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American Concrete Pipe Association established to develop ASTM Standard Specifications

The need to improve quality and production of concrete pipe was formally recognized in 1907 when a group of 150 concrete pipe producers from the USA and Canada formed the Interstate Cement Tile Manufacturers Association (ICTMA). Two years earlier, Frank Wilson of Wilson Concrete Company, Red Oak, Iowa produced the first reinforced concrete culvert pipe. Organizers of the Association considered the development of a product with Standard Specifications and uniform quality to be of greatest importance. In 1914, the ICTMA became the American Concrete Pipe Association (ACPA).

In the beginning

The American Society for Testing and Materials formed in 1898 to address the frequent rail breaks affecting the fast-growing railroad industry, developed Standard Specifications for the steel used to fabricate rails. The name Anson Marston of Iowa State College and his assistants appears in the early records of the ICTMA. ASTM Drain Tile Standard Specifications are based on the work by Marston and his assistants. Marston was a member of ASTM C-4, which prepared the Standard Specifications for plain concrete sewer pipe.

Both Marston and Professor W. J. Schlick were very active in the work of the Joint Concrete Culvert Pipe Committee of ASTM. It was Schlick who often attended the early meetings of ICTMA. The 1909 Bulletin No. 2 of ICTMA contained the proposed Standard Specifications for plain concrete drain tile. This is the first indication of tentative Standard Specifications for any kind of concrete pipe in America. The recommendation for Standard Specifications for the manufacture of plain concrete drain tile was adopted March 30, 1910. ICTMA member, John L. Zeidler joined the American Society for Testing Materials in 1910 and worked relentlessly for the adoption of written concrete sewer pipe Standard Specifications.


The ACPA celebrated its Silver Jubilee in 1932 when ASTM Committee C-4 was divided into a group for clay pipe and one for concrete pipe. The result was that the concrete pipe industry would have concrete pipe Standard Specifications processed much more easily. The draft of the Standard Specifications Specification for Unreinforced Concrete Sewer Pipe (ASTM C14 specification), was read at the 1932 convention for the first time.

Modern times

With such a strong relationship with ASTM throughout its history, ACPA has the best ASTM Standard Specifications recognized worldwide. ACPA staffs and representatives of member firms continue to serve in key positions on all ASTM committees, subcommittees and task groups that have any impact on the concrete pipe industry.

There are some 65 core ASTM Standard Specifications that were developed to help the concrete pipe industry produce and test concrete pipe. In addition, there are ASTM Standard Specifications for precast concrete boxes used for a wide range of applications related to concrete pipe (www.concrete-pipe.org/pdf/astm_specs.pdf).

In most cases, the manufacture of concrete pipe and box sections, and their installation...

The ASTM Standard for box sections designed in accordance with the AASHTO Standard Specifications for Highway Bridges is the Standard Design Code: ASTM C 1433, Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers. However, the Standard Specifications are no longer maintained by AASHTO, so a more recent ASTM Standard was developed in accordance with the most current AASHTO LRFD Bridge Design Specifications. That standard is the ASTM Standard for the Load and Resistance Factor Design (LRFD) Code; ASTM C 1577, Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers According to AASHTO LRFD. There are no similar standards for box sections within AASHTO. However, in the AASHTO box sections standard specifications for culverts M259 and M273, there is a note that states: “If load–and-resistance factor design is required, then use ASTM C 1577.”

The use of a rubber gasket does not by itself ensure that different joint types are equal. Designers can utilize ASTM Standards to specify desired performance but in the case of alternate materials, additional guidance may be required. Concrete pipe joints are governed in national Standards by detailed designs with tight tolerances and high test pressures.

ASTM Standard Specifications go a long way to ensure the performance and quality of concrete pipe. The concrete pipe industry has taken additional steps to ensure that products produced by its members, are of the highest quality possible.

The word, “quality” is often brandished as if everyone hearing or reading the word were clear on the meaning. ISO 8402:1994 standard defines quality as the “totality of characteristics of an entity that bear on its ability to satisfy stated and implied needs.” This may be interpreted as a measure of excellence free from defects, deficiencies and significant variations with a commitment to Standards to achieve uniformity that meets the needs of the end user. Each unit of concrete pipe that is created by a concrete pipe plant is an engineered product. Production runs are standardized, tested and inspected – most to ASTM Standard Specifications. It goes without saying that the equipment used to produce a single unit of pipe is inherently of a very high quality to be able to produce the concrete pipe consistently within tolerances that are easily managed.

ASTM C497 Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile includes test methods used for the production and quality control of RCP. These tests are completed to properly evaluate all the various properties required for the completion of a quality finished product. C-497 includes and discusses the following critical test procedures: Three-Edge Bearing Test Method, Core Strength Test Method, Absorption Test, Hydrostatic Test Method, Cylinder Strength Test, and Joint Shear Test. There are test methods covered in ASTM for almost all of the components of RCP, as well as test methods to confirm conformance of the installed product including joint materials and joint tightness. These tests are carried out within the laboratories or on the floor of production facilities.

ASTM International (formerly ASTM) has no role in requiring or enforcing compliance with its Standards. The Standards, however, may become mandatory when referenced by an external contract, corporation, or government. The strength of ASTM International Standards is found in the way that the Standards are developed that goes back to the day that ASTM was established in 1898. Other organizations can develop standards using less than full consensus procedures. ASTM International cannot. ASTM International Standards have full consensus. Subcommittees responsible for a Standard Specification must deal with and resolve every negative vote.

This is what makes the concrete pipe industry strong, and its products resilient to modern man-made and natural catastrophes. Modern concrete pipe plants continue to produce precast concrete products that are at the core of our critical buried infrastructure. ASTM Standard Specifications are ever-present to ensure that this continues from one generation to the next.