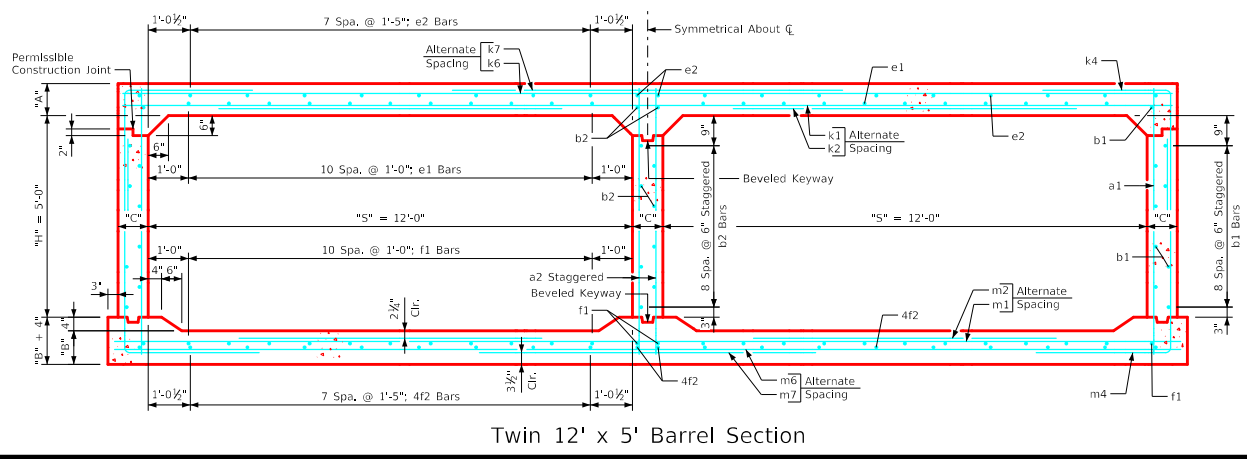
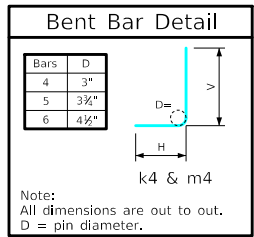


### Variable Dimensions and Quantities for Twin 12' x 5' Barrel Sections

| Dimensions |    |   |      |      |   |   |   |       |      |       |       |      | Bar List |       |      |     |       |      |     |     |      |     |     |      |     |     |      |     |     |      |     |     |      |     |     |      |     |        |      |     |       |      |     |       |      |       |     |      |        |     |      |       |     |      |        |
|------------|----|---|------|------|---|---|---|-------|------|-------|-------|------|----------|-------|------|-----|-------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|--------|------|-----|-------|------|-----|-------|------|-------|-----|------|--------|-----|------|-------|-----|------|--------|
| Fill       | S  | H | A    | B    | C | D | E | U     | W    | X     | Z     | a1   |          |       | a2   |     |       | b1   |     |     | b2   |     |     | e1   |     |     | e2   |     |     | f1   |     |     | f2   |     |     | k1   |     |        | k2   |     |       | k4   |     |       | k6   |       |     | k7   |        |     | k9   |       |     |      |        |
|            |    |   |      |      |   |   |   |       |      |       |       | Size | Sp.      | L     | Size | Sp. | L     | Size | Sp. | No. | Size | Sp. | No. | Size | Sp. | No. | Size | Sp. | No. | Size | Sp. | No. | Size | Sp. | No. | Size | Sp. | No.    | Size | Sp. | No.   | Size | Sp. | No.   | Size | Sp.   | No. | Size | Sp.    | No. | Size | Sp.   | No. | Size | Sp.    |
| 0          | 12 | 5 | 14   | 12   | 9 | 9 | 9 | 0'-2  | 7'-7 | 2'-6  | 6'-0  | 4    | 12       | 7'-1  | 7    | 9   | 7'-1  | 4    | 6   | 20  | 4    | 6   | 11  | 4    | 12  | 22  | 4    | 17  | 20  | 4    | 12  | 26  | 4    | 17  | 20  | 6    | 18  | 25'-11 | 6    | 18  | 12'-9 | 5    | 9   | 6'-8  | 3'-1 | 3'-7  | 5   | 18   | 25'-11 | 6   | 18   | 15'-2 | 6   | 4.5  | 25'-11 |
| 1          | 12 | 5 | 13.5 | 11.5 | 9 | 9 | 9 | 0'-8  | 7'-2 | 2'-7  | 5'-6  | 4    | 9        | 7'-0  | 7    | 9   | 7'-0  | 4    | 6   | 20  | 4    | 6   | 11  | 4    | 12  | 22  | 4    | 17  | 20  | 4    | 12  | 26  | 4    | 17  | 20  | 6    | 18  | 25'-11 | 6    | 18  | 12'-3 | 6    | 9   | 7'-0  | 3'-1 | 3'-11 | 4   | 9    | 25'-11 | 4   | 9    | 14'-4 | 4   | 4.5  | 25'-11 |
| 2          | 12 | 5 | 10   | 10   | 9 | 6 | 9 | 2'-1  | 6'-2 | 3'-4  | 4'-7  | 4    | 6        | 6'-7  | 7    | 9   | 6'-7  | 4    | 6   | 20  | 4    | 6   | 11  | 5    | 12  | 22  | 4    | 17  | 20  | 4    | 12  | 26  | 4    | 17  | 20  | 6    | 12  | 25'-11 | 5    | 12  | 10'-1 | 6    | 9   | 7'-4  | 3'-8 | 3'-8  | 5   | 12   | 25'-11 | 6   | 12   | 12'-4 | 6   | 4.5  | 25'-11 |
| 3          | 12 | 5 | 9    | 10   | 9 | 9 | 9 | 2'-8  | 5'-2 | 3'-7  | 4'-5  | 4    | 9        | 6'-6  | 6    | 9   | 6'-6  | 4    | 6   | 20  | 4    | 6   | 11  | 4    | 12  | 22  | 4    | 17  | 20  | 4    | 12  | 26  | 4    | 17  | 20  | 5    | 9   | 25'-11 | 4    | 9   | 8'-5  | 6    | 9   | 7'-2  | 3'-7 | 3'-7  | 4   | 12   | 25'-11 | 7   | 12   | 10'-4 | 7   | 4.5  | 25'-11 |
| 4          | 12 | 5 | 9    | 10   | 9 | 9 | 9 | 2'-11 | 4'-9 | 3'-7  | 4'-1  | 4    | 9        | 6'-6  | 6    | 9   | 6'-6  | 4    | 6   | 20  | 4    | 6   | 11  | 4    | 12  | 22  | 4    | 17  | 20  | 4    | 12  | 26  | 4    | 17  | 20  | 5    | 9   | 25'-11 | 4    | 9   | 8'-0  | 6    | 9   | 7'-2  | 3'-7 | 3'-7  | 4   | 12   | 25'-11 | 7   | 12   | 9'-6  | 7   | 4.5  | 25'-11 |
| 5-7        | 12 | 5 | 9.5  | 11   | 9 | 9 | 9 | 2'-3  | 4'-7 | 3'-4  | 4'-2  | 4    | 12       | 6'-7  | 6    | 9   | 6'-7  | 4    | 6   | 20  | 4    | 6   | 11  | 4    | 12  | 22  | 4    | 17  | 20  | 4    | 12  | 26  | 4    | 17  | 20  | 5    | 12  | 25'-11 | 5    | 12  | 9'-6  | 5    | 6   | 6'-6  | 3'-3 | 3'-3  | 5   | 12   | 25'-11 | 7   | 12   | 9'-2  | 7   | 4.5  | 25'-11 |
| 8-10       | 12 | 5 | 11   | 13   | 9 | 9 | 9 | 3'-0  | 4'-2 | 3'-2  | 4'-1  | 4    | 12       | 6'-11 | 6    | 9   | 6'-11 | 4    | 6   | 20  | 4    | 6   | 11  | 4    | 12  | 22  | 4    | 17  | 20  | 4    | 12  | 26  | 4    | 17  | 20  | 5    | 9   | 25'-11 | 4    | 9   | 8'-4  | 5    | 6   | 5'-10 | 2'-6 | 3'-4  | 5   | 9    | 25'-11 | 6   | 9    | 8'-4  | 6   | 4.5  | 25'-11 |
| 11-13      | 12 | 5 | 12.5 | 14.5 | 9 | 6 | 9 | 2'-10 | 4'-3 | 3'-0  | 4'-3  | 4    | 6        | 7'-2  | 6    | 9   | 7'-2  | 4    | 6   | 20  | 4    | 6   | 11  | 4    | 12  | 22  | 4    | 17  | 20  | 4    | 12  | 26  | 4    | 17  | 20  | 5    | 9   | 25'-11 | 4    | 9   | 9'-0  | 4    | 6   | 5'-6  | 2'-5 | 3'-1  | 4   | 9    | 25'-11 | 7   | 9    | 8'-6  | 7   | 4.5  | 25'-11 |
| 14-16      | 12 | 5 | 14.5 | 16.5 | 9 | 9 | 9 | 2'-3  | 4'-4 | 2'-7  | 4'-5  | 4    | 9        | 7'-6  | 6    | 9   | 7'-6  | 4    | 6   | 20  | 4    | 6   | 11  | 4    | 12  | 22  | 4    | 17  | 20  | 4    | 12  | 26  | 4    | 17  | 20  | 7    | 18  | 25'-11 | 6    | 18  | 10'-6 | 4    | 6   | 5'-8  | 2'-5 | 3'-3  | 5   | 12   | 25'-11 | 8   | 12   | 8'-8  | 8   | 4.5  | 25'-11 |
| 15-19      | 12 | 5 | 16   | 18   | 9 | 9 | 9 | 2'-3  | 4'-5 | 2'-4  | 4'-6  | 4    | 12       | 7'-9  | 6    | 9   | 7'-9  | 4    | 6   | 20  | 4    | 6   | 11  | 4    | 12  | 22  | 4    | 17  | 20  | 4    | 12  | 26  | 4    | 17  | 20  | 6    | 12  | 25'-11 | 5    | 12  | 10'-8 | 4    | 6   | 5'-11 | 2'-6 | 3'-5  | 5   | 9    | 25'-11 | 7   | 9    | 8'-10 | 7   | 4.5  | 25'-11 |
| 20-22      | 12 | 5 | 18   | 20   | 9 | 9 | 9 | 1'-9  | 4'-7 | 1'-10 | 4'-8  | 4    | 12       | 8'-1  | 6    | 9   | 8'-1  | 4    | 6   | 20  | 4    | 6   | 11  | 4    | 12  | 22  | 4    | 17  | 20  | 4    | 12  | 26  | 4    | 17  | 20  | 6    | 12  | 25'-11 | 5    | 12  | 11'-2 | 4    | 6   | 6'-2  | 2'-7 | 3'-7  | 5   | 9    | 25'-11 | 7   | 9    | 9'-2  | 7   | 4.5  | 25'-11 |
| 23-25      | 12 | 5 | 19.5 | 21.5 | 9 | 9 | 9 | 1'-7  | 4'-8 | 1'-9  | 4'-10 | 4    | 9        | 8'-4  | 6    | 9   | 8'-4  | 4    | 6   | 20  | 4    | 6   | 11  | 4    | 12  | 22  | 4    | 17  | 20  | 5    | 12  | 26  | 4    | 17  | 20  | 6    | 12  | 25'-11 | 5    | 12  | 11'-4 | 5    | 12  | 6'-8  | 2'-8 | 4'-0  | 5   | 9    | 25'-11 | 7   | 9    | 9'-4  | 7   | 4.5  | 25'-11 |

| Fill  | Bar List |    |       |     |    |       |                  |    |        |               |       |     |    |       |     |    |       |     |     |       |       |       |       |       |        |  |  | Quantities |  |  |  |
|-------|----------|----|-------|-----|----|-------|------------------|----|--------|---------------|-------|-----|----|-------|-----|----|-------|-----|-----|-------|-------|-------|-------|-------|--------|--|--|------------|--|--|--|
|       | m1       | m2 | m4    | m6  | m7 | m9    | Concrete (CY/FT) |    |        | Steel (Lb/FT) |       |     |    |       |     |    |       |     |     |       |       |       |       |       |        |  |  |            |  |  |  |
| Size  | Sp.      | L  | Size  | Sp. | L  | Size  | Sp.              | L  | H      | V             | Size  | Sp. | L  | Size  | Sp. | L  | Size  | Sp. | L   | Slab  | Floor | Walls | Total | Steel |        |  |  |            |  |  |  |
| 0     | 5        | 12 | 26'-5 | 5   | 12 | 9'-1  | 6                | 9  | 10'-10 | 5'-5          | 5'-5  | 5   | 12 | 26'-5 | 5   | 12 | 12'-0 | 5   | 4.5 | 26'-5 | 1.191 | 1.050 | 0.382 | 2.623 | 352.16 |  |  |            |  |  |  |
| 1     | 5        | 12 | 26'-5 | 5   | 12 | 8'-11 | 6                | 9  | 9'-6   | 4'-1          | 5'-5  | 4   | 12 | 26'-5 | 6   | 12 | 11'-0 | 6   | 4.5 | 26'-5 | 1.151 | 1.008 | 0.382 | 2.541 | 353.26 |  |  |            |  |  |  |
| 2     | 6        | 12 | 26'-5 | 5   | 12 | 7'-2  | 6                | 9  | 8'-9   | 3'-6          | 5'-3  | 4   | 9  | 26'-5 | 6   | 9  | 9'-2  | 6   | 4.5 | 26'-5 | 0.867 | 0.885 | 0.382 | 2.134 | 401.18 |  |  |            |  |  |  |
| 3     | 5        | 9  | 26'-5 | 4   | 9  | 6'-9  | 6                | 9  | 8'-7   | 3'-4          | 5'-3  | 4   | 12 | 26'-5 | 7   | 12 | 8'-10 | 7   | 4.5 | 26'-5 | 0.786 | 0.885 | 0.382 | 2.053 | 353.71 |  |  |            |  |  |  |
| 4     | 5        | 9  | 26'-5 | 4   | 9  | 6'-9  | 6                | 9  | 8'-7   | 3'-4          | 5'-3  | 4   | 9  | 26'-5 | 6   | 9  | 8'-2  | 6   | 4.5 | 26'-5 | 0.786 | 0.885 | 0.382 | 2.053 | 353.07 |  |  |            |  |  |  |
| 5-7   | 5        | 9  | 26'-5 | 4   | 9  | 7'-5  | 5                | 6  | 8'-5   | 3'-1          | 5'-4  | 5   | 9  | 26'-5 | 6   | 9  | 8'-4  | 6   | 4.5 | 26'-5 | 0.826 | 0.967 | 0.382 | 2.175 | 368.18 |  |  |            |  |  |  |
| 8-10  | 5        | 9  | 26'-5 | 4   | 9  | 8'-4  | 5                | 6  | 8'-1   | 2'-7          | 5'-6  | 5   | 9  | 26'-5 | 6   | 9  | 8'-2  | 6   | 4.5 | 26'-5 | 0.948 | 1.132 | 0.382 | 2.462 | 375.26 |  |  |            |  |  |  |
| 11-13 | 6        | 12 | 26'-5 | 5   | 12 | 8'-10 | 4                | 6  | 8'-1   | 2'-5          | 5'-8  | 4   | 9  | 26'-5 | 7   | 9  | 8'-6  | 7   | 4.5 | 26'-5 | 1.070 | 1.256 | 0.382 | 2.708 | 362.58 |  |  |            |  |  |  |
| 14-16 | 6        | 12 | 26'-5 | 5   | 12 | 10'-0 | 4                | 6  | 8'-3   | 2'-5          | 5'-10 | 4   | 9  | 26'-5 | 7   | 9  | 8'-10 | 7   | 4.5 | 26'-5 | 1.232 | 1.421 | 0.382 | 3.035 | 374.76 |  |  |            |  |  |  |
| 17-19 | 6        | 12 | 26'-5 | 5   | 12 | 10'-8 | 4                | 6  | 8'-5   | 2'-6          | 5'-11 | 5   | 9  | 26'-5 | 7   | 9  | 9'-0  | 7   | 4.5 | 26'-5 | 1.353 | 1.545 | 0.382 | 3.280 | 398.55 |  |  |            |  |  |  |
| 20-22 | 6        | 12 | 26'-5 | 5   | 12 | 11'-2 | 4                | 6  | 8'-8   | 2'-7          | 6'-1  | 5   | 9  | 26'-5 | 7   | 9  | 9'-4  | 7   | 4.5 | 26'-5 | 1.515 | 1.710 | 0.382 | 3.607 | 404.71 |  |  |            |  |  |  |
| 23-25 | 6        | 12 | 26'-5 | 5   | 12 | 11'-3 | 5                | 12 | 8'-11  | 2'-8          | 6'-3  | 5   | 9  | 26'-5 | 7   | 9  | 9'-8  | 7   | 4.5 | 26'-5 | 1.637 | 1.834 | 0.382 | 3.853 | 415.42 |  |  |            |  |  |  |



- Notes:**
- Dimensions listed on this sheet to be used in conjunction with Sheet TWRCB G3-20.
  - Fill, dimensions "S" and "H" are in feet.
  - Dimensions "A", "B", "C", "D", and "Sp." listed in the bar list are in inches.
  - Dimensions "L", "H", "V" are in feet and inches.

|                             |   |
|-----------------------------|---|
| LATEST REVISION DATE        | <br>IOWADOT Highway Division  |
| APPROVED BY BRIDGE ENGINEER | Standard Design<br><b>Twin Reinforced Concrete Box Culverts</b><br>July, 2020 |
|                             | Culvert Barrel Details<br>12' x 5' Barrel Sections                            |
|                             | TWRCB<br>12-5-20  |

ENGLISH\FDS\DESIGNED\TWIN\CULVERTS.DGN - TWRCB 12-5-20 - THIS SHEET ISSUED 07-2020.