

LOW PRESSURE SERVICE CONNECTION

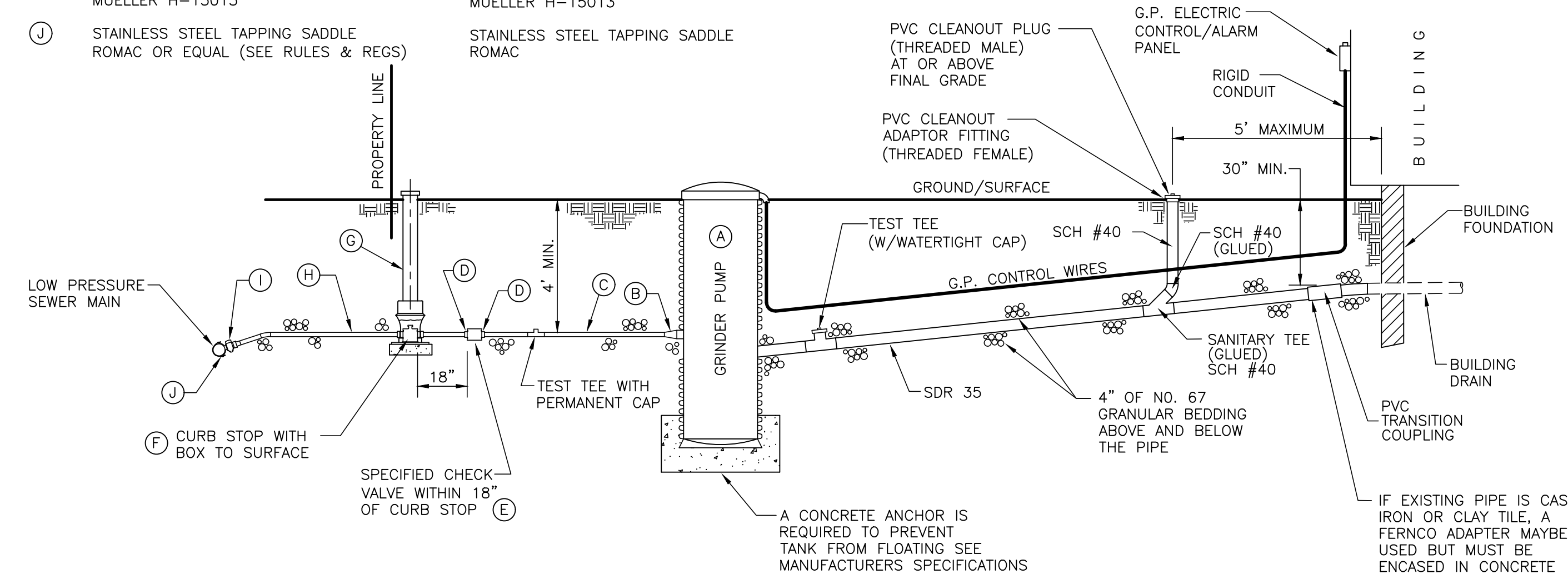
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|--|--|
| DH071-GP1 OR DH151-GP2 | DH152 - DUPLICATION |
| (A) GRINDER PUMP - ENVIRONMENT ONE | GRINDER PUMP (2 PUMP UNIT) ENVIRONMENT ONE |
| (B) REDUCER - BY COUNTY | REDUCER - BY COUNTY |
| (C) 1 1/2" SDR 9 PRESSURE PIPE POLYETHYLENE TUBING | 2" PVC PRESSURE PIPE POLYETHYLENE TUBING |
| (D) MUELLER COMPRESSION FITTING(S) H-15428 OR P-15428 | MUELLER COMPRESSION FITTING(S) H-15428 OR P-15428 |
| (E) CHECK VALVE - S1520-15F SPEARS OR NDS 1 1/2" x 1 1/2" F.I.P. | CHECK VALVE - S1520-20F SPEARS OR NDS 2" x 2" F.I.P. |
| (F) 1 1/2" CURB STOP FORD B-25115 | 2" CURB STOP FORD B-25115 |
| (G) MINNEAPOLIS STYLE CURB BOX TYLER H-10302 | MINNEAPOLIS STYLE CURB BOX TYLER H-10302 |
| (H) 1 1/2" PVC PRESSURE PIPE POLYETHYLENE TUBING | 2" PVC PRESSURE PIPE POLYETHYLENE TUBING |
| (I) CORPORATION STOP (TAP) MUELLER H-15013 | CORPORATION STOP (TAP) MUELLER H-15013 |
| (J) STAINLESS STEEL TAPPING SADDLE ROMAC OR EQUAL (SEE RULES & REGS) | STAINLESS STEEL TAPPING SADDLE ROMAC |

PRESSURE PIPE SPECIFICATIONS:
1 1/2" PVC SCHEDULE 80, SDR 21, OR SDR 26 PIPE PVC SCHEDULE 80 FITTINGS INCLUDE TEE WITH CAP

PRESSURE PIPE TESTING REQUIREMENTS:
WATER TESTED AT 100 PSI

GRAVITY PIPE TESTING REQUIREMENTS:
WATER TEST (10' ABOVE LOWEST POINT FOR 2 HOURS) OR AIR TEST (4 LB'S AIR FOR 2 MINUTES)

GRAVITY PIPE SPECIFICATIONS:
PVC ASTM D-3034 - S.D.R. 35 WITH O-RING GASKETED JOINTS



TYPICAL GRAVITY BUILDING SEWER WITH GRINDER PUMP AND PRESSURE SERVICE CONNECTION
NO SCALE

GRAVITY BUILDING SEWER SPECS.:

PIPE:
*PVC ASTM D-3034 - S.D.R. 35 WITH O-RING GASKETED JOINTS
*SINGLE FAMILY DWELLINGS - 4" OR 6"
*MULTI-FAMILY DWELLINGS - 6"
*COMMERCIAL BUILDINGS - 6"

MINIMUM SLOPE: 1% (1/8" PER FOOT)

SEPARATION FROM WATER LINE: 10' HORIZONTAL FEET

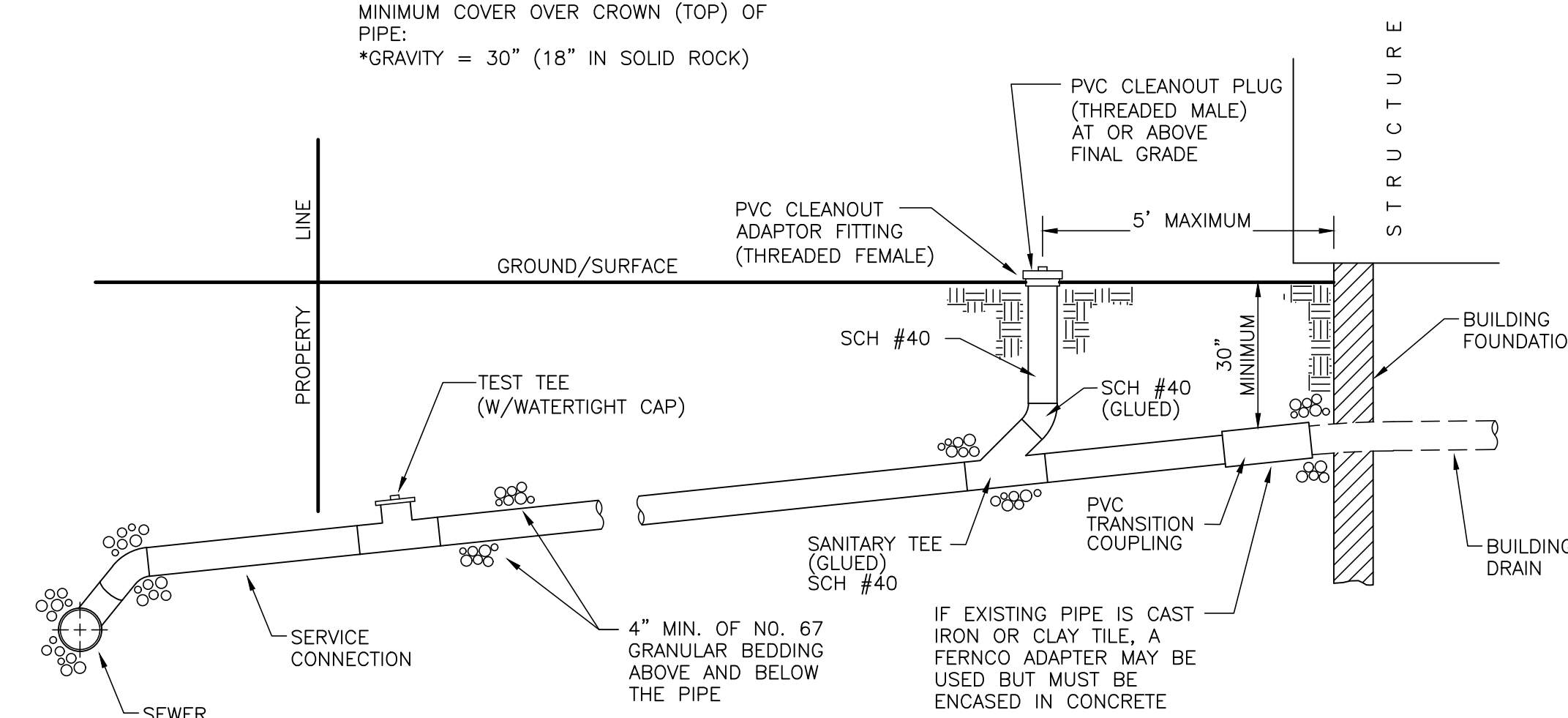
MINIMUM COVER OVER CROWN (TOP) OF PIPE:
*GRAVITY = 30" (18" IN SOLID ROCK)

GRAVITY BUILDING SEWER SPECS.:

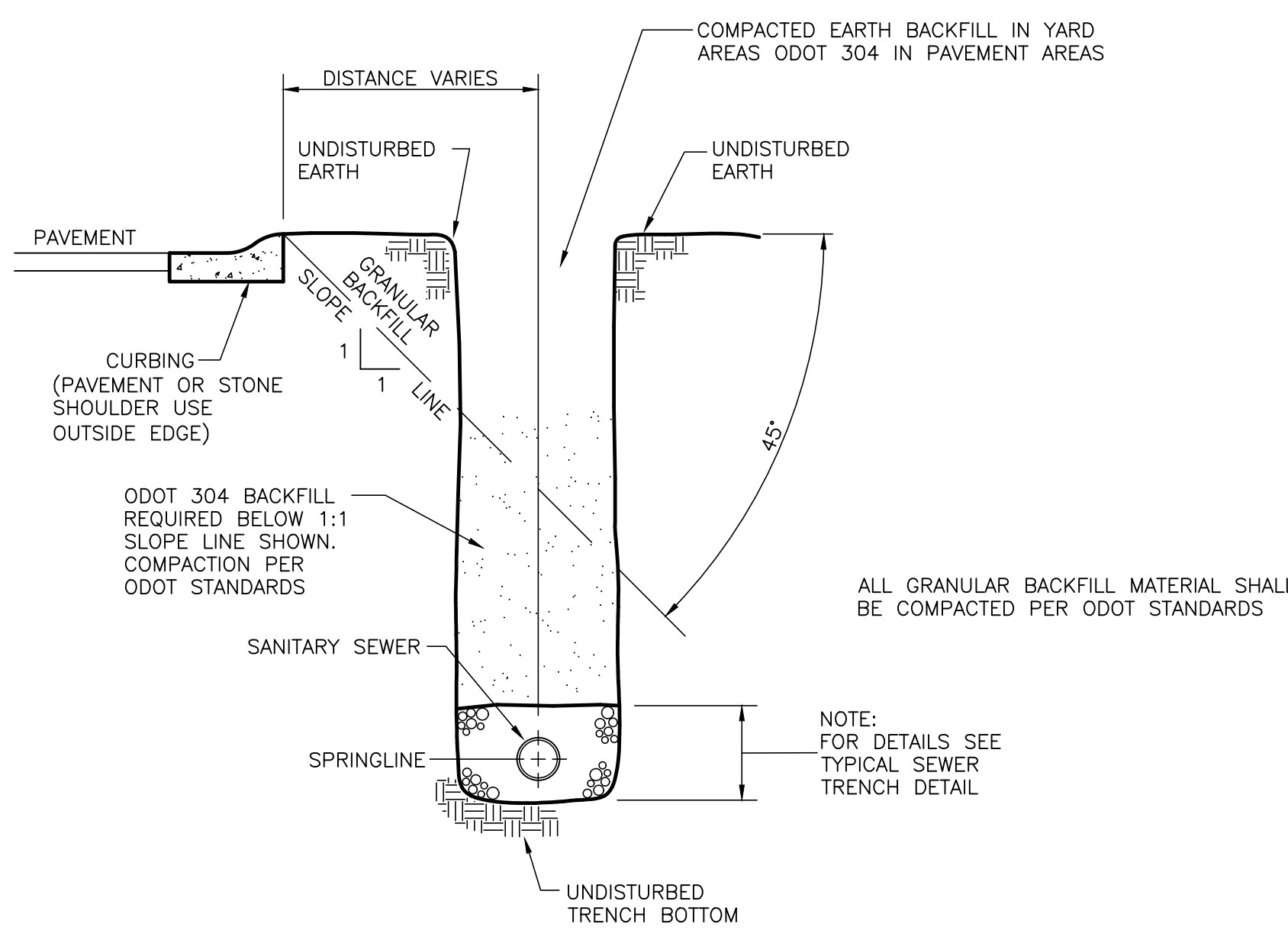
CLEANOUT REQUIRED WITHIN 5' OF FOUNDATION

ALL PIPE MUST BE TESTED PRIOR TO BACKFILL

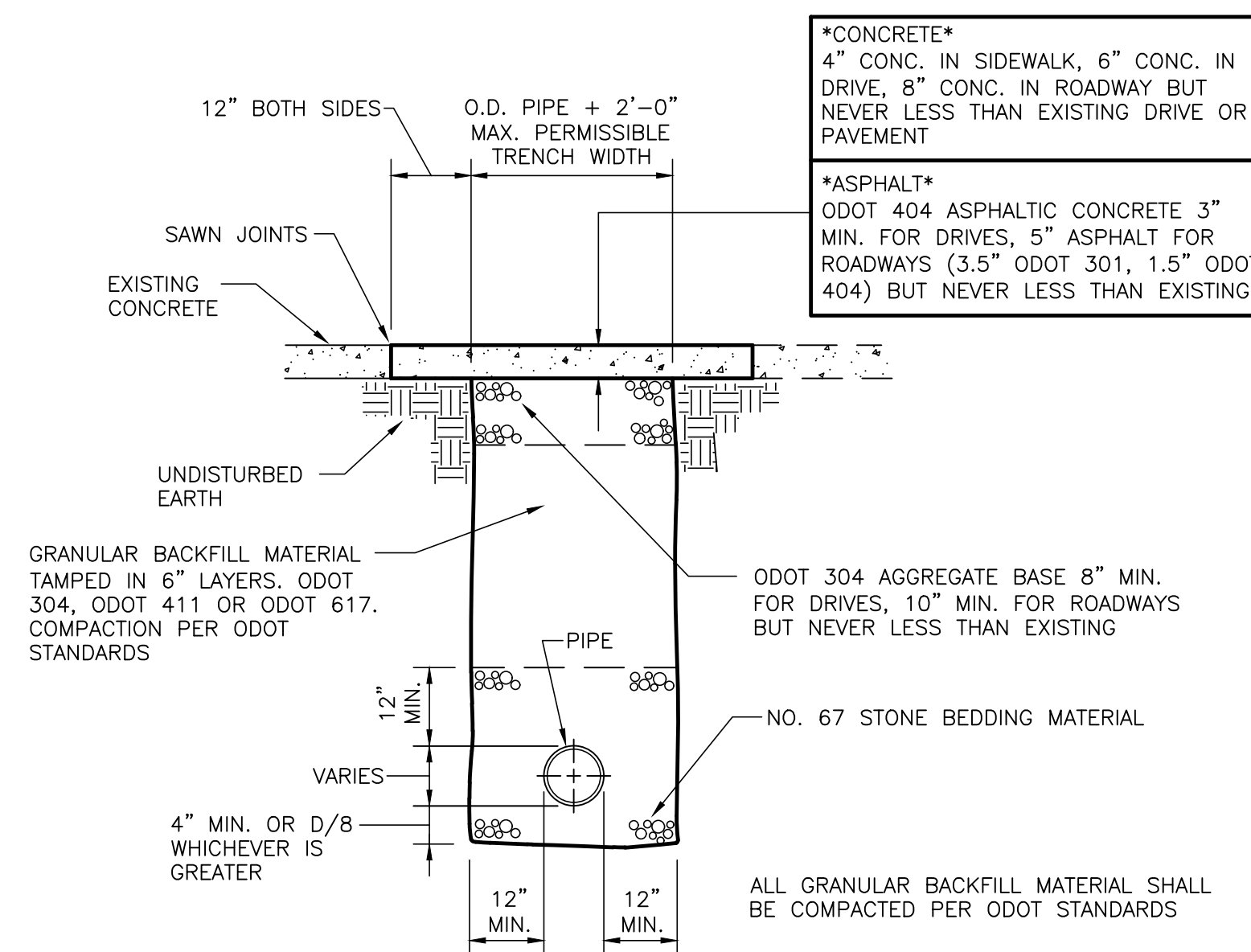
GRANULAR BEDDING REQUIREMENTS:
*NO. 67 LIMESTONE (NORMAL)
*ODOT 304 LIMESTONE (IN PAVED AREAS)
*4" OF BEDDING BELOW PIPE, 4"-6" OVER PIPE



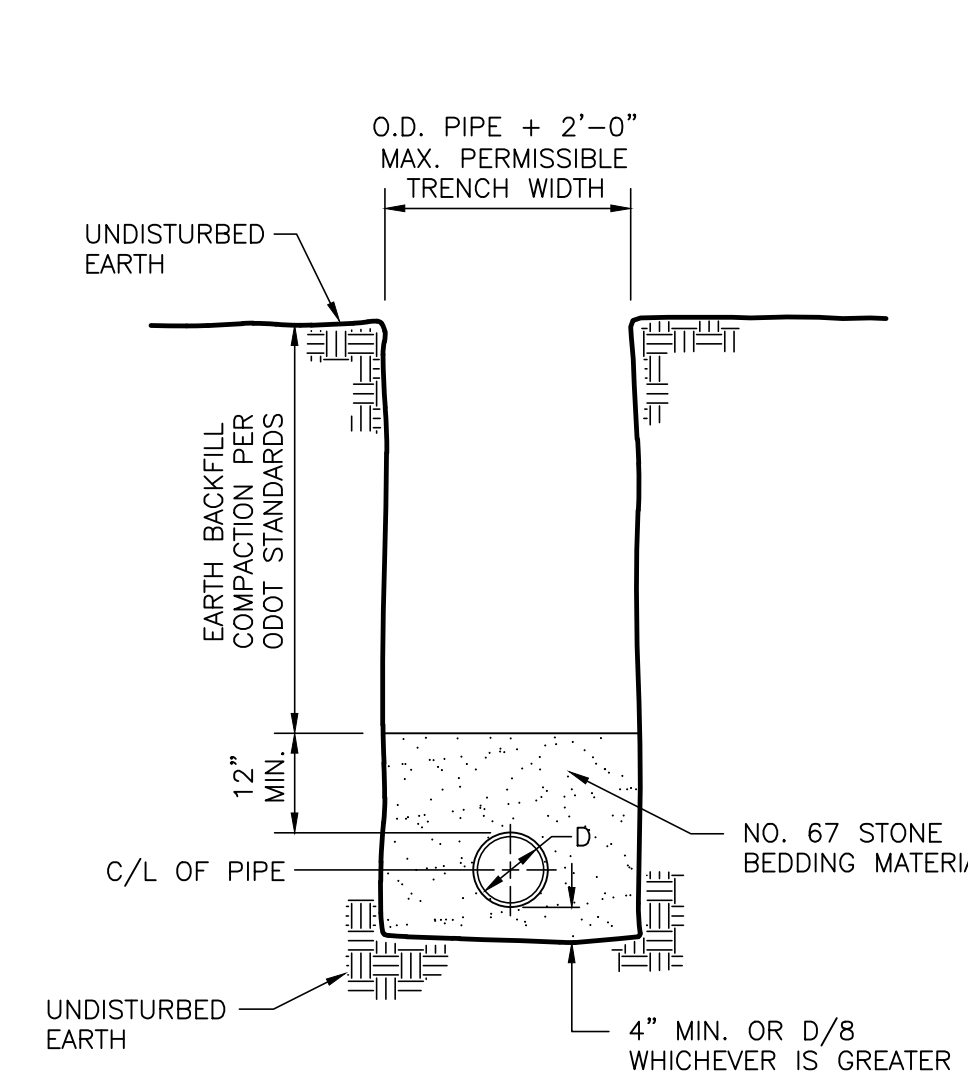
TYPICAL GRAVITY BUILDING SEWER/SERVICE CONNECTION
NO SCALE



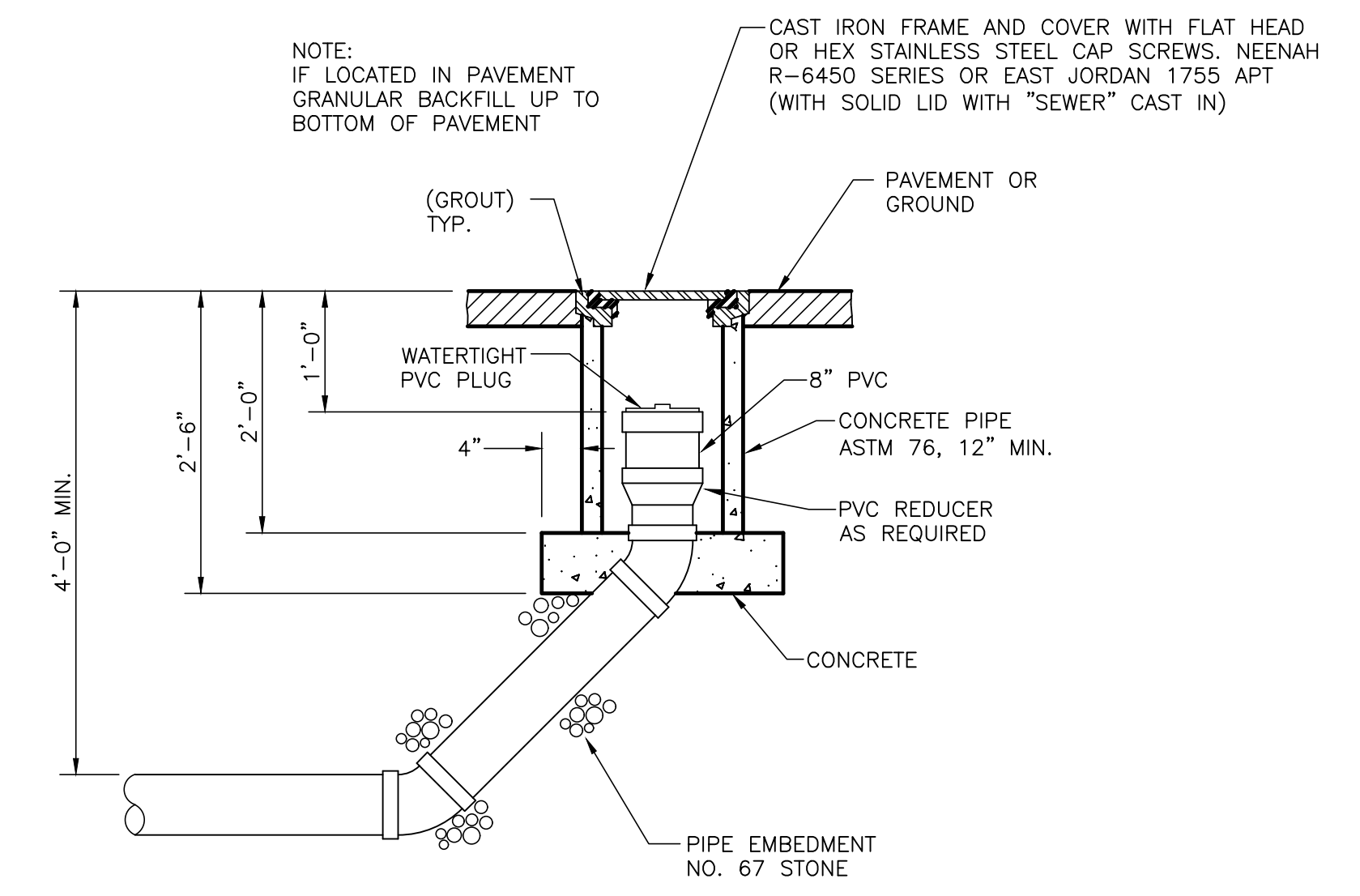
GRANULAR BACKFILL OF SANITARY SEWER TRENCH ALONG PUBLIC STREET OR ROAD
NO SCALE



TRENCH DETAIL IN PAVEMENT
NO SCALE



STANDARD SANITARY SEWER TRENCH DETAIL
NO SCALE



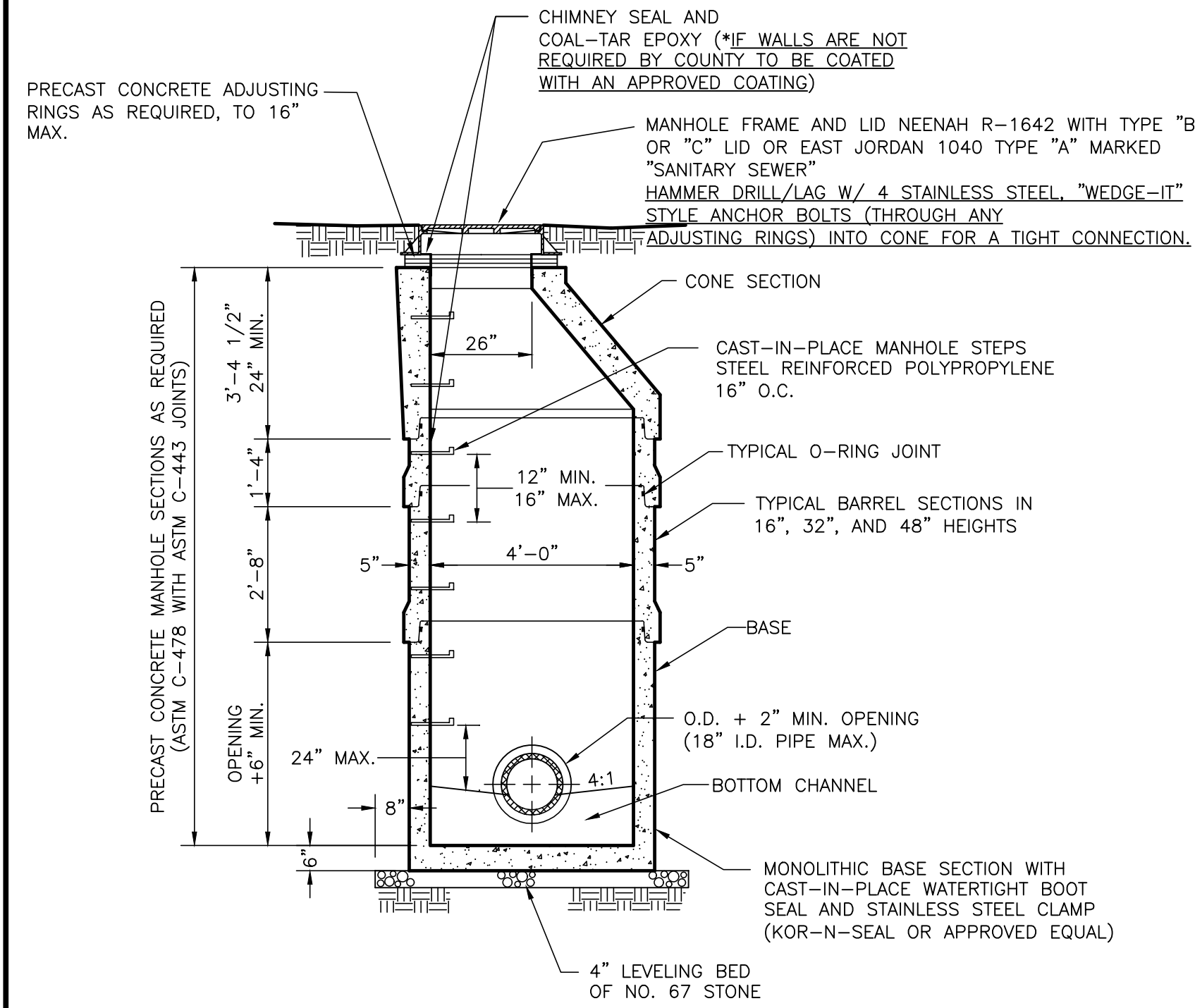
MAIN LINE CLEANOUT DETAIL
NO SCALE

**MANHOLES WITH A CASTING ELEVATION SET BELOW THE 100 YEAR FLOOD PLAIN ELEVATION U.S.G.S. ELE. 578.0, SHALL BE SUPPLIED WITH WATERTIGHT CASTINGS SIMILAR TO NEENAH R-1916 OR EAST JORDAN 1045 PT

NOTE FOR ALL MANHOLES: INTERIOR SURFACE OF THE ENTIRE PUBLIC MANHOLE AND, WHEREVER FORCE MAIN AND/OR HIGH HYDROGEN SULFIDE LEVEL DISCHARGES ARE EXPECTED, INTERIOR WALLS SHALL BE COATED WITH A MIN. OF 125 MILLS OF COUNTY APPROVED, POLYUREA OR URETHANE RESIN BASED COATING PRODUCT.

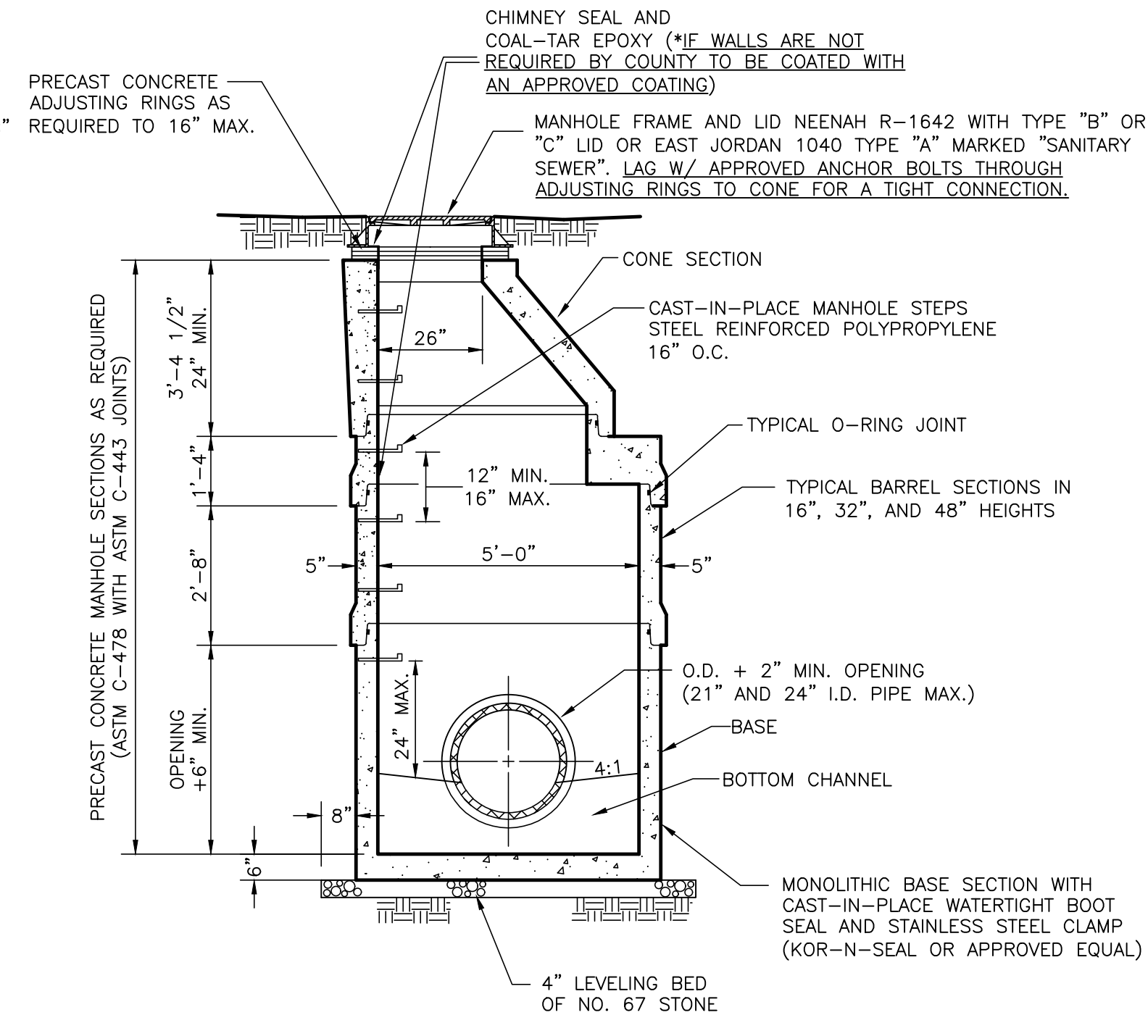
**MANHOLES WITH A CASTING ELEVATION SET BELOW THE 100 YEAR FLOOD PLAIN ELEVATION U.S.G.S. ELE. 578.0, SHALL BE SUPPLIED WITH WATERTIGHT CASTINGS SIMILAR TO NEENAH R-1916 OR EAST JORDAN 1045 PT

MANHOLES WITH A CASTING ELEVATION SET BELOW U.S.G.S. ELE. 578.0 SHALL BE SUPPLIED WITH EAST JORDAN 2800A WITH WATERTIGHT ASSEMBLY OR APPROVED EQUAL



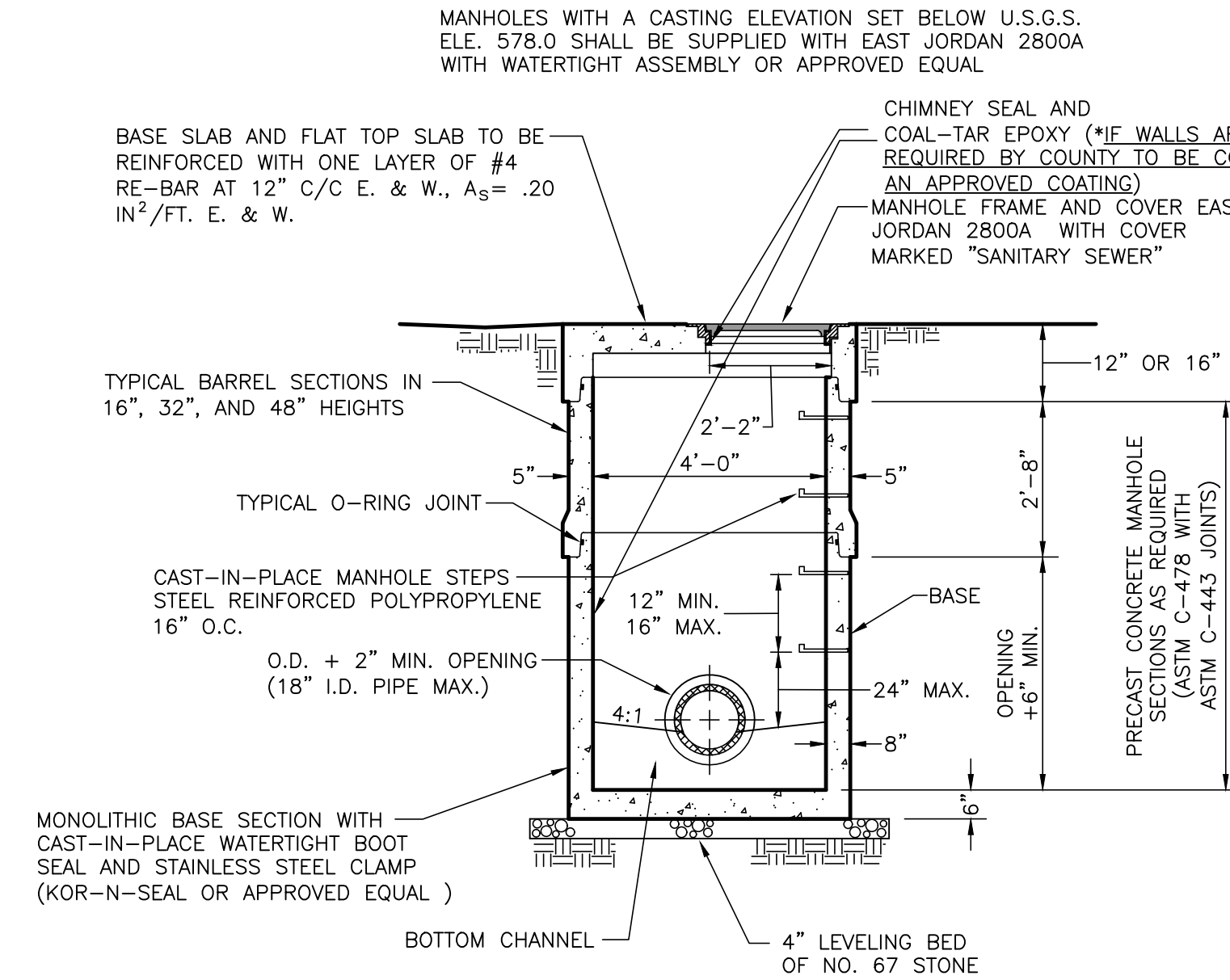
FOR INSTALLATION ON SEWERS 18 INCHES IN DIAMETER OR SMALLER

SANITARY MANHOLE - TYPE I
NO SCALE

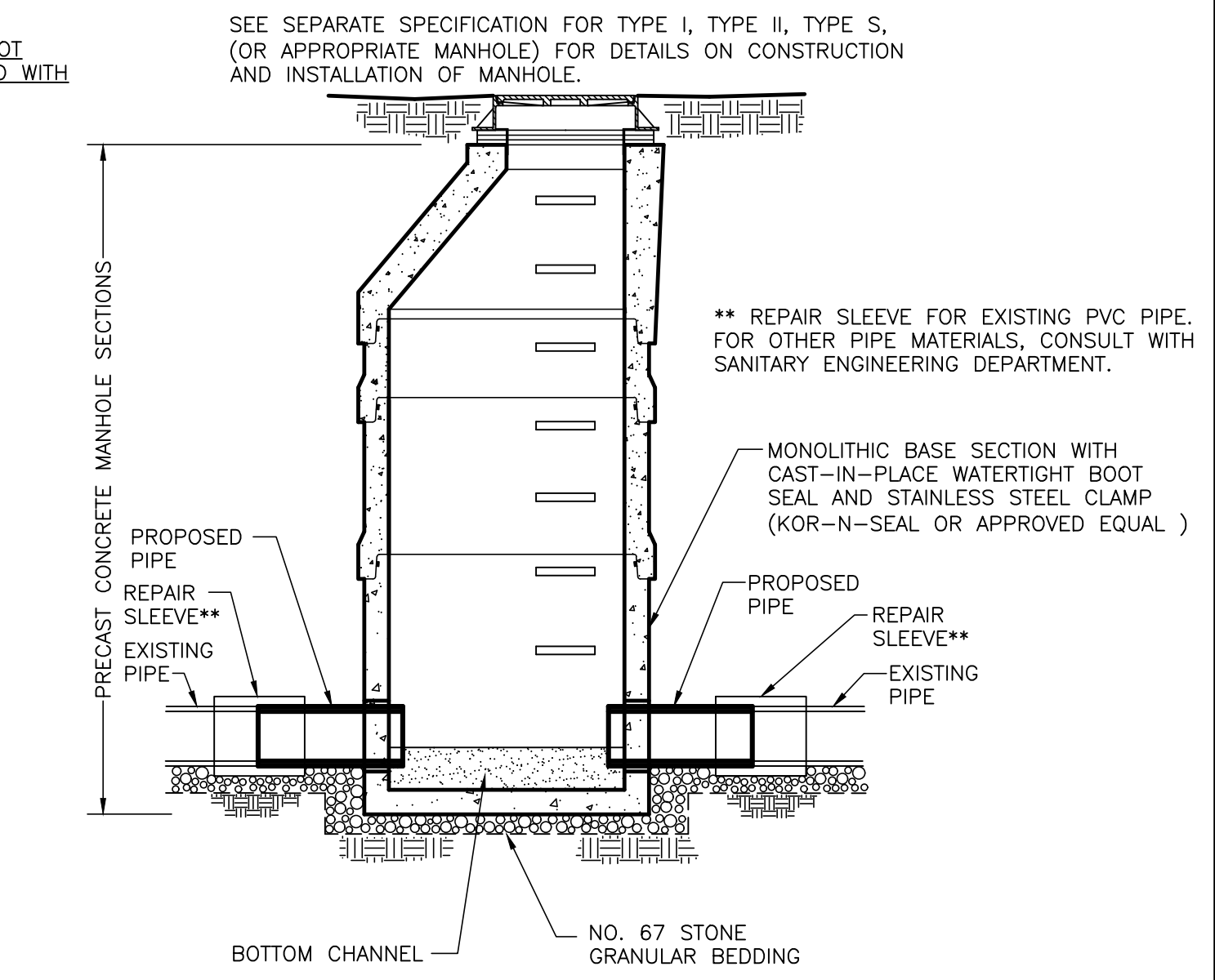


FOR INSTALLATION ON SEWERS 21 INCH AND 24 INCH IN DIAMETER

SANITARY MANHOLE - TYPE II
NO SCALE



SANITARY MANHOLE - TYPE S
NO SCALE



SANITARY MANHOLE - (CUT-IN TO EXISTING SEWER)
NO SCALE

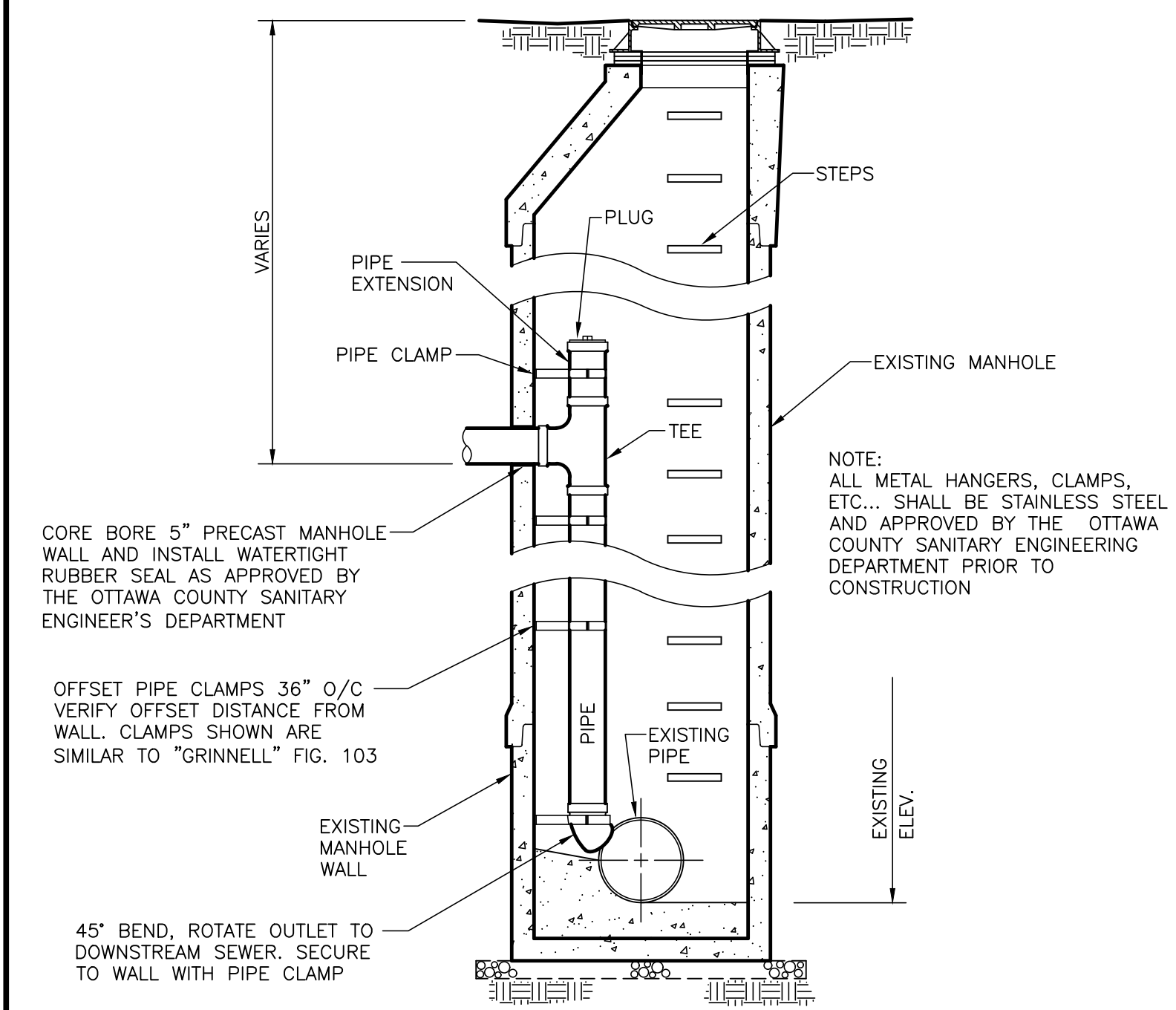
NOTE: VERIFY LOCATION OF STEPS IN MANHOLE

ALL SANITARY SEWER MANHOLES ARE PERMIT REQUIRED CONFINED SPACES AND ENTRANCE MUST COMPLY WITH OSHA REGULATIONS

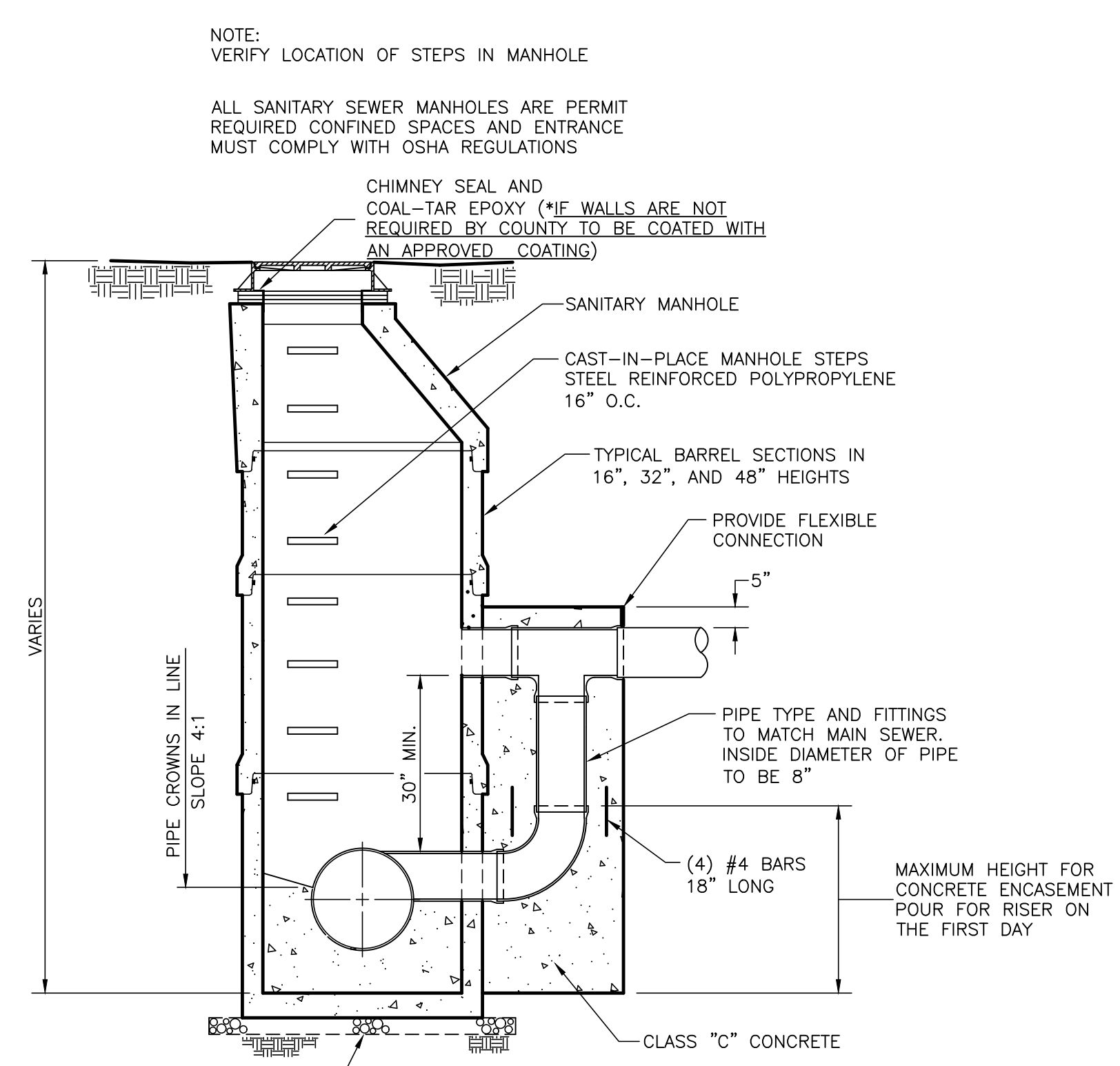
NOTE: MANHOLE REINFORCING STEEL SHALL MEET ASTM AND ODOT SPECIFICATIONS

NOTE: VERIFY LOCATION OF STEPS IN MANHOLE

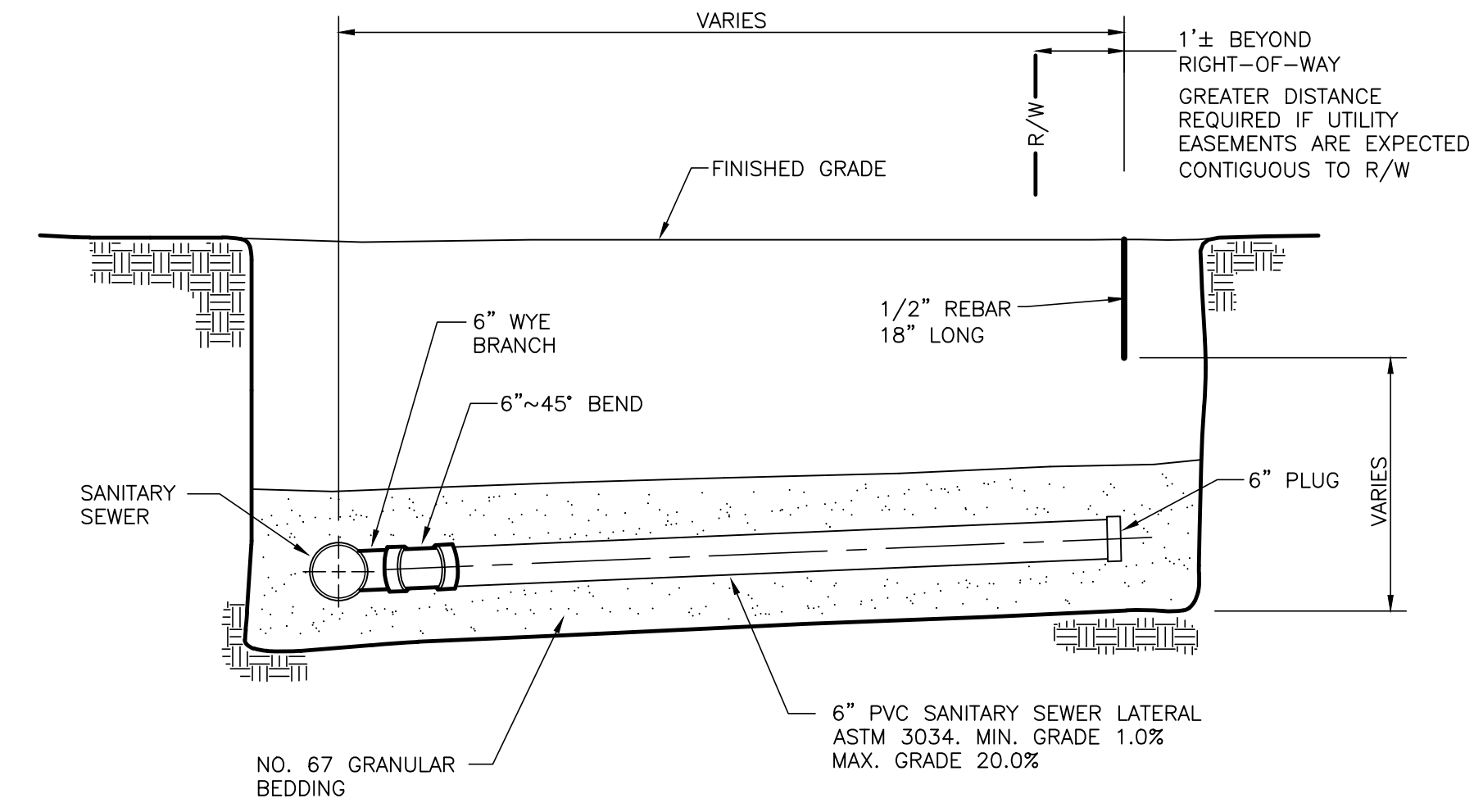
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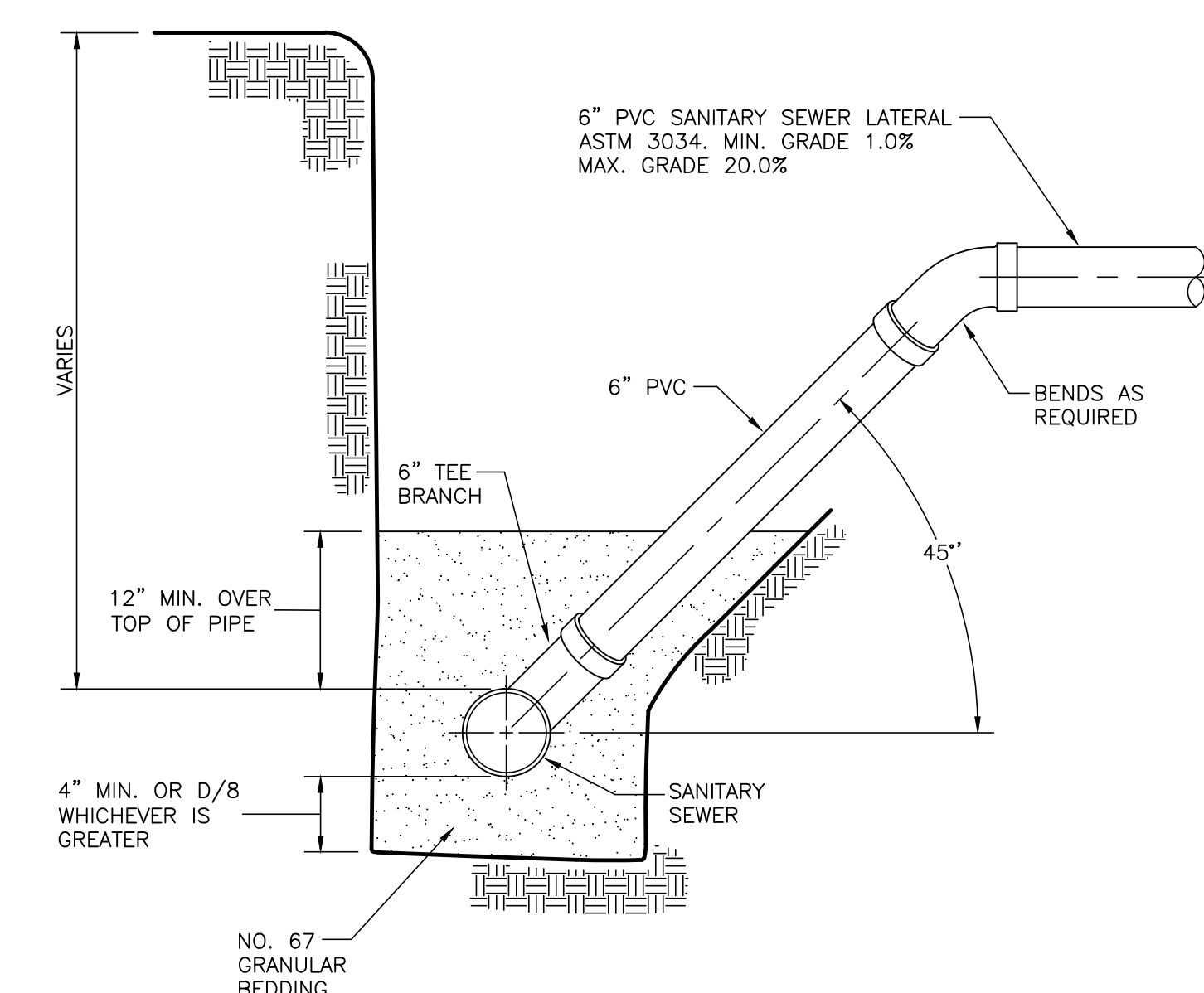
DROP CONNECTION IN EXISTING MANHOLE DETAIL
NO SCALE



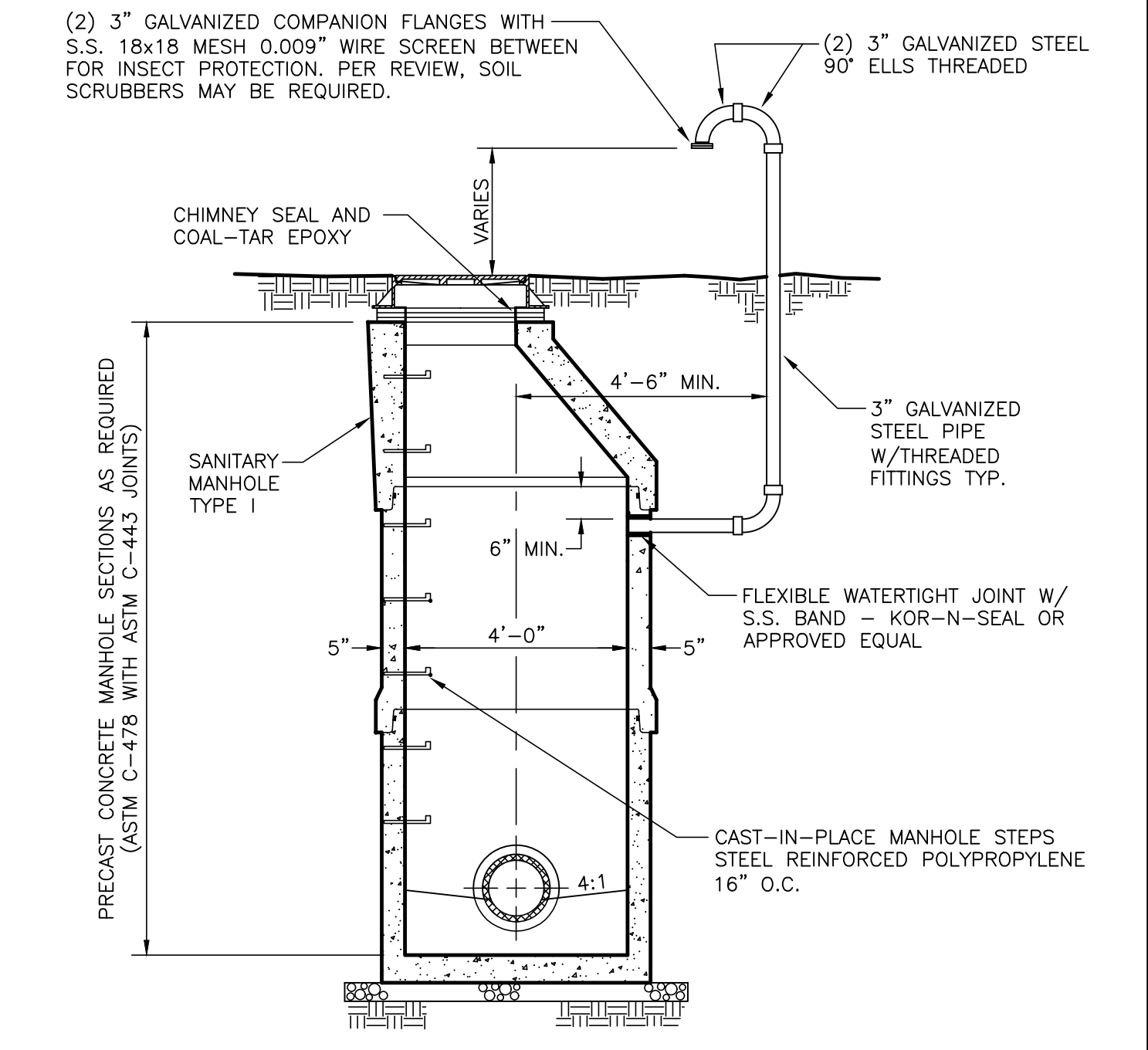
DROP MANHOLE 2
NO SCALE



SANITARY SEWER SERVICE DETAIL
NO SCALE



SANITARY SEWER RISER DETAIL
NO SCALE



SANITARY MANHOLE - WITH VENT PIPE
NO SCALE

GENERAL:

1. ALL SANITARY SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE OTTAWA COUNTY SEWER DISTRICT PUBLIC WATER AND WASTEWATER RULES AND REGULATIONS, TEN STATE STANDARDS, ODOT STANDARDS, AND THE REQUIREMENTS OF THE OHIO E.P.A. ALL CONTRACTORS INSTALLING SANITARY SEWER IMPROVEMENTS MUST BE LICENSED WITH THE OTTAWA COUNTY SANITARY ENGINEERING DEPARTMENT (O.C.S.E.). THE OTTAWA COUNTY SEWER DISTRICT PUBLIC WATER AND WASTEWATER RULES AND REGULATIONS ARE AVAILABLE BY CONTACTING O.C.S.E. OR BY VISITING THE COUNTY'S WEBSITE @ <https://www.co.ottawa.oh.us/316/Regulations>

2. PERMITS SHALL BE SECURED FOR SANITARY SEWER IMPROVEMENTS FROM O.C.S.E. PRIOR TO COMMENCING CONSTRUCTION. THE PROPERTY OWNER SHALL BE REQUIRED TO SECURE PERMITS, COPIES OF SAID PERMITS SHALL BE KEPT ON THE CONSTRUCTION SITE AND AVAILABLE FOR REVIEW AT ANYTIME. CONTRACTORS SHALL BE REQUIRED TO PROVIDE A VALID PERMIT NUMBER WHEN REQUESTING INSPECTIONS.

3. CONTRACTORS SHALL BE RESPONSIBLE FOR COMPLYING WITH ALL FEDERAL, STATE AND LOCAL SAFETY STANDARDS AND REGULATIONS. CONTRACTORS SHALL BE RESPONSIBLE FOR KEEPING THE CONSTRUCTION SITE SAFE FOR ITS EMPLOYEES, EMPLOYEES OF OTTAWA COUNTY, AND THE GENERAL PUBLIC.

4. ALL SANITARY SEWER IMPROVEMENTS SHALL BE INSPECTED AND APPROVED BY THE OTTAWA COUNTY SANITARY ENGINEERING PROJECT OBSERVER PRIOR TO BACKFILLING THE IMPROVEMENTS. FORTY-EIGHT(48) HOURS NOTICE OF COMMENCING CONSTRUCTION SHALL BE GIVEN TO THE PROJECT OBSERVER PRIOR TO STARTING WORK. O.C.S.E. NOTIFICATIONS:

FIELD OPERATIONS:
DANBURY WASTEWATER TREATMENT PLANT
AND REGIONAL WATER DIST. SYSTEM
5785 E. VON GLAHN RD.
LAKESIDE/MARBLEHEAD, OH 43440
PHONE: 419-734-5953
FAX: 419-734-7072

OFFICE OPERATIONS:
OTTAWA COUNTY SANITARY
ENGINEERING (OFFICE)
315 MADISON ST. ROOM 105
PORT CLINTON, OH 43452
PHONE: 419-734-6725
FAX: 419-734-6858

5. OTTAWA COUNTY RESERVES THE RIGHT TO REQUIRE FIELD CHANGES THAT ARE NOT NOTED IN THE IMPROVEMENT DRAWINGS, APPROVAL LETTER(S), OR IN THE RULES AND REGULATIONS TO INSURE THE INTEGRITY AND COMPATIBILITY OF THE PUBLIC WATER AND WASTEWATER TREATMENT SYSTEMS.

6. CONNECTIONS OF DWELLINGS OR OTHER TYPE OF STRUCTURES SHALL NOT BE PERMITTED UNTIL THE SANITARY SEWER MAINS ARE INSTALLED, INSPECTED, TESTED AND APPROVED FOR USE UNLESS OTHERWISE STATED ON THE PERMIT ISSUED BY THE OTTAWA COUNTY SANITARY ENGINEERING DEPARTMENT. CLEAN WATER CONNECTIONS SUCH AS, BUT NOT LIMITED TO, SUMP PUMPS, DOWNSPOUTS, OR FOOTER DRAINS SHALL NOT BE PERMITTED TO BE CONNECTED TO THE SANITARY SEWER COLLECTION SYSTEM.

7. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ANY INFORMATION ON EXISTING WATER AND SANITARY SEWER IMPROVEMENTS OR AN GENERAL FIELD INFORMATION PROVIDED BY THE O.C.S.E. PRIOR TO STARTING CONSTRUCTION OF THE IMPROVEMENTS.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY RESTORING ANY DISTURBED AREAS AROUND EXISTING WATER AND/OR SANITARY SEWER INFRASTRUCTURE AS SOON AS REASONABLY POSSIBLE AFTER WORK HAS BEEN COMPLETED IN THE IMMEDIATE AREA.

9. IT SHALL BE THE PROPERTY OWNER AND CONTRACTOR'S RESPONSIBILITY TO INSURE THAT ALL NECESSARY PERMITS OR APPROVAL ARE SECURED FROM ANY OTHER GOVERNMENTAL AGENCY, ASSOCIATION, OR ORGANIZATION THAT MAY HAVE THEIR JURISDICTION EFFECTED BY THE WATER AND/OR SANITARY SEWER IMPROVEMENTS.

10. THE LOCATION OF ALL EXISTING UTILITIES SHOWN ON THE PLANS APPROXIMATE. THE EXACT LOCATION OF ALL UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR SHALL NOTIFY THE OHIO UTILITIES PROTECTION SERVICE (OUPS) AT 1-800-362-2764 AND ALL UTILITIES TO LOCATE LOCATE THEIR EXISTING FACILITIES AT LEAST TWO (2) WORKING DAYS PRIOR TO START OF CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL DAMAGE TO UTILITIES CAUSED BY HIS OPERATIONS.

11. GRANULAR BEDDING USED FOR BEDDING AND BACKFILL OVER, UNDER AND AROUND THE SANITARY SEWER SHALL CONTAIN LESS THAN ONE (1) PERCENT GYPSUM BY WEIGHT. CONTRACTOR SHALL SUPPLY CERTIFICATION FROM SUPPLIER WHICH STATE THE PERCENTAGE OF GYPSUM CONTAINED IN THE MATERIAL BEING USED ON THE JOB.

12. COMPLETE ROAD CLOSURES REQUIRE PRIOR COUNTY APPROVAL. ANY LANE CLOSURE OR ENCROACHMENT ON OR UNDER STATE HIGHWAYS, FOR EXAMPLE, ROAD BORES, REQUIRE AN ODOT PERMIT.

13. THE CONTRACTOR SHALL MAINTAIN TRAFFIC AT ALL TIME IN ACCORDANCE WITH THE REQUIREMENTS OF SPECIFICATION ITEM 614, AS OUTLINED IN THE CONSTRUCTION AND MAINTENANCE OPERATION SECTION OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREET AND HIGHWAYS, CURRENT EDITION IN EFFECT AT THE TIME OF CONTRACT AWARD.

14. THE DEVELOPER, AND THE DEVELOPER'S ENGINEER, SHALL BE RESPONSIBLE FOR PROVIDING THE OTTAWA COUNTY SANITARY ENGINEERING DEPARTMENT WITH A COMPLETE AND ACCURATE AS-BUILT SET OF PLANS OF THE WATER AND SANITARY SEWER MAIN LINE AND ALL APPURTENANCES INSTALLED BEFORE ANY CONNECTION ARE MADE.

A. GRAVITY SANITARY SEWER NOTES:

1. ALL CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE RULES AND REGULATIONS OF THE OTTAWA COUNTY SANITARY ENGINEERING DEPARTMENT, THE TEN STATE STANDARD FOR THE GREAT LAKES-UPPER MISSISSIPPI RIVER BOARD STATE SANITARY ENGINEERS, AND THE OHIO ENVIRONMENTAL PROTECTION AGENCY.

2. ALL SANITARY GRAVITY SEWERS 15 INCH IN DIAMETER AND SMALLER SHALL BE PVC, ASTM D-3034-SDR35 WITH PREMIUM JOINTS CONFORMING TO ASTM D-3212.

3. PRECAST SANITARY MANHOLES SHALL CONFORM TO ASTM SPECIFICATIONS DESIGNATION C-478 AND THE JOINTS BETWEEN SECTIONS SHALL CONFORM TO ASTM C-443 (RUBBER GASKET).

4. BACKFILL AT ALL TRENCHES WITHIN 5 FEET OF THE BACK OF THE CURB OR EDGE OF PAVEMENT AND ALL TRENCHES UNDER THE PAVEMENT TO WITHIN 5 FEET OF THE BACK OF CURB OR EDGE OF PAVEMENT SHALL BE BACKFILLED WITH GRANULAR MATERIAL TO THE BOTTOM OF THE PAVEMENT. GRANULAR MATERIAL SHALL CONFORM TO O.D.O.T. ITEMS 304, 411 OR 617 AND COMPACTED TO 98% OF STANDARD PROCTOR.

5. ROOF DRAINS, FOUNDATION DRAINS, SUMP PUMPS AND OTHER CLEAN WATER CONNECTIONS TO THE SANITARY SEWER ARE PROHIBITED.

6. ALL SANITARY SEWERS SHALL BE TESTED FOR DEFLECTION AND INFILTRATION (AT LEAST 30 DAYS FOLLOWING INSTALLATION & BACKFILL) BY THE CONTRACTOR WHO SHALL BE LICENSED WITH SANITARY ENGINEERING DEPARTMENT. DEFLECTION SHALL NOT EXCEED 5 PERCENT. THE MAXIMUM RATE OF LEAKAGE OR INFILTRATION ALLOWABLE IS 100 GALLONS PER INCH OF PIPE DIAMETER PER MILE PER 24 HOURS. THE COST OF ALL MATERIALS, EQUIPMENT, LABOR AND INCIDENTALS NECESSARY FOR PERFORMING THE TEST AND MAKING ANY NECESSARY CORRECTIONS AND REPLACEMENTS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

7. ALL SANITARY TAP LOCATIONS ARE APPROXIMATE. FINAL TAP LOCATIONS SHALL BE DETERMINED AT THE TIME OF CONSTRUCTION WITH CONTRACTOR RESPONSIBLE FOR AS BUILT PLANS.

8. ALL SANITARY MANHOLE TOP ELEVATIONS ARE APPROXIMATE. THE CONTRACTOR SHALL FIELD SET THE MANHOLE TOP ELEVATION AT EXISTING OR PROPOSED GRADE DEPENDING ON THE MANHOLE LOCATION.

9. NO SANITARY SERVICE CONNECTIONS SHALL BE PERMITTED TO ENTER MANHOLES.

10. ALL SANITARY SEWERS SHALL BE INSTALLED WITH CONSTANT LINE AND GRADE USING LASER TECHNOLOGY.

11. ALL PIPE NOT CONNECTED DURING CONSTRUCTION OF THE PROJECT SHALL BE FITTED WITH PLUGS AND MARKED WITH A 2" X 2" OAK STAKE. AN 18 INCH LENGTH OF 1/2 INCH DIAMETER REBAR SHALL BE VERTICALLY PLACED, ONE FOOT AWAY FROM THE PLUG AND POUNDED TO BE FLUSH WITH FINISH GRADE.

12. A MINIMUM OF 5 HORIZONTAL FEET SHALL SEPARATE THE SANITARY SEWER FROM ANY OTHER UTILITY EXCEPT FOR WATER LINE AND APPURTENANCES WHICH SHALL BE SEPARATED BY 10 FEET OF HORIZONTAL CLEARANCE AND 18 INCHES OF VERTICAL CLEARANCE WITH SANITARY SEWER BEING BELOW THE WATER LINE AND APPURTENANCES. WHEN IT IS NECESSARY TO CROSS WATER AND SANITARY SEWER MAINS, ALL UNDERGROUND UTILITIES SHALL CROSS MORE PERPENDICULAR THAN PARALLEL.

13. WHENEVER A SANITARY SEWER AND WATER LINE MUST CROSS, THE SEWER SHALL BE LAID AT SUCH AN ELEVATION THAT THE CROWN OF THE SEWER IS AT LEAST 18 INCHES BELOW THE BOTTOM OF THE WATER LINE. IF IT IS ABSOLUTELY IMPOSSIBLE TO MAINTAIN THE 18 INCH SEPARATION, THE SANITARY SEWER SHALL BE CONSTRUCTED OF WATER LINE TYPE MATERIALS WHICH WILL WITHSTAND A 50 PSI PRESSURE TEST. THESE REQUIREMENTS WILL EXTEND FOR A DISTANCE OF 10 FEET, MEASURED PERPENDICULAR, ON BOTH SIDES OF THE WATER LINE. CONSTRUCTION OF SEWERS IN STREAM BEDS IS NOT ACCEPTABLE EXCEPT FOR STREAM CROSSINGS.

14. MANHOLE COATINGS - THE INTERIOR SURFACE OF THE ENTIRE PUBLIC SANITARY SEWER MANHOLE AND WHEREVER FORCE MAIN AND/OR HIGH HYDROGEN SULFIDE LEVEL DISCHARGES ARE EXPECTED, SHALL BE COMPLETELY COATED WITH A MINIMUM 125 MILS OF THE COUNTY APPROVED POLYUREA OR URETHANE RESIN BASED COATING PRODUCT. FOR PRIVATE MANHOLES, SUBJECT TO LOW AMOUNTS OF HYDROGEN SULFIDE, 30 MILS OF COAL TAR, HIGH BUILD EPOXY SHALL BE FACTORY APPLIED. ACCEPTABLE PRODUCTS ARE 46H-413 HI-BUILD TNAME-TAR BY THE TNAME COMPANY OR GLID-GUARD HI-BUILD COAL TAR EPOXY FINISH NO. 5273-5274.

15. SANITARY SEWER MANHOLE CHIMNEY SEALS - CHIMNEY SEALS SHALL BE DESIGNED FOR PROVIDING A FLEXIBLE SEAL BETWEEN MANHOLE FRAMES AND THEIR SUPPORTING ADJUSTING RINGS AND DOME SECTIONS. THE SEALS SHALL BE INTERNAL TYPE AND SHALL CONSIST OF A RUBBER SLEEVE, EXPANSION BAND, AND HARDWARE. AN INTERNAL SEAL SHALL BE PROVIDED FOR ALL FRAMES. CHIMNEY SEALS SHALL BE AS MANUFACTURED BY CRETEX SPECIALTY PRODUCTS, OR COUNTY APPROVED EQUAL AND SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS USING TOOLS DESIGNED SPECIFICALLY FOR THE SEALS BEING INSTALLED. THE INSTALLATION OF THE CHIMNEY SEALS SHALL INCLUDE PREPARATION OF THE WALL SURFACES IN THE CHIMNEY AREA AND CAULKING AS REQUIRED BY THE MANUFACTURER'S INSTRUCTIONS.

16. ALL SANITARY SEWER SERVICE CONNECTIONS (TAPS) SHALL BE SIX INCH IN DIAMETER. SERVICE CONNECTIONS SHALL BE INSTALLED ON THE SANITARY SEWER MAIN PIPE ONLY (NOT INTO MANHOLES) AND SHALL BE EXTENDED TO AT LEAST THE PROPERTY LINE OF THE PROPERTY TO BE SERVED. SERVICE CONNECTIONS SHOULD BE EXTENDED PAST THE PROPERTY LINE WHEN OTHER NEW UNDERGROUND UTILITIES ARE DESIGNED TO BE INSTALLED PARALLEL AND NEXT TO THE PROPERTY LINE. THE CONTRACTOR SHALL INSTALL A WATERTIGHT PLUG/CAP ON THE END OF THE SERVICE CONNECTION. AN 18 INCH LONG PIECE OF STEEL REBAR 1/2 INCH IN DIAMETER SHALL BE INSTALLED VERTICALLY AT THE END OF EACH SERVICE CONNECTION AND SHALL EXTEND UP TO WITHIN ONE FOOT OF THE FINISHED GRADE.

17. SANITARY SEWERS SHALL HAVE A MINIMUM DEPTH OF FOUR AND A HALF (4-1/2) FEET.

18. TESTING REQUIREMENTS:
UNLESS OTHERWISE DIRECTED BY THE ENGINEER, TEST SHALL BE CONDUCTED ON THE SANITARY SEWER IN ACCORDANCE WITH SECTIONS OF THE OTTAWA COUNTY SEWER DISTRICT RULES AND REGULATIONS AS FOLLOWS:

AIR TESTS FOR INFILTRATION AND EXFILTRATION-SECTION 7.0.4.
TESTS FOR DEFLECTION-7.0.5. AND ASTM 1417
VACUUM TESTING OF MANHOLES-7.0.7. AND ASTM C 1244

A. FORCE MAIN AND LOW PRESSURE SANITARY SEWER NOTES:

1. FORCE MAINS/LOW PRESSURE SEWERS SHALL BE HDPE-DIPS, OR PVC PIPE WITH FITTINGS MEETING THE REQUIREMENTS OF ASTM D-2241, LATEST EDITION, AND SHALL BE SDR-21, SDR-26 PIPE & SHALL BE JOINED BY MEANS OF A GASKETED BELL JOINT WHICH SHALL BE AN INTEGRAL AND HOMOGENEOUS PART OF THE PIPE BARREL. JOINTS AND GASKETS SHALL CONFORM TO ASTM D-3139 AND ASTM F477 RESPECTIVELY. ALL FITTINGS SHALL BE SCHEDULE 80. PIPE FOUR (4) INCHES IN DIAMETER FOR LARGER SHALL HAVE A NOMINAL LAYING LENGTH OF 20 FEET OR 40 FEET. HDPE PIPE SHALL BE PRE-APPROVED BY THE COUNTY IN TERMS OF THE SDR AND FUSING.

2. ALL FORCE MAINS AND LOW PRESSURE SANITARY SEWERS SHALL BE PRESSURE TESTED AT AN AVERAGE PRESSURE OF 100 PSI FOR 2 HOURS. THE ALLOWABLE LEAKAGE SHALL BE DETERMINED AT THE TIME OF THE TEST, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM THIS TEST PROPERLY AND IN THE PRESENCE OF THE ENGINEER. IF THE TEST DOES NOT PASS, THE CONTRACTOR SHALL MAKE ALL NECESSARY CORRECTIONS AND RETEST UNTIL ACCEPTABLE. THE COST OF ALL MATERIALS, EQUIPMENT, LABOR AND INCIDENTALS NECESSARY FOR PERFORMING THE TEST AND MAKING ANY CORRECTIONS AND REPLACEMENTS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

3. THE CONTRACTOR SHALL INSTALL A DETECTABLE TRACER TAPE DIRECTLY OVER THE CENTERLINE OF THE FORCE MAIN OR LOW PRESSURE SEWER AT A DEPTH OF 18 INCHES BELOW THE GROUND SURFACE. THE DETECTABLE TRACER TAPE SHALL EXTEND ALONG THE ENTIRE LENGTH OF THE PIPE. SHALL BE BRIGHTLY COLORED TO CONTRAST WITH THE SOIL, AND SHALL READ "CAUTION: FORCE MAIN BURIED BELOW". ALL COSTS FOR PROVIDING THE DETECTION TAPE SHALL BE INCLUDED IN THE PRICE OF THE PIPE. TWO (2) GREEN TRACER WIRES ARE REQUIRED DIRECTLY OVER AND ON THE CENTER OF THE FORCE MAIN FOR ITS ENTIRE LENGTH TO PROVIDE FOR AN INDUCTIVE PATH TO DETERMINE PIPE LOCATION AFTER INSTALLATION. THE WIRES SHALL BE #12 AWG COPPER-CLAD STEEL CORE WITH 30 MIL INSULATION FOR LINES INSTALLED BY OPEN-CUT TRENCHING METHODS. DIRECTIONALLY DRILLED/BORED LINES (WHERE PERMITTED) SHALL HAVE #12 AWG COPPER-CLAD STEEL CORE WITH 45 MIL INSULATION WIRES. TRACER WIRES SHALL BE TERMINATED INSIDE OF ALL VALVE BOXES. CONTRACTOR SHALL PERFORM A CONTINUITY TEST ON TRACER WIRE TO ENSURE CONTINUITY OF THE TRACER WIRE OVER THE LENGTH OF THE ENTIRE FORCE MAIN. TEST SHALL BE REQUIRED UPON COMPLETION OF THE PROJECT AND PRIOR TO COUNTY ACCEPTANCE.