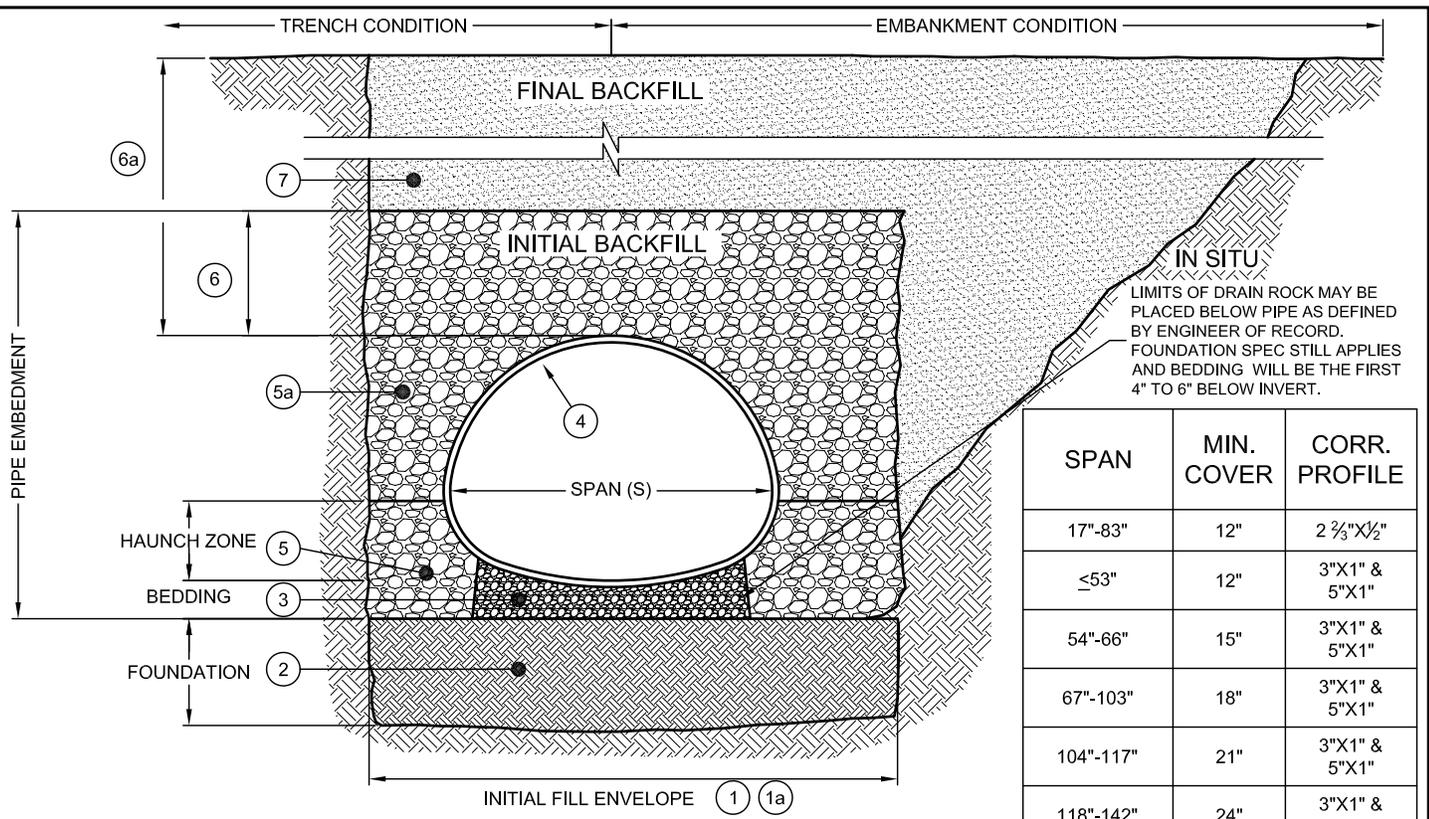


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LIVE LOADS NOT TO EXCEED CONVENTIONAL HIGHWAY LOADS.

- ① MINIMUM TRENCH WIDTH MUST ALLOW ROOM FOR PROPER COMPACTION OF HAUNCH MATERIALS UNDER THE PIPE ARCH. THE TRENCH WIDTH IS THE MINIMUM AMOUNT REQUIRED FOR PROPER INSTALLATION AND TO SUPPORT HORIZONTAL PRESSURE FROM THE PIPE. THE MANUFACTURER'S SUGGESTED MINIMUM VALUE IS: $1.5S + 12"$.
- ①a MINIMUM EMBANKMENT WIDTH (in feet) FOR INITIAL FILL ENVELOPE: $3.0S$ BUT NO LESS THAN $S + 4'0"$.
- ② FOUNDATION SHALL BE WELL CONSOLIDATED, STABLE & CAPABLE OF SUPPORTING FILL MATERIAL LOAD.
- ③ OPEN-GRADED GRANULAR BEDDING MATERIAL SHALL BE A RELATIVELY LOOSE MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE PIPE ARCH, 4" TO 6" IN DEPTH. SUGGESTED PARTICLE SIZE IS 1/2 CORRUGATION DEPTH. THE WIDTH OF BEDDING SHOULD BE THE EXTENTS OF THE INVERT OF THE PIPE ARCH.
- ④ CORRUGATED STEEL PIPE ARCH (CSPA) [HEL-COR PIPE ARCH].
- ⑤ HAUNCH ZONE MATERIAL SHALL BE HAND SHOVELED OR SHOVEL SLICED INTO PLACE TO ALLOW FOR PROPER COMPACTION. REFER TO AASHTO 26.5.2, 26.5.4 OR ASTM A798 10.3 TO PROPERLY ADDRESS CORNER BEARING PRESSURE.
- ⑤a THE BACKFILL MATERIAL SHALL BE FREE-DRAINING, ANGULAR, WASHED-STONE WITH A 1/2" - 2" RECOMMENDED PARTICLE SIZE. MATERIAL SHALL BE PLACED IN 12" MAXIMUM LIFTS AND SHALL BE WORKED INTO THE PIPE HAUNCHES BY MEANS OF SHOVEL-SLICING, RODDING, AIR-TAMPER, VIBRATORY PLATE OR OTHER EFFECTIVE METHODS. COMPACTION IS CONSIDERED ADEQUATE WHEN A DENSITY EQUIVALENT TO 90% STANDARD PROCTOR IS ACHIEVED OR WHEN NO FURTHER YIELDING OF THE MATERIAL IS OBSERVED UNDER THE COMPACTOR OR UNDER FOOT. THE PROJECT ENGINEER OR HIS REPRESENTATIVE MUST BE SATISFIED WITH THE LEVEL OF COMPACTION. INADEQUATE COMPACTION CAN LEAD TO EXCESSIVE PIPE DEFLECTIONS AND SETTLEMENT OF THE SOILS OVER THE SYSTEM. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO-LIFT DIFFERENTIAL BETWEEN THE SIDES OF ANY PIPE IN THE SYSTEM AT ALL TIMES DURING THE BACKFILL PROCESS. BACKFILL SHALL BE ADVANCED ALONG THE LENGTH OF THE SYSTEM AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING ON ANY PIPES IN THE SYSTEM.
- ⑥ INITIAL OPEN GRADED GRANULAR BACKFILL ABOVE PIPE ARCH MAY INCLUDE ROAD BASE MATERIAL (AND RIGID PAVEMENT IF APPLICABLE). SEE TABLE ABOVE.
- ⑥a TOTAL HEIGHT OF COMPACTED COVER IS MEASURED FROM TOP OF PIPE ARCH TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT.
- ⑦ FINAL BACKFILL MATERIAL SELECTION AND COMPACTION REQUIREMENTS SHALL FOLLOW THE PROJECT PLANS AND SPECIFICATIONS PER THE ENGINEER OF RECORD.

NOTES:
 • GEOTEXTILE SHALL BE USED AS REQUIRED TO PREVENT SOIL MIGRATION.
 • FOR MULTIPLE BARREL INSTALLATIONS THE RECOMMENDED STANDARD SPACING BETWEEN PARALLEL PIPE ARCH RUNS SHALL BE $SPAN/2$ BUT NO LESS THAN 12", OR 36" FOR PIPE SPANS 108" AND LARGER. CONTACT YOUR CONTECH REPRESENTATIVE FOR NONSTANDARD SPACING.

242-CSP-STANDARD BACKFILL-PIPE ARCH-RETENTION

 www.ContechES.com 9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069 800-338-1122 513-645-7000 513-645-7993 FAX		242 - CSP PIPE ARCH STANDARD BACKFILL DETAIL RETENTION\UNDERDRAIN		
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