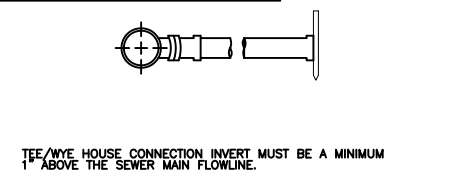


**RISER DETAIL**



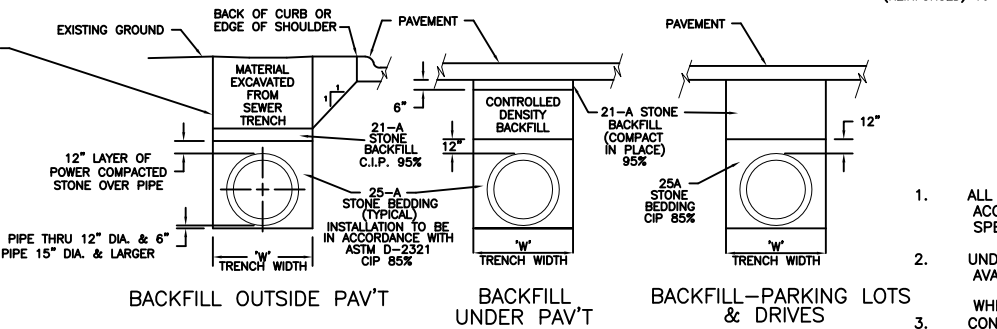
**TEE OR WYE HOUSE CONNECTION**

**SANITARY SEWER NOTES:**

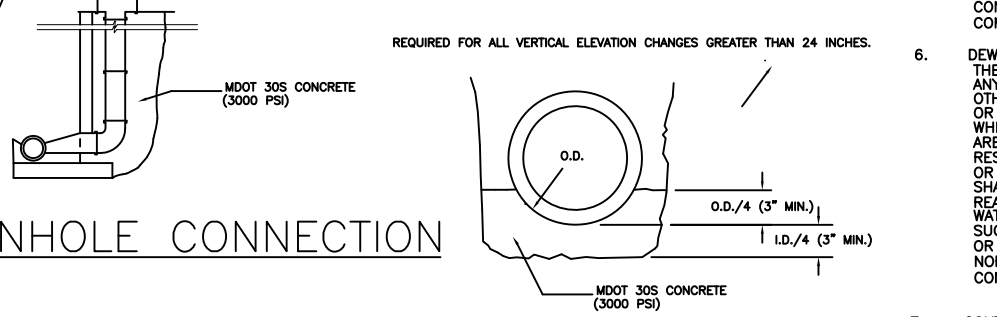
- NO CONNECTION RECEIVING STORM WATER, SURFACE WATER, OR GROUND WATER SHALL BE MADE TO SANITARY SEWERS.
- TESTING OF SANITARY SEWERS AND EXISTING STUBS BY INFILTRATION/EXFILTRATION OR AIR TESTING AND TELEVISION INSPECTION IS REQUIRED.  
IF ANY SECTION OF THE SEWER FAILS TO MEET THESE REQUIREMENTS THE CONTRACTOR SHALL PERFORM A TELEVISION INSPECTION OF THE FAULTY SECTION AND REPAIR OR REPLACE AT HIS OWN EXPENSE ALL DEFECTIVE MATERIALS OR WORKMANSHIP. THE TEST PROCEDURE SHALL BE REPEATED UNTIL THE RESULTS ARE ACCEPTABLE.
- ROCK EXCAVATION: WHERE ROCK IS ENCOUNTERED THE EXCAVATION SHALL BE TO A DEPTH WHICH WILL ALLOW THE PLACING OF THE 6" STONE CUSHION. ROCK SHALL BE REMOVED TO A CLEAR DISTANCE OF 8" AROUND THE PERIMETER OF THE STRUCTURE.
- BEDDING AND BACKFILLS: ALL SANITARY SEWERS SHALL BE PLACED IN CRUSHED STONE, MDOT 25A, FLEXIBLE PIPE (I.E. PVC) BEDDING, INITIAL BACKFILL, AND INSTALLATIONS SHALL MEET ASTM D 2321. RIGID PIPE (I.E. RCP) BEDDING, INITIAL BACKFILL, AND INSTALLATIONS SHALL MEET ASTM C 12.  
ALL STRUCTURE BASES WHETHER OF PRECAST TYPE OR POURED IN PLACE TYPE SHALL BE PLACED ON A 6" COMPACTED STONE BEDDING. BACKFILL AROUND STRUCTURES WHICH ARE OR WILL BE UNDER A DRIVE, ALLEY, PARKING AREA OR SIDEWALK SHALL BE WITH CRUSHED STONE COMPACTED TO 95% MAXIMUM DENSITY. CONTROL DENSITY BACKFILL SHALL BE USED AT ALL LOCATIONS UNDER EXISTING OR PROPOSED STREETS. THE RECOMMENDED STANDARDS FOR WASTEWATER FACILITIES, SECTIONS 33.5, 33.82, 33.83, 33.84 MAY BE USED FOR REFERENCE FOR PIPE ALIGNMENT, BEDDING CRADLE, BASE, TRENCHING AND BACKFILLING.
- ALL TRENCHES UNDER EXISTING AND PROPOSED DRIVES, PARKING LOTS, CURBS AND WALKS SHALL BE BACKFILLED WITH APPROVED CRUSHED STONE 21A MATERIAL AND COMPACTED TO 95% MAXIMUM UNIT DENSITY.
- ALL TRENCHES WITHIN THE PAVED ROADBED INFLUENCE AREA (PAVEMENT WIDTH PLUS 5 FEET OFF EACH EDGE OF PAVEMENT) SHALL BE BACKFILLED WITH CONTROLLED DENSITY BACKFILL WITH A MINIMUM COMPRESSIVE STRENGTH OF 50 P.S.I. IN 28 DAYS AND A MAXIMUM COMPRESSIVE STRENGTH OF 100 P.S.I. IN 28 DAYS FROM TOP OF PIPE BEDDING TO SUBGRADE LINE.
- INFILTRATION TESTING REQUIREMENTS FOR PIPE PER SECTIONS 14 AND 15 OF DIVISION F OF THE CONTRACT SPECIFICATIONS ARE:  
P.V.C. AND ABS TRUSS PIPE-50 GALLONS PER INCH DIAMETER PER MILE PER DAY.  
ALL OTHER PIPE MATERIAL AND MANHOLES - 100 GALLONS PER INCH DIAMETER PER MILE PER DAY.  
ALTERNATE: MANHOLE VACUUM TESTING - 5 IN HG FOR 1 MINUTE WITH NO LOSS

**TRENCH WIDTH TABLE**

I.D. PIPE(INCHES)	18" & LESS	21"	24"	27"	30"	33"	36"	42"	48"	54"	60"	66"	72"	78"	84"	90"	96"	102"	108"
"W" TRENCH WIDTH(FEET)	3.0'	3.5'	4.0'	4.5'	5.0'	5.5'	6.0'	7.0'	8.0'	9.0'	10.0'	10.5'	11.0'	11.5'	12.0'	12.5'	13.0'	13.5'	14.0'



**STANDARD BEDDING AND BACKFILL PAY LIMITS**



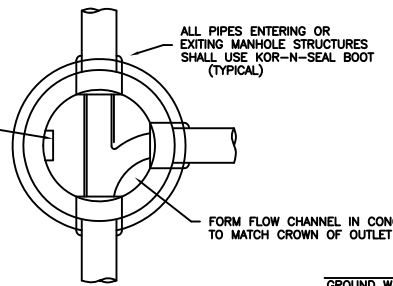
**CONCRETE CRADLE BEDDING**

**SANITARY SEWER MATERIAL:**

- REINFORCED CONCRETE PIPE: REINFORCED CONCRETE SEWER PIPE SHALL MEET THE REQUIREMENTS OF A.S.T.M. C-76. UNLESS OTHERWISE SPECIFIED, ALL CONCRETE PIPE, ADJUSTING RINGS & MANHOLE CASTING JOINTS SHALL HAVE A RUBBER "O-RING" GASKET CONFORMING TO THE REQUIREMENTS OF A.S.T.M. C-443.
- VITRIFIED CLAY PIPE: VITRIFIED CLAY SEWER PIPE SHALL CONFORM TO THE STANDARDS OF A.S.T.M. C-700 EXTRA STRENGTH PIPE. COMPRESSIVE JOINTS FOR VITRIFIED CLAY PIPE AND FITTINGS SHALL CONFORM TO A.S.T.M. C-425.
- POLYVINYL CHLORIDE (P.V.C.): ALL P.V.C. GRAVITY SEWER PIPE SHALL CONFORM TO THE REQUIREMENTS OF A.S.T.M. D-3034, TYPE PSM, SDR MAX 35, P.V.C. SEWER PIPE AND FITTINGS.  
ALL P.V.C. PIPE SHALL PROVIDE AN ELASTOMERIC GASKET JOINT TO PREVENT EXFILTRATION OR INFILTRATION AND SHALL CONFORM TO THE REQUIREMENTS OF A.S.T.M. D-3212.
- PIPE MATERIALS NOT ALLOWED ARE:  
ASBESTOS - CEMENT  
CAST IRON
- MANHOLES AND GRADE ADJUSTING RINGS: UNLESS OTHERWISE SPECIFIED ON THE PLANS, ALL MANHOLES AND GRADE ADJUSTMENT RINGS SHALL BE CONSTRUCTED OF PRECAST REINFORCED CONCRETE MANHOLE SECTIONS CONFORMING TO THE REQUIREMENTS OF A.S.T.M. C-478 AND C-443. MANHOLES SHALL HAVE BOTTOM CAST INTEGRAL WITH FIRST SECTION.
- STANDARD MANHOLE COVERS SHALL HAVE EITHER:  
A. EAST JORDAN NO. 1040WT SOLID COVER WT. 400 LBS. OR:  
B. NEENAH NO. R-1916-F SOLID COVER WT. 400 LBS. CASTINGS TO BE FURNISHED AND INSTALLED WITH ANCHOR BOLTS ON ALL FRAMES.
- STEPS: MATERIAL SHALL BE ALUMINUM OR POLYPROPYLENE (REINFORCED).

NOTE: THE SPECIFICATIONS PROVIDED ON THIS SHEET ARE NOT INTENDED TO BE ALL INCLUSIVE, BUT ARE PROVIDED AS GENERAL REQUIREMENTS. FOR DETAILED SPECIFICATIONS CONTACT THE CITY OF MONROE ENGINEERING DEPARTMENT.

SPECIFICATIONS REVISION DATE: 5-16-2007



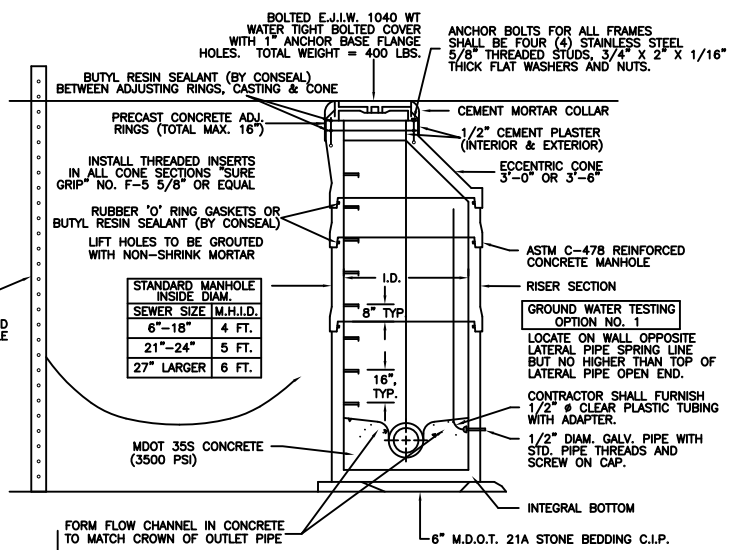
**SPECIAL NOTES:**

- ALL CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF MONROE.
- UNDERGROUND UTILITY LINES AND STRUCTURES SHOWN ARE PER RECORDS MADE AVAILABLE BY THE UTILITY OR MUNICIPALITY, AND BY FIELD OBSERVATION WHERE POSSIBLE.
- CONTRACTOR SHALL CALL MISS DIG AT (800)482-7171, 72 HOURS PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE DONE TO ANY EXISTING UTILITY DURING CONSTRUCTION.
- ALL WORKMANSHIP, MATERIALS AND TESTING PROCEDURES SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF MONROE FOR SANITARY SEWERS.
- ALL PROVISIONS, THE "SOIL EROSION SEDIMENTATION CONTROL ACT" AND ALL APPLICABLE RULES ON SOIL EROSION AND SEDIMENTATION CONTROL AS ESTABLISHED BY THE MONROE COUNTY DRAIN COMMISSION SHALL APPLY TO THIS PROJECT.
- DEWATERING (PUMPING AND BAILING): THE CONTRACTOR SHALL REMOVE BY PUMPING, BAILING, OR OTHERWISE ANY WATER WHICH MAY ACCUMULATE OR BE FOUND IN THE TRENCH AND OTHER EXCAVATIONS; AND SHALL FORM ALL DAMS, FLUMES OR OTHER WORKS NECESSARY TO KEEP THEM ENTIRELY FREE FROM WATER WHILE THE SEWERS, THEIR APPURTENANCES AND THEIR FOUNDATIONS, IF ANY, ARE BEING CONSTRUCTED. NEWLY LAID MASONARY SHALL BE PROTECTED FROM INJURY, RESULTING FROM THE UNWATERING WORK, BY PLANK BY THE USE OF CANVAS, TAR PAPER, OR BY OTHER SUITABLE METHODS AS MAY BE APPROVED. THE CONTRACTOR SHALL AT ALL TIMES HAVE UPON THE WORKS SUFFICIENT PUMPING MACHINERY READY FOR IMMEDIATE USE.  
WATER FROM THE TRENCHES AND EXCAVATIONS SHALL BE DISPOSED OF IN SUCH A MANNER AS WILL NOT CAUSE INJURY TO THE PUBLIC HEALTH, NOR TO PUBLIC OR PRIVATE PROPERTY, NOR TO THE WORK COMPLETED OR IN PROGRESS, NOR TO THE SURFACE OF THE STREET, NOR CAUSE A VIOLATION OF THE SOIL EROSION CONTROL ACT AS ADMINISTERED BY THE MONROE COUNTY DRAIN COMMISSION.

- CONTRACTOR SHALL NOTIFY THE CITY OF MONROE ENGINEERING DEPARTMENT 48 HOURS PRIOR TO THE START OF CONSTRUCTION: PHONE: (734)384-9126.
- THE CITY OF MONROE ENGINEER SHALL BE NOTIFIED FORTY-EIGHT (48) HOURS IN ADVANCE OF ALL SEWER INFILTRATION/EXFILTRATION AND AIR TESTS SO HIS REPRESENTATIVE MAY BE PRESENT. NO SEWER WILL BE ACCEPTED FOR USE UNTIL THE CITY OF MONROE HAS APPROVED IT FOR SPECIFIC INFILTRATION REQUIREMENTS.
- AS A REQUIREMENT FOR FINAL ACCEPTANCE OF SANITARY SEWER INSTALLATIONS AFTER REQUIRED INFILTRATION, EXFILTRATION, AIR TESTING AND DEFLECTION TESTING HAVE BEEN APPROVED, THE CONTRACTOR SHALL HAVE AN INDEPENDENT AGENCY PREPARE AND SUBMIT TO THE CITY ENGINEER A TELEVISION VIDEO ON VHS FORMAT AND HANDWRITTEN LOG OF EVERY MAIN LINE SEWER INSTALLED.
- ALL FLEXIBLE SANITARY SEWER PIPE SHALL BE SUBJECT TO DEFLECTION TESTING THIRTY (30) DAYS AFTER INSTALLATION. THE DEFLECTION SHALL NOT EXCEED 5%. THE MEASUREMENT SHALL BE IN COMPLIANCE WITH ASTM D-2122.
- LOW-PRESSURE AIR TESTING OF A.B.S. AND P.V.C. SANITARY SEWERS SHALL BE IN ACCORDANCE WITH A.S.T.M. F-1417. THE TIME REQUIREMENTS FOR 0.5 P.S.I.G. PRESSURE DROP SHALL APPLY AS SHOWN BELOW. AIR TESTING OF P.V.C. PIPE SHALL NOT BE PERMITTED IF THE PIPE SECTION OR THE TEST AIR PRESSURE REQUIRED IS GREATER THAN 9 P.S.I.G.
- LOW-PRESSURE AIR TESTING OF CONCRETE, CLAY, & ALL OTHER SANITARY SEWER PIPE MATERIALS SHALL BE IN ACCORDANCE WITH THE TIME REQUIREMENTS FOR 1.0 P.S.I.G. PRESSURE DROP & IN ACCORDANCE WITH THE TABLES SHOWN BELOW. AIR TESTING OF THESE PIPE MATERIALS SHALL NOT BE PERMITTED IF THE AIR PRESSURE REQUIRED FOR THE TEST IS GREATER THAN 9 P.S.I.G.

A.B.S. & P.V.C. PIPE ASTM F 1417) (0.5 PSIG Drop Allowable)  
Minimum Specified Time Required for a 0.5 psig Pressure Drop for Size and Length of Pipe Indicated

Nominal Pipe Size, in.	Minimum Time, mins.	Length for Minimum Time, ft.	Time for Longer Length, s
4	1:53	597	0.190 L
6	2:50	398	0.427 L
8	3:47	298	0.760 L
10	4:43	239	1.187 L
12	5:40	199	1.709 L
15	7:05	159	2.671 L
18	8:30	133	3.846 L
21	9:55	114	5.235 L
24	11:20	99	6.837 L
27	12:45	88	8.653 L
30	14:10	80	10.683 L
33	15:35	72	12.926 L
36	17:00	66	15.384 L



**STANDARD MANHOLE**

**CONCRETE PIPE ONLY (ASTM C 924)**  
(1 psig Drop Allowable) Minimum Test Time for Various Pipe Sizes

Nominal Pipe Size, in.	T (time), min/100 ft	Nominal Pipe Size, in.	T (time) Min/100 ft
4	0.3	15	2.1
6	0.7	18	2.4
8	1.2	21	3.0
10	1.5	24	3.6
12	1.8		

**CLAY PIPE ONLY (ASTM C 828)**  
(1 psig Drop Allowable) Minimum Test Time for Various Pipe Sizes

Nominal Pipe Size, in.	T (time), min/100 ft	Nominal Pipe Size, in.	T (time) Min/100 ft
3	0.2	21	3.0
4	0.3	24	3.6
6	0.7	27	4.2
8	1.2	30	4.8
10	1.5	33	5.4
12	1.8	36	6.0
15	2.1	39	6.6
18	2.4	42	7.3

**ALL OTHER PIPE**  
(1 psig Drop Allowable)  
(Except Clay, Concrete, A.B.S. & P.V.C. Pipe)

PIPE SIZE (INCH)	TIME
4	2 1/2 Minutes
6	4 Minutes
8	5 Minutes
10	6-1/2 Minutes
12	7-1/2 Minutes
15	9-1/2 Minutes

REVISIONS

NO.	DRAWN BY:	DATE:
7	W.E.W.	4-19-01
8	J.R.	4-23-02
9	B.S.L.	11-3-03
10	B.S.L.	6-2-04
11	P.M.L.	5-5-05
12	J.R.	5-17-07
13	B.S.L.	2-14-08
14	B.S.L.	1-19-12

CITY OF MONROE, MICHIGAN  
ENGINEERING DEPARTMENT  
SANITARY SEWER  
DETAILS

SCALE: NONE FILE NO. F-997B  
DATE: JANUARY, 1996 SHEET NO. 1 OF 1

DWG. OF RECORD  
DATE: \_\_\_\_\_  
APPROVED: \_\_\_\_\_  
CITY ENGINEER

NOTE: THIS DWG. SUPERSEDES DWG. NO. 997A