TOWN OF DARIEN
DEPARTMENT OF PUBLIC WORKS
2 RENSHAW ROAD - TOWN HALL
DARIEN, CT 06820-5397
TELEPHONE (203) 656-7346

EDWARD L. GENTILE JR., P.E.
DIRECTOR OF PUBLIC WORKS

DARREN OUSTAFINE, P.E.
ASSISTANT DIRECTOR OF PUBLIC WORKS

Addendum Number Three

Date: April 26, 2024

Bid Opening Date: Monday, May 13, 2024

Project Name: Gorham's Pond Dam Emergency Repair
Bid No. 2024-24

Addendum Number Three. Prospective bidders, and those concerned, are hereby informed that the following is made a part of the bid documents:

- Fuss & O'Neill Addendum No. 3, 176 pages, dated April 26, 2024.

Please acknowledge receipt of this addendum in bid submittal.

Sincerely,

Darren Oustafine, P.E.
Assistant Director of Public Works

P:\GORHAM'S POND\IDA Sept 1 2021\Bidding Documents\Addenda Number Three 042624.doc

FUSS & O'NEILL

April 26, 2024

ADDENDUM No. 3

RE: Gorhams Pond Dam Emergency Repair
Town of Darien
Darien, Connecticut

TO ALL PROSPECTIVE BIDDERS:

Enclosed is a copy of Addendum No. 3 for the referenced project. Please retain this with your Contract Documents. Information provided herein shall be considered part of the Contract Documents.

This Addendum forms a part of the Contract Documents and modifies the original Bidding Documents dated March 2024. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject Bidder to disqualification.

Sincerely,

Elsa Loehmann, P.E.
Project Manager

Shawn King, E.I.T.
on behalf of Elsa Loehmann, P.E.

Enclosures

146 Hartford Road
Manchester, CT
06040
t 860.646.2469
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f 860.533.5143

www.fando.com

Connecticut
Maine
Massachusetts
New Hampshire
New York
Rhode Island
Vermont

F:\P2020\0921\B11\Deliverables\Task 7 Bid Assistance\Addendum 3.docx
Corres. (HQ)

FUSS & O'NEILL

GORHAMS POND DAM EMERGENCY REPAIR
TOWN OF DARIEN
DARIEN, CONNECTICUT

ADDENDUM NO. 3

LIST OF CONTENTS

QUESTIONS & ANSWERS

Q-1: Will the bid due date be extended?

A-1: The bid due date shall be extended to **Monday, May 13, 2024 at 3:00 P.M.** Sealed bids for the construction of the Gorham's Pond Dam Emergency Repair Project and associated work will be received and opened in the Office of the Selectmen, Room 202, Town Hall, 2 Renshaw Road, Darien, CT 06820 on **Monday, May 13, 2024, at 3:00 P.M.**, at which time and place all bids will be publicly opened and read aloud.

FUSS & O'NEILL

REVISIONS TO CONTRACT DOCUMENTS – SEE ATTACHMENT A

1. **Revisions to the Contract Drawings:**
   a. **CS-101 (Addendum No. 3)**
      i. Suggested Construction Sequence Note 9.7 was revised; "waterproofing membrane" was deleted and replaced with "HDPE membrane".

   b. STR-102 (Addendum No. 3)
      i. "Waterproofing membrane" references were replaced with "HDPE membrane".

      ii. The extents of the HDPE membrane and non-woven geotextile were modified beneath the reinforced concrete slab on the dam crest. Callouts associated with the HDPE membrane were added to the drawing.

      iii. An additional callout for Non-Woven Geotextile was added for the geotextile below the stone revetment.

      iv. Anchors Note #1 was amended to include: "All anchors shall be epoxy coated."

2. **Revisions to the Contract Manual Specifications:**
   a. Delete Section 00015 List of Drawings in its entirety and replace with the revised Section 00015 List of Drawings (Addendum No. 3) enclosed.

   b. Delete Section 00411 Bid Schedule in its entirety and replace with the revised Section 00411 Bid Schedule (Addendum No. 3) enclosed.

   c. Delete Section 01205 Payment Items in its entirety and replace with the revised Section 01205 Payment Items (Addendum No. 3) enclosed.

   d. Delete Section 02205 Protection of Dam in its entirety and replace with the revised Section 02205 Protection of Dam (Addendum No. 3) enclosed.

   e. Insert Section 02142 HDPE Membrane (Addendum No. 3) immediately before Section 02230 Site Clearing & Demolition. Section 02142 HDPE Membrane (Addendum No. 3) is enclosed with this Addendum No. 3.

   f. Delete Section 02245 Water Control System in its entirety and replace with the revised Section 02245 Water Control System (Addendum No. 3) enclosed.

   g. Delete Section 02300 Earthwork in its entirety and replace with the revised Section 02300 Earthwork (Addendum No. 3) enclosed.

   h. Delete Section 03150 Excavation Support and Protection in its entirety and replace with the revised Section 03150 Excavation Support and Protection (Addendum No. 3) enclosed.

i. Delete Section 03302 Cast-in-Place Concrete in its entirety and replace with the revised Section 03302 Cast-in-Place Concrete (Addendum No. 3) enclosed.

j. Delete Section 04860 Stone Masonry in its entirety and replace with the revised Section 04860 Stone Masonry (Addendum No. 3) enclosed.

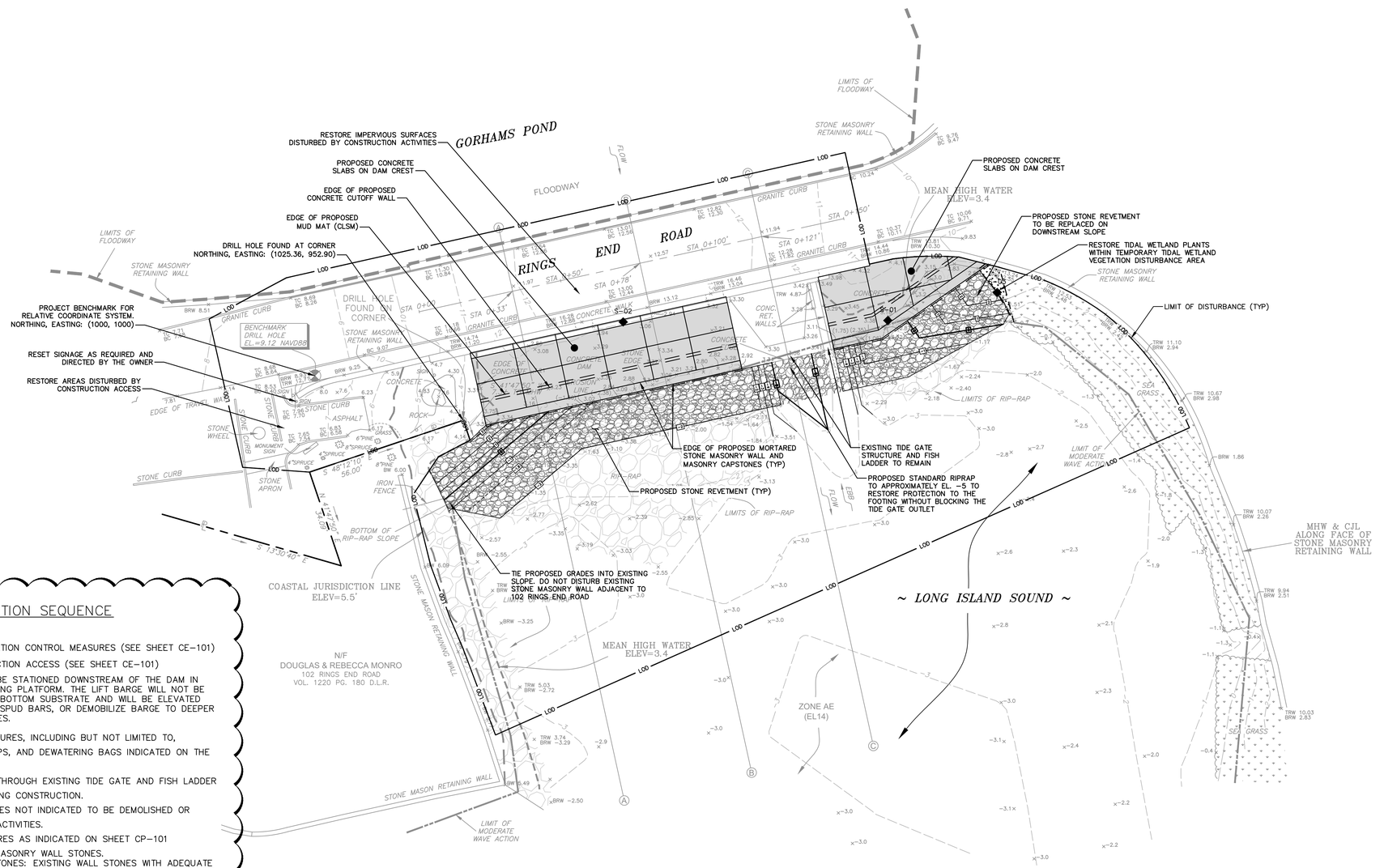
k. The "Gorhams Pond Dam Hydrologic & Hydraulic Report" associated with the Connecticut Department of Energy and Environmental Protection License Certificate of Permission 202302334-COP is enclosed with this Addendum No. 3.

l. Sieve analysis results for sample points S-01, S-02, and S-03 indicated on the plans are enclosed with this Addendum No. 3.

m. The issued permits or authorizations listed under Section 01100 – Summary, Part 1.5 are enclosed with this Addendum No. 3.

FUSS & O'NEILL

Attachment A – Revisions to the Contract Documents



SUGGESTED CONSTRUCTION SEQUENCE

1. MOBILIZE TO SITE
2. PROVIDE EROSION & SEDIMENTATION CONTROL MEASURES (SEE SHEET CE–101)
3. PROVIDE TEMPORARY CONSTRUCTION ACCESS (SEE SHEET CE–101)
   - 3.1. NOTE: A LIFT BARGE MAY BE STATIONED DOWNSTREAM OF THE DAM IN ORDER TO CREATE A WORKING PLATFORM. THE LIFT BARGE WILL NOT BE ALLOWED TO REST ON THE BOTTOM SUBSTRATE AND WILL BE ELEVATED ABOVE THE BOTTOM USING SPUD BARS, OR DEMOBILIZE BARGE TO DEEPER WATER AS THE TIDE RECEDES.
4. PROVIDE WATER CONTROL MEASURES, INCLUDING BUT NOT LIMITED TO, TEMPORARY COFFERDAMS, PUMPS, AND DEWATERING BAGS INDICATED ON THE PLANS.
5. PROTECT AND MAINTAIN FLOW THROUGH EXISTING TIDE GATE AND FISH LADDER STRUCTURE AT ALL TIMES DURING CONSTRUCTION.
6. PROTECT EXISTING SITE FEATURES NOT INDICATED TO BE DEMOLISHED OR DISTURBED BY CONSTRUCTION ACTIVITIES.
7. DEMOLISH EXISTING SITE FEATURES AS INDICATED ON SHEET CP–101
   - 7.1. SALVAGE EXISTING STONE MASONRY WALL STONES.
     - 7.1.1. REUSE OF SALVAGED STONES: EXISTING WALL STONES WITH ADEQUATE PROPERTIES AS DETERMINED BY THE SPECIFICATIONS AND AS DIRECTED IN THE FIELD AND APPROVED BY THE ENGINEER, MAY BE SAVED AND REUSED FOR THE PROPOSED MORTARED STONE MASONRY WALLS OR PROPOSED STONE REVETMENT CONSTRUCTION.
     - 7.1.2. STONES SMALLER THAN ADEQUATE SIZE MAY BE REUSED ON SITE AT THE DISCRETION OF THE ENGINEER, OR RELOCATED TO ANOTHER LOCATION WITHIN THE TOWN FOR STORAGE AT THE REQUEST OF THE TOWN.
     - 7.1.3. DISPOSE OF UNSUITABLE MATERIALS TO AN OFFSITE FACILITY AUTHORIZED TO ACCEPT THE MATERIAL.
8. EXCAVATE AS SHOWN WITHIN THE GRADING LIMITS FOR INSTALLATION OF PROPOSED SITE IMPROVEMENTS.
9. PROVIDE PROPOSED STRUCTURES (SEE SHEETS STR–101 & STR–102):
   - 9.1. PROVIDE TEMPORARY SHORING AS NECESSARY FOR CONSTRUCTION OF PROPOSED SITE IMPROVEMENTS
   - 9.2. PROVIDE TEMPORARY SHORING AT THE LIMITS OF THE TIDE GATE AND FISH LADDER STRUCTURE TO PROTECT THE STRUCTURE FOOTINGS.
   - 9.3. INSTALL MUD MAT (CLSM) AND CONCRETE KEY FOR PROPOSED WALLS
   - 9.4. INSTALL PROPOSED MORTARED STONE MASONRY WALLS AND CAPSTONES
   - 9.5. INSTALL PROPOSED CONCRETE CUTOFF WALL
   - 9.6. BACKFILL STRUCTURES
   - 9.7. INSTALL PROPOSED UPSTREAM CONCRETE KEY AND CONCRETE SLAB WITH HDPE MEMBRANE ON THE DAM CREST
10. INSTALL PROPOSED STONE REVETMENT.
11. PERFORM SITE GRADING TO PROPOSED GRADES.
12. REMOVE WATER CONTROL MEASURES.
13. REMOVE EROSION & SEDIMENTATION CONTROL MEASURES.
14. RESTORE ALL OTHER AREAS DISTURBED BY CONSTRUCTION ACTIVITIES TO ORIGINAL OR IMPROVED CONDITION
15. DEMOBILIZE FROM SITE

1

LEGEND

- LOD — LIMIT OF DISTURBANCE
- EDGE OF PROPOSED STRUCTURE (BEYOND)
- EDGE OF PROPOSED STRUCTURE
- 100 — PROPOSED CONTOUR
- PROPOSED STONE REVETMENT
- S–01 ◆ SOIL SAMPLE LOCATION

NOTES:

1. THE CONSTRUCTION SEQUENCE SHOWN IS A SUGGESTED CONCEPT THAT IS CONSIDERED FEASIBLE FOR PERFORMING THE WORK. THIS SHEET IS INTENDED TO PROVIDE INFORMATION PERTINENT FOR THE DEVELOPMENT OF THE CONTRACTOR'S DETAILED CONSTRUCTION SEQUENCE.
2. THE CONTRACTOR SHALL EVALUATE SITE CONDITIONS AND SUBMIT A DETAILED CONSTRUCTION SEQUENCE, CONSISTING OF PLANS AND NARRATIVE, IN CONFORMANCE WITH THE CONTRACT REQUIREMENTS, FOR THE ENGINEER'S REVIEW. NO WORK SHALL BE PERFORMED PRIOR TO THE ENGINEER'S REVIEW AND ACCEPTANCE OF THE CONTRACTOR'S DETAILED CONSTRUCTION SEQUENCE.
3. WORKING POINT COORDINATES SHOWN ARE BASED ON THE RELATIVE COORDINATE SYSTEM ESTABLISHED WITH THE PROJECT BENCHMARK SET AT (1000, 1000). CONTRACTOR SHALL VERIFY THE WORKING POINTS ON SHEET STR–101 AT THE EDGES OF THE TIDAL GATE AND FISH LADDER STRUCTURE, AND ADJUST AS REQUIRED.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1	4/23/2024	ADDENDUM NO. 3	SAK	PWM

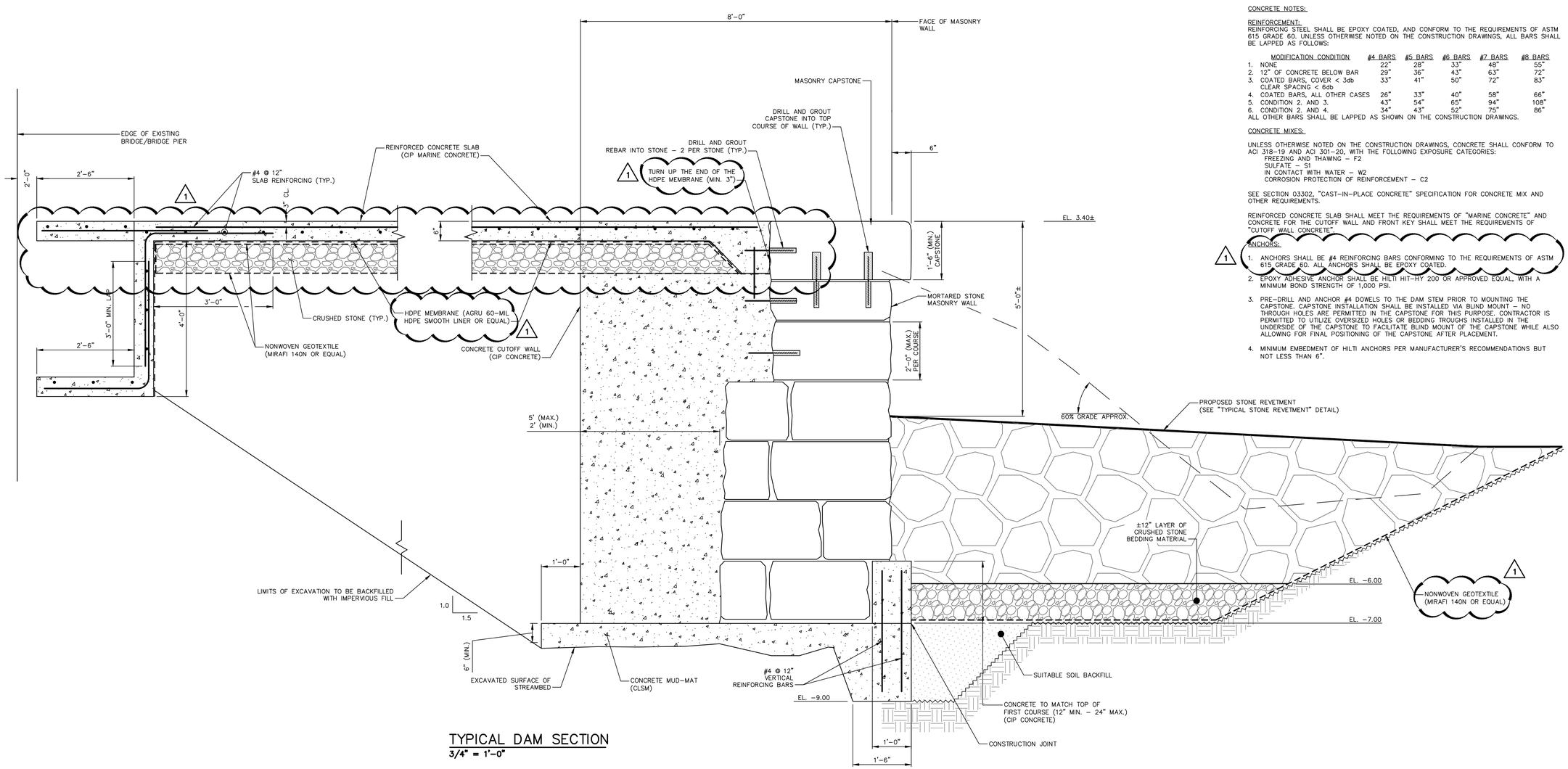
SCALE:
HORZ.: 1"= 20'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
20 10 0 20
GRAPHIC SCALE

FUSS & O'NEILL
146 HARTFORD ROAD
MANCHESTER, CONNECTICUT 06040
860.646.2469
www.fando.com

TOWN OF DARIEN
PROPOSED SITE PLAN
GORHAMS POND DAM EMERGENCY REPAIRS
RINGS END ROAD
DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: MARCH 26, 2024

CS-101



TYPICAL DAM SECTION
3/4" = 1'-0"

CONCRETE NOTES:

REINFORCEMENT:
REINFORCING STEEL SHALL BE EPOXY COATED, AND CONFORM TO THE REQUIREMENTS OF ASTM 615 GRADE 60. UNLESS OTHERWISE NOTED ON THE CONSTRUCTION DRAWINGS, ALL BARS SHALL BE LAPPED AS FOLLOWS:

MODIFICATION CONDITION	#4 BARS	#5 BARS	#6 BARS	#7 BARS	#8 BARS
1. NONE	22"	28"	33"	48"	55"
2. 12" OF CONCRETE BELOW BAR	29"	36"	43"	63"	72"
3. COATED BARS, COVER < 3db CLEAR SPACING < 6db	33"	41"	50"	72"	83"
4. COATED BARS, ALL OTHER CASES	26"	33"	40"	58"	66"
5. CONDITION 2. AND 3.	43"	54"	65"	94"	108"
6. CONDITION 2. AND 4.	34"	43"	52"	75"	86"

ALL OTHER BARS SHALL BE LAPPED AS SHOWN ON THE CONSTRUCTION DRAWINGS.

CONCRETE MIXES:

UNLESS OTHERWISE NOTED ON THE CONSTRUCTION DRAWINGS, CONCRETE SHALL CONFORM TO ACI 318-19 AND ACI 301-20, WITH THE FOLLOWING EXPOSURE CATEGORIES:
- FREEZING AND THAWING – F2
- SULFATE – S1
- IN CONTACT WITH WATER – W2
- CORROSION PROTECTION OF REINFORCEMENT – C2

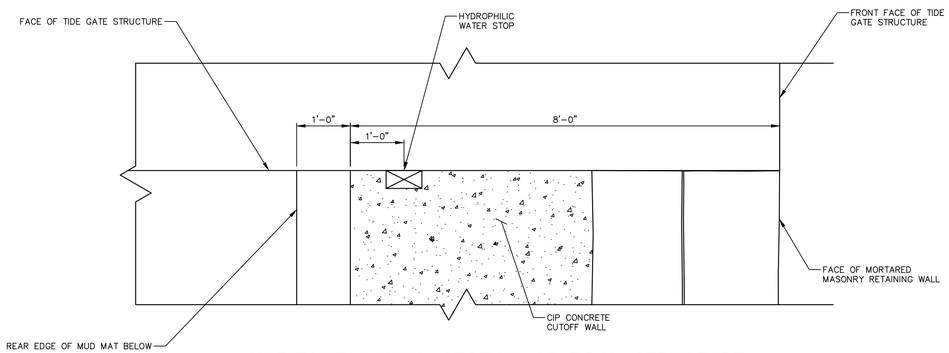
SEE SECTION 03302, "CAST-IN-PLACE CONCRETE" SPECIFICATION FOR CONCRETE MIX AND OTHER REQUIREMENTS.

REINFORCED CONCRETE SLAB SHALL MEET THE REQUIREMENTS OF "MARINE CONCRETE" AND CONCRETE FOR THE CUTOFF WALL AND FRONT KEY SHALL MEET THE REQUIREMENTS OF "CUTOFF WALL CONCRETE".

1 ANCHORS:
1. ANCHORS SHALL BE #4 REINFORCING BARS CONFORMING TO THE REQUIREMENTS OF ASTM 615 GRADE 60. ALL ANCHORS SHALL BE EPOXY COATED.
2. EPOXY ADHESIVE ANCHOR SHALL BE HILTI HIT-HY 200 OR APPROVED EQUAL, WITH A MINIMUM BOND STRENGTH OF 1,000 PSI.
3. PRE-DRILL AND ANCHOR #4 DOWELS TO THE DAM STEM PRIOR TO MOUNTING THE CAPSTONE. CAPSTONE INSTALLATION SHALL BE INSTALLED VIA BLIND MOUNT – NO THROUGH HOLES ARE PERMITTED IN THE CAPSTONE FOR THIS PURPOSE. CONTRACTOR IS PERMITTED TO UTILIZE OVERSIZED HOLES OR BEDDING TROUGHS INSTALLED IN THE UNDERSIDE OF THE CAPSTONE TO FACILITATE BLIND MOUNT OF THE CAPSTONE WHILE ALSO ALLOWING FOR FINAL POSITIONING OF THE CAPSTONE AFTER PLACEMENT.
4. MINIMUM EMBEDMENT OF HILTI ANCHORS PER MANUFACTURER'S RECOMMENDATIONS BUT NOT LESS THAN 6".

MUD MAT NOTES:

1. MUD MAT SHALL BE COMPRISED OF NON-EXCAVATABLE CONTROLLED LOW STRENGTH MATERIAL (CLSM), AND SHALL CONFORM TO THE REQUIREMENTS OF CT DOT STANDARD SPECIFICATIONS FOR 818 ARTICLE M.03.01 WITH MIXTURE OF PORTLAND CEMENT, FLY ASH (OPTIONAL), FINE AGGREGATES, AIR ENTRAINING AGENT, AND WATER.
2. CLSM MIX DESIGN SHALL BE SUBMITTED FOR REVIEW AND APPROVAL.
3. CLSM SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 100 PSI.
4. THE PRESENCE OF WATER SHALL BE MINIMIZED TO THE EXTENT POSSIBLE. ALL WATER FLOW SHALL BE DIVERTED AWAY FROM THE AREA OF THE POUR, AND THE LOCATION DEWATERED TO REMOVE PONDING.
5. THE MUD MAT IS TO BE FOUNDED ON FIRM AND EVEN SURFACE OF STREAMBED. IF FOUNDATION MATERIALS OR RUBBLE ARE PRESENT AT THE ELEVATION OF THE PROPOSED MUD MAT, THESE SHALL BE EXCAVATED TO A DEPTH OF ONE FOOT BELOW GRADE, AND ADDITIONAL CLSM MATERIAL SHALL BE USED TO ACHIEVE THE PROPOSED GRADES. EXCAVATION TO BE PAID FOR UNDER PAYMENT ITEM #9 EXCAVATION OF DAM EMBANKMENT. ADDITIONAL CLSM MATERIAL TO BE PAID FOR UNDER PAYMENT ITEM #13 CONTROLLED LOW STRENGTH MATERIAL (CLSM) MUD MAT.



HORIZONTAL WALL SECTION AT TIDAL STRUCTURE
3/4" = 1'-0"

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1	4/23/2024	ADDENDUM NO. 3	SAK	PWM/DW

SCALE: HORZ.: 1"= 20' VERT.:
DATUM: HORZ.: NAD83 VERT.: NAVD88
GRAPHIC SCALE 20 10 0 20

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TOWN OF DARIEN
STRUCTURE PLAN & ELEVATION
GORHAMS POND DAM EMERGENCY REPAIRS
RINGS END ROAD
DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: MARCH 26, 2024

STR-102

File: J:\DWG\P2020\09211B11\Civil\Plan\20200921B11_STR02.dwg Layout: STR-102 Plotted: 2024-04-25 3:53 PM Saved: 2024-04-24 4:53 PM User: Shawn.King
PC3: NONE STB/CTB: FO.STB
LAYER STATE:
MS VIEW:

ADDENDUM NO. 3

Sheet No.	Title
GI-001	COVER SHEET
GI-002	GENERAL NOTES & INFORMATION
LTS	LIMITED TOPOGRAPHIC SURVEY
~~CP-101~~	~~SITE PREPARATION AND DEMOLITION PLAN~~
CP-101	DEMOLITION AND SITE PREPARATION PLAN
CE-101	EROSION, SEDIMENTATION AND WATER CONTROL PLAN
CS-101	PROPOSED SITE PLAN
STR-101	STRUCTURE PLAN & ELEVATION
~~STR-102~~	~~STRUCTURE SECTIONS & DETAILS~~
STR-102	STRUCTURE PLAN & ELEVATION
CD-501	DETAILS

ADDENDUM NO. 3

Sheet
No. Title

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ADDENDUM NO. 3

BID SCHEDULE

Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words will govern.

BASE BID

Item No.	Item and Unit Price		Engineer's Estimate of Quantity	Computed Total
1	**Mobilization/Demobilization** at the Lump Sum Price of _____ Dollars and _____ Cents ($)	LS	1	$ _____
2	**General Requirements and Incidental Construction** at the Lump Sum Price of _____ Dollars and _____ Cents ($)	LS	1	$ _____
3	**Erosion and Sedimentation Control** at the Lump Sum Price of _____ Dollars and _____ Cents ($)	LS	1	$ _____
4	**Temporary Construction Access Routes and Staging Areas** at the Lump Sum Price of _____ Dollars and _____ Cents ($))	LS	1	$ _____

ADDENDUM NO. 3

BASE BID

Item No.	Item and Unit Price		Engineer's Estimate of Quantity	Computed Total
5	**Control of Water** at the per Lump Sum Price of _____ Dollars and _____ Cents ($))	LS	1	$ _____
6	**Stone Masonry Demolition** at the per ~~Ton Price~~ Cubic Yard Price of _____ Dollars and _____ Cents ($)	CY	185	$ _____
7	**Concrete Crest Demolition** at the per Cubic Yard Price of _____ Dollars and _____ Cents ($)	CY	40	$ _____
8	**Excavation at Dam Toe** at the per Cubic Yard Price of _____ Dollars and _____ Cents ($)	CY	475	$ _____
9	**Excavation of Dam Embankment** at the per Cubic Yard Price of _____ Dollars and _____ Cents ($)	CY	690	$ _____

ADDENDUM NO. 3

BASE BID

Item No.	Item and Unit Price		Engineer's Estimate of Quantity	Computed Total
10	**Disposal of Unsuitable Materials** at the per Cubic Yard Price of _____ Dollars and _____ Cents ($)	CY	535	$ _____
11	**Cast-in-Place Concrete Construction** at the per Cubic Yard Price of _____ Dollars and _____ Cents ($)	CY	212	$ _____
12	**Marine Concrete Construction** at the per Cubic Yard Price of _____ Dollars and _____ Cents ($)	CY	78	$ _____
13	**Controlled Low-Strength Material (CLSM) Mud Mat Construction** at the per Cubic Yard Price of _____ Dollars and _____ Cents ($)	CY	40	$ _____
14	**Mortared Stone Masonry Wall Construction** at the per Square Foot Price of _____ Dollars and _____ Cents ($)	SF	209	$ _____

ADDENDUM NO. 3

BASE BID

Item No.	Item and Unit Price		Engineer's Estimate of Quantity	Computed Total
15	**Suitable Soil Backfill** at the per Cubic Yard Price of _____ Dollars and _____ Cents ($)	CY	415	$ _____
16	**Crushed Stone Bedding** at the per Cubic Yard Price of _____ Dollars and _____ Cents ($)	CY	90	$ _____
17	**Stone Revetment Construction / Reposition Stone Armor** at the per Cubic Yard Price of _____ Dollars and _____ Cents ($)	CY	317	$ _____
18	**Filter Fabric ~~for Stone Revetment Construction~~** at the per Square Yard Price of _____ Dollars and _____ Cents ($)	SY	~~420~~ 1,080	$ _____
19	**Supplemental Stone Armor** at the per ~~Ton Price~~ Cubic Yard Price of _____ Dollars and _____ Cents ($)	~~Ton~~ CY	108	$ _____

ADDENDUM NO. 3

BASE BID

Item No.	Item and Unit Price		Engineer's Estimate of Quantity	Computed Total
20	**Lift Barge** at the Lump Sum Price of	LS	1	
	_____ Dollars			$ _____
	and _____ Cents ($)			
21	**Traffic Control** at the Lump Sum Price of	LS	1	
	_____ Dollars			$ _____
	and _____ Cents ($)			
22	**Construction Survey and Records** at the Lump Sum Price of	LS	1	
	_____ Dollars			$ _____
	and _____ Cents ($)			
23	**Site Restoration** at the Lump Sum Price of	LS	1	
	_____ Dollars			$ _____
	and _____ Cents ($)			
	TOTAL CONTRACT BASE BID			$_____

BID PRICE ALTERNATES

Within each of the following items, the price for the work shall be given on a per unit and total basis (including fees, permits, and taxes to be paid by the Contractor). The total price shall be based on the estimated values determined by the Contractor to complete the scope of work.

ADDENDUM NO. 3

Item No.	Item and Unit Price		Engineer's Estimate of Quantity	Computed Total
A1	**Transportation and Disposal of Contaminated Soil/Sediment (Non-Hazardous with PAHs < 100 ppm)** at the Per Ton Price of _____ Dollars and _____ Cents ($)	TON	420	$ _____

END OF BID SCHEDULE

ADDENDUM NO. 3

SECTION 01205 – PAYMENT ITEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes measurement and payment paragraphs for

1. Base Bid payment items.

~~1.~~2. Alternate Bid payment items.

B. Related Sections include the following:

1. Division 1 through 4 Sections for detailed procedural, material, and installation requirements associated with the Work of each payment item.

1.3 DEFINITIONS

A. Base Bid: The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

~~A.~~B. Alternate Bid Items: The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for additional work that is outside the scope of the Base Bid. These items may be executed at the discretion of the Owner.

~~B.~~C. Payment Item: The Owner's distribution of the Contract Sum through listed work items.

1. Each item is specified to include a defined scope of services. However, not all materials, labor, equipment, or services of a payment item are guaranteed to be listed or specified.
2. Include costs associated with items of work required to complete the defined scope of services within the appropriately specified payment item.
3. Payment items include all necessary material, plus cost for delivery, installation, applicable taxes, overhead, and profit.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 LIST OF PAYMENT ITEMS ASSOCIATED WITH GORHAMS POND DAM EMERGENCY REPAIR

A. Payment Item No. 1 – Mobilization/Demobilization

1. Work associated with this item will be paid for at the stated price including respective portions of work under all specifications necessary to initiate, sustain, and conclude Contractor's activities at the project site.

    a. Includes, but is not limited to: All labor, equipment, tools, and materials necessary to complete the work associated with the mobilization and demobilization of temporary utilities, materials, personnel, and equipment to and from the project site. Also includes restoring all incidental areas inside or outside the project limits disturbed by Contractor's activities or traffic control to existing condition or better. Mobilization shall be considered complete when the Contractor has commenced the work on-site. Demobilization shall be considered complete when the Contractor has achieved final completion of the work and removed all equipment and materials from the site, and has restored all disturbed areas. Amount bid for this item shall not exceed 5 percent (5%) of the Total Contract Base Bid Price.

2. Payment: Lump Sum price as stated on the Bid Form.

3. Measurement: As measured by the Owner. Contractor will be paid 50% upon completion of mobilization, 25% upon earning 50% of the total base bid contract value, and the remaining 25% upon completion of demobilization from the site.

B. Payment Item No. 2 – General Requirements and Incidental Construction

1. Work associated with this item will be paid for at the stated price including respective portions of work under all specifications necessary to initiate, sustain, and conclude Contractor's activities at the project site.

    a. Includes Contractor's general requirements for completing the work, including insurance, bonds, administrative and general requirements, furnishing temporary facilities, site security including construction barricade fence, temporary measures not specified elsewhere, and miscellaneous costs associated with the Work including incidentals not covered by other payment items.

2. Payment: Lump Sum price as stated on the Bid Form.

3. Measurement: As measured by the Owner, pro-rated with the Contractor's progress of work in completing the project.

C. Payment Item No. 3 –Erosion and Sedimentation Control Measures

1. Work associated with this item includes, but is not limited to: furnishing, installing, maintaining, and removing all temporary erosion and sedimentation control measures and practices for completion of all work associated with the project. Temporary erosion and sedimentation control measures include silt fence, straw bales, dewatering bags or filtration basins, dust control including sweeping of streets and drives, and incidentals including materials, equipment, tools, and labor required to complete the work. Includes removing and disposing of all accumulated sediment off site and installing/maintaining controls or establishing temporary vegetation in areas to remain dormant for extended periods.

2. Payment: Lump Sum price as stated on the Bid Form.

3. Measurement: As measured by the Owner, pro-rated with the Contractor's progress of work in establishing, maintaining, and restoring all temporary and erosion control measures and practices required for completion of work.

D. Payment Item No. 4 – Temporary Construction Access Routes and Staging Areas

1. Work associated with this item includes, but is not limited to: furnishing, installing, maintaining, and removing all temporary access routes and haul roads, temporary tracking pads, and storage/staging areas necessary for completion of all work associated with the project. Also includes protecting existing features within and adjacent to such access routes and storage/staging areas and repairing any damage to such features resulting from the Contractor's operations, identifying, and locating surface and below ground utilities, protecting and temporarily relocating such utilities as required by respective utility owners for the duration of work activities potentially affecting respective utilities. Also includes restoring all access routes and storage/staging areas to pre-construction or improved condition.

2. Payment: Lump Sum price as stated on the Bid Form.

3. Measurement: As measured by the Owner, pro-rated with the Contractor's progress of work in establishing, maintaining, and restoring all access routes and storage/staging areas required for completion of work.

E. Payment Item No. 5 – Control of Water

1. Work associated with this item includes, but is not limited to: Providing labor, equipment, and materials to perform and maintain a temporary pond drawdown, surface water and groundwater control within respective project work areas, and conveying of flow to pumps as required during construction as work progresses at the site, including associated erosion and sedimentation controls and protection of

adjacent properties from discharged/diverted waters. The temporary water control system also includes providing labor, equipment, and materials for sheet pile and sandbag cofferdams (or approved equivalent cofferdams). This work includes design, installation, maintenance, and removal of the temporary water control system. Also includes preparation of water handling plan and construction flood contingency operations plan.

2. Payment: Lump Sum price as stated on the Bid Form.

3. Measurement: As measured by the Owner, pro-rated with the Contractor's progress of work in completing respective items requiring control of water, including but not limited to, installation of cofferdams, temporary bypass, and construction dewatering discharge settling basins or sediment dewatering bags.

F. Payment Item No. 6 – Stone Masonry Demolition

1. Work associated with this item includes, but is not limited to: Provide labor and equipment for demolition, excavation, removal, salvage, and disposal of the existing stone masonry features as depicted on the Contract Drawings and as directed by the Owner. It is anticipated that all salvaged masonry will be reused on site, and no disposal will be necessary. Includes protecting existing features within and adjacent to stone masonry demolition areas and repairing any damage to such features resulting from the Contractor's operations. Labor and equipment to remove and stockpile existing stone masonry shall be included in this bid item.

2. Payment: Unit price per cubic yard as stated on the Bid Form.

3. Measurement: As measured by the Contractor per cubic yard of stone masonry wall demolished and stockpiled onsite for re-use and accepted by the Owner. The volume of the wall shall be measured prior to demolition. All such measurements shall be clearly depicted on a scaled site plan, with supporting computations provided in electronic (spreadsheet) or otherwise in hard copies, and preconstruction photographs as requested by the Owner. All plans and computations shall be certified as accurate by an Officer of the Contractor's corporation and transmitted to the Owner's review and recommendation for payment.

~~4.~~G. Payment Item No. 7– Concrete Crest Demolition

~~5.~~1. Work associated with this item includes, but is not limited to: Provide labor and equipment for demolition, excavation, removal, and disposal of the existing concrete crest of the dam structure as depicted on the Contract Drawings and as directed by the Owner. Associated quality control is considered incidental to this bid item. Includes protecting existing features within and adjacent to concrete demolition areas and repairing any damage to such features resulting from the Contractor's operations. Labor and equipment to stockpile and remove existing concrete shall be included in this bid item.

~~6.~~2. Payment: Price per ~~square foot~~ cubic yard of concrete dam crest removed and disposed as stated on the Bid Form.

~~7.~~3. Measurement: As measured by the Contractor and accepted by the Owner per ~~square foot~~ cubic yard of existing concrete removed and disposed from the site.

~~G.~~H. Payment Item No. 8 – Excavation at Dam Toe

1. Work associated with this item includes, but is not limited to: Provide labor and equipment for excavation, removal, salvage of, and stockpiling existing stone armor from the dam toe for use in the proposed stone revetment construction. Labor and equipment to install the proposed stone revetment and stone armor shall be included in Bid Item No. 17. Disposal of materials classified as unsuitable by the Owner shall be included in Bid Item No. 10. No payment shall be made for excavation beyond the proposed subgrade elevations indicated on the Contract Drawings.
2. Payment: Price per cubic yard as stated on the Bid Form.
3. Measurement: As measured by the Contractor and accepted by the Owner per cubic yard of existing stone armor salvaged and stockpiled on site.
    a. Measurement will be made by in-place volume in cubic yards of stone armor salvaged as determined by topographic survey completed prior to and upon completion of excavation at the dam toe. Such survey shall be by a licensed surveyor or licensed professional Engineer, be conducted only in the presence of the Engineer's or Owner's on-site representative or otherwise no sooner than 48-hours after Contractor's written notification to the Owner of such survey and be referenced to the site's vertical and horizontal datum.
    b. All such survey measurements shall be clearly depicted on a scaled site plan and section drawings bearing the stamp of the surveyor or professional engineer, with supporting computations provided in electronic (spreadsheets) format or otherwise in hard copies.

~~H.~~I. Payment Item No. 9 – Excavation of Dam Embankment

1. Work associated with this item includes, but is not limited to: Provide labor and equipment to perform excavation, removal, salvage of, and stockpiling existing earthen embankment material as needed for construction of the proposed Work. Collection and laboratory analysis of soil/sediment samples required for disposal and preparation of disposal facility waste profile will be completed by the Contractor. Labor and equipment to install the salvaged earthen embankment material as backfill within the dam embankment shall be included in Bid Item No. 15. Labor and equipment to remove and dispose of unsuitable materials shall be included in Bid Item No. 10.
2. Payment: Price per cubic yard as stated on the Bid Form.

3. Measurement: As measured by the Contractor and accepted by the Owner per cubic yard of existing earthen embankment material salvaged and stockpiled on site.

   a. Measurement will be made by in-place volume in cubic yards of earthen embankment material salvaged as determined by topographic survey completed prior to and upon completion of excavation at the dam toe. Such survey shall be by a licensed surveyor or licensed professional engineer, be conducted only in the presence of the Engineer's or Owner's on-site representative or otherwise no sooner than 48-hours after Contractor's written notification to the Owner of such survey and be referenced to the site's vertical and horizontal datum.

   b. All such survey measurements shall be clearly depicted on a scaled site plan and section drawings bearing the stamp of the surveyor or professional engineer, with supporting computations provided in electronic (spreadsheets) format or otherwise in hard copies.

~~I.~~J. Payment Item No. 10 – Disposal of Unsuitable Materials

1. Work associated with this item includes, but is not limited to: Provide labor and equipment to excavate and dispose of existing soft, unsuitable organic materials that do not meet project specification requirements for subgrade or for reuse onsite or as determined by the Owner.
2. Payment: Price per cubic yard as stated on the Bid Form.
3. Measurement: As measured by the Contractor and accepted by the Owner per cubic yard of unsuitable material removed and disposed of from the site.

~~J.~~K. Payment Item No. 11 – Cast-in-Place Concrete Construction

1. Work associated with this item includes, but is not limited to: furnishing and installing of the cast-in-place concrete cutoff wall and concrete key as depicted on the Contract Drawings. Includes incidental materials and labor to install reinforcing steel, waterstops, ~~waterproofing membranes~~ HDPE membrane~~,~~ to provide quality control, to protect existing features within and adjacent to the work areas, and to repair any damage to such features resulting from the Contractor's operations. The associated earthwork for foundation bearing surface preparation and backfill is included within Bid Item No. 15.
2. Payment: Price per cubic yard of concrete as indicated on the Bid Form.
3. Measurement: As measured by the Contractor and accepted by the Owner per cubic yard of concrete delivered and placed at the project site.

~~K.~~L. Payment Item No. 12 – Marine Concrete Construction

1. Work associated with this item includes, but is not limited to: furnishing and installing the cast-in-place concrete slabs on the dam crest as depicted on the Contract Drawings. Includes incidental materials and labor to install reinforcing steel, waterstops, ~~waterproofing membranes~~ HDPE membrane~~,~~; to provide quality control, to protect existing features within and adjacent to the work areas, and to repair any damage to such features resulting from the Contractor's operations. The associated earthwork for foundation bearing surface preparation and backfill is included within Bid Item No. 15.
2. Payment: Price per cubic yard of concrete as indicated on the Bid Form.
3. Measurement: As measured by the Contractor and accepted by the Owner per cubic yard of concrete delivered and placed at the project site.

~~L.~~M. Payment Item No. 13 – Non-Excavatable Controlled Low-Strength Material (CLSM) Mud Mat Construction

1. Work associated with this item includes, but is not limited to: furnishing and installing the non-excavatable controlled low-strength material (CLSM) concrete mud mats as depicted on the Contract Drawings. Includes incidental materials and labor ~~to install waterstops,~~ to provide quality control, to protect existing features within and adjacent to the work areas, and to repair any damage to such features resulting from the Contractor's operations. The associated earthwork for foundation bearing surface preparation and backfill is included within Bid Item No. 15.
2. Payment: Price per cubic yard as indicated on the Bid Form.
3. Measurement: As measured by the Contractor and accepted by the Owner per cubic yard of non-excavatable controlled low-strength material delivered and placed at the project site.

~~M.~~N. Payment Item No. 14 – Mortared Stone Masonry Wall Construction

1. Work associated with this item includes, but is not limited to: construction of mortared stone masonry walls using salvaged existing masonry stones, provision of new masonry stones, grout, and masonry capstones as required for installation of mortared stone masonry walls as depicted on the Contract Drawings. Provision of materials and labor required for drilling and grouting reinforcement into stone masonry units and masonry capstones is included within this Bid Item. Includes incidental materials and labor to provide quality control, to protect existing features within and adjacent to the work areas, and to repair any damage to such features resulting from the Contractor's operations. The associated earthwork for wall construction and backfill is included within Bid Item No. 15.
2. Payment: Price per square foot of stone masonry wall face as indicated on the Bid Form.

3. Measurement: As measured by the Contractor and accepted by the Owner per square foot of stone masonry face constructed.

~~N.~~O. Payment Item No. 15– Suitable Soil Backfill

1. Work associated with this item includes, but is not limited to: Furnish additional suitable soil as required to backfill the concrete and masonry structures if the quantity of existing earth embankment material salvaged for reuse is insufficient, as determined by the Owner. Labor and equipment for earthwork associated with foundation bearing surface preparation, backfill of proposed structures using furnished or salvaged suitable soils, and quality control for backfill is included in this Bid Item.
2. Payment: Price per cubic yard as stated on the Bid Form.
3. Measurement: As measured by the Contractor and accepted by the Owner per cubic yard of suitable soil delivered to the site. Measurement will be made by the Contractor with supporting delivery slips to the site.

~~O.~~P. Payment Item No. 16 – Crushed Stone Bedding

1. Work associated with this item includes, but is not limited to: Provide crushed stone for bedding below cast-in-place concrete slabs on the dam crest and for bedding in stone revetment construction. Includes incidental materials and labor to provide quality control. Labor and equipment for earthwork associated with foundation bearing surface preparation and backfilling of proposed structures is included in Bid Item No. 15. Provision of filter fabric shall be included in Bid Item No. 18.
2. Payment: Price per cubic yard as stated on the Bid Form.
3. Measurement: As measured by the Contractor and accepted by the Owner per cubic yard of crushed stone bedding material delivered to the site. Measurements will be made by the Contractor with supporting delivery slips to the site.

~~P.~~Q. Payment Item No. 17 – Stone Revetment Construction / Reposition Stone Armor

1. Work associated with this item includes, but is not limited to: Labor and equipment for installation of new stone revetment using salvaged existing stone armor determined suitable for reuse as depicted on the Contract Drawings and as directed by the Owner. Also includes placing and grading riprap and bedding stone materials within the lines and grades depicted on the Contract Drawings. Labor and equipment for salvaging and stockpiling existing stone armor shall be included in Bid Item No. 8. Provision of supplemental stone armor for stone revetment construction shall be included in Bid Item No. 19. Provision of crushed stone bedding material for stone revetment construction shall be included in Bid Item No. 16. Provision of filter fabric for stone revetment construction shall be included in Bid Item No. 18.

2. Payment: Price per cubic yard as stated on the Bid Form.

3. Measurement: As measured by the Contractor and accepted by the Owner per cubic yard.

~~Q.~~R. Payment Item No. 18 – Filter Fabric ~~for Stone Revetment Construction~~

1. Work associated with this item includes, but is not limited to: Provide filter fabric for stone revetment construction and for installation around the crushed stone bedding below the cast-in-place concrete slabs on the dam crest as depicted on the Contract Drawings and as directed by the Owner.

2. Payment: Price per square yard as indicated on the Bid Form.

3. Measurement: As measured by the Contractor and accepted by the Owner.

~~R.~~S. Payment Item No. 19 – Supplemental Stone Armor

1. Work associated with this item includes, but is not limited to: Furnish additional stone armor as needed to construct the stone revetment and stone armor at the toe of the dam as shown on the Contract Drawings and as directed by the Owner. Labor and equipment to install the stone revetment and stone armor shall be included in Bid Item No. 17.

2. Payment: Price per cubic yard as stated on the Bid Form.

3. Measurement: As measured by the Contractor and accepted by the Owner per cubic yard of stone armor delivered to the site. Measurement will be made by the Contractor with supporting delivery slips to the site.

~~S.~~T. Payment Item No. 20 – Lift Barge

1. Work associated with this item includes, but is not limited to: Providing a lift barge for Contractor's use during the completion of the Work.

2. Payment: Lump Sum price for use of the lift barge for various activities during construction including, but not limited to, control of water, installation of stone revetment, and other miscellaneous use during construction as stated on the Bid Form.

3. Measurement: As measured and accepted by the Owner on a pro-rated basis based on the Contractor's progress of work in completing respective items utilizing the lift barge.

~~T.~~U. Payment Item No. 21 – Traffic Control

1. Work associated with this item includes, but is not limited to:

a. Provision of sufficient number of signs, drums, traffic cones, and other traffic control devices to forewarn traffic of the construction as in accordance with the Contractors approved traffic management plan.

b. Provision of sufficient number of signs, pavement markings, and other safety measures to safely direct vehicles through detours as shown on the site plans or as directed by the Owner or Owner.

c. Incidentals including materials (including aggregate and pavement necessary for transitions), equipment, tools and labor (including trafficmen) required to complete the Work.

2. Payment: Lump Sum price as stated on the Bid Form.

3. Measurement: As measured by the Owner, pro-rated with the Contractor's progress of work.

~~U.~~V. Payment Item No. 22 – Construction Survey and Records

1. Work associated with this item includes, but is not limited to: establish survey control at the site, stake out vertical and horizontal limits of proposed features, conduct additional surveys of constructed features to confirm conformance to required lines and grades depicted on the Contract Drawings or otherwise instructed by the Owner or as required by the CT DEEP License Certificate of Permission, survey constructed features as required for measurement and payment of completed work, conduct final survey(s) of completed work, prepare and revise record drawings, as accepted by the Engineer and as required by the CT DEEP License Certificate of Permission.

2. Payment: Lump Sum price as stated on the Bid Form.

3. Measurement: As measured by the Owner, pro-rated with the Contractor's progress of work in completing respective items requiring construction stakeout, measurement and record drawings. For purposes of disbursing payments for this payment item, one-third (33%) of the lump sum shall be considered as payment in whole for establishing survey control and construction stakeout of proposed features, one-third (33%) of the lump sum shall be considered as payment in whole for measurement of completed items, and one-third (33%) of the lump sum shall be considered as payment in whole for final surveys and production of completed record documents. The Contractor shall submit a final topographic survey bearing the stamp of a licensed surveyor or licensed professional engineer of the site upon completion of the construction and include all items required for as-built plans by the CT DEEP License Certificate of Permission.

~~V.~~W. Payment Item No. 23 – Site Restoration

1. Work associated with this item includes, but is not limited to: Fine grading, restoration of tidal resource areas, including restoration of tidal wetland plants within the temporary tidal wetland vegetation disturbance zone, restoration of any features

adjacent to the site impacted by construction activities to original condition (or better), such as, but not limited to, fencing adjacent to the site, and restoring other site features to their original condition (or better) that were disrupted by construction activities as noted on the Contract Drawings and as directed by the Owner.

2. Payment: Lump Sum as stated on the Bid Form.

3. Measurement: As measured by the engineer, pro-rated with the Contractor's progress of work to restore the site.

3.2 LIST OF ALTERNATE PAYMENT ITEMS ASSOCIATED WITH GORHAMS POND DAM EMERGENCY REPAIR

A. Alternate Payment Item No. A1 – Transportation and Disposal of Contaminated Soil/Sediment (Non-Hazardous with PAHs <100 ppm)

1. Work associated with this item includes: Loading, transporting, and legal off-site disposal of contaminated soil/sediment excavated from the site with PAH concentrations less than 100 ppm at a permitted licensed disposal facility. Incidentals required to complete the work including materials, equipment, tools, and labor incidental to the Work.

2. Payment: Price per ton as stated on the Bid Form.

3. Measurement: As measured on a per ton basis for material delivered to permitted disposal facilities. Actual net weight in tons of material delivered to treatment / disposal facilities, as measured by the permanent scales at the respective facilities. Total weight will be the summation of weigh bills issued by such facilities.

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ADDENDUM NO. 3

SECTION 02205 – PROTECTION OF DAM

PART 1 - GENERAL

1.1 SUMMARY

A. The Section includes protecting the dam from damage during construction activities, including but not limited to dewatering, excavation, fill placement, concrete placement, stone placement, and compaction as required. Potentially dangerous situations during construction include but are not limited to:

1. During removal of the earthen portion of the embankment and removal of stone masonry walls, the dam will be unstable under normal hydrostatic and flood loading conditions, thereby necessitating protection against release of surface or ground water into the excavated area and protection of the dam from failure due to flood loading and flood flows or tidal flows.
2. During removal of the existing cast-in-place concrete crest of the dam, the embankment and the tide gate and fish ladder structure will be exposed to potential damage.
3. During the excavation and installation of the mortared stone masonry walls, controlled low-strength material (CLSM) mud-mat, and cast-in-place concrete cutoff wall, the embankment and the tide gate and fish ladder structure will be exposed to potential damage and the existing concrete tide gate structure and fish ladder may be undermined and exposed to potential damage.
4. During the installation of the temporary sheet pile cofferdam system, the existing wall footings, bridge piers, and other existing site improvements may potentially be subject to damage due to impact from sheeting or potentially affected by vibrations. Damage could result in cracking of structures or settlement of material beneath the structures.
5. During lowering of the impoundment for water control purposes, the masonry walls and other structures upstream of the dam may be exposed to potential damage.

1.2 RELATED DOCUMENTS

A. Division 2 Section "Site Clearing & Demolition"

B. Division 2 Section "Earthwork"

C. Division 2 Section "Water Control System"

D. Division 2 Section "Dewatering"

E. Division 2 Section "Stone Armor"

F. Division 3 Section "Excavation Support and Protection"

PART 2 - PRODUCTS

2.1 MATERIALS

A. Provide equipment and materials as required to protect the dam during construction.

B. Provide survey equipment, personnel, and crack gages to monitor adjacent structures as needed.

PART 3 - EXECUTION

3.1 GENERAL

A. The dam, fish ladder, tide gate structure, adjacent bridge and associated structures, and masonry walls upstream of the dam shall be inspected prior to the start of construction to identify locations of existing cracks, joints, and spalling, as well as any obvious signs of sinkholes or depressions in the ground adjacent to the structures. Locations shall be noted on a plan of the site and photographs shall be taken of each item noted during the inspection.

B. Materials, procedures, and methods employed by the Contractor for dam protection shall allow access to all portions of the dam throughout construction.

C. Protect the dam, tide gate structure, and fish ladder throughout the Contract period. Care shall be exercised while operating equipment on and adjacent to the dam. The Contractor shall be responsible to assure that the equipment which is utilized does not cause damage to the dam or its appurtenances. Loading of the tide gate structure and fish ladder with construction equipment must be avoided to protect the structures. Temporary shoring shall be providing at the limits of the existing tide gate structure and fish ladder structure to protect footings.

D. Protect the adjacent bridge and appurtenances throughout the Contract period. Care shall be exercised while operating equipment on and adjacent to the bridge. The Contractor shall be responsible to assure that the equipment which is utilized does not cause damage to the bridge or its appurtenances.

E. Access to various portions of the dam for the construction of improvements shall be undertaken in such a manner that the dam is protected at all times. Access ways shall be

constructed, maintained and protected with erosion and sediment controls to prevent damage from erosion during a major storm or tidal surge event.

F. Placement and compaction of fill materials adjacent to the existing structures shall be completed in such a manner that the dam and appurtenances are protected from damage at all times.

G. Dewatering systems and measures to block flow to the work area and divert in-flow to the downstream area shall be installed, operated, maintained and removed in such manners to protect the dam and appurtenances from damage at all times.

H. Walls and existing stone armor adjacent to work shall be protected from damage.

I. Walls, structures, and other existing features upstream of the work shall be protected from damage.

J. A post-construction survey of the adjacent concrete tide gate structure, fish ladder, and bridge and associated structures ~~tide gate and fish ladder structure~~ shall be performed to document any damage to the existing structure, or changes in the condition of the previously identified cracks, construction joints, depressions or other deficiencies.

3.2 MONITORING OF EXISTING STRUCTURES

A. The Engineer shall indicate monitoring points on adjacent structures and ground near adjacent structures to be surveyed by the Contractor for settlement or movement during sheet pile installation.

B. The Engineer shall indicate locations of monitoring points adjacent to the existing fish ladder, tide gate structure, and bridge and associated structures ~~existing fish ladder and tide gate structure~~ for measurement of ground surface waves generated from sheet pile driving activity.

C. The Owner shall retain a testing agency experienced in vibration monitoring to install and monitor equipment capable of real time recording of ground surface wave velocities adjacent to the existing fish ladder, tide gate structure, and bridge and associated structures ~~existing fish ladder and tide gate structure~~.

D. Settlement and vibration monitoring shall be performed continuously during the initial sheet pile installation process to establish a base line at time intervals. After the first two hours of monitoring the points shall be monitored at intervals not to exceed two hours during the remainder of the sheet pile driving.

E. Crack gages shall be installed at each existing crack and exposed concrete joint of the fish ladder, tide gate structure, and bridge and associated structures ~~fish ladder and tide gate~~

~~structure~~ identified during the pre-construction survey. The crack gages shall be monitored at the same frequency as the settlement and vibration monitoring.

F. A ground surface wave velocity of 2 inches per second immediately adjacent to the fish ladder, tide gate structure, and bridge and associated structures ~~and tide gate structure~~ shall be the initial threshold value for the sheet pile installation, assuming damage or settlement are not experienced at lower velocities.

G. If the ground surface wave velocity threshold of 2 inches per second is reached without damage or settlement, continuous monitoring will be resumed until the Engineer determines a lower monitoring frequency can be implemented.

H. If new cracks in the fish ladder, tide gate structure, or bridge and associated structures' ~~or tide gate structure~~ concrete are observed, worsening of existing cracks, or separation of construction joints are observed, or excessive settlement of the soil or stone armoring around the fish ladder is observed, pile installation will stop and alternatives will be considered. These may include using a pile hammer with a different vibration frequency, or a hammer with a variable frequency/force capability, or supporting the fish ladder through another means such as pressure grouting or underpinning with helical piles, or other alternatives.

I. Settlement monitoring shall be performed at a minimum of once daily within one week following the sheet pile installations.

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SECTION 02142 - HDPE MEMBRANE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes a HDPE membrane with seaming and testing.

B. Related Sections include the following:

1. Division 2 Section "Earthwork" for general site earthwork requirements.

1.3 DEFINITIONS

A. Installer: Authorized installer of geomembrane manufacturer.

B. HDPE: High Density Polyethylene

C. Manufacturer's Field Representative: Authorized and trained manufacturer representative.

D. Quality Assurance Consultant (QAC): Owner's representative that will review material, procedure, and testing submittals; and will observe on-site installation including seaming operations and repair work.

1.4 SUBMITTALS

A. Bidding Submittals

1. Installer name and qualifications, including Project experience descriptions.
2. Superintendent qualifications.
3. Geomembrane product data sheet.
4. Warranties regarding quality of materials, workmanship, and long-term performance of the completed geomembrane system.

B. Process submittals to the Owner's Quality Assurance Consultant (QAC.)

C. Action Submittals, as prepared by the Installer.

1. Product Data: Include manufacturer's requirements for surface preparation, technical data, and tested physical and performance properties of geomembrane.

2. Qualification Data: For Installer and geomembrane manufacturer's Field Representative.

3. Shop Drawings: Indicate extent, panel sizes, panel identification number, and details of penetrations and seams.

   a. Assign each geomembrane panel and seam a simple and logical identification number or letters. Correlate seam identification system with panel identification system.

   b. Panel layout. Indicate seam direction and roll sizes.

      1) Design layout to utilize largest panel sizes possible, minimize seams, and to minimize horizontal field seams on slopes.

   c. Details

      1) Termination of material at perimeter of membrane areas.

      2) Penetration sealing procedures.

      3) Anchoring procedures.

4. Installation Procedures: Include manufacturer's requirements and detailed quality control procedures.

D. Informational Submittals

1. Material Quality Control Certificate: Provide for each geomembrane roll delivered to the site. List specified material properties. Clearly label with distinctive code number.

2. Manufacturer's Quality Control Test Data: Provide test data collected in accordance with the requirements of GRI Test Method GM13, dated March 2021, including test frequencies and physical/chemical properties listed in Tables 1(a) and 1(b) thereof.

3. Samples: As requested by the Quality Assurance Consultant.

4. Daily Examination Report: Before proceeding with membrane installation, complete and submit to Owner "Letter of Surface Confirmation," which states observation and acceptance of surface area to receive membrane, signed by Installer and QAC.

5. Trial Seam Test Report: Submit on a weekly basis. Installer shall record date, time, weather conditions, test results, operator, and equipment number for each trial seam tested.

   a. Trial Seam Sample: Submit properly identified unused section of trial weld seam to Owner.

6. Record Drawings: Include panel layout and identification, seam type and identification, repair locations and identifications, and destructive test sample locations and identification.

   a. Record the roll number, location, and date of installation of each panel placed.

   b. Submit working copies when requested by the Quality Assurance Consultant.

c. Submit final Record Drawings prior to demobilizing from the site.

7. Installation Certificate: The Installer shall submit a Certificate of Acceptance stating that installation procedures and required testing have been completed in accordance with the specifications.

1.5 QUALITY ASSURANCE

A. Geomembrane Manufacturer: Manufacturer that has successfully supplied a minimum of 10,000,000 s.f. of geomembrane.

B. Geomembrane Manufacturer's Field Representative Qualifications: Competent, field technical representative that has personally supervised and directed the installation of a minimum of 2,000,000 s.f. of the specified geomembrane product.

C. Installer: An experienced Installer that has successfully completed projects similar in size and scope but no less than 10 geomembrane installation projects totaling a minimum of 2,000,000 s.f.

1. Seaming Personnel: Experienced in projects of similar nature, material, and installation method, with at least one seamer having a minimum of 1,000,000 s.f. installation experience.

D. Source Limitations: Obtain each type of geomembrane through one source from a single manufacturer.

E. The Installer shall promptly inform the Quality Assurance Consultant upon placing an order for materials so that arrangements may be made, if desired, for inspection before shipment from the place of manufacture.

F. The Installer shall provide the Quality Assurance Consultant and his representatives with facilities, labor, tools, and equipment as required during installation, and allow proper time for inspecting and testing materials and workmanship.

G. Preinstallation Conference: Conduct conference at Project site.

1. Review manufacturer requirements including surface condition, forecasted weather conditions, seam details, installation and repair procedures, testing and inspection procedures, and protection of installed geomembrane.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Upon delivery of geomembrane rolls to the site, assist Owner's Quality Assurance Consultant with inspection and provide labor as needed for inspection.

1. Immediately remove from the site damaged or defective material.

B. Store membrane rolls on a prepared surface approved by the QAC, no more than 3 rolls high. Protect rolls from dirt, grease, water, abrasions, excessive heat or cold, or other damage.

C. Handle geomembrane rolls with appropriate equipment, designed to handle sheet materials. Use spreader bars and cloth chokers when loading and transporting to prevent damage or stressing of the geomembrane material.

D. Any damaged membrane shall be repaired or replaced immediately, at the discretion of the Quality Assurance Consultant, and at no cost to the Owner.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit system to be installed according to manufacturer's written instructions and warranty requirements.

1. Install material when ambient air temperature is within the temperature range as specified and as required by the manufacturer.

B. Do not allow vehicular traffic directly on geomembrane panels. Equipment shall not damage panels by handling, leakage, transporting across panels, or any other means.

C. Personnel working with geomembrane panels shall not wear shoes that will damage the panels.

1.8 WARRANTY

A. Manufacturer's Warranty: Provide written warranty as it relates to the quality of the material, for a period of not less than 20 years.

B. Installer: Provide written, standard general contractor's warranty as it relates to performance for a period of not less than 5 years.

PART 2 - PRODUCTS

2.1 HDPE GEOMEMBRANE

A. Material: First quality HDPE resin containing less than 2-percent clean recycled polymer.

Properties	Requirement
Melt Index ASTM D1238, Condition 190/2.16	<1 gram/10 min
Specific Gravity ASTM D792, Method A	> 0.90 g/cm^3
Oxidative Inductive Time ASTM D3895 (1atm/200°C)	120

B. Membrane Properties: Unreinforced HDPE containing 3 percent by weight maximum additives, fillers or extenders including carbon black; free of striations, pinholes, blisters, bubbles, undispersed raw materials, or signs of contamination by foreign matter on the material surface.

1. Smooth HDPE: Physical and Chemical properties meeting the requirements of the Geosynthetic Research Institute's "Test Method GM13", Table 1(a)

2. Textured HDPE: Physical and Chemical properties meeting the requirements of the Geosynthetic Research Institute's "Test Method GM13", Table 2(a)

C. Membrane Seams

Properties	Smooth HDPE
Peal Adhesion ASTM D6392	48 lb/in, width, minimum and Film Tear Bond
Bonded Seam Strength ASTM D6392	55 lb/in width, minimum and Film Tear Bond

2.2 MEMBRANE PENETRATIONS

A. Penetrations shall be made as shown on the drawings and in accordance with liner manufacturer's instructions.

1. Geomembrane boots shall be specifically manufactured by the membrane manufacturer for such use or field fabricated of Geomembrane material in accordance with manufacturer's instructions.

2. Stainless steel banding shall be type 304, ¾" wide with adjustable screw-type clasp, or approved equal.

3. Gasket shall be neoprene, closed cell medium, ¼" thick, 2" wide with adhesive on one side as supplied by geomembrane liner manufacturer, or approved equal.

PART 3 - EXECUTION

3.1 GENERAL

A. Owner's Quality Assurance Consultant (QAC) will observe the complete installation of the geomembrane system including delivery to site, handling, deploying, seaming, testing, and repair work.

1. Do not install geomembrane without QAC being present.

2. No additional compensation will be provided for possible delays that may be caused due to inspection and testing of materials and workmanship.

B. Inform QAC on a daily basis of proposed work schedule, including changes.

C. Mark geomembrane panels by their identification number or letters.

D. Install geomembrane under the direct supervision of the Manufacturer's Field Representative.

1. Do not install geomembrane without Field Representative being present.

E. The Installer shall be responsible for field handling, storing, placing, seaming, plus any other processes required to assemble a continuous secure geomembrane system.

3.2 PREPARATION

A. See Division 2 Section "Earthwork" for subgrade preparation and bedding placement.

1. Surfaces shall be smooth and free of rocks, stones, sticks, roots, sharp objects, and debris, and provide a firm, unyielding foundation for the geomembrane with no sudden, sharp or abrupt changes or break in grade.

3.3 EXAMINATION

A. Installer and Quality Assurance Consultant shall inspect the prepared subgrade on a daily basis and immediately inform the Contractor of remedial work required to bring the subgrade to the specifications required for liner installation.

1. Upon satisfactory subgrade condition, the Installer and Quality Assurance Consultant will issue a joint "Letter of Surface Confirmation."

3.4 INSTALLATION

A. Install and seam membrane panels when the ambient air temperature is between 40 degrees F and 104 degrees F, as measured 6 inches above subgrade surface elevation.

1. Do not install, seam, or repair membrane panels during precipitation, excessively high winds, or in areas of ponded water or excessive moisture.

2. Do not install and seam geomembrane panels in ambient temperatures below 40 degrees F unless approved by the Quality Assurance Consultant, and only if trial seams demonstrate the ability to meet seaming specifications.

B. Before deploying geomembrane panels, Installer shall repair subgrade or other underlying surface disturbed or damaged after issuance of "Letter of Surface Confirmation."

C. Place material over prepared subgrade with minimum handling. Place rolls in accordance with approved panel layout.

1. Install only rolls of material that can be anchored and sealed by end of each day's operation.

D. Properly secure geomembrane during installation with sandbags, rubber tires or other means approved by the QAC. Do not use large or sharp rocks, or other sharp objects.

E. Install geomembrane material in relaxed condition. Provide excess material for each panel as per requirements. Do not stretch material to fit area; keep material free from stress and tension during installation.

1. Unroll geomembrane panels in a manner that will not stretch, crimp, abrade, or otherwise damage panels. Place panels in a manner that minimizes wrinkles and differential wrinkles between adjacent panels.

F. Overlap geomembrane panels to facilitate drainage of water. All panels deployed during a single day shall be seamed or tack welded together that same day to the extent practicable.

G. Anchor perimeter of geomembrane panels in trench as indicated on the Drawings.

3.5 FIELD SEAMING

A. Lay out the geomembrane seams parallel to the line of maximum slope.

1. Minimize the use of cross or butt seams on slopes, seams located in corners, and unusual geometric panel shapes.

B. The seam identification system shall be related to and compatible with the panel identification system.

C. Equipment: Include temperature gages and readout devices that allow continuous monitoring of apparatus temperatures during seaming. Electric generators shall be capable of providing constant voltage under load and shall be underlain with a splash pad to collect spilled fuel or oil when located on the membrane.

D. Overlap geomembrane surfaces a minimum of 4 inches and clean surfaces of moisture, grease, dust, dirt, debris and foreign material.

1. Do not use solvent or adhesive for seaming without approval from the manufacturer and the Quality Assurance Consultant.

2. When needed, install beneath the seam a protective sheet of plastic beneath the geomembrane sheets to minimize moisture and dirt during seaming

3. Where moisture or dirt causes seaming difficulty, install a protective sheet of plastic below the geomembrane material being seamed. As seaming progresses, pull the protective sheet along beneath the seaming apparatus.

a. Do not leave the protective sheet beneath the geomembrane.

4. For extrusion welding, clean surfaces to be seamed of oxidation by disc grinder not more than one hour before extruding the seam. Abrasion of the seam area with the disc grinder shall not extend more than one-half inch beyond the extrusion bead area. Tack welding of the panels to be seamed shall not damage the membrane or adversely affect the seaming operation. The top membrane of the seam overlap shall be beveled and the extrusion apparatus shall be purged of heat-degraded extrudant before seaming.

E. Fish mouths shall be cut along the ridge of the wrinkle and laid flat to overlap the edges of the cut. The overlap shall be extrusion-seamed and any portion of the seam with less than 3 inches of overlap shall be patched with a circular or oval patch extending a minimum of 6 inches beyond the cut in all directions.

F. The Installer shall log the ambient air temperature 6 inches above the membrane elevation, extruded temperatures in extruder barrels and nozzles, and operating temperatures of hot wedge seamers at intervals of 2 hours or less.

3.6 MEMBRANE PENETRATIONS

A. Any penetrations in the membrane required by a pipe, vent, utility pole, fence post, concrete structure or other constructed feature shall be connected to the membrane as shown on the drawings and in accordance with the geomembrane Manufacturer's recommendations as approved by the Engineer.

1. The connection to the geomembrane shall be made to assure the permeability of the liner at the connection has not been increased. Any damage to the liner materials shall be repaired in accordance with the specifications. Each penetration shall be inspected and approved by the Engineer prior to being covered.

3.7 INSPECTION

A. Visually inspect seams and panels for holes, crimps, abrasions, or defects, and mark suspect locations. Clearly mark repair locations and assign an appropriate identifying label which shall be clearly marked on the panel adjacent to the repair location and shall be shown on the Record Drawing. Each marked location shall be repaired, non-destructively tested, and data recorded on the Record Drawings.

1. Do not cover repairs until passing results of non-destructive tests are achieved and accepted by the Quality Assurance Consultant.

B. Remove large wrinkles in geomembrane panels before installation of protection sand cover. Cut wrinkle, reseam and test until an acceptable seam is obtained.

3.8 GEOMEMBRANE PROTECTION

A. Direct heavily-loaded construction vehicles, such as loaded dump trucks, to travel over geomembrane panels with a cover of 18 inches minimum.

B. Use tracked-equipment for spreading of sand cover over geomembrane panels.

1. Tracked equipment shall exert a maximum contact pressure of 10 psi (equivalent to a Caterpillar D-6 bulldozer with standard track configuration), and shall operate on a minimum of 9 inches of sand cover over geomembranes

2. Tracked equipment will not make turns in such a manner as to displace underlying soil or put additional stress on the geomembrane liner.

3. Under no circumstances shall tracked equipment be permitted to pivot steer.

C. Do not place concrete on a membrane that is under stress due to thermal contraction or other causes, or that has large wrinkles that may fold over and crimp, or when the ambient air temperature 6 inches above the membrane is greater than 104 degrees F or lower than 40 degrees F.

D. Cut and patch panels under tensile stress due to thermal contraction or any other cause, and compensate for membrane contraction prior to placement of overlying cover material.

3.9 REPAIRS

A. Remove or repair damaged geomembrane panels damaged during installation at no additional cost to Owner.

B. Repair geomembrane panels as follows:

1. Preparation. Abrade surface of geomembrane in the seam/repair area no more than one hour before the repair is made. Keep repair/seam areas clean and dry at the time of the repair.

2. Spot weld small tears, pinholes or over-abraded areas where thickness of the geomembrane has been reduced by more than 4 mils (0.004 inches).

3. Abrade and reweld small sections of defective extrusion welds.

4. Remove defective seam and replace with a new strip of material. Defective hot wedge seams may be abraded and extrusion welded providing the top membrane overlap is carefully cut off.

5. Patch larger holes and defects. Extend patch material a minimum of 6 inches beyond the edges of the defect. Round corners of patches with a radius of at least 3 inches.

3.10 FIELD QUALITY CONTROL TESTING

A. Seam Testing. Record locations and results of seam tests on the Record Drawing. Keep records on site for inspection by the Owner and Quality Assurance Consultant.

B. Trial Seams

1. Sample Quantity: For each seaming apparatus, for the following instances.

a. At the beginning of each shift.

b. After apparatus has been turned off or disconnected from its power source.

c. When apparatus has been idle for 30 minutes (extrusion welder) or 60 minutes (hot wedge welder).

d. Change in operator personnel.

e. When deemed necessary by the Quality Assurance Consultant.

2. Sample Size: 3 feet long and 12 inches wide (perpendicular to the seam), minimum.

a. Cut 1-inch-wide samples perpendicular to the seam for testing. Provide at a minimum, six for peel test and three for shear test.

3. Shear (Bonded Seam Strength) and Peel (Adhesion) Tests: In accordance with ASTM D6392. Installer shall provide tensiometer, calibrated within one year from start of geomembrane installation.

4. Conduct trial seams under the same physical conditions as permanent seaming.

a. For double-fusion hot wedge seams, both seams in each sample shall be tested for peel adhesion.

b. All six peel tests and all three shear tests are required to pass for the trial seam to be acceptable.

c. Each sample failure must consist of a ductile break that is film tearing bond.

5. If either test sample fails (shear or peel), repeat trial seam test procedure. If any test seams fail on the second trial seam, the seaming apparatus shall not be used until it is repaired or faulty conditions are corrected, and two trial seams pass the destructive tests.

C. Non-destructive Seam Testing

1. Acceptable Methods. Vacuum box testing, air-pressure testing of double-fusion seams, or other methods approved by the manufacturer and Quality Assurance Consultant.

2. Perform non-destructive testing over the full length of each seam. Perform testing as work progresses. Do not wait to perform testing until the completion of large segments of field seaming.

3. Vacuum Box Testing: In accordance with ASTM D5641. Utilize vacuum box approved by the Quality Assurance Consultant. Vacuum box shall include rigid housing, transparent viewing window, a soft rubber gasket on the bottom edge, and a valve assembly with a vacuum gage.

a. Mark geomembrane seamed areas when soap bubbles are visible in the viewing window.

b. Repair marked locations and retest.

4. Air Pressure Testing: In accordance with ASTM D5820. Perform air –pressure test on double-fusion seams having an air channel between the seams in accordance with ASTM D 5820. Mark results on the geomembrane adjacent to the test location.

5. If a seam is located where non-destructive testing cannot be performed, the seam shall, at the discretion of the Quality Assurance Consultant, be cap-stripped and the cap-stripping operation shall be observed by the Quality Assurance Consultant and Installation Contractor for completeness.

D. Destructive Seam Testing

1. Samples: The Installer shall cut and remove destructive test samples from the installed geomembrane material, assign the sample an identification number, and record the sample location on the Record Drawings.
    a. Perform one series of destructive seam tests per 1,000 l.f. of seam, minimum. One test must be performed per welding machine per day.
    b. Locations: As determined by the Quality Assurance Consultant.
    c. Sample Size: 12 inches wide and 40 inches long with the seam centered lengthwise.
    d. Perform destructive seam strength testing as work progresses in order to obtain test results before seams are covered.
    e. The Installer shall immediately repair the geomembrane at the destructive test sample location, and perform non-destructive test.
2. Destructive Seam Series Test: In accordance with ASTM D6392.
    a. Field Testing. Installer shall provide field tensiometer, calibrated within one year from start of geomembrane installation.
        1) Shear (Bonded Seam Strength)
            a) One 1-inch strip cut from sample.
        2) Peel (Adhesion) Tests:
            a) Laboratory Test: Five 1-inch strips cut from samples.
    b. Laboratory Testing. Coordinated by the Quality Assurance Consultant and performed by an independent geosynthetic testing laboratory paid for by the Owner.
        1) Shear (Bonded Seam Strength)
            a) Laboratory Test: Five 1-inch strips cut from samples.
        2) Peel (Adhesion) Tests:
            a) Laboratory Test: Five 1-inch strips cut from samples.
        3) Double-fusion Hot Wedge Seams. Test both seams in each sample for peel. Testing shall include, but not necessarily be limited to, thickness (ASTM D 5199)

E. Failure of Seam Tests.
1. If either field destructive test seams or laboratory test seams do not pass, reconstruct the seam between two passing test seam locations. Intermediate tests may be performed on each side of the failed test sample location to further isolate the defective seam area.
2. If intermediate field test seams pass, laboratory test seams shall be performed on samples from the same locations.

3. If laboratory test seams also pass, then the seam shall be reconstructed between the intermediate sample locations.

4. If either of the test seams fail, then the process shall be repeated with intermediate samples further away from the original failing seam location to determine the defective seam area.

F. Acceptable Seams.

1. Each seam shall be bounded by two locations where samples passed the laboratory destructive tests.

2. Whenever a reconstructed seam exceeds 200 feet, an additional sample shall be obtained for destructive testing along the reconstructed seam.

3. At the Quality Assurance Consultant's discretion, the Installer may be directed to take additional samples from seams welded on the same day by a seaming apparatus that welded a failed seam, at no additional cost to the Owner.

3.11 CLEANING

A. The Contractor shall be responsible for cleaning the work area at the end of each work day of unnecessary scrap material, sand bags, tools and other materials used during geomembrane installation.

3.12 POST CONSTRUCTION

A. An inspection shall be performed by the Installation Contractor, Quality Assurance Consultant, and Owner prior to the Installers' capping crew moving off the site. All identified problem areas shall be repaired by the Installation Contractor and accepted by the Quality Assurance Consultant prior to the crew moving off site.

END OF SECTION

ADDENDUM NO. 3

SECTION 02245 – WATER CONTROL SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION

A. This Section includes, but is not limited to, the following:

1. Temporary water control measures including cofferdams and water bypass conveyances (Water Control System) for Normal Water Control Conditions and Flood Water Control Conditions including design and sequencing, construction, installation, maintenance, and removal of temporary protective facilities and appurtenances required to convey surface water beyond or around project work areas and to dewater/divert groundwater seepage into work areas. Temporary measures and appurtenances may include but are not limited to:
   a. surface and subsurface dams (including cofferdams);
   b. flow diversions;
   c. special linings for erosion protection;
   d. pipes;
   e. sumps;
   f. pumps;
   g. barriers;
   h. sedimentation pools;
   i. prefabricated sediment containment devices; and
   j. watertight seals.
2. Temporary drawdown of the dam impoundment (Gorhams Pond).
3. Safe conveyance of flow exchange of Gorhams Pond and Long Island Sound.
4. Protection of existing structures, constructed improvements, work in progress, and adjacent areas/properties during significant rainfall events (up to and including the 50-percent annual chance (2-year) inland flood event) under varying tidal conditions in Gorhams Pond and Long Island Sound.
5. Contractor is responsible for protection and stabilization of site features, including existing structures, constructed improvements, work in progress, and adjacent areas at the site above the Minimum Normal Water Control. Refer to the flood contingency plan contained within the "Gorhams Pond Dam Hydrologic & Hydraulic Report" associated with the Connecticut Department of Energy and Environmental Protection License Certificate of Permission 202302334-COP."

1.3 DEFINITIONS

A. Conveyance Structures: Temporary systems for conveying or by-passing water flows from cofferdammed areas to the downstream channel to Long Island Sound without overtopping the temporary upstream and downstream cofferdam systems.

B. Cofferdammed Area: Work area(s) within Gorhams Pond and Long Island Sound that are protected from tidal ebbs and flows following construction of temporary cofferdam(s).

C. Impoundment Area: Cofferdammed area of pond or lake water remaining after drawdown.

D. Work Vessel: Any barge, vessel, skiff, or floating work platform utilized in the execution of the work.

1.4 QUALITY ASSURANCE

A. Where "Standard Specification" is used, it shall mean Form 818 State of Connecticut, Department of Transportation, Standard Specifications for Roads, Bridges and Incidental Construction and all amendments.

1.5 PERFORMANCE REQUIREMENTS

A. General

1. The water control approach reflected on the Drawings is for permitting purposes only and represents a potential alternative/approach to controlling water throughout the duration of the project. The Contractor, however, is responsible for providing adequate water control capacity and developing an approach (including phasing) to adequately dewater the work areas and protect the improvements and adjacent properties throughout the duration of the project.

2. In-water work is prohibited from October 1st through May 30th, inclusive of any year in order to protect fisheries resources in the area.

3. The Contactor shall design, furnish, install, monitor, and maintain water conveyance measures capable of supporting and resisting hydrostatic pressures and flood flows and groundwater seepage.

   a. Provide professional engineering services needed to assume engineering responsibility, including preparation of Shop Drawings and a comprehensive engineering analysis by a qualified professional engineer.

4. Install, maintain, and remove water conveyance measures without damaging existing structures and other adjacent improvements.

   a. The Contractor is responsible for protection of the dam from failure during the construction period. Nothing in this Specification relieves the Contractor from this responsibility.

5. Include controls to protect living resources within the work area, adjacent areas, and in the downstream watercourse. Incorporate additional controls during drawdown and dewatering.

6. Prevent induction danger to persons and other living resources and damage or blockage by debris including trees, branches and other debris.

   a. Debris entrained by the cofferdam or conveyances shall be removed and disposed off-site promptly.

B. Minimum Normal Water Control System Top Elevation and Diversion Pumping:

1. Safely pass or impound flows without provision of Flood Water Control measures up to El. 7.5 feet (NAVD88). This elevation is approximately 4.1 feet above the mean high water and 2.3 feet above high tide level. Impounding water levels to elevations greater than that recommended could adversely impact flooding in low-lying areas/properties/structures upstream of the dam.

2. Diversion Pumping shall be capable of passing up to approximately 490 cfs (the approximate 2-year flood flow from an inland storm event).

C. Design system to prevent damage by debris including weeds, branches and other debris and withstand wave, hydrostatic, and hydrodynamic loads.

1. Evaluate need for higher water control system top elevation due to Project factors including construction duration and risk of damage to existing and proposed structures.

2. Water Runoff. Water levels experienced within Gorhams Pond and downstream watercourse at the project location will vary during significant storm events depending upon existing tidal conditions at time of event. Include, at a minimum, the following parameters into design of water conveyance measures. At a minimum, utilize values at time of respective project activities. Adjust parameters for duration of installed conveyance measures as work in respective project areas progresses and is capable of channeling flow through the work area.

   a. Historic tidal and storm surge conditions.

   b. Existing soil saturation in watershed.

D. Flood Water Control Measures: Safely pass flood flows.

1. Have materials and measures readily available for rapid implementation upon the threat or occurrence of flood water flow in excess of Normal Water Control conditions. Protect erodible portions of the site from erosion. Protect existing features and completed work from damage.

E. Location and Materials on Contract Drawings: The locations and materials for Water Control System cofferdams and water bypass provisions shown on the Contract Drawings are for reference only.

1. The Contractor shall determine its manner of constructing, maintaining, and removing its cofferdams and conveyances meeting performance requirements contained herein.

2. Layout cofferdam(s) to provide adequate clearances in all directions as required for execution of work to be performed within the watercourse, including room for pumps and suction/discharge lines, bypass pipes, channels and siphons, and construction operations.

3. All materials used in the cofferdam system must be clean and free of contaminants, debris and trash or other materials that may pollute the river.

   a. No material may be used in the cofferdam that may be harmful to plant growth or aquatic life.

   b. All materials shall be stable when subjected to expected ebbs and flows such that they will not migrate within the watercourse and not be removable in its entirety following construction.

   c. If a liner is used it shall be a continuous, flexible, liner membrane that provides a complete barrier to ebbs and flows when positioned. Liners shall extend adequately into the upstream and transverse watercourse sections and be anchored in place to provide a complete, firm seal during the work by hydrostatic pressure of the overlying water column.

F. Alternative water control methods will be considered, providing proposed methods conform to applicable local, state, and federal codes; will not require an extension of contract time; and will not result in an increase of construction costs.

   1. The Engineer and Owner are not obligated to accept alternative methods and may impose additional requirements as condition of acceptance.

G. Contractor may allow limited water flows in the areas of work, provided the magnitude of flows and character of channel bottom does not endanger site workers, equipment or materials and does not pollute or otherwise cause an increase in turbidity in the watercourse above pre-construction turbidity levels.

   1. Contractor shall only allow equipment into work areas within the watercourse that is in good condition and does not have oil, grease, fuel or other materials on its surface that may damage or pollute the watercourse or adjacent wetland areas.

      a. All equipment shall be equipment with spill control materials (e.g., booms, dry absorbent) that can be deployed immediately in the event of a release of such materials.

      b. All equipment shall be inspected each day prior to entering the watercourse for surface materials; if observed such materials shall be completely cleaned and removed from the equipment prior to entering work areas within the watercourse.

      c. The Owner may, at its sole discretion, direct the Contractor to remove equipment from in-water work areas that is leaking fluids or is otherwise polluting the water or substrate material. The Contractor shall address such conditions causing pollution to the satisfaction of the Owner prior to resuming work within the watercourse.

      d. Equipment staging or material storage is prohibited within the watercourse.

   2. The Contractor and Owner's or Engineer's representative will monitor turbidity in Gorhams Pond and the downstream watercourse to Long Island Sound (outside of

cofferdammed work areas) throughout the project duration to evaluate turbidity levels.

3. If the Owner's or Engineer's representative determines that Contractor's activities are resulting in an excessive increase of turbidity, the Contractor shall suspend work causing such conditions and adjust operations, equipment, materials, activities or locations as required to reduce turbidity levels to acceptable levels.

4. The Owner's or Engineer's representative shall be solely responsible for evaluating and determining what constitutes an excessive increase of turbidity levels in the watercourse. Such means may include use of real-time turbidity monitoring equipment to evaluate upstream and downstream levels.

1.6 RELATED WORK

A. Division 2 Section "Dewatering."

1.7 SUBMITTALS

A. Water Control Plan: Include the following.

1. Materials.

2. Methods for controlling water and product data.

3. Methods for impoundment drawdown.

4. Schedule of operations and phasing approach.

5. Emergency plan including list of equipment and materials available on-site in response to unexpected or uncontrolled flows.

6. Flood Contingency Plan. This Plan describes the measures to be taken during construction to protect life and property and minimize pollution to the maximum extent practicable during significant rain events.

7. List of emergency contact personnel and 24-hour contact number(s).

8. Submit field-required modifications to approved Water Control Plan to Engineer, prior to actual construction of modification.

B. Submittals For Information

1. Shop Drawings: Signed and sealed by a qualified professional engineer responsible for their preparation, who is registered in the State of Connecticut. Include plans, sections, and details of water control systems and accessory items, locations of discharge lines; and means of discharge and disposal of water.

2. Hydraulic Computations: In support of required facilities and appurtenances, signed and sealed by the qualified professional engineer responsible for their preparation.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide products and materials that are either new or in serviceable condition and utilize manufactured or otherwise prepared items for their intended use.

B. Other water control system materials, structures or equipment including but not limited to sheeting, large sand bags, inflatable water-filled rubber dams or inflatable dams, concrete blocks, structured framing and liner assemblies, pumps, siphons, chutes, conduits, pipes or other conveyances with the approval of the Engineer. All such provisions, if used, shall remain within the limits of disturbance indicated on the Contract Drawings.

PART 3 - EXECUTION

3.1 GENERAL

A. Investigate and verify existing surface water and subsurface ground water conditions at each site.

B. Submit Water Control Plan and associated information to the Engineer for review and approval prior to commencing water control operations.

C. Prior to commencing impoundment drawdown, provide 14 calendar day written notice to the Owner and Engineer.

D. The Contractor shall take actions necessary to assure the safety and protection of the construction area and adjacent areas during any periods of significant rainfall or tidal conditions. This shall include bringing manpower, equipment and materials to the site necessary to resist damage or failure as a result of a significant rainfall. The Contractor may need to man the job site 24 hours a day during such events to assure timely response to problems which may develop.

E. Construct Water Control System in phases as required to bypass flow around active work area(s), to maintain an exchange of flow within Gorhams Pond, and to protect adjacent properties and structures.

F. The Contractor shall furnish, install and successfully operate water conveyance measures to maintain suitable conditions for construction of all site improvements.

G. The Contractor shall be solely responsible for controlling water in the project area. Alternative methods are acceptable only with prior review and acceptance by the Engineer.

H. Do not begin work within cofferdammed areas until Water Control System materials and equipment are in place and operating as intended such that water levels in active work areas have been lowered to achieve water depths that do not cause excessive sedimentation or otherwise endanger site workers, equipment, constructed features, or adjacent properties, structures and features.

I. Water levels experienced within Gorhams Pond and the downstream watercourse at the project location will vary during significant rainfall events depending upon existing tidal conditions at time of event and numerous factors including, but not limited to, the following:

1. Historic tidal and storm surge conditions and other coastal weather phenomena.
2. Existing soil saturation in watershed.
3. Response time of watershed due to impervious cover, and availability of storage within watershed.

J. For any work vessels (e.g., lift barge) utilized in the execution of the work, the Contractor shall ensure that such work vessels:

1. Do not rest on, or come in contact with, the substrate at any time, unless specifically authorized in the permits or licenses.
2. Are not stored over intertidal flats, submerged aquatic vegetation or tidal wetland vegetation, or in a location that interferes with navigation. In the event any work vessel is grounded, no dragging or prop dredging shall occur to free the vessel.

3.2 PREPARATION

A. Investigate and verify existing conditions at the site.

B. Evaluate type of conveyance measures, appurtenances, materials, products and sequencing operations required. Develop and submit Water Control Plan for Engineer's review and acceptance.

3.1 DRAWDOWN

A. The water level in the upstream impoundment (Gorhams Pond) will be lowered no lower than three (3) feet below the existing dam spillway crest elevation.

B. Install pumps as required to increase rate of drawdown of Gorhams Pond. Ensure that the rate of discharge does not exceed the capacity of the downstream watercourse channel and flood channel banks; or cause erosion, sedimentation, or piping of soil.

3.2 WATER CONTROL

A. Construct water conveyance measures as acceptable by the Engineer and applicable permits, to allow construction of permanent structures.

1. Install water conveyance structures as required during respective phases of work.
    a. Design devices for intended use and anticipated soil and water pressures. Provide watertight seals with devices where required, to prevent damage, water seepage, piping erosion, or collapse.
2. Perform pumping and related work.

3. Provide conduits, pipes, siphons, pumps or other conveyances or barriers as required to convey high flows downstream of proposed features without damaging the work or existing structures or endangering the public.

4. Provide dewatering siphons, pumps, well points, or other measures for excavations or structures located below drawdown elevation or where subsurface water must be removed as described in Division 2 Section "Dewatering".

5. Provide erosion and sedimentation controls to mitigate sediment discharge to the downstream watercourse channel.

B. ~~Contractor shall protect and maintain flow through the tide gate structure and fish ladder at all times during construction.~~ Tide gate structure and fish ladder shall remain open without flow obstructions at all times during construction.

C. Refill of Gorhams Pond shall commence as soon as is practicable as the Work has been completed, to reduce aquatic impacts due to drawdown. Refill of the pond shall not commence prior to Owner inspection and approval of constructed site features including, but not limited to, proposed structures and proposed stone revetments.

3.3 PROTECTION – FLOOD WATER CONTROL

A. Since water level is dependent on inland flow contributions from the contributing watershed in addition to tidal and storm surge conditions, water levels in the pond and adjacent tidal areas will vary. The potential for major flood and storm surge events is always a possibility. Ensure safety of the site and adjacent areas.

1. Monitor dewatering systems continuously and provide additional measures as needed to control resulting increases in water surface elevations and water flows without damage or risk of failure to the Water Control System.

B. During predicted periods of significant coastal storm surge or flooding events, provide 24-hour, on-site coverage to assure timely response. Maintain personnel and equipment on-site to mitigate potential damage during flood and coastal storm surge events if overtopping of the water control system is anticipated to occur.

C. Have materials and measures readily available for rapid implementation upon the threat or occurrence of flood water flow in excess of Normal Water Control conditions or if overtopping of the water control system is anticipated. Protect erodible portions of the site from erosion. Protect existing features and completed work from damage.

3.4 MAINTENANCE

A. Monitor water control system daily. Promptly correct seepage, breakage, or other evidence of movement to ensure that water conveyance system components remains stable and functioning as intended.

3.5 REMOVAL AND REPAIRS

A. Correct movements or failures of temporary protection facilities and appurtenances, which prevents proper completion of permanent work; or which can potentially damage existing structures and downstream areas.

B. Remove water control systems accordingly when each phase of construction is substantially complete and permanent construction has progressed sufficiently to accommodate normal and flood flows. Remove in stages to avoid damage to existing and proposed structures.

1. Repair or replace adjacent work damaged or displaced by construction operations at no additional cost.

2. Remove water control systems and refill the pond as soon as practicable as the Work has been completed, to reduce aquatic impacts.

3.6 ALTERNATIVE METHODS

A. The Contractor may propose alternative methods for conveyance of water for consideration by the Engineer. The proposed alternative method(s):

1. Shall be deployed and operated prior to any excavation.

2. Shall conform to all applicable local, State and Federal codes and regulations and permits.

3. Shall not require an extension of the Contract time.

4. Shall not result in an increase in Contract costs.

5. Shall prevent groundwater from entering excavations.

6. Shall maintain flow exchange within Gorhams Pond.

7. Shall safely convey flood flows around work areas.

8. Shall not damage or otherwise cause damage to project construction or other adjacent structures, including trees and other natural resources.

B. The Engineer and Owner are not obligated to accept alternative methods and may impose additional requirements as a condition of acceptance of any alternative method proposed by the Contractor.

C. Add reference to Commissioner approval here.

3.7 EMERGENCY NOTIFICATION

A. In the event that significant flood flows endanger the site, adjacent structures or properties, the Contractor shall immediately notify the Engineer, the Owner, and the Town of Darien Police Department.

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SECTION 02300 - EARTHWORK

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. Furnish all labor, materials, equipment, and incidentals necessary to perform all earthwork, to include but not limited to excavation, fill placement, grading, and compaction required to complete the work in accordance with the Contract Drawings and Specifications. Section also includes dewatering, loading and transportation, and disposal of unsuitable soil or surplus suitable soils, if required.

B. Related Sections:

1. Division 1 Section "Temporary Erosion and Sedimentation Control"
2. Division 2 Section "Site Clearing & Demolition"
3. Division 2 Section "Dewatering"
4. Division 2 Section "Water Control System"
5. Division 2 Section "Stone Armoring"
6. Division 3 Section "Excavation Support and Protection"

1.3 DEFINITIONS

A. Backfill: Suitable soil materials used to fill trench, structure, or pit excavations.

B. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.

C. Contaminated/Impacted Soil/Material: the term, as used herein, is intended as a generic term for polluted sediment and impacted sediment and potentially hazardous material.

D. Excavation: Removal of material encountered above subgrade elevations.

E. Fill: Soil materials used to raise existing grades.

F. 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.

G. Subgrade: Surface or elevation remaining/exposed after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or loam materials.

H. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.

I. Utilities: On-site overhead wires, underground pipes, conduits, ducts, and cables, as well as underground services to buildings.

1.4 SUBMITTALS

A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirement indicated.

1. For each on-site and borrow soil material proposed for fill and backfill as follows:

a. Classification according to ASTM D 2487 or AASHTO M 145.

b. Gradation analysis according to ASTM D 6913, prior to delivery to the site and one per 1,000 CY delivered.

c. Laboratory compaction test results according to ASTM D 1557 or AASHTO T 180.

d. Field Compaction Test results according to ASTM D 6938, one per 1,000 square feet of lift, or one per lift if lift is less than 1,000 square feet.

B. Imported Material Environmental Testing Data

Chemical analytical data for imported material including topsoil, suitable soil, gravel, and crushed stone shall be submitted for approval by the Engineer as described below.

1. Obtain one composite sample for every 500 cu. yds. of soil/material with at least three samples for each soil/material type from each borrow source location. Analyze each for pesticides (EPA Method 8081), Chlorinated Herbicides (EPA Method 8151), Polyaromatic Hydrocarbons (EPA Method 8270), Total Petroleum Hydrocarbons (CTETPH method), Total RCRA 8 Metals (EPA Method 6010 / 7421 / 7470), Volatile Organic Compounds (EPA

Method 8260), and Polychlorinated Biphenyls (EPA Method 8082). Based on the results of this testing, additional Synthetic Precipitation Leaching Procedure (SPLP) or Toxicity Characteristic Leaching Procedure (TCLP) testing may be required at the discretion of the Engineer. The Owner reserves the right to reject material based on the results of this testing.

a. Satisfactory soil/material shall not exceed laboratory detection limits for concentrations of Pesticides, Chlorinated Herbicides, Polyaromatic Hydrocarbons, Total Petroleum Hydrocarbons, Volatile Organic Compounds, and Polychlorinated Biphenyls.

b. Satisfactory soil/material shall not exceed naturally occurring background levels for concentrations of RCRA-8 Metals in native soils on site.

c. In no case shall soil/material exceed any GA pollutant mobility criteria (GA PMC) or residential direct exposure criteria (RES DEC) established in Sections 22a-133k-1 through 22a-133k-3 of the regulations of Connecticut state agencies.

2. Soil/Material Origin: Provide a description for each originating off-site location or project from which imported soil/material is obtained, including known historical activities occurring on the site, and any possible releases that have occurred.

3. The following are not acceptable:

a. Soils/materials originating from sites subject to any Federal or State remediation program.

b. Soils/materials that have undergone any treatment process for one or more chemical constituents listed within the CT RSRs.

C. Product Data: For each type of the following manufactured products required:

1. Geotextiles (including non-woven and woven geotextiles)

~~D. Product Data:~~

~~1. Crushed Stone~~

~~E.~~D. Field Surveys: By a surveyor licensed in the state of Connecticut field-locating excavation areas, existing elevations, and required excavation depths and elevations demonstrating compliance with layouts and elevations required on drawings. At the end of excavation and grading activities, a record drawing ~~proposed conditions~~ survey of the site shall be performed by a surveyor licensed in the state of Connecticut.

~~F.~~E. Material shipment records required by applicable Federal, State and local regulations and for review by the Engineer. Scale tickets from disposal facility for confirmation of quantity of material disposed off-site, and for review by the Engineer.

~~G.~~F. Qualification Data:

1. For qualified testing agency and licensed surveyor.
2. Submit copies of current licenses, permits or approvals, as applicable.
3. Proposed waste haulers.
4. Proposed Transportation Storage & Disposal Facilities.

~~H.~~G. Certification Letters

1. Training: Certify that personnel engaged in site activities have appropriate training per OSHA 29 CFR 1926.65 and OSHA 29 CFR 1910.120.

1.5 QUALITY ASSURANCE

A. Where "Standard Specification" is used, it shall mean Form 818 State of Connecticut, Department of Transportation, Standard Specifications for Roads, Bridges and Incidental Construction and all amendments.

B. Materials shall be tested using the following standards:

1. ASTM D 1557: Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.
2. ASTM D 6913: Grain Size Analysis
3. ASTM D 6938: Nuclear Density Testing

C. Soil Testing and Inspection Service

1. Soil tests as required to determine compliance with this Specification shall be provided by the Contractor.
2. In areas where compaction is not found to comply with Contract Documents, fill material shall be recompacted or removed and replaced with material specified densities and moisture contents. Corrected areas shall be retested at no additional cost to the Owner.
3. The Contractor shall maintain sufficient reference points to provide vertical and horizontal locations of soil tests.

1.6 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt existing utilities unless permitted in writing by the Owner and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Owner and Engineer not less than two days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without Owner's written permission.

3. Utility Locator Service: Notify CT "Call Before You Dig" for area where Project is located before beginning excavation or controlled demolition operations. Coordinate with Utility Companies to raise and/or support overhead utilities adjacent to the project site as necessary to allow safe access and construction activities at the site.

B. Traffic: Minimize interference with adjoining structures, roads, streets, walks, and other adjacent facilities during earth moving operations.

1. Do not close or obstruct driveways, streets, walks, or other adjacent facilities without permission from the Owner and authorities having jurisdiction.

2. Provide alternate routes around closed or obstructed traffic ways if required by the Owner or authorities having jurisdiction.

C. Do not commence earthwork operations until temporary erosion and sedimentation control measures and water control measures are in place.

D. Do not commence earthwork operations until tree protection and tidal wetland protection measures are in place.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: While not called for in the plans, if additional borrow material is needed as specified in Earthwork 02300 Part 2.1.A., the material shall meet the requirements of Form 818 Standard Specifications Section 2.07.02 and also shall be free from cobbles greater than 4 inches in diameter, ice and snow, roots, sod, rubbish, and other deleterious or organic matter. ~~Provide borrow soil materials meeting the requirements of Form 818 Standard Specifications Section 2.07 when sufficient satisfactory soil materials are not available from excavations.~~

B. Crushed Stone: shall consist of material conforming to Form 818 Standard Specifications Section M.02.01 and meeting the requirements of grading "A," M.02.06.

C. Non-Woven Geotextile: Nonwoven geotextile, specifically manufactured as a drainage geotextile; made from polyolefins, polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:

1. Grab Tensile Strength: 120 lbf; ASTM D 4632
2. Tear Strength: 50 lbf; ASTM D 4533
3. Puncture Resistance: 310 lbf; ASTM D 4833
4. Water Flow Rate: 135 gpm per sq.ft.: ASTM D 4491
5. Apparent Opening Size: No. 70; ASTM D 4751
6. Available Product and Manufacturer:
    a. Mirafi 140N by Tencate
    b. Or an approved equal

D. Impervious Fill: to be used for backfill around structures where called out on the Contract Drawings shall be free from ice, snow, roots, sod, rubbish, and other deleterious or organic matter, and shall be graded within the following limits:

U.S. Standard Sieve Size	Percent Passing by Weight
3-inch	100
No. 10	30 – 90
No. 40	10 – 70
No. 200	10 – 40

E. Satisfactory Excavated Soil: Any excavated soil that meets the specifications for a specified soil type defined in this Part. Test requirements for reuse of excavated soil shall be the same as for specified imported soil.

F. Suitable Soil: For use as backfill below the proposed stone revetment as indicated on the Contract Drawings, and shall consist of soil that is greater than 50 percent sand and gravel by weight and free from cobbles greater than 4 inches in diameter, ice and snow, roots, sod, rubbish, and other deleterious or organic matter.

G. Unsuitable Soil: Any soil that contains cobbles greater than 4 inches in diameter, ice and snow, roots, sod, rubbish, and other deleterious or organic matter. Any soil that does not meet the specifications for any soils proposed to be used for backfill.

H. All fill material shall be free from ice and snow, roots, sod, rubbish, and other deleterious or organic matter.

I. Imported Material: All rock, boulders, and cobble moved on site deemed suitable for reuse by the Engineer shall be reused on site prior to import of new material.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.

C. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways. Protect and maintain erosion and sedimentation controls during earth moving operations.

D. Protect and maintain water control measures during earth moving operations.

3.2 DEWATERING

A. Comply with Division 2 Section "Dewatering" and Division 2 Section "Water Control System".

3.3 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus one 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.

B. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Do not allow heavy machinery or equipment on the bottom of the excavation area

indicated for Controlled Low-Strength Material (CLSM) mud mat installation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

3.4 UNAUTHORIZED EXCAVATION

A. If unauthorized excavation is performed beyond the limits shown on the Contract Drawings or the limits directed by the Engineer, without pre-approval by the Engineer it shall be backfilled at the Contractor's expense with material satisfactory to the Engineer and compacted in accordance with provisions in this section.

3.5 SUBGRADE PREPARATION

A. Prior to fill placement, the subgrade should be compact, dry, and free from debris, ice, and snow. Fill placement will not be allowed over frozen subgrade.

B. After completion of excavation to subgrade and prior to backfill placement and construction of the proposed features, the subgrade shall be proof compacted with a heavy static roller or other suitable equipment to detect soft or loose zones. Notify the Engineer prior to proof compacting.

1. Do not proof roll wet or saturated subgrades.
2. Excavate soft or loose zones, unsatisfactory soils, and areas of excessing pumping or rutting to a depth indicated by the Engineer and replace with compacted backfill.
3. Compact subgrade soil within a moisture range based on the results of the proctor tests that will allow for compaction to not less than 95% of maximum dry unit weight according to ASTM D 1557.
4. For compacting subgrade, use equipment specifically designed for compaction purposes, and which provides satisfactory results as approved by the Engineer.

C. Subgrade preparation should be followed immediately by fill placement, or the intended construction. Deterioration of the subgrade between excavation and initial fill placement shall be the responsibility of the Contractor and shall be repaired at the Contractor's expense.

D. All subgrades must be inspected by the Engineer prior to fill placement. Sufficient time must be given to the Engineer to inspect and perform any necessary tests on the subgrade.

E. If in the opinion of the Engineer, the subgrade becomes disturbed, the material shall be recompacted if conditions permit, or excavated and replaced with compacted suitable material as ordered by the Engineer.

3.6 STOCKPILES

A. Stockpile borrow materials and satisfactory excavated soil materials in the designated stockpile area indicated on the Plans or as otherwise approved by the Engineer. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Prevent windblown dust. Provide erosion control measures. Stockpile soil materials away from edge of excavations.

B. Provide a drainage system to dewater stockpiled sediment. Sediment control devices indicated are the minimum required. Provide additional sediment and erosion control devices as necessary.

C. Inspect stockpile daily. Maintain stockpile and dewatering controls as needed.

D. Unsuitable materials shall not be stockpiled at the construction site. Unsuitable material shall be removed from the site and disposed of properly off the Owner's property.

3.7 FILL PLACEMENT

A. Delivery and compaction of fill material shall be made during the presence of the Owner's representative and shall be subject to his approval. This inspection by no means absolves the Contractor from responsibility to properly compact the fill as specified.

B. Fill shall be placed in a continuous manner. Deterioration of fill surfaces due to freezing and thawing, precipitation, excessive drying, etc. shall be repaired by and at the expense of the Contractor to the satisfaction of the Engineer prior to placement of additional fill materials.

C. Maximum loose lift thickness of fill during placement is not to exceed 12 inches, unless otherwise noted.

D. Maximum loose lift thickness against existing or new structures shall be a maximum loose lift thickness of 8 inches. Fill against new or existing structures shall be compacted with hand compaction equipment (ie, plate compactor).

E. All fill shall be placed "in the dry" to the maximum extent practicable. The fill areas shall be graded to drain and provide a smooth surface which will readily shed water.

F. Fill placement shall not be allowed on top of frozen ground or during weather conditions which do not allow for proper moisture and density controls.

G. Temporary dewatering structures (sumps, berms, ditches, etc) are to be removed in their entirety and backfilled under dry conditions. Temporary sumps are to be backfilled promptly after removing the pumps or any associated drainage material to reduce the potential for disturbance from the phreatic surface (returning seepage or groundwater).

3.8 FILL COMPACTION CRITERIA

A. Fill that is too wet for proper compaction shall be disced, harrowed, or otherwise dried to a proper moisture content for compaction to the required density.

B. Fill that is too dry for proper compaction shall receive water uniformly applied over the surface of the loose layer. Sufficient water shall be added to allow for compaction to the required density.

C. The Engineer's presence does not include supervision or direction of the actual work by the Contractor, his employees, or agents. Neither the presence of the Engineer nor any observations and testing performed by him shall excuse the Contractor from defects discovered in his work.

D. The degree of compaction shall be based on a maximum dry density as determined by ASTM Specification D 1557. The degree of compaction required, unless otherwise noted on the Plans or directed and approved by the Engineer, shall be as follows:

1. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 95 percent.

2. Under structures, slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.

3. Under unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 90 percent.

E. Compaction of all fill against new and existing structures shall be performed using hand-operated compaction equipment to minimize the potential for damage to structures.

F. Tests will be performed at the following frequencies:

1. At each compacted fill layer, at least one test for every 1,000 square feet.
2. At least one test per compacted fill layer per day.

G. When testing agency reports indicate fill or backfill has not achieved the degree of compaction specified, re-compact and retest until specified compaction is obtained.

3.9 GRADING

A. General: Comply with compaction requirements and grade to 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 structures and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1 inch.
3. Pavements: Plus or minus 1/2 inch.

3.10 GEOTEXTILE FABRIC INSTALLATION

A. Install fabric on the prepared subgrade at the indicated locations and dimensions, as recommended by the manufacturer, and as directed by the Engineer.
1. Overlap adjacent rolls a minimum of 12 inches or as specified by the manufacturer with approval of the Engineer.
2. Place overlap in the direction of filling, such that the aggregate being spread does not push adjacent sheets of fabric apart.

3.11 WORK IN FREEZING WEATHER

A. Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees Fahrenheit.

B. Do not place foundations or fill material on frozen ground. Removal of these unsatisfactory materials will be required as directed by the Engineer.

C. When freezing temperatures may be expected, do not excavate to full depth indicated, unless foundations or fill material can be placed immediately after excavation has been completed and inspected.

D. The Contractor shall keep the operations under this Contract clear and free of accumulation of snow within the limits of Contract Lines as required to carry out the work.

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 settlement occurs before Project correction period elapses, remove finished surfacing, backfill with additional suitable material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.13 FIELD QUALITY CONTROL

A. Testing Agency: Contractor will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

C. Footing Subgrade: Verification and approval of footing subgrades will be based on a visual comparison of subgrade with tested subgrade when approved by the Owner.

D. Testing agency will test compaction of soils in place according to ASTM D 1556 (AASHTO T 191), ASTM D 2167 (AASHTO T 205), ASTM D 2922 (AASHTO T 310), and ASTM D 2937 (AASTO T 204-90), as applicable.

E. When testing agency reports that subgrades, fills, or backfills have not achieved the degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

F. The Contractor will be required to collect samples as needed for disposal facility waste characterization purposes as described below:

1. Soil/Sediment Disposal Characterization Activities

a. The Contractor will collect a representative sample(s) of the soil/sediment stockpiles prior to removal from the site. The Contractor will submit this sample(s) to a Connecticut Department of Energy & Environmental Protection certified laboratory for analysis of a suite of analytical parameters based on the requirements of the anticipated disposal facility. Upon receipt, the analytical results will be provided to the Owner and the anticipated disposal facility to evaluate and coordinate acceptance and appropriate transportation paperwork.

b. Obtain one composite sample for every 200 cu. yds. of soil/sediment. Analyze each for pesticides (EPA Method 8081), Chlorinated Herbicides (EPA Method 8151), Semivolatile Organic Compounds(EPA Method 8270), Total Petroleum Hydrocarbons (CTETPH method), Total RCRA 8 Metals (EPA Method 6010 / 7421 / 7470), TCLP RCRA 8 Metals, Volatile Organic Compounds (EPA Method 8260), and Polychlorinated Biphenyls (EPA Method 8082), Reactivity, Corrosivity, Flashpoint, pH, and Paint Filter Test.

c. If soil/sediment has detected concentrations of pesticides, herbicides, SVOCs, ETPH, VOCs or PCBs it shall be disposed of at an off-site permitted facility. If soil/sediment has detected concentrations of RCRA 8 metals exceeding Connecticut Remediation Standard Regulations Residential Direct Exposure Criteria or GA Pollutant Mobility Criteria it shall be disposed of at an off-site permitted facility.

d. Any reuse of polluted soil/sediment as defined in the Connecticut Remediation Standard Regulations must follow the procedures described in RCSA Section 22a-133k-2(h)(3) at the Contractor's expense. Any request by the Contractor to reuse polluted soil/sediment in lieu of disposal at an off-site permitted facility must be approved by the Engineer.

3.14 CHARACTERIZATION, LOADING, TRANSPORTING, AND DISPOSING EXCAVATED MATERIAL

A. The Contractor shall collect characterization soil samples in accordance with disposal facility's requirements for laboratory analysis for the purposes of creating a waste characterization profile.

B. Unsuitable excavated materials will be disposed of at the most cost-effective, appropriately-licensed disposal facility that can accept the material based on compliance of the analytical results with their specific acceptance requirements. Once accepted for off-site disposal and sufficiently drained, the material will be transferred to an approved watertight container or truck using the excavator. The material will be transported to Town scales prior to being transported to an off-site disposal site. Trucks traveling to or returning from the Town scales or off-site disposal site must adhere to all applicable rules and regulations. The material will then be transported to the disposal facility under appropriate shipping record, manifest, or bill of lading and in accordance with applicable local, state, and federal regulations.

C. Contractor shall prepare a waste characterization profile and submit to the Owner for review. Submit waste manifests required for transport of wastes. At the end of construction, submit material shipment records and scale tickets to Owner for confirmation of quantities.

D. The Contractor vehicles shall utilize maximum legal load limits for transport from the site to the disposal facility. No trucks that contain free-draining liquids will be allowed to leave the site. Should loads be rejected by the receiving facility due to water content, additional disposal costs will be the responsibility of the Contractor.

E. Remove surplus waste material (including trash and non-impacted debris) and legally dispose of it off the owner's property.

F. Bulk Impacted Material

1. Load and transport bulk impacted material other than soil, to a permitted disposal facility.
2. Secure load to prevent shifting or release during transport. Keep load a minimum of 4 inches below top of container.

3.15 DISPOSAL RECORDS

A. Disposal Records: For all waste generated by the project, submit records indicating receipt and acceptance by a facility licensed to accept the type of waste in question.

1. Records must clearly indicate name of accepting facility, quantity of material accepted (e.g., tons of impacted soil) and dates of acceptance.
2. Records must indicate that the disposal facility was provided with satisfactory waste characterization data.
3. Submit Bills of Lading for all non-Hazardous (e.g. Connecticut-Regulated Wastes) and manifests for hazardous materials generated by the project.
4. All records must be submitted to the Owner no later than 14 days following substantial project completion.

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SECTION 03150 - EXCAVATION SUPPORT AND PROTECTION

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 temporary excavation support and protection systems.

B. Related Sections:

1. Division 1 Section "Temporary Facilities and Controls"
2. Division 1 Section "Temporary Erosion and Sedimentation Controls"
3. Division 2 Section "Water Control System"
4. Division 2 Section "Dewatering"

1.3 PERFORMANCE REQUIREMENTS

A. Design, furnish, install, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting soil and hydrostatic pressure and superimposed and construction loads.

1. Delegated Design: Design excavation support and protection system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
2. Prevent surface water from entering excavations by grading, dikes, or other means.
3. Install excavation support and protection systems without damaging existing buildings, structures, and site improvements adjacent to excavation.
4. Monitor vibrations, settlements, and movements.

1.4 SUBMITTALS

A. Shop Drawings: For excavation support and protection system.

B. Delegated-Design Submittal: For excavation support and protection system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Qualification Data: For qualified professional engineer.

D. Other Informational Submittals:

1. Photographs: Show existing conditions of adjacent construction and site improvements that might be misconstrued as damage caused by the absence of, the installation of, or the performance of excavation support and protection systems. Submit before Work begins.
2. Record Drawings: Identifying and locating capped utilities and other subsurface structural, electrical, or mechanical conditions.
    a. Note locations and capping depth of wells and well points.

1.5 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at Project site.
1. Review methods and procedures related to excavation support and protection system including, but not limited to, the following:
    a. Geotechnical report, if applicable.
    b. Existing utilities and subsurface conditions.
    c. Proposed excavations.
    d. Proposed equipment.
    e. Monitoring of excavation support and protection system.
    f. Working area location and stability.
    g. Coordination with ~~waterproofing~~ HDPE membrane installation.
    h. Removal of excavation support and protection system.

B. Where "Standard Specification" is used, it shall mean Form 818 State of Connecticut, Department of Transportation, Standard Specifications for Roads, Bridges and Incidental Construction and all amendments.

1.6 PROJECT CONDITIONS

A. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
1. Notify Engineer not less than two days in advance of proposed utility interruptions. Notify Utility Company in accordance with their requirements for advance notice.
2. Do not proceed with utility interruptions without Utility Company's written permission.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide materials that are either new or in serviceable condition.

B. Structural Steel: ASTM A 36/A 36M (AASHTO M 183M/M 183), ASTM A 690/A 690M, or ASTM A 992/A 992M.AASHTO M 169, or AASHTO M 270M/M 270

C. Steel Sheet Piling: In accordance with CT DOT Standard Specifications M.09.01.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.

1. Shore, support, and protect utilities encountered.

B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

C. Locate excavation support and protection systems clear of permanent construction so that forming and finishing of concrete surfaces are not impeded.

D. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure that excavation support and protection systems remain stable.

E. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

3.2 SHEET PILING

A. Sheet piling shall be installed as per CT DOT Standard Specification 7.14 - Temporary Sheet Piling.

B. Cutoff disposal shall be as specified in CT DOT Standard Specification 7.15.

3.3 REMOVAL AND REPAIRS

A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.

1. Fill voids immediately with approved backfill compacted to density specified in Division 2 Section "Earthwork."

2. Repair or replace, as approved by Engineer, adjacent work damaged or displaced by removing excavation support and protection systems.

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ADDENDUM NO. 3

SECTION 03302 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 Summary

A. This Section specifies cast-in-place concrete, including reinforcement, concrete materials, mix design, placement procedures, and finishes.

1.3 Submittals

A. Product and Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:

1. For each type of manufactured material and product indicated.
2. Form materials and form-release agents
3. Waterstops
4. ~~Membrane waterproofing~~
5. Bonding agents
6. Adhesive anchors
7. Pre-formed Expansion Joint-filler
8. Cementitious materials and aggregates.
9. Steel reinforcement and reinforcement accessories.
10. Admixtures.
11. Curing materials.

B. Product Data: For each type of manufactured material and product indicated, including the hydrophilic and PVC waterstops.

C. Design Mixes: For each concrete mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

1. Submit copies of test reports by independent test labs conforming to ASTM C 1077 showing that the mixture has been successfully tested to produce concrete with the properties specified.
2. Do not add water to concrete during delivery, at Project site, or during placement, unless included in the mix design and approved by the Engineer. Procedure for adding and calculating amount of water to be added at the Project site shall be submitted with the mix design if water is to be added at the Project site.

D. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for openings through concrete structures.

1. Do not scale dimensions form structural drawings to determine lengths of reinforcing bars.

E. Minutes of preinstallation conference.

1.4 Quality Assurance

A. Comply with ACI 301, "Specification for Structural Concrete," including the following, unless modified by the requirements of the Contract Documents.

1. General requirements, including submittals, quality assurance, acceptance of structure, and protection of in-place concrete.
2. Formwork and form accessories.
3. Steel reinforcement and supports.
4. Concrete mixtures.
5. Handling, placing, and constructing concrete.

B. Installer Qualifications: An experienced installer who has completed concrete Work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

C. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

1. Manufacturer must be certified according to the National Ready Mixed Concrete Association's Certification of Ready Mixed Concrete Production Facilities.

D. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

E. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.

F. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel."

G. ACI Publications: Comply with the following, unless more stringent provisions are indicated:

1. ACI 301, "Specification for Structural Concrete."
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
3. ACI 305R, "Hot Weather Concreting"
4. ACI 306.1, "Standard Specifications for Cold Weather Concreting"

H. Pre-installation Conference: Conduct conference at Project site.

1. Before submitting design mixes, review concrete mix design and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
   a. Contractor's superintendent.
   b. Independent testing agency responsible for concrete design mixes.
   c. Ready-mix concrete producer
   d. Concrete subcontractor

1.5 Delivery, Storage, And Handling

A. Deliver, store, and handle steel reinforcement to prevent bending and damage.

PART 2 - PRODUCTS

2.1 Formwork

A. Furnish formwork and form accessories according to ACI 301.

B. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. To be used during casting of wing wall stems, barriers, and headwalls.

2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:

   a. High-density overlay, Class 1, or better.

C. 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.

1. To be used during casting of all other concrete components contained in the work not covered by Section 2.1-A of this specification.

D. Chamfer Strips: Wood, metal, PVC, or rubber strips, 1 inch by 1 inch (19 by 19 mm), minimum.

E. 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.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
2. Comply with local regulations controlling use of volatile organic compounds (VOCs).
3. Available Products: GCC-100 FRW water based or approved equivalent.

F. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish ties that, when removed, will leave holes not larger than 1 inch (25 mm) in diameter in concrete surface.
2. Patch holes left by the removal of form ties in an appropriate manner.

2.2 Steel Reinforcement

A. Epoxy-Coated Reinforcing Bars: Conform to Section M8.01.7 of the MassDOT Standard Specifications, ASTM A 775 / A 775M, and as follows:

1. Steel Reinforcement: ASTM A 615/A 615M, Grade 60, deformed.

B. Epoxy-Coated Wire: ASTM A 884/A 884M, Class A coated, plain-steel wire

C. Epoxy-Coated Welded Wire Fabric: ASTM A 884/A 884M, Class A, plain steel

2.3 Concrete Materials

A. Portland Cement: ASTM C 150, Types I or II or Type I/II.

B. Normal-Weight Aggregate: ASTM C 33, uniformly graded, not exceeding 1-1/2-inch nominal size.

C. Water: Potable and complying with ASTM C 94.

2.4 Admixtures

A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cement and to be compatible with other admixtures. Do not use admixtures containing calcium chloride.

B. Air-Entraining Admixture: ASTM C 260.

C. Water-Reducing Admixture: ASTM C 494, Type A.

D. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

2.5 Waterstops

A. Hydrophilic Waterstops: Manufactured rectangular or trapezoidal strip, hydrophilic material for adhesive bonding to concrete.

B. PVC Waterstops: Flexible polyvinyl chloride (PVC) waterstops shall conform to the following typical physical properties:

Property	**Test Method**	**Required Results**
Specific Gravity	ASTM D 792	1.38 to 1.40
Shore A Hardness (15 sec.)	ASTM D 2240	77±3 at 25°C (77°F)
Tensile Strength	ASTM D638	2,100 psi
Ultimate Elongation	ASTM D638	400%
Stiffness in Flexure	ASTM D747	700 psi
Tear Resistance	ASTM D624	320 lbs./inch
Brittle Point	ASTM D746	-37°C (-35°F) No Failure
Accelerated Extraction Tensile Strength	Corps of Engineers	2,005 psi
Accelerated Extraction Elongation	Corps of Engineers	390%
Effect of Alkali Weight Change	CRD C572-74	+0.11%

Property	Test Method	Required Results
Effect of Alkali Hardness Change	CRD C572-74	-0.6 points

~~2.6 Membrane Waterproofing~~

~~A. Shall be 60 mil bituminous waterproofing membrane.~~

~~2.7~~2.6 Concrete Mix for Marine Concrete

A. Prepare design mixes for each type and strength of concrete determined by either laboratory trial mix or field test data bases, as follows:

1. Proportion normal-weight concrete according to ACI 211.1 and ACI 301.

B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the laboratory trial mix basis.

C. Calcium nitrite corrosion inhibitors shall conform to AASHTO M 194M/M 194.

1. The calcium nitrite solution shall contain 30 ± 2% calcium nitrite by weight. The calcium nitrite material shall have neutral set characteristics.

2. The calcium nitrite shall be added at a rate of 3 gal per yd^3 of concrete in order to increase the active corrosion threshold to 9.9 lb of chloride per yd^3 of concrete at the reinforcing bar level.

D. Concrete for Project: Proportion normal-weight concrete mix as follows:

1. Compressive Strength (28 Days): 5000 psi (34.5 MPa).

2. Minimum Cementitious Materials Content: 710 lb/cu. yd.

3. Nominal Maximum Aggregate Size: 3/8 in.

4. Minimum Slump: 2 inches (50 mm).

5. Maximum Slump: 6 inches (100 mm).

E. Cementitious Materials: Limit percentage, by dry weight, of cementitious materials other than portland cement in concrete as follows:

1. Silica Fume: 6 percent ±1%

2. Fly Ash (in lieu of slag cement): 15 percent.

3. Slag Cement (in lieu of fly ash): 25 percent to 40 percent

F. Maximum Water-Cementitious Materials Ratio: As required by the MassDOT Standard Specifications.

G. Air Content: Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows within a tolerance of plus 1 or minus 1.5 percent, unless otherwise indicated:

1. Air Content: 6.0 for 3/8 inch nominal maximum aggregate size

H. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) 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.

~~2.8~~2.7 Concrete Mix for CIP Concrete

A. Prepare design mixes for each type and strength of concrete determined by either laboratory trial mix or field test data bases, as follows:

1. Proportion normal-weight concrete according to ACI 211.1 and ACI 301.

B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the laboratory trial mix basis.

C. Calcium nitrite corrosion inhibitors shall conform to AASHTO M 194M/M 194.

1. The calcium nitrite solution shall contain 30 ± 2% calcium nitrite by weight. The calcium nitrite material shall have neutral set characteristics.

2. The calcium nitrite shall be added at a rate of 3 gal per yd^3 of concrete in order to increase the active corrosion threshold to 9.9 lb of chloride per yd^3 of concrete at the reinforcing bar level.

D. Concrete for Project: Proportion normal-weight concrete mix as follows:

1. Compressive Strength (28 Days): 3000 psi (34.5 MPa).

2. Minimum Cementitious Materials Content: 470 lb/cu. yd.

3. Nominal Maximum Aggregate Size: 1 ½ in.

4. Minimum Slump: 2 inches (50 mm).

5. Maximum Slump: 6 inches (100 mm).

E. Cementitious Materials: Limit percentage, by dry weight, of cementitious materials other than portland cement in concrete as follows:

1. Silica Fume: 6 percent ±1%
2. Fly Ash (in lieu of slag cement): 15 percent.
3. Slag Cement (in lieu of fly ash): 25 percent to 40 percent

F. Maximum Water-Cementitious Materials Ratio: As required by the MassDOT Standard Specifications.

G. Air Content: Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows within a tolerance of plus 1 or minus 1.5 percent, unless otherwise indicated:

1. Air Content: 6.5 for 1-1/2 inch nominal maximum aggregate size, for unreinforced concrete

H. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) 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.

~~2.9~~2.8 Concrete Mixing

A. Ready-Mixed Concrete: Comply with ASTM C 94.

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.

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 concrete 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. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:

ADDENDUM NO. 3

1. Class A, 1/8 inch.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces.

1. Do not use rust-stained steel form-facing material.

F. Chamfer exterior corners and edges of permanently exposed concrete.

G. Clean forms and adjacent surfaces to receive concrete.

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.

B. PVC waterstops shall be stored and installed per manufacturer's recommendations as shown in the plans.

C. PVC waterstops shall be selected based on the location they are to be installed and in accordance with Manufacturer's recommendations. All concrete construction joints (such as between stage construction limits) between any two discrete CIP concrete pours shall include a double sided waterstop that is made for this purpose. This waterstop shall be embedded at least 3 inches into both faces of the concrete mass. Hydrophilic waterstop shall be installed into any existing concrete face prior to any proposed CIP concrete pours for the purposes of embedding at least 3 inches into that concrete. Hydrophilic waterstop are required whenever a proposed concrete surface abuts an existing concrete surface such as at the existing tide gate structure and dam interface, or other locations as indicated on the plans.

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.

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.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire fabric in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

ADDENDUM NO. 3

3.4 Joints

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Locate and install so as not to impair strength or appearance of concrete, at locations indicated or as approved by Engineer.

C. Isolation Joints: Install joint-filler strips at junctions with slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint fillers full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.

3.5 Concrete Placement

A. Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.

B. Do not add water to concrete during delivery, at Project site, or during placement.

C. Consolidate concrete with mechanical vibrating equipment.

D. Deposit concrete continuously or in 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 specified. Deposit concrete to avoid segregation.

E. Deposit concrete in forms in horizontal layers no deeper than 24 inches and in a manner to avoid inclined construction joints. Place each layer while preceding layer is still plastic, to avoid cold joints.

1. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.

F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Screed slab surfaces with a straightedge and strike off to correct elevations.

2. Slope surfaces uniformly to drains where required.

3. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, free of humps or hollows, before excess moisture or bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

G. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.

2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.

H. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.

3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.6 Finishing Formed Surfaces

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.

1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Completely remove fins and other projections.

1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.

2. Do not apply rubbed finish to smooth-formed finish.

3. Apply the following rubbed finish, defined in ACI 301, to smooth-formed finished concrete.

a. Smooth-rubbed finish.

C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.7 Finishing Unformed Surfaces

A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on the surface.

1. Do not further disturb surfaces before starting finishing operations.

C. Float Finish: Apply float finish to surfaces indicated, to surfaces to receive trowel finish.

D. Trowel Finish: Apply a hard trowel finish to non-formed surfaces exposed to view.

3.8 Tolerances

A. Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

3.9 Concrete Protection 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 follow recommendations in ACI 305R for hot-weather protection during curing.

B. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.

C. Curing Methods: Cure formed and unformed concrete for at least seven days by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these.

3.10 Field Quality Control

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement. Tests will be performed according to ACI 301.

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mix exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.

ADDENDUM NO. 3

3.11 Repairs

A. Remove and replace concrete that does not comply with requirements in this Section.

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ADDENDUM NO. 3

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ADDENDUM NO. 3

SECTION 04860 - STONE MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes the following applications of stone masonry:

1. Anchored to concrete backup.
2. Anchored to unit masonry backup.

B. Products installed and furnished in this Section include:

1. Drill & grout anchors for stone masonry

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

1. For stone varieties proposed for use on Project, include test data indicating compliance with physical properties
2. Epoxy product to be used for drilling & grouting anchors between masonry units and from masonry blocks to CIP concrete.

B. Samples for Initial Selection: For colored mortar and other items involving color selection.

C. Samples for Verification:

1. For each stone type indicated. Include at least two samples in each set for each type of stone, exhibiting extremes of the full range of color and other visual characteristics expected in completed Work
2. For each color of mortar required.

D. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, sources of supply, and other information as required to identify materials used. Include mix proportions for mortar and source of aggregates.

1. Submittal is for information only. Neither receipt of list nor approval of mockups constitutes approval of deviations from the Contract Documents unless such

deviations are specifically brought to the attention of Engineer and approved in writing.

E. Qualification Data: For qualified Installer.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs experienced stonemasons and stone fitters.

B. Source Limitations for Stone: Obtain each variety of stone, regardless of finish, from one quarry, whether specified in this Section or in another Section of the Specifications, with resources to provide materials of consistent quality in appearance and physical properties.

C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

D. Mockups: A ten foot long portion of the wall shall be constructed, and visually approved by the Engineer, prior to mortaring and continuing wall construction.

E. Preinstallation Conference: Conduct conference at Project Site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

B. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

C. Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.

D. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.6 PROJECT CONDITIONS

A. Protection of Stone Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed stone masonry when construction is not in progress.

B. Stain Prevention: Immediately remove mortar and soil to prevent them from staining the face of stone masonry.

1. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on the ground and over the wall surface.

2. Protect sills, ledges, and projections from mortar droppings.

3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.

4. Turn scaffold boards near the wall on edge at end of each day to prevent rain from splashing mortar and dirt on completed stone masonry.

C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace stone masonry damaged by frost or freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.

D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

1.7 COORDINATION

A. Advise installers of other work about specific requirements for placement of reinforcement, veneer anchors, flashing, and similar items to be built into stone masonry.

PART 2 - PRODUCTS

2.1 STONE

A. Varieties and Sources: Stone currently at the site and previously used for the in-service structure shall be reused, and supplemented with similar stone of the same type as required. When stone from off-site is provided, they shall be approved by the Engineer for likeness prior to installation.

B. Capstone: The capstone shall be granite and of uniform color along the length of the dam. A sample stone shall be presented to the Engineer for review and approval prior to procuring.

1. Size: The capstone shall have a minimum width of ~~3.0~~ 1.7 ft (measured along the length of the dam), a thickness (height) of 1.5 ft and length (perpendicular to the dam) of ~~1.7~~ 3.0 ft.

C. Wall Stones: Visible wall stones shall be uniform in color along the face of the dam to the greatest extent achievable.

1. Size: Wall stones shall not exceed 2.0 ft in thickness (height). The minimum width of wall face stones (perpendicular to the dam) shall be 1.25 ft. The minimum stone size of wall stones shall be 10 inches in thickness (height) and 10 inches in length (along the length of the dam).

2.2 MORTAR MATERIALS

A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

1. Low-Alkali Cement: Not more than 0.60 percent total alkali when tested according to ASTM C 114.

B. Hydrated Lime: ASTM C 207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or III, and hydrated lime complying with ASTM C 207.

D. Mortar Cement: ASTM C 1329.

E. Masonry Cement: ASTM C 91.

F. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in stone masonry mortar.

G. Aggregate: ASTM C 144 and as follows:

1. For pointing mortar, use aggregate graded with 100 percent passing No. 16 (1.18-mm) sieve.

2. White Aggregates: Natural white sand or ground white stone.

3. Colored Aggregates: Natural-colored sand or ground marble, granite, or other sound stone; of color necessary to produce required mortar color.

a. Match Engineer's sample.

H. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

I. Water: Potable.

J. Mortar shall be rated for and satisfactory for use in marine and saltwater environments.

2.3 ANCHORS

A. Materials:

1. Steel anchors shall meet the requirements specified on the plans.

2. For adhesive bonded dowels, the adhesive bonding material shall meet the assessment requirements of ACI 355.4 latest edition and of ICC-ES AC308 Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements including use under sustained tension loads, installation in holes drilled horizontally, and for use with reinforcing bars embedded the code-required tension development length of the bar. The characteristic bond strength of the adhesive bonding material shall meet or exceed the design characteristic bond stress value specified on the plans.

3. Dowels shall meet the requirements specified on the plans.

2.4 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar and grout stains, efflorescence, and other new construction stains from stone masonry surfaces without discoloring or damaging masonry surfaces; expressly approved for intended use by cleaner manufacturer and stone producer.

2.5 MORTAR MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.

1. Do not use calcium chloride.

2. Limit cementitious materials in mortar to portland cement, mortar for stone masonry, and lime.

3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

4. Mixing Pointing Mortar: Thoroughly mix cementitious and aggregate materials together before adding water. Then mix again, adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for one to two hours. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within 30 minutes of final mixing; do not retemper or use partially hardened material.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in the form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

C. Mortar for Stone Masonry: Comply with ASTM C 270 Specification, with a minimum 28-day compressive strength of 1800 psi and a water retention of 75% minimum.

1. Mortar for Setting Stone: Type S

2. Mortar for Pointing Stone: Type N

D. Latex-Modified Portland Cement Setting Mortar: Proportion and mix portland cement, aggregate, and latex additive to comply with latex-additive manufacturer's written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces indicated to receive stone masonry, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Examine concrete wall to ensure precast anchors required for stone placement are correctly installed and in the correct position. If bars are not precast into the concrete, it is permitted to drill & grout using the same product used for installation of bars into masonry stones.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean dirty or stained stone surfaces by removing soil, stains, and foreign materials before setting. Clean stone by thoroughly scrubbing with fiber brushes and then drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives.

3.3 SETTING OF STONE MASONRY, GENERAL

A. Perform necessary field cutting and trimming as stone is set.

1. Use power saws to cut stone that is fabricated with saw-cut surfaces. Cut lines straight and true, with edges eased slightly to prevent snipping.

2. Use hammer and chisel to split stone that is fabricated with split surfaces. Make edges straight and true, matching similar surfaces that were shop or quarry fabricated.

3. Pitch face at field-split edges as needed to match stones that are not field split.

B. Sort stone before it is placed in wall to remove stone that does not comply with requirements relating to aesthetic effects, physical properties, or fabrication, or that is otherwise unsuitable for intended use.

C. Arrange stones in uncoursed rubble pattern with joint widths within tolerances indicated. Insert small stones into spaces between larger stones as needed to produce joints as uniform in width as practical.

D. Set stone to comply with requirements indicated on Drawings. Install supports, fasteners, and other attachments indicated or necessary to secure stone masonry in place. Set stone accurately in locations indicated with edges and faces aligned according to established relationships and indicated tolerances.

3.4 CONSTRUCTION TOLERANCES

A. Variation from Level: Top of capstone shall not vary stone shall not vary more than ½" over 20 ft, nor more than ½" from the specified top elevation over its length.

3.5 INSTALLATION OF ANCHORED STONE MASONRY

A. Anchor stone masonry to concrete with cast-in or drilled-and-grouted steel anchors as shown on the plans.

B. Anchor stone masonry to other stone masonry units with cast-in or drilled-and-grouted steel anchors as shown on the plans.

3.6 POINTING

A. Prepare stone-joint surfaces for pointing with mortar by removing dust and mortar particles. Where setting mortar was removed to depths greater than surrounding areas, apply pointing mortar in layers not more than 3/8 inch (10 mm) deep until a uniform depth is formed.

B. Point stone joints by placing and compacting pointing mortar in layers not more than 3/8 inch (10 mm) deep. Compact each layer thoroughly and allow to become thumbprint hard before applying next layer.

C. Tool joints, when pointing mortar is thumbprint hard, with a smooth jointing tool to produce the following joint profile:

1. Joint Profile: Smooth, flat face slightly below edges of stone

3.7 ADJUSTING AND CLEANING

A. Remove and replace stone masonry of the following description:

1. Broken, chipped, stained, or otherwise damaged stone. Stone may be repaired if methods and results are approved by Engineer.
2. Defective joints.
3. Stone masonry not matching approved samples and mockups.
4. Stone masonry not complying with other requirements indicated.

B. Replace in a manner that results in stone masonry matching approved samples and mockups, complying with other requirements, and showing no evidence of replacement.

C. In-Progress Cleaning: Clean stone masonry as work progresses. Remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean stone masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on mockup; leave one-half of panel uncleaned for comparison purposes. Obtain Engineer's approval of sample cleaning before cleaning stone masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
4. Wet wall surfaces with water before applying cleaner; remove cleaner promptly by rinsing thoroughly with clear water.
5. Clean stone masonry by bucket and brush hand-cleaning method described in BIA Technical Note No. 20 Revised II, using job-mixed detergent solution.
6. Clean stone masonry with proprietary acidic cleaner applied according to manufacturer's written instructions.
7. Clean limestone masonry to comply with recommendations in ILI's "Indiana Limestone Handbook."

3.8 EXCESS MATERIALS AND WASTE

A. Excess Stone: Stack excess stone where directed by Owner for Owner's use.

B. Disposal as Fill Material: Dispose of clean masonry waste, including mortar and excess or soil-contaminated sand, by crushing and mixing with fill material as fill is placed.

1. Crush masonry waste to less than 4 inches (100 mm) in greatest dimension.
2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Division 2 Section "Earthwork."
3. Do not dispose of masonry waste as fill within project limits, unless approved by the Engineer.

C. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above, and other waste, and legally dispose of off Owner's property.

END OF SECTION

Gorhams Pond Dam
Hydrologic & Hydraulic Report

March 2023

FUSS & O'NEILL

146 Hartford Road
Manchester, CT 06040

Prepared by: _____ Date: 03/16/23
Sage Hardesty

Reviewed by: _____ Date: 03/16/23
Elsa Loehmann, PE

Approved by: _____ Date: 03/16/23
Elsa Loehmann, PE

FUSS & O'NEILL

Table of Contents
Hydrologic & Hydraulic Report

1 Executive Summary

This Hydrologic and Hydraulic Report has been prepared for the proposed repairs to Ring's End Dam in Darien, Connecticut.

The proposed repairs will restore the dam to its original condition, which has been damaged due to significant storms. Most recently, Tropical Storm Ida caused substantial scour of the downstream toe of the dam, with subsequent undermining of the downstream masonry face, collapse, and complete loss of stones from the downstream face, erosion of the underlying embankment soils, and undermining and collapse of the concrete spillway crest slab. The project is located within a 100-year flood hazard area and a coastal wave zone; thus, future heavy flows over the dam will result in further erosion of the exposed downstream embankment face and loss of currently undermined stone masonry wall stone. It is recommended that the dam be repaired as quickly as possible to avoid further damage. This is a no hazard classification dam; however, the impact of dam failure is the loss of the impoundment upstream, and the loss of this historic structure, and potential damage to the Ring's End Road bridge.

Repairs will be consistent with the original construction of the dam to return the dam to its original construction prior to heavy storm damage. The dam crest elevation, dimension, and spillway characteristics will remain unchanged from the original construction. Thus, the hydraulics of the structure are not changing and have not been analyzed for this project.

This analysis and report describe the temporary hydraulic analysis necessary for the design of water control structures at the dam.

2 Hydrology

2.0 Drainage Basin

The drainage area of the Goodwives River at the project site is approximately 6.06 square miles (according to the most recent effective Flood Insurance Study). This drainage area is provided in the FIS at the confluence of Stony Brook with the Goodwives River, approximately 2000 feet upstream of the site location. The contributing watershed is comprised of mixed-use classes, with natural, residential, and commercially developed areas. The watershed has a main channel slope of approximately 20 ft/mile.

2.1 FEMA Flood Insurance Study

The most recent effective Flood Insurance Study (FIS) released by FEMA is dated October 16, 2013 and includes all communities in Fairfield County[1]. According to the effective FIS, pre-county wide analysis starting water surface elevations for Goodwives River were calculated using the rating curves for Ring's End Dam. Starting water surface elevations for Stony Brook were obtained from the hydraulic analyses for the Goodwives River. Goodwives River and Stony Brook were studied by detailed methods

[1] Federal Emergency Management Agency, U.S. Department of Homeland Security. (October 16, 2013). "Flood Insurance Study, Fairfield County, Connecticut". Washington, D.C.

during countywide analyses in June 2010. The calculated peak flood discharges are summarized in the following tables:

Table 1
FEMA Peak Discharges
Goodwives River upstream of confluence of Stony Brook

Return Frequency	Peak Discharge (cfs)
10-year	290
50-year	410
100-year	495
500-year	780

Table 2
FEMA Peak Discharges
Stony Brook upstream of confluence of Goodwives River

Return Frequency	Peak Discharge (cfs)
10-year	465
50-year	670
100-year	800
500-year	1,200

3 Temporary Hydraulic Facilities

Temporary water controls are necessary for this project to allow for construction under dry conditions and to protect sensitive habitat during construction. An upstream coffer dam system and water control near the outlet of the dam will be installed. Downstream cofferdams will be placed both to the east and west of the existing tide gate. A pump will be used behind sheet piles (or approved equivalent) to reduce water within the work are. Water will be discharged through a settling basin to the river. Another temporary pump will be installed within the settling basin to control water levels as necessary.

3.1 Temporary Design Discharge

Guidance for selecting the design discharge for temporary water control devices is provided in Chapter 6, Appendix F, "Temporary Hydraulic Facilities" of the ConnDOT Drainage Manual. In accordance with these guidelines, the design discharge should be the 2-year peak flow, as calculated and documented in *Appendix A*. This discharge was approximated from a logarithmic extrapolation on flood flows for the Goodwives River and Stony Brook from the effective FEMA FIS. The 2-year design flow applied to this analysis were a summation of the two extrapolated flood flows and was estimated to be 490 cfs.

3.2 Temporary Facility Hydraulic Analysis

The temporary conditions hydraulic analysis presented in this report were completed utilizing United States Department of Transportation Federal Highway Administration's HY-8 modeling software, version 7.70.2.0. As part of the temporary conditions hydraulic analysis, one single arch culvert under Ring's End Road Bridge was modeled with the 2-year temporary design discharge, as only one culvert will be open during the construction process. The approximate roadway overtopping elevation is 12.35 feet NAVD88. Model results show that a single culvert has the capacity to fully pass the 2-year flow with approximately 5.6 feet of freeboard. As an additional measure of safety, the 10-year and 50-year storms were modeled and the single culvert had sufficient capacity to pass these storms with 4.5 and 3.3 feet of freeboard, respectively. The temporary hydraulic conditions analysis demonstrated that backwater from the proposed activity will not impact an existing dam, dike, or detention structure. The modeled results are presented in table 3 below:

Table 3
HY-8 Single Culvert Modeled Results
Stony Brook upstream of confluence of Goodwives River

Headwater Elevation (ft)	Discharge Names	Single Arch Discharge (cfs)
6.73	2-year	490
7.84	10-year	755
9.05	50-year	1080

4 Conclusions & Recommendations

In the past, the existing Ring's End Dam was damaged from previous storm events such as those mentioned. The dam is proposed to be repaired to match its original condition as a solution to prevent further damage in the future. This report discusses the temporary conditions hydraulic analyses performed necessary to design appropriately sized water control controls structures to protect the site and downstream assets during construction. The hydraulic analysis indicates that the single arch culvert that would be open during construction has sufficient capacity to pass the 2-year temporary design discharge. Upstream and downstream coffer dam systems, dewatering pit, and other water controls are proposed to be installed during the repairs at the site to provide additional sediment and erosion control and protection.

5 Flood Contingency Plan

5.1 General Description

This Flood Contingency Plan has been prepared for repair of the Ring's End Dam in Darien, Connecticut. This Plan describes the measures to be taken during construction to help protect life and property, and prevent pollution during significant precipitation events. The contact information in this Plan regarding emergency service agencies should be reviewed immediately prior to the onset of construction and updated as necessary. This project involves work below the Coastal Jurisdiction Limit and the High Tide Line. Although there will be some change from current to proposed conditions, the proposed conditions restore the original condition of the dam. The project increases flood resilience for both the dam as well as Ring's End Bridge. No provision will be made for post construction flooding, as the project returns the dam to its original condition.

The actions outlined in this Flood Contingency Plan below shall be performed for any significant rainfall event that occurs during construction at the project site. For the purpose of this Plan, a "significant rainfall event" is defined as a storm in which more than 2.5 inches of rainfall may occur in a one-hour period (thunder showers), or more than 6.5 inches may fall in a 24-hour period (a storm with potential annual recurrence interval of at least 50 years).

5.2 Flood Contingency Procedures

The person responsible for implementing this Plan is the Contractor responsible for oversight of construction activities at the site. The Contractor will be selected by the Town of Darien.

The Contractor shall use best efforts to notify the Owner of any impending significant rainfall event or any coastal flooding event as soon as practicable and, if possible, no less than twenty-four (24) hours before the onset of precipitation. The owner is:

The Town of Darien
2 Renshaw Road
Darien, CT 06820
Contact:

Darren Oustafine, PE Assistant Director of Public Works (203) 656-7365; doustafine@darienct.gov
Edward Gentile, PE Director of Public Works (203) 656-7364 ; egentile@darienct.gov

The Contractor shall then perform the following actions to minimize the potential for damage to downstream life and property, and/or pollution.

1. All construction equipment, tools, heavy equipment, vehicles, storage containers, etc. shall be relocated to upland storage areas or areas protected from flooding. Such areas, identified before the start of construction activities, shall be located outside of flood hazard areas, flood prone areas, and areas that may experience significant overland flow of water during precipitation events.

2. All fuel and maintenance fluids shall be located to a upland storage area. If practicable, these fluids should be placed in an enclosed structure; at a minimum they shall be covered with tarps and placed in an upland storage area that is bermed to prevent run-on of surface water.

3. All work areas shall be inspected to ensure that items under construction (e.g., access roads) are stabilized. All practical measures shall be undertaken to protect active construction areas from rising water levels and to ensure that water diversion structures (i.e., sandbags, pumps, inlet and outlet structures) perform adequately.

4. All work areas and any stockpiles shall be inspected to ensure that erosion control measures are in place and in such condition as to allow their proper function during the rainfall event.

5. Access to all work areas shall be closed to the public and non-essential work personnel. Access points to areas under construction shall be barricaded and posted as being closed during construction.

6. In addition to notifying the Owner, the Contractor shall notify emergency service agencies if conditions are observed which may pose an imminent danger to downstream residents or property:
   - Local Fire and/or Police: Tel. 911
   - Connecticut Department of Energy and Environmental Protection Inland Water Resources Division Tel. (860) 424-3706

As soon as practicable after a significant rainfall event or severe storm, the site should be inspected for damage caused by flooding.

Appendix A

Calculations - Temporary Hydraulic Facilities

Appendix F – Hydrology for Temporary Facilities

Step 1: Determine Impact Ratings

The following selection factors are rated considering their severity as 1, 2, or 3 for low, medium or high conditions.

Potential Loss of Life - If inhabited structures, permanent or temporary, can be inundated or are in the path of a flood wave caused by an embankment failure, then this item will have a multiple of 15 applied. If no possibility of the above exists, then loss of life will be the same as the severity used for the A.D.T.

Property Damages - Private and public structures (houses, commercial, or manufacturing); appurtenances such as sewage treatment and water supply; utility structures either above or below ground, are to have a multiple of 10 applied. Active cropland, parking lots, recreational areas are to have a multiple of 5 applied. All other areas shall use the severity determined by site conditions.

Traffic Interruption - Includes consideration for emergency supplies and rescue; delays; alternate routes; busses; etc. Short duration flooding of a low volume roadway might be acceptable. If the duration of flooding is long (more than a day), and there is a nearby good quality alternate route, then the flooding of a higher volume highway might also be acceptable. The severity of this component is determined by the detour length multiplied by the average daily traffic projected for bi-directional travel.

Detour Length - The length in kilometers (miles) of an emergency detour by other roads should the temporary facility fail.

Height Above Streambed - The difference in elevation in meters (feet) between the traveled roadway and the bed of the waterway.

Drainage Area - The total area contributing runoff to the temporary facility, in km^2 (mi^2).

Average Daily Traffic - The average amount of vehicles traveling bi-directional through the area in a 24-h period.

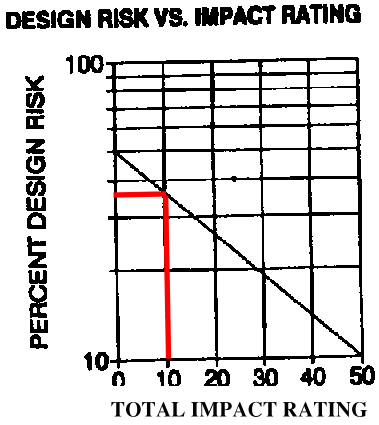
RATING SELECTION

Factor	Rating		
	1	2	3
Loss of Life	See Instructions		
Property Damage	See Instructions		
Traffic Interruptions	< 2000	2000-4000	> 4000
Detour Length, km (mi)	< 8 (< 5)	8-16 (5-10)	> 16 (> 10)
Height Above Streambed, m (ft)	< 3 (< 10)	3-6 (10-20)	> 6 (> 20)
Drainage Area, km^2 (mi^2)	< 2.6 (< 1)	2.6-26.0 (1-10)	> 26.0 (> 10)
Rural ADT	< 400	400-1500	> 1500
Suburban ADT	< 750	750-1500	> 1500
Urban ADT	< 1500	1500-3000	> 3000

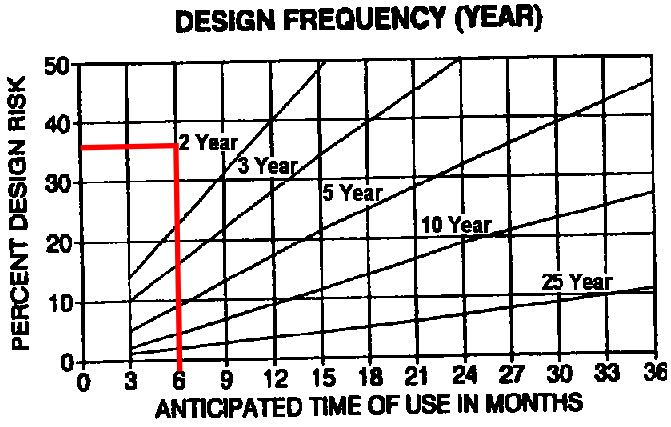
IMPACT RATING TABLE

Loss of Life Rating (See Instructions)=	1
Property Damage Rating (See Instructions) =	1
Traffic Interruption Rating =	1
Detour Length Rating =	1
Height Above Streambed Rating =	2
Drainage Area Rating =	2
Average Daily Traffic Rating =	2
Total Impact Rating = (sum of the above) =	10

Step 2: Determine risk percentage



Step 3: Determine Temporary Design Frequency



(for temporary facility)

Percent Design Risk = 36 **Design Frequency =** 2 **years**

Step 4: Determine Temporary Design Discharge

A. If sufficient discharges have been developed either by the designer or a Flood Insurance Study, then the Temporary Design Discharge should be taken either directly or from a frequency curve plot of the data, based on the design frequency determined in Step 3. Enter the Temporary Design Discharge below. *If Discharge – Frequency information is unavailable, proceed to Step 4 B.*

Temporary Design Discharge = 14 **m^3/s (** 490 **cfs)**

B. Use only when Discharge – Frequency information is unavailable

(1) Determine Multiplier Ratio

Year	Multiplier	Year	Multiplier
2.0	0.8	10.0	1.9
3.0	1.2	25.0	2.7
5.0	1.4		

(2) Compute the Temporary Design Discharge from the following equations

Multiplier _____ × 0.27 ($Q_{50\ yr.}$ _____) = _____ m^3/s (cfs)

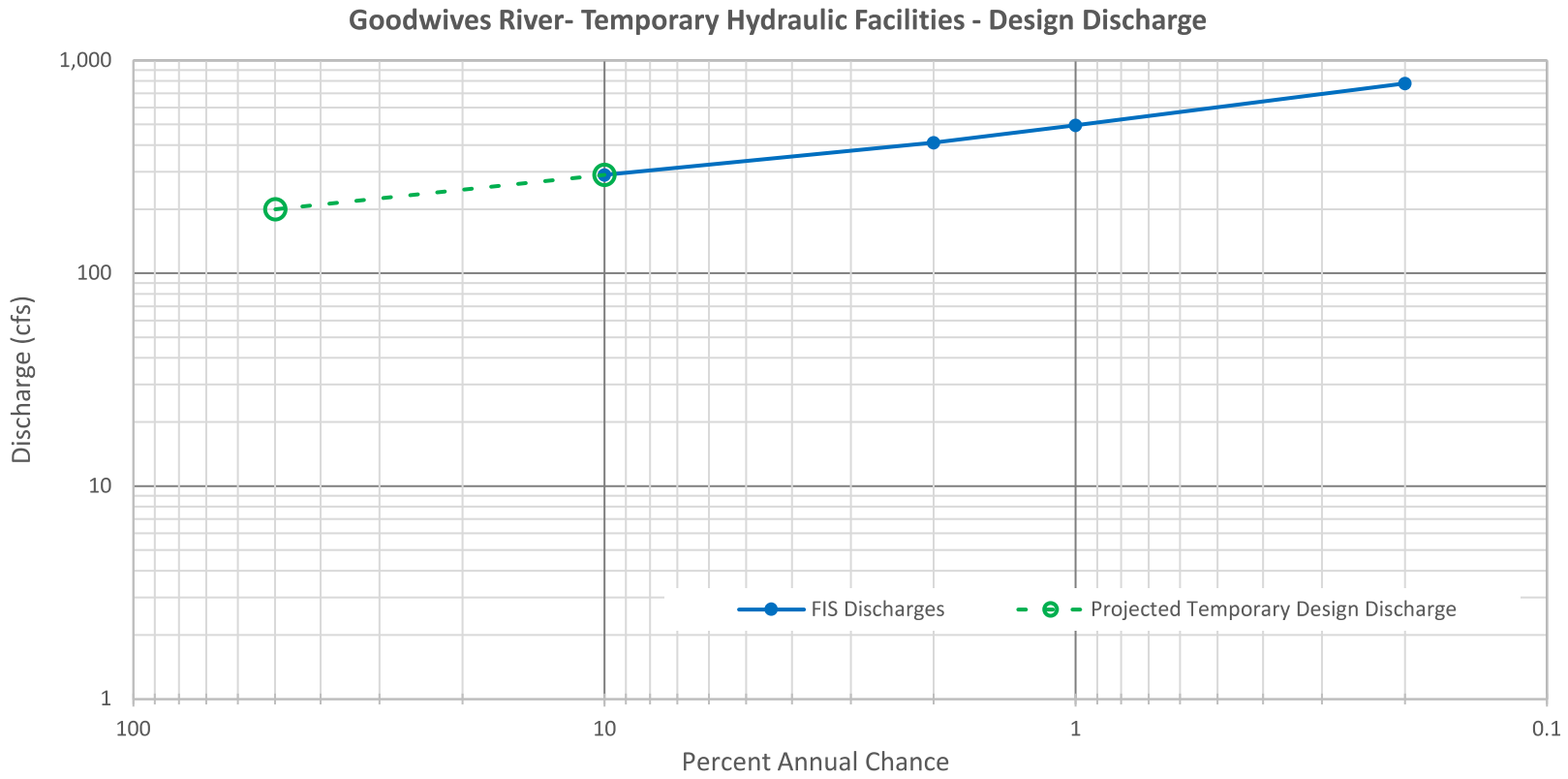
Multiplier _____ × 0.20 ($Q_{100\ yr.}$ _____) = _____ m^3/s (cfs)

(3) Select the higher of the two discharges computed in Step 4B-(2). Enter discharge below.

Temporary Design Discharge = _____ m^3/s (cfs)

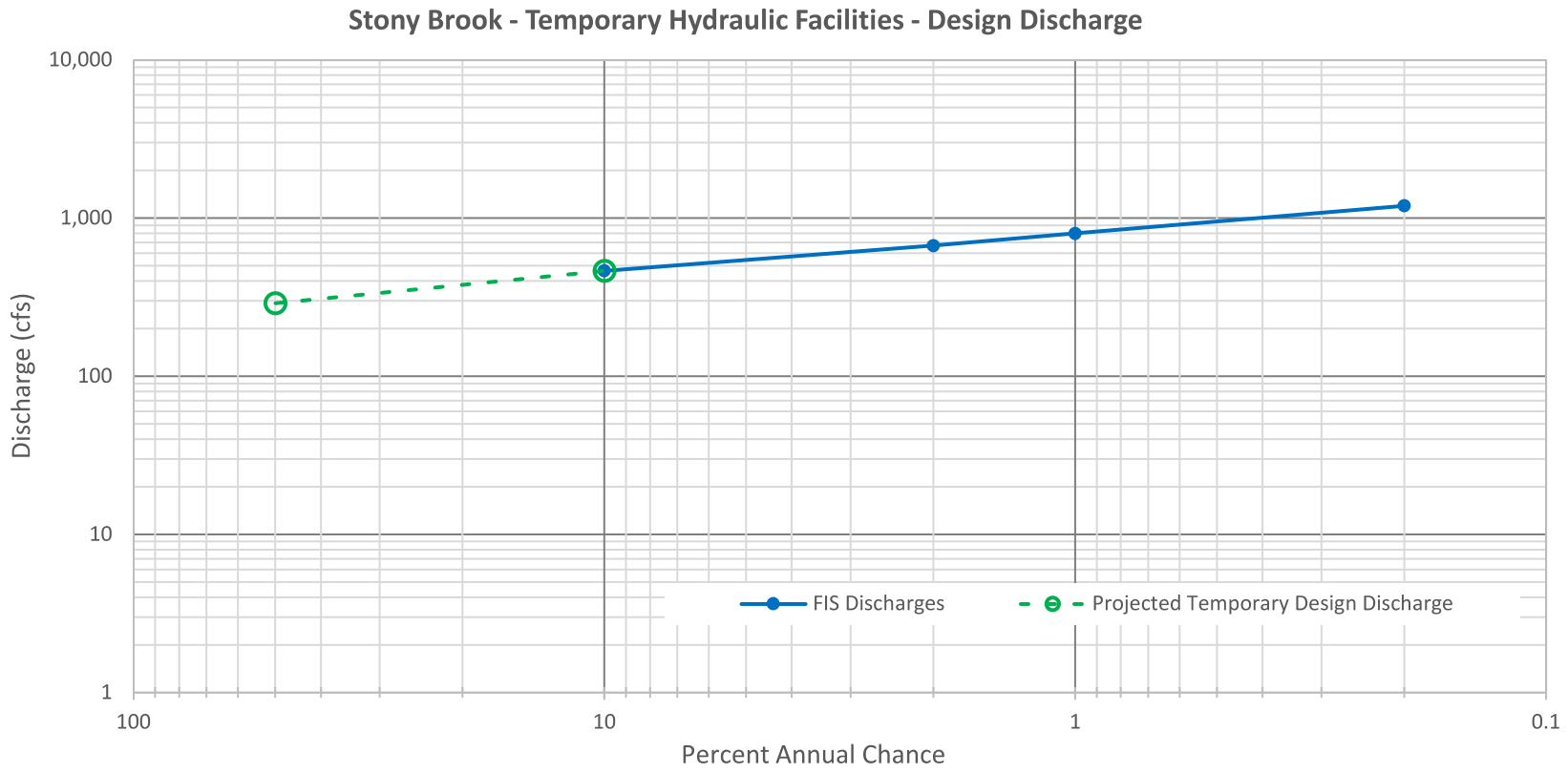
Goodwives River - Hydrologic and Hydraulic Analysis Report
Temporary Water Control - Design Discharge

Frequency		Discharge	
years	% A.C.	cfs	Source
2	50	200	Projected
10	10	290	FIS
50	2	410	FIS
100	1	495	FIS
500	0.2	780	FIS



Stony Brook - Hydrologic and Hydraulic Analysis Report
Temporary Water Control - Design Discharge

Frequency		Discharge	
years	% A.C.	cfs	Source
2	50	290	Projected
10	10	465	FIS
50	2	670	FIS
100	1	800	FIS
500	0.2	1,200	FIS



Culvert Crossing: RingsEndRoad

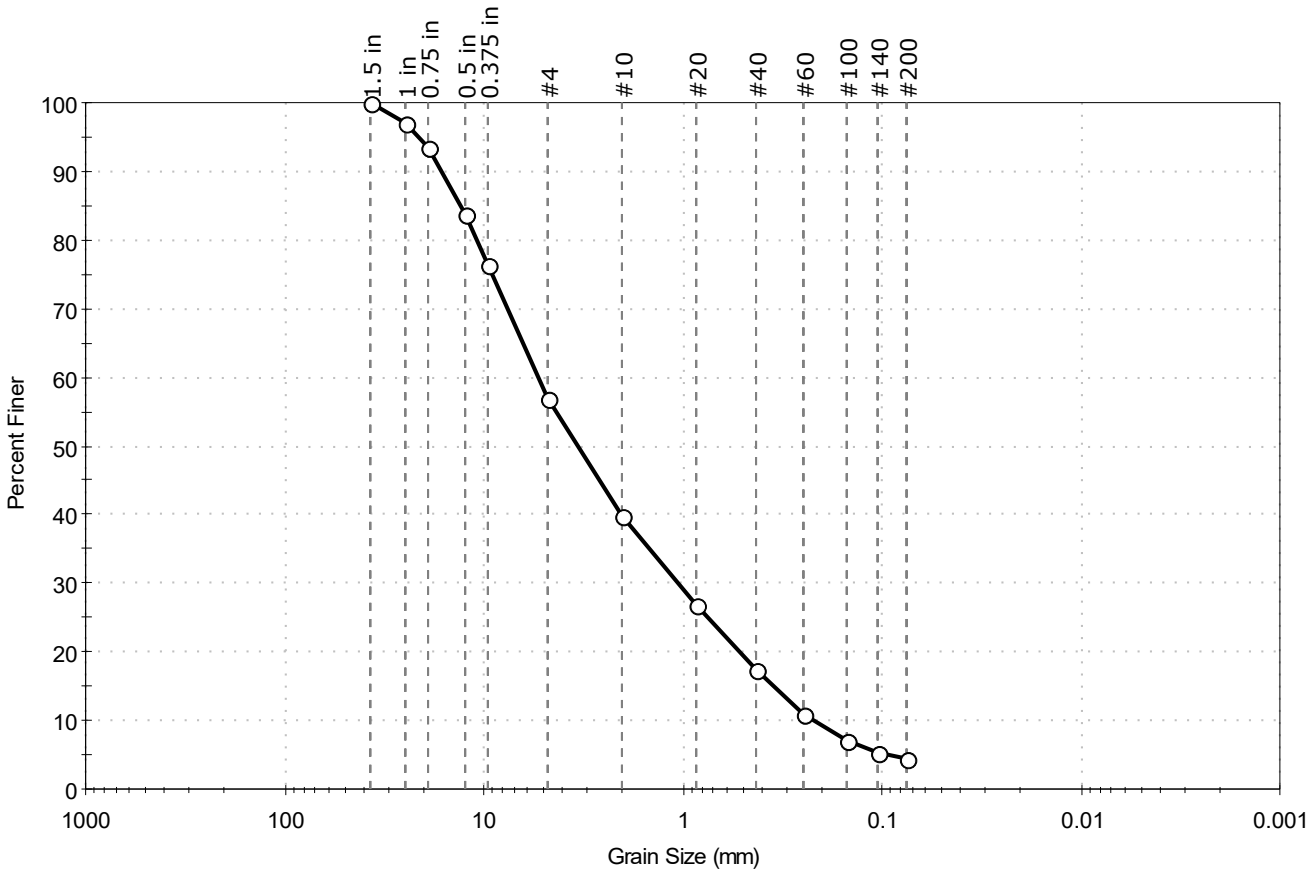
Crossing Summary Table

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Single Arch Discharge (cfs)	Roadway Discharge (cfs)	Iterations
6.73	2 year	490.00	490.00	0.00	1
7.84	10 year	755.00	755.00	0.00	1
9.05	50 year	1080.00	1080.00	0.00	1
9.79	100 year	1295.00	1295.00	0.00	1
12.02	500 year	1980.00	1980.00	0.00	1
12.35	Overtopping	2083.58	2083.58	0.00	Overtopping

GeoTesting EXPRESS

Client:	Fuss & O'Neill, Inc.				
Project:	Rings End Dam				
Location:	Darien, CT			Project No:	GTX-316093
Boring ID:	B-01	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-01	Test Date:	09/23/22	Checked By:	ank
Depth :	6"	Test Id:	685761		
Test Comment:	---				
Visual Description:	Moist, dark olive brown sand with gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	43.0	52.5	4.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	97		
0.75 in	19.00	94		
0.5 in	12.50	84		
0.375 in	9.50	77		
#4	4.75	57		
#10	2.00	40		
#20	0.85	27		
#40	0.42	17		
#60	0.25	11		
#100	0.15	7		
#140	0.11	5		
#200	0.075	4.5		

Coefficients

D_{85} = 13.1773 mm	D_{30} = 1.0373 mm
D_{60} = 5.2798 mm	D_{15} = 0.3483 mm
D_{50} = 3.3275 mm	D_{10} = 0.2192 mm
C_u = 24.087	C_c = 0.930

Classification

ASTM — Poorly graded SAND with Gravel (SP)

AASHTO — Stone Fragments, Gravel and Sand (A-1-a (1))

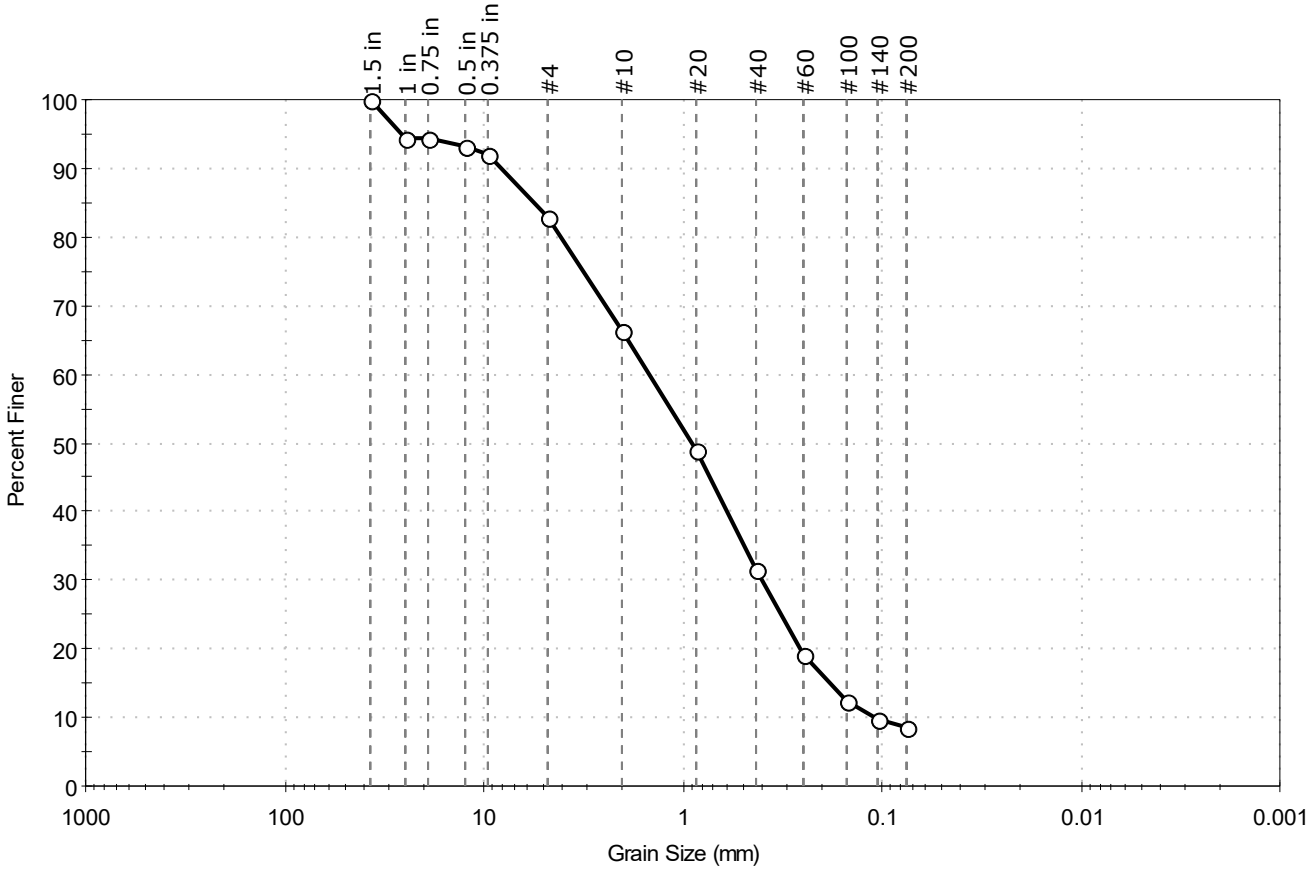
Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Client:	Fuss & O'Neill, Inc.				
Project:	Rings End Dam				
Location:	Darien, CT			Project No:	GTX-316093
Boring ID:	B-02	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-02	Test Date:	09/23/22	Checked By:	ank
Depth :	6"	Test Id:	685762		
Test Comment:	---				
Visual Description:	Moist, dark olive brown sand with silt and gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	17.3	74.3	8.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	94		
0.75 in	19.00	94		
0.5 in	12.50	93		
0.375 in	9.50	92		
#4	4.75	83		
#10	2.00	66		
#20	0.85	49		
#40	0.42	32		
#60	0.25	19		
#100	0.15	12		
#140	0.11	10		
#200	0.075	8.4		

Coefficients

D_{85} = 5.6006 mm	D_{30} = 0.3972 mm
D_{60} = 1.4634 mm	D_{15} = 0.1817 mm
D_{50} = 0.8979 mm	D_{10} = 0.1085 mm
C_u = 13.488	C_c = 0.994

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (1))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

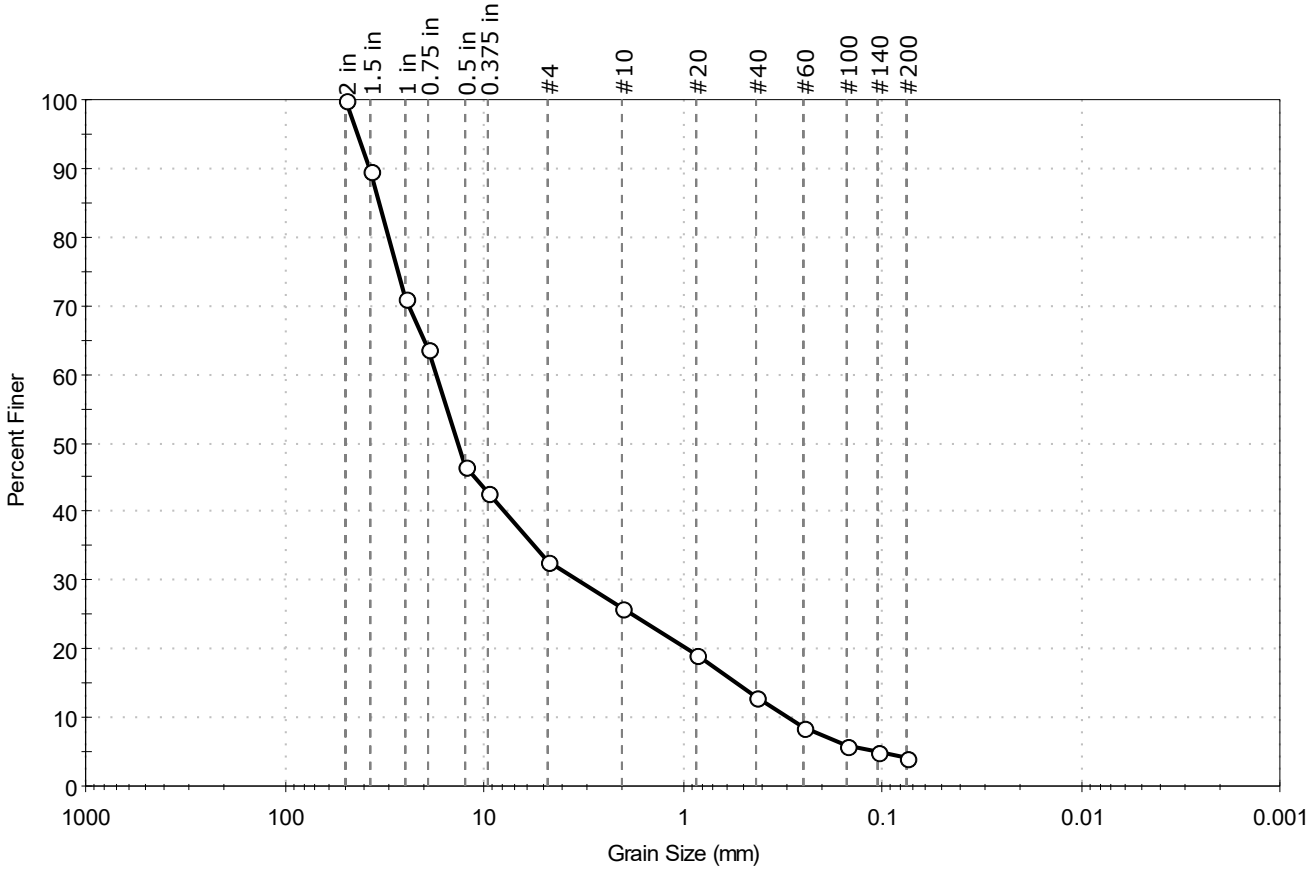
Sand/Gravel Hardness : HARD

GeoTesting EXPRESS

Client:	Fuss & O'Neill, Inc.				
Project:	Rings End Dam				
Location:	Darien, CT			Project No:	GTX-316093
Boring ID:	B-03	Sample Type:	jar	Tested By:	ckg
Sample ID:	S-03	Test Date:	09/22/22	Checked By:	ank
Depth :	6"	Test Id:	685763		

Test Comment: ---
Visual Description: Moist, olive brown gravel with sand
Sample Comment: ---

Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	67.2	28.6	4.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
2 in	50.00	100		
1.5 in	37.50	90		
1 in	25.00	71		
0.75 in	19.00	64		
0.5 in	12.50	47		
0.375 in	9.50	43		
#4	4.75	33		
#10	2.00	26		
#20	0.85	19		
#40	0.42	13		
#60	0.25	9		
#100	0.15	6		
#140	0.11	5		
#200	0.075	4.2		

Coefficients

D_{85} = 33.8919 mm D_{30} = 3.3361 mm
D_{60} = 17.3390 mm D_{15} = 0.5318 mm
D_{50} = 13.6029 mm D_{10} = 0.2954 mm
C_u = 58.697 C_c = 2.173

Classification

ASTM: Well-graded GRAVEL with Sand (GW)

AASHTO: Stone Fragments, Gravel and Sand (A-1-a (1))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Connecticut Department of Energy and Environmental Protection License*

Certificate of Permission

Licensee(s):	Town of Darien
Licensee Address(s):	2 Renshaw Rd Darien CT 06820
License Number(s):	202302334-COP
Municipality:	Darien
Project Description:	Repairs to a dam
Project Address/Location:	100 Rings End Rd.
Waters:	Goodwives River
Authorizing CT Statute(s) and/or Federal Law:	CGS Section 22a-28 to 35; CGS Section 22a-359 to 363g; CGS Section 22a-90 to 112; Section 401 CWA (33 USC 1341)
Applicable Regulations of CT State Agencies:	22a-30-1 to 17, 22a-426-1 to 9
Agency Contact:	Land & Water Resources Division, Bureau of Water Protection & Land Reuse, 860-424-3019
License Expiration:	Five (5) years from the date of issuance of this license.
Project Site Plan Set:	*9* plan sheets titled *Rings End Dam Emergency Repairs,* dated February 20, 2023, and prepared by Fuss & O'Neill.
License Enclosures:	LWRD General Conditions; Site Plan Set; Land Record Filing; LWRD Compliance Certification Form; LWRD Work Commencement Form

Authorized Activities:

The Licensee is hereby authorized to conduct the following work as described in application # 202302334-COP and as depicted on any site plan sheets / sets cited herein:

1. Install erosion and sedimentation control measures,

*Connecticut's Uniform Administrative Procedure Act defines License to include, "*the whole or part of any agency permit, certificate, approval, registration, charter or similar form of permission required by law . . .*"

2. Install a steel sheetpile cofferdam at the north and south side of the dam as identified on plan sheet CE-101 and temporarily dewater the work area,
3. Drawdown the impoundment a maximum of 3',
4. Excavate approximately 1,120 cy (cubic yards) of existing material from the dam,
5. Place approximately 232 cy of new stone masonry and 347 cy of concrete,
6. Place approximately 166 cy of material on the pond side of the dam,
7. Excavate approximately 801 cy of material from the downstream toe of the dam,
8. Place approximately 460 cy of material for boulder revetments,
9. Place approximately 5 cy of material and regrade immediately downstream of the existing tide gate structure, and
10. Remove temporary cofferdam and erosion and sedimentation control measures authorized under paragraph 1 and 2., above.

Failure to comply with the terms and conditions of this license shall subject the Licensee and / or the Licensee's contractor(s) to enforcement actions and penalties as provided by law.

This license is subject to the following Terms and Conditions:

1. **License Enclosure(s) and Conditions.** The Licensee shall comply with all applicable terms and conditions as may be stipulated within the License Enclosure(s) listed above.
2. **Time-of-Year Restrictions**. In-water work is prohibited from April 1st to June 30th inclusive of any year in order to protect fisheries resources in the area unless otherwise authorized in writing by the Commissioner.
3. **Tidal Wetland Restoration**. The Licensee shall temporarily store and replace approximately 65 square feet tidal wetlands impacted during construction.
4. **Stream Flow Maintenance**. Protect and maintain flow through existing tide gate structure and fish ladder structure at all times during construction.
5. **Wetland Delineation and Demarcation.** Prior to construction commencement, the Licensee shall demarcate, by use of silt fence, hay bales, and/ or construction fence, the limits of wetlands located at the site. Any work, vehicular / pedestrian passage, equipment staging, or material storage shall be prohibited within these limits to prevent any wetland impacts. Any such demarcation material should be capable of withstanding daily tidal ebbs and flows and shall be maintained in optimal operating condition until project completion, at which time fencing and erosion controls shall be removed to an upland location.
6. **Water Handling.** If final water handling varies from that shown on the plans approved herein, the Licensee shall submit, at least two weeks prior to the commencement of work and for the Commissioner's review and written approval, a final water handling plan.
7. **Management of Materials.** Any dredged/excavated sediment removed from the site shall be managed in accordance with all federal, state, and local requirements, including Chapter 446K Water Pollution Control, Chapter 445 Hazardous Waste, and Chapter 446d Solid Waste of the Connecticut General Statutes.

Issued under the authority of the Commissioner of Energy and Environmental Protection on:

June 12, 2023

Date

Brian P. Thompson
Division Director
Land & Water Resources Division

LWRD General Conditions

1. **Land Record Filing (for *Structures Dredging & Fill*, *Tidal Wetlands*, *Certificate of Permission*, and *Long Island Sound General Permit* Licenses only).** The Licensee shall file the Land Record Filing on the land records of the municipality in which the subject property is located not later than thirty (30) days after license issuance pursuant to Connecticut General Statutes (CGS) Section 22a-363g. A copy of the Notice with a stamp or other such proof of filing with the municipality shall be submitted to the Commissioner no later than sixty (60) days after license issuance. If a Land Record Filing form is not enclosed and the work site is not associated with an upland property, no filing is required.

2. **Contractor Notification.** The Licensee shall give a copy of the license and its attachments to the contractor(s) who will be carrying out the authorized activities prior to the start of construction and shall receive a written receipt for such copy, signed and dated by such contractor(s). The Licensee's contractor(s) shall conduct all operations at the site in full compliance with the license and, to the extent provided by law, may be held liable for any violation of the terms and conditions of the license. At the work site, the contractor(s) shall, whenever work is being performed, have on site and make available for inspection a copy of the license and the authorized plans.

3. **Work Commencement[1].** Not later than two (2) weeks prior to the commencement of any work authorized herein, the Licensee shall submit to the Commissioner, on the Work Commencement Form attached hereto, the name(s) and address(es) of all contractor(s) employed to conduct such work and the expected date for commencement and completion of such work, if any.
    - For water diversion activities authorized pursuant to 22a-377(c)-1 of the Regulations of Connecticut State Agencies, the Licensee shall also notify the Commissioner in writing two weeks prior to initiating the authorized diversion.
    - For emergency activities authorized pursuant Connecticut General Statutes Section 22a-6k, the Licensee shall notify the Commissioner, in writing, of activity commencement at least one (1) day prior to construction and of activity completion no later than five (5) days after conclusion.

4. **For Coastal Licenses Only - License Notice.** The Licensee shall post the first page of the License in a conspicuous place at the work area while the work authorized therein is undertaken.

5. **Unauthorized Activities.** Except as specifically authorized, no equipment or material, including but not limited to, fill, construction materials, excavated material or debris, shall be

[1] The Work Commencement condition and the need for a Work Commencement Form is not applicable to Flood Management Certification approvals.

deposited, placed or stored in any wetland or watercourse on or off-site. The Licensee may not conduct work within wetlands or watercourses other than as specifically authorized, unless otherwise authorized in writing by the Commissioner. Tidal wetlands means "wetland" as defined by section 22a-29 and "freshwater wetlands and watercourses" means "wetlands" and "watercourses" as defined by section 22a-38.

6. **Unconfined Instream Work.** Unless otherwise noted in a condition of the license, the following conditions apply to projects in non-coastal waters:
    - Unconfined instream work is limited to the period June 1 through September 30.
    - Confinement of a work area by cofferdam techniques using sand bag placement, sheet pile installation (vibratory method only), portadam, or similar confinement devices is allowed any time of the year. The removal of such confinement devices is allowed any time of the year.
    - Once a work area has been confined, in-water work within the confined area is allowed any time of the year.
    - The confinement technique used shall completely isolate and protect the confined area from all flowing water. The use of silt boom/curtain or similar technique as a means for confinement is prohibited.

7. **For State Actions Only - Material or Equipment Storage in the Floodplain.** Unless approved by a Flood Management Exemption, the storage of any materials at the site which are buoyant, hazardous, flammable, explosive, soluble, expansive, radioactive, or which could in the event of a flood be injurious to human, animal or plant life, below the elevation of the five-hundred (500) year flood is prohibited. Any other material or equipment stored at the site below said elevation by the Licensee or the Licensee's contractor must be firmly anchored, restrained or enclosed to prevent flotation. The quantity of fuel stored below such elevation for equipment used at the site shall not exceed the quantity of fuel that is expected to be used by such equipment in one day. In accordance with the licensee's Flood Contingency Plan, the Licensee shall remove equipment and materials from the floodplain during periods when flood warnings have been issued or are anticipated by a responsible federal, state or local agency. It shall be the Licensee's responsibility to obtain such warnings when flooding is anticipated.

8. **Temporary Hydraulic Facilities for Water Handling.** If not reviewed and approved as a part of the license application, temporary hydraulic facilities shall be designed by a qualified professional and in accordance with the *Connecticut Guidelines for Soil Erosion and Sediment Control*, the *2004 Connecticut Stormwater Quality Manual*, or the *Department of Transportation's ConnDOT Drainage Manual,* as applicable. Temporary hydraulic facilities may include channels, culverts or bridges which are required for haul roads, channel relocations, culvert installations, bridge construction, temporary roads, or detours.

9. **Excavated Materials.** Unless otherwise authorized, all excavated material shall be staged and managed in a manner which prevents additional impacts to wetlands and watercourses.

10. **Best Management Practices.** The Licensee shall not cause or allow pollution of any wetlands or watercourses, including pollution resulting from sedimentation and erosion. In constructing

or maintaining any authorized structure or facility or conducting any authorized activity, or in removing any such structure or facility, the Licensee shall employ best management practices to control storm water discharges, to prevent erosion and sedimentation, and to otherwise prevent pollution of wetlands and other waters of the State. For purposes of the license, "pollution" means "pollution" as that term is defined by CGS section 22a-423. Best Management Practices include, but are not limited, to practices identified in the *Connecticut Guidelines for Soil Erosion and Sediment Control* as revised, *2004 Connecticut Stormwater Quality Manual*, Department of Transportation's *ConnDOT Drainage Manual* as revised, and the Department of Transportation Standard Specifications as revised.

11. **In-Water Work Vessel Staging and Storage. (for Structures Dredging & Fill, Tidal *Wetlands*, *Certificate of Permission*, and *Long Island Sound General Permit* Licenses only).** For any barge, vessel, skiff or floating work platform ("work vessels") utilized in the execution of the work authorized herein, the Licensee shall ensure that such work vessels:
    - do not rest on, or come in contact with, the substrate at any time, unless specifically authorized in the license.
    - are not stored over intertidal flats, submerged aquatic vegetation or tidal wetland vegetation or in a location that interferes with navigation. In the event any work vessel is grounded, no dragging or prop dredging shall occur to free it.

12. **Work Site Restoration.** Upon completion of any authorized work, the Licensee shall restore all areas impacted by construction, or used as a staging area or accessway in connection with such work, to their condition prior to the commencement of such work.

13. **Inspection.** The Licensee shall allow any representative of the Commissioner to inspect the project location at reasonable times to ensure that work is being or has been conducted in accordance with the terms and conditions of this license.

14. **Change of Use. (Applies only if a use is specified within the License "*Project Description*")**
    a. The work specified in the license is authorized solely for the purpose set forth in the license. No change in purpose or use of the authorized work or facilities as set forth in the license may occur without the prior written approval of the Commissioner. The Licensee shall, prior to undertaking or allowing any change in use or purpose from that which is authorized by this license, request permission from the Commissioner for such change. Said request shall be in writing and shall describe the proposed change and the reason for the change.

    b. A change in the form of ownership of any structure authorized herein from a rental/lease commercial marina to a wholly-owned common interest community or dockominium may constitute a change in purpose as specified in paragraph (a) above.

15. **De Minimis Alteration.** The Licensee shall not deviate from the authorized activity without prior written approval from the Commissioner. The Licensee may request a de minimis change to any authorized structure, facility, or activity. A de minimis alteration means a change in the authorized design, construction or operation that individually and cumulatively has minimal additional environmental impact and does not substantively alter the project as authorized.

- For diversion activities authorized pursuant to 22a-377(c)-2 of the Regulations of Connecticut State Agencies, a de minimis alteration means an alteration which does not significantly increase the quantity of water diverted or significantly change the capacity to divert water.

16. **Extension Request.** The Licensee may request an extension of the license expiration date. Such request shall be in writing and shall be submitted to the Commissioner at least thirty (30) days prior to the license expiration. Such request shall describe the work done to date, what work still needs to be completed, and the reason for such extension. The Commissioner may extend the expiration date of this license for a period of up to one year, in order for the Licensee to complete the authorized activities. It shall be at the Commissioner's sole discretion to grant or deny such request. No more than three (3) one-year extensions will be granted under this license.

17. **Compliance Certification.** Not later than 90 days after completion of the authorized work, the Licensee shall prepare and submit to the Commissioner the attached Compliance Certification Form. Such Compliance Certification shall be completed, signed, and sealed by the Licensee and a Connecticut Licensed Design Professional. If non-compliance is indicated on the form, or the Commissioner has reason to believe the activities and/or structures were conducted in non-compliance with the license, the Commissioner may require the Licensee to submit as-built plans as a condition of this license.

18. **Maintenance.** The Licensee shall maintain all authorized structures or work in optimal condition or shall remove such structures or facility and restore the affected waters to their pre-work condition. Any such maintenance or removal activity shall be conducted in accordance with applicable law and any additional approvals required by law.

19. **No Work After License Expiration.** Work conducted after the license expiration date is a violation of the license and may subject the licensee to enforcement action, including penalties, as provided by law.

20. **License Transfer.** The license is not transferable without prior written authorization of the Commissioner. A request to transfer a license shall be submitted in writing and shall describe the proposed transfer and the reason for such transfer. The Licensee's obligations under the license shall not be affected by the passage of title to the license site to any other person or municipality until such time as a transfer is approved by the Commissioner.

21. **Document Submission.** Any document required to be submitted to the Commissioner under the license or any contact required to be made with the Commissioner shall, unless otherwise specified in writing by the Commissioner, be directed to:

    Regulatory Section
    Land & Water Resources Division
    Department of Energy and Environmental Protection
    79 Elm Street
    Hartford, Connecticut 06106-5127
    860-424-3019

22. **Date of Document Submission.** The date of submission to the Commissioner of any document required by the license shall be the date such document is received by the Commissioner. The date of any notice by the Commissioner under the license, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three (3) days after it is mailed by the Commissioner, whichever is earlier. Except as otherwise specified in the license, the word "day" as used in the license means calendar day. Any document or action which is required by the license to be submitted or performed by a date which falls on a Saturday, Sunday or a Connecticut or federal holiday shall be submitted or performed on or before the next day which is not a Saturday, Sunday, or a Connecticut or federal holiday.

23. **Certification of Documents.** Any document, including but not limited to any notice, which is required to be submitted to the Commissioner under the license shall be signed by the Licensee and by the individual or individuals responsible for actually preparing such document, each of whom shall certify in writing as follows: "I have personally examined and am familiar with the information submitted in this document and all attachments and certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief, and I understand that any false statement made in this document or its attachments may be punishable as a criminal offense."

24. **Accuracy of Documentation.** In evaluating the application for the license, the Commissioner has relied on information and data provided by the Licensee and on the Licensee's representations concerning site conditions, design specifications and the proposed work, including but not limited to representations concerning the commercial, public or private nature of the work or structures, the water-dependency of said work or structures, its availability for access by the general public, and the ownership of regulated structures or filled areas. If such information proves to be false, deceptive, incomplete or inaccurate, the license may be modified, suspended or revoked, and any unauthorized activities may be subject to enforcement action.

25. **Limits of Liability.** In granting the license, the Commissioner has relied on all representations of the Licensee, including information and data provided in support of the Licensee's application. Neither the Licensee's representations nor the issuance of the license shall constitute an assurance by the Commissioner as to the structural integrity, the engineering feasibility or the efficacy of such design.

26. **Reporting of Violations.** In the event that the Licensee becomes aware that they did not or may not comply, or did not or may not comply on time, with any provision of this license or of any document incorporated into the license, the Licensee shall immediately notify the agency contact specified within the license and shall take all reasonable steps to ensure that any noncompliance or delay is avoided or, if unavoidable, is minimized to the greatest extent possible. In so notifying the agency contact, the Licensee shall provide, for the agency's review and written approval, a report including the following information:

    a. the provision(s) of the license that has been violated;

    b. the date and time the violation(s) was first observed and by whom;

c. the cause of the violation(s), if known;

d. if the violation(s) has ceased, the duration of the violation(s) and the exact date(s) and times(s) it was corrected;

e. if the violation(s) has not ceased, the anticipated date when it will be corrected;

f. steps taken and steps planned to prevent a reoccurrence of the violation(s) and the date(s) such steps were implemented or will be implemented; and

g. the signatures of the Licensee and of the individual(s) responsible for actually preparing such report.

If the violation occurs outside of normal business hours, the Licensee shall contact the Department of Energy and Environmental Protection Emergency Dispatch at 860-424-3333. The Licensee shall comply with any dates which may be approved in writing by the Commissioner.

27. **Revocation/Suspension/Modification.** The license may be revoked, suspended, or modified in accordance with applicable law.

28. **Other Required Approvals.** License issuance does not relieve the Licensee of their obligations to obtain any other approvals required by applicable federal, state and local law.

29. **Rights.** The license is subject to and does not derogate any present or future property rights or powers of the State of Connecticut, and conveys no property rights in real estate or material nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the property or activity affected hereby.

30. **Condition Conflicts.** In the case where a project specific special condition listed on the license differs from, or conflicts with, one of the general conditions listed herein, the project specific special condition language shall prevail. It is the licensee's responsibility to contact the agency contact person listed on the license for clarification if needed prior to conducting any further regulated activities.

RINGS END DAM EMERGENCY REPAIRS

CT DAM NO. 3504 · DARIEN · CONNECTICUT

PERMITTING PLANS

FEBRUARY 20, 2023

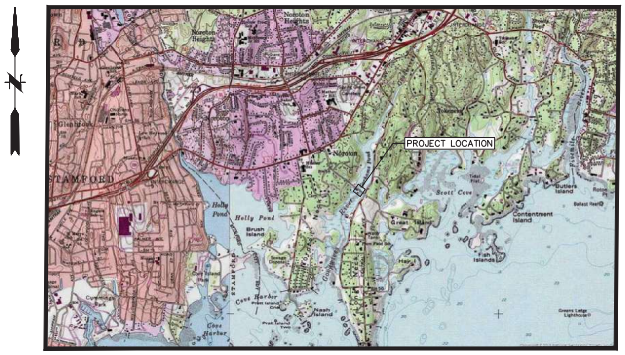
PREPARED FOR

TOWN OF DARIEN
2 RENSHAW ROAD
DARIEN, CT 06820

PREPARED BY

FUSS&O'NEILL
146 HARTFORD ROAD
MANCHESTER, CONNECTICUT 06040
860.646.2469
www.fando.com

SHEET INDEX



LOCATION MAP
SCALE: 1" = 1000'

PROJ. No.: 20200921.B11
DATE: FEBRUARY 20, 2023

GI-001

CIVIL GENERAL NOTES

GENERAL

1. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SHOWN ON THE DRAWINGS TO SCALE OR TO THEIR ACTUAL DIMENSION OR LOCATION. COORDINATE DETAIL SHEET DIMENSIONS, MANUFACTURERS' LITERATURE, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.
2. DO NOT RELY SOLELY ON ELECTRONIC VERSIONS OF DRAWINGS, SPECIFICATIONS, AND DATA FILES THAT ARE PROVIDED BY THE ENGINEER. FIELD VERIFY LOCATION OF PROJECT FEATURES.
3. PERFORM NECESSARY CONSTRUCTION NOTIFICATIONS, APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK AS REQUIRED BY THE CONTRACT DOCUMENTS.
4. BASE PLAN: THE TOPOGRAPHY AND PHYSICAL FEATURES ARE BASED ON A LIMITED TOPOGRAPHIC SURVEY DATED AUGUST 4, 2022 PERFORMED ON THE GROUND BY REDNISS & MEAD. SEE SHEET LTS FOR ADDITIONAL SURVEY NOTES AND REFERENCES.
6. TOPOGRAPHIC ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
7. REFERENCE IS MADE TO FEMA FLOOD INSURANCE RATE MAP NO. 09001C0536G, EFFECTIVE DATE JULY 8, 2013.
8. REFER TO THE CONTRACT MANUAL FOR TECHNICAL SPECIFICATIONS.

WORK RESTRICTIONS

1. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, FIRE HYDRANTS, AND UTILITIES WITHOUT APPROPRIATE PERMITS. SEE SHEET CP-101 FOR ADDITIONAL INFORMATION ON TEMPORARY LANE AND SIDEWALK CLOSURE OF RINGS END ROAD.
2. WORK IS RESTRICTED TO 8:00 A.M. TO 4:30 P.M. MONDAY THROUGH FRIDAY UNLESS OTHERWISE DIRECTED BY THE TOWN.
3. OTHER WORK RESTRICTIONS WILL BE DETERMINED FOLLOWING REGULATOR CONSULTATIONS.

REGULATORY REQUIREMENTS

1. WITHIN LOCAL RIGHTS-OF-WAY, PERFORM THE WORK IN ACCORDANCE WITH LOCAL MUNICIPAL STANDARDS AND, AS APPLICABLE, IN ACCORDANCE WITH THE LATEST EDITION OF THE DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS AND ISSUED REVISIONS/SUPPLEMENTS (FORM 818).
2. PROVIDE TRAFFIC SIGNAGE AND PAVEMENT MARKINGS IN CONFORMANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
3. BE RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. PERFORM CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
4. DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES AND STATUTES.
5. THE RINGS END DAM HAS A FISHWAY THAT PASSES ANADROMOUS ALEWIFE UPSTREAM INTO GORHAMS POND. TO PROTECT THESE FISH DURING THEIR SPRING SPAWNING MIGRATION, ALL IN-WATER WORK IS PROHIBITED FROM APRIL 1 TO JUNE 30, INCLUSIVE. THIS PROHIBITION INCLUDES THE INSTALLATION AND REMOVAL OF COFFERDAMS.

EROSION AND SEDIMENT CONTROL

1. INSTALL EROSION CONTROL MEASURES PRIOR TO STARTING ANY WORK ON THE SITE. REFER TO SHEET CE-101.
2. IMPLEMENT ALL NECESSARY MEASURES REQUIRED TO CONTROL STORMWATER RUNOFF, DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE. PERFORM CORRECTIVE ACTION AS NEEDED FOR EROSION CLEANUP AND REPAIRS TO OFF SITE AREAS, IF ANY, AT NO COST TO OWNER.
3. INSPECT AND MAINTAIN EROSION CONTROL MEASURES PER THE SCHEDULE IN THE EROSION AND SEDIMENT CONTROL DRAWINGS. DISPOSE OF SEDIMENT IN AN UPLAND AREA. DO NOT ENCUMBER DRAINAGE STRUCTURES AND PROTECTED AREAS.
4. PERFORM CONSTRUCTION SEQUENCING IN SUCH A MANNER TO CONTROL EROSION AND TO MINIMIZE THE TIME THAT EARTH MATERIALS ARE EXPOSED BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED.
5. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, REMOVE AND DISPOSE OF TEMPORARY EROSION CONTROL MEASURES. CLEAN SEDIMENT AND DEBRIS FROM TEMPORARY MEASURES AND FROM PERMANENT STORM DRAIN SYSTEMS.

DEMOLITION

REFER TO DEMOLITION NOTES ON SHEET CP-101.

CONSTRUCTION LAYOUT

1. PROVIDE PROPER TRANSITIONS BETWEEN EXISTING AND PROPOSED SITE IMPROVEMENTS. FIELD VERIFY EXISTING HARDSCAPED SURFACED (E.G. PAVEMENT, CONCRETE, ETC.) AND GROUND ELEVATIONS AT THE INTERFACE WITH PROPOSED IMPROVEMENTS BEFORE START OF CONSTRUCTION.
2. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, FIELD VERIFY PROPOSED UTILITY ROUTES AND IDENTIFY ANY INTERFERENCES OR OBSTRUCTIONS WITH EXISTING UTILITIES OR PUBLIC RIGHTS-OF-WAY.
3. IMMEDIATELY INFORM THE ENGINEER IN WRITING IF EXISTING UTILITY CONDITIONS CONFLICT OR DIFFER FROM THAT INDICATED AND IF THE WORK CANNOT BE COMPLETED AS INDICATED.
4. BOUNDS OR MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A PROFESSIONAL LICENSED SURVEYOR.

EARTHWORK

1. NOTIFY UTILITY LOCATOR SERVICE AT LEAST 72 HOURS BEFORE STARTING EXCAVATION: "CALL BEFORE YOU DIG" AT 1-800-922-4455.
2. STOP WORK IN THE VICINITY OF SUSPECTED CONTAMINATED SOIL, GROUNDWATER OR OTHER MEDIA. IMMEDIATELY NOTIFY THE OWNER SO THAT APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN. RESUME WORK IN THE IMMEDIATE VICINITY ONLY UPON DIRECTION BY THE OWNER.

UTILITIES

3. THE TYPE, SIZE AND LOCATION OF DEPICTED UNDERGROUND UTILITIES ARE APPROXIMATE REPRESENTATIONS OF INFORMATION OBTAINED FROM FIELD LOCATIONS OF VISIBLE FEATURES, EXISTING MAPS AND PLANS OF RECORD, UTILITY MAPPING, AND OTHER SOURCES OF INFORMATION OBTAINED BY THE ENGINEER. ASSUME NO GUARANTEE AS TO THE COMPLETENESS, SERVICEABILITY, EXISTENCE, OR ACCURACY OF UNDERGROUND FACILITIES.

PAVEMENT

1. AT A MINIMUM, CONSTRUCT ACCESSIBLE ROUTES, PARKING SPACES, RAMPS, SIDEWALKS AND WALKWAYS IN CONFORMANCE WITH THE FEDERAL AMERICANS WITH DISABILITIES ACT AND WITH STATE AND LOCAL LAWS AND REGULATIONS (WHICHEVER ARE MORE STRINGENT).

SITE RESTORATION

1. PROVIDE 6 INCHES OF TOPSOIL AND SEED TO AREAS DISTURBED DURING CONSTRUCTION AND NOT DESIGNATED TO BE RESTORED WITH IMPERVIOUS SURFACES (BUILDINGS, PAVEMENTS, WALKS, ETC.) UNLESS OTHERWISE NOTED.
2. REPAIR DAMAGES RESULTING FROM CONSTRUCTION LOADS, AT NO ADDITIONAL COST TO OWNER.
3. RESTORE AREAS DISTURBED BY CONSTRUCTION OPERATIONS TO THEIR ORIGINAL CONDITION OR BETTER, AT NO ADDITIONAL COST TO OWNER.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE: HORZ.:
VERT.:
DATUM: HORZ.:
VERT.:
0 GRAPHIC SCALE

RUSS&O'NEILL
146 HARTFORD ROAD
MANCHESTER, CONNECTICUT 06040
860.646.2469
www.russoneill.com

TOWN OF DARIEN

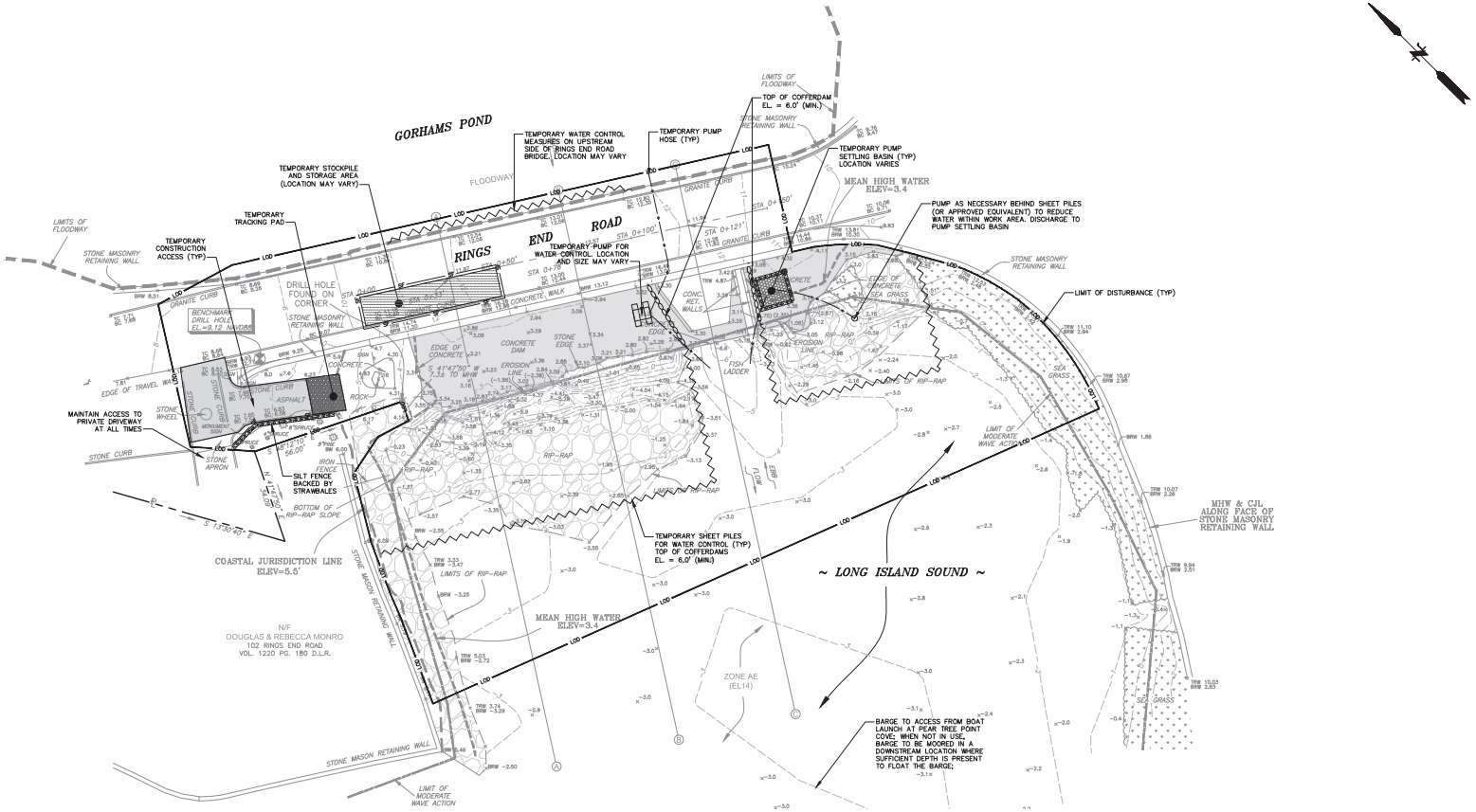
GENERAL NOTES & INFORMATION

RINGS END DAM EMERGENCY REPAIRS

RINGS END ROAD DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: FEBRUARY 20, 2023

GI-002



LEGEND

- LOD — LIMIT OF DISTURBANCE
- SF — SILT FENCE
- STRAWBALES
- SC — TURBIDITY CURTAIN
- WATER CONTROL (SHEET PILES OR APPROVED EQUAL)
- WATER CONTROL (SANDBAGS OR APPROVED EQUAL)
- STONE TRACKING PAD
- STORAGE AND STOCKPILE AREA
- PUMP SETTLING BASIN

WATER CONTROL NOTES

1. CONTRACTOR TO PROVIDE A WATER CONTROL PLAN DEVELOPED BY A PROFESSIONAL ENGINEER FOR SUBMISSION TO THE ENGINEER FOR APPROVAL PRIOR TO INITIATION OF CONSTRUCTION.
2. THE CONTRACTOR MAY ELECT TO PERFORM THE WORK USING ADDITIONAL STAGES OF WATER CONTROL THAT VARY FROM THOSE DEPICTED HEREIN. WATER CONTROL MEETING THE REQUIREMENTS OF THESE PLANS SHALL BE MAINTAINED DURING ALL STAGES OF CONSTRUCTION.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING AND PROVIDING FULLY ADEQUATE PASSAGE OF BASE STREAM FLOWS AT ALL TIMES DURING CONSTRUCTION, AND SHALL IMPLEMENT PROVISIONS, AS REQUIRED, TO PROVIDE FULLY ADEQUATE PASSAGE OF THE TEMPORARY DESIGN STORM.
4. ONE BRIDGE BAY SHALL BE LEFT FULLY UNOBSTRUCTED AT ALL TIMES.
5. CONTRACTOR IS RESPONSIBLE FOR OBSERVING TIDAL ELEVATIONS AND ADJUSTING THE WATER CONTROL MEASURES ACCORDINGLY TO KEEP THE WORK AREA DRY (TO THE EXTENT POSSIBLE).
6. THE WATER LEVEL IN THE UPSTREAM IMPOUNDMENT WILL BE LOWERED NO LOWER THAN APPROXIMATELY 3' BELOW THE SPILLWAY CREST.

HYDRAULIC DATA GOODWIVES RIVER & STONY BROOK	
DRAINAGE AREA	6 SQ MI
DESIGN STORM FREQUENCY	2 YR
DESIGN DISCHARGE	490 CFS

TIDAL DATA*	
CJL (NAVD88)	5.5 FT
MHW (NAVD88)	3.4 FT
MLW (NAVD88)	−3.7 FT
HTL (NAVD88)	5.2 FT

*TIDAL INFORMATION OBTAINED FROM THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS "RESOURCES FOR TIDAL AND NAVIGABLE WATERS IN CONNECTICUT" DATED OCTOBER 15, 2012

EROSION & SEDIMENTATION CONTROL NOTES

1. **CONSTRUCTION STANDARDS** – CONSTRUCT ALL EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE MOST RECENT EDITION OF THE "CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL" (CT DEP BULLETIN 34). ALL MEASURES SHALL BE MAINTAINED AND UPGRADED TO ACHIEVE PROPER SEDIMENT CONTROL DURING CONSTRUCTION.

2. **PLAN IMPLEMENTATION** – IMPLEMENT THIS EROSION AND SEDIMENT CONTROL PLAN. THIS IMPLEMENTATION INCLUDES THE INSTALLATION AND MAINTENANCE OF CONTROL MEASURES UNTIL PERMANENT STABILIZATION IS ACHIEVED, INFORMING ALL SUBCONTRACTORS OF THE REQUIREMENTS AND OBJECTIVES OF THE PLAN, AND NOTIFYING THE PROPER MUNICIPAL AGENCY OF ANY TRANSFER OF THIS RESPONSIBILITY. THE OWNER SHALL BE RESPONSIBLE FOR CONVEYING A COPY OF THE EROSION AND SEDIMENT CONTROL PLAN TO THE NEW OWNER IF THE TITLE OF THE LAND IS TRANSFERRED PRIOR TO ACHIEVING PERMANENT STABILIZATION.

3. **INSTALLATION SCHEDULE** – INSTALL THE CONSTRUCTION ENTRANCE BEFORE CONSTRUCTION TRAFFIC INTO AND OUT OF THE PROJECT AREA BEGINS. INSTALL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO CONSTRUCTION. INSTALL ADDITIONAL CONTROL MEASURES DURING THE CONSTRUCTION PERIOD, IF DEEMED NECESSARY BY THE OWNER, HIS AGENTS OR AGENTS OF THE MUNICIPALITY.

4. **FUGITIVE DUST** – CONTROL FUGITIVE DUST USING WATER SPRAYS OR CALCIUM CHLORIDE ON SOIL SURFACES, SWEEPING PAVED AREAS, TEMPORARY WINDBREAKS OR NON-ASPHALTIC SOIL TACKIFIERS.

5. **STRAW BALE LIFE SPAN** – INSTALL STRAW BALES WHERE PROTECTION AND EFFECTIVENESS IS REQUIRED FOR LESS THAN 90 DAYS. OTHERWISE, INSTALL SILT FENCE.

6. **CATCH BASINS** – IF APPLICABLE, PROTECT CATCH BASINS WITH PROPER CONTROLS THROUGHOUT THE CONSTRUCTION PERIOD UNTIL ALL DISTURBED AREAS ARE PERMANENTLY STABILIZED.

7. **STOCKPILES** – ENCIRCLE STOCKPILES OF ERODIBLE SOIL WITH A STRAW BALE OR SILT FENCE BARRIER. THE SIDE SLOPES OF ERODIBLE STOCKPILED MATERIAL SHALL BE NO STEEPER THAN 2:1. STOCKPILES THAT ARE NOT TO BE USED WITHIN 30 DAYS SHALL BE SEEDED AND MULCHED IMMEDIATELY AFTER THEY ARE FORMED.

8. **TOE OF SLOPE** – ESTABLISH AN EROSION CONTROL BARRIER (SILT FENCE OR STRAW BALE BARRIER) APPROXIMATELY 5 TO 10 FEET FROM THE PROPOSED TOE OF THE CUT OR FILL AREA PRIOR TO BEGINNING EARTHWORK UNLESS WITHIN THE WORK AREAS CONFINED BY SHEET PILES.

9. **SEDIMENT REMOVAL** – SEDIMENT REACHING ½ THE HEIGHT OF THE EROSION CONTROL BARRIER SHALL BE REMOVED. REMOVE AND DISPOSE OF SEDIMENT IN A MANNER CONSISTENT WITH THE INTENT OF THE PLAN.

10. **SOIL STABILIZATION SCHEDULE** – APPLY PERMANENT SOIL STABILIZATION MEASURES TO ALL GRADED AREAS WITHIN 7 DAYS OF ESTABLISHING FINAL GRADE.

11. **PERMANENT SEEDING** – SEED PERMANENT LAWN AREAS IN ACCORDANCE WITH THE SPECIFICATIONS.

12. **INSPECTION** – THE OWNER SHALL SECURE THE SERVICES OF A SOIL SCIENTIST OR PROFESSIONAL ENGINEER TO VERIFY IN THE FIELD THAT THE CONTROLS REQUIRED BY THIS PLAN ARE PROPERLY INSTALLED AND MAINTAINED DURING CONSTRUCTION OR FOLLOWING A STORM EVENT.

No.	DATE	DESCRIPTION	DESIGNER REVIEWER

SCALE: HORZ.: 1"= 20'
VERT.:
DATUM: HORZ.: NAD83
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GRAPHIC SCALE 20 0 20 40

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TOWN OF DARIEN
EROSION, SEDIMENTATION, AND WATER CONTROL PLAN
RINGS END DAM EMERGENCY REPAIRS
RINGS END ROAD
DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: FEBRUARY 20, 2023

CE-101

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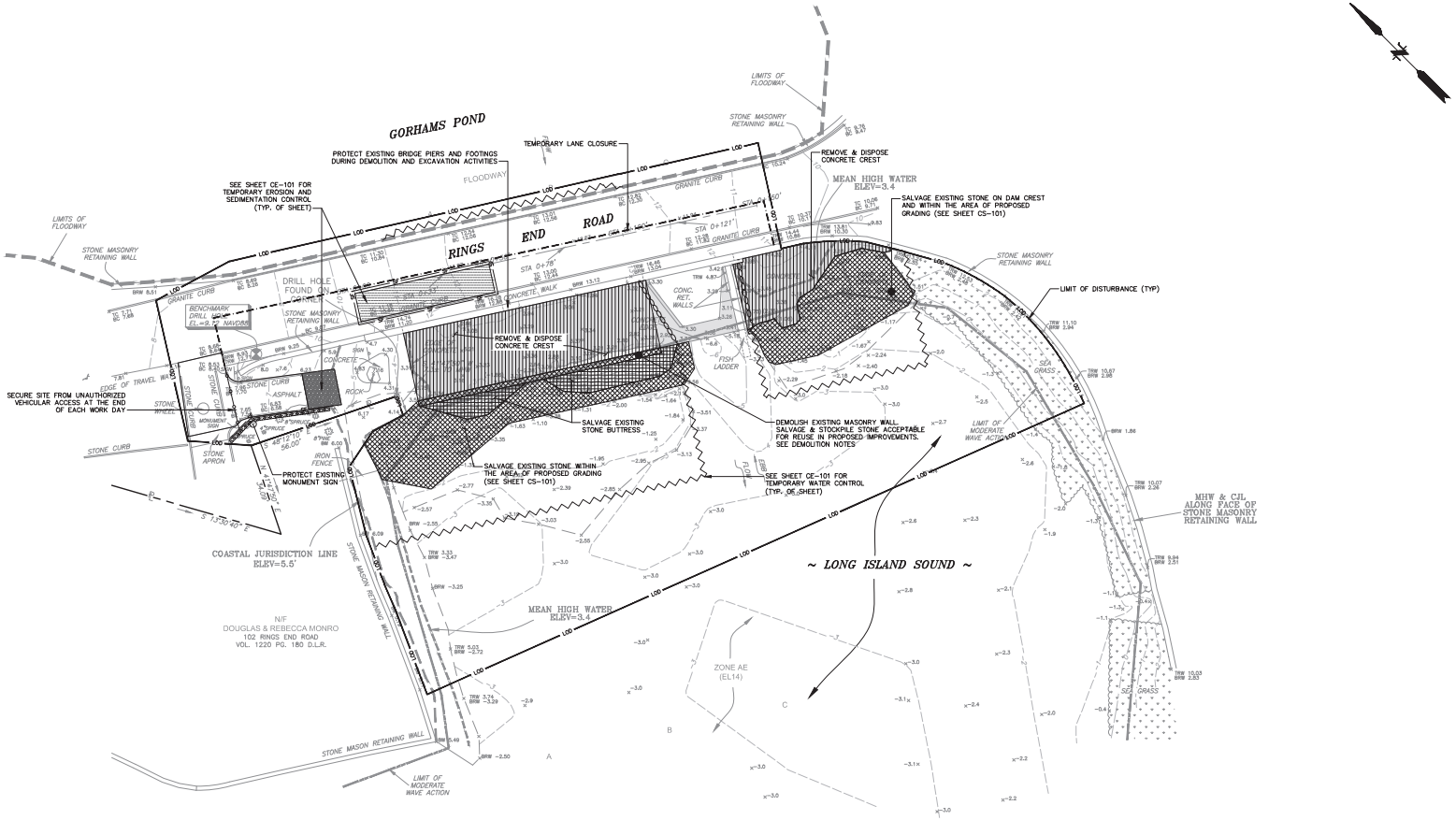

LEGEND

- LOD — LIMIT OF DISTURBANCE
- SF — SILT FENCE
- STRAWBALES
- SC — TURBIDITY CURTAIN
- WATER CONTROL (SHEET PILES OR APPROVED EQUAL)
- WATER CONTROL (SANDBAGS OR APPROVED EQUAL)
- TEMPORARY SITE SECURITY FENCING
- STONE TRACKING PAD
- STORAGE AND STOCKPILE AREA
- DEMOLITION AREA
- SALVAGED MATERIAL AREA

No.	DATE	DESCRIPTION	DESIGNER REVIEWER

SCALE: HORZ.: 1"= 20'
VERT.:
DATUM: HORZ.: NAD83
VERT.: NAVD88

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TOWN OF DARIEN
DEMOLITION & SITE PREPARATION PLAN
RINGS END DAM EMERGENCY REPAIRS
RINGS END ROAD
DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: FEBRUARY 20, 2023

CP-101

File: J:\DWG\P2020\09211B11\Civil\Plan\20200921B11_DEM01.dwg, Layout: CP-101 Plotted: 2023-06-02 12:51 PM Saved: 2023-01-27 2:05 PM User: SCrespo
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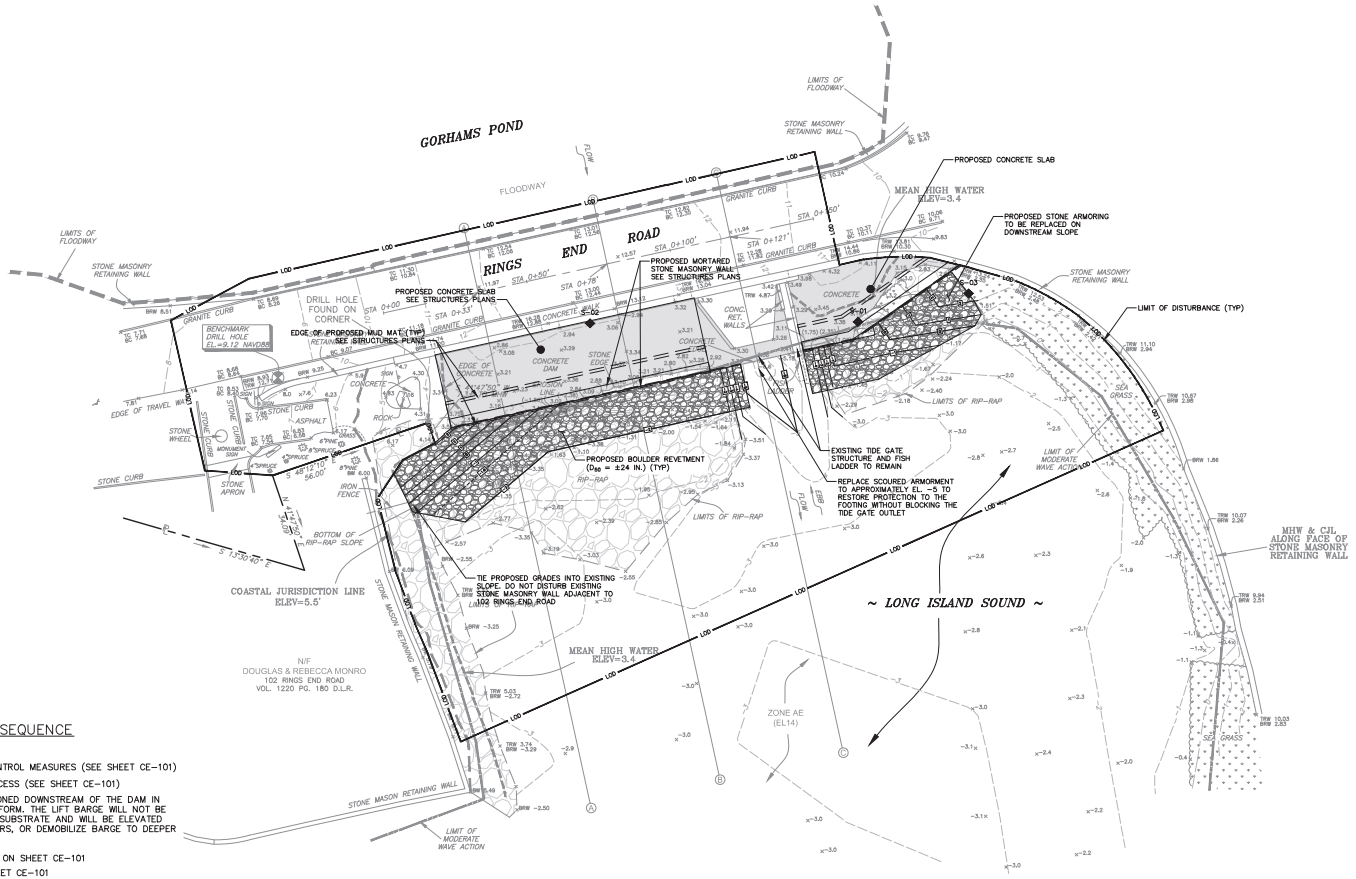

SUGGESTED CONSTRUCTION SEQUENCE

1. MOBILIZE TO SITE
2. PROVIDE EROSION & SEDIMENTATION CONTROL MEASURES (SEE SHEET CE-101)
3. PROVIDE TEMPORARY CONSTRUCTION ACCESS (SEE SHEET CE-101)
   - 3.1. NOTE: A LIFT BARGE MAY BE STATIONED DOWNSTREAM OF THE DAM IN ORDER TO CREATE A WORKING PLATFORM. THE LIFT BARGE WILL NOT BE ALLOWED TO REST ON THE BOTTOM SUBSTRATE AND WILL BE ELEVATED ABOVE THE BOTTOM USING SPUD BARS, OR DEMOBILIZE BARGE TO DEEPER WATER AS THE TIDE RECEDES.
4. PROVIDE WATER CONTROL AS INDICATED ON SHEET CE-101
   - 4.1. SEE WATER CONTROL NOTES ON SHEET CE-101
   - 4.2. PROVIDE SHORING AT THE LIMITS OF THE TIDE GATE STRUCTURE TO PROTECT THE TIDE GATE FOOTING.
5. DEMOLISH EXISTING SITE FEATURES AS INDICATED ON SHEET CP-101
   - 5.1. SALVAGE EXISTING MASONRY. STONES OF AN ADEQUATE SIZE, AS DIRECTED IN THE FIELD AND APPROVED BY THE ENGINEER, MAY BE SAVED AND REUSED FOR THE MORTARED STONE MASONRY WALL CONSTRUCTION. STONES SMALLER THAN ADEQUATE SIZE MAY BE REUSED ON SITE AT THE DISCRETION OF THE ENGINEER, OR RELOCATED TO ANOTHER LOCATION WITHIN THE TOWN FOR STORAGE AT THE REQUEST OF THE TOWN.
   - 5.2. PROTECT AND MAINTAIN FLOW THROUGH EXISTING TIDE GATE STRUCTURE AND FISH LADDER STRUCTURE AT ALL TIMES DURING CONSTRUCTION
6. EXCAVATE AS SHOWN WITHIN THE GRADING LIMITS FOR INSTALLATION OF PROPOSED SITE IMPROVEMENTS
7. PROVIDE PROPOSED STRUCTURE (SEE SHEETS STR-101 & STR-102):
   - 7.1. PROVIDE TEMPORARY SHORING AS NECESSARY FOR CONSTRUCTION OF PROPOSED SITE IMPROVEMENTS
   - 7.2. INSTALL MUD MAT FOR PROPOSED MORTARED STONE MASONRY WALLS
   - 7.3. INSTALL PROPOSED MORTARED STONE MASONRY WALLS
   - 7.4. INSTALL PROPOSED CONCRETE CUTOFF WALL
   - 7.5. BACKFILL BEHIND WALL WITH APPROVED MATERIAL
   - 7.6. INSTALL PROPOSED CONCRETE SLAB WITH WATERPROOFING MEMBRANE ON THE DAM CREST
8. INSTALL STONE REVETMENT AS INDICATED ON THE PLANS
   - 8.1. SEE DETAIL SHEET CD-502
9. PERFORM SITE GRADING TO PROPOSED GRADES SHOWN THIS SHEET
10. REMOVE WATER CONTROL MEASURES
11. REMOVE EROSION & SEDIMENTATION CONTROL MEASURES
12. RESTORE ALL OTHER AREAS DISTURBED BY CONSTRUCTION ACTIVITIES TO ORIGINAL OR IMPROVED CONDITION
13. DEMOBILIZE FROM SITE

LEGEND

- LOD — LIMIT OF DISTURBANCE
- EDGE OF PROPOSED MUD MAT
- PROPOSED MORTARED STONE MASONRY WALL
- 100 — PROPOSED CONTOUR
- PROPOSED RIPRAP/BOULDER REVETMENT (TYP.)
- S-01 — SOIL SAMPLE LOCATION

NOTES:

1. THE CONSTRUCTION SEQUENCE SHOWN IS A SUGGESTED CONCEPT THAT IS CONSIDERED FEASIBLE FOR PERFORMING THE WORK. THIS SHEET IS INTENDED TO PROVIDE INFORMATION PERTINENT FOR THE DEVELOPMENT OF THE CONTRACTOR'S DETAILED CONSTRUCTION SEQUENCE.
2. THE CONTRACTOR SHALL EVALUATE SITE CONDITIONS AND SUBMIT A DETAILED CONSTRUCTION SEQUENCE, CONSISTING OF PLANS AND NARRATIVE, IN CONFORMANCE WITH THE CONTRACT REQUIREMENTS, FOR THE ENGINEER'S REVIEW. NO WORK SHALL BE PERFORMED PRIOR TO THE ENGINEER'S REVIEW AND ACCEPTANCE OF THE CONTRACTOR'S DETAILED CONSTRUCTION SEQUENCE.

No.	DATE	DESCRIPTION	DESIGNER/REVIEWER

SCALE: HORZ.: 1"= 20'
VERT.:
DATUM: HORZ.: NAD83
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TOWN OF DARIEN
PROPOSED SITE PLAN
RINGS END DAM EMERGENCY REPAIRS
RINGS END ROAD
DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: FEBRUARY 20, 2023

CS-101

File: J:\DWG\P2020\09\21\B11\Civil\Plan\20200921B11_STP01.dwg Layout: CS-101 Plotted: 2023-06-02 12:51 PM Saved: 2023-03-09 4:20 PM User: SKing
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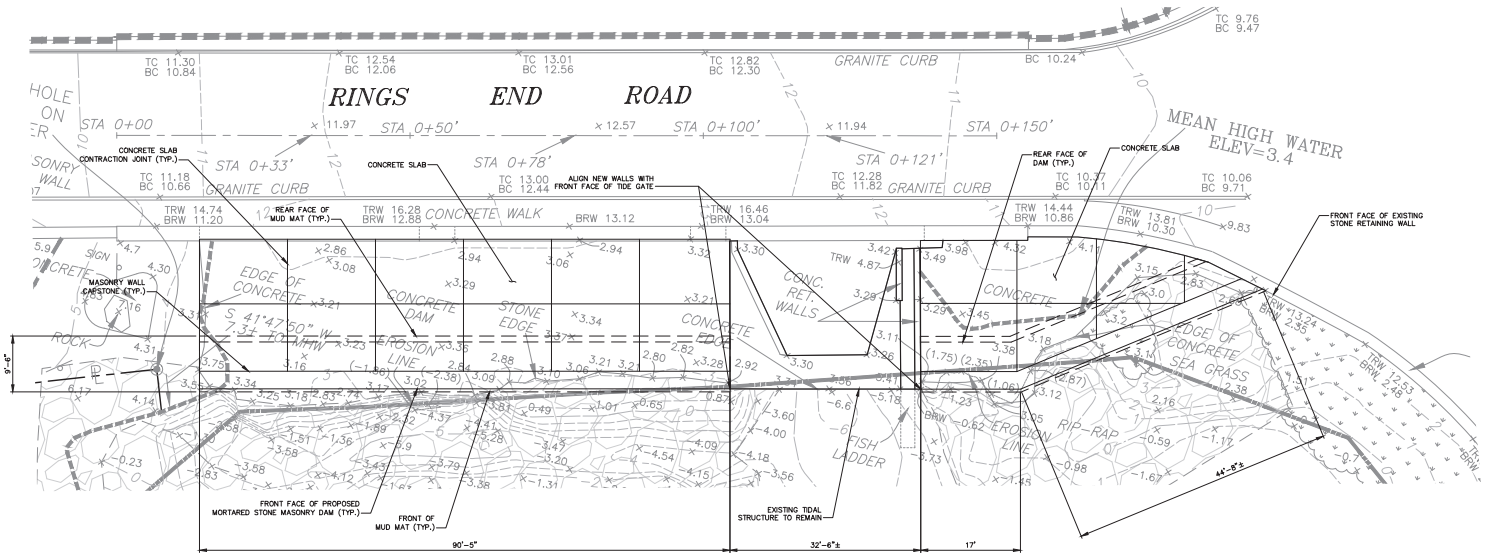
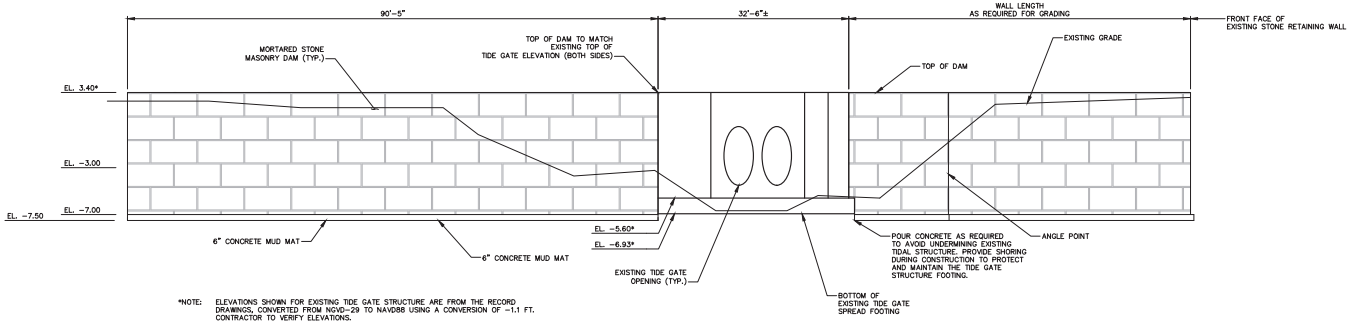


PLAN
1" = 10'-0"



*NOTE: ELEVATIONS SHOWN FOR EXISTING TIDE GATE STRUCTURE ARE FROM THE RECORD DRAWINGS, CONVERTED FROM NGVD-29 TO NAVD88 USING A CONVERSION OF -1.1 FT. CONTRACTOR TO VERIFY ELEVATIONS.

ELEVATION
1" = 10'-0" (H)
1" = 5'-0" (V)

No.	DATE	DESCRIPTION	DESIGNER REVIEWER

SCALE: HORZ.: 1"= 20'
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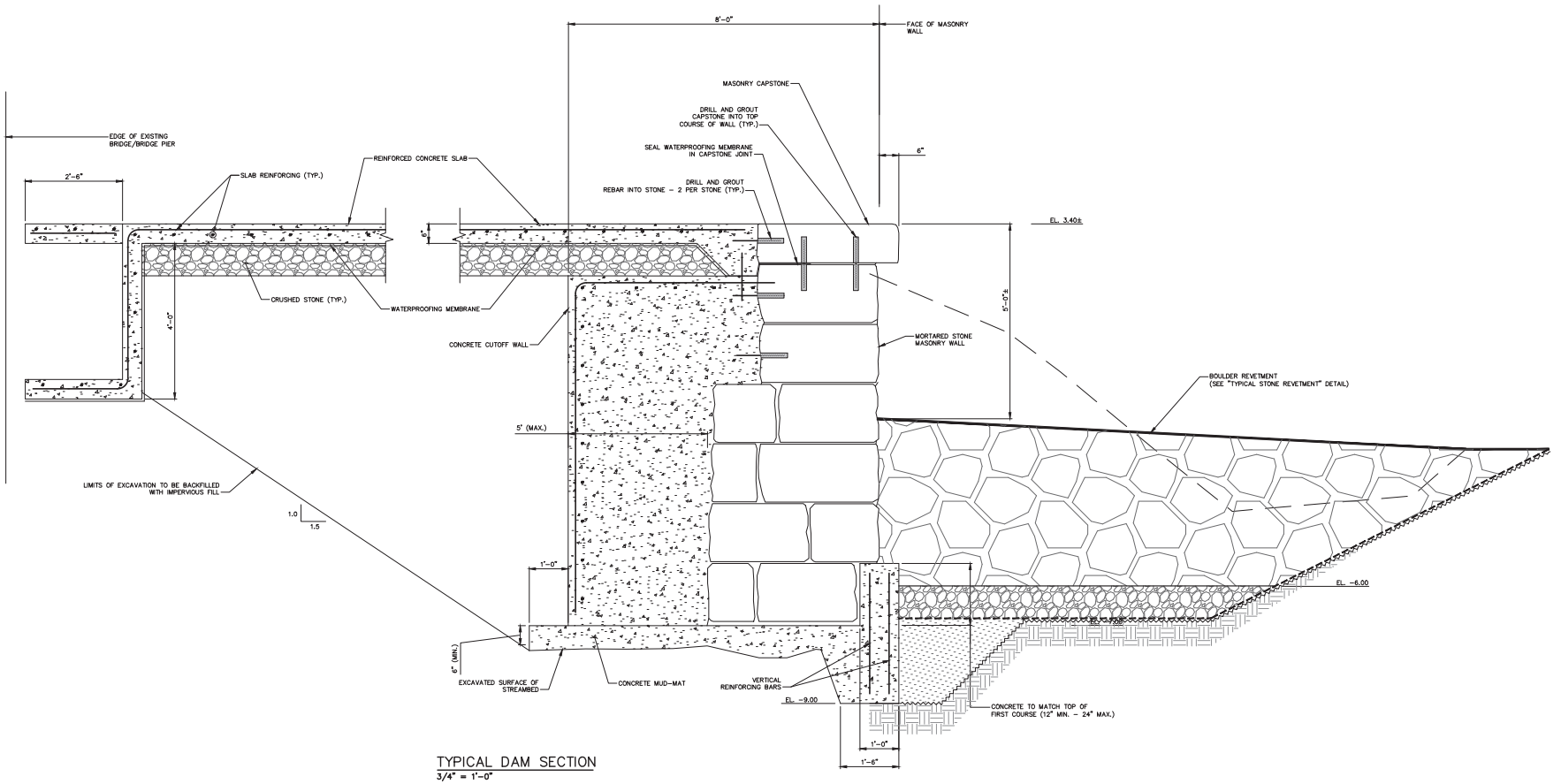
TOWN OF DARIEN
STRUCTURE PLAN & ELEVATION
RINGS END DAM EMERGENCY REPAIRS
RINGS END ROAD
DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: FEBRUARY 20, 2023

STR-101



TYPICAL DAM SECTION
3/4" = 1'-0"

No.	DATE	DESCRIPTION	DESIGNER REVIEWER

SCALE: HORZ.: 1"= 20'
VERT.:
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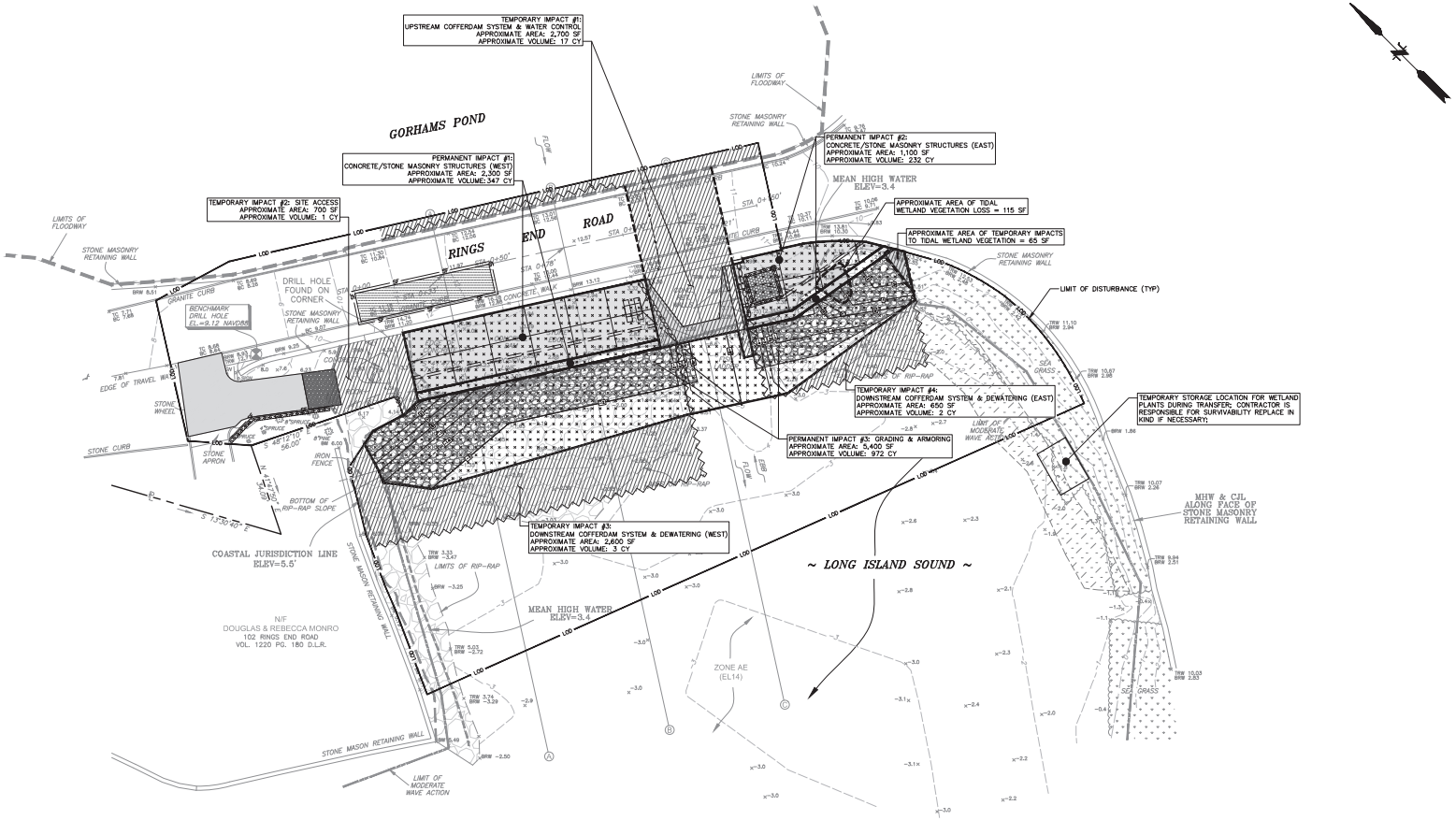
TOWN OF DARIEN
STRUCTURE PLAN & ELEVATION
RINGS END DAM EMERGENCY REPAIRS
RINGS END ROAD
DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: FEBRUARY 20, 2023

STR-102

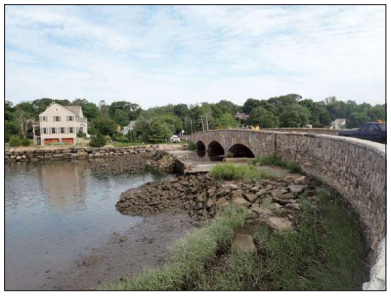


LEGEND

- LOD — LIMIT OF DISTURBANCE
- PERMANENT IMPACT AREA
- TEMPORARY IMPACT AREA
- APPROXIMATE LIMIT OF INTERTIDAL MUD FLATS

TIDAL DATA*	
CJL (NAVD88)	5.5 FT
MHW (NAVD88)	3.4 FT
MLW (NAVD88)	−3.8 FT
HTL (NAVD88)	5.2 FT

1 OVERVIEW OF DAM FROM LEFT
SEPTEMBER 2007



2 OVERVIEW OF DAM FROM LEFT
JULY 2022

MAP REFERENCE
1.TIDAL INFORMATION OBTAINED FROM THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS "RESOURCES FOR TIDAL AND NAVIGABLE WATERS IN CONNECTICUT" DATED OCTOBER, 15, 2012.
2.THE "APPROXIMATE LIMIT OF INTERTIDAL MUD FLATS" DELINEATED WAS REFERENCED FROM THE ENV. RESOURCES AND PROPOSED DISTURBANCE LIMITS SHEET.

No.	DATE	DESCRIPTION	DESIGNER REVIEWER

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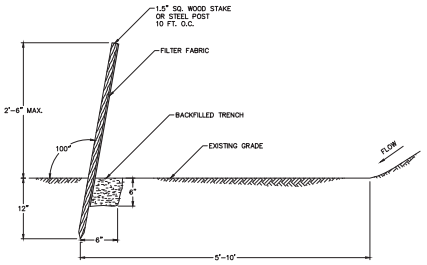
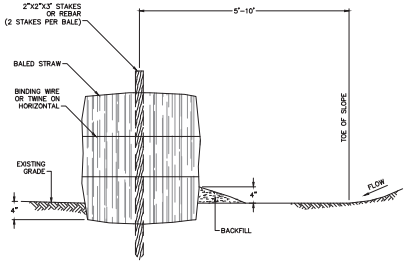
TOWN OF DARIEN
RESOURCE AREA IMPACT PLAN
RINGS END DAM EMERGENCY REPAIRS
RINGS END ROAD
DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: FEBRUARY 20, 2023

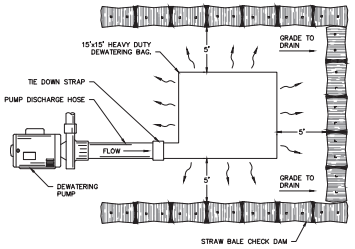
WET-01



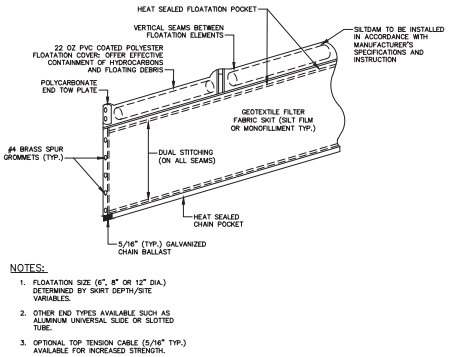
SILT FENCE
NOT TO SCALE



TOE OF SLOPE STRAW BALE BARRIER
NOT TO SCALE



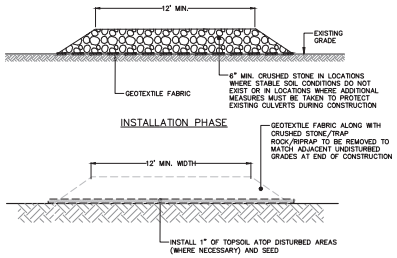
DEWATERING BAG
NOT TO SCALE



NOTES:

1. FLOATATION SIZE (6", 8" OR 12" DIA.) DETERMINED BY SKIRT DEPTH/SITE VARIABLES.
2. OTHER END TYPES AVAILABLE SUCH AS ALUMINUM UNIVERSAL SLIDE OR SLOTTED TUBE.
3. OPTIONAL TOP TENSION CABLE (5/16" TYP.) AVAILABLE FOR INCREASED STRENGTH.

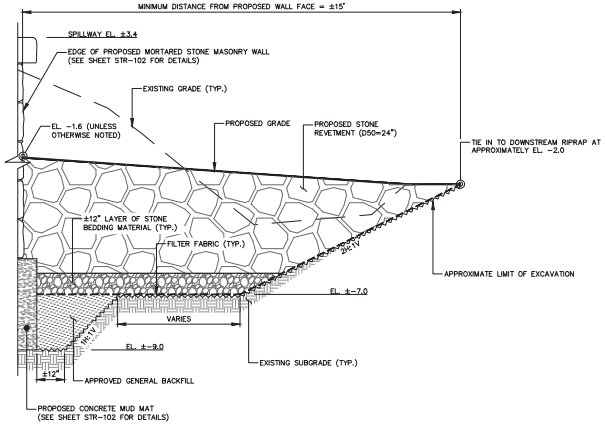
SILTDAM FLOATING TURBIDITY BARRIER
NOT TO SCALE



NOTES:

1. PLACE ADDITIONAL CRUSHED STONE AS REQUIRED THROUGHOUT CONSTRUCTION TO MAINTAIN STABLE ACCESS IN LOCATIONS ALONG ACCESSED WHERE STABLE SOILS DO NOT EXIST OR IN LOCATIONS WHERE ADDITIONAL MEASURES MUST BE TAKEN TO PROTECT EXISTING FEATURES DURING CONSTRUCTION.
2. FOR WET AREAS, CONTRACTOR SHALL FURNISH AND PLACE ADDITIONAL MEASURES (E.G., SWAMP MATS, GEOGRID, GEOTEXTILE FABRIC, TRAP ROCK/RIPRAP, ADDITIONAL STONE, ETC.) AS REQUIRED TO MAINTAIN STABLE ACCESS FOR CONSTRUCTION EQUIPMENT AND VEHICLES REQUIRED TO COMPLETE WORK.
3. IN SUCH LOCATIONS WHERE ADDITIONAL CRUSHED STONE, TRAP ROCK/RIPRAP, ETC., IS REQUIRED, INSTALL MATERIALS ATOP GEOTEXTILE FILTER FABRIC TO FACILITATE THE REMOVAL OF THIS MATERIAL PRIOR TO RESTORATION ACTIVITIES.
4. AT END OF CONSTRUCTION AND PRIOR TO RESTORATION, REMOVE ALL GEOTEXTILE FILTER FABRIC AND STONE (I.E. THAT ABOVE ADJACENT EXISTING GROUND ELEVATION). TOP DRESS AREA WITH TOPSOIL (AS REQUIRED) AND SEED TO ESTABLISH GRASS VEGETATION.
5. CONTRACTOR SHALL PREPARE AND SUBMIT A DETAILED CONSTRUCTION ACCESS AND MAINTENANCE PLAN INDICATING PHASING, VEHICLES/EQUIPMENT, LOCATIONS AND TYPES OF MATERIALS TO BE EMPLOYED TO CREATE AND MAINTAIN STABLE ACCESS THROUGHOUT CONSTRUCTION WHILE AVOIDING IMPACTS TO EXISTING BURIED UTILITIES AND ASSURING CONTINUED ACCESS BY OWNER TO ALL SITE FACILITIES.

TEMPORARY CONSTRUCTION ACCESS ROUTE
NOT TO SCALE



TYPICAL STONE REVETMENT
NOT TO SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE: HORZ.: NOT TO SCALE
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TOWN OF DARIEN

DETAILS

RINGS END DAM EMERGENCY REPAIRS

RINGS END ROAD

DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: FEBRUARY 20, 2023

CD-501

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

Bureau of Water Protection & Land Reuse
Land & Water Resources Division

79 Elm Street • Hartford, CT 06106-5127 portal.ct.gov/DEEP Affirmative Action/Equal Opportunity Employer

Land Record Filing*

To: DO NOT FILE

Signature and

NOTE: Due to the electronic delivery of this license and the legal requirement to have a live signature on this document, the "Land Record Filing" as detailed in General Condition #1 will be sent to the Licensee via U.S. Mail for the Licensee to file with the city/town clerk.

~~**Date:**~~

~~**Subject:**~~ _____

~~License # _____~~

If you have any questions pertaining to this matter, please contact the Land & Water Resources Division at 860-424-3019.

~~Return to:~~

~~Land & Water Resources Division~~
~~State of Connecticut~~
~~Department of Energy & Environmental Protection~~
~~79 Elm Street~~
~~Hartford, CT 06106-5127~~

*The Licensee shall file the Land Record Filing on the land records of the municipality in which the subject property is located not later than thirty (30) days after license issuance pursuant to Connecticut General Statutes (CGS) Section 22a-363g. A copy of the Notice with a stamp or other such proof of filing with the municipality shall be submitted to the Commissioner no later than sixty (60) days after license issuance.

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

Bureau of Water Protection & Land Reuse
Land & Water Resources Division

79 Elm Street • Hartford, CT 06106-5127 portal.ct.gov/DEEP Affirmative Action/Equal Opportunity Employer

LWRD Work Commencement Form

To: DEEP.LWRDRegulatory@ct.gov or
Regulatory Section
Department of Energy and Environmental Protection
Land & Water Resources Division
79 Elm Street
Hartford, CT 06106-5127

Licensee Name: __Town of Darien_____
Municipality in which the project is occurring: __Darien_____
DEEP License No(s):_____202302334-COP_____

CONTRACTOR(s):

1 Name: _____
Address: _____
Telephone:_____
E-mail: _____

2 Name: _____
Address: _____
Telephone:_____
E-mail: _____

3 Name: _____
Address: _____
Telephone:_____
E-mail: _____

Date Contractor(s) received a copy
of the license and approved plans: _____

EXPECTED DATE OF COMMENCEMENT OF WORK: _____

EXPECTED DATE OF COMPLETION OF WORK: _____

LICENSEE: _____ _____
(Signature) (Date)

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 portal.ct.gov/DEEP Affirmative Action/Equal Opportunity Employer

Compliance Certification Form

The following certification must be signed by the licensee working in consultation with a Connecticut-licensed design professional and must be submitted to the address indicated at the end of this form within ninety (90) days of completion of the authorized work.

1. Licensee Name: ___Town of Darien_____

   DEEP License Number(s):_____202302334-COP _____

   Municipality in which project is occurring:____Darien_____

2. **Check one:**

   (a) ☐

   (b) ☐

3. "I understand that any false statement in this certification is punishable as a criminal offence under section 53a-157b of the General Statutes and under any other applicable law."

_____ _____
Signature of Licensee Date

_____
Name of Licensee (print or type)

_____ _____
Signature of CT-Licensed Design Professional Date

_____
Name of CT-Licensed Design Professional (print or type)

_____
Professional License Number (if applicable)

Affix Stamp Here

- As-built plans shall include: elevations or tidal datums, as applicable, and structures, including any proposed elevation views and cross sections included in the approved license plans. Such as-built plans shall be the original ones and be signed and sealed by an engineer, surveyor or architect, as applicable, who is licensed in the State of Connecticut.
- The Licensee will be notified by staff of the Land and Water Resources Division (LWRD) if further compliance review is necessary. Lack of response by LWRD staff does not imply compliance.

Submit this completed form to :
DEEP.LWRDRegulatory@ct.gov or
Regulatory Section
Department of Energy and Environmental Protection
Land & Water Resources Division
79 Elm Street
Hartford, CT 06106-5127

Peyton Debowsky

From: Kotelly, Kevin R CIV USARMY CENAE (USA) <Kevin.R.Kotelly@usace.army.mil>
Sent: Thursday, August 10, 2023 12:12 PM
To: Lynn Rae
Cc: Oustafine, Darren; Elsa Loehmann; Kristin Connell
Subject: NAE-2023-01603 Rings End/Gorham Pond Emergency Dam Repair, Town of Darien
Attachments: Connecticut General Permit 2021.pdf; 202302334-COP License Signed.pdf

Ms. Rae and Loehmann, per our call this morning, the Corps of Engineers assigned this file #NAE-2023-01603. It requires a PCN of CTGP2. Given the emergency condition and risk of failure of the dam as a result of damages from Hurricane Ida, the work can proceed immediately under the terms and conditions of the CT General Permit and the CTDEEP Certificate of Permission issued June 12, 2023. The Corps of Engineers will review the permit application and issue our permit decision after-the-fact, if construction is already complete. Regards,

Kevin R. Kotelly, P.E.
Chief, CT/RI Section
US Army Corps of Engineers
696 Virginia Road
Concord, Massachusetts 01742-2751
Tel 978-318-8703
Cell 978-578-6406
kevin.r.kotelly@usace.army.mil

From: Lynn Rae <LRae@fando.com>
Sent: Tuesday, August 1, 2023 9:39 AM
To: Kotelly, Kevin R CIV USARMY CENAE (USA) <Kevin.R.Kotelly@usace.army.mil>
Cc: Oustafine, Darren <doustafine@darienct.gov>; Elsa Loehmann <ELoehmann@fando.com>; Kristin Connell <KConnell@fando.com>
Subject: [URL Verdict: Neutral][Non-DoD Source] Rings End/Gorham Pond Emergency Dam Repair, Town of Darien

Hello Kevin,

I am following up on your review of the submittal package (dated March 17, 2023) for the Rings End/Gorham Pond Dam in Darien, CT. As noted in our previous correspondence, the project is receiving emergency funding from FEMA to repair the dam. We received the Certificate of Permission (COP) from CT DEEP and the Town is ready to move forward this month. (Included below is the previous email correspondence for the submittal package and COP approval for your reference.)

We assume since it has been almost five months, you have no comments, and the Town can proceed with the project as proposed. I would greatly appreciate your timely response confirming your concurrence with the guidance from CT DEEP.

Respectfully,

Lynn

Lynn Rae
Project Manager
Fuss & O'Neill, Inc. | LRae@fando.com
(860) 645-2002 | 146 Hartford Road | Manchester CT 06040
www.fando.com | Instagram | vimeo | facebook | linkedin

From: Elsa Loehmann <ELoehmann@fando.com>
Sent: Thursday, June 29, 2023 9:38 AM
To: Kevin.R.Kotelly@usace.army.mil
Cc: Oustafine, Darren <doustafine@darienct.gov>; Kristin Connell <KConnell@fando.com>; Lynn Rae <LRae@fando.com>
Subject: FW: 202302334-COP, Town of Darien

Hello Kevin,

See attached CT DEEP COP approval for the Ring's End dam removal in Darien, CT. See approval email from CT DEEP, far below. I have also included below our most recent correspondence with your office, for your reference.

Our client is moving forward faithfully with the intention to begin construction by August.
Please let me know if there is anything that I can do to facilitate your review.

Kind Regards,
Elsa

Elsa Loehmann, PE, WEDG (she / her)
Associate
Fuss & O'Neill, Inc. | ELoehmann@fando.com
(860) 783-4677
59 Elm Street Suite 500 | New Haven, CT 06510
www.fando.com | Instagram | vimeo | facebook | linkedin

From: Kotelly, Kevin R CIV USARMY CENAE (USA) Kevin.R.Kotelly@usace.army.mil
Sent: Tuesday, March 21, 2023 10:44 AM
To: Martin, Leslie CIV USARMY USACE (USA) Leslie.Martin@usace.army.mil
Cc: Elsa Loehmann ELoehmann@fando.com
Subject: FW: [URL Verdict: Neutral][Non-DoD Source] File Transfer: Ring's End Dam Repair COP - Darien, CT - Gorham Pond Dam Emergency R

Leslie, can you retrieve these files please. Thank You

From: Elsa Loehmann <ELoehmann@fando.com>
Sent: Friday, March 17, 2023 4:40 PM
To: Kotelly, Kevin R CIV USARMY CENAE (USA) <Kevin.R.Kotelly@usace.army.mil>

Subject: [URL Verdict: Neutral][Non-DoD Source] File Transfer: Ring's End Dam Repair COP - Darien, CT - Gorham Pond Dam Emergency R

Project: 20200921.B11 **Darien, CT - Gorham Pond Dam Emergency R**

Notification about File Transfer **Ring's End Dam Repair COP**

Remarks

Hello Mr. Kotelly,

The Town of Darien has submitted a COP to CT DEEP for repair of the Ring's End Dam in Darien, CT. The application package and submittal confirmation have been included here for your reference. We are submitting the attached memo for review by your agency.

The dam was damaged during Tropical Storm Ida, and the repair will receive emergency funding from FEMA under funding award: 4629DR-CT (4629DR) Darien, Town of (Fairfield County) (001-18850-00) [669543] Gorham's Pond Dam. CT DEEP has agreed to an expedited regulatory review; relevant correspondence has been included in the attached memo for your reference.

We respectfully request that the project be reviewed by your agency under an expedited review and authorization, in accordance with 33 CFR 3325.2(3)(4), and concurrent with guidance from CT DEEP.

I'm happy to set up a call with the Town if you felt that would be helpful to your review. Please let me know how I can facilitate.

Kind Regards,
Elsa

Download all files

File Transfer Info

To: **Kevin Kotelly (US Army Corps of Engineers, New England District)**
CC: **Darren Oustafine (Darien, CT); Alison Baranovic (Fuss & O'Neill, Inc.)**
Purpose: **For your review and comment**
Expiration Date: **4/16/2023**

Transferred Files

202302334 - Application Form & Attachments.pdf	3/17/2023	7:30 AM	48,284 KB
202302334 - Transmittal Form.pdf	3/17/2023	9:45 AM	407 KB

FTP_Screenshot.JPG	3/17/2023	10:03 AM	187 KB
Transmittal - 00003.pdf	3/17/2023	4:39 PM	109 KB
USACE_Permitting_Memorandum.pdf	3/16/2023	12:58 PM	31,236 KB

Additional Links

Reply to All

From: Missell, Danielle <Danielle.Missell@ct.gov>
Sent: Tuesday, June 13, 2023 8:02 AM
To: Oustafine, Darren <doustafine@darienct.gov>; Elsa Loehmann <ELoehmann@fando.com>
Cc: Kristin Connell <KConnell@fando.com>; Williams, Bruce <Bruce.Williams@ct.gov>; Kevin.R.Kotelly@usace.army.mil; Martin, Leslie CIV USARMY USACE (USA) <Leslie.Martin@usace.army.mil>
Subject: 202302334-COP, Town of Darien

Good Morning,
Please find attached License for 100 Rings End Rd, Darien. Please affirmatively indicate whether you will accept personal delivery of this document via email and waive any right to additional service of this document.

-Danielle

Danielle Missell
Environmental Analyst
Land and Water Resources Division
Bureau of Water Protection and Land Reuse
Connecticut Department of Energy & Environmental Protection
79 Elm Street, Hartford, CT 06106-5127
p: 860 424-3698 | Danielle.Missell@ct.gov

Connecticut
Department of Energy &
Environmental Protection

Conserving, improving, and protecting our natural resources and environment;
Ensuring a clean, affordable, reliable, and sustainable energy supply.

| portal.ct.gov/DEEP

November 16, 2022

Ms. Elsa Loehmann
Fuss & O'Neill
146 Hartford Road
Manchester, CT 06040
(sent via email only to ELoehmann@fando.com)

Subject: Rings End Road Dam Repair Project
Gorham's Pond
Darien, Connecticut

Dear Ms. Loehmann:

The State Historic Preservation Office (SHPO) has reviewed the referenced project in response to your request for our comments regarding the potential effects to historic properties. SHPO understands that you are assisting the Town of Darien with performing repairs to the masonry face of the Rings End Road Dam that resulted from substantial scour of the downstream toe of the dam during Tropical Storm Ida. The proposed activities at the Easton Reservoir Dam include an in-kind replacement of missing mortared stone along the downstream face of the dam, restoration of scour protection material, and repair of the existing poured concrete spillway crest slab. SHPO notes that the proposed work will occur from the spillway and/or from a barge. Because the proposed undertakings are subject to permitting from the United States Army Corps of Engineers, it is subject to the provisions of Section 106 of the National Historic Preservation Act and project review by this office.

There are no properties listed on the National Register of Historic Places (NRHP) recorded within or immediately adjacent to the identified project areas. However, The Rings End Road Bridge, located just upstream of the proposed project location, was reviewed by the Connecticut Department of Transportation in 2012 and assigned Bridge Number 04992. At the time of inspection the bridge, constructed in 1929, was assessed as potentially eligible for inclusion on the NRHP applying the criteria for evaluation (36CFR 60.4[a-d]). In addition, several previously identified archaeological sites have been identified in the areas surrounding the proposed project location. Project plans indicate that the repairs, staging, access, and improvements will be confined to the existing waterway. As a result, it is unlikely that significant archeological deposits would be impacted. Although the dam has not been formally evaluated for listing on the NRHP, with additional research, it may be considered eligible for listing. For this reason, we support the effort to retain and repair historic materials to the greatest extent possible. The proposed rehabilitation and repair work could continue to preserve many of the important engineering features associated with the dam. Therefore, based on the information submitted to this office, it is the opinion of SHPO that no historic properties will be affected by the proposed activities.

This office appreciates the opportunity to review and comment upon this project. Do not hesitate to contact Cory Atkinson, Staff Archaeologist and Environmental Reviewer, for additional information at (860) 500-2458 or cory.atkinson@ct.gov.

Sincerely,

Jonathan Kinney
State Historic Preservation Officer

Connecticut Department of
Energy & Environmental Protection
Bureau of Natural Resources
Fisheries Division

DEEP Fisheries Consultation Form

To the Applicant - Prior to the submission of your license application to the Connecticut Department of Energy & Environmental Protection (DEEP) Water Planning and Management Division (WPMD) or Land and Water Resources Division (LWRD), please complete Part I below and e-mail the following to deep.inland.fisheries@ct.gov:

1. this completed DEEP *Fisheries Consultation Form*;
2. a site location map,
3. a PDF version of the proposed project plans including a site survey of existing conditions (if available), and
4. photos of the site.

Fisheries Division staff will contact you if further details are needed. Once the Fisheries Division staff returns the completed form to you, please include the form, and any signed plans (if applicable) in your license application submittal to DEEP.

Part I: Applicant and Site Information (*to be completed by APPLICANT)*

1. Applicant/Registrant Information

Name: Town of Darien
Mailing Address: 2 Renshaw Road
City/Town: Darien State: CT Zip Code: 06820
Business Phone: 203-656-7365 Ext.: _____
Contact Person: Darren Oustafine Phone: _____ Ext: _____
E-mail Address: Doustafine@darienct.gov

2. Engineer/Surveyor/Agent Information (list as applicable)

Name: Fuss & O'Neill
Mailing Address: 146 Hartford Road
City/Town: Manchester State: CT Zip Code: 06040
Business Phone: 860-783-4677 Ext.: _____
Contact Person: Elsa Loehmann Phone: _____ Ext: _____
E-mail Address: ELoehmann@fando.com
Service Provided: Engineering Design and Permitting Services

3. Site Location:

Name of Site: Rings End Pond
Address of Site or Location Description: 100 Rings End Road
City/Town: Darien State: CT Zip Code: 06820
Parcel Location/Tax Assessor's Reference: Map 51 Block _____ Lot 2
Name of Stream or Waterbody: Rings End Pond

4. **Activity:** Check the box best describing your activity: (check all that apply):

- ☐ new public/fishing access;
- ☐ new docks and marinas on the Connecticut River;
- ☐ coastal/tidal dredging projects;
- ☐ activities in inland/non-tidal waterbodies and watercourses;
- ☐ withdrawal of water from a non-tidal/inland river, stream, pond or lake;
- ☐ withdrawal of water from a wetland, marsh, swamp, or bog hydrologically connected to a non-tidal/inland river, stream, pond or lake;
- ☐ withdrawal of groundwater from stratified drift deposits hydrologically connected to a non-tidal/inland river, stream, pond or lake.
- ☐ maintenance dredging
- ☐ beach nourishment
- ☒ cofferdam installation

Note: Fisheries consultation is **not required** for docks and marinas on Long Island Sound.

Part I: Applicant and Site Information (*to be completed by APPLICANT) (continued)*

5. **DEEP Pre-application Contact:** Indicate name of permit analyst or engineer, if applicable.
   Danielle Missell
6. **Project Description:** Provide or attach a brief, but thorough, description of the project including any measures to protect, enhance or restore fish populations:

   See attached

Part II: Fisheries Determination *(To be completed by DEEP Fisheries Staff only)*

To Fisheries Staff - This completed consultation form is required to be submitted as part of an application to DEEP. The application has not yet been submitted to DEEP. Please review the enclosed materials and determine whether the project will significantly impact any fisheries or fisheries habitat. You may provide comments or recommendations regarding the proposal. Send this completed form to the applicant and copy the DEEP analyst, if known, or the applicable WPMD/LWRD Supervisor. If the proposed work **WILL** significantly impact any fisheries and/or habitat or if you have any comments or concerns regarding the regulatory review for this project, contact the DEEP analyst, if known, or the applicable WPMD/LWRD Supervisor.

DEEP FISHERIES DIVISION DETERMINATION

Date Consultation Form received: 11/01/22

Please check applicable boxes and return the completed Consultation Form to the applicant:

- ☐ I have determined that the work described in Part I of this form and attachments **WILL NOT** significantly impact any fisheries and/or habitat;
- ☒ I have determined that the work described in Part I of this form and attachments **WILL NOT** significantly impact any fisheries and/or habitat **if the below Recommendations are followed**; and/or,
- ☐ I have determined that the work described in Part I of this form and attachments **WILL NOT** significantly impact any fisheries and/or habitat **if the design features shown on the attached plans are incorporated**. Fisheries staff to sign and date plans and return to the applicant with the completed Consultation Form.

COMMENTS/RECOMMENDATIONS (or check here if these are attached following this page: ☐):

The Rings End Dam has a fishway that passes anadromous Alewife upstream into Gorhams Pond. To protect these fish during their spring spawning migration, all in-water work should be prohibited from April1 to June 30, inclusive. This prohibition should include the installation and removal of cofferdams.

"By entering my name below, I agree that I am providing my legal signature, and am legally bound by the determination above."

Bruce H Williams	12/16/22
Signature of Fisheries Division Staff	Date
Bruce H Williams	Senior Fisheries Biologist
Print Name of Fisheries Division Staff	Title

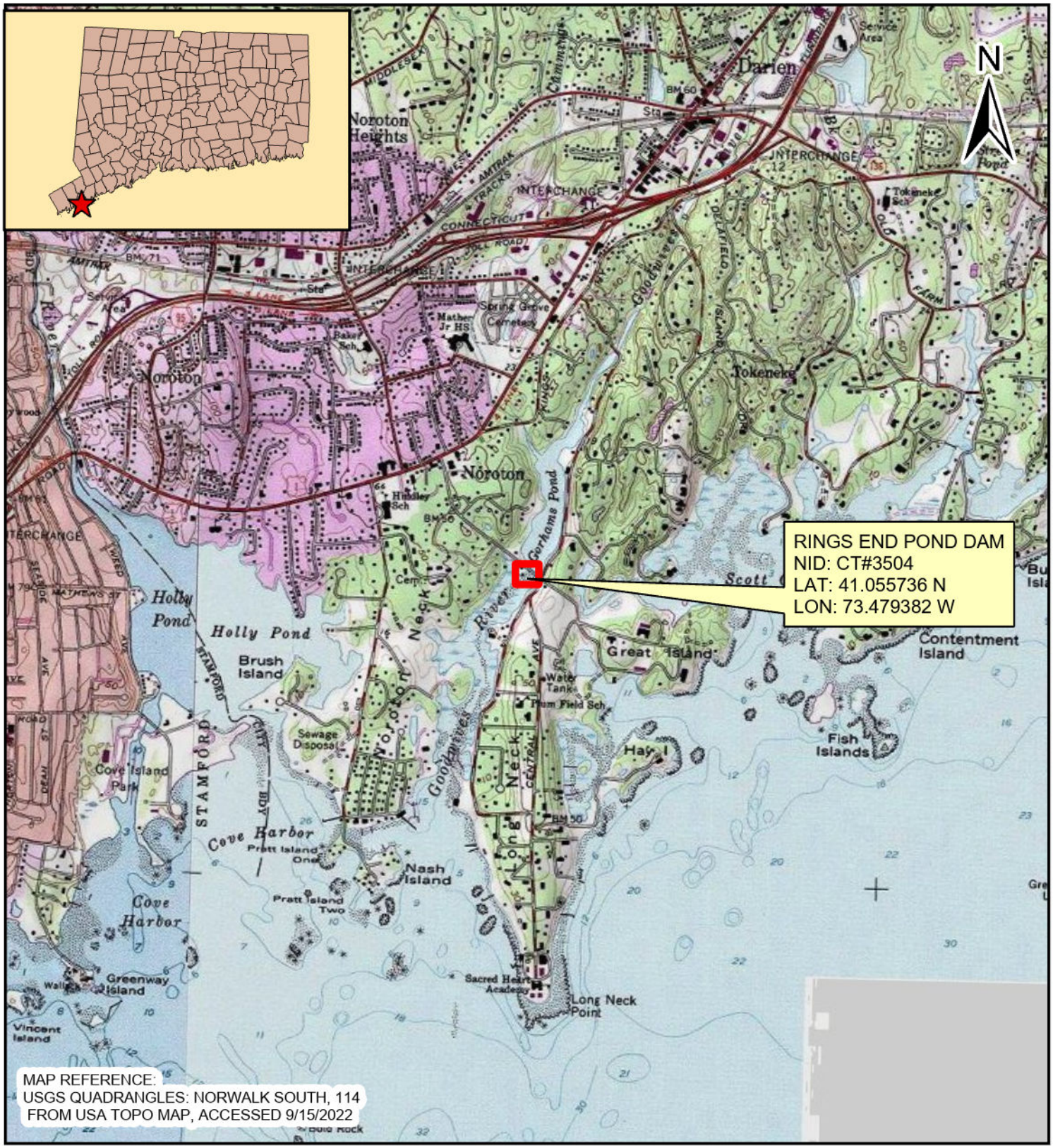
Project Summary

The Town of Darien experienced catastrophic flooding in early September 2021 as a result of Tropical Storm Ida. The Rings End Dam, located at the base of Rings End Bridge, suffered severe damage from excessive flood flows on the Goodwives River.

As a result of the storm, substantial scour of the downstream toe of the dam has occurred, with subsequent undermining of the downstream masonry face, collapse and complete loss of stones from the downstream face, erosion of the underlying embankment soils, and undermining and collapse of the concrete spillway crest slab. Future heavy flows over the dam could result in further erosion of the exposed downstream embankment face and loss of currently undermined stone masonry wall stone. It is recommended that the dam be repaired as quickly as possible to avoid further damage. This is a no hazard classification dam; however, the impact of dam failure is the loss of the impoundment upstream, and the loss of this historic structure, and potential damage to the Ring's End Road bridge.

The dam is a historic structure of great importance to the Town of Darien, and therefore repairs must be consistent with the original construction of the dam to return the dam to what it looked like prior to sustaining damages from Tropical Storm Ida. Use of stone masonry to reconstruct the damaged and missing stone masonry wall will be required to satisfy the historic concerns for this structure.

The proposed repairs include removal of loose material away from the toe of the dam and from the scour hole that has formed at the toe of the dam. Suitable material will be stockpiled for reuse on site. Downstream toe protective stone will be temporarily removed in order to excavate for the foundation of the stone masonry wall placement. Voids will be filled or chinked with large stone anchored with mortar, similar to the original construction. The damaged concrete spillway crest slab will be sawcut and a replacement slab will be poured. The new slab will be integrated to the stone masonry face with dowels and reinforcing to form a waterproof seal. Installation may occur either from equipment staged on the spillway and protected from tidal inundation using a coffer dams, or by a barge that will be positioned using spuds to protect benthic habitat. Should construction methodology require dewatering, water will be discharged to a temporary settling basin. The existing tide gate and fish ladder do not require repair.



SEPTEMBER 2022

FIGURE 1

TOWN OF DARIEN

SITE LOCATION MAP

RINGS END POND DAM (CT14840)

DARIEN, CONNECTICUT

SCALE
HORZ: 1 INCH = 2500 FEET
VERT:
DATUM
HORZ:
VERT: NAVD88

K:\P2020\0921\B11\MXD\MuddyRiverNDDBApplication.aprx

RINGS END DAM EMERGENCY REPAIRS

CT DAM NO. 3504 · DARIEN · CONNECTICUT

PRELIMINARY DESIGN PLANS

OCTOBER 19, 2022

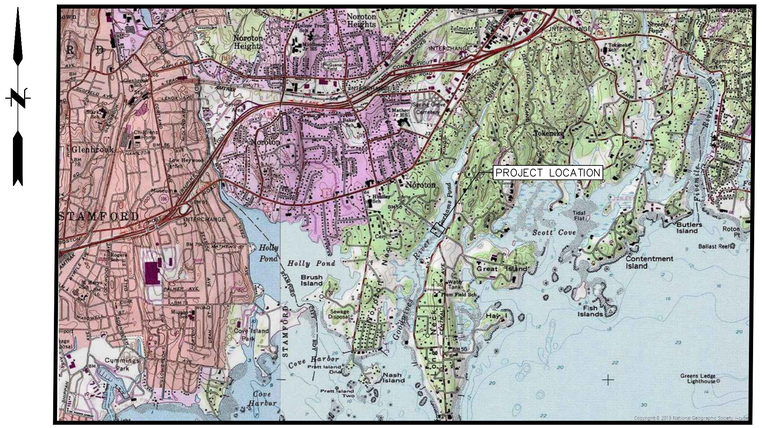
PREPARED FOR

TOWN OF DARIEN
2 RENSHAW ROAD
DARIEN, CT 06820

PREPARED BY

FUSS & O'NEILL
146 HARTFORD ROAD
MANCHESTER, CONNECTICUT 06040
860.646.2469
www.fando.com

SHEET INDEX



LOCATION MAP
SCALE: 1" = 1000'

PHILIP E. FORZLEY — CT P.E. LICENSE NO.: ######

PROJ. No.: 20200921.B11
DATE: OCTOBER 2022

GI-001

File: J:\DWG\P2020\0921B11\CivilPlan\20200921B11_COV01.dwg Layout: GI-001 Plotted: 2022-10-19 2:56 PM Saved: 2022-10-19 2:50 PM User: SKing

CIVIL GENERAL NOTES

GENERAL

1. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SHOWN ON THE DRAWINGS TO SCALE OR TO THEIR ACTUAL DIMENSION OR LOCATION. COORDINATE DETAIL SHEET DIMENSIONS, MANUFACTURERS' LITERATURE, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.
2. DO NOT RELY SOLELY ON ELECTRONIC VERSIONS OF DRAWINGS, SPECIFICATIONS, AND DATA FILES THAT ARE PROVIDED BY THE ENGINEER. FIELD VERIFY LOCATION OF PROJECT FEATURES.
3. PERFORM NECESSARY CONSTRUCTION NOTIFICATIONS, APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK AS REQUIRED BY THE CONTRACT DOCUMENTS.
4. BASE PLAN: THE TOPOGRAPHY AND PHYSICAL FEATURES ARE BASED ON A LIMITED TOPOGRAPHIC SURVEY DATED AUGUST 4, 2022 PERFORMED ON THE GROUND BY REDNISS & MEAD. SEE SHEET LTS FOR ADDITIONAL SURVEY NOTES AND REFERENCES.
6. TOPOGRAPHIC ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
7. REFERENCE IS MADE TO FEMA FLOOD INSURANCE RATE MAP NO. 09001C0536G, EFFECTIVE DATE JULY 8, 2013.

WORK RESTRICTIONS

1. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, FIRE HYDRANTS, AND UTILITIES WITHOUT APPROPRIATE PERMITS. SEE SHEET CP-101 FOR ADDITIONAL INFORMATION ON TEMPORARY LANE AND SIDEWALK CLOSURE OF RINGS END ROAD.
2. WORK IS RESTRICTED TO [INSERT RESTRICTIONS FROM TOWN].
3. OTHER WORK RESTRICTIONS WILL BE DETERMINED FOLLOWING REGULATOR CONSULTATIONS.

REGULATORY REQUIREMENTS

1. WITHIN LOCAL RIGHTS-OF-WAY, PERFORM THE WORK IN ACCORDANCE WITH LOCAL MUNICIPAL STANDARDS AND, AS APPLICABLE, IN ACCORDANCE WITH THE LATEST EDITION OF THE DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS AND ISSUED REVISIONS/SUPPLEMENTS (FORM 818).
2. PROVIDE TRAFFIC SIGNAGE AND PAVEMENT MARKINGS IN CONFORMANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
3. BE RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. PERFORM CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
4. DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES AND STATUTES.

EROSION AND SEDIMENT CONTROL

1. INSTALL EROSION CONTROL MEASURES PRIOR TO STARTING ANY WORK ON THE SITE. REFER TO SHEET CE-101.
2. IMPLEMENT ALL NECESSARY MEASURES REQUIRED TO CONTROL STORMWATER RUNOFF, DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE. PERFORM CORRECTIVE ACTION AS NEEDED FOR EROSION CLEANUP AND REPAIRS TO OFF SITE AREAS, IF ANY, AT NO COST TO OWNER.
3. INSPECT AND MAINTAIN EROSION CONTROL MEASURES PER THE SCHEDULE IN THE EROSION AND SEDIMENT CONTROL DRAWINGS. DISPOSE OF SEDIMENT IN AN UPLAND AREA. DO NOT ENCUMBER DRAINAGE STRUCTURES AND PROTECTED AREAS.
4. PERFORM CONSTRUCTION SEQUENCING IN SUCH A MANNER TO CONTROL EROSION AND TO MINIMIZE THE TIME THAT EARTH MATERIALS ARE EXPOSED BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED.
5. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, REMOVE AND DISPOSE OF TEMPORARY EROSION CONTROL MEASURES. CLEAN SEDIMENT AND DEBRIS FROM TEMPORARY MEASURES AND FROM PERMANENT STORM DRAIN SYSTEMS.

DEMOLITION

REFER TO DEMOLITION NOTES ON SHEET CP-101.

CONSTRUCTION LAYOUT

1. PROVIDE PROPER TRANSITIONS BETWEEN EXISTING AND PROPOSED SITE IMPROVEMENTS. FIELD VERIFY EXISTING HARDSCAPED SURFACED (E.G. PAVEMENT, CONCRETE, ETC.) AND GROUND ELEVATIONS AT THE INTERFACE WITH PROPOSED IMPROVEMENTS BEFORE START OF CONSTRUCTION.
2. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, FIELD VERIFY PROPOSED UTILITY ROUTES AND IDENTIFY ANY INTERFERENCES OR OBSTRUCTIONS WITH EXISTING UTILITIES OR PUBLIC RIGHTS-OF-WAY.
3. IMMEDIATELY INFORM THE ENGINEER IN WRITING IF EXISTING UTILITY CONDITIONS CONFLICT OR DIFFER FROM THAT INDICATED AND IF THE WORK CANNOT BE COMPLETED AS INDICATED.
4. BOUNDS OR MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A PROFESSIONAL LICENSED SURVEYOR.

EARTHWORK

1. NOTIFY UTILITY LOCATOR SERVICE AT LEAST 72 HOURS BEFORE STARTING EXCAVATION: "CALL BEFORE YOU DIG" AT 1-800-922-4455.
2. STOP WORK IN THE VICINITY OF SUSPECTED CONTAMINATED SOIL, GROUNDWATER OR OTHER MEDIA. IMMEDIATELY NOTIFY THE OWNER SO THAT APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN. RESUME WORK IN THE IMMEDIATE VICINITY ONLY UPON DIRECTION BY THE OWNER.

UTILITIES

3. THE TYPE, SIZE AND LOCATION OF DEPICTED UNDERGROUND UTILITIES ARE APPROXIMATE REPRESENTATIONS OF INFORMATION OBTAINED FROM FIELD LOCATIONS OF VISIBLE FEATURES, EXISTING MAPS AND PLANS OF RECORD, UTILITY MAPPING, AND OTHER SOURCES OF INFORMATION OBTAINED BY THE ENGINEER. ASSUME NO GUARANTEE AS TO THE COMPLETENESS, SERVICEABILITY, EXISTENCE, OR ACCURACY OF UNDERGROUND FACILITIES.

PAVEMENT

1. AT A MINIMUM, CONSTRUCT ACCESSIBLE ROUTES, PARKING SPACES, RAMPS, SIDEWALKS AND WALKWAYS IN CONFORMANCE WITH THE FEDERAL AMERICANS WITH DISABILITIES ACT AND WITH STATE AND LOCAL LAWS AND REGULATIONS (WHICHEVER ARE MORE STRINGENT).

SITE RESTORATION

1. PROVIDE 6 INCHES OF TOPSOIL AND SEED TO AREAS DISTURBED DURING CONSTRUCTION AND NOT DESIGNATED TO BE RESTORED WITH IMPERVIOUS SURFACES (BUILDINGS, PAVEMENTS, WALKS, ETC.) UNLESS OTHERWISE NOTED.
2. REPAIR DAMAGES RESULTING FROM CONSTRUCTION LOADS, AT NO ADDITIONAL COST TO OWNER.
3. RESTORE AREAS DISTURBED BY CONSTRUCTION OPERATIONS TO THEIR ORIGINAL CONDITION OR BETTER, AT NO ADDITIONAL COST TO OWNER.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.:
VERT.:
0
GRAPHIC SCALE

FUSS&O'NEILL
146 HARTFORD ROAD
MANCHESTER, CONNECTICUT 06040
860.646.2469
www.fando.com

TOWN OF DARIEN

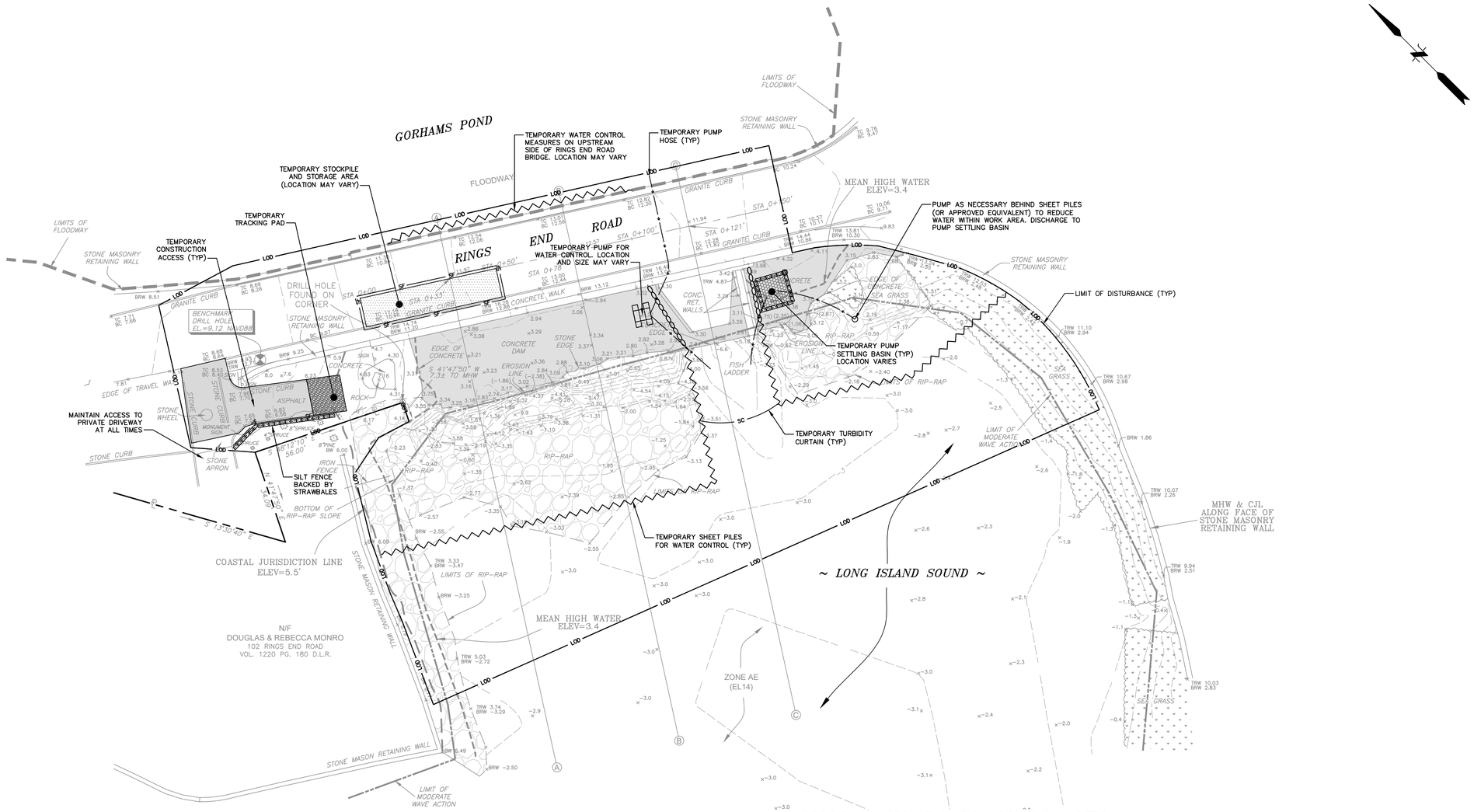
GENERAL NOTES & INFORMATION

RINGS END DAM EMERGENCY REPAIRS

RINGS END ROAD DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: OCTOBER 2022

GI-002



LEGEND

- LOD — LIMIT OF DISTURBANCE
- SF — SILT FENCE
- STRAWBALES
- SC — TURBIDITY CURTAIN
- WATER CONTROL (SHEET PILES OR APPROVED EQUAL)
- WATER CONTROL (SANDBAGS OR APPROVED EQUAL)
- STONE TRACKING PAD
- STORAGE AND STOCKPILE AREA
- PUMP SETTLING BASIN

WATER CONTROL NOTES

1. CONTRACTOR TO DEVELOP WATER CONTROL PLAN FOR SUBMISSION TO THE ENGINEER FOR APPROVAL PRIOR TO INITIATION OF CONSTRUCTION
2. THE CONTRACTOR MAY ELECT TO PERFORM THE WORK USING ADDITIONAL STAGES OF WATER CONTROL THAT VARY FROM THOSE DEPICTED HEREIN. WATER CONTROL MEETING THE REQUIREMENTS OF THESE PLANS SHALL BE MAINTAINED DURING ALL STAGES OF CONSTRUCTION.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING AND PROVIDING FULLY ADEQUATE PASSAGE OF BASE STREAM FLOWS AT ALL TIMES DURING CONSTRUCTION, AND SHALL IMPLEMENT PROVISIONS, AS REQUIRED, TO PROVIDE FULLY ADEQUATE PASSAGE OF THE TEMPORARY DESIGN STORM.

HYDRAULIC DATA GOODWIVES RIVER & STONY BROOK	
DRAINAGE AREA	### SQ MI
DESIGN STORM FREQUENCY	###-YR
DESIGN DISCHARGE	#,### CFS

TIDAL DATA*	
CJL (NAVD88)	5.5 FT
MHW (NAVD88)	3.4 FT
MLW (NAVD88)	−3.8 FT

*TIDAL INFORMATION OBTAINED FROM THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS "RESOURCES FOR TIDAL AND NAVIGABLE WATERS IN CONNECTICUT" DATED OCTOBER 15, 2012

EROSION & SEDIMENTATION CONTROL NOTES

1. CONSTRUCTION STANDARDS – CONSTRUCT ALL EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE MOST RECENT EDITION OF THE "CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL" (CT DEP BULLETIN 34). ALL MEASURES SHALL BE MAINTAINED AND UPGRADED TO ACHIEVE PROPER SEDIMENT CONTROL DURING CONSTRUCTION.

2. PLAN IMPLEMENTATION – IMPLEMENT THIS EROSION AND SEDIMENT CONTROL PLAN. THIS IMPLEMENTATION INCLUDES THE INSTALLATION AND MAINTENANCE OF CONTROL MEASURES UNTIL PERMANENT STABILIZATION IS ACHIEVED, INFORMING ALL SUBCONTRACTORS OF THE REQUIREMENTS AND OBJECTIVES OF THE PLAN, AND NOTIFYING THE PROPER MUNICIPAL AGENCY OF ANY TRANSFER OF THIS RESPONSIBILITY. THE OWNER SHALL BE RESPONSIBLE FOR CONVEYING A COPY OF THE EROSION AND SEDIMENT CONTROL PLAN TO THE NEW OWNER IF THE TITLE OF THE LAND IS TRANSFERRED PRIOR TO ACHIEVING PERMANENT STABILIZATION.

3. INSTALLATION SCHEDULE – INSTALL THE CONSTRUCTION ENTRANCE BEFORE CONSTRUCTION TRAFFIC INTO AND OUT OF THE PROJECT AREA BEGINS. INSTALL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO CONSTRUCTION. INSTALL ADDITIONAL CONTROL MEASURES DURING THE CONSTRUCTION PERIOD, IF DEEMED NECESSARY BY THE OWNER, HIS AGENTS OR AGENTS OF THE MUNICIPALITY.

4. FUGITIVE DUST – CONTROL FUGITIVE DUST USING WATER SPRAYS OR CALCIUM CHLORIDE ON SOIL SURFACES, SWEEPING PAVED AREAS, TEMPORARY WINDBREAKS OR NON–ASPHALTIC SOIL TACKIFIERS.

5. STRAW BALE LIFE SPAN – INSTALL STRAW BALES WHERE PROTECTION AND EFFECTIVENESS IS REQUIRED FOR LESS THAN 90 DAYS. OTHERWISE, INSTALL SILT FENCE.

6. CATCH BASINS – IF APPLICABLE, PROTECT CATCH BASINS WITH PROPER CONTROLS THROUGHOUT THE CONSTRUCTION PERIOD UNTIL ALL DISTURBED AREAS ARE PERMANENTLY STABILIZED.

7. STOCKPILES – ENCIRCLE STOCKPILES OF ERODIBLE SOIL WITH A STRAW BALE OR SILT FENCE BARRIER. THE SIDE SLOPES OF ERODIBLE STOCKPILED MATERIAL SHALL BE NO STEEPER THAN 2:1. STOCKPILES THAT ARE NOT TO BE USED WITHIN 30 DAYS SHALL BE SEEDED AND MULCHED IMMEDIATELY AFTER THEY ARE FORMED.

8. TOE OF SLOPE – ESTABLISH AN EROSION CONTROL BARRIER (SILT FENCE OR STRAW BALE BARRIER) APPROXIMATELY 5 TO 10 FEET FROM THE PROPOSED TOE OF THE CUT OR FILL AREA PRIOR TO BEGINNING EARTHWORK UNLESS WITHIN THE WORK AREAS CONFINED BY SHEET PILES.

9. SEDIMENT REMOVAL – SEDIMENT REACHING ½ THE HEIGHT OF THE EROSION CONTROL BARRIER SHALL BE REMOVED. REMOVE AND DISPOSE OF SEDIMENT IN A MANNER CONSISTENT WITH THE INTENT OF THE PLAN.

10. SOIL STABILIZATION SCHEDULE – APPLY PERMANENT SOIL STABILIZATION MEASURES TO ALL GRADED AREAS WITHIN 7 DAYS OF ESTABLISHING FINAL GRADE.

11. PERMANENT SEEDING – SEED PERMANENT LAWN AREAS IN ACCORDANCE WITH THE SPECIFICATIONS.

12. INSPECTION – THE OWNER SHALL SECURE THE SERVICES OF A SOIL SCIENTIST OR PROFESSIONAL ENGINEER TO VERIFY IN THE FIELD THAT THE CONTROLS REQUIRED BY THIS PLAN ARE PROPERLY INSTALLED AND MAINTAINED DURING CONSTRUCTION OR FOLLOWING A STORM EVENT.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE:
HORZ.: 1"= 20'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
20 10 0 20
GRAPHIC SCALE

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MANCHESTER, CONNECTICUT 06040
860.646.2469
www.fando.com

TOWN OF DARIEN
EROSION, SEDIMENTATION, AND WATER CONTROL PLAN
RINGS END DAM EMERGENCY REPAIRS
RINGS END ROAD DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: OCTOBER 2022

CE-101

File: J:\DWG\P2020\09211B11\Civil\Plan\20200921B11_ERO01.dwg Layout: CE-101 Plotted: 2022-10-19 2:56 PM Saved: 2022-10-19 2:50 PM User: SKing
PC3: NONE STB/CTB: FO.STB
LAYER STATE:
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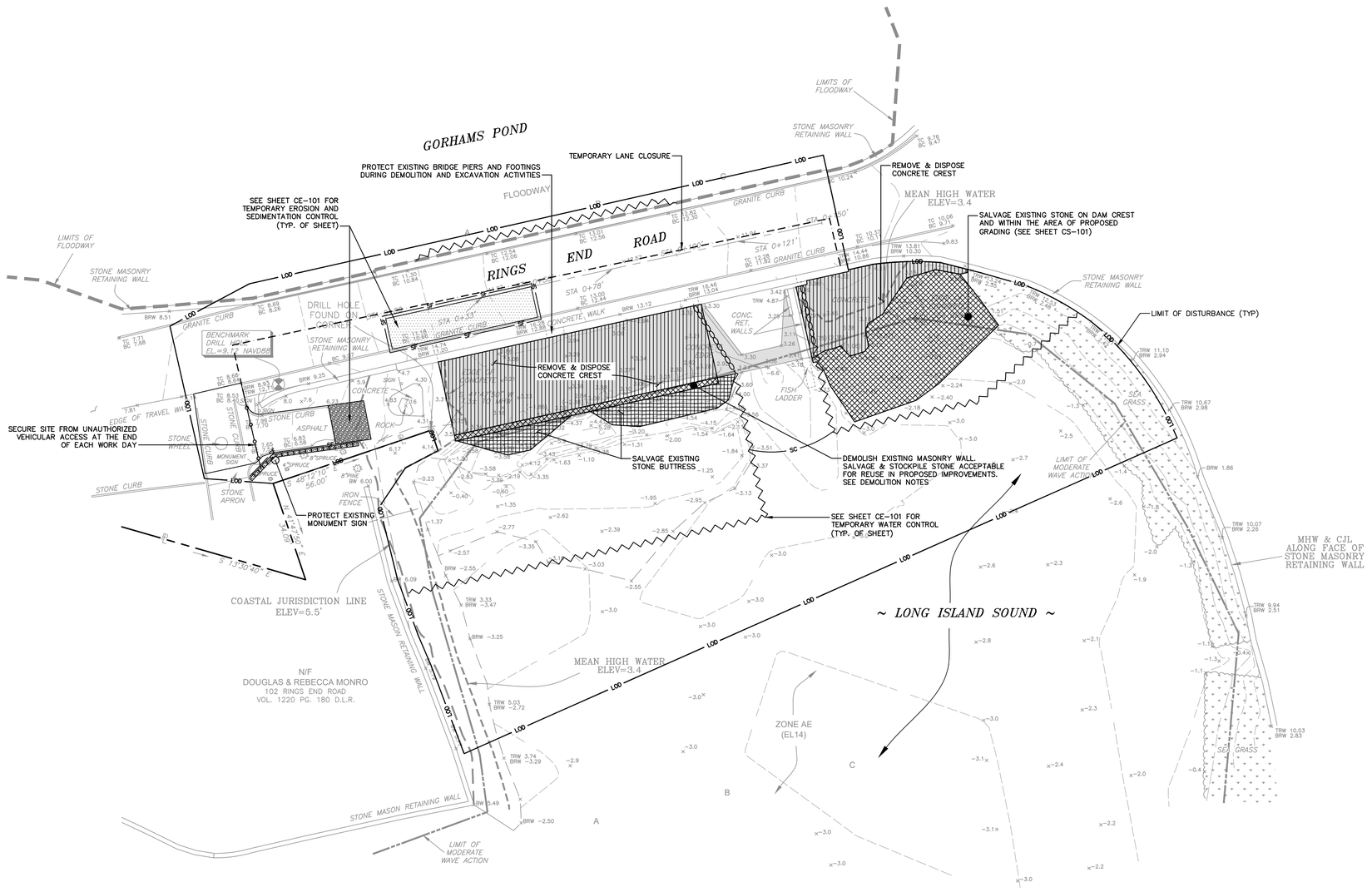

LEGEND

- LOD — LIMIT OF DISTURBANCE
- SF — SILT FENCE
- STRAWBALES
- SC — TURBIDITY CURTAIN
- WATER CONTROL (SHEET PILES OR APPROVED EQUAL)
- WATER CONTROL (SANDBAGS OR APPROVED EQUAL)
- TEMPORARY SITE SECURITY FENCING
- STONE TRACKING PAD
- STORAGE AND STOCKPILE AREA
- DEMOLITION AREA
- SALVAGED MATERIAL AREA

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

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VERT.: NAVD88
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GRAPHIC SCALE

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TOWN OF DARIEN
DEMOLITION & SITE PREPARATION PLAN
RINGS END DAM EMERGENCY REPAIRS
RINGS END ROAD — DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: OCTOBER 2022

CP-101

File: J:\DWG\P2020\0921\B11\Civil\Plan\20200921B11_DEM01.dwg Layout: CP-101 Plotted: 2022-10-19 2:56 PM Saved: 2022-10-19 2:41 PM User: SKing
MS VIEW: | LAYER STATE: | PC3: NONE STB/CTB: FO.STB

SUGGESTED CONSTRUCTION SEQUENCE

1. MOBILIZE TO SITE
2. PROVIDE EROSION & SEDIMENTATION CONTROL MEASURES (SEE SHEET CE-101)
3. PROVIDE TEMPORARY CONSTRUCTION ACCESS (SEE SHEET CE-101)
   - 3.1. NOTE: A LIFT BARGE MAY BE STATIONED DOWNSTREAM OF THE DAM IN ORDER TO CREATE A WORKING PLATFORM. THE LIFT BARGE WILL NOT BE ALLOWED TO REST ON THE BOTTOM SUBSTRATE AND WILL BE ELEVATED ABOVE THE BOTTOM USING SPUD BARS.
4. PROVIDE WATER CONTROL AS INDICATED ON SHEET CE-101
   - 4.1. SEE WATER CONTROL NOTES ON SHEET CE-101
5. DEMOLISH EXISTING SITE FEATURES AS INDICATED ON SHEET CP-101
   - 5.1. SALVAGE EXISTING MASONRY. STONES OF AN ADEQUATE SIZE MAY BE SAVED AND REUSED FOR THE AND BUTTRESS WALL CONSTRUCTION. STONES SMALLER THAN ADEQUATE SIZE MAY BE REUSED ON SITE AT THE DISCRETION OF THE ENGINEER, OR RELOCATED TO ANOTHER LOCATION WITHIN THE TOWN FOR STORAGE AT THE REQUEST OF THE TOWN.
   - 5.2. PROTECT AND MAINTAIN FLOW THROUGH EXISTING TIDE GATE STRUCTURE AND FISH LADDER STRUCTURE AT ALL TIMES DURING CONSTRUCTION
6. EXCAVATE AS SHOWN WITHIN THE GRADING LIMITS FOR INSTALLATION OF PROPOSED SITE IMPROVEMENTS
7. PROVIDE PROPOSED STRUCTURE (SEE SHEETS STR-101 & STR-102):
   - 7.1. PROVIDE TEMPORARY SHORING AS NECESSARY FOR CONSTRUCTION OF PROPOSED SITE IMPROVEMENTS
   - 7.2. INSTALL SHEET PILE CUTOFF AS INDICATED ON THE PLANS
   - 7.3. INSTALL MUD MAT FOR PROPOSED MORTARED MASONRY BLOCK WALLS
   - 7.4. INSTALL PROPOSED MORTARED MASONRY BLOCK WALLS
   - 7.5. INSTALL PROPOSED CONCRETE CUTOFF WALL
   - 7.6. BACKFILL BEHIND WALL WITH APPROVED MATERIAL
   - 7.7. INSTALL PROPOSED CONCRETE SLAB WITH WATERPROOFING MEMBRANE ON THE DAM CREST
8. INSTALL STONE REVETMENT AS INDICATED ON THE PLANS
   - 8.1. SEE DETAIL SHEET CD-502
9. PERFORM SITE GRADING TO PROPOSED GRADES SHOWN THIS SHEET
10. REMOVE WATER CONTROL MEASURES
11. REMOVE EROSION & SEDIMENTATION CONTROL MEASURES
12. RESTORE ALL OTHER AREAS DISTURBED BY CONSTRUCTION ACTIVITIES TO ORIGINAL OR IMPROVED CONDITION
13. DEMOBILIZE FROM SITE

LEGEND

LOD	LIMIT OF DISTURBANCE
	EDGE OF PROPOSED MUD MAT
	PROPOSED MORTARED MASONRY BLOCK WALL
100	PROPOSED CONTOUR
	PROPOSED RIPRAP/BOULDER REVETMENT (TYP.)

NOTES:

1. THE CONSTRUCTION SEQUENCE SHOWN IS A SUGGESTED CONCEPT THAT IS CONSIDERED FEASIBLE FOR PERFORMING THE WORK. THIS SHEET IS INTENDED TO PROVIDE INFORMATION PERTINENT FOR THE DEVELOPMENT OF THE CONTRACTOR'S DETAILED CONSTRUCTION SEQUENCE.
2. THE CONTRACTOR SHALL EVALUATE SITE CONDITIONS AND SUBMIT A DETAILED CONSTRUCTION SEQUENCE, CONSISTING OF PLANS AND NARRATIVE, IN CONFORMANCE WITH THE CONTRACT REQUIREMENTS, FOR THE ENGINEER'S REVIEW. NO WORK SHALL BE PERFORMED PRIOR TO THE ENGINEER'S REVIEW AND ACCEPTANCE OF THE CONTRACTOR'S DETAILED CONSTRUCTION SEQUENCE.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE:
HORZ.: 1"= 20'
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HORZ.: NAD83
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TOWN OF DARIEN
PROPOSED SITE PLAN
RINGS END DAM EMERGENCY REPAIRS
RINGS END ROAD DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: OCTOBER 2022

CS-101

File: J:\DWG\P2020\0921\B11\Civil\Plan\20200921B11_STP01.dwg Layout: CS-101 Plotted: 2022-10-19 2:56 PM Saved: 2022-10-19 2:50 PM User: SKing
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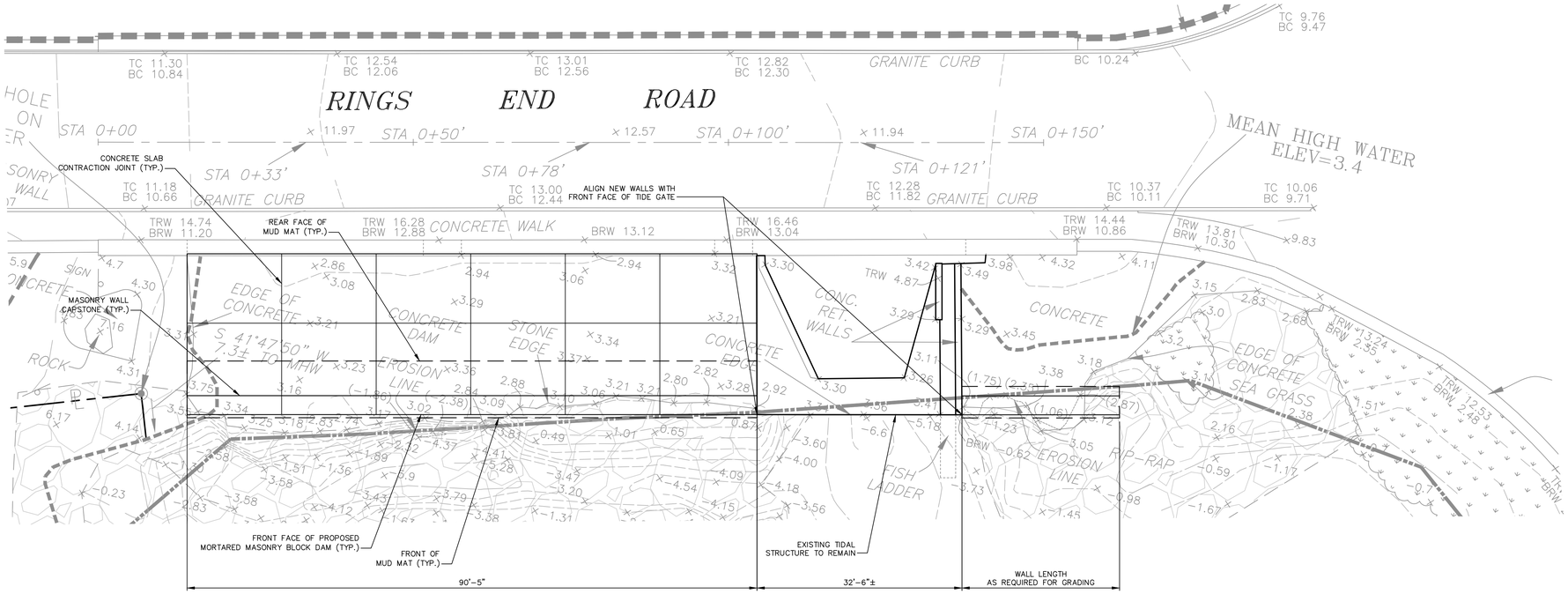
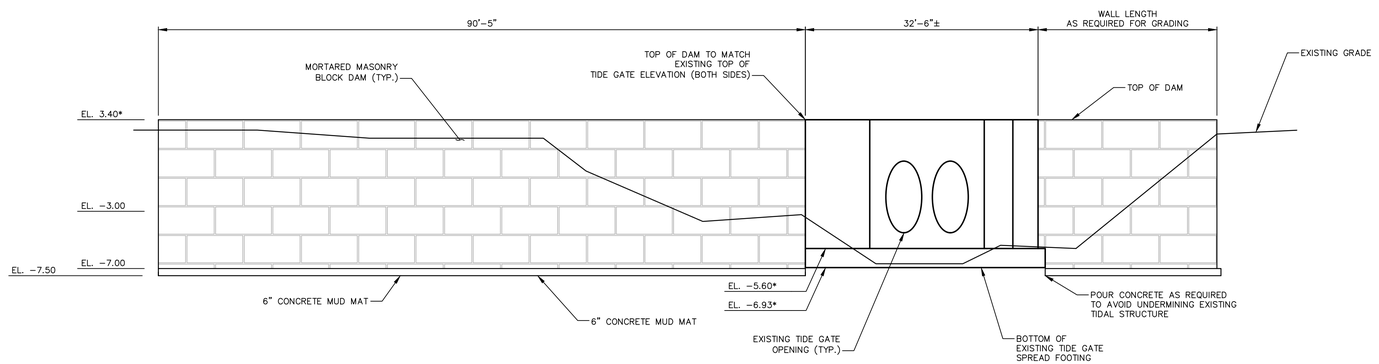


PLAN
1" = 10'-0"



*NOTE: ELEVATIONS SHOWN FOR EXISTING TIDE GATE STRUCTURE ARE FROM THE RECORD DRAWINGS, CONVERTED FROM NGVD-29 TO NAVD88 USING A CONVERSION OF -1.1 FT. CONTRACTOR TO VERIFY ELEVATIONS.

ELEVATION
1" = 10'-0" (H)
1" = 20'-0" (V)

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE:
HORZ.: 1"= 20'
VERT.:
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HORZ.: NAD83
VERT.: NAVD88
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TOWN OF DARIEN
STRUCTURE PLAN & ELEVATION
RINGS END DAM EMERGENCY REPAIRS
RINGS END ROAD DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: OCTOBER 2022

STR-101

File: J:\DWG\P2020\20200921B11\Civil\Plan\20200921B11_STR01.dwg Layout: STR-101 Plotted: 2022-10-19 2:56 PM Saved: 2022-10-19 9:28 AM User: EOcfrancesco
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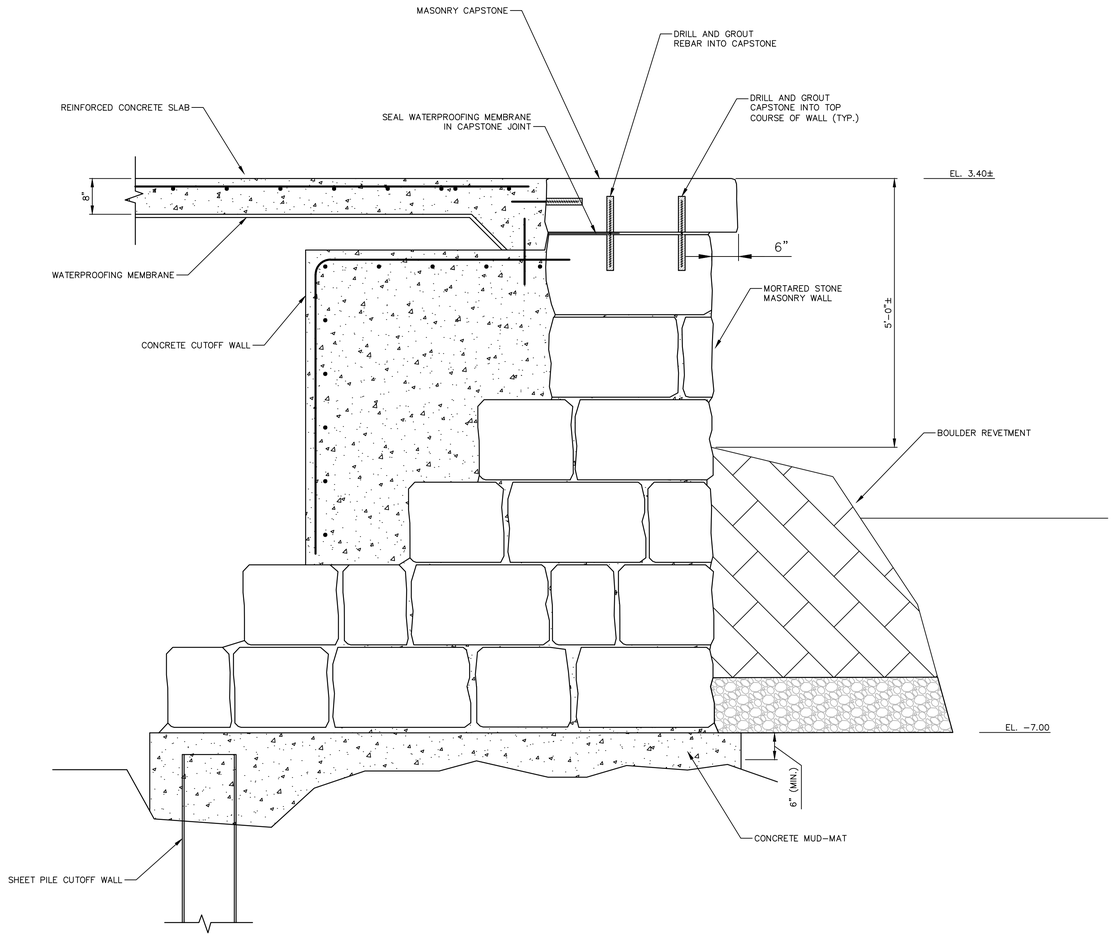

TYPICAL DAM SECTION
3/4" = 1'-0"

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

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DATUM: HORZ.: NAD83 VERT.: NAVD88
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TOWN OF DARIEN

RINGS END DAM EMERGENCY REPAIRS

RINGS END ROAD DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: OCTOBER 2022

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HORZ.: NAD83
VERT.: NAVD88

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GRAPHIC SCALE

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TOWN OF DARIEN

RESOURCE AREA IMPACT PLAN

RINGS END DAM EMERGENCY REPAIRS

RINGS END ROAD DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: OCTOBER 2022

WET-01

File: J:\DWG\P2020\20200921B11\Civil\Plan\20200921B11_WET01.dwg Layout: WET-01 Plotted: 2022-10-19 2:56 PM Saved: 2022-10-18 8:14 PM User: SKing
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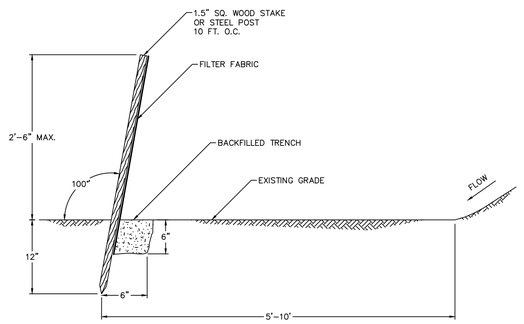
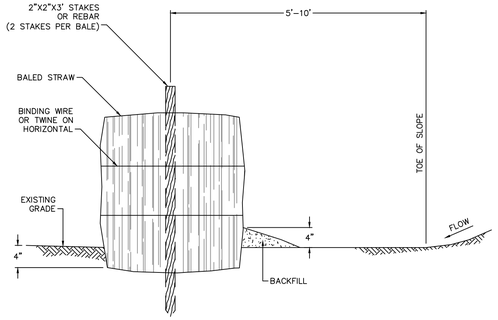
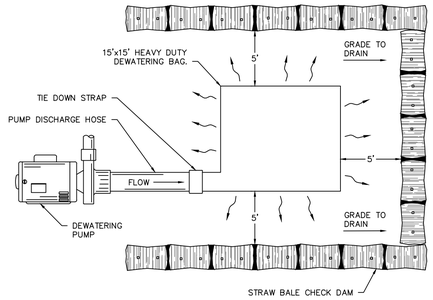


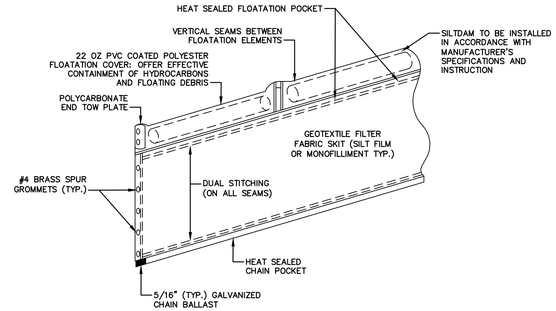
SILT FENCE
NOT TO SCALE



TOE OF SLOPE STRAW BALE BARRIER
NOT TO SCALE



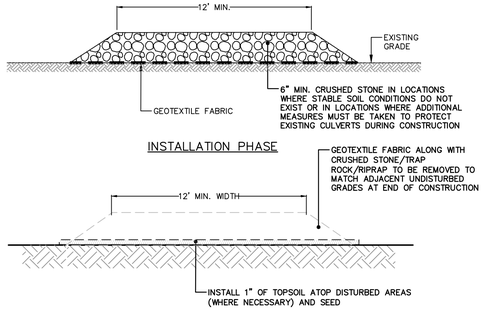
DEWATERING BAG
NOT TO SCALE



NOTES:

1. FLOATATION SIZE (6", 8" OR 12" DIA.) DETERMINED BY SKIRT DEPTH/SITE VARIABLES.
2. OTHER END TYPES AVAILABLE SUCH AS ALUMINUM UNIVERSAL SLIDE OR SLOTTED TUBE.
3. OPTIONAL TOP TENSION CABLE (5/16" TYP.) AVAILABLE FOR INCREASED STRENGTH.

SILTDAM FLOATING TURBIDITY BARRIER
NOT TO SCALE



NOTES:

1. PLACE ADDITIONAL CRUSHED STONE AS REQUIRED THROUGHOUT CONSTRUCTION TO MAINTAIN STABLE ACCESS IN LOCATIONS ALONG ACCESSES WHERE STABLE SOILS DO NOT EXIST OR IN LOCATIONS WHERE ADDITIONAL MEASURES MUST BE TAKEN TO PROTECT EXISTING FEATURES DURING CONSTRUCTION.
2. FOR WET AREAS, CONTRACTOR SHALL FURNISH AND PLACE ADDITIONAL MEASURES (E.G., SWAMP MATS, GEOGRID, GEOTEXTILE FABRIC, TRAP ROCK/RIPRAP, ADDITIONAL STONE, ETC.) AS REQUIRED TO MAINTAIN STABLE ACCESS FOR CONSTRUCTION EQUIPMENT AND VEHICLES REQUIRED TO COMPLETE WORK.
3. IN SUCH LOCATIONS WHERE ADDITIONAL CRUSHED STONE, TRAP ROCK/RIPRAP, ETC., IS REQUIRED, INSTALL MATERIALS ATOP GEOTEXTILE FILTER FABRIC TO FACILITATE THE REMOVAL OF THIS MATERIAL PRIOR TO RESTORATION ACTIVITIES.
4. AT END OF CONSTRUCTION AND PRIOR TO RESTORATION, REMOVE ALL GEOTEXTILE FILTER FABRIC AND STONE (I.E. THAT ABOVE ADJACENT EXISTING GROUND ELEVATION). TOP DRESS AREA WITH TOPSOIL (AS REQUIRED) AND SEED TO ESTABLISH GRASS VEGETATION.
5. CONTRACTOR SHALL PREPARE AND SUBMIT A DETAILED CONSTRUCTION ACCESS AND MAINTENANCE PLAN INDICATING PHASING, VEHICLES/EQUIPMENT, LOCATIONS AND TYPES OF MATERIALS TO BE EMPLOYED TO CREATE AND MAINTAIN STABLE ACCESS THROUGHOUT CONSTRUCTION WHILE AVOIDING IMPACTS TO EXISTING BURIED UTILITIES AND ASSURING CONTINUED ACCESS BY OWNER TO ALL SITE FACILITIES.

TEMPORARY CONSTRUCTION ACCESS ROUTE
NOT TO SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

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TOWN OF DARIEN

DETAILS

RINGS END DAM EMERGENCY REPAIRS

RINGS END ROAD DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: OCTOBER 2022

CD-501

File: J:\DWG\P2020\0921\B11\Civil\Plan\20200921B11_DET01.dwg Layout: CD-502 Plotted: 2022-10-19 2:56 PM Saved: 2022-10-19 2:50 PM User: SKing
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CD-502

PROJ. No.: 20200921.B11
DATE: OCTOBER 2022

TOWN OF DARIEN

DETAILS

RINGS END DAM EMERGENCY REPAIRS

RINGS END ROAD DARIEN, CONNECTICUT

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No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

Photo 1: Spillway Crest from Left Side of Rings End Road Bridge

Photo 2: Spillway Crest from Right Abutment

Photo 3: Downstream View of Left Abutment

Photo 4: Eroded protective stone downstream of the dam,
with shellfish bed beyond. Downstream channel on left.

Photo 5: Erosion on left side of the dam

Photo 6: Crumbled Concrete Slab to Left of Fish Way

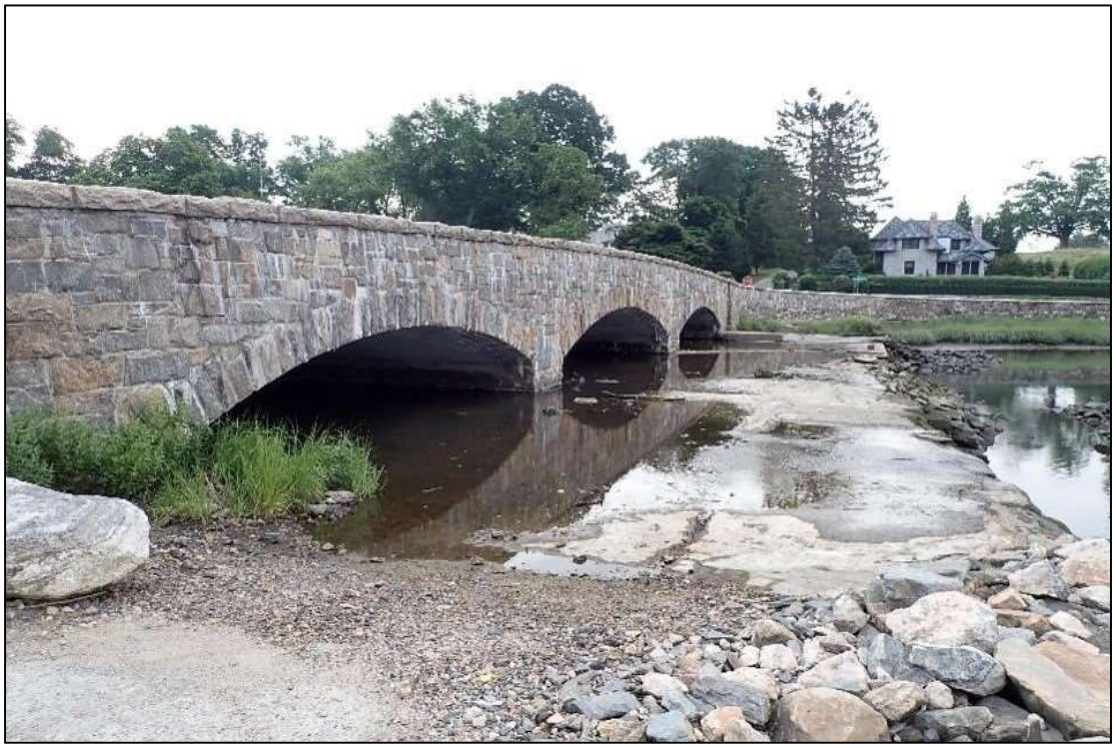


Photo 7: Downstream Overview of Bridge from Right Abutment

Photo 8: Wetland Area at Left Abutment

Photo 9: Downstream face of tide gates

Photo 10: Overview of Scour Hole from Right Abutment

Connecticut Department of
Energy & Environmental Protection
Bureau of Water Protection & Land Reuse
Land & Water Resources Division

LWRD License Application
Pre-Submission Consultation Form

State of CT, Department of Agriculture, Bureau of Aquaculture

A pre-submission consultation with Aquaculture is required for some of the LWRD license applications. Please refer to the application form for specific projects and locations which require consultation.

To the applicant- Prior to the submission of your license application to the Connecticut Department of Energy and Environmental Protection (DEEP) Land & Water Resources Division (LWRD), please complete Part I and submit this form to the Department of Agriculture, Bureau of Aquaculture ("DOA/BOA") by: hardcopy, P.O. Box 97, Milford, CT, 06460; facsimile, 203-783-9976; or e-mail, david.carey@ct.gov. Include a location map of your site and project plans. Once the DOA/BOA returns the completed form to you, please submit it along with your license application to DEEP.

Part I: *To be completed by APPLICANT*

1. Applicant/Registrant Information

Name: Town of Darien
Mailing Address: 2 Renshaw Road
City/Town: Darien State: CT Zip Code: 06820
Business Phone: 203-656-7365 Ext.: _____
Contact Person: Darren Oustafine Title: Asst Dir of Public Works
Business Phone: _____ Ext.: _____
E-mail: Doustafine@darienct.gov

2. Engineer/Surveyor/Agent Information (list as applicable)

Name: Fuss & O'Neill Title: _____
Mailing Address: 146 Hartford Road
City/Town: Manchester State: CT Zip Code: 06040
Business Phone: 860-783-4677 Ext.: _____
Contact Person: Elsa Loehmann Title: Project Manager
Business Phone: _____ Ext.: _____
E-mail: ELoehmann@fando.com
Service Provided: Engineering Design & Permitting Services

3. Site Location:

Name of Site : Rings End Pond
Street Address: 100 Rings End Road
City/Town: Darien State: CT Zip Code: 06820
Tax Assessor's Reference: Map 51 Block _____ Lot 2
Name of Waterbody: Rings End Pond

4. ☒ **Confirm location map and site plans are attached.**

Date of plans: September 2022

Part I: *To be completed by APPLICANT (continued)*

5. Provide or attach a brief, but thorough description of the project. _____

See attached

Part II: *To be completed by DOA/BOA*

This consultation form is required to be submitted as part of an application for a Structures, Dredging & Fill license (Connecticut General Statutes (CGS) Section 22a-361) and/or Tidal Wetlands license (CGS Section 22a-32) and some of the General Permits to DEEP LWRD. The application has not yet been submitted to DEEP. Please review the enclosed materials and determine whether the project will significantly impact shellfish beds. You may also provide comments or recommendations regarding the proposal. Should you have any questions regarding this process, please call DEEP LWRD at 860-424-3019. **Please return the completed form to the applicant.**

CGS Section 22a-361(b) requires that the Commissioner of DEEP shall hold a public hearing on license applications submitted pursuant to CGS section 22a-361 provided that a petition requesting such hearing signed by 25 or more persons is received **and** if the project will significantly impact any shellfish area, as determined by the DOA/BOA.

DOA/BOA DETERMINATION:

Project located on (check one): ☐ natural bed ☐ state bed ☐ local bed ☐ none

☒ other, please specify: Goodwives river a designated Natural Bed

If project is located upon a franchised or leased shellfish bed, please provide the owner or lessee's contact information below.

Check one of the following:

☒ I have determined that the work described in Part I of this form and attachments **WILL NOT** significantly impact any shellfish area.

☐ I have determined that the work described in Part I of this form and attachments **WILL** significantly impact any shellfish area and that a public hearing must be held if the DEEP issues a public notice for the project as currently designed and a qualified petition is received.

COMMENTS/RECOMMENDATIONS (or check here if attached: ☒):

No in water work from June 1 through October 1 to protect spawning shellfish and natural bed oyster habitat and the oyster resource. In water work outside that restriction should use turbidity curtains to contain the suspension and dispersion of sediments in the river.

David H Carey

Signature of Commission Representative

01/17/2023

Date

Aquaculture Director

Print Name of Commission Representative

Title

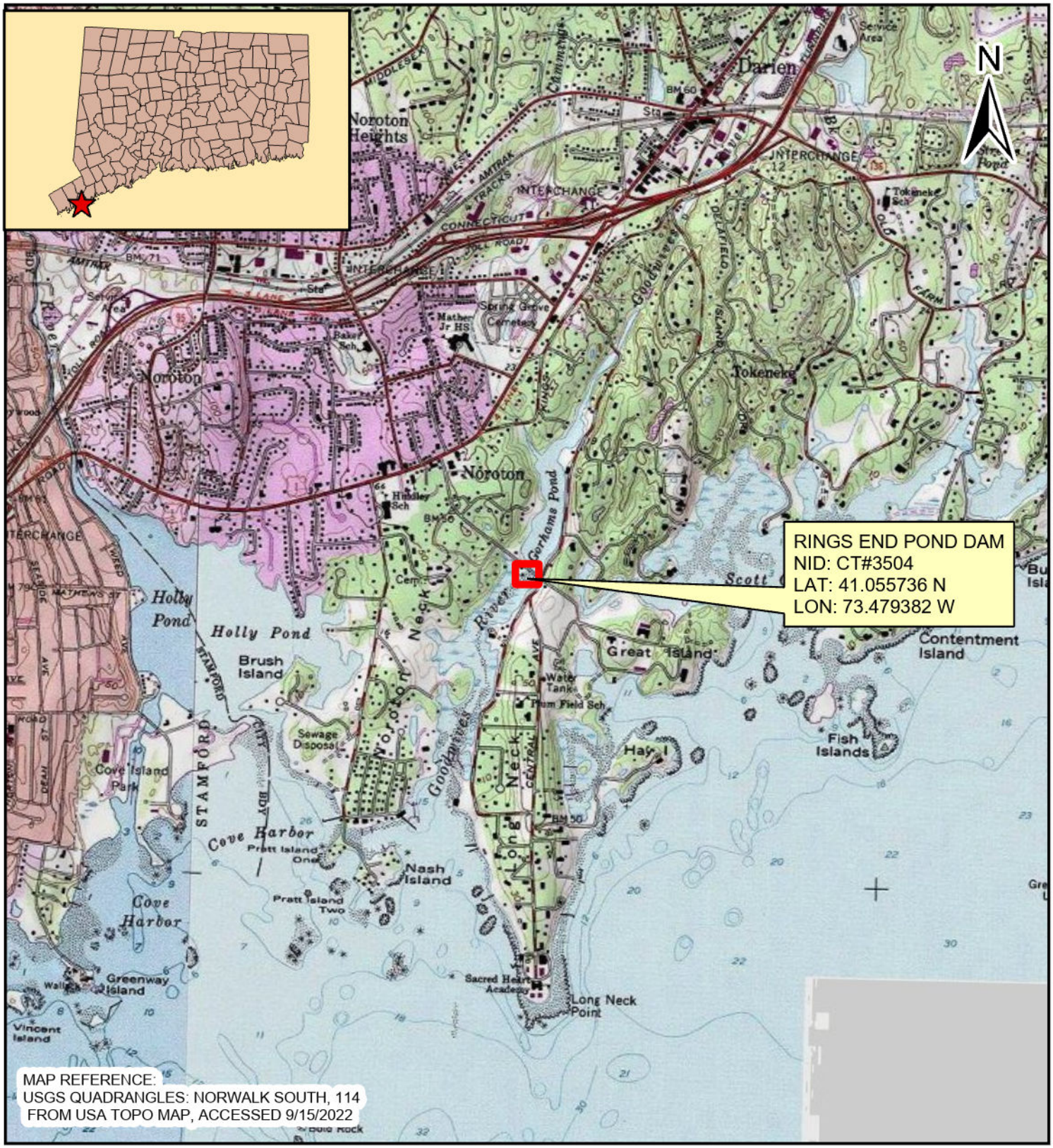
Project Summary

The Town of Darien experienced catastrophic flooding in early September 2021 as a result of Tropical Storm Ida. The Rings End Dam, located at the base of Rings End Bridge, suffered severe damage from excessive flood flows on the Goodwives River.

As a result of the storm, substantial scour of the downstream toe of the dam has occurred, with subsequent undermining of the downstream masonry face, collapse and complete loss of stones from the downstream face, erosion of the underlying embankment soils, and undermining and collapse of the concrete spillway crest slab. Future heavy flows over the dam could result in further erosion of the exposed downstream embankment face and loss of currently undermined stone masonry wall stone. It is recommended that the dam be repaired as quickly as possible to avoid further damage. This is a no hazard classification dam; however, the impact of dam failure is the loss of the impoundment upstream, and the loss of this historic structure, and potential damage to the Ring's End Road bridge.

The dam is a historic structure of great importance to the Town of Darien, and therefore repairs must be consistent with the original construction of the dam to return the dam to what it looked like prior to sustaining damages from Tropical Storm Ida. Use of stone masonry to reconstruct the damaged and missing stone masonry wall will be required to satisfy the historic concerns for this structure.

The proposed repairs include removal of loose material away from the toe of the dam and from the scour hole that has formed at the toe of the dam. Suitable material will be stockpiled for reuse on site. Downstream toe protective stone will be temporarily removed in order to excavate for the foundation of the stone masonry wall placement. Voids will be filled or chinked with large stone anchored with mortar, similar to the original construction. The damaged concrete spillway crest slab will be sawcut and a replacement slab will be poured. The new slab will be integrated to the stone masonry face with dowels and reinforcing to form a waterproof seal. Installation may occur either from equipment staged on the spillway and protected from tidal inundation using a coffer dams, or by a barge that will be positioned using spuds to protect benthic habitat. Should construction methodology require dewatering, water will be discharged to a temporary settling basin. The existing tide gate and fish ladder do not require repair.



SEPTEMBER 2022

FIGURE 1

TOWN OF DARIEN

SITE LOCATION MAP

RINGS END POND DAM (CT14840)

DARIEN, CONNECTICUT

SCALE
HORZ: 1 INCH = 2500 FEET
VERT:
DATUM
HORZ:
VERT: NAVD88

K:\P2020\0921\B11\MXD\MuddyRiverNDDBApplication.aprx

RINGS END DAM EMERGENCY REPAIRS

CT DAM NO. 3504 · DARIEN · CONNECTICUT

PRELIMINARY DESIGN PLANS

OCTOBER 19, 2022

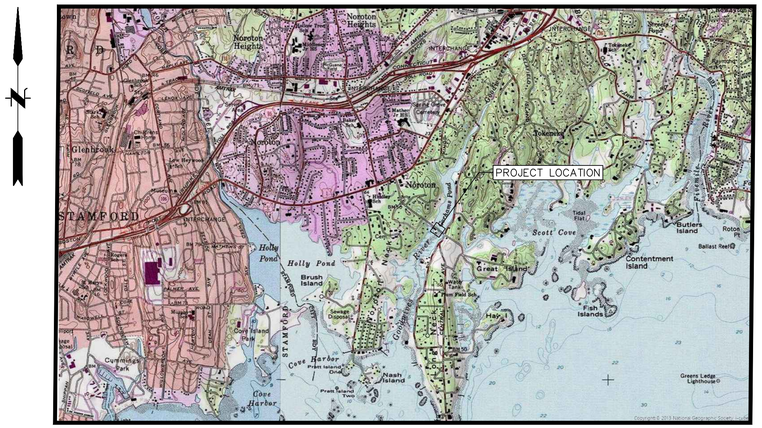
PREPARED FOR

TOWN OF DARIEN
2 RENSHAW ROAD
DARIEN, CT 06820

PREPARED BY

FUSS & O'NEILL
146 HARTFORD ROAD
MANCHESTER, CONNECTICUT 06040
860.646.2469
www.fando.com

SHEET INDEX



LOCATION MAP
SCALE: 1" = 1000'

PHILIP E. FORZLEY — CT P.E. LICENSE NO.: ######

PROJ. No.: 20200921.B11
DATE: OCTOBER 2022

GI-001

File: J:\DWG\P2020\0921B11\CivilPlan\20200921B11_COV01.dwg Layout: GI-001 Plotted: 2022-10-19 2:56 PM Saved: 2022-10-19 2:50 PM User: SKing

CIVIL GENERAL NOTES

GENERAL

1. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SHOWN ON THE DRAWINGS TO SCALE OR TO THEIR ACTUAL DIMENSION OR LOCATION. COORDINATE DETAIL SHEET DIMENSIONS, MANUFACTURERS' LITERATURE, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.
2. DO NOT RELY SOLELY ON ELECTRONIC VERSIONS OF DRAWINGS, SPECIFICATIONS, AND DATA FILES THAT ARE PROVIDED BY THE ENGINEER. FIELD VERIFY LOCATION OF PROJECT FEATURES.
3. PERFORM NECESSARY CONSTRUCTION NOTIFICATIONS, APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK AS REQUIRED BY THE CONTRACT DOCUMENTS.
4. BASE PLAN: THE TOPOGRAPHY AND PHYSICAL FEATURES ARE BASED ON A LIMITED TOPOGRAPHIC SURVEY DATED AUGUST 4, 2022 PERFORMED ON THE GROUND BY REDNISS & MEAD. SEE SHEET LTS FOR ADDITIONAL SURVEY NOTES AND REFERENCES.
6. TOPOGRAPHIC ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
7. REFERENCE IS MADE TO FEMA FLOOD INSURANCE RATE MAP NO. 09001C0536G, EFFECTIVE DATE JULY 8, 2013.

WORK RESTRICTIONS

1. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, FIRE HYDRANTS, AND UTILITIES WITHOUT APPROPRIATE PERMITS. SEE SHEET CP-101 FOR ADDITIONAL INFORMATION ON TEMPORARY LANE AND SIDEWALK CLOSURE OF RINGS END ROAD.
2. WORK IS RESTRICTED TO [INSERT RESTRICTIONS FROM TOWN].
3. OTHER WORK RESTRICTIONS WILL BE DETERMINED FOLLOWING REGULATOR CONSULTATIONS.

REGULATORY REQUIREMENTS

1. WITHIN LOCAL RIGHTS-OF-WAY, PERFORM THE WORK IN ACCORDANCE WITH LOCAL MUNICIPAL STANDARDS AND, AS APPLICABLE, IN ACCORDANCE WITH THE LATEST EDITION OF THE DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS AND ISSUED REVISIONS/SUPPLEMENTS (FORM 818).
2. PROVIDE TRAFFIC SIGNAGE AND PAVEMENT MARKINGS IN CONFORMANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
3. BE RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. PERFORM CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
4. DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES AND STATUTES.

EROSION AND SEDIMENT CONTROL

1. INSTALL EROSION CONTROL MEASURES PRIOR TO STARTING ANY WORK ON THE SITE. REFER TO SHEET CE-101.
2. IMPLEMENT ALL NECESSARY MEASURES REQUIRED TO CONTROL STORMWATER RUNOFF, DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE. PERFORM CORRECTIVE ACTION AS NEEDED FOR EROSION CLEANUP AND REPAIRS TO OFF SITE AREAS, IF ANY, AT NO COST TO OWNER.
3. INSPECT AND MAINTAIN EROSION CONTROL MEASURES PER THE SCHEDULE IN THE EROSION AND SEDIMENT CONTROL DRAWINGS. DISPOSE OF SEDIMENT IN AN UPLAND AREA. DO NOT ENCUMBER DRAINAGE STRUCTURES AND PROTECTED AREAS.
4. PERFORM CONSTRUCTION SEQUENCING IN SUCH A MANNER TO CONTROL EROSION AND TO MINIMIZE THE TIME THAT EARTH MATERIALS ARE EXPOSED BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED.
5. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, REMOVE AND DISPOSE OF TEMPORARY EROSION CONTROL MEASURES. CLEAN SEDIMENT AND DEBRIS FROM TEMPORARY MEASURES AND FROM PERMANENT STORM DRAIN SYSTEMS.

DEMOLITION

REFER TO DEMOLITION NOTES ON SHEET CP-101.

CONSTRUCTION LAYOUT

1. PROVIDE PROPER TRANSITIONS BETWEEN EXISTING AND PROPOSED SITE IMPROVEMENTS. FIELD VERIFY EXISTING HARDSCAPED SURFACED (E.G. PAVEMENT, CONCRETE, ETC.) AND GROUND ELEVATIONS AT THE INTERFACE WITH PROPOSED IMPROVEMENTS BEFORE START OF CONSTRUCTION.
2. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, FIELD VERIFY PROPOSED UTILITY ROUTES AND IDENTIFY ANY INTERFERENCES OR OBSTRUCTIONS WITH EXISTING UTILITIES OR PUBLIC RIGHTS-OF-WAY.
3. IMMEDIATELY INFORM THE ENGINEER IN WRITING IF EXISTING UTILITY CONDITIONS CONFLICT OR DIFFER FROM THAT INDICATED AND IF THE WORK CANNOT BE COMPLETED AS INDICATED.
4. BOUNDS OR MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A PROFESSIONAL LICENSED SURVEYOR.

EARTHWORK

1. NOTIFY UTILITY LOCATOR SERVICE AT LEAST 72 HOURS BEFORE STARTING EXCAVATION: "CALL BEFORE YOU DIG" AT 1-800-922-4455.
2. STOP WORK IN THE VICINITY OF SUSPECTED CONTAMINATED SOIL, GROUNDWATER OR OTHER MEDIA. IMMEDIATELY NOTIFY THE OWNER SO THAT APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN. RESUME WORK IN THE IMMEDIATE VICINITY ONLY UPON DIRECTION BY THE OWNER.

UTILITIES

3. THE TYPE, SIZE AND LOCATION OF DEPICTED UNDERGROUND UTILITIES ARE APPROXIMATE REPRESENTATIONS OF INFORMATION OBTAINED FROM FIELD LOCATIONS OF VISIBLE FEATURES, EXISTING MAPS AND PLANS OF RECORD, UTILITY MAPPING, AND OTHER SOURCES OF INFORMATION OBTAINED BY THE ENGINEER. ASSUME NO GUARANTEE AS TO THE COMPLETENESS, SERVICEABILITY, EXISTENCE, OR ACCURACY OF UNDERGROUND FACILITIES.

PAVEMENT

1. AT A MINIMUM, CONSTRUCT ACCESSIBLE ROUTES, PARKING SPACES, RAMPS, SIDEWALKS AND WALKWAYS IN CONFORMANCE WITH THE FEDERAL AMERICANS WITH DISABILITIES ACT AND WITH STATE AND LOCAL LAWS AND REGULATIONS (WHICHEVER ARE MORE STRINGENT).

SITE RESTORATION

1. PROVIDE 6 INCHES OF TOPSOIL AND SEED TO AREAS DISTURBED DURING CONSTRUCTION AND NOT DESIGNATED TO BE RESTORED WITH IMPERVIOUS SURFACES (BUILDINGS, PAVEMENTS, WALKS, ETC.) UNLESS OTHERWISE NOTED.
2. REPAIR DAMAGES RESULTING FROM CONSTRUCTION LOADS, AT NO ADDITIONAL COST TO OWNER.
3. RESTORE AREAS DISTURBED BY CONSTRUCTION OPERATIONS TO THEIR ORIGINAL CONDITION OR BETTER, AT NO ADDITIONAL COST TO OWNER.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.:
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GRAPHIC SCALE

FUSS&O'NEILL
146 HARTFORD ROAD
MANCHESTER, CONNECTICUT 06040
860.646.2469
www.fando.com

TOWN OF DARIEN

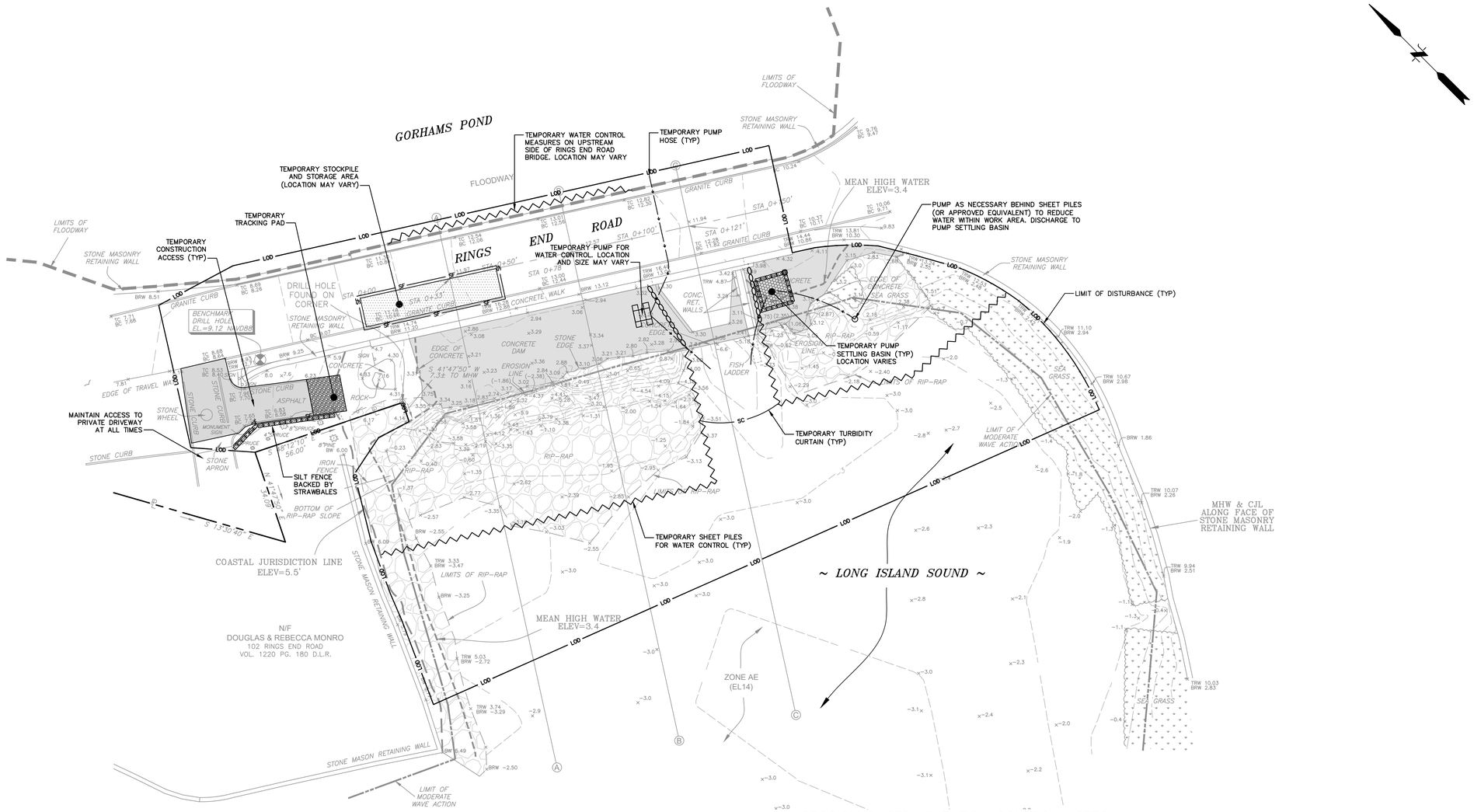
GENERAL NOTES & INFORMATION

RINGS END DAM EMERGENCY REPAIRS

RINGS END ROAD DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: OCTOBER 2022

GI-002



LEGEND

- LOD — LIMIT OF DISTURBANCE
- SF — SILT FENCE
- STRAWBALES
- SC — TURBIDITY CURTAIN
- WATER CONTROL (SHEET PILES OR APPROVED EQUAL)
- WATER CONTROL (SANDBAGS OR APPROVED EQUAL)
- STONE TRACKING PAD
- STORAGE AND STOCKPILE AREA
- PUMP SETTLING BASIN

WATER CONTROL NOTES

1. CONTRACTOR TO DEVELOP WATER CONTROL PLAN FOR SUBMISSION TO THE ENGINEER FOR APPROVAL PRIOR TO INITIATION OF CONSTRUCTION
2. THE CONTRACTOR MAY ELECT TO PERFORM THE WORK USING ADDITIONAL STAGES OF WATER CONTROL THAT VARY FROM THOSE DEPICTED HEREIN. WATER CONTROL MEETING THE REQUIREMENTS OF THESE PLANS SHALL BE MAINTAINED DURING ALL STAGES OF CONSTRUCTION.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING AND PROVIDING FULLY ADEQUATE PASSAGE OF BASE STREAM FLOWS AT ALL TIMES DURING CONSTRUCTION, AND SHALL IMPLEMENT PROVISIONS, AS REQUIRED, TO PROVIDE FULLY ADEQUATE PASSAGE OF THE TEMPORARY DESIGN STORM.

HYDRAULIC DATA GOODWIVES RIVER & STONY BROOK	
DRAINAGE AREA	### SQ MI
DESIGN STORM FREQUENCY	###-YR
DESIGN DISCHARGE	#,### CFS

TIDAL DATA*	
CJL (NAVD88)	5.5 FT
MHW (NAVD88)	3.4 FT
MLW (NAVD88)	−3.8 FT

*TIDAL INFORMATION OBTAINED FROM THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS "RESOURCES FOR TIDAL AND NAVIGABLE WATERS IN CONNECTICUT" DATED OCTOBER 15, 2012

EROSION & SEDIMENTATION CONTROL NOTES

1. CONSTRUCTION STANDARDS – CONSTRUCT ALL EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE MOST RECENT EDITION OF THE "CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL" (CT DEP BULLETIN 34). ALL MEASURES SHALL BE MAINTAINED AND UPGRADED TO ACHIEVE PROPER SEDIMENT CONTROL DURING CONSTRUCTION.

2. PLAN IMPLEMENTATION – IMPLEMENT THIS EROSION AND SEDIMENT CONTROL PLAN. THIS IMPLEMENTATION INCLUDES THE INSTALLATION AND MAINTENANCE OF CONTROL MEASURES UNTIL PERMANENT STABILIZATION IS ACHIEVED, INFORMING ALL SUBCONTRACTORS OF THE REQUIREMENTS AND OBJECTIVES OF THE PLAN, AND NOTIFYING THE PROPER MUNICIPAL AGENCY OF ANY TRANSFER OF THIS RESPONSIBILITY. THE OWNER SHALL BE RESPONSIBLE FOR CONVEYING A COPY OF THE EROSION AND SEDIMENT CONTROL PLAN TO THE NEW OWNER IF THE TITLE OF THE LAND IS TRANSFERRED PRIOR TO ACHIEVING PERMANENT STABILIZATION.

3. INSTALLATION SCHEDULE – INSTALL THE CONSTRUCTION ENTRANCE BEFORE CONSTRUCTION TRAFFIC INTO AND OUT OF THE PROJECT AREA BEGINS. INSTALL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO CONSTRUCTION. INSTALL ADDITIONAL CONTROL MEASURES DURING THE CONSTRUCTION PERIOD, IF DEEMED NECESSARY BY THE OWNER, HIS AGENTS OR AGENTS OF THE MUNICIPALITY.

4. FUGITIVE DUST – CONTROL FUGITIVE DUST USING WATER SPRAYS OR CALCIUM CHLORIDE ON SOIL SURFACES, SWEEPING PAVED AREAS, TEMPORARY WINDBREAKS OR NON–ASPHALTIC SOIL TACKIFIERS.

5. STRAW BALE LIFE SPAN – INSTALL STRAW BALES WHERE PROTECTION AND EFFECTIVENESS IS REQUIRED FOR LESS THAN 90 DAYS. OTHERWISE, INSTALL SILT FENCE.

6. CATCH BASINS – IF APPLICABLE, PROTECT CATCH BASINS WITH PROPER CONTROLS THROUGHOUT THE CONSTRUCTION PERIOD UNTIL ALL DISTURBED AREAS ARE PERMANENTLY STABILIZED.

7. STOCKPILES – ENCIRCLE STOCKPILES OF ERODIBLE SOIL WITH A STRAW BALE OR SILT FENCE BARRIER. THE SIDE SLOPES OF ERODIBLE STOCKPILED MATERIAL SHALL BE NO STEEPER THAN 2:1. STOCKPILES THAT ARE NOT TO BE USED WITHIN 30 DAYS SHALL BE SEEDED AND MULCHED IMMEDIATELY AFTER THEY ARE FORMED.

8. TOE OF SLOPE – ESTABLISH AN EROSION CONTROL BARRIER (SILT FENCE OR STRAW BALE BARRIER) APPROXIMATELY 5 TO 10 FEET FROM THE PROPOSED TOE OF THE CUT OR FILL AREA PRIOR TO BEGINNING EARTHWORK UNLESS WITHIN THE WORK AREAS CONFINED BY SHEET PILES.

9. SEDIMENT REMOVAL – SEDIMENT REACHING ½ THE HEIGHT OF THE EROSION CONTROL BARRIER SHALL BE REMOVED. REMOVE AND DISPOSE OF SEDIMENT IN A MANNER CONSISTENT WITH THE INTENT OF THE PLAN.

10. SOIL STABILIZATION SCHEDULE – APPLY PERMANENT SOIL STABILIZATION MEASURES TO ALL GRADED AREAS WITHIN 7 DAYS OF ESTABLISHING FINAL GRADE.

11. PERMANENT SEEDING – SEED PERMANENT LAWN AREAS IN ACCORDANCE WITH THE SPECIFICATIONS.

12. INSPECTION – THE OWNER SHALL SECURE THE SERVICES OF A SOIL SCIENTIST OR PROFESSIONAL ENGINEER TO VERIFY IN THE FIELD THAT THE CONTROLS REQUIRED BY THIS PLAN ARE PROPERLY INSTALLED AND MAINTAINED DURING CONSTRUCTION OR FOLLOWING A STORM EVENT.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE:
HORZ.: 1"= 20'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
20 10 0 20
GRAPHIC SCALE

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860.646.2469
www.fando.com

TOWN OF DARIEN
EROSION, SEDIMENTATION, AND WATER CONTROL PLAN
RINGS END DAM EMERGENCY REPAIRS
RINGS END ROAD DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: OCTOBER 2022

CE-101

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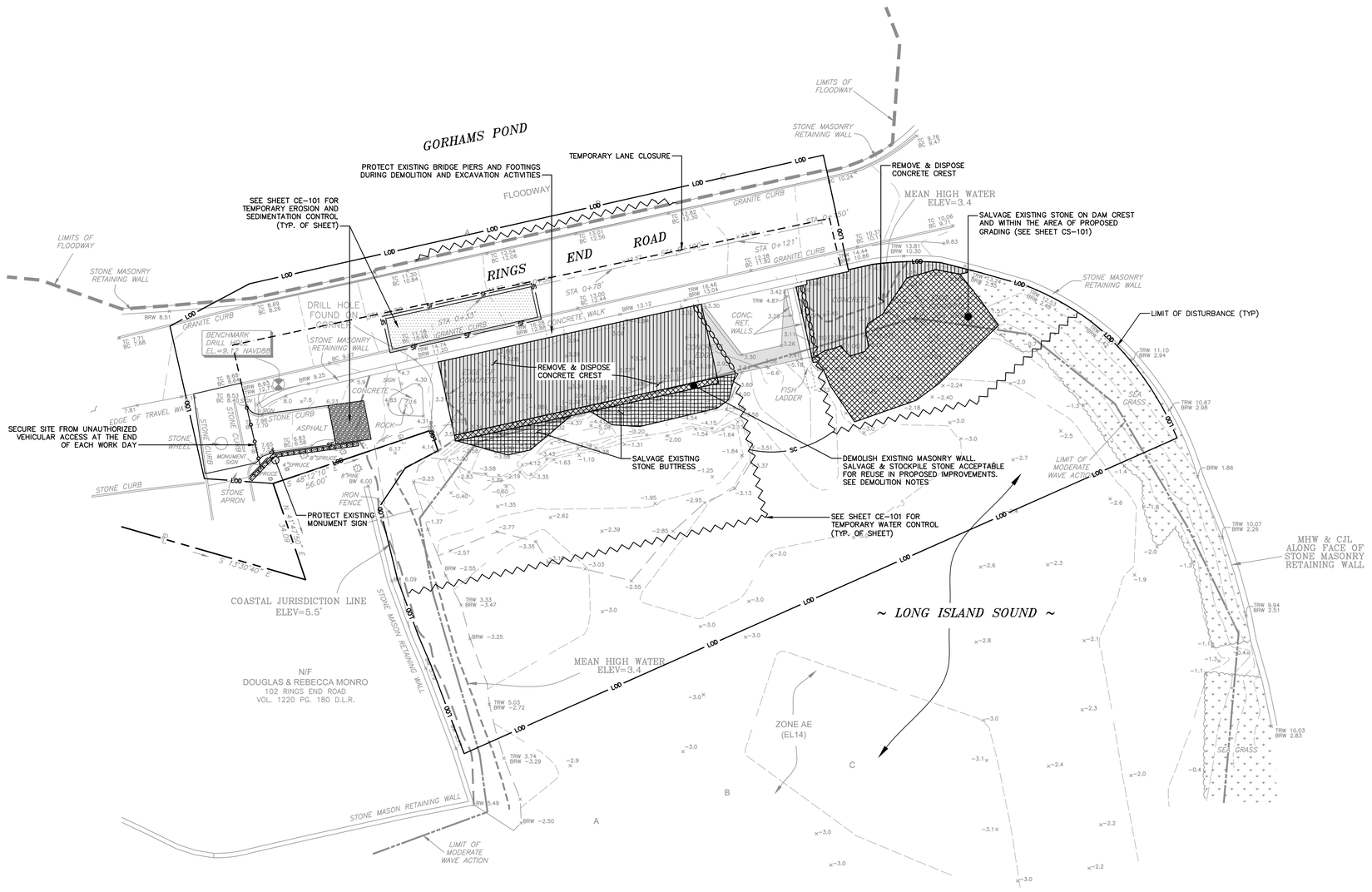

LEGEND

- LOD — LIMIT OF DISTURBANCE
- SF — SILT FENCE
- STRAWBALES
- SC — TURBIDITY CURTAIN
- WATER CONTROL (SHEET PILES OR APPROVED EQUAL)
- WATER CONTROL (SANDBAGS OR APPROVED EQUAL)
- TEMPORARY SITE SECURITY FENCING
- STONE TRACKING PAD
- STORAGE AND STOCKPILE AREA
- DEMOLITION AREA
- SALVAGED MATERIAL AREA

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE:
HORZ.: 1"= 20'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
20 10 0 20
GRAPHIC SCALE

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TOWN OF DARIEN
DEMOLITION & SITE PREPARATION PLAN
RINGS END DAM EMERGENCY REPAIRS
RINGS END ROAD — DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: OCTOBER 2022

CP-101

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SUGGESTED CONSTRUCTION SEQUENCE

1. MOBILIZE TO SITE
2. PROVIDE EROSION & SEDIMENTATION CONTROL MEASURES (SEE SHEET CE-101)
3. PROVIDE TEMPORARY CONSTRUCTION ACCESS (SEE SHEET CE-101)
   - 3.1. NOTE: A LIFT BARGE MAY BE STATIONED DOWNSTREAM OF THE DAM IN ORDER TO CREATE A WORKING PLATFORM. THE LIFT BARGE WILL NOT BE ALLOWED TO REST ON THE BOTTOM SUBSTRATE AND WILL BE ELEVATED ABOVE THE BOTTOM USING SPUD BARS.
4. PROVIDE WATER CONTROL AS INDICATED ON SHEET CE-101
   - 4.1. SEE WATER CONTROL NOTES ON SHEET CE-101
5. DEMOLISH EXISTING SITE FEATURES AS INDICATED ON SHEET CP-101
   - 5.1. SALVAGE EXISTING MASONRY. STONES OF AN ADEQUATE SIZE MAY BE SAVED AND REUSED FOR THE AND BUTTRESS WALL CONSTRUCTION. STONES SMALLER THAN ADEQUATE SIZE MAY BE REUSED ON SITE AT THE DISCRETION OF THE ENGINEER, OR RELOCATED TO ANOTHER LOCATION WITHIN THE TOWN FOR STORAGE AT THE REQUEST OF THE TOWN.
   - 5.2. PROTECT AND MAINTAIN FLOW THROUGH EXISTING TIDE GATE STRUCTURE AND FISH LADDER STRUCTURE AT ALL TIMES DURING CONSTRUCTION
6. EXCAVATE AS SHOWN WITHIN THE GRADING LIMITS FOR INSTALLATION OF PROPOSED SITE IMPROVEMENTS
7. PROVIDE PROPOSED STRUCTURE (SEE SHEETS STR-101 & STR-102):
   - 7.1. PROVIDE TEMPORARY SHORING AS NECESSARY FOR CONSTRUCTION OF PROPOSED SITE IMPROVEMENTS
   - 7.2. INSTALL SHEET PILE CUTOFF AS INDICATED ON THE PLANS
   - 7.3. INSTALL MUD MAT FOR PROPOSED MORTARED MASONRY BLOCK WALLS
   - 7.4. INSTALL PROPOSED MORTARED MASONRY BLOCK WALLS
   - 7.5. INSTALL PROPOSED CONCRETE CUTOFF WALL
   - 7.6. BACKFILL BEHIND WALL WITH APPROVED MATERIAL
   - 7.7. INSTALL PROPOSED CONCRETE SLAB WITH WATERPROOFING MEMBRANE ON THE DAM CREST
8. INSTALL STONE REVETMENT AS INDICATED ON THE PLANS
   - 8.1. SEE DETAIL SHEET CD-502
9. PERFORM SITE GRADING TO PROPOSED GRADES SHOWN THIS SHEET
10. REMOVE WATER CONTROL MEASURES
11. REMOVE EROSION & SEDIMENTATION CONTROL MEASURES
12. RESTORE ALL OTHER AREAS DISTURBED BY CONSTRUCTION ACTIVITIES TO ORIGINAL OR IMPROVED CONDITION
13. DEMOBILIZE FROM SITE

LEGEND

LOD	LIMIT OF DISTURBANCE
	EDGE OF PROPOSED MUD MAT
	PROPOSED MORTARED MASONRY BLOCK WALL
100	PROPOSED CONTOUR
	PROPOSED RIPRAP/BOULDER REVETMENT (TYP.)

NOTES:

1. THE CONSTRUCTION SEQUENCE SHOWN IS A SUGGESTED CONCEPT THAT IS CONSIDERED FEASIBLE FOR PERFORMING THE WORK. THIS SHEET IS INTENDED TO PROVIDE INFORMATION PERTINENT FOR THE DEVELOPMENT OF THE CONTRACTOR'S DETAILED CONSTRUCTION SEQUENCE.
2. THE CONTRACTOR SHALL EVALUATE SITE CONDITIONS AND SUBMIT A DETAILED CONSTRUCTION SEQUENCE, CONSISTING OF PLANS AND NARRATIVE, IN CONFORMANCE WITH THE CONTRACT REQUIREMENTS, FOR THE ENGINEER'S REVIEW. NO WORK SHALL BE PERFORMED PRIOR TO THE ENGINEER'S REVIEW AND ACCEPTANCE OF THE CONTRACTOR'S DETAILED CONSTRUCTION SEQUENCE.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE:
HORZ.: 1"= 20'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
20 10 0 20
GRAPHIC SCALE

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TOWN OF DARIEN
PROPOSED SITE PLAN
RINGS END DAM EMERGENCY REPAIRS
RINGS END ROAD DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: OCTOBER 2022

CS-101

File: J:\DWG\P2020\0921\B11\Civil\Plan\20200921B11_STP01.dwg Layout: CS-101 Plotted: 2022-10-19 2:56 PM Saved: 2022-10-19 2:50 PM User: SKing
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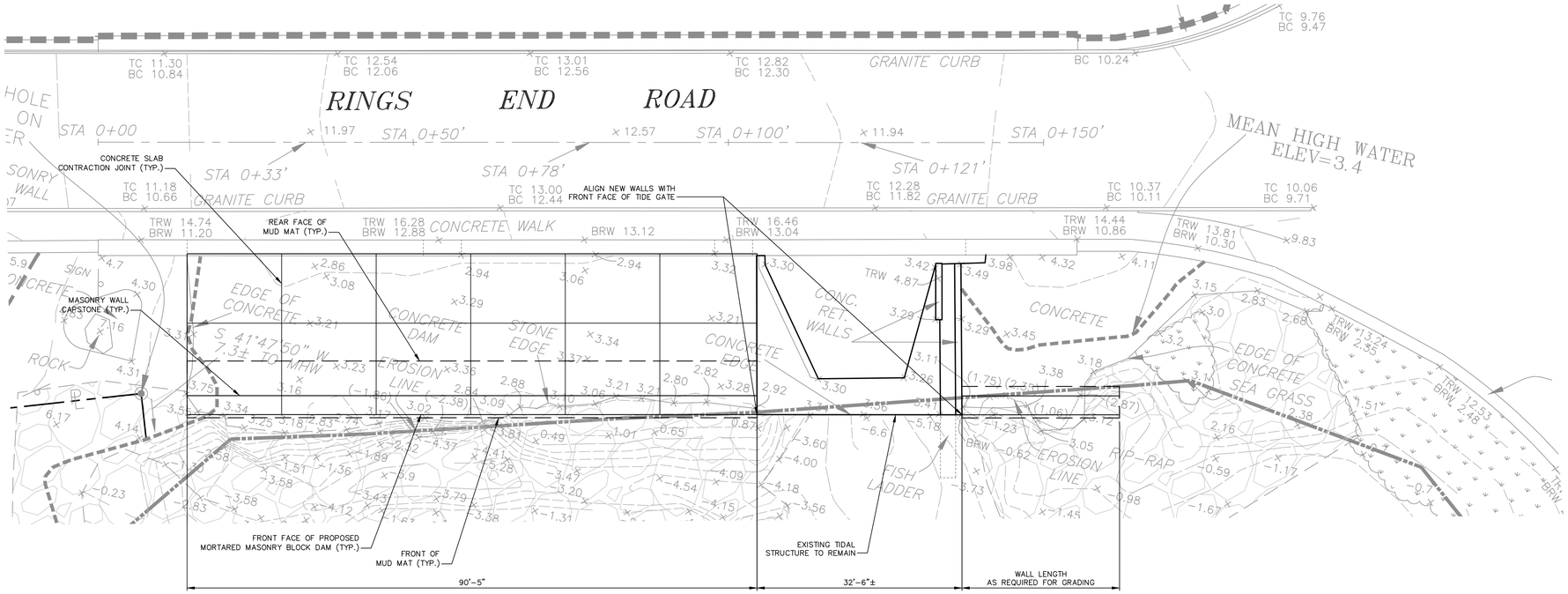
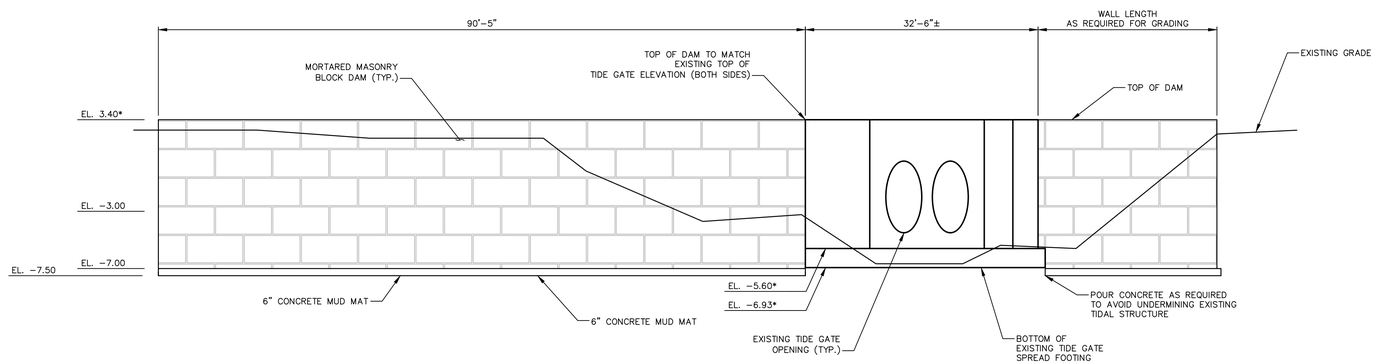


PLAN
1" = 10'-0"



*NOTE: ELEVATIONS SHOWN FOR EXISTING TIDE GATE STRUCTURE ARE FROM THE RECORD DRAWINGS, CONVERTED FROM NGVD-29 TO NAVD88 USING A CONVERSION OF -1.1 FT. CONTRACTOR TO VERIFY ELEVATIONS.

ELEVATION
1" = 10'-0" (H)
1" = 20'-0" (V)

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE:
HORZ.: 1"= 20'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
20 10 0 20
GRAPHIC SCALE

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TOWN OF DARIEN
STRUCTURE PLAN & ELEVATION
RINGS END DAM EMERGENCY REPAIRS
RINGS END ROAD DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: OCTOBER 2022

STR-101

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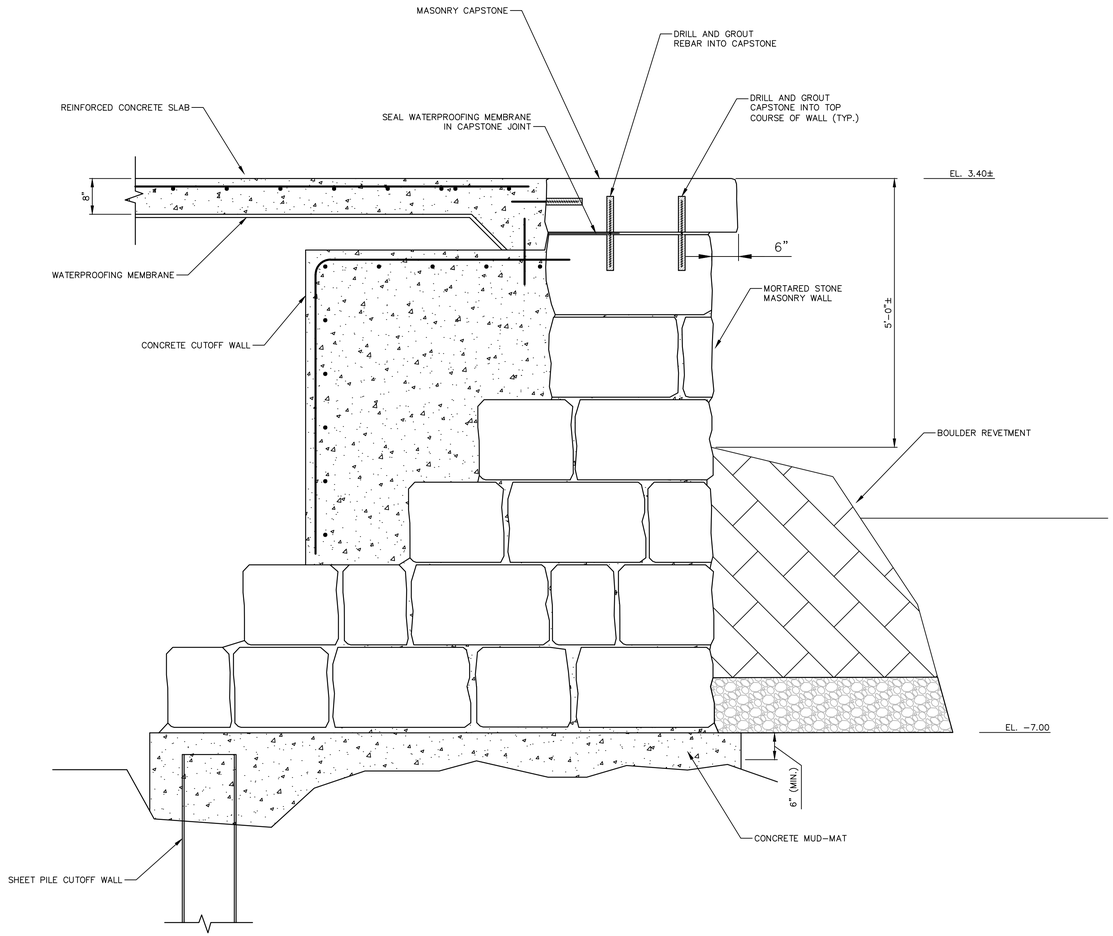

TYPICAL DAM SECTION
3/4" = 1'-0"

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE: HORZ.: VERT.:
DATUM: HORZ.: NAD83 VERT.: NAVD88
0 GRAPHIC SCALE

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TOWN OF DARIEN

RINGS END DAM EMERGENCY REPAIRS

RINGS END ROAD DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: OCTOBER 2022

File: J:\DWG\P2020\20200921B11\Civil\Plan\20200921B11_STR02.dwg Layout: STR-102 Plotted: 2022-10-19 2:56 PM Saved: 2022-10-18 1:52 PM User: ECofrancesco
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FUSS & O'NEILL
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MANCHESTER, CONNECTICUT 06040
860.646.2469
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TOWN OF DARIEN

RESOURCE AREA IMPACT PLAN

RINGS END DAM EMERGENCY REPAIRS

RINGS END ROAD DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: OCTOBER 2022

WET-01

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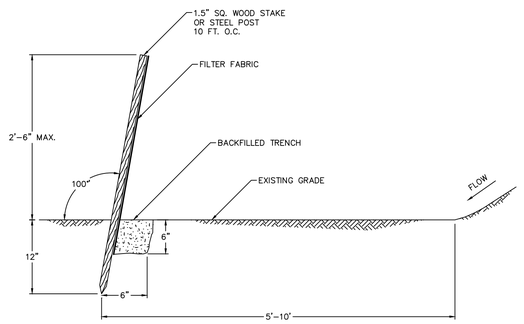

SILT FENCE
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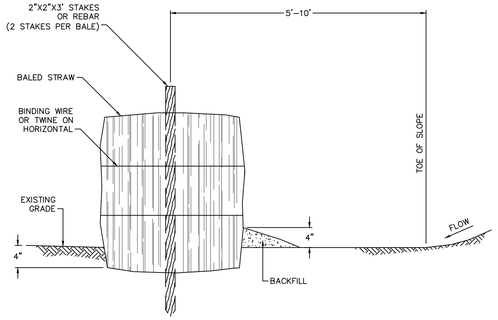

TOE OF SLOPE STRAW BALE BARRIER
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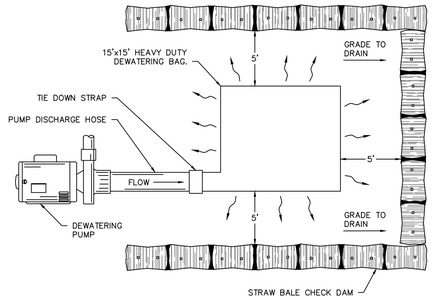
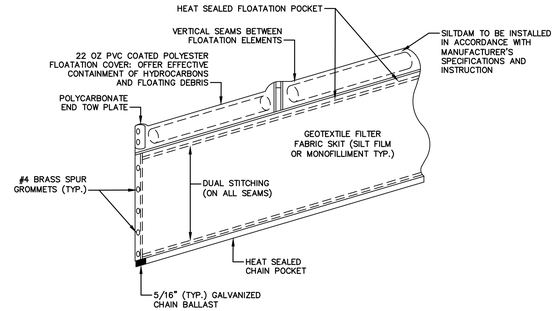


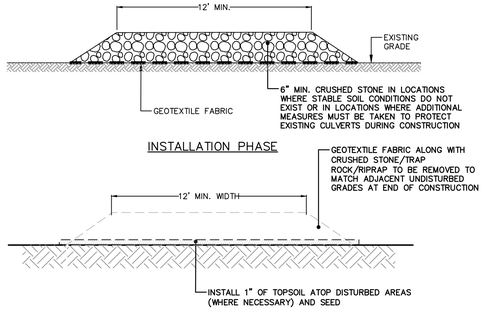
DEWATERING BAG
NOT TO SCALE



NOTES:

1. FLOATATION SIZE (6", 8" OR 12" DIA.) DETERMINED BY SKIRT DEPTH/SITE VARIABLES.
2. OTHER END TYPES AVAILABLE SUCH AS ALUMINUM UNIVERSAL SLIDE OR SLOTTED TUBE.
3. OPTIONAL TOP TENSION CABLE (5/16" TYP.) AVAILABLE FOR INCREASED STRENGTH.

SILTDAM FLOATING TURBIDITY BARRIER
NOT TO SCALE



NOTES:

1. PLACE ADDITIONAL CRUSHED STONE AS REQUIRED THROUGHOUT CONSTRUCTION TO MAINTAIN STABLE ACCESS IN LOCATIONS ALONG ACCESSES WHERE STABLE SOILS DO NOT EXIST OR IN LOCATIONS WHERE ADDITIONAL MEASURES MUST BE TAKEN TO PROTECT EXISTING FEATURES DURING CONSTRUCTION.
2. FOR WET AREAS, CONTRACTOR SHALL FURNISH AND PLACE ADDITIONAL MEASURES (E.G., SWAMP MATS, GEOGRID, GEOTEXTILE FABRIC, TRAP ROCK/RIPRAP, ADDITIONAL STONE, ETC.) AS REQUIRED TO MAINTAIN STABLE ACCESS FOR CONSTRUCTION EQUIPMENT AND VEHICLES REQUIRED TO COMPLETE WORK.
3. IN SUCH LOCATIONS WHERE ADDITIONAL CRUSHED STONE, TRAP ROCK/RIPRAP, ETC., IS REQUIRED, INSTALL MATERIALS ATOP GEOTEXTILE FILTER FABRIC TO FACILITATE THE REMOVAL OF THIS MATERIAL PRIOR TO RESTORATION ACTIVITIES.
4. AT END OF CONSTRUCTION AND PRIOR TO RESTORATION, REMOVE ALL GEOTEXTILE FILTER FABRIC AND STONE (I.E. THAT ABOVE ADJACENT EXISTING GROUND ELEVATION). TOP DRESS AREA WITH TOPSOIL (AS REQUIRED) AND SEED TO ESTABLISH GRASS VEGETATION.
5. CONTRACTOR SHALL PREPARE AND SUBMIT A DETAILED CONSTRUCTION ACCESS AND MAINTENANCE PLAN INDICATING PHASING, VEHICLES/EQUIPMENT, LOCATIONS AND TYPES OF MATERIALS TO BE EMPLOYED TO CREATE AND MAINTAIN STABLE ACCESS THROUGHOUT CONSTRUCTION WHILE AVOIDING IMPACTS TO EXISTING BURIED UTILITIES AND ASSURING CONTINUED ACCESS BY OWNER TO ALL SITE FACILITIES.

TEMPORARY CONSTRUCTION ACCESS ROUTE
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TOWN OF DARIEN

DETAILS

RINGS END DAM EMERGENCY REPAIRS

RINGS END ROAD DARIEN, CONNECTICUT

PROJ. No.: 20200921.B11
DATE: OCTOBER 2022

CD-501

File: J:\DWG\P2020\0921\B11\Civil\Plan\20200921B11_DET01.dwg Layout: CD-502 Plotted: 2022-10-19 2:56 PM Saved: 2022-10-19 2:50 PM User: SKing
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CD-502

PROJ. No.: 20200921.B11
DATE: OCTOBER 2022

TOWN OF DARIEN

DETAILS

RINGS END DAM EMERGENCY REPAIRS

RINGS END ROAD DARIEN, CONNECTICUT

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No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

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November 4, 2022

Elsa Loehmann
Fuss and O'Neill
146 Hartford Rd
Manchester CT 06040
eloehmann@fando.com

Project: Rings End Dam Repair, southeast of 100 Rings End Road, Darien, CT
NDDB Determination No.: 202210871

Dear Elsa Loehmann,

I have reviewed Natural Diversity Database (NDDB) maps and files regarding the area of work provided for the proposed repair and reconstruction of existing dam, stone walls, buttresses, spillway slab at Rings End Dam on Gorhams Pond and the Darien River, south of Rings End Road, Darien, Connecticut. I do not anticipate negative impacts to State-listed species (RCSA Sec. 26-306) resulting from your proposed activity at the site based upon the information contained within the NDDB. The result of this review does not preclude the possibility that listed species may be encountered on site and that additional action may be necessary to remain in compliance with certain state permits. Contact NDDB to report the presence of any listed species and for more detailed guidance. This determination is good for two years. Please re-submit a new NDDB Request for Review if the scope of work changes or if work has not begun on this project by November 4, 2024.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey, cooperating units of DEEP, landowners, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the NDDB should not be substitutes for on-site surveys necessary for a thorough environmental impact assessment. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the database as it becomes available.

Please contact me if you have further questions at (860) 424-3378, or karen.zyko@ct.gov . Thank you for consulting the Natural Diversity Database.

Sincerely,

Karen Zyko
Environmental Analyst