



TOWN OF BUCKEYE
Engineering Department

Case Number: 13-21

Date: 06-05-13

To: MAG Specifications and Details Committee

From: Craig Sharp

RE: Section 742 Pre Cast Manhole Bases

Purpose: Creating a new section and details for pre-cast manhole bases

Revisions:

Creating a new section and details for pre-cast manhole bases.

SECTION 742

PRE CAST MANHOLE BASES

742.1 GENERAL:

This specification covers the requirements of pre cast manhole bases for gravity sanitary sewer. When noted on the plans or in the special provisions pre cast manhole bases shall be constructed according to this specification. All pre cast manhole base manufacturers shall be NPCA (National Pre Cast Association) certified and shall provide all certifications upon request. Loading criteria for the pre cast base shall meet or exceed the AASHTO 1120 loading requirements. All pre cast manhole bases and risers shall be monolithically cast to ensure water tightness and have a certified structural design. An anti-float ring shall be cast with the base and riser during manufacturing.

742.2 MATERIALS:

742.2.1 Cementitious Materials: Cementitious materials shall conform to Section 725.2 and shall have a minimum compressive strength after 28 days of 4000 PSI.

742.2.2 Pre Cast Sections: Pre Cast sections shall conform to ASTM C478, AASHTO M199

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

742.3 CASTING TYPES:

All pre cast manhole bases shall be cast using either a dry cast or a wet cast system. Each manufacturer shall be proficient in their manner of casting and shall monitor and test the materials being used in the casting. The test results shall be available upon request by the contracting agency.

742.3.1 Wet Castings: Wet casting shall consist of pouring thoroughly mixed cementitious materials in its plastic form into a pre determined mold the size and shape required per the drawings or special provisions. Concrete shall be placed in forms and vibrated in such a manner to make a dense uniform product conforming to the plans and specifications.

742.3.2 Dry Castings: Dry casting shall consist of casting the base utilizing mechanized equipment with a zero (0) slump concrete between the core and jacket. Curing shall be by a kiln or a combination of tarps and moisture curing.

742.4 CUT OUT/KNOCK OUT:

Cut out of the precast base shall be done using a mechanical whole saw. The location of the whole 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.

742.5 REINFORCING

Reinforcing for the base shall meet the following specifications:

- Wire ASTM A82 or A496
- Wire fabric A185 or A497

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

742.6 GASKETS

A flexible pipe to manhole connector shall be used whenever a pipe penetrates into a pre cast 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 manor 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

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.

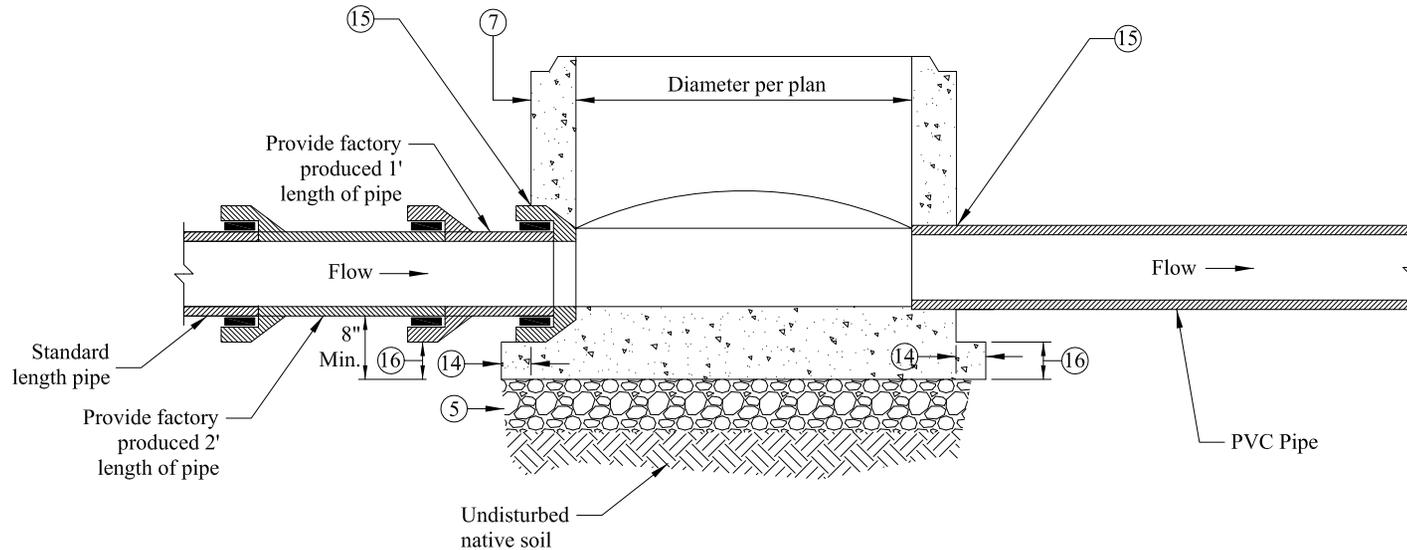
742.7 LIFTING DEVICES

Lifting devices 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 pre cast 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.

742.8 IMPERFECTIONS

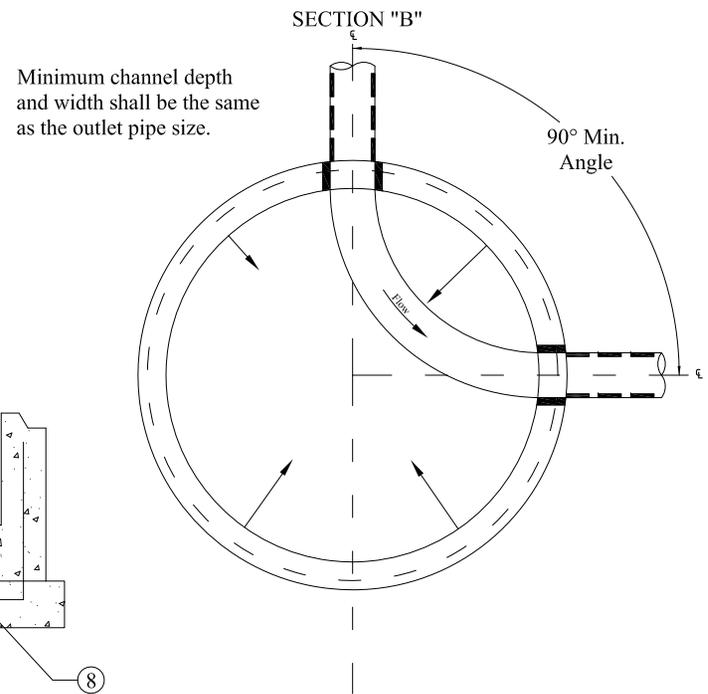
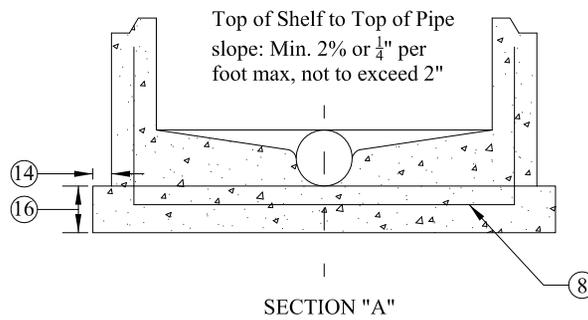
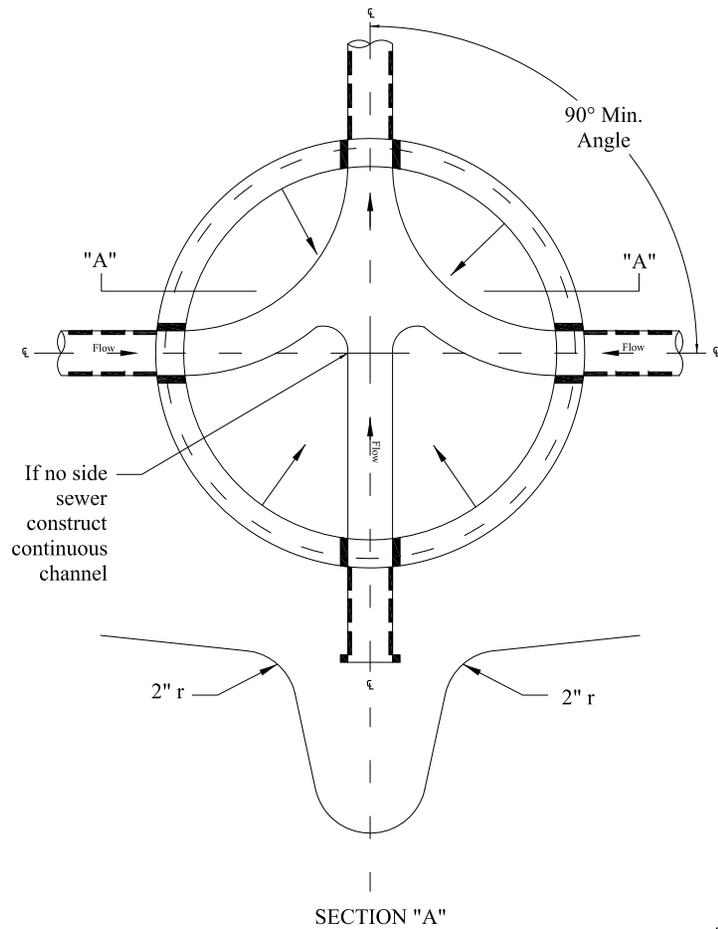
742.8.1 Imperfections: Any imperfections which in the opinion of the engineer may adversely affect the performance of the pre cast base shall be cause for rejection.

-End of Section -



GENERAL NOTES

- ①. Pre-Cast manufacturer shall be an NPCA certified plant.
- ②. MAG "A" 4000 PSI concrete shall be used for manhole bases per ASTM C478.
- ③. Spring line of cast-in-place bell shall stop at inside face of manhole.
- ④. Joints for barrel section shall be tongue and groove or lap joint. All lifting holes shall be sealed with non metallic non-shrink grout.
- ⑤. All pre-cast manhole bases shall be placed on 10" minimum of #57 crushed rock or 8" minimum ABC compacted to 100% relative density.
- ⑥. The contractor is liable for all invert alignment and shall not make any field modifications to the base.
- ⑦. Minimum wall thickness shall be 1/12 of the largest diameter of the pre-cast manhole base plus 1".
- ⑧. Reinforcement shall be designed by structural engineer.
- ⑨. Channel width shall remain constant through the manhole base.
- ⑩. There shall be no hard connections (grouted) into the manhole base.
- ⑪. All sewer service connections shall have the same connection types into the pre-cast manhole base.
- ⑫. All core holes into this structural pre-cast base shall be coated with approved coating material. All cores require special approval.
- ⑬. Base shall be cast monolithically with the manhole sides.
- ⑭. The minimum anti-float ring shall be 6" wide on 48" bases, 7" wide on 60" bases, and 8" wide on 72" bases.
- ⑮. Cast in place VCP bell w/ polyurethane joint per ASTM standard C425, A-Lok, Z-Lok field gaskets, pipe to manhole rubber boot, or approved equal per ASTM C425.
- ⑯. Anti-Float ring shall be a minimum of 5" thick.



DETAIL NO.
XXXX-2



STANDARD DETAIL
ENGLISH

PRE-CAST CONCRETE MANHOLE BASE

REVISED
01-01-2014

DETAIL NO.
XXXX-2