

SEWER TESTING PROCEDURES

TESTS FOR NON-PRESSURE PIPELINES FOR TRANSPORT OF SEWAGE

The leakage shall be determined by exfiltration, infiltration or low pressure air.

A. Exfiltration Testing

- Exfiltration tests shall be made by filling a section of pipeline with water and measuring the quantity of leakage.
- The head of water at the beginning of the test shall be at least 2 feet above the highest pipe within the section being tested.
 - Should groundwater be present within the section being tested, the head of water for the test shall be 2 feet above the hydraulic gradient of the groundwater.
 - Should the requirement of 2 feet of water above the highest pipe subject any joint at the lower end of the test section to a differential head of greater than 11.5 feet, another method of testing shall be employed.

B. Infiltration Testing

- Infiltration tests will be allowed only when the water table gauges determine the groundwater level to be 2 feet or more above the highest pipe of the section being tested.
- Infiltration test shall be made by measuring the quantity of water leaking into a section of pipeline.
- Measurement of the infiltration shall be by means of a calibrated weir constructed at the outlet of the section being tested.

C. Allowable Leakage for Non-Pressure Pipelines

- The allowable leakage (exfiltration or infiltration) for non-pressure pipelines shall not exceed the following in gallons per 24 hours per inch of diameter per 1000 feet of pipe:

Type of Pipe	Leakage
Ductile iron - mechanical or push-on joints	100
Polyvinyl chloride, thermal plastic or fiberglass with rubber joints	100
Cast iron soil pipe	0

- Regardless of the above allowable leakage, any spurring leaks detected shall be permanently stopped.

D. Low Pressure Air Testing

- Air testing for acceptance shall not be performed until the backfilling has been completed.
- Low pressure air tests shall conform to ASTM C 828 or ASTM F1417-92, Section B.2.2, Time-Pressure Drop Method for a 0.5 psi drop, except as specified herein and shall not be limited to type or size of pipe.
- All sections of pipelines shall be cleaned and flushed prior to testing.
- The air test shall be based on the starting pressure of 3.5 to 4.0 psi gauge. The time allowed for the 0.5 psi drop in pressure, measured in seconds, will be computed based on the size and length of the test section by the Engineer.
 - When groundwater is present, the average test pressure of 3 psig shall be above any back pressure due to the groundwater level.
 - The maximum pressure allowed under any condition in air testing shall be 10 psig. The maximum groundwater level for air testing is 13 feet above the top of the pipe.
- The equipment required for air testing shall be furnished by the Contractor and shall include the necessary compressor, valves, gauges and pipes to allow for the monitoring of the pressure, release of pressure and a separable test gauge.
 - The test gauge shall be sized to allow for the measuring of the 0.5 psi loss allowed during the test period and shall be on a separate line to the test section.

E. Deflection Testing

- Deflection testing shall be performed 30 days after backfilling. The test shall be made by passing a ball or cylinder no less than 80% of the pipe diameter through the pipe. The test shall be performed without mechanical pulling devices.

F. Manhole Testing

- General
 - Each manhole shall be tested by either exfiltration, infiltration or vacuum testing.
 - A manhole will be acceptable if the leakage does not exceed an allowance of one gallon per vertical foot of depth for 24 hours. Regardless of the allowable leakage, any leaks detected shall be permanently stopped.
 - Infiltration tests shall be performed after backfilling when the groundwater level is above the joint of the top section of a precast manhole.
 - Vacuum testing shall be performed after backfilling in accordance with the latest revision of ASTM C1248-02 as follows:
 - The test head shall be placed at the top of the manhole in accordance with the manufacturer's recommendations.
 - A vacuum of 10 in. of mercury shall be drawn on the manhole, the valve on the vacuum line of the test head closed, and the vacuum pump shut off. The time shall be measured for the vacuum to drop to 9 in. of mercury.
 - The manhole shall pass if the time for the vacuum reading to drop from 10 in. of mercury to 9 in. of mercury meets or exceeds the values indicated below:

Minimum Test Times for Various Manhole Diameters in Seconds:

Depth (ft)	Diameter (Inches)	48	60
8 or less		20	26
10		25	33
12		30	39
14		35	46
16		40	52
18		45	59
20		50	65

- If the manhole fails the initial test, necessary repairs shall be made by an approved method. The manhole shall then be retested until a satisfactory test is obtained.

SEWER MAIN NOTES

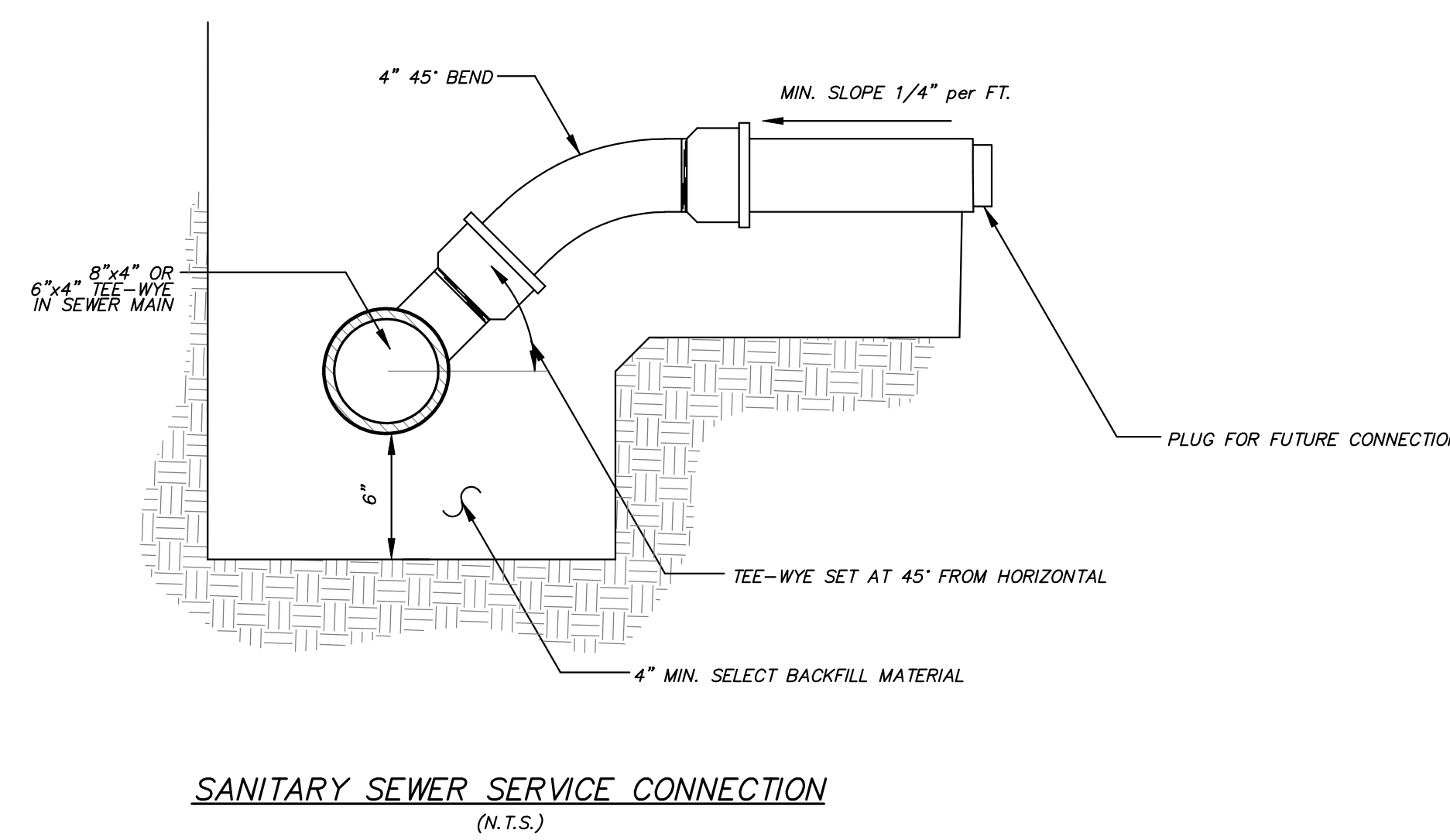
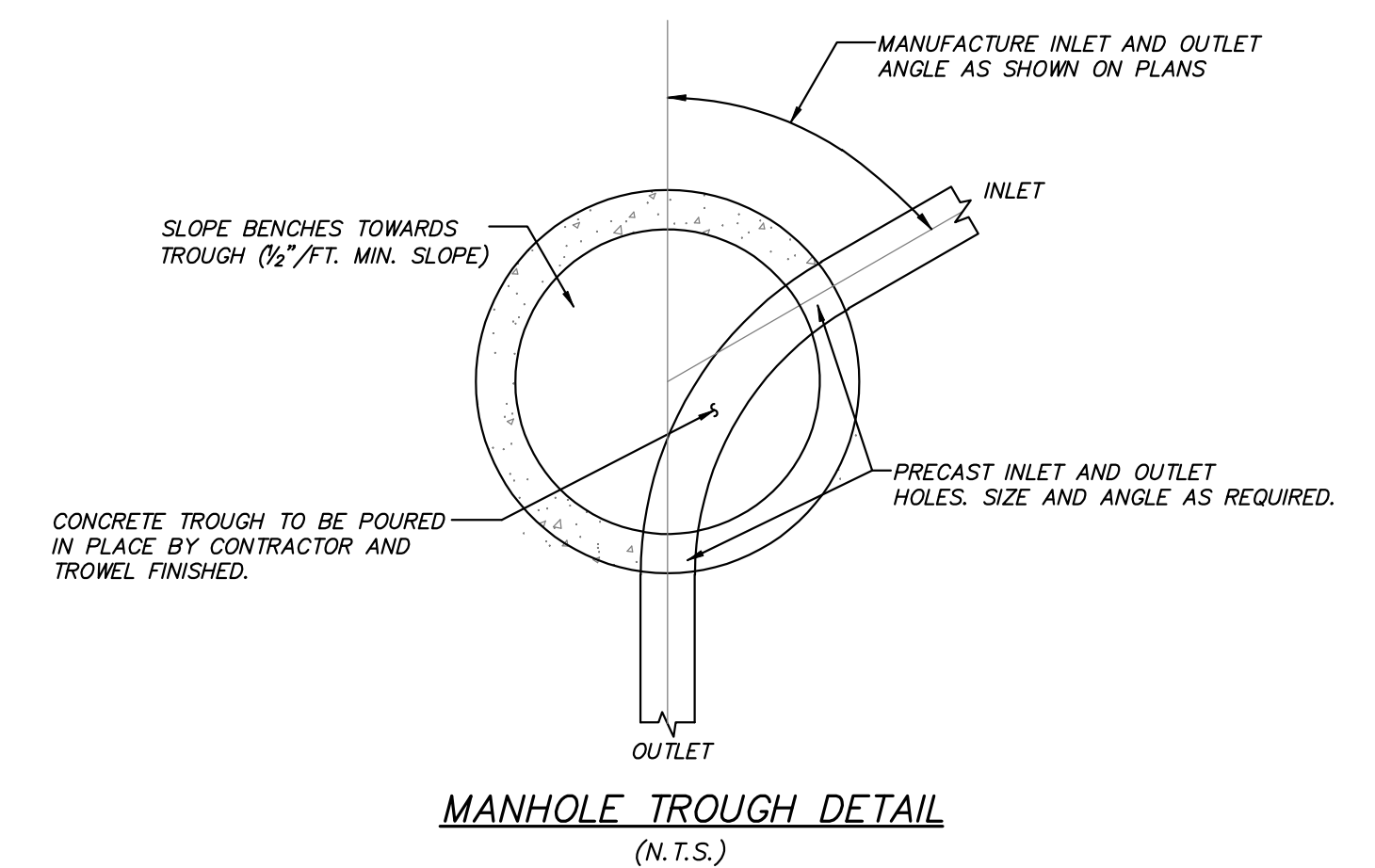
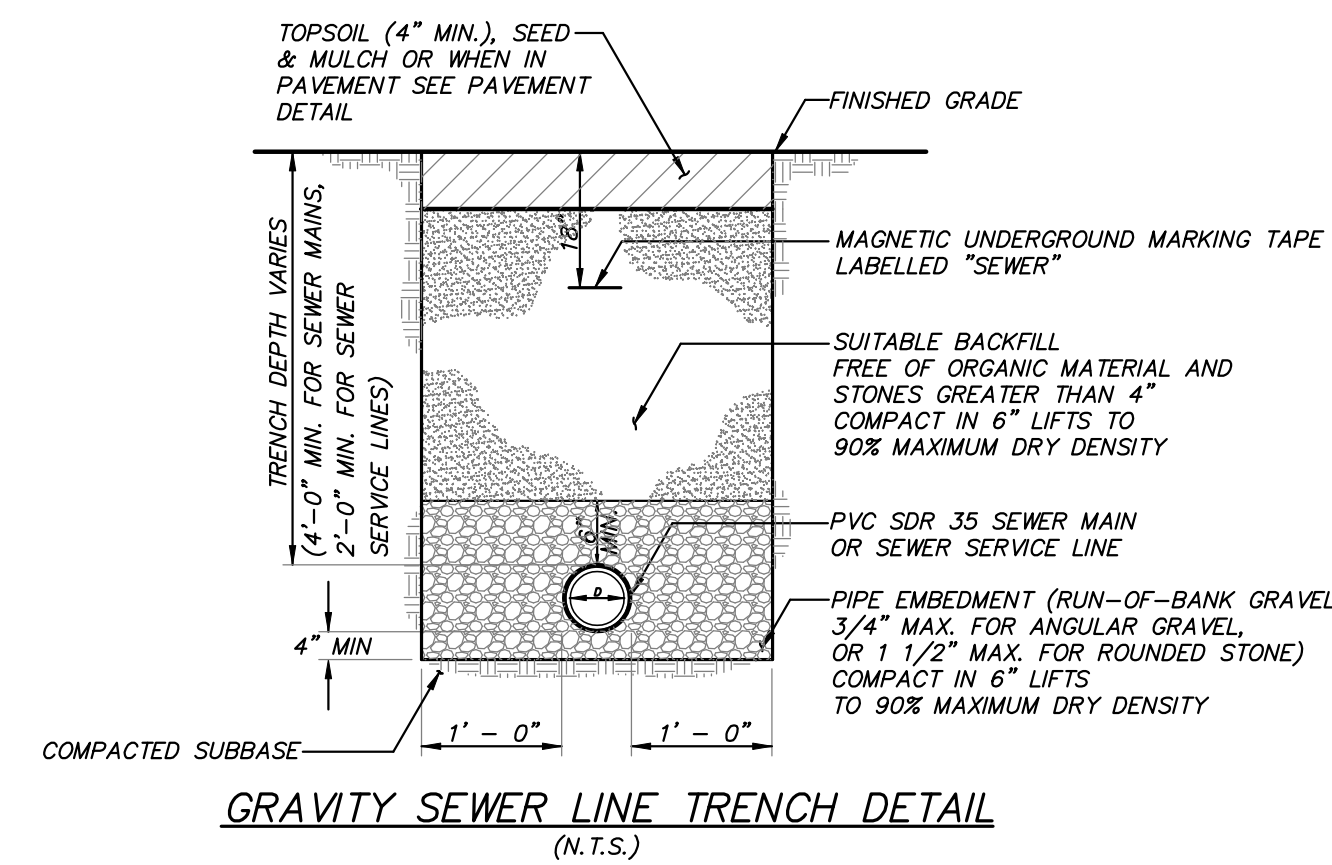
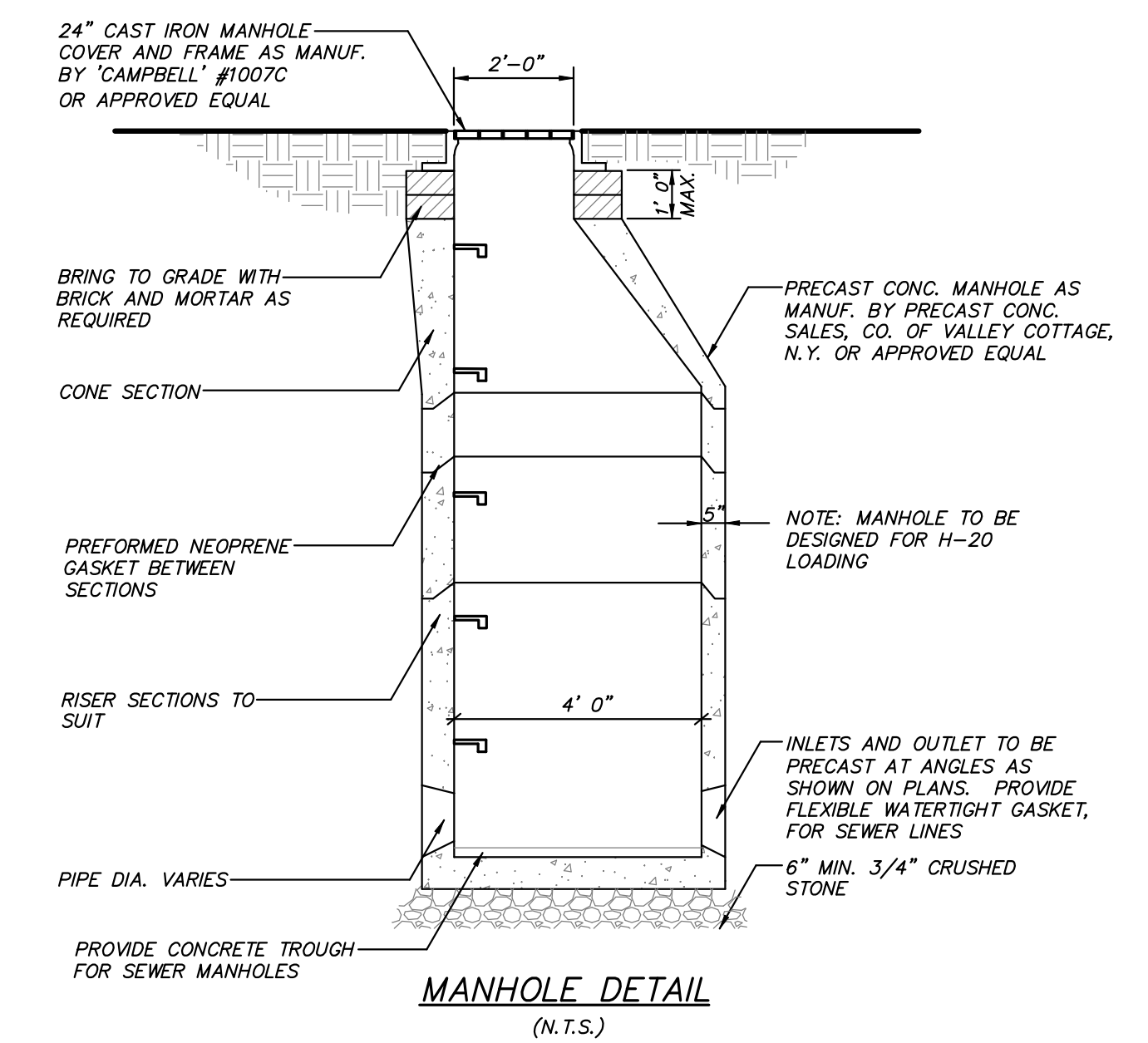
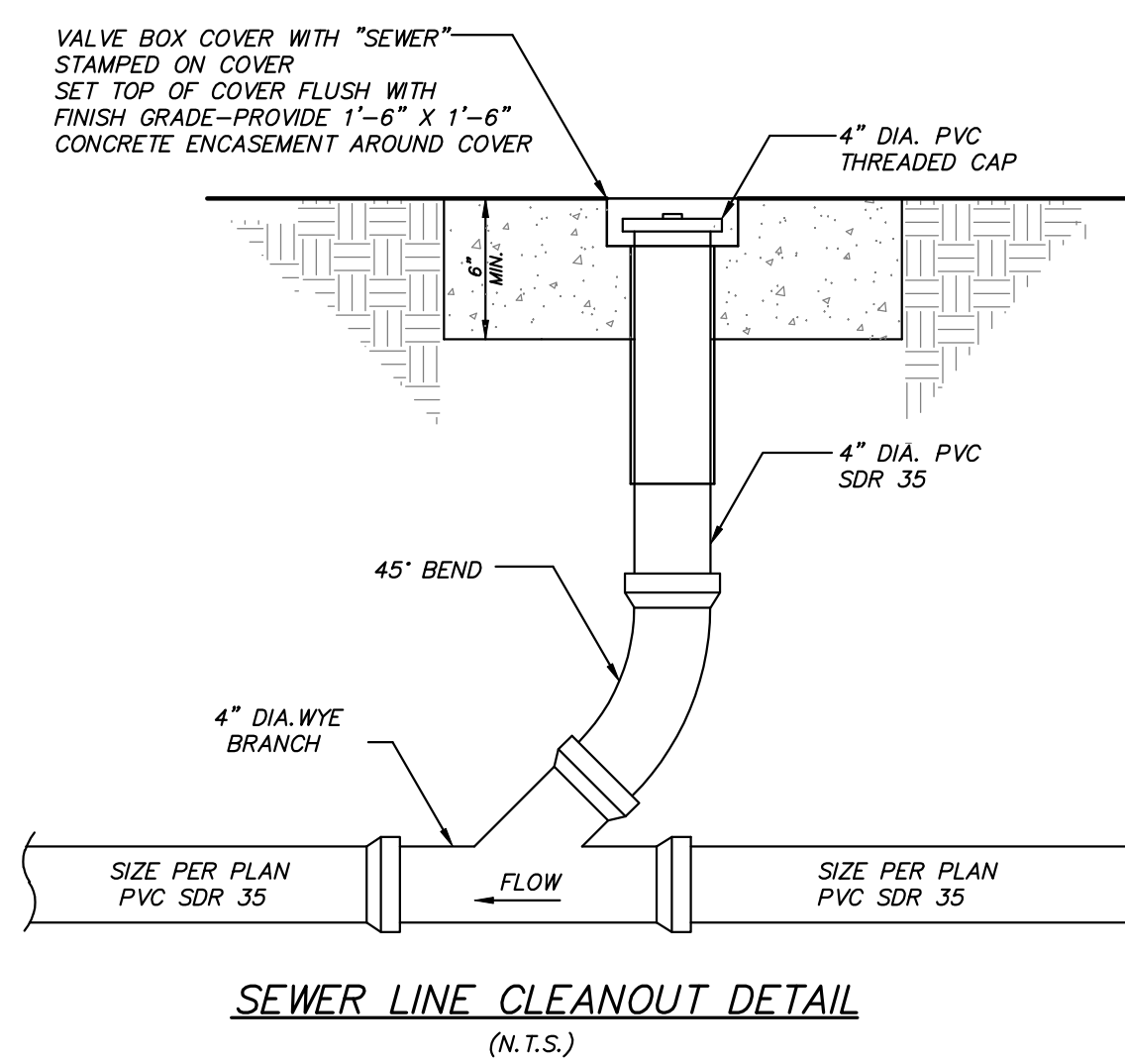
- All sewer mains & sewer services shown on these plans shall be polyvinyl chloride (PVC) SDR 35.
- Sewers shall be laid at least 10 feet horizontally from any existing or proposed water main. The distance shall be measured edge to edge in cases where it is not practical to maintain a 10 foot separation, the Design Engineer and Putnam County Department of Health may allow deviation with prior approval on a case-by-case basis, if supported by data from the Design Engineer.
- Sewers crossing water mains shall be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the either above or below the sewer. The crossing shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer to maintain line and grade. The vertical separation also applies to water service connections.
- Sanitary sewer service lines shall be tested in conjunction with the sewer mains to the property line or easement line and in accordance with the latest Putnam County Department of Health Rules & Regulations.
- Testing of the manholes with the pipeline shall not be permitted. Manholes & sanitary sewer lines shall be tested independently of each other.
- The owner/applicant shall be responsible for acquiring supervision of the construction of the sanitary sewer main system by a person or firm qualified to practice professional engineering in the state of New York.
- The owner/applicant shall be responsible for providing Three (3) copies of as-built drawings signed and sealed by a licensed and registered New York State Professional Engineer to the Putnam County Department of Health at the completion of the construction.
- The Design Engineer, Putnam County Department of Health, and Town Engineering Department shall be notified forty eight (48) hours before construction is started.
- The sanitary sewer mains shall not be placed into service until a certificate of construction compliance has been submitted to and accepted by the Putnam County Department of Health.
- The Putnam County Department of Health and the New York City Department of Environmental Protection must be notified forty eight (48) hours prior to pressure testing the sewer main improvements.
- Manhole frames & covers to be Campbell pattern #10070 for 24" opening or approved equal. M.H. covers to be marked "SEWER" and to have six 3/4" hole vents. (Use solid covers where necessary.)
- The exterior of all manholes shall be covered with an approved asphalt waterproofing.
- Concrete base slabs shall be air entrained concrete with a minimum design strength of 3,000 psi.
- The contractor shall submit shop drawings of the precast manholes to the Design Engineer for review and acceptance.
- Precast manholes shall have minimum reinforcement of 0.12 sq. in. per lin. ft. for 48" barrels & be designed in accordance with A.S.T.M. C-478 and withstand an H-20 design loading.
- Precast base sections to have the required number of gaskets and openings as shown and specified.
- Precast manhole sections shall employ a watertight gasket arrangement between each section approved by the Design Engineer.
- Openings for pipes shall be precast or machine cored. Gaskets or collars for pipe connections to manholes shall be resilient and watertight and compatible with the type of pipe being used.
- The length of pipes entering or leaving any manhole shall be greater than 2'-0".
- Precast manholes under 6'-0" deep shall have a "Flat Top" slab roof.
- Gaskets or collars for pipe connections to manhole shall provide a minimum of 0.1" drop across the manhole.

SEWER FORCEMAIN TESTING PROCEDURES

TESTS ON PRESSURE PIPING FOR TRANSPORT OF SEWAGE

A. Hydrostatic Pressure and Leakage Test

- Test pressure shall be as scheduled or, where no pressure is scheduled, shall be 100 psi.
- Test pressure shall be held on the piping for a period of at least 30 minutes, unless a longer period is requested by the Engineer.
 - At the completion of the test, the pressure shall be released at the furthestmost point from the point of application.
- All exposed piping shall be examined during the test and all leaks, defective material or joints shall be repaired or replaced before repeating the tests.
- The allowable leakage for forcemain pressure pipelines shall not exceed 0.5 gallons per 1,000 LF of pipe for any 30-minute period.
- Regardless of the above allowables, any viable leaks shall be permanently stopped.
- The test medium shall be water.



NO.	DATE	REVISION	BY
PROJECT: UNION PLACE ROUTE 6 & BALDWIN PLACE ROAD, TOWN OF CARMEL, PUTNAM COUNTY, NEW YORK			
DRAWING: SITE DETAILS			
PROJECT NO.	02119.100	PROJECT MANAGER	J.J.C.
DATE	06-18-10	DRAWN BY	K.M.W.
SCALE	AS SHOWN	CHECKED BY	R.D.W.
DRAWING NO.	D-4		SHEET 31
			32