Executive Office of Energy and Environmental Affairs
Massachusetts Environmental Protection Act Office
100 Cambridge Street, Suite 900
Boston, MA 02114

Attn: Secretary Rebecca Tepper

4 August 2023

Ref: New England Wind 2 Connector Draft Environmental Impact Report (DEIR) Supplement

Dear Secretary Tepper:

Commonwealth Wind, LLC, a wholly owned subsidiary of Avangrid Renewables, LLC, (the "Company") is pleased to submit the attached Supplement to the Draft Environmental Impact Report (DEIR) submitted on July 14, 2023 for the New England Wind 2 Connector (the "Project"). This DEIR Supplement describes a minor engineering modification designed to reduce potential future climate change-related impacts to Project infrastructure proposed at the landfall site. Specifically, one transition joint bay (TJB) buried beneath the southern end of the paved parking lot will be lowered by an additional two feet. This engineering design modification will bring the TJB burial depth to four feet below grade, preventing its exposure due to modeled extreme future storm events associated with climate change. As a result, Project infrastructure proposed at the landfall site would have no effect on modeled extreme future storm impacts at the landfall site throughout the life of the Project.

The benefit of increasing the burial depth of the southern TJB was identified through a climate change resiliency analysis conducted using the Design Standards Tools provided by Massachusetts Climate Resilient Action Team led by Massachusetts Coastal Zone Management and the Massachusetts Emergency Management Agency (see Section 10.1.2 of the DEIR). In accordance with Commonwealth of Massachusetts requirements, a climate resiliency modeling analysis of the shoreline near the landfall site was conducted to predict flooding and erosion associated with worst-case extreme future storm events (see DEIR Section 10.1.3). The extreme future storm event modeling analysis predicted that all Project infrastructure at the landfall site (including three buried cables, two TJBs, and the duct bank) would remain below-grade throughout the life of the Project except for the southern TJB, which would be exposed by less than two feet. The final engineering design presented in the enclosed engineering plans lowers the southern TJB by two feet so it would remain buried even under modeled extreme worst-case future storm event conditions.

This DEIR supplement provides three updated attachments to replace those in the original DEIR submittal:

- Updated Attachment C3 Landfall Site HDD (Engineering Plans);
- Updated Attachment C8 Subsea Cable Pull-In (Engineering Plans); and
- Updated Attachment Q2 Coastal Design Memo.

We respectfully request that the enclosed Attachments Q2, C3, and C8 replace the versions in the original DEIR. Avangrid has already voluntarily extended the DEIR comment period to September 22, 2023, and given the small scope of this design update the Company does not believe a further extension is warranted.

Thank you for your consideration of the Project. We are committed to working with state, federal, tribal, local, and regional officials, as well as other stakeholders, to maximize this unique, timely, and important opportunity to establish southern New England as the center for the offshore wind industry in the United States, and soon start to make large reductions in carbon emissions.

Sincerely,

Ken Kimmell
Vice President of Development for Offshore Wind, Avangrid Renewables, LLC

CC: Distribution List (Attachment B)

Updated Attachment C3

Engineering Plans (Landfall Site HDD)

NEW ENGLAND WIND 2 CONNECTOR
DOWSES BEACH LANDING
HDD LANDFALL DRILL PATHS

INDEX OF SHEETS

LOCATION MAP
SCALE: 1" = 10,000'

REV.	DATE	REVISION DESCRIPTION	STATUS	DRAWN	CHKD	APPRVD
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CONTRACTOR:
Stantec Consulting Services Inc.
400 Crown Colony Drive Suite 200
Quincy, MA U.S.A. 02169–0982

CLIENT:
125 High Street
Boston, MA 02110

PROJECT: NEW ENGLAND WIND 2 CONNECTOR

TITLE: DOWSES BEACH LANDING
COVER SHEET

DOC ID: CWW-HDD-STC-DW-0004

SHEET 1 OF 9	DWG. NO.	SCALE	FORMAT/SIZE	REV:
	SHEET – 1	AS SHOWN	ANSI D	F

ALL UNITS SHOWN ARE 'ENGLISH UNITS' (FEET AND INCHES)

THIS PLAN SET IS PRELIMINARY AND HAS BEEN ISSUED FOR PERMITTING PURPOSES ONLY; AND, IS NOT INTENDED FOR CONSTRUCTION PURPOSES.

GENERAL NOTES

1. UNLESS OTHERWISE NOTED:
   1.1. DIMENSIONS ARE IN FEET.
   1.2. CHAINAGES ARE MEASURED ALONG A LEVEL PLAN OF DRILL PATH.
   1.3. ELEVATIONS OVER WATER ARE BASED ON MEAN LOWER LOW WATER (MLLW) DATUM FOR DOWSES BEACH (LONGITUDE -70.361478, LATITUDE 41.624038). DATUM WAS CONVERTED FROM NAVD88 TO MLLW WITH A CONVERSION OF 2.14 FEET AT DOWSES BEACH.
   1.4. DATUM FOR ALL LAND BASED ELEVATIONS IS NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), FROM DAWOOD SURVEY.
   1.5. INTERPOLATED SURFACE BETWEEN LAND SURVEY SURFACE AND MUDLINE SURFACE AS SHOWN ON PLANS IS BASED ON MLLW DATUM.
   1.6. DIMENSIONS ARE TO THE DRILL PATH CENTERLINE.
   1.7. ANGLES ARE ROUNDED TO THE NEAREST DEGREE.
2. THE HORIZONTAL REFERENCE DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83).
3. BORING LOCATIONS SHOWN WERE PROVIDED BY AVANGRID, BORINGS WERE PERFORMED BY OTHERS
4. UNLESS OTHERWISE NOTED, THE DESIGN CONFORMS TO THE LATEST VERSION OF REFERENCED CODES AND STANDARDS IN EFFECT AT THE TIME OF DESIGN (AUGUST 12, 2022).
5. PIPELINE CONSTRUCTION TO COMPLY WITH THE PROJECT'S APPLICABLE HDD SPECIFICATIONS, CROSSING AGREEMENTS, PROJECT CONSTRUCTION SPECIFICATIONS AND FEDERAL, STATE AND MUNICIPAL REGULATIONS. REQUIREMENTS THAT THE CONTRACTOR CONSIDERS TO BE CONFLICTING SHALL BE REVIEWED BY THE PROJECT'S AUTHORIZED REPRESENTATIVE. HARD COPIES OF CROSSING AGREEMENT AND CONTRACT DOCUMENTS SHALL BE ON SITE DURING CONSTRUCTION.
6. BEFORE INITIATING CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL CALL DIGSAFE AT 811 AND ALSO VERIFY THE FIELD SURVEY DATA, TOPOGRAPHY AND LOCATION OF ALL EXISTING UTILITIES.
7. CONSTRUCTION ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH CONTRACT DOCUMENTS AND HDD EXECUTION PLAN.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREVENTING DAMAGE TO ADJACENT STRUCTURES OR FACILITIES (ABOVE OR BELOW GROUND) DUE TO HDD OPERATIONS.
9. THE PILOT DRILL SHALL FOLLOW THE PATH SHOWN ON THE DRAWINGS WITH THE FOLLOWING REQUIREMENTS AND TOLERANCES IN ORDER OF PRECEDENCE:
   9.1. THE FINAL INSTALLATION SHALL BE CONSISTENT WITH OWNERS OFFSHORE EXPORT CABLE CORRIDOR (OECC).
   9.2. UNDERGROUND FACILITIES ARE PROTECTED AT ALL STAGES OF INSTALLATION, AND THE FINAL INSTALLATION IS WITHIN THE PERMISSIBLE DRILL ZONE AS DETERMINED BY THE GEOTECHNICAL SUB-SURFACE INVESTIGATIONS.
   9.3. ENTRY, EXIT, DEPTH AND ALIGNMENT TOLERANCES LISTED BELOW:
      9.3.1. ENTRY POINT: UP TO 3.0 FEET FORWARD OR BACK FROM THE DESIGNED ENTRY POINT; UP TO 3.0 FEET RIGHT OR LEFT OF THE DESIGNED ALIGNMENT.
      9.3.2. EXIT POINT: UP TO 10.0 FEET SHORT OR 15.0 FEET LONG RELATIVE TO THE DESIGNED EXIT POINT; UP TO 6.0 FEET RIGHT OR LEFT OF THE DESIGNED ALIGNMENTS.
      9.3.3. ELEVATION: UP TO 6.0 FEET ABOVE OR BELOW THE DESIGNED ALIGNMENT.
      9.3.4. ALIGNMENT: UP TO 6.0 FEET RIGHT OF LEFT OF THE DESIGNED ALIGNMENT.
10. FOR PRELIMINARY ESTIMATING PURPOSES ONLY, DRILL RIG SHALL BE SIZED BASED ON A MINIMUM PUSH/PULL FORCE OF 500,000 LBS.
11. EQUIPMENT FOR SOLIDS CONTROL SUCH AS SHAKERS AND CENTRIFUGES SHALL BE BASED ON MAINTENANCE OF DRILLING FLUID WITH MAXIMUM DENSITY AND MAXIMUM SAND CONTENT WITHIN LEVELS DETAILED IN CONTRACTOR DRILLING PLAN.
12. SURFACE CASING DIAMETER SHALL BE SIZED FOR THE FINAL REAM PASS.
13. INADVERTENT RELEASE PLAN AS IT PERTAINS TO FLUID RELEASE SHALL BE REVIEWED AND APPROVED BY ENGINEER AND ALL REQUIRED RESPONSE EQUIPMENT SHALL BE ON SITE PRIOR TO DRILLING.
14. BOREHOLE PRESSURE AND WATER SURFACE MUST BE MONITORED REGULARLY DURING ACTIVE DRILLING ACTIVITIES FOR A POTENTIAL RELEASE OF DRILLING FLUIDS. IF A FLUID RELEASE OCCURS, THE APPROVED INADVERTENT RELEASE PLAN SHALL BE IMPLEMENTED AND THE EFFECTS OF THE WORK ON THE AQUATIC ENVIRONMENT SHALL BE ASSESSED IN ACCORDANCE WITH RELEVANT FEDERAL, STATE AND LOCAL REGULATIONS.
15. TURBIDITY MEASUREMENTS AND ACTIVE MONITORING OF THE DRILL PATH SHALL BE CARRIED OUT DURING CONSTRUCTION AND IMMEDIATELY FOLLOWING A LOSS OF CIRCULATION EVENT.
16. DISPOSAL METHODS AND LOCATION OF DRILLING FLUID WASTE AND CUTTINGS SHALL COMPLY WITH ALL STATE AND LOCAL REGULATIONS AND GUIDELINES.
17. ENGINEERED DRILLING FLUID PLAN MUST BE IMPLEMENTED IN THE FIELD WITH PROPOSED EQUIPMENT.
18. ENGINEERED DRILLING FLUID PLAN MUST BE APPROVED AND ACCEPTED PRIOR TO COMMENCING DRILLING.
19. SPECIFICATIONS OF PROPOSED EQUIPMENT FOR ANNULAR PRESSURE MONITORING, DOWNHOLE SURVEY, SURFACE TRACKING AND ELECTRONIC DRILL RECORDING SHALL BE REVIEWED AND APPROVED BY THE PROJECT'S AUTHORIZED REPRESENTATIVE AND INSPECTED BEFORE DRILLING ACTIVITIES COMMENCE.
20. CONTRACTOR SHALL SERVE AS ENGINEER OF RECORD FOR THE HDD. ENGINEERING AND DESIGN PRODUCTS, AS WELL AS AS-BUILT DATA, SHALL BE SEALED BY CONTRACTOR'S PROFESSIONAL ENGINEER REGISTERED IN THE COMMONWEALTH OF MASSACHUSETTS.
21. DEWATERING ACTIVITIES SHALL BE CONDUCTED IN A MANNER SO AS TO MINIMIZE THE DISCHARGE OF POLLUTANTS FROM DEWATERING OPERATIONS. DEWATERING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH PROJECT PERMITS AND APPROVALS INCLUDING THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) CONSTRUCTION GENERAL PERMIT (CGP) FOR STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES.

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CLIENT:
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125 High Street
Boston, MA 02110

PROJECT
NEW ENGLAND WIND 2 CONNECTOR

TITLE:
DOWSES BEACH LANDING
GENERAL NOTES

DOC ID:
CWW-HDD-STC-DW-0004

SHEET 2 OF 9	DWG. NO.	SCALE	FORMAT/SIZE	REV:
	SHEET - 2	AS SHOWN	ANSI D	F

ORIGINAL SHEET - ANSI D

LEGEND:

CENTERLINE OF HDD-SOUTH DRILL PATH

CENTERLINE OF HDD-CENTER DRILL PATH

CENTERLINE OF HDD-NORTH DRILL PATH

CONSTRUCTION FENCE

MHW — MEAN HIGH WATER LINE

MLW — MEAN LOW WATER LINE

MLLW — MEAN LOWER LOW WATER LINE

EXPORT POWER CABLE PATH

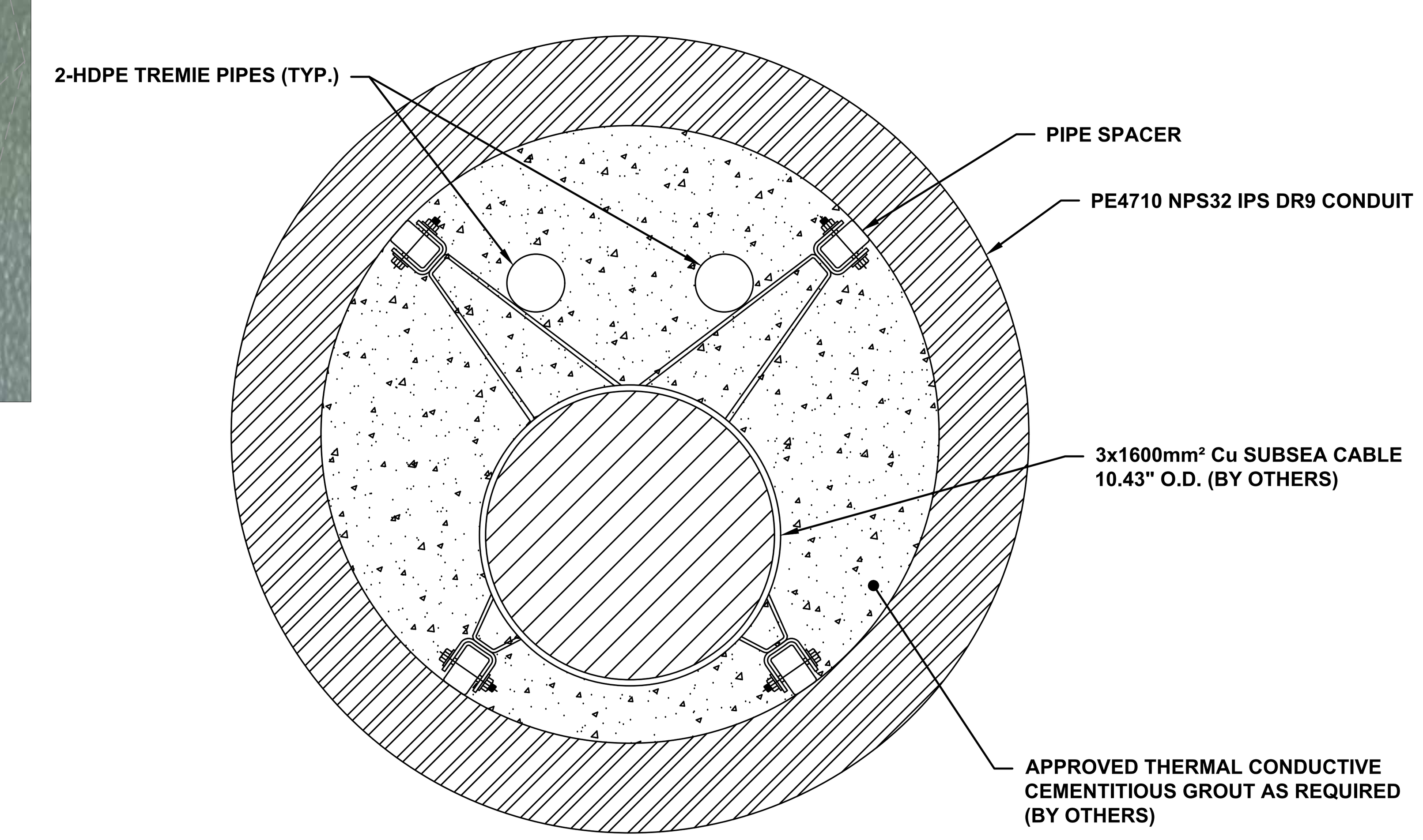
BORING

NOTES:

1. REFER TO GENERAL NOTES ON SHEET 2.
2. THESE SKETCHES ARE CONCEPTUAL IN NATURE AND ARE NOT FOR CONSTRUCTION. ONLY MAJOR PIECES OF EQUIPMENT ARE SHOWN AND ALL FEATURES SHOWN ARE APPROXIMATE. THE ACTUAL SITE ARRANGEMENT WILL BE DETERMINED BY THE HDD CONTRACTOR.
3. UTILITIES LOCATIONS ARE UNKNOWN. ANY EXISTING UTILITIES MUST BE LOCATED PRIOR TO CONSTRUCTION BY CALLING DIG SAFE PRIOR TO EXCAVATION AND EXPOSING ANY EXISTING UTILITIES AS NEEDED. REQUIRED CLEARANCES SHALL BE PROVIDED FOR ANY EXISTING OVERHEAD UTILITIES.
4. THIS LAYOUT HAS BEEN BASED ON ANTICIPATED MINIMUM SEPARATION DISTANCES OF ADJACENT HDD BORES AT THE ENTRY PITS AND AT THE MHW MARK. INTENDED MINIMUM SEPARATION AT THE EXIT POINT IS AS SHOWN ON PLAN. FINAL DESIGN OF ALL HDD DRILLPATHS WILL BE COMPLETED BY THE HDD CONTRACTOR FOR REVIEW BY AVANGRID.
5. BORING LOCATIONS SHOWN WERE PROVIDED BY AVANGRID, BORINGS WERE PERFORMED BY OTHERS.
6. TIDAL DATA INTERPOLATED FROM DAWOOD SURVEY OUTSIDE OF DAWOOD SURVEY LIMITS.
7. REFER TO DRAWING SET CWW-OCP-STC-DW-0001 FOR DETAILS OF INTERFACING 275 kV DUCT BANK.

0 80 200 300

SCALE: 1" = 80'



TYPICAL CROSS SECTION

0 5 10 15 20

SCALE: 1" = 5"

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PROJECT
NEW ENGLAND WIND 2 CONNECTOR

TITLE:
DOWSES BEACH LANDING
HDD OVERALL PLAN

DOC ID: CWW-HDD-STC-DW-0004

SHEET 3 OF 9	DWG. NO. SHEET – 3	SCALE AS SHOWN	FORMAT/SIZE ANSI D	REV: F

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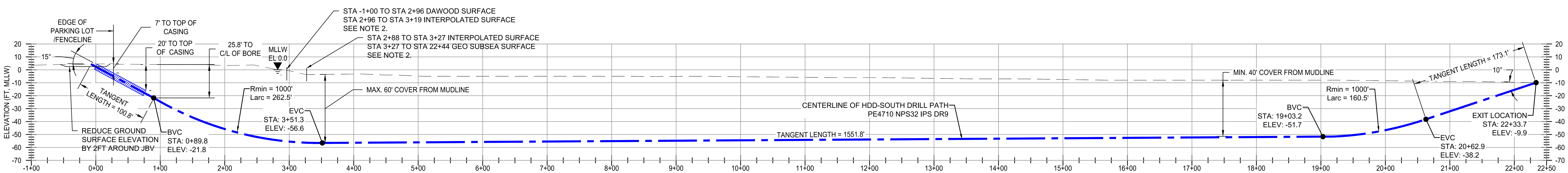
SCALE: 1" = 80'



PROFILE

HOR. 1" = 80'

80 0 80 160

40 0 40 80

VER. 1" = 40'

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3. CONTRACTOR TO CONSTRUCT APPROPRIATE CONTAINMENT FOR DRILLING MUD.
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7. PIPE SPECIFICATIONS ARE FOR REFERENCE ONLY. FINAL PIPE SPECIFICATIONS WILL BE DETERMINED AFTER COMPLETION OF A STRESS ANALYSIS.

LEGEND:

- CENTERLINE OF HDD-SOUTH DRILL PATH
- CONSTRUCTION FENCE
- MHW — MEAN HIGH WATER LINE
- MLW — MEAN LOW WATER LINE
- MLLW — MEAN LOWER LOW WATER LINE
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CLIENT:

AVANGRID Offshore Wind
125 High Street
Boston, MA 02110

PROJECT: NEW ENGLAND WIND 2 CONNECTOR

TITLE: DOWSES BEACH LANDING HDD-SOUTH - PLAN AND PROFILE

DOC ID: CWW-HDD-STC-DW-0004

SHEET 4 OF 9	DWG. NO. SHEET - 4	SCALE AS SHOWN	FORMAT/SIZE ANSI D	REV. F

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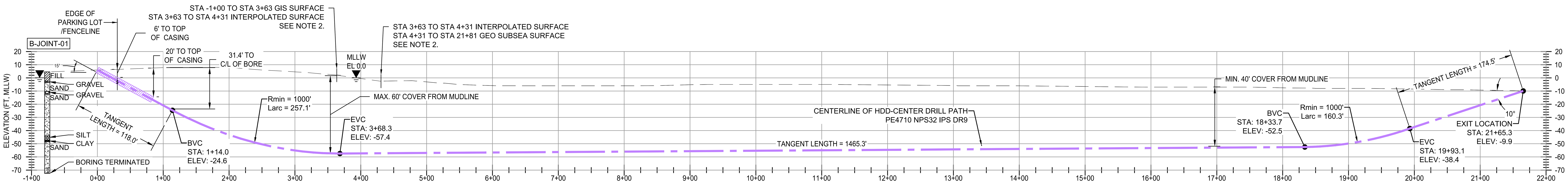
SCALE: 1" = 80'



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LEGEND:

	CENTERLINE OF HDD-CENTER DRILL PATH
	CENTERLINE OF HDD-NORTH DRILL PATH
	CONSTRUCTION FENCE
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PROJECT

NEW ENGLAND WIND 2 CONNECTOR

TITLE:

DOWSES BEACH LANDING
HDD-CENTER - PLAN AND PROFILE

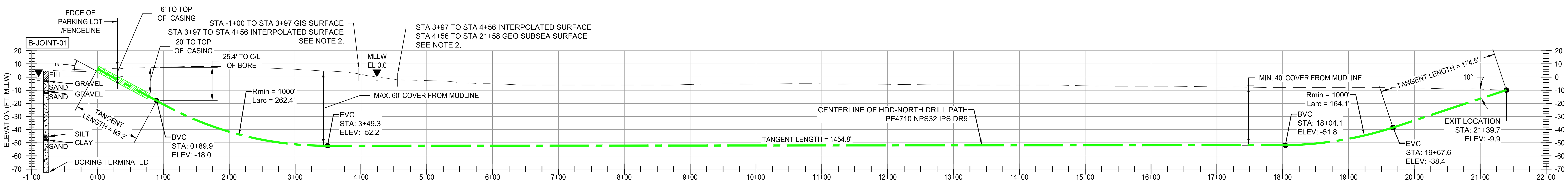
DOC ID:

CWW-HDD-STC-DW-0004

SHEET	DWG. NO.	SCALE	FORMAT/SIZE	REV:
5 OF 9	SHEET – 5	AS SHOWN	ANSI D	F

ORIGINAL SHEET - ANSI D

SCALE: 1" = 80'



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TITLE: DOWSES BEACH LANDING
HDD-NORTH - PLAN AND PROFILE

DOC ID: CWW-HDD-STC-DW-0004

SHEET	DWG. NO.	SCALE	FORMAT/SIZE	REV.
6 OF 9	SHEET – 6	AS SHOWN	ANSI D	F

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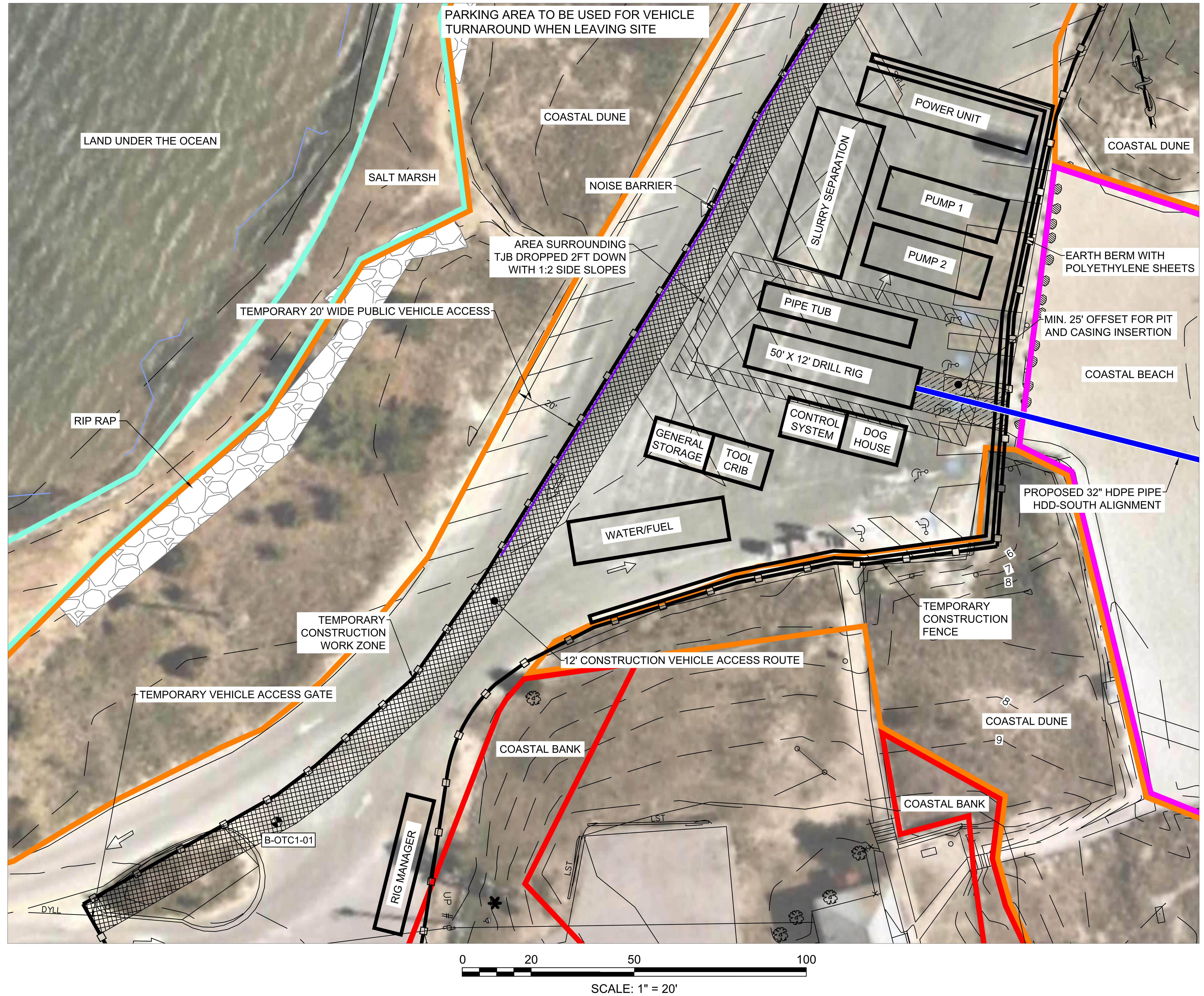

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D	2023-05-03	ISSUED FOR STATE PERMITTING	IFI	RN	MD/EA	KEF
C	2023-02-14	ISSUED FOR STATE PERMITTING	IFI	RN	MD/EA	KEF
B	2022-09-26	ISSUED FOR STATE PERMITTING	IFI	RN	MD/EA	KEF
A	2022-08-19	ISSUED FOR CLIENT REVIEW	IFCR	RN	MD/EA	KEF

CONTRACTOR:

Stantec Consulting Services Inc.
400 Crown Colony Drive Suite 200
Quincy, MA U.S.A. 02169-0982

CLIENT:

125 High Street
Boston, MA 02110

PROJECT

NEW ENGLAND WIND 2 CONNECTOR

TITLE:

DOWSES BEACH LANDING
HDD-SOUTH - CONSTRUCTION STAGING

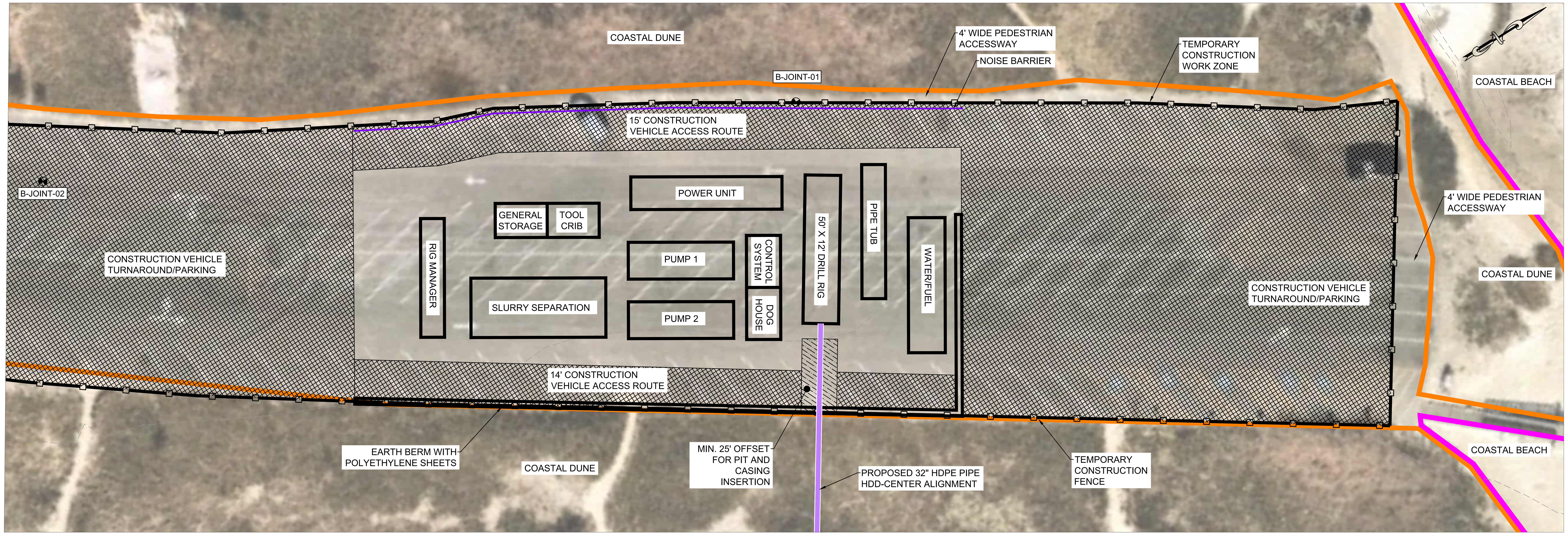
DOC ID: CWW-HDD-STC-DW-0004

SHEET	7	DWG. NO.	SCALE	FORMAT/SIZE	REV:
OF	9	SHEET - 7	AS SHOWN	ANSI D	F

ORIGINAL SHEET - ANSI D

NOTES:

1. REFER TO GENERAL NOTES ON SHEET 2



SCALE: 1" = 20'

SCALE: 1" = 100'

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Stantec Consulting Services Inc.
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CLIENT:

AVANGRID Offshore Wind
125 High Street
Boston, MA 02110

PROJECT

NEW ENGLAND WIND 2 CONNECTOR

TITLE:

DOWSES BEACH LANDING
HDD-CENTER - CONSTRUCTION STAGING

DOC ID: CWW-HDD-STC-DW-0004

SHEET 8 OF 9	DWG. NO.	SCALE	FORMAT/SIZE	REV:
	SHEET - 8	AS SHOWN	ANSI D	F

ORIGINAL SHEET - ANSI D

0 20 50 100

SCALE: 1" = 20'

0 100 200 300 400

SCALE: 1" = 100'

NOTES:

1. REFER TO GENERAL NOTES ON SHEET 2

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125 High Street
Boston, MA 02110

PROJECT
NEW ENGLAND WIND 2 CONNECTOR

TITLE:
DOWSES BEACH LANDING
HDD-NORTH - CONSTRUCTION STAGING

DOC ID: CWW-HDD-STC-DW-0004

SHEET 9 OF 9	DWG. NO.	SCALE	FORMAT/SIZE	REV:
	SHEET - 9	AS SHOWN	ANSI D	F

Updated Attachment C8

Engineering Plans (Subsea Cable Pull-In)

DOWSES BEACH
SUBSEA CABLE LANDFALL

INDEX OF SHEETS

SHEET NO.	TITLE
1	COVER SHEET
2	GENERAL NOTES
3	SUBSEA CABLE-SOUTH LANDFALL
4	SUBSEA CABLE-CENTER LANDFALL
5	SUBSEA CABLE-NORTH LANDFALL
6	SUBSEA CABLE-SOUTH CONSTRUCTION STAGING
7	SUBSEA CABLE-CENTER CONSTRUCTION STAGING
8	SUBSEA CABLE-NORTH CONSTRUCTION STAGING

LOCATION MAP
SCALE: 1" = 10,000'

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CLIENT:
125 High Street
Boston, MA 02110

PROJECT
NEW ENGLAND WIND 2 CONNECTOR

TITLE:
DOWSES BEACH
SUBSEA CABLE LANDFALL - COVER SHEET

DOC ID:
CWW-ECP-STC-DW-0012

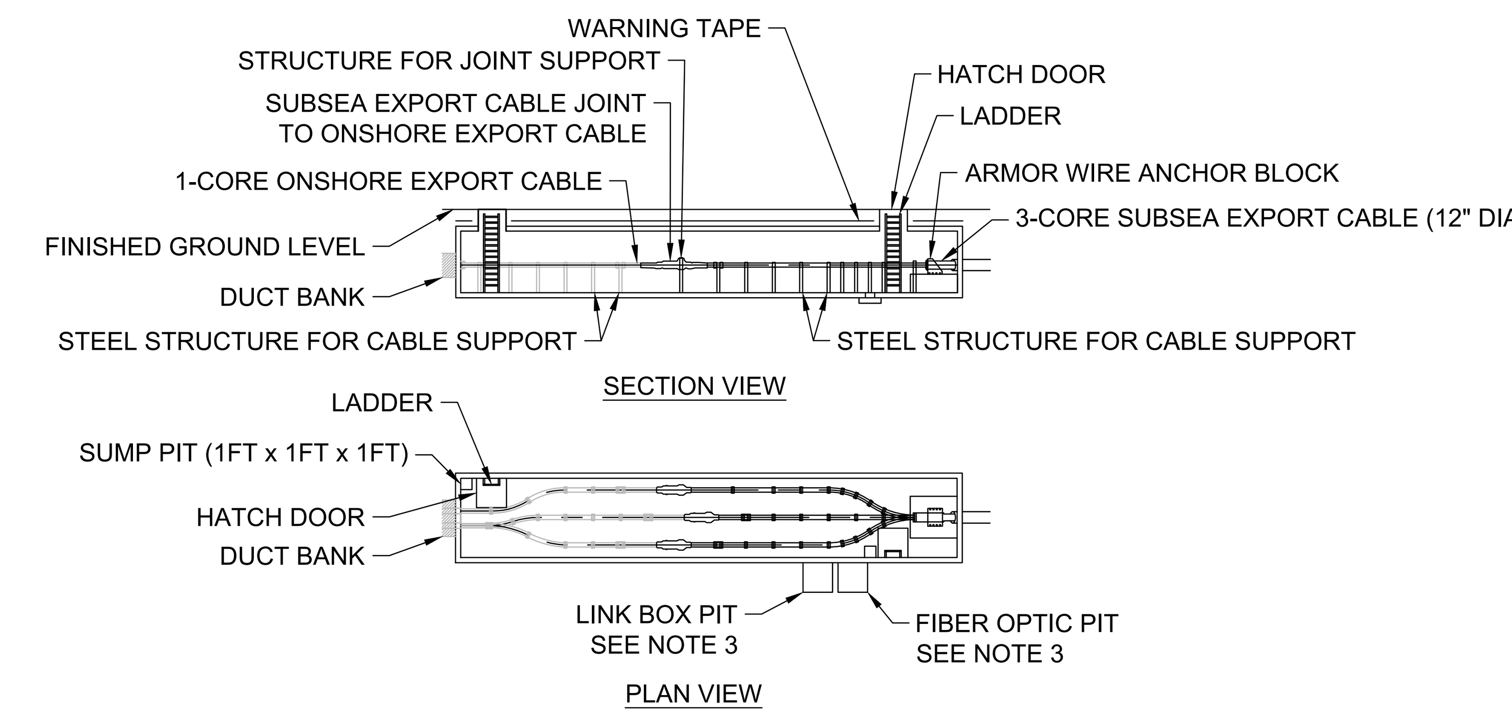
SHEET 1 OF 8	DWG. NO.	SCALE	FORMAT/SIZE	REV:
	SHEET - 1	AS SHOWN	ANSI D	D

GENERAL NOTES

1. GENERAL DESCRIPTION OF SUBMARINE CABLE LANDFALL ACTIVITIES:
   - A. CABLE LAY VESSEL (CLV) ARRIVES AT SITE AND COMPLETES READINESS CHECKS.
   - B. ONSHORE TEAM INFORMS CLV THAT CABLE PULL-IN OPERATIONS ARE READY TO COMMENCE.
   - C. THE WEATHER FORECAST IS CONFIRMED.
   - D. THE CLV PASSES A MESSENGER ROPE TO THE LANDFALL WINCH.
   - E. THE CLV PULLS THE LANDFALL WINCH WIRE TO THE CLV DECK.
   - F. CLV CONNECTS THE LANDFALL WINCH WIRE TO THE CABLE PULL-IN RIGGING.
   - G. WEATHER FORECAST IS RE-CONFIRMED.
   - H. CLV CONFIRMS OVER PULL TAPE MARK IS APPLIED TO THE CABLE DURING PAYOUT OPERATIONS.
   - I. FROM INSTRUCTION FROM THE CLV, THE LANDFALL WINCH SLOWLY STARTS PULL-IN OPERATIONS.
     - I.A. WINCH SPEED IS ADJUSTED AND MONITORED.
     - I.B. THE TENSION OF THE LANDFALL WINCH IS RELAYED TO THE CLV CONTINUOUSLY.
   - J. CABLE PULL-IN CONTINUES UNTIL CABLE PULL-IN RIGGING IS OBSERVED AT THE ONSHORE HDD EXIT.
     - J.A. CABLE PULL-IN SPEED IS SLOWED AND THE PULL-IN RIGGING AND CABLE IS INSPECTED FROM A SAFE DISTANCE FROM THE HDD ONSHORE EXIT.
   - K. CABLE PULL-IN CONTINUES UNTIL THE OVER PULL MARK IS OBSERVED AT THE ONSHORE HDD EXIT.
   - L. WITH AGREEMENT FROM ALL SITE REPRESENTATIVES, AN "ALL STOP" IS CALLED FOR CABLE PULL-IN.
   - M. THE OVER PULL LENGTH IS CHECKED AND CONFIRMED.
   - N. TEMPORARY HOLDBACK TO THE CABLE IS APPLIED, AND ONCE INSTALLED, THE CLV IS INFORMED.
   - O. ALL LANDFALL PERSONNEL STAY CLEAR OF THE CABLE WHILE THE CLV STARTS SUBMARINE CABLE LAYING OPERATIONS.
   - P. ONCE THE CLV HAS LAID A PREDETERMINED MINIMUM LENGTH OF CABLE, THE LANDFALL CABLE ARMOR WIRE IS PERMANENTLY CONNECTED TO THE ANCHOR BLOCK ONSHORE.
   - Q. THE ABOVE DESCRIPTION IS CONCEPTUAL ONLY. CONTRACTOR SHALL ESTABLISH CABLE INSTALLATION MEANS AND METHODS.

2. TRANSITION JOINT BAY LOCATION IS PRELIMINARY AND SUBJECT TO CHANGE - PREDICATED ON CONTRACTOR MEANS AND METHODS.

3. NORTH & CENTER TRANSITION JOINT BAY (TJB) TO BE 2-FEET BELOW GRADE. SOUTH TJB TO BE 4-FEET BELOW GRADE.



NOTES:
1. FINAL DIMENSIONS TO BE DETERMINED BY CABLE CONTRACTOR WITH COLLABORATION WITH CONTRACTOR AND OWNER
2. EARTHING DESIGN TO BE DONE BY CABLE CONTRACTOR
3. LOCATION OF LINK BOX PIT AND FIBER OPTIC PIT TO BE DETERMINED DURING DETAILED DESIGN. MAY BE LOCATED WITHIN THE TRANSITION JOINT BAY

TYPICAL POST CONSTRUCTION DETAIL

1" = 20'

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CONTRACTOR:

Stantec
Stantec Consulting Services Inc.
400 Crown Colony Drive Suite 200
Quincy, MA U.S.A. 02169-0982

CLIENT:

AVANGRID Offshore Wind
125 High Street
Boston, MA 02110

PROJECT: NEW ENGLAND WIND 2 CONNECTOR

TITLE: DOWSES BEACH
SUBSEA CABLE LANDFALL - GENERAL NOTES

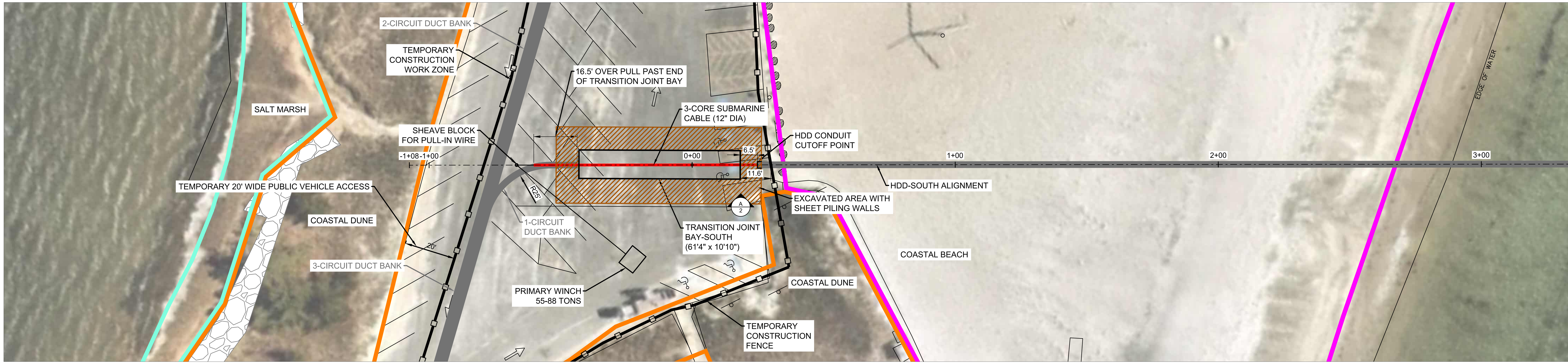
DOC ID: CWW-ECP-STC-DW-0012

SHEET	DWG. NO.	SCALE	FORMAT/SIZE	REV:
2 OF 8	SHEET - 2	AS SHOWN	ANSI D	D

ORIGINAL SHEET - ANSI D

by: millington, dylan

PARKING AREA TO BE USED FOR VEHICLE TURNAROUND WHEN LEAVING SITE



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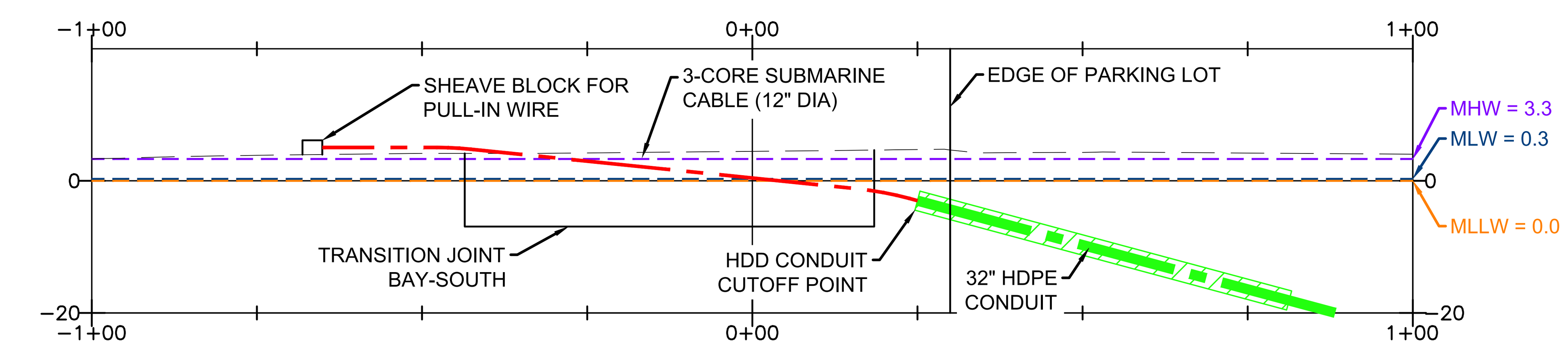

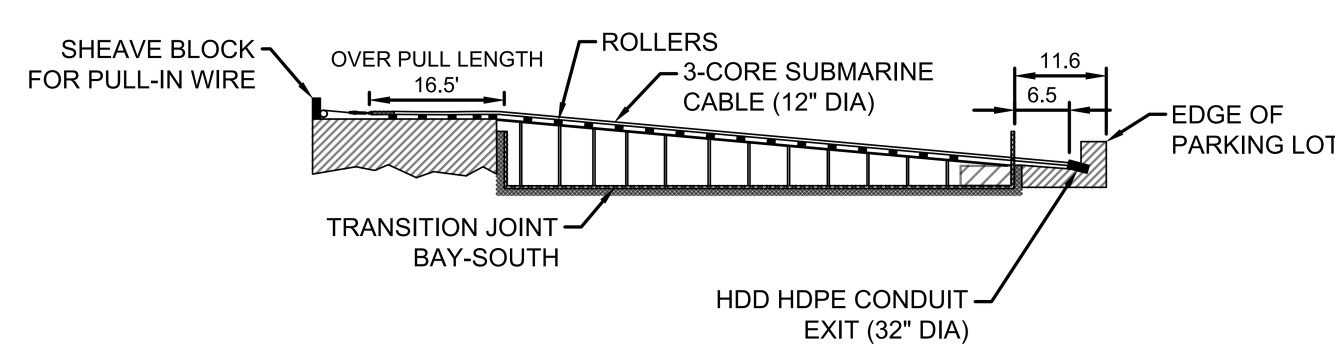

SECTION A

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SCALE: 1" = 100'

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CLIENT:

AVANGRID Offshore Wind
125 High Street
Boston, MA 02110

PROJECT: NEW ENGLAND WIND 2 CONNECTOR

TITLE: DOWSES BEACH SUBSEA CABLE-SOUTH LANDFALL

DOC ID: CWW-ECP-STC-DW-0012

SHEET	DWG. NO.	SCALE	FORMAT/SIZE	REV.
3 OF 8	SHEET – 3	AS SHOWN	ANSI D	D

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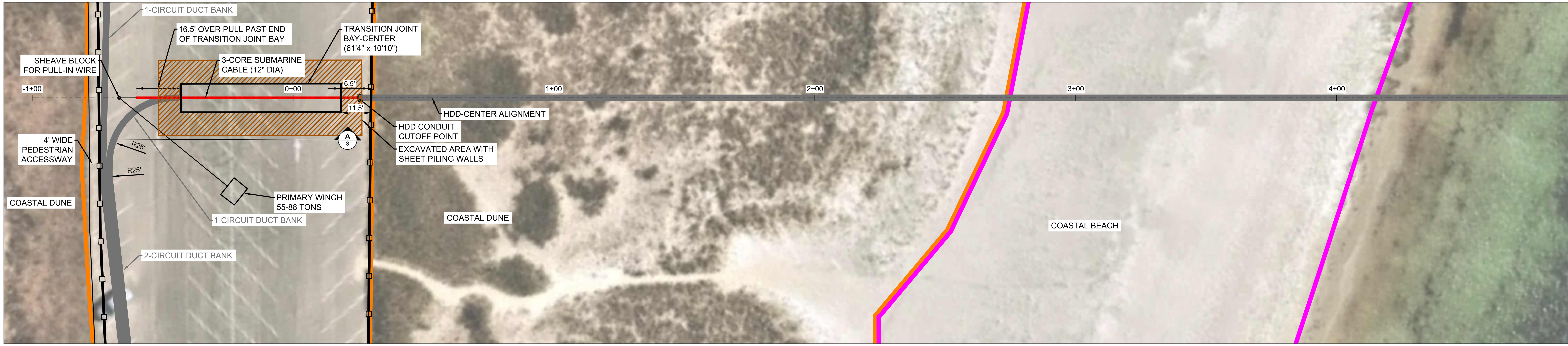

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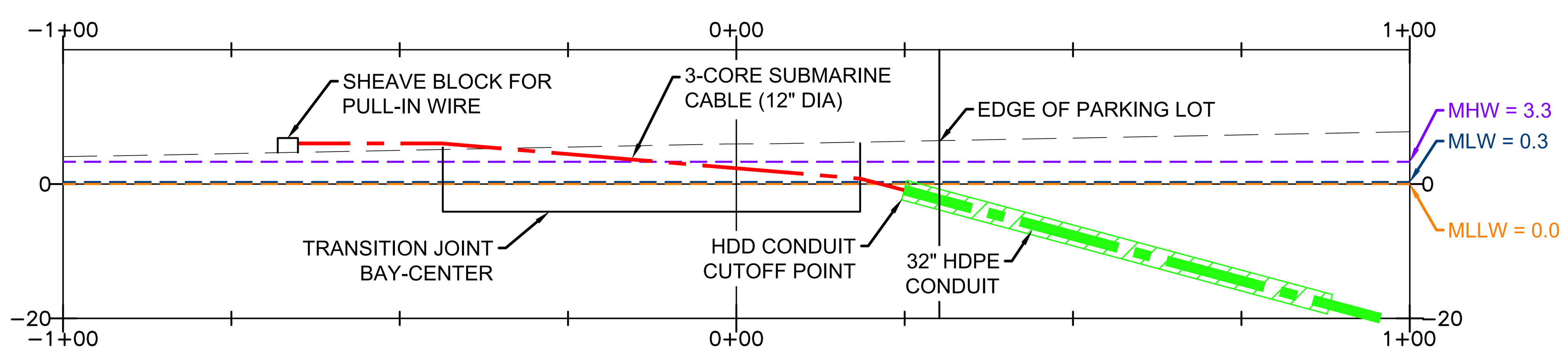

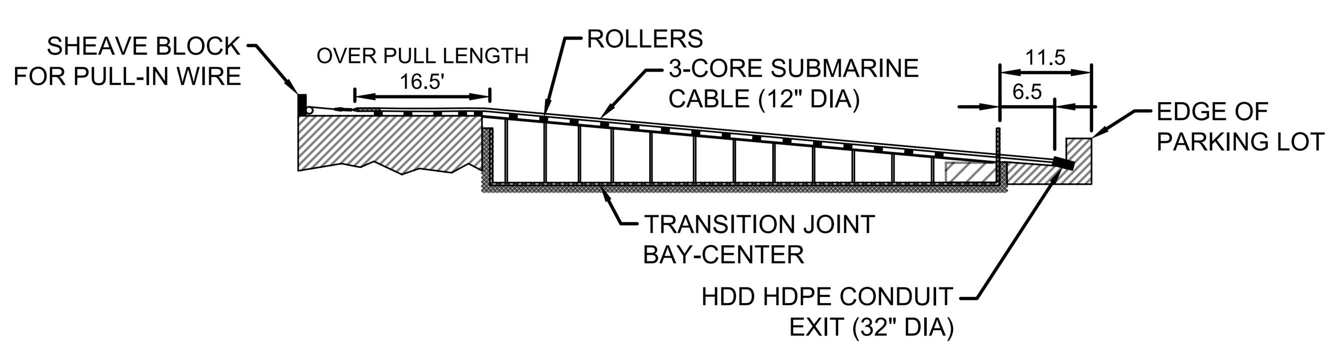

SECTION A

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SCALE: 1" = 100'

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CONTRACTOR:

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Quincy, MA U.S.A. 02169-0982

CLIENT:

AVANGRID Offshore Wind

125 High Street
Boston, MA 02110

PROJECT: NEW ENGLAND WIND 2 CONNECTOR

TITLE: DOWSES BEACH SUBSEA CABLE-CENTER LANDFALL

DOC ID: CWW-ECP-STC-DW-0012

SHEET 4 OF 8	DWG. NO.	SCALE	FORMAT/SIZE	REV:
	SHEET - 4	AS SHOWN	ANSI D	D

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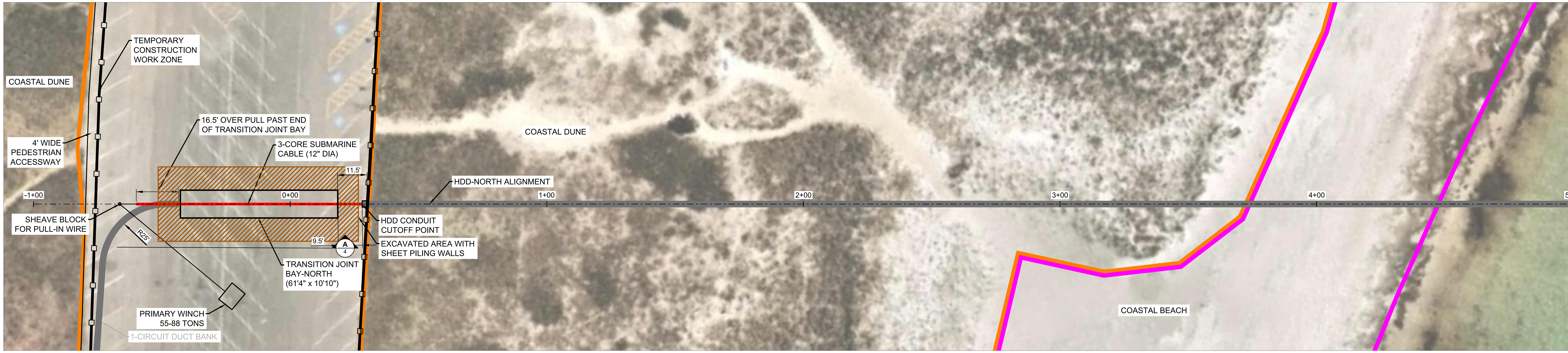

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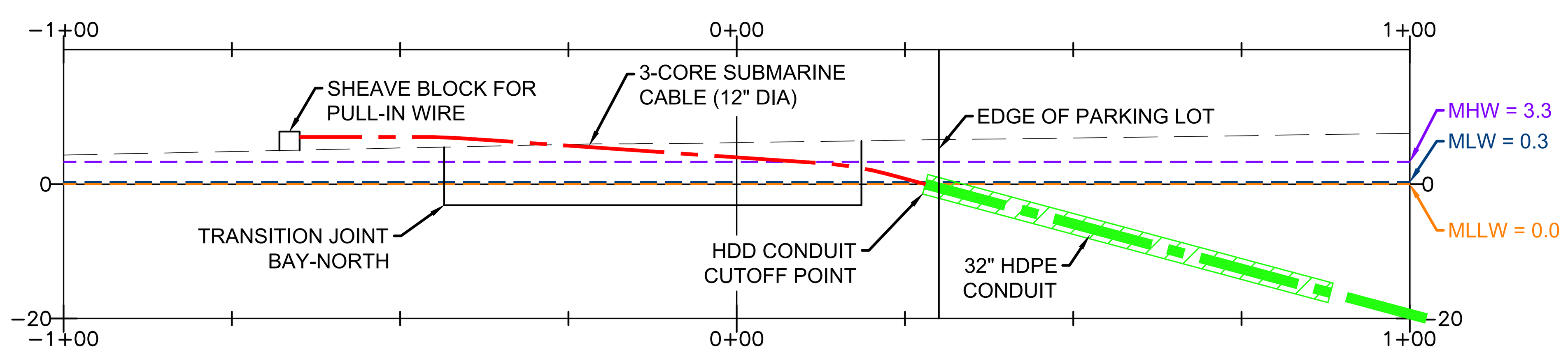

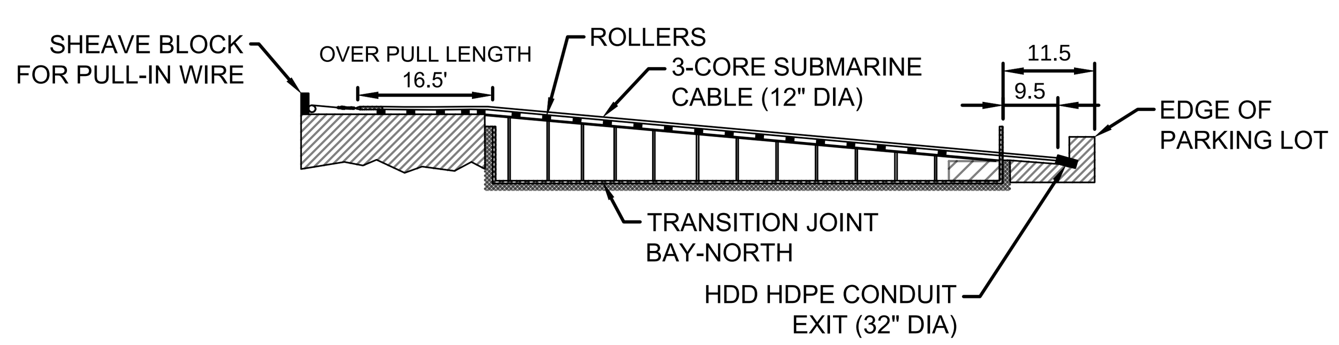

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1" = 20'

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PROJECT: NEW ENGLAND WIND 2 CONNECTOR

TITLE: DOWSES BEACH SUBSEA CABLE-NORTH LANDFALL

DOC ID: CWW-ECP-STC-DW-0012

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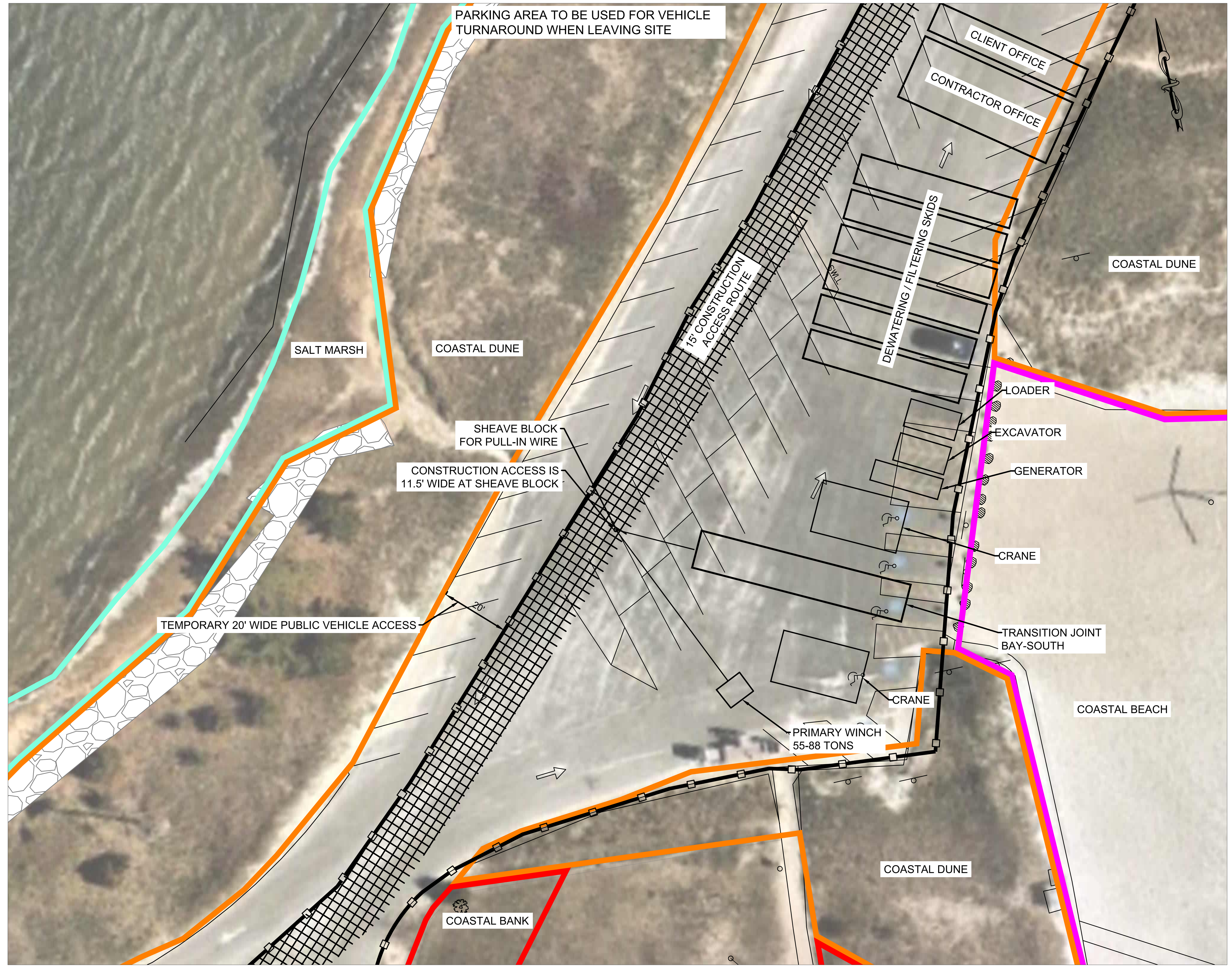
5 OF 8	SHEET - 5	AS SHOWN	ANSI D	D

ORIGINAL SHEET - ANSI D



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125 High Street
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PROJECT
NEW ENGLAND WIND 2 CONNECTOR

TITLE:
DOWSES BEACH
SUBSEA CABLE-SOUTH CONSTRUCTION STAGING

DOC ID:
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SHEET 6 OF 8	DWG. NO.	SCALE	FORMAT/SIZE	REV:
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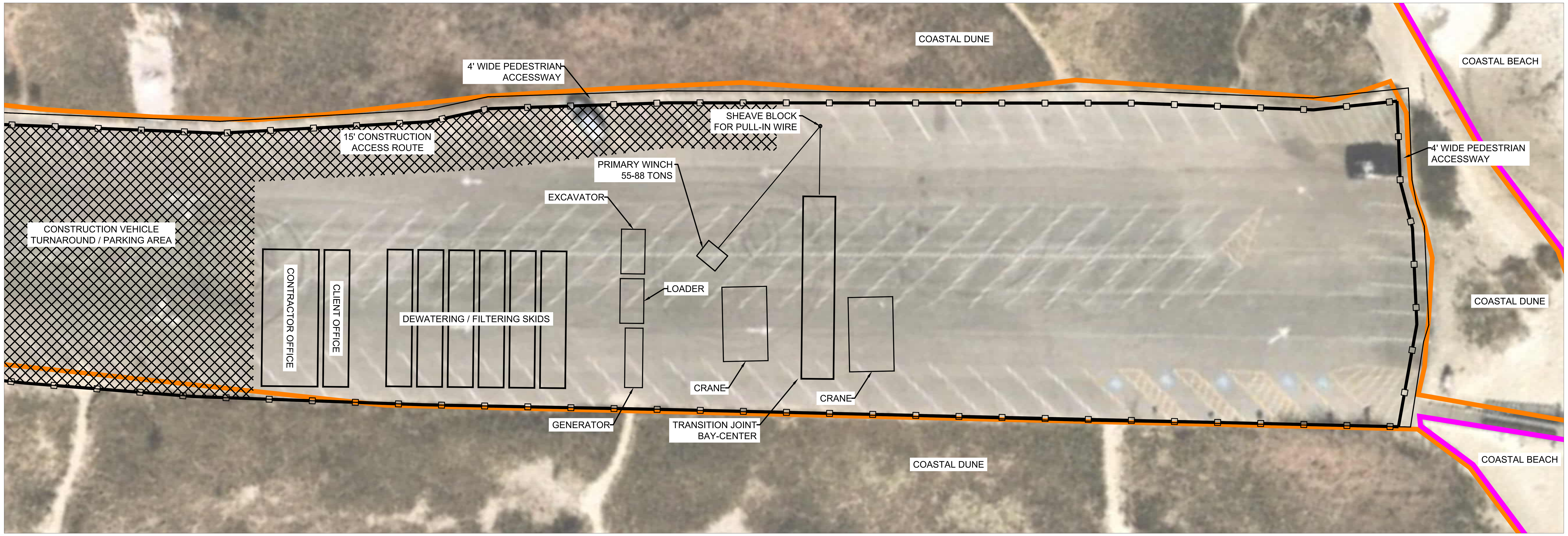

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PROJECT

NEW ENGLAND WIND 2 CONNECTOR

TITLE:

DOWSES BEACH
SUBSEA CABLE-CENTER CONSTRUCTION STAGING

DOC ID: CWW-ECP-STC-DW-0012

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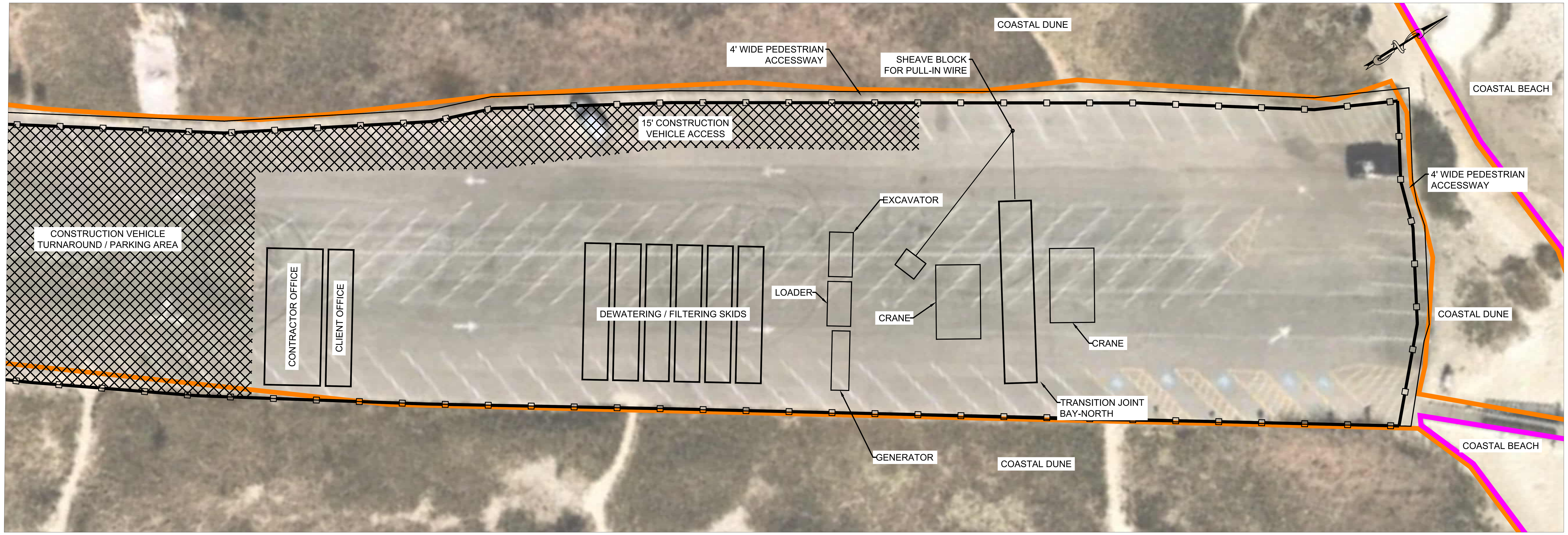

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125 High Street
Boston, MA 02110

PROJECT

NEW ENGLAND WIND 2 CONNECTOR

TITLE:

DOWSES BEACH
SUBSEA CABLE-NORTH CONSTRUCTION STAGING

DOC ID: CWW-ECP-STC-DW-0012

SHEET 8 OF 8	DWG. NO.	SCALE	FORMAT/SIZE	REV:
	SHEET - 8	AS SHOWN	ANSI D	D

Updated Attachment Q2

Coastal Design Memo

Stantec

Memo

To:	Avangrid Offshore Wind / Commonwealth Wind LLC 125 High Street, 6th Floor, Boston, MA 02110	From:	Dan Tatem Stantec Consulting Services Inc. 300 Crown Colony Drive, Suite 110, Quincy, MA 02169
Project/File:	198804104	Date:	August 2, 2023

Reference: Engineering Evaluation of Coastal Storm Modeling Results for Dowses Beach Area

Avangrid Offshore Wind / Commonwealth Wind LLC (Avangrid) engaged environmental consulting company RPS Group (RPS) to model extreme coastal storms to indicate the worst-case potential impacts to the Dowses Beach area, which is proposed to be utilized for the New England Wind 2 Connector/Commonwealth Wind (CWW) Project landfall site and proximate duct bank route. Avangrid subsequently requested Stantec Consulting Services Inc. (Stantec) evaluate the RPS coastal storm modeling results, provide engineering recommendations, and identify potential design enhancements to enable the Project infrastructure to withstand the modeled conditions. This memo outlines the results of Stantec's evaluation.

Interpretation of RPS Data

Modeling results from RPS were used to examine the potential erosion, wave forces, and water levels in the areas where Project infrastructure is proposed. Results of the 2050 storm modeling analysis were used as the basis of the engineering evaluation, since they presented the most severe conditions during the Project design life and, accordingly, would result in the most conservative design.

Figure 1 illustrates modeled worst-case post-storm bed level change (in feet) from the 2050 back-to-back storm event scenario by comparing pre- and post-event ground elevations; negative values indicate erosion, and positive values indicate accretion. Figure 2 presents potential wave forces (lb/ft^2) on a structure using the Goda equation (USACE Coastal Engineering Manual Table VI-5-53) with the modeled peak wave conditions from the 2050 200-year storm event. Proposed structure locations are shown in red. As set forth in the RPS reports, this worst-case storm scenario is extreme and would damage the coastline in many parts of Cape Cod, not just Dowses Beach, and would do so regardless of the project.

Worst-case erosion values along proposed structure locations were modeled to be as high as 8.9 feet (2.7 meters), but this value would be isolated to a single area on the causeway that is likely minimally erodible. At the South Transition Joint Bay, the maximum modeled erosion would be 3.6 feet (1.1 meters). Maximum potential wave forces at proposed structure locations ranged from 250 to 410 lb/ft^2. Additionally, the RPS worst-case modeling indicated that the 2050 200-year storm event water level could potentially reach a maximum of 14.6 feet (4.4 meters) NAVD88, which includes sea level rise, tides, and storm surge. At this elevation, the entire Dowses Beach Area, including its causeway and parking lot, would be submerged.

Reference: Engineering Evaluation of Coastal Storm Modeling Results for Dowses Beach Area

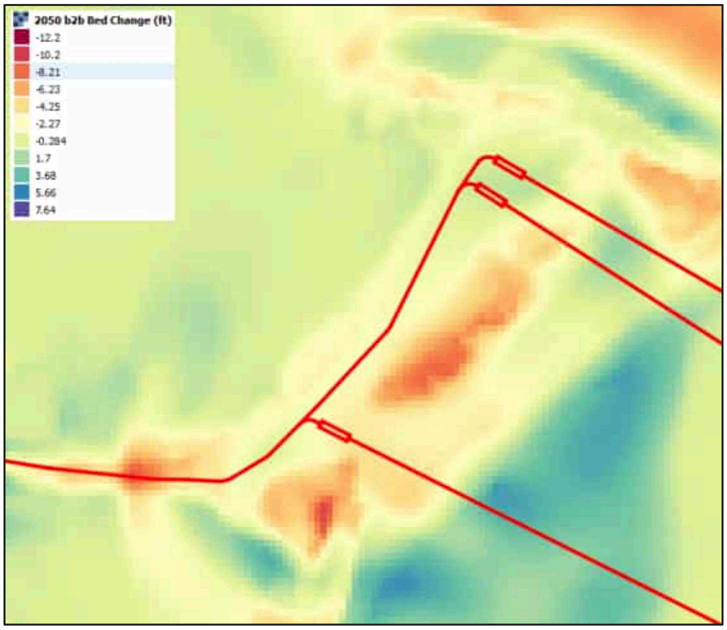


Figure 1 – Bed Level Change, 2050 Back-to-Back Storm Event Scenario

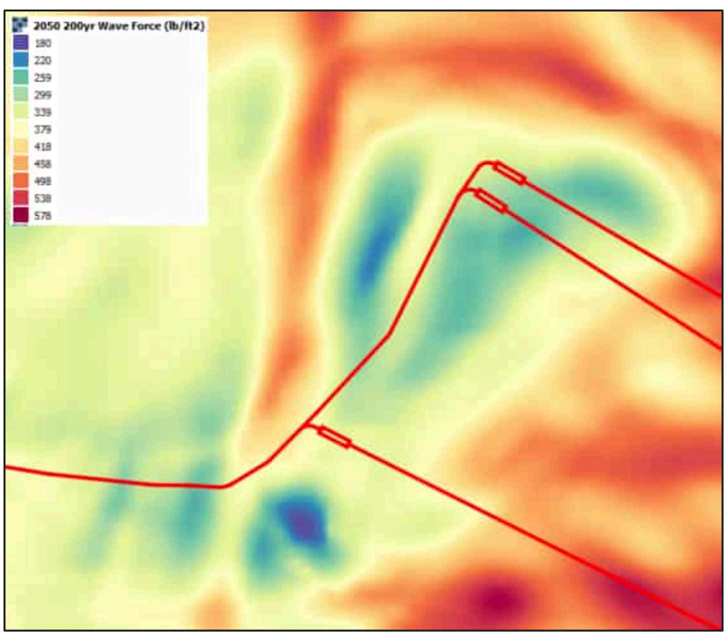


Figure 2 – Maximum Wave Force on Structure, 2050 200-Year Storm Event Scenario

Engineering Evaluation of Infrastructure

Transition Joint Bays in the Paved Parking Lot:

A conservative interpretation of the erosion illustration (Figure 1), indicated the maximum erosion at the South Transition Joint Bay (vault) to be 3-4 feet at the east end of the vault. The North and Center vaults experienced minimal (less than one foot) erosion or accretion. The maximum wave pressure illustration (Figure 2) indicated a force of 400 lb/ft^2 at the vault locations. The vaults included in the Project's current conceptual design were 8.5 feet in height and were placed 2 feet below grade. Each includes two access hatches that will be connected to the vaults by extension collars. The erosion at the southern vault, on the order of 3-4 feet, would expose the top 1 to 2 feet of the vault, during the 2050 storm event.

The vaults are planned to be sourced from a manufacturer as precast concrete structures that will be assembled on-site. These precast vaults will be robust in design with reinforced walls, tops, and bottoms. The vault manufacturer, who will serve as the vault Engineer of Record, will design the vaults and their internal reinforcement for the intended service conditions. Manufacturers will be contacted during the next phase of design to coordinate details.

South Vault – The South Vault design will incorporate the following to accommodate the modeled erosion:

1. Lower the South vault elevation so that the vault top at or below the modeled erosion level.
2. Extend the vault extension collars to the accessways to accommodate this vault elevation change.
3. Anchor the South vault to the bottom seal slab and design the slab to resist floatation uplift forces.
4. Coordinate the vault manufacturer's design to accommodate the hydraulic pressure resulting from the 14.6 feet water level plus the downward wave pressure acting downward on the top of the vault.

The lower vault elevation is not anticipated to worsen storm impacts, as the infrastructure is not expected to be exposed.

North and Center Vaults – The North and Center vaults will be subject to a relatively minor degree of sediment accumulation or minor erosion. The vault manufacture's detail design will need to accommodate the hydraulic pressure resulting from the 14.6 feet water level and accretion. The current vault placement is acceptable to accommodate the modeled storms.

The above design concepts will be further evaluated and refined in the ongoing project design process.

Duct Bank:

The RPS modeling analysis indicates that the duct bank alignment, as initially proposed in the paved parking lot at the landfall site, could potentially experience a maximum of 3 feet of erosion. Assuming the Project typical 3.5 feet installation depth of the current design, the duct bank would not be exposed and, therefore, not subject to lateral wave forces.

The RPS modeled results show that some portions of the Causeway would be exposed to higher degrees of erosion under extreme worst-case storm event conditions. To remedy concerns about these conditions, the duct banks can be either be lowered or fortified as follows:

- Erosion levels up to 7 feet – The Project design has already developed a duct bank detail intended for utility crossings that places the top of the duct bank 7 feet below grade. This design can be implemented for portions of the 3-conduit wide (W) x 4-conduit high (H) duct bank for erosion levels up to 7 feet. The lowered duct bank is not anticipated to worsen storm impacts, as the infrastructure is not expected to be exposed. The deeper excavation for duct bank installation will likely require additional dewatering measures; however, with an appropriate plan in place, the deeper excavation and additional dewatering are feasible.

- Erosion levels greater than 7 feet – RPS modeling identified an isolated potential maximum 8.9-foot erosion depth at the east end of the causeway under extreme worst-case storm event conditions. Since the duct bank cannot be lowered deeper than 7 feet, protection can be provided by permanent steel sheet pile on the sides of the duct bank and a structural concrete top slab just above the duct bank. Refer to Attachment 1.

Duct Bank Transition to Culvert Crossing:

Figure 1 indicates that erosion in the vicinity of the existing causeway, leading to the landfall site, could be a maximum of 3.25 feet; under these conditions, the duct bank, in a 3W x 4H conduit configuration, would not become exposed. However, to cross the existing culvert within the causeway, the duct bank conduit would rise and transition from a 3W x 4H to a 12W x 1H configuration on their approach to the hollow core slabs that bridge over the culvert, and in this location would have a limited depth of cover under the roadway pavement and would become exposed with the maximum modeled erosion. This duct bank transition can be protected from wave forces by an enclosure of PZ40 steel sheet pile walls and a 15 inch cast-in-place top slab. The sheet pile would form permanent sides of the excavation for installing the conduits with customary installation techniques. Once the duct bank construction is completed and any temporary bracing removed, the structural concrete slab would be placed directly on top of the duct bank conduits. As the duct bank rises, as it approaches the bridge crossing, the top of the slab would be just below the bottom of the roadway pavement. The reinforced structural concrete slab will be designed to support roadway traffic loads and be secured by steel angle segments, welded to the sheet pile.

As the conduits achieve the 12W x 1H configuration just before entering the hollow core slabs, the structural slab will be cast around the ducts with reinforcement above and below the conduit. The cross section is similar to the post-tensioning tendons of the hollow core section except that it will be a conventional cast-in-place slab with reinforcement. The cast-in-place slab spans transversely and is supported by the sheet pile sides of the permanent protection. Please refer to Attachment 1 for a graphical depiction of this concept.

The sheet pile would be installed a minimum 20 feet below all excavations. The sheet pile size and required temporary bracing for the construction will be determined during detailed design.

Culvert Crossing:

Over the existing culvert within the causeway, the conduits will be placed in precast concrete hollow core slabs that span over the culvert and will be supported by new pile caps on each side of the culvert. The hollow core slabs and pile cap will form a structure, independent of and not connected to, the existing culvert. The ends of the hollow core slabs would be anchored and secured to the pile cap support with dowels placed between the plank joints and by end blocks on the pile cap to resist lateral and uplift forces.

This new structure would allow for future repairs or replacement of the existing culvert while maintaining the conduits in place.

Conclusion

This memo presents potential conceptual design enhancements to proposed Project infrastructure at the landfall site and along the proximate duct bank route that would enable the project to withstand the maximum modeled erosion, wave pressure forces, and storm surge indicated in the RPS coastal storm modeling analysis. We note that the modeled storm scenarios are extreme and would damage the coastline in many parts of Cape Cod and in Barnstable in particular, not just Dowses Beach. The modeled damage would be caused regardless of the project.

As a conservative measure, results of the 2050 coastal storm modeling analysis were used as the basis of the engineering evaluation, since they presented the most severe conditions modeled during the project design life and, accordingly, would result in the most conservative design. The RPS model results identified the following worst-case conditions to occur during the 2050 storm:

- Erosion Level – as high as 8.9 feet
- Storm Forces – as high as 250 to 400 lb/ft^2
- Water Level (sea level rise, tides, and storm surge) – as high as 14.6 feet

Based on engineering evaluation, the following design upgrades will enable the Project infrastructure to withstand the above modeled conditions:

- Transition Joint Bays – The South Transition Joint Bay will be lowered below the modeled erosion level. This would not worsen storm impacts, as the infrastructure is not expected to be exposed.

  The North and Center Transition Joint Bays are not anticipated to require modification, either in design or placement.

- Duct Bank – Lower duct bank elevation below modeled erosion level, which would not worsen storm impacts, as the infrastructure is not expected to be exposed.
- Duct Bank Transition to Culvert Crossing – Install within sheet pile walls and secure with horizontal cast-in-place structural slabs,
- Culvert Crossing – Anchor and secure ends of the hollow core slabs to the pile cap support with dowels placed between the plank joints and by end blocks on the pile cap to resist lateral and uplift forces.

The above design concepts will be further evaluated and refined as the design progresses.

Reference: Engineering Evaluation of Coastal Storm Modeling Results for Dowses Beach Area

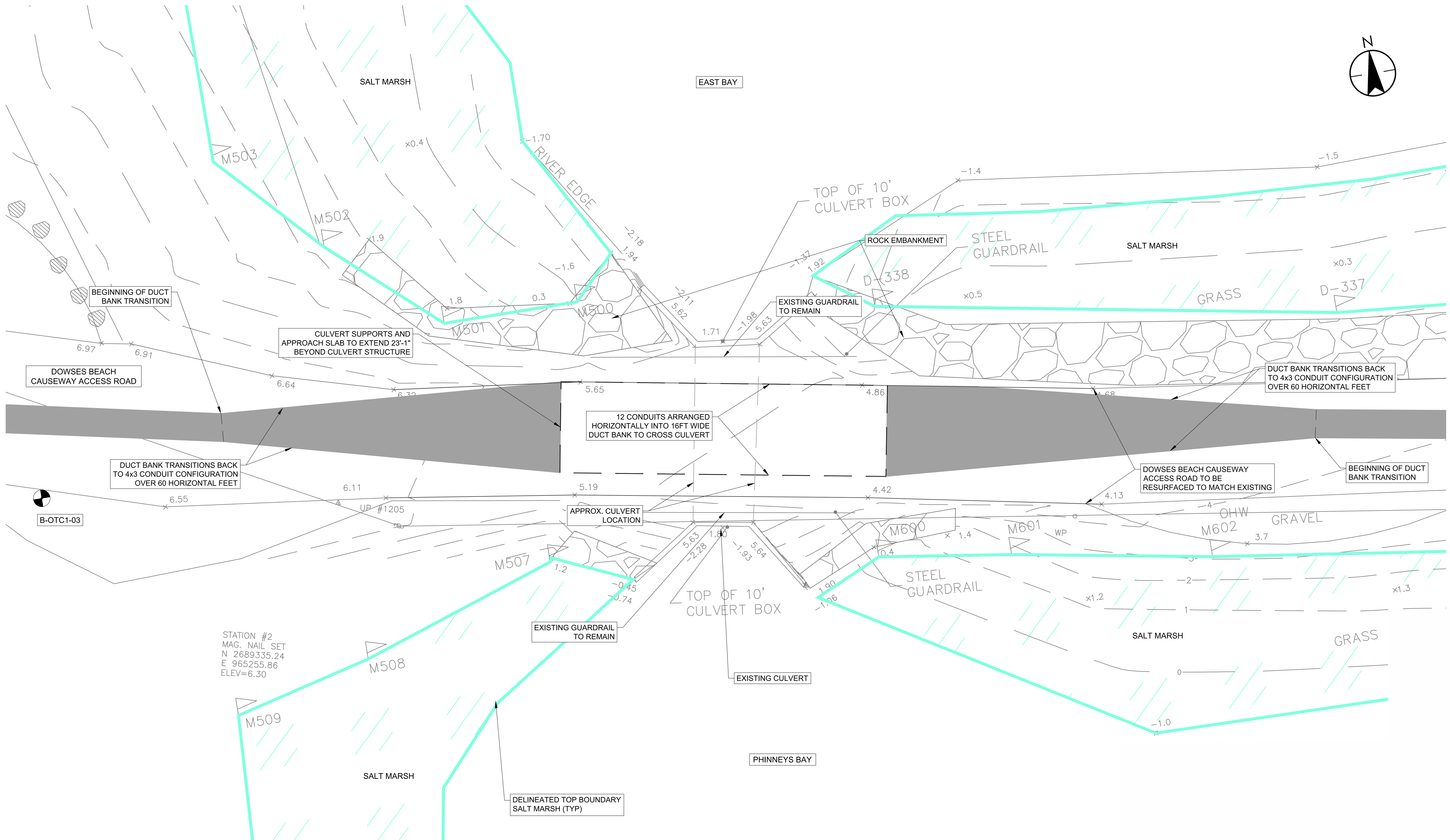
Respectfully,

STANTEC CONSULTING SERVICES INC.

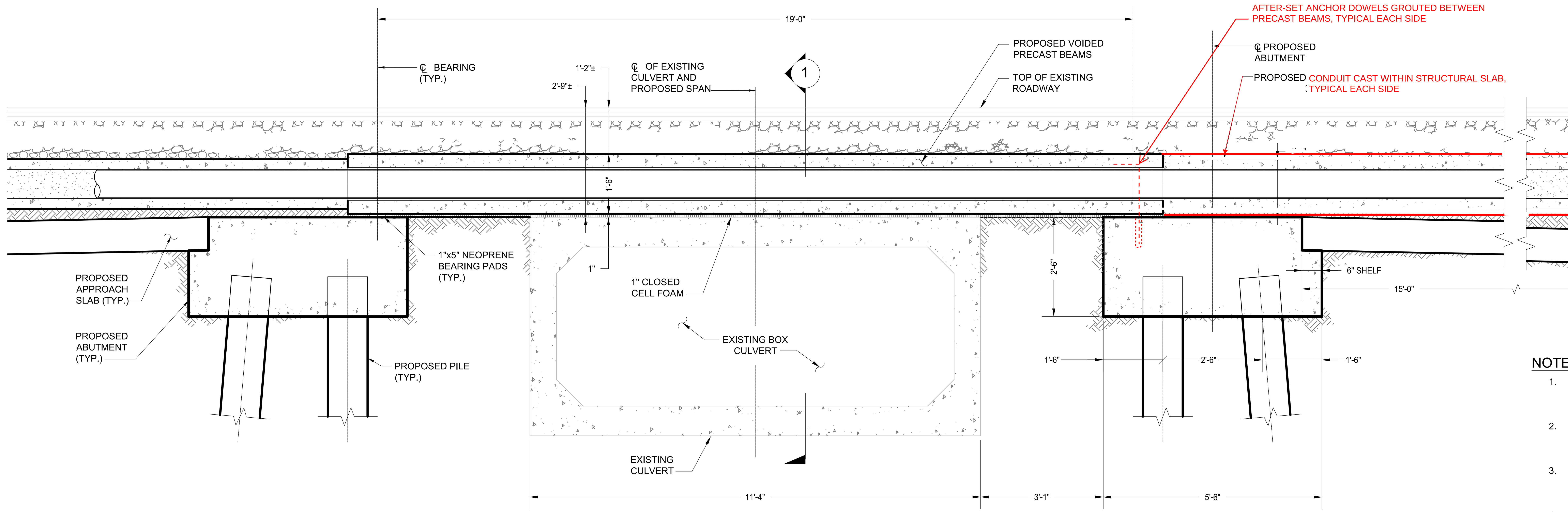
J. Daniel Tatem
Sr. Associate / Civil Lead

Attachment: Attachment 1 – Culvert Crossing & Duct Bank Transition

Attachment 1
Culvert Crossing & Duct Bank Transition



PLAN VIEW
SCALE: 1"=10'

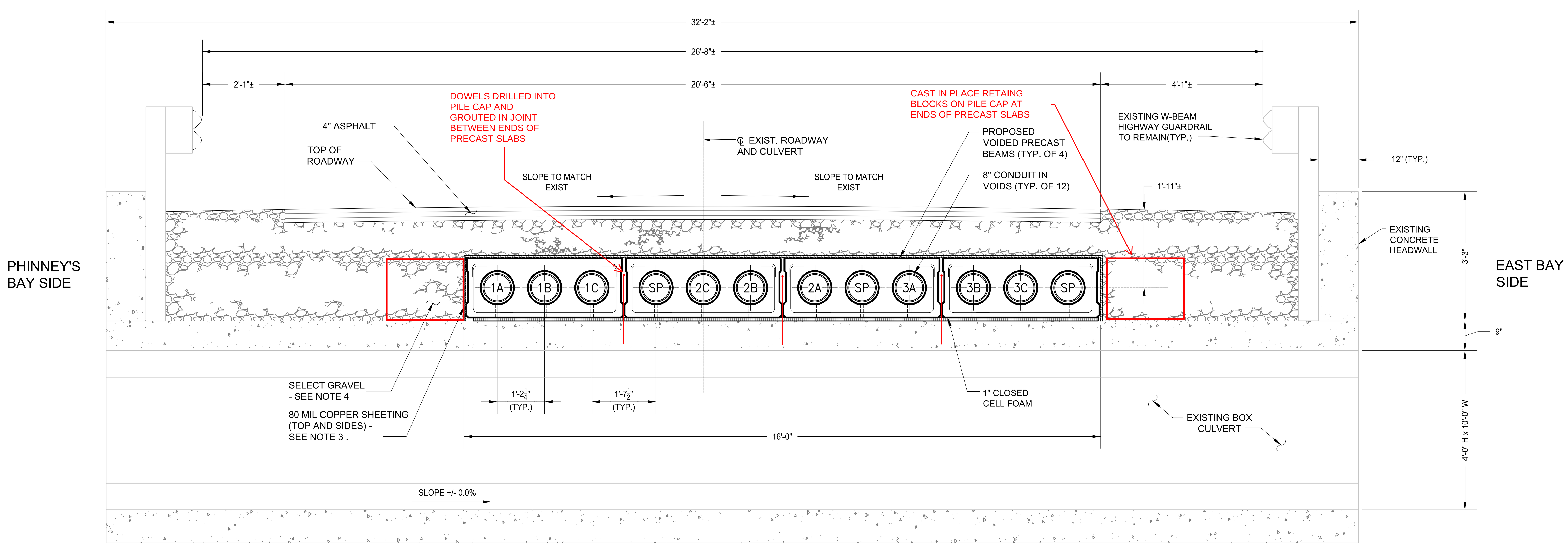


LONGITUDINAL SECTION - PROPOSED STRUCTURE

SCALE: 1"=20"

NOTES:

1. ALL DIMENSIONS OF EXISTING FEATURES WERE OBTAINED FROM FIELD MEASUREMENTS TAKEN ON 2/14/2023.
2. THE CULVERT SLOPE PROVIDED IS FROM DRAFT SITE PLAN AND DETAILS (DATED DECEMBER 2005) AND IS APPROXIMATE.
3. A CONTINUOUS METALLIC SHEET SHALL BE FORMED INTO AN INVERTED "U" SHAPE TO COVER TOP AND SIDES.
4. DETAIL DESIGN TO EVALUATE ANY REQUIREMENT FOR CATHODIC PROTECTION.



1 SECTION AT EXISTING CULVERT CROSSING

SCALE: 1"=20"

FINISH PAVEMENT
15" REINFORCED CONCRETE SLAB WITH TOP AND BOTTOM REINFORCING. BOTTOM BARS AND L WELDED TO SHEET PILE
VARIES
VARIES
DUCT BANK WIDTH AND HEIGHT VARIES ALONG TRANSITION
SECTION AT TYPICAL DUCT BANK
SECTION 1
CONTINUOUS SHEET PILE TO REMAIN IN PLACE
60'-0"
END OF TRANSITION
FLAT CONDUIT CROSSING OVER BOX CULVERT
START OF TRANSITION
END OF 3 OVER 4 DUCTBANK
11'-10 3/4"
PLAN
FINISH PAVEMENT
CAST IN PLACE REINFORCED SLAB WITH CONDUIT EMBEDED
SHEET PILE
L WELDED TO SHEET PILE FOR SLAB SUPPORT, TYP
BOTTOM BAR WELDED TO SHEET PILE, TYP
SHEET PILE
SECTION AT FACE OF HOLLOW CORE PLANK
SECTION 3
FINISH PAVEMENT
THICKENED CAST IN PLACE REINFORCED SLAB WITH CONDUIT EMBEDED
SHEET PILE
SHEET PILE
L WELDED TO SHEET PILE FOR SLAB SUPPORT, TYP
BOTTOM BAR WELDED TO SHEET PILE, TYP
SECTION AT TRANSITION FROM CONDUIT BELOW TO WITHIN REINFORCED SLAB
SECTION 2
CONDUIT IN DUCT BANK WITH STRUCTURAL SLAB ABOVE
THICKENED SLAB WITH REINFORCING TOP AND BOTTOM AND CONDUIT WITHIN SLAB
60'-0"
FLAT CONDUIT CROSSING OVER BOX CULVERT
START OF TRANSITION
END OF TRANSITION
GRADE
0.00
END OF 3 OVER 4 DUCTBANK
BRIDGE CROSSING
-2.00
DUCTBANK CENTERLINE
-4.25
SEC 2
SEC 3
SEC 1
ELEVATION
ORIGINAL SHEET - ANSI D