

## Vineyard Wind Terrestrial Archaeological Resources Area of Potential Effect (APE) March 8, 2019

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The Area of Potential Effect (APE) for terrestrial archaeological resources includes areas potentially impacted by any ground disturbing activities. For the terrestrial archaeological resources, the APE is presented as a conservative estimate and includes the Landfall Sites, underground cable routes, the substation site and equipment laydown areas. The depth and breadth of potential ground disturbing activities is described below for each location. Selected plans and figures are also included in Attachments 1-4 to provide a visual representation of the APE.

### Landfall Site - Covell's Beach (Preferred Route)

The APE for the Covell's Beach landfall site is specified as follows. At the Covell's Beach landfall site, the horizontal directional drilling (HDD) rig and its supporting equipment will occupy approximately 0.8 acres of the paved staging area in the eastern end of the two acre Covell's Beach parking lot. As shown on Sheets 15-17 in Attachment 1, the following Project elements will require excavation into the parking lot:

1. At the upper end of the parking lot, two transitional cable joint bays (one per landfall power cable), each approximately 6 m wide by 18.9 m long (20 feet (ft) wide by 62 ft long) by 2 m (6.5 ft) deep.
2. Immediately adjacent to each joint bay, two fiber optic cable vaults (one fiber optic cable per landfall power cable), each approximately 1.8 m (6 ft) long by 1.2 m (4 ft) wide by 1.5 m (5 ft) deep.
3. Approximately 9.1 m (30 ft) from the seaward edge of the parking lot, two HDD entry pits (one per landfall cable duct), each approximately 1.5 m (5 ft) wide by 1.5 m (5 ft) long by 1 m (3.3 ft) deep.
4. From each temporary HDD entry pit, a 46 cm – 76 cm (18-30 inch) diameter High-Density Polyethylene (HDPE) pipe with a ground disturbance diameter of 91 cm (36 inches) will be installed via HDD for use in housing the export cables which will intersect with the onshore cable route. As shown on the attached Figure 1-5 in Attachment 1, HDPE conduits will run beneath the parking lot, beach and intertidal zone, emerging at an exit point approximately 305 m (1,000 ft) offshore. The HDD conduit will be approximately 6.7 m (22 ft) beneath the middle of the beach; and at its deepest point, the conduit will be approximately 9.1 m (30 ft) below the seafloor.
5. Between the HDD entry pit and the joint bay, the two export cables will be installed in open trenches measuring approximately 1.8 m (6 ft) in depth, 1.2 m (4 ft) in width at the bottom and 2.4 m (8 ft) in width at the top.
6. After the export cables leave the two joint bays, they will be housed inside the proposed concrete encased duct bank of 8 ducts in a 4 x 2 array (6 for cables + 2 spares). Overall

concrete duct bank width will be 1.5 m (5 ft) and overall duct bank height will be 0.8 m (2.5 ft). The duct bank leaving Covell's Beach will be installed with 0.9 m (3 ft) of cover in an open trench with approximate trench depth of 1.7 m (5.5 ft) and approximate trench width (at the top) of 3 m (10 ft). The duct bank will leave the paved parking area, cross a short segment of unpaved area between Craigville Beach Road and the northwest corner of the parking lot. The duct bank will then follow roadways, and the dimensions will be as described below under "Onshore Cable Routes."

#### Landfall Site - New Hampshire Avenue (Noticed Alternative Route)

The Proponent is proposing open-trenching at the New Hampshire Avenue Landfall Site, but is maintaining a short HDD as an alternative approach. Both options are described below.

As shown on Sheet 16 in Attachment 2, at the New Hampshire Avenue Landfall Site, the in-water work area for open trenching would be enclosed with temporary sheet piling and is approximately 9.1 m (30 ft) wide and extending up to 61 m (200 ft) from shore, with a maximum depth of approximately 6.1 m (20 ft) mean sea level. A landfall transition vault would be located approximately 39.6 m (130 ft) from the landward edge of the sea wall; the vault's expected outer dimensions are 10.8 m (35.5 ft) long by 2.8 m (9.5 ft) wide by 2.9 m (9.5 ft) tall. Each landfall cable would be installed in a 46 cm – 76 cm (18-30 inch) HDPE conduit with a ground disturbance diameter of 91 cm (36 inches) that would be trenched in from the in-water work area to the landfall transition vault; the trench dimensions for these two transfer conduits will be about 2.4 m (8 ft) in depth, 1.2 m (4 ft) in width at the bottom and 2.4 m (8 ft) in width at the top. Landward of the transition vault, the dimensions for cable installation will be as described below under "Onshore Cable Routes."

If HDD were to be used at the New Hampshire Avenue Landfall Site instead of open trenching, the HDD rig and its supporting equipment will be set up using an up to 0.25-acre staging area near the southernmost end of New Hampshire Avenue. As shown on Sheet 18 in Attachment 2, the HDD would extend approximately 91.4 m (300 ft) offshore (total length of approximately 126 m [415 ft] long), with a 46 cm – 76 cm (18-30 inch) HDPE conduit with a ground disturbance diameter of 91 cm (36 inches) and a maximum depth of 4 m (13 ft) below mean sea level. A landfall transition vault (as described in the preceding paragraph) will be installed near the landward end of the HDD. Landward of the transition vault, the dimensions for cable installation will be as described below under "Onshore Cable Routes."

#### Cable Routes - Covell's Beach (Preferred Route)

The APE for the preferred onshore cable route associated with the Covell's Beach Landfall Site is the Town of Barnstable right-of-way along the proposed onshore cable route (shown on Figure 1-2 in Attachment 4). As described further below, the disturbance within the right-of-way will range from 3.4 m (11 ft) wide and 2.4 m (8 ft) deep for the typical trench width to install the duct bank, or up to 10.9 m (36 ft) wide and 3.7 m (12 ft) deep where splice vaults are necessary. Both the duct bank and the splice vaults may be installed anywhere within the Town of Barnstable right-of-way; therefore,

the entire right-of-way along the onshore export cable route is considered the APE, though only a portion of the right-of-way will actually be disturbed.

At either the Preferred Route or Noticed Alternative (described in the following section), the proposed underground cable routes will be installed within HDPE or PVC pipes or sleeves encased in concrete duct banks connecting from the selected Landfall site to the Substation site. The proposed duct banks will be formed using cast-in-place concrete installed in open trenches measuring approximately 2.4 m (8 ft) in depth, 1.8 m (6 ft) in width at the bottom and 3.4 m (11 ft) in width at the top. Existing conditions within paved roadways will dictate the orientation of the duct bank, which will be either: 0.8 m (2.5 ft) wide by 1.5 m (5 ft) deep or 1.5 m (5 ft) wide by 0.8 m (2.5 ft) deep. In locations where splice vaults are necessary, the excavated area will be larger, approximately 11 m (36 ft) wide by 15.2 m (50 ft) long and 3.7 m (12 ft) deep, to accommodate pairs of pre-cast concrete splice vaults, which typically are 2.9 m (9.5 ft) wide by 10.8 m (35.5 ft) long and up to 2.9 m (9.5 ft) deep (outer dimensions). Thus, the maximum extent of disturbance within the APE (the Town of Barnstable right-of-way along the onshore cable route) is 11 m (36 ft) wide and 3.7 m (12 ft) deep.

The Preferred Route also includes Variant 1 along a utility ROW. This Variant would include the same dimensions for the duct banks or the splice vaults that are described in the preceding paragraph. For the purposes of defining the APE, an area of potential ground disturbance measuring 3.7 m (12 ft) in depth and 11 m (36 ft) in width for the entirety of Variant 1 should be considered the APE.

#### Cable Routes - New Hampshire Avenue (Noticed Alternative Route)

The APE for the alternative onshore cable route associated with the New Hampshire Avenue Landfall Site is the Town of Yarmouth and/or Town of Barnstable right-of-way along the proposed onshore cable route (shown on Figure 1-2 in Attachment 4). As described in the previous section for Covell's Beach, the disturbance within the right-of-way will range from 3.4 m (11 ft) wide and 2.4 m (8 ft) deep for the typical trench width to install the duct bank, or up to 10.9 m (36 ft) wide and 3.7 m (12 ft) deep where splice vaults are necessary. Both the duct bank and the splice vaults may be installed anywhere within the Town of Yarmouth and/or Town of Barnstable right-of-way; therefore, the entire right-of-way along the onshore export cable route is considered the APE, though only a portion of the right-of-way will actually be disturbed.

The Noticed Alternative Route also includes portions that are unpaved or do not have a defined roadway right-of-way; and all or parts of Variants 2, 3, and 5 are either unpaved or do not have a defined roadway right-of-way. For the purposes of defining the APE for areas without a defined roadway right-of-way, an area of potential ground disturbance measuring 3.7 m (12 ft) in depth and 11 m (36 ft) in width should be considered the APE.

#### Substation Site

The APE for the Substation site is 5.9 acres of the total 6.35 acre site with a maximum ground disturbance of 4.6 m (15 ft) below the high peak of existing grade for the entirety of the roughly 5.9-acre area. The same substation site would be used regardless of the Landfall Site and onshore route

chosen. Approximately 5.9 acres of the substation site will be cleared and graded; this proposed land clearing is limited only to what is needed to accommodate the substation. To complete finished site grades, and to balance earth cuts and fills, several retaining walls will be required and excavation for and construction of these walls will be required as part of completing the site grading effort. Construction at the substation site will also require excavation of areas required for major component foundations/footings and full volume containment, excavation of the drainage swales and basins required for site drainage, and excavation of the trench for the portions of the duct bank within the substation site. As shown on Sheet 4 in Attachment 3, ground disturbing activities will vary across the site and are anticipated to be a maximum of 4.6 m (15 ft) below the high peak of existing grade for the entirety of the roughly 5.9-acre area.

#### Equipment Laydown and Staging Areas – Covell’s Beach Landfall Site to Substation (Preferred Route)

Equipment laydown and staging areas will be set up along the proposed routes.

As mentioned previously, for the Covell’s Beach landfall site, the HDD rig and its supporting elements will be set up using an approximately 0.8 acre staging area in the eastern end of the two-acre paved Covell’s Beach parking lot. Additional staging areas may be necessary along the onshore export cable route. Any additional staging areas will either be paved or, if unpaved, will be previously-established, well-known staging areas that are already used to support construction projects. Within these established staging areas, no excavation or vegetation clearing will be required. It is expected that, if additional staging areas are used, they will temporarily store items such as typical roadway construction equipment (excavators, backhoes, dump trucks, etc.), lengths of pipe, framing/support materials, etc. Since any additional unpaved staging areas used will be existing, previously-established staging areas that are used for multiple projects, it is not expected that these staging areas need to be considered part of the specific APE for the Vineyard Wind Project.

#### Equipment Laydown and Staging Areas – New Hampshire Avenue Landfall Site to Substation (Noticed Alternative Route)

As mentioned previously, for the New Hampshire Avenue Landfall Site, the HDD rig and its supporting elements will be set up using an up to 0.25-acre staging area near the southernmost end of New Hampshire Avenue (as shown on Sheet 18 and on Sheet entitled “Proposed Rig Side HDD Equipment Layout (Horizontal Directional Drilling) New Hampshire Ave” in Attachment 2). For existing paved areas such as those mentioned for the Landfall Sites, no ground disturbance is expected at equipment laydown and staging areas.

As shown on Sheet 10 in Attachment 2, an equipment staging area with dimensions of approximately 0.22 acres (19.5 m [64 ft] wide by 45.7 m [150 ft] long by <0.3 m [1 ft] deep) is also proposed along the inactive extension of Higgins Crowell Road where a MassDOT bike path parking lot is proposed. As shown on Sheet 12 in Attachment 2, two additional staging areas are town-owned parcels within the Eversource ROW that while partially disturbed from the existing utility line, are unpaved. These areas are approximately 0.6 acres in size (Area 3 is approximately 22.9 m [75 ft] wide by 113 m [370 ft] long and Area 4 is approximately 30 m [100 ft] wide by 84 m [275 ft] long) and may require

minimal grading for level storage of materials. For unpaved equipment areas, the depth of potential disturbance is expected to be a maximum of 0.3-0.9 m (1-3 ft).

### GIS Files

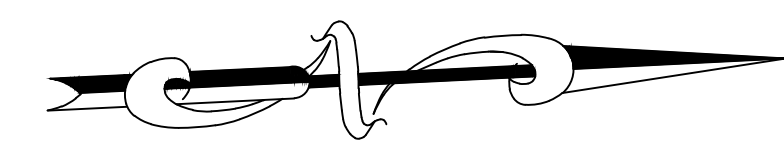
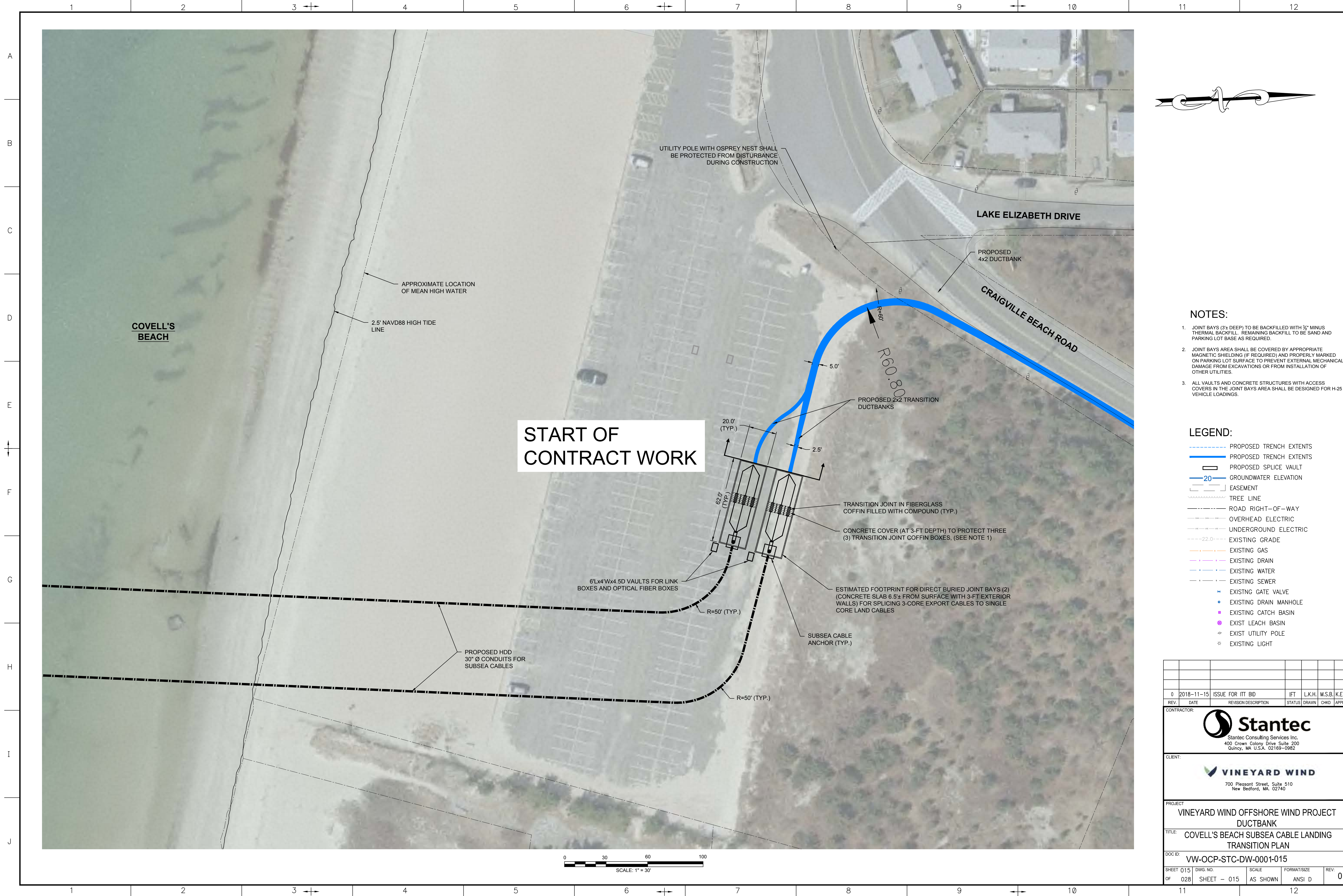
GIS files for all onshore routes and variants are attached. GIS files for the defined roadway rights-of-way where present along the onshore cable routes are also attached.

**Attachment 1**

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Selected Plans - Covell's Beach Landfall Site



**NOTES:**

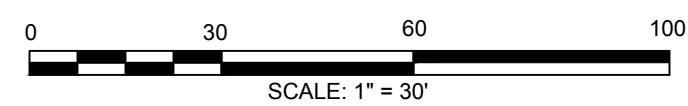
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2. JOINT BAYS AREA SHALL BE COVERED BY APPROPRIATE MAGNETIC SHIELDING (IF REQUIRED) AND PROPERLY MARKED ON PARKING LOT SURFACE TO PREVENT EXTERNAL MECHANICAL DAMAGE FROM EXCAVATIONS OR FROM INSTALLATION OF OTHER UTILITIES.
3. ALL VAULTS AND CONCRETE STRUCTURES WITH ACCESS COVERS IN THE JOINT BAYS AREA SHALL BE DESIGNED FOR H-25 VEHICLE LOADINGS.

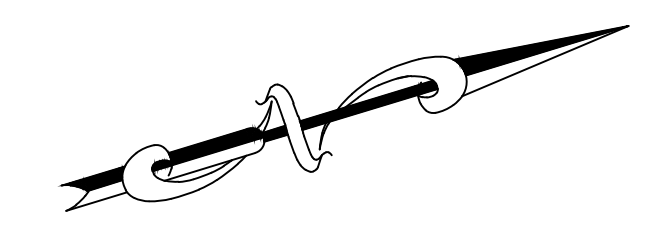
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- PROPOSED TRENCH EXTENTS
- 20--- GROUNDWATER ELEVATION
- EASEMENT
- TREE LINE
- ROAD RIGHT-OF-WAY
- OVERHEAD ELECTRIC
- UNDERGROUND ELECTRIC
- 22.0--- EXISTING GRADE
- EXISTING GAS
- EXISTING DRAIN
- EXISTING WATER
- EXISTING SEWER
- EXISTING GATE VALVE
- EXISTING DRAIN MANHOLE
- EXISTING CATCH BASIN
- EXIST LEACH BASIN
- EXIST UTILITY POLE
- EXISTING LIGHT

**START OF CONTRACT WORK**

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REV.	DATE	REVISION DESCRIPTION	STATUS	DRAWN	CHKD	APPRVD
CONTRACTOR:						
 <b>Stantec</b> Stantec Consulting Services Inc. 400 Crown Colony Drive Suite 200 Quincy, MA U.S.A. 02169-0982						
CLIENT:						
 <b>VINEYARD WIND</b> 700 Pleasant Street, Suite 510 New Bedford, MA, 02740						
PROJECT						
VINEYARD WIND OFFSHORE WIND PROJECT						
DUCTBANK						
TITLE:						
COVELL'S BEACH SUBSEA CABLE LANDING						
TRANSITION PLAN						
DOC ID:						
VW-OC-PTC-DW-0001-015						
SHEET 015	DWG. NO.	SCALE	FORMAT/SIZE	REV.		
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- LEGEND:**
- PROPERTY LINE
  - CONSTRUCTION FENCE

- NOTES:**
1. 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.
  2. 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.
  3. 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 328 FEET. FINAL DESIGN OF ALL HDD DRILLPATHS WILL BE COMPLETED BY THE HDD CONTRACTOR FOR REVIEW BY VINEYARD WIND.

REV.	DATE	REVISION DESCRIPTION	STATUS	DRAWN	CHKD	APPRVD
0	2018-11-15	ISSUE FOR ITT BID	IFT	L.K.H.	M.S.B.	K.E.F.

CONTRACTOR:

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

CLIENT:

VINEYARD WIND  
700 Pleasant Street, Suite 510  
New Bedford, MA, 02740

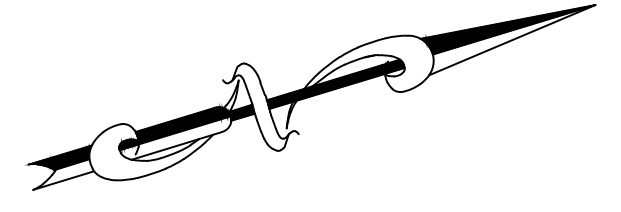
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DUCTBANK

TITLE: COVELLS BEACH LANDING HDD LAYOUT - DRILL PATH 1

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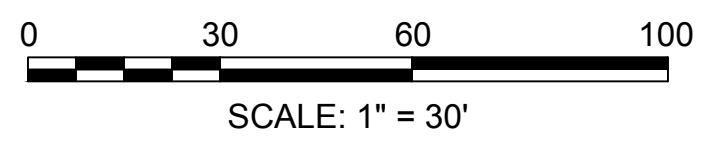
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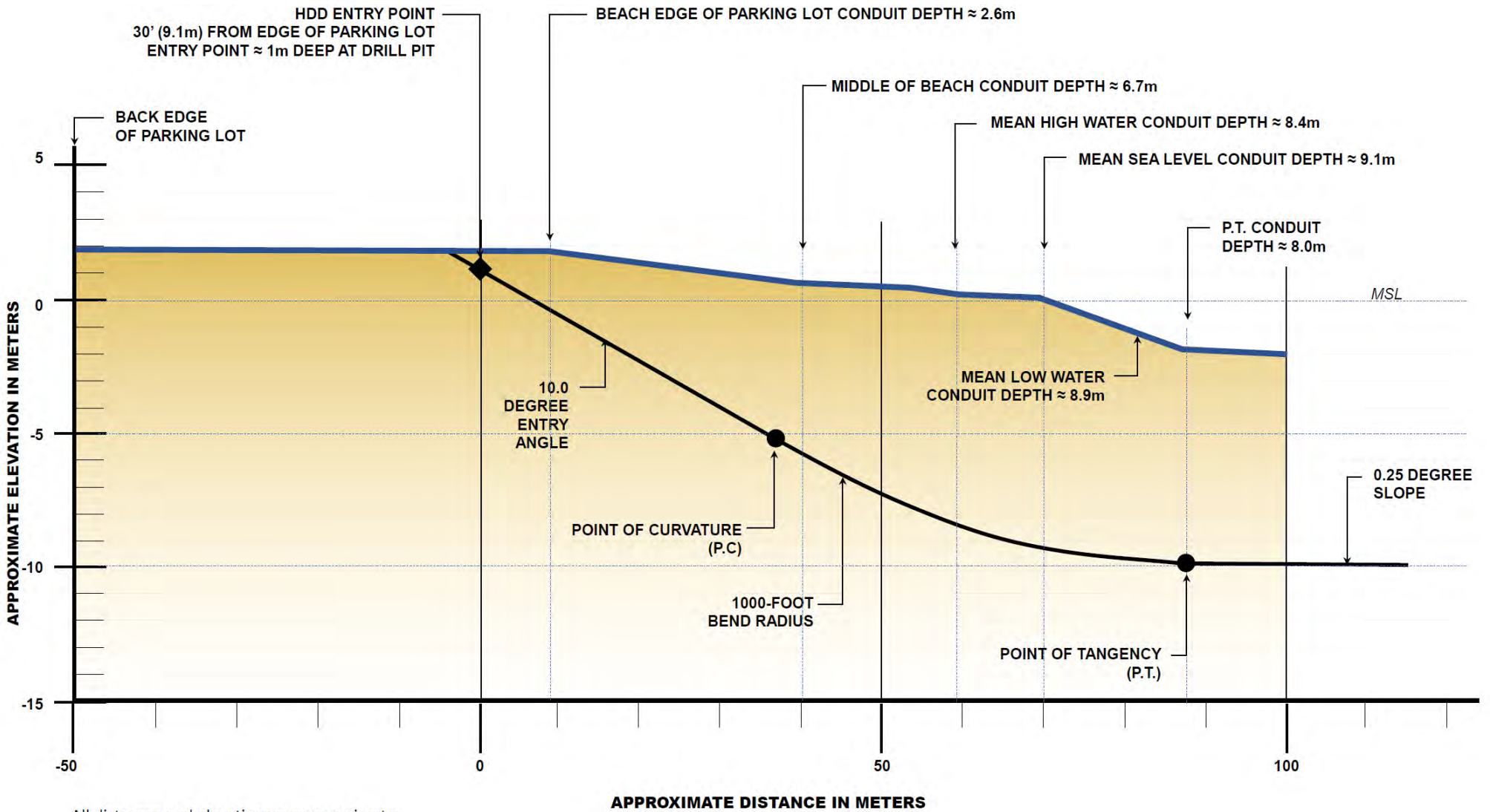


- LEGEND:**
- — — — — PROPERTY LINE
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- NOTES:**
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  2. UTILITIES LOCATIONS ARE UNKNOWN. ANY EXISTING UTILITIES MUST BE LOCATED PRIOR TO CONSTRUCTION BY CALLING DIG SAFE PRIOR TO EXCAVATION AND EXPOSING ANY EXISTING UTILITIES AS NEEDED. REQUIRED CLEARANCES SHALL BE PROVIDED FOR ANY EXISTING OVERHEAD UTILITIES.
  3. 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 328 FEET. FINAL DESIGN OF ALL HDD DRILLPATHS WILL BE COMPLETED BY THE HDD CONTRACTOR FOR REVIEW BY VINEYARD WIND.



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CLIENT:							
 700 Pleasant Street, Suite 510 New Bedford, MA, 02740							
PROJECT							
VINEYARD WIND OFFSHORE WIND PROJECT DUCTBANK							
TITLE:							
COVELLS BEACH LANDING HDD LAYOUT - DRILL PATH 2							
DOC ID:							
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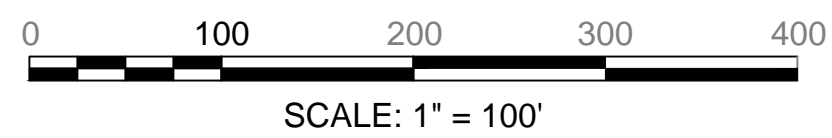
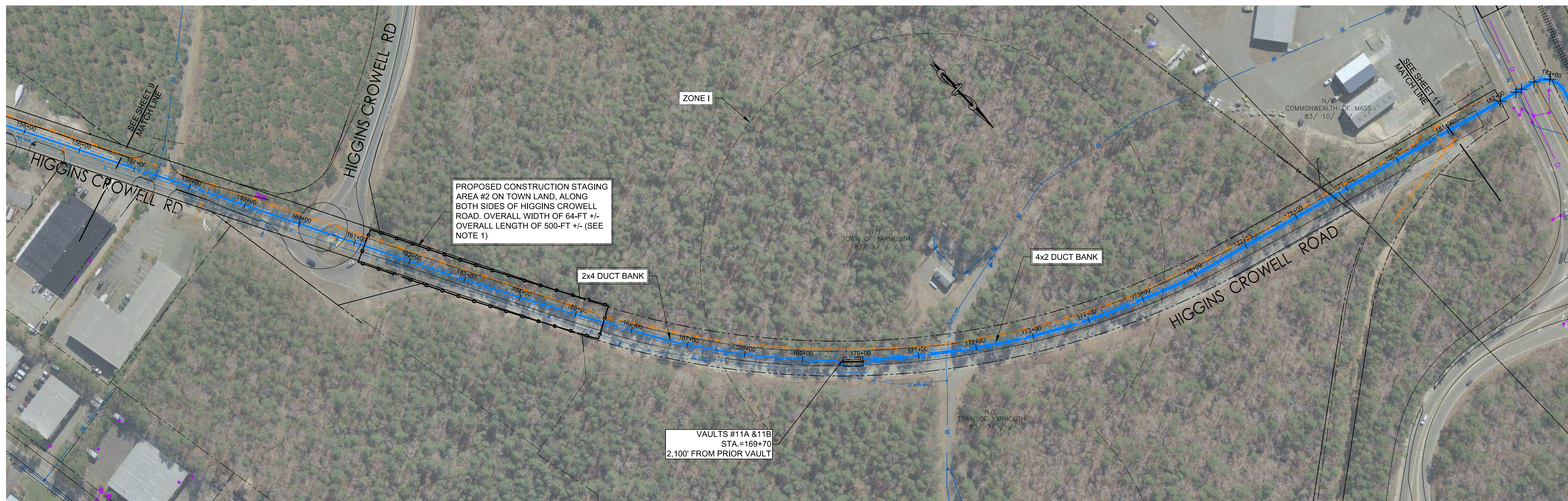
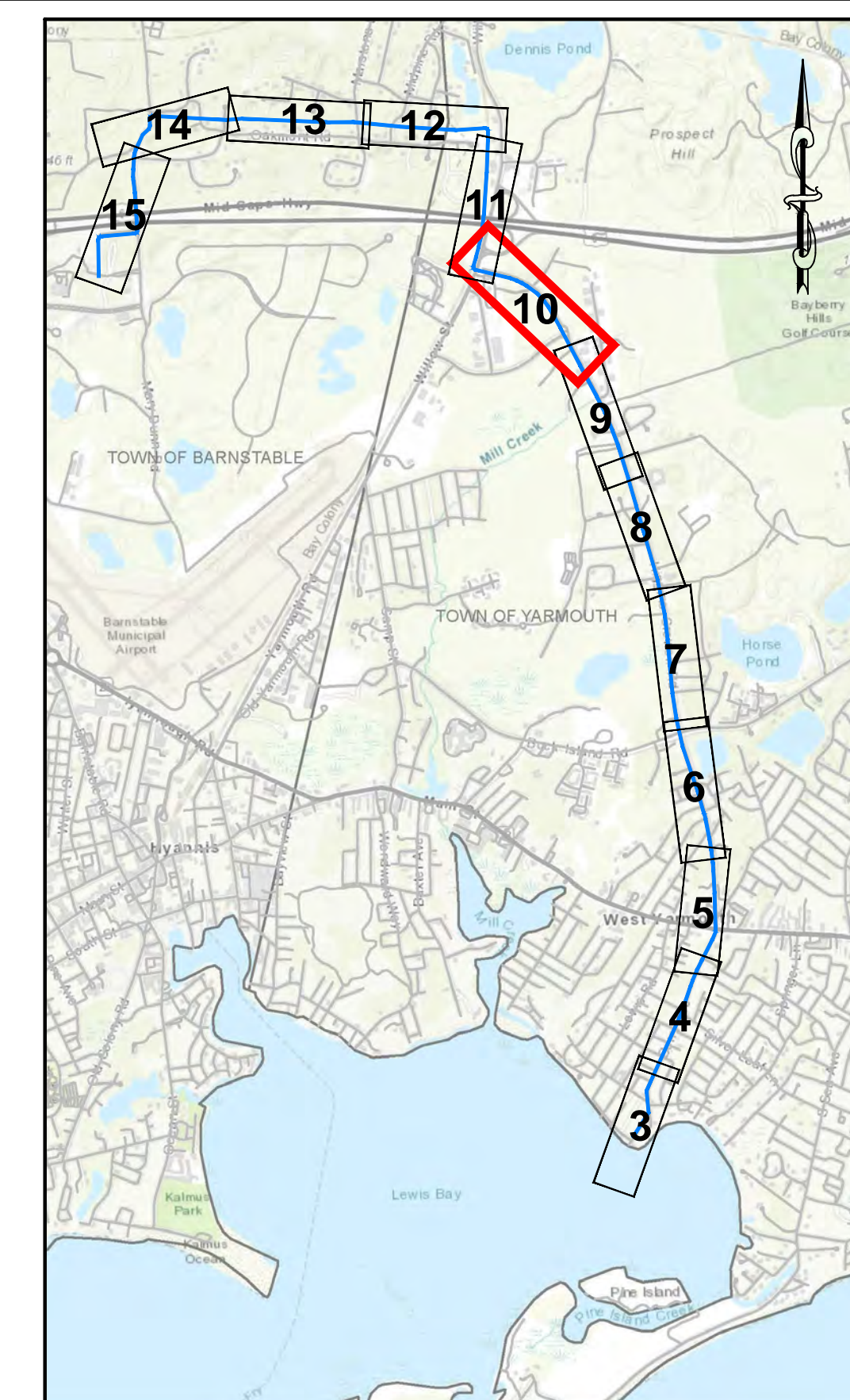
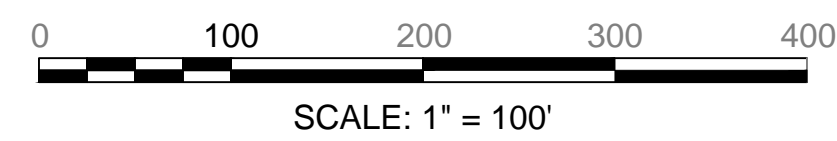
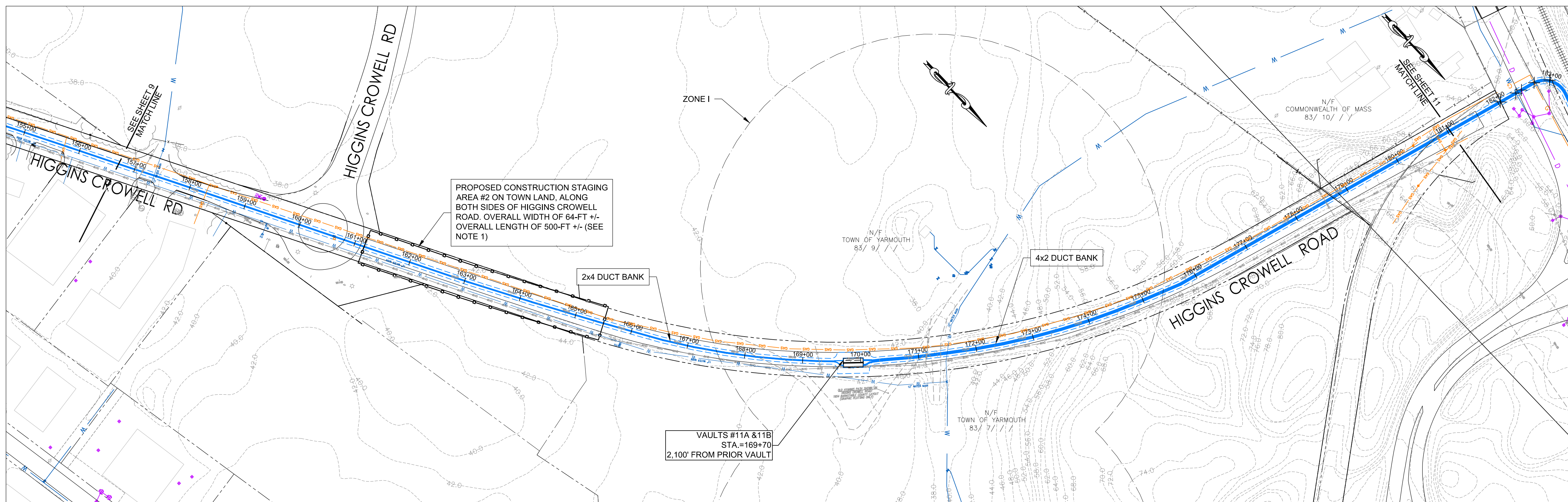


**Attachment 2**

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Selected Plans – New Hampshire Avenue Landfall Site



**NOTES:**

1. PROPOSED TOWN OF YARMOUTH DRAINAGE IMPROVEMENTS FROM "PROPOSED ROADWAY RECONSTRUCTION OF HIGGINS CROWELL ROAD", FINAL DESIGN PLANS, DECEMBER 2014.

**REFERENCE DWGS:**

**LEGEND:**

- PROPOSED TRENCH EXTENTS
- PROPOSED DUCT BANK ROUTE
- PROPOSED SPLICE VAULT
- 20 — GROUNDWATER ELEVATION
- EXISTING GAS LINE
- EXISTING DRAIN LINE
- EXISTING WATER LINE
- EXISTING GATE VALVE
- EXISTING DRAIN MANHOLE
- EXISTING CATCH BASIN
- EXIST LEACH BASIN
- EXIST UTILITY POLE
- EXISTING LIGHT
- TOWN PROPOSED DRAIN OR CULVERT
- TOWN PROPOSED CATCH BASIN
- TOWN PROPOSED DRAIN MANHOLE
- TOWN PROPOSED LEACHING CHAMBER

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REV.	DESCRIPTION	DRAWN	CHKD	APPRVD	DATE
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C	SUBMITTAL FOR DRAFT EIR	LKH	MSB	KEF	25-APR-2018
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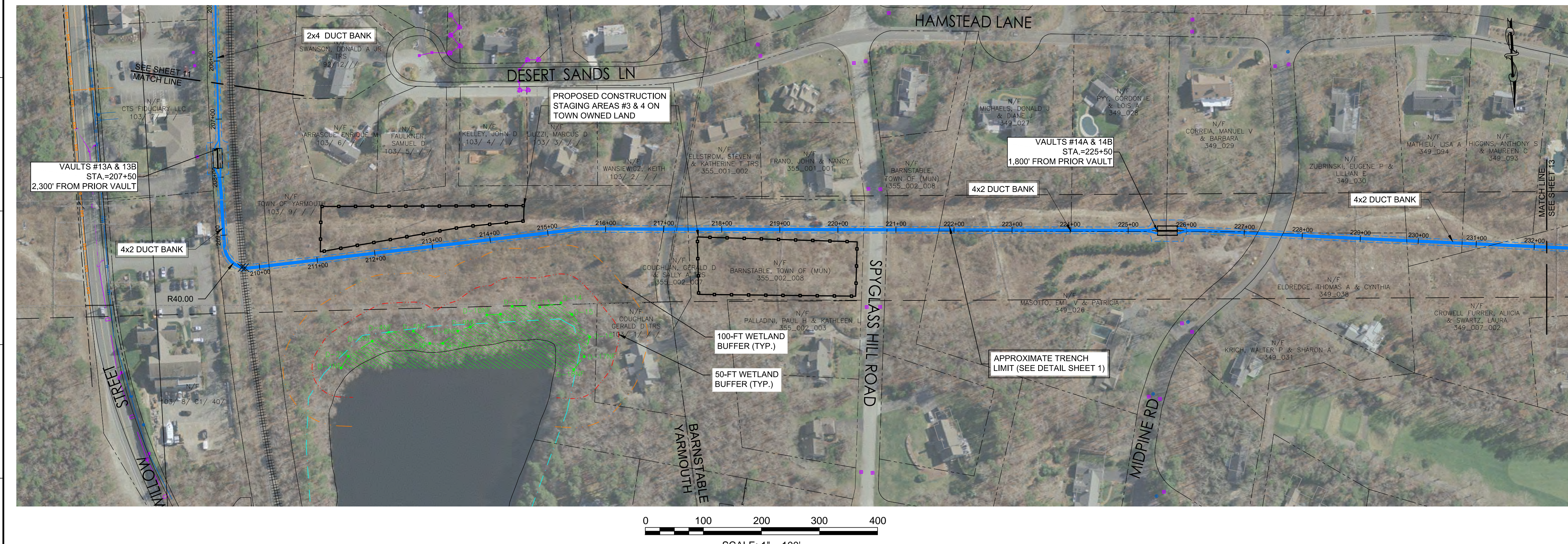
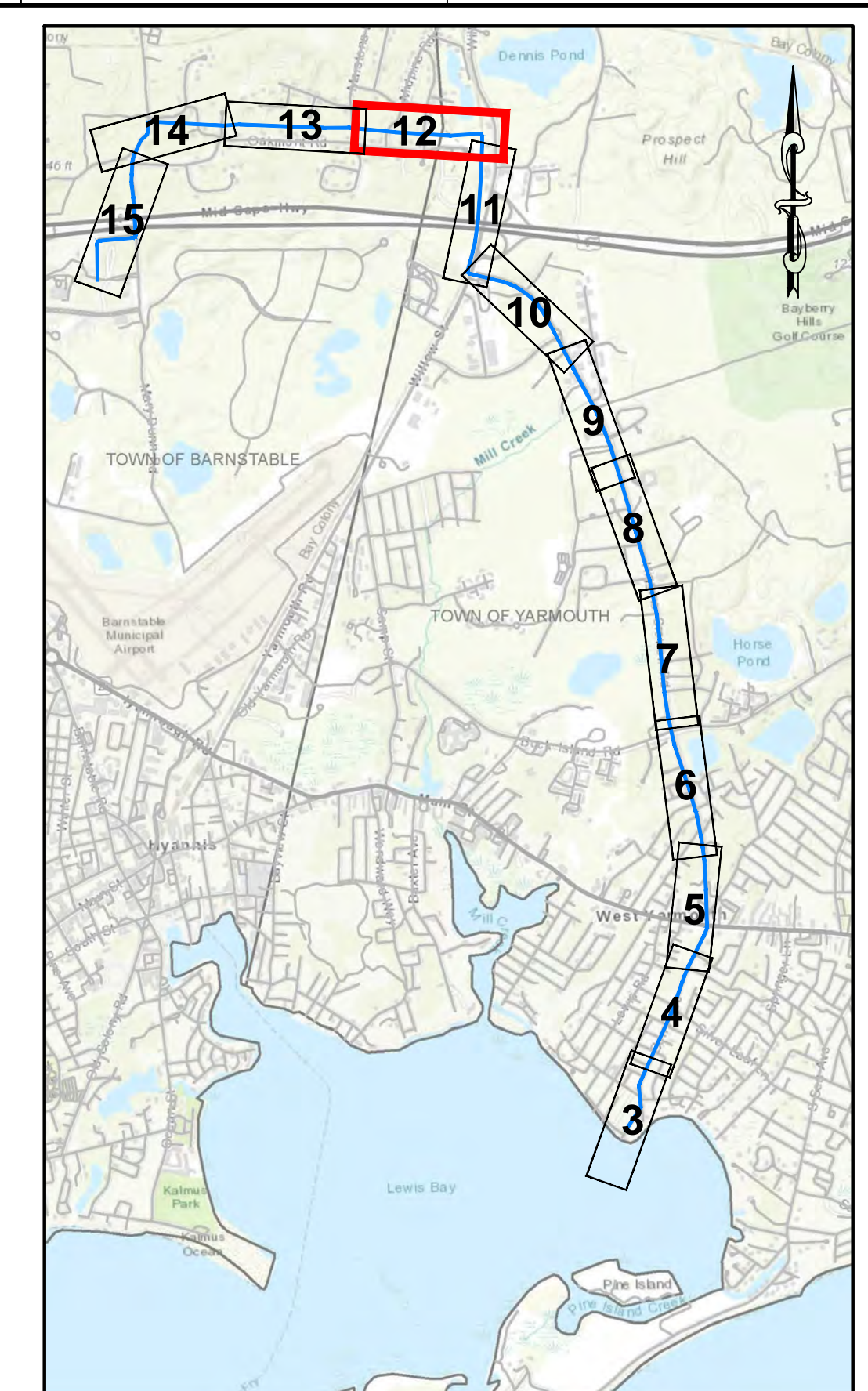
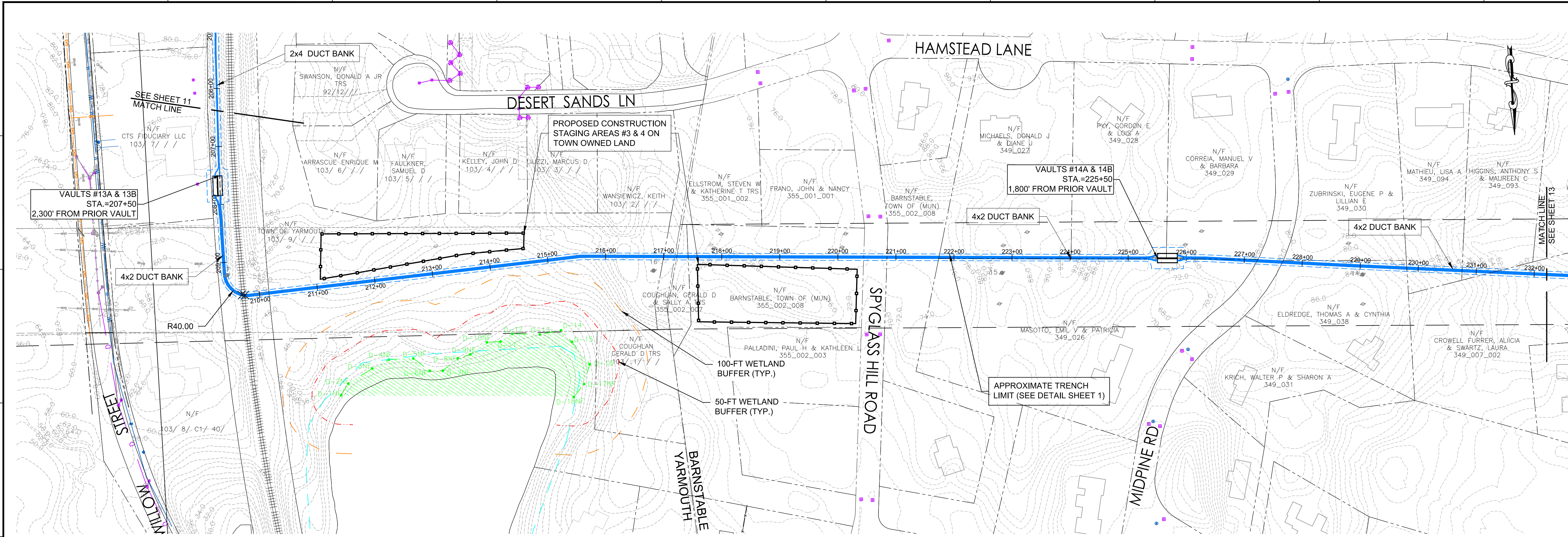
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CLIENT/PROJECT:	VINEYARD WIND YARMOUTH, MASSACHUSETTS
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ACKNOWLEDGED PROCESS PIPING MECH STRUCT ELECT INSTR REVISIONS:



**NOTES:**

**REFERENCE DWGS:**

**LEGEND:**

- PROPOSED TRENCH EXTENTS
- PROPOSED DUCT BANK ROUTE
- PROPOSED SPLICE VAULT
- 20 GROUNDWATER ELEVATION
- EXISTING GAS LINE
- EXISTING DRAIN LINE
- EXISTING WATER LINE
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- EXISTING CATCH BASIN
- EXIST LEACH BASIN
- EXIST UTILITY POLE
- EXISTING LIGHT
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- TOWN PROPOSED DRAIN MANHOLE
- ▭ TOWN PROPOSED LEACHING CHAMBER

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D	SUBMITTAL FOR SDEIR	LKH	MSB	KEF	03-AUG-2018
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B	REVISIONS FOR MEPA SUBMITTAL	LKH	MSB	KEF	06-APR-2018
A	ISSUED FOR PERMIT	LKH	MSB	KEF	30-NOV-2017

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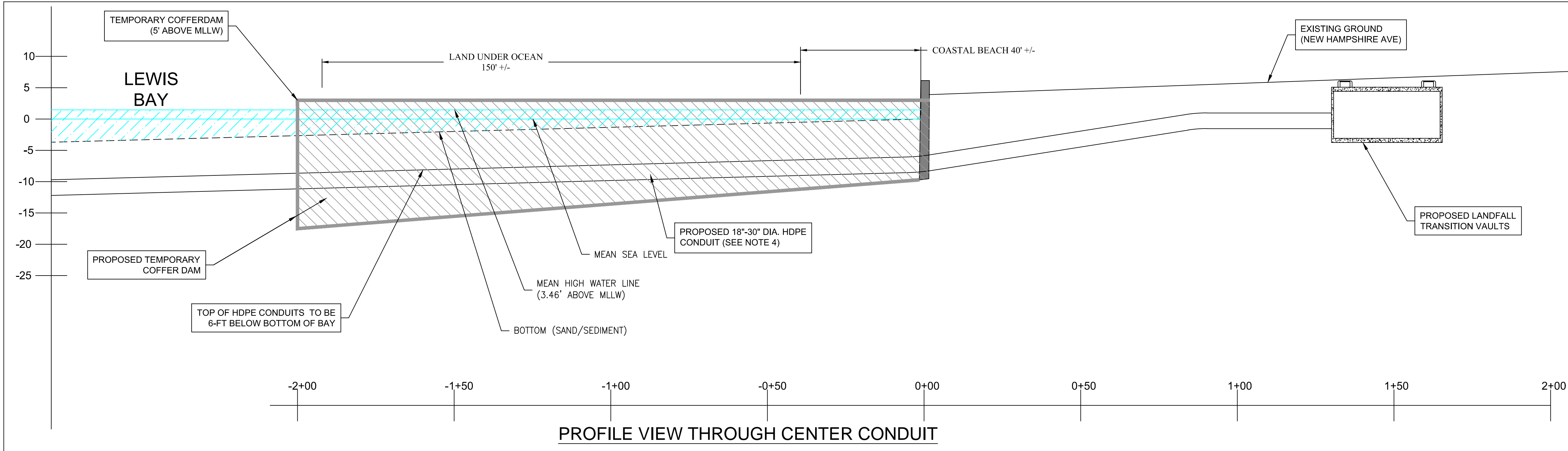
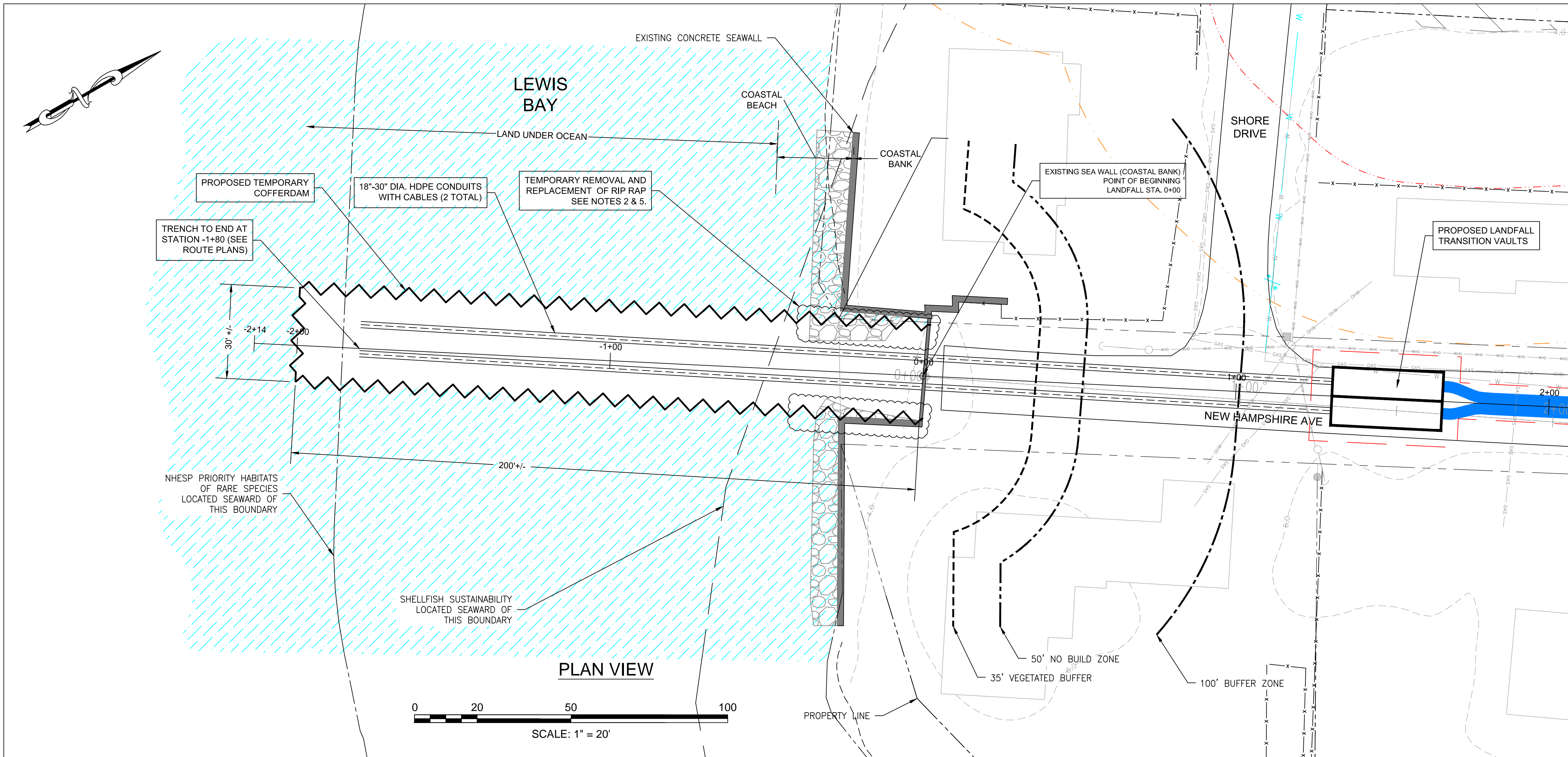
CLIENT/PROJECT:  
**VINEYARD WIND  
YARMOUTH, MASSACHUSETTS**

TITLE:  
**PROPOSED DUCTBANK LAYOUT**

SHT 12 OF 33    DWG NO: **SHEET 12**    REV: --

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- CONSTRUCTION NOTES**
1. SHEET PILE COFFERDAM TO BE INSTALLED FROM A BARGE.
  2. RIP RAP REMOVAL SHALL BE REQUIRED AT SEA WALL TO ALLOW SHEET PILE INSTALLATION, (SEE NOTE 5).
  3. THE TWO CONDUIT TRENCHES WITHIN COFFERDAM SHALL BE EXCAVATED FROM A BARGE. EACH TRENCH FOR EACH CONDUIT SHALL BE OVER EXCAVATED (THROUGH ANY TOP LAYER OF BAY SEDIMENT) TO REACH SAND STRATUM, THEN BACKFILLED WITH CLEAN SAND TO CREATE BEDDING FOR CONDUIT. EACH CONDUIT SHALL BE BACKFILLED TO MAX DEPTH (TOP OF CONDUIT) OF 6-FT TO FACILITATE CONNECTION TO THE MARINE SIDE INSTALLATION, WHICH SHALL ALSO BE AT 6-FT.
  4. 18"-30" DIA. CONDUITS TO BE INSTALLED VIA OPEN TRENCH METHOD WITH REQUIRED DE-WATERING.
  5. AFTER PIPELINE INSTALLATION AND BACKFILL ARE COMPLETED, SHEET PILES SHALL BE PULLED AND REMOVED (BARGE METHOD), AND ALL DISTURBED RIP RAP AREAS SHALL BE RESTORED.
  6. ACCORDING TO INFORMATION ON THE FLOOD INSURANCE RATE MAP FOR BARNSTABLE COUNTY, MASSACHUSETTS, MAP NUMBER 25001C0588J, WITH EFFECTIVE DATE JULY 16, 2014: THE AREA OFFSHORE OF THE SHORELINE IN THE VICINITY OF NEW HAMPSHIRE AVE IS FLOOD ZONE VE (ELEVATION 13), AND THE AREA ENCOMPASSING NEW HAMPSHIRE AVE FROM THE SHORELINE TO APPROXIMATELY 600- FEET INLAND IS ZONE AE (ELEVATION 12), AND THE AREA FROM THE END OF ZONE AE (ELEVATION 12) TO APPROXIMATELY THE INTERSECTION OF BERRY AVE AND WATER STREET IS ZONE AE (ELEVATION 11).
  7. UPLAND ELEVATIONS IN PLAN ARE REFERENCED TO NGVD29.
  8. THERE IS NO ACCEPTED NGVD 29 CONNECTION TO MLLW IN THE PROJECT AREA. RELATIONSHIP BETWEEN MLL AND NGVD29 APPROXIMATED TO GENERATE PROFILE (SEE NOTE 13).
  9. EXISTING GROUND ELEVATIONS IN PROFILE ARE ESTIMATED ONLY.
  10. ACTUAL RELATIONSHIP MUST BE ESTABLISHED THROUGH SURVEY AND GEOTECHNICAL ASSESSMENT PRIOR TO CONSTRUCTION.
  11. REFERENCE FOR LEWIS BAY DEPTH: NOAA NAUTICAL CHART 13229 FOR SOUTH COAST OF CAPE COD AND BUZZARDS BAY; MSL - MEAN SEA LEVEL; MLLW - MEAN LOWER LOW WATER.
  12. DEPTH TO BOTTOM OF LEWIS BAY FROM MLLW IS 2'-FT AT A DISTANCE OF 300-FT +/- FROM THE SHORELINE.
  13. MEAN SEA LEVEL (MSL) IS APPROX 2'-FT ABOVE MLLW.
  14. MEAN HIGH WATER (MHW) IS 3.46'-FT ABOVE MLLW.



- NOTES:**
- REFERENCE DWGS:**
- LEGEND:**
- PROPOSED TRENCH EXTENTS
  - PROPOSED DUCT BANK ROUTE
  - PROPOSED SPLICE VAULT
  - GROUNDWATER ELEVATION
  - EXISTING GAS LINE
  - EXISTING DRAIN LINE
  - EXISTING WATER LINE
  - EXISTING GATE VALVE
  - EXISTING DRAIN MANHOLE
  - EXISTING CATCH BASIN
  - EXIST LEACH BASIN
  - EXIST UTILITY POLE
  - EXISTING LIGHT
  - TOWN PROPOSED DRAIN OR CULVERT
  - TOWN PROPOSED CATCH BASIN
  - TOWN PROPOSED DRAIN MANHOLE
  - TOWN PROPOSED LEACHING CHAMBER
  - EXISTING PROPERTY LINE

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REV.	DESCRIPTION	DRAWN	CHKD	APPRVD	DATE
E	SUBMITTAL FOR DRAFT SDEIR	LKH	MSB	KEF	29-AUG-2018
D	SUBMITTAL FOR SDEIR	LKH	MSB	KEF	03-AUG-2018
C	SUBMITTAL FOR DRAFT EIR	LKH	MSB	KEF	25-APR-2018
B	REVISIONS FOR MEPA SUBMITTAL	LKH	MSB	KEF	06-APR-2018
A	ISSUED FOR PERMIT	LKH	MSB	KEF	30-NOV-2017

DRAWING REVISIONS

**Stantec**

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PROJECT NO: 198802613  
SCALE: AS SHOWN

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DESIGNED: M.S.B.	CHECKED: --	APPROVED: K.E.F.

CLIENT/PROJECT:

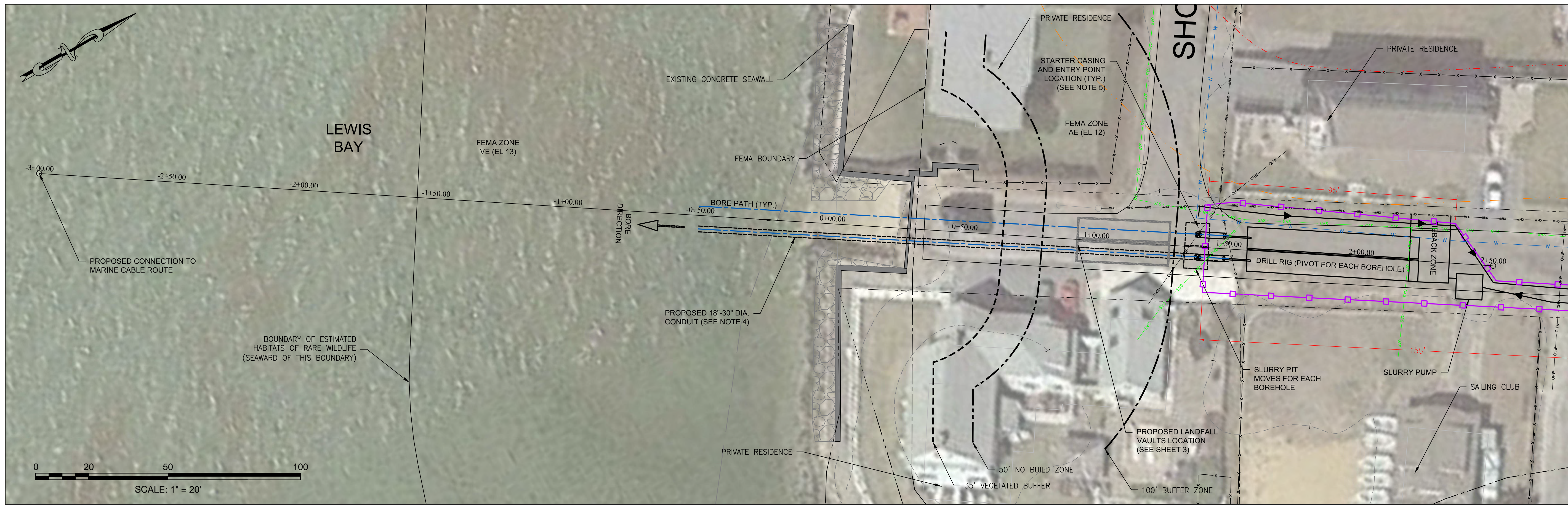
VINEYARD WIND  
YARMOUTH, MASSACHUSETTS

TITLE:

PROPOSED NEW HAMPSHIRE AVE  
LANDFALL DETAILS

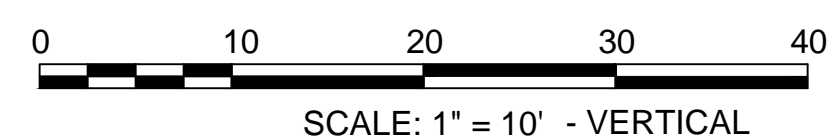
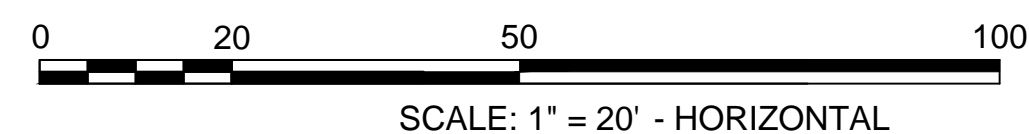
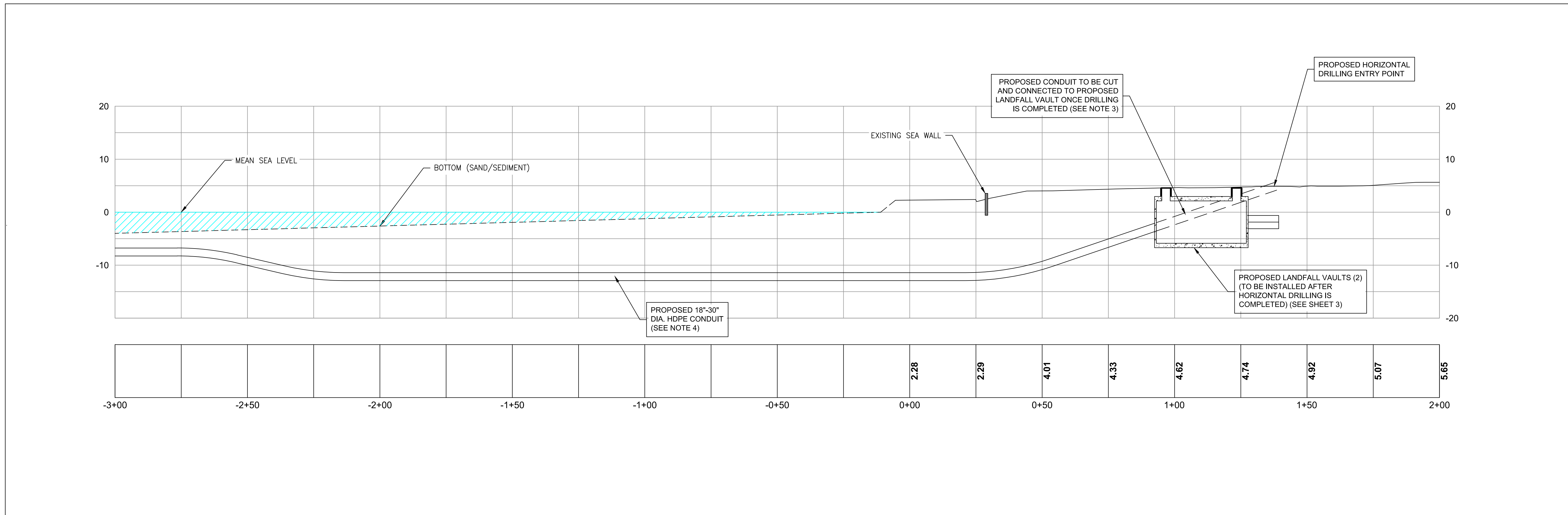
SHT 16 OF 33  
DWG NO: SHEET 16

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- LEGEND:**
- PROPOSED CONSTRUCTION FENCE
  - EXISTING GAS LINE
  - EXISTING DRAIN LINE
  - EXISTING WATER LINE
  - EXISTING GATE VALVE
  - EXISTING DRAIN MANHOLE
  - EXISTING CATCH BASIN
  - EXIST LEACH BASIN
  - EXIST UTILITY POLE
  - EXISTING LIGHT
  - EXISTING PROPERTY LINE
  - EXISTING CONTOUR

- NOTES:**
1. REFERENCE FOR LEWIS BAY DEPTH: NOAA NAUTICAL CHART 13229 FOR SOUTH COAST OF CAPE COD AND BUZZARDS BAY. MSL - MEAN SEA LEVEL. MLLW - MEAN LOWER LOW WATER.
  2. APPROXIMATE DEPTH TO BOTTOM OF LEWIS BAY FROM MLLW IS 2-FT AT 300 HORIZONTAL DISTANCE AND APPROXIMATELY A DEPTH OF 4-FT FROM MSL AT 300 HORIZONTAL FEET.
  3. STEEL STARTER CASING SHALL BE DRIVEN (60' +/-) FOR EACH BOREHOLE, AND THEN REMOVED AFTER CONDUIT INSTALLATION.
  4. HDPE CONDUIT SIZE WILL DEPEND ON THE CABLES REQUIRED FOR THE POWER SERVICE LEVEL APPROVED BY THE STATE.
  5. CUT AND REMOVE EXCESS HDPE CONDUITS TO ENTRY OF LANDFALL VAULTS.
  6. ACCORDING TO INFORMATION ON THE FLOOD INSURANCE RATE MAP FOR BARNSTABLE COUNTY, MASSACHUSETTS, MAP NUMBER 25001C0588J, WITH EFFECTIVE DATE, JULY 16, 2014: THE AREA OFFSHORE OF THE SHORELINE IN THE VICINITY OF NEW HAMPSHIRE AVE IS FLOOD ZONE VE (ELEVATION 13), AND THE AREA ENCOMPASSING NEW HAMPSHIRE AVE FROM THE SHORELINE TO APPROXIMATELY 600-FOOT INLAND IS ZONE AE (ELEVATION 12), AND THE AREA FROM THE END OF ZONE AE (ELEVATION 12) TO APPROXIMATELY THE INTERSECTION OF BERRY AVE AND WATER STREET IS ZONE AE (ELEVATION 11).
  7. UPLAND ELEVATIONS IN PLAN ARE REFERENCED TO NGVD29.
  8. THERE IS NO ACCEPTED NGV29 CONNECTION TO MLLW IN THE PROJECT AREA. RELATIONSHIP BETWEEN MLL AND NGVD29 APPROXIMATED TO GENERATE PROFILE.
  9. EXISTING GROUND ELEVATIONS IN PROFILE ARE ESTIMATED ONLY.
  10. ACTUAL RELATIONSHIP MUST BE ESTABLISHED THROUGH SURVEY AND GEOTECHNICAL ASSESSMENT PRIOR TO CONSTRUCTION.



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REV.	DESCRIPTION	DRAWN	CHKD	APPRVD	DATE
E	SUBMITTAL FOR DRAFT SDEIR	LKH	MSB	KEF	29-AUG-2018
D	SUBMITTAL FOR SDEIR	LKH	MSB	KEF	03-AUG-2018
C	SUBMITTAL FOR DRAFT EIR	LKH	MSB	KEF	25-APR-2018
B	REVISIONS FOR MEPA SUBMITTAL	LKH	MSB	KEF	06-APR-2018
A	ISSUED FOR PERMIT	LKH	MSB	KEF	30-NOV-2017

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L.K.H.	M.S.B.	--
DESIGNED:	CHECKED:	APPROVED:
M.S.B.	--	K.E.F.

PROJECT NO: 198802613

SCALE: AS SHOWN

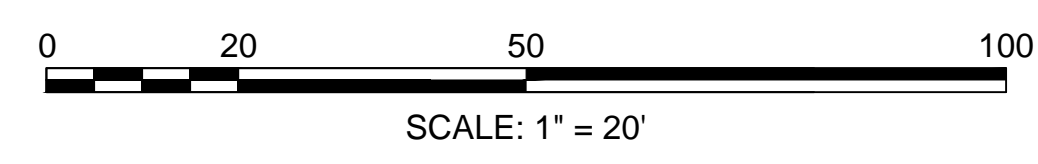
CLIENT/PROJECT:	
VINEYARD WIND YARMOUTH, MASSACHUSETTS	
TITLE:	
PROPOSED HDD PLAN AND PROFILE (HORIZONTAL DIRECTIONAL DRILLING) NEW HAMPSHIRE AVE	
SHT 18 OF 33	DWG NO: <b>SHEET 18</b>

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- NOTES:**
- ON-SITE UTILITIES TO BE PROVIDED FOR HDD WORK ARE ELECTRIC POWER, AND WATER (NO SEWER).
  - CONSTRUCTION FENCE SHALL INCLUDE SOUND ATTENUATION BLANKETS AND HAVE REMOVABLE SECTIONS FOR ACCESS.
  - ALL PIPING FROM DRILL RIG/DRILL PIT AREA TO MUD SETTLING TANK AND PROCESSING AREA SHALL BE INSTALLED IN TEMPORARY TRENCHES WITH STEEL PLATE COVERS TO ENABLE MOVEMENT OF VEHICLES TO/FROM PARKING AND BOAT RAMP AREA.
  - HDD WORK WILL **NOT** BE ALLOWED DURING SUMMER SEASON.
  - HDD DRILLING ANGLE OF TEN DEGREES IS PLANNED THEREFORE THE DEPTH OF BORE HOLE AT THE SEA WALL WILL BE APPROXIMATELY AT ELEVATION -16.0± WHICH SHOULD BE BELOW SEA WALL.
  - CONTRACTOR SHALL PREVENT DAMAGE TO ALL UNDERGROUND UTILITIES AND OVERHEAD WIRES; AND REPAIR OR REPLACE ANY UTILITIES DAMAGED BY HDD ACTIVITIES.
  - CONTRACTOR SHALL BE PREPARED TO PROVIDE ACCESS FOR EMERGENCY VEHICLE AT ANYTIME.

- LEGEND:**
- PROPOSED CONSTRUCTION FENCE
  - EXISTING GAS LINE
  - EXISTING DRAIN LINE
  - EXISTING WATER LINE
  - EXISTING GATE VALVE
  - EXISTING DRAIN MANHOLE
  - EXISTING CATCH BASIN
  - EXIST LEACH BASIN
  - EXIST UTILITY POLE
  - EXISTING LIGHT
  - EXISTING PROPERTY LINE
  - EXISTING CONTOUR



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 WRITTEN AUTHORIZATION IS OBTAINED FROM THE ENGINEER.

REV.	DESCRIPTION	DRAWN	CHD	APPRVD	DATE
B	ISSUED FOR EFSB RESPONSES	LKH	MSB	KEF	12-OCT-2018
A	ISSUED FOR EFSB RESPONSES	LKH	MSB	KEF	05-JUNE-2018

DRAWING REVISIONS					
REV.	DESCRIPTION	DRAWN	CHD	APPRVD	DATE

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DESIGNED: M.S.B.	CHECKED: --	APPROVED: K.E.F.

PROJECT NO:  
198802613

SCALE:  
AS SHOWN

CLIENT/PROJECT:	
VINEYARD WIND YARMOUTH, MASSACHUSETTS	
TITLE: PROPOSED RIG SIDE HDD EQUIPMENT LAYOUT (HORIZONTAL DIRECTIONAL DRILLING) NEW HAMPSHIRE AVE	
SHT OF	DWG NO: 198802613-C00-736-001
REV:	

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ACKNOWLEDGED PROCESS PIPING MECH STRUCT ELECT INSTR



**Attachment 3**

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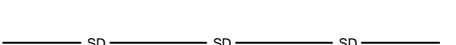








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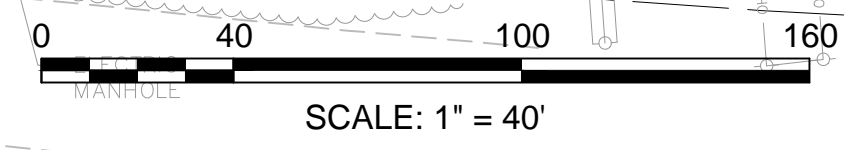
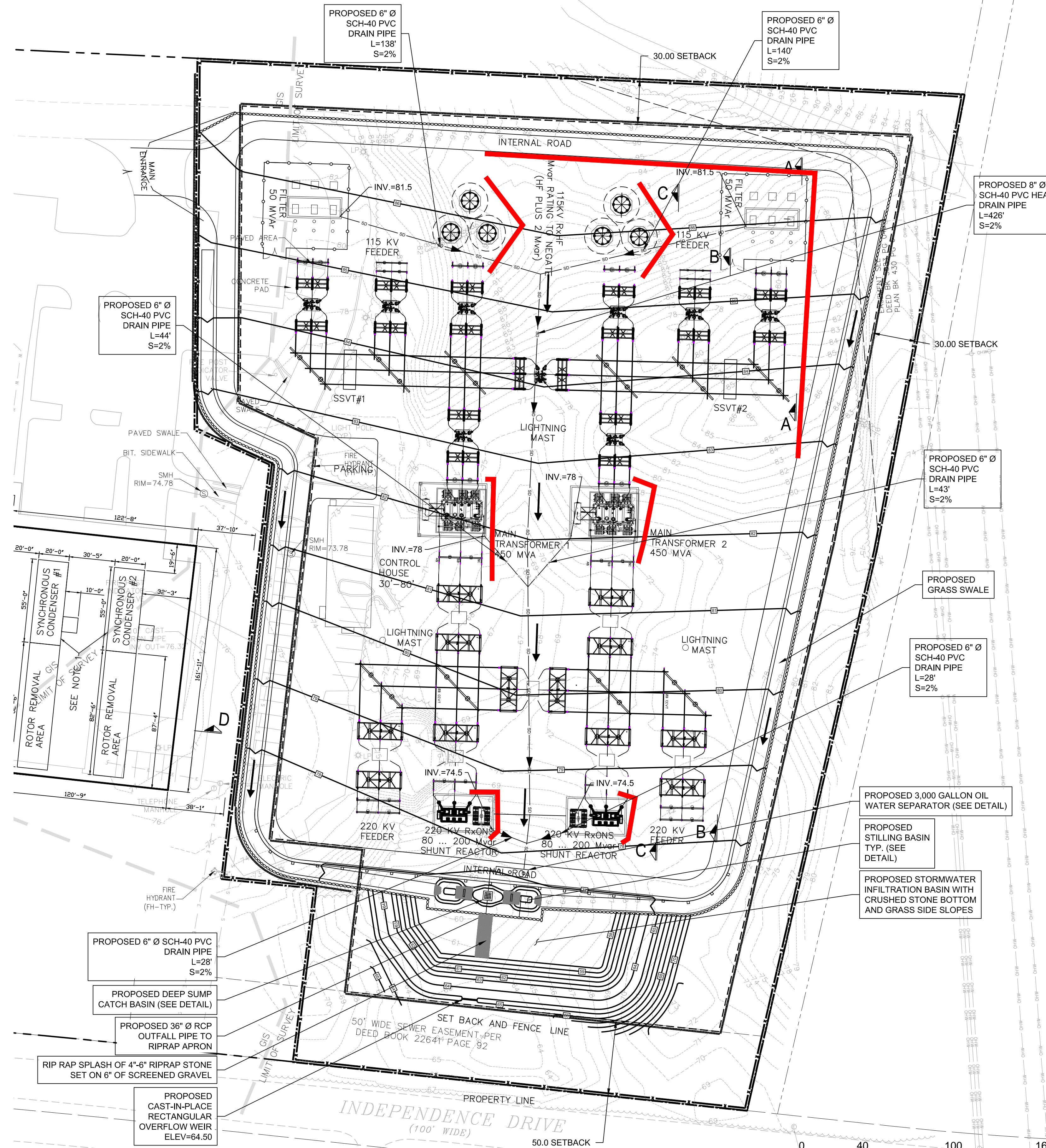
Selected Plans – Substation

NOTES:

1. STRAW WATTLES OR OTHER SILTATION CONTROLS SHALL BE PLACED ALONG ALL DOWN GRADIENT LIMITS OF WORK BEFORE THE START OF ANY CONSTRUCTION ACTIVITIES.
2. ALL CONSTRUCTION ACTIVITIES MUST CONFORM WITH THE EROSION CONTROL PLAN WHICH CAN BE FOUND IN THE STORMWATER REPORT PRODUCED BY STANTEC CONSULTING SERVICES INC.
3. DETAILED DESIGN OF DRAINAGE STRUCTURES WILL BE COMPLETED AND SUBMITTED AS PART OF THE CONSTRUCTION PLANS AND DOCUMENTS AT A LATER DATE.
4. EACH CONTAINMENT OUTLET TO INCLUDE OIL BARRIER DEVICE BELOW FROST LINE SET IN ACCESS MANHOLE FOR INSPECTION AND MAINTENANCE (REFER TO DETAILS).
5. SUBSTATION YARD AREA TO BE DOUBLE WASHED 3/4" MINUS CRUSHED STONE, 12-INCH THICK, PLACED OVER SELECT GRANULAR FILL, 12-INCH THICK, COMPACTED IN TWO 6-INCH LIFTS.
6. ACCESS ROAD & PARKING AREA TO BE 2-1/2" BASE COURSE WITH 1-1/2" FINISH COURSE. PAVEMENT SUBGRADE TO BE 4-INCHES OR DENSE GRADED CRUSHED STONE OVER 8-INCHES OF COMPACTED GRAVEL BORROW TYPE "B".
7. GRASS SWALE TO BE 8' WIDE x 12" DEEP WITH 3:1 SIDE SLOPES AND 2' BOTTOM WIDTH.
8. STORMWATER INFILTRATION BASIN SHALL HAVE DOUBLE WASHED CRUSHED STONE (3/4" MINUS) BASE 6-INCHES THICK ON EXISTING SAND & GRAVEL SOILS. SIDE SLOPES (3:1) SHALL BE STABILIZED WITH 6" LOAM AND SPREAD WITH EROSION CONTROL NETTING PINNED IN PLACE.
9. GRASS SEED MIX SHALL BE A MIX OF RED FESCUE & HARD FESURE, WITH A MINIMUM OF THREE VARIETIES OF EACH SPECIES. SEED SHALL NOT HAVE LESS THAN 90% GERMINATION, NOT LESS THAN 85% PURE SEED AND NOT MORE THAN 0.5% WEED SEED, THE MIX APPLICATION IS 4LBS PER 1,000 SF WITH A TYPICAL DISTRIBUTION OF 600,000 SEEDS PER POUND, WHICH IS APPROXIMATELY 175 POUNDS PER ACRE. ANY AREA RE-VEGETATED SHALL BE MONITORED CONTINUOUSLY UNTIL IT HAS RE-ESTABLISHED.
10. THE SIDE SLOPES AND BOTTOM OF THE SWALES SHALL INCORPORATE EROSION CONTROL BLANKETS, PINNED IN POSITION, TO PROTECT THE GRASS SEED, THE BLANKETS SHALL REMAIN IN PLACE UNTIL THE SEED HAS GERMINATED AND A GRASS COVER IS ESTABLISHED.
11. CONTRACT SHALL GUARANTEE ALL GRASS FOR ONE YEAR FROM ACCEPTANCE OF FINISHED PLANTING.

Legend

-  FLOW ARROW
-  STORM DRAIN FLOW ARROW
-  STORM DRAIN
-  RETAINING WALL
-  LIMIT OF WORK/EROSION CONTROL
-  BOUNDARY SOUND WALL (CONFIRMATION REQUIRED)
-  SECURITY FENCE
-  PROPOSED PROPERTY LINE
-  EXISTING PROPERTY LINE
-  PROPOSED GUARDRAIL
-  ZONING SETBACKS



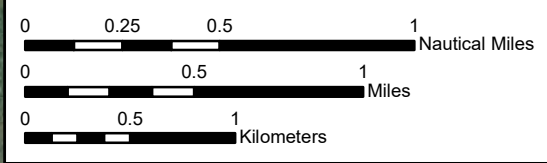
0	2018-11-15	ISSUE FOR ITT BID	IFT	L.K.H.	M.S.B.	K.E.F.
REV.	DATE	REVISION DESCRIPTION	STATUS	DRAWN	CHKD	APPROV
CONTRACTOR:  Stantec Consulting Services Inc. 400 Crown Colony Drive Suite 200 Quincy, MA U.S.A. 02169-0982						
CLIENT:  VINEYARD WIND 700 Pleasant Street, Suite 510 New Bedford, MA, 02740						
PROJECT: VINEYARD WIND OFFSHORE WIND PROJECT SUBSTATION						
TITLE: PROPOSED GRADING & DRAINAGE (AIS)						
DOC ID: VW-OSP-STC-DW-0001-004						
SHEET 004 OF 006	DWG. NO. SHEET - 004	SCALE AS SHOWN	FORMAT/SIZE ANSI D	REV: 0		

**Attachment 4**

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Figure of Onshore Routes and Variants



**LEGEND**

- Covell's Beach Route (Preferred)
- Preferred Variant 1: Utility ROW
- New Hampshire Avenue Route (Alternative)
- Alt. Variant 1: Willow Street
- Alt. Variant 2: Utility ROW
- Alt. Variant 3: Bike Path
- Alt. Variant 5: Independence Drive\*
- \*Variant 4 was eliminated from the Project; however, variant numbering has been maintained to avoid confusion with previous filings.
- Proposed Substation Site
- Town Boundary

Scale 1:36,000 0 1,500 3,000  
 1 inch = 3,000 feet Feet

Basemap: World Imagery, ESRI