## ③ STEEL PIPE ARCH 2 2/3" X 1/2" CORRUGATIONS

| SPAN Inches | RISE Inches | RC Inches | MINIMUM COVER ABOVE PIPE Inches | (H) MAXIMUM ALLOWABLE COVER IN FEET 16 GA. ( 0.064" ) | 14 GA. ( 0.079" ) | 12 GA. ( 0.109" ) | 10 GA. ( 0.138" ) | 8 GA. ( 0.168" ) |
|---|---|---|---|---|---|---|---|---|
| 17 | 13 | 3.5 | 18 | 6 | 6 | - | - | - |
| 21 | 15 | 4.125 | 18 | 6 | 6 | - | - | - |
| 24 | 18 | 4.875 | 18 | 5 | 5 | - | - | - |
| 28 | 20 | 5.5 | 18 | 5 | 5 | - | - | - |
| 35 | 24 | 6.875 | 18 | 5 | 5 | - | - | - |
| 42 | 29 | 8.25 | 18 | 4 | 4 | - | - | - |
| 49 | 33 | 9.625 | 18 | - | - | 4 | 4 | 4 |
| 57 | 38 | 11.0 | 18 | - | - | 4 | 4 | 4 |
| 64 | 43 | 12.375 | 18 | - | - | 4 | 4 | 4 |
| 71 | 47 | 13.75 | 18 | - | - | - | 4 | 4 |
| 77 | 52 | 15.125 | 18 | - | - | - | - | 4 |
| 83 | 57 | 16.5 | 18 | - | - | - | - | 4 |

## ④ STEEL PIPE ARCH 3" X 1" CORRUGATIONS

| SPAN Inches | RISE Inches | RC Inches | MINIMUM COVER ABOVE PIPE Inches | (H) MAX. ALLOWABLE COVER IN FT. 16 GA. ( 0.064" ) | 14 GA. ( 0.079" ) | 12 GA. ( 0.109" ) | 10 GA. ( 0.138" ) |
|---|---|---|---|---|---|---|---|
| 60 | 46 | 18.75 | 18 | 6 | 6 | - | - |
| 66 | 51 | 20.75 | 18 | 6 | 6 | - | - |
| 73 | 55 | 22.875 | 18 | 8 | 8 | - | - |
| 81 | 59 | 20.875 | 18 | - | 7 | 7 | - |
| 87 | 63 | 22.625 | 18 | - | 7 | 7 | - |
| 95 | 67 | 24.375 | 18 | - | 6 | 6 | - |
| 103 | 71 | 26.125 | 24 | - | - | 6 | - |
| 112 | 75 | 27.75 | 24 | - | - | 5 | - |
| 117 | 79 | 29.5 | 24 | - | - | 5 | - |
| 128 | 83 | 31.25 | 24 | - | - | - | 5 |

## ⑤ PIPE ARCH STRUCTURAL STEEL 6" X 2" CORRUGATIONS

| SPAN Inches | RISE Inches | RC Inches | MINIMUM COVER ABOVE PIPE Inches | (H) MAXIMUM ALLOWABLE COVER IN FEET 12 GA. (0.109") | 10 GA. (0.138") | 8 GA. (0.168") | 7 GA. (0.187") |
|---|---|---|---|---|---|---|---|
| 73 | 55 | 18 | 18 | 8 | - | - | - |
| 84 | 61 | 18 | 18 | 7 | - | - | - |
| 95 | 67 | 18 | 18 | 6 | - | - | - |
| 106 | 73 | 18 | 24 | 6 | - | - | - |
| 117 | 79 | 18 | 24 | 5 | - | - | - |
| 131 | 85 | 18 | 24 | 5 | - | - | - |
| 142 | 91 | 18 | 24 | 4 | - | - | - |
| 154 | 100 | 18 | 24 | 4 | - | - | - |
| 159 | 112 | 31 | 24 | 6 | - | - | - |
| 170 | 118 | 31 | 24 | 6 | - | - | - |
| 184 | 124 | 31 | 24 | - | 6 | - | - |
| 195 | 130 | 31 | 36 | - | 5 | - | - |
| 206 | 136 | 31 | 36 | - | 5 | - | - |
| 217 | 142 | 31 | 36 | - | - | 5 | - |
| 231 | 148 | 31 | 36 | - | - | 4 | - |
| 239 | 154 | 31 | 36 | - | - | 4 | - |
| 247 | 158 | 31 | 36 | - | - | - | 4 |

## ⑥ ROUND PIPE STRUCTURAL STEEL 6" X 2" CORRUGATIONS

| DIAMETER OF PIPE 'D' Inches | MINIMUM COVER ABOVE PIPE Inches | (H) MAXIMUM ALLOWABLE COVER IN FEET 12 GAGE ( 0.109" ) | | 10 GAGE ( 0.138" ) | | 8 GAGE ( 0.168" ) | | 7 GAGE ( 0.187" ) | | 5 GAGE ( 0.218" ) | | 3 GAGE ( 0.250" ) | | 1 GAGE ( 0.281" ) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Round | Elongated | Round | Elongated | Round | Elongated | Round | Elongated | Round | Elongated | Round | Elongated | Round | Elongated |
| 60 | 12 | 35 | 35 | 43 | 52 | 51 | 67 | - | - | - | - | - | - | - | - |
| 66 | 12 | 29 | 32 | 35 | 45 | 41 | 61 | - | - | - | - | - | - | - | - |
| 72 | 12 | 25 | 29 | 29 | 43 | 34 | 56 | - | - | - | - | - | - | - | - |
| 78 | 12 | 22 | 27 | 25 | 40 | 29 | 52 | 31 | 60 | - | - | - | - | - | - |
| 84 | 12 | 19 | 25 | 22 | 37 | 25 | 48 | 27 | 53 | - | - | - | - | - | - |
| 90 | 12 | 18 | 23 | 20 | 34 | 22 | 44 | 23 | 47 | - | - | - | - | - | - |
| 96 | 12 | 16 | 22 | 18 | 32 | 20 | 40 | 21 | 42 | - | - | - | - | - | - |
| 102 | 24 | 15 | 21 | 17 | 30 | 18 | 36 | 19 | 38 | - | - | - | - | - | - |
| 114 | 24 | 14 | 18 | 15 | 27 | 16 | 32 | 17 | 33 | 18 | 36 | - | - | - | - |
| 120 | 24 | 13 | 18 | 14 | 26 | 15 | 30 | 16 | 31 | 17 | 33 | - | - | - | - |
| 126 | 24 | 13 | - | 13 | 25 | 14 | 29 | 15 | 30 | 16 | 31 | - | - | - | - |
| 132 | 24 | 12 | - | 13 | 24 | 14 | 27 | 14 | 28 | 15 | 30 | - | - | - | - |
| 138 | 24 | 12 | - | 13 | 23 | 13 | 26 | 14 | 27 | 14 | 29 | - | - | - | - |
| 144 | 24 | 12 | - | 12 | 22 | 13 | 26 | 13 | 26 | 14 | 27 | - | - | - | - |
| 150 | 24 | 12 | - | 12 | 21 | 12 | 25 | 13 | 26 | 13 | 27 | 14 | 28 | - | - |
| 156 | 24 | 11 | - | 12 | 20 | 12 | 24 | 12 | 25 | 13 | 26 | 13 | 27 | - | - |
| 162 | 24 | 11 | - | 12 | 19 | 12 | 24 | 12 | 24 | 13 | 25 | 13 | 26 | 13 | 27 |
| 168 | 24 | 11 | - | 11 | 19 | 12 | 23 | 12 | 24 | 12 | 25 | 13 | 25 | 13 | 26 |
| 174 | 24 | 11 | - | 11 | 18 | 12 | 23 | 12 | 23 | 12 | 24 | 12 | 25 | 13 | 25 |
| 180 | 24 | 11 | - | 11 | 17 | 11 | 23 | 11 | 23 | 12 | 24 | 12 | 24 | 12 | 25 |

### GENERAL NOTES:

The maximum allowable cover values indicated hereon for the various kind of pipe culvert installations are design values based on current Standard and Supplemental Specifications (Class "C" Bedding and other normal conditions).

Unless specified otherwise, the Contractor may choose the type of corrugated pipe and installation to furnish as long as the selection conforms to the limits indicated for the type specified.

Refer to tabulation of culvert installations and other detail project plans as well as appropriate other Standard Road Plans for additional information regarding individual culvert installations.

For culverts shown in Elongated column, the installation shall be made in accordance with current Standard and Supplemental Specifications.

Minimum allowable cover for roadway culverts H=2.0'.

### DESIGN CRITERIA:

These height of cover tables have been prepared from data in the "AASHTO Standard Specifications for Highway Bridges," Section 8, with exceptions only as stated.

W = Density of soil = 120 lbs. per cu. ft.

CIRCULAR CORRUGATED METAL PIPE

(A) Seam strength
(B) Handling and installation strength
(C) Failure of conduit wall (buckling)
(D) Deflection of flattening

K = Soil stiffness factor = 0.55
E' = Modulus of passive earth pressure = 400 psi per inch

CORRUGATED METAL PIPE ARCHES
Allowable corner pressure = 2,000 lbs. per sq. ft.

**SPECIAL NOTE:**

Special installations may be designed to exceed indicated maximum allowable cover by specific modification of one or more of the following conditions:

1. Bedding class
2. Pipe strength (including special design pipe)
3. Type of backfill or cover material
4. Compaction requirements for backfill or cover material
5. Controlled trench width

Where site conditions favor such modifications significant economy may result from special design installations and these should be considered. Special designs shall specify particular modifications of construction requirements or design criteria as applicable. Necessary modifications of normal requirements will not ordinarily be paid for separately but will be included in the price bid for that culvert pipe.

Iowa Department of Transportation
*Project Development Division*

**STANDARD ROAD PLAN** **RF-33**

REVISION: Place in CADD; Renumber Tables and update General Notes.

REVISION NO. 2

David R. Ruth 11-18-94
APPROVED BY DESIGN METHODS ENGINEER

REVISION DATE 03-28-95

DEPTH OF COVER TABLES FOR CORRUGATED PIPE