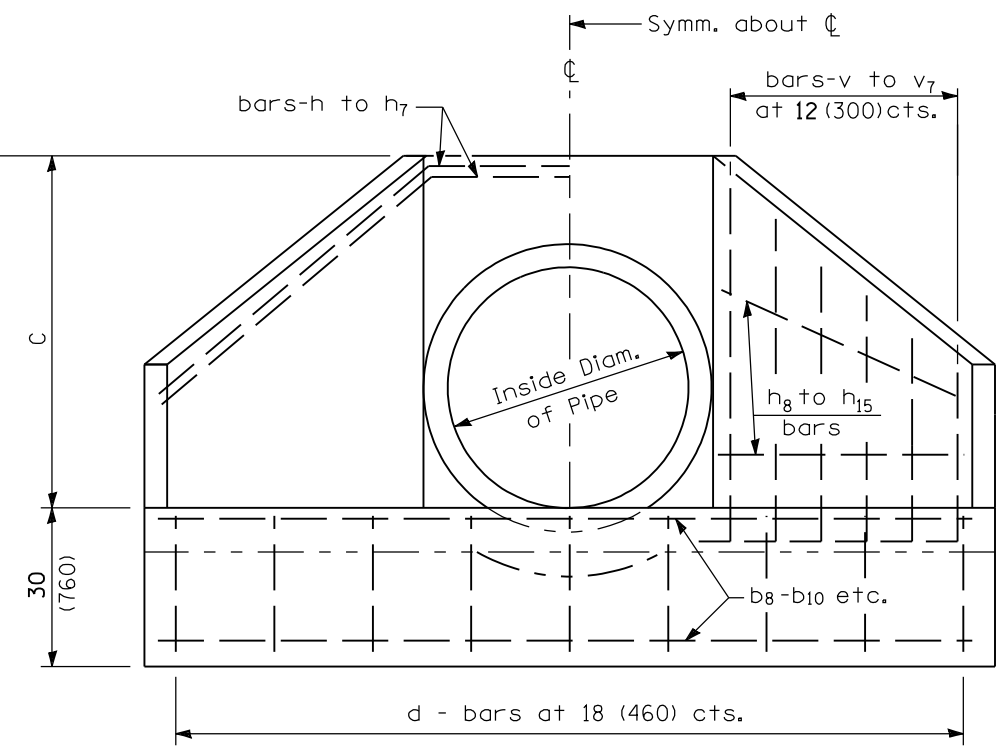
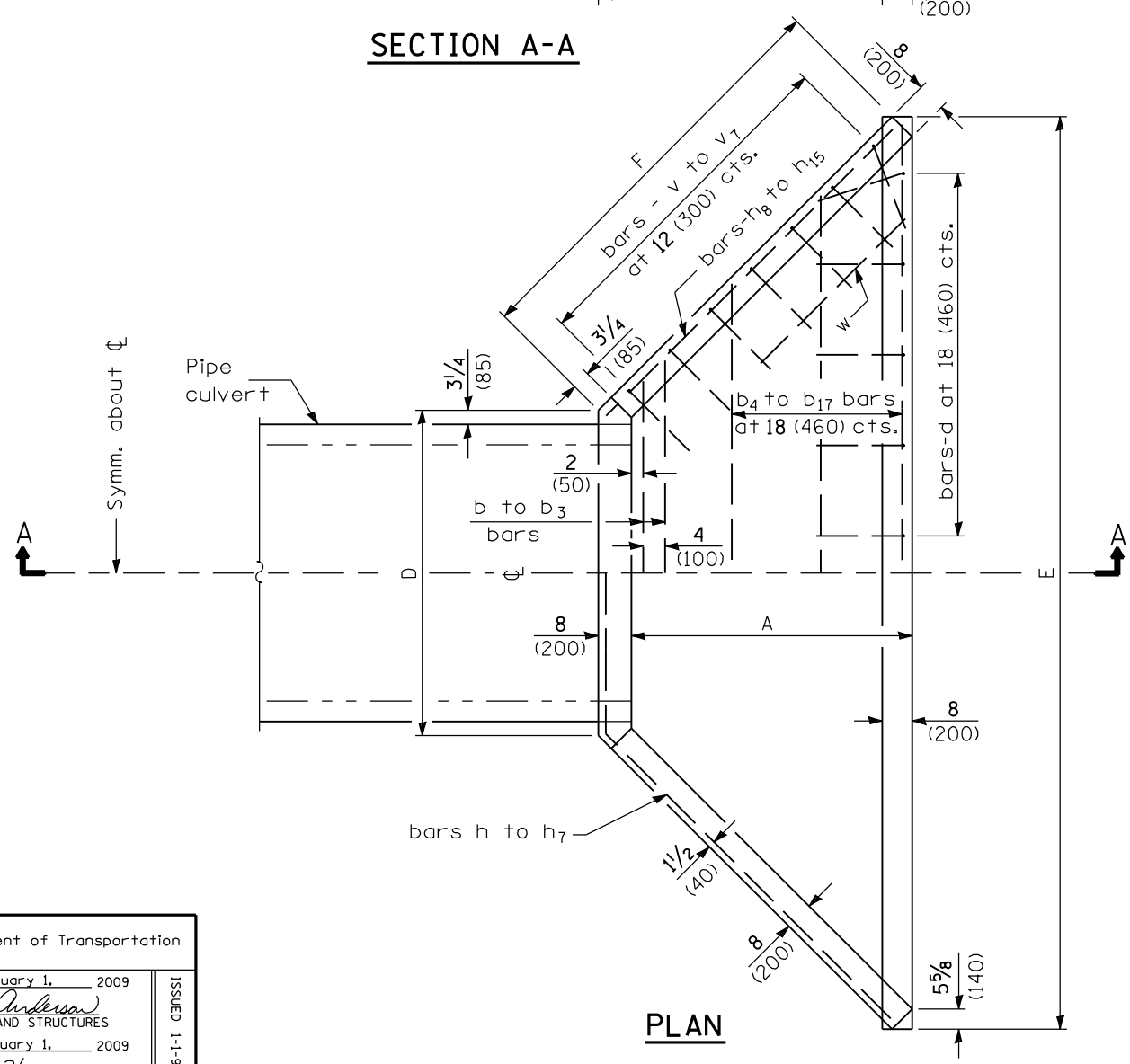


SECTION A-A



END ELEVATION



PLAN

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).
 All dimensions are in inches (millimeters) unless otherwise shown.

| DATE | REVISIONS |
|--------|---|
| 1-1-09 | Switched units to English (metric). |
| 1-1-07 | Soft converted metric reinforcement bars. |

REINFORCED CONCRETE END SECTIONS FOR PIPE CULVERT
42" (1050 mm) THRU 60" (1500 mm) DIA. AT RIGHT ANGLES WITH ROADWAY
 (Sheet 1 of 2)
STANDARD 542106-02

Illinois Department of Transportation

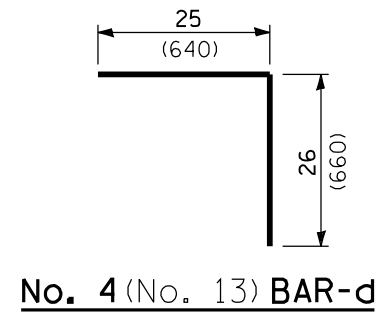
APPROVED January 1, 2009
Ralph E. Anderson
 ENGINEER OF BRIDGES AND STRUCTURES

APPROVED January 1, 2009
Ken E. Han
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-07

DIMENSIONS OF STRAIGHT BARS

| Bar | Size | Length | Bar | Size | Length |
|-----------------|-------------------|--------------------|-----------------|-------------------|--------------------|
| b | No. 5 (No. 16) | 6'-3" (1.9 m) | b ₁₃ | No. 4 (No. 13) | 15'-0" (4.75 m) |
| b ₁ | No. 5 (No. 16) | 6'-9" (2.06 m) | b ₁₄ | No. 4 (No. 13) | 15'-6" (4.72 m) |
| b ₂ | No. 5 (No. 16) | 7'-3" (2.21 m) | b ₁₅ | No. 4 (No. 13) | 16'-6" (5.03 m) |
| b ₃ | No. 5 (No. 16) | 8'-0" (2.44 m) | b ₁₆ | No. 4 (No. 13) | 17'-0" (5.18 m) |
| b ₄ | No. 4 (No. 13) | 8'-3" (2.51 m) | b ₁₇ | No. 4 (No. 13) | 19'-0" (5.79 m) |
| b ₅ | No. 4 (No. 13) | 9'-0" (2.74 m) | h ₈ | No. 4 (No. 13) | 4'-9" (1.45 m) |
| b ₆ | No. 4 (No. 13) | 10'-0" (3.05 m) | h ₉ | No. 4 (No. 13) | 6'-3" (1.9 m) |
| b ₇ | No. 4 (No. 13) | 10'-6" (3.2 m) | h ₁₀ | No. 4 (No. 13) | 5'-3" (1.6 m) |
| b ₈ | No. 4 (No. 13) | 11'-3" (3.43 m) | h ₁₁ | No. 4 (No. 13) | 7'-3" (2.2 m) |
| b ₉ | No. 4 (No. 13) | 12'-0" (3.66 m) | h ₁₂ | No. 4 (No. 13) | 6'-0" (1.83 m) |
| b ₁₀ | No. 4 (No. 13) | 13'-6" (3.96 m) | h ₁₃ | No. 4 (No. 13) | 8'-0" (2.44 m) |
| b ₁₁ | No. 4 (No. 13) | 13'-6" (4.11 m) | h ₁₄ | No. 4 (No. 13) | 6'-6" (1.98 m) |
| b ₁₂ | No. 4 (No. 13) | 14'-3" (4.34 m) | h ₁₅ | No. 4 (No. 13) | 8'-9" (2.67 m) |
| | | | w | No. 4 (No. 13) | 4'-0" (1.22 m) |



BARS IN ONE END SECTION

| 42 Pipe (1050) | | | | 48 Pipe (1200) | | | | 54 Pipe (1350) | | | | 60 Pipe (1500) | | | |
|---------------------|-----|-----------------|-----|--------------------|-----|-----------------|-----|---------------------|-----|-----------------|-----|--------------------|-----|-----------------|-----|
| D42-1/2 (D1.05-1/2) | | D42-2 (D1.05-2) | | D48-1/2 (D1.2-1/2) | | D48-2 (D1.2-2) | | D54-1/2 (D1.35-1/2) | | D54-2 (D1.35-2) | | D60-1/2 (D1.5-1/2) | | D60-2 (D1.5-2) | |
| Bars | No. | Bars | No. | Bars | No. | Bars | No. | Bars | No. | Bars | No. | Bars | No. | Bars | No. |
| d | 8 | d | 9 | d | 9 | d | 10 | d | 10 | d | 12 | d | 11 | d | 13 |
| b | 2 | b | 2 | b ₁ | 2 | b ₁ | 2 | b ₂ | 2 | b ₂ | 2 | b ₃ | 2 | b ₃ | 2 |
| b ₅ | 1 | b ₄ | 1 | b ₇ | 1 | b ₆ | 1 | b ₅ | 1 | b ₅ | 1 | b ₇ | 1 | b ₇ | 1 |
| b ₈ | 2 | b ₈ | 1 | b ₁₀ | 2 | b ₁₀ | 1 | b ₉ | 1 | b ₉ | 1 | b ₁₁ | 1 | b ₁₁ | 1 |
| | | b ₁₁ | 2 | | | b ₁₄ | 2 | b ₁₂ | 2 | b ₁₃ | 1 | b ₁₄ | 2 | b ₁₅ | 1 |
| | | | | | | | | | | b ₁₆ | 2 | | | b ₁₇ | 2 |
| h | 2 | h ₁ | 2 | h ₂ | 2 | h ₁ | 2 | h ₄ | 2 | h ₅ | 2 | h ₆ | 2 | h ₇ | 2 |
| h ₈ | 4 | h ₉ | 4 | h ₁₀ | 4 | h ₉ | 4 | h ₁₂ | 4 | h ₁₃ | 4 | h ₁₄ | 4 | h ₁₅ | 4 |
| v ₃ | 2 | v ₃ | 2 | v ₂ | 2 | v ₂ | 2 | v ₁ | 2 | v ₁ | 2 | v | 2 | v | 4 |
| v ₄ | 2 | v ₄ | 2 | v ₃ | 2 | v ₃ | 4 | v ₂ | 2 | v ₂ | 4 | v ₁ | 2 | v ₁ | 2 |
| v ₅ | 2 | v ₅ | 4 | v ₄ | 2 | v ₄ | 2 | v ₃ | 2 | v ₃ | 2 | v ₂ | 2 | v ₂ | 2 |
| v ₆ | 2 | v ₆ | 2 | v ₅ | 2 | v ₅ | 2 | v ₄ | 2 | v ₄ | 2 | v ₃ | 2 | v ₃ | 4 |
| v ₇ | 2 | v ₇ | 2 | v ₆ | 2 | v ₆ | 4 | v ₅ | 2 | v ₅ | 4 | v ₄ | 2 | v ₄ | 2 |
| | | | | | | | | v ₆ | 2 | v ₆ | 2 | v ₅ | 4 | v ₅ | 4 |
| w | 2 | w | 2 | w | 2 | w | 2 | w | 2 | w | 2 | w | 2 | w | 2 |

DIMENSIONS OF BENT BARS

| No. 5-bars v to v ₇ (No. 16) | | | No. 5-bars h to h ₇ (No. 16) | | | |
|---|-------------------|-------------------|---|--------------------|------------------------|--------------------|
| BARS | c | TOTAL LENGTH | BARS | a | TOTAL LENGTH | |
| v | 6'-0" (1.83 m) | 8'-0" (2.44 m) | h | 4'-8" (1.42 m) | 5'-2" (1.57 m) | 15'-0" (4.56 m) |
| v ₁ | 5'-6" (1.68 m) | 7'-6" (2.29 m) | h ₁ | 4'-8" (1.42 m) | 6'-8" (2.03 m) | 18'-0" (5.48 m) |
| v ₂ | 5'-0" (1.52 m) | 7'-0" (2.13 m) | h ₂ | 5'-3" (1.6 m) | 5'-10 1/2" (1.79 m) | 17'-0" (5.18 m) |
| v ₃ | 4'-6" (1.37 m) | 6'-6" (1.98 m) | h ₃ | 5'-3" (1.6 m) | 7'-6" (2.29 m) | 20'-3" (6.18 m) |
| v ₄ | 4'-0" (1.22 m) | 6'-0" (1.83 m) | h ₄ | 5'-10" (1.78 m) | 6'-7" (2.01 m) | 19'-0" (5.78 m) |
| v ₅ | 3'-6" (1.07 m) | 5'-6" (1.68 m) | h ₅ | 5'-10" (1.78 m) | 8'-4" (2.54 m) | 22'-6" (6.86 m) |
| v ₆ | 36 (920) | 5'-0" (1.53 m) | h ₆ | 6'-5" (1.96 m) | 7'-2" (2.18 m) | 20'-9" (6.32 m) |
| v ₇ | 24 (610) | 4'-6" (1.22 m) | h ₇ | 6'-5" (1.96 m) | 9'-3 1/2" (2.83 m) | 25'-0" (7.59 m) |

DIMENSIONS AND QUANTITIES

| Design No. | Nominal Inside Dia. of Pipe | Slope of Wing Walls | Dimensions | | | | | | Concrete 2 End Secs. cu. yds. (m ³) | Reinf. Bars 2 End Secs. lbs. (kg) |
|---------------------|-----------------------------|---------------------|-------------------|-------------|-----------------------|--------------------|-------------------------|-----------------------|---|-----------------------------------|
| | | | A | B | C | D | E | F | | |
| D42-1/2 (D1.05-1/2) | 42 (1050) | 1:1 1/2 | 3'-4" (1.01 m) | 26 (660) | 4'-4 1/2" (1.33 m) | 4'-10" (1.48 m) | 11'-10 1/2" (3.63 m) | 5'-0" (1.52 m) | 4.8 (3.7) | 330 (150) |
| D42-2 (D1.05-2) | 42 (1050) | 1:2 | 4'-5" (1.35 m) | 26 (660) | 1.33 m (1.33 m) | 4'-10" (1.48 m) | 14'-0 1/2" (4.29 m) | 6'-6 1/4" (1.99 m) | 6.2 (4.7) | 400 (180) |
| D48-1/2 (D1.2-1/2) | 48 (1200) | 1:1 1/2 | 3'-9" (1.14 m) | 29 (740) | 4'-11" (1.5 m) | 5'-5" (1.65 m) | 13'-3 1/2" (4.05 m) | 5'-7" (1.7 m) | 5.8 (4.4) | 360 (163) |
| D48-2 (D1.2-2) | 48 (1200) | 1:2 | 5'-0" (1.52 m) | 29 (740) | 4'-11" (1.5 m) | 5'-5" (1.65 m) | 15'-9 1/2" (4.82 m) | 7'-4 1/4" (2.24 m) | 7.6 (5.8) | 460 (210) |
| D54-1/2 (D1.35-1/2) | 54 (1350) | 1:1 1/2 | 4'-2" (1.27 m) | 32 (815) | 5'-5 1/2" (1.66 m) | 6'-0" (1.83 m) | 14'-8 1/2" (4.49 m) | 6'-2" (1.88 m) | 6.8 (5.2) | 430 (195) |
| D54-2 (D1.35-2) | 54 (1350) | 1:2 | 5'-7" (1.7 m) | 32 (815) | 5'-5 1/2" (1.66 m) | 6'-0" (1.83 m) | 17'-6 1/2" (5.35 m) | 8'-2" (2.49 m) | 9.2 (7.0) | 550 (250) |
| D60-1/2 (D1.5-1/2) | 60 (1500) | 1:1 1/2 | 4'-7" (1.4 m) | 35 (890) | 6'-0" (1.83 m) | 6'-7" (2.0 m) | 16'-1 1/2" (4.91 m) | 6'-9" (2.06 m) | 8.0 (6.1) | 490 (223) |
| D60-2 (D1.5-2) | 60 (1500) | 1:2 | 6'-2" (1.88 m) | 35 (890) | 6'-0" (1.83 m) | 6'-7" (2.0 m) | 19'-3 1/2" (5.88 m) | 9'-0" (2.74 m) | 10.8 (8.3) | 630 (285) |

