

I:\SVR-NASH\proj\191-656-GIS\Maps\191-656 Figure 1 Permit Mod Location Aerial.mxd (10/8/2019 3:56:41 PM)

REFERENCE
 TDOT AERIAL IMAGERY
 GO TO ARCGIS ON TNMAP.TN.GOV/BASEMAPS/IMAGERY
 ACCESSED 10/8/2019

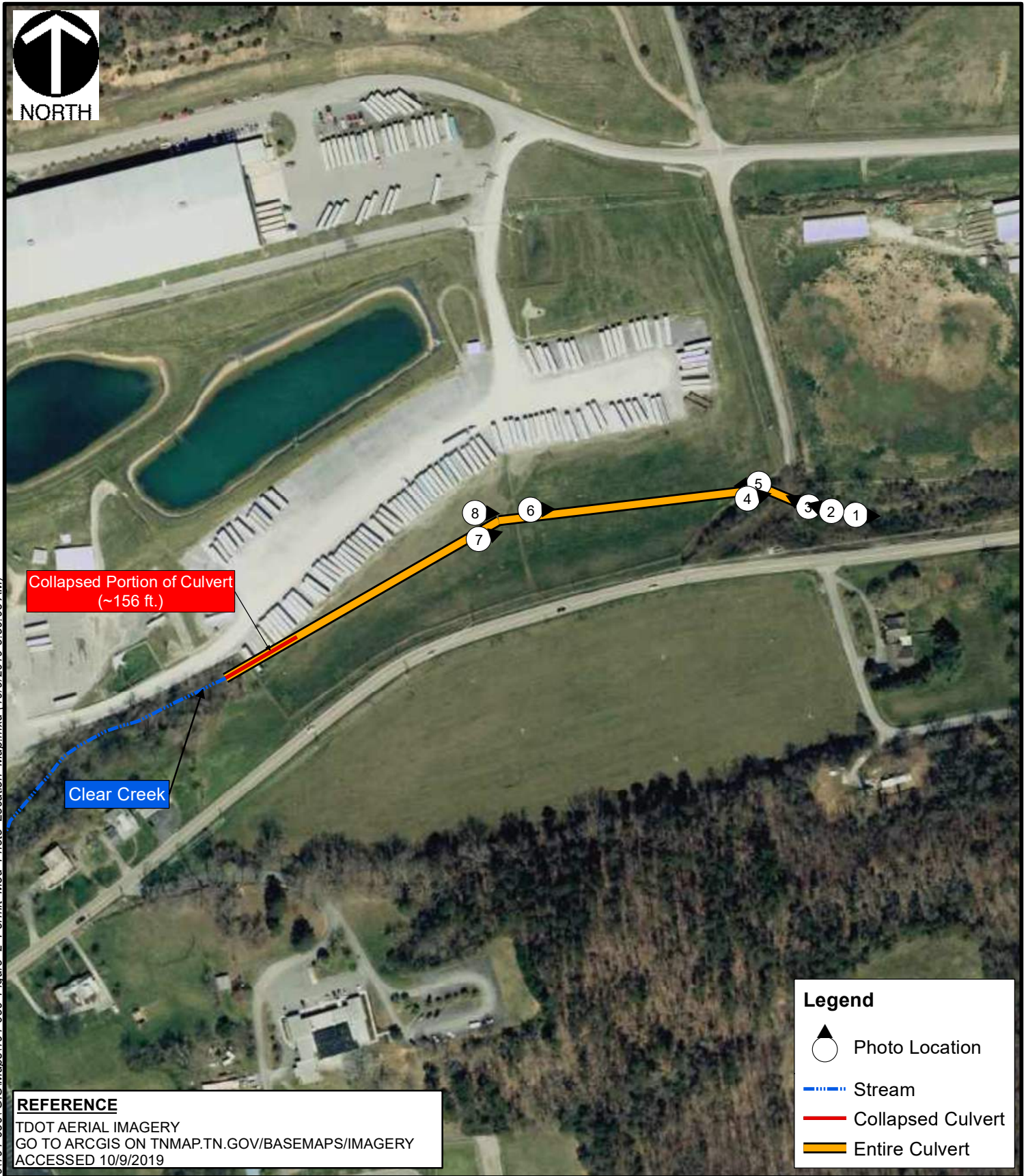
Legend
 Stream
 Collapsed Culvert
 Entire Culvert

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BUSH BROTHERS & COMPANY
 GARAP NRS1903.124
 MODIFICATION REQUEST
 DANDRIDGE, JEFFERSON COUNTY, TN

PROJECT LOCATION AERIAL MAP

DRAWN BY: JTM	CHECKED BY: JMS	APPROVED BY: JLW <small>* Hand signature on file</small>	FIGURE NO: 1
DATE: 10/8/2019	SCALE: 1" = 250'	PROJECT NO: 191-656	



**Collapsed Portion of Culvert
(~156 ft.)**

Clear Creek

Legend

- Photo Location
- Stream
- Collapsed Culvert
- Entire Culvert

REFERENCE
 TDOT AERIAL IMAGERY
 GO TO ARCGIS ON TNMAP.TN.GOV/BASEMAPS/IMAGERY
 ACCESSED 10/9/2019

I:\SVR-NASH\proj\projects\2019\191-656-GIS\Maps\191-656 Figure 2 Permit Mod Photo Location Map.mxd (10/9/2019 8:50:08 AM)



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PHOTO LOCATION MAP

DRAWN BY: JTM	CHECKED BY: JMS	APPROVED BY: JLW <small>* Hand signature on file</small>	FIGURE NO: 2
DATE: 10/9/2019	SCALE: 1" = 250'	PROJECT NO: 191-656	



Photo 1 – General view of Clear Creek facing upstream of existing culvert inlet.



Photo 2 – General view of existing one 60” CMP at inlet. CMP is partially collapsed; surrounding area shows sign of erosion; debris build-up evident. Proposed begin impact location for permit modification request.



Photo 3 – General view of interior of the single 60” CMP. CMP is noticeable misshaped and disjunct. This pipe conveys Clear Creek.



Photo 4 – General view facing upgradient of upstream junction box; transition location from single 60” CMP to two 60” CMPs.



Photo 5 – General view of the inlet of the two 60” CMPs at the upstream junction box.



Photo 6 – Existing conditions aboveground of the proposed culvert(s) replacement; looking upstream.



Photo 7 – General view of the outlet of the two 60” CMPs proposed for replacement as part of the modification. Debris build up was evident and culverts were observed to be damaged and disjunct.



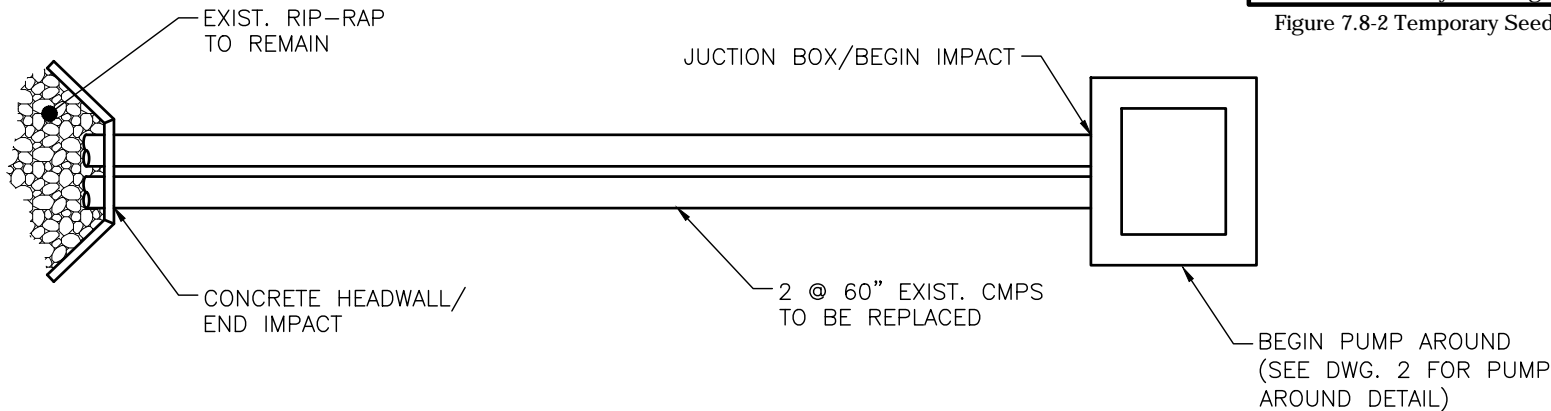
Photo 8 – General view of the outlet of the two 60” CMPs proposed for replacement as part of the modification. Debris build up was evident and culverts were observed to be damaged and disjunct.

Table 7.9-2 Allowable seed mixes and planting dates.

	Zone	Best	Marginal	Rate/Mix (lb/ac PLS)
Region II	Low maintenance, Slopes and Poor, shallow soils	Aug 25 - Sept 15 Feb 15 - Apr 21	Sept 15 - Oct 25 Mar 21 - Apr 15	100 Pensacola bahiagrass 40 Bermudagrass (hulled) 20 Korean Lespedeza** 10 Kobe Lespedeza**
	Low maintenance, Moderate Slopes, soils > 6 in. depth	Aug 25 - Sept 15 Feb 15 - Apr 21	Sept 15 - Oct 25 Mar 21 - Apr 15	80 Pensacola bahiagrass 30 Bermudagrass (hulled) 20 Korean Lespedeza** 15 Kobe Lespedeza**
	High maintenance	Aug 15 - Oct 15	Feb 15 - Apr 15	200 KY 31 fescue**

SPECIES	RATE (Lb/acre)
Oats	60
Brown top millet	30
SEEDING DATES	
East.....	May 15 - Aug. 15
Middle	May 1 - Aug. 15
West	Apr. 15 - Aug. 15
SOIL AMENDMENTS	
Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.	
MULCH	
Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, nesting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.	
MAINTENANCE	
Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.	

Figure 7.8-2 Temporary Seeding Recommendation Summer.



GENERAL NOTES/CONSTRUCTION SEQUENCING:

1. IN-STREAM WORK SHALL BE PERFORMED IN THE DRY.
2. WORK SHALL NOT BEGIN UNTIL ALL MATERIALS NECESSARY FOR PIPE REMOVAL/REPLACEMENT ARE AVAILABLE ON-SITE.
3. PLACE SEDIMENT TUBES, PER TDOT STANDARD DRAWING EC-STR-37, DOWNGRADIENT OF DISTURBANCE.
4. IF NECESSARY, A TEMPORARY PIPE DIVERSION, PER TDOT STANDARD DRAWING EC-STR-32, SHALL BE INSTALLED AT THE END EACH WORK DAY TO CONVEY STREAM FLOW.
5. APPLY TEMPORARY STABILIZATION WITHIN 14 DAYS OF THE DATE OF LAST DISTURBANCE.
6. PERMANENT STABILIZATION SHALL BE APPLIED PER SEEDING SPECIFICATIONS THIS SHEET.
7. TEMPORARY EPSC MEASURES SHALL REMAIN IN PLACE UNTIL FINAL STABILIZATION HAS BEEN ACHIEVED PER THE TNCGP.


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 DANDRIDGE TN. 37725

CONSTRUCTION DETAIL TYPICAL

DRAWN BY:	KLU	CHECKED BY:	TJN	APPROVED BY:	*JLW	DRAWING NO.:	1
DATE:	MAY 2019	DWG SCALE:	N/A	PROJECT NO:	191-656		

*HAND SIGNATURE ON FILE

PUMP-AROUND DIVERSION

Temporary measure for dewatering in-channel construction sites

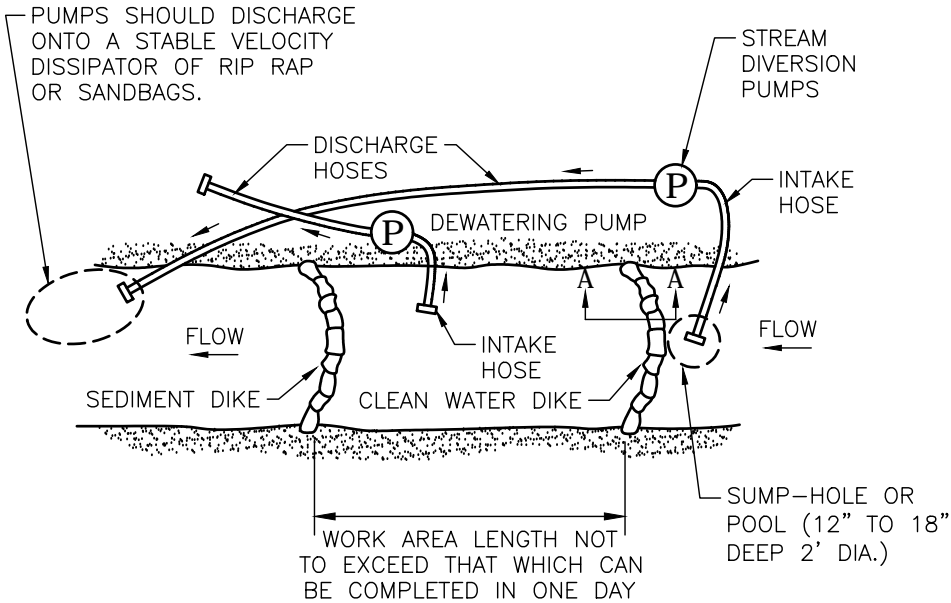
DESCRIPTION

The work should consist of installing a temporary pump and supporting measures to divert flow around in-stream construction sites.

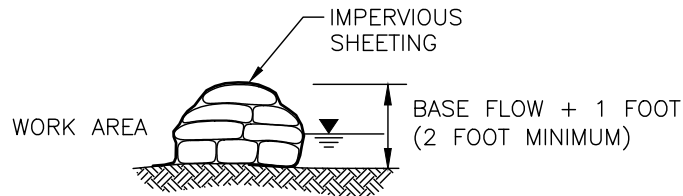
IMPLEMENTATION SEQUENCE

Sediment control measures, pump-around practices, and associated channel and bank construction should be completed in the following sequence

1. Construction activities including the installation of erosion and sediment control measures should not begin until all necessary easements and/or right-of-ways have been acquired. All existing utilities should be marked in the field prior to construction. The contractor is responsible for any damage to existing utilities that may result from construction and should repair the damage at his/her own expense to the city's, county's or utility company's satisfaction.
2. The contractor should stake out all limits of disturbance prior to the pre-construction meeting so they may be reviewed. The participants will also designate the contractor's staging areas and flag all trees within the limit of disturbance which will be removed for construction access. Trees should not be removed within the limit of disturbance without approval from the City or their Designated Representative.
3. Construction should not begin until all sediment and erosion control measures have been installed and approved by the engineer and the sediment control inspector. The contractor should stay within the limits of the disturbance as shown on the plans and minimize disturbance within the work area whenever possible.
4. Upon installation of all sediment control measures and approval by the sediment control inspector, the contractor should begin work at the upstream section and proceed downstream beginning with the establishment of stabilized construction entrances. In some cases, work may begin downstream, if appropriate. The contractor should only begin work in an area which can be completed by the end of the day including grading adjacent to the channel. At the end of each work day, the work area must be stabilized and the pump around removed from the channel. Work should not be conducted in the channel during rain events.
5. Sandbag dikes should be situated at the upstream and downstream ends of the work area as shown on the plans, and stream flow should be pumped around the work area. The pump should discharge onto a stable velocity dissipater made of riprap or sandbags.
6. Water from the work area should be pumped to a sediment filtering measure such as a dewatering basin, sediment bag, or other approved source. The measure should be located such that the water drains back into the channel below the downstream sandbag dike.
7. Traversing a channel reach with equipment within the work area where no work is proposed should be avoided. If equipment has to traverse such a reach for access to another area, then timber mats or similar measures should be used to minimize disturbance to the channel. Temporary stream crossings should be used only when necessary and only where noted on the plans or specified.
8. All stream restoration measures should be installed as indicated by the plans and all banks graded in accordance with the grading plans and typical cross-sections. All grading must be stabilized at the end of each day with seed and mulch or seed and matting as specified on the plans.
9. After an area is completed and stabilized, the clean water dike should be removed. After the first sediment flush, a new clean water dike should be established upstream from the old sediment dike. Finally, upon establishment of a new sediment dike upstream the old one, the old sediment dike should be removed.
10. A pump around must be installed on any tributary or storm drain outfall which contributes baseflow to the work area. This should be accomplished by locating a sandbag dike at the downstream end of the tributary or storm drain outfall and pumping the stream flow around the work area. This water should discharge onto the same velocity dissipater used for the main stem pump around.
11. The contractor is responsible for providing access to and maintaining all erosion and sediment control devices until the sediment control inspector approves their removal.
12. After construction, all disturbed areas should be regraded and revegetated as per the project specifications.



SECTION A-A



CROSS SECTION OF SANDBAG DIKE

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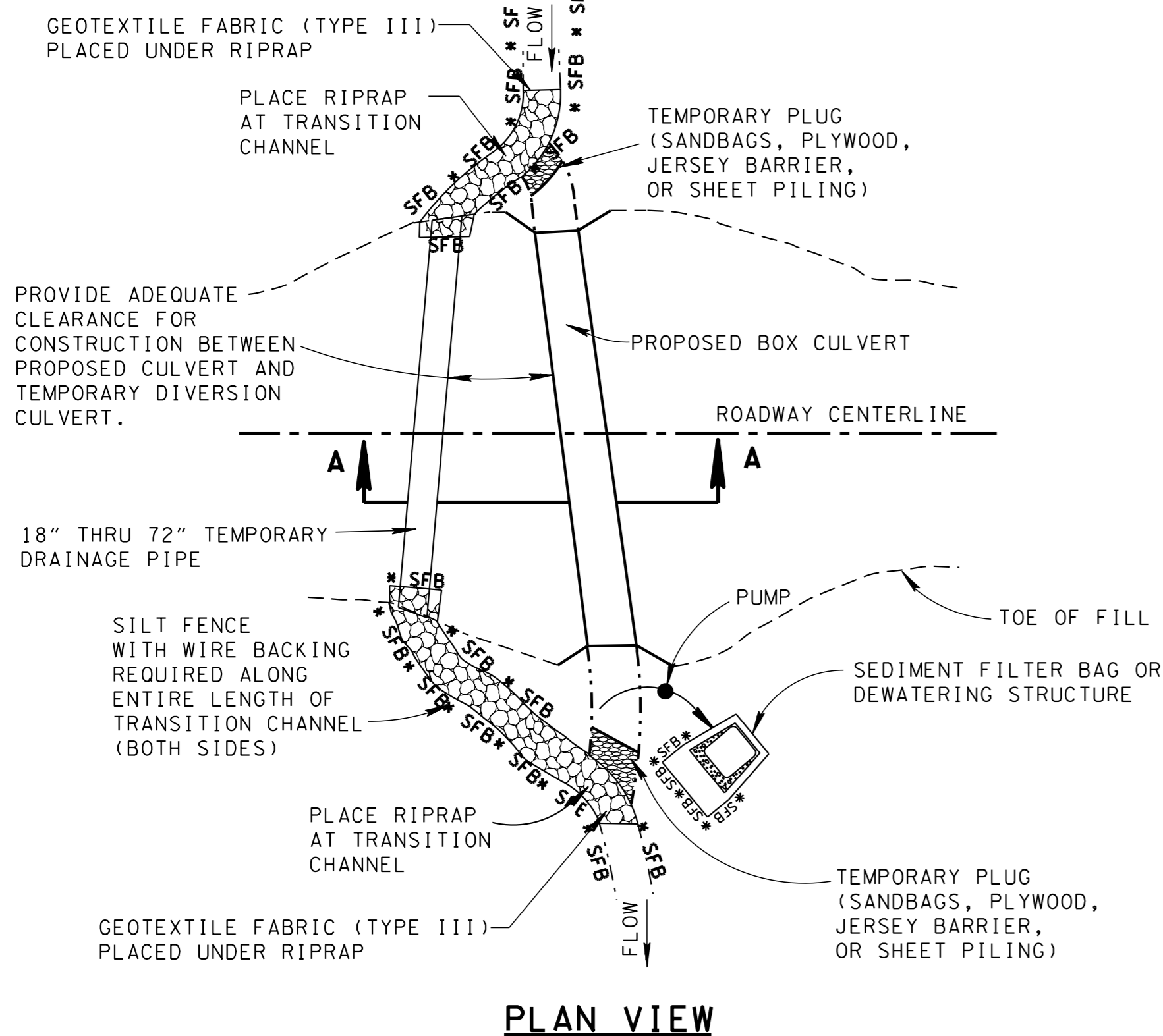
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 DANDRIDGE TN. 37725

PUMP AROUND TYPICAL

DRAWN BY:	KLU	CHECKED BY:	TJN	APPROVED BY:	*JLW	DRAWING NO.:	
DATE:	MAY 2019	DWG SCALE:	N/A	PROJECT NO:	191-656		2

*HAND SIGNATURE ON FILE

TEMPORARY DIVERSION CULVERT WITH CHANNEL TRANSITIONS



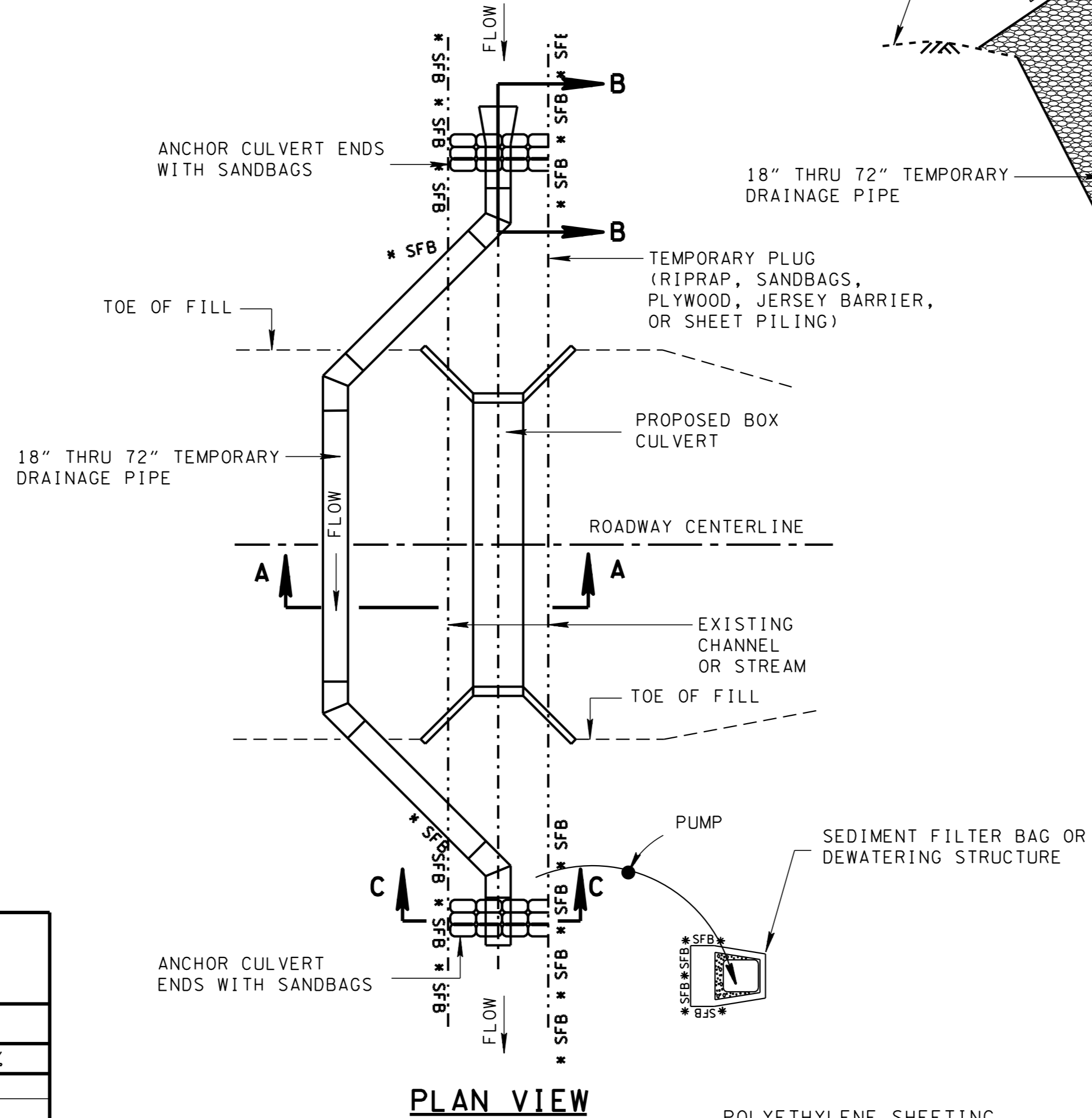
PLAN VIEW

TEMPORARY DIVERSION CULVERT SELECTION						
FLOW CAPACITY IN CFS OF A GIVEN PIPE AT A GIVEN CHANNEL SLOPE						
PIPE DIAMETER (INCHES)	AVERAGE CHANNEL SLOPE					
	0.5%	1%	1.5%	2.0%	2.5%	3.0%
18	8.5	9.1	9.8	10.4	11.0	11.3
24	17.4	18.8	20.0	21.4	21.5	21.7
30	30.1	32.3	33.9	34.1	33.5	33.0
36	46.8	50.4	49.5	47.8	46.6	45.8
42	67.7	69.0	65.5	62.8	61.0	59.6
48	92.6	88.1	76.8	78.6	75.8	73.7
54	127.2	107.0	91.9	94.9	91.1	88.1
60	146.5	121.1	118.4	111.1	106.1	101.9
72	194.9	142.2	153.6	141.3	133.3	127.9
RIPRAP	B	B	B	B	B/C	B/C

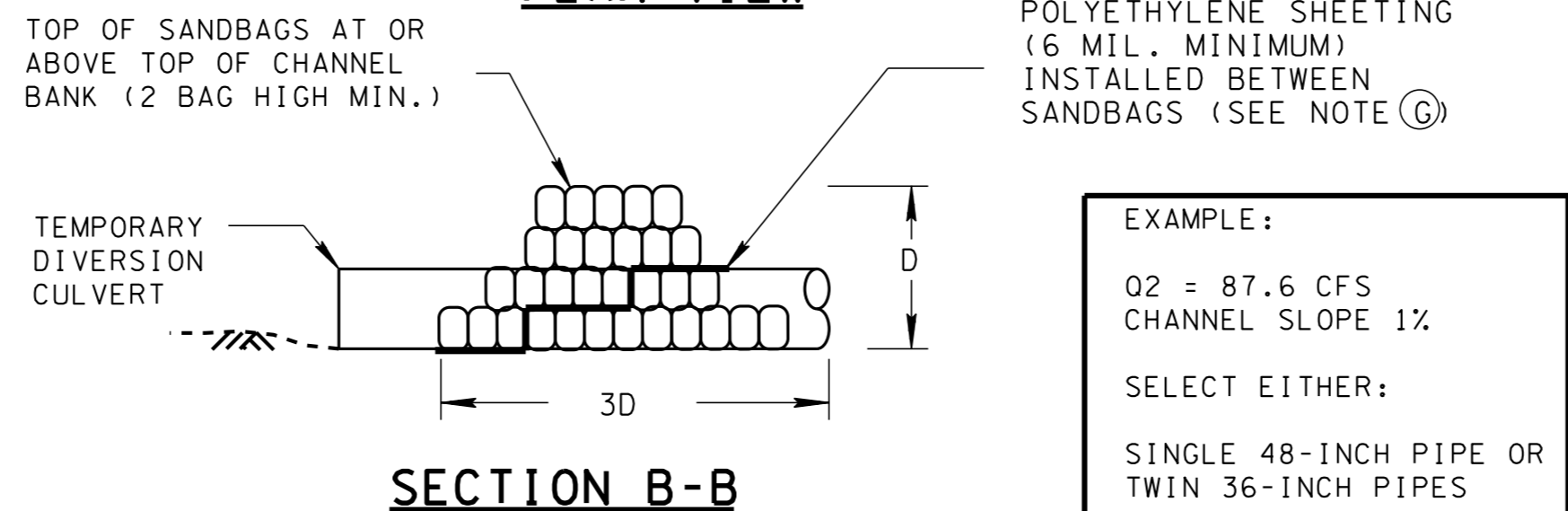
NOTES: FLOW RATES BASED ON 2.5-FOOT INCREASE IN WATER SURFACE ELEVATION ABOVE NORMAL LEVEL FOR THE 2-YEAR, 24 HOUR STORM EVENT

ASSUMES CORRUGATED PIPE (n = 0.024)

TEMPORARY DIVERSION CULVERT WITH ELBOWS

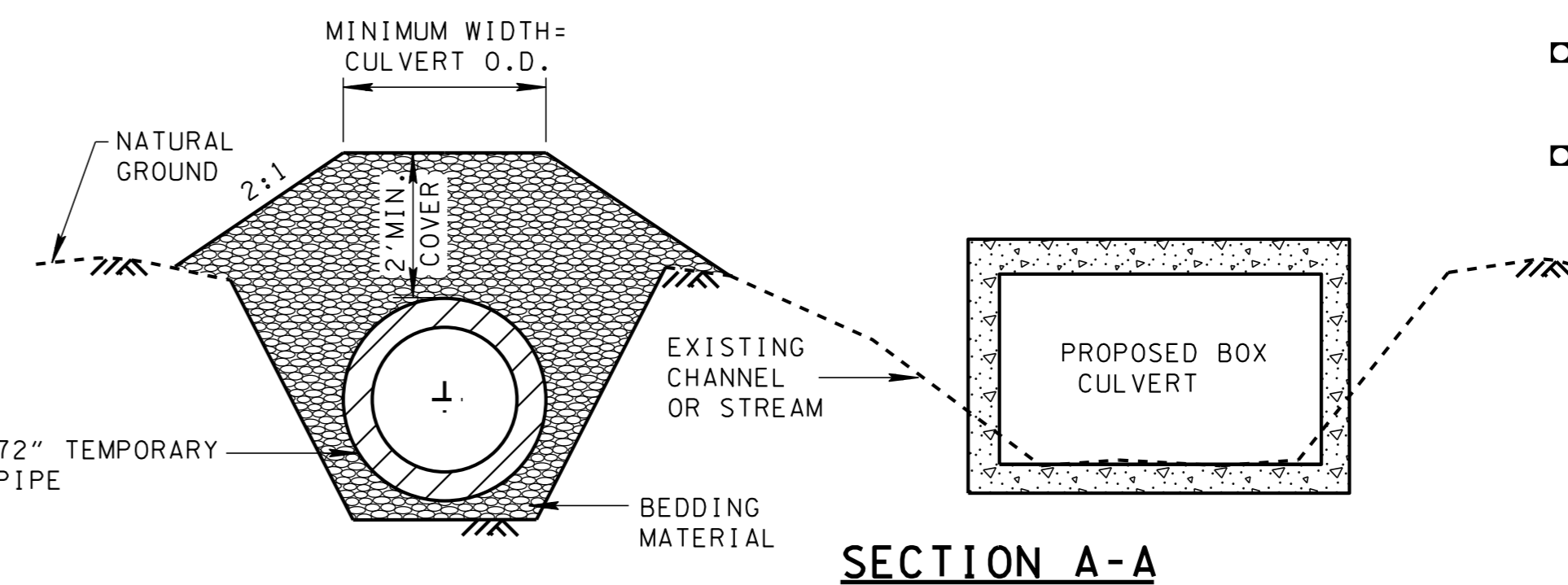


PLAN VIEW



SECTION B-B

EXAMPLE:
Q2 = 87.6 CFS
CHANNEL SLOPE 1%
SELECT EITHER:
SINGLE 48-INCH PIPE OR
TWIN 36-INCH PIPES



SECTION A-A

TEMPORARY DIVERSION CULVERTS GENERAL NOTES

- (A) TEMPORARY DIVERSION CULVERTS ARE GENERALLY CONSTRUCTED UNDER AN EXISTING ROADWAY, WHERE IT IS NECESSARY TO MAINTAIN TRAFFIC, TO CONVEY STREAM FLOW AROUND IN-STREAM CONSTRUCTION. THIS ALLOWS IN-STREAM WORK TO BE COMPLETED IN THE DRY, SEPARATED FROM FLOWING WATER.
- (B) EXAMPLE SHOWN IS FOR CULVERT REPLACEMENT OR NEW CONSTRUCTION. OTHER PROJECTS WOULD BE CONSTRUCTED IN A SIMILAR MANNER.
- (C) TEMPORARY DIVERSION CULVERTS SHALL BE DESIGNED USING A 2-YEAR FREQUENCY STORM FLOW RATE. AT SITES WHICH INVOLVE EXCEPTIONAL TENNESSEE WATERS OR SEDIMENT-IMPAIRED STREAMS, THE PIPE SHALL BE ADEQUATE TO CONVEY THE 5-YEAR, PEAK FLOW. THE TABLE "TEMPORARY DIVERSION CULVERT SELECTION" MAY BE USED AS A GUIDELINE FOR DETERMINING THE PIPE SIZE. FOR ANY SITE WHERE Q_{50} EXCEEDS 500 CFS, THE DESIGN OF THIS MEASURE SHOULD BE COMPLETED BY THE HYDRAULICS SECTION OF THE STRUCTURES DIVISION.
- (D) THE DESIGNER SHALL PROVIDE CULVERT SECTIONS FOR TEMPORARY CULVERT CROSSINGS. MINIMUM COVER FOR CONSTRUCTION LOADS IS 2 FEET.
- (E) THE RIPRAP TRANSITION AT THE INLET AND THE DIVERSION CULVERT SHALL BE DESIGNED IN ACCORDANCE WITH APPROVED TOOT METHODS.
- (F) WHERE EXCAVATION FOR A DIVERSION TRANSITION EXPOSES BEDROCK, GEOTEXTILE FABRIC AND RIPRAP SHALL BE USED ONLY ON THE SIDES OF THE CHANNEL.
- (G) IN ORDER TO PROVIDE THE BEST POSSIBLE SEAL, THE POLYETHYLENE SHEETING USED IN AN UPSTREAM PIPE ANCHOR SHOULD BE FITTED AROUND THE PIPE. SANDBAGS ON THE DOWNSTREAM SIDE OF THE SHEETING SHOULD BE PLACED FIRST, AND THE SHEETING PLACED ON THESE BAGS. THE REMAINING SANDBAGS WOULD THEN BE PLACED ON THE SHEETING. WHERE MULTIPLE SHEETS ARE USED, THEY SHOULD OVERLAP A MINIMUM OF 18 INCHES.
- (H) DURING CONSTRUCTION OF THE TEMPORARY DIVERSION CULVERT, DAMAGE TO THE EXISTING STREAM AND CANOPY SHALL BE MINIMIZED. ALL EXISTING VEGETATION OUTSIDE THE CUT AND FILL LINES BUT INSIDE THE RIGHT-OF-WAY SHALL NOT BE DISTURBED UNLESS IT INTERFERES WITH SAFETY STANDARDS. THE TEMPORARY CULVERT SHOULD BE LOCATED SO AS TO MINIMIZE THE LENGTH OF ANY TRANSITIONS REQUIRED.
- (I) DIVERSION CULVERT CONSTRUCTION SHALL BE COMPLETED IN THE DRY BEFORE DIVERTING WATER FROM THE EXISTING CHANNEL. WHERE THIS IS NOT FEASIBLE, TEMPORARY FLOW DIVERSION STRUCTURES CAN BE USED UNTIL WORK IS COMPLETE. THESE STRUCTURES CAN BE ANY NON-ERODIBLE MATERIAL.
- (J) CONSTRUCTION SHALL PROCEED AS FOLLOWS:
 1. CONSTRUCT THE TEMPORARY CULVERT ADJACENT TO THE PROPOSED PROJECT. ISOLATE THE TEMPORARY CHANNEL FROM THE EXISTING CHANNEL WITH TEMPORARY PLUGS.
 2. DIVERT FLOW BY MOVING THE TEMPORARY PLUGS FROM THE TEMPORARY CHANNEL TO THE EXISTING CHANNEL. A COFFER DAM MAY BE USED UPSTREAM TO PREVENT STREAM FLOW DURING THIS OPERATION.
 3. CONSTRUCT THE PROJECT IN THE EXISTING STREAM AND PLACE PERMANENT EROSION CONTROL ON THE EXISTING STREAM BANKS.
 4. WHERE A TEMPORARY PLUG IS REQUIRED AT THE DOWNSTREAM END OF THE DIVERSION, IT SHOULD BE REMOVED FIRST. THEN REMOVE THE UPPER PLUG IN ORDER TO RELEASE FLOW INTO THE RECONSTRUCTED CHANNEL.
 5. REMOVE LINING MATERIALS FROM THE DIVERSION TRANSITIONS, RESTORE THE AREA TO GRADE AND STABILIZE EXPOSED SOILS.
- (K) DIVERSION CULVERT, SANDBAG ANCHORS AND TRANSITIONS SHALL BE INSPECTED WEEKLY OR AFTER EVERY RAIN EVENT. ANY NEEDED REPAIRS SHALL BE DONE IMMEDIATELY.
- (L) ONLY GEOTEXTILE FABRIC (TYPE III) LISTED ON THE QUALIFIED PRODUCTS LIST SHALL BE USED.
- (M) FOR INSTALLATION DETAILS AND ITEM NUMBERS FOR DEWATERING STRUCTURES (EC-STR-1), SEDIMENT FILTER BAGS (EC-STR-2), AND SILT FENCE WITH WIRE BACKING (EC-STR-3C), SEE THEIR RESPECTIVE STANDARD DRAWINGS.
- (N) TEMPORARY DIVERSION CULVERTS SHALL BE PAID FOR UNDER THE FOLLOWING ITEM NUMBERS:

203-01	ROAD AND DRAINAGE EXCAVATION (UNCLASSIFIED) PER CUBIC YARD
209-09.01	SAND BAGS PER BAG
209-20.03	POLYETHYLENE SHEETING (6 MIL. MINIMUM) PER SQUARE YARD
621-03.02	THRU
621-03.11	THRU
709-05.06	MACHINED RIP-RAP (CLASS A-1) PER TON
709-05.08	MACHINED RIP-RAP (CLASS B) PER TON
709-05.09	MACHINED RIP-RAP (CLASS C) PER TON
740-10.03	GEOTEXTILE (TYPE III) (EROSION CONTROL) PER SQUARE YARD

DEWATERING STRUCTURES, SEDIMENT FILTER BAGS, AND SILT FENCE WITH WIRE BACKING SHALL BE PAID FOR ACCORDING TO THEIR RESPECTIVE STANDARD DRAWINGS.

TEMPORARY PLUGS SHALL BE PAID FOR UNDER THEIR RESPECTIVE ITEM NUMBERS.

PAYMENT SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY FOR CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY DIVERSION CULVERTS.

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

NOT TO SCALE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

TEMPORARY
DIVERSION
CULVERTS