

GENERAL NOTES FOR WASTEWATER

1. ALL GRAVITY WASTEWATER COLLECTION SYSTEM MAINS, LATERALS, AND SERVICE LINES MUST BE:
 - A. P.V.C WASTEWATER PIPE MINIMUM OF SDR 35 FOR 0-10' IN DEPTH AND A MINIMUM OF SDR 26 FOR 10' AND GREATER DEPTHS, MEETING A.S.T.M. D3034.
 - B. ALL WASTEWATER LINES SHALL BE CONSTRUCTED OF SAME MATERIAL AND TYPE OF PIPE BETWEEN MANHOLES, UNLESS AN EXCEPTION IS SPECIFICALLY REQUESTED AND APPROVED BY DIRECTOR OF PUBLIC WORKS.
 - C. DUCTILE IRON PIPE (MIN. C.L. 50) SHALL BE PROTECTIVE COATED (PROTECTO 401 EPOXY LINED OR APPROVED 40 MIL EQUIVALENT) ON THE INSIDE FOR WASTEWATER SERVICE.
2. ALL FORCE MAINS SHALL BE C.L. 160 PSI, SDR-26 PVC PIPE OR AS INDICATED BY DESIGN ENGINEER ON PLANS.
3. A. PVC PIPE JOINTS FOR FORCE MAINS AND GRAVITY SEWER MAINS SHALL:
 - HAVE PERMANENTLY INSTALLED REINFORCED RUBBER RING GASKETS IN AN INTEGRAL BELL JOINT GASKETS SHALL MEET ASTM F-477 SPECIFICATIONS FOR ELASTOMERIC SEALS.
 - B. DUCTILE IRON PIPE JOINTS SHALL BE TYTON JOINT OR APPROVED EQUIVALENT. OR APPROVED EQUIVALENT.
4. WASTEWATER PIPE LINES SHALL BE LAID IN STRAIGHT WITH UNIFORM GRADE BETWEEN MANHOLES AND WITH MINIMUM CURVE RADII FOR PVC PIPE AND SHALL BE BASED ON THE FORMULA;
R=300D WHERE
R = MINIMUM ALLOWABLE RADIUS OF CURVATURE FROM BENDING.
D = OUTSIDE PIPE DIAMETER (WHERE R AND D ARE IN THE SAME UNITS).
5. ALL WASTEWATER PIPE LINES MUST BE CONSTRUCTED IN ACCORDANCE WITH CURRENT OR AS AMENDED TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REGULATIONS, CHAPTER 217-DESIGN CRITERIA FOR SEWERAGE SYSTEMS.
6. WHEN THE EFFLUENT PIPE IS FOUR TIMES OR GREATER THAN THE OUTSIDE DIAMETER OF THE INFLUENT PIPE; THE TOPS OF ALL OF THE PIPES SHALL BE PLACED AT THE SAME ELEVATION IN THE MANHOLE AND THE FLOW CHANNELS IN THE INVERT BE SLOPED ON AN EVEN SLOPE FROM PIPE TO PIPE.
7. ALL STANDARD MANHOLES SHALL BE INSTALLED:
 - A. WITH ECCENTRIC CONE SECTIONS.
 - B. WITH APPROVED TYPE 32" DIAMETER FRAME AND COVER
 - C. WITH DROP PIPING WHEN THE WASTEWATER INFLUENT PIPE FLOWLINE IS 24" OR GREATER ABOVE MAIN WASTEWATER PIPE FLOWLINES.
8. FOR SEPARATION DISTANCES BETWEEN POTABLE WATER LINES AND WASTEWATER LINES; REFER TO TCEQ REGULATIONS SUBSECTION 217.53 APPENDIX E OR AS MAY BE AMENDED. SERVICE LINES SHALL HAVE A MINIMUM SEPARATION OF 1'-0".
9. ALL TRENCH SAFETY AND TRENCH SHORING SHALL BE THE RESPONSIBILITY OF THE CONTRANCTOR AND COMPLY WITH THE UNITED STATES OCCUPATION SAFETY AND HEALTH ADMINISTRATION (OSHA) REQUIREMENTS. ALL CONSTRUCTION OPERATIONS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH APPLICABLE REGULATIONS OF OSHA. WHERE CONDITIONS WARRANT, THE CONTRACTOR SHALL PROVIDE A TRENCH SAFETY PLAN TO THE CITY OF TEMPLE AS REQUIRED BY THE LAWS OF THE STATE OF TEXAS.
10. TESTING OF WASTEWATER LINES AND MANHOLES:
 - A. AIR TESTS SHALL BE MADE BY THE PRESSURE DROP VERSUS TIME METHOD; TIME RECORDED FOR PRESSURE TO DROP FROM 3.5 TO 2.5 PSIG. PER ATTACHED TABLE.
 - B. DEFLECTION TESTING SHALL BE DONE ON THE INSTALLATION OF AT LEAST 30 DAYS AFTER ALL BACKFILL HAS BEEN COMPLETED. A MANDREL WILL BE PULLED THROUGH THE PIPE TO TEST FOR MAXIMUM FIVE PERCENT (5%) DEFLECTION. MANDREL SHALL BE CONSTRUCTED AS LISTED:

SHEET 1 OF 2

		CITY OF TEMPLE ENGINEERING DEPARTMENT
APPROVED BY: Michael Newman, P.E.	DSAB APPROVED DATE: 10 March 2011	3210 E. Avenue H, Bldg. A
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WASTEWATER GENERAL NOTES		SCALE: N.T.S.

NOMINAL PIPE SIZE (INCHES)	MANDREL O.D. (NEAREST 1/16")
6	5-7/16
8	7-4/16
10	9-1/16
12	10-13/16

FOR LARGER PIPE SIZES, DESIGN ENGINEER TO SPECIFY.

TABLE -- DURATION REQUIREMENTS FOR AIR TESTING*

SPECIFICATION TIME REQUIRED FOR LOSS OF PRESSURE FROM 3.5PSIG TO 2.5PSIG FOR SIZE AND LENGTH OF PIPE INDICATION FOR Q=0.0015

PIPE DIAMETER (IN)	MINIMUM TIME (MIN:SEC)	LENGTH FOR MINIMUM TIME (FT)	SPECIFICATION TIME FOR LENGTH (L) SHOWN (MIN:SEC)							
			100FT	150FT	200FT	250FT	300FT	350FT	400FT	450FT
4	3:47	586.66	3:47	3:47	3:47	3:47	3:47	3:47	3:47	3:47
6	5:40	397.77	5:40	5:40	5:40	5:40	5:40	5:40	5:40	5:40
8	7:33	298.33	7:33	7:33	7:33	7:33	7:36	8:52		7:33
10	9:27	238.66	9:27	9:27	9:27	9:54	11:52			9:27
12	11:20	198.89	11:20	11:20	11:24	14:15				11:20
15	14:10	159.11	14:10	14:10	17:48					14:10
18	17:00	132.59	17:00	19:14						19:14
21	19:50	113.65	19:50	26:11						26:11
24	22:40	99.44	22:48							22:48
27	25:30	88.39	28:51							28:51
30	28:20	79.55	35:37							35:37
33	31:10	72.32	43:06							43:06

*THIS TABLE IS BASED ON $T=DK/Q$

WHERE: T = time, seconds

K = 0.000419 DL, but not less than 1.0

Q = rate of loss, 0.0015 cu. ft/min/sq. ft. internal surface

D = pipe diameter, in.

L = length of pipe being tested, ft.

**TAKEN FROM APRIL, 1972 JOURNAL OF WATER POLLUTION CONTROL FEDERATION ARTICLE ENTITLED "TESTING NEW SEWER PIPE INSTALLATION" BY ROY E. RAMSEIER.

C. TESTING OF 48 INCH DIAMETER MANHOLE (ASTM C1244-93). TESTS TO BE CONDUCTED WITHOUT RING AND COVER (AT TOP OF CONE).

DEPTH (FT)	0-8	10	12	14	16
TIMES (SEC)	25	30	35	40	45

11. SEWER CLEAN-OUT CAP

A CAST IRON SEWER CLEAN-OUT CAP SHALL BE FURNISHED AND INSTALLED BY PLUMBER AT THE PROPERTY LINE AND PAID FOR BY THE OWNER/BUILDER AT TIME OF WATER METER INSTALLATION.

SHEET 2 OF 2

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