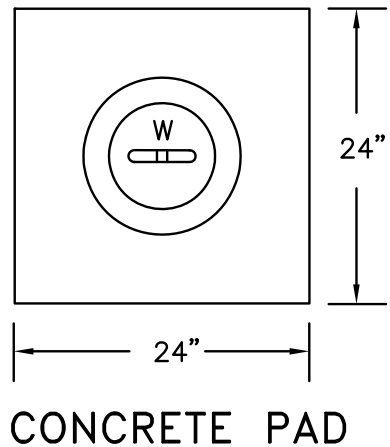


NOTES:

- 1) VALVE BOX NOT TO REST ON OPERATING ASSEMBLY.
- 2) OPERATOR EXTENSION REQUIRED WHEN VALVE NUT IS DEEPER THAN 3 FEET FROM FINISHED GRADE.
- 3) CENTER VALVE BOX ON AXIS OF OPER. NUT.
- 4) PROVIDE 24" SQUARE BY 4" THICK CONCRETE PAD AROUND VALVE BOX OUTSIDE OF PAVED AREAS AS SHOWN IN CONCRETE PAD DETAIL



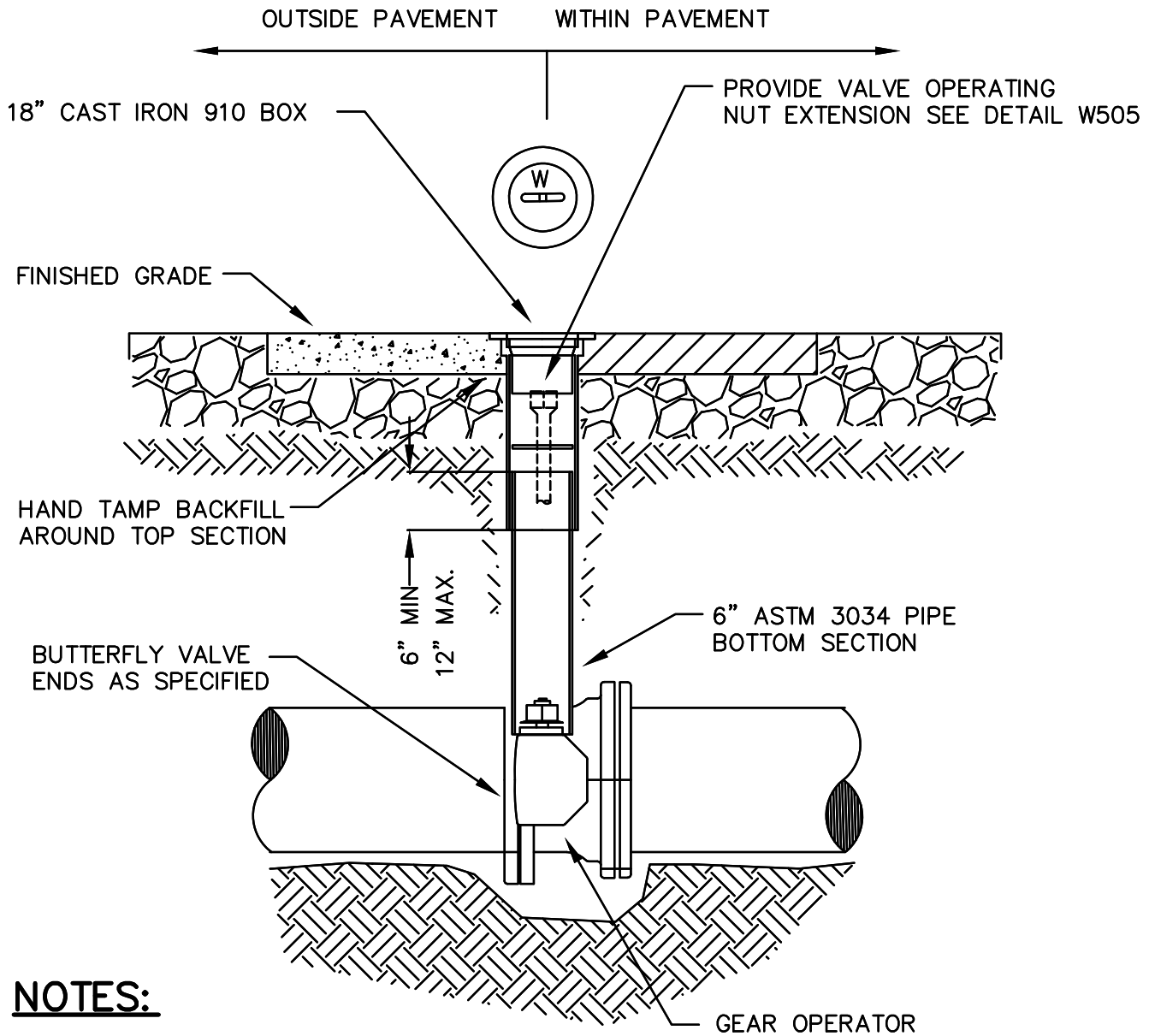
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FAX: (503) 684-7297

APPROVED BY:
THEODORE S. KYLE, P.E.
CITY ENGINEER
JANUARY 2011
APPROVAL DATE

**TYPICAL GATE
VALVE**

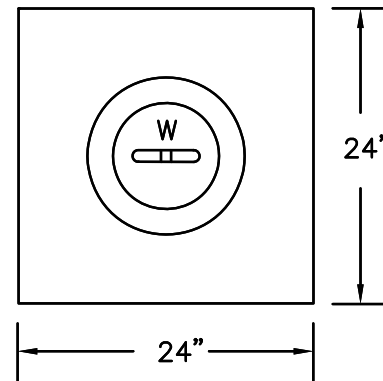
NO SCALE

DWG. NO.
503



NOTES:

- 1) VALVE BOX NOT TO REST ON OPERATING ASSEMBLY.
- 2) OPERATING NUT EXTENSION REQUIRED WHEN VALVE NUT IS DEEPER THAN 3 FEET FROM FINISHED GRADE. SEE DETAIL W5.
- 3) CENTER VALVE BOX ON AXIS OF OPER. NUT.
- 4) PROVIDE 24" SQUARE BY 4" THICK CONCRETE PAD AROUND VALVE BOX OUTSIDE OF PAVED AREAS AS SHOWN IN CONCRETE PAD DETAIL



CONCRETE PAD

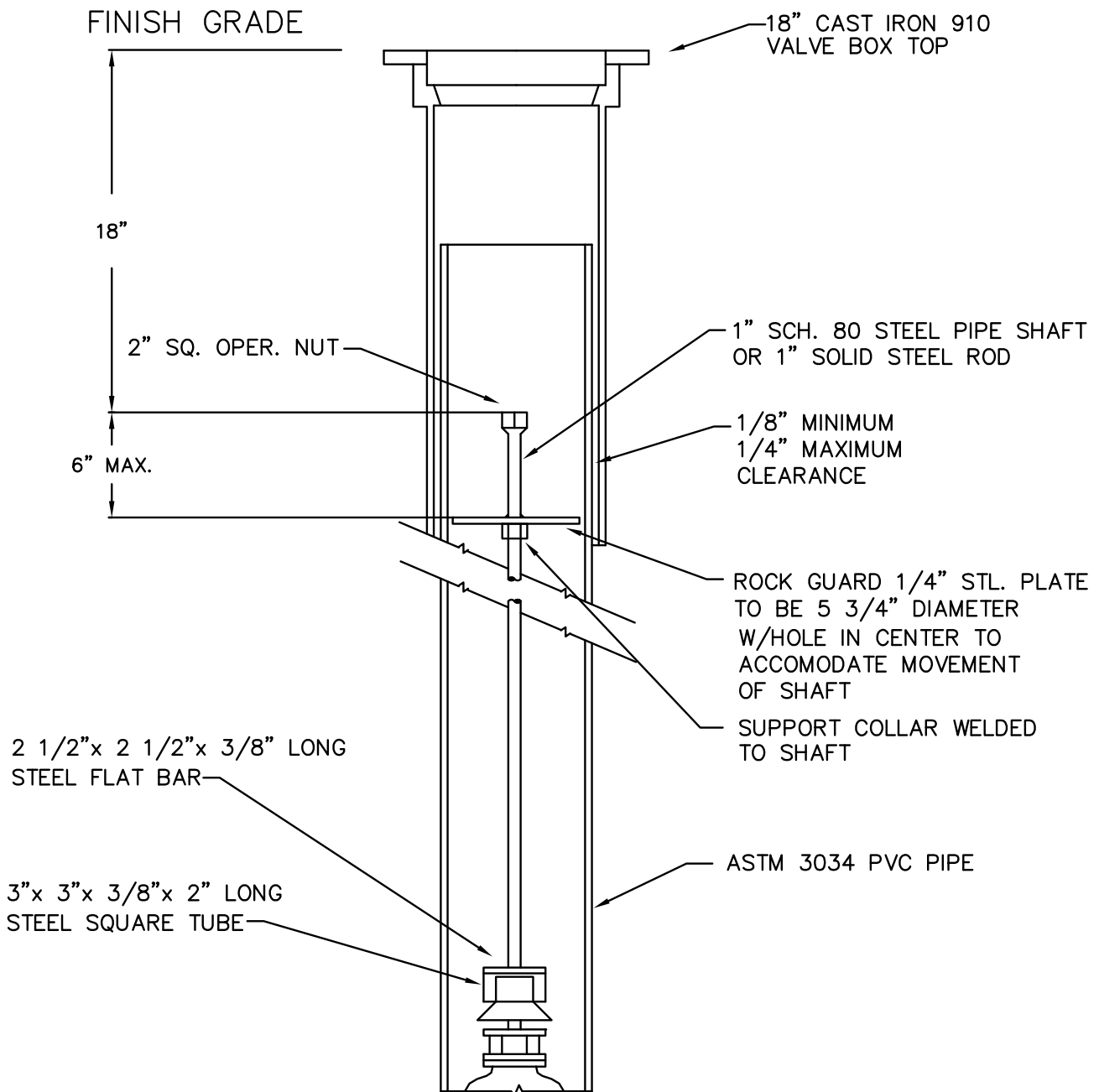


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 JANUARY 2011
 APPROVAL DATE

TYPICAL BUTTERFLY VALVE

NO SCALE
 DWG. NO.
504



NOTE:

- 1) EXTEND 2" NUT TO WITHIN 18" OF FINISH GRADE WHEN VALVE NUT IS DEEPER THAN 3 FEET FROM FINISHED GRADE



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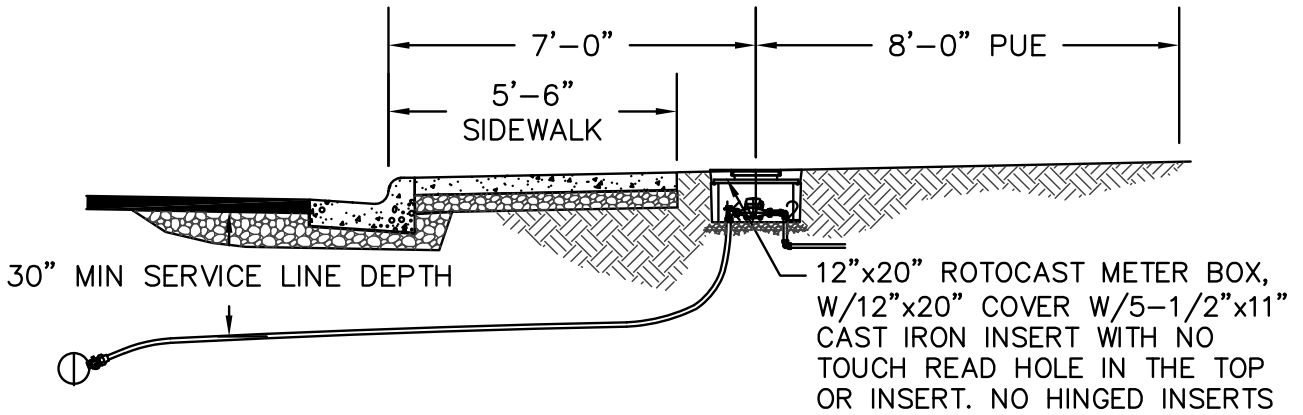
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CITY ENGINEER
JANUARY 2011
APPROVAL DATE

**OPERATING NUT
EXTENSION**

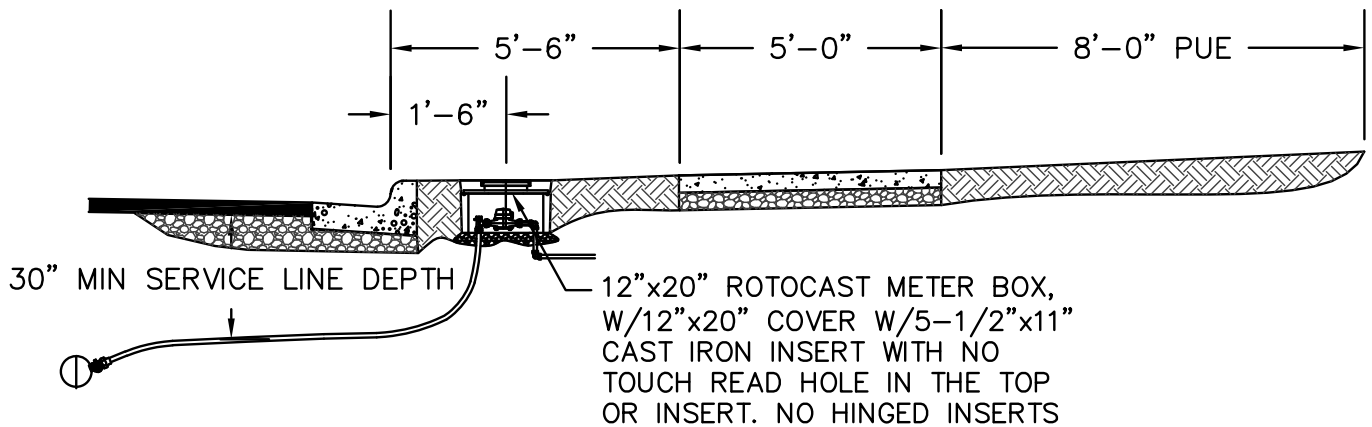
NO SCALE

DWG. NO.

505



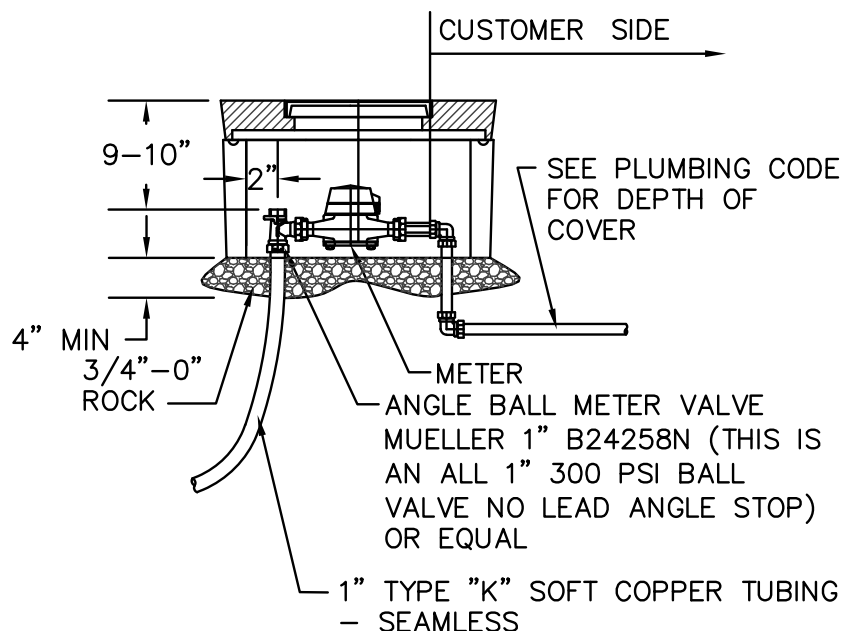
SIDEWALK ADJACENT TO CURB



SIDEWALK WITH PLANTER STRIP AT CURB

NOTES:

1. SURVEYOR TO INSTALL TEMPORARY HUB AND GUARD STAKE AT LOT LINE FOR METER INSTALLATION.
2. BOXES SET IN CONCRETE SHALL BE NEXT SIZE LARGER.
3. CENTER OF METER BOX TO BE OFFSET 1' FROM PROPERTY LINE.
4. BANKED METERS WITH SHARED SERVICE LINE TRENCH SHALL HAVE 18" MINIMUM DISTANCE BETWEEN TAP INSTALLATIONS.
5. IF WATER METER IS LOCATED IN A SIDEWALK AREA THE BOX SIZE WILL BE ARMORCAST 17"x30"x12" RPM 20K COVER OR EQUIVALENT. IF TWO METERS ARE BANKED IN SIDEWALK AREA THEN DISTANCE BETWEEN ANGLE STOPS WILL BE 24".



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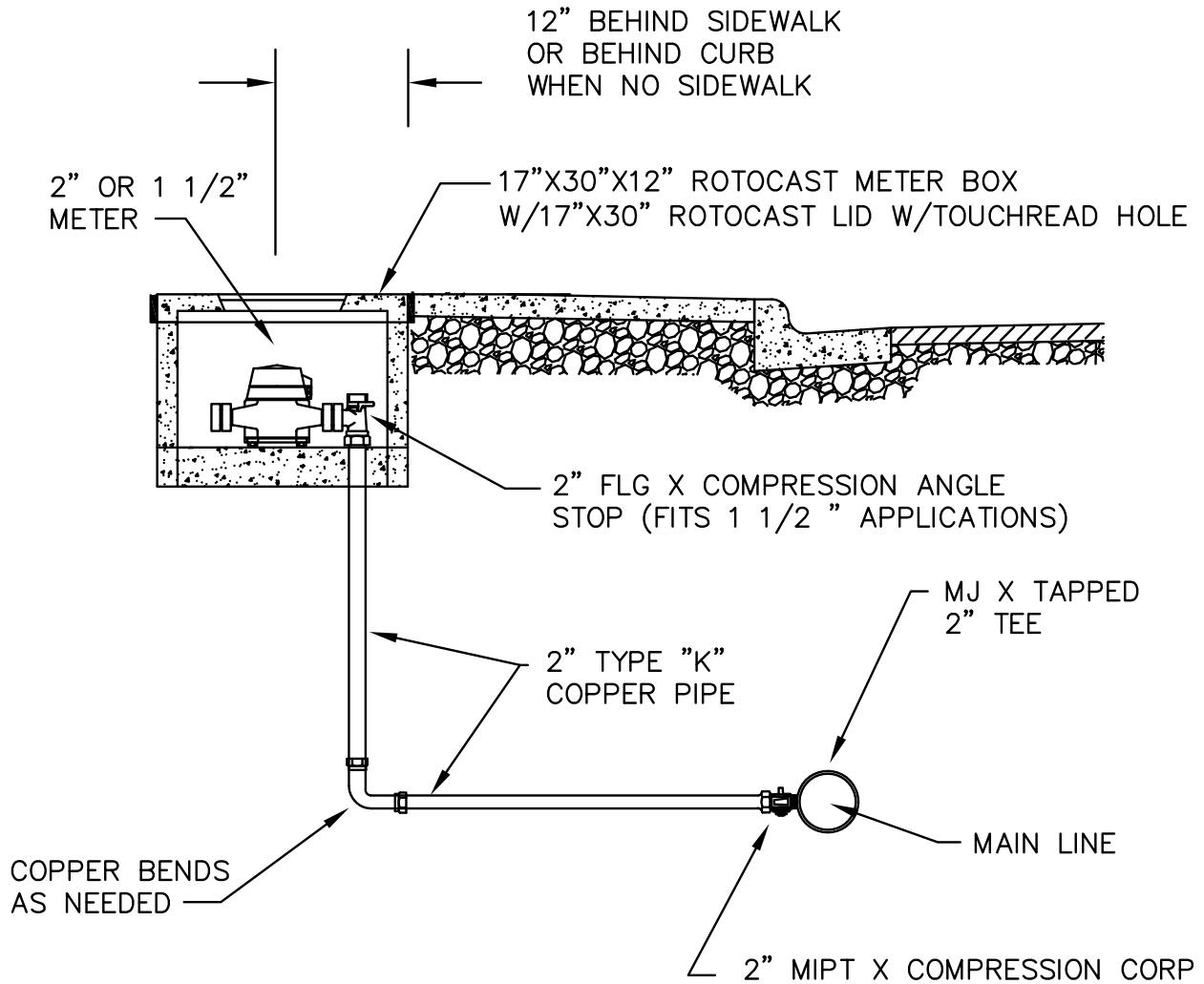
APPROVED BY:
LORI FAHA, P.E.
CITY ENGINEER
MARCH 2017
APPROVAL DATE

1" WATER SERVICE

NO SCALE

DWG. NO.

520



NOTES:

1. CONTRACTOR TO INSTALL MJ X TAPPED 2" TEES AT 90° ANGLES TO METER LOCATIONS. HORIZONTAL & LEVEL.
2. BANKED 2" METERS SHALL HAVE 24" MINIMUM DISTANCE BETWEEN SERVICE TAP INSTALLATIONS
3. IF 2" METER IS LOCATED IN SIDEWALK AREA THE METER BOX NEEDS TO BE 28"X27"X12" ROTOCAST. IF TWO ARE BANKED THEN THE ANGLE STOPS NEED TO BE AT A MINIMUM OF 30" APART.



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CITY ENGINEER
JANUARY 2011
APPROVAL DATE

**2" & 1-1/2"
WATER SERVICE**

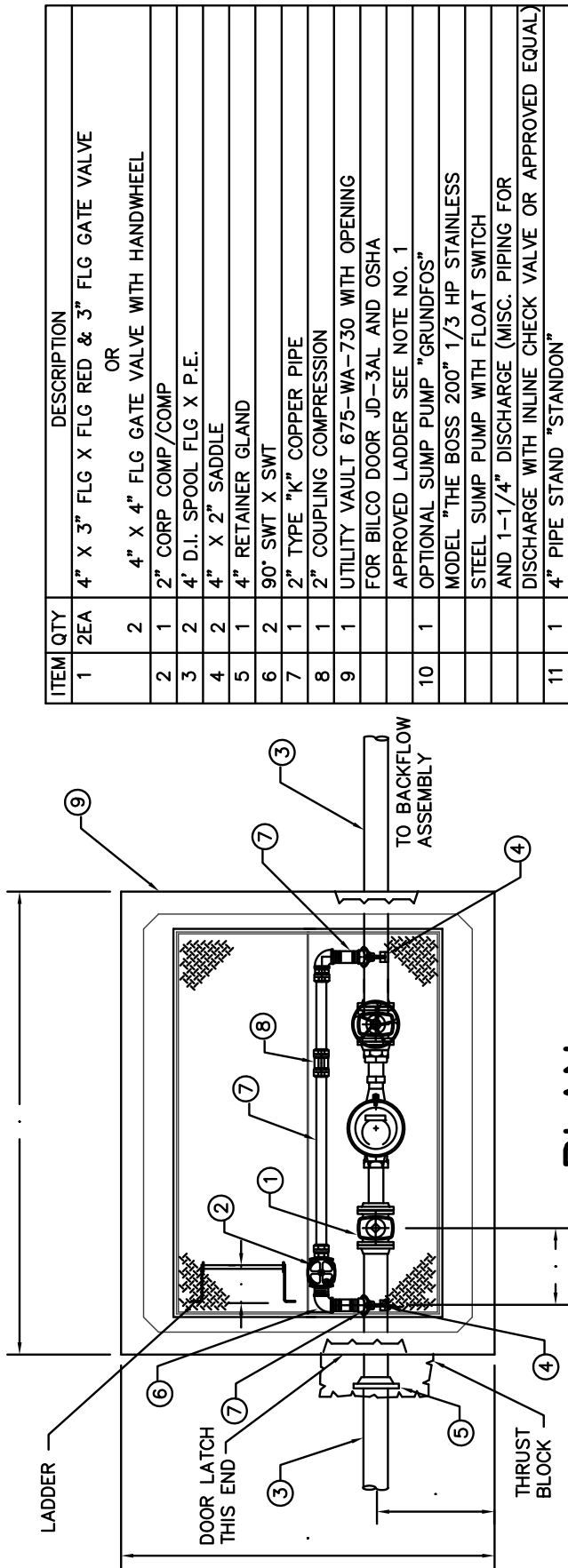
NO SCALE

DWG. NO.

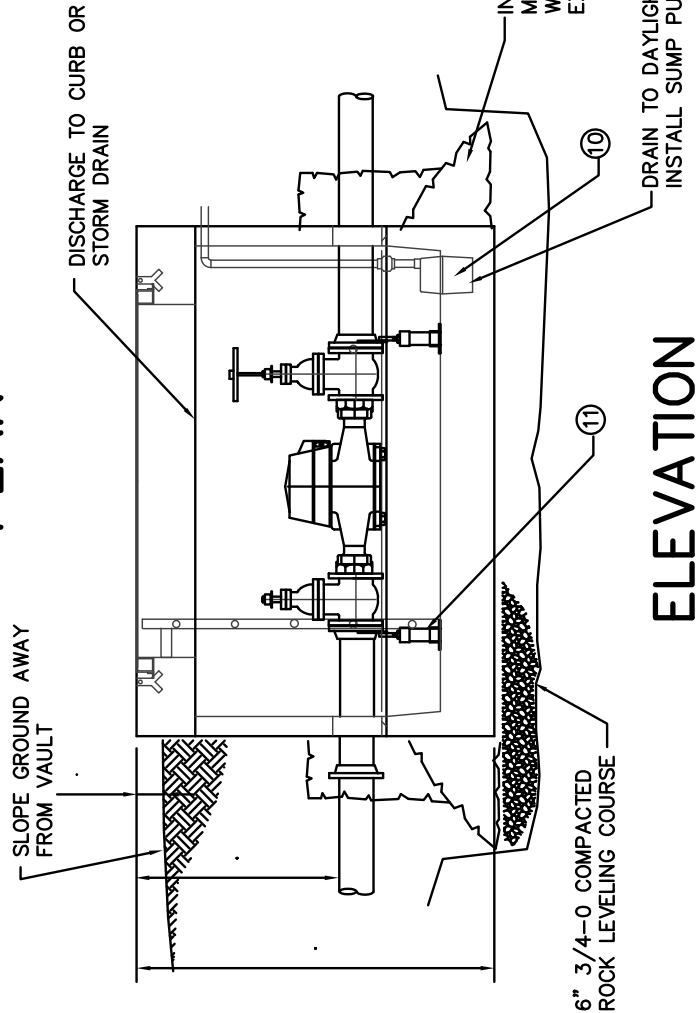
521

STREET SIDE

CUSTOMER SIDE



PLAN



ELEVATION

NOTES:

1. SEAL ALL OPENINGS IN VAULT WITH NON SHRINK GROUT.
2. ALL COPPER PIPE SWEAT JOINTS. (CAN SUBSTITUTE COMPRESSION FITTINGS)

INSTALL CONCRETE BALLAST 3 CY MIN AROUND BASE OF VAULT IN AREAS WHERE FLOODING OR HIGH GROUNDWATER EXISTS

DRAIN TO DAYLIGHT OR INSTALL SUMP PUMP

6" 3/4-0 COMPACTED ROCK LEVELING COURSE

ITEM	QTY	DESCRIPTION
1	2EA	4" X 3" FLG X FLG RED & 3" FLG GATE VALVE OR
2	2	4" X 4" FLG GATE VALVE WITH HANDWHEEL
3	1	2" CORP COMP/COMP
4	2	4' D.I. SPOOL FLG X P.E.
5	2	4" X 2" SADDLE
6	1	4" RETAINER GLAND
7	2	90° SWT X SWT
8	1	2" TYPE "K" COPPER PIPE
9	1	2" COUPLING COMPRESSION
10	1	UTILITY VAULT 675-WA-730 WITH OPENING FOR BILCO DOOR JD-3AL AND OSHA APPROVED LADDER SEE NOTE NO. 1
11	1	OPTIONAL SUMP PUMP "GRUNDFOS" MODEL "THE BOSS 200" 1/3 HP STAINLESS STEEL SUMP PUMP WITH FLOAT SWITCH AND 1-1/4" DISCHARGE (MISC. PIPING FOR DISCHARGE WITH INLINE CHECK VALVE OR APPROVED EQUAL) 4" PIPE STAND "STANDON"



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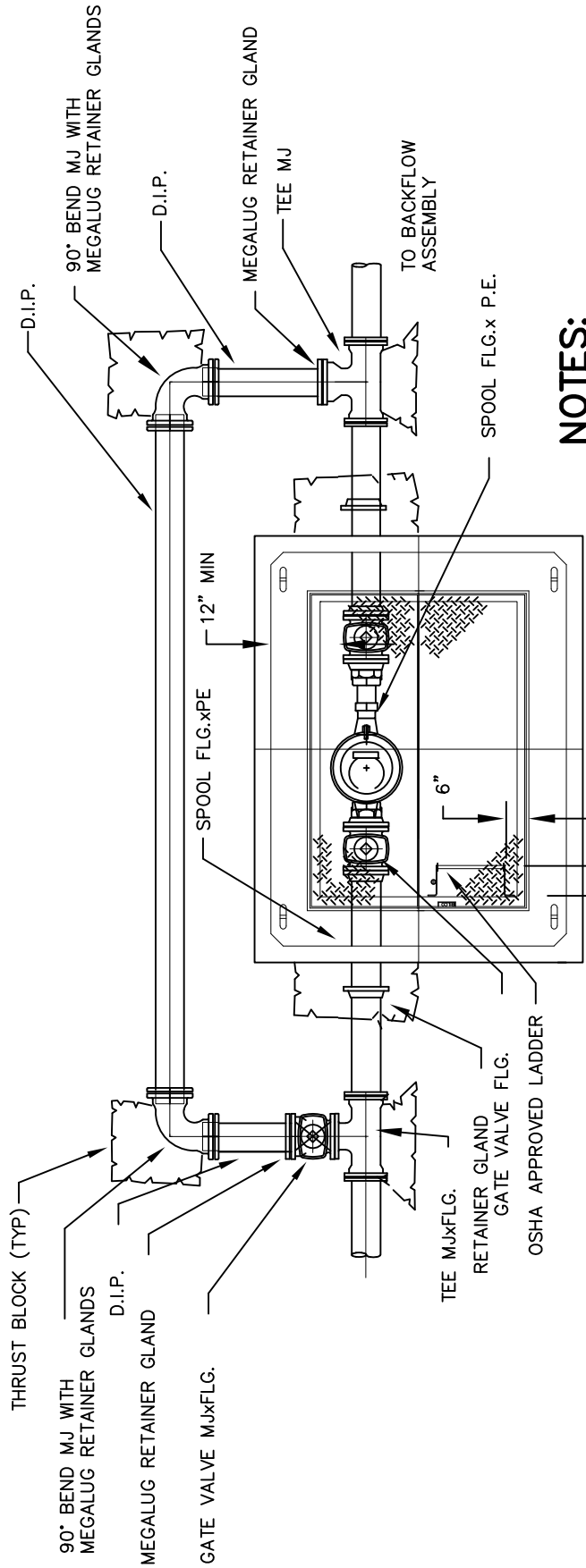
APPROVED BY:
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CITY ENGINEER
JANUARY 2011
APPROVAL DATE

3" & 4"
METER

NO SCALE
DWG. NO.
523

CUSTOMER SIDE

STREET SIDE

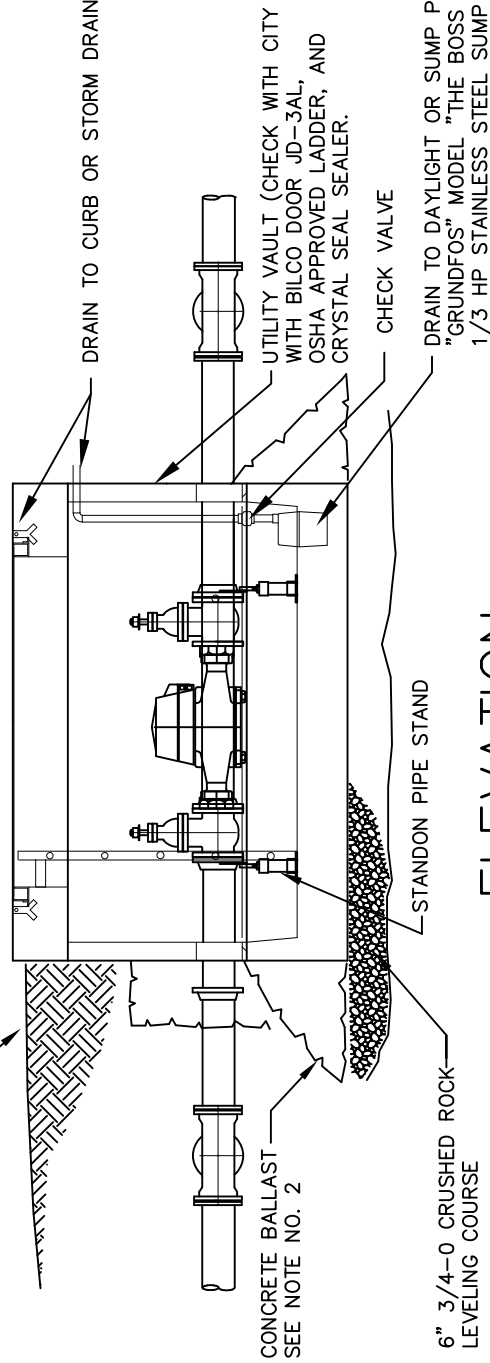


NOTES:

1. CONTRACTOR TO SEAL ALL OPENING IN VAULT WITH NON-SHRINK GROUT.
2. CONTRACTOR TO INSTALL CONCRETE BALLAST 3 CU. YD. MIN. AROUND BASE OF VAULT IN THOSE AREAS WHERE FLOODING OR HIGH GROUND WATER EXIST.

PLAN

FINISH GRADE TO SLOPE AWAY FROM VAULT LID



ELEVATION

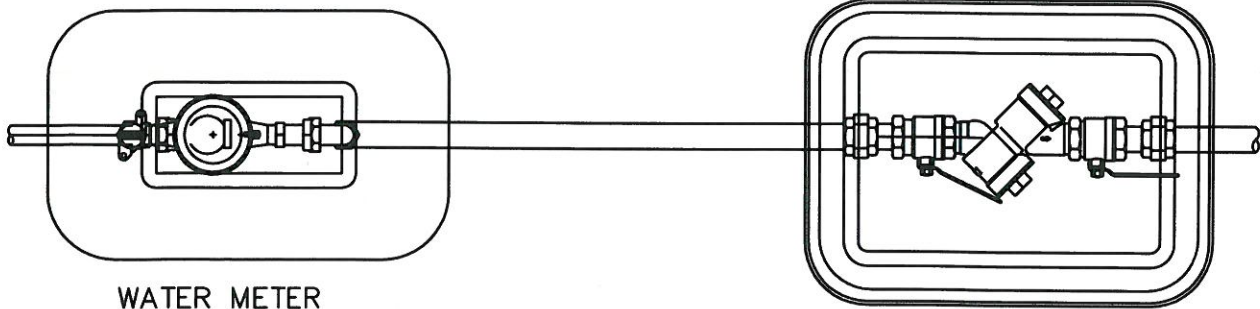


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APPROVED BY:
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CITY ENGINEER
OCTOBER 2016
APPROVAL DATE

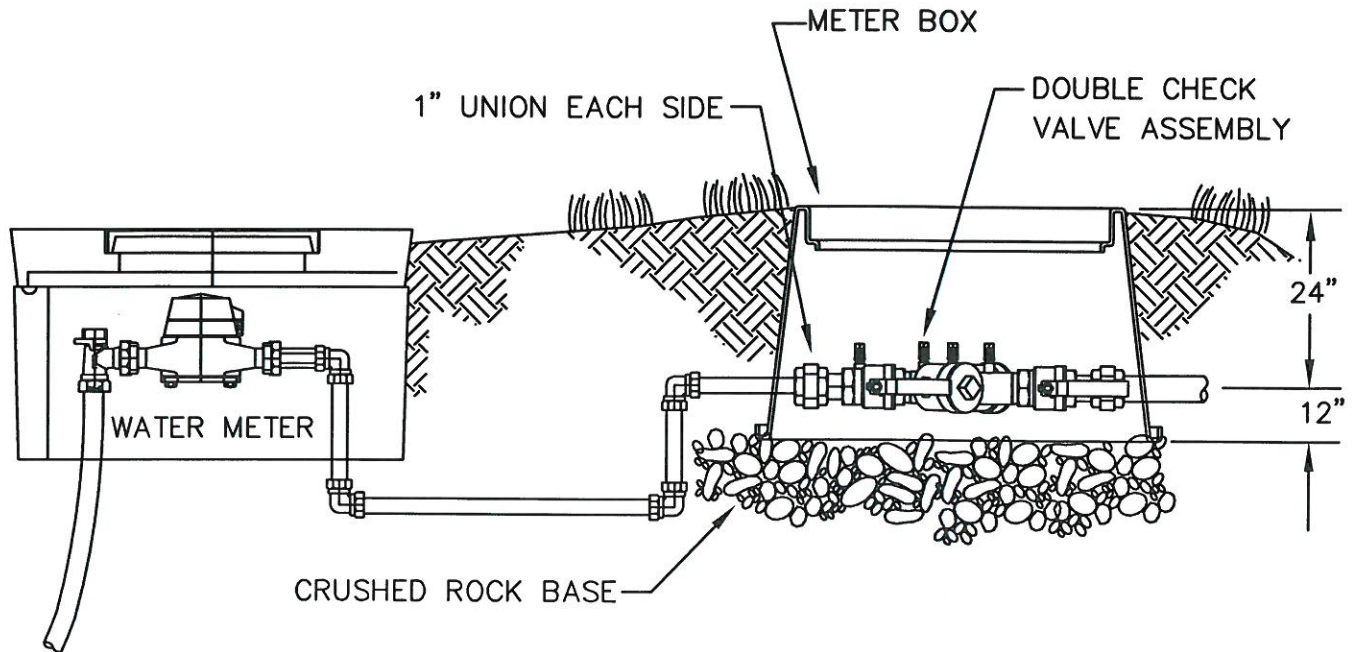
**LARGE METER
W/BYPASS**

NO SCALE
DWG. NO.
525



WATER METER

PLAN



ELEVATION

BOX SPECIFICATIONS	
DEVICE SIZE	BOX TYPE
3/4" - 1"	BROOKS #1419 SERIES OR EQUAL
1 1/2" - 2"	CARSON 1730D P15L OR EQUAL

INSTALLATION SHOWN IS ONLY A SUGGESTION.

1. DOUBLE CHECK TO BE LOCATED DIRECTLY BEHIND WATER METER.
2. BRASS, STAINLESS, OR PLASTIC PLUGS TO BE INSTALLED IN TEST COCKS IF BELOW GROUND INSTALLATION.
3. DISTANCE FROM BOTTOM OF DEVICE TO FINISH GRADE, FREEZE PROTECTION, AND CLEARANCE FOR TESTING AND REPAIR ARE THE MAJOR CONSIDERATIONS FOR INSTALLATION.



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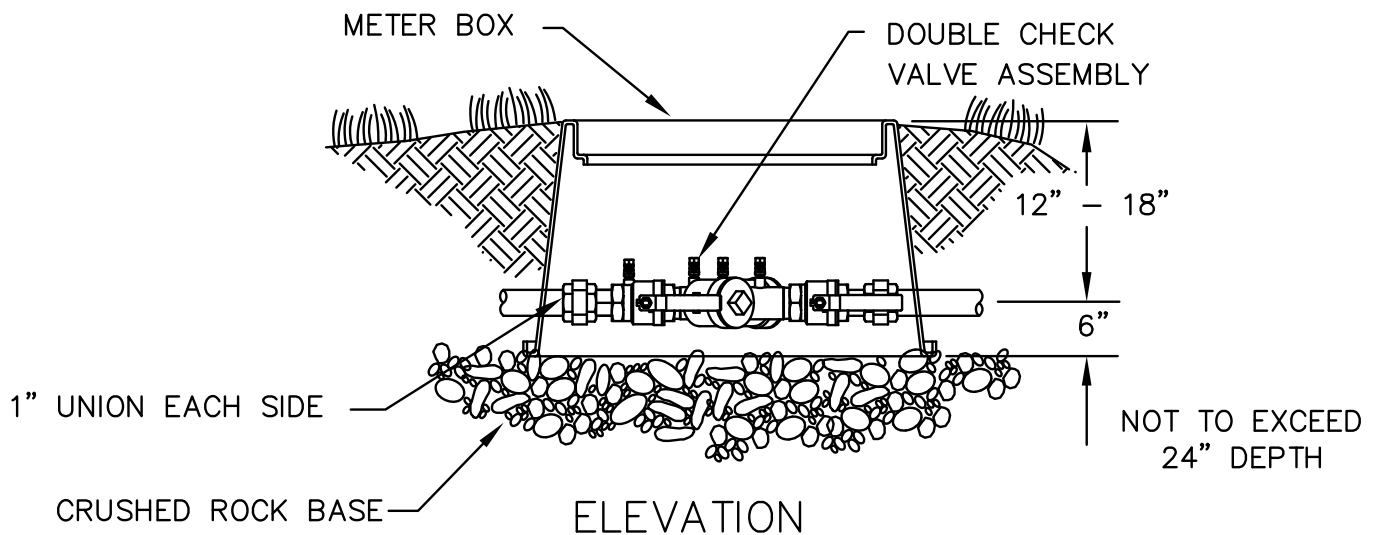
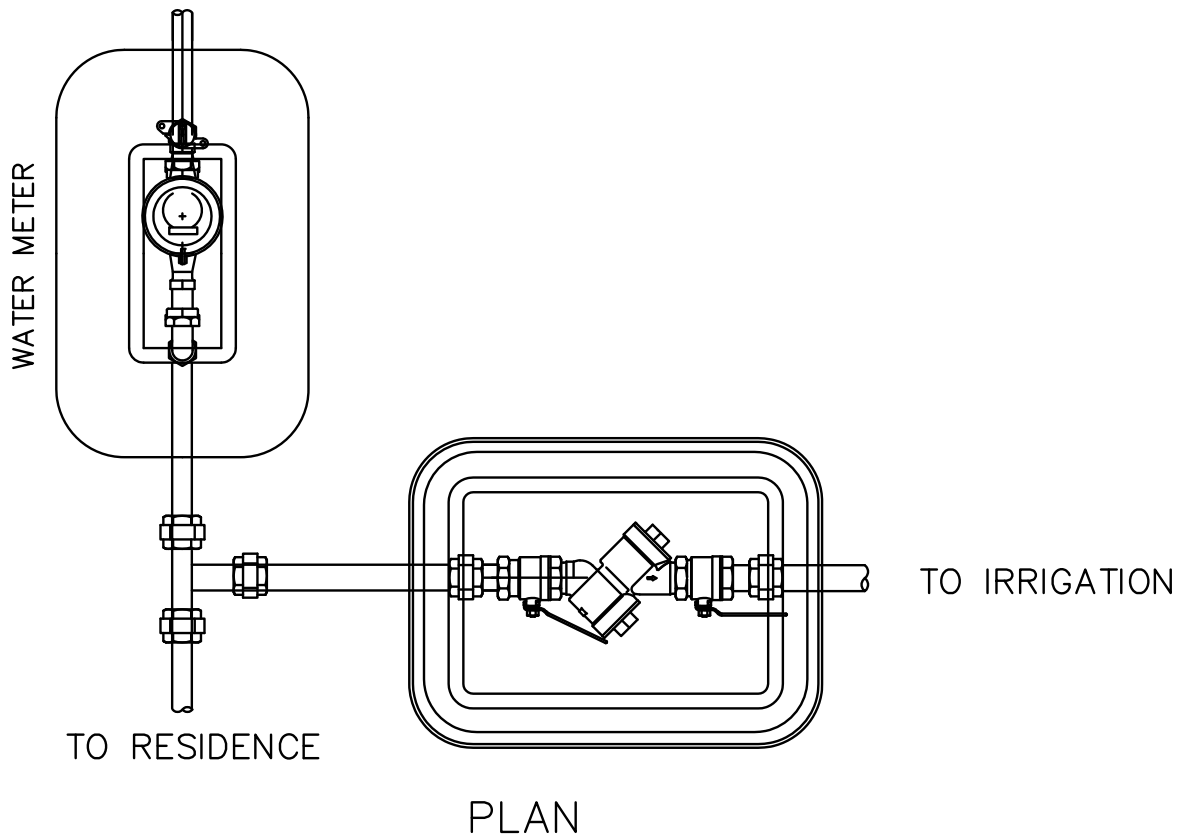
JANUARY 2011
APPROVAL DATE

**DOUBLE CHECK
ASSEMBLY**

NO SCALE

DWG. NO.

530



INSTALLATION SHOWN IS ONLY A SUGGESTION.

1. DOUBLE CHECK TO BE LOCATED DIRECTLY BEHIND WATER METER.
2. BRASS, STAINLESS, OR PLASTIC PLUGS TO BE INSTALLED IN TEST COCKS IF BELOW GROUND INSTALLATION.
3. DISTANCE FROM BOTTOM OF DEVICE TO FINISH GRADE, FREEZE PROTECTION, AND CLEARANCE FOR TESTING AND REPAIR ARE THE MAJOR CONSIDERATIONS FOR INSTALLATION.



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APPROVAL DATE

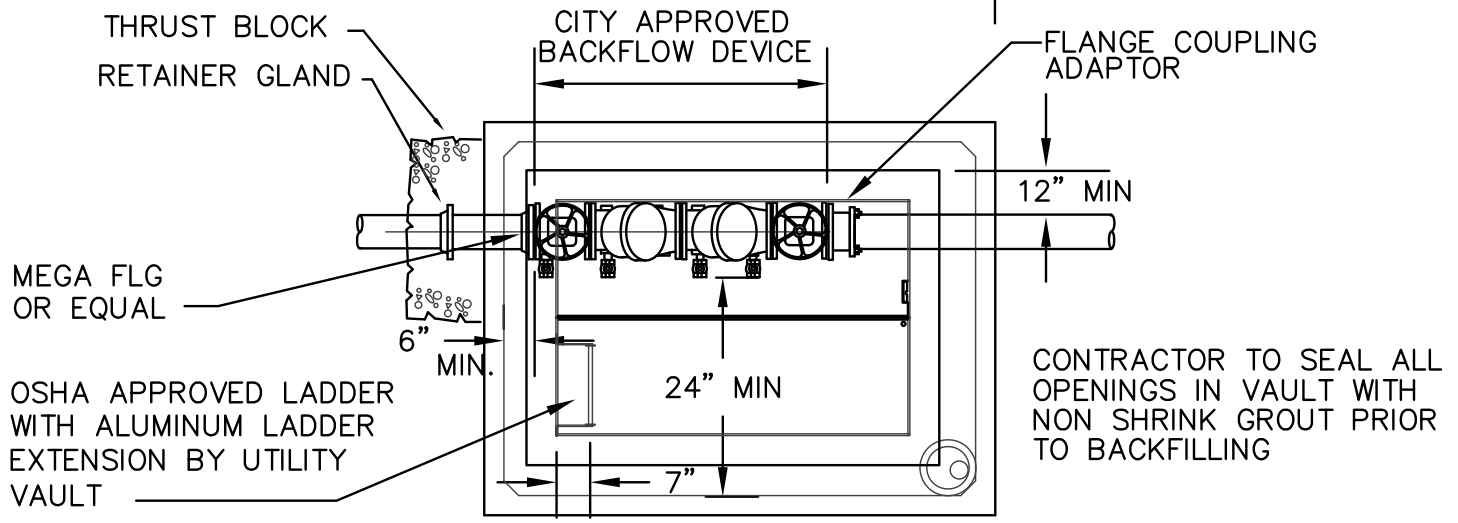
IRRIGATION DOUBLE CHECK ASSEMBLY

NO SCALE

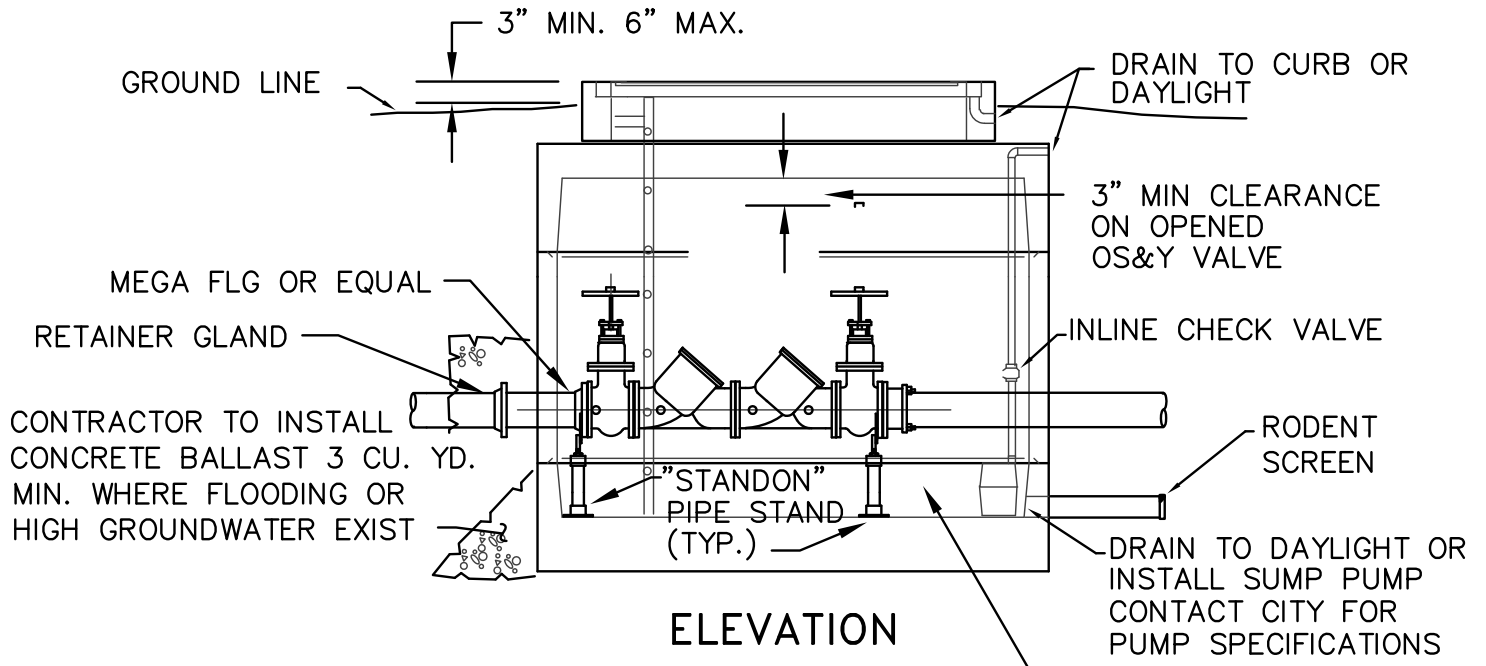
DWG. NO.

531

CITY WATER DEPT STANDARDS PLUMBING CODE



PLAN



ELEVATION

DOUBLE CHECK VALVE ASSEMBLY

SIZE	UTILITY VAULT OR *EQUAL	BILCO DOOR OR *EQUAL
3	660-WA	J-5AL
4	577-WA	J-5AL
6	676-WA	J-5AL
8	687-WA	JD-3AL
10	5106-LA	JD-3AL

* CITY ENGINEER APPROVED EQUAL

12" MIN
24" MAX
FLOOR TO BOTTOM
OR DEVICE

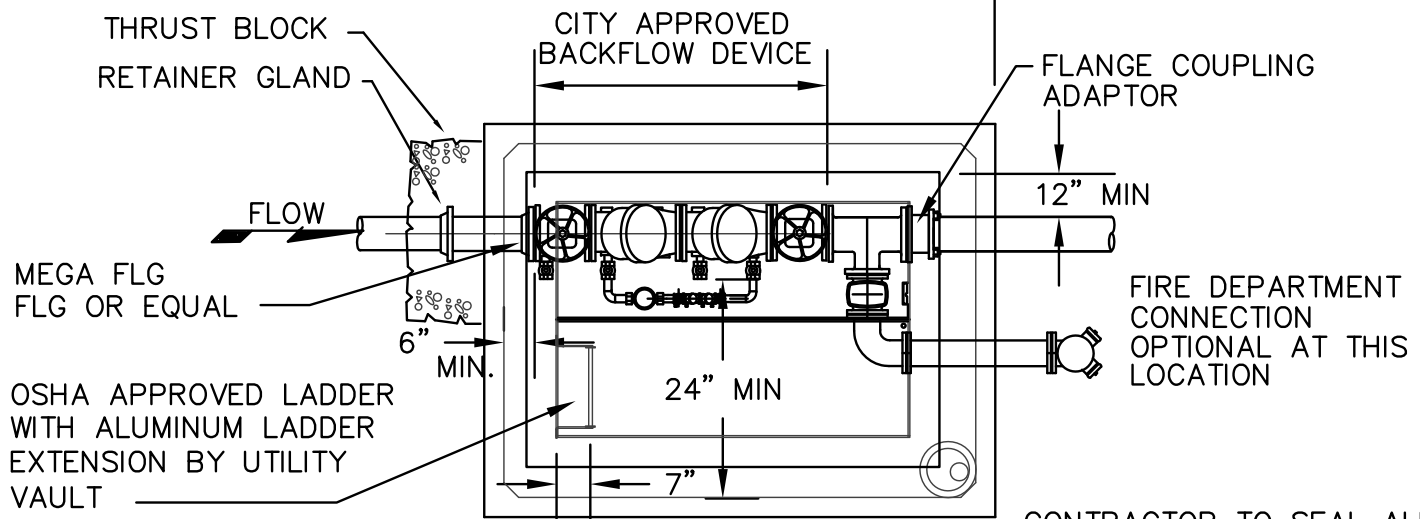


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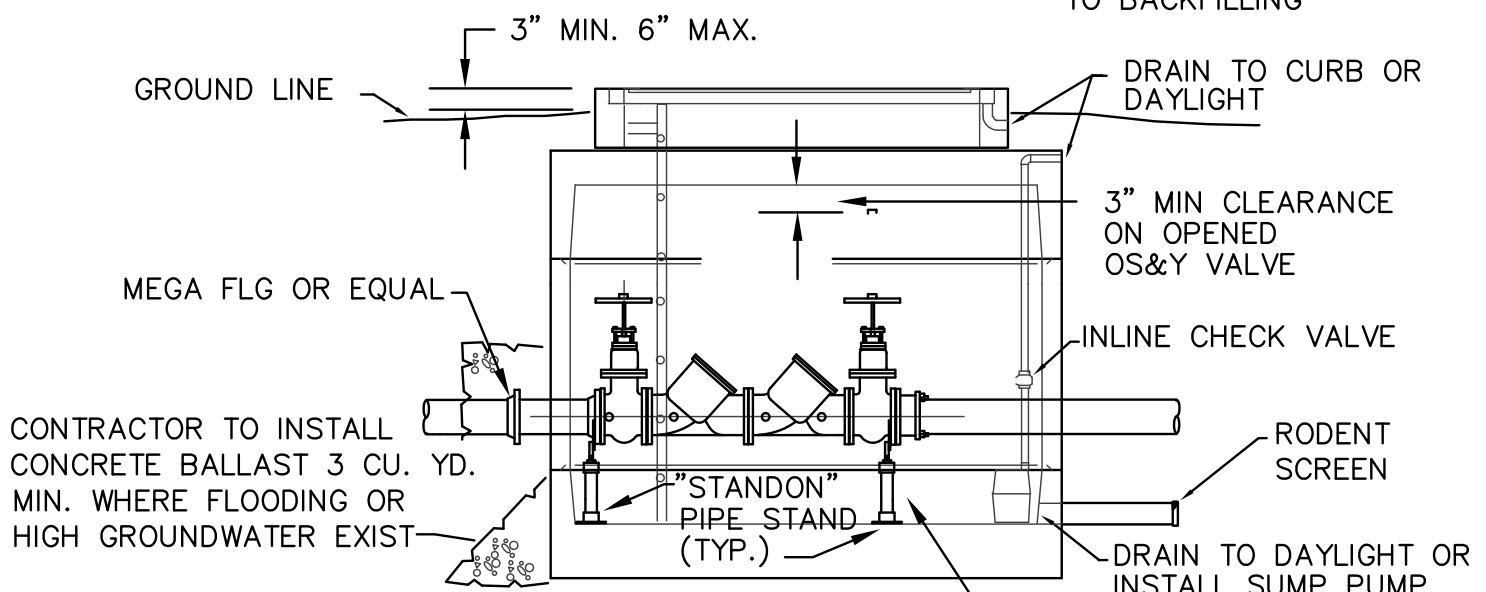
**DOUBLE CHECK
VALVE ASSEMBLY**

NO SCALE
DWG. NO.
532



PLAN

CONTRACTOR TO SEAL ALL OPENINGS IN VAULT WITH NON SHRINK GROUT PRIOR TO BACKFILLING



ELEVATION

FIRE DOUBLE CHECK VALVE ASSEMBLY

SIZE	UTILITY VAULT OR *EQUAL		BILCO DOOR OR *EQUAL
	WITH F.D.C.	WITHOUT F.D.C.	
4	676-WA	577-WA	J-5AL
6	687-WA	676-WA	J-5AL
8	5106-LA	687-WA	JD-3AL
10	5106-LA	2106-LA	JD-3AL

* CITY ENGINEER APPROVED EQUAL



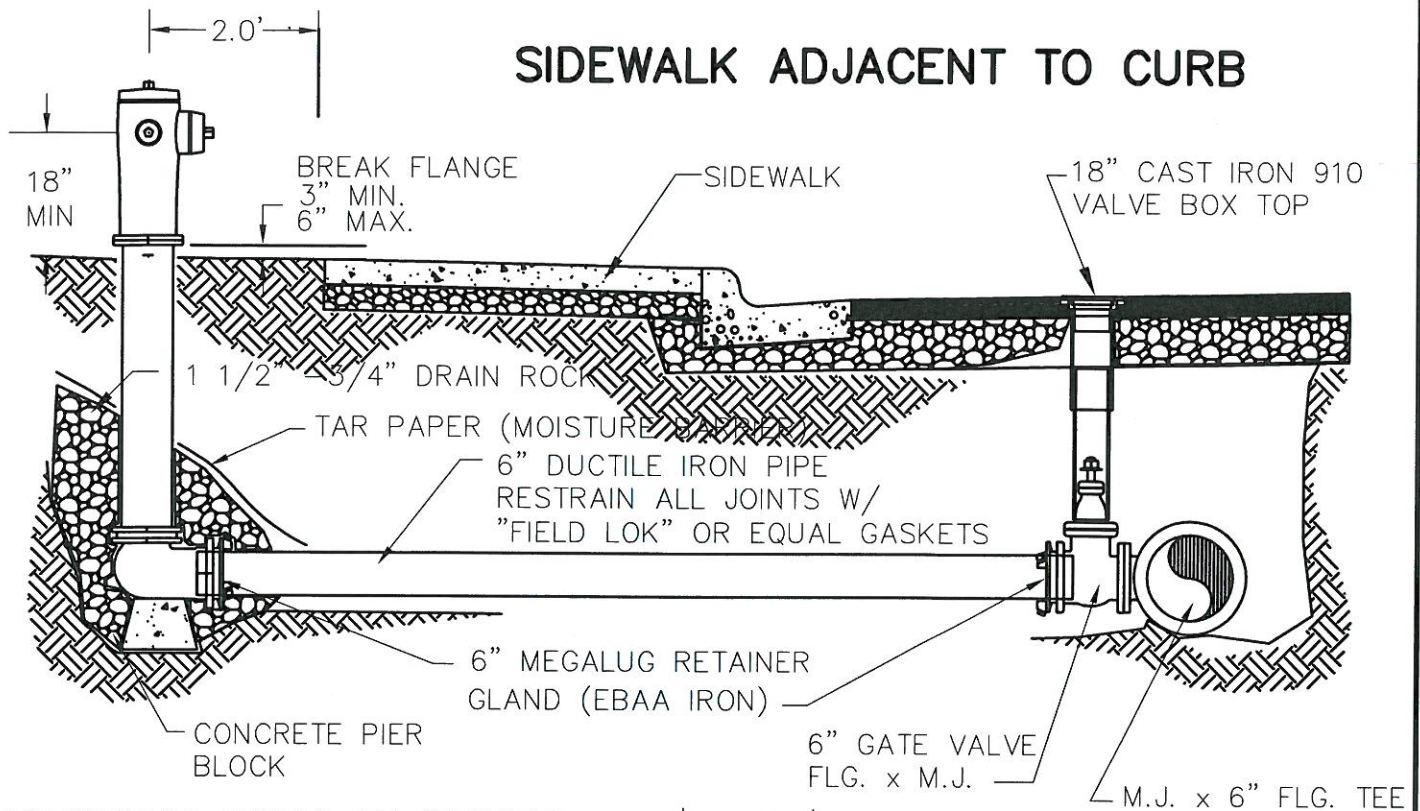
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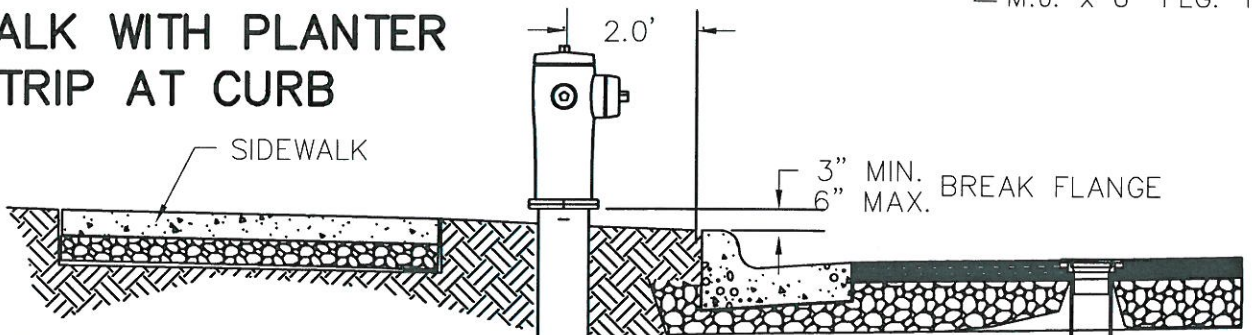
**DOUBLE CHECK DETECTOR
VALVE ASSEMBLY**

NO SCALE
DWG. NO.
533

SIDEWALK ADJACENT TO CURB



SIDEWALK WITH PLANTER STRIP AT CURB



NOTES:

1. HYDRANTS TO BE MUELLER CENTURION, A-423,(OR APP'D EQUAL) 6" MJ, 5 1/4" MVO 3 PORT – TWO 2 1/2" PENTAGON OPERATION NUT, OPEN LEFT WITH THE FOLLOWING:
 - A. OIL RESERVOIR
 - B. BRONZE ACTUATION NUT
 - C. BRONZE SEAT RING
 - D. WEATHER SHIELD CAP
 - E. SAFETY SLEEVE COUPLING
 - F. THREADED NOZZLES WITH "O" RINGS
 - G. NATIONAL STANDARD THREADS
2. SAFETY CHAINS TO BE REMOVED.
3. HYDRANTS TO BE PAINTED USING R-1317 SAFETY YELLOW OR AN ALTERNATE APPROVED BY DISTRICT FIRE MARSHALL.
4. HYDRANT TO BE INSTALLED TRUE AND PLUMB.
5. NO OBSTRUCTIONS WITHIN 3' 0" RADIUS OF HYDRANT.
6. IF SUBJECT TO VEHICLE DAMAGED, PROTECTIVE POST TO BE PROVIDED.
7. VALVE BOX TO BE IN ACCORDANCE WITH STANDARD DRAWING NO. 503 OR AS APPROVED BY ENGINEER.
8. THRUST BLOCKS SHALL NOT BE PLACED AT HYDRANT LOCATIONS.
9. INSTALL A STORZ HPHA50-45NH PERMANENT HYDRANT ADAPTER (OR EQUIVALENT) ON THE 4 1/2" PORT.



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APPROVED BY:

LORI FAHA, P.E.

CITY ENGINEER

AUGUST 2015

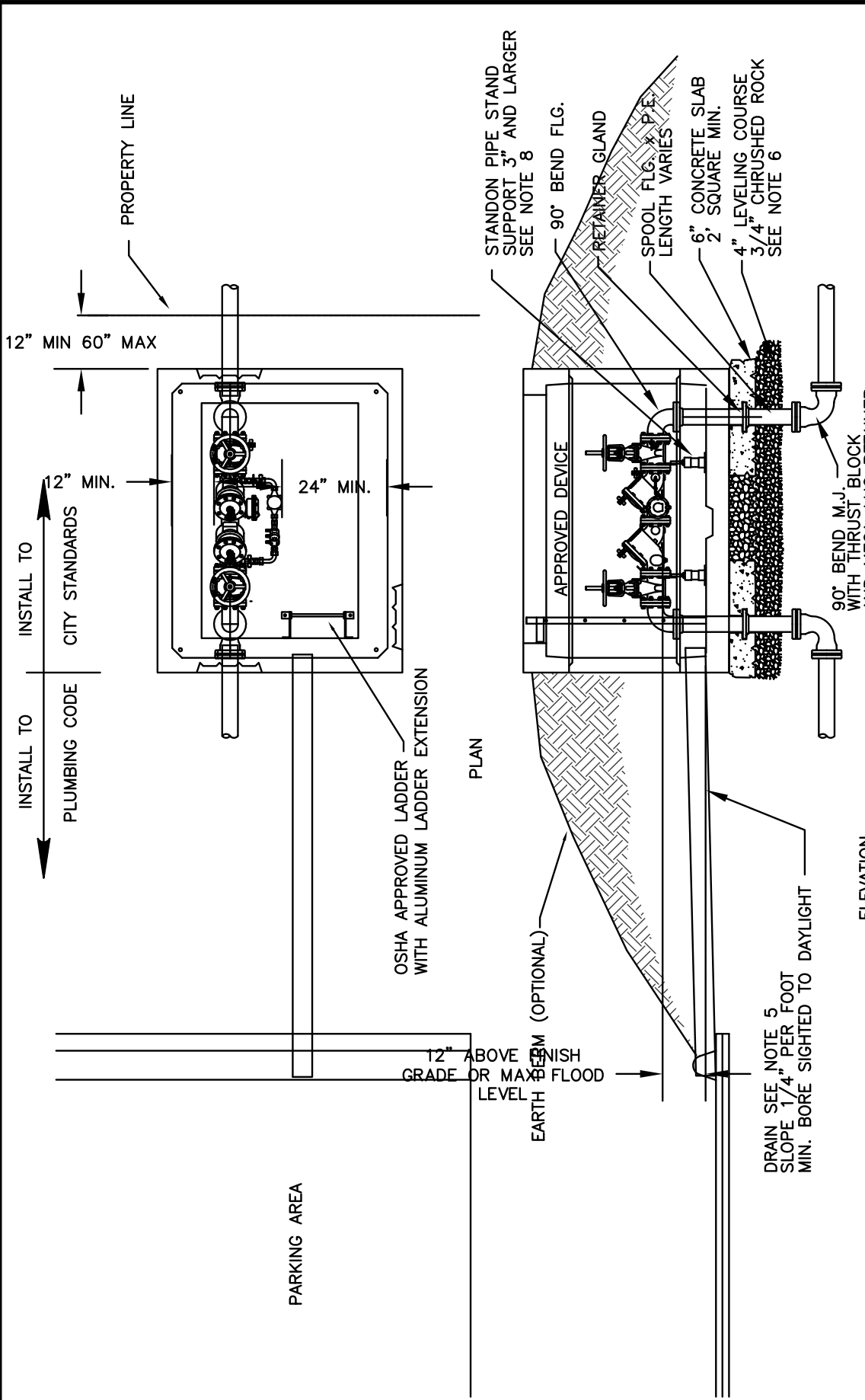
APPROVAL DATE

**FIRE HYDRANT
ASSEMBLY**

NO SCALE

DWG. NO.

542



- NOTES:
1. REDUCED PRESSURE BACKFLOW ASSEMBLY SHALL BE INSTALLED IN A LOCATION APPROVED BY CITY
 2. REDUCED PRESSURE BACKFLOW ASSEMBLY SHALL BE INSTALLED HORIZONTAL AND PLUMB.
 3. ALL CLEARANCES APPLY TO OUTSIDE, IN-BUILDING, AND VAULT INSTALLATIONS.
 4. TO BE INSULATED AND/OR HAVE A HEAT SOURCE TO KEEP ENCLOSURE AT 40°F (NFPA 13-4-5.4.1.1).
 5. ENCLOSURE SHALL INCLUDE A BORE SIGHTED DRAIN TO DAYLIGHT CAPABLE OF DRAINING A FULL RELIEF VALVE DISCHARGE SEE DETAIL 557.
 6. 4" 3/4"-0" COMPACTED GRAVEL LEVELING COURSE
 7. A BILCO DOOR OR OTHER APPROVED ACCESS SHALL BE PROVIDED.
 8. ALL ASSEMBLIES 2 1/2" AND LARGER SHALL BE FLANGED
 9. ALL STRUCTURES TO COMPLY WITH LOCAL BUILDING CODES.
 10. OPENINGS IN BOTTOM OF VAULT TO BE PRE-FORMED KNOCKOUTS
 11. DETECTOR METER TO READ IN CUBIC FEET

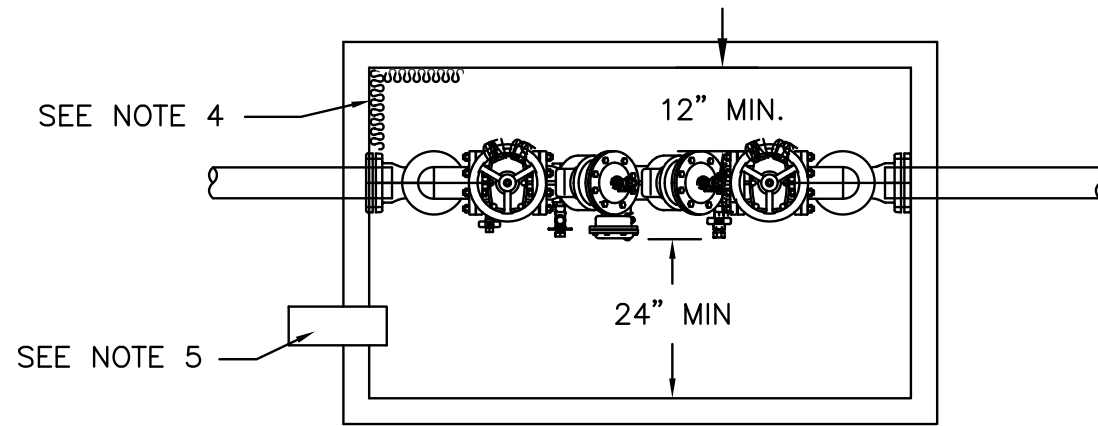


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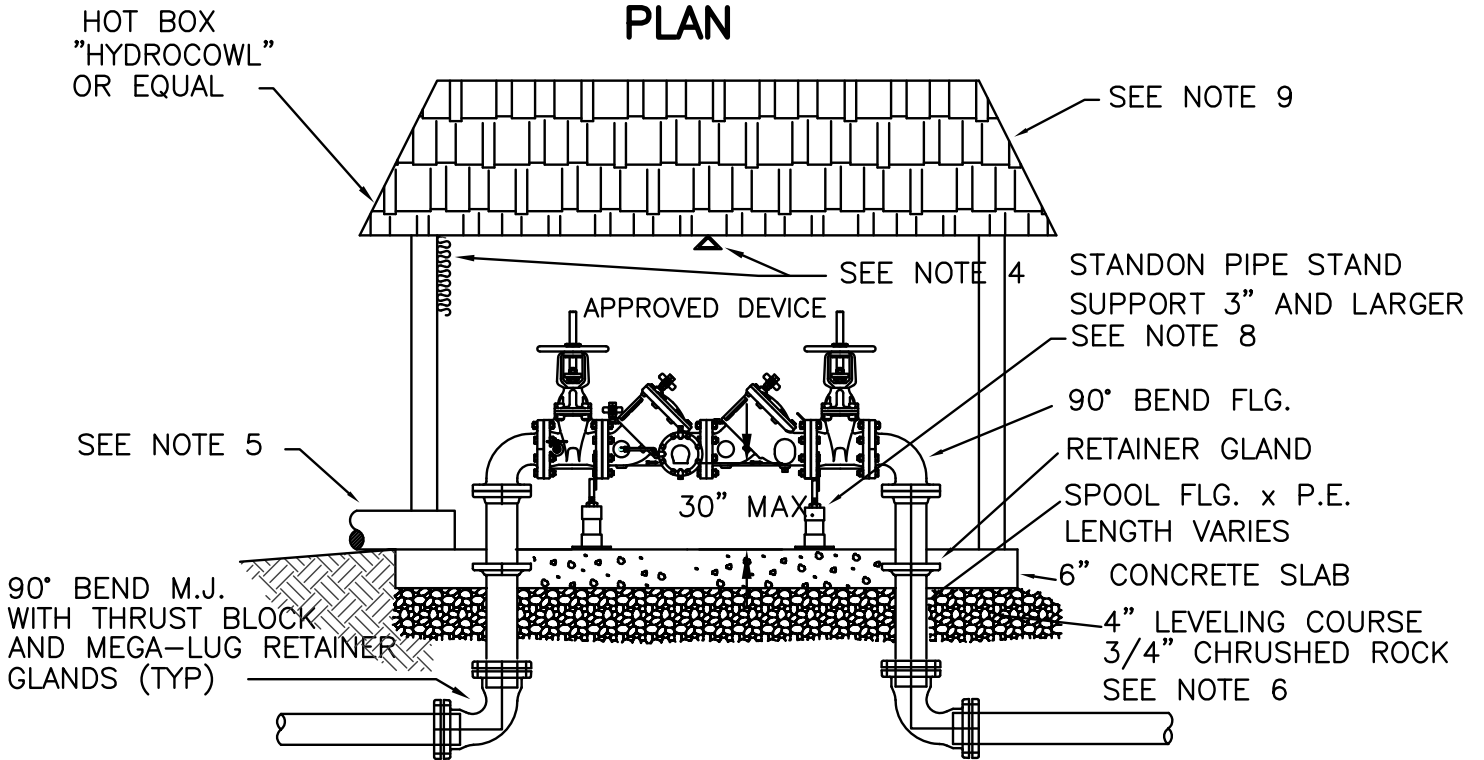
APPROVED BY:
THEODORE S. KYLE, P.E.
 CITY ENGINEER
 JANUARY 2011
 APPROVAL DATE

REDUCED PRESSURE DETECTOR
BACKFLOW ASSEMBLY
 2-1/2" - 10" (BELOW GROUND)

NO SCALE
 DWG. NO.
550



PLAN



ELEVATION

NOTES:

1. REDUCED PRESSURE BACKFLOW ASSEMBLY SHALL BE INSTALLED IN A LOCATION APPROVED BY CITY OF TIGARD.
2. REDUCED PRESSURE BACKFLOW ASSEMBLY SHALL BE INSTALLED HORIZONTAL AND PLUMB.
3. ALL CLEARANCES APPLY TO OUTSIDE, IN-BUILDING, AND VAULT INSTALLATIONS.
4. TO BE INSULATED AND/OR HAVE A HEAT SOURCE TO KEEP ENCLOSURE AT 40°F (NFPA 13-4-5.4.1.1).
5. ENCLOSURE SHALL INCLUDE A BORE SIGHTED DRAIN TO DAYLIGHT CAPABLE OF DRAINING A FULL RELIEF VALVE DISCHARGE. SEE DETAIL 557.
6. 4" 3/4"-0" COMPACTED GRAVEL LEVELING COURSE
7. A DOOR OR OTHER APPROVED ACCESS SHALL BE PROVIDED.
8. ALL ASSEMBLIES 2 1/2" AND LARGER SHALL BE FLANGED
9. ALL STRUCTURES TO COMPLY WITH LOCAL BUILDING CODES.
10. DETECTOR METER TO READ IN CUBIC FEET.
11. INSTALL 3/4" REDUCED PRESSURE BACKFLOW AFTER DETECTOR METER.

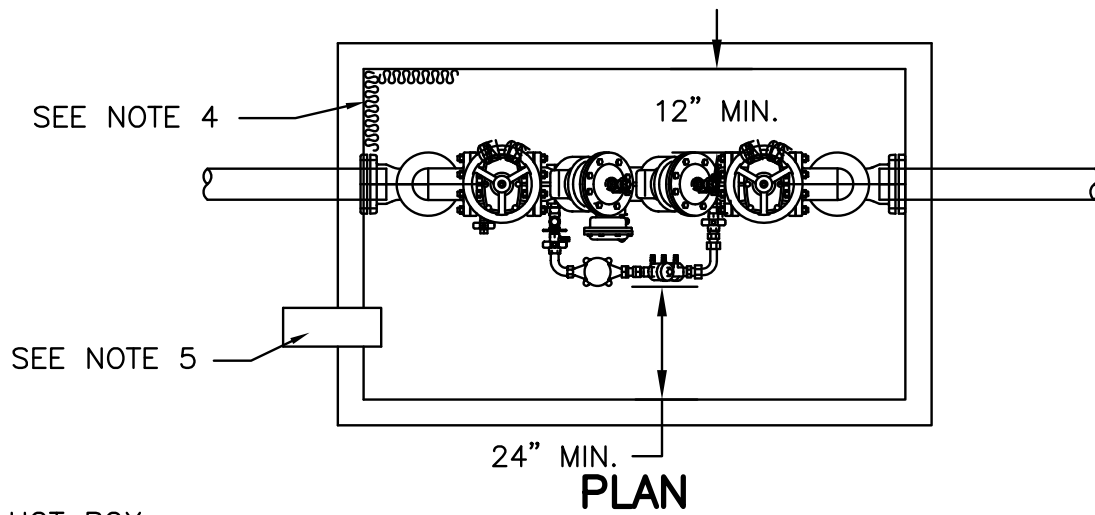


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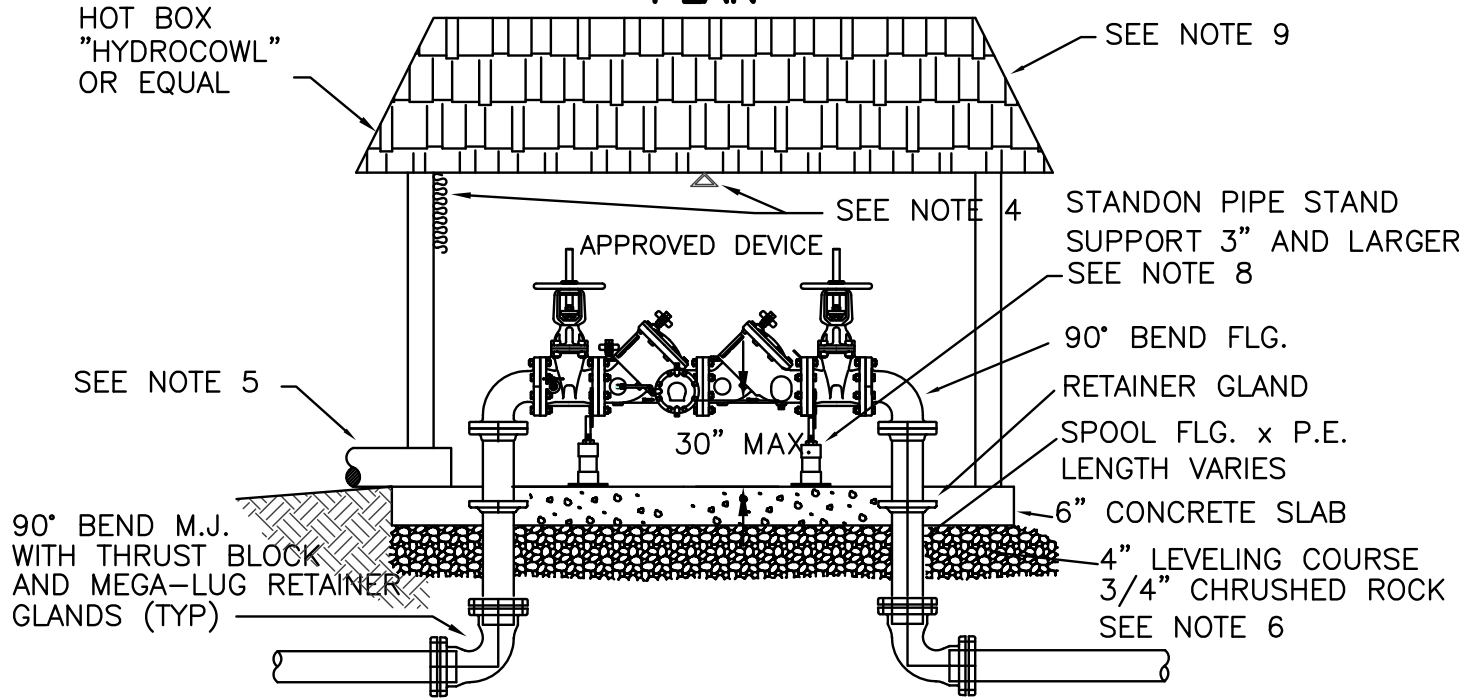
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 CITY ENGINEER
 JANUARY 2011
 APPROVAL DATE

RP BACKFLOW ASSEMBLY
2-1/2" + (ABOVE GROUND)

NO SCALE
 DWG. NO.
553



PLAN



ELEVATION

NOTES:

1. REDUCED PRESSURE BACKFLOW ASSEMBLY SHALL BE INSTALLED IN A LOCATION APPROVED BY CITY OF TIGARD.
2. REDUCED PRESSURE BACKFLOW ASSEMBLY SHALL BE INSTALLED HORIZONTAL AND PLUMB.
3. ALL CLEARANCES APPLY TO OUTSIDE, IN-BUILDING, AND VAULT INSTALLATIONS.
4. TO BE INSULATED AND/OR HAVE A HEAT SOURCE TO KEEP ENCLOSURE AT 40°F (NFPA 13-4-5.4.1.1).
5. ENCLOSURE SHALL INCLUDE A BORE SIGHTED DRAIN TO DAYLIGHT CAPABLE OF DRAINING A FULL RELIEF VALVE DISCHARGE. SEE DETAIL 557.
6. 4" 3/4"-0" COMPACTED GRAVEL LEVELING COURSE
7. A DOOR OR OTHER APPROVED ACCESS SHALL BE PROVIDED.
8. ALL ASSEMBLIES 2 1/2" AND LARGER SHALL BE FLANGED
9. ALL STRUCTURES TO COMPLY WITH LOCAL BUILDING CODES.
10. DETECTOR METER TO READ IN CUBIC FEET.
11. INSTALL 3/4" REDUCED PRESSURE BACKFLOW AFTER DETECTOR METER.



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JANUARY 2011
APPROVAL DATE

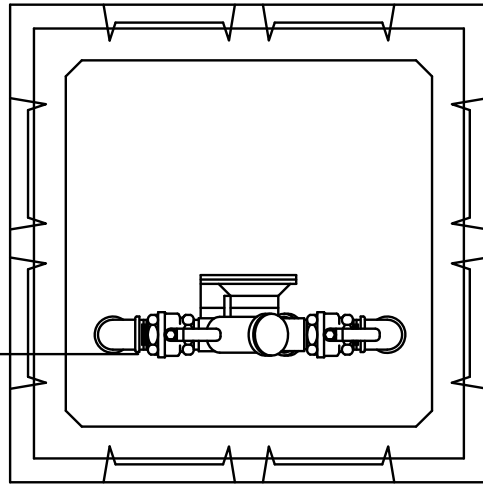
**REDUCED PRESSURE DETECTOR
BACKFLOW (ABOVE GROUND)**

NO SCALE
DWG. NO.
554

VAULT SPECIFICATIONS

SIZE	MFG.
1"	UTILITY VAULT 3030-LA (OR EQUAL)
1-1/2" - 2"	UTILITY VAULT 3642-PUT (OR EQUAL)

ADEQUATE
WORKING
SPACE FOR
MAINTENANCE
12" MIN



PLAN

REDUCED PRESSURE BACKFLOW
PREVENTER FEBCO MODEL 825Y
OR EQUAL

SLOPE EARTH AWAY FROM
VAULT IN BERM AREA

12' MIN
ABOVE FINISH
GRADE

CURB

FINISH GRADE

ELEVATION

CONCRETE PAD

ADEQUATE DRAIN TO DAYLIGHT
(SEE DETAIL NO. 557)

INSTALLATION SHOWN IS ONLY A SUGGESTION.

NOTES:

1. DOUBLE CHECK TO BE LOCATED DIRECTLY BEHIND WATER METER.
2. BRASS, STAINLESS, OR PLASTIC PLUGS TO BE INSTALLED IN TEST COCKS IF BELOW GROUND INSTALLATION.
3. DISTANCE FROM BOTTOM OF DEVICE TO FINISH GRADE, FREEZE PROTECTION, AND CLEARANCE FOR TESTING AND REPAIR ARE THE MAJOR CONSIDERATIONS FOR INSTALLATION.



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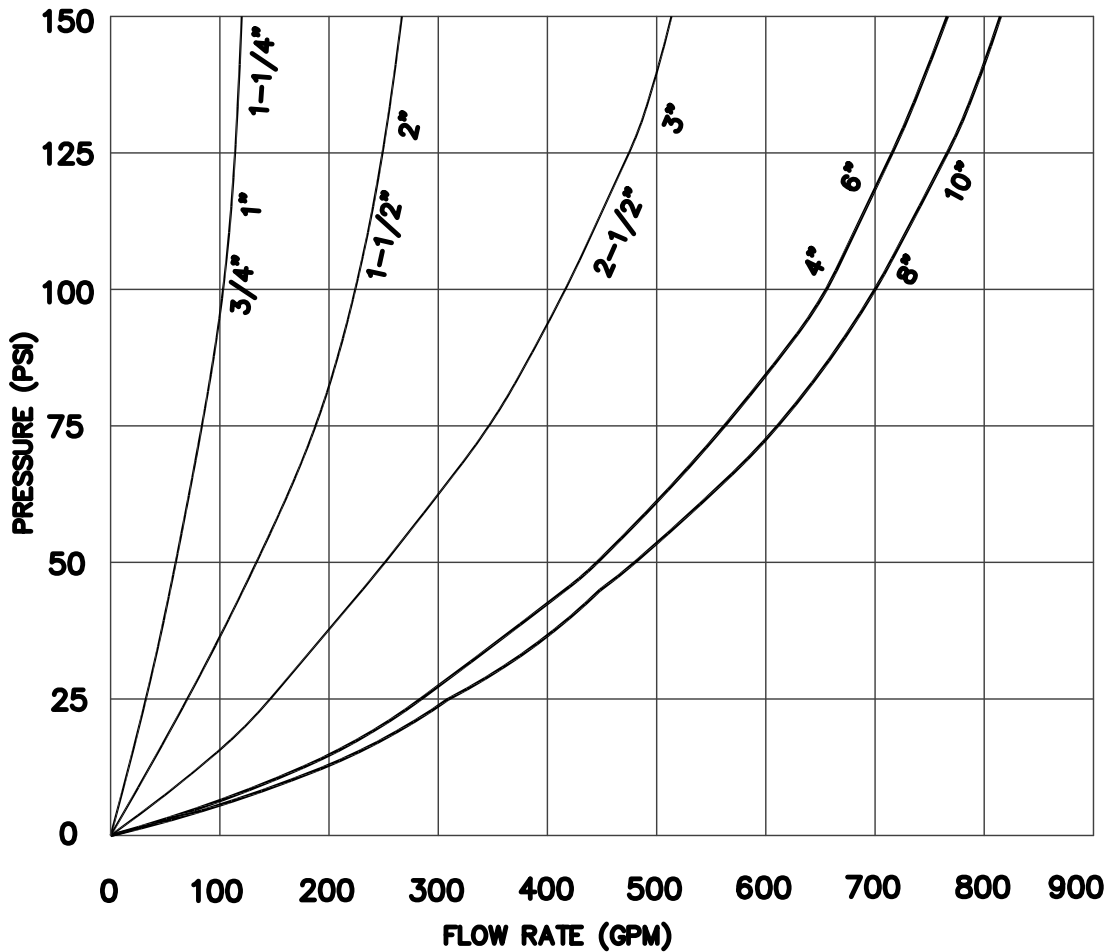
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THEODORE S. KYLE, P.E.
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JANUARY 2011
APPROVAL DATE

**REDUCED PRESSURE
BACKFLOW ASSEMBLY**

NO SCALE

DWG. NO.

555



APPROXIMATE RELIEF VALVE DISCHARGE RATES FOR REDUCED PRESSURE BACKFLOW ASSEMBLIES

CARE SHOULD BE TAKEN TO ENSURE THE ENTIRE DRAINAGE SYSTEM HAS ADEQUATE CAPACITY TO CARRY THE CONTINUOUS DISCHARGE RATES SHOWN ABOVE. THE FOLLOWING ARE TYPICAL DESIGN FLOW CAPACITIES FOR ONE MANUFACTURER'S FLOOR DRAIN. DRAIN LINE MUST BE ADEQUATELY SIZED FOR RELIEF VALVE DISCHARGE RATE.

SIZE	3"	4"	6"	8"
CAPACITY	112	170	450	760

FOR PARALLEL ASSEMBLIES, THE DRAINAGE SYSTEM SHOULD BE DESIGNED FOR THE DISCHARGE FROM BOTH ASSEMBLIES.



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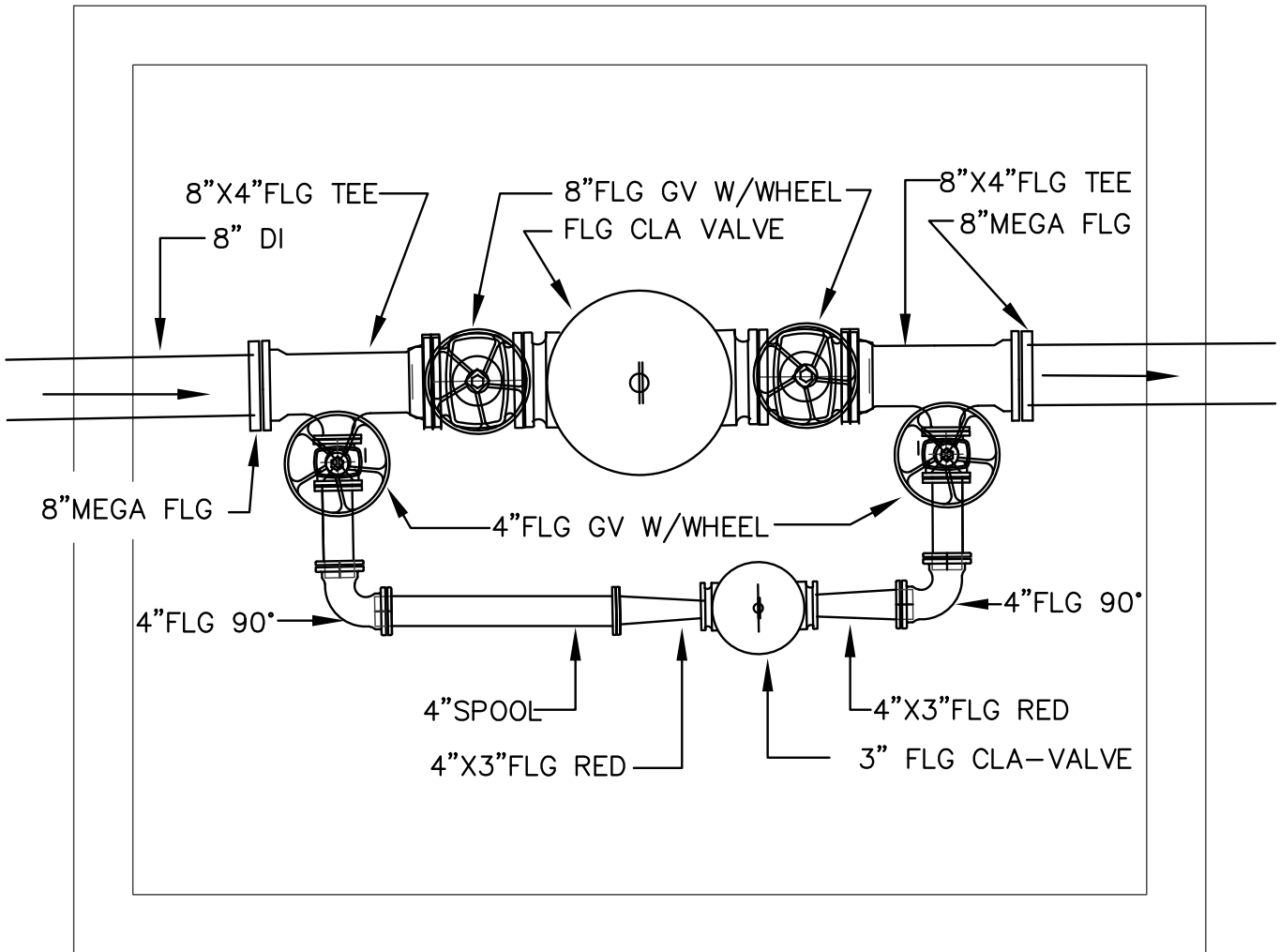
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**REDUCED PRESSURE BACKFLOW
 ASSEMBLY DISCHARGE RATES**

NO SCALE

DWG. NO.

557



NOTE:

CLA-VAL mfg. PRE-FABRICATED DROP-IN
INSTALLATIONS MAY BE SUBSTITUTED AS APPROVED
EQUAL TO THESE DETAILS



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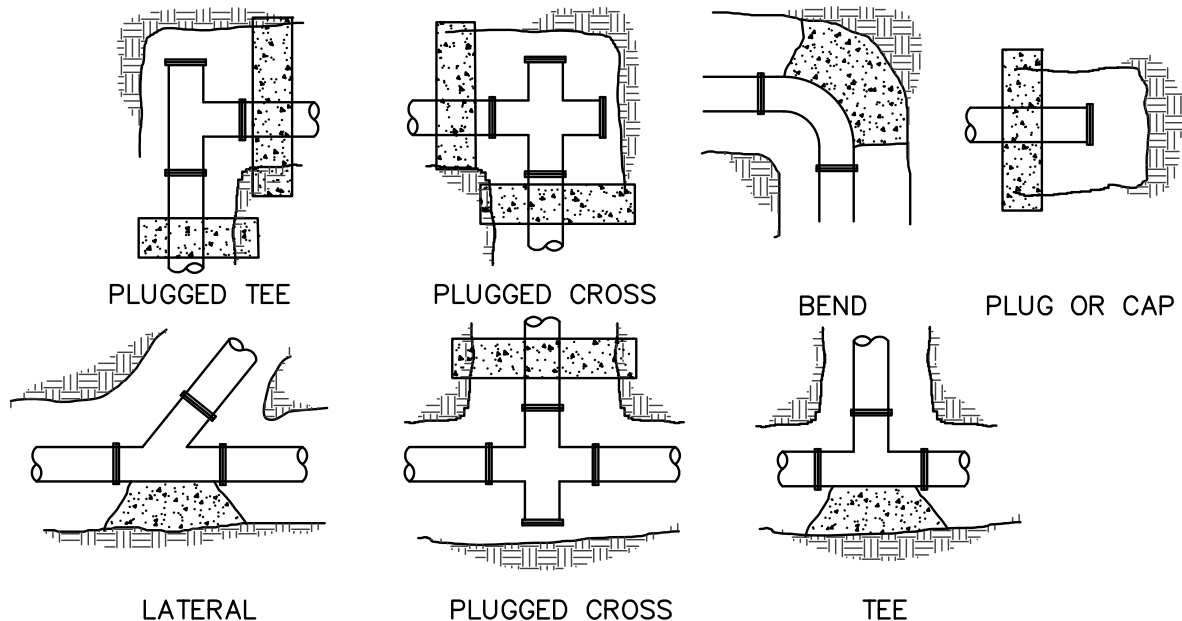
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**PRESSURE REDUCING
STATION**

NO SCALE

DWG. NO.

558



CONCRETE THRUST BLOCK SCHEDULE

(BEARING AREA OF THRUST BLOCKS IN SQUARE FEET)

FITTING SIZE (INCHES)	90° BEND, TEE, OR PLUGGED CROSS	45° BEND	22 1/2° BEND	11 1/4° BEND
4	01.9	01.3	--	--
6	04.0	02.1	01.3	--
8	07.1	03.9	02.0	01.3
12	16.0	08.8	04.5	02.3
16	28.4	15.5	08.0	04.0
24	64.0	34.9	18.1	09.1

ABOVE BEARING AREAS BASED ON TEST PRESSURE OF 150 P.S.I. AND AN ALLOWABLE SOIL BEARING STRENGTH OF 1500 POUND PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION

$$\text{BEARING AREAS} = (\text{TEST PRESSURE}/150) \times (1500/\text{SOIL BEARING STRESS}) \times (\text{TABLE VALUE})$$

NOTES:

1. CONCRETE THRUST BLOCKS NOT PERMITTED UNLESS APPROVED BY CITY ENGINEER
2. STRADDLE BLOCKS REQUIRED WHERE LINES MAY BE EXTENDED IN FUTURE SEE DETAIL NO. 561
3. CONCRETE THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.
4. KEEP CONCRETE CLEAR OF JOINT AND ACCESSORIES.
5. THE REQUIRED THRUST BEARING AREAS FOR SPECIAL CONNECTIONS ARE SHOWN ENCIRCLED ON THE PLANS: e.g. 15 INDICATES 15 SQUARE FEET BEARING AREA REQUIRED.
6. IF NOT SHOWN ON PLANS, REQUIRED BEARING AREAS AT FITTING SHALL BE AS INDICATED ABOVE, ADJUST IF NECESSARY, TO CONFORM TO THE TEST PRESSURE(S) AND ALLOWABLE SOIL BEARING STRESS(ES) STATED IN THE SPECIAL PROVISIONS.
7. BEARING AREAS AND SPECIAL BLOCKING DETAILS SHOWN ON PLANS TAKE PRECEDENCE OVER BEARING AREAS AND BLOCKING DETAILS SHOWN ON THIS STANDARD DETAIL. BEARING AREA OF THRUST BLOCKS ARE IN SQUARE FEET.



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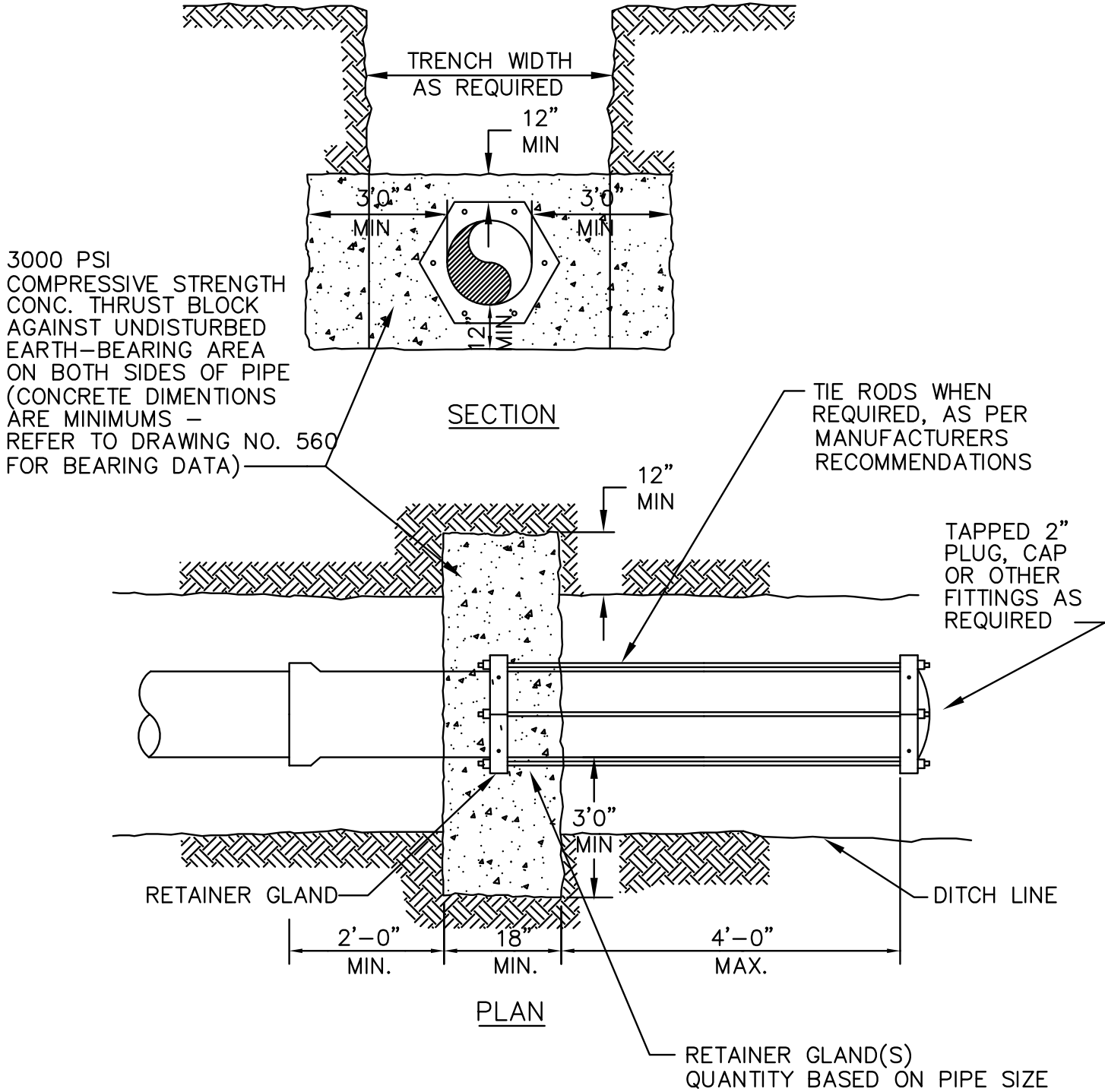
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**STANDARD THRUST
BLOCK**

NO SCALE

DWG. NO.

560



3000 PSI
 COMPRESSIVE STRENGTH
 CONC. THRUST BLOCK
 AGAINST UNDISTURBED
 EARTH-BEARING AREA
 ON BOTH SIDES OF PIPE
 (CONCRETE DIMENSIONS
 ARE MINIMUMS -
 REFER TO DRAWING NO. 560
 FOR BEARING DATA)

SECTION

PLAN

STRADDLE BLOCKS TO BE USED ONLY BY APPROVAL OF CITY ENGINEER.

1. END OF LINE BLOW OFFS
2. BLIND TEES
3. BLIND CROSSES
4. VERTICAL BENDS

NOTE: MECHANICAL FIELD RESTRAINT IS REQUIRED FOR THRUST RESTRAINT



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STRADDLE BLOCK

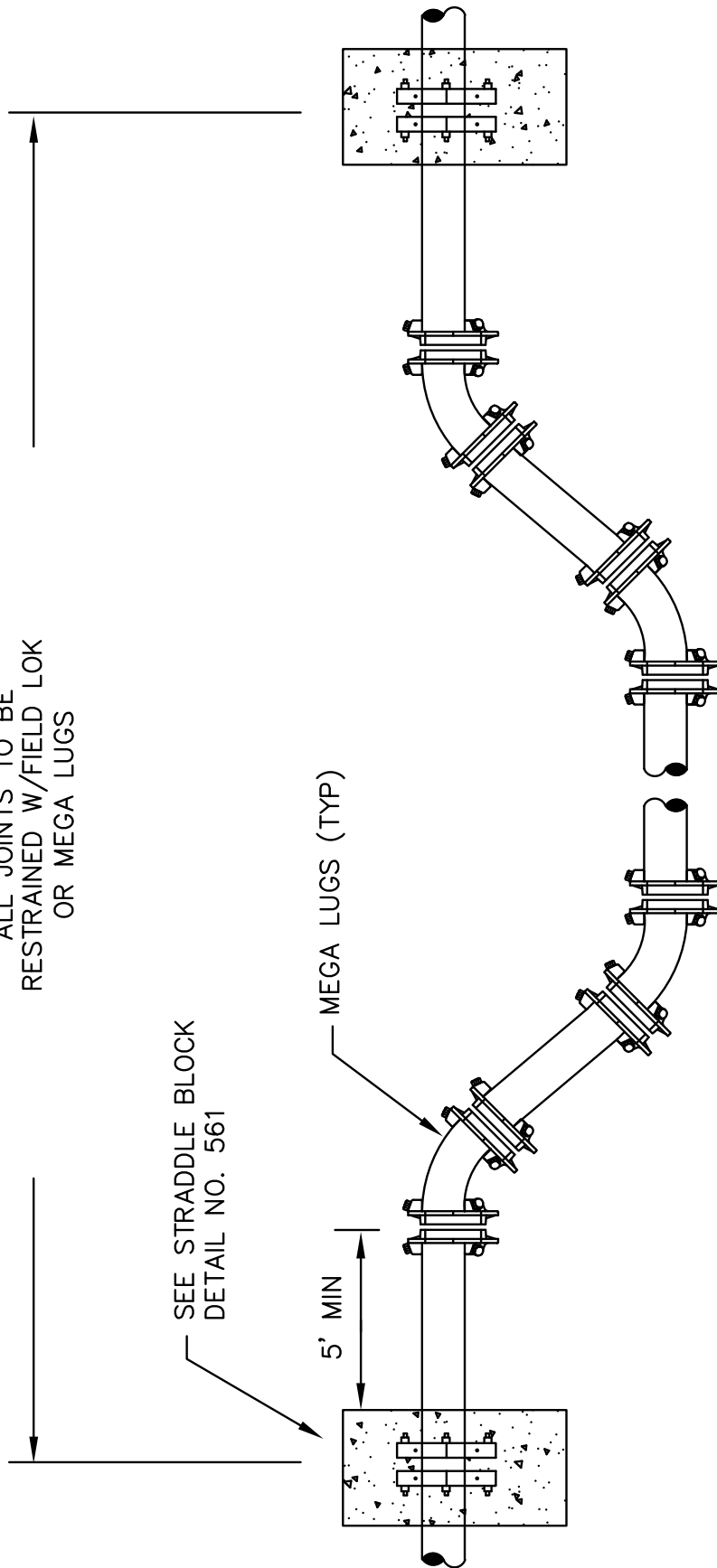
NO SCALE
 DWG. NO.
561

ALL JOINTS TO BE
RESTRAINED W/FIELD LOK
OR MEGA LUGS

SEE STRADDLE BLOCK
DETAIL NO. 561

MEGA LUGS (TYP)

5' MIN



NOTE:

BEARING AREA IN SQUARE FEET TO BE DETERMINED BY
CHART ON DETAIL NO. 560 OR BY CITY ENGINEER, DEPENDING
ON SOIL CONDITIONS.

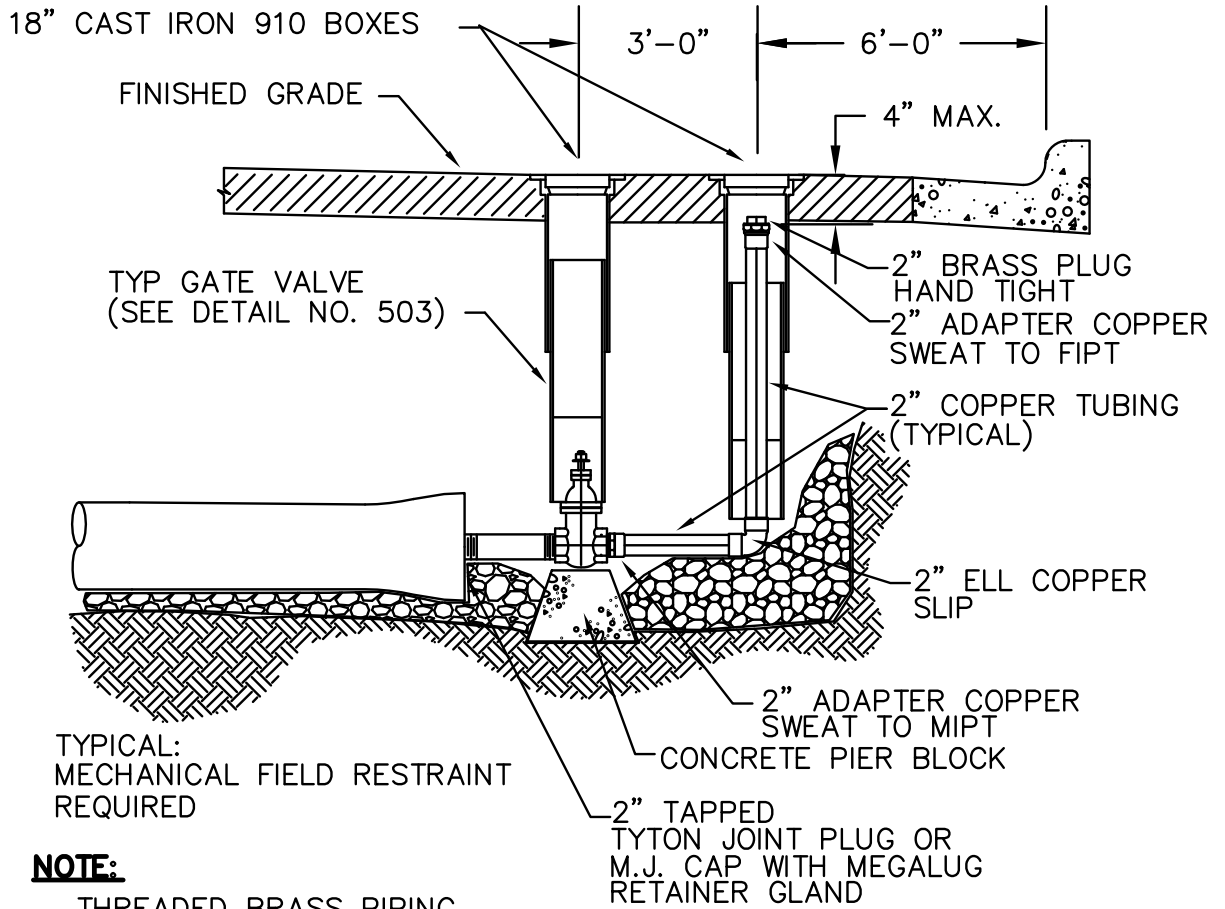


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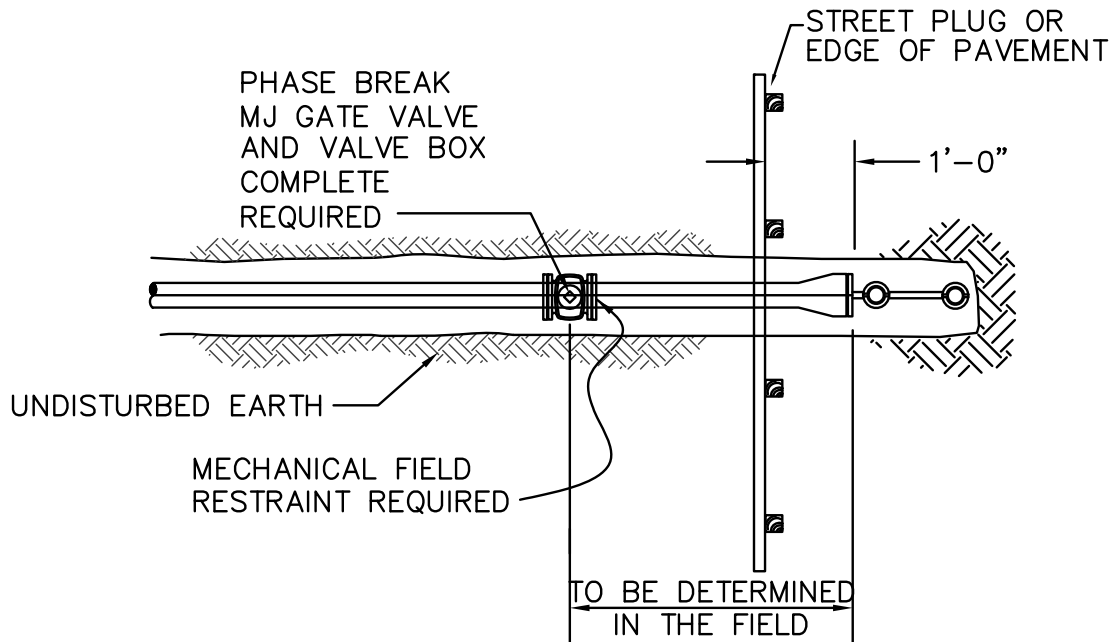
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**VERTICAL BEND
RESTRAINT**

NO SCALE
DWG. NO.
563



PERMANENT



TEMPORARY



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**2" STANDARD
BLOWOFF**

NO SCALE

DWG. NO.

570

STANDARD VALVE BOX
SEE DETAIL NO. 503

6" PLUG MJ
6" 90° BEND MJ

CONCRETE PAD

1'-6" MIN.

___ x 6" TEE MJ x FLG.
ROTATED DOWN 45°

2'-6"
DIA.

LENGTH VARIES

LENGTH VARIES

THRUST BLOCK

6" 45° BEND FLG

MEGALUG RETAINER
GLANDS (TYP.)

6" 90° BEND MJ

6" GATE VALVE MJ x FLG

CONC. PIER BLOCK

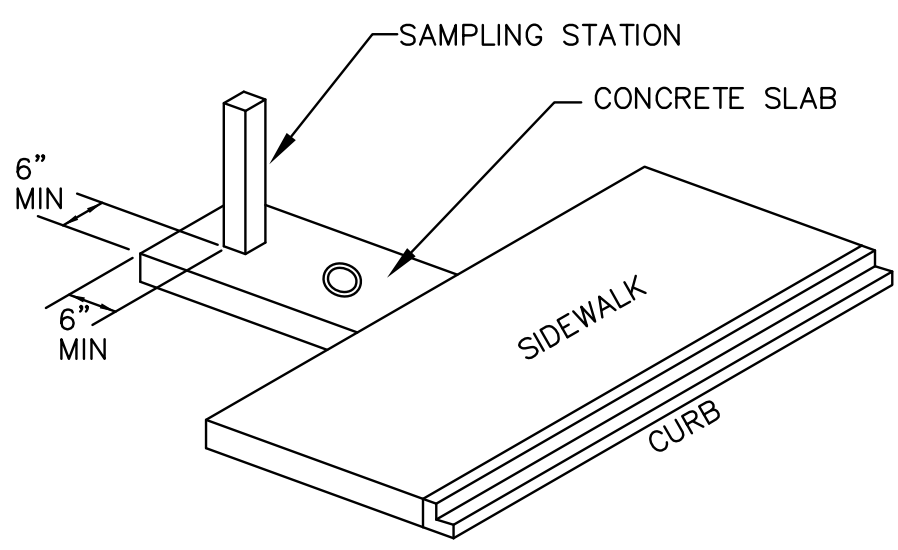
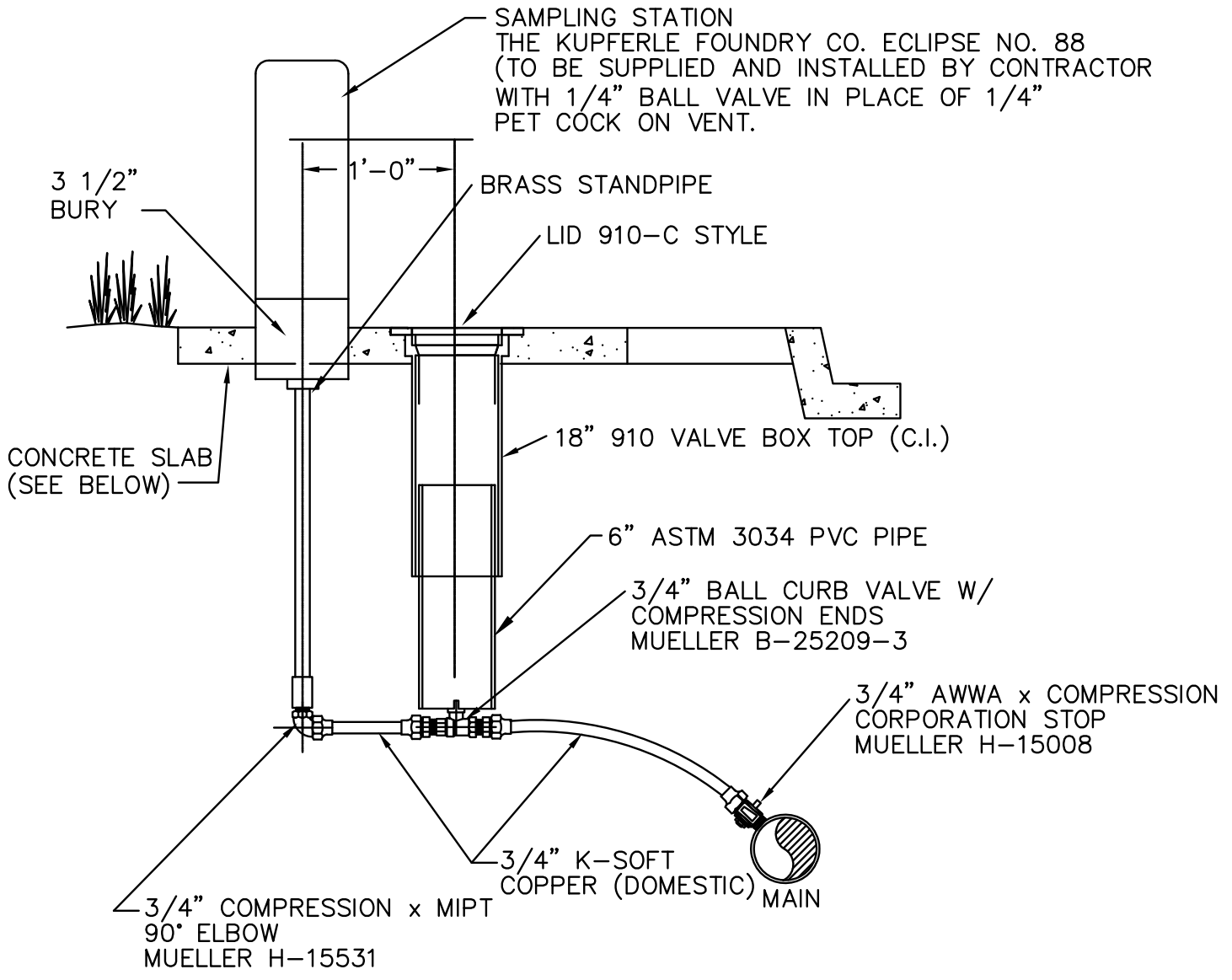


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6" BLOWOFF

NO SCALE
DWG. NO.
571

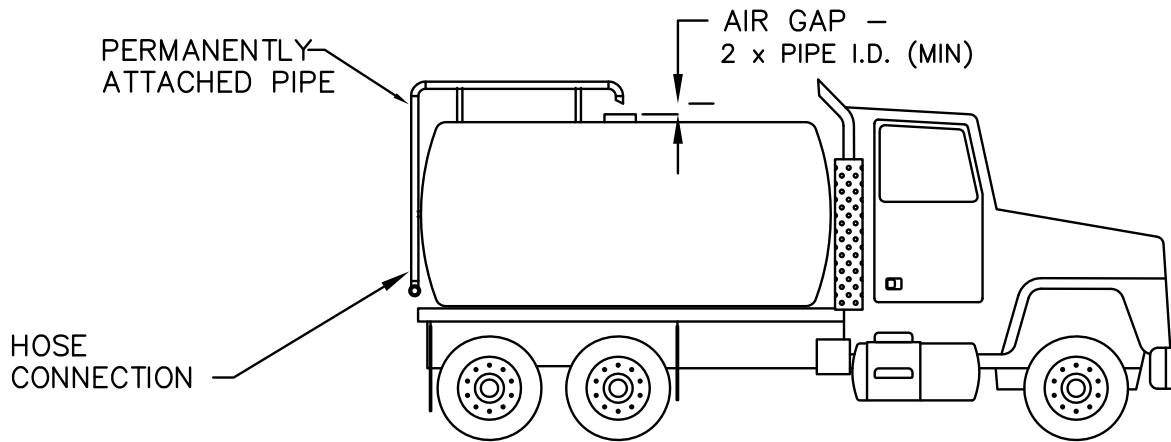


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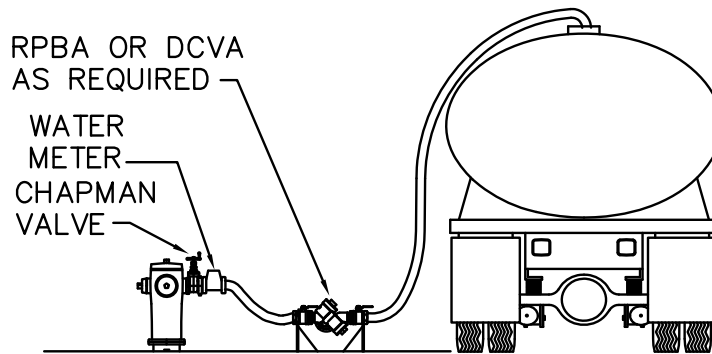
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SAMPLING STATION

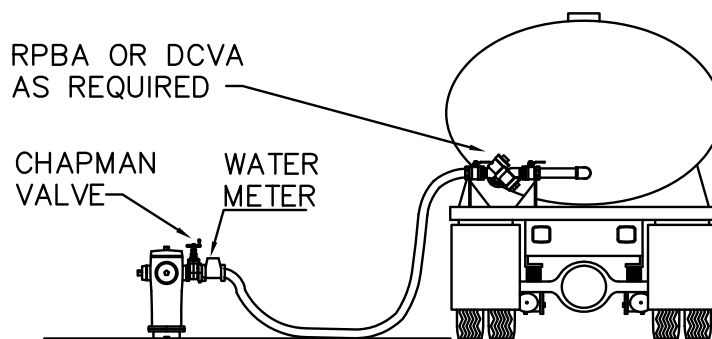
NO SCALE
DWG. NO.
572



WITH AIR GAP



WITH PORTABLE ASSEMBLY



WITH TRUCK MOUNTED ASSEMBLY



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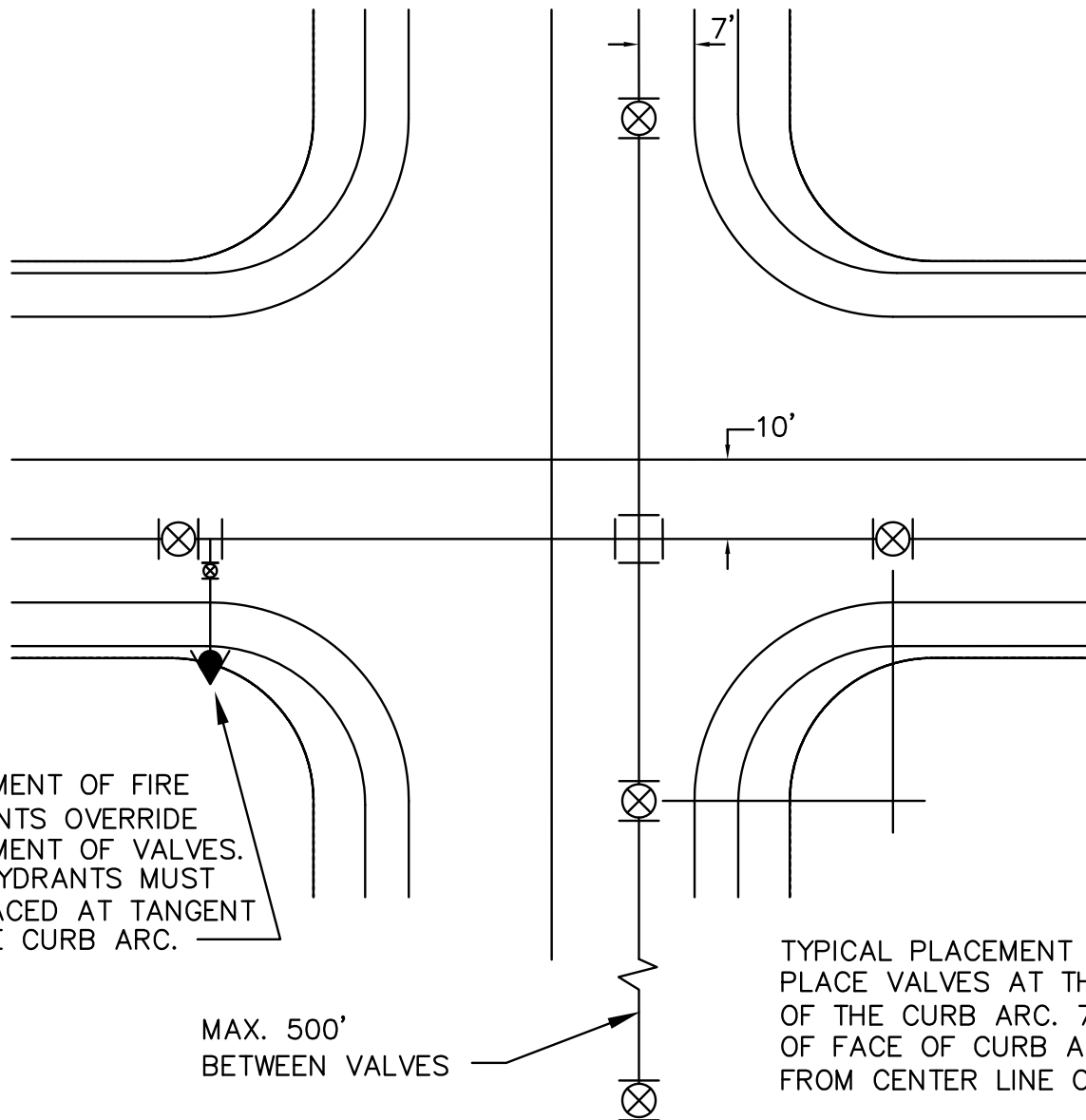
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**MINIMUM PROTECTION FOR
FILLING TANKER TRUCK**

NO SCALE

DWG. NO.

573



PLACEMENT OF FIRE HYDRANTS OVERRIDE PLACEMENT OF VALVES. FIRE HYDRANTS MUST BE PLACED AT TANGENT OF THE CURB ARC.

MAX. 500' BETWEEN VALVES

TYPICAL PLACEMENT OF VALVES. PLACE VALVES AT THE TANGENT OF THE CURB ARC. 7' IN FRONT OF FACE OF CURB AND/OR 10' FROM CENTER LINE OF ROAD

NOTES:

1. VALVES ARE NOT TO BE LOCATED IN CURB AND GUTTER AREA
2. VALVE BOXES ARE REQUIRED AT EACH VALVE LOCATION
3. VALVE BOXES CONSIST OF 6" ASTM 3034 PVC RISER AND 18" CAST IRON 910 COVER
4. MAXIMUM SPACING FOR VALVES IS 500 FEET
5. ALL VALVES ARE TO CONFORM WITH AWWA STANDARDS
6. GATE VALVES ARE REQUIRED FOR 8" AND SMALLER PIPE.
7. BUTTERFLY VALVES ARE REQUIRED FOR 12" AND LARGER PIPE.



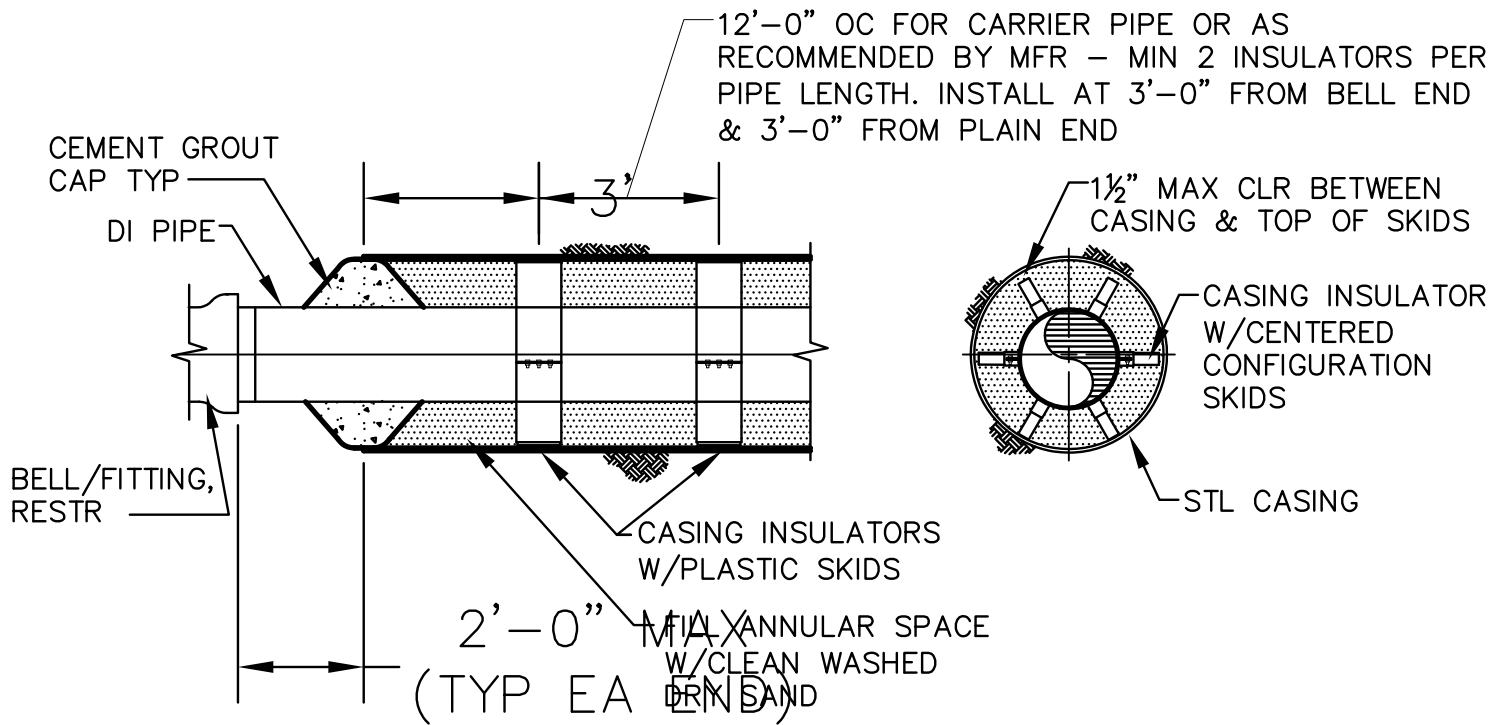
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**TYPICAL VALVE
 AND HYDRANT LOCATION**

NO SCALE
 DWG. NO.
575



END DETAIL

SECTION A-A

CARRIER PIPE DIA	TYPICAL CASING DIA REQUIRED
6"	16"
8"	24"
12"	24"
16"	36"
18"	36"
20"	36"
24"	48"

NOTES:

1. REQUIRED CASING MATERIAL AND WALL THICKNESS DEPENDENT UPON INSTALLATION METHOD, DEPTH OF BURY, SOIL CONDITIONS, AND OTHER FACTORS. CASING DIAMETER MAY NEED TO BE INCREASED TO ACCOMMODATE GREATER WALL THICKNESS OF CARRIER PIPE OR CASING.
2. PROVIDE 2" MINIMUM CLEARANCE BETWEEN CASING AND CARRIER PIPE BELLS AND APPURTENANCES.
3. VERIFY CASING SIZES PRIOR TO ORDERING AND SIZING CASING INSULATORS.
4. ALL CARRIER PIPE TO BE RESTRAINED.
5. PASSIVE ANODES MAY BE REQUIRED AS DETERMINED BY CITY ENGINEER.



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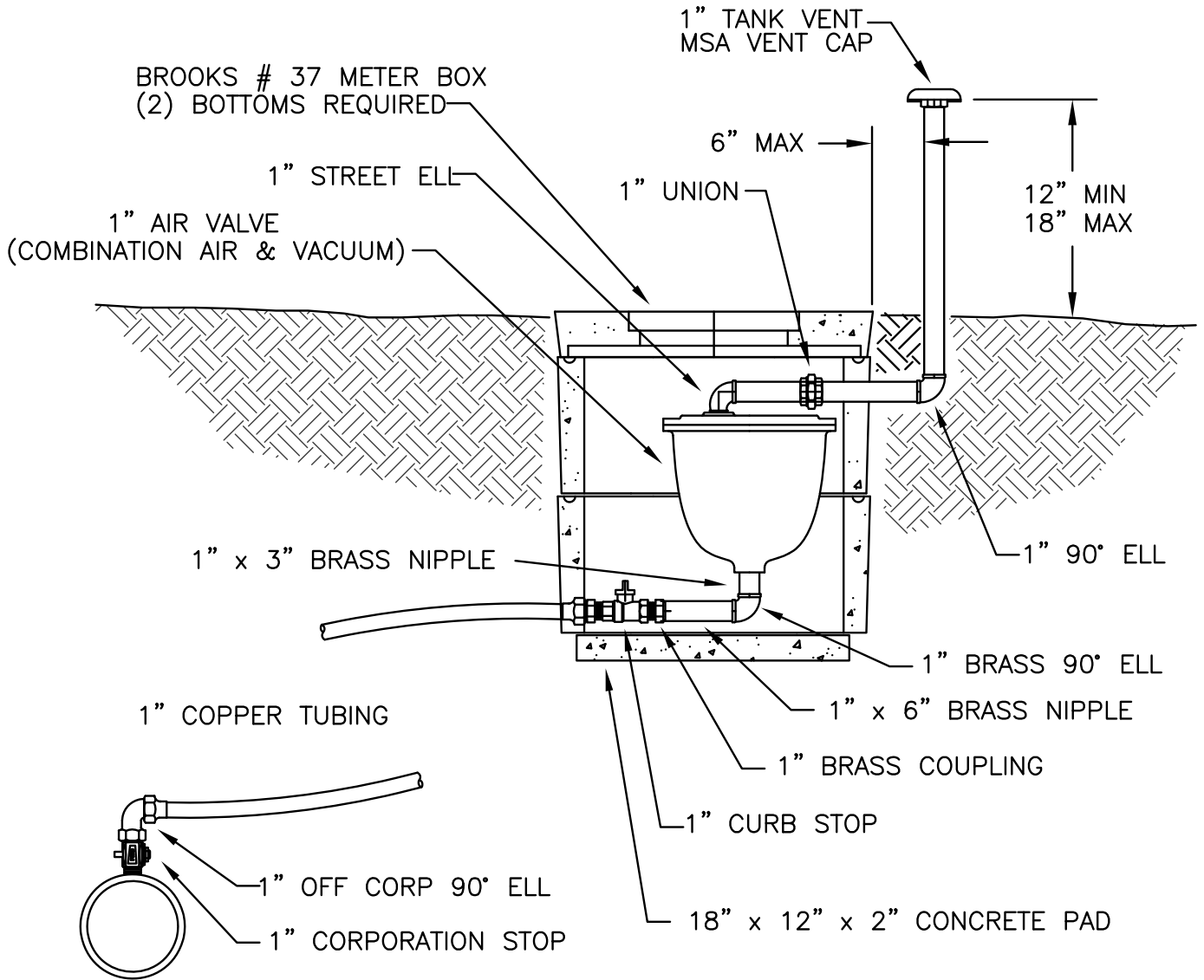
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CASING DETAIL

NO SCALE

DWG. NO.

580



NOTES:

1. FOR 12" AND SMALLER WATER MAINS
2. VENT PIPING TO BE GALV.
3. SLOPE COPPER TUBING FROM MAIN UP TO AIR VALVE 1% MIN.
4. LOCATE AS NEEDED OR REQUIRED
5. CONTACT CITY WATER DEPARTMENT FOR ACCEPTABLE DEVICES.
6. PROVIDED & INSTALLED BY CONTRACTOR.



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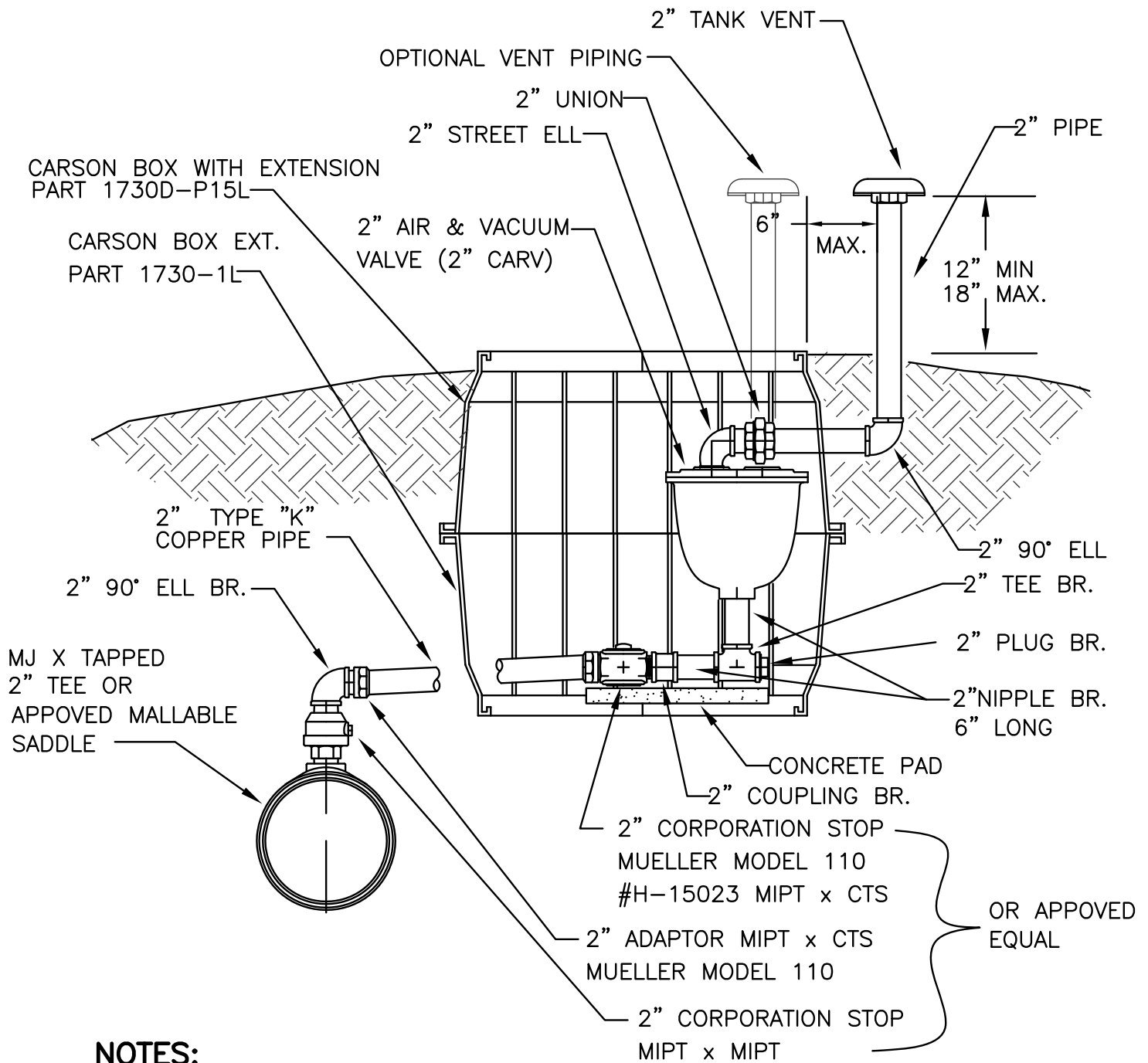
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**1" COMBINATION
 AIR & VACUUM VALVE**

NO SCALE

DWG. NO.

590



NOTES:

1. VENT PIPING TO BE GALV.
2. SLOPE COPPER TUBE FROM MAIN UP TO AIR VALVE 1% MIN.
3. CONTACT WATER DEPARTMENT FOR ACCEPTABLE DEVICES.
4. PROVIDED & INSTALLED BY CONTRACTOR.



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**2" COMBINATION
 AIR & VACUUM VALVE**

NO SCALE

DWG. NO.

591