

## **SUGGESTED MANHOLE GRADE ADJUSTING RING SPECIFICATION**

### **PART 1 GENERAL**

#### **1.01 SCOPE**

This specification defines the materials required for the adjustment of all manholes, catch basins or other underground utility structures to final elevation as shown on the project drawings.

#### **1.02 WORK REQUIRED**

- A. Grade adjustment rings meeting the requirements of this section shall be used to adjust and support the frame and cover or grate to the specified final elevation on all manholes, catch basin or other utility structures.

#### **1.03 SYSTEM DESCRIPTION**

- A. Design Requirements – The grade adjustment rings shall be designed to allow final adjustment of the frame and cover or grate to the grade established by the ENGINEER on the project drawings. The rings shall also be designed to accommodate flat or sloping surfaces to within approximately ¼” (one quarter inch) to ½” (one half inch) of the specified final elevation. The grade adjustment system shall have a minimum 50 (fifty) year design life.
- B. Performance Requirements – The grade adjustment rings shall be capable of supporting the minimum requirements of AASHTO M-306, H-25 and HS-25, be UV stable and be resistant to chemicals and corrosion commonly associated with the sanitary and storm sewer environments.

#### **1.04 SUBMITTALS**

- A. Test Report – A test report from an approved third party testing agency showing the grade adjustment rings meets the minimum requirements of AASHTO M-306, H-25 and HS-25.
- B. Certification – The manufacturer of the grade adjustment rings shall provide certification to the ENGINEER stating that the product meets the design life and material requirements of this specification.

### **PART 2 PRODUCTS**

#### **2.01 MANHOLE AND CATCH BASIN GRADE ADJUSTMENT RING**

Manhole and catch basin grade adjustment rings shall consist of a variety of heights (thicknesses), diameters and shapes all conforming to the following requirements:

- A. Grade Adjustment Rings – The grade adjustment rings shall be manufactured from ARPRO® Expanded Polypropylene (EPP), black. 5000 series meeting ASTM D3575 and ASTM D4819-13; B6D7G4L3M<sub>2</sub>4S2T<sub>1</sub>7W7. The rings shall be manufactured using a high compression molding process to produce a finished density of 120 g/l ((7.5 pcf).
- B. “Grade” adjustment rings may contain either an upper and lower keyway (tongue and groove) for vertical alignment and/or an adhesive trench on the underside with a flat top.

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- C. "Finish" or "Flat" rings may either have a keyway (groove) on the underside for vertical alignment and/or an adhesive trench with a flat upper surface. These rings shall be available in heights (thicknesses) which will allow final adjustment of the frame and cover or grate to within  $\frac{1}{4}$ " (one quarter inch) to  $\frac{1}{2}$ " (one half inch) of the specified final elevation.

"Finish" rings may also have a keyway on the upper surface of the inner diameter to facilitate installation of an "Angle" ring.

- D. "Angle" rings may either have an upper and lower keyway (tongue and groove) for vertical alignment and/or an adhesive trench on the underside. When required, the "Angle" ring or rings shall allow final adjustment of the frame and cover or grate to within  $\frac{1}{4}$ " (one quarter inch) to  $\frac{1}{2}$ " (one half inch) of the specified final elevation.

- E. Acceptable Manufacturer – PRO-RING™ by Cretex Specialty Products

## **2.02 EQUIPMENT**

The contractor shall have the required tools and equipment necessary to facilitate proper installation of the grade adjustment rings.

## **2.03 ADHESIVE/SEALANT**

- A. Any adhesive or sealant used for watertight installation of the manhole grade adjustment rings shall be M-1 Structural Adhesive/Sealant or equal meeting the following specifications:

ASTM C-920, Type S, Grade NS, Class 25, Uses NT, T, M, G, A and O

Federal Specification TT-S-00230-C Type II, Class A

Corps of Engineers CRD-C-541, Type II, Class A

Canadian Standards Board CAN 19, 13-M82

AAMA 802.3-08 Type II, AAMA 803.3-08 Type I and AAMA 805.2-08 Group C

- B. Other adhesives or sealants may only be used with engineer or owner's written authorization.

## **2.04 REPAIR MORTAR**

- A. Repair mortar shall be a one component, quick set, high strength, non-shrink; polymer modified cementitious patching mortar, which has been formulated for vertical or overhead use meeting the requirements of ASTM C-109 for Compressive Strength, C-348 and C-78 for Flexural Strength and C-882 for Slant Shear Bond Strength. Repair mortar shall not contain any chlorides, gypsums, plasters, iron particles, aluminum powder or gas-forming agents nor shall it promote the corrosion of any steel that it may come in contact with.

- B. Acceptable Manufacturers

1. Octocrete by IPA Systems
2. Pre-Approved Equal

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## **2.05 CEMENTITIOUS GROUT**

- A. Cementitious grout shall be a premixed, non-metallic, high strength, non-shrink grout which meets the requirements of ASTM C-191 and C-827 as well as CRD-C-588 and C-621. When mixed to a mortar or "plastic" consistency, it shall have minimum one day and 28 day compressive strength of 6,000 and 9,000 psi, respectively.
- B. Acceptable Manufacturers
  - 1. PennGrout by IPA Systems
  - 2. Pre-Approved Equal

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Installation and surface preparation shall be in accordance with the manufacturer's instructions.
- B. The joint between the first grade ring and top of the manhole, catch basin or utility structure shall be sealed using an adhesive/sealant meeting the requirements of Section 2.03.
- C. If the top of the manhole, catch basin or utility structure is not level or is irregular, then a non-shrink repair mortar meeting the requirements of Section 2.04 or non-shrink cementitious grout meeting the requirements of Section 2.05 shall be used. A bed the specified mortar or grout shall be placed on the top surface of the utility structure and then the first grade ring shall be embedded and leveled into the bed of material.
- D. The remaining joints between all manhole adjustment rings and the frame and cover or grate shall be sealed using an adhesive/sealant meeting the requirements of Section 2.03.
- E. No other materials shall be used in the construction of the grade adjustment area beyond those specified above. Prohibited materials include, but are not limited to wood or wood shims of any kind, concrete, brick, block, stones, etc.
- F. The use of any heat shrinkable chimney seals shall only be permitted with engineer or owner's written authorization.