

Appendix A

Boring Logs

FUSS & O'NEILL, INC.
CONSULTING ENGINEERS
MANCHESTER, CT

BORING LOG

Project: Silver Sands
Location: Milford, CT

Boring ID: B-1
Sheet 2 of 2
Project No.: 2000445.A20

Contractor: Clarence Welti Assoc. Inc.
Operator: L. Lindenberger
F&O Rep.: Chris Cullen
Drilling Method: HSA
Sampling Method: Split Spoon (2" OD)
Hammer Wt.: 140 lbs Hammer Fall (in.): 30
Boring Location: See Plan
Ground Elevation:
Date Start: 12/8/12 Date Finish: 12/8/12

Water Level Measurements

Date	Ref. Pt.	Depth	Time

Time & Date of Completion:

Depth (ft)	Sample No.	Sample Depth (ft)	Rec/ Pen	Blows/ 6"	Sample Description	Strata Change	USCS Class.	Remarks
17								
18								
19								
20	S-5	20-21.5		16-14-16	Dense brown fine SAND, some Silt	Silty Sand	SM	
21					Bottom of boring at 21.5 feet			
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								

MINOR CONSTITUENT PROPORTIONS:
Trace 0 to 10% Some 20 to 35%
Little 10 to 20% And 35 to 50%

REMARKS:

FUSS & O'NEILL, INC.
CONSULTING ENGINEERS
MANCHESTER, CT

BORING LOG

Project: Silver Sands
Location: Milford, CT

Boring ID: B-2
Sheet 1 of 3
Project No.: 2000445.A20

Contractor: Clarence Welti Assoc. Inc.
Operator: L. Lindenberger
F&O Rep.: Chris Cullen
Drilling Method: HSA
Sampling Method: Split Spoon (2" OD)
Hammer Wt.: 140 lbs Hammer Fall (in.): 30
Boring Location: See Plan
Ground Elevation:
Date Start: 12/8/12 Date Finish: 12/8/12

Water Level Measurements

Date	Ref. Pt.	Depth	Time

Time & Date of Completion:

Depth (ft)	Sample No.	Sample Depth (ft)	Rec/ Pen	Blows/ 6"	Sample Description	Strata Change	USCS Class.	Remarks
0								
1								
2						Sand		
3								
4								
5								
6	S-1	5-7		1-1-1-1	Very soft black organic SILT and PEAT	Organic Silt	ML-OL	
7								
8								
9								
10	S-2	10-11.5		9-13-19	Dense gray fine SAND, some Silt		SM	
11								
12						Silty Sand		
13								
14								
15								
16	S-3	15-16.5		10-15-15	Dense gray fine SAND and SILT		SP-ML	

MINOR CONSTITUENT PROPORTIONS:

Trace 0 to 10% Some 20 to 35%
Little 10 to 20% And 35 to 50%

REMARKS:

FUSS & O'NEILL, INC. CONSULTING ENGINEERS MANCHESTER, CT	BORING LOG		Boring ID: B-2
	Project: Silver Sands		Sheet 2 of 3
	Location: Milford, CT		Project No.: 2000445.A20

Contractor: Clarence Welti Assoc. Inc.
 Operator: L. Lindenberger
 F&O Rep.: Chris Cullen
 Drilling Method: HSA
 Sampling Method: Split Spoon (2" OD)
 Hammer Wt.: 140 lbs Hammer Fall (in.): 30
 Boring Location: See Plan
 Ground Elevation:
 Date Start: 12/8/12 Date Finish: 12/8/12

Water Level Measurements			
Date	Ref. Pt.	Depth	Time
Time & Date of Completion:			

Depth (ft)	Sample No.	Sample Depth (ft)	Rec/ Pen	Blows/ 6"	Sample Description	Strata Change	USCS Class.	Remarks	
17									
18									
19									
20	S-4	20-21.5		11-11-18	Medium dense gray fine SAND	Silty Sand'	SP-ML		
21					and SILT				
22									
23									
24									
25	S-5	25-26.5		10-11-16	Medium dense gray fine SAND			SP-ML	
26					and SILT				
27						Silt			
28									
29									
30	S-6	30-31.5		9-10-12	Medium dense gray SILT, little			ML	
31					fine Sand				
32									
33									

MINOR CONSTITUENT PROPORTIONS:
 Trace 0 to 10% Some 20 to 35%
 Little 10 to 20% And 35 to 50%

REMARKS:

FUSS & O'NEILL, INC. CONSULTING ENGINEERS MANCHESTER, CT	BORING LOG		Boring ID: B-3
	Project: Silver Sands		Sheet 2 of 2
	Location: Milford, CT		Project No.: 2000445.A20

Contractor: Clarence Welti Assoc. Inc.
 Operator: L. Lindenberger
 F&O Rep.: Chris Cullen
 Drilling Method: HSA
 Sampling Method: Split Spoon (2" OD)
 Hammer Wt.: 140 lbs Hammer Fall (in.): 30
 Boring Location: See Plan
 Ground Elevation:
 Date Start: 12/8/12 Date Finish: 12/8/12

Water Level Measurements			
Date	Ref. Pt.	Depth	Time
Time & Date of Completion:			

Depth (ft)	Sample No.	Sample Depth (ft)	Rec/ Pen	Blows/ 6"	Sample Description	Strata Change	USCS Class.	Remarks
17								
18						Silty Sand		
19								
20								
20	S-4	20-21.5		13-25-27	Very dense gray fine SAND, little Silt		SM	
21					Bottom of boring at 21.5 feet			
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								

MINOR CONSTITUENT PROPORTIONS: Trace 0 to 10% Some 20 to 35% Little 10 to 20% And 35 to 50%	REMARKS:
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Appendix B

Sand Analysis Lab Results

GRAIN SIZE DISTRIBUTION TEST DATA

12/17/2011

Client: FUSS & O'NEILL

Project: SILVER SANDS STATE PARK

Location: B-2

Depth: 15.0

Sample Number: 3

Testing Remarks: WATER CONTENT = 28.3%

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 50.80
 Tare Wt. = 0.00
 Minus #200 from wash = 32%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
74.60	0.00	#10	0.00	0.00	100
		#20	0.10	0.00	100
		#40	0.50	0.00	99
		#100	15.00	0.00	79
		#200	27.50	0.00	42

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	0	0	0	0	1	57	58			42

D10	D15	D20	D30	D50	D60	D80	D85	D90	D95
				0.0855	0.1018	0.1534	0.1763	0.2101	0.2704

Fineness Modulus
0.25

GRAIN SIZE DISTRIBUTION TEST DATA

12/17/2011

Client: FUSS & O'NEILL

Project: SILVER SANDS STATE PARK

Location: B-2

Depth: 30.0

Sample Number: 6

Testing Remarks: WATER CONTENT = 33.1%

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 13.60
 Tare Wt. = 0.00
 Minus #200 from wash = 83%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
80.40	0.00	#10	0.00	0.00	100
		#20	0.10	0.00	100
		#40	0.30	0.00	100
		#100	3.20	0.00	96
		#200	6.50	0.00	87

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	0	0	0	0	0	13	13			87

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
								0.0913	0.1416

Fineness Modulus
0.06

Appendix C

DEEP Certification of Permission



March 18, 2014

State of Connecticut, DEEP
Jennifer Perry
79 Elm Street
Hartford, CT 06106

Subject: Certificate of Permission #201401589-SJ
Silver Sands State Park, Milford

Dear Ms. Perry:

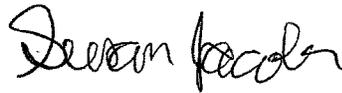
Enclosed please find a copy of the certificate of permission (“certificate”) which is being issued pursuant to your application of February 26, 2014. Your attention is directed to the conditions of the enclosed certificate. All work must conform to that which is specifically authorized by this certificate. Any work in tidal wetlands or waterward of the coastal jurisdiction line in tidal, navigable and coastal waters of the State which has not been authorized by a valid permit or certificate is a violation of state law and subject to enforcement action by the Department of Energy and Environmental Protection and the Office of the Attorney General.

Your initiation of authorized activities will be relied upon as your agreement to comply with the terms and conditions of the certificate. Please note that Appendix B of the certificate has been enclosed for your convenience to comply with Connecticut General Statutes Section 22a-363g. Also, the Permit Notice, found at the back of your authorization, must be posted at the work area while the work is being undertaken. Please refer to the SPECIAL TERMS AND CONDITIONS of your certificate for further details.

If you have not already done so, you should contact your local Planning and Zoning Office to determine local permit requirements for your project. Also, your activity may be eligible for General Permit authorization from the U.S. Army Corps of Engineers (“Corps”). Most maintenance and reconstruction activities require no further authorization from the Corps. Other activities, generally involving work in tidal wetlands or other special aquatic sites, and in or near a federal Navigation Project or involving filling, must receive written authorization from the Corps prior to beginning work. The State of Connecticut will automatically forward this certificate to the Corps for its determination of General Permit eligibility. You do not need to apply directly to the Corps unless they notify you. For more information regarding this federal process, you may write to the Corps New England Division, Regulatory Branch, 696 Virginia Road,

Concord, Massachusetts, 02254 or call 978-318-8335 or 800-343-4789.

Sincerely,



Susan Jacobson, Environmental Analyst
Office of Long Island Sound Programs
Bureau of Water Protection and Land Reuse

Enclosure – COP #201401589-SJ (original cover letter, Appendix B and Permit Notice;
COP copy)

cc: File #201401589-SJ (original COP; copy cover letter, Appendix B, Permit Notice)
via e-mail: Craig Lapinski, Fuss & O'Neill, Inc.
Municipal CEO
Corps
Harbor Master



CERTIFICATE OF PERMISSION

Certificate No: 201401589-SJ
Municipality: Milford
Site of Activity: Great Creek off property located at Silver Sands State Park
Certificate Holder: State of Connecticut, DEEP
79 Elm Street
Hartford, CT 06106

Pursuant to section 22a-363b of the Connecticut General Statutes (“CGS”) and in accordance with CGS sections 22a-359 to 22a-363g, 22a-98, and the Connecticut Water Quality Standards effective February 25, 2011, a certificate of permission (“certificate”) is hereby granted to maintain and modify the Great Creek tide gate and outlet structure for flood and erosion control as is more specifically described below in the SCOPE OF AUTHORIZATION. The work performed shall conform to the terms and conditions of this certificate.

*******NOTICE TO CERTIFICATE HOLDERS AND CONTRACTORS*******

UPON INITIATION OF ANY WORK AUTHORIZED HEREIN, THE CERTIFICATE HOLDER ACCEPTS AND AGREES TO COMPLY WITH ALL TERMS AND CONDITIONS OF THIS CERTIFICATE. FAILURE TO CONFORM TO THE TERMS AND CONDITIONS OF THIS CERTIFICATE MAY SUBJECT THE CERTIFICATE HOLDER AND ANY CONTRACTOR TO ENFORCEMENT ACTIONS, INCLUDING INJUNCTIONS AS PROVIDED BY LAW AND PENALTIES UP TO \$1,000.00 PER DAY PURSUANT TO THE ADMINISTRATIVE CIVIL PENALTY POLICY DESCRIBED IN SECTIONS 22a-6b-1 THROUGH 22a-6b-15 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES.

SCOPE OF AUTHORIZATION

The Certificate Holder is hereby authorized to conduct the following work as described in application number 201401589-SJ, including 21 sheets of plans dated February 11, 2014, submitted by the Certificate Holder to the Commissioner of Energy and Environmental Protection (“Commissioner”) and attached hereto:

maintain and modify the Great Creek tide gate and outlet structure by:

1. installing temporary water control structures, as necessary;
2. constructing a 30’ long concrete box culvert extension;

3. conducting substantial maintenance within the culvert and tide gate as noted on plan sheet 20, attached hereto;
4. removing the temporary water control structures;
5. removing the existing training walls and fence for upland disposal;
6. placing any excavated sand on the northeast side of the outlet;
7. installing new training walls with steel piles and timber lagging; and
8. placing riprap scour protection.

SPECIAL TERMS AND CONDITIONS

1. Work authorized herein is prohibited between April 15th and August 30th, inclusive, of any year in order to protect nesting piping plover (*Charadrius melodus*) in the area unless otherwise authorized in writing by the Commissioner.
2. All work authorized herein shall be conducted in-the-dry behind water control structures, or during periods of lower water to minimize sedimentation.
3. Not later than two (2) weeks prior to the commencement of any work authorized herein, the Certificate Holder shall submit to the Commissioner, on the form attached hereto as Appendix A, 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.
4. The Certificate Holder shall file Appendix B on the land records of the municipality in which the subject property is located not later than thirty (30) days after certificate issuance pursuant to CGS Section 22a-363g. A copy of Appendix B 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 certificate issuance.
5. The Certificate Holder shall give a copy of this certificate to the contractor(s) who will be carrying out the activities authorized herein prior to the start of construction and shall receive a written receipt for such copy, signed and dated by such contractor(s). The Certificate Holder's contractor(s) shall conduct all operations at the site in full compliance with this certificate and, to the extent provided by law, may be held liable for any violation of the terms and conditions of this certificate. At the work area the contractor(s) shall, whenever work is being performed, make available for inspection a copy of this certificate and the final plans for the work authorized herein.
6. The Certificate Holder shall post the attached Permit Notice in a conspicuous place at the work area while the work authorized herein is undertaken.
7. Except as specifically authorized by this certificate, no equipment or material including, but not limited to, fill, construction materials, excavated material or debris, shall be deposited, placed or stored in any wetland or watercourse on or off-site, nor shall any wetland or watercourse be used as a staging area or accessway other than as provided herein.
8. The Certificate Holder shall dispose of sediments in accordance with the terms and conditions of this permit. All waste material generated by the performance of the work authorized herein shall be disposed of by the Certificate Holder at an upland site approved

for the disposal of such waste material, as applicable.

9. On or before ninety (90) days after completion of the work authorized herein, the Certificate Holder shall submit to the Commissioner "as-built" plans of the work area showing all tidal datums and structures, including any proposed elevation views and cross sections included in the certificate. Such 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.

GENERAL TERMS AND CONDITIONS

1. All work authorized by this certificate shall be completed within three (3) years from date of issuance of this certificate ("work completion date") in accordance with all conditions of this permit and any other applicable law.
 - a. The Certificate Holder may request a one-year extension of the work completion date. Such request shall be in writing and shall be submitted to the Commissioner at least thirty (30) days prior to said work completion date. Such request shall describe the work done to date, what work still needs to be completed, and the reason for such extension. It shall be the Commissioner's sole discretion to grant or deny such request.
 - b. Any work authorized herein conducted after said work completion date or any authorized one-year extension thereof is a violation of this certificate and may subject the Certificate Holder to enforcement action, including penalties, as provided by law.
2. In conducting the work authorized herein, the Certificate Holder shall not deviate from the attached plans, as may be modified by this certificate. The Certificate Holder shall not make de minimis changes from said plans without prior written approval of the Commissioner.
3. The Certificate Holder may not conduct work waterward of the coastal jurisdiction line or in tidal wetlands at this certificate site other than the work authorized herein, unless otherwise authorized by the Commissioner pursuant to CGS section 22a-359 et. seq. and/or CGS section 22a-28 et. seq.
4. The Certificate Holder shall maintain all structures or other work authorized herein in good condition. Any such maintenance shall be conducted in accordance with applicable law including, but not limited to, CGS sections 22a-28 through 22a-35 and CGS sections 22a-359 through 22a-363g.
5. In undertaking the work authorized hereunder, the Certificate Holder shall not cause or allow pollution of wetlands or watercourses, including pollution resulting from sedimentation and erosion. For purposes of this certificate, "pollution" means "pollution" as that term is defined by CGS section 22a-423.
6. Upon completion of any work authorized herein, the Certificate Holder 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.
7. The work specified in the SCOPE OF AUTHORIZATION is authorized solely for the

purpose set forth in this certificate. No change in purpose or use of the authorized work or facilities as set forth in this certificate may occur without the prior written authorization of the Commissioner. The Certificate Holder shall, prior to undertaking or allowing any change in use or purpose from that which is authorized by this certificate, request authorization from the Commissioner for such change. Said request shall be in writing and shall describe the proposed change and the reason for the change.

8. The Certificate Holder shall allow any representative of the Commissioner to inspect the work authorized hereunder at reasonable times to ensure that it is being or has been accomplished in accordance with the terms and conditions of this certificate.
9. This certificate is not transferable without prior written authorization of the Commissioner. A request to transfer a certificate shall be submitted in writing and shall describe the proposed transfer and the reason for such transfer. The Certificate Holder's obligations under this certificate shall not be affected by the passage of title to the certificate site to any other person or municipality until such time as a transfer is authorized by the Commissioner.
10. Any document required to be submitted to the Commissioner under this certificate or any contact required to be made with the Commissioner shall, unless otherwise specified in writing by the Commissioner, be directed to:

Permit Section
Office of Long Island Sound Programs
Department of Energy and Environmental Protection
79 Elm Street
Hartford, Connecticut 06106-5127
(860) 424-3034
Fax # (860) 424-4054

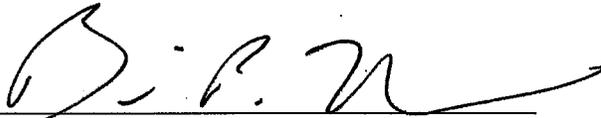
11. The date of submission to the Commissioner of any document required by this certificate shall be the date such document is received by the Commissioner. The date of any notice by the Commissioner under this certificate, including but not limited to notice of approval or disapproval of any document 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 this certificate, the word "day" as used in this certificate means calendar day. Any document or action which is required by this certificate 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.
12. Any document, including but not limited to any notice, which is required to be submitted to the Commissioner under this certificate shall be signed by Certificate Holder 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.”

13. In evaluating the application for this certificate the Commissioner has relied on information and data provided by the Certificate Holder and on the Certificate Holder's representations concerning site conditions, design specifications and the proposed work authorized herein, including but not limited to representations concerning the commercial, public or private nature of the work or structures authorized herein, 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, this certificate may be modified, suspended or revoked, and any unauthorized activities may be subject to enforcement action.
14. In granting this certificate, the Commissioner has relied on all representations of the Certificate Holder, including information and data provided in support of the Certificate Holder's application. Neither the Certificate Holder's representations nor the issuance of this certificate shall constitute an assurance by the Commissioner as to the structural integrity, the engineering feasibility or the efficacy of such design.
15. In the event that the Certificate Holder becomes aware that he did not or may not comply, or did not or may not comply on time, with any provision of this certificate or of any document required hereunder, the Certificate Holder shall immediately notify the Commissioner 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 Commissioner, the Certificate Holder shall state in writing the reasons for the noncompliance or delay and propose, for the review and written approval of the Commissioner, dates by which compliance will be achieved, and the Certificate Holder shall comply with any dates which may be approved in writing by the Commissioner. Notification by the Certificate Holder shall not excuse noncompliance or delay and the Commissioner's approval of any compliance dates proposed shall not excuse noncompliance or delay unless specifically stated by the Commissioner in writing.
16. This certificate may be revoked, suspended, or modified in accordance with applicable law.
17. The issuance of this certificate does not relieve the Certificate Holder of his obligations to obtain any other approvals required by applicable federal, state and local law.
18. This certificate 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.

Issued on March 18, 2014.

STATE OF CONNECTICUT
DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION



Brian P. Thompson, Director
Office of Long Island Sound Programs
Bureau of Water Protection and Land Reuse

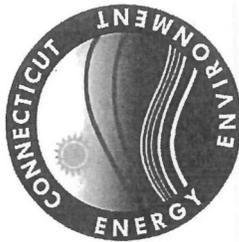
Certificate of Permission No. 201401589-SJ
State of Connecticut, DEEP

PROPOSED TIDE GATE AND OUTLET STRUCTURE IMPROVEMENTS GREAT CREEK OUTLET STRUCTURE

SILVER SANDS PARK · MILFORD · CONNECTICUT

FEBRUARY 11, 2014

PREPARED FOR
STATE OF CONNECTICUT DEEP



PREPARED BY
FUSS & O'NEILL



146 HARTFORD ROAD
MANCHESTER, CONNECTICUT 06040
860.644.2469
www.fandco.com

SHEET INDEX

SHEET No.	SHEET TITLE
SHT 1	COVER SHEET
SHT 2	GENERAL NOTES
SHT 3	LEGEND
SHT 4	KEY MAP
SHT 5 - 6	EXISTING CONDITIONS MAP
SHT 7	WATER CONTROL / CONCRETE IMPROVEMENTS PLAN AND SECTION A
SHT 8 - 9	SITE PLAN
SHT 10	SECTION B - SECTION LOOKING SOUTHWEST
SHT 11	SECTION C - SECTION LOOKING NORTHEAST
SHT 12	SECTION D - BOX CULVERT SECTION
SHT 13	SECTION E - TYPICAL SECTION THRU TRAINING WALLS
SHT 14	SECTION F - SECTION THRU RIPRAP
SHT 15	TYPICAL HP PILE - LAGGING CONNECTION DETAIL
SHT 16	TYPICAL TRAINING WALL ELEVATION
SHT 17 - 19	TIDE GATE STRUCTURE REPAIR DETAILS
SHT 20	TIDE GATE STRUCTURE REPAIR DETAIL LEGEND
SHT 21	EROSION CONTROL NOTES AND DETAIL

PROJECT No. 2009044532
DATE 02/11/14
SHT 1

PERMIT PLAN:

1. THIS PLAN IS FOR PERMITTING PURPOSES ONLY. THE PLAN DESCRIBES THE FULL SCOPE OF THE PROJECT. THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER FOR DETAILS AND SPECIFICATIONS PRIOR TO PROVIDING A BID ON THIS PROJECT.

GENERAL NOTES:

- THE PURPOSE OF THIS PROJECT IS TO RESTORE AND IMPROVE THE GREAT CREEK TIDE GATE AND OUTLET STRUCTURE AT SILVER SANDS STATE PARK IN MILFORD, CT. THE PROPOSED WORK INCLUDES REPAIRS AND MAINTENANCE TO THE EXISTING TIDE GATE AND INSTALLATION OF AN IMPROVED OUTLET ON SILVER BEACH.
- THE IMPROVED OUTLET ON SILVER BEACH WILL REQUIRE THE REMOVAL OF THE EXISTING TRAINING WALLS AS WELL AS THE INSTALLATION OF A BOX CULVERT EXTENSION AND NEW TIMBER TRAINING WALLS.
- THE IMPROVED OUTLET HAS BEEN DESIGNED TO REQUIRE MINIMUM MAINTENANCE AND IMPROVE THE LITTORAL MIGRATION OF SEDIMENT TO THE DOWNDRIFT BEACH (NORTH OF THE EXISTING STRUCTURE).
- CONSTRUCTION ACCESS TO THE OUTLET STRUCTURE WILL BE GAINED FROM THE EAST BROADWAY CUL-DE-SAC, AS SHOWN ON PLAN SHEETS 7 AND 8 (SHT-7 & SHT-8).
- MINIMIZE CONSTRUCTION ACTIVITIES WITHIN THE INTERTIDAL FLAT TO THE GREATEST EXTENT PRACTICABLE.
- CONSTRUCTION EQUIPMENT AND MATERIALS WILL BE MOVED FROM THE WORK AREA AND BEACH AND SECURED WITHIN THE CONSTRUCTION ENTRANCE AND/OR DESIGNATED STAGING AREAS DURING PERIODS OF HIGH WATER AND AT THE END OF EVERY WORKDAY.
- PERFORM REPAIRS AND MAINTENANCE TO THE EXISTING TIDE GATE AND CULVERT TO AVOID TEMPORARY OR PERMANENT IMPACTS TO ADJACENT RESOURCE AREAS.
- AREAS DISTURBED BY CONSTRUCTION OPERATIONS WILL MINIMALLY BE RESTORED TO THEIR ORIGINAL CONDITION, AT NO ADDITIONAL COST TO THE OWNER.

SURVEY NOTES:

- VERTICAL DATUM REPORTED IN NGVD 29. TIDAL AND JURISDICTIONAL BENCHMARKS (I.E., CUL, MHW, MLW) CONVERTED FROM NGVD 88 FOR CONSISTENCY WITH THE VERTICAL DATUM OF THE SURVEY.
- THE BACKGROUND INFORMATION DEPICTED HEREON WAS TAKEN FROM VARIOUS SOURCES AND COMPILED INTO THIS PLAN.
 - PLAN ENTITLED STATE OF CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION SILVER SANDS STATE PARK GREAT CREEK OUTLET STRUCTURE OUTLET STRUCTURE DETAIL / BEACH SURVEY MILFORD CONNECTICUT SCALE 1"=20' SHEET V-2.03 DATED 11/12/2013 PREPARED BY FUSS & O'NEILL, INC.
 - STATE OF CONNECTICUT 2004 CTDEEP DIGITAL ORTHO PHOTOS.
 - PLANIMETRIC FEATURES DEPICTED HEREON ARE BASED ON PHOTOGRAMMETRY BY GOLDEN AERIAL SURVEYS, INC. DATE OF PHOTOGRAPHY IS JAN. 28, 1995.
 - PROPERTY LINE INFORMATION DEPICTED APPROXIMATELY FROM A PLAN ENTITLED "PLAN OF PROPERTY OF STATE OF CONNECTICUT INCLUDING LAND TO BE ACQUIRED FROM UNITED ILLUMINATING CO. & CITY OF MILFORD SILVER SANDS STATE PARK MILFORD, CONNECTICUT" SCALE 1"=200'. BY CHANDLER, PALMER, & KING, DATED AUGUST 6, 1979, REV. TO JUNE 17, 1980.

CONSTRUCTION SEQUENCE:

- INSTALL GRAVEL CONSTRUCTION ENTRANCE PRIOR TO STARTING WORK ON THE SITE.
- INSTALL A TEMPORARY CONDUIT THROUGH THE EXISTING CULVERT WITH AN UPSTREAM COFFERDAM IN THE TIDEGATE STRUCTURE AND A DOWNSTREAM COFFERDAM BETWEEN THE EXISTING TRAINING WALLS.
- DEWATER WORK AREA TO THE GREATEST EXTENT PRACTICABLE, WORK IN THE DRY.
- CONSTRUCT THE NEW CULVERT EXTENSION AND REPAIR CONCRETE SPALLS IN THE EXISTING CULVERT.
- REMOVE THE COFFERDAMS AND TEMPORARY CONDUIT.
- REMOVE THE EXISTING CHAIN-LINK FENCE AND TRAINING WALLS.
- CONSTRUCT THE NEW TRAINING WALLS AND MANAGE WATER IN OPEN EXCAVATION AS REQUIRED TO FACILITATE CONSTRUCTION.
- INSTALL INTERMEDIATE RIPRAP SEAWARD OF THE NEW BOX CULVERT EXTENSION OPENING.
- INSTALL NEW CHAIN-LINK FENCE.
- RESTORE ADJACENT BEACH AND TIDAL FLAT ELEVATIONS IN DISTURBED AREAS.
- REPAIR THE TIDEGATE STRUCTURE.

RESTRICTIONS:

- DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, FIRE HYDRANTS, AND UTILITIES WITHOUT APPROPRIATE PERMITS.
- FEDERAL AND STATE THREATENED PIPING PLOVER (CHARADRIUS MELODIUS) UTILIZE SILVER SANDS STATE PARK. TO LIMIT POTENTIAL IMPACTS, NO CONSTRUCTION ACTIVITIES ON THE BEACH WILL OCCUR DURING THIS SPECIES NESTING SEASON, APRIL 15 THROUGH AUGUST 30, WITHOUT PRIOR WRITTEN AUTHORIZATION FROM THE STATE OF CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION (CT DEEP).
- ADDITIONAL RESTRICTIONS MAY BE REQUIRED AS SPECIAL CONDITIONS OF ENVIRONMENTAL PERMITS.

SITE RESTORATION:

- RESTORE TEMPORARY IMPACTS TO THE ADJACENT BEACH AND TIDAL FLAT BY REPLACING EXCAVATED MATERIAL IN-KIND (I.E., FINE MATERIAL EXCAVATED FROM THE TIDAL FLAT AND SAND EXCAVATED FROM THE BEACH SHALL BE REPLACED IN THEIR RESPECTIVE POINTS OF ORIGIN).
- PRE-CONSTRUCTION ELEVATIONS WILL BE RESTORED ON THE UPDRIFT BEACH, SOUTH OF THE OUTLET STRUCTURE.
- EXCESS EXCAVATED SAND, IF AVAILABLE, WILL BE USED TO NOURISH THE DOWNDRIFT BEACH AS DETAILED ON PLAN SHEET 9 (SHT-9).

SCALE:	HORIZ: N.T.S.
	VERT: ..
DATUM:	HORIZ: NA
	VERT: NA
GRAPHIC SCALE	



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STATE OF CONNECTICUT
 GENERAL NOTES
 SILVER SANDS STATE PARK
 GREAT CREEK OUTLET STRUCTURE

PROJ. No.: 2004045A30
 DATE: 02/11/2014
SHT-2

CONNECTICUT

MILFORD

EXISTING CONDITIONS LEGEND

	PROPERTY LINE
	EDGE OF WATER
	EXISTING CONTOUR
	INDEX CONTOUR
	CHAIN LINK FENCE
	STORM DRAINAGE PIPE
	CJL ELEV. 5.8 (NGVD)
	MHW ELEV. 4.0
	LIMIT OF WORK
	CONTRACTOR STAGING AREA
	EXCESS SAND PLACEMENT AREA

PROPOSED LEGEND

	CULVERT EXTENSION
	TRAINING WALL

SCALE:	HORIZ.: N.T.S.
	VERT.:
DATUM:	HORIZ.: NA
	VERT.: NA
GRAPHIC SCALE	
0	



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STATE OF CONNECTICUT

LEGEND

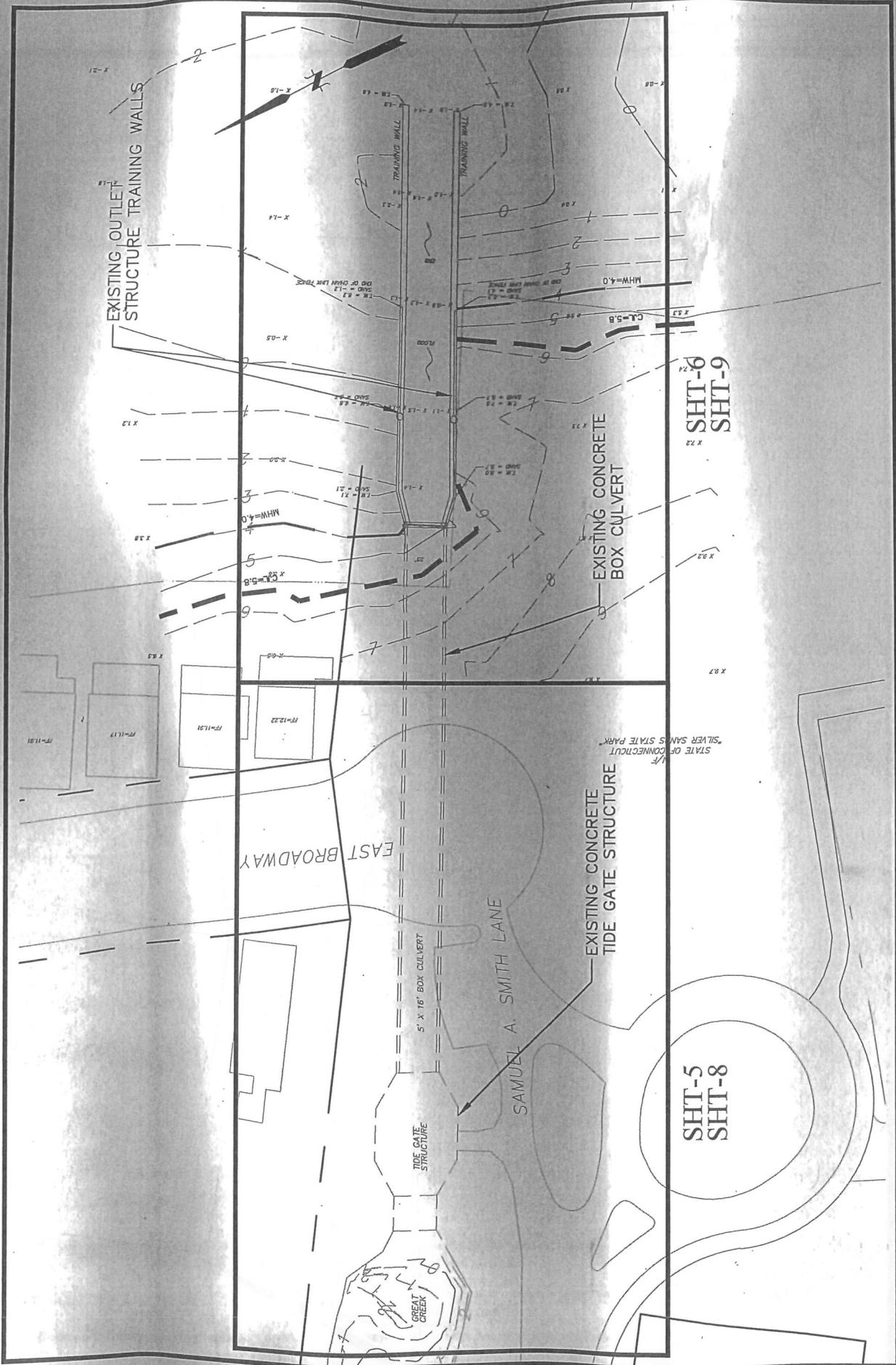
SILVER SANDS STATE PARK
 GREAT CREEK OUTLET STRUCTURE

MILFORD

CONNECTICUT

PROJ. No.: 2000445A30
 DATE: 02/11/2014

SHT-3



SCALE:	HORIZ.: 1"=60'
	VERT.:
DATUM:	HORIZ.: NAD 27
	VERT.: NGVD29
GRAPHIC SCALE	

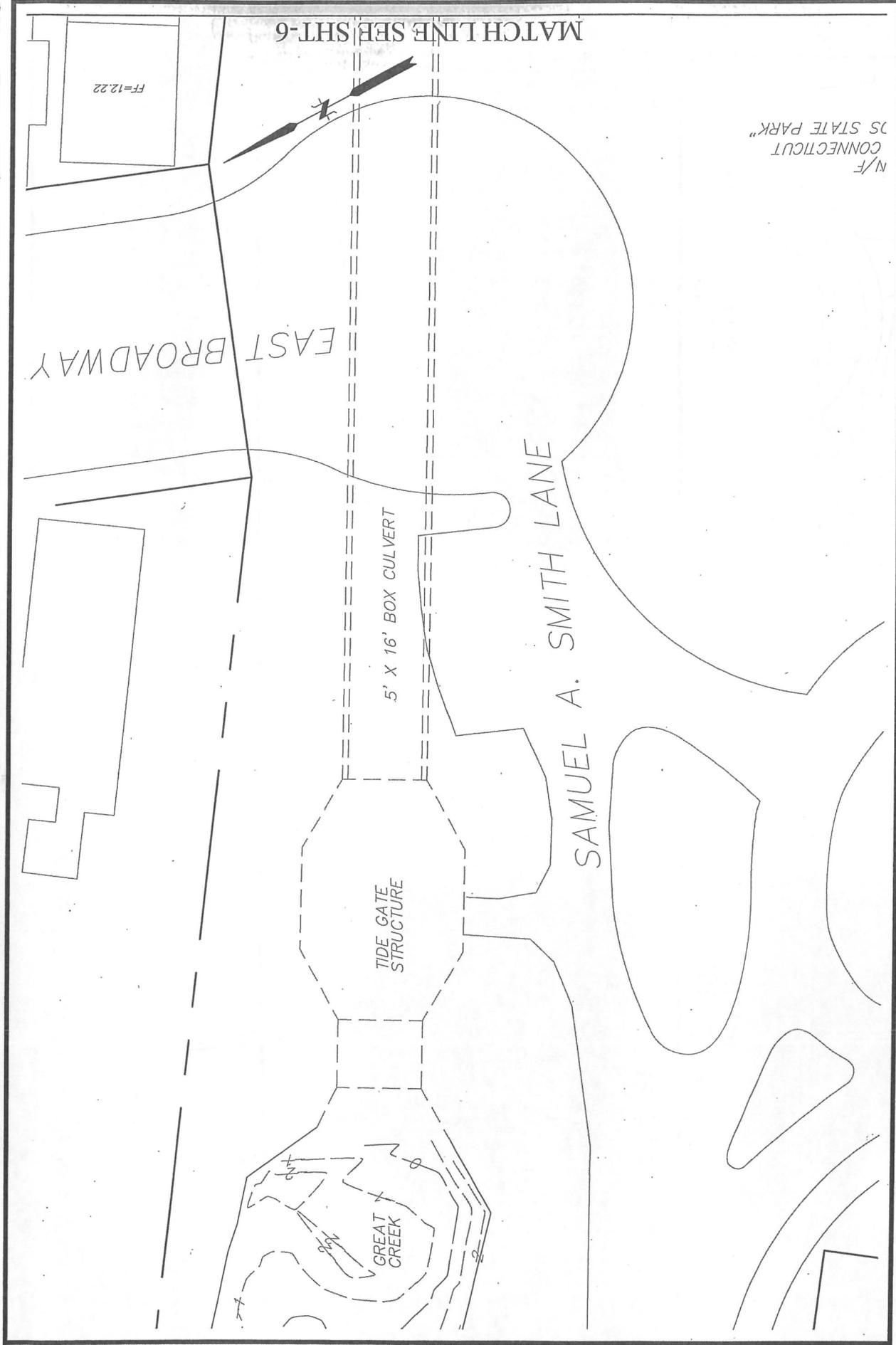

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STATE OF CONNECTICUT
 KEY MAP
 SILVER SANDS STATE PARK
 GREAT CREEK OUTLET STRUCTURE

PROJ. No.: 2000445A30
 DATE: 02/11/2014
SHT-4

CONNECTICUT

MILFORD



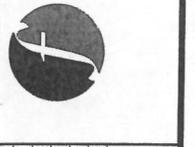
PROJ. No.: 2000445.A30
 DATE: 02/11/2014

SHT-5

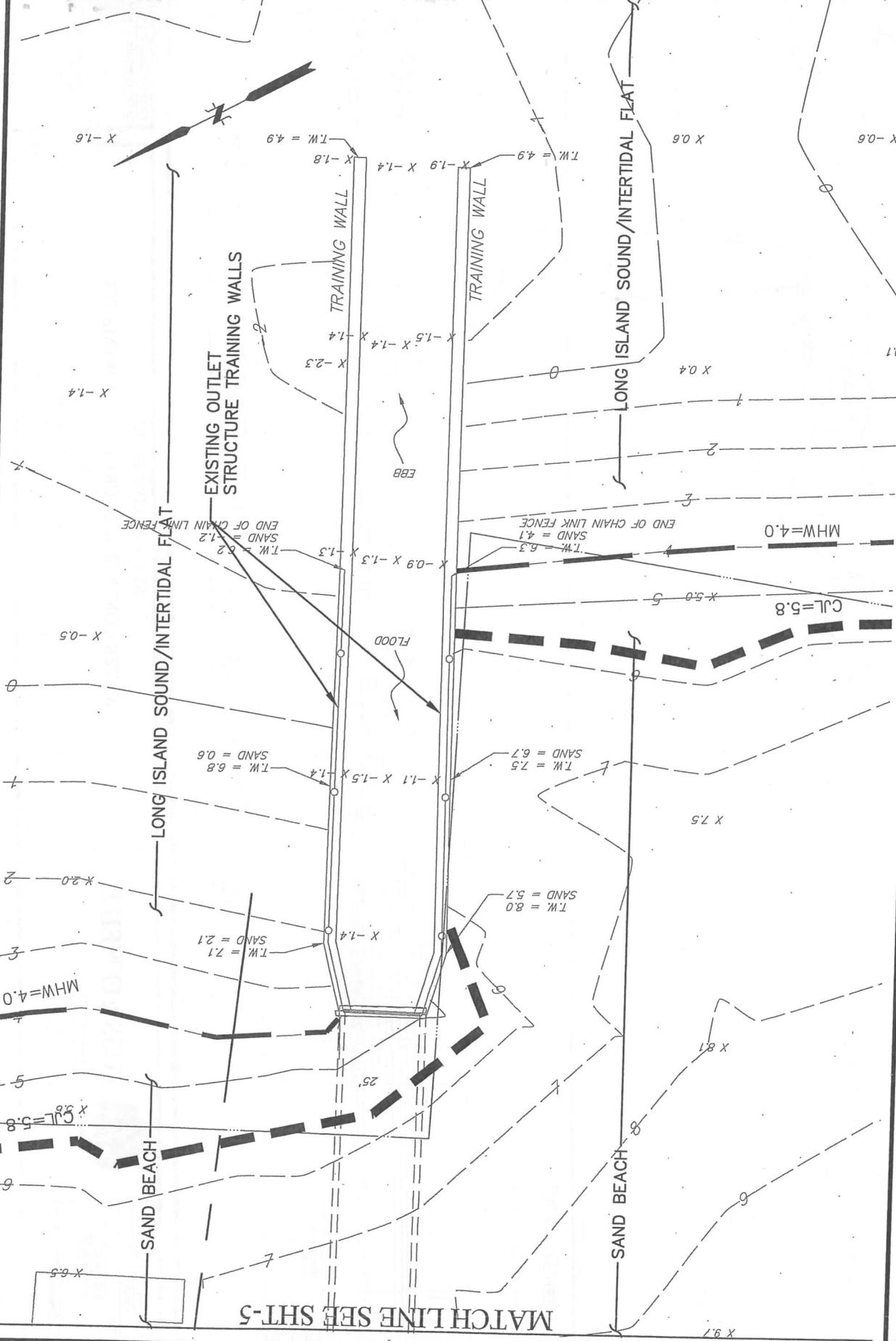
STATE OF CONNECTICUT
 EXISTING CONDITIONS MAP
 SILVER SANDS STATE PARK
 GREAT CREEK OUTLET STRUCTURE

MILFORD
 CONNECTICUT

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SCALE:	HORZ.: 1"=30'
	VERT.:
DATUM:	HORZ.: NAD 27
	VERT.: NGVD 29
GRAPHIC SCALE	



PROJ. No.: 2000445A30
DATE: 02/11/2014

SHT-6

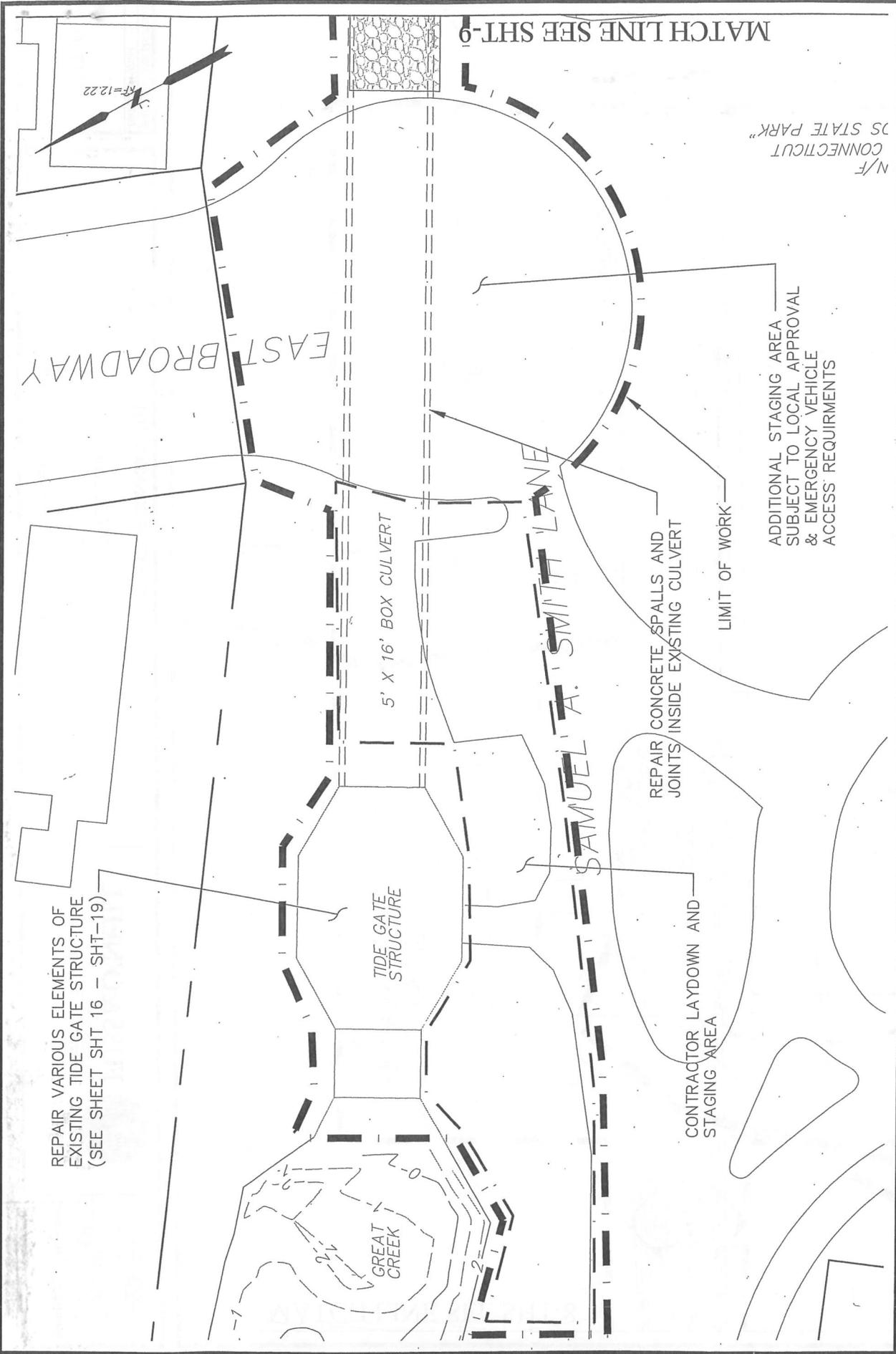
STATE OF CONNECTICUT
EXISTING CONDITIONS MAP
SILVER SANDS STATE PARK
GREAT CREEK OUTLET STRUCTURE

MILFORD

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SCALE:	HORZ.: 1"=30'
	VERT.:
DATUM:	HORZ.: NAD 27
	VERT.: NGVD 29
	GRAPHIC SCALE
	0 15 30



PROJ. No.: 2000445.A30
 DATE: 02/11/2014

SHT-8

STATE OF CONNECTICUT

SITE PLAN

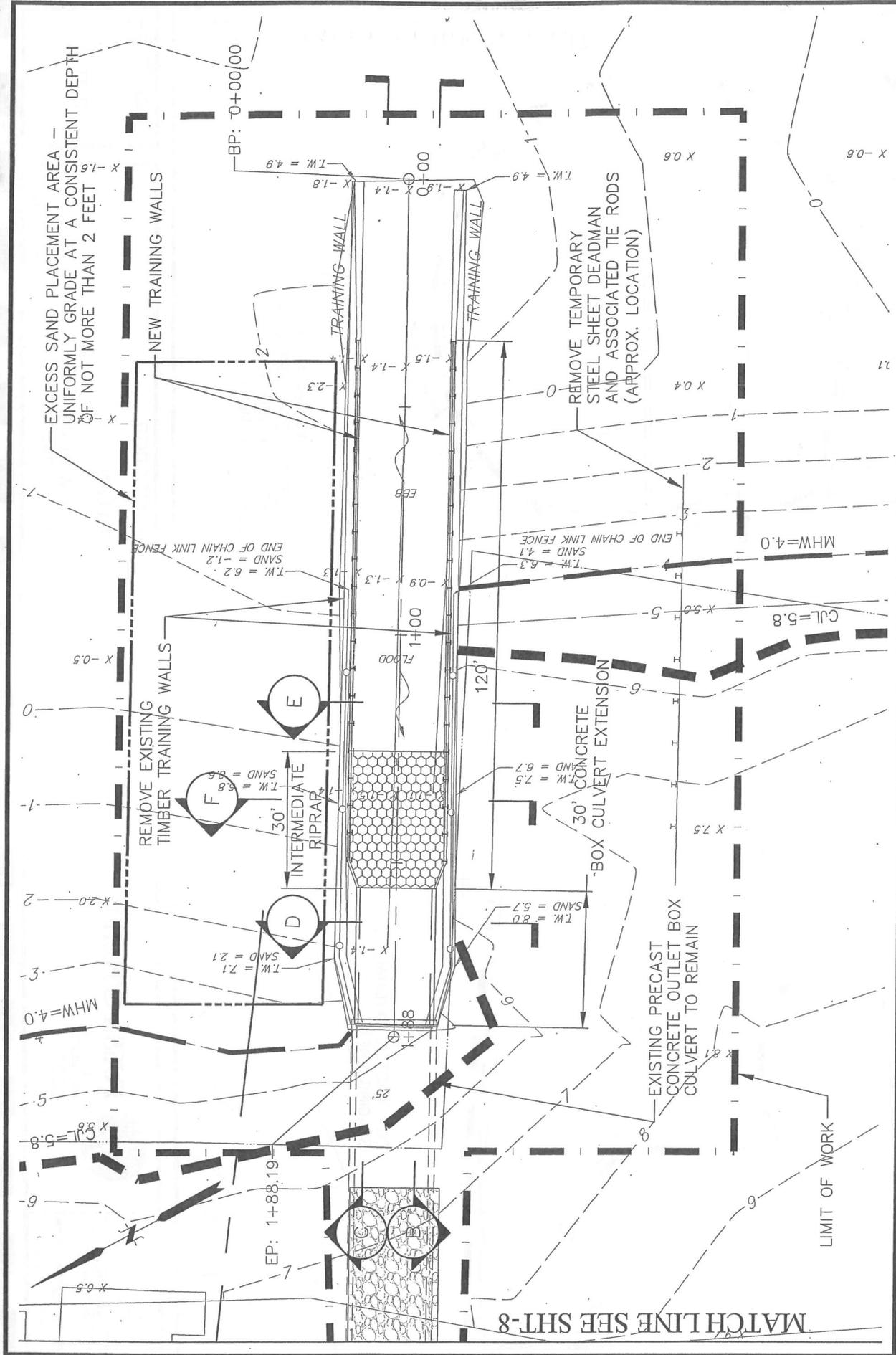
SILVER SANDS STATE PARK
 GREAT CREEK OUTLET STRUCTURE

MILFORD
 CONNECTICUT

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SCALE:	HORZ.: 1"=30'
	VERT.:
DATUM:	
	HORZ.: NAD 27
	VERT.: NGVD 29
	0 15 30
	GRAPHIC SCALE



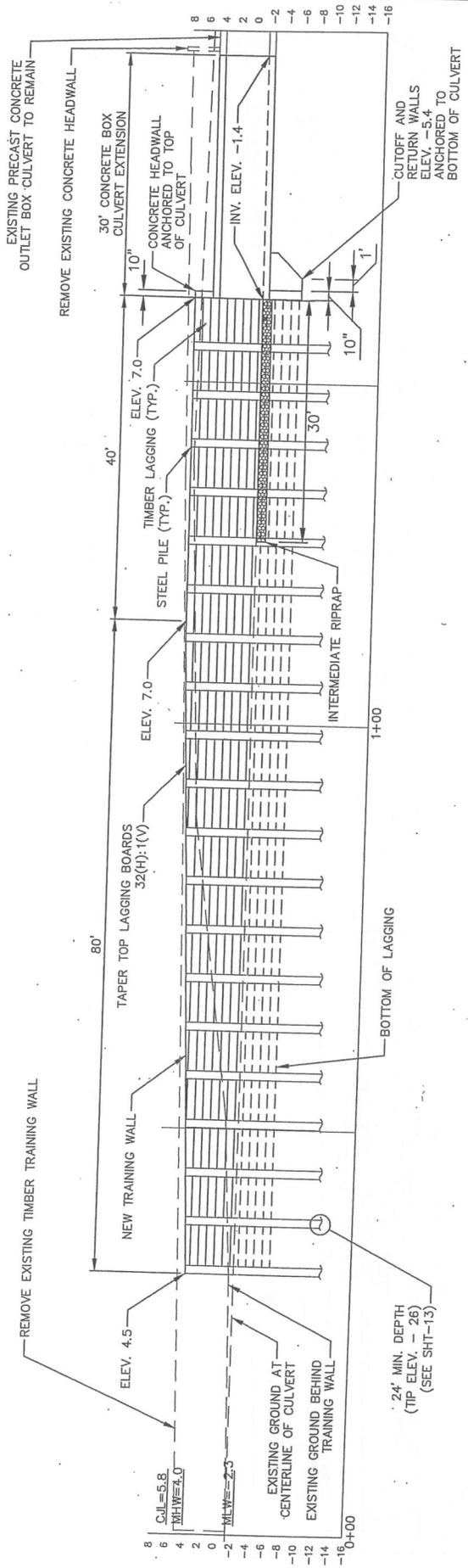
MATCH LINE SEE SHT-8

SCALE:	HORZ.: 1"=30'
	VERT.:
DATUM:	HORZ.: NAD 27
	VERT.: NGVD 29
GRAPHIC SCALE	
0 15 30	

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STATE OF CONNECTICUT
 SITE PLAN
 SILVER SANDS STATE PARK
 GREAT CREEK OUTLET STRUCTURE
 MILFORD
 CONNECTICUT

PROJ. No.: 2000045.A30
 DATE: 02/11/2014
SHT-9



B SECTION LOOKING SOUTHWEST
SCALE: 1"=20'

PROJ. No.: 2000445.A30
DATE: 02/11/2014

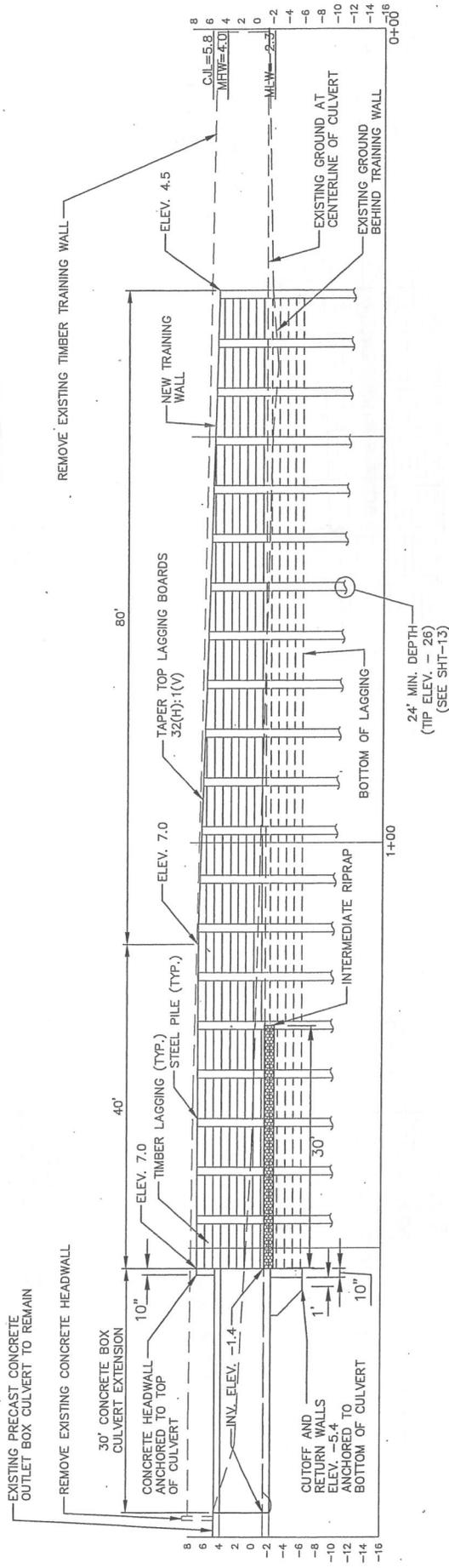
SHT-10

STATE OF CONNECTICUT
SECTION B - SECTION LOOKING WEST
SILVER SANDS STATE PARK
GREAT CREEK OUTLET STRUCTURE

MILFORD

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860.662.2469
www.fandob.com

SCALE:	HORIZ: 1"=20'
	VERT: 1"=2'
DATUM:	
	HORIZ: NA
	VERT: NA
GRAPHIC SCALE	
0 10 20	



C SECTION LOOKING NORTHEAST
 SCALE: 1" = 20'

SCALE:	HORZ.: 1"=20'
	VERT.: 1"=2'
DATUM:	HORZ.: NA
	VERT.: NA
GRAPHIC SCALE	

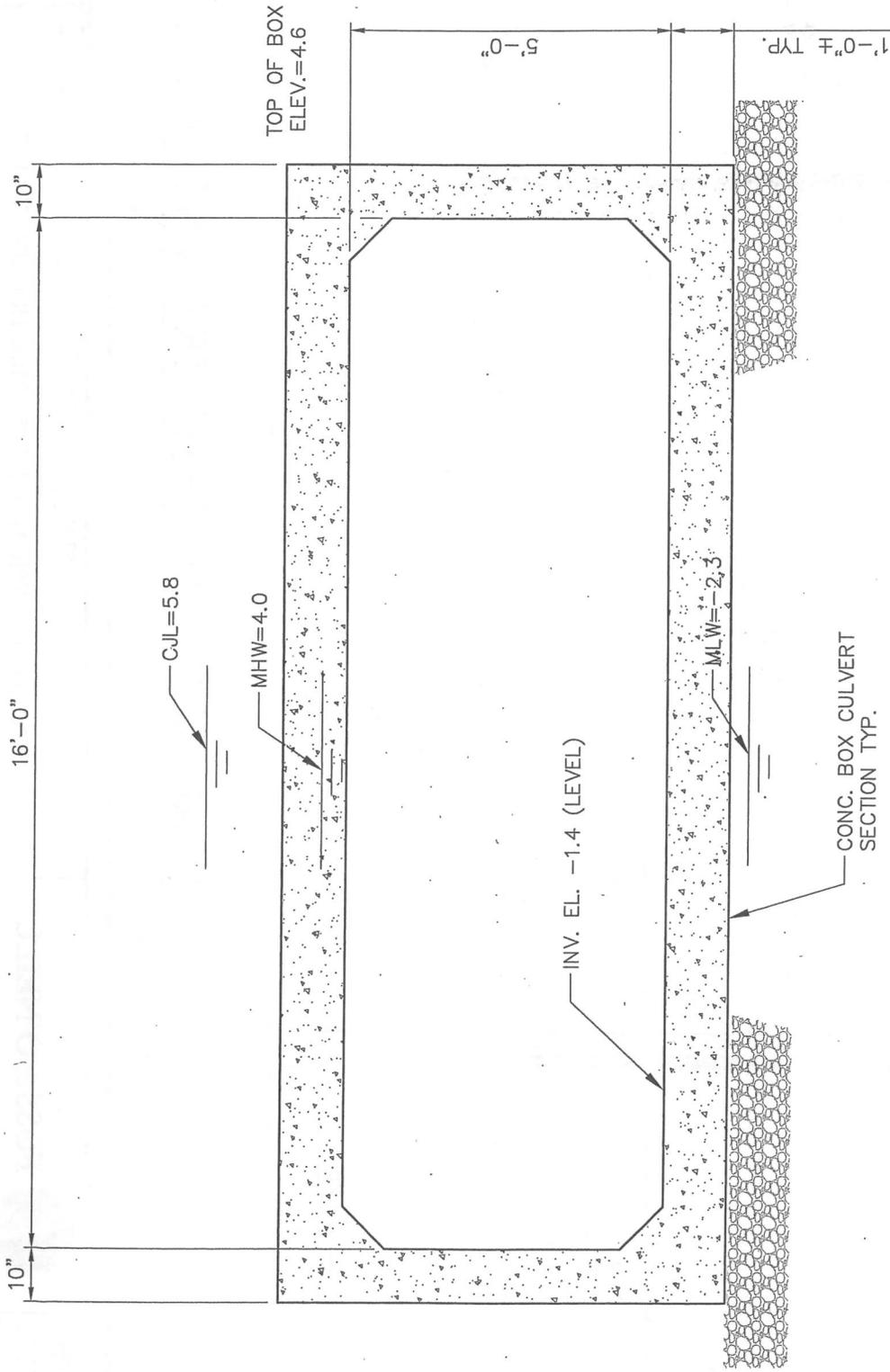
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STATE OF CONNECTICUT
 SECTION C - SECTION LOOKING EAST
 SILVER SANDS STATE PARK
 GREAT CREEK OUTLET STRUCTURE

PROJ. No.: 2000445A30
 DATE: 02/11/2014
SHT-11

CONNECTICUT

MILFORD



BOX CULVERT SECTION

SCALE: 3/8" = 1'-0"

SCALE:	HORIZ.: AS NOTED
	VERT.:
DATUM:	HORIZ.: NA
	VERT.: NA
GRAPHIC SCALE	

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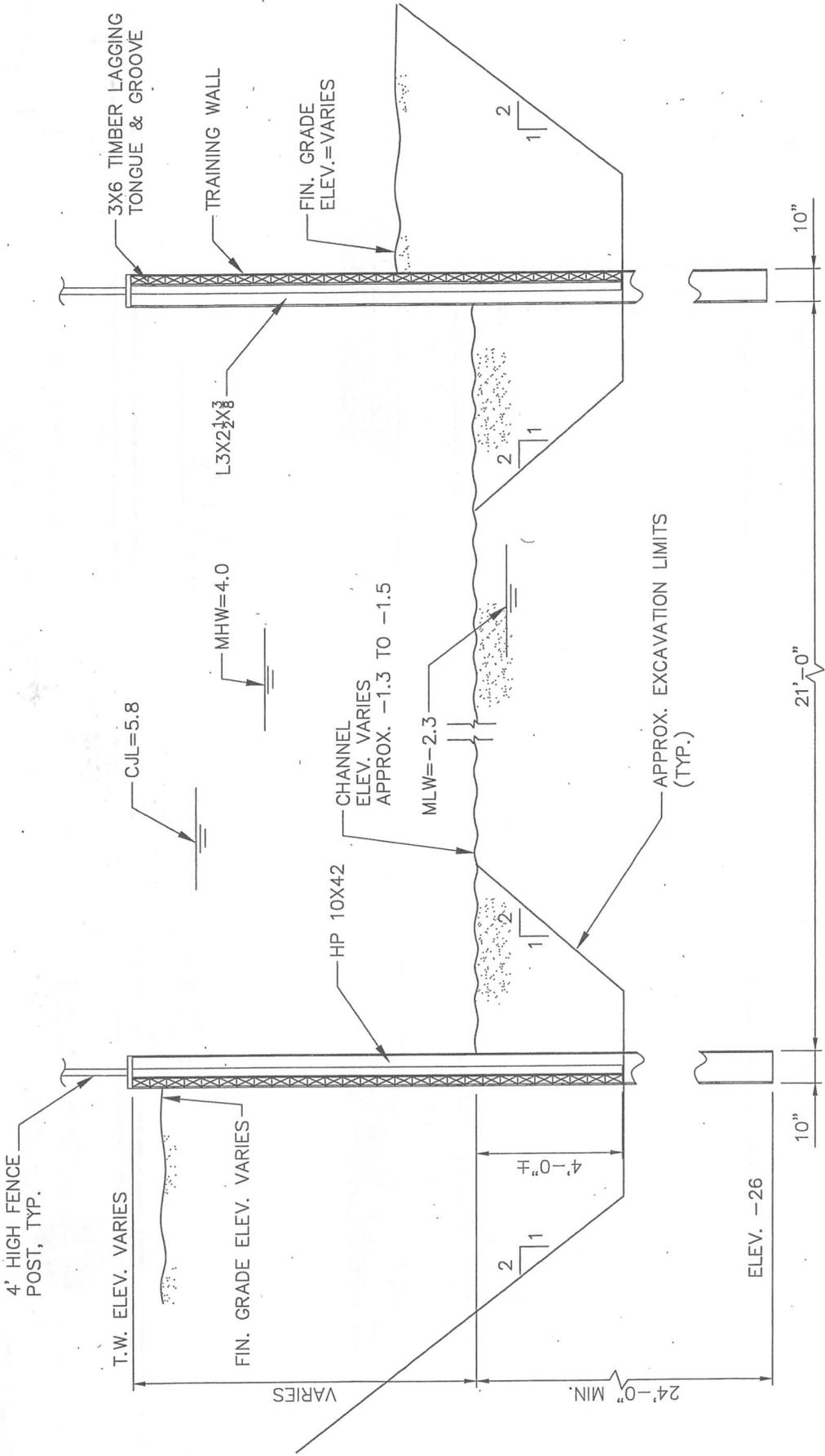
STATE OF CONNECTICUT
 SECTION D - BOX CULVERT SECTION
 SILVER SAND STATE PARK
 GREAT CREEK OUTLET STRUCTURE

PROJ. No.: 2000445A30
 DATE: 02/17/2014

SHT 12

CONNECTICUT

MILFORD

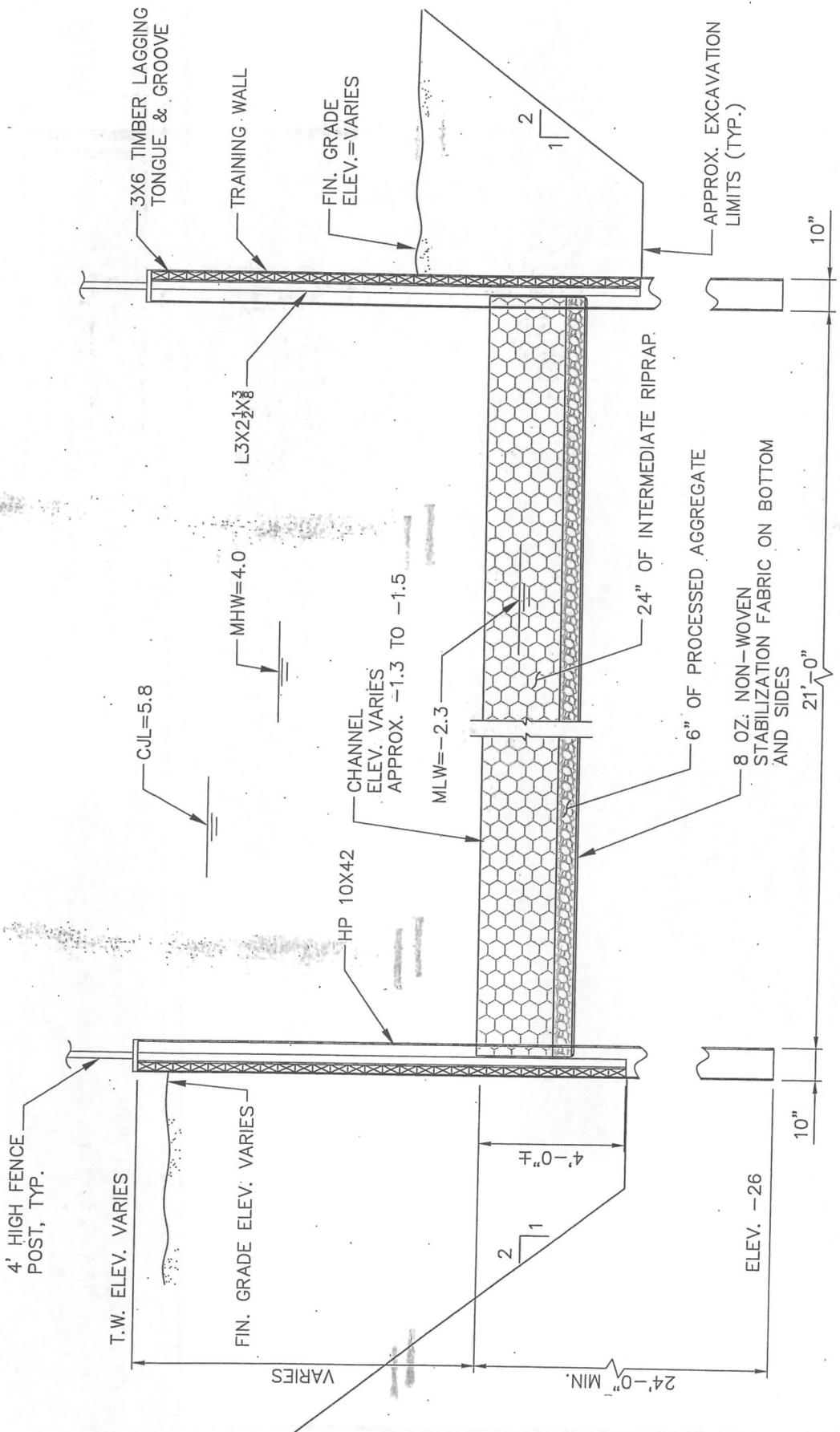


E TYPICAL SECTION THRU TRAINING WALLS
 SCALE: 1/4" = 1'-0"

SCALE:	HORIZ: AS NOTED
	VERT: 1"
DATUM:	HORIZ: NA
	VERT: NA
GRAPHIC SCALE	

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STATE OF CONNECTICUT
 SECTION E - TYPICAL SECTION THRU TRAINING WALLS
 SILVER SAND STATE PARK
 GREAT CREEK OUTLET STRUCTURE
 MILLFORD
 CONNECTICUT



F SECTION THRU RIPRAP

SCALE: 1/4" = 1'-0"

SCALE:	HORIZ.: AS NOTED
	VERT.:
DATUM:	
	HORIZ.: NA
	VERT.: NA



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STATE OF CONNECTICUT

SECTION F - SECTION THRU RIPRAP

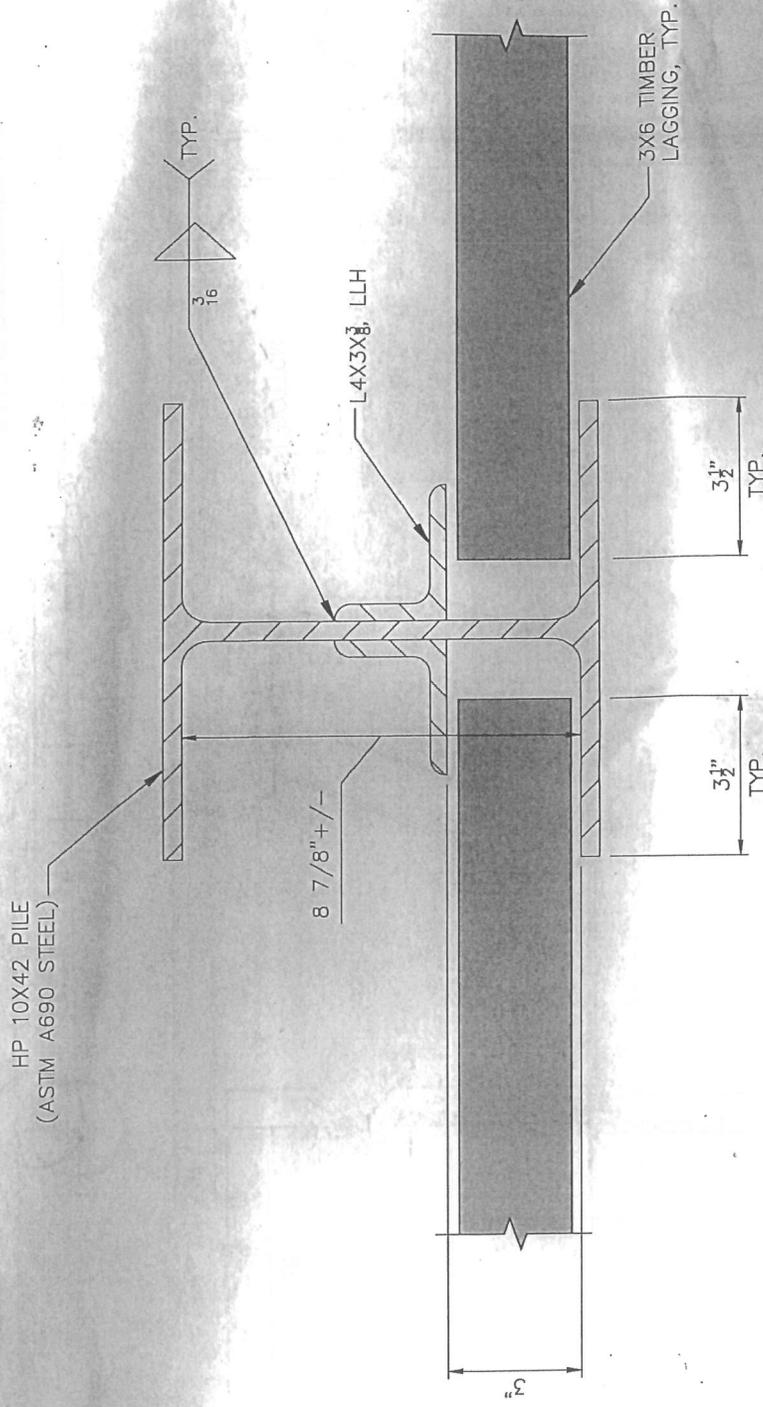
SILVER SAND STATE PARK
 GREAT CREEK OUTLET STRUCTURE

MILFORD

CONNECTICUT

PROJ. No.: 2000445.A30
 DATE: 02/11/2014

SHT 14



PROJ. No.: 2000445A30
 DATE: 02/11/2014

SHT15

STATE OF CONNECTICUT
 TYPICAL HP PILE - LAGGING CONNECTION DETAIL
 SILVER SAND STATE PARK
 GREAT CREEK OUTLET STRUCTURE
 CONNECTICUT

MILFORD

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SCALE:	HORIZ.: 3" = 1'-0"
	VERT.:
DATUM:	
	HORIZ.: NA
	VERT.: NA
0	
GRAPHIC SCALE	

Ø PILE

NOTE:

TIMBER LAGGING SHALL BE SOUTHERN YELLOW PINE, NO. 1 OR BETTER, PRESURE TREATED. TIMBER PRESERVATIVE SHALL BE SUITABLE FOR HUMAN CONTACT (AWPA USE CATEGORY UC3B AND SHALL BE NON-CORROSIVE TO STEEL HARDWARE)

4' HIGH VINYL COATED (BLACK) CHAIN-LINK FENCE, TYP.

STEEL CAP PLATE (TYP.)

3/2

3x6 TIMBER LAGGING BOARDS (TONGUE & GROOVE)

HP10x42 PILE, TYP.

8'-0" Ø PILE TO Ø PILE

Ø PILE

SCALE: HORZ.: 3/4" = 1'
VERT.:
DATUM:
HORZ.:
VERT.:

GRAPHIC SCALE



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STATE OF CONNECTICUT

TYPICAL TRAINING WALL ELEVATION

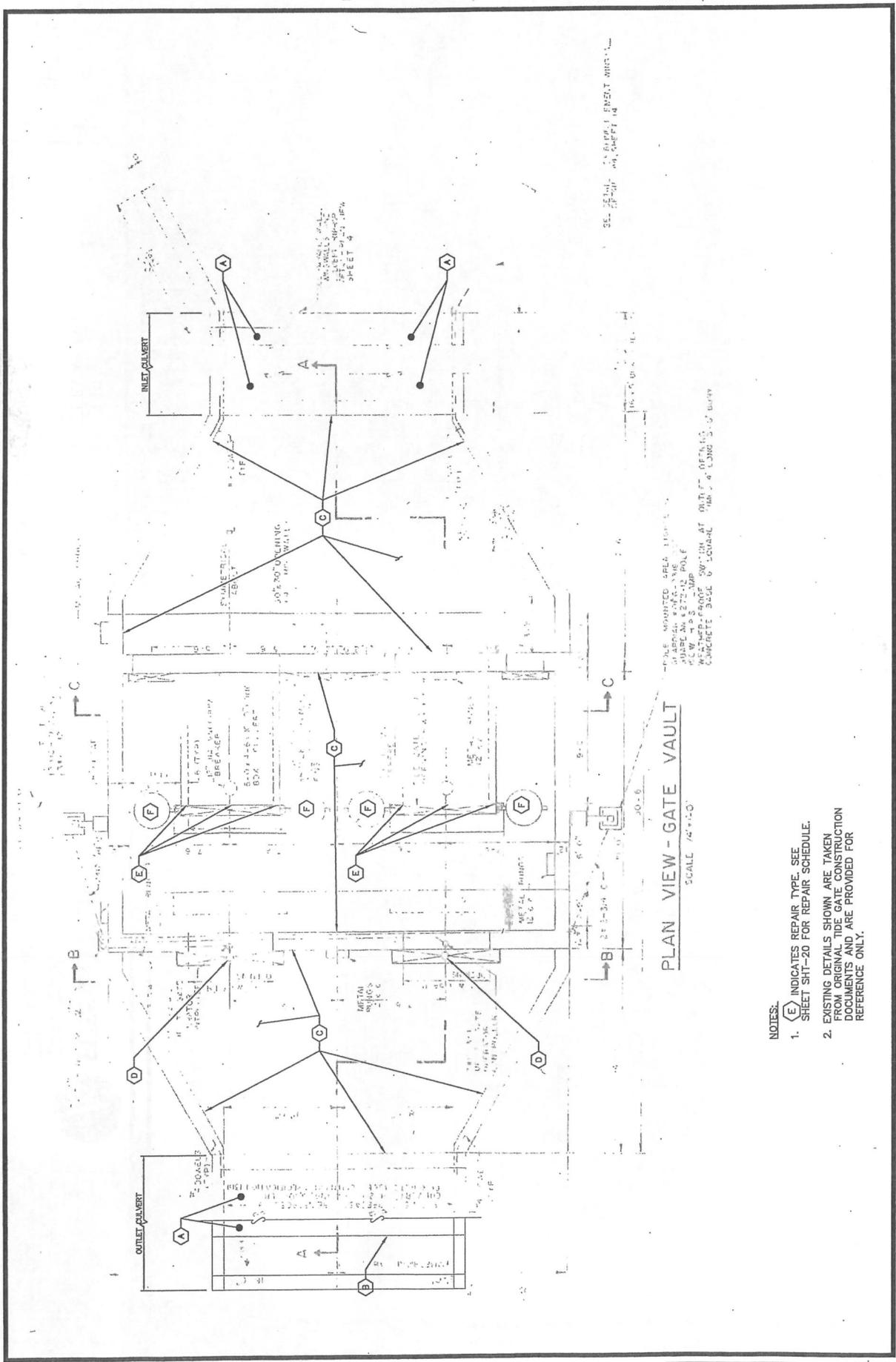
SILVER SAND STATE PARK
GREAT CREEK OUTLET STRUCTURE

MILFORD

CONNECTICUT

PROJ. No.: 2009445.A30
DATE: 02/11/2014

SHT 16



PLAN VIEW - GATE VAULT
 SCALE 1/4" = 1'-0"

- NOTES:
1. (E) INDICATES REPAIR TYPE SEE SHEET SHT-20 FOR REPAIR SCHEDULE.
 2. EXISTING DETAILS SHOWN ARE TAKEN FROM ORIGINAL TIDE GATE CONSTRUCTION DOCUMENTS AND ARE PROVIDED FOR REFERENCE ONLY.

SCALE:	HORIZ.: N.T.S.
	VERT.:
DATUM:	
	HORIZ.: NA
	VERT.: NA
	0
	GRAPHIC SCALE

STATE OF CONNECTICUT
 TIDE GATE STRUCTURE REPAIR DETAILS
 SILVER SANDS STATE PARK
 GREAT CREEK OUTLET STRUCTURE

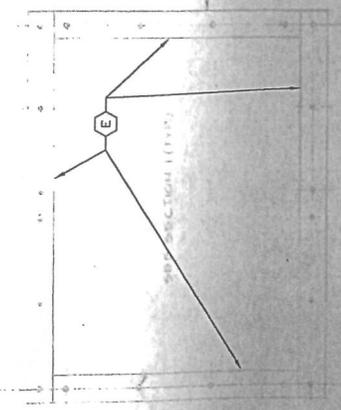
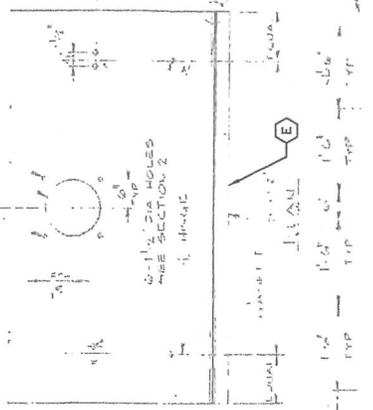
PROJ. No.: 2000445A30
 DATE: 02/11/2014

SHT-18

STATE OF CONNECTICUT
 TIDE GATE STRUCTURE REPAIR DETAILS
 SILVER SANDS STATE PARK
 GREAT CREEK OUTLET STRUCTURE
 MILFORD
 CONNECTICUT

ALL DIMENSIONS ARE IN FEET AND INCHES UNLESS OTHERWISE NOTED
 UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE TO FACE

CONCRETE WALL NEW 1/2" W/OUT THROUGH CULVERT
 4'-3 1/2" x 4'-0" DEEP



FRONT ELEVATION

CONCRETE BOX CULVERT
 24" x 4'-0"

THIS BRIDGE IS TO BE REPAIRED IN ACCORDANCE WITH THE
 REQUIREMENTS OF THE BRIDGE REPAIR PLATE

THE BRIDGE IS TO BE REPAIRED IN ACCORDANCE WITH THE
 REQUIREMENTS OF THE BRIDGE REPAIR PLATE

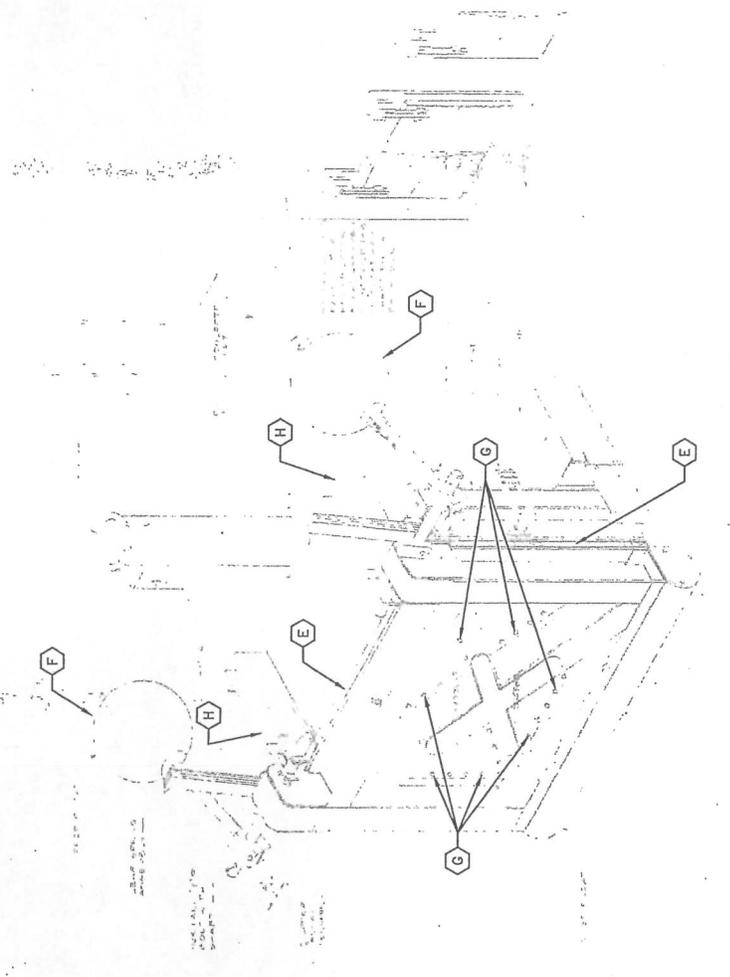
1. BRIDGE IS TO BE REPAIRED IN ACCORDANCE WITH THE
 REQUIREMENTS OF THE BRIDGE REPAIR PLATE

- NOTES:
1. (E) INDICATES REPAIR TYPE. SEE SHEET SHT-20 FOR REPAIR SCHEDULE.
 2. EXISTING DETAILS SHOWN ARE TAKEN FROM ORIGINAL TIDE GATE CONSTRUCTION DOCUMENTS AND ARE PROVIDED FOR REFERENCE ONLY.

SCALE:	HORIZ.: N.T.S.
	VERT.: NA
DATUM:	HORIZ.: NA
	VERT.: NA
GRAPHIC SCALE	

NOTES:

1. **E** INDICATES REPAIR TYPE. SEE SHEET SHT-20 FOR REPAIR SCHEDULE.
2. EXISTING DETAILS SHOWN ARE TAKEN FROM ORIGINAL TIDE GATE CONSTRUCTION DOCUMENTS AND ARE PROVIDED FOR REFERENCE ONLY.



ISOMETRIC VIEW OF INSTALLED SELF-REGULATING TIDE GATE

PROJ No.: 2000445-A30
DATE: 02/11/2014

SHT-19

STATE OF CONNECTICUT

TIDE GATE STRUCTURE REPAIR DETAILS

SILVER SANDS STATE PARK
GREAT CREEK OUTLET STRUCTURE

CONNECTICUT

MILFORD

SCALE: HORZ.: N.T.S.
VERT.:
DATUM:
HORZ.: NA
VERT.: NA



REPAIR SCHEDULE

TYPE	DESCRIPTION	EST. QTY
A	REPAIR CONCRETE SPALLS ON INLET AND OUTLET CULVERTS	50 S.F.
B	REPAIR EXPOSED PORTIONS OF JOINTS BETWEEN OUTLET BOX CULVERT SECTIONS	1,400 S.F.
C	REMOVE ACCUMULATED BIO-FOULING FROM THE SRT ASSEMBLIES, CHAMBER WALLS & FLOORS, SRT GATE SUMPS, AND SLUICE GATE SUMPS.	
D	REPLACE CLEAR PLASTIC PROTECTIVE SLEEVES OVER LIFT SCREWS	2 EA.
E	RE-BOND GASKETS TO THE STAINLESS STEEL BACKING PLATE	2 EA.
F	REPLACE UPPER FLOATS WITH ALL NEW SPHERES	4 EA.
G	REPLACE ALL BROKEN AND MISSING BOLTS WITH 316 STAINLESS STEEL BOLTS	40 EA.
H	REDESIGN THE SRT HINGE SUB-ASSEMBLY TO OPTIMIZE PERFORMANCE	2 EA.

EXISTING DETAILS SHOW ARE TAKEN FROM ORIGINAL TIDE GATE CONSTRUCTION DOCUMENTS AND ARE PROVIDED FOR REFERENCE ONLY.

PROJ. No.: 2000445A30
DATE: 02/11/2014

SHT-20

STATE OF CONNECTICUT

TIDE GATE STRUCTURE REPAIRS DETAILS LEGEND

SILVER SANDS STATE PARK
GREAT CREEK OUTLET STRUCTURE

CONNECTICUT

SCALE: HORZ: N.T.S.
VERT: N.T.S.

DATUM: _____

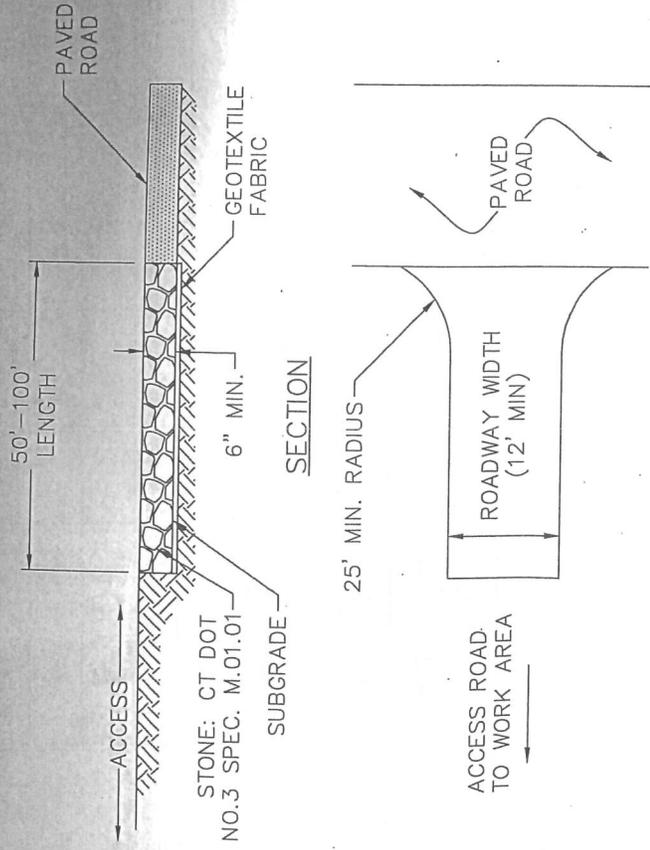
HORZ: _____

VERT: _____

GRAPHIC SCALE

EROSION & SEDIMENT 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 DEEP 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 STUMP REMOVAL AND 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, THAN 90 DAYS. OTHERWISE, INSTALL SILT FENCE.
5. HAY BALE LIFE SPAN — INSTALL HAY BALES WHERE PROTECTION AND EFFECTIVENESS IS REQUIRED FOR LESS THAN 90 DAYS. OTHERWISE, INSTALL SILT FENCE.
6. CATCH BASINS — 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 HAY BALE OR SILT FENCE BARRIER. THE SIDE SLOPES OF ERODIBLE STOCKPILES OF 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 HAY BALE BARRIER) APPROXIMATELY 5 TO 10 FEET FROM THE PROPOSED TOE OF THE CUT OR FILL AREA PRIOR TO BEGINNING EARTHWORK.
9. SEDIMENT REMOVAL — SEDIMENT REACHING 1/4 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. APPLY TEMPORARY SOIL STABILIZATION MEASURES IF FINAL GRADING IS TO BE DELAYED MORE THAN 30 DAYS.
11. TEMPORARY SEEDING — TEMPORARILY SEED ERODIBLE SOILS THAT WILL BE EXPOSED GREATER THAN 1 BUT LESS THAN 12 MONTHS WITHIN THE FIRST 7 DAYS OF SUSPENDING GRADING OPERATIONS. APPLY LIME AT A RATE OF 90 LBS/1000 SQ. FT. APPLY 10-10-10 FERTILIZER AT A RATE OF 7 1/2 LBS/1000 SQ. FT. APPLY PERENNIAL RYE GRASS AT A RATE OF 2 LBS/1000 SQ. FT. TO A DEPTH OF 1/2 INCH. OPTIMUM SEEDING DATES ARE MARCH 15 TO JULY 1 AND AUGUST 1 TO OCTOBER 15. MULCH FOR SEED APPLIED WITHIN THE OPTIMUM SEEDING DATES SHALL BE APPLIED EVENLY SUCH THAT IT PROVIDES 80%-95% SOIL COVERAGE. MULCH FOR SEED APPLIED OUTSIDE OF THE OPTIMUM SEEDING DATES SHALL BE APPLIED EVENLY SUCH THAT IT PROVIDES 95%-100% COVERAGE.
12. PERMANENT SEEDING — SEED PERMANENT LAWN AREAS IN ACCORDANCE WITH THE SPECIFICATIONS.
13. 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. THESE INSPECTIONS SHALL BE NOT LESS FREQUENTLY THAN WEEKLY AND WITHIN 24 HOURS OF THE END OF A STORM HAVING A RAINFALL AMOUNT OF 0.1 INCH OR GREATER. FOLLOWING THESE INSPECTIONS, A WRITTEN REPORT SHALL BE PREPARED, INFORMING THE OWNER OR HIS AGENT NOT LESS FREQUENTLY THAN WEEKLY AND THE MUNICIPALITY NOT LESS FREQUENTLY THAN MONTHLY OF OBSERVATIONS, MAINTENANCE, AND CORRECTIVE ACTIVITIES UNDERTAKEN.



CONSTRUCTION ENTRANCE

NOT TO SCALE

SCALE:	HORIZ.: N.T.S.
	VERT.:
DATUM:	HORIZ.: MA
	VERT.: NA

GRAPHIC SCALE



FUSS & O'NEILL

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MANCHESTER, CONNECTICUT 06040
860.646.2469
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STATE OF CONNECTICUT

EROSION CONTROL NOTES AND DETAIL

SILVER SANDS STATE PARK
GREAT CREEK OUTLET STRUCTURE

CONNECTICUT

PROJ. No.: 20000445.A30
DATE: 02/11/2014

SHT-21



PERMIT NOTICE

This Certifies that Authorization to perform work below the Coastal Jurisdiction Line and/or within Tidal Wetlands of coastal, tidal, or navigable waters of Connecticut

Has been issued to: State of Connecticut, DEEP

At this location: Silver Sands State Park, Milford

To conduct the following:

maintain and modify the Great Creek tide gate and outlet structure by:

1. installing temporary water control structures, as necessary;
2. constructing a 30' long concrete box culvert extension;
3. conducting substantial maintenance within the culvert and tide gate;
4. removing the temporary water control structures;
5. removing the existing training walls and fence for upland disposal;
6. placing any excavated sand on the northeast side of the outlet;
7. installing new training walls with steel piles and timber lagging; and
8. placing riprap scour protection.

Permit #: 201401589-SJ

Issued on:

This Authorization expires on:

This Notice must be posted in a conspicuous place on the job during the entire project.

Department of Energy and Environmental Protection
Office of Long Island Sound Programs
79 Elm Street • Hartford, CT 06106-5127
Phone: (860) 424-3034 Fax: (860) 424-4054
www.ct.gov/deep

OFFICE OF LONG ISLAND SOUND PROGRAMS

APPENDIX A

TO: Permit Section
Department of Energy and Environmental Protection
Office of Long Island Sound Programs
79 Elm Street
Hartford, CT 06106-5127

Certificate Holder: State of Connecticut, DEEP
79 Elm Street
Hartford, CT 06106

Certificate No: 201401589-SJ, Milford

CONTRACTOR 1: _____

Address: _____

Telephone #: _____

CONTRACTOR 2: _____

Address: _____

Telephone #: _____

CONTRACTOR 3: _____

Address: _____

Telephone #: _____

EXPECTED DATE OF COMMENCEMENT OF WORK: _____

EXPECTED DATE OF COMPLETION OF WORK: _____

PERMITTEE: _____
(signature) (date)



OFFICE OF LONG ISLAND SOUND PROGRAMS

APPENDIX B

NOTICE OF CERTIFICATE ISSUANCE
DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION

To: Milford City Clerk

Signature and *Karen Onofri*
Date: 3-18-14

Subject: Silver Sands State Park
Certificate of Permission #201401589-SJ

Pursuant to Section 22a-363g and Section 22a-363b of the Connecticut General Statutes, the Commissioner of Energy and Environmental Protection gives notice that a certificate has been issued to State of Connecticut, DEEP, 79 Elm Street, Hartford, CT, 06106 to:

maintain and modify the Great Creek tide gate and outlet structure by:

1. installing temporary water control structures, as necessary;
2. constructing a 30' long concrete box culvert extension;
3. conducting substantial maintenance within the culvert and tide gate as noted on plan sheet 20, attached hereto;
4. removing the temporary water control structures;
5. removing the existing training walls and fence for upland disposal;
6. placing any excavated sand on the northeast side of the outlet;
7. installing new training walls with steel piles and timber lagging; and
8. placing riprap scour protection.

If you have any questions pertaining to this matter, please contact the Office of Long Island Sound Programs at 860-424-3034.

Return to:
Office of Long Island Sound Programs
State of Connecticut
Department of Energy & Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

Appendix D

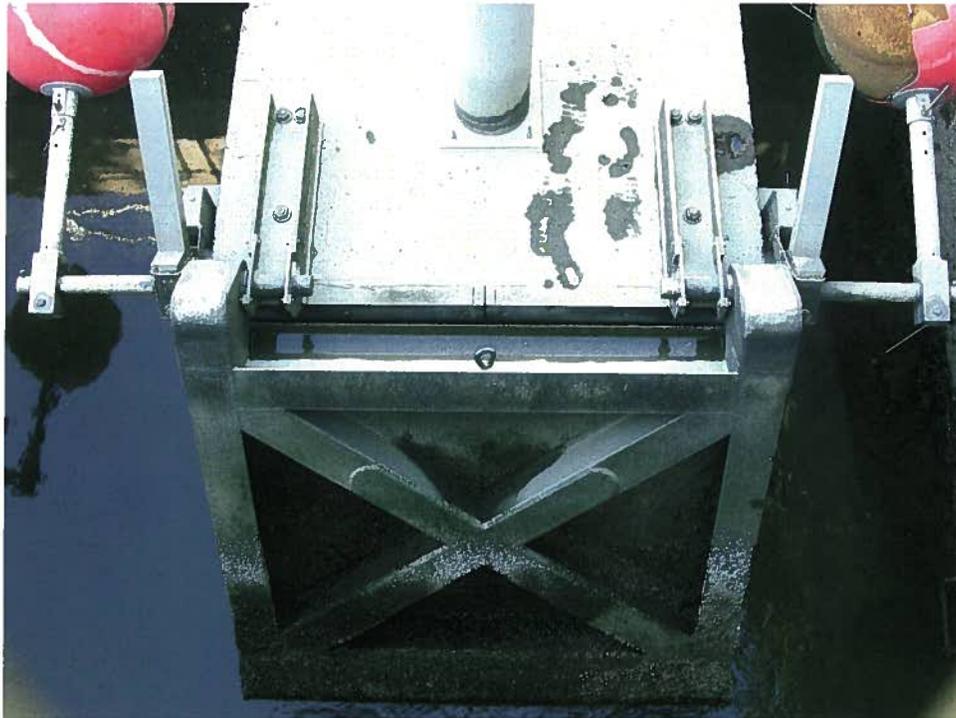
Tide Gates Report

Report
to
Fuss & O'Neil, Inc.
Concerning
the
Great Creek Outlet Structure Improvement Project
Milford Connecticut

Review and Recommendations Concerning the Self-Regulating Tidegates

Thomas J. Steinke

December 20, 2011



(Photo 4118. View of easterly Self-Regulating Tidegate Assembly)

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NOTE: The report text includes two sets of numbers that refer to item views in the 11/13/87 fabrication drawings of the Self-Regulating Tidegate by Spiegel and Zamecnik {item # }; and to annotated photographs in the appendix (photo #).

I. Introduction

The Great Creek flood relief project for drainage improvements at the Silver Sands Beach area of East Broadway Milford, was substantially completed and the two SRTs were installed in 1989. Since that time the tidegate chamber and sluice gates have been repaired, but the SRTs apparently have had little or no maintenance or repair after their initial installation – and they show it; yet they continue to operate satisfactorily – a testament to the good design engineering by Spiegel and Zamecnik, Inc. and fabrication by the Southington Metal Fabricating Company.

A. Project background

The initial objective of the Great Creek flood control project was to provide drainage relief to the residents occupying low-lying homes located northerly of East Broadway and southerly of the Great Creek salt marshes (photo 3906). These properties were often flooded for a period of days following a coastal storm event as a result of storm waves over-washing the East Broadway barrier beach and then flowing into the tidal wetland basin behind the beach. A relatively large upland watershed also drained to the marsh; and its runoff, combined with the beach over-wash coastal flood water, overtopped the creek banks and flooded the local streets and low-lying homes because the only drainage conduit was a 48" RCP under East Broadway – and this culvert was usually filled with sand and shell thereby significantly obstructing drainage. A primary goal of the flood relief efforts was the provision for discharge of floodwaters in the 12-hour tidal cycle following a storm event instead of over the next week.

The marsh flood water often required many days to drain down to normal water elevations through the obstructed culvert – which created another problem during the summer due to the mosquito breeding that followed the rains by creating excellent breeding habitat with no fish to prey on the larvae in isolated marsh pools.

Another consequence of inadequate drainage and flushing of the tidal wetland in the marsh basin was the loss of salt water and the elimination of the natural salt marsh plants and animals followed by their replacement with the low-salt tolerant phragmites plant (Phragmites australis or tall reed grass) that supported extensive annual marsh grass fires that threatened the houses bordering the marsh.

Of the flooding, fire, and mosquito problems, flooding was considered the most significant and the state and city sought plans and funding for providing relief.

B. Design Conditions and Tidegate Adjustments

The initial drainage design provided for two wall-mounted manually-operated, electrically-powered vertical sluice gates as the primary water control structures in the flood relief system. Subsequent coastal management priorities for fire and mosquito control, and for ecological restoration of the extensive salt marshes, resulted in the addition of two self-regulating tidegates located immediately behind the sluice gates. Unfortunately, this belt-and-suspenders design approach placed the two different gate design systems in direct conflict and resulted in the premature closure of the SRTs rendering them incapable of operating properly while both sluice gates were wide open. The reason for this conflict results from the fact that the SRT is designed for conditions where the in-coming tidal water transitions from laminar to turbulent flow in the short distance (approximately five feet) between the leading edge of the floating SRT gate door and the mouth of the SRT culvert. If a turbulent flow condition exists in front of this gate door transition zone, e. g., by locating the sluice gate opening

immediately in front of the SRT door as was done at Great Creek, the turbulent in-coming tidal currents will impinge on the leading edge of the SRT door where this turbulent water wave will ride-up over the door and the water current will push the gate closed at about one-third tide, thereby eliminating further water flow into the marsh.

As a corrective measure, the two sluice gates are operated at very different and opposite openings, with reciprocal settings of approximately 100% (primary gate) and 25% (secondary gate) of gate capacity, so as to cause a crossing water current to flow from the fully-opened primary sluice gate, past the rear SRT that closed prematurely, and then approach from the side of the fully opened adjacent SRT (thereby avoiding the turbulent flow impinging on the leading edge of the SRT). These settings allow the SRTs to open at any time that the head inside the SRT is greater than the water level outside the SRT. The sluice gate openings are adjusted manually: 100% for the primary gate opening and 25 – 30% for the secondary sluice gate opening. The sluice gate lift-stem settings are marked at reciprocal points with tapes of different colors on the guide housings and the sluice gate settings are periodically reversed to ensure equal wear and tear on all gate assemblies.

In hindsight, the SRTs may have been better installed where they would not have been affected by the disruptive flow of another water control structure. This could have been achieved by locating the SRT sufficiently behind the sluice gates at a point where there was no turbulent flow impinging on the SRT door; or, forward of the sluice gates, on the wall at the front of the chamber as the first water control structure facing the in-coming tide.

C. Operational Considerations

An inspection of the SRTs will show that one of its sub-assemblies has been deactivated, i.e., the vertical floats located on each side of the SRT. The SRTs have a vacuum-break or Air Purge {25} (photo 4074) which is designed for operational conditions on long culverts that allow for the development of dynamic opening forces on the rear (interior) face of the SRT following its closure. These forces are the result of closure of the SRT on an in-coming tide with the submerged culvert flowing full behind it; and developing a velocity head that, upon gate closure, caused the water to evacuate the culvert and then rush back into the culvert and run-up against the interior face of the door with its velocity head differential exceeding the tidal forces acting on the exterior face of the gate and thereby causing the gate door to reopen. This hydraulic flow reversal could be repeated several times in a harmonic sequence to the detriment of the gate assembly. To prevent this repetition or cycling, two buoyant vertical float assemblies are poised for deployment from just below and behind the gate hinge shaft {14} spring arms {8} and they float up behind the spring float arms when the gate door rotates closed. They remain deployed until they drop out of position with the receding tide water. These vertical float sub-assemblies are unnecessary at the Great Creek chamber installation with the present upper float settings for SRT closure because the chamber SRT culverts are in an essentially open system that does not become submerged and produce vacuum forces, nor does it confine discharge water in a long culvert behind it and therefore do not form the cycling forces that tend to reopen the SRT – the SRTs stay closed after closing due to the greater force of the tide water on the outside or exterior face of the SRT door. If the vertical floats deploy under these circumstances, they have no effective role in SRT operation and only serve to temporarily and slightly retard water flow when discharging from the marsh through the SRT and the four adjacent flapper tidegates. To prevent even that temporary and minor flow reduction, the vertical floats have been weighted and/or tied down to prevent their deployment (photo 4174).

II. Findings and Recommendations

A. Chamber

The concrete chamber structure has several issues needing attention:

1. Culverts

The easterly upper wall of the easterly SRT box culvert on the marsh end has a open hole into the rebar and aggregate that is flowing at high tide (photo 4142).

The concrete ceilings of both SRT box culverts are spalled and scaling with exposed rebar (photos 4144, 4147).

Recommendation: The chamber floor around the SRTs and the SRT door sumps below the gates contain accumulations of mud, shells, bottles and debris that should be removed with a shovel (photo 4171).

2. Sluice Gates

I recall that the sluice gates were operated before the limit switches were installed resulting in breaking/repair of the concrete in the bottom sumps beneath the sluice gates, stressing the assemblies and tracks, and subsequently shuddering and chattering in operation.

Recommendation: The clear plastic protective sleeves over the lift screws should be cleaned or replaced and permanent reciprocal sluice-gate opening reference points clearly marked on the sleeves for systematic adjustment of the sluice-gates; and indirect adjustment of the SRTs.

3. Ground Surface Outside of the Chamber

A hole was observed in the ground surface near the northeasterly corner of the chamber installation with sediment patterns in the grass indicating that the hole may have been flowing during the recent Tropical Storm Irene (photo 3877).

Recommendation: Investigate the hole and secure as necessary.

B. Self-Regulating Tidegates

The SRTs are in relatively good shape considering the time period and marine environment in which they have operated. However, several sub-assemblies are in need of attention and consideration should be given to sending the SRTs out for redesign, refit and repair on a rotating basis to maintain operation of at least one SRT in the chamber at all times.

Recommendation: I recommend that Spiegel and Zamecnik and Southington Metal Fabricating Company be considered for the redesign/refit project as their work product is of the highest quality.

1. Sub-assemblies

a. Gaskets

The Neoprene rubber Gasket {Plan Sheet 2, part no. 27/28} and Gasket Backing Plate {29/30} have separated at the adhesive joint on the easterly SRT along the invert's easterly side of the opening of the box culvert where it leaks at high tide (photo 3834, 4226). The stainless steel gasket backing plate is still bolted to the studs in the concrete, while the 3.5-ft. long gasket was recovered on the floor of the chamber at its transition to the creek channel upstream. The two horizontal neoprene

gasket sections, at the crown and invert of the SRT culvert, were originally designed as a single unit 7-ft. long, but the gaskets on the SRT invert and crown are composed of two separate pieces, each 3.5-ft. long, and secured with three studs in the face of the box culvert (photo 4083, 4122). The two-piece gasket is at variance with the SRT plans and I could not find any explanation for this anomalous condition. It is possible that the fabricator (SMF) could not obtain gaskets of the initial 7-ft. design and so provided an alternate that Spiegel and Zamecnik (S&Z) covered in revised shop drawings or the “as-built” provided to the state (S&Z’s representative supervised the installation of all SRTs during construction.)

Recommendation: Rebond the gasket to the stainless steel backing plate and install on the studs.

b. Upper Floats

The upper floats, i.e., the two large orange spheres {9} on each SRT, are foam-injected rotationally-molded PVC shells, retro-fitted with internal PVC sleeves, that continue to function properly despite the fact that the PVC shells are cracked and broken (photos 4081, 4088). These are among the most important SRT components as they serve to close the gates and secure the protected area from flooding after the desired high tide elevation is achieved.

Recommendation: Replace the upper floats with all new spheres (foam-injected with internal PVC sleeve tubing as per original design plans).

c. Filler Plates

Each SRT gate has four triangular filler plates {sheet 1, items 22 and 23} secured to the downstream face of the inner flanges of the cross-beams by 3/8-inch bolts along their perimeter (photos 4157, 4205). Several of these bolts, or their bolt heads, are missing. It appears that the bolts may be stressed by the constant small shock and vibration of floating debris and ice impacting on the upstream (inland), face of the filler plates at various stages of the out-going tide, eventually breaking off the bolt head or backing out the bolt.

Recommendation: Drill out and replace all broken and missing bolts and replace with 316 stainless steel bolts and “Loctite”.

d. Hinge and Float Shafts

The SRT Hinge and Float Shafts {14} and Hinge Side Plates {33} are wearing due to scoring and flattening of their bearing surfaces (photos 4103, 4077). The hinge shaft is designed to roll (not rotate) back and forth within the elongated hinge hole or slot created by the upper Hinge Cover Plate {32} and the lower Hinge Side Plate {33} as the gate door rises and falls with the tide. However, the combined buoyancy of the large bottom door float and the two large back floats serve to lift the door assembly approximately 1/4th inch within the hinge hole just prior to closing, at which point water currents due to turbulence may push the gate assembly with hinge shaft forward to the front of the hinge slot where the hinge shaft then rotates in a stationary position as the door rotates approximately 90-degrees to closure. This rotary motion serves to deform the bearing surfaces by scoring a groove (about 3/16th inch deep) in the shafts and a similar amount of cutting and mushrooming in the lower Hinge Side Plate (photo 4077).

Recommendation: Redesign the SRT hinge sub-assembly so that the hinge shaft has a full bearing

surface between the lower Hinge Side Plates to support the shaft without deformation. This may be achieved by adding a front extension bearing plate (to support the full width of the hinge shaft) to the Hinge Web Plate {37} between the Hinge Side Plates; or by rebuilding the profile of the scored shaft and fitting a sacrificial sleeve over the hinge shaft to be replaced as needed.

e. Vertical Floats

As noted above, the vertical floats have been deactivated, initially with stone weights placed on the Top Plates {53} of the tank sub-assemblies and subsequently with ropes, to prevent their deployment when the SRT closes (photos 4155, 4168, 4171).

Recommendation: Allow these units to remain in their deactivated condition under the existing upper float settings; and be prepared to reactivate them if subsequent upper float adjustments warrant it in the future.

f. Bio-fouling:

The SRT Tide Gate Door Assemblies each support approximately 50 to 100 lbs. of marine fouling organisms composed primarily of acorn barnacles, mud snails, oysters, blue and ribbed mussels, seaweeds, and sediment (photos 4157, 4158). As an environmental variable, this fouling community contributes to the weights and balances equation used in determining the settings of the Upper Float Assembly. However, the practical effect of the weight of the fouling community is negligible on gate operation and opening – closing in the context of the greater buoyancy of the bottom door float tube {20} and the two upper float spheres {9}. Marine fouling is of greater importance with respect to corrosion as noted below.

Recommendation: I recommend that the SRT assemblies be scraped (with a putty knife or paint scraper) or power washed on an annual basis for the purposes of removing the marine fouling community, but more importantly for inspecting and monitoring the SRT assembly in its operating environment. The knowledge of SRT operation, wear points, deterioration, and maintenance needs of all sub-assemblies is of the utmost value to proper gate operation, maintenance and repair in the long term.

g. Corrosion

The SRTs are fabricated primarily from an aluminum alloy (alloy 6061-T6) that is corrosion resistant in the marine environment. A quick inspection of the sub-assemblies will reveal little corrosion on the SRTs. However, an inspection below the marine fouling community will reveal scattered shallow corrosion blisters and pits where conditions promote oxidation of the surface and base metal (photos 4158, 4160, 4162, 4164). If the metal surfaces can be maintained substantially free of fouling organisms, the metal surfaces will quickly form a protective oxide over the aluminum wherever the surface is abraded or scratched leading to an extended service life.

Recommendation: The Chamber walls, floor and the SRT gate sumps and sluice gate sumps should all be cleaned following the cleaning of the SRTs.

Recommendation: As noted above, implement an annual cleaning procedure for the SRTs and include it in the O&M manual.

2. Operation and Maintenance Manual (O&M Manual)

The O&M Manual for the Tide Gate Chamber water control systems should include a description of the Sluice gates and the SRTs, with all of their sub-assemblies described with respect to their purpose and adjustment, and how the success of the flood relief and marsh restoration goals are dependent on the operational settings of the gate systems. Also, describe all inspection protocols and cleaning procedures and the annual schedules for the same. Further, include a description and location of several permanent benchmark elevations and a tide gage staff, clearly marked and maintained in and around the Chamber, for the purpose of monitoring gate closing and opening water levels when adjusting SRT upper float and Sluice gate openings.

In addition to operational aspects, the O&M manual should include copies of all plans and drawings; sources of gate parts and service; installation and service history; and providing for addenda sheets, standard forms, and photographs for documenting all damage, repair, inspection, cleaning, and adjustment events associated with the Chamber installation and its water control structures.

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Appendix

(All photographs taken in November and December 2011.)



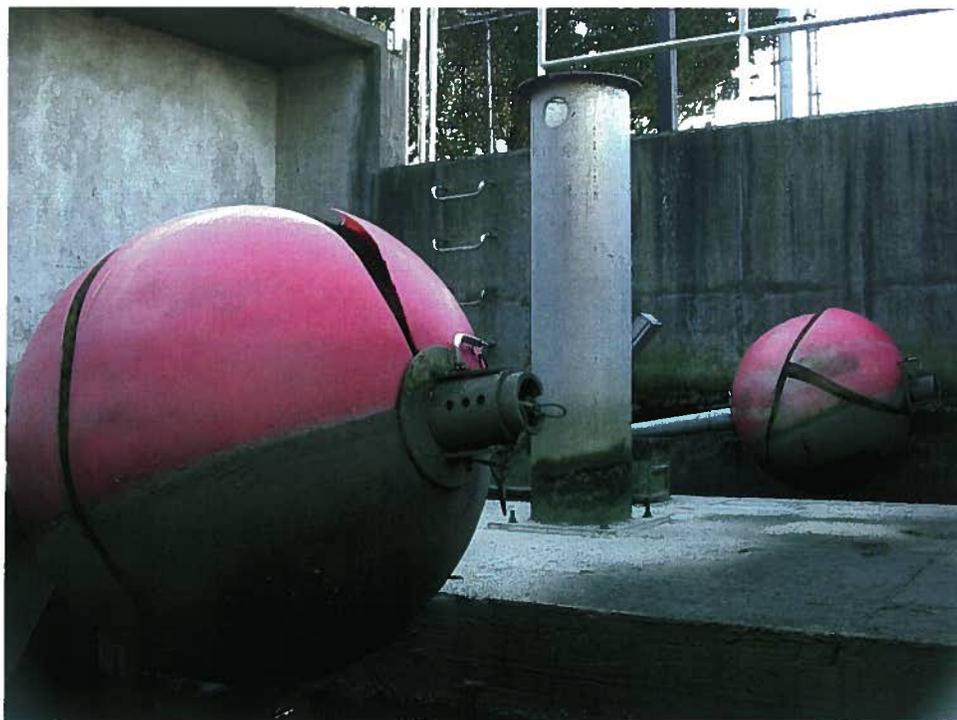
3834. View of easterly culvert invert gasket leak at high tide with the SRT closed.



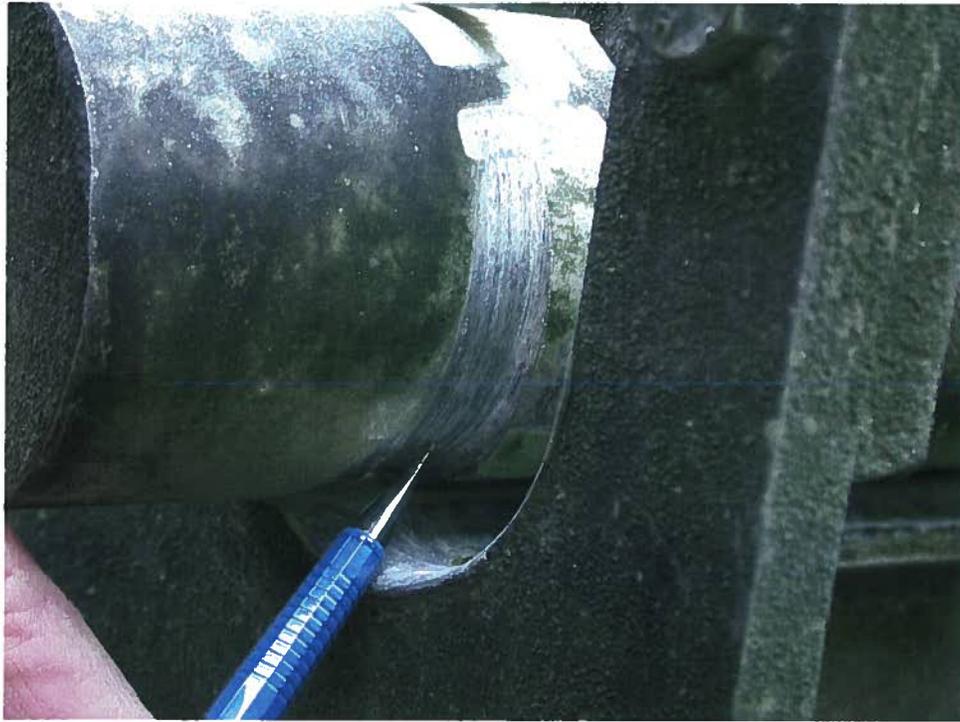
3877. View of hole in the soil located outside of the northeasterly corner of the concrete chamber with indications of flowage from recent Tropical Storm Irene.



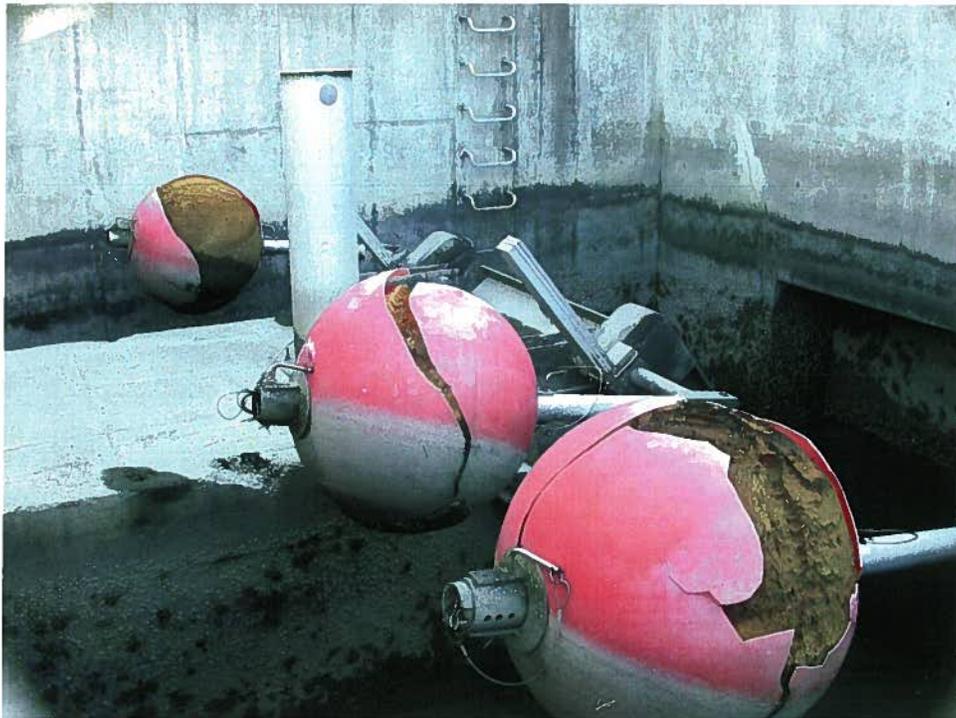
3906. View of low-lying homes bordering the restored salt marsh north of E. Broadway.



4074. View of vacuum-break or air purge pipe on crown of box culvert between the upper floats of the westerly SRT.



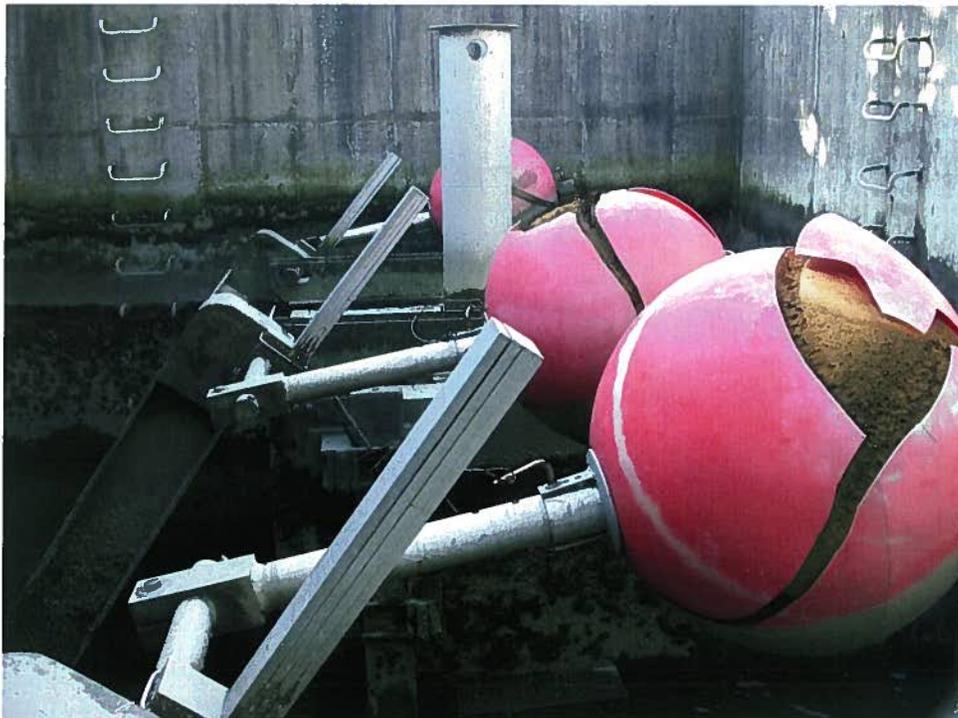
4077. View of scoring of shaft and mushrooming and down-cutting of hinge side plate due to hinge shaft rotating in place, instead of rolling forward, when gate door closes.



4081. View of deteriorated, but serviceable, foam-injected PVC shell upper floats and the pin-and-plate apparatus for adjusting position of float ball on the float ball arm and sleeve.



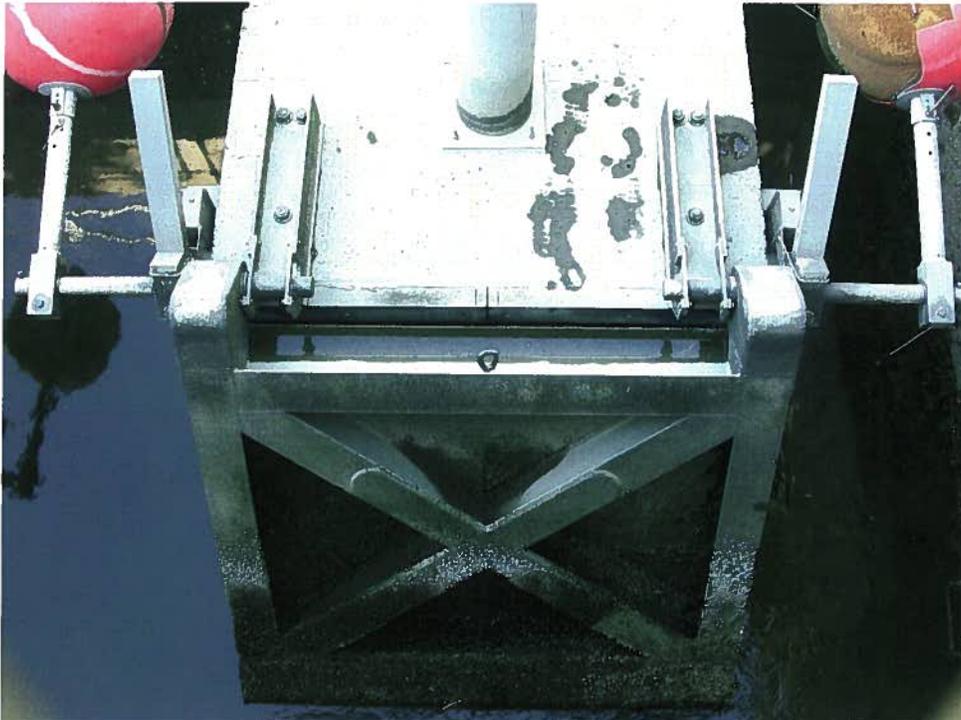
4083. View of intact two-piece (left- and right-side) gasket assembly on crown of easterly SRT for comparison with missing right-hand half gasket at invert immediately below. Vacuum-break hole in ceiling to right.



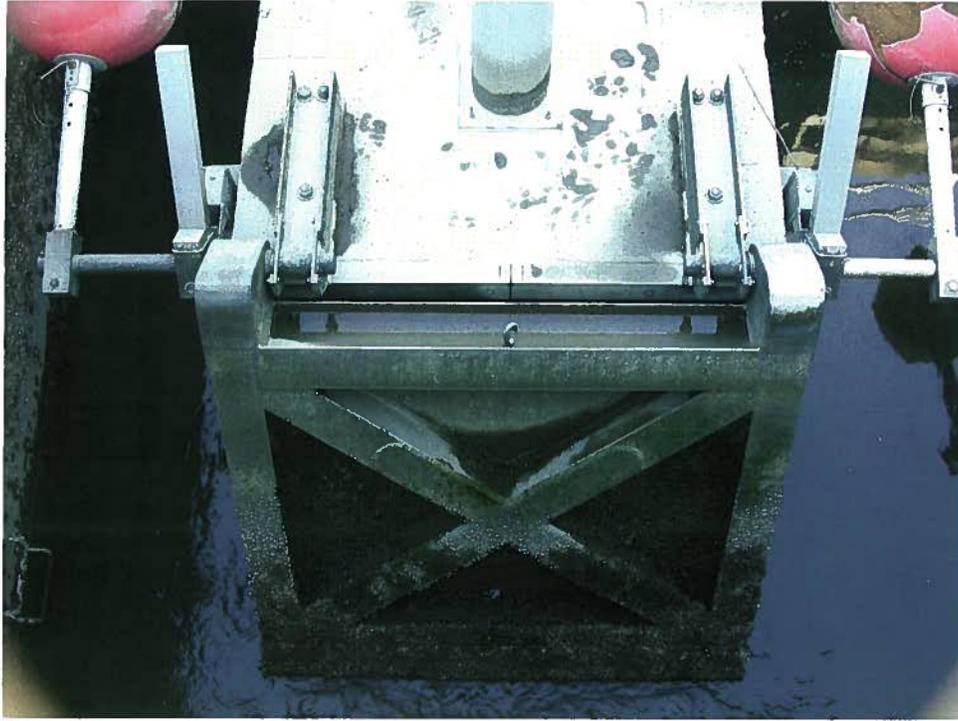
4088. Alternate view of foam-injected molded PVC shell upper floats that are still safe and functional in spite of their cosmetically-deteriorated appearance.



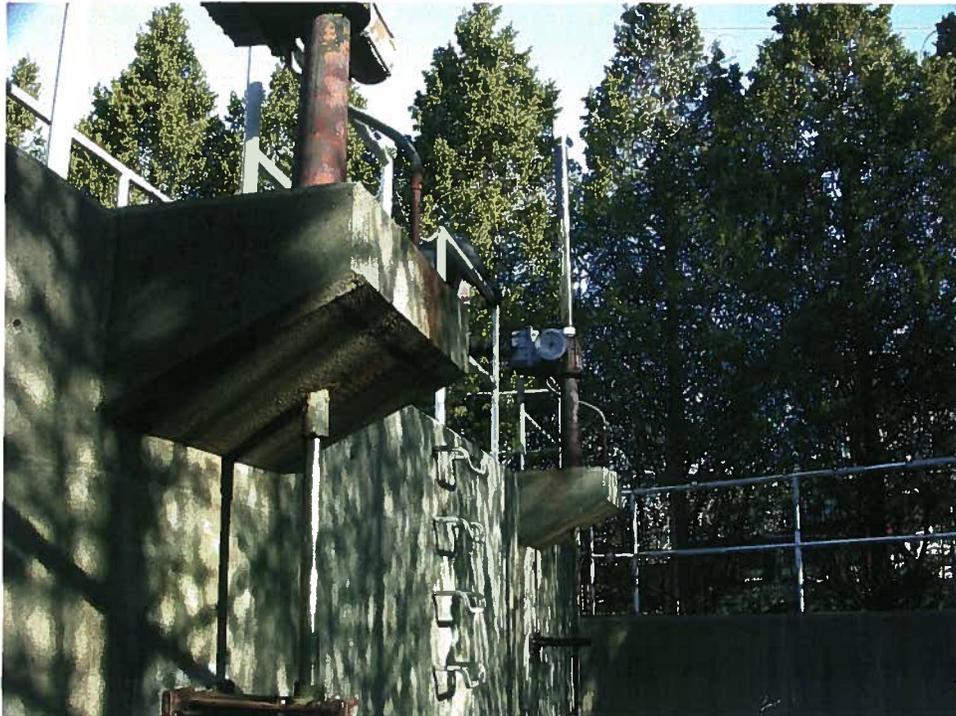
4103. View of SRT hinge shaft in hinge box, with gate door above, and leaf-spring arm, and top of vertical float in lower right. Deformation of hinge shaft and side plate is due to rotation instead of rolling in the slot.



4118 View of easterly SRT assembly with gate door and bottom float, hinge boxes and hinge shafts supporting leaf-springs (with vertical floats below and behind) and upper float arms and PVC floats.



4122. View of westerly SRT at crown of culvert noting the two-piece gasket with center joint which is identical to the gasket at the invert with its right-hand half-section having separated from the mounting plate and studs.



4133. View of Sluice Gate assemblies and the protective plastic sleeves with marker tapes indicating the relative positions of the sluice gate valve stems for proper operation of the SRTs.



4135. View of the westerly Sluice Gate valve leaf adjusted to the wide-open position (reciprocal position of easterly Sluice Gate is three-quarters closed) for proper operation of the SRTs located immediately behind.



4142. View of upper easterly wall of easterly box culvert noting a hole that flows freely with water at high tide after the SRTs are closed. Steel rebar is visible in the hole.



4144. View of ceiling of box culvert with rust staining the surface where the reinforcing steel is exposed through the concrete.



4155. View of SRT complete vertical float assembly secured with a rope in its low tide position.



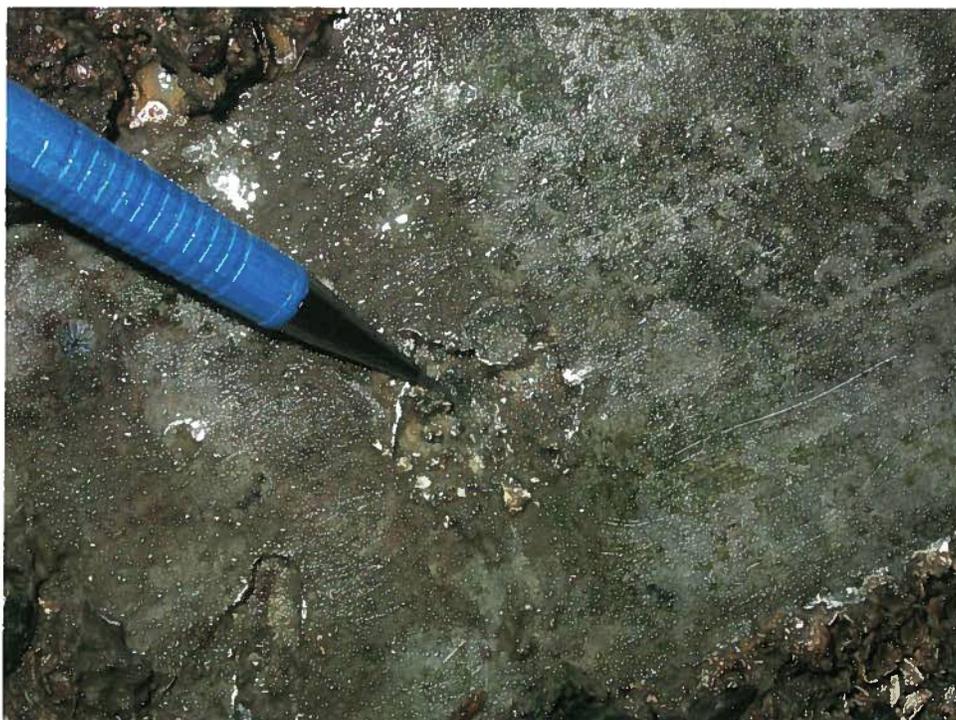
4147. View of ceiling of westerly box culvert with spalling of concrete and rust staining of surface from an earlier repair due to exposure of reinforcing rods to seawater. The hole for the vacuum-break is to lower right.



4157. View of westerly SRT gate door filler plates and cross-beams with the marine-fouling community adhering to the gate surface.



4158. View of westerly SRT gate door and bottom float with bio-fouling primarily composed of acorn barnacles and blue mussels.



4160. View of SRT gate door cross-beam where the marine-fouling community has been scrapped away disclosing the pit corrosion beneath (center and lower left).



4162. View of SRT gate door triangular filler plate where bio-fouling has been removed exposing pit corrosion and exfoliation of thin aluminum blisters.



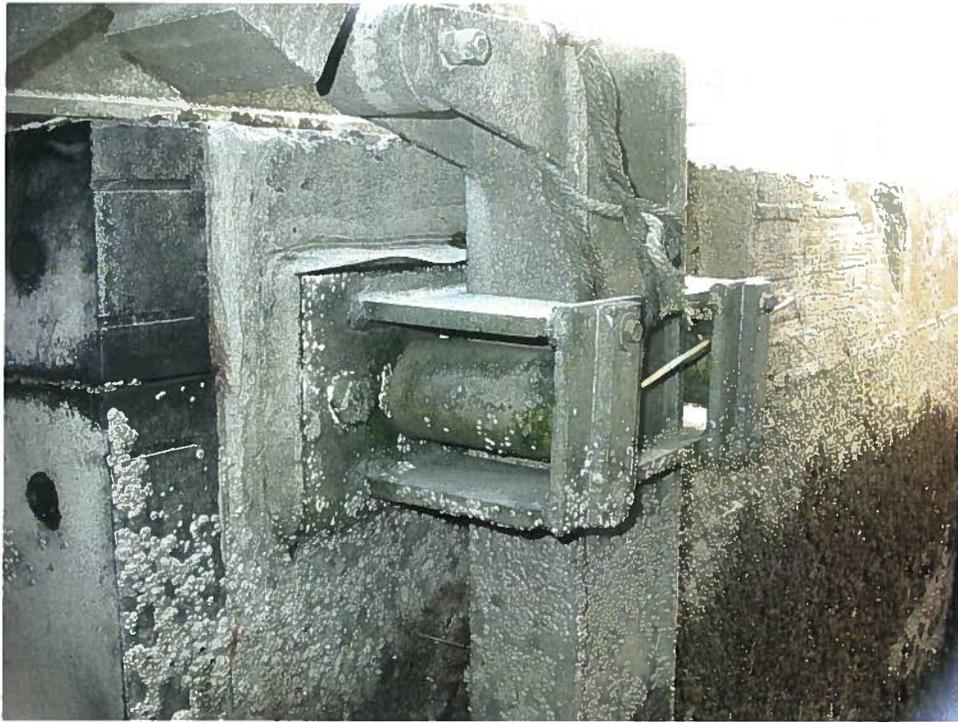
4164. View of SRT gate door filler plate where the marine-fouling community has been scrapped away exposing the scattered blisters and pit corrosion beneath.



4168. Low tide view of upper portion of vertical float assembly having been deactivated with rope and stone weights because the floats are not needed at the particular upper float settings now used to close the SRTs.



4171. Low tide view of lower portion of easterly SRT vertical float assembly (on left) noting accumulations of debris and oyster bed on wall and floor of chamber.



4174. View of lateral float and roller assembly depicting rope used to restrain the float from deploying when the gate closes as the float is not needed at the present upper float settings for gate closure.



4180. View of flood-tide sandbar on the inland side of the chamber deposited from water currents carrying in beach sand and scouring of the channel bottom. Its removal could incrementally enhance water flow.