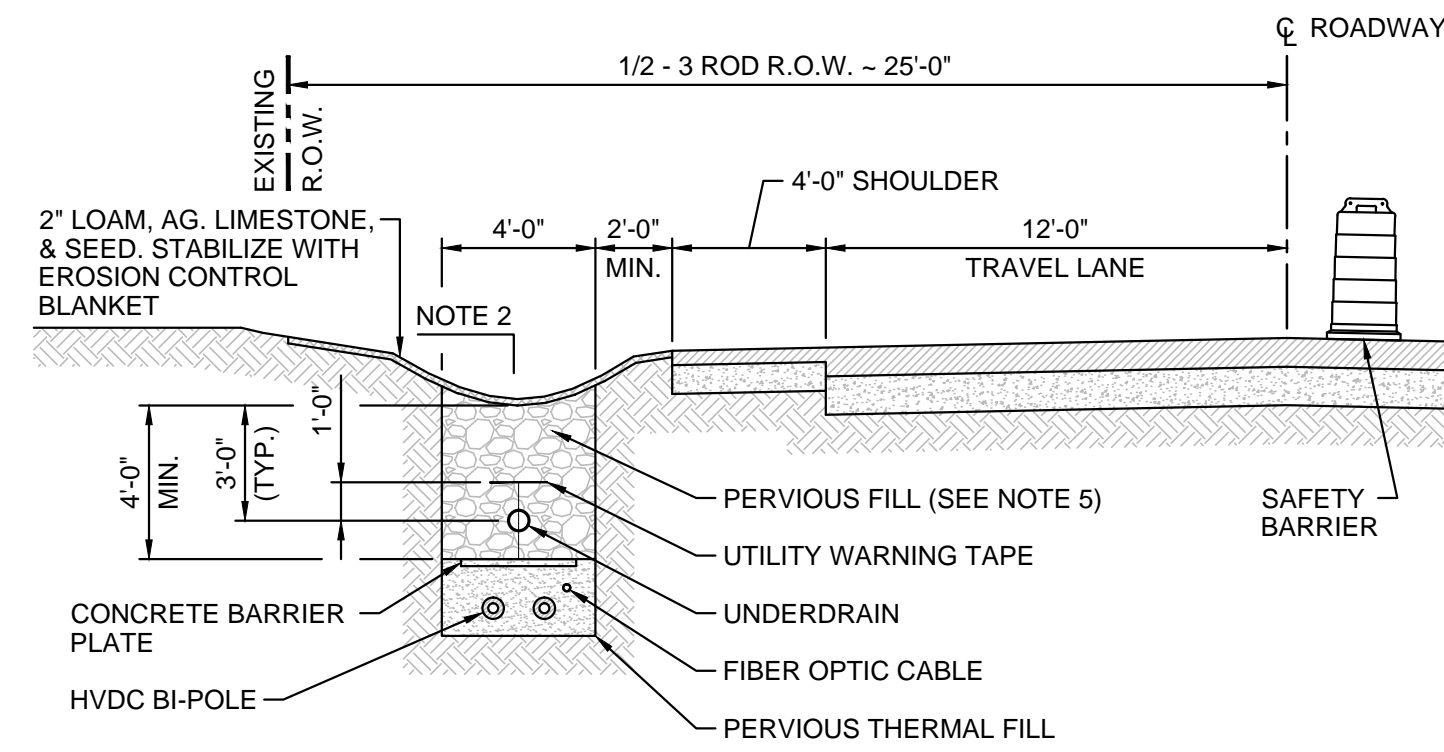


**NOTES**

- CABLE SPACING MAY VARY BASED UPON CONTRACTOR INSTALLATION PREFERENCE AND LOCATION. A TYPICAL SPACING OF UP TO 3 FEET IS ANTICIPATED.
- CABLES WILL BE BEDDED IN SCREENED SAND OR NATIVE SOIL. THERMAL SAND WILL BE USED WHERE REQUIRED. DEPTH OF THERMAL SAND OVER CABLE WILL BE FIELD DETERMINED FOLLOWING TESTING OF NATIVE SOILS.
- CONCRETE PROTECTIVE PLATES WILL BE PROVIDED OVER CABLES.
- EXCAVATION MAY BE VERTICAL SHORED OR SLOPED BACK PER OSHA REQUIREMENTS WHERE NECESSARY.
- THERMAL SAND OVER SCREENED NATIVE SOIL SHALL BE 1 FOOT MINIMUM OVER CABLES. ADDITIONAL THERMAL FILL SHALL BE PROVIDED AS REQUIRED PER DESIGN.
- PRIOR TO EXCAVATION, PROVIDE EROSION AND SEDIMENT CONTROLS AS REQUIRED.
- ABOVE SKETCH IS TO PRESENT CONCEPTS. MORE RESTRICTIVE REQUIREMENTS OF THE RAILROAD, STATE OR OTHER AUTHORITY WILL BE REFLECTED IN THE DETAILED DESIGN.

**TYPICAL TRENCH CROSS SECTION**

SCALE: N.T.S.

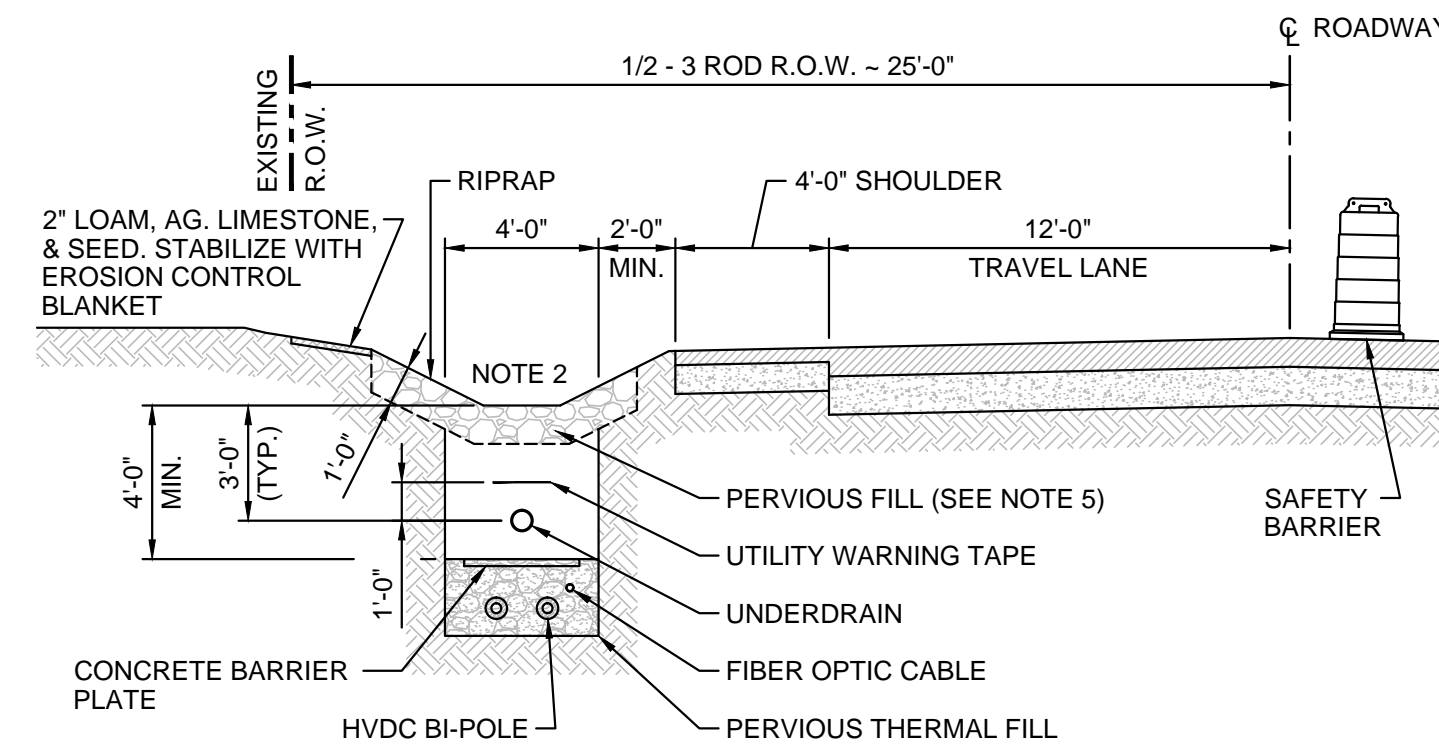


**NOTES**

- DRAWING DEVELOPED TO DEPICT TYPICAL INSTALLATION WITHIN DITCHLINE OF ROAD SEGMENTS UPGRADED PER THE "RECLAIM" STANDARD DESIGN.
- DITCH SIDE SLOPE VARIES. SIDE SLOPE AND GRADE TO BE RECONSTRUCTED PER VTRANS STANDARD DESIGN DETAILS UNLESS OTHERWISE DIRECTED OR APPROVED. DITCH BOTTOM SHALL BE NOT LESS THAN 2'-0" WIDE.
- EDGE OF PLANNED TRENCH EXCAVATION TO BE NOT LESS THAN 2'-0" FROM EXISTING EDGE OF PAVEMENT.
- THERMAL FILL SHALL BE PERVIOUS (P = 1X10<sup>-3</sup> CM/SEC OR GREATER) WITH THERMAL RHO AS SPECIFIED.
- THERMAL FILL SHALL HAVE PERMEABILITY (P = 1X10<sup>-3</sup> CM/SEC OR GREATER) AND A THERMAL RHO NOT TO EXCEED 100°C-CM/WATT UNLESS A LESSER VALUE IS SPECIFIED.
- TRENCH BACKFILL SHALL BE COMPACTED TO 95% ASTM D1557, MODIFIED PROCTOR.
- PROVIDE EROSION, SEDIMENTATION AND INVASIVE SPECIES CONTROL IN ACCORDANCE WITH ESTABLISHED BMP MEASURES AND ISSUED PERMITS. EROSION CONTROL MATERIALS SHALL BE IAW VTRANS STANDARD SPECIFICATION SECTIONS 653, 755.08 AND 755.11.
- TREE REMOVAL AND TRIMMING SHALL BE LIMITED TO VTRANS R.O.W. AND THE MINIMUM NECESSARY FOR PERFORMANCE OF THE WORK.
- PERMANENT AND TEMPORARY EROSION CONTROL AND DRAINAGE STRUCTURES PROMOTE SHEET FLOW WHERE PRACTICAL AND INFILTRATION. DIRECT DISCHARGE TO SURFACE WATERS SHALL BE AVOIDED. DITCH OUTFALLS SHALL BE STABILIZED.
- DISTURBED AREAS SHALL BE RE-LOAMED, SEEDED AND AGRICULTURAL LIMESTONE APPLIED. STABILIZE DISTURBED AREAS WITH EROSION CONTROL MATTING.

**ROADWAY DITCHLINE INSTALLATION**

SCALE: N.T.S.

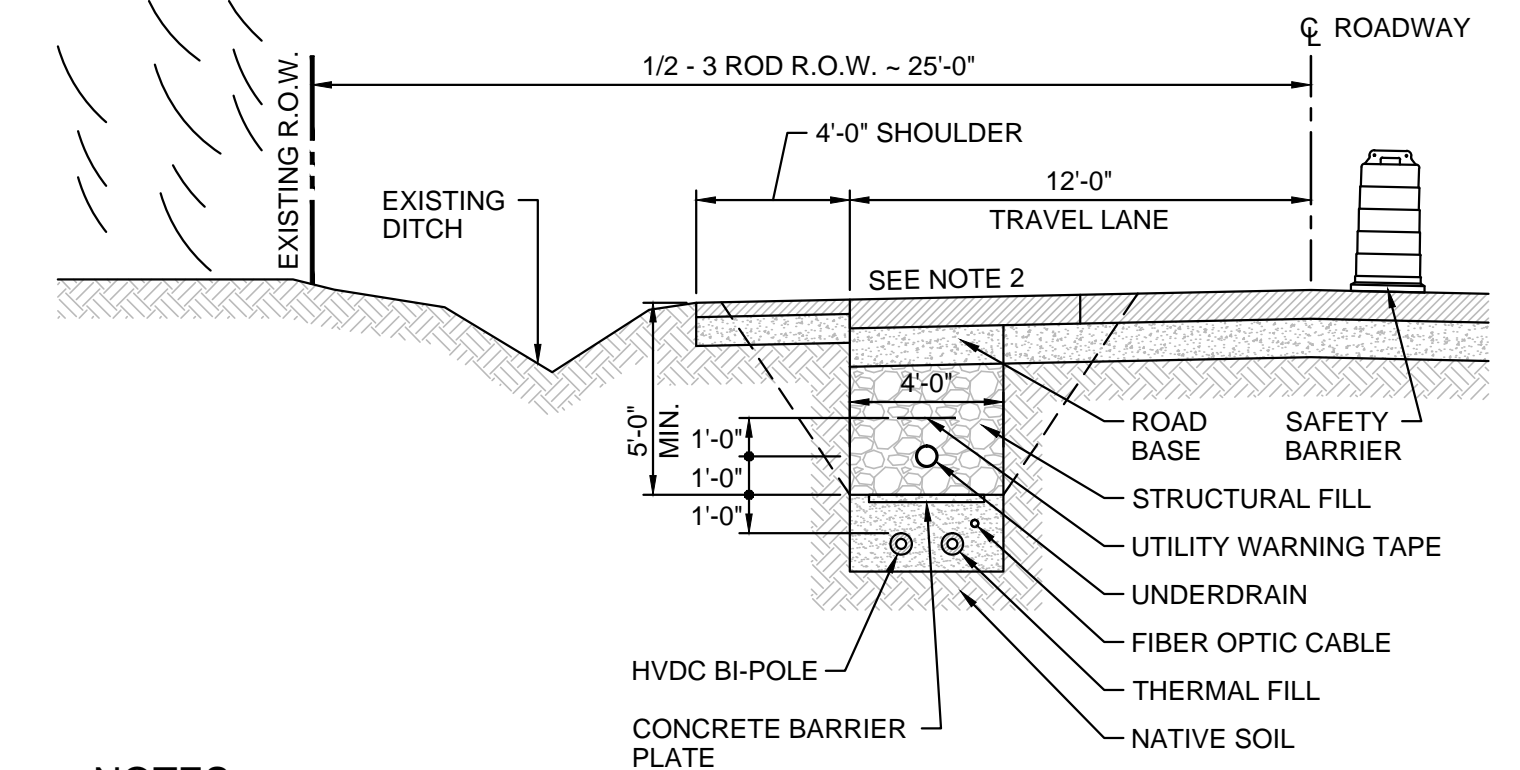


**NOTES**

- DRAWING DEVELOPED TO DEPICT TYPICAL INSTALLATION WITHIN DITCHLINE OF ROAD SEGMENTS UPGRADED PER THE "RECLAIM" AND "DITCH CLEANING" STANDARD DESIGNS.
- PROVIDE RIPRAP DITCH LINING FOR DITCH SECTIONS WHERE RIPRAP LINING CURRENTLY EXISTS AND OTHER LOCATIONS WHERE EROSION IS EVIDENT WITHIN THE CHANNEL. PROFILE DITCH PER VTRANS STANDARD DESIGN DETAILS WITH MINIMUM 2'-0" WIDE DITCH BOTTOM.
- EDGE OF PLANNED TRENCH EXCAVATION TO BE NOT LESS THAN 2'-0" FROM EXISTING EDGE OF PAVEMENT.
- THERMAL FILL SHALL BE PERVIOUS (P = 1X10<sup>-3</sup> CM/SEC OR GREATER) WITH THERMAL RHO AS SPECIFIED.
- THERMAL FILL SHALL HAVE PERMEABILITY (P = 1X10<sup>-3</sup> CM/SEC OR GREATER) AND A THERMAL RHO NOT TO EXCEED 100°C-CM/WATT UNLESS A LESSER VALUE IS SPECIFIED.
- TRENCH BACKFILL SHALL BE COMPACTED TO 95% ASTM D1557, MODIFIED PROCTOR.
- PROVIDE EROSION, SEDIMENTATION AND INVASIVE SPECIES CONTROL IN ACCORDANCE WITH ESTABLISHED BMP MEASURES AND ISSUED PERMITS. EROSION CONTROL MATERIALS SHALL BE IAW VTRANS STANDARD SPECIFICATION SECTIONS 653, 755.08 AND 755.11.
- TREE REMOVAL AND TRIMMING SHALL BE LIMITED TO VTRANS R.O.W. AND THE MINIMUM NECESSARY FOR PERFORMANCE OF THE WORK.
- PERMANENT AND TEMPORARY EROSION CONTROL AND DRAINAGE STRUCTURES PROMOTE SHEET FLOW WHERE PRACTICAL AND INFILTRATION. DIRECT DISCHARGE TO SURFACE WATERS SHALL BE AVOIDED. DITCH OUTFALLS SHALL BE STABILIZED.
- DISTURBED AREAS SHALL BE RE-LOAMED, SEEDED AND AGRICULTURAL LIMESTONE APPLIED. STABILIZE DISTURBED AREAS WITH EROSION CONTROL MATTING.

**ROADWAY DITCHLINE INSTALLATION W/ IMPROVED DITCH**

SCALE: N.T.S.

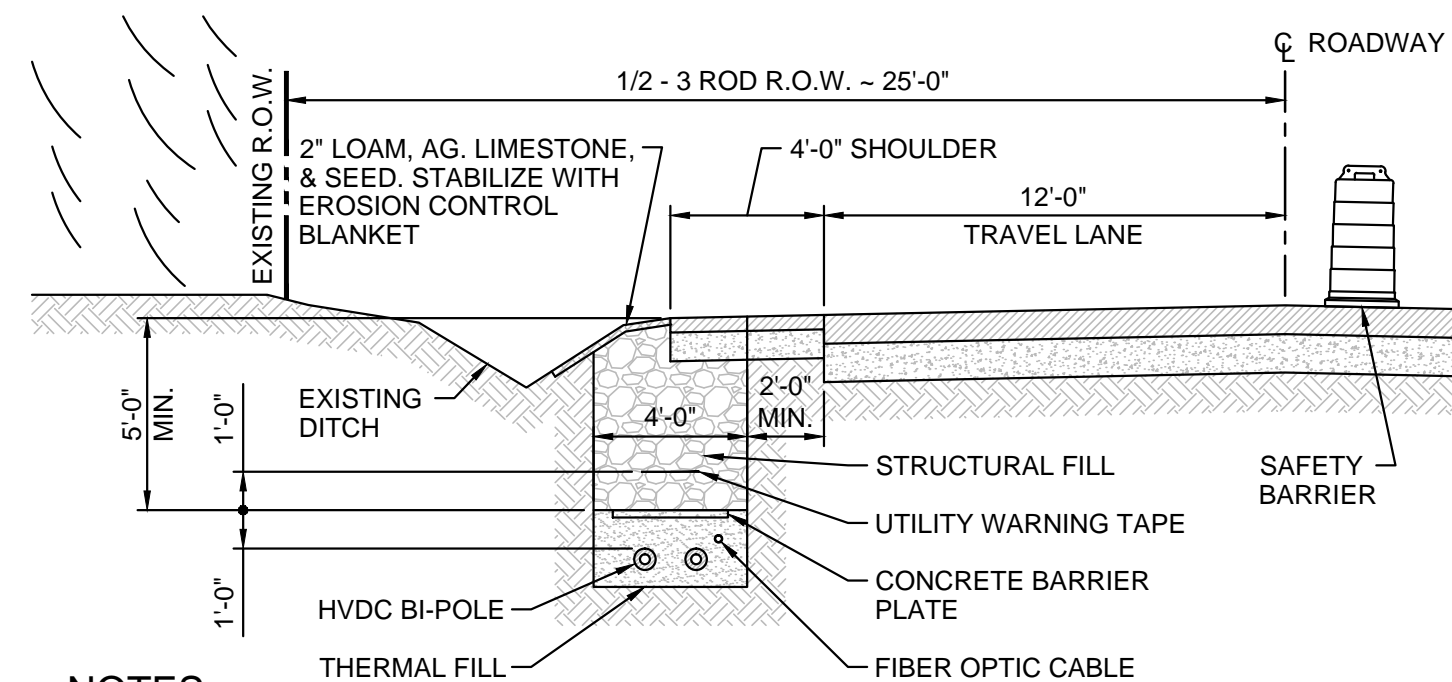


**NOTES**

- DIMENSIONS AND DETAILS ARE CONCEPT ONLY AND SUBJECT TO MODIFICATION TO MEET MUNICIPAL, STATE AND FEDERAL REQUIREMENTS.
- DRAWING DEVELOPED TO DEPICT TYPICAL INSTALLATION WITHIN PAVED TRAVEL LANE. LOCATE TRENCH AT EDGE OF TRAVEL LANE UNLESS NOTED OTHERWISE.
- ROADWAY PAVEMENT REPLACEMENT TO BE KEYS MIN. 1'-0" PER PAVEMENT COURSE. OVERALL PAVEMENT THICKNESS TO MATCH EXISTING. ALL PAVEMENT MATERIAL PER VERMONT AOT SPECIFICATIONS.
- TRENCH DEPTH 5'-0" MIN. TO TOP OF CONCRETE BARRIER. OVERALL TRENCH DEPTH VARIES BASED ON THERMAL SOIL PROPERTIES AND VTRANS REQUIREMENTS.
- STRUCTURAL FILL SHALL BE PER VERMONT AOT SPECIFICATION EXCEPT THERMAL RESISTIVITY SHALL BE 100°C-CM/WATT OR LESS UNLESS OTHERWISE SPECIFIED. NATIVE MATERIAL MAY BE USED PROVIDED IT MEETS THE SPECIFIED THERMAL RESISTIVITY.
- TRENCH SHORING IS NOT SHOWN. CONTRACTOR SHALL SHORE OR BENCH EXCAVATION TO MEET FEDERAL AND STATE SAFETY REQUIREMENTS.
- PROVIDE EROSION, SEDIMENTATION AND INVASIVE SPECIES CONTROL IN ACCORDANCE WITH ESTABLISHED BMP MEASURES AND ISSUED PERMITS. EROSION CONTROL MATERIALS SHALL BE IAW VTRANS STANDARD SPECIFICATION SECTIONS 656 AND 755.11.
- PERMANENT AND TEMPORARY EROSION CONTROL AND DRAINAGE STRUCTURES PROMOTE SHEET FLOW WHERE PRACTICAL AND INFILTRATION. DIRECT DISCHARGE TO SURFACE WATERS SHALL BE AVOIDED. DITCH OUTFALLS SHALL BE STABILIZED.
- DISTURBED AREAS SHALL BE RE-LOAMED, SEEDED AND AGRICULTURAL LIMESTONE APPLIED. STABILIZE DISTURBED AREAS WITH EROSION CONTROL MATTING.

**ROADWAY TRENCH SECTION IN PAVEMENT**

SCALE: N.T.S.

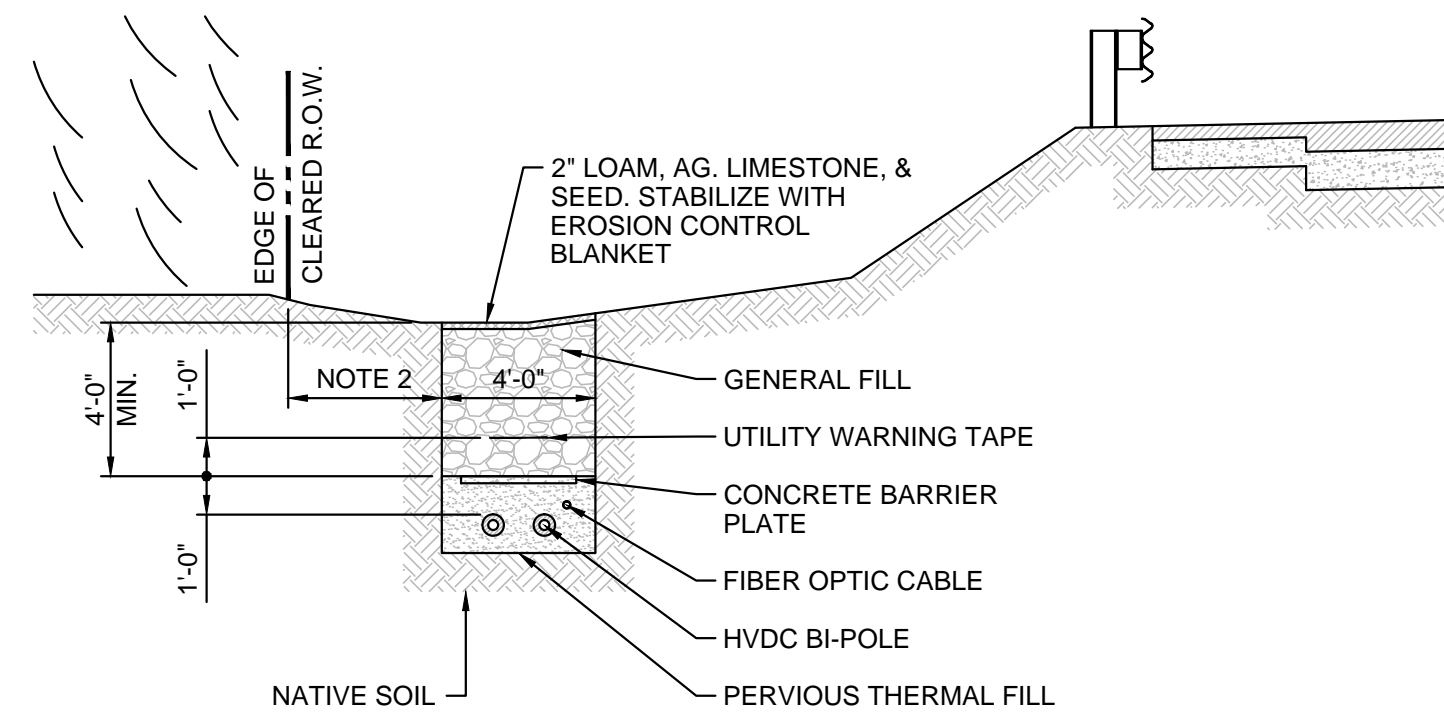


**NOTES**

- DIMENSIONS AND DETAILS ARE CONCEPT ONLY AND SUBJECT TO MODIFICATION TO MEET MUNICIPAL, STATE AND FEDERAL REQUIREMENTS.
- DRAWING DEVELOPED TO DEPICT TYPICAL INSTALLATION WITHIN ROAD SHOULDER/BREAKDOWN LANE.
- ROADWAY SHOULDER/BREAKDOWN LANE PAVEMENT REPLACEMENT TO BE KEYS MIN. 1'-0" PER PAVEMENT COURSE. OVERALL PAVEMENT THICKNESS TO MATCH EXISTING. ALL PAVEMENT MATERIAL PER VERMONT AOT SPECIFICATIONS.
- EDGE OF PLANNED TRENCH EXCAVATION TO BE NOT LESS THAN 2'-0" FROM EXISTING EDGE OF TRAVEL LANE PAVEMENT.
- TRENCH DEPTH 5'-0" MIN. TO TOP OF CONCRETE BARRIER. OVERALL TRENCH DEPTH VARIES BASED ON THERMAL SOIL PROPERTIES AND VTRANS REQUIREMENTS.
- STRUCTURAL FILL SHALL BE PER VERMONT AOT SPECIFICATION EXCEPT THERMAL RESISTIVITY SHALL BE 100°C-CM/WATT OR LESS UNLESS OTHERWISE SPECIFIED. NATIVE MATERIAL MAY BE USED PROVIDED IT MEETS THE SPECIFIED THERMAL RESISTIVITY.
- TRENCH SHORING IS NOT SHOWN. CONTRACTOR SHALL SHORE OR BENCH EXCAVATION TO MEET FEDERAL AND STATE SAFETY REQUIREMENTS.
- PROVIDE EROSION, SEDIMENTATION AND INVASIVE SPECIES CONTROL IN ACCORDANCE WITH ESTABLISHED BMP MEASURES AND ISSUED PERMITS. EROSION CONTROL MATERIALS SHALL BE IAW VTRANS STANDARD SPECIFICATION SECTIONS 656 AND 755.11.
- TREE REMOVAL AND TRIMMING SHALL BE LIMITED TO VTRANS R.O.W. AND THE MINIMUM NECESSARY FOR PERFORMANCE OF THE WORK.
- PERMANENT AND TEMPORARY EROSION CONTROL AND DRAINAGE STRUCTURES PROMOTE SHEET FLOW WHERE PRACTICAL AND INFILTRATION. DIRECT DISCHARGE TO SURFACE WATERS SHALL BE AVOIDED. DITCH OUTFALLS SHALL BE STABILIZED.
- DISTURBED AREAS SHALL BE RE-LOAMED, SEEDED AND AGRICULTURAL LIMESTONE APPLIED. STABILIZE DISTURBED AREAS WITH EROSION CONTROL MATTING.

**ROADWAY TRENCH SECTION IN SHOULDER**

SCALE: N.T.S.

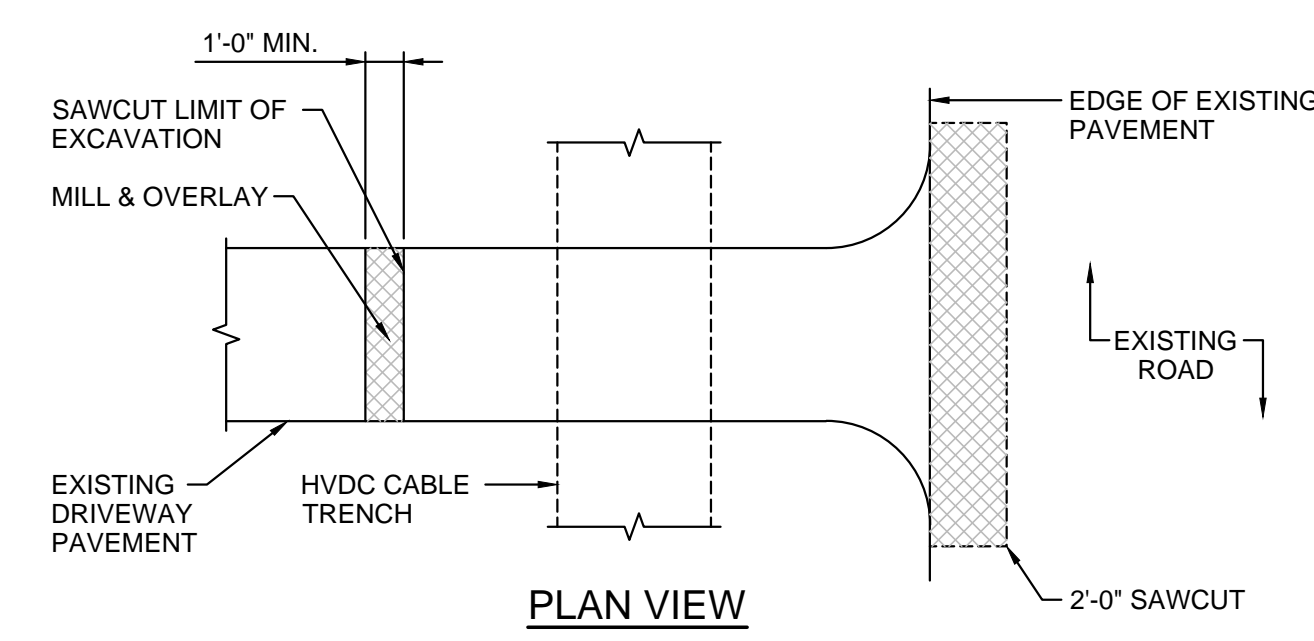


**NOTES**

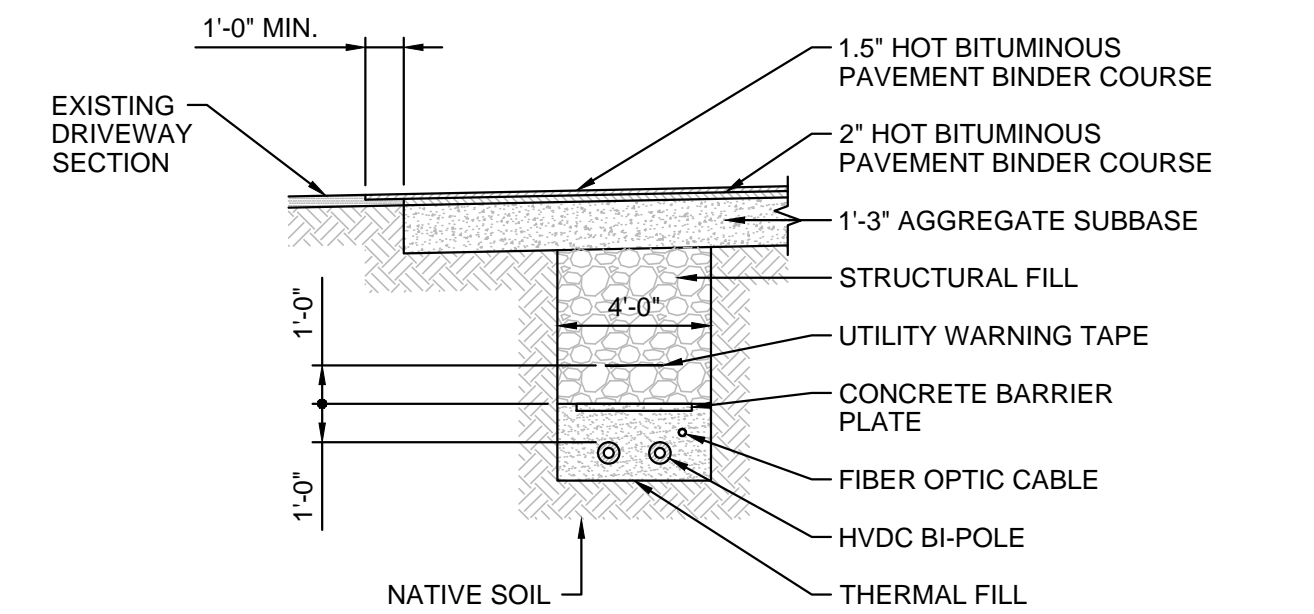
- DIMENSIONS AND DETAILS ARE CONCEPT ONLY AND SUBJECT TO MODIFICATION TO MEET MUNICIPAL, STATE AND FEDERAL REQUIREMENTS.
- CABLE TO BE LOCATED AT EDGE OF CLEARED R.O.W. WITH SUFFICIENT SPACE TO ERECT REQUIRED SAFETY AND ENVIRONMENTAL CONTROLS UNLESS OTHERWISE APPROVED BY VTRANS.
- PROVIDE THERMAL FILL AS REQUIRED.
- TRENCH GENERAL BACKFILL SHALL BE NATIVE SOIL COMPACTED TO MATCH IN-SITU SOIL DENSITY UNLESS OTHERWISE SPECIFIED.
- TRENCH SHORING IS NOT SHOWN. CONTRACTOR SHALL SHORE OR BENCH EXCAVATION TO MEET FEDERAL AND STATE SAFETY REQUIREMENTS.
- PROVIDE EROSION, SEDIMENTATION AND INVASIVE SPECIES CONTROL IN ACCORDANCE WITH ESTABLISHED BMP MEASURES AND ISSUED PERMITS. EROSION CONTROL MATERIALS SHALL BE IAW VTRANS STANDARD SPECIFICATION SECTIONS 656 AND 755.11.
- TREE REMOVAL AND TRIMMING SHALL BE LIMITED TO VTRANS R.O.W. AND THE MINIMUM NECESSARY FOR PERFORMANCE OF THE WORK.
- PERMANENT AND TEMPORARY EROSION CONTROL AND DRAINAGE STRUCTURES PROMOTE SHEET FLOW WHERE PRACTICAL AND INFILTRATION. DIRECT DISCHARGE TO SURFACE WATERS SHALL BE AVOIDED. DITCH OUTFALLS SHALL BE STABILIZED.
- DISTURBED AREAS SHALL BE RE-LOAMED, SEEDED AND AGRICULTURAL LIMESTONE APPLIED. STABILIZE DISTURBED AREAS WITH EROSION CONTROL MATTING.
- AT COMPLETION OF THE WORK, RESTORE CONSTRUCTION SITE TO MATCH SURROUNDING TURFED SURFACES.

**ROADWAY TRENCH SECTION IN TURFED AREA**

SCALE: N.T.S.



**PLAN VIEW**



**SECTION VIEW**

**NOTES**

- DIMENSIONS AND DETAILS ARE CONCEPT ONLY AND SUBJECT TO MODIFICATION TO MEET MUNICIPAL, STATE AND FEDERAL REQUIREMENTS.
- WHERE HVDC BI-POLE IS INSTALLED IN ROAD SHOULDERS OR OTHERWISE IMPACTS EXISTING PAVED DRIVEWAYS, THE ENTIRE DRIVEWAY APRON SHALL BE REMOVED AND REPLACED.
- DRIVEWAY MATERIALS SHALL MEET THE CURRENT MUNICIPAL STANDARDS.
- CULVERTS WITHIN THE EXISTING R.O.W. IMPACTED BY THE CABLE INSTALLATION SHALL BE INSPECTED AND, WHERE APPROPRIATE, REPLACED.

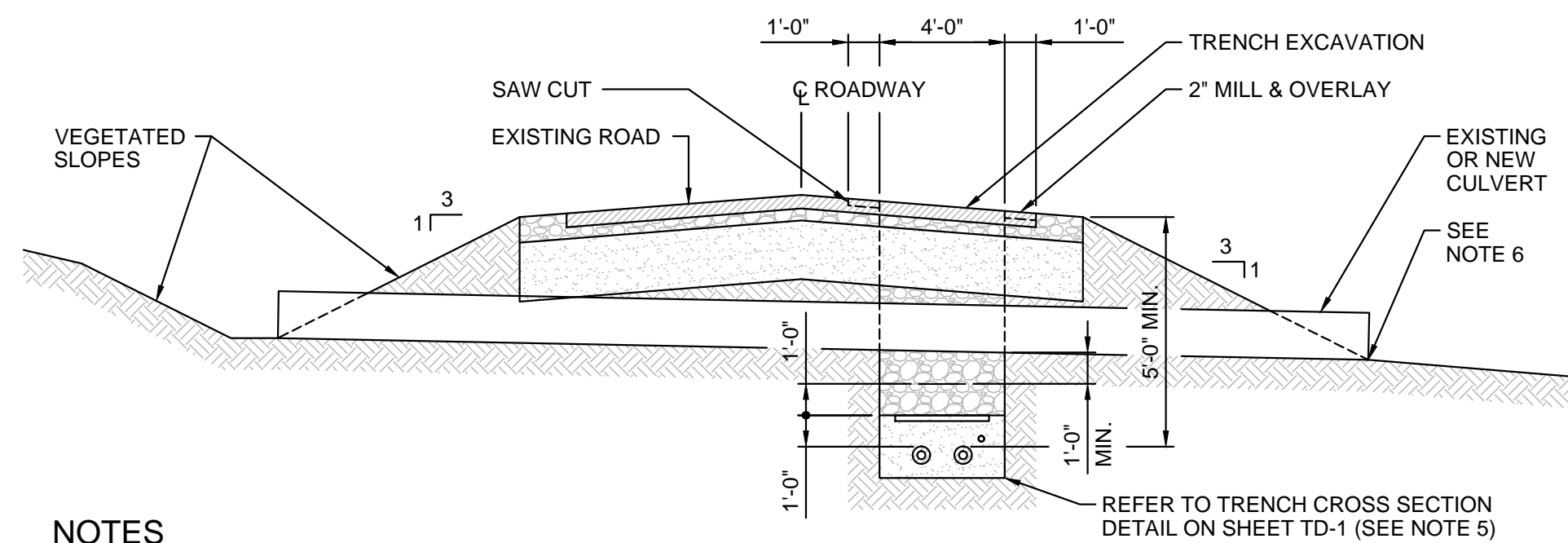
**DRIVEWAY APRON PATCH**

SCALE: N.T.S.

Designed	TRC
Drawn	TRC
Checked	-
Approved	-
Scale	AS NOTED

No.	Revision	Date	By	Ck	PE	PE #
A	20% ANR Submission	12/5/14	TRC	AMW		

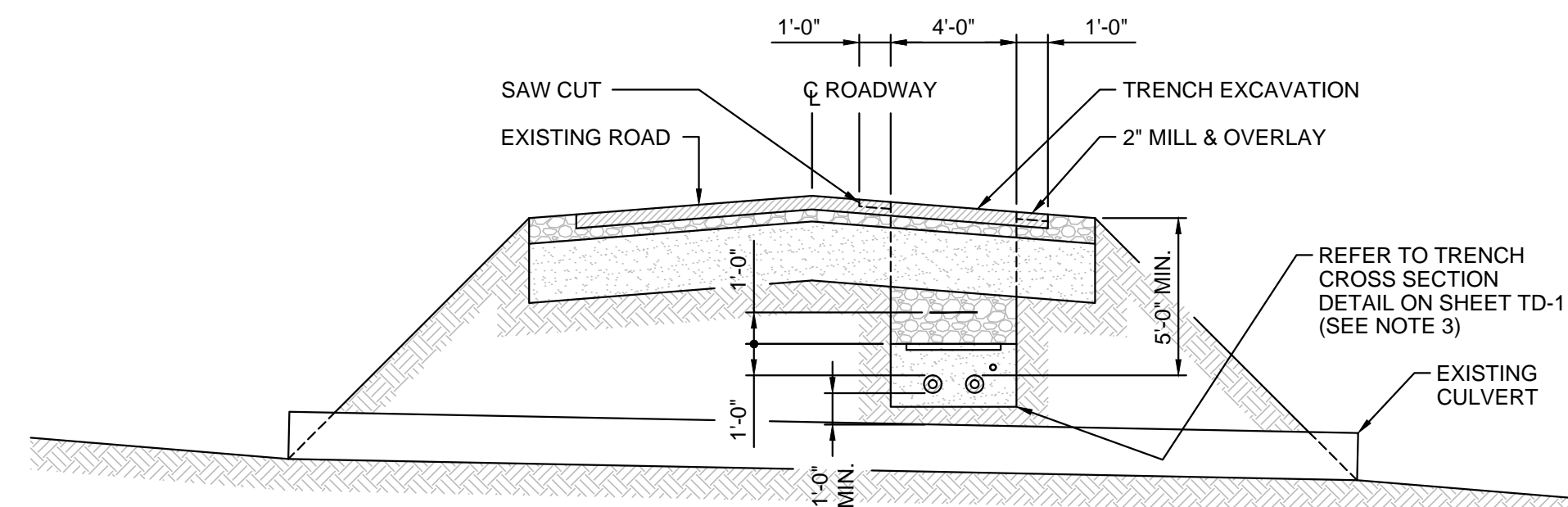
**TDI New England**  
 New England Clean Power Link  
 TDI New England  
 Typical Details  
 TD-1  
 Prepared by: TRC 09/19/14



**NOTES**

1. DIMENSIONS AND DETAILS ARE CONCEPT ONLY AND SUBJECT TO MODIFICATION FOR CONFORMANCE WITH STATE AND FEDERAL REQUIREMENTS.
2. CULVERTS ALONG THE ROUTE MAY BE DISASSEMBLED OR TEMPORARILY REMOVED TO FACILITATE CABLE INSTALLATION.
3. CULVERTS DETERMINED TO BE UNDERSIZED OR DETERIORATED MAY BE REPLACED.
4. CULVERT BEDDING AND BACKFILL SHALL BE CONSTRUCTED IN ACCORDANCE WITH APPLICABLE STATE ROAD SPECIFICATIONS.
5. CABLE TRENCH DESIGN SHALL BE COORDINATED WITH CULVERT INSTALLATION TO ENSURE NOT LESS THAN 1'-0" OF SEPARATION BETWEEN CULVERT AND TOP OF CONCRETE BARRIER PLATE.
6. UNLESS DETERMINED NECESSARY FOR PROPER ROAD CONSTRUCTION, CULVERT INVERTS SHALL MATCH EXISTING.

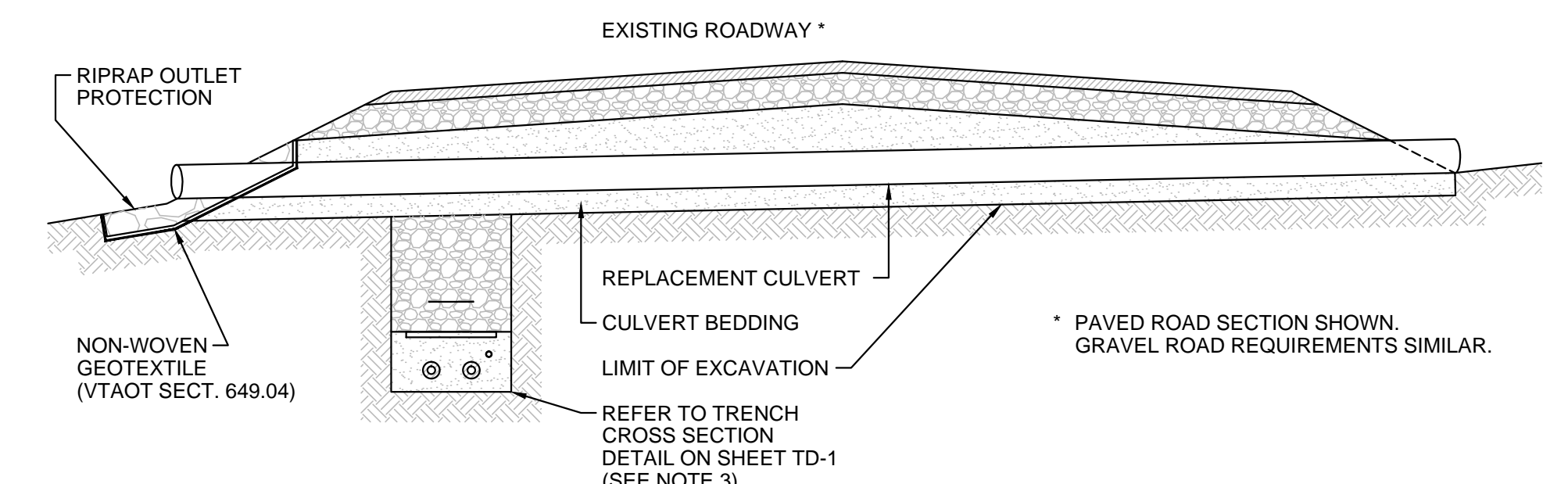
**STATE HIGHWAY CULVERT CROSSING (UNDER)**  
SCALE: N.T.S.



**NOTES**

1. DIMENSIONS AND DETAILS ARE CONCEPT ONLY AND SUBJECT TO MODIFICATION FOR CONFORMANCE WITH STATE AND FEDERAL REQUIREMENTS.
2. CULVERT BEDDING AND BACKFILL SHALL BE CONSTRUCTED IN ACCORDANCE WITH APPLICABLE MUNICIPAL OR STATE SPECIFICATIONS.
3. CABLE TRENCH DESIGN SHALL BE COORDINATED WITH CULVERT INSTALLATION TO ENSURE NOT LESS THAN 1'-0" SEPARATION BETWEEN CULVERT AND BOTTOM OF HVDC CABLE.

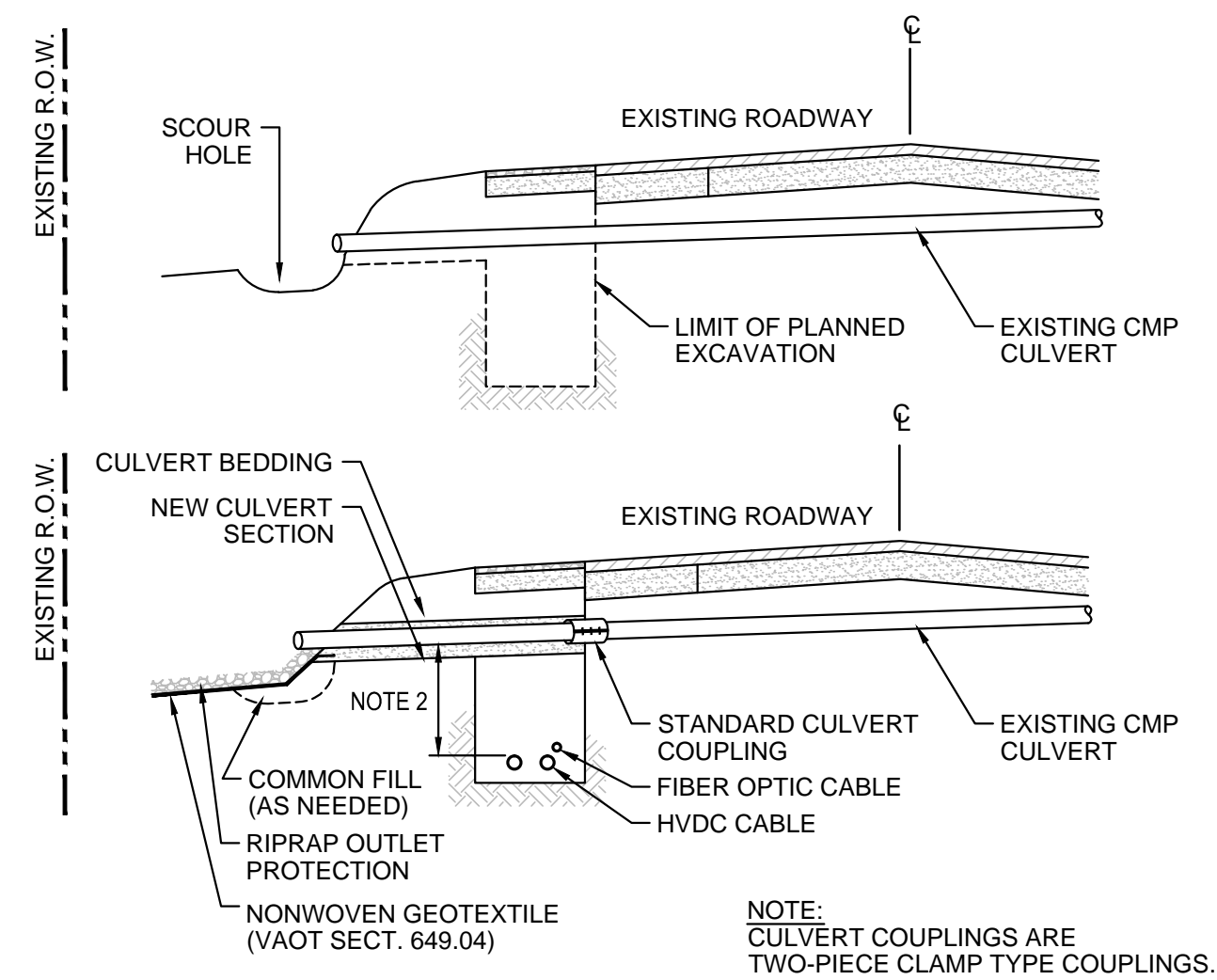
**TYPICAL CULVERT CROSSING (OVER)**  
SCALE: N.T.S.



**NOTES**

1. CULVERTS MAY BE REPLACED WHEN EXISTING CULVERT IS DETERMINED TO BE UNDERSIZED OR DETERIORATED BEYOND REPAIR.
2. NEW CULVERTS SHALL MATCH EXISTING CULVERTS IN DIAMETER AND MATERIAL UNLESS A LARGER DIAMETER CULVERT IS WARRANTED.
3. UNLESS DETERMINED NECESSARY FOR PROPER ROAD CONSTRUCTION, NEW CULVERT INVERTS SHALL MATCH EXISTING.
4. PROVIDE NOT LESS THAN 12 INCHES OF SEPARATION BETWEEN HVDC CABLE AND CULVERT.
5. PROVIDE EROSION REPAIR, RIPRAP, AND GEOTEXTILE WHERE CONDITIONS WARRANT.
6. ALL CULVERT INSTALLATIONS AND EROSION REPAIR SHALL BE CONFINED TO ROADWAY R.O.W. UNLESS EASEMENTS OUTSIDE THE R.O.W. HAVE BEEN OBTAINED.
7. RIPRAP SHALL BE IN ACCORDANCE WITH VTAOT SECT. 613 EXCEPT STONE SHALL BE 12-INCH NOMINAL DIMENSION (AVG. 120-150 LBS.)
8. REFER TO DETAIL 209513-TRN-03 FOR CABLE TRENCH PROPERTIES AND DIMENSIONS ASSOCIATED WITH CABLE INSTALLATION UNDER PAVEMENT AND SHOULDER OF STATE HIGHWAYS.

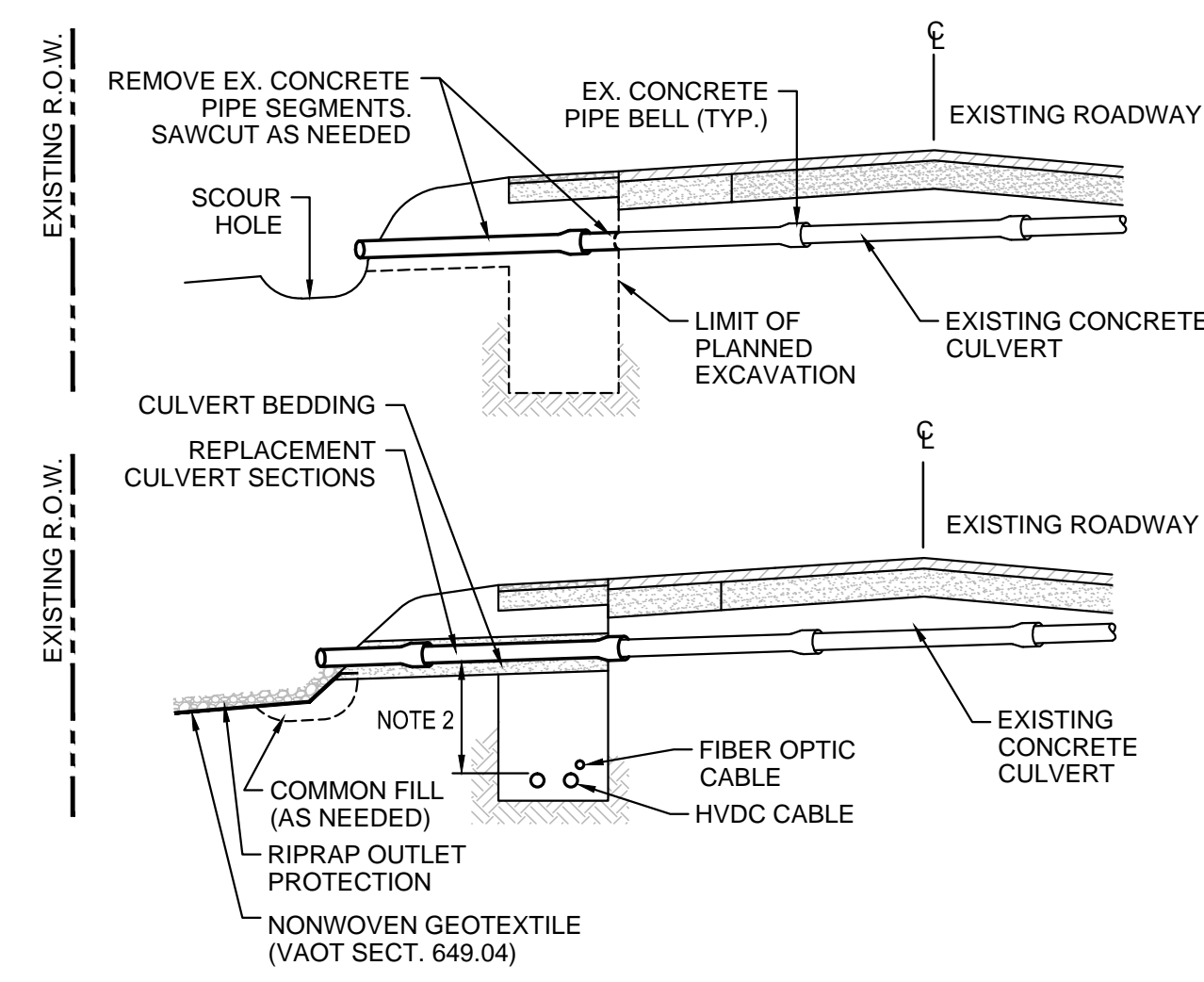
**TYPICAL CULVERT REPLACEMENT**  
SCALE: N.T.S.



**NOTES:**

1. CULVERT MODIFICATION TO BE EMPLOYED WHERE EXISTING CULVERT IS OF GOOD SERVICEABLE CONDITION, DEPTH OF CULVERT BURIAL IS 7 FEET OR LESS, AND IT IS DETERMINED FULL REMOVAL IS NOT WARRANTED.
2. NEW CULVERT SECTION SHALL MATCH EXISTING CULVERT DIAMETER AND MATERIAL. JOIN CULVERT SECTIONS WITH STANDARD GALVANIZED STEEL TWO-PIECE CLAMP TYPE COUPLING.
3. PROVIDE NOT LESS THAN 12" SEPARATION BETWEEN HVDC CABLE AND CULVERT.
4. PROVIDE EROSION REPAIR, RIPRAP, AND GEOTEXTILE WHERE CONDITIONS WARRANT.
5. ALL CULVERT MODIFICATION AND EROSION REPAIR TO BE CONFINED TO ROADWAY R.O.W. UNLESS EASEMENTS OUTSIDE THE R.O.W. HAVE BEEN OBTAINED.
6. RIPRAP SHALL BE IN ACCORDANCE WITH VTAOT SECT. 613 EXCEPT STONE SHALL BE 12" NOM. DIMENSION (AVG. 120-150 LBS EACH).

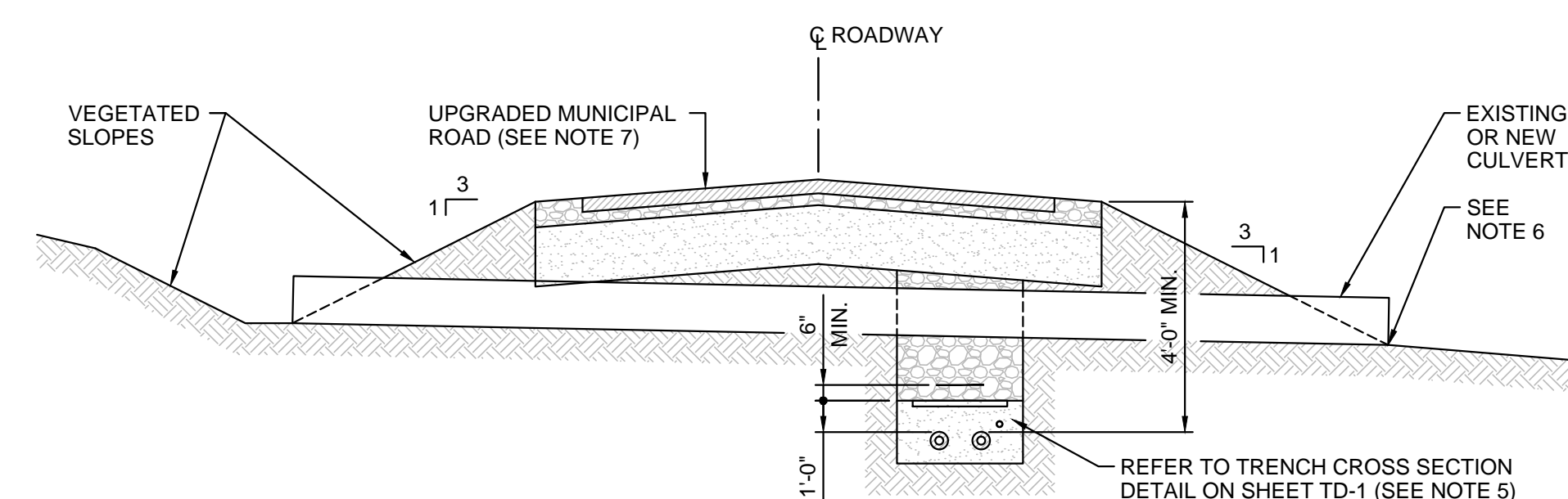
**EXISTING CULVERT MODIFICATION - CMP**  
SCALE: N.T.S.



**NOTES:**

1. CULVERT MODIFICATION TO BE EMPLOYED WHERE EXISTING CULVERT IS OF GOOD SERVICEABLE CONDITION, DEPTH OF CULVERT BURIAL IS 7 FEET OR LESS, AND IT IS DETERMINED FULL REMOVAL IS NOT WARRANTED.
2. PROVIDE NEW CULVERT SECTION OR REINSTALL SERVICEABLE SECTIONS. NEW CULVERT SECTIONS SHALL MATCH EXISTING CULVERT DIAMETER AND MATERIAL. PROVIDE NEW CULVERT GASKETS AT EACH BELL.
3. CULVERT SECTION LENGTH MAY VARY. CONCEPT DESIGN ASSUMES SECTIONS ARE 10 FEET.
4. PROVIDE NOT LESS THAN 12-INCH SEPARATION BETWEEN HVDC CABLE AND CULVERT.
5. PROVIDE EROSION REPAIR, RIPRAP, AND GEOTEXTILE WHERE CONDITIONS WARRANT.
6. ALL CULVERT MODIFICATION AND EROSION REPAIR TO BE CONFINED TO ROADWAY R.O.W. UNLESS EASEMENTS OUTSIDE THE R.O.W. HAVE BEEN OBTAINED.
7. RIPRAP SHALL BE IN ACCORDANCE WITH VTAOT SECT. 613 EXCEPT STONE SHALL BE 12-INCH NOM. DIMENSION (AVG. 120-150 LBS EACH).

**EXISTING CULVERT MODIFICATION - CONCRETE**  
SCALE: N.T.S.




**NOTES**

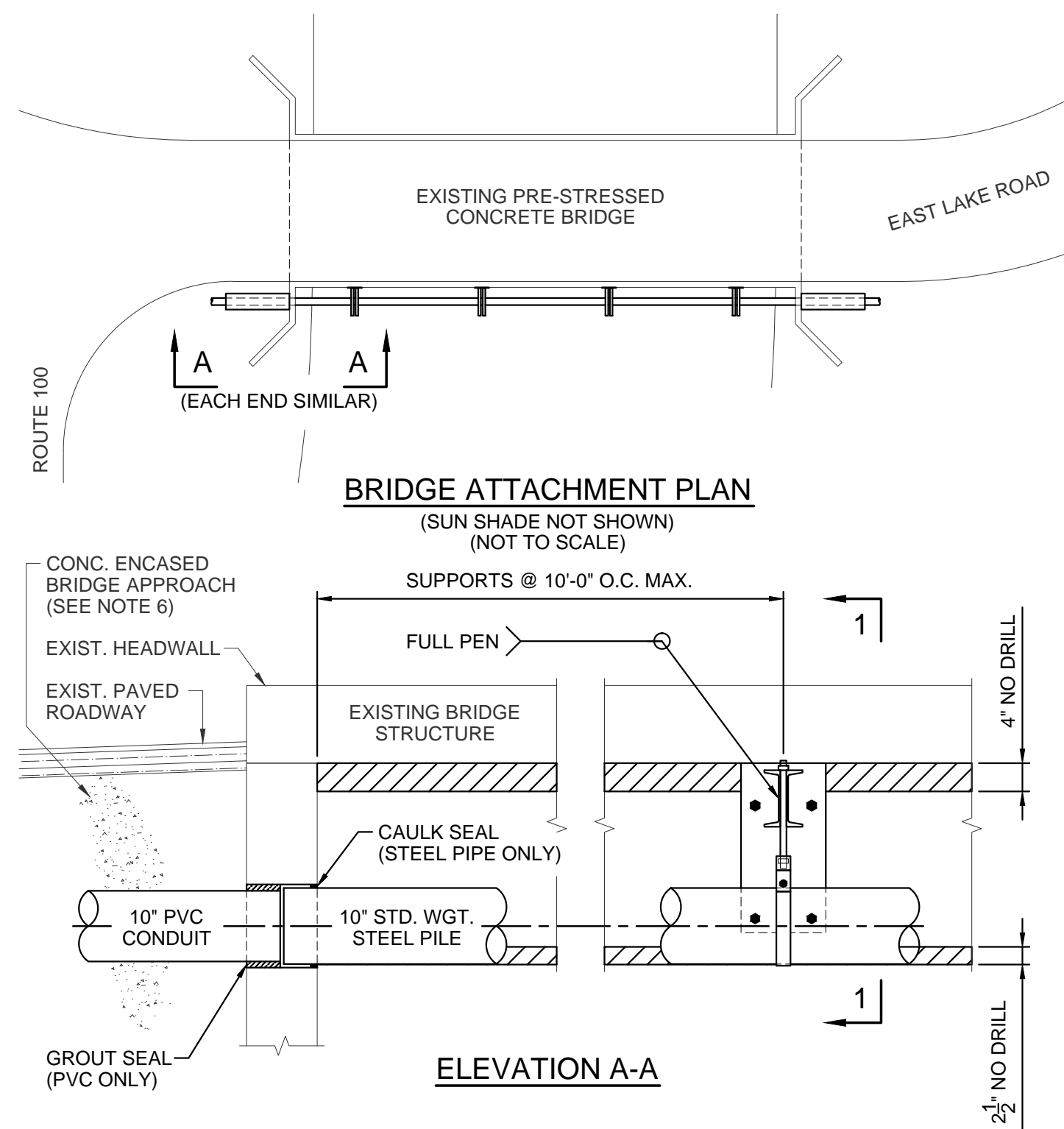
1. DIMENSIONS AND DETAILS ARE CONCEPT ONLY AND SUBJECT TO MODIFICATION TO MEET TOWN OF LUDLOW, STATE AND FEDERAL REQUIREMENTS.
2. CULVERTS ALONG THE ROUTE MAY BE DISASSEMBLED OR TEMPORARILY REMOVED TO FACILITATE CABLE INSTALLATION.
3. CULVERTS DETERMINED TO BE UNDERSIZED OR DETERIORATED MAY BE REPLACED.
4. CULVERT BEDDING AND BACKFILL SHALL BE CONSTRUCTED IN ACCORDANCE WITH APPLICABLE MUNICIPAL ROAD SPECIFICATIONS.
5. CABLE TRENCH DESIGN SHALL BE COORDINATED WITH CULVERT INSTALLATION TO ENSURE NOT LESS THAN SIX INCHES OF SEPARATION BETWEEN CULVERT AND TOP OF CONCRETE BARRIER PLATE.
6. UNLESS DETERMINED NECESSARY FOR PROPER ROAD CONSTRUCTION, CULVERT INVERTS SHALL MATCH EXISTING.
7. EXISTING MUNICIPAL DIRT ROADS SHALL BE UPGRADED TO MEET CURRENT MUNICIPAL ROAD STANDARDS. ROAD WIDENING TO CURRENT MUNICIPAL STANDARDS SHALL BE PROVIDED WHERE PRACTICAL.

**TYPICAL MUNICIPAL CULVERT CROSSING**  
SCALE: N.T.S.

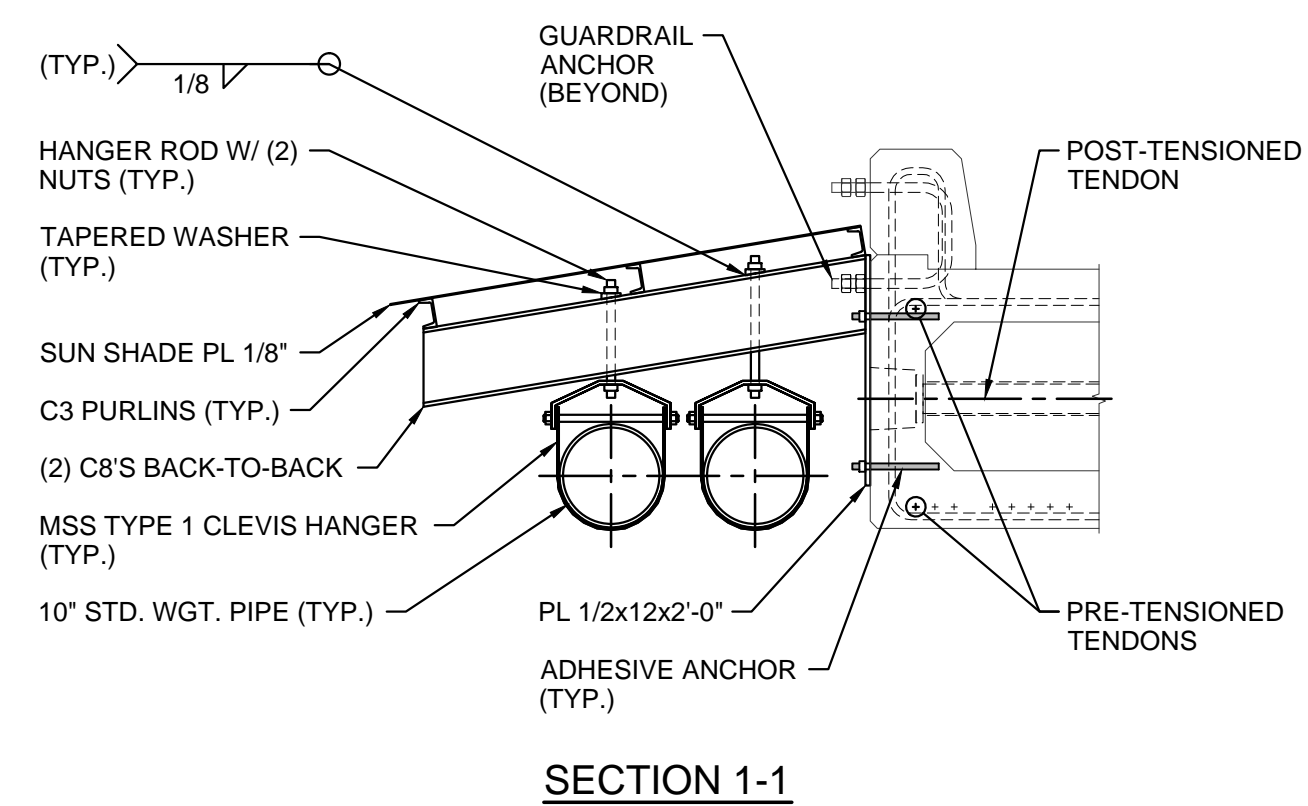
Designed	TRC
Drawn	TRC
Checked	-
Approved	-
Scale	AS NOTED

No.	Revision	Date	By	Ck	PE	PE #
A	20% ANR Submission	12/5/14	TRC	AMW		

  
**New England Clean Power Link**  
 TDI New England  
 Typical Details  
 TD-2  
 Prepared by: TRC 10/09/14



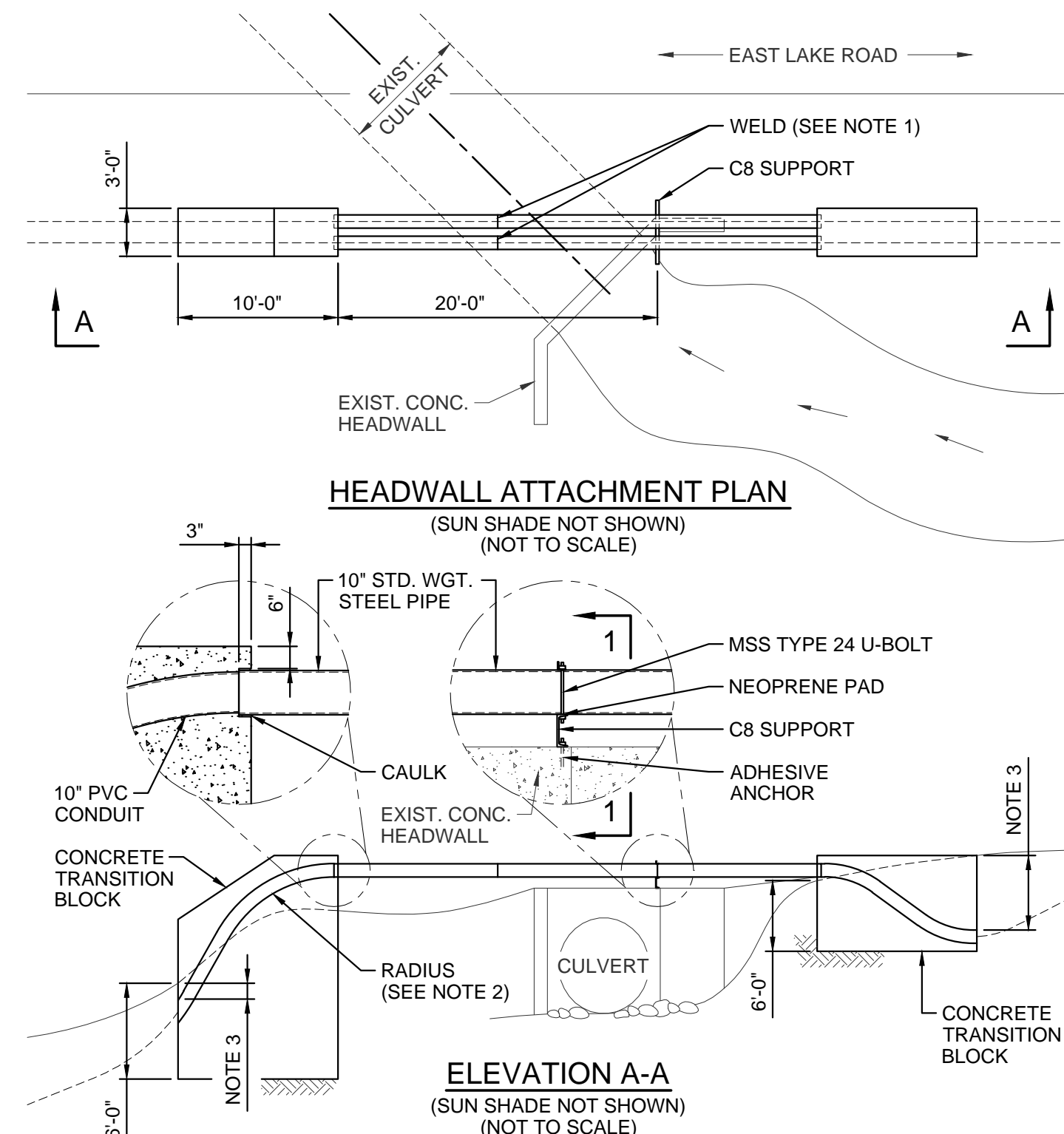
**EAST LAKE ROAD BRIDGE ATTACHMENT**  
**DETAIL 1**  
SCALE: 1" = 20'



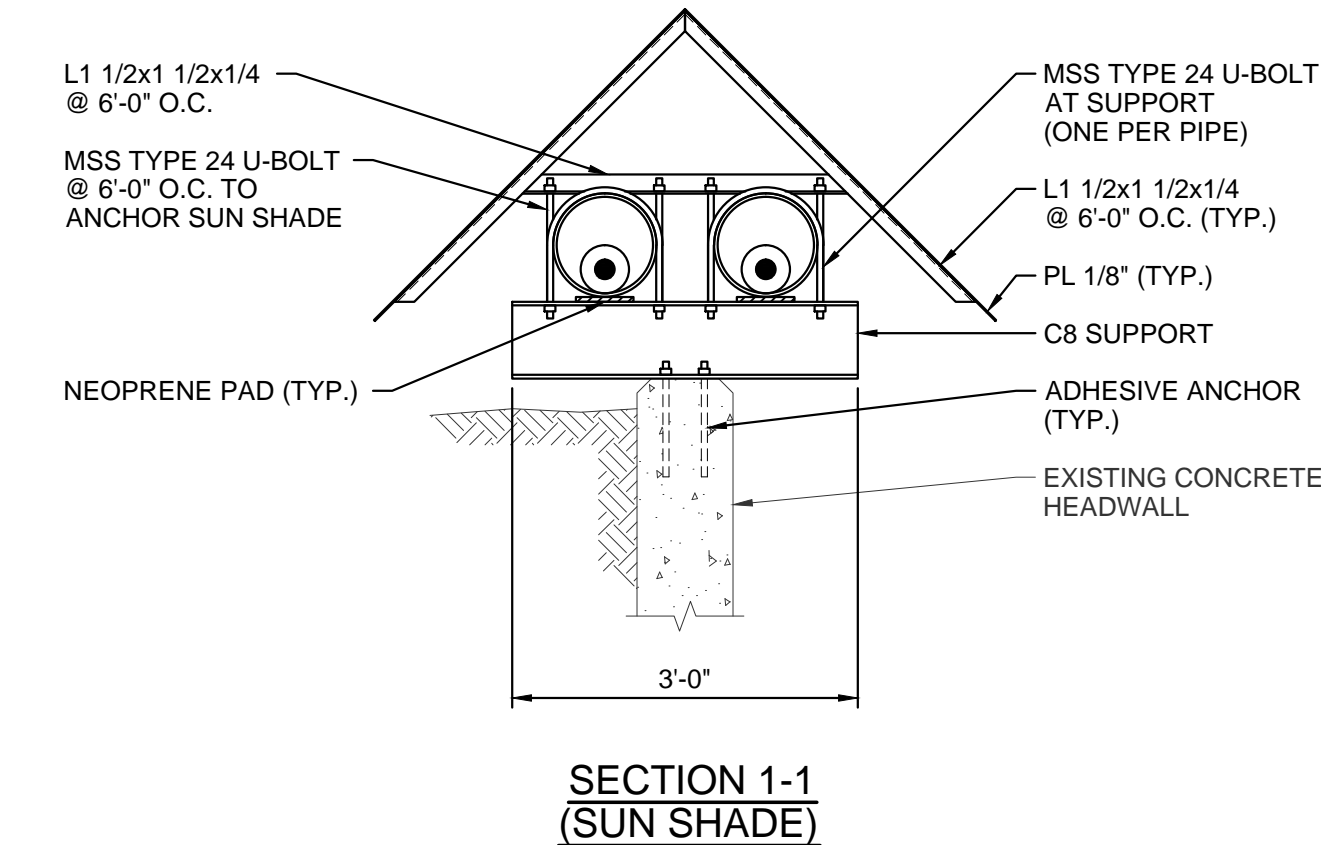
**NOTES**

- REFER TO W.E. DAILEY DESIGN DRAWINGS FOR COORDINATION WITH BRIDGE REINFORCEMENT, PRE- AND POST-TENSIONED TENDONS.
- CONTRACTOR SHALL AVOID BORING ANCHOR HOLES WITHIN ONE INCH OF PRE- OR POST-TENSIONED TENDONS.
- CONTRACTOR SHALL AVOID PENETRATING PRE-STRESSED BOX BEAM IN AREAS MARKED "NO DRILL". COORDINATE ANCHOR LOCATIONS WITH REFERENCED W.E. DAILEY DRAWINGS.
- ALL COMPONENTS OF CONDUIT AND SUPPORTS TO BE GALVANIZED AFTER FABRICATION. FIELD WELD PIPE AFTER FITTING INTO HEADWALL PENETRATIONS. ROOT WELD SHALL BE TIG WELDED WITHOUT BACKER RING. GALVANIZE COMPLETED WELD USING ZINC RICH GALVANIZING PAINT.
- COORDINATE SUPPORT LOCATION AND SUN SHADE WITH GUARDRAIL ATTACHMENTS. TRIM SUN SHADE PLATE AROUND GUARDRAIL POSTS.
- CONDUIT APPROACH TO BRIDGE SHALL BE EMBEDDED IN CONCRETE MIN. 6" ALL AROUND CONDUIT.

**EAST LAKE ROAD BRIDGE ATTACHMENT**  
**DETAIL 2**  
SCALE: 1" = 20'



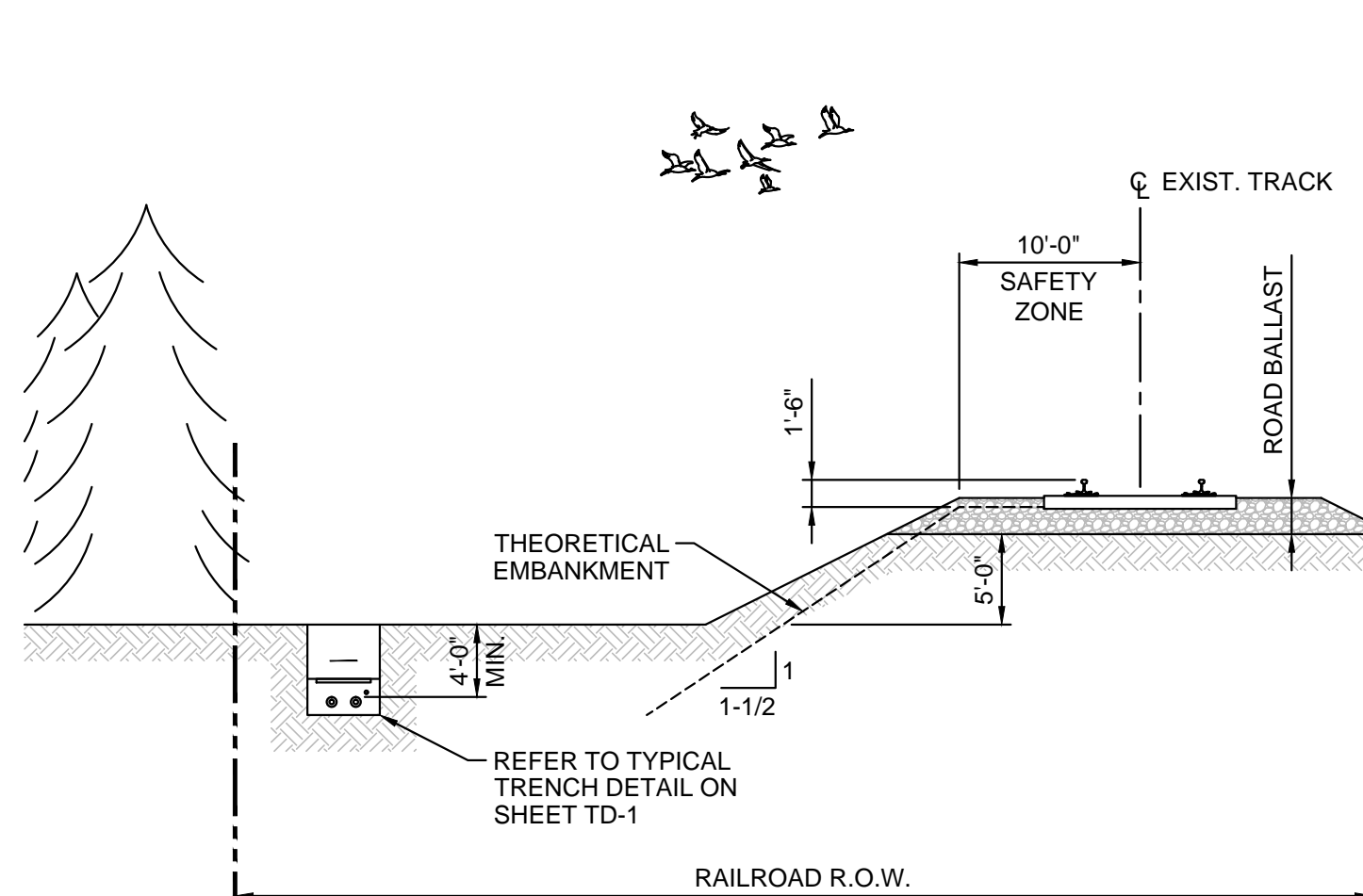
**EAST LAKE ROAD HEADWALL ATTACHMENT**  
**DETAIL 1**  
SCALE: N.T.S.



**NOTES**

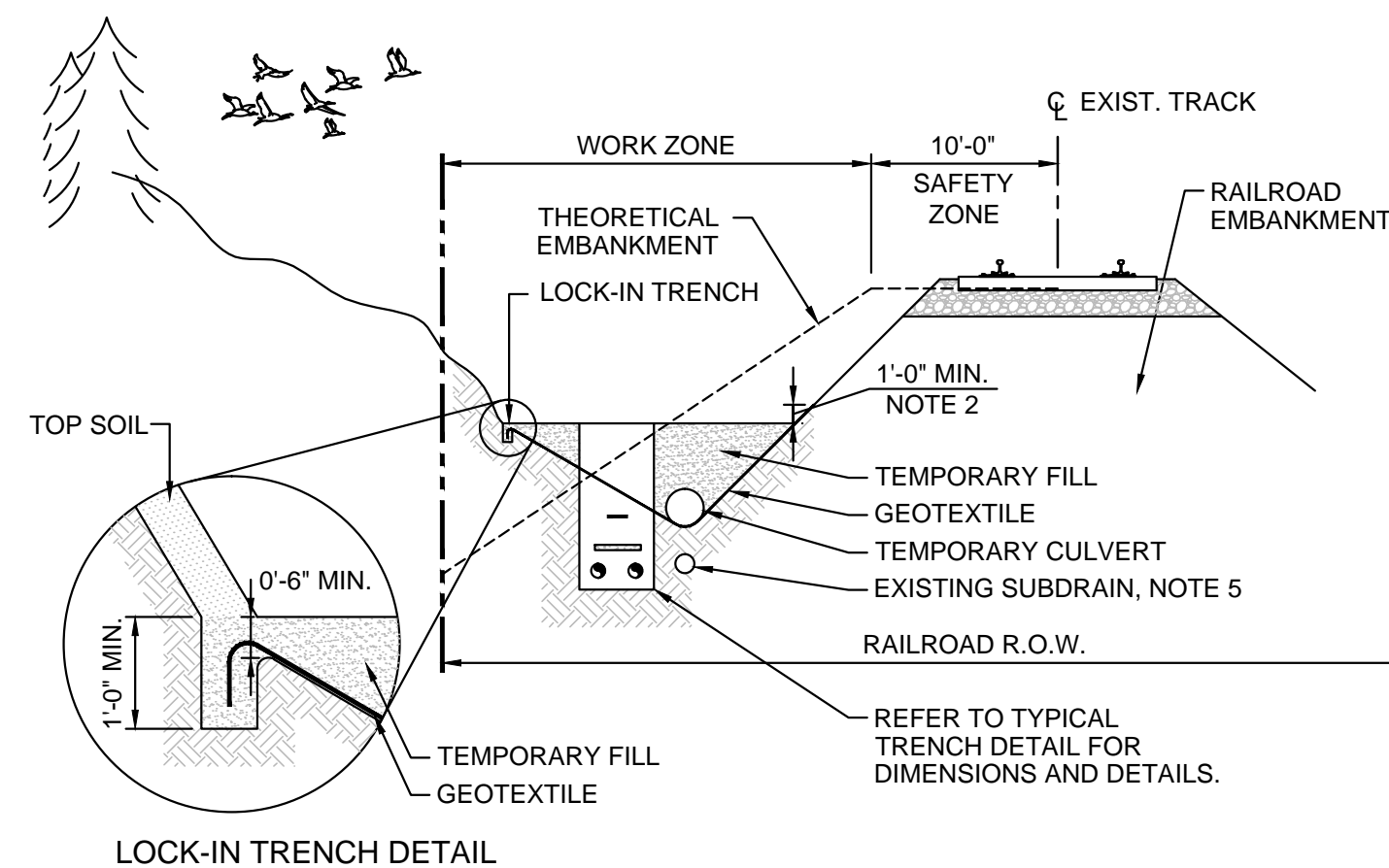
- ALL COMPONENTS TO BE GALVANIZED AFTER FABRICATION. FIELD WELD PIPE AFTER FITTING INTO TRANSITION BLOCKS. ROOT WELD SHALL BE TIG WELDED WITHOUT BACKER RING. GALVANIZE COMPLETED WELD USING ZINC RICH GALVANIZING PAINT.
- PVC ENCASED WITHIN CONCRETE SHALL BE BENT AT A 12 FT. RADIUS UNLESS A LARGER RADIUS IS REQUIRED BY THE CABLE MANUFACTURER.
- CONDUIT BEND RADIUS AND CONCRETE TRANSITION BLOCK LENGTHS SHALL BE COORDINATED TO PROVIDE 4 FEET MINIMUM COVER OVER CABLE AT EXIT FROM BLOCK.

**EAST LAKE ROAD HEADWALL ATTACHMENT**  
**DETAIL 2**  
SCALE: 1" = 20'



**NOTES**

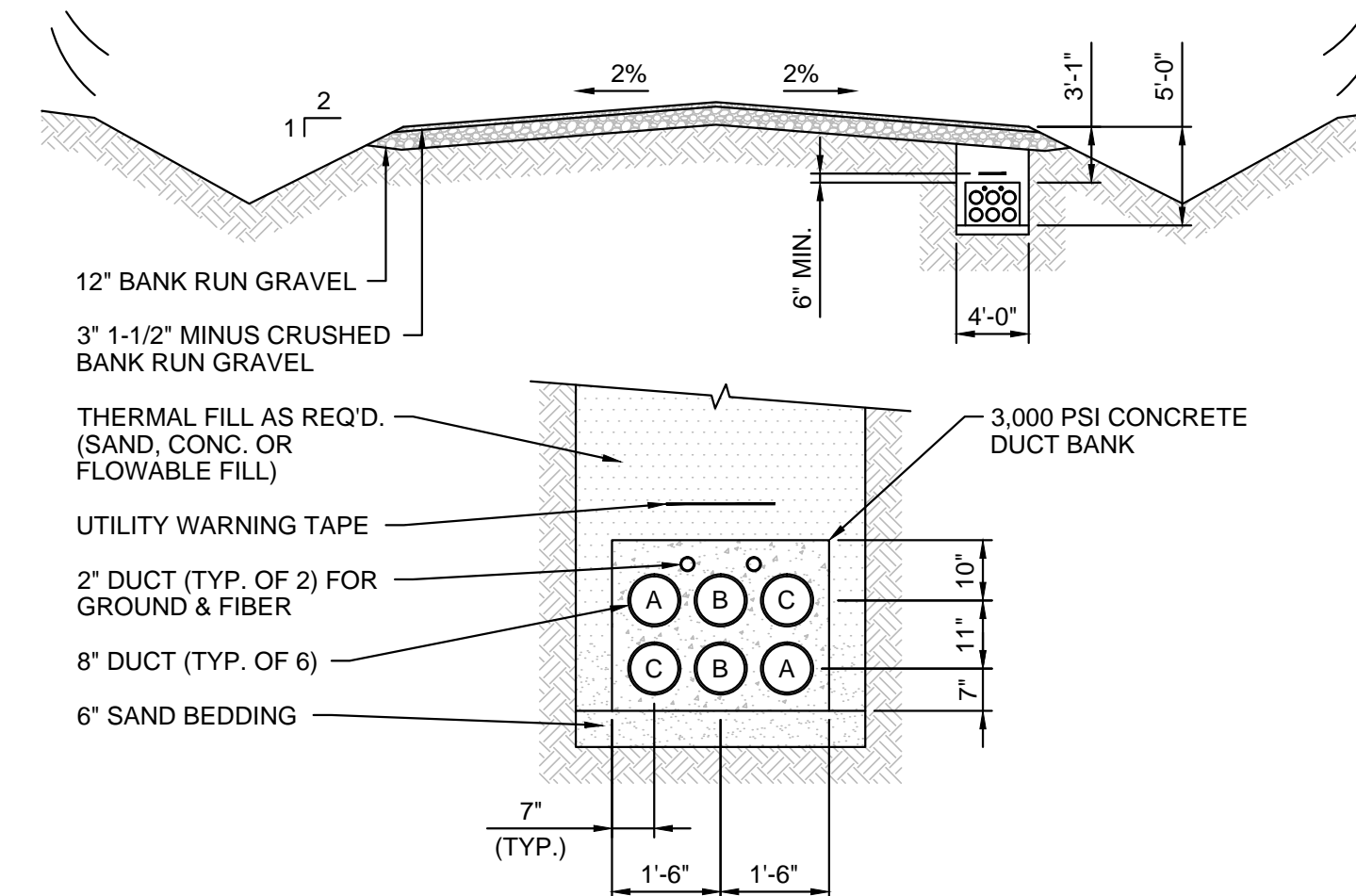
- THE THEORETICAL EMBANKMENT IS THE THEORETICAL LIMIT OF THE RAILROAD FOUNDATION CARRYING THE DYNAMIC TRACK LOADING. THE EMBANKMENT STARTS AT A DEPTH OF 1-1/2 FT. BELOW THE TOP OF THE RAILS AND 10 FT. FROM THE TRACK CENTERLINE, EXTENDING AT A SLOPE OF 1-1/2H:1V TO A DEPTH OF AT LEAST 5 FT. BELOW THE ROAD BALLAST.
- ANY EXCAVATION PENETRATING THE THEORETICAL EMBANKMENT SHALL BE SHORED. SHORING SHALL BE DEVELOPED TO CARRY E-30 LOADING FOLLOWING PROCEDURES ESTABLISHED BY AREMA CHAPTER 8, SECTION 20 AND 28.
- DURING TRAIN MOVEMENT, ALL PERSONNEL AND EQUIPMENT SHALL BE OUTSIDE THE SAFETY ZONE, AND ALL EQUIPMENT WITHIN 50 FT. OF THE TRACK SHALL BE SHUT DOWN AND OPERATORS OUT OF THE VEHICLES.
- THE TYPICAL SECTION AND REQUIREMENTS ARE PRESENTED FOR CONCEPT ONLY. ADDITIONAL AND MORE STRINGENT REQUIREMENTS MAY BE REQUIRED BY THE OPERATING RAILROAD, FEDERAL, STATE AND LOCAL REGULATIONS.
- PROVIDE EROSION AND SEDIMENT CONTROLS AS REQUIRED BY APPROVED PERMITS, VT. STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL, AND AS DIRECTED.



**NOTES**

- AFTER CLEARING WORK ZONE, AREAS TO RECEIVE TEMPORARY FILL SHALL BE STRIPPED OF TOPSOIL PRIOR TO PLACING GEOTEXTILE OVER THE EXPOSED SUBGRADE.
- EDGE OF GEOTEXTILE SHALL BE ANCHORED IN A LOCK-IN TRENCH ON THE OUTER EDGE OF THE R.O.W. AND SURFACE LAID AGAINST THE RAILROAD EMBANKMENT.
- WIDTH OF FILL AREA VARIES WITH SITE TOPOGRAPHY.
- PROVIDE TEMPORARY PERFORATED CULVERT TO COLLECT AND DIRECT GROUNDWATER TO ESTABLISHED DRAINAGE STRUCTURES.
- CONTRACTOR SHALL BE AWARE DRAINAGE DITCHES ALONG THE RAILROAD MAY BE UNDERLAIN WITH EXISTING PERFORATED PIPE SUBDRAINS. CABLE TRENCH SHALL EITHER AVOID THE EXISTING OR REMOVE AND REPLACE THEM AS THE WORK PROGRESSES.
- EXISTING SUBGRADE SHALL BE PROTECTED BY A WOVEN GEOTEXTILE. THE GEOTEXTILE IS INTENDED TO PROVIDE STABILITY AND SEPARATION OF THE EXISTING SOIL AND TEMPORARY FILL.
- TEMPORARY FILL SHALL BE GRANULAR, FREE DRAINING BANK RUN GRAVEL, CRUSHED GRAVEL, OR SAND.
- UPON COMPLETION OF THE WORK, REMOVE THE TEMPORARY FILL, CULVERT, AND GEOTEXTILE. RESTORE THE SITE TO ITS ORIGINAL CONDITION.

**RAILROAD ADJACENT**  
**TEMPORARY FILL DETAIL**  
SCALE: 1" = 10'



**NOTES**

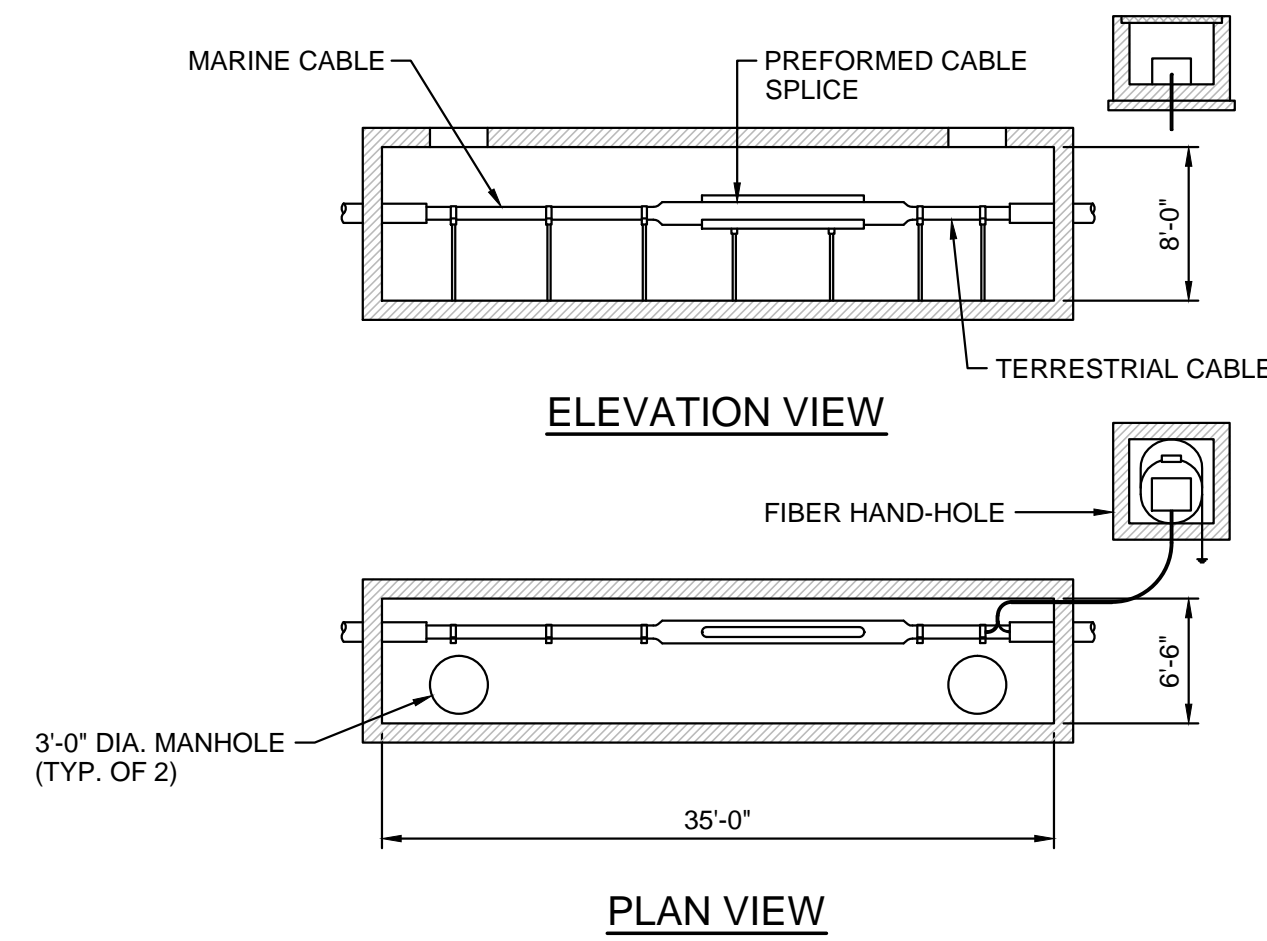
- DIMENSIONS AND DETAILS ARE CONCEPT ONLY AND SUBJECT TO MODIFICATION TO MEET TOWN OF LUDLOW, STATE AND FEDERAL REQUIREMENTS.
- ROADWAY WIDTH VARIES.
- ROADWAY GRAVEL SHALL MEET THE MINIMUM STANDARDS OF THE TOWN OF LUDLOW, VERMONT TOWN ROAD & BRIDGE STANDARDS.
- TRENCH BACKFILL SHALL BE THERMAL FILL AS REQUIRED TO MEET CALCULATED THERMAL CONDUCTIVITY REQUIREMENTS OF THE DESIGN.
- UTILITY WARNING TAPE SHALL BE PLACED NOT LESS THAN 6 INCHES ABOVE THE DUCT BANK CONCRETE.

**MUNICIPAL ROADWAY HVAC SECTION**  
SCALE: N.T.S.

Designed	TRC
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Approved	-
Scale	AS NOTED

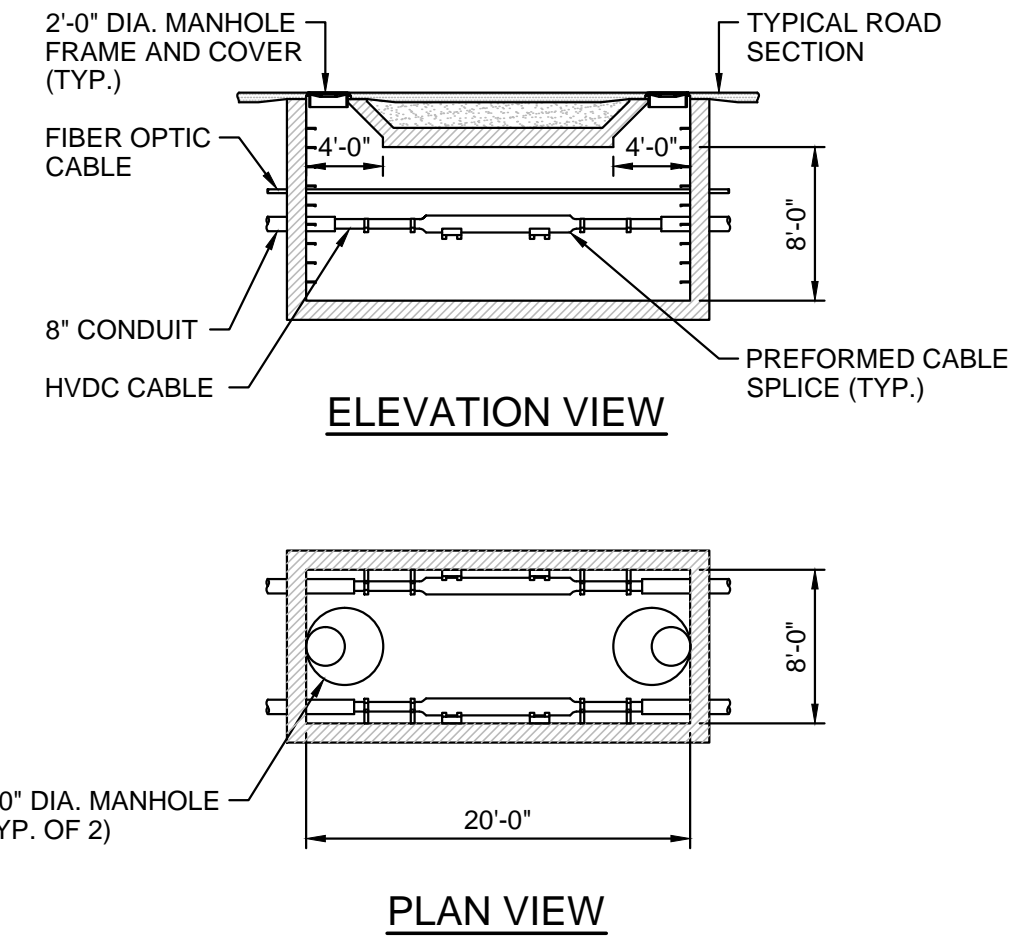
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**TDI New England**  
New England Clean Power Link  
TDI New England  
Typical Details  
TD-3  
Prepared by: TRC 10/09/14



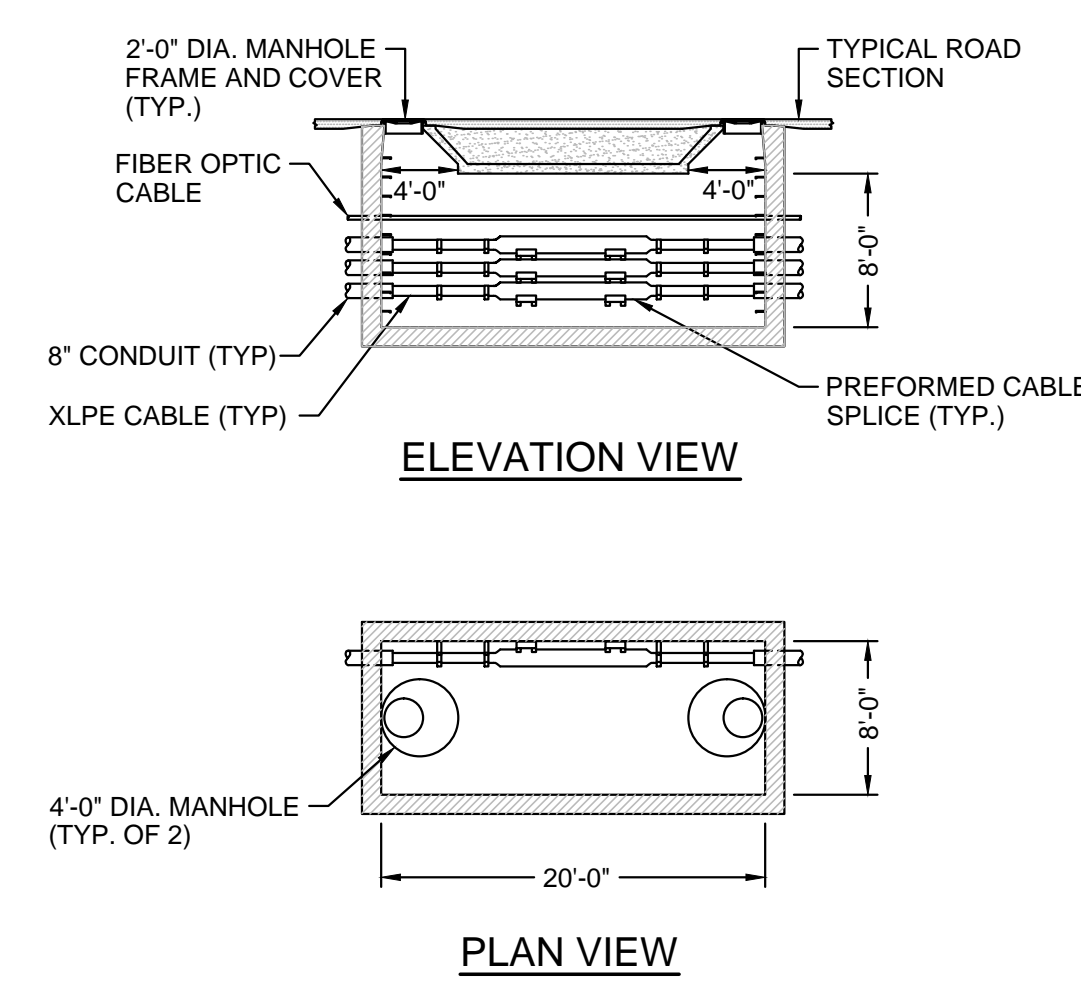
- NOTES**
1. SPLICE VAULTS TO BE CONSTRUCTED IN IMMEDIATE VICINITY OF MARINE CABLE LANDFALL LOCATION. ONE SPLICE VAULT PER BI-POLE CONDUCTOR WILL BE REQUIRED.
  2. ONLY ONE FIBER CABLE SPLICE HAND-HOLE WILL BE REQUIRED.
  3. SPLICE VAULT DESIGN AND DIMENSIONS ARE CONCEPT ONLY. ACTUAL INSTALLED DIMENSIONS AND CONFIGURATION MAY DIFFER.

**TYPICAL TRANSITION SPLICE VAULT**  
SCALE: 1" = 10'



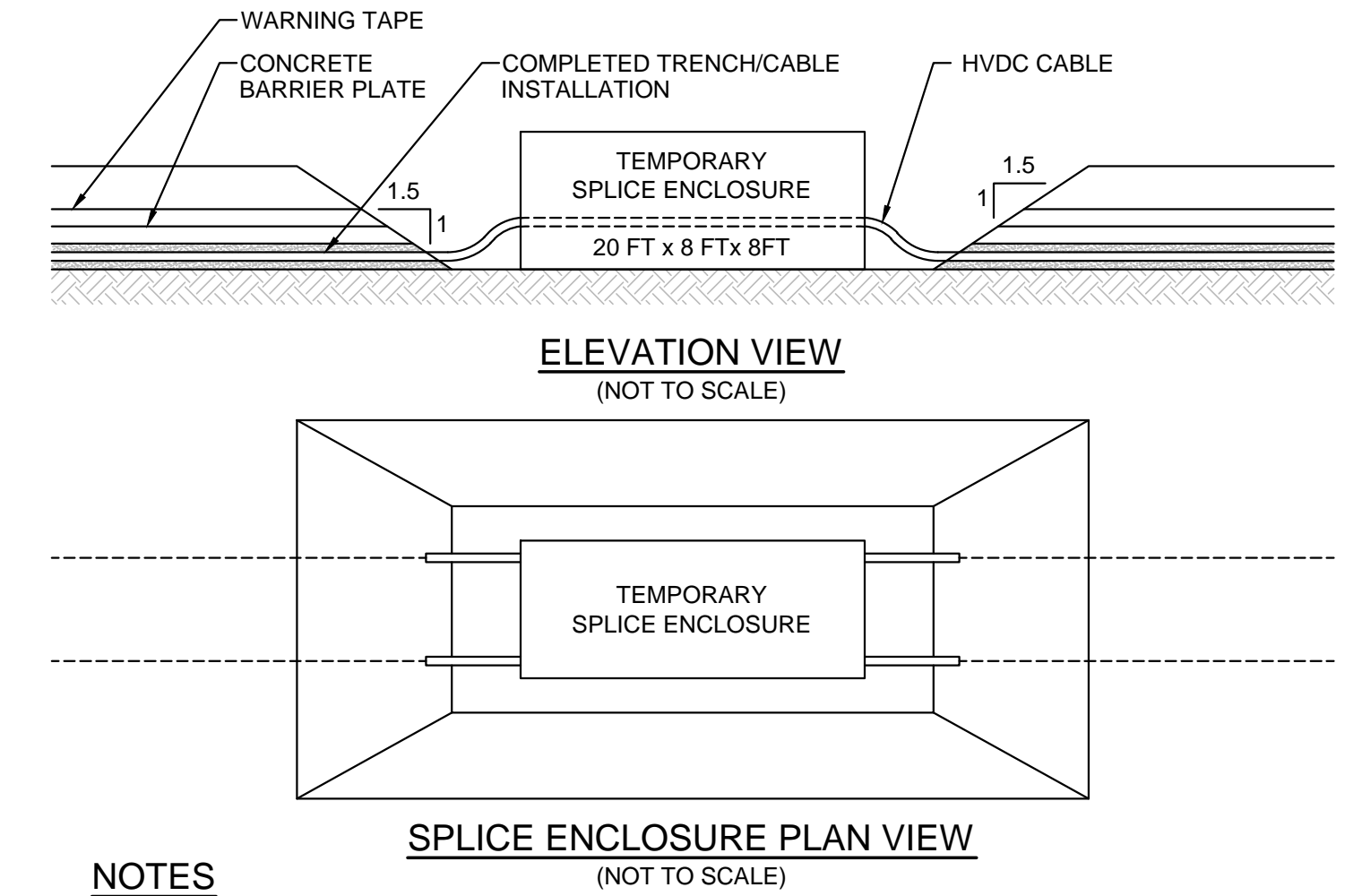
- NOTES**
1. SPLICE MANHOLE FRAMES AND COVERS SHALL BE RATED FOR H-20 VEHICLE LOADING.
  2. SPLICE MANHOLE DESIGN AND DIMENSIONS ARE CONCEPT ONLY. INSTALLED LOCATION, DIMENSIONS AND DESIGN MAY DIFFER FROM THAT PRESENTED HEREIN.

**TYPICAL HVDC SPLICE MANHOLE**  
SCALE: 1" = 10'



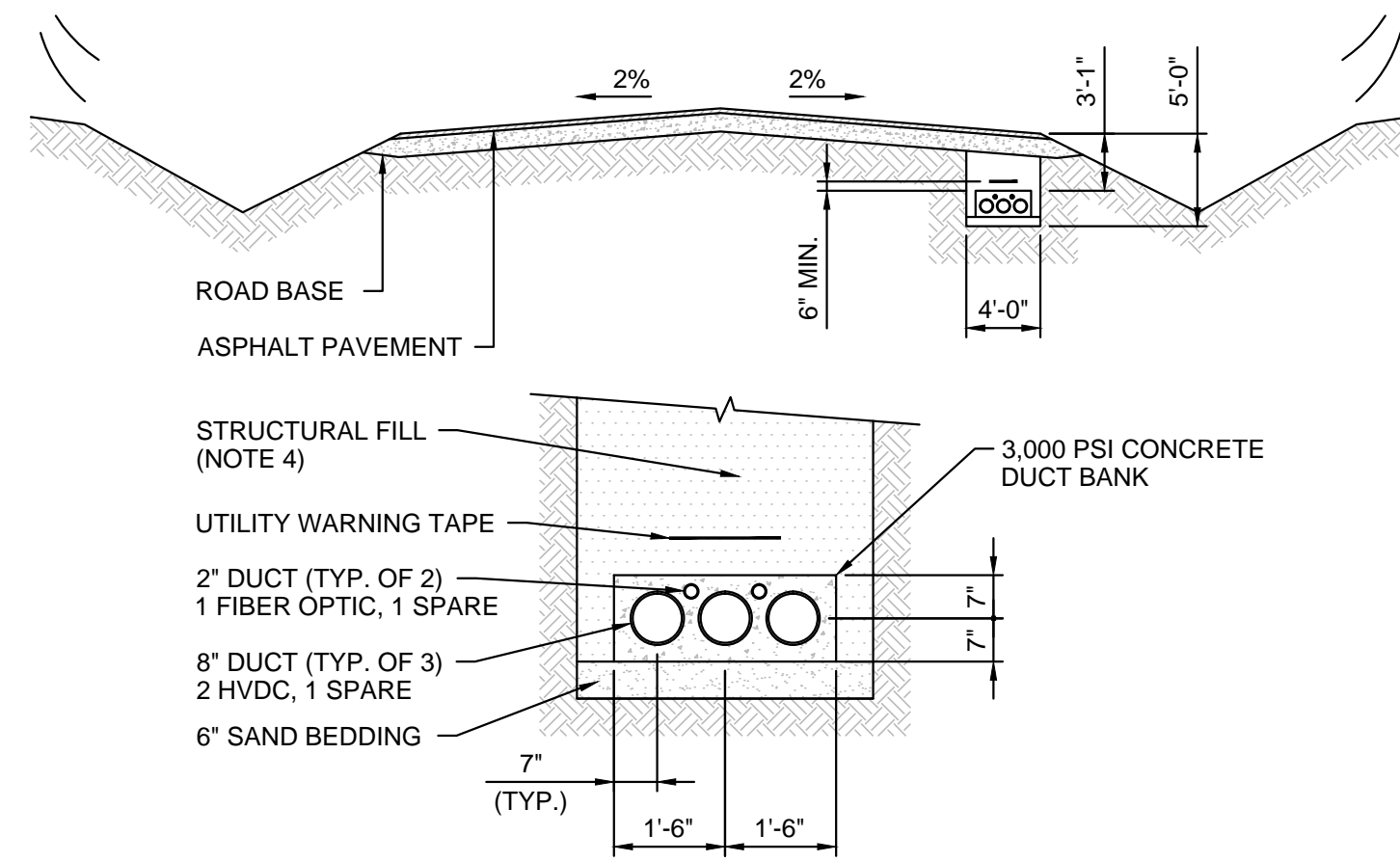
- NOTES**
1. 345 KV HVAC SPLICE MANHOLE SHALL BE USED FOR THE ROUTE SEGMENT BETWEEN THE NECP CONVERTER STATION AND THE EXISTING COOLIDGE SUBSTATION.
  2. ONE OR MORE SPLICE MANHOLES WILL BE INSTALLED WITHIN THE CONVERTER STATION ACCESS ROAD AND NELSON ROAD.
  3. SPLICE MANHOLE, FRAMES AND COVERS SHALL BE RATED FOR H-20 VEHICLE LOADING.
  4. SPLICE MANHOLE DESIGN AND DIMENSIONS ARE CONCEPT ONLY. INSTALLED LOCATION, DIMENSIONS AND DESIGN MAY DIFFER FROM THAT PRESENTED HEREIN.

**HVAC SPLICE MANHOLE**  
SCALE: 1" = 10'



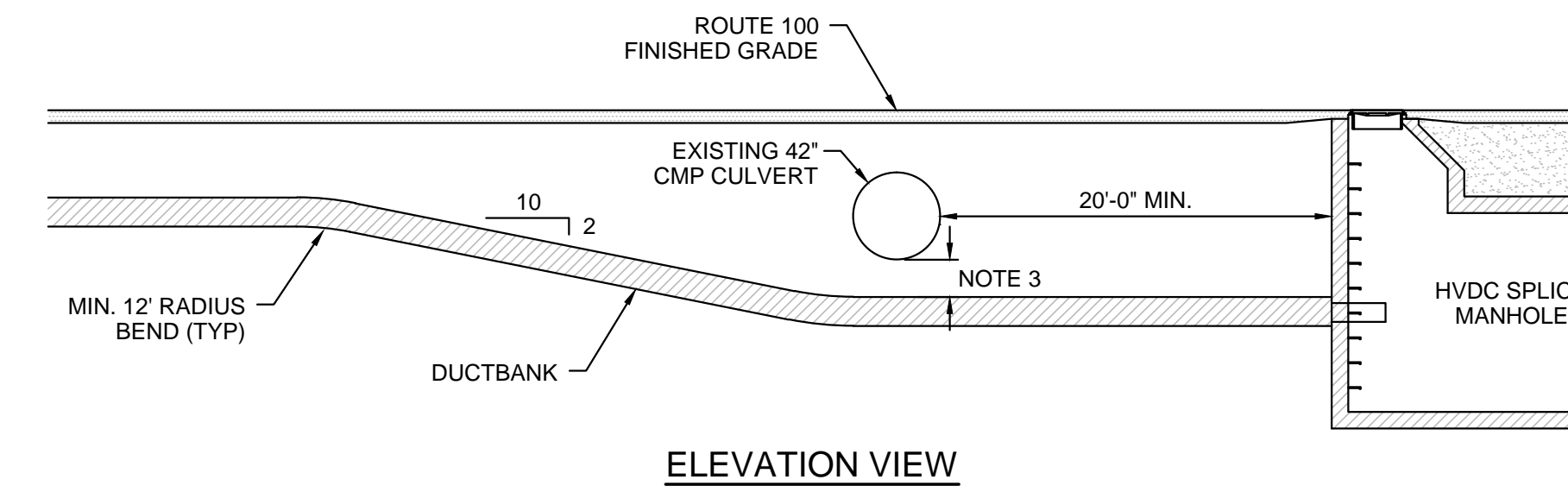
- NOTES**
1. HVDC CABLE SHALL BE DIRECT BURIED AFTER SPLICING. WORK SEQUENCE INCLUDES:
    - A. LAY CABLES WITH APPROXIMATELY 20 FEET OF OVERLAP AT PLANNED SPLICE LOCATIONS.
    - B. BACKFILL ON PLATE OVER TRENCH UNTIL SPLICING OPERATION REACHES THIS LOCATION.
    - C. EXPOSE LAPPED CABLES AND EXCAVATE TEMPORARY SPLICE PIT WITH BOTTOM DIMENSION OF APPROXIMATELY 28 FEET X 10 FEET.
    - D. INSTALL TEMPORARY CLIMATE CONTROLLED SPLICE ENCLOSURE WITHIN PIT.
    - E. LIFT CABLES INTO ENCLOSURE USING FLOOR ACCESS HATCH AND PERFORM SPLICES.
    - F. WHEN SPLICE IS COMPLETE RETURN CABLE TO FLOOR OF EXCAVATION AND REMOVE SPLICE ENCLOSURE.
    - G. BACKFILL EXCAVATION, INCLUDING PLACEMENT OF CONCRETE BARRIER AND WARNING TAPE OVER CABLES.
  2. SPLICE PIT SHOWN IS FOR CONCEPT ONLY. ACTUAL DIMENSIONS AND DEPTH MAY VARY BASED ON SPECIFIC SPLICE LOCATION.
  3. EXCAVATION DEPICTED USES SIDES SLOPED AT 1 1/2 : 1. IN LIEU OF SLOPED EXCAVATION, SHORING AND OTHER MEANS MAY BE USED TO LIMIT SIZE OF EXCAVATION.

**HVDC SPLICE SEQUENCE**  
SCALE: N.T.S.



- NOTES**
1. DIMENSIONS AND DETAILS ARE CONCEPT ONLY AND SUBJECT TO MODIFICATION TO MEET STATE AND FEDERAL REQUIREMENTS.
  2. UTILITY WARNING TAPE SHALL BE PLACED NOT LESS THAN 6 INCHES ABOVE THE TOP OF THE DUCT BANK CONCRETE.
  3. DUCTBANK BURIAL DEPTH VARIES ALONG THE ROUTE. MINIMUM BURIAL DEPTH TO TOP OF DUCTBANK CONCRETE SHALL BE 4 FEET.
  4. STRUCTURAL FILL SHALL BE PER VERMONT AOT SPECIFICATIONS EXCEPT THERMAL RESISTIVITY SHALL BE 100" C-CM/WATT OR LESS. EXISTING ROAD MATERIAL MAY BE USED PROVIDED IT MEETS THE SPECIFIED THERMAL RESISTIVITY.

**STATE ROUTE 100 HVDC DUCTBANK SECTION**  
SCALE: N.T.S.




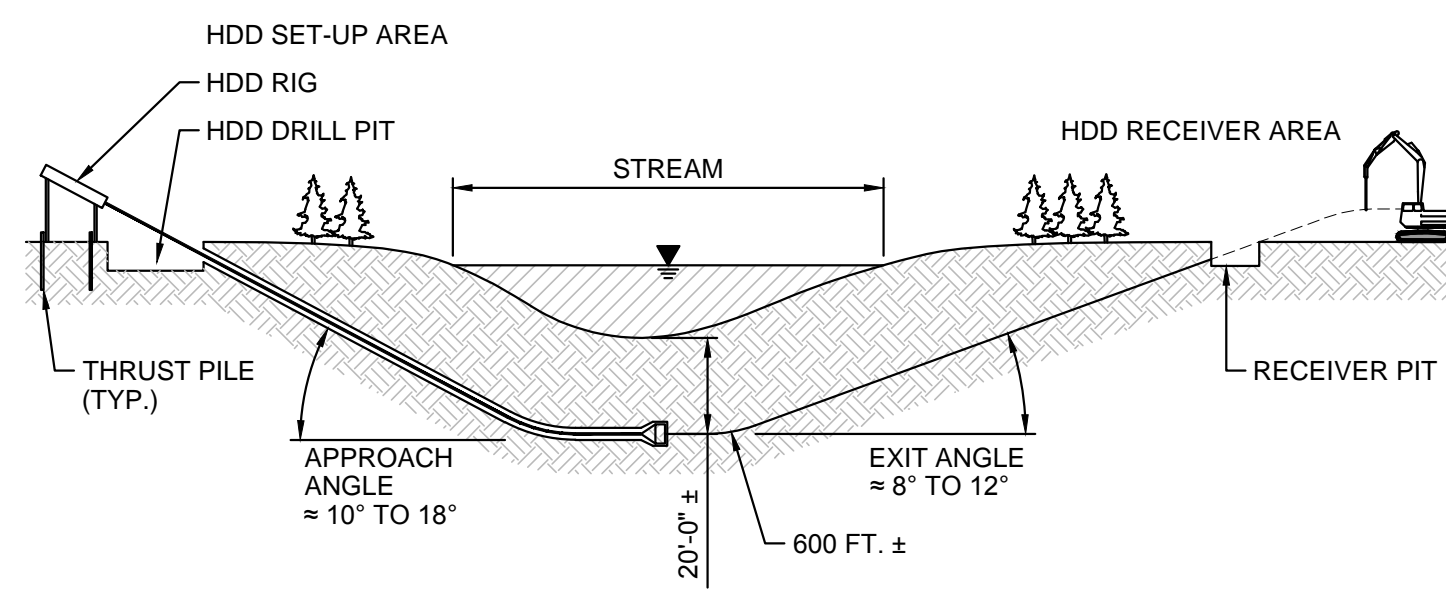
- NOTES**
1. DIMENSIONS AND DETAILS ARE CONCEPT ONLY AND SUBJECT TO MODIFICATION FOR CONFORMANCE WITH STATE AND FEDERAL REQUIREMENTS.
  2. DUCTBANK ELEVATION TRANSITION SHALL SLOPE AT APPROXIMATELY 10H:2V UNLESS OTHERWISE APPROVED.
  3. DUCTBANK SHALL PASS NOT LESS THAN 1 1/2 FEET BELOW THE EXISTING CULVERT.
  4. LOCATE HVDC SPLICE MANHOLE APPROXIMATELY AS INDICATED BUT NOT LESS THAN 20 FEET FROM THE EXISTING CULVERT.
  5. DUCTBANK BETWEEN CULVERT AND MANHOLE SHALL BE STRAIGHT WITH NO CHANGES OF ELEVATION OR DIRECTION.
  6. DUCTBANK SHALL BE INSTALLED WITHOUT MODIFICATION OF THE EXISTING CULVERT. PROVIDE CULVERT BRACING AND OTHER TEMPORARY SUPPORTS AS NECESSARY.

**STATE ROUTE 100 HVDC DUCTBANK STREAM CROSSING**  
SCALE: N.T.S.

Designed	TRC
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Scale	AS NOTED

No.	Revision	Date	By	Ck	PE	PE #
A	20% ANR Submission	12/5/14	TRC	AMW		

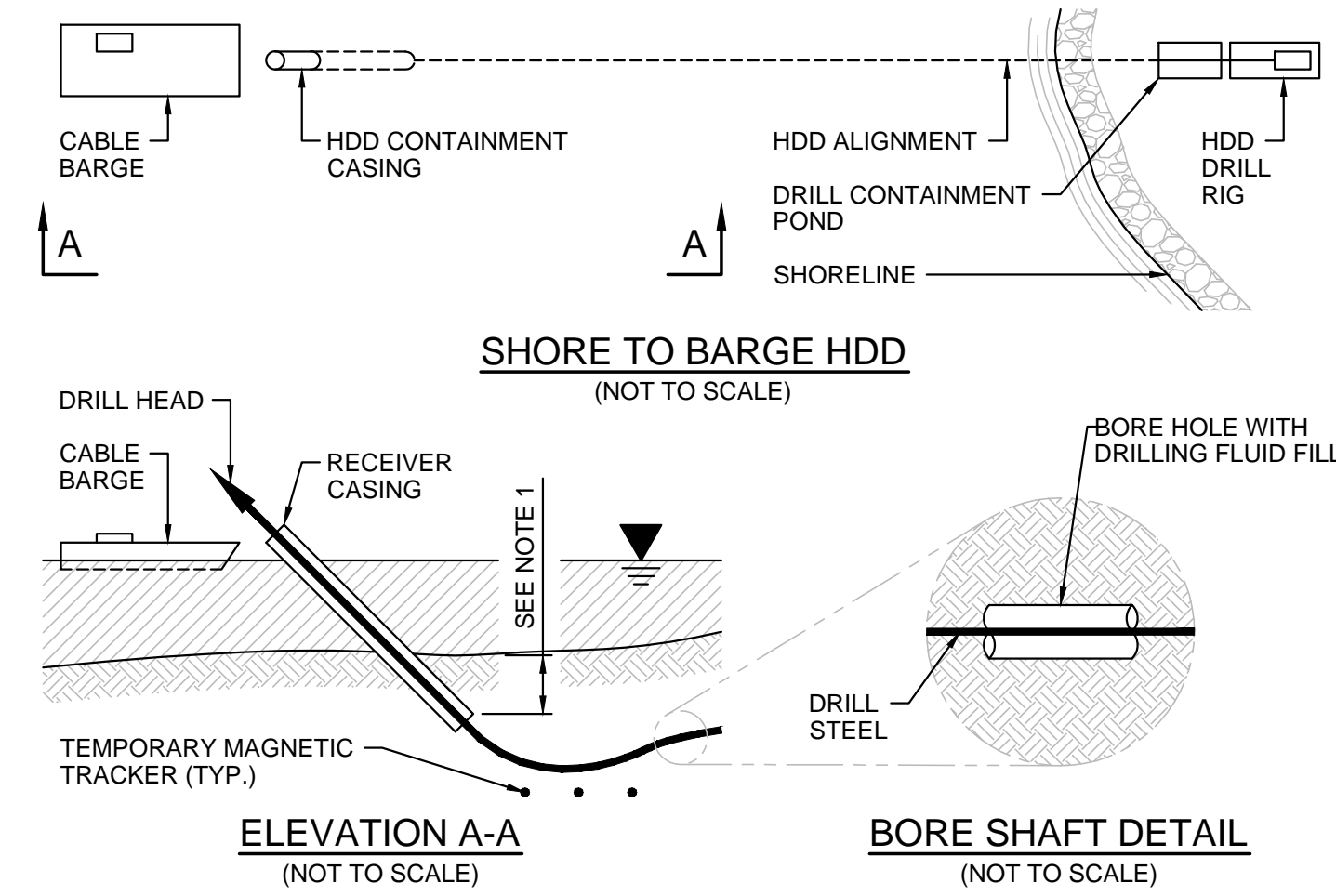
  
**New England Clean Power Link**  
 TDI New England  
 Typical Details  
 TD-4  
 Prepared by: TRC 10/09/14



**NOTES**

- HDD SET-UP AREA IS APPROXIMATELY 50 FT. x 250 FT. FOR LARGE HDD OPERATIONS. THIS STAGING AREA MAY BE REDUCED FOR SMALLER BORING OPERATIONS OR SOME EQUIPMENT ASSOCIATED WITH LARGE HDD OPERATIONS MAY BE STAGED AT OTHER LOCATIONS.
- DRILL PIT MAY BE ELIMINATED IN TOTAL IF ALTERNATE MEANS FOR DRILL MUD CONTAINMENT IS PROVIDED. TYPICAL DRILL PIT FOR LARGE HDD OPERATIONS IS 6 FT. DEEP x 8 FT. x 20 FT.
- HDD SHALL PASS NOT LESS THAN 20 FT. UNDER STREAMS NOR LESS THAN 15 FT. BELOW ROADWAYS AND OTHER GROUND SURFACES.
- RECEIVER PIT MAY BE ELIMINATED IF ALTERNATE DRILL MUD CONTROL METHOD IS PROVIDED. RECEIVER PIT IS TYPICALLY 5 FT. DEEP x 10 FT. x 10 FT. FOR LARGE DRILL OPERATIONS.
- FOR CASING AND CABLE PULL-BACK, CASING MAY BE SUSPENDED ABOVE R.O.W. TO FACILITATE INSTALLATION.
- TWO BORE HOLES PER CROSSING ARE REQUIRED. FOR PLANNING PURPOSES, BORE HOLE SPACING SHALL BE 15-25 FEET. LESSER SPACING MAY BE USED IN CERTAIN SOIL CONDITIONS AND/OR BORE OPERATIONS.

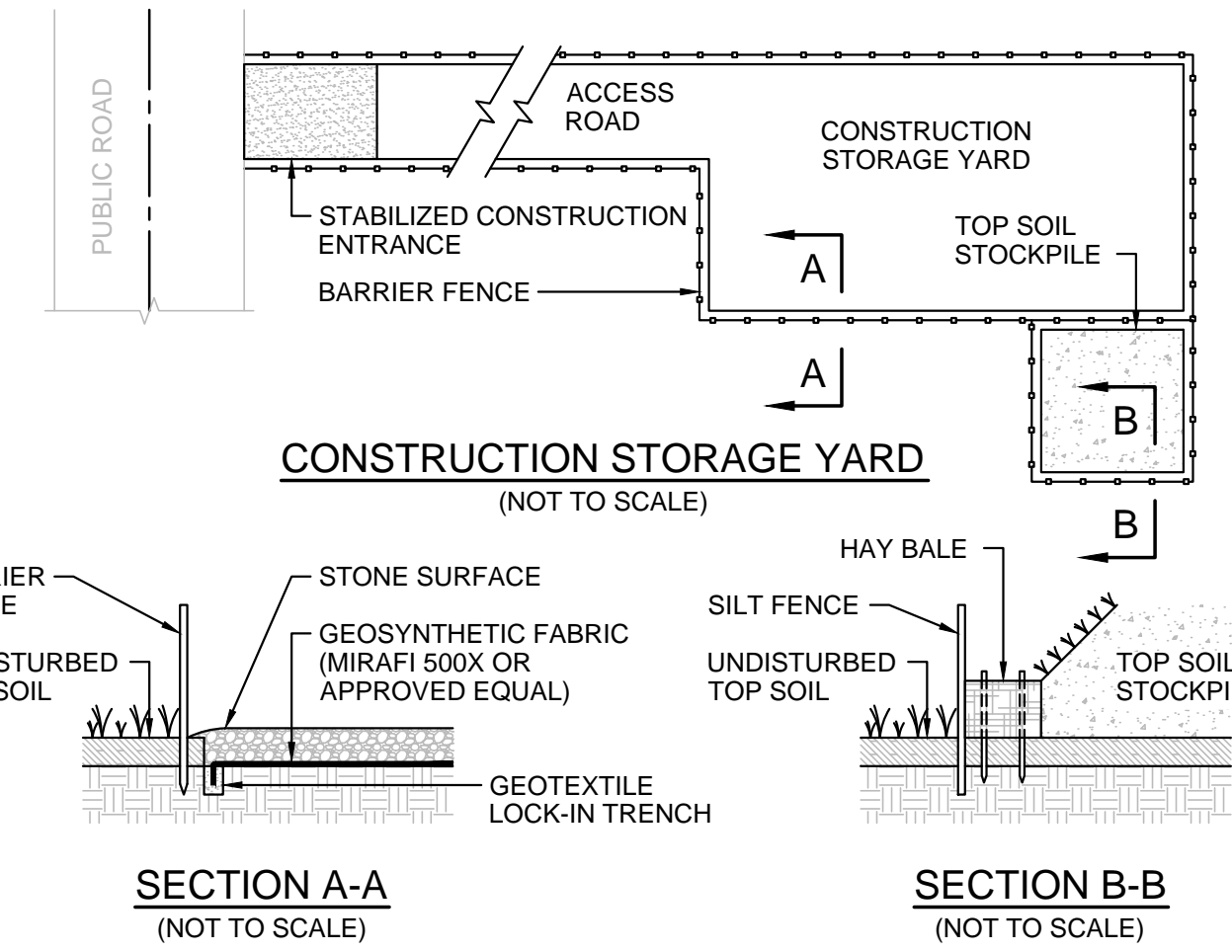
**TYPICAL HDD STREAM CROSSING**  
SCALE: N.T.S.



**NOTES**

- RECEIVER CASING SHALL BE DRIVEN INTO THE LAKE BOTTOM AT SUFFICIENT DEPTH TO ENSURE ADEQUATE EARTH COVER TO CONTAIN DRILL MUD.
- RECEIVER CASING SHALL BE 48 INCH OR LARGER STEEL PIPE DRIVEN INTO THE LAKE BOTTOM AND USED TO CONTAIN DRILL CUTTINGS AND DRILLING FLUID AT BREAK-OUT.
- SUITABLE MAGNETIC TRACKING DEVICES OR SIMILAR SHALL BE USED TO GUIDE THE DRILL LEAD INTO THE RECEIVER CASING.
- RECEIVER CASING AND TRACKING DEVICES SHALL BE REMOVED AT THE COMPLETION OF THE HDD OPERATION.
- CABLE BARGE WILL BE USED FOR HDD TOOL INSTALLATION/REMOVAL, CASING PULL-IN AND CABLE PULLING.
- COFFER DAM MAY BE USED IN LIEU OF RECEIVER CASING SHOULD BOTTOM CONDITIONS OR OTHER FACTORS NOT BE CONDUCIVE TO RECEIVER INSTALLATION OR USE. REFER TO DETAIL 209513-CBL-08.
- DRILLING FLUID IS TYPICALLY BENTONITE DRILLING MUD. WATER MAY BE USED UNDER SOME CIRCUMSTANCES.

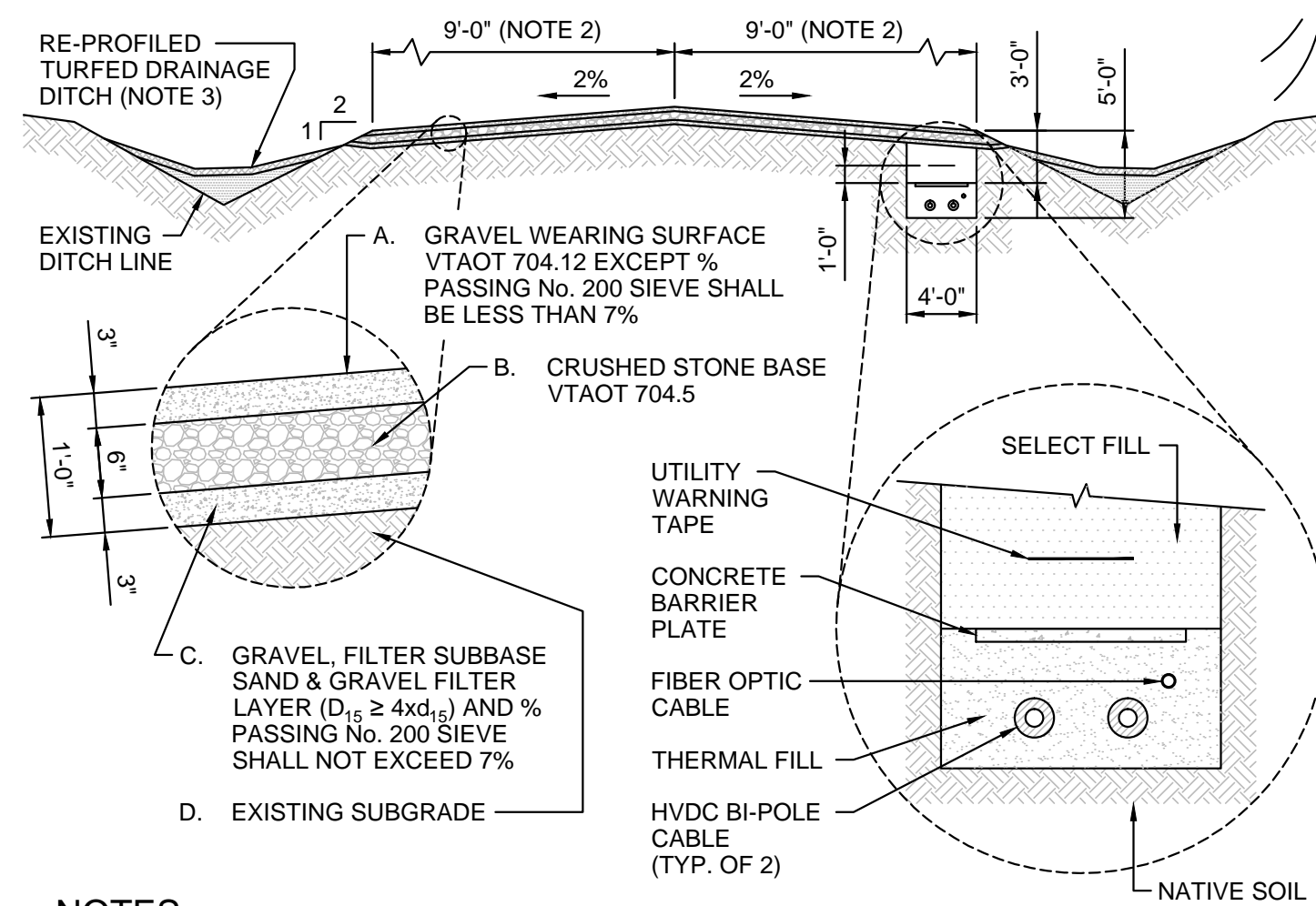
**HDD RECEIVER CASING**  
SCALE: N.T.S.



**NOTES**

- CONSTRUCTION YARDS BUILT ON AGRICULTURAL LAND AND OTHER SENSITIVE SOILS SHALL BE STRIPPED OF TOP SOIL AND STOCKPILED FOR LATER RESTORATION OF AREA. STOCKPILED TOP SOIL SHALL BE PROTECTED BY SILT FENCE, HAY BALES, AND OTHER MEASURES TO LIMIT EROSION. STOCKPILES SHALL BE SEEDED FOR LONG-TERM PROTECTION.
- STORAGE YARD AND ACCESS ROAD SHALL BE BUILT UPON A GEOSYNTHETIC STABILIZATION/SEGREGATION FABRIC ANCHORED AT ITS EDGES USING A LOCK IN TRENCH OR SIMILAR MEANS. THE ACTIVE YARD WILL BE TOPPED WITH NOT LESS THAN 6 INCHES OF CRUSHED STONE OR GRAVEL. ENTIRE YARD PERIMETER AND ACCESS ROAD SHALL BE BORDERED USING BARRIER FENCE, SILT FENCE OR HAY BALES AS APPROPRIATE TO PROVIDE EROSION CONTROL AND DELINEATE LIMIT OF YARD.
- PUBLIC ROAD END OF ACCESS ROAD SHALL INCLUDE A STABILIZED CONSTRUCTION ENTRANCE. STABILIZED CONSTRUCTION ENTRANCE SHALL MEET PERMIT REQUIREMENTS AND VT. EROSION PROTECTION & SEDIMENT CONTROL STANDARDS. REFER TO DETAIL 209513-ESC-09.
- AT THE COMPLETION OF THE WORK, UNLESS OTHERWISE DIRECTED, THE CONSTRUCTION STORAGE YARD SHALL BE RESTORED TO ITS ORIGINAL CONDITION. RESTORATION SHALL INCLUDE LOOSENING THE TOP 6 IN. OF YARD SUBGRADE TO UNCOMPACT SOILS. SPREAD STOCKPILED TOP SOIL, SEED AND MULCH. ALL YARD GRAVEL, GEOSYNTHETICS, EROSION CONTROL MATERIALS, WASTE AND DEBRIS SHALL BE REMOVED AND PROPERLY DISPOSED OF.

**CONSTRUCTION STORAGE AREAS**  
SCALE: N.T.S.





**NOTES**

- DRAWING DEVELOPED TO DEPICT PROPOSED GRAVEL ROAD IMPROVEMENTS ALONG PROJECT ROUTE IN BENSON. ROADS INCLUDE NORTH LAKE ROAD, STONY POINT ROAD AND OLD NORTH LAKE ROAD.
- ROAD GRAVEL TO BE APPLIED OVER THE LESSER OF THE ENTIRE LANE WIDTH INDICATED OR TO EDGE OF EXISTING ROADWAY.
- PROVIDE ROAD DITCH CLEANING AND PROFILING WHERE GRADES PERMIT SUCH ALTERATIONS.
- EXISTING ROAD SURFACE SHALL BE GRADED TO PROVIDE UNIFORM CROSS-SLOPE TO MATCH FINISHED ROAD CROWN. COMPACT TOP SIX INCHES OF SUBGRADE TO NOT LESS THAN 95% ASTM 1557 PRIOR TO SUBBASE APPLICATION.
- SUBBASE, BASE, WEARING SURFACE AND TRENCH BACKFILL SHALL BE COMPACTED TO 95% ASTM 1557, THEORETICAL MAXIMUM DENSITY.
- EXISTING DRIVEWAY APRON SHALL BE ADJUSTED TO MATCH RE-BUILT ROAD ELEVATION.

**TYPICAL BENSON ROADWAY SECTION**  
SCALE: N.T.S.

Designed	TRC
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Checked	-
Approved	-
Scale	AS NOTED

No.	Revision	Date	By	Ck	PE	PE #
A	20% ANR Submission	12/5/14	TRC	AMW		

  
**New England Clean Power Link**  
 TDI New England  
 Typical Details  
**CHAMPLAIN-LUDLOW HVDC**  
 TD-5  
 Prepared by:  TRC 10/09/14