

STANDARD DETAILS



Water and Sewer Utilities

Standard Drawings and Specifications

Revised November 2017

Updated: 05/17/2018

**CITY OF SANTA CLARA
STANDARD DRAWING INDEX**

Revised date: **NOVEMBER 2017**

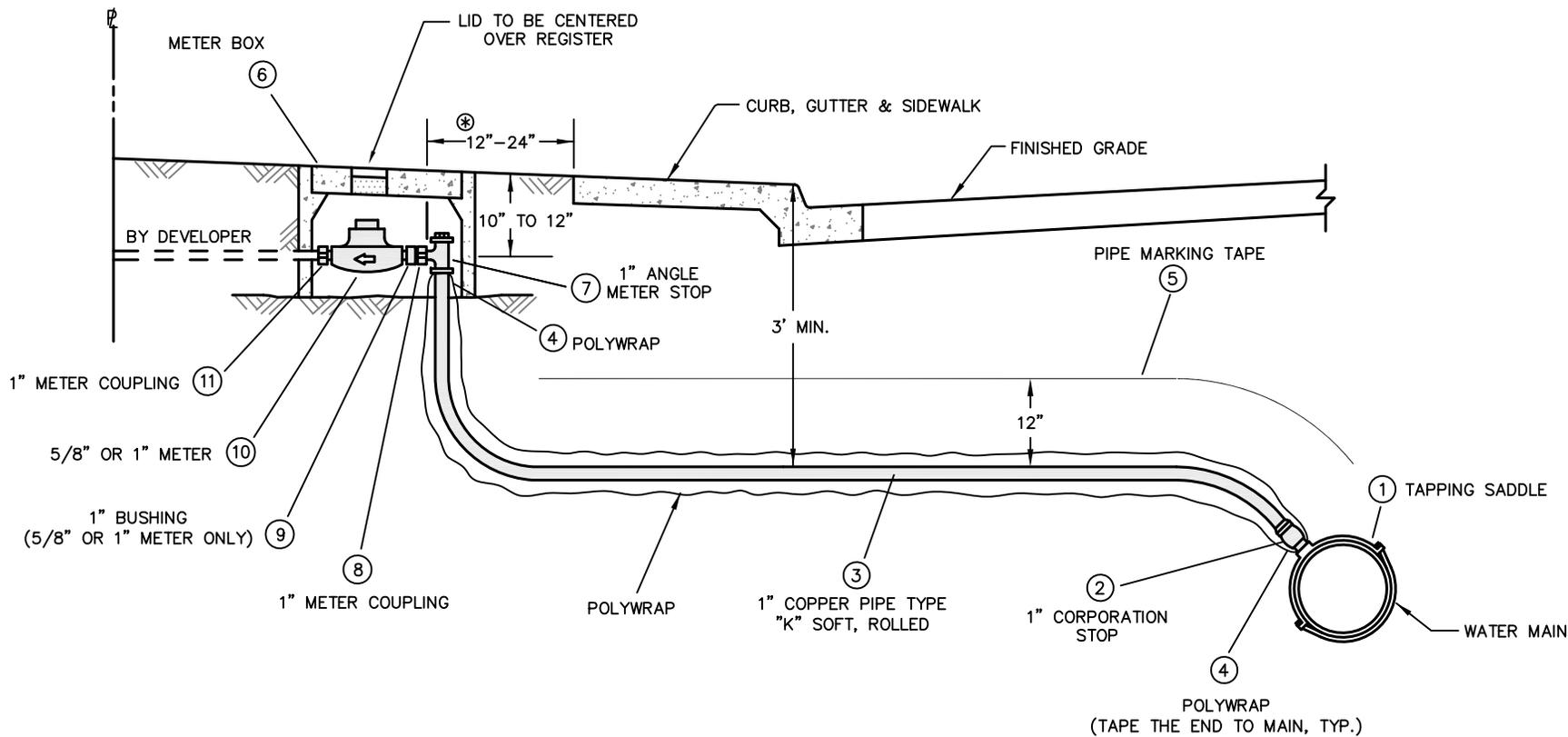
Standard No.	
1	1" WATER SERVICE
2	1" RECYCLED WATER SERVICE
3	1" WATER SERVICE WITH RP
3A	NOT USED
3B	1" WATER SERVICE WITH RP (DUAL VALVE BOXES)
4	NOT USED
5	1½" AND 2" RECYCLED WATER SERVICE
6	1½" AND 2" WATER SERVICE WITH RP
6B	1½" AND 2" WATER SERVICE WITH RP (DUAL VALVE BOXES)
7	2" FIRE SERVICE ASSEMBLY
8	NOT USED
9	NOT USED
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12	4", 6" AND 8" WATER SERVICE WITH RP (DUAL METER SERVICE)
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13A	4", 6" AND 8" RECYCLED WATER SERVICE (ABOVE GROUND)
14	NOT USED
15	NOT USED
16	4" - 10" FIRE SERVICE ASSEMBLY (WITH DOUBLE CHECK DETECTION ASSEMBLY)
17	4" - 10" FIRE SERVICE ASSEMBLY (WITH REDUCED - PRESSURE PRINCIPLE BACKFLOW DETECTION ASSEMBLY)
18	FIRE HYDRANT ASSEMBLY
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20	TRAFFIC VALVE BOX
21	THRUST BLOCK
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27	TREE ROOT BARRIER
28	AS-BUILT REQUIREMENTS
29	WATER SAMPLING STATION
30	NOT USED
30A	NOT USED
31	UPGRADE EXISTING 4" - 10" FIRE SERVICE ASSEMBLY (WITH ABOVE GRADE BACKFLOW DETECTION ASSEMBLY)
32	CLEARANCE FROM EXISTING UTILITIES
33	WATER SERVICE OFFSET

Approved by: **SHILPA M. / TERRY W.**

Checked by: **TANISHA W. / JOHN S.**

Draft by: **DUC L.**

Updated: 5/17/2018



⊗ 12" FROM BACK OF WALK (FOR A 5' OR WIDER SIDEWALK)
 24" FROM BACK OF WALK (FOR A 4' SIDEWALK)



Drawn By: DUC L.
 Checked By: TANISHA W. / JOHN S.
 Approved By: SHILPA M. / TERRY W.
 Revised Date: NOVEMBER 2017

Signature:

 Director of
 Water and Sewer Utilities

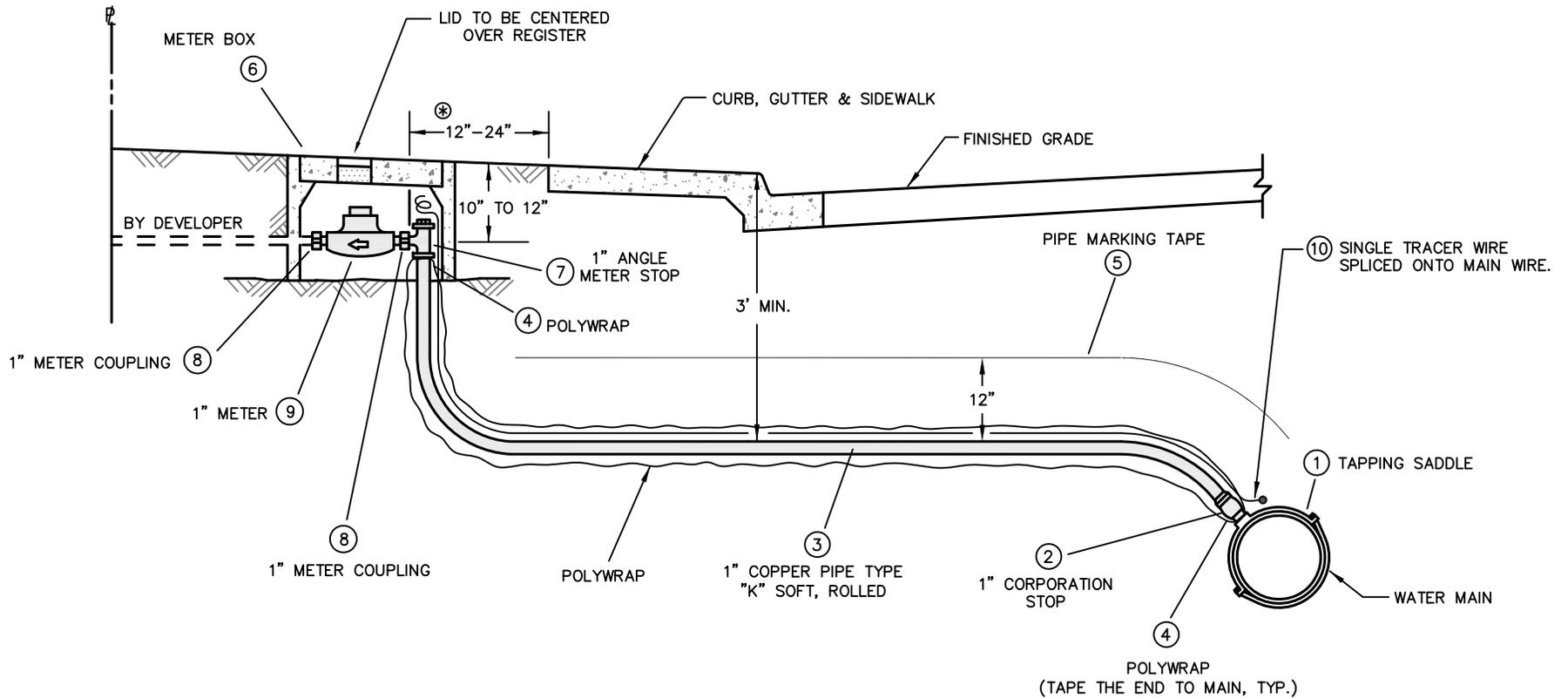
CITY OF SANTA CLARA
 WATER AND SEWER UTILITIES - STANDARD NO. 1

1" WATER SERVICE

Standard No. 1 – 1” Water Service – Material List

Domestic Products Only. Use no lead products for domestic water services.

Material	Description	Manufacturer	Model
1. Tapping Saddle	For PVC C900, bronze saddle, specified pipe size x 1” AWWA/CC Tap	Ford	202BS
	For ductile iron, cast iron, ACP: single strap bronze, specified pipe size x 1” AWWA/CC Tap	Ford	101B
		Mueller	BRIB
2. Corporation Stop	1" AWWA/CC thread inlet x compression outlet	Mueller	B-25008N
		Ford	FB-1000-4-G-NL
For locations requiring insulated corporation stops, use Mueller N-35008 insulated corp ball valve			
3. Copper Tubing	1" ASTM B88, type K soft rolled tubing		
4. Polywrap	Blue. 8 mil low density or 4 mil high density polyethylene film installed per AWWA C105. Tape the end to main.		
5. Pipe Marking Tape	Blue. 3” wide, 4 mil, non-detectable.		
6. Meter Box with Lid	Lid marked "Water" or “Water Meter”	Christy	B-16 box with B-16G lid
7. Angle Meter Stop	1" Compression inlet x FIP outlet.	Ford	BA41-444 W-G-NL
		Mueller	B-24258N
8. Meter Coupling	1" include gaskets.	Ford	C38-44-X-NL (X=to fit)
		Mueller	H-10871N
9. Meter Bushing	Brass. To adapt to 1” meter coupling	Mueller	H-10889N
		Ford	A34S-NL include gasket
10. Water Meter & Register (manufacturer's test results are to be submitted with all meters).	Provide Elster transmitter compatible encoded register with Nicor connector. All registers to be facing inlet and provide cubic feet reading.		
	1" meter and register.	Badger	E-SERIES
		Sensus	SR II
11. Meter Coupling	Include gaskets	1" - Ford	C38-44-2



⊗ 12" FROM BACK OF WALK (FOR A 5' OR WIDER SIDEWALK)
 24" FROM BACK OF WALK (FOR A 4' SIDEWALK)



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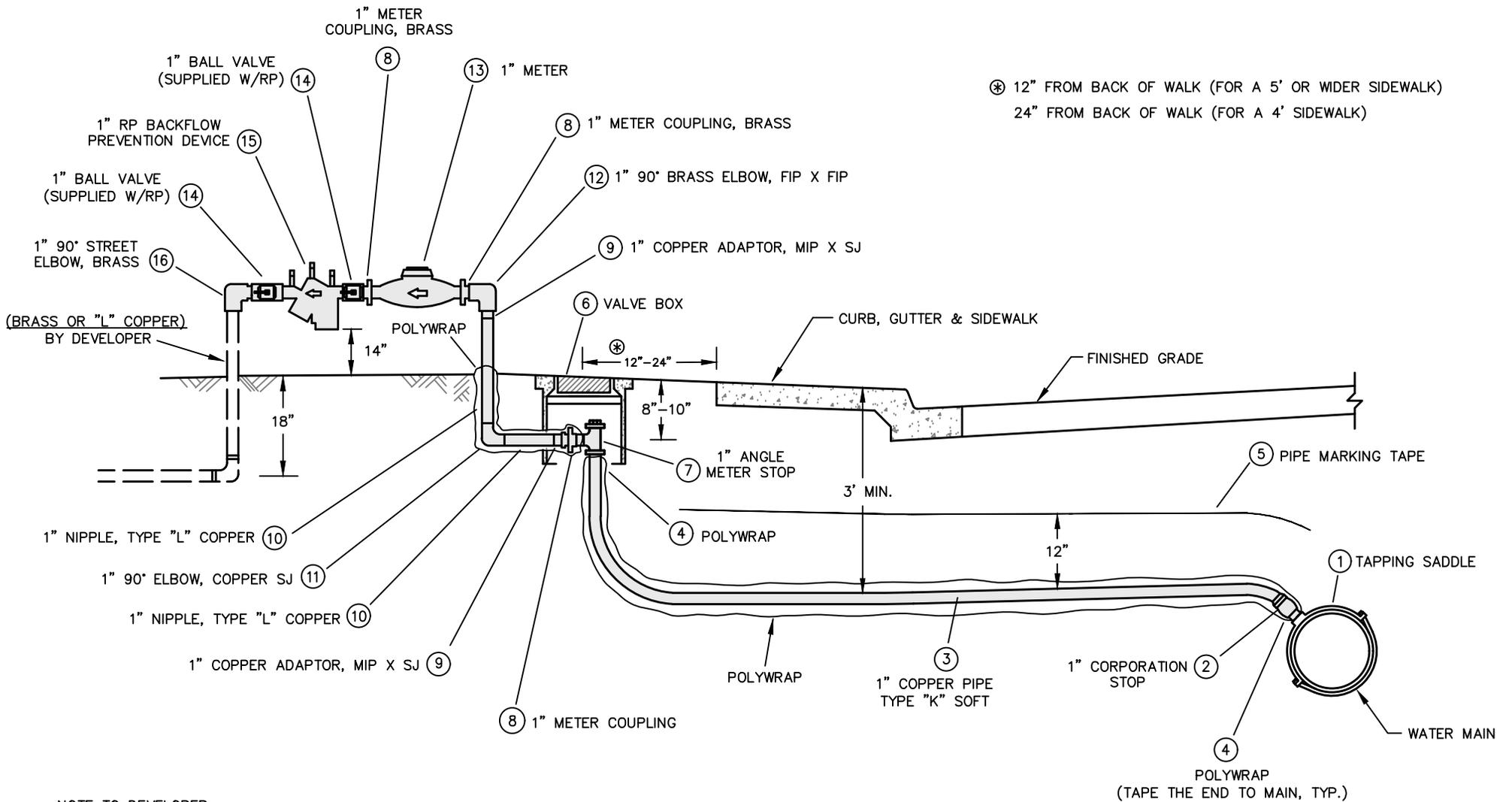
CITY OF SANTA CLARA
 WATER AND SEWER UTILITIES - STANDARD NO. 2

1" RECYCLED WATER SERVICE

City of Santa Clara – Water and Sewer Utilities
Standard No. 2 – 1” Recycled Water Service – Material List
Domestic Products Only.

11/07/17 Revised Date

Material	Description	Manufacturer	Model
1. Tapping Saddle	For PVC C900, bronze saddle, specified pipe size x 1” AWWA/CC Tap	Ford	202BS
	For ductile iron, cast iron, ACP: single strap bronze, specified pipe size x 1” AWWA/CC Tap	Ford	101B
		Mueller	BRIB
2. Corporation Stop	1" AWWA/CC thread inlet x compression outlet	Mueller	B-25008
		Ford	FB-1000-4-G
For locations requiring insulated corporation stops, use Mueller N-35008 insulated corp ball valve			
3. Copper Tubing	1" ASTM B88, type K soft rolled tubing		
4. Polywrap	Purple. 8 mil low density or 4 mil high density polyethylene film installed per AWWA C105. Tape the end to main.		
5. Pipe Marking Tape	Purple. 3” wide, 4 mil, non-detectable.		
6. Meter Box with Lid	Purple lid marked "RECYCLED" or "RECYCLED WATER"	Christy	B-16 box with B-16G lid
7. Angle Meter Stop	1" Compression inlet x FIP outlet. Flange should be marked "RECYCLED WATER"	Ford	BARW-444 W-G
		Mueller	B-24258N
8. Meter Coupling	1" include gaskets.	Ford	C38-44-X (X=to fit)
		Mueller	H-10871
9. Water Meter & Register (manufacturer's test results are to be submitted with all meters).	1" meter and purple recycled water register. Provide Elster transmitter compatible encoded register with Nicor connector. All registers to be facing inlet and provide cubic feet reading.	Badger	E-SERIES
		Sensus	SR II
10. Tracer Wire	RHW #12 AWG solid with 12" minimum slack inside all valve boxes.		



NOTE TO DEVELOPER:

1. KEEP METER & BACKFLOW INSTALLATION PLUMB AND LEVEL.

Updated Date: 05/17/2018



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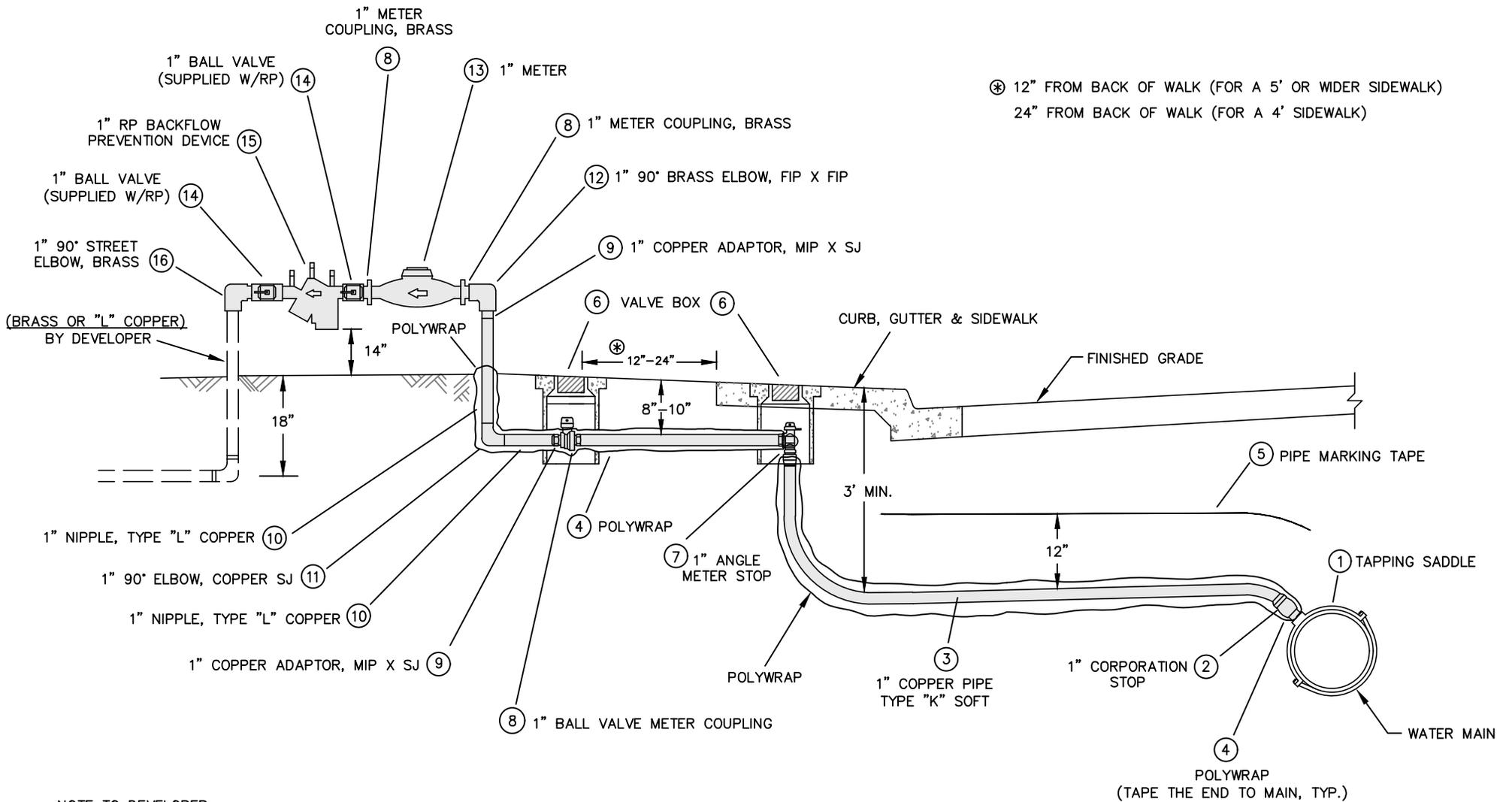
Signature: *[Handwritten Signature]*
 Director of
 Water and Sewer Utilities

CITY OF SANTA CLARA
 WATER AND SEWER UTILITIES - STANDARD NO. 3

1" WATER SERVICE WITH RP

Standard No. 3 - 1” Water Service with RP – Material List**Domestic Products Only. Use no lead products for domestic water services.****Coat above ground water service with Dunn Edwards Paint #10-L, 11-789-04 Santa Clara Mission Sand, Syn Lustró**

Material	Description	Manufacturer	Model
1. Tapping Saddle	For PVC C900, bronze saddle, specified pipe size x 1” AWWA/CC Tap	Ford	202BS
	For ductile iron, cast iron, ACP: single strap bronze, specified pipe size x 1” AWWA/CC Tap	Ford	101B
		Mueller	BRIB
2. Corporation Stop	1” AWWA/CC thread inlet x compression outlet	Mueller	B-25008N
		Ford	FB-1000-4-G-NL
For locations requiring insulated corporation stops, use Mueller N-35008 insulated corp ball valve			
3. Copper Tubing	1” ASTM B88, type K soft rolled tubing		
4. Polywrap	Blue. 8 mil low density or 4 mil high density polyethylene film installed per AWWA C105. Tape the end to main.		
5. Pipe Marking Tape	Blue. 3” wide, 4 mil, non-detectable.		
6. Valve Box with Lid	Lid marked "Water" or "Water Meter"	Tyler Union	G5 with lid marked "Water"
7. Angle Meter Stop	1” Compression inlet x FIP outlet.	Ford	BA41-444 W-G-NL
		Mueller	B-24258N
8. Meter Coupling	1” Brass. Include gaskets.	Ford	B11-444 W
		Mueller	H-10871N
9. 1" Copper Adapter	MIP x sweat joint (SJ)		
10. 1" Nipple	Type L rigid copper tubing; riser length to suit		
11. 1" 90 Degree Elbow	Copper sweat joint		
12. 1" 90 Degree Elbow	Brass, FIP x FIP		
13. Water Meter & Register (manufacturer's test results are to be submitted with all meters).	Provide Elster transmitter compatible encoded register with Nicor connector. All registers to be facing inlet and provide cubic feet reading.		
	1" meter and register.	Badger	E-SERIES
		Sensus	SR II
14. 1" Ball Valve	supplied with RP		
15. 1" RP with Backflow Device	3 - 1/4" Standard pipe thread. 3 - 1/4" SAE flare test cock fittings.	Wilkins	975XL (no lead)
16. 1" 90 Degree Elbow	Brass		



NOTE TO DEVELOPER:

1. KEEP METER & BACKFLOW INSTALLATION PLUMB AND LEVEL.

Updated Date: 05/17/2018



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 Director of
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CITY OF SANTA CLARA
 WATER AND SEWER UTILITIES. - STANDARD NO. 3B
**1" WATER SERVICE WITH RP
 (DUAL VALVE BOXES)**

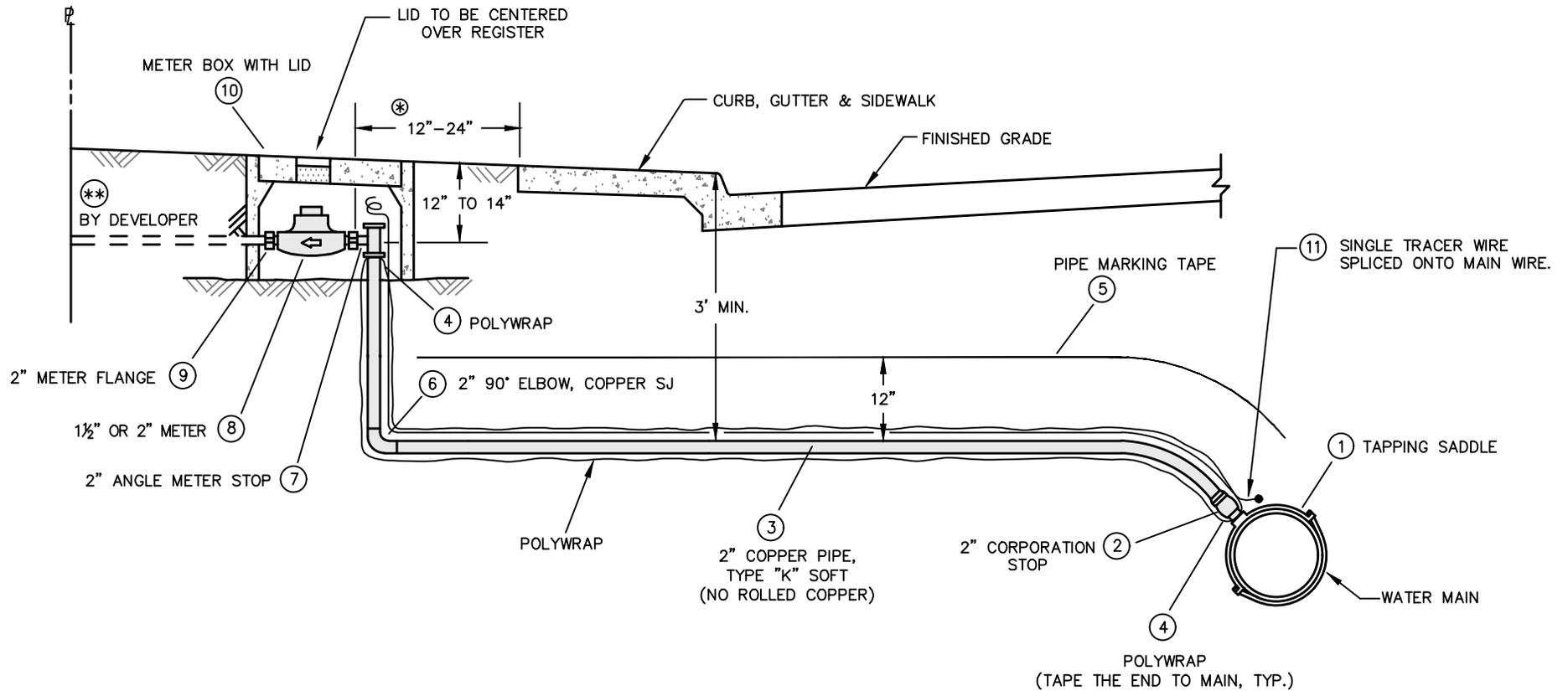
Standard No. 3B – 1” Water Service with RP (Dual Valve Boxes) – Material List

Domestic Products Only. Use no lead products for domestic water services.

Coat above ground water service with Dunn Edwards Paint #10-L, 11-789-04 Santa Clara Mission Sand, Syn Lustrro

Material	Description	Manufacturer	Model
1. Tapping Saddle	For PVC C900, bronze saddle, specified pipe size x 1” AWWA/CC Tap	Ford	202BS
	For ductile iron, cast iron, ACP: single strap bronze, specified pipe size x 1” AWWA/CC Tap	Ford	101B
		Mueller	BRIB
2. Corporation Stop	1" AWWA/CC thread inlet x compression outlet	Mueller	B-25008N
		Ford	FB-1000-4-G-NL
For locations requiring insulated corporation stops, use Mueller N-35008 insulated corp ball valve			
3. Copper Tubing	1" ASTM B88, type K soft rolled tubing		
4. Polywrap	Blue. 8 mil low density or 4 mil high density polyethylene film installed per AWWA C105. Tape the end to main.		
5. Pipe Marking Tape	Blue. 3” wide, 4 mil, non-detectable.		
6. Valve Box with Lid	Lid marked "Water" or “Water Meter”	Tyler Union	G5 with lid marked “Water”
7. Angle Meter Stop	1" Compression inlet x FIP outlet.	Ford	BA41-444-W-G-NL
		Mueller	B-24258N
8. 1" Ball Valve with Meter Coupling	1" Brass lockable ball valve (no flange) and meter coupling. Include gaskets.	Ford	B11-444-W
		Mueller	H-10871N
9. 1" Copper Adapter	MIP x sweat joint (SJ)		
10. 1" Nipple	Type L rigid copper tubing; riser length to suit		
11. 1" 90 Degree Elbow	Copper sweat joint		
12. 1" 90 Degree Elbow	Brass, FIP x FIP		
13. Water Meter & Register (manufacturer's test results are to be submitted with all meters).	Provide Elster transmitter compatible encoded register with Nicor connector. All registers to be facing inlet and provide cubic feet reading. 1" meter and register.		
		Badger	E-SERIES
		Sensus	SR II
14. 1" Ball Valve	supplied with RP		
15. 1" RP with Backflow Device	3 - 1/4" Standard pipe thread. 3 - 1/4" SAE flare test cock fittings.	Wilkins	975XL (no lead)
16. 1" 90 Degree Elbow	Brass		

⊗ 12" FROM BACK OF WALK (FOR A 5' OR WIDER SIDEWALK)
 24" FROM BACK OF WALK (FOR A 4' SIDEWALK)



⊗⊗ NOTE TO DEVELOPER:

1. PRIVATE ABOVE GROUND RECYCLED WATER BACKFLOW SHALL BE PAINTED PURPLE COLOR (PANTONE 512).



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 Checked By: TANISHA W. / JOHN S.
 Approved By: SHILPA M. / TERRY W.
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Signature:

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CITY OF SANTA CLARA
 WATER AND SEWER UTILITIES - STANDARD NO. 5

1 1/2" AND 2" RECYCLED WATER SERVICE

City of Santa Clara – Water and Sewer Utilities
Standard No. 5 – 1 1/2” and 2” Recycled Water Service – Material List

11/07/17 Revised Date

Domestic Products Only.

Material	Description	Manufacturer	Model
1. Tapping Saddle	For PVC C900, bronze saddle, specified pipe size x 2” AWWA/CC Tap	Ford	202BS
	For ductile iron, cast iron, ACP: single strap bronze, specified pipe size x 2” AWWA/CC Tap	Ford	202B
		Mueller	BR2B
2. Corporation Stop	2” AWWA/CC thread inlet x compression outlet	Mueller	B-25008N
		Ford	FB-1000-7-G
For locations requiring insulated corporation stops, use Mueller N-35008 insulated corp ball valve			
3. Copper Tubing	2” ASTM B88, type K. Straight lengths. No rolled copper.		
4. Polywrap	Purple. 8 mil low density or 4 mil high density polyethylene film installed per AWWA C105. Tape the end to main.		
5. Pipe Marking Tape	Purple. 3” wide, 4 mil, non-detectable.		
6. 2” 90 Degree Elbow	Copper sweat joint or Pack joint 90 compression fittings		
7. Angle Meter Stop	2” Compression inlet x meter flange outlet with 316 stainless steel bolts, nuts, and washers. Flange should be marked "RECYCLED WATER."	Ford	BFA43-777W-G
		Mueller	B-24276N
8. Water Meter & Register (manufacturer's test results are to be submitted with all meters).	Provide Elster transmitter compatible encoded register with Nicor connector. All registers to be facing inlet and provide cubic feet reading. Use 316 stainless steel bolts to fit meter.		
	1-1/2” meter and register.	Badger	E-SERIES
	2” meter and register.	Badger	E-SERIES
9. Meter Flange	2” brass to accept 1-1/2” meters or 2” meters		
	1-1/2” meter – 1/8” thick, 2-hole full face gasket EPDM rubber with 5/8” x 2-1/2” hex head, 316 stainless steel bolts, nuts, and washers	Calpico Style 60	
	2” meter – 1/8” thick, 2-hole full face gasket EPDM rubber with 3/4” x 2-1/2” hex head, 316 stainless steel bolts, nuts, and washers	Calpico Style 60	
10. Meter Box with Lid	Purple Lid marked "RECYCLED" or "RECYCLED WATER”	Christy	B-36 box with lid no. B36G
11. Tracer Wire	RHW #12 AWG solid with 12” minimum slack inside all valve boxes.		

Standard No. 6 – 1 1/2” and 2” Water Service with RP – Material List

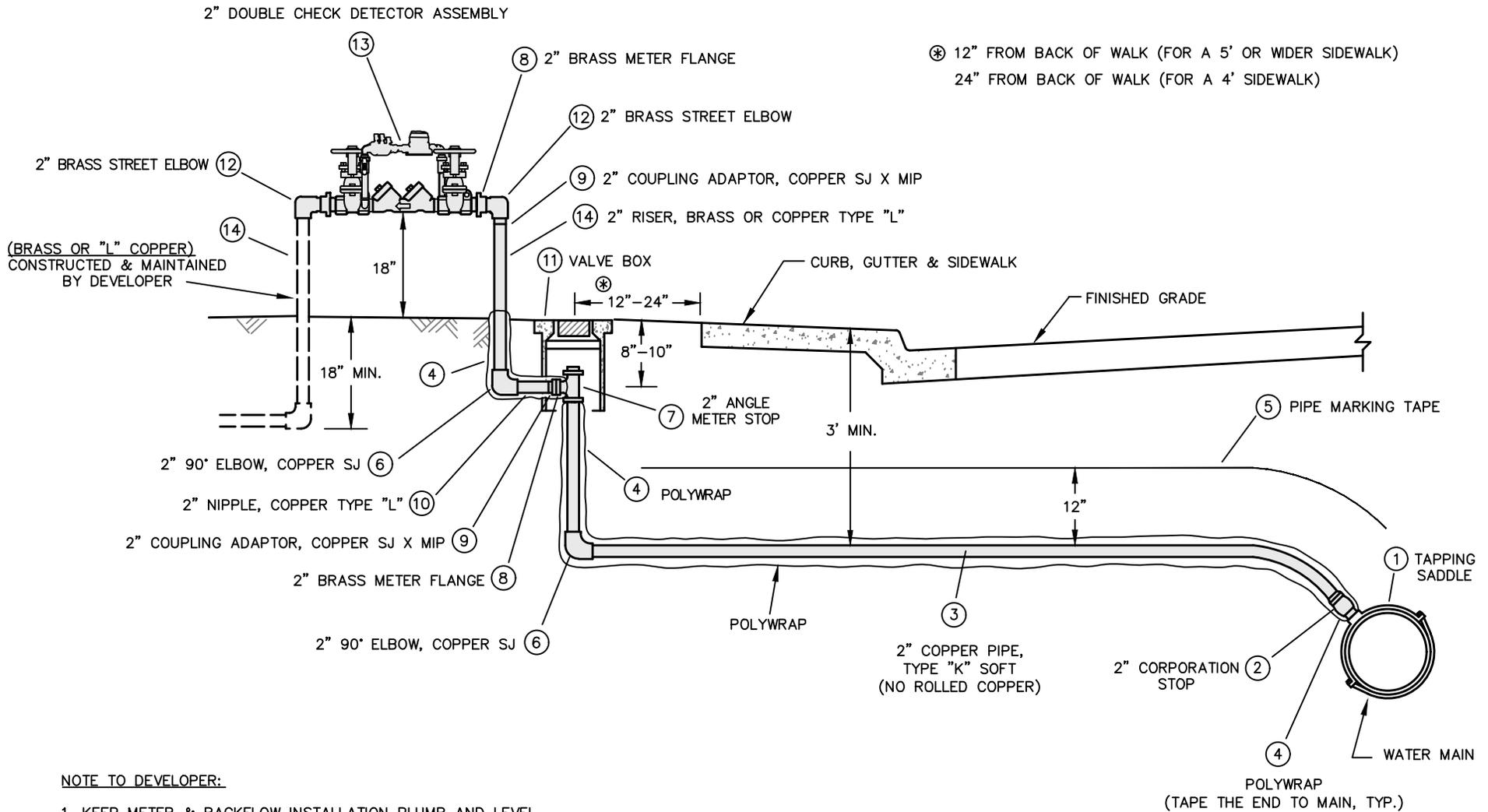
Domestic Products Only. Use no lead products for domestic water services.

Coat above ground water service with Dunn Edwards Paint #10-L, 11-789-04 Santa Clara Mission Sand, Syn Lustrro

Material	Description	Manufacturer	Model
1. Tapping Saddle	For PVC C900, bronze saddle, specified pipe size x 2” AWWA/CC Tap	Ford	202BS
	For ductile iron, cast iron, AC pipe: double strap bronze, specified pipe size x 2” AWWA/CC Tap	Ford	102B
		Mueller	BR2B
2. Corporation Stop	2” AWWA/CC thread inlet x compression outlet	Mueller	B-25008N
		Ford	FB-1000-7-G-NL
For locations requiring insulated corporation stops, use Mueller N-35008 insulated corp ball valve			
3. Copper Tubing	2” ASTM B88, type K. Straight lengths. No rolled copper.		
4. Polywrap	Blue. 8 mil low density or 4 mil high density polyethylene film installed per AWWA C105. Tape the end to main.		
5. Pipe Marking Tape	Blue. 3” wide, 4 mil, non-detectable.		
6. 2” 90 Degree Elbow	Copper sweat joint or Pack joint 90 compression fittings		
7. Angle Meter Stop	2” Compression inlet x meter flange outlet with 316 stainless steel bolt, nuts, and washers.	Ford	BFA43-777W-G-NL
		Mueller	B-24276N
8. Meter Flange	2” brass to be slotted to accept 1-1/2” or 2” meters	Ford	CF31-77
	1-1/2” meter – use 1/8” thick, 2-hole full face gasket EPDM rubber with 5/8” x 2-1/2” hex head, 316 stainless steel bolts, nuts, and washers	Calpico Style 60	1-1/2”
	2” meter – 1/8” thick, 2-hole full face gasket EPDM rubber with 3/4” x 2-1/2” hex head, 316 stainless steel bolts, nuts, and washers	Calpico Style 60	2”
9. Copper Adapter	2” MIP x sweat joint		
10. Nipple	2” Type L rigid copper tubing; riser length to suit		
11. Valve Box with Lid	Lid marked "Water" or "Water Meter"	Tyler Union	G5 with lid marked "Water"
12. 90 Degree Street Elbow	Brass		
13. Water Meter & Register (manufacturer's test results are to be submitted with all meters).	Provide Elster transmitter compatible encoded register with Nicor connector. All registers to be facing inlet and provide cubic feet reading. Use 316 stainless steel bolts to fit meter.		
	1-1/2" meter and register.	Sensus	Omni R2
		Badger	E-SERIES
	2" meter and register.	Sensus	Omni R2
Badger		E-SERIES	
14. Close Nipple	Brass		
15. 2" Ball Valve	supplied with RP		
16. Reduced Pressure Back Flow Prevention Device	Includes ball valves; 3 - 1/4" Standard pipe thread. 3 - 1/4" SAE flare test cock fittings.	Wilkins	975XL (no lead)

Standard No. 6B – 1 1/2” and 2” Water Service with RP (Dual Valve Boxes) – Material List**Domestic Products Only. Use no lead products for domestic water services.****Coat above ground water service with Dunn Edwards Paint #10-L, 11-789-04 Santa Clara Mission Sand, Syn Lustrro**

Material	Description	Manufacturer	Model
1. Tapping Saddle	For PVC C900, bronze saddle, specified pipe size x 2” AWWA/CC Tap	Ford	202BS
	For ductile iron, cast iron, AC pipe: double strap bronze, specified pipe size x 2” AWWA/CC Tap	Ford	102B
		Mueller	BR2B
2. Corporation Stop	2” AWWA/CC thread inlet x compression outlet	Mueller	B-25008N
		Ford	FB-1000-7-G-NL
For locations requiring insulated corporation stops, use Mueller N-35008 insulated corp ball valve			
3. Copper Tubing	2” ASTM B88, type K. Straight lengths. No rolled copper.		
4. Polywrap	Blue. 8 mil low density or 4 mil high density polyethylene film installed per AWWA C105. Tape the end to main.		
5. Pipe Marking Tape	Blue. 3” wide, 4 mil, non-detectable.		
6. 2” 90 Degree Elbow	Copper sweat joint or Pack joint 90 compression fittings		
7. Angle Meter Stop	2” Compression inlet x meter flange outlet with 316 stainless steel bolt, nuts, and washers.	Ford	BFA43-777W-G-NL
		Mueller	B-24276N
8. 2” Brass Meter Ball Valve with Flange	2” brass to be slotted to accept 1-1/2” or 2” meters; lock able ball valve	Ford	B13-777W-NL
	1-1/2” meter – use 1/8” thick, 2-hole full face gasket EPDM rubber with 5/8” x 2-1/2” hex head, 316 stainless steel bolts, nuts, and washers	Calpico Style 60	1-1/2”
	2” meter – 1/8” thick, 2-hole full face gasket EPDM rubber with 3/4” x 2-1/2” hex head, 316 stainless steel bolts, nuts, and washers	Calpico Style 60	2”
9. Copper Adapter	2” MIP x sweat joint		
10. Nipple	2” Type L rigid copper tubing; riser length to suit		
11. Valve Box with Lid	Lid marked "Water" or "Water Meter"	Tyler Union	G5 with lid marked "Water"
12. 90 Degree Street Elbow	Brass		
13. Water Meter & Register (manufacturer's test results are to be submitted with all meters).	Provide Elster transmitter compatible encoded register with Nicor connector. All registers to be facing inlet and provide cubic feet reading. Use 316 stainless steel bolts to fit meter. 1-1/2" meter and register.	Sensus Badger	Omni R2 E-SERIES
	2" meter and register.	Sensus Badger	Omni R2 E-SERIES
14. Close Nipple	Brass		
15. 2” Ball Valve	supplied with RP		
16. Reduced Pressure Back Flow Prevention Device	Includes ball valves; 3 - 1/4" Standard pipe thread. 3 - 1/4" SAE flare test cock fittings.	Wilkins	975XL (no lead)



Updated Date: 05/17/2018



Drawn By: DUC L.
 Checked By: TANISHA W. / JOHN S.
 Approved By: SHILPA M. / TERRY W.
 Revised Date: NOVEMBER 2017

Signature: *[Handwritten Signature]*
 Director of
 Water and Sewer Utilities

CITY OF SANTA CLARA
 WATER AND SEWER UTILITIES - STANDARD NO. 7

2" FIRE SERVICE ASSEMBLY

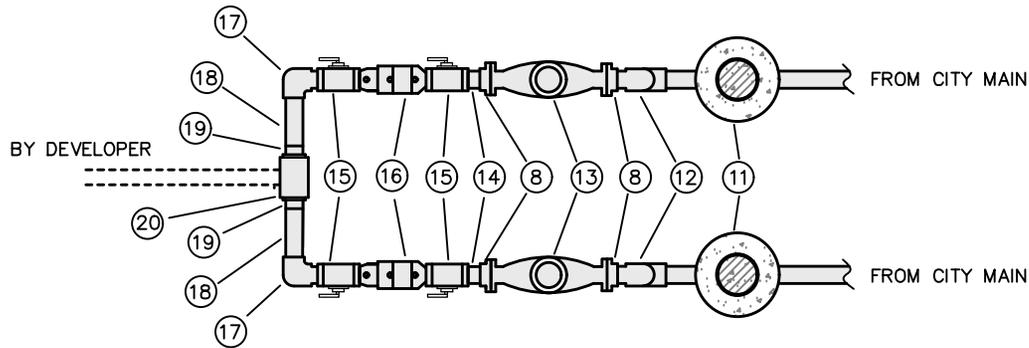
Standard No. 7 – 2” Fire Service Assembly – Material List

Domestic Products Only.

Coat above ground water service with Dunn Edwards Paint #10-L, 11-789-04 Santa Clara Mission Sand, Syn Lustró

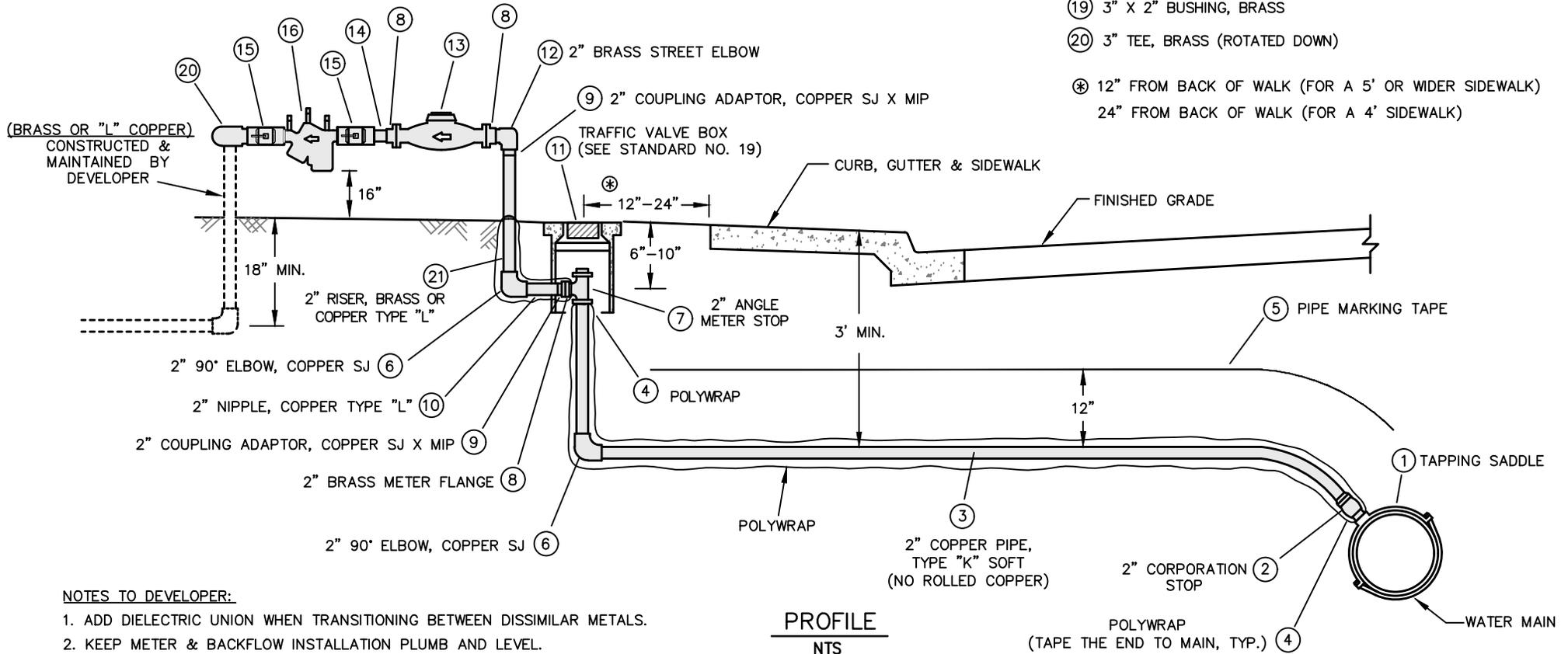
Provide 5-foot clearance around service above ground.

Material	Description	Manufacturer	Model
1. Tapping Saddle	For PVC C900, bronze saddle, specified pipe size x 2” AWWA/CC Tap	Ford	202BS
	For ductile iron, cast iron, AC pipe: double strap bronze, specified pipe size x 2” AWWA/CC Tap	Ford	102B
		Mueller	BR2B
2. Corporation Stop	2” AWWA/CC thread inlet x compression outlet	Mueller	B-25008N
		Ford	FB-1000-7-G
For locations requiring insulated corporation stops, use Mueller N-35008 insulated corp ball valve			
3. Copper Tubing	2” ASTM B88, type K. Straight lengths. No rolled copper.		
4. Polywrap	8 mil low density or 4 mil high density polyethylene film installed per AWWA C105. Tape the end to main.		
5. Pipe Marking Tape	Blue. 3” wide, 4 mil, non-detectable.		
6. 2” 90 Degree Elbow	Copper sweat joint or Pack joint 90 compression fittings		
7. Angle Meter Stop	2” Compression inlet x meter flange outlet with 316 stainless steel bolt, nuts, and washers.	Ford	BFA43-777W-G-NL
		Mueller	B-24276N
8. Meter Flange	2” brass to be slotted to accept 1-1/2” or 2” meters	Ford	CF31-77
	1-1/2” meter – use 1/8” thick, 2-hole full face gasket EPDM rubber with 5/8” x 2-1/2” hex head, 316 stainless steel bolts, nuts, and washers	Calpico Style 60	1-1/2”
	2” meter – 1/8” thick, 2-hole full face gasket EPDM rubber with 3/4” x 2-1/2” hex head, 316 stainless steel bolts, nuts, and washers	Calpico Style 60	2”
9. Copper Adapter	2” MIP x sweat joint		
10. Nipple	2” Type L rigid copper tubing		
11. Valve Box with Lid	Lid marked "Water" or "Water Meter"	Tyler Union	G5 with lid marked "Water"
12. 90 Degree Street Elbow	Brass		
13. Double Check Detector Assembly	Supplied with full port gate valves. Badger detector meter with Elster transmitter compatible encoded register with Nicor connector. All registers to be facing inlet and provide cubic feet reading.	Wilkins	950XLTD A
14. Riser	2” Riser length to suit; Brass or copper type "L"		



PLAN
NTS

- ⑪ TRAFFIC VALVE BOX
 - ⑫ 2" BRASS STREET ELBOW
 - ⑬ 2" METER
 - ⑭ 2" CLOSE NIPPLE
 - ⑮ 2" BALL VALVE (SUPPLIED W/RP)
 - ⑯ 2" R.P. BACKFLOW PREVENTION DEVICE
 - ⑰ 2" 90° ELBOW, BRASS SJ X MIP
 - ⑱ 2" X 7" COPPER NIPPLE, TYPE "L"
 - ⑲ 3" X 2" BUSHING, BRASS
 - ⑳ 3" TEE, BRASS (ROTATED DOWN)
- ⊛ 12" FROM BACK OF WALK (FOR A 5' OR WIDER SIDEWALK)
24" FROM BACK OF WALK (FOR A 4' SIDEWALK)



PROFILE
NTS

NOTES TO DEVELOPER:

1. ADD DIELECTRIC UNION WHEN TRANSITIONING BETWEEN DISSIMILAR METALS.
2. KEEP METER & BACKFLOW INSTALLATION PLUMB AND LEVEL.

Updated Date: 05/17/2018



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 Water and Sewer Utilities

CITY OF SANTA CLARA
 WATER AND SEWER UTILITIES - STANDARD NO. 10

**3" WATER SERVICE WITH RP
 (DUAL METER SERVICE)**

Standard No. 10 – 3” Water Service with RP (Dual Meter Service) – Material List

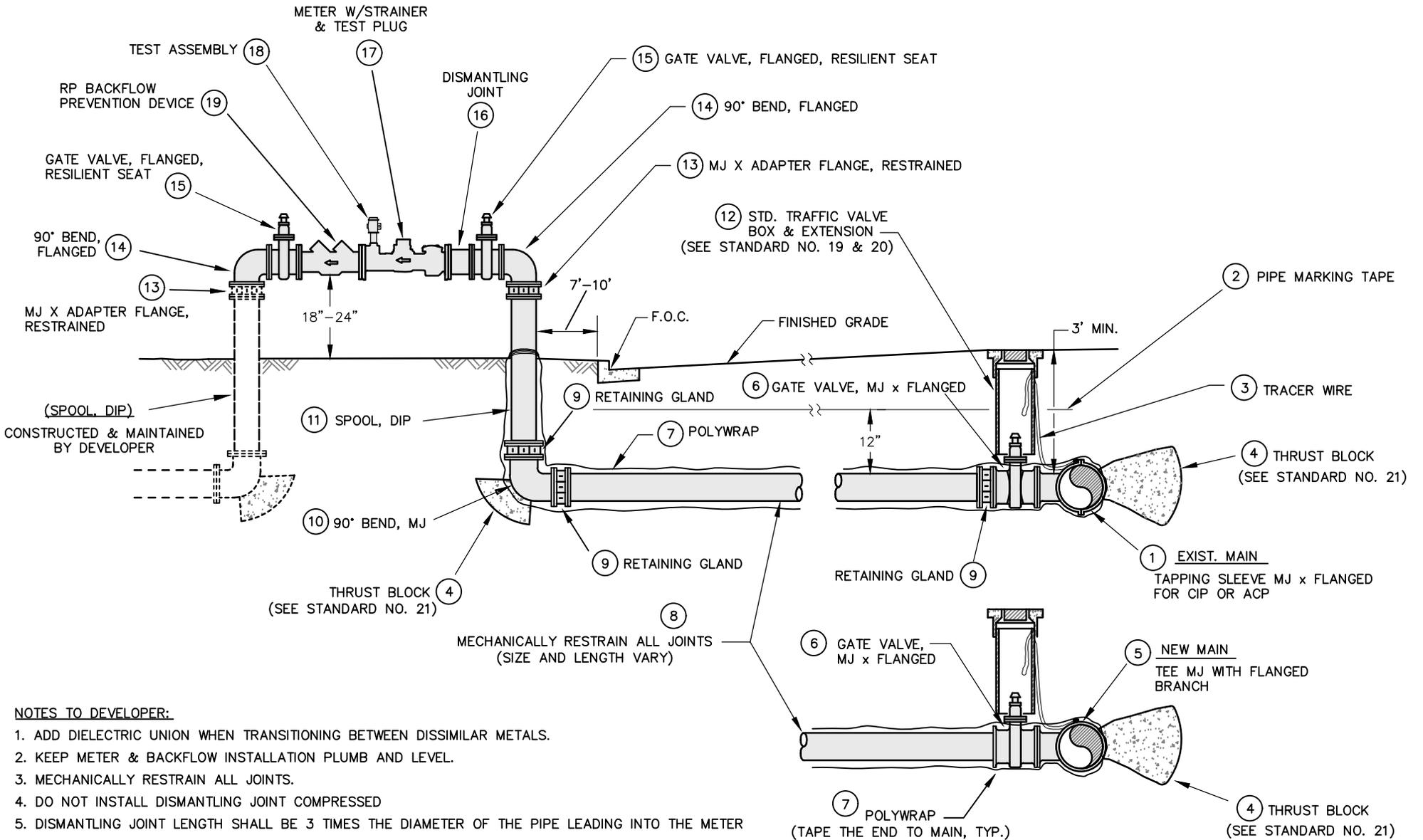
Domestic Products Only. Use 316 stainless steel bolts, flange gasket with EPDM rubber, nuts, and washers for all bolted connections.

Use no lead products for domestic water services.

Coat above ground water service with Dunn Edwards Paint #10-L, 11-789-04 Santa Clara Mission Sand, Syn Lustró

Provide 5-foot clearance around service above ground.

Material	Description	Manufacturer	Model
1. Tapping Saddle	For PVC C900, bronze saddle, specified pipe size x 2” AWWA/CC Tap	Ford	202BS
	For ductile iron, cast iron, AC pipe: double strap bronze, specified pipe size x 2” AWWA/CC Tap	Ford	102B
		Mueller	BR2B
2. Corporation Stop	2” AWWA/CC thread inlet x compression outlet	Mueller	B-25008N
		Ford	FB-1000-7-G-NL
For locations requiring insulated corporation stops, use Mueller N-35008 insulated corp ball valve			
3. Copper Tubing	2” ASTM B88, type K. Straight lengths. No rolled copper.		
4. Polywrap	8 mil low density or 4 mil high density polyethylene film installed per AWWA C105. Tape the end to main.		
5. Pipe Marking Tape	Blue. 3” wide, 4 mil, non-detectable.		
6. 2” 90 Degree Elbow	Copper sweat joint or Pack joint 90 compression fittings		
7. Angle Meter Stop	2” Compression inlet x meter flange outlet with 316 stainless steel bolt, nuts, and washers.	Ford	BFA43-777W-G-NL
		Mueller	B-24276N
8. Meter Flange	2” brass to be slotted to accept 1-1/2” or 2” meters	Ford	CF31-77
	1-1/2” meter – use 1/8” thick, 2-hole full face gasket EPDM rubber with 5/8” x 2-1/2” hex head, 316 stainless steel bolts, nuts, and washers	Calpico Style 60	1-1/2”
	2” meter – 1/8” thick, 2-hole full face gasket EPDM rubber with 3/4” x 2-1/2” hex head, 316 stainless steel bolts, nuts, and washers	Calpico Style 60	2”
9. Copper Adapter	2” MIP x sweat joint		
10. Nipple	2” Type L rigid copper tubing		
11. Valve Box with Lid (see Standard Detail No. 19)	Lid marked "Water" or "Water Meter" in landscape	Tyler Union	G5 with lid marked "Water"
12. 90 Degree Street Elbow	Brass		
13. Water Meter & Register (manufacturer's test results are to be submitted with all meters).	Provide Elster transmitter compatible encoded register with Nicor connector. All registers to be facing inlet and provide cubic feet reading.		
	1-1/2" meter and register.	Sensus Badger	Omni R2 E-SERIES
	2" meter and register.	Sensus Badger	Omni R2 E-SERIES
14. Close Nipple	Brass		
15. 2" Ball Valve	supplied with RP		
16. Reduced Pressure Back Flow Prevention Device	Includes ball valves; 3 - 1/2" x 1/4" Standard pipe thread and SAE flare brass fittings.	Wilkins	975XL (No Lead)
17. 90 Degree Street Elbow	Brass SJ x MIP		
18. Nipple	2" Type L rigid copper tubing; 2" x 7"		
19. Bushing	3" x 2", Brass		
20. 3" Tee	3" Tee, Rotated Down		
21. Riser	2" Riser length to suit; Brass or copper type "L"		



NOTES TO DEVELOPER:

1. ADD DIELECTRIC UNION WHEN TRANSITIONING BETWEEN DISSIMILAR METALS.
2. KEEP METER & BACKFLOW INSTALLATION PLUMB AND LEVEL.
3. MECHANICALLY RESTRAIN ALL JOINTS.
4. DO NOT INSTALL DISMANTLING JOINT COMPRESSED
5. DISMANTLING JOINT LENGTH SHALL BE 3 TIMES THE DIAMETER OF THE PIPE LEADING INTO THE METER

Updated Date: 05/17/2018

Drawn By: **DUC L.**
 Checked By: **TANISHA W. / JOHN S.**
 Approved By: **SHILPA M. / TERRY W.**
 Revised Date: **NOVEMBER 2017**

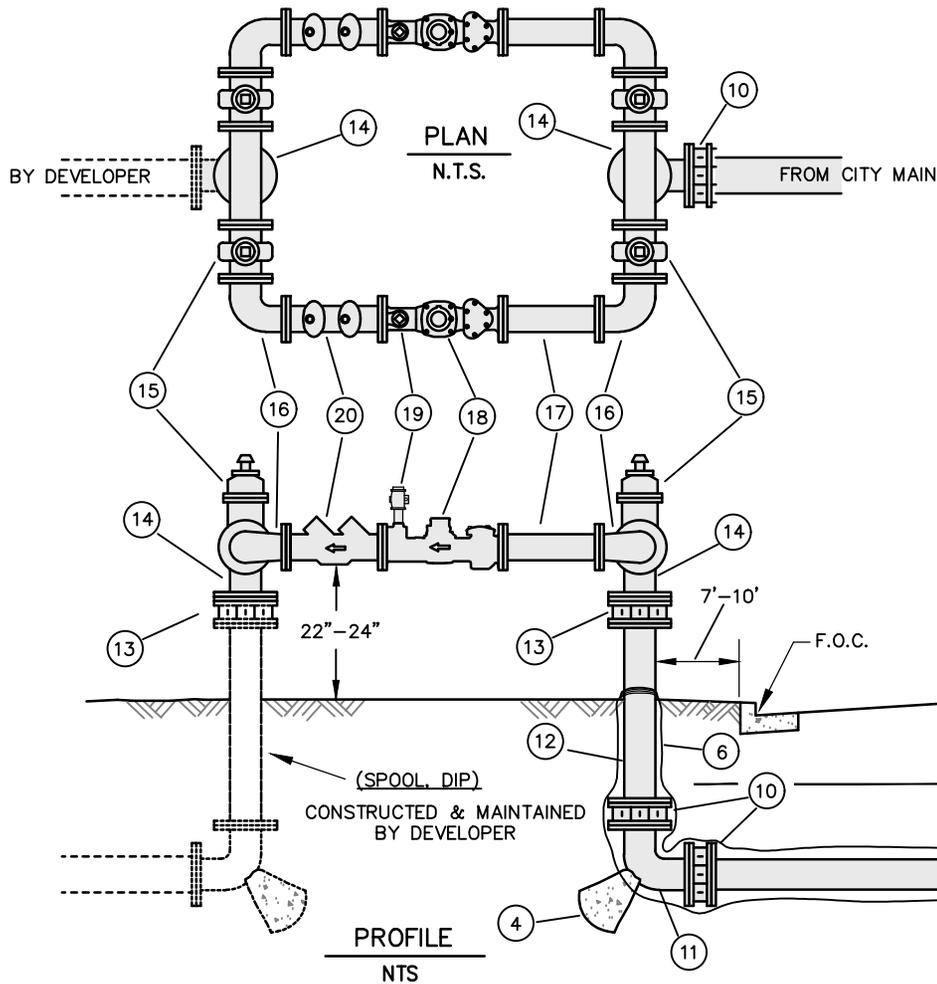
Signature: *[Signature]*
 Director of
 Water and Sewer Utilities

CITY OF SANTA CLARA
WATER AND SEWER UTILITIES - STANDARD NO. 11
4", 6" AND 8" WATER SERVICE WITH RP
(SINGLE METER SERVICE)



Standard No. 11 – 4”, 6” and 8” Water Service with RP (Single Meter Service) – Material List**Domestic Products Only. Use 316 stainless steel bolts, flange gasket with EPDM rubber, nuts, and washers for all bolted connections.****Use no lead products for domestic water services.****Coat above ground water service with Dunn Edwards Paint #10-L, 11-789-04 Santa Clara Mission Sand, Syn Lustro.****Provide 5-foot clearance around service above ground.**

Material	Description	Manufacturer	Model
1. Tapping Saddle	Mechanical joint with all accessories. -Ductile iron, cast iron, or PVC -AC pipe	Mueller H-615 Clow F-5205 Mueller H-619 Clow F-5207	
2. Pipe Marking Tape	Blue. 3” wide, 4 mil, non-detectable.		
3. Tracer Wire	RHW#12 AWG Solid. Tape to the top of the water main with 12” minimum slack inside all valve boxes		
4. Thrust Block	See City Standard No. 21		
5. Tee	Mechanical joint with flanged branch. AWWA C-153 compact ductile iron with mechanical joint, cement lined with stainless steel bolts and gaskets	US Pipe Tyler Union	
6. Gate Valve	MJ x Flanged. AWWA C-509 resilient seat, epoxy coat inside and out to meet AWWA C-550. Open left with 2” square operating nut. All rubber components shall be EPDM.	M&H Mueller Clow	Style 4067 A-2361
7. Polywrap	Blue. 8 mil low density or 4 mil high density polyethylene film installed per AWWA C105. Tape end to pipe with 10 mil tape.		
8. Pipe mechanically restrain all joints	Size and type as specified. -Ductile iron, cement lined Class 50. Protect with polywrap for underground pipe.	US Pipe Pacific States	
9. Retaining Gland	Joint restraint for use with mechanical joint fittings. Size as specified.	US Pipe (not allowed above ground) EBAA Uniflange	MJ Field Lok, High Max, Romac Megalug Series 1100 Series 1400 (DIP)
10. 90 Degree Bend with Mechanical Joint	AWWA C-153 ductile iron with mechanical joint, cement lined with stainless steel bolts and gaskets	US Pipe Tyler Union	
11. Spool	Ductile iron, cement lined Class 50		
12. Traffic Valve Box & Extension (see Standard Detail Nos. 19 & 20)	Lid marked "Water" or "Water Meter" Extension - 8” PVC SDR 35, single piece cut to proper length.	Tyler Union	G5 with lid marked "Water"
13. MJ x Flange Adapter	AWWA C-153 ductile iron.	Tyler Union Trinity / USP	#5-158 With megalug restraining gland
14. 90 Degree Bend	Flanged. Size as specified. AWWA C-110 ductile iron, cement-lined.	US Pipe Tyler Union	
15. Gate Valve	See 6. above		
16. Dismantling Joint	Dismantling Joint. Length = 3x diameter.	Romac KRAUSZ	DJ400 or DJ405
17. Water Meter & Register (manufacturer's test results are to be submitted with all meters).	Turbine meter with strainer and test plug. Provide Elster transmitter compatible encoded register with Nicor connector. All registers to be facing inlet and provide cubic feet reading.	Sensus Sensus	Omni T2 (industrial - more constant flow) Omni C2 (varying flow)
18. Test Assembly	Consisting of a brass nipple, ball valve and brass plug. See meter manufacturer's specifications for size.	Ball valve - Ford	B11-NL
19. Reduced Pressure Backflow Prevention Device	Reduced pressure zone assembly, cast iron, 3 - 1/2" x 1/4" Standard pipe thread and SAE flare brass fittings.	Watts Wilkins	LF909 375XL



- ① TAPPING SLEEVE, MJ
- ② TEE MJ WITH FLANGED BRANCH
- ③ TRACER WIRE
- ④ THRUST BLOCK
(SEE STANDARD NO. 21)
- ⑤ GATE VALVE, MJ X FLANGED
- ⑥ POLYWRAP (TAPE THE END TO MAIN)
- ⑦ DUCTILE IRON PIPE
- ⑧ STD. TRAFFIC VALVE BOX & EXTENSION
(SEE STANDARD NO. 19 & 20)
- ⑨ PIPE MARKING TAPE
- ⑩ RETAINING GLAND
- ⑪ 90° BEND, MJ X MJ
- ⑫ SPOOL, DIP
- ⑬ MJ X FLANGE ADAPTER, RESTRAINED
- ⑭ TEE, FLANGED
- ⑮ GATE VALVE, FLANGED
- ⑯ REDUCING 90° BEND, FLANGED
- ⑰ DISMANTLING JOINT
- ⑱ TURBINE METER
- ⑲ TEST ASSEMBLY
- ⑳ RP BACKFLOW PREVENTION DEVICE,
SAME SIZE AS METER

NOTE:
 4" SERVICE USE TWO 3" METERS
 6" SERVICE USE TWO 4" METERS
 8" SERVICE USE TWO 6" METERS

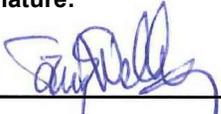
NOTES TO DEVELOPER:

1. ADD DIELECTRIC UNION WHEN TRANSITIONING BETWEEN DISSIMILAR METALS.
2. KEEP METER & BACKFLOW INSTALLATION PLUMB AND LEVEL.
3. MECHANICALLY RESTRAIN ALL JOINTS.
4. DO NOT INSTALL DISMANTLING JOINT COMPRESSED.
5. DISMANTLING JOINT LENGTH SHALL BE 3 TIMES THE DIAMETER OF THE PIPE LEADING INTO THE METER.

Updated Date: 05/17/2018



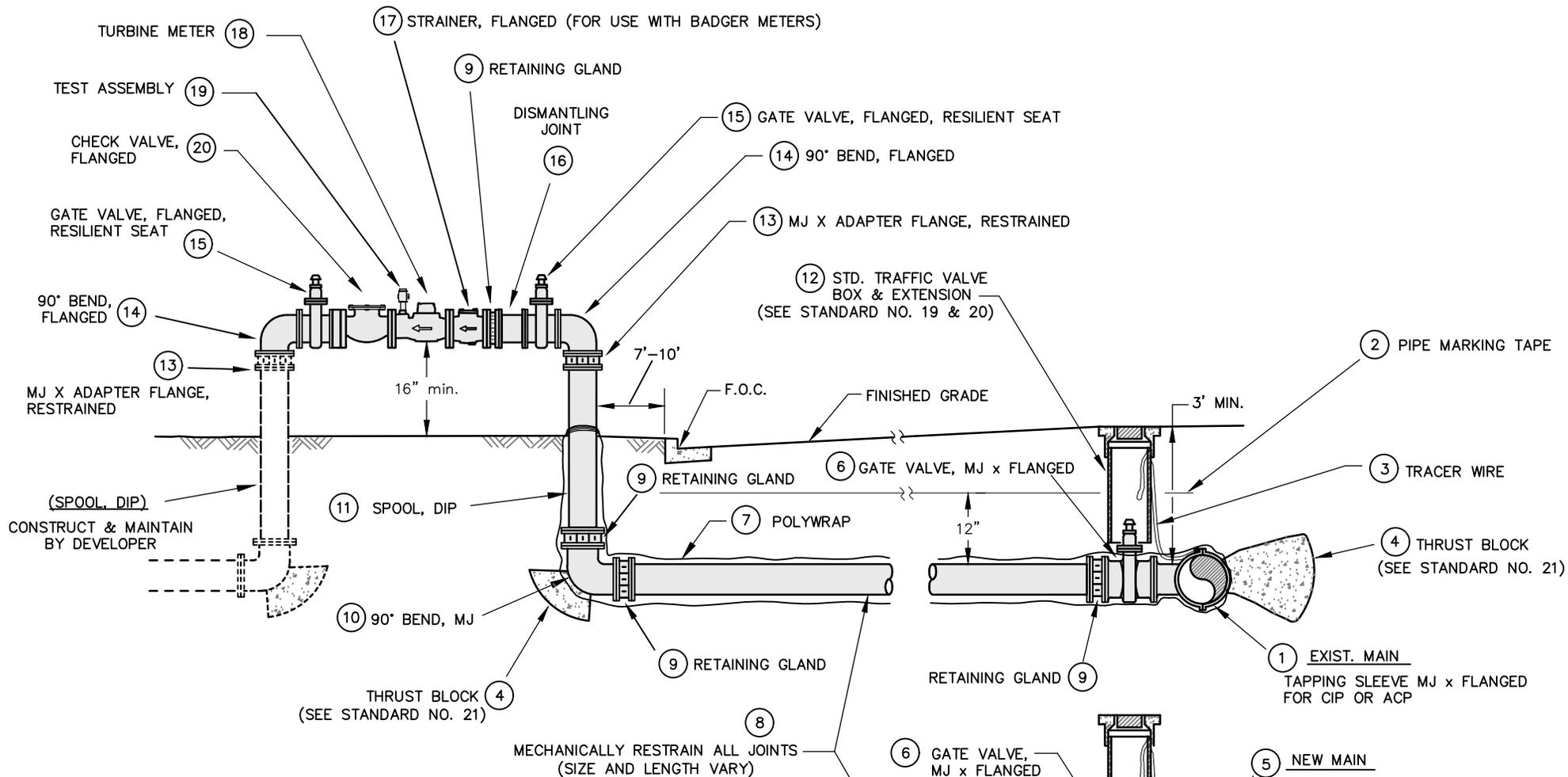
Drawn By: DUC L.
 Checked By: TANISHA W. / JOHN S.
 Approved By: SHILPA M. / TERRY W.
 Revised Date: NOVEMBER 2017

Signature: 
 Director of
 Water and Sewer Utilities

CITY OF SANTA CLARA
 WATER AND SEWER UTILITIES - STANDARD NO. 12
4", 6" AND 8" WATER SERVICE WITH RP
 (DUAL METER SERVICE)

Standard No. 12 – 4”, 6” and 8” Water Service with RP (Dual Meter Service) – Material List**Domestic Products Only. Use 316 stainless steel bolts, flange gasket with EPDM rubber, nuts, and washers for all bolted connections.****Use no lead products for domestic water services.****Coat above ground water service with Dunn Edwards Paint #10-L, 11-789-04 Santa Clara Mission Sand, Syn Lustro.****Provide 5-foot clearance around service above ground.**

Material	Description	Manufacturer	Model
1. Tapping Sleeve	Mechanical joint with all accessories. -Ductile iron, cast iron, or PVC	Mueller H-615 Clow F-5205	
	-AC pipe	Mueller H-619 Clow F-5207	
2. Tee	Mechanical joint with flanged branch. AWWA C-153 compact ductile iron, cement lined with stainless steel bolts and gaskets	US Pipe Tyler Union	
3. Tracer Wire	RHW#12 AWG Solid. Tape to the top of the water main with 12" minimum slack inside all valve boxes		
4. Thrust Block	See City Standard No. 21		
5. Gate Valve	MJ x Flanged. AWWA C-509 resilient seat, epoxy coated inside and out to meet AWWA C-550. Open left with 2" square operating nut. All rubber components shall be EPDM.	M&H	Style 4067
		Mueller	A-2361
		Clow	F-6106
6. Polywrap	Blue. 8 mil low density or 4 mil high density polyethylene film installed per AWWA C105. Tape end to pipe with 10 mil tape.		
7. Pipe mechanically restrain all joints	Size and type as specified.	US Pipe Pacific States	
	-Ductile iron, cement lined Class 50. Protect with polywrap for underground pipe.		
8. Traffic Valve Box & Extension (see Standard Detail Nos. 19 & 20)	Lid marked "Water" or "Water Meter"	Tyler Union	G5 with lid marked "Water"
	Extension - 8" PVC SDR 35, single piece cut to proper length.		
9. Pipe Marking Tape	Blue. 3" wide, 4 mil, non-detectable.		
10. Retaining Gland	Joint restraint for use with mechanical joint fittings. Size as specified.	US Pipe (not allowed above ground)	MJ Field Lok, High Max, Romac
		EBAA	Megalug Series 1100
		Uniflange	Series 1400 (DIP)
11. 90 Degree Bend with Mechanical Joint	AWWA C-153 ductile iron with mechanical joint, cement lined with stainless steel bolts and gaskets	US Pipe Tyler Union	
12. Spool	Ductile iron, cement lined Class 50 with restrained adapter flange.		
13. MJ x Flange Adapter	AWWA C-153 ductile iron, restrained.	Tyler Union	#5-158
		Trinity / USP	With megalug restraining gland
14. Tee	Flanged. Size as specified. AWWA C-110 ductile iron, cement-lined.	US Pipe	
		Tyler Union	
15. Gate Valve	Flanged. AWWA C-509 resilient seat, epoxy coated inside and out to meet AWWA C-550. Open left with 2" square operating nut. All rubber components shall be EPDM.	M&H	Style 4067
		Mueller	A-2360
		Clow	F-6102
16. Reducing 90 Degree Bend	Flanged, AWWA C-110 ductile iron, cement lined.	US Pipe	
		Tyler Union	
17. Dismantling Joint	Dismantling Joint. Length = 3x diameter.	Romac KRAUSZ	DJ400 or DJ405
18. Meter and Register (manufacturer's test results are to be submitted with all meters).	Turbine meter with strainer and test plug. Provide Elster transmitter compatible encoded register with Nicor connector. All registers to be facing inlet and provide cubic feet reading.	Sensus	Omni T2 (industrial - more constant flow)
		Sensus	Omni C2 (varying flow)
19. Test Assembly	Consisting of a brass nipple, ball valve and brass plug. See meter manufacturer's specifications for size.	Ball valve - Ford	B11-NL
20. Reduced Pressure Backflow Prevention Device	Same size as meter. Reduced pressure zone assembly. 3 - 1/2" x 1/4" Standard pipe thread and SAE flare brass fittings.	Watts	LF 909
		Wilkins	375XL

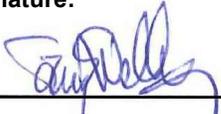


NOTES TO DEVELOPER:

1. METER SHALL BE TAGGED AND LABELED TO INDICATE RECYCLED WATER, PAINT PURPLE (PANTONE 512).
2. ADD DIELECTRIC UNION WHEN TRANSITIONING BETWEEN DISSIMILAR METALS.
3. KEEP METER & BACKFLOW INSTALLATION PLUMB AND LEVEL.
4. MECHANICALLY RESTRAIN ALL JOINTS.
5. DO NOT INSTALL DISMANTLING JOINT COMPRESSED.
6. DISMANTLING JOINT LENGTH SHALL BE 3 TIMES THE DIAMETER OF THE PIPE LEADING INTO THE METER.
7. ABOVE GROUND BACKFLOW SHALL BE PAINTED PURPLE COLOR (PANTONE 512).

Updated Date: 05/17/2018

Drawn By: **DUC L.**
 Checked By: **TANISHA W. / JOHN S.**
 Approved By: **SHILPA M. / TERRY W.**
 Revised Date: **NOVEMBER 2017**

Signature: 
 Director of
 Water and Sewer Utilities

CITY OF SANTA CLARA
 WATER AND SEWER UTILITIES - STANDARD NO. 13A
**4", 6" AND 8" RECYCLED WATER SERVICE
 (ABOVE GROUND)**



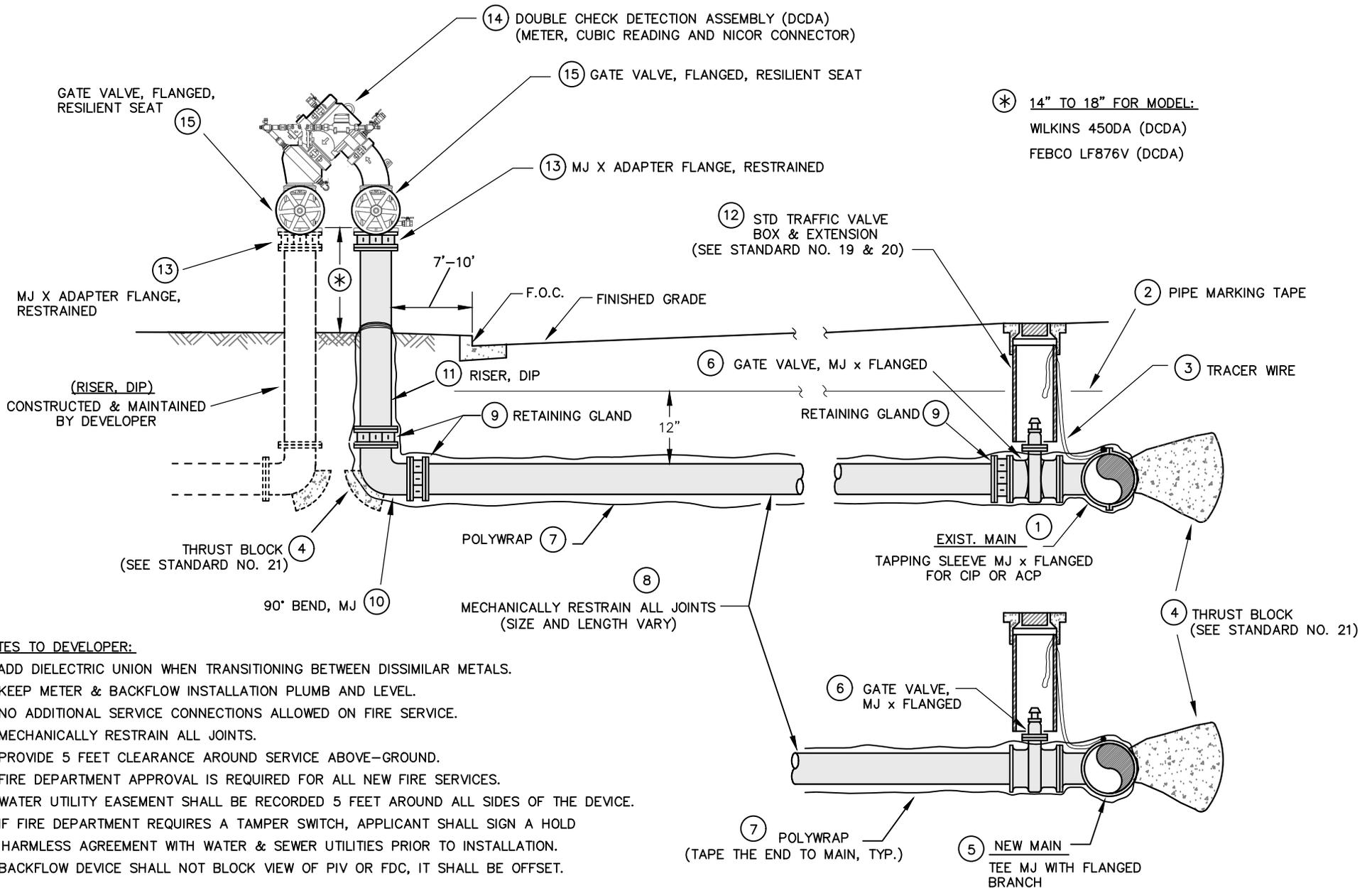
Standard No. 13A – 4”, 6” and 8” Recycled Water Service (Above Ground) – Material List

Domestic Products Only. Use 316 stainless steel bolts, flange gasket with EPDM rubber, nuts, and washers for all bolted connections. Use no lead products for domestic water services.

Coat above ground water service paint with purple (Pantone 512)

Provide 5-foot clearance around service above ground.

Material	Description	Manufacturer	Model
1. Tapping Saddle	Mechanical joint with all accessories. -Ductile iron, cast iron, or PVC -AC pipe	Mueller H-615 Clow F-5205 Mueller H-619 Clow F-5207	
2. Pipe Marking Tape	Purple. 3” wide, 4 mil, non-detectable.		
3. Tracer Wire	RHW#12 AWG Solid. Tape to the top of the water main with 12” minimum slack inside all valve boxes		
4. Thrust Block	See City Standard No. 21		
5. Tee	Mechanical joint with flanged branch. AWWA C-153 compact ductile iron with mechanical joint, cement lined with stainless steel bolts and gaskets	US Pipe Tyler Union	
6. Gate Valve	MJ x Flanged. AWWA C-509 resilient seat, epoxy coat inside and out to meet AWWA C-550. Open left with 2” square operating nut. All rubber components shall be EPDM.	M&H Mueller Clow	Style 4067 A-2361
7. Polywrap	Purple. 8 mil low density or 4 mil high density polyethylene film installed per AWWA C105. Tape end to pipe with 10 mil tape.		
8. Pipe mechanically restrain all joints	Size and type as specified. -Ductile iron, cement lined Class 50. Protect with polywrap for underground pipe.	US Pipe Pacific States	
9. Retaining Gland	Joint restraint for use with mechanical joint fittings. Size as specified.	US Pipe (not allowed above ground) EBAA Uniflange	MJ Field Lok, High Max, Romac Megalug Series 1100 Series 1400 (DIP)
10. 90 Degree Bend with Mechanical Joint	AWWA C-153 ductile iron with mechanical joint, cement lined with stainless steel bolts and gaskets	US Pipe Tyler Union	
11. Spool	Ductile iron, cement lined Class 50		
12. Traffic Valve Box & Extension (see Standard Detail Nos. 19 & 20)	Valve Box with purple painted lid mared "RECYCLED" or "RECYCLED WATER" Extension - 8” PVC SDR 35, single piece cut to proper length.	Tyler Union	G5 with lid marked "RECYCLED" or "RECYCLED WATER"
13. MJ x Flange Adapter	AWWA C-153 ductile iron.	Tyler Union Trinity / USP	#5-158 With megalug restraining gland
14. 90 Degree Bend	Flanged. Size as specified. AWWA C-110 ductile iron, cement-lined.	US Pipe Tyler Union	
15. Gate Valve	See 6. above		
16. Dismantling Joint	Dismantling Joint. Length = 3x diameter.	Romac KRAUSZ	DJ400 or DJ405
17. Strainer (for use with 6" & 8" Badger meters)	Provide separate strainer for 6" & 8" Badger meters	Badger	
18. Water Meter & Register (manufacturer's test results are to be submitted with all meters).	With strainer and test plug. Purple recycled water encoded register that is Elster transmitter compatible with Nicor connector. All registers to be facing inlet and provide cubic feet reading.	Badger Sensus	Turbo Series 450 RECLAIMED/ test plug Omni T2 (industrial - more constant flow)
19. Test Assembly	Consisting of a brass nipple, ball valve and brass plug. See meter manufacturer's specifications for size.	Ball valve - Ford	B11-NL
20. Check Valve	Brass, flanged	Mueller	A-2600-06

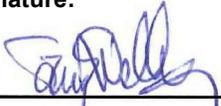


NOTES TO DEVELOPER:

1. ADD DIELECTRIC UNION WHEN TRANSITIONING BETWEEN DISSIMILAR METALS.
2. KEEP METER & BACKFLOW INSTALLATION PLUMB AND LEVEL.
3. NO ADDITIONAL SERVICE CONNECTIONS ALLOWED ON FIRE SERVICE.
4. MECHANICALLY RESTRAIN ALL JOINTS.
5. PROVIDE 5 FEET CLEARANCE AROUND SERVICE ABOVE-GROUND.
6. FIRE DEPARTMENT APPROVAL IS REQUIRED FOR ALL NEW FIRE SERVICES.
7. WATER UTILITY EASEMENT SHALL BE RECORDED 5 FEET AROUND ALL SIDES OF THE DEVICE.
8. IF FIRE DEPARTMENT REQUIRES A TAMPER SWITCH, APPLICANT SHALL SIGN A HOLD HARMLESS AGREEMENT WITH WATER & SEWER UTILITIES PRIOR TO INSTALLATION.
9. BACKFLOW DEVICE SHALL NOT BLOCK VIEW OF PIV OR FDC, IT SHALL BE OFFSET.

Updated Date: 05/17/2018

Drawn By: DUC L.
 Checked By: TANISHA W. / JOHN S.
 Approved By: SHILPA M. / TERRY W.
 Revised Date: NOVEMBER 2017

Signature: 
 Director of
 Water and Sewer Utilities

CITY OF SANTA CLARA
 WATER AND SEWER UTILITIES - STANDARD NO. 16
**4" - 10" FIRE SERVICE ASSEMBLY
 (WITH DOUBLE CHECK DETECTION ASSEMBLY)**



Standard No. 16 – 4"-10" Fire Service Assembly (with Double Check Detection Assembly) – Material List**Domestic Products Only.**

Use 316 stainless steel bolts, flange gasket with EPDM rubber, nuts, and washers for all bolted connections.

Coat above ground fire service shall be painted fire safety red.

Provide 5-foot clearance around service above ground.

Material	Description	Manufacturer	Model
1. Tapping Saddle	Mechanical joint with all accessories. -Ductile iron, cast iron, or PVC	Mueller H-615 Clow F-5205	
	-AC pipe	Mueller H-619 Clow F-5207	
2. Pipe Marking Tape	Blue. 3" wide, 4 mil, non-detectable.		
3. Tracer Wire	RHW#12 AWG Solid. Taped to the top of the water main with 12" minimum slack inside all valve boxes		
4. Thrust Block	See City Standard No. 21		
5. Tee	Mechanical joint with flanged branch. AWWA C-153 ductile iron with mechanical joint, cement lined with stainless steel bolts and gaskets	US Pipe	
		Tyler Union	
6. Gate Valve	Flange x MJ. AWWA C-509 resilient seat, epoxy coat inside and out to meet AWWA C-550. Open left with 2" square operating nut. All rubber components shall be EPDM.	M&H	Style 4067
		Mueller	A-2361
		Clow	F-6106
7. Polywrap	Blue. 8 mil low density or 4 mil high density polyethylene film installed per AWWA C105		
8. Pipe	Mechanically restrain all joints. -Ductile iron, cement lined Class 50. Protect with polywrap for underground pipe.	US Pipe Pacific States	
9. Retaining Gland	Joint restraint for use with mechanical joint fittings. Size as specified.	US Pipe (not allowed above ground)	MJ Field Lok High Max Romac
		EBAA	Megalug Series 1100
		Uniflange	Series 1400 (DIP)
10. 90 Degree Bend with mechanical joint	AWWA C-153 ductile iron with mechanical joint, cement lined with stainless steel bolts and gaskets	US Pipe	
		Tyler Union	
11. Riser	Ductile iron, class 50 minimum		
12. Traffic Valve Box & Extension (see Standard Detail Nos. 19 & 20)	Valve Box	Tyler Union	G5 with lid marked "WATER"
	Extension - 8" PVC SDR 35, single piece cut to proper length.		
13. MJ x Flange Adapter	AWWA C-153 ductile iron.	Tyler Union	#5-158
		Trinity / USP	With megalug restraining gland
14. Double Check Detection & Assembly & gate valves 15.	Includes gate valves and bypass (leak detection) Badger meter. Provide Elster transmitter compatible encoded register with Nicor connector. All registers to be facing inlet and provide cubic feet reading. 6 test nipples, 3 - 3/4" x 1/4" Standard pipe thread and SAE flare brass fittings.	Wilkins	450DA
		FEBCO	LF876V

Standard No. 17 – 4"-10" Fire Service Assembly (with Reduced-Pressure Principle Backflow Detection Assembly) – Material List

Domestic Products Only.

Use 316 stainless steel bolts, flange gasket with EPDM rubber, nuts, and washers for all bolted connections.

Coat above ground fire service shall be painted fire safety red.

Provide 5-foot clearance around service.

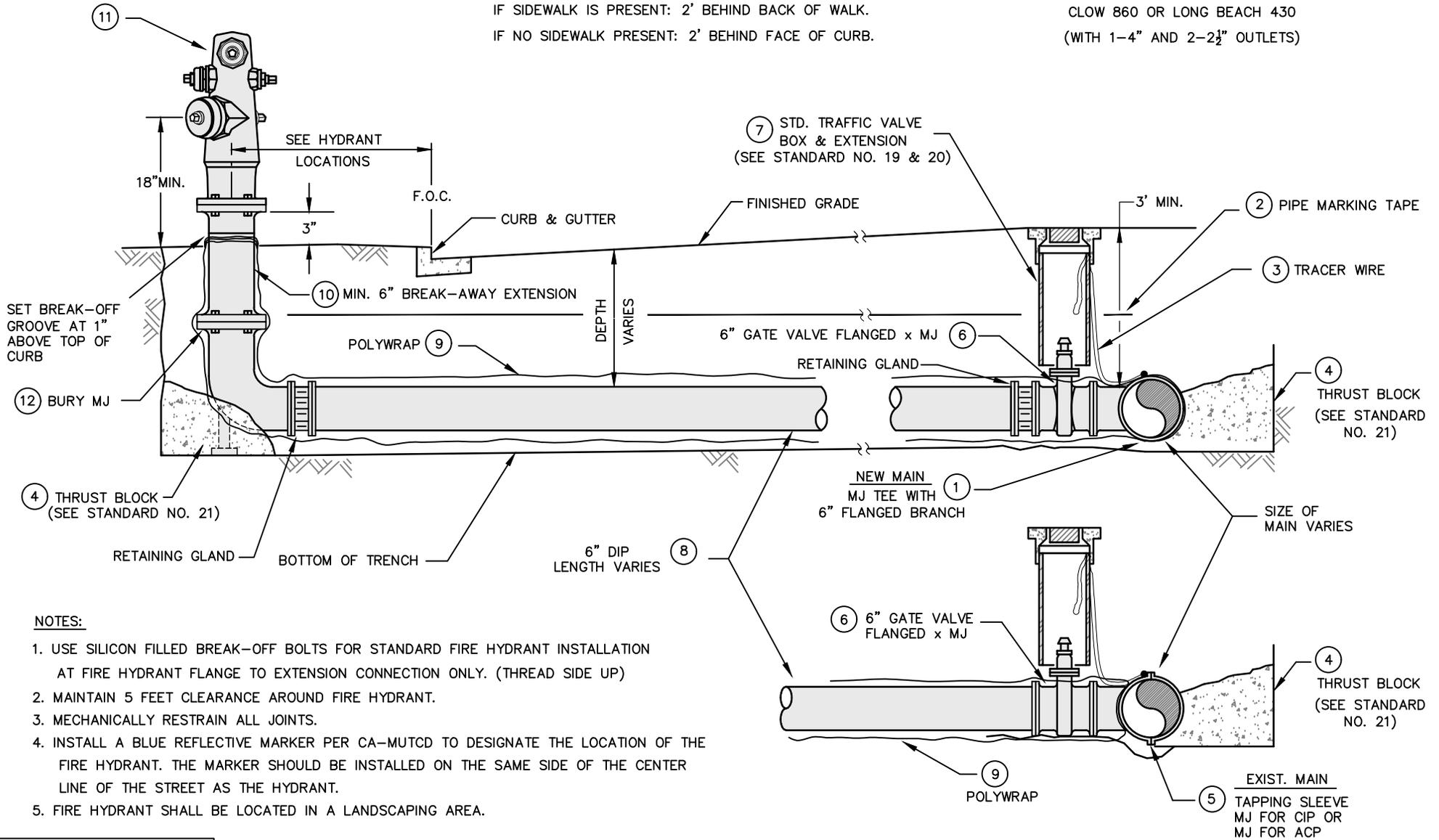
Material	Description	Manufacturer	Model
1. Tapping Saddle	Mechanical joint with all accessories. -Ductile iron, cast iron, or PVC	Mueller H-615 Clow F-5205	
	-AC pipe	Mueller H-619 Clow F-5207	
2. Pipe Marking Tape	Blue. 3" wide, 4 mil, non-detectable.		
3. Tracer Wire	RHW#12 AWG Solid. Taped to the top of the water main with 12" minimum slack inside all valve boxes		
4. Thrust Block	See City Standard No. 21		
5. Tee	Mechanical joint with flanged branch. AWWA C-153 compact ductile iron with mechanical joint, cement lined with stainless steel bolts and gaskets	US Pipe	
		Tyler Union	
6. Gate Valve	MJ x Flanged. AWWA C-509 resilient seat, epoxy coat inside and out to meet AWWA C-550. Open left with 2" square operating nut. All rubber components shall be EPDM.	M&H	Style 4067
		Mueller	A-2361
		Clow	F-6106
7. Polywrap	Blue. 8 mil low density or 4 mil high density polyethylene film installed per AWWA C105. Tape ends to pipe with 10 mil tape.		
8. Pipe	Size and type as specified. -Ductile iron, cement lined Class 50. Protect with polywrap for underground pipe.	US Pipe	
		Pacific States	
9. Retaining Gland	Joint restraint for use with mechanical joint fittings. Size as specified.	US Pipe (not allowed above ground)	MJ Field Lok High Max Romac
		EBAA	Megalug Series 1100
		Uniflange	Series 1400 (DIP)
10. 90 Degree Bend with mechanical joint	AWWA C-153 ductile iron with mechanical joint, cement lined with stainless steel bolts and gaskets	US Pipe	
		Tyler Union	
11. Riser	Ductile iron, class 50 minimum		
12. Traffic Valve Box & Extension (see Standard Detail Nos. 19 & 20)	Valve Box	Tyler Union	G5 with lid marked "WATER"
	Extension - 8" PVC SDR 35, single piece cut to proper length.		
13. MJ x Flange Adapter	AWWA C-153 ductile iron.	Tyler Union	#5-158
		Trinity / USP	With megalug restraining gland
14. Reduced-Pressure Principle & Backflow Detection Assembly & 15. gate valves	Includes gate valves and bypass (leak detection) Badger meter with Elster transmitter compatible encoded register with Nicor connector. Meter register to be facing inlet and provide cubic feet reading. Each RP to have separate serial number. 6 test nippleS, 3 - 3/4" x 1/4" Standard pipe thread and SAE flare brass fittings.	Watts	LF909 RPDA with Rising Stems
		Wilkins	475DA, 375DA

HYDRANT LOCATIONS

IF SIDEWALK IS PRESENT: 2' BEHIND BACK OF WALK.
IF NO SIDEWALK PRESENT: 2' BEHIND FACE OF CURB.

HYDRANT REQUIREMENTS

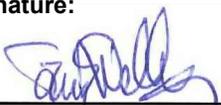
CLOW 860 OR LONG BEACH 430
(WITH 1-4" AND 2-2½" OUTLETS)



Updated Date: 05/17/2018



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Checked By: TANISHA W. / JOHN S.
Approved By: SHILPA M. / TERRY W.
Revised Date: NOVEMBER 2017

Signature: 
Director of
Water and Sewer Utilities

CITY OF SANTA CLARA
WATER AND SEWER UTILITIES - STANDARD NO. 18

FIRE HYDRANT ASSEMBLY

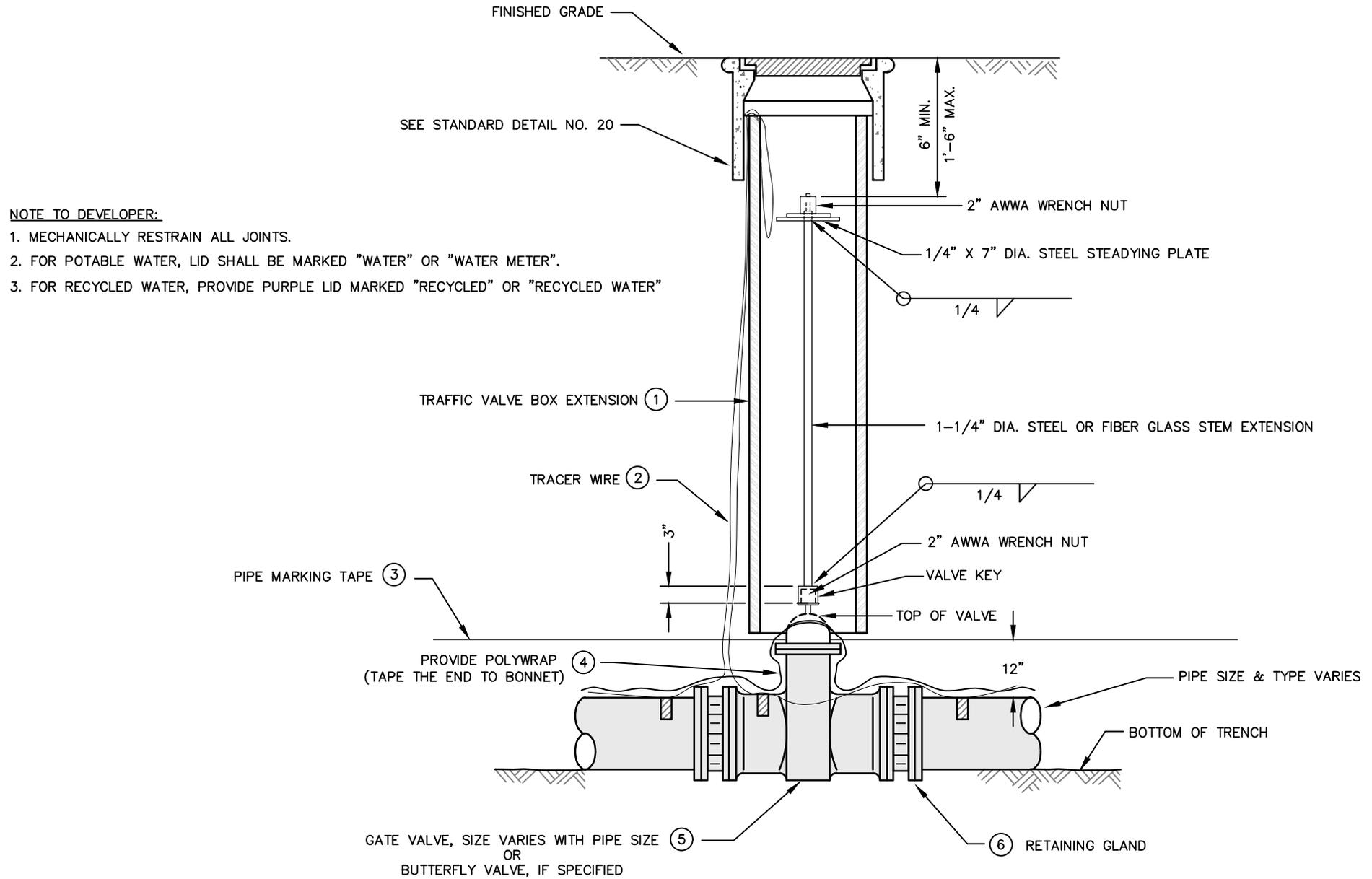
City of Santa Clara – Water and Sewer Utilities
Standard No. 18 – Fire Hydrant Assembly – Material List

05/17/18 Updated Date

Domestic Products Only.

Use 316 stainless steel bolts, flange gasket with EPDM rubber, nuts, and washers for all bolted connection, except for break-away bolts.

Material	Description	Manufacturer	Model
1. Tee	Mechanical joint with flanged branch. AWWA C-153 compact ductile iron with mechanical joint, cement lined with stainless steel bolts and gaskets	US Pipe Tyler Union	
2. Pipe Marking Tape	Blue. 3" wide, 4 mil, non-detectable.		
3. Tracer Wire	RHW#12 AWG Solid. Taped to the top of the water main with 12" minimum slack inside all valve boxes		
4. Thrust Block	See City Standard No. 21		
5. Tapping Sleeve	Mechanical joint with all accessories. -Ductile iron, cast iron, or PVC	Mueller H-615 Clow F-5205	
	-AC pipe	Mueller H-619 Clow F-5207	
6. Gate Valve	MJ x Flanged. AWWA C-509 resilient seat, epoxy coat inside and out to meet AWWA C-550. Open left with 2" square operating nut. All rubber components shall be EPDM.	M&H	Style 4067
		Mueller	A-2361
		Clow	F-6106
7. Traffic Valve Box & Extension (see Standard Detail Nos. 19 & 20)	Valve Box Lid marked "Water"	Tyler Union	G5 with lid marked "Water"
	Extension - 8" PVC SDR 35, single piece cut to proper length.		
8. Pipe mechanically restrain all joints	Size and type as specified.	US Pipe Pacific States	
	-Ductile iron, cement lined Class 50. Protect with polywrap for underground pipe.		
9. Polywrap	To be used for DIP. Blue. 8 mil low density or 4 mil high density polyethylene film installed per AWWA C105. Tape ends to pipe with 10 mil tape.		
10. Break-Away Extension	Minimum 6" with breakaway groove. Imports are acceptable.		
11. Fire Hydrant	With 1-4" and 2-2-1/2" outlets. All with cast iron caps (City No. 76) Coat hydrant with Dunn-Edwards paint #10-L-1, Gloss White Enamel, Syn-Lustro GL L Base	Clow	860
		Long Beach	430
12. Bury MJ	Mechanical joint inlet x hydrant flange outlet. 6" x appropriate height. Imports are acceptable.	Clow Rich	

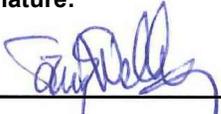


NOTE TO DEVELOPER:

1. MECHANICALLY RESTRAIN ALL JOINTS.
2. FOR POTABLE WATER, LID SHALL BE MARKED "WATER" OR "WATER METER".
3. FOR RECYCLED WATER, PROVIDE PURPLE LID MARKED "RECYCLED" OR "RECYCLED WATER"

Updated Date: 05/17/2018

	Drawn By: DUC L.
	Checked By: TANISHA W. / JOHN S.
	Approved By: SHILPA M. / TERRY W.
	Revised Date: NOVEMBER 2017

Signature: 
 Director of
 Water and Sewer Utilities

CITY OF SANTA CLARA
 WATER AND SEWER UTILITIES - STANDARD NO. 19

GATE VALVE INSTALLATION

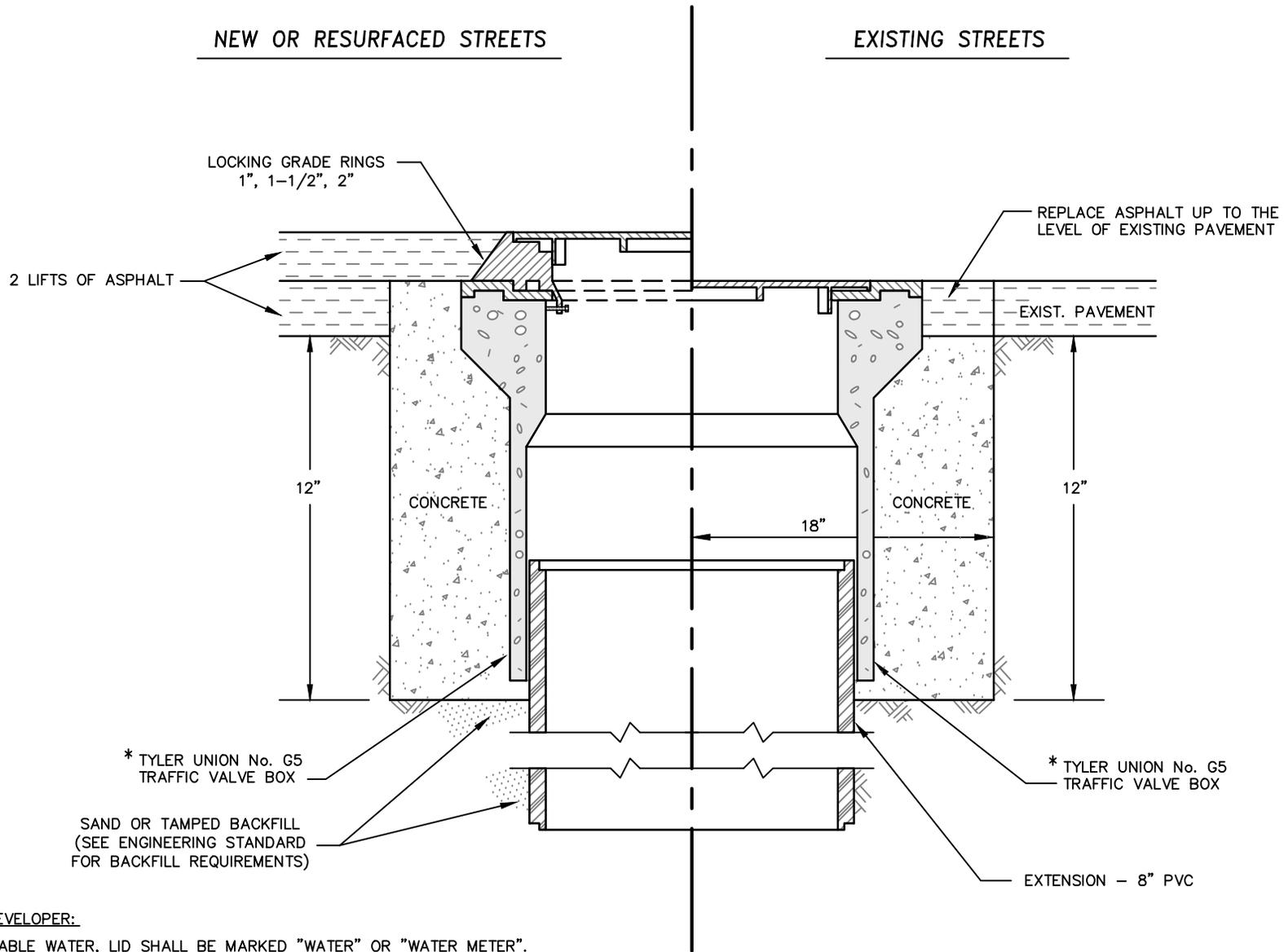
Standard No. 19 – Gate Valve Installation – Material List

Use no lead products for domestic water services.

Domestic Products Only.

Use 316 stainless steel bolts, flange gasket with EPDM rubber, nuts, and washers for all bolted connections.

Material	Description	Manufacturer	Model
1. Traffic Valve Box & Extension (see Standard Detail No. 20 for valve box installation)	Traffic valve box with lid. For potable water, lid shall be marked "Water" or "Water Meter". For recycled water, provide purple lid marked "Recycled" or "Recycled Water"	Tyler Union	G5
	Extension - 8" PVC SDR 35, single piece cut to proper length.		
2. Tracer Wire	RHW #12 AWG solid with 12" minimum slack inside all valve boxes.		
3. Pipe Marking Tape	For potable water, use blue. For recycled water, use purple. 3" wide, 4 mil, non-detectable.		
4. Polywrap	For potable water, use blue. For recycled water, use purple. 8 mil low density or 4 mil high density polyethylene film installed per AWWA C105. Tape the end to bonnet.		
5. Gate Valve Butterfly Valve	End connections as required or specified - size as specified. AWWA C-509 resilient seat, epoxy coated inside and out to meet AWWA C-550. Open left with 2" square operating nut. All rubber components shall be EPDM.	M&H	Style 4067
		Mueller	A-2361
		Clow	F-6106
	End connections as required or specified - size as specified. AWWA C-504 resilient seat, epoxy coated inside and out to meet AWWA C-550. Open left with 2" square operating nut. All rubber components shall be EPDM.	Pratt	Groundhog series
		Mueller	Linesal III
6. Retaining Gland	Joint restraint for use with mechanical joint fittings. Size as specified.	US Pipe	MJ Field Lok, High Max, Romac
		EBAA	Megalug Series 1100
		Uniflange	Series 1400 (DIP) Series 1500 (PVC)



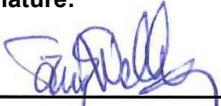
*** NOTE TO DEVELOPER:**

1. FOR POTABLE WATER, LID SHALL BE MARKED "WATER" OR "WATER METER".
2. FOR RECYCLED WATER, PROVIDE PURPLE LID MARKED "RECYCLED" OR "RECYCLED WATER"

Updated Date: 05/17/2018



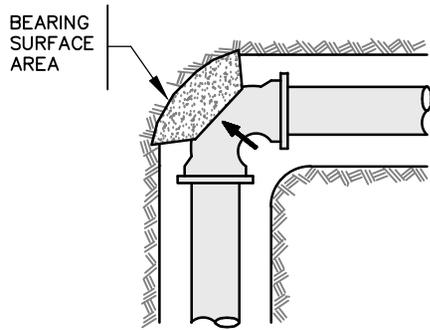
Drawn By: DUC L.
 Checked By: TANISHA W. / JOHN S.
 Approved By: SHILPA M. / TERRY W.
 Revised Date: NOVEMBER 2017

Signature: 
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 Water and Sewer Utilities

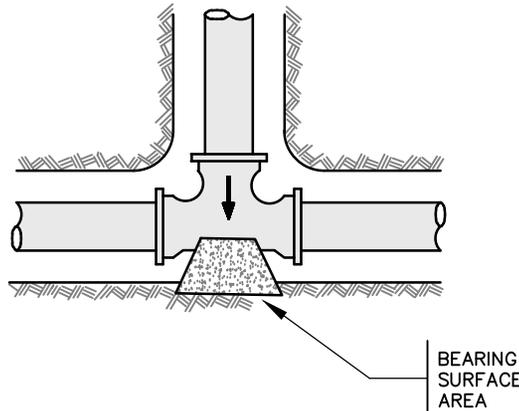
CITY OF SANTA CLARA
 WATER AND SEWER UTILITIES - STANDARD NO. 20

TRAFFIC VALVE BOX

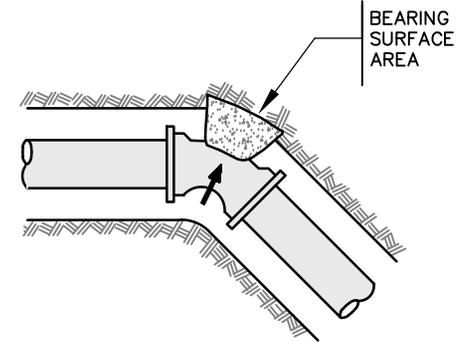
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**90°
ELBOW**



TEE



**(45° - 22 1/2° - 11 1/4°)
ELBOW**

MIN. BEARING SURFACE AREA (sq. ft. of undisturbed earth)^{2,3}

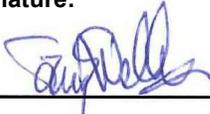
PIPE SIZE	TEES ¹ , PLUG OR DEAD END	90° ELBOW	45° ELBOW	22 1/2° ELBOW	11 1/4° ELBOW
2"	1/2	1/2	1/2	1/2	1/2
4"	1	1-1/2	1	1/2	1/2
6"	2	3	2	1	1
8"	4	5	3	1-1/2	1
10"	6	8	5	3	2
12"	8	12	6	3	3

NOTES:

1. BRANCH OUTLET SIZE.
2. AREAS BASED ON 150 PSI. WATER PRESSURE AND 2000 PSF. ALLOWABLE SOIL BEARING CAPACITY.
3. FOR SOFT OR DAMP CLAY, DOUBLE THE MIN. BEARING SURFACE AREA.
4. PORTLAND CEMENT SHALL BE - 6 SACK - 2" SLUMP - 3/4" ROCK.



Drawn By: **DUC L.**
 Checked By: **TANISHA W. / JOHN S.**
 Approved By: **SHILPA M. / TERRY W.**
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Signature: 
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 Water and Sewer Utilities

CITY OF SANTA CLARA
 WATER AND SEWER UTILITIES - STANDARD NO. 21

THRUST BLOCK

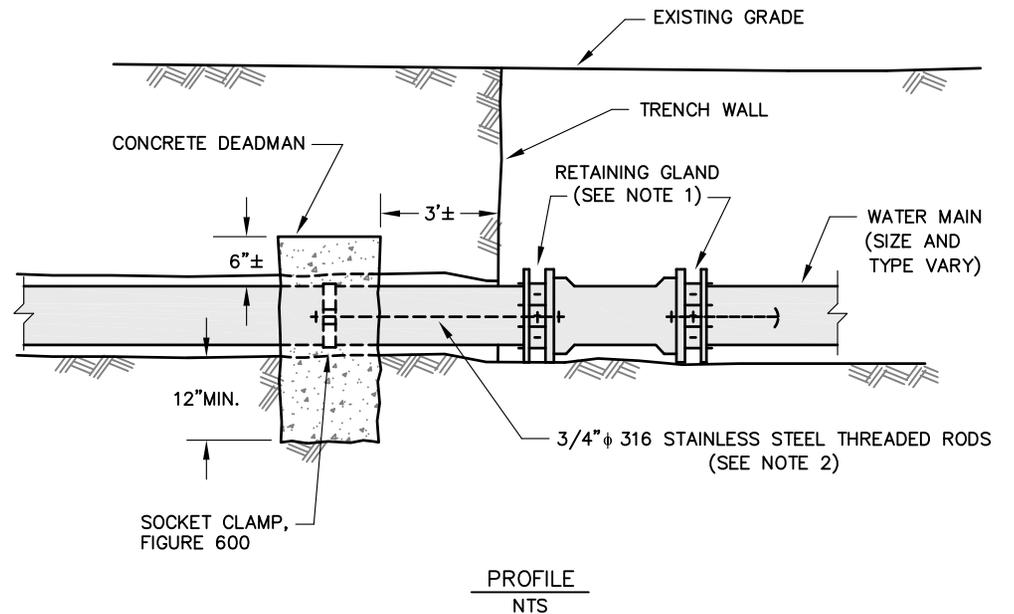
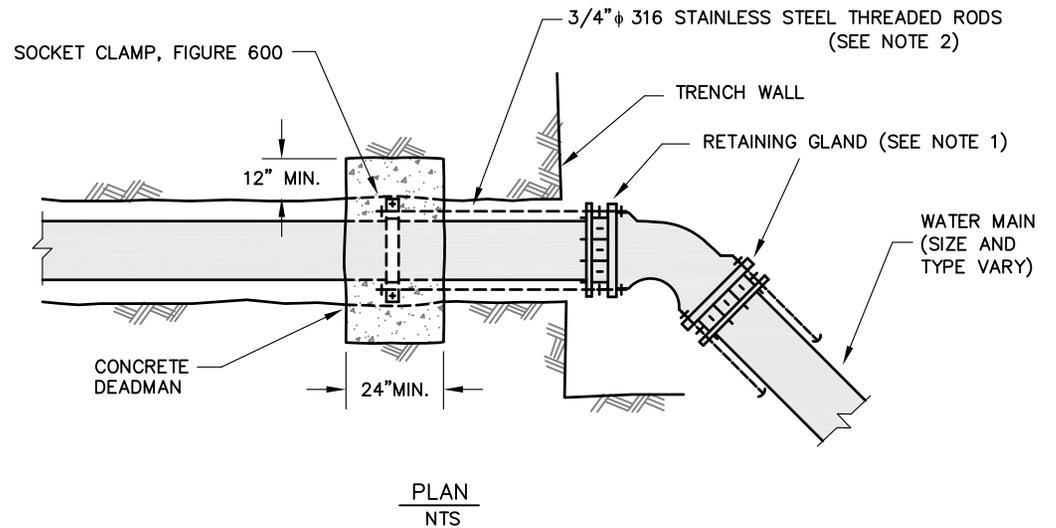
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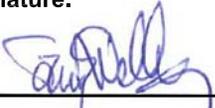
- FOR DIP & PVC, USE DEADMAN W/ SOCKET CLAMP WITHOUT 3/4"φ 316 STAINLESS STEEL THREADED RODS. USE RETAINING GLANDS ON FITTINGS AS INSTRUCTED BY WATER DEPT. INSPECTOR.

RETAINING GLAND	MANUFACTURER	MODEL
	US PIPE	MJ FIELD LOK
	EBAA	MEGA LUG SERIES 1100
	UNIFLANGE	SERIES 1400 (DIP)
		SERIES 1500 (PVC)

- FOR ACP & CIP, USE DEADMAN W/ SOCKET CLAMP AND 3/4"φ 316 STAINLESS STEEL THREADED RODS TO FITTINGS, EQUALLY SPACED.
- USE OTHER ADDITIONAL RESTRAINTS AS DIRECTED BY WATER DEPT. INSPECTOR.
- FOR MAINS 8" OR LESS, USE ONE SOCKET CLAMP AND TWO 3/4"φ 316 STAINLESS STEEL THREADED RODS, WHERE REQUIRED.
- FOR 10" & 12" MAINS, USE TWO SOCKET CLAMPS AND FOUR 3/4"φ 316 STAINLESS STEEL THREADED RODS, WHERE REQUIRED.
- CONCRETE SHALL BE SACK - 2" SLUMP - 3/4" ROCK WITH NO ADDITIVES FOR HIGH EARLY STRENGTH.
- DIMENSIONS BASED ON 150 PSI. WATER PRESSURE AND 2000 PSF. ALLOWABLE SOIL BEARING CAPACITY FOR 12" MAIN.
- USE SS BOLTS, NUTS AND WASHERS FOR ALL FLANGE CONNECTIONS.



Drawn By: DUC L.
 Checked By: TANISHA W. / JOHN S.
 Approved By: SHILPA M. / TERRY W.
 Revised Date: NOVEMBER 2017

Signature: 
 Director of
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CITY OF SANTA CLARA
 WATER AND SEWER UTILITIES - STANDARD NO. 22

CONCRETE REVERSE THRUST BLOCK

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NOTES:

1. REFER TO DEPARTMENT OF PUBLIC WORKS STANDARD DETAIL No. ST-24 FOR TRENCH BACKFILL AND PAVEMENT REPLACEMENT. FOR PAVED SURFACE, USE ONLY OPTION A.
2. FOR UNPAVED SURFACE, CONTRACTOR CAN PROPOSE SUITABLE NATIVE BACKFILL MATERIAL.
3. FOR PCC SURFACE, REPLACE PCC TO MATCH EXISTING. INSTALL DOWELS PER DEPARTMENT PUBLIC WORKS STANDARD DETAIL No. ST-17 AND ST-18. REPLACE PCC PER CALTRANS STANDARD SPECS SECTION 90, CLASS 2. USE ONLY PORTLAND CEMENT, NO FLY ASH.

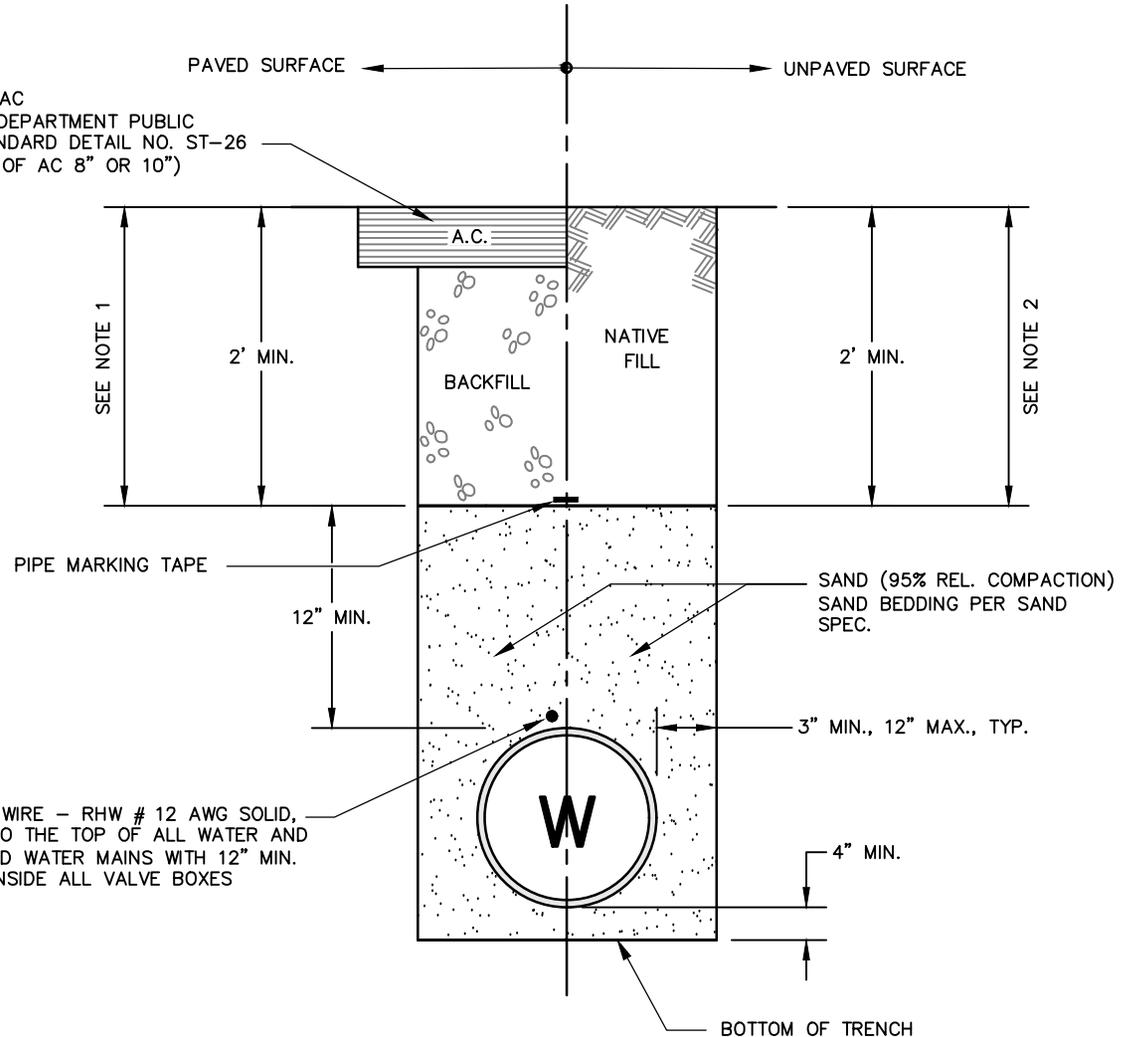
SAND SPEC.

SAND SHALL BE CLEAN AND FREE FROM CLAY AND ORGANICS. IT SHALL BE A CLEAN, HARD, DURABLE MATERIAL RESULTING FROM NATURAL DISINTEGRATION AND ABRASION OF GRANITE, QUARTZ, OR SIMILAR HARD ROCK OR BY THE PROCESSING OF COMPLETELY FRIABLE SANDSTONE. IT SHALL HAVE A SAND EQUIVALENT VALUE OF NOT LESS THAN 35. THE PERCENTAGE COMPOSITION BY WEIGHT AS DETERMINED BY LABORATORY SIEVES SHALL CONFORM TO THE FOLLOWING GRADING LIMITS OR APPROVED:

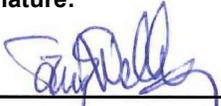
QUAIL HOLLOW UTILITY/TRENCH SAND (#271)

SIEVE SIZE	QUAIL HOLLOW UTILITY SAND (% PASSING)
1/2"	100
#4	100
#8	99
#16	96
#30	87
#50	57
#100	12
#200	4

MATCH EX. AC
(REFER TO DEPARTMENT PUBLIC WORKS STANDARD DETAIL NO. ST-26 FOR DEPTH OF AC 8" OR 10")

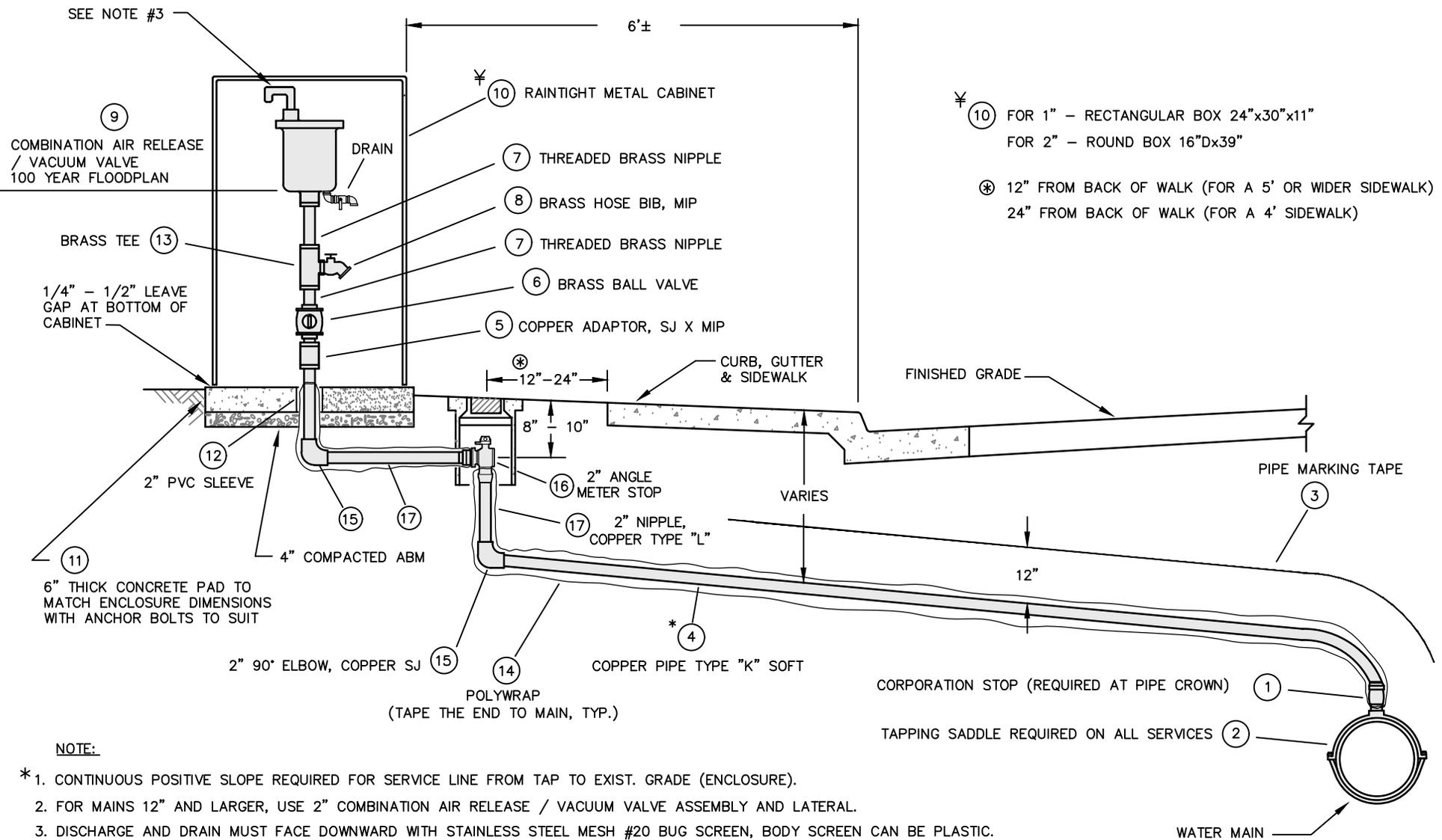


Drawn By: **DUC L.**
 Checked By: **TANISHA W. / JOHN S.**
 Approved By: **SHILPA M. / TERRY W.**
 Revised Date: **NOVEMBER 2017**

Signature: 
 Director of
 Water and Sewer Utilities

CITY OF SANTA CLARA
 WATER AND SEWER UTILITIES - STANDARD NO. **23**
TRENCH BACKFILL

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SEE NOTE #3

9 COMBINATION AIR RELEASE / VACUUM VALVE 100 YEAR FLOODPLAN

BRASS TEE 13

1/4" - 1/2" LEAVE GAP AT BOTTOM OF CABINET

12 2" PVC SLEEVE

11 6" THICK CONCRETE PAD TO MATCH ENCLOSURE DIMENSIONS WITH ANCHOR BOLTS TO SUIT

15 2" 90° ELBOW, COPPER SJ

14 POLYWRAP (TAPE THE END TO MAIN, TYP.)

12"-24"

16 2" ANGLE METER STOP

17 2" NIPPLE, COPPER TYPE "L"

4 COPPER PIPE TYPE "K" SOFT

15 2" 90° ELBOW, COPPER SJ

14 POLYWRAP

CURB, GUTTER & SIDEWALK

FINISHED GRADE

PIPE MARKING TAPE

1 CORPORATION STOP (REQUIRED AT PIPE CROWN)

2 TAPPING SADDLE REQUIRED ON ALL SERVICES

WATER MAIN

10 RAIN TIGHT METAL CABINET

7 THREADED BRASS NIPPLE

8 BRASS HOSE BIB, MIP

7 THREADED BRASS NIPPLE

6 BRASS BALL VALVE

5 COPPER ADAPTOR, SJ X MIP

10 FOR 1" - RECTANGULAR BOX 24"x30"x11"
FOR 2" - ROUND BOX 16"Dx39"

12" FROM BACK OF WALK (FOR A 5' OR WIDER SIDEWALK)
24" FROM BACK OF WALK (FOR A 4' SIDEWALK)

NOTE:

- *1. CONTINUOUS POSITIVE SLOPE REQUIRED FOR SERVICE LINE FROM TAP TO EXIST. GRADE (ENCLOSURE).
- 2. FOR MAINS 12" AND LARGER, USE 2" COMBINATION AIR RELEASE / VACUUM VALVE ASSEMBLY AND LATERAL.
- 3. DISCHARGE AND DRAIN MUST FACE DOWNWARD WITH STAINLESS STEEL MESH #20 BUG SCREEN, BODY SCREEN CAN BE PLASTIC. ALL PARTS LEAD FREE BRASS.
- 4. FOR RECYCLED WATER PAINT ITEMS (5) - (13) PURPLE (PANTONE 512), ITEM (10) CABINET COLOR PAINT PURPLE INSIDE AND OUTSIDE.



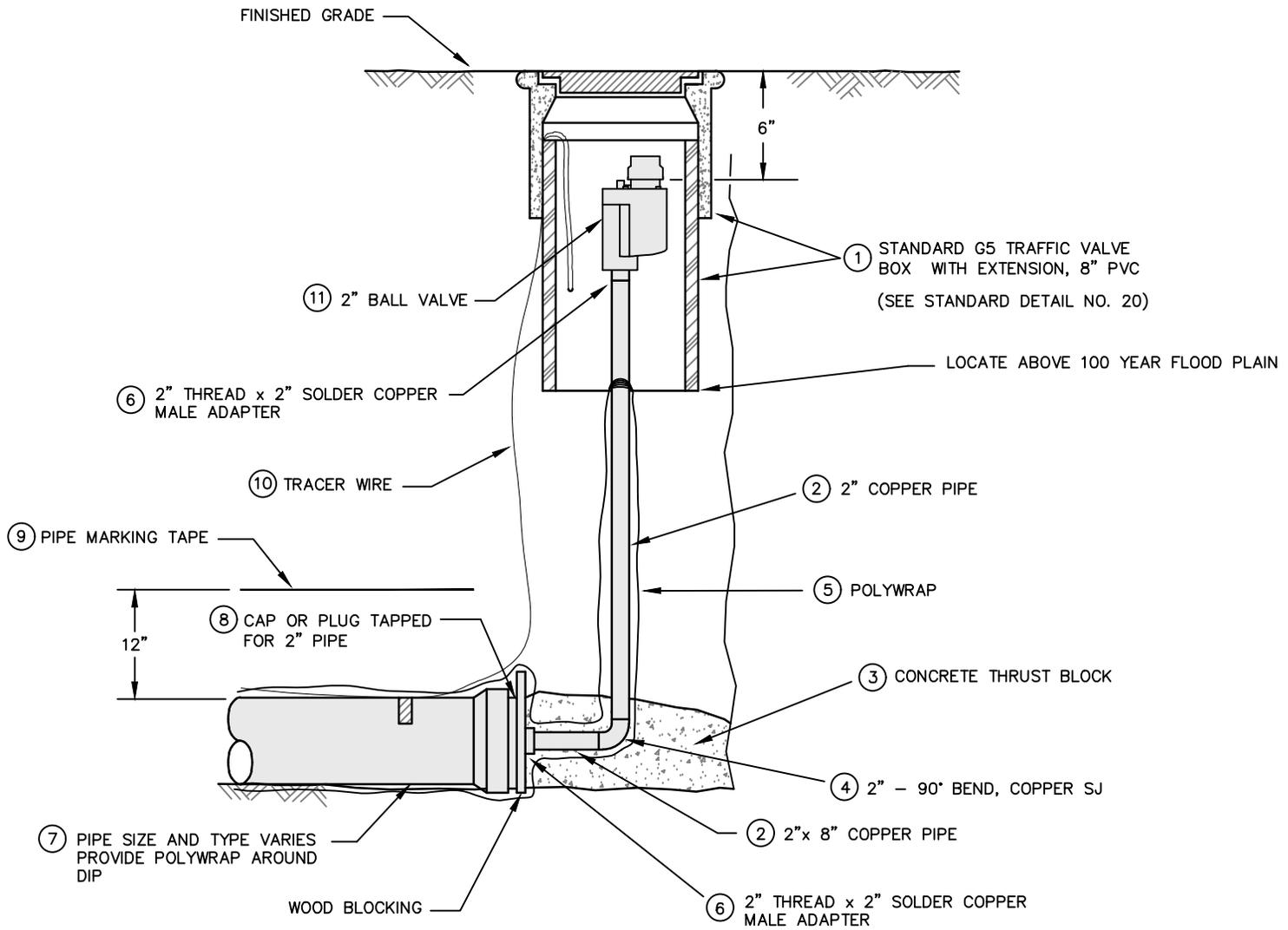
Drawn By: DUC L.
 Checked By: TANISHA W. / GRANT K.
 Approved By: SHILPA M. / TERRY W.
 Revised Date: NOVEMBER 2017

Signature: *[Handwritten Signature]*
 Director of Water and Sewer Utilities

CITY OF SANTA CLARA
 WATER AND SEWER UTILITIES - STANDARD NO. 24
 1" AND 2" COMBINATION AIR RELEASE / VACUUM VALVE

Standard No. 24 – 1" and 2" Combination Air Release / Vacuum Valve – Material List**Domestic Products Only.****Use no lead products for domestic water services.****For potable water, coat above ground water service with Dunn Edwards Paint #10-L, 11-789-04 Santa Clara Mission Sand, Syn Lustró****For recycled water, paint items 5 - 9, purple (Pantone 512)**

Material	Description	Manufacturer	Model
1. Corporation Stop	1" or 2" AWWA/CC thread inlet x compression outlet	Mueller	B-25008N
		Ford	FB-1000-4-G-NL
2. Tapping Saddle	For PVC C900, bronze saddle, specified pipe size x 1" or 2" AWWA/CC Tap For ductile iron, cast iron, ACP: single strap bronze, specified pipe size x 1" AWWA/CC Tap	Ford	202BS
		Ford	101B
		Mueller	BRIB
3. Pipe Marking Tape	For potable water, use blue. For recycled water, use purple. 3" wide, 4 mil, non-detectable.		
4. Copper Tubing	1" ASTM B88, type K soft rolled tubing 2" ASTM B88, type K. Straight lengths. No rolled		
5. Copper Adapter	1" or 2" Adapter, SJ x MIP		
6. Ball Valve	Lead free brass. 1" 2"	Mueller	B-20200N
		Ford	B11-444-NL
		Mueller	B-20200N
		Ford	B11-777-NL
7. Nipple	1" or 2" threaded brass		
8. Hose Bib	1" x 3/4" or 2" x 3/4" brass, MIP		
9. Combination Air Release / Vacuum Valve	Install above 100 year floodplain 1" (20-150 PSI, 3/16" AVO) 2" (20-150 PSI, 1/4" AVO)	Crispin	UL10
		Crispin	UL20
10. Metal Cabinet	Rain tight for outside use. <u>1" Rectangular Box:</u> 24" wide x 30" high x 11" deep. <u>2" Round Box:</u> 18" diameter x 39" high Powder coated Mission Sand color for all applications (Dunn-Edwards Santa Clara Mission Sand #10-L 11-789-04, Syn Lustró) For recycled water, paint purple inside and outside box	Advantage Metal Products	
11. Concrete Pad	6" thick to match enclosure dimensions with anchor bolts to suit		
12. Sleeve	2" PVC sleeve		
13. Tee	1" x 3/4" or 2" x 3/4" brass tee		
14. Polywrap	For potable water, use blue. For recycled water, use purple. 8 mil low density or 4 mil high density polyethylene film installed per AWWA C105. Tape the end to pipe.		
15. Angle Meter Stop	2" Compression inlet x meter flange outlet with 316 stainless steel bolt, nuts, and washers.	Ford	BFA43-777W-G-NL
		Mueller	B-24276N
16. Nipple	2" Type L rigid copper tubing; riser length to suit		
17. 2" 90 Degree Elbow	Copper sweat joint or Pack joint 90 compression fittings		



Updated Date: 05/17/2018



Drawn By: DUC L.

Checked By: TANISHA W. / JOHN S.

Approved By: SHILPA M. / TERRY W.

Revised Date: NOVEMBER 2017

Signature: *[Handwritten Signature]*

Director of
Water and Sewer Utilities

CITY OF SANTA CLARA
WATER AND SEWER UTILITIES - STANDARD NO. 25

BLOW-OFF ASSEMBLY

City of Santa Clara – Water and Sewer Utilities
Standard No. 25 – Blow Off Assembly – Material List

05/17/18 Updated Date

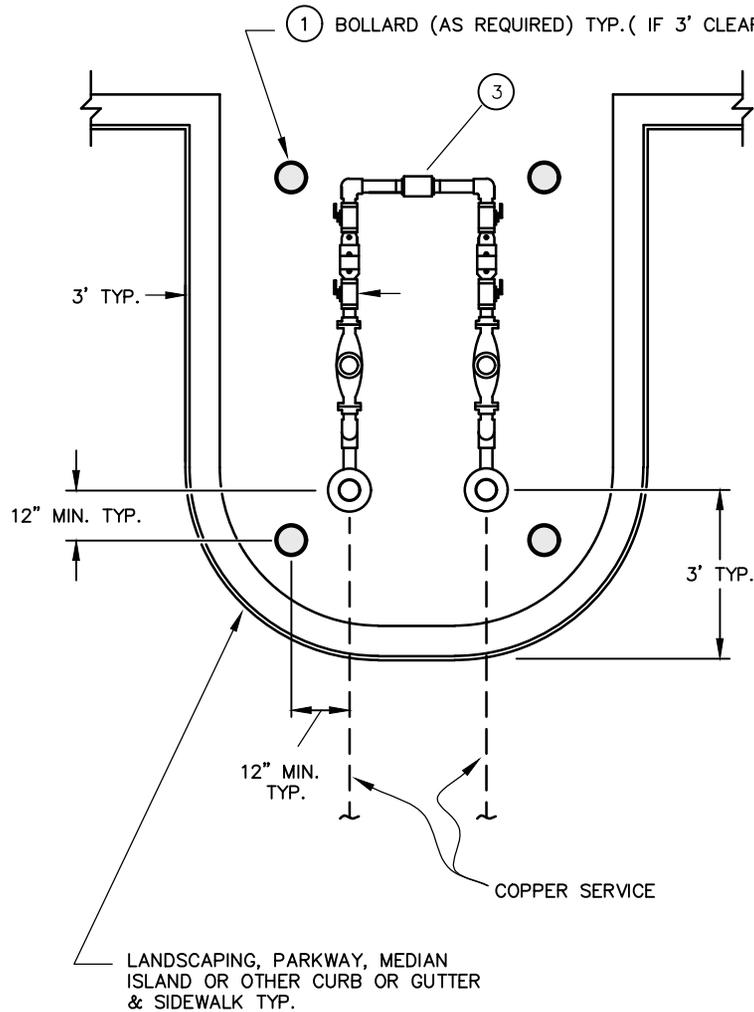
Domestic Products Only.

Use no lead products for domestic water services.

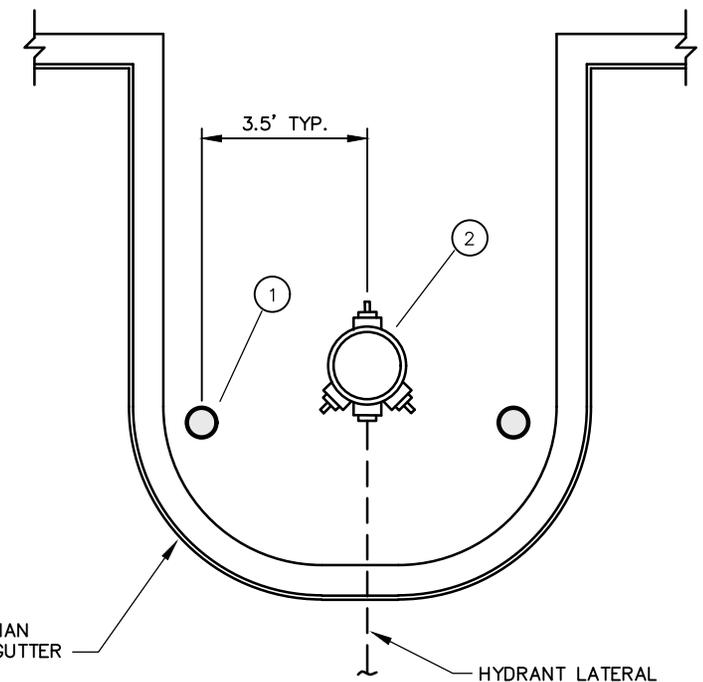
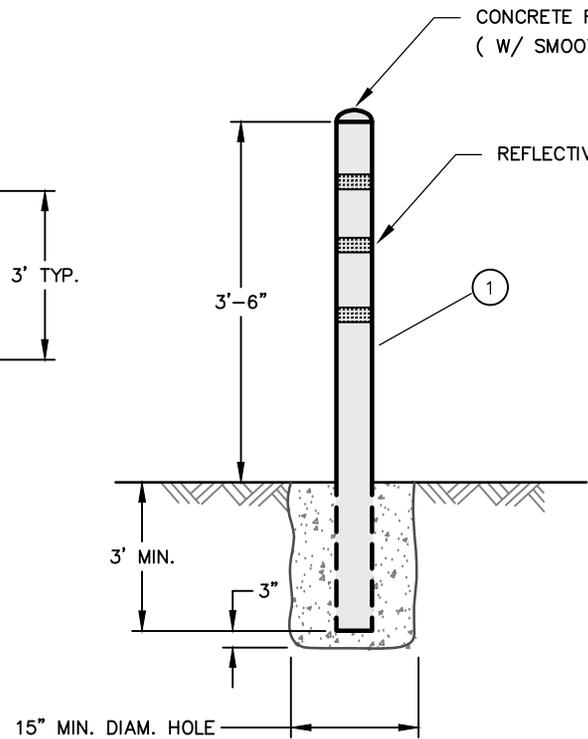
For potable water, coat above ground water service with Dunn Edwards Paint #10-L, 11-789-04 Santa Clara Mission Sand, Syn Lustrro

For recycled water, paint items 6 - 9, purple (Pantone 512)

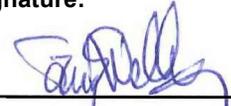
Material	Description	Manufacturer	Model
1. Traffic Valve Box & Extension	Traffic valve box with lid. For potable water, lid shall be marked "WATER". For recycled water, provide purple lid marked "CSC-RW".	Tyler Union	G5
	Extension - 8" PVC SDR 35, single piece cut to proper length.		
2. Copper Tubing	2" ASTM B88, type K. Straight lengths. No rolled copper.		
3. Thrust Block	See City Standard No. 21		
4. 2" 90 Degree Elbow	Copper sweat joint or Pack joint coupling	Ford	L-44-77
5. Polywrap	For potable water, use blue. For recycled water, use purple. 8 mil low density or 4 mil high density polyethylene film installed per AWWA C105. Tape the ends to pipe with 10 mil tape.		
6. Adapter	2" copper adapter, SJ x MIP		
7. Pipe	Size and type as specified. -Ductile iron, cement lined Class 50. Protect with polywrap for underground pipe.	US Pipe Pacific States	
	-PVC. C900. DR-14.	JM Eagle Certainteed	
8. Cap & Plug	Push on or mechanical joint with 2" IPS Tap	US Pipe Tyler Union	
9. Pipe Marking Tape	For potable water, use blue. For recycled water, use purple. 3" wide, 4 mil, non-detectable.		
10. Tracer Wire	RHW #12 AWG solid with 12" minimum slack inside all valve boxes.		
11. Blow Off Valve	2" Ball Valve	Kupferles	TF550



- ① 4" DIAMETER, IRON OR STEEL PIPE PAINTED WHITE WITH 3 YELLOW REFLECTIVE TAPE BANDS, 2" MINIMUM WIDTH.
- ② FIRE HYDRANT
- ③ WATER SERVICE W/RP (CLEARANCES SIMILAR FOR SINGLE SERVICE INSTALLATION)



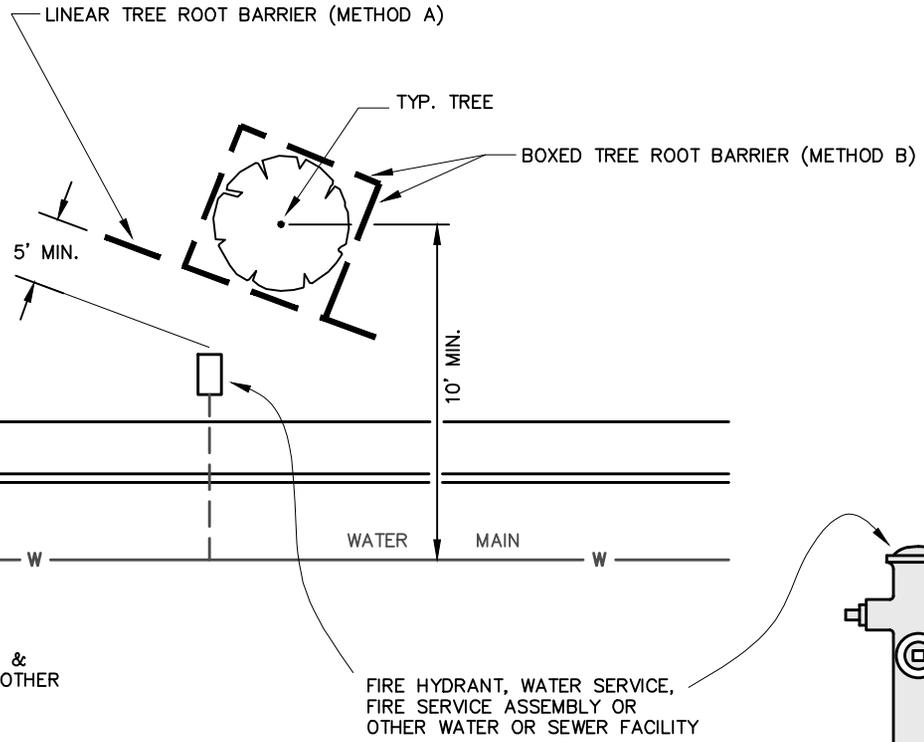
Drawn By: **DUC L.**
 Checked By: **TANISHA W. / JOHN S.**
 Approved By: **SHILPA M. / TERRY W.**
 Revised Date: **NOVEMBER 2017**

Signature: 
 Director of
 Water and Sewer Utilities

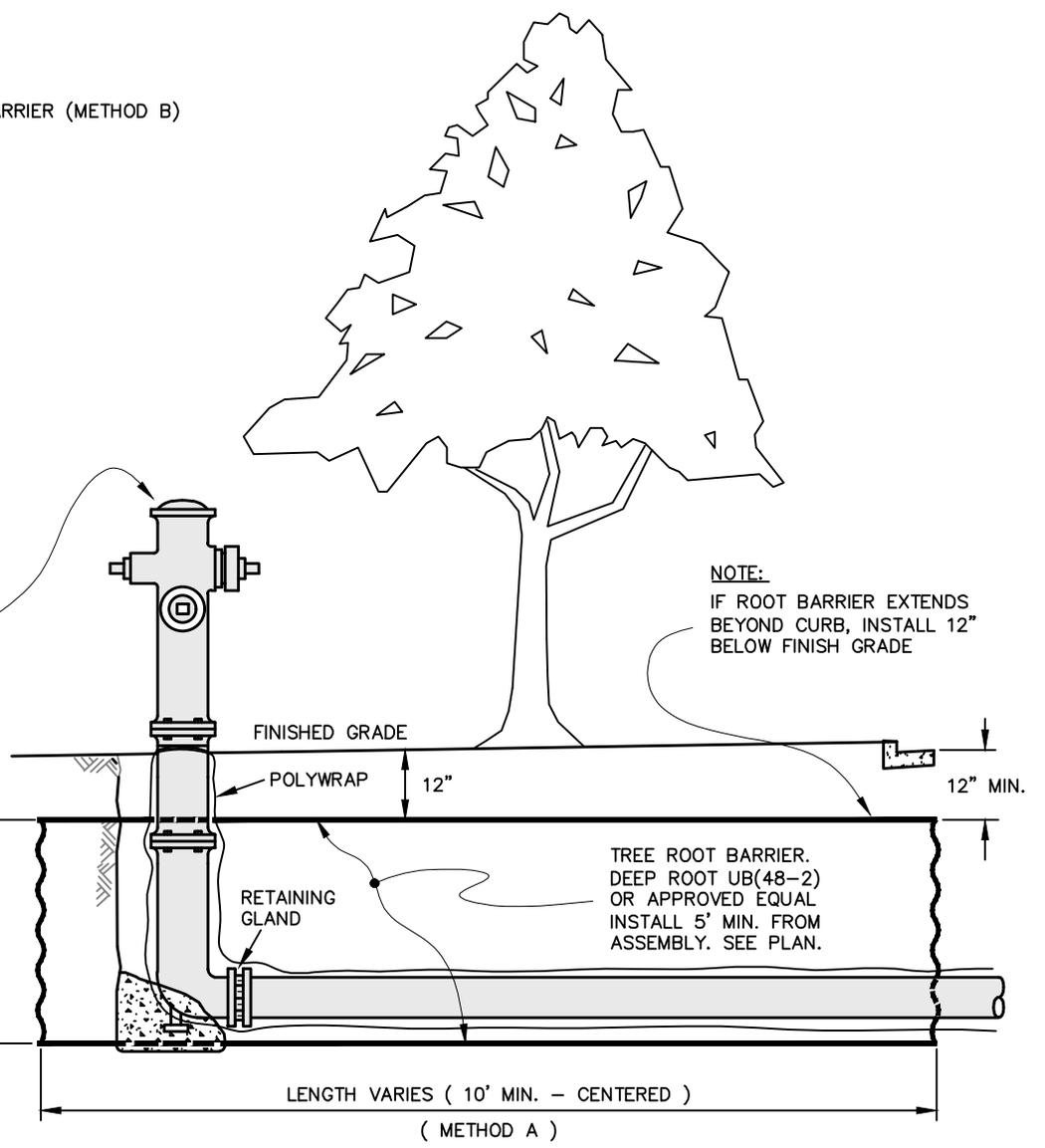
CITY OF SANTA CLARA
 WATER AND SEWER UTILITIES - STANDARD NO. **26**

BOLLARD DETAIL

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PLAN



PROFILE

NOTE:
IF ROOT BARRIER EXTENDS BEYOND CURB, INSTALL 12" BELOW FINISH GRADE

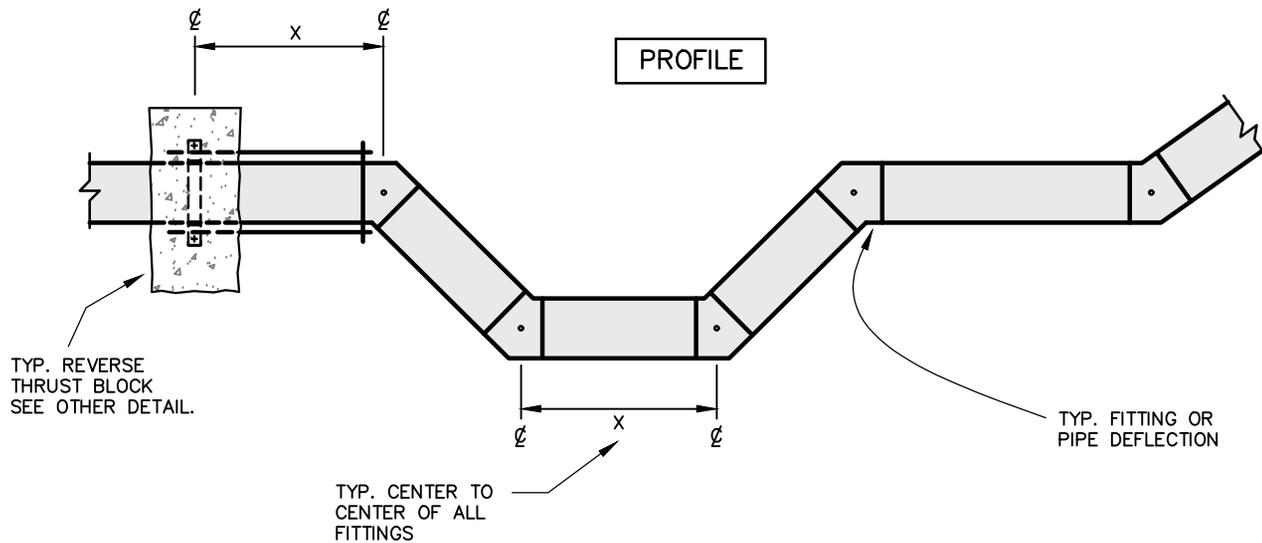
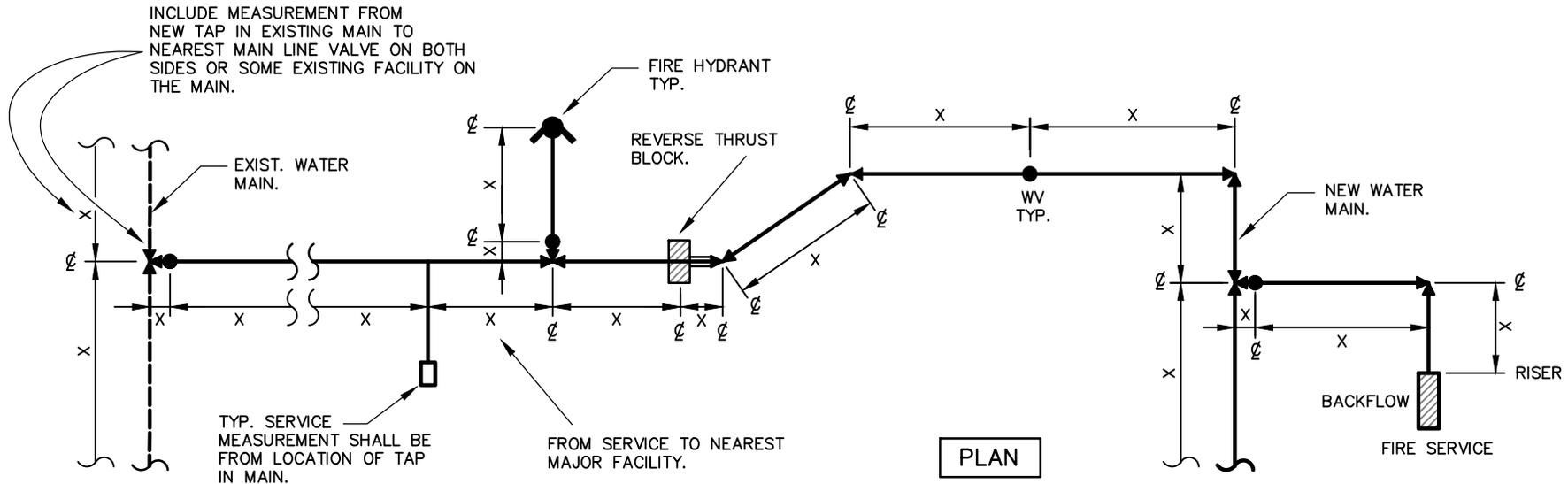


Drawn By: DUC L.
 Checked By: TANISHA W. / JOHN S.
 Approved By: SHILPA M. / TERRY W.
 Revised Date: NOVEMBER 2017

Signature: *[Handwritten Signature]*
 Director of
 Water and Sewer Utilities

CITY OF SANTA CLARA
 WATER AND SEWER UTILITIES - STANDARD NO. 27
TREE ROOT BARRIER

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NOTES:

1. FIELD MEASUREMENT TO BE SUBMITTED TO WATER AND SEWER UTILITIES AT ALL TIMES.
2. MEASUREMENTS SHALL BE IN FEET AND INCHES FROM CENTER TO CENTER OF ALL FITTINGS, WATER FACILITIES AND APPURTENANCES
3. FOR PROFILE: SHOW DEPTH AT NECESSARY LOCATIONS IF OTHER THAN DESIGN DEPTH.
4. NOTE LOCATIONS WHERE RESTRAINTS WERE ADDED AND NOT SHOWN IN THE DESIGN PLANS.
5. PROVIDE GPS MEASUREMENTS AT FITTINGS AND CHANGE IN DIRECTION.

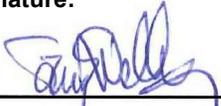


Drawn By: **DUC L.**

Checked By: **TANISHA W. / JOHN S.**

Approved By: **SHILPA M. / TERRY W.**

Revised Date: **NOVEMBER 2017**

Signature: 

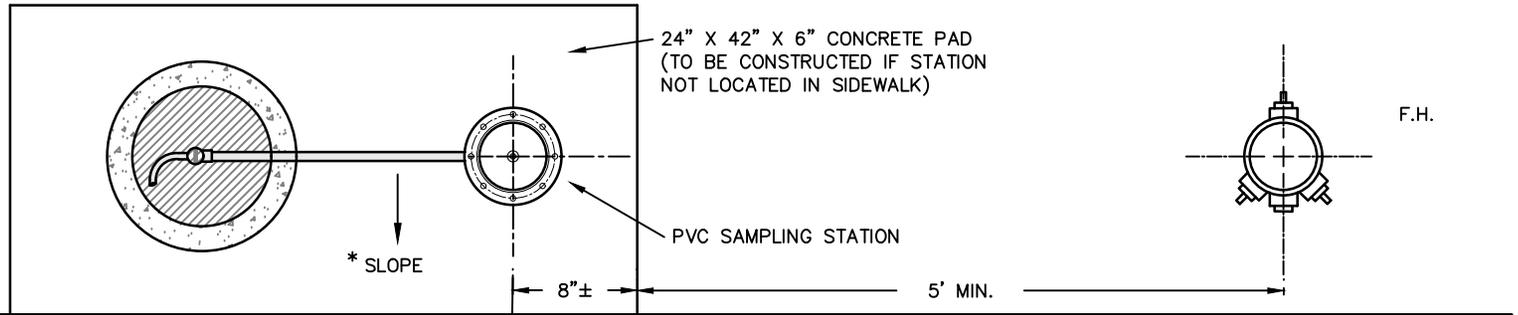
Director of
Water and Sewer Utilities

CITY OF SANTA CLARA
WATER AND SEWER UTILITIES - STANDARD NO. **28**

AS - BUILT REQUIREMENTS

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* SLOPE 2% TOWARD CURB TO MATCH POSSIBLE FUTURE SIDEWALK IF CONSTRUCTED AT BACK OF CURB.



24" X 42" X 6" CONCRETE PAD
(TO BE CONSTRUCTED IF STATION NOT LOCATED IN SIDEWALK)

F.H.

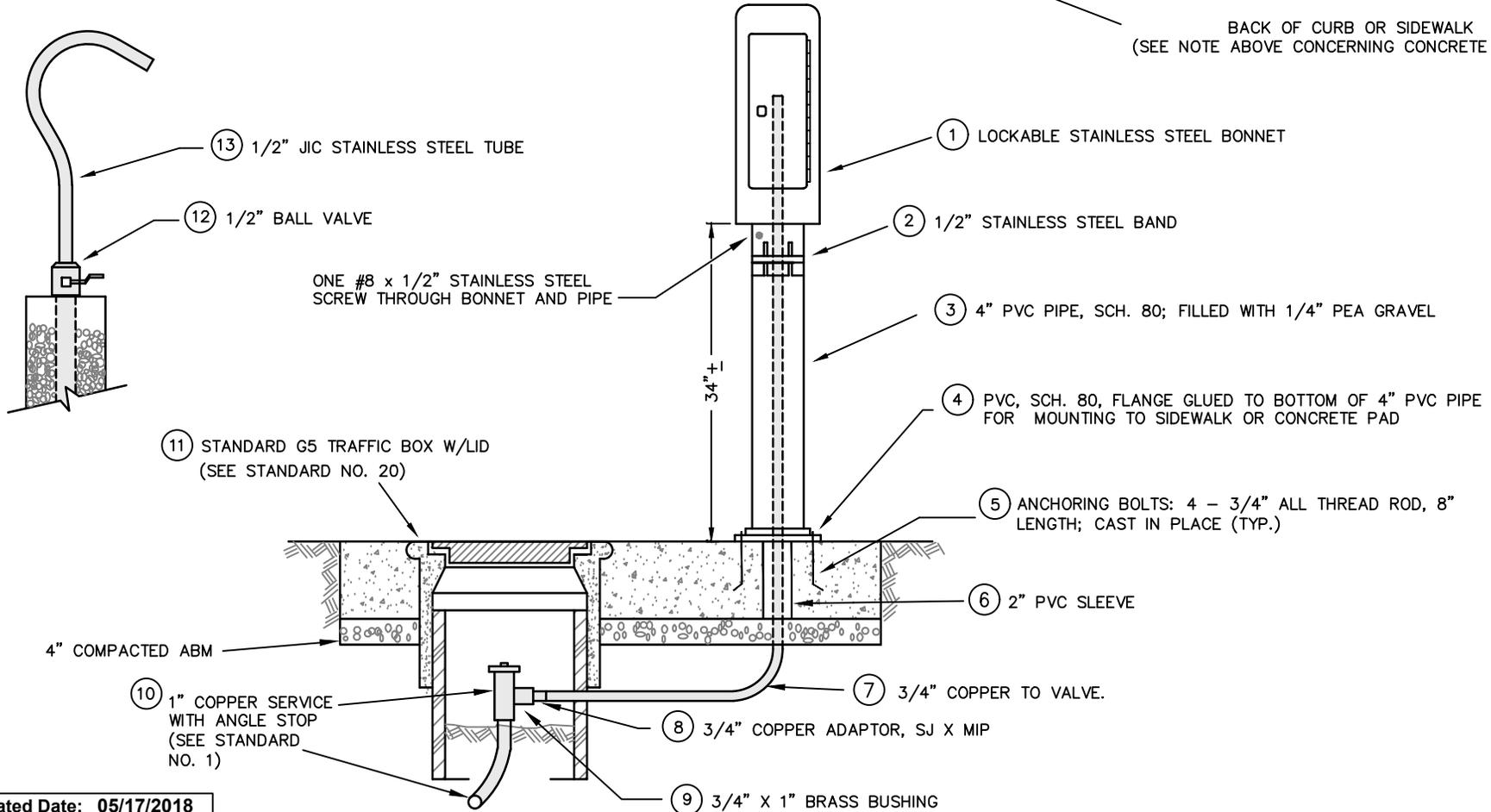
PVC SAMPLING STATION

* SLOPE

8"±

5' MIN.

BACK OF CURB OR SIDEWALK
(SEE NOTE ABOVE CONCERNING CONCRETE PAD)



13 1/2" JIC STAINLESS STEEL TUBE

12 1/2" BALL VALVE

ONE #8 x 1/2" STAINLESS STEEL SCREW THROUGH BONNET AND PIPE

1 LOCKABLE STAINLESS STEEL BONNET

2 1/2" STAINLESS STEEL BAND

3 4" PVC PIPE, SCH. 80; FILLED WITH 1/4" PEA GRAVEL

4 PVC, SCH. 80, FLANGE GLUED TO BOTTOM OF 4" PVC PIPE FOR MOUNTING TO SIDEWALK OR CONCRETE PAD

5 ANCHORING BOLTS: 4 - 3/4" ALL THREAD ROD, 8" LENGTH; CAST IN PLACE (TYP.)

6 2" PVC SLEEVE

11 STANDARD G5 TRAFFIC BOX W/LID
(SEE STANDARD NO. 20)

4" COMPACTED ABM

7 3/4" COPPER TO VALVE.

10 1" COPPER SERVICE WITH ANGLE STOP
(SEE STANDARD NO. 1)

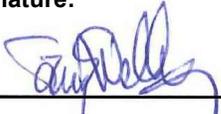
8 3/4" COPPER ADAPTOR, SJ X MIP

9 3/4" X 1" BRASS BUSHING

Updated Date: 05/17/2018



Drawn By: DUC L.
Checked By: TANISHA W. / JOHN S.
Approved By: SHILPA M. / TERRY W.
Revised Date: NOVEMBER 2017

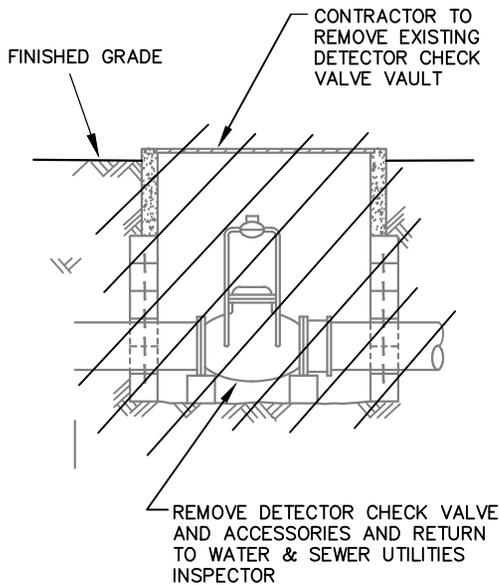
Signature: 
Director of
Water and Sewer Utilities

CITY OF SANTA CLARA
WATER AND SEWER UTILITIES - STANDARD NO. 29

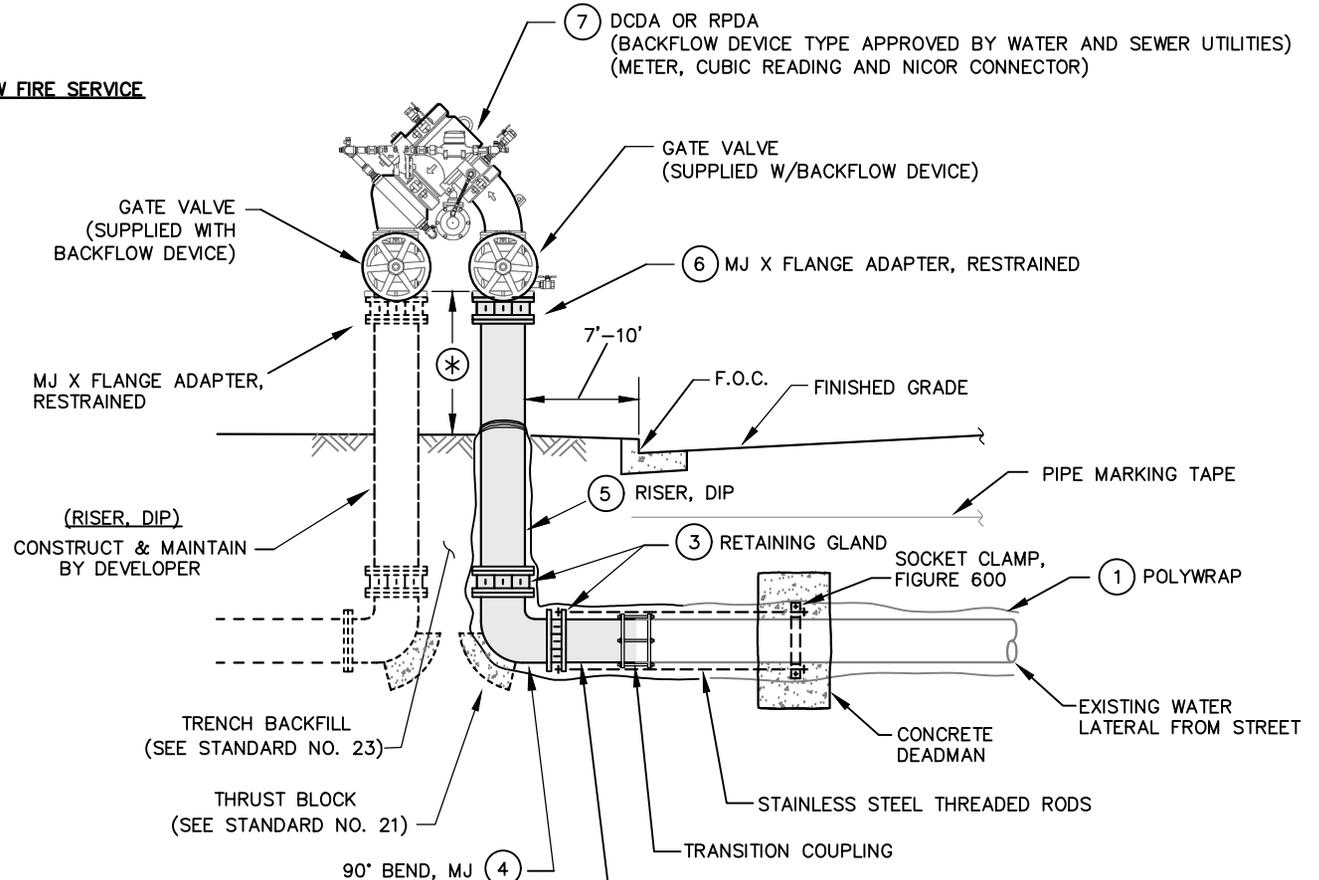
WATER SAMPLING STATION

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EXISTING FIRE SERVICE



NEW FIRE SERVICE



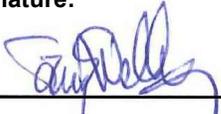
NOTES TO DEVELOPER:

1. ADD DIELECTRIC UNION WHEN TRANSITIONING BETWEEN DISSIMILAR METALS.
2. KEEP METER & BACKFLOW INSTALLATION PLUMB AND LEVEL.
3. NO ADDITIONAL SERVICE CONNECTIONS ALLOWED ON FIRE SERVICE.
4. MECHANICALLY RESTRAIN ALL JOINTS.
5. PROVIDE 5 FEET CLEARANCE AROUND SERVICE ABOVE-GROUND SERVICES.
6. BOLLARDS MAY BE REQUIRED AS DETERMINED BY CITY.
7. WATER UTILITY EASEMENT IS REQUIRED 5 FEET AROUND ALL SIDES OF THE DEVICE.
8. UPGRADED BACKFLOW DEVICE SHALL NOT BLOCK VIEW OF PIV OR FDC, IT SHALL BE OFFSET 3 FEET.
9. ALL UPGRADES REQUIRED FIRE DEPARTMENT APPROVAL.
10. IF FIRE DEPARTMENT REQUIRES A TAMPER SWITCH, APPLICANT SHALL SIGN A HOLD HARMLESS AGREEMENT WITH WATER AND SEWER UTILITIES PRIOR TO INSTALLATION.

- (*) 14" TO 18" FOR MODEL:
 WILKINS 450DA (DCDA)
 WILKINS 375DA, 475DA (RPDA)
 FEBCO LF876V (DCDA)
18" TO 24" FOR MODEL:
 WATTS LF909 (RPDA)



Drawn By: **DUC L.**
 Checked By: **TANISHA W. / JOHN S.**
 Approved By: **SHILPA M. / TERRY W.**
 Revised Date: **NOVEMBER 2017**

Signature: 
 Director of
 Water and Sewer Utilities

CITY OF SANTA CLARA
WATER AND SEWER UTILITIES - STANDARD NO. 31
UPGRADE EXISTING 4" - 10" FIRE SERVICE ASSEMBLY
(WITH ABOVE-GRADE BACKFLOW DETECTION ASSEMBLY)

**Standard No. 31 – Upgrade Existing 4"-10" Fire Service Assembly
(with Above Grade Backflow Detection Assembly) – Material List**

Domestic Products Only.

Use 316 stainless steel bolts, flange gasket with EPDM rubber, nuts, and washers for all bolted connections.

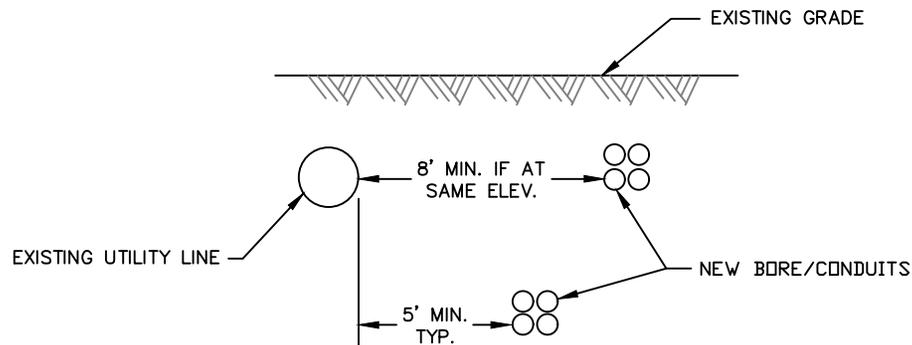
Coat above ground fire service shall be painted fire safety red.

Provide 5-foot clearance around service above ground.

Material	Description	Manufacturer	Model
1. Polywrap	Blue. 8 mil low density or 4 mil high density polyethylene film installed per AWWA C105. Tape ends to pipe with 10 mil tape.		
2. Pipe	Mechanically restrain all joints. -Ductile iron, cement lined Class 50. Protect with polywrap for underground pipe.	US Pipe Pacific States	
3. Retaining Gland	Joint restraint for use with mechanical joint fittings. Size as specified.	US Pipe (not allowed above ground)	MJ Field Lok, High Max, Romac
		EBAA	Megalug Series 1100
		Unflange	Series 1400 (DIP)
4. 90 Degree Bend with mechanical joint	AWWA C-153 ductile iron with mechanical joint, cement lined with stainless steel bolts and gaskets	US Pipe Tyler Union	
5. Riser	Ductile iron, class 50 minimum.		
6. MJ x Flange Adapter	AWWA C-153 ductile iron.	Tyler Union	#5-158
		Trinity / USP	With megalug restraining gland
7. Double Check Detection Assembly Reduced Pressure Principle Backflow Detection Assembly	Includes gate valves and bypass (leak detection) Badger meter. Provide Elster transmitter compatible encoded register with Nicor connector. All registers to be facing inlet and provide cubic feet reading.	Wilkins	450DA
		FEBCO	LF876V
	Includes gate valves and bypass (leak detection) Badger meter with Elster transmitter compatible encoded register with Nicor connector. Meter register to be facing inlet and provide cubic feet reading. Each RP to have separate serial number.	Watts	LF909 RPDA with Rising Stems
Wilkins		375DA, 475DA	
*(Unit to be determined by City)			

HORIZONTAL CLEARANCE

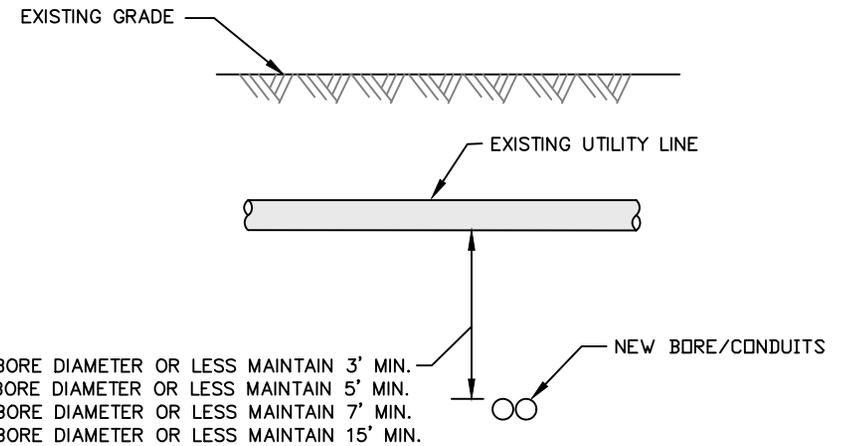
N.T.S



IF LESS THAN 5' HORIZONTAL CLEARANCE, MAINTAIN 5' MIN. VERTICAL CLEARANCE FROM UTILITIES

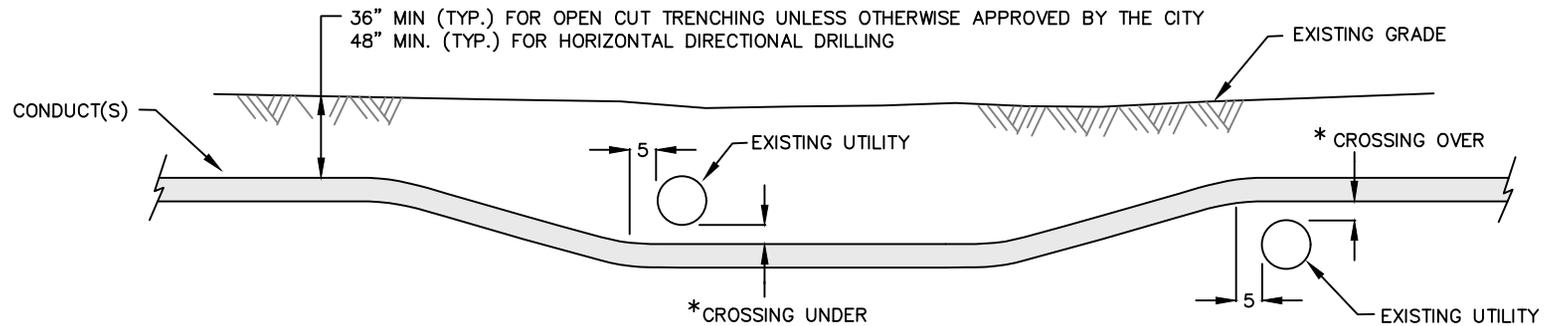
VERTICAL CLEARANCE

N.T.S



TYPICAL UTILITY CROSSING DETAIL

N.T.S



- * - CROSSING 24" MIN OVER OR UNDER FIBER MARKING TAPE.
(SAND SLURRY ASPHALT OR ROCK ASPHALT).
- 24" MIN. VERTICAL CLEARANCE (TYP.) FOR OPEN CUT TRENCHING
- 60" MIN. VERTICAL CLEARANCE (TYP.) FOR HORIZONTAL DIRECTIONAL DRILLING

NOTE:

EXISTING UTILITY = WATER, RECYCLED WATER, SEWER



Drawn By: **DUC L.**

Checked By: **TANISHA W. / JOHN S.**

Approved By: **SHILPA M. / TERRY W.**

Revised Date: **NOVEMBER 2017**

Signature:

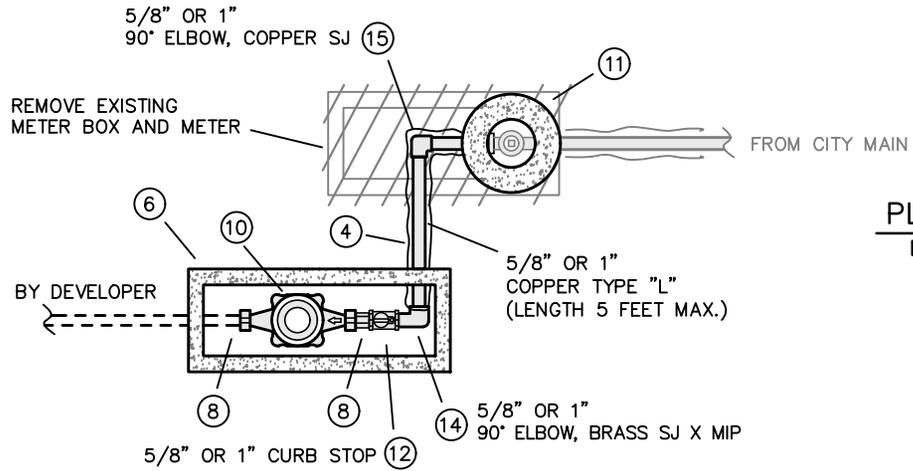
[Handwritten Signature]

Director of
Water and Sewer Utilities

CITY OF SANTA CLARA
WATER AND SEWER UTILITIES - STANDARD NO. **32**

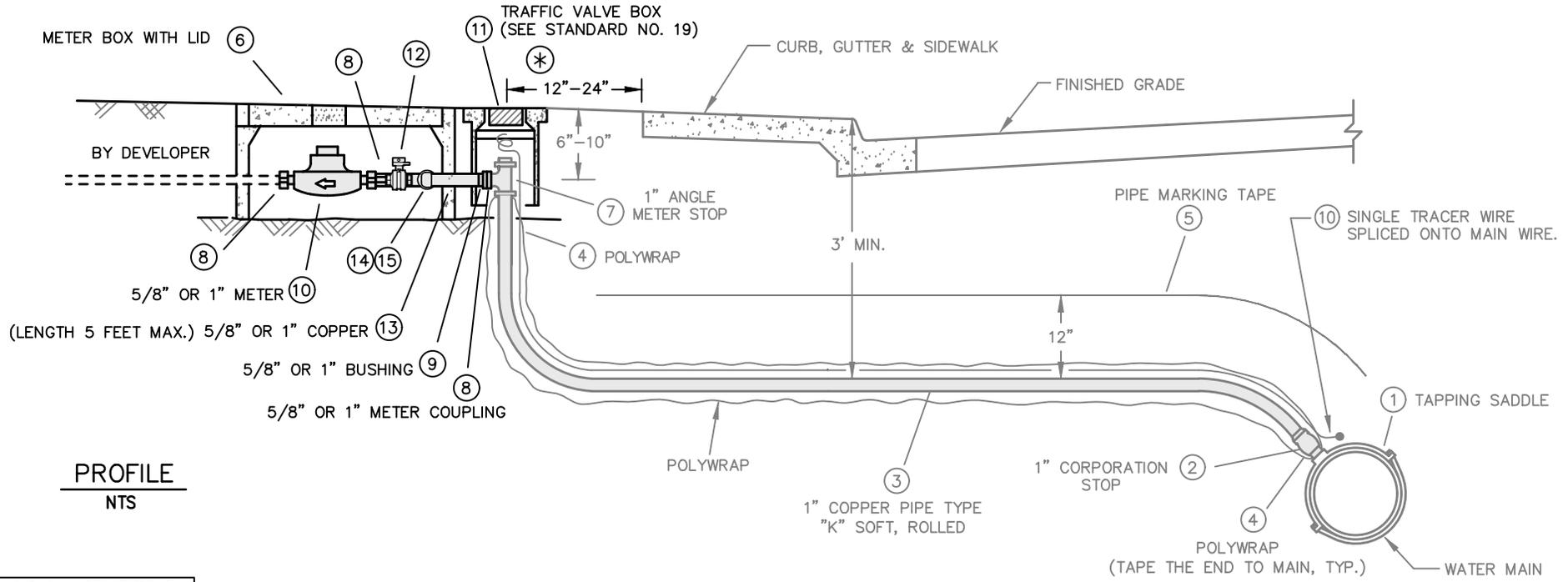
CLEARANCE FROM EXISTING UTILITIES

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PLAN
NTS

⊛ 12" FROM BACK OF WALK (FOR A 5' OR WIDER SIDEWALK)
24" FROM BACK OF WALK (FOR A 4' SIDEWALK)



PROFILE
NTS

Updated Date: 05/17/2018



Drawn By: DUC L.
 Checked By: TANISHA W. / JOHN S.
 Approved By: SHILPA M. / TERRY W.
 Revised Date: NOVEMBER 2017

Signature: *[Handwritten Signature]*
 Director of
 Water and Sewer Utilities

CITY OF SANTA CLARA
 WATER AND SEWER UTILITIES - STANDARD NO. 33

WATER SERVICE OFFSET

Standard No. 33 – Water Service Offset – Material List

Domestic Products Only. Use no lead products for domestic water services.

Material	Description	Manufacturer	Model
1. Tapping Saddle	For PVC C900, bronze saddle, specified pipe size x 1” AWWA/CC Tap	Ford	202BS
	For ductile iron, cast iron, ACP: single strap bronze, specified pipe size x 1” AWWA/CC Tap	Ford	101B
		Mueller	BRIB
2. Corporation Stop	1" AWWA/CC thread inlet x compression outlet	Mueller	B-25008N
		Ford	FB-1000-4-G-NL
For locations requiring insulated corporation stops, use Mueller N-35008 insulated corp ball valve			
3. Copper Tubing	1" ASTM B88, type K soft rolled tubing		
4. Polywrap	Blue. 8 mil low density or 4 mil high density polyethylene film installed per AWWA C105. Tape the end to main.		
5. Pipe Marking Tape	Blue. 3” wide, 4 mil, non-detectable.		
6. Meter Box with Lid	Lid marked "Water" or “Water Meter”	Christy	B-16 box with B-16G lid
7. Angle Meter Stop	1" Compression inlet x FIP outlet.	Ford	BA41-444 W-G-NL
8. Meter Coupling	1" include gaskets.	Ford	C38-44-X-NL (X=to fit)
		Mueller	H-10871N
9. Meter Bushing	Brass. To adapt 5/8" meter to 1” meter coupling	Mueller	H-10889N
		Ford	A34S-NL include gasket
10. Water Meter & Register (manufacturer's test results are to be submitted with all meters).	Provide Elster transmitter compatible encoded register with Nicor connector. All registers to be facing inlet and provide cubic feet reading.		
	5/8" meter and register.	Badger	LP
	1" meter and register.	Badger	E-SERIES
		Sensus	SR II
11. Traffic Valve Box with Lid	Lid marked "Water" or “Water Meter”	Tyler Union	G-5
12. Curb Stop	Brass Curb Stop clockable		
13. Copper MIP	MIP x sweat joint (SJ)		
14. 90 Degree Brass Elbow	Brass, FIP		
15. 90 Degree Copper Elbow	Copper sweat joint (SJ)		

SECTION 02071

WATER MAINS AND SERVICES

1.0 GENERAL

1.1 SCOPE OF WORK

The work shall include the furnishing of all labor, materials, tools, equipment, and incidentals required to construct and complete in an efficient and workmanlike manner the installation of public water mains and related facilities in accordance with the Plans and Specifications. Public water facilities include but are not limited to all those facilities including the water main, valves, fittings and appurtenances complete in-place to the back of meters and/or backflow prevention devices. All materials to be domestic made.

1.2 ADDITIONAL DEFINITIONS AND TERMS

Refer to Section 00050 of the General Provisions for definitions and terms. In addition, the following definitions and terms are used herein.

- A. "A.S.T.M." shall mean the American Society for Testing and Materials.
- B. "AWWA" shall mean the American Water Works Association, and it is intended that the current requirements of their standards shall govern throughout, unless otherwise herein specified. Such AWWA requirements shall be used in their entirety unless otherwise noted.
- C. "DDW" shall mean Department of Drinking Water.
- D. "Engineer" shall mean the Director of Water & Sewer Utilities of the City of Santa Clara, or designee.

2.0 MATERIALS

2.1 DUCTILE IRON PIPE

Ductile iron pipe shall be Pressure Class 350 conforming to AWWA Standards C150 and C151.

Unless otherwise specified in the special provisions, ductile iron pipe shall receive an asphaltic coating as specified in AWWA Standard C151 and a cement lining conforming AWWA Standard C104. Ductile iron pipe and fittings shall be wrapped with an approved polyethylene encasement per AWWA Standard C105.

All ductile iron pipe joints shall be mechanically restrained. Mechanically restrained joints shall be "TR FLEX" Restrained Joint or Tyton pipe with Field-Lok gaskets by U.S. Pipe, Flex-Ring or Lok-Ring Restrained joints by American Ductile Iron Pipe, or equal. As an alternative, joints may be restrained with EBAA Iron Megalug restraints, Tyler MJ field loc restraints or equal.

Mechanical joint bell, flange, bolts, follower gland-sealing gasket and accessories shall conform to the requirements of AWWA Standard C-111. Bolts shall be Type 316 stainless steel, Class 2, conforming to ASTM A193 for bolts and ASTM A194 for nuts.

All rubber gaskets and rings shall be ethylene propylene diene monomer (EPDM).

2.2 POLYVINYLCHLORIDE PIPE

Polyvinylchloride pipe (PVC) shall conform to the requirements of the latest revision of the AWWA Standards C900 and C905, and shall be minimum of Pressure Class 200 psi and dimension ratio of 14, ductile iron pipe equivalent outside diameter and rubber ring mechanical joints. Recycled water pipes shall be purple or wrapped with purple polywrap.

2.3 DUCTILE IRON FITTINGS

Ductile iron compact mechanical joint fittings shall be used on all ductile iron and polyvinylchloride pipelines and shall conform to AWWA Standard C153, latest revision, in material, body thickness, and radii of curvature. Mechanical joint fittings shall be cement-lined in accordance with AWWA Standard C104, latest revision. Flange ends, except as required by the Plans or the Water and Sewer Utilities Standard Drawings, may be substituted only after approval of the Engineer. Ductile iron fittings shall be wrapped with an approved polyethylene encasement per AWWA Standard C105.

2.4 GATE VALVES

Gate valves shall be interior and exterior epoxy-coated, resilient seat gate valves with 316 stainless steel fasteners and trim, non-rising stem, open left, two-inch (2") square wrench nut and with 316 stainless steel retainer nut inside, in accordance with AWWA Standards C509 and C550. All rubber material shall be EPDM. The valves shall have ends designed to join directly with the type of pipe or fitting being used or with ends called for on the Plans.

2.5 VALVE BOXES

Gate valve boxes shall be per the Water and Sewer Utilities Standard Drawings. Covers shall be marked "Water" for potable water boxes, "Recycled" or "Recycled Water" for recycled water boxes. Valve risers shall be a single length of eight-inch (8") diameter polyvinylchloride pipe - SDR 35.

2.6 BLOWOFF BOXES

Valve boxes for manual blowoff assemblies shall be the same as item number 2.5 VALVE BOXES. Covers shall be marked "Water" for potable water boxes, "Recycled" or "Recycled Water" for recycled water boxes.

2.7 FIRE HYDRANTS

Fire hydrants shall be furnished with buries with inlets that shall be mechanical joint. All hydrants shall be fusion epoxy-lined on the interior and the exterior shall be coated pursuant to Water and Sewer Utilities Standard Drawings. All hydrants

shall have National Standard hose threads on outlets and 1-1/8" pentagonal tips on caps and valve stems. Hydrant bury shall be 30" to 48" long with 6" inlet.

2.8 HYDRANT RISER (EXTENSION)

Hydrant risers or extension shall be with localized breakoff scoring on the exterior near each flanged end. Break-off bolts shall be hollow.

2.9 FLANGES

Steel pipe flanges shall conform to the requirements of AWWA Standard C207, Class D. Bolts shall be Type 316 stainless steel, Class 2, conforming to ASTM A193 for bolts and ASTM A194 for nuts. Flange and bolt coatings shall match adjacent pipe. Gaskets shall be full face rubber.

2.10 INSULATING FLANGED JOINTS

Each insulating flange set shall consist of a full-face central gasket, a full length sleeve for each flange bolt, and two insulating washers with two steel washers for each bolt. The ring type central gasket shall be 1/8" thick sheet packing, having a high dielectric constant. Bolt sleeves shall be plastic (polyethylene) and insulating washers shall be constructed of fabric reinforced phenolic resin. The complete assembly shall have an ANSI pressure rating equal to that of the flanges between which it is installed.

2.11 CASINGS FOR WATER MAINS

Steel casings utilized for boring and jacking for water mains shall be smooth steel pipe conforming to AWWA C200, fabricated in sections for welded field joints and be the size shown on the Plans. Field joints shall be full circumferential welded butt joints.

2.12 CASING INSULATORS

Insulators utilized for electrical isolation shall be 12" wide, two-piece steel band type. Each insulator shall have an insulating liner with a thick retainer type edge to isolate the steel bands from the carrier pipe. Insulating runners shall be 1" wide steel capped with molded rubber or polyester fiberglass. Insulator spacing shall be determined by the Contractor according to manufacturer's recommendations for each pipeline alternate and approved by the Engineer. The outside diameter of the casing insulator skirts shall be sufficient height to isolate all portions of the carrier pipe from the casing.

2.13 CASING END SEALS

After installation of the carrier pipe and sand is blown to fill the annular space, the ends of the casing shall be sealed. End seals shall be pull-on type, S-shaped, constructed of 1/8" minimum highly flexible synthetic rubber. Each end seal shall be furnished with two 1/2", 14-gauge stainless steel bands for banding the seal to the casing and carrier pipe.

2.14 EPOXY COATINGS

Epoxy coatings for fittings when required in the project Plans and Specifications shall be 8 mils minimum thickness fusion epoxy and shall be subjected to thickness and discontinuity (holiday) testing at the discretion of the Engineer. The application of the coating and preparation of the substrate shall be in accordance with the manufacturer's recommendations.

2.15 PORTLAND CEMENT CONCRETE

Portland cement concrete for hydrant bases; thrust blocks and anchors shall conform to the requirements of Section 90, "Portland Cement Concrete," of the Standard Specifications and specified herein. The concrete shall be Class "B" containing six (6) sacks of Portland cement per cubic yard of concrete. The grading of the combined aggregate shall conform with the requirements of three quarter inches (3/4") maximum. The addition of calcium chloride for high early strength concrete shall not be permitted. See standard details for required slump.

2.16 BITUMASTIC

Bitumastic for coated couplings, rods, fittings and joints shall conform to the requirements of Bureau of Reclamation Specification CA-50.

2.17 TRACER WIRE

Tracer Wire for all pipes shall be RHW #12 AWG solid, taped to the top of the water main with 12" min. slack inside all valve boxes. For connection to existing trace wires, place wires in water-proof direct bury wire connector, 3M #9756 or bulk pack #dbr-6.

2.18 POLY WRAP

All pipes wrapped with polyethylene. Poly Wrap shall be 8 mil low-density or 4 mil high-density polyethylene film installed per AWWA Standard C105. Purple poly wrap shall be used for recycled water pipes.

2.19 PIPE MARKING TAPE

3" width, 4 mil, non-detectable

- For potable water mains and services, use blue tape.
- For recycled water mains and services, use purple tape.

2.20 NUTS, BOLTS & WASHERS

Use 316 stainless steel bolts, nuts, and washers for all bolted connections. Bolts shall be Type 316 stainless steel, Class 2, conforming to ASTM A193 for bolts and ASTM A194 for nuts.

2.21 CHLORINE

Hypochlorite shall conform to AWWA Standard B300.

2.22 MISCELLANEOUS SERVICES

Material for water services shall comply with the Water and Sewer Utilities Standard Drawings.

2.23 APPROVAL OF EQUIVALENTS

If materials other than those specified on the Plans or these Specifications are to be considered, a description, including manufacturer's specifications, shall be supplied to the Engineer or Water and Sewer Utilities Inspector for evaluation. Only those materials which are compatible with the existing water system and have the City's written approval will be allowed.

3.0 CONSTRUCTION METHODS

Trench excavation, backfill, imported bedding material, imported backfill, drainage and water, pavement replacement shall be as specified in Section 02062: FURNISHING AND INSTALLING PIPE of the Technical Provisions except that there shall be four inch minimum sand bedding in the bottom of the trench and a minimum of twelve inches of sand over the top of the water pipe.

The Contractor shall give two (2) working days' notice to the City's Water and Sewer Utilities when making connections to existing water facilities. At all times, the manipulation of existing valves shall be done by City Water and Sewer Utilities personnel.

3.1 HANDLING OF MATERIALS

Water pipe, fittings, hydrants and valves must be carefully handled at all times. Only suitable and proper equipment and appliances shall be used for the safe loading, hauling, unloading, handling and placing of materials. Special care shall be exercised so that the coating on pipe, valves and fittings will not be damaged. If such damage should occur, the coating shall be repaired to the satisfaction of the Engineer or Water and Sewer Utilities Inspector. Chain slings will not be permitted. Pipe loaded on trucks or stacked one upon another shall be supported on wooden blocking. Pipe handled on skidway shall not be skidded or rolled against pipe already on the ground.

3.2 PIPE LAYING

All pipes shall be laid to conform to AWWA Standards C600 and C603. All pipes shall be laid true to line and grade as shown on the Plans or as directed by the Engineer to pass existing obstructions. Before any length of pipe is laid, it shall be carefully inspected for defects. No pipe or other material which is cracked or shows other defects shall be installed.

Clearances

- A. Two feet minimum vertical clearance for open trench construction between water and recycled water mains and services and other facilities unless otherwise noted on the plans.
- B. Five feet minimum vertical clearance for horizontal directional boring construction between water and recycled water mains and services and

other facilities unless otherwise noted on the plans.

- C. Ten feet minimum horizontal clearance between water and recycled water mains and services and sanitary mains and services and trees. Clearance is measured from outside edge of pipe to outside edge pipe.
- D. Five feet minimum horizontal clearance between water and storm mains and laterals and other general utilities or facilities. Clearance is measured from outside edge of pipe to outside edge pipe or facility.

All pipe valves and fittings must be carefully wiped out and cleaned, as they are being laid so that no earth or rubbish may become lodged inside. Every open end of installed pipe shall be capped or plugged with an approved fitting at all times when work is suspended, at the close of the workday and as directed by the Engineer or Water and Sewer Utilities Inspector.

Pipe must be given a solid, uniform bearing in the bottom of the trench. Blocking or supporting pipe on earth mounds will not be permitted. Whenever it is necessary to use a short length of pipe at a fitting or valve, the minimum length shall be thirty-two inches (32"). If it is necessary to cut pipe, said cut shall be made with an approved pipe cutter.

No deflection will be permitted at joints where water pipe is joined to cast iron fittings or valves. In all other cases, deflections will be permitted up to the maximum allowed by the manufacturer's recommendation.

A minimum of type RHW insulated #12 AWG solid copper wire shall be installed in the trench with non-metallic pipe and spliced to any existing tracer wire. For connection to existing trace wires, place wires in water-proof direct bury wire connector, 3M #9756 or bulk pack #dbr-6. The wire shall be insulated and shall be laid along the top of the pipe. The wire shall be installed so that there is no direct contact between the copper and any other metal in the trench.

3.3 JOINTS

All joints shall be assembled to conform to AWWA Standards C600 and C603. All joints shall be water tight and shall be made by competent workers. Unless otherwise specified on the Plans or in these Specifications, joints may be of any of the types listed below which are consistent with the type of pipe being used, except that joints shall in no case be caulked with cement.

3.4 WORKING INVOLVING ASBESTOS-CEMENT PIPE

Field cutting and machining operations involving asbestos-cement pipe shall be in compliance with OSHA Asbestos Standards.

Power-driven saws and abrasive discs shall not be used for the dry cutting or beveling of asbestos-cement pipe.

Pressure or "wet" tapping of asbestos-cement pipe shall be positive purge, blowoff or other type that allows pipe cuttings to be flushed from the pipe.

3.5 MECHANICAL JOINTS

The last eight inches (8") of the outside of the spigot and inside of the bell of mechanical joints shall be thoroughly cleaned of all foreign material. Mechanical joints shall be installed according to the manufacturer specifications.

3.6 SETTING VALVES, FITTINGS AND HYDRANTS

Gate valves shall be set with stems in vertical position and provided with valve boxes. Gate valves shall be anchored as shown on the Plans or the Water and Sewer Utilities Standard Drawings.

Fire hydrants and fire hydrant connections shall be installed where indicated on the Plans, except where the Engineer directs that they shall be relocated to avoid an obstruction. The Contractor shall make such relocations at the time of reconstruction and without additional compensation. Each hydrant shall be installed in accordance with the Water and Sewer Utilities Standard Drawings for hydrants or as shown on the Plans.

3.7 CONNECTION TO EXISTING MAINS

The Contractor shall make connections to existing mains where indicated on the Plans. The newly installed facilities are to be kept isolated from the City system until bacteriologically acceptable. If isolation is provided by a closed gate valve, pressure testing for leakage in the new facilities shall only be conducted after bacteriological acceptance.

The Engineer shall designate method and sequence of connecting to existing mains to minimize contamination danger. Connections to existing valves prior to obtaining satisfactory leakage and pressure tests of the new facilities shall be at the Contractor's risk.

The City will assume no responsibility for the water tightness of existing valves. Service in existing mains can be interrupted only upon authorization of the Engineer, who will specify time and duration of the outage. The Contractor shall notify all affected users in writing at least forty-eight (48) hours in advance of service interruption using printed forms provided by the City. The Contractor shall notify the City's Water and Sewer Utilities personnel at least four (4) business days in advance to schedule valve closing for service interruption. Manipulation of new or existing valves shall only be done by City Water and Sewer Utilities personnel.

Developments using one water service (single feed) into the property may use standard no. 11.

Developments using a looped system (multiple feeds) shall use standard no. 2.

3.8 COMBINATION AIR RELIEF / VACUUM VALVES AND BLOWOFFS

Combination Air relief / vacuum valve and blowoff assemblies shall be located as shown on the Plans and installed in accordance with the Water and Sewer Utilities Standard Details.

3.9 PAINING

All metals anodic to ductile iron that are not adequately protected against corrosion by a suitable protective coating shall be carefully cleaned and given a suitable protective coating of a good quality bitumastic coating. This coating shall be allowed to cure before the material is covered with polyethylene wrap or backfill material.

All valves, flexible coupling adapters, and flexible couplings shall be fusion epoxy coated pursuant to Section 2.14 and shall be subjected to thickness and discontinuity (holiday) testing at the discretion of the Engineer.

Bolts, nuts, washers, and any other metallic elements exposed to the soil shall be coated with bitumastic in accordance with Paragraph C-20, entitled "Bitumastic", of these Standard Provisions.

All Water services shall be painted Mission Sand Syn Lusto Dunn Edwards (#10-L, 11-789-04 Santa Clara Mission Sand), or approved equal.

All Fire services shall be painted fire safety red.

All Recycled water services shall be painted purple (PANTONE 512).

3.10 THRUST BLOCKING OR JOINT THRUST RESTRAINTS

Thrust blocks and anchor blocks shall conform to Water and Sewer Utilities Standard Drawings or as directed by the Engineer or Water and Sewer Utilities Inspector.

3.11 INSULATING FLANGED JOINTS

All insulating components of the insulating flanged gasket set shall be cleaned of all dirt, grease, oil and other foreign materials immediately prior to assembly. Bolt holes in mating flanges shall be properly aligned at the time bolts and insulating sleeves are inserted to prevent damage to the insulation. After flanged bolts have been tightened, each insulating washer shall be inspected for cracks or other damage. All damaged washers shall be replaced. After assembly, resistance between each bolt and flange shall be measured with an approved ohmmeter, and the minimum resistance shall be 50,000 ohms. Where the insulating joint is assembled in the shop and shipped as a unit, resistance shall be measured in the shop between the flanges and between each bolt and flange, and shall meet the above requirements. All insulating flanged joints shall be coated as shown on the Water and Sewer Utilities Standard Drawings and specified herein.

3.12 PRESSURE TESTS

Each run of pipe between two (2) sectionalizing valves or between a valve and a cap or plug or as directed by the Engineer shall be tested for leakage. Only one (1) run of pipe shall be tested at a time, but the pressure may be applied through sections of pipe already tested. Services and fire hydrant runs may be tested individually or with the sections of water main. It is the intention of these tests to test the water tightness of the closed gate valves as well as the piping.

The Contractor shall furnish all necessary equipment and labor to perform the pressure tests.

The hydrostatic test pressure shall be two hundred (200) pounds per square inch, based on the elevation of the lowest point of the section under test and corrected to the elevation of the test gauge.

The test pressure shall be maintained for not less than two (2) hours. No pressure drop is permissible. The Contractor shall at his own expense take whatever steps are necessary to eliminate the leakage, after which the test shall be repeated as often as necessary until acceptable results are obtained.

3.13 DISINFECTING AND FLUSHING WATER LINES

Disinfecting of the completed work, including all pipelines, valves, and fittings, shall be performed by the Contractor, who will supply all materials, equipment, supplies and labor required for the operation. The required concentration of chlorine throughout the main is fifty (50) parts per million. The pipe line shall be disinfected in accordance with AWWA Standards B300 and C651, and as specified as follows:

A. LIQUID CHLORINE SOLUTION METHOD

Flush all foreign matter from mains, branch runs, hydrant runs and installed services. Introduce liquid chlorine solution at appropriate locations to assure uniform distribution through the facilities at the proper concentration. The sanitizing solution shall be retained in the facilities for a period of twenty-four (24) hours, after which each service, hydrant run, branch run and dead end shall be flushed until the residual chlorine is less than one (1) part per million or is no greater than the concentration of chlorine in the water supplied for flushing.

B. HTH TABLET METHOD

Tablets are to be fastened to the inside top surface of each length of pipe using a food-grade adhesive at time of pipe laying. Tablets shall not be available at any time for casual pilferage by the general public or by children. The new facilities are to be slowly filled with water. Air is to be exhausted from each dead end, branch run, hydrant run and installed service. Retain water for a period of twenty-four (24) hours, after which each service, hydrant run, branch run and dead end shall be thoroughly flushed to clear foreign matter and until the residual chlorine concentration is less than one (1) part per million or is no greater than the concentration of chlorine in the water supplied for flushing.

It shall be unlawful to discharge any chlorinated water from the flushing operations into any storm drain or natural outlet or channel without a valid National Pollution Discharge Elimination System permit. The Contractor shall discharge the chlorinated water into a sanitary sewer manhole or other approved opening in a City sanitary sewer collection system. No person shall discharge any liquid having a pH lower than six (6) or more than twelve and one-half (12.5) into the sanitary sewer system.

3.14 BACTERIOLOGICAL TESTING

Samples shall be gathered and tests conducted by City. Samples shall be taken at representative points as required by the Engineer.

The new facilities shall remain isolated and out of service until satisfactory test results have been obtained which meet the requirement of the Division of Drinking Water and the Engineer has accepted the results as indicative of the bacteriological condition of the facilities. If unsatisfactory or doubtful results are obtained from the initial sampling, the disinfection process shall be repeated until acceptable test results are reported. The follow-up sampling costs shall be borne by the Contractor.

3.15 BACKFILL

Sand shall be clean and free from clay and organics. It shall be a clean, hard, durable material resulting from natural disintegration and abrasion of granite, quartz, or similar hard rock or by the processing of completely friable sandstone. It shall have a sand equivalent value of not less than 35. The percentage composition by weight as determined by laboratory sieves shall conform to the following grading limits or approved equal:

Quail Hollow Utility/Trench Sand (#271)

<u>Sieve Size</u>	<u>Quail Hollow Utility Sand (% Passing)</u>
1/2"	100
#4	100
#8	99
#16	96
#30	87
#50	57
#100	12
#200	4
Organic Impurities:	Lighter than Plate 3
Sand Equivalent:	70
pH:	7.8
Chloride Content:	2.2 ppm
Sulfate Content:	9.6 ppm
Coefficient of Uniformity:	2.3
Resistivity (ohms-cm):	48,000

4.0 ABANDONMENT METHOD

4.1 WATER MAIN ABANDONMENT:

Water and Sewer Utilities inspector (Office: 408-615-2053) shall be notified prior to abandonment of any water facility to coordinate the water main shutoff and inspect the abandonment. The location of any pipe cut shall be determined in the field with the Water inspector. It is the contractor's responsibility to expose the existing water main and prepare the site for the abandonment. The following steps summarize a basic water main abandonment procedure. Additional requirements may be directed by the Water inspector during construction:

- Isolate the main in the location of the abandonment. City to operate water valves on the existing main.
- Remove the tee connection (if applicable) and use an appropriately sized plain piece of pipe and two restrained couplings to restore the pipe as required by Water inspector.
- Cut the abandoned main two feet minimum away from the active main (a section removed) to allow for further separation between the active and abandoned mains. The abandoned main shall be filled with slurry or sand. The pipe ends shall be securely sealed with a watertight plug of concrete at least one foot thick (concrete cap).
- A concrete thrust block shall be poured between the cap and the abandoned main
- Polywrap shall be placed over all metallic fittings on the active main and mastic shall be placed over all stainless steel bolts.
- Backfill and restore the roadway in accordance with City standards when the abandonment work is complete.

4.2 SMALL WATER SERVICE (2" AND SMALLER) ABANDONMENT

Water and Sewer Utilities inspector (Office: 408-615-2053) shall be notified prior to abandonment of any water facility to coordinate the water main shutoff and inspect the abandonment. The location of any pipe cut shall be determined in the field with the Water inspector. It is the contractor's responsibility to expose the existing water main and prepare the site for the abandonment. The following steps summarize a basic water service abandonment procedure. Additional requirements may be directed by the Water inspector during construction:

- Shut off the corporation stop. Cut the corporation stop at the nut and remove the service line, then cap at the nut.
- At the water main connection, place 10mil PVC tape over the corporation stop.
- The copper service line to remain in the ground, shall be cut two feet below finished grade at the meter location.
- Contractor to remove all water services and coordinate with the Water inspector to salvage the water meters and backflow prevention devices back to the City. After the services are removed, remove the entire meter box/vault, backfill the excavation, and restore surface in accordance with City standards and requirements.
- Backfill and restore the roadway, as needed, in accordance with City standards when the abandonment work is complete.

4.3 LARGE WATER SERVICE (3" AND LARGER) ABANDONMENT

Water and Sewer Utilities inspector (Office: 408-615-2053) shall be notified prior to abandonment of any water facility to coordinate the water main shutoff and inspect the abandonment. The location of any pipe cut shall be determined in the field with the Water inspector. It is the contractor's responsibility to expose the existing water main and prepare the site for the abandonment. The following steps summarize a basic water service abandonment procedure. Additional requirements may be directed by the Water inspector during construction:

- Isolate the main in the location of the service abandonment. City to operate water valves on the existing main.
- Remove the gate valve and tee connection (if applicable) and use an appropriately sized plain piece of pipe and two restrained couplings to restore the pipe as required by Water inspector.
- Cut the abandoned service two feet minimum away from the active main (a section removed) to allow for further separation from the abandoned service. The abandoned service shall receive a solid sleeve on both ends.
- Polywrap shall be placed over all metallic fittings on the active main and mastic shall be placed over all stainless steel bolts.
- At the service box, remove all piping two feet below the finished grade and plug the ends of the remaining pipe in the ground with six inches of concrete.
- Contractor to remove all water services and coordinate with the Water inspector to salvage the water meters and backflow prevention devices back to the City. After the services are removed, remove the entire meter box/vault, backfill the excavation, and restore surface in accordance with City standards and requirements.
- Backfill and restore the roadway, as needed, in accordance with City standards when the abandonment work is complete.

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