

Bid Requirements and Specifications for

**Erie Canal Park and Preserve  
Trail Boardwalk and Bridge Construction**

NYS Contract No: C1000546

Department of Public Works  
Town of Pittsford  
Monroe County  
New York

Dated: February 13, 2020

**BID OPENING: March 3, 2020 at 11:00am at Pittsford Town Hall**



**Department  
of State**

This document was prepared with funding provided by the New York State Department of State under Title 11 of the Environmental Protection Fund.

## **PROJECT SUMMARY**

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Project Title                Erie Canal Park and Preserve Trail Boardwalk and Bridge Construction  
NYS Contract ID            C1000546

### **PROJECT DESCRIPTION**

The project consists of the construction of a modular pedestrian boardwalk and a pedestrian bridge as part of the Erie Canal Park and Preserve Project. The project scope includes installation of a modular pedestrian boardwalk, pedestrian bridge, associated helical piles, cast in place concrete abutment walls, boulder wing walls, and rough site grading.

### **PROJECT OWNER**

**Town of Pittsford**                Paul Schenkel  
   Commissioner of Public Works  
   11 South Main Street  
   Pittsford, NY 14534  
   (585) 248-6250

### **PROJECT DESIGN**

Landscape Architecture        Sue Steele Landscape Architecture, PLLC  
   9 Summit Street  
   Fairport, NY 14450  
   (585)747-9996  
   steele.la

Contact: Sue R. Steele, RLA, Owner

### **Environmental**

RAVI Engineering & Land Surveying PC  
2110 South Clinton Avenue #1  
Rochester, NY 14618  
(585) 223-3660  
ravieng.com

Contact: Mike Bogardus, LS, Survey Department Manager  
   Jim MacKecknie, PG, Environmental Engineer

## **PROJECT TYPE**

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This is a LUMP SUM contract and includes bid alternate(s) 1-2.

A lump sum bid shall be submitted for the basic scope of services for each of the following alternates:

### **ADD ALTERNATE No. 1: Ipe Decking in Lieu of Pressure Treated Lumber at Bridge**

Construction of modular decking panels and toe kick for the bridge to be constructed with Ipe hardwood. If not accepted the modular decking panels and toe kick shall be constructed with pressure treated lumber as specified.

### **ADD ALTERNATE No. 2: Ipe Decking in Lieu of Pressure Treated Lumber at Boardwalk**

Construction of modular decking panels and toe kick for the boardwalk to be constructed with Ipe hardwood. If not accepted the modular decking panels and toe kick shall be constructed with pressure treated lumber as specified.

## **CONTRACT DOCUMENTS**

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- A. NYSDOT Standard Specifications (US Customary Units) Vol 1-4, January 1, 2020 and Addendums
- B. Contract Proposal Book for the Erie Canal Park and Preserve Boardwalk and Bridge Construction
- C. Contract Proposal Form for the Erie Canal Park and Preserve Boardwalk and Bridge Construction
- D. Contact Drawings for the Erie Canal Park and Preserve Boardwalk and Bridge Construction

## **WORK BY OTHERS**

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The intent of the 'Work by Others' portion of the Project Summary section is to advise the prospective Bidder of any anticipated work to be done by others for informational and coordination purposes. The information is furnished solely for the convenience of the Contractor, without a warrant expressed or implied as to its accuracy or completeness.

- A. **Site Preparation:** Stabilized construction access route, tree removals, clearing and grubbing, installation of temporary erosion controls and temporary tree protection fencing will be completed by the Town of Pittsford.
- B. **Site Grading:** Final site grading to be complete by the Town of Pittsford. Contractor only responsible for earthwork and backfill associated with proposed concrete abutment walls and stone wing walls.
- C. **Seed Establishment:** Establishment of lawn and wetland seed schedules will be completed by the Town of Pittsford.

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## **PART 1 GENERAL INFORMATION, INSTRUCTIONS, AND BID REQUIREMENTS**

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### PURPOSE OF BID:

The Town of Pittsford (“Town”) intends to secure the services of an experienced and properly equipped contractor (“Contractor”) to construct a pedestrian bridge and pedestrian boardwalk. The contract award will be based on low bid price from a responsible and qualified bidder; submission of required bonds and insurance; and full compliance with these Requirements and Specifications. The Town reserves the right to reject any bid should the Commissioner of Public Works (“Commissioner”) determine that it is in the Town’s best interest to do so.

### GENERAL INFORMATION AND INSTRUCTIONS FOR BIDDERS:

1. All bidders should review carefully the contents of this document. All of the Requirements and Specifications in this document will become part of the agreement to be signed by the Town and the successful bidder.
2. The Contractor shall include all labor, materials, equipment services and transportation to locate the building on the site designated with all other work
3. Work shall be performed as necessary and required for the construction of the structures as indicated. The bridge and boardwalk shall be as dimensioned with all features and as per specification
4. The final pages of this document contain the “Bid Proposal Form” and “Non-Collusive Bidding Certificate”. The Bid Sheet needs to be completed and returned to confirm the amount of the bid. All exceptions to the specifications should be carefully noted on the bid sheet. The Non-Collusive Bidding Certificate is a document required by the General Municipal Law of the State of New York and is to be signed and returned with the Bid Sheet.
5. All bids must be sealed and be addressed to the “Commissioner of Public Works” and be marked “Pittsford Erie Canal Park and Preserve Erie Canal Park and Preserve Boardwalk and Bridge Construction Bid”.
6. Bids may be mailed or personally delivered to the Commissioner at the Pittsford Town Hall, 11 South Main Street, Pittsford, New York 14534. All bids must be received by the Commissioner by the date and time set for the bid opening noted on the cover sheet of this document.
7. All bids submitted shall remain good for a period of sixty (60) days from the date of bid opening.
8. The Town reserves the right to reject any bid for non-compliance with these Requirements and Specifications and/or to waive informalities.
9. All bids, at the earliest, will be presented to the Town Board at its March 17, 2020 meeting, for consideration. Immediately following an award of bid by the Town Board, the successful bidder will be notified, by letter from the Commissioner. The Commissioner’s letter will include an agreement, to be signed by the successful bidder and returned to the Town, together with the required Insurance Certificates and

## **PART 1 GENERAL INFORMATION, INSTRUCTIONS, AND BID REQUIREMENTS**

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performance bond. The signed agreement, Insurance Certificates and performance bond must be received, by the Town, within ten (10) days

10. Additional information may be obtained from Paul Schenkel, Commissioner of Public Works at (585) 248-6250. Informal and informational responses will not be binding on the Town. Formal requests for interpretations of these Requirements and Specifications must be made in writing to the Commissioner at least five (5) days before bid opening.

### **RESPONSIBLE BIDDER QUALIFICATIONS:**

The contractor is made aware that some specifications utilized on this project require specialized experience. The contractor is required to submit qualifications along with the bid proposal form. Contractor must provide written certification that it has 5 or more years' experience under the same name. Contractor must provide written references with contact information for at least five completed timber frame structures. This material will be utilized in evaluating the lowest responsible bidder. The following specifications require contractor qualifications.

- A. Modular Boardwalk Fabrication
- B. Helical Pile Installer

The Town reserves the right to reject any bid where the bidder cannot satisfy the Town as to ability to perform.

All workmen shall be skilled and qualified for the work that they perform. All materials used, unless otherwise specified, shall be new and of the types and grades specified.

### **EXECUTION OF AGREEMENT:**

Within ten (10) days after written notice has been given to the successful bidder (hereafter "Contractor") that the agreement has been awarded, the Contractor shall execute an agreement incorporating all of the terms, conditions of these "Bid Requirements and Specifications" and the "Bid Sheet" submitted by the Contractor, together with any and all required performance bond and insurance certificates. In the event that the Contractor shall fail to complete the above, the Contractor's bid will be deemed withdrawn and the bid security forfeited to the Town.

### **PERFORMANCE BOND:**

At the time of agreement execution, the Contractor shall furnish a performance bond in the amount of \$5,000.00, in a form and by a company acceptable to the Commissioner, to secure the full, faithful, and timely performance of the terms, conditions and specifications of the agreement.

### **SAFETY, INDEMNITY AND INSURANCE:**

The Contractor shall render performance in a manner such that all persons and property are protected at all times. The Town specifically reserves the right to suspend or terminate (at the Town's option) all performance under this agreement in the event that the Contractor and/or the

## **PART 1 GENERAL INFORMATION, INSTRUCTIONS, AND BID REQUIREMENTS**

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Contractor's employees or subcontractors are proceeding in a manner that threatens the life, health or safety of any of Contractor's employees, subcontractor's employees, Town employees or members of the public. This reservation of rights by the Town in no way obligates the Town to inspect the safety practices of the Contractor.

The Contractor shall protect, indemnify and hold harmless, including payment for all attorney's fees and court costs, the Town, its officers, agents, and/or employees, from any liability, cost, loss or damage on account of any injury to person or property or both, arising from the Contractor's performance. The Contractor shall defend, at the Contractor's own expense, all suits which may be brought to recover damages arising from the Contractor's performance, including any and all suits or actions brought against the Town, its officers, agents, and/or employees.

At all times during the life of the agreement, the Contractor shall procure and maintain insurance, at the Contractor's expense, for liability for damages, costs and/or claims with insurance companies authorized to do business in New York State, such policies to embrace all operations performed under the Agreement by the Contractor. More particularly, the Contractor shall procure and maintain the kind and amounts of insurance as follows:

1. WORKERS' COMPENSATION INSURANCE: As required by New York State law.
2. MOTOR VEHICLE LIABILITY INSURANCE: Each policy shall cover the Contractor and the Town of Pittsford, as "additional insured", with a combined single limit of not less than \$1,000,000.00.
3. COMPREHENSIVE GENERAL LIABILITY POLICY: Each policy shall cover the Contractor and the Town of Pittsford, as "additional insured", with limits not less than \$1,000,000.00 for each occurrence; \$1,000,000.00 personal injury; and \$2,000,000.00, general aggregate.
4. UMBRELLA POLICY: Each policy shall cover the Contractor and the Town of Pittsford, as "additional insured", with coverage of at least \$1,000,000.00

At the time of the execution of the agreement, the Contractor shall furnish to the Commissioner "Certificates of Insurance", in a form satisfactory to the Commissioner, showing proof of the above insurance requirements, which Certificates shall provide that the policies shall not be changed or canceled until ten (10) days written notice has been given to the Commissioner.

### OTHER LAWS:

The Contractor, and all employees acting under the direction of the Contractor, shall strictly comply with all federal, state and local laws and ordinances controlling or limiting in any way the actions of those engaged in the work (including their wages, hours, or benefits), shall be strictly complied with by the Contractor and all employees working under his direction. This shall also include Equal Employment Opportunity requirements, Article 8, and Section 220 of the New York State Labor Law. This is a New York State Department of Labor prevailing wage rate bid. Certified payrolls shall be furnished by the Contractor to demonstrate compliance on a monthly basis, prior to payment.

**PART 1 GENERAL INFORMATION, INSTRUCTIONS, AND  
BID REQUIREMENTS**

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Contractor shall certify that all of its employees doing business with the Town have had all of the sexual harassment prevention training required by NYS Labor Law §201-g within the last year.

PERFORMANCE PENALTIES:

The agreement between the Contractor and the Town may be terminated for the material breach of any term by the Contractor. Further, the Contractor shall be liable for all loss, costs, and/or damages of the Town, including reasonable attorney's fees resulting from any litigation arising hereunder, together with a performance penalty equal to 15% of the bid price, per day, in the event of a breach of contract by the Contractor.

**END OF SECTION**



## **PART 2 SCOPE OF SERVICES**

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### LOCATION:

The Boardwalk and Bridge part of the shared-use trail being construction on the Town owned property located in the Village of Pittsford along the Erie Canal. The property is accessible from Monroe Avenue.

### TIME OF PERFORMANCE

The structure shall be completed and ready for use no later than June 30, 2020. The timing of the start of construction shall be at the discretion of the Contractor, with the approval of the Commissioner. All preliminary site work will be performed by the Town, prior to the commencement of construction by the Contractor.

### APPROVAL OF PLANS:

All work to be performed under the conditions of this specification shall comply with the rules and regulations of all agencies having jurisdiction for this classification of construction and design and shall conform to the applicable live loads due to wind, rain and snow.

### SPECIAL CONDITIONS

- Work times under this contract shall be limited to:
  - Mondays – Fridays from 7:00 am – 8:00 PM
  - Saturdays – Sundays from 9:00 am – 5:00 PM.
- Construction activities must not interfere with the operations and public use of the adjacent Erie Canalway Trail.

### SUBMITTAL REQUIREMENTS – SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

The requirements of this Section are general in nature and basically apply to all Sections of Part 4: Technical Specifications. Additional submissions and more specific requirements on submissions are contained in the various Specification Sections.

No construction shall be initiated by the Contractor on any portion of the project without the proper submissions called for in the Contract Documents. Before construction is started on any portion of the work, all shop and/or placing drawings pertaining to that portion of the work shall have been submitted and reviewed by the Engineer/Architect.

Schedule - Within ten days after the final work progress schedule has been distributed each Prime Contractor shall submit to the Engineer/Architect a preliminary schedule of Shop Drawing submissions. The Engineer/Architect shall be notified immediately of changes in the preliminary schedule.

Shop Drawings - include all drawings, diagrams, illustrations, brochures, catalog cut sheets, schedules, and other data which are prepared by the Contractor, Subcontractor, manufacturer, supplier, or distributor and which illustrate the equipment or some portion of the work.

Outline of Submittals - This schedule is included for convenience only, and is not necessarily intended to be “all-inclusive”. Shop drawings shall be ordered as deemed necessary by the Architect for those items required by the contract specifications.

<b>NUMBER</b>	<b>NAME / DESCRIPTION</b>	<b>SUBMITTALS REQUIRED</b>
<b>Layout of Work</b>		
	Bridge/Boardwalk Location	Field Verification
	Wing Wall Location	Field Verification
<b>033000</b>	<b>Cast In Place concrete</b>	
	Steel Reinforcement	Product Data
	Design Mixture	Product Data, Material Certificates
	Testing Agency	Qualifications
	Concrete Aggregate	Test Report
	Concrete Installer	Qualifications
	Ready-Mix Concrete	Qualifications
<b>312000</b>	<b>Earth Moving</b>	
	Geotextile Product Data	Product Data, Sample
	Aggregate Material	Product Data, Test Report, Sieve Analysis, Sample
<b>323400</b>	<b>Modular Pedestrian Boardwalk/Bridge</b>	
	All Materials	Product Data
	Bridge	Contractor/Installer Qualifications, Engineering Fabrication Drawings
	Decking	Engineering Fabrication Drawings, Field Verification
	Helical Piles	Field Verification

**END OF SECTION**

**PART 3 BIDDER QUALIFICATIONS FORMS**

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**BIDDER QUALIFICATIONS & REFERENCES FORM**

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Please detail the specifics of similar experience to that of this proposed contract that you have successfully completed over the past five years:

Item Description (Circle)                      Modular Boardwalk/Bridge                      Helical Pile Installer

Contractor/Subcontractor Name \_\_\_\_\_

Supervisor Name \_\_\_\_\_

Years of Firm Experience \_\_\_\_\_

Years of Supervisor Experience \_\_\_\_\_

*Attached firm and supervisor resumes.*

**REFERENCE PROJECTS**

**Project No. 1** Project Name / Year Complete \_\_\_\_\_

Contact Name / Phone Number \_\_\_\_\_

**Project No. 2** Project Name / Year Complete \_\_\_\_\_

Contact Name / Phone Number \_\_\_\_\_

**Project No. 3** Project Name / Year Complete \_\_\_\_\_

Contact Name / Phone Number \_\_\_\_\_

**Project No. 4** Project Name / Year Complete \_\_\_\_\_

Contact Name / Phone Number \_\_\_\_\_

**Project No. 5** Project Name / Year Complete \_\_\_\_\_

Contact Name / Phone Number \_\_\_\_\_

*Attached reference photograph(s) for each project listed.*

Authorized Signature: \_\_\_\_\_ Date: \_\_\_\_\_

# BID PROPOSAL FORM

**Notice:** Any deviations from the listed specifications must be completely outlined on the reverse side of this sheet. Failure to comply will constitute reason to declare the bid informal. The Town Board of the Town of Pittsford reserves the right to reject any and all bids and waive any informalities. A Non-Collusive Bidding Certificate must accompany all bids. The prices bid are in full consideration for all work as described in these specifications. If requested by the Town, the bidder shall provide a breakdown of individual costs to assist with bid evaluations.

ALL BIDS MUST BE LISTED AS FOLLOWS ON THIS SHEET:

BASE BID SCHEDULE			
Item No	Description	Price	
		Written	Figure
1	Pedestrian Boardwalk (including abutment and wing walls)		
2	Helical Piles		
3	Pedestrian Bridge (including abutment and wing walls)		
<b>BASE BID</b> (Total must equal the sum of the items listed above)			

**Additional Alternate No 1:**

**Ipe Decking in Lieu of Pressure Treated Lumber at Bridge**

BID \_\_\_\_\_ + \$ \_\_\_\_\_  
 (Words) (Figure)

**Additional Alternate No. 2:**

**Ipe Decking in Lieu of Pressure Treated Lumber ad Boardwalk**

BID \_\_\_\_\_ + \$ \_\_\_\_\_  
 (Words) (Figure)

Signed: \_\_\_\_\_ Title: \_\_\_\_\_

Representing: \_\_\_\_\_

Telephone: \_\_\_\_\_ Date: \_\_\_\_\_

# NON – COLLUSIVE BIDDING CERTIFICATE

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## Erie Canal Park and Preserve Boardwalk and Bridge Reconstruction

As required by §103-d of the General Municipal Law of the State of New York, the bidder certifies that by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty or perjury, that to the best of knowledge and belief:

1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

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Print Name of Bidder

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Authorized Signature

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Date

NOTE: Where a bid on behalf of a corporation contains this certification, it shall be deemed to have been authorized by the Board of Directors of the bidder, and such authorization shall be deemed to include the signing and submission of the bid and the inclusion therein of the certification as to non-collusion as the act and deed of the corporation.

# PART 4: TECHNICAL SPECIFICATIONS

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Number of Section Pages

033000	Cast in Place Concrete	9
312000	Earth Moving	8
323400	Modular Pedestrian Boardwalk/Bridge	3

## SECTION 033000 - CAST-IN-PLACE CONCRETE

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

#### 1.2 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
  - 1. Footings.

#### 1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Material Certificates: For each of the following, current and signed by manufacturers:
  - 1. Cementitious materials.
  - 2. Admixtures.
  - 3. Form materials and form-release agents.
  - 4. Steel reinforcement and accessories.
  - 5. Curing compounds.
  - 6. Concrete Sealers
  - 7. Bonding agents.
  - 8. Adhesives.
  - 9. Repair materials.

- C. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
  - 1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

## 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
  - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated (By Owner).
- D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
  - 1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
  - 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.

## PART 2 - PRODUCTS

### 2.1 FORM-FACING MATERIALS

- A. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.



- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

## 2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60

## 2.3 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

- 1. Portland Cement: ASTM C 150, Type I. Supplement with the following:
  - a. Fly Ash: ASTM C 618, Class F or C.
  - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

- B. Silica Fume: ASTM C 1240, amorphous silica.

- C. Normal-Weight Aggregates: ASTM C 33, graded.

- 1. Maximum Coarse-Aggregate Size: 1 inch nominal.
- 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

- D. Lightweight Aggregate: ASTM C 330, 1-inch nominal maximum aggregate size.

- E. Water: ASTM C 94/C 94M and potable.

## 2.4 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.

- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

- 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
- 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
- 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
- 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
- 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
- 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

## 2.5 CURING MATERIALS

- A. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
    - b. BASF Construction Chemicals - Building Systems; Kure 200.
    - c. ChemMasters; Safe-Cure Clear.
    - d. Conspec by Dayton Superior; W.B. Resin Cure.
    - e. Dayton Superior Corporation; Day-Chem Rez Cure (J-11-W).
    - f. Edoco by Dayton Superior; Res X Cure WB.
    - g. Euclid Chemical Company (The), an RPM company; Kurez W VOX; TAMMSCURE WB 30C.
    - h. Kaufman Products, Inc.; Thinfilm 420.
    - i. Lambert Corporation; AQUA KURE - CLEAR.
    - j. L&M Construction Chemicals, Inc.; L&M Cure R.
    - k. Meadows, W. R., Inc.; 1100-CLEAR.
    - l. Nox-Crete Products Group; Resin Cure E.
    - m. Right Pointe; Clear Water Resin.
    - n. SpecChem, LLC; Spec Rez Clear.
    - o. Symons by Dayton Superior; Resi-Chem Clear.
    - p. TK Products, Division of Sierra Corporation; TK-2519 DC WB.
    - q. Vexcon Chemicals, Inc.; Certi-Vex Enviocure 100.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.

## 2.6 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
  - 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.
- C. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

D. Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.45.
3. Slump Limit: 4 inches plus or minus 1 inch (25 mm).
4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery.

2.7 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.8 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

2.9 EPOXY ADHESIVE

- A. Acrylic Resin Epoxy Adhesive: Shall be Redhead Epcon A7 or approved equal.
1. Shall meet ASTM C881-02 (Type IV, Grade 3, Class A, B, C)
  2. Shrinkage during cure shall meet ASTM D2566: .002 / in.
  3. Heat deflection temperature, ASTM D648: 140 deg min.

PART 3 - EXECUTION

3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

- C. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- D. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- E. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

### 3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
  - 2. Contractor to acquire anchor templates from appropriate design source for all embedded anchoring.

### 3.3 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

### 3.4 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
  - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.

### 3.5 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Owner's Representative.
- C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
  - 1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
- D. Cold-Weather Placement: Comply with ACI 306.1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
- E. Hot-Weather Placement: Comply with ACI 301:

### 3.6 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
  - 1. Apply only to concrete surfaces that are not visible.
- B. Broom Finish:
  - 1. Apply to exposed horizontal surfaces of all cast in place concrete.

### 3.7 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Cure concrete for 7 days according to ACI 308.1, by one or a combination of the following methods:
  - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days.
  - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

### 3.8 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas if acceptable to, and approved by, Owner's Representative. Remove and replace concrete that cannot be repaired and patched to Owner's Representative's approval.
- B. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
- C. Repair materials and installation not specified above may be used, subject to approval by Owner's Representative.

### 3.9 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- C. Testing Services: Testing and inspecting of composite samples of fresh concrete obtained according to ASTM C 172/C 172M shall be performed according to the following requirements:
  - 1. Testing Frequency: At least Obtain at least one composite sample for each 100 cu. yd., or less, of each concrete mixture placed each day.
  - 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
  - 3. Air Content: ASTM C 231/C 231M, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
  - 4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when it is 80 deg F (27 deg C) and above, and one test for each composite sample.
  - 5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
    - a. Specimens shall be cured under laboratory conditions except that when in the opinion of the Architect there is possibility of the surrounding air temperature falling below 40°F.
  - 6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.
    - a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.
- D. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
- E. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and

inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

- F. If average strength of seven day tests fail to satisfy the Architect, work affected by concrete poured shall be stopped until tests can be confirmed by 28 day tests. Where Architect is not satisfied as to strength or durability of completed concrete, the Architect may require: (1) additional tests, or (2) removal and reconstruction of entire section or structure. Costs of any additional tests, removal, and reconstruction resulting from the failure to meet the specified compression strength with the test cylinders shall be the responsibility of the Contractor.
- G. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
- H. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
- I. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

END OF SECTION 033000

## SECTION 312000 - EARTH MOVING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Excavating and backfilling for structures.

#### 1.3 DEFINITIONS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
- B. Base Course: Aggregate layer placed between the subbase course and surface paving.
- C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- E. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
  - 1. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.
  - 2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Owner's Representative. Unauthorized excavation, as well as remedial work directed by Owner's Representative, shall be without additional compensation.
- F. Fill: Soil materials used to raise existing grades.
- G. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. for bulk excavation or 3/4 cu. yd. for footing, trench, and exceed a standard penetration resistance of 100 blows/2 inches when tested by a geotechnical testing agency according to ASTM D 1586.
- H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- I. Subbase Course: Aggregate layer placed between the subgrade and base course or surface pavement course.



- J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- K. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of the following manufactured products required:
  - 1. Geosynthetics / geotextile fabrics.
- B. Samples for Verification: For the following products, in sizes indicated below:
  - 1. Geotextile fabrics: 12 x 12 inches

#### 1.5 INFORMATIONAL SUBMITTALS:

- A. Qualification Data: For qualified testing agency.
- B. Materials test reports: For each on-site and borrow soil materials proposed for fill and backfill as follows:
  - 1. Classification according to ASTM D 2487
  - 2. Laboratory compaction curve according to ASTM D 698 ASTM D 1557.
- C. Pre-Excavation Existing Damage Photographs: Show existing conditions of protected features, adjoining construction or other site features that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

#### 1.6 QUALITY ASSURANCE:

- A. Geotechnical testing agency qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

#### 1.7 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining trails, walks, and other adjacent occupied or used facilities during earth moving operations.
  - 1. Do not close or obstruct trails, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
  - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.
  - 1. Do not proceed with work on adjoining property until directed by Owner's Representative.

- C. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth moving operations.
- D. Do not commence earth moving operations until all temporary erosion- and sedimentation-control measures are in place.
- E. Do not commence earth moving operations until all plant/vegetation protection measures are in place.
- F. The following practices are prohibited within tree protection zones:
  - 1. Storage of construction materials, debris, or excavated material.
  - 2. Parking vehicles or equipment.
  - 3. Foot traffic.
  - 4. Erection of sheds or structures.
  - 5. Impoundment of water.
  - 6. Excavation or other digging unless otherwise indicated.
  - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- G. Do not direct vehicle or equipment exhaust towards protection zones.
- H. Prohibit heat sources, flames, ignition sources, and smoking within or near tree protection zones.

## PART 2 - PRODUCTS

### 2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory (Suitable) Soils: Satisfactory soil material is defined as any material whose composition is satisfactory for use in embankment construction as per NYSDOT Standard Specifications, Subsection 203-1. In general, any mineral (inorganic) soil, blasted or broken rock and similar material of natural or man-made origin, including mixtures thereof, are considered as satisfactory materials. The Owner's Representative will determine whether a specific soil material is a satisfactory soil material.
- C. Unsatisfactory (Unsuitable) Soils: Unsatisfactory soil material is defined as any material containing vegetative or organic matter, such as muck, peat, organic silt, topsoil, or sod that is not satisfactory for use in embankment construction as per NYSDOT Standard Specifications, Subsection 203-1. Certain man-made deposits of industrial waste, sludge, or landfill may also be determined by the Owner's Representative to be unsatisfactory.
- D. Sand and gravel, approved blast furnace slag, or stone, conforming to the material requirements of NYSDOT Standard Specifications, Subsection 304-2. Provide the type of subbase material shown on the Contract Drawings or called for in other Specification Sections for each application.

<u>Type</u>	<u>Sieve Size Designation</u>	<u>Percent Passing By Weight</u>
2	2 inch	100
	1/4 inch	25-60
	no. 40	5-40
	no. 200	0-10

- E. Base Material: Type 2 crusher run (CR1) dolomitic limestone. The Owner’s Representative must approve the source of all base materials.
- F. Fill Materials: Satisfactory soil materials with no particles larger than 2/3 of the maximum allowable loose lift thickness. (See compaction requirements for allowable loose lift thicknesses.)
- G. Backfill Materials: In cases where backfill with subbase material, drainage fill, select granular backfill or another specific fill material is not specified, backfill may be with satisfactory soil materials, with no particles larger than 2” allowed in trench backfills up to the subgrade and with no particles larger than 4” in all other unspecified backfills up to the subgrade line.
- H. Select Granular Backfill: Sand and gravel or stone meeting the following requirements:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
3 inch	100
2inch	90-100
¼ inch	30-65
No 40	5-40
No 200	2000-8

- I. Spoil: Satisfactory or unsatisfactory soil materials not suitable or required for filling or backfilling, finish grading, or landscaping.

2.2 GEOSYNTHETICS

- A. Sub-Surface Drainage Fabric: Non-woven needle-punched geotextile, manufactured for subsurface drainage applications, Mirafi 140N or approved equal.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, trails, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

- B. Protect and maintain erosion and sedimentation controls during earthwork operations.

### 3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
  - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

### 3.3 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions.
  - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
- B. Excavations at Edges of Tree- and Plant-Protection Zones:
  - 1. Excavate by hand to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.

### 3.4 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

### 3.5 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

### 3.6 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

- B. Place and compact fill material in layers to required elevations as follows:
  - 1. Under footings and foundations, use material as specified.

- C. Place soil fill on subgrades free of mud, frost, snow, or ice.

### 3.7 SOIL MOISTURE CONTROL

- A. Prior to compaction, uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
  - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
  - 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

### 3.8 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 6 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698 ASTM D 1557:
  - 1. Under structural foundations and building slabs, proofroll the existing subgrade prior to starting mass fill operations. Proof roll the subgrade to verify it is stable and verify that unsuitable fill has been removed. Compact the new fill to 95 percent density (ASTM D-1557). Compact subsequent layers of fill to 95 percent within 2 percent of optimum moisture content as determined by ASTM D-1557. Backfill around footings, foundation walls, and column piers with alternating lifts, evenly on all sides. Backfill under slabs, sidewalks, and pavements to 95 percent density within 2 percent of optimum moisture content as determined by ASTM D-1557 and areas in green areas to 90 percent or as specified as the landscape architect. Conduct at least one density test per 50 lineal feet of backfill on alternate lifts but not less than two tests per lift.

### 3.9 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
  - 1. Provide a smooth transition between adjacent existing grades and new grades.
  - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
  - 1. Turf or Unpaved Areas: Plus or minus 1 inch.

### 3.10 SUBBASE COURSE BENEATH WALLS

- A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:
  - 1. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
  - 2. Shape subbase course and base course to required crown elevations and cross-slope grades.
  - 3. Place subbase course and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
  - 4. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

### 3.11 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
  - 1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
  - 2. Determine that fill material and maximum lift thickness comply with requirements.
  - 3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.
- B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.
- C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
- E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.12 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
  - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.13 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.
- B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Owner's Representative.

END OF SECTION 312000

SECTION 323400 – MODULAR PEDESTRIAN BOARDWALK/BRIDGE

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the final structural design, details, fabrication, and installation of the modular pedestrian boardwalk and bridge in the configuration and geometry and at the location indicated on the construction drawings. This includes the steel framing, decking and toe kick, and foundations. The deck and toe rail shall be of timber construction with steel framing. The supplier shall furnish all materials including connecting steel and hardware for a complete installation.

The contractor is advised that compliance with the requirements of this specification may result in minor modifications to the contract drawings. The contractor is fully responsible for all final structural detailing, fabrication, and installation of the pedestrian bridge.

Examine the contract drawings for requirements that affect the work in this section. The contract drawings require specific bridge dimensions, deck types, foundations, and other finishing details.

- B. Related Sections:

1. Section 033000 "Cast-in-Place Concrete"

1.2 ACTION SUBMITTALS

- A. Product Data: For all materials

- B. Engineering Shop Drawings: Layout of structure, including elevations and cross sections, and fabrication details for all wood members and steel assemblies, and foundations. Include all pertinent dimensions, wood grades, drilled holes, fasteners, connectors, reinforcing schedule (for cast in place concrete) and types of wood preservative treatment.

1. Submit shop drawings and calculations stamped by a Professional Engineer licensed in the state of New York and experienced in bridge design.
  - a. Design Loads
    - 1) Pedestrian Live Load: Uniformly distributed 100 lbs per sq. ft.
    - 2) Lateral Wind Load and Uplift: 90 MPH Wind Speed
    - 3) Maximum Deflection: 1/360
2. Furnish a WCLIB or WWPA Certificate of Conformance for all sawn lumber
3. Contractor shall provide warranty against defects in material and workmanship for a period of five (5) years.
4. Provide manufacturer warranty to cover workmanship on all fabrication against defects for the period of use of the modular boardwalk/bridge:
  - a. Galvanized Structural Steel Framing – 100 years



- b. Pressure Treated Wood Decking – 15 years
- c. Ipe Hardwood Decking – 25 Years

- C. Samples:
  - 1. Decking: 12” length

### 1.3 QUALITY ASSURANCE

- A. Modular Boardwalk Fabrication: Engage an experienced fabricator with at least 5 years of experience of projects of similar scope and materials. Contractor must be able to demonstrate successful completion of at least five (5) comparable projects. Submit all pertinent qualifications information to demonstrate experience as noted under informational submittal above.
- B. Helical Pile Contractor / Installer: Engage an experienced installer with at least 5 years of experience of projects of similar scope and materials. Contractor must be able to demonstrate successful completion of at least five (5) comparable projects. Submit all pertinent qualifications information to demonstrate experience as noted under informational submittal above.

### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Schedule delivery of materials to avoid extended on-site storage and to avoid delaying the Work.
- B. Store materials under cover and protected from weather and contact with damp or wet surfaces. Provide for air circulation within and around stacks and under temporary coverings.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

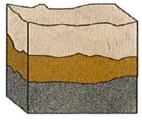
- A. Materials and construction shall be as specified on the contract drawing and as manufactured by:
  - 1. Modular Trail Structures  
modulartrailstructures.com  
608-609-9277
  - 2. Wickcraft  
Wickcraft.com  
608-496-1082
  - 3. Or approved equal.
- B. Frames
  - 1. Must meet or exceed design loads:

- a. Pedestrian Live Load: 100LB/SF
      - b. Lateral Wind Load: 90 MPH Wind Speed
      - c. Max Deflection: 1/360
    2. Modular frames shall be constructed from ASTM A500 structural steel.
    3. Frame to be hot dip galvanized with a minimum of 3.9 mill thickness of zinc based galvanizing.
    4. Frames shall be free of any sharp edges without compromising the integrity of the galvanized finish.
  - C. Helical Piles
    1. Piles shall be as manufactured by the Ideal Group (585-872-7190) or approved equal.
    2. Shaft shall meet or exceed the requirements of ASTM A500, 80KSI
    3. Helix to meet or exceed the requirements of ASTM A572/A1018/A656/ 50KSI
  - D. Saddle Bracket
    1. Bracket shall have a minimum tolerance of 5" longitudinally and 12": width wise.
    2. Bracket and fastening bolts to be hot dip galvanized.
  - E. Steel connectors, mounting brackets, and hardware required to assemble the bridge, anchor to abutment walls, shall be ASTM A-36 and hardware to be ASTM A-307. Welding by certified welders per AWS specifications D1.5. All steel and hardware to be hot dipped galvanized.
  - F. Decking and Toe Kick
    1. Modular decking to arrive at installation site prefabricated in one piece and no deck boards shall be fastened at time of installation.
    2. Decking shall be kiln dried No 1 pressure treated southern yellow pine
      - a. ADD ALTERNATE No 1 and No 2: Ipe Hardwood Decking
- 2.2 FABRICATION
- G. The contractor shall install and assemble the bridge in accordance with the dimensions and details shown on the approved shop drawings.
  - H. All welded connections shall be completed by certified welders per AWS specifications.

END OF SECTION 323400

# APPENDIX A: GEOTECHNICAL EVALUATION

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# Foundation Design, P.C.

SOIL • BEDROCK • GROUNDWATER

November 5, 2019

Town of Pittsford  
11 South Main Street  
Pittsford, New York 14534

Attention: Paul Shenkel  
Commissioner of Public Works

Reference: Erie Canal Park and Reserve Trail  
Pittsford, New York  
Geotechnical Evaluation, E4692.0

Dear Mr. Shenkel:

This report summarizes our Geotechnical Evaluation for the referenced project. We understand that the project consists of an elevated trail to connect the Erie Canal with the Auburn Trail system. We base this evaluation on new test boring exploration, and consultation with the design team. This report is intended exclusively for use on this project.

The proposed elevated trail will be located in Pittsford, New York, in between the Auburn Trail and Erie Canal. The elevated portion of the trail is located in delineated wet lands, and is surrounded by dense woods. The approximate site location is delineated on the *General Location Plan* attached.

We performed three soil borings, one at each of the abutment locations and one in the middle of the trail (B19-2 and B19-4 were deleted in the field due to access constraints). Nothnagle Drilling provided a Geoprobe-mounted SPT sampling unit for the borings. The borings ranged from 15.0 to 20.0 feet deep. A *Boring Location Plan* and the boring logs are attached to this report. Boring locations and elevations were picked up by Ravi Engineering.

We reviewed the soil samples recovered and selected representative samples for laboratory analysis. Our office performed six moisture content determinations. We discuss the test results below. The laboratory report is enclosed.

Erie Canal Park and Reserve Trail  
November 5, 2019  
Page 2

The following interpretations of the soil, bedrock, and groundwater conditions are based on the widely spaced borings and our site observations. See the attached boring logs for soil descriptions at the test locations. Variations from the inferred profile are possible. Contact us immediately if variations are found during construction so we may evaluate the impact on our recommendations.

The soil borings indicated fill (boring B19-1, south abutment) over native soils. The fill contains some debris and extends about 4'9" below grade. Below this the native soils were loose sands that were wet or saturated. The soils became compact (and showed less moisture) at a depth of 18 to 20 feet. Moisture contents in the upper loose sands were high (16 to 24 percent) and were low (7 percent) at depth in the more compact formation.

Bedrock was not encountered during the exploration. Geologic mapping indicates that the bedrock on the majority of the elevated trail is of the Lockport Group. This formation consists of limestone and dolostone. Geologic mapping indicates that the bedrock on the southern portion of the trail is of the Vernon Formation. This formation consists of shale and dolostone.

Due to the depth of fill required, potential for settlement from fill loads, and permitting issues in placing fill in the wetlands we recommend using helical piles to support the elevated trail system.

Outlined below are our recommendations for the design of the proposed trail:

1. For design purposes, we estimate that a 12-inch helical pile will have a working capacity of 5 to 10 kips at a depth of 10 feet below grade. Significantly more capacity is available if the piles extend into the compact soils below a depth of 20 feet. Keep in mind that design and installation of these piles is somewhat proprietary; allow the contractor some flexibility in submitting a helical pile structurally capable of supporting the actual design loads and/or to propose an alternate helical configuration. Piles should be installed with an as-built accuracy of four inches (horizontal). Require a load test at the start of pile installation to calibrate the contractor's equipment and procedures to the soil conditions. The load test should include a pull out test if the design has the helical piles resisting uplift loads.

Provide as-built locations to the structural engineer for review as the pipes may 'wander' off location during installation. Installation records shall include pile length, installation angle and final

Erie Canal Park and Reserve Trail  
November 5, 2019  
Page 3

torque as well as general comments such as stability of the torque head during installation and any obstructions encountered. Field conditions (ie. boulders) may require re-analysis of eccentric loading, etc. Allow for adequate assessment of this data by the design team prior to de-mobilizing the installation equipment from the site.

2. Both pile layout and confirmation of actual installed locations shall be done by the contractor. The contractor shall be responsible for any re-analysis and/or construction (modified pile cap, installation of additional pile, etc.) resulting from piles not installed within four inches of the planned location. Piles shall be installed so as to maintain a vertical alignment (tolerance of two inches in ten feet as estimated during installation).
3. Because of the subjective nature of the design and installation process we require that we review pile submittals and be on site during pile testing and production installation. We will compile a close-out summary of our construction observations and judgments concerning the acceptability of the work. This document should help with Code Enforcement review of the work prior to issuance of a Certificate of Occupancy. Forward the near-final plans for our review and schedule us as appropriate.

This letter completes this portion of our services. We look forward to hearing from you as the project progresses towards construction.

Very truly yours,

**FOUNDATION DESIGN, P.C.**



Brennan J. Valentino, I.E.  
Staff Engineer



James M. Baker, P.E.  
President  
Enc.



# Important Information about This

# Geotechnical-Engineering Report

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

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

## Geotechnical-Engineering 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 given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared solely for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled.* No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

## Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

## You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the 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. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

## This Report May Not Be Reliable

*Do not rely on this report* if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be, and, in general, if you are the least bit uncertain about the continued reliability of this report, contact your geotechnical engineer before applying it.* A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

## Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

### **This Report's Recommendations Are Confirmation-Dependent**

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

### **This Report Could Be Misinterpreted**

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

### **Give Constructors a Complete Report and Guidance**

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may

perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

### **Read Responsibility Provisions Closely**

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include 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 personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old*.

### **Obtain Professional Assistance to Deal with Moisture Infiltration and Mold**

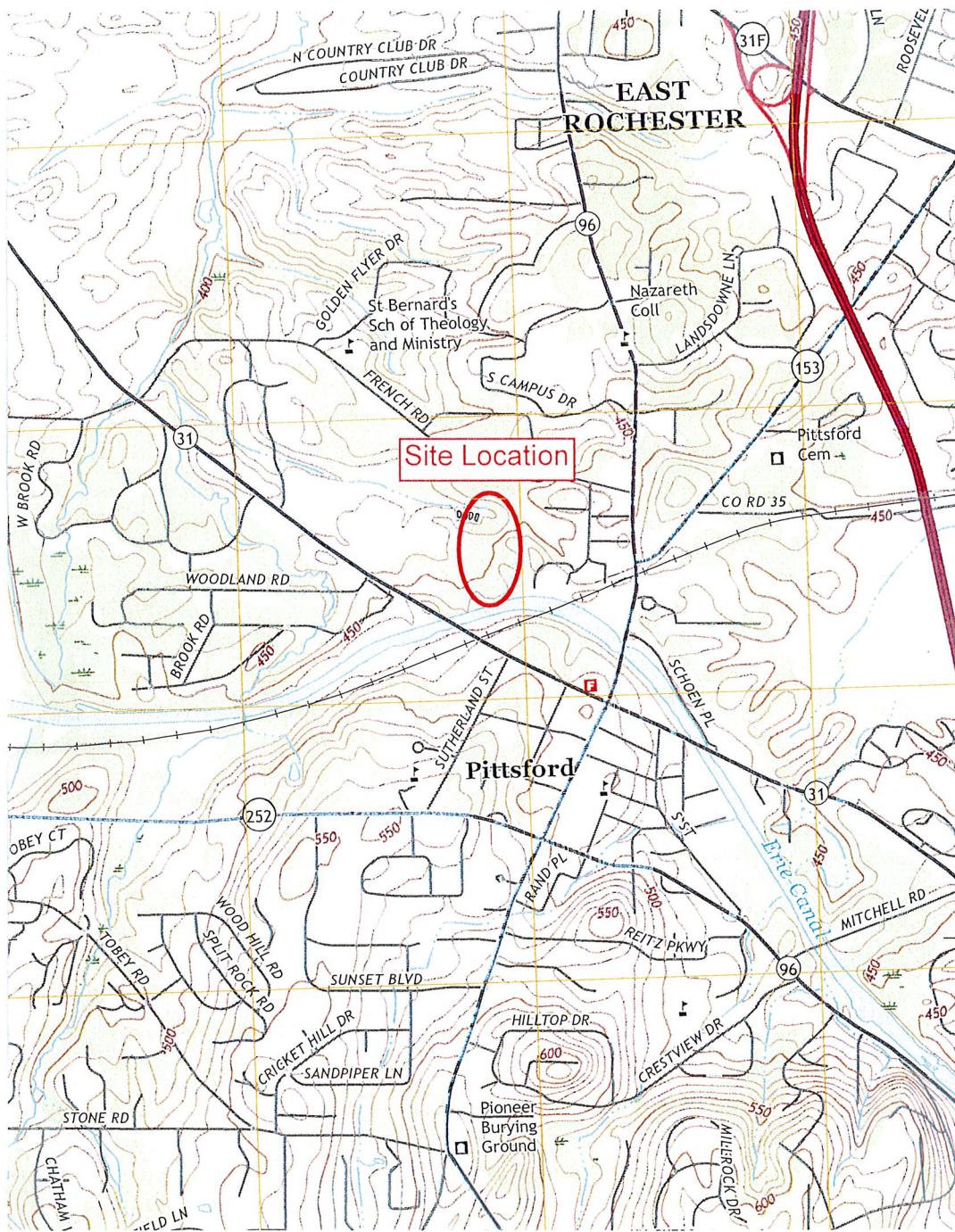
While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, *proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration*. Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. *Geotechnical engineers are not building-envelope or mold specialists*.



Telephone: 301/565-2733

e-mail: [info@geoprofessional.org](mailto:info@geoprofessional.org) [www.geoprofessional.org](http://www.geoprofessional.org)





**Foundation  
Design, P.C.**

46A Sager Drive  
Rochester, New York 14607  
Phone (585) 458-0824  
FAX (585) 458-3323

**Erie Canal Park and Reserve Trail  
Pittsford, NY  
General Location Plan**

Adapted from: USGS topographic mapping  
*Pittsford* quadrangle dated 2016

CHECKED BY: JMB

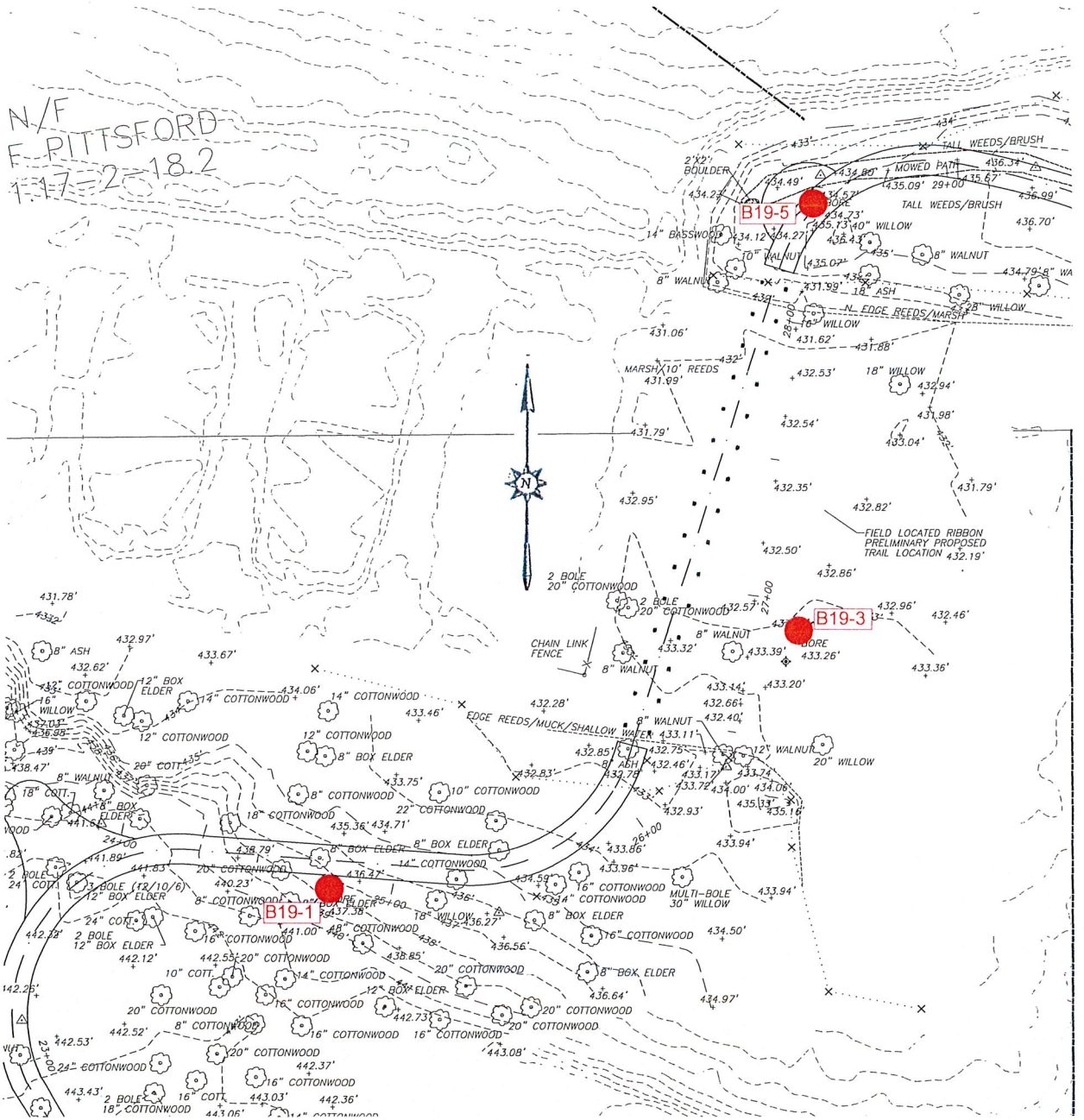
DRAWN BY: BJV

Scale 1" = 2,000'

DATE: 10-24-19

JOB NO.:4692.0

N/F  
 F. PITTSFORD  
 1-17-2-18.2



**Foundation  
 Design, P.C.**

46A Sager Drive  
 Rochester, New York 14607  
 Phone (585) 458-0824  
 FAX (585) 458-3323

**Erie Canal Park and Reserve Trail  
 Pittsford, NY**

**Boring Location Plan**

Adapted from: Sue Steele Landscape Architecture PLLC  
 Bore Locations

CHECKED BY: JMB

DRAWN BY: BJV

Scale 1" = 60'

DATE: 10-31-19

JOB NO.: 4692.0

## SOIL DESCRIPTIONS

### COHESIVE SOIL

Very fine grained soils. Plastic soils that can be rolled into a thin thread if moist. Clays and silty clays show cohesion.

### NON-COHESIVE SOIL

Soils composed of silt, sand and gravel, showing no cohesion or very slight cohesion

<u>DESCRIPTION</u>	<u>STP –BLOWS/FOOT</u>	<u>DESCRIPTION</u>	<u>STP –BLOWS/FOOT</u>
Very Soft	0-2	Loose	0-10
Soft	3-5	Firm	11-25
Medium	6-15	Compact	26-40
Stiff	16-25	Dense	41-50
Hard	26 or more	Very Dense	51 or more

<u>SOIL COMPOSITION</u>	<u>DESCRIPTION</u>	<u>ESTIMATED PERCENTAGE</u>
	and	50
	some	30-49
	little	11-29
	trace	0-10

### MOISTURE CONDITIONS

Dry, Damp, Moist, Wet, Saturated  
Groundwater measured in the boring or test pit may not have reached equilibrium

### SOIL STRATA:

<u>TERM</u>	<u>DESCRIPTION</u>
layer	Soil deposit more than 6" thick
seam	Soil deposit less than 6" thick
parting	Soil deposit less than 1/8" thick
varved	Horizontal uniform layers or seams of soil

### GRAIN SIZE

<u>MATERIAL</u>	<u>SIEVE SIZE</u>
Boulder	Larger than 12 inches
Cobble	3 inches to 12 inches
Gravel - coarse	1 inch to 3 inches
- medium	3/8 inch to 1 inch
- fine	No. 4 to 3/8 inch
Sand - coarse	No. 10 to No. 4
- medium	No. 40 to No. 10
- fine	No. 200 to No. 40
Silt and Clay	Less than No. 200

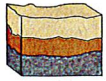
Standard Penetration Test: The number of blows required to drive a split spoon sampler into the soil with a 140 pound hammer dropped 30 inches. The number of blows required for each 6-inches of penetration is recorded. The total number of blows required for the second and third 6-inches of penetration is termed the penetration resistance, or the "N" value.

Split Spoon Sampler: Typically a 2-foot long, 2-inch diameter hollow steel tube that breaks apart or splits in two down the tube length.

Refusal: Depth in the boring where more than 100 blows per 5-inches are needed to advance the sample spoon.

Core Recovery (%): The total length of rock core recovered divided by the total core run.

RQD (%): Rock Quality Designation – the total length of all the pieces of the rock core longer than 4-inches divided by the total length of the rock core run.

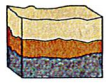


## Boring Log

<b>Project No.</b>	4692.0	<b>Page</b>	1	<b>of</b>	1	<b>Test Boring No.</b>	B19-1
<b>Project Name</b>	Erie Canal Park and Reserve Trail, Pittsford, NY						
<b>Client</b>	Town of Pittsford, 11 South Main Street, Pittsford, New York 14534						
<b>Elevation</b>	437.38	<b>Weather</b>	Sunny 60s		<b>Engineer</b>	B.Valentino	
<b>Date Started</b>	10/23/19	<b>Completed</b>	10/23/19		<b>Driller</b>	J.Schweitzer	
<b>Drilling Company:</b>	Nothnagle Drilling Inc			<b>Drilling Equipment:</b>	Geoprobe 6610DT		

Ft.	Blows Per Six Inches				N Value	Sample No.	Depth	Visual Soil and Rock Classifications
	0"/6"	6"/12"	12"/18"	18"/24"				Remarks
								Augered to 3'0"
								3'0"
	3	3						Loose mottled black orange tan brown SILT and mf SAND, trace clay, trace organics, possible fill
5			3	3	6	S-1	3'-5'	
								Black below 4'9"
								6'6"
	5	6						Firm gray saturated mf SAND, some silt
10			6	4	12	S-2	8'-10'	
								11'6"
								Loose gray saturated SILT, some to little fine sand, little clay, little gravel
	1	WH						
15			WH	4	WH	S-3	13'-15'	
	3	5						
20			5	10	10	S-4	18'-20'	S-4: Same
								20'0"
								Boring Terminated at 20'0"
25								
30								Notes: 1. Water at 7'0" in augers. 2. Advanced hole using hollow stem augers. 3. Bore hole backfilled using auger spoils.

N=No. of blows to Drive 2" Spoon 12" with 140 lb. Wt. 30" Ea. Blow Hammer: Auto Size Rod: 2"



Foundation Design, P.C.

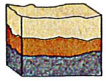
Boring Log

<b>Project No.</b> 4692.0	<b>Page</b> 1 <b>of</b> 1	<b>Test Boring No.</b> B19-2
<b>Project Name</b> Erie Canal Park and Reserve Trail, Pittsford, NY		
<b>Client</b> Town of Pittsford, 11 South Main Street, Pittsford, New York 14534		
<b>Elevation</b> _____	<b>Weather</b> Sunny 60s	<b>Engineer</b> B.Valentino
<b>Date Started</b> 10/23/19	<b>Completed</b> 10/23/19	<b>Driller</b> J.Schweitzer
<b>Drilling Company:</b> Nothnagle Drilling Inc		<b>Drilling Equipment:</b> Geoprobe 6610DT

Ft.	Blows Per Six Inches				N Value	Sample No.	Depth	Visual Soil and Rock Classifications
	0"/6"	6"/12"	12"/18"	18"/24"				Remarks
								Deleted in Field
5								
10								
15								
20								
25								
30								

Notes:  
1. Dry upon completion.  
2. Advanced hole using hollow stem augers.  
3. Bore hole backfilled using auger spoils.

N=No. of blows to Drive 2" Spoon 12" with 140 lb. Wt. 30" Ea. Blow Hammer: \_\_Auto\_\_ Size Rod: \_\_2"\_\_



## Boring Log

<b>Project No.</b>	<u>4692.0</u>	<b>Page</b>	<u>1</u>	<b>of</b>	<u>1</u>	<b>Test Boring No.</b>	<u>B19-3</u>
<b>Project Name</b>	<u>Erie Canal Park and Reserve Trail, Pittsford, NY</u>						
<b>Client</b>	<u>Town of Pittsford, 11 South Main Street, Pittsford, New York 14534</u>						
<b>Elevation</b>	<u>433.26</u>	<b>Weather</b>	<u>Sunny 60s</u>			<b>Engineer</b>	<u>B.Valentino</u>
<b>Date Started</b>	<u>10/23/19</u>	<b>Completed</b>	<u>10/23/19</u>			<b>Driller</b>	<u>J.Schweitzer</u>
<b>Drilling Company:</b>	<u>Nothnagle Drilling Inc</u>					<b>Drilling Equipment:</b>	<u>Geoprobe 6610DT</u>

Ft.	Blows Per Six Inches				N Value	Sample No.	Depth	Visual Soil and Rock Classifications
	0"/6"	6"/12"	12"/18"	18"/24"				Remarks
								Augered to 3'0"
								3'0"
	4	4						Loose gray saturated mf SAND, little to some silt
<b>5</b>			4	4	8	S-1	3'-5'	
	1	5						S-2: Same
<b>10</b>			5	6	10	S-2	8'-10'	
	4	3				S-3	13'-14'	13'0"
<b>15</b>			3	5	6	S-4	14'-15'	Loose gray saturated cmf SAND and GRAVEL, some silt
								14'0"
								Loose gray moist SILT and fine SAND, little gravel, little clay
	7	15						S-5: Firm
<b>20</b>			13	11	28	S-5	18'-20'	20'0"
								Boring Terminated at 20'0"
<b>25</b>								
<b>30</b>								Notes: 1. Dry upon completion. 2. Advanced hole using hollow stem augers. 3. Bore hole backfilled using auger spoils.

N=No. of blows to Drive 2" Spoon 12" with 140 lb. Wt. 30" Ea. Blow Hammer: Auto Size Rod: 2"



### Boring Log

<b>Project No.</b> 4692.0	<b>Page</b> 1 <b>of</b> 1	<b>Test Boring No.</b> B19-4
<b>Project Name</b> Erie Canal Park and Reserve Trail, Pittsford, NY		
<b>Client</b> Town of Pittsford, 11 South Main Street, Pittsford, New York 14534		
<b>Elevation</b>	<b>Weather</b> Sunny 60s	<b>Engineer</b> B.Valentino
<b>Date Started</b> 10/23/19	<b>Completed</b> 10/23/19	<b>Driller</b> J.Schweitzer
<b>Drilling Company:</b> Nothnagle Drilling Inc		<b>Drilling Equipment:</b> Geoprobe 6610DT

Ft.	Blows Per Six Inches				N Value	Sample No.	Depth	Visual Soil and Rock Classifications
	0"/6"	6"/12"	12"/18"	18"/24"				Remarks
								Deleted in Field
5								
10								
15								
20								
25								
30								

- Notes:
- 1. Dry upon completion.
  - 2. Advanced hole using hollow stem augers.
  - 3. Bore hole backfilled using auger spoils.

N=No. of blows to Drive 2" Spoon 12" with 140 lb. Wt. 30" Ea. Blow Hammer: \_\_Auto\_\_ Size Rod: \_\_2"\_\_



## Boring Log

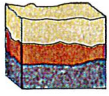
<b>Project No.</b>	4692.0	<b>Page</b>	1	<b>of</b>	1	<b>Test Boring No.</b>	B19-5
<b>Project Name</b>	Erie Canal Park and Reserve Trail, Pittsford, NY						
<b>Client</b>	Town of Pittsford, 11 South Main Street, Pittsford, New York 14534						
<b>Elevation</b>	434.73	<b>Weather</b>	Sunny 60s		<b>Engineer</b>	B.Valentino	
<b>Date Started</b>	10/23/19	<b>Completed</b>	10/23/19		<b>Driller</b>	J.Schweitzer	
<b>Drilling Company:</b>	Nothnagle Drilling Inc				<b>Drilling Equipment:</b>	Geoprobe 6610DT	

Ft.	Blows Per Six Inches				N Value	Sample No.	Depth	Visual Soil and Rock Classifications
	0"/6"	6"/12"	12"/18"	18"/24"				Remarks
	WH	3						Firm brown tan damp cmf SAND, little silt
			8	5	11	S-1	0'-2'	
	5	4						3'0"
			4	4	8	S-2	2'-4'	Loose black moist SILT, some fine sand, little clay, trace organics
<b>5</b>	2	6						4'0"
			8	5	14	S-3	4'-6'	Firm gray tan brown moist mf SAND, some silt, trace clay, trace gravel
	5	5						
			5	6	10	S-4	6'-8'	S-4: Loose, wet, no gravel
	2	3						
<b>10</b>			4	3	7	S-5	8'-10'	S-5: Loose, saturated, no gravel
	6	3						
<b>15</b>			4	4	7	S-6	13'-15'	S-6: Same as S-5
								15'0"
								Boring Termianted at 15'0"
<b>20</b>								
<b>25</b>								
<b>30</b>								

- Notes:
1. Water at 7' in augers.
  2. Advanced hole using hollow stem augers.
  3. Bore hole backfilled using auger spoils.

N=No. of blows to Drive 2" Spoon 12" with 140 lb. Wt. 30" Ea. Blow Hammer: Auto Size Rod: 2"





# Foundation Design, P.C.

SOIL • BEDROCK • GROUNDWATER

October 24, 2019

Town of Pittsford  
11 South Main Street  
Pittsford, New York 14534

Attention: Paul Shenkel  
Commissioner of Public Works

Reference: Erie Canal Park and Reserve Trail  
Pittsford, New York  
Laboratory Test Results, 4692.0

Dear Mr. Shenkel:

Foundation Design, P.C. is pleased to present the following results of the laboratory testing performed on the referenced project. The testing was performed in accordance with the following ASTM test methods:

6 Moisture Content Test

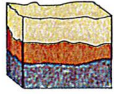
ASTM D-2216

We appreciate the opportunity to provide these testing services and look forward to hearing from you again in the near future.

Very truly yours,

**FOUNDATION DESIGN, P.C.**

Ryan Radford, I.E.  
Project Engineer



**Foundation  
Design, P.C.**

SOIL • BEDROCK • GROUNDWATER

**Erie Canal Park and Reserve Trail  
Pittsford, New York  
4692.0**

October 23, 2019

**Moisture Content Test Report  
(ASTM D-2216)**

<b>Moisture Content Test Results</b>			
<b>Boring Number</b>	B19-1	B19-1	B19-3
<b>Sample Number</b>	S-2	S-4	S-1
<b>Depth</b>	8'-10'	18'-20'	3'-5'
<b>Moisture Content (%)</b>	<b>24.1</b>	<b>7.4</b>	<b>21.5</b>

<b>Moisture Content Test Results</b>			
<b>Boring Number</b>	B19-3	B19-5	B19-5
<b>Sample Number</b>	S-5	S-3	S-6
<b>Depth</b>	18'-20'	4'-6'	13'-15'
<b>Moisture Content (%)</b>	<b>7.4</b>	<b>16.2</b>	<b>21.5</b>