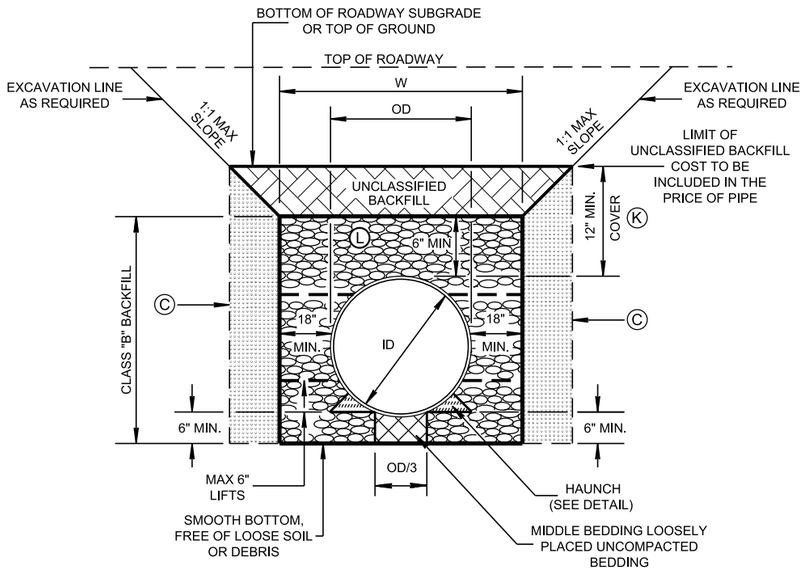
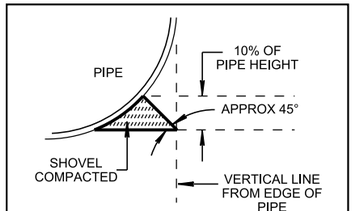
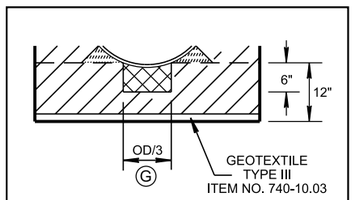


STANDARD TRENCH INSTALLATION

(PIPE CULVERT INSTALLATION DETAIL)
NOTE: CENTER PIPE IN TRENCH
SEE GENERAL NOTE (B)



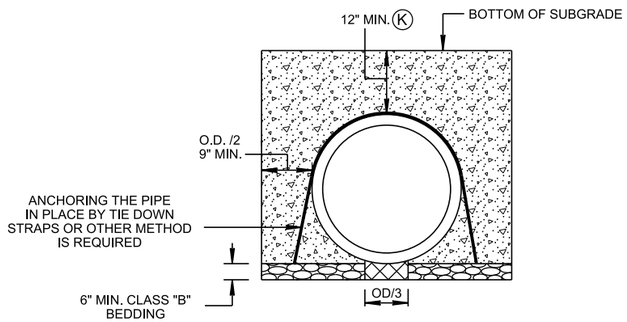
HAUNCH AREA DETAIL



IMPROVED FOUNDATION DETAIL

TABLE A

PIPE CULVERT		CLASS "B" BEDDING MATERIAL (CY/LF)
PIPE DIA	PAYMENT ITEM NO	
18"	607-03.30	0.313
24"	607-05.30	0.382
30"	607-06.30	0.497
36"	607-07.30	0.626
42"	607-08.30	0.767
48"	607-09.30	0.969
54"	607-10.30	1.141
60"	607-11.30	1.588
66"	607-12.30	1.805
72"	607-13.30	2.035



ALTERNATE BACKFILL DETAIL USING EXCAVATABLE FLOWABLE FILL (EFF)

SEE GENERAL NOTE (G)

LEGEND

ID = INSIDE DIAMETER
OD = OUTSIDE DIAMETER

- CLASS "B" STRUCTURAL BACKFILL COMPACTED TO 90% STANDARD PROCTOR DENSITY
- CLASS "B" BEDDING UNCOMPACTED
- FIRM INSITU SOIL OR CLASS "B" BEDDING COMPACTED TO 90% STANDARD PROCTOR DENSITY
- HAUNCH AREA, SHOVEL COMPACTED
- UNCLASSIFIED BACKFILL (FINE COMPACTABLE SOIL)
- EXCAVATABLE FLOWABLE FILL (EFF)

GENERAL NOTES

PIPE MATERIALS:

(A) FLEXIBLE PIPE MATERIALS ARE HDPE, PVC, CMP, SRTRP, AND PP.

ALL HIGH DENSITY POLYETHYLENE (HDPE) PIPE USED FOR CULVERT AND STORM DRAIN APPLICATIONS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M294, TYPE S, CURRENT EDITION ALL HDPE PIPE DELIVERED AND USED SHALL BE A PARTICIPANT IN NTPEP. MAX. PIPE DIA. FOR HDPE PIPE IS 60 INCHES.

POLY VINYL CHLORIDE (PVC) PROFILE WALL DRAINAGE PIPE SHALL MEET AASHTO DESIGNATION M-304. THE MAXIMUM PIPE DIAMETER FOR PVC PIPE IS 36".

STEEL REINFORCED THERMOPLASTIC RIBBED PIPE (SRTRP) SHALL MEET AASHTO DESIGNATION M-335. THE MAXIMUM PIPE DIAMETER FOR THE PIPE IS 36".

CORRUGATED METAL PIPE (CMP) SHALL BE ALUMINIZED COATED CORRUGATED METAL PIPE AND SHALL MEET AASHTO M274, MAXIMUM DIA IS 72". CMP FROM 78"-144" IN DIAMETER MAY BE USED IN SPECIAL CASES SUCH AS IF A BOX CULVERT WOULD NOT BE FEASIBLE.

POLYPROPYLENE PIPE (PP) SHALL MEET AASHTO DESIGNATION M-330, THE MAXIMUM PIPE DIAMETER IS 60".

INSTALLATIONS REQUIREMENTS:

(B) FOR EMBANKMENT AREAS OR WHERE TRENCH CONDITIONS DO NOT EXIST, AN INDUCED TRENCH SHALL BE CONSTRUCTED. SEE STD. DWG. NO. D-PB-3.

(C) FOR TRENCHES WITH IN SITU SOIL WALLS, ANY PORTION OF THE WALL SHALL BE AT LEAST AS FIRM AS THE MAJORITY OF THE SUBGRADE. SOIL NOT MEETING THIS REQUIREMENT SHALL BE REMOVED AND REPLACED.

(D) FOR ADDITIONAL INSTALLATION INFORMATION SEE AASHTO SECTION 30 OR ASTM D2321. ALL PIPES SHALL BE ASSEMBLED AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. PIPE SHALL BE PLACED IN THE BED STARTING AT THE DOWNSTREAM END.

(E) ONLY AS MUCH TRENCH AS CAN BE SAFELY MAINTAINED SHALL BE OPENED. ALL TRENCHES SHALL BE BACKFILLED AND COMPACTED TO THE MINIMUM COVER DEPTH OF 12" ABOVE THE PIPE AS SOON AS PRACTICABLE, BUT NOT LATER THAN THE END OF EACH WORKING DAY IN ACCORDANCE WITH THE COMPACTION REQUIREMENTS.

(F) JOINTS FOR FLEXIBLE PIPE SHALL MEET THE PERFORMANCE REQUIREMENT OF ASTM D3212. JOINTS SHALL BE INSTALLED SO THAT THE CONNECTION OF PIPE SECTION FOR A CONTINUOUS LINE WILL BE FREE FROM IRREGULARITIES IN THE FLOW LINE. JOINTS BETWEEN PLASTIC FLEXIBLE PIPE AND STRUCTURE SHALL HAVE A GASKET MEETING ASTM F2510. FOR CMP PIPE TO STRUCTURE CONNECTIONS OR PLASTIC PIPE AT A SKEW GREATER THAN 15°, WHERE A GASKET WILL NOT WORK, NON-SHRINK GROUT APPLIED IN TWO STAGES SHALL BE USED.

(G) ONLY WHERE THE TRENCH FOUNDATION IS FOUND UNACCEPTABLE OR LOCATION WHERE THE WATER TABLE IS FOUND HIGH:

(1) IMPROVED FOUNDATION OR EXCAVATABLE FLOWABLE FILL (EFF) MAY BE USED AT ENGINEER'S INSTRUCTION AND PAID FOR UNDER ITEM NO. 204-06.02, FLOWABLE FILL (EXCAVATABLE) PER C.Y.

(2) MAX FILL HEIGHTS AND JOINT SPECIFICATIONS SHALL BE REVIEWED TO VERIFY CONDITIONS MEET WITH THE MANUFACTURER'S SPECIFICATIONS.

(H) ALL PIPE INSTALLATIONS REQUIRE CONCRETE ENDWALLS.

(I) MINIMUM SPACING BETWEEN MULTIPLE PIPES ARE:

36" PIPES AND SMALLER: EQUAL TO THE OUTSIDE DIAMETER OF THE LARGEST PIPE.

PIPES LARGER THAN 36": EQUAL TO HALF THE OUTSIDE DIAMETER OF THE LARGEST PIPE.

(J) MAXIMUM ALLOWABLE FILL HEIGHTS ARE AS DEFINED IN THE DRAINAGE MANUAL TABLE 6A-1.

(K) FOR MINIMUM COVER DEPTHS FOR CONSTRUCTION LOADS SEE D-PB-3.

GRANULAR COMPACTABLE BACKFILL REQUIREMENTS:

(L) THE BACKFILL SHALL BE CLASS "B" GRADING D OR E MATERIAL MEETING THE REQUIREMENTS OF SUBSECTION 903.05.

STRUCTURAL BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING A 6 INCH LOOSE LIFT THICKNESS AND BROUGHT UP EVENLY AND SIMULTANEOUSLY ON BOTH SIDES OF THE PIPE TO AN ELEVATION NOT LESS THAN 6 INCHES ABOVE THE TOP OF THE PIPE.

UNCLASSIFIED BACKFILL TO THE LIMIT OF PIPE BACKFILL LINE SHALL BE COMPACTED IN ACCORDANCE TO STANDARD SPECIFICATION 204.11.

A MINIMUM COMPACTION LEVEL OF 90% STANDARD PROCTOR DENSITY PER AASHTO T99 SHALL BE ACHIEVED BY USE OF VIBRATORY PLATE. HYDROHAMMER TYPE COMPACTORS SHALL NOT BE USED OVER THE PIPE. ALL COMPACTION EQUIPMENT USED SHALL BE APPROVED BY THE ENGINEER.

(M) **INSPECTION REQUIREMENTS:**

(1) ALL PIPES SHALL UNDERGO INSPECTION DURING INSTALLATION.

(2) FINAL INSPECTIONS SHALL BE CONDUCTED NO SOONER THAN 30 DAYS AFTER COMPLETION OF INSTALLATION AND FINAL FILL.

(3) ALL PIPE INSTALLATIONS SHALL BE VISUALLY INSPECTED. AT LEAST 10% OF THE TOTAL NUMBER OF PIPE RUNS REPRESENTING AT LEAST 10% OF THE TOTAL PROJECT FOOTAGE ON THE PROJECT SHALL BE RANDOMLY SELECTED BY THE ENGINEER AND INSPECTED FOR DEFLECTION. USING MANDREL OR AN EQUIVALENT PRACTICE. (REFER TO AASHTO, SECTION 30, CURRENT EDITION FOR ADDITIONAL INSPECTION REQUIREMENTS).

(4) FOR LOCATIONS WHERE PIPE DEFLECTION EXCEEDS 5% OF THE INSIDE DIAMETER, AN EVALUATION SHALL BE CONDUCTED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL CONSIDERING THE SEVERITY OF THE DEFLECTION, STRUCTURAL INTEGRITY, ENVIRONMENTAL CONDITIONS, AND THE DESIGN SERVICE LIFE OF THE PIPE. INSTALLED PIPE DEFLECTIONS THAT EXCEED 5% OF THE INITIAL INSIDE DIAMETER MAY INDICATE THAT THE INSTALLATION WAS SUBSTANDARD. SEE TDOT STANDARDS SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, SECTION 607.09. PIPE REMEDIATION OR REPLACEMENT SHALL BE REQUIRED FOR LOCATIONS WHERE THE EVALUATION FINDS THAT THE DEFLECTION EXCEEDS 7.5%.

PAYMENT:

(N) EXCAVATION FOR PIPE WILL NOT BE MEASURED AND PAID FOR DIRECTLY AND ANY SOIL NOT MEETING REQUIREMENT FOR TRENCHES SHALL BE REMOVED AND REPLACED. ALL COST OF THIS WORK WILL BE INCLUDED IN THE COST OF THE PROPOSED PIPE CULVERT.

PAYMENT FOR GRANULAR COMPACTABLE CLASS "B" BACKFILL, UNCLASSIFIED BACKFILL TO THE LIMIT LINE, AND/OR EXCAVATABLE FLOWABLE FILL, TIE DOWN STRAPS AND BEDDING MATERIAL WILL BE INCLUDED IN THE UNIT PRICE OF THE PIPE.

GEOTEXTILE TYPE III WILL BE PAID UNDER ITEM NO. 740-10.03, GEOTEXTILE (TYPE III)(EROSION CONTROL), S.Y. TO BE USED ONLY IF IMPROVED FOUNDATION IS REQUIRED.

NOT TO SCALE

■ REV. 7-12-07: REVISED GENERAL NOTE (J).

REV. 6-1-09: REVISED GENERAL NOTE (I) AND TITLE NAME. ADDED GENERAL NOTE (J).

REV.2-1-12: REVISED DRAWING NAME ADDED EFF DETAIL. REVISED GENERAL NOTES AND TABLE. ADDED MINIMUM COVER TABLE.

REV. 8-21-12: REVISED GENERAL NOTES. CHANGED BACKFILL MATERIAL.

REV. 1-2-13: REVISED TRENCH AND ADDED FILL DETAIL.

REV. 1-29-14: ADDED PP, RE LETTERED AND REVISED NOTES.

REV. 06-28-19: REVISED DETAIL FOR STANDARD TRENCH INSTALLATION AND GENERAL NOTES. REMOVED TABLE A AND RENAMED TABLE B TO A. REVISED TABLE A CONTENT AND LEGEND. REDREW SHEET.

◘ MINOR REVISION – FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
DEPARTMENT OF
TRANSPORTATION

STANDARD DETAILS FOR FLEXIBLE PIPE INSTALLATION

3-15-07 | D-PB-2

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