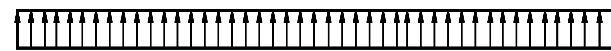
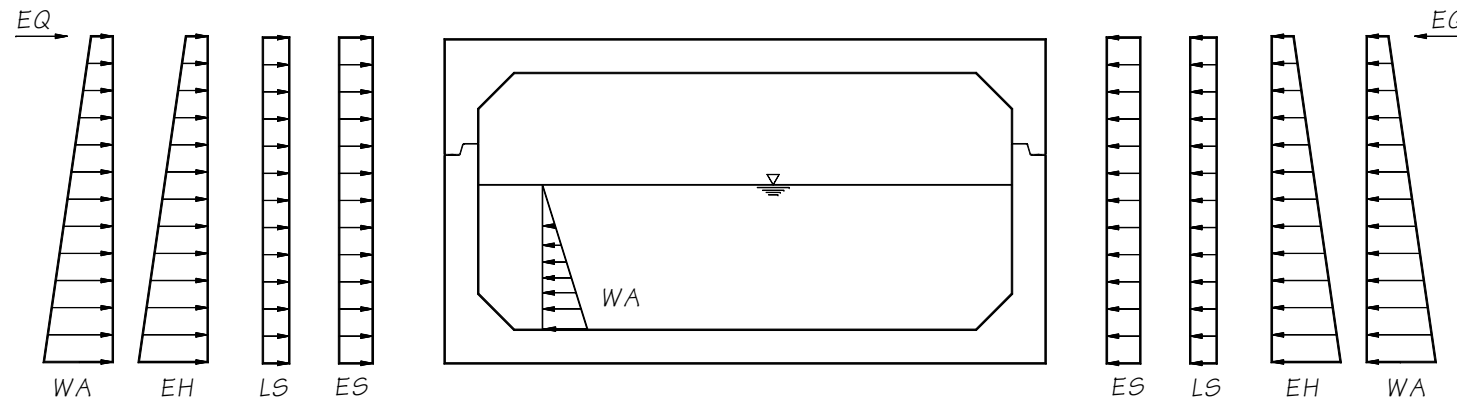
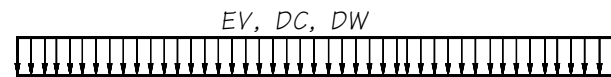
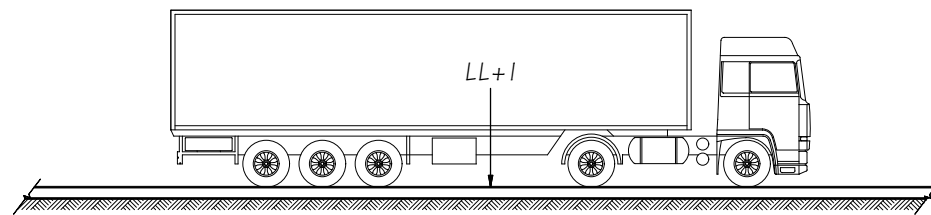


GEOMETRY

SEE BRIDGE STANDARD DRAWINGS 8.3.2-A2 FOR DIMENSIONS
 * DATA PROVIDED BY THE HYDRAULIC ENGINEER
 ** DATA PROVIDED BY THE GEOTECH ENGINEER



LOADING DIAGRAMS

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.
2. THE CULVERT TO BE DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 7TH EDITION 2014 WITH INTERIM THROUGH 2015.
3. THE SEISMIC DESIGN OF THIS STRUCTURE TO BE DESIGNED IN ACCORDING TO PUBLICATION NO. FHWA-NHI-10-034 NOVEMBER 2008 EDITION "TECHNICAL MANUAL FOR DESIGN AND CONSTRUCTION OF ROAD TUNNELS - CIVIL ELEMENTS" WITH THE SEISMIC PEAK GROUND ACCELERATION OF ___g.
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.
8. ALL STEEL PLATES AND SHAPES SHALL BE ASTM A36 OR ASTM A 992. ALL BOLTS, NUTS AND WASHERS (UNLESS NOTED OTHERWISE) SHALL BE ASTM A 307 AND COMPLY WITH STD. SPEC. SECT. 9-16.3(4), AND RESIN BONDED ANCHORS SHALL BE ASTM A 193 GRADE B7, OR ASTM A 449. ALL STEEL PLATES SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M 111 AFTER FABRICATION. BOLTS AND HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M 232.
9. UNLESS OTHERWISE SHOWN IN THE PLANS, CONCRETE COVER MEASURED FROM THE FACE OF CONCRETE TO THE FACE OF ANY REINFORCING STEEL SHALL BE 2" AT THE TOP OF THE ROOF DECK, 1½" AT THE BOTTOM OF THE ROOF DECK, 3" AT THE BOTTOM OF FOOTINGS, AND 2" AT ALL OTHER LOCATIONS.
10. 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".

LOAD COMBINATIONS

THE BURIED STRUCTURES TO BE DESIGNED WITH THE LIMIT STATES SHOWN BELOW:

$$\text{STRENGTH I} = \gamma_p DC + \gamma_p DW + 1.35/0.90 EH + 1.35/0.90 EV + 1.50/0.75 ES + 1.75 LS + 1.75 (L+I) + 1.00 WA + 1.00 B + 0.50/1.20 TU$$

$$\text{SERVICE} = 1.00 DC + 1.00 DW + 1.00 EH + 1.00 EV + 1.00 ES + 1.00 LS + 1.00 (L+I) + 1.00 WA + 1.00 B + 1.00/1.20 TU$$

$$\text{EXTREME I} = 1.00 DC + 1.00 DW + 1.00 EH + 1.00 EV + 1.00 ES + 1.00 LS + \gamma EQ L + 1.00 WA + 1.00 B + 1.00 EQ$$

$$\text{EXTREME II} = 1.00 DC + 1.00 DW + 1.00 EH + 1.00 EV + 1.00 ES + 1.00 LS + \gamma EQ L + 1.00 WA + 1.00 B + 1.00 IC$$

(EXTREME II LIMIT STATE IS FOR SCOUR AND ICE DESIGN.)

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
 B = BUOYANCY
 IC = ICE LOAD

γ_p FOR DC = 1.25 MAX./0.90 MIN.
 γ_p FOR DW = 1.50 MAX./0.65 MIN.
 $\gamma EQ = 0.5$

$\phi = 0.90$ FOR FLEXURE (CIP)
 $\phi = 0.85$ FOR SHEAR (CIP)

$\phi = 1.00$ FOR FLEXURE (PRECAST)
 $\phi = 0.90$ FOR SHEAR (PRECAST)

* K_0 SHOULD BE USED FOR ALL LIMIT STATES, UNLESS OTHERWISE NOTED BY GEOTECHNICAL ENGINEER.
 ** EQ = LOADING FOR BOTH LATERAL RACKING AND VERTICAL COMBINED.

LAST REVISED: 1/4/19

SHEET

JOB NO.

8.3-A1

| | | | | | | | | |
|-----------------------|---|----------|------------|-------|--------------------|-----------|--------------|------------------|
| Bridge Design Engr. | M:\STANDARDS\Buried Structures\SPLIT BOX CULVERT\8.3-A1_SPLIT BOX CULVERT_GENERAL NOTES.MAN | | | | | | | BRIDGE SHEET NO. |
| Supervisor | | | REGION NO. | STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS | |
| Designed By | | | 10 | WASH. | | | | |
| Checked By | | | JOB NUMBER | | | | | |
| Detailed By | | | | | | | | |
| Bridge Projects Engr. | | | | | | | | |
| Prelim. Plan By | | | | | | | | |
| Architect/Specialist | DATE | REVISION | BY | APPD | | | | |

BRIDGE AND STRUCTURES OFFICE



PRECAST SPLIT BOX CULVERT
 GENERAL NOTES AND LOADING DIAGRAMS