**SECTION 5.4**

**TECHNICAL SPECIFICATION FOR**

**MANHOLE FRAME SEAL**

**PART 1: GENERAL**

**1.1 Scope of Work**

Furnish all materials, labor, equipment, tools, and required incidentals for providing and installing a frame seal and required extension in all new wastewater manholes. The frame seal and extension shall span the entire adjustment area of the manhole by connecting to the bottom of the frame casting and top of the manhole cone.

**1.2 Definitions**

* Chimney:

The chimney is the cylindrical variable height portion of the manhole which extends from the top of the cone to the base of the manhole frame.

* Cone:

The Cone is the inclined portion of the manhole structure which slopes upward and inward from the barrel of the manhole to the required chimney or frame diameter.

**1.3 Acceptable Manufacturers**

Internal Chimney Seal by Cretex Specialty Products or approved equal.

**PART 2: QUALITY ASSURANCE**

**2.1 Reference Standards**

### Unless otherwise stated, the latest editions of the following documents are applicable

for this specification:

## ASTM C923 Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals

## ASTM F593 Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs

## ASTM F594 Standard Specification for Stainless Steel Nuts

* 1. **Warranty**
     + A one-year warranty for the manhole frame seal shall be included from the Contractor, and shall cover the cost of replacement and freight to project site, should the frame seal have any defects in material or workmanship.
     + Unless otherwise specified, the warranty periods shall begin after the Certificate of Acceptance is issued for the Contract.

**PART 3: PRODUCTS**

* 1. **General**

The manhole frame seal shall be designed to prevent leakage of water through the manhole frame throughout a 50-year design life. It shall also be capable of allowing repeated vertical movement of not less than 2 inches and/or repeated horizontal movement of not less than 1/2 inch after installation and throughout its design life.

Frame seals shall consist of a flexible internal rubber sleeve, extensions and stainless steel expansion bands, all conforming to the following requirements:

**3.2 Rubber Sleeve and Extension**

The flexible rubber sleeve and extensions shall be extruded or molded from a high grade rubber compound conforming to the applicable material requirements of ASTM C-923, with a minimum 1500 psi tensile strength, maximum 18% compression set and a hardness (durometer) of 48±5.

The rubber sleeve shall be double, triple or quadruple pleated with a minimum unexpanded vertical height of 8 inches, 10 inches or 13 inches respectively and a minimum thickness of 3/16 inches. The top and bottom section of the sleeve that compresses against the manhole frame casting and the chimney/cone shall have an integrally formed expansion band recess and a series of sealing fins to facilitate a watertight seal.

Any splice used to fabricate the sleeve and extension shall be hot vulcanized and have a strength such that the sleeve shall withstand a 180 degree bend with no visible separation.

**3.3 Expansion Bands**

The expansion bands used to compress the sleeve against the manhole shall be integrally formed from 16 gauge stainless steel conforming to the applicable material requirements of ASTM C-923, Type 304, with no welded attachments and shall have a minimum width of 1-3/4 inches.

The bands shall have a minimum adjustment range of 2-1/2 diameter inches and a positive locking mechanism which secures the band in its expanded position after tightening.

**PART 4: EXECUTION**

* The Contractor shall field measure the required dimension of the manholes prior to ordering frame seals and other appurtenances.
* All sealing surfaces shall be reasonably smooth, clean and free of any form offsets or excessive honeycomb.
* The internal frame seals and extensions shall be installed in accordance with the manufacturer’s instructions.

**PART 5: METHOD OF MEASUREMENT AND PAYMENT**

Method of Measurement and Payment for providing Manhole Frame Seal as specified in this section shall be incidental and inclusive in the applicable unit price bid item.

**\*\*END OF SECTION\*\***