Appendix C. Conceptual Project Design Drawings

Document Revision: A

Issue Date: February 2021
Notes:
1. HTV denotes Heavy Transport Vessel.
2. Monopile indicative only pending manufacturer information.
CONCEPT ONLY

Notes:
1. HTV denotes Heavy Transport Vessel.
2. Transition piece indicative only pending manufacturer information.
STAGE 1
- Moor cargo barge along starboard HLV.
- Connect spreader bar and transfer rigging to main hook and slew to cargo barge.
- Connect transfer rigging to monopile.
- Cut sea fastening.
- Lift-off monopile.

STAGE 2
- Lower monopile on to rollover frame on HLV deck.
- Disconnect monopile transfer rigging.
STAGE 3
- Upend monopile.
STAGE 5

- Hammer the monopile to depth.
STAGE 6

- Disengage the hammer tool.
- Retract the gripper.
Notes:
- Lift the transition piece off cargo barge with lifting tool and position over the monopile.
- Lower the transition piece on top of the monopile.
STAGE 1
- Lift-off installation frame from HLV
dock.
- Lower installation frame to depth
slightly above seabed.
- Check frame position and level it,
then install on seabed.
- Park lifting tool on frame.

STAGE 2
- Moor cargo barge alongside HLV.
- Transfer three pin piles to HLV deck.
STAGE 3
- Upend pin pile from HLV deck using the lifting tool.

STAGE 4
- Lift-off pin pile from HLV deck using the lifting tool.
STAGE 5
- Stab first pile into installation frame.

STAGE 6
- Allow pile to self-penetrate to intermediate depth.
STAGE 7
- Transfer the next pile to pile upend location and repeat stages 3 to 6 for the remaining two pin piles.

STAGE 8
- Install the hammer.
- Hammer the pin pile to target depth and repeat for the remaining two piles.
- Recover installation frame.
1. Jacket will be connected to pile foundations per jacket design.
FIBER OPTIC UNIT

LEAD ALLOY SHEATH
(EXPORT)
COPPER WIRE SCREEN
(ARRAY)
OR COPPER WIRE SCREEN &
ALUMINIUM FOIL (ARRAY)

ARMOR

FILLER MATERIAL

CONDUCTOR

INSULATION
CONCEPT ONLY

Notes:
1. Final dimensions and design details to be provided by manufacturer.
2. Drawing not to scale.
3. Overall outer diameter = 24mm.

METALLIC TUBE
SECONDARY PROTECTION

INNER SHEATH

ARMOR

SECOND SHEATH

OPTICAL FIBERS

OUTER PROTECTION

WATER BLOCKING
NOTES:

1. CABLE SIZE DEPICTED IS ASSUMED BASED ON LOADING CRITERIA. FINA CABLE SIZING TO BE DETERMINED DURING DETAILED DESIGN.

2. THE INNER LAYER DIMENSIONS WILL BE PROVIDED BY CABLE MANUFACTURER.
NOTE:
1. FINAL CABLE SIZING TO BE DETERMINED DURING DETAILED DESIGN.
NOTE:
1. CABLE SIZE DEPICTED IS ASSUMED BASED ON FAULT CURRENT CRITERIA. FINAL CABLE SIZING TO BE DETERMINED DURING DETAILED DESIGN.
NOTES:
1. ALL DIMENSIONS ARE INDICATIVE AND ARE SUBJECT TO CHANGE.
2. HOT MIX ASPHALT (HMA) OR OTHER APPROVED MATERIAL.
3. TYPE OF CONDUIT MAY VARY BASED ON FIELD CONDITIONS.

3'-0" (914mm)
3" (76mm)
1'-0" (305mm)
1'-6" (457mm)
5'-9" (1,743mm)
4'-3" (1,286mm)
1'-6" (457mm)

12) 8" SCH 40 PVC POWER CONDUITS
ID: 7.981"
OD: 8.625"

12) 2" SCH 40 PVC CONDUITS FOR GROUNDING AND FIBER
ID: 2.067"
OD: 2.375"

3,000 PSI CONCRETE
WARNING TAPE OR OTHER APPROVED IDENTIFICATION MEASURE
APPROVED BACKFILL

DENSE GRADED AGGREGATE BASE COURSE

WARNING TAPE OR OTHER APPROVED IDENTIFICATION MEASURE
APPROVED BACKFILL

(12) 8" SCH 40 PVC POWER CONDUITS
ID: 7.981"
OD: 8.625"

(12) 2" SCH 40 PVC CONDUITS FOR GROUNDING AND FIBER
ID: 2.067"
OD: 2.375"

TRENCH BASE COURSE (IF REQUIRED BY FIELD CONDITIONS)
NOTES:
1. ALL DIMENSIONS ARE INDICATIVE AND ARE SUBJECT TO CHANGE.
2. HOT MIX ASPHALT (HMA) OR OTHER APPROVED MATERIAL.
3. TYPE OF CONDUIT MAY VARY BASED ON FIELD CONDITIONS.

HORIZONTAL SPLIT 2X3 INDICATIVE CONCRETE ENCASED DUCT BANK ARRANGEMENT - BOTH SIDES OF ROADWAY

EXISTING ROAD

APPROVED BACKFILL

WARNING TAPE OR OTHER APPROVED IDENTIFICATION MEASURE

(6) 2" SCH 40 PVC CONDUITS FOR GROUNDING AND FIBER
ID: 2.067"
OD: 2.375"

(6) 3" SCH 40 PVC POWER CONDUITS
ID: 3.000"
OD: 3.255"

3,000 PSI CONCRETE BASE COURSE (AS REQUIRED BY FIELD CONDITIONS)

TRENCH BASE COURSE (IF REQUIRED BY FIELD CONDITIONS)

DENSE-GRANED AGGREGATE BASE COURSE

EXISTING ROAD

DIMENSION VARIES

HORIZONTAL SPLIT 2X3 INDICATIVE CONCRETE ENCASED DUCT BANK ARRANGEMENT - BOTH SIDES OF ROADWAY

NOTE 2
NOTES:

1. ALL DIMENSIONS ARE INDICATIVE AND ARE SUBJECT TO CHANGE.

2. HOT MIX ASPHALT (HMA) OR OTHER APPROVED MATERIAL.

3. TYPE OF CONDUIT MAY VARY BASED ON FIELD CONDITIONS.

VERTICAL SPLIT 3X2 INDICATIVE CONCRETE ENCASED DUCT BANK ARRANGEMENT - BOTH SIDES OF ROADWAY

DENSE GRADED AGGREGATE BASE COURSE

WARNING TAPE OR OTHER APPROVED IDENTIFICATION MEASURE

(6) 2" SCH 40 PVC CONDUITS FOR GROUNDING AND FIBER
OD: 2.375"
ID: 2.067"
OD: 8.625" ID: 7.981"
(6) 8" SCH 40 PVC CONDUITS FOR GROUNDING AND FIBER
OD: 6.825"
ID: 6.375"
3,000 PSI CONCRETE

TRENCH BASE COURSE (IF REQUIRED BY FIELD CONDITIONS)

VERTICAL SPLIT 3X2 INDICATIVE ROAD GRADING

DENSE GRADED AGGREGATE BASE COURSE

WARNING TAPE OR OTHER APPROVED IDENTIFICATION MEASURE

(6) 2" SCH 40 PVC CONDUITS FOR GROUNDING AND FIBER
OD: 2.375"
ID: 2.067"
OD: 8.625" ID: 7.981"
(6) 8" SCH 40 PVC CONDUITS FOR GROUNDING AND FIBER
OD: 6.825"
ID: 6.375"
3,000 PSI CONCRETE

TRENCH BASE COURSE (IF REQUIRED BY FIELD CONDITIONS)

NOT TO SCALE

SEE NOTE 2

EXISTING ROAD

EXISTING ROAD

EXISTING ROAD

EXISTING ROAD

EXISTING ROAD

SEE NOTE 2

EXISTING ROAD

EXISTING ROAD

WARNING TAPE OR OTHER APPROVED IDENTIFICATION MEASURE

(6) 2" SCH 40 PVC CONDUITS FOR GROUNDING AND FIBER
OD: 2.375"
ID: 2.067"
OD: 8.625" ID: 7.981"
(6) 8" SCH 40 PVC CONDUITS FOR GROUNDING AND FIBER
OD: 6.825"
ID: 6.375"
3,000 PSI CONCRETE

TRENCH BASE COURSE (IF REQUIRED BY FIELD CONDITIONS)

NOTE: ALL DIMENSIONS ARE INDICATIVE AND ARE SUBJECT TO CHANGE.

NOT TO SCALE
NOTES:
1. ALL DIMENSIONS ARE INDICATIVE AND ARE SUBJECT TO CHANGE.
2. NOT HOT ASPHALT (HMA) OR OTHER APPROVED MATERIAL.
3. TYPE OF CONDUIT MAY VARY BASED ON FIELD CONDITIONS.

SCALE FOR MICROFILMING

INDICATIVE 2X6 CONCRETE-ENCASED DUCT BANK ARRANGEMENT IN ROADWAY

NOT TO SCALE

DENSE GRADED AGGREGATE BASE COURSE

POWER CONDUITS
ID: 7.981" OD: 8.625"

(12) 2" SCH 40 PVC CONDUITS FOR GROUNDING AND FIBER OD 2.375"

TRENCH BASE COURSE (IF REQUIRED BY FIELD CONDITIONS)

WARNING TAPE OR OTHER APPROVED IDENTIFICATION MEASURE

APPROVED BACKFILL

NOTES:
1. ALL DIMENSIONS ARE INDICATIVE AND ARE SUBJECT TO CHANGE.
2. HOT MIX ASPHALT (HMA) OR OTHER APPROVED MATERIAL.
3. TYPE OF CONDUIT MAY VARY BASED ON FIELD CONDITIONS.

PRELIMINARY - NOT FOR CONSTRUCTION

MAYFLOWER WIND PROJECT
CONCEPTUAL DRAWINGS
BARNSTABLE COUNTY, MASSACHUSETTS

UG-004 F
4.4_Duct Bank Arrangement 2 & indicative road grading

D. GOGOL, D. LAWTON

01-DEC-2020 J. RIFFEL

12/29/2020 4:50 PM CKUNTZ
NOTES:
1. ALL DIMENSIONS ARE INDICATIVE AND ARE SUBJECT TO CHANGE.
2. HOT MIX ASPHALT (HMA) OR OTHER APPROVED MATERIAL.
3. TYPE OF CONDUIT MAY VARY BASED ON FIELD CONDITIONS.

WARNING TAPE OR OTHER APPROVED IDENTIFICATION MEASURE

OPTIONAL PROTECTIVE MATERIAL

APPROVED BACKFILL

PRELIMINARY - NOT FOR CONSTRUCTION

DARK GRADED AGGREGATE BASE COURSE

TRENCH BASE COURSE (IF REQUIRED BY FIELD CONDITIONS)

APPROVED BACKFILL

(8) 2" SCH 40 PVC CONDUITS FOR GROUNDING AND FIBER ID: 2.067" OD: 2.375" (12) 8" SCH 40 PVC POWER CONDUITS ID: 7.981" OD: 8.625"

PRELIMINARY - NOT FOR CONSTRUCTION

NOTES:
1. ALL DIMENSIONS ARE INDICATIVE AND ARE SUBJECT TO CHANGE.
2. HOT MIX ASPHALT (HMA) OR OTHER APPROVED MATERIAL.
3. TYPE OF CONDUIT MAY VARY BASED ON FIELD CONDITIONS.

WARNING TAPE OR OTHER APPROVED IDENTIFICATION MEASURE

OPTIONAL PROTECTIVE MATERIAL

APPROVED BACKFILL

PRELIMINARY - NOT FOR CONSTRUCTION

DENSE GRADED AGGREGATE BASE COURSE

TRENCH BASE COURSE (IF REQUIRED BY FIELD CONDITIONS)

APPROVED BACKFILL

(8) 2" SCH 40 PVC CONDUITS FOR GROUNDING AND FIBER ID: 2.067" OD: 2.375" (12) 8" SCH 40 PVC POWER CONDUITS ID: 7.981" OD: 8.625"
NOTES:
1. ALL DIMENSIONS ARE INDICATIVE AND ARE SUBJECT TO CHANGE.
2. HOT MIX ASPHALT (HMA) OR OTHER APPROVED MATERIAL.
3. TYPE OF CONDUIT MAY VARY BASED ON FIELD CONDITIONS.
NOTES:

1. SOME UTILITIES MAY REQUIRE GREATER SEPARATION.
2. 3'-0" (914mm) MAX. SPAN. OR DIRECTED BY THE UTILITY WHICHEVER IS LESS.
3. CONTRACTOR SHALL SUBMIT METHOD OF SUPPORT TO RESPECTIVE UTILITY OWNERS FOR APPROVAL PRIOR TO CONSTRUCTION.
4. UTILITIES INCLUDE TELEPHONE, GAS LINES, WATER MAINS, AND SEWERS.
5. UTILITY RELOCATIONS TO ACCOMMODATE DUCT BANK ALIGNMENT COULD BE POSSIBLE. CONTRACTOR TO COORDINATE RELOCATION EFFORTS WITH THE UTILITY OWNER.
NOTES:
1. MINIMUM DEPTH OF COVER, AS MEASURED AT ANY POINT OF THE BURIED MANHOLES, SHALL TYPICALLY BE DESIGNED TO A MINIMUM OF 3'-0" AND A MAXIMUM OF 15'-0".
2. MINIMUM DESIGN LOAD RATING TO AASHTO HS-25.
3. CABLE RACKING SHALL BE PROVIDED BY CABLE INSTALLER.
4. REBAR WITHIN SPLICE CHAMBER WALLS SHALL NOT FORM A CLOSED LOOP AROUND ANY 8" CONDUIT OPENING.
5. DETAILS SHOWN REPRESENT SPLICE VAULT FOR A SINGLE CIRCUIT. ALTHOUGH NOT SHOWN, A SECOND CIRCUIT COULD BE INSTALLED WITHIN THE SAME VAULT WHICH MAY INCREASE DIMENSIONS.
6. ALL DIMENSIONS ARE INDICATIVE AND ARE SUBJECT TO CHANGE.
NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE PRELIMINARY AND SUBJECT TO CHANGE DURING DETAILED DESIGN.

2. IF REQUIRED, HOIST OR RAILING SYSTEM INSIDE OF TRANSITION VAULT TO BE DESIGNED BY CABLE MANUFACTURER.

3. MINIMUM DEPTH OF COVER, AS MEASURED AT ANY POINT OF THE BURIED MANHOLES, SHALL TYPICALLY BE DESIGNED TO A MINIMUM OF 3'-0" AND A MAXIMUM OF 15'-0".

4. MINIMUM DESIGN LOAD RATING TO AASHTO HS-25.

5. CABLE RACKING SHALL BE PROVIDED BY CABLE INSTALLER.

6. REBAR WITHIN SPLICE CHAMBER WALLS SHALL NOT FORM A CLOSED LOOP AROUND ANY 8" CONDUIT OPENING.

7. ALL DIMENSIONS ARE INDICATIVE AND ARE SUBJECT TO CHANGE.
NOTES:
1. DIMENSIONS AND DETAILS SHOWN ARE PRELIMINARY AND SUBJECT TO CHANGE DURING DETAILED DESIGN.
2. CABLE RACKING SHALL BE PROVIDED BY CABLE INSTALLER.
3. CONCRETE SURROUND WALLS AND COVER COULD BE REQUIRED AND WILL BE DETERMINED DURING DETAILED DESIGN.
4. HOT MIX ASPHALT (HMA) OR OTHER APPROVED MATERIAL.
5. TRENCH EXCAVATION SUPPORT TO BE DETERMINED AND DESIGNED BY CONTRACTOR.
NOTES:
1. DIMENSIONS AND DETAILS SHOWN ARE PRELIMINARY AND SUBJECT TO CHANGE DURING DETAIL DESIGN.
2. CABLE RACKING SHALL BE PROVIDED BY CABLE INSTALLER.
3. CONCRETE SURROUND WALLS AND COVER COULD BE REQUIRED AND WILL BE DETERMINED DURING DETAIL DESIGN.
4. HOT MIX ASPHALT (HMA) OR OTHER APPROVED MATERIAL.
5. TRENCH EXCAVATION SUPPORT TO BE DETERMINED AND DESIGNED BY CONTRACTOR.

SECTION A-A
NOT TO SCALE

SECTION B-B
NOT TO SCALE
NOTES:
1. ALL DIMENSIONS ARE INDICATIVE AND ARE SUBJECT TO CHANGE.
2. HOT MIX ASPHALT (HMA) OR OTHER APPROVED MATERIAL.

WORK SPACE CLOSED TO TRAFFIC
11'-0" (3,353MM)
OPEN TO TRAFFIC

GENERAL ARRANGEMENT CROSS SECTION
NOT TO SCALE

NOT ISSUED FOR REVIEW
12/1/2020 JR
12/1/2020 JR
12/9/2020 JR
12/18/2020 JR
12/22/2020 JR
12/29/2020 JR
01/13/2021 JR

MAYFLOWER WIND PROJECT
CONCEPTUAL DRAWINGS
BARNSTABLE COUNTY, MASSACHUSETTS

Preliminary - Not for Construction

INSTALLATION
GENERAL ARRANGEMENT CROSS SECTION
NOTES:
1. EQUIPMENT DIMENSIONS AND LAYOUT WILL VARY DEPENDING ON SITE CONDITIONS AND SELECTED CONTRACTOR.
2. PLAN DRAWING DEPICTS A SINGLE HDD INSTALLATION. EACH OFFSHORE EXPORT CABLE W/ 1/2 UPDATE INSTALLATION IN A SEPARATE HDD BORE.
3. BARGE SIZE WILL VARY DEPENDING ON CONTRACTOR AND WATER DEPTH. TENDER
   BARGE NOT SHOWN.

NOTES:
1. THERMAL GROUT FILL OF THE BOREHOLE ANNULUS MAY BE REQUIRED.
2. FINAL BOREHOLE SIZE DEPENDENT ON CONDUIT DIAMETER, VARIES BY TOOL SIZE
   AND SUBSURFACE CONDITIONS.
3. GRAVITY CELL MAY BE USED IN LIEU OF CONDUCTOR CASING, DEPENDING ON SITE
   CONDITIONS.
4. CONDUCTOR CASING SIZE AND DEPTH VARY BY INSTALLATION.
5. BARGE TYPE VARY BY WATER DEPTH.
6. CONSTRUCTION OF TEMPORARY CONTAINMENT STRUCTURES (E.G. COFFERDAM, GRAVITY
   CELL) AT OFFSHORE HDD EXIT POINT MAY BE REQUIRED.
PRODUCT PULLBACK TYPICALLY TOWARD HDD ENTRY

NOTES:
1. THERMAL GROUT FILL OF THE BOREHOLE ANNULUS MAY BE REQUIRED.
2. FINAL BOREHOLE SIZE DEPENDENT ON CONDUIT DIAMETER, VARIES BY TOOL SIZE AND SUBSURFACE CONDITIONS.

NOTES:
1. EQUIPMENT DIMENSIONS AND LAYOUT WILL VARY DEPENDING ON SITE CONDITIONS AND SELECTED CONTRACTOR.
2. PLAN DRAWING DEPICTS A SINGLE HDD INSTALLATION. EACH OFFSHORE EXPORT CABLE WILL BE INSTALLED IN A SEPARATE HDD BORE.
3. DUCT LAYDOWN AT EXIT AREA NOT SHOWN.

NOTES:
1. HDD GEOMETRY VARIES BY LOCATION AND TO ACCOMMODATE SITE AND SUBSURFACE CONDITIONS.
2. PILOT HOLE CENTERLINE - ENLARGED BY REAMING
3. BOREHOLE AVARIES BY LOCATION AND TO ACCOMMODATE SITE AND SUBSURFACE CONDITIONS.

ONSHORE HDD SCHEMATIC

NOTES:
1. HDD ENTRY AREA WORK SPACE VARIES BASED ON RIG SIZE AND AVAILABLE SPACE

NOTES:
1. EQUIPMENT DIMENSIONS AND LAYOUT WILL VARY DEPENDING ON SITE CONDITIONS AND SELECTED CONTRACTOR.
2. PLAN DRAWING DEPICTS A SINGLE HDD INSTALLATION. EACH OFFSHORE EXPORT CABLE WILL BE INSTALLED IN A SEPARATE HDD BORE.
3. DUCT LAYDOWN AT EXIT AREA NOT SHOWN.

NOTES:
1. HDD GEOMETRY VARIES BY LOCATION AND TO ACCOMMODATE SITE AND SUBSURFACE CONDITIONS.
2. PILOT HOLE CENTERLINE - ENLARGED BY REAMING
3. BOREHOLE AVARIES BY LOCATION AND TO ACCOMMODATE SITE AND SUBSURFACE CONDITIONS.

ONSHORE HDD SCHEMATIC

NOTES:
1. HDD ENTRY AREA WORK SPACE VARIES BASED ON RIG SIZE AND AVAILABLE SPACE

NOTES:
1. EQUIPMENT DIMENSIONS AND LAYOUT WILL VARY DEPENDING ON SITE CONDITIONS AND SELECTED CONTRACTOR.
2. PLAN DRAWING DEPICTS A SINGLE HDD INSTALLATION. EACH OFFSHORE EXPORT CABLE WILL BE INSTALLED IN A SEPARATE HDD BORE.
3. DUCT LAYDOWN AT EXIT AREA NOT SHOWN.

NOTES:
1. HDD GEOMETRY VARIES BY LOCATION AND TO ACCOMMODATE SITE AND SUBSURFACE CONDITIONS.