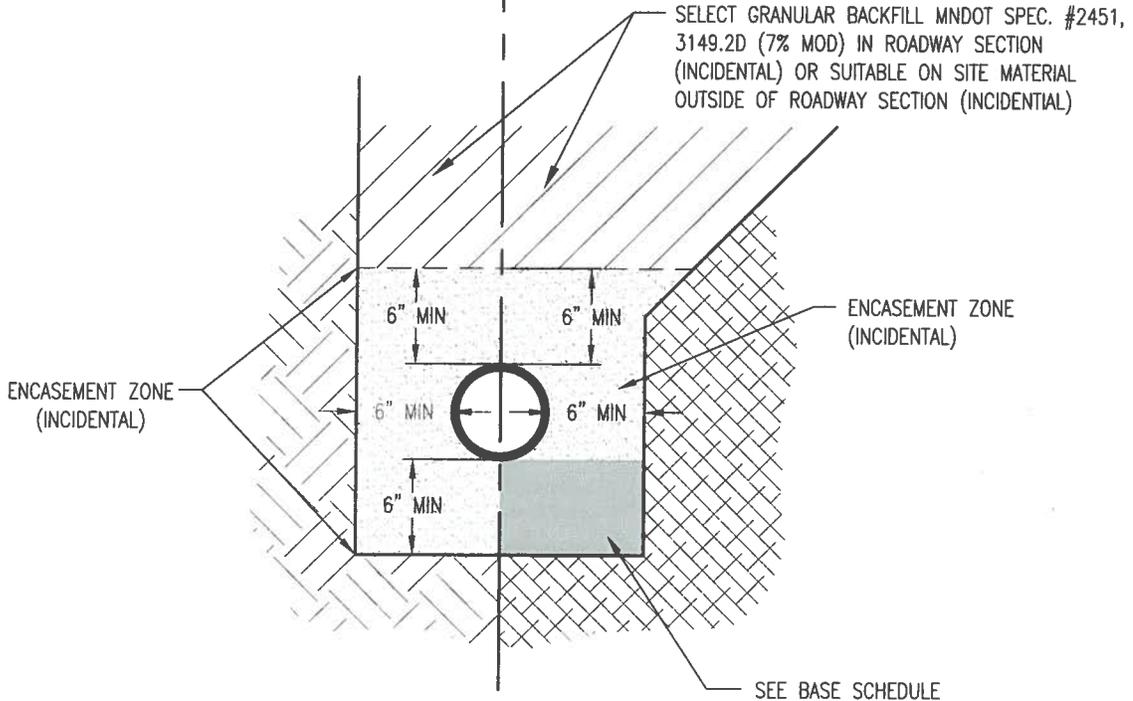


## GAS SYSTEM DETAILS

- G-1 ALL STEEL & 6" AND LARGER PE GAS MAIN BEDDING DETAIL
- G-2 STEEL TO PE SERVICE CONNECTION
- G-3 GAS MAIN BRANCH CONNECTIONS TO STEEL MAIN
- G-4 TYPICAL WELD JOINTS
- G-5 PE VALVE BOX SETTING
- G-8 HP GAS CROSSING AT RAILROAD
- G-9 TYPICAL STEEL GAS SERVICE RISER
- G-10 HIGH PRESSURE  $\frac{1}{2}$ " GAS SERVICE INSTALLATION - RESIDENTIAL
- G-11 HIGH PRESSURE GAS SERVICE INSTALLATION - 1" CTS & 2" IPS SERVICE
- G-11A METER INSTALLATION, SIZES 400, 675, & 1000
- G-12 ROOTS METER INSTALLATION
- G-12A 15C ROOTS COMPACT METER INSTALLATION
- G-12B 5M ROOTS COMPACT METER INSTALLATION
- G-13 UNDERGROUND GAS FUEL LINE PIPING - PAST METER
- G-14 DUPLEX METER CONNECTION
- G-14A TYPICAL MULTI-METER INSTALLATION
- G-14B TYPICAL MULTI-METER INSTALLATION - 6 RESIDENTIAL METERS
- G-15 MOBILE HOME GAS METER CONNECTION
- G-16 SEALING UNUSED LP GAS SERVICES
- G-17 CATHODIC PROTECTION
- G-18 TYPICAL METHOD OF BRAZED CONNECTION TO PIPE
- G-22 GAS PIPING BUILDING ENTRY, BELOW GRADE
- G-23 TYPICAL WELL FOR BELOW GRADE GAS PIPE ENTRY
- G-24 TYPICAL GAS PIPING REVISION
- G-26 TELEMETRIC GAS PRESSURE STATION
- G-30 TYPICAL CAGE & LANDSCAPING FOR GAS DISTRIBUTION REGULATOR
- G-33 BOLLARD DETAIL
- G-34 REGULATOR VENT EXTENSION
- G-35 7" WC METERING PRESSURE METER LOCATION
- G-36 ELEVATED PRESSURE METER LOCATION

ROCK SECTION

UNDISTURBED GROUND SECTION



NOTES:

1. MAXIMUM PAY WIDTH IN A ROCK TRENCH SHALL BE THE PIPE O.D. + 24"

BASE SCHEDULE		
TRENCH TYPE	MATERIAL	THICKNESS
NORMAL TRENCH	ENCASEMENT MATERIAL	4"
WET TRENCH	ENCASEMENT MATERIAL OVER FOUNDATION MATERIAL	4" + FOUNDATION THICKNESS T.B.D.
UNSTABLE TRENCH	AS DIRECTED BY INSPECTOR	AS DIRECTED BY INSPECTOR

MATERIAL SCHEDULE		
SIEVE SIZE	ENCASEMENT (SAND COVER)	FOUNDATION
2"	-	100
1"	-	85-100
3/4"	-	30-60
3/8"	-	0-10
#4	100	-
#10	95-100	-
#40	0-50	-
#200	0-8	-

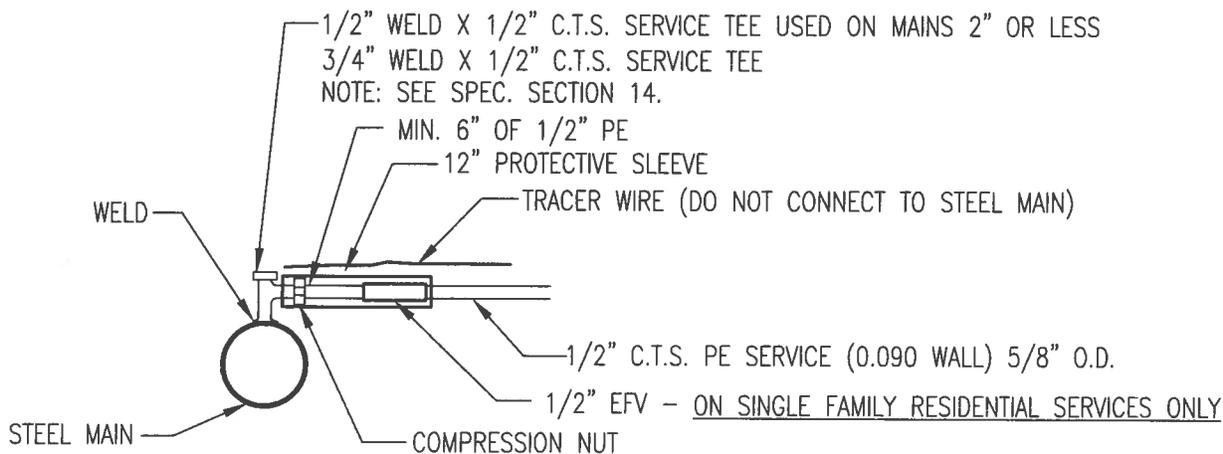
ALL STEEL & 6" AND LARGER PE GAS MAIN BEDDING DETAIL

G-1

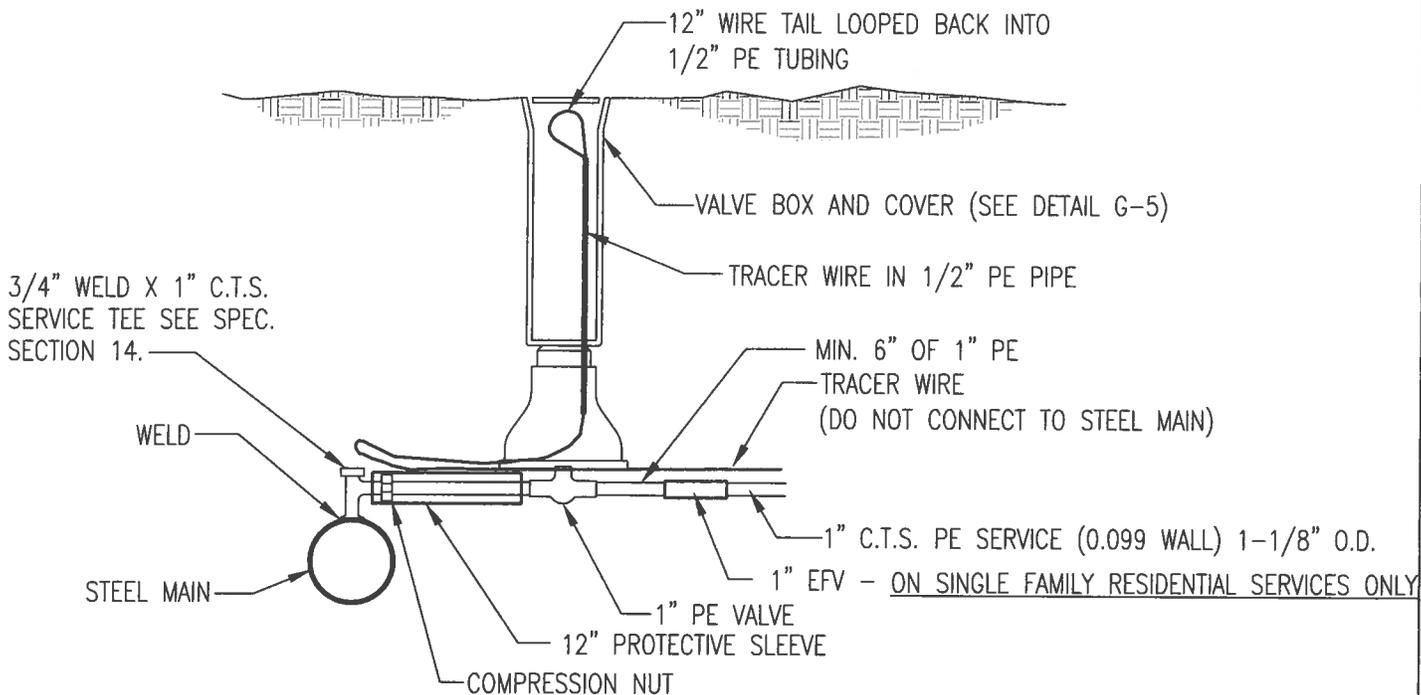
REVISED/APPROVED 06/01/2014

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



**1/2" C.T.S. PE SERVICE ON STEEL MAIN**



**1" C.T.S. PE SERVICE ON STEEL MAIN**

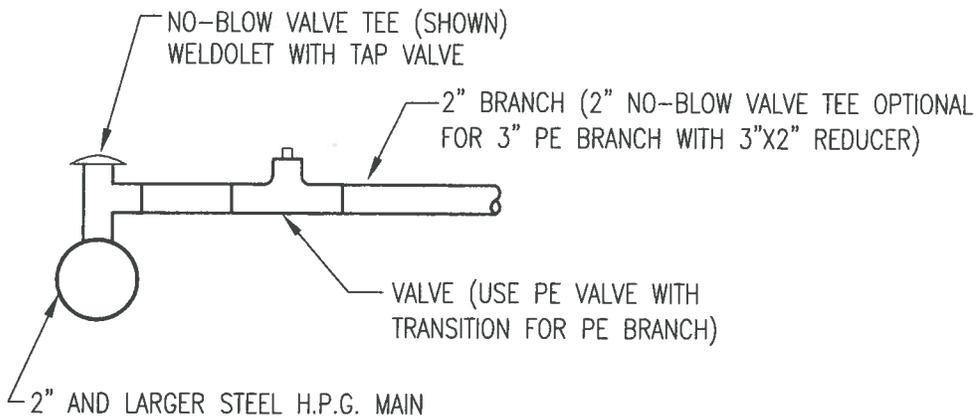
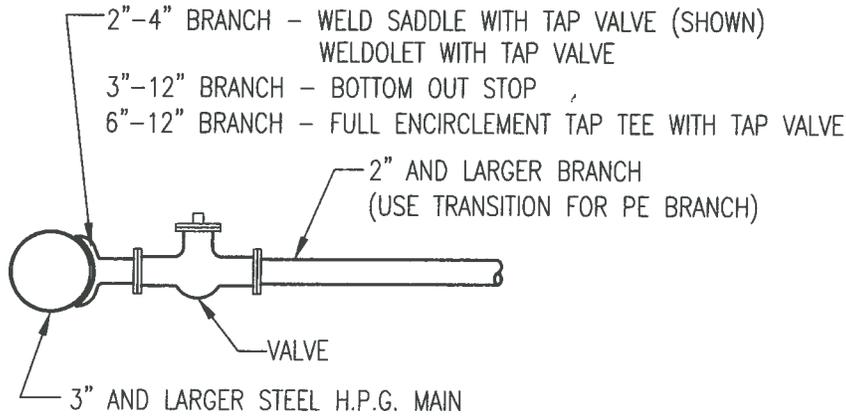
STEEL TO PE SERVICE CONNECTION

G-2

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CITY OF DULUTH STANDARD DETAIL  
 DEPT. OF PUBLIC WORKS AND UTILITIES

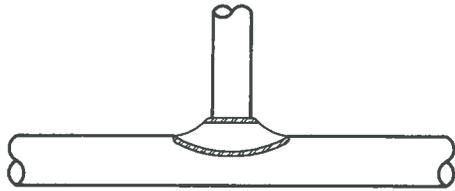
NO SCALE



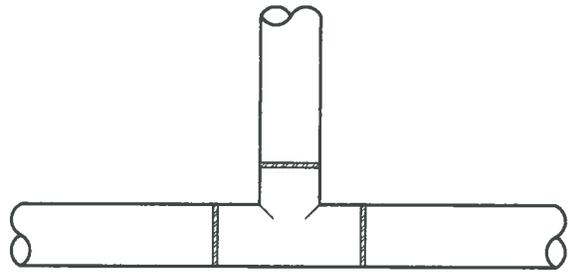
GAS MAIN BRANCH CONNECTIONS TO STEEL MAIN		G-3
REVISED/APPROVED 2/01/2013	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE

FULL SIZE OR REDUCED ONE SIZE ONLY

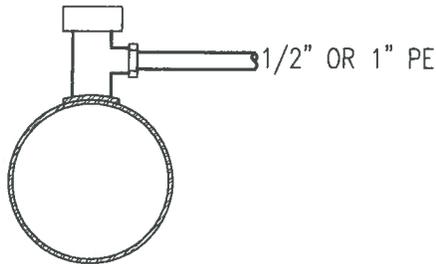
REDUCED LATERAL



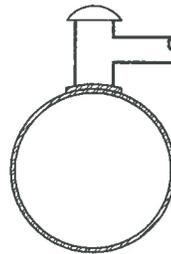
SADDLE



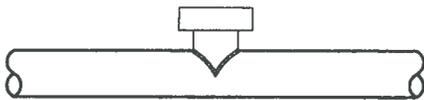
WELDING TEE IN LINE



1/2" AND 1" TAP TEES



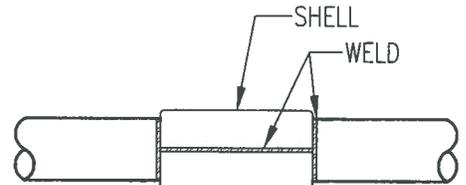
1", 1-1/2", 2" NO-BLOW TEE



MUELLER STOP - 2" & 3"  
RUBBER PLUG

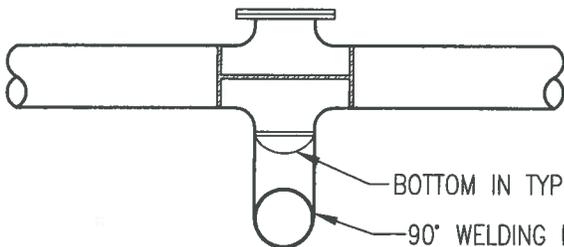


HALF SOLE REPAIR



PUMPKIN ENCIRCLEMENT

MUELLER LINE STOP



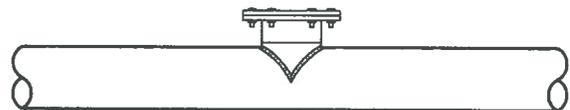
BOTTOM IN TYPE

90° WELDING EL IF USING  
BOTTOM-OUT TYPE

MUELLER STOP  
4" - 6" - 8" - 10" - 12"

(STEEL PLUG)

T.D. WILLIAMSON LINE STOP



T.D. WILLIAMSON STOP  
10" - 12" - 14" - 16"

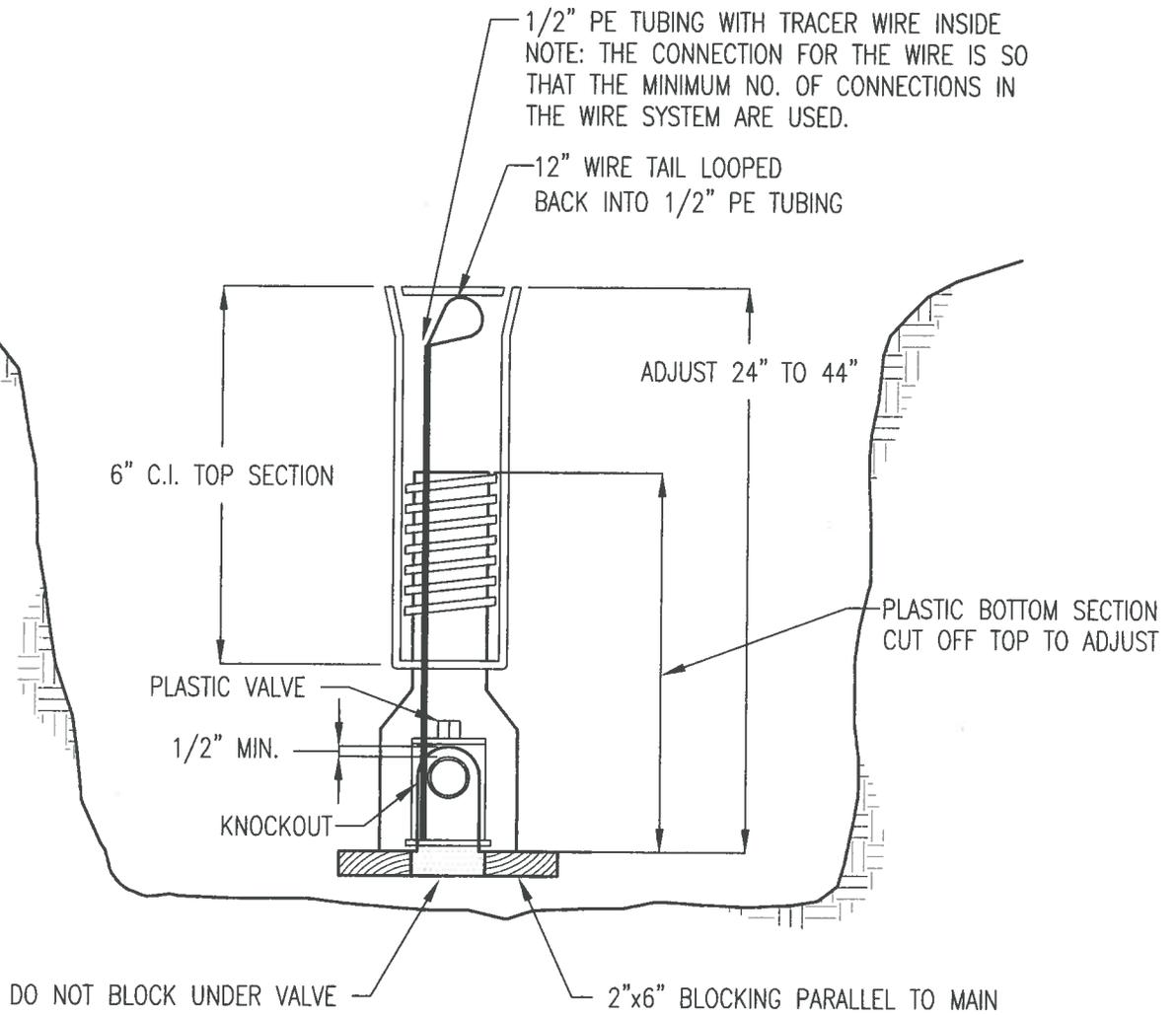
TYPICAL WELD JOINTS

G-4

REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



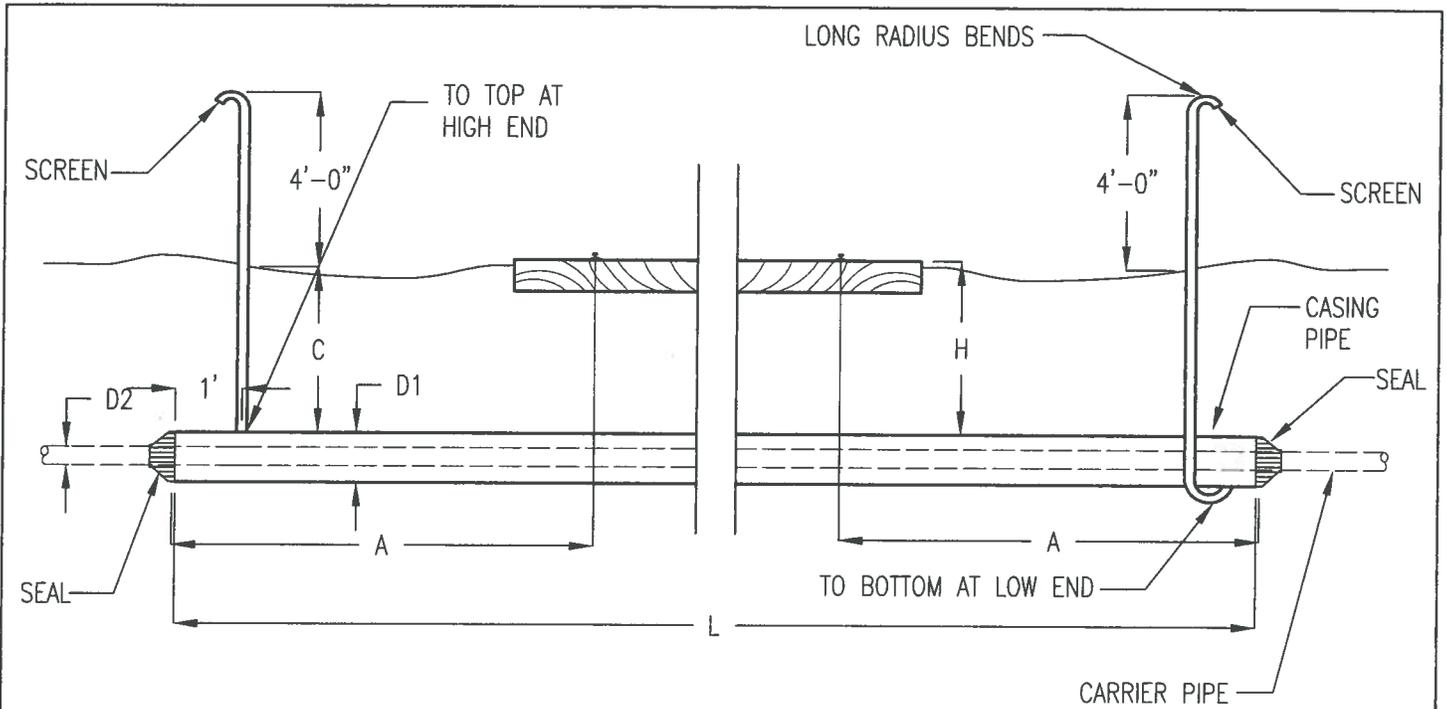
PE VALVE BOX SETTING

G-5

REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL  
 DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



**DIMENSIONS**

A = \_\_\_\_\_ D1 (CASING DIA.) = \_\_\_\_\_  
 L = \_\_\_\_\_ D2 (CARRIER DIA.) = \_\_\_\_\_  
 H = \_\_\_\_\_ CASING THICKNESS = \_\_\_\_\_  
 C = \_\_\_\_\_ 1/4" - 6" THRU 16"  
 5/16" - 18" THRU 20"  
 3/8" - 22" THRU 24"

**MATERIALS**

CASING = \_\_\_\_\_ CARRIER PIPE = \_\_\_\_\_  
 CASING SEALS - P.S.I. MODEL "S" FOR PE, LINK SEAL FOR STEEL PIPE \_\_\_\_\_ VENT PIPE - 2" WELDED STEEL AS DETAILED \_\_\_\_\_  
 CASING INSULATORS = \_\_\_\_\_ OPERATING PRESSURE = \_\_\_\_\_

**GENERAL INFORMATION**

RAILROAD COMPANY = \_\_\_\_\_ CROSSING LOCATION = \_\_\_\_\_  
 NO. OF TRACKS = \_\_\_\_\_ METHOD OF INSTALLATION = \_\_\_\_\_

HP GAS CROSSING AT RAILROAD

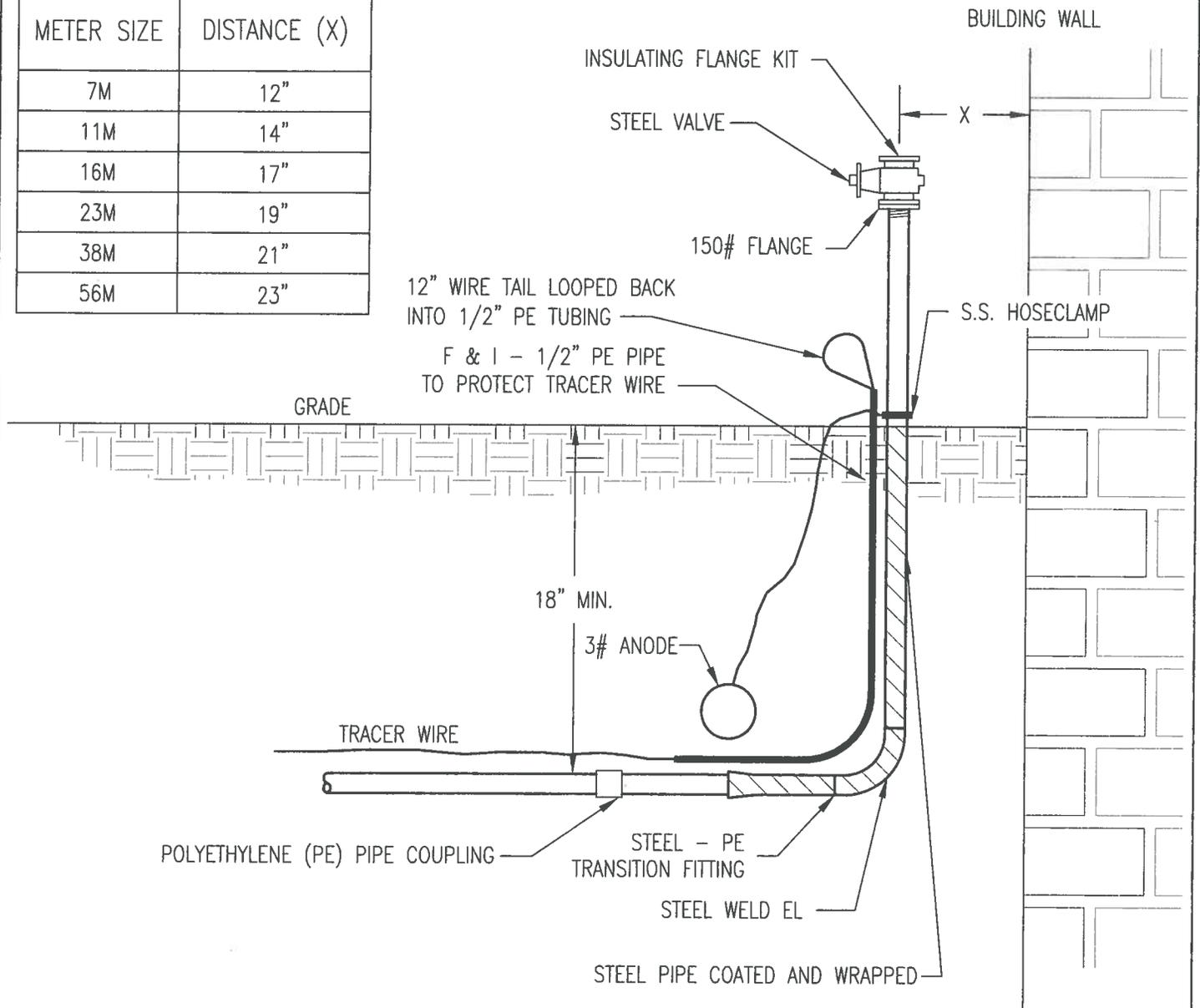
G-8

REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL  
 DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE

METER SIZE	DISTANCE (X)
7M	12"
11M	14"
16M	17"
23M	19"
38M	21"
56M	23"



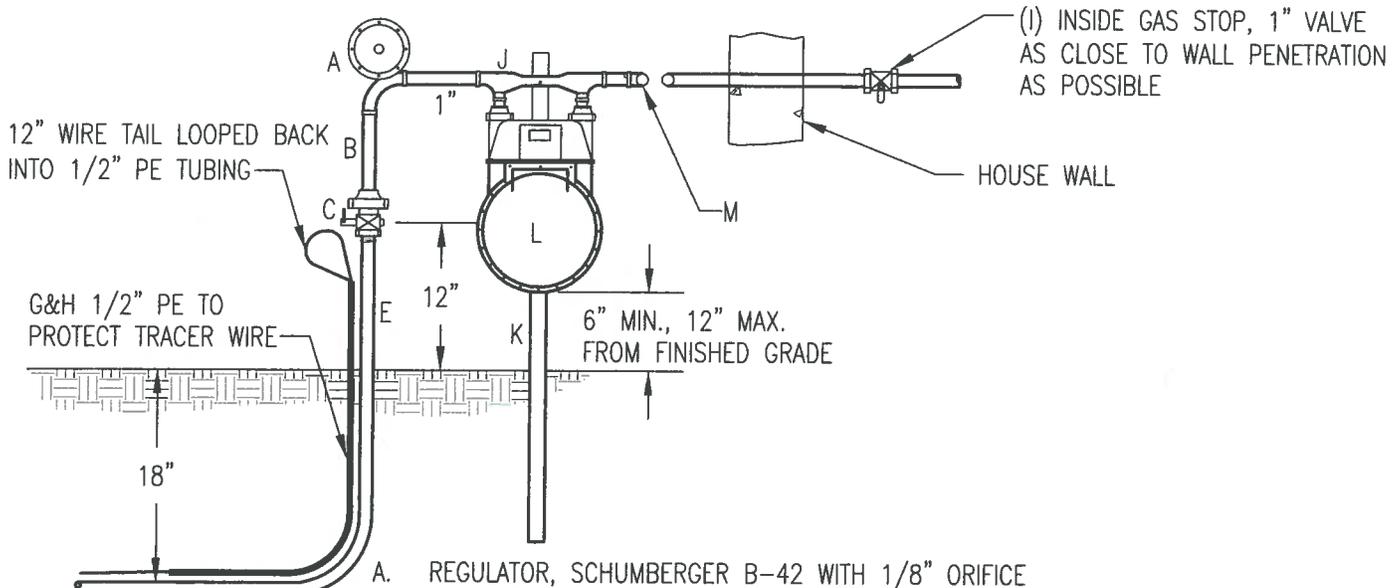
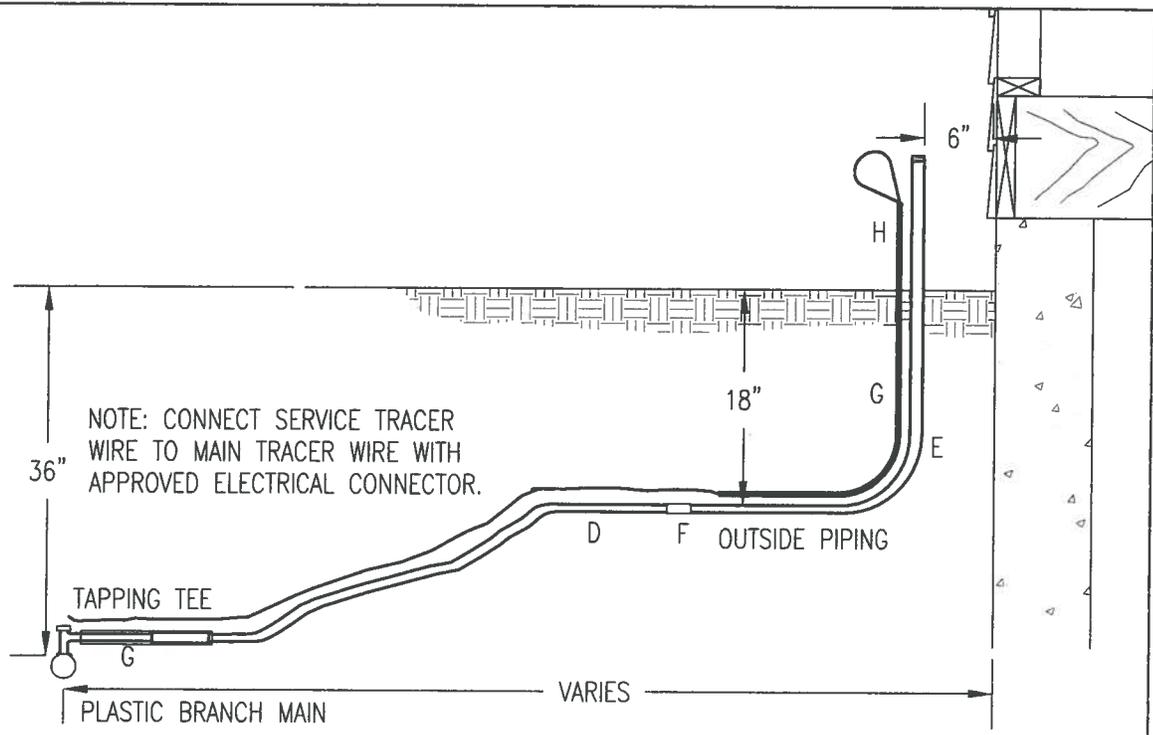
TYPICAL STEEL GAS SERVICE RISER

G-9

REVISED/APPROVED 2/01/2013

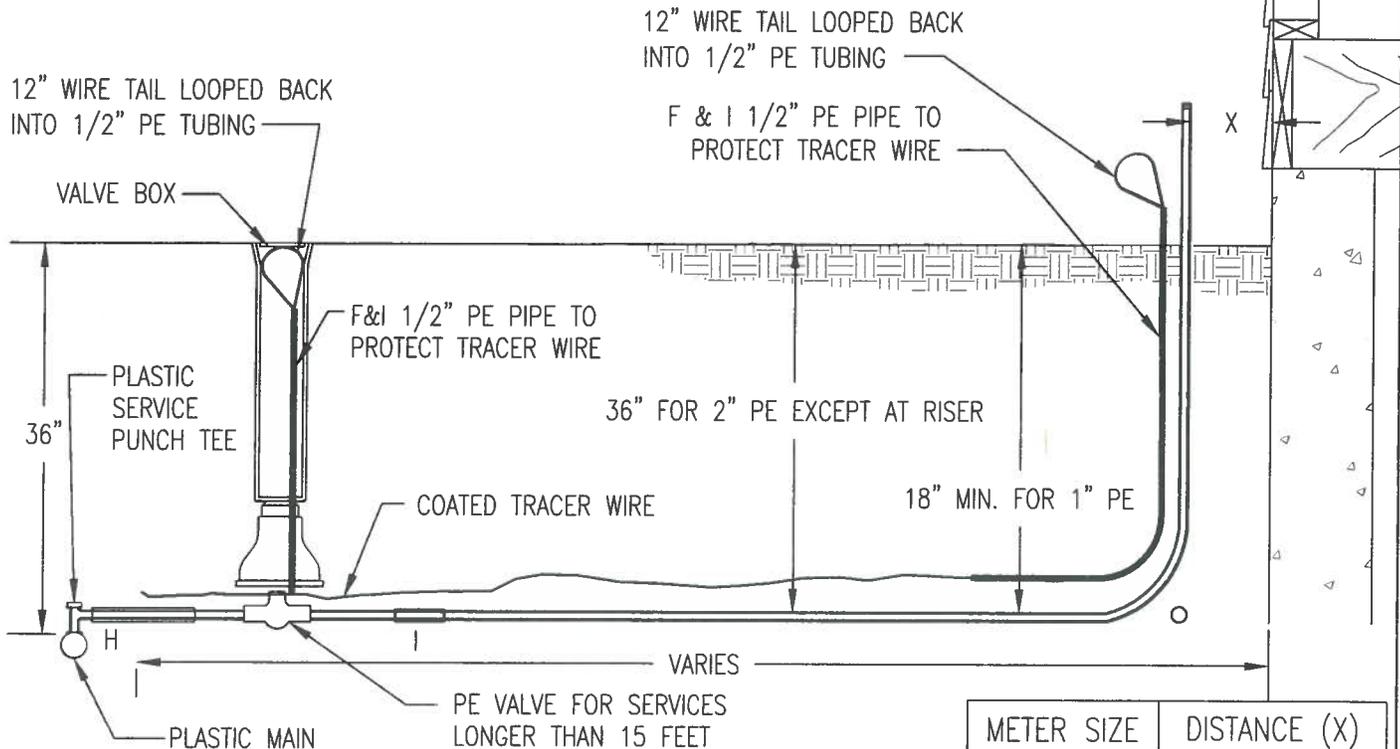
CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



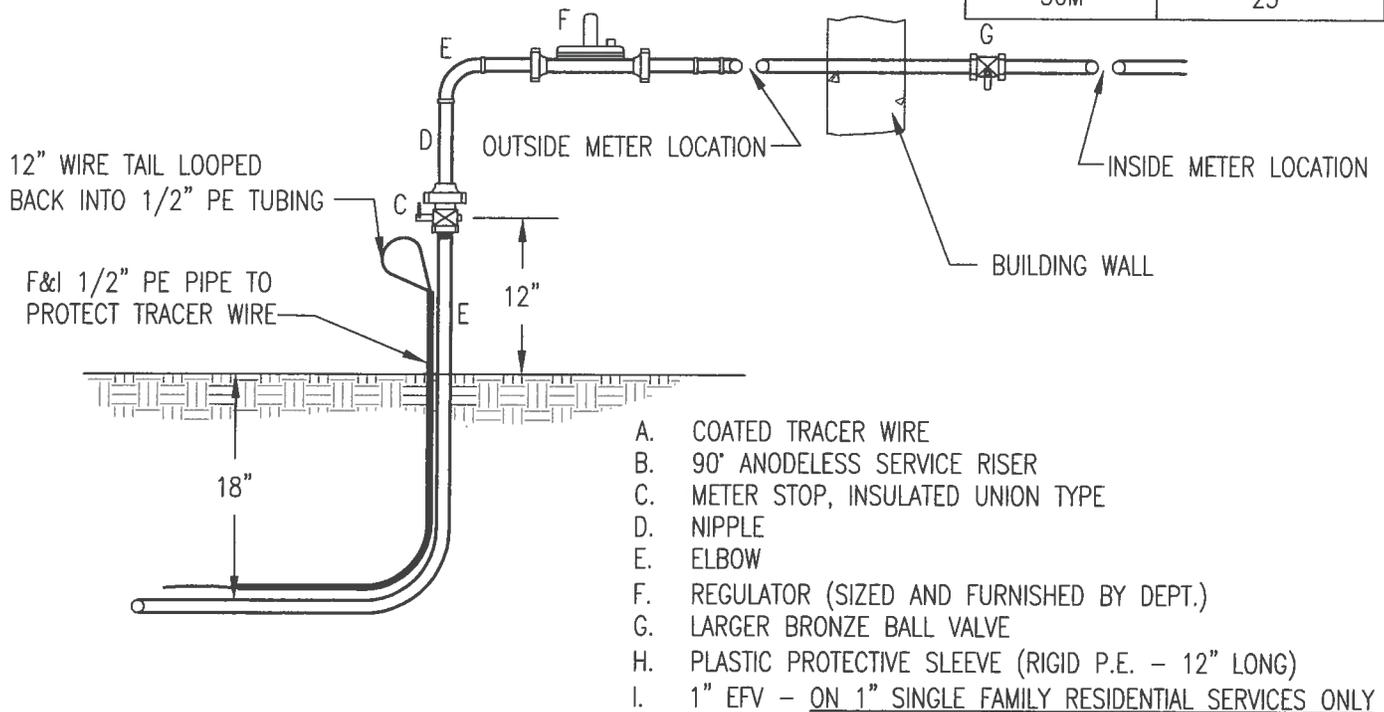
- A. REGULATOR, SCHUMBERGER B-42 WITH 1/8" ORIFICE
- B. 3/4" NIPPLE
- C. 3/4" METER STOP
- D. 1/2" C.T.S. P.E. PIPE (5/8" O.D.)
- E. 1/2" X 3/4" ANODELESS SERVICE RISER
- F. 1/2" C.T.S. P.E. SOCKET COUPLING
- G. PLASTIC PROTECTIVE SLEEVE (PE PIPE)
- H. COATED TRACER WIRE
- I. 1" BRONZE BALL VALVE
- J. ROCKFORD ECLIPSE 701173 26-M WEDGESEAL METER BAR (OR EQUAL)
- K. ADVANCE ENG. CORP. D.P. 1004 METER MOUNTING BRACKET (OR EQUAL)
- L. METER
- M. 1" MIN BLACK STEEL PIPE

HIGH PRESSURE 1/2" GAS SERVICE INSTALLATION – RESIDENTIAL		G-10
REVISED/APPROVED 06/01/2014	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE



1. CONNECT SERVICE TRACER WIRE TO MAIN TRACER WIRE WITH ELECTRIC CONNECTOR.
2. IN MULTIPLE METER SITUATIONS, EACH METER SHALL HAVE A LOCKING VALVE WHICH ALLOWS ANY METER TO BE LOCKED OUT OF SERVICE WHILE THE OTHER REMAIN IN SERVICE.
3. TEST POINTS SHALL BE INSTALLED WITH 1-1/4" OR LARGER REGULATOR ON HIGH AND LOW SIDES USING WELD ON 1/4" COUPLING COMPLETE WITH PETE'S PLUGS.

METER SIZE	DISTANCE (X)
7M	12"
11M	14"
16M	17"
23M	19"
38M	21"
56M	23"



- A. COATED TRACER WIRE
- B. 90° ANODELESS SERVICE RISER
- C. METER STOP, INSULATED UNION TYPE
- D. NIPPLE
- E. ELBOW
- F. REGULATOR (SIZED AND FURNISHED BY DEPT.)
- G. LARGER BRONZE BALL VALVE
- H. PLASTIC PROTECTIVE SLEEVE (RIGID P.E. - 12" LONG)
- I. 1" EFV - ON 1" SINGLE FAMILY RESIDENTIAL SERVICES ONLY

HIGH PRESSURE GAS SERVICE INSTALLATION - 1" CTS & 2" IPS SERVICES

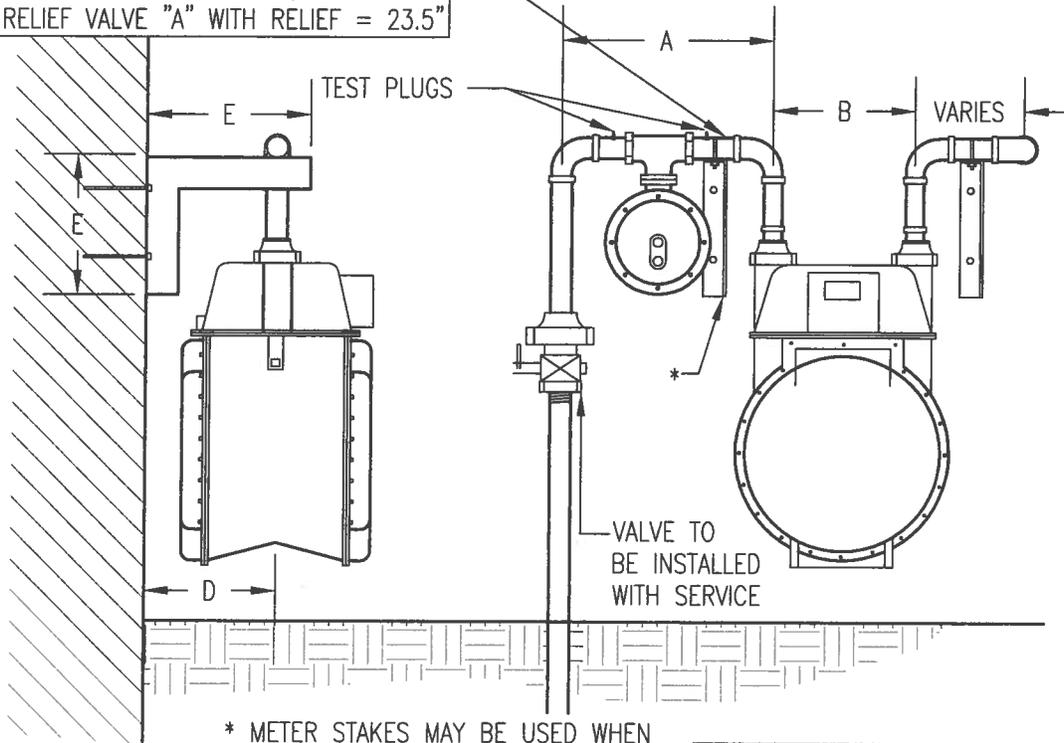
G-11

REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE

WHEN REQUIRED, INSTALL 1-1/4" x 1" TEE AND RELIEF VALVE "A" WITH RELIEF = 23.5"



\* METER STAKES MAY BE USED WHEN ATTACHMENT TO BUILDING IS NOT POSSIBLE

NOTE:

- ① EXTEND VENT ONLY WHEN NECESSARY, SEE O & M SECTION 30. DEPT. TO FURNISH: REGULATOR, TEST "PETE'S PLUG" - 2 EACH WITH 1-1/4" NIPPLES, METER WITH SWIVELS AND NUTS, AND ANGLE BRACKETS.
- ② RELIEF DEVICE REQUIRED - 1" FISHER 289L

DIMENSION	400	675	1000
A	17-9/16"	17-11/16"	17-15/16"
B	7"	10"	11"
C	27"	32"	36"
D	9"	9"	9"
E	11"	11"	11"

CUSTOMER LOAD (CFH)	397 TO 600		600 TO 900		900 TO 1428	
METER SIZE	400		675		1000	
METER CONNECTION	1-1/2"		1-1/2"		2"	
PRESSURE LOSS (WC)	1/2" @ 397 CFH		1/2" @ 397 CFH		1/2" @ 397 CFH	
	1" @ 595 CFH		1" @ 918 CFH		1" @ 1428 CFH	
REGULATOR TYPE	B-31-R, 1-1/4" CONN.		B-31-R, 1-1/4" CONN.		B-31-R, 1-1/4" CONN.	
SYSTEM PRESSURE	22#-10#	66#-30#	22#-10#	66#-30#	22#-10#	66#-30#
ORIFICE	1/8"	1/8"	3/16"	1/8"	1/4"	3/16" ②
CAP @ PIN MAX.	600	1560	1560	1560	2240	2500
CAP @ PIN MIN.	400	765	870	765	1470	2025
VENT MAX. LENGTH ①	130'	20'	18'	20'	0'-3/4", 30'-1"	0'-3/4", 8'-1"
CAPACITY DATA IS FOR SANDARD 7" (WC) DELIVERY PRESSURE						

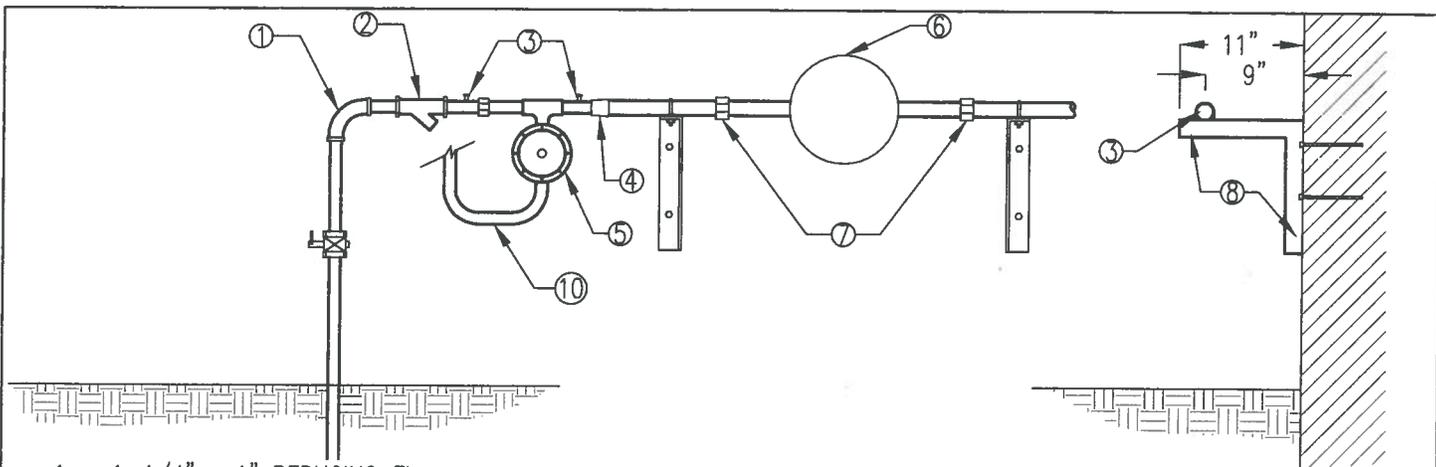
METER INSTALLATION DETAIL - SIZES 400, 675, & 1000

G-11A

REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE

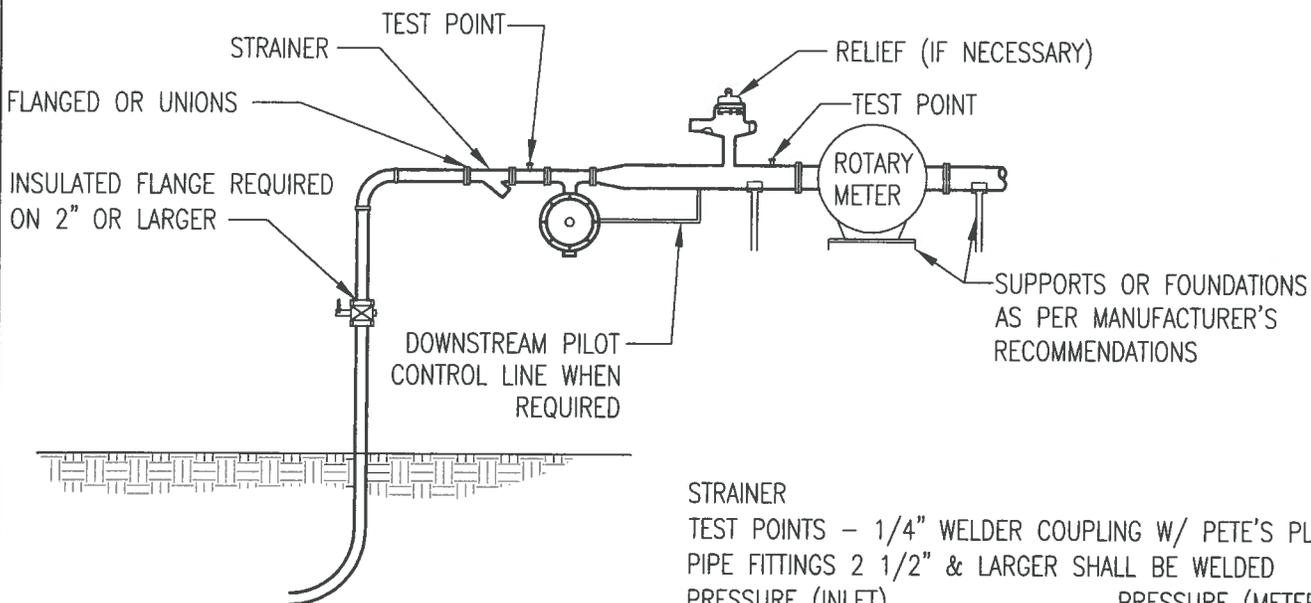


1. 1-1/4" x 1" REDUCING EL
2. 1-1/4" STRAINER W/BLOWDOWN
3. 1/4" WELD ON COUPLING & PETE'S PLUGS
4. 1-1/2" x 1-1/4" REDUCER
5. SPRAGUE B-31R REGULATOR
6. 1.5M125 ROOTS METER
7. 1-1/2" UNIONS
8. 1-1/2" WELDED ANGLE
9. 1-1/2" x 1/4" U-CLAMPS
10. VENT W/RAIN CAP WHERE REQUIRED

**1.5M125 ROOTS METER & REGULATOR DETAIL**

REGULATOR CAPACITY (CFH)						
P OUT	7" WC			2 PSI*		
	1/8"	3/16"	1/4"	3/16"	1/4"	5/16"
P IN						
55	1300	-	-	850	1450	1650
35	860	2280	-	1560	1100	1250
15	-	1080	1640	-	-	-
10	-	-	1470	-	-	-

\*METER PRESSURE 1.83 PSI @ MAX. FLOW



**TYPICAL DETAIL  
3M125 ROOTS METER & LARGER**

STRAINER  
 TEST POINTS - 1/4" WELDER COUPLING W/ PETE'S PLUGS  
 PIPE FITTINGS 2 1/2" & LARGER SHALL BE WELDED  
 PRESSURE (INLET) PRESSURE (METERING)  
 REGULATOR-TYPE ORIFACE  
 (BY GAS DIVISION)  
 RELIEF-TYPE (BY GAS DIVISION)  
 BUILDING TO BACK OF METER - MIN. 3"  
 FLANGES SHALL BE 150# FLAT FACE

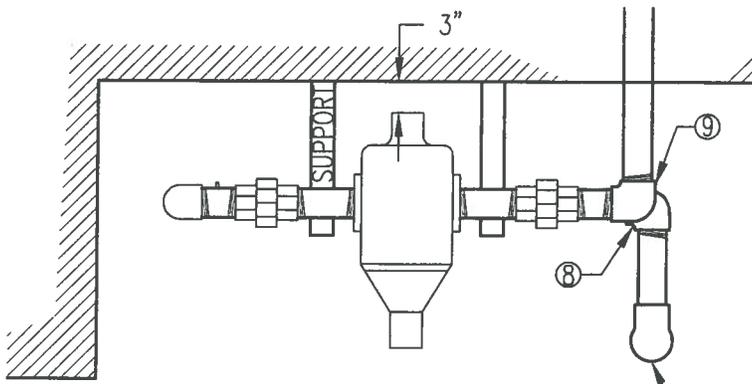
**ROOTS METER INSTALLATION**

G-12

REVISED/APPROVED 06/01/2014

CITY OF DULUTH STANDARD DETAIL  
 DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE

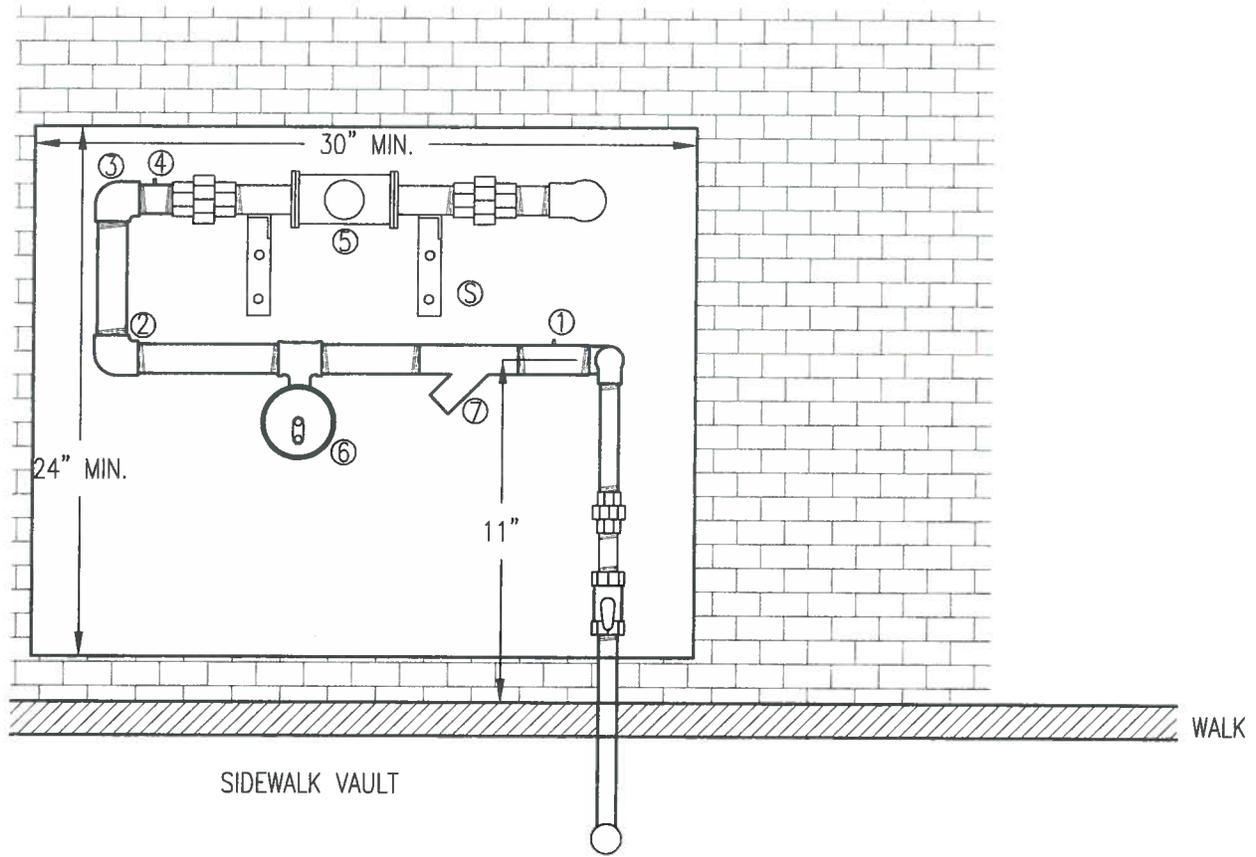


MATERIALS LIST

1. 1-1/4" x 3" NIPPLE W/ TEST PLUG
2. 1-1/4" x 1/1/2" RED. EL.
3. 1-1/2" EL.
4. 1-1/2" x 3" NIPPLE W/ TEST PLUG
5. 15C ROOTS METER
6. B-31-R WITH 3/16" ORF. REG.
7. 1-1/4" STRAINER
8. 3/4" x 1-1/4" RED. EL.
9. 1-1/2" EL.
- S. ANGLE IRON SUPPORTS

PROPOSED RISER AND  
METER STOP VALVE

TOP VIEW



FRONT VIEW

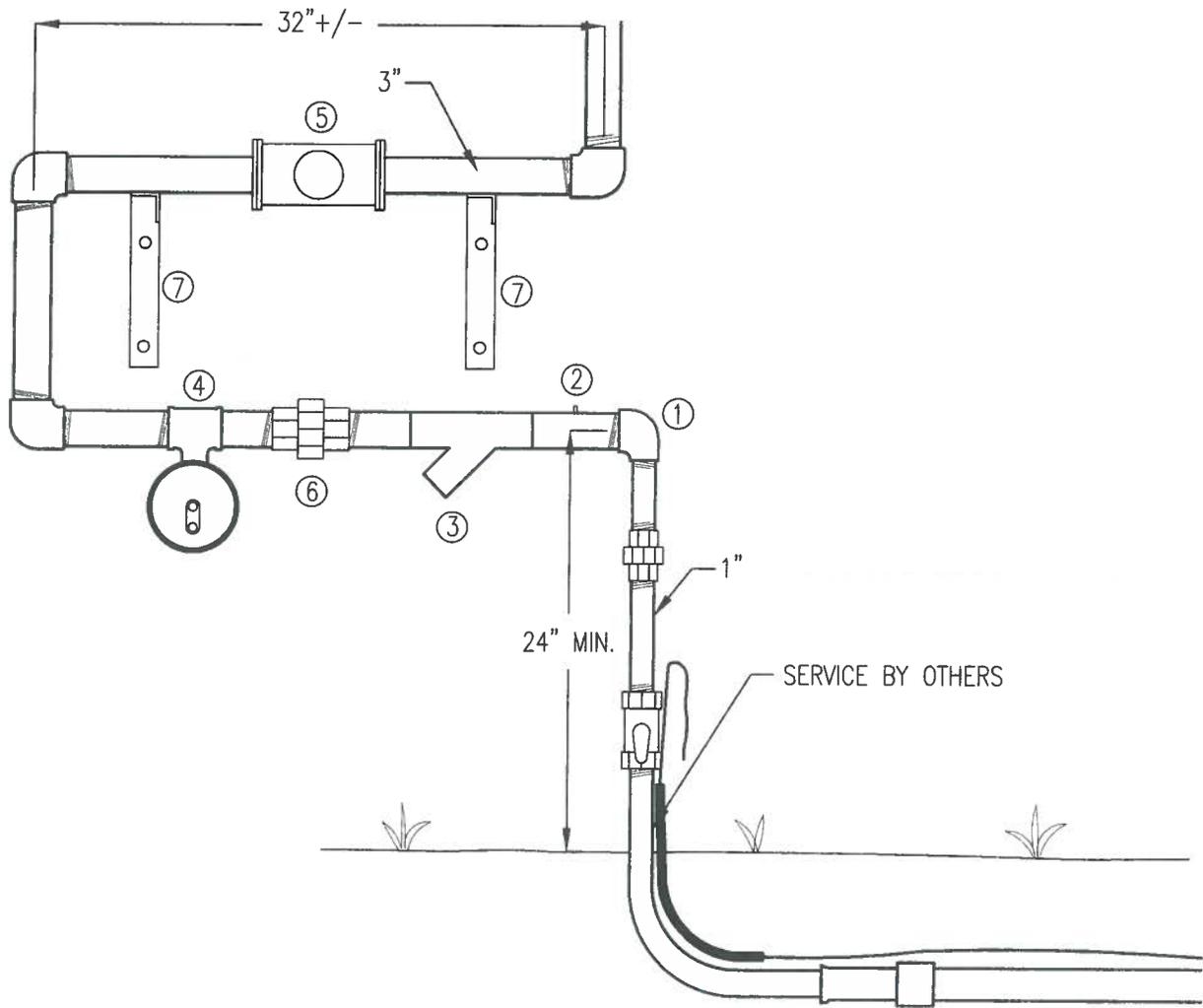
15C ROOTS COMPACT METER INSTALLATION

G-12A

REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



MATERIALS LIST

- 1. 1" x 2" STREET EL
- 2. TEST POINTS (D)
- 3. 2" STRAINER (D)
- 4. FISHER S202 - 2" - W/ 3/8" ORIFICE REGULATOR (D)
- 5. 5M ROOTS METER - 3" FLANGE CONN. (D)
- 6. 2" UNION
- 7. ANGLE IRON BRACKETS (D)
- (D) INDICATES TO BE FURNISHED BY DEPARTMENT

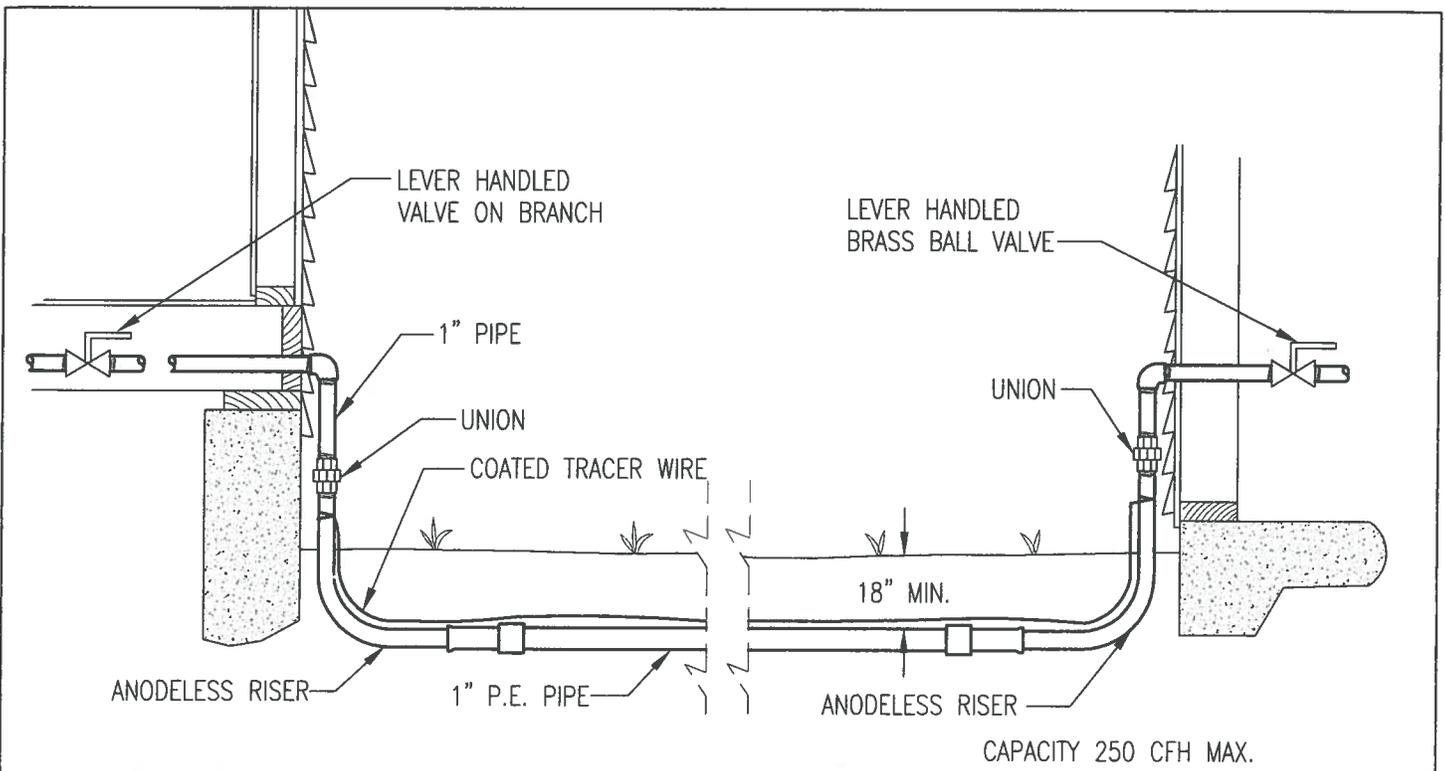
5M ROOTS COMPACT METER INSTALLATION

G-12B

REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

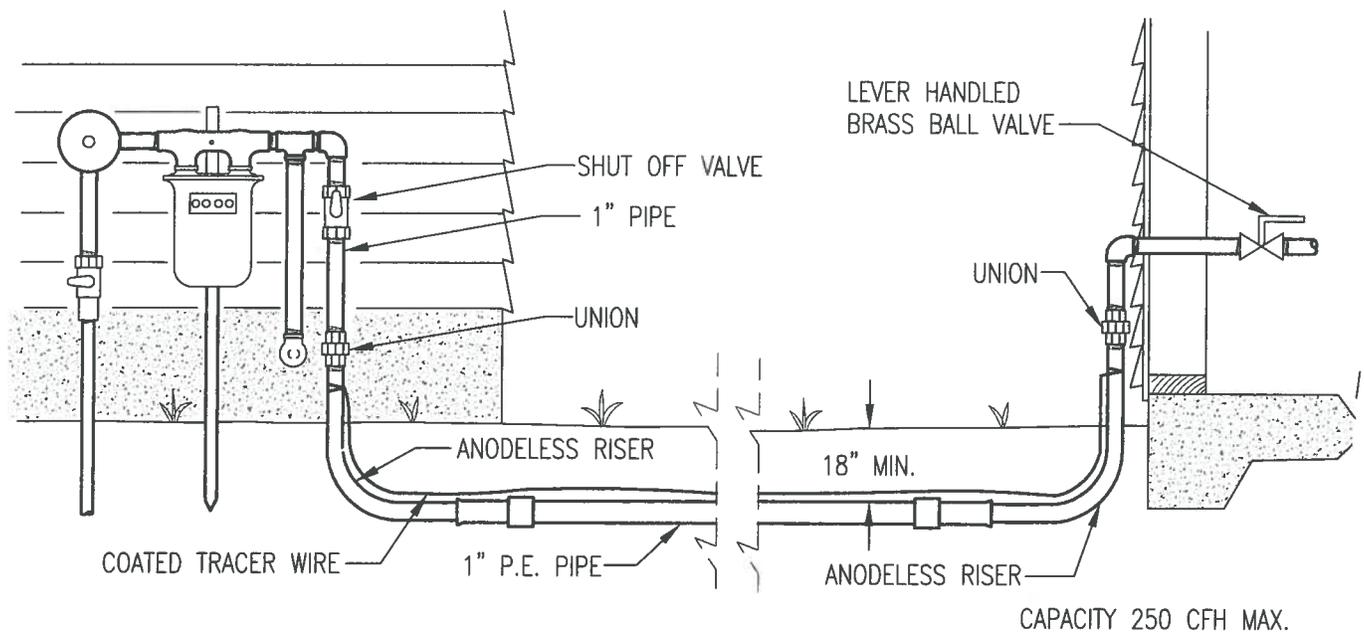
NO SCALE



**STANDARD TYPICAL GAS FUEL LINE TO OUT BUILDING**

NOTE:

1. REGISTERED LETTER TO BE MUST BE SENT TO CUSTOMER FOR ALL BURIED FUEL LINE INSTALLATIONS.

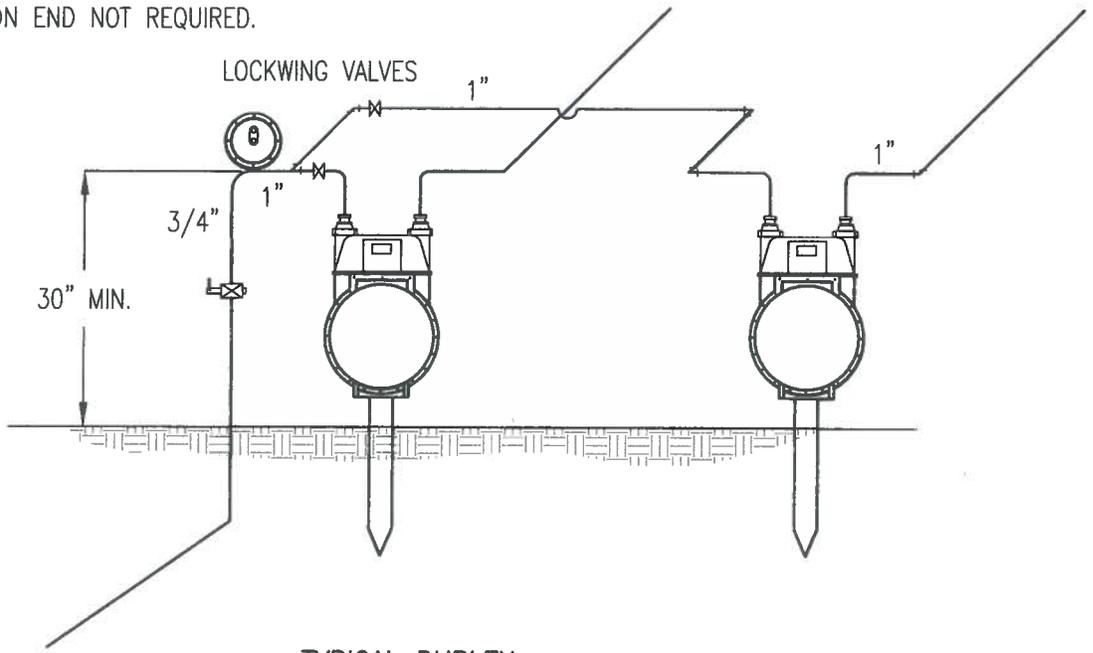


**STANDARD NON-TYPICAL GAS FUEL LINE TO OUT BUILDING**

UNDERGROUND GAS FUEL LINE PIPING – PAST METER		G-13
REVISED/APPROVED 06/01/2014	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE

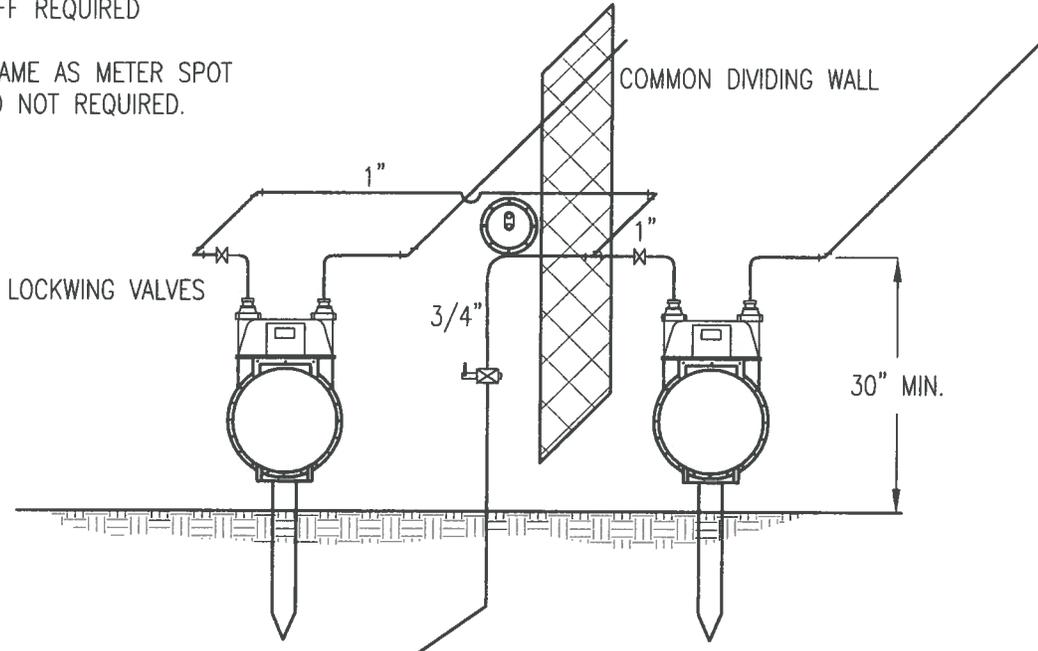
SEE SPEC. SECTION 14  
FOR INSIDE SHUTOFF REQUIRED

LOCKWING VALVE SAME AS METER SPOT  
EXCEPT UNION END NOT REQUIRED.



SEE SPEC. SECTION 14  
FOR INSIDE SHUTOFF REQUIRED

LOCKWING VALVE SAME AS METER SPOT  
EXCEPT UNION END NOT REQUIRED.



DUPLEX METER CONNECTION

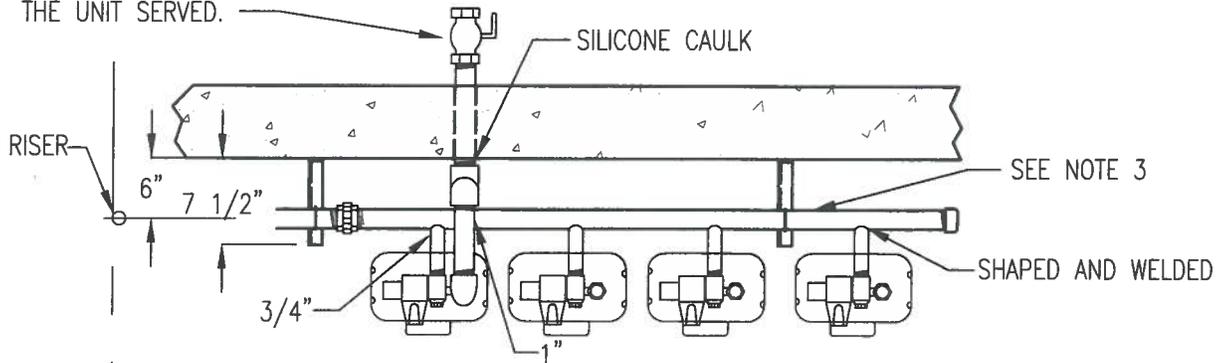
G-14

REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE

VALVE REQUIRED WHEN SERVING ADJACENT UNIT ONLY. UNITS WHICH ARE REMOTE FROM METER WILL HAVE VALVE CUT IN AT THE UNIT SERVED.

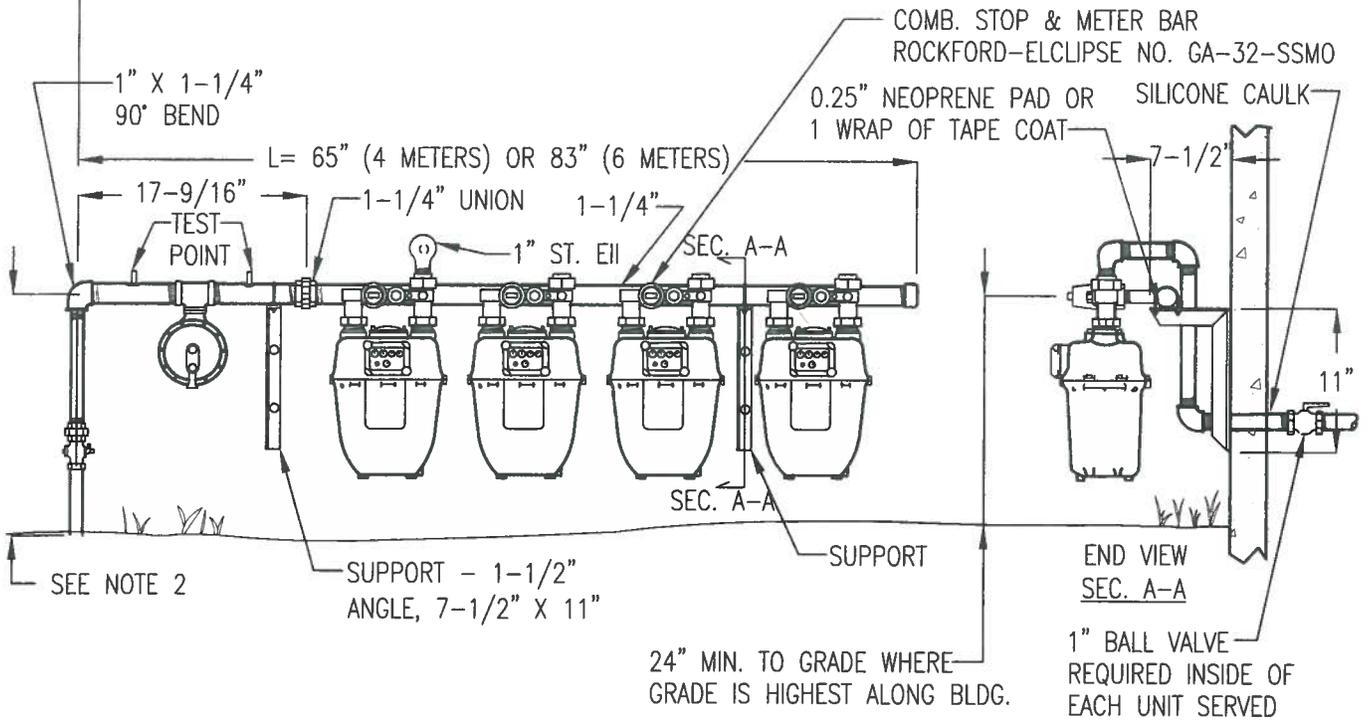


NOTES:

1. 6 METER SET REQUIRES 4 ANGLE SUPPORTS.
2. HEIGHT IS DETERMINED BY ANY METER NOT BEING CLOSER THAN 6" OFF GRADE. MANIFOLD SHALL BE HORIZONTAL.
3. 1-1/4" MANIFOLD BY DEPT. OR MANUFACTURER.
4. DEPT. TO ATTACH BRASS TAG W/NUMBER OF UNIT SERVICED TO EACH METER BAR.

**TOP VIEW**

3 OR MORE RESIDENTIAL METERS



**FRONT VIEW**

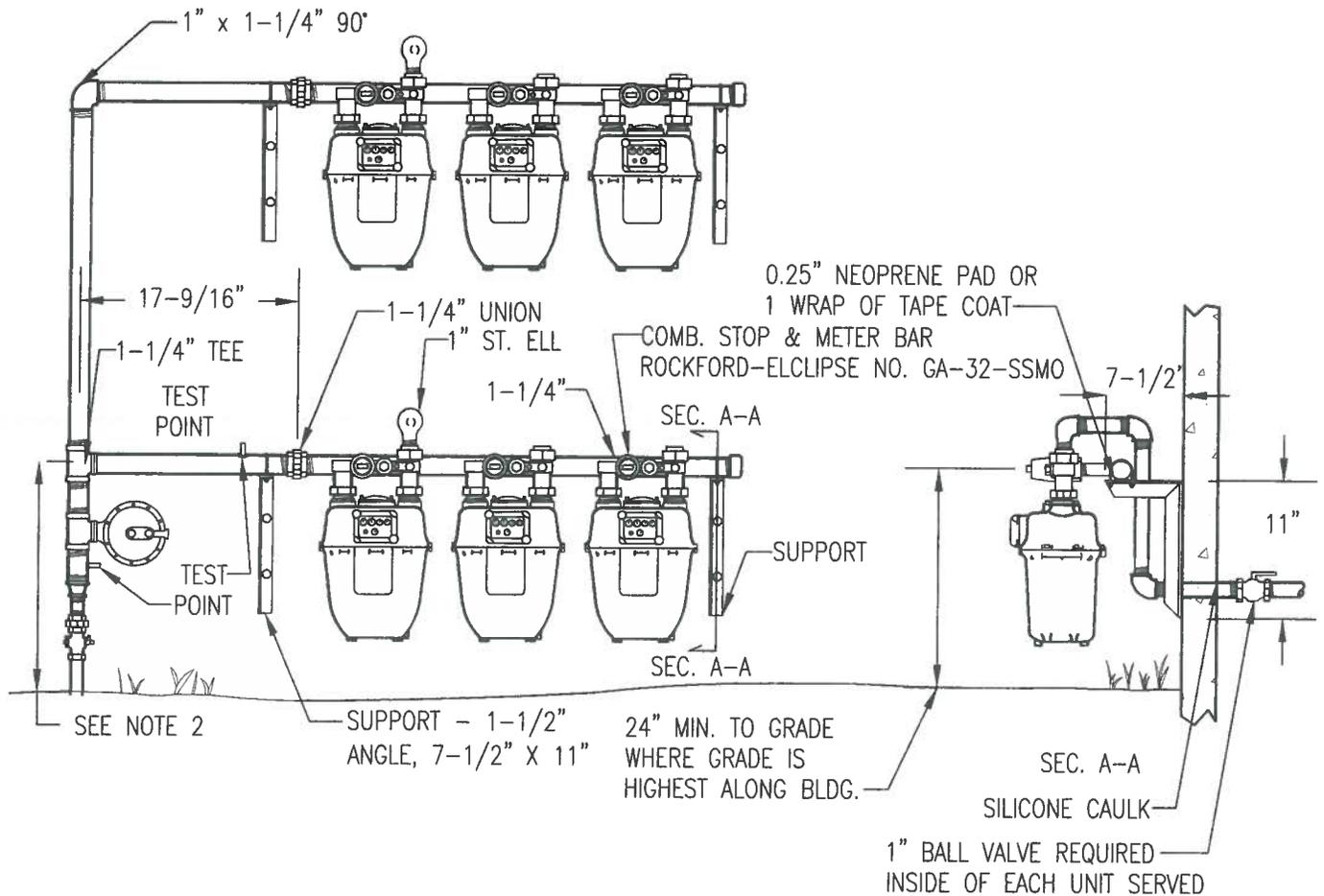
TYPICAL MULTI-METER INSTALLATION

G-14A

REVISED/APPROVED 02/01/2013

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



**FRONT VIEW**

**END VIEW**

**NOTES**

1. 6 METER SET REQUIRES 4 ANGLE SUPPORTS.
2. HEIGHT IS DETERMINED BY ANY METER NOT BEING CLOSER THAN 6" OFF GRADE. MANIFOLD SHALL BE HORIZONTAL.
3. 1-1/4" MANIFOLD BY DEPT. OR MANUFACTURER.
4. DEPT. TO ATTACH BRASS TAG W/NUMBER OF UNIT SERVICED TO EACH METER BAR.

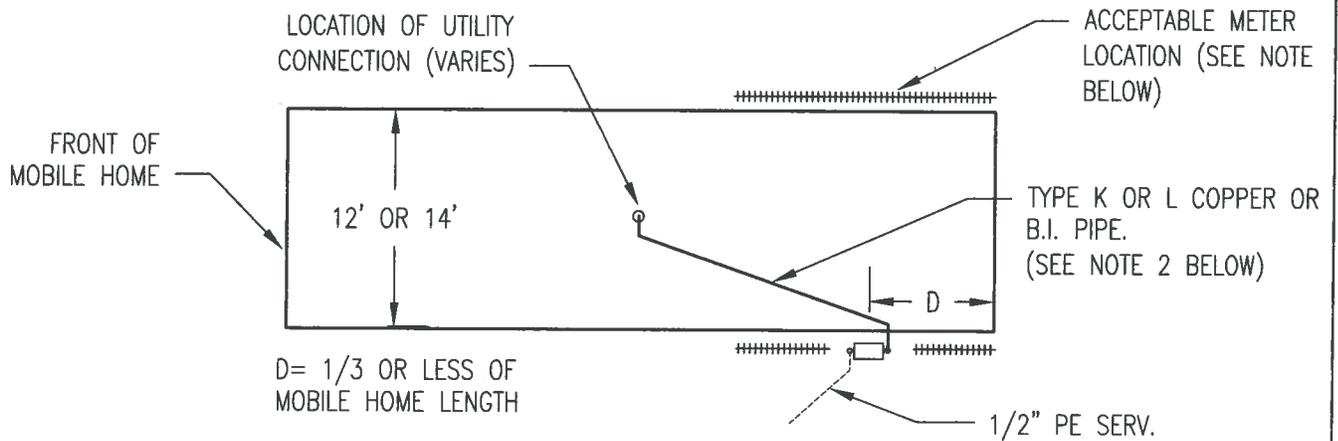
TYPICAL MULTI-METER INSTALLATION – 6 RESIDENTIAL METERS

G-14B

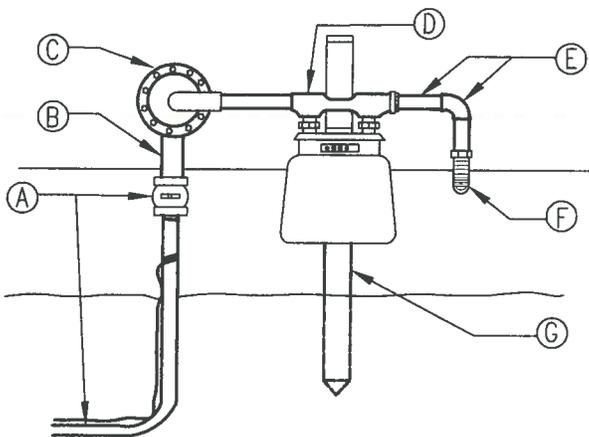
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CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

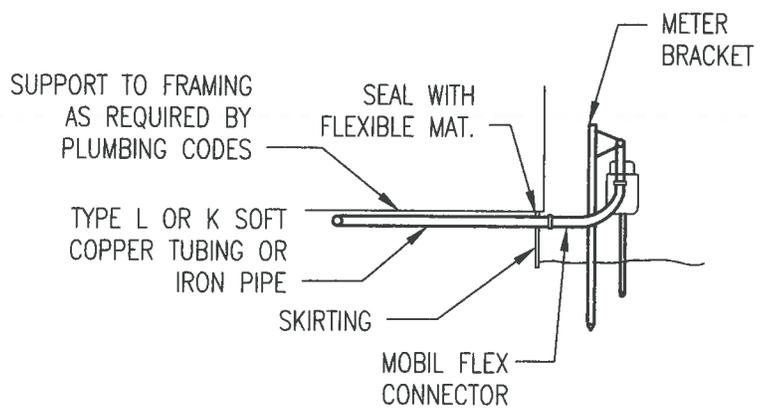
NO SCALE



**MOBILE HOME UTILITY CONNECTION**



**METER SET – FRONT VIEW N.T.S.**



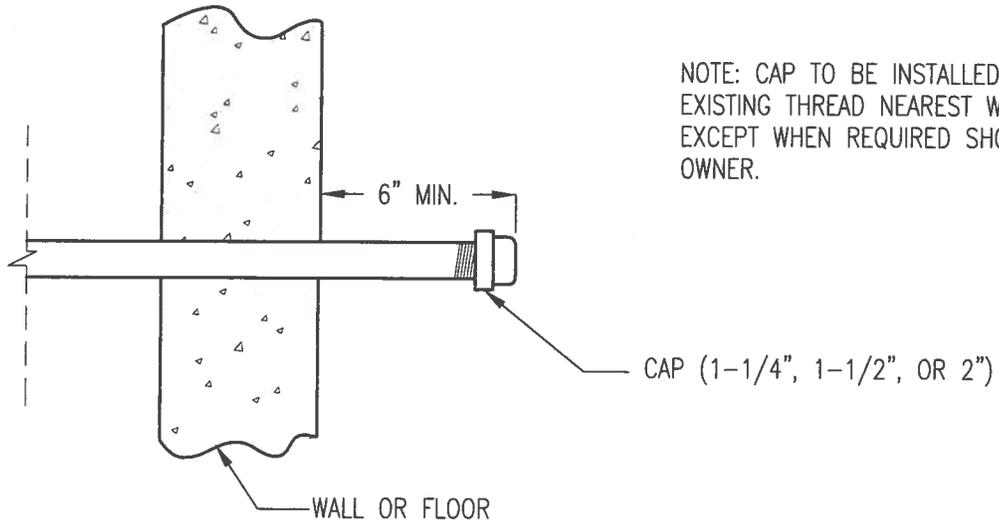
**MOBILE HOME ENTRANCE – SIDE VIEW N.T.S.**

- A. RISER & METER STOP (TO BE INSTALLED BY OTHERS)
- B. 3/4" NIPPLE
- C. REGULATOR – 252 (TO BE FURNISHED BY DEPT.)
- D. METER BAR (TO BE FURNISHED BY DEPT.)
- E. 1" NIPPLE W/ 1" X 3/4" REDUCING ELL
- F. MOBILE FLEX CONNECTOR
- G. METER BRACKET (TO BE FURNISHED BY DEPT.)

**SPECIFICATIONS:**

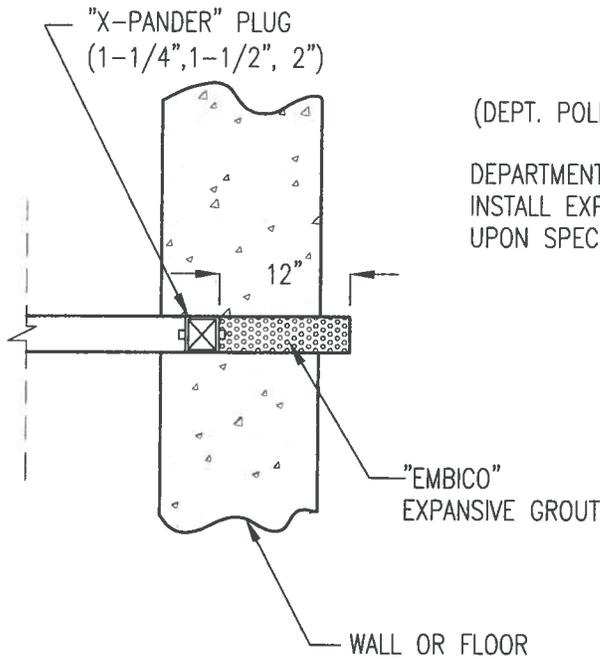
1. METER LOCATION SHALL BE ALONG THE SIDE AND WITHIN THE REAR 1/3 OF LENGTH.
2. ALL HEATING ACCOUNTS TO HAVE NOT LESS THAN 3/4" COPPER LINE WITH FLARED FITTINGS OR 3/4" B.I. PIPE THREADED FROM METER TO POINT WHERE PRESENT LINE ENTERS FLOOR FROM UNDERNEATH. NON-HEATING ACCOUNTS TO HAVE NOT LESS THAN 5/8" COPPER OR 1/2" B.I. PIPE BETWEEN ABOVE MENTIONED POINTS.
3. ANY EXISTING PIPING WHICH MEETS THE ABOVE REQUIREMENTS MAY BE UTILIZED IN MAKING THE CONNECTION.
4. EXISTING AND NEW PIPING DOWNSTREAM FROM FLEXIBLE CONNECTOR SHALL BE PRESSURE TESTED AT 10 PSI BEFORE SETTING METER.

<b>MOBILE HOME GAS METER CONNECTION</b>		G-15
REVISED/APPROVED 2/01/2013	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE



NOTE: CAP TO BE INSTALLED AT LAST EXISTING THREAD NEAREST WALL OR FLOOR EXCEPT WHEN REQUIRED SHORTER BY OWNER.

**STANDARD METHOD**



(DEPT. POLICY I-54)

DEPARTMENT WILL CUT PIPE OFF CLOSE AS POSSIBLE AND INSTALL EXPANDING RUBBER PLUG AND EXPANSIVE GROUT ONLY UPON SPECIFIC REQUEST BY OWNER.

(STREET MAIN MUST BE INACTIVE)

**SPECIAL METHOD**

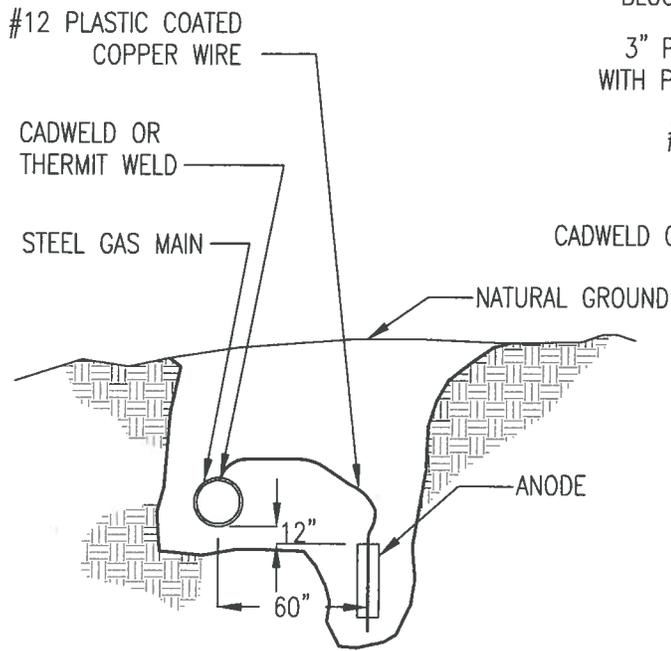
**SEALING UNUSED LP GAS SERVICES**

G-16

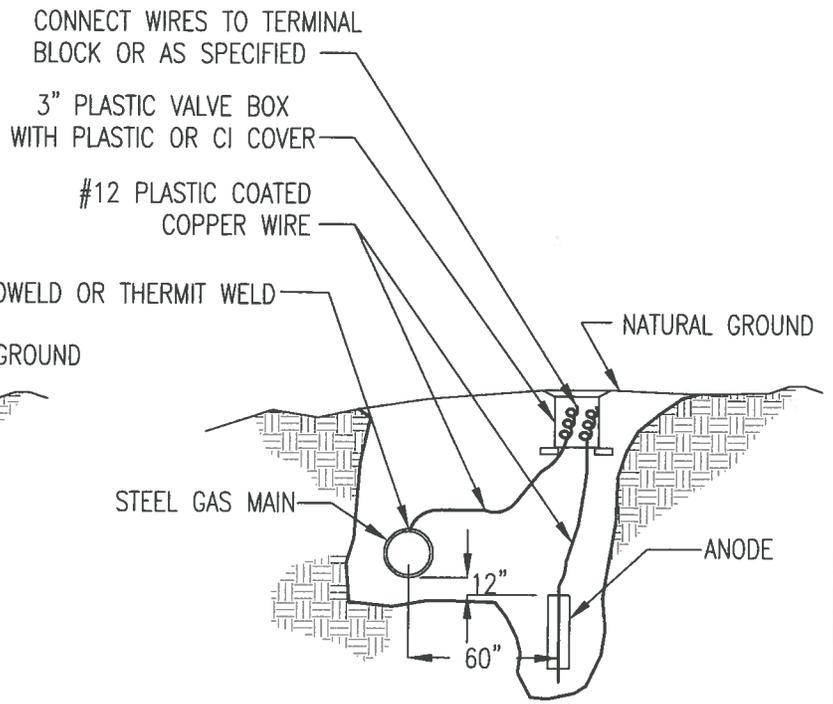
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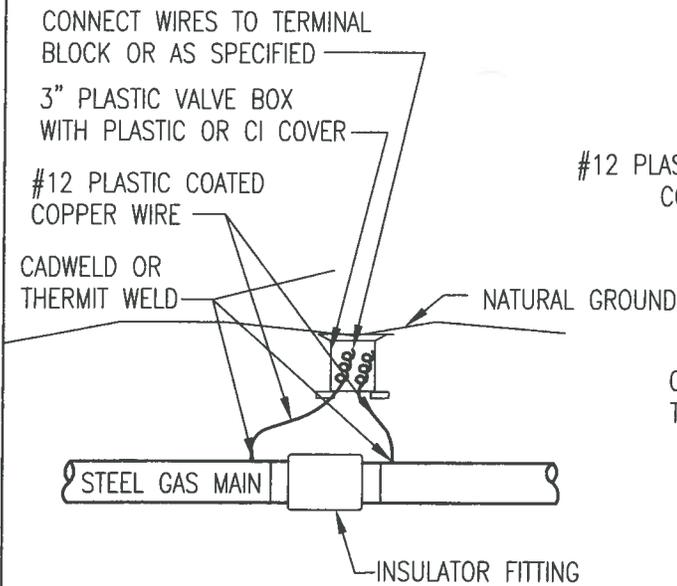
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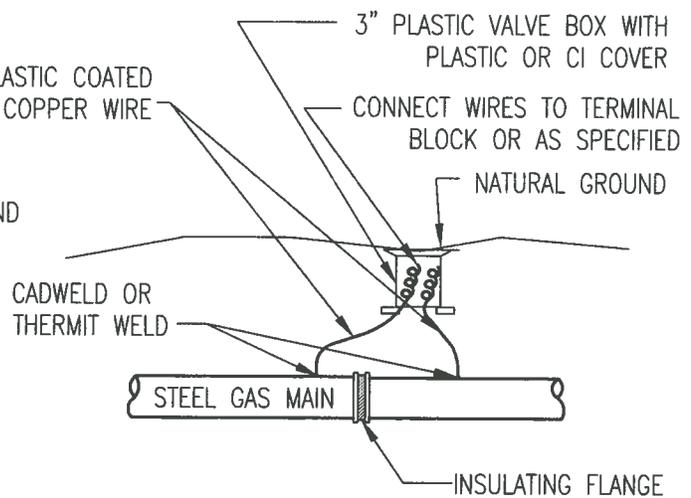
ANODE WITHOUT TEST LEADS



ANODE WITH TEST LEADS



TYPICAL INSULATOR WITH TEST LEADS



TYPICAL INSULATING FLANGE WITH TEST LEADS

CATHODIC PROTECTION

G-17

REVISED/APPROVED 2/01/2013

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DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE

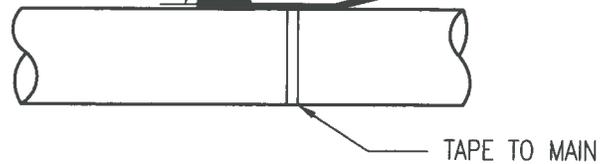
**STEP 1**

REMOVE COATING, FILE PIPE TO BRIGHT AND DRY

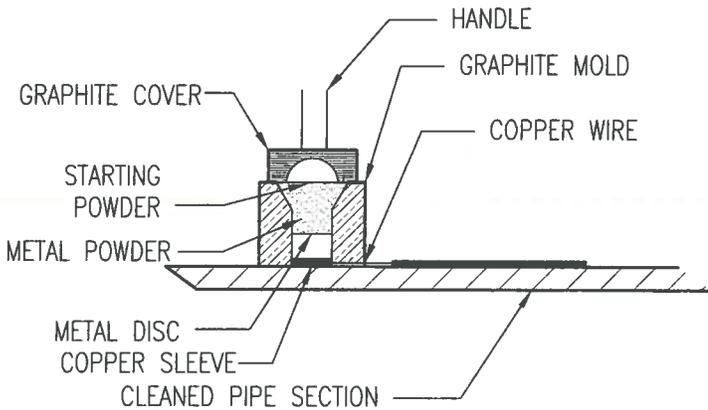


**STEP 2**

STRIP INSULATION FROM WIRE & INSTALL COPPER SLEEVE OVER WIRE  
COPPER SLEEVE

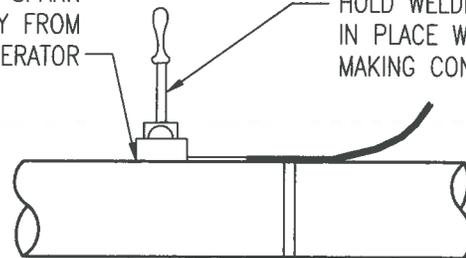


**STEP 3**



**STEP 4**

APPLY SPARK GUN AWAY FROM OPERATOR  
HOLD WELDER FIRMLY IN PLACE WHILE MAKING CONNECTION



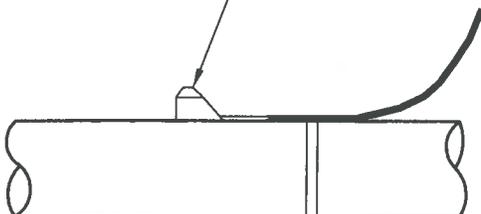
**PROCEDURES**

1. PREPARE GRAPHITE MOLD AS SHOWN IN DETAIL.
  - A. PLACE METAL DISC
  - B. PLACE METAL POWER
  - C. FILL WITH STARTING POWDER
  - D. PLACE GRAPHITE COVER
2. PLACE GRAPHITE MOLD ON PIPE

MAXIMUM SIZE CHARGE TO BE USED SHALL BE "CADWELD" CA-15.

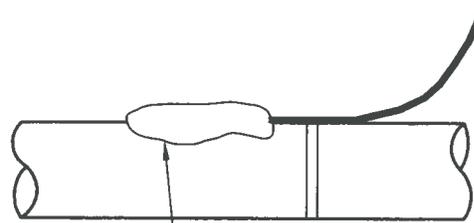
**STEP 5**

REMOVE SLAG WITH HAMMER



**STEP 6**

COAT ALL BARE SURFACES



TYPICAL METHOD OF BRAZED CONNECTION TO PIPE

G-18

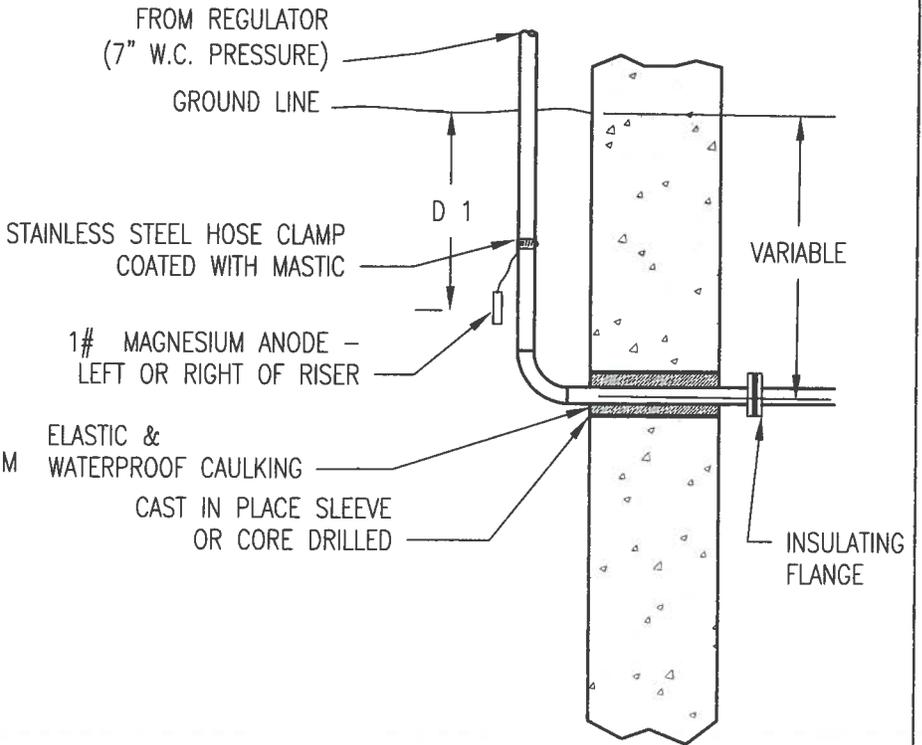
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CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE

NOTES:

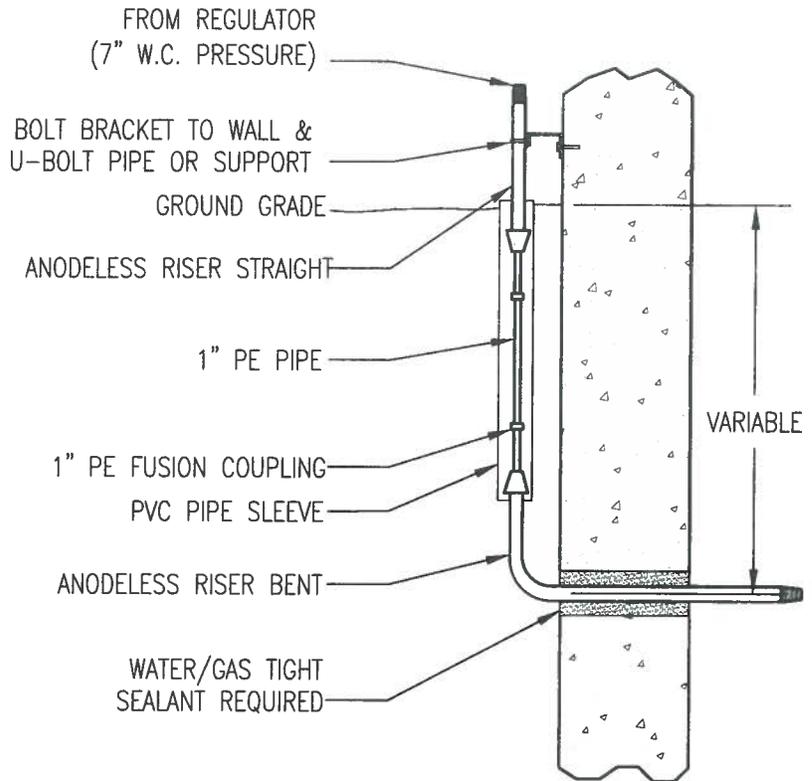
1. ABOVE GRADE ENTRY IS REQUIRED GENERALLY, BELOW GRADE WILL BE PERMITTED ONLY BY SPECIAL EXCEPTION.
2. PIPE SHALL BE AT LEAST STANDARD WEIGHT STEEL, CONFORMING TO A53 OR API 5L, WELDED, COATED, & WRAPPED
3. GAS PIPE THROUGH WALL SHALL BE IN SLEEVE OR CORE DRILLED HOLE AND ANNULAR SPACE SEALED WITH ELASTIC & WATERPROOF CAULKING. CEMENT CAULK NOT PERMITTED.
4. ANODE DEPTH (D 1) SHALL BE A MINIMUM OF 2' OR BELOW MID DEPTH OF RISER, WHICHEVER IS DEEPER.



BELOW GRADE GAS PIPE ENTRY - 2 1/2" & LARGER

NOTES

1. ABOVE GRADE ENTRY IS REQUIRED GENERALLY, BELOW GRADE WILL BE PERMITTED ONLY BY SPECIAL EXCEPTION.
2. PE COUPLING SHALL BE FUSED ONLY BY CERTIFIED FUSORS - DEPT. STANDARD SPECIFICATION SEC. 25.



BELOW GRADE GAS PIPE ENTRY - 1" & 2"

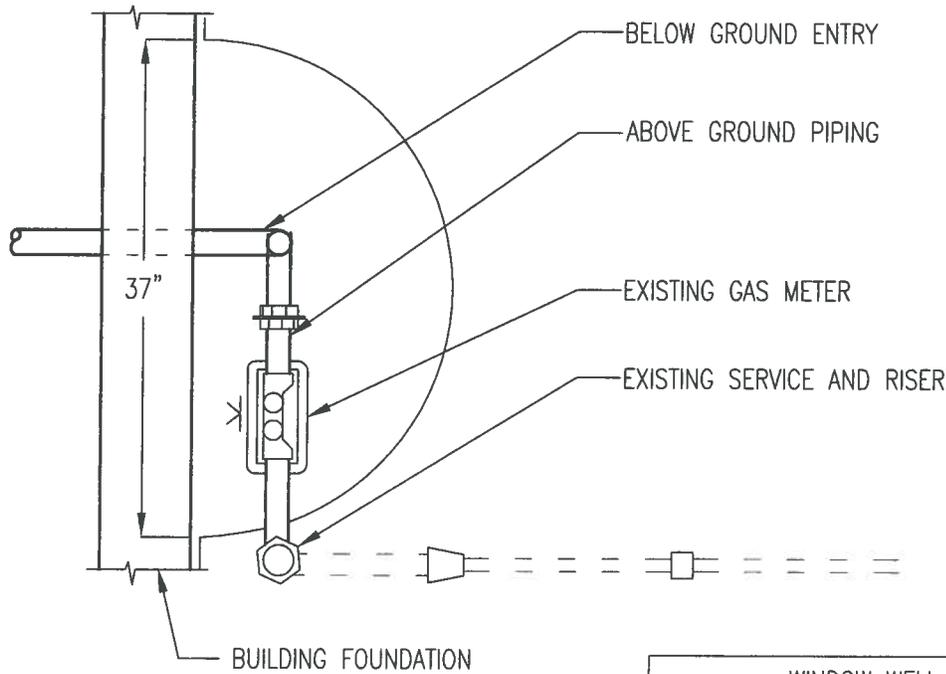
GAS PIPING BUILDING ENTRY, BELOW GRADE

G-22

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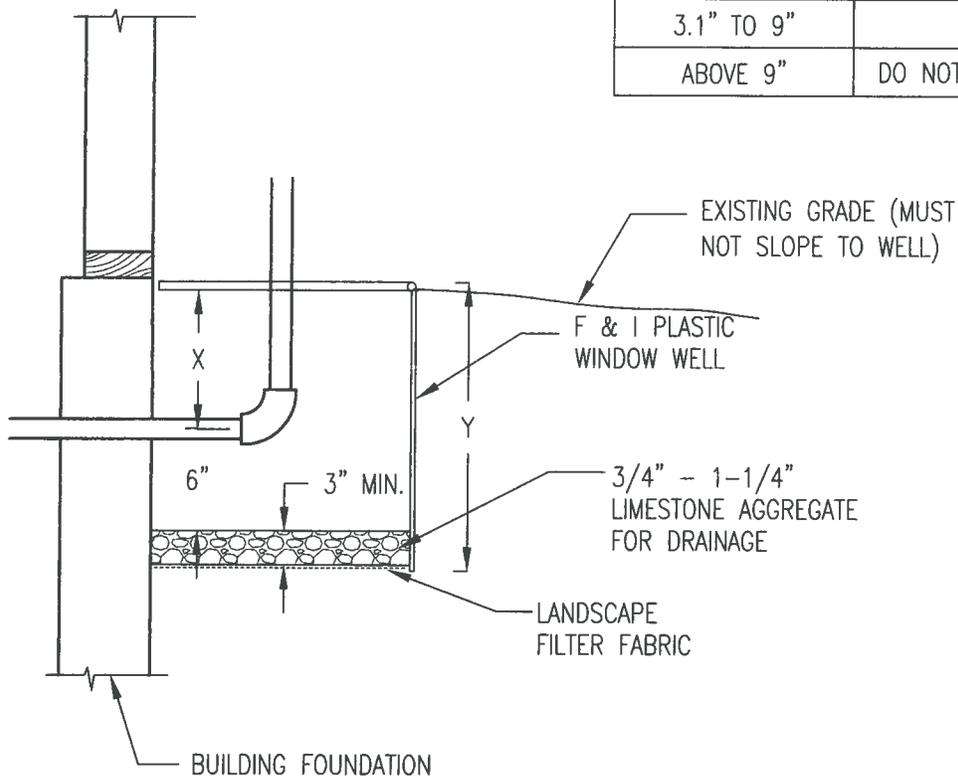
CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



**PLAN VIEW**

WINDOW WELL SIZING CHART	
IF X IS...	Y=
3" OR LESS	12"
3.1" TO 9"	18"
ABOVE 9"	DO NOT USE WINDOW WELL



**SIDE VIEW**

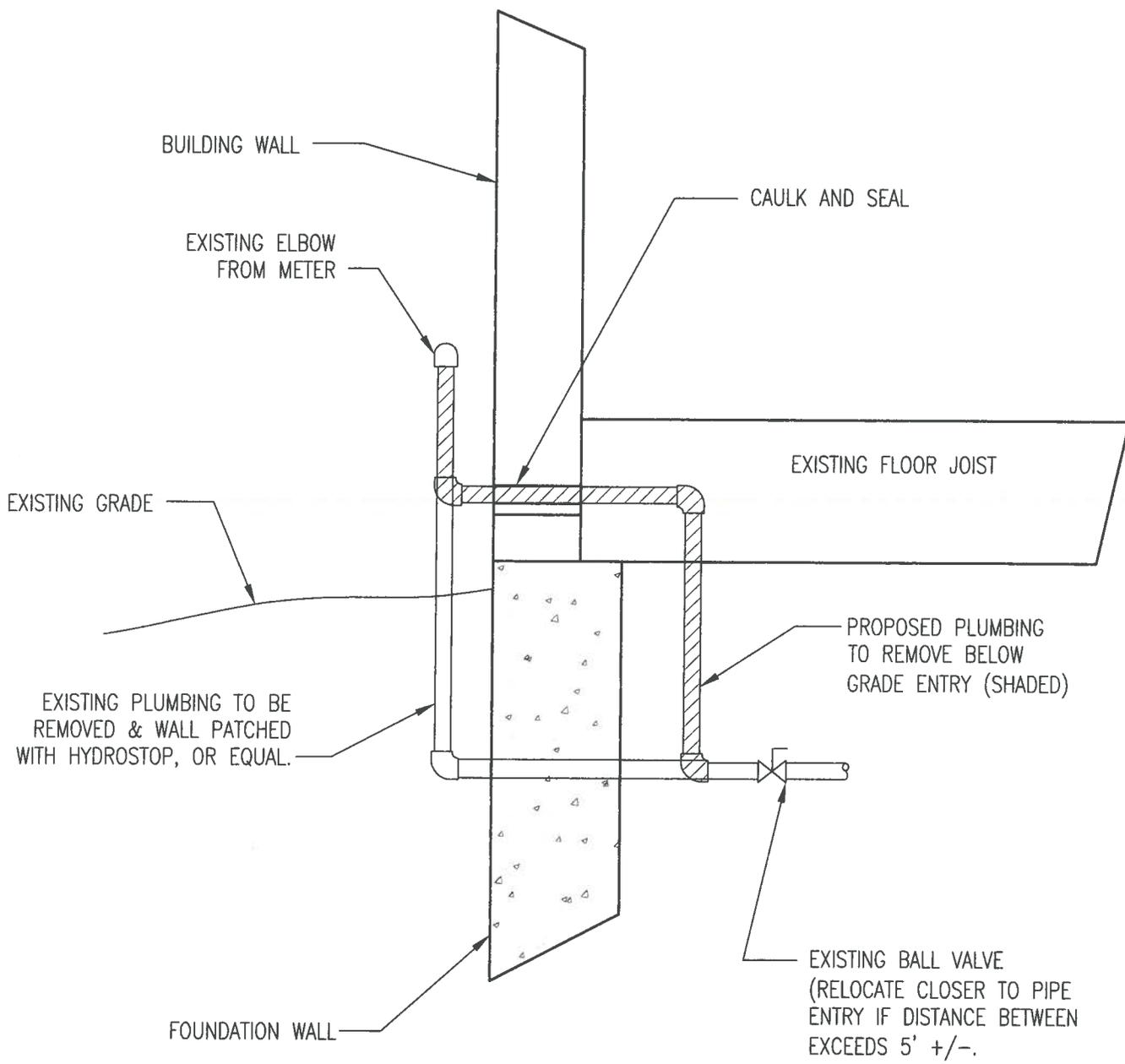
TYPICAL WELL FOR BELOW GRADE GAS PIPE ENTRY

G-23

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DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



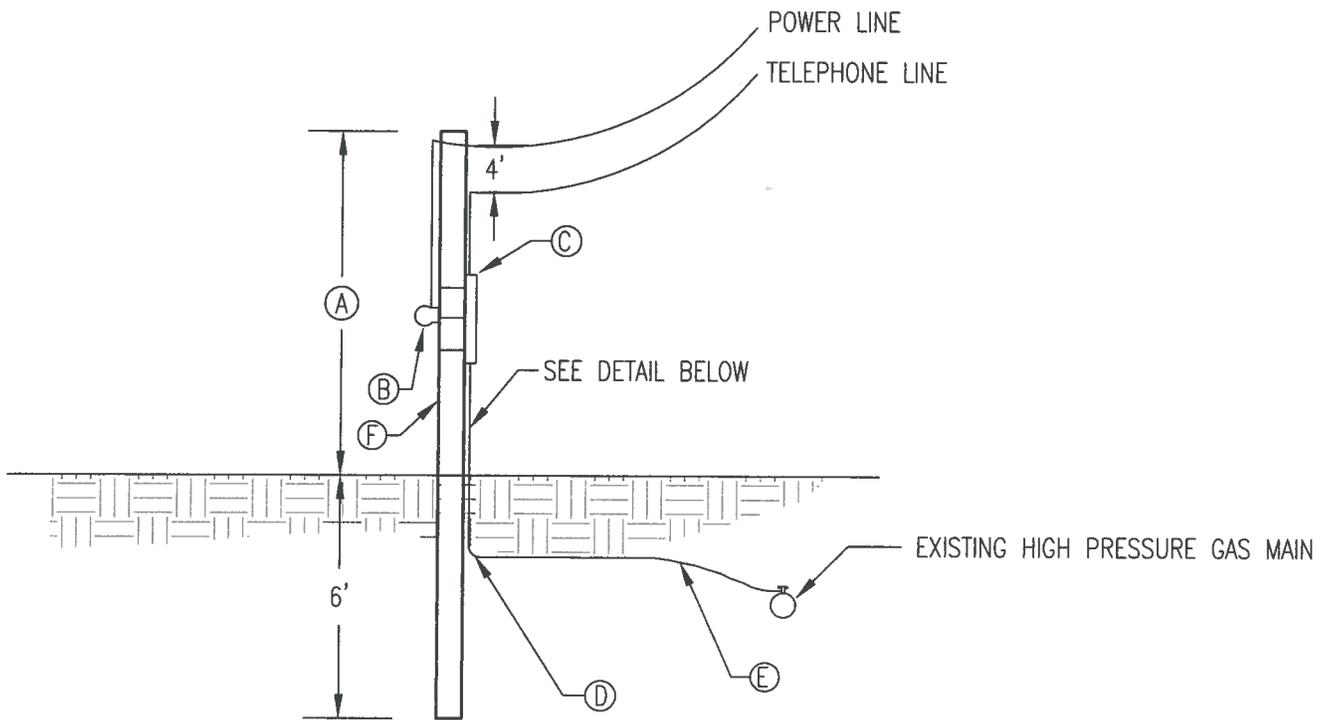
TYPICAL GAS PIPING REVISION

G-24

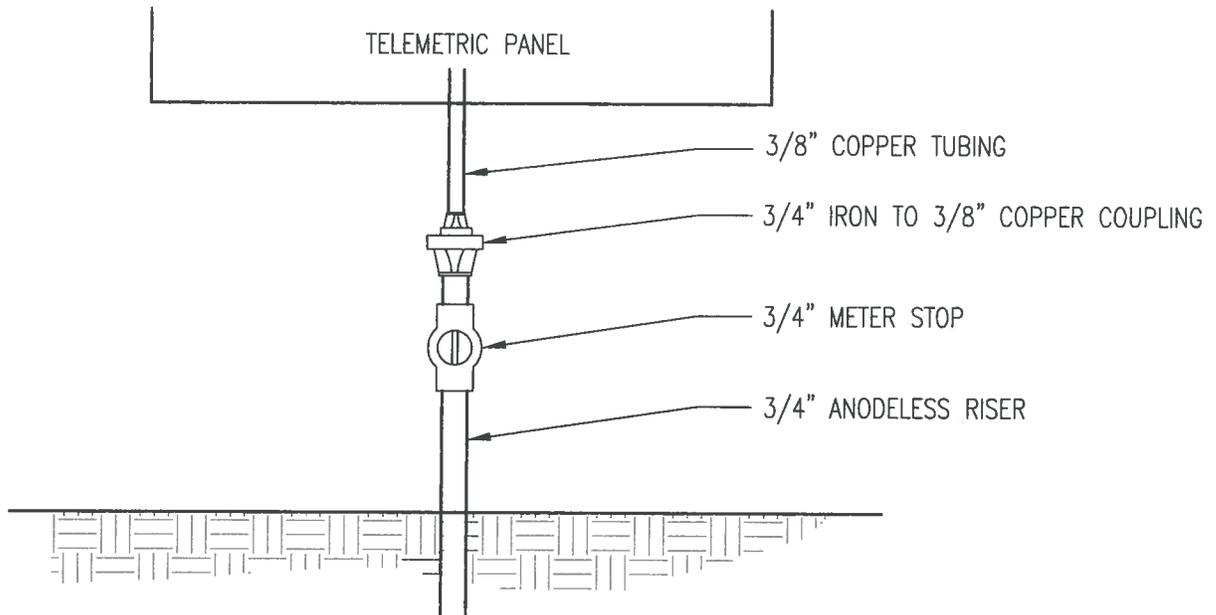
REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



- A. 22' MIN. FOR STREET X-ING OR 18' MIN. OTHERWISE
- B. ELECTRIC METER
- C. TELEMETRIC PANEL (6' MAX. TO TOP)
- D. 3/4" ANODELESS RISER
- E. 1/2" C.T.S. PE H.P. GAS SERVICE
- F. 6" STL. POLE FOR STREET X-ING  
4" STL. POLE FOR OTHER



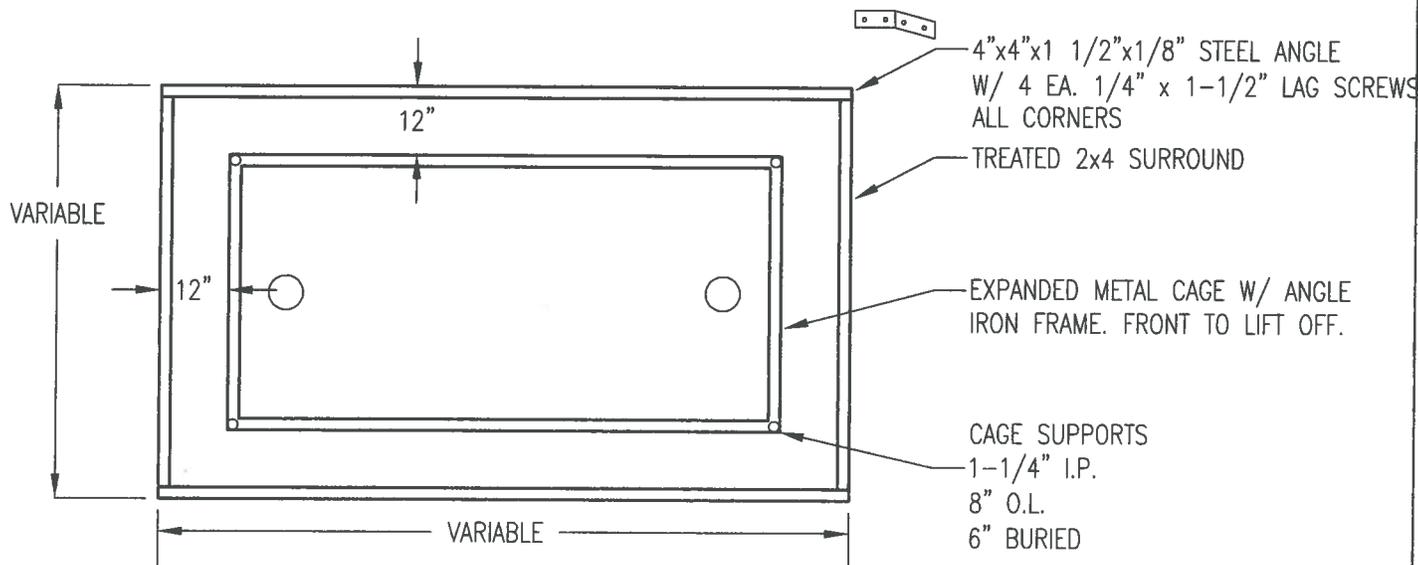
TELEMETRIC GAS PRESSURE STATION

G-26

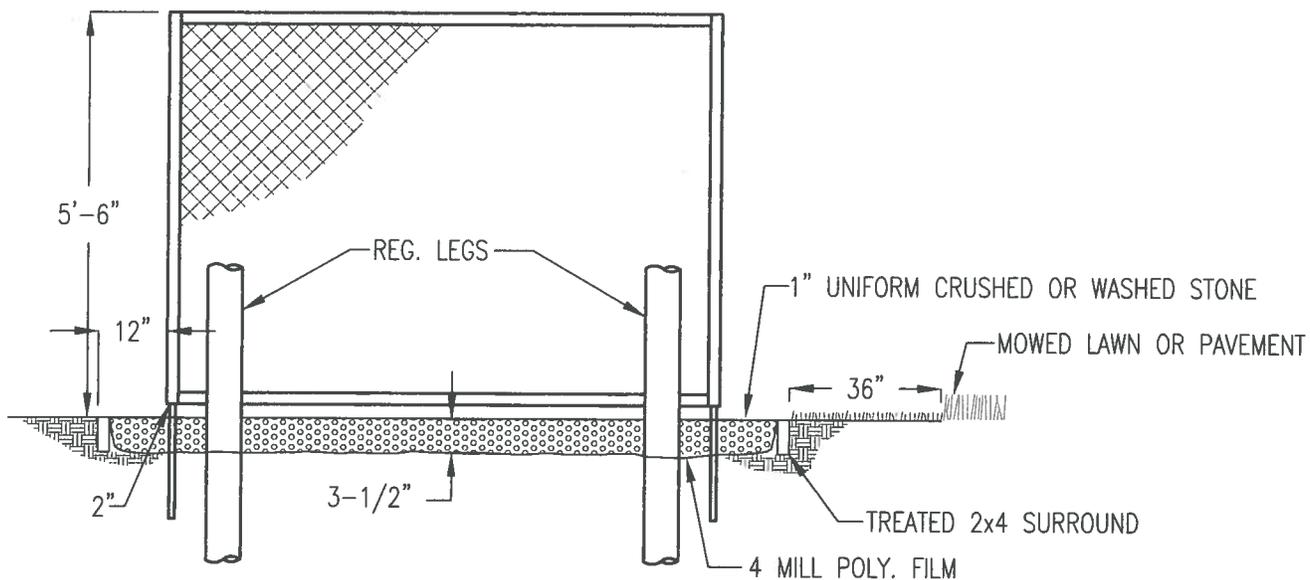
REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



PLAN



PROFILE

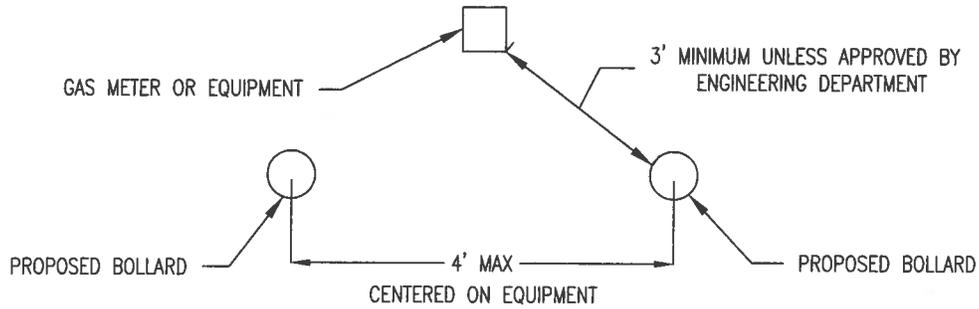
TYPICAL CAGE & LANDSCAPING FOR GAS DISTRIBUTION REGULATOR

G-30

REVISED/APPROVED 02/01/2013

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

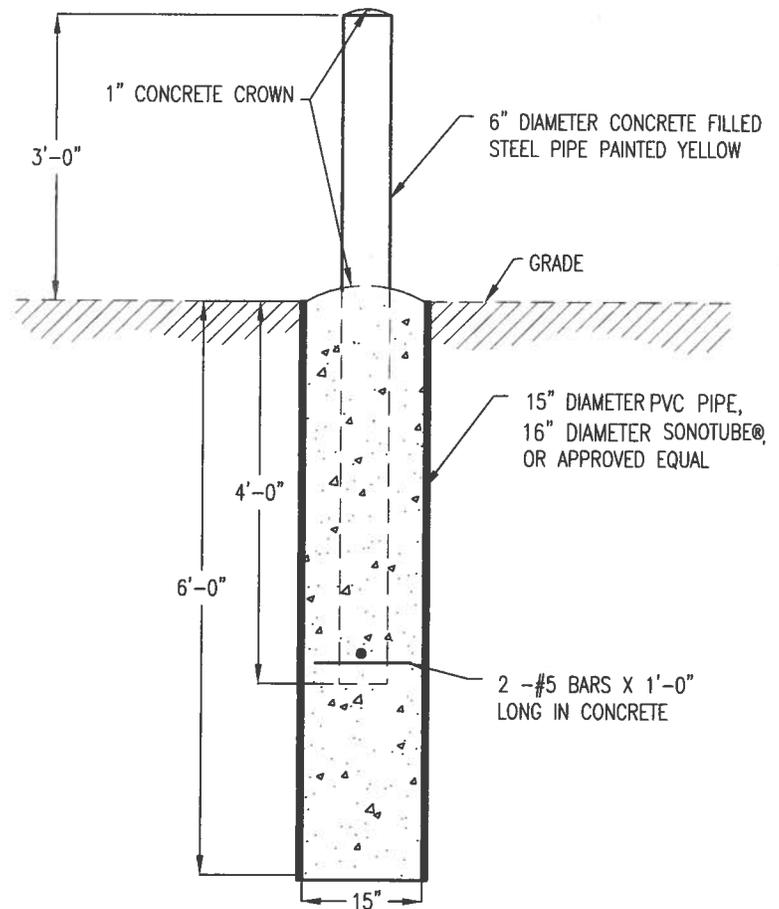
NO SCALE



**NOTES**

1. MULTIPLE BOLLARDS SHALL BE SPACED AT 4' ON CENTER
2. BACKFILL BOLLARD WITH WASTE CUTTINGS, COMPACT TO 95% MAXIMUM DENSITY.
3. BOLLARD SHALL BE FINISHED WITH ONE OF THE FOLLOWING METHODS:
  - A. COVERED WITH A HDPE PLASTIC BOLLARD SLEEVE DESIGNED TO FIT OVER A 6" PIPE BOLLARD. THE SLEEVE SHALL HAVE A SMOOTH FINISH, DOME TOP, AND BE YELLOW IN COLOR. AN ADHESIVE SEALANT SHALL BE USED TO AFFIX THE SLEEVE TO THE BOLLARD.
  - B. PAINTED TO THE FOLLOWING SPECIFICATIONS

SURFACE PREPARATION	BLAST TO THE EXTENT OF AN SSPC-SP6 COMMERCIAL-GRADE LEVEL OF CLEANLINESS AND PRIME BEFORE ANY RUST BLOOM REFORMS
PRIMER	APPLY ONE EVEN COAT OF TNEPEC SERIES 69-COLOR PRIMER TO A DFT OF 5.0 MILS
FIELD FINISH	APPLY ONE EVEN COAT OF TNEPEC SERIES 69-COLOR TO A DFT OF 5.0 MILS
FINAL FINISH	APPLY ONE COAT TNEPEC SERIES 73-COLOR TO A DFT OF 2.0-2.5 MILS OVER THE FIELD FINISH
COLORS	BOLLARDS: SAFETY YELLOW



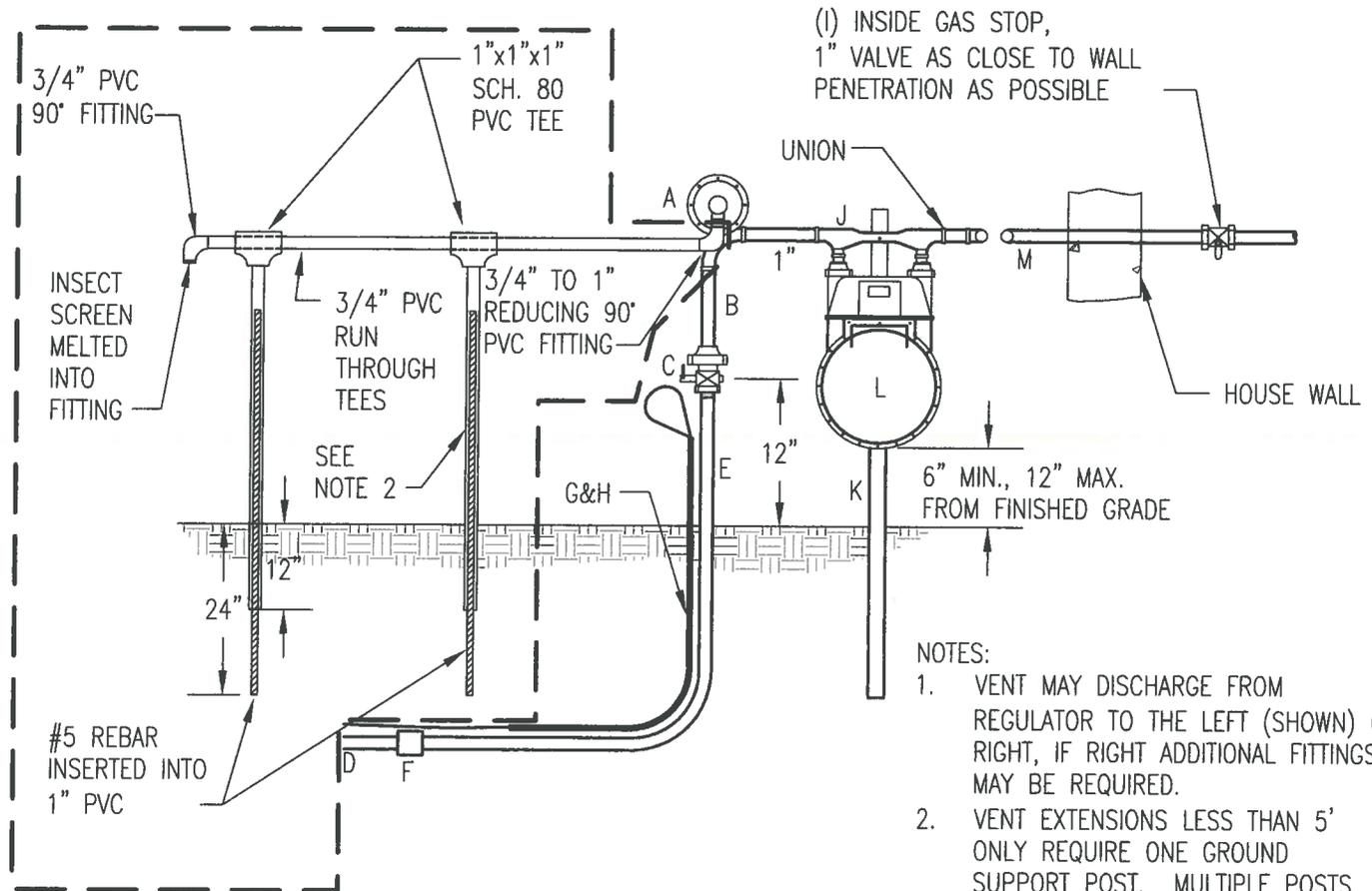
**BOLLARD DETAIL**

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REVISED/APPROVED 02/19/2015

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



(I) INSIDE GAS STOP,  
1" VALVE AS CLOSE TO WALL  
PENETRATION AS POSSIBLE

NOTES:

1. VENT MAY DISCHARGE FROM REGULATOR TO THE LEFT (SHOWN) OR RIGHT, IF RIGHT ADDITIONAL FITTINGS MAY BE REQUIRED.
2. VENT EXTENSIONS LESS THAN 5' ONLY REQUIRE ONE GROUND SUPPORT POST. MULTIPLE POSTS SHALL BE NO MORE THAN 4' APART.
3. PIPE SHALL BE INSTALLED WITH NEGATIVE SLOPE FROM THE REGULATOR TO THE DISCHARGE.
4. ALL PVC VENT PIPE AND FITTINGS SHALL BE GRAY. PIPE MATERIALS SHALL BE SCH. 80 AND FITTINGS SHALL BE SCH. 40.

- A. REGULATOR, SCHUMBERGER B-42 WITH 1/8" ORIFICE
- B. 3/4" NIPPLE
- C. 3/4" METER STOP
- D. PE SERVICE
- E. 1/2" X 3/4" ANODELESS SERVICE RISER
- F. 1/2" C.T.S. P.E. SOCKET COUPLING
- G. 1/2" P.E. TO PROTECT TRACER WIRE
- H. COATED TRACER WIRE
- I. 1" BRONZE BALL VALVE
- J. ROCKFORD ECLIPSE 701173 26-M WEDGESEAL METER BAR (OR EQUAL)
- K. ADVANCE ENG. CORP. D.P. 1004 METER MOUNTING BRACKET (OR EQUAL)
- L. METER
- M. 1" MINIMUM BLACK STEEL PIPE

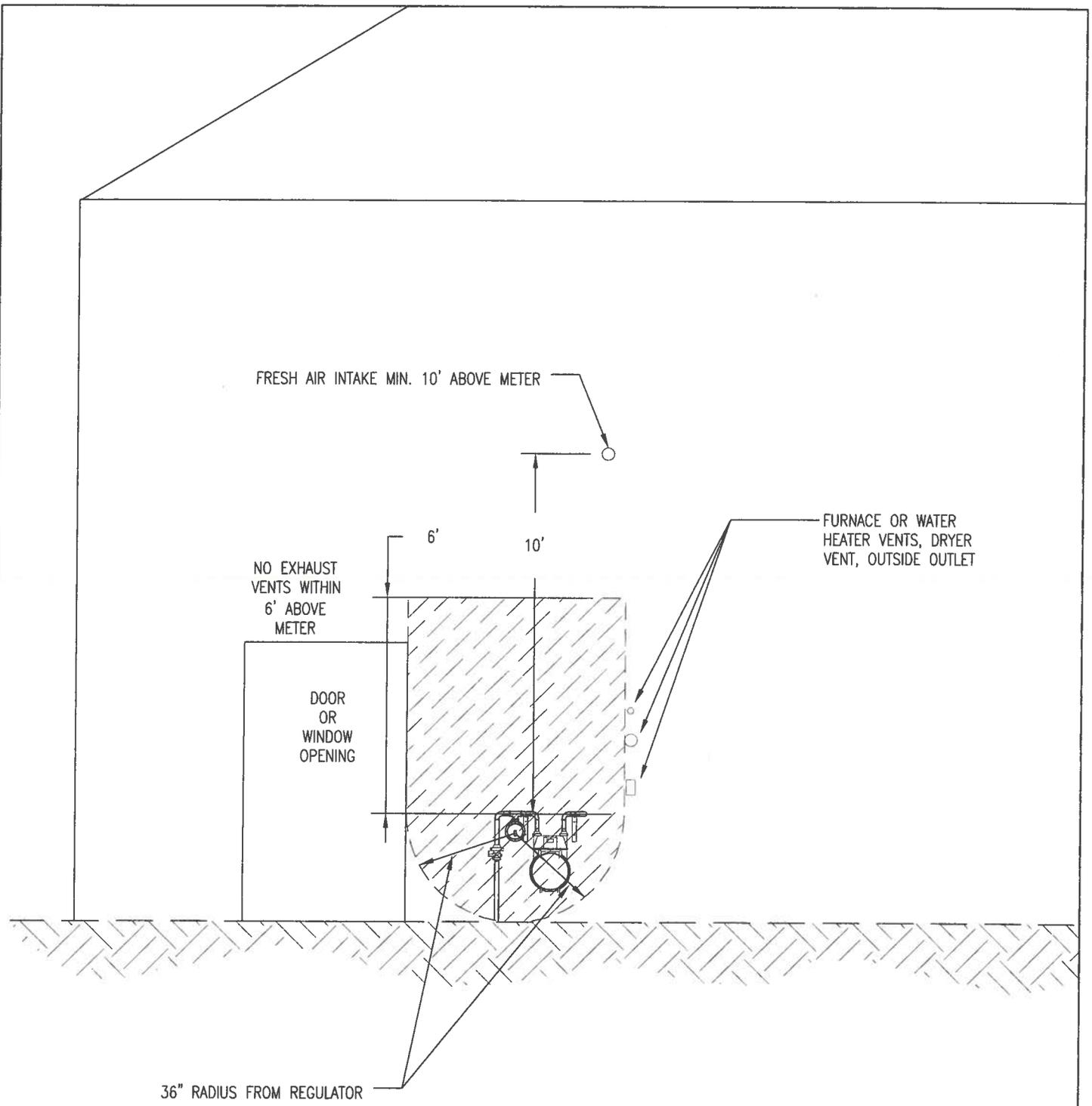
REGULATOR VENT EXTENSION

G-34

REVISED/APPROVED 06/01/2014

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



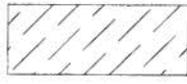
FURNACE OR WATER HEATER VENTS, DRYER VENT, OUTSIDE OUTLET

FRESH AIR INTAKE MIN. 10' ABOVE METER

NO EXHAUST VENTS WITHIN 6' ABOVE METER

DOOR OR WINDOW OPENING

36" RADIUS FROM REGULATOR



INDICATES AREA WHERE NO WINDOWS, DOORS, EXHAUST VENTS, DRYER VENTS MAY BE LOCATED

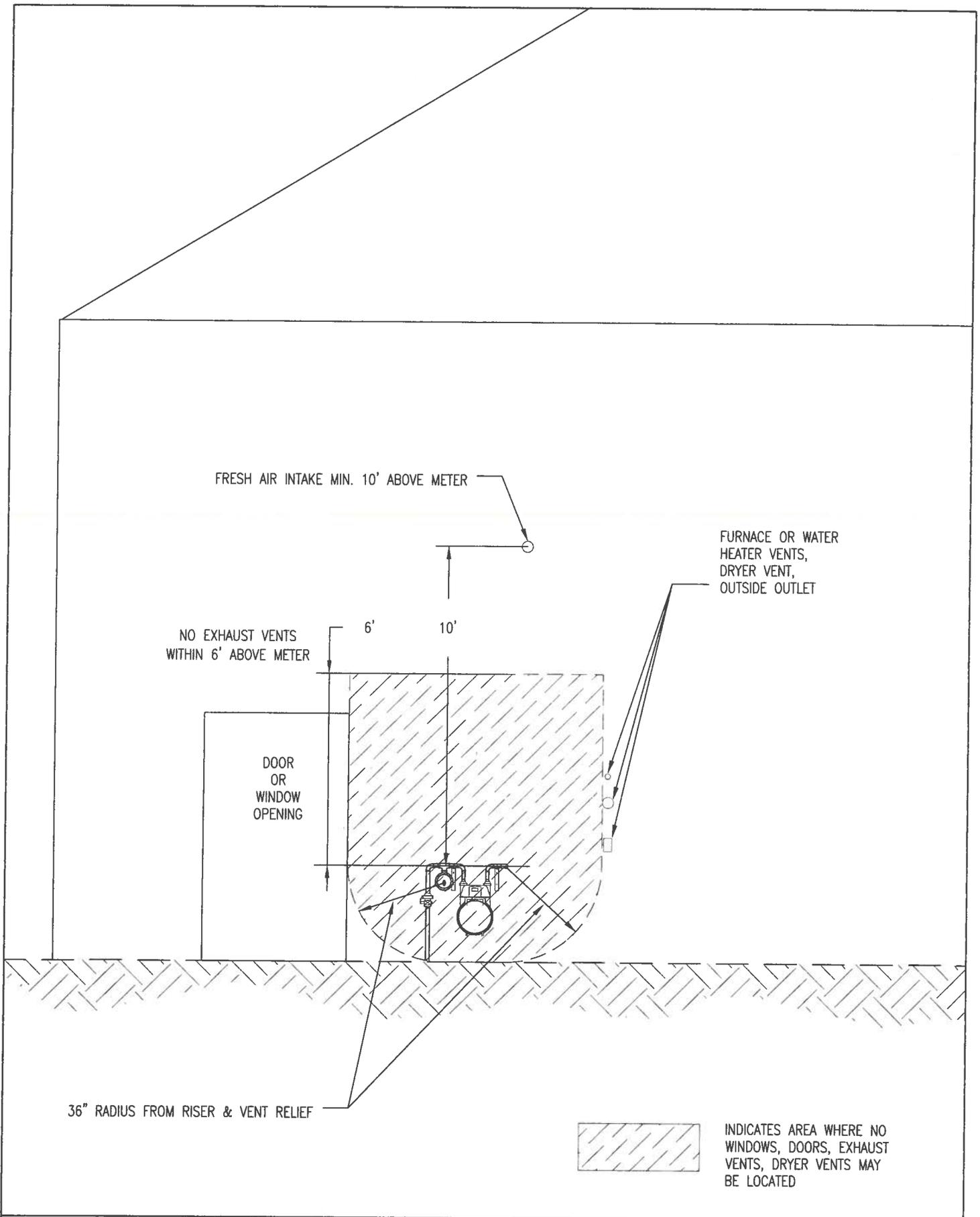
7" WC METERING PRESSURE METER LOCATION

G-35

REVISED/APPROVED 06/01/2014

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DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



ELEVATED PRESSURE METER LOCATION

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REVISED/APPROVED 06/01/2014

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE