

NEW YORK STATE DEPARTMENT OF STATE
COASTAL MANAGEMENT PROGRAM

Federal Consistency Assessment Form

An applicant, seeking a permit, license, waiver, certification or similar type of approval from a federal agency which is subject to the New York State Coastal Management Program (CMP), shall complete this assessment form for any proposed activity that will occur within and/or directly affect the State's Coastal Area. This form is intended to assist an applicant in certifying that the proposed activity is consistent with New York State's CMP as required by U.S. Department of Commerce regulations (15 CFR 930.57). It should be completed at the time when the federal application is prepared. The Department of State will use the completed form and accompanying information in its review of the applicant's certification of consistency.

A. **APPLICANT** (please print)

1. Name: _____
2. Address: _____
3. Telephone: Area Code (315) _____

B. **PROPOSED ACTIVITY:**

1. Brief description of activity:

2. Purpose of activity:

3. Location of activity:

_____	_____	_____
County	City, Town, or Village	Street or Site Description

4. Type of federal permit/license required: _____

5. Federal application number, if known: _____

6. If a state permit/license was issued or is required for the proposed activity, identify the state agency and provide the application or permit number, if known:

C. **COASTAL ASSESSMENT** Check either "YES" or "NO" for each of these questions. The numbers following each question refer to the policies described in the CMP document (see footnote on page 2) which may be affected by the proposed activity.

- | | |
|---|--------|
| 1. Will the proposed activity result in any of the following: | YES/NO |
| a. Large physical change to a site within the coastal area which will require the preparation of an environmental impact statement? (11, 22, 25, 32, 37, 38, 41, 43) | — — |
| b. Physical alteration of more than two acres of land along the shoreline, land under water or coastal waters? (2, 11, 12, 20, 28, 35, 44) | — — |
| c. Revitalization/redevelopment of a deteriorated or underutilized waterfront site? (1) | — — |
| d. Reduction of existing or potential public access to or along coastal waters? (19, 20) | — — |
| e. Adverse effect upon the commercial or recreational use of coastal fish resources? (9,10) | — — |
| f. Siting of a facility essential to the exploration, development and production of energy resources in coastal waters or on the Outer Continental Shelf? (29) | — — |
| g. Siting of a facility essential to the generation or transmission of energy? (27) | — — |
| h. Mining, excavation, or dredging activities, or the placement of dredged or fill material in coastal waters? (15, 35) | — — |
| i. Discharge of toxics, hazardous substances or other pollutants into coastal waters? (8, 15, 35) | — — |
| j. Draining of stormwater runoff or sewer overflows into coastal waters? (33) | — — |
| k. Transport, storage, treatment, or disposal of solid wastes or hazardous materials? (36, 39) | — — |
| l. Adverse effect upon land or water uses within the State's small harbors? (4) | — — |
| 2. Will the proposed activity affect or be located in, on, or adjacent to any of the following: | YES/NO |
| a. State designated freshwater or tidal wetland? (44) | — — |
| b. Federally designated flood and/or state designated erosion hazard area? (11, 12, 17) | — — |
| c. State designated significant fish and/or wildlife habitat? (7) | — — |
| d. State designated significant scenic resource or area? (24) | — — |
| e. State designated important agricultural lands? (26) | — — |
| f. Beach, dune or Barrier Island? (12) | — — |
| g. Major ports of Albany, Buffalo, Ogdensburg, Oswego or New York? (3) | — — |
| h. State, county, or local park? (19, 20) | — — |
| i. Historic resource listed on the National or State Register of Historic Places? (23) | — — |
| 3. Will the proposed activity require any of the following: | YES/NO |
| a. Waterfront site? (2, 21, 22) | — — |
| b. Provision of new public services or infrastructure in undeveloped or sparsely populated sections of the coastal area? (5) | — — |
| c. Construction or reconstruction of a flood or erosion control structure? (13, 14, 16) | — — |
| d. State water quality permit or certification? (30, 38, 40) | — — |
| e. State air quality permit or certification? (41, 43) | — — |
| 4. Will the proposed activity occur within and/or affect an area covered by a State-approved local waterfront revitalization program, or State-approved regional coastal management program?
(see policies in program document*) | — — |

D. ADDITIONAL STEPS

1. If all of the questions in Section C are answered "NO", then the applicant or agency shall complete Section E and submit the documentation required by Section F.
2. If any of the questions in Section C are answered "YES", then the applicant or agent is advised to consult the CMP, or where appropriate, the local waterfront revitalization program document*. The proposed activity must be analyzed in more detail with respect to the applicable state or local coastal policies. On a separate page(s), the applicant or agent shall: (a) identify, by their policy numbers, which coastal policies are affected by the activity, (b) briefly assess the effects of the activity upon the policy; and, (c) state how the activity is consistent with each policy. Following the completion of this written assessment, the applicant or agency shall complete Section E and submit the documentation required by Section F.

E. CERTIFICATION

The applicant or agent must certify that the proposed activity is consistent with the State's CMP or the approved local waterfront revitalization program, as appropriate. If this certification cannot be made, the proposed activity shall not be undertaken. If this certification can be made, complete this Section.

"The proposed activity complies with New York State's approved Coastal Management Program, or with the applicable approved local waterfront revitalization program, and will be conducted in a manner consistent with such program."

Applicant/Agent's Name: _____

Address: _____

Telephone: Area Code (585) _____

Applicant/Agent's Signature: _____ Date: _____



F. SUBMISSION REQUIREMENTS

1. The applicant or agent shall submit the following documents to the **New York State Department of State, Office of Planning and Development, Attn: Consistency Review Unit, One Commerce Plaza-Suite 1010, 99 Washington Avenue, Albany, New York 12231.**

- a. Copy of original signed form.
- b. Copy of the completed federal agency application.
- c. Other available information which would support the certification of consistency.

2. The applicant or agent shall also submit a copy of this completed form along with his/her application to the federal agency.

3. If there are any questions regarding the submission of this form, contact the Department of State at (518) 474-6000.

*These state and local documents are available for inspection at the offices of many federal agencies, Department of environmental Conservation and Department of State regional offices, and the appropriate regional and county planning agencies. Local program documents are also available for inspection at the offices of the appropriate local government.

Written Assessment/Documentation to Support Responses in Federal Consistency Assessment Form

C. Coastal Assessment:

1. Will the proposed activity result in any of the following:

h. Mining, excavation, or dredging activities, or the placement of dredged or fill material in coastal waters? (15,35)

POLICY 15

Mining, excavation or dredging in coastal waters shall not significantly interfere with the natural coastal processes which supply beach materials to land adjacent to such waters and shall be undertaken in a manner which will not cause an increase in erosion of such land.

Excavation in coastal waters will occur as part of the project during the removal material within the limits of Lake Ontario for placement of heavy stone armoring. Some material is proposed to be removed at toe of existing armoring prior to placement of new stone. No increase in erosion to land adjacent to coastal waters will occur as a result of this project.

POLICY 35

Dredging and filling in coastal waters and disposal of dredged material will be undertaken in a manner that meets existing State dredging permit requirements, and protects significant fish and wildlife habitats, scenic resources, natural protective features, important agricultural lands, and wetlands.

Dredging other than the activity described above, will not occur as part of this project. State and federal permit requirements will be met as part of this project.

2. Will the proposed activity affect or be located in, on, or adjacent to any of the following:

a. State designated freshwater or tidal wetland (44)

POLICY 44

Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.

The project involves the reconstruction of an existing roadway within the regulated wetland adjacent area of a State Wetland, and adjacent to the shoreline of Lake Ontario. A Joint Application has been submitted to NYSDEC and Army Corps of Engineers, and permit requirements will be followed.

b. Federally designated flood and/or state designated erosion hazard area? (11, 12, 17)

POLICY 11

Buildings and other structures will be sited in the coastal area so as to minimize damage to property and the endangering of human lives caused by flooding and erosion.

The project involves the replacement of an existing roadway on the same alignment. The project purpose is to reduce erosion along the shoreline, and flooding and erosion are not anticipated to increase as part of this project.

POLICY 12

Activities or development in the coastal area will be undertaken so as to minimize damage to natural resources and property from flooding and erosion by protecting natural protective features including beaches, dunes, barrier islands and bluffs.

The project site is a previously constructed roadway with existing heavy stone armoring, and is the sole access roadway to Point Peninsula. Beaches, dunes, barrier islands and bluffs are not anticipated to be negatively impacted as part of this project.

POLICY 17

Non-structural measures to minimize damage to natural resources and property from flooding and erosion shall be used whenever possible.

Previously placed heavy stone armoring exists along Lake Ontario for the extent of the newly proposed stone armoring that is part of this project. Structural measures are not proposed to replace natural measures.

c. State designated fish and or wildlife habitat (7)

POLICY 7

Significant coastal fish and wildlife habitats will be protected, preserved, and where practical, restored so as to maintain their viability as habitats.

Review of the NYSDEC Environmental Resource Mapper has indicated that the project is in the vicinity of the Rare Plants and Animals (fish species): Blackchin Shiner and Bridle Shiner. The project is also in the vicinity of a Significant Raptor Winter Concentration Area and Animals Listed as Endangered or Threatened. The proposed reconstruction of the existing roadway is not anticipated to disturb coastal fish and wildlife habitats. A Joint Application has been submitted to NYSDEC and Army Corps of Engineers, and permit requirements will be followed.

f. Beach, dune or Barrier Island (12)

POLICY 12

Activities or development in the coastal area will be undertaken so as to minimize damage to natural resources and property from flooding and erosion by protecting natural protective features including beaches, dunes, barrier islands and bluffs.

The existing beach and barrier island have previously been armored for the length of the project with heavy stone and damage to natural resources is not anticipated. The project proposed to add additional protection to the roadway and adjacent property from flooding and erosion during storm and high water events on Lake Ontario.

f. State, County or Local Park (19, 20)

POLICY 19

Protect, maintain, and increase the level and types of access to public water related recreation resources and facilities.

POLICY 20

Access to the publicly-owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly-owned shall be provided and it shall be provided in a manner compatible with adjoining uses.

A small amount of work is proposed within the adjacent NYSDEC owned boat launch for a turtle crossing culvert. Access to public water related recreation is not anticipated to be impacted, and NYSOGS will be consulted in addition to NYSDOS and NYSDEC.

3. Will the proposed activity require any of the following:

a. Waterfront site (2, 21, 22)

POLICY 2

Facilitate the siting of water dependent uses and facilities on or adjacent to coastal waters.

POLICY 21

Water dependent and water enhanced recreation will be encouraged and facilitated, and will be given priority over non-water-related uses along the coast.

POLICY 22

Development when located adjacent to the shore will provide for water-related recreation whenever such use is compatible with reasonably anticipated demand for such activities, and is compatible with the primary purpose of the development.

The project site is a previously constructed roadway with existing heavy stone armoring, and is the sole access roadway to Point Peninsula. The roadway already occupies a waterfront site, with no potential for other water dependent uses.

c. Construction or reconstruction of a flood or erosion control structure? (13, 14, 16)

POLICY 13

The construction or reconstruction of erosion protection structures shall be undertaken only if they have a reasonable probability of controlling erosion for at least thirty years as demonstrated in design and construction standards and/or assured maintenance or replacement programs.

The reconstruction of the erosion protection structures that is needed to protect this roadway is critical to maintaining access to Point Peninsula. Continued maintenance will be undertaken by Jefferson County.

POLICY 14

Activities and development, including the construction or reconstruction of erosion protection structures, shall be undertaken so that there will be no measurable increase in erosion or flooding at the site of such activities or development, or at other locations.

The reconstruction of the erosion protection structure was designed per design standards to properly determine wave height and stone armor size. This was done to prevent over-sizing the stone which may result in increased flooding, and to prevent under-sizing which may result in increased erosion and debris deposition.

POLICY 16

Public funds shall only be used for erosion protective structures where necessary to protect human life, and new development which requires a location within or adjacent to an erosion hazard area to be able to function, or existing development; and only where the public benefits outweigh the long term monetary and other costs including the potential for increasing erosion and adverse effects on natural protective features.

The reconstruction of the erosion protection structure is necessary to maintain access to residents on Point Peninsula, and the public benefits are anticipated to outweigh long-term costs. Potential for increasing erosion and adverse effects on natural protective features are not anticipated.

d. State water quality permit or certification? (30, 38, 40)

POLICY 30

Municipal, industrial, and commercial discharge of pollutants, including but not limited to, toxic and hazardous substances, into coastal waters will conform to State and National water quality standards.

Stormwater Best Management Practices will be utilized to control pollutant discharge related to construction activities, and will conform to State Water Quality Standards. A NY State Water Quality Certification will be required for and adhered to for the project.

POLICY 38

The quality and quantity of surface water and groundwater supplies will be conserved and protected, particularly where such waters constitute the primary or sole source of water supply.

Stormwater Best management Practices will be utilized to ensure the quality and quantity of surface and groundwater supplies. No primary or sole source aquifers or surface water sources exist in the vicinity of the project.

POLICY 40

Effluent discharged from major steam electric generating and industrial facilities into coastal waters will not be unduly injurious to fish and wildlife and shall conform to State water quality standards.

No effluent will occur as a result of this project.



JOINT APPLICATION FORM

For Permits for activities affecting streams, waterways, waterbodies, wetlands, coastal areas, sources of water, and endangered and threatened species.

You must separately apply for and obtain Permits from each involved agency before starting work. Please read all instructions.

1. Applications To:
>NYS Department of Environmental Conservation
Check all permits that apply: Stream Disturbance, Dams and Impoundment Structures, Tidal Wetlands, Water Withdrawal, etc.
>US Army Corps of Engineers
Check all permits that apply: Section 404 Clean Water Act, Section 10 Rivers and Harbors Act
>NYS Office of General Services
Check all permits that apply: State Owned Lands Under Water, Utility Easement, Docks, Moorings or Platforms
>NYS Department of State
Check if this applies: Coastal Consistency Concurrence

2. Name of Applicant
Mailing Address, Telephone, Email, Taxpayer ID, Post Office / City, State, Zip
Applicant Must be (check all that apply): Owner, Operator, Lessee

3. Name of Property Owner (if different than Applicant)
Mailing Address, Telephone, Email, Post Office / City, State, Zip

For Agency Use Only Agency Application Number:

4. Name of Contact / Agent

Mailing Address _____ Post Office / City _____ State _____ Zip _____

Telephone _____ Email _____

5. Project / Facility Name _____ Property Tax Map Section / Block / Lot Number: _____

Project Street Address, if applicable _____ Post Office / City _____ State _____ Zip _____

_____ NY _____

Provide directions and distances to roads, intersections, bridges and bodies of water

Town Village City County _____ Stream/Waterbody Name _____

Project Location Coordinates: Enter Latitude and Longitude in degrees, minutes, seconds:

Latitude: _____° _____' _____" Longitude: _____° _____' _____"

6. Project Description: Provide the following information about your project. Continue each response and provide any additional information on other pages. **Attach plans on separate pages.**

a. Purpose of the proposed project:

b. Description of current site conditions:

c. Proposed site changes:

d. Type of structures and fill materials to be installed, and quantity of materials to be used (e.g., square feet of coverage, cubic yards of fill material, structures below ordinary/mean high water, etc.):

e. Area of excavation or dredging, volume of material to be removed, location of dredged material placement:

f. Is tree cutting or clearing proposed? Yes If Yes, explain below. No

Timing of the proposed cutting or clearing (month/year): _____

Number of trees to be cut: _____ Acreage of trees to be cleared: _____

g. Work methods and type of equipment to be used:

h. Describe the planned sequence of activities:

i. Pollution control methods and other actions proposed to mitigate environmental impacts:

j. Erosion and silt control methods that will be used to prevent water quality impacts:

k. Alternatives considered to avoid regulated areas. If no feasible alternatives exist, explain how the project will minimize impacts:

l. Proposed use: Private Public Commercial

m. Proposed Start Date: Estimated Completion Date:

n. Has work begun on project? Yes If Yes, explain below. No

o. Will project occupy Federal, State, or Municipal Land? Yes If Yes, explain below. No

p. List any previous DEC, USACE, OGS or DOS Permit / Application numbers for activities at this location:

q. Will this project require additional Federal, State, or Local authorizations, including zoning changes?

Yes If Yes, list below. No

7. Signatures.

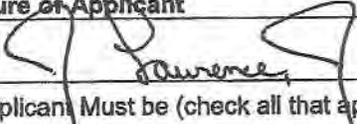
Applicant and Owner (If different) must sign the application. If the applicant is the landowner, the landowner attestation form can be used as an electronic signature as an alternative to the signature below, if necessary. Append additional pages of this Signature section if there are multiple Applicants, Owners or Contact/Agents.

I hereby affirm that information provided on this form and all attachments submitted herewith is true to the best of my knowledge and belief.

Permission to Inspect - I hereby consent to Agency inspection of the project site and adjacent property areas. Agency staff may enter the property without notice between 7:00 am and 7:00 pm, Monday - Friday. Inspection may occur without the owner, applicant or agent present. If the property is posted with "keep out" signs or fenced with an unlocked gate, Agency staff may still enter the property. Agency staff may take measurements, analyze site physical characteristics, take soil and vegetation samples, sketch and photograph the site. I understand that failure to give this consent may result in denial of the permit(s) sought by this application.

False statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the NYS Penal Law. Further, the applicant accepts full responsibility for all damage, direct or indirect, of whatever nature, and by whomever suffered, arising out of the project described herein and agrees to indemnify and save harmless the State from suits, actions, damages and costs of every name and description resulting from said project. In addition, Federal Law, 18 U.S.C., Section 1001 provides for a fine of not more than \$10,000 or imprisonment for not more than 5 years, or both where an applicant knowingly and willingly falsifies, conceals, or covers up a material fact; or knowingly makes or uses a false, fictitious or fraudulent statement.

Signature of Applicant



Date

8/19/20

Applicant Must be (check all that apply): Owner Operator Lessee

Printed Name

Jim Lawrence

Title

Highway Superintendent

Signature of Owner (if different than Applicant)

Date

Printed Name

Title

Signature of Contact / Agent



Date

8/19/20

Printed Name

Bryan Bancroft

Title

Consultant, Lu Engineers

For Agency Use Only

DETERMINATION OF NO PERMIT REQUIRED

Agency Application Number _____

_____ (Agency Name) has determined that No Permit is required from this Agency for the project described in this application.

Agency Representative:

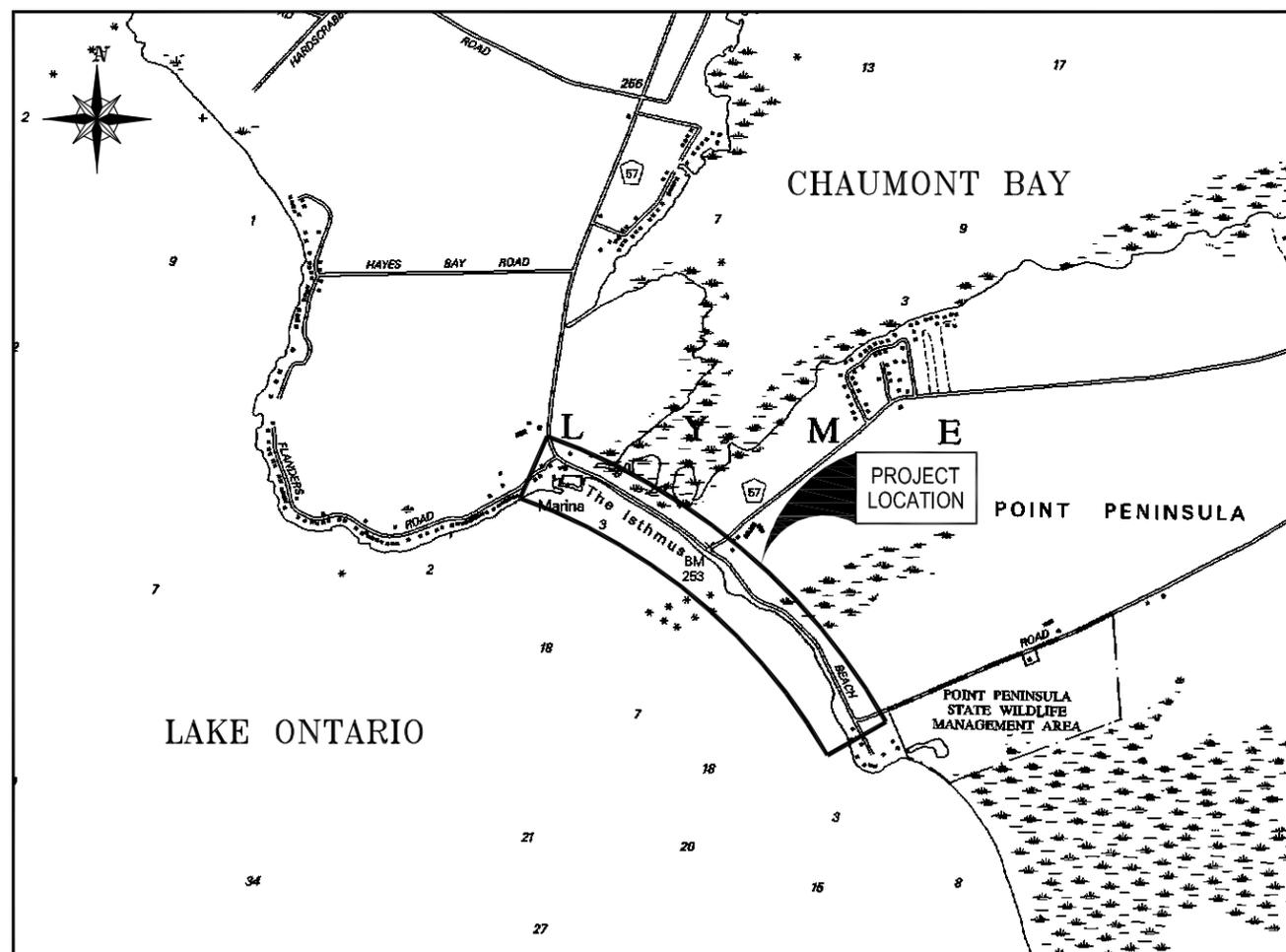
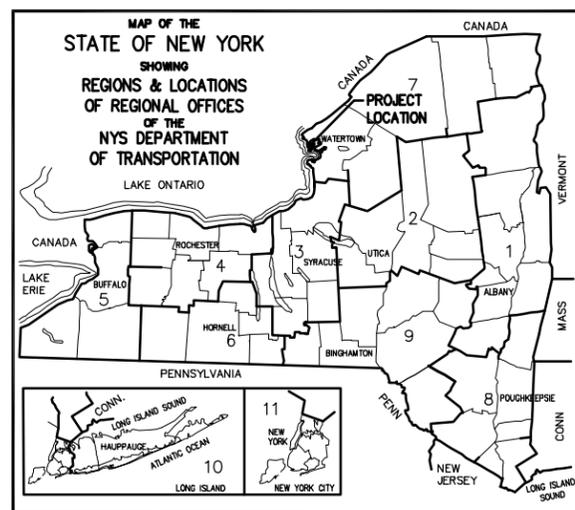
Printed Name

Title

Signature

Date

CONTRACT DRAWINGS FOR REDI PROJECT COUNTY ROAD 57 POINT PENINSULA, JEFFERSON COUNTY



LOCATION MAP
N.T.S.

APPROVALS:

JAMES LAWRENCE, JR.
SUPERINTENDENT, HIGHWAY DEPARTMENT

DATE _____

RECOMMENDATION:

JONATHAN W. OTTMAN, P.E.
NYS LICENSE # 075865
LU ENGINEERS

DATE _____

**60% PLANS SUBMISSION
AUGUST 2020**

<p>PREPARED FOR:</p> <p>JEFFERSON COUNTY HIGHWAY DEPARTMENT</p> <p>21897 County Route 190 Watertown, New York 13601</p>	<p>PREPARED BY:</p>  <p>Lu Engineers</p> <p>ENVIRONMENTAL • TRANSPORTATION • CIVIL</p> <p>339 East Avenue, Suite 200 Rochester, New York 14604</p>
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J:\Projects\36200 - Jefferson County\36206 - Jefferson County REDI Projects\Cadd\Contract Dwg\CR 57\02 - Estimate of Quantities and Index\Estimate of Quantities and Index.dwg, 8/18/2020 3:53:46 PM, JMessinger

ESTIMATE OF QUANTITIES				
ITEM	DESCRIPTION	UNIT	ESTIMATE	FINAL
201.06	CLEARING AND GRUBBING	LS	1.0	
203.02	UNCLASSIFIED EXCAVATION AND DISPOSAL	CY	450.0	
203.03	EMBANKMENT IN PLACE	CY	500.0	
203.07	SELECT GRANULAR FILL	CY	20.0	
206.0201	TRENCH AND CULVERT EXCAVATION	CY	550.0	
207.20	GEOTEXTILE BEDDING	SY	6,900.0	
207.21	GEOTEXTILE SEPARATION	SY	7,250.0	
209.13	SILT FENCE-TEMPORARY	LF	300.0	
304.12	SUBBASE COURSE, TYPE 2	CY	4,200.0	
304.6000017	FULL DEPTH RECLAMATION OF ASPHALT PAVEMENT	SY	5,000.0	
304.8000017	BITUMINOUS STABILIZING AGENT FOR FULL DEPTH RECLAMATION OF ASPHALT PAVEMENT	GAL	5,000.0	
402.000013	PLANT PRODUCTION QUALITY ADJUSTMENT TO HMA ITEMS	QU	133.0	
402.098303	9.5 F3 TOP COURSE HMA, 80 SERIES COMPACTION	TON	600.0	
402.198903	19 F9 BINDER COURSE HMA, 80 SERIES COMPACTION	TON	2,060.0	
407.0102	DILUTED TACK COAT	GAL	760.0	
418.7603	ASPHALT PAVEMENT JOINT ADHESIVE	LF	1,800.0	
490.10	PRODUCTION COLD MILLING OF BITUMINOUS CONCRETE	SY	500.0	
603.7307	REINFORCED CONCRETE PIPE END SECTIONS 30 INCH DIAMETER	EACH	2.0	
603.7407	REINFORCED CONCRETE PIPE, CLASS II, 30 INCH DIAMETER	LF	90.0	
606.10	BOX BEAM GUIDE RAILING	LF	1,545.0	
606.120201	BOX BEAM GUIDE RAILING END ASSEMBLY, TYPE IIA	EACH	2.0	
608.020102	HOT MIX ASPHALT (HMA) SIDEWALKS, DRIVEWAYS AND BICYCLE PATHS AND VEGETATION CONTROL STRIPS	TON	85.0	
610.1401	TOPSOIL - REUSE ON-SITE MATERIALS	CY	220.0	
610.1402	TOPSOIL - ROADSIDE	CY	220.0	
610.1601	TURF ESTABLISHMENT - ROADSIDE	SY	3,960.0	
616.08000024	LIVE STAKE PLANTINGS (1" TO 2")	EACH	960.0	
619.01	BASIC WORK ZONE TRAFFIC CONTROL	LS	1.0	
619.04	TYPE III CONSTRUCTION BARRICADE	EACH	6.0	
619.1711	TEMPORARY POSITIVE BARRIER - CATEGORY 1 (PINNING PROHIBITED)	LF	80.0	
620.03	STONE FILLING (LIGHT)	CY	1,400.0	
620.05	STONE FILLING (HEAVY)	CY	5,400.0	
620.06	DRY RIP-RAP	CY	1,500.0	
620.0801	BEDDING MATERIAL, TYPE 1	CY	1,250.0	
620.14010009	EXTRA HEAVY STONE, TYPE A	CY	1,250.0	
625.01	SURVEY OPERATIONS	LS	1.0	
627.50140008	CUTTING PAVEMENT	LF	52.0	
685.11	WHITE EPOXY REFLECTORIZED PAVEMENT STRIPES - 20 MILS	LF	3,700.0	
685.12	YELLOW EPOXY REFLECTORIZED PAVEMENT STRIPES - 20 MILS	LF	3,700.0	
697.03	FIELD CHANGE PAYMENT	DC	153,200.0	
698.04	ASPHALT PRICE ADJUSTMENT	DC	100.0	
698.05	FUEL PRICE ADJUSTMENT	DC	100.0	
699.040001	MOBILIZATION (4% MAXIMUM)	LS	1.0	

DRAWING INDEX		
DWG NO.	TITLE OF DRAWING	SHEET NO.
	COVER SHEET	1
EQ - 1	ESTIMATE OF QUANTITIES AND INDEX	2
TS - 1	HIGHWAY TYPICAL SECTIONS	3
PL - 1 TO PL - 5	ROADWAY PLAN AND PROFILE	4 - 8



DATE	REVISIONS	BY

DRAWING ALTERATION
 Note: It is a violation of law for any person, unless they are acting under the direction of a licensed professional engineer, architect, landscape architect or land surveyor to alter an item in any way. If an item bearing the stamp of a licensed professional is altered, the altering engineer, architect, landscape architect or land surveyor shall stamp the document and include the notation "altered by" followed by their signature, the date of such alteration, and a specific description of the alteration.

BY: _____
 DATE: _____



339 East Avenue, Suite 200
 Rochester New York 14604
 (585) 385-7417
 Fax: (585) 546-1634
 luengineers.com

PROJECT:
REDI PROJECT
 COUNTY ROAD 57
 POINT PENINSULA

CLIENT:
 JEFFERSON COUNTY
 HIGHWAY DEPARTMENT
 21897 County Route 190
 Watertown, New York 13601

DRAWING TITLE:
ESTIMATE OF QUANTITIES AND INDEX

DESIGNED BY: JRM	SCALE: AS SHOWN
DRAWN BY: JRM	DATE: AUGUST 2020
CHECKED BY: JWO	PROJECT No. 36206
SHEET 2 OF 8	DRAWING No. EQ - 1



DATE	REVISIONS	BY

DRAWING ALTERATION
 Note: It is a violation of law for any person, unless they are acting under the direction of a licensed professional engineer, architect, landscape architect or land surveyor to alter in any way, if an item bearing the stamp of a licensed professional is altered, the altering engineer, architect, landscape architect or land surveyor shall stamp the document and include the notation "altered by" followed by their signature, the date of such alteration, and a specific description of the alteration.

BY: _____
 DATE: _____



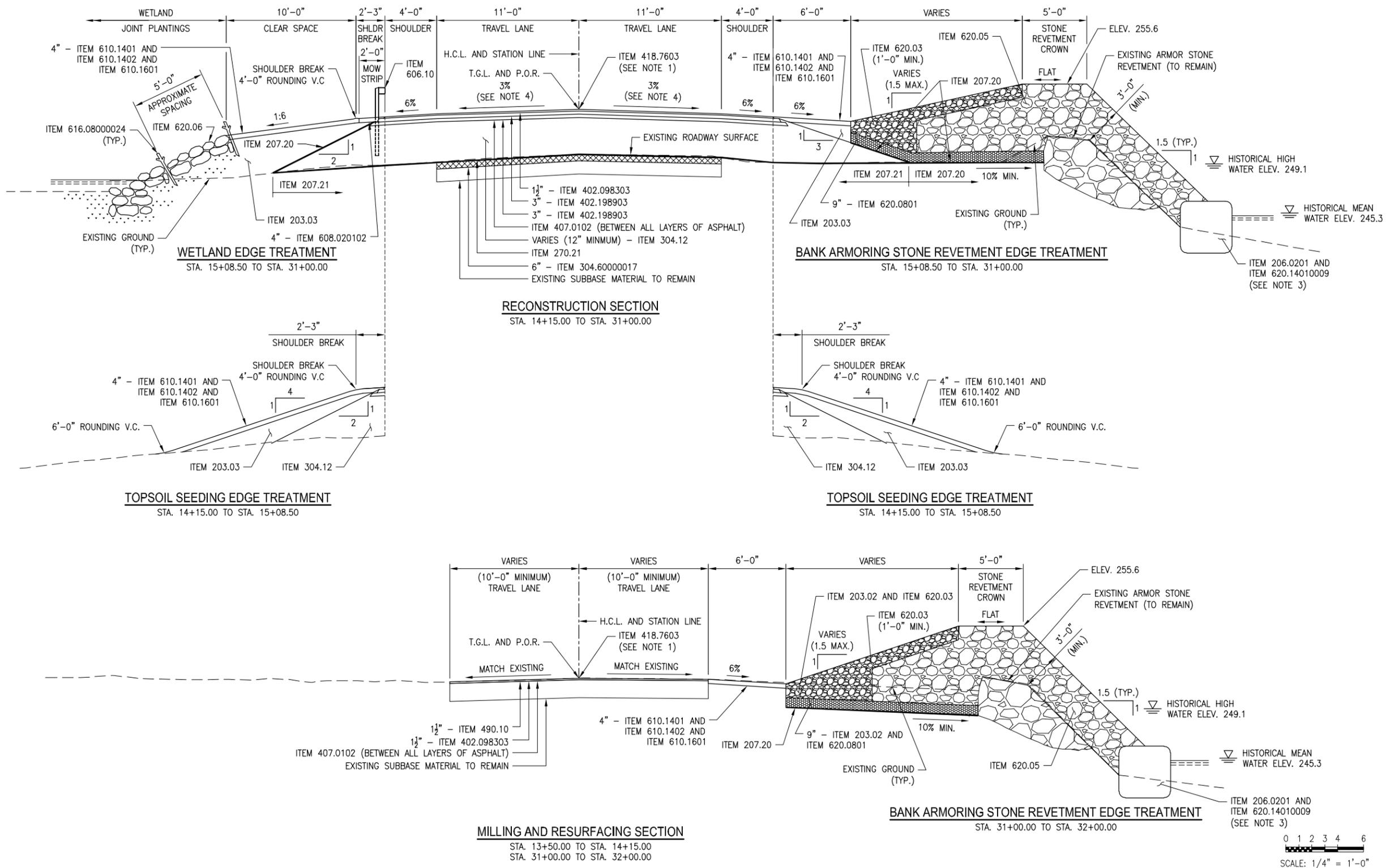
339 East Avenue, Suite 200
 Rochester New York 14604
 (585) 385-7417
 Fax: (585) 546-1634
 luengineers.com

PROJECT:
REDI PROJECT
 COUNTY ROAD 57
 POINT PENINSULA

CLIENT:
**JEFFERSON COUNTY
 HIGHWAY DEPARTMENT**
 21897 County Route 190
 Watertown, New York 13601

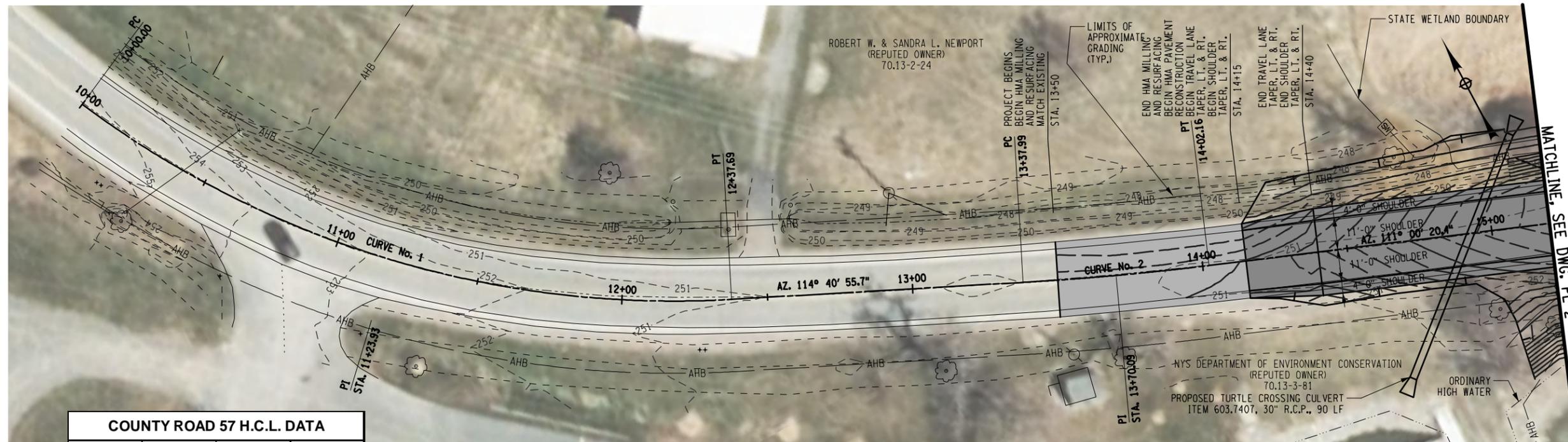
DRAWING TITLE:
**HIGHWAY
 TYPICAL
 SECTIONS**

DESIGNED BY: JRM	SCALE: AS SHOWN
DRAWN BY: JRM	DATE: AUGUST 2020
CHECKED BY: JWO	PROJECT No. 36206
SHEET 3 OF 8	DRAWING No. TS - 1



ITEM NO.	DESCRIPTION	UNIT	ITEM NO.	DESCRIPTION	UNIT	NOTES
203.02	UNCLASSIFIED EXCAVATION AND DISPOSAL	CY	606.10	BOX BEAM GUIDE RAILING	FT	1. ASPHALT PAVEMENT JOINT ADHESIVE (ITEM 418.7603) SHALL BE USED ON ALL VERTICAL FACES FOR ALL THE JOINTS ON THE TOP HMA PAVEMENT COURSE SUCH AS LONGITUDINAL, TRANSVERSE, CURBS OR OTHER JOINTS BUTTING AGAINST THE NEW HMA PAVEMENT. 2. REFER TO ROADWAY PLANS DWGS. FOR TRAVEL LANE AND SHOULDER TAPER LOCATIONS. 3. EXTRA HEAVY STONE (ANCHOR ROCKS) SHALL BE KEYED INTO EXISTING GROUND ALONG THE EXISTING STONE ARMORED SHORELINE. 4. REFER TO ROADWAY PLAN AND PROFILE DWGS. PL-1 THRU PL-5 FOR PAVEMENT CROSS-SLOPE TRANSITIONS AND SUPERELEVATION STATIONING.
203.03	EMBANKMENT IN PLACE	CY	608.020102	HMA SIDEWALKS, DRIVEWAYS, BICYCLE PATHS, AND VEGETATION CONTROL STRIPS	TON	
206.0201	TRENCH AND CULVERT EXCAVATION	CY	610.1401	TOPSOIL, REUSE ON-SITE MATERIALS	CY	
207.20	GEOTEXTILE BEDDING	SY	610.1402	TOPSOIL, ROADSIDE	CY	
207.21	GEOTEXTILE SEPARATION	SY	610.1601	TURF ESTABLISHMENT, ROADSIDE	SY	
304.12	SUBBASE COURSE, TYPE 2	CY	616.08000024	LIVE STAKE PLANTINGS (1" TO 2")	EACH	
304.60000017	FULL DEPTH RECLAMATION ASPHALT PAVEMENT	SY	620.0801	BEDDING MATERIAL, TYPE 1	CY	
402.098303	9.5 F3 TOP COURSE HMA, 80 SERIES COMPACTION	TON	620.03	STONE FILLING, LIGHT	CY	
402.198903	19 F9 BINDER COURSE HMA, 80 SERIES COMPACTION	TON	620.05	STONE FILLING, HEAVY	CY	
407.0102	DILUTED TACK COAT	GAL	620.06	DRY RIP-RAP	CY	
418.7603	ASPHALT PAVEMENT JOINT ADHESIVE	FT	620.14010009	EXTRA HEAVY STONE, TYPE A	CY	

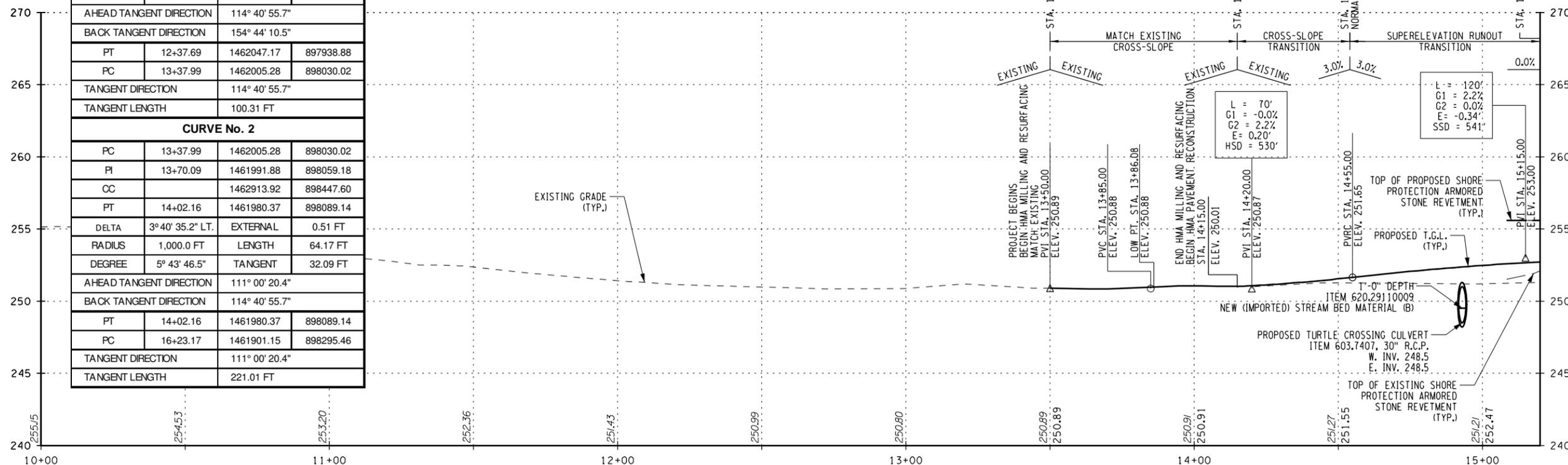
J:\Projects\36200 Jefferson County REDI Projects\Cadd\Contract Dwgs\CR 57\06 - Typical Sections\Highway Typical Sections.dwg, 8/18/2020 2:37:00 PM, JMessinger



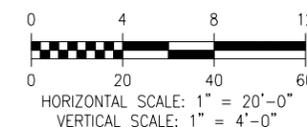
COUNTY ROAD 57 H.C.L. DATA

POINT	STATION	NORTHING	EASTING
CURVE No. 1			
POB (PC)	10+00.00	1462211.00	897773.38
PI	11+23.93	1462098.92	897826.27
CC		1462356.10	898080.86
PT	12+37.69	1462047.17	897938.88
DELTA	40° 03' 14.9" LT.	EXTERNAL	21.88 FT
RADIUS	340.0 FT	LENGTH	237.69 FT
DEGREE	16° 51' 06.1"	TANGENT	123.93 FT
AHEAD TANGENT DIRECTION	114° 40' 55.7"		
BACK TANGENT DIRECTION	154° 44' 10.5"		
PT	12+37.69	1462047.17	897938.88
PC	13+37.99	1462005.28	898030.02
TANGENT DIRECTION	114° 40' 55.7"		
TANGENT LENGTH	100.31 FT		
CURVE No. 2			
PC	13+37.99	1462005.28	898030.02
PI	13+70.09	1461991.88	898059.18
CC		1462913.92	898447.60
PT	14+02.16	1461980.37	898089.14
DELTA	3° 40' 35.2" LT.	EXTERNAL	0.51 FT
RADIUS	1,000.0 FT	LENGTH	64.17 FT
DEGREE	5° 43' 46.5"	TANGENT	32.09 FT
AHEAD TANGENT DIRECTION	111° 00' 20.4"		
BACK TANGENT DIRECTION	114° 40' 55.7"		
PT	14+02.16	1461980.37	898089.14
PC	16+23.17	1461901.15	898295.46
TANGENT DIRECTION	111° 00' 20.4"		
TANGENT LENGTH	221.01 FT		

CR 57 - ROADWAY PLAN



CR 57 - ROADWAY PROFILE



DATE	REVISIONS	BY

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 Note: It is a violation of law for any person, unless they are acting under the direction of a licensed professional engineer, architect, landscape architect or land surveyor to alter an item in any way. If an item bearing the stamp of a licensed professional is altered, the altering engineer, architect, landscape architect or land surveyor shall stamp the document and include the notation "altered by" followed by their signature, the date of such alteration, and a specific description of the alteration.

BY: _____
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 Fax: (585) 546-1634
 luengineers.com

PROJECT:
REDI PROJECTS
COUNTY ROAD 57
POINT PENINSULA

CLIENT:
JEFFERSON COUNTY
HIGHWAY DEPARTMENT
 21897 County Route
 Watertown, New York 13601

DRAWING TITLE:
ROADWAY
PLAN
AND
PROFILE

DESIGNED BY: JRM	SCALE: AS NOTED
DRAWN BY: JRM	DATE: AUGUST 2020
CHECKED BY: JWO	PROJECT No. 36206

SHEET
4 OF 8

DRAWING No.
PL - 1

FILE NAME = 36206 Jefferson County REDI Projects - Proposed.dgn
 DATE/TIME = 18-AUG-2020 07:02
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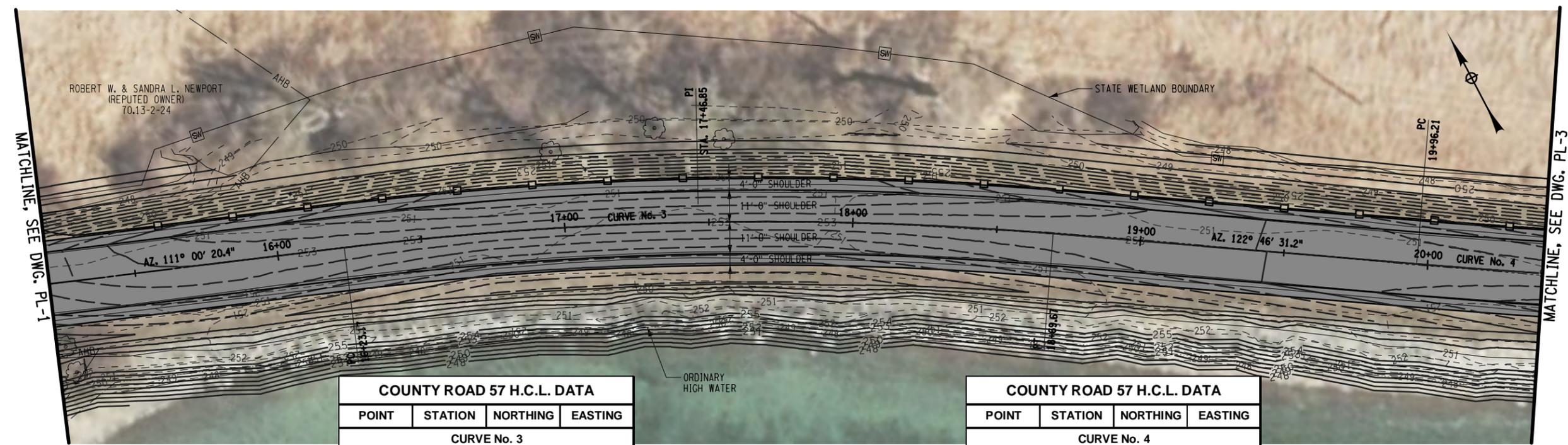
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PROJECT:
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 COUNTY ROAD 57
 POINT PENINSULA

CLIENT:
 JEFFERSON COUNTY
 HIGHWAY DEPARTMENT
 21897 County Route
 Watertown, New York 13601

DRAWING TITLE:
 ROADWAY
 PLAN
 AND
 PROFILE

DESIGNED BY: JRM	SCALE: AS NOTED
DRAWN BY: JRM	DATE: AUGUST 2020
CHECKED BY: JWO	PROJECT No. 36206
SHEET 5 OF 8	DRAWING No. PL - 2

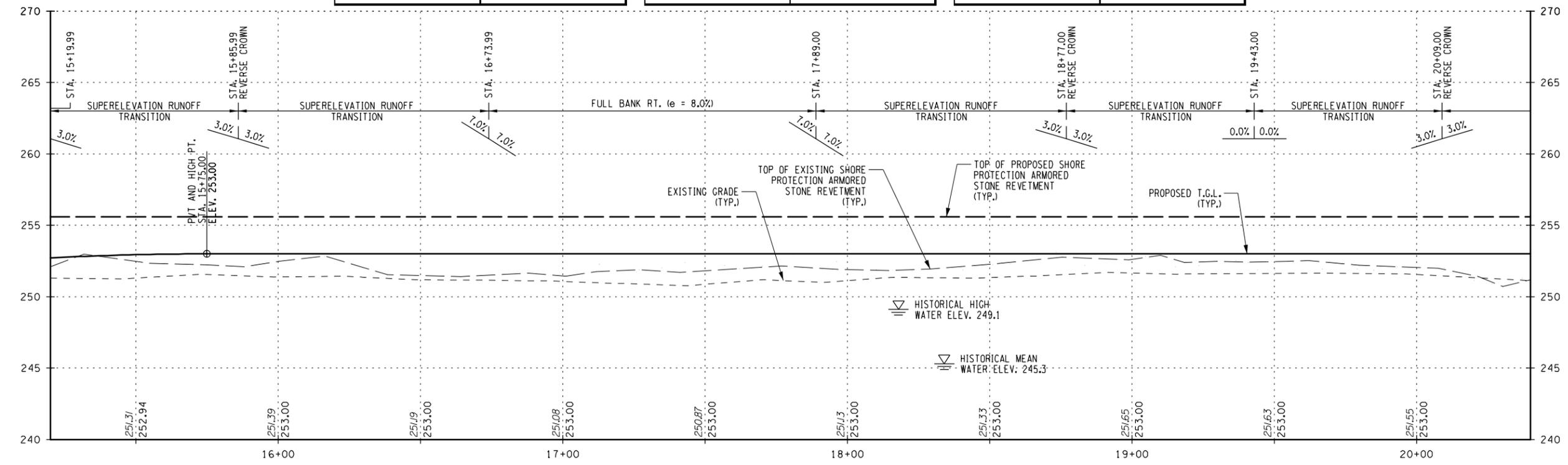


COUNTY ROAD 57 H.C.L. DATA			
POINT	STATION	NORTHING	EASTING
CURVE No. 3			
PC	16+23.17	1461901.15	898295.46
PI	17+46.85	1461856.81	898410.93
CC		1460780.90	897865.31
PT	18+69.67	1461789.86	898514.92
DELTA	11° 46' 10.8" RT.	EXTERNAL	6.36 FT
RADIUS	1,200.0 FT	LENGTH	246.50 FT
DEGREE	4° 46' 28.7"	TANGENT	123.69 FT
AHEAD TANGENT DIRECTION	122° 46' 31.2"		
BACK TANGENT DIRECTION	111° 00' 20.4"		

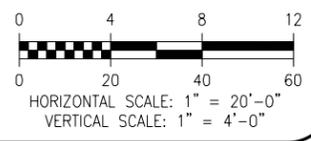
COUNTY ROAD 57 H.C.L. DATA			
POINT	STATION	NORTHING	EASTING
PT	18+69.67	1461789.86	898514.92
PC	19+96.21	1461721.36	898621.32
TANGENT DIRECTION	122° 46' 31.2"		
TANGENT LENGTH	126.54 FT		

COUNTY ROAD 57 H.C.L. DATA			
POINT	STATION	NORTHING	EASTING
CURVE No. 4			
PC	19+96.21	1461721.36	898621.32
PI	20+71.94	1461680.36	898684.99
CC		1463823.36	899974.68
PT	21+47.62	1461643.29	898751.03
DELTA	3° 28' 12.5" LT.	EXTERNAL	1.15 FT
RADIUS	2,500.0 FT	LENGTH	151.41 FT
DEGREE	2° 17' 30.6"	TANGENT	75.73 FT
AHEAD TANGENT DIRECTION	119° 18' 18.7"		
BACK TANGENT DIRECTION	122° 46' 31.2"		

CR 57 - ROADWAY PLAN



CR 57 - ROADWAY PROFILE



FILE NAME = 36206 Jefferson County REDI Projects - Proposed.dgn
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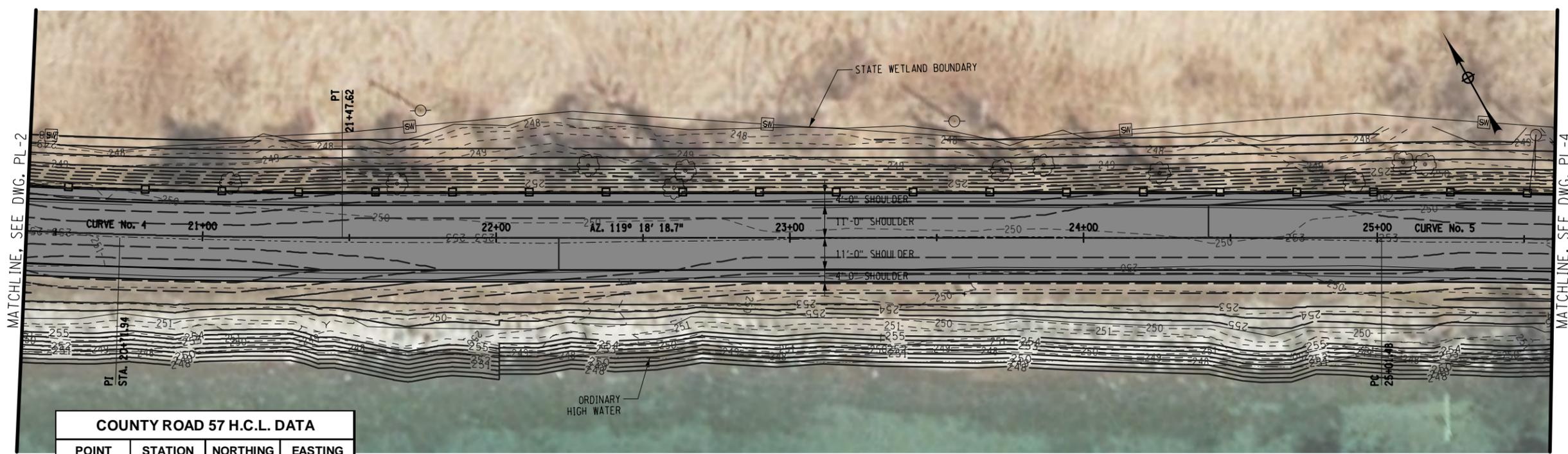
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PROJECT:
 REDI PROJECTS
 COUNTY ROAD 57
 POINT PENINSULA

CLIENT:
 JEFFERSON COUNTY
 HIGHWAY DEPARTMENT
 21897 County Route
 Watertown, New York 13601

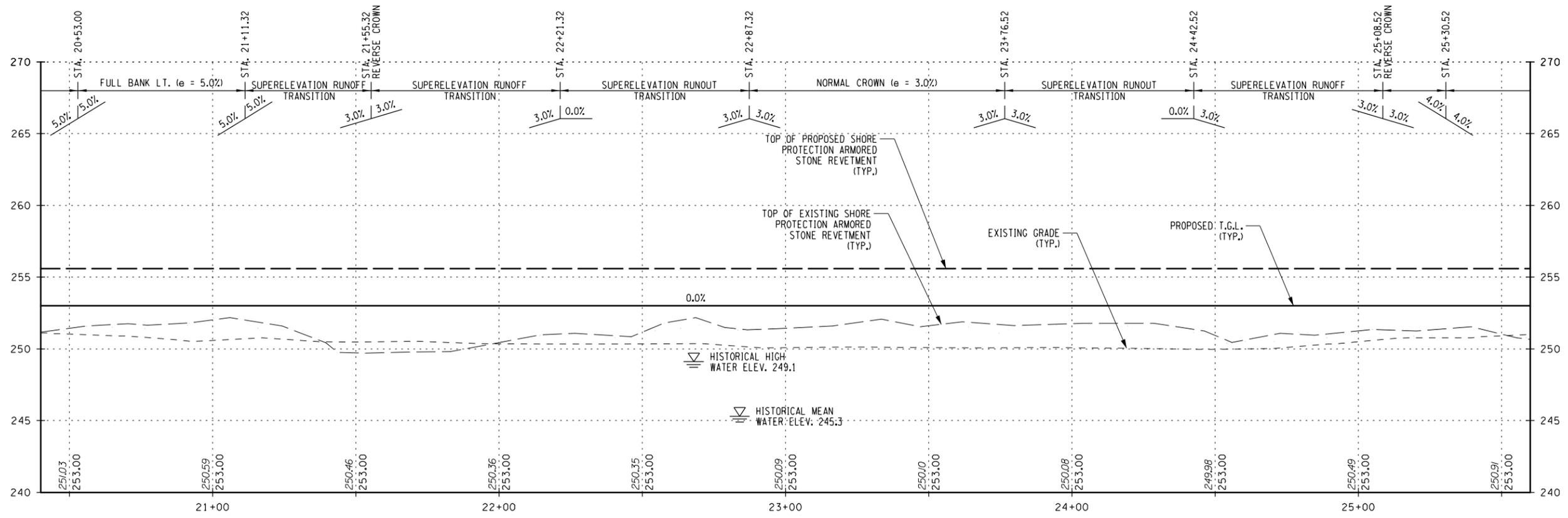
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 AND
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DESIGNED BY: JRM	SCALE: AS NOTED
DRAWN BY: JRM	DATE: AUGUST 2020
CHECKED BY: JWO	PROJECT No. 36206
SHEET 6 OF 8	DRAWING No. PL - 3

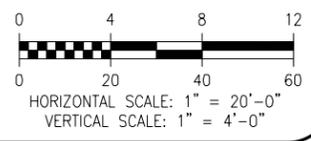


POINT	STATION	NORTHING	EASTING
PT	21+47.62	1461643.29	898751.03
PC	25+01.48	1461470.09	899059.60
TANGENT DIRECTION	119° 18' 18.7"		
TANGENT LENGTH	353.86 FT		

CR 57 - ROADWAY PLAN



CR 57 - ROADWAY PROFILE



FILE NAME = 36206 Jefferson County REDI Projects - Proposed.dgn
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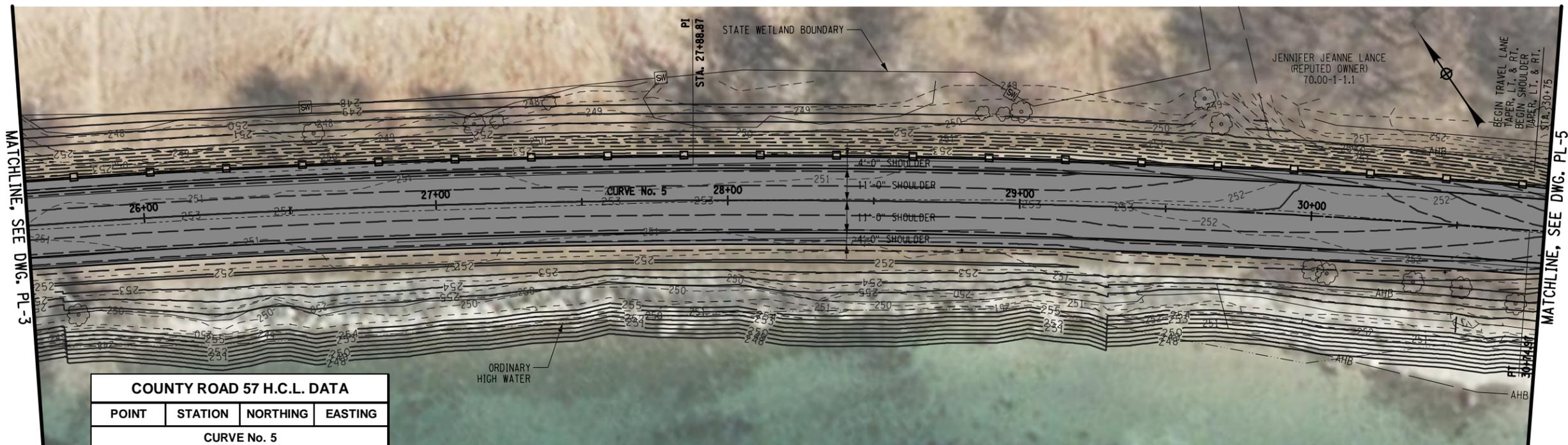
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PROJECT:
REDI PROJECTS
COUNTY ROAD 57
POINT PENINSULA

CLIENT:
JEFFERSON COUNTY
HIGHWAY DEPARTMENT
 21897 County Route
 Watertown, New York 13601

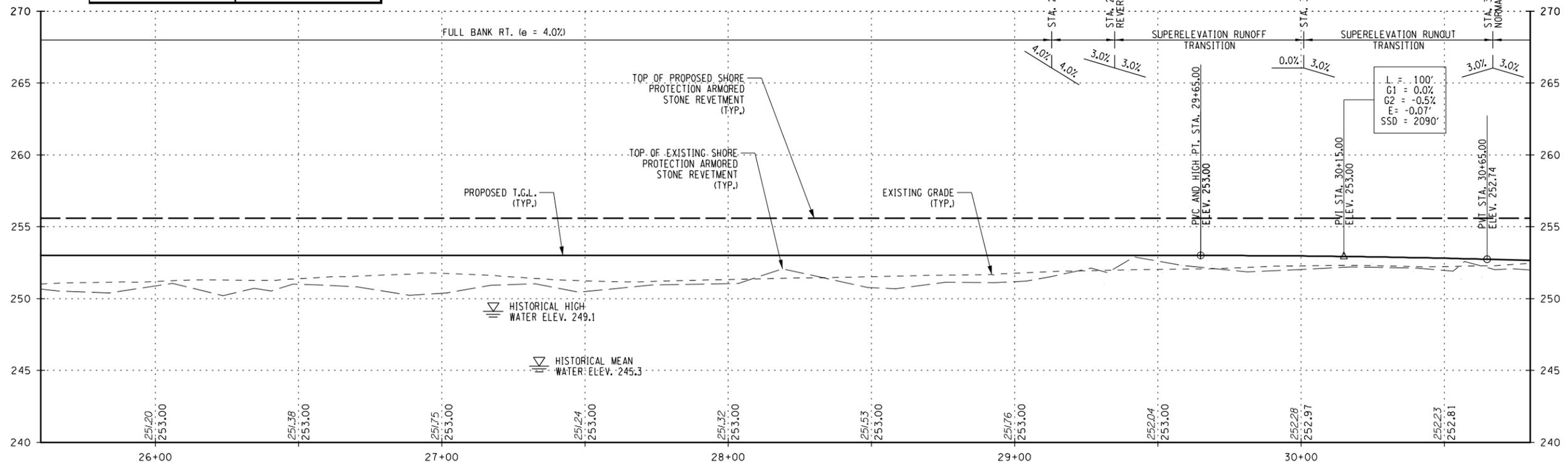
DRAWING TITLE:
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PLAN
AND
PROFILE

DESIGNED BY: JRM	SCALE: AS NOTED
DRAWN BY: JRM	DATE: AUGUST 2020
CHECKED BY: JWO	PROJECT No. 36206
SHEET 7 OF 8	DRAWING No. PL - 4

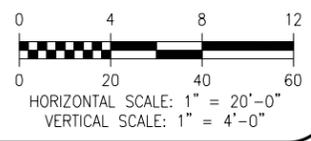


COUNTY ROAD 57 H.C.L. DATA			
POINT	STATION	NORTHING	EASTING
CURVE No. 5			
PC	25+01.48	1461470.09	899059.60
PI	27+88.87	1461329.43	899310.21
CC		1458418.01	897346.49
PT	30+74.97	1461149.77	899534.52
DELTA	9° 23' 17.4" RT.	EXTERNAL	11.78 FT
RADIUS	3,500.0 FT	LENGTH	573.49 FT
DEGREE	1° 38' 13.3"	TANGENT	287.39 FT
AHEAD TANGENT DIRECTION	128° 41' 36.1"		
BACK TANGENT DIRECTION	119° 18' 18.7"		

CR 57 - ROADWAY PLAN

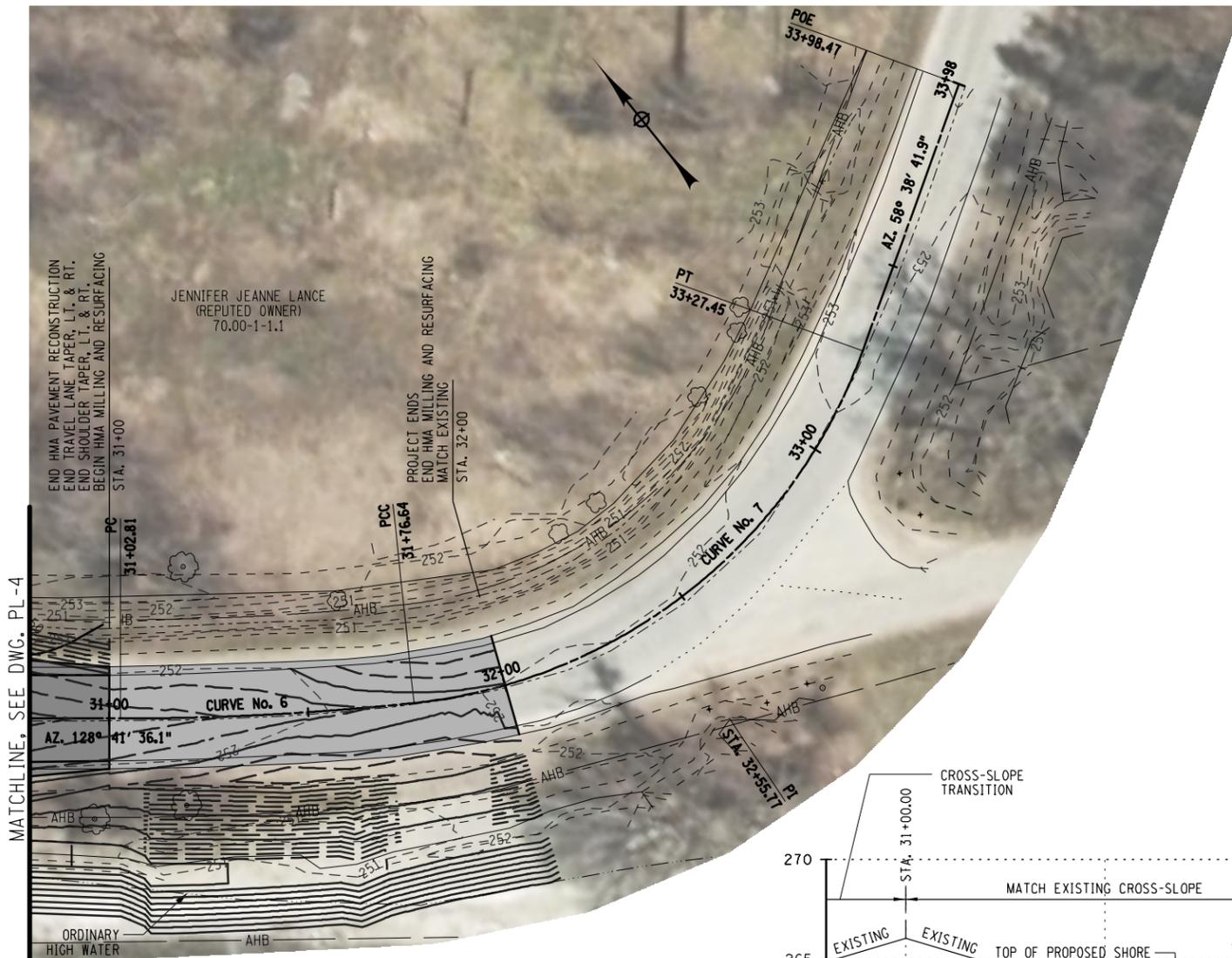


CR 57 - ROADWAY PROFILE

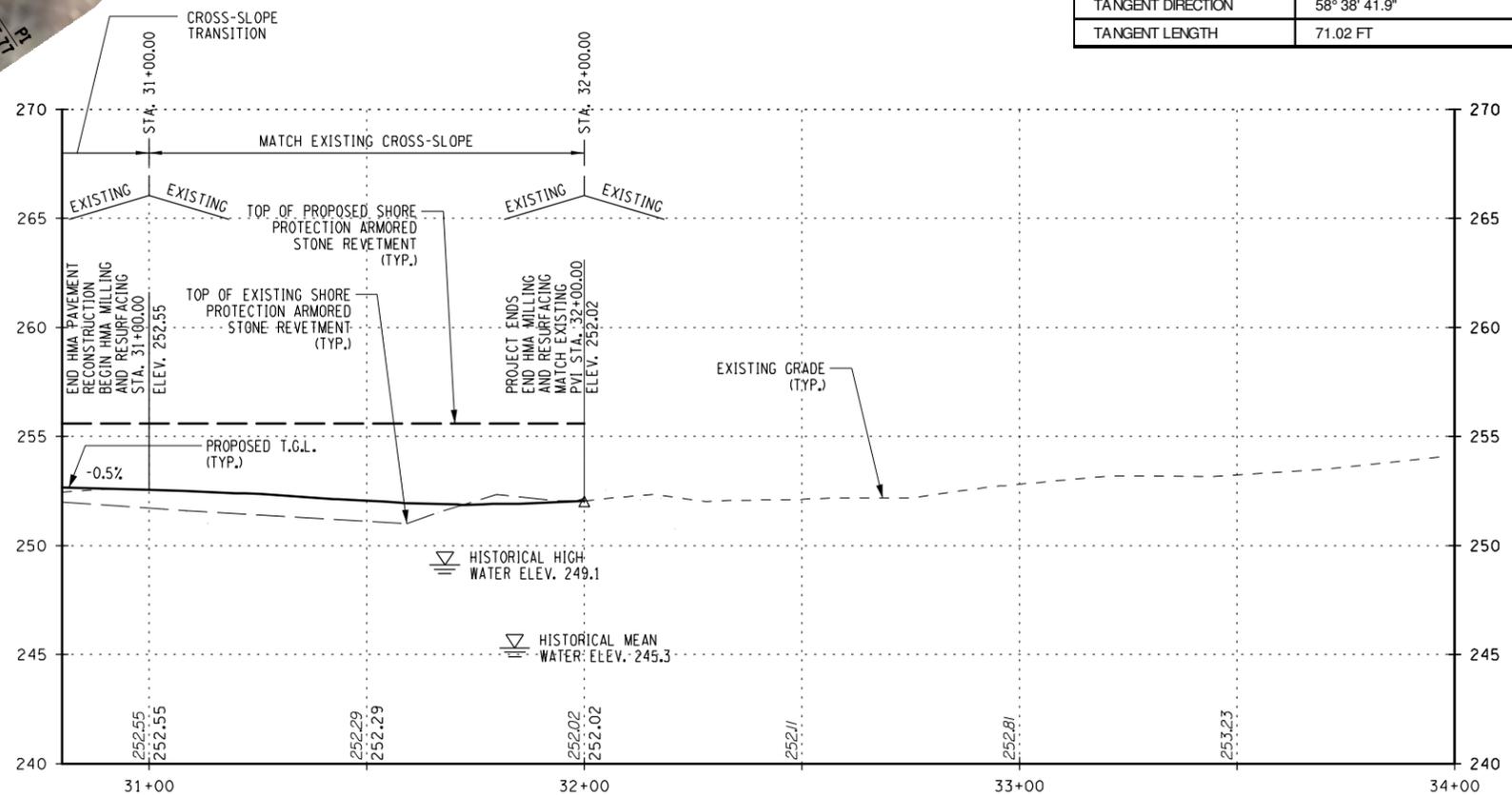


FILE NAME = 36206 Jefferson County REDI Projects - Proposed.dgn
 DATE/TIME = 19-AUG-2020 07:03
 USER = jmessinger

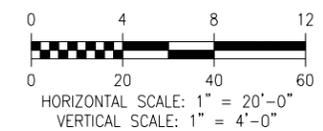
FILE NAME = 36206 Jefferson County REDI Projects- Proposed.dgn
 DATE/TIME = 18-AUG-2020 07:03
 USER = jmessinger



CR 57 - ROADWAY PLAN



CR 57 - ROADWAY PROFILE



COUNTY ROAD 57 H.C.L. DATA			
POINT	STATION	NORTHING	EASTING
PT	30+74.97	1461149.77	899534.52
PC	31+02.81	1461132.36	899556.25
TANGENT DIRECTION		128° 41' 36.1"	
TANGENT LENGTH		27.84 FT	
CURVE No. 6			
PC	31+02.81	1461132.36	899556.25
PI	31+39.76	1461109.26	899585.09
CC		1461678.71	899993.86
PCC	31+76.64	1461089.33	899616.20
DELTA	6° 02' 34.9" LT.	EXTERNAL	0.97 FT
RADIUS	700.0 FT	LENGTH	73.83 FT
DEGREE	8° 11' 06.4"	TANGENT	36.95 FT
AHEAD TANGENT DIRECTION		122° 39' 01.2"	
BACK TANGENT DIRECTION		128° 41' 36.1"	
CURVE No. 7			
PCC	31+76.64	1461089.33	899616.20
PI	32+61.01	1461043.81	899687.24
CC		1461202.99	899689.04
PT	33+27.45	1461087.71	899759.28
DELTA	64° 00' 19.2" LT.	EXTERNAL	24.19 FT
RADIUS	135.0 FT	LENGTH	150.81 FT
DEGREE	42° 26' 28.7"	TANGENT	84.37 FT
AHEAD TANGENT DIRECTION		58° 38' 41.9"	
BACK TANGENT DIRECTION		122° 39' 01.2"	
PT	33+27.45	1461087.71	899759.28
POE	33+98.47	1461124.66	899819.93
TANGENT DIRECTION		58° 38' 41.9"	
TANGENT LENGTH		71.02 FT	



DATE	REVISIONS	BY

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PROJECT:
 REDI PROJECTS
 COUNTY ROAD 57
 POINT PENINSULA

CLIENT:
 JEFFERSON COUNTY
 HIGHWAY DEPARTMENT
 21897 County Route
 Watertown, New York 13601

DRAWING TITLE:
 ROADWAY
 PLAN
 AND
 PROFILE

DESIGNED BY: JRM	SCALE: AS NOTED
DRAWN BY: JRM	DATE: AUGUST 2020
CHECKED BY: JWO	PROJECT No. 36206
SHEET 8 OF 8	DRAWING No. PL-5

Technical Memorandum

To: Jefferson County Highway Department

From: Bryan Bancroft

Date: August 17, 2020

Project: Jefferson County REDI Project- County Road 57 at Lake Ontario

Re: Wetland and Surface Water Evaluation

Introduction

Lu Engineers is involved in the design phase of the County Road 57 REDI Project at Point Peninsula. The project is located in the Town of Lyme, Jefferson County, New York. The project is being undertaken by Jefferson County with New York State Department of Transportation involvement. The objective of this project is to improve the roadway profile of County Route 57 along the segment joining the mainland with Point Peninsula. This roadway section is vulnerable to erosion and deposition of debris in the road due to wind and wave action along the exposed shoreline. This deposition behavior makes it necessary for the County maintenance forces to monitor and clear the road after storm events allow for passage of the roadway.

As part of the design process, the entire area within the project's footprint was assessed for wetland areas, as well as areas adjacent to the project boundary. Potential wetland areas, showing wetland characteristics of wetland tolerant plants and evidence of hydrology were identified and are reviewed further in the discussion below.

The purpose of this Wetland Evaluation is to determine the potential for waters of the U.S. and NY State within the project area and to identify water resources that may fall under Jurisdiction of U.S. Army Corps of Engineers and N.Y. State Department of Environmental Conservation.

Wetland Evaluation Method

Lu Engineers completed a wetland evaluation on August 12, 2020 to review the extent of water-related resources within and adjacent to the project limits, and the potential of these resources to be regulated by State and federal regulatory agencies.

Lu Engineers reviewed the project area to determine the presence of surface water and wetland areas that may fall within the project limits and be impacted by project activities. Wetland areas were delineated by using the Routine On-Site Method outlined in the U.S. Army Corps of Engineers 1987 Wetland Delineation Manual and the Northeast/Northcentral Regional Supplement to the 1987 Corps of Engineers Wetland Delineation Manual.

Dominant vegetation in the tree, sapling/shrub, vine and herb layers was identified using the areal dominance method. Trees, shrubs and saplings were identified within a radius of typically 30 feet around the soil test pit for each sample point. Herbs and vines were identified within a radius of 5 feet around the soil test pit for each sample point.

Soils were described using USDA methods for color identification (the Munsell color system), texture, structure and redoximorphic features. Hydric soil indicators provided in the Northeast/Northcentral Regional Supplement were also utilized in the classification of the soils. Wetland hydrology was identified using field indicators as described in the 1987 Delineation Manual.

A wetland determination data form provided in the Northeast/Northcentral Supplement to the Wetland Delineation Manual was used to characterize the vegetation, soils and hydrology at each sample point. The data form provides indicators for Hydric Soil and Wetland Hydrology, as well as Hydrophytic Vegetation indicators.

The Ordinary High Water (OHW) was determined by identifying and locating the *'mark or line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil.'* A Trimble GEO 7X hand-held GPS unit with sub-meter accuracy was used to locate the wetland flags and OHWM locations.

In addition to field investigations, Lu Engineers reviewed publicly available data sources to aid in the description of the site. Data sources examined included Online NYS Freshwater Wetland Maps, National Wetland Inventory Mapping, and the FEMA Floodplain Maps.

Wetland and Regulatory Waterways

Current site conditions consist of the existing County Route 57 on the isthmus between Lake Ontario and Chaumont Bay. The roadway is bordered on either side by regulated waters.

Lake Ontario borders the southern edge of the roadway, and the limits of the lake were determined by locating the OHWM for the length of the project. Chaumont Bay borders the northern edge of the roadway. This area is mapped on NWI mapping as Palustrine Emergent, Persistent, Semi-permanently flooded (PEM1F) wetland area. This area is also mapped as State Wetland V-14, which is a 70.4-acre Class 1 wetland that borders the edge of the bay. The limit of this area was identified by the presence of hydrophytic (wetland tolerant) vegetation including cattails and reeds, evidence of hydrology including flow patterns, saturated ground surface and drift deposits, and hydric soils.

Wetland Delineation mapping was prepared using GIS to depict the delineated Lake Ontario and Chaumont Bay/wetland area. Wetland flags and OHWM points are shown on the attached mapping, as well as Sample Point locations. The limits of the Wetland and Ordinary High Water are also shown on the attached project plans. Site Photographs, Wetland Data sheets and regulatory agency mapping are also attached.

Impacts to wetlands and regulatory waterways resulting from the proposed project design evaluated for this project are summarized in Joint Application package.

Conclusions

Based on this review, the Chaumont Bay/wetland areas located adjacent to the roadway are federal and state jurisdictional wetlands, and Lake Ontario is a State Classified Water and Water of the U.S.

This memorandum is submitted with the permit application for this project to document the presence of wetlands and regulatory waterways. Anticipated permits include an Army Corps of Engineers Section 404 and Section 10 Permits and NYSDEC Articles 15 and 24 permits, and Section 401 water quality certification. Coordination with NYS Office of General Services and NYS Department of State will also occur.



WETLAND DELINEATION MAP
Jefferson County REDI Project
County Road 57
Town of Lyme, Jefferson County, NY

DATE: August 2020
SCALE: 1 inch = 300 feet
DRAWN/CHECKED: BCB
DATA SOURCE:
NYS GIS Clearinghouse



Photo 1: View of Lake Ontario Shoreline along project area from west end of project facing southeast



Photo 2: View of Lake Ontario Shoreline along project area from approximate center facing southeast



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Photos 1-2
Jefferson County REDI Project
County Road 57 – Wetland Photos
 Town of Lyme
 Jefferson County, New York

Date: August 2020

Scale: Photo not to scale

Drawn by: BB

Source: Digital photo taken
 by Lu Engineers,
 August 12, 2020



Photo 3: View of Lake Ontario Shoreline along project area from east end of project facing northwest



Photo 4: View of Lake Ontario Shoreline along project area from east end of project facing southeast



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Photos 3-4
Jefferson County REDI Project
County Road 57 – Wetland Photos
 Town of Lyme
 Jefferson County, New York

Date: August 2020

Scale: Photo not to scale

Drawn by: BB

Source: Digital photo taken
 by Lu Engineers,
 August 12, 2020



Photo 5: View of roadway facing southeast with State Wetland to left and Lake Ontario on right.



Photo 6: View of roadway facing northwest with Lake Ontario to left. Debris and stone as seen in foreground previously deposited from wave action on wetland side of road.



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Photos 5-6
Jefferson County REDI Project
County Road 57 – Wetland Photos
 Town of Lyme
 Jefferson County, New York

Date: August 2020

Scale: Photo not to scale

Drawn by: BB

Source: Digital photo taken
 by Lu Engineers,
 August 12, 2020



Photo 7: View of Sample Point 1, within State Wetland Area facing northeast



Photo 8: View of Sample Point 2, outside of State Wetland Area facing north



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Photos 7-8
Jefferson County REDI Project
County Road 57 – Wetland Photos
Town of Lyme
Jefferson County, New York

Date: August 2020

Scale: Photo not to scale

Drawn by: BB

Source: Digital photo taken
by Lu Engineers,
August 12, 2020



Photo 9: View of Sample Point 3, within State Wetland Area facing north



Photo 10: View of Sample Point 4, outside State Wetland Area facing south



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Photos 9-10
Jefferson County REDI Project
County Road 57 – Wetland Photos
Town of Lyme
Jefferson County, New York

Date: August 2020

Scale: Photo not to scale

Drawn by: BB

Source: Digital photo taken
by Lu Engineers,
August 12, 2020



August 19, 2020

Wetlands

- | | | |
|--|---|--|
|  Estuarine and Marine Deepwater |  Freshwater Emergent Wetland |  Lake |
|  Estuarine and Marine Wetland |  Freshwater Forested/Shrub Wetland |  Other |
| |  Freshwater Pond |  Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

ONTARIO

NORTH SHORE ROAD

ZONE X

FLOOD INSURANCE NOT AVAILABLE FOR NEW CONSTRUCTION OR SUBSTANTIALLY IMPROVED STRUCTURES ON AND AFTER NOVEMBER 16, 1990 IN DESIGNATED COASTAL BARRIERS.

57

CHAUMONT BAY

57

ZONE AE (EL 250)

ZONE AE (EL 250)

ZONE X

NORTH SHORE ROAD

ZONE X

FLOOD INSURANCE NOT AVAILABLE FOR NEW CONSTRUCTION OR SUBSTANTIALLY IMPROVED STRUCTURES ON AND AFTER NOVEMBER 16, 1990 IN DESIGNATED COASTAL BARRIERS.

ZONE AE



APPROXIMATE SCALE

2000 0 2000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

TOWN OF
LYME,
NEW YORK
JEFFERSON COUNTY

PANEL 25 OF 50
(SEE MAP INDEX FOR PANELS NOT PRINTED)

NOTE:
THIS MAP INCORPORATES APPROXIMATE BOUNDARIES OF COASTAL BARRIER RESOURCES EVALUATION UNITS AND OTHER WIDE PROTECTED AREAS ESTABLISHED UNDER THE COASTAL BARRIER IMPROVEMENT ACT OF 1982 (PL 97-351).



PANEL LOCATION

COMMUNITY-PANEL NUMBER
360343 0025 C

MAP REVISED:
SEPTEMBER 2, 1993



Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Technical Memorandum

To: Vance Carpenter, P.E., Project Manager
From: Kirk D. Wilson, PE, Senior Project Engineer
Date: August 17, 2020
Project: Jefferson County REDI projects
County Route 57, Point Peninsula Road reconstruction

Re: **Wave Height Determination and Revetment Stone Size and Weight**

Lu Project No.: 36206

Summary: The subject project is to improve the roadway profile of County Route 57 along the segment joining the mainland with Point Peninsula. This roadway section is vulnerable to erosion and deposition of debris in the road due to wind and wave action along the exposed shoreline. This deposition behavior makes it necessary for the County maintenance forces to monitor and clear the road after storm events to permit the residents to come and go from the island as this is the only land-based means of vehicle access.

The purpose of this Technical Memorandum is to describe the methodology for determining the wave height experienced along the lakeward shoreline of the roadway and determine an appropriate armor stone size and weight for the shoreline revetment to facilitate rational design decisions related to the improvement of the roadway section under consideration.

Supporting Documentation

1. **USACE Wave Information Study data** - The US Army Corps of Engineers (USACE) has a series of wave monitoring buoys deployed along the shore of Lake Ontario that have been accumulating wave data from 1970 to the present. Two monitoring stations are in the vicinity of the subject project (91005, 91006) data from these stations have been used as a basis for initial extreme wave heights for the wave estimates.
2. **USACE Coastal Engineering Manual, Volume 6** – Used to estimate required stone size for the revetment improvement along the lakeward side of the roadway.
3. **USACE Shore Protection Manual, 1984** – Methods for estimating wave heights contained in this manual have been used to develop wave height estimates for five recurrence intervals: 1-year, 5-year, 10-year, 20-year, and 50-yr.
4. **Estimating Nearshore Conditions for Irregular Waves**, 1980; Selig, William and Ahrens, John; USACE Technical Paper 80-3

Technical Memorandum
County Route 57; Jefferson County, NY
Wave Height Determination and Revetment Stone Size and Weight

Methodology – Wave Height determination

Utilizing data from the Wave Information Study, wave heights were determined at WIS Sta. 91005, a wave monitoring station located approximately 1.73 miles from the subject site on a bearing of approximately 248 deg. The data set includes wave height (recorded in meters) and direction readings from 1979 to 2014 taken hourly. Utilizing these data, the waves of interest were divided into three classes. Class I waves are those that approach the site from 30 deg to 90 deg clockwise from a normal line to the beach (AZ. 213 deg). Class I waves approach the site from 303 deg to 243 deg. Class II waves approach the site from 30 deg clockwise from the normal to 30 deg counterclockwise from the normal. Class II waves approach the site from 243 deg to 183 deg. Class III waves approach the site from 183 deg to 123 deg.

The peak waves in each Class were determined and are as follows:

- Class I: 4.1 m (13.4 ft.)
- Class II: 4.08 m (13.4 ft.)
- Class III: 2.66 m (8.53 ft.)

The Class III waves were eliminated from further consideration due to their height relative to the waves of the other two classes.

The method for determining the significant wave heights at the subject site presented in Technical Paper TP 80-3 were used to establish estimates of the wave height at the site for the following recurrence intervals: 1-yr, 2-yr, 5-yr, 10-yr, 20-yr, and 50-yr.

The design water depth was estimated from the following (based upon the International Great Lakes Datum, IGLD): Historic mean lake elevation 245.3 ft. (IGLD) assumes water depth of 0 at point of interest, historic high-water lake elevation 249.1 ft. (IGLD), estimated storm surge depth: 2 feet. This results in an estimated depth of 5.8 feet (1.77 m), rounded to the nearest meter is 2 m.

The results are summarized in Tables 1 and 2 attached to this Memo.

Methodology – Revetment Stone sizing

The median stone size and weight are determined using Hudson's Equation based upon the derived wave height and unit weight of the stone material used for the revetment. The stone is assumed to be sound limestone or dolomite with a unit weight of at least 160 lb./cu. ft. The wave used to determine the stone weight and size is a 50-yr. recurrence wave of 5.5 feet. The resulting median stone weight, W_{50} , is calculated as 2319 lb., with a volume of 14.5 cu. ft.



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 County Route 57; Jefferson County, NY
 Wave Height Determination and Revetment Stone Size and Weight

Table 1 - Class I Waves

Design Wave	a ₀ , deg	T _s , sec	d, m	d/g*Ts^2	Kr	a, deg	Ho, m	Ho', m	Lo	Ho'/Lo	d/Ho'	Ho'/gT^2	Hs/Ho'	Hs, m	Hs, ft	H1/Ho'	H1, m	H1, ft
1 yr	30	10	2	0.00204	0.85	4.5	3.0	2.55	156	0.0163	0.784	0.0026	0.60	1.53	5.0	0.75	1.91	6.3
2 yr	30	10	2	0.00204	0.84	4.5	3.3	2.77	156	0.0178	0.722	0.0028	0.50	1.39	4.5	0.7	1.94	6.4
5 yr	30	10	2	0.00204	0.84	4.5	3.6	3.02	156	0.0194	0.661	0.0031	0.48	1.45	4.8	0.65	1.97	6.4
10 yr	30	10	2	0.00204	0.84	4.5	3.8	3.19	156	0.0205	0.627	0.0033	0.48	1.53	5.0	0.6	1.92	6.3
20 yr	30	10	2	0.00204	0.84	4.5	4.1	3.44	156	0.0221	0.581	0.0035	0.40	1.38	4.5	0.55	1.89	6.2
50 yr	30	10	2	0.00204	0.84	4.5	4.4	3.70	156	0.0282	0.541	0.0045	0.38	1.67	5.5	0.5	1.85	6.1

Table 2 Class II Waves

Design Wave	a ₀ , deg	T _s , sec	d, m	d/g*Ts^2	Kr	a, deg	Ho, m	Ho', m	Lo	Ho'/Lo	d/Ho'	Ho'/gT^2	Hs/Ho'	Hs, m	Hs, ft	H1/Ho'	H1, m	H1, ft
1 yr	0	10	2	0.00204	0.9	3.5	3.0	2.70	156	0.0173	0.741	0.0028	0.60	1.62	5.3	0.75	2.03	6.6
2 yr	0	10	2	0.00204	0.9	3.5	3.3	2.97	156	0.0190	0.673	0.0030	0.50	1.49	4.9	0.7	2.08	6.8
5 yr	0	10	2	0.00204	0.9	3.5	3.6	3.24	156	0.0208	0.617	0.0033	0.48	1.56	5.1	0.65	2.11	6.9
10 yr	0	10	2	0.00204	0.9	3.5	3.8	3.42	156	0.0219	0.585	0.0035	0.48	1.64	5.4	0.6	2.05	6.7
20 yr	0	10	2	0.00204	0.9	3.5	4.1	3.69	156	0.0237	0.542	0.0038	0.40	1.48	4.8	0.55	2.03	6.7
50 yr	0	10	2	0.00204	0.9	4.5	4.4	3.96	156	0.0282	0.505	0.0045	0.38	1.67	5.5	0.5	1.98	6.5

a₀ – angle of incident waves from normal to beachfront (Az. 213)

T_s – wave period, in seconds, estimated from STA. 91005 data

Kr – refraction coefficient

Ho – wave height, in meters, at measuring Sta. 91005

H'o – refracted wave height, meters

Lo – wavelength, in meters

Hs – significant wave height at point of interest

H1 – wave height of 1% exceedance

Beach slope, m 1:100 (actual 1:137)

S* =4.0, wind waves

Since highest incident waves are close to azimuth between Class I and Class II waves (Az 243), both are shown here for comparison.

Note that 50-yr recurrence wave is extrapolated from curve fitting of available storm event data and is based upon limited data in the range of consideration.

Jefferson County REDI Projects
County Route 57 location
Lu Engineers J/N: 36206

Hudson's Equation for median size of revetment stone

Stone unit wt.

$$W_R := 160 \frac{\text{lbf}}{\text{ft}^3}$$

Water unit wt.

$$W_w := 62.4 \frac{\text{lbf}}{\text{ft}^3}$$

$$S_r := \frac{W_R}{W_w} = 2.564$$

$$K_D := 2$$

$$\theta := 33.69 \text{ deg}$$

$$\text{slope} := 1.5 \quad \cot(\theta) = 1.500$$

Design significant wave height

$$H := 5.5 \text{ ft}$$

Hudson's Equation for W50 stone weight

$$W_{50} := \frac{W_R \cdot (H)^3}{K_D \cdot (S_r - 1)^3 \cdot \cot(\theta)} = 2319 \text{ lbf}$$

Volume of median W50 stone

$$V_{50} := \left(\frac{W_{50}}{160 \frac{\text{lbf}}{\text{ft}^3}} \right) = 14.5 \text{ ft}^3$$

diameter of median W50 stone

$$\overrightarrow{D}_{50} := 2 \cdot \left(\frac{\left(\frac{W_{50} \cdot \frac{3}{4}}{160 \frac{\text{lbf}}{\text{ft}^3} \cdot \pi} \right)^{\frac{1}{3}}}{\frac{1}{3}} \right) = 36.3 \text{ in}$$