Iowa Department
of Transportation
Project Development Division

TWIN REINFORCED CONCRETE BOX CULVERT STANDARDS

GENERAL NOTES:

1. THE RCB CULVERT SECTIONS ARE DESIGNED FOR MS18 LIVE LOAD AND EARTH FILLS OF VARYING HEIGHTS.
2. THE MAXIMUM SERVICE LOAD STRESS (MPa) IN THE REINFORCING STEEL FOR CRACK CONTROL SHALL BE:
   $fsa = 29\ 800 / \sqrt[3]{dcA}$;
   dc AND A ARE IN mm AND mm^2 RESPECTIVELY.
3. METAL BAR CHAIRS SPACED AT NOT OVER 900 mm 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 50 mm UNLESS OTHERWISE NOTED.
5. LONGITUDINAL REINFORCING IS NOT TO EXTEND THRU THE CONSTRUCTION JOINTS, EXCEPT FOR r1 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 20 mm DRESSED AND BEVELED STRIP.
9. THE PERMISSIBLE CONSTRUCTION JOINT AT THE TOP OF THE WALLS MAY BE LOWERED AT THE CONTRACTOR'S OPTION WITH ENGINEER'S APPROVAL.
10. THE REINFORCEMENT SUPPLIED FOR THIS STRUCTURE SHALL BE GRADE 400 REINFORCEMENT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE DESIGN STRESSES ARE BASED ON 400 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	15	20	25	30
MINIMUM SPLICE LENGTH	640 mm	790 mm	1320 mm	1850 mm

   THIS SPLICE, IF USED, WILL BE AT THE CONTRACTOR'S EXPENSE.
12. REBAR CLEARANCES WILL BE AS FOLLOWS:

VERTICAL, TOP	50 mm
VERTICAL, BOTTOM	90 mm, OR 75 mm IF THE OVERALL HEIGHT OF THE CULVERT IS NOT IN 10 mm INCREMENTS
TRANSVERSE	50 mm
EDGE CLEARANCES	50 mm, EXCEPT, TOP OF FLOOR 60 mm TO NEAR TRANSVERSE REINF BAR OR BOTTOM OF FLOOR 90 mm TO NEAR TRANSVERSE REINF BAR.

13. ALL CONSTRUCTION JOINTS SHALL BE FORMED WITH A BEVELED KEYWAY EXCEPT AT BELL JOINTS.

   ALL BEVELED KEYWAYS SHALL BE CENTERED.

   KEYWAY SIZE SHALL BE 50 mm x 100 mm EXCEPT AS FOLLOWS :
   KEYWAY BETWEEN THE FLOOR AND WALL SHALL BE 50 mm x 150 mm WHEN THE WALL IS GREATER THAN 255 mm WIDE.
14. IF 0 mm 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 MILLIMETERS (mm) 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.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 1992. DESIGN STRESSES HAVE BEEN CONVERTED TO A METRIC VERSION.
REINFORCING STEEL IN ACCORDANCE WITH SECTION 8, GRADE 400.
CONCRETE IN ACCORDANCE WITH SECTION 8, f'c = 24 MPa.

INDEX FOR CULVERT STANDARDS :

MTWRCB 2400-1800-95	CULVERT BARREL DETAILS, VARIABLE DIMENSIONS AND QUANTITIES TABLES - 2400 mm SPANS.
MTWRCB 2400-2400-95	CULVERT BARREL DETAILS, VARIABLE DIMENSIONS AND QUANTITIES TABLES - 2400 mm SPANS.
MTWRCB 2400-3000-95	CULVERT BARREL DETAILS, VARIABLE DIMENSIONS AND QUANTITIES TABLES - 2400 mm SPANS.
MTWRCB 3000-1800-95	CULVERT BARREL DETAILS, VARIABLE DIMENSIONS AND QUANTITIES TABLES - 3000 mm SPANS.
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MTWRCB 3000-3000-95	CULVERT BARREL DETAILS, VARIABLE DIMENSIONS AND QUANTITIES TABLES - 3000 mm SPANS.
MTWRCB 3000-3600-95	CULVERT BARREL DETAILS, VARIABLE DIMENSIONS AND QUANTITIES TABLES - 3000 mm SPANS.
MTWRCB 3600-1800-95	CULVERT BARREL DETAILS, VARIABLE DIMENSIONS AND QUANTITIES TABLES - 3600 mm SPANS.
MTWRCB 3600-2400-95	CULVERT BARREL DETAILS, VARIABLE DIMENSIONS AND QUANTITIES TABLES - 3600 mm SPANS.
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MTWRCB 3600-3600-95	CULVERT BARREL DETAILS, VARIABLE DIMENSIONS AND QUANTITIES TABLES - 3600 mm SPANS.
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MTWH 0-3-95	TYPICAL VIEW - FRONT & BACK FACE REINFORCING, CENTER WALL, TYPICAL SECTION - NEAR CENTER OF APRON, TOP OF WINGWALL DETAILS AND SECTION THRU PARAPET.
MTWH 0-4-95	BENT BAR DETAILS, BILL OF REINFORCING FOR ONE HEADWALL, 0° SKEW - 3600 mm AND 3000 mm SPANS.
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MTWH 15-2-95	PLAN VIEW - APRON REINFORCING, TOP & BOTTOM.
MTWH 15-3-95	TYPICAL SECTION - NEAR CENTER OF APRON, TOP OF WINGWALL DETAILS, SECTION THRU PARAPET, AND CURTAIN WALL DETAILS.
MTWH 15-4-95	TYPICAL VIEW - FRONT & BACK FACE REINFORCING, SHORT & LONG WINGWALL, AND CENTER WALL.
MTWH 15-5-95	BENT BAR DETAILS, BILL OF REINFORCING FOR ONE HEADWALL, 15° SKEW - 3600 mm AND 3000 mm SPANS.
MTWH 15-6-95	BENT BAR DETAILS, BILL OF REINFORCING FOR ONE HEADWALL, 15° SKEW - 2400 mm SPANS.
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MTWH 30-2-95	PLAN VIEW - APRON REINFORCING, TOP & BOTTOM.
MTWH 30-3-95	TYPICAL SECTION - NEAR CENTER OF APRON, TOP OF WINGWALL DETAILS, SECTION THRU PARAPET, AND CURTAIN WALL DETAILS.
MTWH 30-4-95	TYPICAL VIEW - FRONT & BACK FACE REINFORCING, SHORT & LONG WINGWALL, AND CENTER WALL.
MTWH 30-5-95	BENT BAR DETAILS, BILL OF REINFORCING FOR ONE HEADWALL, 30° SKEW - 3600 mm AND 3000 mm SPANS.
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MTWH 45-7-95	BENT BAR DETAILS, BILL OF REINFORCING FOR ONE HEADWALL, 45° SKEW - 2400 mm SPANS.
MTWCBJ 1-95	CULVERT BELL JOINT DETAILS AND ESTIMATE OF QUANTITIES TABLE - 2400 mm SPANS.
MTWCBJ 2-95	CULVERT BELL JOINT DETAILS AND ESTIMATE OF QUANTITIES TABLE - 3000 mm & 3600 mm SPANS.
MTWCBJ 3-95	PERMISSIBLE CULVERT BELL JOINT DETAILS.

LATEST REVISION DATE : 04-02
APPROVED BY :

STANDARD DESIGN
GENERAL INFORMATION
FOR
TWIN REINFORCED CONCRETE BOX CULVERTS

PROJECT DEVELOPMENT DIVISION
IOWA DEPARTMENT OF TRANSPORTATION

JULY, 1995

MTWRCB-GI-95

REVISED : 12/96 ; GENERAL NOTE #13 CHANGED.
REVISED 04-02 - ADDED TWCBJ3M.S01 STANDARD SHEET. GENERAL NOTE 12 CHANGED THE BOTTOM VERTICAL CLEARANCE TO 90 mm.
TWRCBGIM.S01

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