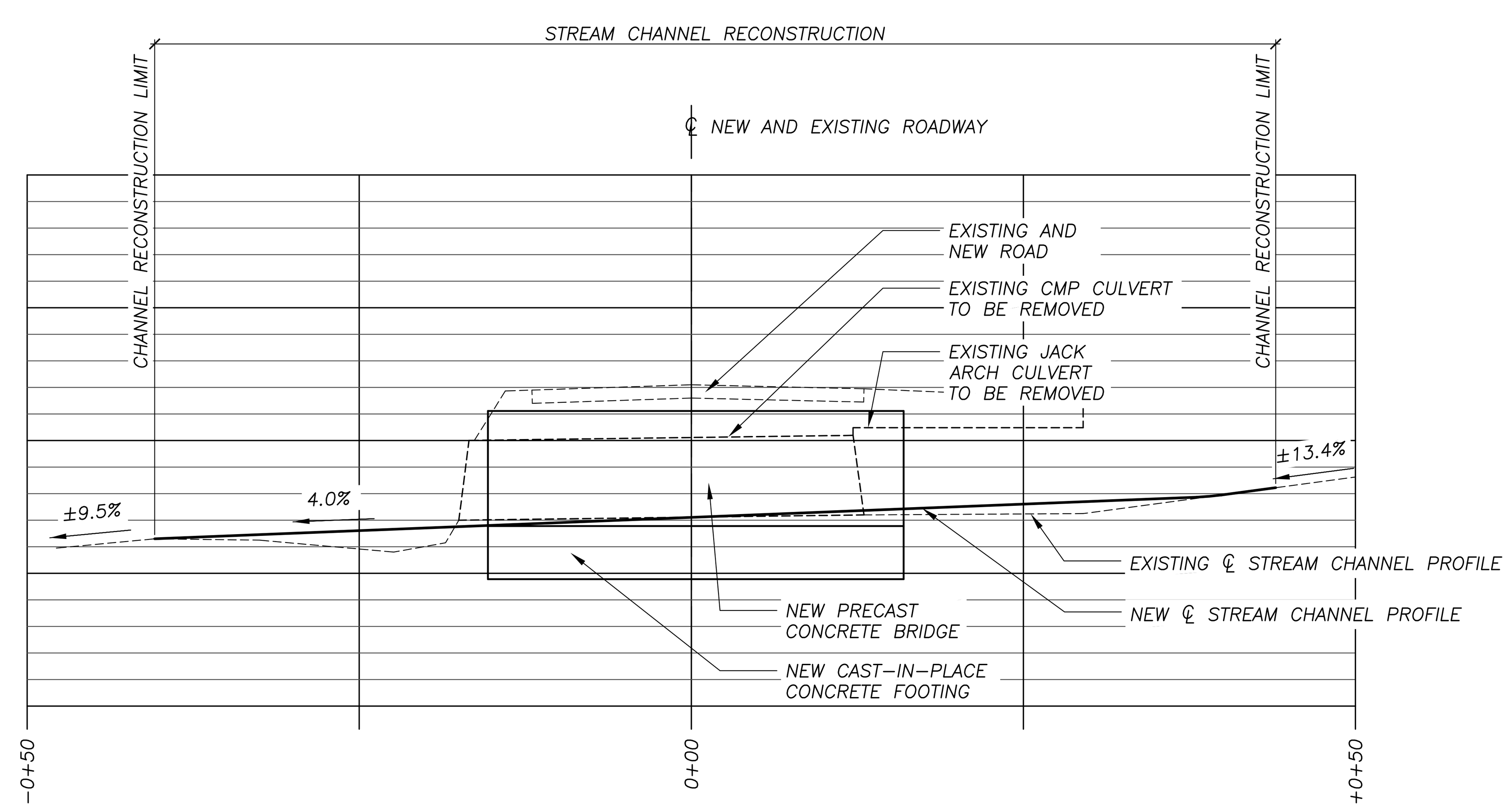
1. THE CONTRACTOR SHALL INCLUDE IN HIS BID THE COST FOR REGRADING OF THE STREAM CHANNEL WITHIN THE LIMITS INDICATED. FINAL DESIGN FOR CHANNEL RECONSTRUCTION SHALL BE PROVIDED BY THE U.S. FISH AND WILDLIFE SERVICE AND SHALL INCLUDE THE INSTALLATION OF UP TO SIX (6) SHALLOW STEP POOLS AND UP TO (5) LARGE (3/4 CU. YD.) NATURAL ROUNDED STONE BOULDERS IN THE RECONSTRUCTED REACH. SEE TYPICAL CHANNEL SECTION, THIS DWG.

APPROXIMATE EARTHWORK QUANTITIES BELOW ORDINARY HIGH WATER MARK

		UPSTREAM OF BRIDGE	BELOW BRIDGE	DOWNSTREAM OF BRIDGE	TOTAL
EXCAVATION		10 cu. yd.	64 cu. yd.	13 cu. yd.	87 cu. yd.
FILL	RIPRAP	3 cu. yd.	50 cu. yd.	3 cu. yd.	56 cu. yd.
	STREAM BED MATERIAL	4 cu. yd.	14 cu. yd.	5 cu. yd.	23 cu yd.

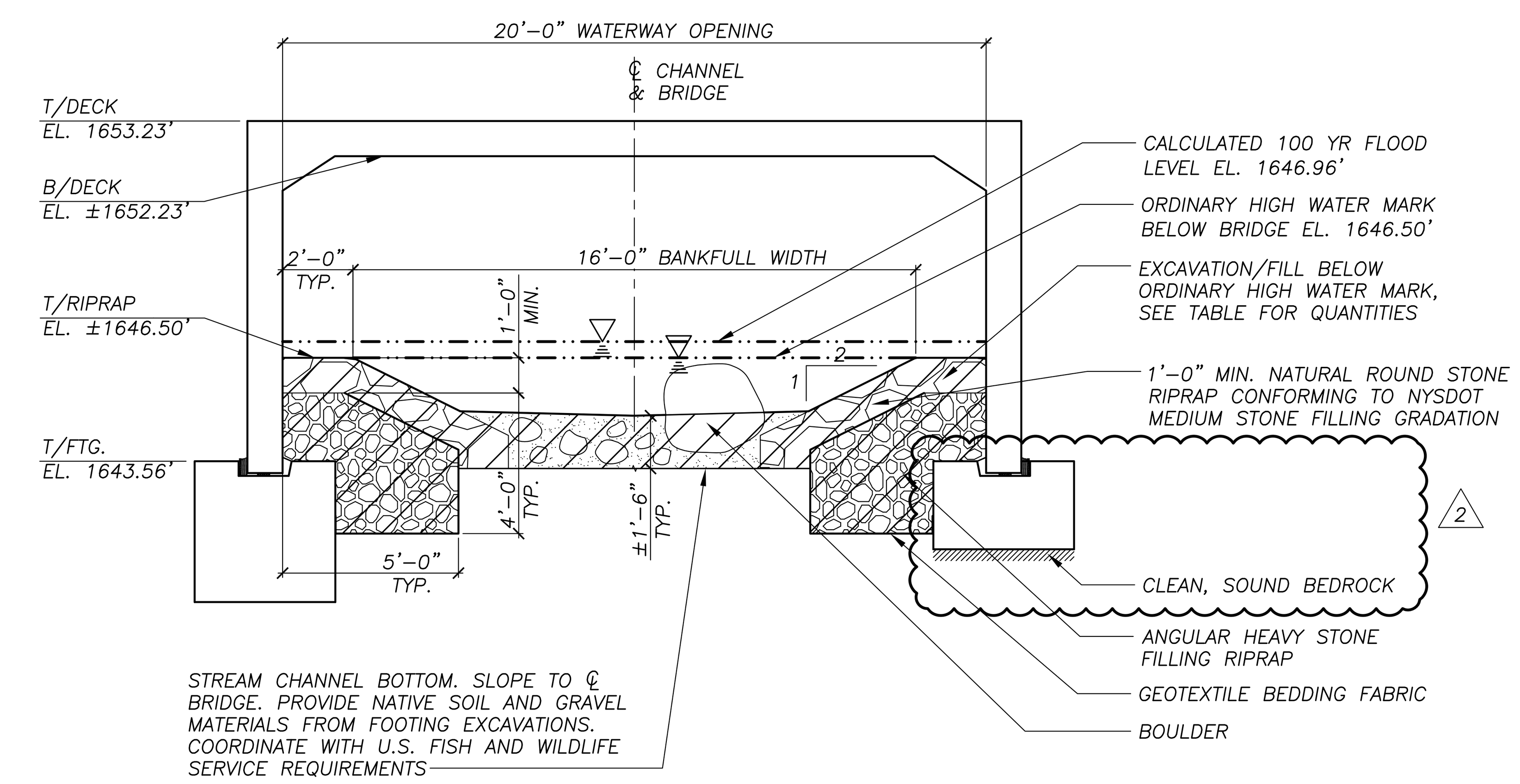
LEGEND

- ----98---- EXISTING CONTOUR
- ——98—— NEW CONTOUR
- ———— EXISTING OVERHEAD UTILITY
- —·—·— EDGE OF STREAM



STREAM CHANNEL PROFILE

1"=10'



STREAM CHANNEL SECTION AT BRIDGE

1"=4'

REVISIONS		
REV.	DATE	DESCRIPTION
0	3/25/15	ISSUED FOR REVIEW
1	4/27/15	BID AND CONSTRUCTION
2	5/27/15	MODS. TO NORTH FOOTING

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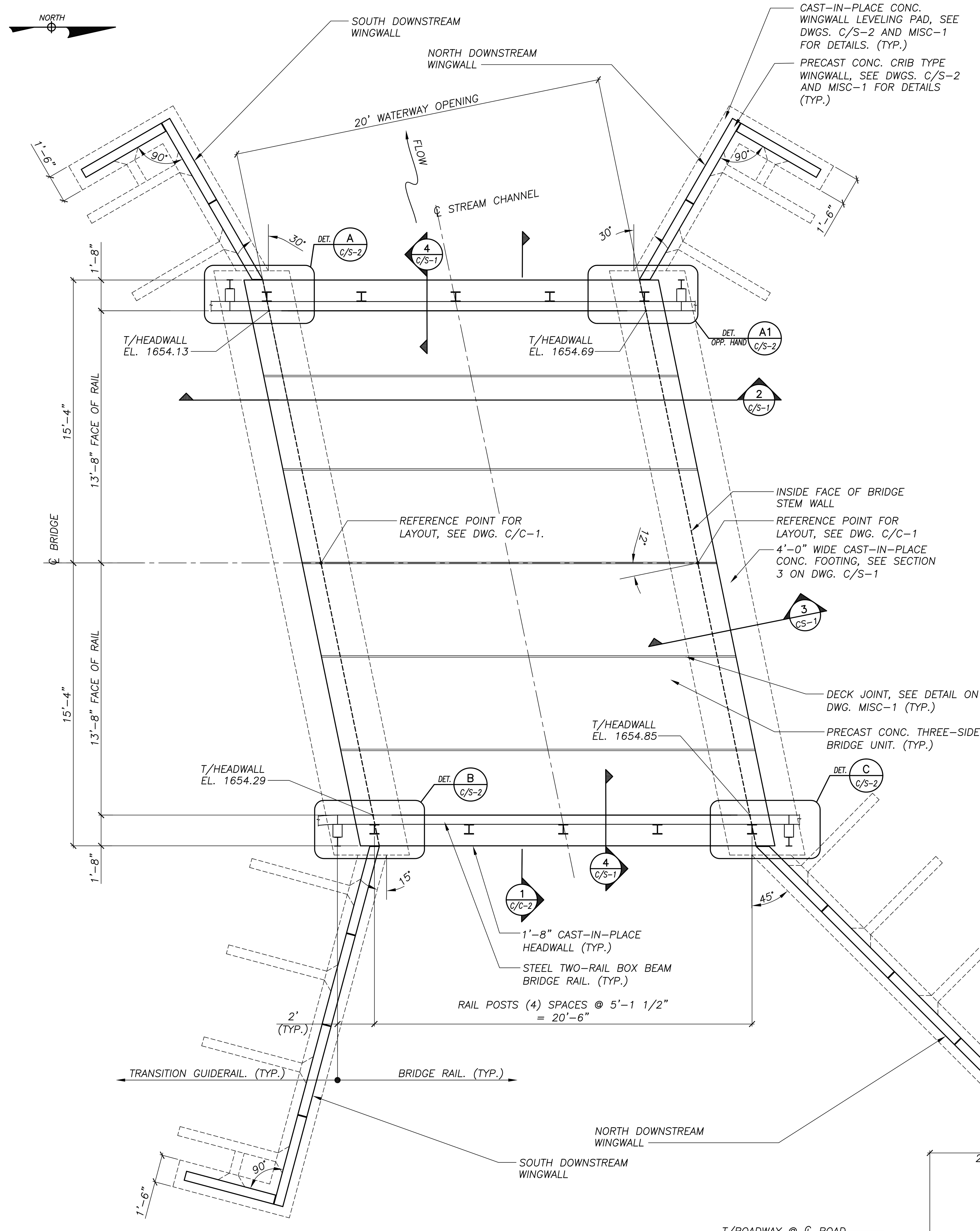
DATE: 4/27/15	ENG. BY: JGL
PROJ. NO: 12-474.36	CHK'D BY: CBS

CLIENT NAME
ESSEX COUNTY DEPARTMENT OF PUBLIC WORKS
Elizabethtown, NY

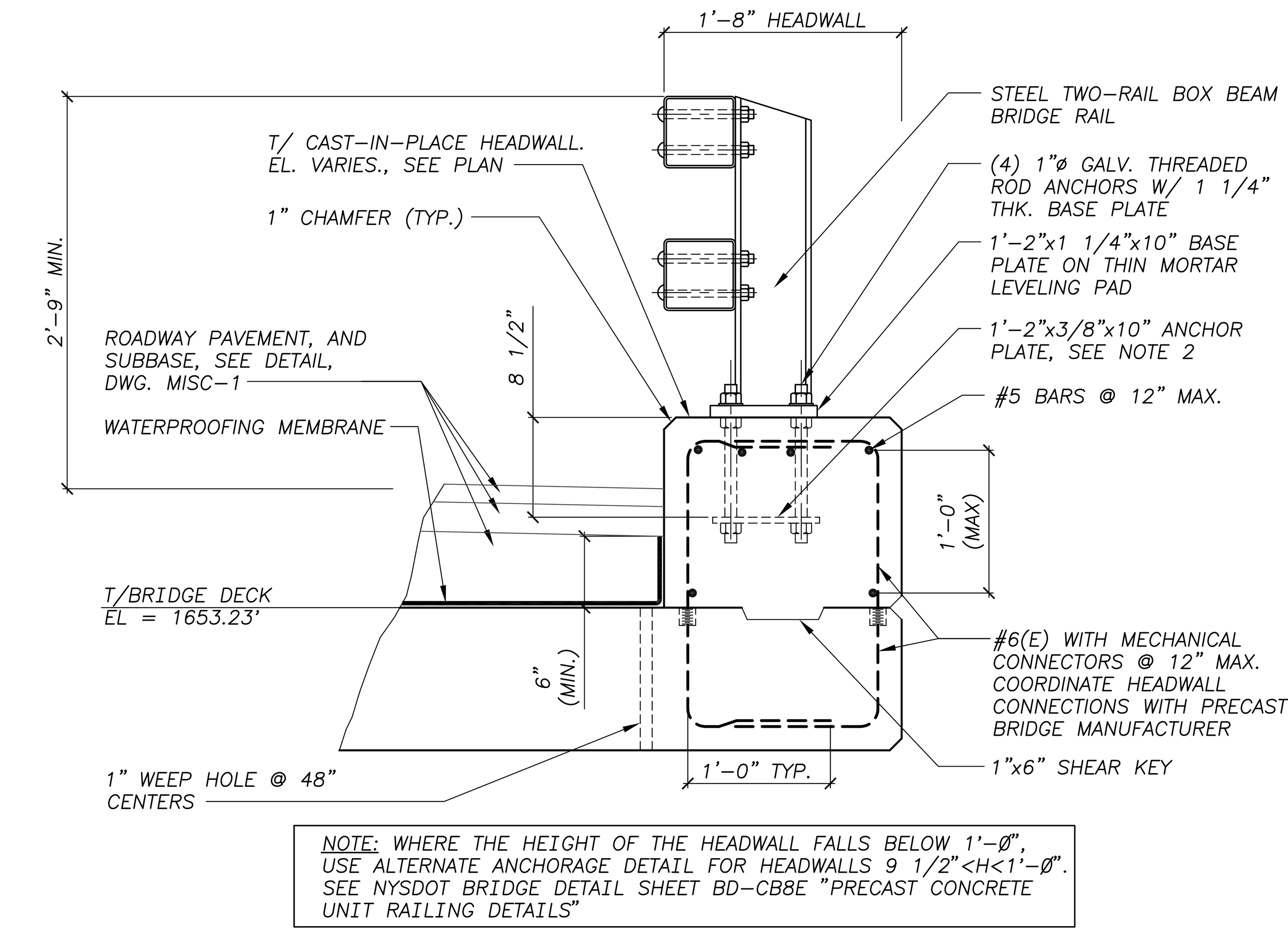
DRAWING TITLE
RIVER RD. (CR21) OVER HOLCOMB POND OUTLET BRK. BRIDGE REPLACEMENT
U.S. ARMY CORPS OF ENGINEERS PERMIT DRAWING

SURVEYED BY
DAVID F. BARRASS
LAND SURVEYOR
5 MAPLE STREET
CORINTH, NEW YORK

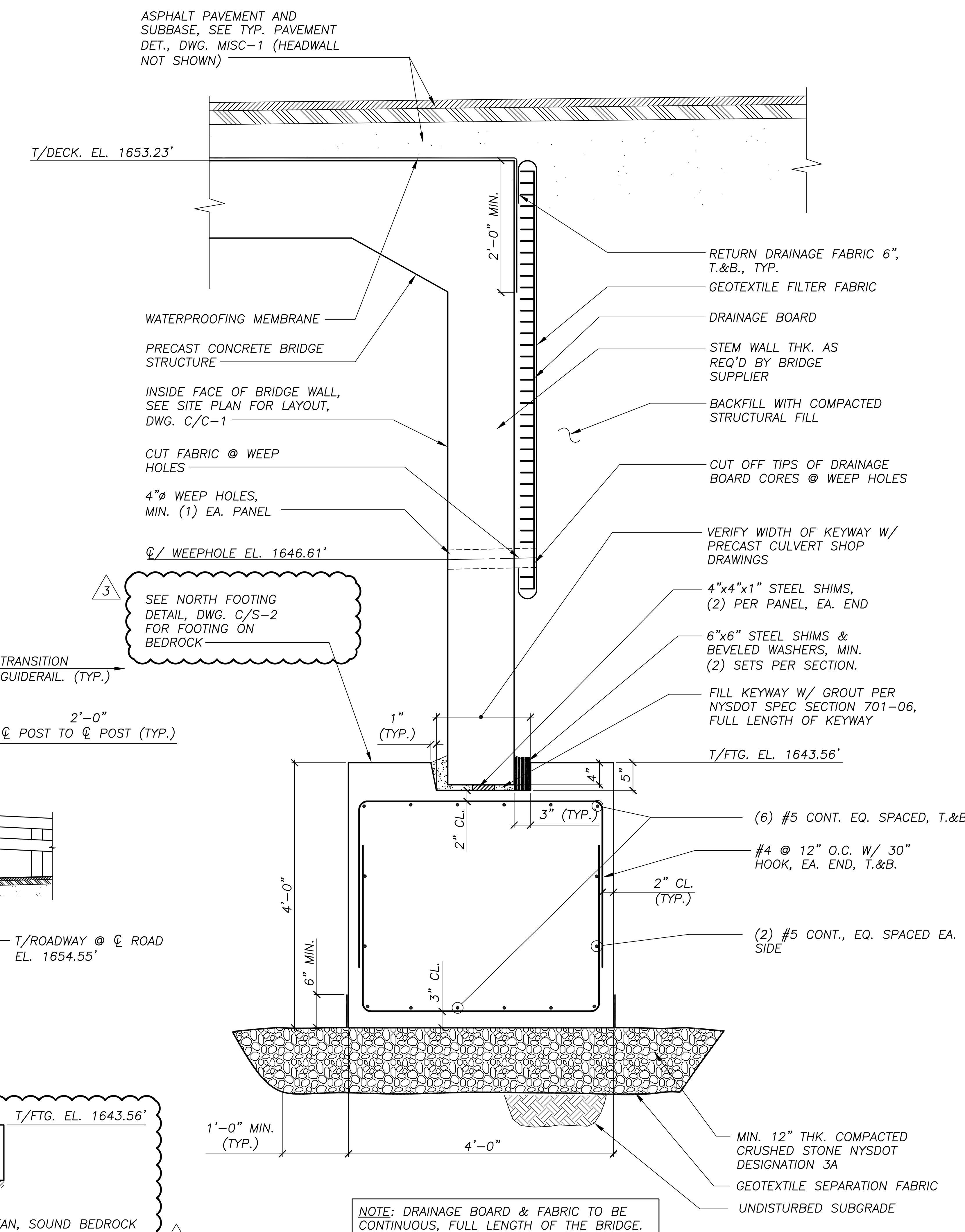
DRAWING NO. C/COE-1
SHT. 20 OF 21
REV. 1



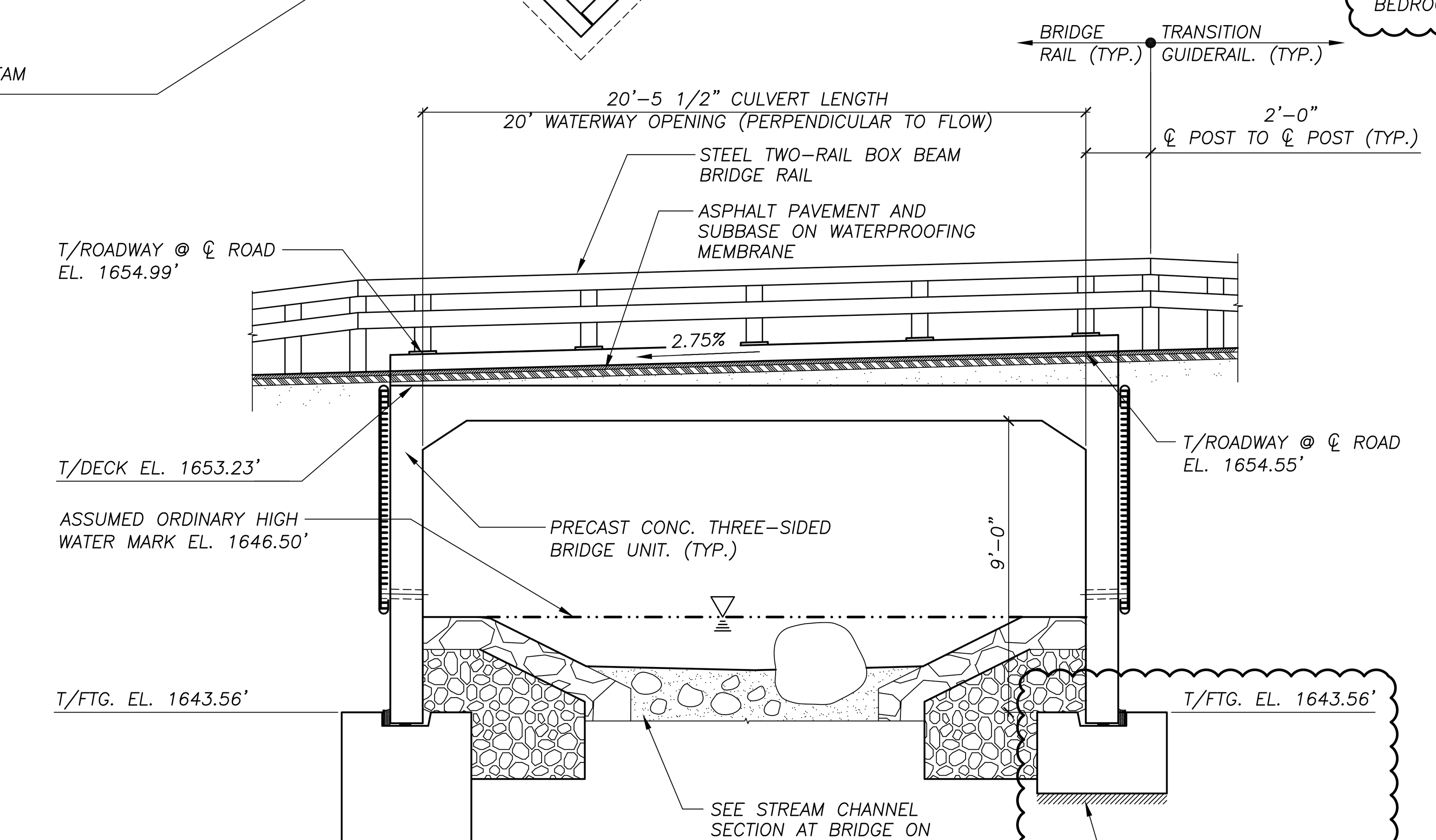
BRIDGE PLAN
1/4"=1'-0"



SECTION 4 (C/S-1)
1"=1'-0"



SECTION 3 (C/S-1)
3/4"=1'-0"



SECTION 2 (C/S-1)
1/4"=1'-0"

REVISIONS		
REV.	DATE	DESCRIPTION
0	1/19/15	ISSUED FOR REVIEW
1	2/9/15	MODS. PER TNC REVIEW
2	4/27/15	BID AND CONSTRUCTION
3	5/27/15	MODS. TO NORTH FOOTING

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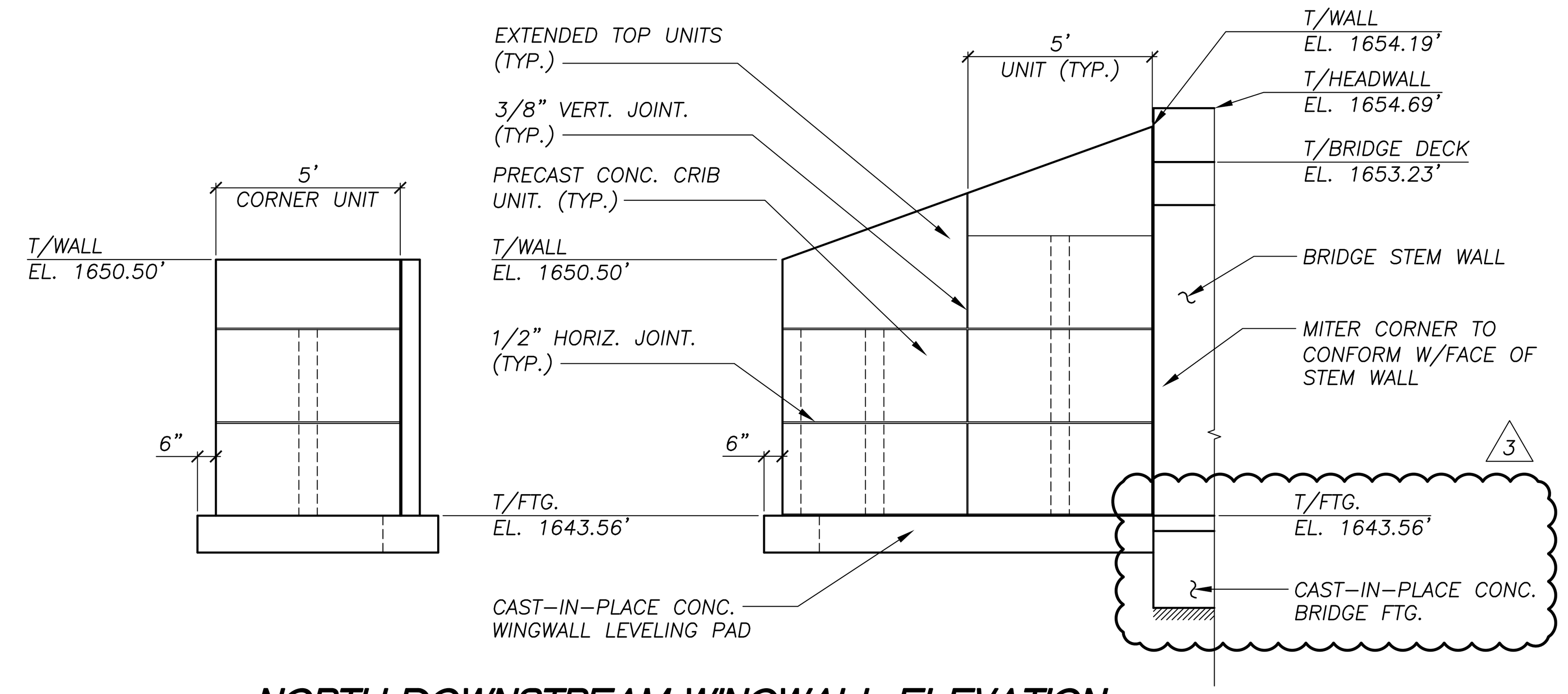
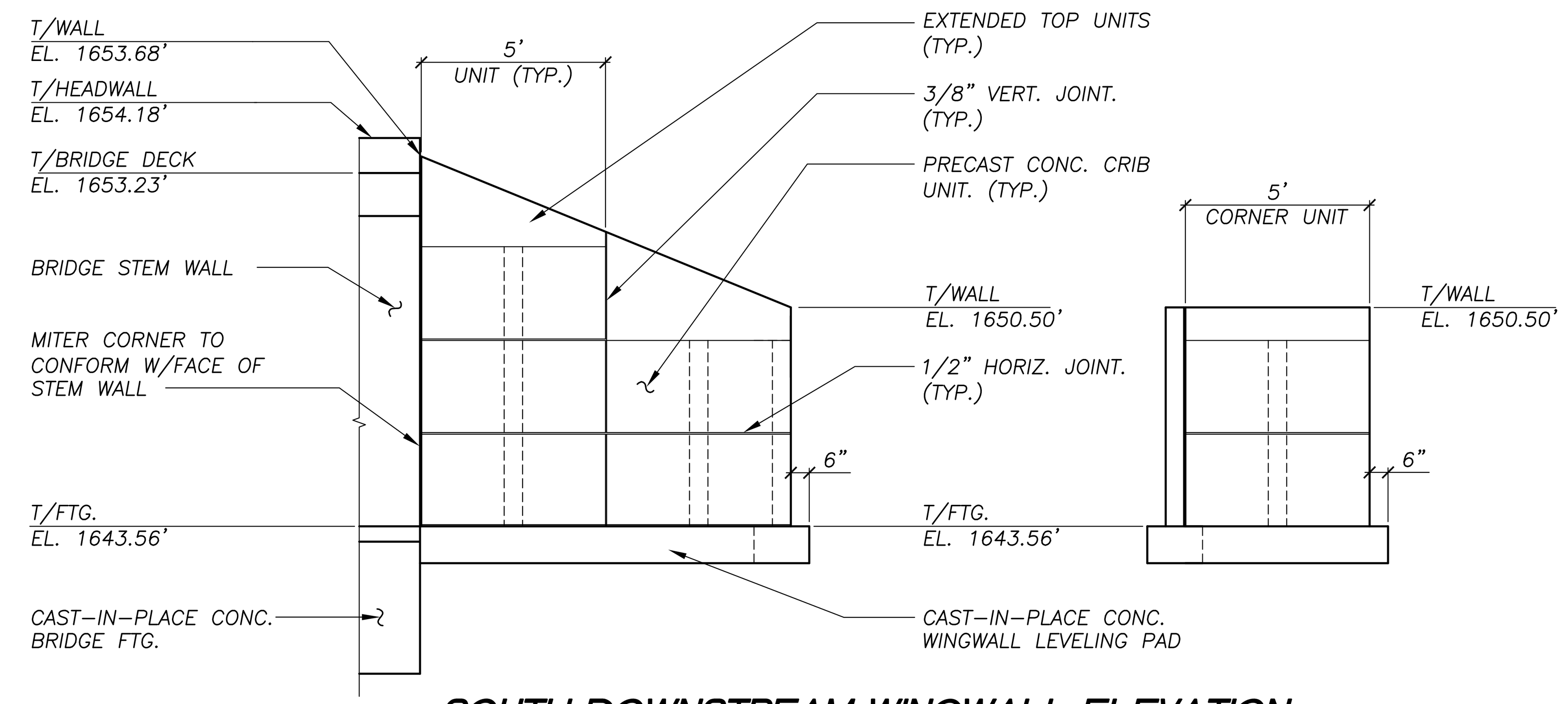
CLIENT NAME
ESSEX COUNTY DEPARTMENT OF PUBLIC WORKS
Elizabethtown, NY

DRAWING TITLE
PRECAST CONCRETE BRIDGE PROJECTS
FEBRUARY, 2015
– PROJECT C –
CULVERT PLAN & SECTIONS

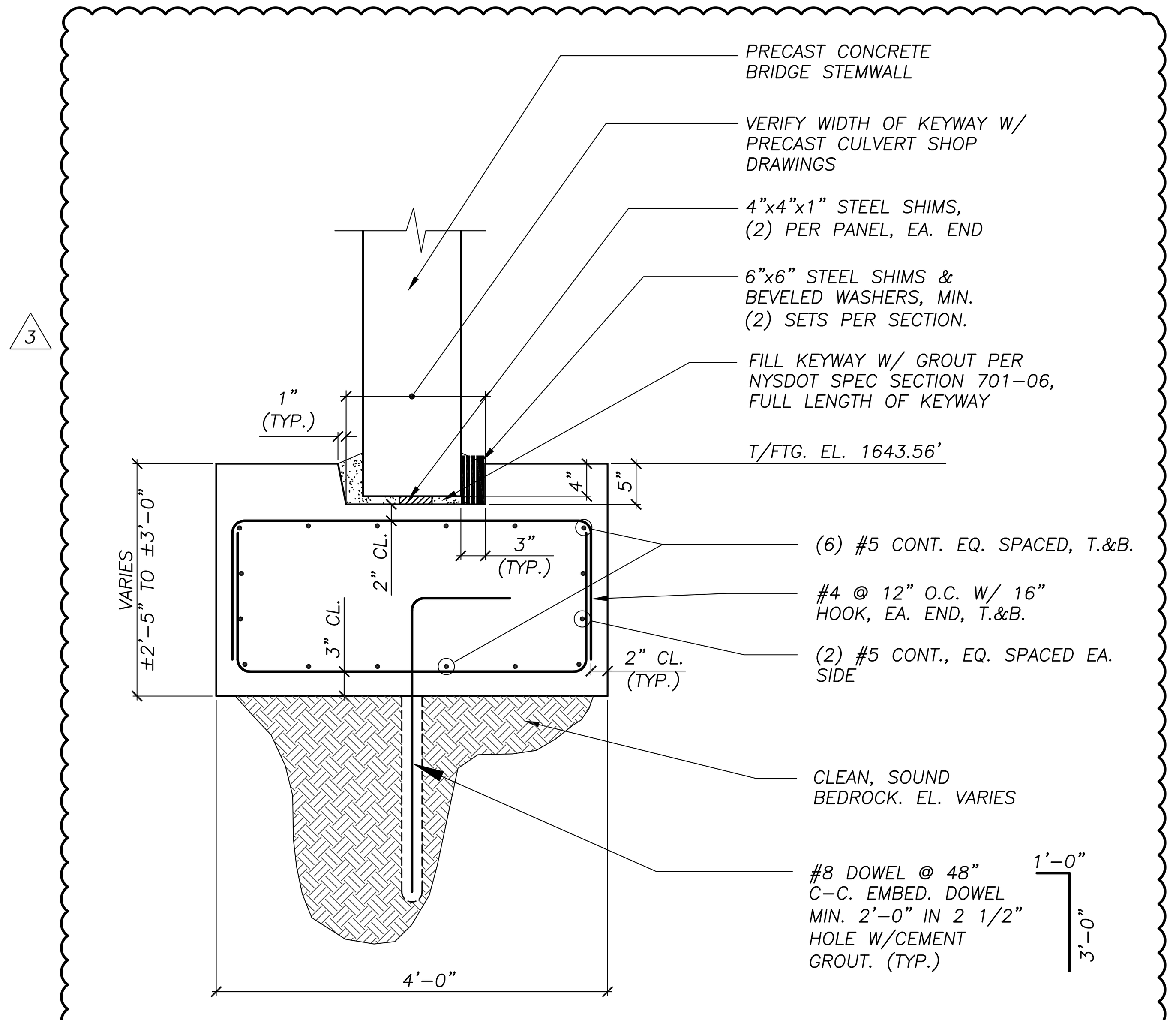
DRAWING NO. C/S-1
SHT. 18 OF 21
REV. 3



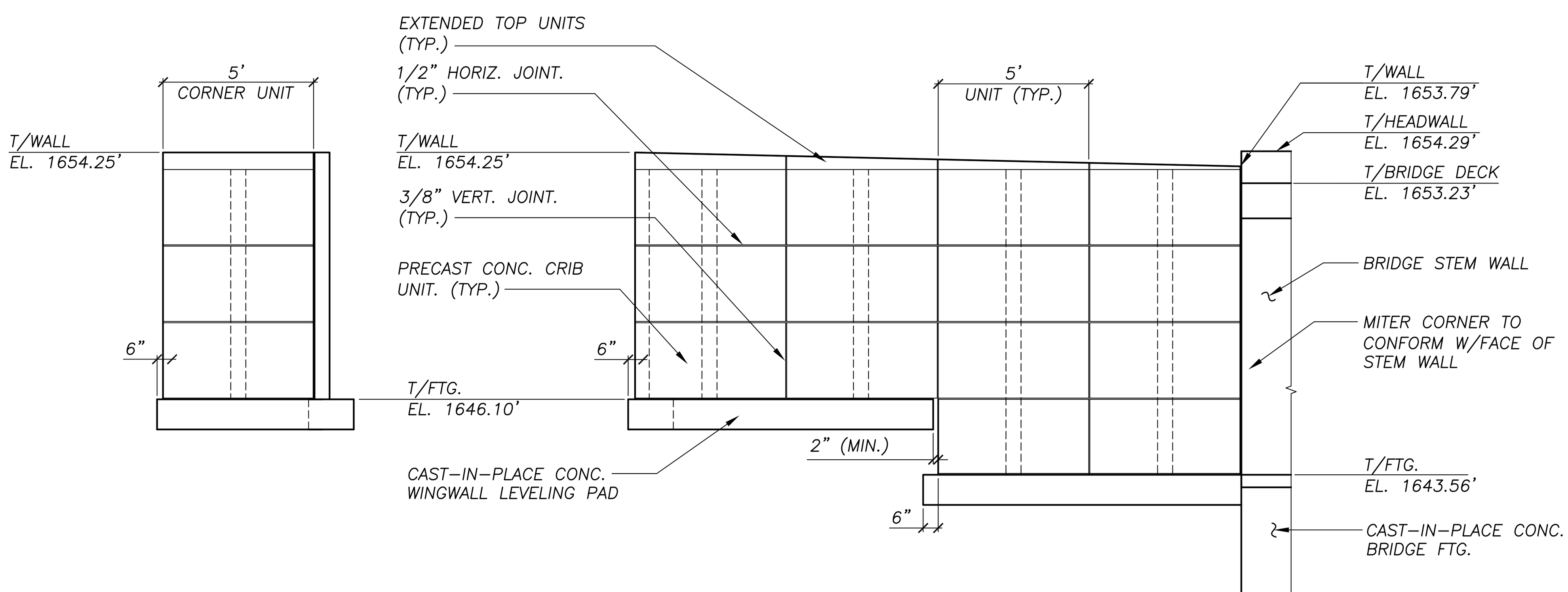
NORTH DOWNSTREAM WINGWALL ELEVATION
1/4"=1'-0"



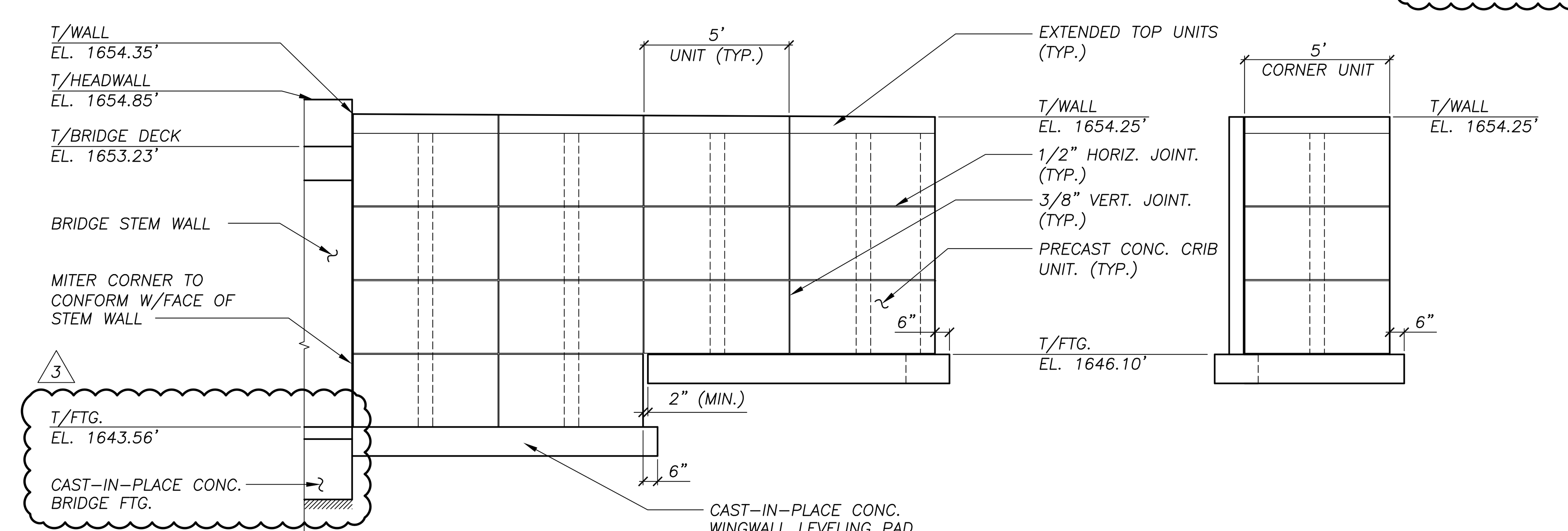
SOUTH DOWNSTREAM WINGWALL ELEVATION
1/4"=1'-0"



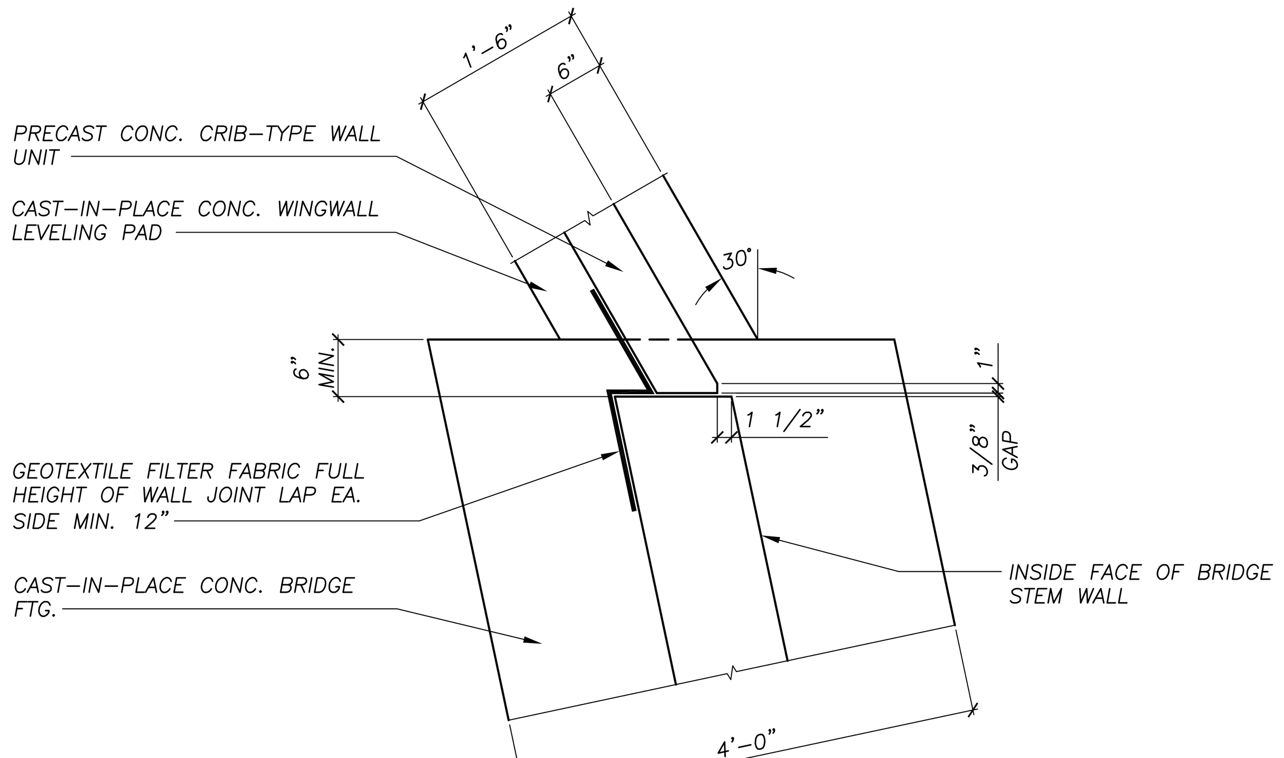
NORTH FOOTING DETAIL
3/4"=1'-0"



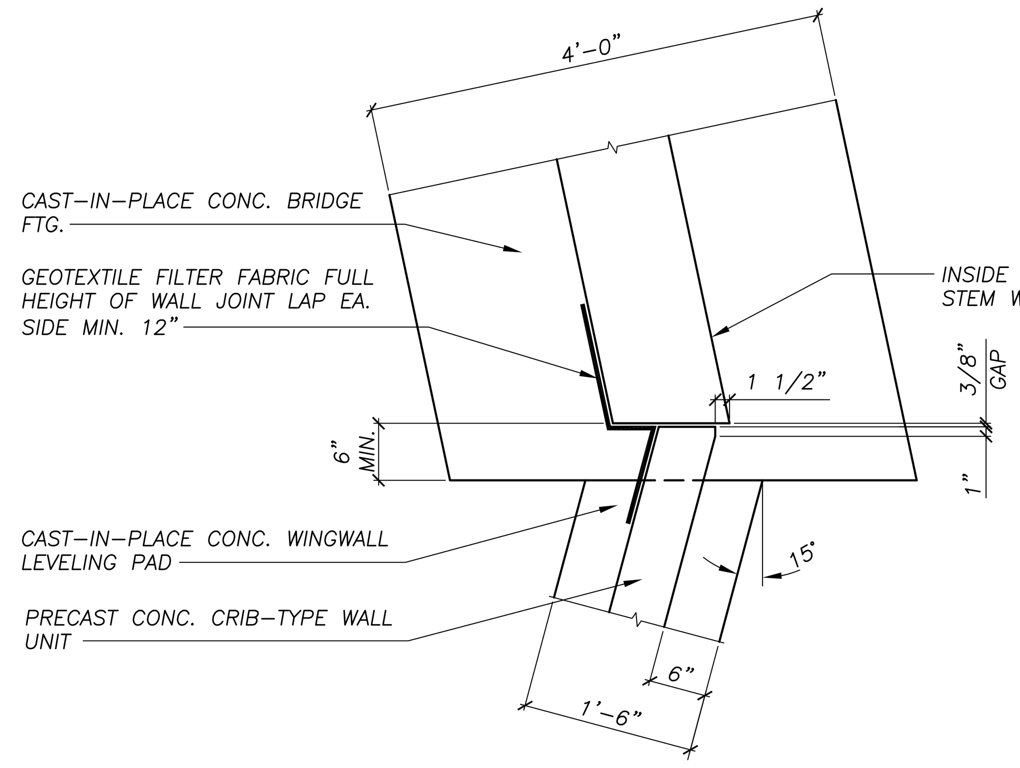
SOUTH UPSTREAM WINGWALL ELEVATION
1/4"=1'-0"



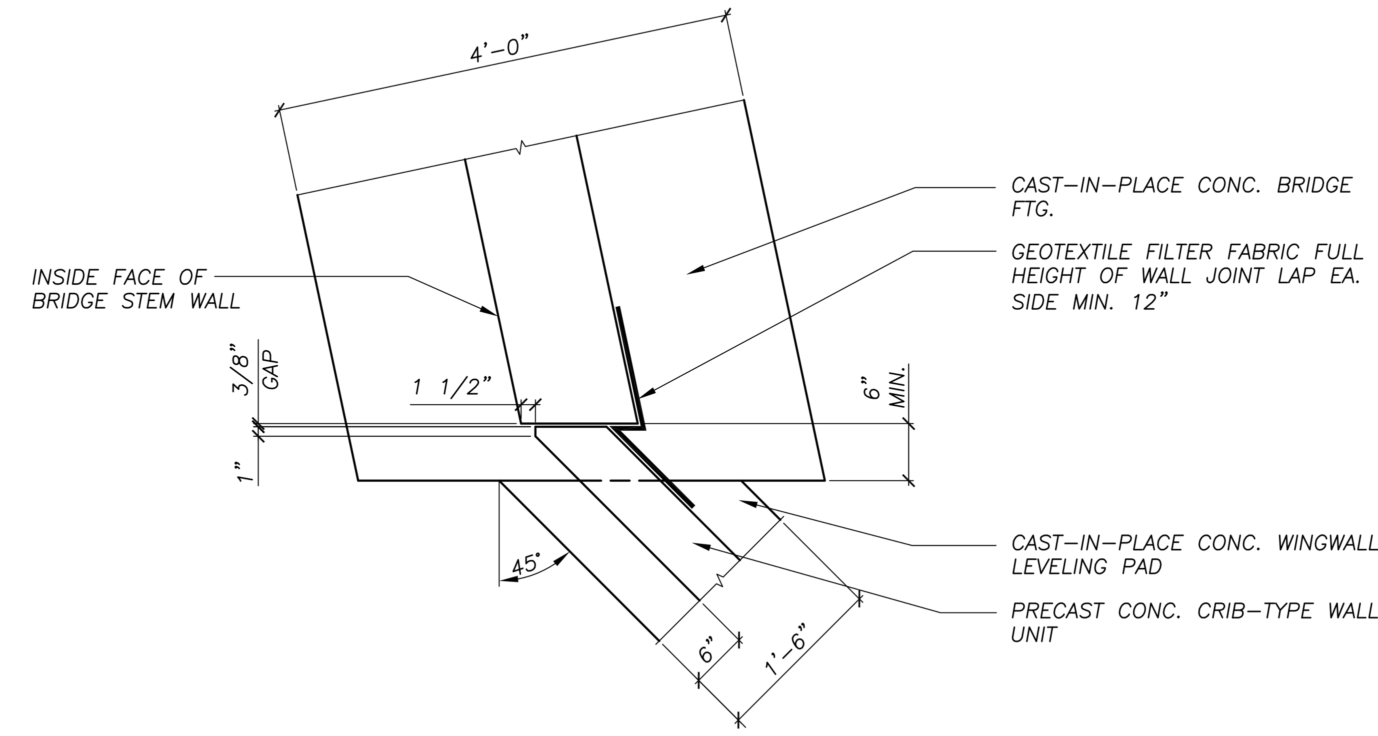
NORTH UPSTREAM WINGWALL ELEVATION
1/4"=1'-0"



DETAIL (A) (A1) C/S-2 C/S-2
3/4"=1'-0"



DETAIL (B) C/S-2
3/4"=1'-0"



DETAIL (C) C/S-2
3/4"=1'-0"

REVISIONS

REV.	DATE	DESCRIPTION
0	1/19/15	ISSUED FOR REVIEW
1	2/9/15	MODS. PER TNC REVIEW
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3	5/27/15	MODS. TO NORTH FOOTING

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Elizabethtown, NY

DRAWING TITLE
PRECAST CONCRETE BRIDGE PROJECTS
FEBRUARY, 2015
– PROJECT C –
WINGWALL ELEVATIONS & DETAILS

DRAWING NO. C/S-2

SHT. 19 OF 21
REV. 3