

## **449 PRECAST CONCRETE DRAINAGE PRODUCTS.**

**(REV 12-7-07) (FA 12-18-07) (7-08)**

ARTICLE 449-1 (Page 440) is deleted and the following substituted:

### **449-1 Description.**

Precast concrete drainage products hereinafter called products, may include but are not limited to, round concrete pipe, elliptical concrete pipe, underdrains, manholes, endwalls, inlets, junction boxes, three-sided precast concrete culverts, and precast concrete box culverts.

Ensure that all precast drainage products are designed and manufactured in accordance with the requirements of the Contract Documents.

Obtain precast concrete pipes, box culverts, and drainage structures from a plant that is currently on the Department's list of Producers with Accepted Quality Control Programs. Producers seeking inclusion on the list shall meet the requirements of 105-3.

At the beginning of each project, provide a notarized statement to the Engineer from a company designated representative certifying that the plant will manufacture the products in accordance with the requirements set forth in the Contract Documents and plant's Quality Control Plan. The Quality Control Manager's stamp on each product indicates certification that the product was fabricated in conformance with the Contractor's Quality Control Plan, the Contract, and this Section. Ensure that each shipment of precast concrete products to the project site is accompanied with a Quality Control signed or stamped delivery ticket providing the description and the list of the products.

Accept responsibility of either obtaining products from a plant with an approved Quality Control Program, or await re-approval of the plant, when the plant's Quality Control Program is suspended by the Department.

The Engineer will not allow changes in Contract Time or completion dates as a result of the plant's loss of qualification. Accept responsibility for all delay costs or other costs associated with the loss of the plant's qualification.

ARTICLE 449-6 (Pages 443-445) is deleted and the following substituted:

### **449-6 Requirements For Pipe Joints When Rubber Gaskets Are To Be Used:**

**449-6.1 Design of Joint:** Use pipe joint of the bell-and-spigot type or the double spigot and sleeve type, meeting the requirements called for in the Design Standards. Ensure the joint is so proportioned that the spigot, or spigots, will readily enter the bell or sleeve of the pipe.

Ensure the joint ring forms for forming the joint surface are made of either heavy steel, cast iron, or aluminum, and accurately machined to the dimensions of the joint. They must be a true circular form within a tolerance of 1/32 inch. Dimensional checks of joint ring form will indicate for each size pipe a length of spigot, or tongue, not more than 1/8 inch shorter than the bell, or groove, depth. The pipe will be so manufactured that joint surfaces are concentric with the inside of the pipe within a tolerance of 3/32 inch. The shape and dimensions of the joint must be such as to provide compliance with the following requirements:

(a) The joint must be so dimensioned that when the gasket is placed on the spigot it will not be stretched more than 20% of its original length, or the maximum stretch length that is recommended by the manufacturer, whichever is lower.

(b) The space provided for the gasket must be a groove in the spigot end of the pipe and such space, when the joint is made, it cannot be more than 110% of the volume of the gasket.

(c) The joint must be designed so that when the outer surface of the spigot and the inner surface of the bell come into contact at some point on the periphery, the diametric deformation in the gasket at the point of contact cannot be greater than 50% of the normal gasket diameter, and the diametric deformation in the gasket at a point opposite the contact point cannot be less than 20% of the normal gasket diameter.

(d) When the pipes are joined, there must be parallel surfaces on both the bell and the spigot, extending from the outside edge of the gasket toward the bell face for a distance of not less than 3/4 inch. These parallel surfaces cannot be farther apart than 1/8 inch, when the spigot is centered in the bell. The tapers on these surfaces cannot exceed three degrees.

(e) The inside surface of the bell at the end of the bell must be flared to facilitate joining the pipe sections without damaging or displacing the gasket.

**449-6.2 When Rubber gaskets are Used:** Ensure that the pipe joints have been tested at the plant hydrostatically and shown to meet the requirements of Section 6.2 of the Materials Manual, which is available at the following URL:  
[www2.dot.state.fl.us/specificationsestimates/materialsmanual/section62.pdf](http://www2.dot.state.fl.us/specificationsestimates/materialsmanual/section62.pdf) .

**449-6.3 When Profile Rubber Gaskets are Used:** Ensure the joint design meets the requirements set forth in Article 7 of ASTM C 443.

**449-6.4 Tolerances in Imperfections, and Permissible Repairs for Joint of Concrete Gasketed Pipe:** Ensure that all surfaces of near-contact of the jointed pipes are free from air holes, chipped or spalled concrete, laitance, and other such defects.

Pipes showing minor manufacturing imperfections or handling injuries to the bell or spigot may be acceptable if such defects are acceptably repaired as prescribed below.

Individual air holes (trapped air), or spalled areas with a length of up to one-half the pipe radius, or 12 inches whichever is less, may be repaired by careful use of a hand-placed, stiff, pre-shrunk, 1-to-1 mortar of cement and fine sand, and with no additional preparation other than a thorough washing with water of the defect. Curing will be done either by moisture curing under wet burlap or by application of an approved membrane curing compound. Such repaired pipe which is sound, properly finished and cured, and which otherwise conforms to specification requirements will be acceptable.

Exposed reinforcing and minor spalling in the spigot groove may be accepted if repaired in the following manner: The spalled areas will be chipped back to solid concrete. Exposed reinforcing will be cleaned of all laitance and scale. The entire area is to be coated with an approved epoxy at a thickness of 5 to 10 mils. The coating must be smooth and conform to the shape of the groove. The epoxy must be a Type F-1 as specified in Section 926.