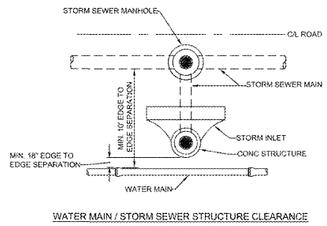
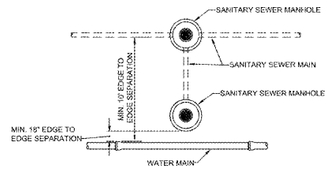
THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE SPECIFIC PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY BOWMAN CONSULTING SHALL BE WITHOUT LIABILITY TO BOWMAN CONSULTING.

WATER STANDARDS WATER ENGINEERING DIVISION	STD. NO. WS-403
WATER MAIN INSTALLATION HORIZONTAL CLEARANCES	SHT. 2 OF 2



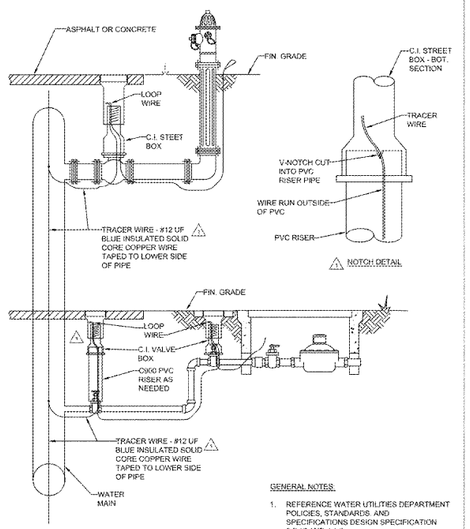
WATER MAIN / STORM SEWER STRUCTURE CLEARANCE



WATER MAIN / SANITARY SEWER STRUCTURE CLEARANCE

APPROVED	DATE	PREPARED BY GEG	DATE 04/22/05	REVISION	1
APPROVED	DATE	CHECKED BY	ISSUE DATE: 08/16/16	REVISION DATE: 07/21/16	NO.

WATER STANDARDS WATER ENGINEERING DIVISION	STD. NO. WS-501
TRACER WIRE INSTALLATION	SHT. 1 OF 2

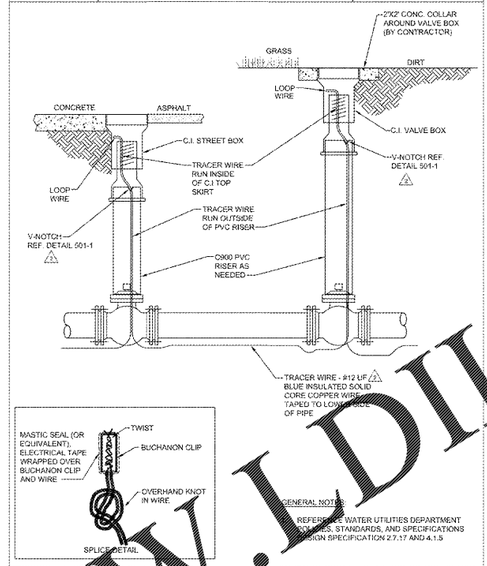


GENERAL NOTES:

1. REFERENCE WATER UTILITIES DEPARTMENT POLICIES, STANDARDS, AND SPECIFICATIONS DESIGN SPECIFICATION 2.7.17 AND 4.1.5.
2. REFERENCE DETAIL 501-2.

APPROVED	DATE	PREPARED BY GEG	DATE 10/11/00	REVISION	2
APPROVED	DATE	CHECKED BY	ISSUE DATE: 08/16/16	REVISION DATE: 07/21/16	NO.

STANDARDS WATER ENGINEERING DIVISION	STD. NO. WS-501
TRACER WIRE INSTALLATION	SHT. 2 OF 2

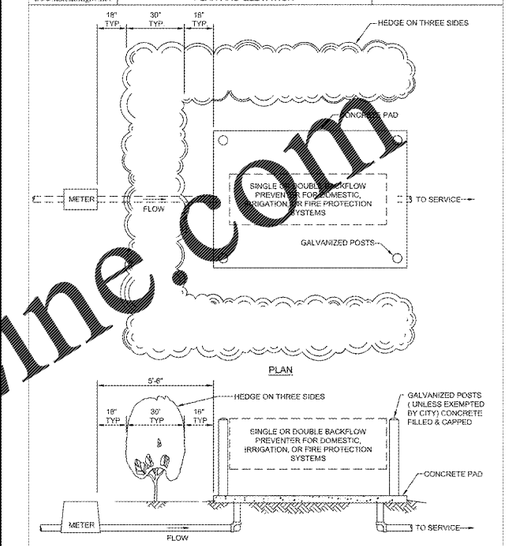


GENERAL NOTES:

REFERENCE WATER UTILITIES DEPARTMENT ...ES, STANDARDS, AND SPECIFICATIONS ...IGN SPECIFICATION 2.7.17 AND 4.1.5

APPROVED	DATE	PREPARED BY GEG	DATE 11/14/01	REVISION	3
APPROVED	DATE	CHECKED BY	ISSUE DATE: 08/16/16	REVISION DATE: 07/21/16	NO.

WATER STANDARDS WATER ENGINEERING DIVISION	STD. NO. WS-601
BACKFLOW PREVENTION DEVICES LANDSCAPING PLAN AND ELEVATION	SHT. 1 OF 1

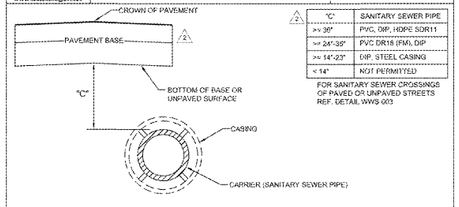


PLAN

ELEVATION

APPROVED	DATE	PREPARED BY GEG	DATE 08/20/02	REVISION	1
APPROVED	DATE	CHECKED BY	ISSUE DATE: 08/16/16	REVISION DATE: 07/21/16	NO.

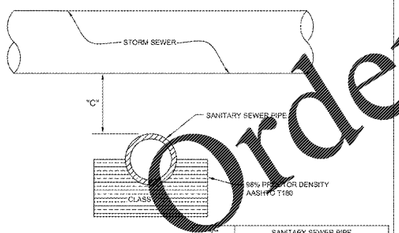
WASTEWATER STANDARDS WATER ENGINEERING DIVISION	DETAIL NO.: WWS-011
SANITARY SEWER CLEARANCES	SHT. 1 OF 1



"C"	SANITARY SEWER PIPE
>= 36"	PVC, DIP, HDPE SDR11
>= 24"-35"	PVC DR18 (FM), DIP
>= 14"-23"	DIP, STEEL CASING
< 14"	NOT PERMITTED

FOR SANITARY SEWER CROSSINGS OF PAVED OR UNPAVED STREETS REF. DETAIL WWS-003

CLEARANCES-STRUCTURAL REQUIREMENTS

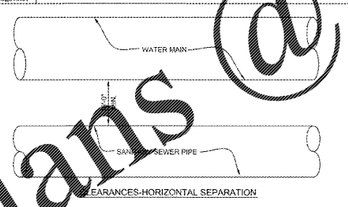


"C"	SANITARY SEWER PIPE
>= 12"	PVC, DIP
>= 3'-1"	DIP, PVC DR18 & CLASS 2 BEDDING
< 3'	CONFLICT STRUCTURE, STEEL CASING

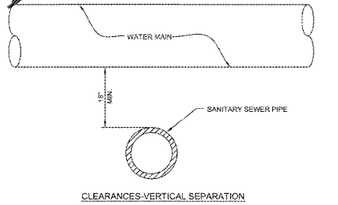
CLEARANCES-VERTICAL SEPARATION

APPROVED	DATE	PREPARED BY GEG	DATE 09/29/03	REVISION	2
APPROVED	DATE	CHECKED BY	ISSUE DATE 10/15/07	REVISION DATE 04/05/04	NO. 2

WASTEWATER STANDARDS WATER ENGINEERING DIVISION	DETAIL NO.: WWS-011A
SANITARY SEWER CLEARANCES FOR WATER MAINS	SHT. 1 OF 1



CLEARANCES-HORIZONTAL SEPARATION



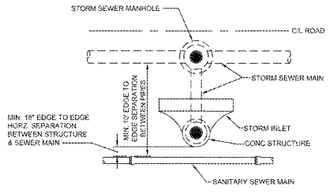
CLEARANCES-VERTICAL SEPARATION

GENERAL NOTES:

1. WHERE ENCROACHMENT UPON THE MINIMUM 10 FOOT HORIZONTAL SEPARATION IS PERMITTED BY THE WATER UTILITY, C900 OR DUCTILE IRON PIPE SHALL BE USED.
2. WHERE ENCROACHMENT UPON THE MINIMUM 18" VERTICAL SEPARATION IS PERMITTED BY THE WATER UTILITY, THE SEWER PIPE SHALL EITHER BE PLACED IN A STEEL SLEEVE OR ARRANGED SO SEWER PIPE AND WATER PIPE JOINTS ARE SEPARATED BY A MINIMUM OF 10 FEET. REFERENCE LAKELAND WATER UTILITIES WASTEWATER OPERATIONS POLICIES, STANDARDS, AND SPECIFICATIONS FOR SUBDIVISIONS AND COMMERCIAL DEVELOPMENTS, SECTION 8.4 "PROTECTION OF WATER SUPPLY".

APPROVED	DATE	PREPARED BY GEG	DATE 09/29/03	REVISION	
APPROVED	DATE	CHECKED BY	ISSUE DATE 10/15/07	REVISION DATE	NO.

WASTEWATER STANDARDS WATER ENGINEERING DIVISION	DETAIL NO.: WWS-011B
SANITARY SEWER INSTALLATION HORIZONTAL CLEARANCES	SHT. 1 OF 1



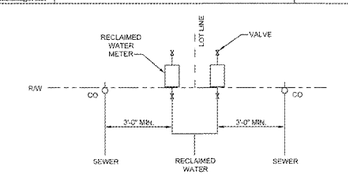
CLEARANCES-HORIZONTAL SEPARATION

GENERAL NOTES:

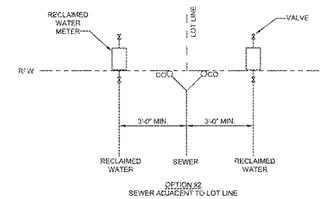
1. SANITARY SEWER MAINS SHALL BE DESIGNED WITH MINIMUM 18" EDGE TO EDGE HORIZONTAL SEPARATION FROM STORM STRUCTURES.
2. INCREASE HORIZONTAL SEPARATION AS DEPTH OF COVER INCREASES OVER SANITARY SEWER MAINS DESIGNED ADJACENT TO STORM STRUCTURES. FOR EXCAVATION BELOW THE BASE OF THE STRUCTURE, SOIL CLASSIFICATION AND STABILITY OF THE STRUCTURE DURING EXCAVATION IS TO BE CONSIDERED.

APPROVED	DATE	PREPARED BY GEG	DATE 04/29/05	REVISION	
APPROVED	DATE	CHECKED BY	ISSUE DATE 10/15/07	REVISION DATE	NO.

WASTEWATER STANDARDS WATER ENGINEERING DIVISION	DETAIL NO.: WWS-011C
RECLAIMED WATER SEWER SERVICE SEPARATION	SHT. 1 OF 1



OPTION #1
RECLAIMED WATER ADJACENT TO LOT LINE



OPTION #2
SEWER ADJACENT TO LOT LINE

GENERAL NOTES:

1. ALL RECLAIMED WATER METER ASSEMBLIES SHALL BE INSTALLED BY CITY OF LAKELAND WATER OPERATIONS.
2. RECLAIMED WATERMAIN TAPS BY CITY OF LAKELAND CREWS ONLY. REFERENCE WATER OPERATIONS MANUAL FOR FURTHER INFORMATION.
3. REFERENCE CITY OF LAKELAND WATER UTILITIES ALTERNATIVE IRRIGATION SYSTEM EXCEPTION TABLE.

APPROVED	DATE	PREPARED BY WG	DATE 09/29/03	REVISION	
APPROVED	DATE	CHECKED BY	ISSUE DATE 10/15/07	REVISION DATE	NO.

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9/28/2020

PLAN STATUS	
DATE	DESCRIPTION

PMP DESIGN	PMP DRAWN	TJ CHKD
SCALE	AS SHOWN	
JOB No.	010713-01-001	
DATE		

SHEET C7.2