

WOODLAND WATER STANDARDS SHEET INDEX

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WATER STANDARDS - SHEET INDEX

APPROVED

Bart Stupp 11/21/12

PUBLIC WORKS DIRECTOR DATE

REVISIONS

DATE

DRAWN

DESIGNED

W-00



GENERAL NOTES FOR WATER MAIN INSTALLATION

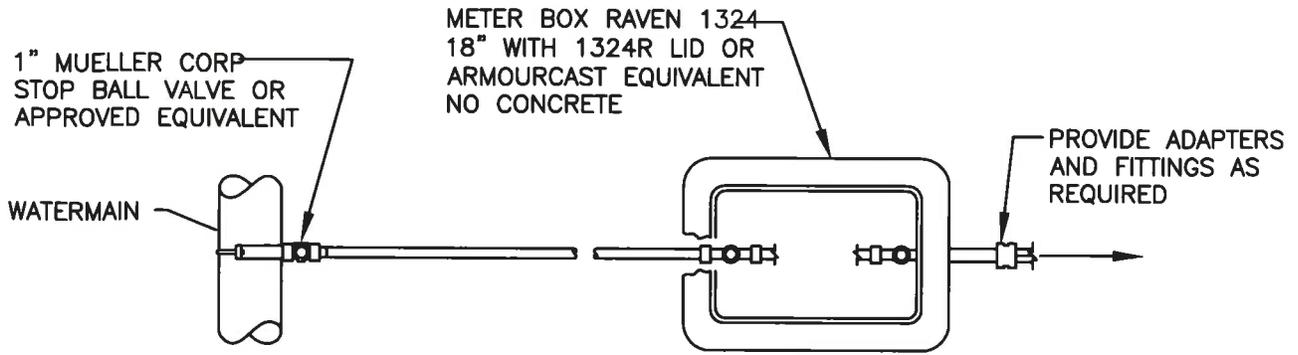
1. ALL WORKMANSHIP AND MATERIAL SHALL BE IN ACCORDANCE WITH THE WSDOT/APWA STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION HEREIN IDENTIFIED AS THE "STANDARD SPECIFICATIONS", AND AWWA SPECIFICATIONS, EXCEPT AS MODIFIED BELOW OR BY CITY OF WOODLAND STANDARD DETAILS.
2. A PRE-CONSTRUCTION MEETING SHALL BE HELD WITH CITY OF WOODLAND AT LEAST 48-HOURS PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE CONSTRUCTION SCHEDULES AND TRAFFIC CONTROL PLANS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. PROPOSED "EQUIVALENTS" MUST BE SUBMITTED TO THE CITY OF WOODLAND FOR APPROVAL.
3. THE CONTRACTOR SHALL NOTIFY THE CITY PUBLIC WORKS DEPARTMENT AT (360) 225-7999, 48-HOURS PRIOR TO LIVE TAPS OR OTHER CONNECTIONS TO EXISTING WATERMAINS. WHERE CONNECTIONS REQUIRE SHUT-DOWN OF SERVICE, CONNECTION POINTS WILL BE EXPOSED FOR "FIELD VERIFICATION" BY CONTRACTOR AND CONNECTION DETAILS SHALL BE VERIFIED 48 HOURS PRIOR TO DISTRIBUTING SHUT-DOWN NOTICES.
4. CALL UNDERGROUND LOCATE AT 811 A MINIMUM OF 48-HOURS PRIOR TO ANY EXCAVATIONS.
5. UNLESS OTHERWISE ESTABLISHED IN WRITING BY THE CITY, ALL WATER MAINS SHALL BE STAKED FOR GRADES AND ALIGNMENT BY AN ENGINEERING OR SURVEYING FIRM CAPABLE OF PERFORMING SUCH WORK.
6. EXISTING VALVES AND ANY VALVES INSTALLED DIRECTLY TO AND CONNECTED TO A PORTION OF ACTIVE WATER SYSTEM ARE TO BE OPERATED BY CITY OF WOODLAND REPRESENTATIVES ONLY.
7. WATER MAINS SHALL BE PVC IN ACCORDANCE WITH AWWA C900, PRESSURE CLASS AS SPECIFIED ON DRAWINGS OR DUCTILE IRON PRESSURE CLASS 50 OR AS NOTED ON DRAWING.
8. ALL LINES SHALL BE CHLORINATED AND TESTED IN CONFORMANCE WITH THE STANDARD SPECIFICATIONS PRIOR TO USE.
9. HARD COPY AND ELECTRONIC "AS-BUILT" DRAWINGS SHALL BE SUBMITTED TO CITY OF WOODLAND UPON COMPLETION OF THE WORK.
10. ALL WATERMAINS, FIRE HYDRANTS, BLOW OFF ASSEMBLIES, VACUUM BREAKERS, AND WATER SERVICES MUST HAVE LOCATE WIRE INSTALLED.



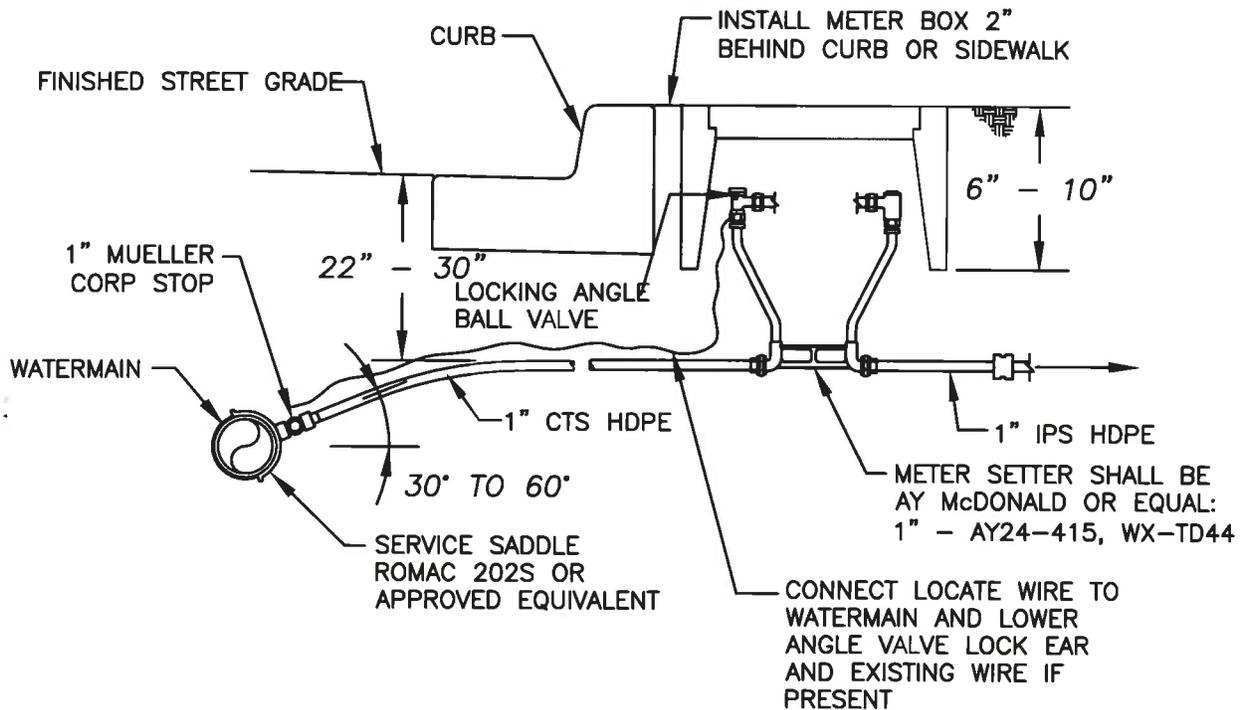
GENERAL NOTES FOR WATER MAIN INSTALL

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<i>Bob Stupa</i> 11/21/12				
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W-01



PLAN VIEW

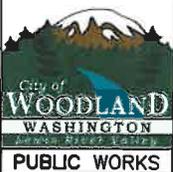


SECTION VIEW

NOTES:

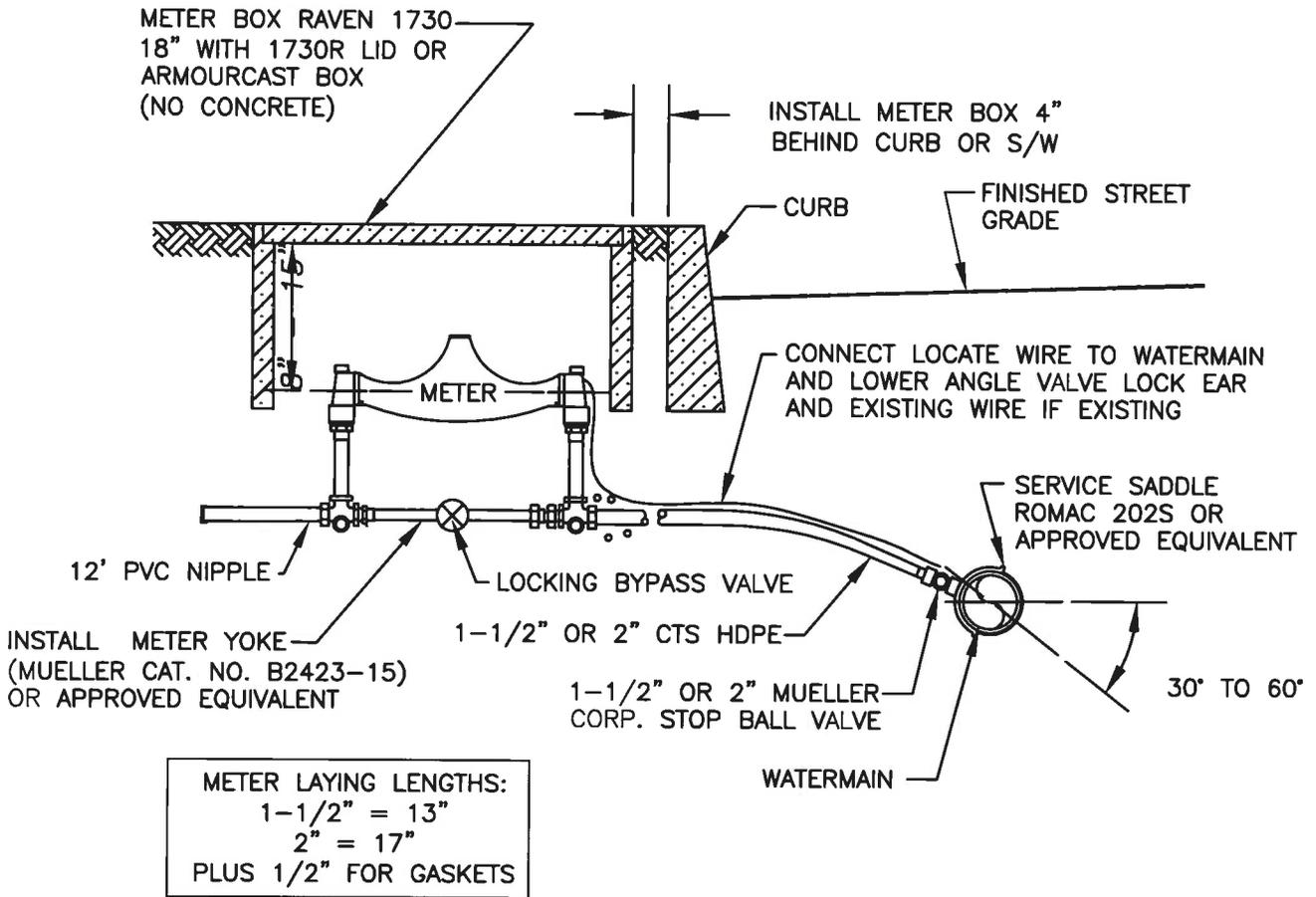
1. SERVICE LINES ON NEW WATERMAINS SHALL BE PRESSURE TESTED UP TO THE LOCKING ANGLE BALL VALVE AS PART OF THE WATERMAIN TESTING.
2. METER BOXES SHALL HAVE A 4' WOOD STAKE WITH BLUE PAINT BEHIND THE BOX.
3. ALL DOMESTIC AND IRRIGATION METERS SHALL BE SUPPLIED, OWNED, AND INSTALLED BY THE CITY OF WOODLAND.

3/4" AND 1" WATER SERVICE



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<i>Paul Stipp</i> 11/21/12				
PUBLIC WORKS DIRECTOR		DATE		

W-02



NOTES:

1. ALL DOMESTIC AND IRRIGATION METERS SHALL BE SUPPLIED, OWNED, AND INSTALLED BY THE CITY OF WOODLAND.
2. PRIOR TO CITY INSTALLATION OF METERS, ALL SERVICE APPLICATIONS MUST BE COMPLETED AND APPROVED. SERVICE FEES PAID IN FULL AND AS-BUILTS SUBMITTED AND APPROVED.
3. CONTRACTOR SHALL CONTACT THE CITY OF WOODLAND PUBLIC WORKS OFFICE (360) 225-7999 48-HOURS PRIOR TO INSTALLING ANY WATER SERVICE CONNECTIONS.
4. METERS WILL NOT BE SET BY THE CITY PRIOR TO DISINFECTION OF THE MAIN AND SERVICE, AND PRIOR TO A SUCCESSFUL BACTERIOLOGICAL TEST.
5. SERVICE LINES ON NEW WATERMAINS SHALL BE PRESSURE TESTED UP TO THE LOCKING ANGLE BALL VALVE AS PART OF THE WATERMAIN TESTING.
6. DURING THE PRESSURE TEST, THE MAIL SHALL BE OPEN FOR INSPECTION OF ALL CORPORATION STOPS.
7. USE 1-7/8" BIT FOR ALL 2" SADDLE TAPS AND 1-3/8" BIT FOR 1-1/2" SADDLE TAPS.
8. METER BOXES ARE NOT ALLOWED IN HARD SURFACED AREAS WITHOUT PRIOR WRITTEN APPROVAL. METER BOXES IN HARD SURFACE AREAS SHALL BE SLIGHTLY HIGHER (1/8" MAX) THAN SURROUNDING GRADE AND BOTH THE BOX AND LID MUST BE TRAFFIC RATED.
9. RAVEN OR ARMOURCAST BOX AND EXTENSION MAY BE ALLOWED WITH 1 1/2" METER SETS ONLY.
10. 1 1/2" METER CAN BE INSTALLED IN A 2" SETTING WITH ADAPTORS.

1-1/2" AND 2" WATER SERVICE

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DATE

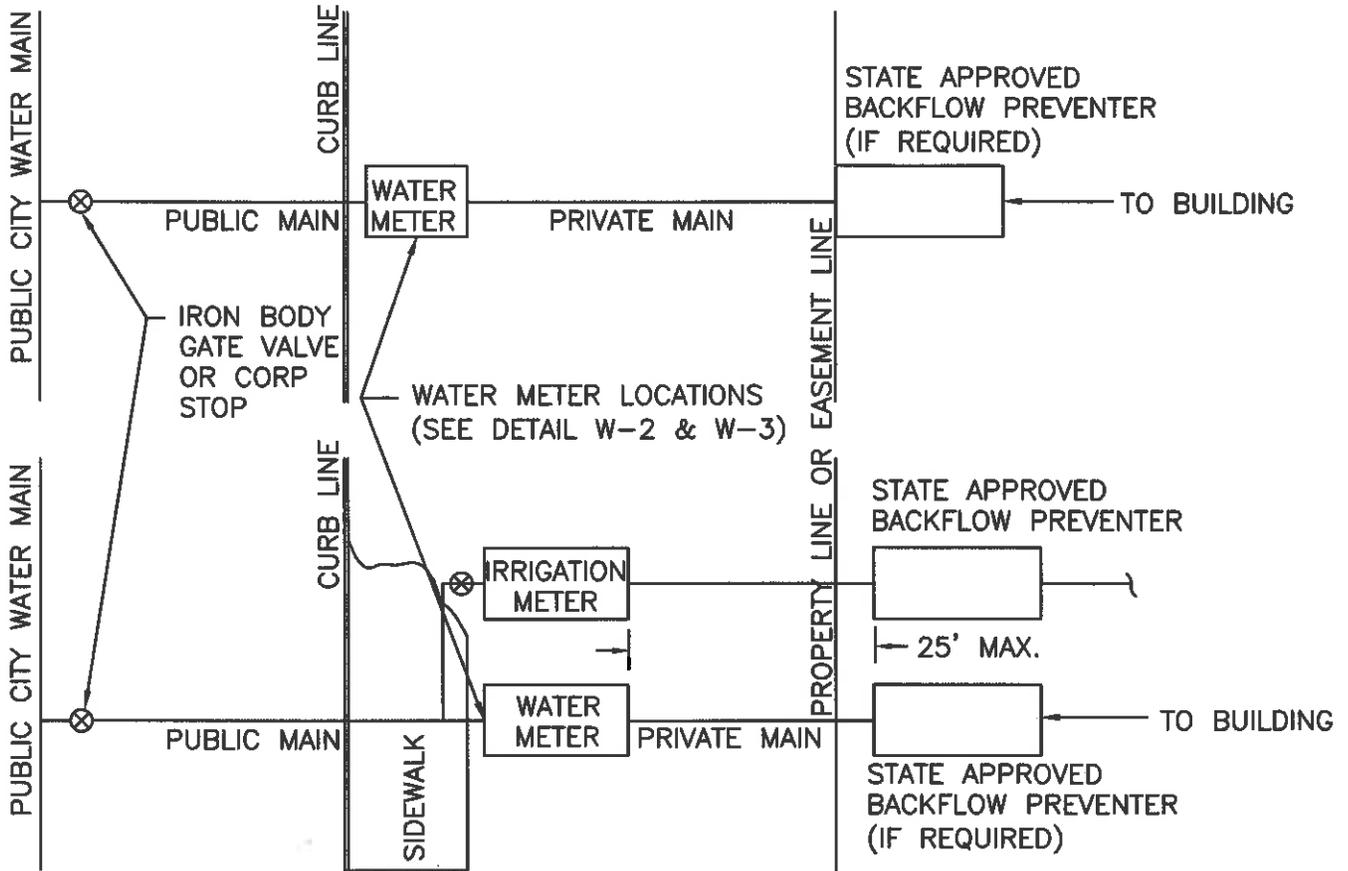
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Bart Stepp 11/2/12
PUBLIC WORKS DIRECTOR DATE

W-03



NOTES:

1. ALL NON-SINGLE FAMILY DOMESTIC SERVICES SHALL BE TAPPED SEPARATELY FROM ANY FIRE PROTECTION AND FIRE HYDRANT LEAD PIPING.
2. ALL IRRIGATION METERS SHALL BE PER APPROVED PLAN.
3. IRRIGATION METERS SHALL BE PLACED IN A STANDARD METER BOX WITH READER LID ACCORDING TO METER SIZE (SEE DETAIL W-02 & W-03).
4. EXCEPTIONS TO THESE REQUIREMENTS MAY BE SUBMITTED IN WRITING FOR REVIEW AND APPROVAL.
5. IRRIGATION METERS WILL BE READ DURING REGULAR BILLING CYCLES.

STANDARD METER LOCATIONS

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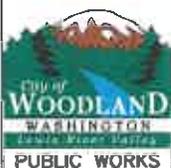
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DATE

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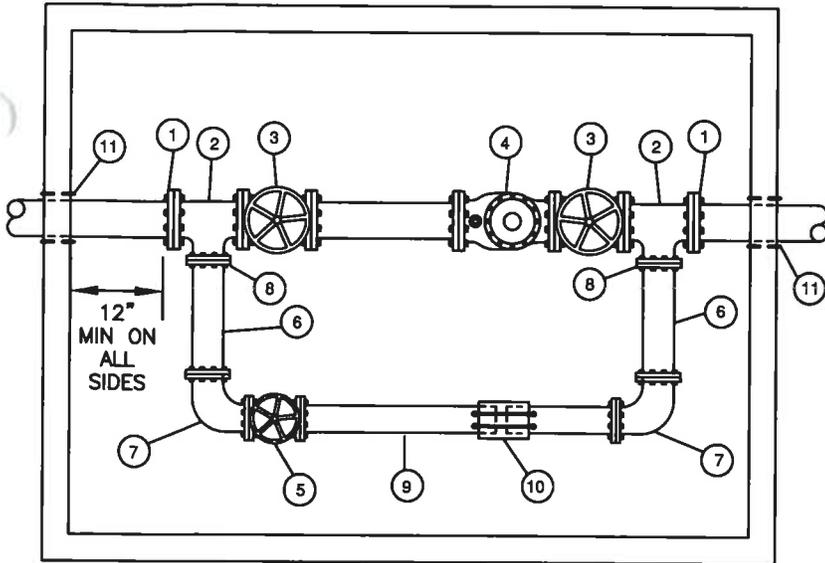
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W-04



Bart Stupp 1/6/14
PUBLIC WORKS DIRECTOR DATE

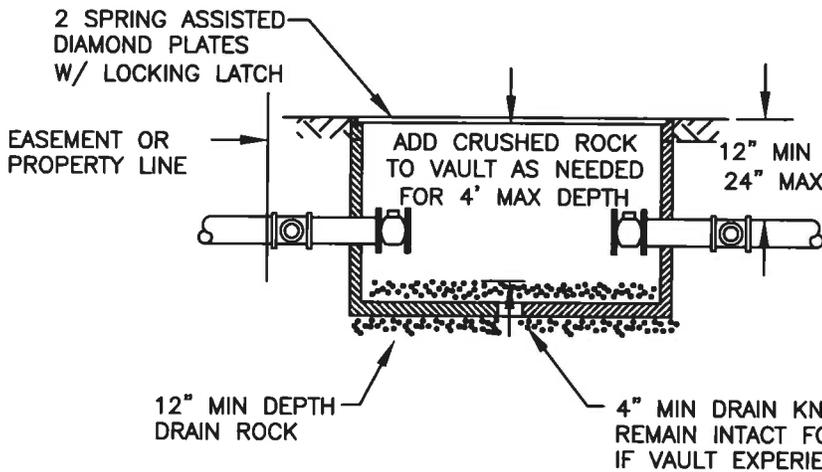
REVISIONS	DATE	DRAWN	DESIGNED



- ① FLEX X FLG COUPLING
- ② ALL-FLG TEE
- ③ FLG RES. SEATED GATE VALVE W/HAND WHEEL
- ④ COMPOUND METER
- ⑤ GATE VALVE W/HAND WHEEL
- ⑥ BRASS OR DUCTILE IRON NIPPLES
- ⑦ 90° ELBOWS (MATERIAL TO BE SAME AS PIPE)
- ⑧ COMPANION FLG
- ⑨ BRASS OR DUCTILE IRON PIPE
- ⑩ MECHANICAL COUPLING
- ⑪ PIPE SLEEVE

VAULT

UTILITY VAULT CO. R.C.P. VAULTS
 #575-LA-3660P #76632
 #676-WA-3660P W/#57-TL-B LID



METER SIZE	BY-PASS LINE SIZE	BY-PASS MATERIAL
3" & 4"	2" MIN	COPPER
6"	4"	DUCTILE IRON
8"	6"	DUCTILE IRON

NOTES:

1. THE CITY OF WOODLAND WILL SUPPLY, OWN AND MAINTAIN THE METER, METER SPACER, REDUCING TEE, AND STRAINER. CONTACT THE CITY PUBLIC WORKS DEPARTMENT 2 WEEKS PRIOR TO INSTALLATION.
2. ALL METERS SHALL BE INSTALLED BY THE CITY. CONTRACTOR TO INSTALL TEMP. SPACER AS PER NOTE 1.
3. 10 PIPE DIAMETERS OF STRAIGHT PIPE REQUIRED, IN & OUT OF METER (IF USING 6" PIPE, NO BENDS ALLOWED WITHIN 5' OF THE METER IN EITHER DIRECTION [IE: 6" x 10 = 60"]).
4. PIPE AND FIXTURES TO BE SET ON VALVE STANDS INSTALLED ACCORDING TO MANUFACTURERS SPECS.
5. REMOTE READER UNIT SHALL BE LOCATED IN A READILY ACCESSIBLE AREA OUTSIDE THE VAULT, AS APPROVED BY THE CITY.
6. CONTRACTOR SHALL USE APPROPRIATE METHODS TO ENSURE COPPER PIPE, FITTINGS AND JOINTS WILL REMAIN LEAK-TIGHT.
7. METER BOX SHALL NOT BE ALLOWED IN HARD SURFACED AREAS WITHOUT PRIOR WRITTEN APPROVAL. METER BOXES AND LIDS IN HARD SURFACE AREAS SHALL BE SLIGHTLY HIGHER THAN SURROUNDING GRADE AND BOTH MUST BE TRAFFIC RATED.
8. INSTALL OR CONNECT LOCATING WIRE WITH LONG LOOP IN VAULT.

COMPOUND METER INSTALLATION

APPROVED

REVISIONS

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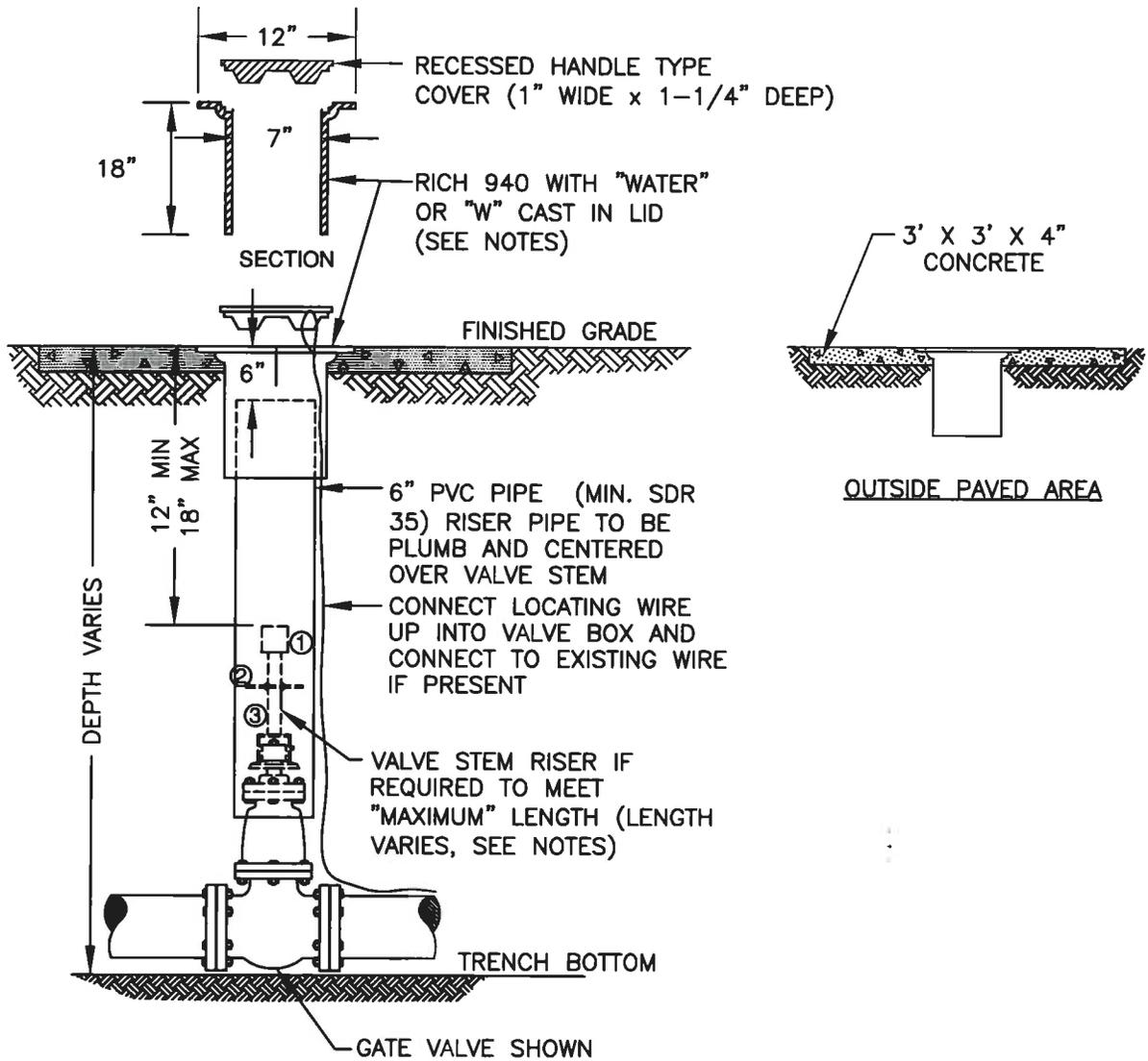
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Bart Stupp 11/2/12
 PUBLIC WORKS DIRECTOR DATE

W-05



NOTES:

1. VALVE STEM EXTENSION TO INCLUDE THE FOLLOWING WELDS TO BE 1/4" FILLET WELD ALL AROUND.
2. VALVE OPERATING NUT OR 1-7/8" X 1-7/8" X 2" HIGH GRADE STEEL.
3. 3/16" THICK X 5-1/5" DIA STEEL GUIDE PLATE SHAFT.
4. 2" X 2" X 3/16" SQUARE STRUCTURAL STEEL TUBING TO FIT OPERATING NUT.
5. FOR NEW VALVES IN EXISTING STREET, RESTORE PAVEMENT PER CITY OF WOODLAND STANDARDS.

STANDARD VALVE BOX AND COVER

APPROVED

REVISIONS

DATE

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DESIGNED



Bart Stipp 11/21/12
PUBLIC WORKS DIRECTOR DATE

W-06

GENERAL NOTES FOR BACKFLOW PROTECTION

1. ALL REDUCED PRESSURE AND BACKFLOW DEVICES SHALL BE WASHINGTON STATE APPROVED, PER WAC 246-290.
2. FIRE SPRINKLER AND IRRIGATION SYSTEMS SHALL BE PROTECTED WITH STATE APPROVED BACKFLOW PROTECTION ASPRESCRIBED IN WAC 246-290. IRRIGATION SYSTEMS ARE PROTECTED COMMENSURATE WITH THE DEGREE OF HAZARD AS DEFINED BELOW:
 - HIGH HEALTH HAZARD - IS ASSESSED TO ANY IRRIGATION SYSTEM THAT CONTAINS PUMPS OR INFECTORS FOR THE ADDITION OF CHEMICALS. THIS RISK ASSESSMENT IS ALSO BASED ON THE ADDITIONAL HARZARD POSED BY BACTERIAL CONTAMINATS FOUND ON LAWNS, AND ON THE POSSIBILITY OF CHANGES BEING MADE TO THE IRRIGATION SYSTEM BY THE CUSTOMER. AN APPROVED REDUCED PRESSURE BACKFLOW ASSEMBLY, OR AN APPROVED AIR GAP SEPARTION, SHOULD BE REQUIRED IN ALL CASES WHERE MEANS ARE PROVIDED FOR CHEMICALS OR HERBICIDES TO THE INJECTED INTO THE IRRIGATION SYSTEM, OR WHERE AN AUXILIARY SUPPLY IS ALSO PROVIDED FOR IRRIGATION WATER.
 - LOW HEALTH HAZARD - IS ASSESSED TO ALL IRRIGATION SYSTEMS NOT OTHERWISE ASSESSED AS A HIGH HEALTH HAZARD. THIS RISK ASSESSMENT IS BASED ON THE HAZARD POSED BY BACTERIAL AND CHEMICAL CONTAMINANTS FOUND ON LAWNS, AND ON THE POSSIBILITY OF CHANGES BEING MADE TO THE IRRIGATION SYSTEM BY THE CUSTOMER. AN APPROVED DOUBLE CHECK VALVE ASSEMBLY IS REQUIRED.
3. ALL COMMERCIAL, INDUSTRIAL AND MULTI-FAMILY FACILITIES SHALL BE PROTECTED WITH WASHINGTON STATE APPROVED BACKFLOW PROTECTION.
4. FURTHER BACKFLOW PREVENTION SHALL BE REQUIRED BY THE CITY OF WOODLAND DEPENDENT UPON ACTIVITY (BOILERS, CHILLERS, CHEMICAL ADDITION, BOOSTER PUMPS, WELLS, MEDICAL EQUIP. SODA POP MACHINES, ETC).
5. ALL HOSEBIBS SHALL BE PROTECTED WITH VACUUM BREAKERS.
6. IF CHEMICALS ARE ADDED TO THE FIRE PROTECTION SYSTEM, A REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER IS REQUIRED.
7. IF A WELL IS NOW EXISTING ON-SITE OR IS DRILLED IN THE FUTURE, A REDUCED PRESSURE BACKFLOW ASSEMBLY WILL BE REQUIRED AT EACH METER.
8. WHERE A VAULT IS REQUIRED, A GALV. STEEL WALL MOUNTED CHAMBER LADDER W/EXTENSIONS IS REQUIRED AND SHALL BE CENTERED UNDER THE ACCESS DOOR.
9. DOUBLE CHECK ASSEMBLIES SHALL BE INSTALLED IN EITHER AN APPROVED VAULT OR INSIDE THE BUILDING IN A MAINTAINABLE LOCATION.
10. REDUCED PRESSURE ASSEMBLIES SHALL BE INSTALLED EITHER OUTSIDE ABOVE GROUND OR INSIDE THE BUILDING.
11. ALL BACKFLOW DEVICES SHALL BE PROTECTED FROM FREEZING.
12. BACKFLOW PREVENTION ASSEMBLY VAULTS (I.E.: FIRE AND SERVICE PROTECTION) MUST BE INSTALLED AT THE CUSTOMER'S SIDE OF THE EASEMENT OR PROPERTY LINE. ALTERNATE LOCATIONS MUST BE REQUESTED IN WRITING AND APPROVED BY CITY OF WOODLAND PUBLIC WORKS PRIOR TO INSTALLATION.
13. NO PART OF THE BACKFLOW PREVENTION ASSEMBLY SHALL BE SUBMERGED IN WATER OR INSTALLED IN A LOCATION SUBJECT TO FLOODING. IF A BACKFLOW PREVENTION ASSEMBLY IS INSTALLED IN A VAULT OR BASEMENT, ADEQUATE DRAINAGE SHALL BE PROVIDED.
14. ALL FIRE PROTECTION SERVICES SHALL HAVE A IRON BODY GATE VALVE AT THE PUBLIC MAIN AND SHALL BE PRIVATE AFTER THAT VALVE.
15. ALL DOMESTIC SERVICES WITH BACKFLOW PROTECTION SHALL BE PRIVATE AFTER THE DOMESTIC WATER METER.
16. ALL BACKFLOW PREVENTION DEVICES SHALL BE TESTED AFTER INSTALLATION PRIOR TO ACCEPTANCE AND ANNUALLY THEREAFTER BY A CERTIFIED BACKFLOW ASSEMBLY TESTER. A PARTIAL LIST OF WASHINGTON STATE APPROVED TESTERS IS AVAILABLE UPON REQUEST. TEST RESULTS SHALL BE SENT TO THE CITY OF WOODLAND PUBLIC WORKS DEPARTMENT.

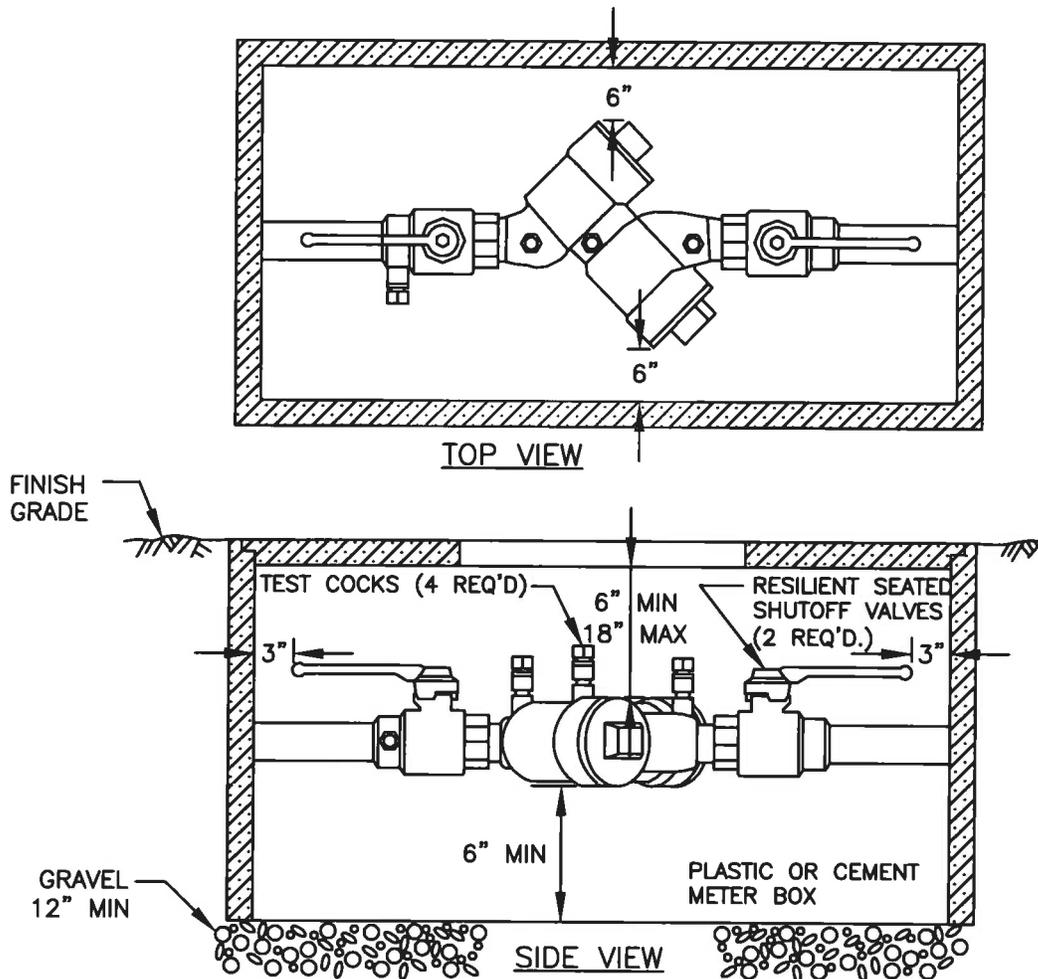
MAIL TEST RESULTS TO: CITY OF WOODLAND - PUBLIC WORKS
P.O. BOX 9
WOODLAND, WA 98674



GENERAL NOTES FOR BACKFLOW PROTECTION

APPROVED	REVISIONS	DATE	DRAWN	DESIGNED
<i>Bart Stipp</i>		11/21/12		
PUBLIC WORKS DIRECTOR		DATE		

W-07



NOTES:

1. APPROVED DOUBLE CHECK VALVE ASSEMBLY (DCVA) TO LAY HORIZONTAL WITH GROUND. (VERTICAL ALLOWED IF APPROVED BY WASHINGTON STATE DEPARTMENT OF HEALTH)
2. DCVA MAY BE INSTALLED ABOVE OR BELOW GROUND PROVIDED ALL CLEARANCES ARE MET.
3. DESIGN FOR BACK SIPHONAGE AND BACK PRESSURE.
4. UNIONIZED ASSEMBLIES REQUIRED.
5. TEST COCKS TO EITHER FACE OUTWARDS OR UPWARDS FROM ASSEMBLY.
6. THOROUGHLY FLUSH LINES PRIOR TO INSTALLATION OF BACKFLOW PREVENTER.
7. DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING.
8. DCVA MUST BE ACCESSIBLE.
9. PROTECT DCVA FROM FREEZING.
10. DCVA SHALL BE APPROVED BY THE STATE OF WASHINGTON
11. PLUMBING PERMIT IS REQUIRED. CONTACT CITY BUILDING DEPARTMENT AT (360) 225-7299.
12. DCVA MUST BE TESTED AFTER INSTALLATION, THEN ANNUALLY BY A WASHINGTON STATE CERTIFIED BACKFLOW TESTER. RESULTS SHALL BE SENT TO THE CITY PUBLIC WORKS DEPARTMENT.

DOUBLE CHECK VALVE ASSEMBLY 2" & SMALLER

APPROVED

REVISIONS

DATE

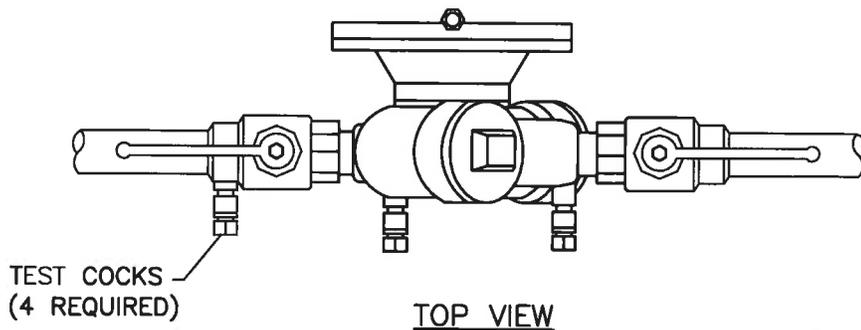
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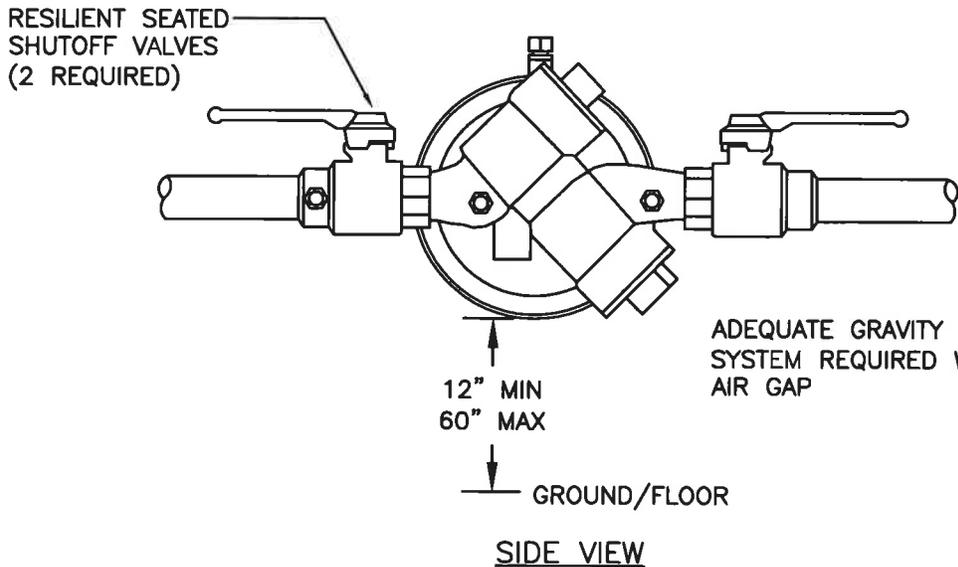
Burt Stepp 11/21/12
PUBLIC WORKS DIRECTOR DATE

W-08



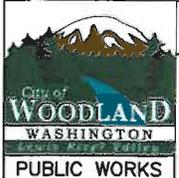


MIN 12" CLEARANCES AROUND
BACKFLOW PREVENTER - ALL SIDES,
TOP AND BOTTOM



NOTES:

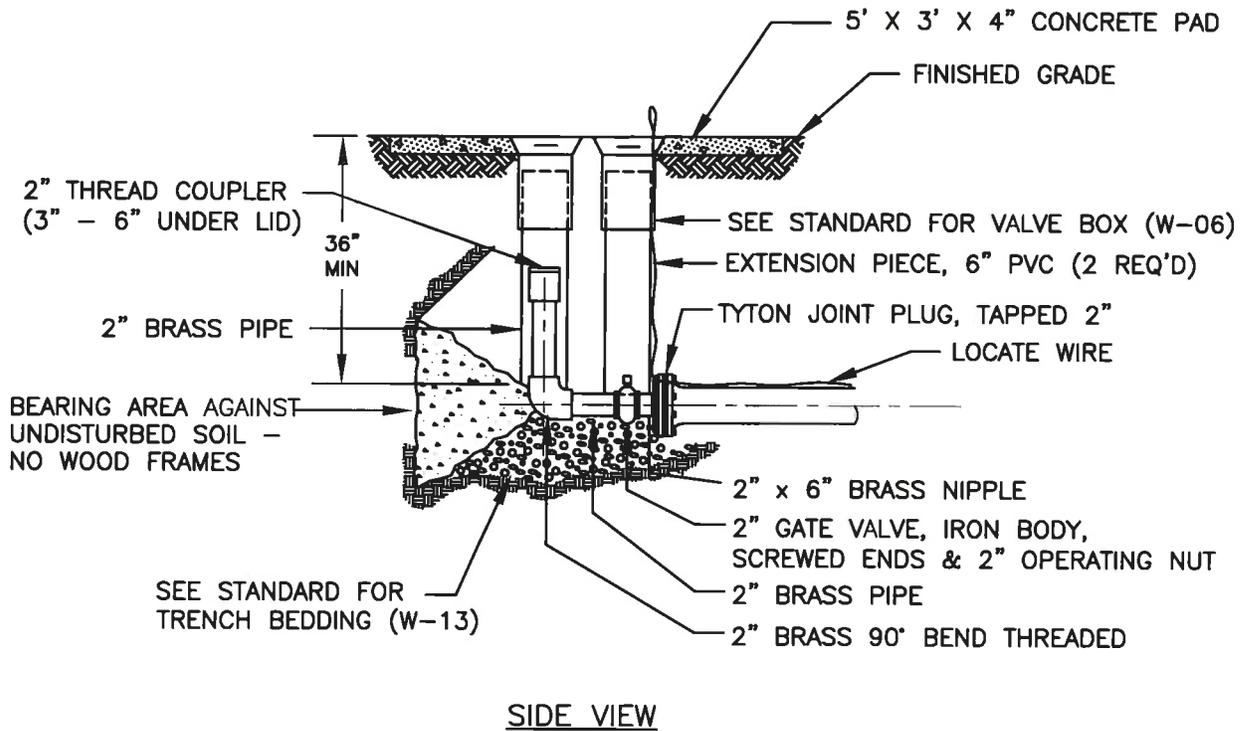
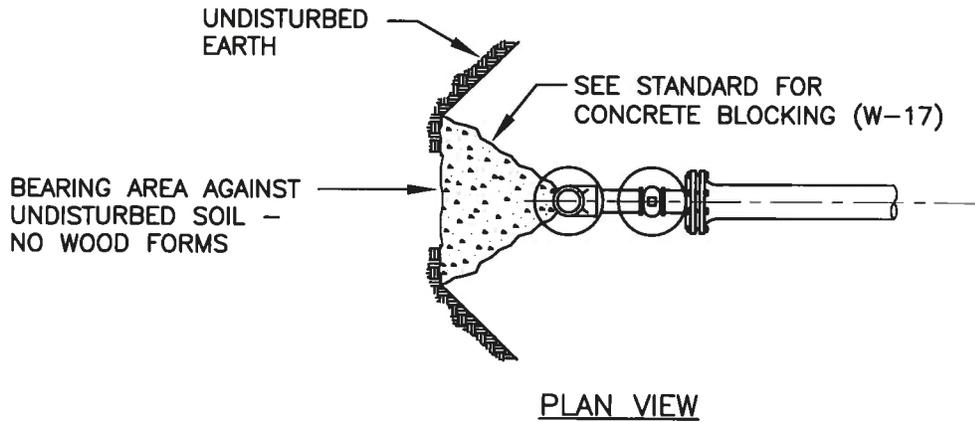
1. APPROVED REDUCED PRESSURE BACKFLOW ASSEMBLY (RPBA) TO LAY HORIZONTAL WITH GROUND (VERTICAL IS ALLOWED IF APPROVED BY WASHINGTON STATE DEPARTMENT OF HEALTH).
2. DESIGN RPBA FOR BACK SIPHONAGE AND BACK PRESSURE.
3. UNIONIZED ASSEMBLIES REQUIRED.
4. THOROUGHLY FLUSH LINES PRIOR TO INSTALLATION OF BACKFLOW PREVENTER.
5. DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING.
6. ABOVE GROUND INSTALLATION ONLY.
7. RPBA MUST BE ACCESSIBLE.
8. PROTECT RPBA FROM FREEZING.
9. A PLUMBING PERMIT IS REQUIRED. CONTACT THE CITY OF WOODLAND BUILDING DEPARTMENT AT (360) 225-7299.
10. RPBA MUST BE TESTED AFTER INSTALLATION, THEN ANNUALLY BY A WASHINGTON STATE CERTIFIED BACKFLOW TESTER. RESULTS SHALL BE SENT TO THE CITY OF WOODLAND PUBLIC WORKS DEPARTMENT.
11. RPBA SHALL BE APPROVED BY THE STATE OF WASHINGTON.



REDUCED PRESSURE BACKFLOW ASSEMBLY 2" & SMALLER

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<i>Bart Stys</i>				
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W-09



NOTE:

1. NO WOOD OR TIE DOWNS ALLOWED.

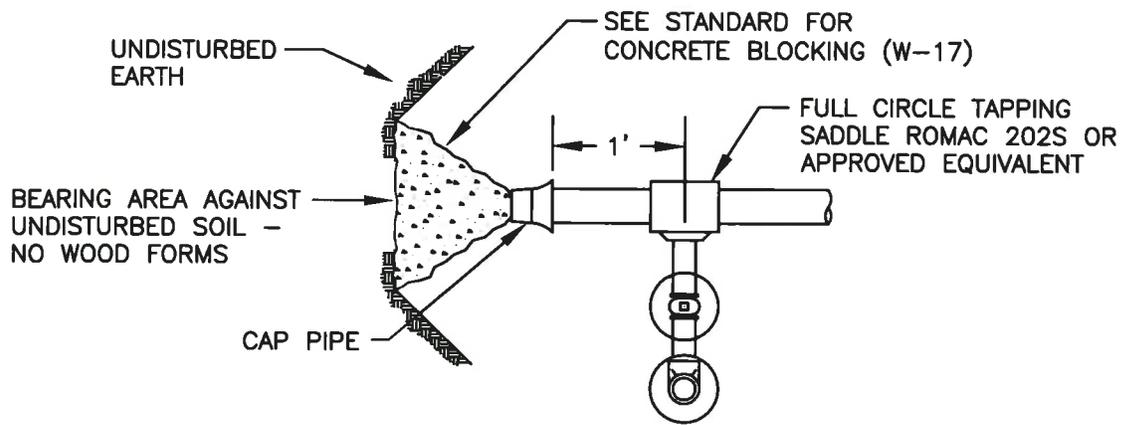


STANDARD BLOW OFF

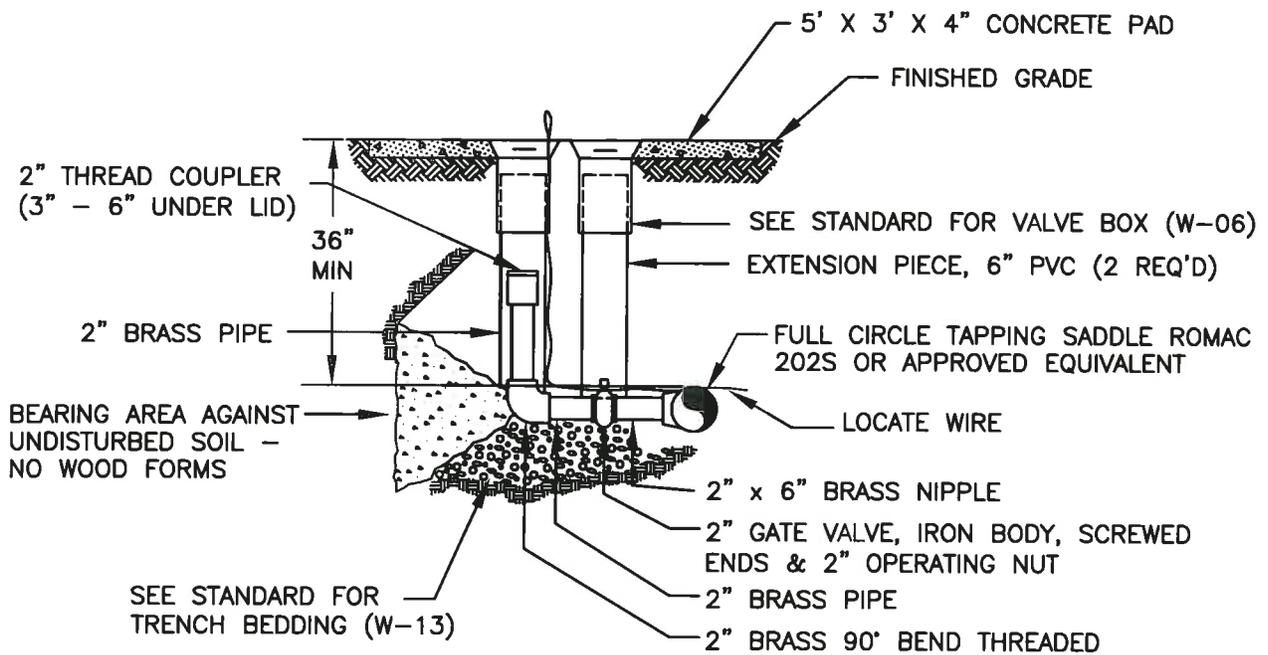
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<i>Bart Stipp</i>				

PUBLIC WORKS DIRECTOR DATE

W-10



PLAN VIEW



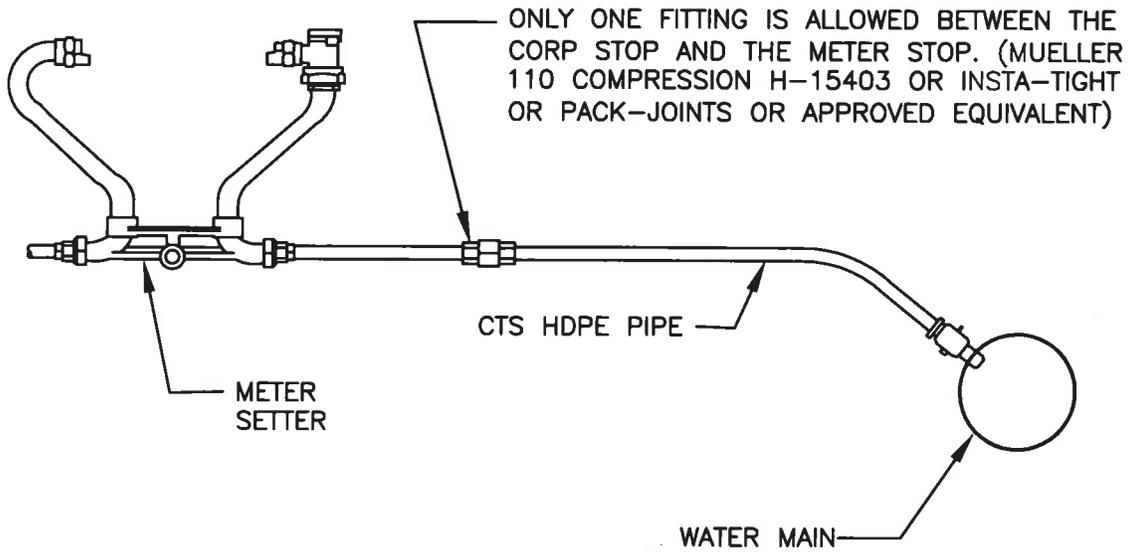
TOP VIEW



SIDE TAP BLOW OFF

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<i>Bart Stupp</i>				
11/21/12				
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W-11



NOTE:

1. REPLACE ALL SERVICES WHICH MEET ANY OF THE FOLLOWING CONDITIONS:
 - A. METER BOX IS RELOCATED
 - B. SUBSTANDARD EITHER BY MATERIALS OR LACK OF COVER
 - C. THE METER SETTER MUST BE REPLACED
2. ALL SERVICES MUST TERMINATE AT METER SETTER.
3. FOR SERVICE TRANSFERS ONLY, ONE FITTING IS ALLOWED BETWEEN THE CORP STOP AND THE METER STOP.

METER SERVICE TRANSFER AND REPLACEMENT

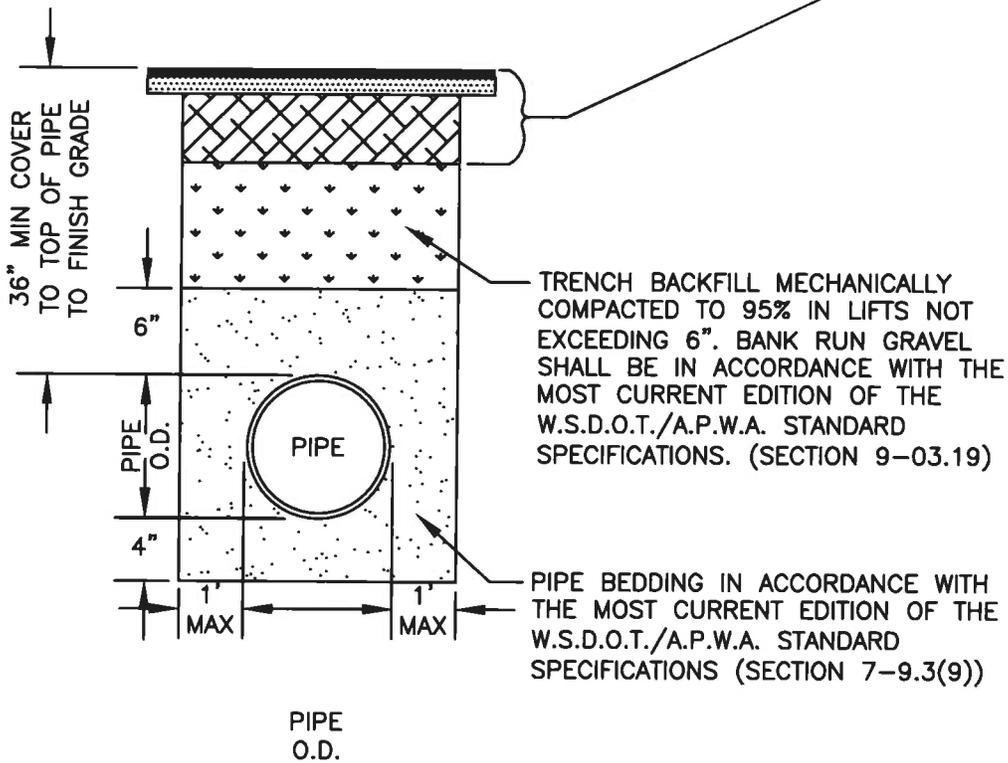


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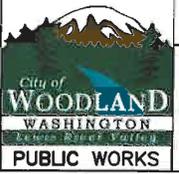
W-12

FOR THIS ZONE OF THE TRENCH SECTION, SEE CITY, COUNTY OR WSDOT RIGHT OF WAY PERMIT OR STANDARD STREET REPAIR DETAIL. FOR NON-PAVED SURFACES, MATCH EXISTING GRAVEL OR SEEDED LAWN, OR REFER TO APPROVED DRAWINGS.



NOTE:

- CLEAN NATIVE MATERIAL MAY BE USED AS PIPE BEDDING AND TRENCH BACKFILL AS APPROVED BY CITY OF WOODLAND PUBLIC WORKS.

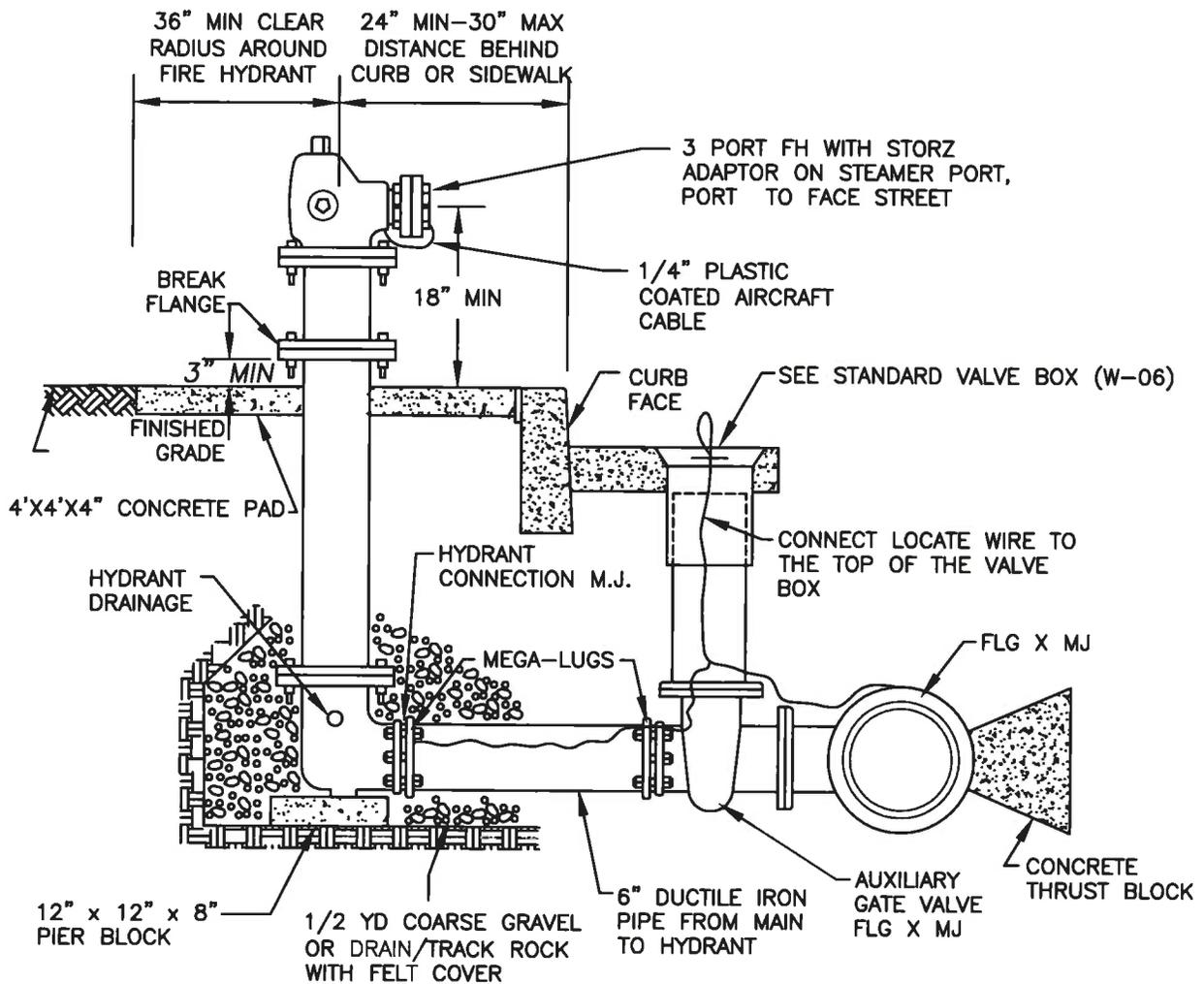


WATER PIPE TRENCH BEDDING & BACKFILL

APPROVED
Bart Stupp 11/21/12
 PUBLIC WORKS DIRECTOR DATE

REVISIONS	DATE	DRAWN	DESIGNED

W-13



NOTES:

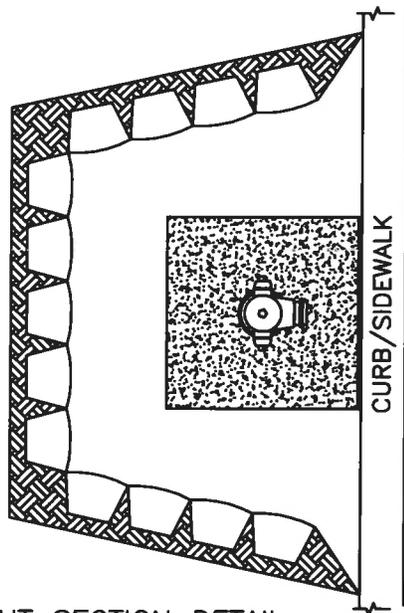
1. HYDRANT TO BE WATEROUS WB67 CLASS 250.
2. HYDRANT TO BE 5-1/4" COMMERCIAL W/ (2) 2-1/2" NST, (1) 4-1/2" NST THREADED PORT(S) WITH (1) 5" TWO LUG QUARTER TURN STORZ OR APPROVED EQUAL PUMPER PORT CONNECTION.
3. STORZ ADAPTORS ARE REQUIRED.
4. FOUR (4) GUARD POSTS TO BE INSTALLED IN UNPROTECTED AREAS (4' RADIUS).
5. FIRE HYDRANT INSTALLATION SHALL BE APPROVED BY THE CITY OF WOODLAND PUBLIC WORKS DEPARTMENT PRIOR TO BACKFILLING.
6. HYDRANTS SHALL NOT BE SET UNTIL LOCATION AND DEPTH ARE APPROVED BY THE CITY OF WOODLAND.
7. FIRE HYDRANTS SHALL BE SHOP PAINTED PRIOR TO INSTALLATION W/ SAFETY YELLOW (RODDA NO. QD81) HIGH GLOSS EQUIPMENT ENAMEL.
8. HYDRANT STANDARD BURY IS 4' UNLESS OTHERWISE NOTED ON THE PLANS, OR WHEN BREAKAWAY JOINT IS STALLED 7" ABOVE FINISHED GRADE.
9. HYDRANT LOCATIONS SHALL BE AS SHOWN ON THE PLANS.
10. JOINT RESTRAINT SYSTEM MAY BE USED FOR INSTALLATIONS OF NOT MORE THAN 18' (ONE PIPE LENGTH).
11. INSTALL LOCATING WIRE AND CONNECT TO EXISTING WIRE IF PRESENT.



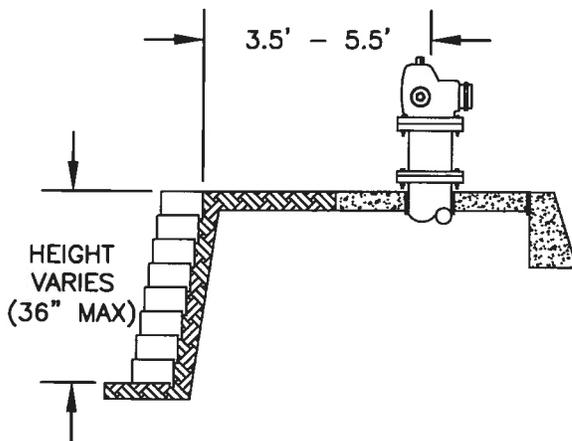
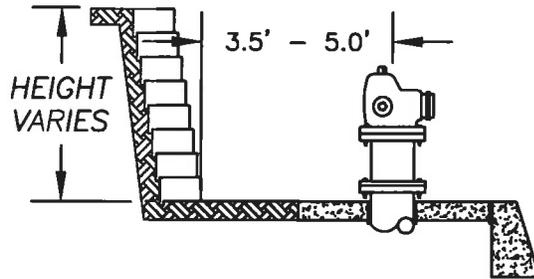
FIRE HYDRANT

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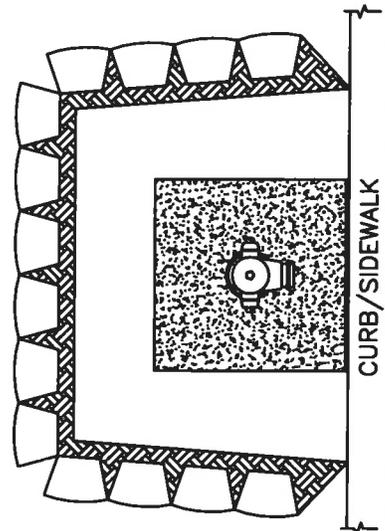
W-14



CUT SECTION DETAIL



FILL SECTION DETAIL



NOTES:

1. CONSULT I.B.C. FOR RETAINING WALL CONSTRUCTION REQUIREMENTS.
2. THE AREA WITHIN THE RETAINING WALL BOUNDARIES FROM THE CURB/SIDEWALK TO THE REAR RETAINING WALL SHALL HAVE A MAXIMUM SLOPE OF 1% IN ANY DIRECTION.
3. THE 4'x4' CONCRETE PAD SHALL HAVE A MAXIMUM SLOPE OF 1%.
4. RETAINING WALL SHALL MAINTAIN A MINIMUM RADIUS OF 3.5' AROUND THE HYDRANT

HYDRANT RETAINING WALL DETAIL

APPROVED

Burt Stepp 11/21/12
PUBLIC WORKS DIRECTOR DATE

REVISIONS

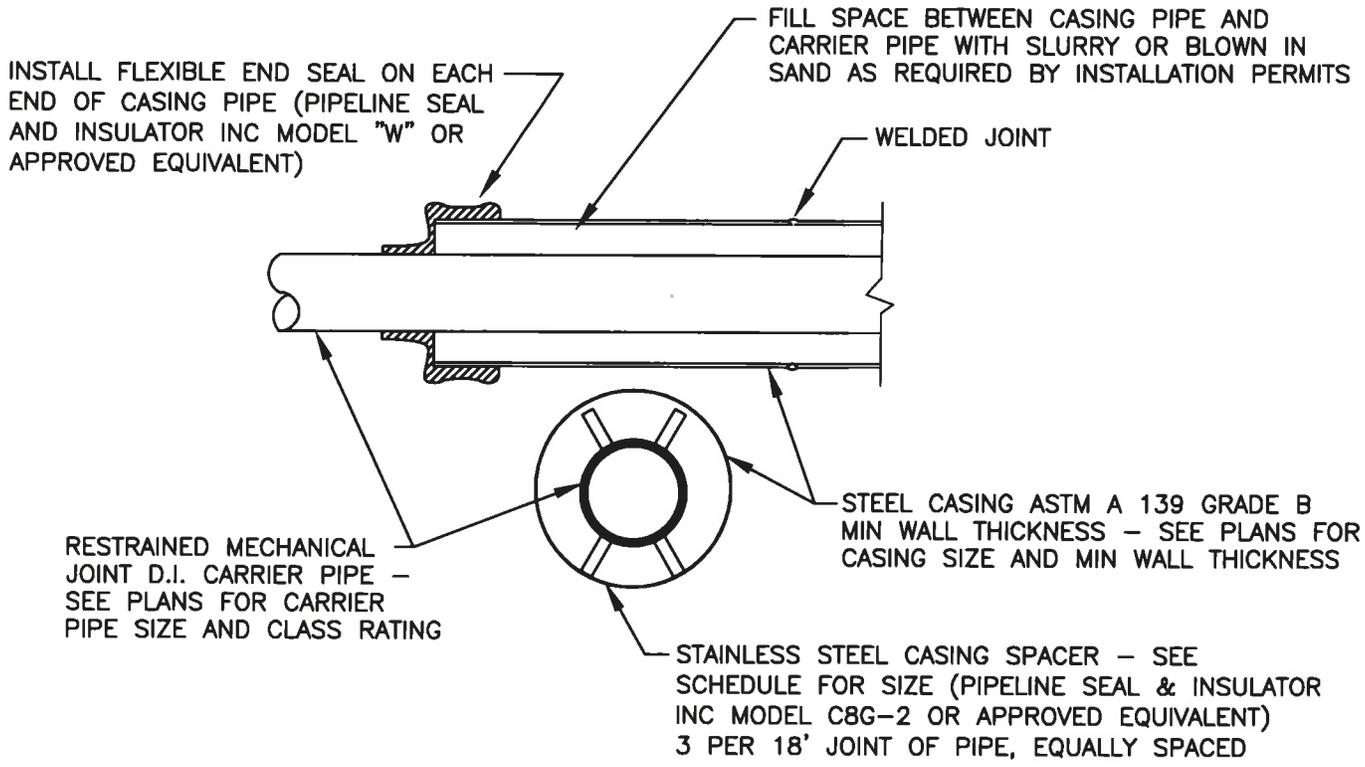
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CASING SIZING REQUIREMENTS

CARRIER PIPE	MINIMUM CASING REQUIREMENTS	WALL THICKNESS
4"	16" A36 STEEL	3/8"
6"	16" A36 STEEL	3/8"
8"	24" A36 STEEL	3/8"
10"	24" A36 STEEL	3/8"
12"	24" A36 STEEL	3/8"
16"	36" A36 STEEL	5/8"
24"	48" A36 STEEL	5/8"

NOTES:

1. CASING TO BE EXTENDED 5' BEYOND ANY CURBS, WALLS, STRUCTURES, OR FOOTINGS.
2. PUBLIC AND PRIVATE MAINS SHALL BE PLACED IN SEPARATE CASINGS.
3. FOR CASINGS UNDER RAILROAD TRACKS, WRITTEN PERMISSION FOR THE OWNER OF THE RAILROAD TRACKS IS REQUIRED PRIOR TO OBTAINING CITY OF WOODLAND PERMITS TO PROCEED.
4. NO PRIVATE UTILITIES SHALL BE ALLOWED IN CITY OF WOODLAND CASINGS.



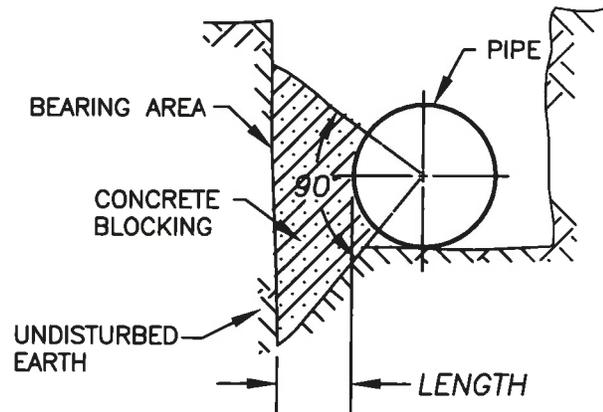
PIPE CASING DETAILS

APPROVED
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SOIL BEARING = 2000 LB/S.F.				
PIPE SIZE	HORZ. BENDS	MIN. BEARING AREA S.F.	MIN. VOL. OF BLOCKING C.F.	MIN. LENGTH OF BLOCKING
4"	TEE	2.3	0.8	0.86
	90°	3.2	1.4	1.06
	45°	1.7	0.5	0.73
	22-1/2°	0.9	0.2	0.46
	11-1/4°	-	-	-
6"	TEE	4.7	2.4	1.24
	90°	6.6	4.0	1.53
	45°	3.6	1.6	1.05
	22-1/2°	1.8	0.6	0.66
	11-1/4°	0.9	0.2	0.39
8"	TEE	8.0	5.4	1.63
	90°	11.4	9.0	2.00
	45°	6.2	3.6	1.37
	22-1/2°	3.1	1.3	0.87
	11-1/4°	1.6	0.5	0.51
10"	TEE	12.1	9.9	2.00
	90°	17.1	16.7	2.46
	45°	9.3	6.6	1.69
	22-1/2°	4.7	2.4	1.08
	11-1/4°	2.4	0.9	0.63
12"	TEE	17.1	16.7	2.37
	90°	24.2	28.0	2.93
	45°	13.1	11.2	2.01
	22-1/2°	6.7	4.1	1.28
	11-1/4°	3.4	1.5	0.74
16"	TEE	23.8	27.3	2.73
	90°	33.6	46.0	3.37
	45°	18.2	18.3	2.29
	22-1/2°	9.3	6.7	1.42
	11-1/4°	4.7	2.4	0.80
18"	TEE	29.9	38.5	3.05
	90°	42.2	64.7	3.79
	45°	22.9	25.8	2.57
	22-1/2°	11.7	9.4	1.60
	11-1/4°	5.9	3.3	0.90
24"	TEE	52.3	89.1	4.03
	90°	74.0	149.8	5.00
	45°	40.0	59.7	3.55
	22-1/2°	20.4	21.7	2.11
	11-1/4°	10.3	7.7	1.18



NOTES:

1. ALL BLOCKING SHALL BE POURED AGAINST FIRM UNDISTURBED SOIL.
2. ALL CONCRETE BLOCKING SHALL BE POURED IN PLACE WITHOUT DIRECT CONTACT TO PIPE, FITTINGS OR FLANGES. 15 LB. ASPHALT- IMPREGNATED FELT, OR EQUIVALENT AS APPROVED BY THE INSPECTOR, SHALL BE PLACED BETWEEN THE CONCRETE AND PIPE, FITTINGS OR FLANGES.
3. LAYOUT TO BE APPROVED BY THE INSPECTOR PRIOR TO AND AFTER CONCRETE POUR.
4. CONCRETE FOR ALL BLOCKING SHALL HAVE A 28-DAY MINIMUM COMPRESSIVE STRENGTH OF 2,300 P.S.I.
5. THIS CHART IS NOT APPLICABLE TO VERTICAL BENDS. LOCATION SPECIFIC DESIGN IS REQUIRED FOR SUCH INSTALLATIONS.
6. WHERE THE TRENCH SOIL HAS A BEARING PRESSURE LESS THAN 2000 POUNDS PER SQUARE FOOT, LOCATION SPECIFIC DESIGN IS REQUIRED.

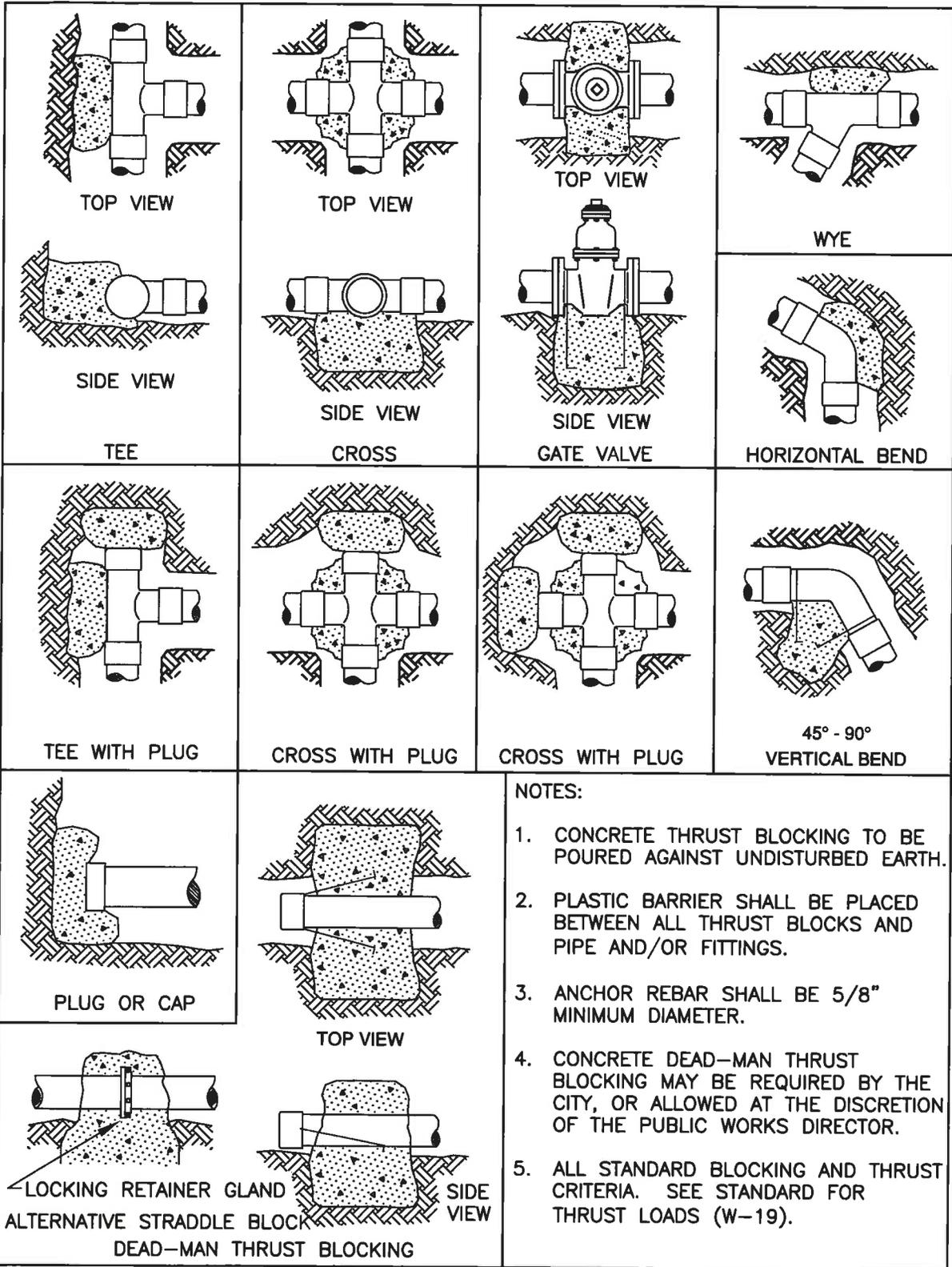
STANDARD THRUST BLOCK



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THRUST BLOCKING

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THRUST LOADS

THRUST AT FITTINGS IN POUNDS AT 200 POUNDS PER SQUARE INCH OF WATER PRESSURE

PIPE DIAMETER	90° BEND	45° BEND	22-1/2° BEND	11-1/4° BEND	DEAD END OR TEE
4"	3,600	2,000	1,000	500	2,600
6"	8,000	4,400	2,300	1,200	5,700
8"	14,300	7,700	4,000	2,000	10,100
10"	22,300	12,100	6,200	3,100	15,800
12"	32,000	17,400	8,900	4,500	22,700
14"	43,600	23,600	12,100	6,100	30,800
16"	57,000	30,800	15,700	7,900	40,300

NOTES:

1. BLOCKING SHALL BE COMMERCIAL CONCRETE POURED IN PLACE AGAINST UNDISTURBED EARTH. FITTING SHALL BE ISOLATED FROM CONCRETE THRUST BLOCK WITH PLASTIC OR SIMILAR MATERIAL.
2. TO DETERMINE THE BEARING AREA OF THE THRUST BLOCK IN SQUARE FEET (S.F.):
EXAMPLE : 12" - 90° BEND IN SAND AND GRAVEL 32,000 LBS 3000 LB/S.F. = 10.7 S.F. OF AREA
3. AREAS MUST BE ADJUSTED FOR OTHER PIPE SIZE, PRESSURES AND SOIL CONDITIONS.
4. BLOCKING SHALL BE ADEQUATE TO WITHSTAND FULL TEST PRESSURE AS WELL AS TO CONTINUOUSLY WITHSTAND OPERATING PRESSURE UNDER ALL CONDITIONS OF SERVICE.

SAFE SOIL BEARING LOADS

FOR HORIZONTAL THRUSTS WHEN THE DEPTH OF COVER OVER THE PIPE EXCEEDS 2 FEET

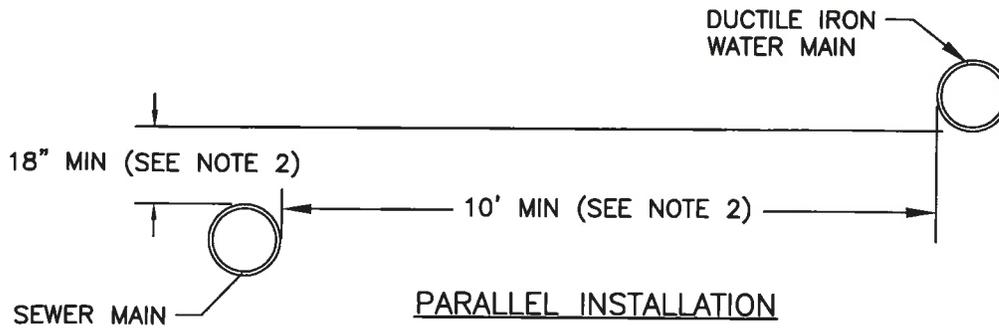
SOIL	POUNDS PER SQUARE FOOT
MUCK, PEAT	0
SOFT CLAY	1,000
SAND	2,000
SAND & GRAVEL	3,000
SAND & GRAVEL CEMENTED WITH CLAY	4,000
HARD SHALE	10,000



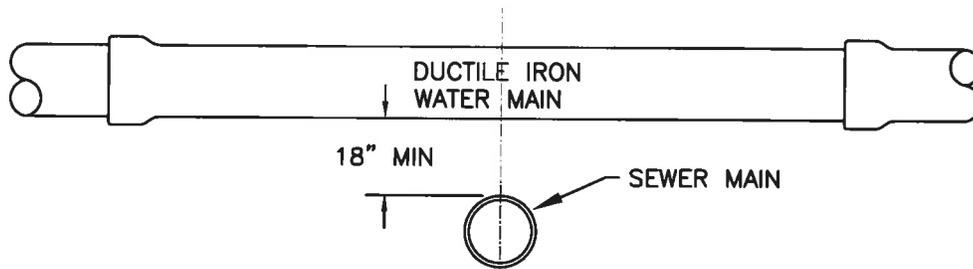
THRUST LOADS

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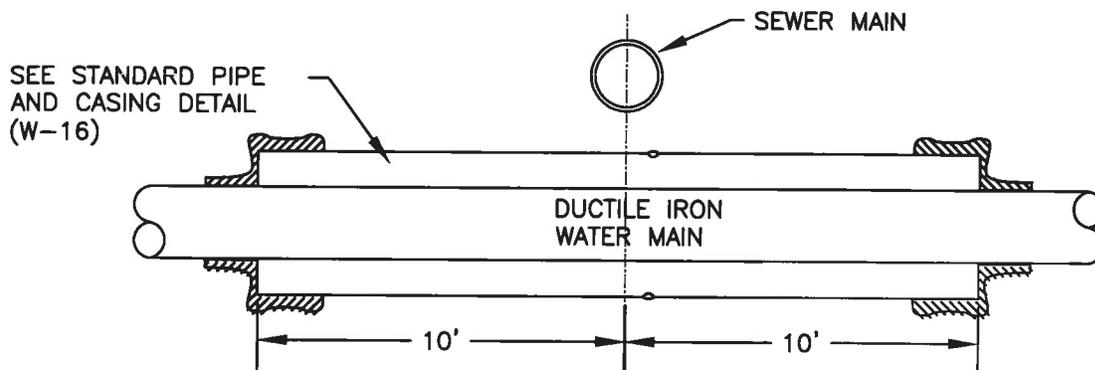
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PARALLEL INSTALLATION



CROSSING WATER OVER SEWER



CROSSING WATER UNDER SEWER

NOTES:

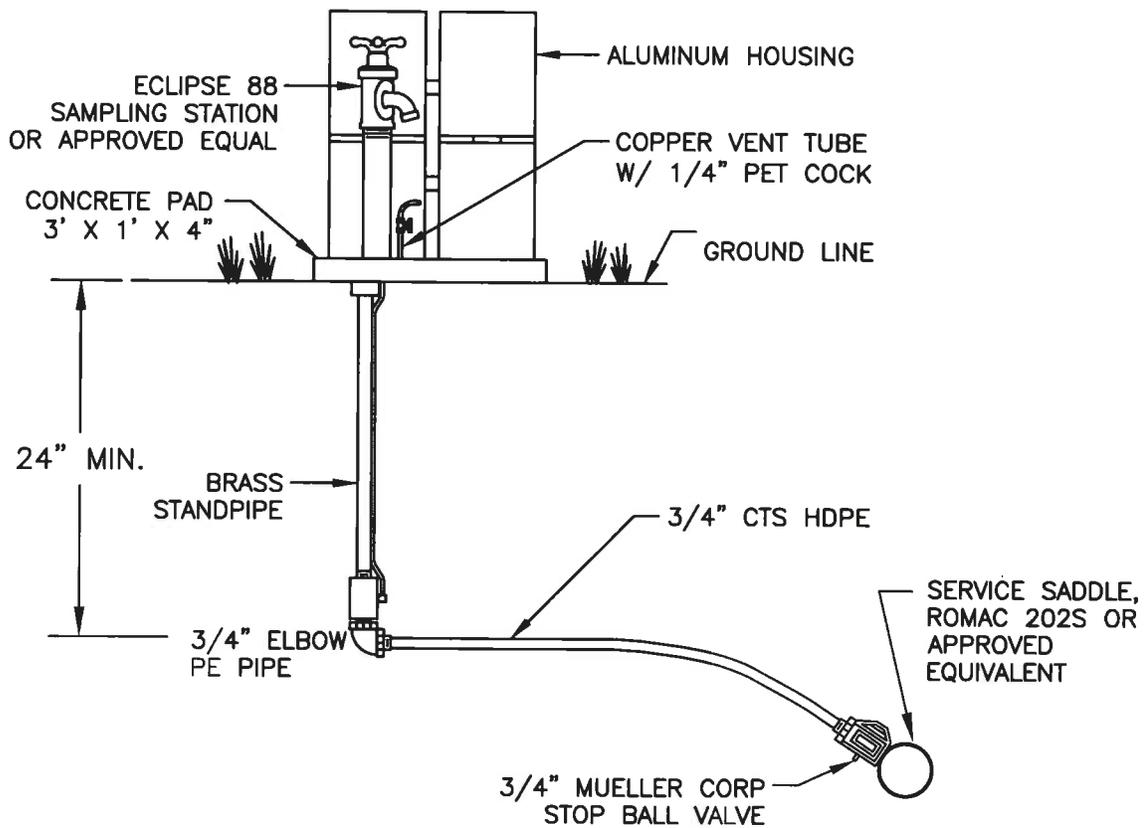
1. EXCEPTIONS SHALL BE APPROVED BY THE CITY OF WOODLAND IN WRITING.
2. WHERE MINIMUM CLEARANCES CANNOT BE MET, THE SEWER MAIN SHALL BE PLACED IN SEPARATE TRENCHES AND CONSTRUCTED OF MATERIALS EQUIVALENT TO THE CITY OF WOODLAND WATER MAIN STANDARDS, INCLUDING PRESSURE TESTING. ADEQUATE RESTRAINT SHALL BE PROVIDED TO ALLOW TESTING TO OCCUR.
3. ALL SEWER CROSSINGS OVER OR UNDER WATER MAINS SHALL MAXIMIZE THE JOINT SEPARATION BY USING THE LONGEST STANDARD LENGTH PIPE AVAILABLE FROM THE MANUFACTURER FOR BOTH THE WATER AND SEWER MAINS. BOTH PIPES SHALL BE CENTERED AT THE POINT OF CROSSING.
4. ALL SEWER CROSSING OVER WATER MAINS SHALL BE CONSTRUCTED OF MATERIALS EQUIVALENT TO THE CITY OF WOODLAND WATER MAIN STANDARDS, INCLUDING PRESSURE TESTING



WATER AND SEWER SPACING

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NOTES:

1. SAMPLING STATIONS SHALL BE 24" BURY, WITH A 3/4" FIP INLET, AND A (3/4" HOSE) NOZZLE.
2. ALL STATIONS SHALL BE ENCLOSED IN A LOCKABLE, NONREMOVEABLE, ALUMINUM-CAST HOUSING.
3. WHEN OPENED, THE STATION SHALL REQUIRE NO KEY FOR OPERATION, AND THE WATER WILL FLOW IN AN ALL BRASS WATERWAY.
4. ALL WORKING PARTS WILL ALSO BE OF BRASS AND BE REMOVABLE FROM ABOVE GROUND WITH NO DIGGING. EXTERIOR PIPING SHALL BE BRASS.
5. A COPPER VENT TUBE WILL ENABLE EACH STATION TO BE PUMPED FREE OF STANDING WATER TO PREVENT FREEZING AND TO MINIMIZE BACTERIA GROWTH.
6. ECLIPSE NO. 88 BRASS SAMPLING STATION SHALL BE INSTALLED.
7. INSTALL LOCATE WIRE.
8. POUR 3' X 1' X 4" CONCRETE PAD.

SAMPLING STATION

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Standard Abbreviations

<p>AB ANCHOR BOLT AC ASPHALTIC CONCRETE, ACOUSTIC ADJ ADJUSTABLE AL ALUMINUM ALT ALTERNATE AMB AMBIENT APPROX APPROXIMATELY ASSY ASSEMBLY AUTO AUTOMATIC AUX AUXILIARY</p> <p>BF BLIND FLANGE BLDG BUILDING BV BALL VALVE</p> <p>CB CATCH BASIN CDF CONTROL DENSITY FILL CEM CEMENT CFM CUBIC FEET PER MINUTE CJ CONSTRUCTION JT CL CENTERLINE CLR CLEAR CO CLEANOUT COMB COMBINATION CONC CONCRETE, CONCRETING CPLG COUPLING CSTC CRUSHED SURFACING TOP COURSE CTR CENTER CTS COPPER TUBE SIZE CSBC CRUSHED SURFACING BASE COURSE</p> <p>D DRAIN, DECANT DI DUCTILE IRON DIA, Ø DIAMETER DWG(S) DWG(S)</p> <p>E EAST EA EXHAUST AIR, EACH ECC ECCENTRIC ELEV. ELEVATION (ELEV) ELECT ELECTRICAL E.O.P. EDGE OF PAVEMENT EQUIP EQUIPMENT EQUIV EQUIVALENT EX. EXISTING EXH EXHAUST EXP EXPANSION, EXPOSED EXT EXTERIOR</p> <p>FF FINISH FLOOR FIP FEMALE IRON PIPE FLEX FLEXIBLE FLG FLANGE FLR FLOOR</p> <p>GALV GALVANIZED GPD GALLONS PER DAY GPM GALLONS PER MINUTE GV GATE VALVE</p>	<p>H HIGH, HORIZONTAL HB HOSE BIB HDPE HIGH DENSITY POLYETHYLENE HOA HAND-OFF-AUTO HP HORSEPOWER HT HEIGHT HZ HERTZ (CYCLES PER SECOND)</p> <p>ID INSIDE DIAMETER IPS IRON PIPE SIZE</p> <p>JB JUNCTION BOX JT JOINT</p> <p>LB POUND(S) LVR LOUVER LW LOCATE WIRE MAG MAGNETIC MAINT MAINTENANCE MAT'L MATERIAL MAX MAXIMUM MCC MOTOR CONTROL CENTER MIN MINIMUM, MINUTE MJ MECHANICAL JOINT</p> <p>N NEUTRAL, NORTH NC NORMALLY CLOSED NE NORTH EAST NEG NEGATIVE NO NORMALLY OPEN, NUMBER NPSH NET POSITIVE SUCTION HEAD NRS NONRISING STEM NTS NOT TO SCALE</p> <p>OD OUTSIDE DIAMETER OH OVER HEAD OPNG OPENING</p> <p>PE PLAIN END, POLYETHYLENE PEN PENETRATION PH PHASE PL PROPERTY LINE PLCS PLACES PLY PLYWOOD PP POWER POLE PRES PRESSURE PRV PRESSURE REDUCING (RELIEF) VALVE PS PRESSURE SWITCH, PRESSURE SENSOR PSI POUNDS PER SQUARE INCH PVC POLYVINYL CHLORIDE PVMT PAVEMENT</p> <p>R RADIUS, RISER R/C REINFORCED CONCRETE RD ROOF DRAIN, ROAD RED REDUCED(R) REINF REINFORCED REQ'D REQUIRED RPM REVOLUTIONS PER MINUTE R/W RIGHT OF WAY</p>	<p>S SOUTH SCH SCHEDULE SEC SECOND SHT SHEET SIM SIMILAR SOLN SOLUTION SPEC SPECIFICATION SQ SQUARE SS SANITARY SEWER, SOLID SST STAINLESS STEEL STA STATION STD STANDARD, STUD STL STEEL STRUCT STRUCTURAL</p> <p>T TRAP, TOP, TANGENT TB TERMINAL BOX, TOP & BOTTOM T/B TOP OF BANK TC TOP OF CURB/CONCRETE TDH TOTAL DYNAMIC HEAD TESCP TEMPORARY EROSION AND SEDIMENTATION CONTROL PLAN THRD THREAD(ED) TOW TOP OF WALL TRANS TRANSITION TS TOP OF SLAB/SLOPE TYP TYPICAL</p> <p>UG UNDERGROUND UH UNIT HEATER U/P UTILITY POLE</p> <p>VAC VACUUM, VOLTS ALTERNATING CURRENT VAR VARIES, VARIABLE VC VERTICAL CURVE VERT VERTICAL VTR VENT THROUGH ROOF</p> <p>W WEST, WATER W/ WITH W/O WITHOUT WSDOT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION WSEL WATER SURFACE ELEVATION WT WATERTIGHT, WEIGHT WWF WELDED WIRE FABRIC</p> <p>XFMR POWER TRANSFORMER XP EXPLOSION PROOF</p> <p># NUMBER, POUNDS & AND @ AT Ø DIAMETER, PHASE</p>
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STANDARD ABBREVIATIONS



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