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DOCUMENT A00803

## **DRAWINGS AND SKETCHES**

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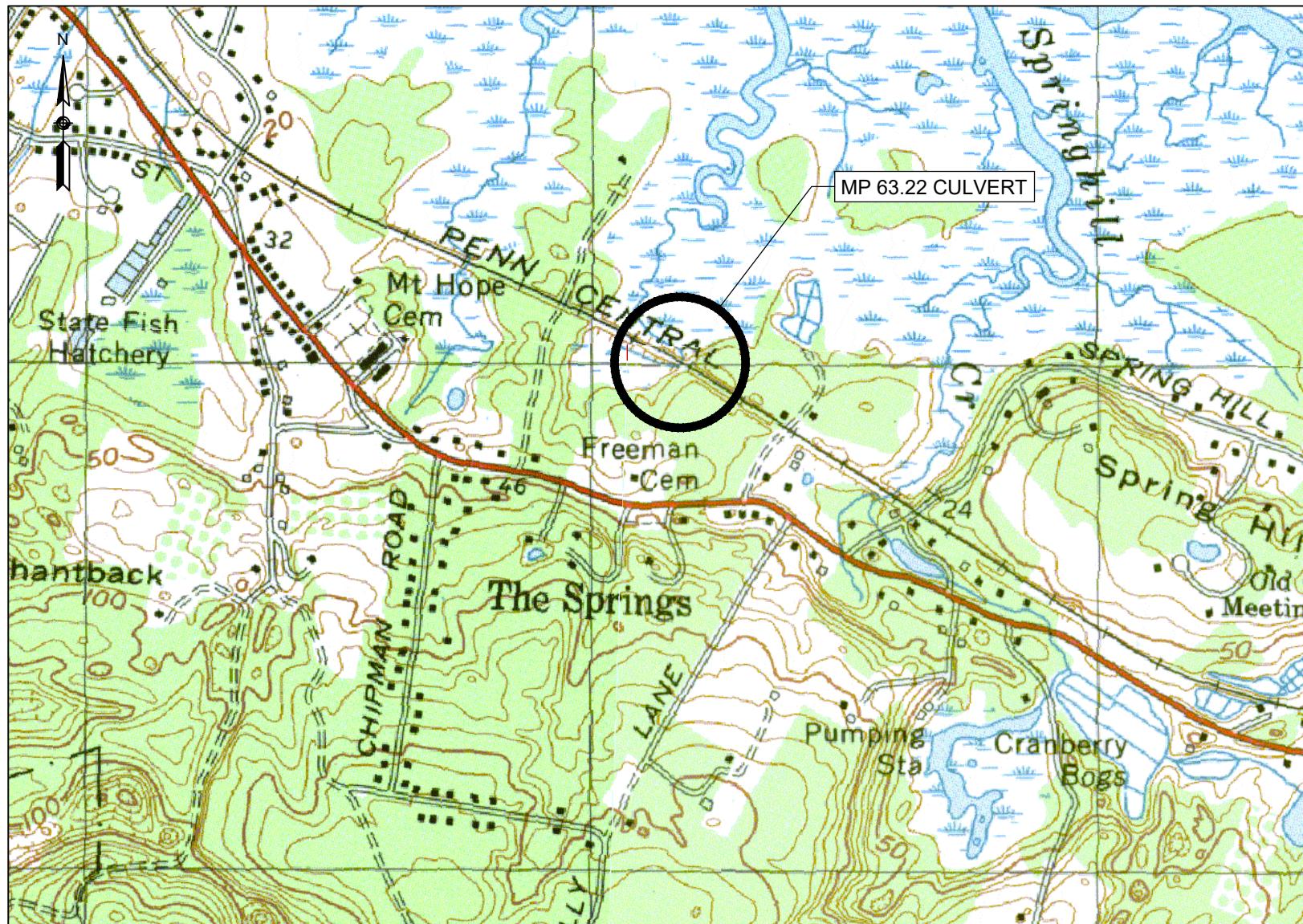
# MASSACHUSETTS DEPARTMENT OF TRANSPORTATION RAIL AND TRANSIT DIVISION

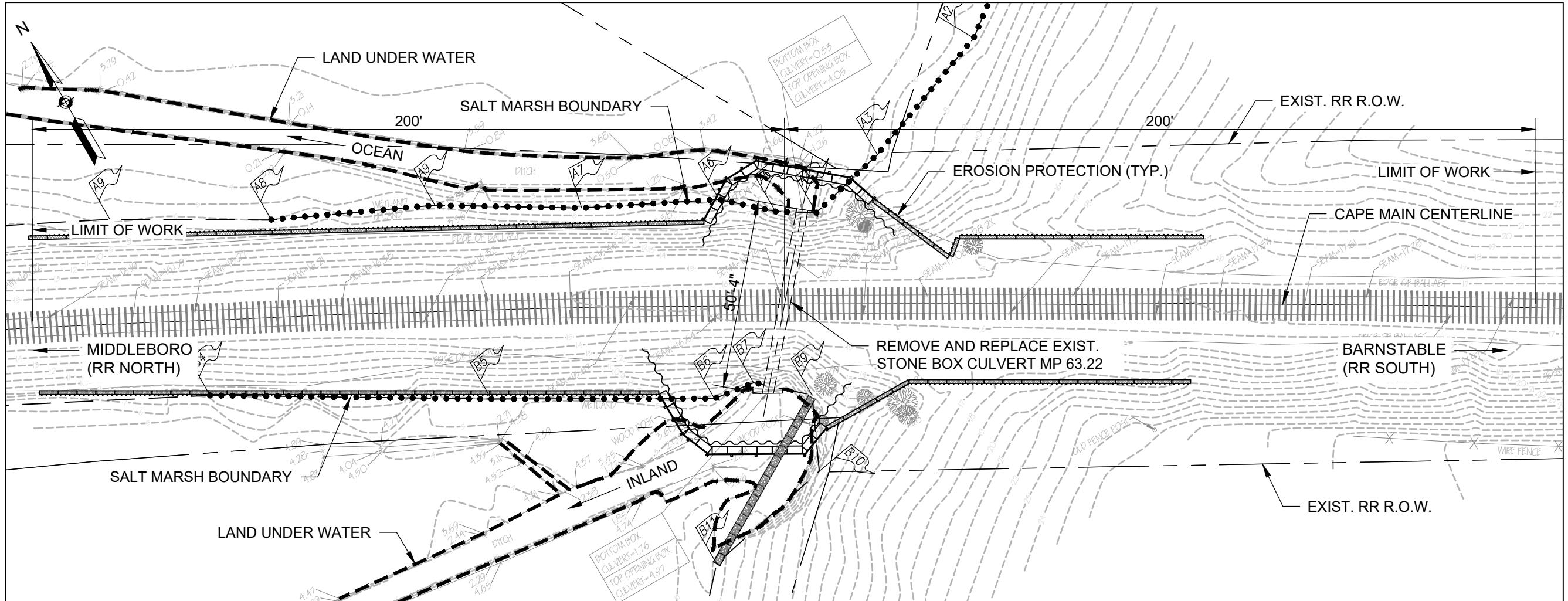
## EMERGENCY REPAIRS TO CULVERT AT CAPE MAIN LINE MP 63.22

IN THE TOWN OF  
SANDWICH, MA

### INDEX OF DRAWINGS

SHEET	TITLE
1	COVER SHEET
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8	EROSION CONTROL, SALT MARSH MITIGATION AND PLANTING NOTES





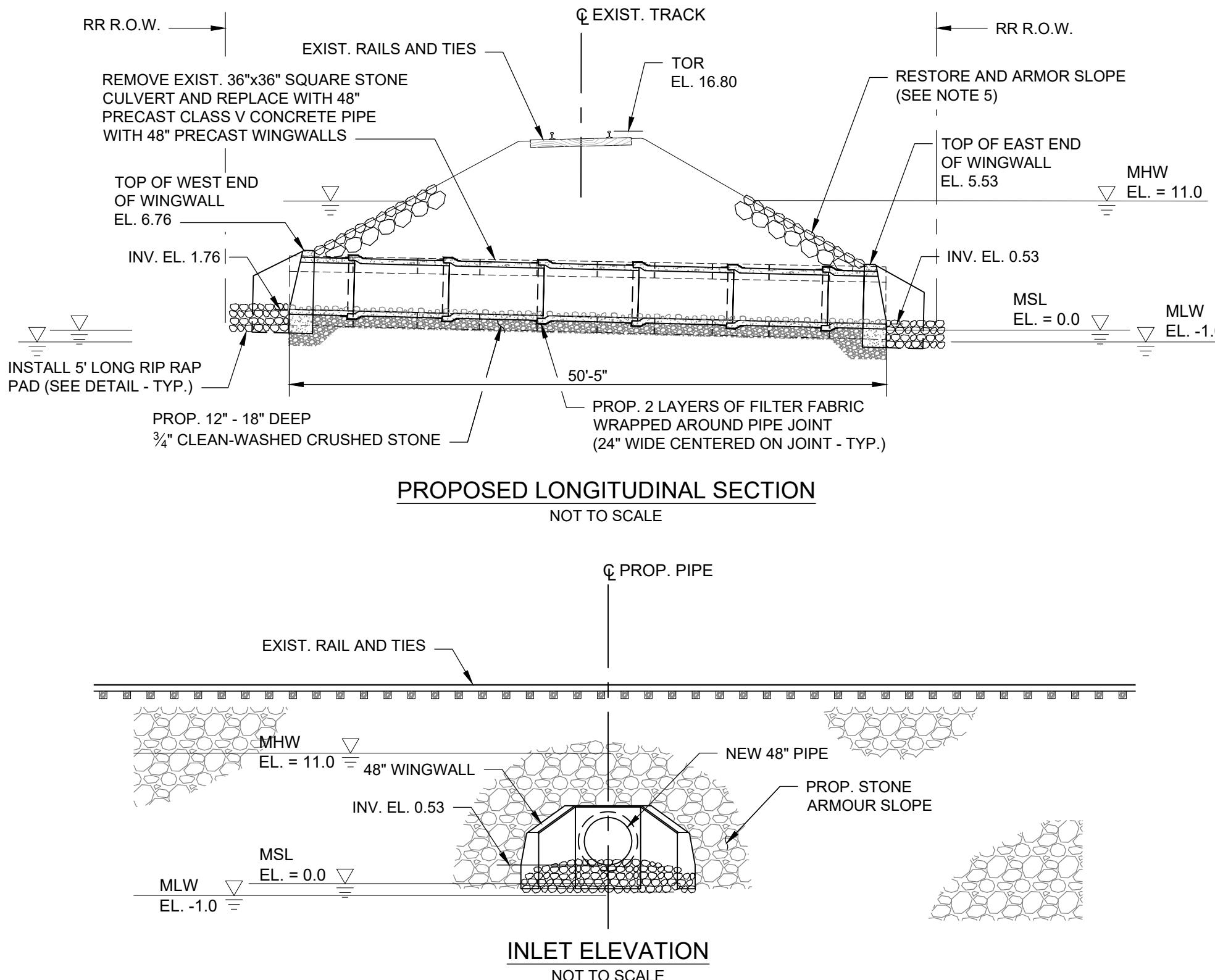
**PLAN**  
NOT TO SCALE



INLET (LOOKING EAST)  
INLAND SIDE

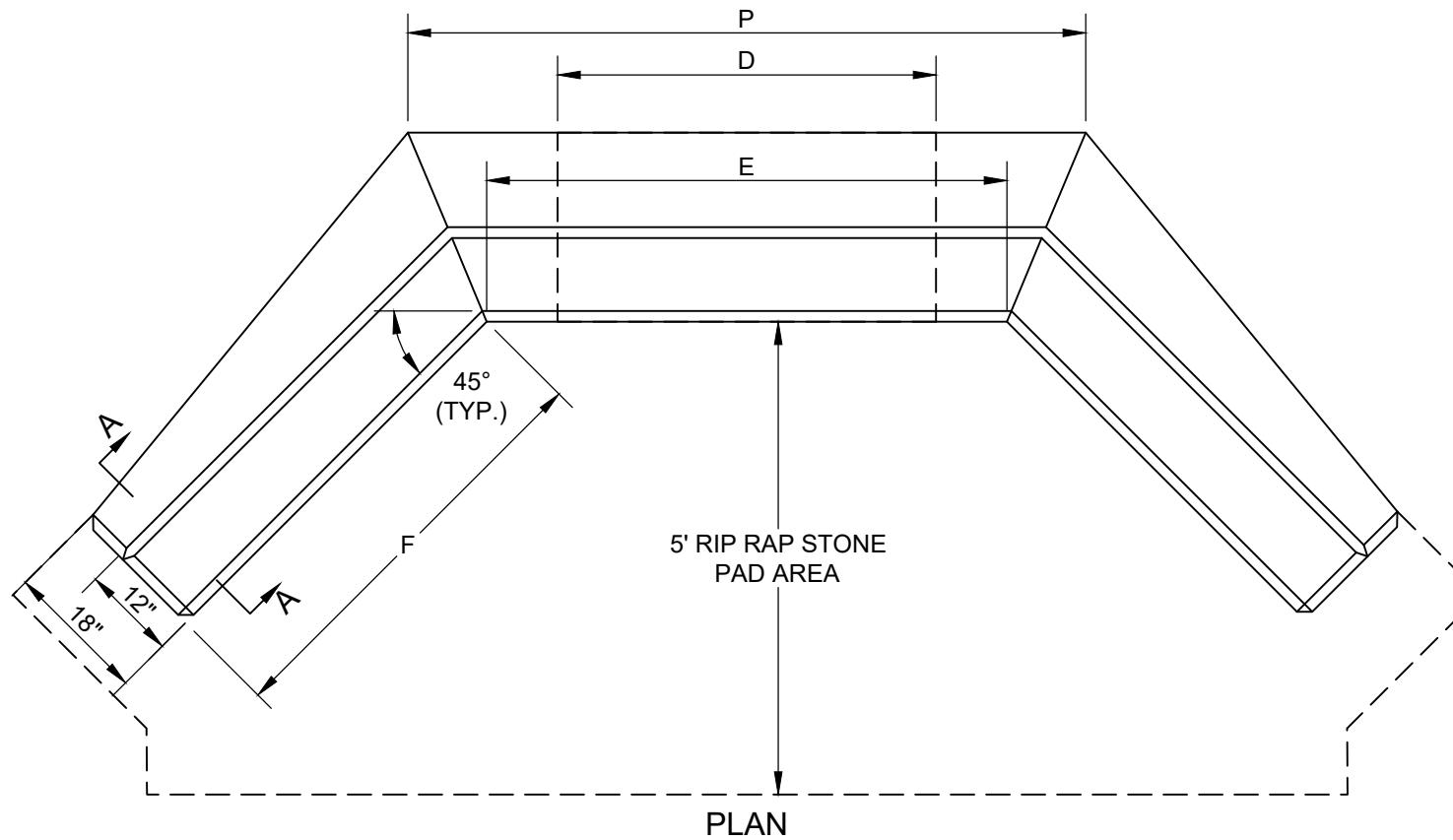


OUTLET (LOOKING WEST)  
OCEAN SIDE



NOTES:

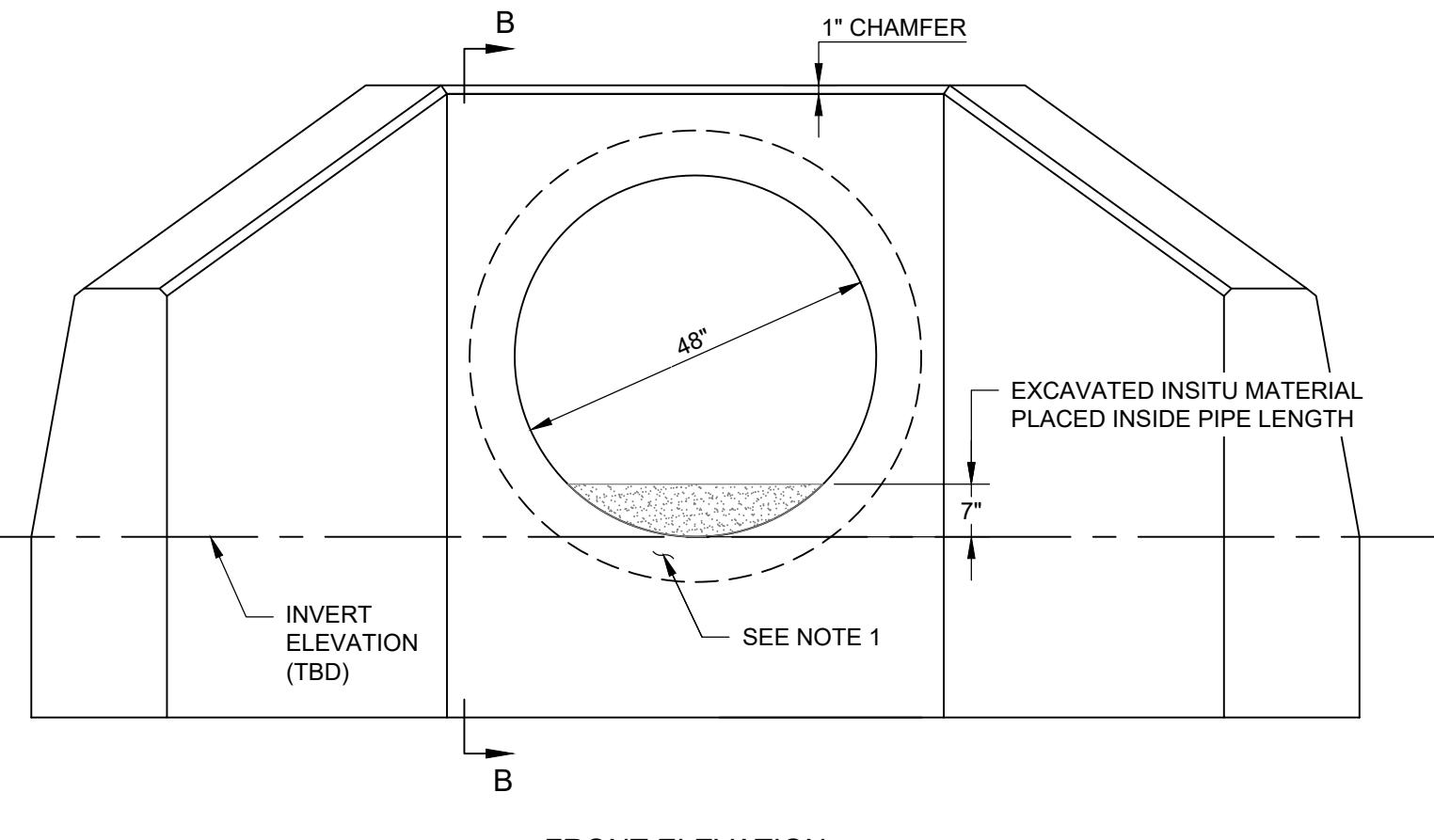
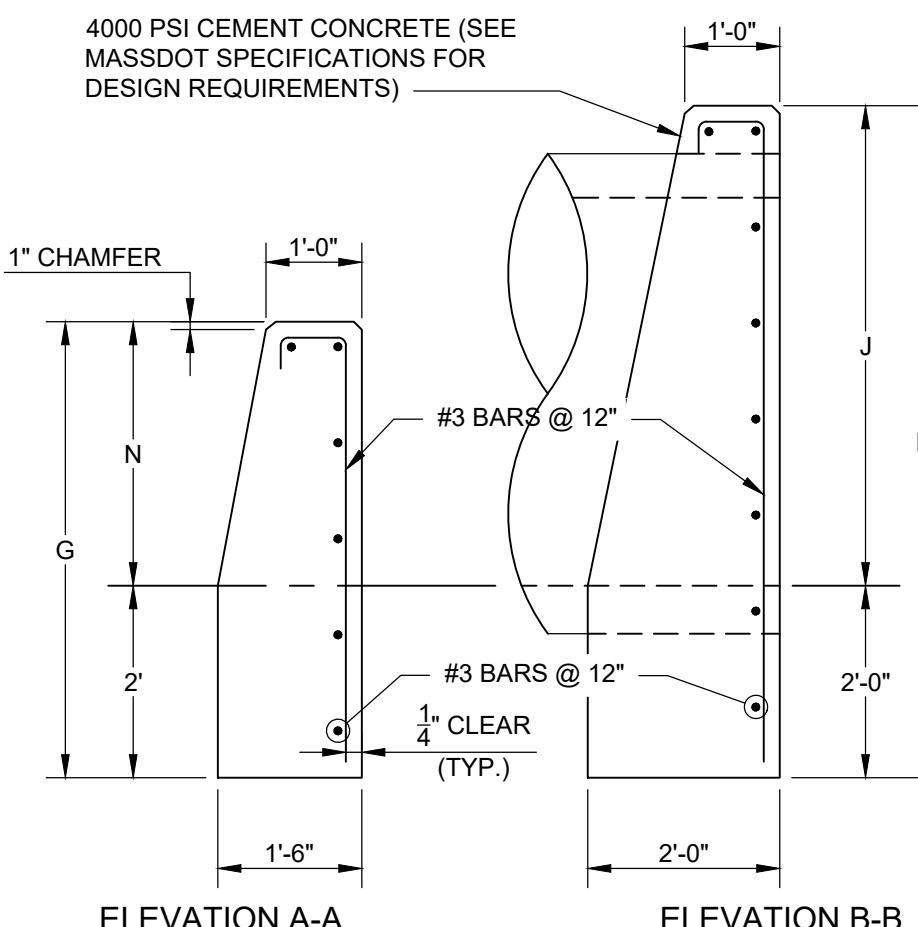
1. ALL CULVERT AND WINGWALL INSTALLATION WORK SHALL BE PERFORMED IN THE DRY WITH TEMPORARY COFFERDAMS, DEWATERING PUMPING, AND ALL EROSION CONTROL MEASURES IN PLACE AND MAINTAINED FOR THE DURATION OF THE WORK.
2. CONTRACTOR SHALL MINIMIZE ENCROACHMENT INTO THE ADJACENT WATER AND NATURAL VEGETATION TO THE GREATEST EXTENT POSSIBLE TO LIMIT SOIL AND WATER DISTURBANCE.
3. CONTRACTOR SHALL REMOVE AND TEMPORARILY STOCKPILE EMBANKMENT SLOPE SOILS AND SURFACE BALLAST TO BE RESET TO MATCH EXISTING CONDITION FOLLOWING CULVERT INSTALLATION WORK AT THE DIRECTION OF THE ENGINEER ONLY.
4. ANY ADDITIONAL PROCESSED GRAVEL, CRUSHED STONE, AND STONE BALLAST DETERMINED TO BE NEEDED BY THE CONTRACTOR SHALL BE APPROVED BY MASSDOT'S ENGINEER PRIOR TO ORDERING FOR DELIVERY TO THE SITE.
5. CONTRACTOR SHALL PLACE AND EMBED STONE ARMOR RIP RAP ON BOTH SIDES OF THE CULVERT TO LIMITS SHOWN. STONES SHALL BE CHINKED IN TO ELIMINATE ANY DISLODGING OR SLIP-FAILING OF THE RECONSTRUCTED SLOPE.
6. PLACE 7" OF RECLAIMED MUD AND STONE MATERIAL INSIDE NEW PIPE SO THAT FLOW VOLUME IS EQUAL TO THAT OF EXISTING 30" STONE BOX.
7. ALL EMBANKMENT FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED TWELVE (12) INCHES IN LAYERED DEPTH FOLLOWING COMPACTION. SUBSEQUENT LAYERS SHALL ONLY THEN PLACED AND COMPACTED AFTER THE PREVIOUS LOWER FILL LAYER IS FULLY COMPACTED IN PLACE.



1V:1.5H SLOPE									
D	E	G	H	J	L	N	P	F	CONC. MASONRY CY STEEL LBS
48"	5'-6"	4'-9"	7'-0"	5'-0"	2'-0"	2'-9"	7'-2"	4'-6"	5.19 65

NOTE:

1. CONTRACTOR SHALL INSTALL REPLACEMENT, PRECAST WINGWALL AND SEAL CONCRETE CULVERT END WITH WATERTIGHT GROUT SEALANT PRIOR TO REMOVAL OF COFFERDAM.





PLAN  
SCALE: 1" = 60'

0 60 120  
SCALE IN FEET

**Jacobs**

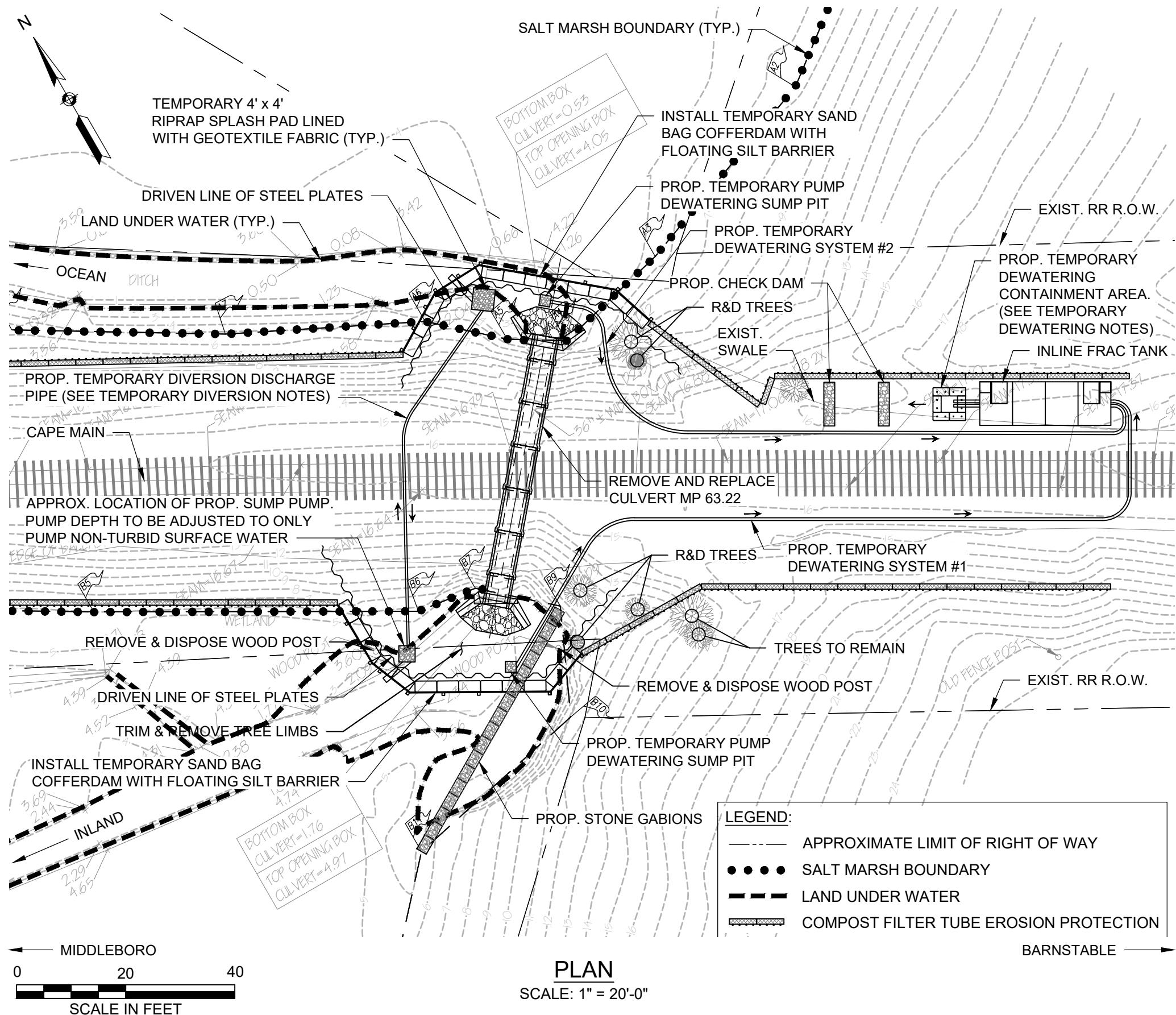
**massDOT**  
Massachusetts Department of Transportation  
Rail & Transit Division

DATE:  
June 1, 2022

CAPE MAIN  
SANDWICH, MASSACHUSETTS

CULVERT AT MP 63.22  
SITE ACCESS AND STAGING AREA

SHEET  
5

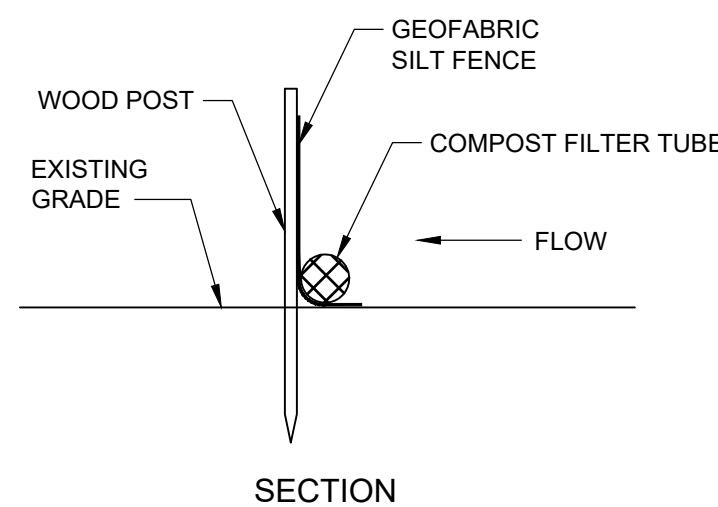
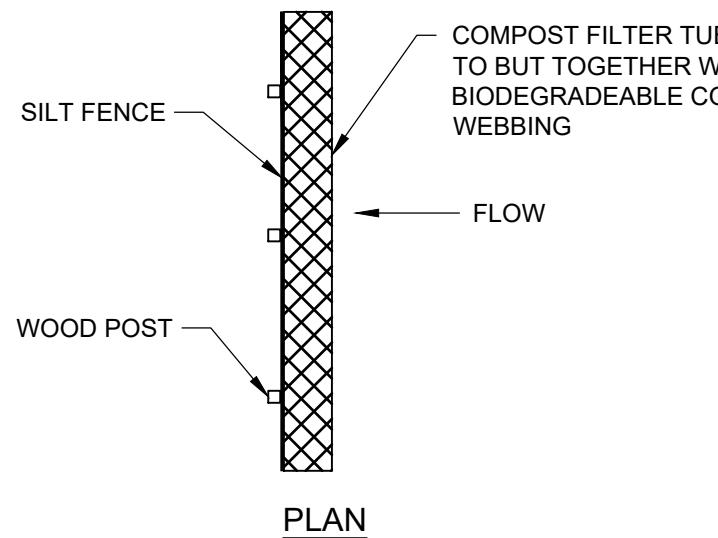


#### TEMPORARY DIVERSION NOTES:

1. THE CONTRACTOR SHALL DESIGN AND SUBMIT FOR APPROVAL A TEMPORARY PUMP DIVERSION SYSTEM TO DIVERT WATER FLOW AROUND CULVERT CONSTRUCTION AREA, INCLUDING REQUIRED SIZE/LOCATION OF DIVERSION PUMP, DISCHARGE PIPE SIZE, AS WELL AS CONTINGENCY PLANS IN THE EVENT OF PUMP FAILURE.
2. WATER LEVELS ARE SUBJECT TO CHANGE, THE CONTRACTOR IS RESPONSIBLE FOR MAKING DETERMINATION OF WATER LEVELS THAT WILL EXIST DURING CONSTRUCTION AND INSTALL AND REFORIFY COFFER DAMS AS APPLICABLE.
3. UPON INSTALLATION OF ALL SEDIMENT CONTROL MEASURES THE CONTRACTOR SHALL BEGIN IMPLEMENTING THE DIVERSION AND DEWATERING PLAN FOLLOWING INSPECTION.
4. THE CONTRACTOR SHALL INSTALL THE TEMPORARY DISCHARGE PIPES, SUMP-HOLE, DIVERSION PUMPS AND RIP-RAP DISCHARGE SPLASH PAD PRIOR TO PLACING PIPE PLUGS, DRIVEN STEEL PLATES AND SAND BAG COFFERDAMS.
5. THE TEMPORARY DISCHARGE PIPE SHALL BE CONSTRUCTED OF DURABLE MATERIAL ABLE TO WITHSTAND ANTICIPATED SITE CONDITIONS.
6. WATER FROM THE WORK AREA SHALL BE PUMPED TO A DEWATERING CONTAINMENT AREA THE AREA SHALL BE LOCATED SUCH THAT THE WATER DRAINS BACK INTO THE MARSHLAND BELOW THE DOWNGRADIENT COFFERDAM.
7. AFTER THE CULVERT HAS BEEN REPLACED AND READY TO RECEIVE FLOW AND THE DISTURBED AREA HAS BEEN STABILIZED, THE DRIVEN STEEL SHEETS SHALL BE PULLED OUT AND "COFFERDAMS" SHALL BE REMOVED STARTING ON THE NORTHERN END. THEN THE TEMPORARY DIVERSION SHALL BE REMOVED.

#### TEMPORARY DEWATERING NOTES:

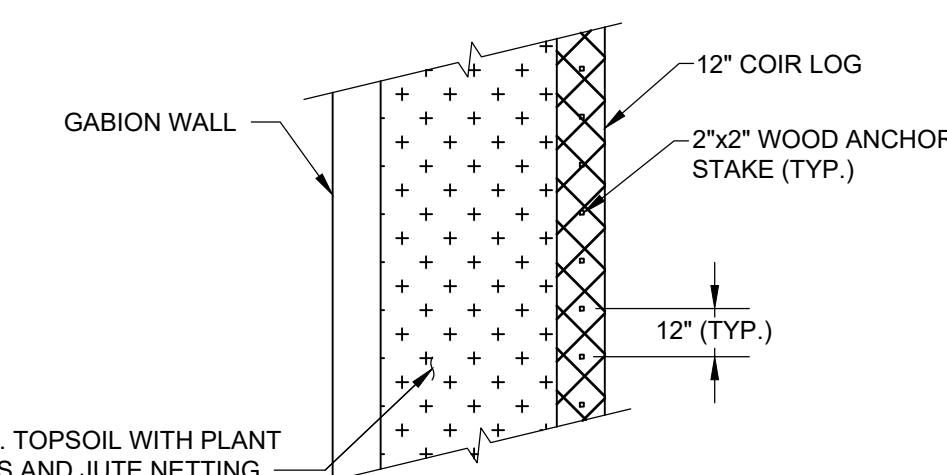
1. THE PROP. TEMPORARY DEWATERING CONTAINMENT AREA. SIZE AND LOCATION OUTSIDE THE WETLAND AREA TO BE DETERMINED BY THE CONTRACTOR AND PRE-APPROVED BY THE ENGINEER'S DRAINAGE ENGINEER AND WETLAND SCIENTIST.
2. CONTRACTOR SHALL EXCAVATE BACK THIS EMBANKMENT AREA AS REQUIRED TO INSTALL DEWATERING CONTAINMENT AREA AND RESTORE SLOPE UPON ITS REMOVAL.



### SILT FENCE / COMPOST FILTER TUBE EROSION CONTROL BARRIER

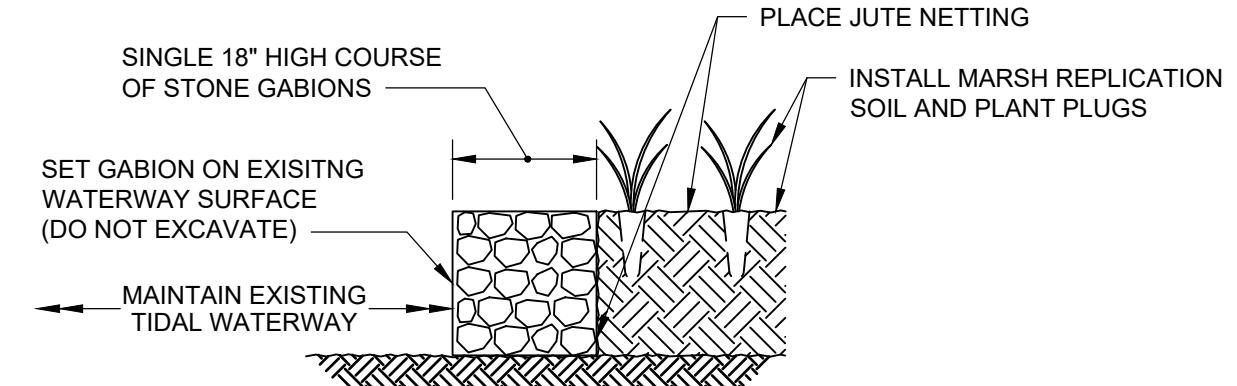
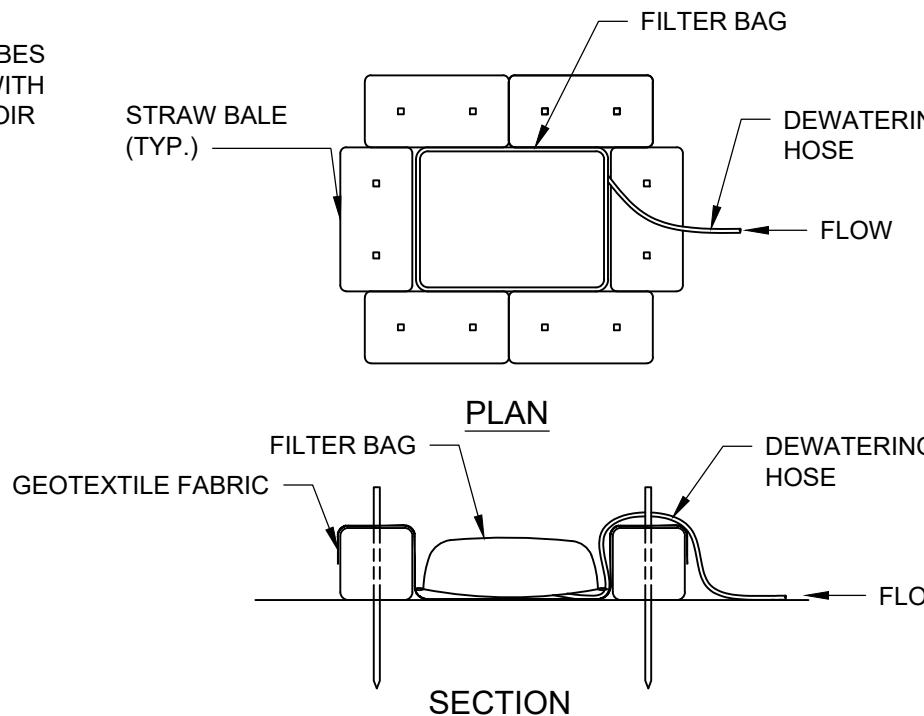


### STONE CHECK DAM DETAIL



### WETLAND MITIGATION DETAIL

### DEWATERING CONTAINMENT AREA DETAIL



### GABION INSTALLATION SECTION DETAIL

#### GABION INSTALLATION NOTES

1. INSTALLATION OF THIS GABION WALL DURING LOW TIDE ONLY SHALL BE SET UPON EXISTING WATERWAY BOTTOM SURFACE GROUND ALONG THE LOCATION SHOWN IN PLAN VIEW WITH NO PERMITTED EXCAVATION, NOR PLACEMENT OF A SUPPORTING STONE LAYER NOR OTHER IMPACTS INFILCTED TO THE EXISTING WATERWAY.
2. THE TOP ELEVATION OF THIS SINGLE COURSE GABION WALL RUN SHALL BE SET NEARLY EQUIVALENT TO THAT OF THE ADJACENT TOP OF MARSHLAND SURFACE GRADE.
3. A CONTINUOUS BIODEGRADABLE JUTE MESH FOLDED OVER ALONG THE BACKSIDE OF THE GABION CAGES AND LAPPED ATOP OF THE INFILLED MARSHLAND REPLICATION PLANTINGS AREA SHALL CONTAIN THE INFILLED SOIL MATERIAL AS SHOWN IN DETAIL ABOVE AND IN ACCORDANCE WITH APPROVAL BY THE ENGINEER.

EROSION CONTROL NOTES:

- PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT FOR ACCEPTANCE A GENERAL WORK SCHEDULE, CONSTRUCTION SEQUENCE AND PLAN WHICH INDICATES PLANNED IMPLEMENTATION OF TEMPORARY AND PERMANENT EROSION CONTROL MEASURES. THIS PLAN SHALL INCLUDE PROPOSED METHODS OF SOILS MANAGEMENT AND LEGAL OFFSITE DISPOSAL OF WASTE MATERIALS.
- FOR EROSION CONTROL INSTALLATION REQUIREMENTS, REFER TO SHEET 6.
- THE TOE OF ANY SLOPE IS TO REMAIN AT LEAST ONE FOOT INSIDE OF ALL EROSION CONTROLS. UNDER NO CIRCUMSTANCE SHALL THE CONTRACTOR COVER ANY PORTION OF THE EROSION CONTROLS WITH MATERIAL. ANY MATERIAL THAT IS PLACED ON ANY EROSION CONTROLS BY THE CONTRACTOR, OR ANY AGENT OF THE CONTRACTOR, SHALL BE IMMEDIATELY REMOVED BY THE CONTRACTOR, AND ANY NECESSARY REPAIRS TO THE EROSION CONTROLS ACCOMPLISHED, AT NO COST TO THE OWNER.
- ADDITIONAL AND/OR REPLACEMENT EROSION CONTROLS SHALL BE INSTALLED AS CONDITIONS WARRANT, OR AS DIRECTED BY THE ENGINEER'S WETLAND SCIENTIST.
- DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EROSION CONTROL MAINTENANCE AND SHALL INSPECT AND/OR REPLACE ALL CONTROLS AS NEEDED. MAINTENANCE WILL BE CARRIED OUT IN ACCORDANCE WITH THE SPECIFICATIONS AND PERMIT CONDITIONS. THE CONTRACTOR IS RESPONSIBLE FOR CARRYING OUT NECESSARY MAINTENANCE DURING ALL PHASES OF PROJECT CONSTRUCTION AND SHALL BE SUBJECT TO THE INSPECTION AND ACCEPTANCE OF THE ENGINEER.
- DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING RUNOFF FLOW DURING STORMS AND PERIODS OF RAINFALL, THROUGHOUT THE WORK AREA.
- SEDIMENTATION CONTROL DEVICES SHALL BE INSPECTED CLOSELY AND MAINTAINED PROMPTLY AS DESCRIBED IN THE SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER'S WETLAND SCIENTIST.
- DISTURBED SLOPES ALONG THE ROW EMBANKMENT WITHIN THE WORK ZONE WILL BE STABILIZED WITH LOAM AND SEED OR BALLAST AS DIRECTED BY THE ENGINEER.

SALT MARSH REPLICATION NOTES:

- THE SALT MARSH REPLICATION SITE WILL BE CLEARED AND THE SUBGRADE ELEVATION BROUGHT TO AN EVEN LEVEL. THE SUPERVISING WETLAND SCIENTIST WILL INSPECT THE SUB-GRADE OF THE SALT MARSH REPLICATION SITE TO ENSURE THAT THE AREA IS AT A UNIFORM GRADE.
- COIR LOGS WILL BE INSTALLED AND STACKED ON THE UPSLOPE SIDE OF THE ROCK GABION WALL UNTIL ADJACENT SALT MARSH ELEVATIONS ARE ACHIEVED.

SALT MARSH REPLICATION NOTES (CONT.):

- MANUFACTURED HYDRIC SOIL SHALL BE PLACED WITHIN THE SALT MARSH REPLICATION SITE AFTER GRADING THE SUBGRADE HAS BEEN APPROVED. SOILS USED FOR SALT MARSH REPLICATION WILL BE CREATED WITH SOIL AMENDMENTS. MANUFACTURED HYDRIC SOILS ARE CREATED FROM A MIXTURE OF ORGANIC AND MINERAL MATERIALS, WITH THE FINAL PRODUCT CONTAINING AT LEAST 12 PERCENT ORGANIC MATTER CONTENT BY WEIGHT. THE CONTRACTOR MUST PROVIDE AN ANALYSIS OF THE PREPARED TOPSOIL TO THE WETLAND SCIENTIST FOR APPROVAL PRIOR TO INSTALLATION. SOIL MUST BE FREE OF SEEDS OR RHIZOMES OF INVASIVE PLANT SPECIES.
- NO SOIL USED FOR THE CREATION OF SALT MARSH WILL BE TAKEN FROM ANY AREA SUPPORTING INVASIVE SPECIES, THE PROJECT WILL NOT TRANSLOCATE OR REUSE POTENTIALLY CONTAMINATED SALT MARSH OR WETLAND SOILS FROM AREAS ADJACENT TO THE EXISTING RAILROAD. MANUFACTURED WETLAND SOIL WILL BE GRADED TO ACHIEVE A TOPOGRAPHY TO MATCH THE EXISTING ADJACENT SALT MARSH, OR TO ACHIEVE TOPOGRAPHY OF THE TARGET SALT MARSH COVER TYPE. CONTRACTOR IS RESPONSIBLE FOR PROVIDING SPOT GRADES TO CONFIRM THE FINAL ELEVATION OF THE SALT MARSH REPLICATION AREA.
- THE SUPERVISING WETLAND SCIENTIST WILL INSPECT THE FILLED SALT MARSH REPLICATION AREA TO ENSURE THAT FINAL ELEVATIONS HAVE BEEN MET. IN RESPONSE TO LOCAL HYDROLOGIC CONDITIONS, THE SUPERVISING WETLAND SCIENTIST MAY MAKE MINOR MODIFICATIONS TO THE FINAL ELEVATIONS IN THE FIELD.
- THE SALT MARSH REPLICATION SITE WILL BE COVERED WITH A 100% BIODEGRADABLE EROSION CONTROL BLANKET AND SECURED IN PLACE USING 100% BIODEGRADABLE STAKES OR OTHER FASTENERS.
- THE EROSION CONTROL BARRIERS WILL BE DISASSEMBLED AND PROPERLY DISPOSED OF BEFORE NOVEMBER 1 OF THE THIRD FULL GROWING SEASON AFTER PLANTING OF THE SALT MARSH REPLICATION SITE. SEDIMENT COLLECTED BY THE BARRIERS WILL BE REMOVED AND DISPOSED OF IN A MANNER THAT PREVENTS EROSION AND TRANSPORT TO A WETLAND OR WATERWAY. IF MINOR GRADING IS REQUIRED IN THE IMMEDIATE ZONE AROUND THE EROSION CONTROL BARRIER TO PROVIDE SURFACE HYDROLOGIC CONNECTION BETWEEN THE SALT MARSH REPLICATION SITE AND THE EXISTING SALT MARSH AREA, IT WILL BE DONE BY HAND AND STABILIZED BY MULCH.
- CONTRACTOR SHALL SUBMIT AN AS-BUILT GRADING PLAN PRIOR TO PLANTINGS.
- CONTRACTOR SHALL NOT FOUL EXISTING FREIGHT AND SIDING TRACKS, THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARY CROSSING MEANS AND METHODS AND PROTECTING THE TRACK AT ALL TIMES.

PLANTING NOTES:

- PLANTING WITHIN THE SALT MARSH REPLICATION SITE WILL CONFORM TO THE PLANS OR WILL BE COMPLETED IN ACCORDANCE WITH DIRECTIONS PROVIDED IN THE FIELD. ONLY PLANT MATERIALS NATIVE AND INDIGENOUS TO THE REGION WILL BE USED. USE OF CULTIVARS WILL BE PROHIBITED. SPECIES NOT SPECIFIED IN THE FINAL PLANTING PLAN WILL NOT BE USED WITHOUT WRITTEN APPROVAL FROM THE PERMITTING AGENCY.
- ALL PLUGS WILL BE SPACED APPROXIMATELY 6-INCHES ON-CENTER, AT THE DIRECTION OF THE SUPERVISING WETLAND SCIENTIST TO SIMULATE NATURAL GROWTH PATTERNS.
- TRANSPLANTS AND PLANT MATERIAL COLLECTED FROM THE WILD ARE PROHIBITED UNLESS APPROVED IN WRITING BY THE WETLAND SCIENTIST. ALL PLANT MATERIAL USED SHALL BE NURSERY-GROWN AND HEALTHY, SOUND AND FREE OF DISEASE, INSECT PESTS, EGGS OR LARVAE, DISCOLORATIONS, LEAF WILTING OR CURLING AND WEEDS.
- CONTAINER GROWN STOCK SHALL HAVE BEEN GROWN IN A CONTAINER LONG ENOUGH FOR THE ROOT SYSTEM TO HAVE DEVELOPED SUFFICIENTLY TO HOLD ITS SOIL AFTER REMOVAL FROM THE CONTAINER. ROOTS SHALL VISIBLE EXTEND TO THE INSIDE FACE OF THE GROWING CONTAINER BUT SHALL NOT BE ROOT-BOUND OR GIRDLED.
- ALL PLANTS SHALL BE DELIVERED TO THE SITE AS LIVE, ACTIVELY GROWING, OR JUST BREAKING DORMANCY, AND ARRIVE TO THE PROJECT SITE READY FOR PLANTING. THE WETLAND SCIENTIST MAY REJECT PLANTS DAMAGED IN HANDLING OR TRANSPORT. PLANT MATERIAL SHALL BE INSTALLED AS SOON AS POSSIBLE AFTER IT HAS BEEN DELIVERED TO THE SITE.
- SOIL AND ROOTMASS SHALL BE WATERED AND MOIST ON DELIVERY TO THE JOB SITE. PLANTS WITH DRY SOIL AND ROOTS SHALL NOT BE ACCEPTABLE. ALL PLANT MATERIALS TEMPORARILY STORED AT THE SITE PRIOR TO PLANTING SHALL BE STORED OUT OF DIRECT EXPOSURE TO SUN AND WIND, SHALL BE MAINTAINED BY CAREFUL WATERING, AND SHALL BE PROTECTED FROM DAMAGE DUE TO CONSTRUCTION ACTIVITIES AND ADVERSE WEATHER.
- PLANTING TO OCCUR BETWEEN MAY 1 AND SEPTEMBER 15. ALL PLANT MATERIALS SHALL BE GUARANTEED FOR ONE YEAR FOLLOWING DATE OF FINAL ACCEPTANCE.