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These sizes are restricted to inlet and outlet treatment for water management systems or similar applications.

Values shown for estimating pipe quantities and are for information only.

NOTE: See Sheets 6 and 7 for details and general notes.

REMARKS

SINGLE AND MULTIPLE ROUND CORRUGATED METAL PIPE

SECTION

TOP VIEW-SINGLE PIPE

TOP VIEW-MULTIPLE PIPE

SIDE DRAIN MITERED END SECTION

INDEX NO. 273

SHEET NO. 2 of 7

DESIGN STANDARDS

2016

DESCRIPTION:

LAST REVISION 07/02/02
DIMENSIONS & QUANTITIES

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NOTE: See Sheets 6 and 7 for details and general notes.

SINGLE AND MULTIPLE CORRUGATED METAL PIPE-ARCH

SIDE DRAIN MITERED END SECTION

SLOPE Varies
See Ditch Transition And
Pavement Modification

TOP VIEW-SINGLE PIPE

TOP VIEW-MULTIPLE PIPE

SECTION

Pipe Culvert

Construction Joint Permitted

Construction Joint Permitted

Concrete Slab, 3" Thick, Reinforced
With WWF 6x6-W1.4xW1.4

Concrete Slab, 3" Thick, Reinforced
With WWF 6x6-W1.4xW1.4

SIDE DRAIN MITERED END SECTION

INDEX

NO. 273

SHEET NO. 3 of 7
FOR ALL SIZES OF SINGLE AND MULTIPLE DRAIN PIPE FASTENER UNIT

DETAILS FOR CONCRETE & CORRUGATED METAL PIPE
Notes:
- Anchors required for CMP only.
- Anchor, washer and nuts to be galvanized steel.
- Bend anchor where required to center in concrete slab.
- Damaged surfaces to be repaired after bending.
- Anchors are to be spaced a distance equal to four (4) corrugations.
- Place the anchors in the outside crest of corrugation.
- Flat washer to be placed on inside wall of pipe.
- Notes in the mitered end pipe are to be drilled or punched; burning not permitted.

ANCHOR DETAIL

FOR SINGLE & MULTIPLE DRAIN PIPE

GRATE DETAIL

See General Notes, Sheet 7.

CONCRETE PIPE CONNECTOR DETAIL

DETAILS FOR CONCRETE & CORRUGATED METAL PIPE

SIDE DRAIN MITERED END SECTION
1. Unless otherwise designated in the plans, concrete pipe mitered and sections may be used with any type of side drain pipe; corrugated steel pipe mitered end sections may be used with any type of side drain pipe except aluminum pipe; and, corrugated aluminum mitered end sections may be used with any type of side drain pipe except steel pipe. When bituminous coated metal pipe is specified for side drain pipes, mitered end sections shall be constructed with the pipe or concrete pipe. When the mitered end section pipe is dissimilar to the side drain pipe, a concrete jacket shall be constructed in accordance with Index No. 280.

2. Corrugated polyethylene pipe (HDPE), polyvinyl-chloride pipe (PVC) and polypropylene pipe (PP) for side drain applications shall utilize either corrugated metal or concrete mitered end sections (MES). When used in conjunction with corrugated (MES), connection shall be by either a formed metal band specifically designated to join HDPE or PVC pipe, with metal pipe or other coupling approved by the State Drainage Engineer. When used in conjunction with a concrete (MES), connection shall be by concrete jacket constructed in accordance with Index No. 280.

3. Concrete pipe used in the assembly of mitered end sections shall be of select lengths to avoid excessive connections.

4. Corrugated metal pipe galvanizing that is damaged during beveling and perforating for mitered end section shall be repaired.

5. That portion of corrugated metal pipe in direct contact with the concrete slab and extending 12” beyond shall be bituminous coated prior to placing of the concrete.

6. In critical hydraulic locations, gratings shall not be used until potential debris transport has been evaluated by the drainage engineer and appropriate adjustments made. Ditch transitions shall be used on all grades in excess of 3% or pipe with less than 1.5’ of cover and grades in excess of 1% will require such an evaluation (General Note 9).

7. The reinforced concrete slab shall be constructed for all sizes of side drain pipe and cast in place with Class B6 concrete.

8. Round pipe size 30” or greater, pipe-arch size 35”x24” or greater and elliptical pipe 19”x30” or greater shall be grouted unless excepted in the plans. Smaller sizes of pipe shall be grouted only when called for in plans. The lower grate on trailing downstream ends on divided highways shall be omitted.

9. Grates are to be fabricated from steel ASTM A53, Grade B, pipe. The lower grate on all traffic approach ends shall be Schedule 80 and all remaining grates shall be Schedule 40. Grates subject to salt free and corrosive free environment may be fabricated from galvanized pipe, with base metal exposed during fabrication repaired as specified in Section 562, Standard Specifications; or, fabricated from black pipe and hot dip galvanized after fabrication in accordance with ASTM A123. Grates subject to salt water or highly corrosive environment shall be hot dip galvanized after fabrication in accordance with ASTM A123.

10. Ditch transitions shall be used on grades in excess of 3% as directed by the Engineer.

11. The project engineer shall contact the District Drainage Engineer for possible alternate treatment prior to constructing side drain mitered end sections where a minimum spacing of 30’ will not result between the toe points of the mitered end sections.

12. The grates, fasteners, reinforcing, connectors, anchors, concrete, sealants, jackets and coupling bands shall be included in the cost for the mitered end section. Sodding shall be paid for separately under the contract unit price for Performance Turf, SY.

13. Mitered end sections shall be paid for under the contract unit price for Mitered End Section (SD), Ea., based on each independent pipe end.

NOTES & INFORMATION

1. In critical hydraulic locations, gratings shall not be used until potential debris transport has been evaluated by the drainage engineer and appropriate adjustments made. Ditch grades in excess of 3% or pipe with less than 1.5’ of cover and grades in excess of 1% will require such an evaluation (General Note 9).

2. The design engineer shall determine highly corrosive locations and specify in the plans when the grate shall be hot-dip galvanized after fabrication (General Note 10).

3. The design engineer shall determine and designate in the plans which alternate types of mitered end section will not be permitted. The restriction shall be based on corrosive or structural requirements.