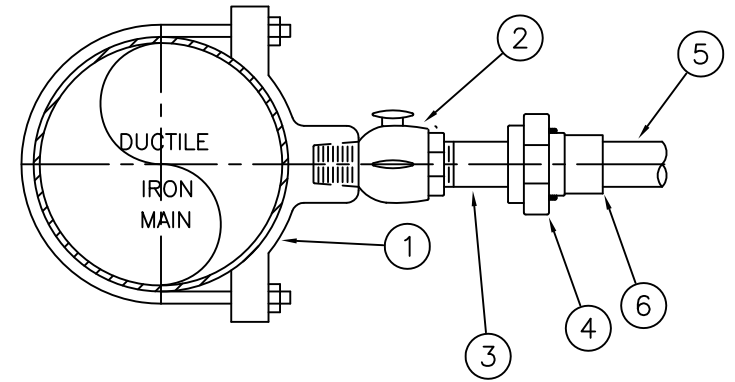


- MATERIALS**
- | ITEM NO. | SIZE & DESCRIPTION*  |
|----------|--|
| ①        | DOUBLE STRAP IRON BODY SERVICE SADDLE 1" I.P. OUTLET (FOR DUCTILE IRON PIPE MAINS)<br>CAST BRONZE SERVICE SADDLE WITH 1" I.P. OUTLET (FOR C900 PVC PIPE MAIN)  |
| ②        | 3/4" BRONZE CORPORATION STOP I.P. THREAD X COMPRESSION (FOR DUCTILE IRON PIPE MAIN)  |
| ③        | 1" METER SIZE COPPERSETTER W/ 3/4" TO 1" METER SIZE MALE ADAPTOR (REQUIRED FOR 3/4" METERS), 15" HIGH, 1" INLET/OUTLET   |
| ④        | 1" COPPER OR POLYETHYLENE TUBING   |
| ⑤        | METER BOX W/ CONCRETE LID CHRISTY BOX OR EQUAL   |
| ⑥        | 6" BASE OF 3/4" ROCK   |
| ⑦        | ZINC ANODE AND LEAD WIRE.<br>ANODE TO BE PLACED VERTICALLY OR HORIZONTALLY AT A MINIMUM SEPARATION OF 2 FEET FROM THE COPPER SERVICE. ANODE SHALL BE SIZED BASED ON METAL SURFACE AREA. ANODE SHALL BE BAGGED IN GYPSUM, BENTONITE AND SODIUM SULFATE. |

**DIALECTRICAL INSULATION FOR DIP MAINS**



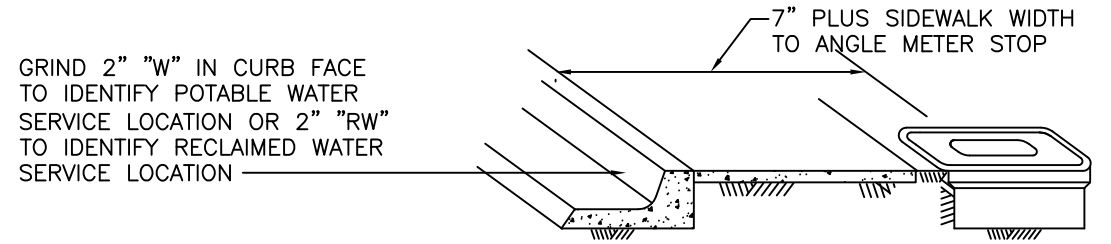
**MATERIALS\*:**

- |   |  |
|---|--|
| ① | SERVICE SADDLE AND CORPORATION STOP        |
| ② | BRONZE CORPORATION STOP MALE I.P. X F.I.P. |
| ③ | NIPPLE MALE I.P. X MALE I.P., BRONZE       |
| ④ | DIELECTRIC UNION F.I.P. X SWEAT            |
| ⑤ | TYPE K COPPER SERVICE TUBING               |
| ⑥ | COMPRESSION ADAPTER                        |

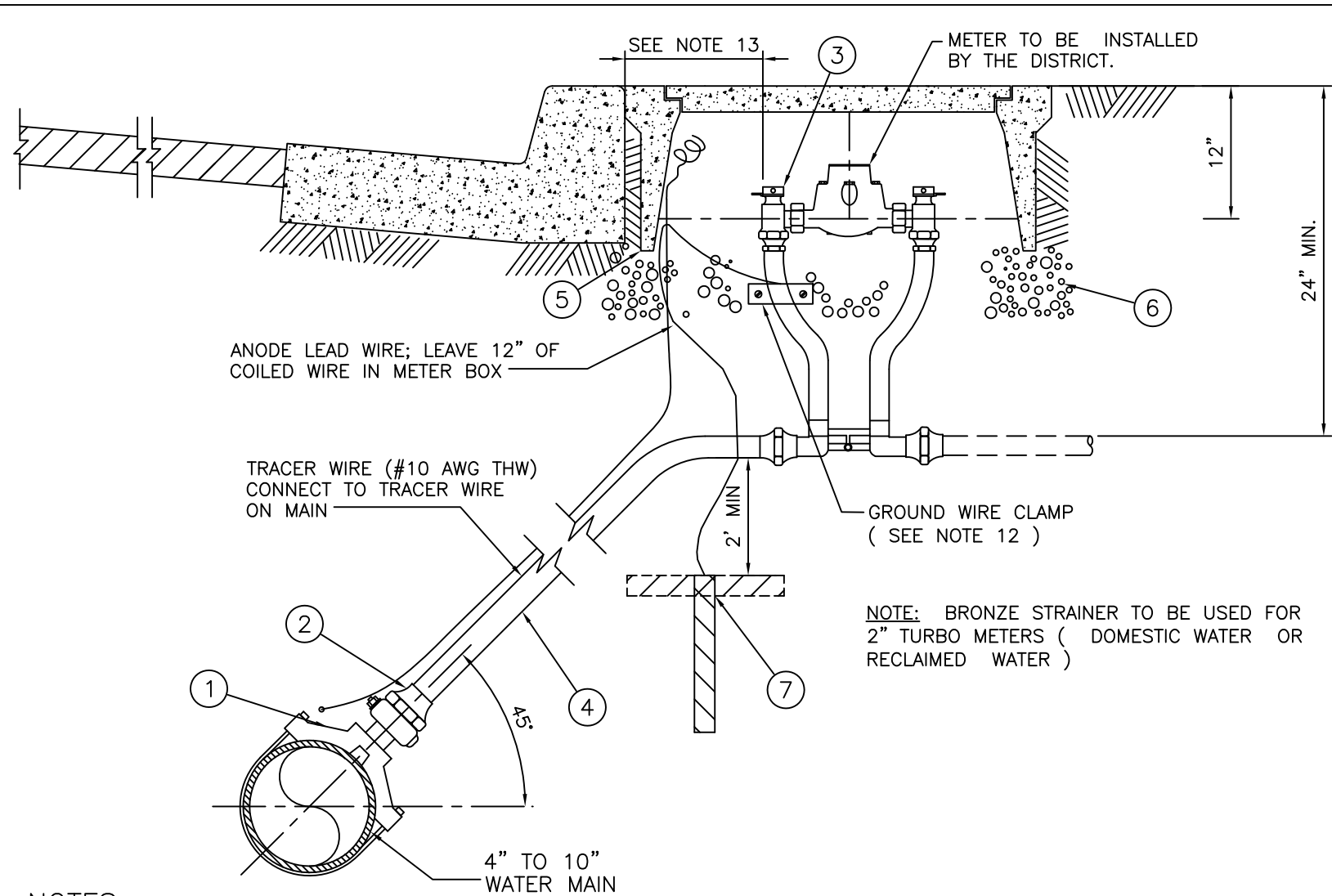
**NOTES:**

- 1- SERVICE SADDLE SHALL NOT BE INSTALLED WITHIN 18" OF VALVE, COUPLING, JOINT OR FITTING. TAPPED COUPLINGS ARE NOT PERMITTED.
- 2- INSTALL CORPORATION STOP WITH KEY IN OPEN POSITION.
- 3- SET TOP OF METER BOX FLUSH WITH SIDEWALK OR CURB AS SHOWN.
- 4- THE CORPORATION STOP TAP SHALL BE MADE AS SPECIFIED PER MANUFACTURER'S RECOMMENDATION. ALL TAPS SHALL BE MADE WITH MACHINE GUIDE OR PILOT TAP.
- 5- THE WATER SERVICE SHALL EXTEND PERPENDICULAR TO THE CENTERLINE OF THE STREET FROM THE WATER MAIN TO THE METER STOP.
- 6- METER BOX SHALL BE SET BEHIND SIDEWALK WHERE SIDEWALK IS ADJACENT TO CURB, OR IN PARKWAY BETWEEN CURB AND SIDEWALK.
- 7- ALL SPLICES OF COPPER TUBING SHALL BE COMPRESSION CONNECTIONS.
- 8- METER BOX LID FOR ALL RECYCLE WATER SERVICES SHALL BE PURPLE IN COLOR PER SPECIFICATIONS.
- 9- ANODE LEAD WIRE SHALL BE CLAMPED TO COPPER TUBING. CLAMP SHALL BE DIRECT BURIAL TYPE OF RED BRASS WITH BRASS SCREWS AS MANUFACTURED BY DOTTIE, OR APPROVED EQUAL.
- 10- COPPERSETTER SHALL BE CENTERED IN THE METER BOX. DISTANCE FROM THE CURB SHALL BE SPECIFIED IN THE CONTRACT DRAWINGS.
- 11- ANODE(S) SHALL BE INSTALLED WHEN REQUIRED BY CORROSION STUDY REPORT (SEE MASTER PLAN REQUIREMENT IN DEVELOPMENT PROCEDURE SECTION100).

\* SEE SPECIFICATIONS FOR APPROVED MANUFACTURERS & MODELS.



APPROVED BY DISTRICT ENGINEER		<b>MARINA COAST WATER DISTRICT STANDARD PLAN</b>		STANDARD
DATE 11/2007		<b>1" WATER SERVICE INSTALLATION</b>		<b>W-1</b>
				SHEET 1 OF 1



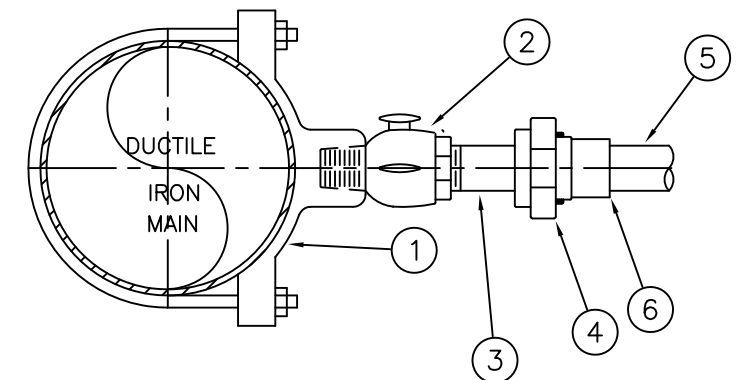
**NOTES**

- 1- SERVICE SADDLE SHALL NOT BE INSTALLED WITHIN 18" OF VALVE, COUPLING, JOINT OR FITTING. TAPPED COUPLINGS ARE NOT PERMITTED
- 2- INSTALL CORPORATION STOP WITH KEY SIDWAYS IN OPEN POSITION.
- 3- SET TOP OF METER BOX FLUSH WITH SIDEWALK OR CURB AS SHOWN
- 4- THE CORPORATION STOP TAP SHALL BE MADE AS SPECIFIED PER MANUFACTURER'S RECOMMENDATION.
- 5- THE WATER SERVICE SHOULD EXTEND PERPENDICULAR TO THE CENTERLINE OF THE STREET FROM THE WATER MAIN TO THE METER STOP.
- 6- METER BOX SHALL BE SET BEHIND SIDEWALK WHERE SIDEWALK IS ADJACENT TO CURB, OR IN PARKWAY BETWEEN CURB AND SIDEWALK.
- 7- ALL SPLICES OF COPPER TUBING SHALL BE COMPRESSION CONNECTIONS.
- 8- METER BOX LID FOR ALL RECYCLE WATER SERVICE SHALL BE PURPLE IN COLOR PER SPECIFICATIONS.
- 9- COMPRESSION TYPE CORPORATION STOP AND ANGLE METER STOP MAY BE SUBSTITUTED FOR THE FEMALE IRON PIPE STYLE WITH MALE IRON BY SWEAT ADAPTERS AS SHOWN.
- 10- ALL SWEAT JOINTS SHALL BE SILVER SOLDER ( EXCEPT AS NOTED )
- 11- A 1" BYPASS LINE WITH LOCKING CURB STOP MAY BE REQUIRED FOR INSTALLATIONS NEEDING CONTINUOUS SERVICE.
- 12- ANODE LEAD WIRE SHALL BE CLAMPED TO COPPER TUBING. CLAMP SHALL BE DIRECT BURIAL TYPE OF RED BRASS WITH BRASS SCREWS AS MANUFACTURED BY DOTTIE, OR APPROVED EQUAL.
- 13- COPPERSETTER SHALL BE CENTERED IN THE METER BOX. DISTANCE FROM THE CURB SHALL BE SPECIFIED IN CONTRACT DRAWINGS.
- 14- WATER SERVICES SHALL NOT BE PERMITTED ON WATER MAINS LARGER THAN 10"
- 15- ANODE(S) SHALL BE INSTALLED WHEN REQUIRED BY CORROSION STUDY REPORT (SEE MASTER PLAN REQUIREMENT IN DEVELOPMENT PROCEDURE SECTION 100).

**MATERIALS**

- | ITEM NO. | SIZE & DESCRIPTION*   |
|----------|---|
| ①        | DOUBLE STRAP IRON BODY SERVICE SADDLE 2" I.P. OUTLET ( FOR DUCTILE IRON PIPE MAINS )<br>CAST BRONZE SERVICE SADDLE 2" I.P. OUTLET ( FOR C900 PVC PIPE MAINS )   |
| ②        | 2" BRONZE CORPORATION STOP MALE I.P. THREAD X F.I.P. ( FOR DUCTILE IRON MAINS )   |
| ②A       | 2" BRONZE CORPORATION STOP MALE I.P. THREAD X COMPRESSION ( FOR C900 PVC PIPE MAINS )   |
| ③        | 2" METER SIZE COPPERSETTERS, 15" HIGH   |
| ④        | 2" COPPER OR POLYETHYLENE TUBING  |
| ⑤        | METER BOX W/CONCRETE LID CHRISTY BOX OR EQUAL   |
| ⑥        | 6" BASE OF 3/4" ROCK  |
| ⑦        | ZINC ANODE AND LEAD WIRE. ANODE IS TO BE PLACED VERTICALLY OR HORIZONTALLY AT A MINIMUM SEPARATION OF 2 FEET FROM THE COPPER SERVICE. ANODE SHALL BE SIZED BASED ON METAL SURFACE AREA. ANODE SHALL BAGGED IN GYPSUM, BENTONITE AND SODIUM SULFATE. |

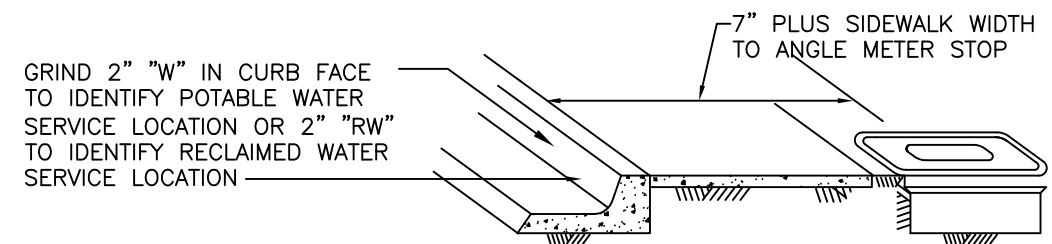
**DIELECTRICAL INSULATION FOR DIP MAINS**



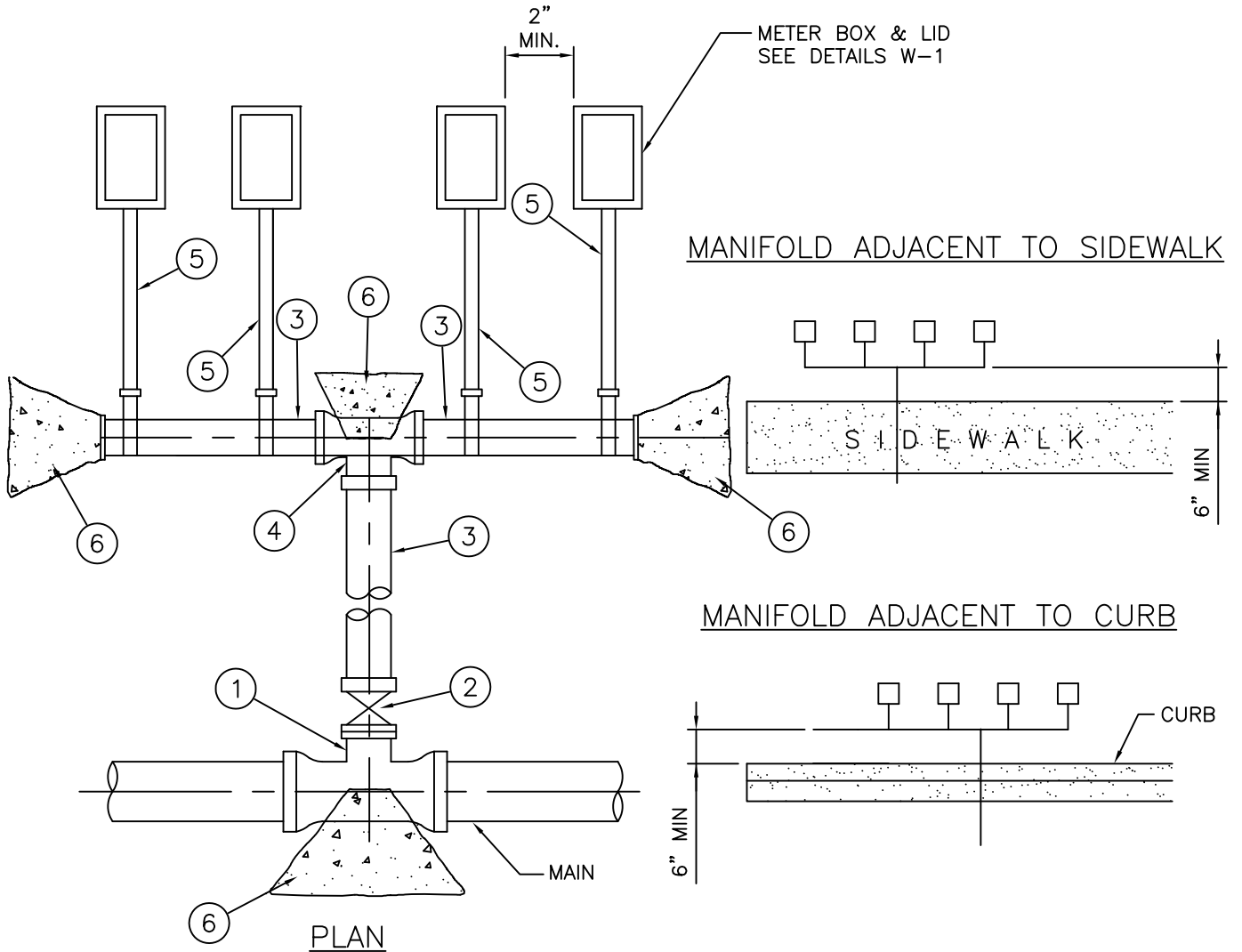
**MATERIALS\*:**

- ① SERVICE SADDLE AND CORPORATION STOP
- ② BRONZE CORPORATION STOP MALE I.P. X F.I.P.
- ③ NIPPLE MALE I.P. X MALE I.P., BRONZE
- ④ DIELECTRIC UNION F.I.P. X SWEAT
- ⑤ TYPE K COPPER SERVICE TUBING
- ⑥ COMPRESSION ADAPTER

\*SEE SPECIFICATIONS FOR APPROVED MANUFACTURERS & MODELS.



APPROVED BY DISTRICT ENGINEER		MARINA COAST WATER DISTRICT STANDARD PLAN	STANDARD
DATE 11/2007		2" WATER SERVICE INSTALLATION	W-2
			SHEET 1 OF 1



MATERIALS

- ① — D.I. MJ X FLG. TEE
- ② — 4" MJ X FLG GATE VALVE
- ③ — 4" PVC
- ④ — D.I. MJ TEE
- ⑤ — 1" SERVICE INSTALLATION — SEE MCWD STD. DWG. W-1
- ⑥ — THRUST BLOCK — SEE MCWD STD. PLAN W-13

APPROVED BY  
DISTRICT  
ENGINEER

DATE  
11/2007



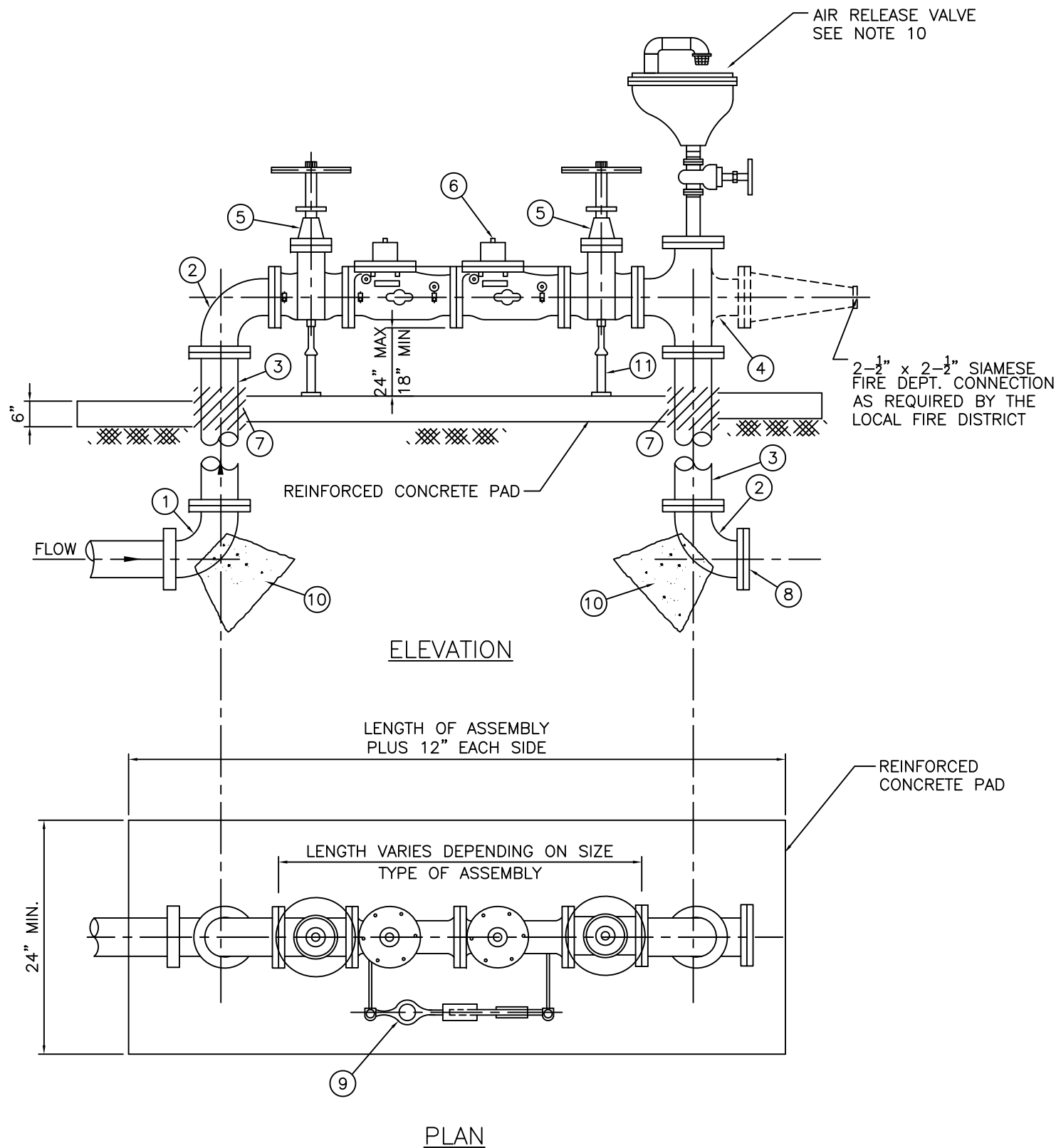
MARINA COAST WATER DISTRICT STANDARD PLAN

MANIFOLD ASSEMBLY  
FOR 4 TO 10 1-INCH SERVICES

STANDARD

**W-3**

SHEET 1 OF 1




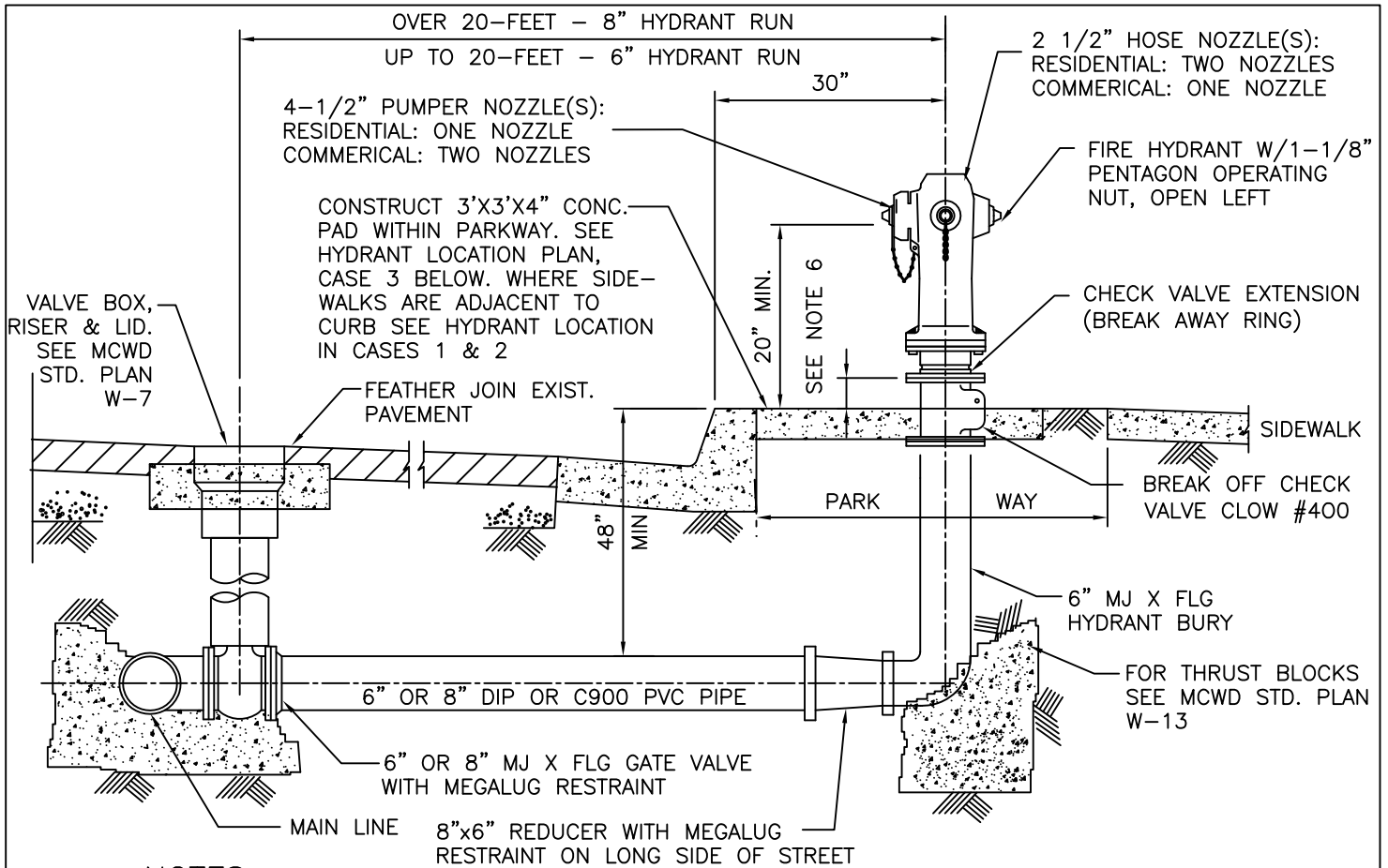
**MATERIALS**

- ① 90° D.I. ELL FLG x PE
- ② 90° D.I. ELL MJ X MJ WITH MEGALUG RESTRAINT
- ③ D.I. SPOOL PE WITH MEGALUG RESTRAINT
- ④ 90° D.I. (CL) TEE FLG x FLG x FLG OR OPTIONAL D.I. (CL) CROSS AND SIAMESE FIRE DEPT. CONNECTION (2 1/2" x 2 1/2"). CLEARANCE AND ORIENTATION AS REQUIRED BY THE FIRE DEPARTMENT.
- ⑤ U.S.C.-APPROVED SHUT-OFF VALVES. SEE GENERAL NOTE 1. OS&Y SHUTOFF VALVES AS REQUIRED BY LOCAL FIRE DEPARTMENT.
- ⑥ DOUBLE CHECK DETECTOR ASSEMBLY OR REDUCED PRESSURE BACKFLOW ASSEMBLY AS APPROVED BY THE DISTRICT
- ⑦ CALPICO VI-10 PROTECTIVE TAPE OR EQUAL
- ⑧ BLIND FLANGE
- ⑨ FACTORY INSTALLED BY-PASS METER AND U.S.C. APPROVED BACKFLOW PREVENTION DEVICE.
- ⑩ THRUST BLOCK PER MCWD STD. PLAN W-14
- ⑪ GALVANIZED ADJUSTABLE PIPE SUPPORT SHALL BE GRINELL FIG. 264, ELCEN FIG. 40 OR EQUAL. SUPPORT SHALL BE GALVANIZED AFTER FABRICATION.

**NOTES:**

- 1. NOTIFY M.C.W.D. PRIOR TO INSTALLATION OF UNIT.
- 2. DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLIES SHALL BE U.S.C. APPROVED ASSEMBLIES. ENTIRE ASSEMBLIES INCLUDING ISOLATION VALVES, TEST COCKS AND BYPASS METER (IF REQUIRED) SHALL BE PROVIDED AS A COMPLETE UNIT.
- 3. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLIES SHALL BE U.S.C. APPROVED ASSEMBLIES. ENTIRE ASSEMBLY INCLUDING ISOLATION VALVES, TEST COCKS AND BYPASS METER WITH BACKFLOW DEVICE (IF REQUIRED) SHALL BE PROVIDED AS A COMPLETE UNIT.
- 4. INSTALLATION SHALL COMPLY WITH THE LATEST PLUMBING CODES AND APPLICABLE LOCAL AGENCY REQUIREMENTS. CHECK WITH LOCAL BUILDING DEPARTMENT IF A PLUMBING PERMIT IS REQUIRED.
- 5. THRUST BLOCKS SHALL BE SIZED PER MCWD STD. PLAN W-14.
- 6. THE APPROPRIATE EASEMENTS MUST BE DEDICATED TO THE DISTRICT PRIOR TO PLAN APPROVAL.
- 7. BACKFLOW PREVENTERS 3" AND LARGER SHALL BE SUPPORTED BY GALVANIZED PIPE SADDLE SUPPORTS.
- 8. ASSEMBLIES ON FIRE SERVICE LINES SHALL HAVE OS&Y VALVES. HAND WHEELS ON OS&Y VALVES SHALL BE CHAINED AND LOCKED. USE GALVANIZED CHAIN, STRAIGHT LINK.
- 9. INSTALLATION REQUIRED BY TITLE 17 OF THE CALIFORNIA CODE OF REGULATIONS AND THE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH.
- 10. BACKFLOW PREVENTERS 2.5" AND LARGER SHALL HAVE AN AIR RELEASE VALVE. VALVES SHALL BE APCO NO. 50, 1/2" FOR 2.5" TO 6" SERVICE, 3/4" FOR 8" TO 12" SERVICE.
- 11. ASSEMBLY SHALL BE PROTECTED BY GUARD POSTS WHEN LOCATED NEAR TRAFFIC AREAS, AS REQUIRED BY THE DISTRICT.
- 12. NO CONNECTIONS OR TEES WILL BE ALLOWED BETWEEN METER OR MCWD ISOLATION VALVE AND BACKFLOW PREVENTER.
- 13. DEVICE MUST BE ACCESSIBLE FOR TESTING AND MAINTENANCE. LOCATION SHALL BE APPROVED BY DISTRICT PRIOR TO INSTALLATION.
- 14. INSTALLATIONS USING THREADED OR SOLDERED FITTINGS SHALL INCLUDE ONE THREE PART UNION ON EACH SIDE OF THE ASSEMBLY. SOLDER SHALL BE LEAD FREE.
- 15. ASSEMBLIES INSTALLED IN AREAS SUBJECT TO VANDALISM SHALL BE ENCLOSED IN A CAGE. CAGE SHALL PROVIDE 12" MINIMUM CLEARANCE ALL AROUND AND SHALL BE SUBMITTED TO MCWD FOR APPROVAL. OPTIONAL.

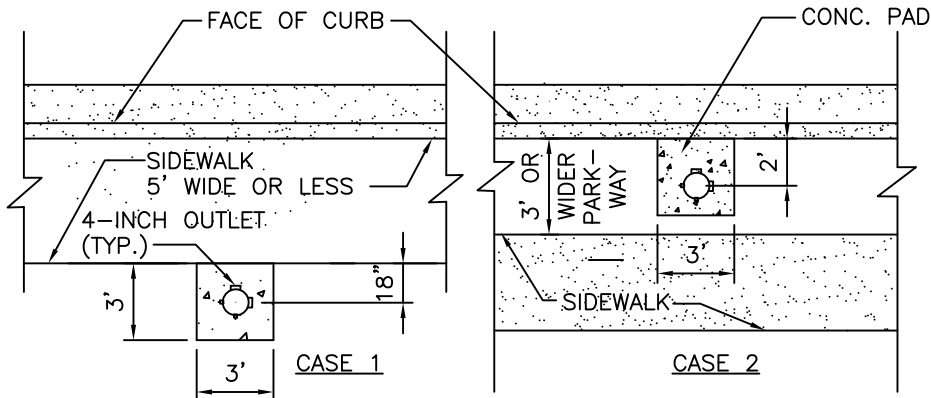
APPROVED BY DISTRICT ENGINEER		<b>MARINA COAST WATER DISTRICT STANDARD PLAN</b>  <b>DOUBLE CHECK BACKFLOW ASSEMBLY &amp; REDUCED PRESSURE BACKFLOW DEVICE</b>  <b>SIZE 2.5-INCH &amp; LARGER</b>	STANDARD
DATE 05/2014			<b>W-4</b>
			SHEET 1 OF 1



**NOTES:**

1. FOR APPROVED TYPES OF FIRE HYDRANTS SEE SPECIFICATIONS SECTION 15139
2. HYDRANTS TO BE PAINTED ACCORDING TO PAINT SPECIFICATION SECTION 09900
3. HYDRANT FLANGE GASKET SHALL BE "FULL FACE" AND OF RUBBER COMPOSITION 1/8" THICK.
4. BOLLARDS SHALL BE INSTALLED AS REQUIRED BY THE DISTRICT.
5. THRUST BLOCK NOT REQUIRED IF LATERAL IS FULLY RESTRAINED.
6. GASKET AT TOP OF BREAK OFF CHECK VALVE SHALL BE MINIMUM 4-INCHES, MAXIMUM 8-INCHES ABOVE CONCRETE.

**HYDRANT LOCATION PLANS**



SIDEWALK NOT ADJACENT TO CURB

APPROVED BY  
DISTRICT  
ENGINEER

DATE  
04/2017



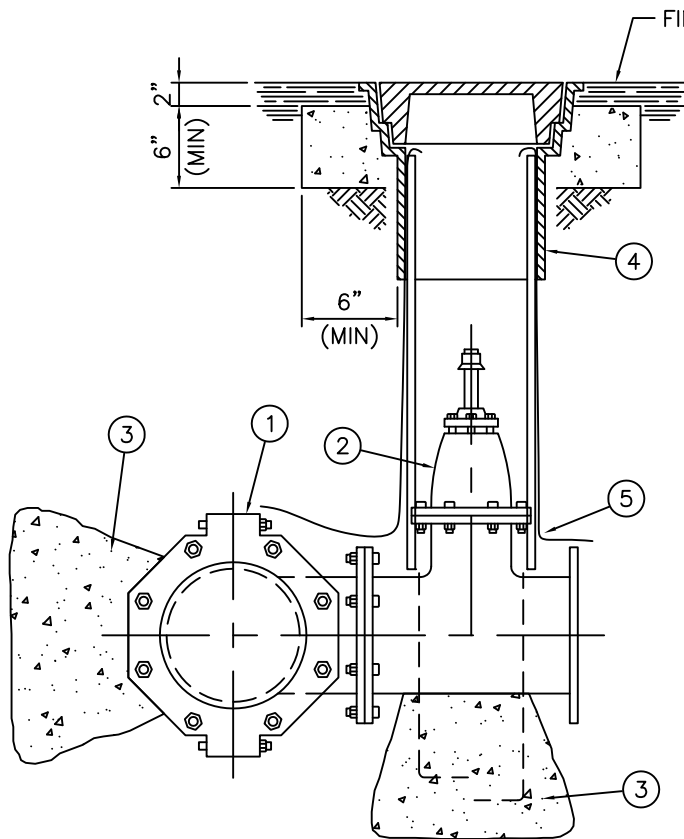
MARINA COAST WATER DISTRICT STANDARD PLAN

FIRE HYDRANT INSTALLATION

STANDARD

W-5

SHEET 1 OF 1



- ① TAPPING SLEEVE – CAST IRON, MJ
- ② GATE VALVE – RESILIENT WEDGE, FLANGED
- ③ CONSTRUCT CONCRETE THRUST BLOCK PER STD. PLAN W-13
- ④ VALVE RISER, BOX & LID PER STD. PLAN W-7
- ⑤ TRACER WIRE

NOTES

- 1. AIR TEST TAPPING SLEEVE PRIOR TO TAP
- 2. COAT ALL TAPPING SLEEVE BOLTS WITH KOPPERS BITSMASTIC
- 3. USE SHELL CUTTER ON ALL PVC TAPS

TAP OF ACP, PVC OR D.I.P. MAINS

APPROVED BY  
DISTRICT  
ENGINEER

DATE  
11/2007



MARINA COAST WATER DISTRICT STANDARD PLAN

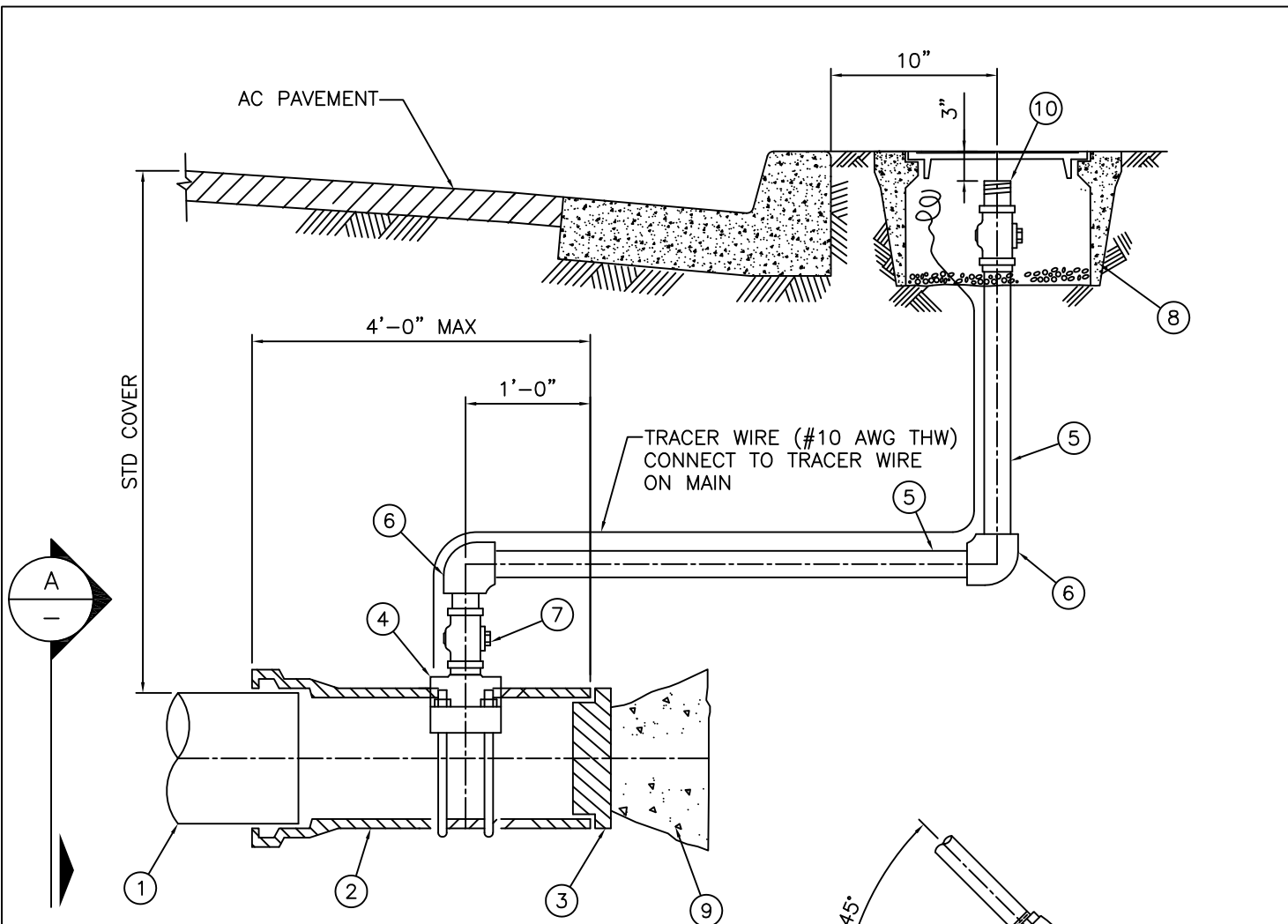
CONNECTION TO EXISTING PIPE

STANDARD

**W-6**

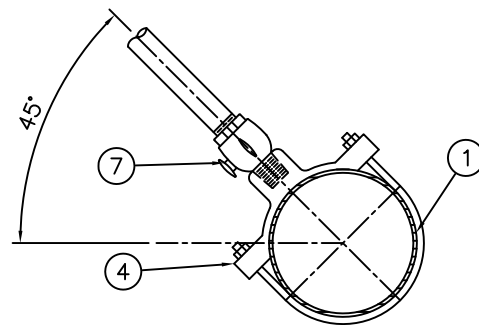
SHEET 1 OF 1





**NOTES:**

- ① — 4", 6", 8", 10" OR 12" PVC OR DUCTILE IRON PIPE
- ② — PVC SPOOL (TO BE REMOVED AT TIME OF FUTURE MAIN EXTENSION INSTALLATION)
- ③ — DIP MJ CAP
- ④ — 1-1/2" BRONZE DOUBLE STRAP TAPPING SADDLE FOR ACP & DIP, SINGLE BAND SADDLE OR BRASS SADDLE FOR PVC C900
- ⑤ — 1" TYPE K RIGID COPPER TUBING
- ⑥ — 1" 90° ELBOW, COPPER
- ⑦ — CORPORATION STOP
- ⑧ — TRAFFIC VALVE BOX
- ⑨ — THRUST BLOCK PER MCWD STD. PLAN W-13
- ⑩ — 1" ANGLE INVERTED KET VALVE W/ LOCK WING & BRASS SERVICE PLUG



**SECTION 'A'**

APPROVED BY  
DISTRICT  
ENGINEER

DATE  
11/2007



**MARINA COAST WATER DISTRICT STANDARD PLAN**

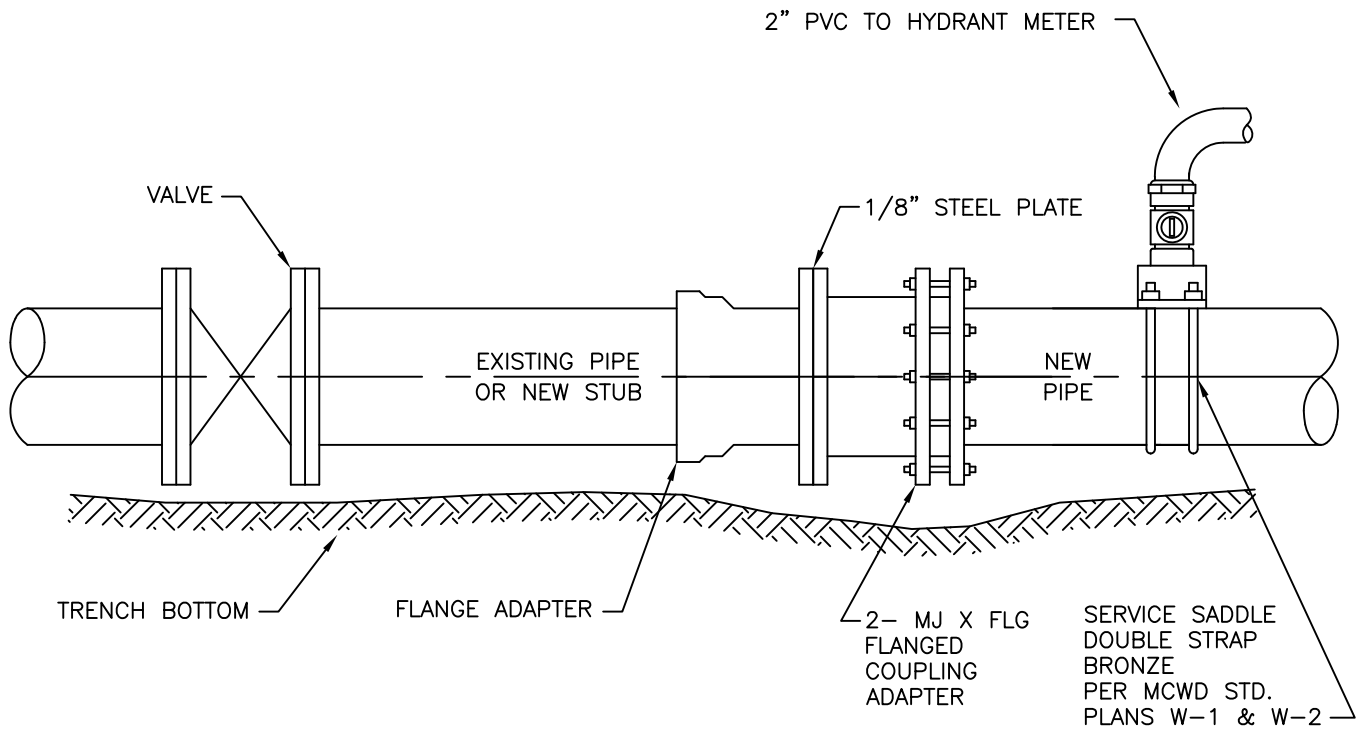
**MANUAL AIR RELEASE ASSEMBLY**

STANDARD

**W-8**

SHEET 1 OF 1





- 1- THE CONTRACTOR SHALL NOT OPERATE DISTRICT VALVES. 24 HOURS NOTICE IS REQUIRED FOR OPERATION BY DISTRICT.
- 2- UPON THE ACCEPTANCE OF THE NEW SYSTEM. THE CONTRACTOR SHALL REMOVE THE 2" BYPASS, PLUG THE SADDLES WITH BRASS PLUGS AND REMOVE THE STEEL PLATE.
- 3- THE BYPASS SHALL BE CHECKED BY THE DISTRICT'S INSPECTOR.
- 4- THE DOUBLE CHECK VALVE ASSEMBLY SHALL BE DOHS APPROVED.
- 5- THE SHUTOFF VALVE ON THE DOWN STREAM SIDE ON THE BACK FLOW PREVENTER SHALL BE CLOSED DURING PRESSURE TESTING AND DISINFECTING THE NEW PIPE.
- 6- THE CONTRACTOR SHALL PROVIDE THRUST RESTRAINTS TO PREVENT JOINT SEPARATION.
- 7- SIZE OF BYPASS MAY BE INCREASED SUBJECT TO MCWD APPROVAL.
- 8- DOUBLE CHECK VALVE ASSEMBLY SHALL NOT BE BACKFILLED.

APPROVED BY  
DISTRICT  
ENGINEER

DATE  
11/2007



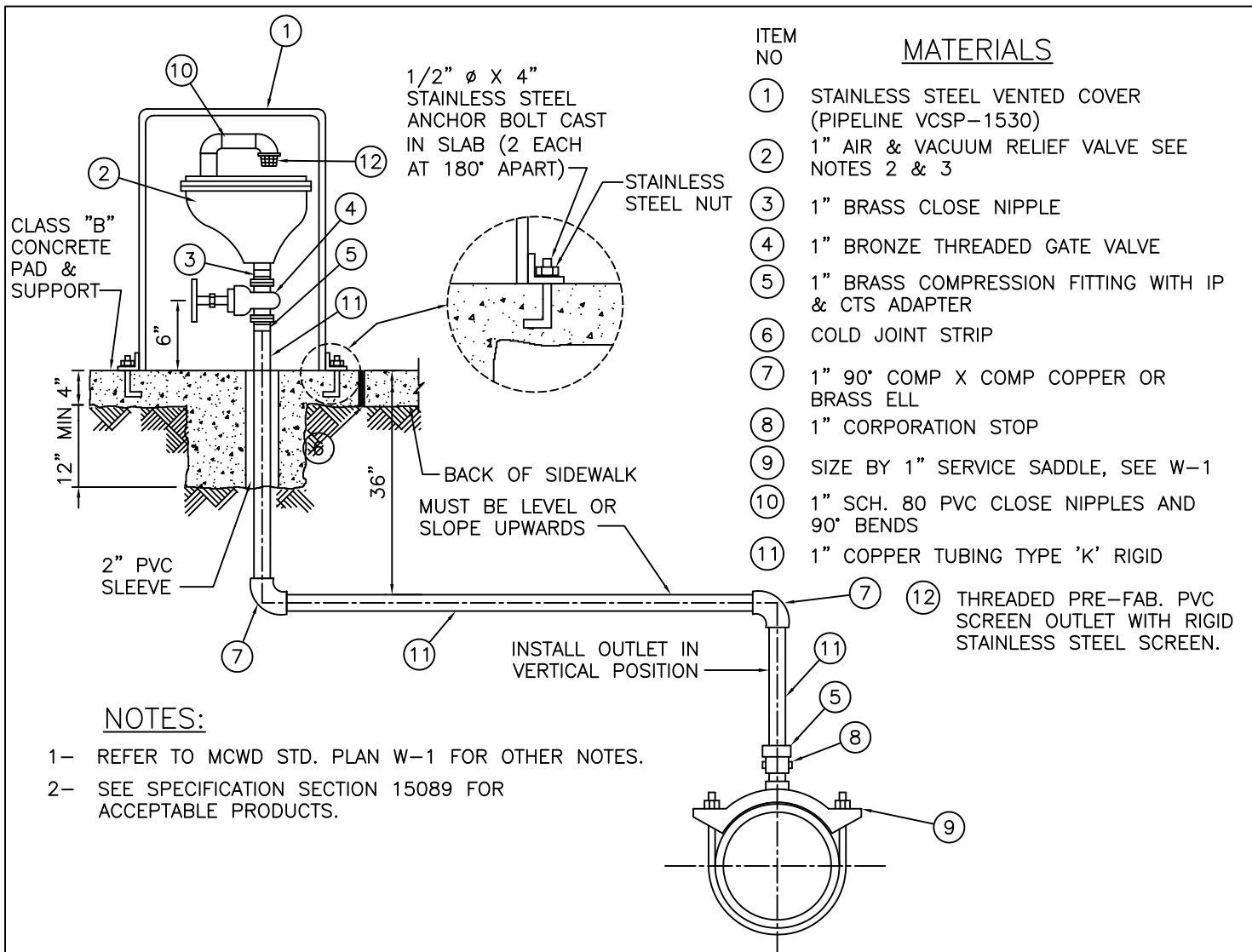
MARINA COAST WATER DISTRICT STANDARD PLAN

TEMPORARY  
BYPASS CONNECTION TO NEW MAINS

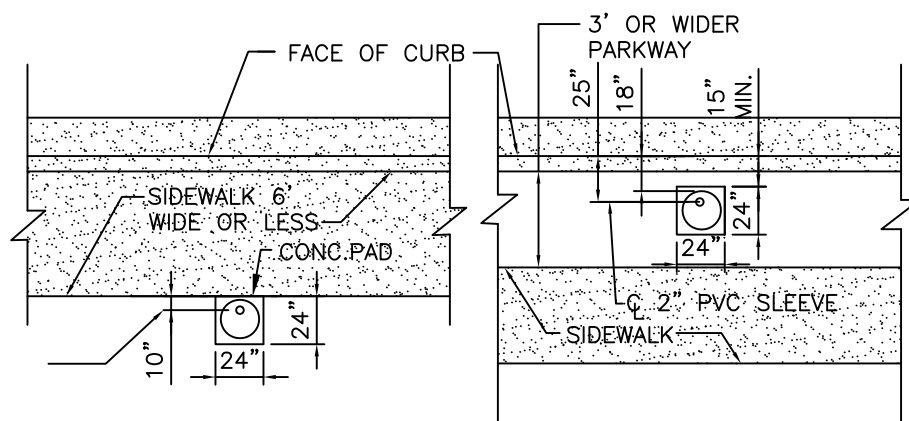
STANDARD

W-9

SHEET 1 OF 1



VALVE ASSEMBLY LOCATION



SIDEWALK ADJACENT TO CURB

SIDEWALK NOT ADJACENT TO CURB

APPROVED BY  
DISTRICT  
ENGINEER

DATE

11/2007



MARINA COAST WATER DISTRICT STANDARD PLAN

1" AIR RELEASE & VACUUM RELIEF  
VALVE ASSEMBLY

STANDARD

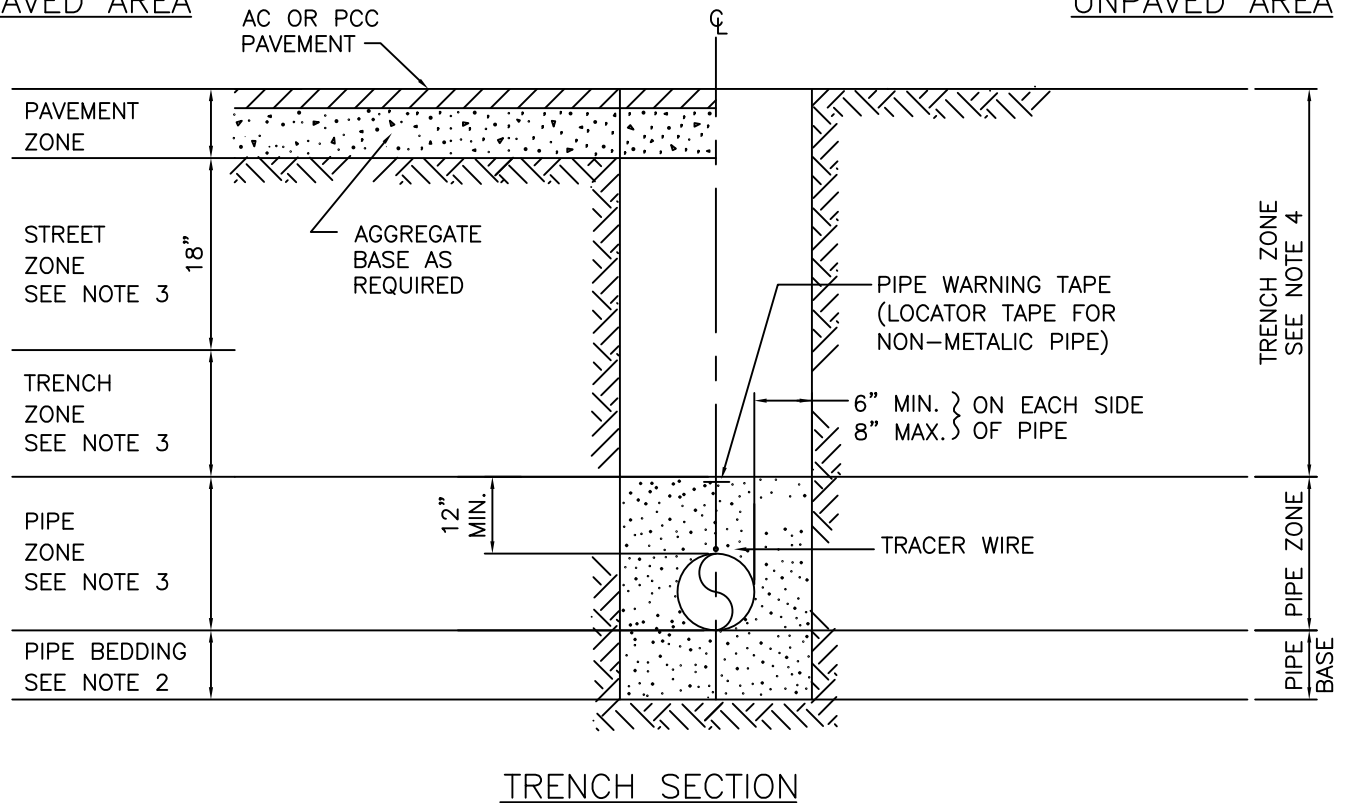
**W-10**

SHEET 1 OF 1



PAVED AREA

UNPAVED AREA



NOTES:

- 1- ALL WORKS SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02223.
- 2- FOR PIPE SIZES 4-INCH THROUGH 10-INCH DIAMETER, PIPE BASE SHALL BE A MINIMUM OF 4-INCHES IN DEPTH; FOR 12-INCH DIAMETER PIPE AND LARGER, PIPE SHALL BE A MINIMUM OF 6-INCHES IN DEPTH.
- 3- 95% COMPACTION OF IMPORTED BACKFILL OR NATIVE BACKFILL AS APPROVED BY DISTRICT ENGINEER
- 4- 90% COMPACTION OF IMPORTED BACKFILL OR NATIVE BACKFILL AS APPROVED BY DISTRICT ENGINEER

APPROVED BY  
DISTRICT  
ENGINEER

DATE

11/2007



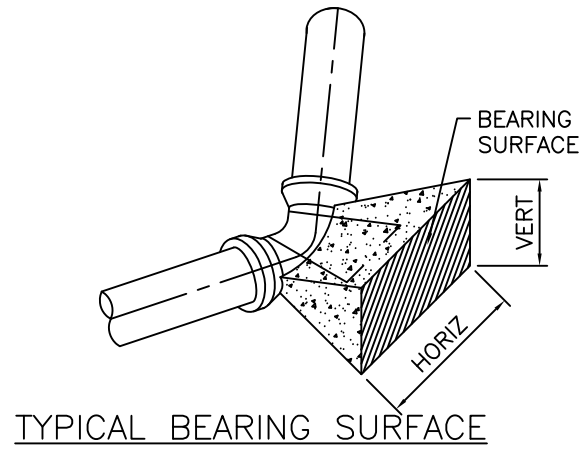
MARINA COAST WATER DISTRICT STANDARD PLAN

WATER LINE TRENCH SECTION AND  
BEDDING DETAILS

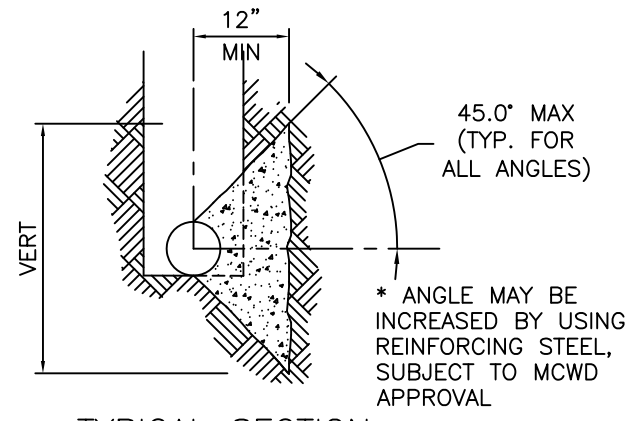
STANDARD

W-12

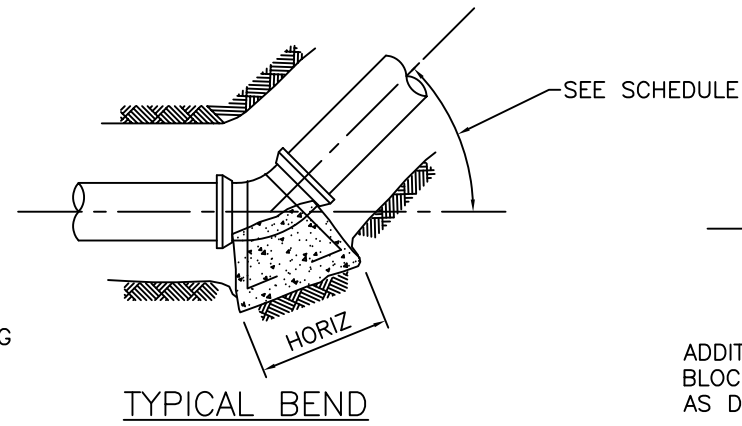
SHEET 1 OF 1



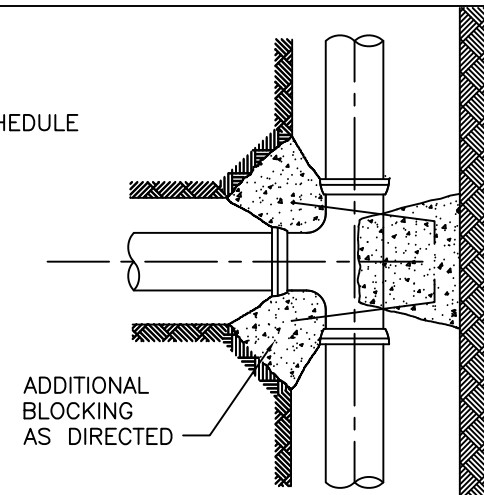
TYPICAL BEARING SURFACE



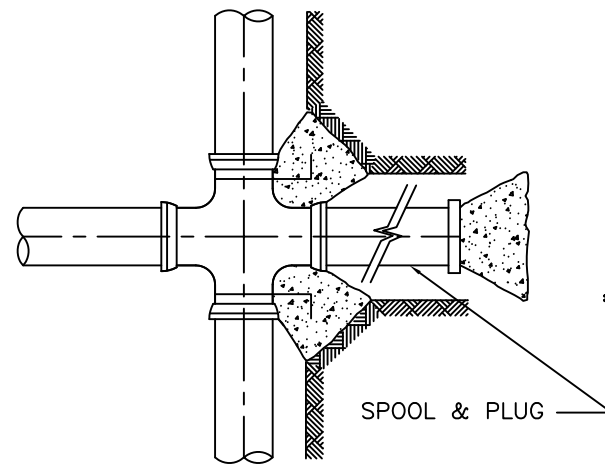
TYPICAL SECTION



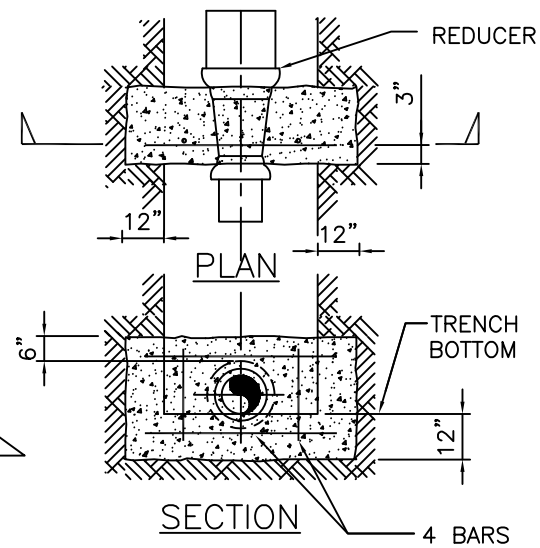
TYPICAL BEND



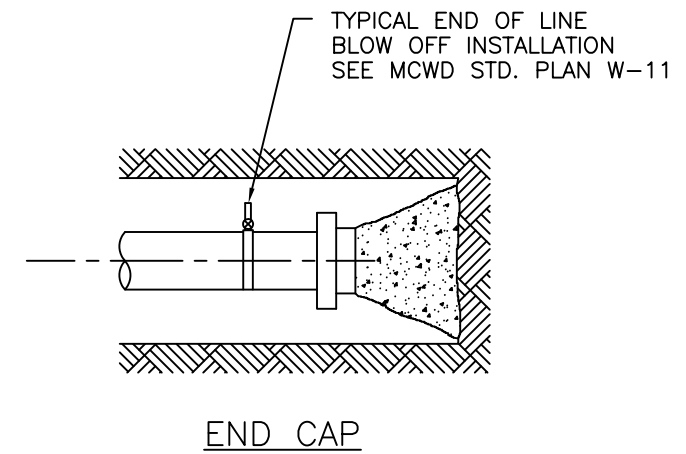
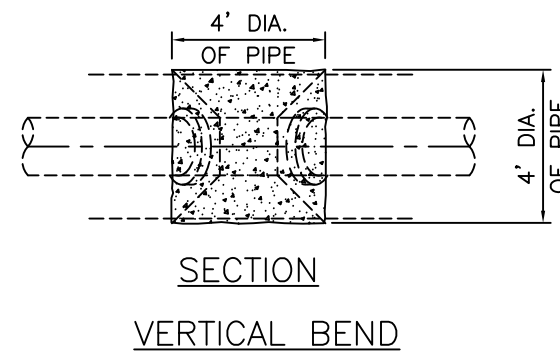
TEE OR VALVE



CROSS  
SEE NOTE 8



REDUCER



END CAP

**NOTES:**

- 1- THRUST BLOCK BEARING AREA BASED ON ALLOWABLE SOIL BEARING VALUE OF 1500 psf PRESSURE AND 225 psi LINE PRESSURE WITH 3'-0" COVER MINIMUM.  
FOR BEARING = 1000 psf, 1.5 X AREA SHOWN  
FOR BEARING = 500 psf, 3.0 X AREA SHOWN
- 2- ALL THRUST BLOCKS SHALL BE 2,000 PSI CONCRETE AND PLACED AGAINST UNDISTURBED SOIL. DESIGN ENGINEER SHALL DETERMINE SIZES NOT SHOWN.
- 3- STRAPS TO BE #4 REBARS EMBEDDED IN THRUST BLOCK TO A DEPTH EQUAL TO 3/4 OF PIPE DIAMETER. STRAP BEND EQUALS 1/2 PIPE DIAMETER
- 4- CONCRETE SHALL NOT EXTEND ONTO FLANGE OR ADJOINING PIPE.
- 5- JOINTS AND FACE OF PLUGS TO BE KEPT CLEAR OF CONCRETE
- 6- WRAP EXPOSED PORTION OF BARS AND 2" INTO CONCRETE WITH HALF LAPPED, 10 MIL PVC TAPE
- 7- WHEN CLEARANCES TO OTHER FACILITIES OR UTILITIES DO NOT ALLOW THE USE OF THRUST BLOCK, RESTRAINED PIPE SHALL BE USED.
- 8- THRUST BLOCKS ON CROSSES SHALL BE USED ONLY WHEN THERE IS A STUB-OUT ON ONE OR MORE SIDES, OR WHEN THERE IS ADJOINING UNRESTRAINED LENGTHS OF VALVES.
- 9- PIPE DIAMETERS GREATER THAN 12" SHALL BE CALCULATED BY THE ENGINEER & SUBMITTED TO DISTRICT ENGINEER FOR APPROVAL.
- 10- DISTRICT ALLOWS RESTRAINED JOINTS AS AN ALTERNATIVE TO THRUST BLOCKS.

MINIMUM SIZE OF THRUST BLOCK BEARING SURFACE

PIPE SIZE	11 1/4" BEND		22 1/2" BEND		45° BEND		90° BEND		TEE		END CAP	
	HORIZ.	VERT.	HORIZ.	VERT.	HORIZ.	VERT.	HORIZ.	VERT.	HORIZ.	VERT.	HORIZ.	VERT.
4"	1'-6"	0'-9"	1'-6"	0'-9"	1'-6"	1'-0"	2'-3"	1'-3"	1'-6"	1'-0"	1'-6"	1'-6"
6"	2'-6"	1'-0"	2'-6"	1'-0"	3'-6"	1'-6"	4'-6"	2'-3"	4'-0"	2'-0"	2'-6"	1'-9"
8"	3'-0"	1'-6"	3'-0"	1'-6"	4'-3"	2'-3"	5'-6"	3'-0"	5'-0"	2'-6"	3'-9"	2'-0"
10"	3'-9"	1'-9"	3'-9"	1'-9"	5'-0"	2'-9"	7'-0"	3'-6"	5'-6"	3'-3"	4'-6"	2'-6"
12"	4'-3"	2'-3"	4'-3"	2'-3"	5'-6"	3'-6"	8'-3"	4'-0"	7'-0"	3'-6"	5'-3"	3'-0"

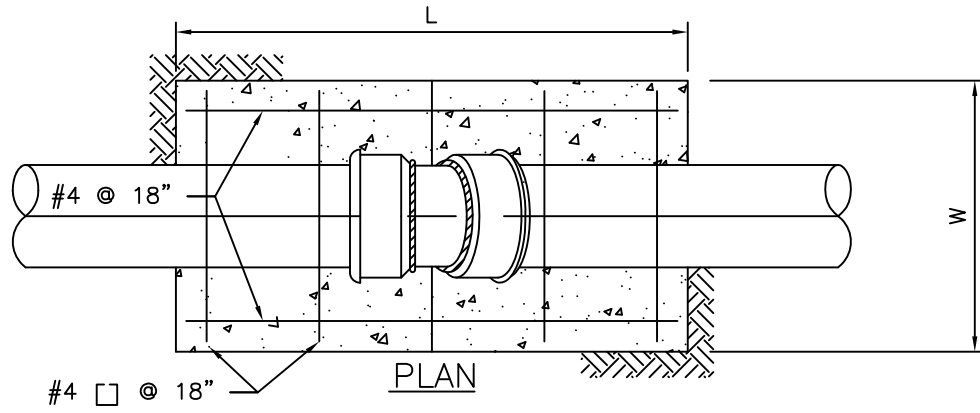
APPROVED BY  
DISTRICT  
ENGINEER  
  
DATE  
11/2007



MARINA COAST WATER DISTRICT STANDARD PLAN

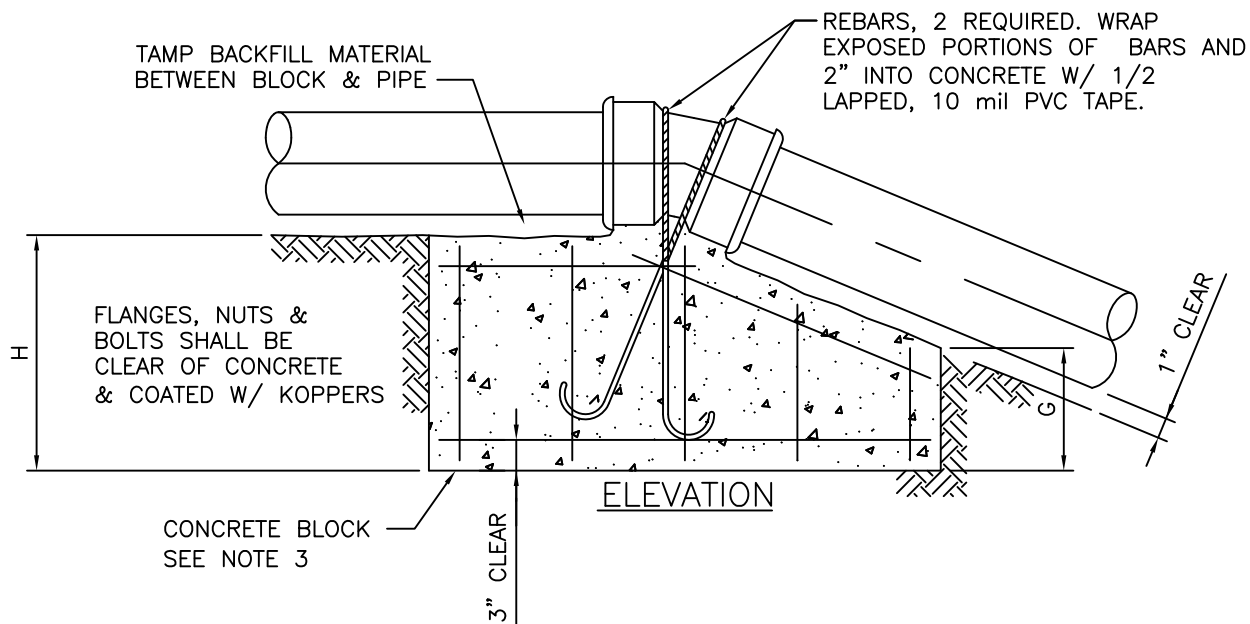
THRUST BLOCK DETAILS

STANDARD  
**W-13**  
SHEET 1 OF 1



#4 □ @ 18"

PLAN



TAMP BACKFILL MATERIAL BETWEEN BLOCK & PIPE

REBARS, 2 REQUIRED. WRAP EXPOSED PORTIONS OF BARS AND 2" INTO CONCRETE W/ 1/2 LAPPED, 10 mil PVC TAPE.

FLANGES, NUTS & BOLTS SHALL BE CLEAR OF CONCRETE & COATED W/ KOPPERS

CONCRETE BLOCK SEE NOTE 3

ELEVATION

3" CLEAR

1" CLEAR

THRUST BLOCK DIMENSION – UPWARD THRUST															
PIPE SIZE	11–1/4° BEND					22–1/2° BEND					45° BEND				
	L	W	H	G	BAR	L	W	H	G	BAR	L	W	H	G	BAR
6"	3.5	2.0	2.0	1.0	4	4.5	2.0	3.0	1.0	4	4.5	4.0	3.0	1.0	4
8"	3.5	3.0	2.0	1.0	4	4.5	4.0	3.0	2.0	4	5.5	5.0	4.0	1.5	5
10"	4.0	3.5	2.5	1.0	4	5.0	4.0	3.5	1.5	5	6.0	5.0	4.5	1.5	6
12"	4.0	3.5	3.5	1.0	4	5.0	4.0	4.0	2.0	5	6.5	5.0	5.0	2.5	7
16"	6.0	4.0	4.0	1.0	5	6.5	5.0	5.0	2.5	7	10.0	5.0	6.0	3.0	10

NOTES:

- 1– ENCASE ALL BURIED METALIC SURFACES WITH POLYETHYLENE WRAP AS SPECIFIED IN AWWA C105.
- 2– RESTRAINED JOINT DUCTILE IRON PIPE MAY BE USED IN PLACE OF THRUST BLOCK. CONTACT MCWD FOR APPROVAL AND DETAILS.
- 3– DIMENSIONS L, W, H, G ARE IN FEET.
- 4– THRUST BLOCK DIMENSIONS BASED ON 150 PSI TEST PRESSURE AND CONCRETE SHALL BE 2000 PSI MIN, 28 DAY COMPRESSIVE STRENGTH.

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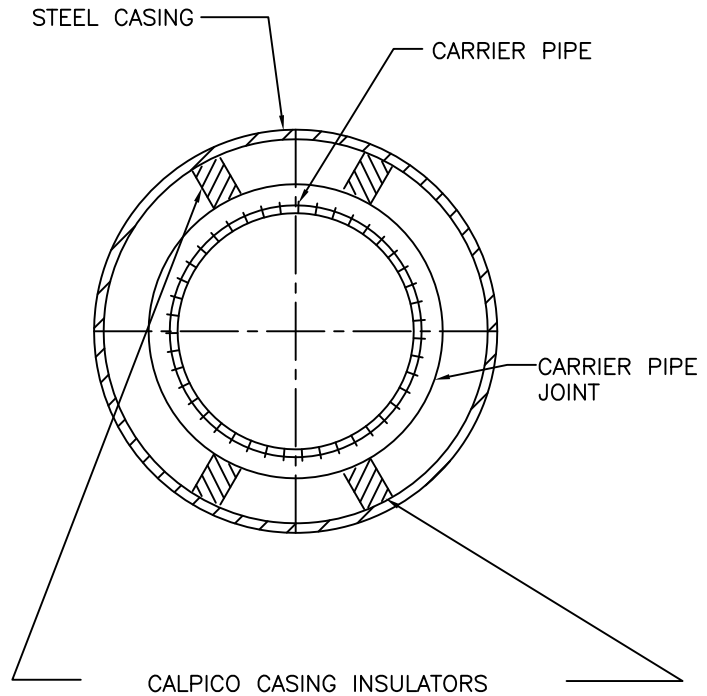


MARINA COAST WATER DISTRICT STANDARD PLAN

UPWARD THRUST BLOCK DETAILS

STANDARD  
**W-14**  
SHEET 1 OF 1

SCHEDULE STEEL CASING		
NOMINAL CARRIER PIPE SIZE	MINIMUM CASING SIZE	MIN. WALL THICK.
4"	10 3/4 O.D.	1/4"
6"	12 3/4 O.D.	1/4"
8"	16" O.D.	5/16"
10"	18" O.D.	5/16"
12"	20" O.D.	5/16"



NOTES:

- 1- CASING SHALL BE INSTALLED BY THE BORE, JACK AND/OR TUNNEL METHOD.
- 2- SIZE AND THICKNESS OF CASING SHALL BE AS SHOWN IN SCHEDULE. FOR LONG BORES OR SPECIAL SITUATIONS, GREATER WALL THICKNESS THAN SHOWN IN THE SCHEDULE MAY BE REQUIRED
- 3- ALL STEEL CASING PIPE FIELD JOINTS SHALL BE WELDED FULL-CIRCUMFERENCE.
- 4- CALPICO CASING INSULATORS SHALL BE PROVIDED PER DETAIL ABOVE AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
- 5- CARRIER PIPE SHALL BE PRESSURE TESTED PRIOR TO FILLING CASING.
- 6- EACH END OF CASING SHALL BE SEALED WITH CONCRETE.
- 7- CONTRACTOR SHALL FURNISH ALL NECESSARY THRUST RESTRAINT DEVICES.
- 8- BACKFILL FOR CASING IN OPEN CUT SHALL BE IN ACCORDANCE WITH MCWD STD. PLAN W-12.
- 9- STEEL CASING PIPE SHALL BE ANALYZED FOR PASSIVE CORROSION RESISTANCE & ANALYSIS SUBMITTED TO DISTRICT ENGINEER FOR APPROVAL.
- 10- FILLING OF ANNULAR SPACE MAY BE REQUIRED BY ROW JURISDICTION OVER ROAD OR RAIL OR AS DIRECTED BY DISTRICT ENGINEER.

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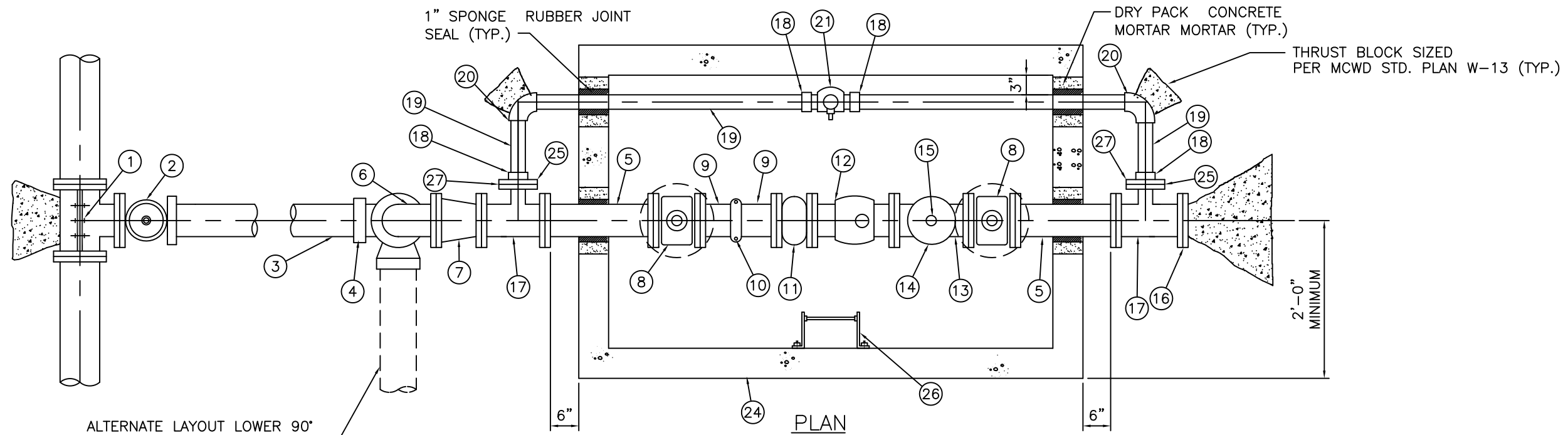
MARINA COAST WATER DISTRICT STANDARD PLAN

TRENCHLESS CROSSING  
STEEL CASING PIPE

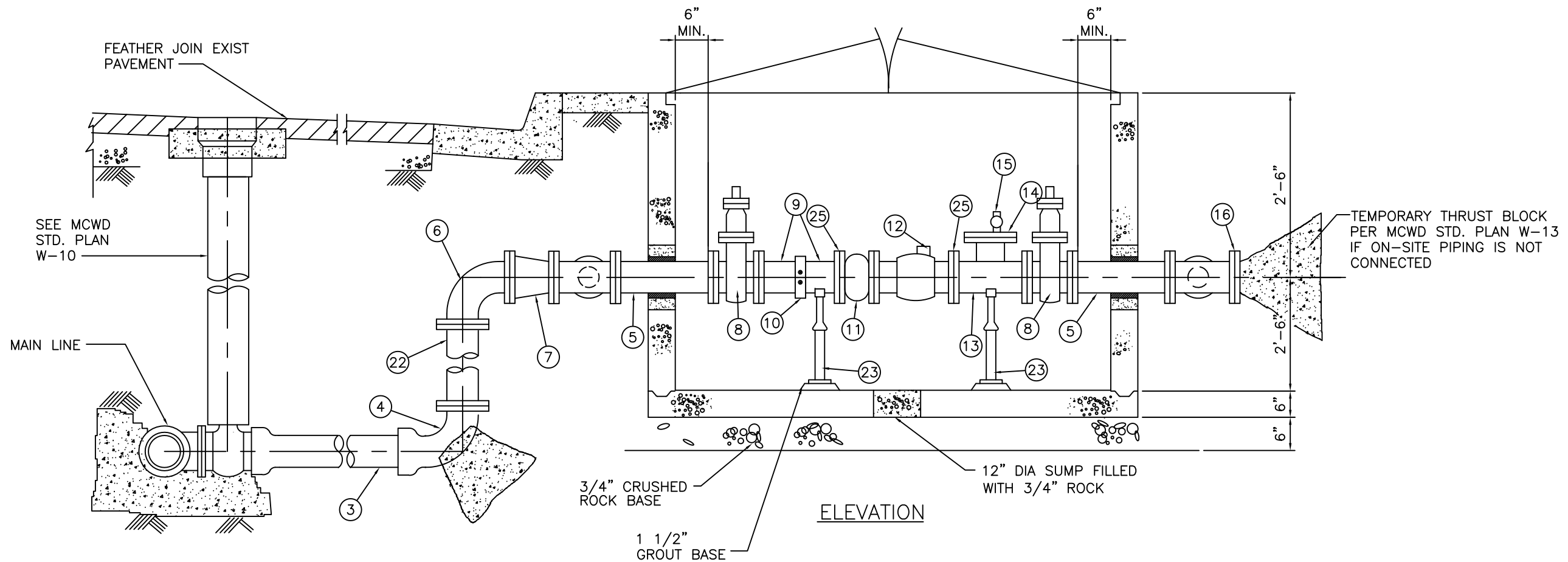
STANDARD

**W-15**

SHEET 1 OF 1



ALTERNATE LAYOUT LOWER 90° BEND ROTATED 90° FOR METER RUN PARALLEL TO CURB



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MARINA COAST WATER DISTRICT STANDARD PLAN  
  
3" TO 10" TURBINE METER INSTALLATION

STANDARD  
**W-17**  
SHEET 1 OF 2



## MATERIALS

<u>ITEM</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>
①	1 EACH	SIZE X 4" TAPPING SLEEVE (USE PUSH-ON X FLG. TEE IF HOT TAP IS NOT REQUIRED).
②	1 EACH	4" PUSH-ON X FLG. TAPPING VALVE (USE RW OR GATE VALVE IF HOT TAP IS NOT REQUIRED).
③	AS REQ'D	4" PVC PIPE OR D.I. PIPE LATERAL, PUSH-ON JOINTS
④	1 EACH	4" D.I. 90° ELL, PUSH-ON X FLG.
⑤	2 EACH	FLG X FLG. D.I. SPOOL - METER SIZE X 2'-6"
⑥	1 EACH	4" D.I. 90° ELL FLG. X FLG.
⑦	1 EACH	4" X 3" D.I. REDUCER FLG. X FLG. (FOR 3" SERVICE ONLY)
⑧	2 EACH	RW OR GATE VALVE FLG. X FLG.
⑨	2 EACH	FLG. X GROOVED END D.I. SPOOL, 6" LENGTH
⑩	1 EACH	GROOVED-END COUPLING
⑪	1 EACH	STRAINER
⑫	1 EACH	TURBINE METER
⑬	1 EACH	METER SIZE X 6" D.I. TEE - FLANGED
⑭	1 EACH	METER-SIZE D.I. COMPANION FLANGE TAPPED FOR 2 1/2" I.P.
⑮	1 EACH	2" CORPORATION STOP - MIP X MIP
⑯	1 EACH	D.I. BLIND FLANGE
⑰	2 EACH	METER SIZE FLANGED D.I. TEE
⑱	4 EACH	ADAPTER - 2" M.I.P. BY S.J.
⑲	AS REQ'D	2" COPPER TUBING
⑳	2 EACH	2" 90° ELBOW - S.J. X S.J.
㉑	1 EACH	2" BALL VALVE WITH LOCKING WING - F.I.P. X F.I.P.
㉒	1 EACH	4" D.I. SPOOL - FLG. X FLG. (IF REQUIRED)
㉓	2 EACH	GALVANIZED PIPE SUPPORT
㉔	1 EACH	PRECAST CONCRETE VAULT (5'-0" WIDE X 6'-6" LONG X 5'-0" HIGH) WITH HALLIDAY SPRING ASSIST HINGED DIAMOND PLATE ALUMINUM COVER (M4' X 4' MIN.) AND RECESSED LOCKING HASP. PROVIDE 6" X 12" HINGED READING LID INSTALLED OVER METER REGISTER.
㉕	4 EACH	BOLT AND FLANGE INSULATING KIT
㉖	1 EACH	GALV. STEEL LADDER W/LADDER - UP AND S.S. ANCHOR BOLTS.
㉗	2 EACH	METER SIZE BRONZE COMPANION FLANGE WITH 2" THREADED I.P. OUTLET

NOTES:

1. VAULT SHOWN IS FOR PARKWAY USE ONLY. FOR TRAFFIC LOADING AND OTHER REQUIREMENTS, CONTACT DISTRICT REPRESENTATIVE.
2. VAULT COVER TO BE SET TO CONFORM TO PARKWAY GRADE.
3. WHEN A BY - PASS LINE IS NOT REQUIRED PER SECTION 15150, DELETE ITEMS 18, 19, 20 AND 21.
4. ALL PART SHALL BE INSTALLED SUCH THAT THEY MAY BE LIFTED DIRECTLY THROUGH THE ACCESS COVER.

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ENGINEER

DATE

11/2007



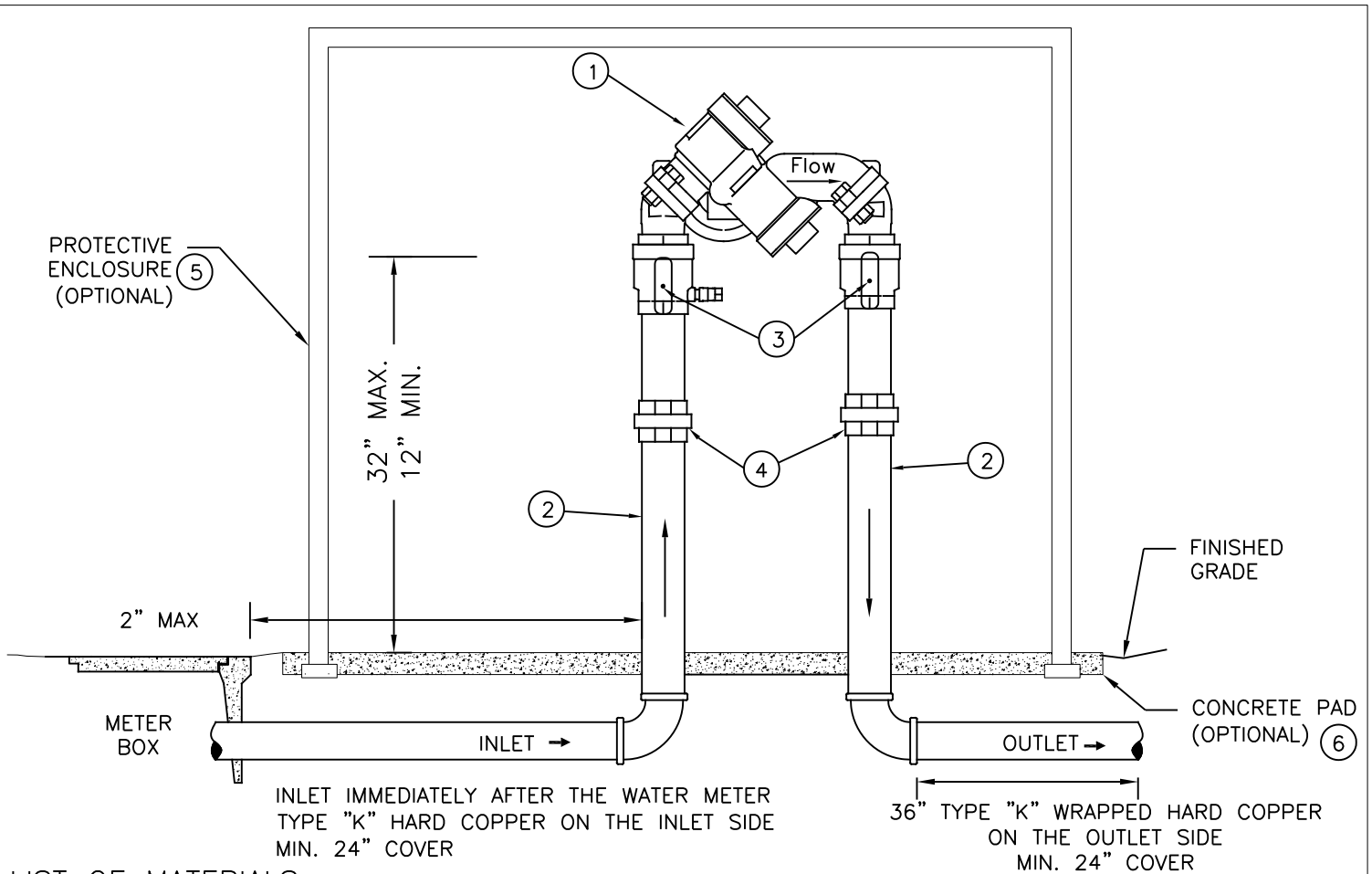
**MARINA COAST WATER DISTRICT STANDARD PLAN**

**3" TO 10" TURBINE METER INSTALLATION  
MATERIALS LIST**

STANDARD

**W-17**

SHEET 2 OF 2



**LIST OF MATERIALS:**

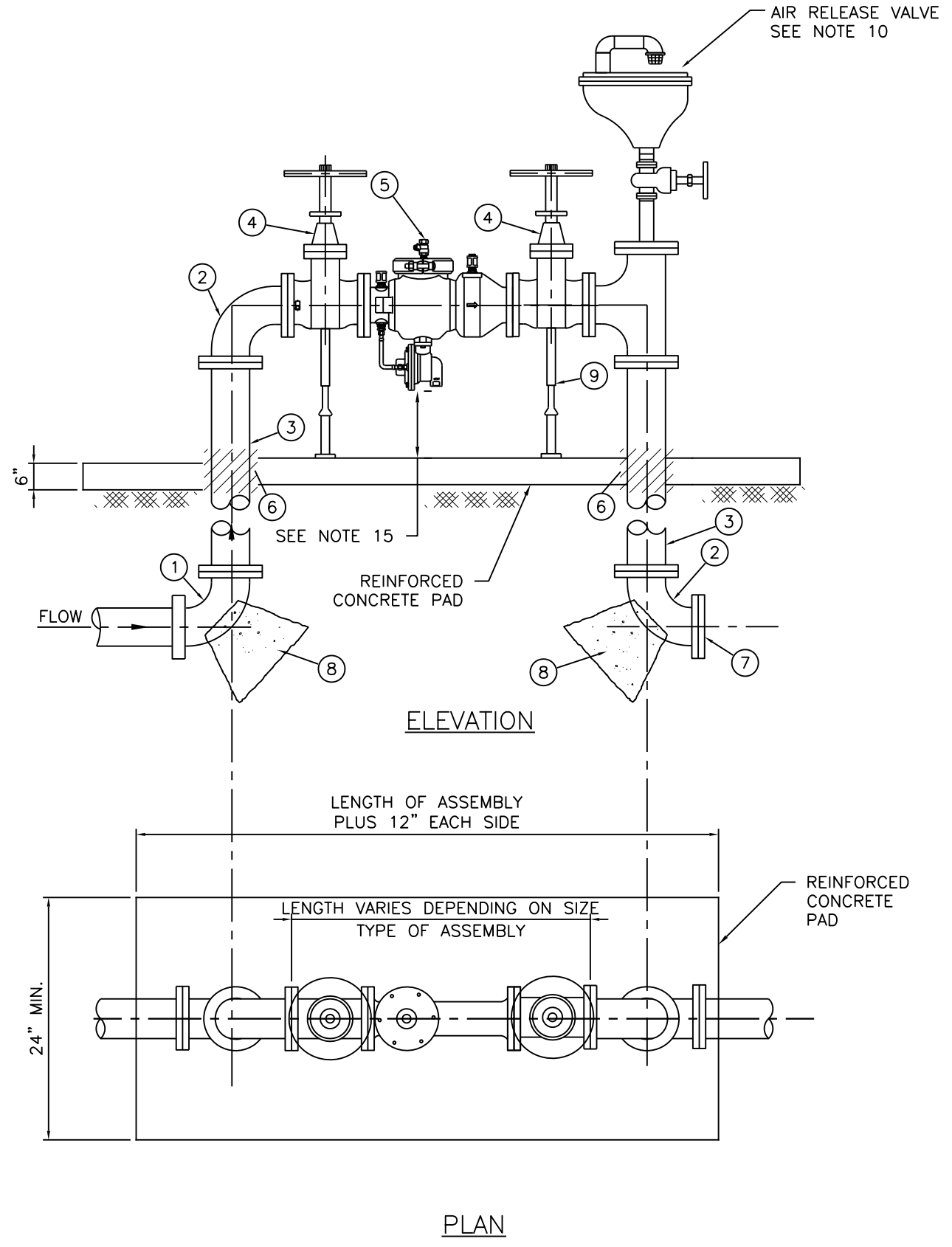
- ① BACKFLOW PREVENTION DEVICE SHALL BE INCLUDED IN THE CURRENT "LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES," FOUNDATION FOR CROSS-CONNECTION AND HYDRAULIC RESEARCH, UNIVERSITY OF SOUTHERN CALIFORNIA, SCHOOL OF ENGINEERING.
- ② PIPE SPOOL, TYPE "L" HARD COPPER, 3/4" THRU 2 1/2".
- ③ IF NO METER EXISTS BEHIND THE ASSEMBLY, ADDITIONAL BALL VALVE SHALL BE INSTALLED AT THE INLET SIDE TO ALLOW FOR ASSEMBLY REPLACEMENT. BALL VALVE SHALL BE PER MCWD STD SPECIFICATION 15100 AND INSTALLED AS CLOSE TO MCWD WATER MAIN AS POSSIBLE, OR ON THE PROPERTY LINE OF THE PARCEL.
- ④ PIPE UNION, BRASS OR COPPER, IF NEEDED.
- ⑤ LOCKABLE STEEL CAGE ANCHORED A CONCRETE PAD, OPTIONAL.
- ⑥ CONCRETE PAD, OPTIONAL.

**GENERAL NOTES:**

- 1. BACKFLOW ASSEMBLIES MUST BE TESTED AT THE TIME OF INSTALLATION & ANNUALLY BY A CERTIFIED TESTER WHO IS RECOGNIZED BY MARINA COAST WATER DISTRICT.
- 2. COPPER FITTINGS SHALL BE CONNECTED WITH LEAD FREE SOLDER JOINTS OR APPROVED EQUAL.
- 3. FINISHED GRADE UNDERNEATH THE BACKFLOW PREVENTER SHALL BE AT 90% COMPACTION.
- 4. ALL NIPPLES TO BE COPPER OR BRASS.
- 5. IN CERTAIN CASES, A PLUMBING PERMIT FROM YOUR LOCAL BUILDING DEPARTMENT MAY BE REQUIRED, PLEASE VERIFY ACCORDINGLY.
- 6. BACKFLOW ASSEMBLY MUST BE WITHIN 2" OF THE OUTSIDE OF METER BOX.

APPROVED BY DISTRICT ENGINEER		<p align="center"><b>MARINA COAST WATER DISTRICT STANDARD PLAN</b>  <b>REDUCED PRESSURE PRINCIPLE</b>  <b>BACKFLOW PREVENTION</b></p>	STANDARD <b>W-18</b>
DATE 04/2014			<p align="center"><b>3/4-INCH THROUGH 2.5-INCH</b></p>

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**MATERIALS**

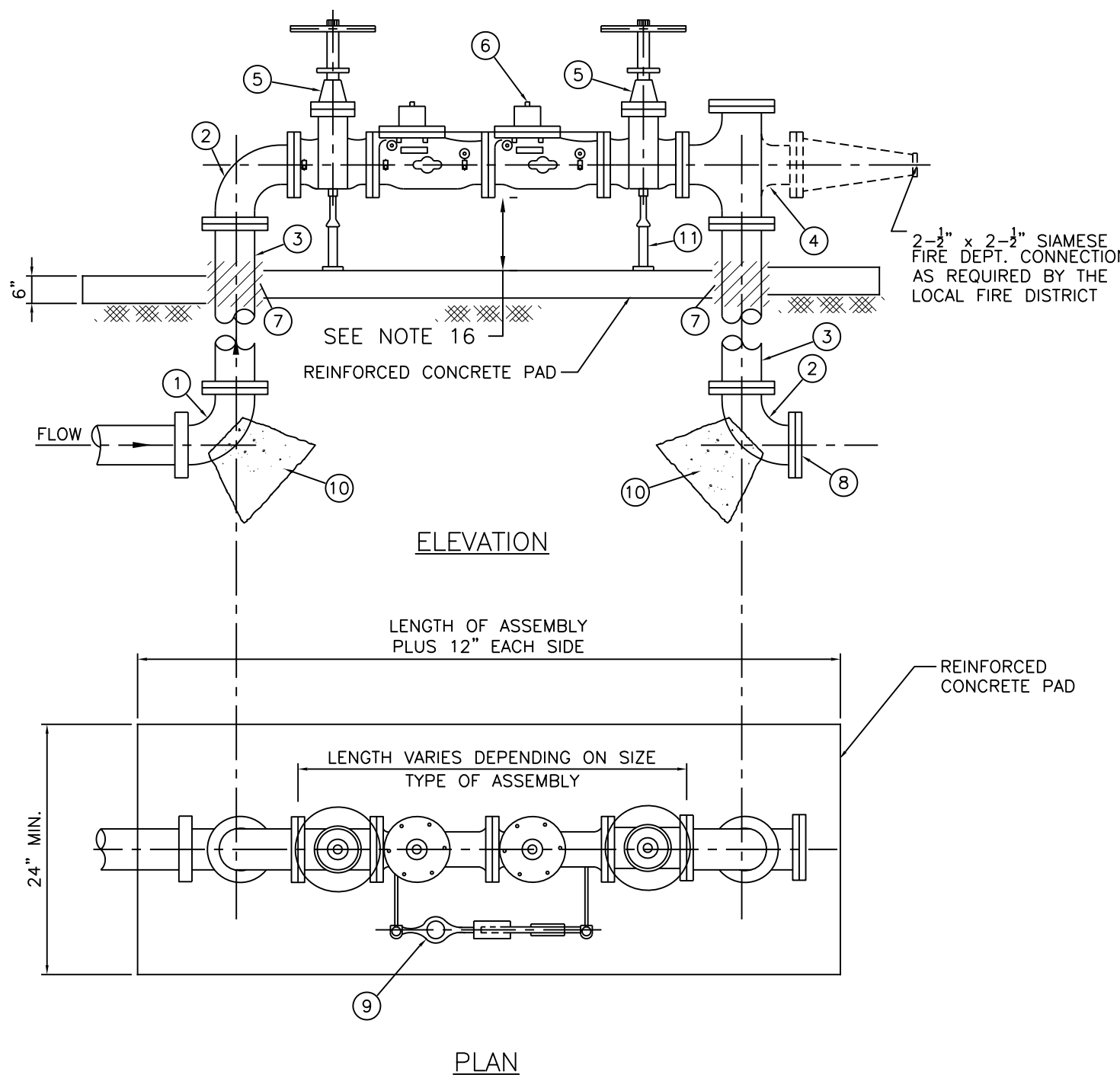
- ① 90° D.I. ELL FLG x PE
- ② 90° D.I. ELL MJ X MJ WITH MEGALUG RESTRAINT
- ③ D.I. SPOOL PE WITH MEGALUG RESTRAINT
- ④ U.S.C.-APPROVED SHUT-OFF VALVES. SEE GENERAL NOTE 2.
- ⑤ U.S.C. APPROVED REDUCED PRESSURE BACKFLOW ASSEMBLY AS APPROVED BY THE DISTRICT
- ⑥ CALPICO VI-10 PROTECTIVE TAPE OR EQUAL
- ⑦ BLIND FLANGE
- ⑧ THRUST BLOCK PER MCWD STD. PLAN W-14
- ⑨ GALVANIZED ADJUSTABLE PIPE SUPPORT SHALL BE GRINELL FIG. 264, ELCEN FIG. 40 OR EQUAL. SUPPORT SHALL BE GALVANIZED AFTER FABRICATION.

**NOTES:**

- 1. NOTIFY M.C.W.D. PRIOR TO INSTALLATION OF UNIT.
- 2. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLIES SHALL BE U.S.C. APPROVED ASSEMBLIES. ENTIRE ASSEMBLY INCLUDING ISOLATION VALVES AND TEST COCKS SHALL BE PROVIDED AS A COMPLETE UNIT.
- 3. INSTALLATION SHALL COMPLY WITH THE LATEST PLUMBING CODES AND APPLICABLE LOCAL AGENCY REQUIREMENTS. CHECK WITH LOCAL BUILDING DEPARTMENT IF A PLUMBING PERMIT IS REQUIRED.
- 4. THRUST BLOCKS SHALL BE SIZED PER MCWD STD. PLAN W-14.
- 5. THE APPROPRIATE EASEMENTS MUST BE DEDICATED TO THE DISTRICT PRIOR TO PLAN APPROVAL.
- 6. BACKFLOW PREVENTERS 3" AND LARGER SHALL BE SUPPORTED BY GALVANIZED PIPE SADDLE SUPPORTS.
- 7. INSTALLATION REQUIRED BY TITLE 17 OF THE CALIFORNIA CODE OF REGULATIONS AND THE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH.
- 8. BACKFLOW PREVENTERS 3" AND LARGER SHALL HAVE AN AIR RELEASE VALVE. VALVES SHALL BE APCO NO. 50, 1/2" FOR 2.5" TO 6" SERVICE, 3/4" FOR 8" TO 12" SERVICE.
- 9. ASSEMBLY SHALL BE PROTECTED BY GUARD POSTS WHEN LOCATED NEAR TRAFFIC AREAS, AS REQUIRED BY THE DISTRICT.
- 10. NO CONNECTIONS OR TEES WILL BE ALLOWED BETWEEN METER OR MCWD ISOLATION VALVE AND BACKFLOW PREVENTER.
- 11. DEVICE MUST BE ACCESSIBLE FOR TESTING AND MAINTENANCE. LOCATION SHALL BE APPROVED BY DISTRICT PRIOR TO INSTALLATION.
- 12. INSTALLATIONS USING THREADED OR SOLDERED FITTINGS SHALL INCLUDE ONE THREE PART UNION ON EACH SIDE OF THE ASSEMBLY. SOLDER SHALL BE LEAD FREE.
- 13. ASSEMBLIES INSTALLED IN AREAS SUBJECT TO VANDALISM SHALL BE ENCLOSED IN A CAGE. CAGE SHALL PROVIDE 12" MINIMUM CLEARANCE ALL AROUND AND SHALL BE SUBMITTED TO MCWD FOR APPROVAL. OPTIONAL.
- 14. FOR METERED SERVICES, BACKFLOW ASSEMBLY MUST BE WITHIN 2" OF THE OUTSIDE OF METER BOX. IF THAT SETBACK CAN NOT BE MET, LOCATION SHALL BE APPROVED BY DISTRICT PRIOR TO INSTALLATION.
- 15. CLEARANCE FROM ASSEMBLY TO PAD SHALL BE FROM THE BOTTOM OF THE RELIEF VALVE ON AN RP DEVICE. MAXIMUM CLEARANCE = 32-INCHES, MINIMUM CLEARANCE = 12-INCHES.

APPROVED BY DISTRICT ENGINEER		<b>MARINA COAST WATER DISTRICT STANDARD PLAN</b>	STANDARD
DATE	11/2015	<b>REDUCED PRESSURE PRINCIPLE BACKFLOW DEVICE SIZE 3-INCH &amp; LARGER</b>	<b>W-19</b>
			SHEET 1 OF 1

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**MATERIALS**

- ① 90° D.I. ELL FLG x PE
- ② 90° D.I. ELL MJ X MJ WITH MEGALUG RESTRAINT
- ③ D.I. SPOOL PE WITH MEGALUG RESTRAINT
- ④ 90° D.I. (CL) TEE FLG x FLG x FLG OR OPTIONAL D.I. (CL) CROSS AND SIAMESE FIRE DEPT. CONNECTION (2 1/2" x 2 1/2"). CLEARANCE AND ORIENTATION AS REQUIRED BY THE FIRE DEPARTMENT.
- ⑤ U.S.C. APPROVED SHUT-OFF VALVES. SEE GENERAL NOTE 2. OS&Y SHUTOFF VALVES AS REQUIRED BY LOCAL FIRE DEPARTMENT.
- ⑥ U.S.C. APPROVED DOUBLE CHECK DETECTOR ASSEMBLY AS APPROVED BY THE DISTRICT
- ⑦ CALPICO VI-10 PROTECTIVE TAPE OR EQUAL
- ⑧ BLIND FLANGE
- ⑨ FACTORY INSTALLED BY-PASS METER AND U.S.C. APPROVED BACKFLOW PREVENTION DEVICE.
- ⑩ THRUST BLOCK PER MCWD STD. PLAN W-14
- ⑪ GALVANIZED ADJUSTABLE PIPE SUPPORT SHALL BE GRINELL FIG. 264, ELCEN FIG. 40 OR EQUAL. SUPPORT SHALL BE GALVANIZED AFTER FABRICATION.

**NOTES:**

- 1. NOTIFY M.C.W.D. PRIOR TO INSTALLATION OF UNIT.
- 2. DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLIES SHALL BE U.S.C. APPROVED ASSEMBLIES. ENTIRE ASSEMBLIES INCLUDING ISOLATION VALVES, TEST COCKS AND BYPASS METER (IF REQUIRED) SHALL BE PROVIDED AS A COMPLETE UNIT.
- 3. INSTALLATION SHALL COMPLY WITH THE LATEST PLUMBING CODES AND APPLICABLE LOCAL AGENCY REQUIREMENTS. CHECK WITH LOCAL BUILDING DEPARTMENT IF A PLUMBING PERMIT IS REQUIRED.
- 4. THRUST BLOCKS SHALL BE SIZED PER MCWD STD. PLAN W-14.
- 5. THE APPROPRIATE EASEMENTS MUST BE DEDICATED TO THE DISTRICT PRIOR TO PLAN APPROVAL.
- 6. DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLIES SHALL BE SUPPORTED BY GALVANIZED PIPE SADDLE SUPPORTS.
- 7. ASSEMBLIES ON FIRE SERVICE LINES SHALL HAVE OS&Y VALVES. HAND WHEELS ON OS&Y VALVES SHALL BE CHAINED AND LOCKED. USE GALVANIZED CHAIN, STRAIGHT LINK.
- 8. INSTALLATION REQUIRED BY TITLE 17 OF THE CALIFORNIA CODE OF REGULATIONS AND THE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH.
- 9. NO CONNECTIONS OR TEES WILL BE ALLOWED BETWEEN METER OR MCWD ISOLATION VALVE AND BACKFLOW PREVENTER.
- 10. ASSEMBLY SHALL BE PROTECTED BY GUARD POSTS WHEN LOCATED NEAR TRAFFIC AREAS, AS REQUIRED BY THE DISTRICT.
- 11. NO CONNECTIONS OR TEES WILL BE ALLOWED BETWEEN METER OR MCWD ISOLATION VALVE AND BACKFLOW PREVENTER.
- 12. DEVICE MUST BE ACCESSIBLE FOR TESTING AND MAINTENANCE. LOCATION SHALL BE APPROVED BY DISTRICT PRIOR TO INSTALLATION.
- 13. INSTALLATIONS USING THREADED OR SOLDERED FITTINGS SHALL INCLUDE ONE THREE PART UNION ON EACH SIDE OF THE ASSEMBLY. SOLDER SHALL BE LEAD FREE.
- 14. ASSEMBLIES INSTALLED IN AREAS SUBJECT TO VANDALISM SHALL BE ENCLOSED IN A CAGE. CAGE SHALL PROVIDE 12" MINIMUM CLEARANCE ALL AROUND AND SHALL BE SUBMITTED TO MCWD FOR APPROVAL. OPTIONAL.
- 15. FOR METERED SERVICES, BACKFLOW ASSEMBLY MUST BE WITHIN 2" OF THE OUTSIDE OF METER BOX. IF THAT SETBACK CAN NOT BE MET, LOCATION SHALL BE APPROVED BY DISTRICT PRIOR TO INSTALLATION.
- 16. CLEARANCE FROM ASSEMBLY TO PAD SHALL BE FROM THE LOWEST PART OF ASSEMBLY FOR DCDA. MAXIMUM CLEARANCE = 32-INCHES, MINIMUM CLEARANCE = 12-INCHES.

APPROVED BY DISTRICT ENGINEER		MARINA COAST WATER DISTRICT STANDARD PLAN	STANDARD
DATE 11/2015		DOUBLE CHECK DETECTOR ASSEMBLY SIZE 3-INCH & LARGER	W-20
			SHEET 1 OF 1