



Plant Prequalification Program - Setting a Standard of Excellence

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In a perfect world, the overwhelming number of drainage products offered today could be assessed with one set of standards. Unfortunately, each industry has specific requirements so stakeholders of drainage infrastructure must decide if the testing and inspection of a product should be performed by a first-party, second-party or third-party. First-party assessments are commonly performed by the internal manufacturing operation. Responsible manufacturers will have a quality management system that ensures their products comply with all requirements. However, the risks associated with the non-compliance of drainage products are far too high to stop at this. Second-party assessments are performed by someone that represents the end user's interests. This may be the designer, contractor, contract administrator, or owner of the drainage infrastructure. In many cases, the second-party may not have the expertise in either the production process or the finished product to assess it adequately.

Stakeholders should rely on a reputable third-party certification program to verify an industry's specific requirements. A good third-party certification program requires a manufacturer to disclose all ingredients, all production data, and all test results to an unbiased third-party who is qualified to audit all aspects of both the production process and the final product. The auditor must conduct random, independent data reviews and should perform its own testing to confirm the accuracy of the first-party's claims. Finally, the auditor must verify in writing that the finished product meets all relevant standards by issuing a certificate which lists the certified products and is valid for a fixed period of time.

In the summer 2009 edition of the Concrete Pipe Journal, OCPA publicized the Ministry of Transportation's recent

move to only allow third-party certified CSP, HDPE and PVC pipe products on all MTO Contracts with Special Provision No. 118S04, 118S05, and 118S06, respectively. A Special Provision was not necessary for reinforced concrete pipe due to the existence of the Plant Prequalification Program (PPP) that has served Ontario as a third-party certification program since 1965, and is already a requirement in OPSS 1820-Material Specification for Circular Concrete Pipe, 1351-Material Specification for Precast Reinforced Concrete Components for Maintenance Holes (MH's), Catch Basins, Ditch Inlets, and Valve Chambers, and 1821-Material Specification for Precast Reinforced Concrete Box Culverts and Box Sewers. The Plant Prequalification Advisory Committee that oversees the PPP is comprised of representatives from the Municipal Engineers Association (MEA), Ministry of Transportation (MTO), Ontario Provincial Standards (OPS), Canadian Precasters Association of Ontario (CPA), OCPA, and a third-party auditor who is a licensed Professional Engineer in Ontario.

A PPP Certificate could cover a wide range of precast concrete products which includes pipe, MH's, catchbasins, box culverts, pressure pipe, and other specialty precast concrete products. The publication entitled Prequalification Requirements for Precast Concrete Drainage Products outlines the protocols of the PPP and is available from the OCPA. Some of the highlights of the PPP include the following:

1. Certificates are issued to each manufacturing facility listing the specific products to which the prequalification applies, and is only valid for 12 months after the date of issue. For companies with multiple plants, each plant is audited and certified independently.
2. A Prequalification Certificate could be cancelled at any time. If deficiencies are found during a random audit, a



manufacturer is given a limited amount of time for corrective action.

3. Each plant is required to submit a six-month Interim Report between annual inspections to certify that testing and record keeping is being properly maintained. Also, a detailed inspection is conducted every 3 years.
4. Conformance of all raw materials must be supported with vendor certificates or the manufacturer's own test data, such as sieve analysis of coarse and fine aggregates.
5. Quality Control includes:
 - a. *Dimensional checks of finished products. Joint dimensions for 100 percent of pipe and MH sections up to and including 1200mm diameter is gauged which is unique to the concrete pipe industry.*
 - b. *Structural test results for all pipe sizes and strength classes in a Three-Edge Bearing Test.*
 - c. *Hydrostatic pressure tests of MH and pipe products in various configurations which include pipe in proper alignment, pipe with joints deflected, and pipe joints under differential load.*
 - d. *Concrete durability tests such as air void or salt scaling.*
 - e. *Regular concrete compressive strength test results.*



6. Calibration records of all manufacturing and testing equipment must be maintained.
7. QC Personnel are required to hold a valid American Concrete Institute (ACI) Concrete Field Testing Technician Grade 1, and pass an exam that tests their knowledge of the PPP requirements.
8. Every manufacturer's QC lab is subjected to a Correlation Test to demonstrate their ability to consistently test compressive strength cylinders. Cylinders prepared from a single source are distributed to every lab and the results are returned to the third-party for comparison and a competency rating.

9. Markings on concrete drainage products must include the Prequalification Stamp. It is important for designers and inspectors to understand the difference between a mark on the product indicating the relevant standard designation versus a product certification mark. For example, concrete pipe stamped with "CSA A257.2" or HDPE pipe stamped "CSA B182.8" should not be interpreted as a product that is CSA approved. The requirement for all pipe industries is that certified product be marked with the logo of the third-party program such as the Prequalification Stamp, CSA Logo, or the certification mark of an approved certification body.

The manufacturer also benefits from third-party certification programs by creating uniformity within its own industry, limits their risk, and reduces the expense of excessive product testing.

Third-party certification should not always be taken as the final word since it really only means that a manufacturer is capable of producing a quality product. However, a good certification program gives designers, owners, and end users of drainage infrastructure some assurances that a competent third-party has evaluated and tested both the production facility and the finished product. The quality assurance provided by the PPP in the concrete pipe industry is highly regarded and is now mandatory in jurisdictions outside of Ontario, such as the cities of Calgary, Edmonton and Winnipeg. 