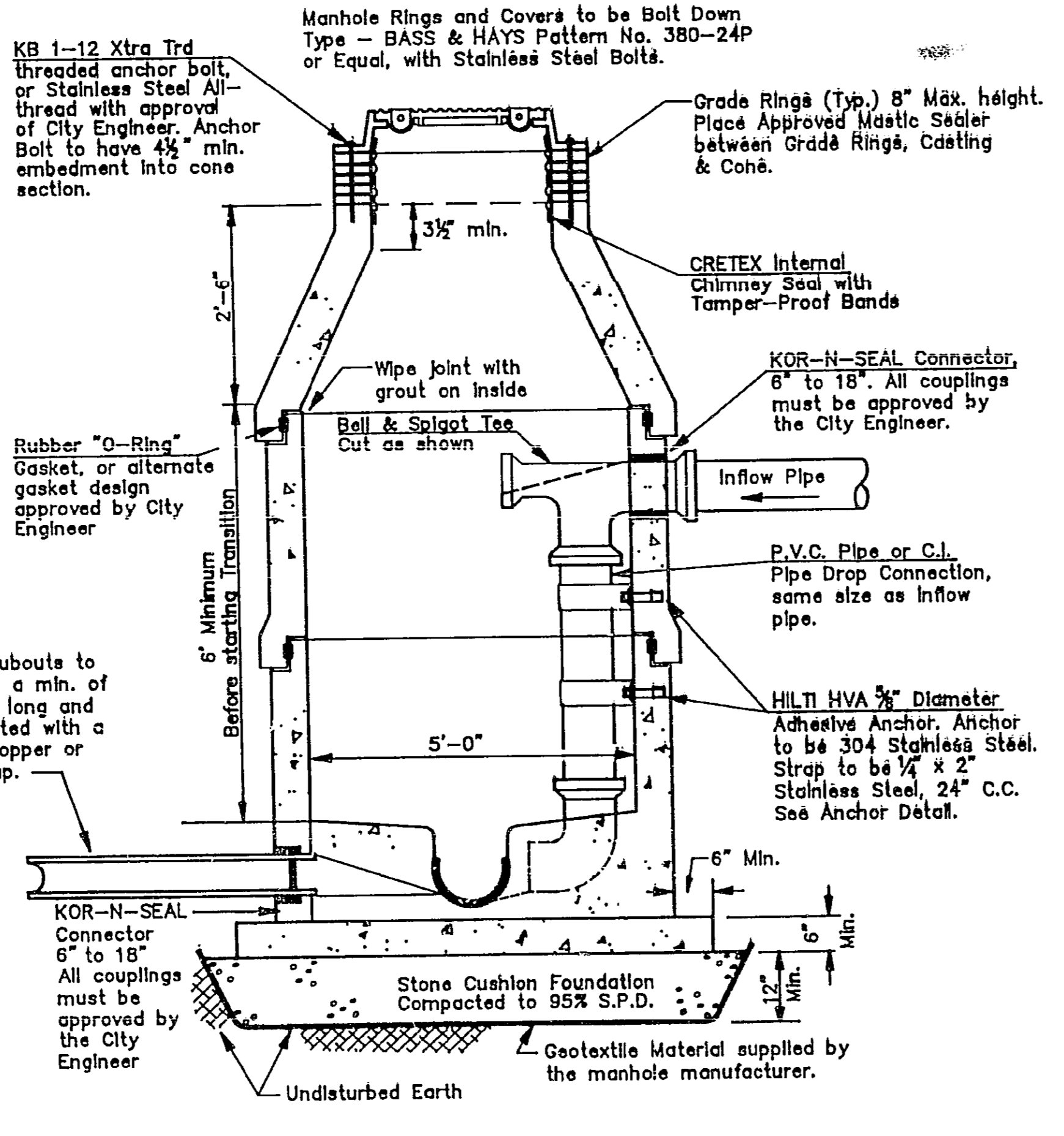


**PRECAST MANHOLE**

NOT TO SCALE

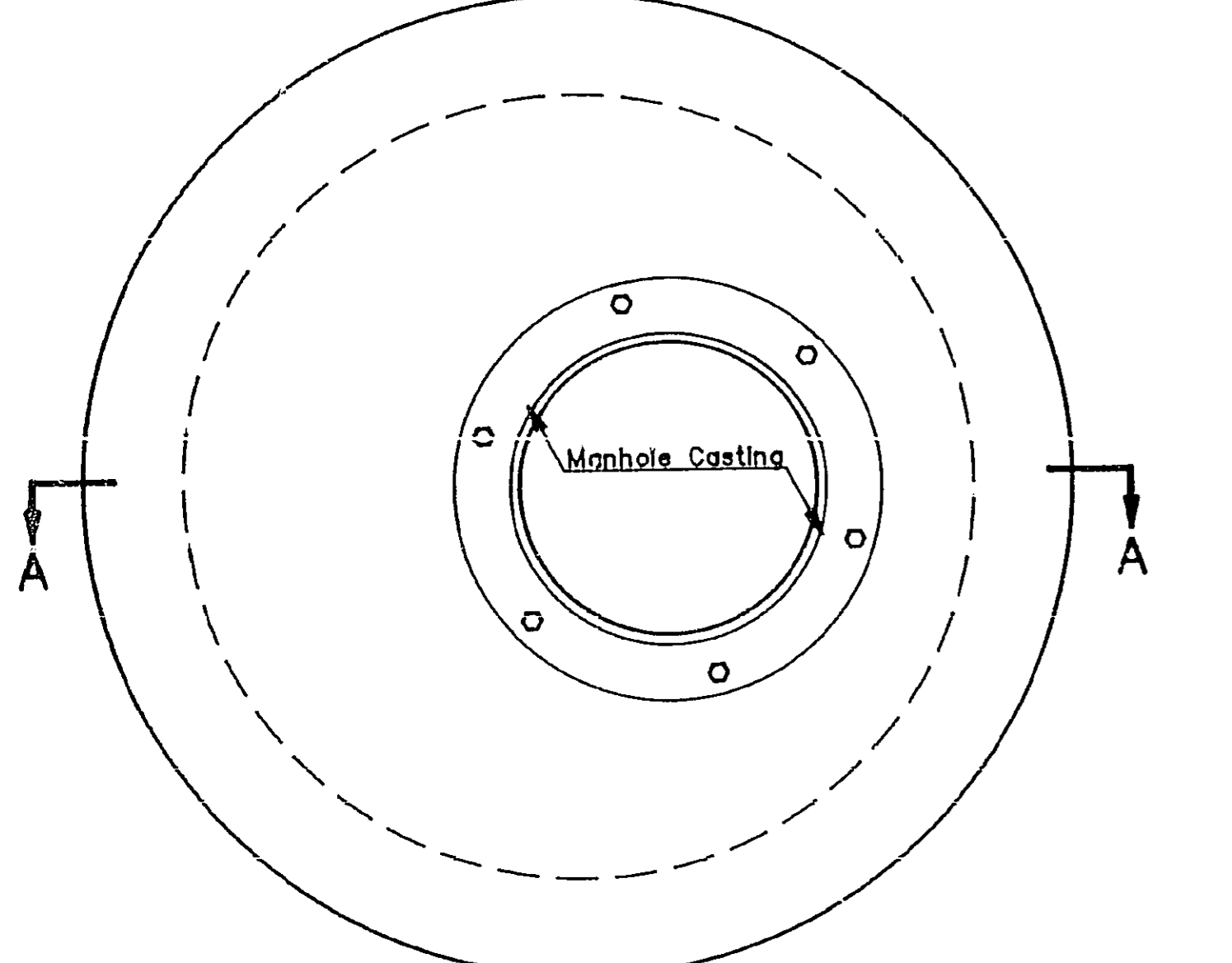
Precast manholes to be used in all new construction unless alternate approved by City Engineer.



**PRECAST DROP-MANHOLE**

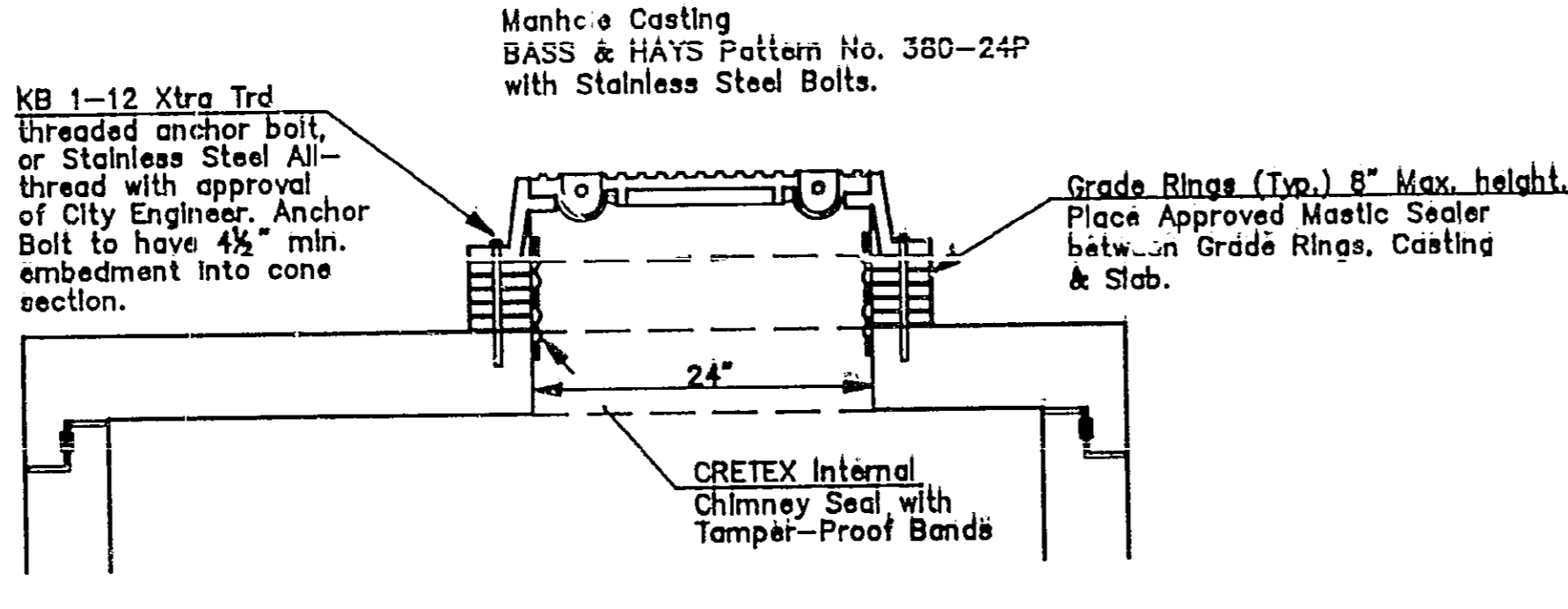
NOT TO SCALE

Precast manholes to be used in all new construction unless alternate approved by City Engineer.



**PRE-CAST MANHOLE FLAT LID**

NOT TO SCALE

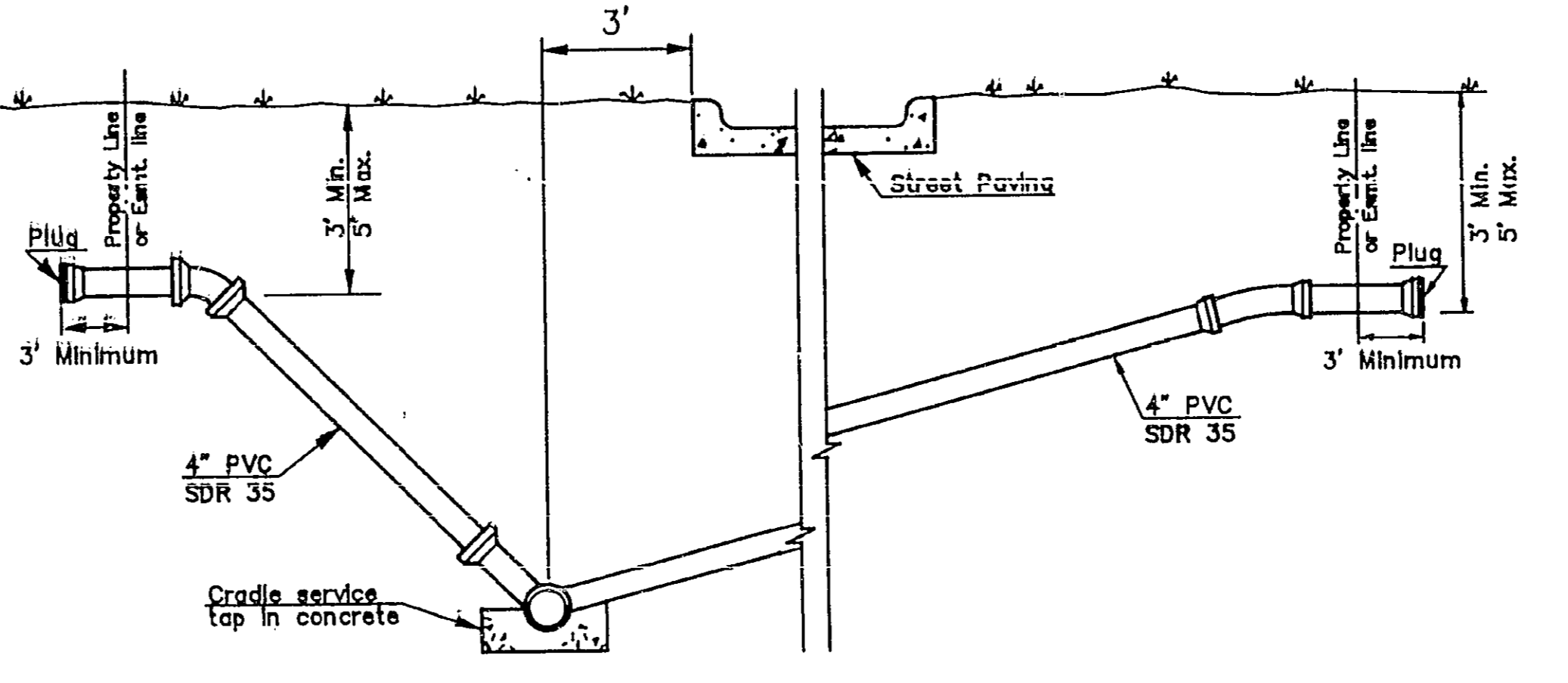


**SECTION A-A**

NOT TO SCALE

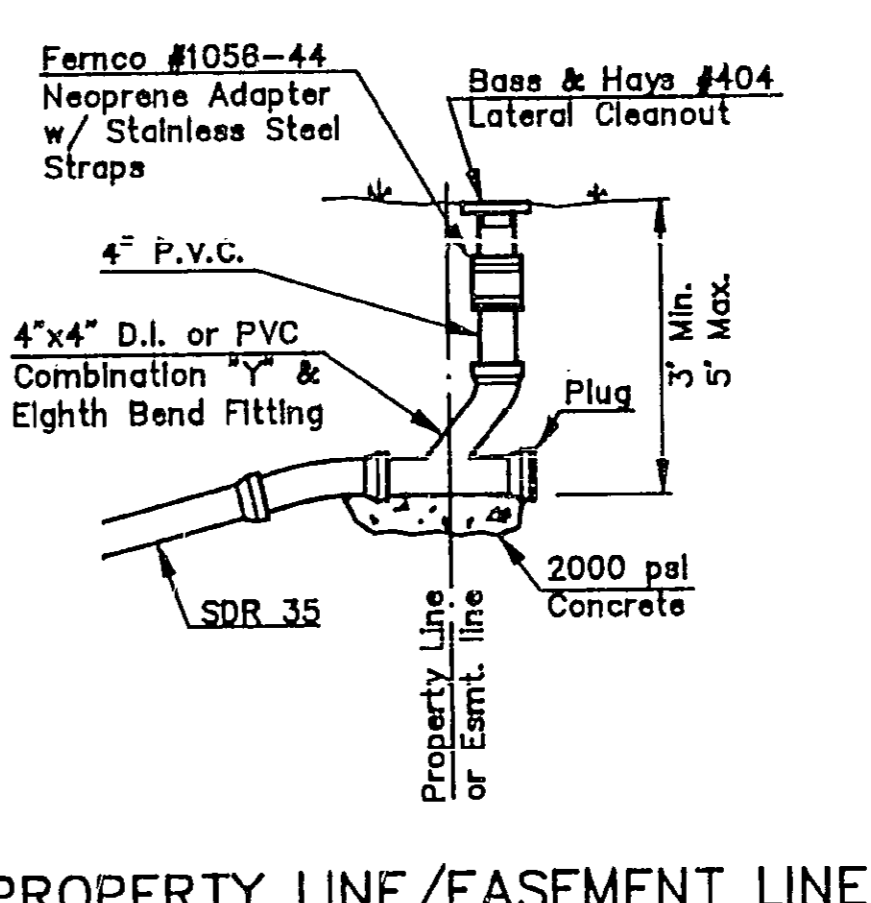
In some situations, manhole castings may be cast integrally with the pre-cast manhole flat lid, however, an alternate design with a watertight, bolt-down casting must be approved.

Manhole Flat lids must be load rated for HS-20 loadings.



**TYPICAL SEWER SERVICE RESIDENTIAL CONNECTIONS**

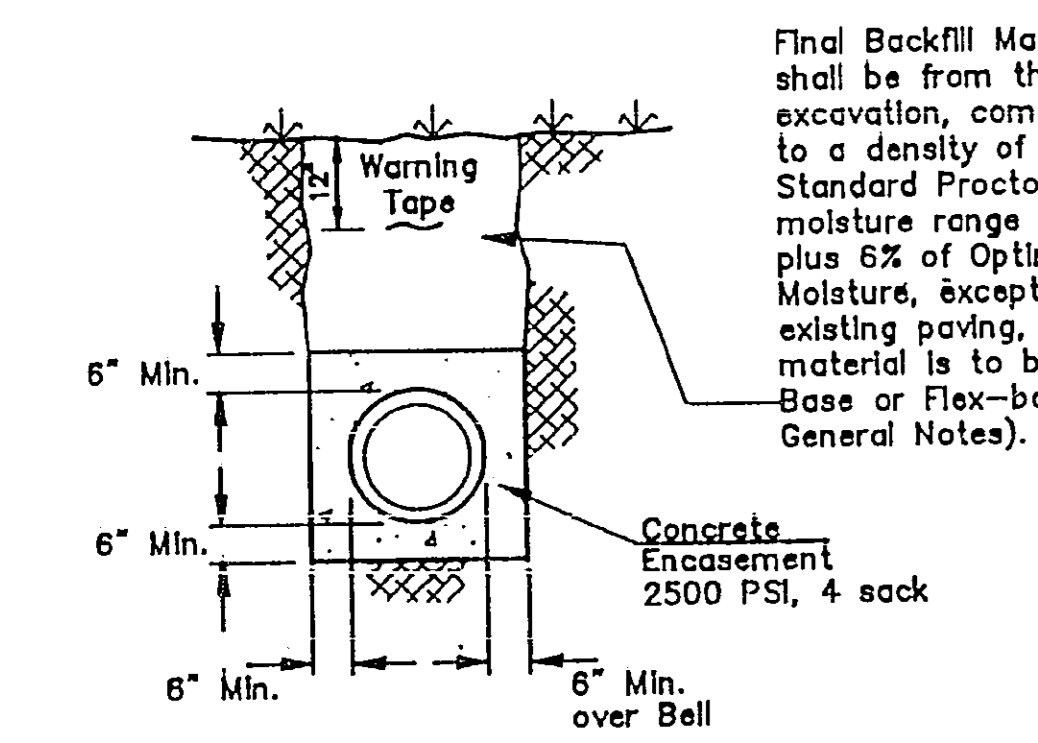
NOT TO SCALE



**PROPERTY LINE/EASEMENT LINE CLEAN-OUT**

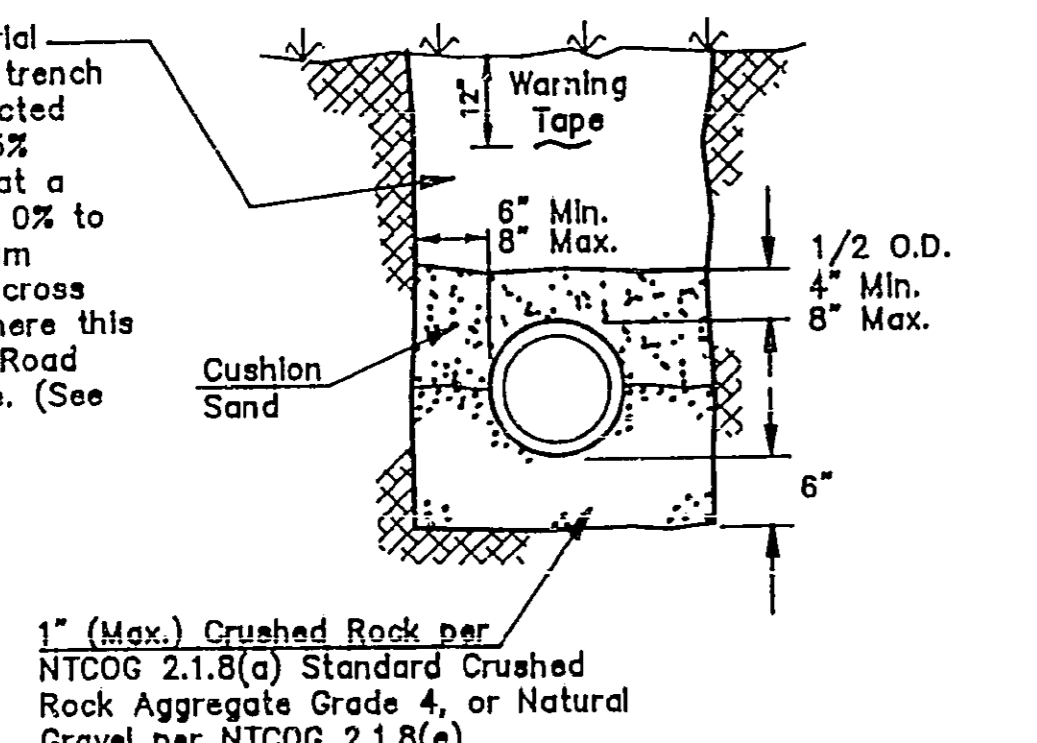
NOT TO SCALE

Install on residential services only at the Direction of the City Engineer.



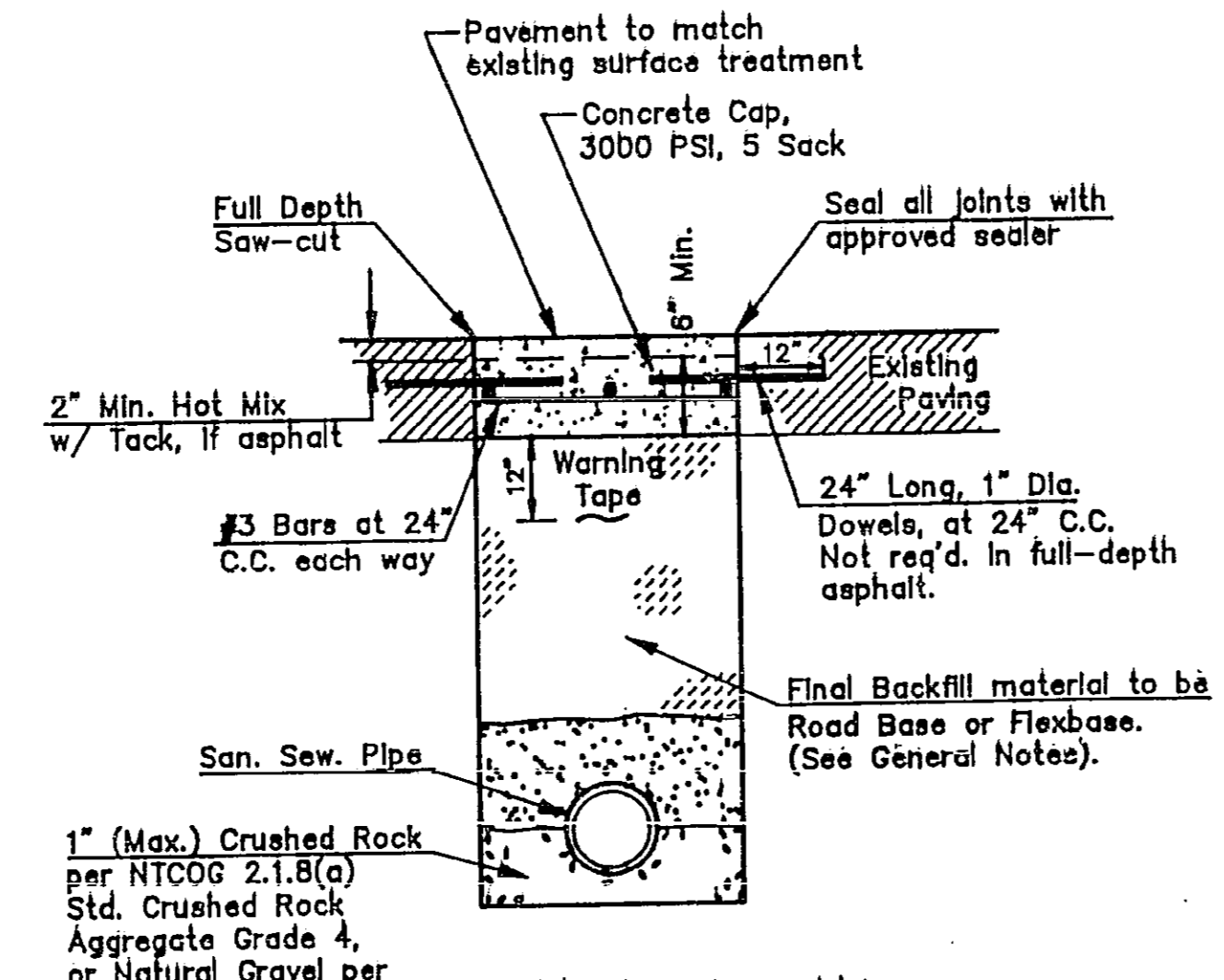
**ENCASEMENT DETAIL**

NOT TO SCALE



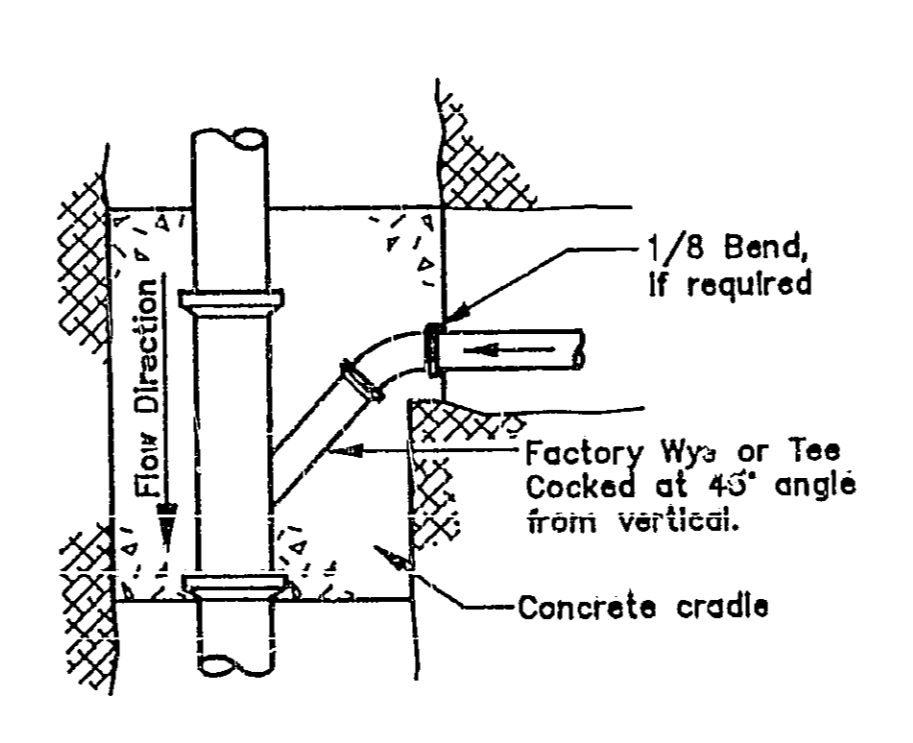
**EMBEDMENT DETAIL for PVC**

NOT TO SCALE



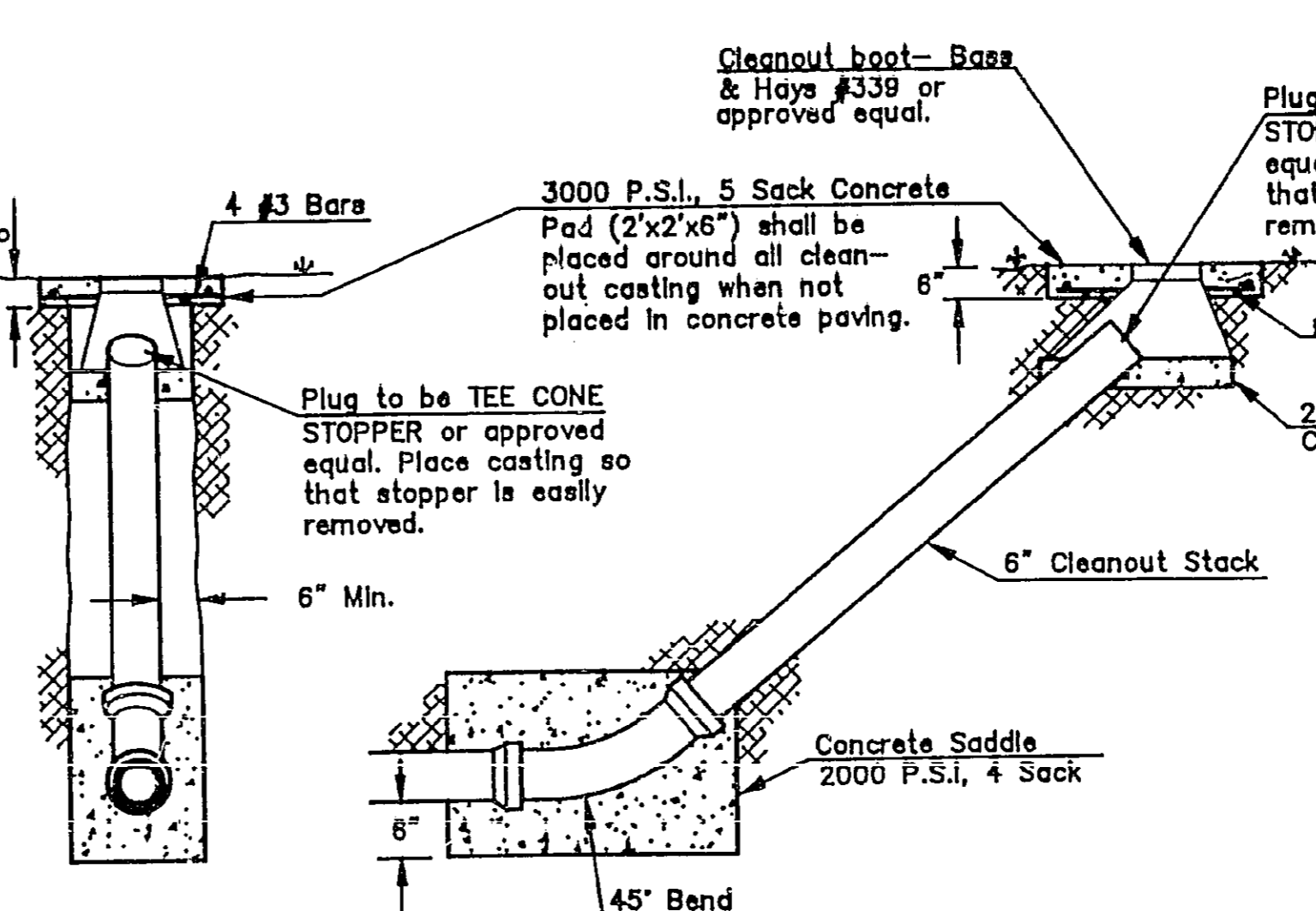
**PAVEMENT CUT DETAIL**

NOT TO SCALE



**SERVICE CONNECTION**

NOT TO SCALE



**STANDARD CLEANOUT**

NOT TO SCALE

**GENERAL NOTES**

**GENERAL**

1. All sanitary sewer system details, design and construction must meet current Texas Natural Resource Conservation Commission regulations 30 TAC Section 317.1 to 317.3.

**MANHOLES**

1. Pre-cast manholes shall be used in all new construction, unless an alternate is approved by the City Engineer. Shop drawings of pre-cast manholes shall be submitted to the City Engineer for review and approval.
2. Tee-base manholes are an approved alternate for pre-cast manholes for concrete pipe sanitary sewer mains 30" diameter or greater. Shop drawings for Tee-base manholes shall be submitted to the City Engineer for review and approval.
3. Manhole diameter shall be increased to 5'-0" for manholes 15' depth and greater as measured from top of rim to flowline of pipe.
4. All drop manholes shall be 5' in diameter, per above detail.
5. Lifting eyes are not allowed in pre-cast manholes.
6. All manholes shall have a CRETEX Internal Manhole Chimney Seal installed.
7. All manholes shall have a 3/4" plywood false bottom installed prior to initiation of grading and/or lining operations.
8. All manholes shall be vacuum tested, including grade rings and casting, per TNRC regulations 30 TAC 317.2.
9. All manhole covers must be bolt-down type - Bass & Hays Pattern No. 380-24 P or equal.
10. All manhole inverts shall be to the full depth of the largest pipe.
11. Manhole final backfill material shall be from the trench excavation, compacted to a density of 95% Standard Proctor at a moisture range of 0% to plus 6% Optimum Moisture, except under existing paving, where backfill shall be compacted gravel base course or Flex-base per NCTCOG standard specification 2.1.3, placed in 12" loose lifts (maximum) and compacted to 95% of Standard Proctor Density at a moisture range of 0% to plus 6% of optimum moisture. No deleterious material, vegetation, or debris of any kind may be used for backfill.
12. Existing manholes to have drops installed may terminate drop of invert ledge.
13. In some situations, manhole castings may be cast integrally with the pre-cast manhole flat lid, however, an alternate design with a watertight, bolt-down casting must be approved.
14. Manhole Flat lids must be load rated for HS-20 loadings.

**TESTING**

1. Sanitary Sewer Lines must pass an Air and Mandrel Test, per NCTCOG Standard Specification Item 6.7.2 (f) & (h), and TNRC regulations 30 TAC 317.1 to 317.3.
2. All manholes shall be vacuum tested, including grade rings and casting, per TNRC regulations 30 TAC 317.2.
3. Trench final backfill material shall be from trench excavation, placed in 12" loose lifts (maximum) and compacted to 95% of Standard Proctor Density at a moisture range of 0% to plus 6% of optimum moisture. Under existing paving backfill shall be compacted gravel base course or Flex-base per NCTCOG standard specification 2.1.3, placed in 12" loose lifts (maximum) and compacted to 95% of Standard Proctor Density at a moisture range of 0% to plus 6% of optimum moisture. The Contractor shall take new proctors at each change in soil type, and will be required to take density tests at a frequency of one test per lift, per 300 L.F., at locations specified by the City Engineer. The City Engineer also has the authority to waive some or all of these tests if conditions warrant or if it is evident that acceptable compaction is being obtained. The Contractor shall notify the City Public Works Construction Inspector of all testing 24 hours prior to the scheduled test.

**PIPE**

1. P.V.C. Sewer Pipe and fittings shall conform to the current ASTM designation D 3034, SDR 35 for 4" through 15" diameter. The P.V.C. pipe must have gaskets in place gaskets or otherwise secured to prevent rolling of same. P.V.C. pipe must be installed per applicable City standards and manufacturer's recommendations. Consult with City Engineer for specifications for pipe of diameters larger than 15".
2. P.V.C. Sewer Pipe shall be increased to SDR-26 for all installation depths equal to or greater than 15' deep, as measured from pipe flowline to final surface grade.
3. All sanitary sewer pipe, including services, shall be colored green to conform with American Public Works Association (APWA) Uniform Color Code for underground utilities.
4. Sanitary Sewer Lines must pass an Air and Mandrel Test, per NCTCOG Standard Specification Item 6.7.2 (f) & (h), and TNRC regulations 30 TAC 317.1 to 317.3.
5. Pre-fabricated fittings are to be used on all new construction. Saddle fittings may only be used in special conditions with the approval of the City Engineer.
6. All boring operations shall have pipe placed and the void between pipe and earth grouted within 24 hours.
7. Any existing main being replaced is to be cut and plugged, or removed at the City Engineer's discretion.

**SERVICES**

1. Sanitary sewer services shall be 4" PVC, SDR 35, unless otherwise specified.
2. When installing new sanitary sewer mains, new service lines are to be furnished installed, and connected from the main to the existing service at the property line.
3. Sanitary sewer services are to be extended a minimum of 3 feet beyond the property line or easement line.
4. Services shall be installed with a continuous detectable green warning tape placed approximately 12" below finished grade. Tape shall be brought to the surface at the end of services to mark end of line. Tape shall be high stretch, 3" width THOR "Magna-Tec", TERRA TAPE "Detectable" or other approved by the City Engineer, and shall have the wording "CAUTION - Sewer Line Buried Below" imprinted on tape.
5. A 4" Cleanout with Cover, as shown on this detail, shall be placed at the property line or easement line on sanitary sewer services, per the discretion of the City Engineer.

**SAFETY**

1. All excavation and trench operations shall be in accordance with 28 CFR Part 1928 Subpart P and all applicable City and State regulations. Prior to commencing any excavation or trenching operation, the Contractor shall submit to the City Engineer a plan indicating the intended procedures to be used by the Contractor to comply with OSHA requirements. Such Plan shall further identify the "Competent Person" as required by paragraph 1928.851 (X)(1) that will work with each crew. A copy of said Plan shall be available for review at the job site at all times.
2. All contractors and developers, with their employees and agents, shall comply with all applicable Federal, State and Local safety laws and regulations including, but not limited to the Occupational Safety and Health Act of 1970, ordinances, rules, regulations and orders of any public authority having jurisdiction for the safety of persons or property to protect them from damage, injury or loss. He shall provide, erect and maintain, as required by existing conditions and progress of the work, all reasonable safeguards for safety and protection, including constructing barricades and posting danger signs in accordance with the most current Barricade and Construction Standards from the Texas Manual of Uniform Traffic Control Devices (and other such barricades and signs as deemed necessary by the City Engineer), promulgating safety regulations and notifying owners and users of adjacent utilities. Safety precautions shall include but not be limited to compliance with all local, state and federal standards, laws, ordinances, and standards for design and implementation of trench safety, confined space and traffic control.

**BACKFILL**

1. Trench final backfill material shall be from trench excavation, placed in 12" loose lifts (maximum) and compacted to 95% of Standard Proctor Density at a moisture range of 0% to plus 6% of Optimum Moisture. Under existing paving backfill shall be compacted gravel base course or Flex-base per NCTCOG standard specification 2.1.3, placed in 12" loose lifts (maximum) and compacted to 95% of Standard Proctor Density at a moisture range of 0% to plus 6% of optimum moisture. The Contractor shall take new proctors at each change in soil type, and will be required to take density tests at a frequency of one test per lift, per 300 L.F., at locations specified by the City Engineer. The City Engineer also has the authority to waive some or all of these tests if conditions warrant or if it is evident that acceptable compaction is being obtained. The Contractor shall notify the City Public Works Construction Inspector of all testing 24 hours prior to the scheduled test.
2. Manhole final backfill material shall be from the trench excavation, compacted to a density of 95% Standard Proctor at a moisture range of 0% to plus 6% of Optimum Moisture, except under existing paving, where backfill shall be compacted gravel base course or Flex-base per NCTCOG standard specification 2.1.3, placed in 12" loose lifts (maximum) and compacted to 95% of Standard Proctor Density at a moisture range of 0% to plus 6% of optimum moisture.
3. All sanitary sewer pipe, including services, shall be installed with a continuous detectable green warning tape placed approximately 12" below finished grade. Tape shall be brought to the surface at the end of services to mark end of line. Tape shall be high stretch, 3" width THOR "Magna-Tec", TERRA TAPE "Detectable" or other approved by the City Engineer, and shall have the wording "CAUTION - Sewer Line Buried Below" imprinted on tape.
4. No deleterious material, vegetation, or debris of any kind may be used for backfill.

APPROVED: *Earl Hardin* Manager of Engineering Services Date: 5/10/95

Rev. No.	Date	Description
1	SEPT. '94	Various Details & Notes
2	MAY '95	General Revision

**SANITARY SEWER SHEET ONE**  
**STANDARD DETAILS**

**Engineering Division**  
**City of Mesquite, Texas**

Drawn	Date	Scale	File
S. Hardin	Sept. 27, 1991	N.T.S.	SANSEW