**GENERAL NOTES**

1. ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION DATED 2016, AND AMENDMENTS.


3. THE GEOMETRIC DESIGN OF THIS STRUCTURE TO BE DESIGNED IN ACCORDANCE WITH PUBLICATION NO. FHWA-NHI-10-034 NOVEMBER 2008 EDITION "TECHNICAL MANUAL FOR DESIGN AND CONSTRUCTION OF ROAD TUNNELS - CIVIL ELEMENTS" WITH THE GEOMETRIC PEAK GROUND ACCELERATION OF 0.3.

4. THE CULVERT SHALL BE DESIGNED FOR SCOUR PER HYDRAULIC REPORT.

5. THE PRECAST CULVERT SHALL BE DESIGNED AS A PIN CONNECTION BETWEEN TOP AND BOTTOM UNITS. THE CONNECTION BETWEEN TOP AND BOTTOM UNITS SHALL BE DESIGNED PER LOADING DEFINED BELOW.

6. THE PRECAST CONCRETE SHALL BE CLASS 5000, 6000, OR 7000 SELF CONSOLIDATING CONCRETE (SCC). OTHER CONCRETE SHALL BE CLASS 4000.

7. THE FABRICATOR SHALL DESIGN FOR LIFTING AND TRANSPORTING FOR SUBMITTAL PER STD. SPEC. SECTION 7-02.3(6)A2.


9. THE BACKFILL ON BOTH SIDES OF THE CULVERT TO BE PLACED IN SEQUENCE AND COMPACTED IN ACCORDANCE TO THE STD. SPEC. 2-09.3(1)E. THE MAXIMUM FIELD HEIGHT DIFFERENCE MEASURED FROM SIDE TO SIDE NO MORE 2'-0".

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**LOAD COMBINATIONS**

The buried structure is to be designed with the limit states shown below:

**STRENGTH**

\[ p_{DC} = 1.25 \text{ MAX.} / 0.90 \text{ MIN.} \]
\[ p_{DW} = 1.50 \text{ MAX.} / 0.65 \text{ MIN.} \]

**SERVICE**

\[ \text{LL} + \text{I} = 1.00 \text{ DC} + 1.00 \text{ DW} + 1.00 \text{ EH} + 1.00 \text{ EV} + 1.00 \text{ ES} + 1.00 \text{ LS} + 1.00 \text{ (L+I)} + 1.00 \text{ WA} + 1.00 \text{ B} + 1.00 \text{ EQ} \]

**EXTREME I**

\[ \text{EXTREME II} = 1.00 \text{ DC} + 1.00 \text{ DW} + 1.00 \text{ EH} + 1.00 \text{ EV} + 1.00 \text{ ES} + 1.00 \text{ LS} + 1.00 \text{ (L+I)} + 1.00 \text{ WA} + 1.00 \text{ B} + 1.00 \text{ IC} \]

**EXTREME II**

\[ \text{EXTREME II} = 1.00 \text{ DC} + 1.00 \text{ DW} + 1.00 \text{ EH} + 1.00 \text{ EV} + 1.00 \text{ ES} + 1.00 \text{ LS} + 1.00 \text{ (L+I)} + 1.00 \text{ WA} + 1.00 \text{ B} + 1.00 \text{ EQ} \]

**LOADING DIAGRAMS**

- **DC** = WEIGHT OF SUPERSTRUCTURE
- **EH** = EARTH PRESSURE*
- **ES** = EARTH SURCHARGE
- **EQ** = EARTHQUAKE**
- **EV** = VERTICAL EARTH PRESSURE
- **LL + I** = LIVE LOAD PLUS IMPACT
- **LS** = LIVE LOAD SURCHARGE
- **WA** = HYDRO-STATIC PRESSURE
- **B** = BUOYANCY
- **IC** = ICE LOAD

\[ p = 0.20 \text{ FOR FLEXURE (CIP)} \]
\[ p = 0.20 \text{ FOR SHEAR (CIP)} \]
\[ p = 0.20 \text{ FOR FLEXURE (PRECAST)} \]
\[ p = 0.20 \text{ FOR SHEAR (PRECAST)} \]

**K** SHOULD BE USED FOR ALL UNIT STATES, UNLESS OTHERWISE NOTED BY GEOTECH ENGINEER.

**EQ** = LOADING FOR BOTH LATERAL RACKING AND VERTICAL COMBINED.