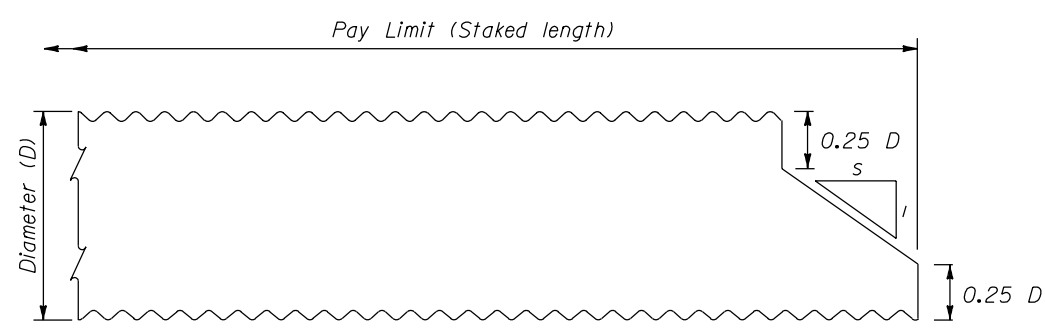


STRUCTURAL PLATE PIPE CULVERT
FILL HEIGHT AND METAL THICKNESS TABLE

| STEEL | | | | | | | | | | | ALUMINUM | | | | | | | | |
|---|---------------|---------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|---|---------------|---------------------------------------|--------|--------|--------|--------|--------|--------|
| PIPE SIZE DIAMETER | MINIMUM COVER | 152 x 51 CORRUGATIONS | | | | | | | | | PIPE SIZE DIAMETER | 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 |
| MAXIMUM FILL HEIGHT ABOVE TOP OF PIPE IN METERS | | | | | | | | | | | MAXIMUM FILL HEIGHT ABOVE TOP OF PIPE IN 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 | 900 | | | | 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 | 900 | | | | | | 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:

- Dimensions not labeled are in millimeters.
- Fabricate the bottom plates one (1) thickness heavier than the side plates but not heavier than 9.65 mm for steel or 6.35 mm for aluminum.
- Fasten plates with galvanized steel M20 bolts and nuts conforming to AASHTO M167M. Imperial sized 3/4 inch bolts and nuts conforming to AASHTO M167 may be used until metric fasteners are available.
- 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.
- 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.



$\frac{s}{1}$ $S = 1.5$ for 1:1.5 fill slopes
 $S = 2$ for 1:2 or flatter slopes

END TREATMENT DIAGRAM

NO SCALE

| | |
|--|---------------|
| U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION FEDERAL LANDS HIGHWAY | |
| METRIC STANDARD | |
| STRUCTURAL PLATE PIPE CULVERT | |
| STANDARD APPROVED FOR USE 3/1996 | STANDARD |
| REVISED: | M603-1 |