

DESIGN CHECKLIST - CONCRETE CHANNEL LINING DESIGN

7/23/01

Harris County Flood Control District is providing this Design Checklist for Concrete Channel Lining to the Design Engineer as a minimum guide for preparation of Construction Plans. All concrete reinforcement shown on the channel lining detail sheet is for graphical purposes. The Design Engineer is responsible for ensuring the details are complete and adequate for the design. For convenience, the District has listed some of the items that should be addressed:

A. Typical Trapezoidal Channel Lining (Plan)

- _____ Design and dimension the required riprap. Specify riprap grade and specify geotextile fabric, if geotextile is recommended.
- _____ Specify weep hole locations and spacing.
- _____ Specify channel bottom width.
- _____ Verify if grade beams are required.
- _____ Specify stair locations and width on plan and profile sheets, as required.
- _____ Specify reinforcing steel for toewall, including thickness and depth of toewall on Section A.

B. Typical Trapezoidal Channel Lining (Half Section)

- _____ Design and specify reinforcing steel (including minimum clearances).
- _____ Dimension concrete section.
- _____ Determine if a thickened bottom section is required as shown. If so, dimension and specify limits. If not, modify the drawing to show a uniform slab thickness.
- _____ Specify side slopes.
- _____ Specify weep hole locations.
- _____ Specify construction and/or keyed joint locations. (Note: Construction or keyed joints are not to be located at the toe of the channel lining).
- _____ Specify minimum seal slab thickness (4-inch minimum required).

C. Typical Low Flow Channel with Channel Lining (Half Section)

- _____ Design and specify reinforcing steel (including minimum clearances).
- _____ Dimension concrete section.
- _____ Specify side slopes.
- _____ Specify weep hole locations.
- _____ Specify minimum seal slab thickness (4-inch minimum required).
- _____ Specify construction and/or keyed joint location (Note: Construction or keyed joints are not to be located in the corners of the low flow section).
- _____ Specify structural backfill material per Section 02316 – Structural Excavating and Backfilling.

D. Typical Channel Lining (Section)

- _____ Design and specify reinforcing steel (including minimum clearances).
- _____ Specify minimum channel lining thickness (5-inch minimum required).
- _____ Specify side slopes.
- _____ Specify weep hole locations.

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E. Pipe Outfall Details

- _____ Design and specify reinforcing steel (including minimum clearances).
- _____ Design and specify diagonal steel reinforcement.
- _____ Verify the outfall pipe flowline is 1 foot (minimum) above the channel flowline or 1 foot above normal water surface elevation.
- _____ Design thickened section around pipe opening. Verify minimum dimensions are adequate for design application.
OR
Provide alternative design to tie outfall into channel lining.

NOTE: Individually design pipe outfalls with a diameter greater than 42 inches and all outfalls of reinforced concrete pipe. Provide the details elsewhere in the Plans. Headwall construction located flush with channel lining and a concrete flume is a preferable design.

NOTE: Individually design all box culvert outfalls and provide the details on appropriate sheets in the Plans. Headwall construction with wingwalls and an apron is a preferable design. The Texas Department of Transportation's standard headwall design is acceptable.

F. Construction Joints/Expansion Joints/Control Joints

- _____ Designate type of joint to be used. Cross out one not to be used (construction or expansion).
- _____ Specify joint material (red wood etc.).
- _____ Specify minimum and maximum distance between construction or expansion joints in Note 7.

G. Stair Detail

- _____ Design and specify reinforcing steel (including minimum clearances).
- _____ Dimension channel lining thickness.
- _____ Dimension riser and tread.
- _____ For stairs to be located in a low flow channel section, provide additional details.

H. Grade Beam Detail

- _____ Design and specify reinforcing steel (include minimum clearances).
- _____ Dimension grade beam.
- _____ Design and specify grade beam spacing in Note 6.

I. Weep Hole Details

- _____ For type "C" weep holes, specify type of material and verify availability of continuous water transmitting core.
- _____ Specify filter fabric with compatible AOS for adjacent soils.
- _____ Specify filter fabric minimum EOS, maximum EOS and weight.