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**DMS - 4370**  
**PRECAST TRENCH DRAIN**

**EFFECTIVE DATE: DECEMBER 2013**

**4370.1. Description.** This Specification governs the material requirements and approval procedures for precast trench drains of the types specified.

**4370.2. Units of Measurements.** The values given in parentheses (if provided) are not standard and may not be exact mathematical conversions. Use each system of units separately. Combining values from the two systems may result in nonconformance with the standard.

**4370.3. Definitions.**

- A. Precast Trench Drain**—a trench drain that is precast, whose primary use is to remove water from the roadway.
- B. Producer**—a manufacturer of any of the products covered by this specification.
- C. Precast Trench Drain Type**—a specific material and manufacture.

**4370.4. Material Producer List.** The Design Division, Roadway Design Section (DES-RDS) maintains the Material Producer List (MPL) of products conforming to this Specification. Materials listed on the MPL, entitled “[Precast Trench Drain](#),” require no further testing unless deemed necessary by the Project Engineer or DES-RDS.

Use of pre-qualified materials does not relieve the contractor of the responsibility to provide materials that meet the specifications. All material may be inspected or tested at any time. Any material that does not meet the specifications and requirements of the plans will be rejected and removed from the MPL.

**4370.5. Pre-Qualification Procedure.**

- A. Pre-Qualification Request.** Submit a written request for evaluation to the Texas Department of Transportation, DES-RDS, 125 East 11th Street, Austin, Texas 78701-2483. Include two copies of catalog sheets for each type of precast trench drain along with independent test laboratory results indicating that materials meet the requirements of this specification.
- B. Evaluation.** DES-RDS will review independent test laboratory reports for specification compliance and will notify prospective suppliers after completion of material evaluation.
  - 1. Pre-Qualification.** If approved for use by the Department, DES-RDS will add the precast trench drain types to the MPL.

Once pre-qualified, do not change materials or manufacturing methods without prior approval by the Department. The Department will conduct whatever tests are necessary

to identify materials and verify compliance to specifications. Unapproved changes will result in rejection and removal from the MPL for one year.

- 2. Failure.** Precast trench drain types not qualified under this specification may not be furnished on Department projects and must be corrected of all deficiencies before reconsideration for qualification. Producers may not resubmit failing types for evaluation until one year from the date of rejection. DES-RDS may waive this time limit as necessary

The Department will deduct amounts due from monthly or final estimates on contracts or from partial or final payments on direct purchases by the Department. Products will not be retested until costs for previously failed tests have been paid.

- C. Disqualification.** If materials or manufacturing methods of approved precast trench drain types do not match the pre-qualified submittals, the material will be removed from the MPL for one year at the discretion of the Department. The Department will require correction of all deficiencies before reconsideration for qualification.

- D. Requalification.** If materials are removed from the MPL for failing to meet any of the specification requirements, DES-RDS will not allow resubmission of the material for pre-qualification for one year after being removed from the list. DES-RDS may waive this time limit if provided with documentation from an independent testing facility showing the materials meet all requirements. DES-RDS will enforce the one year time limit if, after retesting, the material again fails any of the specification requirements.

**4370.6. Material Requirements.** The manufacturer of the precast trench drain must provide certified results from an AASHTO **AMRL/CCRL-accredited** or an A2LA-**certified** laboratory verifying that the material meets the requirements listed below.

- A. Precast Trench Drain.** Precast trench drain is composed of a monolithic polymer concrete made from a mixture of aggregate and polyester resin. **Grates may be constructed from ductile iron or may be monolithically cast as part of the trench drain body.**

The precast channels must have a radius or trapezoidal bottom and a minimum channel flow width of 4 in. The drain channel must be smooth to the touch and have interconnecting end profiles to obtain channel alignment within  $\pm 1/16$  in.

Trench drain bodies must conform to the requirements listed in Table 1.

Table 1

Precast Trench Drain Body Properties		
Physical Property	Test Method	Requirement
Lateral/Vertical Deflection	Described Below	Pass
Compressive Strength	ASTM C 579	11,000 psi minimum
Moisture Absorption	ASTM D 570	1% maximum after 24 hr. immersion
Freeze/Thaw	ASTM C 666	1% maximum weight loss after 300 cycles
Chemical Resistance	ASTM C 267	Hydrocarbons / Automotive fluids – No weight loss
Weathering Resistance	ASTM D 2565	No cracking after 2,000 hr. exposure
Burning Rate	ASTM D 635	HB

**1. Lateral Deflection.** Test the channel body in a typical section of the length and width described in the catalog and supplied to the Contractor. The channel body must have a maximum lateral deflection of 1/4 in. when test loaded by 350 lb. per square foot applied over the entire sidewall of the channel body. Validation of the deepest channel body will validate all shallower channel bodies manufactured with the same design. For channel bodies with ductile iron grates, test without the grate. For channel bodies with monolithically cast grates, test as a unit.

**2. Vertical Deflection.** Test the grate and channel body as a unit in accordance with AASHTO M 306, with the following modifications:

- test block dimensions are 9 in. long by 75% of the trench grate width;
- proof pressure is 200 psi applied for one minute duration;
- acceptance criteria is no breaking, buckling, or bowing and a maximum deflection of 1/8 in. (0.125 in.); and
- each grate width must be validated.

**B. Grates and Frames.** The grates for the trench drains must have openings consisting of a minimum of 60 percent of the total top surface area of the grate, with no individual opening or slot having a dimension greater than 2 in. when measured in the direction of the grated line drain flow line.

Grates or frames must have studs for anchoring to the surrounding concrete. Studs must be a minimum of 0.25 in. in diameter, which must extend at least 3 in. from the grate or frame. The anchor studs must be spaced 24 in. or less along the length of the grate or frame on both sides. Studs must be either integrally cast with or welded to the grate or frame. Welded studs must have a 360-degree flash.

Precast trench drain and catch basin grating and frames must be either grey iron casting in accordance with ASTM A 48, Class 35B, or ductile iron casting in accordance with ASTM A 536, grade 80-55-06 (as per AASHTO M 306 or equal.)

All grates and frames must have a load capacity meeting or exceeding AASHTO HS-20 for bridge construction. The grates supplied must meet AASHTO M 306-09, with the following modifications:

- proof load contact area width is 75% of trench flow width to a maximum contact width of 9 in.;
- proof load contact length is 9 in. for all trench widths; and
- proof load is 494 psi for a maximum of 40,000 lb. proof load for a 9 in. × 9 in. contact area.

**4370.7. Archived Versions.** Archived versions are available.