

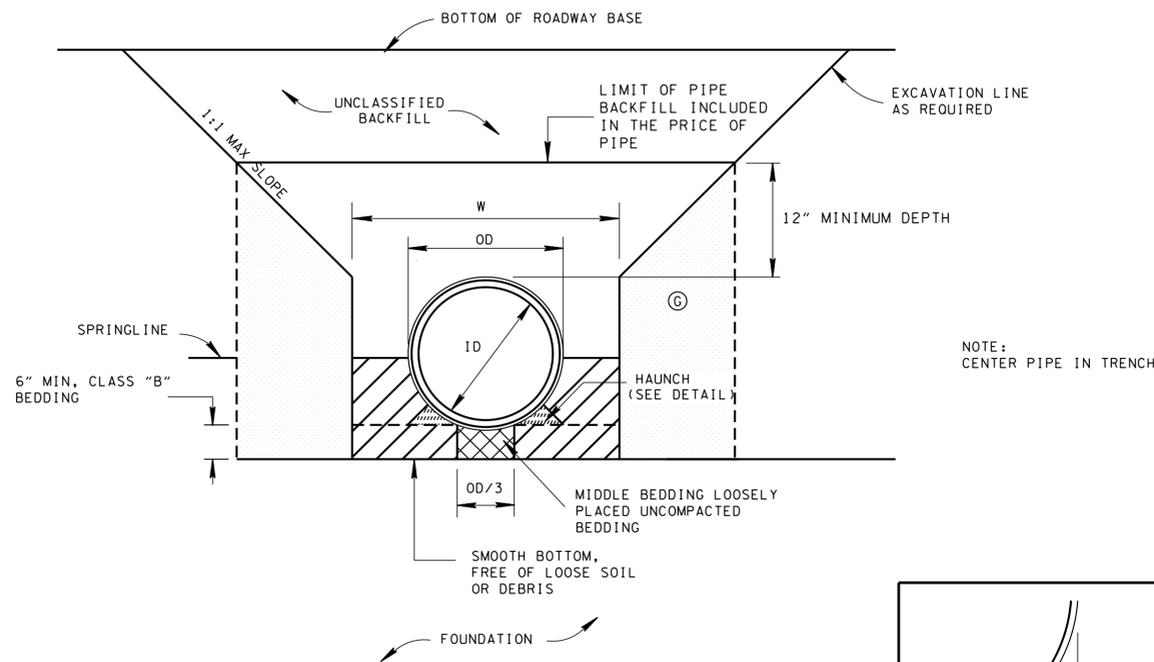
REV. 7-12-07: REVISED GENERAL NOTE ①

REV. 6-1-09: REVISED GENERAL NOTE ① AND TITLE NAME. ADDED GENERAL NOTE ①.

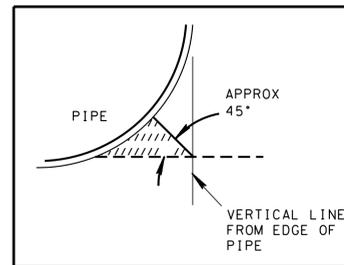
REV. 2-1-12: REVISED DRAWING NAME ADDED EFF DETAIL. REVISED GENERAL NOTES AND TABLE. ADDED MINIMUM COVER TABLE.

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

REV. 1-2-13: REVISED TRENCH DETAILS REVISED BEDDING TABLE.



**STANDARD TRENCH INSTALLATION (H)**  
(PIPE CULVERT INSTALLATION IN CUTS)



**MINIMUM HAUNCH AREA DETAIL**

**TABLE A**

REINFORCED CONCRETE PIPE CLASSIFICATION (AASHTO M170)	
FILL	CLASS
≤ 16	III
> 16 TO ≤ 24	IV
> 24 TO ≤ 38	V
> 38	SPECIAL DESIGN

**TABLE B**

PIPE CULVERT			CLASS "B" BEDDING MATERIAL CY/LF
PIPE DIA	PAYMENT ITEM NO	W	
18"	607-03.30	47"	0.149
24"	607-05.30	54"	0.192
30"	607-06.30	61"	0.239
36"	607-07.30	68"	0.289
42"	607-08.30	75"	0.343
48"	607-09.30	82"	0.400
54"	607-10.30	89"	0.461
60"	607-11.30	96"	0.525
66"	607-12.30	106"	0.623
72"	607-13.30	115"	0.719
78"	607-14.30	124"	0.821
84"	607-15.30	133"	0.929

OD=OUTSIDE DIAMETER  
ID=INSIDE DIAMETER

- CLASS "B" BEDDING 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

**GENERAL NOTES**

- (A) REINFORCED CONCRETE PIPE SHALL MEET THE REQUIREMENTS OF AASHTO M-170 THE WALL THICKNESS SHALL BE "WALL B" (EXCEPT FOR STRUCTURES DEEPER THAN THE MINIMUM DEPTH, "WALL C" MAY BE USED) AND THE CLASS SHALL BE AS LISTED IN "TABLE A". ALL PIPES SHALL BE CERTIFIED BY EITHER ACPA OR NCPA.
- (B) 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 AS SHOWN ON D-PB-2.
  - (2) MAX FILL HEIGHTS AND JOINT SPECIFICATIONS SHALL BE REVIEWED TO VERIFY CONDITIONS MEET WITH THE MANUFACTURER'S SPECIFICATIONS.
- (C) FOR MINIMUM CONSTRUCTION COVER DEPTHS SEE D-PB-3.
- (D) IF LOCAL SOIL CONDITIONS MEET MINIMUM BEDDING REQUIREMENTS BEDDING IS NOT REQUIRED UNDER SIDE DRAINS FOR PRIVATE DRIVES, FIELD ENTRANCES, PIPES PARALLEL TO THE ROADWAY IN AN UNPAVED MEDIAN, PIPES OUTSIDE THE SHOULDER LIMITS OF INTERCHANGE RAMP, OR PIPES OUTSIDE NORMAL SLOPE LINES.
- (E) FOR ADDITIONAL INSTALLATION INFO SEE SECTION 27 "CONCRETE CULVERTS" OF THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES AND ASTM C-1479-10 AND TO MANUFACTURER'S SPECIFICATIONS.
- (F) ONLY AS MUCH TRENCH AS CAN BE SAFELY MAINTAINED SHALL BE OPENED. ALL TRENCHES SHALL BE BACK FILLED TO THE MINIMUM COVER DEPTH "D" ABOVE THE PIPE AND COMPACTED AS SOON AS PRACTICABLE, BUT NOT LATER THAN THE END OF EACH WORKING DAY.
- (G) FOR TRENCHES WITH IN SITU SOIL WALLS, THE SOIL SHALL BE AT RELATIVELY AS DENSE AS THE MAJORITY OF THE SUBGRADE AS DETERMINED BY THE ENGINEER. SOIL NOT MEETING THIS REQUIREMENT SHALL BE REMOVED AND REPLACED.
- (H) FOR EMBANKMENT AREAS OR WHERE TRENCH CONDITIONS DO NOT EXIST, AN INDUCED TRENCH SOIL EMBANKMENT SHALL BE CONSTRUCTED SEE D-PB-3.
- (I) ARCH AND ELLIPTICAL SHAPED PIPE CULVERTS SHALL BE INSTALLED THE SAME AS CIRCULAR WITH O.D. EQUAL TO THE WIDEST HORIZONTAL DIMENSION ON THE PIPE. TO ESTIMATE BEDDING MATERIAL FOR THESE PIPES WITH INTERNAL WIDTH THE SAME AS DIAMETER IN THE TABLE, MULTIPLY BEDDING QUANTITY BY 0.5 FOR THE SHOWN MIN TRENCH DIMENSIONS.
- (J) FOR MULTIPLE PIPES MINIMUM SPACING BETWEEN PIPES IS:
  - 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.
- (K) THE BACKFILL SHALL BE TYPE "B" BEDDING MATERIAL MEETING THE REQUIREMENTS OF CONSTRUCTION SPECIFICATION SUBSECTION 903.05 TO THE SPRINGLINE.
 

UNCLASSIFIED BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING AN 8 INCH LOOSE LIFT THICKNESS AND BROUGHT UP EVENLY AND SIMULTANEOUSLY ON BOTH SIDES OF THE PIPE TO AN ELEVATION NOT LESS THAN ONE FOOT 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.
- (L) JOINTS BETWEEN PIPES REQUIRE A RUBBER GASKET MEETING ASTM C443. AT CONNECTIONS TO STRUCTURES USE NON-SHRINK GROUT OR RUBBER GASKET PER C923 OR C1478.
- (M) INSPECTION REQUIREMENTS
  - (1) ALL PIPES SHALL UNDERGO INSPECTION DURING INSTALLATION, FOR LONGITUDINAL AND TRANSVERSE CRACKS. (PER SECTION 27 OF AASHTO STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES)
  - (2) FINAL INSPECTIONS SHALL BE CONDUCTED NO SOONER THAN 30 DAYS AFTER COMPLETION OF INSTALLATION AND FINAL FILL.
- (N) EXCAVATION FOR PIPE WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COST WILL BE INCLUDED IN THE COST OF THE PROPOSED PIPE CULVERT.
 

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

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

**STANDARD DETAILS  
FOR CONCRETE  
PIPE  
INSTALLATION**

D-PB-1