

1. Culvert – Structural excavation shall consist of excavating, removing and satisfactorily disposing of all material encountered within the limits of the work as required for the construction of all drainage structures. All suitable material removed may be used for backfilling or within fill areas. In case the foundation material is soft or otherwise unsatisfactory, it may be necessary to excavate to a greater depth and backfill with granular material to establish a firm and suitable foundation for the drainage structure. If the foundation is solid rock, the trench should be excavated to a depth of six (6) inches below the flow line and backfilled with a granular material to ensure a cushion between the culvert and the rock foundation.

The foundation should be carefully shaped so that the culvert will have full support for the entire length. Shimming beneath the culvert with dirt, stones, wood, etc., to meet the designated grade, will not be permitted.

The trench should be excavated to a width of twelve (12) inches beyond each side of the culvert to allow for proper backfill and compaction. The backfill material should be placed in layers, and each layer thoroughly compacted by means of hand tamps or vibratory compactors if available. The first layer should not exceed one-half the diameter of the pipe, with the following layers not exceeding twelve (12) inches. The layers shall be placed on all sides at the same time to prevent displacement of the structure. When the backfill reaches a sufficient depth, compaction may be obtained by running heavy equipment or trucks back and forth over the trench. A minimum depth of fifteen (15) inches of backfill shall be placed and compacted over the top of any culvert before using heavy equipment for compaction.

Backfill material shall be of the same nature as that removed from the trench; i.e., granular material should be used only when the material adjacent to the trench is granular. Caution should be taken so that no large stones come in contact with the culvert during backfilling.

Culvert pipes shall extend from toe of slope to toe of slope, the pipes to be bedded in a foundation of uniform density that is compacted and carefully shaped at the required grade to fit the lower part of the pipe. Headers or stone rip-rap, or both, shall be used at both inlet and outlet of culverts as approved by the Highway Superintendent or Engineer.

Laying of pipe will begin at the outlet; it shall be laid carefully in the prepared bed with the outside laps of circumferential joints pointing upgrade. The longitudinal laps parallel to the centerline of the pipe shall be placed on the side of the culvert with the outside laps pointing down. The ends of sections shall be fully and closely joined and true to the grade given. Each section of joint and pipe shall be securely attached to the adjoining section of joint or pipe with connecting bands. The band shall be tightly drawn so that a rigid joint will be formed.

In fills with five (5) feet or more in depth over the top of the pipe, all pipe culverts forty-eight (48) inches in diameter and larger shall be elongated along the vertical diameter approximately three (3) percent by means of timber struts. Struts shall be left in place until the fill is thoroughly compacted.

New corrugated metal pipe with a minimum diameter of fifteen (15) inches shall be used under the roadway. Driveway culverts shall have a minimum length of twenty-four (24) feet and minimum diameter of twelve (12) inches or larger, depending upon local conditions, with a minimum cover of eighteen (18) inches. (See 4.18 For Driveway Regulations)

8. Driveway Construction Standards.

All newly constructed driveways shall be constructed as follows:

- a. Driveways must be graded and have proper drainage to prevent runoff from a state, town or abutters right-of-way.
- b. Where culverts are necessary, all culverts must have headwalls, flares or flanges built on each end.
- c. A minimum 1.5 feet cover over HDP (high density polyethylene) or CMP (corrugated metal pipe) culvert for residential driveway, 2.0 feet minimum for commercial.
- d. Site distance ten (10) feet back from the edge of the roadway and five (5) feet high, should be two hundred (200) feet. May require clearing of brush and/or trees.
- e. Driveway width shall be a minimum of twelve (12) foot wide
- f. Driveway may flare to twenty-two (22 ) feet at roadway.
- g. Base must be a minimum of 6 inches bank run gravel for residential. Commercial minimum base to be 12 - 18 inches, depending on soil conditions.
- h. The service must be a minimum of 6 inches of crushed gravel.
- i. No driveway shall have a slope greater than 12%.
- j. Material design and surface of a driveway is at the homeowner's discretion.
- k. In the case where a culvert in an existing driveway needs to be installed, repaired or replaced a permit is required. However, in this case, there is no fee.

9. Driveway General Requirements:

- a. Driveway shall intersect the street at a 90° angle, +/- 15 degrees.
- b. The driveway approach to the street should be as flat as practicable