

CONCRETE PER LINEAL FOOT OF BARREL ENCASED

| LIN. FT. | SIZE OF PIPE | | | | | | | | | | | | LIN. FT. |
|----------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|----------|
| | 8" | 10" | 12" | 15" | 18" | 20" | 22" | 24" | 27" | 30" | 33" | 36" | |
| 1 | .079 | .094 | .108 | .130 | .154 | .172 | .192 | .206 | .239 | .268 | .291 | .328 | 1 |
| 2 | .158 | .188 | .216 | .260 | .308 | .344 | .384 | .412 | .478 | .536 | .582 | .656 | 2 |
| 3 | .237 | .282 | .324 | .390 | .462 | .516 | .576 | .618 | .717 | .804 | .873 | .984 | 3 |
| 4 | .316 | .376 | .432 | .520 | .616 | .688 | .768 | .824 | .956 | 1.072 | 1.164 | 1.312 | 4 |
| 5 | .395 | .470 | .540 | .650 | .770 | .860 | .960 | 1.030 | 1.195 | 1.340 | 1.455 | 1.640 | 5 |
| 6 | .474 | .564 | .648 | .780 | .924 | 1.032 | 1.152 | 1.236 | 1.434 | 1.608 | 1.746 | 1.968 | 6 |
| 7 | .553 | .658 | .756 | .910 | 1.078 | 1.204 | 1.344 | 1.442 | 1.673 | 1.876 | 2.037 | 2.296 | 7 |
| 8 | .632 | .752 | .864 | 1.040 | 1.232 | 1.376 | 1.536 | 1.648 | 1.912 | 2.144 | 2.328 | 2.624 | 8 |
| 9 | .711 | .846 | .972 | 1.170 | 1.386 | 1.548 | 1.728 | 1.854 | 2.151 | 2.412 | 2.619 | 2.952 | 9 |
| 10 | .790 | .940 | 1.080 | 1.300 | 1.540 | 1.720 | 1.920 | 2.060 | 2.390 | 2.680 | 2.910 | 3.280 | 10 |
| 11 | .869 | 1.034 | 1.188 | 1.430 | 1.694 | 1.892 | 2.112 | 2.266 | 2.629 | 2.948 | 3.201 | 3.608 | 11 |
| 12 | .948 | 1.128 | 1.296 | 1.560 | 1.848 | 2.064 | 2.304 | 2.472 | 2.868 | 3.216 | 3.492 | 3.936 | 12 |
| 13 | 1.027 | 1.222 | 1.404 | 1.690 | 2.002 | 2.236 | 2.496 | 2.678 | 3.107 | 3.484 | 3.783 | 4.264 | 13 |
| 14 | 1.106 | 1.316 | 1.512 | 1.820 | 2.156 | 2.408 | 2.688 | 2.884 | 3.346 | 3.752 | 4.074 | 4.592 | 14 |
| 15 | 1.185 | 1.410 | 1.620 | 1.950 | 2.310 | 2.580 | 2.880 | 3.090 | 3.585 | 4.020 | 4.365 | 4.920 | 15 |
| 16 | 1.264 | 1.504 | 1.728 | 2.080 | 2.464 | 2.752 | 3.072 | 3.296 | 3.824 | 4.288 | 4.656 | 5.248 | 16 |
| 17 | 1.343 | 1.598 | 1.836 | 2.210 | 2.618 | 2.924 | 3.264 | 3.502 | 4.063 | 4.556 | 4.947 | 5.576 | 17 |
| 18 | 1.422 | 1.692 | 1.944 | 2.340 | 2.772 | 3.096 | 3.456 | 3.708 | 4.302 | 4.824 | 5.238 | 5.904 | 18 |
| 19 | 1.501 | 1.786 | 2.082 | 2.470 | 2.926 | 3.268 | 3.648 | 3.914 | 4.541 | 5.092 | 5.529 | 6.232 | 19 |
| 20 | 1.580 | 1.880 | 2.160 | 2.600 | 3.080 | 3.440 | 3.840 | 4.120 | 4.780 | 5.360 | 5.820 | 6.560 | 20 |
| 21 | 1.659 | 1.974 | 2.268 | 2.730 | 3.234 | 3.612 | 4.032 | 4.326 | 5.019 | 5.628 | 6.111 | 6.888 | 21 |
| 22 | 1.738 | 2.068 | 2.376 | 2.860 | 3.388 | 3.784 | 4.224 | 4.532 | 5.258 | 5.896 | 6.402 | 7.216 | 22 |
| 23 | 1.817 | 2.162 | 2.484 | 2.990 | 3.542 | 3.956 | 4.416 | 4.738 | 5.497 | 6.164 | 6.693 | 7.544 | 23 |
| 24 | 1.896 | 2.256 | 2.592 | 3.120 | 3.696 | 4.128 | 4.608 | 4.944 | 5.736 | 6.432 | 6.984 | 7.872 | 24 |
| 25 | 1.975 | 2.350 | 2.700 | 3.250 | 3.850 | 4.300 | 4.800 | 5.150 | 5.975 | 6.700 | 7.275 | 8.200 | 25 |
| 26 | 2.054 | 2.444 | 2.808 | 3.380 | 4.004 | 4.472 | 4.992 | 5.356 | 6.214 | 6.968 | 7.566 | 8.528 | 26 |
| 27 | 2.133 | 2.538 | 2.916 | 3.510 | 4.158 | 4.644 | 5.184 | 5.562 | 6.453 | 7.236 | 7.857 | 8.856 | 27 |
| 28 | 2.212 | 2.632 | 3.024 | 3.640 | 4.312 | 4.816 | 5.376 | 5.768 | 6.692 | 7.504 | 8.148 | 9.184 | 28 |
| 29 | 2.291 | 2.726 | 3.132 | 3.770 | 4.466 | 4.988 | 5.568 | 5.974 | 6.931 | 7.772 | 8.439 | 9.512 | 29 |
| 30 | 2.370 | 2.820 | 3.240 | 3.900 | 4.620 | 5.160 | 5.760 | 6.180 | 7.170 | 8.040 | 8.730 | 9.840 | 30 |
| 31 | 2.449 | 2.914 | 3.348 | 4.030 | 4.774 | 5.332 | 5.952 | 6.386 | 7.409 | 8.308 | 9.021 | 10.168 | 31 |
| 32 | 2.528 | 3.008 | 3.456 | 4.160 | 4.928 | 5.504 | 6.144 | 6.592 | 7.648 | 8.576 | 9.312 | 10.496 | 32 |
| 33 | 2.607 | 3.102 | 3.564 | 4.290 | 5.082 | 5.676 | 6.336 | 6.798 | 7.887 | 8.844 | 9.603 | 10.824 | 33 |
| 34 | 2.686 | 3.196 | 3.672 | 4.420 | 5.236 | 5.848 | 6.528 | 7.004 | 8.126 | 9.112 | 9.894 | 11.152 | 34 |
| 35 | 2.765 | 3.290 | 3.780 | 4.550 | 5.390 | 6.020 | 6.720 | 7.210 | 8.365 | 9.380 | 10.185 | 11.480 | 35 |
| 36 | 2.844 | 3.384 | 3.888 | 4.680 | 5.544 | 6.192 | 6.912 | 7.416 | 8.604 | 9.648 | 10.476 | 11.808 | 36 |
| 37 | 2.923 | 3.478 | 3.996 | 4.810 | 5.698 | 6.364 | 7.104 | 7.622 | 8.843 | 9.916 | 10.767 | 12.136 | 37 |
| 38 | 3.002 | 3.572 | 4.104 | 4.940 | 5.852 | 6.536 | 7.296 | 7.828 | 9.082 | 10.184 | 11.058 | 12.464 | 38 |
| 39 | 3.081 | 3.666 | 4.212 | 5.070 | 6.006 | 6.708 | 7.488 | 8.034 | 9.321 | 10.452 | 11.349 | 12.792 | 39 |
| 40 | 3.160 | 3.760 | 4.320 | 5.200 | 6.160 | 6.880 | 7.680 | 8.240 | 9.560 | 10.720 | 11.640 | 13.120 | 40 |

QUANTITIES-TWO HEADWALLS

| SIZE PIPE | VIT. PIPE CULVERT | | REIN. CONC. CAST IRON, COR. METAL CULVERT | | REIN. CONC. CAST IRON, COR. METAL AND VIT. PIPE CULVERTS | | SIDE ROAD | | HILLSIDE | |
|-----------|-------------------|--------------|---|--------------|--|--------------|------------|--------------|------------|--------------|
| | STEEL LBS. | CONC. CU.YD. | STEEL LBS. | CONC. CU.YD. | STEEL LBS. | CONC. CU.YD. | STEEL LBS. | CONC. CU.YD. | STEEL LBS. | CONC. CU.YD. |
| 12" | 65 | 2.0 | 40 | 1.3 | 60 | 2.6 | 40 | 2.7 | | |
| 14" | | | 45 | 1.5 | | | | | | |
| 15" | 70 | 2.3 | | | 65 | 2.9 | 40 | 2.8 | | |
| 16" | | | 50 | 1.7 | | | | | | |
| 18" | 80 | 2.7 | 50 | 1.9 | 70 | 3.3 | 45 | 3.0 | | |
| 20" | 85 | 3.0 | 55 | 2.1 | 75 | 3.5 | 45 | 3.1 | | |
| 22" | 90 | 3.2 | | | 80 | 3.8 | 45 | 3.1 | | |
| 24" | 105 | 3.5 | 65 | 2.8 | 85 | 4.1 | 50 | 3.2 | | |
| 27" | 115 | 4.0 | | | | | | | | |
| 30" | 125 | 4.6 | 75 | 3.6 | | | | | | |
| 33" | 150 | 5.2 | | | | | | | | |
| 36" | 165 | 5.8 | 90 | 4.8 | | | | | | |

In case the headwall is placed at the edge of the roadway a coping may be added 9" thick projecting 2" at sides and ends.

If coping is used add .037 cu. yds. per lineal foot of coping.

Concrete for headwalls 1:5½ mix. Concrete for encasing pipe 1:8 mix. Rein. steel ½" or equal sectional area.

| SMALL HEADWALL HILLSIDE CULVERT | | |
|---------------------------------|------------|--------------|
| SIZE PIPE | STEEL LBS. | CONC. CU.YD. |
| 12" | 17 | .9 |
| 15" | 17 | 1.0 |
| 18" | 18 | 1.0 |
| 20" | 18 | 1.0 |
| 22" | 19 | 1.1 |
| 24" | 20 | 1.1 |

**BUREAU OF CONSTRUCTION
OHIO
DEPARTMENT OF HIGHWAYS**

TABLES NO. 1

STANDARD
CONSTRUCTION DRAWING
JAN. 5, 1931