



**US Army Corps  
of Engineers**<sup>®</sup>  
New England District  
696 Virginia Road  
Concord, MA 01742-2751

# PUBLIC NOTICE

**Comment Period Begins: 4/21/2020**  
**Comment Period Ends: 5/21/2020**  
**File Number: NAE-2013-01925**  
**In Reply Refer To: Alan R. Anacheka-Nasemann**  
**Phone: (978) 318-8214**  
**E-mail: [alan.r.anacheka-nasemann@usace.army.mil](mailto:alan.r.anacheka-nasemann@usace.army.mil)**

The District Engineer has received a permit application to conduct work in waters of the United States from Massachusetts Bay Transportation Authority, 10 Park Plaza, Boston, MA 02116. This work is proposed in the Annisquam River near 61 Riverside Avenue, Gloucester, Massachusetts 01930. The site coordinates are: Latitude 42.617858, Longitude -70.679195.

The work involves the complete reconstruction of the railroad bridge, which has reportedly reached the end of its useful life. The work includes: (1) Installation of 9 drilled shafts within vertical casings, 7 feet in diameter, totalling 346 ft.<sup>2</sup> to support the new bridge; and to replace 138 existing timber pilings that currently support the bridge; (2) removal of the 138 existing timber pilings, 12 inches in diameter, cutting them approximately 2 feet below the river channel mudline, thus gaining 138 ft.<sup>2</sup> of waterway; (3) removal of the existing fender system, 128.5 linear feet on the east side and 150 feet on the west; and removal (or cutting 2 feet below the mudline) of its 121, 12" pilings; (4) replacing the fender system with a new fender system, 200 linear feet on the east side and 180 feet on the west side of the channel that will be attached to 96 timber piles, driven into the river bottom, such that the bottom rails of the fender system will be set at mean low water elevation, affecting an additional 164 ft.<sup>2</sup> of waterway; and (5) installation of a 575 foot long sheet pile retaining wall and associated backfill along the south side of the West Causeway, totalling 16,000 ft.<sup>2</sup> below the high tide line (12,000 ft.<sup>2</sup> below mean high water) in order to allow for construction of new track. Work will be done such that only one of the two tracks will be taken out of service at a time, so that train operations can continue during construction.

The work is shown on the enclosed plans entitled "REPLACEMENT OF GLOUCESTER DRAWBRIDGE OVER ANNISQUAM RIVER MBTA CONTRACT NO. B92PS07," on 19 sheets, and dated "December, 2019."

As mitigation for the proposed net of 16,402 ft.<sup>2</sup> of wetland/mudflat loss, the applicant has agreed to provide funds to an in lieu fee program managed by the Massachusetts Department of Fish and Game.

## **AUTHORITY**

Permits are required pursuant to:

- Section 10 of the Rivers and Harbors Act of 1899
- Section 404 of the Clean Water Act
- Section 103 of the Marine Protection, Research and Sanctuaries Act.
- Section 14 of the Rivers and Harbors Act of 1899 (33 USC 408)

The decision whether to issue a permit will be based on an evaluation of the probable impact of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization

**CENAE-R**  
**FILE NO. NAE-2013-01925**

of important resources. The benefit which may reasonably accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered, including the cumulative effects thereof; among those are: conservation, economics, aesthetics, general environmental concerns, wetlands, cultural value, fish and wildlife values, flood hazards, flood plain value, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food production and, in general, the needs and welfare of the people.

The U.S. Army Corps of Engineers, New England District (Corps), is soliciting comments from the public; Federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. The Corps will consider all comments received to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

Where the activity involves the discharge of dredged or fill material into waters of the United States or the transportation of dredged material for the purpose of disposing it in ocean waters, the evaluation of the impact of the activity in the public interest will also include application of the guidelines promulgated by the Administrator, U.S Environmental Protection Agency, under authority of Section 404(b) of the Clean Water Act, and/or Section 103 of the Marine Protection Research and Sanctuaries Act of 1972, as amended.

The activities proposed herein will also require permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a Corps federally authorized Federal Navigation Project (FNP) known as the Gloucester Harbor and Annisquam River. The proposed alteration involves permanent occupation of the FNP by spanning it. A permit pursuant to Section 10/404/103 shall not be granted until the Section 408 permission is issued. Through this public notice we are soliciting information necessary to inform the Corps evaluation and review.

**ESSENTIAL FISH HABITAT**

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires all federal agencies to consult with the National Marine Fisheries Service on all actions, or proposed actions, permitted, funded, or undertaken by the agency, that may adversely affect Essential Fish Habitat (EFH). Essential Fish Habitat describes waters and substrate necessary for fish for spawning, breeding, feeding or growth to maturity.

The dredging portion of this project will impact approximately 402 SF of EFH. Habitat at this site can be described as subtidal mudflat. Loss of this habitat may adversely affect species that use these waters and substrate. However the District Engineer has made a preliminary determination that the site-specific adverse effect will not be substantial. Further consultation with the National Marine Fisheries Service regarding EFH conservation recommendations is being conducted and will be concluded prior to the final decision.

The dredged material disposal is proposed to either be sidecast immediately adjacent to the concrete 7-foot shafts, or disposed of upland. This is an open water site, which provides EFH. Habitat at this site can be described as tidal mudflat with winter flounder and other species. Loss of this habitat may adversely affect

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species that use these waters and substrate. However, the District Engineer has made a preliminary determination that the site-specific adverse effect will not be substantial. Further consultation with the National Marine Fisheries Service regarding EFH conservation recommendations is being conducted and will be concluded prior to the final decision.

This project will impact 0.38 acres of EFH. This habitat consists of tidal mudflat (402 SF) and pebble-cobble (16,000 SF). Loss of this habitat may adversely affect species that use these waters and substrate. However, the District Engineer has made a preliminary determination that the site-specific adverse effect will not be substantial. Further consultation with the National Marine Fisheries Service regarding EFH conservation recommendations is being conducted and will be concluded prior to the final decision.

**NATIONAL HISTORIC PRESERVATION ACT**

Based on his initial review, the District Engineer has determined that little likelihood exists for the proposed work to impinge upon properties with cultural or Native American significance, or listed in, or eligible for listing in, the National Register of Historic Places. Therefore, no further consideration of the requirements of Section 106 of the National Historic Preservation Act of 1966, as amended, is necessary. This determination is based upon one or more of the following:

- a. The permit area has been extensively modified by previous work.
- b. The permit area has been recently created.
- c. The proposed activity is of limited nature and scope.
- d. Review of the latest published version of the National Register shows that no presence of registered properties listed as being eligible for inclusion therein are in the permit area or general vicinity.
- e. Coordination with the State Historic Preservation Officer and/or Tribal Historic Preservation Officer(s).

**ENDANGERED SPECIES CONSULTATION**

The Corps has reviewed the application for the potential impact on Federally-listed threatened or endangered species and their designated critical habitat pursuant to section 7 of the Endangered Species Act as amended. It is our preliminary determination that the proposed activity for which authorization is being sought is designed, situated or will be operated/used in such a manner that it is not likely to adversely affect a listed species or their critical habitat. We are coordinating with the National Marine Fisheries Service and/or U.S. Fish and Wildlife Service on listed species under their jurisdiction and the ESA consultation will be concluded prior to the final decision.

**OTHER GOVERNMENT AUTHORIZATIONS**

The states of Connecticut, Maine, Massachusetts, New Hampshire and Rhode Island have approved Coastal Zone Management Programs. Where applicable, the applicant states that any proposed activity will comply with and will be conducted in a manner that is consistent with the approved Coastal Zone Management Program. By this Public Notice, we are requesting the State concurrence or objection to the applicant's consistency statement.

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The following authorizations have been applied for, or have been, or will be obtained:

- (X) Permit, license or assent from State.
- (X) Permit from local wetland agency or conservation commission.
- (X) Water Quality Certification in accordance with Section 401 of the Clean Water Act.

**COMMENTS**

In order to properly evaluate the proposal, we are seeking public comment. Anyone wishing to comment is encouraged to do so. Comments should be submitted in writing by the above date. If you have any questions, please contact Alan R. Anacheke-Nasemann at (978) 318-8214, (800) 343-4789 or (800) 362-4367, if calling from within Massachusetts.

Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider the application. Requests for a public hearing shall specifically state the reasons for holding a public hearing. The Corps holds public hearings for the purpose of obtaining public comments when that is the best means for understanding a wide variety of concerns from a diverse segment of the public.

The initial determinations made herein will be reviewed in light of facts submitted in response to this notice. All comments will be considered a matter of public record. Copies of letters of objection will be forwarded to the applicant who will normally be requested to contact objectors directly in an effort to reach an understanding.

**THIS NOTICE IS NOT AN AUTHORIZATION TO DO ANY WORK.**

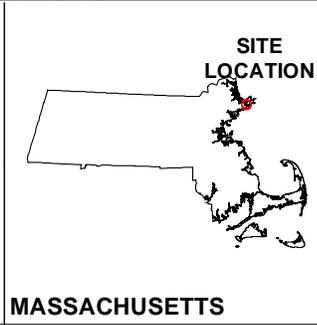
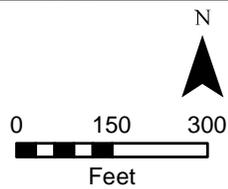
**Barbara H. Newman**  
**Chief, Permits and Enforcement Branch**  
**Regulatory Division**

If you would prefer not to continue receiving Public Notices by email, please contact Ms. Tina Chaisson at (978) 318-8058 or e-mail her at [bettina.m.chaisson@usace.army.mil](mailto:bettina.m.chaisson@usace.army.mil). You may also check here ( ) and return this portion of the Public Notice to: Bettina Chaisson, Regulatory Division, U.S. Army Corps of Engineers, 696 Virginia Road, Concord, MA 01742-2751.

NAME: \_\_\_\_\_  
ADDRESS: \_\_\_\_\_  
PHONE: \_\_\_\_\_



- Project Area
- Channel Reach



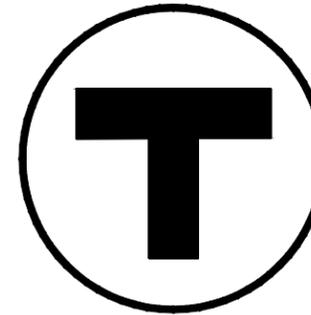
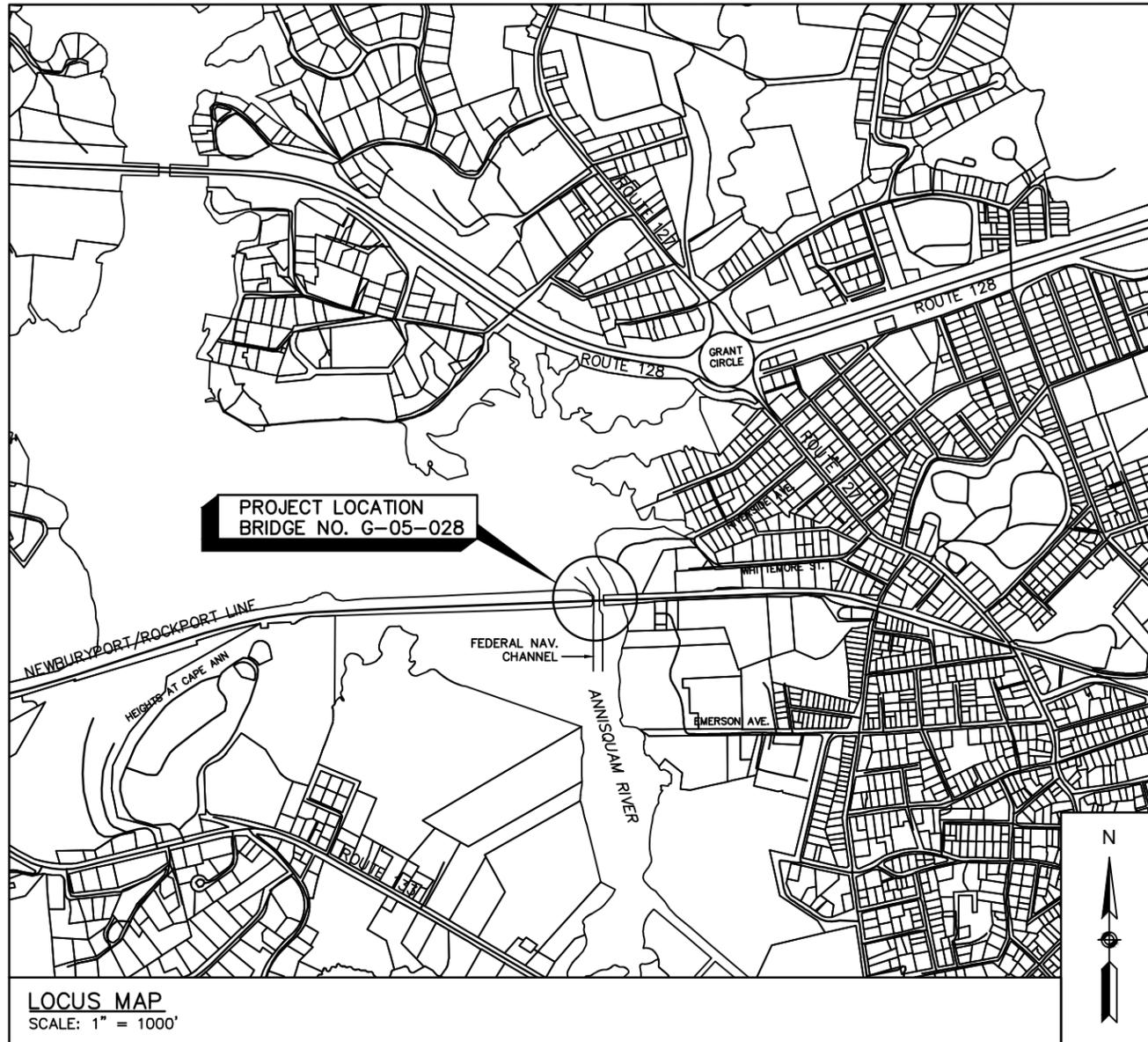
**TRC** Wannalancit Mills  
650 Suffolk Street  
Lowell, MA 01854  
978-970-5600

**CHANNEL REACH**  
**MBTA GLOUCESTER**  
**DRAW RAILROAD BRIDGE**  
**(NO. G-05-028)**  
**GLOUCESTER, MA**

**FIGURE 1**      **FEBRUARY 2020**

Base Map: Esri and its contributors, "World Imagery", 2017  
Coordinate System: NAD 1983 StatePlane Massachusetts Mainland (Feet)

FILE NAME: S:\1794\Active\179410231\03 - Gloucester Draw\01 Design Phase\18 100% Submittal\US Army Corps of Engineers Plan Set\Working Drawings\G-01 TITLE SHEET.dwg PLOTTED: Tuesday, February 18, 2020 - 5:02pm USER: jkiterney



MASSACHUSETTS  
BAY  
TRANSPORTATION  
AUTHORITY

US ARMY CORPS OF ENGINEERS  
INDIVIDUAL PERMIT APPLICATION PLAN  
SET

GLOUCESTER, MA  
BRIDGE NO. G-05-028 (A7C)

MBTA CONTRACT NO. B92PS07

SEPTEMBER 2015  
REVISED DECEMBER 2019



MODJESKI AND MASTERS, INC.  
100 STERLING PARKWAY, SUITE 302  
MECHANICSBURG, PA 17050

LTK ENGINEERING SERVICES  
10 MILK STREET, SUITE 701  
BOSTON, MA 02108

JACOBS ENGINEERING GROUP, INC.  
2600 MICHELSON DRIVE, SUITE 500  
IRVINE, CA 92612

TRC  
650 SUFFOLK STREET  
LOWELL, MA 01854

KEVILLE ENTERPRISES, INC.  
475 SCHOOL STREET, SUITE 11  
MARSHFIELD, MA 02050

GZA GEOENVIRONMENTAL, INC.  
249 VANDERBILT AVENUE  
NORWOOD, MA 02062

GREEN INTERNATIONAL AFFILIATES, INC.  
239 LITTLETON ROAD, SUITE 3  
WESTFORD, MA 01886

APPROVALS:

Erik Stoothoff, P.E. DATE  
CHIEF ENGINEER FOR DESIGN  
AND CONSTRUCTION

John C. Schwarz, P.E. DATE  
DIRECTOR OF BRIDGE  
AND TUNNEL PROJECTS

Edmond F. Hunter DATE  
ASSISTANT GENERAL MANAGER  
FOR DESIGN AND CONSTRUCTION

FILE NAME: S:\179A\Active\1794\0231\03 - Gloucester Draw\01 Design Phase\18 100% Submittal\US Army Corps of Engineers Plan Set\Working Drawings\ACOE-2 INDEX OF PLANS.dwg PLOTTED: Tuesday, February 18, 2020 - 4:51pm USER: jklemezy

SHEET NUMBER	SHEET TITLE
ACOE-1	TITLE SHEET
ACOE-2	INDEX OF PLANS
ACOE-3	LEGEND AND GENERAL NOTES
ACOE-4	TRACK - GENERAL NOTES LEGEND AND ABBREVIATIONS
ACOE-5	EXISTING CONDITIONS PLAN
ACOE-6	STAGED CONSTRUCTION - STAGE 1
ACOE-7	STAGED CONSTRUCTION - STAGE 2
ACOE-8	STAGED CONSTRUCTION - STAGE 3
ACOE-9	SITE PLAN AND PROFILE
ACOE-10	BRIDGE PLAN AND ELEVATION
ACOE-11	FENDER SYSTEM LAYOUT
ACOE-12	ELECTRICAL GENERAL PLAN AND ELEVATION
ACOE-13	SUBMARINE CABLE DETAILS
ACOE-14	WEST CAUSEWAY EXISTING CONDITIONS - PLAN
ACOE-15	WEST CAUSEWAY RETAINING WALL - PLAN
ACOE-16	WEST CAUSEWAY RETAINING WALL - SECTION
ACOE-17	WEST CAUSEWAY ENVIRONMENTAL IMPACT - PLAN
ACOE-18	WEST CAUSEWAY CONSTRUCTION STAGING
ACOE-19	WEST SIGNAL INSTRUMENT HOUSE FOUNDATION DETAILS

	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY					
	REPLACEMENT OF GLOUCESTER DRAWBRIDGE OVER ANNISQUAM RIVER MBTA CONTRACT NO. B92PS07					
INDEX OF PLANS						
 65 NETWORK DRIVE BURLINGTON, MA			MASSACHUSETTS BAY TRANSPORTATION AUTHORITY			
			APPROVED BY:			
MANAGER OF DESIGN: _____ DATE _____			DIRECTOR OF OPERATIONS SUPPORT DATE _____			
HORIZ.	AS NOTED	DES. BY	DR. BY	CHK. BY	PLAN NO.	ISSUE 
VERT.	AS NOTED				SHEET ACOE-2	
DATE:	DEC. 2019					

# GENERAL NOTES

**NOTES:**

1. THE CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND GRADES IN THE FIELD BY SURVEY BEFORE COMMENCING WORK AND PROMPTLY NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE COMMENCING CONSTRUCTION AND/OR FABRICATION. WHERE THE CLEAR INTENT OF THE NEW WORK IS TO MATCH EXISTING CONDITIONS, THE FIELD DATA SHALL GOVERN, UNLESS OTHERWISE SPECIFIED BY THE ENGINEER. ALL DIMENSIONS, LOCATIONS AND ELEVATIONS OF KNOWN EXISTING STRUCTURES SHOWN ON THE CONTRACT DRAWINGS ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR IN THE FIELD.
2. THE CONTRACTOR SHALL SET AND FURNISH WARNING LIGHTS, AND OTHER PROTECTIVE DEVICES THAT ARE NECESSARY, IN THE JUDGEMENT OF THE ENGINEER, FOR THE PROTECTION OF THE PUBLIC IN ACCORDANCE WITH THE M.U.T.C.D. LATEST EDITION.
3. EXISTING GRADES SHOWN ON THESE PLANS ARE DERIVED FROM PHOTOGRAMMETRY AND GROUND SURVEY PERFORMED BY GREEN INTERNATIONAL AFFILIATES AND PROVIDED TO FAY, SPOFFORD & THORNDIKE. THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE ENGINEER ANY VARIATION BETWEEN HIS SURVEY AND THE GRADES SHOWN THESE PLANS.
4. ALL EXISTING AND PROPOSED GRADES AND ELEVATIONS ARE SHOWN IN THE NORTH AMERICAN VERTICAL DATUM OF 1988 (N.A.V.D. 88).
5. EXISTING UTILITY LINES INDICATED OR NOTED ON THESE DRAWINGS ARE SHOWN AS OBTAINED FROM SURVEY INFORMATION AND ARE ONLY APPROXIMATE IN LOCATION. EXISTING UTILITIES OTHER THAN THOSE INDICATED ON THE PLANS MAY BE ON SITE. THE CONTRACTOR IS WARNED TO PROCEED WITH CAUTION WITH ALL WORK, ESPECIALLY EXCAVATION WORK. THE CONTRACTOR IS TO MAKE ALL POSSIBLE INVESTIGATIONS AN ALL AREA UTILITY COMPANIES ARE TO BE CONTACTED AND ASKED TO PROVIDE INFORMATION PERTAINING TO ALL UNDERGROUND UTILITIES WITHIN THE PROJECT LIMITS BEFORE EXCAVATING, INSTALLING, GRADING OR REPAIRING. ALL UTILITY COMPANIES, PUBLIC AND PRIVATE, MUST BE NOTIFIED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY UTILITY CONFLICTS WITHOUT DELAY, FOR RESOLUTION OF THE CONFLICT. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR DAMAGES OR DELAYS INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCURATELY SHOWN. IF THE CONTRACTOR DAMAGES ANY UTILITIES, THEN THE CONTRACTOR SHALL REPAIR THEM TO THE SATISFACTION OF THE UTILITY COMPANY AND THE ENGINEER AT THE CONTRACTOR'S OWN EXPENSE. THE CONTRACTOR SHALL NOTIFY DIG-SAFE AT LEAST 72 BUSINESS HOURS BEFORE ANY CONSTRUCTION BEGINS AT 1-888-344-7233.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH ALL LOCAL UTILITY COMPANIES FOR MAINTENANCE, PROTECTION AND RELOCATION OF THEIR FACILITIES AS REQUIRED FOR THE CONSTRUCTION.
7. THE CONTRACTOR SHALL RESTRICT WORK TO MBTA, CITY OR STATE OWNED LAND, OR AREAS UNDER A CONSTRUCTION EASEMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LEASING OR OTHERWISE OBTAINING ANY ADDITIONAL LANDS HE DEEMS NECESSARY FOR AREAS OF CONSTRUCTION STAGING AND/OR STORAGE OF CONSTRUCTION MATERIALS AND EQUIPMENT.
8. THE EXISTING COMMUTER RAIL TRACKS ARE OWNED BY THE MBTA AND OPERATED BY KEOLIS. THE CONTRACTOR SHALL NOT INTERFERE WITH THE OPERATIONS OF THE MBTA AND KEOLIS UNLESS OTHERWISE NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS.
9. THE CONTRACTOR WILL NOT BE ALLOWED TO WORK WITHIN THE FOUL AREA OF AN ACTIVE RAILROAD (15 FEET, OR THE POTENTIAL TO GET WITHIN 15 FEET, FROM CENTERLINE OF TRACK) WITHOUT FLAGMEN AND/OR TRACK FOREMAN PRESENT FROM THE OPERATING RAILROAD. THE CONTRACTOR SHALL COORDINATE MBTA RAILROAD OPERATIONS AND KEOLIS FOR WORK REQUIREMENTS AND RESTRICTIONS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL APPROPRIATE STATE AND LOCAL PERMITS FOR THE CONSTRUCTION OF THE BRIDGES AND RELATED APPROACH WORK.
11. ALL CONTRACTOR ACTIVITIES SHALL BE PERFORMED WITH CARE TO AVOID DAMAGE OR ALTERING THE STRUCTURE BEYOND THE REPAIRS SHOWN IN THESE CONTRACT DRAWINGS.
12. ANY DAMAGE TO ANY EXISTING STRUCTURES AND RAILWAYS CAUSED BY CONSTRUCTION OF THE BRIDGES AND RELATED APPROACH WORK SHALL BE REPAIRED OR REPLACED IN A MANNER SATISFACTORY TO THE ENGINEER AT THE EXPENSE OF THE CONTRACTOR.
13. THE CONTRACTOR SHALL FENCE AND SECURE THE SITE TO PREVENT THE PUBLIC FROM ACCESSING. THE CONTRACTOR SHALL ENSURE THAT THE WORK AREA IS SEGREGATED FROM THE GENERAL PUBLIC.

**LEGEND:**

ADD'L.	ADDITIONAL
APPROX.	APPROXIMATE
ABAND.	ABANDONED
ABUT.	ABUTMENT
BOT.	BOTTOM
⊖	BASELINE
BR.	BRIDGE
C.I.P.	CAST-IN-PLACE
C.J. OR CONST. JT.	CONSTRUCTION JOINT
⊕	CENTERLINE
CL. OR CLR.	CLEAR
C.L.F.	CHAIN LINK FENCE
COL.	COLUMN
CONC.	CONCRETE
DIA. OR ∅	DIAMETER
E.F.	EACH FACE
E.W.	EACH WAY
EXP.	EXPANSION
E.J.	EXPANSION JOINT
EL. OR ELEV.	ELEVATION
EQ.	EQUAL
E.S.	EACH SIDE
EXIST.	EXISTING
F.C.M.	FRACTURE CRITICAL MEMBER
GALV.	GALVANIZED
HORIZ.	HORIZONTAL
M.H.W.	MEAN HIGH WATER
M.L.W.	MEAN LOW WATER
NO. OR #	NUMBER
O.C.	ON CENTER
OPP.	OPPOSITE
OSL	OUTSTANDING LEG
Ⓜ OR PL.	PLATE
PROP.	PROPOSED
REINF.	REINFORCING
SP. OR SPCS.	SPACES
SS	STAINLESS STEEL
STA.	STATION
T.O.R.	TOP OF RAIL
T.O.S.	TOP OF STEEL OR TOP OF SLAB
T.O.W.	TOP OF WALL
TYP.	TYPICAL
UON	UNLESS OTHERWISE NOTED

FILE NAME: S:\179A\Active\1794\0231\03 - Gloucester Draw\01 Design Phase\18 100% Submittal\US Army Corps of Engineers Plan Set\Working Drawings\ACOE-3 LEGEND AND GENERAL NOTES.dwg PLOTTED: Tuesday, February 18, 2020 - 4:51pm USER: jtkenny

	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
	REPLACEMENT OF GLOUCESTER DRAWBRIDGE OVER ANNISQUAM RIVER MBTA CONTRACT NO. B92PS07	
<b>LEGEND AND GENERAL NOTES</b>		
	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
	APPROVED BY:	
MANAGER OF DESIGN:	DATE:	DIRECTOR OF OPERATIONS SUPPORT DATE:
HORIZ. AS NOTED	DES. BY	DR. BY
VERT. AS NOTED	CHK. BY	DATE:
DATE: DEC. 2019	PLAN NO.	
SHEET ACOE-3		ISSUE

FILE NAME: S:\179A\Active\1794\0231\03 - Gloucester Draw\01 Design Phase\18 100% Submittal\US Army Corps of Engineers Plan Set\Working Drawings\ACOE-4 TRACK - GENERAL NOTES LEGEND AND ABBREVIATIONS.dwg PLOTTED: Tuesday, February 18, 2020 - 4:51pm USER: jtkirney

**GENERAL NOTES**

1. EXISTING TRACK ALIGNMENT IS BASED UPON SURVEY INFORMATION PREPARED BY PHOTOGRAMMETRIC METHODS USING AERIAL PHOTOGRAPHY DATED APRIL 8, 2010. GROUND CONTROL SURVEYS BY GREEN INTERNATIONAL AFFILIATES, INC..
2. CONTRACTOR SHALL CONFIRM EXISTING CONDITIONS AND REPORT ALL DISCREPANCIES BETWEEN PLANS AND ACTUAL CONDITIONS TO THE ENGINEER.
3. CONTRACTOR SHALL COOPERATE AND COORDINATE ALL WORK WITH ADJACENT CONTRACTORS.
4. THE CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ANY ITEMS DESIGNATED FOR REMOVAL ON THE DRAWINGS, OR AS DIRECTED IN THE SPECIFICATIONS. ALL DEMOLISHED MATERIALS, RUBBISH, EXCAVATED MATERIALS AND DEBRIS SHALL BE DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS HAVING JURISDICTION.
5. ANY AREAS ADJACENT TO AND WITHIN THE CONSTRUCTION ZONE WHICH ARE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO THEIR ORIGINAL CONDITION. DAMAGE TO ANY EXISTING FACILITIES OR APPURTENANCES WILL BE REPAIRED BY THE RESPECTIVE OWNER OR IT'S AGENT, AT THE SOLE EXPENSE OF THE CONTRACTOR.
6. WORK SHALL BE COORDINATED AND PERFORMED IN SUCH A WAY THAT WILL NOT IMPACT OR INTERFERE WITH RAILROAD OPERATIONS.

**ABBREVIATIONS**

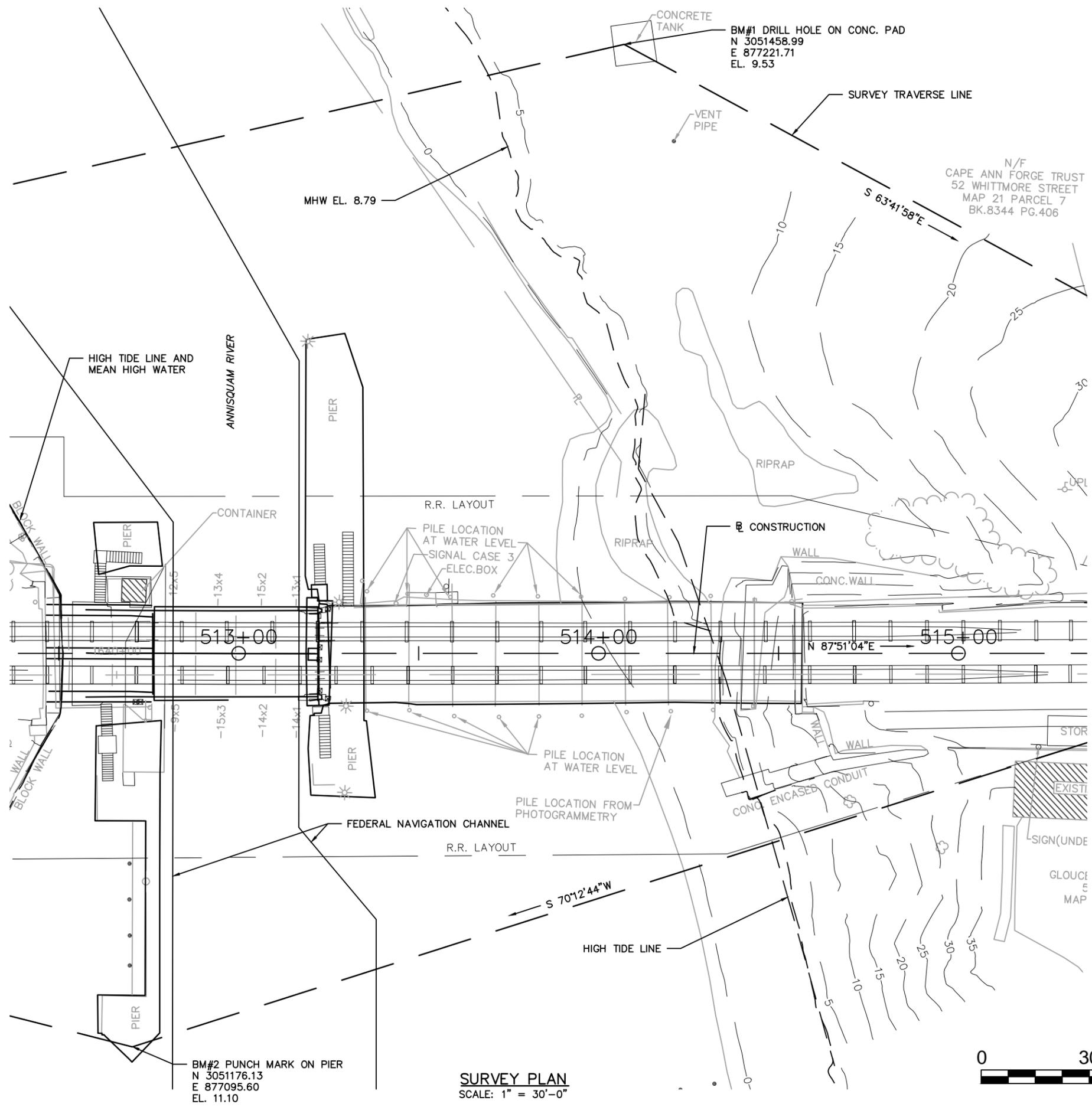
CL	CENTERLINE
C.S.	CURVE TO SPIRAL
DEG, °	DEGREE
DIA., Ø	DIAMETER
Ea	ACTUAL SUPERELEVATION
Eu	UNBALANCED SUPERELEVATION
EL.	ELEVATION
EQ.	EQUAL
FT.	FEET
IN.	INCH
L	LENGTH
L.F.	LINEAR FEET
L.V.C.	LENGTH OF VERTICAL CURVE
MAX.	MAXIMUM
MIN.	MINUTE
MIN.	MINIMUM
MPH	MILES PER HOUR
NO.	NUMBER
O.C.	ON CENTER
OPP.	OPPOSITE
P.C.	POINT OF CURVATURE
P.I.	POINT OF INTERSECTION
P.I.T.O.	POINT OF TURNOUT INTERSECTION
P.O.B.	POINT OF BEGINNING
P.O.E.	POINT OF END
PS	POINT OF SWITCH
P.T.	POINT OF TANGENCY
P.V.C.	POINT OF VERTICAL CURVATURE
P.V.I.	POINT OF VERTICAL INTERSECTION
P.V.T.	POINT OF VERTICAL TANGENCY
R., RAD.	RADIUS
S.C.	SPIRAL TO CURVE
SEC	SECOND
S.T.	SPIRAL TO TANGENT
STA.	STATION
STD.	STANDARD
TRK.	TRACK
T/O	TURNOUT
T/R	TOP OF RAIL
T.S.	TANGENT TO SPIRAL
TYP.	TYPICAL

**LEGEND**

	CL NEW TRACK		POINT OF SWITCH
	NEW TRACK STATIONING		TURNOUT POINT OF INTERSECTION
	CURVE POINT		TURNOUT
	CURVE TAG		

	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY			
	REPLACEMENT OF GLOUCESTER DRAWBRIDGE OVER ANNISQUAM RIVER MBTA CONTRACT NO. B92PS07			
<b>TRACK – GENERAL NOTES LEGEND AND ABBREVIATIONS</b>				
		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY		
MANAGER OF DESIGN: _____ DATE _____		APPROVED BY: _____ DATE _____		
HORIZ. AS NOTED	DES. BY	DR. BY	CHK. BY	PLAN NO.
VERT. AS NOTED				SHEET ACOE-4
DATE: DEC. 2019				

FILE NAME: S:\179A\Active\179410231\03 - Gloucester Draw\01 Design Phase\18 100% Submittal\US Army Corps of Engineers Plan Set\Working Drawings\ACOE-5 SURVEY PLAN.dwg PLOTTED: Tuesday, February 18, 2020 - 4:51pm USER: jtklarney



**NOTES:**

1. THE MBTA RIGHT OF WAY (R.O.W.) LINES SHOWN ON THIS PLAN ARE THE DIRECT RESULT OF AN INSTRUMENT SURVEY PERFORMED ON THE GROUND BY GREEN INTERNATIONAL AFFILIATES, INC. FROM JUNE TO AUGUST, 2011 WITH AN ERROR OF CLOSURE LESS THAN 1:10,000, AND FROM PLANS AND DEEDS OF RECORD.
2. THE PROPERTY LINES SHOWN ON THIS PLAN ARE BASED UPON ASSESSOR MAPS AND ARE APPROXIMATE ONLY.
3. THE EXISTING CONDITIONS SHOWN ON THIS PLAN ARE THE RESULT OF A PHOTOGRAMMETRY SURVEY PERFORMED BY SANBORN, CHARLOTTE, NC ON AUGUST 2, 2011 (FLIGHT DATE 4/8/10) AND SUPPLEMENTED WITH AN INSTRUMENT SURVEY PERFORMED ON THE GROUND BY GREEN INTERNATIONAL AFFILIATES, INC. IN JUNE, 2011.
4. UNDERGROUND UTILITIES SHOWN ARE BASED UPON FIELD OBSERVATIONS AND PLANS OF RECORD. THESE UTILITIES ARE NOT WARRANTED TO BE CORRECT NOR IS IT WARRANTED THAT ALL UNDERGROUND UTILITIES ARE SHOWN.
5. BEARINGS ARE BASED UPON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM.
6. CONTOURS AND ELEVATIONS SHOWN ARE BASED UPON N.A.V.D. 1988.

BM#2 PUNCH MARK ON PIER  
 N 3051176.13  
 E 877095.60  
 EL. 11.10

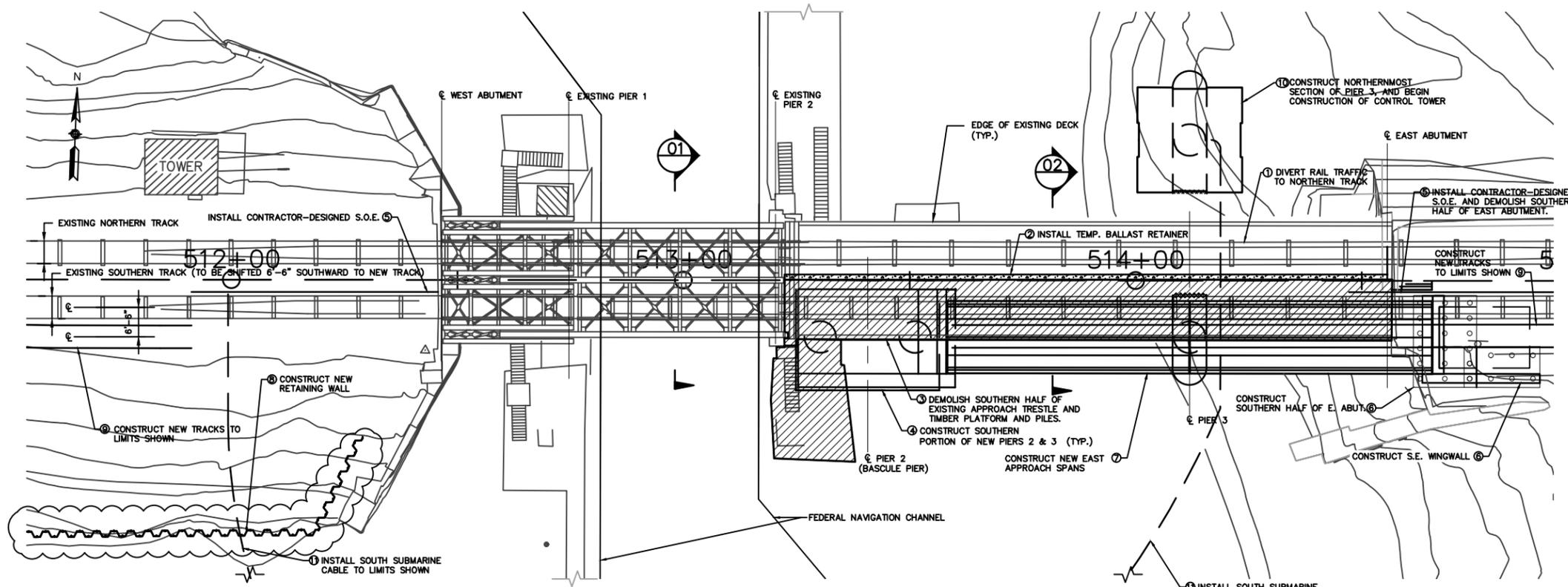
**SURVEY PLAN**  
 SCALE: 1" = 30'-0"



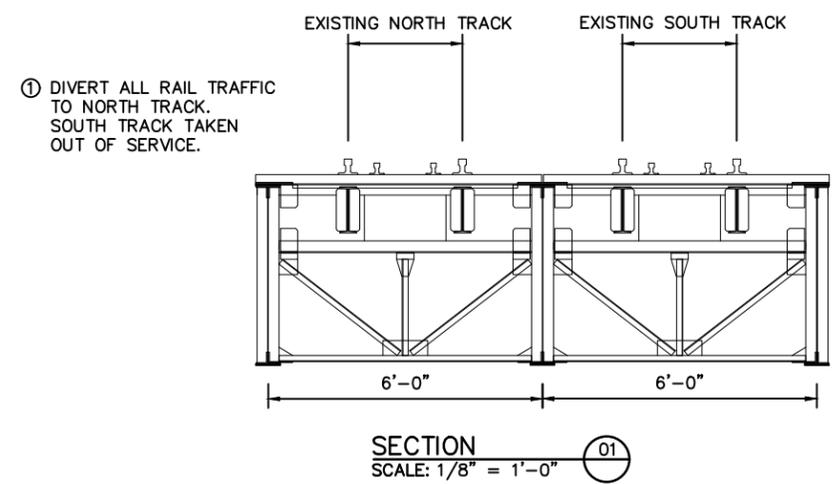
SCALE: 1" = 30'

	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
	REPLACEMENT OF GLOUCESTER DRAWBRIDGE OVER ANNISQUAM RIVER MBTA CONTRACT NO. B92PS07	
<b>EXISTING CONDITIONS PLAN</b>		
	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
	APPROVED BY:	
MANAGER OF DESIGN:	DATE:	DIRECTOR OF OPERATIONS SUPPORT DATE:
HORIZ. AS NOTED	DES. BY	CHK. BY
VERT. AS NOTED	PLAN NO.	
DATE: DEC. 2019	SHEET ACOE-5	

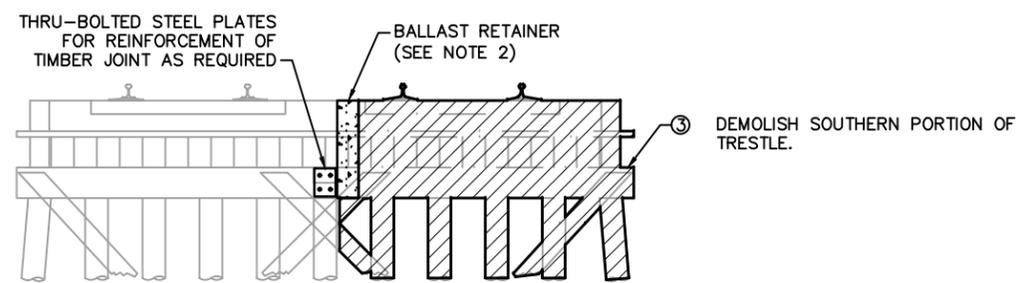
FILE NAME: S:\179A\Active\1794\0231\03 - Gloucester Draw\01 Design Phase\18 100% Submittal\US Army Corps of Engineers Plan Set\Working Drawings\ACOE-6 STAGED CONSTRUCTION - STAGE 1.dwg PLOTTED: Tuesday, February 18, 2020 - 4:52pm USER: jtkerney



**STAGE 1**  
SCALE: 1" = 30'-0"



**SECTION 01**  
SCALE: 1/8" = 1'-0"



**SECTION 02**  
SCALE: 1/8" = 1'-0"

**NOTES:**

(EXISTING MOVABLE SPAN REMAINS FUNCTIONAL. ALL RAIL TRAFFIC DIVERTED TO NORTHERN TRACK).

1. DIVERT ALL RAIL TRAFFIC TO EXISTING NORTHERN TRACK. EXISTING SOUTHERN TRACK TAKEN OUT OF SERVICE.
2. INSTALL TEMPORARY BALLAST RETAINER. TEMPORARY BALLAST RETAINER TO BE DESIGNED BY CONTRACTOR AND SUBMITTED TO ENGINEER FOR APPROVAL PRIOR TO COMMENCEMENT OF THIS PORTION OF THE WORK. CONTRACTOR SHALL TAKE FIELD MEASUREMENTS NECESSARY TO ASSURE PROPER FIT. CALCULATIONS SHALL BE STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE COMMONWEALTH OF MASSACHUSETTS.
3. DEMOLISH EXISTING SOUTHERN HALF OF EAST APPROACH TRESTLE. DEMOLISH TIMBER PILE PLATFORM & FENDER AT SOUTHERN END OF EXISTING PIER 2. DEMOLISH TIMBER PILES BELOW THE MUDLINE. REFER TO DEMOLITION DRAWINGS FOR ADDITIONAL DETAILS.
4. CONSTRUCT SOUTHERN PORTION OF NEW PIERS 2 AND 3.
5. INSTALL CONTRACTOR-DESIGNED SUPPORT OF EXCAVATION AT EAST AND WEST ABUTMENTS. CALCULATIONS TO BE STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE COMMONWEALTH OF MASSACHUSETTS. DEMOLISH SOUTHERN PORTION OF EXISTING EAST ABUTMENT.
6. CONSTRUCT NEW SOUTHERN PORTION OF EAST ABUTMENT AND S.E. WINGWALL.
7. CONSTRUCT SOUTHERN PORTION OF EASTERN APPROACH SPANS.
8. CONSTRUCT NEW RETAINING WALL ALONG SOUTH SIDE OF WEST APPROACH.
9. CONSTRUCT NEW SOUTHERN TRACK TO LIMITS SHOWN.
10. CONSTRUCT SECTION OF NEW PIER 3 BELOW PROPOSED CONTROL TOWER, AND BEGIN CONSTRUCTION OF CONTROL TOWER.
11. INSTALL SOUTH AUXILIARY SUBMARINE CABLE TO LIMITS SHOWN.

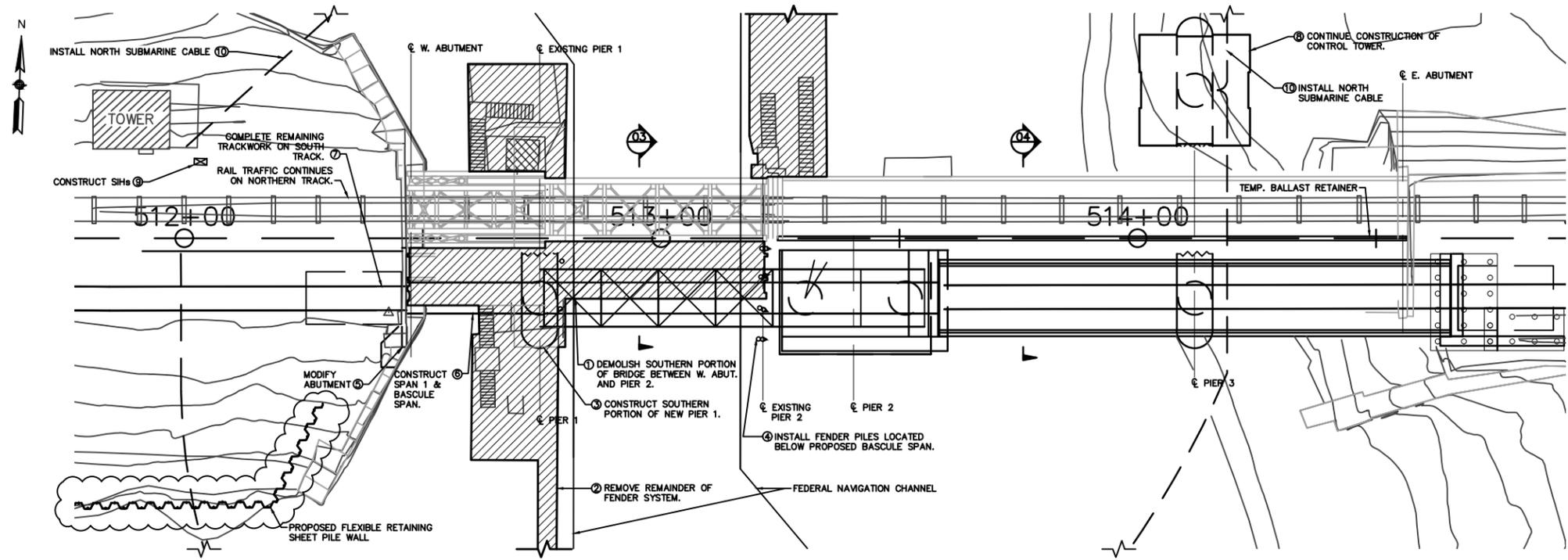
**STAGED CONSTRUCTION**



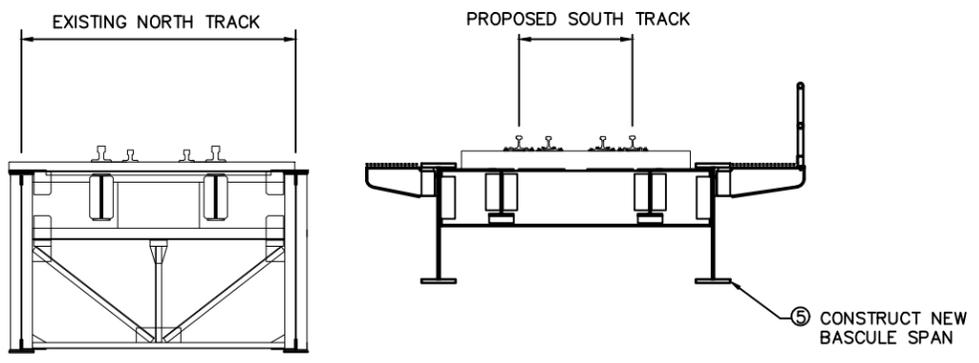
SCALE: 1" = 30'

<b>T</b>	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
	REPLACEMENT OF GLOUCESTER DRAWBRIDGE OVER ANNISQUAM RIVER MBTA CONTRACT NO. B92PS07	
<b>STAGED CONSTRUCTION - STAGE 1</b>		
 65 NETWORK DRIVE BURLINGTON, MA		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY APPROVED BY: _____ DIRECTOR OF OPERATIONS SUPPORT      DATE: _____
MANAGER OF DESIGN: _____ DATE: _____	DES. BY: _____	CHK. BY: _____
HORIZ. AS NOTED	DATE: DEC. 2019	PLAN NO. _____
VERT. AS NOTED		SHEET ACOE-6
		ISSUE

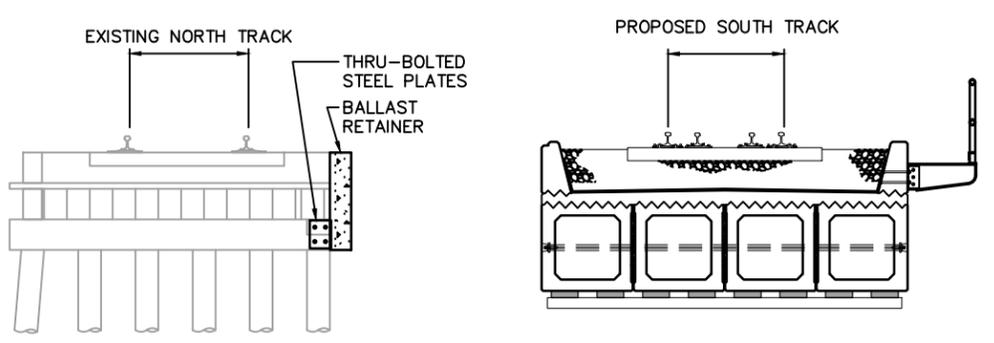
FILE NAME: S:\179A\Active\1794\0231\03 - Gloucester Draw\01 Design Phase\18 100% Submit\18 100% Submit\US Army Corps of Engineers Plan Set\Working Drawings\ACOE-7 STAGED CONSTRUCTION - STAGE 2.dwg PLOTTED: Tuesday, February 18, 2020 - 4:52pm USER: jtkerney



**STAGE 2**  
SCALE: 1" = 30'-0"



**SECTION 03**  
SCALE: 1/8" = 1'-0"



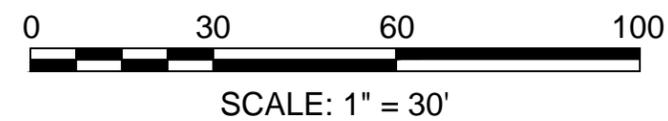
**SECTION 04**  
SCALE: 1/8" = 1'-0"

**NOTES:**

(EXISTING MOVABLE SPAN DISABLED AND REMAINS IN DOWN POSITION. RAIL TRAFFIC CONTINUES ON NORTHERN TRACK)

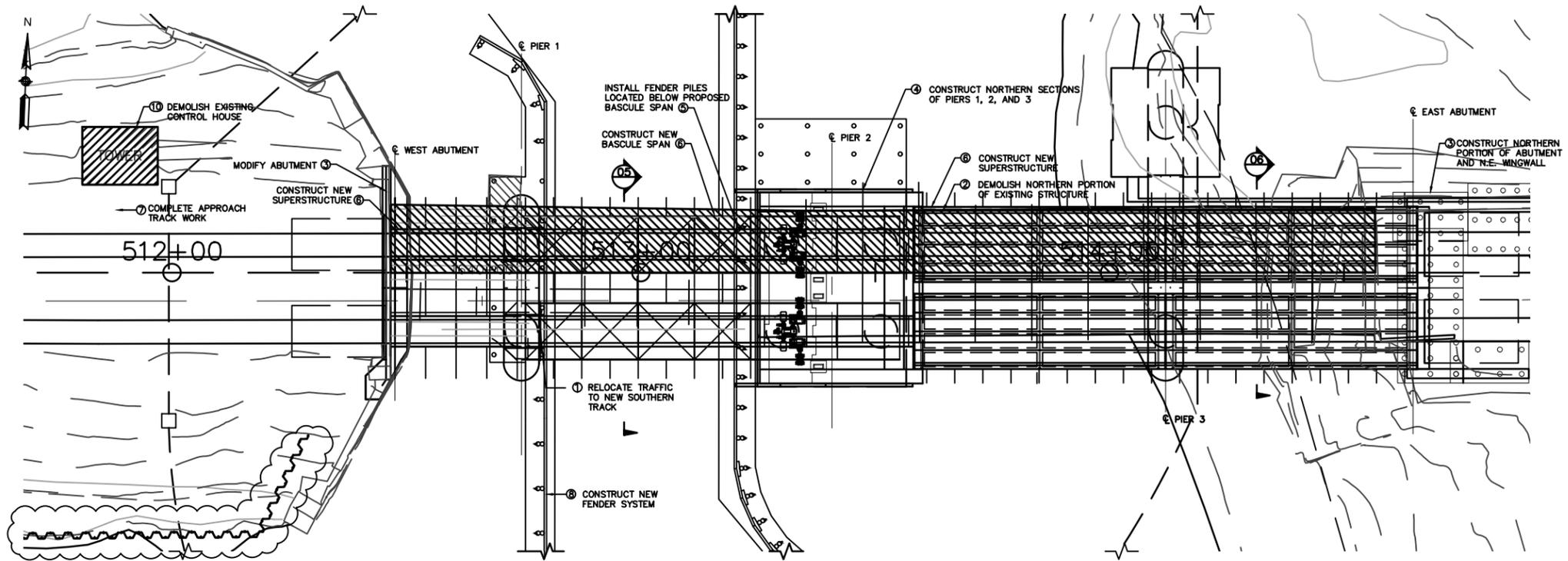
1. DEMOLISH SOUTHERN PORTION OF EXISTING BASCULE SPAN AND COUNTER WEIGHT. REMOVE SOUTHERN PORTION OF EXISTING PIER 1 FRAMING AND SPAN 1. REMOVE SOUTHERN PORTION OF PIER 1 PILE CAP AND PILES BELOW THE MUDLINE. REMOVE SOUTHERN PORTION OF EXISTING PIER 2 AND PILES BELOW THE MUDLINE. CONTRACTOR TO SUBMIT DETAILED CONSTRUCTION STAGING PLAN. SEE SPECIFICATIONS.
2. REMOVE REMAINDER OF FENDER SYSTEM. REMOVE TIMBER PILES BELOW THE MUDLINE. REMOVE EXISTING MECHANICAL SYSTEM AND PLATFORM.
3. CONSTRUCT SOUTHERN PORTION OF NEW PIER 1.
4. INSTALL FENDER PILES LOCATED BELOW PROPOSED SOUTHERN BASCULE SPAN.
5. MODIFY SOUTHERN PORTION OF WEST ABUTMENT.
6. CONSTRUCT NEW SOUTHERN BASCULE SPAN (SPAN 2), AS WELL AS SOUTHERN SPAN 1.
7. COMPLETE TRACKWORK FOR SOUTHERN TRACK.
8. COMPLETE CONSTRUCTION OF CONTROL TOWER.
9. CONSTRUCT SIGNAL INSTRUMENTATION HOUSES (SIHs).
10. INSTALL NORTH SUBMARINE CABLE.

**STAGED CONSTRUCTION**

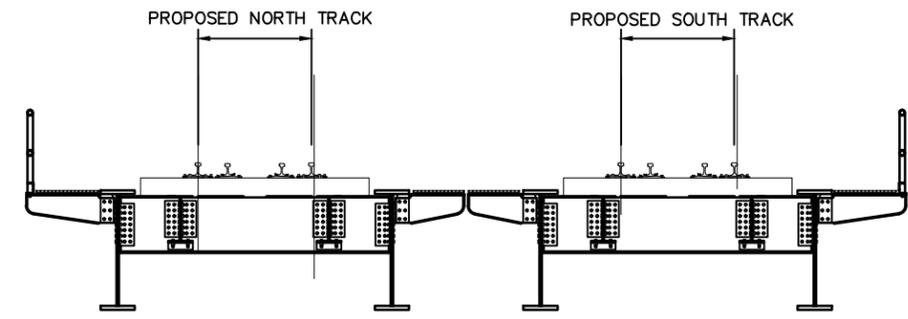


<b>MASSACHUSETTS BAY TRANSPORTATION AUTHORITY</b> REPLACEMENT OF GLOUCESTER DRAWBRIDGE OVER ANNISQUAM RIVER MBTA CONTRACT NO. B92PS07		<b>STAGED CONSTRUCTION - STAGE 2</b>	
		<b>Stantec</b> 85 NETWORK DRIVE BURLINGTON, MA	
MANAGER OF DESIGN: _____ DATE: _____		DIRECTOR OF OPERATIONS SUPPORT: _____ DATE: _____	
HORIZ. AS NOTED	DES. BY	DR. BY	CHK. BY
VERT. AS NOTED	PLAN NO. _____ SHEET ACOE-7		ISSUE
DATE: DEC. 2019			

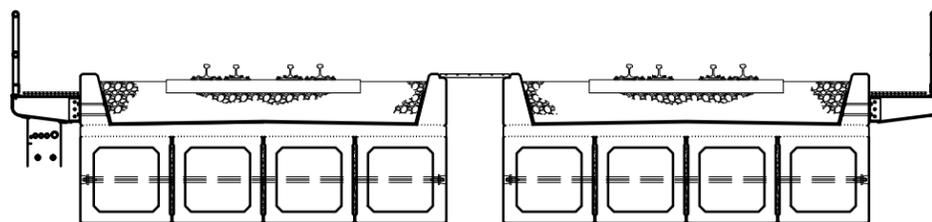
FILE NAME: S:\179A\Active\1794\0231\03 - Gloucester Draw\01 Design Phase\18 100% Submittal\US Army Corps of Engineers Plan Set\Working Drawings\ACOE-8 STAGED CONSTRUCTION - STAGE 3.dwg PLOTTED: Tuesday, February 18, 2020 - 4:52pm USER: jtkerney



**STAGE 3**  
SCALE: 1" = 30'-0"



**SECTION 05**  
SCALE: 1/8" = 1'-0"



**SECTION 06**  
SCALE: 1/8" = 1'-0"

**STAGED CONSTRUCTION**

**NOTES:**

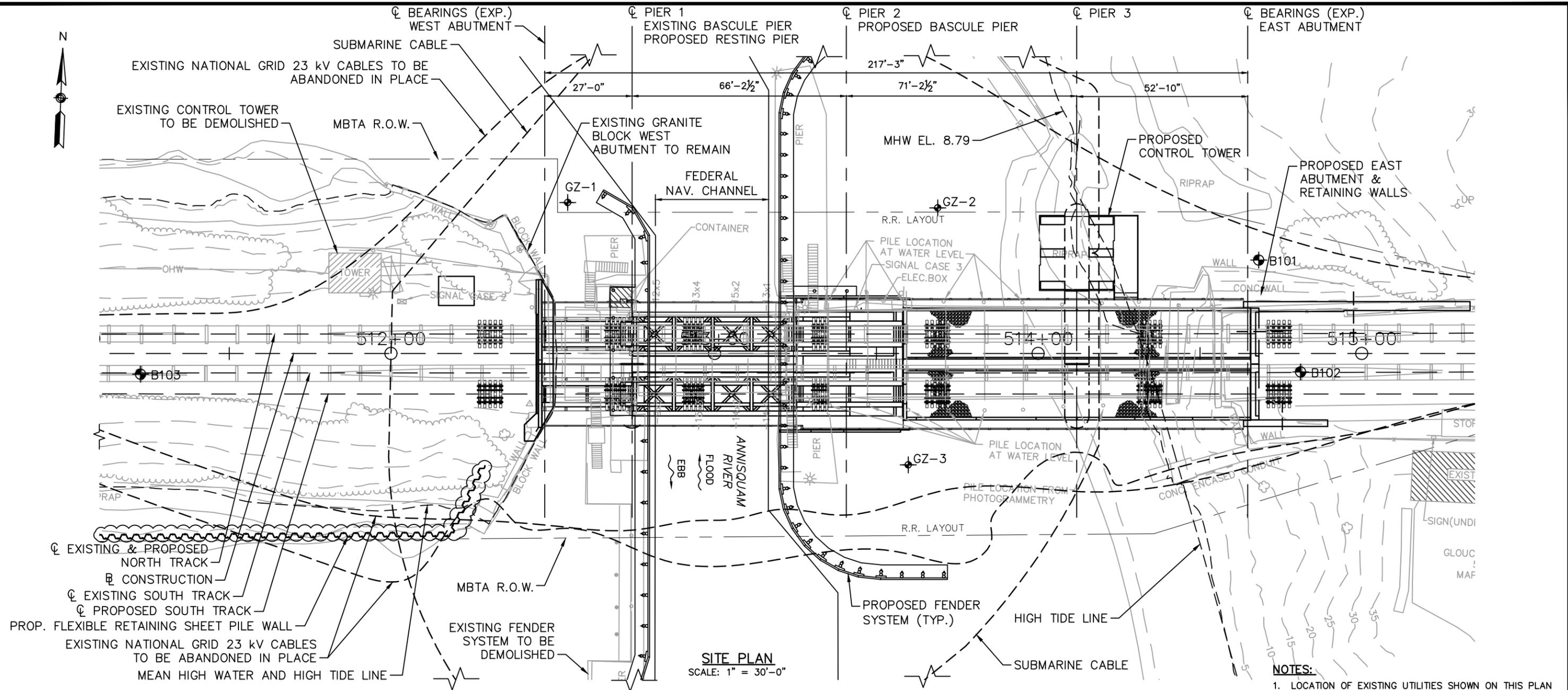
(RAIL TRAFFIC RELOCATED TO NEWLY COMPLETED SOUTHERN TRACK. NORTHERN PORTION OF EXISTING BRIDGE DEMOLISHED, AND NEW NORTHERN BRIDGE AND APPROACH SPANS CONSTRUCTED.)

1. RELOCATE ALL RAIL TRAFFIC TO NEWLY COMPLETED SOUTHERN TRACK.
2. DEMOLISH REMAINING NORTHERN PORTION OF EXISTING STRUCTURE, INCLUDING BASCULE SPAN, APPROACH SPANS, AND SUBSTRUCTURE BELOW THE MUDLINE.
3. MODIFY NORTHERN PORTION OF WEST ABUTMENT AND CONSTRUCT NORTHERN PORTION OF EAST ABUTMENT AND N.E. WINGWALL.
4. CONSTRUCT NEW NORTHERN SECTION OF PIERS 1, 2, 3,
5. INSTALL FENDER PILES LOCATED BELOW PROPOSED NORTHERN BASCULE SPAN.
6. CONSTRUCT NEW WEST APPROACH SPAN, BASCULE SPAN, DECK OVER COUNTERWEIGHT, AND EAST APPROACH SPANS.
7. COMPLETE APPROACH TRACK WORK.
8. CONSTRUCT REMAINDER OF NEW FENDER SYSTEM.
9. INSTALL BACKUP GENERATOR (NOT SHOWN) AND TRENCHED POWER FEEDERS TO CONTROL HOUSE.
10. DEMOLISH EXISTING CONTROL HOUSE.

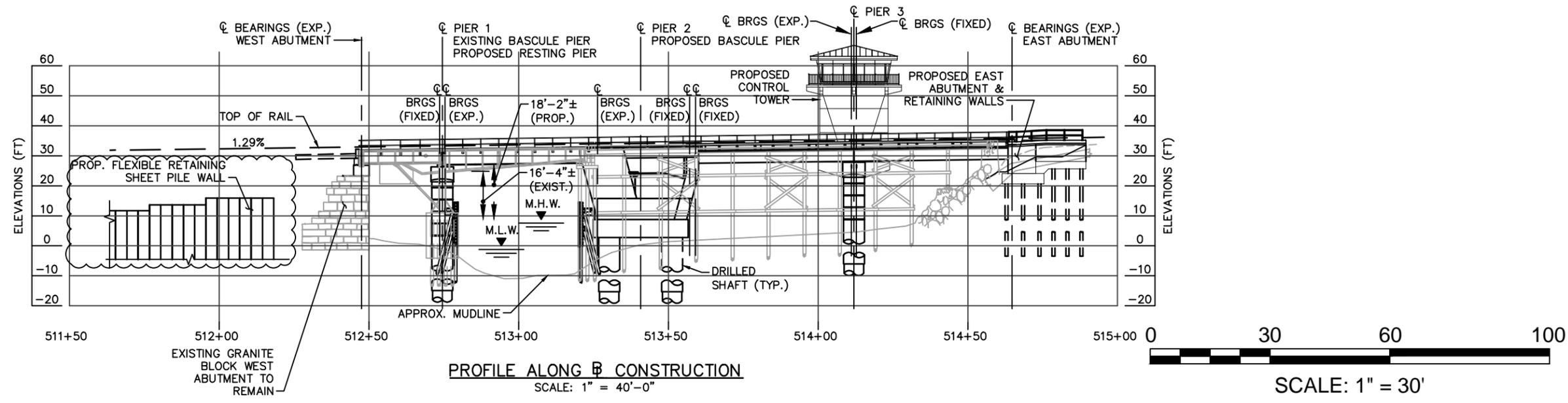


<b>T</b>		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
		REPLACEMENT OF GLOUCESTER DRAWBRIDGE OVER ANNISQUAM RIVER MBTA CONTRACT NO. B92PS07	
<b>STAGED CONSTRUCTION - STAGE 3</b>			
<b>Stantec</b> 85 NETWORK DRIVE BURLINGTON, MA		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
		APPROVED BY: _____ DIRECTOR OF OPERATIONS SUPPORT      DATE _____	
MANAGER OF DESIGN: _____	DATE: _____	DR. BY: _____	CHK. BY: _____
HORIZ. AS NOTED	DES. BY: _____	DR. BY: _____	DATE: _____
VERT. AS NOTED	DATE: DEC. 2019	PLAN NO. _____	ISSUE _____
		SHEET ACOE-8	

FILE NAME: S:\179A\Active\1794\0231\03 - Gloucester Draw\01 Design Phase\18 100% Submittal\US Army Corps of Engineers Plan Set\Working Drawings\ACOE-9 SITE PLAN AND PROFILE.dwg PLOTTED: Tuesday, February 18, 2020 - 4:53pm USER: jtkerney

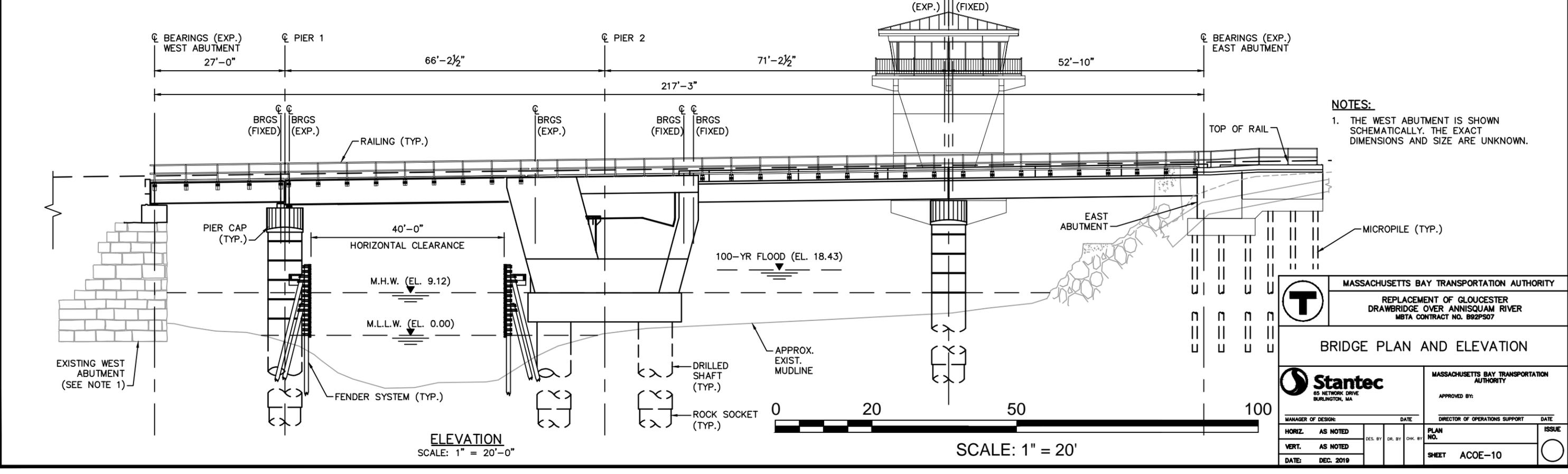
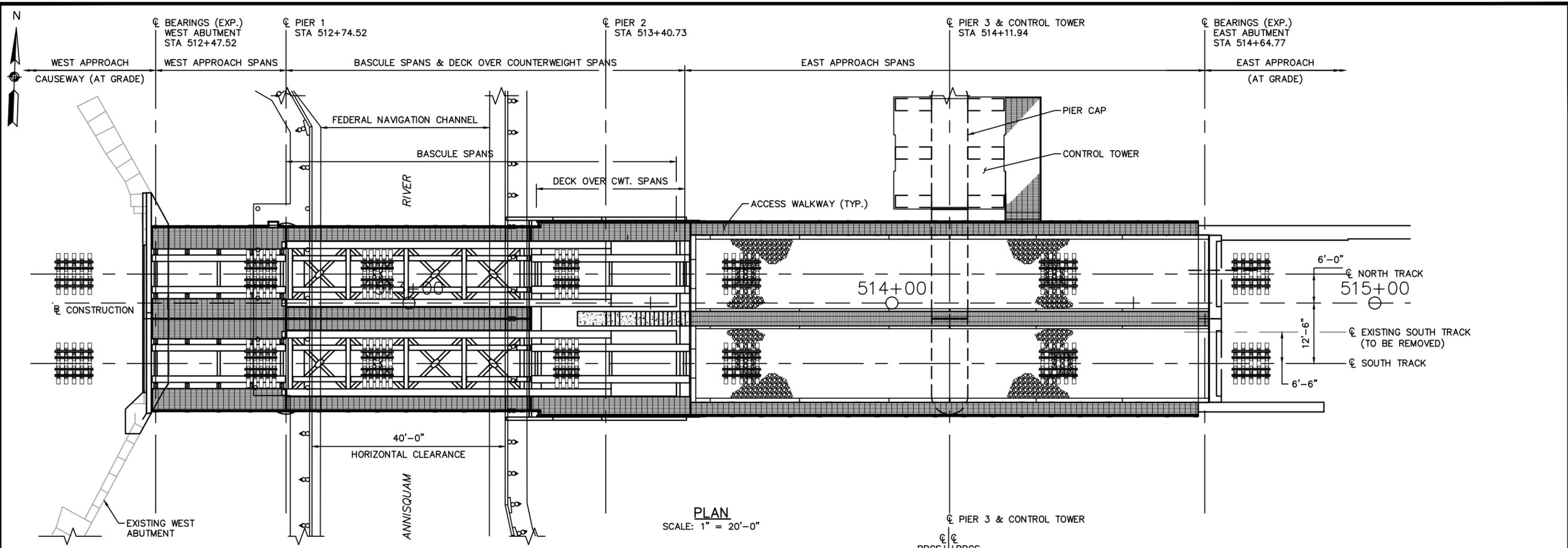


- NOTES:**
1. LOCATION OF EXISTING UTILITIES SHOWN ON THIS PLAN IS APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
  2. PROTECTION OR RELOCATION OF ALL UTILITIES SHALL BE COORDINATED WITH THE UTILITY OWNER.
  3. ALL GRADES AND CONTOURS ARE FOR INFORMATION ONLY AND SHALL BE VERIFIED PRIOR TO COMMENCING WORK.
  4. ORIGINAL CONTOURS AND ELEVATIONS WERE BASED ON N.A.V.D. 1988, BUT FOR THE PURPOSE OF THESE DOCUMENTS, ELEVATIONS HAVE BEEN CONVERTED SUCH THAT MLLW = 0 FT (N.A.V.D. 1988 MLLW = -4.93 FT).



		<b>REPLACEMENT OF GLOUCESTER DRAWBRIDGE OVER ANNISQUAM RIVER</b> MBTA CONTRACT NO. B92P507	
		<b>SITE PLAN AND PROFILE</b>	
		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY APPROVED BY: _____ DATE: _____ DIRECTOR OF OPERATIONS SUPPORT	
MANAGER OF DESIGN: _____ DATE: _____ HORIZ. AS NOTED VERT. AS NOTED DATE: DEC. 2019	DES. BY: _____ DR. BY: _____ CHK. BY: _____	PLAN NO. _____ SHEET ACOE-9	DATE: _____ ISSUE: _____

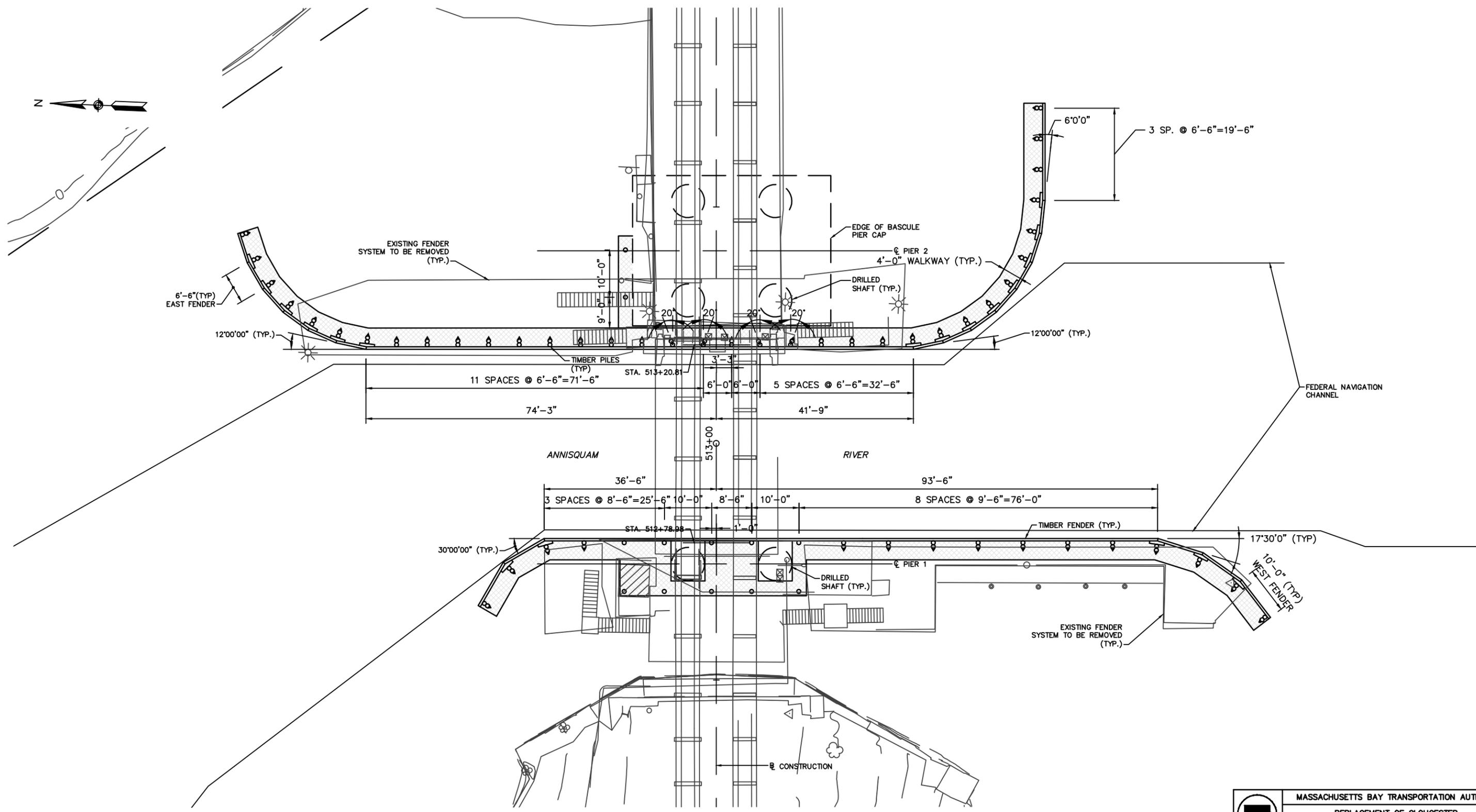
FILE NAME: S:\179A\Active\179410231\03 - Gloucester Draw\01 Design Phase\18 100% Submittal\US Army Corps of Engineers Plan Set\Working Drawings\ACOE-10 BRIDGE PLAN AND ELEVATION.dwg PLOTTED: Tuesday, February 18, 2020 - 4:56pm USER: jklerney



**NOTES:**  
1. THE WEST ABUTMENT IS SHOWN SCHEMATICALLY. THE EXACT DIMENSIONS AND SIZE ARE UNKNOWN.

<b>MASSACHUSETTS BAY TRANSPORTATION AUTHORITY</b>	
REPLACEMENT OF GLOUCESTER DRAW BRIDGE OVER ANNISQUAM RIVER MBTA CONTRACT NO. B92PS07	
<b>BRIDGE PLAN AND ELEVATION</b>	
<b>Stantec</b> 85 NETWORK DRIVE BURLINGTON, MA	
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
APPROVED BY: _____	
DIRECTOR OF OPERATIONS SUPPORT DATE	
MANAGER OF DESIGN: _____ DATE	DATE
HORIZ. AS NOTED	DES. BY
VERT. AS NOTED	DR. BY
DATE: DEC. 2019	CHK. BY
PLAN NO.	ISSUE
SHEET ACOE-10	○

FILE NAME: S:\179A\Active\1794\0231\03 - Gloucester Draw\01 Design Phase\18 100% Submittal\US Army Corps of Engineers Plan Set\Working Drawings\ACOE-11 FENDER SYSTEM LAYOUT.dwg PLOTTED: Tuesday, February 18, 2020 - 4:54pm USER: jklemezy



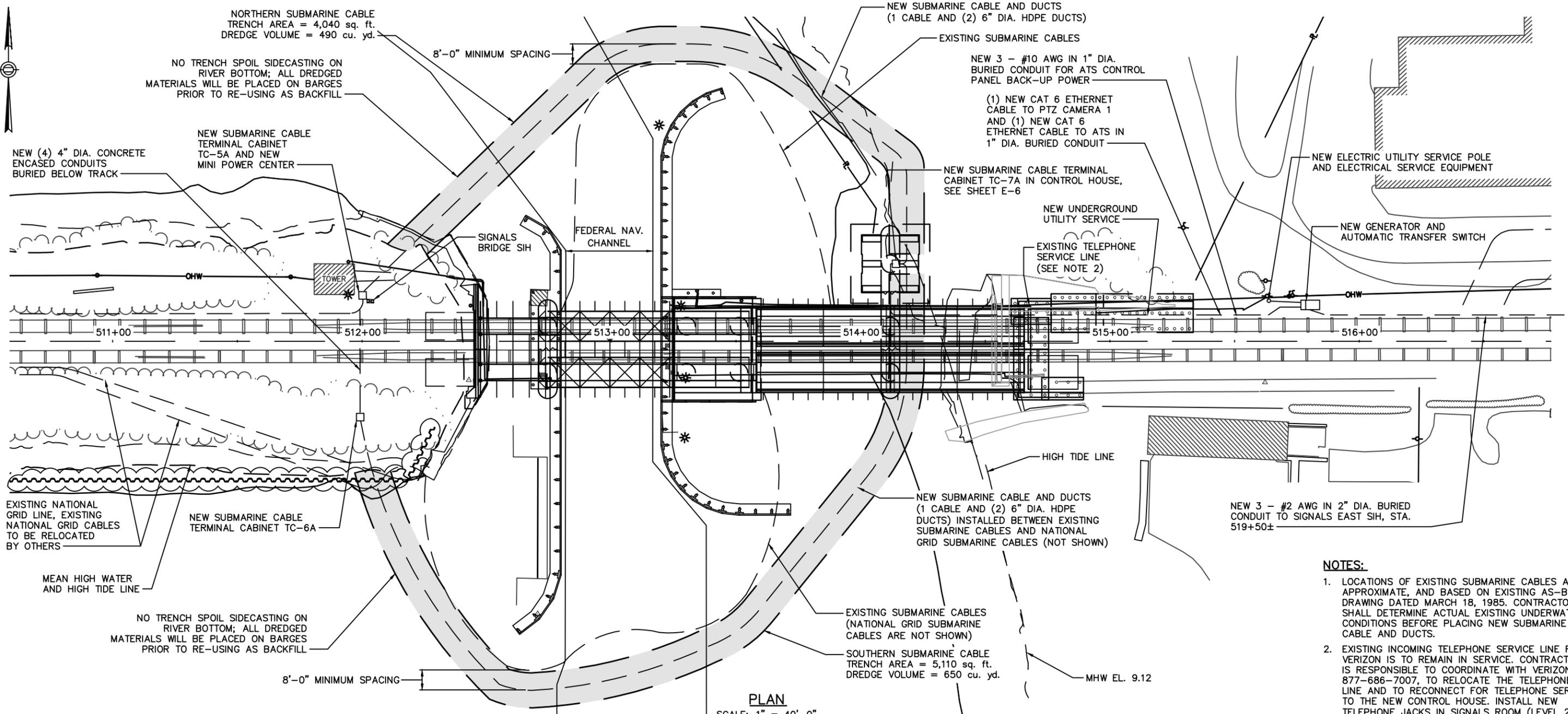
FENDER SYSTEM LAYOUT PLAN  
SCALE: 1" = 20'



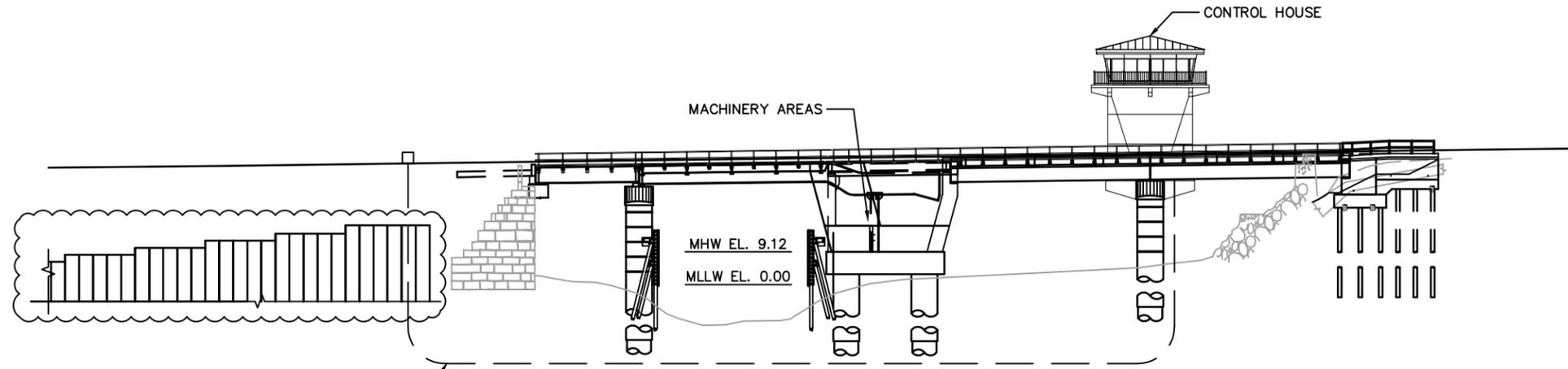
SCALE: 1" = 20'

<b>T</b>	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY			
	REPLACEMENT OF GLOUCESTER DRAWBRIDGE OVER ANNISQUAM RIVER MBTA CONTRACT NO. B92PS07			
FENDER SYSTEM LAYOUT				
<b>Stantec</b> 85 NETWORK DRIVE BURLINGTON, MA		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY		
		APPROVED BY:		
MANAGER OF DESIGN: _____ DATE: _____		DIRECTOR OF OPERATIONS SUPPORT: _____ DATE: _____		
HORIZ. AS NOTED	DES. BY	DR. BY	CHK. BY	PLAN NO.
VERT. AS NOTED				SHEET ACOE-11
DATE: DEC. 2019				○

FILE NAME: S:\179A\Active\1794\0231\03 - Gloucester Draw\01 Design Phase\18 100% Submittal\US Army Corps of Engineers Plan Set\Working Drawings\ACOE-12 ELECTRICAL GENERAL PLAN AND ELEVATION.dwg PLOTTED: Tuesday, February 18, 2020 - 4:54pm USER: jtkerney



**PLAN**  
SCALE: 1" = 40'-0"



**ELEVATION**  
SCALE: 1" = 40'-0"

**NOTES:**

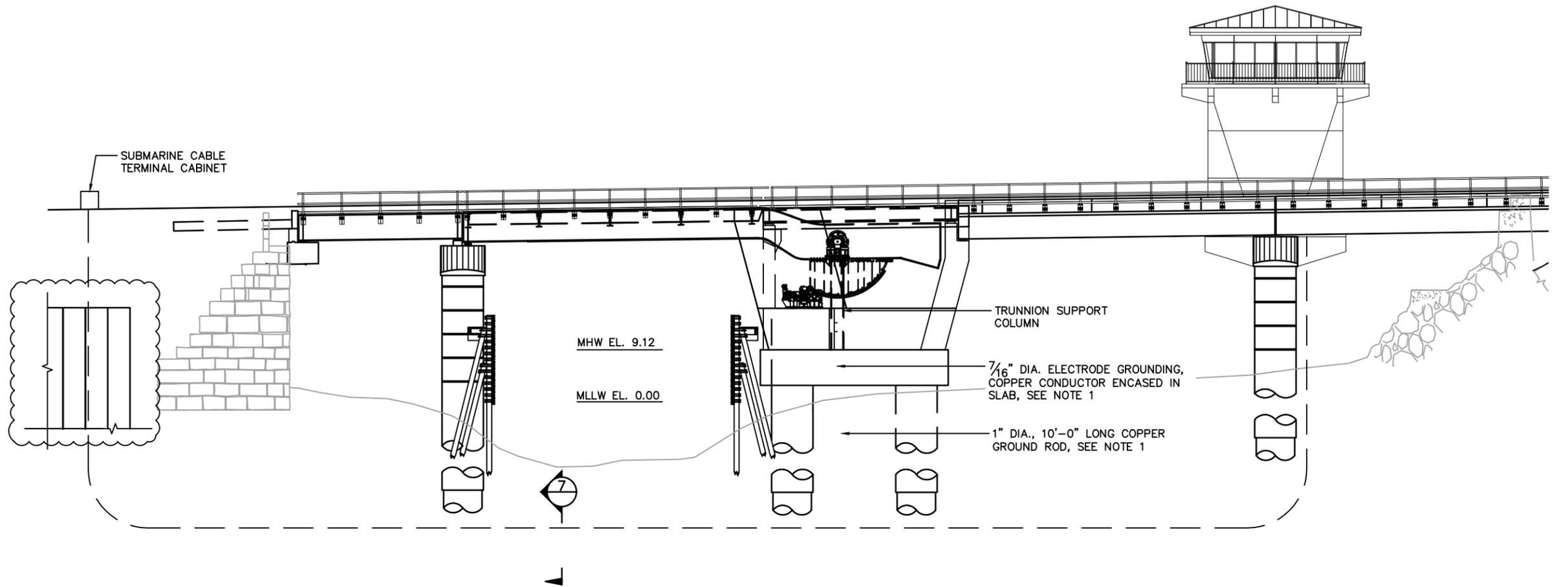
1. LOCATIONS OF EXISTING SUBMARINE CABLES ARE APPROXIMATE, AND BASED ON EXISTING AS-BUILT DRAWING DATED MARCH 18, 1985. CONTRACTOR SHALL DETERMINE ACTUAL EXISTING UNDERWATER CONDITIONS BEFORE PLACING NEW SUBMARINE CABLE AND DUCTS.
2. EXISTING INCOMING TELEPHONE SERVICE LINE FROM VERIZON IS TO REMAIN IN SERVICE. CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH VERIZON, 877-686-7007, TO RELOCATE THE TELEPHONE LINE AND TO RECONNECT FOR TELEPHONE SERVICE TO THE NEW CONTROL HOUSE. INSTALL NEW TELEPHONE JACKS IN SIGNALS ROOM (LEVEL 2) AND IN OBSERVATION ROOM (LEVEL 3).
3. COORDINATE ALL ELECTRICAL WORK WITH OTHER CONSTRUCTION DISCIPLINES AND STAGING OF THE PROJECT.
4. ORIGINAL CONTOURS AND ELEVATIONS WERE BASED ON N.A.V.D. 1988, BUT FOR THE PURPOSE OF THESE DOCUMENTS, ELEVATIONS HAVE BEEN CONVERTED SUCH THAT MLLW = 0 FT (N.A.V.D. 1988 MLLW = -4.93 FT).

<b>T</b>		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
		REPLACEMENT OF GLOUCESTER DRAWBRIDGE OVER ANNISQUAM RIVER MBTA CONTRACT NO. B92PS07	
<b>ELECTRICAL GENERAL PLAN AND ELEVATION</b>		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
APPROVED BY:		APPROVED BY:	
MANAGER OF DESIGN:		DIRECTOR OF OPERATIONS SUPPORT:	
DATE:		DATE:	
HORIZ. AS NOTED	DES. BY	DR. BY	CHK. BY
VERT. AS NOTED	PLAN NO.		ISSUE
DATE: DEC. 2019	SHEET ACOE-12		○

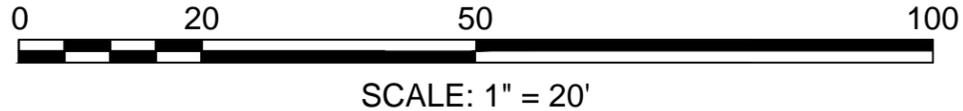


85 NETWORK DRIVE  
BURLINGTON, MA

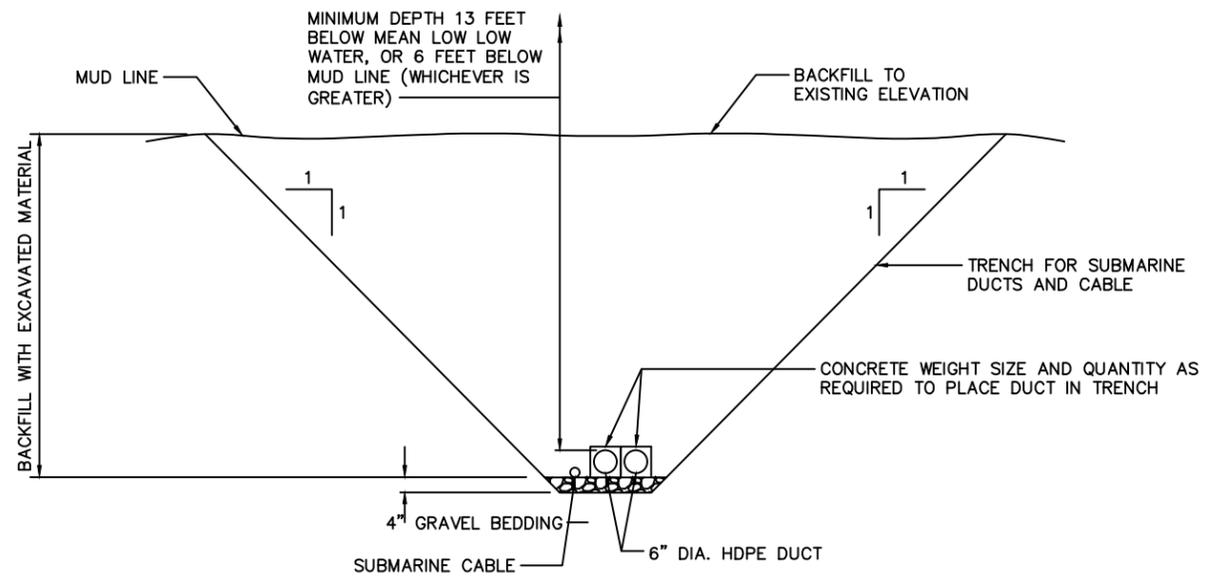
FILE NAME: S:\179A\Active\1794\0231\03 - Gloucester Draw\01 Design Phase\18 100% Submittal\US Army Corps of Engineers Plan Set\Working Drawings\ACOE-13 SUBMARINE CABLE DETAILS.dwg PLOTTED: Tuesday, February 18, 2020 - 4:55pm USER: jkierney



**ELEVATION**  
SCALE: 1" = 20'-0"

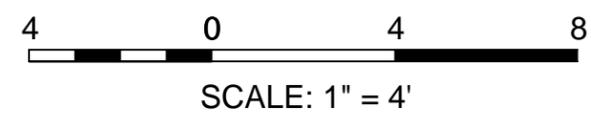


**SUBMARINE CABLE MAKE-UP**  
10 #1/0 AWG COPPER CONDUCTORS  
7 #8 AWG COPPER CONDUCTORS



**SECTION**  
SCALE: 1" = 4'

**TRENCH FOR SUBMARINE DUCTS AND CABLE**

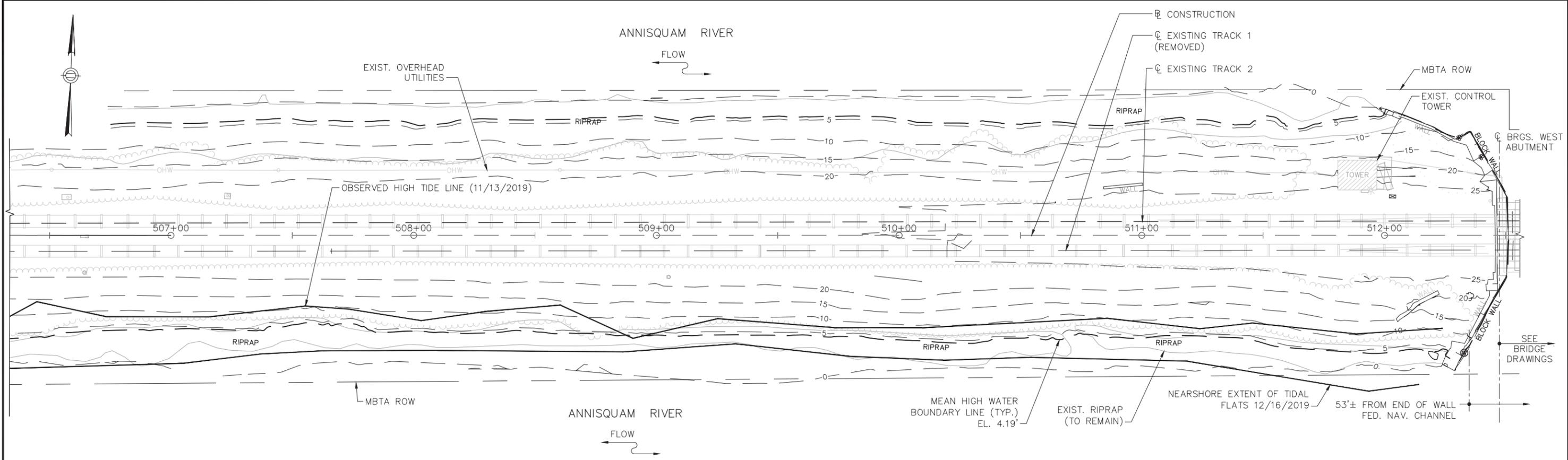


**NOTES:**

1. PROVIDE AN ELECTRODE GROUNDING CONDUCTOR TO BOND EACH TRUNNION SUPPORT COLUMN TO EACH DESIGNATED GROUND ROD DRIVEN IN MUD, TOTAL OF FOUR REQUIRED. EXOTHERMICALLY WELD EACH ELECTRODE GROUNDING CONDUCTOR TO ITS TRUNNION COLUMN, AND CONNECT TO ITS DESIGNATED GROUND ROD WITH BRONZE CONNECTOR. BOND ELECTRODE GROUNDING CONDUCTOR TO STEEL REINFORCEMENT IN SLAB.
2. ORIGINAL CONTOURS AND ELEVATIONS WERE BASED ON N.A.V.D. 1988, BUT FOR THE PURPOSE OF THESE DOCUMENTS, ELEVATIONS HAVE BEEN CONVERTED SUCH THAT MLLW = 0 FT (N.A.V.D. 1988 MLLW = -4.93 FT).

		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY REPLACEMENT OF GLOUCESTER DRAWBRIDGE OVER ANNISQUAM RIVER MBTA CONTRACT NO. B92PS07	
		<b>SUBMARINE CABLE DETAILS</b>	
		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY APPROVED BY:	
MANAGER OF DESIGN: _____ DATE: _____		DIRECTOR OF OPERATIONS SUPPORT: _____ DATE: _____	
HORIZ. AS NOTED	DES. BY: _____	DR. BY: _____	PLAN NO. _____
VERT. AS NOTED	DATE: DEC. 2019	SHEET ACOE-13	ISSUE _____

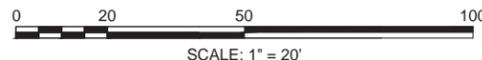
FILE NAME: S:\1794\active\179410231\03 - Gloucester Draw\01 Design Phase\01 Structural\2-Drawings\Design Drawings - Revised\CAD files\ACOE-14 EXISTING CONDITIONS - PLAN.dwg PLOTTED: Tuesday, February 18, 2020 - 4:47pm USER: jkitterney



**EXISTING CONDITIONS PLAN**  
SCALE: 1" = 20'-0"

**NOTES**

1. ORIGINAL CONTOURS AND ELEVATIONS WERE BASED ON N.A.V.D. 1988, BUT FOR THE PURPOSE OF THESE DOCUMENTS, ELEVATIONS HAVE BEEN CONVERTED SUCH THAT MLLW = 0 FT (N.A.V.D. 1988 MLLW = -4.93 FT).
2. MLW AND MLLW ARE LOCATED OFF PLAN.



PERMIT SET - NOT FOR CONSTRUCTION

<b>T</b>	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
	REPLACEMENT OF GLOUCESTER DRAWBRIDGE OVER ANNISQUAM RIVER MBTA CONTRACT NO. H62CN03	

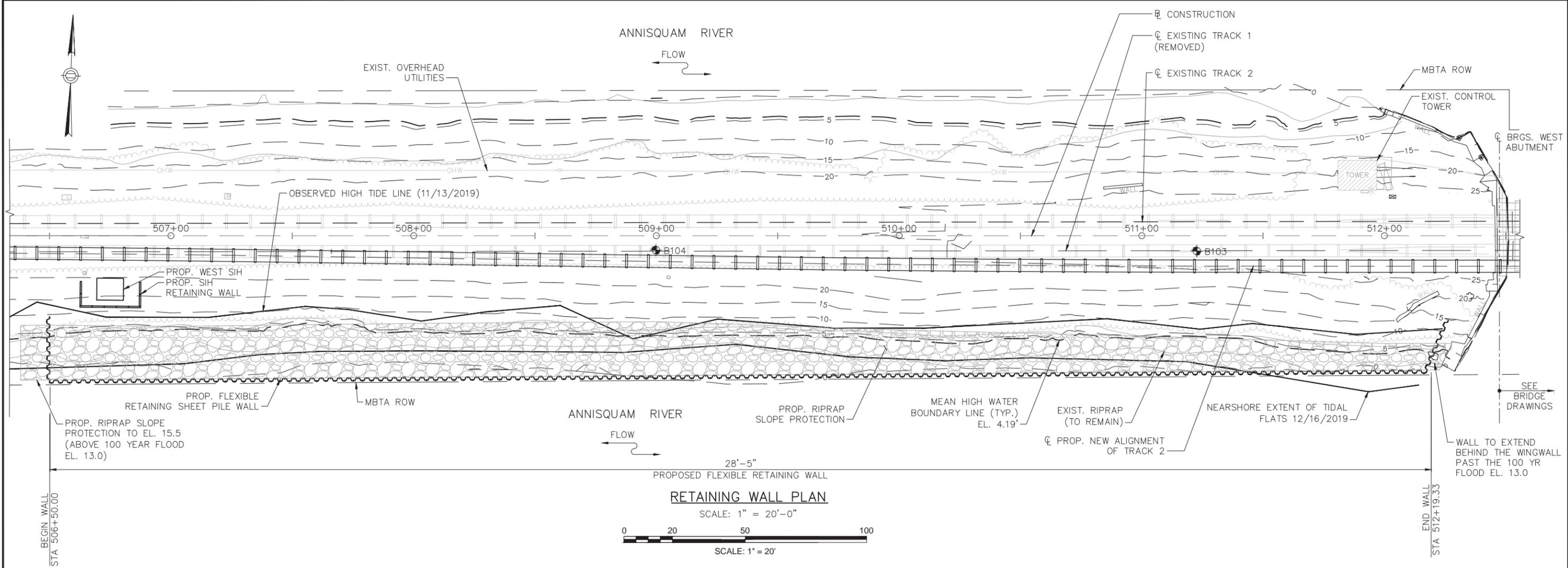
**WEST CAUSEWAY  
EXISTING CONDITIONS - PLAN**

<b>Stantec</b> 65 NETWORK DRIVE BURLINGTON, MA	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
	APPROVED BY:	

MANAGER OF DESIGN:	DATE:	DIRECTOR OF OPERATIONS SUPPORT:	DATE:
HORIZ. AS NOTED	DES. BY:	DR. BY:	CHK. BY:
VERT. AS NOTED	DATE:	DEC. 2019	
PLAN NO.		SHEET	
		ACOE-14	

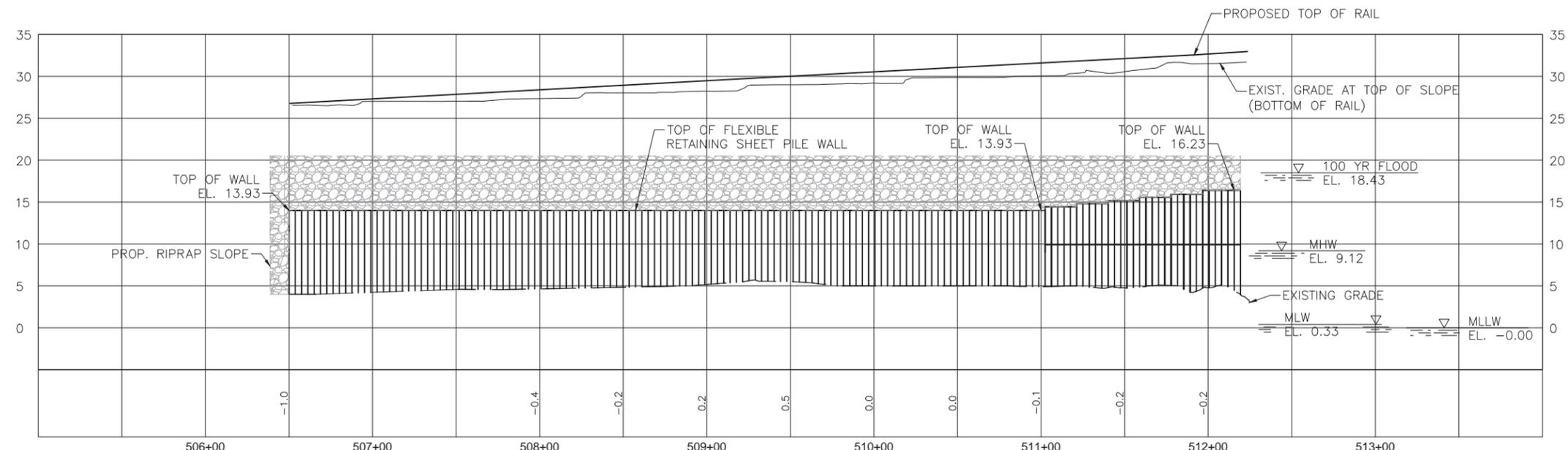
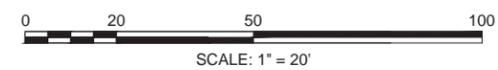
ISSUE	DATE	DESCRIPTION	BY	CHKD.	APP.

FILE NAME: S:\1794\active\179410231\03 - Gloucester Draw\01 Design Phase\01 Structural\Draw\01 Drawings\2-Drawings\Design Drawings - Revised\CAD files\ACOE-15 RETAINING WALL - PLAN.dwg PLOTTED: Tuesday, February 18, 2020 - 4:47pm USER: jktiemey



**RETAINING WALL PLAN**

SCALE: 1" = 20'-0"



**RETAINING WALL ELEVATION**

HORIZONTAL SCALE: 1" = 40'-0"

VERTICAL SCALE: 1" = 8'-0"

HOR. SCALE IN FEET



VER. SCALE IN FEET

**NOTES**

1. ORIGINAL CONTOURS AND ELEVATIONS WERE BASED ON N.A.V.D. 1988, BUT FOR THE PURPOSE OF THESE DOCUMENTS, ELEVATIONS HAVE BEEN CONVERTED SUCH THAT MLLW = 0 FT (N.A.V.D. 1988 MLLW = -4.93 FT).
2. MLW AND MLLW ARE LOCATED OFF PLAN.

PERMIT SET - NOT FOR CONSTRUCTION

<b>T</b>	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
	REPLACEMENT OF GLOUCESTER DRAWBRIDGE OVER ANNISQUAM RIVER MBTA CONTRACT NO. H62CN03	

**WEST CAUSEWAY RETAINING WALL - PLAN**

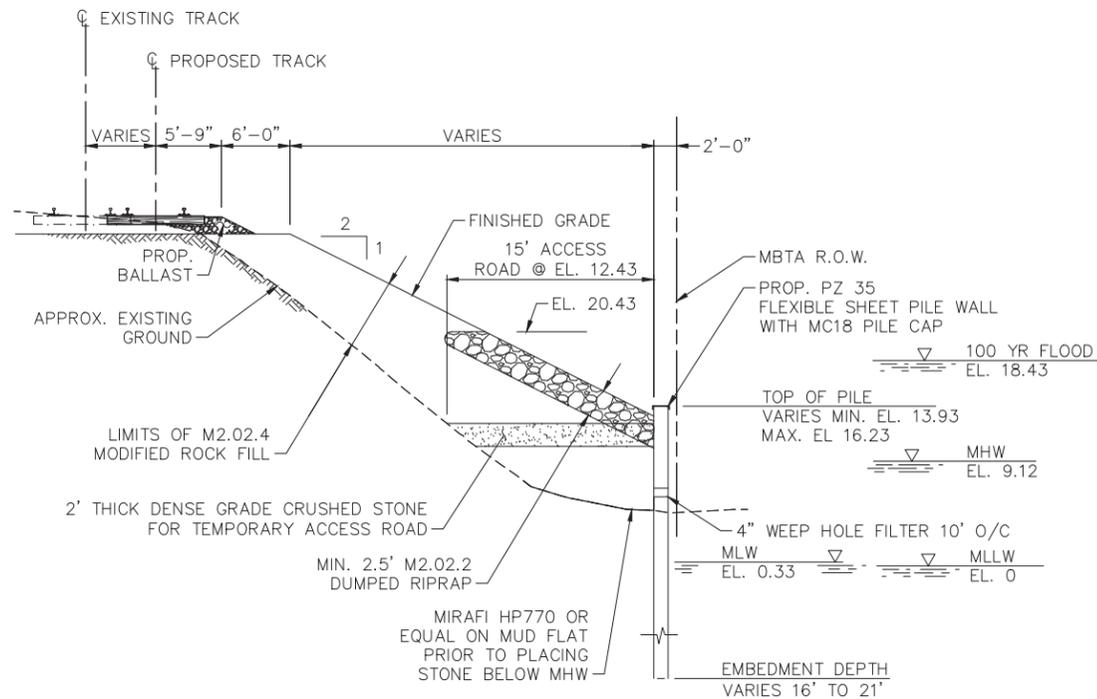


MASSACHUSETTS BAY TRANSPORTATION AUTHORITY  
APPROVED BY:

MANAGER OF DESIGN:	DATE:	DIRECTOR OF OPERATIONS SUPPORT:	DATE:
HORIZ. AS NOTED	DES. BY:	DR. BY:	CHK. BY:
VERT. AS NOTED	DATE: DEC. 2019	PLAN NO.:	ISSUE:
		SHEET ACOE-15	

ISSUE	DATE	DESCRIPTION	BY	CHK.	APP.

FILE NAME: S:\1794\active\179410231\03 - Gloucester Draw\01 Design Phase\01 Structural\2-Drawings\Design Drawings - Revised\CAD files\ACOE-16 RETAINING WALL - SECTION.dwg PLOTTED: Tuesday, February 18, 2020 - 4:48pm USER: jkiterney

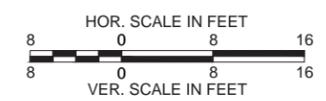


**NOTES:**

- ELEVATIONS HAVE BEEN CONVERTED SUCH THAT MLLW = 0 FT (N.A.V.D. 1988 MLLW = -4.93 FT).
- FILL VOIDS IN EXISTING RIPRAP SLOPE WITH CRUSHED STONE.
- M2.02.2 DUMPED RIPRAP SHALL BE PLACED UP TO EL. 15.5.
- SHEET PILES SHALL BE COATED WITH COAL TAR EPOXY FULL LENGTH ON BOTH SIDES.
- TOTAL BACKFILL ON TIDAL FLATS: 1,400 CY TOTAL  
BACKFILL ON MHW IMPACT AREA: 3,000 CY TOTAL  
BACKFILL ON HTL IMPACT AREA: 4,200 CY TOTAL  
PROJECT BACKFILL 5,700 CY

**RETAINING WALL TYPICAL SECTION**

SCALE: 1" = 8'-0"



PERMIT SET - NOT FOR CONSTRUCTION

**T** MASSACHUSETTS BAY TRANSPORTATION AUTHORITY  
REPLACEMENT OF GLOUCESTER DRAWBRIDGE OVER ANNISQUAM RIVER  
MBTA CONTRACT NO. H62CN03

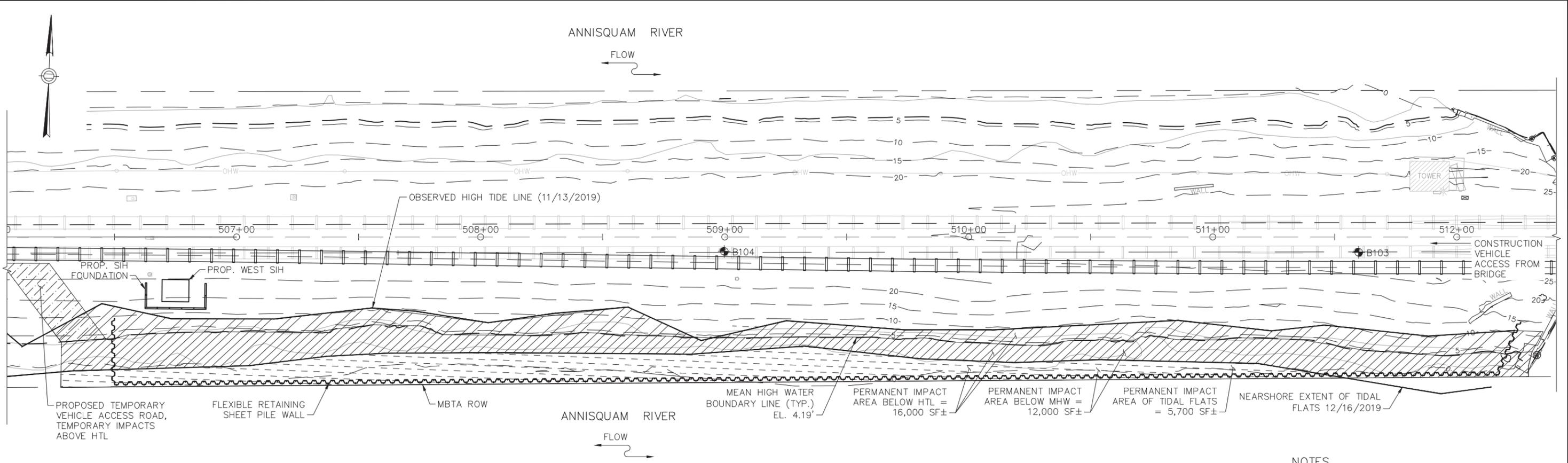
**WEST CAUSEWAY RETAINING WALL - SECTION**

**Stantec** 65 NETWORK DRIVE BURLINGTON, MA  
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY  
APPROVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

ISSUE	DATE	DESCRIPTION	BY	CHKD.	APP.

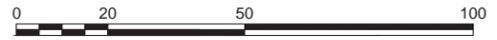
MANAGER OF DESIGN:	DATE:	DIRECTOR OF OPERATIONS SUPPORT:	DATE:
HORIZ. AS NOTED	DES. BY	DR. BY	CHK. BY
VERT. AS NOTED			
DATE: DEC. 2019			
PLAN NO.		SHEET	ACOE-16
ISSUE			

FILE NAME: S:\1794\active\179410231\03 - Gloucester Draw\01 Design Phase\01 Structural\2-Drawings\Design Drawings - Revised\CAD files\ACOE-17 ENVIRONMENTAL IMPACT - PLAN.dwg PLOTTED: Tuesday, February 18, 2020 - 4:48pm USER: jkterrey



**IMPACT LIMITS**

SCALE: 1" = 20'-0"



SCALE: 1" = 20'

**NOTES**

1. ORIGINAL CONTOURS AND ELEVATIONS WERE BASED ON N.A.V.D. 1988, BUT FOR THE PURPOSE OF THESE DOCUMENTS, ELEVATIONS HAVE BEEN CONVERTED SUCH THAT MLLW = 0 FT (N.A.V.D. 1988 MLLW = -4.93 FT).
2. MLW AND MLLW ARE LOCATED OFF PLAN.

**LEGEND**

- PERMANENT IMPACT LIMITS BELOW HTL
- PERMANENT IMPACT LIMITS BELOW MHW
- PERMANENT IMPACT LIMITS IN TIDAL FLATS
- TEMPORARY ACCESS ROAD

PERMIT SET - NOT FOR CONSTRUCTION

<b>T</b>	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY REPLACEMENT OF GLOUCESTER DRAWBRIDGE OVER ANNISQUAM RIVER MBTA CONTRACT NO. H62CN03
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**WEST CAUSEWAY  
ENVIRONMENTAL IMPACT - PLAN**

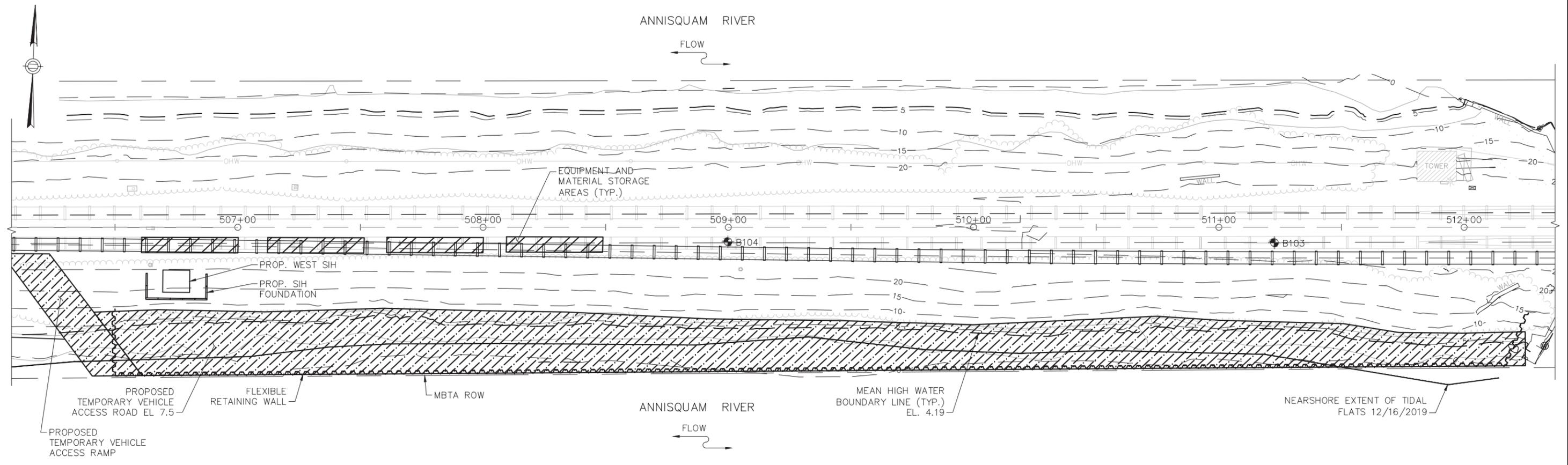
Stantec <small>65 NETWORK DRIVE BURLINGTON, MA</small>	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY APPROVED BY:
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MANAGER OF DESIGN:	DATE:	DIRECTOR OF OPERATIONS SUPPORT:	DATE:
HORIZ. AS NOTED	DES. BY	DR. BY	CHK. BY
VERT. AS NOTED	DES. BY	DR. BY	CHK. BY
DATE: DEC. 2019			

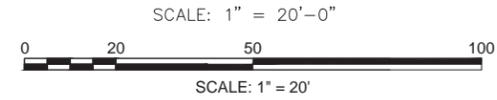
ISSUE	DATE	DESCRIPTION	BY	CHKD.	APP.

PLAN NO.	ISSUE
SHEET ACOE-17	○

FILE NAME: S:\1794\active\179410231\03 - Gloucester Draw\01 Design Phase\01 Structural\2-Drawings\Design Drawings - Revised\CAD files\ACOE-18 CONSTRUCTION STAGING.dwg PLOTTED: Tuesday, February 18, 2020 - 4:48pm USER: jkterney



**CONSTRUCTION STAGING PLAN**



**SEQUENCE OF CONSTRUCTION**

1. CONSTRUCT TEMPORARY ACCESS RAMP DOWN TO ACCESS ROAD WITH MODIFIED ROCK FILL AND DENSE GRADE CRUSHED STONE.
2. INSTALL EROSION AND SEDIMENT CONTROL DEVICES.
3. INSTALL TEMPORARY ROAD TO WEST SIH LOCATION. INSTALL TEMPORARY SUPPORT OF EXCAVATION AT WEST SIH AS REQUIRED TO CONSTRUCTION OF THE SIH FOUNDATION.
4. INSTALL SIH HOUSE INVERTED-T RETAINING WALL.
5. CONTINUE INSTALLING ACCESS ROAD ON GEOTEXTILE WITH MODIFIED ROCK FILL AS NECESSARY FOR EQUIPMENT TO ACCESS AND INSTALL SHEET PILES.
6. INSTALL APPROX. 50 LINEAR FEET OF SHEET PILES IN AN EASTERLY DIRECTION.
7. PLACE MIRAFI HP770 OR EQUAL ON MUD FLAT BELOW MHW LINE.
8. BACKFILL BEHIND SHEET PILE WALL UP TO APPROX. EL. 5.5 FEET WITH MODIFIED ROCK FILL. AT EAST (OPEN) END OF SHEET PILE SLOPE MODIFIED ROCK FILL DOWN FILL TO EXISTING MUDLINE.
9. PLACE AND COMPACT 2-FOOT-THICK LAYER OF DENSE GRADE CRUSHED STONE ABOVE MODIFIED ROCK FILL UP TO EL. 7.5 FEET.
10. REPEAT STEPS 5 TO 9 TO THE EAST END OF THE WALL.
11. INSTALL CLOSURE SHEET PILES AT WEST ABUTMENT.
12. REMOVE DENSE GRADE CRUSHED STONE AS NECESSARY TO PLACE M2.02.2 RIPRAP.
13. PLACE M2.02.2 RIPRAP AND MODIFIED ROCK FILL AS SHOWN ON PLAN AND SECTIONS.
14. PLACE M2.02.2 RIPRAP AND MODIFIED ROCK FILL AROUND SIH INVERTED-T WALL AND AT WEST END.
15. INSTALL CLOSURE SHEET PILES AT THE WEST END OF SHEET

**NOTES**

1. ORIGINAL CONTOURS AND ELEVATIONS WERE BASED ON N.A.V.D. 1988, BUT FOR THE PURPOSE OF THESE DOCUMENTS, ELEVATIONS HAVE BEEN CONVERTED SUCH THAT MLLW = 0 FT (N.A.V.D. 1988 MLLW = -4.93 FT).
2. MLW AND MLLW ARE LOCATED OFF PLAN.

**LEGEND**

- TEMPORARY ACCESS ROAD
- EQUIPMENT AND MATERIAL STORAGE

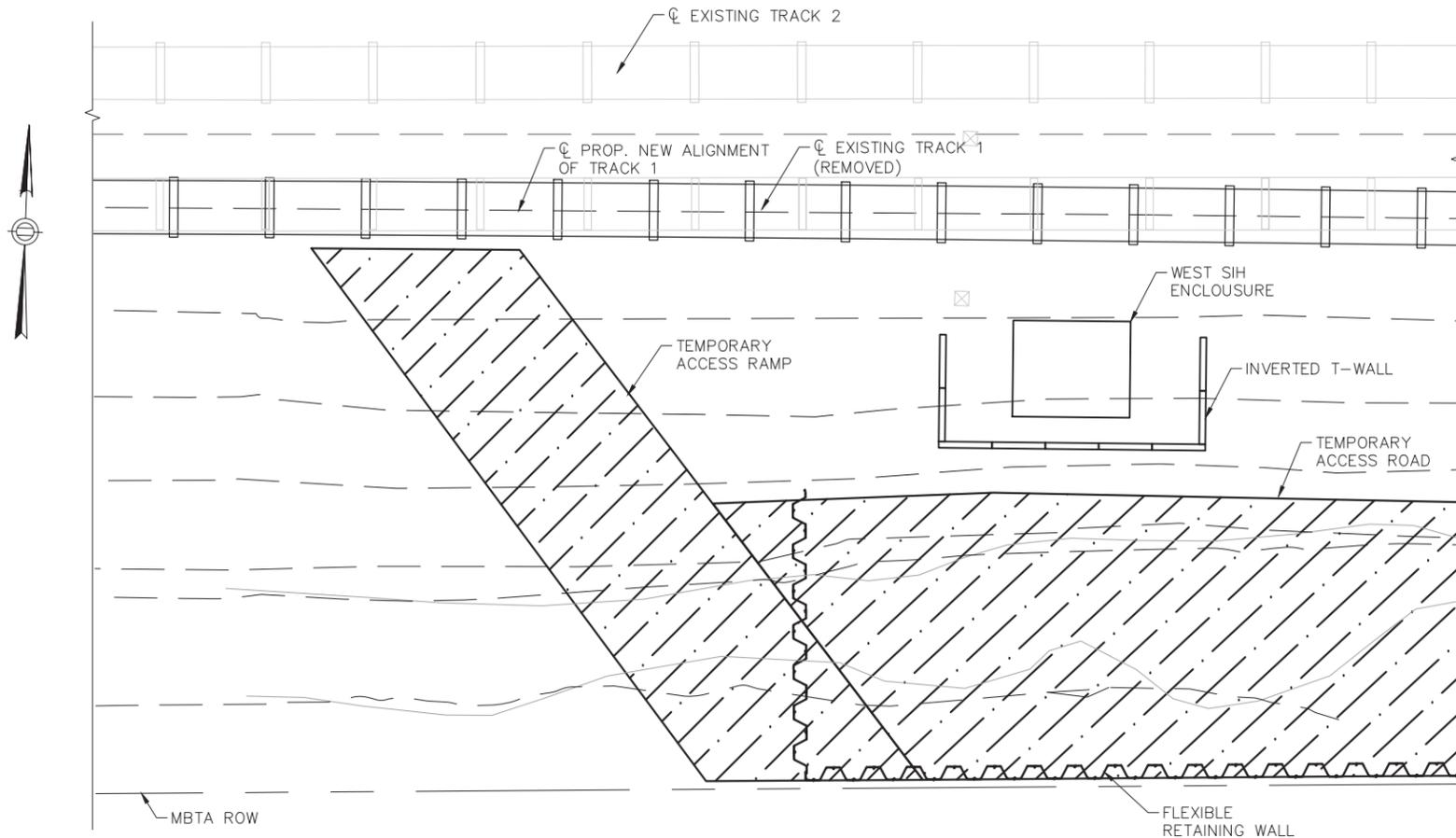
PERMIT SET - NOT FOR CONSTRUCTION

<b>T</b>	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
	REPLACEMENT OF GLOUCESTER DRAWBRIDGE OVER ANNISQUAM RIVER MBTA CONTRACT NO. H62CN03

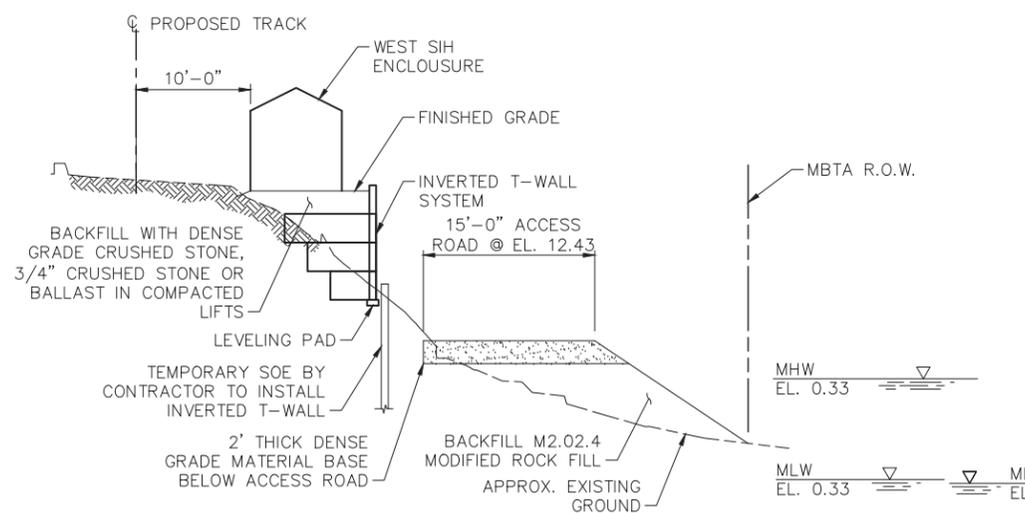
<b>Stantec</b> <small>65 NETWORK DRIVE BURLINGTON, MA</small>	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
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MANAGER OF DESIGN: _____ DATE: _____		DIRECTOR OF OPERATIONS SUPPORT: _____ DATE: _____	
HORIZ. AS NOTED	DES. BY	DR. BY	CHK. BY
VERT. AS NOTED	PLAN NO.		ISSUE
DATE: DEC. 2019	SHEET ACOE-18		○

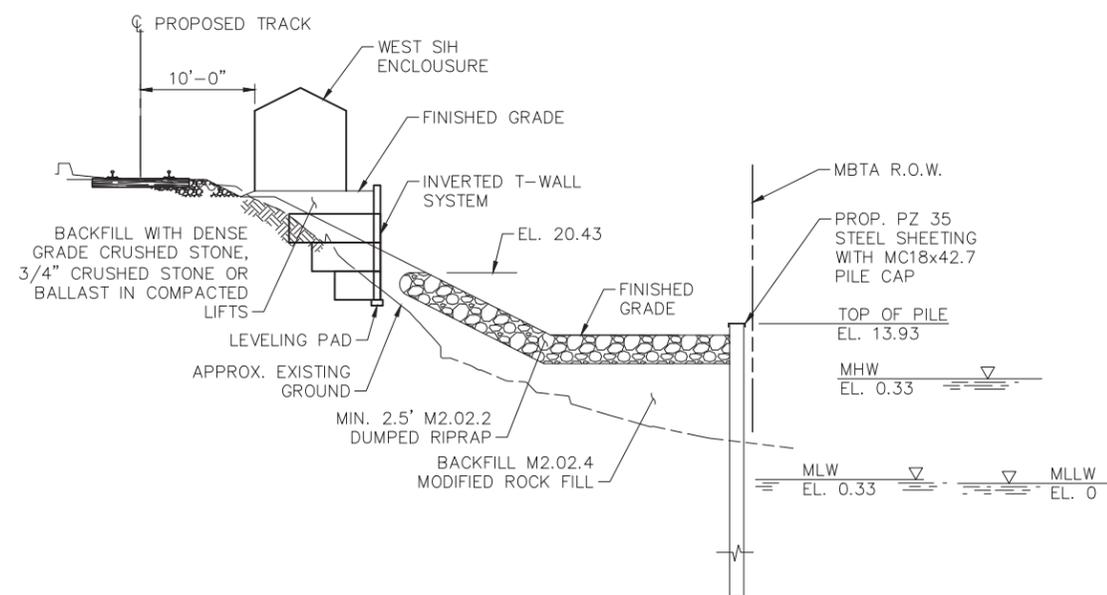
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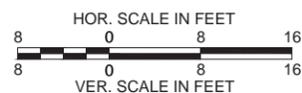
**WEST SIH FOUNDATION PLAN**  
SCALE: 1" = 8'-0"



**WEST SIH FOUNDATION STAGING SECTION @ 506+75**  
SCALE: 1" = 8'-0"



**WEST SIH FOUNDATION PERMANENT SECTION SECTION @ 506+75**  
SCALE: 1" = 8'-0"



**NOTES**

1. ORIGINAL CONTOURS AND ELEVATIONS WERE BASED ON N.A.V.D. 1988, BUT FOR THE PURPOSE OF THESE DOCUMENTS, ELEVATIONS HAVE BEEN CONVERTED SUCH THAT MLLW = 0 FT (N.A.V.D. 1988 MLLW = -4.93 FT).
2. MLW AND MLLW ARE LOCATED OFF PLAN.

PERMIT SET - NOT FOR CONSTRUCTION

**T** MASSACHUSETTS BAY TRANSPORTATION AUTHORITY  
REPLACEMENT OF GLOUCESTER DRAWBRIDGE OVER ANNISQUAM RIVER  
MBTA CONTRACT NO. H62CN03

**WEST SIGNAL INSTRUMENT HOUSE FOUNDATION DETAILS**



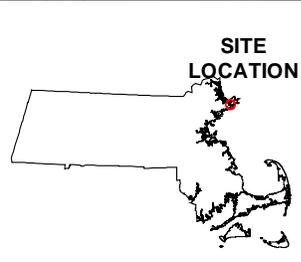
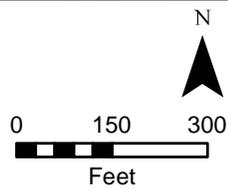
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY  
APPROVED BY: \_\_\_\_\_  
DIRECTOR OF OPERATIONS SUPPORT DATE: \_\_\_\_\_

MANAGER OF DESIGN: _____	DATE: _____	DIRECTOR OF OPERATIONS SUPPORT: _____	DATE: _____
HORIZ. AS NOTED	DES. BY: _____	DR. BY: _____	CHK. BY: _____
VERT. AS NOTED	PLAN NO. _____		
DATE: DEC. 2019	SHEET ACOE-19		

ISSUE	DATE	DESCRIPTION	BY	CHKD.	APP.



- Project Area
- Channel Reach



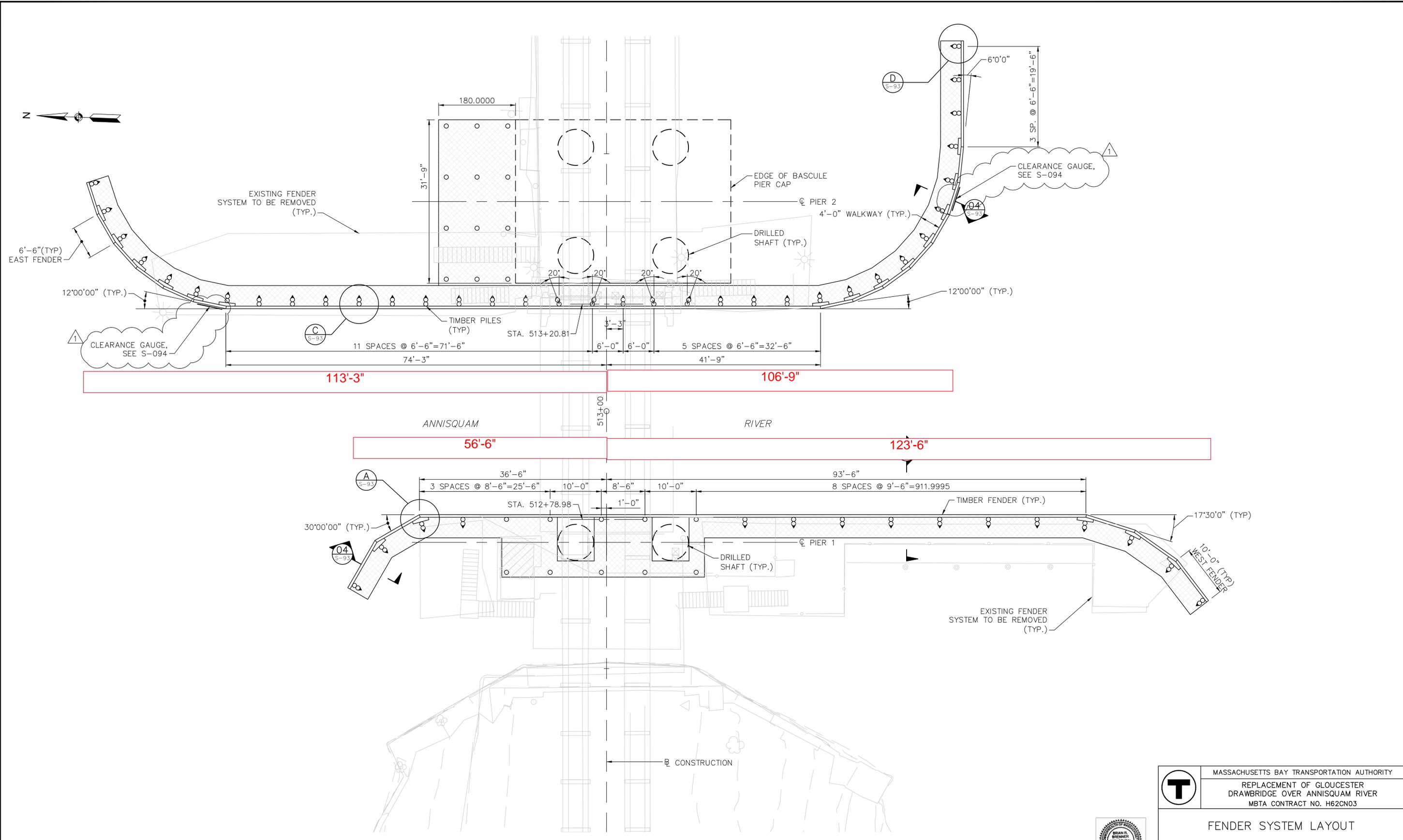
**TRC** Wannalancit Mills  
650 Suffolk Street  
Lowell, MA 01854  
978-970-5600

**CHANNEL REACH**  
**MBTA GLOUCESTER**  
**DRAW RAILROAD BRIDGE**  
**(NO. G-05-028)**  
**GLOUCESTER, MA**

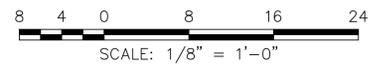
**FIGURE 1**      **FEBRUARY 2020**

Base Map: Esri and its contributors, "World Imagery", 2017  
Coordinate System: NAD 1983 StatePlane Massachusetts Mainland (Feet)

FILE NAME: S:\1794\Active\179410231\03 - Gloucester Draw\01 Structural\2-Drawings\Design Drawings - Revised\CAD\_files\S-92 FENDER SYSTEM LAYOUT.dwg PLOTTED: Monday, September 09, 2019 - 11:48am USER: mmulti



FENDER SYSTEM LAYOUT PLAN  
SCALE: 1/8" = 1'-0"



ISSUE	DATE	DESCRIPTION	BY	CHKD.	APP.
1	9/9/19	VERTICAL CLEARANCE GAUGE	MM	EAK	WPH

		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY REPLACEMENT OF GLOUCESTER DRAWBRIDGE OVER ANNISQUAM RIVER MBTA CONTRACT NO. H62CN03	
		FENDER SYSTEM LAYOUT	
FAY, SPOFFORD & THORNDIKE, LLC BURLINGTON, MA		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
MANAGER OF DESIGN:		DATE:	
DIRECTOR OF OPERATIONS SUPPORT:		DATE:	
HORIZ. AS NOTED		DES. BY:	
VERT. AS NOTED		DR. BY:	
DATE: OCT 2017		CHK. BY:	
PLAN NO. 184175		ISSUE	
SHEET S-92		0	