

TYPICAL TRENCH SECTION

TRENCH WIDTH

PIPE DIAMETER	MINIMUM WIDTH	MAXIMUM WIDTH
4"	1'-4"	2'-4"
6"	1'-6"	2'-6"
8"	1'-8"	2'-8"
12"	2'-0"	3'-0"
16"	2'-4"	3'-4"
20"	2'-8"	3'-8"
24"	4'-0"	5'-0"

NOTES:

- TRENCHES 5 FT DEEP OR GREATER REQUIRE A "PROTECTIVE SYSTEM" AS DEFINED BY OSHA. TRENCHES 20 FT DEEP OR GREATER REQUIRE THAT THE PROTECTIVE SYSTEM BE DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER.
- OSHA'S STANDARDS REQUIRE THAT TRENCHES BE INSPECTED DAILY AND AS CONDITIONS CHANGE BY A "COMPETENT PERSON" (AS DEFINED BY OSHA) PRIOR TO WORKER ENTRY TO ENSURE ELIMINATION OF EXCAVATION HAZARDS. FOR ADDITIONAL INFORMATION REGARDING OSHA REQUIREMENTS CALL 1-800-321-OSHA.
- MINIMUM COVER OVER PIPE TO BE BELOW OFFICIAL STREET GRADE.
- FOR ASPHALT PATCH DEPTH REFER TO THE REQUIREMENTS IN CHAPTER 9 OF THE STANDARDS AND SPECIFICATIONS.
- FOR PIPE BEDDING REQUIREMENTS REFER TO CHAPTER 9 OF THE STANDARDS AND SPECIFICATIONS.
- PIPE BEDDING SHALL BE PLACED AGAINST UNDISTURBED SOIL IN THE TRENCH BOTTOM, HOWEVER, WHERE ADVERSE SOIL IS ENCOUNTERED IN THE TRENCH BOTTOM, SOIL SHALL BE REMOVED AND TRENCH STABILIZATION MATERIAL SHALL BE PLACED IN ACCORDANCE WITH THE RECOMMENDATIONS OF A GEOTECHNICAL ENGINEER.
- ALL RECLAIMED PIPE SHALL BE PURPLE. REFER TO CHAPTER 11 FOR ACCEPTABLE MATERIAL.
- FOR THRUST BLOCK REQUIREMENTS REFER TO CHAPTER 3 OF THE STANDARDS AND SPECIFICATIONS.

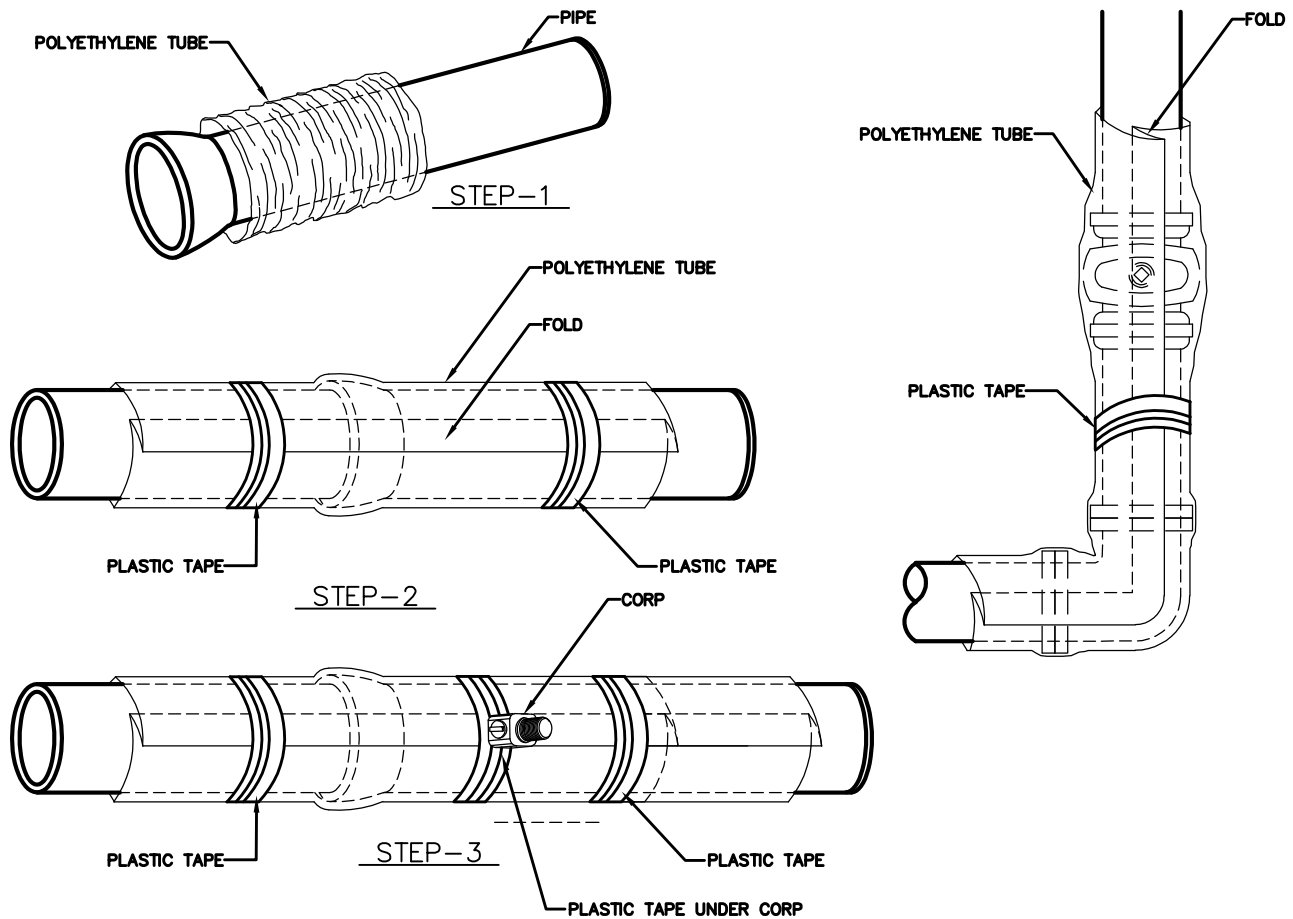


CITY of WESTMINSTER
4800 WEST 92ND AVENUE
WESTMINSTER, COLO. 80031

**TYPICAL TRENCH SECTION
RECLAIMED PIPE PROTECTION**

DATE: JANUARY 2020

SHEET R1



FIELD INSTALLATION—POLYETHYLENE WRAP

- STEP-1 PLACE TUBE OF POLYETHYLENE MATERIAL AROUND PIPE PRIOR TO LOWERING PIPE 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 THE PIPE AND TAPED IN PLACE.

NOTE: POLYETHYLENE MUST MEET CITY STANDARDS AND BE PURPLE IN COLOR.

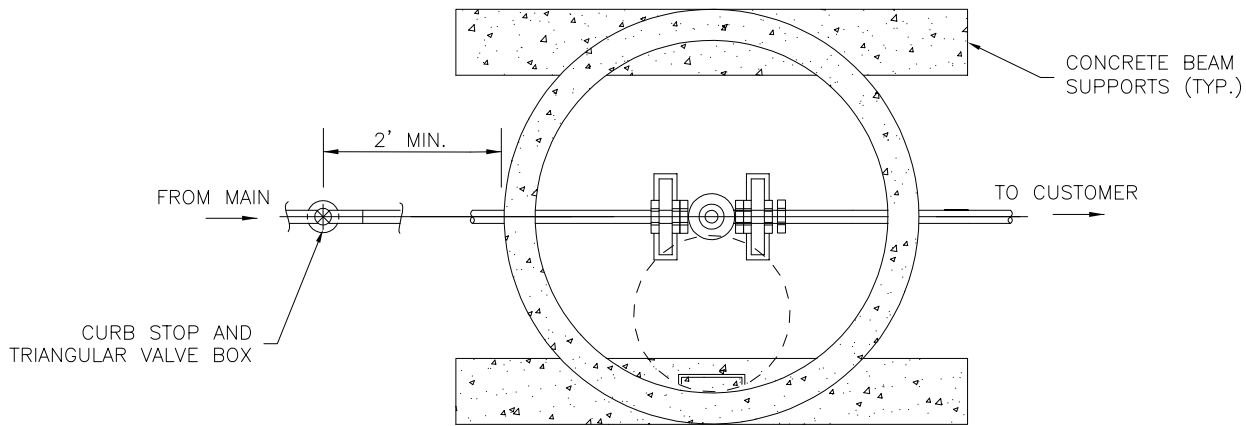


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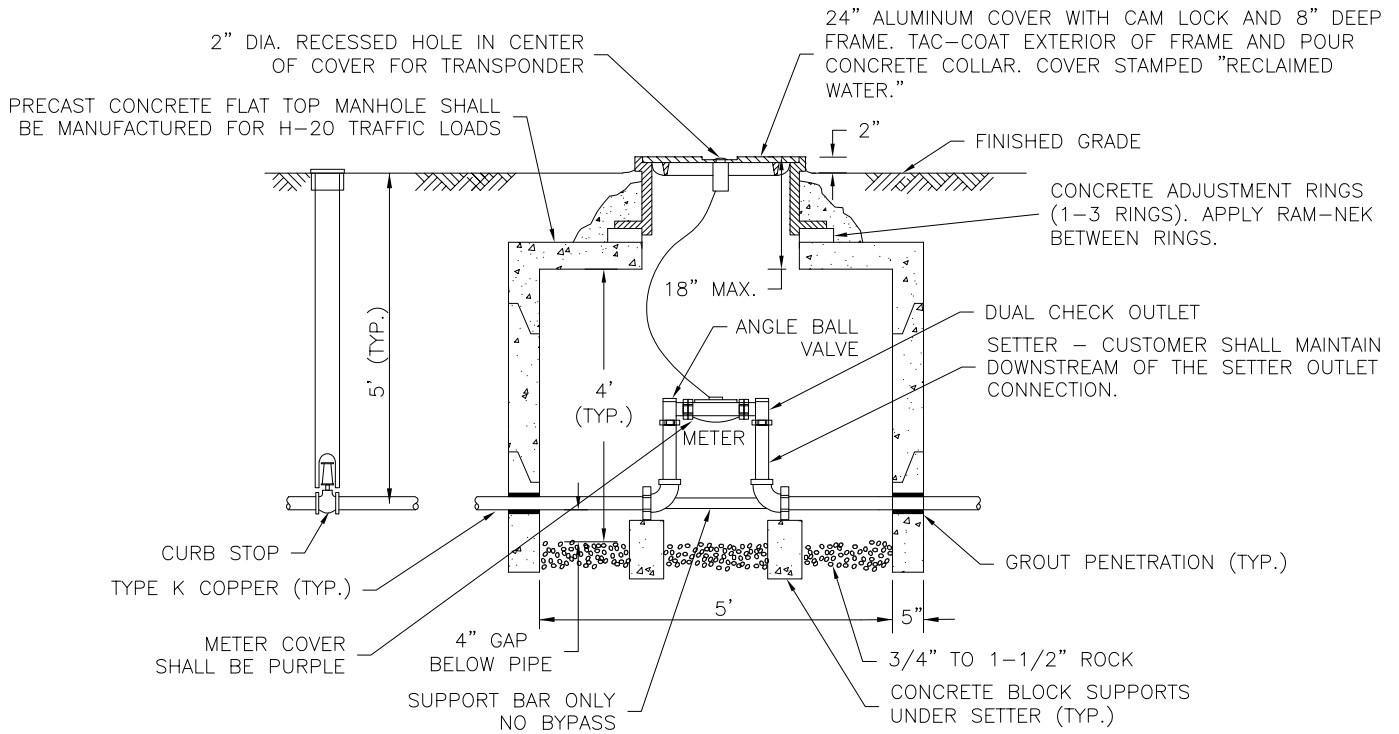
POLYETHYLENE WRAP FOR
 RECLAIMED PIPE & FITTINGS

DATE: JANUARY 2020

SHEET R2



PLAN VIEW



ELEVATION SECTION

NOTES:

1. FOR APPROVED MANUFACTURERS AND MODEL NUMBERS OF FITTINGS, REFER TO CHAPTER 11 OF THE CITY STANDARDS.
2. METER MANHOLE SHALL BE SURVEYED SO THAT THE COVER CAN BE PROPERLY LOCATED 2" ABOVE FINISHED GRADE PRIOR TO BACKFILLING.
3. ONLY COMPRESSION FITTINGS WILL BE ALLOWED ON COPPER SERVICE PIPES.
4. MANHOLE STEPS SHALL BE PLACED 12" ON CENTER AND 18" MAX. FROM THE TOP OF THE FRAME TO THE FIRST STEP.
5. METER MANHOLE AND CURB STOP SHALL BE LOCATED IN A SOD OR MULCH AREA WITH A 10' MIN. WIDTH UTILITY EASEMENT. NO TREES, SHRUBS OR STRUCTURES SHALL BE LOCATED IN THE EASEMENT.
6. THIS MANHOLE IS NOT INTENDED FOR INSTALLATION IN STREETS, DRIVEWAYS OR CONCRETE AREAS.
7. SERVICE LINES UP TO THE METER SHALL BE INSTALLED PERPENDICULAR TO THE WATER MAIN.
8. A BACKFLOW PREVENTION DEVICE INSTALLED DOWNSTREAM OF THE METER PIT SHALL BE USED IN CONJUNCTION WITH THIS METER PIT.

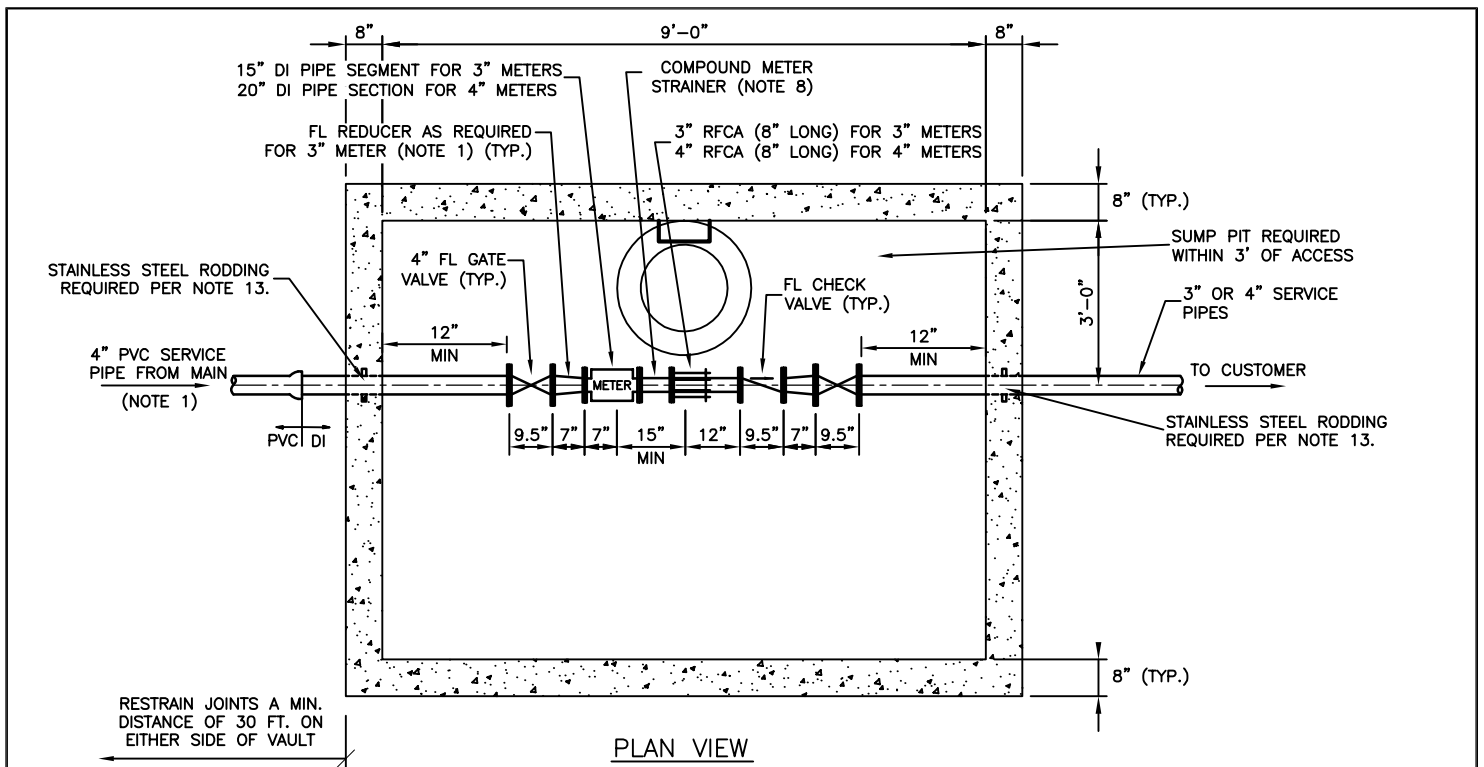


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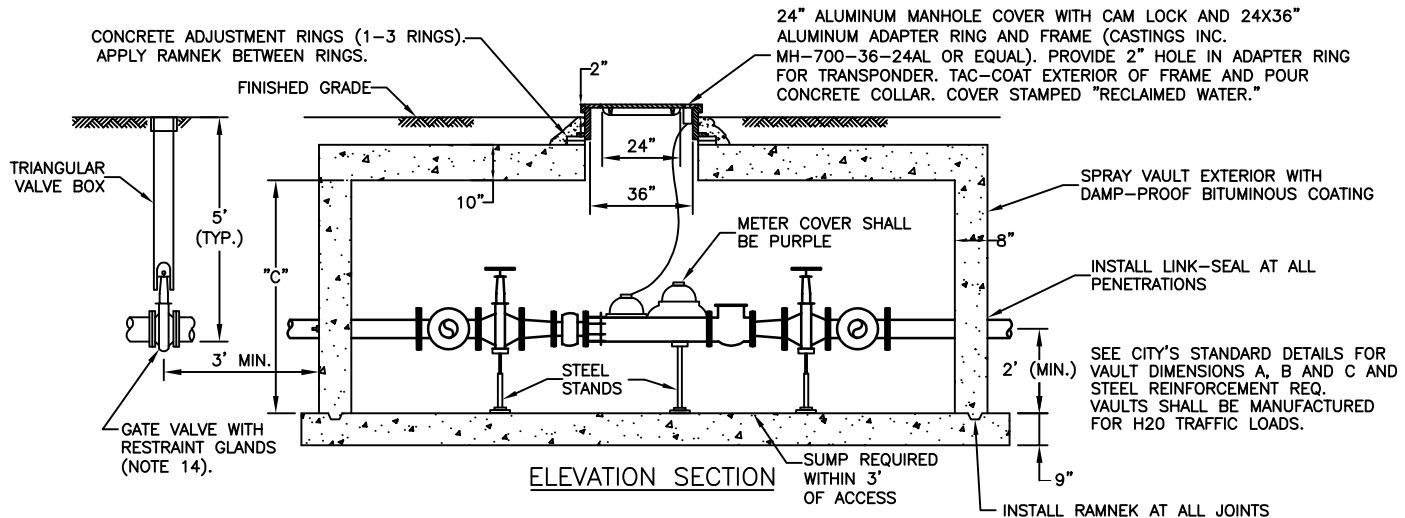
1-1/2" AND 2" RECLAIMED
 IRRIGATION METER SETS

DATE: JANUARY 2020

SHEET R3



PLAN VIEW



ELEVATION SECTION

NOTES:

1. FOR ALL 3" AND 4" METER SETTINGS, 4" PURPLE PVC SERVICE PIPE SHALL BE REQUIRED FROM THE MAIN TO THE VAULT AS SHOWN ON THIS DETAIL. FOR 3" METER SETTINGS, A REDUCER SHALL BE REQUIRED BEFORE THE METER AND ALSO ON THE BYPASS AS SHOWN (SEE NOTE 2 FOR EXCEPTION).
2. UPSIZING OF THE SERVICE PIPE AFTER THE METER REQUIRES THE APPROVAL OF PWU. FOR A SERVICE PIPE UPSIZED FROM 3" TO 4", A REDUCER SHALL BE INSTALLED AFTER THE METER AS SHOWN (REDUCER IS NOT REQUIRED ON BYPASS IN THIS CASE).
3. IN GENERAL, PVC PIPE SHALL BE USED ON THE SERVICE LINE OUTSIDE THE VAULT, EXCEPT WHERE THE DI PIPE STUBS THROUGH THE VAULT WALLS, AND DI PIPE SHALL BE USED INSIDE THE VAULT. FITTINGS INSIDE THE VAULT SHALL BE FLANGED, UNLESS OTHERWISE NOTED. FITTINGS OUTSIDE THE VAULT SHALL BE MECHANICAL JOINT.
4. FOR APPROVED MANUFACTURERS AND MODEL NUMBERS OF FITTINGS, REFER TO CHAPTER 11 OF THESE STANDARDS AND SPECIFICATIONS.
5. METER VAULT SHALL BE SURVEYED SO THAT THE COVER CAN BE PROPERLY LOCATED 2" ABOVE FINISHED GRADE PRIOR TO BACKFILLING.
6. MANHOLE STEPS SHALL BE PLACED 12" ON CENTER AND 18" MAX. FROM FINISHED GRADE TO THE FIRST STEP.
7. SERVICE PIPES LARGER THAN 4" WILL REQUIRE SHOP DRAWING SUBMITTAL AND APPROVAL BY PWU.
8. COMPOUND METERS SHALL HAVE STRAINERS UPSTREAM OF THE 15" PIPE SEGMENT. TURBO METERS SHALL HAVE INTEGRAL STRAINERS.
9. STEEL PIPE STANDS SHALL BE REQUIRED: 3 FOR MAIN LINE (MINIMUM). REFER TO DETAIL W12.
10. METER VAULT SHALL BE LOCATED IN A SOD OR MULCH AREA. SEE CITY STANDARD 11.19.00 FOR EASEMENT REQUIREMENTS. VALVE SHALL BE LOCATED IN SOD OR MULCH UNLESS APPROVED IN WRITING BY PWU.
11. THIS VAULT IS NOT INTENDED FOR INSTALLATION IN STREETS, DRIVEWAYS OR CONCRETE AREAS.
12. SERVICE LINES SHALL BE INSTALLED PERPENDICULAR TO THE WATER MAIN.
13. NOTE: VAULT RODDING, NUTS AND WALL PLATES MUST BE STAINLESS STEEL. REFER TO DETAIL W14.
14. ALL SERVICE PIPE AND FITTINGS OUTSIDE OF THE VAULT SHALL BE RESTRAINED FOR A MIN. DISTANCE OF 30' ON EITHER SIDE OF VAULT.
15. STAINLESS STEEL NUTS & BOLTS ON ALL FITTINGS WITH ANTI-SEIZE.

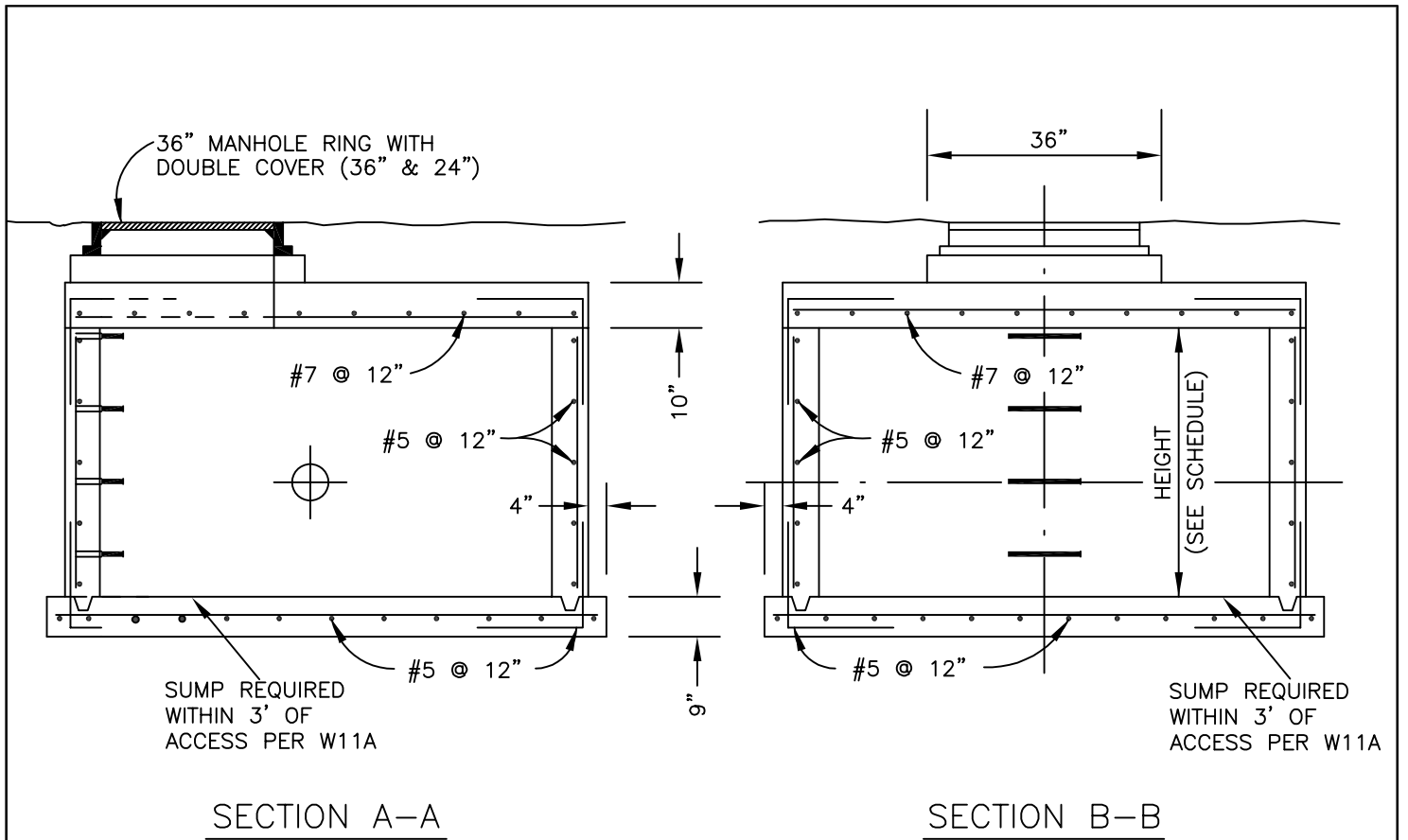


CITY of WESTMINSTER
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3" AND 4" RECLAIMED
 METER SETS

DATE: JANUARY 2020

SHEET R4A



METER VAULT-INSIDE DIMENSION SCHEDULE

METER SIZE	LENGTH	WIDTH	HEIGHT	WALL THICKNESS
3"	9'-0"	5'-0"	7'-0"	8"
4"	9'-0"	5'-0"	7'-0"	8"

NOTE: PRE-CAST VAULTS WILL BE ALLOWED AND SHALL BE DESIGNED TO MEET HS-20 LOADING. SHOP DRAWINGS AND CERTIFICATES OF COMPLIANCE SHALL BE SUBMITTED FOR REVIEW AND WRITTEN APPROVAL BY THE CITY ENGINEER PRIOR TO INSTALLATION.

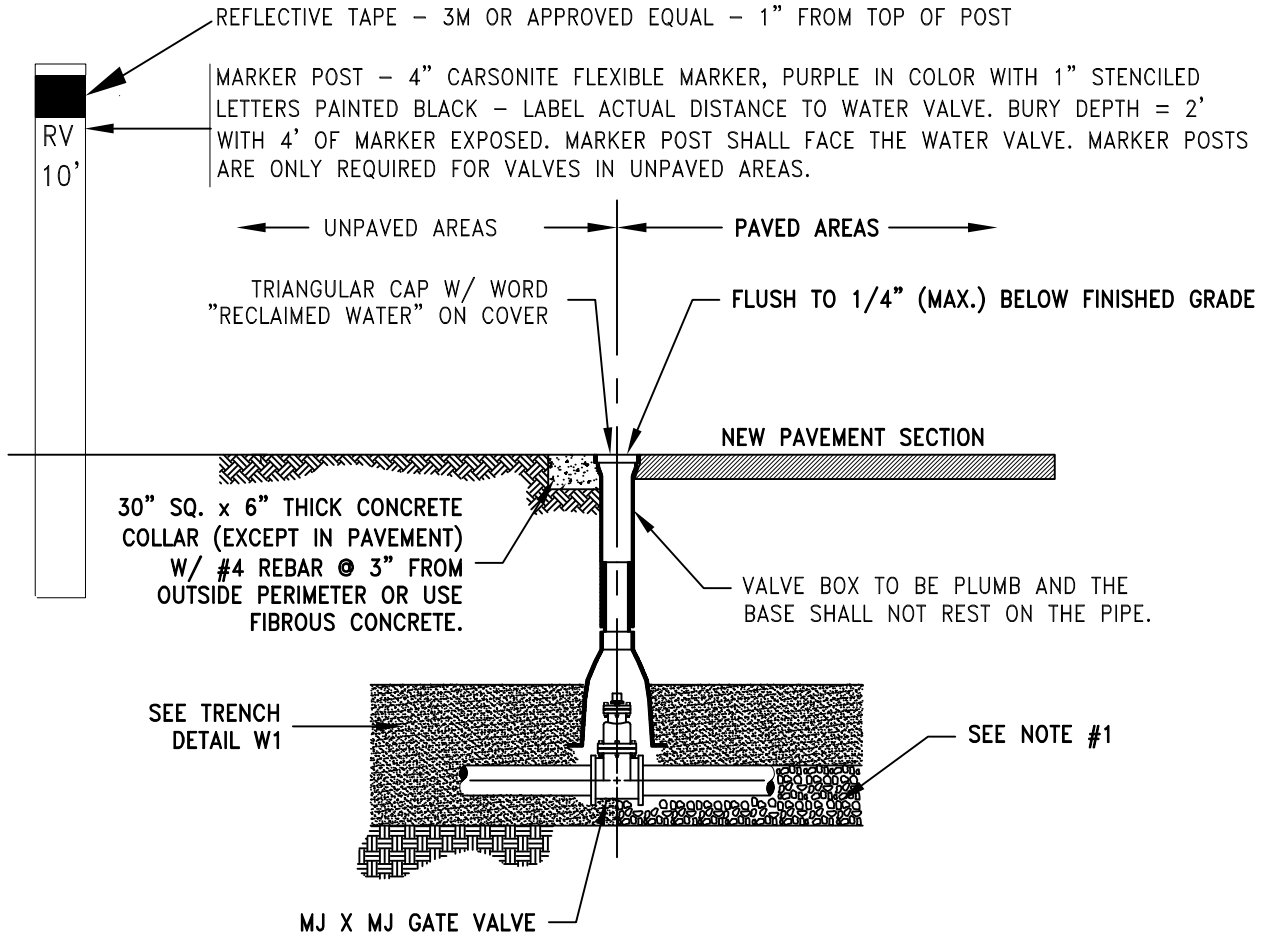


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TYPICAL METER VAULT

DATE: JANUARY 2020

SHEET R4B



NOTES:

1. CARE SHALL BE TAKEN WHEN INSTALLING VALVES TO ASSURE PROPER SUPPORT OF THE VALVE. THE CITY ENGINEER MAY REQUIRE 3/4" CRUSHED ROCK TO BE INSTALLED UNDER THE VALVE TO PROVIDE PROPER SUPPORT.
2. VALVES SHALL NOT BE PLACED IN CONCRETE SIDEWALKS, CROSS PANS, GUTTERS, OR OTHER DRAINAGE WAYS.
3. OPERATING NUTS OR EXTENSIONS SHALL NOT BE SET CLOSER THAN TWO (2) FEET FROM FINAL GRADE. IF THE OPERATING NUT IS DEEPER THAN FIVE (5) FEET FROM FINAL GRADE, PROVIDE A 1 1/4" EXTENSION SHAFT W/ CENTERING RING. OPERATOR EXTENSIONS SHALL BE CONNECTED TO THE VALVE OPERATOR NUT USING A PIN. THE EXTENSION SHAFT SHALL INCLUDE A 1/4" THICK TRASH RING LOCATED 6" BELOW THE NON-RISING PORTION OF THE VALVE BOX. THE DIAMETER OF THE TRASH RING SHALL BE 1/8" LESS THAN THE INSIDE DIAMETER OF THE VALVE BOX.
4. GATE VALVE SHALL BE POLYETHYLENE WRAPPED (8 MIL) PER CITY STANDARD 11.61.02.
5. CONCRETE COLLARS & MARKER POSTS ARE REQUIRED WHEN VALVE IS LOCATED IN AN UNPAVED AREA.
6. VALVE BOXES ARE TO BE BROUGHT UP TO GRADE AT THE TIME OF PAVEMENT PLACEMENT OR OVERLAY. VALVE BOX ADJUSTING RINGS ARE NOT ALLOWED.

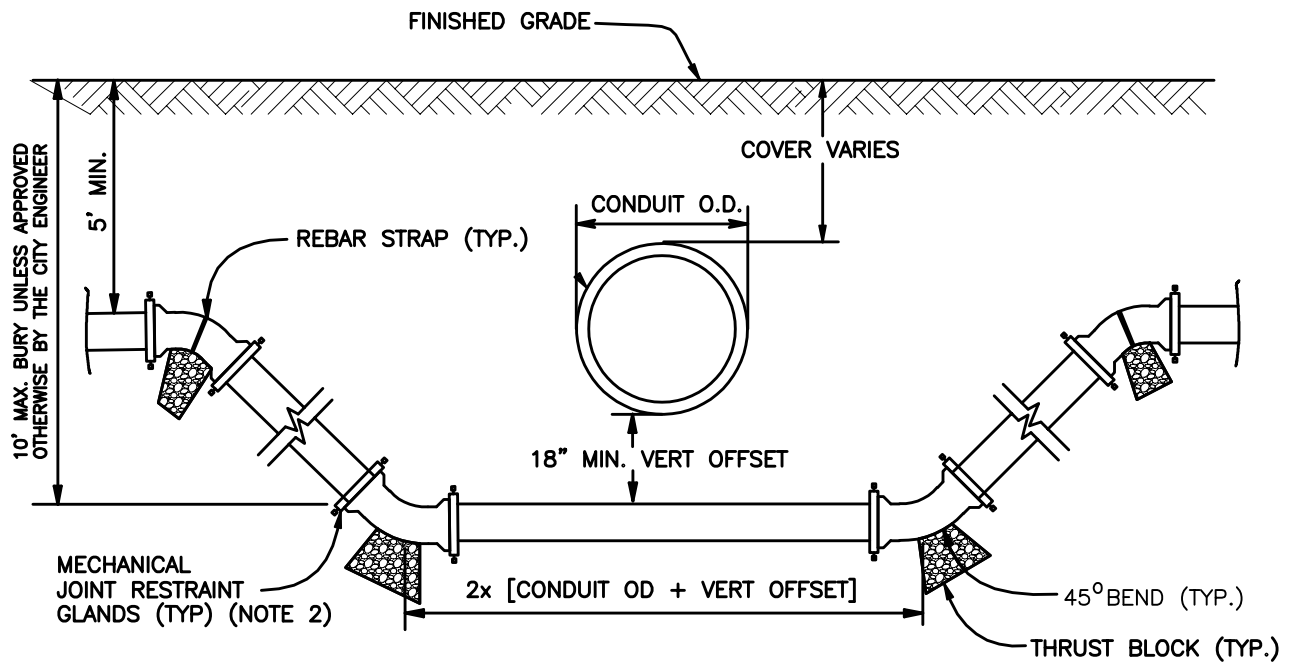


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RECLAIMED
 VALVE BOX

DATE: JANUARY 2020

SHEET R5



NOTES:

1. REFER TO SECTION 11.18.00 OF THESE STANDARDS AND SPECIFICATIONS FOR CONDUIT CROSSING REQUIREMENTS.
2. MECHANICAL JOINT RESTRAINTS SHALL BE PROVIDED AT ALL JOINTS IN THE LOWERING AND FOR THE SPECIFIED DISTANCE BACK FROM THE LOWERING AS DESIGNED BY THE ENGINEER OF RECORD AND IN ACCORDANCE WITH CHAPTER 11 OF THESE STANDARDS AND SPECIFICATIONS. THRUST BLOCKS SHALL ALSO BE INSTALLED AT ALL FITTINGS IN ACCORDANCE WITH THE CITY'S STANDARD DETAILS AND DRAWINGS.
3. RECLAIMED WATER MAINS CROSSING CULVERTS THAT ARE EXPOSED TO THE ELEMENTS SHOULD BE EVALUATED FOR FREEZE POTENTIAL.
4. A BORED CROSSING MAY BE REQUIRED BELOW EXISTING CONDUITS.
5. CATHODIC PROTECTION MAY BE REQUIRED FOR DUCTILE IRON AND STEEL RECLAIMED WATER MAINS AS SPECIFIED BY THE ENGINEER.
6. ALL IRON PIPE AND FITTINGS SHALL BE WRAPPED IN PURPLE POLYETHYLENE IN ACCORDANCE WITH THE CITY'S STANDARD DETAILS AND DRAWINGS.

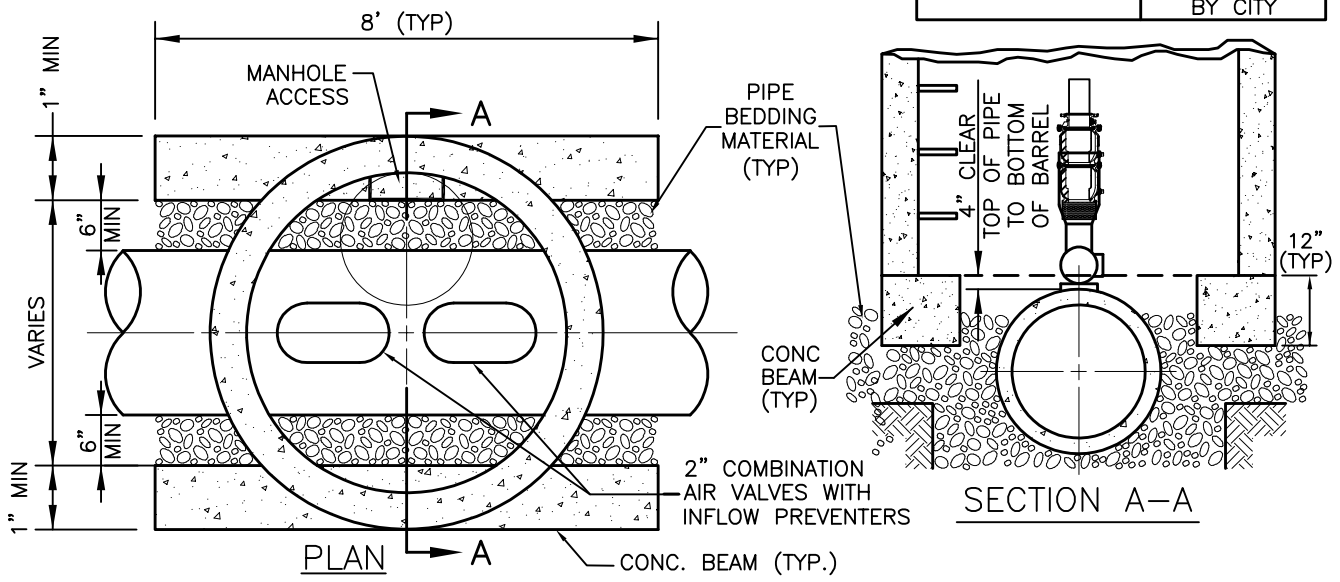
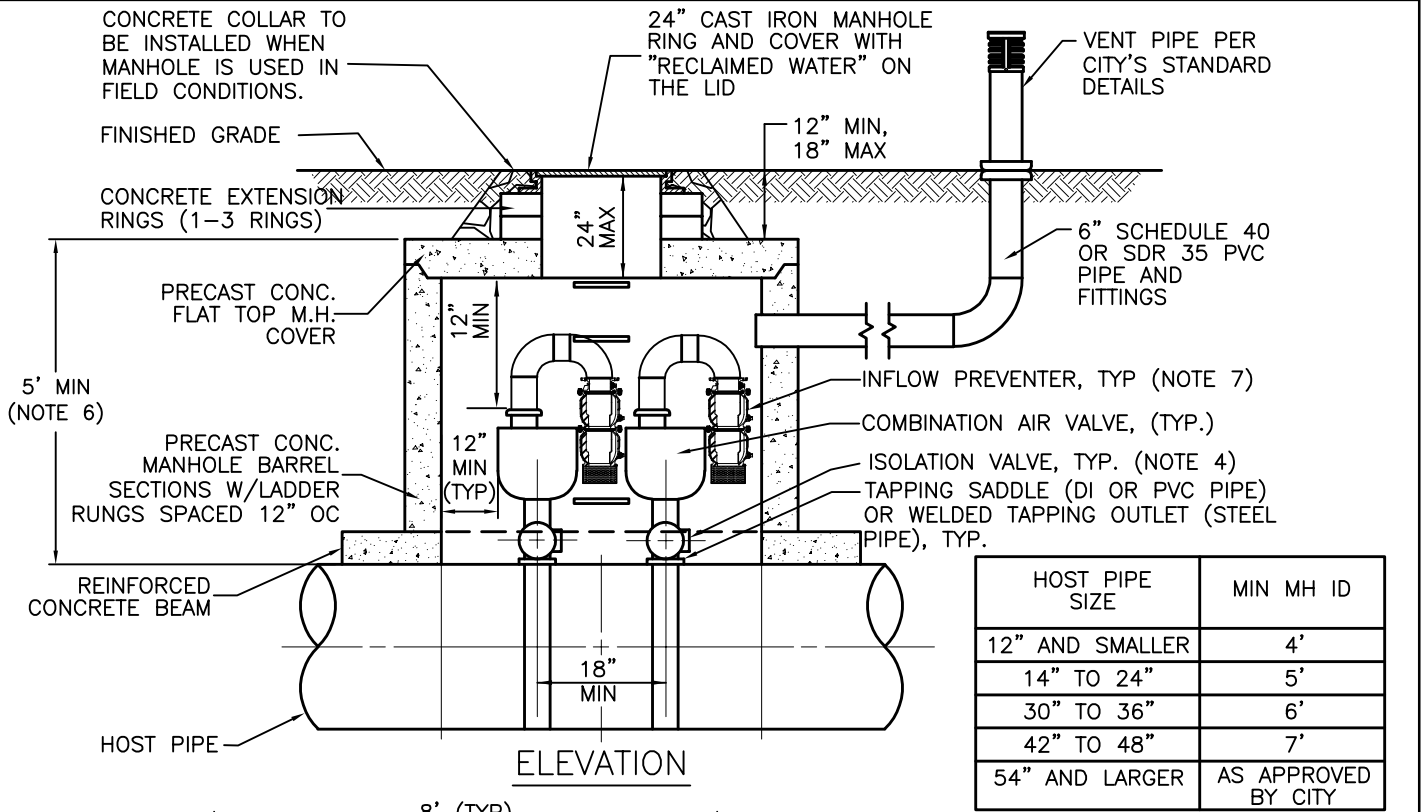


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TYPICAL TRENCH SECTION
 RECLAIMED PIPE PROTECTION

DATE: JANUARY 2020

SHEET R6



NOTES:

- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF VAULT LAYOUT AND FITTINGS FOR APPROVAL BY THE CITY REPRESENTATIVE.
- AIR VALVES SHALL BE SIZED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- FOR APPROVED MANUFACTURER'S AND MODEL NUMBERS OF FITTINGS, REFER TO CITY STANDARD 11.64.00.
- ISOLATION VALVES SHALL BE FULL PORT BRONZE BALL STYLE WITH HAND LEVER. TWO INCH VALVES SHALL BE CORPORATION TYPE AND THREE INCH AND LARGER VALVES SHALL INCORPORATE FLANGE FITTINGS TO MATE WITH FLANGED AIR VALVES.
- ALL COMPONENTS OF MANHOLE STRUCTURE SHALL MEET AASHTO H20 LOAD RATING.
- CHECK HEIGHT OF AIR VALVE AND ASSOC. PLUMBING AND ENSURE PROPER CLEARANCES FROM VAULT PRIOR TO ESTABLISHING HOST PIPE DEPTH.
- VAL-MATIC FLOODSAFE SERIES 1300 INFLOW PREVENTOR OR OTHER PWU APPROVED DEVICE.



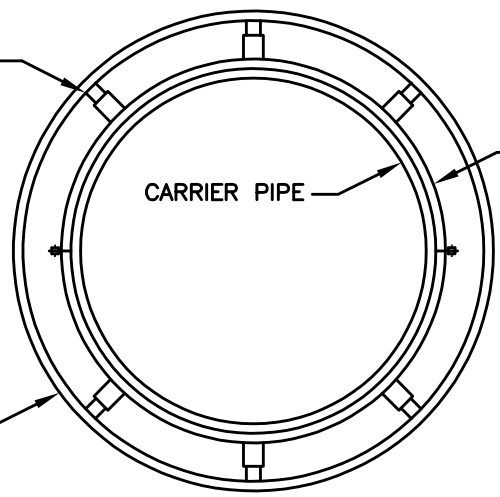
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RECLAIMED COMBINATION AIR VALVE INSTALLATION

DATE: JANUARY 2020

SHEET R7

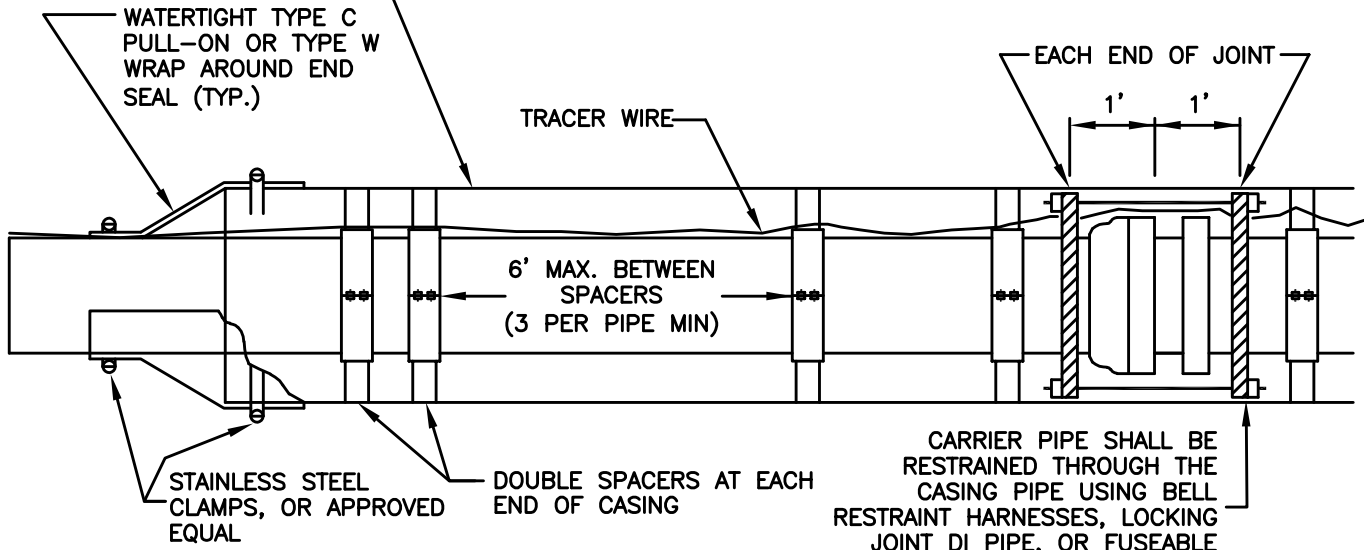
THE NUMBER OF RUNNERS ON EACH SPACER DEPENDS ON THE PIPE DIAMETER. THE GAP ON THE TOP SPACERS SHALL NOT EXCEED 3/4"



NEOPRENE, EPDM RUBBER OR PVC SPACERS SHALL BE ELECTRICALLY ISOLATED FROM THE CASING PIPE

STEEL CASING PIPE (SEE TABLE FOR WALL THICKNESS)

SECTION VIEW



SIDE VIEW

CARRIER PIPE NOMINAL Ø	CASING PIPE	
	MIN OD	MIN WALL THICKNESS
4"	12"	0.188"
6"	16"	0.25"
8"	18"	0.282"
12"	22"	0.344"
16"	28"	0.406"
20"	32"	0.469"

NOTE:
THE ANNULAR SPACE BETWEEN THE CASING AND CARRIER PIPES SHALL NOT BE FILLED WITH ANY MATERIAL.

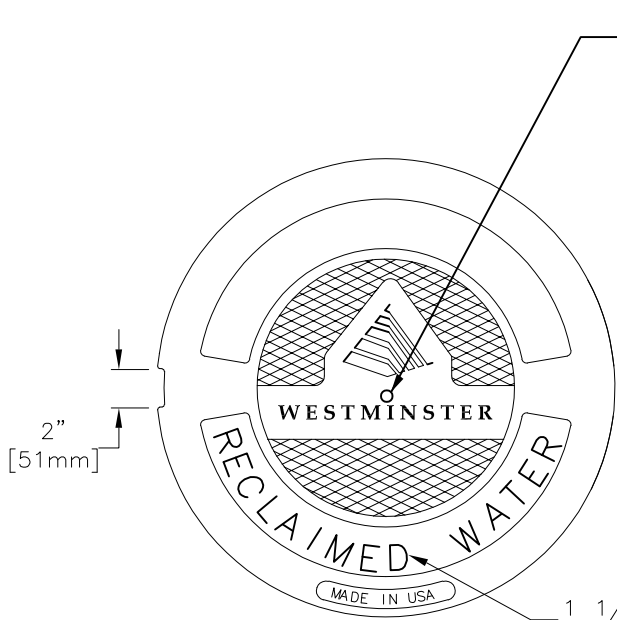


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RECLAIMED
BORING DETAIL

DATE: JANUARY 2020

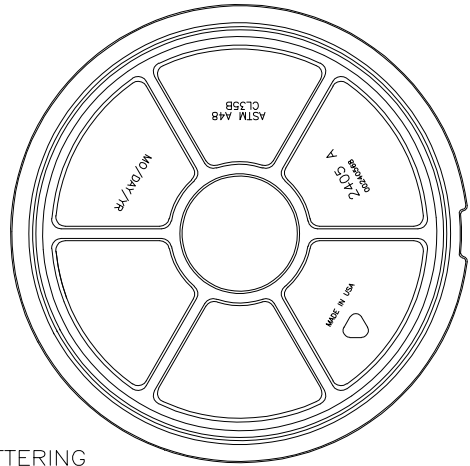
SHEET R8



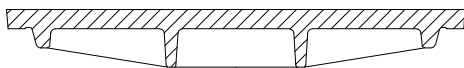
COVER TOP

2" DIAMETER
RECESSED HOLE IN
CENTER FOR
TRANSPONDER WHEN
USED WITH METER
VAULT.

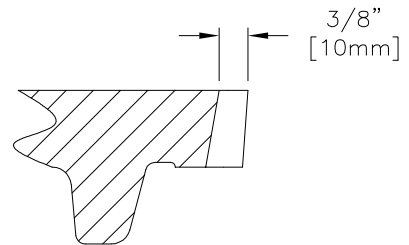
1 1/2" (38mm) LETTERING
(RECESSED FLUSH)



COVER BOTTOM



SECTION



PICKSLOT DETAIL

NOTE: DIMENSIONS PER CITY STANDARD 11.57.02

NOTE: SEE CITY STANDARD 11.57.02

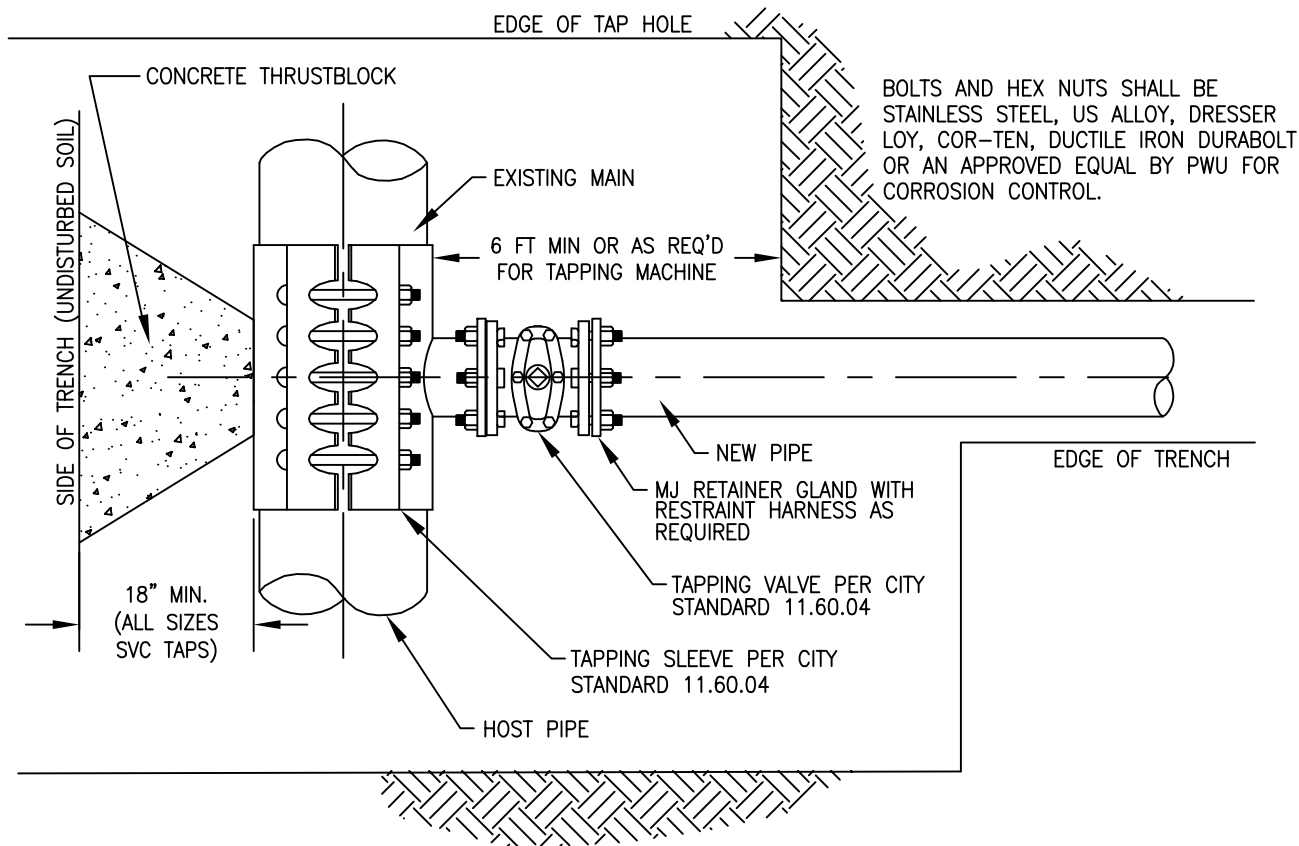


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RECLAIMED WATER VAULT LID

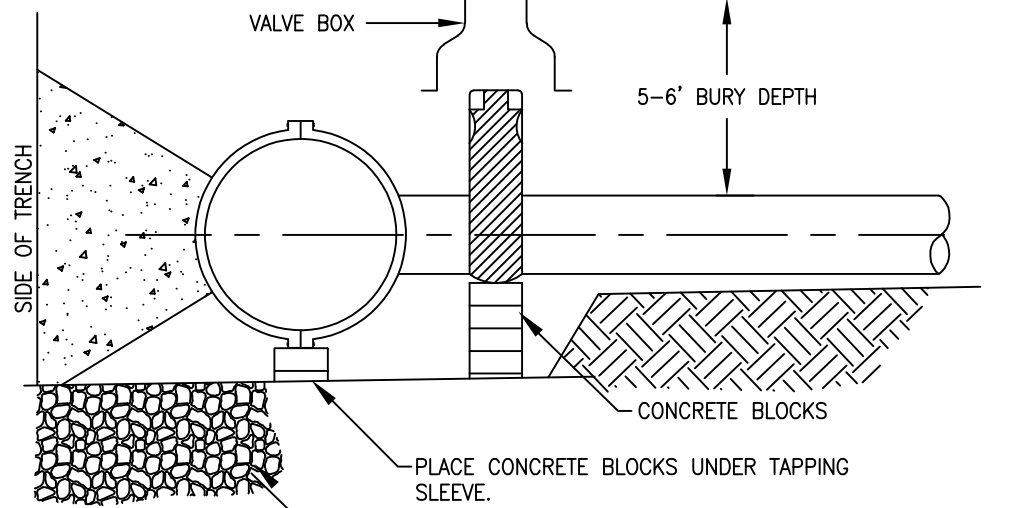
DATE: JANUARY 2020

SHEET R9



BOLTS AND HEX NUTS SHALL BE STAINLESS STEEL, US ALLOY, DRESSER LOY, COR-TEN, DUCTILE IRON DURABOLT OR AN APPROVED EQUAL BY PWU FOR CORROSION CONTROL.

18" MIN. (ALL SIZES SVC TAPS)



IN WET AND/OR UNSTABLE GROUND, THE TRENCH BOTTOM WILL BE BROUGHT TO GRADE WITH 1.5" ROCK TO SUPPORT THRUST BLOCK

NOTES:

1. THE CITY SHALL BE NOTIFIED AT LEAST 72 HOURS PRIOR TO TAPPING. THE CITY'S REPRESENTATIVE SHALL BE ON SITE DURING TAPPING. IF OUTSIDE OF RECLAIMED WATER TREATMENT FACILITY, COORDINATE TAPPING SLEEVE AND SCHEDULE WITH PWU SUBMITTAL.
2. ALL CAST IRON / DUCTILE IRON FITTINGS TO RECEIVE DOUBLE PURPLE POLY WRAP PER CITY STANDARD 11.61.02.



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RECLAIMED WET TAP CONNECTION
 4" AND LARGER TAP

DATE: JANUARY 2020

SHEET R10