

SECTION 742  
PRECAST MANHOLE

742.1 GENERAL:

This specification covers the requirements of for precast manhole sections for gravity sanitary sewer and storm drain manhole. When noted on the plans or in the special provisions precast manhole shall be constructed according to this specification. All precast manhole manufacturers shall be NPCA (National Precast Association) certified and shall provide all NPCA certifications upon request. Loading criteria for the precast manholes shall meet or exceed the AASHTO H20 loading requirements. All precast manhole risers shall be monolithically cast to ensure water tightness and have a certified structural design and the manhole shall be cast in a fashion to achieve water tightness. This shall include a monolithic cast manhole or a multi section cast manhole which also shall have a certified structural design.

Comment [CS1]: Minor word semantics can be discussed.

742.2 MATERIALS:

742.2.1 Concrete Materials: Concrete materials shall conform to the requirements of Section 725 and Table 725-1 for Class AA.

742.2.2 Precast Sections: Precast sections shall conform to ASTM C478, AASHTO M199. The design shall be in accordance with ACI 318 and ASTM C890 using traffic load A-16 (HS20-44).

742.2.3 Joints and Connections: Joints and connections shall conform to ASTM C425, C990, and C923, or C425 as applicable.

Comment [CS2]: Clay pipe is predominately used by the City of Phoenix and the City of Buckeye, again minor word semantics can be discussed.

742.3 MANHOLE PENETRATIONS:

Manhole penetrations may be formed or cut out. Cut outs of the precast base shall be done using a mechanical hole saw. The location of the holes shall be determined by the plans and specifications. After the core is removed from the casting the manufacturer shall coat all reinforcing with a corrosion inhibiting epoxy suitable for end use application. The thickness of the epoxy shall be per the manufacturer recommendation suitable for the end use application. Knock outs shall be formed in the location noted on the plans or specifications.

Comment [RTH3]: ASTM C425 only applies to vitrified clay pipe joints, therefore it should be last not first in the list.

Comment [RTH4]: Penetrations should be formed in precast units when feasible. Cut outs should be reserved for field adjustment or corrections.

742.4 REINFORCING

Reinforcing for the base steel shall meet the following specifications:

- Wire Bars ASTM A615 or A706
- Wire and wire fabric A1064

Design of the reinforcing shall be in accordance with ACI 318 and ASTM C890

Comment [CS5]: This is something we address in the detail 420-2 note number 1. We do not want any modifications done to the base in the field at all. All Modifications shall be done at the plant.

742.5 GASKETS

A flexible pipe to manhole connector shall be used whenever a pipe penetrates into a precast concrete manhole or structure.

The design of the connector shall provide a flexible, watertight seal between the pipe and the concrete. The connector shall assure that a seal is made between the structure wall and the pipe by:

- Casting the connector integrally with the structure wall during the manufacturing process in a manner manner that will not pull out during pipe coupling.

- compressing the connector against the inside circumference of the structure by means of wedge or toggle style connection, expansion ring or other means approved by the engineer.

The connector shall be made of from materials that conform to the physical and chemical requirements outlined in the ASTM C923, ~~and or~~ C425 as applicable.

The connector shall be sized specifically for the type of pipe being used and shall be installed in accordance with the recommendations of the manufacturer.

The connection hardware shall be constructed of a 316 stainless steel meeting ASTM A480. The hardware shall ensure a water tight connection between the concrete and the pipe material and shall provide an adequate seal enough to withstand the negative air pressure test per ASTM C-1244.

#### 742.6 LIFTING POINTS

Lifting points shall be designed and evaluated by a registered professional engineer and have a minimum safety factor of 4. There shall be a minimum of 2 lifting points on every precast ~~section~~ manhole base. After base installation, the lifting holes shall be thoroughly packed with a pre-packaged non-shrink grout. Bent reinforcing steel bars shall not be used as lifting devices. Through lifting holes will not be allowed.

#### 742.7 IMPERFECTIONS

**742.7.1 Imperfections:** Any imperfections which in the opinion of the engineer may adversely affect the performance of the precast base-section shall be cause for rejection.

-End of Section -

**Comment [CS6]:** I will add "TYPE" to the text to hopefully make it more clear.

**Comment [RTH7]:** Where is 316 stainless steel defined?

**Comment [CS8]:** ASTM A480 has definitions for the types of SS called out. Also in ASTM C923 specifically for the connectors section 4. Materials and manufacturers calls out the different types of SS that can be used. Specifically referencing type 316.

**Comment [CS9]:** Yes, typically barrel sections are handled with a steel hoop without lifting lugs

**Comment [RTH10]:** Is this true only for the base or for all precast sections?