SEWER STANDARDS

16 WASTEWATER COLLECTION SYSTEM

16-1 DESCRIPTION

This work shall consist of furnishing and installing sewer pipe and appurtenances in accordance with the Standard Drawings and these Standard Specifications.

16-2 EXTRA STRENGTH VITRIFIED CLAY PIPE (E.S.V.C.P.)

Shall be bell and spigot extra strength vitrified clay pipe manufactured, tested, delivered, and inspected in accordance with the latest revision of ASTM Designation C700. The clay pipe shall be made with flexible, interlocking, resilient, mechanical compression joints (Wedgelock or equal) formed in the pipe at the factory and shall conform to the latest revision of ASTM Serial Designation C425.

16-3 DUCTILE IRON TYTON JOINT PIPE

Ductile iron pipe shall conform to the requirements for service class pipe, standards and dimensions, in accordance with ANSI/AWWA C151/A21.51. All joints to be hub and spigot Class 50.

16-4 C900 PVC PIPE (FORCE MAIN)

PVC pressure pipe, 4 inch to 12 inch, shall conform to AWWA Standard C900. Rubber rings shall conform to manufacturer's recommendation.

PVC pressure pipe, 14 inch to 30 inch, shall conform to AWWA Standard C905. Rubber rings shall conform to manufacturer's recommendation.

16-5 PVC SEWER PIPE - 4 INCH TO 15 INCH (GRAVITY)

PVC solid wall sewer pipe shall conform to ASTM Standard D3034-SDR26 Standard Specification for PVC Sewer Pipe and Fittings with rubber sealing ring meeting ASTM D-3212 "Joints for Drain and Sewer Pipes Using Flexible Elastomeric Seals", or an approved equal.

PVC solid wall sewer pipe 18 inch to 48 inch shall conform to ASTM Standard F679, P5115 Standard Specification for PVC large diameter plastic Gravity Sewer Pipe and Fittings with rubber sealing ring meeting ASTM D-3212 "Joints for Drain and Sewer Pipes using Flexible Elastomeric Seals", or an approved equal.

16-6 PIPE LAYING

Unless otherwise specified by the Engineer, all pipes shall be laid with the bells facing the direction of laying and shall be laid in accurate conformity with the prescribed lines and grades. Each length shall be jointed to the preceding section as hereinafter specified; and after said jointing procedure has commenced, there shall be no movement of the pipe whatsoever in subsequent operations. Each pipe shall have a firm bearing for its full length in the trench, except at bell holes and field joints. Only approved lubricants shall be used as an aid to mating bells and spigots. The reference line on the spigot end should be flush with the end of the bell.

Every precaution shall be taken to protect the pipe against the entrance of foreign material before the pipe is placed in the trench. At the close of the day's operations, or whenever workmen are absent from the job site, the last section of pipe shall be plugged, capped or otherwise tightly closed to prevent the entry of foreign matter of any nature.

All trenches shall be of sufficient depth to provide a minimum cover of 30 inches, measured from the top of the pipe to the finish grade, unless otherwise approved by the Engineer.

16-7 MINIMUM SLOPES AND GRADE DEVIATIONS

The minimum allowable slopes permitted on sewer lines shall be as follows:

PIPE DIAMETER (INCH)	MINIMUM SLOPE (ft/ft)
8	0.0024
10	0.0018
12	0.0015
15	0.0011
18	0.0009

The minimum size PVC permitted for City maintained sewer lines is 8 inch diameter. A larger line will not be allowed to dump into a smaller line without prior authorization of the Engineer (i.e. 8 inch will not be allowed to dump into a 6 inch).

16-8 USES OF PIPE

C900 Class 200, PVC shall be used when a sewer is within 50 feet of a domestic water well, or when crossing water lines or whenever deemed necessary because of lack of cover. (Note: Concrete slabs or cradles shall not be used around sewer lines.)

16-9 PRECAST MANHOLE SECTIONS

Precast manhole sections shall conform to size, shape and details shown on the Standard Plans. Pipe sections shall conform to current ASTM Specification C76, Class II, as amended to date. A minimum of one cage of reinforcing is required, the cross sectional area of which is equal to that specified for the inner cage of the above ASTM Specifications. Cement used in the precast sections shall be Type II or Type V. (ASTM Specification C478 may be used in lieu of C76).

Manholes shall be placed at every change in line direction (unless as specified in sub-section 16-1.22), at the end of dead end lines, at all street intersections, at lateral connections larger than 4 inches in diameter and no more than 500 feet apart unless otherwise specified.

16-10 STUB-OUTS

Stub-outs from manholes constructed for future use shall be installed to the property line or limits of construction to provide service to adjoining property or for future extensions. Stub-outs to private property shall require a manhole behind apron or sidewalk.

16-11 CUL-DE-SAC CONNECTIONS

Only one house service connection smaller than 6 inches shall be connected by means of installation into a cul-de-sac manhole. All other house connections shall be installed by means of a wye on the main line.

16-12 RISER RINGS

Riser rings shall be precast reinforced rings or if poured in-place risers are used, they shall meet the following height requirements:

PRECAST MANHOLES LESS THAN 36 INCHES IN HEIGHT

Riser ring shall not exceed 9 inches in height including manhole frame and cover.

PRECAST MANHOLES 37 INCHES TO 72 INCHES IN HEIGHT

Riser rings shall not exceed 12 inches in height including manhole frame and cover.

PRECAST MANHOLES OVER 72 INCHES IN HEIGHT

Riser rings shall not exceed 18 inches in height including manhole frame and cover. All measurements shall be taken from the top of the sewer main to the top of the manhole frame.

16-13 MANHOLE FRAMES AND COVERS

Manhole frames and covers shall be as outlined in the Standard Drawings. They shall conform accurately to the form and dimensions shown on the Standard Drawings. Castings must be of workmanlike finish, free from blow and sand holes or any defects of any kind, and shall be made from a superior quality of even-grained gray iron, and shall possess a tensile strength of not less than 38,000 pounds per square inch. Before leaving the foundry, they shall be thoroughly cleaned and coated by dipping in asphalt applied at a temperature of 300°F in such a manner as to provide a firm, durable, tenacious coating.

16-14 SERVICE CONNECTIONS - SMALLER THAN 10 INCH DIAMETER

Service connections made on existing mains smaller than 10 inches shall be made in accordance with the Standard Specifications. All house connection wyes shall be installed at the time of main line construction and shall be bell and spigot. In the case of a cul-de-sac, the manhole shall be installed as deep in the turn-around as possible. The lot directly in front may be connected directly into the manhole as specified in subsection 16-1.10 of these Standard Specifications. All 4 inch lateral connections shall be installed with a clean out at the property line directional to the City main. A G-5 Christy box shall be installed at all service cleanout locations. All connections greater than 4 inches shall require a manhole.

16-15 SERVICE CONNECTIONS - 10 INCH TO 15 INCH DIAMETER

Service connections made on existing sewer mains between 10 inches and 15 inches shall be with Inserta-Tee sewer pipe fittings manufactured by Fowler Mfg. Co. or an approved equal. All 4 inch lateral connections shall be installed with a clean out at the property line directional to the City main. A G-5 Christy box shall be installed at all service cleanout locations. All connections greater than 4 inches shall require a manhole.

16-16 SERVICE CONNECTIONS - 15 INCH AND LARGER IN DIAMETER

Service connections on existing mains with a diameter larger than 15 inches will not be permitted under any circumstances. A parallel line large enough to carry the volume of flow from the house connections in the affected project area shall be installed and all connections made to this line. This line shall not be smaller than 8 inches in diameter. All 4 inch lateral connections shall be installed with a clean-out at the property

line directional to the City main. A G-5 Christy box shall be installed at all service cleanout locations. All connections greater than 4 inches shall require a manhole.

16-17 CLEAN-OUTS

Clean-outs on mains shall be used only where a line comes to a dead end for a future extension and where the distance to the next downstream manhole is less than 100 feet.

16-18 CITY DRILLED PILOT HOLES

The tapped hole shall be made by the City by the pilot-hole cutter system. The City shall be notified at least 48 hours in advance of requested construction and all material shall be furnished by the Contractor or under a City agreement. All excavation and shoring of the trench shall be performed by the Contractor. A deposit, covering the cost of the City's involvement, shall be placed with the City prior to the work being performed. No parts will be supplied or loaned to the contractor.

16-19 MARKINGS

All services shall be marked on the face of the curb with a 3 inch letter "S" in wet concrete.

16-20 SEWER TERMINATION

All sewer mains shall terminate with a City standard manhole. For situations where there are less than three services, or the termination is only temporary, a lamphole may be used with the approval of the Engineer.

16-21 TRENCHING AND BACKFILL

The trenching and backfilling shall conform to the requirements of Section 14 of these Standard Specifications.

16-22 HORIZONTAL ALIGNMENT DESIGN

Sewer lines shall be straight lines from manhole to manhole, except as specified herein. For radius sewer lines, the minimum radius used shall be 300 feet. The minimum number of pipes to be used for twenty foot length pipes shall be eight. Construction of lines on a radius shall be inspected prior to any backfilling.

16-23 CLEANING AND FLUSHING OF NEW SEWER LINES

After all backfilling is completed and the structure frames and covers have been set, the Contractor shall clean and flush all sewer pipes. This shall be done in the presence of the Engineer and as described hereinafter.

16-24 PLACEMENT OF SAND TRAP

A temporary sand trap of a design approved by the Engineer shall be securely placed within the outlet of the next lower manhole of the section of sewer pipe to be cleaned and flushed. The sand trap shall catch all debris flushed downstream and prevent it from being carried into the sewer pipe below. All debris collected by the sand trap shall be carefully removed from the manhole.

16-25 INSTALLATION AND REMOVAL OF SAND TRAP

The Contractor shall not clean and flush any section of the sewer pipe until the sand trap has been installed and approved by the Engineer. Upon completion of the cleaning and flushing procedure, the Contractor shall not remove said sand trap without first receiving approval from the Engineer. Where sewers have been flushed without a sand trap, the Contractor shall be fully responsible for removing material and debris,

that are a result of the Contractor's operations, from the existing service lines. This shall be done to the satisfaction of the Engineer.

16-26 CLEANING AND FLUSHING 12 INCH OR SMALLER PIPE

To clean and flush sewer pipes 12 inches or less in diameter, the Contractor shall furnish and use a heavy rubber ball, manufactured for this purpose and approved by the Engineer. When inflated with air it should have an outside diameter equal to the interior diameter of the pipe to be cleaned. The ball should fit snugly into the sewer pipe with the final determination being made by the Engineer. The ball shall be placed in the uppermost structure of the line to be cleaned and then water shall be introduced into the structure in back of the ball. The ball shall pass through the pipe with only the pressure of the water behind it. The rate at which the ball is allowed to pass through the pipe shall be controlled by a rope attached to the ball at all times.

This procedure shall be conducted on each new section of pipe that has been installed. Care shall be exercised to feed the ball slow enough to allow all debris to be removed in a manner which is satisfactory to the Engineer. The work shall be done in such a manner as to prevent sewage from backing up into and flooding adjacent properties.

The mandrel test shall be required on all PVC pipe 8 inches or larger:

1) Be a rigid, non-adjustable, odd-numbering-leg (9 legs minimum) mandrel having an effective length not less than its nominal diameter.

Have a minimum diameter at any point along the full length as follows:

PIPE MATERIAL	NOMINAL SIZE (INCHES)	MINIMUM MANDREL DIAMETER (INCHES)	MINIMUM MADEREL PERCENTAGE
PVC-SDR26	4	3.62	5
PVC-SDR26	6	5.34	5
PVC-SDR26	8	7.11	5
PVC-SDR26	10	8.87	5
PVC-SDR26	12	10.55	5
PVC-SDR26	15	12.90	5

16-27 CLEANING AND FLUSHING PIPES LARGER THAN 12 INCHES

Sewer pipes over 12 inches in diameter may be cleaned by means other than the above described ball method, with the prior approval of the Engineer.

16-28 LEAKAGE TESTS FOR SEWER PIPES LARGER THAN 30 INCHES

Sewers larger than 30 inches in diameter will be tested for leakage by visual inspection by the Engineer. No leakage by infiltration shall be allowed.

16-29 LEAKAGE TESTS FOR SEWER PIPES 30 INCHES AND SMALLER

All sewers shall be tested for tightness when completed and ready for service by the Water Exfiltration Test. The method to perform said test follows: Each section of sewer shall be tested between successive manholes by closing the lower end of the sewer to be tested and the inlet sewer of the upper manhole with stoppers. The pipe and manhole shall be filled with water to a point 4 feet above the invert of the sewer at the center of the upper manhole; or if ground water is present, 4 feet above the average adjacent ground water level.

The allowable leakage will be computed by the formula:

E = 0.0001 LD H for mortared joints.
E = 0.00002 LD H for all other joints.

Where:

E = the allowable leakage in gallons per minute of sewer tested.
L = length of sewer and house connections tested, in feet.
D = the internal diameter of the pipe in inches.
H = the difference in elevation between the water surface in the upper manhole and the invert of the pipe at the lower manhole; or if ground water is present above the invert of the pipe in the lower manhole, the difference in elevation between the water surface in the upper manhole and the ground water at the lower manhole.

The contractor shall, at its expense, furnish all water, materials and labor for making the required test. All tests shall be made in the presence of the Engineer.

16-30 LOW PRESSURE AIR TEST

This test shall be performed on all sanitary sewer and storm drain lines to demonstrate the integrity of the installed line, when so requested by the Engineer. The method to perform said test follows:

METHOD

Use the Time-Pressure Drop Method for all testing. The test procedures are described hereinafter:

1. Clean the sewer to be tested and remove all debris as noted previously.

2. Wet the sewer prior to testing, if desirable.

3. Plug all sewer outlets with suitable test plugs. Brace each plug securely.

4. Check the average height of the ground water over the sewer, because the pressure of ground water will affect the test. The height of the ground water table shall be determined just prior to testing. This shall be done by drilling exploratory holes or such other methods as approved by the Engineer. The Engineer will make the final determination in regards to the height to be used for the test. The test pressures required below shall be increased 0.433 psi for each foot of average water depth over the sewer.

5. Add air slowly to the section of sewer pipe being tested until the internal air pressure is raised to 4.0 psi greater than the average back pressure of any ground water that may submerge the pipe.

6. After the internal test pressure is reached, allow at least 2 minutes for the air temperature to stabilize. During this time add only the amount of air required to maintain the pressure in the pipe.

7. After the temperature stabilization period, disconnect the air supply.

8. Determine and record the time, in seconds, that is required for the internal air pressure to drop from 3.5 psi to 2.5 psi greater than the average back pressure of any ground water that may submerge the pipe.

ACCEPTANCE

The sewer shall be considered acceptable when tested as described, if the section under test does not lose air at a rate greater than (1) 0.0015 cfm per square foot of internal sewer surface, or (2) 2 cfm, whichever is greater. However, this will not be considered final acceptance. The Contractor's attention is directed to subsection 16-32 of these Standard Specifications for the requirements for final acceptance.

16-31 SUBSEQUENT FAILURE

Infiltration of ground water in an amount greater than 3.84 gallons per day per inch diameter per 100 feet, following a successful air test indicates an error in the original test or that a subsequent failure of the pipeline has occurred. The Contractor shall correct such failures at his sole expense if they occur within the warranty period.

16-32 MATERIALS REQUIRED

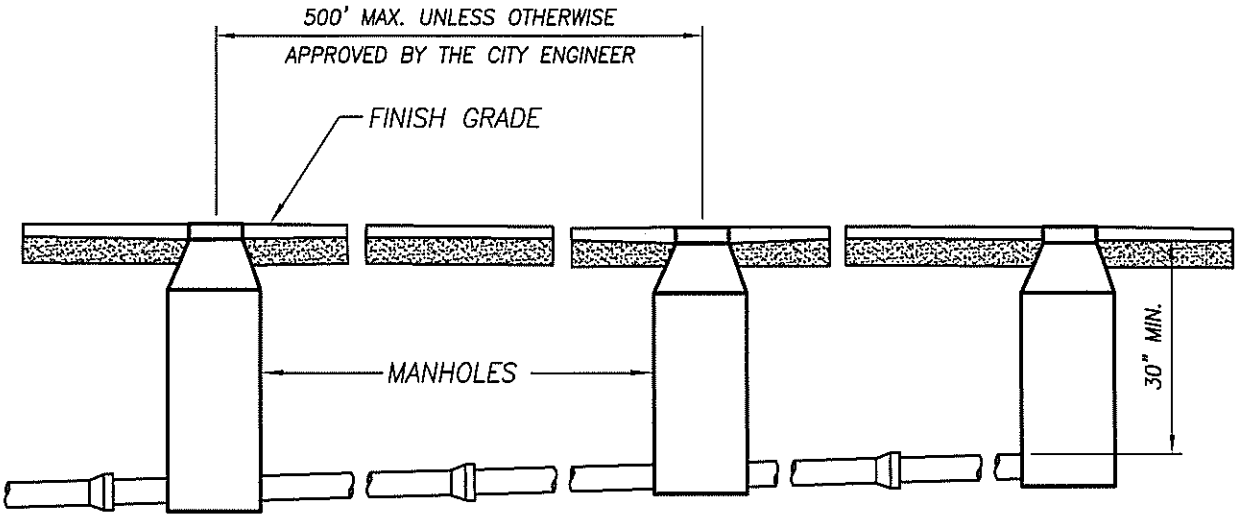
All tools, materials and appurtenances required for testing the sewers as specified shall be approved by the Engineer and furnished by the Contractor.

16-33 CLOSED CIRCUIT TV INSPECTION OF SEWER SYSTEMS

Prior to placing the final street surfacing, the City, at the developer's request and expense, will inspect all new sewer systems with a closed circuit television system. This will be done after the pipe has been installed true to the prescribed lines and grades, the trench backfilled and compacted, the manhole and clean-out covers set to proper grade, the roadway subgrade compacted, aggregate sub-bases and bases placed and compacted and the sewer system cleaned of all debris. The Developer shall make the necessary repairs or corrections at his sole expense so that the work is acceptable to the Engineer. All repairs are to be made with repair (shear) couplings. After the tests are completed, to the satisfaction of the Engineer, the Contractor may commence paving. After all offsite improvements are complete, re-testing will be done for final acceptance. The sewer system may also be inspected with said television system any time within the twelve month warranty period after filing the Notice of Completion.

16-34 GREASE AND SAND AND OIL INTERCEPTOR

When an interceptor is required, it shall conform to the requirements of Standard Drawings.



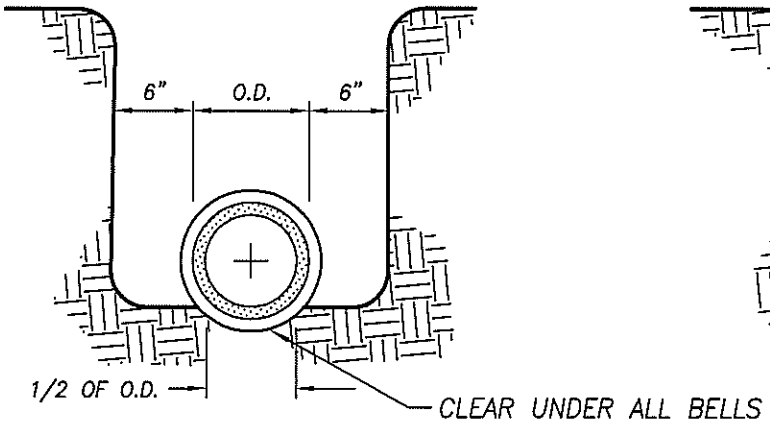
PIPE SIZE	MIN. SLOPE
8" DIA.	0.0024
10" DIA.	0.0018
12" DIA.	0.0015
15" DIA.	0.0011
18" DIA.	0.0009
>18" DIA.	PROVIDE CALCS

NOTES:

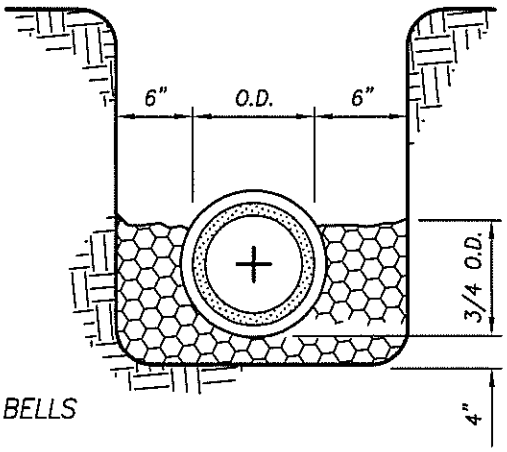
1. MINIMUM COVER SHALL BE 30 INCHES.
2. MANHOLES SHALL BE INSTALLED AT THE END OF ALL LINES, WHERE SEWERS INTERSECT, AT CHANGES IN LINE SIZE OR MATERIAL AND AT SERVICE CONNECTIONS LARGER THAN 4" IN DIAMETER.
3. ALL SERVICE CONNECTIONS TO SEWERS SHALL BE MADE AT WYES.
4. THE ENGINEERING DIVISION SHALL BE SUPPLIED WITH AN "AS-BUILT" PLAN SHOWING LOCATION OF ALL LATERALS AND INVERT ELEVATIONS.
5. A MANHOLE SHALL BE INSTALLED AT ALL CONNECTIONS TO A TRUNK LINE.

SANITARY SEWER DATA

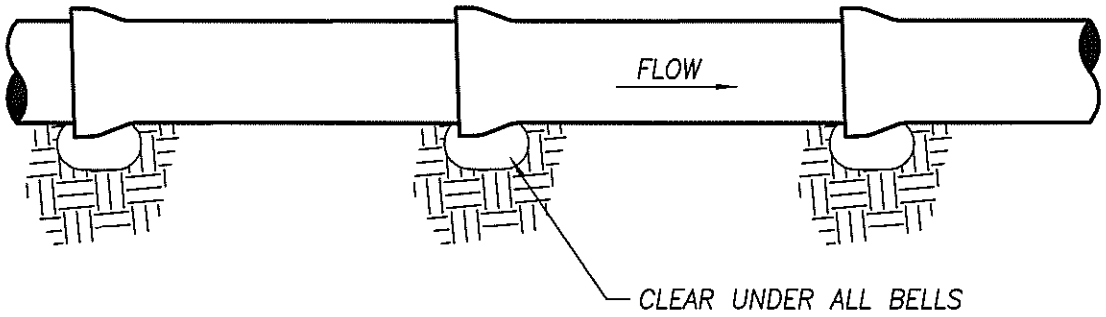
CITY OF TURLOCK INC. 1907	DRAWN BY: JSH	CITY OF TURLOCK	DRAWING NO. S-1
	CHECK BY: NBB	APPROVED BY:	COUNCIL APPROVAL DEC, 2015
	SCALE: NONE	CITY ENGINEER – MICHAEL G. PITCOCK – RCE 52694	



STANDARD TRENCH (TYP.)



IMPROVED BEDDING



NOTES:

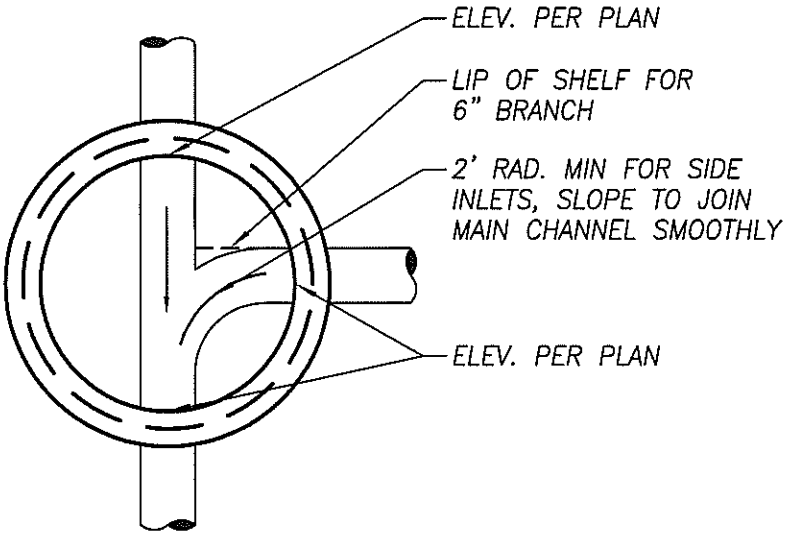
1. WHEN BASE OF TRENCH IS HARD PAN, CONTRACTOR SHALL OVER-EXCAVATE 4" MIN. AND PLACE IMPORT OR SELECT NATIVE MATERIAL PRIOR TO INSTALLING PIPE
2. BACKFILL SETTLING AND COMPACTION SHALL NOT BE ACHIEVED BY MEANS OF "JETTING" OR PONDING.

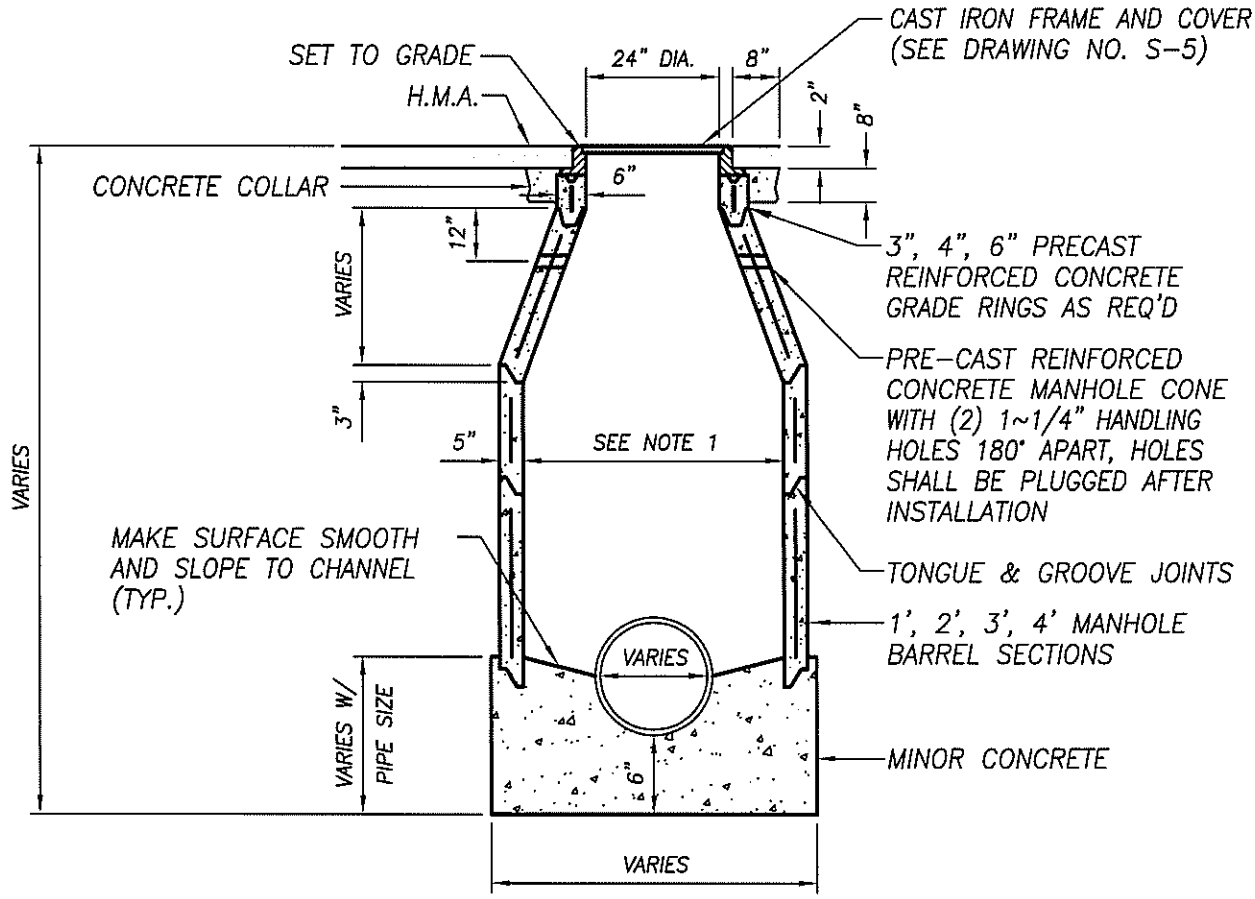
SEWER LINE DETAIL

CITY OF TURLOCK INC. 1908	DRAWN BY: JSH	CITY OF TURLOCK	DRAWING NO. S-2
	CHECK BY: NBB	APPROVED BY:	COUNCIL APPROVAL DEC, 2015
	SCALE: NONE	CITY ENGINEER – MICHAEL G. PITCOCK – RCE 52694	

NOTES:

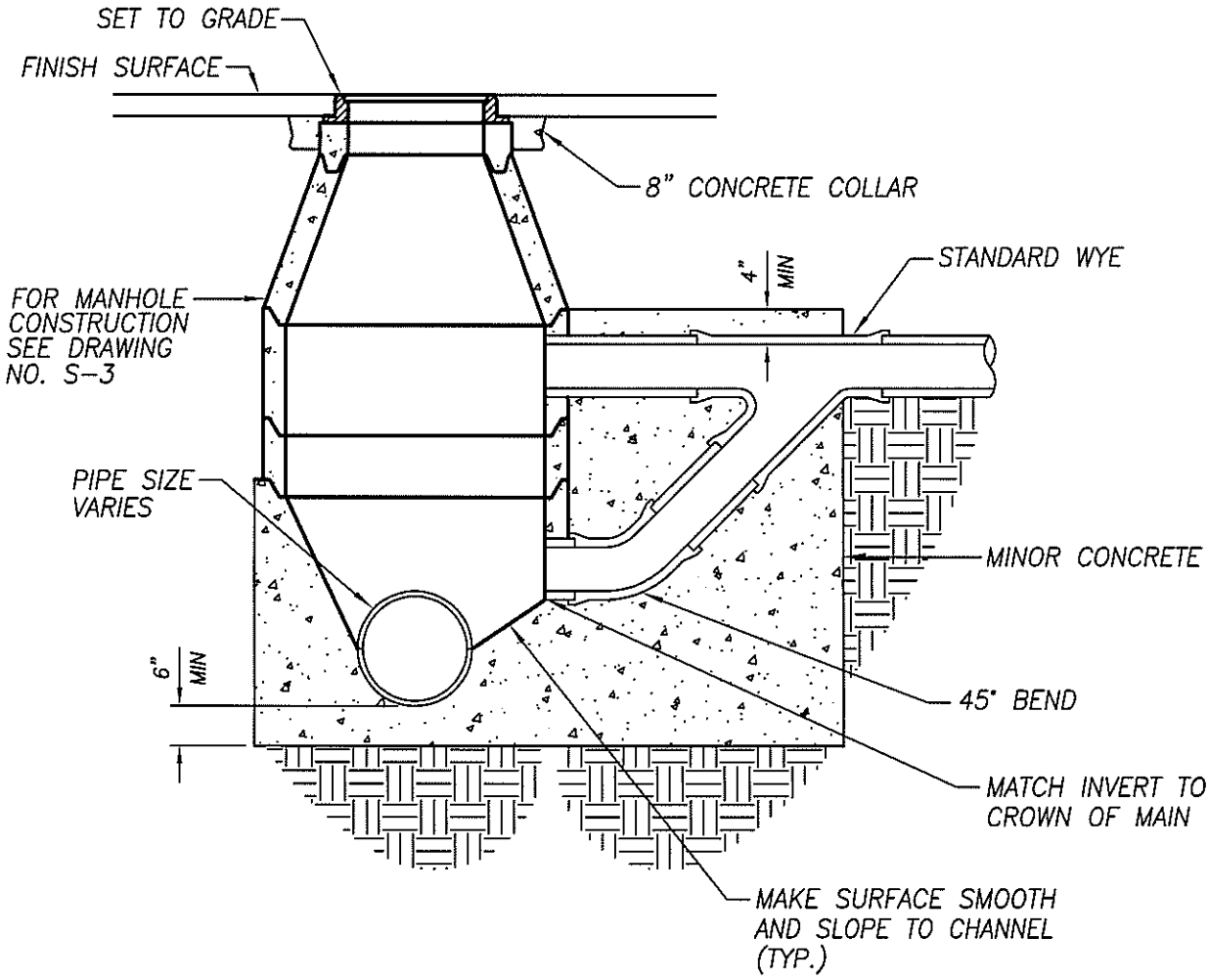
1. MANHOLE DIAMETER SHALL BE 48" WHEN SERVING PIPES 24" IN DIAMETER OR SMALLER. MANHOLE DIAMETER SHALL BE 60" WHEN SERVING PIPES LARGER THAN 24" IN DIAMETER
2. SEE STANDARD DWG. S-4 FOR DROP MANHOLE DETAIL
3. THE DEPTH OF CHANNELS FLOWING INTO THE MAIN LINE SHALL BE NO DEEPER THAN HALF IT'S PIPE DIAMETER
4. ALL JOINTS SHALL BE SET WITH RAMNEK, OR APPROVED EQUAL, AND GROUTED





STANDARD MANHOLE

CITY OF TURLOCK INC. 1918	DRAWN BY: JSH	CITY OF TURLOCK	DRAWING NO. S-3
	CHECK BY: NBB	APPROVED BY:	COUNCIL APPROVAL DEC, 2015
	SCALE: NONE	CITY ENGINEER – MICHAEL G. PITCOCK – RCE 52694	

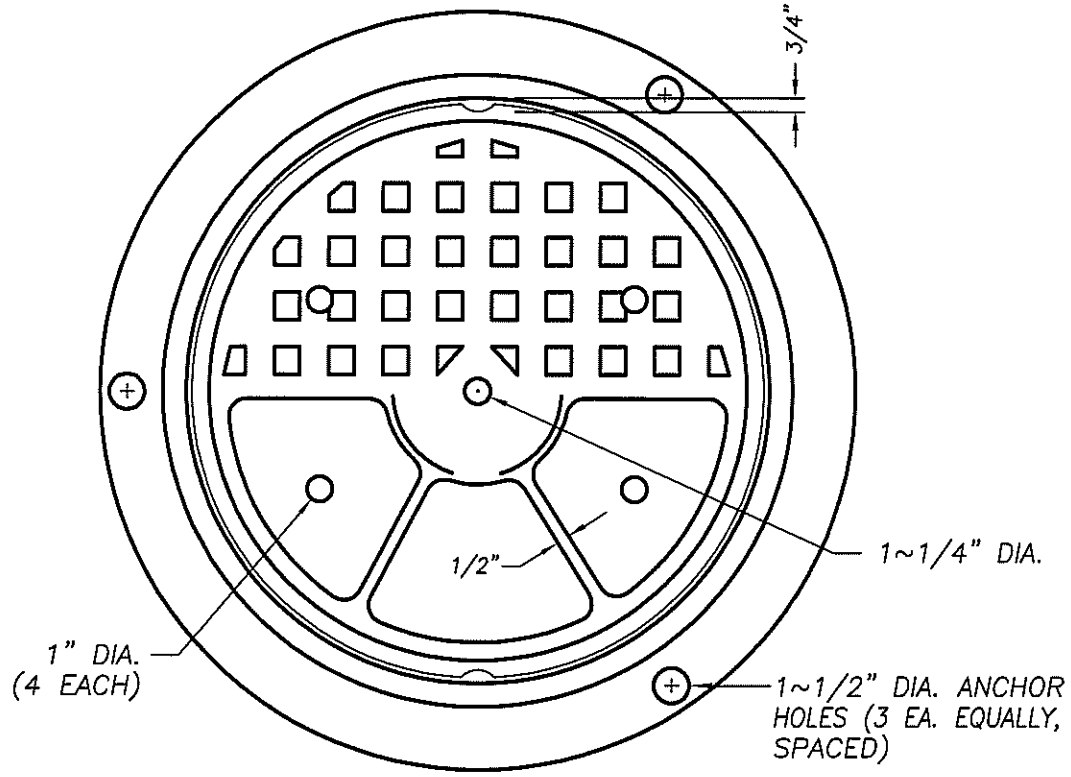


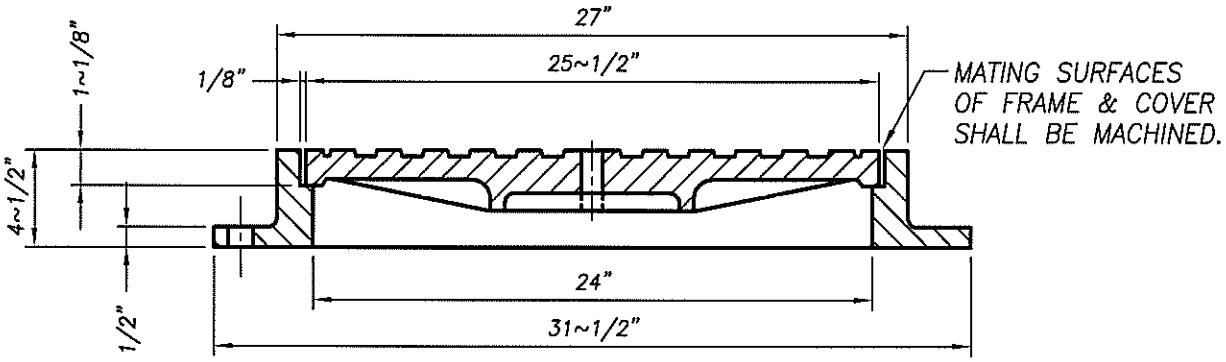
NOTE:

1. DROP MANHOLE SHALL BE USED WHEN THE SLOPE OF THE LINE WOULD EXCEED 2%, OR AS APPROVED BY CITY ENGINEER.
2. ALTERATIONS MAY BE REQUIRED BY CITY ENGINEER.

STANDARD DROP MANHOLE

CITY OF TURLOCK INC. 1908	DRAWN BY: JSH	CITY OF TURLOCK	DRAWING NO. S-4
	CHECK BY: NBB	APPROVED BY:	COUNCIL APPROVAL DEC, 2015
	SCALE: NONE	CITY ENGINEER – MICHAEL G. PITCOCK – RCE 52694	





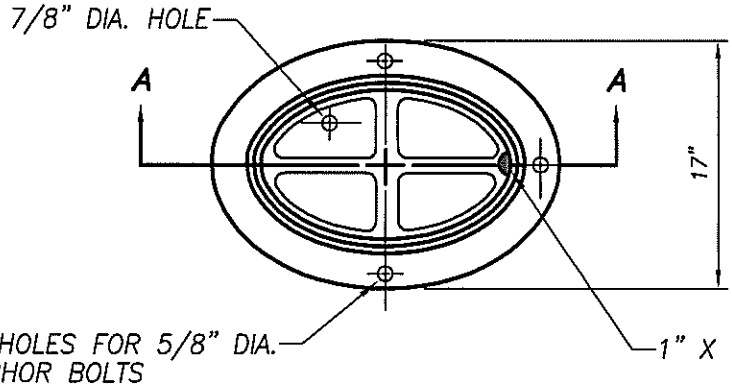
SECTION A–A

NOTES:

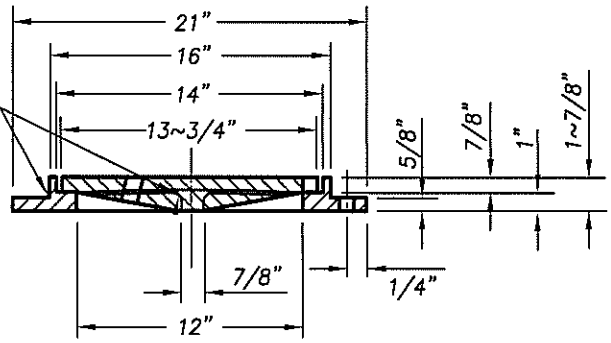
1. CAST IRON SHALL HAVE A TENSILE STRENGTH OF 38,000 PSI.
2. FRAME SHALL BE SET TO FINISH GRADE
3. SOUTH BAY FOUNDRY FRAME AND LID NO. 624/106 OR APPROVED EQUAL FOR SANITARY SEWER.
4. SOUTH BAY FOUNDRY FRAME AND LID NO. 624 OR APPROVED EQUAL FOR STORM DRAIN.
5. WEIGHT OF LID SHALL BE 100 POUNDS MINIMUM.

MANHOLE FRAME AND COVER

CITY OF TURLOCK INC. 1908	DRAWN BY: JSH	CITY OF TURLOCK	DRAWING NO. S–5
	CHECK BY: NBB	APPROVED BY:	COUNCIL APPROVAL DEC, 2015
	SCALE: NONE	CITY ENGINEER – MICHAEL G. PITCOCK – RCE 52694	

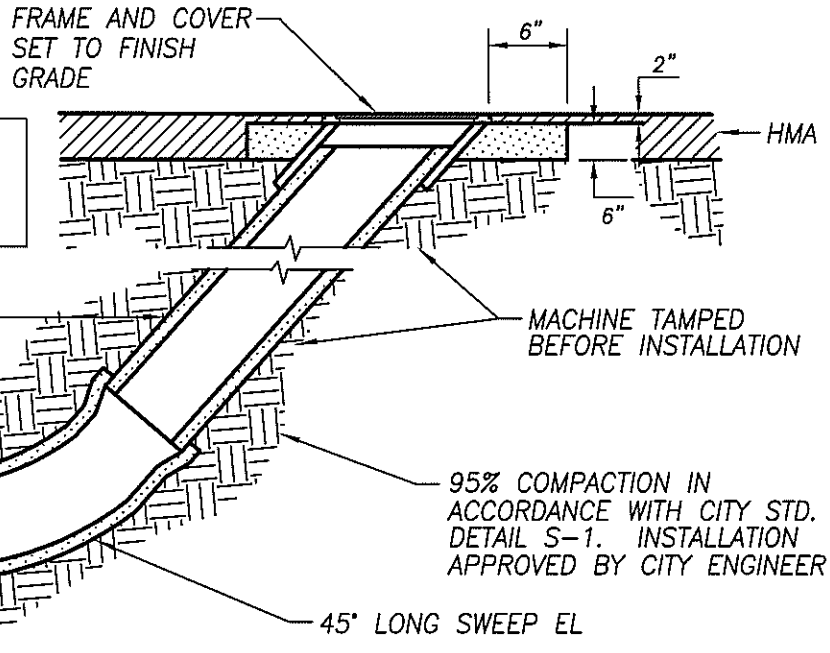


COVER:
PINKERTON A-143
OR APPROVED EQUAL



FRAME:
PINKERTON A-144
OR APPROVED EQUAL

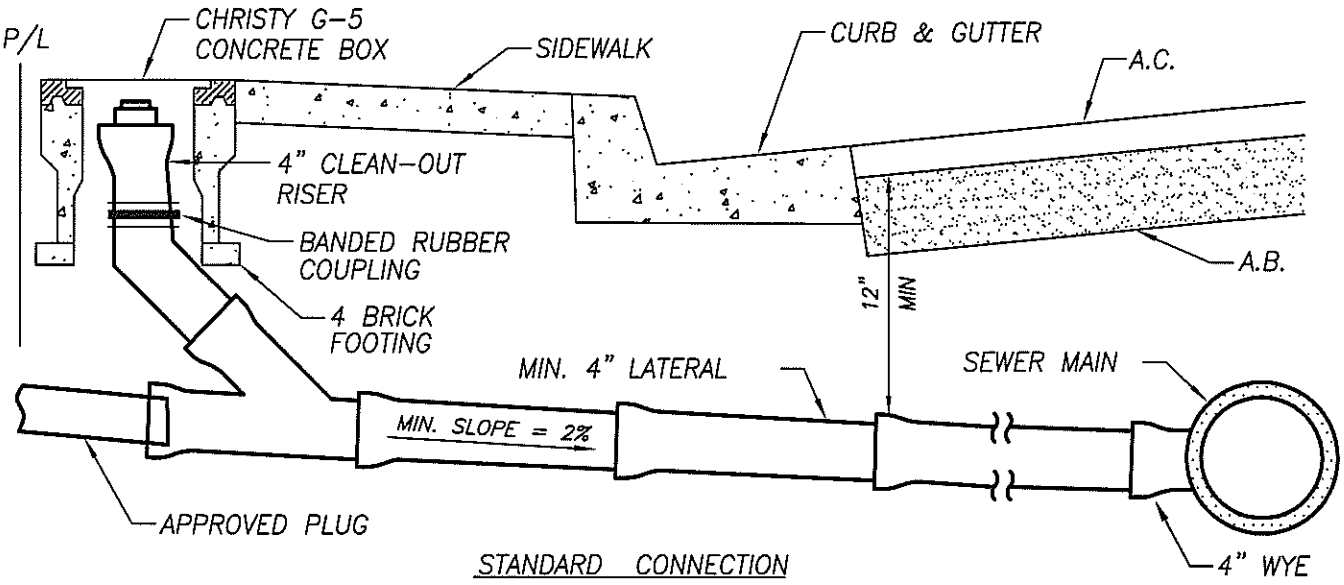
SECTION A-A



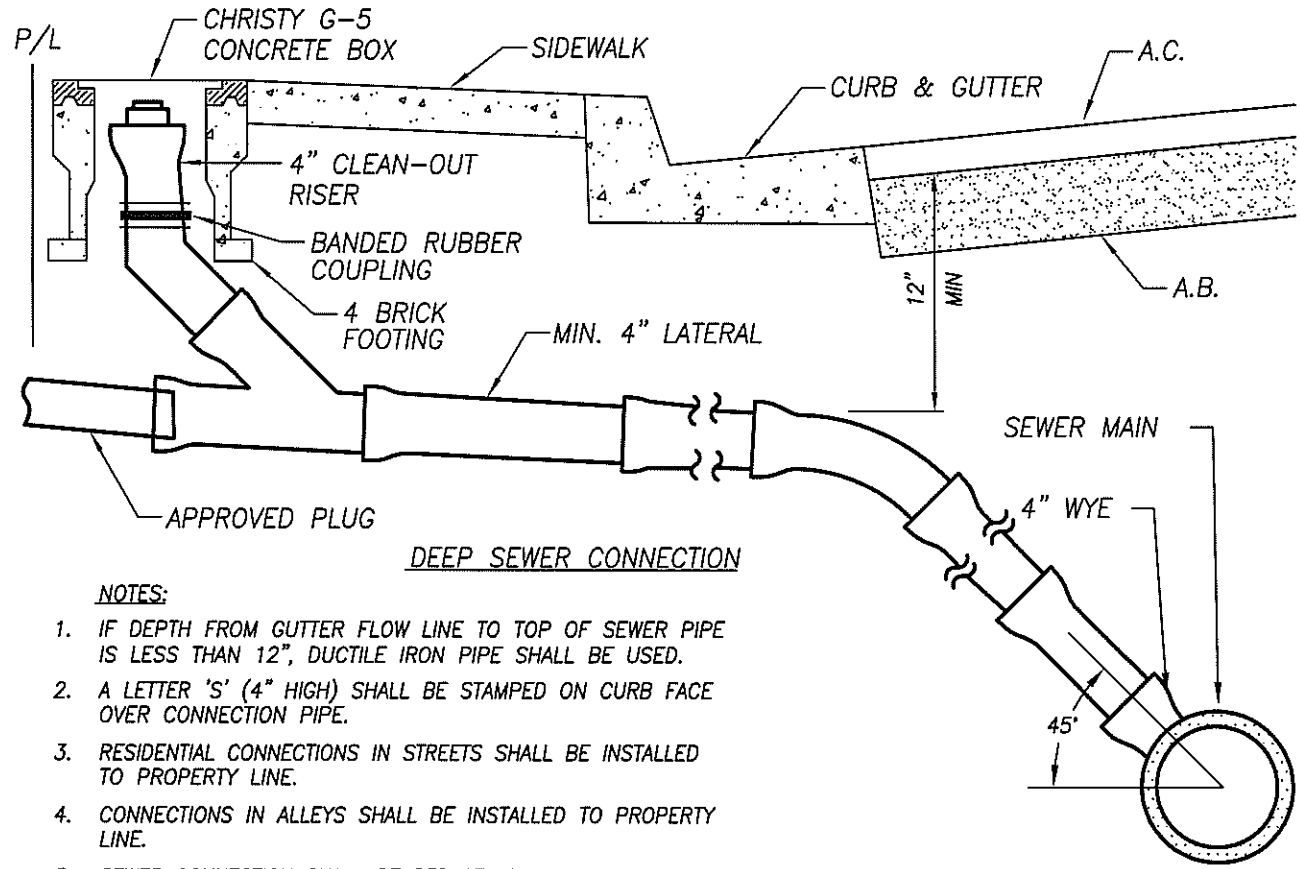
NOTE:
ONLY TO BE USED WITH PRIOR APPROVAL OF CITY ENGINEER.

LAMPHOLE AND COVER

DRAWN BY: JSH	CITY OF TURLOCK		DRAWING NO. S-6
CHECK BY: NBB	APPROVED BY:		COUNCIL APPROVAL DEC, 2015
SCALE: NONE	CITY ENGINEER - MICHAEL G. PITCOCK - RCE 52694		



STANDARD CONNECTION



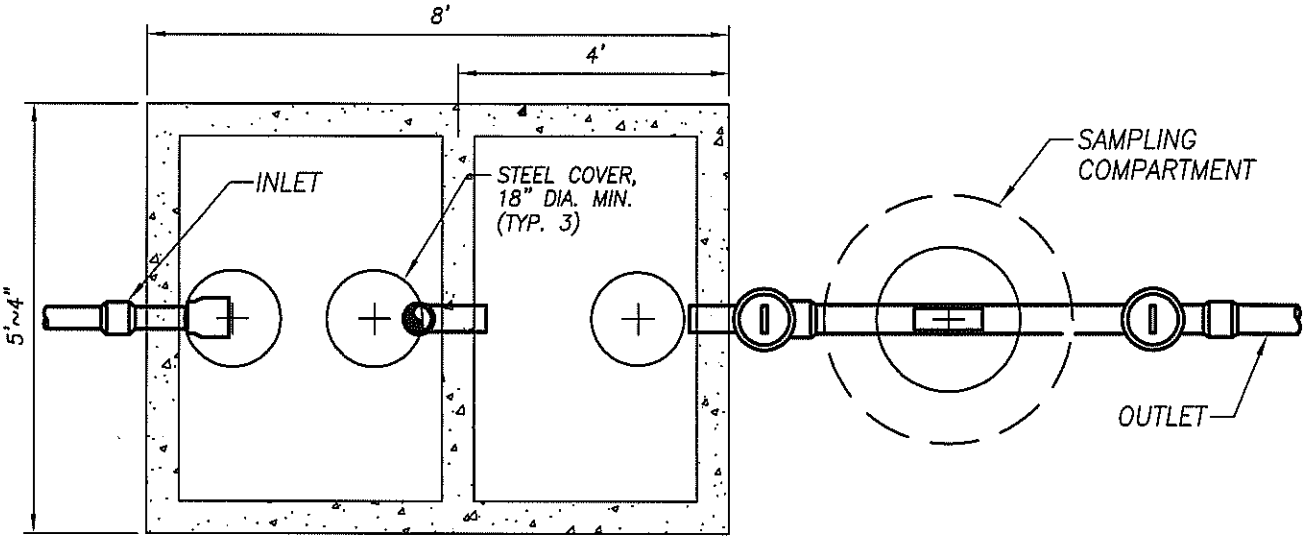
DEEP SEWER CONNECTION

NOTES:

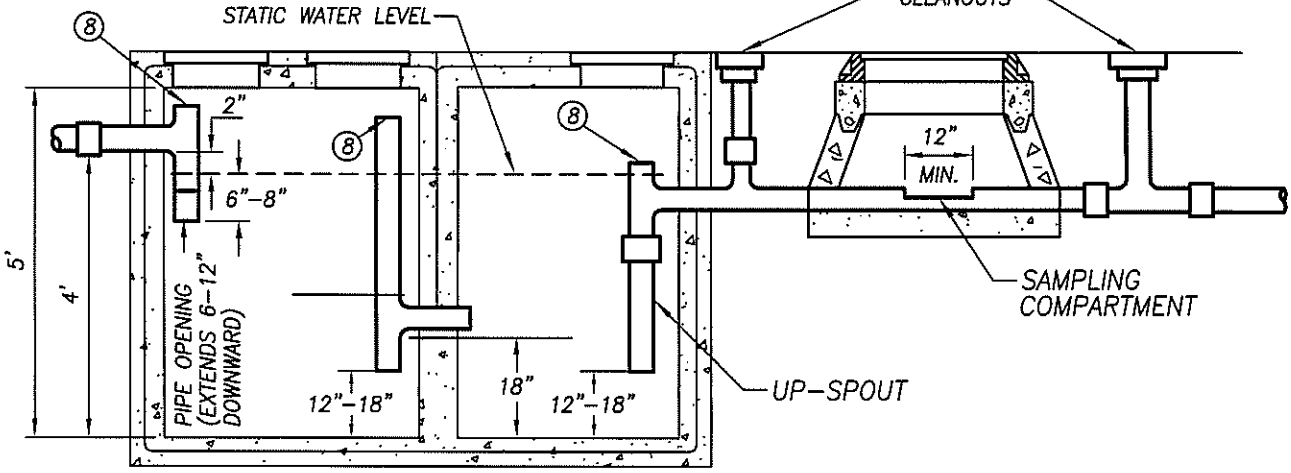
1. IF DEPTH FROM GUTTER FLOW LINE TO TOP OF SEWER PIPE IS LESS THAN 12", DUCTILE IRON PIPE SHALL BE USED.
2. A LETTER 'S' (4" HIGH) SHALL BE STAMPED ON CURB FACE OVER CONNECTION PIPE.
3. RESIDENTIAL CONNECTIONS IN STREETS SHALL BE INSTALLED TO PROPERTY LINE.
4. CONNECTIONS IN ALLEYS SHALL BE INSTALLED TO PROPERTY LINE.
5. SEWER CONNECTION SHALL BE PER STANDARD SPECIFICATIONS. MINIMUM DIAMETER SHALL BE 4".
6. CHRISTY BOX TO BE PLACED 12 INCHES BACK OF SIDEWALK ON PROPERTY LINE SIDE.

SEWER CONNECTIONS

CITY OF TURLOCK INC. 1908	DRAWN BY: JSH	CITY OF TURLOCK	DRAWING NO. S-7
	CHECK BY: NBB	APPROVED BY:	COUNCIL APPROVAL DEC, 2015
	SCALE: NONE	CITY ENGINEER – MICHAEL G. PITCOCK – RCE 52694	



PLAN VIEW



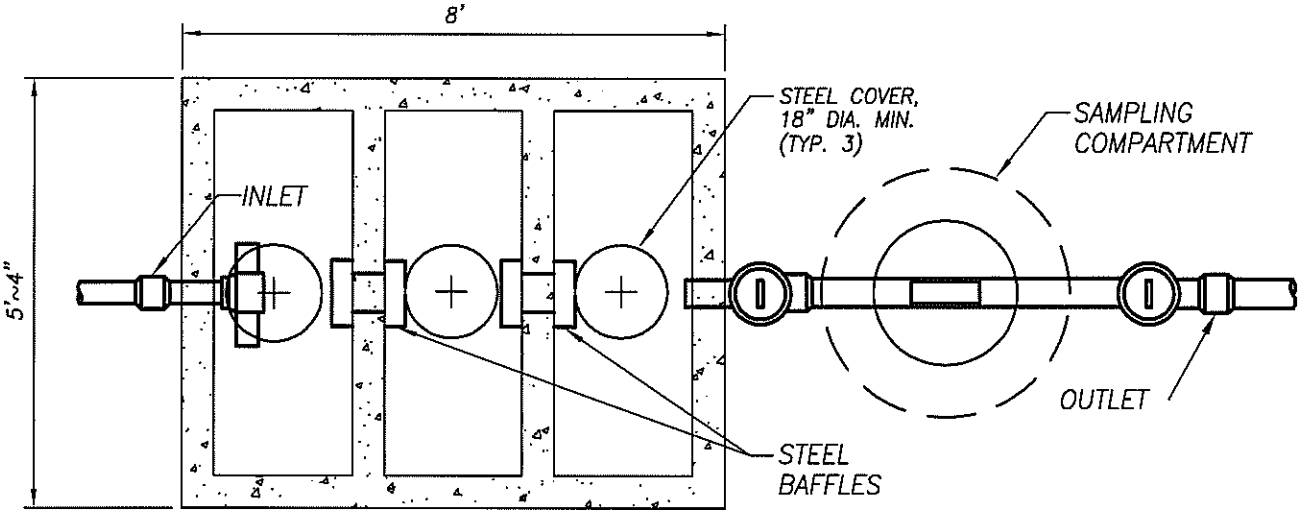
SECTION VIEW

NOTES:

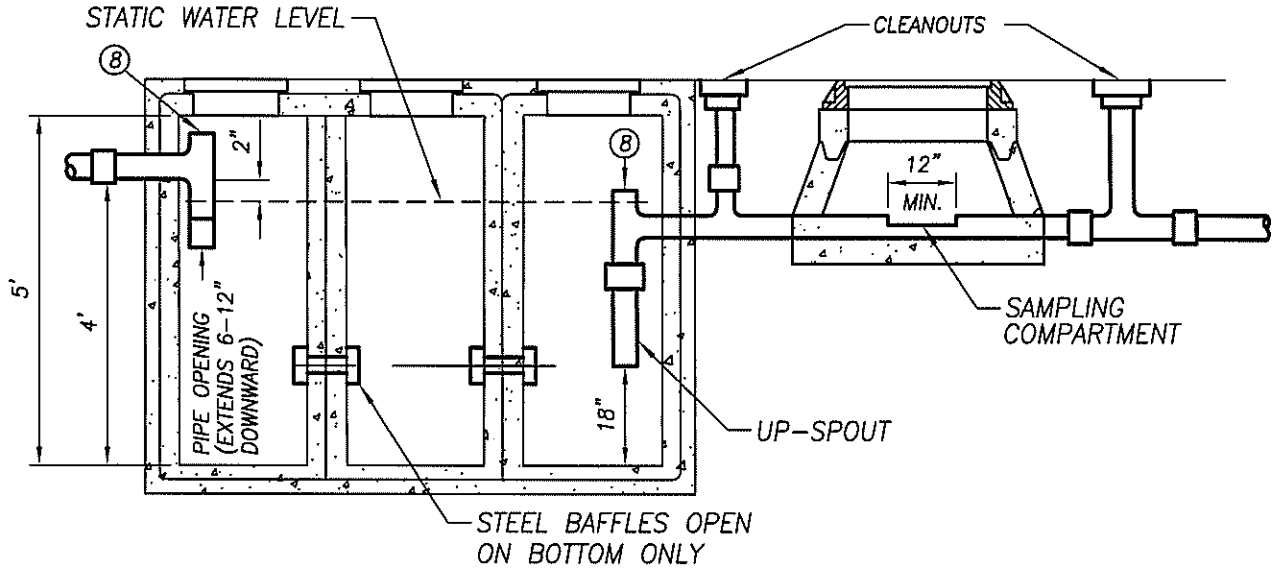
1. DIMENSIONS SHOWN ARE FOR MINIMUM SIZE TRAP (750 GALLON).
2. WHEN A LARGER SIZE IS REQUIRED, THE UNIT SHALL BE DESIGNED BY A REGISTERED CIVIL ENGINEER AND APPROVED BY THE CITY ENGINEER.
3. CONCRETE SHALL BE MINIMUM 3000 PSI AT 28 DAYS.
4. A SAMPLING COMPARTMENT IS REQUIRED, THE CITY ENGINEER MAY WAIVE THE REQUIREMENT IF A HARDSHIP EXISTS.
5. COVERS SHALL BE STEEL AND SHALL BE GAS TIGHT.
6. ALL WASTE SHALL ENTER TRAP THROUGH THE INLET PIPE ONLY.
7. REINFORCEMENT SHALL BE ADEQUATE FOR TRAFFIC CONDITIONS IN AREA WHERE TRAP IS LOCATED.
8. TEES SHALL BE ACCESSIBLE FOR CLEANING THROUGH THE ACCESS COVERS.

TYPICAL GREASE INTERCEPTOR

CITY OF TURLOCK INC. 1906	DRAWN BY: JSH	CITY OF TURLOCK	DRAWING NO. S-8
	CHECK BY: NBB	APPROVED BY: M. Pitcock	COUNCIL APPROVAL DEC, 2015
	SCALE: NONE	CITY ENGINEER – MICHAEL G. PITCOCK – RCE 52694	



PLAN VIEW



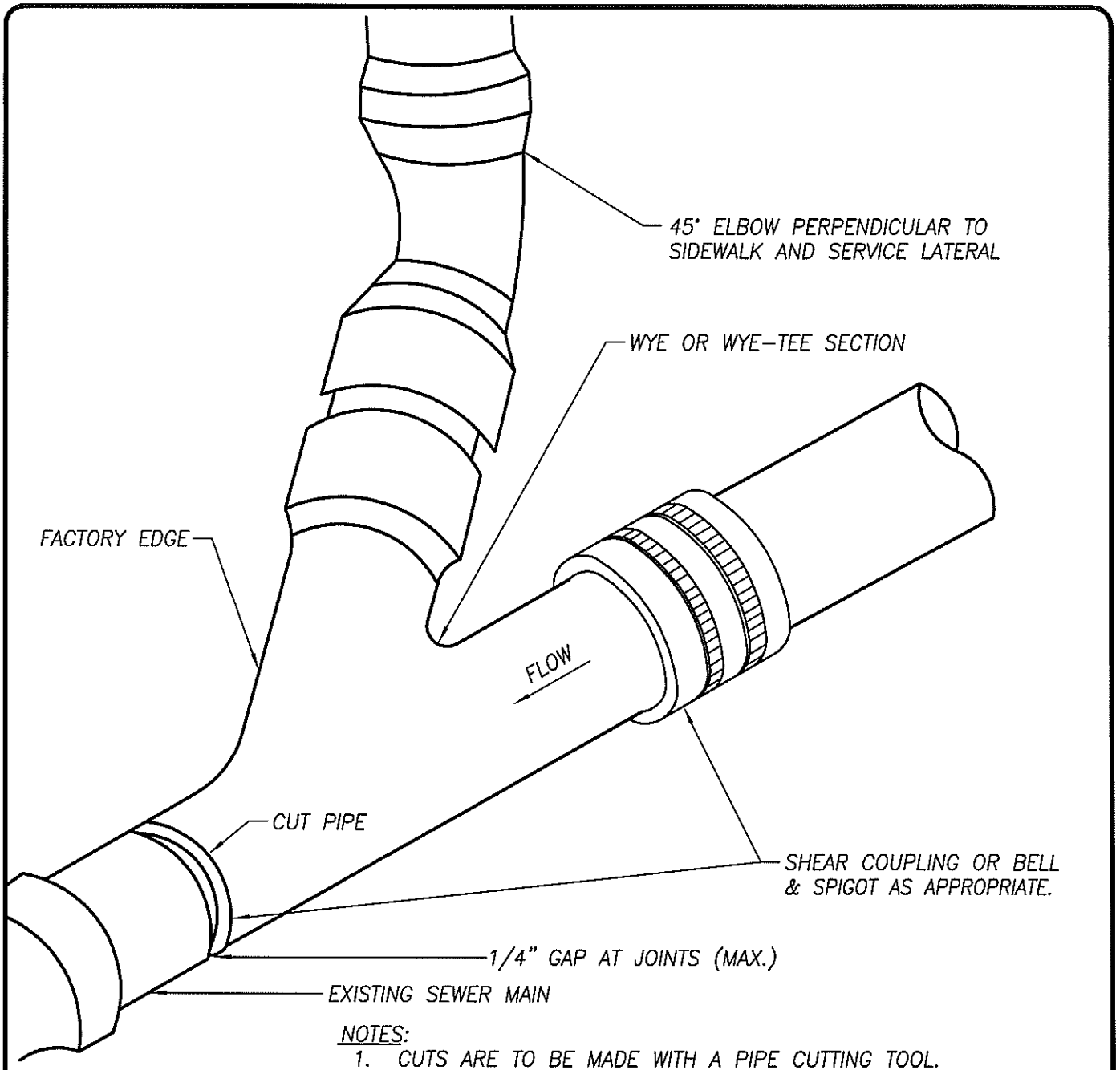
SECTION VIEW

NOTES:

1. DIMENSIONS SHOWN ARE FOR MINIMUM SIZE TRAP (750 GALLON).
2. WHEN A LARGER SIZE IS REQUIRED, THE UNIT SHALL BE DESIGNED BY A REGISTERED CIVIL ENGINEER AND APPROVED BY THE CITY ENGINEER.
3. CONCRETE SHALL BE MINIMUM 3000 PSI AT 28 DAYS.
4. A SAMPLING COMPARTMENT IS REQUIRED, THE CITY ENGINEER MAY WAIVE THE REQUIREMENT IF A HARDSHIP EXISTS.
5. COVERS SHALL BE STEEL AND SHALL BE GAS TIGHT.
6. ALL WASTE SHALL ENTER TRAP THROUGH THE INLET PIPE ONLY.
7. REINFORCEMENT SHALL BE ADEQUATE FOR TRAFFIC CONDITIONS IN AREA WHERE TRAP IS LOCATED.
8. TEES SHALL BE ACCESSIBLE FOR CLEANING THROUGH THE ACCESS COVERS.

TYPICAL SAND AND OIL INTERCEPTOR

CITY OF TURLOCK INC. 1908	DRAWN BY: JSH	CITY OF TURLOCK	DRAWING NO. S-9
	CHECK BY: NBB	APPROVED BY:	COUNCIL APPROVAL DEC, 2015
	SCALE: NONE	CITY ENGINEER – MICHAEL G. PITCOCK – RCE 52694	

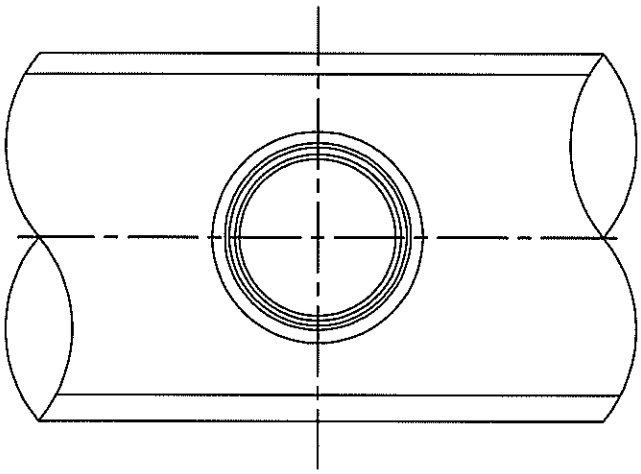


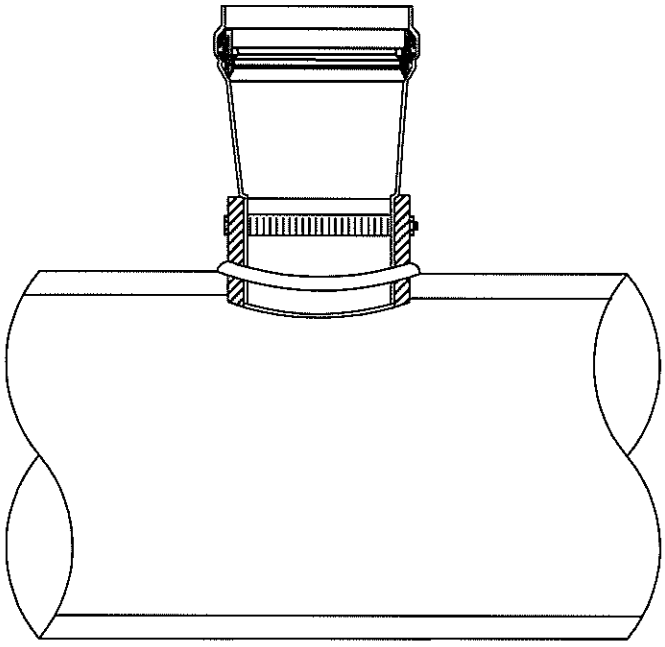
NOTES:

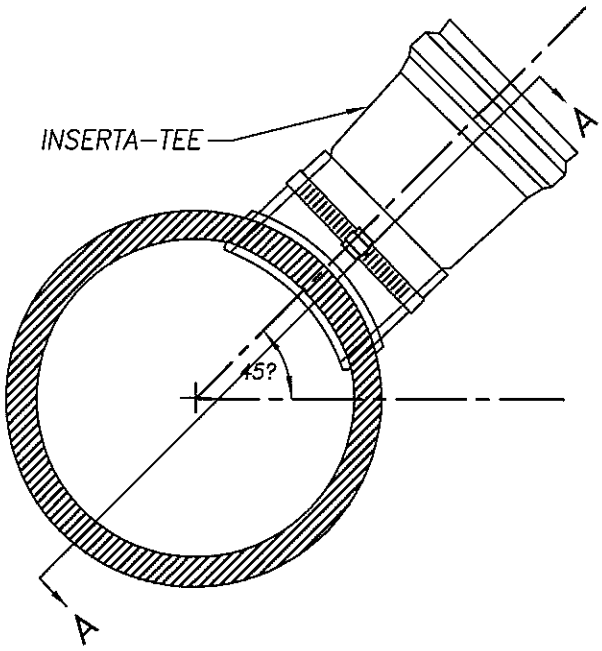
1. CUTS ARE TO BE MADE WITH A PIPE CUTTING TOOL.
2. THERE SHALL BE NO MORE THAN TWO BANDS IN FIVE FOOT LENGTH OF SEWER MAIN.
3. A MANHOLE SHALL BE REQUIRED TO CONNECT A SERVICE LATERAL LARGER THAN 4" INSIDE DIAMETER, UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
4. WYES SHALL BE INSTALLED ON 10" LINES OR SMALLER.

NEW SERVICE WYE IN EXISTING LINE

CITY OF TURLOCK INC. 1918	DRAWN BY: JSH	CITY OF TURLOCK	DRAWING NO. S–10
	CHECK BY: NBB	APPROVED BY:	COUNCIL APPROVAL DEC, 2015
	SCALE: NONE	CITY ENGINEER – MICHAEL G. PITCOCK – RCE 52694	







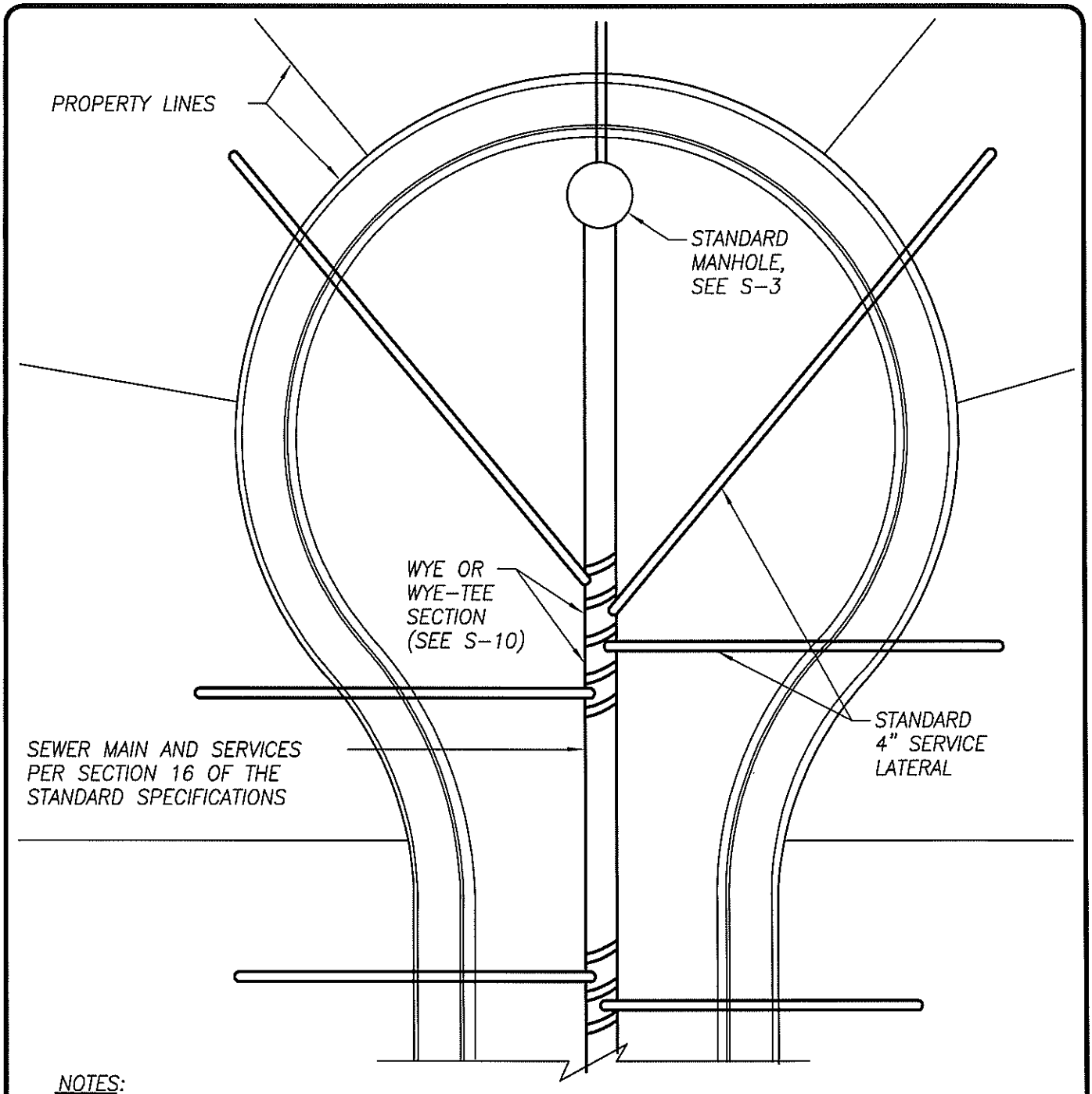
SECTION A–A

NOTES:

1. PROCEDURE FOR CONNECTION OF 4" SERVICE ON 10" AND 12" MAINS ONLY.
2. CONNECTION TO SEWER LINES 15" AND LARGER SHALL BE MADE BY INSTALLING A MANHOLE.
3. TAPPING OF SEWER MAIN SHALL BE ACCOMPLISHED BY CITY CREWS OR OBSERVED BY THE ENGINEERING DIVISION

SERVICE CONNECTION TO EXISTING MAINS

CITY OF TURLOCK INC. 1908	DRAWN BY: JSH	CITY OF TURLOCK	DRAWING NO. S–11
	CHECK BY: NBB	APPROVED BY:	COUNCIL APPROVAL DEC, 2015
	SCALE: NONE	CITY ENGINEER – MICHAEL G. PITCOCK – RCE 52694	

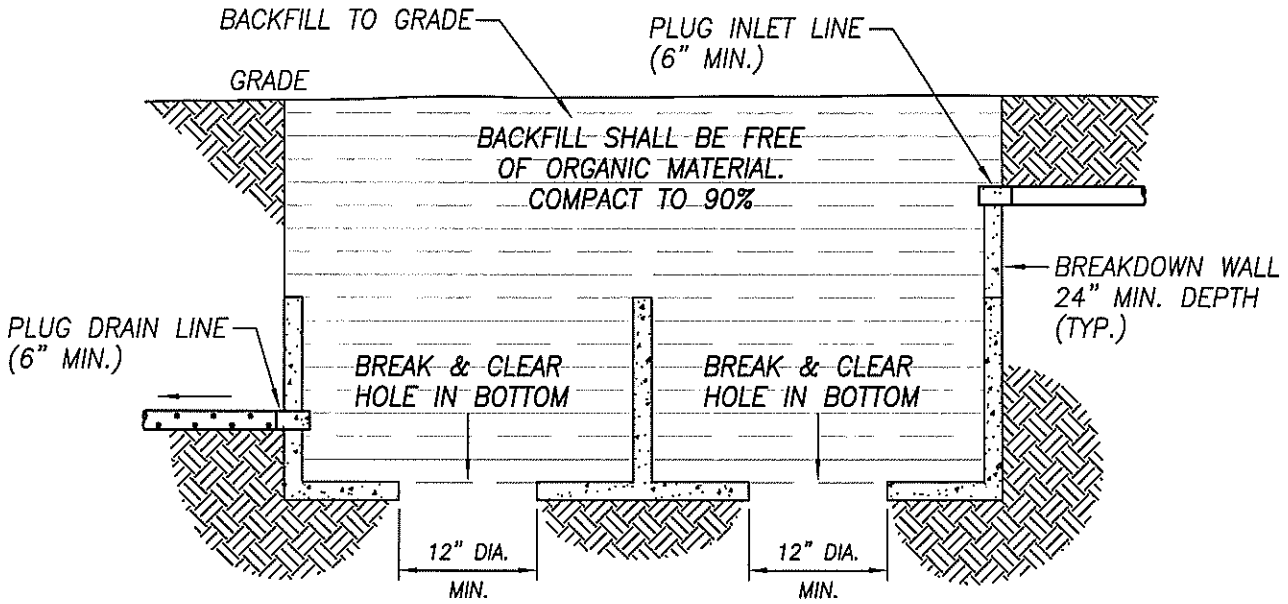


NOTES:

1. SEWER SERVICES SHALL NOT BE PLACED UNDER DRIVEWAY APPROACHES
2. MAXIMUM OF (1) CONNECTION TO MANHOLE UNLESS APPROVED BY THE CITY ENGINEER. SEE SPECIFICATION 16-1.14.
3. A MANHOLE SHALL BE REQUIRED AT THE MAIN AND ON-SITE FOR A SERVICE LARGER THAN 4", UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.

TYPICAL CUL-DE-SAC SEWER SERVICES

CITY OF TURLOCK INC. 1906	DRAWN BY: JSH	CITY OF TURLOCK	DRAWING NO. S-12
	CHECK BY: NBB	APPROVED BY: M. Pitcock	COUNCIL APPROVAL DEC, 2015
	SCALE: NONE	CITY ENGINEER - MICHAEL G. PITCOCK - RCE 52694	

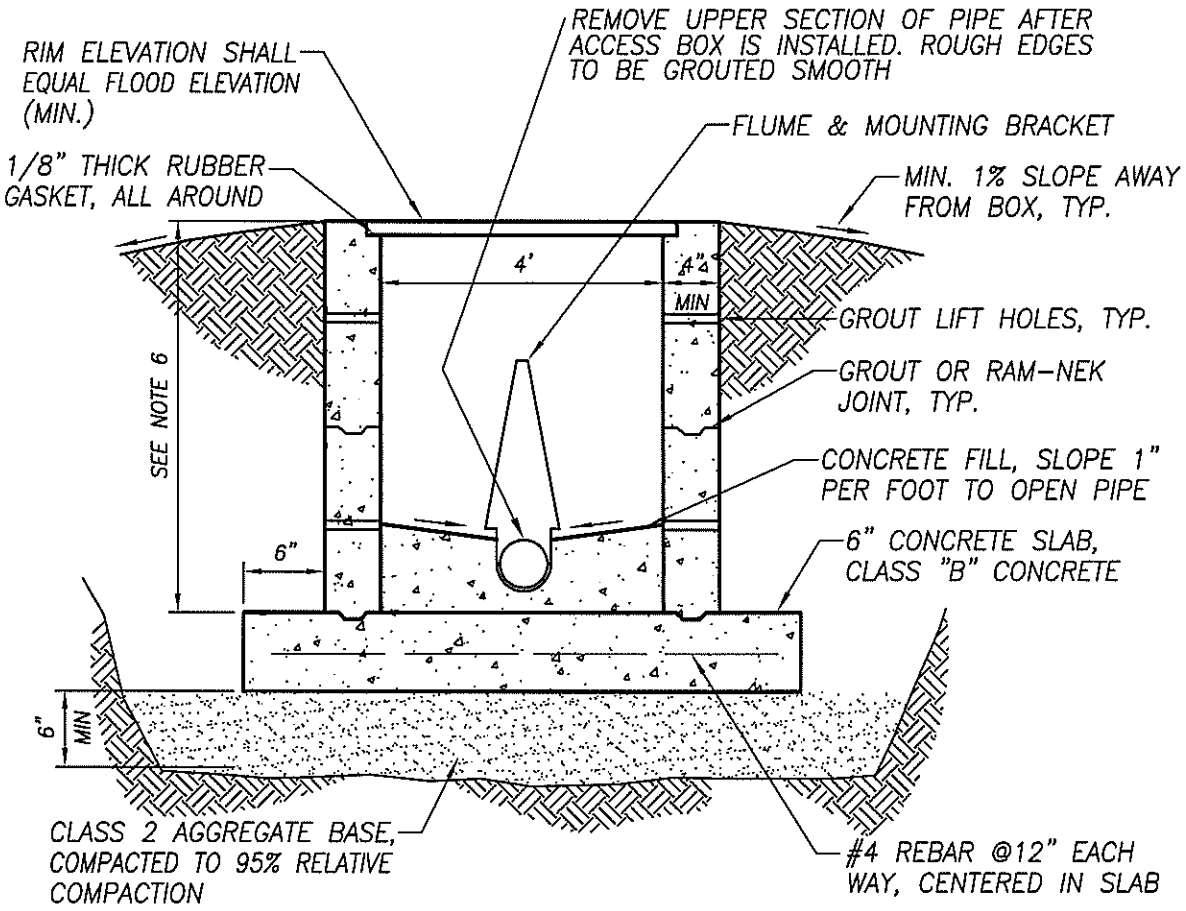


NOTES:

1. A REFUNDABLE DEPOSIT SHALL BE PAID PRIOR TO BEGINNING WORK. THE REFUND, LESS INSPECTION FEES, SHALL BE MADE AFTER THE WORK HAS BEEN INSPECTED AND APPROVED BY MUNICIPAL SERVICES DEPARTMENT.
2. SEPTIC TANK SHALL BE PUMPED OUT, FLOOR BROKEN OUT, WALLS BROKEN DOWN AND ALL PIPES PLUGGED WITH CONCRETE WITHIN 30 DAYS AFTER CONNECTING TO THE CITY SEWER SYSTEM.
3. INSPECTIONS SHALL BE SCHEDULED IN ADVANCE BY CALLING MUNICIPAL SERVICES DEPARTMENT AT (209) 668-5590
4. SEPTIC TANK SHALL NOT BE BACKFILLED UNTIL THE MUNICIPAL SERVICES DEPARTMENT HAS COMPLETED THE INSPECTION.
5. UPON APPROVAL, BACKFILL THE SEPTIC TANK AS SHOWN IN THE ILLUSTRATION.

SEPTIC TANK DESTRUCTION

CITY OF TURLOCK INC. 1918	DRAWN BY: JSH	CITY OF TURLOCK	DRAWING NO. S-13
	CHECK BY: NBB	APPROVED BY:	COUNCIL APPROVAL DEC, 2015
	SCALE: NONE	CITY ENGINEER – MICHAEL G. PITCOCK – RCE 52694	

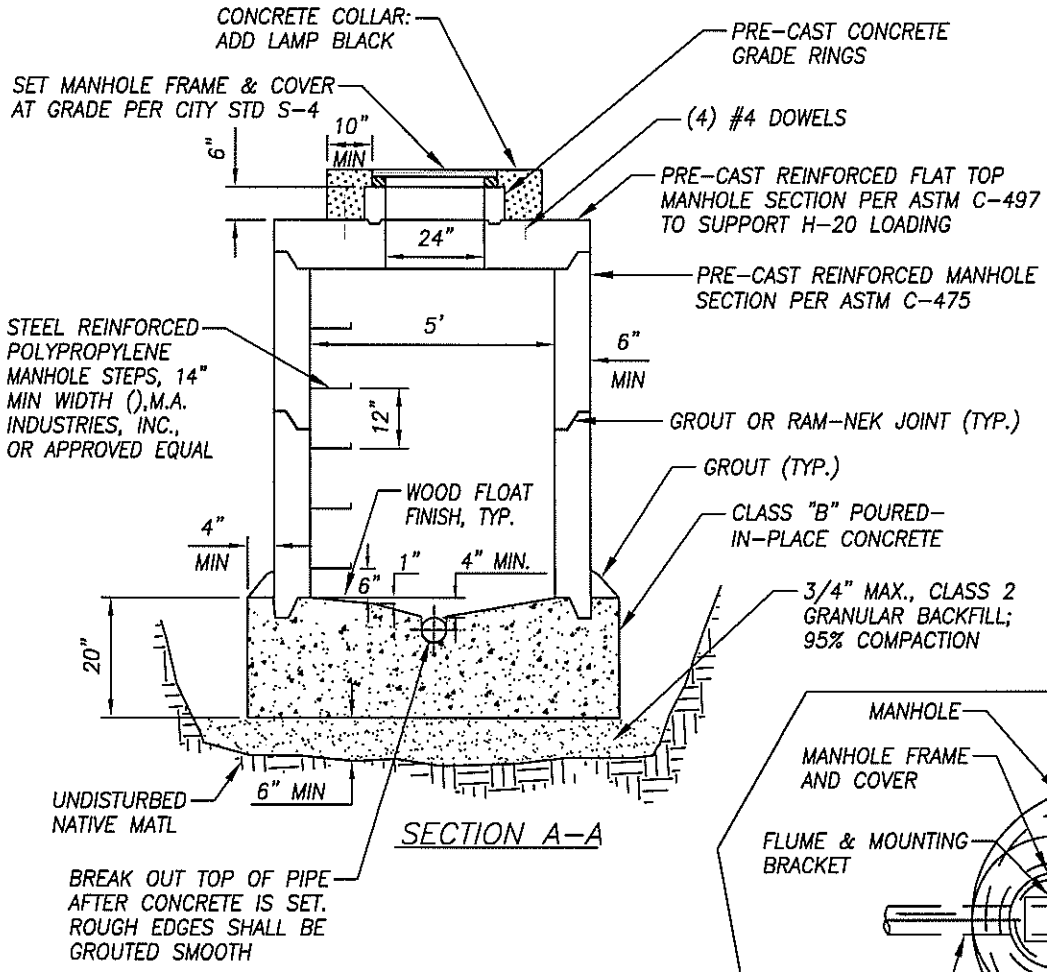


NOTES:

1. ACCESS BOX TYPE MONITORING STATION AND FLUME TO BE USED WITH SHALLOW LATERALS IN NON-TRAFFIC LOADED AREAS.
2. ACCESS BOX SHALL BE 5' X 4' PRE-CAST CONCRETE WITH TWO-PIECE GALVANIZED STEEL LID, PARKWAY TYPE, HINGED, SPRINGLOADED, SCREW DOWN TYPE.
3. BOX AND COVER SHALL BE CHRISTY CONCRETE PRODUCTS, "R" SERIES PRE-CAST PIT, OR EQUAL.
4. FLUME SHALL BE PARSHALL INVERT TYPE OR PERMANENT TYPE WITH TRANSDUCER MOUNTING BRACKET. FLUME SHALL BE PLASTIFAB PARSHALL OR EQUAL. SIZE TO BE DETERMINED BY VOLUME OF FLOW TO BE MEASURED. SET FLUME LEVEL AT DOWN-STREAM END OF PIPE AND GROUT IN PLACE WITH TRANSDUCER BRACKET ATTACHED. USE END BULKHEADS TO MATCH THE SMALLER FLUME WHEN PIPE SIZE IS LARGER THAN THE FLUME.
5. A DETAILED SUBMITTAL INDICATING EXACT EQUIPMENT TO BE FURNISHED MUST BE PROVIDED FOR CITY REVIEW AND APPROVAL.
6. MINIMUM VERTICAL CLEARANCE MUST BE VERIFIED PRIOR TO INSTALLATION OF FLUME AND MONITOR EQUIPMENT.
7. INSTALLATION SHALL BE FREE OF BACKWATER CONDITIONS.

INDUSTRIAL WASTE MONITOR - ACCESS BOX TYPE

CITY OF TURLOCK INC. 1903	DRAWN BY: JSH	CITY OF TURLOCK	DRAWING NO. S-14
	CHECK BY: NBB	APPROVED BY:	COUNCIL APPROVAL DEC, 2015
	SCALE: NONE	CITY ENGINEER - MICHAEL G. PITCOCK - RCE 52694	



NOTES:

1. MANHOLE TYPE MONITORING STATION AND FLUME TO BE USED WITH DEEP LATERALS OR IN TRAFFIC LOADED AREAS.
2. FLUME SHALL BE PARSHALL INVERT TYPE OR PERMANENT TYPE WITH TRANSDUCER MOUNTING BRACKET. FLUME SHALL BE PLASTIFAB PARSHALL OR EQUAL. SIZE TO BE DETERMINED BY VOLUME OF FLOW TO BE MEASURED. SET FLUME LEVEL AT DOWN-STREAM END OF PIPE AND GROUT IN PLACE WITH TRANSDUCER BRACKET ATTACHED. USE END BULKHEADS TO MATCH THE SMALLER FLUME WHEN PIPE SIZE IS LARGER THAN THE FLUME.
3. A DETAILED SUBMITTAL INDICATING EXACT EQUIPMENT TO BE FURNISHED MUST BE PROVIDED FOR CITY REVIEW AND APPROVAL.
4. MINIMUM VERTICAL CLEARANCE MUST BE VERIFIED PRIOR TO INSTALLATION OF FLUME AND MONITOR EQUIPMENT.
5. INSTALLATION SHALL BE FREE OF BACKWATER CONDITIONS.

INDUSTRIAL WASTE MONITOR – MANHOLE TYPE

CITY OF TURLOCK INC. 1918	DRAWN BY: JSH	CITY OF TURLOCK	DRAWING NO. S-15
	CHECK BY: NBB	APPROVED BY:	COUNCIL APPROVAL DEC, 2015
	SCALE: NONE	CITY ENGINEER – MICHAEL G. PITCOCK – RCE 52694	