PERMITTING & CONSTRUCTION NOTES: MEANS OF CONSTRUCTION & IMPACTS

TYPICAL HDD ENTRY CONSTRUCTION

1. PER BOND DRAWINGS 2-23-980T

TYPICAL CABLE PULL IN & MOORING NOTES

1. THE LANDING OF THE EXPORT CABLE IS A VERY TIME INTENSIVE PROCESS REQUIRING CLOSE COORDINATION BETWEEN THE BEACH TEAM AND THE OFFSHORE VESSELS, WITH HSSE AS THE PRIORITY FOR ALL WORKS.

2. THE CLV WILL PROGRESS ALONG THE CABLE ROUTE BY PULL-AHEAD ANCHOR IN SHALLOW WATERS, AND MAY TRANSITION FROM ANCHOR TO DYNAMIC POSITIONING (DP) IN DEEPER WATERS.

   A. IN SHALLOW WATERS, THE CLV WILL USE A 6 + 1-POINT MOORING SYSTEM AS SHOWN IN THE FIGURE BELOW. THE PULLING ANCHOR CONNECTED TO THE BOW OF THE CLV WILL PROVIDE THE BOLLARD PULL REQUIRED TO PLOW THROUGH THE SEABED. ANCHOR HANDLING TUGS (AHTS) WILL BE USED TO REPOSITION THE ANCHORS CONTINUOUSLY DURING CABLE LAY OPERATIONS, MEANING THAT SOME ANCHORS WILL BE MOVED WHILE OTHERS ARE USED TO POSITION THE CLV.
   B. IN VERY SHALLOW WATERS, CABLE-LAY OPERATIONS REQUIRE A SHALLOW WATER BARGE THAT WOULD ANCHOR A SAFE DISTANCE FROM THE HDD EXIT POINT.
   C. THE TRANSITION FROM ANCHOR POSITION TO DP WILL BE DETERMINED CONSIDERING WATER DEPTH, CLEARANCE FROM OBSTRUCTIONS (E.G. SHORELINE), AND OTHER CRITERIA TO BE DEFINED BETWEEN THE INSTALLATION CONTRACTOR AND OWNER PRIOR TO INSTALLATION.

3. ASSUMES SHALLOW WATER MARINE SPREAD WILL BE UTILIZING TYPCALLY 7T DANFORTH ANCHORS WITH 110-INCH SWING DIAMETER OR 10T DELTA PATTERN ANCHORS WITH TRIP LINES TO REDUCE DRAG EMBEDMENT DISTANCES.

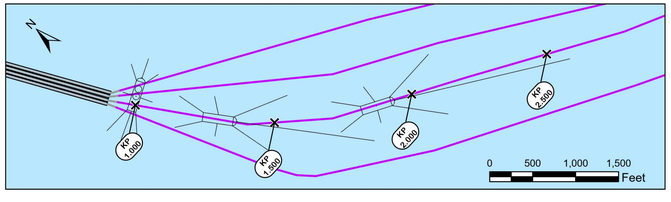
4. ADDITIONAL SUPPORT VESSEL (JACK-UP/LIFT-BOAT) WITH UP TO 4 SPUDS/LEGS MAY BE UTILIZED OVER THE HDD ENTRY POINTS OR AT SPECIFIED ALTER COURSES. WHERE THESE VESSELS ARE OF SIMILAR SIZE TO THOSE EMPLOYED IN HDD CONSTRUCTION, GROUND DISTURBANCE IS MINIMIZED BY POSITIONING IN PRIOR 'FOOTPRINTS'.

5. 'FIRST END' METHOD:

   A. A BELLMOUTH IS FITTED TO THE HDD ENTRY OR AN EXTENSION TUBE CONNECTED TO THE HDD ENTRY AND LIFTED ABOARD A LIFT-BOAT/JACK-UP.
   B. THE PRODUCT CABLE IS ATTACHED TO THE MESSENGER WIRE IN THE HDD DUCT.
   C. A WINCH AT THE TJB PULLS IN THE MESSENGER WIRE WHILST THE CABLE LAY VESSEL PAYS OUT PRODUCT CABLE.
   D. ONCE THE PRODUCT CABLE REACHES THE TJB AND OVER-LENGTH PULLED, THE PRODUCT CABLE IS MADE FAST ONSHORE.
   E. THE CLV LAYS CABLE INTO THE HDD ENTRY PIT.
   F. THE CLV SURFACE LAYS CABLE OR DEPLOYS A SIMULTANEOUS LAY AND BURY TOOL WHICH, THOUGH SLOWER, CAN MITIGATE THE NEED FOR A SECOND BURIAL OPERATION.
   G. OTHERWISE; A BURIAL MACHINE IS DEPLOYED TO THE CABLE AND THE MAXIMUM PRACTICABLE AMOUNT OF CABLE BURIED. THIS MAY REQUIRED CFE WHERE OTHER BURIAL TOOLS ARE OPERATIONALLY LIMITED.
   H. UNBURIED CABLE IS RECTIFIED BY MATTRESS PLACEMENT OR ROCK BERM CONSTRUCTION.

6. 'SECOND END' METHOD:

   A. A BELLMOUTH IS FITTED TO THE HDD ENTRY OR AN EXTENSION TUBE CONNECTED TO THE HDD ENTRY AND LIFTED ABOARD A LIFT-BOAT/JACK-UP.
   B. THE CLV LAYS CABLE INTO THE FIELD.
   C. BURIAL PROTECTION CEASES ADJACENT TO THE HDD ENTRY PIT.
   D. THE MESSENGER WIRE FROM THE HDD IS RECOVERED TO THE CLV OR SUPPORT LIFT-BOAT/JACK-UP.
   E. THE CLV PAYS OUT A LOOP OF PRODUCT CABLE FLOATED ON THE SEA SURFACE WITH DETATCHABLE FLOATS IN AN 'OMEGA BIGHT' UNTIL SUFFICENT CABLE TO REACH THE TJB PLUS THE OVER-LENGTH IS AFLOAT.
   F. THE PRODUCT CABLE IS CUT AND THE MESSENGER LINE ATTACHED TO THE FREE END.
   G. A WINCH AT THE TJB PULLS IN THE MESSENGER WIRE CONSUMING THE FLOATING 'OMEGA BIGHT'. FLOATS ARE DETATCHED AS THEY ARE DRAGGED TO SUBMERGE TOWARDS THE HDD ENTRY AND RECOVERED TO THE CLV BY A SMALL BOAT/TENDER.
   H. ONCE THE PRODUCT CABLE REACHES THE TJB, ALL OF THE OVER-LENGTH IS PULLED UNTIL THE PRODUCT CABLE BECOMES TAUGHT ON THE SEABED THEN THE PRODUCT CABLE IS MADE FAST ONSHORE.
   I. A BURIAL MACHINE IS DEPLOYED TO THE CABLE AND THE MAXIMUM PRACTICABLE AMOUNT OF CABLE BURIED. THIS MAY REQUIRED CFE WHERE OTHER BURIAL TOOLS ARE OPERATIONALLY LIMITED.
   J. UNBURIED CABLE IS RECTIFIED BY MATTRESS PLACEMENT OR ROCK BERM CONSTRUCTION.

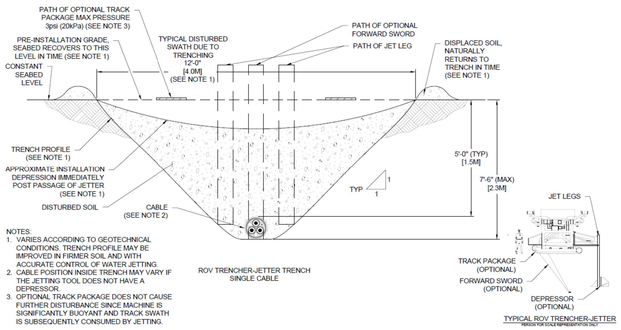


TYPICAL EXPORT CABLE PROTECTION BY BURIAL

1. THE CONTRACTOR CHOOSES THE SUITABLE METHOD FOR LOWERING THE CABLE TO ATTAIN THE DESIRED TARGET BURIAL DEPTH AS DETERMINED BY CONSENT AND THE CABLE BURIAL RISK ASSESSMENT (CBRA).

2. THE IMPACTS LISTED HERE PERTAIN TO THE MOST IMPACTFUL METHOD, WHICH INVOLVES WATER JETTING WITHOUT DEPRESSORS, WITH EDUCTION FORMING BERMS ADJACENT TO A SEMI-OPEN TRENCH.

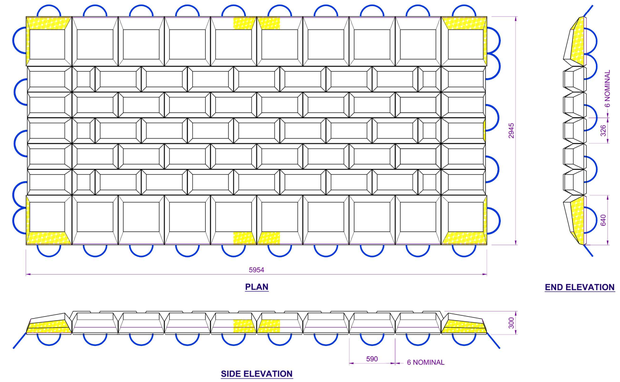
3. WHERE A BURIAL MACHINE IS UTILIZED THAT DOES NOT HAVE POSITIVE DEPRESSION AND INDICATION THAT TARGET BURIAL DEPTH IS REACHED, A SURVEY PASS IS FLOWN TO VERIFY THAT THE CABLE IS DEEPER THAN TARGET DEPTH.



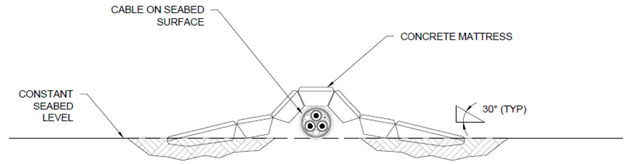
TYPICAL MOST IMPACTFUL CABLE PROTECTION BY WATER JETTING (NOT TO SCALE)

TYPICAL CABLE PROTECTION NOTES (MATTRESSING OPTION)

1. THE MATTRESS WILL BE MADE OF CONCRETE AND HAS A NOMINAL LENGTH OF 19 FT LONG 13 FT WIDE AND THICKNESS APPROACHING 1.5 FT AS REQUIRED BASED ON STABILIZATION STUDIES. MATTRESSES ARE DESIGNED TO PROTECT THE CABLE IN REGIONS OF REDUCED BURIAL OR CROSSINGS OF OTHER INFRASTRUCTURE.



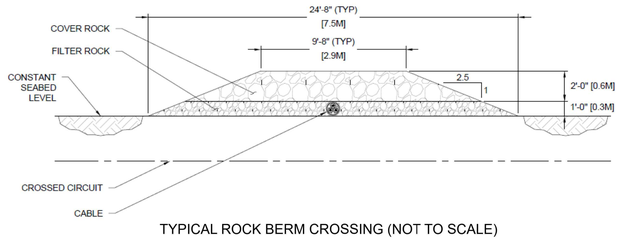
TYPICAL CONCRETE SEGMENTAL MATTRESS (NOT TO SCALE)



TYPICAL DRAPED MATTRESS DEPLOYMENT (NOT TO SCALE)

TYPICAL CABLE PROTECTION NOTES (ROCK BERM OPTION)

1. A ROCK BERM IS CONSTRUCTED BY SIDE STONE PLACEMENT OR FALL-PIPE PLACEMENT WITH THE LATTER PREFERRED DUE TO MORE ACCURATE PLACEMENT AND LOWER VOLUMES OF MATERIAL BEING REQUIRED.



TYPICAL ROCK BERM CROSSING (NOT TO SCALE)

TEMPORARY/PERMANENT IMPACTS

	TEMPORARY/PERMANENT IMPACTS													
		Cable burial trench and skid/tracks		Sandbedform remodeling		Anchoring / mooring / jacking (incl. HDD works)		Jacking operations, incl. Landfall HDD works		External protection (inc. Crossings)		Route Clearance for potential inactive pipe/cable		TOTAL	
TOTAL	Within Boundary	Temporary (acre)	Permanent (acre)	Temporary (acre)	Permanent (acre)	Temporary (acre)	Permanent (acre)	Temporary (acre)	Permanent (acre)	Temporary (acre)	Permanent (acre)	Temporary (acre)	Permanent (acre)	Temporary (acre)	Permanent (acre)
	State Waters (Not Exclusive of Other Areas)	**98.8**	**-**	**39.5**	**-**	**15.4**	**-**	**0.1**	**-**	**-**	**24.7**	**3.7**	**-**	**157.5**	**24.7**
	Sand Resource Area	10.1	-	4.0	-	1.3	-	-	-	-	2.5	-	-	15.4	2.5
	NJGIN Prime Fishing Grounds	25.2	-	10.1	-	3.1	-	-	-	-	6.3	-	-	38.4	6.3

ATLANTIC SHORES offshore wind
ATLANTIC CITY, NJ

STATE OF NEW JERSEY · TYLER MCARTHUR · No. GE52385 · LICENSED PROFESSIONAL ENGINEER

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Date: 2024.01.23 14:33:09-06'00'

TYLER R. MCARTHUR
N.J. PROFESSIONAL ENGINEER
LIC. NO. 24GE05238500
C.O.A. NO. 24GA28066400

BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co, Inc.

project	contract
ASOW PROJECT 1	164550

ISSUED FOR PERMITTING NOT FOR CONSTRUCTION

THESE DRAWINGS ARE FOR DESIGN AND PERMITTING PURPOSES ONLY AND NOT FOR CONSTRUCTION. FINAL LOCATION AND METHODS WILL FOLLOW FURTHER ENGINEERING ANALYSIS AND BE COORDINATED WITH THE CONSTRUCTION CONTRACTOR.

THESE DRAWINGS SHOW THE APPROXIMATE LOCATION AND DEPTH OF CABLE ROUTE(S). FINAL CABLE ROUTE(S) TO BE PROVIDED BY THE CONTRACTOR IN ACCORDANCE WITH CABLE BURIAL RISK ASSESSMENT (CBRA).

designed	detailed
D. SLEE	O. GREEN
date	checked
22 JAN 2024	T. MCARTHUR

ATLANTIC SHORES OFFSHORE WIND
PROJECT 1 - NJ STATE WATERS
P1 PLAN & NOTES
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