POTABLE WATER FACILITIES

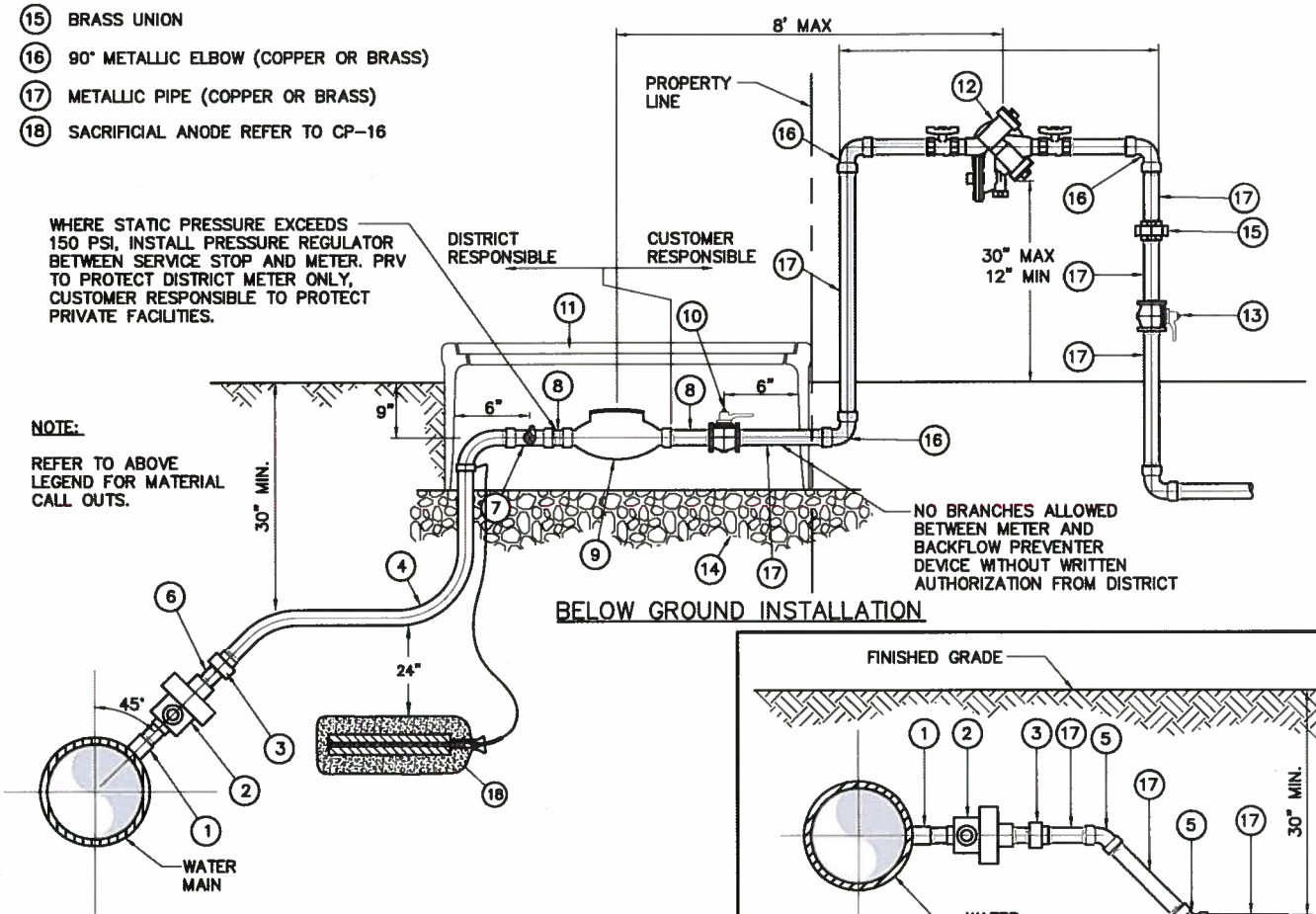
STANDARD DRAWINGS

MATERIAL LIST

1. FORGED STEEL HALF-COUPLING, THREADED, CLASS 3000 WELDED TO PIPE PER W-5. (CML&C PIPE) OR DOUBLE STRAP, STAINLESS STEEL, TAPPING COLLAR (PVC OR DUCTILE IRON)
2. BRASS CORP STOP
3. BRASS MALE/COPPER ADAPTER
4. TYPE "K" COPPER TUBING
5. 45° COPPER ELL
6. BRASS NIPPLE, THREADED
7. BRASS SERVICE STOP, B-11 W INSTALLED FOR RIGHT HAND OPERATION PER RMWD SPEC. 15057 2.03
8. BRASS METER TAILS WITH GASKETS
9. WATER METER SUPPLIED BY DISTRICT
10. BRASS BALL VALVE
11. HDPE PLASTIC METER BOX AND COVER, FOR 1" USE 20"X26" BOX (BLACK) FOR 1.5" & 2" USE 26"X39" BOX (BLACK).
12. STATE APPROVED REDUCED PRESSURE BACKFLOW PREVENTION DEVICE
13. BRONZE BALL VALVE, CLASS 125.
14. 6" BASE OF 3/4" ROCK
15. BRASS UNION
16. 90° METALLIC ELBOW (COPPER OR BRASS)
17. METALLIC PIPE (COPPER OR BRASS)
18. SACRIFICIAL ANODE REFER TO CP-16

TYPICAL CONSTRUCTION NOTES:

1. USE SILVER SOLDER FOR COPPER PIPE JOINTS.
2. MORTAR COUPLING AND MALE THREADS OF CORP STOP AFTER CONNECTING TO A MORTAR – COATED STEEL PIPE.
3. APPLY BITUMASTIC COMPOUND TO COUPLING AND MALE THREADS OF CORP STOP AFTER CONNECTING TO A TAR / WRAPPED STEEL PIPE.
4. PIPE THREADS SHALL BE CLEAN, SHARP, AND WRAPPED WITH A PIPE THREAD SEAL TAPE.
5. WHERE METER BOX IS LOCATED IN CONCRETE OR ASPHALT TRAFFIC AREAS, CONTACT DISTRICT FOR AN APPROVED CONCRETE METER BOX.
6. ON 1-1/2" & 2" METERS (WHICH ARE FLANGED), PROVIDE THREADED COMPANION FLANGES, 150-LB.
7. ALL BRASS FITTINGS TO BE DOMESTIC PRODUCTS.
8. WRAP BURIED COPPER WITH 10 MIL CALPICO TAPE OR POLYETHALENE ENCASEMENT.
9. METER TO BACKFLOW – ANY DISTANCE GREATER THAN 8' NEEDS APPROVAL FROM D.E.



BELOW GROUND INSTALLATION

ALTERNATE: FOR SERVICE OF AN EXISTING SHALLOW WATER MAIN

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED:
RCE # 55790 EXP.12/31/2012

REVISION	APPROVED	DATE

TYPICAL 1" TO 2" WATER SERVICE INSTALLATION

STANDARD DRAWING NO.

W-1

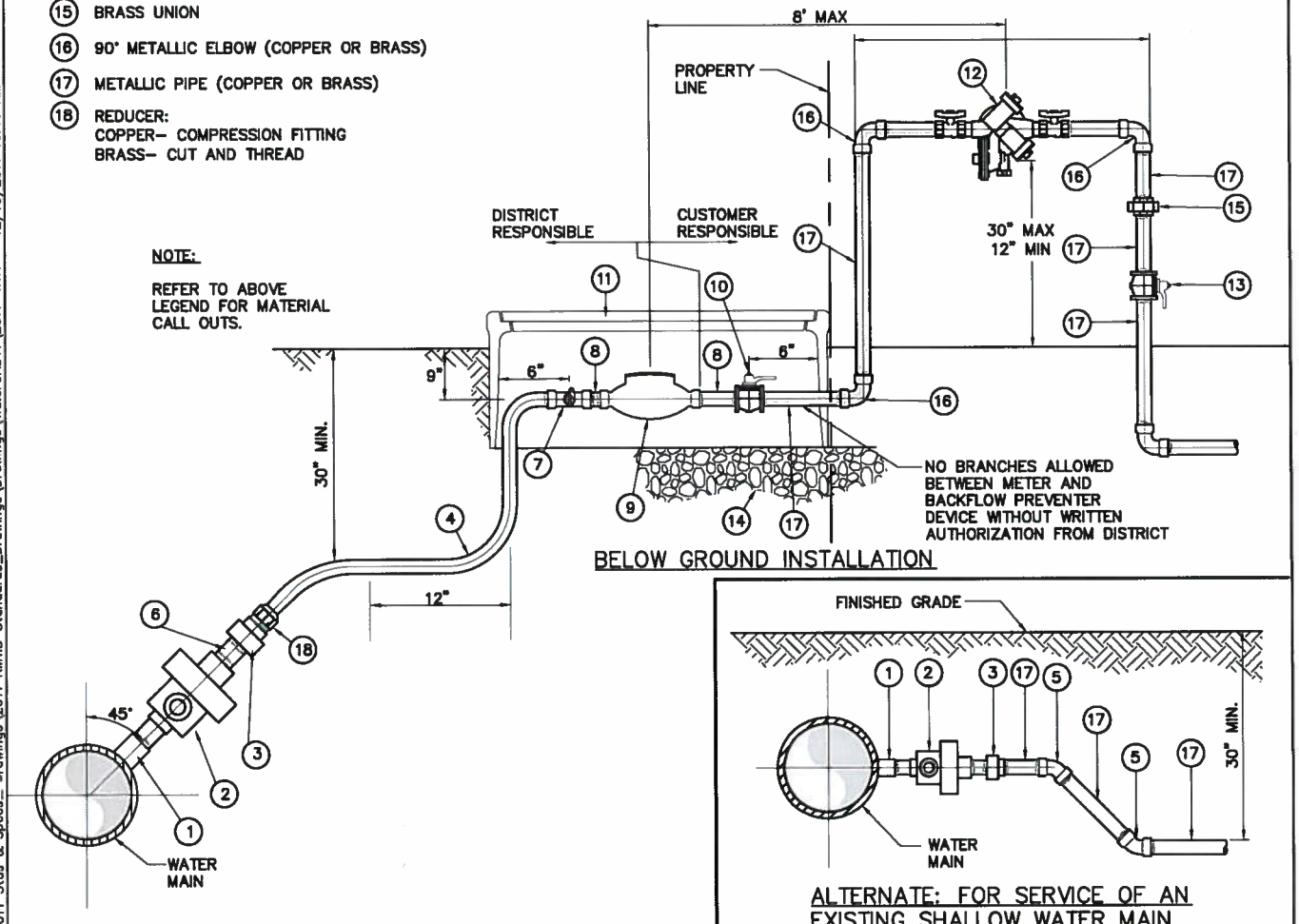
DECEMBER 2011

MATERIAL LIST

1. FORGED STEEL HALF-COUPLING, THREADED, CLASS 3000 WELDED TO PIPE PER W-5. (CML&C PIPE) OR DOUBLE STRAP, STAINLESS STEEL, TAPPING COLLAR (PVC OR DUCTILE IRON)
2. BRASS CORP STOP
3. BRASS MALE/COPPER ADAPTER
4. TYPE "K" COPPER TUBING
5. 45° COPPER ELL
6. BRASS NIPPLE, THREADED
7. BRASS SERVICE STOP, B-11 W INSTALLED FOR RIGHT HAND OPERATION PER RMWD SPEC. 15057 2.03
8. BRASS METER TAILS WITH GASKETS
9. WATER METER SUPPLIED BY DISTRICT
10. BRASS BALL VALVE
11. HDPE PLASTIC METER BOX AND COVER, FOR 1" USE 20"X26" BOX (BLACK) FOR 1.5" & 2" USE 26"X39" BOX (BLACK).
12. STATE APPROVED REDUCED PRESSURE BACKFLOW PREVENTION DEVICE
13. BRONZE BALL VALVE, CLASS 125.
14. 6" BASE OF 3/4" ROCK
15. BRASS UNION
16. 90° METALLIC ELBOW (COPPER OR BRASS)
17. METALLIC PIPE (COPPER OR BRASS)
18. REDUCER: COPPER- COMPRESSION FITTING BRASS- CUT AND THREAD

TYPICAL CONSTRUCTION NOTES:

1. USE SILVER SOLDER FOR COPPER PIPE JOINTS.
2. MORTAR COUPLING AND MALE THREADS OF CORP STOP AFTER CONNECTING TO A MORTAR – COATED STEEL PIPE.
3. APPLY BITUMASTIC COMPOUND TO COUPLING AND MALE THREADS OF CORP STOP AFTER CONNECTING TO A TAR / WRAPPED STEEL PIPE.
4. PIPE THREADS SHALL BE CLEAN, SHARP, AND WRAPPED WITH A PIPE THREAD SEAL TAPE.
5. WHERE METER BOX IS LOCATED IN CONCRETE OR ASPHALT TRAFFIC AREAS, CONTACT DISTRICT FOR AN APPROVED CONCRETE METER BOX.
6. ON 1-1/2" & 2" METERS (WHICH ARE FLANGED), PROVIDE THREADED COMPANION FLANGES, 150-LB.
7. ALL BRASS FITTINGS TO BE DOMESTIC PRODUCTS.
8. WRAP BURIED COPPER WITH 10 MIL CALPICO TAPE OR POLYETHALENE ENCASEMENT.
9. METER TO BACKFLOW – ANY DISTANCE GREATER THAN 8' NEEDS APPROVAL FROM D.E.



BELOW GROUND INSTALLATION

ALTERNATE: FOR SERVICE OF AN EXISTING SHALLOW WATER MAIN

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Tim C. Lee
RCE # 55790 EXP.12/31/2012

REVISION	APPROVED	DATE

REDUCED WATER SERVICE INSTALLATION

STANDARD DRAWING NO.

W- 1A

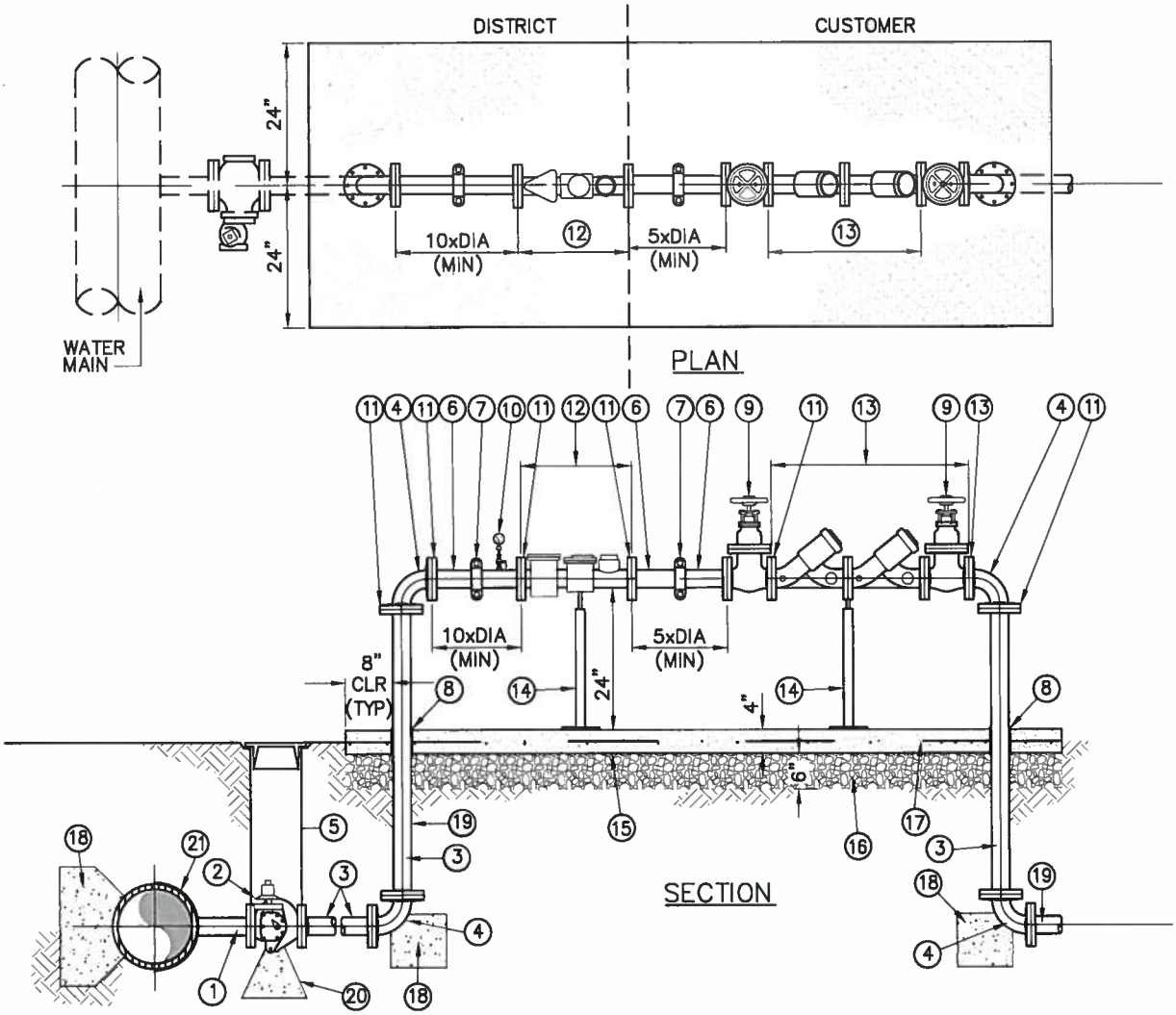
DECEMBER 2011

MATERIAL LIST

1. 3" FLANGED OUTLET PER AWWA AND DISTRICT STANDARDS
2. 3" FLANGED GATE VALVE, (OR FLANGED PLUG VALVE, WHERE PRESSURE IS GREATER THAN 250 PSI
3. 3" DI PIPE T.2E.
4. 3"X90° DI PIPE ELBOW, FLANGED.
5. VALVE BOX INSTALLATION PER DISTRICT STD. DWG NO. W-19
6. 3" FLANGE X GROVE END SPOOL.
7. 3" COUPLING, 150-LB, GALVANIZED.
8. WRAP WITH FOAM TAPE FOR CONCRETE PENETRATION
9. 3" GATE VALVE, FLANGED,
10. PRESSURE GAUGE INSTALLATION PER D.E.
11. 3" COMPANION FLANGE, FLANGED, 150-LB
12. WATER METER SUPPLIED BY DISTRICT
13. DISTRICT APPROVED REDUCED PRESSURE BACKFLOW PREVENTION DEVICE AS REQUIRED BY THE DISTRICT
14. ADJUSTABLE STAINLESS STEEL PIPE SUPPORT FOR 3" PIPING.
15. CONCRETE SLAB, CLASS 520-A-2500.
16. BACKFILL WITH AGGREGATE BASE, (95% RELATIVE COMPACTION).
17. STEEL REBAR, 12" O.C. EACH WAY GRADE 60 #4, AT MID-DEPTH
18. THRUST BLOCK, PER RMWD SEC. 03300
19. WRAP PER DISTRCIT STANDARDS
20. VALVE SUPPORT BLOCK PER STD DWG W-4

NOTES:

1. CUSTOMER RESPONSIBLE FOR SUPPLYING PRESSURE REDUCING VALVE (PRV) WHEN PRESSURE EXCEEDS 175 PSI. REFER TO THE UNIFORM BUILDING CODE AND A PRIVATE ENGINEER REGARDING INSTALLATION OF A PRV AFTER THE METER.



RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Kim C. Lee
RCE # 55790 EXP.12/31/2012

REVISION	APPROVED	DATE

3" WATER SERVICE

STANDARD DRAWING NO.

W-2

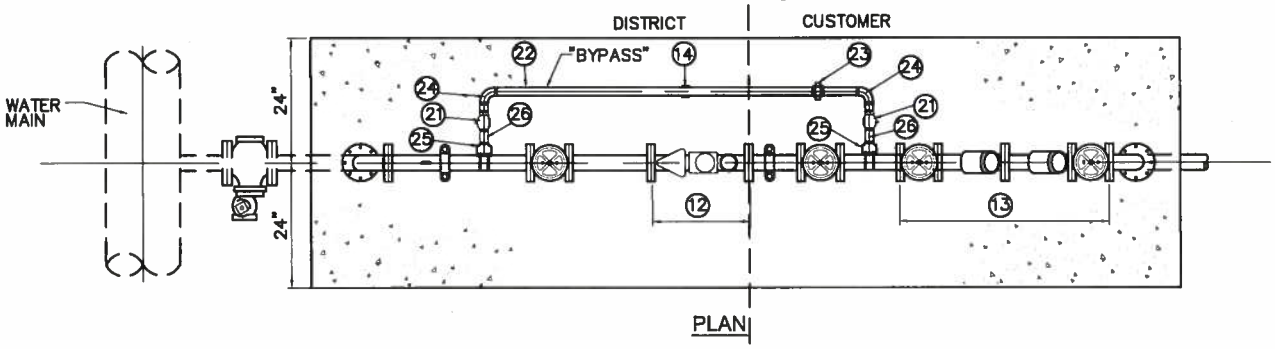
DECEMBER 2011

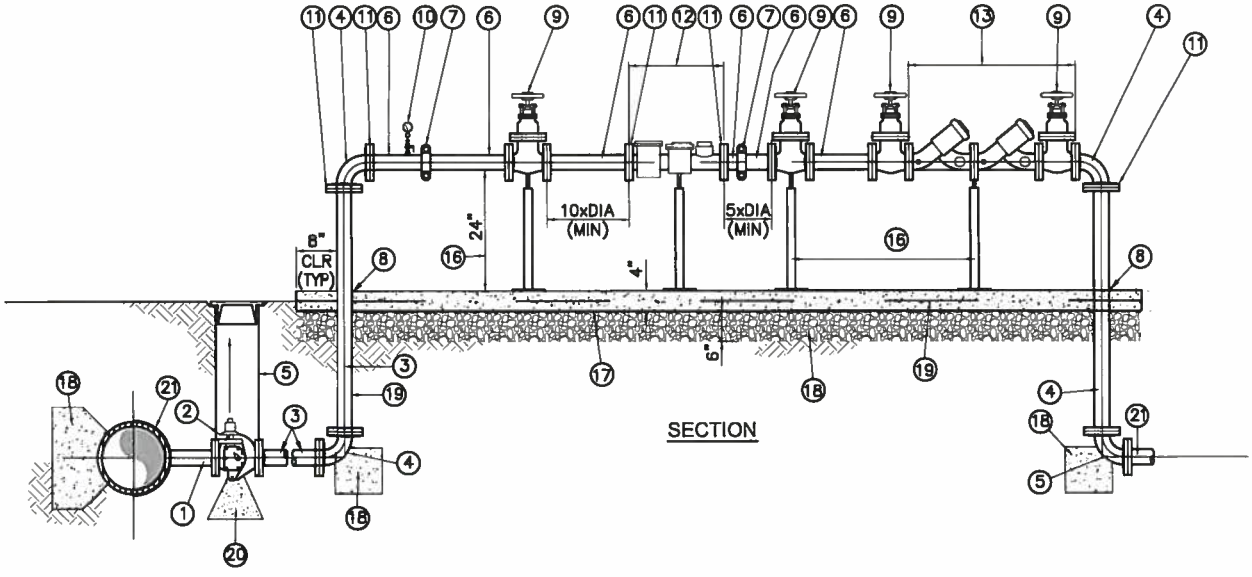
MATERIAL LIST

1. FLANGED OUTLET PER AWWA AND DISTRICT STANDARDS
2. FLANGED GATE VALVE, (OR FLANGED PLUG VALVE, WHERE PRESSURE IS GREATER THAN 250 PSI)
3. DI PIPE T.2E.
4. 90° DI PIPE ELBOW, FLANGED.
5. VALVE BOX INSTALLATION PER DISTRICT STD. DWG NO. W-19
6. FLANGE X GROVE END SPOOL.
7. COUPLING, 150-LB, GALVANIZED.
8. WRAP WITH FOAM TAPE FOR CONCRETE PENETRATION
9. FLANGED GATE VALVE (OR FLANGED PLUG VALVE, WHERE PRESSURE IS GREATER THAN 250 PSI), WITH HANDWHEEL OPERATOR
10. PRESSURE GAUGE INSTALLATION PER D.E.
11. COMPANION FLANGE, FLANGED, 150-LB
12. WATER METER SUPPLIED BY DISTRICT
13. DISTRICT APPROVED REDUCED PRESSURE BACKFLOW PREVENTION DEVICE AS REQUIRED BY THE DISTRICT
14. ADJUSTABLE STAINLESS STEEL PIPE SUPPORT PIPING.
15. CONCRETE SLAB, CLASS 520-A-2500.
16. BACKFILL WITH AGGREGATE BASE, (95% RELATIVE COMPACTION).
17. STEEL REBAR, 12" O.C. EACH WAY GRADE 60 #4, AT MID-DEPTH
18. THRUST BLOCK, PER RMWD SEC. 03300
19. WRAP PER DISTRCIT STANDARDS
20. VALVE SUPPORT BLOCK PER STD DWG W-4
21. BRASS SERVICE STOP
    INSTALLED FOR RIGHT HAND OPERATION
    PER RMWD SPEC. 15057 2.03
22. 2" BRASS PIPE
23. BRASS UNION
24. 90° BRASS ELBOW
25. FORGE STEEL HALF-COUPLING, THREADED, CLASS 3000
    DOUBLE STRAP, STAINLESS STEEL, TAPING COLLAR
26. BRASS NIPPLE

NOTES:

1. CUSTOMER RESPONSIBLE FOR SUPPLYING PRESSURE REDUCING VALVE (PRV) WHEN PRESSURE EXCEEDS 175 PSI. REFER TO THE UNIFORM BUILDING CODE AND A PRIVATE ENGINEER REGARDING INSTALLATION OF A PRV AFTER THE METER.
2. REPLACE 150-LB VALVES AND PIPING WITH COMPONENTS TO MEET PRESSURE REQUIREMENTS IN HIGH PRESSURE AREAS





RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Tim C. Lee
RCE # 55790 EXP.12/31/2012

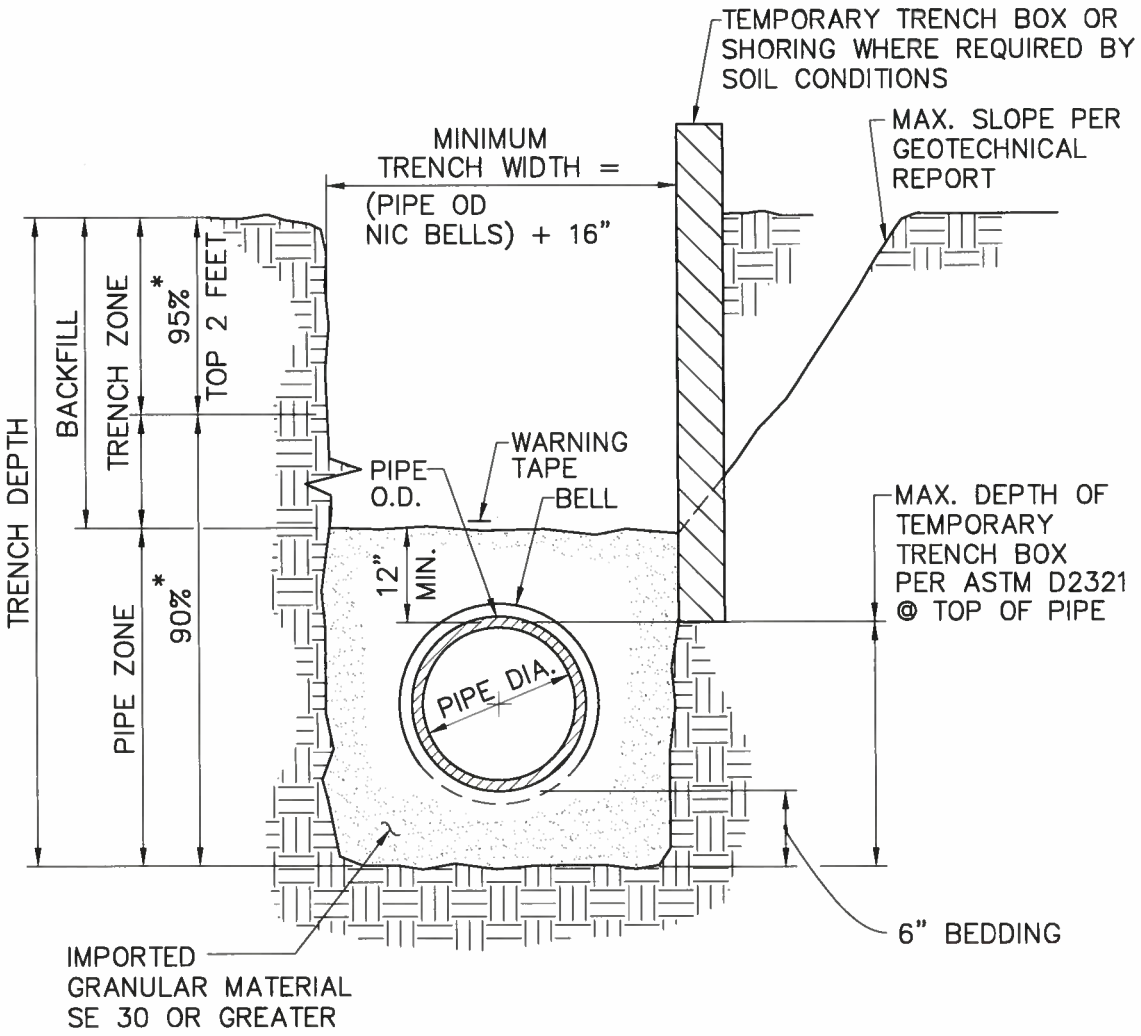
REVISION	APPROVED	DATE

4" TO 6" WATER SERVICE

STANDARD DRAWING NO.

W-2A

DECEMBER 2011



NOTES:

1. REFER TO SECTION 02223 OF THE SPECIFICATIONS
2. PAVING OR PAVEMENT REPAIR TO BE DONE IN ACCORDANCE TO CITY OR COUNTY STANDARDS
3. EXCAVATE BELL HOLES AT EACH PIPE JOINT TO PERMIT PROPER ASSEMBLY AND INSPECTION OF THE ENTIRE JOINT.
4. (*) INDICATES MINIMUM RELATIVE COMPACTION.

RAINBOW MUNICIPAL WATER DISTRICT

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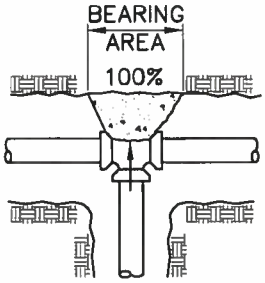
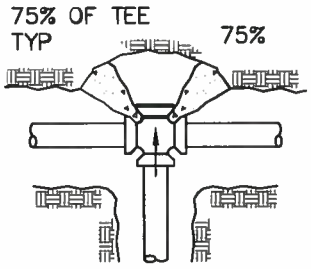
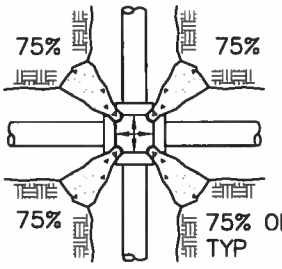
REVISION	APPROVED	DATE

STANDARD PIPE ZONE AND TRENCH BACKFILL

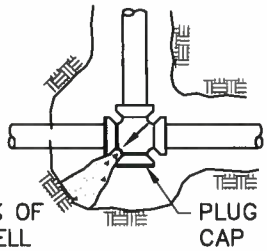
STANDARD DRAWING NO.
W-3
DECEMBER 2011

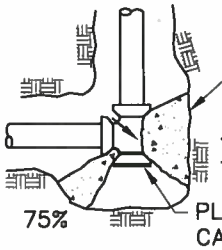


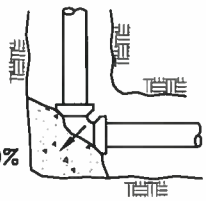


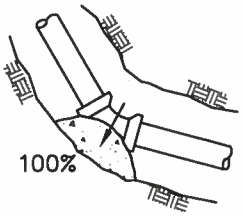


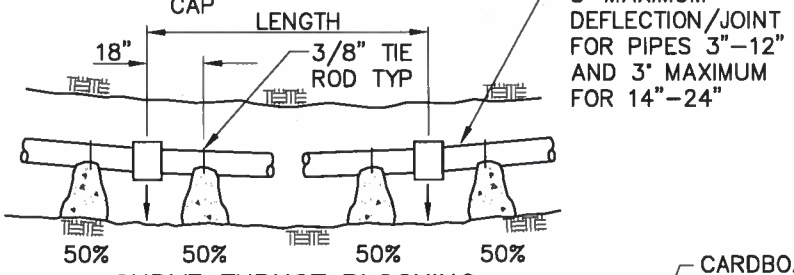
PLANS



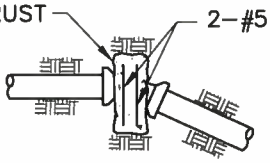




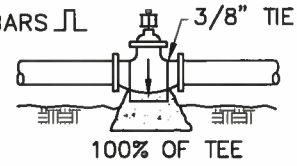




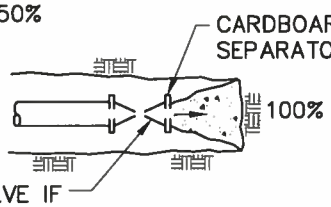
CURVE THRUST BLOCKING



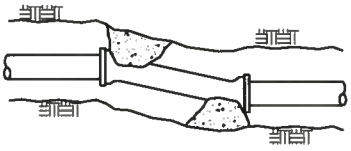
VERTICAL BEND



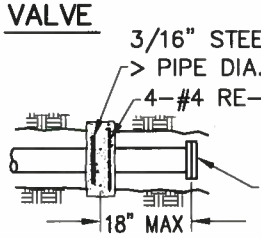
VALVE



DEAD–END



DEFLECTION



STEEL PIPE THRUST COLLAR

NOTES:

1. IN USING THE ABOVE TABLES, USE THE MAXIMUM INTERNAL PRESSURE ANTICIPATED (i.e. HYDROSTATIC TEST PRESSURE, POSSIBLE SURGE PRESSURE DUE TO PUMP SHUT–OFF, ETC.)
2. SEE SOILS REPORT FOR BEARING STRENGTH OF SOIL. IN THE ABSENCE OF A SOILS REPORT, AN AVERAGE SOIL (SPADABLE MEDIUM CLAY) CAN BE ASSUMED TO HAVE A BEARING STRENGTH OF 2000 P.S.F.
3. ARROWS (——) INDICATE THRUST DIRECTION
4. FIGURE (100%) AT THRUST BLOCK INDICATES PER CENT OF TOTAL THRUST TO BE APPLIED FOR BEARING AREA.
5. CONC. FOR THRUST BLOCKS TO BE 450–C–2000
6. CONCRETE THRUST BLOCK TO BE POURED AGAINST UNDISTURED EARTH.

MINIMUM BEARING AREAS IN SQUARE FEET PER 100 PSI OF PRESSURE

PIPE SIZE	DEAD END OR TEE	90° ELBOW	45° ELBOW	22–1/2° ELBOW	11–1/4° ELBOW
6	3.7	5.3	2.9	1.5	0.7
8	6.4	9.1	4.9	2.5	1.3
10	9.7	13.7	7.4	3.8	1.9
12	13.7	19.4	10.5	5.3	2.7
14	18.4	26.0	14.1	7.2	3.6
16	23.8	33.6	18.2	9.3	4.7
18	24.9	42.2	22.9	11.7	5.9
20	36.6	51.8	28.0	14.3	7.2
24	52.3	73.9	40.0	20.4	10.2
30	80.4	113.7	61.6	31.4	15.8

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Tim C. Lee
RCE # 55790 EXP.12/31/2012

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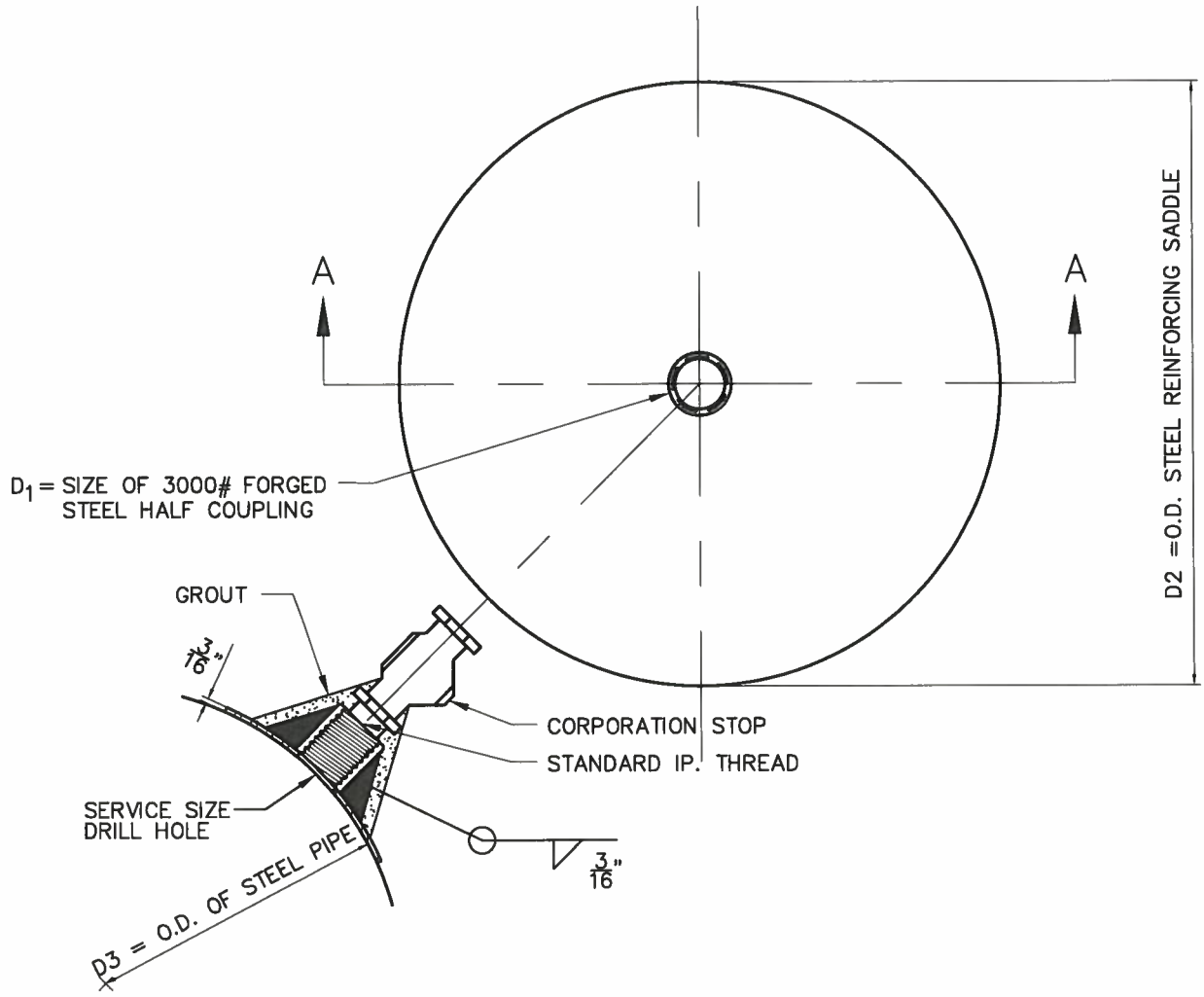
CONCRETE THRUST BLOCKS

STANDARD DRAWING NO.
W-4

DECEMBER 2011



NOTES:

1. USE DOUBLE-PASS WELDS FOR FABRICATION & FIELD WELDS.
2. SADDLE CURVATURE TO BE FORMED TO MEET PIPE DIAMETERS D_3 AS INDICATED.
3. WHEN INSTALLED, OUTLET TO BE COATED WITH SAME COATING AS PIPE.
4. SERVICE LATERALS TO BE INSTALLED AT 45° ANGLE ABOVE SPRINGLINE OF PIPE.

SECTION A-A

SADDLE DIMENSIONS		
SERVICE SIZE	D 1	D 2
3/4" / 1"	1 1/4"	5"
1 1/2" / 2"	2 1/2"	7"

RAINBOW MUNICIPAL WATER DISTRICT

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RCE # 55790 EXP.12/31/2012

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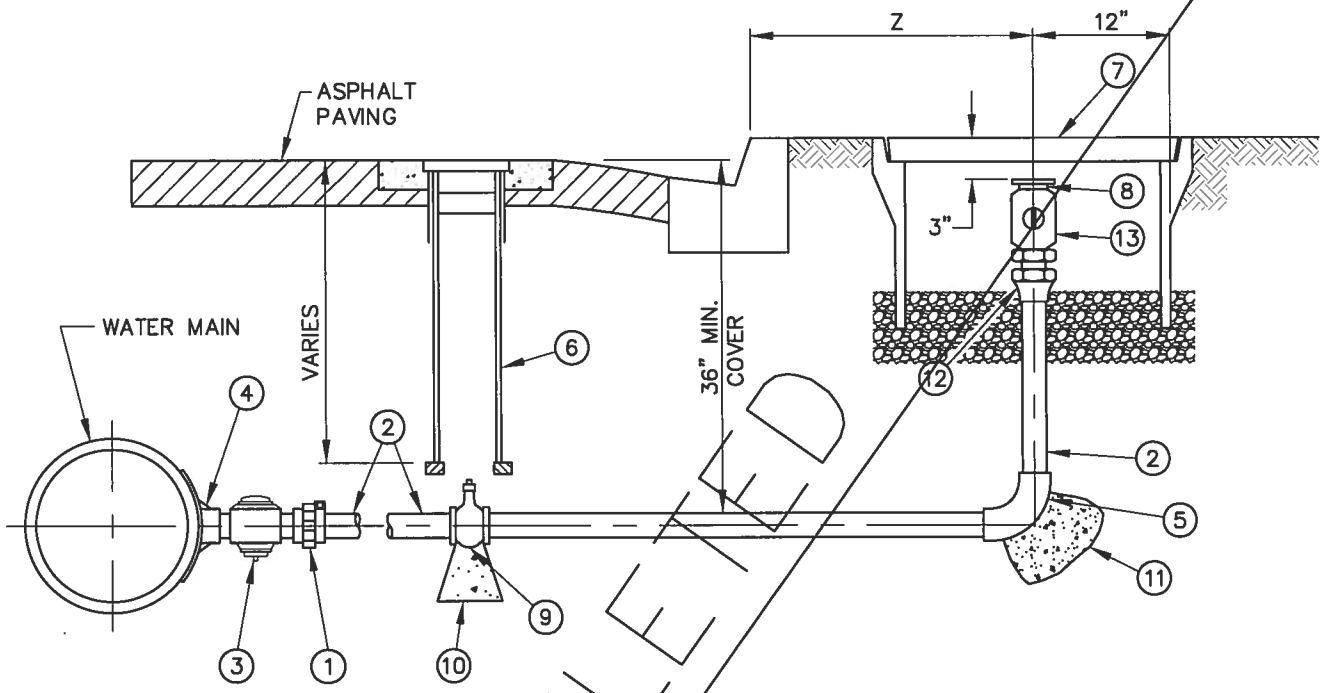
SERVICE OUTLET SADDLE

STANDARD DRAWING NO.
W-5
DECEMBER 2011



Z = 2' FROM BACK OF SIDEWALK.
2' FROM FACE OF CURB IF NO SIDEWALK EXISTS.

ITEM	NO.	DESCRIPTION	REMARKS
1	1	2" BRASS ADAPTOR	BRASS
2	1	2" BRASS TUBING	BRASS
3	1	CORPORATION STOP	
4	1	SERVICE OUTLET SADDLE	PER RMWD STD. DWG. W-5
5	1	90° BRASS ELBOW	
6	1	VALVE BOX INSTALLATION PER DISTRICT STD. DWG# W-19	
7	1	POLYMER METER BOX WITH LID, 17" X 30"	
8	1	BRASS 2" IRON PIPE THREAD X 2 1/2" HOSE PIPE THREAD ADAPTER	
9	1	2" BALL VALVE	
10	1	VALVE SUPPORT BLOCK	PER RMWD STD. DETAIL W-4
11	1	THRUST BLOCK	PER RMWD SECTION 03300
12	1	PIPE TO TUBING ADAPTER	
13	1	BALL VALVE	

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED:

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REVISION	APPROVED	DATE

2" BLOW-OFF ASSEMBLY

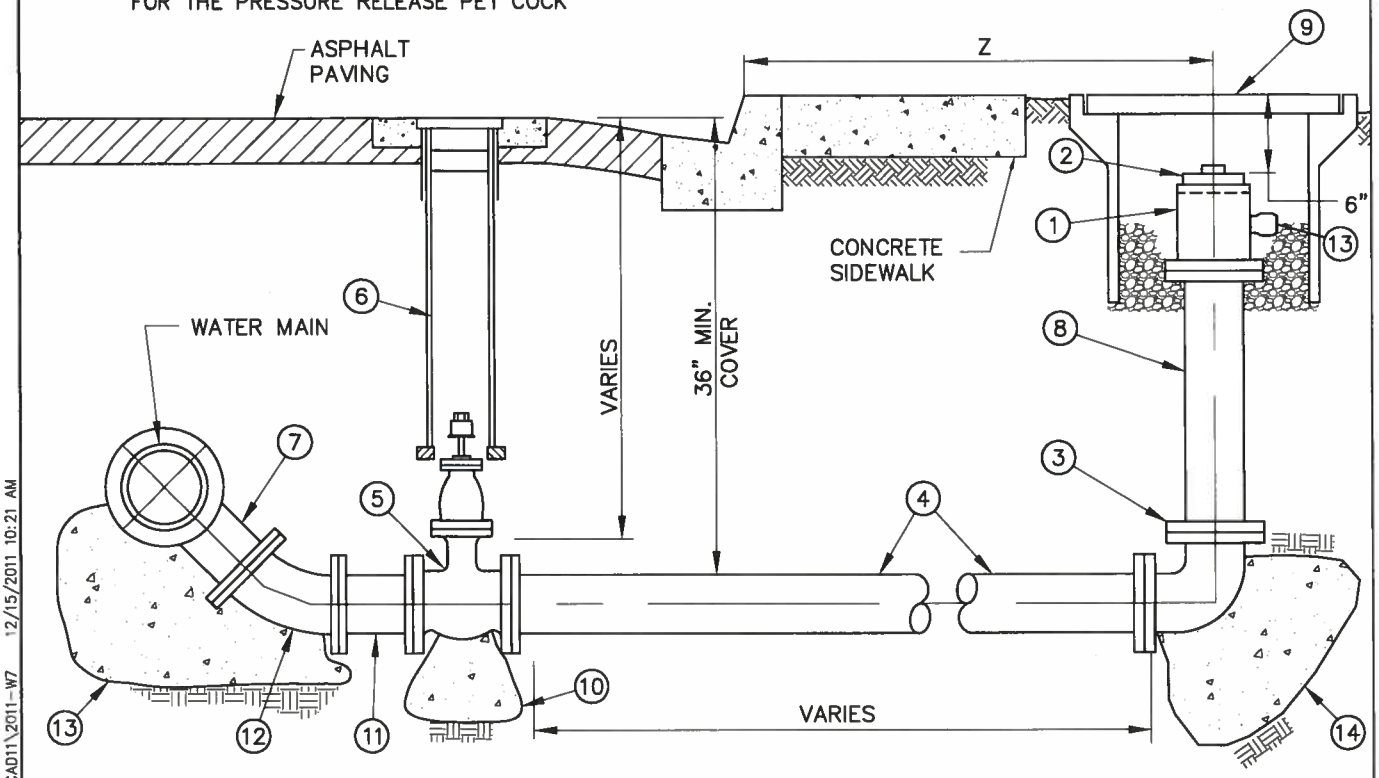
STANDARD DRAWING NO.

W-6

DECEMBER 2011

NOTE:

1. BLOWOFFS INSTALLED AT STREETS OR ROADS WITHOUT CURBS SHALL BE PROTECTED WITH GUARD POSTS (2). PER RMWD STANDARD DETAIL W-13
2. FOR 6" BLOWOFF, USE STANDARD FIRE HYDRANT PER RMWD STD. DETAIL W-9 OR W-10
3. COUPLING SHALL BE DRILLED AND TAPPED AS REQUIRED FOR THE PRESSURE RELEASE PET COCK



Z 2'-6" FROM BACK OF SIDEWALK.
2'-6" FROM FACE OF CURB IF NO SIDEWALK EXISTS.

ITEM	NO.	DESCRIPTION	REMARKS
1	1	4" DIP COUPLING, FL	
2	1	4" BRASS PLUG	
3	1	FLG. 90° BEND	
4	–	4"DUCTILE IRON PIPE	LENGTH AS REQ'D. STEEL WITH D.E. APPROVAL
5	1	4" GATE VALVE FLG.	
6	1	VALVE BOX INSTALLATION PER DISTRICT STD. DWG# W-19	
7	1	4" FLANGED OUTLET	
8	1	4" DIP FL X FL	LENGTH AS REQ'D
9	1	12" CAST IRON VALVE WELL COVER	
10	–	VALVE SUPPORT BLOCK	PER RMWD STD. DETAIL W-4
11	–	4" FL X FL SPOOL	LENGTH AS REQ'D
12	–	4" 45° FL X FL ELL	
13	–	THRUST BLOCK	PER RMWD STD. DETAIL W-4
14	1	1/4" PRESSURE RELEASE PET COCK	SEE NOTE 3

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Tim C. Lee
RCE # 55790 EXP.12/31/2012

REVISION	APPROVED	DATE

4" BLOW-OFF ASSEMBLY

(FOR PRESSURE LESS THAN 250 PSI)

STANDARD DRAWING NO.
W-7
DECEMBER 2011

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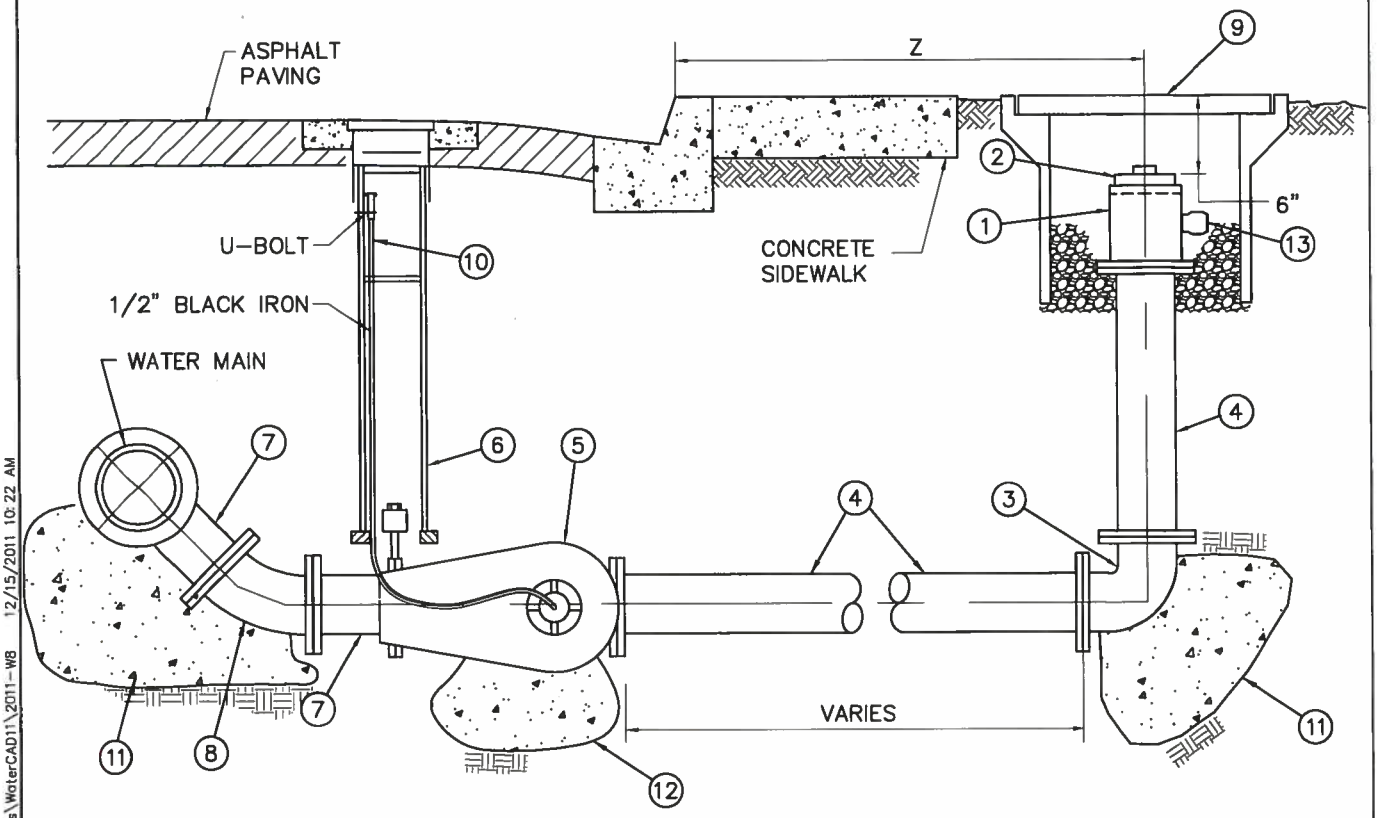
NOTES:

1. BLOWOFFS INSTALLED AT STREETS OR ROADS WITHOUT CURBS SHALL BE PROTECTED WITH GUARD POSTS (2). PER RMWD STANDARD DETAIL W-13
2. FOR 6" BLOWOFF, USE STANDARD FIRE HYDRANT PER RMWD STD. DETAIL W-9 OR W-10
3. COUPLING SHALL BE DRILLED AND TAPPED AS REQUIRED FOR THE PRESSURE RELEASE PET COCK



Z 2' FROM BACK OF SIDEWALK.
2' FROM FACE OF CURB IF NO SIDEWALK EXISTS.

ITEM	NO.	DESCRIPTION	REMARKS
1	1	4" DIP COUPLING, FL	
2	1	4" BRASS PLUG	
3	1	4" 90°, FLG.	LENGTH AS REQ'D
4	–	4" DIP, FL X FL	LENGTH AS REQ'D
5	1	4" PLUG VALVE, FLG.	
6	1	VALVE BOX INSTALLATION PER STD. DWG W-19	
7	1	4" FLANGED OUTLET	
8	1	4" FL X FL 45° ELL	
9	1	12" CAST IRON VALVE WELL COVER	
10	2	GREASE TUBE	
11	2	THRUST BLOCK	PER RMWD STD. DETAIL W-4
12	1	VALVE SUPPORT	PER RMWD STD. DETAIL W-4
13	1	1/4" PRESSURE RELEASE PET COCK	SEE NOTE 3

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Tim C. Lee
RCE # 55790 EXP.12/31/2012

REVISION	APPROVED	DATE

4" BLOW-OFF ASSEMBLY

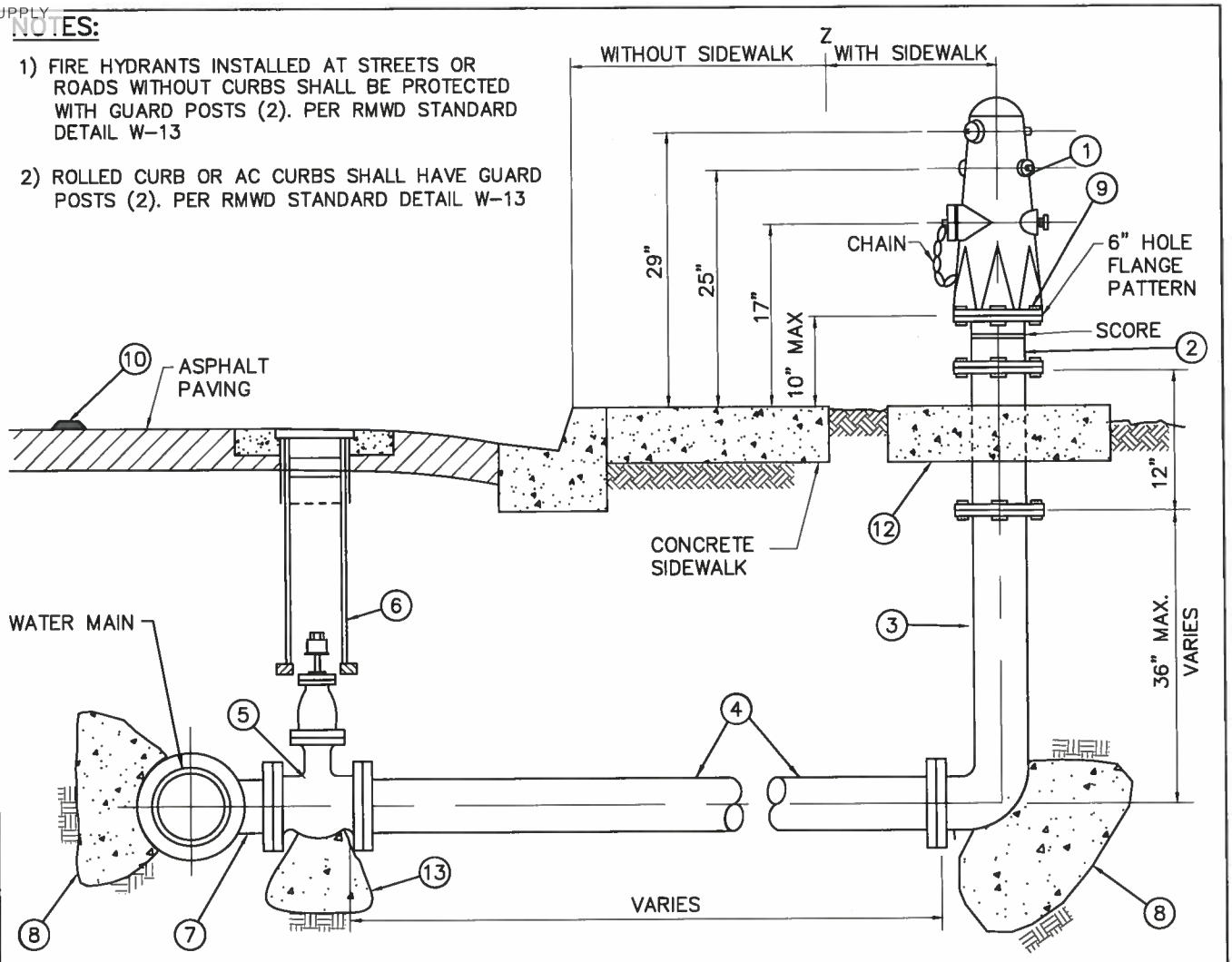
(FOR PRESSURE GREATER THAN 250 PSI)

STANDARD DRAWING NO.
W-8
DECEMBER 2011

NOTES:

1) FIRE HYDRANTS INSTALLED AT STREETS OR ROADS WITHOUT CURBS SHALL BE PROTECTED WITH GUARD POSTS (2). PER RMWD STANDARD DETAIL W-13

2) ROLLED CURB OR AC CURBS SHALL HAVE GUARD POSTS (2). PER RMWD STANDARD DETAIL W-13



Z 2'-6" FROM BACK OF SIDEWALK.
2'-6" FROM FACE OF CURB IF NO SIDEWALK EXISTS.

DESCRIPTION	BARRELS OUTLETS
COMMERCIAL FIRE HYDRANT	6"x4"x2 1/2"x2 1/2"
SINGLE FAMILY RESIDENTIAL	6"x4"x2 1/2"

ITEM	NO.	DESCRIPTION	REMARKS
1	1	6" FIRE HYDRANT	6 BOLTS, ALL BRONZE, SAFETY YELLOW
2	1	BREAK-OFF RISER, 6" STEEL OR DUCTILE IRON	SCORED (NOT MOLDED)
3	1	DUCTILE IRON BURY ELL	
4	–	6" DI PIPE	
5	1	6" GATE VALVE FL OR PO	PER STANDARD SPECIFICATION
6	1	VALVE BOX INSTALLATION PER DISTRICT STD. DWG# W-19	SEE STANDARD SPECIFICATION
7	1	6" FLANGED OUTLET	PER STANDARD SPECIFICATION
8	1	THRUST BLOCK	PER RMWD 03300
9	6	BREAK OFF BOLTS, THREADS UP FILL W/SILICON	PER STANDARD SPECIFICATIONS
10	1	REFLECTIVE PAVEMENT MARKER (BLUE)	PER FIRE DISTRICT REQUIREMENTS
11	–	RESTRAINT HARNESS	
12	1	4' x 4' CONCRETE PAD, 4" THICK, 520-C-2500	
13	–	VALVE SUPPORT BLOCK	PER RMWD STD. DETAIL W-4

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Brian C. Lee
RCE # 55790 EXP.12/31/2012

REVISION	APPROVED	DATE

6" FIRE HYDRANT ASSEMBLY
(FOR PRESSURE LESS THAN 250 PSI)

STANDARD DRAWING NO.
W-9
DECEMBER 2011

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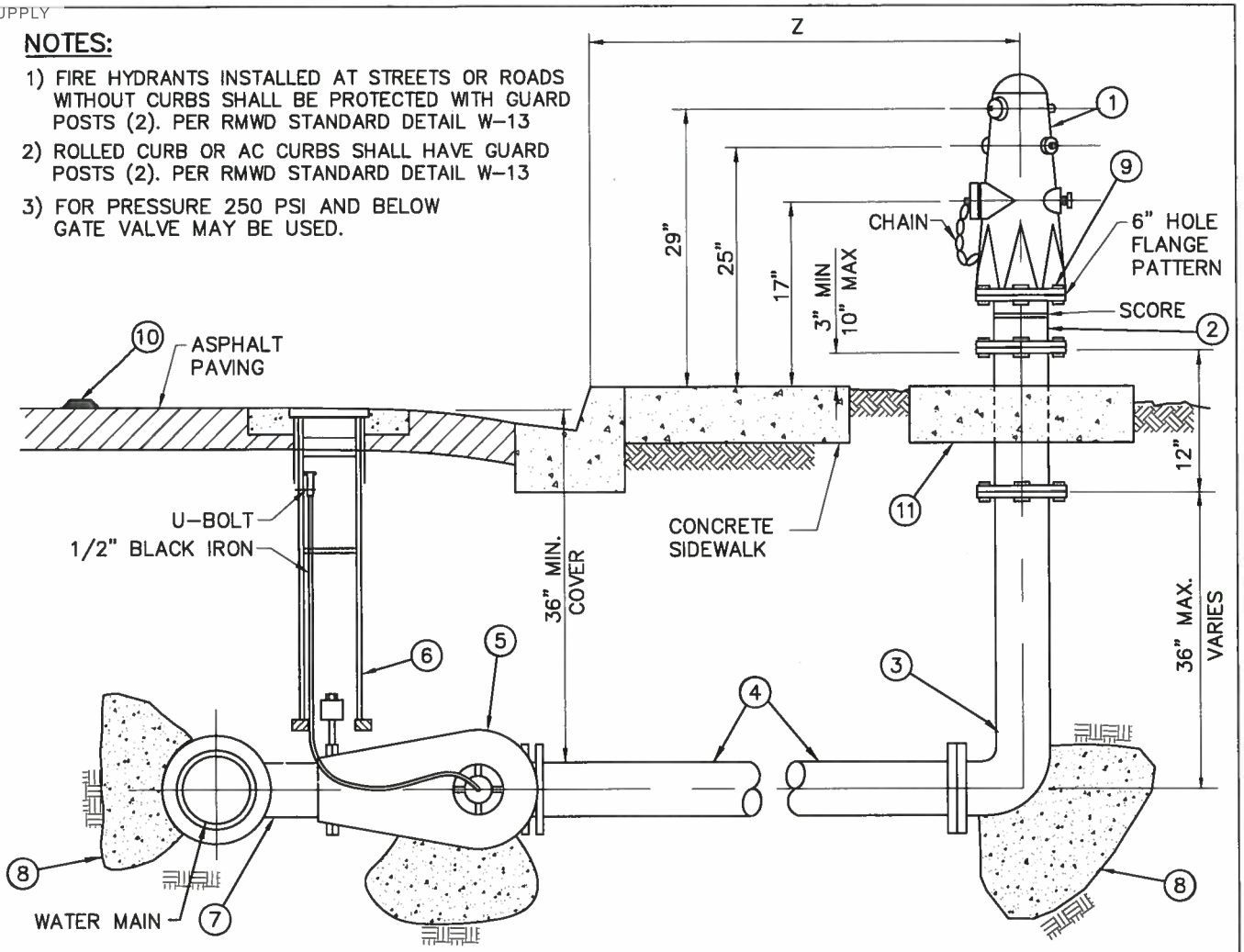
NOTES:

1) FIRE HYDRANTS INSTALLED AT STREETS OR ROADS WITHOUT CURBS SHALL BE PROTECTED WITH GUARD POSTS (2). PER RMWD STANDARD DETAIL W-13
2) ROLLED CURB OR AC CURBS SHALL HAVE GUARD POSTS (2). PER RMWD STANDARD DETAIL W-13
3) FOR PRESSURE 250 PSI AND BELOW GATE VALVE MAY BE USED.



ITEM	NO.	DESCRIPTION	REMARKS
1	1	6" FIRE HYDRANT	6 BOLTS,
			SAFETY YELLOW
2	1	6" BREAK-OFF RISER,	SCORED (NOT MOLDED)
3	1	6" BURIED ELL, FLG.	
4	–	6" STEEL PIPE	CL-300
5	1	6" PLUG VALVE, FLG.	PER STANDARD SPECIFICATION
6	1	VALVE BOX INSTALLATION PER DISTRICT STD. DWG# W-19	SEE STANDARD SPECIFICATION
7	1	6" FLANGED OUTLET	PER STANDARD SPECIFICATION
8	1	THRUST BLOCK	PER RMWD STD. DETAIL W-4
9	6	BOLTS BREAK OFF BELOW 300 psi.	PER STANDARD SPECIFICATIONS
10	1	REFLECTIVE PAVEMENT MARKER(BLUE) AT STREET CL	PER FIRE DISTRICT REQUIREMENTS
11	1	4' x 4' CONCRETE PAD 4" THICK, 520-C-2500	

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Tim C. Lee
RCE # 55790 EXP.12/31/2012

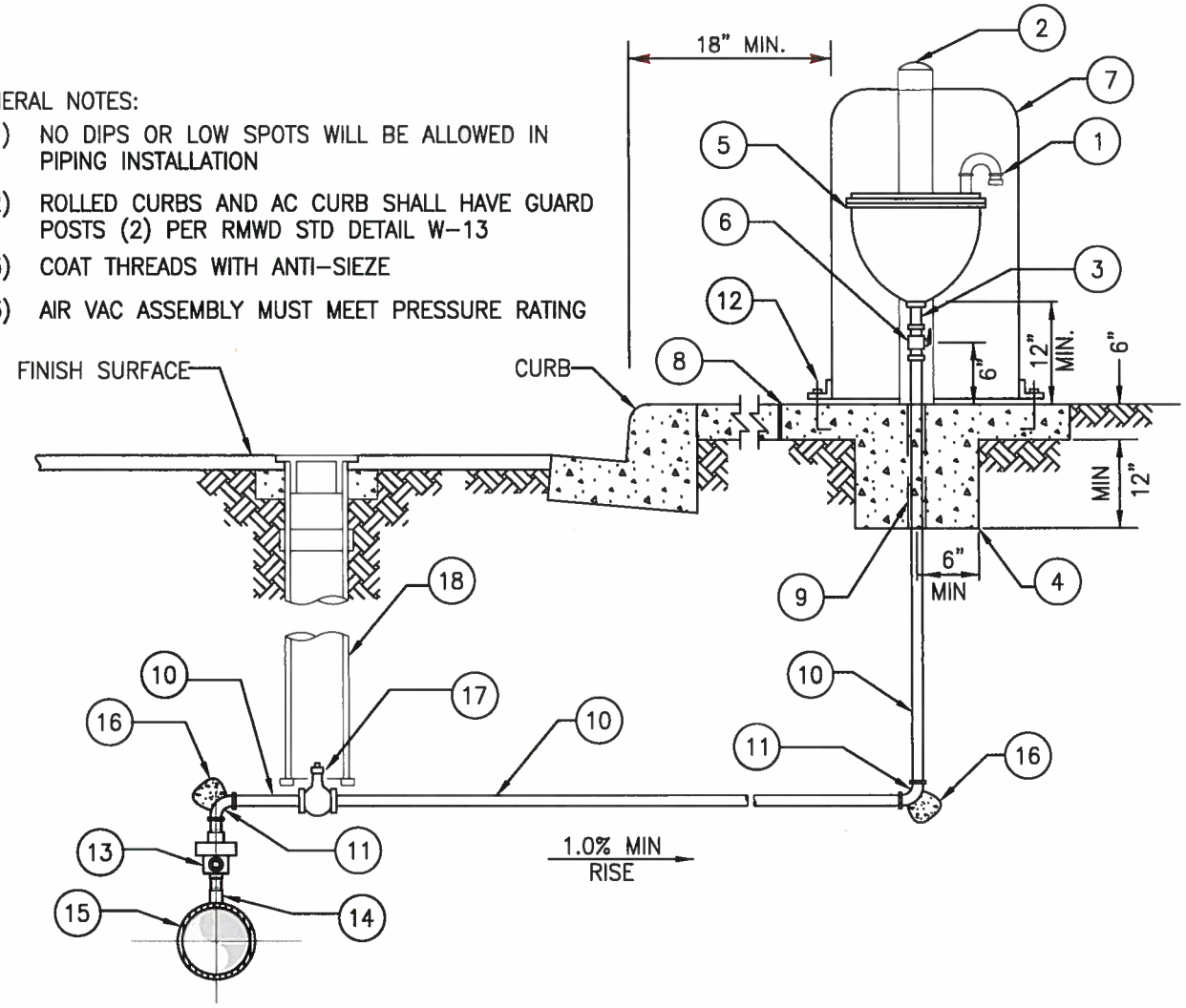
REVISION	APPROVED	DATE

6" FIRE HYDRANT ASSEMBLY
(FOR PRESSURE GREATER THAN 250 PSI)

STANDARD DRAWING NO.
W-10
DECEMBER 2011

GENERAL NOTES:

1) NO DIPS OR LOW SPOTS WILL BE ALLOWED IN PIPING INSTALLATION
2) ROLLED CURBS AND AC CURB SHALL HAVE GUARD POSTS (2) PER RMWD STD DETAIL W-13
3) COAT THREADS WITH ANTI-SIEZE
3) AIR VAC ASSEMBLY MUST MEET PRESSURE RATING



ITEM	SIZE & DESCRIPTION	ITEM	SIZE & DESCRIPTION
1	GALV CLOSE NIPPLE & RETURN BEND WITH INSECT SCREEN TURNED OUT	11	90° BRASS ELL
		12	316 SST, BOLTS ON ENCLOSURE RED HEAD
2	GUARD POSTS PER W-13	13	BRASS CORP STOP,
3	BRASS CLOSE NIPPLE	14	FORGED STEEL HALF-COUPLING, THREADED, CLASS 3000 WELDED TO PIPE PER W-5. (CML&C PIPE) OR DOUBLE STRAP, STAINLESS STEEL, TAPPING COLLAR (PVC OR DUCTILE IRON)
4	SQUARE CONCRETE BASE		
5	AUTOMATIC AIR RELEASE AND VACUUM RELIEF VALVE		
6	BALL VALVE WITH HANDLE AND SERVICE STOP	15	CML&C OR DIP WATER MAIN
		16	THRUST BLOCK PER RMWD SECTION 03300
7	HOUSING, 18" DIA. X 30" TALL	17	BALL VALVE
8	1/2" EXPANSION JOINT	18	VALVE BOX INSTALLATION PER DISTRICT STD. DWG NO. W-19
9	PVC SLEEVE, EXTEND 2" BELOW CONCRETE		
10	BRASS PIPE		

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Kim C. Lee
RCE # 55790 EXP.12/31/2012

REVISION	APPROVED	DATE

1" AND 2" AUTOMATIC AIR RELEASE AND VACUUM RELIEF VALVE

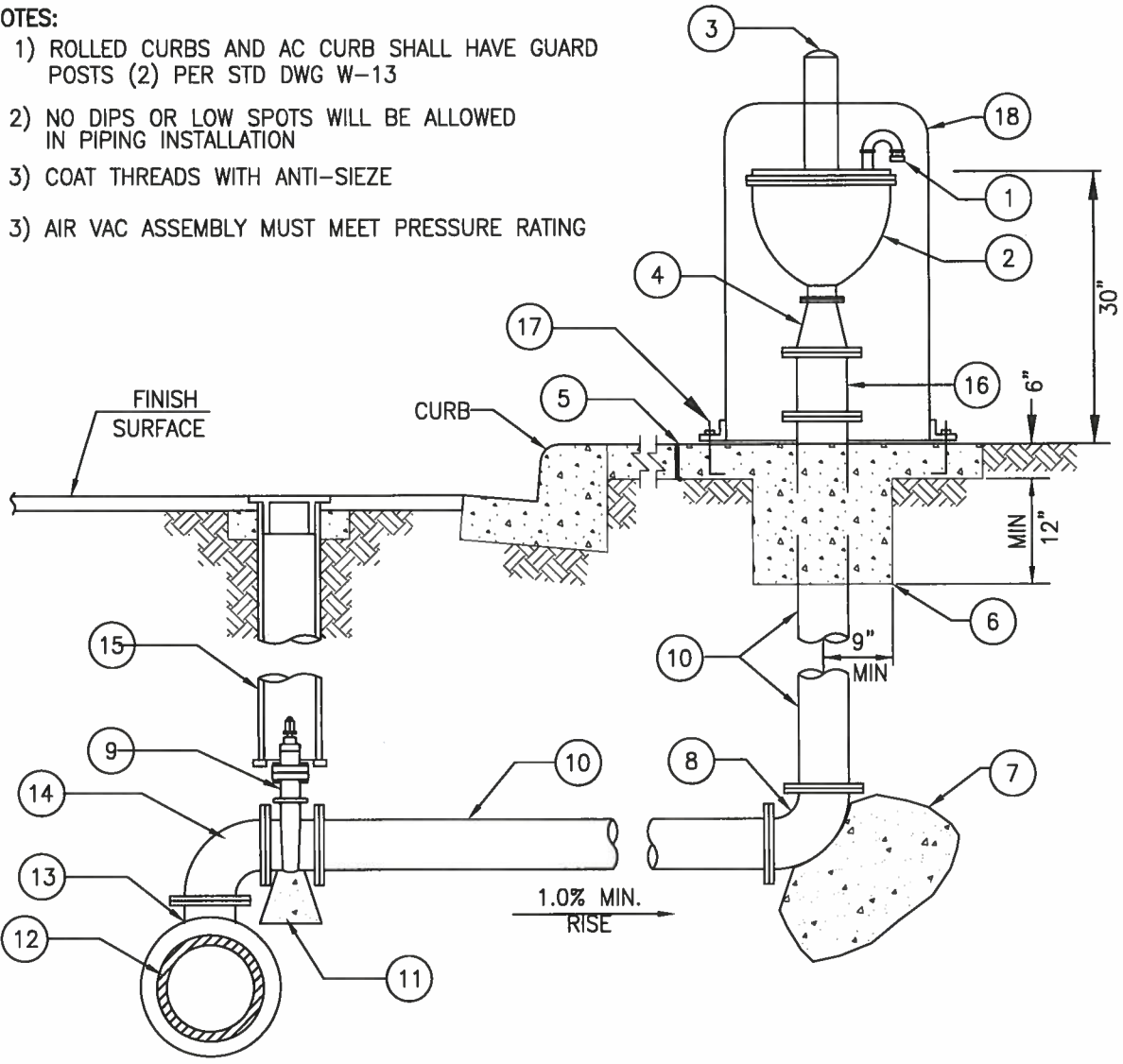
STANDARD DRAWING NO.

W-11

DECEMBER 2011

NOTES:

1) ROLLED CURBS AND AC CURB SHALL HAVE GUARD POSTS (2) PER STD DWG W-13
2) NO DIPS OR LOW SPOTS WILL BE ALLOWED IN PIPING INSTALLATION
3) COAT THREADS WITH ANTI-SIEZE
3) AIR VAC ASSEMBLY MUST MEET PRESSURE RATING



ITEM	SIZE & DESCRIPTION	ITEM	SIZE & DESCRIPTION
1	GALV CLOSE NIPPLE & RETURN BEND WITH INSECT SCREEN TURNED OUT	10	DUCTILE IRON PIPE WRAPPED W/ PE
		11	VALVE SUPPORT BLOCK PER RMWD STD DETAIL W-4
2	AUTOMATIC AIR RELEASE AND VACUUM RELIEF VALVE	12	STEEL OR DUCTILE IRON WATER MAIN
		13	FLG x FLG TEE
3	GUARD POSTS PER W-13	14	FLG DIP 90° BEND
4	6" x 4" FLG REDUCER IF NEEDED	15	VALVE BOX INSTALLATION PER DISTRICT STD. DWG NO. W-19
5	1/2" EXPANSION JOINT		
6	SQUARE CONCRETE BASE, 560-C-3250	16	DIP FLG X FLG SPOOL
7	THRUST BLOCK PER RMWD SEC. 03300	17	316 SST, BOLTS ON ENCLOSURE RED HEAD
8	DIP FLG x FLG 90° BEND	18	HOUSING, 24" X 36" TALL, FACE LOCK AWAY FROM CURB
9	FL x FL GATE VALVE		

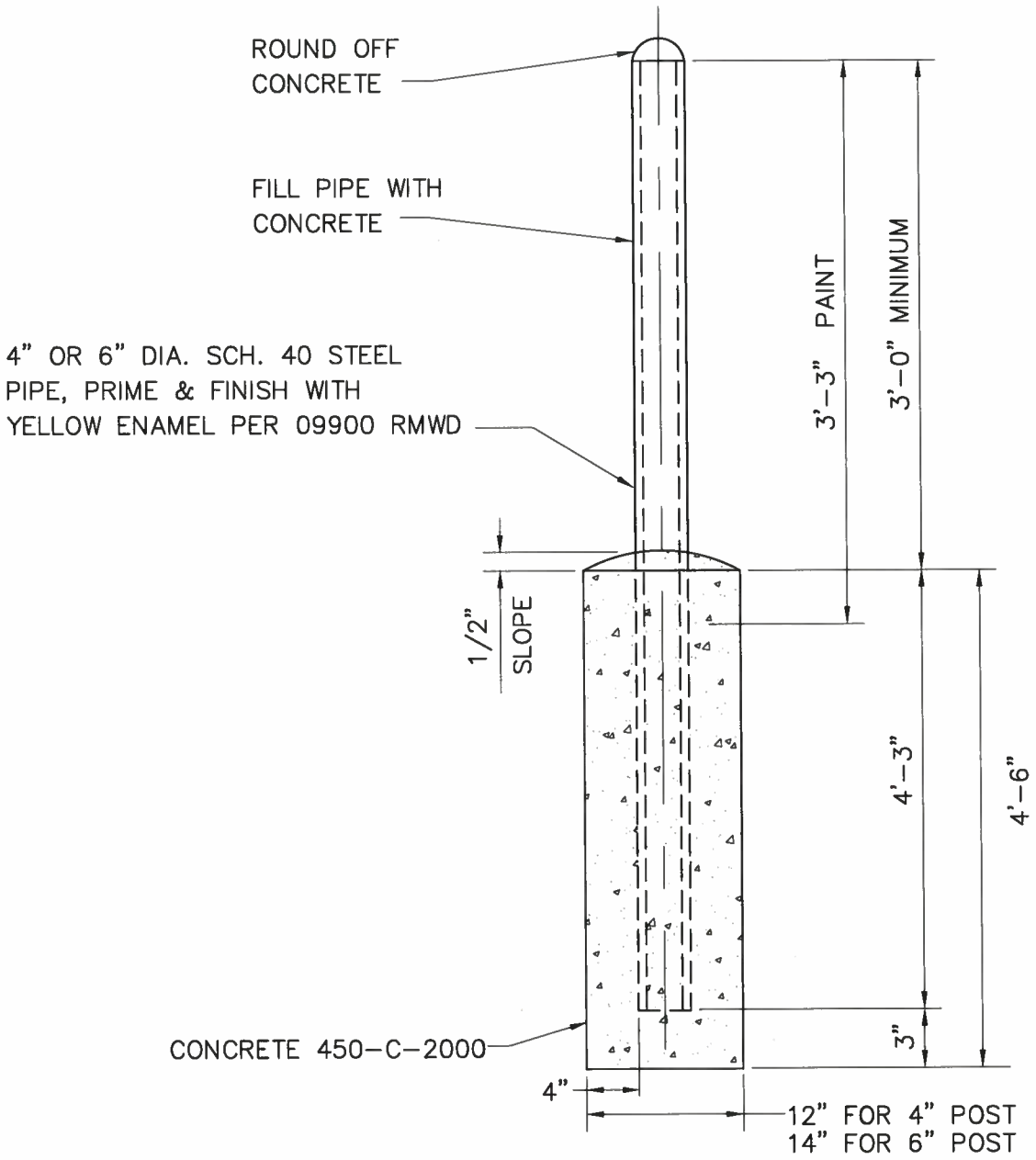
RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Erin C. Lee
RCE # 55790 EXP.12/31/2012

REVISION	APPROVED	DATE

4" AND 6" AUTOMATIC AIR RELEASE AND VACUUM RELIEF VALVE

STANDARD DRAWING NO.
W-12
DECEMBER 2011



NOTES:

1. LOCATION SHALL BE AS SHOWN ON PLAN VIEW, OR AS DIRECTED IN THE FIELD BY DISTRICT ENGINEER.
2. 4" DIA. POSTS SHALL BE APPROVED BY D.E. FOR SPEED GREATER THAN 30 MPH 6" DIA. POSTS SHALL BE USED.

RAINBOW MUNICIPAL WATER DISTRICT

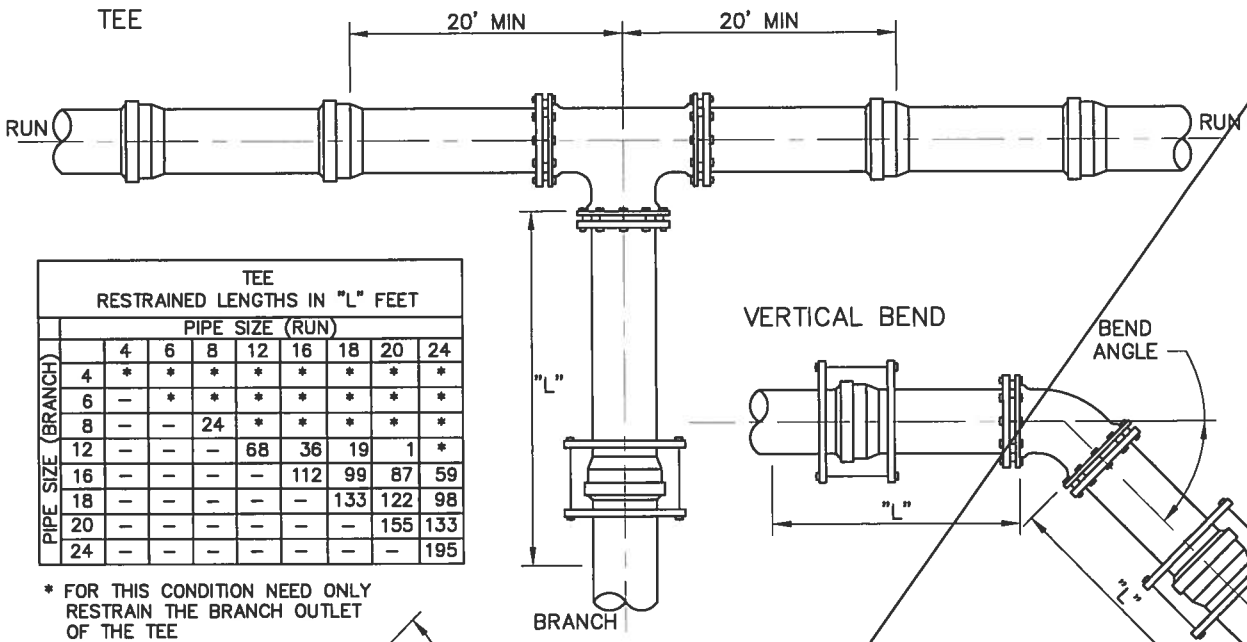
APPROVED: Tim C. Lee
RCE # 55790 EXP.12/31/2012

REVISION	APPROVED	DATE

STANDARD GUARD POST INSTALLATION

STANDARD DRAWING NO.
W-13
DECEMBER 2011

TEE



TEE
RESTRAINED LENGTHS IN "L" FEET

PIPE SIZE (BRANCH) \ PIPE SIZE (RUN)	4	6	8	12	16	18	20	24
4	*	*	*	*	*	*	*	*
6	–	*	*	*	*	*	*	*
8	–	–	24	*	*	*	*	*
12	–	–	–	68	36	19	1	*
16	–	–	–	–	112	99	87	59
18	–	–	–	–	–	133	122	98
20	–	–	–	–	–	–	155	133
24	–	–	–	–	–	–	–	195

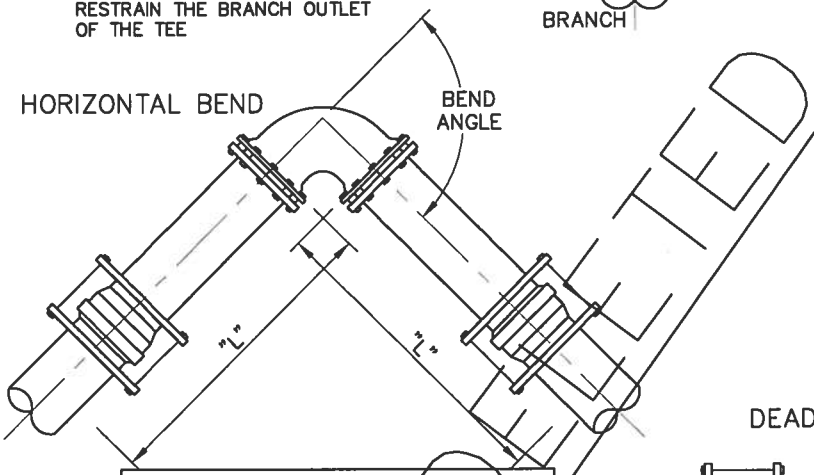
* FOR THIS CONDITION NEED ONLY RESTRAIN THE BRANCH OUTLET OF THE TEE

VERTICAL BEND

VERTICAL BEND
RESTRAINED LENGTHS IN "L" FEET

PIPE SIZE	45° ELBOW	22-1/2° ELBOW	11-1/4° ELBOW
4	25	12	6
6	35	17	8
8	46	22	11
12	65	31	15
16	84	40	20
18	92	44	22
20	102	49	24
24	119	57	28

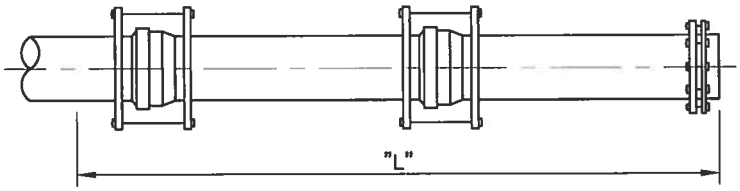
HORIZONTAL BEND



HORIZONTAL BEND
RESTRAINED LENGTHS IN "L" FEET

PIPE SIZE	90° ELBOW	45° ELBOW	22-1/2° ELBOW	11-1/4° ELBOW
4	25	10	5	2
6	34	14	7	3
8	45	19	9	4
12	63	26	13	6
16	81	34	16	8
18	89	37	18	9
20	98	40	19	10
24	113	47	23	11

DEAD END/EACH SIDE OF VALVE TEE



DEAD END/EACH SIDE OF VALVE
RESTRAINED LENGTHS IN "L" FEET

PIPE SIZE (RUN)							
4	6	8	12	16	18	20	24
59	84	110	156	202	223	245	287

NOTES:

1. ALL JOINTS WITHIN LENGTH "L" MUST BE RESTRAINED.
2. FOR TEE RESTRAIN BOTH RUN-SIDE JOINTS AND INSTALL A FULL LENGTH OF PIPE ON EACH SIDE OF BRANCH.
3. FORTY-EIGHT (48) INCHES MINIMUM DEPTH OF COVER.
4. A SAFETY FACTOR OF 1.5.
5. SOIL TYPE ML (INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS) PER UNITED SOIL CLASSIFICATION ASTM D-2487.
   A. NO BEDDING IN GRANULAR MATERIAL.
   B. NO USE OF PHI = 0 PRINCIPAL.
6. PIPE BEDDING PER RMWD STANDARD DRAWINGS.
7. TEST PRESSURE 225 PSI.
8. IF ACTUAL CONDITIONS DIFFER FROM THOSE LISTED ABOVE OR THE REQUIRED RESTRAINED LENGTH CANNOT BE MET, THE RESTRAINED LENGTH SHALL BE DETERMINED BY THE DESIGN ENGINEER AND APPROVED BY THE DISTRICT ENGINEER.

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED:

RCE # 55790 EXP.12/31/2012

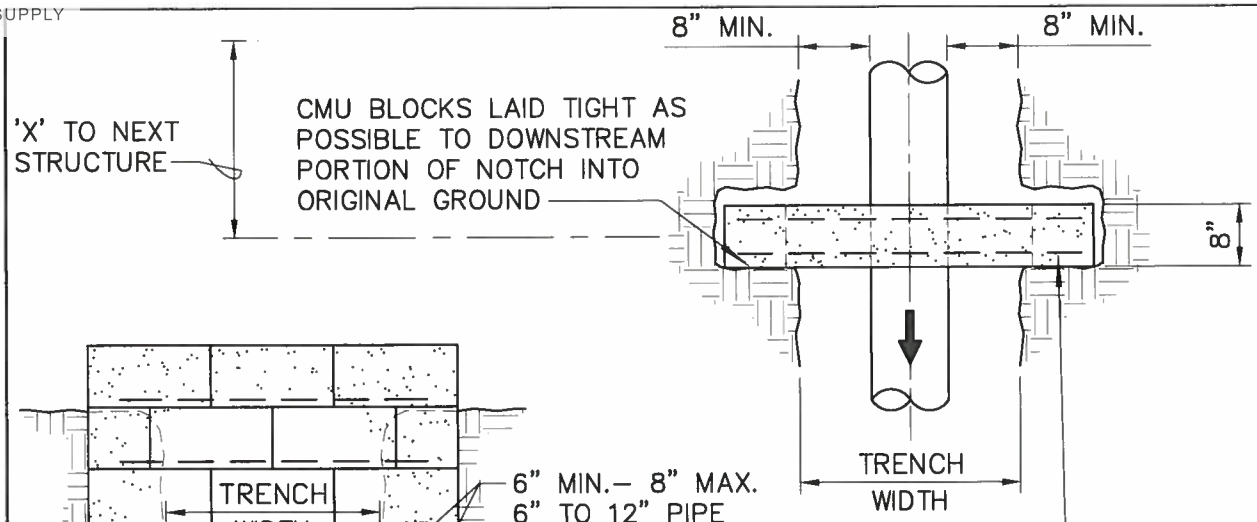
REVISION	APPROVED	DATE

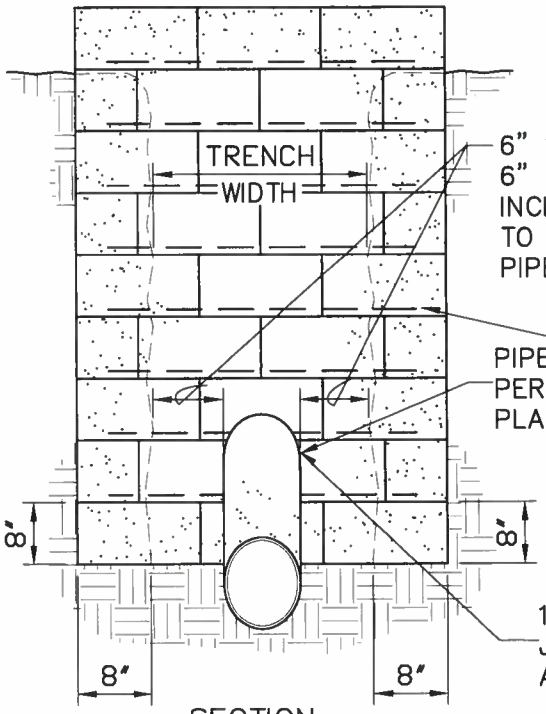
STANDARD RESTRAINT, TEE, DEAD END, BEND FOR PVC C-900 & C905

STANDARD DRAWING NO.

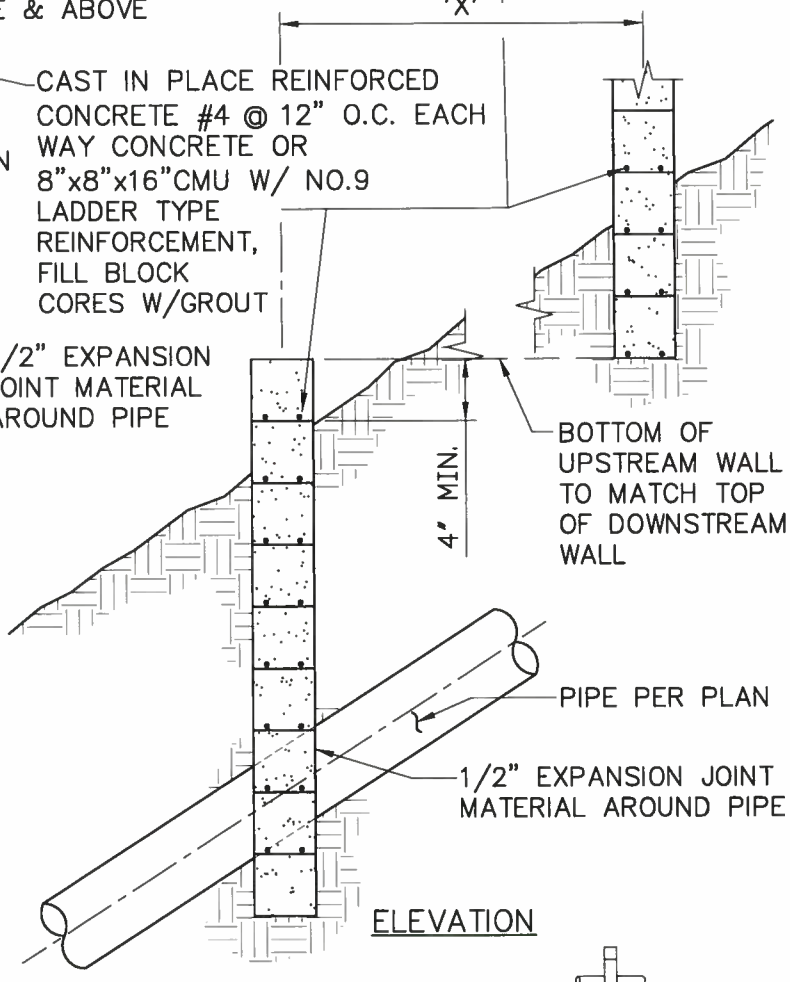
W-14

DECEMBER 2011





SECTION



ELEVATION

PIPE SLOPE	'X'–MAX. DISTANCE
15–20%	45'
20–25%	35'
25–30%	30'
30–40%	20'
>40%	CONSULT DISTRICT

NOTES
1. PIPE ANCHORS REQUIRED ON ALL SLOPES OF 15% OR GREATER.
2. ANCHOR SHALL EXTEND 8" MIN. INTO NATURAL UNDISTURBED SOIL.
3. CONCRETE SHALL BE 450–C–2000
4. ANCHORS FOR TRAPEZOIDAL TRENCH SECTIONS WILL CONFORM TO TRENCH CROSS SECTION AND EXTEND 8" MIN. IN TO UNDISTURBED SOIL.

LEGEND ON PLAN

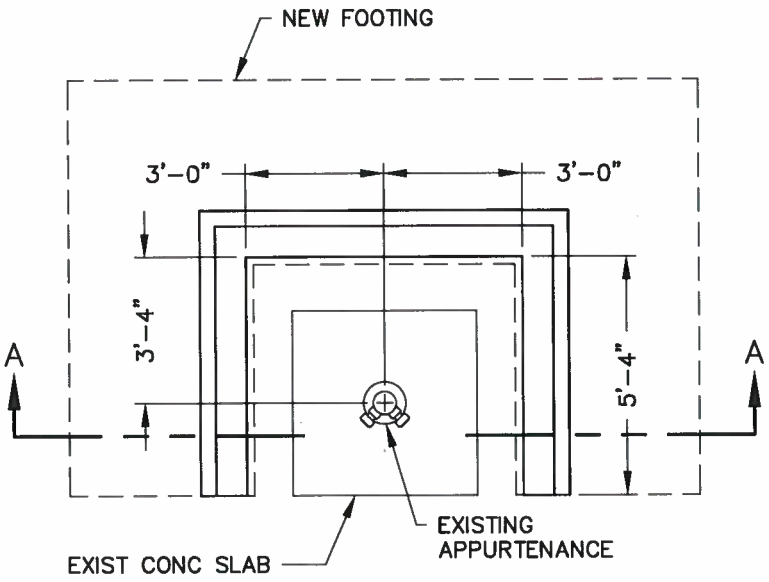
RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Kim C. Lee
RCE # 55790 EXP.12/31/2012

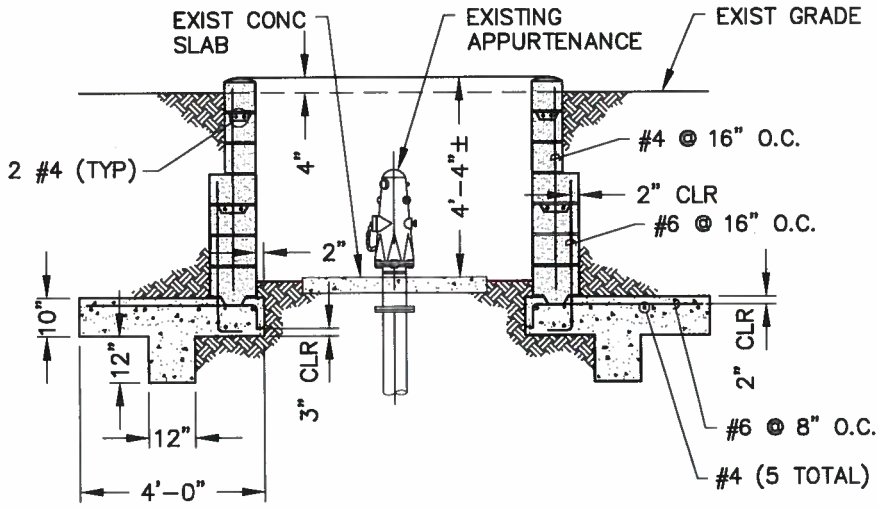
REVISION	APPROVED	DATE

STANDARD CUTOFF WALL

STANDARD DRAWING NO.
W-15
DECEMBER 2011



PLAN



SECTION A–A

NOTES:

1. SEE SDRSD C–4, C–7 AND C–8 FOR ADDTIONAL DETAILS AND NOTES.
2. MASONRY BLOCK TYPE 1 SHALL CONFORM TO ASTM C90. SIZE SHALL BE 16"x8"x8" AND 16"x12"x8". UNITS SHALL BE SPLIT FACE (ONE SIDE ONLY). COLOR SHALL BE LA PAZ.

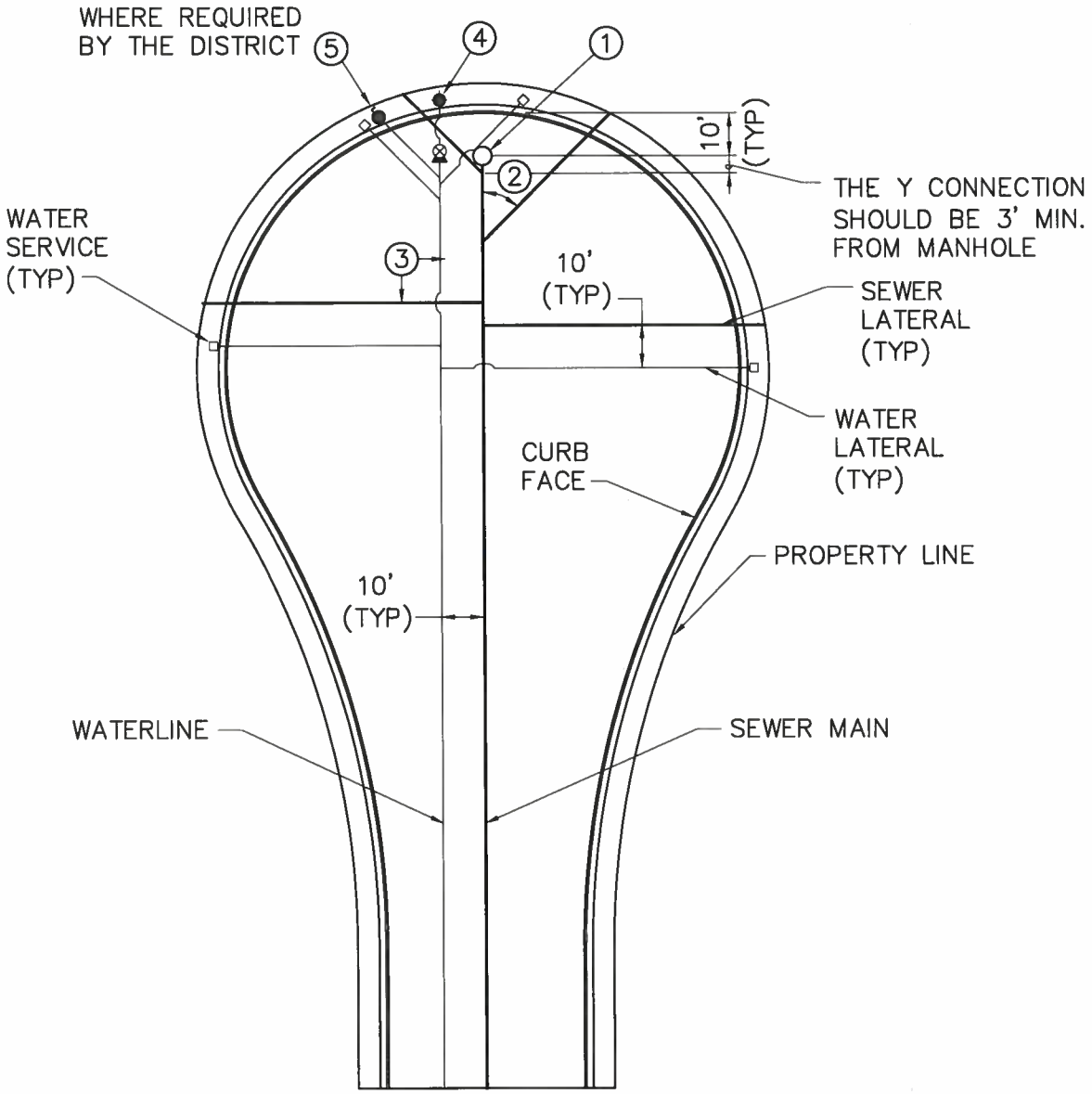
RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Kim C. Lee
RCE # 55790 EXP.12/31/2012

REVISION	APPROVED	DATE

APPURTENANCE WALL

STANDARD DRAWING NO.
W-16
DECEMBER 2011



ITEM	DESCRIPTION
1	USE WATER-TIGHT MANHOLE COVER WHERE CUL-DE-SAC CREATES LOW POINT
2	45° ANGLE ONLY IF NECESSARY TO SERVE REAR LOTS (WATER & SEWER)
3	90° ANGLE (STANDARD) (WATER & SEWER)
4	END OF MAIN FIRE HYDRANT (TO SERVE AS A BLOWOFF). LOCATE TO CLEAR DRIVEWAYS
5	END OF MAIN A.V.A.R. (WHERE CUL-DE-SAC CREATES A HIGH POINT).

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Brian C. Lee
RCE # 55790 EXP. 12/31/2012

REVISION	APPROVED	DATE

STANDARD CUL-DE-SAC WATER LATERALS

STANDARD DRAWING NO.

W-17

DECEMBER 2011

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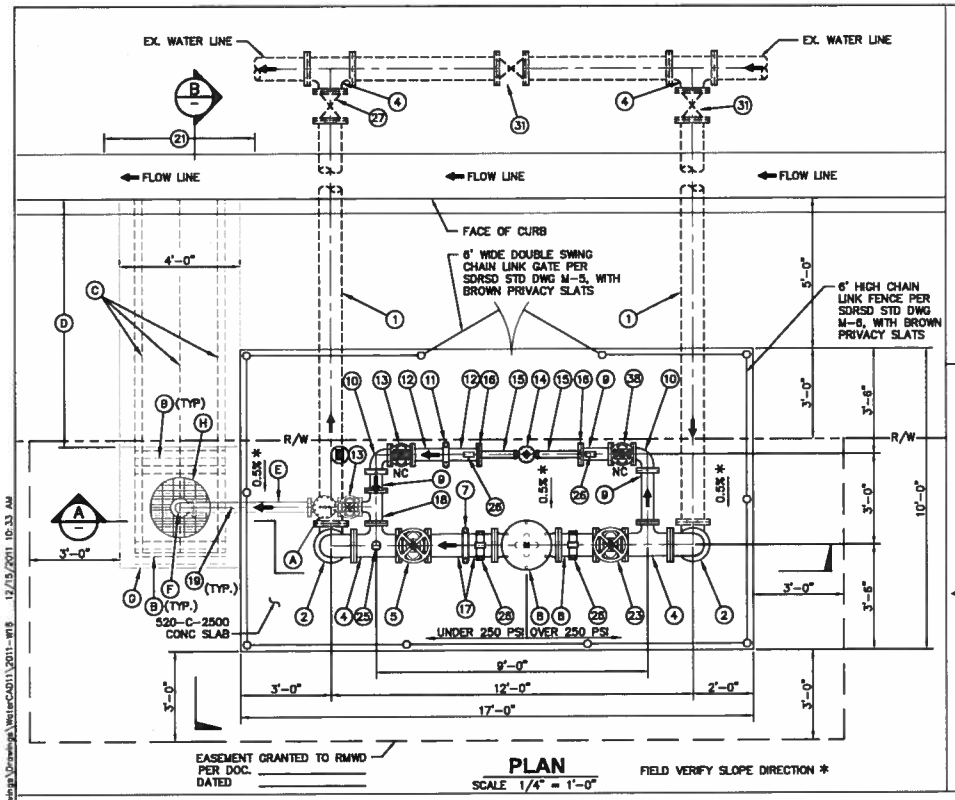
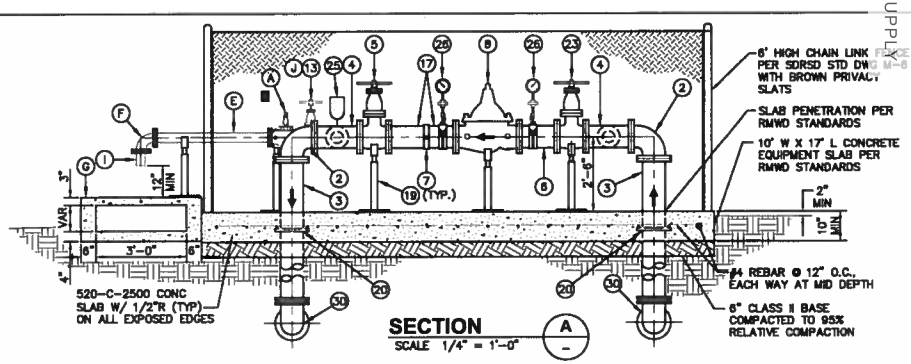


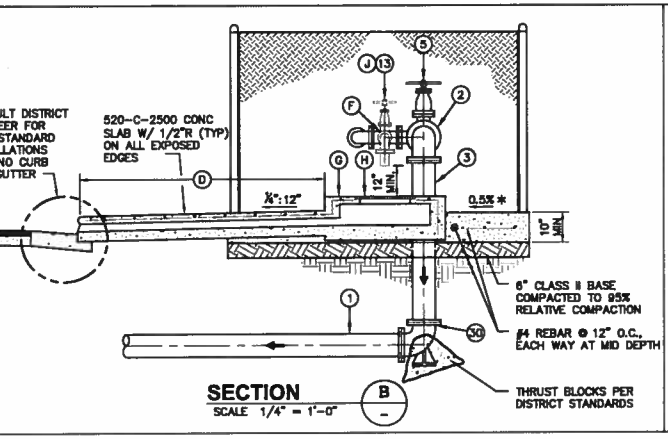
PLAN

SCALE 1/4" = 1'-0"



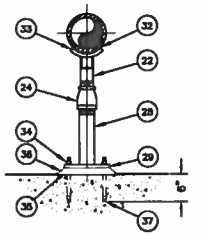
SECTION

SCALE 1/4" = 1'-0"



SECTION

SCALE 1/4" = 1'-0"



ELEVATION

1. CONTRACTOR TO VERIFY ALL DIMENSIONS PRIOR TO PURCHASE AND FABRICATION
2. PAINT PER DISTRICT SPECIFICATIONS AFTER FABRICATION

ADJUSTABLE PIPE SUPPORT DETAIL

NOT TO SCALE

LEGEND

1. 8" DIP PIPE SPOOL
2. 8" DIP FLANGED 90° ELBOW
3. 8" DIP PIPE SPOOL, FLANGED X FLANGED
4. 8"X8"X4" DIP FLANGED TEE
5. 8" FLANGED RESILIENT SEAT GATE VALVE WITH HANDWHEEL OPERATOR
6. 8" DIP FLANGED SPOOL
7. 8" VICTAULIC COUPLING
8. 8" FLANGED PRESSURE REDUCING VALVE, WITH 150 POUND FLANGES, DUCTILE IRON BODY, STAINLESS STEEL TRIM, INTERIOR AND EXTERIOR EPOXY COATING, 30 – 300 PSI SPRING RANGE, 70 – 140 PSI RANGE FOR BYPASS
9. 4" DIP FLANGED PIPE SPOOL
10. 4" DIP FLANGED 90° ELBOW
11. 4" VICTAULIC COUPLING
12. 4" DIP FLANGED X GROOVED END PIPE SPOOL
13. 4" FLANGED RESILIENT SEAT GATE VALVE WITH HANDWHEEL OPERATOR WITH PIPE SUPPORT PER DETAIL 1, THIS SHEET
14. 2 1/2" SCREWED PRESSURE REDUCING VALVE, DUCTILE IRON BODY, STAINLESS STEEL TRIM INTERIOR AND EXTERIOR EPOXY COATING, 30 – 300 PSI SPRING RANGE
15. 2 1/2" SCH 40 EPOXY LINED STEEL PIPE
16. 4" X 2 1/2" COMPANION FLANGE
17. 8" FLANGED X GROOVED END DIP SPOOL
18. 4"X4"X4" DIP FLANGED TEE
19. PIPE SUPPORT SEE DETAIL 1, THIS SHEET
20. MID SPAN RESTRAINT SYSTEM
21. REMOVE AND REPLACE CONCRETE CURB AND GUTTER IF NECESSARY TO CONSTRUCT NEW CURB PENETRATION
22. 2 1/2" GALVANIZED STEEL PIPE
23. PRESSURE SIDE VALVE: 8" GATE VALVE – UP TO 250 PSI; 8" BALL VALVE – OVER 250 PSI WITH HANDWHEEL OPERATOR
24. ADJUSTABLE THREADED COLLAR, GALVANIZED
25. 1" AIR VAC VALVE, WITH TAPPING COLLAR AND BRASS ISOLATION VALVE, LOCATION TO BE DETERMINED IN FIELD
26. 3 1/2" DIA. PRESSURE GAUGE WITH BRASS SNUBBER, BRASS CORP STOP AND FITTINGS ATTACHED WITH BRONZE TAPPING COLLAR, DO NOT THREAD INTO DIP PIPE WALL
27. 8" RESILIENT SEAT GATE VALVE FOR BURIED SERVICE CLASS 250
28. 3" GALVANIZED STEEL PIPE
29. 9" DIA. X 3" THREADED FLANGE, 150 LB, GALVANIZED
30. 6" DIP BEND X MJ BASE CELL 90° BEND
31. PRESSURE SIDE VALVE: GATE VALVE – UP TO 250 PSI; BALL VALVE – OVER 250 PSI.
32. 1/4" THICK NEOPRENE LINER
33. SADDLE TYPE PIPE SUPPORT
34. STAINLESS STEEL 316 NUT AND WASHER (4 REQUIRED)
35. STAINLESS STEEL 316 LEVELING NUT AND WASHER (4 REQUIRED)
36. 1" THICK MIN. NON-SHRINK GROUT
37. 1/2" DIA. STAINESS STEEL 316 ANCHOR BOLT (4 REQUIRED)
38. PRESSURE SIDE VALVE: 4" GATE VALVE – UP TO 250 PSI; 4" BALL VALVE – OVER 250 PSI WITH HANDWHEEL OPERATOR

PRESSURE RELIEF VALVE LEGEND

NOTE: PRESSURE RELIEF VALVE AND CONCRETE DISCHARGE STRUCTURE TO BE INSTALLED ONLY AS DIRECTED BY DISTRICT ENGINEER

- (A) 4" FLANGED PRESSURE RELIEF VALVE, WITH 150 POUND FLANGES, DUCTILE IRON BODY, STAINLESS STEEL TRIM, INTERIOR AND EXTERIOR EPOXY COATING, 100 – 300 PSI SPRING RANGE
- (B) #4 @ 3" O.C.
- (C) #4 BARS CONTINUOUS
- (D) MODIFIED TYPE A CURB OUTLET PER SDRSD D-25. MANHOLE COVER SHALL BE OPEN GRATE TO ALLOW FOR FLOW FROM PRESSURE RELIEF PIPING
- (E) 4" DIP FLANGED X FLANGED SPOOL
- (F) 4" DIP FLANGED 90° ELBOW
- (G) POUR-IN-PLACE CONCRETE CATCH BASIN
- (H) 24" DIA FIBERGLASS GRATING
- (I) 4" DIP FLANGED X PE SPOOL (LENGTH TO SUIT)
- (J) 4" BALL VALVE WITH HAND WHEEL

RAINBOW MUNICIPAL WATER DISTRICT

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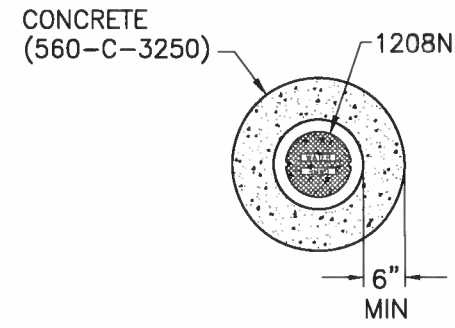
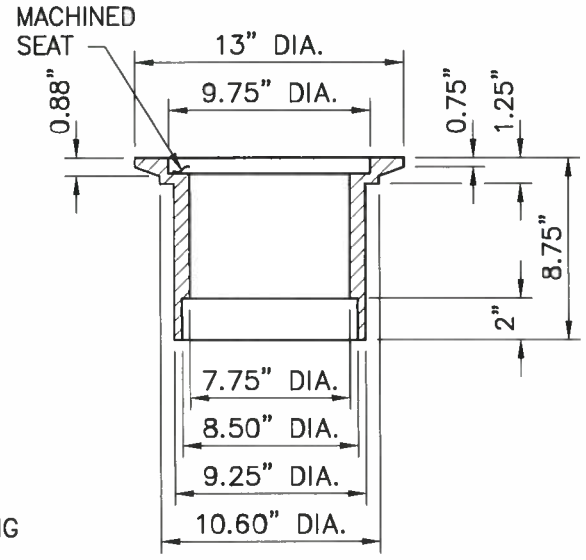
STANDARD PRESSURE REGULATING STATION

STANDARD DRAWING NO.

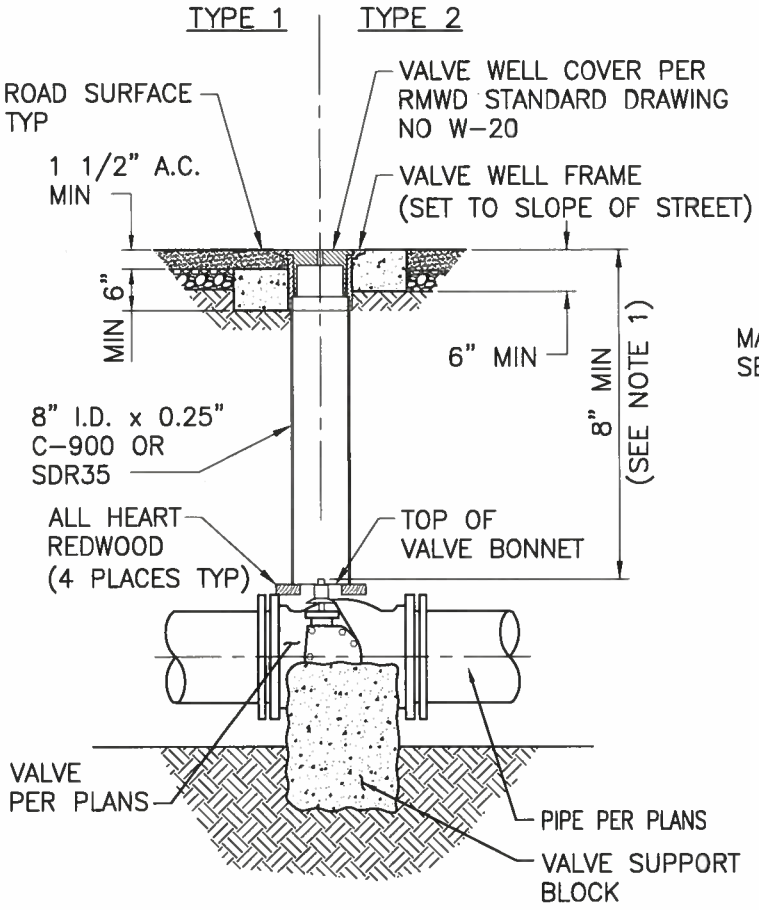
W-18

DECEMBER 2011

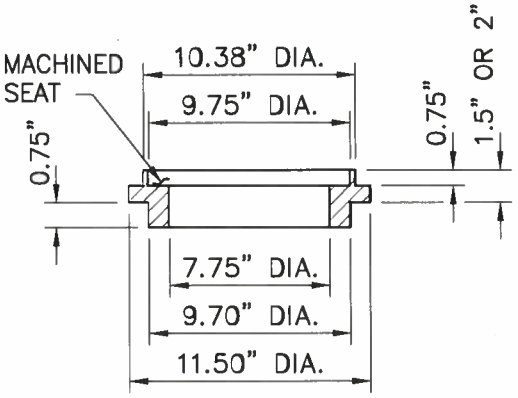




CAST IRON
VALVE WELL FRAME



VALVE WELL AND FRAME
FOR NEW INSTALLATIONS



CAST IRON RISER RING
FOR RETROFITTING AND
OVERLAY PROJECTS

NOTES:

1. FOR GATE VALVES, PROVIDE VALVE KEY EXTENSION WHERE THIS DIMENSION EXCEEDS 25 INCHES.
2. THE SURFACE OF THE VALVE WELL COVER SHALL MATCH THE STREET CROSS SLOPE AND PROFILE.

RAINBOW MUNICIPAL WATER DISTRICT

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VALVE WELL FRAME

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W-19
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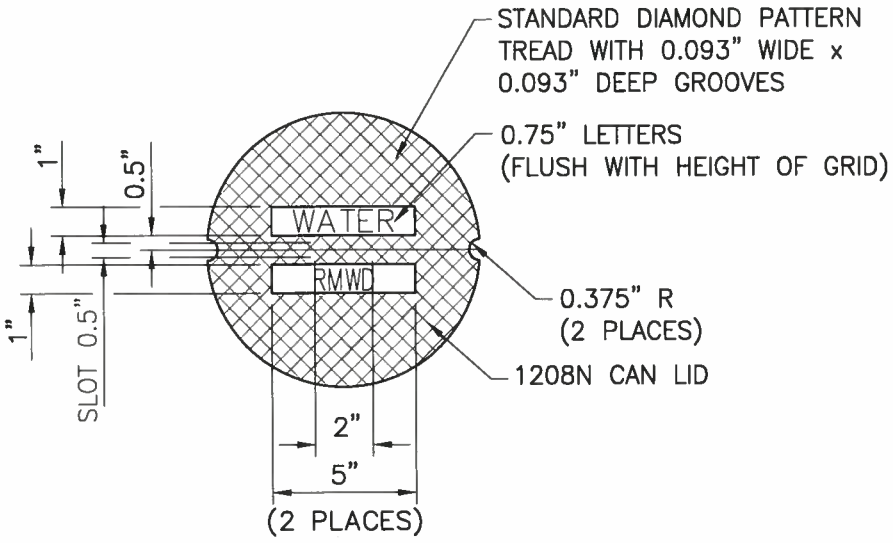

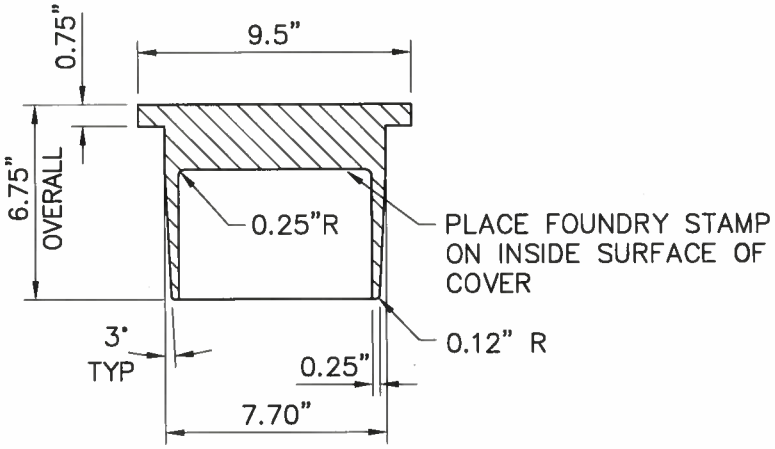

VALVE WELL COVER PAINT CHART

INLINE VALVES	B.O.s AND AIR VACS	HYDRANTS
WHITE	YELLOW	RED

RAINBOW MUNICIPAL WATER DISTRICT

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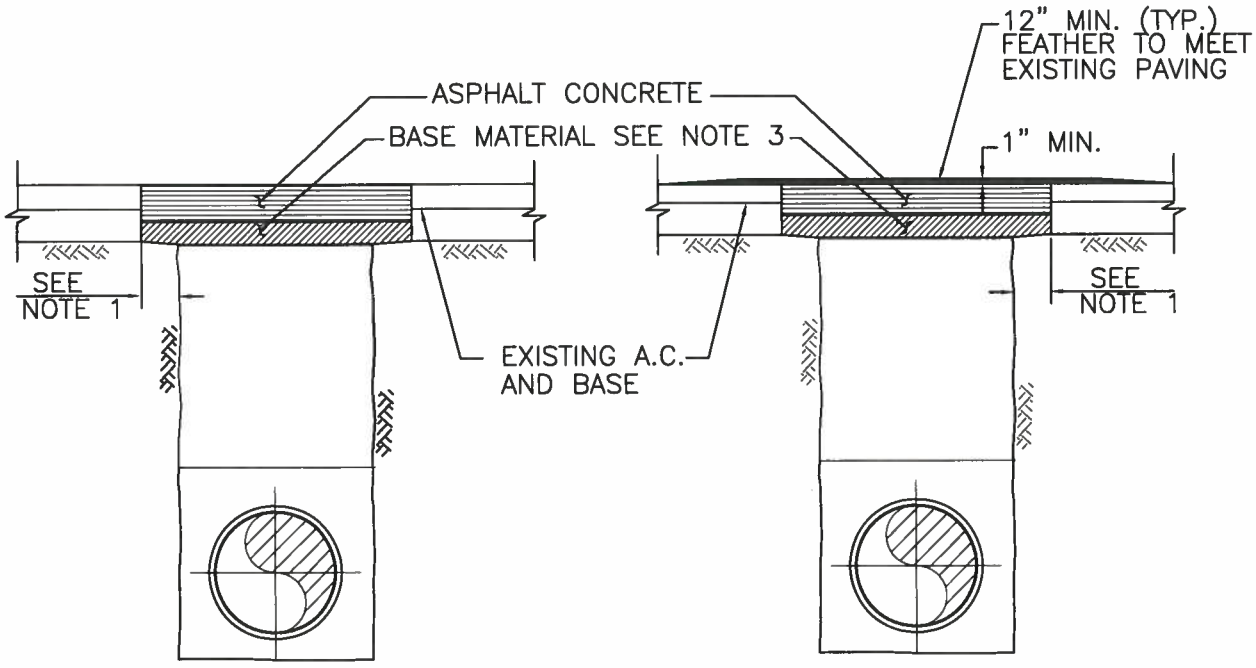
VALVE WELL COVER

STANDARD DRAWING NO.
W-20
DECEMBER 2011



TYPE A

TYPE B

NOTES:

1) TRENCH EDGES TO BE CUT A MINIMUM OF 6" WIDER THAN TRENCH FOR TRENCHES 3' WIDE OR LESS, AND 12" WIDER FOR TRENCHES OVER 3' WIDE.

2) EXISTING AC SHALL BE CUT AND REMOVED IN SUCH A MANNER SO AS NOT TO TEAR, BULGE OR DISPLACE ADJACENT PAVEMENT. EDGES SHALL BE CLEAN AND VERTICAL. ALL CUTS SHALL BE PARALLEL OR PERPENDICULAR TO STREET CENTERLINE, WHEN PRACTICAL.

3) BASE MATERIAL TO BE REPLACED TO DEPTH OF EXISTING BASE OR 6" MINIMUM, AC MAY BE SUBSTITUTED FOR BASE MATERIAL.

4) A TACK COAT OF ASPHALT EMULSION OR PAVING ASPHALT SHALL BE APPLIED TO EXISTING AC OR P.C.C. CONTACT SURFACES, PRIOR TO RESURFACING.

5) ASPHALT CONCRETE RESURFACING:
   A) MINIMUM TOTAL THICKNESS SHALL BE ONE INCH GREATER THAN EXISTING AC OR 3" MINIMUM,
   B) AC SHALL BE HOT PLANT MIX CALTRANS SPEC GRADE C2-PG-64-10.
   C) FINISH COURSE FOR TYPE B RESURFACING SHALL BE LAID DOWN USING A SPREADER BOX.

6) ALL AC RESURFACING SHALL BE SEAL COATED WITH AN EMULSIFIED ASPHALT AND COVERED WITH SAND. CHIP SEALING TO BE APPLIED AS REQUIRED BY AGENCY.

7) TYPE B SHALL NOT BE USED ON LATERAL CROSSINGS.

8) SLOUGHING OF TRENCH UNDER PAVEMENT SHALL BE CAUSE FOR REQUIRING ADDITIONAL PAVEMENT AND BASE.

RAINBOW MUNICIPAL WATER DISTRICT

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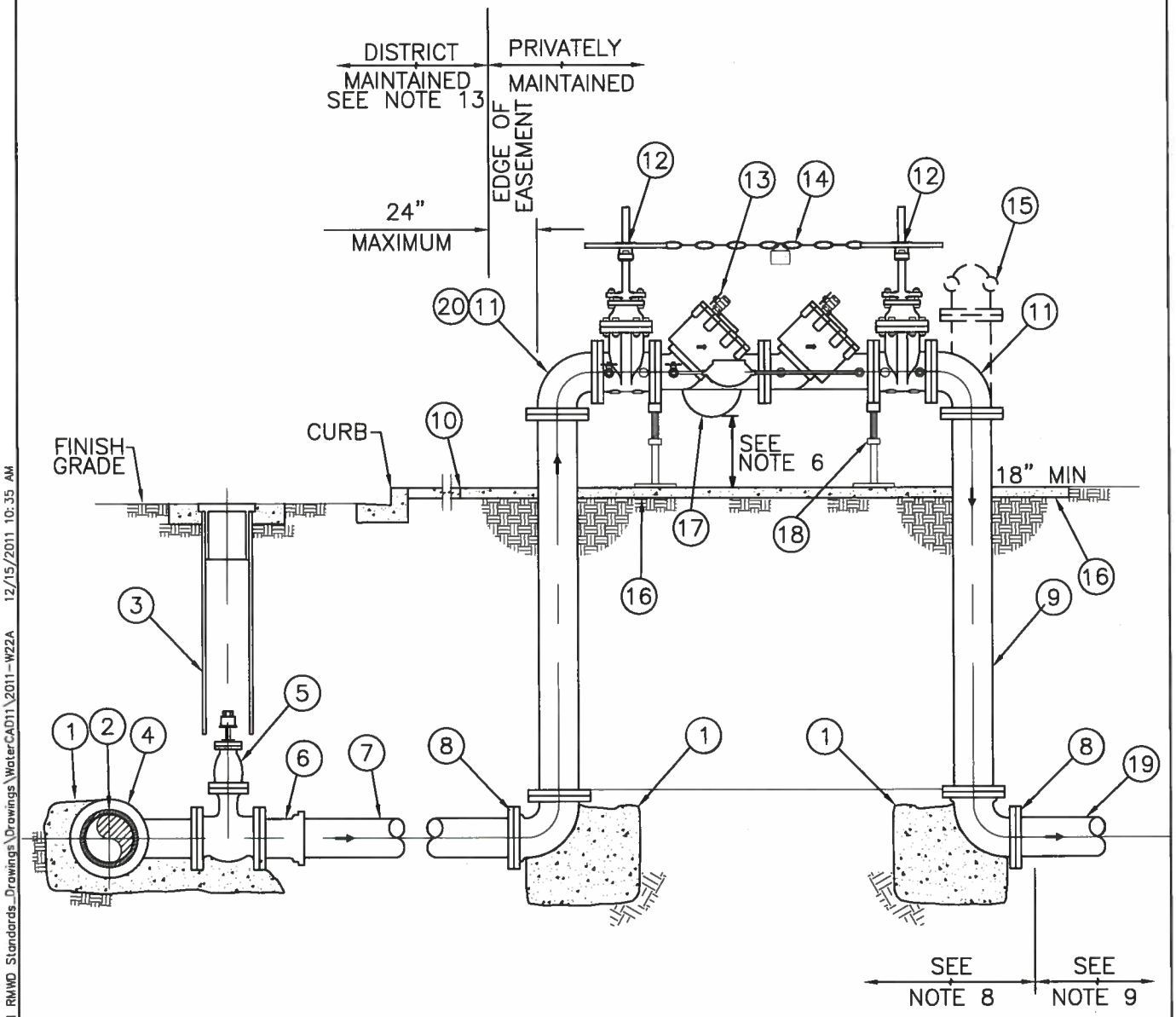
TRENCH RESURFACING TYPES A & B

STANDARD DRAWING NO.

W-21

DECEMBER 2011



FOR NOTES REGARDING THE INSTALLATION AND DESCRIPTION OF FIRE SERVICES SEE W22B

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED
RCE # 55790 EXP.12/31/2012

REVISION	APPROVED	DATE

4" AND LARGER FIRE SERVICE INSTALLATION

STANDARD DRAWING NO.

W-22A

DECEMBER 2011

FOR DRAWING OF FIRE SERVICE INSTALLATION SEE W22A

NOTES:

1) REFER TO SECTION 15112 OF THE SPECIFICATIONS
2) INSTALL WARNING/IDENTIFICATION TAPE AS SHOWN ON W-3
3) LOCATION OF FIRE SERVICES SHALL BE AS DIRECTED BY THE FIRE DEPARTMENT OF JURISDICTION. FIRE SERVICES SHOULD BE LOCATED IN SUCH A MANNER THAT WILL ALLOW THE DEVICE TO BE READILY ACCESSIBLE FOR INSPECTION, REPAIR, AND USAGE.
4) TAMPER SWITCH, AUTOMATIC RESET, CHAIN WITH KNOX LOCK, AND FIRE DEPARTMENT CONNECTION ("FDC") SHALL BE AS REQUIRED BY THE FIRE DEPARTMENT OF JURISDICTION.
5) BALL VALVE TEST COCKS SHALL BE PROVIDED AND LOCATED PER THE MANUFACTURES RECOMMENDATIONS AND THE REQUIREMENTS OF THE WATER AGENCY STANDARDS.
6) INSTALL FIRE SERVICES SO THAT THE DISTANCE BETWEEN THE BOTTOM OF THE RELIEF DIAPHRAGM AND THE CONCRETE SLAB OR FINISH GRADE IS 12" MIN. AND 36" MAX.
7) INSTALL AN ANGLE PRESSURE REDUCING VALVE IN LIEU OF THE FIRST 90° BEND WHEN SYSTEM STATIC PRESSURE EXCEEDS 175psi OR WHEN RECOMMENDED BY THE BACKFLOW MANUFACTURER
8) INSTALL PIPE AND RELATED APPURTENANCES IN THIS AREA PER THE REQUIREMENT OF THE RMWD SPECIFICATIONS.
9) INSTALL PIPE AND RELATED APPURTENANCES IN THIS AREA AS REQUIRED BE THE FIRE DEPARTMENT OF JURISDICTION.
10) ABOVE GROUND APPURTENANCE SHALL BE PAINTED AND IDENTIFIED AS CALLED FOR BY THE FIRE DEPARTMENT OF JURISDICTION.
11) TESTING SHALL BE CONDUCTED AS CALLED FOR IN SECTION 15112 OF THE SPECIFICATIONS PRIOR TO ACCEPTANCE BY THE DISTRICT.
12) MATERIALS SHALL BE SELECTED FORM THE APPROVED MATERIALS LIST.
13) DISTRICT RESPONSIBILITY ENDS AT EDGE OF PROPERTY LINE, RIGHT OF WAY, OR EASEMENT.

ITEM NO.	SIZE AND DESCRIPTION	ITEM NO.	
1	CONCRETE THRUST BLOCK SEE W-4	11	FLANGED 90° BEND, SEE NOTE 7
2	WATER MAIN	12	FLG'D OS&Y RWGV WITH HAND WHEEL
3	GATE WELL SEE W-19	13	RPDA SEE NOTE 4
4	SIZE X SIZE FLG X FLG TEE	14	CHAIN WITH LOCK SEE NOTE 4
5	FLG X FLG RWGV	15	FLANGED TEE WITH "FDC" SEE NOTE 4
6	FLG X MJ/PO ADAPTER (IF REQUIRED)	16	CONCRETE SLAB, 4" THICK X 48" WIDE, 520-C-2500
7	DI OR STEEL	17	3/4" BYPASS, METER & DOUBLE CHECK VALVE OR RP DEVICE
8	FLG X FLG 90° BEND	18	ADJUSTABLE VALVE SUPPORT
9	FLANGED DUCTILE IRON PIPE	19	DI PIPE SEE NOTE 9
10	1/2" EXPANSION JOINT	20	FLANGED ANGLE PRESSURE REDUCING VALVE SEE NOTE 7

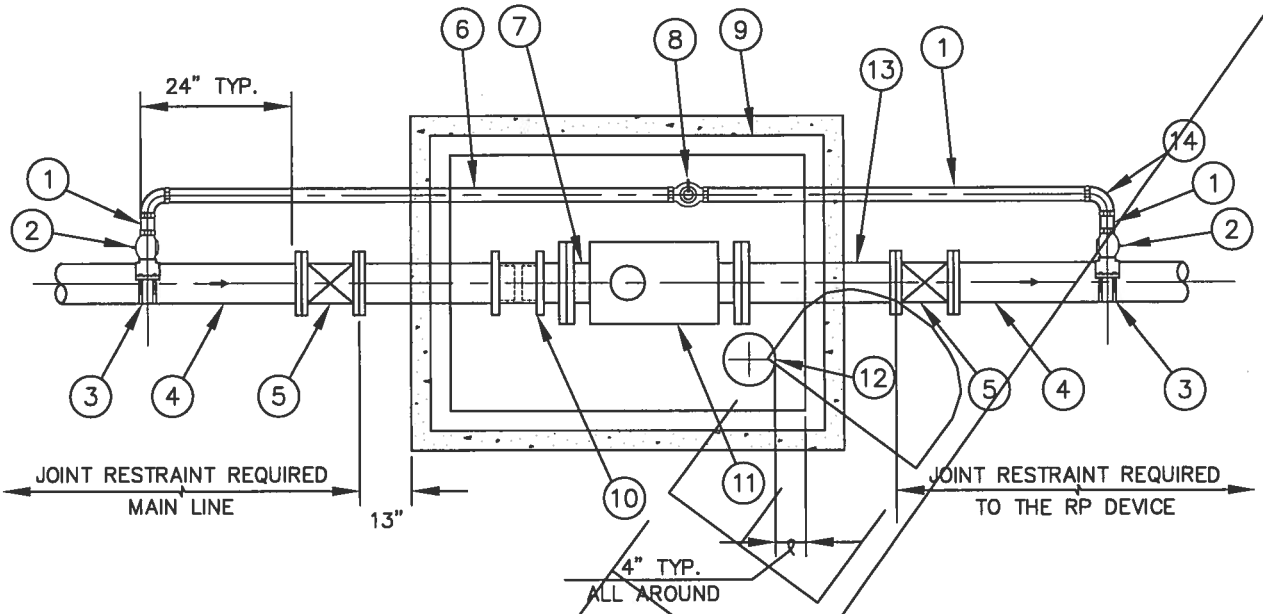
RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Brian C. Lee
RCE # 58790 EXP.12/31/2012

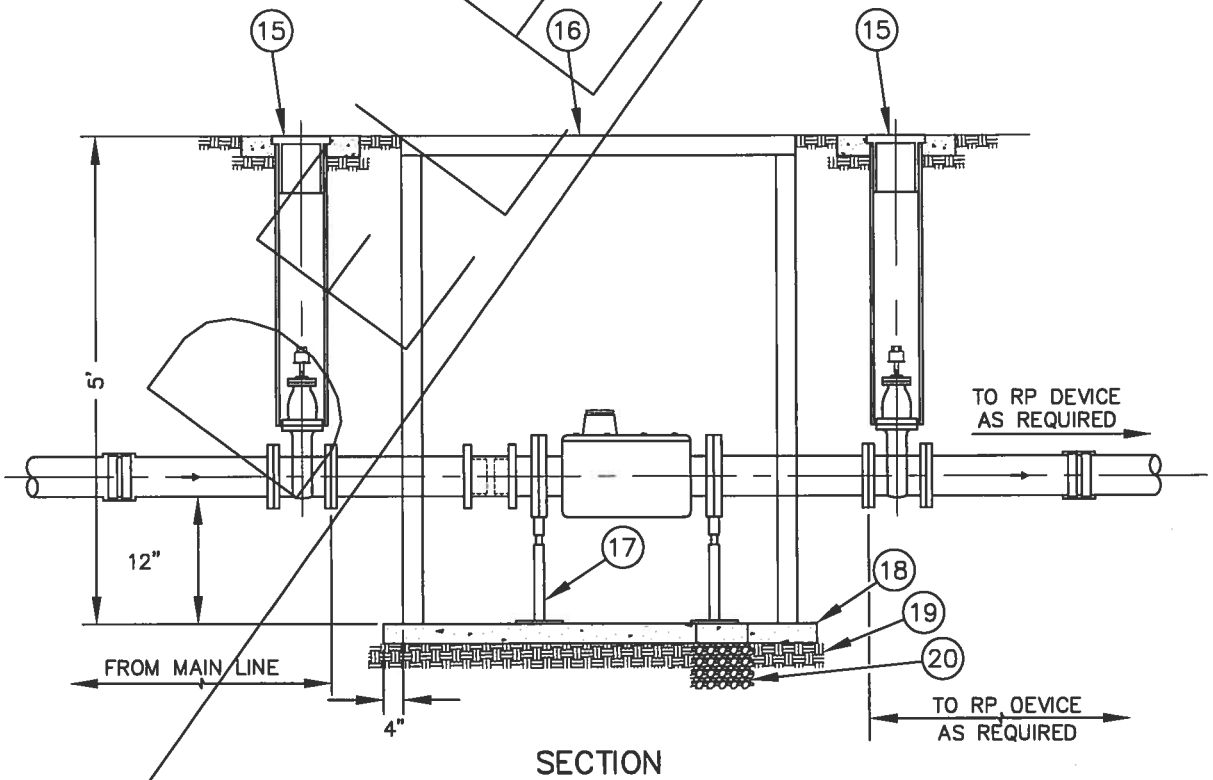
REVISION	APPROVED	DATE

4" AND LARGER FIRE SERVICE INSTALLATION

STANDARD DRAWING NO.
W-22B
DECEMBER 2011



PLAN VIEW



SECTION

FOR MATERIAL DESCRIPTIONS AND NOTES SEE W23B

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED:

RCE # 55790 EXP.12/31/2012

REVISION	APPROVED	DATE
NML		08/24/04

4" OR 6" METER INSTALLATION

STANDARD DRAWING NO.

W-23A

DECEMBER 2011

FOR DRAWING OF METER INSTALLATION

NOTES:

1) REFER TO SECTION 15150 OF THE SPECIFICATIONS

2) TO BE USED WHERE POTABLE OR RECYCLED WATER SERVICE IS TO BE PROVIDED ONLY FOR FIRE PROTECTION ON SITE REFER TO W-22 A&B

3) LOCATION OF 4" OR 6" METER TO BE APPROVED BY DISTRICT ENGINEER

4) 8" OR 10" METER TO BE DESIGNED BY AN ENGINEER AND SUBMITTED FOR DISTRICT'S APPROVAL AS NEEDED ON A CASE-BY-CASE BASIS

5) METER SHALL BE FURNISHED AND INSTALLED BY THE AGENCY OF JURISDICTION

6) 4" METER REQUIRES A 48" X 60" VAULT
6" METER REQUIRES A 48" X 72" VAULT

7) IN AREAS WHERE GROUND WATER IS PRESENT THE DISTRICT ENGINEER MAY REQUIRE A SEALED SUMP TO BE CONSTRUCTED

8) MATERIAL SHALL BE SELECTED FORM THE APPROVED MATERIAL LIST

ITEM NO.	SIZE AND DESCRIPTION	ITEM NO.	SIZE AND DESCRIPTION
1	2" X REQUIRED LENGTH TYPE "K" COPPER PIPE	11	4" OR 6" COMPOUND METER, SEE NOTE 6
2	2" BRONZE CORPORATION STOP	12	12" DIAMETER X 6" LONG DI OR STEEL PIPE
3	LINE SIZE X 2" SERVICE SADDLE	13	LINE SIZE X 24" LONG FLANGED DUCTILE-IRON SPOOL
4	4" OR 6" DI OR STEEL PIPE	14	2" 90° COMPRESSION ELL (TYPICAL)
5	4" OR FLG X FLG GATE VALVE	15	8" GATE WELL, SEE W-19
6	LINE SIZE X 24" LONG DUCTILE-IRON SPOOL	16	HINGED VAULT ACCESS DOOR
7	LINE SIZE X 6" LONG DUCTILE-IRON SPOOL	17	ADJUSTABLE PIPE SUPPORT (TYPICAL)
8	2" COMPRESSION, LOCKABLE BALL VALVE	18	6" CONCRETE FLOOR, 560-C-3250 WITH #4 @ 12" O.C. EACH WAY MID-DEPTH
9	FRP VAULT WITH HINGED ACCESS DOOR, SEE NOTE 6	19	6" CLASS 2 BASE COMPACTED TO 90%
10	4" OR 6" FLEXIBLE COUPLING	20	12" DIAMETER X 12" DEEP, 3/4" GRAVEL SUMP, SEE NOTE 7

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED:

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REVISION	APPROVED	DATE

4" OR 6" METER INSTALLATION

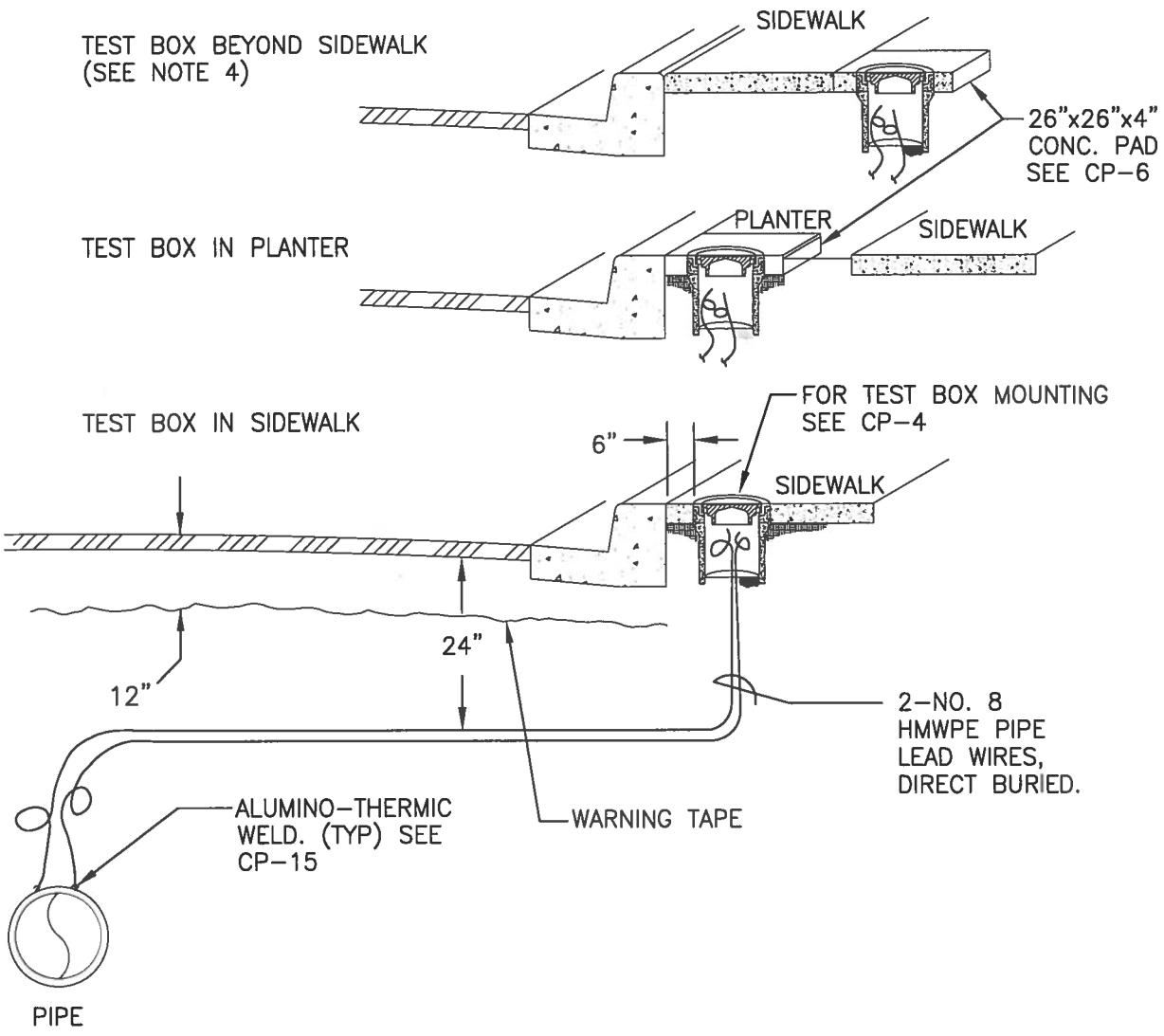
STANDARD DRAWING NO.

W-23B

DECEMBER 2011

CATHODIC PROTECTION

STANDARD DRAWINGS



NOTES:

1. PROVIDE 18" SLACK WIRE AT WELD AND COILED IN TEST BOX.
2. WIRE TRENCH SHALL BE 24-INCHES DEEP (MIN). PLACE 3-INCHES OF SAND OR DG BEDDING IN TRENCH BEFORE PLACING WIRES. COVER WIRES WITH 6-INCHES OF SAND OR DG. COMPACT WIRE TRENCH FILL PER RWD-STD.
3. USE 6" WIDE, 4 MIL THICK INERT PLASTIC TAPE PRINTED WITH "CAUTION: CATHODIC PROTECTION CABLE BELOW". PLACE 12-INCHES BELOW GRADE.
4. TEST BOX TO BE PLACED BEHIND CURB IN SIDEWALK, BEYOND EDGE OF SIDEWALK, OR IN PLANTER AS SHOWN PER ENGINEER'S DIRECTION. IF NO CURB EXISTS, LOCATE TEST BOX JUST OFF PAVED SURFACE. IN UNPAVED AREAS OR PARKING LOTS, LOCATE TEST BOX OVER PIPE BUT NOT DIRECTLY IN PARKING SPACE. (SEE CP-2).

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Tom C. Lee
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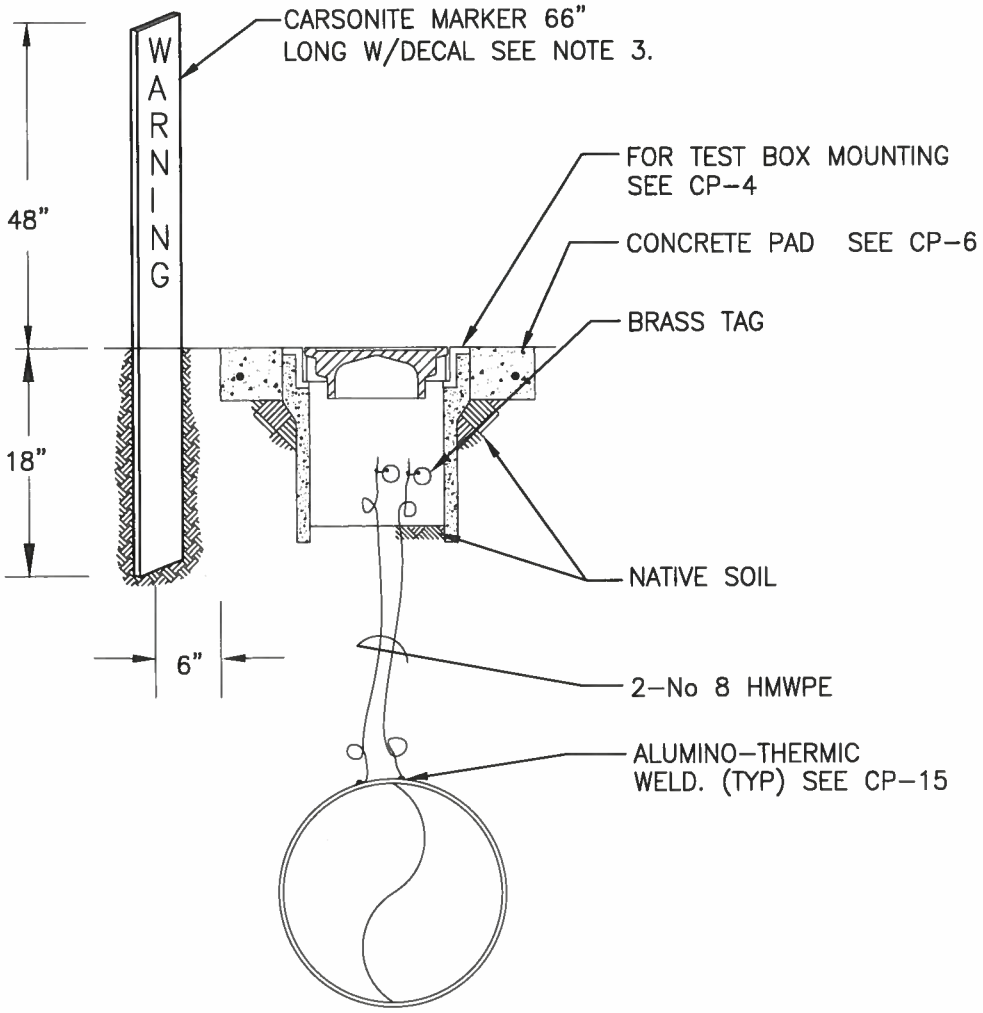
2-WIRE TEST STATION (PAVED STREET)

STANDARD DRAWING NO.

CP-1

DECEMBER 2011



NOTES:

1. PLACE TEST STATION DIRECTLY OVER PIPE IF POSSIBLE.
2. SEE NOTES 1 THROUGH 4 ON CP-1.
3. CARSONITE MODEL R-845, YELLOW WITH BLACK CHARACTERS WITH: "RAINBOW MUNICIPAL WATER DISTRICT, UNDERGROUND CABLES, WARNING, BEFORE DIGGING CALL (760)728-1178."

RAINBOW MUNICIPAL WATER DISTRICT

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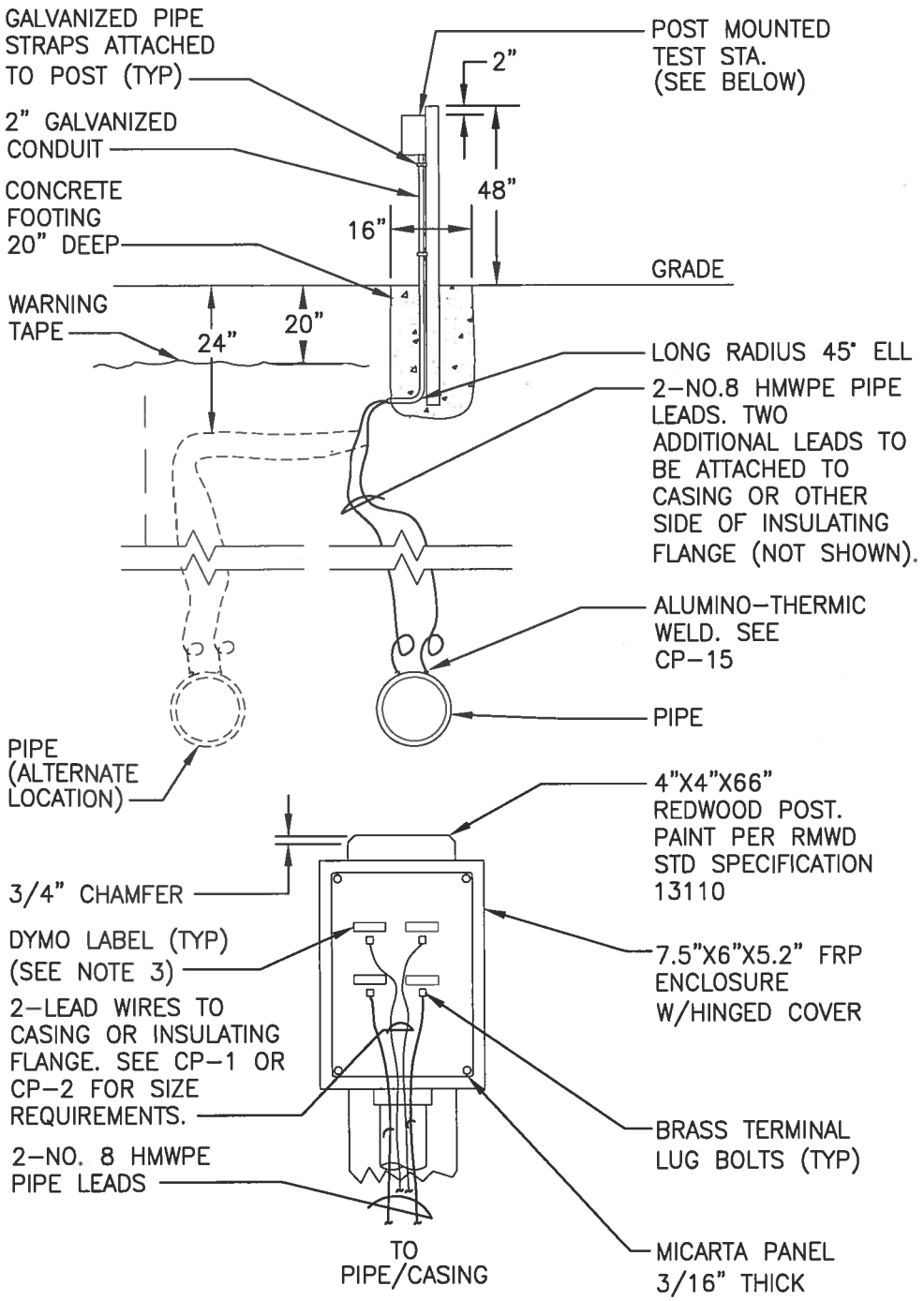
2-WIRE TEST STATION (UNPAVED AREA)

STANDARD DRAWING NO.

CP-2

DECEMBER 2011



NOTES:

1. INSTALL TEST STATION OVER PIPE IF POSSIBLE. OFFSET POST AS NECESSARY TO PLACE IN PROTECTED AREA AND PUT OF TRAFFIC LANES. BUT NOT OUTSIDE RIGHT-OF-WAY.
2. FOUR-WIRE TEST STATION SHOWN IS APPLICABLE TO CASING AND INSULATING FLANGE TEST STATIONS (SEE CP-7 AND CP-5). TWO WIRE TEST STATIONS SIMILAR.
3. EACH WIRE SHALL BE IDENTIFIED WITH A DYMO LABEL AFFIXED TO THE MICARTA PANEL. LABEL WILL IDENTIFY RWD, SIZE, MATL AND SERVICE (I.E. RMWD, 14", CML&C, RW)

RAINBOW MUNICIPAL WATER DISTRICT

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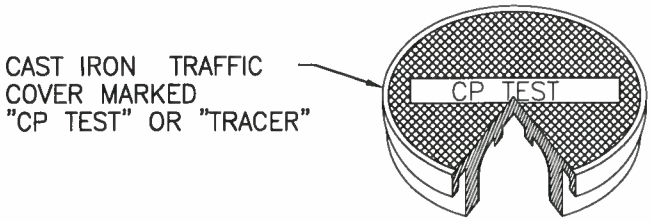
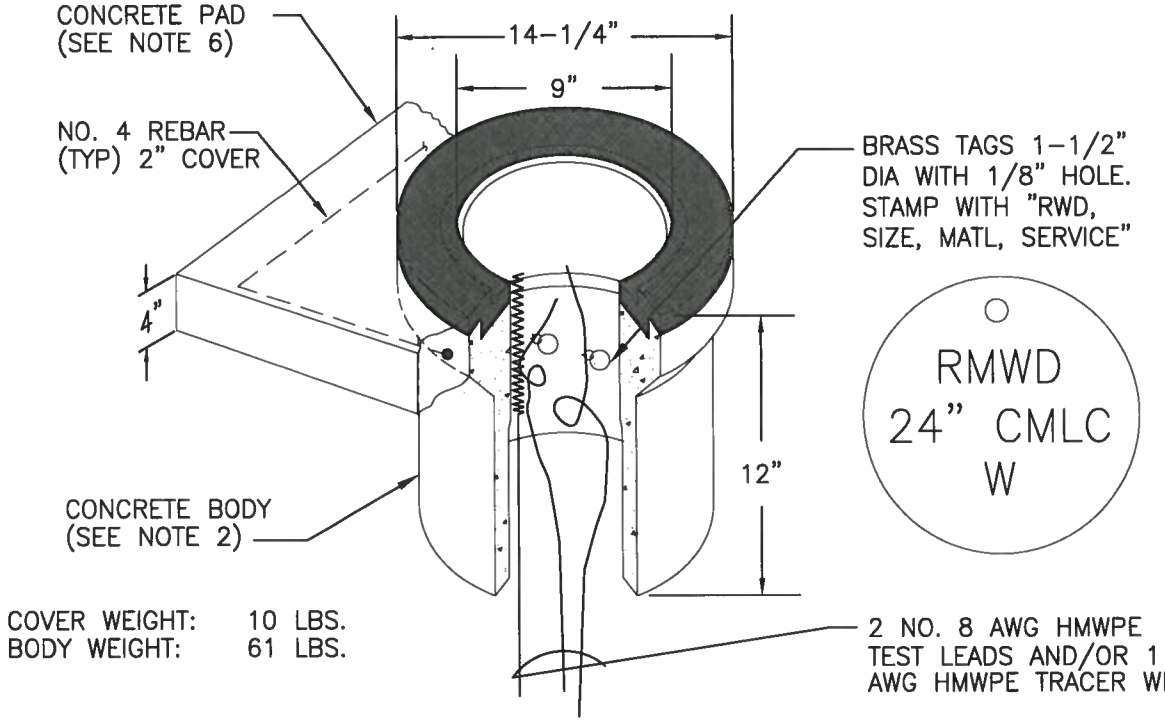
2 OR 4-WIRE TEST STATION

STANDARD DRAWING NO.

CP-3

DECEMBER 2011





NOTES:

1. SEE CP-1 FOR PLACEMENT OF TEST BOX ON PAVED STREETS AND CP-2 FOR REPLACEMENT IN UNPAVED AREAS.
2. CONCRETE BODY, RATED FOR OCCASIONAL VEHICLE TRAFFIC.
3. ALL WIRES SHALL HAVE 24" MIN. SLACK IN BOX.
4. BOTTOM OF TEST BOX SHALL BE NATIVE SOIL. DO NOT PLACE ROCK, GRAVEL OR SAND IN TEST BOX.
5. FIRMLY STAMP BRASS TAGS (1-1/2" DIA WITH 1/16" DIA. HOLE) "RMWD, SIZE AND SERVICE" (EXAMPLE: RMWD 24" W). USE 1/4" HIGH CHARACTERS. SECURELY ATTACH BRASS TAGS TO TEST LEADS WITH BARE NO. 14 COPPER WIRE.
6. PROVIDE 26" x 26" x 4" THICK REINFORCED CONCRETE PAD AROUND TEST BOXES AT UNPAVED SITES. CONCRETE SHALL BE 560-C-3250.

RAINBOW MUNICIPAL WATER DISTRICT

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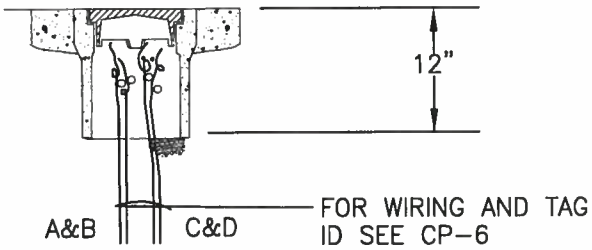
AT GRADE TEST BOX

STANDARD DRAWING NO.

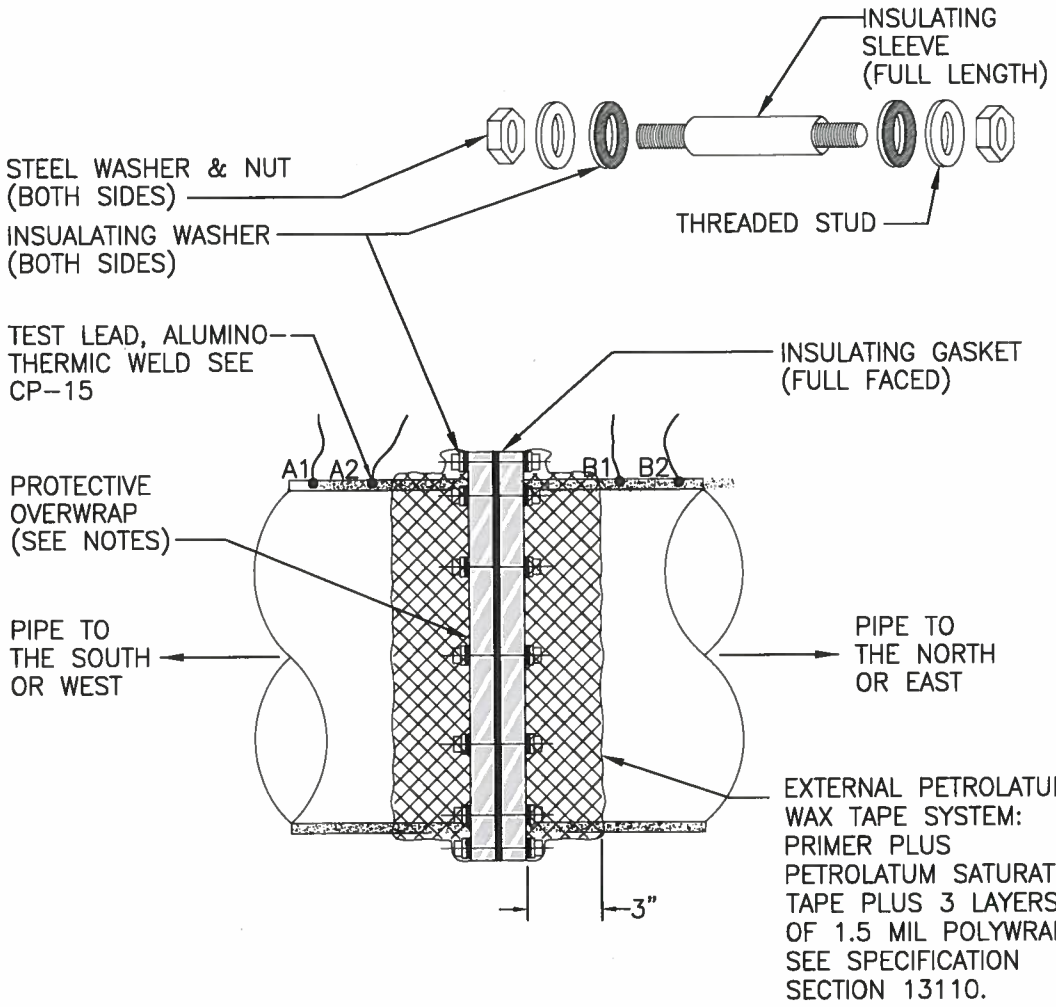
CP-4

DECEMBER 2011



INSULATING MATERIALS:

SEE DRAWING CP-8



NOTES:

1. CARE SHALL BE TAKEN WHEN BACKFILLING TRENCH TO PREVENT DAMAGE TO WAX TAPE SYSTEM.
2. FLANGES 18" AND LARGER SHALL BE OVERWRAPPED WITH 10 MIL PIPE TAPE (2 LAYERS 50% OVERLAP) TO PROTECT WAX TAPE DURING BACKFILLING.
3. FLANGES LESS THAN 18" REQUIRE NO PIPE TAPE PROTECTIVE OVERWRAP.
4. NO TEST LEADS OR TEST STATIONS ARE REQUIRED AT BLOW-OFF INSULATORS.

RAINBOW MUNICIPAL WATER DISTRICT

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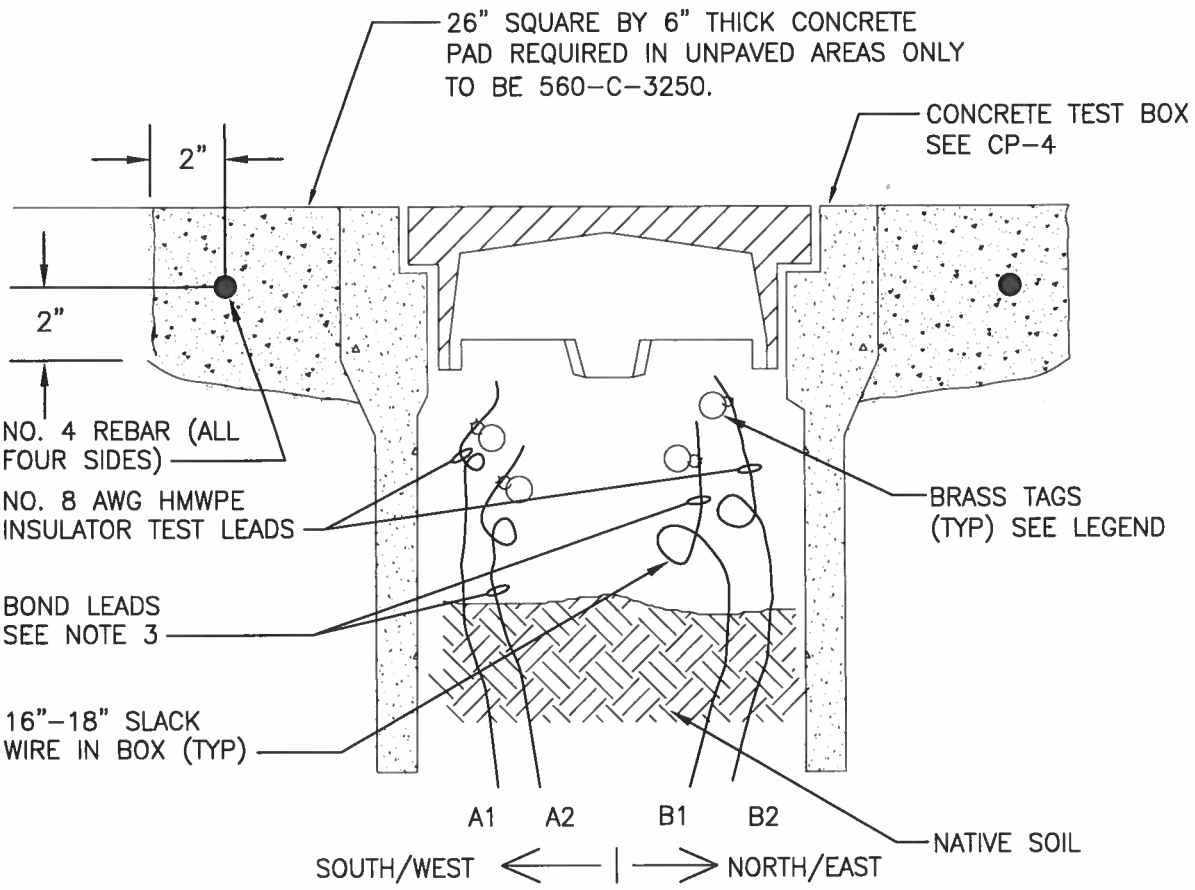
BURIED INSULATING FLANGE

STANDARD DRAWING NO.

CP-5

DECEMBER 2011



BRASS TAG LEGEND

WIRE	SIZE	ID STAMP
A1	NO. 8	"RMWD, SIZE, MATL, SERVICE, SO. OR WT."
A2	SEE NOTE 3	"RMWD, SIZE, MATL, SERVICE, SO. OR WT."
B1	SEE NOTE 3	"RMWD, SIZE, MATL, SERVICE, NO. OR ET."
B2	NO. 8	"RMWD, SIZE, MATL, SERVICE, NO. OR ET."

EXAMPLE: "RMWD 42" W-ET"

NOTES:

1. SEE CP-1 FOR PLACEMENT OF TEST BOX.
2. SEE CP-4 FOR MOUNTING AND BRASS ID TAG REQUIREMENTS.
3. SECOND WIRE (A2 & B1) ON EACH SIDE OF INSULATOR IS SIZED FOR POSSIBLE FUTURE BOND AS FOLLOWS:

WIRE	PIPE DIA	SIZE
A1 & B1	LESS THAN 12"	NO. 6 AWG HMWPE
	12" TO 18"	NO. 4 AWG HMWPE
	GREATER THAN 18"	NO. 2 AWG HMWPE

RAINBOW MUNICIPAL WATER DISTRICT

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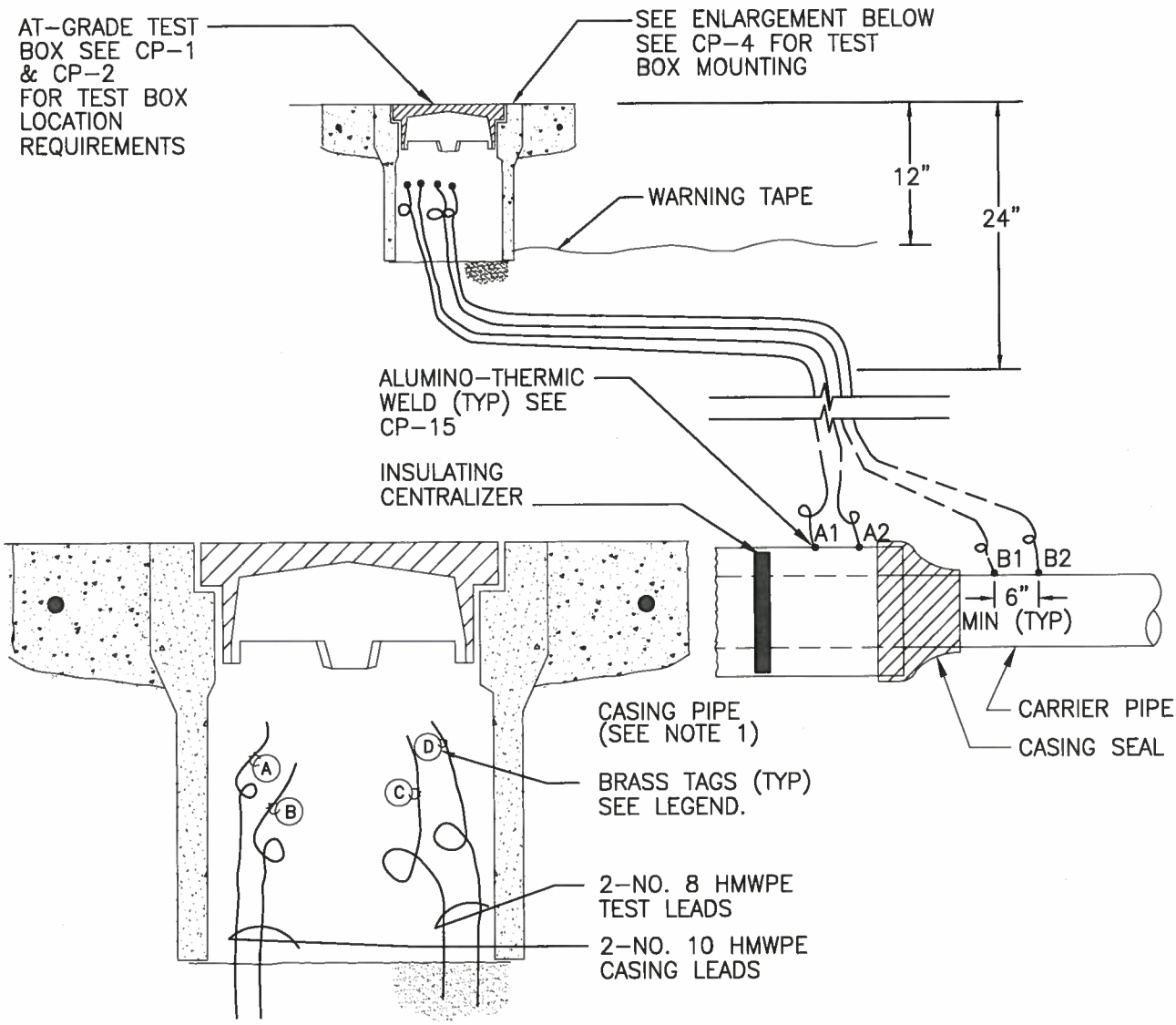
BURIED INSULATING FLANGE AT-GRADE TEST STATION

STANDARD DRAWING NO.

CP-6

DECEMBER 2011



BRASS TAG LEGEND

WIRE	SIZE	ID STAMP
A1	NO. 10	CASING
A2	NO. 10	CASING
B1	NO. 8	RMWD, SIZE, SERVICE
B2	NO. 8	RMWD, SIZE, SERVICE

NOTES:

1. ELECTRICAL/METALLIC INSULATION BETWEEN THE CASING AND THE CARRIER PIPE IS REQUIRED.
2. PROVIDE 18" SLACK LOOP IN EACH WIRE AT PIPE/CASING WELD AND IN TEST BOX.

RAINBOW MUNICIPAL WATER DISTRICT

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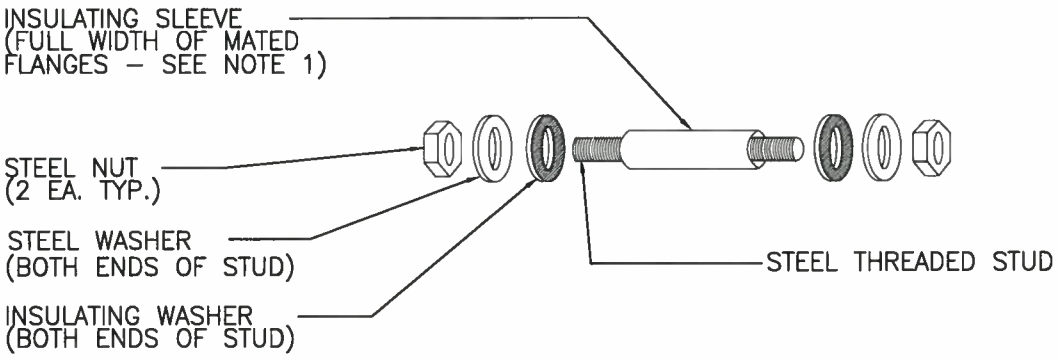
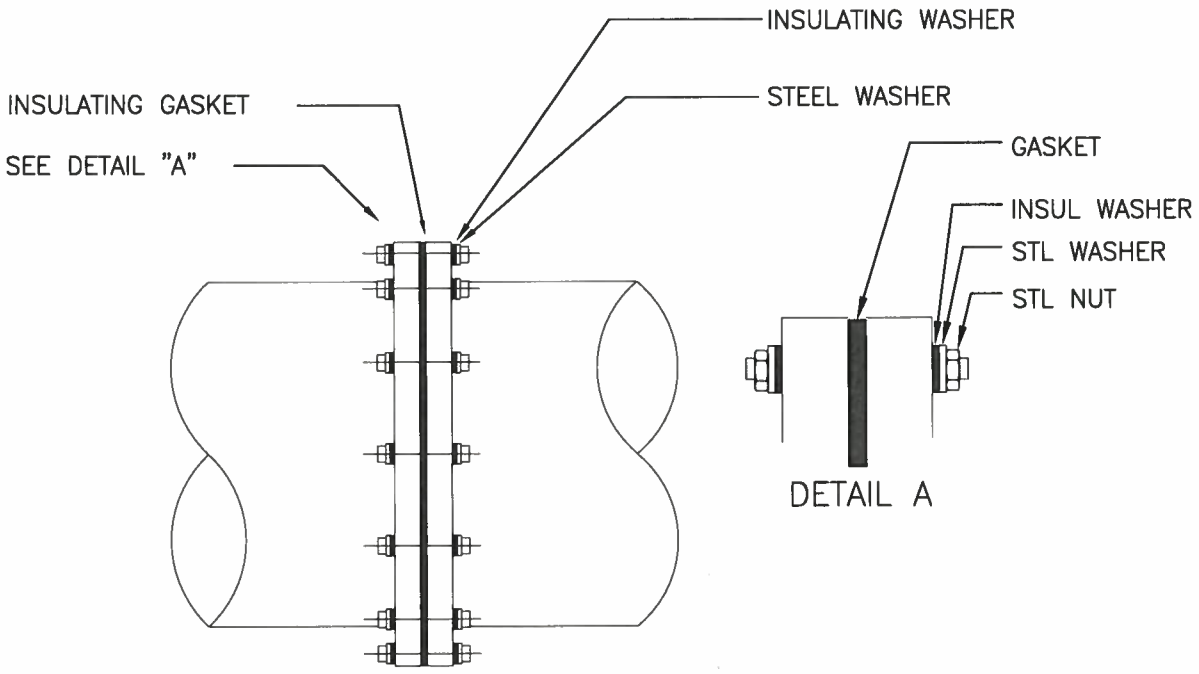
REVISION	APPROVED	DATE

4-WIRE CASING TEST STATION

STANDARD DRAWING NO.
CP-7
DECEMBER 2011





NOTES:

1. USE HALF WIDTH SLEEVES AT THREADED FLANGE BOLTS. (I.E. AT BFV BASE AND BONNET)
2. INSULATING MATERIALS:
   –GASKET – 16" OR GREATER – TYPE "E" FULLFACED PHENOLIC WITH RECTANGULAR NITRILE OR VITON O–RING SEAL.
   – LESS THAN 16" – TYPE "E" FULLFACED NEOPRENE FACED PHENOLIC.
   –SLEEVE –1/32–INCH THICK, FULL LENGTH TUBE, LAMINATED G–10 GLASS.
   –WASHER –1/8–INCH THICK LAMINATED G10 GLASS SHEET.
3. ALIGN FLANGE PROPERLY AND FOLLOW GASKET MANUFACTURER BOLT TIGHTENING SEQUENCE INSTRUCTIONS.
4. DO NOT PAINT OUTER SURFACE OF FLANGE WITH METALLIC PIGMENTED OR CONDUCTIVE PAINTS.
5. TEST MATED FLANGE WITH INSULATION CHECKER. THE FLANGE WILL BE ACCEPTED IF THERE IS NO INDICATION OF FULL OR PARTIAL SHORT.

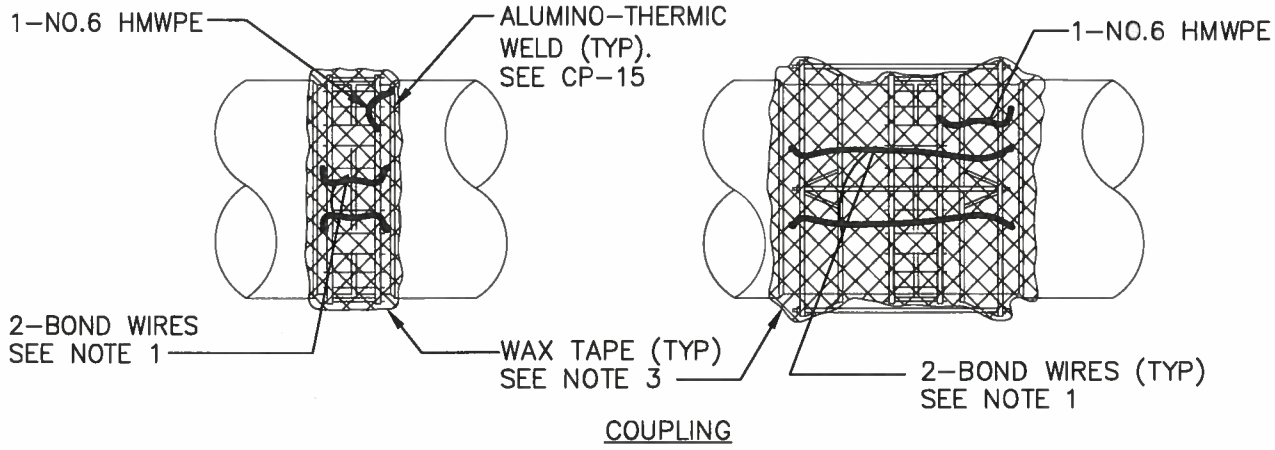
RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Glenn C. Lee
RCE # 55790 EXP.12/31/2012

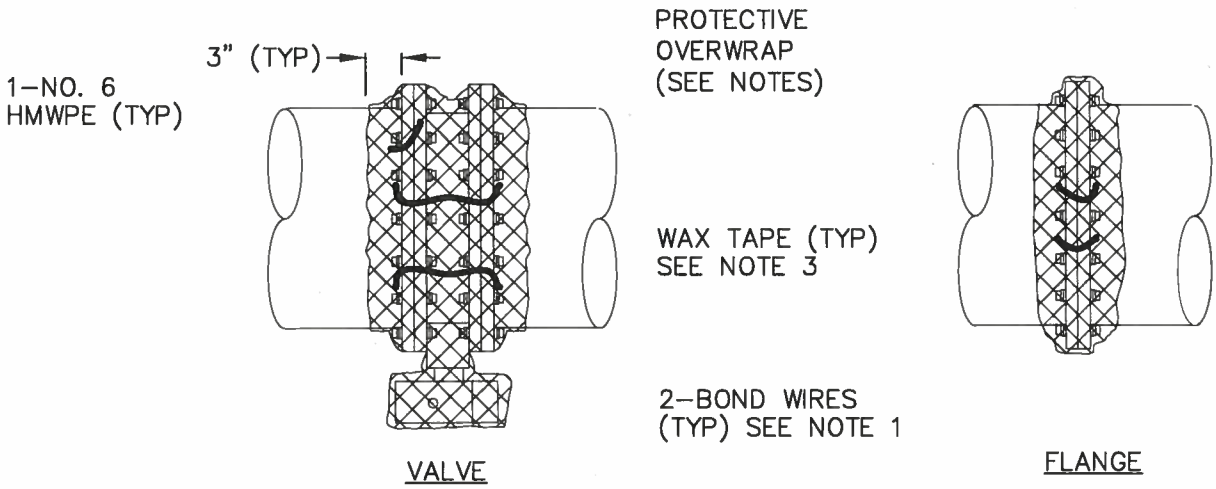
REVISION	APPROVED	DATE

ABOVE–GRADE INSULATING FLANGE

STANDARD DRAWING NO.
CP–8
DECEMBER 2011



COUPLING



VALVE

FLANGE

NOTES:

1. BOND WIRE SIZE:

PIPE DIA	SIZE
LESS THAN 12"	NO. 6 AWG HMWPE
12" THRU 18"	NO. 4 AWG HMWPE
GREATER THAN 18"	NO. 2 AWG HMWPE

2. WIRES CAN BE WELDED DIRECTLY TO PIPE OR FLANGE. JUMPER FROM PIPE TO VALVE OR FOLLOWER IS NO 6 HMWPE.
3. ALL NON-MORTAR COATED SURFACES SHALL BE WRAPPED WITH WAX TAPE. INDIVIDUALLY WRAP ALL RODS, BOLTS & IRREGULAR SURFACES. SEE SPEC SECT 13110.
4. INSTALL BOND WIRES BEFORE WAX TAPE.
5. CARE SHALL BE TAKEN WHEN BACKFILLING TRENCH TO PREVENT DAMAGE TO WAX TAPE SYSTEM.
6. FLANGES (ONLY) 18" AND LARGER SHALL BE OVERWRAPPED WITH 10 MIL PIPE TAPE (2 LAYERS 50% OVERLAP) TO PROTECT WAX TAPE DURING BACKFILLING.
7. FLANGES LESS THAN 18" REQUIRE NO PIPE TAPE PROTECTIVE OVERWRAP.

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Brian C. Lee
RCE # 55790 EXP.12/31/2012

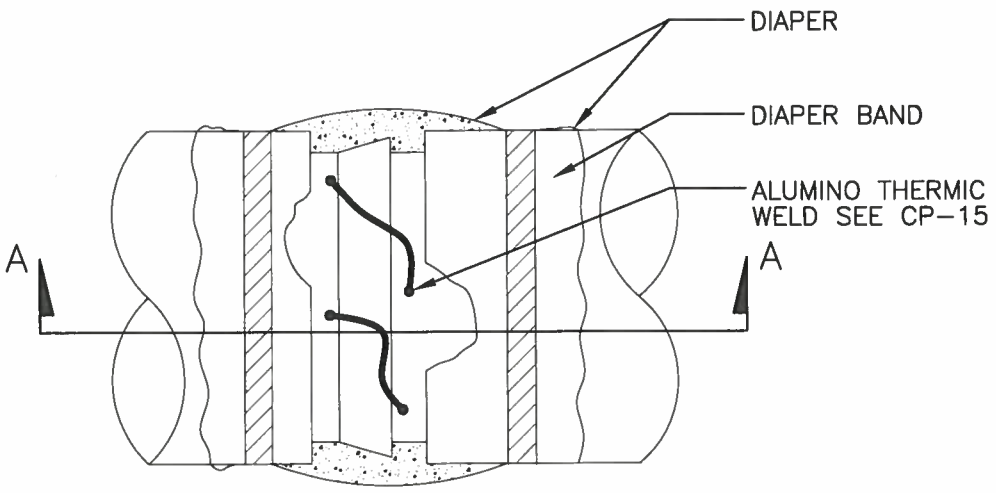
REVISION	APPROVED	DATE

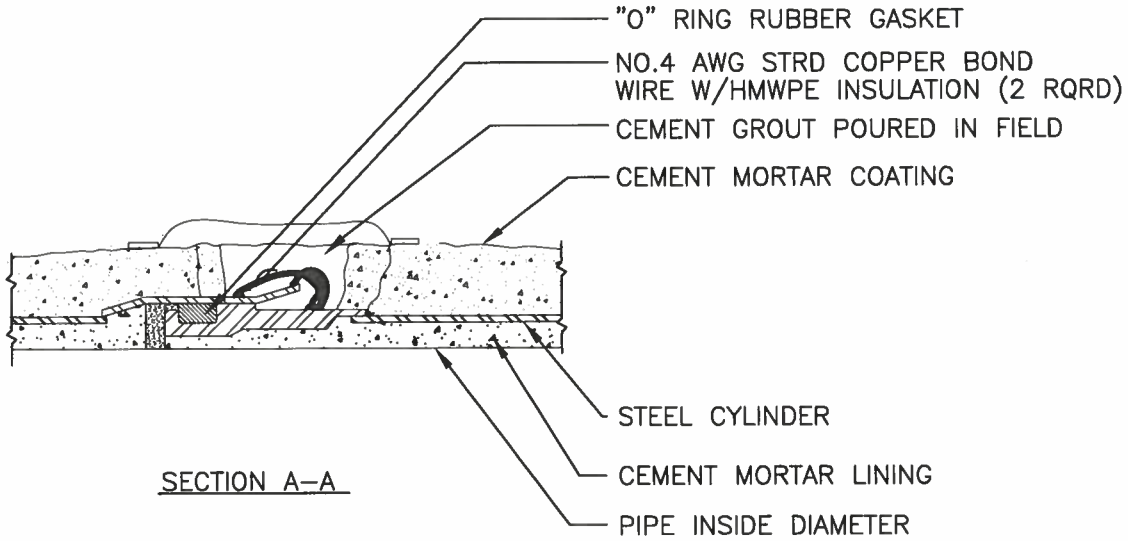
MECHANICAL JOINT BOND

STANDARD DRAWING NO.

CP-9

DECEMBER 2011





SECTION A-A

NOTES:

1. 2 BOND WIRES PER JOINT. SEE CP-9 FOR WIRE SIZE.
2. CHIP OUT MORTAR ONLY AS NECESSARY TO ALLOW WELD MOLD TO SET FLUSH ON CYLINDER OR BELL.
3. BOND WIRES TO BE AS SHORT AS PRACTICAL BUT NOT LESS THAN 6".

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Jim C. Lee
RCE # 55790 EXP.12/31/2012

REVISION	APPROVED	DATE

CML&C STEEL PIPE
JOINT BOND (WIRE JUMPER)

STANDARD DRAWING NO.
CP-10
DECEMBER 2011

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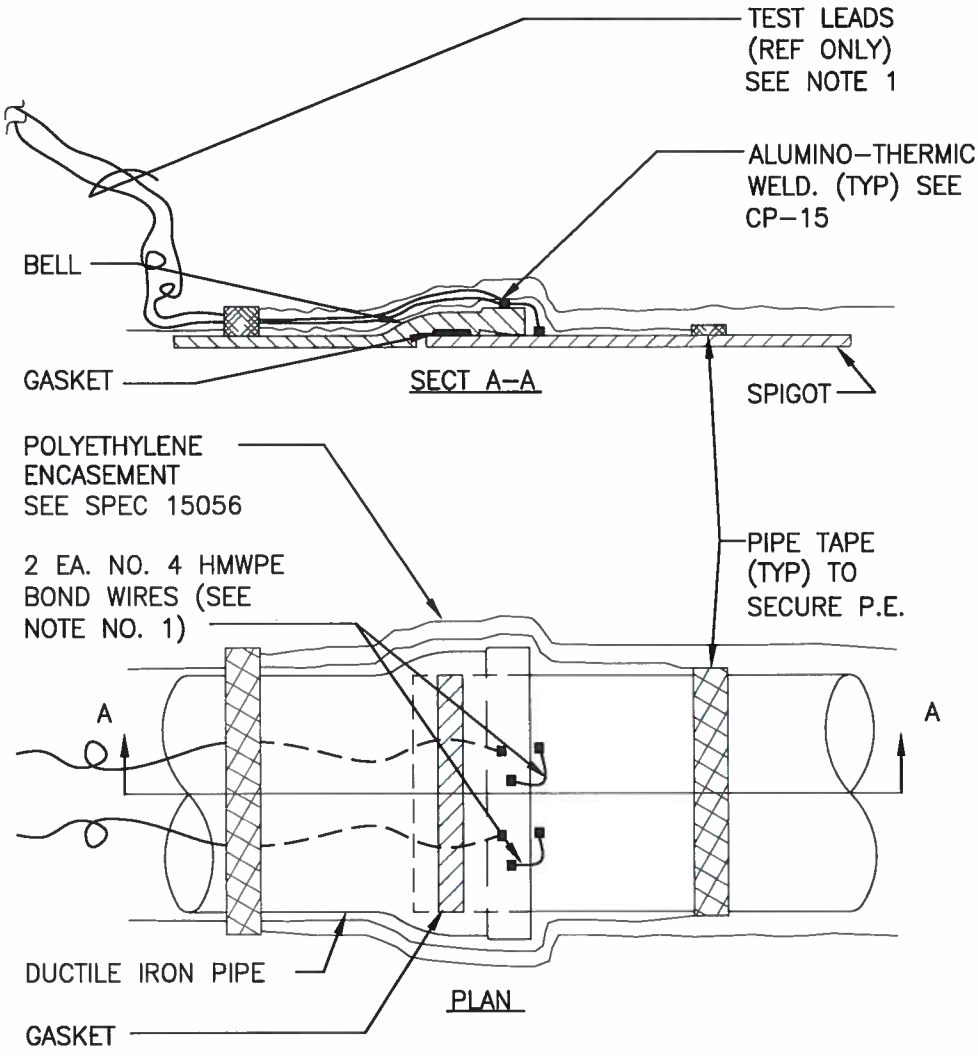

NOTES:

1. INSTALL BONDS AND TEST LEADS ONLY WHEN DIRECTED BY THE ENGINEER.
2. BOND WIRES SHALL BE OF MINIMUM LENGTH (6" MAX LENGTH) AND LAID FLUSH AGAINST PIPE AND UNDER P.E. ENCASEMENT.
3. TEST ALL WELDS BEFORE BACKFILLING. SEE CP-15.
4. WELDS ON BELL MUST BE MADE IN AN AREA BETWEEN THE END OF THE PIPE AND THE JOINT GASKET.
5. COAT WELDS PER CP-15.

RAINBOW MUNICIPAL WATER DISTRICT

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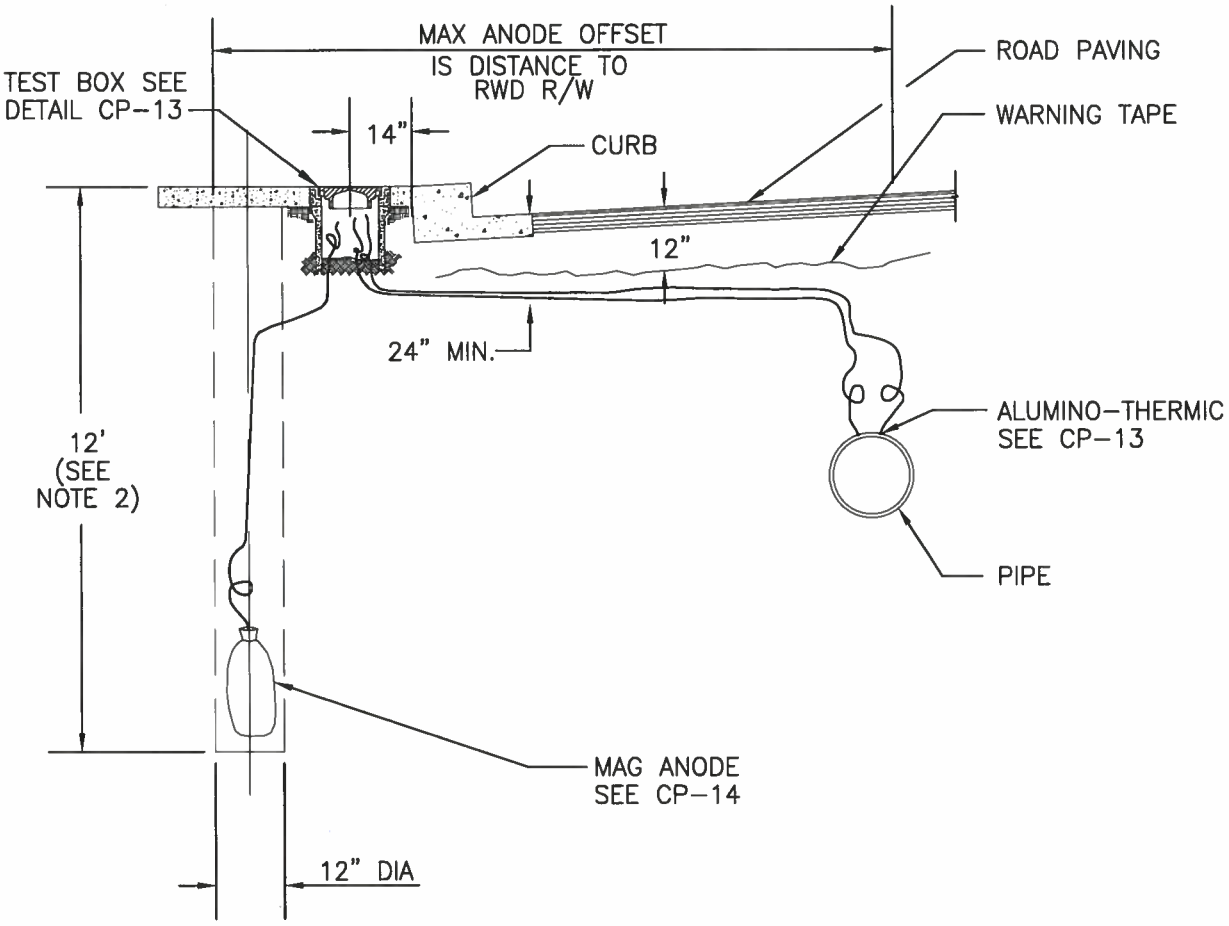
DIP JOINT BONDING AND TEST LEAD CONNECTIONS

STANDARD DRAWING NO.

CP-11

DECEMBER 2011



NOTES:
1. HORIZONTAL DISTANCES OFF PIPE SHALL BE MAXIMUM WITHIN RWD RIGHT-OF-WAY OR AS INDICATED IN PLAN DRAWINGS. DO NOT INSTALL ANODE SUCH THAT A FOREIGN METALLIC PIPELINE EXISTS BETWEEN ANODE AND PIPE.
2. DEPTH IS 12' UNLESS OTHERWISE INDICATED.
3. RELATIVE POSITION OF ANODE, PIPE AND TEST BOX CAN VARY FROM POSITION SHOWN. SEE CP DRAWINGS OR ENGINEER FOR SPECIFIC INSTALLATION REQUIREMENTS.

RAINBOW MUNICIPAL WATER DISTRICT

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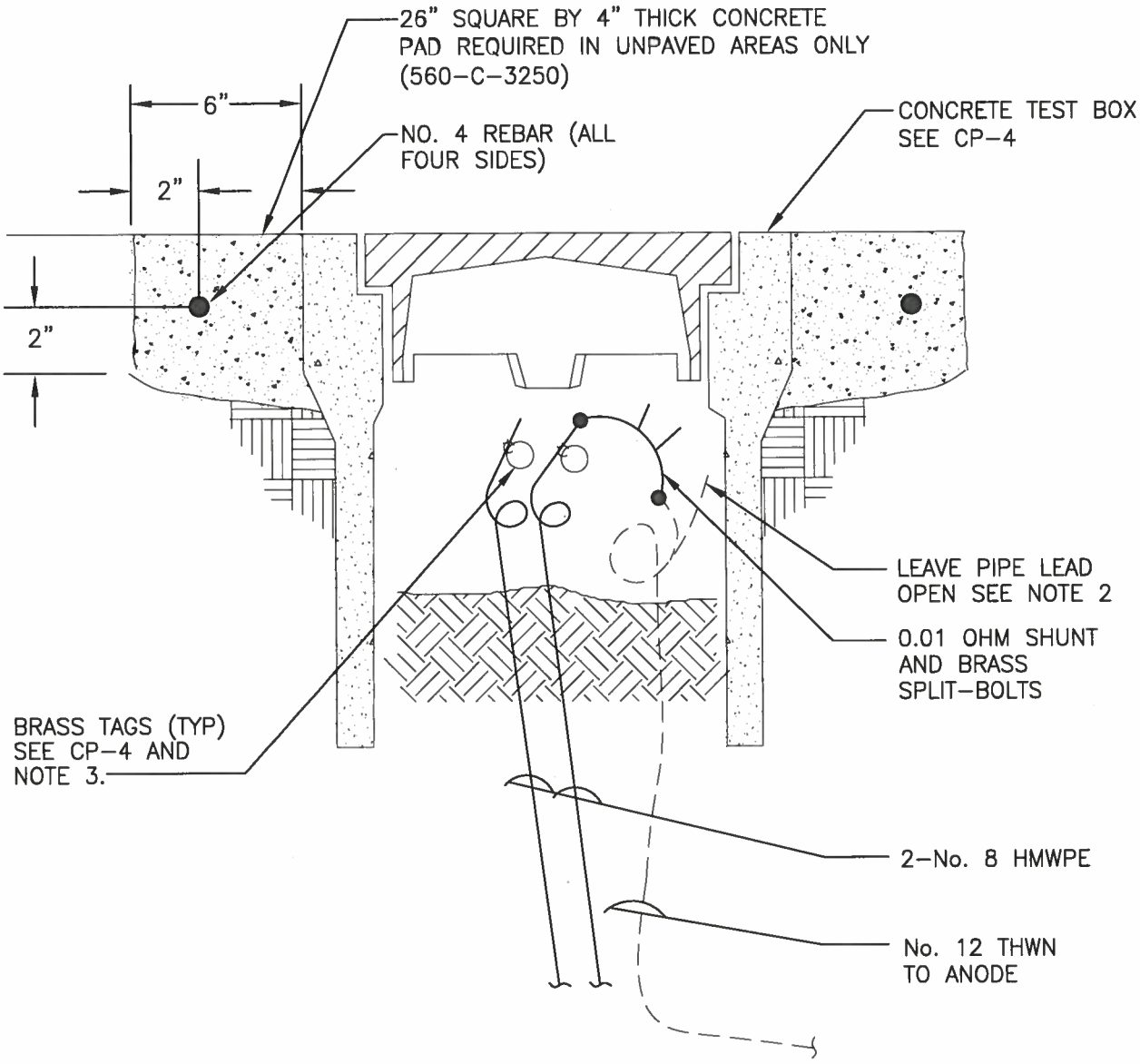
SINGLE ANODE INSTALLATION

STANDARD DRAWING NO.
CP-12
DECEMBER 2011



NOTES:

1. INSTALL TEST BOX AS SHOWN IN CP-1 AND CP-4.
2. CONTRACTOR TO PLACE ALL CONNECTION HARDWARE (SHUNTS & SPLIT BOLTS) IN TEST BOX, BUT MAKE UP TEST LEAD-TO-SHUNT CONNECTION ONLY. ATTACH SPLIT BOLT TO OTHER END OF SHUNT, BUT LEAVE ANODE LEAD OPEN. FINAL CONNECTION TO BE MADE AT SYSTEM ACTIVATION.
3. ANODE LEADS ARE NOT TAGGED.

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Tom C. Lee
RCE # 55790 EXP.12/31/2012

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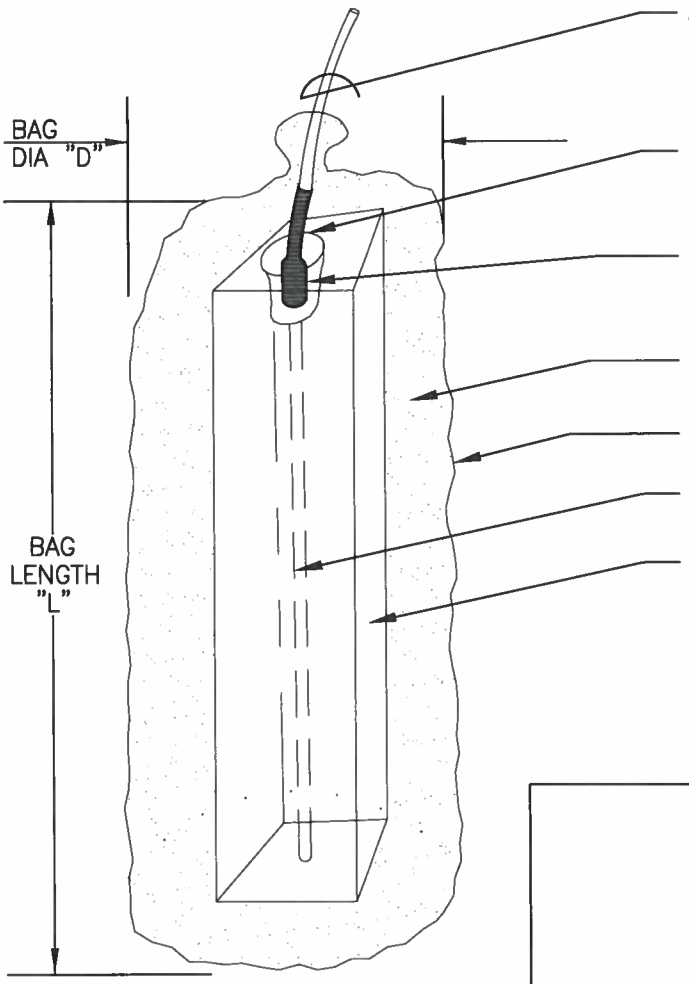
SINGLE ANODE TEST STATION WIRING

STANDARD DRAWING NO.

CP-13

DECEMBER 2011



BACKFILL COMPOSITION

75% GYPSUM
20% BENTONITE
5% SODIUM SULFATE
(SEE NOTE 2)

NOTE:
1. SEE SPEC SECT 13110 FOR ANODE SOAKING AND INSTALLATION REQUIREMENTS.
2. USE HIGH OR STD POTENTIAL ANODE ALLOY AND INGOT WEIGHT AS DIRECTED BY ENGINEER OR AS INDICATED IN THE DESIGN DRAWINGS.

INGOT WT	"D"	"L"	TOTAL WT
17	6-1/2	29	45
32	8-1/2	28	70
48	7-1/2	38	105

NOTE: APPROX DIMENSIONS AND WEIGHTS IN INCHES AND POUNDS.

MAGNESIUM ANODE ALLOY COMPOSITION HIGH & STANDARD POTENTIALS

Element	HIGH POTENTIAL Weight %	STANDARD POTENTIAL Weight %
Al	.01 Max	5.3 to 6.7
Mn	0.05 to 1.3	0.15 to 0.30
Zn	0.002 Max	2.5 to 3.5
Cu	0.02 Max	0.02 Max
Ni	0.001 Max	0.002 Max
Fe	0.025 Max	0.003 Max
Si	0.002 Max	0.10 Max
Other	0.05 each Max and 0.3 Total Max	0.05 each Max and 0.3 Total Max
Mg	Balance	Balance

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Glenn C. Lee
RCE # 55790 EXP.12/31/2012

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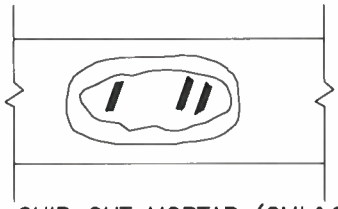
PREPACKAGED MAGNESIUM ANODE

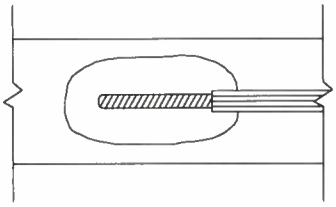
STANDARD DRAWING NO.
CP-14
DECEMBER 2011

STEP 1



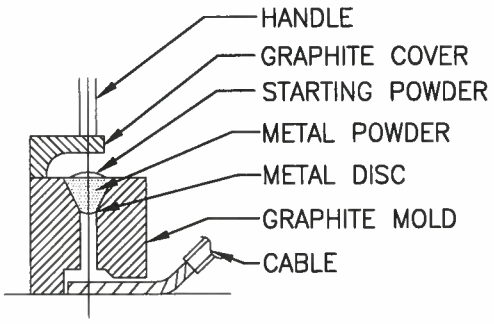
CHIP OUT MORTAR (CML&C) AND/OR FILE SURFACE TO BRIGHT METAL AND CLEAN

STEP 2



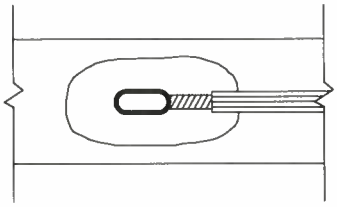
STRIP INSULATION FROM WIRE

STEP 3



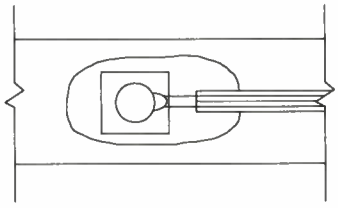
HOLD WELDER FIRMLY WITH OPENING AWAY FROM OPERATION AND IGNITE STARTING POWDER

STEP 4



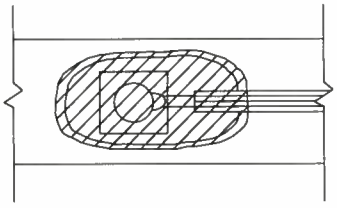
REMOVE SLAG FROM CONNECTION

STEP 5



APPLY 2 COATS OF PRIMER AND COVER CONNECTION WITH A PREFORMED WELD CAP

STEP 6



COAT AREA WITH BITUMEN. PATCH MORTAR. SEE NOTE 5.

NOTES:

1. WELDER SHOWN IS FOR HORIZONTAL SURFACES. FOR VERTICAL SURFACES SIDE WELDER IS REQUIRED.
2. ALL WIRE WELDS SHALL BE 3 INCHES APART, MINIMUM.
3. STANDARD WELD CARTRIDGES SHALL BE USED FOR DUCTILE IRON AND STEEL SURFACE. FOR CAST IRON, USE XF-19 ALLOY OR EQUIVALENT.
4. TEST ALL WELDS BY STRIKING WITH 2 LBS. HAMMER. SEE SPEC SECTION 13110.
5. ALL EXPOSED METAL (STRUCTURE, WIRE & WELD) SHALL BE COVERED WITH 2 COATS OF PRIMER AND AN ELASTOMERIC WELD CAP.
6. APPLY GENEROUS COAT OF BITUMEN OVER WELD CAP AND EXPOSED METAL AREA UP TO EDGE OF MORTAR (CML&C) OR 3" BEYOND WELD CAP (DIP).
7. PATCH MORTAR COATING WITH QUICK SETTING MORTAR (CML&C).

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Tim C. Lee
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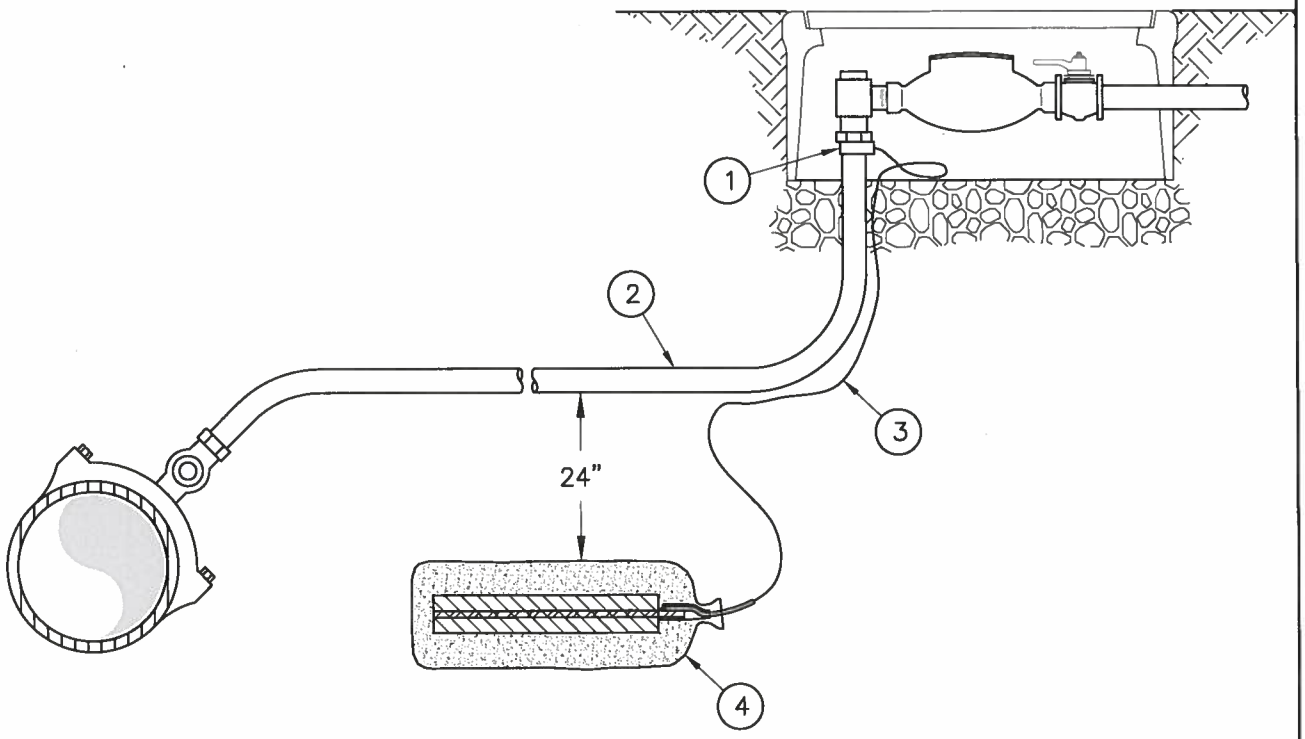
ALUMINO-THERMIC WELD

STANDARD DRAWING NO.

CP-15

DECEMBER 2011



NOTES:

1. REFER TO SECTION 13110 OF THE SPECIFICATIONS.
2. WATER SERVICE SHOWN HEREON IS SHOWN AS AN EXAMPLE ONLY. ANODES SHALL BE INSTALLED ON ALL COPPER TUBING WHEN INDICATED ON THE APPROVED PLANS.
3. CLAMP ANODE LEAD WIRE TO COPPER TUBING AND SECURELY WRAP WITH DIELECTRIC TAPE.
4. LOCATE ANODE WITHIN THE PAVED ROADWAY APPROXIMATELY 5 ' – 10' FROM EDGE OF ROADWAY.
5. LOCATE ANODE WIRE WITHIN COPPER TUBING TRENCH SECURELY ATTACHED TO THE TUBING. TWENTY–FOUR (24) INCHES OF EXCESS WIRE SHALL BE COILED ABOVE GROUND WITHIN METER BOX OR ENCLOSURE.
6. ANODE BACKFILL MATERIALS SHALL BE AS INDICATED IN SECTION 13110.
7. MATERIALS SHALL BE SELECTED FROM THE APPROVED MATERIALS LIST.

C W
LEGEND ON PLANS

ITEM	NO.	DESCRIPTION	REMARKS
1	1	MECHANICAL GROUNDING CLAMP, SEE NOTE 3	
2	1	COPPER TUBING, SEE NOTE 2	
3	1	#12 AWG STRANDED COPPER WIRE WITH THW	
		INSULATION, MINIMUM 25' LONG, SEE NOTE 5	
4	1	15–LBS MINIMUM PREPACKAGED ZINC ANODE,	
		SEE NOTE 4	

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED:
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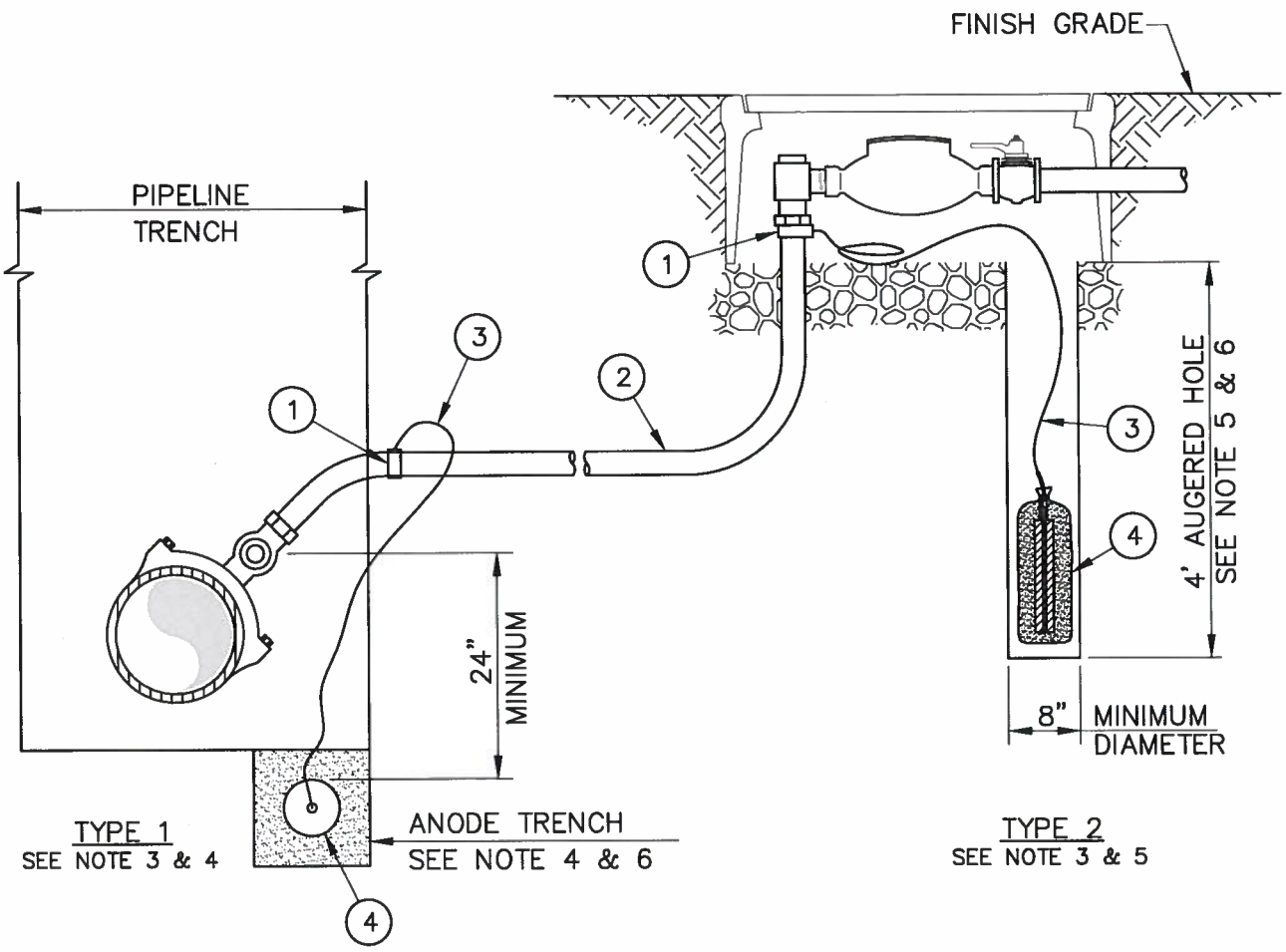
NEW INSTALLATION OF SACRIFICIAL ANODES FOR COPPER TUBING

STANDARD DRAWING NO.

CP–16

DECEMBER 2011



NOTES:

1. REFER TO SECTION 13110 OF THE SPECIFICATIONS.
2. WATER SERVICE SHOWN HEREON IS SHOWN AS AN EXAMPLE ONLY. ANODES SHALL BE INSTALLED ON ALL COPPER TUBING WHEN INDICATED ON THE APPROVED PLANS.
3. CLAMP ANODE LEAD WIRE TO COPPER TUBING AND SECURELY WRAP WITH DIELECTRIC TAPE.
4. FOR TYPE 1 INSTALLATION LOCATE ANODE WITHIN THE PIPELINE TRENCH UNDER THE CORPORATION STOP AS SHOWN ABOVE WITH WIRE SECURELY ATTACHED TO THE TUBING.
5. FOR TYPE 2 INSTALLATION LOCATE ANODE WITHIN AUGERED HOLE AS SHOWN ABOVE. TWENTY-FOUR (24) INCHES OF EXCESS WIRE SHALL BE COILED ABOVE GROUND WITHIN METER BOX OR ENCLOSURE.
6. ANODE BACKFILL MATERIALS SHALL BE AS INDICATED IN SECTION 13110.
7. MATERIALS SHALL BE SELECTED FROM THE APPROVED MATERIALS LIST.

(C) (W) LEGEND ON PLANS

ITEM	NO.	DESCRIPTION	REMARKS
1	1	MECHANICAL GROUNDING CLAMP, SEE NOTE 3	
2	1	EXISTING COPPER TUBING, SEE NOTE 2	
3	1	#12 AWG STRANDED COPPER WIRE WITH THW INSULATION, MINIMUM 25' LONG	
4	1	15-LBS MINIMUM PREPACKAGED ZINC ANODE,	

RAINBOW MUNICIPAL WATER DISTRICT

APPROVED: Tom C. Lee
RCE # 55790 EXP.12/31/2012

REVISION	APPROVED	DATE

RETROFIT INSTALLATION OF SACRIFICIAL ANODES FOR COPPER TUBING

STANDARD DRAWING NO.
CP-17
DECEMBER 2011

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