

## DRIVEWAY CULVERT INSTALLATION INSTRUCTIONS

- 1) The property owner shall hire a Qualified Contractor to install the culvert as per the following instructions.
- 2) Prior to the start of work, the Contractor shall install silt fences in the ditch, upslope and down slope from the area of installation. Please see attached sketch for more information.
- 3) The Contractor is not permitted to store any materials in the ditch, or cross or travel through the ditch at any time.
- 4) The Contractor shall install a 450 mm High Density Polyethylene (HDPE) culvert, unless otherwise noted on the permit. The Municipal Engineer will also accept the installation of a galvanized corrugated steel pipe (CSP) of the same dimension.
- 5) The Contractor shall ensure the culvert is of sufficient length to span the full width of the access, and to extend 300 mm beyond the headwall 2:1 slope. The minimum driveway width permitted is 3 m, with a turning radius of 3.65 m. The recommended driveway width is 6 m, with a turning radius of 2.60 m. The turning radii are measured from the ends of the culvert in the centerline of the ditch. Please see attached sketch for more information.
- 6) The Contractor shall properly align the culvert with the ditch channel and match its existing slope.
- 7) The Contractor shall install the culvert on a firm foundation to provide proper support and prevent sagging. Any large rocks (greater than 100 mm) shall be removed. If the ditch channel is soft, excavate to firm ground, and fill and compact the excavated area with Type 1 aggregate.
- 8) In areas prone to settling, it is recommended that the Contractor apply a camber (slight rise) to the middle of the culvert during installation. To apply the camber, arch the center of the culvert 25 mm (1 inch) for every 3 m (10 ft) of culvert length.
- 9) Once the culvert is situated properly, the Contractor may backfill the culvert. Backfill material shall be free from roots, brush, organic material, rocks larger than 100 mm, cinders, ashes, sods, refuse or other deleterious materials.
- 10) The Contractor shall place the backfill material in 150 mm lifts, evenly on each side and compact, to prevent the culvert from bending out of shape. Ensure to compact backfill by hand along the crevices formed where the culvert meets the ditch channel.
- 11) The minimum depth of cover is one half the culverts diameter, 225 mm; however the recommended depth of cover is 600 mm. The cover material shall be free from roots, brush, organic material, rocks larger than 100 mm, cinders, ashes, sods, refuse or other deleterious materials. The top 100 mm, across the full width of access shall be compacted Type 1 aggregate.
- 12) The Contractor shall ensure that the grade of the driveway, within the Municipal Right-of-way, not exceed (+/-)10 %.
- 13) The inlet and outlet ends of the culvert shall be stabilized using either rip rap, granite stone (both less than 300 mm in any dimension), or pre-cast concrete headwalls.
- 14) The rip rap, granite stone headwalls shall be installed with a 2:1 (run: rise) slope, and shall extend a minimum of one (1) diameter on either side, and one half of a diameter above the inlet and outlet of the culvert.

- 15) If a pre-cast headwall is to be installed, the inlet and outlet of the culvert shall be flush with the face of the headwall and grouted in place. It is recommended that the pre-cast headwalls have wing walls of sufficient length to stabilize the slope and to prevent eroded material entering the ditch channel.
- 16) The area above the rip rap, granite stone, or pre-cast concrete headwalls shall be stabilized. Any soil exposed after the work has been completed shall be stabilized through hydro-seeding, placement of sod or hay.
- 17) The property owner shall contact the Municipal Engineering Department within 24 hours, during normal business days, Monday to Friday, from 8:30 am to 4:30 pm, after installation for a field inspection.
- 18) Any deficiencies observed during the field inspection shall be corrected within 48 hours after notification. Repairs not completed in this time frame, may be completed by the Municipal Engineering Department, at the cost of the property owner.