1. Flared end sections shall conform to the requirements of ASTM C756 with the exception that dimensions and reinforcement shall be as described in the table above. Circumferential reinforcement may consist of either one cage or two cages of steel. Compressive strength of concrete shall be 4000 psi. Stop drawings for flared end sections having dimensions other than above must be submitted for approval to the State Drainage Engineer.

2. Connections between the flared end section and the pipe culvert may be of any of the following types unless otherwise shown on the plans:
   a. Joints meeting the requirements of Section 449 of the Standard Specifications (O-Ring Gasket).
   b. Joints sealed with preformed plastic gaskets. The gaskets shall meet the requirements of Section 494.2-1 of the Standard Specifications and the minimum sizes for gaskets shall be as specified for equivalent sizes of elliptical pipe.
   c. Reinforced concrete jackets, as detailed on this drawing. Cast of the reinforced concrete jacket to be included in the contract unit price for the flared end section. When non-coated corrugated metal pipe is called for in the plans, the pipe shall be bimetallic coated in the jacketed area as specified on Index No. 280. Bimetallic coating to be included in the contract unit price for the pipe culvert. Concrete jackets shall be specified on Index No. 280. Cost of concrete and reinforcement shall be included in the contract unit price for the pipe culvert.

3. Toe walls shall be constructed as shown on the plans or at locations designated by the Engineer. Toe walls to be cast in place with Class I Concrete and paid for under the contract unit price for Flared End Section (Concrete), EA. Reinforcing steel shall be included in the cost of the Flared End Section (Concrete), EA. Toe walls shall be walled as required to fit the flared ends and sections.

4. On skewed pipe culverts the flared and sections shall place in line with the pipe culvert. Side slopes shall be warped as required to fit the flared ends and sections.

5. Flared End Section to be paid for under the contract unit price for Flared End Section (Concrete), EA. Saddle shall be in accordance with Index No. 281 and paid for under the contract unit price for Performance Turf, SY.

**DESIGN NOTES**

1. Flared end sections are intended for use outside the clear zone on median drain and cross drain installations, except that flared end sections for pipe sizes 12" and 15" are permitted within the clear zone. When the slope intersection permits, 12" and 15" flared end sections may be located with the culvert opening as close as 8" beyond the outside edge of the shoulder. Flared end sections are not intended for side drain installations.

2. Reinforced concrete Jackets shall be used at locations where high velocities and/or highly erosive soils may cause dislocating. These locations are to be shown on the plans.

3. Toe walls shall be used whenever the anticipated velocity of discharge and soil type are such that erosion would occur. Toe walls are not required where ditch pavement is provided, except where dislocating would occur if the ditch pavement should fail.