

GENERAL NOTES

- ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT ENGINEERING DESIGN STANDARDS AND SPECIFICATIONS OF THE CITY OF FENTON. SANITARY SEWER CONSTRUCTION SHALL HAVE FULL TIME INSPECTION SUPERVISED BY A LICENSED PROFESSIONAL ENGINEER PROVIDED BY, OR CAUSED TO BE PROVIDED BY, THE CITY OF FENTON.
- BEFORE THE START OF CONSTRUCTION, THE CONTRACTOR MUST REQUEST AND HAVE IN HIS POSSESSION AN APPROVED CONNECTION PERMIT ISSUED BY THE CITY OF FENTON OR ITS AGENT. THE CONTRACTOR SHALL NOTIFY THE CITY OF FENTON 48 HOURS PRIOR TO THE BEGINNING OF ANY CONSTRUCTION.
- NO SINGLE RUN OF SEWER INSTALLATION SHALL HAVE AN INFILTRATION EXCEEDING 100 GALLONS PER INCH DIA. PER MILE OF PIPE PER 24 HOUR PERIOD. AIR TEST IN LIEU OF INFILTRATION TESTS SHALL BE ALLOWED SUBJECT TO APPROVAL OF THE CITY OF FENTON.
- A WATER TIGHT BULKHEAD WITH A CAPPED 1-INCH DIA PIPE TO PERMIT MEASURING INFILTRATION SHALL BE PROVIDED. A TEMPORARY 12-INCH DEEP SLUMP SHALL ALSO BE PROVIDED IN THE FIRST MANHOLE ABOVE THE CONNECTION WHICH WILL BE FILLED IN AFTER SUCCESSFUL COMPLETION OF ANY INFILTRATION TEST UP TO THE STANDARD FILET PROVIDED FOR THE FLOW CHANNEL.
- BUILDING LEADS AND RISERS SHALL BE 6-INCH DIA. OR 26 OR SCHEDULE 40 BUILDING LEADS TO BE FURNISHED WITH MANUFACTURER APPROVED REMOVABLE AIR-TIGHT AND WATER-TIGHT STOPPERS.
- NEW MANHOLES SHALL HAVE FLEXIBLE, WATER-TIGHT SEALS WHERE PIPES PASS THROUGH WALLS. MANHOLES SHALL BE OF PRECAST SECTIONS WITH MODIFIED GROOVE TONGUE AND RUBBER GASKET TYPE JOINTS. PRECAST MANHOLE CONE SECTIONS SHALL BE THE CITY OF FENTON APPROVED ECCENTRIC CONE TYPE.
- DROP CONNECTIONS WILL BE REQUIRED WHEN THE DIFFERENCE IN INVERT ELEVATIONS EXCEEDS 18 INCHES. ONLY OUTSIDE DROP CONNECTIONS WILL BE APPROVED.
- NEW MANHOLES CONSTRUCTED DIRECTLY ON EXISTING SEWERS SHALL BE PROVIDED WITH COVERS READING "CITY OF FENTON SANITARY" IN RAISED LETTERS ONLY. NEW MANHOLES BUILT OVER ANY EXISTING SANITARY SEWERS SHALL HAVE MONOLITHIC Poured BOTTOMS.
- TAPS TO EXISTING MANHOLES SHALL BE MADE BY CORING. THE CONTRACTOR SHALL PLACE A KOR-N-SEAL BOOT (OR APPROVED EQUAL) AFTER CORING IS COMPLETED.
- NO GROUND WATER, STORM WATER, CONSTRUCTION WATER, DOWNSPOUT DRAINAGE SHALL BE ALLOWED TO ENTER ANY SANITARY SEWER.
- PRIOR TO ANY EXCAVATION, THE CONTRACTOR SHALL TELEPHONE MISS DIG (800-482-7171) FOR THE LOCATION OF UNDERGROUND GAS, ELECTRIC, TELEPHONE AND CABLE FACILITIES, AND SHALL ALSO NOTIFY REPRESENTATIVES OF OTHER UTILITIES LOCATED IN THE VICINITY OF THE WORK.
- A MINIMUM VERTICAL CLEARANCE OF 18-INCHES SHALL BE MAINTAINED BETWEEN SANITARY SEWER AND ALL OTHER UTILITIES OR CONCRETE ENCASEMENT IS REQUIRED.
- IT SHALL BE THE OWNER'S ENGINEERS AND CONTRACTOR'S RESPONSIBILITY TO VERIFY AND/OR OBTAIN ANY INFORMATION NECESSARY REGARDING THE PRESENCE OF UNDERGROUND UTILITIES WHICH MIGHT AFFECT THE JOB.
- THE MINIMUM ALLOWABLE SIZE OF A PUBLIC SANITARY SEWER IS 8" DIA. THE LAST UPSTREAM RUN OF SEWER MUST BE AT A GRADE OF 1.00% OR GREATER.
- ONE SEWER LEAD PER UNIT MUST BE PROVIDED. MULTI UNITS SERVICED FROM A SINGLE LEAD WILL NOT BE PERMITTED.

SPECIFICATIONS FOR TRUSS PIPE SANITARY SEWER

MATERIALS AND CERTIFICATIONS

ARMCO TRUSS PIPE AND FITTINGS SHALL BE AS DESCRIBED UNDER ASTM DESIGNATION D2680 STANDARD SPECIFICATION FOR POLYVINYL CHLORIDE (PVC) COMPOSITE SEWER PIPING. APPENDIX XI OF SAID SPECIFICATION SHALL BE MODIFIED BY THE BEDDING REQUIREMENTS OUTLINED BELOW.

SOLID WALL PVC PIPE FOR 6" HOUSE CONNECTION SEWERS SHALL BE SCH. 40 OR DR 26 CONFORMING TO ASTM DESIGNATION D2751 STANDARD SPECIFICATIONS FOR POLYVINYL CHLORIDE (PVC) SEWER PIPE AND FITTINGS. SOLID WALL PIPE SHALL BE INSTALLED IN ACCORDANCE WITH BEDDING REQUIREMENTS OUTLINED BELOW.

ALL PIPE SHALL BE CERTIFIED BY THE MANUFACTURER TO MEET THE APPLICABLE ASTM SPECIFICATION REQUIREMENTS. CERTIFICATION FORMS, TOGETHER WITH A REPORT OF THE TEST RESULTS, SHALL BE PROVIDED TO THE INSPECTOR WITH PIPE DELIVERIES AND COPIES SHALL BE FORWARDED TO THE ENGINEER OR THE OWNER. CERTIFICATION FORMS SHALL INCLUDE PROJECT NAME, LOCATION, CONTRACTOR, AND TEST LOT NUMBER. LOT SIZES SHALL BE ACCEPTABLE TO THE ENGINEER.

ALL PIPE AND FITTINGS SHALL BE SUITABLY MARKED TO PROVIDE MANUFACTURER'S NAME, LOT OR PRODUCTION NUMBER, ASTM DESIGNATION, NOMINAL DIAMETER, AND SDR NUMBER, WHERE APPLICABLE. FITTINGS, HOWEVER, NEED NOT CONTAIN LOT OR PRODUCTION NUMBER. PIPE SHALL HAVE A "HOME" MARK. TRUSS PIPE WITH AN ABSENCE OF FILLER MATERIAL AT THE ENDS GREATER THAN 1/2" DEEP SHALL BE SUBJECT TO REJECTION OR ACCEPTABLE REPAIR.

BEDDING

BEDDING FOR TRUSS PIPE AND PVC SOLID WALL PIPE SHALL BE IN ACCORDANCE WITH ASTM D2321, EXCEPT: (1) ONLY CLASS I AND CLASS II MATERIALS MAY BE USED, (2) BEDDING SHALL EXTEND TO MINIMUM 12" ABOVE TOP OF PIPE, AND (3) FLOODING OR PUDDLING SHALL NOT BE USED TO ACHIEVE COMPACTION. IT IS ESSENTIAL THAT IT BE RECOGNIZED THAT THE SUCCESSFUL USE OF FLEXIBLE AND SEMI-FLEXIBLE PIPE REQUIRES BEDDING THAT PROVIDES UNYIELDING SIDE SUPPORT AND COMPLETE BEDDING CONTACT UNDER PIPE HAUNCHES.

WHERE UNSTABLE BOTTOMS ARE ENCOUNTERED, THE CONTRACTOR SHALL PROVIDE A RECOMMENDATION FOR FOUNDATION SUPPORT PREPARED BY A LICENSED PROFESSIONAL ENGINEER WITH GEO-TECHNICAL EXPERIENCE FOR THIS FOUNDATION WHICH MAY CONSIST OF AN APPROVED GRADED AND PROCESSED ANGULAR STONE OR GRAVEL TO ACT AS AN IMPERVIOUS MAT TO PREVENT MIGRATION OR VERTICAL MOVEMENT OF UNSTABLE SOILS OR BEDDING MATERIALS. WHERE TRENCH SHEETING, PLATES, OR A TRENCH BOX ARE USED DUE TO SEVERE GROUND CONDITIONS, ALL VOIDS TO THE SIDE AND BELOW THE TOP OF THE PIPE CAUSED BY THE SHEETING, PLATES, OR BOX WITHDRAWAL SHALL BE COMPLETELY FILLED OR THE SUPPORTS LEFT IN PLACES BELOW THE TOP OF THE PIPE.

CONCRETE CRADLE BEDDING SHALL NOT BE USED WHERE ALLOWABLE TRENCH WIDTHS ARE EXCEEDED. IN LIEU OF CONCRETE CRADLE BEDDING, STANDARD PIPE BEDDING SHOWN SHALL BE PROVIDED TO THE FULL WIDTH BETWEEN UNDISTURBED TRENCH WALLS OR AT LEAST 2.5 PIPE DIAMETERS ON BOTH SIDES OF THE PIPE.

DUE TO POTENTIAL DAMAGE TO EXTERIOR WALLS OF TRUSS PIPE, PARTICULARLY UNDER COLD WEATHER CONDITIONS, THE CONTRACTOR SHALL CAREFULLY AVOID DUMPING ANY MATERIALS OTHER THAN APPROVED BEDDING SAND OR STONE ON THE PIPE UNTIL 42" COVER IS PLACED OVER THE PIPE. PIPE WALLS AND ENDS SHALL ALSO BE PROTECTED FROM ABRASION AND DAMAGE DURING HANDLING, AND SHALL BE FULLY INSPECTED JUST PRIOR TO PLACING IN THE TRENCH.

CARE SHALL BE TAKEN DURING BEDDING COMPACTION TO AVOID DISTORTING THE SHAPE OF THE PIPE OR DAMAGES ITS EXTERIOR WALL. MOBILE EQUIPMENT SHALL NOT BE USED OVER THE PIPE TRENCHES UNTIL 48" OF COVER HAS BEEN PLACED.

HOUSE CONNECTIONS SHALL BE MADE TO WYE FITTINGS. BEDDING FOR HOUSE CONNECTION SEWERS SHALL BE EQUAL TO THAT OF THE MAIN SEWER BEDDING. RISERS IN DEEP AND UNSTABLE TRENCHES SHOULD BE BEDDED IN ANGULAR STONE TO AVOID SETTLEMENT. CONCRETE SHALL NOT BE USED FOR BEDDING. END CAPS OR PLUGS SHALL BE BRACED OR ANCHORED TO WITHSTAND AIR TEST PRESSURES.

JOINTS

JOINTS FOR PIPE AND FITTINGS SHALL BE OF THE ELASTOMERIC GASKET PUSH-ON TYPE. SUCH JOINTS SHALL CONFORM TO ASTM D3212 AND THE PIPE MANUFACTURER SHALL FILE WITH THE CITY OF FENTON A COPY OF CERTIFIED TEST RESULTS OF ITS JOINTING SYSTEM PRIOR TO USE. GASKET JOINTS SHALL BE INSTALLED IN ACCORDANCE WITH PROCEDURES SPECIFIED BY THE PIPE MANUFACTURER. CARE SHALL BE TAKEN TO INSURE ALL JOINTS BEING PUSHED TO THE FULL "HOME" POSITION AND HELD TIGHTLY IN THE "HOME" POSITION DURING ANY GRADE OR LINE ADJUSTMENTS. JOINTS FOR SEWER LEAD PIPE SHALL BE CHEMICALLY WELDED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION. PIPE SHALL BE ROTATED DURING JOINT INSERTION TO INSURE A COMPLETE SPREAD OF JOINTING CEMENT. PVC PLASTIC CEMENT PRIMER AND PVC PLASTIC PIPE CEMENT SHALL ARRIVE AT THE JOB SITE IN SEALED AND LABELED CONTAINERS. JOHNNY MOP'S OR SIMILAR SMB TYPE APPLICATIONS SHALL BE USED TO APPLY PRIMER AND CEMENT. OPENED CONTAINERS IN THE TRENCH SHALL BE PROTECTED FROM DIRT, WATER, AND OTHER CONTAMINANTS.

CUTTING AND HANDLING

CUTTING OF PIPE LENGTHS, WHERE REQUIRED, SHALL BE PERFORMED BY THE USE OF TOOLS OR EQUIPMENT THAT WILL PROVIDE A NEAT, PERPENDICULAR CUT WITHOUT DAMAGE TO THE PLASTIC OR THE FILLER MATERIAL. THE CONTRACTOR SHALL STORE AND PROTECT THE PIPE TO MINIMIZE BOWING. NOMINAL 12.5FT LENGTHS HAVING DEVIATIONS FROM STRAIGHT GREATER THAN 1" SHALL NOT BE USED.

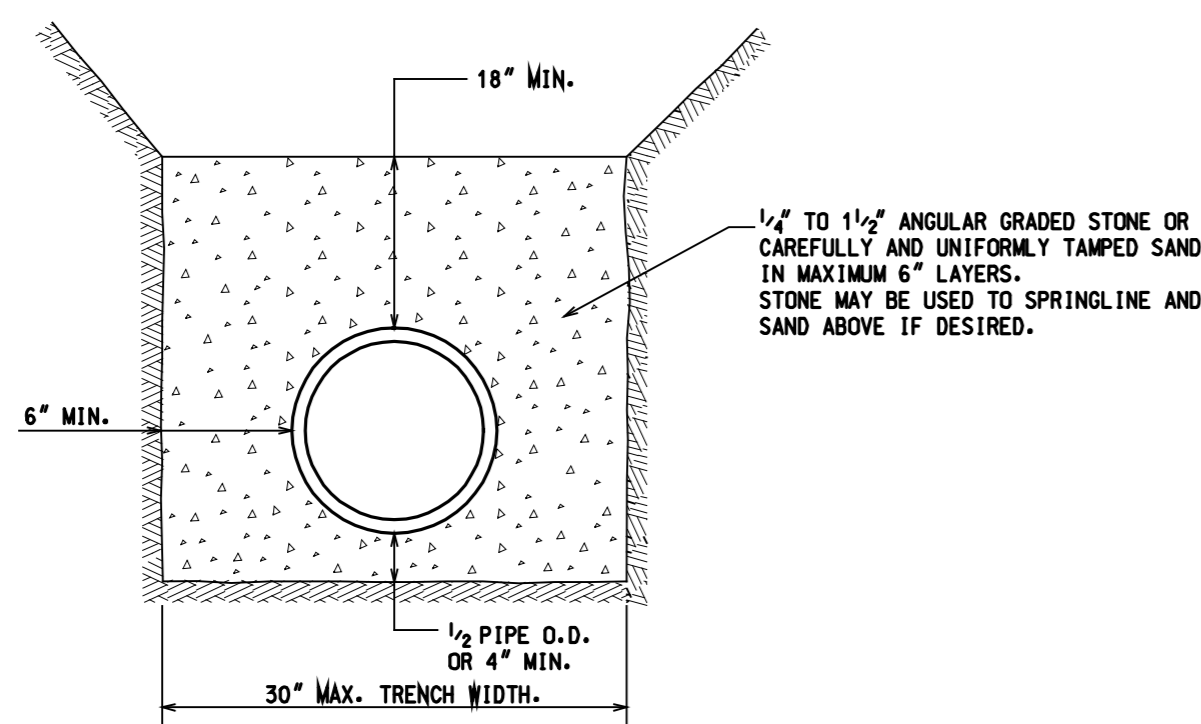
SPECIAL CONDITIONS

THE COMPLETED INSTALLATION SHALL AT NO POINT HAVE OUT-OF-ROUND PIPE DEFLECTIONS GREATER THAN 5%. THE ENGINEER SHALL HAVE THE OPTION OF REQUIRING DEFLECTOMETER OR GO-NO-GO GAUGING TEST RUN PRIOR TO ACCEPTANCE ON PIPELINES WHERE HIGH DEFLECTIONS ARE SUSPECTED.

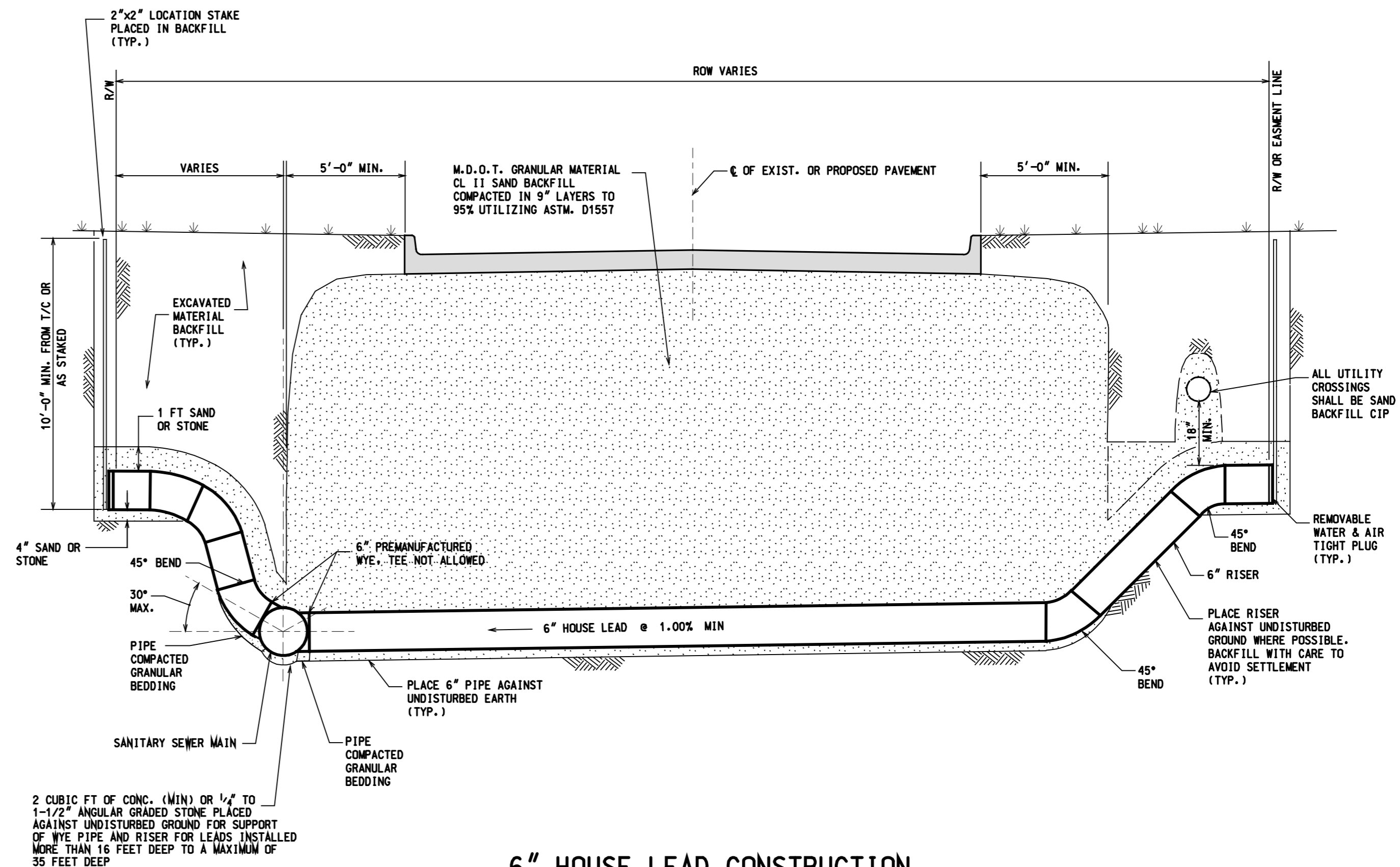
RECORD DRAWING PLANS SHALL BE PROVIDED TO THE CITY OF FENTON BY THE ENGINEER AND RECORD DRAWING PLANS SHALL SPECIFICALLY DESIGNATE THE TYPE OF SEWER PIPE INSTALLED AT ALL LOCATIONS.

TELEVISION OF NEW SANITARY SEWER

NO SOONER THAN 30 DAYS AFTER THE INSTALLATION OF NEW SANITARY SEWER MAINS, THE PIPE SHALL BE INTERNALLY INSPECTED VIA VIDEO CAMERA. THE VIDEO EQUIPMENT SHALL BE SPECIFICALLY DESIGNED FOR THE INTERNAL INSPECTION OF THE PIPE. THE CONTRACTOR SHALL PROVIDE THE CITY OF FENTON WITH 2 COPIES OF BOTH A COLOR DVD AND A WRITTEN LOG DESCRIBING THE CONTENT OF THE VIDEO FOR THE ENTIRE LENGTH OF THE NEW SEWER. THE VIDEO WILL BE REVIEWED BY THE CITY OF FENTON OR ITS AGENTS PRIOR TO ISSUANCE OF FINAL ACCEPTANCE. IF DEFECTS ARE DISCOVERED, THE CONTRACTOR SHALL MAKE THE NECESSARY REPAIRS AT HIS/HER COST PRIOR TO FINAL ACCEPTANCE OF THE SEWER BY THE CITY OF FENTON. A FOLLOW UP VIDEO WILL BE REQUIRED TO BE SUPPLIED BY THE CONTRACTOR TO ENSURE THE REPAIRS HAVE BEEN COMPLETED TO THE CITY OF FENTON'S SATISFACTION.

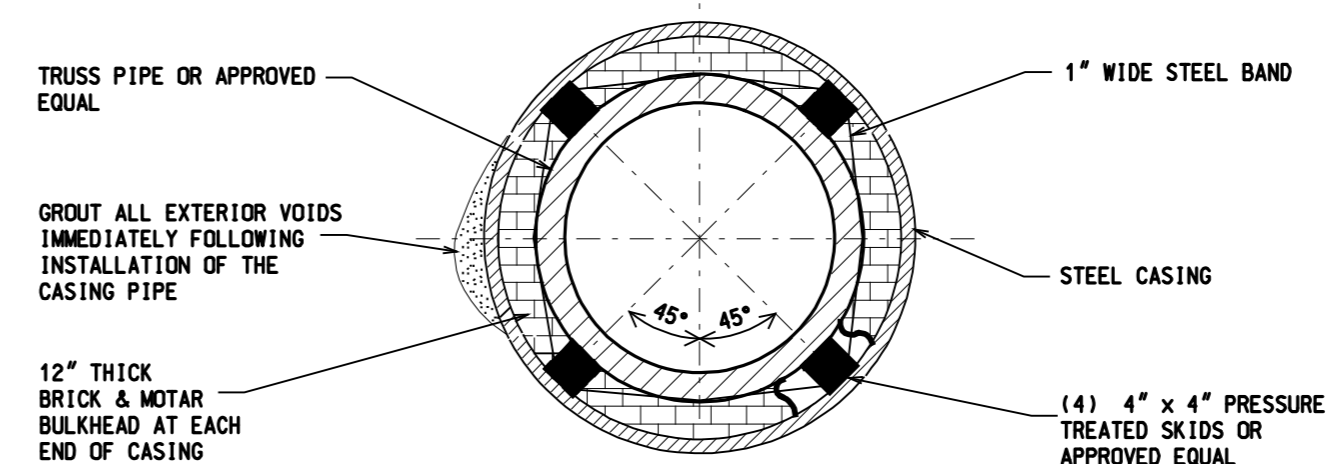


TRUSS & SOLID WALL PIPE BEDDING DETAIL



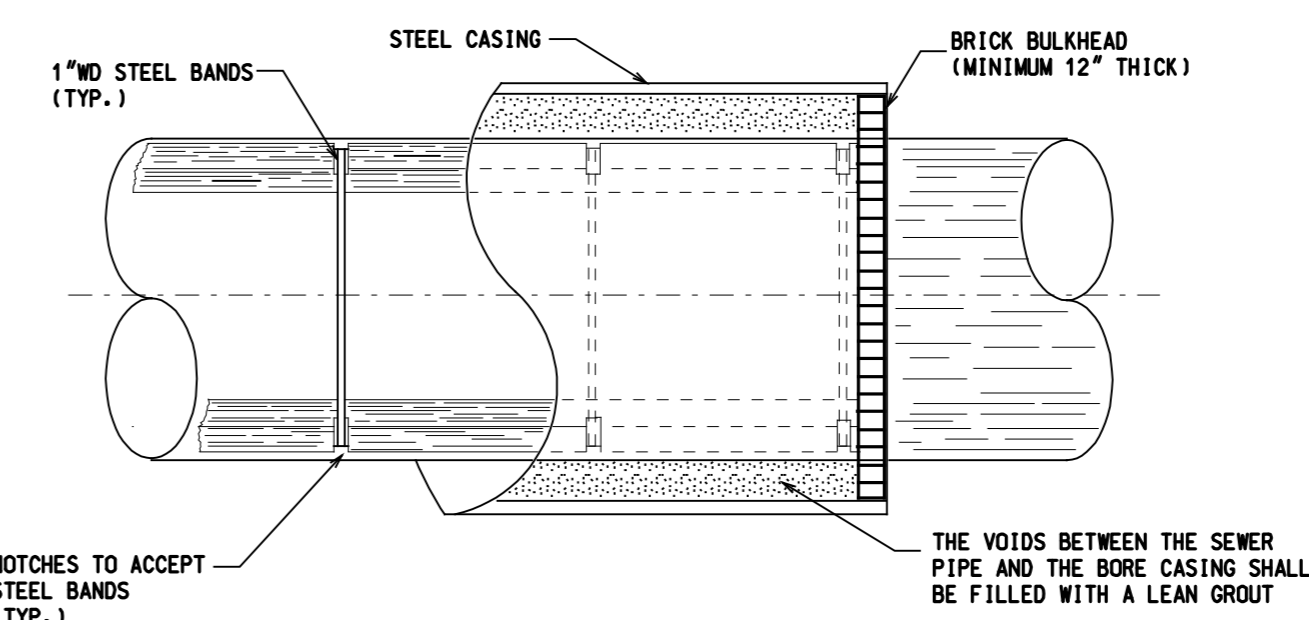
6" HOUSE LEAD CONSTRUCTION

NOTE:
ALL UTILITIES - PUBLIC OR PRIVATE THAT FALL WITHIN A ONE (1) MILE ZONE OF INFLUENCE FROM A POINT 5'-0" BEHIND BACK OF CURB AT TOP OF CURB SHALL BE BACKFILLED WITH M.D.O.T. GRANULAR MATERIAL, CLASS II COMPACTED TO 95% OF MAXIMUM DENSITY UTILIZING ASTM D1557.



SPACING OF STEEL BANDS	NOMINAL SIZE	MIN WALL THICKNESS	CASING PIPE SHALL BE NEW OR UNUSED ASTM A-139 GRADE "B" & WALL THICKNESS AS NOTED.
5 BANDS EQUALLY SPACED PER LENGTH OF PIPE	12" - 20"	0.250"	
	24" - 36"	0.375"	
	42"	0.500"	
	48" - 60"	0.625"	

THE JOINTS OF THE STEEL CASING WILL BE BUTT WELDED AROUND THEIR ENTIRE CIRCUMFERENCE



- NOTES:**
- THE CONTRACTOR SHALL SUBMIT IN WRITING TO THE CITY OF FENTON, THE APPROPRIATE PIPE CASING INSTALLATION DETAILS FOR REVIEW & APPROVAL BEFORE CONSTRUCTION BEGINS.
 - THE DIAMETER OF THE BORE CASING SHALL BE A MINIMUM OF 8" LARGER THAN THE SEWER TO ACCOMMODATE 4" SKIDS ON ALL SIDES.
 - A 4" DIA. PVC GROUT FILL TUBE SHALL BE INSTALLED AT EACH END OF THE CASING. FLOWABLE FILL SHALL BE INSERTED FROM ONE END UNTIL ALL AIR IS REMOVED FROM CASING.

SEWER MAIN BORE



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3-24-08	ADOPTED BY CITY COUNCIL
DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	
DRAWN	J. REC
CHECKED	M. DARGA
APPROVED	J. BOOTH

**CITY OF FENTON
STANDARD
CONSTRUCTION
DETAILS**

**SANITARY SEWER
STANDARDS
2 OF 2**

HRC JOB NO. 20070048	SCALE NONE
DATE JULY, 2007	SHEET NO. 2 OF 2