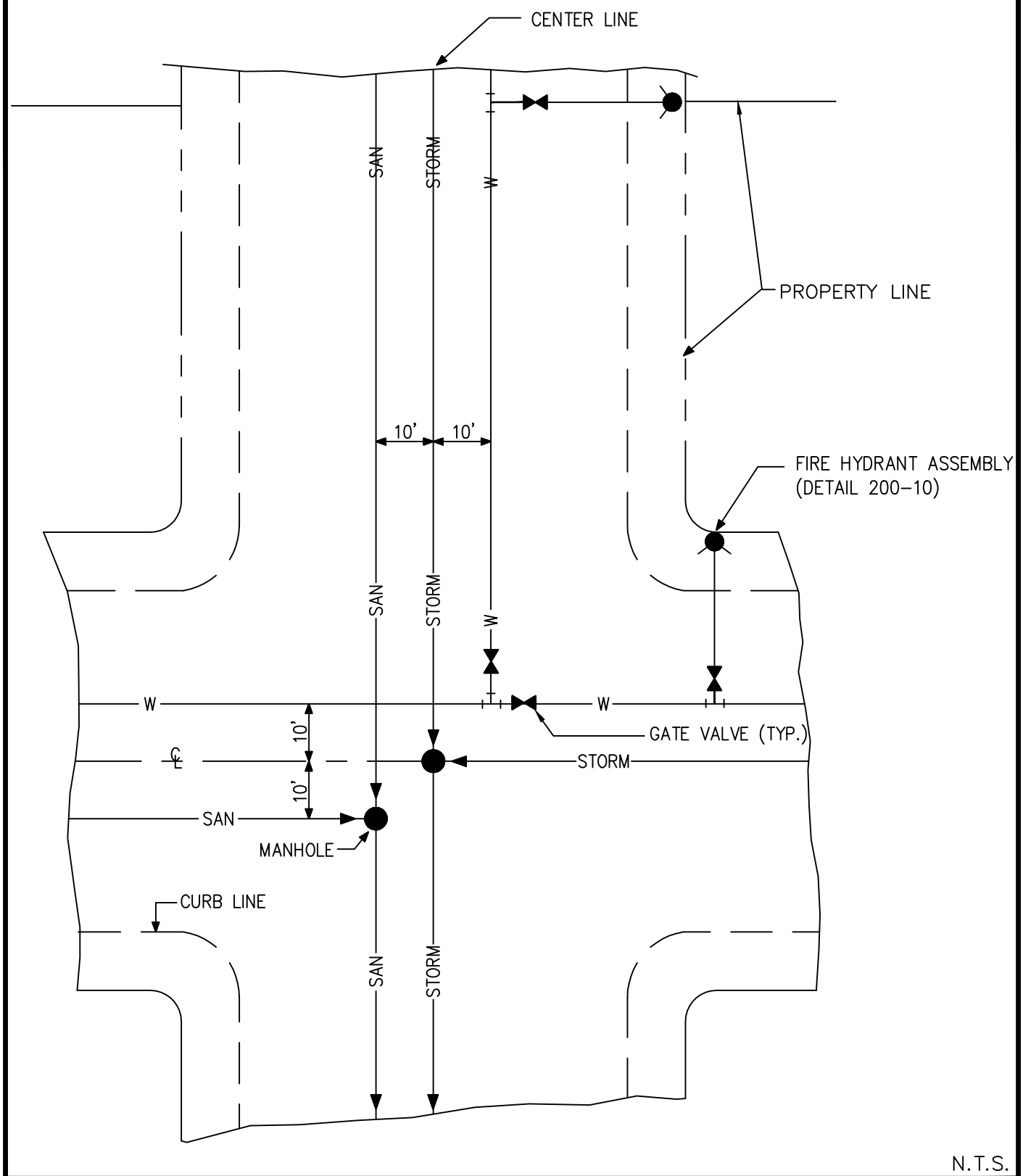


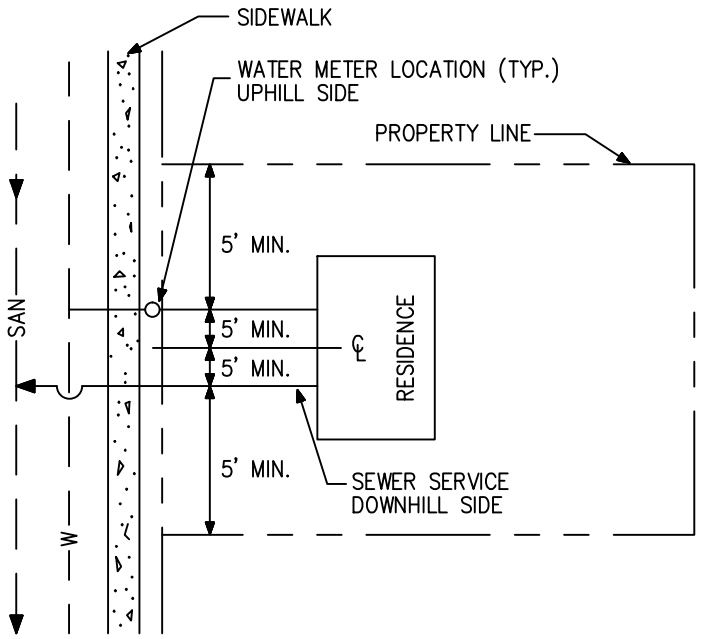
N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

TYPICAL UTILITY LAYOUT DETAIL

ISSUED:
APRIL 1992
REVISED:
APRIL 2010

DRAWING NO.
200-1



TYPICAL HOUSE SERVICE

ALSO REFER TO DETAIL 200-16

SEWER AND WATER SERVICES SHALL BE A MINIMUM OF TEN (10) FEET APART HORIZONTALLY.

SANITARY SEWER SERVICES SHALL BE CONSTRUCTED ON THE SHORTEST AND STRAIGHTEST ROUTE POSSIBLE. NO MORE THAN TWO 1/4 BENDS SHALL BE PERMITTED IN A SANITARY SEWER SERVICE.

SERVICES SHALL NOT BE ANY CLOSER THAN FIVE (5) FEET TO THE SIDE PROPERTY (EXCEPT ON CUL-DE-SACS), AND NO SERVICE MAY BE CONSTRUCTED THROUGH OR IN FRONT OF ANY ADJOINING PROPERTY.

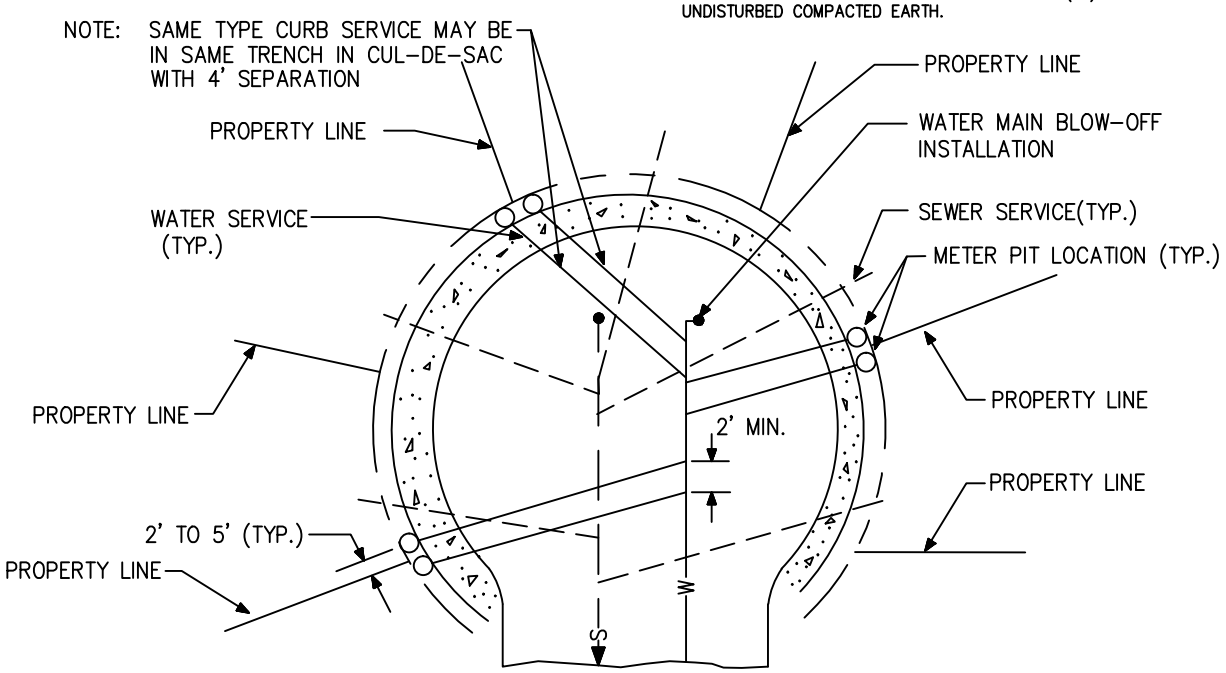
IF SERVICE IS REQUESTED FOR A LOT AT THE END OF A CUL-DE-SAC STREET, THE MAIN TO BE TAPPED MUST NOT BE MORE THAN TWENTY-FIVE (25) FEET FROM THE CURB LINE OR THE PROPOSED CURB LINE AT THE END OF THE CUL-DE-SAC. THE SERVICE PIPE BETWEEN THE MAIN AND THE PROPERTY LINE IN CUL-DE-SACS SHALL BE IN A CONTINUOUS STRAIGHT LINE AND SHALL ENTER THE PROPERTY A DISTANCE OF TWO (2) FEET TO FIVE (5) FEET FROM THE NEAREST LOT CORNER.

WATER SERVICE LOCATIONS SHALL BE MARKED WITH A "V" ON THE CURB. SANITARY SEWER SERVICE LOCATIONS SHALL BE MARKED WITH AN "X" ON THE CURB. MARKINGS SHALL BE NEATLY STAMPED, CHISELED OR SAWCUT, NOT PAINTED.

THAT PORTION OF THE SERVICE PIPE BETWEEN THE MAIN AND THE CURB STOP AND/OR METER WHEN INSTALLED MUST BE IN A CONTINUOUS STRAIGHT LINE, WITH NO JOINTS, EXCEPT REDUCTIONS AND ENLARGEMENTS, AND PERPENDICULAR, IF POSSIBLE, TO THE LINE OF THE MAIN. SERVICES STUBBED INTO THE PROPERTY LINE SHALL BE OF SUFFICIENT LENGTH TO ALLOW DIRECT CONNECTION TO THE METER YOKE.

THE MAIN TO BE TAPPED MUST EXTEND ALONG THE ENTIRE LENGTH OF THE FRONT LOT LINE OF THE PROPERTY TO BE SERVED.

EXCEPT AS HEREINAFTER PROVIDED, SERVICE PIPE SHALL NOT BE INSTALLED IN A TRENCH CONTAINING OTHER CONDUITS WHICH CONVEY ANY SUBSTANCE OTHER THAN POTABLE WATER. THE TRENCH CONTAINING THE SERVICE PIPE SHALL BE SEPARATED LATERALLY FROM TRENCHES CONTAINING OTHER CONDUITS BY AT LEAST TEN (10) FEET OF UNDISTURBED COMPACTED EARTH.



TYPICAL HOUSE SERVICE CONNECTION IN CUL-DE-SACS

N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

SERVICE DETAIL

ISSUED:
APRIL 1992
REVISED:
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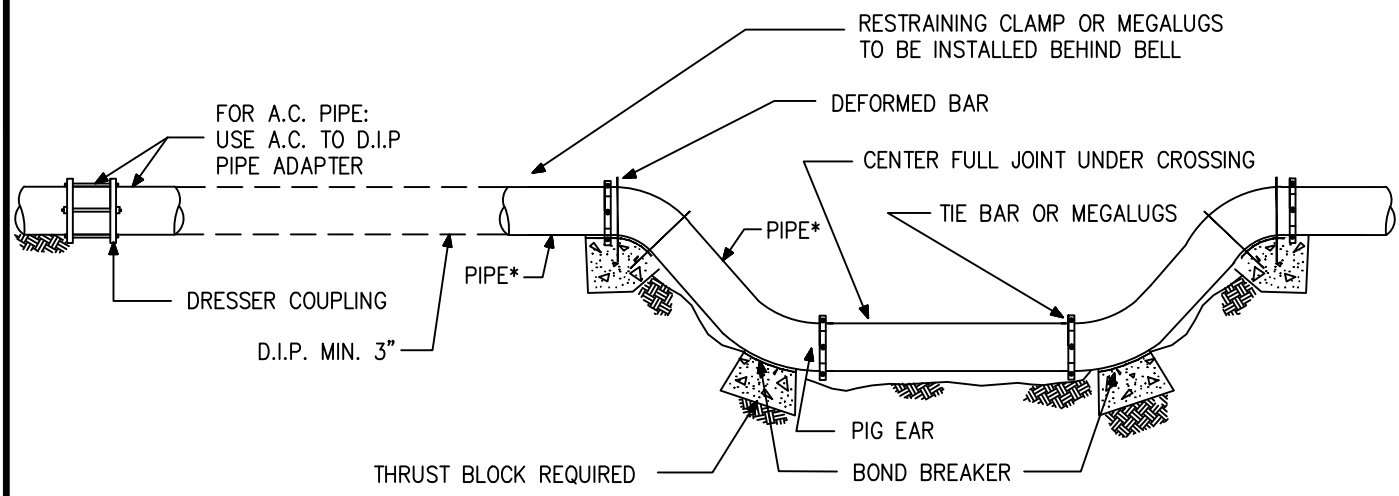
DRAWING NO.
200-2

WATERMAIN LOWERING



PIPE* : D.I.P. OR PVC C-900 DR-14

DIP, STEEL PIPE, HARNESS RODS, STEEL CASING PIPE, FITTINGS, VALVES, AND VALVE BOXES SHALL BE HAND WRAPPED USING POLYETHYLENE WITH A MIN. THICKNESS OF EIGHT (8) MILS AND TWO (2) INCH WIDE, TEN (10) MIL THICK POLYETHYLENE PRESSURE SENSITIVE TAPE TO CLOSE SEAMS OR HOLD OVERLAPS. THE POLYETHYLENE SHALL BE APPLIED TO PREVENT THE CONTACT OF BACKFILL MATERIAL WITH THE FITTING. THE RAW MATERIAL USED TO MANUFACTURE POLYETHYLENE FILM SHALL BE TYPE 1, CLASS A, GRADE E-1 IN ACCORDANCE WITH ASTM STANDARD DESIGNATION D-1248. POLYETHYLENE ENCASEMENT MATERIAL SHALL BE MANUFACTURED IN ACCORDANCE WITH AWWA STANDARD C-105.

BITUMINOUS MATERIAL IS TO BE USED FOR CORROSION PROTECTION ON ALL STEEL CASING PIPES. INSTALLATION SHALL BE IN ACCORDANCE WITH ESTABLISHED AWWA STANDARDS (AWWA C-600 OR C-603).

PIPE SHALL BE INSTALLED IN ACCORDANCE WITH AWWA C-900. BEFORE THE PLACING OF PIPE IN THE TRENCH, EACH PIPE OR FITTING SHALL BE THOROUGHLY CLEANED OF FOREIGN MATERIAL, KEPT CLEAN AND EXAMINED FOR CRACKS OR DEFECTS BEFORE INSTALLATION. THE DEVELOPMENT ENGINEERING MANAGER MAY REJECT ANY PIPE WHICH SHOWS DISCOLORATION DUE TO THE SUN.

JOINT LUBRICANT SHALL BE SUPPLIED BY THE PIPE MANUFACTURER.

WHEN LAYING PIPE ON CURVES, THE PIPE SHALL BE KEPT IN ALIGNMENT BY DEFLECTING JOINTS OR USING SHORT LENGTHS OF PIPE. IF USING DEFLECTING JOINTS, RECOMMENDED PRACTICES AND ALLOWANCES AS STIPULATED BY THE MANUFACTURER MUST BE ADHERED TO. PIPE SHALL BE LAID WITH THE BELL ENDS FACING IN THE DIRECTION OF LAYING UNLESS DIRECTED OTHERWISE BY THE DEVELOPMENT ENGINEERING MANAGER.

WHENEVER THE PIPE IS LEFT UNATTENDED, TEMPORARY PLUGS SHALL BE INSTALLED AT OPENINGS. TEMPORARY PLUGS SHALL BE WATERTIGHT, STANDARD CAST IRON AND SHALL BE SUBJECT TO APPROVAL BY THE DEVELOPMENT ENGINEERING MANAGER.

N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

WATERMAIN LOWERING DETAIL

ISSUED:
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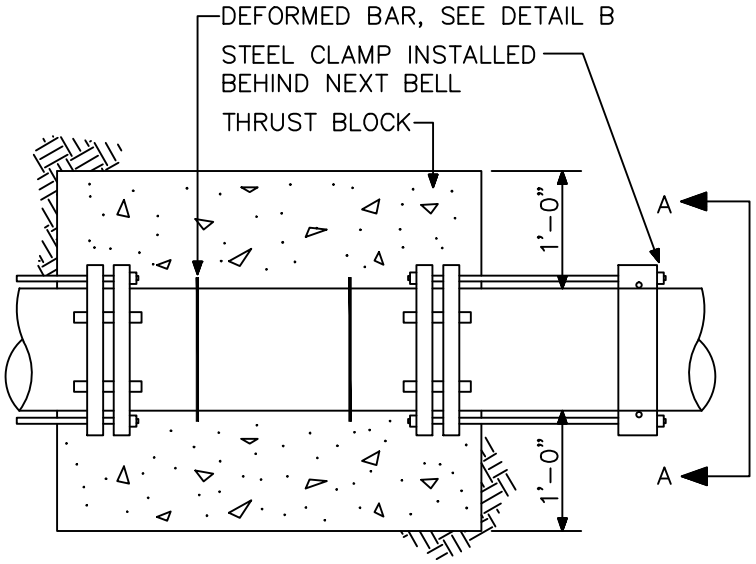
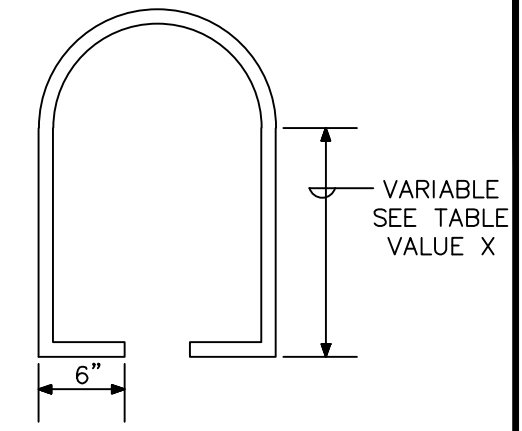
REVISED:
APRIL 2010

DRAWING NO.
200-3A

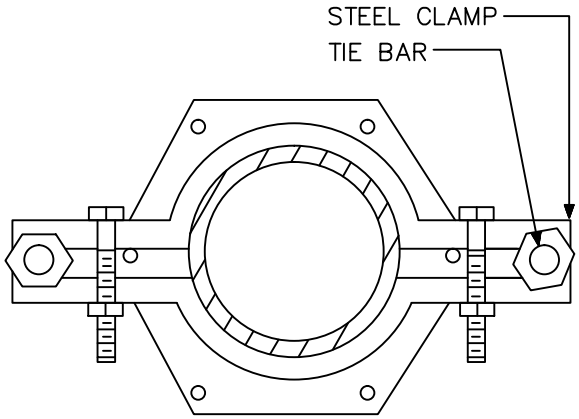


PLAN VIEW A



DETAIL B

MAIN SIZE	DEFORMED BAR		TIE BAR	
	DIA.	X	DIA.	AMOUNT
8"	–	–	.375	2
12"	.500	18"	.500	2
16"	.750	20"	.750	2
24"	1.000	24"	1.000	2



SECTION A–A

NOTES:
1. PIPE USED IN LOWERING SHALL BE DUCTILE IRON PIPE WITH EIGHT (8) MIL POLYWRAP.
2. FITTINGS, PIPES & TIE BARS TO BE WRAPPED SEPARATELY IN POLYETHYLENE.
3. 45° FITTINGS SHALL BE USED.
4. FITTINGS SHALL BE RODDED TO NEXT BELL & NO JOINTS ARE ALLOWED BETWEEN FITTINGS OR UTILIZE MEGALUG CONNECTIONS.
5. FITTINGS SHALL BE M.J.
6. MEGALUG CONNECTIONS OR PIGEARS SHALL BE USED ON RODDING FOR FITTINGS UNLESS OTHERWISE APPROVED BY THE DEVELOPMENT ENGINEERING MANAGER.

N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

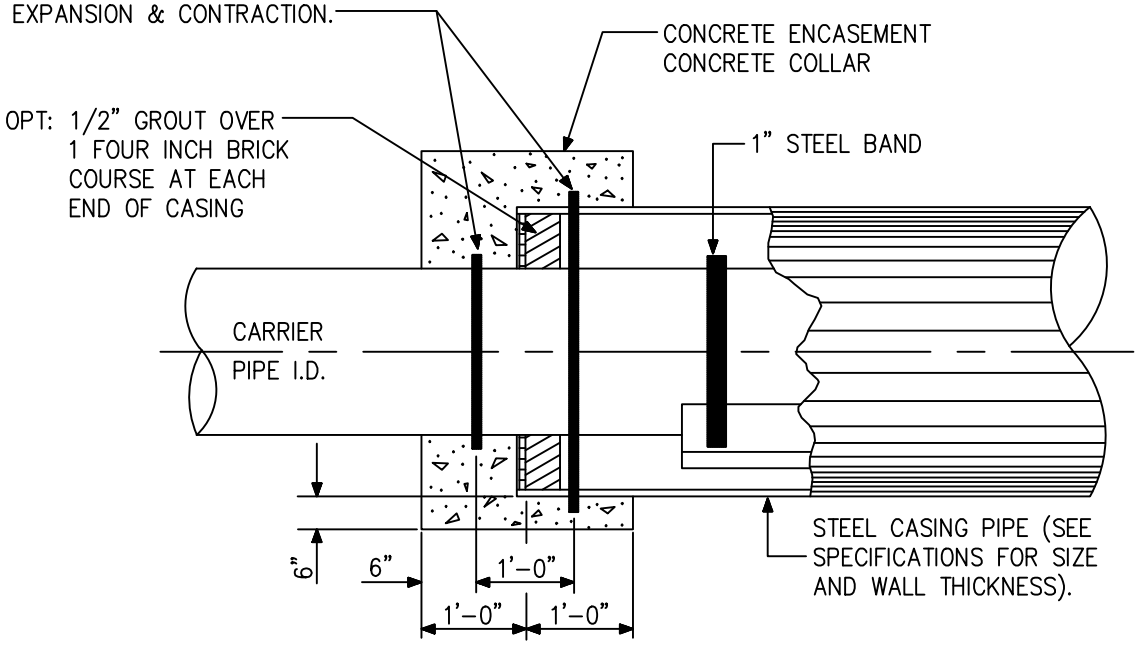
WATERMAIN LOWERING CROSS–SECTION DETAIL

ISSUED:
APRIL 1992
REVISED:
APRIL 2010

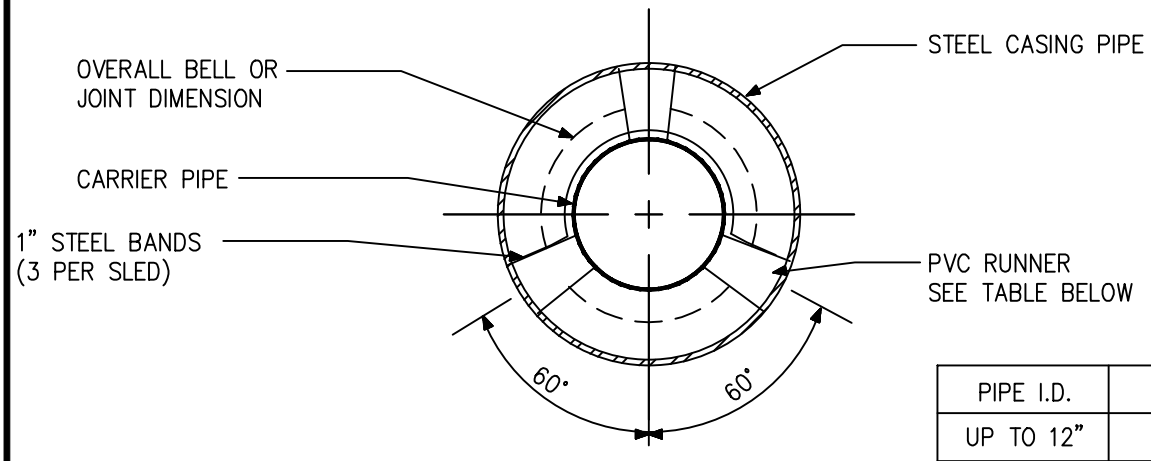
DRAWING NO.
200–3B

SEALING–INSTALL RUBBER O–RINGS OR GASKETS AROUND EACH PIPE (CASING CARRIER) TO PROVIDE CONTINUOUS WATERTIGHT SEAL, TO PREVENT EXPANSION & CONTRACTION.

NOTE:
SLED LENGTHS TO BE 75% OF PIPE LENGTHS.



SLED



PIPE I.D.	RUNNER SIZE
UP TO 12"	4"x 4"
15" – 21"	4"x 4"
24" – 30"	4"x 6"

PIPE CASING DETAIL

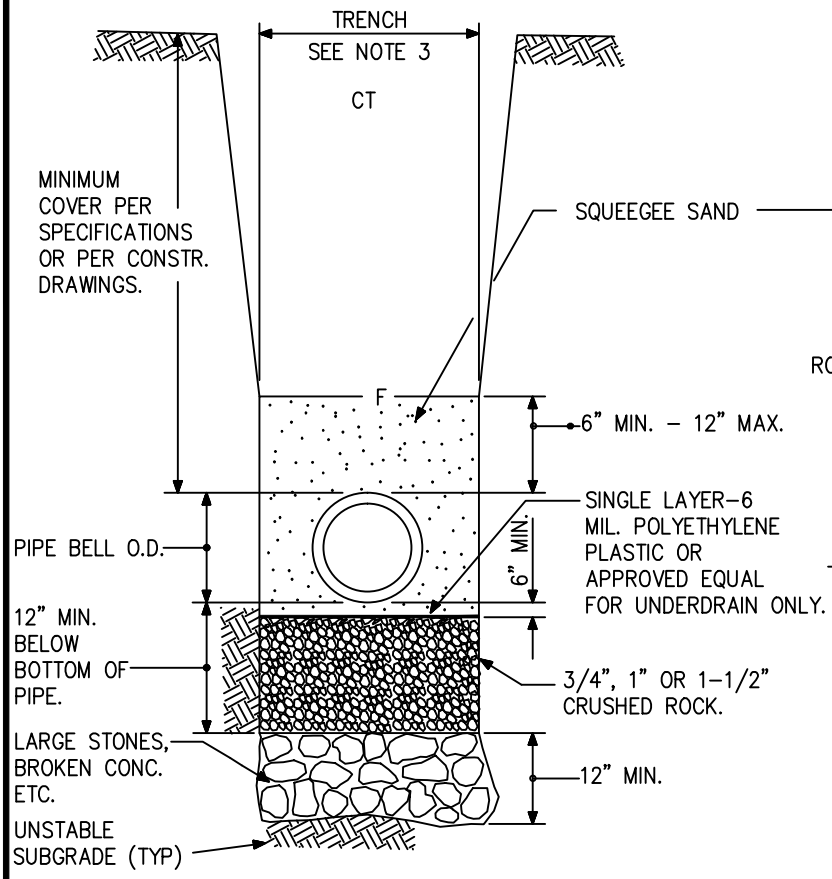
N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

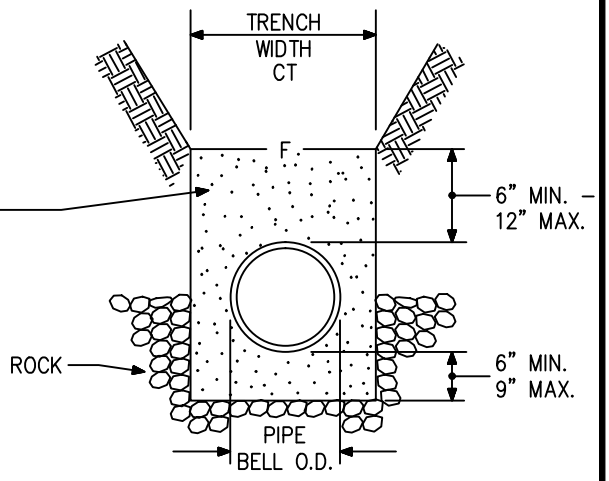
PIPE CASING AND SLED DETAIL

ISSUED:
MARCH 1996
REVISED:
APRIL 2010

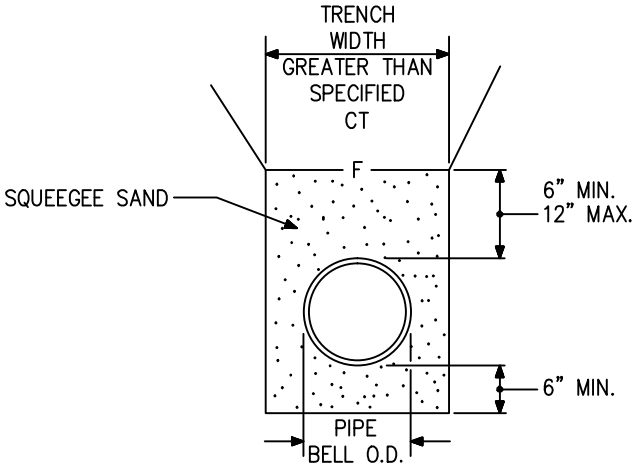
DRAWING NO.
200–4



UNSTABLE SUBGRADE



PIPE BEDDING IN ROCK



TRENCH OVERWIDTH

CT MACHINE COMPACTED TRENCH BACKFILL.

F LIMIT OF SLOPING OR BENCHING OF TRENCH WALLS.

UNDISTURBED GROUND

NOTES:

1. MIN. COVER TO BE BELOW FINAL STREET GRADE WHEN AVAILABLE.
2. TRENCH TO BE BRACED OR SHEETED AS NECESSARY FOR THE PROTECTION OF OTHER UTILITIES AND TO MEET LOCAL, STATE & FEDERAL REQUIREMENTS.
3. TRENCH WIDTH SHALL NOT BE MORE THAN 16 INCHES NOR LESS THAN 12 INCHES WIDER THAN THE LARGEST OUTSIDE DIAMETER OF THE PIPE LAID THEREIN. (BELL OR COUPLING O.D., IF APPLICABLE).

N.T.S.

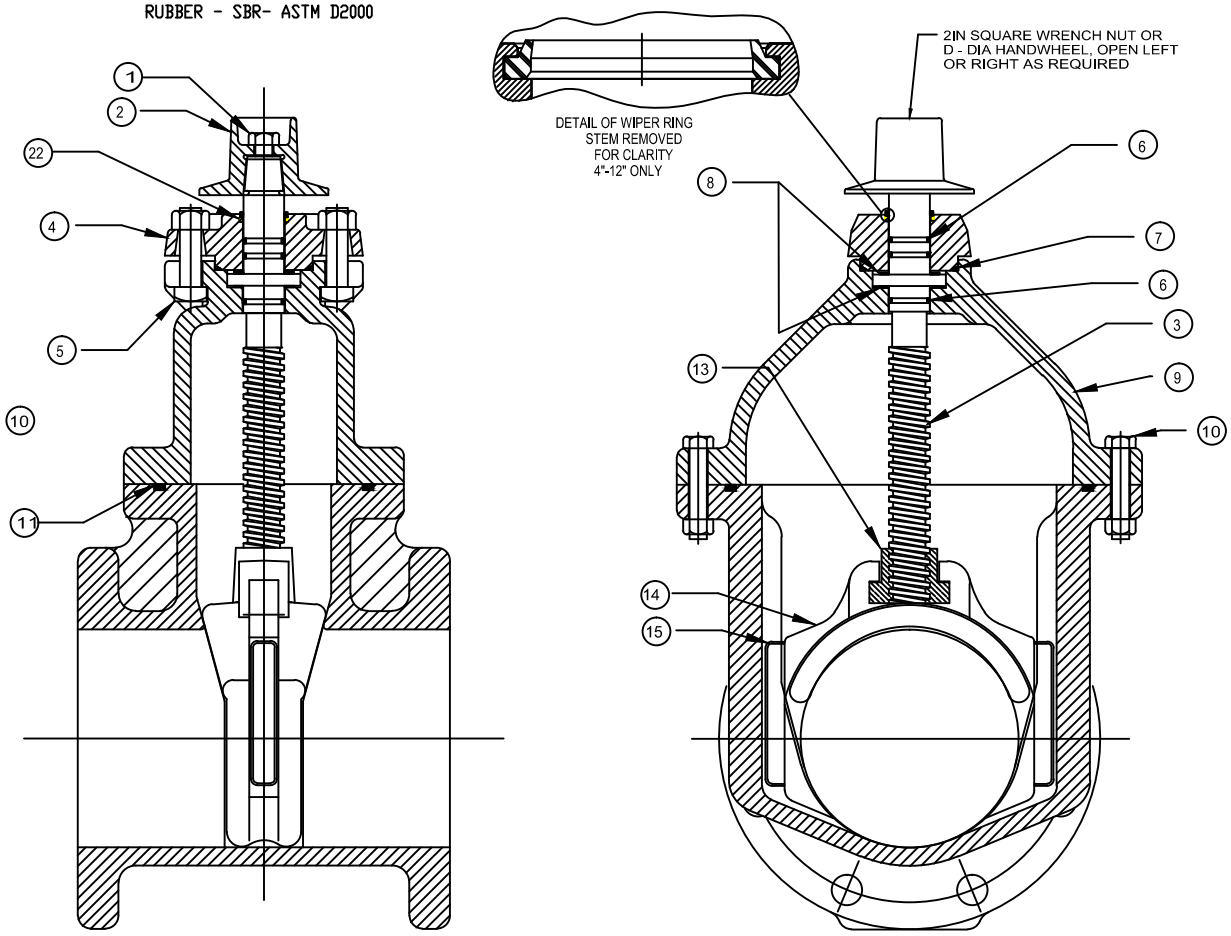
CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

SPECIAL BEDDING DETAIL

ISSUED:
APRIL 1992
REVISED:
APRIL 2010

DRAWING NO.
200–5

NOTES:
1. RUBBER ENCAPSULATED CAST IRON DISC
   CAST IRON - ASTM A126 CLASS B
   RUBBER - SBR- ASTM D2000



PART LIST					
ITEM	DESCRIPTION	REQ'D	MATERIAL	ASTM	
1	CAP SCREW	1	304 STAINLESS STEEL	A193	GRADE B8
2	WRENCH NUT	1	CAST IRON	A126	CLASS B
3	STEM	1	BRONZE	B138	ALLOY C67600
4	STUFFING BOX	1	CAST IRON	A126	CLASS B
5	STUFFING BOX BOLTS STUFFING BOX NUTS	2	304 STAINLESS STEEL 304 STAINLESS STEEL	A193 F594	GRADE B8 GROUP 1
6	O-RING	3	RUBBER	D2000	NITRILE
7	O-RING	1	RUBBER	D2000	NITRILE
8	ANTI-FRICTION WASHER	2	CELCON		
9	BONNET	1	CAST IRON	A126	CLASS B
10	BONNET BOLTS BONNET NUTS	"Z"	304 STAINLESS STEEL 304 STAINLESS STEEL	A193 F594	GRADE B8 GROUP 1
11	BONNET GASKET (O-RING)	1	RUBBER	D2000	NITRILE
13	DISC NUT	1	BRONZE	B62	ALLOY C83600
14	DISC	1	SEE NOTE 1		
15	GUIDE CAP	2	CELCON		
16	BODY - FLANGE ENDS	1	CAST IRON		CLASS B
17	HANDWHEEL	1	CAST IRON	A126	CLASS B
18	BODY - MJ ENDS	1	CAST IRON	A126	CLASS B
19	BODY - SLIP-ON ENDS	1	CAST IRON	A126	CLASS B
20	BODY - FLANGE x MJ END	1	CAST IRON	A126	CLASS B
21	BODY - FLANGE x SLIP-ON END	1	CAST IRON	A126	CLASS B
22	WIPER RING	1	RUBBER		

N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

GATE VALVE DETAIL

ISSUED:
APRIL 2010
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DRAWING NO.
200-6A

GATE VALVES

VALVES SHALL BE MANUFACTURED AND TESTED IN ACCORDANCE WITH AWWA STANDARD C-500, "METAL-SEATED GATE VALVES FOR WATER", OR AWWA C-509 "RESILIENT-SEATED GATE VALVES, 3 THROUGH 12 NPS, FOR WATER AND SEWAGE SYSTEMS" WITH THE FOLLOWING ADDITIONAL REQUIREMENTS OR EXCEPTIONS:

VALVES MEETING AWWA STANDARD C-500 SHALL BE OF A MODIFIED WEDGE DISC CONSTRUCTION, COATED BOTH INSIDE AND OUT WITH A TOUGH, DURABLE EPOXY TO PREVENT CORROSION, CAST IRON BODY, FULLY BRONZE MOUNTED WITH NON-RISING STEMS.

VALVES SHALL BE SUITABLE FOR FREQUENT OPERATION, AS WELL AS SERVICE INVOLVING LONG PERIODS OF INACTIVITY. THE OPERATING PRESSURE FOR VALVES SIX (6) INCHES THROUGH TWELVE (12) INCHES SHALL BE 200 PSI.

VALVE STEMS SHALL BE MADE OF BRONZE AND THREADED SO THAT VALVES SHALL OPEN BY TURNING TO THE LEFT (COUNTERCLOCKWISE). EACH VALVE SHALL BE FURNISHED WITH A TWO (2) INCH SQUARE OPERATING NUT. THE OPERATING NUT SHALL HAVE AN ARROW SHOWING THE DIRECTION OF OPENING AND THE WORD "OPEN" CAST ON THE NUT. THE STEM SEAL SHALL CONSIST OF TWO (2) O-RINGS; ONE OR BOTH POSITIONED ABOVE THE THRUST COLLAR WITH THE VALVE UNDER PRESSURE IN THE FULL OPEN POSITION.

BOLTS AND HEX NUTS USED ON THE BONNET OF THE VALVE SHALL BE THE MANUFACTURER'S STANDARD FABRICATED FROM A LOW ALLOY STEEL FOR CORROSION RESISTANCE.

FLANGES SHALL BE SIZED AND DRILLED IN ACCORDANCE WITH ANSI B-16.1 CLASS 125 SPECIFICATIONS. FLANGES SHALL BE MACHINED IN A FLAT FACE OR MACHINED TO A FLAT SURFACE WITH A SERRATED FINISH IN ACCORDANCE WITH AWWA STANDARD C-207 "STEEL PIPE FLANGES."

THE COMPONENTS OF THE MECHANICAL JOINT SHALL CONFORM TO ANSI A-21.11 (AWWA STANDARD C-111). THE TEE-HEAD BOLTS AND HEXAGON NUTS SHALL BE FABRICATED FROM A HIGH STRENGTH, STAINLESS STEEL, OR AN APPROVED EQUAL.

AFTER APPROVED FACTORY ASSEMBLY, EACH VALVE SHALL BE GIVEN THE OPERATION AND HYDROSTATIC TESTS IN ACCORDANCE WITH THE REFERENCED SPECIFICATIONS.

WEDGE DISC VALVES SHALL BE LIMITED TO THE FOLLOWING MANUFACTURERS OR APPROVED EQUIVALENT: WATEROUS SERIES-500, MUELLER-A-2360, KENSEAL, CLOW R/N. RESILIENT-SEATED GATE VALVES SHALL BE LIMITED TO THE AMERICAN-80 "CRS" GATE VALVE OR THE U.S. PIPE "METROSEAL" GATE VALVE.

THE MANUFACTURER SHALL FURNISH A CERTIFIED STATEMENT THAT THE INSPECTION AND SPECIFIED TESTS HAVE BEEN MADE AND THE RESULTS THEREOF COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE STANDARD(S) HEREIN SPECIFIED. A COPY OF THE CERTIFICATION SHALL BE SENT TO THE DEVELOPMENT ENGINEERING MANAGER UPON REQUEST.

CORROSION PROTECTION SHALL BE COVERED IN SUBSECTION 204.2 OF THESE STANDARDS AND SPECIFICATIONS.

VALVES SHALL BE HANDLED IN SUCH A MANNER AS TO PREVENT ANY INJURY OR DAMAGE AND SHALL BE THOROUGHLY CLEANED BEFORE INSTALLATION. VALVES SHALL BE SET IN SUCH A MANNER THAT THE VALVE STEMS ARE PLUMB. VALVES SHALL BE LOCATED AT POINTS AS SPECIFIED IN SUBSECTION 203.8 OF THESE STANDARDS AND SPECIFICATIONS.

VALVE BOXES

VALVE BOX PARTS SHALL BE MANUFACTURED BY TYLER, SERIES 6860 OR AN APPROVED EQUIVALENT MANUFACTURER AND MADE OF GRAY CAST IRON, BUFFALO TYPE WITH NO. 160 OVAL BASE. A FIVE AND ONE-QUARTER (5 ¼) INCH SCREW-TYPE SHAFT SHALL BE ADJUSTABLE FROM 45 INCHES TO 66 INCHES. VALVE BOX LIDS SHALL BE MARKED WITH THE WORD "WATER" AND SHALL HAVE A LIP OR FLANGE EXTENDING INTO THE VALVE BOX SHAFT. NO SLIP-TYPE BOXES SHALL BE ALLOWED. THE VALVE BOX SHALL BE OF A DESIGN WHICH SHALL NOT TRANSMIT SHOCK OR STRESS TO THE VALVE AND SHALL BE CENTERED AND PLUMB OVER THE OPERATING NUT OF THE VALVE WITH THE BOX COVER FLUSH WITH THE SURFACE OF THE PAVEMENT. IN NON-PAVED AREAS, A 24 INCH SQUARE CONCRETE COLLAR IS REQUIRED AROUND VALVE BOX COVER AS PER THE STANDARD DETAIL IN SECTION 200 OF THESE STANDARDS AND SPECIFICATIONS. IN UNIMPROVED ROADWAYS THE VALVE BOX COVER SHALL BE SET SIX (6) INCHES BELOW FINAL GRADE WITH A MARKER POST INDICATING THE LOCATION AS PER THE STANDARD DETAIL DRAWING.

THE MANUFACTURER SHALL FURNISH A CERTIFIED STATEMENT THAT THE INSPECTION AND SPECIFIED TESTS HAVE BEEN MADE AND THE RESULTS THEREOF COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE STANDARD(S) HEREIN SPECIFIED. A COPY OF THE CERTIFICATION SHALL BE SENT TO THE DEVELOPMENT ENGINEERING MANAGER UPON REQUEST.

FOR VALVE BOXES ALONG FIRE SPRINKLER LINES THE LID SHALL BE LABELED “FIRE”.

CORROSION PROTECTION SHALL BE COVERED IN SUBSECTION 204.2 OF THESE STANDARDS AND SPECIFICATIONS.

FINAL ELEVATION OF VALVE BOXES SHALL BE LEFT TO THE DISCRETION OF THE DEVELOPMENT ENGINEERING MANAGER.

VALVE BOXES SHALL BE INSTALLED PLUMB.

VALVE BOXES WHICH HAVE SHIFTED DURING BACKFILL OPERATIONS AND ARE NO LONGER PLUMB, SHALL BE RE-EXCAVATED AND RE-ALIGNED TO THE SATISFACTION OF THE DEVELOPMENT ENGINEERING MANAGER.

FOR GREENBELT AREA APPLICATION, REFER TO DETAIL 200-7

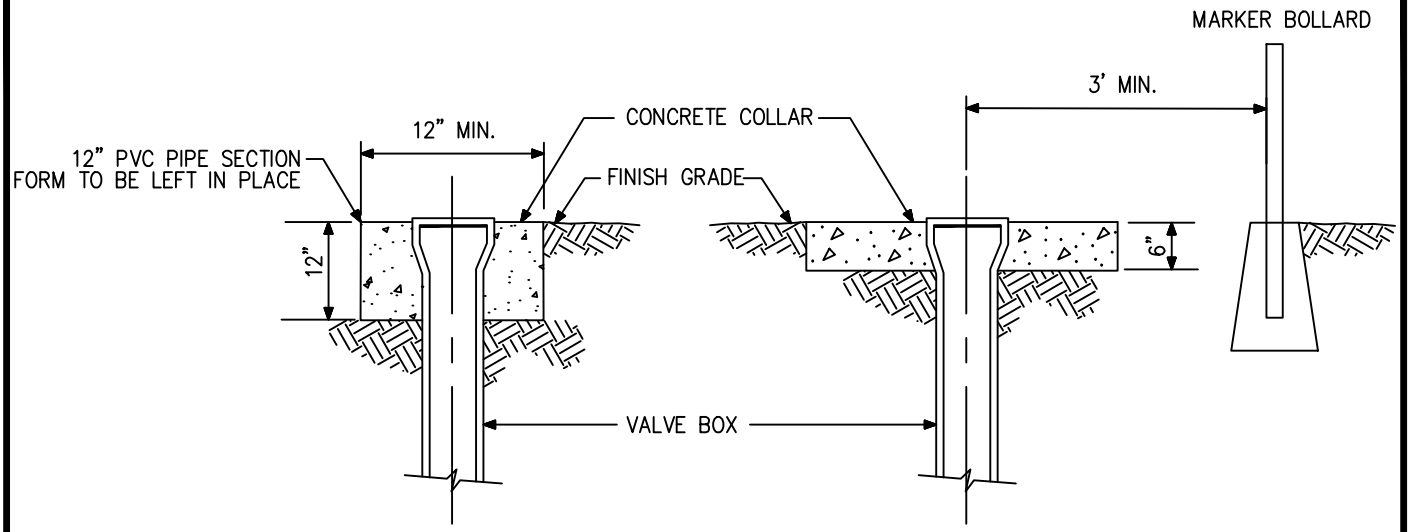
N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

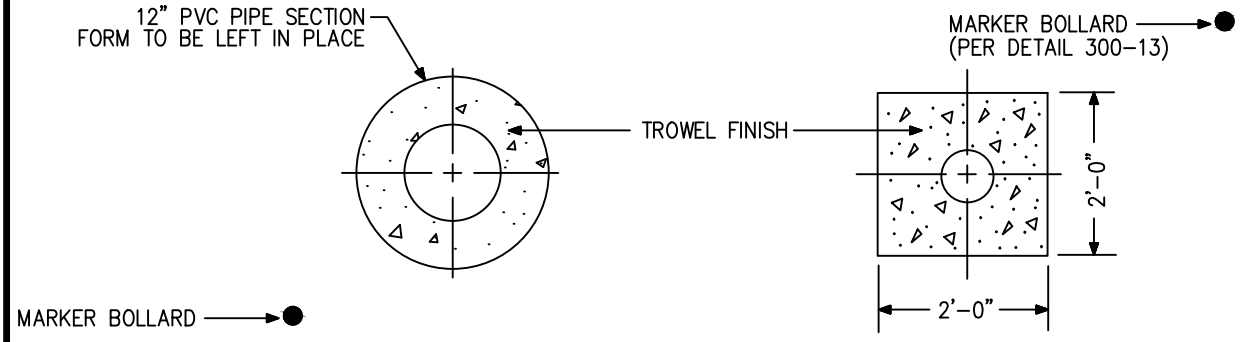
GATE VALVE AND VALVE BOX NOTES

ISSUED:
APRIL 2010
REVISED:

DRAWING NO.
200–6B



SECTION



PLAN

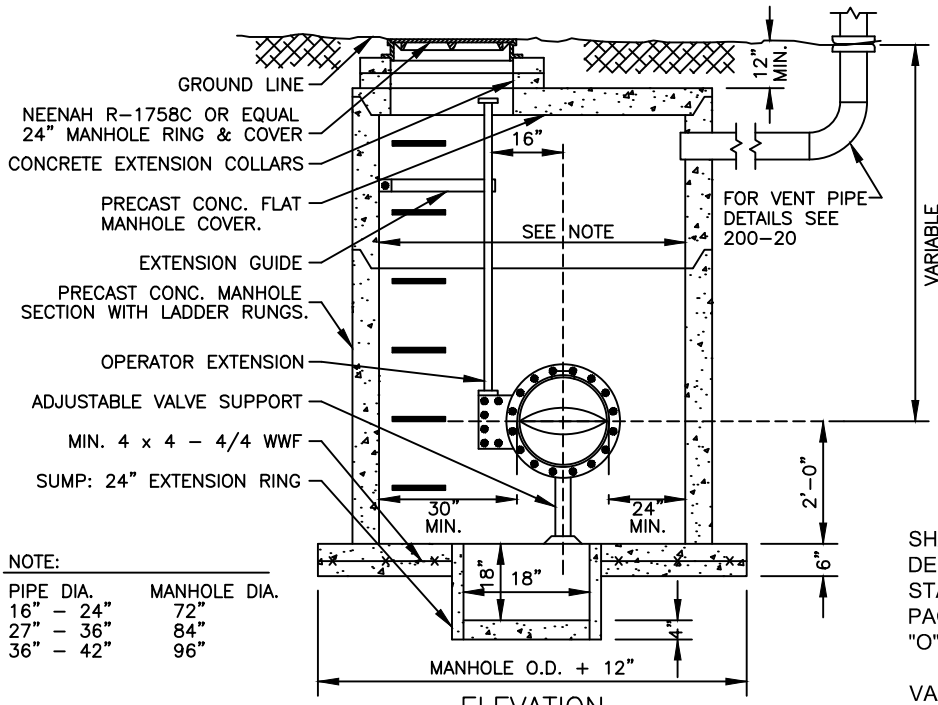
N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

VALVE BOX COLLAR FOR GREENBELT AREA DETAIL

ISSUED:
APRIL 1992
REVISED:
APRIL 2010

DRAWING NO.
200-7



NOTE:

PIPE DIA.	MANHOLE DIA.
16" - 24"	72"
27" - 36"	84"
36" - 42"	96"

ELEVATION

1.) VALVE OPERATOR SHALL BE ACCESSIBLE THRU MANHOLE OPENING.

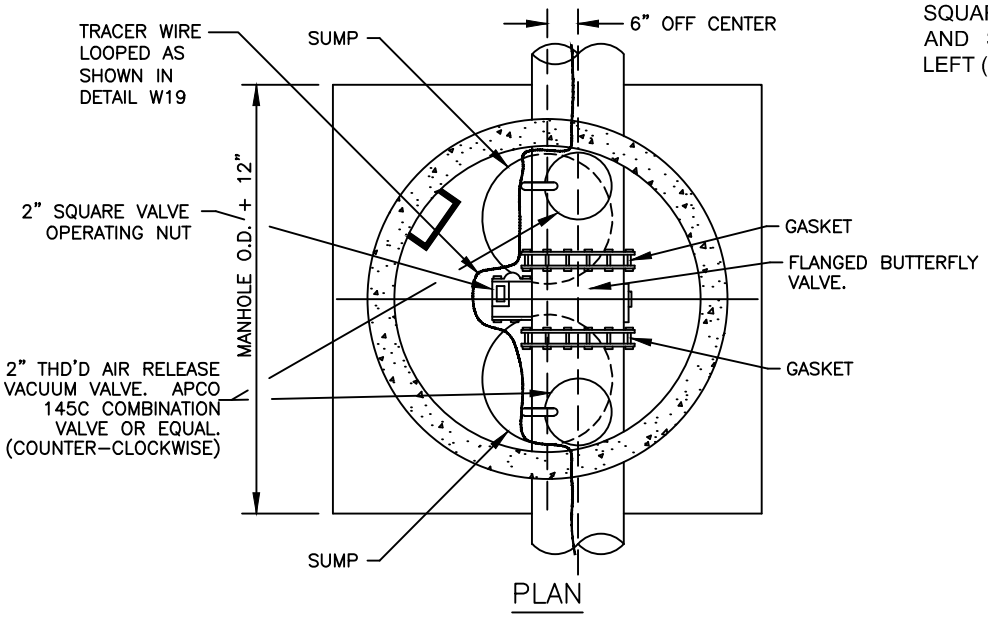
2.) PAD TO REST ON UNDISTURBED SOIL OR 18" OF 1-1/2" FRACTURED ROCK.

3.) SHAFTS SHALL BE A ONE-PIECE UNIT CONSTRUCTED OF STAINLESS STEEL AND SHALL EXTEND COMPLETELY THROUGH THE VALVE DISC BODY.

4.) BUTTERFLY VALVES SHALL BE FURNISHED WITH FLANGED END OR MECHANICAL JOINT CONNECTIONS.

SHAFT SEALS MAY BE DESIGNED FOR THE USE OF STANDARD SPLIT-V TYPE PACKING OR FOR STANDARD "O" RING SEALS.

VALVES SHALL BE FITTED WITH A TWO (2) INCH SQUARE OPERATING NUT AND SHALL OPEN TO THE LEFT (COUNTERCLOCKWISE).



PLAN

NOTE: BUTTERFLY VALVES SHALL BE CLASS 150-B AND CONFORM TO AWWA SPECIFICATION C-504

THE MANUFACTURER SHALL FURNISH A CERTIFIED STATEMENT THAT THE INSPECTION AND SPECIFIED TESTS HAVE BEEN MADE AND THE RESULTS THEREOF COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE STANDARD(S). A COPY OF THE CERTIFICATION SHALL BE SENT TO THE DEVELOPMENT ENGINEERING MANAGER UPON REQUEST.

N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

16" TO 42" VALVE AND VAULT DETAIL

ISSUED:
JANUARY 2005
REVISED:
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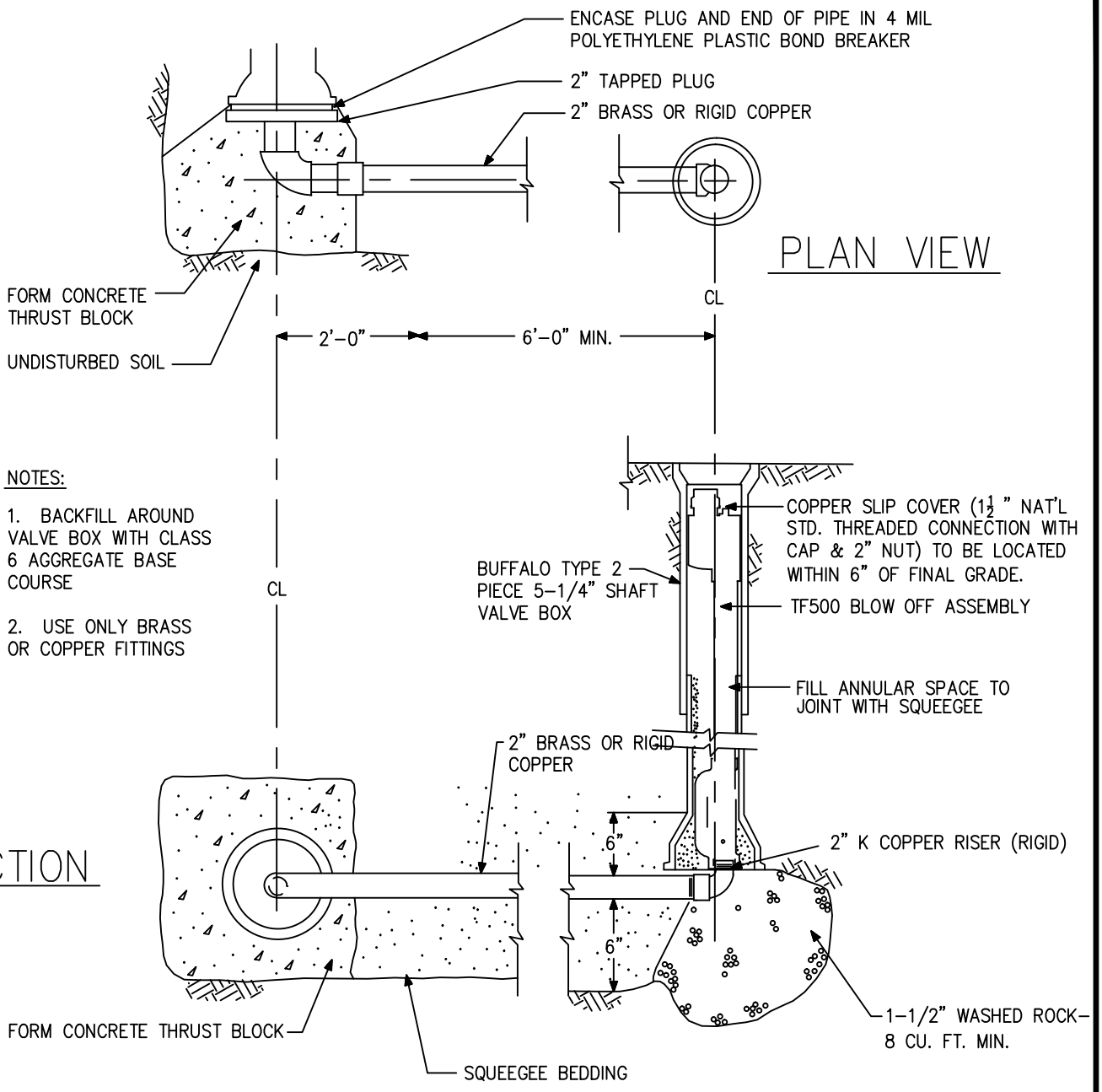
DRAWING NO.
200-8



VALVES SHALL BE HANDLED IN SUCH A MANNER AS TO PREVENT ANY INJURY OR DAMAGE AND SHALL BE THOROUGHLY CLEANED BEFORE INSTALLATION. VALVES SHALL BE SET IN SUCH A MANNER THAT THE VALVE STEMS ARE PLUMB. VALVE BOXES SHALL BE INSTALLED PLUMB. FINAL ELEVATION OF THE VALVE BOXES SHALL BE LEFT TO THE DISCRETION OF THE DEVELOPMENT ENGINEERING MANAGER.

NOTE: FOR LINES 12" AND LARGER, A HYDRANT SHALL BE USED FOR THE BLOWOFF

N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

2" BLOWOFF DETAIL (FOR MAINS LESS THAN 12" DIA.)

ISSUED:
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REVISED:
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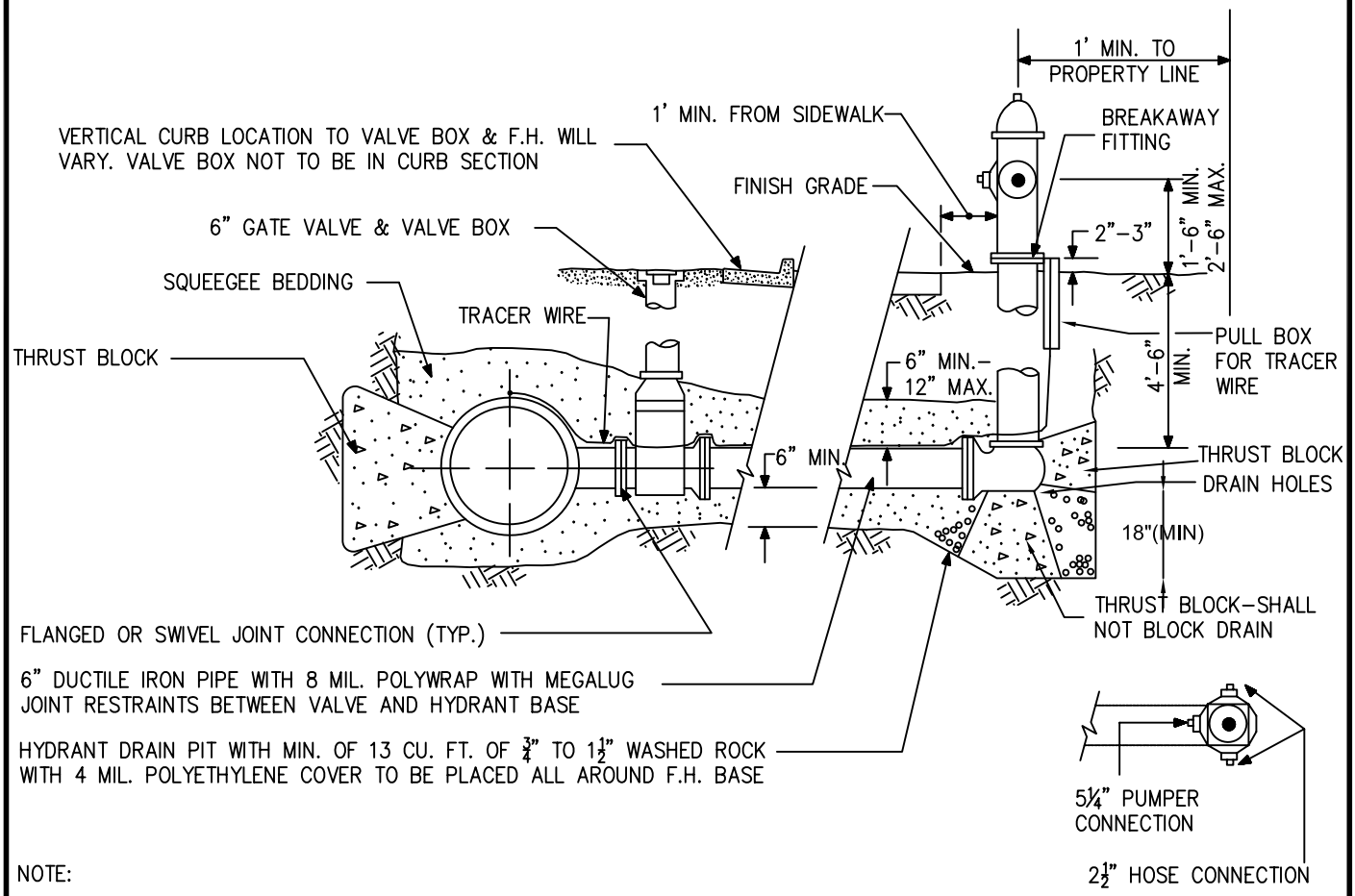
DRAWING NO.
200-9

FIRE HYDRANT ASSEMBLY



NOTE:

FIRE HYDRANTS SHALL BE LIMITED TO THE FOLLOWING MANUFACTURERS ONLY:
1) MUELLER COMPANY 5-1/4 SUPER CENTURION
2) WATEROUS COMPANY (1) MODEL WB-250-PACER

SHOE AND BARREL SHALL BE CONNECTED WITH HIGH STRENGTH STAINLESS BOLTS AND NUTS
HYDRANT SHALL HAVE A FIVE (5') FOOT CLEAR ZONE ON EACH SIDE OF HYDRANT (TEN (10') FOOT EASEMENT AROUND).
MINIMUM DISTANCE FROM DRIVEWAYS SHALL BE SIX (6) FEET.
HYDRANTS SHALL CONFORM TO AND BE TESTED IN ACCORDANCE WITH AWWA SPECIFICATION C-502.
HYDRANTS SHALL BE MADE OF CAST IRON WITH FULL BRONZE MOUNTINGS.
INLET SHALL FIT SIX (6) INCH PIPE WITH BARREL LENGTH SUFFICIENT FOR A FIVE (5) FOOT TRENCH.
ONLY TWO (2) HEIGHT EXTENSIONS MAY BE USED PER HYDRANT.
HYDRANT BASES SHOULD NOT BE ANY DEEPER THAN SIX (6) FEET FROM THE TOP OF FINISHED GRADE.
MAIN VALVE OPENING IN THE HYDRANT SHALL BE NO LESS THAN FIVE (5) INCHES IN DIAMETER.
THREADS ON NOZZLES SHALL BE NATIONAL STANDARD.
OPERATING NUT & NOZZLE COVERS SHALL BE NATIONAL STANDARD PENTAGON MEASURING ONE AND ONE-HALF (1½) INCHES FROM POINT TO OPPOSITE FLAT AND SHALL OPEN CLOCKWISE.
HYDRANTS SHALL BE PLUMBED VERTICALLY WITH PUMPER NOZZLE FACING STREET.
NO WATER SERVICE MAIN TAPS SHALL BE MADE TO A DISTRIBUTION MAIN WITHIN FIVE (5) FEET OF A FIRE HYDRANT BRANCH MAIN.
NO HORIZONTAL BENDS OR OFFSETS SHALL BE USED IN INSTALLING FIRE HYDRANT BRANCH MAINS.

EACH HYDRANT SHALL BE PAINTED WITH OSHA ENAMEL, SAFETY YELLOW, OR AN APPROVED EQUIVALENT.
FIRE HYDRANT ASSEMBLIES SHALL BE MEGALUGGED IN ACCORDANCE WITH SUBSECTION 204.1 (N)

N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

FIRE HYDRANT ASSEMBLY DETAIL

ISSUED:
APRIL 1992
REVISED:
APRIL 2010

DRAWING NO.
200-10

THRUST BLOCKS SHALL BE CONSTRUCTED AT BENDS AND FITTINGS WHICH RESULT IN UNBALANCED LINE THRUST. CARE SHALL BE TAKEN NOT TO BLOCK OUTLETS OR TO COVER BOLTS, NUTS, CLAMPS OR OTHER FITTINGS OR TO MAKE THEM INACCESSIBLE.

A BOND BREAKER SHALL BE PLACED BETWEEN THE FITTING AND THE THRUST BLOCK TO AID IN EASE OF FUTURE REMOVAL.

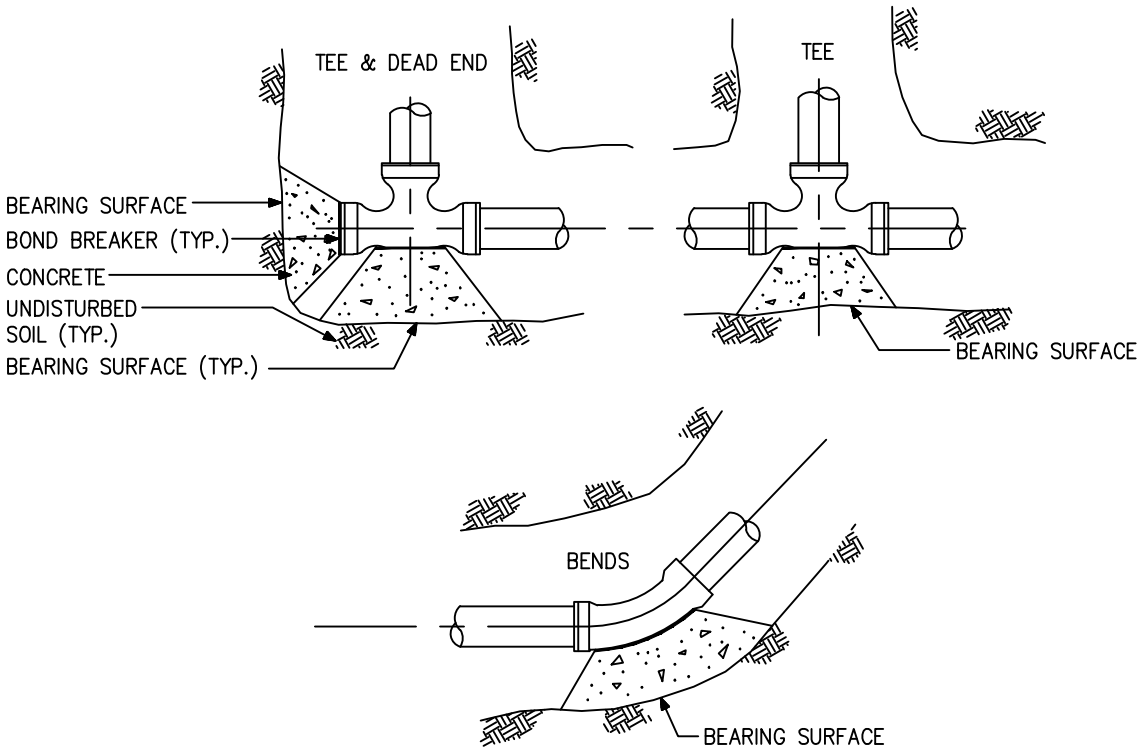
THE VERTICAL SIDES OF THE CONCRETE THRUST BLOCKS SHALL BE FORMED TO ALLOW FOR SYMMETRICAL THRUST.

WHEN IT IS IMPOSSIBLE THROUGH OVER EXCAVATION OR OTHER CAUSES TO POUR A THRUST BLOCK AGAINST UNDISTURBED EARTH, HARNESS RODS SHALL BE REQUIRED TO ANCHOR THE FITTINGS TO THE MAIN UPON APPROVAL OF THE DEVELOPMENT ENGINEERING MANAGER.

BACKFILL MAY BE PLACED OVER THE THRUST BLOCK ONCE THE SURFACE HAS SET SUFFICIENTLY TO RESIST THE WEIGHT OF THE BACKFILL.

NO DRY KICKERS SHALL BE ALLOWED.

NO HAND MIXED CONCRETE SHALL BE ALLOWED.



PLAN VIEW

NOTES:
1. THRUST BLOCKS MUST BE CAST IN PLACE CONCRETE.
2. NO TAMPING OR COMPACTING SHALL BE ALLOWED ABOVE THRUST BLOCK FOR A MINIMUM OF TWENTY–FOUR (24) HOURS AFTER PLACEMENT.
3. CONCRETE MUST SET A MINIMUM OF FORTY–EIGHT (48) HOURS PRIOR TO THE PERFORMANCE OF A HYDROSTATIC TEST.
4. BEARING SURFACE BASED ON BEARING STRENGTH OF 3000 P.S.F. AND MAIN PRESSURE OF 200 P.S.I.. FOR MAINS GREATER THAN 16" OR VERICAL THRUSTS, SHOW AREA REQUIREMENT ON STANDARD DETAILS.
5. BOND BREAKER TO BE MINIMUM OF 8 MIL. POLYETHYLENE PLASTIC.

N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

THRUST BLOCK DETAIL

ISSUED:
APRIL 1992
REVISED:
APRIL 2010

DRAWING NO.
200–11

THE PRESSURE REDUCING VAULT SHALL BE MANUFACTURED BY ENGINEERED FLUID, INC., DAKOTA PUMP INC. OR OTHER APPROVED BY DEVELOPMENT ENGINEERING MANAGER.

THE VAULT SHALL ALSO BE EQUIPPED WITH FOLLOWING:

A. SUMP PUMPS SHALL BE HYDRO-MATIC OSP50AB, OR AN APPROVED EQUIVALENT. A PIPE UNION SHALL BE INSTALLED IN THE DISCHARGE LINE BETWEEN THE PUMP AND THE CHECK VALVE. DISCHARGE LINE SHALL BE MADE OF IRON AND SHALL DIRECT FLOWS TO A LOCATION APPROVED BY CITY OF THORNTON INSPECTOR.

B. VENTILATION FANS SHALL BE AS MANUFACTURED BY ILG, OR AN APPROVED EQUIVALENT, MODEL PTD DIRECT-DRIVE TUBEAXIAL DUCT FAN SIZE PTD 123 (811 CFM @ 3/8" S.P.) WITH A ONE-SIXTH (1/6) HP, 120-VOLT CONSTANT SPEED, SINGLE PHASE, 60HZ ELECTRIC MOTOR. CONTROL SWITCH FOR THE FAN SHALL BE MOUNTED NEXT TO THE ENTRYWAY SO THAT IT CAN BE OPERATED WITHOUT COMPLETELY ENTERING THE VAULT. THE DISCHARGE OF THE VENT FAN SHALL BE TOTALLY ENCLOSED AND ATTACHED TO THE OPENING OF THE EXHAUST VENT PIPE.

C. DEHUMIDIFIERS SHALL BE DAYTON MODEL# 5EAJ7, OR AN APPROVED EQUIVALENT. PROVIDE CONDENSATE DRAIN PIPE FROM DRIP TRAY TO WITHIN SIX (6) INCHES OF THE FINISHED FLOOR.

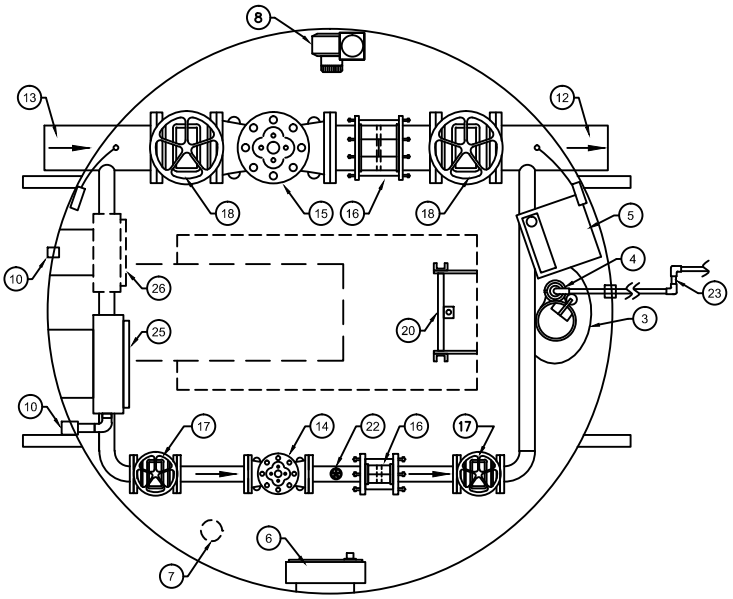
ALL CONTROL LINES AND FITTINGS SHALL BE STAINLESS STEEL AND INCLUDE ISOLATION TO ALL PRV CONTROL LINES

SEE SECTION 204.1(G) AND 204.1(J) OF THE CITY OF THORNTON STANDARDS AND SPECIFICATIONS.

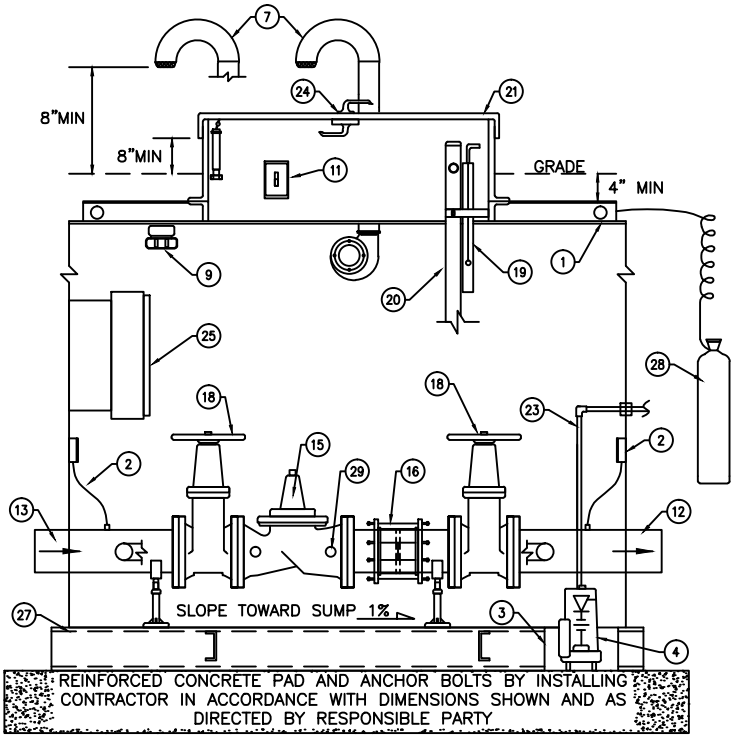
LOW FLOW BYPASS SIZES

PRV	MIN. BYPASS SIZE
8"	2-1/2"
12"	4"
16"	6" w/2" BYPASS

Legend	
1	Lifting Hooks (Add to any equipment in excess of 60 lbs)
2	Pressure Gauges (stainless steel w/ isolation vlv & purge line)
3	Sump Well (18" deep 12" wide)
4	Sump Pump with grate
5	Dehumidifier
6	Station Heater
7	Air Ducts
8	Ventilation Blower
9	Station Light
10	1.5" Conduit (provide a minimum of two conduits)
11	Light and Fan Switch (accessible from outside the vault)
12	Main Outlet
13	Main Inlet
14	Low Flow Bypass
15	Pressure Reducing Valve (With rising stem indicator)
16	Coupling
17	GATE Valves
18	BUTTERFLY valves
19	Safety Post
20	Entrance Ladder
21	Entrance Hatch (weather tight cover with overhang skirt)
22	3/4" Hose Bib
23	Sump discharge (IRON pipe with swivel joint for settlement)
24	Lock with AH1 keys or "BEST" locking assembly
25	Power Panel Enclosure
26	Telemetry Panel (as required by Dev. Eng. Manager)
27	Capsule reinforcement as directed by responsible party
28	Cathotic Protection as directed by responsible party
29	Control lines (stainless steel w/ stainless steel isolation valves)



PLAN VIEW



PROFILE VIEW

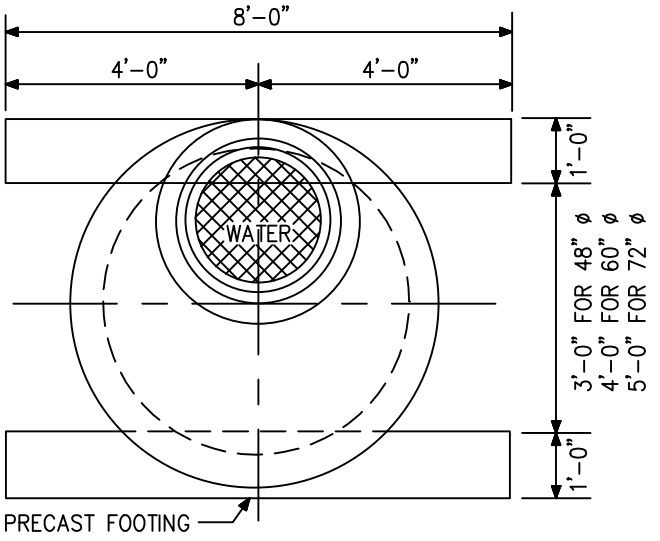
N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

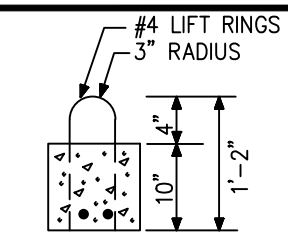
PRESSURE REDUCING VAULT DETAIL

ISSUED:
APRIL 2010
REVISED:

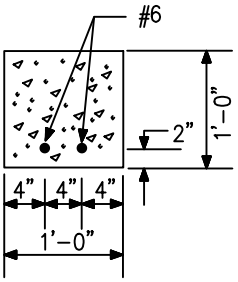
DRAWING NO.
200-12



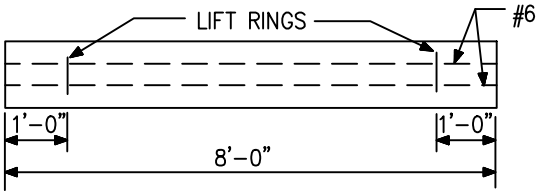
MH PLAN



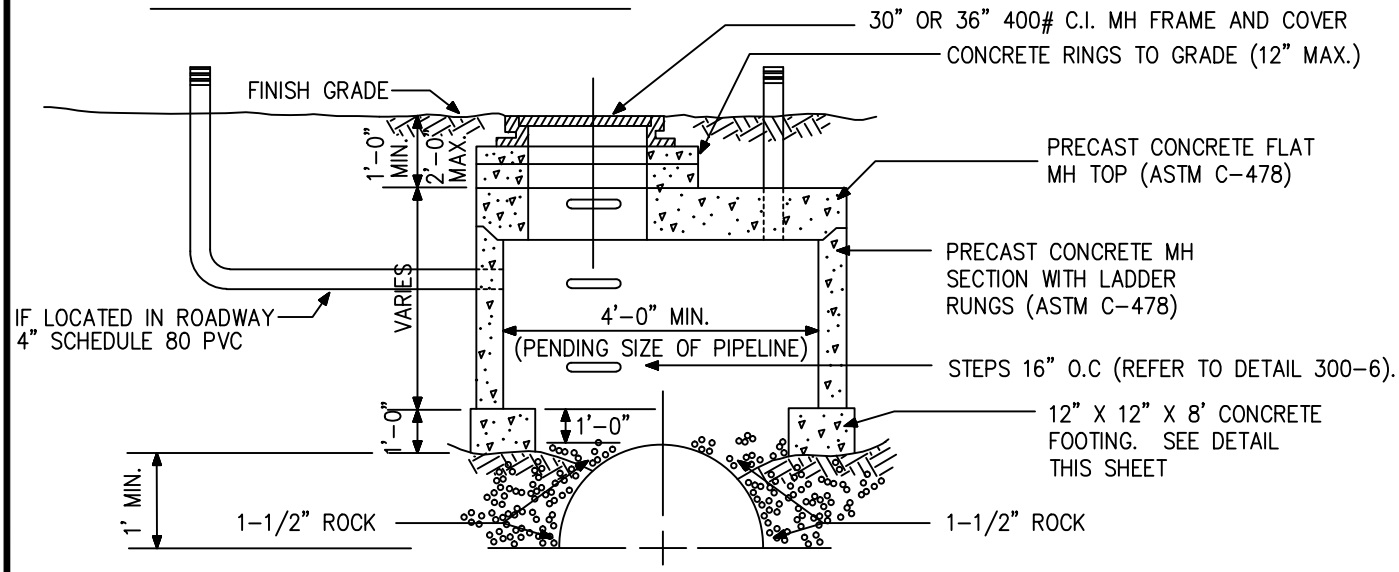
LIFT RING



SECTION
CONCRETE FOOTING



PLAN
CONCRETE FOOTING



ELEVATION

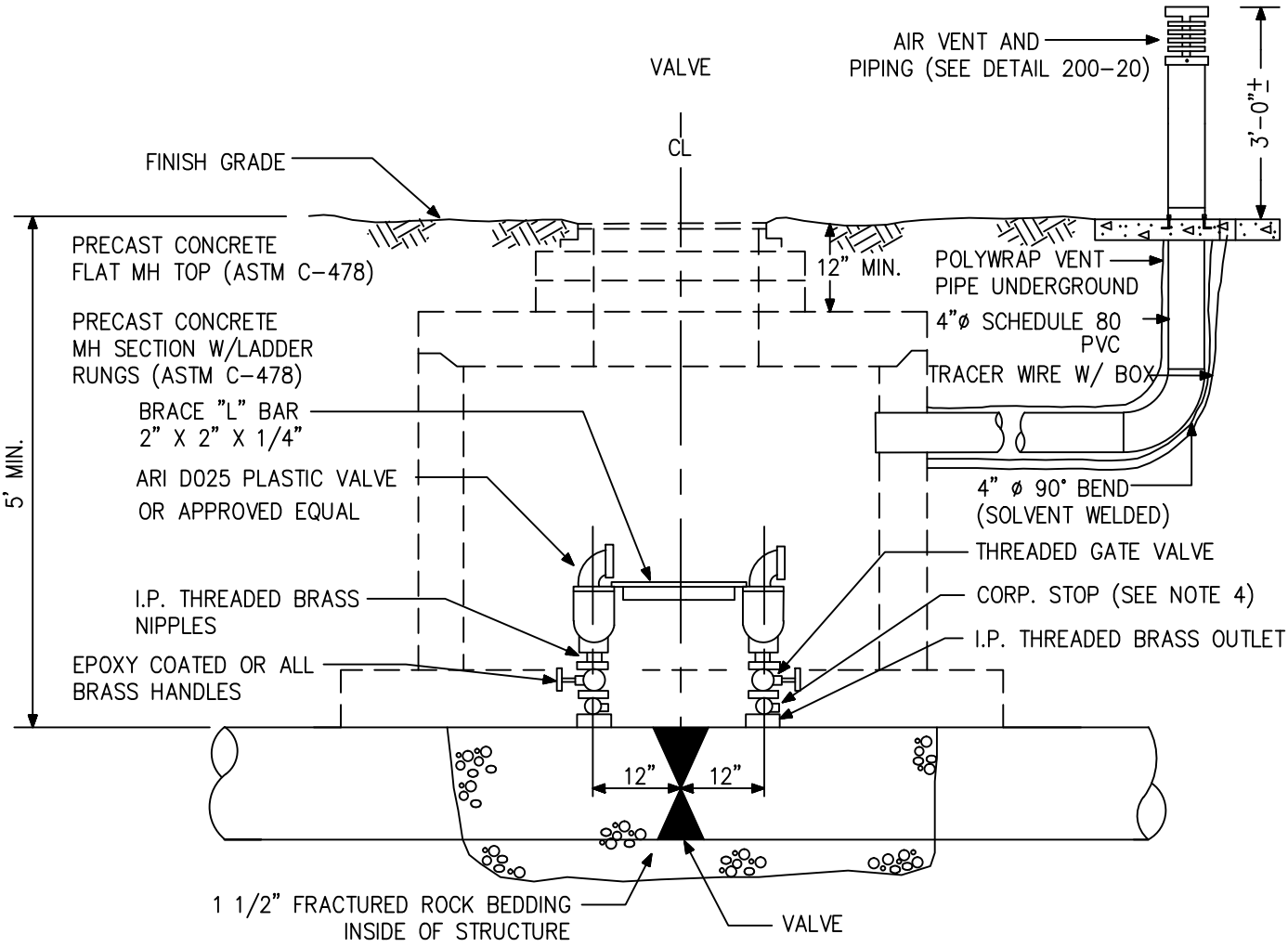
N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

AIR RELIEF VALVE ASSEMBLY MANHOLE DETAIL

ISSUED:
APRIL 1992
REVISED:
APRIL 2010

DRAWING NO.
200-13A



NOTES:

1. 1-1/2" FRACTURED ROCK SHALL BE PLACED IN BOTTOM OF MH TO CROWN OF PIPE ONLY.
2. PIPE AND FITTINGS SHALL BE BRASS.
3. PIPELINES 24" IN DIAMETER AND LARGER SHALL HAVE MH DIAMETERS OF 60" MINIMUM. MH DIAMETER SHALL BE DETERMINED BY ENGINEER.
4. WITH I.P. THREADED OUTLET, CORP. STOP SHALL BE I.P. THREADED BOTH ENDS (MUELLER H-10012 OR APPROVED EQUAL). FOR DIRECT TAP ON PIPE, CORP. STOP SHALL BE MUELLER (CC) THREADED ONE END, I.P. THREADED OTHER (H-10003 OR OTHER APPROVED BY THE DEVELOPMENT ENGINEERING MANAGER).

N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

AIR RELIEF VALVE ASSEMBLY DETAIL

ISSUED:
APRIL 1992
REVISED:
APRIL 2010

DRAWING NO.
200-13B

SERVICE PIPE TWO (2) INCHES OR LESS IN DIAMETER SHALL BE CONNECTED TO THE MAIN BY MEANS OF A BRONZE CORPORATION STOP OF THE SAME SIZE. NO UNDERGROUND JOINTS ARE PERMITTED IN THE COPPER SERVICE PIPE BETWEEN THE CORPORATION STOP AND THE CURB STOP AND/OR METER EXCEPT AT REDUCERS. OVERSIZING OF SERVICE LINES IS PERMITTED, AND SHOULD BE OUTSIDE OF THE PIT OR VAULT.

ALL JOINTS MUST BE OF A SWEAT COPPER DESIGN. SOLDER USED IN CONNECTION OF THE JOINTS SHALL BE OF A LEAD CONTENT OF 0.20 OR LESS.

CORPORATION STOPS SHALL BE AWWA TAPER THREAD TO COPPER CONNECTION OF PACK JOINT AND SHALL BE A FORD TYPE F600 OR AN APPROVED EQUAL. TAPS SHALL BE MADE BY THE RESPONSIBLE PARTY.

NO TAPS SHALL BE MADE UNTIL AFTER THE SERVICE PIPE IS SET IN PLACE AND THE COPPER SETTER (ON RESIDENTIALS) OR CURB STOP (ON COMMERCIALS) HAS BEEN INSTALLED.

UNDER NO CIRCUMSTANCES IS A WATER MAIN TO BE TAPPED DIRECTLY. ONLY SADDLES UTILIZING A CAST BRONZE CASTING WITH DOUBLE SILICONE BRONZE STRAPS SHALL BE PERMITTED.

WHEN TAPPING EXISTING ASBESTOS CEMENT PIPE, THE SIZE OF TAPS MUST BE ONE (1) PIPELINE SIZE SMALLER THAN THE SIZE OF THE PIPE BEING TAPPED.

TAPS SHALL NOT BE MADE ON A WATER MAIN UNTIL THE MAIN HAS PASSED THE CHLORINE AND HYDROSTATIC PRESSURE TESTS AND CLEARWATER TESTS.

CARE SHALL BE TAKEN TO PROPERLY INSTALL WATER SERVICE SO THAT ENOUGH SLACK IS IN THE SERVICE TO PROTECT AGAINST PULLOUT PROBLEMS.

WATER MAINS SHALL BE TAPPED AT A 45 DEGREE ANGLE FROM THE HORIZONTAL CENTER LINE OF THE WATER MAIN ON THE SAME SIDE OF THE PIPE AS THE WATER METER.

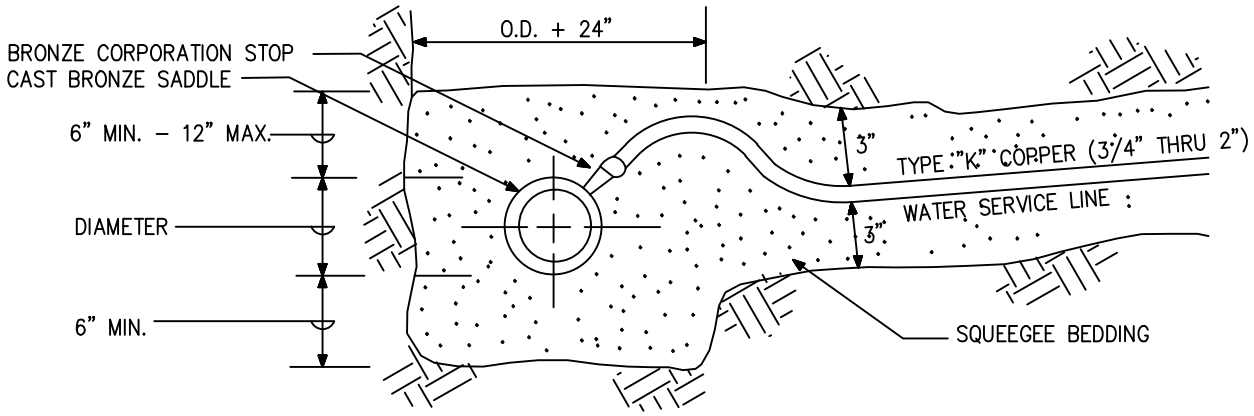
TAPPING MAINS MAY REQUIRE DIGGING OUT BEDDING MATERIAL AND CUTTING OR REMOVING PART OF THE CORROSION PROTECTIVE WRAPPING. AFTER THE TAPS ARE MADE, THE WRAP SHALL BE REPAIRED OR REPLACED BY THE INSTALLING RESPONSIBLE PARTY IN SUCH A MANNER AS TO PROTECT BOTH THE PIPE AND THE MAIN.

SERVICE TAPS SHALL HAVE A MINIMUM SEPARATION OF TWENTY FOUR (24) INCHES AND BE NO CLOSER THAN TWENTY-FOUR (24) INCHES TO A COUPLING OR PIPE JOINT OR FITTING. NO MORE THAN FOUR (4) SERVICE TAPS SHALL BE PERMITTED ON ANY ONE (1) JOINT OF PIPE.

ALL SERVICE PIPE MUST BE LAID AT LEAST FOUR AND ONE-HALF (4½) FEET BELOW THE ESTABLISHED GRADE OF THE STREET IN WHICH THEY WILL BE LAID AND ALL OTHER PLACES AT LEAST FOUR AND ONE-HALF (4½) FEET BELOW THE SURFACE OF THE GROUND.

IF AFTER A SERVICE PIPE HAS BEEN INSTALLED, THE GRADE OF THE SURFACE OF THE GROUND IS LOWERED, THE SERVICE PIPE MUST BE LOWERED TO PROVIDE AT LEAST FOUR AND ONE-HALF (4½) FEET OF COVER.

WATER SERVICE LOCATIONS SHALL BE MARKED WITH A "V" ON THE CURB. SANITARY SEWER SERVICE LOCATIONS SHALL BE MARKED WITH AN "X" ON THE CURB. MARKINGS SHALL BE NEATLY STAMPED, CHISELED, OR SAWCUT, NOT PAINTED.



NOTE: BEDDING MATERIAL SHALL BE SQUEEGEE NON-FRACTURED ROUNDED AND SHALL CONFORM TO THE FOLLOWING LIMITS WHEN TESTED BY MEANS OF LABORATORY SIEVES:

SIEVE SIZE	TOTAL % PASSING BY WEIGHT
3/8- INCH	100
NO. 200	0-5

N.T.S.

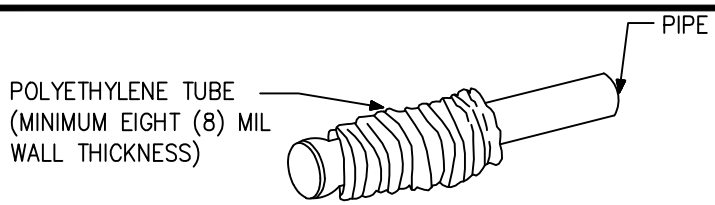
CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

3/4" THRU 2" SERVICE CONNECTION DETAIL

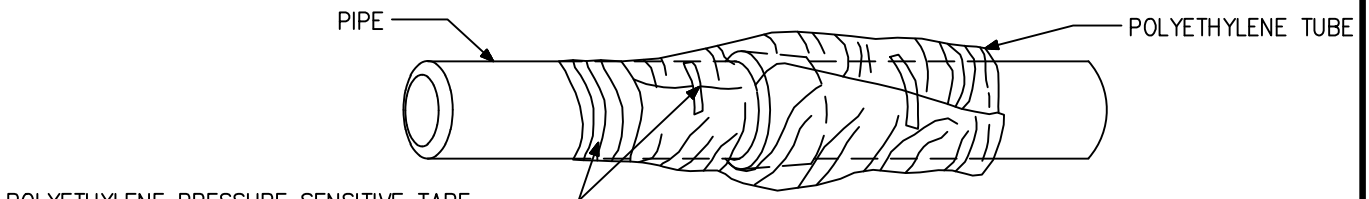
ISSUED:
APRIL 1992
REVISED:
APRIL 2010

DRAWING NO.
200-14

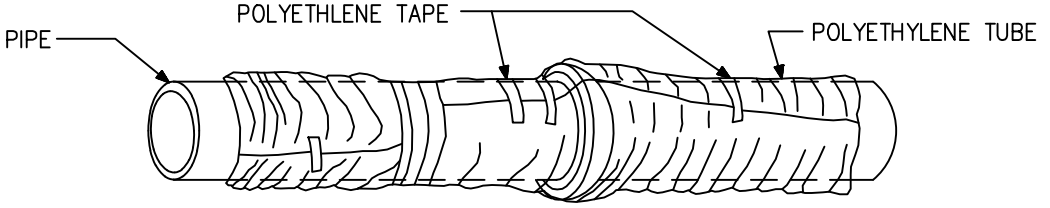
FOR D.I.P.:



STEP 1



STEP 2



STEP 3

NOTE: POLYETHYLENE ENCASEMENT MATERIAL SHALL BE MANUFACTURED IN ACCORDANCE WITH CURRENT ASTM STANDARD. THE RAW MATERIAL USED TO MANUFACTURE POLYETHYLENE FILM SHALL BE TYPE I, CLASS A, GRADE E-1 IN ACCORDANCE WITH CURRENT ASTM STANDARD.

STEP 1 – PLACE TUBE OF POLYETHYLENE MATERIAL ON PIPE PRIOR TO LOWERING IT INTO TRENCH.

STEP 2 – PULL THE TUBE OVER THE LENGTH OF THE PIPE. TAPE TUBE TO PIPE AT JOINT. FOLD MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH TAPE TO HOLD THE PLASTIC TUBE IN PLACE.

STEP 3 – OVERLAP FIRST TUBE WITH ADJACENT TUBE AND SECURE WITH PLASTIC ADHESIVE TAPE. THE POLYETHYLENE TUBE MATERIAL COVERING THE PIPE SHALL BE LOOSE. EXCESS MATERIAL SHALL BE NEATLY DRAWN UP AROUND THE PIPE BARREL, FOLDED ON TOP OF PIPE AND TAPED IN PLACE.

FOR STEEL:

BITUMINOUS MATERIAL IS TO BE USED FOR CORROSION PROTECTION ON ALL STEEL PIPES.

SOIL RESISTIVITY TESTS:

SOIL RESISTIVITY TESTS AND/OR ANY OTHER SOIL TESTS ARE REQUIRED WITH THE UTILIZATION OF METAL PIPING OR AT THE SOLE DISCRETION OF THE DEVELOPMENT ENGINEERING MANAGER. OTHER MEANS OF CORROSION PROTECTION MUST BE SPECIFICALLY APPROVED BY THE DEVELOPMENT ENGINEERING MANAGER. THE RESPONSIBLE PARTY SHALL INCUR THE COSTS OF ALL SOIL TESTING AS REQUIRED.

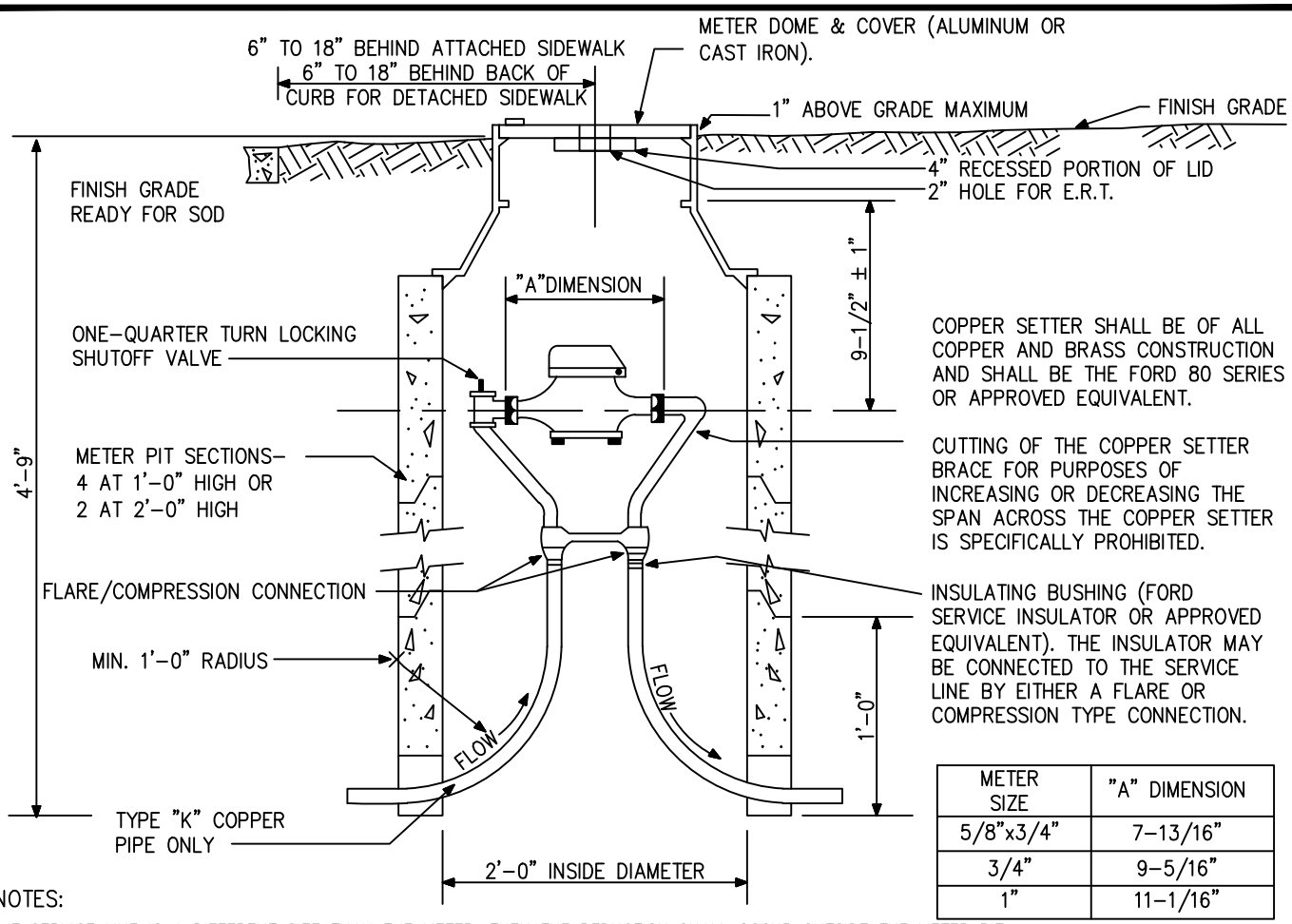
N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

CORROSION PROTECTION DETAIL

ISSUED:
APRIL 1992
REVISED:
APRIL 2010

DRAWING NO.
200-15



METER SIZE	"A" DIMENSION
5/8"x3/4"	7-13/16"
3/4"	9-5/16"
1"	11-1/16"

NOTES:

1. IF SERVICE LINE IS A DIFFERENT SIZE THAN THE METER, THEN THE REDUCTION SHALL OCCUR OUTSIDE THE METER PIT.
2. WATER METER PITS, COPPER SETTERS, DOMES, AND COVERS SHALL BE INSTALLED BY THE RESPONSIBLE PARTY. THE WATER METER SHALL BE INSTALLED BY THE CITY. METER PITS MAY NOT BE INSTALLED IN ANY TYPE OF VEHICULAR OR PEDESTRIAN TRAFFIC ZONE WITHOUT THE APPROVAL OF THE DEVELOPMENT ENGINEERING MANAGER. IN THE EVENT A METER PIT IS INSTALLED WITHIN A VEHICULAR OR PEDESTRIAN TRAFFIC ZONE, A TRAFFIC RATED DOME SHALL BE INSTALLED BY THE RESPONSIBLE PARTY AT THE SOLE EXPENSE OF THE RESPONSIBLE PARTY.
3. IF INSTALLATION IN A RESIDENTIAL DRIVE IS PERMITTED, THE CONCRETE JOINT PATTERN SHALL CONSIST OF JOINTS ALLOWING THE LEAST AMOUNT OF DAMAGE TO THE SURROUNDING CONCRETE AS POSSIBLE.
4. METER PITS SHALL BE CONSTRUCTED OF CONCRETE OR PLASTIC. PLASTIC METER PITS SHALL BE MID-STATES PLASTIC, MODEL NO. MS202448B OF DFW PLASTICS, MODEL NO. 2048 B OR EQUAL AS APPROVED BY THE DEVELOPMENT ENGINEERING MANAGER. PLASTIC METER PITS SHALL MEET SAME DIMENSION REQUIREMENTS AS THE CONCRETE PITS. THE INTERIOR OF THE PLASTIC METER PITS SHALL ALSO BE WHITE.
5. METER PITS GRADE ADJUSTMENT SHALL BE MADE UTILIZING CONCRETE RINGS. THE TRENCH FLOOR UNDER THE CONCRETE RINGS SHALL BE COMPACTED EARTH. COPPER SERVICE PIPE ENTERING AND LEAVING THE PIT BENEATH THE BOTTOM CONCRETE RING SHALL BE OF SUFFICIENT LENGTH SO AS TO MEET THE DEPTH SPECIFICATIONS WHEN THE COPPER SETTER IS INSTALLED. THE PIT SHALL NOT BEAR ON THE SERVICE PIPE. UNDER NO CIRCUMSTANCES SHALL THE SERVICE PIPE ENTER AND EXIT ON THE SAME SIDE OF THE PIT.
6. WATER METER PIT INSTALLATIONS SHALL NOT BE GIVEN FINAL INSPECTION OR THE WATER METER INSTALLED UNTIL FINAL GRADING HAS BEEN COMPLETED. AFTER THE CITY HAS MADE THE FINAL INSPECTION, ANY NECESSARY GRADE ADJUSTMENTS TO THE PIT SHALL BE THE RESPONSIBILITY OF THE RESPONSIBLE PARTY.
7. THE USE OF CONCRETE RISER RINGS FOR THE PURPOSE OF DOME HEIGHT ADJUSTMENT IS PERMITTED PROVIDED SPECIFICATIONS ARE MET AFTER THE INSTALLATION IS COMPLETED (FOR PLASTIC METER PITS RISERS SHOULD BE PER MANUFACTURER'S RECOMMENDATION). THE USE OF BROKEN RINGS OR WOOD SHIMS UNDER THE DOME IS SPECIFICALLY PROHIBITED.
8. GALVANIZED PIPE AND FITTINGS ARE SPECIFICALLY PROHIBITED.
9. WATER SERVICE LOCATIONS SHALL BE MARKED WITH A "V" ON THE CURB. SANITARY SEWER SERVICE LOCATIONS SHALL BE MARKED WITH AN "X" ON THE CURB. MARKINGS SHALL BE NEATLY STAMPED, CHISELED, OR SAWCUT, NOT PAINTED.

N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

STANDARD METER PIT DETAIL 5/8" X 3/4", 3/4" AND 1" METERS ONLY

ISSUED:
APRIL 1992
REVISED:
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DRAWING NO.
200-16

SIZE	LAYING LENGTH
1–1/2"	13–1/2"
2" COMPOUND	15–1/2"
2" TURBINE	10–3/4"

WATER SERVICE SADDLES SHALL BE CAST BRONZE CASTING WITH DOUBLE SILICONE BRONZE STRAPS, SERIES 183–0 AS MANUFACTURED BY R. H. BAKER AND COMPANY; TYPE 323 BY SMITH–BLAIR INC., OR AN APPROVED EQUIVALENT.

CORPORATION STOPS SHALL BE AWWA TAPER THREAD TO COPPER CONNECTION OF PACK JOINT AND SHALL BE A FORD TYPE F600 OR AN APPROVED EQUAL. TAPS SHALL BE MADE BY THE RESPONSIBLE PARTY.

A CURB STOP OR VALVE CONFORMING TO THE FOLLOWING STANDARDS SHALL BE INSTALLED ON EVERY COMMERCIAL SERVICE LARGER THAN ONE (1) INCH BETWEEN THE WATER MAIN AND THE METER WHICH IS AT A POINT AT OR NEAR THE PROPERTY LINE.

CURB STOPS SHALL BE COMPRESSION TO COMPRESSION CONNECTIONS AND SHALL BE FORD BALL VALVES, B44–666M (ONE AND ONE–HALF (1–1/2) INCHES) OR B44–777M (TWO (2) INCHES) OR APPROVED EQUAL.

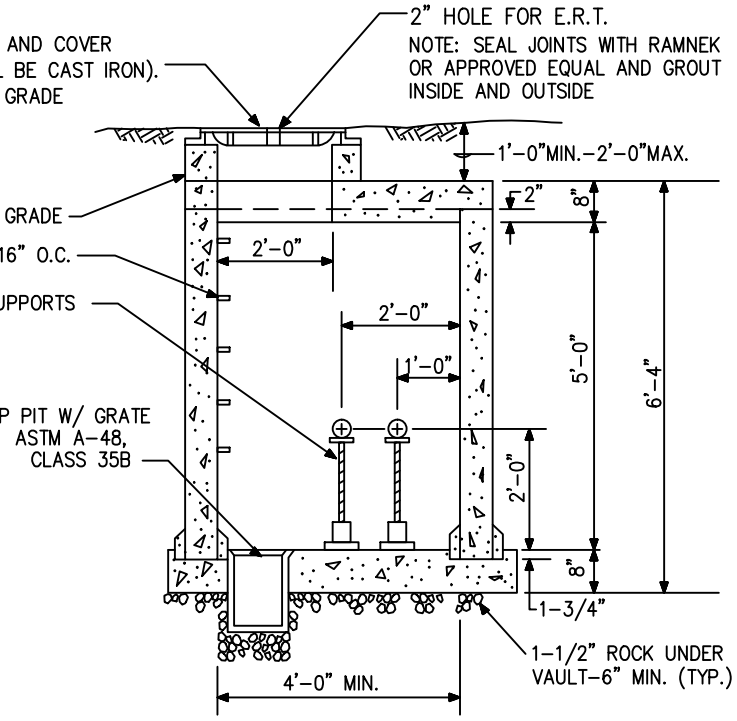
CURB STOP SERVICE BOXES SHALL BE A CAST IRON BOX, MINNEAPOLIS PATTERN, EXTENSION TYPE. THE CURB STOP BOX SHALL BE CENTERED OVER THE CURB STOP VALVE AND IN A VERTICAL POSITION. THE TOP LID OF THE CURB STOP BOX SHALL BE INSTALLED A MAXIMUM OF ONE (1) INCH ABOVE THE FINAL GRADE.

PIPE SHALL BE TYPE K CLASS, RIGID COPPER PIPE. THE METER VAULT PIPING SHALL BE OF THE SAME INSIDE DIAMETER AS THE METER ORIFICE. ANY SERVICE PIPE MATERIAL CHANGES SHOULD OCCUR OUTSIDE THE METER VAULT ON THE OUTLET SIDE.

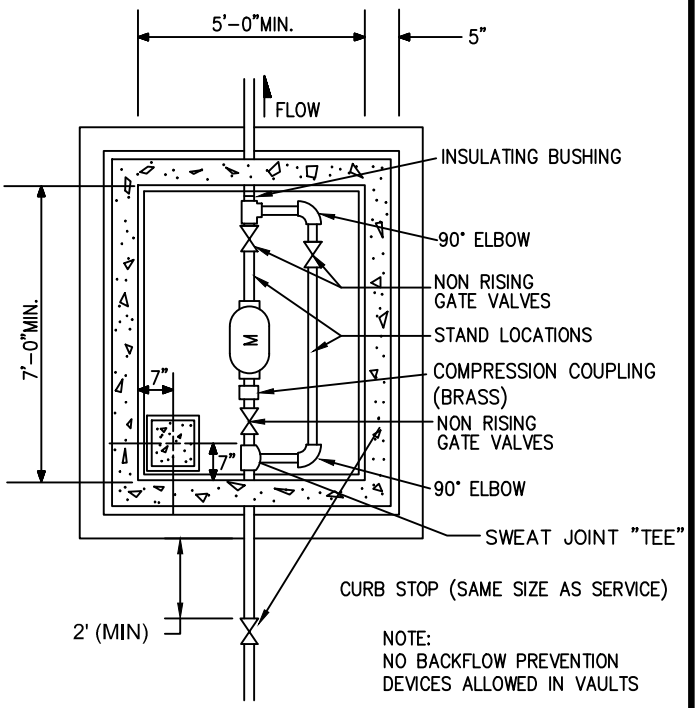
JOINTS SHALL BE OF A SWEAT COPPER DESIGN. SOLDER USED IN CONNECTION OF THE JOINTS SHALL BE OF A LEAD CONTENT OF 0.20 OR LESS.

GATE VALVES SHALL BE AWWA APPROVED GATE VALVES OF BRASS CONSTRUCTION. THE VALVES SHALL BE COUNTERCLOCKWISE OPEN. REFER TO SUBSECTION 204.1(D) OF THESE STANDARDS AND SPECIFICATIONS. VALVES LOCATED IN VAULTS SHALL HAVE HANDWHEELS IN LIEU OF A TWO (2) INCH SQUARE OPERATING NUT.

WATER SERVICE LOCATIONS SHALL BE MARKED WITH A "V" ON THE CURB, AND SEWER SERVICE SHALL BE MARKED WITH AN "X". MARKINGS SHALL BE NEATLY STAMPED, CHISELED, OR SAWCUT, AND SHALL NOT BE PAINTED.



VAULT PROFILE



VAULT PLAN

N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

STANDARD 1–1/2" AND 2" METER SETTING DETAIL

ISSUED:
APRIL 1992
REVISED:
APRIL 2010

DRAWING NO.
200–17A

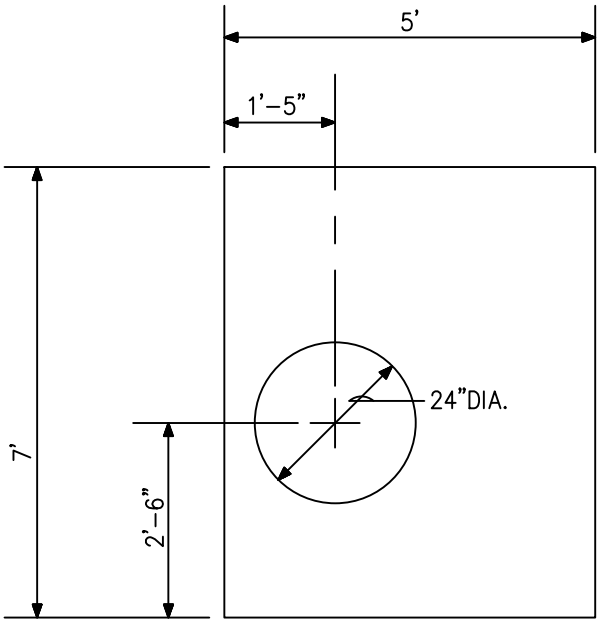
1. METER VAULT LIDS AND COVER SHALL BE CAST IRON.

2. PIPE SHALL BE TYPE K CLASS, RIGID COPPER PIPE. THE METER VAULT PIPING SHALL BE OF THE SAME INSIDE DIAMETER AS THE METER ORIFICE. ANY SERVICE PIPE MATERIAL CHANGES MUST OCCUR OUTSIDE THE METER VAULT ON THE OUTLET SIDE. JOINTS SHALL BE OF SWEAT COPPER DESIGN. SOLDER USED IN CONNECTION OF THE JOINTS SHALL BE OF A LEAD CONTENT OF 0.20 OR LESS. THE OUTLET SIDE OF THE COPPER SETTERS SHALL BE ISOLATED FROM TE SERVICE LINE WITH A FORD SERVICE INSULATOR OR APPROVED EQUIVALENT.

3. GATE VALVES SHALL BE AWWA APPROVED GATE VALVES OF BRASS CONSTRUCTION. THE VALVE STEMS SHALL BE OF NON-RISING DESIGN. VALVES SHALL BE COUNTERCLOCKWISE OPEN, AND SHALL HAVE HANDWHEELS IN LIEU OF A TWO (2) INCH SQUARE OPERATING NUT. VALVES SHALL BE INSTALLED BOTH UPSTREAM AND DOWNSTREAM OF THE WATER METER WITHIN THE VAULT.

4. BYPASS PIPING SHALL BE INSTALLED ON THESE SERVICES TO FACILITATE REMOVAL OF THE WATER METER WITHOUT DISCONTINUATION OF SERVICE. A GATE VALVE SHALL BE INSTALLED ON THE BYPASS LINE. THE CONNECTION TO THE METER SERVICE LINE SHALL BE MADE BY MEANS OF A SWEAT JOINT "TEE" INSIDE THE VAULT. CONNECTIONS SHALL BE UPSTREAM OF THE VALVE ON THE INLET SIDE OF THE WATER METER AND DOWNSTREAM ON THE OUTLET SIDE.

5. BRASS UNIONS OF A COMPRESSION TYPE SEALING DESIGN SHALL BE INSTALLED BETWEEN THE GATE VALVE AND THE WATER METER, EITHER UPSTREAM OR DOWNSTREAM OF THE METER TO FACILITATE REMOVAL OF THE WATER METER FROM THE SERVICE LINE.



ROOF SLAB

N.T.S.

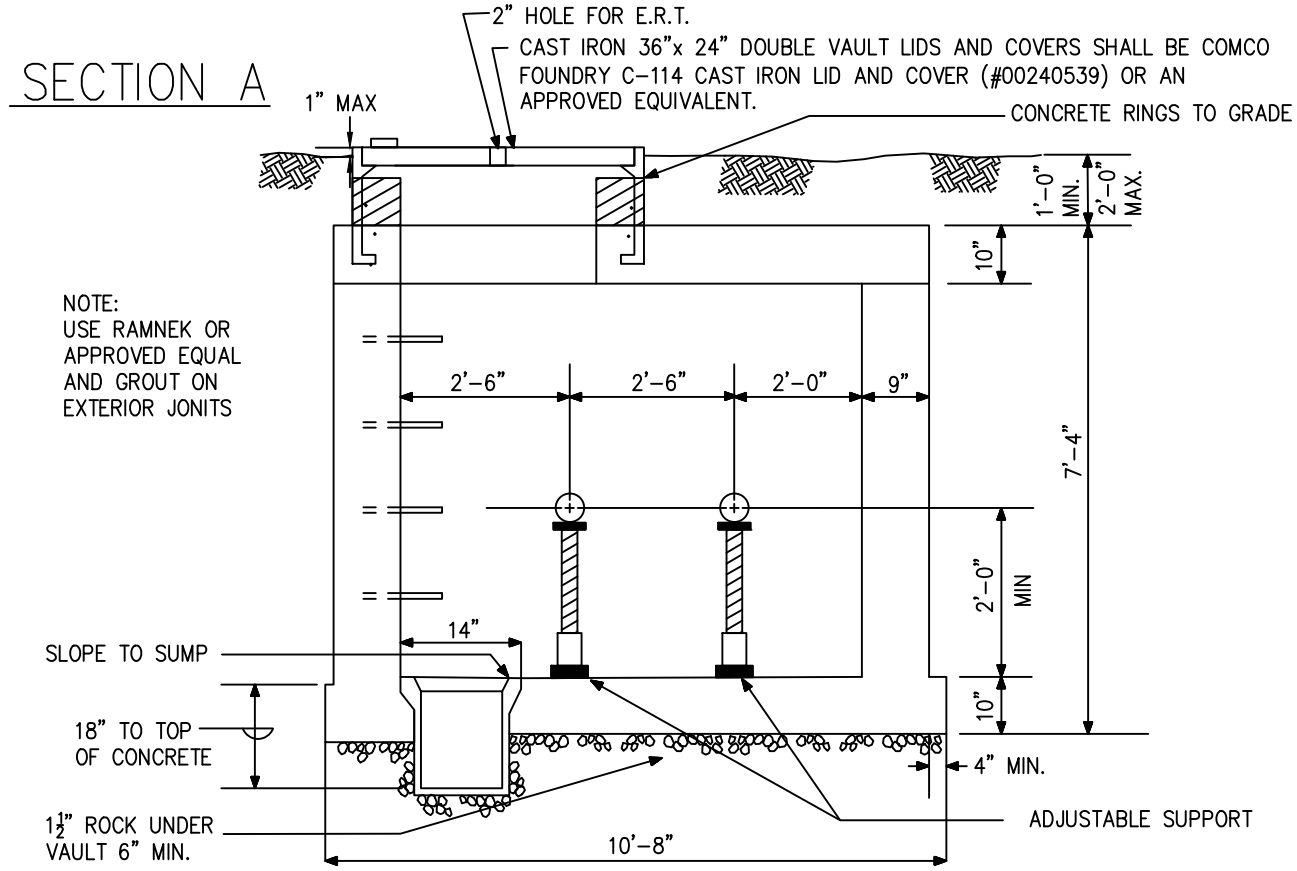
CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

STANDARD 1-1/2" & 2" METER SETTING ROOF SLAB DETAIL

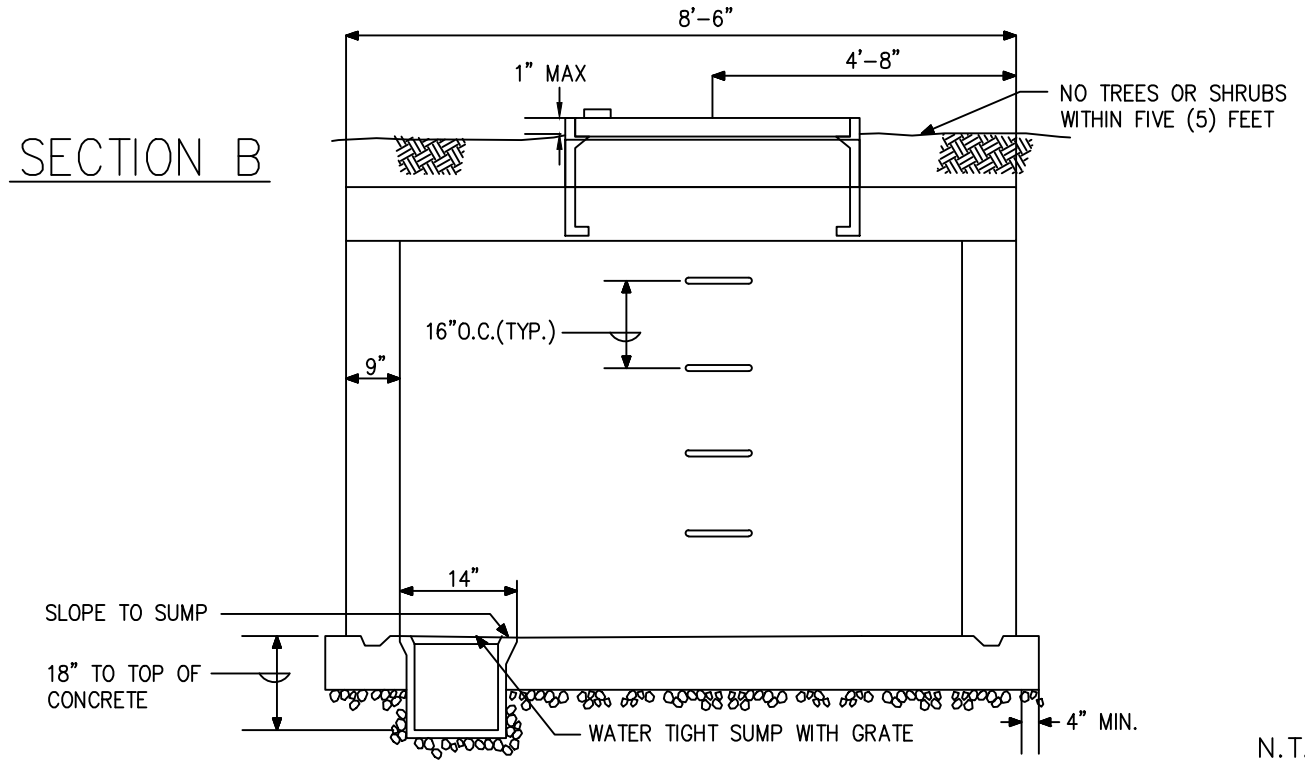
ISSUED:
APRIL 1992
REVISED:
APRIL 2010

DRAWING NO.
200-17B

SECTION A



SECTION B



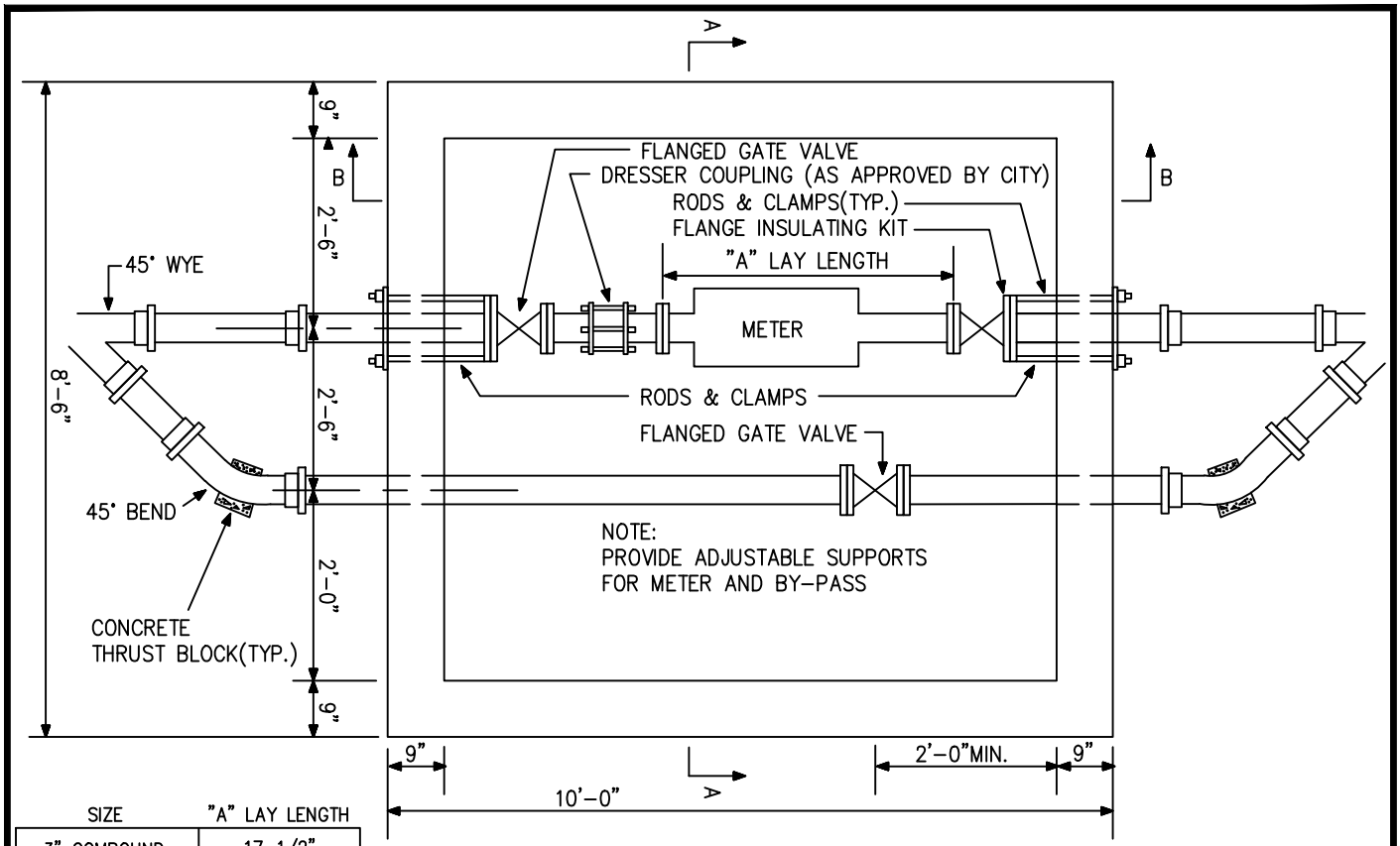
N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

STANDARD 3" AND 4" METER SETTING DETAIL

ISSUED:
APRIL 1992
REVISED:
APRIL 2010

DRAWING NO.
200-18A



SIZE	"A" LAY LENGTH
3" COMPOUND	17-1/2"
3" TURBINE	12-1/4"
4" COMPOUND	20-1/4"
4" TURBINE	14-1/4"

1. WATER SERVICE SADDLES SHALL BE CAST BRONZE CASTING WITH DOUBLE SILICONE BRONZE STRAPS, SERIES 183-0 AS MANUFACTURED BY R. H. BAKER AND COMPANY; TYPE 323 BY SMITH-BLAIR INC., OR AN APPROVED EQUIVALENT.

2. CURB STOP GATE VALVES SHALL MEET AWWA SPECIFICATIONS AND BE CAPABLE OF WITHSTANDING 200 PSI WORKING PRESSURE. THEY SHALL BE OF BRONZE MOUNTED, ALL CAST IRON BODY CONSTRUCTION. THE VALVES AND OPERATING STEMS SHALL BE OF A NON-CORROSIVE CONSTRUCTION, COUNTERCLOCKWISE OPEN. GATE VALVES LARGER THAN THREE (3) INCHES IN SIZE SHALL BE WEDGE DISC TYPE. THE VALVE SHALL BE INSTALLED IN THE SERVICE PIPE A MAXIMUM OF TWO (2) FEET UPSTREAM OF THE METER VAULT WALL THROUGH WHICH THE INCOMING SERVICE PIPE ENTERS.

3. CURB STOP SERVICE BOXES SHALL BE A CAST IRON BOX, MINNEAPOLIS PATTERN, EXTENSION TYPE. THE CURB STOP BOX SHALL BE CENTERED OVER THE CURB STOP VALVE AND IN A VERTICAL POSITION. THE TOP LID OF THE CURB STOP BOX SHALL BE INSTALLED A MAXIMUM OF ONE (1) INCH ABOVE THE FINAL GRADE.

4. PIPING INSIDE THE VAULT FOR THREE (3) INCH AND FOUR (4) INCH METER SERVICES SHALL BE OF DUCTILE IRON, FLANGE JOINT DESIGN ONLY. THE METER VAULT PIPING SHALL BE OF THE SAME SIZE AS THE WATER METER ORIFICE, BOTH ENTERING AND LEAVING THE VAULT.

5. GATE VALVES INSTALLED SHALL MEET ALL AWWA SPECIFICATIONS AND BE CAPABLE OF WITHSTANDING 200 PSI WORKING PRESSURE. THE VALVES SHALL BE COUNTERCLOCKWISE OPEN AND OF A NON-RISING STEM TYPE CONSTRUCTION WITH HAND WHEELS IN LIEU OF SQUARE OPERATING NUTS. REFER TO SUBSECTION 204.1(D) OF THESE STANDARDS AND SPECIFICATIONS.

6. CONNECTION TO THE METER SERVICE FOR THE BYPASS MAY BE MADE BY MEANS OF A "WYE" CONNECTION OUTSIDE THE VAULT, IF NECESSARY, ALTHOUGH THE GATE VALVE MUST BE INSTALLED INSIDE THE METER VAULT.

7. INSTALLATION OF METER SHALL BE PERFORMED BY A LICENSED PLUMBER.

8. WATER SERVICE LOCATIONS SHALL BE MARKED WITH A "V" ON THE CURB, AND SEWER SERVICE SHALL BE MARKED WITH AN "X". MARKINGS SHALL BE NEATLY STAMPED, CHISELED, OR SAWCUT, AND SHALL NOT BE PAINTED.

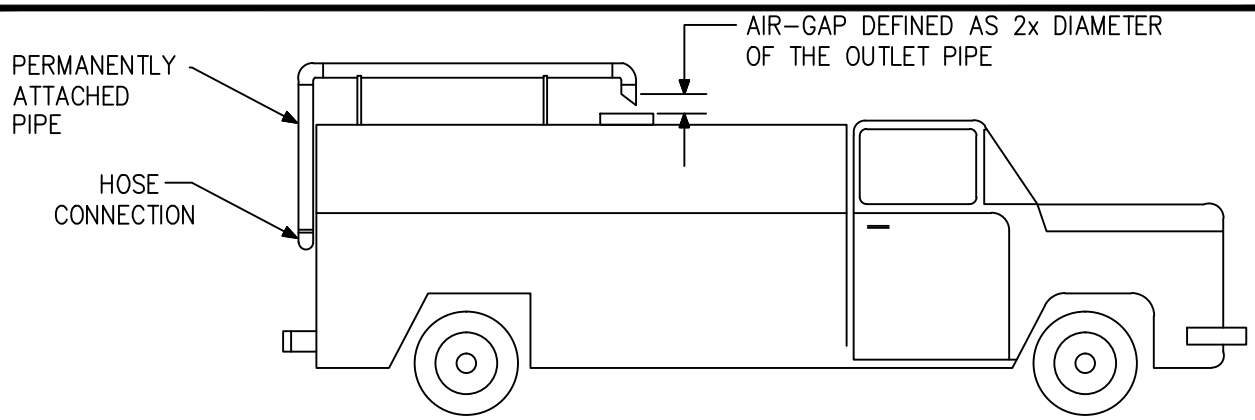
N.T.S.

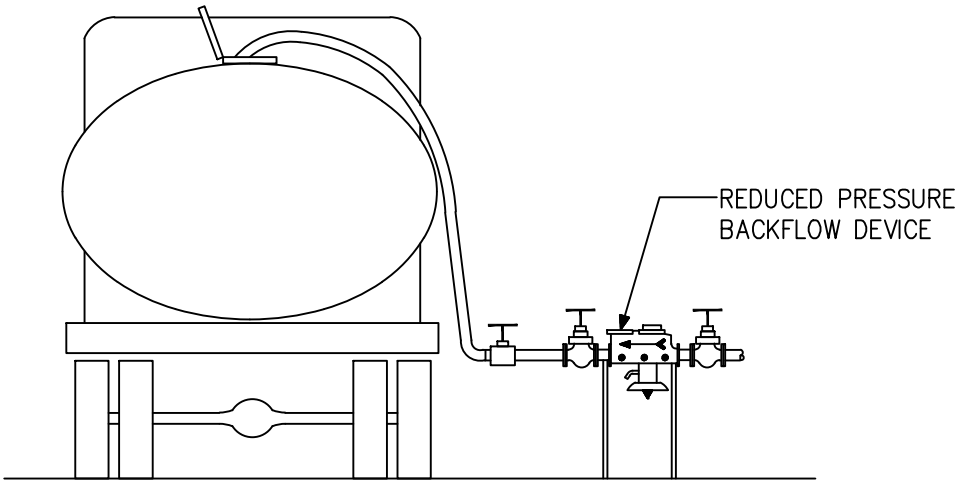
CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

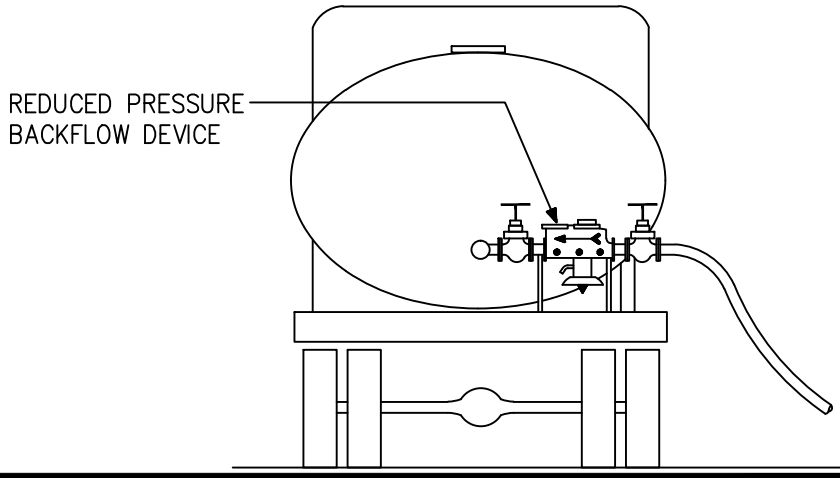
STANDARD 3" AND 4" METER SETTING DETAIL

ISSUED:
APRIL 1992
REVISED:
APRIL 2010

DRAWING NO.
200-18B







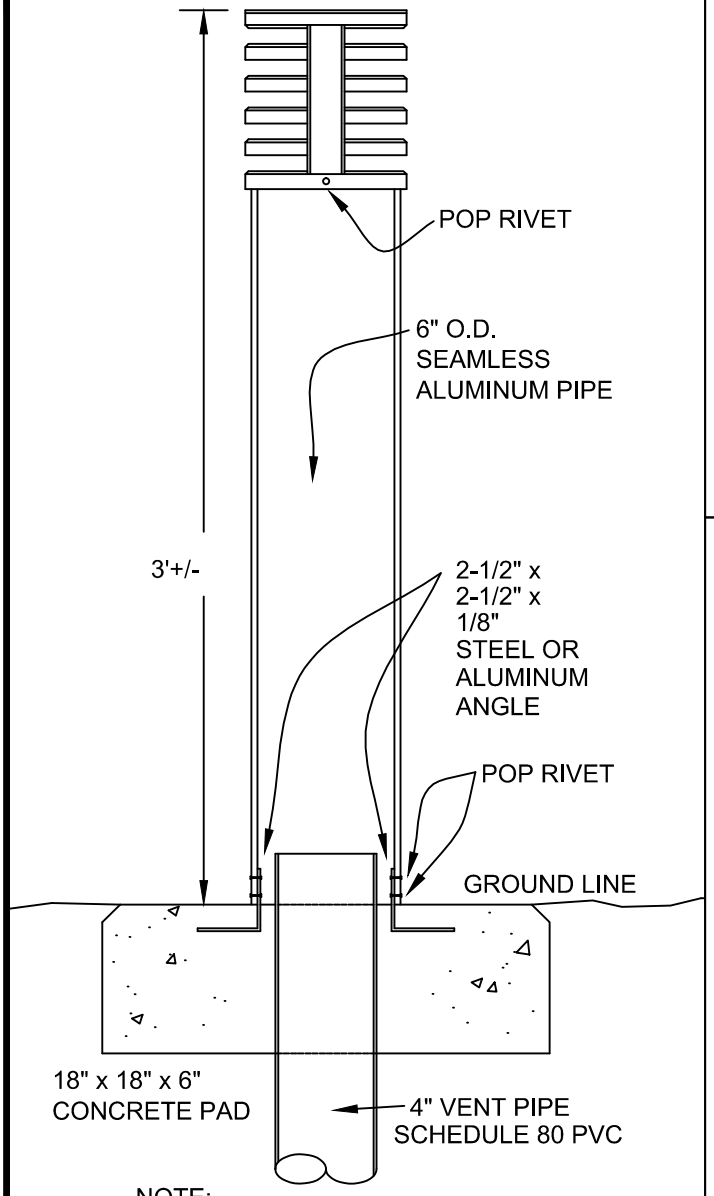
N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

APPROVED METHODS OF FILLING PORTABLE SPRAY AND CLEANING EQUIPMENT

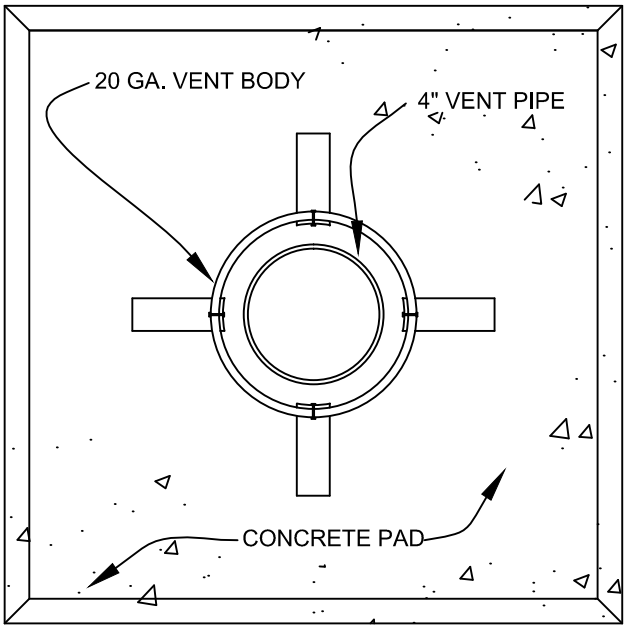
ISSUED:
APRIL 1992
REVISED:
APRIL 2010

DRAWING NO.
200-19

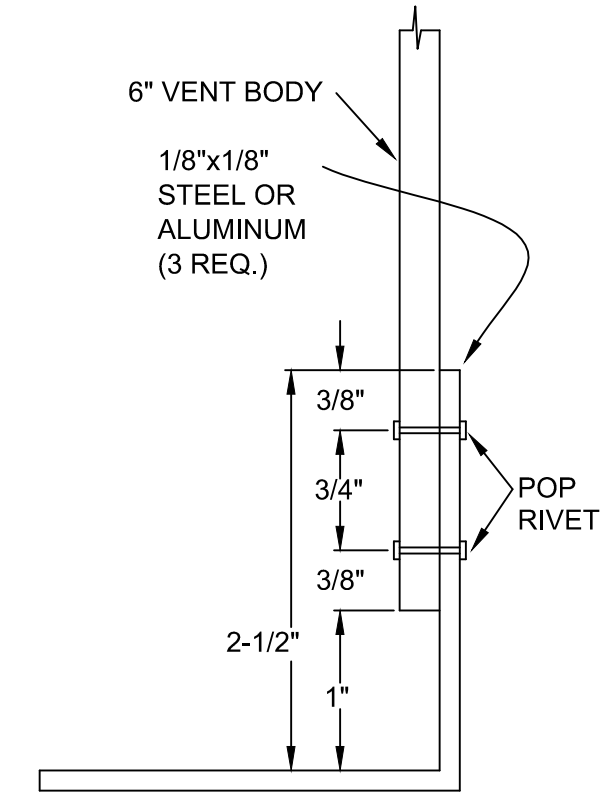


NOTE:
COLOR SHALL BE FLAT BLACK

ROUND VENT SCREEN



BASE DETAIL



STEEL OR ALUMINUM ANGLE DETAIL

N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

TYPICAL AIR VENT DETAIL

ISSUED:
JANUARY 2005
REVISED:
APRIL 2010

DRAWING NO.
200–20