

Figure 5-395.102

Precast Concrete End Section Type I – Single or Double Barrel For Skews Up To 7¹/₂°

Approved, and signed, March 24, 2011. Last date revised: February 22, 2018.

Revised 02-22-2018

Under CONSTRUCTION NOTES:

- Replaced numbered note ⑤, new note reads: “Welded wire reinforcement of equal area may be substituted for rebar.”
- Added numbered note ⑩ “Refer to spec. 2412 for sealant requirements.”

At the SIDE ELEVATION:

- Changed the reinforcement in the drop wall from one row of no. 4 bars at 5” clear to two rows of no. 3 vertical and horizontal bars at 2” clear. Changed accompanying notes to match the reinforcement change.

At TONGUE AND GROOVE JOINT DETAIL:

- Added sealant bead in the joint and added leader line to note ⑩.

Revised 10-09-2015

At PLAN VIEW:

- Changed note above diagram from “Culvert ties are to be 1” dia. rods. See standard plate no. 3145 for connection details (typ.). Two ties are required per joint where h is greater than 4’.” to “Use 1” dia. Culvert ties. See standard plate no. 3145 for connection details (typ.). Use two ties per joint where h is greater than 4’.”

At SECTION A-A:

- Changed note: “1’-0” MAX. RADIUS (TYP.)” to “RADIUS (7” MIN., 1’-0” MAX.) OR CHAMFER (4” MIN., 7” MAX.) (TYP.)”

At FABRIC LAYER DETAIL:

- Changed the title of “FABRIC LAYER DETAIL” to “REINFORCEMENT LAYER DETAIL”.
- Changed all cases of “welded wire fabric” to “welded wire reinforcement” in notes and text.

Under CONSTRUCTION NOTES:

- Added second note “Use concrete mix no. 3W82 with no calcium chloride allowed.
- Added seventh note: “Maximum size of reinforcement bars is no. 6, except no. 7 or 8 bars may be used for Atb on spans greater than 14’. The maximum welded wire reinforcement size is W23 per layer (maximum of two layers).”
- Changed third and fourth sentences of circled note ① from “Limits of excavation for dropwall to be approximately the same as dropwall dimensions. Dropwall to be concrete mix no. 1A43 or mix no. 3Y43.” to “Limits of excavation for dropwall are approximately the same as dropwall dimensions. Dropwall concrete mix is 3S52, or 3Y82 if precast.” Concrete mix designations changed to match 2016 spec. book.
- Changed circled note ③ from “Fill hole with grout. Grout shall consist of 1 part cement and 2 parts sand. Use type 1A air entrained Portland cement. Grout mix shall have a maximum slump of 4’.” to “Fill hole with grout. Grout consists of 1 part cement and 2 parts sand. Use type 1A air entrained Portland cement. Grout mix maximum slump is 4’.”
- Changed “welded wire fabric” to “welded wire reinforcement” both times it appears in circled note ⑤.
- Changed “Longitudinal reinforcement perpendicular to the culvert span shall have a minimum . . .” to “Place longitudinal reinforcement perpendicular to the culvert span with a minimum . . .” in circled note ⑥.

Revised 11-06-2013

At PLAN VIEW:

- Added to the tie bar note: “Two ties are required per joint where h is greater than 4’.”
- Changed the dimensions “W” to “SPAN”.

At SECTION A-A and SECTION B-B:

- Changed the haunch bar note to identify the length of the haunch bar based on wall or slab thickness.

At SECTION A-A:

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- Changed the dimensions “H” to “RISE” and “W” to “SPAN”.

At the TOUNGE and GROOVE JOINT DETAIL:

- Added “Bottom Slab Only” to the end of the welded wire fabric note.

At SIDE ELEVATION:

- Changed the dimensions “H” to “RISE”.
- Removed two notes from the detail at the culvert tie locations: (note 1) “Not required if height h is less than 4’-0”. (note 2) Two culvert ties are required.

At CONSTRUCTION NOTES:

- Added the word “Standard” to precede the figure number in all instances.
- Changed numbered note ④ to read: 3’-6” min. tongue and 3’-7” min. groove for culverts with 6’-0” spans. 5’-0” min. tongue and 5’-1” min. groove for culverts with spans greater than 6’-0”. Center tongue and groove on centerline of each apron joint. Tongue and groove joint on all three sides of apron is permissible.
- Added to numbered note ⑥: Bottom slab thickness may be increased up to 2” max. provided concrete cover is 1 ½” min., 2” max.

At the APRON DIMENSIONS & Ah REINFORCENENT table:

- Added to the table, an option in parenthesis for a 4’-0” end section when spans are 14’-0” and 16’-0”.
- Added to the note below the table: Values in () may be used for end sections with spans of 14’ and 16’ only.

At the “Att, Atb Reinforcement and Abt Reinforcement tables:

- Changed the “WIDTH” column to “SPAN”.

Updated the signature block to make it similar to other standards.

Revised 04-17-2013

This standard was updated to convert reinforcing bar marks from metric to U.S. customary bar designations.

Re-Approved 03-24-2011

Under CONSTRUCTION NOTES:

- Numbered note ⑥ was added: “Apron top and bottom slab thickness may be 8” for culverts with 6’ spans only.”
- Numbered note ⑦ was added: “10” minimum top slab for 14’ and 16’ spans.”
- The 4th general note was moved and is now numbered note ⑧. It was changed to read: “Longitudinal reinforcement perpendicular to the culvert span shall have a minimum of 0.06 square inches per peripheral foot on all faces of the barrel.”

At PLAN VIEW:

- The note: “3” dia. hole in lintel beam ③” has changed To: “3” dia. hole in curb ③.
- Added the note: “No. 13 bent bars (typ.)” with circle and leader line.
- Lengthened the culvert ties at the apron to box location to match the other ties in the view.

At the TONGUE AND GROOVE JOINT DETAIL:

- Changed the note from: “0.192 sq. in²/ft. “ To: “Abt”
- Added numbered note ⑥ to the 10” dimension.

At the SIDE ELEVATION:

- Added the word “CURB” under the 1’-0” dimension line at the curb.
- Added the numbered notes ⑥ and ⑦ under the 9” dimension line at the lintel beam.
- Added the numbered note ⑥ under the 10” bottom of the apron dimension on both ends.
- Changed the note from: “No 13 dowels 1’-0” long” To: “No 19 dowels 1’-0” long” at the apron/drop wall location. Also added the note: “May drill and grout ③” at the apron/drop wall location.
- Lengthened the culvert tie at the apron to box location to represent the actual size.

At the FABRIC LAYER DETAIL:

- Changed the words “MESH” or “STEEL FABRIC” to “WELDED WIRE FABRIC” throughout the detail.

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At SECTION A-A:

- Shortened the No. 10 haunch bars in the view to more accurately show the length. Also added a circled leader line at the end of one of the haunch bars with the note “Haunch bar to extend to, but not past, outside reinforcing (typ.)”
- Added numbered note ⑥ with leader lines circling the longitudinal reinforcement.
- Changed the designation of the top/outside transverse reinforcement from: “At” To: “Att”
- Changed the designation of the top/inside transverse reinforcement from: “Ab” To: “Atb”
- Changed the designation of the bottom/inside transverse reinforcement from: “0.192 in.²/ft.” To: “Abt”
- Added the word “CURB” to the right side of the view.
- Added the numbered notes ⑥ and ⑦ under the 9” dimension line at the lintel beam.
- Added the numbered note ⑥ adjacent to the 10” bottom of the apron dimension.

At SECTION B-B:

- Shortened the No. 10 haunch bars in the view to more accurately show the length. Also added a circled leader line at the end of one of the haunch bars with the note “Haunch bar to extend to, but not past, outside reinforcing (typ.)”
- Added numbered note ⑥ with leader lines circling the longitudinal reinforcement.

At SECTION B-B (cont’d):

- Changed the designation of the bottom/inside transverse reinforcement from: “0.192 in.²/ft.” To: “Abt”
- Added the numbered note ⑥ adjacent to the 10” bottom of the apron dimension.

At the At, Ab Reinforcement Table:

- Changed the title of the table from: “At, Ab Reinforcement” To: “Att, Atb Reinforcement”. Also added an additional row to the table : Width = 16’, Att = 1.52 and Atb = 2.09

Added: A new table labeled “Abt Reinforcement” with reinforcement areas based on fabricator input.

06-30-2003

At SECTION B-B: Drew chamfer at top-outside edges.

Approved, and signed, December 11, 2000