Iowa Department of Transportation

Highway Division

TRIPLE REINFORCED CONCRETE BOX CULVERT STANDARDS

GENERAL NOTES:

1. THE RCB CULVERT SECTIONS ARE DESIGNED FOR HS20-44 LIVE LOAD AND EARTH FILLS OF VARYING HEIGHTS.
2. THE MAXIMUM SERVICE LOAD STRESS (ksi) IN THE REINFORCING STEEL FOR CRACK CONTROL SHALL BE:
   $f_{sa} = 170 / \sqrt[3]{dcA}$
   dc AND A ARE IN INCHES AND INCHES^2 RESPECTIVELY
3. METAL BAR CHAIRS SPACED AT NOT OVER 3'-0 C-C IN EITHER DIRECTION ARE TO BE USED TO SUPPORT ALL SLAB AND FLOOR STEEL AS OUTLINED IN THE STANDARD SPECIFICATIONS (ARTICLE 2404.07).
4. THE CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR EDGE OR END OF REINFORCING BAR TO BE 2" UNLESS OTHERWISE NOTED.
5. LONGITUDINAL REINFORCING IS NOT TO EXTEND THRU THE CONSTRUCTION JOINTS, EXCEPT FOR 5r1 DOWEL BARS IN SLAB.
6. ALL REINFORCING STEEL IS TO BE SECURELY WIRED IN PLACE BEFORE THE CONCRETE IS POURED (ARTICLE 2404.06).
7. FLOOR OF BARREL IS TO BE FINISHED SMOOTH. SIDES OF FOOTING ARE TO BE FORMED TO INSURE CORRECT LINE AND GRADE.
8. ALL EXPOSED CORNERS 90° OR SHARPER TO BE FILLETED WITH A $\frac{3}{4}$" DRESSED AND BEVELED STRIP.
9. THE PERMISSIBLE CONSTRUCTION JOINT AT THE TOP OF THE WALLS MAY BE LOWERED AT THE CONTRACTOR'S OPTION WITH ENGINEERS APPROVAL.
10. THE REINFORCEMENT SUPPLIED FOR THIS STRUCTURE SHALL BE GRADE 60 REINFORCEMENT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE DESIGN STRESSES ARE BASED ON 60 GRADE REINFORCEMENT.
11. THE VERTICAL BARS IN THE WALLS MAY BE SPLICED ABOVE THE FOOTING AT THE CONTRACTOR'S OPTION AS FOLLOWS:

BAR SIZE NUMBER	4	5	6	7	8
MINIMUM SPLICE LENGTH	21"	26"	31"	43"	55"

   THIS SPLICE, IF USED WILL BE AT THE CONTRACTOR'S EXPENSE.
12. REINFORCING BAR CLEARANCES WILL BE AS FOLLOWS:
    EDGE CLEARANCES: 2" EXCEPT
    TOP OF FLOOR $2\frac{1}{4}$" TO NEAR TRANSV. REINF. BAR
    BOTTOM OF FLOOR $3\frac{1}{2}$" TO NEAR TRANSV. REINF. BAR
    END CLEARANCES:
    VERTICAL TOP 2"
    VERTICAL BOTTOM 3" OR $3\frac{1}{2}$" IF OVERALL HEIGHT OF THE CULVERT IN NOT TO A FULL INCH
    TRANSVERSE 2"
13. ALL CONSTRUCTION JOINTS SHALL BE FORMED WITH A BEVELED KEYWAY EXCEPT AT BELL JOINTS.

    KEYWAY DIMENSIONS SHOWN ON THE PLANS ARE BASED ON NOMINAL DIMENSIONS UNLESS STATED OTHERWISE. IN ADDITION, THE BEVEL USED ON THE KEYWAY SHALL BE LIMITED TO A MAXIMUM OF 10 DEGREES FROM VERTICAL.

    ALL BEVELED KEYWAYS SHALL BE CENTERED.

    KEYWAY SIZE SHALL BE 2x4 EXCEPT AS FOLLOWS :
    KEYWAY BETWEEN THE FLOOR AND WALL SHALL BE 2x6 WHEN THE WALL IS GREATER THAN 10 INCHES WIDE.
14. IF 0 FT. OF FILL IS SPECIFIED, DETAILS FOR PAVING NOTCH AND REFERENCE TO EPOXY COATING OF SLAB REINFORCING STEEL, IF APPLICABLE, SHALL BE INCLUDED IN THE FINAL PLANS.
15. ALL DIMENSIONS ARE IN FEET AND INCHES UNLESS OTHERWISE NOTED OR SHOWN.

SPECIFICATIONS:

DESIGN: AASHTO SERIES OF 1992, EXCEPT AS MODIFIED IN GENERAL NOTES 2 ABOVE.
CONSTRUCTION: STANDARD SPECIFICATIONS OF THE IOWA DEPARTMENT OF TRANSPORTATION SPECIFICATION, CURRENT SERIES, PLUS CURRENT SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.

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DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 1992.
REINFORCING STEEL IN ACCORDANCE WITH SECTION 8, GRADE 60.
CONCRETE IN ACCORDANCE WITH SECTION 8, f'c = 3,500 PSI.

LATEST REVISION DATE : 01-09

APPROVED BY :

STANDARD DESIGN

GENERAL INFORMATION

FOR

TRIPLE REINFORCED CONCRETE BOX CULVERTS

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

SEPT., 2001

TRRCB-GI-01

REVISED 01-09 - CHANGED GENERAL NOTE 13 TO EXPLAIN KEYWAY SIZE.
ENGLISHSIGNEDTRIPLECULVERTS.DGN - TRRCB-GI-01 - 09-01 THIS SHEET ISSUED.