

**Appendix C – Culvert Design Form**

**Metric Version**

|  |   |   |   |
|--|---|---|---|
| PROJECT: _____<br>STATION: _____<br>SHEET _____ OF _____   | CULVERT DESIGN FORM<br>DESIGNER / DATE: _____ OF _____<br>REVIEWER / DATE: _____ OF _____   | ROADWAY ELEVATION: _____ (m)  |   |
| HYDROLOGICAL DATA<br><input type="checkbox"/> METHOD: _____<br><input type="checkbox"/> DRAINAGE AREA: _____ <input type="checkbox"/> STREAM SLOPE: _____<br><input type="checkbox"/> CHANNEL SHAPE: _____<br><input type="checkbox"/> ROUTING: _____ <input type="checkbox"/> OTHER: _____<br>DESIGN FLOWS/TAIWATER<br>R.L. (YEARS) FLOW (m <sup>3</sup> /s) TW (m) _____   |   | EL <sub>i</sub> : _____ (m)<br>EL <sub>o</sub> : _____ (m)<br>S = S <sub>o</sub> - Fall/L <sub>o</sub> _____ (m/m)<br>S = _____ (m/m)<br>L <sub>o</sub> = _____ (m) |   |
| CULVERT DESCRIPTION:<br>MATERIAL-SHAPE-SIZE-ENTRANCE   | TOTAL FLOW PER BARREL<br>Q (m <sup>3</sup> /s) _____<br>Q/N _____   | HEADWATER CALCULATIONS  |   |
|  | INLET CONTROL<br>H <sub>WD</sub> (2) _____<br>FALL (3) _____<br>EL <sub>N</sub> (4) _____<br>TW (5) _____<br>d <sub>c</sub> + D / 2 _____ | OUTLET CONTROL<br>h <sub>o</sub> (6) _____<br>k <sub>e</sub> _____<br>H (7) _____<br>EL <sub>ho</sub> (8) _____   | CONN. ROL. HEADWATER ELEVATION _____<br>OUTLET VELOCITY _____ |
| TECHNICAL FOOTNOTES:<br>(1) USE Q/NB FOR BOX CULVERTS<br>(2) H <sub>WD</sub> = H <sub>WD</sub> OR H <sub>WD</sub> FROM DESIGN CHARTS<br>(3) FALL = H <sub>W</sub> - (EL <sub>W</sub> - EL <sub>F</sub> ); FALL IS ZERO FOR CULVERTS ON GRADE<br>(4) EL <sub>N</sub> = H <sub>W</sub> + EL <sub>I</sub> (INVERT OF INLET CONTROL SECTION)<br>(5) TW BASED ON DOWN STREAM CONTROL OR FLOW DEPTH IN CHANNEL<br>(6) h <sub>o</sub> = TW OR (d <sub>c</sub> + D)/2 (WHICHEVER IS GREATER)<br>(7) H = [1 + k <sub>e</sub> + (19.63 m <sup>3</sup> /R <sup>1.33</sup> ) V <sup>2</sup> /2g<br>(8) EL <sub>ho</sub> = EL <sub>o</sub> + H + h <sub>o</sub> |   |   |   |
| COMMENTS / DISCUSSION:<br>a. Approximate<br>f. Culvert Face<br>hd. Design Headwater<br>hi. Headwater in Inlet Control<br>ho. Headwater in Outlet Control<br>i. Inlet Control Section<br>o. Outlet<br>sf. Streamed at Culvert Face<br>tw. Tailwater   |   | CULVERT BARREL SELECTED:<br>SIZE: _____<br>SHAPE: _____<br>MATERIAL: _____ n _____<br>ENTRANCE: _____   |   |

