

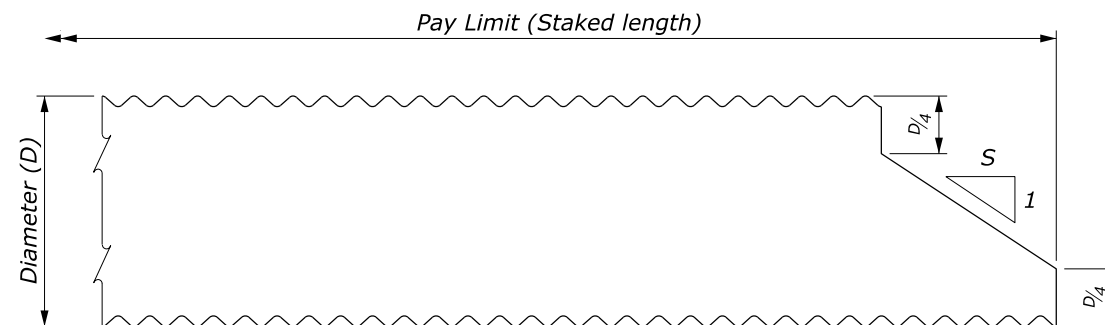
STRUCTURAL PLATE PIPE CULVERT

FILL HEIGHT AND METAL THICKNESS TABLE

| STEEL | | | | | | | | | | | ALUMINUM | | | | | | | | |
|-----------|---------------|--|--------|--------|--------|--------|--------|--------|--------|--------|-----------|---------------|--|--------|--------|--------|--------|--------|--------|
| PIPE SIZE | MINIMUM COVER | 152 x 51 CORRUGATIONS | | | | | | | | | PIPE SIZE | MINIMUM COVER | 230 x 64 CORRUGATIONS | | | | | | |
| | | METAL THICKNESS/BOLTS PER CORRUGATION | | | | | | | | | | | METAL THICKNESS/BOLTS PER CORRUGATION | | | | | | |
| | | 2.82/2 | 3.56/2 | 4.32/2 | 4.79/2 | 5.54/2 | 6.32/2 | 7.11/2 | 7.87/3 | 9.65/4 | | | 2.54/4 | 3.18/4 | 3.81/4 | 4.44/4 | 5.08/4 | 5.72/4 | 6.35/4 |
| DIAMETER | | MAXIMUM FILL HEIGHT ABOVE TOP OF PIPE (METERS) | | | | | | | | | DIAMETER | | MAXIMUM FILL HEIGHT ABOVE TOP OF PIPE (METERS) | | | | | | |
| 1500 | 300 | 14.0 | 20.7 | 27.4 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 1500 | 375 | 9.5 | 13.7 | 18.3 | 21.3 | 24.7 | 28.0 | 30.0 |
| 1655 | 300 | 12.8 | 18.9 | 24.7 | 28.4 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 1655 | 375 | 8.5 | 12.5 | 16.5 | 19.5 | 22.6 | 25.6 | 28.7 |
| 1810 | 300 | 11.6 | 17.4 | 22.9 | 26.2 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 1810 | 450 | 7.6 | 11.3 | 15.2 | 17.7 | 20.4 | 23.5 | 26.2 |
| 1965 | 300 | 10.7 | 15.9 | 21.0 | 24.1 | 29.0 | 30.0 | 30.0 | 30.0 | 30.0 | 1965 | 450 | 7.0 | 10.7 | 14.0 | 16.5 | 18.9 | 21.6 | 24.1 |
| 2120 | 300 | 10.1 | 14.9 | 19.5 | 22.3 | 28.8 | 30.0 | 30.0 | 30.0 | 30.0 | 2120 | 450 | 6.7 | 9.8 | 12.8 | 15.2 | 17.7 | 20.1 | 22.3 |
| 2275 | 300 | 9.6 | 13.7 | 18.3 | 25.0 | 28.6 | 30.0 | 30.0 | 30.0 | 30.0 | 2275 | 525 | 6.1 | 9.1 | 12.2 | 14.3 | 16.5 | 18.6 | 20.7 |
| 2430 | 300 | 8.8 | 13.1 | 17.1 | 19.6 | 23.5 | 27.7 | 30.0 | 30.0 | 30.0 | 2430 | 525 | 5.8 | 8.5 | 11.3 | 13.4 | 15.2 | 17.4 | 19.5 |
| 2585 | 450 | 8.2 | 12.2 | 15.9 | 18.3 | 22.3 | 26.2 | 28.7 | 30.0 | 30.0 | 2585 | 600 | 5.5 | 7.9 | 10.7 | 12.5 | 14.3 | 16.5 | 18.3 |
| 2740 | 450 | 7.6 | 11.6 | 15.2 | 17.4 | 21.0 | 24.7 | 26.8 | 30.0 | 30.0 | 2740 | 600 | 5.2 | 7.6 | 10.1 | 11.9 | 13.7 | 15.5 | 17.4 |
| 2895 | 450 | 7.3 | 11.0 | 14.3 | 16.5 | 19.8 | 23.5 | 25.6 | 30.0 | 30.0 | 2895 | 675 | 4.9 | 7.0 | 9.5 | 11.3 | 12.8 | 14.6 | 16.5 |
| 3050 | 450 | 7.0 | 10.4 | 13.7 | 15.5 | 18.9 | 22.3 | 24.4 | 30.0 | 30.0 | 3050 | 675 | 4.6 | 6.7 | 9.1 | 10.7 | 12.2 | 14.0 | 15.5 |
| 3205 | 450 | 6.7 | 9.8 | 12.8 | 14.9 | 18.0 | 21.0 | 23.2 | 29.0 | 30.0 | 3205 | 750 | 4.3 | 6.4 | 8.5 | 10.1 | 11.6 | 13.4 | 14.9 |
| 3360 | 450 | 6.4 | 9.5 | 12.2 | 14.0 | 17.1 | 20.1 | 22.0 | 27.7 | 29.6 | 3360 | 750 | 4.3 | 6.1 | 8.2 | 9.8 | 11.3 | 12.8 | 14.3 |
| 3515 | 450 | 6.1 | 8.8 | 11.9 | 13.4 | 16.5 | 19.2 | 21.0 | 26.5 | 28.4 | 3515 | 825 | 4.0 | 5.8 | 7.9 | 9.1 | 10.7 | 12.2 | 13.4 |
| 3670 | 450 | 5.8 | 8.5 | 11.3 | 13.1 | 15.5 | 18.6 | 20.1 | 25.3 | 27.1 | 3670 | 825 | 3.7 | 5.5 | 7.6 | 8.8 | 10.1 | 11.6 | 13.1 |
| 3825 | 600 | 5.5 | 8.2 | 11.0 | 12.5 | 14.9 | 17.7 | 19.5 | 24.4 | 26.2 | 3825 | 825 | | 5.5 | 7.3 | 8.5 | 9.8 | 11.0 | 12.5 |
| 3980 | 600 | 5.2 | 7.9 | 10.4 | 11.9 | 14.3 | 17.1 | 18.6 | 23.2 | 25.0 | 3980 | 825 | | 5.2 | 7.0 | 8.2 | 9.5 | 10.7 | 11.9 |
| 4135 | 600 | 5.2 | 7.6 | 10.1 | 11.6 | 14.0 | 16.6 | 18.0 | 22.3 | 24.1 | 4135 | 825 | | | 6.7 | 7.9 | 9.1 | 10.4 | 11.6 |
| 4290 | 600 | 4.9 | 7.3 | 9.8 | 11.0 | 13.4 | 15.9 | 17.4 | 21.6 | 23.2 | 4290 | 825 | | | 6.4 | 7.6 | 8.8 | 10.1 | 11.0 |
| 4445 | 600 | 4.9 | 7.0 | 9.5 | 10.7 | 12.8 | 15.2 | 16.8 | 20.7 | 22.6 | 4445 | 825 | | | 6.1 | 7.3 | 8.5 | 9.5 | 10.7 |
| 4600 | 600 | 4.6 | 6.7 | 9.1 | 10.4 | 12.5 | 14.6 | 16.2 | 20.1 | 21.6 | 4600 | 825 | | | | 7.0 | 8.2 | 9.1 | 10.4 |
| 4755 | 600 | 4.6 | 6.7 | 8.8 | 10.1 | 12.2 | 14.3 | 15.5 | 19.5 | 21.0 | 4755 | 825 | | | 6.7 | 7.9 | 8.8 | 10.1 | |
| 4910 | 600 | | 6.4 | 8.5 | 9.8 | 11.6 | 13.7 | 15.2 | 18.9 | 20.4 | 4910 | 900 | | | | 7.6 | 8.5 | 9.8 | |
| 5065 | 750 | | 6.1 | 8.2 | 9.5 | 11.3 | 13.4 | 14.6 | 18.3 | 19.8 | 5030 | 900 | | | | 7.3 | 8.5 | 9.5 | |
| 5220 | 750 | | 6.1 | 7.9 | 9.1 | 11.0 | 13.1 | 14.3 | 17.7 | 19.2 | 5220 | 900 | | | | 7.0 | 8.2 | 9.1 | |
| 5375 | 750 | | 5.8 | 7.5 | 8.8 | 10.7 | 12.5 | 13.7 | 17.1 | 18.6 | 5385 | 900 | | | | | 7.9 | 8.8 | |
| 5530 | 750 | | | 7.5 | 8.5 | 10.4 | 12.2 | 13.4 | 16.5 | 18.0 | 5530 | 900 | | | | | 7.6 | 8.5 | |
| 5685 | 750 | | | 7.3 | 8.2 | 10.0 | 11.9 | 13.1 | 16.2 | 17.7 | 5685 | 900 | | | | | | 8.2 | |
| 5840 | 750 | | | 7.0 | 7.9 | 9.8 | 11.6 | 12.8 | 15.5 | 17.1 | 5840 | 900 | | | | | | 8.2 | |
| 5995 | 750 | | | 7.0 | 7.6 | 9.5 | 11.3 | 12.5 | 15.2 | 16.8 | | | | | | | | | |
| 6150 | 750 | | | | 7.6 | 9.5 | 11.0 | 12.2 | 14.9 | 16.2 | | | | | | | | | |
| 6305 | 900 | | | | | 9.1 | 10.7 | 11.9 | 14.6 | 15.9 | | | | | | | | | |
| 6460 | 900 | | | | | 8.8 | 10.4 | 11.6 | 14.0 | 15.5 | | | | | | | | | |
| 6615 | 900 | | | | | 8.5 | 10.4 | 11.3 | 13.7 | 14.9 | | | | | | | | | |
| 6770 | 900 | | | | | 8.5 | 10.1 | 11.0 | 13.4 | 11.6 | | | | | | | | | |
| 6925 | 900 | | | | | 8.2 | 9.8 | 10.7 | 13.1 | 14.3 | | | | | | | | | |
| 7080 | 900 | | | | | | 9.5 | 13.4 | 12.8 | 14.0 | | | | | | | | | |
| 7235 | 900 | | | | | | 9.5 | 13.4 | 12.5 | 13.7 | | | | | | | | | |
| 7390 | 1050 | | | | | | | 9.1 | 10.1 | 12.2 | 13.4 | | | | | | | | |
| 7545 | 1050 | | | | | | | | 9.8 | 12.2 | 13.1 | | | | | | | | |
| 7700 | 1050 | | | | | | | | 9.8 | 11.9 | 12.8 | | | | | | | | |
| 7855 | 1050 | | | | | | | | 9.5 | 11.6 | 12.5 | | | | | | | | |

NOTE:

1. Fabricate the bottom plates one (1) thickness heavier than the side plates but not heavier than 9.53 mm for steel or 6.35 mm for aluminum.
2. Fasten plates with galvanized steel M20 bolts and nuts conforming to AASHTO M 167M.
3. When directed, camber pipe culverts upward from a chord through the inlet and outlet inverts an ordinate amount equal to 1% of the pipe length. Develop camber on a parabolic curve. If the midpoint elevation on the parabolic curve as designed exceeds the elevation of the inlet invert, reduce the amount of camber or increase the pipe culvert gradient.
4. Measure minimum cover from the top of the pipe culvert to the subgrade for flexible pavements, and to the top of the pavement for rigid pavements. Measure maximum fill height from the top of the pipe to the top of the pavement for both flexible and rigid pavement.
5. Furnish hardware in the metric sizes shown. Equivalent US Customary sizes may be used when metric sizes are unavailable.
6. Dimensions without units are millimeters.



$\begin{matrix} S \\ \triangle \\ 1 \end{matrix}$

 $S = 1.5$ for 1V:1.5H fill slopes
 $S = 2$ for 1V:2H or flatter slopes

END TREATMENT DIAGRAM

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
 FEDERAL HIGHWAY ADMINISTRATION
 OFFICE OF FEDERAL LANDS HIGHWAY

METRIC FLH STANDARD

**STRUCTURAL PLATE
 PIPE CULVERT**

STANDARD APPROVED FOR USE 3/1996
 REVISED: 6/2005

STANDARD
 M603-1