

BILL OF MATERIALS

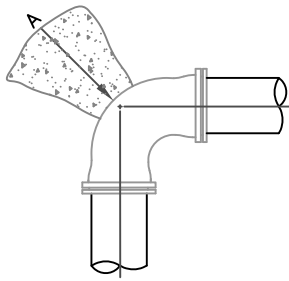
<u>MARK</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>
(A)	1	Single Strap Saddle, Romac 101S or Equal with AWWA taper tap
(B)	1	1' Corporation Stop, AWWA inlet MIP
(C) - 1	2	1' x 90° Brass Elbow
(C) - 2	2	1' Brass Nipple
(C) - 3	1	1' Brass Pipe
(D) - 1	1	1' Ball Valve
(D) - 2	1	Operating Nut
(E)	2	1' MIP x Pack Joint Adaptor
(F)	1	1' HI-Mol Pipe
(G)	1	1' Air and Vacuum Valve, screwed, APCD No. 143C or equal
(H) - 1	2	1' x 90° GIP Elbow
(H) - 2	2	1' GIP nipples
(H) - 3	1	1' GIP
(I)	1	1' Brass Union
(K)	1	1' Return Bend, open pattern
(L)	1	1' Beehive Strainer
(M)	1	18"x24" Valve Box, Seattle Std. or APWA #67
(N)	2	Standard 9" Concrete Guard Posts (see Hydrant Guard Post Detail)
(P)	1	2' x2' Asphalt Pad

1" AIR & VACUUM RELEASE VALVE ASSEMBLY

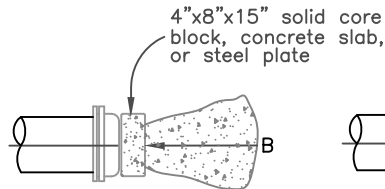
NO SCALE

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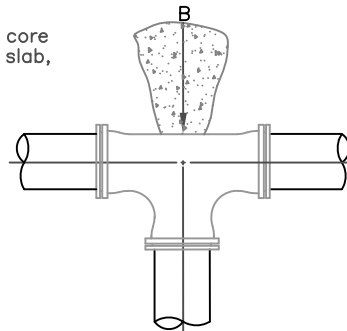
Rev. 7/96 - SGO
WDETAVR1.DWG



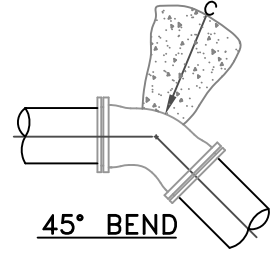
90° BEND



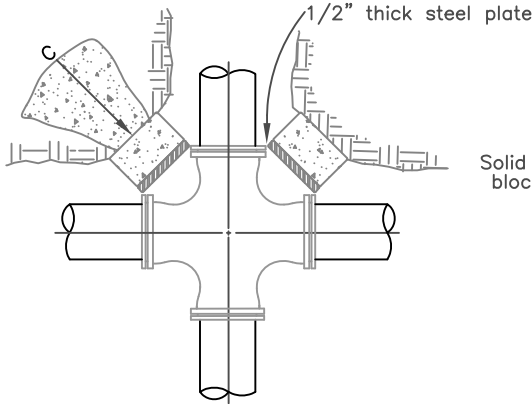
CAP



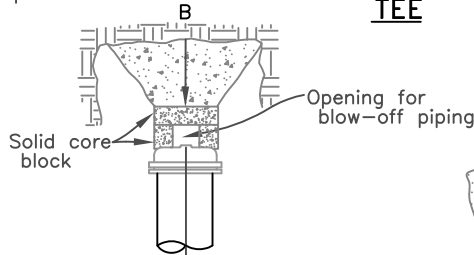
TEE



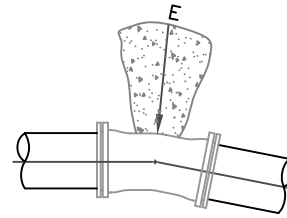
45° BEND



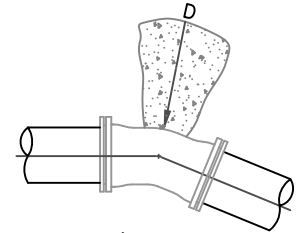
UNBALANCED CROSS



TAPPED TEE



11¼° BEND

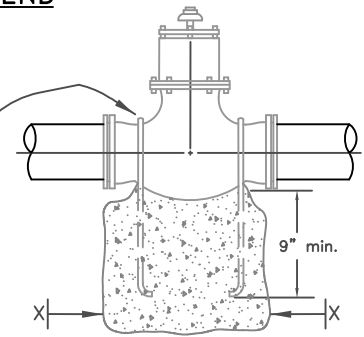


22½° BEND

THRUST BLOCK							
		MIN. BEARING AREA AGAINST UNDISTURBED SOIL—SQ.FT.					
PIPE SIZE	PRESSURE PSI	A	B	C	D	E	X (100 PSI)
4"	200	2/(1)	1/(NONE)	1/(NONE)	NONE	NONE	NONE
	300	3/(2)	2/(2)	2/(1)	1/(1)	NONE	NONE
6"	200	4/(3)	3/(2)	3/(1)	1/(1)	1(NONE)	NONE
	300	6/(4)	4/(3)	3/(2)	2/(1)	1(NONE)	NONE
8"	200	7/(5)	5/(3)	4/(3)	2/(2)	1/(1)	3/(2)
	300	11/(3)	8/(5)	6/(4)	3/(2)	2/(1)	3/(2)
10"	200	11/(8)	8/(6)	6/(4)	3/(2)	2/(1)	4/(3)
	275	16/(11)	11/(7)	9/(6)	5/(3)	3/(2)	4/(3)
12"	200	16/(11)	11/(8)	9/(6)	5/(3)	3/(2)	5/(4)
	250	24/(16)	17/(11)	13/(9)	7/(5)	4/(3)	5/(4)
14"	200	22/(13)	16/(11)	12/(8)	6/(4)	3/(2)	7/(6)
	250	33/(22)	23/(16)	18/(12)	9/(6)	5/(3)	7/(6)
16"	200	29/(19)	21/(14)	16/(11)	8/(6)	5/(3)	10/(7)
	225	23/(16)	23/(16)	17/(12)	9/(6)	5/(3)	10/(7)
18"	200	36/(24)	26/(17)	20/(13)	10/(7)	5/(4)	13/(9)
20"	200	45/(29)	32/(21)	24/(16)	13/(8)	7/(4)	16/(11)
24"	200	64/(43)	46/(30)	35/(23)	18/(12)	9/(6)	23/(16)

2 - 1/2" dia. rods for 10" size and smaller
2 - 1" dia. rods for sizes larger than 10"

NOTE
Additional blocking must be provided if gate valve is at end of line during test.



GATE VALVE

SAFE BEARING LOADS IN LBS./SQ. FT.

The safe bearing loads given in the following table are for horizontal thrusts when the depth of cover over the pipe exceeds 2 feet.

SOIL	SAFE BEARING LOAD LBS./SQ. FT.
*Muck, peat, etc.	0
Soft caly	1,000
Sand	2,000
Sand and gravel	3,000
Sand and gravel cemented with clay	4,000
Hard shale	10,000

*In muck or peat, all thrusts shall be restrained by piles or tie rods to solid foundations or by removal of muck or peat and replacement with ballast of sufficient stability to resist thrusts.

NOTE

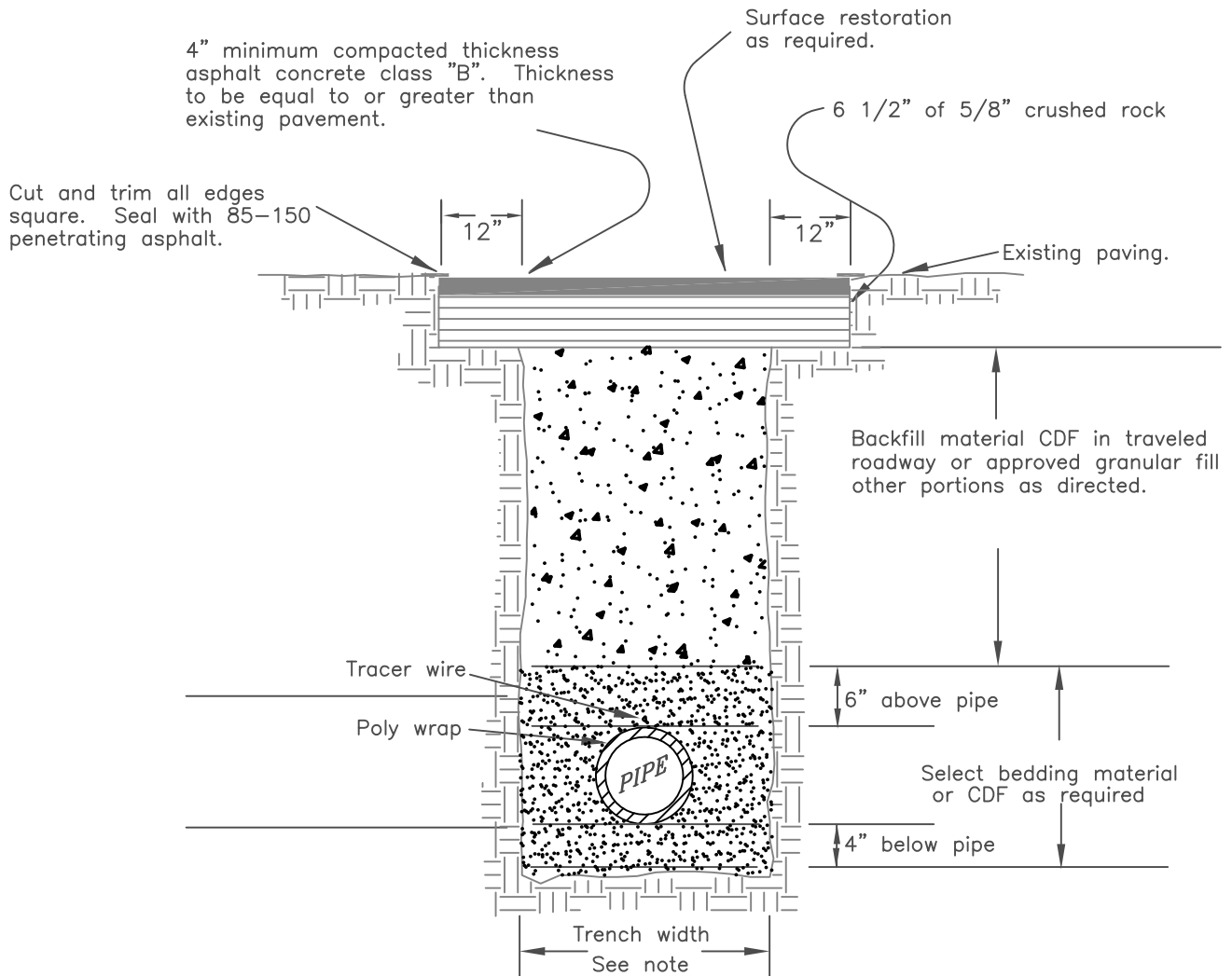
- Square feet of concrete thrust - block area based on safe bearing load of 2000/(3000) pounds per square feet.
- Areas must be adjusted for other size pipe, pressures and soil conditions.
- Concrete blocking shall be cast in place and have a minimum of 1/2 square foot bearing against the fitting.
- Block shall bear against fittings only and shall be clear of joints to permit taking up or dismantling joint.
- Contractor shall install blocking adequate to withstand full test pressure as well as to continuously withstand operating pressure under all conditions of service.

CONCRETE BLOCKING

NO SCALE

Rev. June 2003
Concrete Blocking.dwg





NOTE:
Minimum trench width shall be the pipe O.D. + 12" (6" each side of pipe)

Maximum trench width:
15" diameter and smaller: 40"
18" diameter and larger: 1-1/2 x I.D. + 18"

**RIGID PIPE
TYPICAL TRENCH SECTION**

NO SCALE

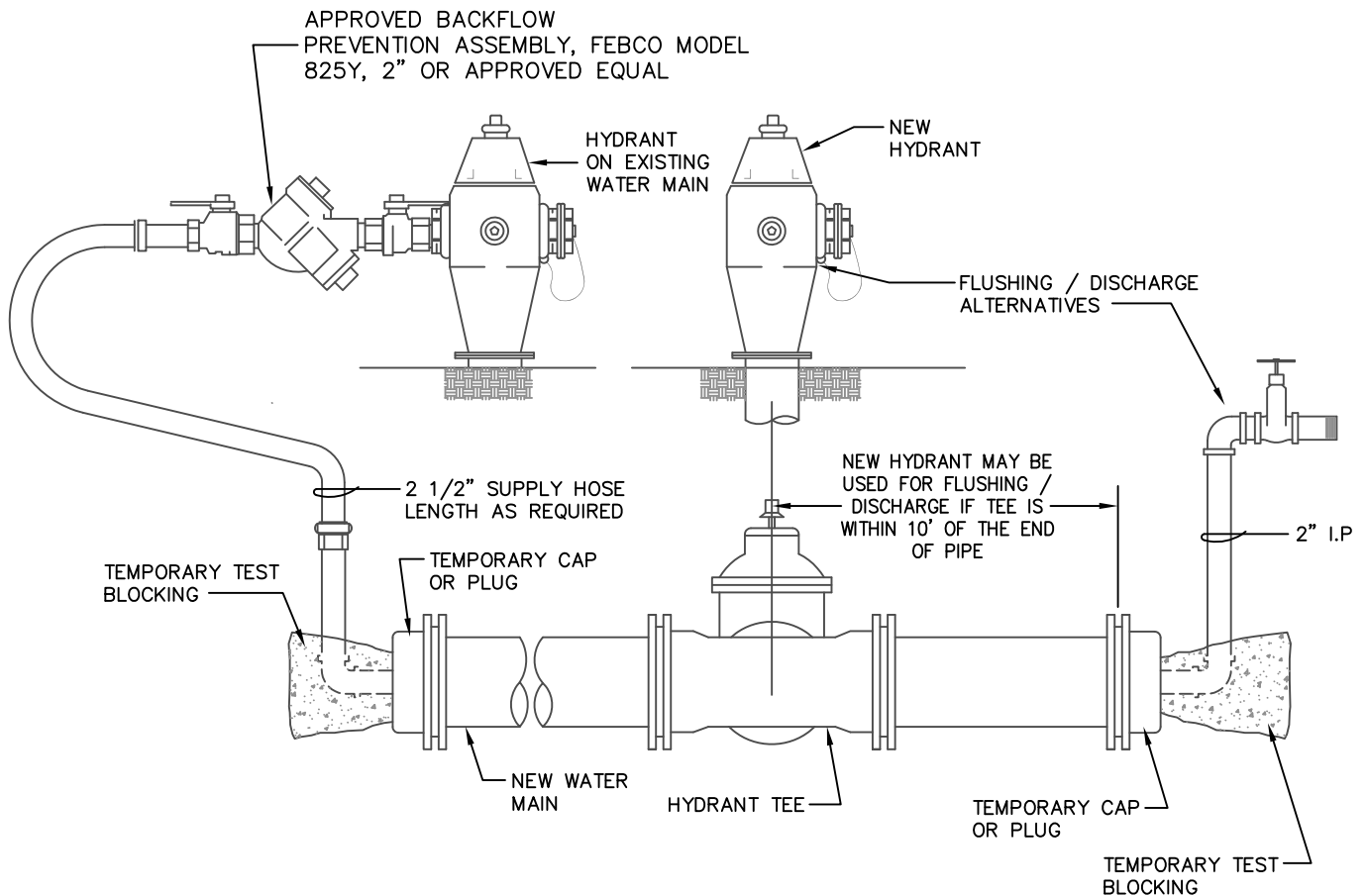
Rev. 6/03
Trench Section.dwg

NOTES:

NEW SECTIONS OF WATER MAIN THAT ARE INSTALLED WHEN EXPANDING A DISTRIBUTION SYSTEM MUST BE SEPARATED FROM THE EXISTING SYSTEM. UNTIL SATISFACTORY FLUSHING, DISINFECTION AND BACTERIOLOGICAL SAMPLING HAS BEEN COMPLETED, THE NEW WATER MAIN MUST BE CONSIDERED CONTAMINATED. IN ADDITION, THE CHLORINE CONCENTRATION USED FOR DISINFECTION PROCEDURES (MINIMUM 25 mg/l) MAKES WATER NON-POTABLE.

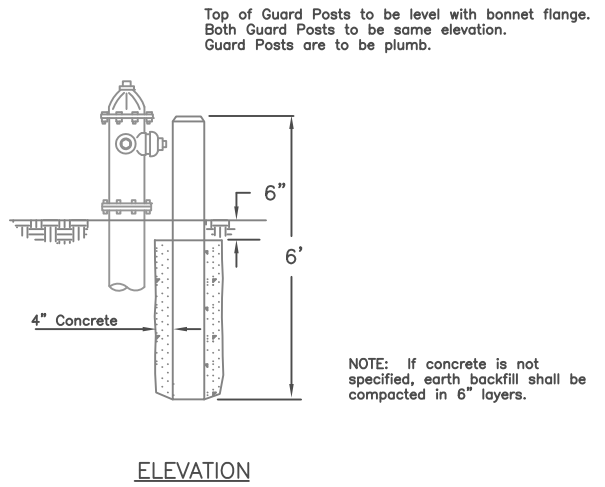
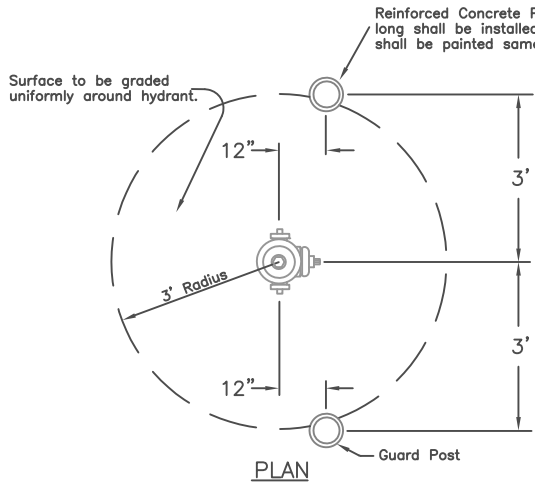
AN APPROVED BACKFLOW PREVENTION ASSEMBLY MUST BE USED ON THE SUPPLYING WATER LINE WHEN FILLING THE NEW WATER MAIN DURING DISINFECTION AND FLUSHING. THE BACKFLOW PREVENTION ASSEMBLY AND SUPPLY PIPING MUST BE REMOVED DURING HYDROSTATIC PRESSURE TESTING OF THE NEW WATER MAIN.

AFTER SATISFACTORY BACTERIOLOGICAL SAMPLE RESULTS ARE OBTAINED FROM THE NEW WATER MAIN, SECTIONS OF CONNECTING PIPE MUST BE INSTALLED BETWEEN IT AND THE EXISTING SYSTEM. BEFORE INSTALLATION, THE INTERIORS OF ALL PIPE AND FITTINGS USED TO MAKE THE CONNECTION MUST BE SWABBED OR SPRAYED WITH A 1% AVAILABLE CHLORINE SOLUTION.



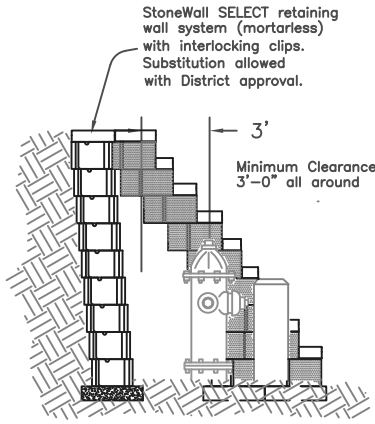
WATER FILLING DETAIL

NO SCALE

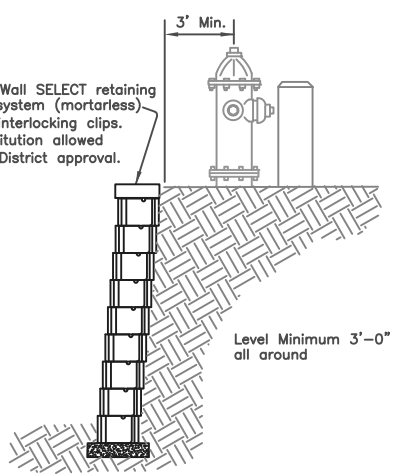


NOTE: If concrete is not specified, earth backfill shall be compacted in 6" layers.

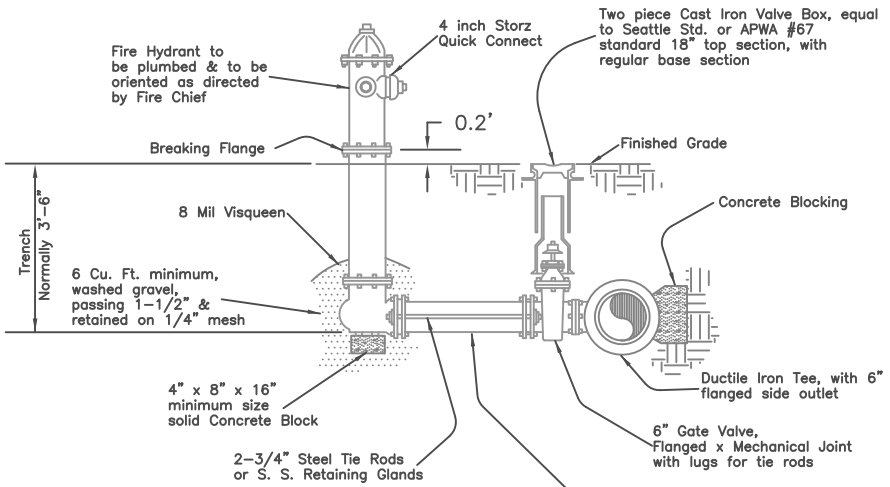
FIRE HYDRANT GUARD POSTS



FIRE HYDRANT IN CUT



FIRE HYDRANT IN FILL



NOTES:
Hydrant shall be prime coated with Steelcote SR-53 heavy duty-brush type or approved equal. Top coats shall be Steelcote acid and oil resistant enamel No. 44-68, color-white, brush type or approved equal.

Stencil on the face of hydrant barrel the distance from hydrant to gate valve in feet and inches with 2" black letters.

Steel Tie Rods shall have a length to fit between lugs. Apply a heavy coat of coal tar preservative on tie rods, nuts and bolts.

Hydrant type: Mueller 5.25" or Approved Equal

FIRE HYDRANT ASSEMBLY

FIRE HYDRANT LOCATION IN CUT OR FILL

STANDARD FIRE HYDRANT DETAIL

NO SCALE

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Rev. 1/10/01 DLM
FIRE HYDRANT ASSEMBLY.DWG

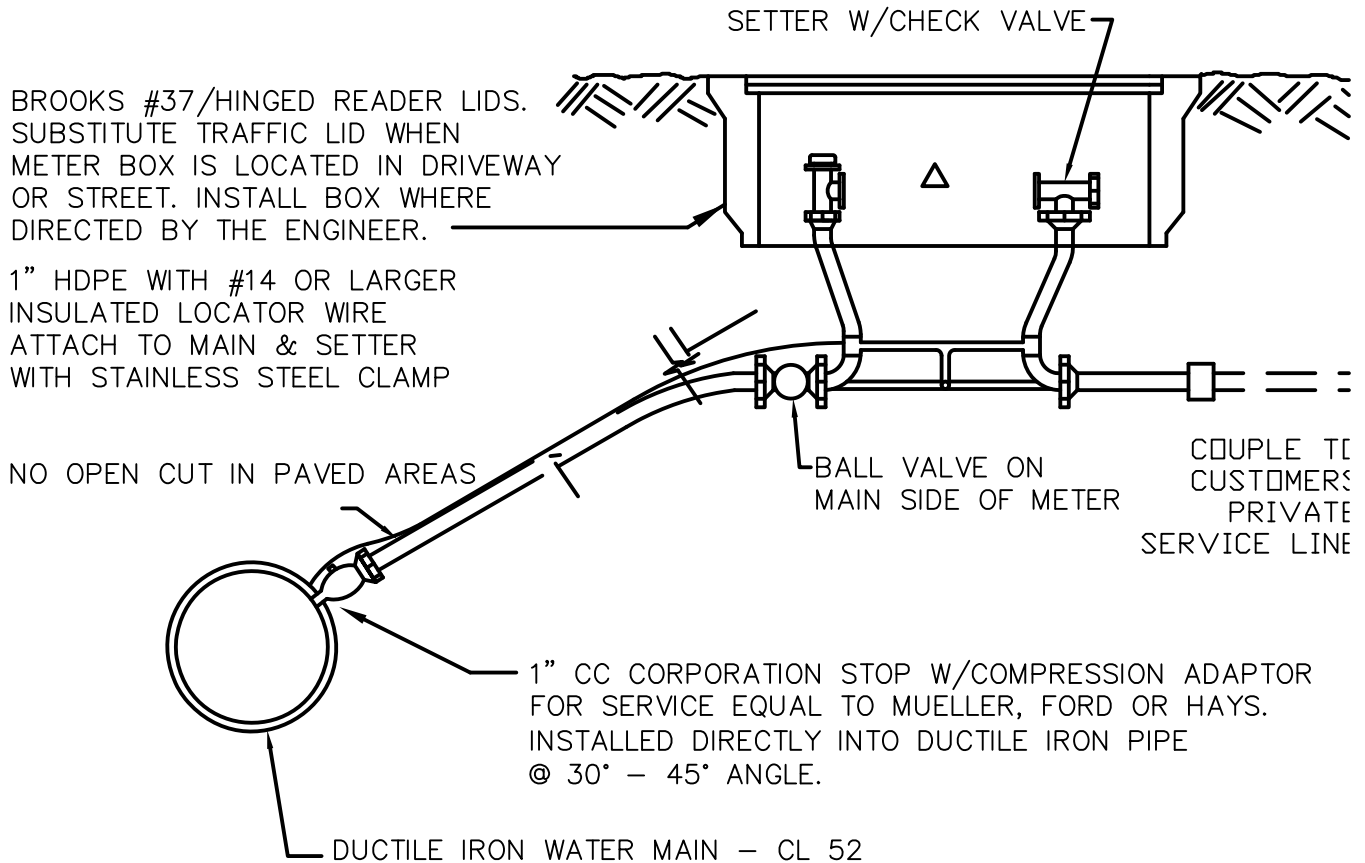


1" SERVICE LINE TO BE DRISCO D2239 SDR 7
 200 PSI HDPE
 1" COPPER SETTER EQUAL TO MUELLER, FORD,
 MCDONALD, OR HAYS, EQUIPPED AS FOLLOWS.

- PADLOCK WINGS ON BALL VALVE
- ANGLE CHECK ON METER OUTLET
- IRON PIPE CONNECTIONS ON SETTER INLET AND OUTLET
- COMPRESSION ADAPTOR ON SETTER INLET AND OUTLET
- INSTALL TYPE K COPPER AND MISC. BRASS FITTINGS FOR CONNECTION TO CUSTOMER'S LINE

HEIGHT OF SETTER CAN VARY BETWEEN 9" AND 15"

COPPER SETTER SHALL BE SET LEVEL AND CENTERED IN THE METER BOX.

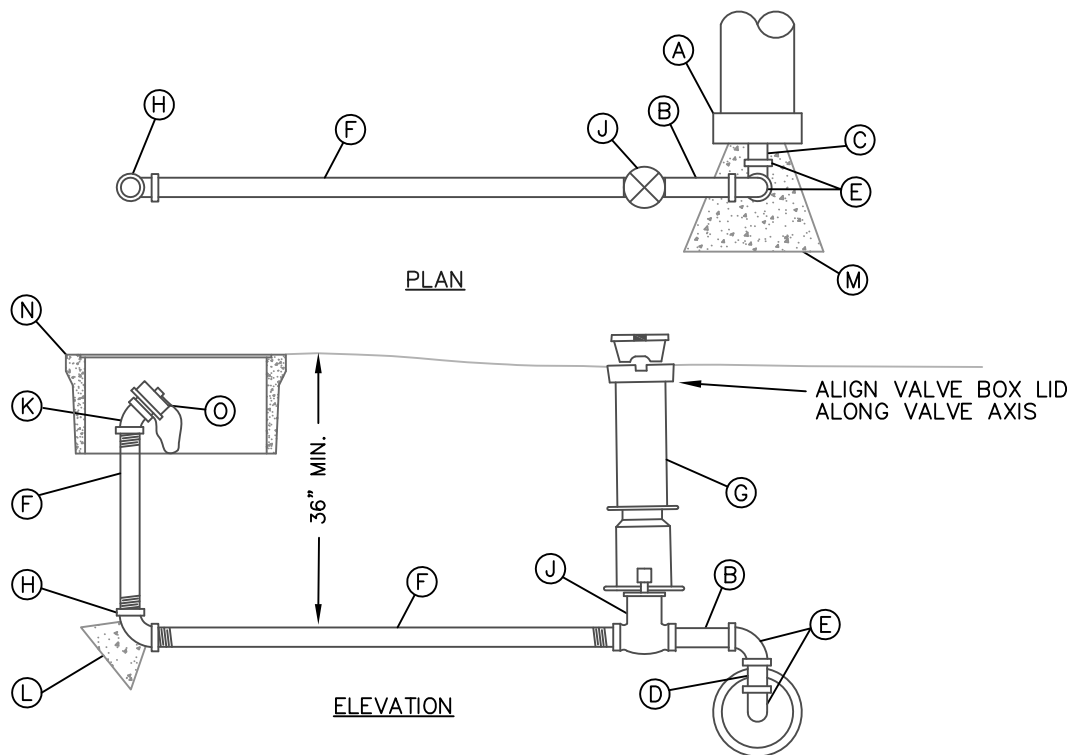


METER BOX SHALL BE INSTALLED FLUSH W/FINAL GRADE AND MUST BE SIZED TO ALLOW FOR MIN. CLEARANCE REQUIREMENTS.

1" - SINGLE WATER SERVICE DETAIL

NO SCALE

Rev. 6/03
 Service, One Inch



MATERIAL LIST

<u>MARK</u>	<u>QUANTITY</u>	<u>ITEM DESCRIPTION</u>
A	1	D.I. CAP, TAP 2", IPS
B	1	2" NIPPLE, BRASS., 1'-0" LONG
C	1	2" NIPPLE, BRASS., 6" LONG
D	1	2" NIPPLE, BRASS., 3" LONG
E	2	2" 90° ELBOW, BRASS., SWING JOINT
F	2	2" GALV., STEEL PIPE, THREADED, LENGTH TO SUIT
G	1	VALVE BOX—OWNER STANDARD
H	1	2" 90° ELBOW, GALV., DRILL w" HOLE (THREADED)
J	1	2" GATE VALVE—OWNER STANDARD
K	1	2" 45° ELBOW, GALV. (THREADED)
L	1/4 CY	WASHED GRAVEL—PASSING 1" AND RETAINED ON r" MESH
M	1	CONCRETE THRUST BLOCK, CAST IN PLACE BEARING AGAINST CAP ONLY
N	1	10 MIL PLASTIC AGAINST CAP
O	1	METER BOX—OWNER STANDARD
		2" PLUG WITH SQUARE HEAD, GALV.
		2" MIPx2 1/2" MIP N.S.T. ADAPTOR (FIRE HOSE) W-CAP

2" BLOW-OFF ASSEMBLY

CONSTRUCTION NOTES

GENERAL NOTES:

1. THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE DISTRICT AND ENGINEER.
2. A COMPLETE SET OF PLANS SHALL BE MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION, AND SHALL REFLECT ANY VARIATION IN CONSTRUCTION FROM THE PLANS. THESE "AS-BUILT" PLANS SHALL BE PROVIDED TO THE DISTRICT AT THE COMPLETION OF CONSTRUCTION.
3. THE CONTRACTOR SHALL COORDINATE HIS CONSTRUCTION ACTIVITIES WITH THE PERTINENT UTILITY COMPANIES TO ENSURE WATER METERS, TELEPHONE VAULTS, ETC., ARE BROUGHT TO GRADE PRIOR TO CONSTRUCTION OF CURB AND SIDEWALKS.
4. THE CONTRACTOR WILL BE FULLY RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL EXISTING UTILITIES. THE UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE AND WILL NEED FIELD VERIFICATION FOR EXACT ALIGNMENT AND DEPTH. THERE MAY BE EXISTING UTILITIES NOT SHOWN ON THE PLANS.
5. CONTRACTOR SHALL COORDINATE CONSTRUCTION WITH SEATTLE CITY POWER & LIGHT FOR UTILITY POLE STABILIZATION IF REQUIRED.
6. ALL EXCAVATION METHODS AND SHORING TECHNIQUES SHALL BE IN ACCORDANCE WITH WAC 296 TRENCH EXCAVATION SAFETY SYSTEMS.
7. THE DISTRICT SHALL AT ALL TIMES HAVE ACCESS TO THE WORK AND TO THE LOCATIONS WHERE THE WORK IS IN PREPARATION.
8. THE CONTRACTOR SHALL NOTIFY ONE CALL UTILITY LOCATING SERVICE PRIOR TO ANY CONSTRUCTION TO VERIFY LOCATION OF EXISTING UTILITIES, AT (800) 424-5555.

WATER NOTES:

1. ALL WORK, MATERIALS, CONCRETE BLOCKING AND TESTING OF WATER LINES SHALL CONFORM TO STANDARD DETAILS OF LAKE FOREST PARK WATER DISTRICT AND AWWA STANDARDS.
2. THE WATER MAIN SHALL BE INSTALLED WITH MINIMUM OF 36 INCHES OF COVER (10-INCH PIPE AND SMALLER) AND 48 INCHES COVER (12-INCH PIPE OR LARGER), AS MEASURED FROM THE TOP OF THE PIPE TO FINISHED GRADE, UNLESS OTHERWISE APPROVED. WHERE UTILITY CONFLICTS OCCUR, THE WATER MAIN SHALL BE LOWERED TO CLEAR AS APPROVED BY THE WATER DISTRICT. THIS INFORMATION SHALL BE REFLECTED ON THE "AS-BUILT" RECORD BY CONTRACTOR.
3. EXACT LOCATIONS AND CONFIGURATION OF WATER METERS AND VAULTS SHALL BE APPROVED BY THE DISTRICT PRIOR TO CONSTRUCTION.
4. BEDDING FOR WATER MAINS SHALL BE PROVIDED AS REQUIRED IN THE STANDARD DETAIL AND SPECIFICATIONS.
5. ALL SERVICE CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH LAKE FOREST PARK WATER DISTRICT REQUIREMENTS.
6. ALL FIRE HYDRANTS SHALL BE INSTALLED, INSPECTED AND ADJUSTED IN ACCORDANCE WITH THE DISTRICT'S STANDARD DETAILS.
7. AFTER THE PIPE AND APPURTENANCES ARE IN PLACE AND THE SYSTEM HAS BEEN SATISFACTORILY PRESSURE TESTED, IT SHALL BE FLUSHED WITH WATER OF SUFFICIENT VELOCITY TO REMOVE ALL DIRT AND OTHER FOREIGN MATERIALS AND DISINFECTED/CHLORINATED IN ACCORDANCE WITH RECOMMENDED AWWA STANDARDS. THE CONTRACTOR SHALL REQUEST A BACTERIOLOGICAL SAMPLE TO BE TAKEN AT LEAST 24 HOURS AFTER FLUSHING AND DISINFECTING.
8. DUCTILE IRON PIPE SHALL CONFORM TO AWWA C-151 WITH A STANDARD THICKNESS CLASS 52. FITTINGS FOR D.I. PIPE SHALL BE DUCTILE IRON OR CLASS 250 GRAY IRON CONFORMING TO AWWA C-110.
9. PRIOR TO BACKFILLING, ALL MAINS AND APPURTENANCES SHALL BE INSPECTED AND APPROVED FOR BACKFILLING BY THE DISTRICT.
10. NO CONNECTIONS TO THE EXISTING WATER SYSTEM SHALL BE MADE WITHOUT AN APPROVED BACKFLOW PREVENTION DEVICE AND THE DISTRICT'S OR LAKE FOREST PARK WATER DISTRICT'S APPROVAL. PERMANENT CONNECTION SHALL NOT BE MADE UNTIL NEW MAINS HAVE BEEN DISINFECTED, FLUSHED AND HAVE PURITY IN ACCORDANCE WITH DISTRICT REQUIREMENTS. ANY CONNECTION TO THE EXISTING WATER SYSTEM SHALL BE WITNESSED BY THE DISTRICT'S INSPECTOR.
11. ALL THRUST BLOCKS SHALL BE FORMED IN PLACE. BLOCKS SHALL NOT BE BACKFILLED PRIOR TO SPECIFIC APPROVAL OF THE DISTRICT AND THE FIRST AGES OF THE CONCRETE CURING PROCESS ARE EVIDENT.
12. WATER PIPE ABANDONMENT:
 - REMOVE WHERE DIRECTED AND SALVAGE TO DISTRICT
 - OPEN ALL MAIN VALVES AND CAP ENDS OF PIPE
 - REMOVE VALVE BOX TOPS AND RESTORE SURFACE

TEMPORARY EROSION AND STORM CONTROL (TESC):

1. CONTRACTOR SHALL HAVE EROSION CONTROL MEASURES IN PLACE BEFORE BEGINNING CONSTRUCTION
2. ALL RELEASES OF PETROLEUM PRODUCTS, PAINTS, SOLVENTS, AND OTHER DELETERIOUS MATERIALS MUST BE PROMPTLY CONTAINED AND REMOVED IN A MANNER THAT WILL PREVENT THEIR DISCHARGE TO WATERS AND SOILS. BARRELS, PETROPHILIC PADS, TARPS AND OTHER EQUIPMENT NECESSARY FOR SPILL RECOVERY AND DISPOSAL SHALL BE MAINTAINED BY CONTRACTOR ON-SITE.
3. DUST CONTROL SHALL BE PROVIDED BY CONTRACTOR AS DIRECTED BY THE ENGINEER
4. CONTRACTOR SHALL SECURE LOADS PER RCW 46.61.655

LANDSCAPING RESTORATION:

1. REPLACE ALL TREES, LANDSCAPING, AND IRRIGATION DAMAGED DURING CONSTRUCTION
2. PROVIDE HYDROSEED FOR ALL UNPAVED AND NON-GRAVEL AREAS DISTURBED DURING CONSTRUCTION

ROADWAY, SIDEWALK, CURB AND GUTTER RESTORATION:

1. SIDEWALK, CURB AND GUTTERS DISTURBED BY CONSTRUCTION SHALL BE REPLACED WITH NEW SECTIONS IN ACCORDANCE WITH THE CITY OF LAKE FOREST PARK RIGHT-OF-WAY PERMIT AND PER THE TECHNICAL SPECIFICATIONS OF THE CONTRACT
2. ROAD SHOULDERS DISTURBED DURING CONSTRUCTION SHALL BE RE-GRADED WITH 5/8-MINUS CRUSHED ROCK

TRAFFIC CONTROL:

1. CONTRACTOR SHALL SUBMIT A DETAILED TRAFFIC CONTROL PLAN TO THE CITY OF LAKE FOREST PARK FOR APPROVAL PRIOR TO CONSTRUCTION
2. TRAFFIC CONTROL DEVICES SHALL MEET THE *MANUAL OF UNIFORM TRAFFIC CONTROL* DEVICES STANDARDS. BARRICADES SHALL HAVE AMBER FLASHING LIGHTS THAT ARE USED AT NIGHT
3. CONTRACTOR SHALL PROVIDE EMERGENCY VEHICLE ACCESS TO ALL PROPERTIES ADJACENT TO THE PROJECT. CONTRACTOR SHALL NOTIFY THE CITY OF LFP OF ANY CHANGES TO THE TRAFFIC PLAN DURING CONSTRUCTION