



WATER UTILITY SPECIFICATIONS, STANDARDS, AND PROCEDURES

1. All water services are to be sized by the Building and Safety Division and all fire services verified by the Fire Department before a permit will be issued. (Plans approved by the Building and Safety Division and Fire Department shall be submitted to the Water Division before a permit will be issued.)
2. Domestic meters up to and including 2 inches in size shall be installed in a meter box.
 - ❖ Domestic Meters 3 inches and above and all fire services shall be installed above ground with backflow protection.
 - ❖ All service connections will be installed by and at the cost of the developer or property owner.
3. The developer or property owner shall:
 - a. Submit to the Water Division for approval, the original plan view on an 8 1/2" x 11" page. This plan will contain, the installation location stationed from the nearest street intersection, the meter lateral and all appurtenances. **WATER METERS WILL NOT BE INSTALLED IN EXISTING OR FUTURE DRIVEWAYS OR APPROACHES**
 - b. Obtain a Public Works permit from the Engineering Division when working in the Public Right of Way or for Encroachment work. Obtain an encroachment permit from Cal-Trans if the installation is within the right-of-way of Pacific Coast Highway. The Cal-Trans permit shall be submitted to the city prior to receiving the Public Works permit. Copies of the approved plan and the completed Water Installation Invoice from the Water Division will be required for the Public Works permit. Before a permit will be issued, the applicant will pay the City an amount which will include permit fee, inspection fee, cost of equipment supplied by the city if any, and a security deposit to insure that existing improvements are replaced and any changes to public or private property is corrected to the satisfaction of the city.
 - c. Following receipt of appropriate fees and deposits – Notify the Water Division at least one week prior to beginning the construction to arrange for inspection of materials. In addition, it will be the responsibility of the person or company who obtained the "Permit for work in the Public Streets" to notify the Water Division so that a water inspector can be on site for the following procedures:

Saddle or tapping tee installation, **hydrostatic** pressure test, main tapping lateral line installation, thrust block placement, backfill and compaction, **hydrostatic** pressure test, bacteriological sampling, and other procedures deemed necessary by the water inspector.

****24 HOUR NOTICE REQUIRED BEFORE INSPECTION****

Water Division (310) 524-2745



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- d. Disinfect per AWWA 651. Arrange for bacteriological tests with a laboratory certified by the State of California Health Department. Water line shall be flushed a minimum of 24 hours before a bacteriological sample is taken and the disinfectant residual shall be checked to ensure that the residual in the lateral is consistent with the distribution system residual when flushing is completed.
- e. **Hydrostatic** pressure test the new water line a minimum of 150 psi for a one hour period. **Do not test old city water mains or valves.**
- f. All work accomplished in public streets or roadways including permanent pavement restoration shall be completed within 45 days from the date the permit is issued.
- g. **Notify the Public Works Inspector at least 24 hours prior to permanent street resurfacing (310) 524-2360.**

Road surfaces not permanently replaced within the 45 day period may be replaced by city forces resulting in a forfeiture of deposit.

- h. Standard methods, material and compaction requirements will be utilized for all excavations in the public street, unless adjusted by city inspectors to meet varying soil or load conditions.
- i. Trenches in the public roadway will not remain open overnight unless special approval is obtained from the City Engineer. Trenches shall be filled or plated as directed by the Public Works Inspector.
- j. If the Water Division determines that a backflow prevention device is required it must be installed and tested by a certified tester before the job is complete.

No installation will be complete and no water service will be turned on until the Water Division is in possession of bacteriological test results and a completed passing backflow test report

- 4. After final inspection the Water Inspector will notify the Water Division of a completed service installation. Before the service can become active (turned on) the owner or tenant shall complete a Water Service Request form and submit it to h2oinquiries@elsegundo.org or drop off at the Public Works counter at City Hall (350 Main St). The Water Division will then issue a notice to turn-on water service to the Meter staff.

Water Division	400 Lomita St.	El Segundo, CA 90245	(310) 524-2745
Engineering	350 Main St.	El Segundo, CA 90245	(310) 524-2360
Street Maintenance	150 Illinois St.	El Segundo, CA 90245	(310) 524-2709



WATER UTILITY SPECIFICATIONS, STANDARDS, AND PROCEDURES

SPECIFICATIONS:

1. All backflow preventers shall be USC FCCC & HR approved. Fire service detector meters to be cubic foot reading
2. Hot tap and lateral line installations greater than 2 inches shall be a minimum of 4 inches.
3. Pipe (3-inches or larger) to be Class 350 ductile iron cement lined. Fittings to be cement lined ductile iron minimum 250 psi pressure class. Joints to be mechanical joint, push on or flanged class 125
 - **All joints will be restrained**
 - i. Restrained joints shall be mega lug or equivalent as determined by inspector
 - ii. All flange bolts and nuts underground shall be field coated with NO-OX-ID or food grade oil to the satisfaction of the inspector
4. Plastic sheeting shall be placed between concrete thrust blocks and all metallic materials
5. Tapping sleeves shall be **all stainless** Muller H-304 SS or equal
6. Gate Valves shall be resilient seated gate valve AWWA C-509, Clow 6100 or equal
7. Fire hydrants shall be wet barrel Clow 2000 series (See spec #WT-2)
8. Water Services:
 - A. Services 3/4 inch – 1 inch shall use 1 inch copper type K tubing with lead-free soldered joints and a low-lead brass angle curb stop 360 degree turn copper flair nut x meter swivel nut and a low-lead brass corporation stop copper flair x MIP
 - B. Services 1 ½ inch or 2 inch shall use 2 inch copper type K tubing with lead-free soldered joints and a brass coupling on the corporation stop. All adapters will be MIP thread. A combination angle curb stop shall be used that will accept both 1 ½ inch and 2 inch meters.
9. Saddles shall be double strap brass Mueller BR 2 B AWWA I.P.T. or equal
10. Meter boxes will be per spec WT-12
11. Corporation stops shall be Mueller series 300 ball lock wing 360 degree travel angel meter valves or equal
 - 1" B-24255-3 flare x meter swivel nut
 - 2" B-24286-3 F.I.P. x flange

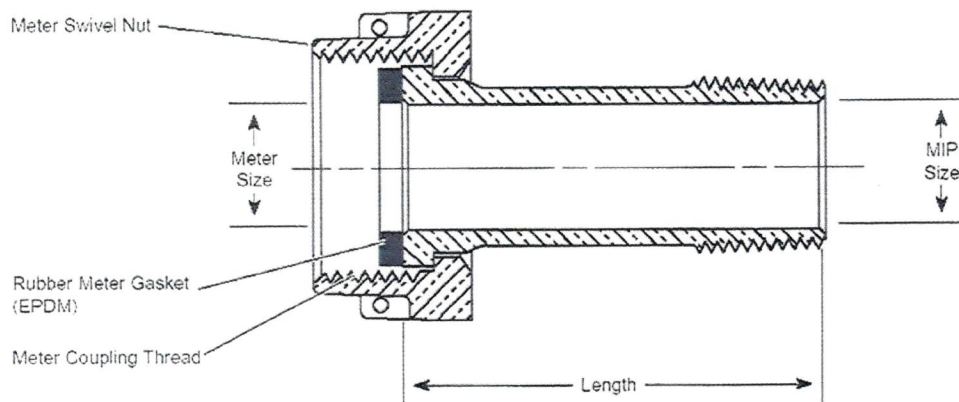


WATER UTILITY SPECIFICATIONS, STANDARDS, AND PROCEDURES

1. Obtain a plumbing permit from the Building and Safety Department for work that will be performed on private property.
2. Obtain a Public Works Encroachment permit from the Public Works Engineering Division for any work that is performed in the public right of way including work on all water service lines.
3. Contact the Water Division to have the water meter shut off before you begin work and to turn the water back on after work is performed. (Turning the meter on and off yourself will result in a fine)

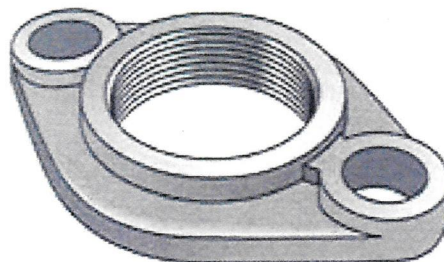
Parts required for $\frac{3}{4}$ " or 1" Connections:

- Meter Coupling made of Lo-Lead Brass
- Rubber Meter Gasket



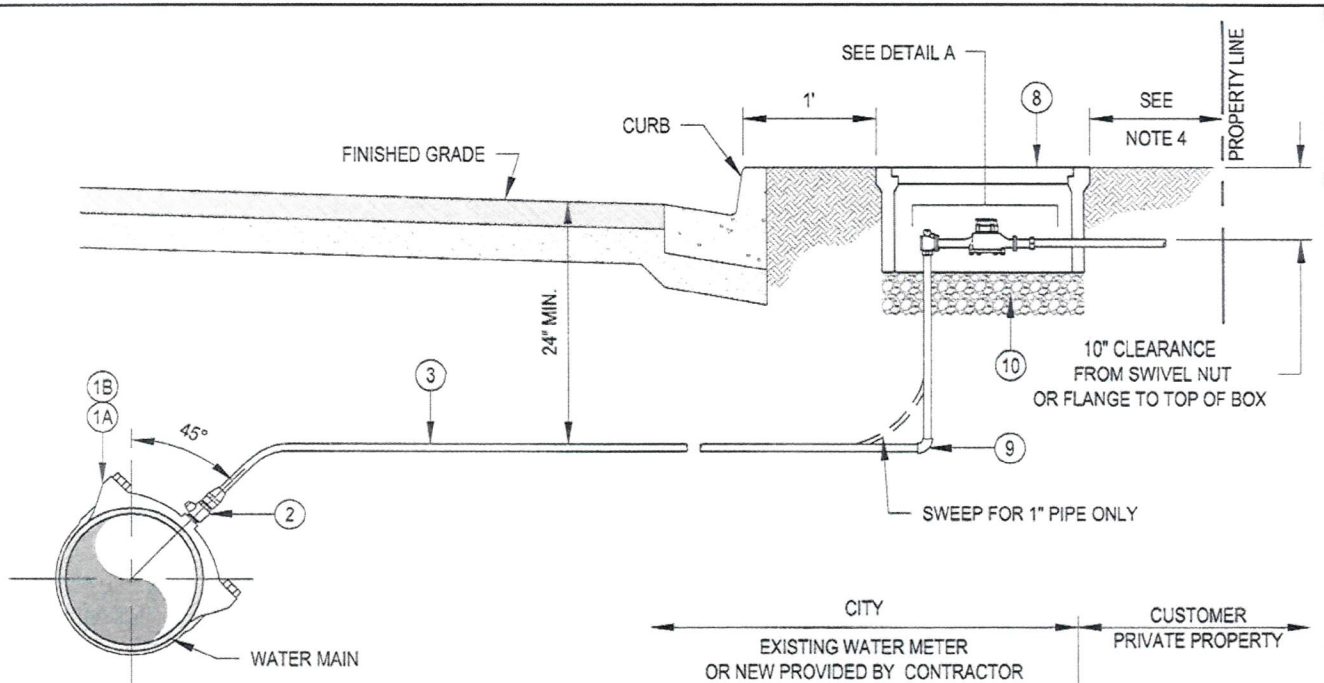
Parts required for 1 1/2" and 2" Connections:

- Meter Flange made of Brass
- Rubber Meter Gasket



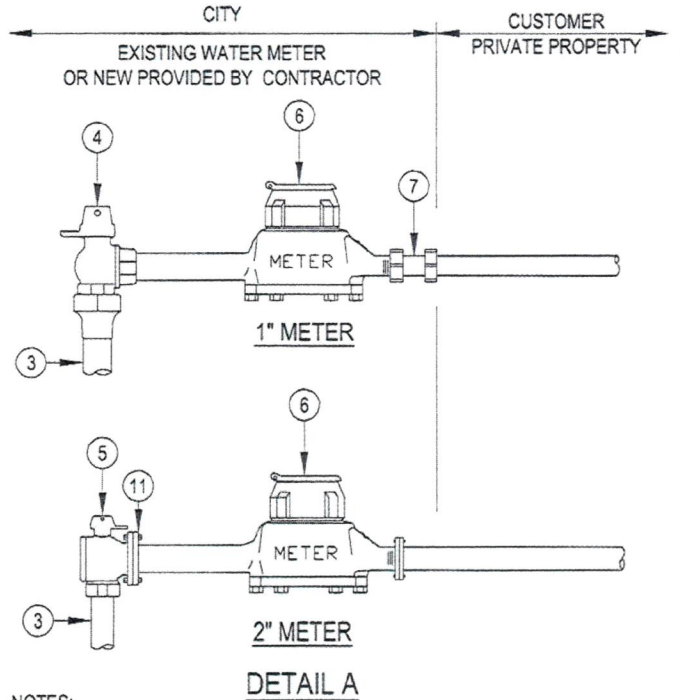
180607 - CITY OF EL SEGUNDO WATER STANDARD DETAILS

El Segundo Water Details			
	Detail No.	Sheet No.	Sheet Title
1	WT-1	1 of 1	1-inch & 2-inch Copper Branch Service
2	WT-2	1 of 1	Fire Hydrant Assembly
3	WT-3	1 of 2	2-inch Copper Fire Line
4	WT-3	2 of 1	New Fire Service Installation
5	WT-4	1 of 1	New 3"-8" Water Service Installation With Backflow Preventer
6	WT-5	1 of 1	Thrust and Anchor Block Tables
7	WT-6	1 of 2	Restrained Length Tables Horizontal
8	WT-6	2 of 2	Restrained Length Tables Vertical
9	WT-7	1 of 1	Water Main Trench Detail
10	WT-8	1 of 1	Pipe Casing Installation
11	WT-9	1 of 1	Fire Hydrant, Valve and Tee Removal Detail
12	WT-10	1 of 2	New Gate Valve Installation
13	WT-10	2 of 2	Adjustable Valve Box with Cap in AC Pavement
14	WT-11	1 of 1	1-inch or 2-inch Air and Vacuum Release
15	WT-12	1 of 3	To be Used For: 3/4-inch & 1-inch Meters
16	WT-12	2 of 3	To be Used For: 1-1/2-inch & 2-inch Meters
17	WT-12	3 of 3	To be Used With Manifold Type Meter Installations
18	WT-13	1 of 3	5/8" x 3/4" & 1" Water Meters
19	WT-13	2 of 3	1.5" & 2" Water Meters
20	WT-13	3 of 3	3" Water Meter



METER SIZE	*METER BOX SIZE
1"	22" x 15" x 12"
1-1/2" & 2"	30" x 19" x 13"

*SEE SHEET WT-12 FOR METER BOX DETAILS.



NOTES:

1. ALL SERVICE LATERAL ASSEMBLIES SHALL BE NSF 61, ANNEX G AND CALIFORNIA AB1953 COMPLIANT.
2. ALL WATER METERS SHALL CONFORM TO AWWA WATER METER LAY LENGTH STANDARDS.
3. ALL PIPING SHALL BE RATED FOR 300 PSI.
4. PLACE METER BOX ASSEMBLY 1-FT FROM PROPERTY LINE IF INSTALLED WITHIN ALLEY. METER AND BOX ROTATION REQUIRES CITY APPROVAL.

ITEM	MATERIAL
①	BRONZE DOUBLE STRAP SERVICE SADDLE, 1" OR 2" F.I.P.T. OUTLET
②	1" CAST BRONZE BALL CORPORATION STOP, M.I.P.T. x FLARE 2" CAST BRONZE BALL CORPORATION STOP, M.I.P.T. x COMPRESSION
③	1" (ROLLS) OR 2" COPPER PIPE, SOFT/ ANNEALED TYPE K IN 20' LENGTHS.
④	CAST BRONZE ANGLE METER BALL VALVE WITH LOCKWING, FLARE x SWIVEL NUT (MUELLER B-24255N-3, B-24258N-3 OR EQUAL)
⑤	CAST BRONZE ANGLE METER BALL VALVE WITH LOCKWING, F.I.P. x METER FLANGE (MUELLER B-24286N-3, B-24276N-3 OR EQUAL)
⑥	METER (FURNISHED BY CONTRACTOR) (SEE SHEET WT-13)
⑦	STRAIGHT METER COUPLING, SWIVEL NUT x M.I.P.T. - 1 1/2" LONG
⑧	METER BOX (SEE SHEET WT-12)
⑨	90° COPPER ELBOW, C x C SOLDER JOINTS
⑩	6" THICK BASE OF 3/4" CRUSHED ROCK.
⑪	BOLTS, NUTS & WASHERS

DATE	NO.	REVISION / NOTE	BY
		ORIGINAL DRAWING ISSUED	AJS

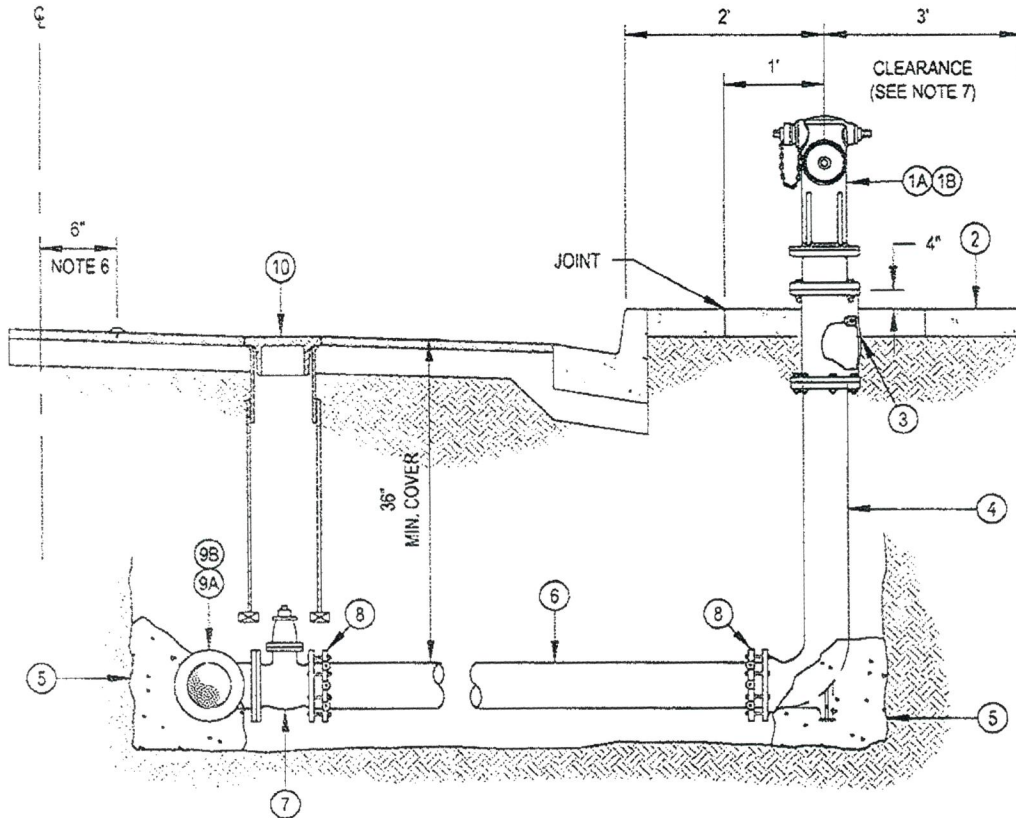


1-INCH & 2-INCH COPPER
BRANCH SERVICE

APPROVED BY: _____ DATE: 20____
Water Resources Engineer

DES: AJS
D: SEM
T:
C:
SCALE: NONE
DATE:
APP:

SHEET NO. 1 OF 1
WT-1



ELEVATION

NOTES:

1. TOP FLANGE OF BREAK-OFF CHECK VALVE SHALL BE SET WITHIN THE CONCRETE PAD. BREAK OFF GROOVE, MINIMUM OF ONE, SHALL BE PLACED ABOVE THE PAD.
2. FIRE HYDRANT FLANGE BOLTS SHALL BE A307 ZINC-PLATED BOLTS INSTALLED WITH NUTS ON TOP OF THE FLANGE.
3. FIRE HYDRANT (AND RISER CAP) TO BE PAINTED WITH SINCLAIR POLE YELLOW, E-6-23D GLOSS ENAMEL.
4. INSTALL BURY SPOOL WHEN NECESSARY TO MEET REQUIRED GRADE.
5. ALL FIRE HYDRANTS THAT ARE REMOVED MUST BE DELIVERED TO THE WATER DIVISION AT 400 LOMITA ST. UNDAMAGED.
6. INSTALL BLUE REFLECTOR 6-INCH OFF STREET CENTERLINE ON HYDRANT SIDE.
7. PER CALIFORNIA FIRE CODE, CLEARANCE AROUND FIRE HYDRANT SHALL BE A 3-FT RADIUS.

ITEM	MATERIAL
(1A)	6" FIRE HYDRANT WITH 2.5" x 4" IN RESIDENTIAL AREAS
(1B)	6" FIRE HYDRANT WITH 2.5" x 4" x 4" IN COMMERCIAL AREAS
(2)	CONCRETE SPLASH PAD
(3)	6" BREAK-OFF CHECK VALVE (CLOW LBI 400A OR JONES J6000)
(4)	WET BARREL HYDRANT BURYS (M/J x FLG) SIZE TO FIT
(5)	CONCRETE THRUST BLOCK PER WT-5
(6)	6" DUCTILE IRON PIPE CL 350
(7)	6" RESILIENT WEDGE GATE VALVE (FLG x M/J)
(8)	RESTRAINED MECHANICAL JOINT
(9A)	DUCTILE IRON TEE WITH 6" FLANGED BRANCH
(9B)	STAINLESS STEEL TAPPING TEE WITH 6" FLANGED BRANCH*
(10)	VALVE BOX AND CAP W/ SLIP CAN

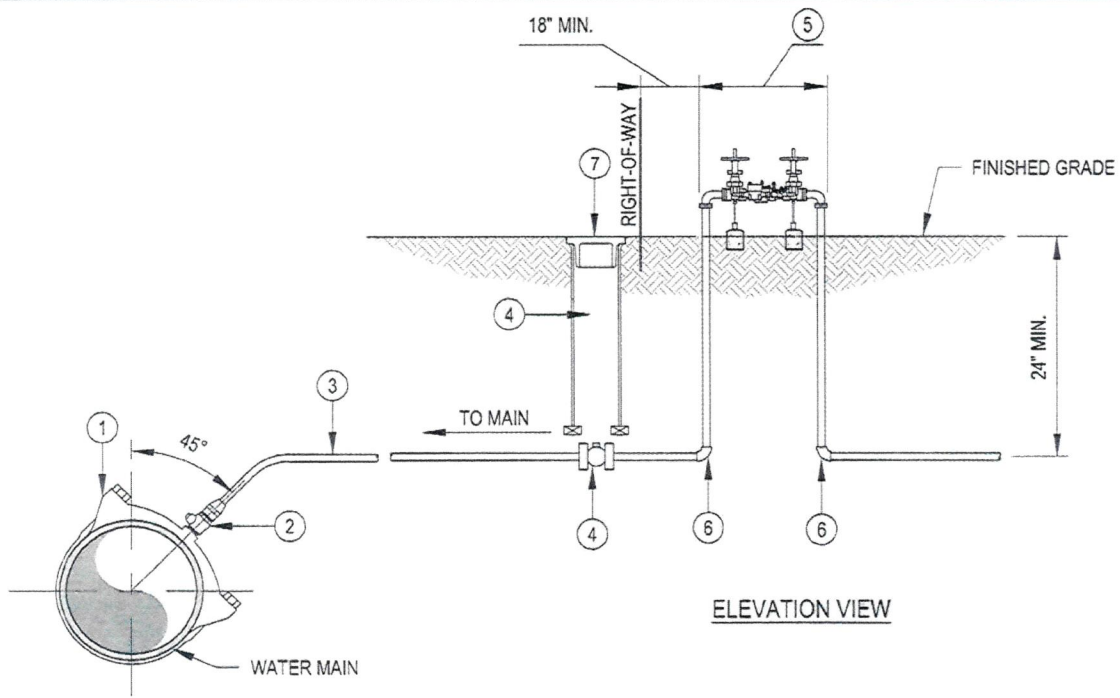
*CHECK COMPATIBILITY OF TEE MATERIAL WITH EXISTING PIPE MATERIAL.

DATE	NO.	REVISION / NOTE	BY
ORIGINAL DRAWING ISSUED			AJS
APPROVED BY	DATE	20	DES: AJS D: SEM T: C:
Water Resources Engineer			SCALE: NONE DATE: APP:



FIRE HYDRANT ASSEMBLY

SHEET NO. 1 OF 1
WT-2

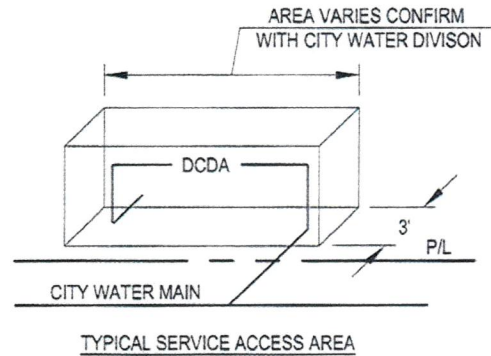


NOTES:

1. FIRE SERVICE SHALL BE INSTALLED WITH 12" MINIMUM TO 30" MAXIMUM CLEARANCE ABOVE NATURAL FINISHED GRADE AND SHALL BE READILY ACCESSIBLE FOR INLINE SERVICE AND TEST (REF. TO L.A. COUNTY DHS, SAFE PLUMBING PRACTICES).
2. THE APPROVED BACKFLOW PREVENTION ASSEMBLY SHALL BE FURNISHED BY THE MANUFACTURE AS A COMPLETE ASSEMBLY, METER TO BE FURNISHED BY THE CONTRACTOR (MEASURED IN CU. FT.).
3. DCDA MUST BE INSTALLED AS CLOSE AS PRACTICAL TO THE PROPERTY LINE AND COMPLETELY WITHIN PRIVATE PROPERTY.

* PROPERTIES WITH ONSITE AUXILIARY WATER SUPPLIES OR CHEMICAL INJECTION FIRE SYSTEMS MAY REQUIRE A REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY. CONTACT THE EL SEGUNDO WATER DEPARTMENT PERSONNEL TO CONSULT AND CONFIRM THE REQUIRED BACKFLOW PREVENTION ASSEMBLY REQUIRED.

ITEM	MATERIAL
①	BRONZE DOUBLE STRAP SERVICE SADDLE, 2" F.I.P.T. OUTLET (FOR DUCTILE IRON PIPE)
②	2" CAST BRONZE BALL CORPORATION STOP, M.I.P.T. x COMPRESSION
③	2" COPPER PIPE, SOFT/ ANNEALED TYPE K IN 20' LENGTHS, ENCASED IN POLY WRAP C
④	2" BALL VALVE WITH TEE HEAD, C x C SOLDER JOINTS OR F.I.P.T. x F.I.P.T.
⑤	USC APPROVED 2.5-INCH BACKFLOW PREVENTION ASSEMBLY - DOUBLE CHECK DETECTOR ASSEMBLY WITH CHEATER METER (WATTS 007M1DCDA OR EQUAL)
⑥	90° COPPER ELBOW, C x C SOLDER JOINTS
⑦	VALVE CAN , SEE SHEET WT-10 (SHEET NO. 2)



DATE	NO.	REVISION / NOTE	BY
		ORIGINAL DRAWING ISSUED	AJS

APPROVED BY: _____ DATE: 20____

Water Resources Engineer

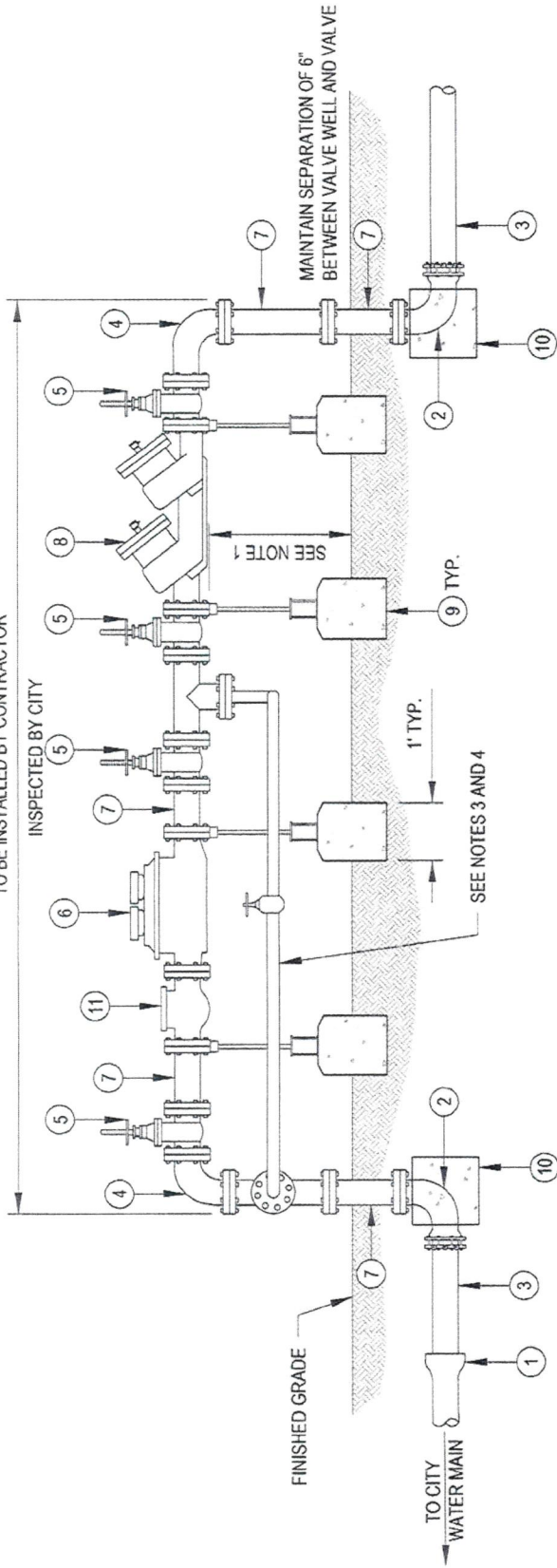


2-INCH COPPER FIRE LINE

SCALE: NONE
DATE: _____
APP: _____

SHEET NO. 1 OF 2
WT-3

TO BE INSTALLED BY CONTRACTOR



ELEVATION VIEW

ITEM	MATERIAL
1	BELL/SPIGOT, TYPICAL
2	90° BEND (MJ x FLG) WITH RESTRAINED MECH. JOINT
3	DUCTILE IRON, CL. 350
4	90° BEND (FLG x FLG)
5	OS&Y GATE VALVE
6	METER (FURNISHED BY CONTRACTOR) (SEE SHEET WT-13)
7	DUCTILE IRON SPOOL (FLG x FLG)
8	USC APPROVED BACKFLOW PREVENTION
9	ADJUSTABLE PIPE SUPPORT WITH CONCRETE FOUNDATION
10	THRUST BLOCK
11	STRAINER DEPENDENT ON METER TYPE/MODEL

NOTES:

1. WATER SERVICE SHALL BE INSTALLED WITH 12" MINIMUM TO 30" MAXIMUM CLEARANCE ABOVE NATURAL FINISHED GRADE AND SHALL BE READILY ACCESSIBLE FOR IN-LINE SERVICE AND TEST (REF. TO CDHS, SAFE PLUMBING PRACTICES).
2. THE APPROVED BACKFLOW PREVENTION ASSEMBLY SHALL BE FURNISHED BY THE MANUFACTURE AS A COMPLETE ASSEMBLY, METER TO BE FURNISHED BY THE CONTRACTOR (MEASURED IN CU. FEET).
3. BY-PASS LINE VARIES IN SIZE (2" TO 4")
4. BY-PASS LINE MAY REQUIRE 45° BENDS OUT TO SIDE TO AVOID SUPPORTS

*A REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY WILL BE REQUIRED WHEN THE PROPERTY TO BE SERVED HAS AN AUXILIARY WATER SUPPLY AND/OR THE PROPERTY HAS A 40-FOOT VERTICAL PIPE OR 3 STORY OR HIGHER BUILDING. CONTACT THE EL SEGUNDO WATER DEPARTMENT PERSONNEL TO CONSULT AND CONFIRM THE REQUIRED BACKFLOW PREVENTION ASSEMBLY REQUIRED.

DATE: _____

BY: _____



NEW 3"-8"
WATER SERVICE INSTALLATION
WITH BACKFLOW PREVENTER

APPROVED BY: _____

DATE: 20__

SCALE: NONE

SHEET NO. 1 OF 1

Water Resources Engineer

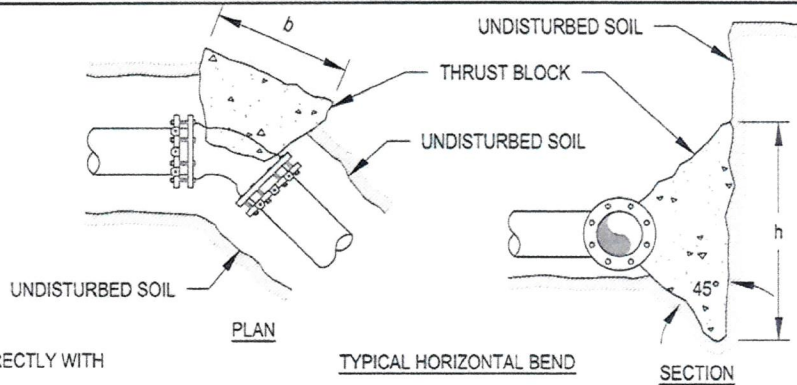
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DATE: _____

WT-4

TABLE 1.1 - CALCULATION ASSUMPTIONS

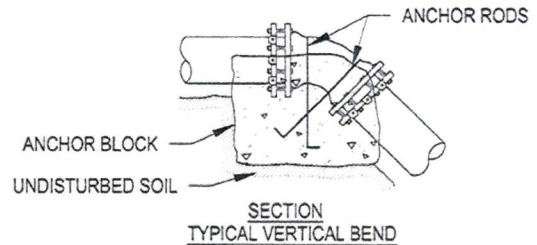
CONDITION	VALUE
LAYING CONDITION	TYPE 4
SOIL CLASSIFICATION	GOOD SAND (GW)
DEPTH OF COVER	3 FEET
DESIGN/TEST PRESSURE	200 PSI ¹
OPERATING PRESSURE	VARIES PER PLAN
ALLOWABLE SOIL BEARING, S _b	1000 PSF ²
MATERIAL DENSITY, W _m	150 PCF
SAFETY FACTOR	1.0 ³



- 1 BEARING AREAS AND ANCHOR VOLUMES INCREASE DIRECTLY WITH INCREASED PRESSURE.
- 2 FOR SOIL BEARING VALUE OF 2000 PSF USE: 1/2 x BEARING AREA SHOWN; FOR SOIL BEARING VALUE OF 500 USE: 2 x BEARING AREA SHOWN.
- 3 CALCULATIONS BASED ON SAFETY FACTOR = 1.0. IF A DIFFERENT SAFETY FACTOR IS TO BE USED, MULTIPLY VALUES BY THAT SAFETY FACTOR.

NOTES:

1. ALL THRUST BLOCKS SHALL BE PORTLAND CEMENT CONCRETE MIX 560-C-3250, ATTAIN 2,000 PSI STRENGTH, AND BE PLACED AGAINST UNDISTURBED SOIL.
2. THRUST BLOCKS ON REDUCERS SHALL BE KEYED INTO THE TRENCH BOTTOM AS SHOWN.
3. CONCRETE SHALL NOT EXTEND ONTO FLANGE OR ADJOINING PIPE.
4. DO NOT COVER FITTING BOLTS WITH CONCRETE.
5. AVOID PLACING CONCRETE ON ANY PART OF THE VALVE BONNET OR VALVE OPERATOR WHEN VALVES ARE FLANGED TO FITTINGS.
6. THE RATIO OF WIDTH (b) TO HEIGHT (h) OF THRUST BLOCK AREA SHALL NOT EXCEED 1 1/2 TO 1.
7. ALL ANCHOR RODS SHALL BE:
FOR PIPE SIZES < 12": #4 BARS
16": #5 BARS
18": #6 BARS
8. COAT REBAR WITH 80 MILS OF COLD-APPLIED "NO-OX-ID" CONTACT GREASE BITUMASTIC WATER-PROOFING COMPOUND. WRAP EXTERIOR OF VALVE, ACTUATOR AND REBAR WITH 8 MIL POLYETHYLENE SHEETING AND TAPE PER IRWD SPECIFICATION.
9. MINIMUM CONCRETE COVER OVER REBAR SHALL BE 3".
10. NO CONCRETE SHALL BE POURED ON VALVE OR PIPE JOINT.
11. YIELD STRENGTH OF STEEL BARS IS ASSUMED TO BE 36 KSI.
12. ANCHOR BLOCKS SHALL BE USED AT VERTICAL BENDS WHEN PIPE IS ABOVE OR BELOW GROUND AS SHOWN ON THE PLANS.
13. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THE SOIL BEARING CONFIRMED PRIOR TO CONSTRUCTION.
14. WHEN RESTRAINED JOINTS ARE PROVIDED FOR THE REQUIRED PIPE LENGTH, PER WT-6, THE THRUST BLOCK SIZE CAN BE REDUCED TO 25% OF ITS SIZE.



$$BEARING AREA (SF) = \frac{S_f \times T}{S_b}$$

$$THRUST (LBS), T = 2 P A \sin \frac{\theta}{2}$$

$$ANCHOR VOLUME (CY) = \left(\frac{1}{27}\right) \times \frac{S_f \times T}{W_m}$$

TABLE 1.3 - VERTICAL ANCHOR BLOCK VOLUMES

PIPE SIZE (IN)	22.5 BEND		45 BEND	
	THRUST (LBS)	VOLUME (CY)	THRUST (LBS)	VOLUME (CY)
4	981	0.2	1,924	0.5
6	2,206	0.5	4,328	1.1
8	3,923	1.0	7,694	1.9
10	6,129	1.5	12,022	3.0
12	8,826	2.2	17,312	4.3
16	15,690	3.9	30,777	7.6
18	19,858	4.9	38,952	9.6

TABLE 1.2 - HORIZONTAL THRUST BLOCK BEARING AREAS

PIPE SIZE (IN)	11.25 BEND		22.5 BEND		45 BEND		90 BEND		DEADEND / TEE	
	THRUST (LBS)	BEARING AREA (SF)	THRUST (LBS)	BEARING AREA (SF)	THRUST (LBS)	BEARING AREA (SF)	THRUST (LBS)	BEARING AREA (SF)	THRUST (LBS)	BEARING AREA (SF)
4	493	0.5	981	1.0	1,924	1.9	3,554	3.6	2,513	2.5
6	1,109	1.1	2,206	2.2	4,328	4.3	7,997	8.0	5,655	5.7
8	1,971	2.0	3,923	3.9	7,694	7.7	14,217	14.2	10,053	10.1
10	3,079	3.1	6,129	6.1	12,022	12.0	22,214	22.2	15,708	15.7
12	4,434	4.4	8,826	8.8	17,312	17.3	31,989	32.0	22,619	22.6
16	7,883	7.9	15,690	15.7	30,777	30.8	56,869	56.9	40,212	40.2
18	9,977	10.0	19,858	19.9	38,952	39.0	71,975	72.0	50,894	50.9

NOTE: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE INFORMATION SHOWN HEREON PRIOR TO ITS USE.


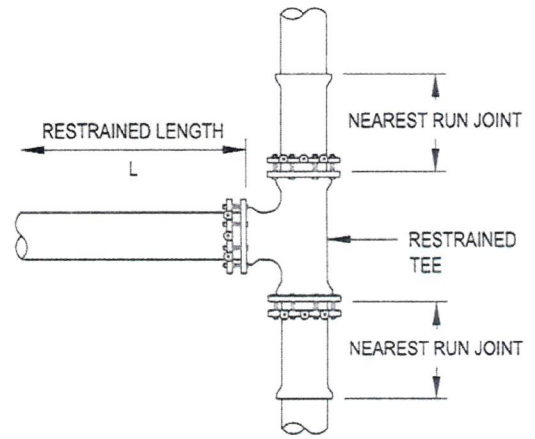
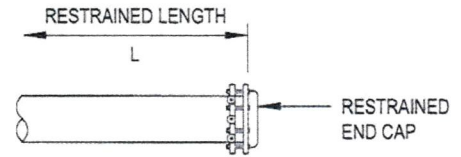
DATE	NO.	REVISION / NOTE	BY		THRUST AND ANCHOR BLOCK TABLES
		ORIGINAL DRAWING ISSUED	AJS		
APPROVED BY:	DATE: 20	DES: AJS	SCALE: NONE	SHEET NO. 1 OF 1	
Water Resources Engineer		D: SEM	DATE:	WT-5	
		T:	APP:		
		C:			

TABLE 2.1 - DEAD END, TEE, AND HORIZONTAL BENDS

CONNECTION CONDITION	RESTRAINED LENGTH, L (FT)		
	PVC	DUCTILE IRON	POLY WARRPPED DUCTILE
6 INCH DIAMETER			
DEAD END / TEE	40	25	73
90° HORIZONTAL BEND	15	12	17
45° HORIZONTAL BEND	6	5	7
22.5° HORIZONTAL BEND	3	3	4
11.25° HORIZONTAL BEND	2	2	2
8 INCH DIAMETER			
DEAD END / TEE	53	33	95
90° HORIZONTAL BEND	19	16	22
45° HORIZONTAL BEND	8	7	10
22.5° HORIZONTAL BEND	4	4	5
11.25° HORIZONTAL BEND	2	2	3
12 INCH DIAMETER			
DEAD END / TEE	74	46	134
90° HORIZONTAL BEND	26	22	31
45° HORIZONTAL BEND	11	9	13
22.5° HORIZONTAL BEND	6	5	6
11.25° HORIZONTAL BEND	3	3	3



TYPICAL TEE CONNECTION



TYPICAL DEAD END CONNECTION

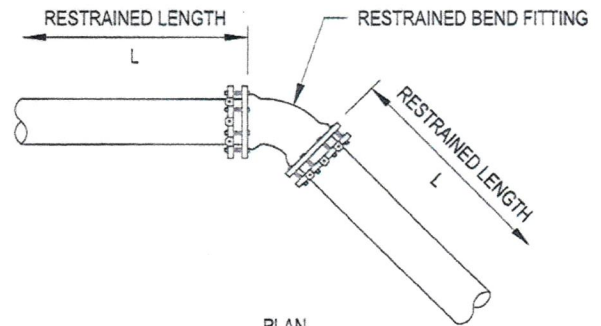
TABLE 2.2 - CALCULATION ASSUMPTIONS

CONDITION	VALUE
LAYING CONDITION	TYPE 4
SOIL CLASSIFICATION	GOOD SAND (GW)
DEPTH OF COVER	3 FEET
DESIGN/TEST PRESSURE	200 PSI ¹
OPERATING PRESSURE	VARIES PER PLAN
NEAREST RUN JOINT FOR TEE	1 FOOT
SAFETY FACTOR	1.0 ²

¹ RESTRAINED LENGTHS FOR TEES CALCULATED USING EQUAL RUN AND BRANCH DIAMETERS.

² RESTRAINED LENGTHS CALCULATED USING SAFETY FACTOR = 1.0. WHEN A DIFFERENT SAFETY FACTOR IS TO BE USED, MULTIPLY RESTRAINED LENGTHS BY THAT SAFETY FACTOR.

NOTE: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE INFORMATION SHOWN HEREON PRIOR TO ITS USE.



PLAN

TYPICAL HORIZONTAL BEND CONNECTION

DATE	NO.	REVISION / NOTE	BY
		ORIGINAL DRAWING ISSUED	AJS



RESTRAINED LENGTH TABLES
HORIZONTAL

APPROVED BY :

DATE : 20

DES: AJS
D: SEM
T:
C:

SCALE: NONE
DATE:
APP:

SHEET NO. 1 OF 2

WT-6

Water Resources Engineer

TABLE 3.1 - VERTICAL OFFSET

DEFLECTION ANGLE	VERTICAL OFFSET, H (FT)	RESTRAINED LENGTH, L1 (FT)			RESTRAINED LENGTH, L2 (FT)		
		PIPE MATERIAL* A	B	C	PIPE MATERIAL* A	B	C
6 INCH DIAMETER							
45° VERTICAL BEND	1				5	4	6
	2	17	11	30	4	3	5
	3				4	3	4
22.5° VERTICAL BEND	1				3	2	3
	2	8	5	15	2	2	3
	3				2	2	2
11.25° VERTICAL BEND	1				2	1	2
	2	4	3	8	1	1	2
	3				1	1	1

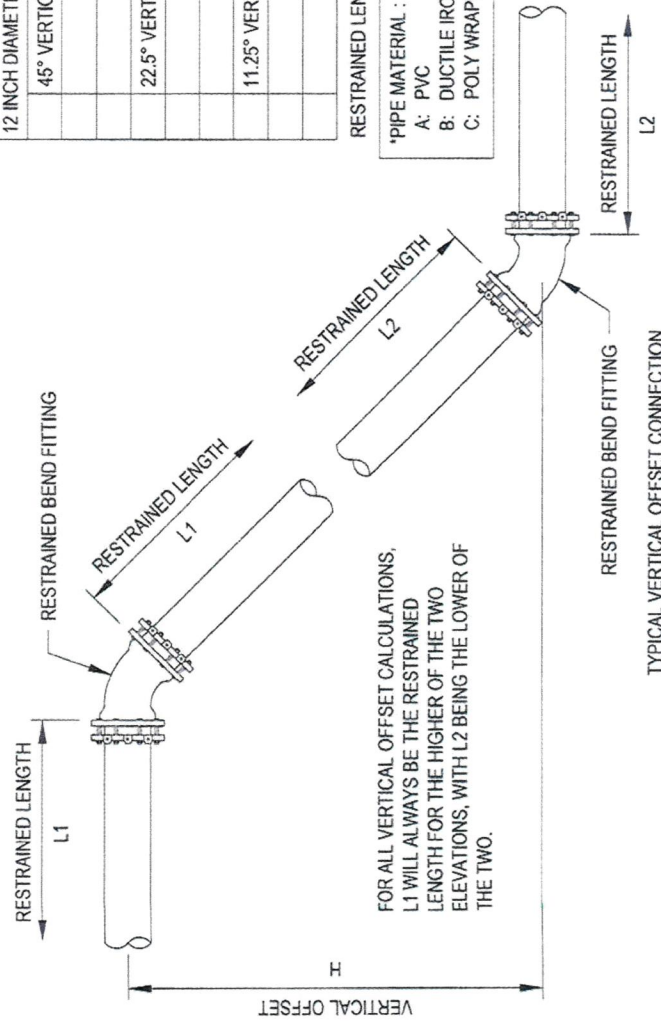
TABLE 3.1 - VERTICAL OFFSET (CONTINUED)

DEFLECTION ANGLE	VERTICAL OFFSET, H (FT)	RESTRAINED LENGTH, L1 (FT)			RESTRAINED LENGTH, L2 (FT)		
		PIPE MATERIAL* A	B	C	PIPE MATERIAL* A	B	C
8 INCH DIAMETER							
45° VERTICAL BEND	1				6	5	7
	2	22	14	40	5	4	6
	3				4	4	5
22.5° VERTICAL BEND	1				3	3	4
	2	11	7	19	3	2	3
	3				2	2	3
11.25° VERTICAL BEND	1				2	2	2
	2	6	4	10	2	1	2
	3				1	1	2
12 INCH DIAMETER							
45° VERTICAL BEND	1				9	7	10
	2	31	19	56	7	6	8
	3				6	5	7
22.5° VERTICAL BEND	1				4	4	5
	2	15	10	27	4	3	4
	3				3	3	4
11.25° VERTICAL BEND	1				2	2	3
	2	8	5	14	2	2	2
	3				2	2	2

RESTRAINED LENGTHS CALCULATED USING ASSUMPTIONS FROM TABLE 2.2 ON SHEET 1 OF SMMW-7.

*PIPE MATERIAL :
 A: PVC
 B: DUCTILE IRON
 C: POLY WRAPPED DUCTILE

NOTE: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE INFORMATION SHOWN HEREON PRIOR TO ITS USE.



TYPICAL VERTICAL OFFSET CONNECTION

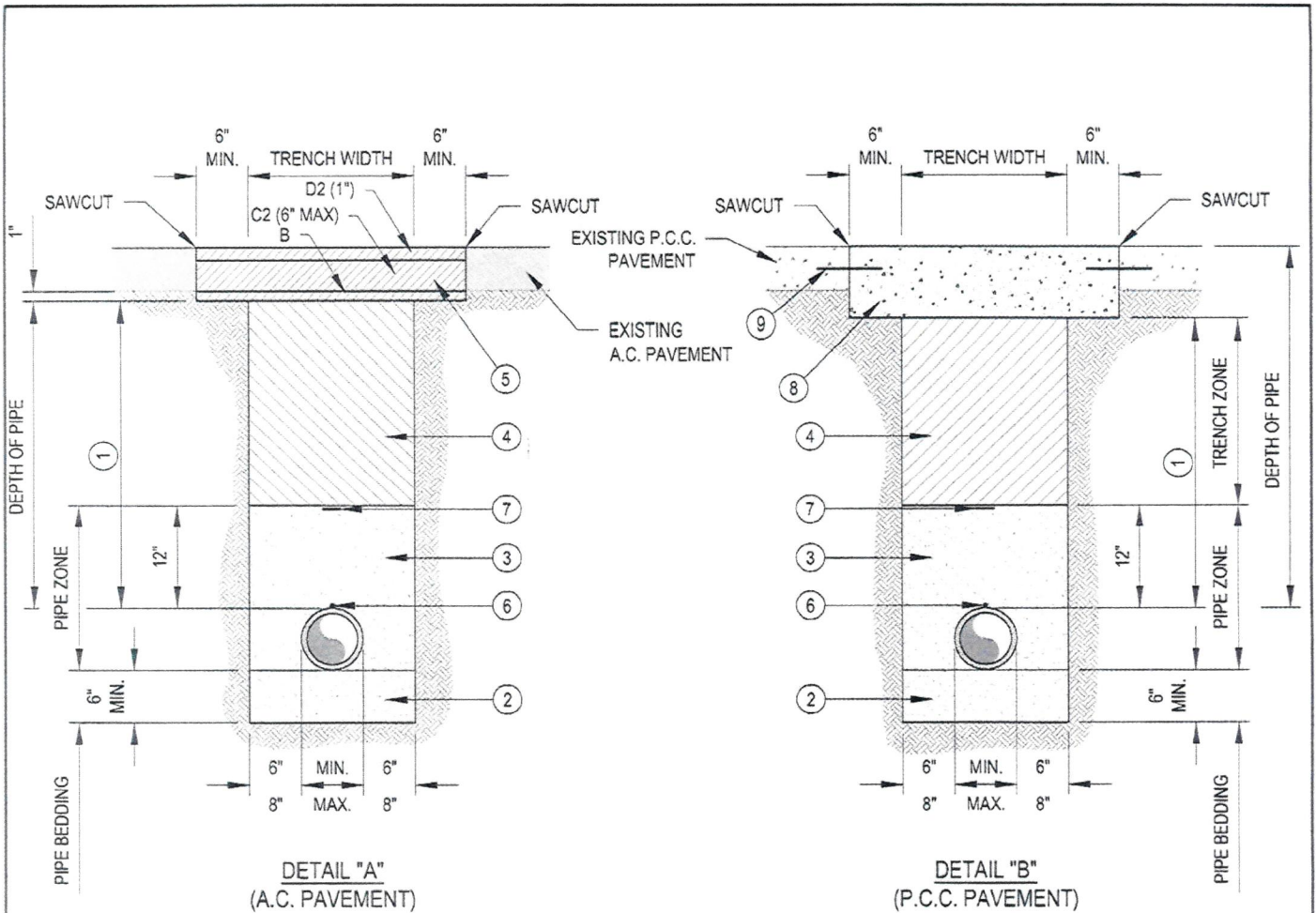


RESTRAINED LENGTH TABLES
 VERTICAL

DES: AJS
 SCALE: NONE
 DATE: APP.
 SHEET NO. 2 OF 2
WT-6

DATE	NO.	REVISION / NOTE	BY


ORIGINAL DRAWING ISSUED
 AJS



ITEM NO.	DESCRIPTION
①	IF COVER TO NEW PIPE IS LESS THAN 36", CITY ENGINEER WILL SPECIFY SPECIAL BEDDING AND BACKFILL REQUIREMENTS
②	6" SAND BEDDING PER SSPWC 306-1.2.1 UNLESS OTHERWISE APPROVED BY THE CITY
③	SAND BACKFILL COMPACTED TO 90% RELATIVE COMPACTION UNLESS OTHERWISE APPROVED BY THE CITY. JETTING IS NOT ALLOWED.
④	ALL BACKFILL SHALL BE MINIMUM 1-SACK SAND-CEMENT SLURRY, CRUSHED MISCELLANEOUS BASE (CMB), DECOMPOSED GRANITE (DG), MECHANICALLY DENSIFIED TO 90% RELATIVE COMPACTION FROM BOTTOM OF TRENCH TO 8" BELOW PAVEMENT. THE TOP 8" SUBGRADE SHALL BE COMPACTED TO 95% RELATIVE COMPACTION. CONTRACTOR TO PROVIDE TEST REPORTS AS EVIDENCE OF PROPER COMPACTION.
⑤	PAVE 6" (OR EXISTING PAVEMENT THICKNESS PLUS 1", WHICHEVER IS GREATER) WITH D2-PG-6410, C2-PG-6410 A.C, B-PG-6410 REFER TO APWA STD PLAN 132-3 AND 133-3
⑥	TRACER WIRE SECURED TO PIPE WHEN APPLICABLE (NOT NECESSARY FOR DIP)
⑦	WARNING/IDENTIFICATION TAPE
⑧	PLACE 8" P.C.C. CLASS 520-A-2500 (OR EXISTING PAVEMENT THICKNESS PLUS 1", WHICHEVER IS GREATER) TO NEAREST SCORE LINE REFER TO APWA STD PLAN 132-3
⑨	#4 DOWEL AT 24" O.C. TO EXISTING PAVEMENT, CONTACT CITY ENGINEER'S OFFICE FOR DOWELING SPECIFICATIONS.

NOTE: IF PAVEMENT CRACKS ARE EVIDENT NEAR TRENCH, CONTRACTOR IS REQUIRED TO OVERCUT THESE CRACKS IN FULL PAVEMENT THICKNESS.

DATE	NO.	REVISION / NOTE	BY
		ORIGINAL DRAWING ISSUED	AJS

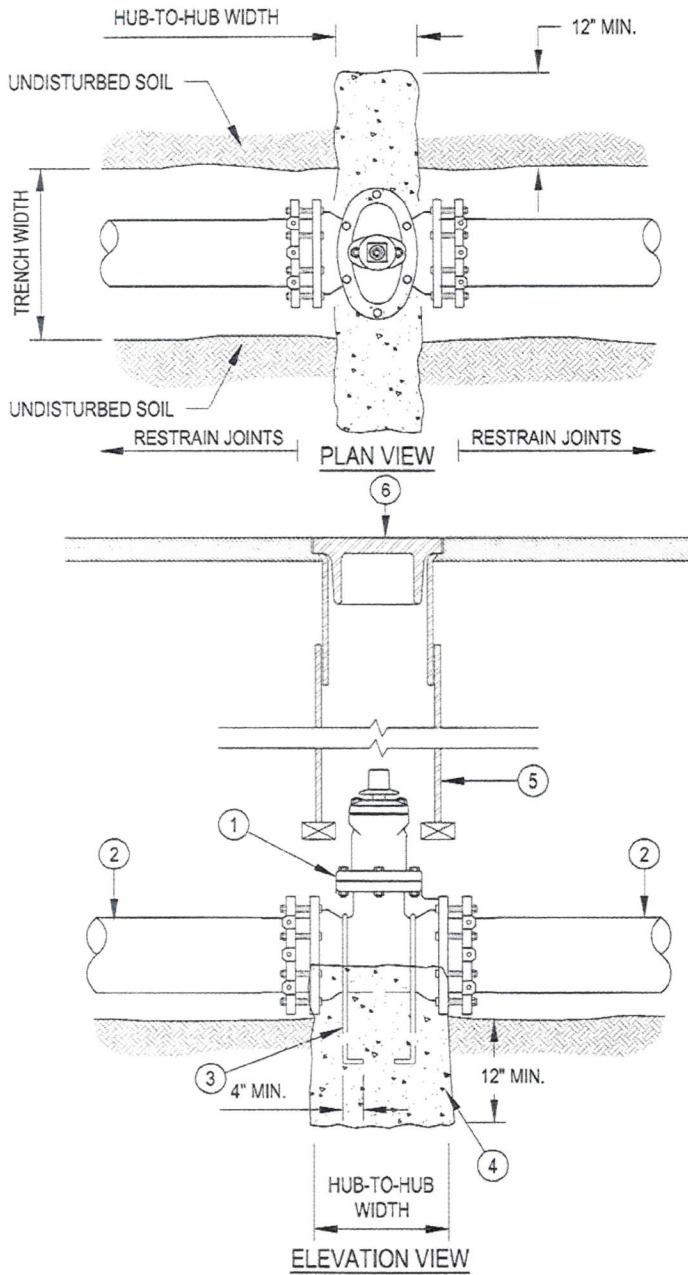


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EL SEGUNDO**

WATER MAIN TRENCH DETAIL

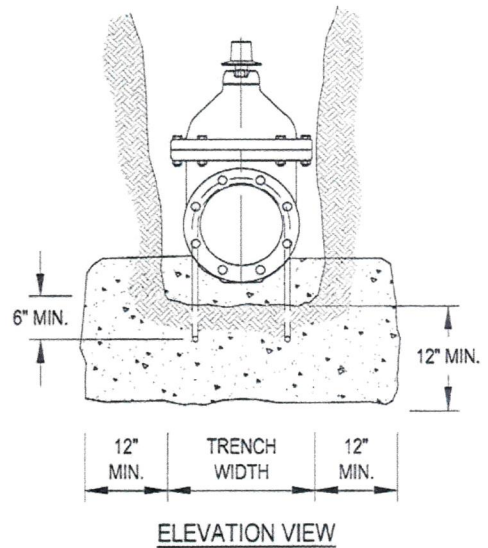
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Water Resources Engineer



NOTES:

1. VALVE STEM EXTENSION NOT SHOWN.
2. VALVE ANCHOR REQUIRED ON ALL VALVES OVER 6" AND ALL VALVES AT DEAD ENDS.
3. ANCHOR STRAPS SHALL BE EMBEDDED DIRECTLY INTO THE CONCRETE THRUST BLOCK.
4. CONCRETE THRUST BLOCKS SHALL CONFORM TO STATE STANDARD 90-1.01, 470 LBS/CY CEMENTITIOUS MATERIAL (5-SACK) AND BE POURED AGAINST UNDISTURBED NATIVE SOIL.
5. ALL VALVES SHALL CONFORM TO SPECIFICATIONS FOR GATE VALVES FOR WATER WORKS SERVICE PER AWWA STANDARD 509-80.
6. 8" VALVE WELL RISER AND CAP SHALL BE USED FOR ALL GATE VALVES.



ITEM	MATERIAL
①	DUCTILE IRON RESILIENT WEDGE GATE VALVE (MJ x MJ)
②	NEW WATER MAIN
③	ANCHOR STRAPS (REBAR NO. 4)
④	CONCRETE THRUST BLOCK
⑤	VALVE RISER. SEE SHEET WT-10 (SHEET NO. 2/2)
⑥	VALVE AND CAP. SEE SHEET WT-10 (SHEET NO. 2/2)

DATE	NO.	REVISION / NOTE	BY
		ORIGINAL DRAWING ISSUED	AJS

APPROVED BY: _____ DATE: 20

Water Resources Engineer



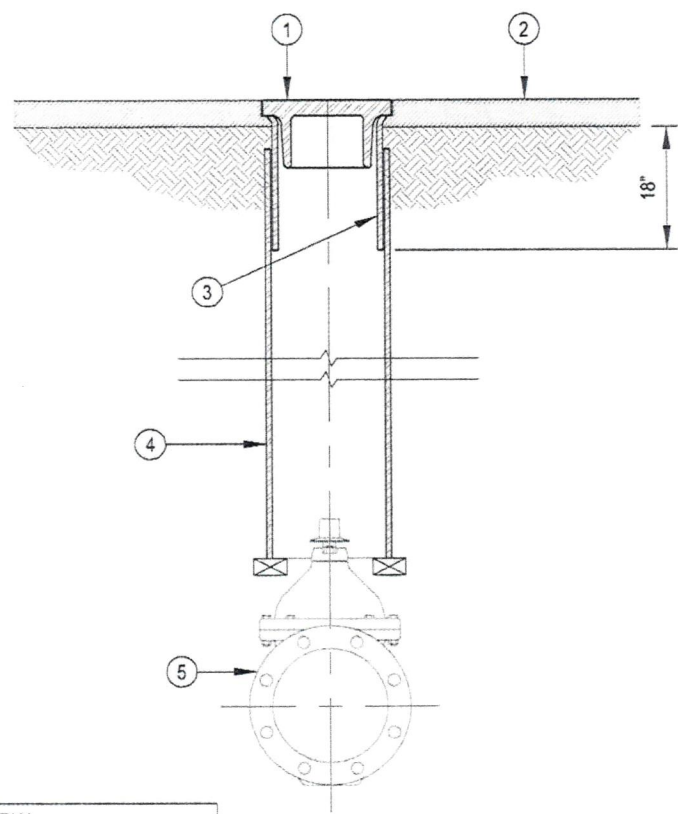
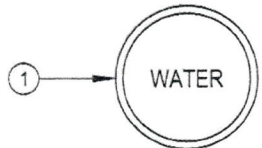
NEW GATE VALVE INSTALLATION

DES: AJS
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SCALE: NONE
 DATE:
 APP:

SHEET NO. 1 OF 2

WT-10



ITEM	MATERIAL
①	TRAFFIC RATED CAST IRON LID (SIGMA VB 4884, OR APPROVED EQUAL), CAST WITH THE WORD "WATER", AND PAINTED PER PAINT SCHEDULE,
②	PARKWAY GRADE OR A.C. PAVED SURFACE.*
③	ADJUSTABLE GALVANIZED VALVE CAN
④	8" DIP OR PVC EXTENSION VALVE RISER**
⑤	GATE VALVE PER WT-10 (SHEET NO. 1)

PAINT SCHEDULE	
CONDITION	COLOR
MAIN LINE VALVE CAPS	SAIL BLUE (RUST-OLEUM #7724)
FLUSHOUT, AIR RELIEF DETECTOR, CHECK, AND LARGE METER VALVE CAPS	
NORMALLY CLOSED VALVE CAPS	BLUE/RED (RUST-OLEUM #964)
ZONE VALVE CAPS	BLUE/YELLOW (RUST-OLEUM #944)
FIRE HYDRANT VALVE CAPS	
URBAN TREATED RUNOFF	PURPLE (RUST-OLEUM #)

PERMANENT PAINT No. PENDING

* WHEN VALVE BOX IS TO BE PLACED IN A NON-PAVED AREA, CONTRACTOR SHALL CONSTRUCT A 2' x 2' x 4" A.C. PAD AROUND THE VALVE CAN.
 ** EXTENSION SHALL EXTEND UP TO 3" BELOW FINISHED SURFACE.

DATE	NO.	REVISION / NOTE	BY
		ORIGINAL DRAWING ISSUED	AJS

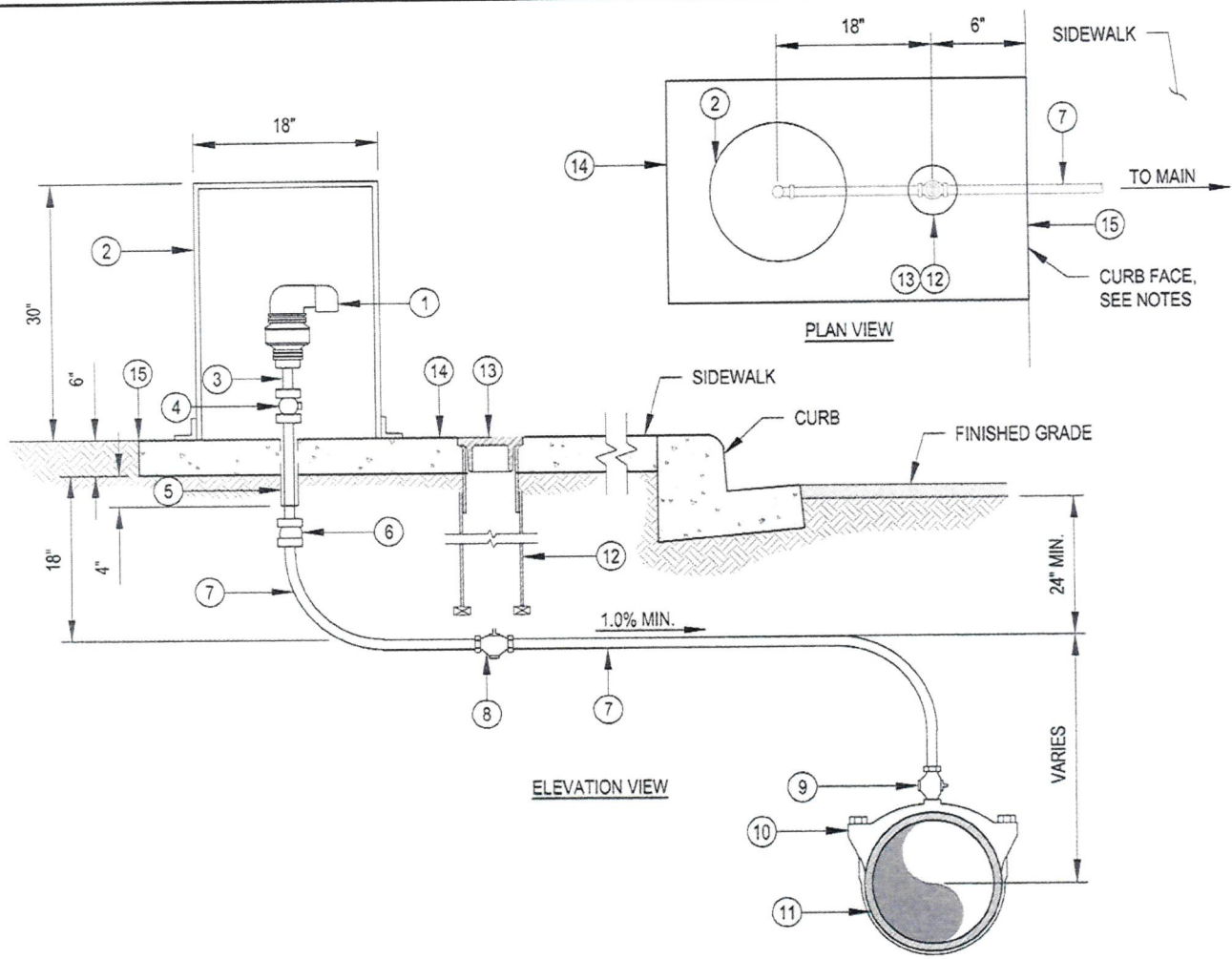


ADJUSTABLE VALVE CAN
WITH CAP IN AC PAVEMENT

APPROVED BY : _____ DATE : 20 _____
 Water Resources Engineer

DES: AJS
 D: SEM
 T:
 C:
 SCALE: NONE
 DATE:
 APP:

SHEET NO. 2 OF 2
WT-10




ITEM	MATERIAL
1	AIR RELEASE AND VACUUM VALVE (A.R.I.)
2	POLYETHYLENE AIR RELEASE VALVE ENCLOSURE, NOTE 1
3	2" x 1-1/2" PVC NIPPLE
4	2" BALL VALVE F.I.P.T. x F.I.P.T.
5	2" x 12" BRASS NIPPLE WITHIN 2" x 1/2" BLACK FOAM SLEEVE
6	2" BRASS COUPLING WITH SOLDER COUPLINGS
7	2" COPPER PIPE TYPE "K", SOFT, ENCASED IN POLY WRAP C
8	2" BALL VALVE WITH TEE HEAD, C x C SOLDER JOINTS OR F.I.P.T. x F.I.P.T.

ITEM	MATERIAL
9	2" BRONZE CORPORATION STOP, M.I.P.T. x COMP.
10	(SIZE) x 2" F.I.P.T SERVICE SADDLE
11	WATER MAIN
12	8" DUCTILE IRON, OR PVC, PIPE EXTENSION
13	VALVE BOX PER WT-10
14	42" x 30" x 6" THICK CONCRETE SLAB
15	COLD JOINT STRIP

NOTES:

1. INSTALL ENCLOSURE PER MANUFACTURER RECOMMENDATIONS
2. WHERE SIDEWALK EXISTS, AIR AND VACUUM VALVE ENCLOSURE TO BE PLACED AT BACK OF CURB FACE.
3. IF NO SIDEWALK, AIR AND VACUUM VALVE ENCLOSURE TO BE PLACED AT 24" FROM ADJACENT PROPERTY LINE.
4. ALL SERVICE LATERALS SHALL BE WRAPPED WITH POLYETHYLENE ENCASEMENT (NORTH TOWN POLY WRAP - C, OR APPROVED EQUAL).

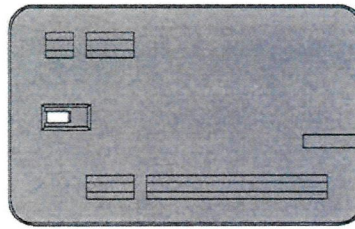
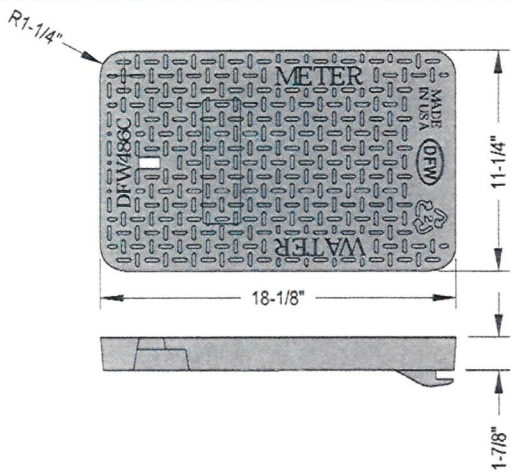
DATE	NO.	REVISION / NOTE	BY
		ORIGINAL DRAWING ISSUED	AJS



**1-INCH & 2-INCH
AIR AND VACUUM
RELEASE**

APPROVED BY: _____	DATE: 20__	DES: AJS D: SEM T: C:	SCALE: NONE DATE: APP:	SHEET NO. 1 OF 1 WT-11
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Water Resources Engineer

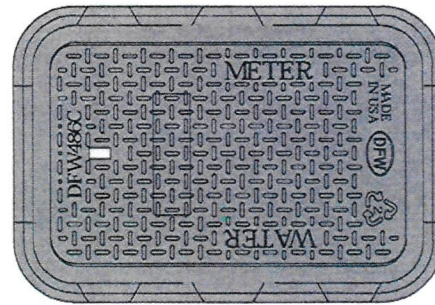


DFW486C-4-LID

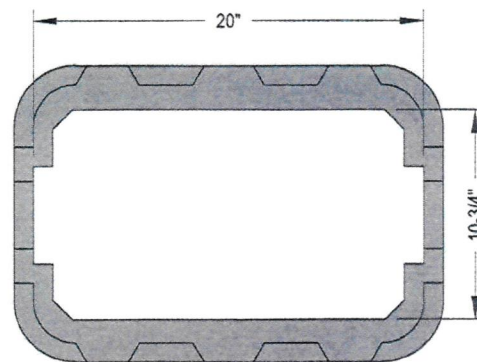
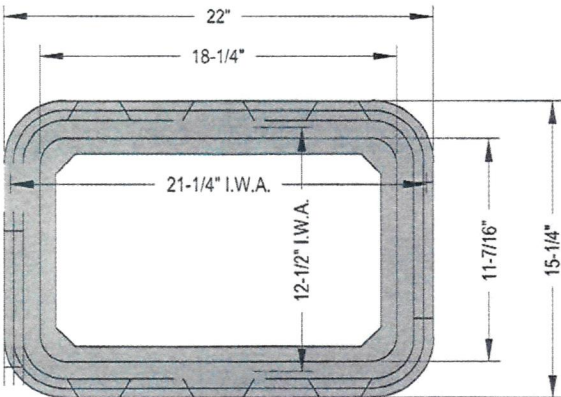
BODY KEY	
WB	WIDE BODY SERIES
C	CONCRETE SERIES
4	GRAY COLOR - PMS 414C
12	12" BODY DEPTH

LID KEY	
4	GRAY COLOR - PMS 414C

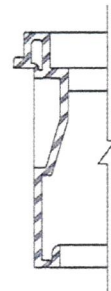
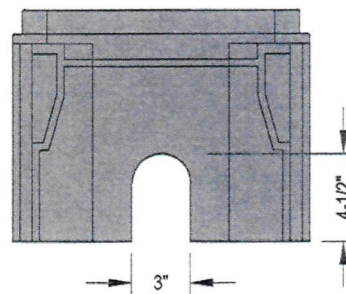
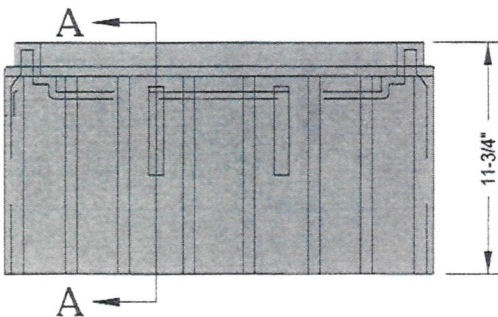
- NOTES
- 1) DIM'S ± 1/8" U.N.O.
 - 2) LID MATERIAL: HDPE
 - 3) BODY MATERIAL: LLDPE
 - 4) WALL THICKNESS: 3/8" MINIMUM
 - 5) I.W.A. = INSIDE WORK AREA



DFW486WBC4-12-4



DFW486WBC4-12-BODY



KISS OFF DETAIL SECTION A-A

DFW PLASTICS, INC. ENGAGES IN ONGOING RESEARCH AND DEVELOPMENT TO IMPROVE AND ENHANCE ITS PRODUCTS. THEREFORE, DFW PLASTICS, INC. RESERVES THE RIGHT TO CHANGE PRODUCT OR SYSTEM SPECIFICATIONS WITHOUT NOTICE.

CONFIRM METER BOX AND LID WITH WATER RESOURCES METER SHOP AT (310) 524-2745 PRIOR TO PURCHASE.

DATE	NO.	REVISION / NOTE	BY

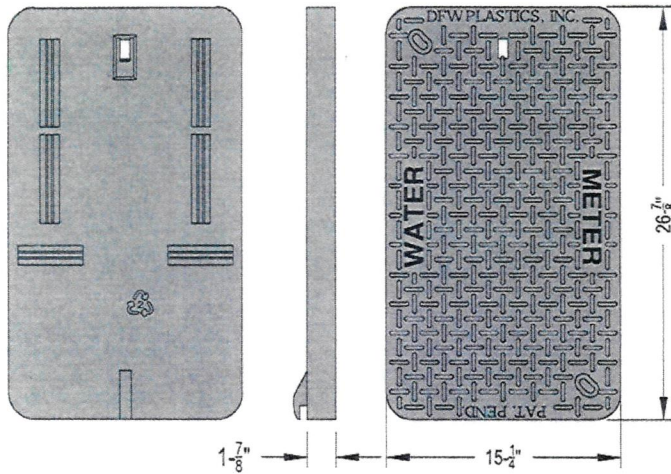


TO BE USED FOR:
3/4-INCH & 1-INCH METERS

APPROVED BY: _____ DATE: 20 _____
Water Resources Engineer

DES: AJS
D: SEM
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C:
SCALE: NONE
DATE:
APP:

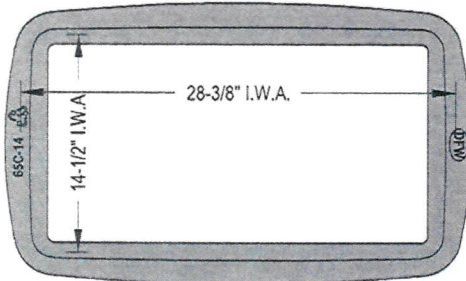
SHEET NO. 1 OF 3
WT-12



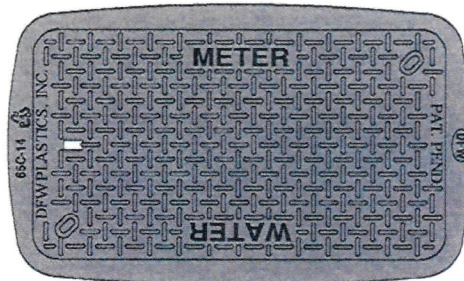
DFW65C-4-LID

BODY KEY	
4	HEAVY WALL, 1/2"
LID KEY	
H	GRAY COLOR

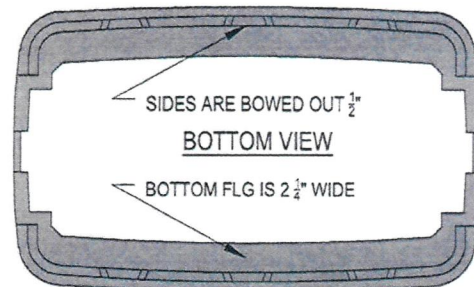
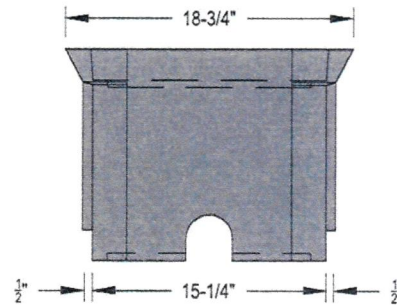
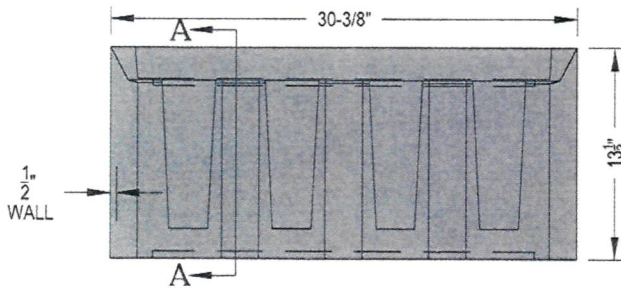
- NOTES**
- 1) DIM'S ± 1/8" U.N.O.
 - 2) LID MATERIAL: HDPE
 - 3) BODY MATERIAL: LLDPE
 - 4) WALL THICKNESS: 1/2" MINIMUM
 - 5) I.W.A. = INSIDE WORK AREA



DFW65CH4-14-BODY



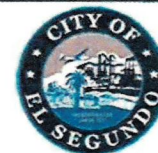
DFW65CH4-14-4



CONFIRM METER BOX AND LID WITH WATER RESOURCES METER SHOP AT (310) 524-2745 PRIOR TO PURCHASE.

DFW PLASTICS, INC. ENGAGES IN ONGOING RESEARCH AND DEVELOPMENT TO IMPROVE AND ENHANCE ITS PRODUCTS. THEREFORE, DFW PLASTICS, INC. RESERVES THE RIGHT TO CHANGE PRODUCT OR SYSTEM SPECIFICATIONS WITHOUT NOTICE.

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		ORIGINAL DRAWING ISSUED	AJS



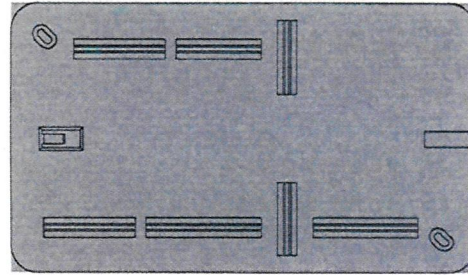
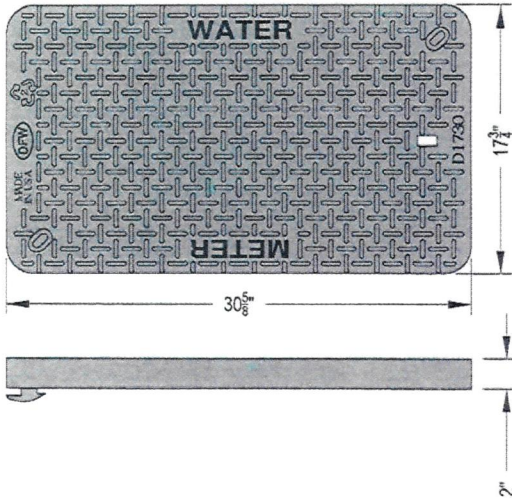
TO BE USED FOR:
1-1/2-INCH & 2-INCH METERS

APPROVED BY: _____ DATE: 20
Water Resources Engineer

DES: AJS
D: SEM
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SCALE: NONE
DATE:
APP:

SHEET NO. 2 OF 3

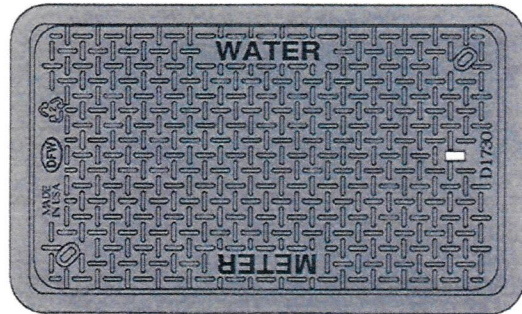
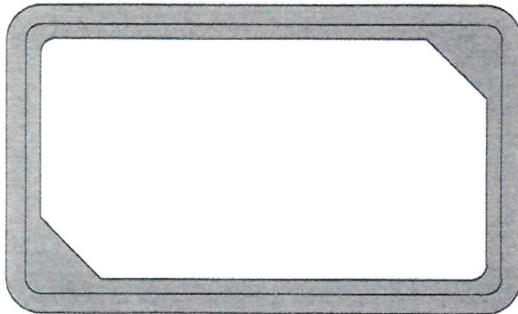
WT-12



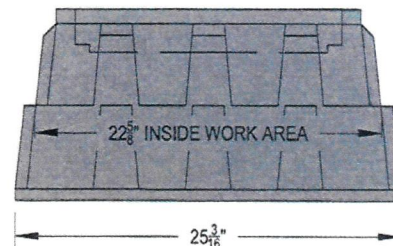
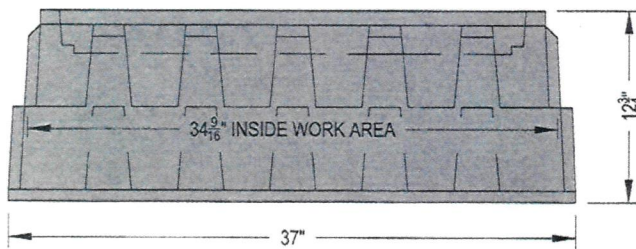
DFW1730C-4-LID

LID KEY

4 | GRAY COLOR



DFW1730FH4-12-4



DFW1730FH4-12-BODY

NOTES

- 1) DIM'S ± 1/8" U.N.O.
- 2) LID MATERIAL: HDPE
- 3) BODY MATERIAL: LLDPE
- 4) WALL THICKNESS: 1/2" ± 5%
- 5) I.W.A. = INSIDE WORK AREA

CONFIRM METER BOX AND LID WITH WATER RESOURCES METER SHOP AT (310) 524-2745 PRIOR TO PURCHASE.

DFW PLASTICS, INC. ENGAGES IN ONGOING RESEARCH AND DEVELOPMENT TO IMPROVE AND ENHANCE ITS PRODUCTS. THEREFORE, DFW PLASTICS, INC. RESERVES THE RIGHT TO CHANGE PRODUCT OR SYSTEM SPECIFICATIONS WITHOUT NOTICE.

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		ORIGINAL DRAWING ISSUED	AJS



TO BE USED WITH MANIFOLD TYPE METER INSTALLATIONS

APPROVED BY :

DATE : 20

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D: SEM
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C:

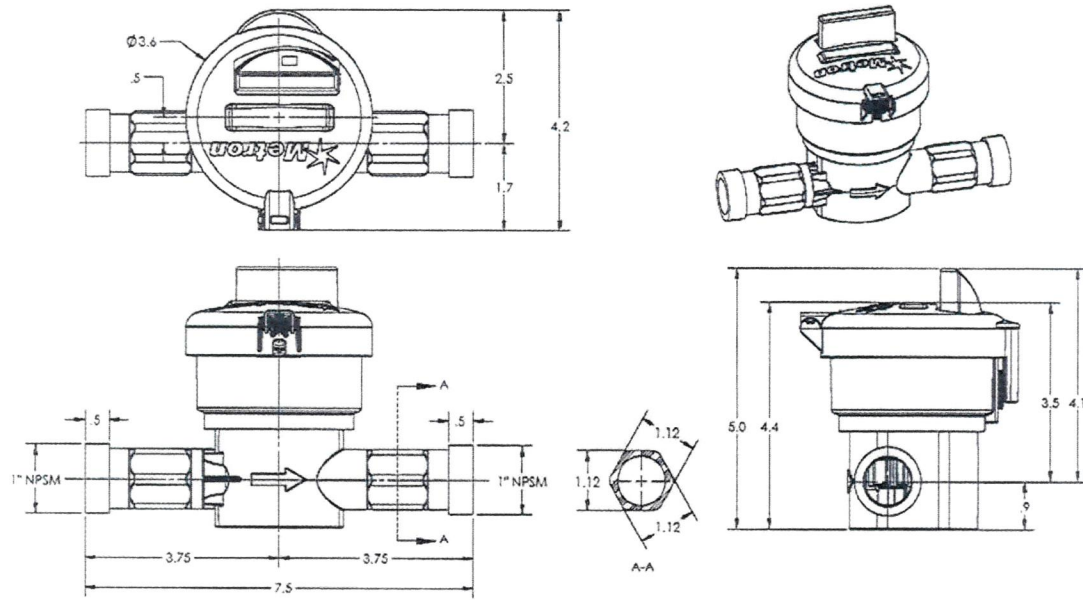
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SHEET NO. 3 OF 3

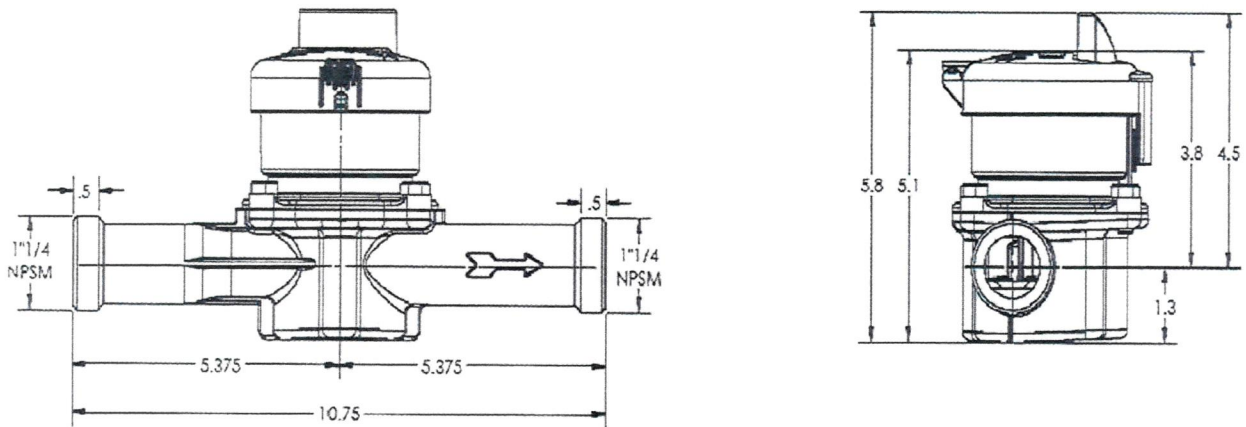
WT-12

Water Resources Engineer

METRON-FARNIER SPECTRUM
30D AND 30DB - 5/8" X 3/4"



METRON-FARNIER SPECTRUM 50DL - 1"

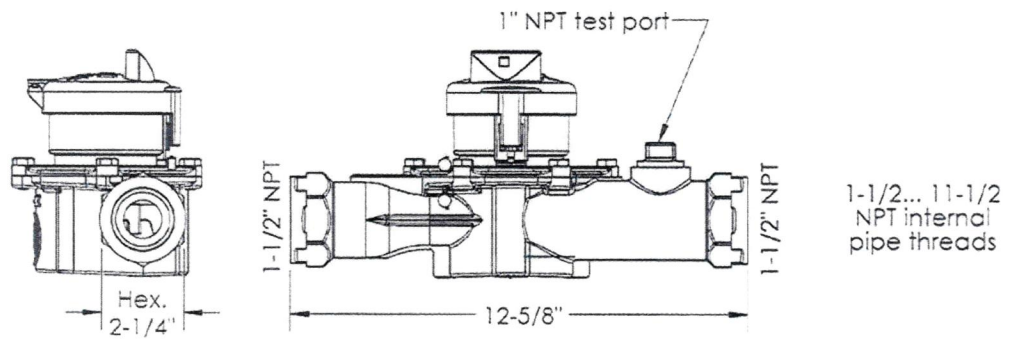
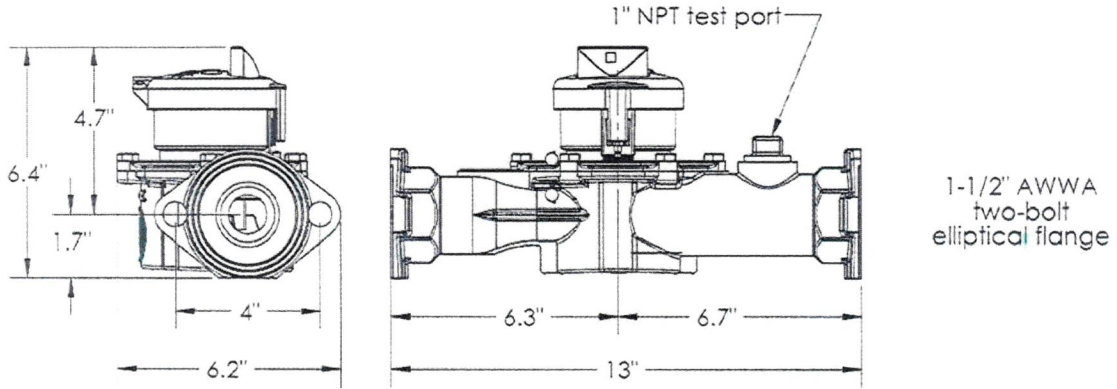


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APPROVED BY:		DATE: 20	DES: JEP D: TPF T: C:
Water Resources Engineer		SCALE: NONE	DATE: APP:
			SHEET NO. 1 OF 3
			WT-13

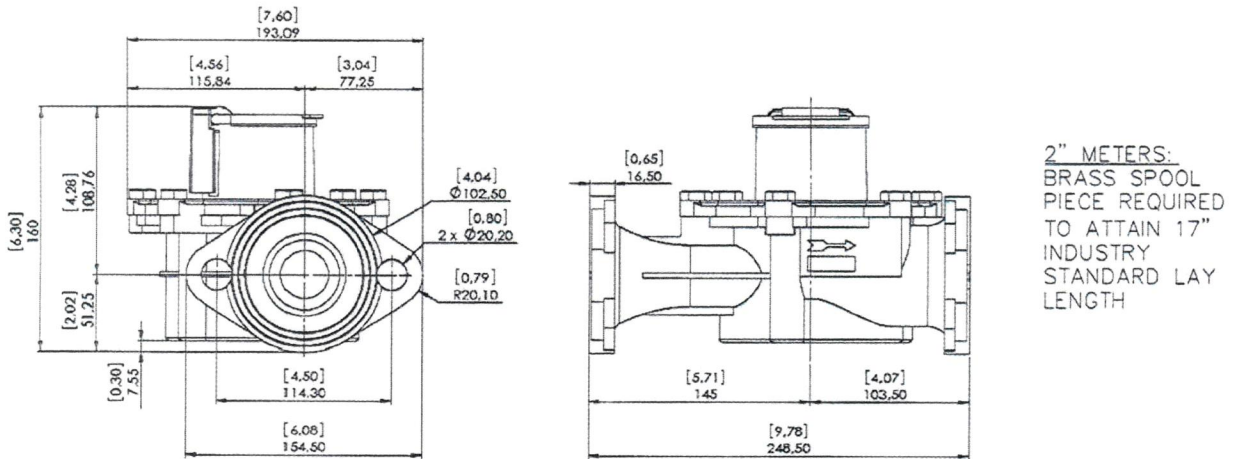


5/8"x3/4" & 1" WATER METERS


METRON-FARNIER
SPECTRUM 88DL- 1.5"



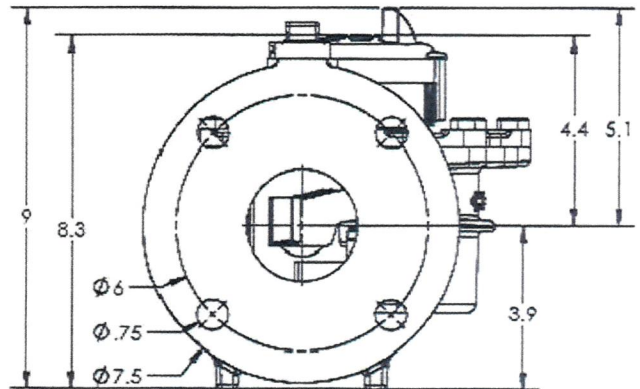
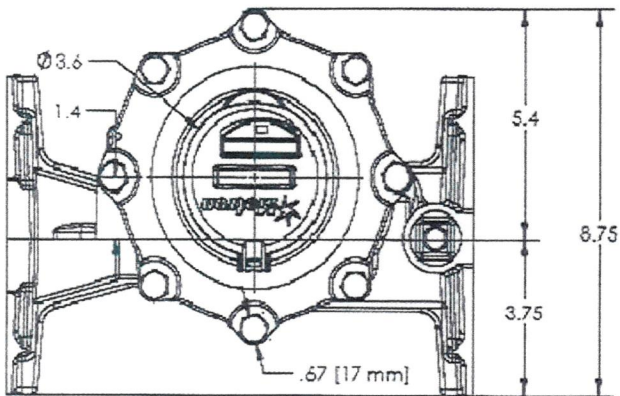
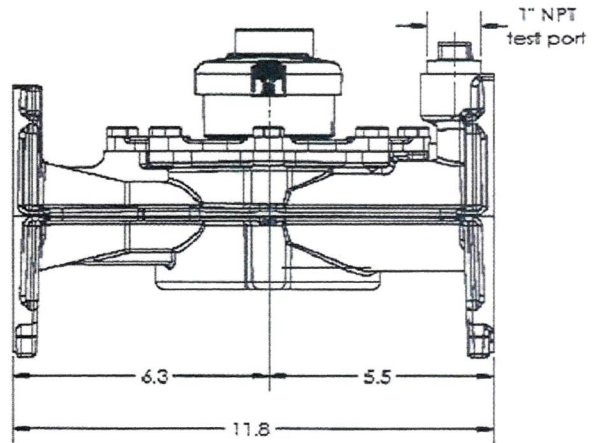
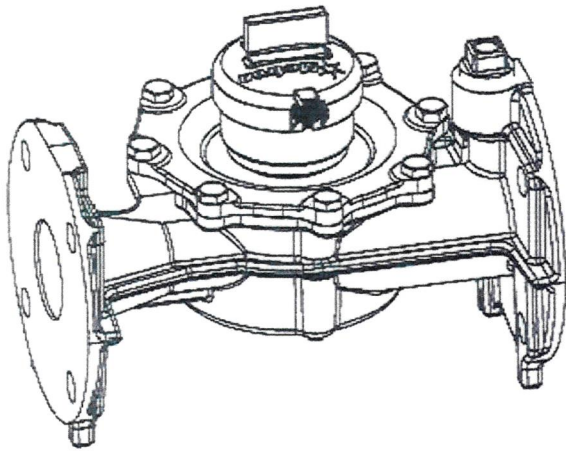
METRON-FARNIER
SPECTRUM 130D - 2"



NOTES:
THE SPECTRUM 130D COME IN A LAY LENGTH SHORTER THAN THE STANDARD AWWA LENGTHS. BRASS SPOOLS AND ADAPTERS ARE AVAILABLE TO ACCOMMODATE COMMON FLANGED AND THREADED LAY LENGTHS.

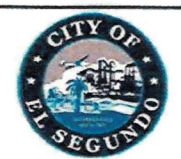
DATE	NO.	REVISION / NOTE	BY		1-1/2" & 2" WATER METERS
APPROVED BY:			DATE: 20	DES: JEP D: TPF T: C:	SCALE: NONE
Water Resources Engineer					DATE: APP:
					SHEET NO. 2 OF 3
					WT-13

METRON-FARNIER
SPECTRUM 175D (3")



NOTES:
ALL D MODELS HAVE INTEGRAL FLANGES AND
OFFER MULTIPLE BRASS SPOOL/ADAPTER
OPTIONS FOR STANDARD AWWA LAY LENGTHS.

DATE	NO.	REVISION / NOTE	BY
		ORIGINAL DRAWING ISSUED	AJS



3" WATER METERS

APPROVED BY: _____ DATE: 20____
Water Resources Engineer

DES: JEP
D: TPF
T:
C:
SCALE: NONE
DATE:
APP:

SHEET NO. 3 OF 3
WT-13

CITY OF EL SEGUNDO APPROVED MATERIALS LIST FOR
USE ON CONSTRUCTION OF POTABLE WATER FACILITIES

NO.	ITEM	DESCRIPTION	MANUFACTURER/MODEL
1-1	AIR/VACUUM VALVE greater than 2-inch	Epoxy coated/lined. Stainless steel hardware/ PVC	ARI D-060 or ARI D-040
1-2	AIR/VACUUM VALVE ABOVE GRADE ENCLOSURE	Air-Vacuum Valve Assembly. "Valve Box" for below grade components	Pipeline Products VCAS 1830 4", Color shall be Granite
			Pipeline Products VCAS 2436 6-8 inch, Color shall be Granite
1-3	ANGLE METER STOPS 1-inch - Compr. x Swivel Meter Nut, Flare. x Swivel Meter Nut	1" Bronze Angle Meter Stop (Ball Valve) with 90 Degree Lock Wing, Compr.(Flare) x Outlet Swivel Meter Nut	Mueller B-24258 N-3
			Mueller B-24255 N-3
			Jones E-1963 WSG L/S
			Jones E-1964 W L/S
1-4	ANGLE METER STOPS 2-inch - Compr. x Meter Fig, Flare. x Meter Fig	2" Bronze Angle Meter Stop (Ball Valve) with 90 Degree Lock Wing, Compr. x Outlet Meter Flange	Mueller B-24276 N-3
			Mueller B-24286 N-3
			Jones E-1975WSG L/S
			Jones E-1974WSG L/S
1-5	BACKFLOW PREVENTER (R.P.)	Reduced Pressure Principal Type Assemblies; Double Check, Valve Detector Assemblies for Fire Sprinkler Systems	List of Approved Assemblies by USC Foundation for Cross-Connection Control And Hydraulic Institute.
1-6	1" and 2" BALL CORPORATION STOP, MIP x Compression	Bronze Compression x MIP Thread Ball Valve 1" and 2" Full Opening, Ball Corp. and Saddle shall be constructed by same manufacturer.	Mueller B-25028 N
			Jones E-1935SG
1-7	Inline BALL Valves, FIP x FIP	FIP (NPT) Ball Valve	Mueller B-20200-N - 3 (1" - 2")
1-8	Meter Fittings	Fittings required to connect ball valve to various meter sizes, Swivel end, flanged end	Mueller H10890N
			Mueller H1088900N
			Mueller H10129N
1-9	BOLTS AND NUTS	Bolts and nuts shall be 316 Stainless Steel	T316 SS Hex Bolt
			T316 SS Hex Nut
			T316 SS Hex Washers

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NO.	ITEM	DESCRIPTION	MANUFACTURER/MODEL
2-1	CASING END SEAL	1/4" Thick Styrene Butadiene Rubber Sheet End Seal. Use 1" Wide Stainless Steel Bands. Zippered End Seals with Stainless, Steel Bands may also be used.	Advanced Products & Sys.
			Cascade
			Calpico
			Pipeline Seal & Insulator
			Powerseal
2-2	CASING SPACER	Stainless Steel Casing Spacer, Center Restrained, Position Type with PVC Liner and Non-metallic Anti-friction Runners	Advanced Products & Sys.
			Cascade
			Calpico
			Pipeline Seal & Insulator
			Powerseal
2-3	Chlorine	Sodium Hypochlorite Solution. Per City Specifications	
2-4	COATING, WATERPROOF	Epoxy Resin Based Cementitious Trowel Grade protective, waterproofing for concrete	Sika Top Seal 107
			STO CR 241
2-6	COUPLING, TRANSITION FLEXIBLE	4" and Larger Steel or Ductile Iron Construction, Slip x Slip, Epoxy Coated with 304 or 316 Stainless Steel Bolts and Nuts. For use on AC, PVC, DI, or Steel Pipe. Proper coupling shall be used for each type pipe	Ford FC1, FC2A, FC2W
			Romac 501, XR 501, Macro HP
			JCM 215 Long DI Coupling Cat. No. 215-0905
			Smith-Blair 441-442, 461
			JCM 210 DI Coupling
2-7	COUPLING, TRANSITION RESTRAINED	For use on AC, PVC, DI, or Steel Pipe, Contractor shall be responsible for providing the proper couplings for each type of connection	EBAA Inc. Series 3800
			Smith-Blair 473
			JCM 241 or 242 with JCM 630 AC Pipe
2-8	FLANGED COUPLING, ADAPTERS RESTRAINED		EBAA Inc. Series 2100
			Romac RFCA for PVC Pipe
			Star Products Pipe Restrainers Series 1100
2-9	FITTING, PIPE RESTRAINT	Mechanical Joint and Pushout Joint Restraint AWWA PVC and Ductile Iron Pipe	EBAA Inc. Series 1100 (Ductile Iron)
			Field Lok Gaskets
2-10	BEND, BURY, DUCTILE IRON	6" Ductile Iron Bury Bends, Long Radius, Flg x MJ/PO (Use of Short Radius Bury Bends with City Engineer Approval Only)	Star
			Sigma
			Tyler
			Clow
			South Bay Foundry
2-15	EPOXY ADHESIVE	High-Modulus, Low Viscosity, Epoxy Resin Based Adhesive suitable for Grouting Bolts or Dowels	Sika Sikadur 31
3-1	FIRE HYDRANT	6" Standard 150 PSI Wet Barrel Ductile Iron Fire	Sika Sikadur 35
			Clow 2050, Clow 2065

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NO.	ITEM	DESCRIPTION	MANUFACTURER/MODEL
3-2	Fire Hydrant Check Valve	Fire Hydrant Check Valve	Clow LBI 400A or Mueller J6000
3-3	FIRE HYDRANT, 200 PSI or Higher	Project Specification Submittal Required	
3-4	FITTING, DUCTILE IRON	Flanged, Mechanical, Joint or Push-on Tees, Bends, Crosses, Reducers, Adapters, etc., for Water Lines 4" and larger. Manufactured per AWWA C110 and C153. Double Cement Mortar Lined.	Griffin
			Nappco/Sigma
			Star
			Tyler
3-7 Not Used			
			US Pipe Full Face Flange-Tyte Gasket
			Calpico

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NO.	ITEM	DESCRIPTION	MANUFACTURER/MODEL
3-6	GASKET	1/8" Thick Full Face or Ring, Aramid Fiber Bound with Nitrile. No Asbestos Content (KEEP NSF 61 approved gaskets)	Garlock 3000
			Johns-Manville
			Klinger 4401
			PSI NSF Approved
			Tripac 2000
			Tripac 5000
			JM Clipper Gaskets 660 and 880
			US Pipe Flange-Tyte Gasket
3-7	GASKET, JOINT RESTRAINT	Rubber Ring Type with Stainless Steel Locking Segments Vulcanized into the Gasket. For use on PVC Carrier and Casing Pipes.	US Pipe Field Lok 350
3-8	GASKET, RUBBER RING	3mm (1/8") Thick, Rubber Ring Type, 1.72 Mpa (250 PSI) Maximum. For 100mm (4") through 900mm (36") Pipe Flanges	Calpico
			Johns-Manville
			US Pipe
3-9	GREASE	For Bolt Corrosion Protection on Buried Bolts, NO-OX-ID Type	Sanchem NO-OX-ID
			Dearborn Chemical
3-12	JOINT SEALING COMPOUND, PLASTIC ROPE	For use on Pre-cast Vault and Manhole in Grooved Joints between sections	Quickset Joint Sealing Compound
3-10	LUBRICANT, PIPE GASKET	Rubber Gasket Pipe Lubricant for use on PVC or ductile Iron Pipe Joints, NSF Listing required.	Whitlam Blue Lube
			Phoenix
3-11	METER	Supplied by Contractor	Per City Specification. Metron Farnier
4-1	METER BOX AND LID	1" Meter or smaller - Meter Box - 15-1/4" x 22" x 11-3/4" (Incidental/Alley)	Brooks 37MB
			J&R Concrete Products: No.W4-1/2
4-2	METER BOX AND LID	1-1/2" to 2" Meter - Meter Box - 18-3/4" x 30-3/8" x 13-1/2" (Incidental/Alley)	Brooks 38MB
			J&R Concrete Products: No.W5-1/4
			DFW: DFW65CH4-14-4
4-3	METER BOX AND LID	To Be Used With Manifold Type Meter Installations - Meter Box - 15-3/16" x 37" x 12-3/4" (Incidental/Alley)	DFW: DFW1730FH4-12-4
4-4	PAINT	Valve Box Lids Prime Coat required on all above ground metal surfaces	Sinclair Gloss Enamel Blue
4-5	PAINT	Fire Hydrants Prime Coat required on all above ground metal surfaces	Yellow (2 coats)
4-7	PAINT	Backflow Assys & Vent Pipes, Meters, Regulators, Vault Piping, Air Valves. Prime Coat required on all above ground metal surfaces (use Tnemec)	Sinclair Gloss Enamel Blue
4-8	PIPE, COPPER TUBING	1" Type K Soft Seamless rolled Tubing 2" Type K Soft Seamless Straight Lengths 1" and 2" Type K Rigid Seamless Straight Lengths	Cerro
			Halstead
			Lee
			Mueller
			Phelps-Dodge
4-9	PIPE, DUCTILE IRON	For Water Lines 100mm (4") and larger manufactured per AWWA C111 C115, C150, C151. Double Cement Mortar Lined	American Pipe
			Griffin
			Pacific States
			U.S. Pipe
5-1	PLASTIC ENCASEMENT	8-mil Thick Polyethylene Encasement Sleeve for Ductile Iron Pipe (DIP) per AWWA C105 and Recycled PVC, CMC/L, or DIP Non-Purple Water Pipe. Clear Sleeve for Potable Water	Northtown-Polywrap
		8-mil Thick Polyethylene Encasement for Buried	

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NO.	ITEM	DESCRIPTION	MANUFACTURER/MODEL
5-2	PLASTIC WRAP	Fittings and Valves -- Double Wrap Clear Sieeve for Potable Water	Northtown-Polywrap
5-3	Service Piping Wrap	Polywrap for service lateral piping	Northtown Polywrap - C
5-4	PRIMER, WAX TAPE	Surface Primer for Underground Application of Petrolatum Wax Tape	Carboline Denso Paste
			Trenton Tem-Coat

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NO.	ITEM	DESCRIPTION	MANUFACTURER/MODEL
5-5	SERVICE SADDLE FOR ACP AND DI PIPE	Cast Brass ASTM B62 Body with Silicone Bronze Double Straps, IP Outlet Sizes 25mm (1") and 50mm (2"). Ball Corp. and Saddle shall be constructed by same manufacturer.	Jones J-979
			Smith-Blair 323
			Romac 202B
			Mueller BR2B
5-11	TAG, BRASS IDENTIFICATION	1" Diameter, 18 Gauge Brass with 3/16" Die Stamped Letters and Numbers, Suitable for Attachment to Cathodic Protection Wires by means of a Nylon Zip Tie.	Ford 202BS
			Jones J-969
			Romac 202N
5-6	TAPE, OUTER WRAP	Adhesive Plastic Outer Wrap for Wax Petrolatum Tape in Underground Applications	Polyken 960
			Trenton Polyply
5-7	TAPE, UTILITY	10 to 50 Mil x 2" Wide General Utility Tape for Corrosion Protection of Above and Below Ground Pipes	Calpico 3M 50, 51
6-1	TAPE, WARNING/ IDENTIFICATION	6" Wide, Warning/Identification (Non-Metallic) Marking Tape for Buried Facilities with Continuous Warning "Caution Water Main Buried Below" or "Caution Treated Urban Run-Off Water Buried Below" Tape for Recycled Water shall be Yellow with Black Lettering	Calpico, Type 1
			Line-Tec, Type B
			T.Christy Eng., Type 1
			Terra Tape, Standard 250
			Thor, Elast Tec
			Northtown
2	TAPE WARNING/ IDENTIFICATION FOR RECYCLED IRRIGATION	3" Wide, Warning/Identification (Non-Metallic) Marking Tape for Buried Irrigation Pipelines. Purple Color with Continuous warning Caution Reclaimed Water Main Buried Below"	Calpico, Type 1
			Line-Tec, Type B
			T.Christy Eng., Type 1
			Terra Tape, Standard 250
			Thor, Elast Tec
Northtown			
6-6	VALVE STEM EXTENSION SS	Round or Square 1-1/2" Diameter SS Rod, Welded Construction, with Top Centering Ring and AWWA 2" Operating Nuts Top and bottom. Use when extension longer than 8 foot.	Pipeline Products SX-908
6-7	VALVE, BALL WITH LOCKING TABS	3/4"Bronze, Straight, FIP x FIP with Locking Tabs and Handle	Ford B11-233WW-NL
			Jones J-1900W
			3/4" Mueller B 20200N
			AY McDonald 76101W
6-8	VALVE, BUTTERFLY 150 PSI	18" and Larger, AWWA C504, Class B. Thermosetting or Fusion Bonded Epoxy coated and Lined. Class D or E Flange x Flange Ends	M&H 1450, 4500

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NO.	ITEM	DESCRIPTION	MANUFACTURER/MODEL
			Mueller Lineseal III
			Pratt Groundhog
6-9	VALVE, BUTTERFLY 250 PSI	18" and Larger, AWWA C504, Class B. Thermosetting or Fusion Bonded Epoxy coated and Lined. Class D or E Flange x Flange Ends	M&H 1450, 4500 (Class 250) Mueller Lineseal XP 250 Pratt Triton HP-250
6-10	VALVE, GATE, RESILIENT WEDGE (RWGV)	4" through 12", non-rising low zinc bronze Stem, Ductile Body and Bonnet, encapsulated Wedge per AWWA C509 Epoxy Coated Interior. Valves larger than 12" shall be manufactured to AWWA C515 with 250 PSI Rating.	Mueller 2362 (AWWA C509), Mueller 2361 (AWWA C515) Clow Kennedy
7-1	VALVE BOX	For Gate Valves & Butterfly Valves, See Standard Dwg W13, Lids shall be marked "Water"	GOST Traffic Box 10-3/8" I.D. x 12" by Christy/Oldcastle
7-2	VALVE BOX	Normally Close Valve, Lids shall be marked "Water"	GOST Traffic Box 10-3/8" I.D. x 12" by Christy/Oldcastle
7-3	VALVE BOX	1" Blow Off or Manual Air Releases. See Standard Dwg W5, Lids shall be marked "Water"	GOST Traffic Box 10-3/8" I.D. x 12" by Christy/Oldcastle
7-4	VALVE BOX	2" Blow Off or Manual Air Release. See Standard Dwg W6 Lids shall be marked "Water"	GOST Traffic Box 10-3/8" I.D. x 12" by Christy/Oldcastle
7-5	VALVE BOX	4" Blow Off Assembly.	GOST Traffic Box 10-3/8" I.D. x 12" by Christy/Oldcastle
7-6	Valve Box Can Extensions		Tyler Union RK Industries
7-7	Valve Can Cover		Sigma-VB-4884-C114A08801 Baron Cosberg Industries Paige Northtown Regency Wire Christy
7-8	WIRE, TRACER	#14 AWG Solid Copper Wire, with Cross Linked Polyethylene insulation. White or Yellow in Color	3M DBR-6 King 4 King 5 King 6
7-9	WIRE, TRACER CONNECTOR	Direct Bury Silicone-Filled Capsule Tube with Standard Wire Nut or Silicone-Filled Wire Nut Connectors for Tracer Wire Connections.	3M DBR-6 King 4 King 5 King 6