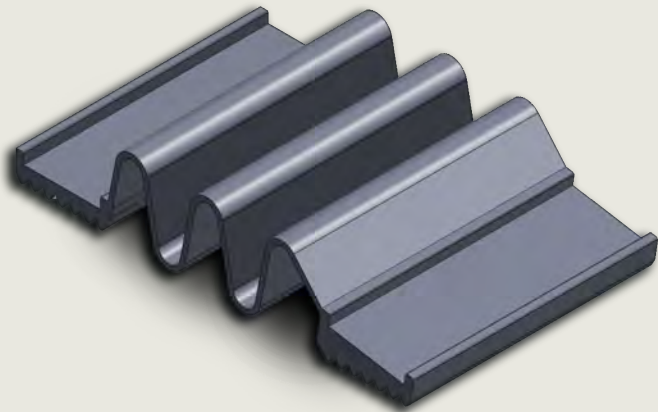


LSS INTERNAL CHIMNEY SEAL

Lightweight internal rubber sleeve developed to stop inflow under the manhole frame.



ADVANTAGES:

- Lower Cost
- Easier Installation
- More Range of Coverage
- Eliminate the Need for Extensions
- Provides Flexible, Water Tight Seal
- Mechanical Seal, does not Rely on Chemical Bond



RUBBER SLEEVE Available in four widths with unexpanded vertical heights of 8 inches (LSS 0-6), 10 inches (LSS 6-12), 14 inches (LSS 12-18), and 18 inches (LSS 18-24). The flexible rubber sleeve shall be extruded or molded from a high grade rubber which conforms to the applicable material requirements of ASTM C-923. The seal shall have a minimum thickness of .130 inches for durability and resistance to tearing and puncturing, and a range of coverage which allows a span of up to 24 vertical inches without the use of an extension. Flexibility of this material allows one size to fit a frame/chimney diameter range of up to 20 %.

EXPANSION BANDS The one piece channeled expansion bands are 1-3/4 inches wide and are fabricated from high quality, corrosion resistant, 16 gauge stainless steel conforming to the applicable material requirements of ASTM C-923, Type 304, with no welded attachments. The multiple transverse tab slots in the band provide for 2-1/2 inches of diameter range. An easy to use mechanical expansion tool quickly expands the band to compress the rubber sleeve against the manhole frame and chimney. Once expanded, the band is locked into place by engagement of the locking tabs which secures the band in its expanded position providing a flexible watertight seal.



0"-6" Lightweight Chimney Seal



6"-12" Lightweight Chimney Seal



12"-18" Lightweight Chimney Seal



18"-24" Lightweight Chimney Seal

SPECIFICATIONS

GENERAL

This section includes the materials and procedures required for the internal sealing of the frame-chimney joint area of brick and block manholes and the entire chimney area of precast, fiberglass and plastic manholes.

FRAME SEAL

Frame seals shall be designed to prevent leakage of water through the above described portions of the manhole throughout a 50 year design life. The seal shall remain flexible throughout this design life, allowing repeated vertical movements of the frame of not less than 2 inches and/or repeated horizontal movement of not less than 1/2 inch, at rates greater than 1/10 inch per minute.

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

1. RUBBER SLEEVE - The flexible rubber sleeve shall be extruded or molded from a high grade rubber conforming to the applicable material requirements of ASTM C-923, with a minimum 1500 psi tensile strength, a maximum 18% compression set and a hardness (durometer) of 48±5. The sleeve shall be corrugated and available in four widths with unexpanded vertical heights of 8 inches (LSS 0-6), 10 inches (LSS 6-12), 14 inches (LSS 12-18) and 18 inches (LSS 18-24). The sleeve shall have a minimum thickness of .130 inches and a range of coverage which allows a span of up to 24 vertical inches of chimney without the use of an extension. The area of the seal that compresses against the manhole frame casting and the chimney/cone shall have a series of sealing fins to facilitate a watertight seal. Any splice used to fabricate the sleeve shall be hot vulcanized and have a strength such that the sleeve shall withstand a 180 degree bend with no visible separation.

2. EXPANSION BANDS - The expansion bands 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. The expansion 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.

INSTALLATION

The contractor shall field measure the manhole to determine the information required on the manufacturer's "Sizing and Ordering" procedure. This information is needed to obtain the proper size of the bands as well as the size and width of the rubber sleeve.

The surfaces against which the sleeve are to be compressed shall be circular, clean, reasonably smooth and free of any loose material and excessive voids. If the masonry surface is rough, sloped, or irregular and would not provide an effective seal, an approved non-shrink patching mortar shall be used to prepare a uniformly vertical surface for the bottom of the sleeve to seal against. Any flaws in the manhole frame such as cracks, pits or protrusions, shall be repaired by either filling with mortar or grinding smooth.

After the rubber sleeve has been placed in the proper position, the stainless steel expansion bands shall be lubricated and placed into the band recesses and individually expanded as required to provide a watertight seal.

PHYSICAL PROPERTIES

Tensile Strength	1500 psi
Elongation at break	350% min
Hardness (Durometer)	48 ±5
Accelerated oven-aging	max. 15% decrease of tensile, 20% of elongation
Chemical resistance	no weight loss in 1 N of sulfuric or hydrochloric acid.
Compression set	18% max. decrease
Water absorption	max 10% increase by weight
Ozone resistance	Rating 0
Low temperature brittle point	No fracture at -40 C°
Tear resistance	200lb. f/in.
Splice strength	180° bend with no visible separation



SIZING AND ORDERING PROCEDURE

MEASUREMENTS

FRAME — Measure the inside diameter of the frame at its base **D1**, and note the height of the flat surface and if this surface is straight or tapered.

1. The width of the sealing surface must be at least 2-1/2".
2. If the inside surface is tapered, measure and note the frame's diameter at a point 3" up from its base.
3. The frame can not be offset from the chimney or cone/corbel by more than approximately 3 inches.

CHIMNEY — Measure the inside diameter **C1**, and height **H1** of the chimney.

1. The inside diameter of the chimney **C1** must be within a maximum of 20 percent of the inside diameter of the frame **D1**. If mortar is to be used on the chimney to provide a sealing surface or to bring it within this tolerance, estimate what the diameter will be after mortaring.
2. A minimum 2-1/2" high vertical sealing surface must be provided on either the chimney, the cone/corbel, or both.

CONE/CORBEL — If the chimney height **H1** is less than approximately 2-1/2 inches measure the inside diameter **C2** and height of the straight section **H2** of the cone/corbel. See installation instructions if **H2** = 0.

SEAL SIZES

The rubber sleeves are normally available in 20, 22, 24, 26, 28, 30 and 36 inch diameters. The steel expansion bands are available in the same sizes and increments, with each having a 2-1/2" diameter range that extends from approximately 1" smaller to 1-1/2" larger than the stated size. Sizes of sleeves and bands other than these are available by special order.

ORDERING

SLEEVE DIAMETER — Order the sleeve the even size closest to the smaller of either the frame diameter **D1** or the applicable chimney or cone/corbel diameter **C1** or **C2**.

BAND DIAMETERS — Order the bands the same size as the sleeve if the diameters of both sealing surfaces, **D1** and **C1** or **C2** are within the band's diameter range; if however, one of these surface diameters is larger than the band's range, order the next larger band for sealing against that surface.

ORDERING AND REPORT FORM

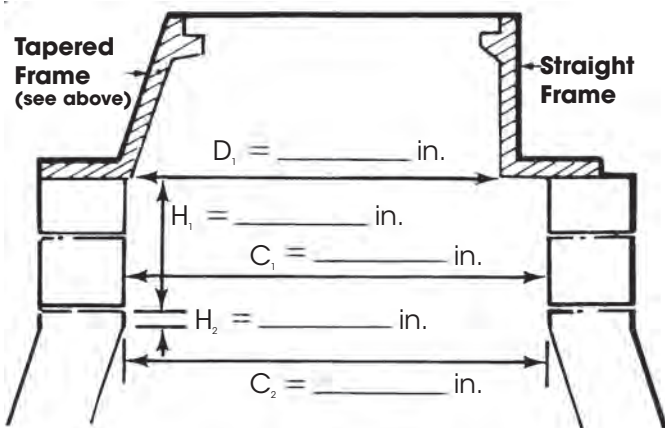
Community: _____ Manhole No: _____

Location: _____ Date: _____

Describe any pertinent factors:

SLEEVE: Dia. _____ Width _____

BAND DIAMETER: Top _____ Middle _____ Bottom _____



SURFACE PREPARATION – All loose and protruding mortar and brick that would interfere with the seal's performance shall be removed and the appropriate surfaces of the frame, chimney and/or cone/corbel prepared in accordance with the manufacturer's instructions.

INSTALLATION – Read complete instructions before starting installation.

1. Install the rubber sleeve with the printing facing up at the top and the top edge of the seal lined up with any previously applied alignment marks.
2. Wipe off the outside of one stainless steel band and apply a moderate coating of band lubricant to the slot area and a light to moderate coating to the remainder of the band's outside surface. Either the top band or the smaller band, if two different sized bands are being used, is to be installed first.
3. Install the band in the appropriate band recess with the slotted end against the rubber surface. Position the expansion tool as shown below and expand the band until the locking tabs pop into the tightest slots possible. To ensure proper tightness, stop expanding and let the seal "relax" for 30 to 60 seconds and then try to tighten again to the next set of slots. Once the band is fully tightened, loosen the expansion tool slowly until the tabs are fully engaged in the slots, and then continue to loosen and remove the tool. When installing a larger diameter band, use one of the auxiliary tool slots to start the expansion process. Move one leg of the tool to the primary tool slot if necessary to complete expansion.
4. Lubricate the second band and install it in the other band recess, attach the tool and expand as before, keeping the bands parallel. The seal may be adjusted up or down as required for minimum or maximum chimney coverage or if excessive sleeve expansion is required.
5. A third band is required for the 12-18 and 18-24 LSS sleeves. When a third band is used, lubricate and install band in the recess in the center of seal and expand as before so it is snug.
6. Check the top and the bottom edges of the installed sleeve to insure that they have been properly compressed against the surfaces.

NOTE: ALWAYS WEAR GLOVES WHEN HANDLING THE BANDS

