

Recommended Installation Procedures Storm and Sanitary Manholes

1. **Lifting Apparatus:** Use approved lifting slings that will adequately lift weight of units. The use of an approved or rated spreader bar is preferred. When lifting manhole bases and risers, make sure chain or cable lengths are long enough to prevent contact with tongue and groove area, and are kept at appropriate lifting angles. Use wooden blocks between sling and manhole wall if necessary.
2. **Recommended Manhole Bedding:** Use a minimum of 6" of approved bedding material compacted to 90% proctor in an area not less than base area but preferably 6" beyond the outside radius on manhole base. The area under incoming and outgoing pipes should be treated the same to prevent shearing of pipes. Local ground conditions may require additional bedding thickness, per Engineer's recommendations.
3. **Setting Manhole Base:** Set manhole base on graded bedding per job specifications making sure boots or pipe openings match design elevations. Level top of manhole base in both directions.
4. **Pipe Connections:** (Per manufacturer's recommendations) check with manufacturer if precast inverts are supplied.
 - A. *Flexible Boot Connections* – Clean pipe surface and inside of boot. Insert pipe flush with inside of manhole wall or as allowed by jurisdiction, keeping the pipe centered in connector. Install all take up clamps(s) in groove(s) if provided at receiving end of connector. Tighten clamp to recommended torque, which will vary depending on size and manufacturer's specifications. Any grouting that will inhibit the design/flexibility of the connector should be avoided.
 - B. *Compression Type Connector* – Cut 3/4" bevel on end of pipe to be inserted into manhole. Clean pipe surface and inside area of connector. Lubricate inside of connector and exterior of area of pipe being inserted with approved lubricant. Center beveled end of pipe into connector. Keeping pipe level, push pipe into connector until pipe is flush with inside of manhole wall or as required per local specifications.
 - C. *Mortar Joint* – Locate pipe into opening to meet elevations. Using non-stick mortar, fill voids around pipe completely. Allow proper curing time before backfilling.
5. **Pipe Stubs:** Any pipe stubs installed in the Manhole must be restrained from movement to prevent blowout resulting from ground water or any testing.
6. **Joint Installation:**
 - A. *Butyl Gasket* – Use only manufacturer recommended sizes for specific diameters. Clean and inspect tongue and groove surfaces. Surfaces should be free of all dust and debris. On tongue-up manhole, place butyl material next to the vertical surface of tongue. Wrap material completely around unit overlapping ends. Knead the ends together to form a unified splice. Make sure ALL protective paper is removed. Lower bell end of next section making sure steps are aligned (if applicable) into final position. If Bell is up, place butyl material next to vertical surface of groove and follow above procedure.
 - B. *Confined O-Ring* – Clean and inspect joint surfaces. Lubricate joint surface liberally. Lubricate O-Ring gasket thoroughly before placing into confined groove space provided. Run a smooth round object between gasket and tongue around entire circumference several times. Lower lubricated end of next section making sure steps are aligned into final position. Keep sections level/plumb while setting to prevent rolling gasket and breaking bell.
 - C. *Offset and Prelubricated Gaskets* – Install per manufacturer's specifications.
7. **Precast Lift Hole Sealing (full penetration):** Lifting holes shall be sealed by inserting a rubber plug or other approved material, into hole (if supplied) and/or filling with non-shrink mortar from inside & outside.
8. **Backfill Procedure:** *If you are vacuum testing, do so before backfilling.* Detecting leaks at this time is easy and repairs are simple. Backfill around manhole equally to prevent tipping. Compact fill in lifts same as standard trench procedure. Backfill material should be clean and free of large rocks.
9. **Testing Procedures:** Refer to NPCA Manhole Vacuum Testing Brochure for vacuum, hydrostatic, and pressure testing where required.