



STANDARD NOTES AND DETAILS

PINERY WATER AND WASTEWATER DISTRICT

NOTES FOR WATER AND SANITARY SEWER SYSTEM PLANS

GENERAL NOTES

- 1) THESE NOTES ARE INTENDED FOR GENERAL INFORMATION ONLY. THE OWNER, ENGINEER & CONTRACTOR ARE ADVISED TO REFER TO THE PINERY WATER & WASTEWATER DISTRICT TECHNICAL SPECIFICATIONS AND DETAILS FOR SPECIFIC REQUIREMENTS. IF THE DISTRICT SPECIFICATION AND DETAILS ARE CONTRADICTORY, THE DETAILS OR PLAN NOTES SHALL BE FOLLOWED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OR DISTRICT OF DISCREPANCIES OR OMISSIONS PRIOR TO CONSTRUCTION.
- 2) ALL WATER AND SANITARY SEWER SYSTEM PLANS AND CONSTRUCTION SHALL CONFORM TO THE CURRENT PINERY WATER AND WASTEWATER DISTRICT ("DISTRICT") SPECIFICATIONS AND DETAILS, AND SHALL BE SUBJECT TO CONSTRUCTION OBSERVATION BY DISTRICT PERSONNEL OR REPRESENTATIVES. COPIES OF THE DISTRICT'S SPECIFICATIONS MAY BE OBTAINED FROM THE DISTRICT.
- 3) THE OWNER, HIS ENGINEER OR CONTRACTOR, SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE DISTRICT AT LEAST 72 HOURS PRIOR TO THE START OF CONSTRUCTION. NO CONSTRUCTION WILL BE PERMITTED UNTIL ALL EASEMENTS ARE SIGNED AND RECORDED AND THE PRE-CONSTRUCTION MEETING HAS BEEN HELD.
- 4) IT IS UNDERSTOOD AND AGREED THAT A REVIEW OF THESE PLANS AND SPECIFICATIONS BY OR ON BEHALF OF THE PINERY WATER AND WASTEWATER DISTRICT (PWWD) IS ONLY FOR DETERMINING GENERAL CONFORMANCE TO DISTRICT REGULATIONS AND IN NO WAY IMPLIES ANY LIABILITY FOR MATERIALS USED OR THE END PRODUCT OF THE WORK CONTEMPLATED HEREIN. THE DISTRICT ASSUMES NO LIABILITY FOR THE ENGINEERING DESIGN, INFORMATION INDICATED ON THE DRAWINGS, GEOLOGIC CONDITIONS, SUBSOIL CONDITIONS, PRESENCE OF GROUNDWATER AND OTHER CONDITIONS WHICH MIGHT AFFECT THE CONSTRUCTION, CONSTRUCTION COSTS, OPERATION AND FUTURE MAINTENANCE OF THE PROJECT.
- 5) THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATION AND PROTECTION OF ALL UTILITIES ENCOUNTERED OR ANTICIPATED DURING CONSTRUCTION, WHETHER SHOWN ON THESE PLANS OR NOT. CONTRACTOR SHALL CONTACT THE RESPECTIVE UTILITY COMPANIES AND HAVE ALL UTILITIES FIELD LOCATED PRIOR TO CONSTRUCTION. ANY UTILITIES AND/OR STRUCTURES DAMAGED MUST BE REPAIRED OR REPLACED BY THE CONTRACTOR PRIOR TO ACCEPTANCE.
- 6) THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS AT HIS OWN EXPENSE AND CONFORM TO NOTIFICATION REQUIREMENTS OF THE REVIEW AGENCIES.
- 7) WHERE WORK IS TO BE PERFORMED WITHIN EASEMENTS, THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO CONTAIN HIS WORK WITHIN THE EASEMENT

SO FAR AS POSSIBLE. IF NECESSARY TO EXTEND CONSTRUCTION OPERATIONS BEYOND EASEMENT BOUNDARIES, THE CONTRACTOR SHALL MAKE ALL NECESSARY ARRANGEMENTS WITH THE PROPERTY OWNER FOR SUCH WORK. A COPY OF ANY EASEMENT WILL BE FURNISHED TO THE CONTRACTOR UPON REQUEST. UPON COMPLETION OF CONSTRUCTION, GROUND SURFACES, FENCING AND OTHER STRUCTURES DAMAGED OR DISTURBED SHALL BE REPLACED TO THE PROPERTY OWNER'S SATISFACTION.

- 8) A SUBMITTAL PACKAGE FOR THE PROPOSED PIPING, APPURTENANCES, BEDDING, CONCRETE AND OTHER MATERIALS REQUIRED TO COMPLETE THE PROJECT SHALL BE PROVIDED TO THE DISTRICT FOR APPROVAL.
- 9) WATER AND SANITARY SEWER LINES CANNOT BE INSTALLED UNTIL AT LEAST 4 FEET (48 INCHES) OF COVER IS PROVIDED ABOVE THE PIPE AND TO AT LEAST 20 FEET EACH SIDE OF THE PIPE (I.E. MOUNDING DIRT OVER THE PIPE IS NOT ADEQUATE COVER). A MINIMUM OF 4 FEET OF COVER SHALL BE MAINTAINED AT ALL TIMES. AT FINISHED OR FINAL GRADE THE MINIMUM COVER OVER WATER LINES SHALL BE 5 FEET AND THE MINIMUM COVER OVER SANITARY SEWER LINES SHALL BE 4 FEET - 6 INCHES (54 INCHES).
- 10) NO TRENCHES SHALL BE BACKFILLED UNTIL APPROVED BY THE DISTRICT INSPECTOR EXCEPT IN EMERGENCY. TRENCHES SHALL BE RE-EXCAVATED AND THE PIPE EXPOSED FOR INSPECTION AT ANY LOCATION IF SO ORDERED BY THE INSPECTOR. THRUSTBLOCKS MUST CURE FOR 24 HOURS PRIOR TO BACKFILLING AND CONCRETE BLANKETED IF TEMPERATURE IS TO FALL BELOW 40 DEGREES FARENHEIGHT.
- 11) THE DISTRICT, DISTRICT ENGINEER AND/OR HIS REPRESENTATIVE ARE NOT GUARANTORS OF THE CONTRACTOR'S OBLIGATIONS OR HIS PERFORMANCE. OBSERVATIONS OF WORK IN PROGRESS AND ON-SITE VISITS ARE NOT TO BE CONSTRUED AS A GUARANTEE BY THE DISTRICT OR IT'S REPRESENTATIVE OF THE CONTRACTORS' PERFORMANCE.
- 12) THE PIPE BEDDING - SQUEEGEE - SHALL BE PLACED IN ACCORDANCE WITH THE TRENCH DETAIL. THE PROPOSED BEDDING MATERIAL GRADATION SHALL BE REVIEWED PRIOR BY THE DISTRICT PRIOR TO INITIAL DELIVERY. A SAMPLE OF THE BEDDING MAY BE REQUIRED. THE PIPE BEDDING ABOVE THE PIPE SHALL BE LEVEL ACROSS THE WIDTH OF THE ENTIRE TRENCH, MOUNDING OF SQUEEGEE ABOVE THE PIPE IS NOT ALLOWED.
- 13) BACKFILL MATERIAL WITHIN RIGHTS-OF-WAYS OR OTHER TRAVELED AREAS SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY UNLESS OTHERWISE NOTED ON THE DRAWINGS OR FOLLOW DOUGLAS COUNTY STANDARDS, WHICHEVER IS MORE STRINGENT. COPIES OF ALL COMPACTION TESTS FOR AREAS OUTSIDE COUNTY RIGHTS-OF-WAYS MUST BE FURNISHED TO THE DISTRICT AS THE WORK PROCEEDS.
- 14) AS-BUILT DRAWINGS SUPPLIED TO THE OWNER'S ENGINEER BY THE CONTRACTOR SHALL BE CHECKED BY THE OWNER'S ENGINEER AND FORWARDED TO THE DISTRICT FOR VERIFYING THE INFORMATION WITH THE RECORDS MAINTAINED BY THE DISTRICT'S INSPECTOR. UPON DISTRICT VERIFICATION THE OWNER'S ENGINEER SHALL PREPARE AS- BUILT DRAWINGS FOR THE DISTRICT RECORDS. ONE PRINTED

FULL-SIZE AS-BUILT SET AND ONE PRINTED REDUCED-SIZE 11" BY 17" ARE REQUIRED BY THE DISTRICT, AS WELL AS A PDF FILE OF THE AS-BUILTS. THE DISTRICT ALSO REQUIRES AN AUTO-CAD FILE OF THE PLANS SHOWING THE AS-BUILT LOCATIONS OF ALL FEATURES. THE AUTO-CAD FILE WILL BE PROVIDED IN UNMODIFIED NAD 1983 STATE PLANE COLORADO CENTRAL US SURVEY FEET. ELEVATIONS WILL BE PROVIDED IN NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). THE ENGINEER SHALL STATE THE INFORMATION ON THE DRAWINGS AND THAT THE AUTO-CAD FILE CONFORMS TO THESE REQUIREMENTS.

- 15) THE DISTRICT AND/OR ITS REPRESENTATIVE ARE NOT RESPONSIBLE FOR SAFETY IN, ON, OR ABOUT THE PROJECT SITE, NOR FOR COMPLIANCE BY THE APPROPRIATE PARTY OF ANY REGULATIONS RELATING THERETO.
- 16) PROBATIONARY ACCEPTANCE OF THE NEW WATER AND SANITARY SEWER SYSTEMS WILL NOT BE CONSIDERED UNTIL ALL REQUIREMENTS ARE MET. REQUIREMENTS ARE DETAILED IN THE "DEVELOPER SERVICE AGREEMENT" FILED AT THE DISTRICT OFFICE. GENERALLY, A TWO-YEAR PROBATIONARY, (WARRANTY) PERIOD BEGINS UPON COMPLETION OF THE PROJECT AND PUNCHLIST COMPLETION.
- 17) WATER AND SEWER LINE MARKER POSTS SHALL BE LOCATED AND LABELED PER DISTRICT INSTRUCTIONS. APPROXIMATE MARKER POST LOCATIONS SHALL BE SHOWN ON THE DRAWINGS.
- 18) NO CONNECTIONS TO THE EXISTING WATER AND SANITARY SEWER SYSTEMS SHALL BE MADE WITHOUT RECEIVING SPECIFIC PERMISSION FOR EACH CONNECTION FROM THE DISTRICT.
- 19) ALL CONCRETE MIX REQUIRED FOR WATER AND SANITARY SEWER SYSTEMS AND APPURTENANCES SHALL BE MIXED AT A CONCRETE PLANT AND DELIVERED BY CONCRETE MIXING TRUCKS. CONCRETE SHALL MEET THE CONCRETE MIX DESIGN CRITERIA BELOW. NO DRY KICKERS OR BAG CONCRETE ALLOWED.

CONCRETE MIX DESIGN					
ASTM COARSE AGGREGATE SIZE	MIMIMUM CEMENT CONTENT , SACKS/CU YD CONCRETE	MAXIMUM WATER/CEMENT RATIO BY WT..	AIR CONTENT PERCENT	SLUMP (INCHES)	MINIMUM 28 DAY COMPRESSIVE STRENGTH
57/67	6	0.47	4.5 - 7.5	3" - 5"	4,000

SANITARY SEWER SYSTEM NOTES

- 1) THE PIPE USED FOR SANITARY SEWER MAINS INSTALLED AT DEPTHS OF LESS THAN 22 FEET SHALL BE IN ACCORDANCE WITH ASTM D-3034 SDR 35 PVC PIPE. PIPE INSTALLED AT DEPTHS OF 22 FEET OR GREATER SHALL BE ASTM D-3034 SDR 26 PVC PIPE. AWWA C900, CLASS 150 OR AWWA C905, CLASS 150 SHALL BE USED WHERE THE SEWER LINE REQUIRES CONCRETE ENCASEMENT OR WHERE 18" MINIMUM VERTICAL SEPARATION OR 10 FEET HORIZONTAL SEPARATION BETWEEN WATER & SEWER LINES IS NOT MAINTAINED.

- 2) THE CONTRACTOR SHALL PROTECT THE EXISTING AND NEW SANITARY SEWER SYSTEM FROM CONSTRUCTION WATER AND DEBRIS. IN INSTANCES WHERE THE CONNECTION TO THE EXISTING SANITARY SYSTEM IS MADE AT AN EXISTING MANHOLE, THE CONTRACTOR SHALL ISOLATE THE NEW SEWER SYSTEM BY PLUGGING THE END OF THE NEW SANITARY SEWER LINE. THE PLUG SHALL BE CHAINED TO A MANHOLE STEP TO PREVENT THE LOSS OF THE PLUG. IN INSTANCES WHERE A NEW MANHOLE IS INSTALLED OVER AN EXISTING SANITARY SEWER LINE, THE EXISTING LINE SHALL NOT BE CUT INTO UNTIL THE NEW SANITARY SEWER SYSTEM IS ACCEPTED BY THE DISTRICT.
- 3) THE SANITARY SEWER SYSTEM SHALL BE TESTED IN ACCORDANCE WITH SECTION 400 OF THE DISTRICT STANDARDS AND SPECIFICATIONS. DISTRICT TESTING REQUIREMENTS ARE EXTENSIVE. THE CONTRACTOR SHALL REVIEW TESTING REQUIREMENTS. ALL MANHOLES IN UNPAVED EASEMENT AREAS SHALL BE TESTED WITH FINAL GRADE RINGS & COVER IN PLACE.
- 4) PROBATIONARY ACCEPTANCE OF THE NEW SANITARY SEWER MAINS IS CONTINGENT UPON SATISFACTORY COMPLETION OF:
 - A. LOW PRESSURE AIR TESTING
 - B. MANHOLE VACUUM TESTING
 - C. VIDEO INSPECTION
 - D. FINAL MANHOLE INSPECTION
- 5) ALL NEW MAINS MUST BE JETTED PRIOR TO THE PROBATION PERIOD. ADDITIONAL JETTING MAY BE REQUIRED PRIOR TO FINAL CONVEYANCE AND ACCEPTANCE BY THE DISTRICT. COSTS OF JETTING WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL PUMPING ASSOCIATED WITH THE LINE JETTING.
- 6) THE CONTRACTOR SHALL VERIFY EXISTING MANHOLE INVERTS AT PROPOSED POINTS OF CONNECTION, PRIOR TO CONSTRUCTION STAKING. CONSTRUCTION STAKING SHALL SHOW DRAWING STATIONING.
- 7) ALL SANITARY SEWER MANHOLES SHALL BE 4-FOOT (4') INSIDE DIAMETER WITH ECCENTRIC CONES. THE SURFACE OF MANHOLE SECTIONS SHALL NOT BE EXCESSIVELY POCK-HOLED AND SHALL NOT HAVE EXCESSIVE AGGREGATE VISIBLE. THE DISTRICT'S ENGINEER AND ENGINEER'S REPRESENTATIVE SHALL HAVE AUTHORITY TO REJECT ANY MANHOLE SECTIONS AND PARTS THEY DEEM AS UNACCEPTABLE. ALL MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PINERY WATER AND WASTEWATER DISTRICT SPECIFICATIONS AND DETAILS.
- 8) THE EDGE OF MANHOLE COVERS SHALL NOT BE CLOSER THAN 4-FEET TO THE GUTTER PAN.
- 9) MANHOLE RIMS SHALL BE SET 1/8-INCH TO 1/4-INCH BELOW FINISHED STREET GRADE. SEE DETAIL SHEETS FOR ADJUSTMENT RING INFORMATION IN PAVED AND UNPAVED AREAS.
- 10) IN UNPAVED AREAS, MANHOLE RIMS SHALL BE SET SIX (6") INCHES ABOVE FINISHED GRADE. THE MANHOLE RIM SHALL HAVE A CONCRETE COLLAR POURED AROUND THE

RIM SEALING IT TO THE CONCRETE MANHOLE CONE. MANHOLE COVERS IN UNPAVED AREAS SHALL BE ALUMINUM WITH CAM LOCKS.

- 11) FINAL GRADE ADJUSTMENT OF MANHOLE COVERS AND FRAME ASSEMBLIES SHALL BE COMPLETED USING 2" TO 6" CONCRETE RISER RINGS. NO MORE THAN 10 INCHES OF GRADE RINGS IS ALLOWED. THE HEIGHT FROM THE TOP OF THE MANHOLE RIM TO THE FIRST MANHOLE STEP SHALL FALL IN A RANGE OF 18 INCHES TO 24 INCHES. THE HEIGHT OF RISER RINGS SHALL BE SELECTED TO HAVE AS FEW JOINTS AS POSSIBLE. GROUT THE INSIDE OF JOINTS WITH NON-SHRINK GROUT. EPOXY-COAT THE GROUT AND THE ENTIRE INSIDE OF THE RISER RING. INSTALL BUTYL RUBBER SEALANT, CON SEAL 102 OR EQUAL BETWEEN TOP CONCRETE RISER RING AND THE CAST IRON OR ALUMINUM MANHOLE FRAME.
- 12) THE CONTRACTOR SHALL TAKE CARE TO PROPERLY SHAPE ALL MANHOLE INVERTS AND BENCHES IN ACCORDANCE WITH DISTRICT SPECIFICATIONS. INVERTS OF LINES INTERSECTING AT 90 DEGREES AND AT HIGHLY DIVERGENT OR FLAT SLOPES ARE ESPECIALLY CRITICAL. MANHOLE INVERTS SHALL BE CONSTRUCTED WITH A SMOOTH TROWEL OR STONE FINISH, AND BENCHES FINISHED WITH A LIGHT BROOM, NON-SKID FINISH. PRE-CAST MANHOLE BASES ARE ACCEPTABLE.
- 13) WHEN GROUNDWATER IS PRESENT, EXTERIOR OF MANHOLE STRUCTURES SHALL BE COATED WITH A WATERPROOF BITUMINOUS MEMBRANE, OR EQUAL. FACTORY PRE-COATED MANHOLES ARE ACCEPTABLE. ALL EXTERIOR JOINTS SHALL BE TAPED PER DISTRICT SPECIFICATIONS. THE CONTRACTOR SHALL SUBMIT MATERIAL SPECIFICATIONS FOR THE EXTERIOR COATING TO THE DISTRICT FOR REVIEW PRIOR TO CONSTRUCTION. THE EXTERIOR COATING SHALL BE APPLIED PER MANUFACTURER'S RECOMMENDATIONS.
- 14) SEWER SERVICES SHALL BE STUBBED OUT AT MINIMUM 2% SLOPE FIFTEEN FEET (15') WITHIN THE PROPERTY LINE. THE END OF THE SEWER SERVICE STUB SHALL BE MARKED WITH 3M DISKS & 2'X4' POST EXTENDING FROM THE END OF THE SERVICE CAP TO 4 TO 6 FEET ABOVE THE FINAL GRADE.
- 15) ALL SEWER SERVICE LINE LOCATIONS SHALL HAVE AN "X" (FOR SEWER) CHISELED IN THE CURB WHERE CURBS ARE PRESENT.
- 16) SERVICE CONNECTIONS TO THE SAME MAIN MUST BE SEPARATED BY AT LEAST 18 INCHES AND BE 18 INCHES OR MORE FROM THE END OF THE PIPE SECTION.
- 17) SEAL OPENINGS OR PIPE PENETRATIONS IN MANHOLES WITH NON-SHRINK GROUT. AFTER GROUT DRIES, APPLY EPOXY COATING OVER THE GROUT AND 2 INCHES BEYOND THE GROUT BOUNDARIES TO THE MANHOLE CONCRETE.
- 18) THE ESTIMATED COST OF CONSTRUCTION IS _____ .

WATER SYSTEM NOTES

- 1) THE PIPE FOR WATER MAINS 12" AND LESS IN DIAMETER SHALL BE IN ACCORDANCE WITH AWWA C900 DR18 CLASS 150 PVC UNLESS OTHERWISE SHOWN ON THE

DRAWINGS OR SPECIFIED BY THE DISTRICT. ALL WATER MAINS 14" OR LARGER SHALL BE IN ACCORDANCE WITH AWWA C905, DR 18 CLASS 235 PVC PIPE. BURIED DUCTILE IRON PIPE SHALL BE THICKNESS CLASS 50. ALL WATER LINES SHALL HAVE A MINIMUM OF FIVE (5.0) FEET OF COVER AND BE LOCATED A MINIMUM OF TEN FEET (10') FROM ANY SANITARY SEWER LINE.

- 2) ALL BURIED DUCTILE IRON PIPE AND FITTINGS TO BE COMPLETELY WRAPPED IN 8 MIL PLASTIC IN ACCORDANCE WITH AWWA C105 REQUIREMENTS. THE PLASTIC WRAPPING SHALL BE FULLY TAPED AROUND THE PIPE AT EACH SIDE OF FITTINGS AND EVERY FIVE (5) FEET ALONG THE PIPE.
- 3) ALL MECHANICAL JOINT FITTINGS REQUIRE A JOINT RESTRAINT MECHANISM AND BELL RESTRAINTS AS SPECIFIED. THE LENGTH OF PIPE RESTRAINT IS DETERMINED FROM THE LENGTH OF RESTRAINT DETAILS. IN A RESTRAINED SECTION OF PIPE, THE FITTING, VALVE, CAP OR PLUG WITH THE LONGEST RESTRAINED DISTANCE DETERMINES THE LENGTH OF RESTRAINED PIPE.
- 4) WATER MAINS SHALL BE DEFLECTED NO GREATER THAN THE MANUFACTURER'S SPECIFICATIONS. HIGH DEFLECTION COUPLING REQUIRE PRIOR APPROVAL BY THE DISTRICT. C905 PVC PIPE SHALL NOT BE DEFLECTED AT THE JOINT OR ALONG THE BARREL SECTION OF THE PIPE.
- 5) WATER MAIN VALVES SHALL OPEN COUNTER-CLOCKWISE (LEFT).
- 6) AIR RELEASE/AIR VACUUM VALVES (COMBINATION VALVES) SHALL BE PROVIDED AT ALL HIGH POINTS FOR WATER LINES.
- 7) WATER SERVICES SHALL BE STUBBED OUT FIFTEEN FEET (15') BEYOND THE PROPERTY LINE. WATER SERVICES SHALL BE BURIED A MINIMUM OF FIVE FEET DEEP (5'-0") DEEP. THE CENTERLINE OF METER YOKE SHALL BE 13" BELOW THE LID OF THE METER COVER. ALL WATER SERVICE LINE LOCATIONS SHALL HAVE A "V" (FOR VALVE) CHISELED IN THE CURB WHERE CURBS ARE PRESENT.
- 8) THE SURFACE OF CONCRETE METER PITS SHALL NOT BE EXCESSIVELY POCK-HOLED AND SHALL NOT HAVE EXCESSIVE AGGREGATE VISIBLE. THE DISTRICT'S ENGINEER AND ENGINEER'S REPRESENTATIVE SHALL HAVE AUTHORITY TO REJECT ANY METER PITS THEY DEEM AS UNACCEPTABLE.
- 9) METER PITS SHALL BE INSTALLED AFTER ADJACENT CURB AND GUTTER ARE INSTALLED, AND AFTER THE AREA WITHIN 30 FEET OF THE METER PIT IS SET TO FINAL GRADE, TO FACILITATE DETERMINING THE CORRECT METER PIT ELEVATION. METER PITS SHALL BE SET TO FINAL GRADE BY THE CONTRACTOR. METERS WILL NOT BE SET UNLESS PIT COVERS ARE AT ACCEPTABLE GRADE.
- 10) THE METER PIT SHALL BE WITNESSED BY THREE, 6-FOOT TALL METAL FENCE POSTS BURIED TO EXPOSE FOUR FEET (4'). TWO POSTS SHALL BE SET ONE FOOT (1') OUT, AND BACK, FROM THE EDGE OF THE METER PIT ON THE PROPERTY SIDE. THE THIRD POST SHALL BE SET 1 FOOT (1') IN FRONT OF THE CURB STOP VALVE, TOWARD THE CURB. THE POSTS SHALL BE WRAPPED IN A TRIANGULAR PATTERN, WITH FOUR FOOT (4') TALL, BRIGHT ORANGE SAFETY FENCING. TO ALLOW ACCESS TO THE METER PIT

AND CURB STOP BOX, NO SAFETY FENCING IS REQUIRED BETWEEN THE TWO FENCE POSTS ON THE HOME SIDE OF THE METER PIT. THE FENCING SHALL BE SECURELY ATTACHED TO THE POSTS.

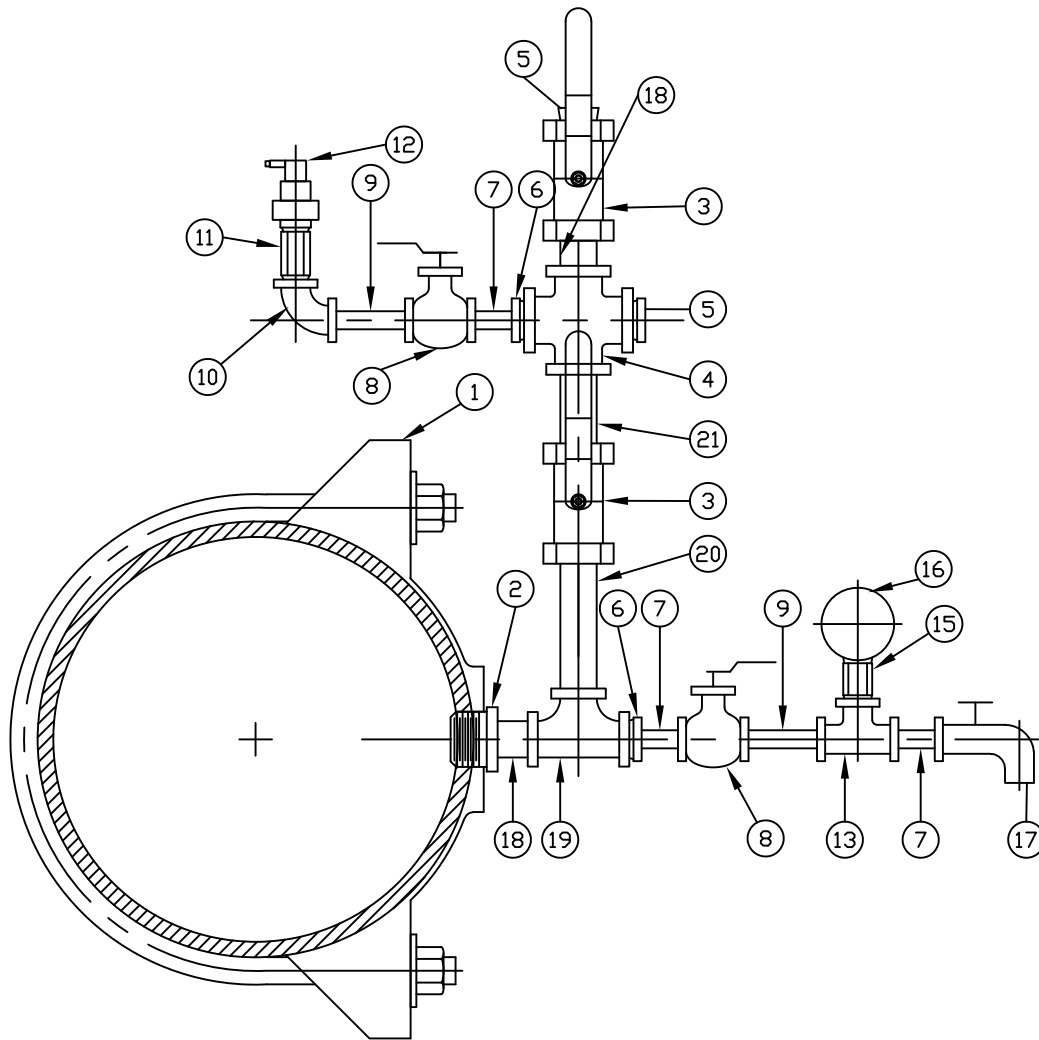
- 11) THE CONTRACTOR IS RESPONSIBLE FOR NOTIFYING THE LOCAL FIRE DEPARTMENT AND ALL CUSTOMERS AFFECTED BY WATER OUTAGES DURING CONSTRUCTION. ALL OUTAGES REQUIRE PRIOR APPROVAL BY THE DISTRICT. THE DISTRICT SHALL OPERATE ALL ISOLATION VALVES REQUIRED FOR THE OUTAGE.
- 12) ALL BRASS PIPES, FITTINGS, METER YOKES, ETC. SHALL MEET THE LOW-LEAD OR LEAD-FREE REGULATIONS.
- 13) CONTRACTOR SHALL GLUE CHLORINE TABLETS TO INSIDE OF PIPE USING APPROVED ADHESIVE WHEN PIPE IS INSTALLED. MINIMUM CONCENTRATION SHALL BE 20 mg/L AFTER SITTING FOR 24 HOURS. HIGH CHLORINE MUST BE FLUSHED OUT PRIOR TO HIGH PRESSURE TESTING.
- 14) CONTRACTOR IS RESPONSIBLE FOR PRESSURE TESTING OF PIPE AT 200 PSI FOR 1 HOUR. DISTRICT WILL CALCULATE ALLOWABLE LOSS.
- 15) CONTRACTOR SHALL BE REQUIRED TO PASS A MINIMUM OF 2 CLEARWATER SAMPLES FOR BACTERIA. TESTING LOCATION TO BE APPROVED BY DISTRICT INSPECTOR.
- 16) THE ESTIMATED COST OF CONSTRUCTION IS _____ .

DEWATERING NOTES

DEWATERING WILL BE REQUIRED ON THIS PROJECT


1. WHERE GROUNDWATER IS ENCOUNTERED, THE CONTRACTOR SHALL UTILIZE EFFECTIVE DEWATERING TECHNIQUES TO ELIMINATE ANY FREE-STANDING WATER FROM THE PIPELINE EXCAVATION WHERE PIPE IS BEING INSTALLED. DISPOSAL OF PUMPED WATER SHALL MEET ALL DOUGLAS COUNTY AND COLORADO DEPARTMENT OF HEALTH AND ENVIRONMENT REQUIREMENTS. CONTRACTOR IS REQUIRED TO OBTAIN ANY REQUIRED PERMITS AT THE CONTRACTOR'S EXPENSE.
2. BEDDING MATERIAL SHALL BE INSTALLED ON A HARD, STABLE TRENCH BOTTOM. IF TRENCH BOTTOM IS UNSTABLE, BUT NO FREE GROUNDWATER IS PRESENT, THE CONTRACTOR MAY ATTEMPT TO CREATE A STABLE TRENCH BOTTOM BY EXCAVATING 18" OR MORE BELOW THE BOTTOM OF THE PIPE AND FORCING IN 4-INCH LIFTS OF $\frac{3}{4}$ " - 1 $\frac{1}{2}$ " CRUSHED GRANITE UNTIL THE ELEVATION OF THE BOTTOM OF THE PIPE IS REACHED. THEN BACKFILL WITH SQUEEGEE AS USUAL.
3. IF FREE GROUND WATER IS PRESENT, OR IF THE 18" EXCAVATION AND $\frac{3}{4}$ " = 1 $\frac{1}{2}$ " CRUSHED ROCK (NOTE 2) FAILS TO STABILIZE THE TRENCH BOTTOM, THE CONTRACTOR SHALL:

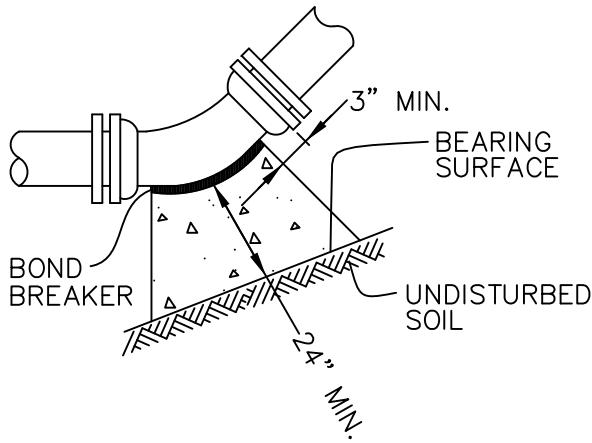
- a. ESTABLISH A DEWATERING SYSTEM CAPABLE OF CONTINUOUSLY KEEPING FREE STANDING WATER OUT OF THE TRENCH BOTTOM.
 - b. EXCAVATE TO A STABLE TRENCH BOTTOM OR AT LEAST 2 FEET BELOW THE BOTTOM OF THE PIPE. FORCE IN 4-INCH LIFTS OF MINUS-4 ROCK MATERIAL UNTIL THE BOTTOM OF THE TRENCH IS STABLE AND THE ELEVATION OF THE BOTTOM OF THE PIPE IS REACHED.
 - c. INSTALL THE PIPE AND USE $\frac{3}{4}$ " CRUSHED GRANITE INSTEAD OF SQUEEGEE TO BED THE SIDES OF THE PIPE AND 12" DEPTH OVER THE TOP OF THE PIPE.
4. ALL DEWATERING EFFORTS AND TRENCH BOTTOM STABILIZATION ARE SUBJECT TO REVIEW AND MODIFICATION BY THE DISTRICT'S ENGINEER OR ENGINEERING REPRESENTATIVE.



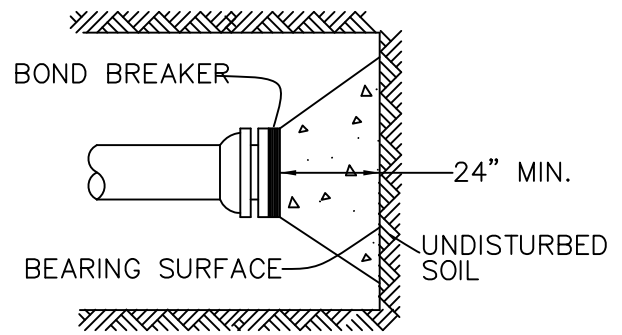
NOTES:

1. SERVICE SADDLE (SEE DRAWING NOTE FOR SADDLE)
2. 1-1/2" TO 1" BUSHING, BUSHING CAN BE ELIMINATED ON 3" AND SMALLER SADDLES USING 1" TAP
3. 1" BALL VALVE, NIBCO T-585-66-LF
4. 1" CROSS
5. 1" PLUG
6. 1" TO 1/2" BUSHING
7. 1/2" CLOSE NIPPLE
8. 1/2" GATE VALVE, NIBCO T-113-LF OR 1/2" BALLVALVE NIBCO T-585-66-LF
9. 1/2" X 3" NIPPLE
10. 1/2" 90 DEGREE BEND
11. PISTON SNUBBER, RAY MODEL 023S, 1/2" NPT
12. PRESSURE TRANSMITTER, SEE INSTRUMENT INDEX ON SHEET I-1
13. 1/2" TEE
14. NOT USED
15. PISTON SNUBBER, RAY MODEL 023S, 1/2" NPT
16. PRESSURE GAUGE, WIKA MODEL 9734355 SERIES 213.53 DW, 0-100 PSIG, 4" LIQUID-FILLED STAINLESS STEEL EXPOSED COMPONENTS
17. 1/2" LEAD FREE SAMPLE TAP, USA BLUEBOOK CAT NO. 47393, OWNER-FURNISHED
18. 1" CLOSE NIPPLE
19. 1" 90 DEGREE TEE
20. 1" X 6" NIPPLE
21. 1" X 3" NIPPLE

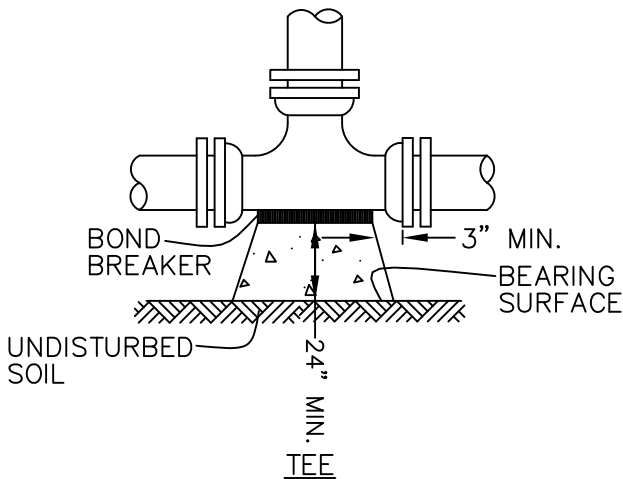
 PINERY WATER & WASTEWATER DISTRICT <i>Quality Water for Life</i>	
SAMPLE TAP	
DRAWN: KAW	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: WATERXXXX	



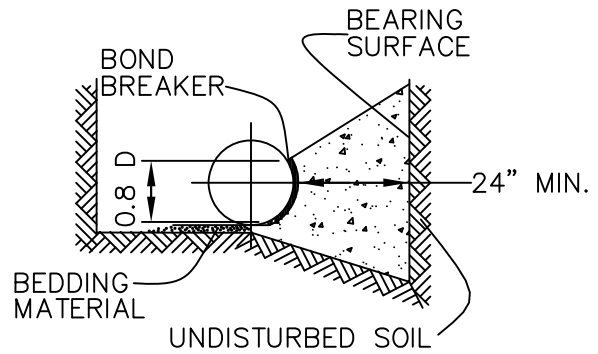
BENDS



DEAD ENDS/HYDRANTS



TEE



TYPICAL CROSS SECTION

AT BENDS, BRANCHES OF TEES, DEAD ENDS, REDUCERS, PLUGS, CAPS AND FIRE HYDRANTS CONCRETE THRUST BLOCKS WILL BE USED IN ADDITION TO OTHER RESTRAINT.

MINIMUM BEARING SURFACE AREA FOR THRUST BLOCKS
(IN SQUARE FEET)

PIPE DIAMETER	BENDS				TEE/DEAD END
	90°	45°	22 1/2°	11 1/2°	
6"	6.0	3.5	2.0	1.0	4.5
8"	10.5	6.0	3.0	1.5	7.5
10"	15.5	8.5	4.5	2.5	11.0
12"	22.0	12.0	6.0	3.0	15.5
16"	38.0	20.5	10.5	5.5	27.0

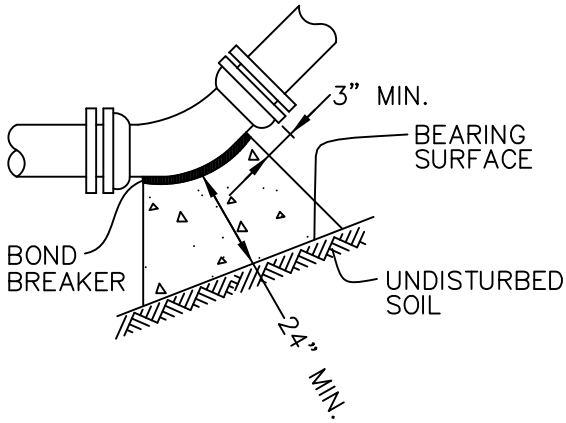
BASED ON 225 PSI (150 PSI INTERNAL PRESSURE AND 75 PSI WATER HAMMER) AND 2000 PSF SOIL BEARING

FOR WATER LINES 20" AND LARGER, ENGINEER SHALL DETERMINE MINIMUM BEARING SURFACE AREA FOR THRUST BLOCKS WITH DISTRICT APPROVAL.

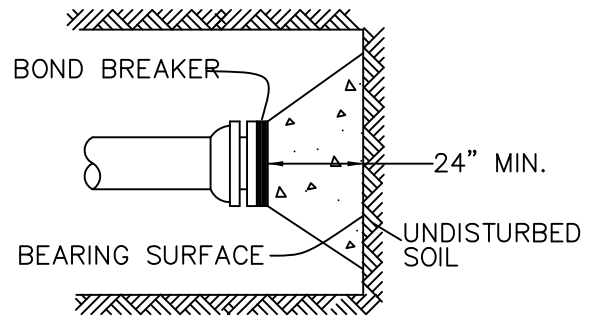


THRUST BLOCK DETAIL

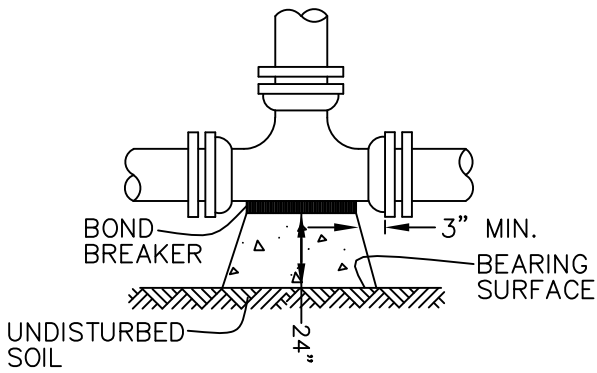
DRAWN: KAW	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: WATER01	



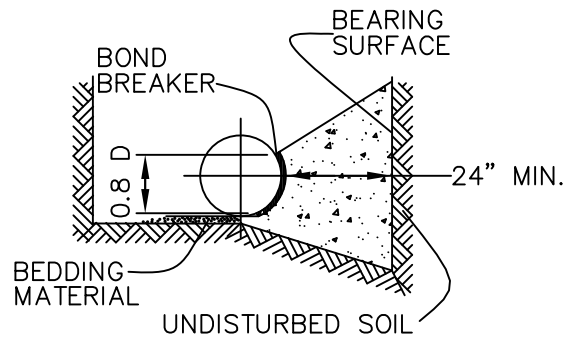
BENDS



DEAD ENDS/HYDRANTS



TEE



TYPICAL CROSS SECTION


AT BENDS, BRANCHES OF TEES, DEAD ENDS, REDUCERS, PLUGS, CAPS AND FIRE HYDRANTS CONCRETE THRUST BLOCKS WILL BE USED IN ADDITION TO OTHER RESTRAINT.

MINIMUM BEARING SURFACE AREA FOR THRUST BLOCKS
(IN SQUARE FEET)

PIPE DIAMETER	BENDS				TEE/DEAD END
	90°	45°	22 1/2°	11 1/2°	
6"	4.7	2.5	1.3	0.7	3.3
8"	8.0	4.4	2.2	1.1	5.7
10"	12.0	6.5	3.3	1.7	8.5
12"	17.0	9.2	4.7	2.4	12.0
16"	29.5	16.0	8.2	4.1	20.9

BASED ON 175 PSI (100 PSI INTERNAL PRESSURE AND 75 PSI WATER HAMMER) AND 2000 PSF SOIL BEARING

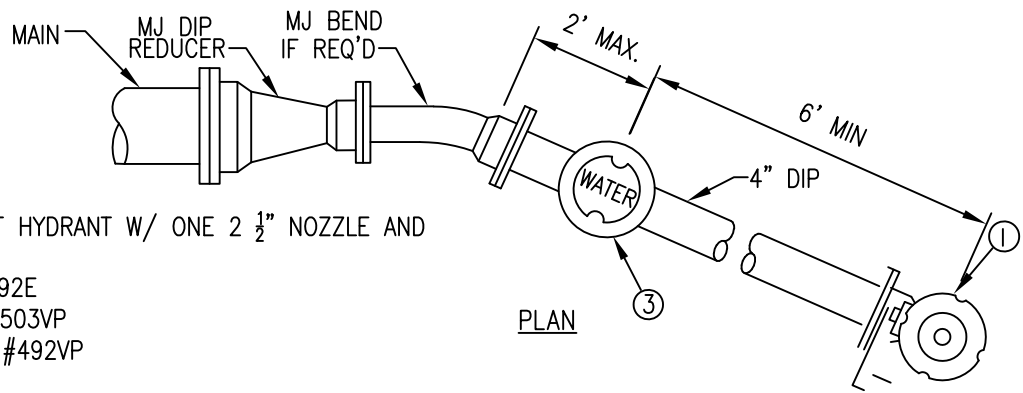
FOR WATER LINES 20" AND LARGER, ENGINEER SHALL DETERMINE MINIMUM BEARING SURFACE AREA FOR THRUST BLOCKS WITH DISTRICT APPROVAL.



PINERY
WATER & WASTEWATER DISTRICT
Quality Water for Life

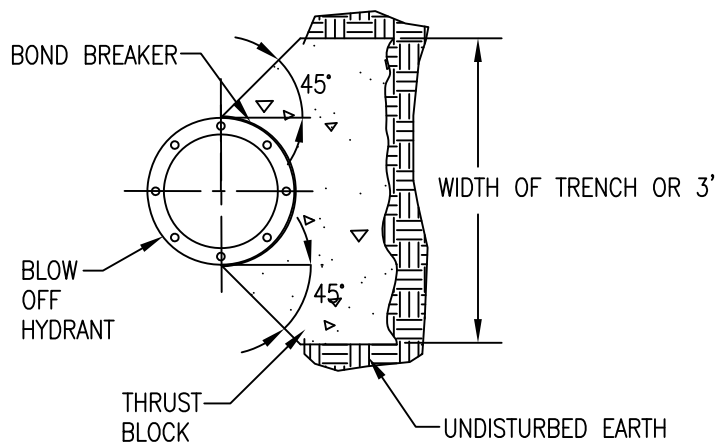
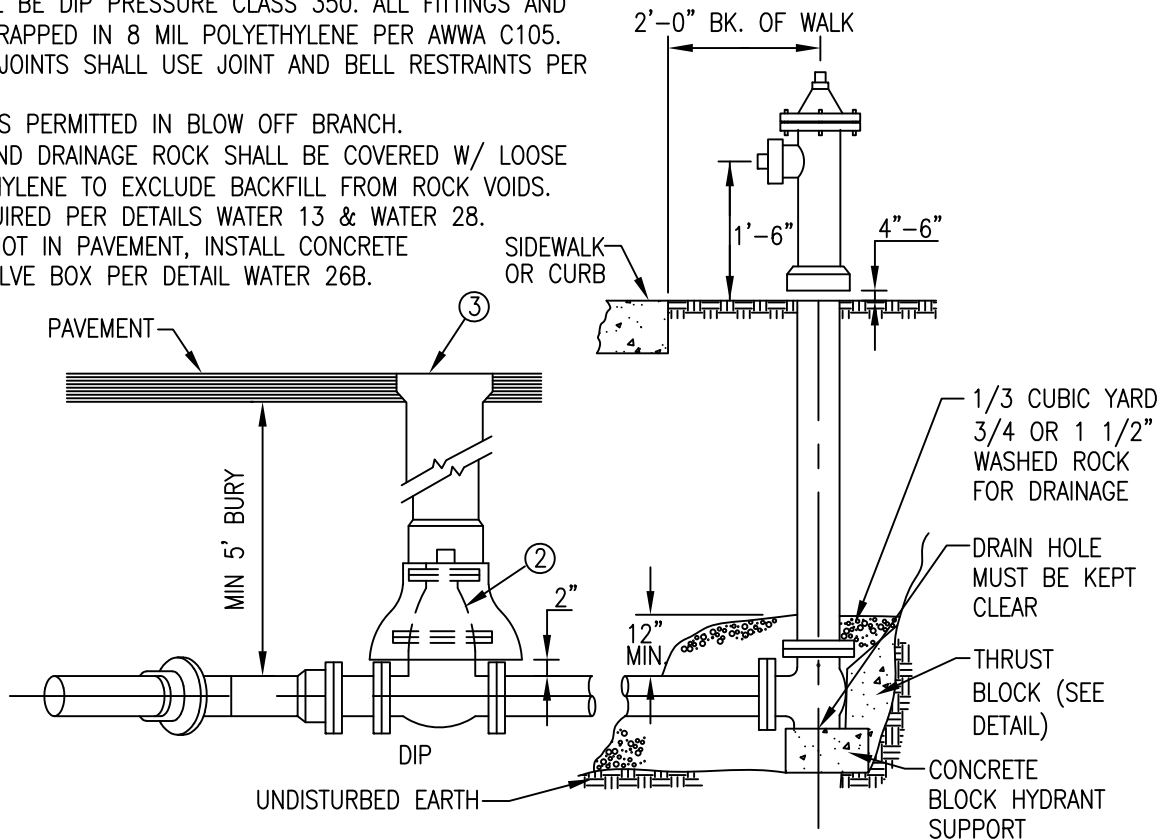
THRUST BLOCK DETAIL


DRAWN: KAW	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: WATER01B	



NOTES:

1. KUPFERLE "ECLIPSE" #2 POST HYDRANT W/ ONE 2 1/2" NOZZLE AND THE FOLLOWING OPTIONS:
 - 1.1. VANDAL PROOF CAP #X592E
 - 1.2. VANDAL PROOF SCREW X503VP
 - 1.3. VANDAL PROOF WRENCH #492VP
 - 1.4. 4" MJ INLET #X571L
2. 4" MJ NRS GATE VALVE (AWWA C509) W/2" OPER. NUT EPOXY COAT INSIDE & OUT - OPEN LEFT
3. VALVE BOX SHALL BE 5 1/4" CAST IRON THREE-PIECE, SCREW TYPE ADJUSTMENT DESIGN, TYLER 6860 SERIES OR STAR PIPE PRODUCTS VB-0006 SERIES W/ #6 BASE. SET BASE MIN. OF 2" ABOVE PIPE.
4. ALL 4" PIPE SHALL BE DIP PRESSURE CLASS 350. ALL FITTINGS AND D.I. PIPE TO BE WRAPPED IN 8 MIL POLYETHYLENE PER AWWA C105.
5. ALL FITTINGS AND JOINTS SHALL USE JOINT AND BELL RESTRAINTS PER DETAIL WATER 21C.
6. NO VERTICAL BENDS PERMITTED IN BLOW OFF BRANCH.
7. BLOW OFF BASE AND DRAINAGE ROCK SHALL BE COVERED W/ LOOSE SHEET OF POLYETHYLENE TO EXCLUDE BACKFILL FROM ROCK VOIDS.
8. TRACER WIRE REQUIRED PER DETAILS WATER 13 & WATER 28.
9. IF VALVE BOX IS NOT IN PAVEMENT, INSTALL CONCRETE COLLAR AROUND VALVE BOX PER DETAIL WATER 26B.

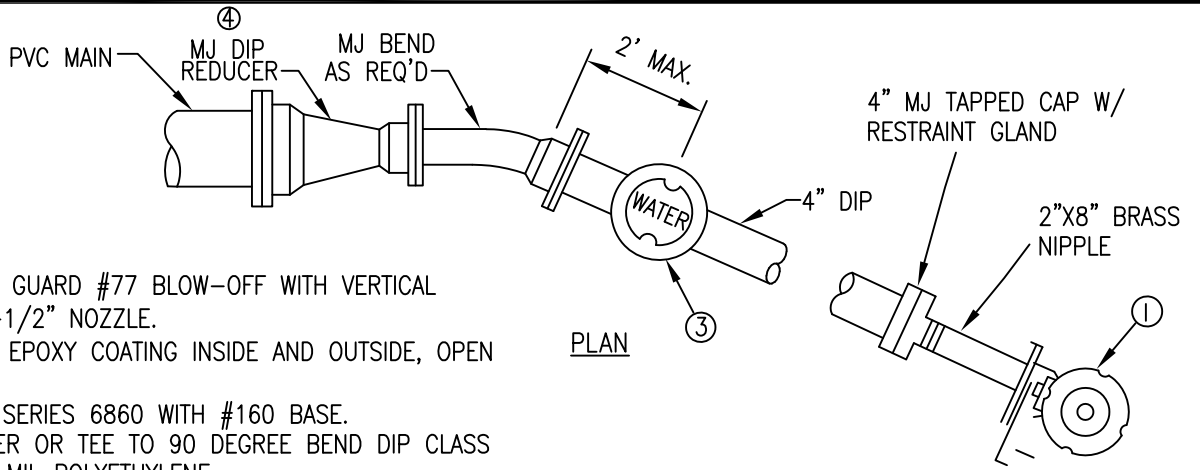




PINERY
WATER & WASTEWATER DISTRICT
Quality Water for Life

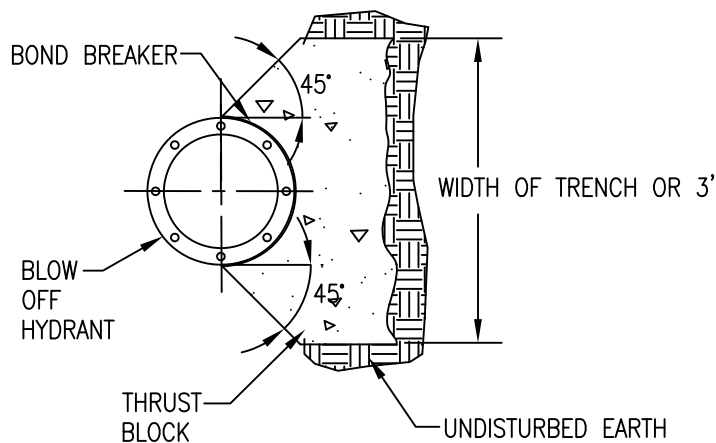
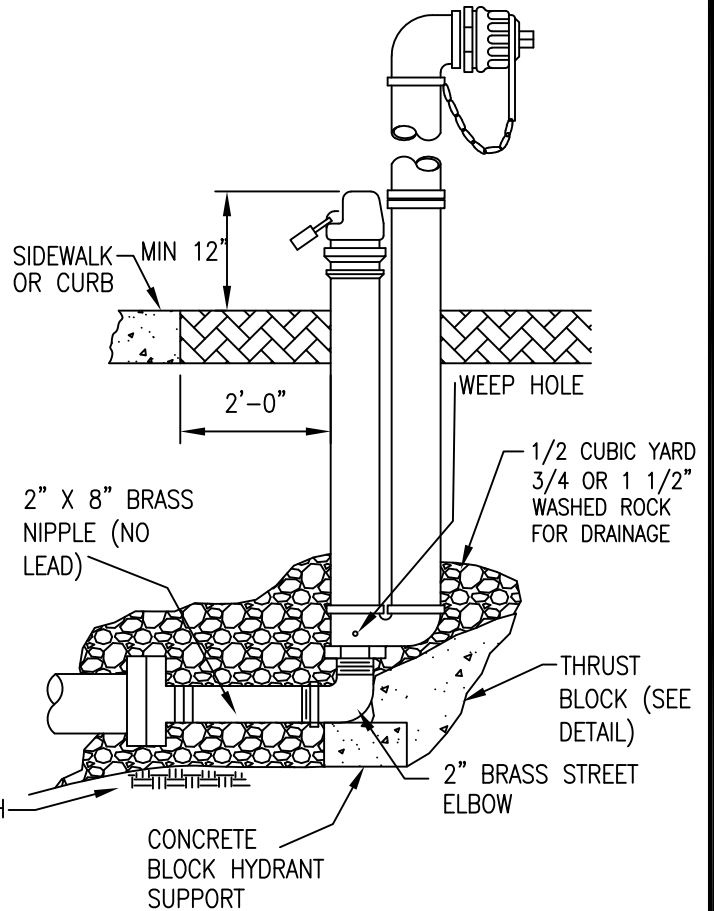
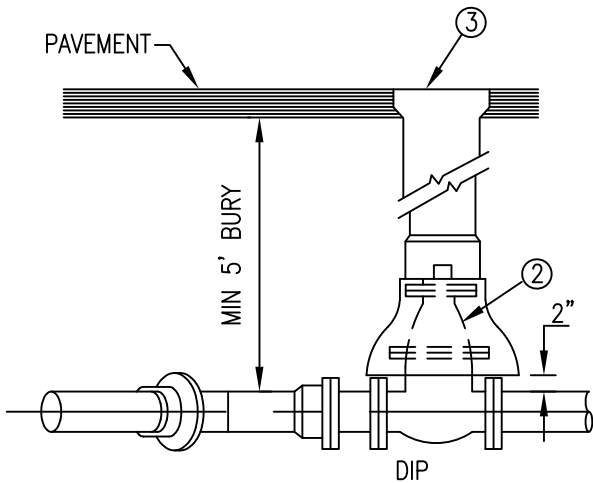
ECLIPSE 2 POST HYDRANT


DRAWN: RK	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: WATER02	



NOTES:

1. 2" KUPFERLE MAIN GUARD #77 BLOW-OFF WITH VERTICAL INLET AND ONE 2-1/2" NOZZLE.
2. 4" MJ GATE VALVE EPOXY COATING INSIDE AND OUTSIDE, OPEN LEFT.
3. TYPER VALVE BOX SERIES 6860 WITH #160 BASE.
4. PIPE FROM REDUCER OR TEE TO 90 DEGREE BEND DIP CLASS 50 WRAPPED IN 8 MIL POLYETHYLENE.
5. ALL FITTINGS AND PIPE SHALL BE RESTRAINED WITH EBBA SERIES 1100 RESTRAINTS AND WRAPPED WITH 8 MIL POLYETHYLENE.
6. NO VERTICAL BENDS ALLOWED IN BLOW OFF BRANCH. VERTICAL ADJUSTMENT CAN BE MADE USING KUPFERLE OPTION X77 EXT-6 (FIRST 6") AND OPTION X77 EXT-XX (EACH ADDITIONAL 6")
7. BLOW-OFF BASE AND DRAINAGE ROCK SHALL BE A MINIMUM OF 12" ABOVE WEEP HOLE AND COVERED WITH LOOSE SHEET OF 8 MIL POLYETHYLENE SHEET.
8. TRACER WIRE REQUIRED, SEE TRACER WIRE DETAIL.
9. BED PIPING IN SQUEEGEE 6" BELOW PIPE AND 12" ABOVE PIPE.
10. ALL BRASS PIPE AND FITTINGS SHALL BE LEAD FREE

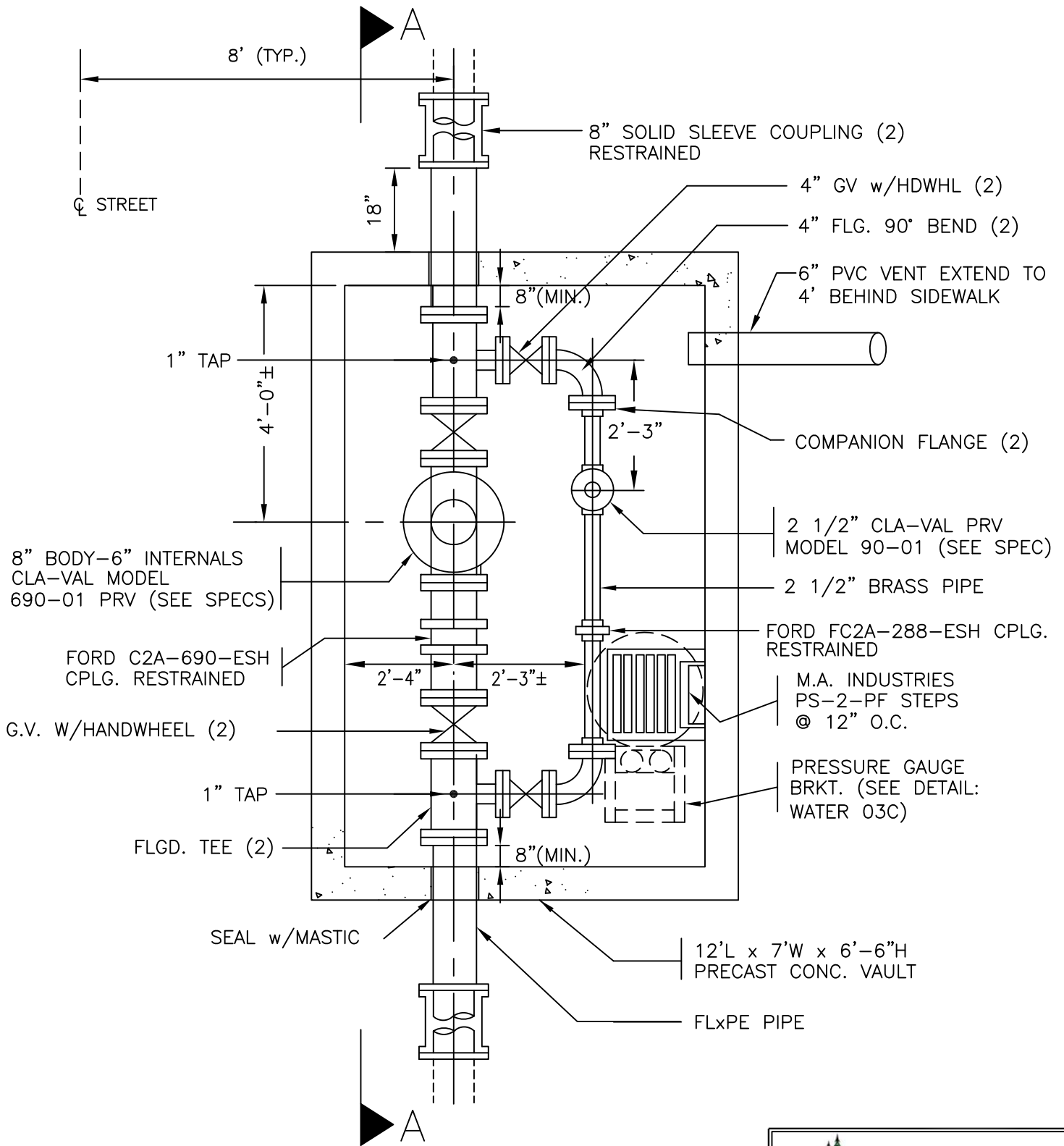




PINERY
WATER & WASTEWATER DISTRICT
Quality Water for Life


BLOWOFF MAIN GUARD 77 DETAIL

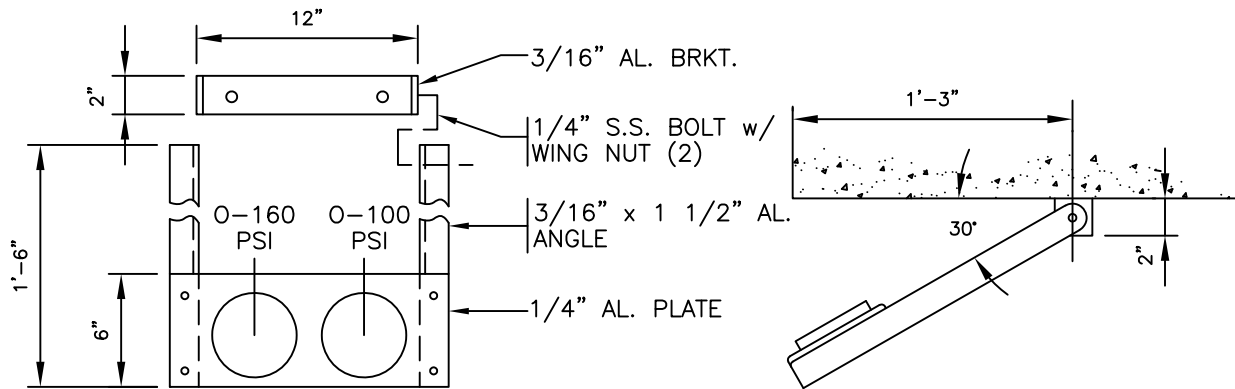
DRAWN: RK	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: WATER02A	



NOTES:

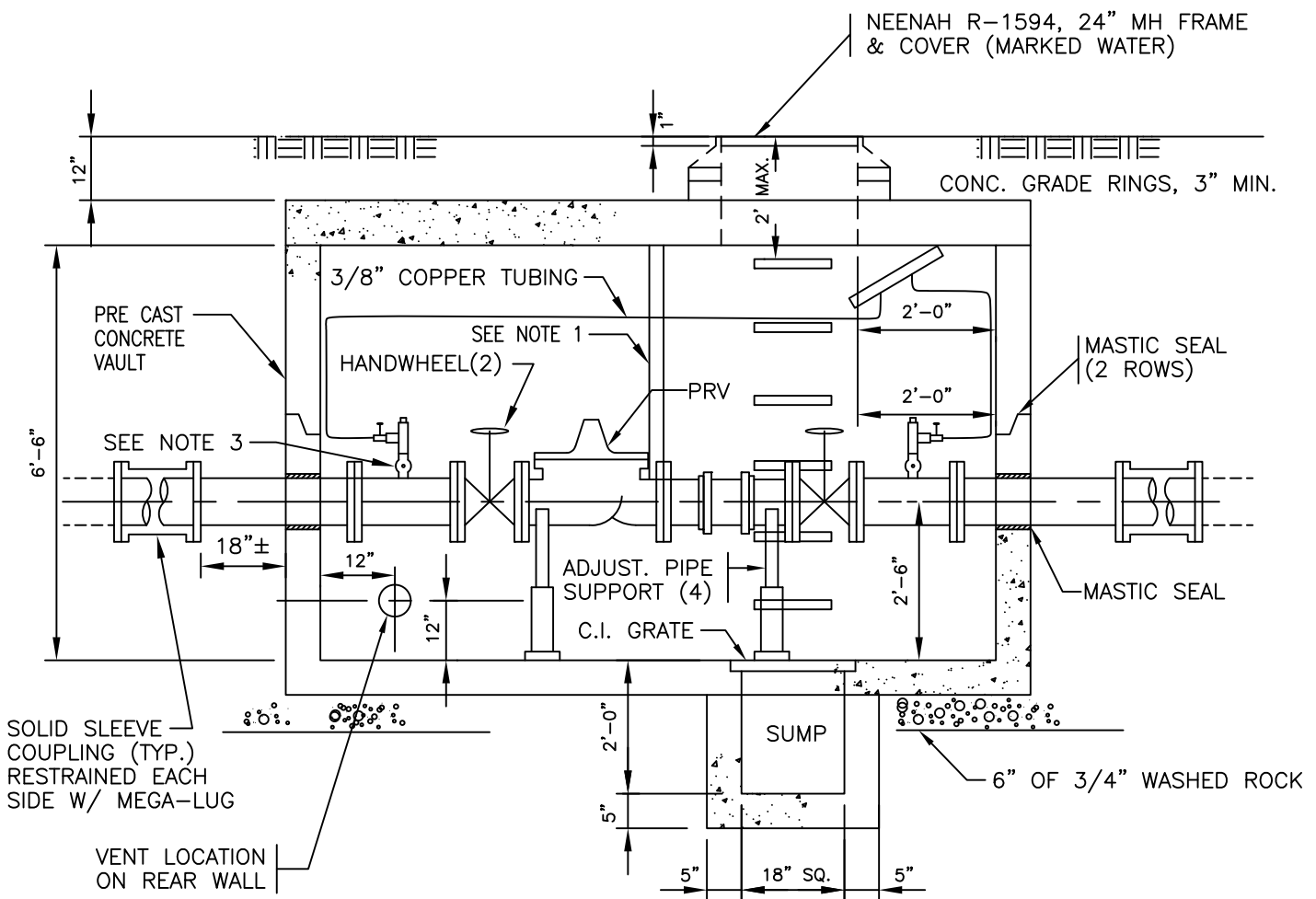
1. ALL PIPING WITH VAULT INCLUDING EXTERIOR PIPING TO SOLID SLEEVE CONNECTION SHALL BE D.I.P. EXCEPTION, 2 1/2" PIPING SHALL BE BRASS PIPE.
2. MANHOLE COVER TO BE PLACED CLOSEST TO 2 1/2" LINE.
3. MANHOLE COVER SHALL BE MINIMUM 4' FROM FLOWLINE.
4. USE HEAVY DUTY VENT ASSEMBLY UNLESS OTHERWISE SHOWN ON CONSTRUCTION NOTES.

 PINERY WATER & WASTEWATER DISTRICT <i>Quality Water for Life</i>	
PRV STATION PLAN SHT. 1	
DRAWN: KAW	CHECKED: RK
DATE: 02/03/2020	
SCALE: NO SCALE	
FILE NO: WATER03B	



PRESS. GAUGES – AMETEK SERIES 541L 4”
LIQUID FILLED, BACK MOUNT


DETAIL – PRESS. GAUGES



SECTION A-A

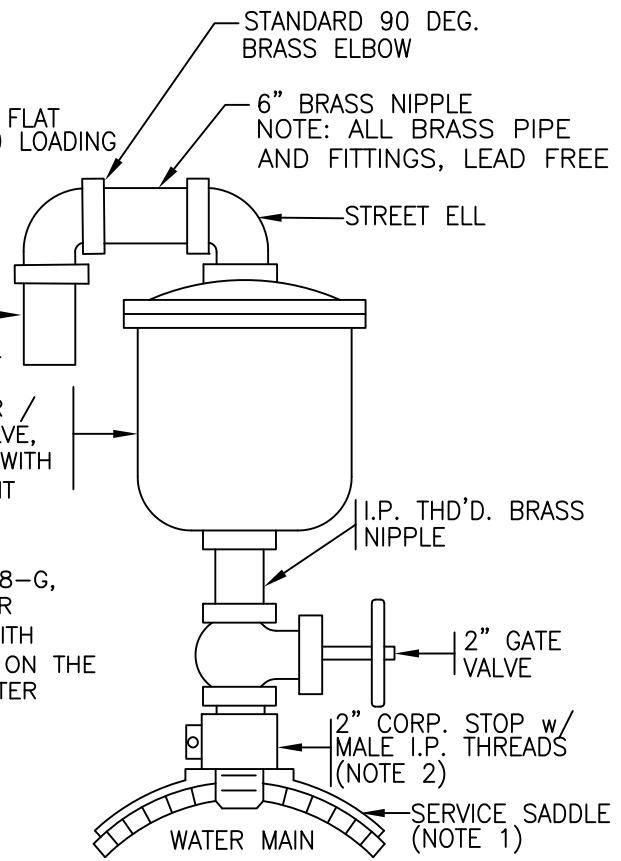
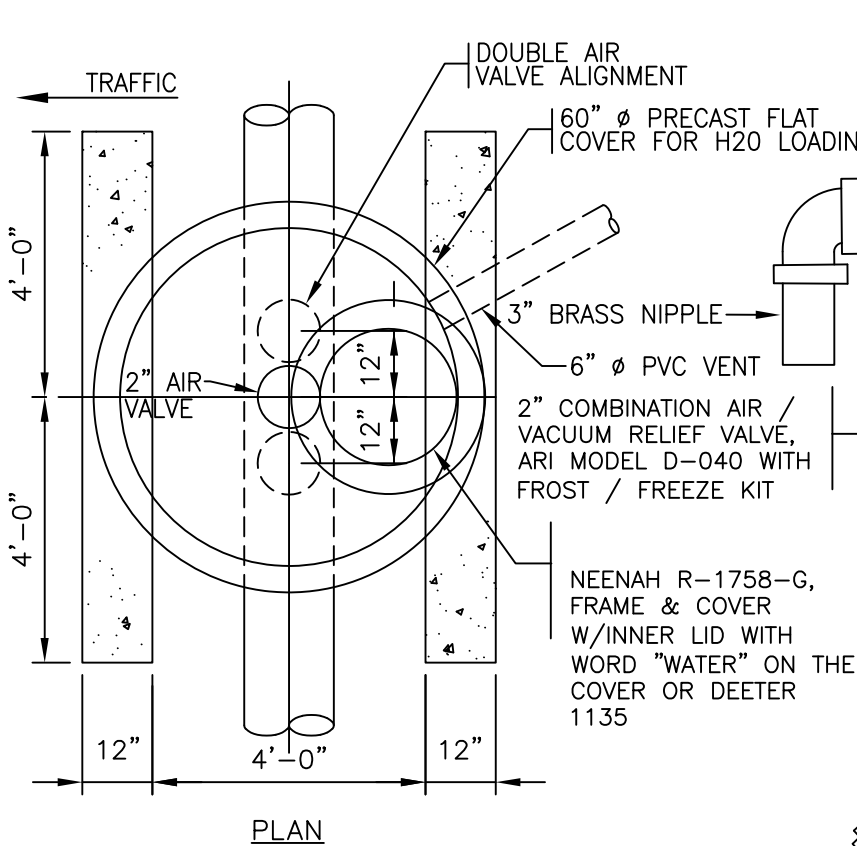
NOTES:

1. ADJUSTABLE PIPE RESTRAINT TO CENTER OF 2 1/2” BRASS PIPE
2. ALL INTERIOR PIPING TO BE PAINTED PER SPECIFICATIONS.
3. COMPONENTS OF 1” TAP (EACH)
 - 1” FORD FB 500-4 CORP STOP
 - 1” BRASS TEE
 - 1” BRASS PLUG
 - 1”x3/8” BRASS BUSHING
 - 3/8” BRASS BALL VALVE



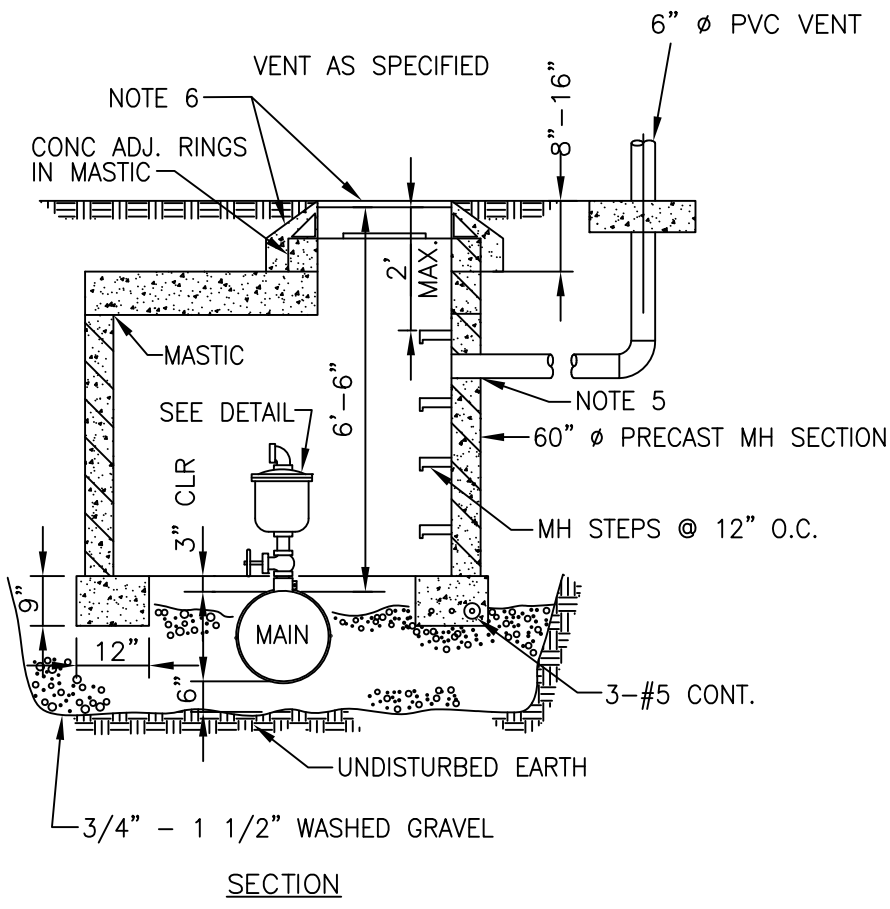
PRV STATION SECTION AND DETAIL SHT. 2

DRAWN: KAW	CHECKED: PM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: WATER03C	



NOTES:

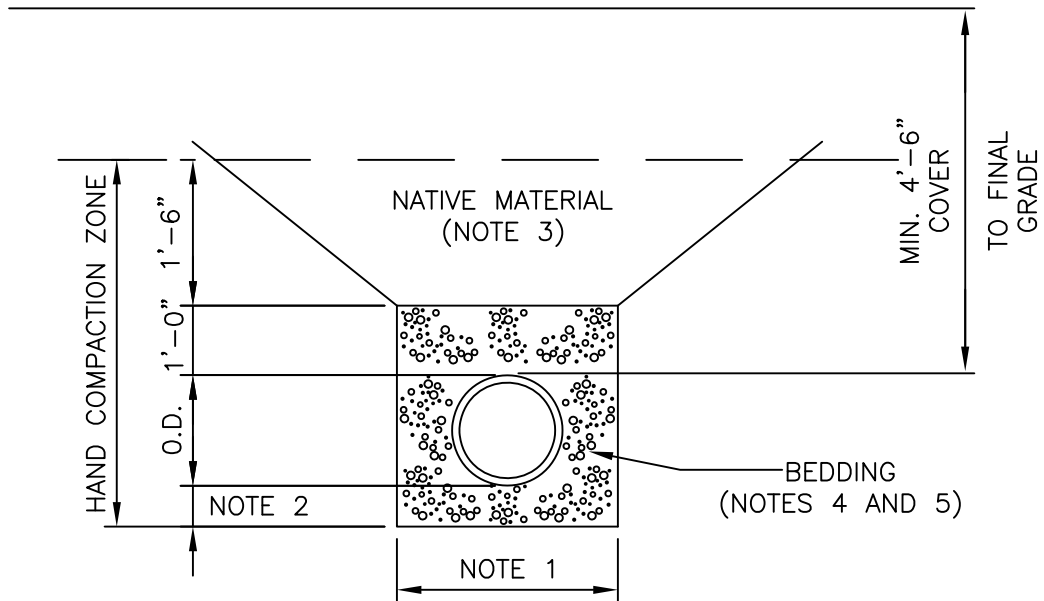
1. FORD S-90 SADDLE FOR C-900 PVC PIPE. FORD 202B WITH AWWA TAPER THREAD FOR D.I.P.
2. FORD MODEL FB400-7 OR EQUAL.
3. FOR DOUBLE AIR AND VAC VALVES LOCATE CENTERS 24" APART.
4. DOUBLE AIR VAC IS REQUIRED ON PIPES 12" DIAMETER OR LARGER.
5. LINK SEAL MODEL #LS-475 WITH 10" DIAMETER CORE HOLE.
6. IN LOCATIONS WITHOUT PAVEMENT TOP OF MANHOLE 3"-5" ABOVE GRADE WITH SLOPING CONCRETE COLLAR AROUND MANHOLE HAT.
7. INSTALL CONSEAL 102 OR EQUAL BETWEEN TOP CONCRETE RISER AND THE CAST IRON OR ALUMINUM MANHOLE FRAME.
8. ANY MANHOLE BARREL SECTION BEING CUT FOR DOGHOUSE FOR CLEARANCE OF WATER MAIN MUST BE SANDBAGGED ON THE OUTSIDE TO PREVENT BEDDING FROM ENTERING MANHOLE.



PINERY
WATER & WASTEWATER DISTRICT
Quality Water for Life

AIR AND VAC VALVE


DRAWN: KAW	CHECKED: RK
DATE: 02/03/2020	
SCALE: NO SCALE	
FILE NO: WATER04	

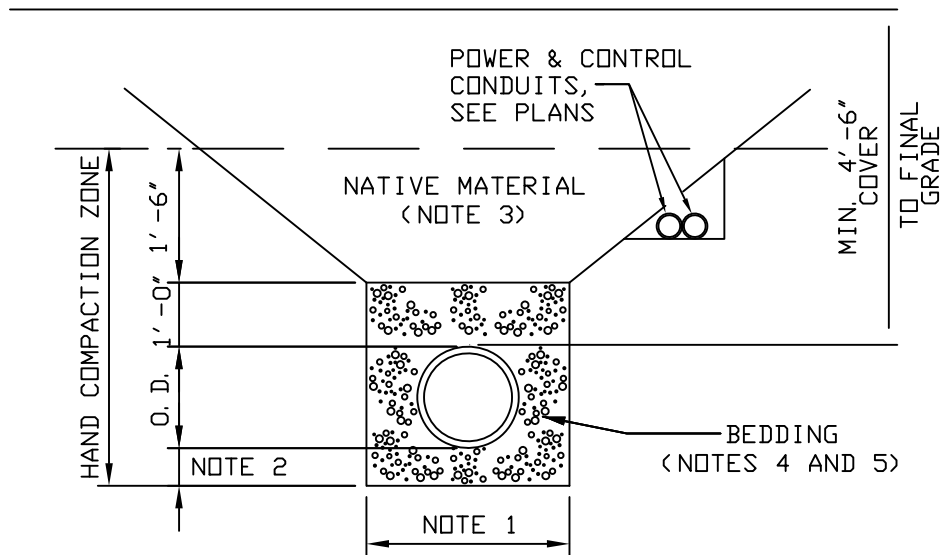


GRANULAR BEDDING

NOTES:

1. TRENCH WIDTH SHALL BE 12"-18" EACH SIDE OF PIPE BELL.
2. 6" BEDDING REQUIRED IF ALL LOOSE MATERIAL IS REMOVED FROM THE TRENCH BOTTOM, OTHERWISE 12" BEDDING REQ'D.
3. PLACE MIN. OF 12" BEDDING MATERIAL AND 18" OF NATIVE MATERIAL OVER PIPE BEFORE USING OTHER THAN HAND COMPACTION EQUIPMENT.
4. GRANULAR BEDDING MUST BE THOROUGHLY WORKED UNDER PIPE HAUNCHES FOR FULL PIPE LENGTH.
5. IF TRENCH BOTTOM IS UNSTABLE, FOLLOW DEWATERING REQUIREMENTS ON COVER SHEET.
6. THE SQUEEGEE BEDDING ABOVE THE PIPE SHALL BE LEVEL ACROSS THE WIDTH OF THE ENTIRE TRENCH. MOUNDING OF SQUEEGEE TO OBTAIN MIN. 12" OF BEDDING ABOVE THE PIPE IS NOT ACCEPTABLE.


	
TRENCH DETAIL	
DRAWN: KAW	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: WATER05	

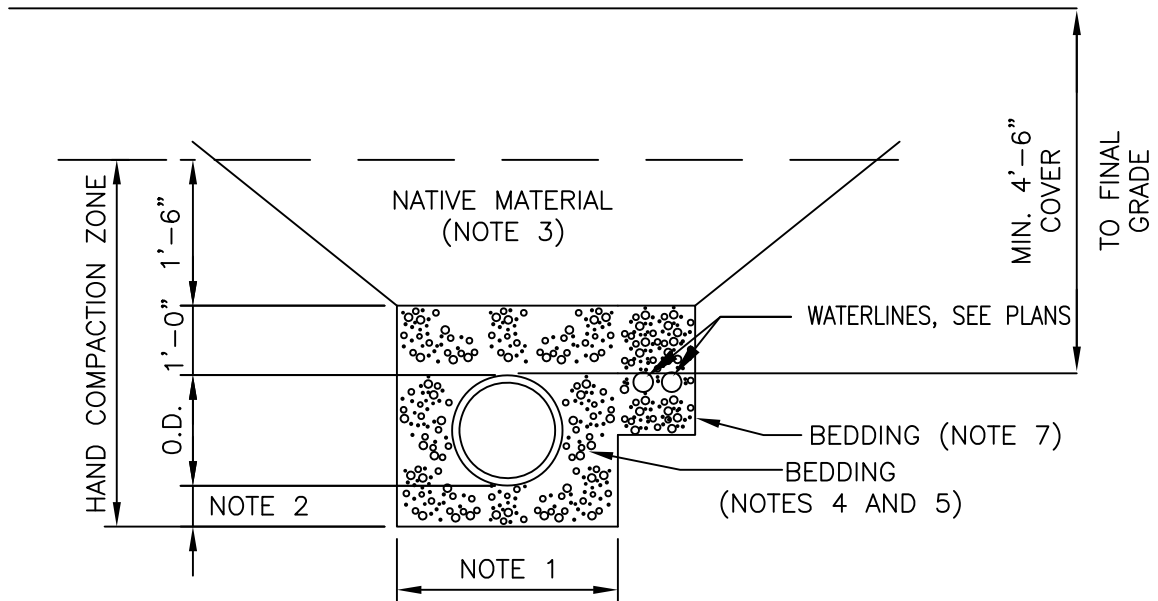


GRANULAR BEDDING

NOTES:

1. MAXIMUM WIDTH = 2' + INT. PIPE DIAMETER, MINIMUM WIDTH = 2'.
2. 6" BEDDING REQUIRED IF ALL LOOSE MATERIAL IS REMOVED FROM THE TRENCH BOTTOM. OTHERWISE 12" BEDDING REQ'D.
3. PLACE MIN. OF 12" BEDDING MATERIAL AND 18" OF NATIVE MATERIAL OVER PIPE BEFORE USING OTHER THAN HAND COMPACTION EQUIPMENT.
4. IF TRENCH BOTTOM IS UNSTABLE, REMOVE PER DISTRICT ENGINEER'S REQUIREMENTS & FILL WITH 3/4"-2" CRUSHED ROCK OR FLOW FILL TO STABILIZE.
5. GRANULAR BEDDING MUST BE THOROUGHLY WORKED UNDER PIPE HAUNCHES FOR FULL PIPE LENGTH.


 PINERY WATER & WASTEWATER DISTRICT <i>Quality Water for Life</i>	
PIPE TRENCH WITH POWER & CONTROL CONDUITS	
DRAWN: PAU	CHECKED: WJM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: WATER05B	

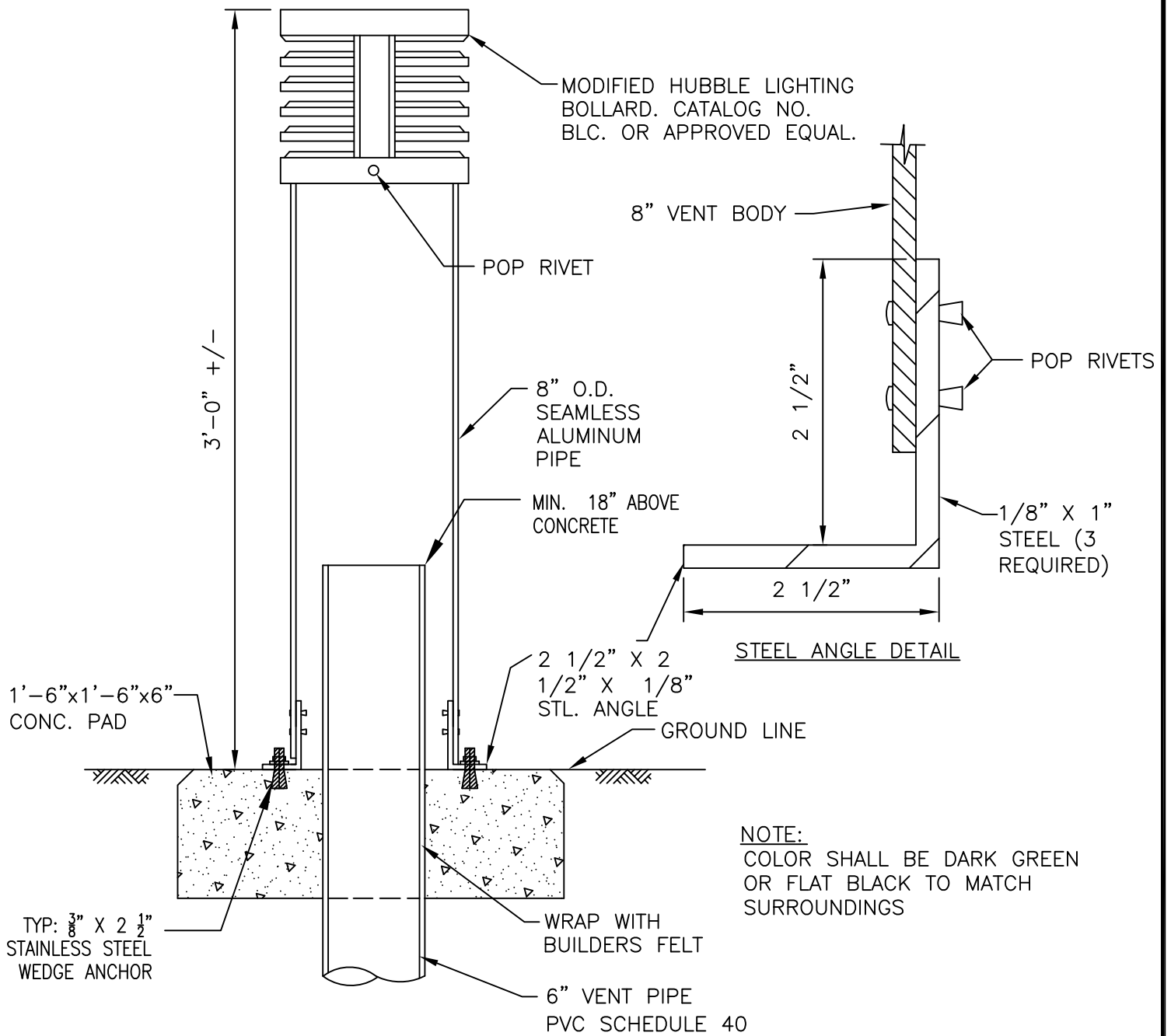


GRANULAR BEDDING

NOTES:

1. TRENCH WIDTH SHALL BE 12"-18" EACH SIDE OF PIPE BELL.
2. 6" BEDDING REQUIRED IF ALL LOOSE MATERIAL IS REMOVED FROM THE TRENCH BOTTOM, OTHERWISE 12" BEDDING REQ'D.
3. PLACE MIN. OF 12" BEDDING MATERIAL AND 18" OF NATIVE MATERIAL OVER PIPE BEFORE USING OTHER THAN HAND COMPACTION EQUIPMENT.
4. GRANULAR BEDDING MUST BE THOROUGHLY WORKED UNDER PIPE HAUNCHES FOR FULL PIPE LENGTH.
5. IF TRENCH BOTTOM IS UNSTABLE, FOLLOW DEWATERING AND TRENCH STABILIZATION REQUIREMENTS IN SPECIFICATION SECTIONS 31 23 19.01 AND 31 23 23.15.
6. THE SQUEEGEE BEDDING ABOVE THE PIPE SHALL BE LEVEL ACROSS THE WIDTH OF THE ENTIRE TRENCH. MOUNDING OF SQUEEGEE TO OBTAIN MIN. 12" OF BEDDING ABOVE THE PIPE IS NOT ACCEPTABLE.
7. PLACE MIN. OF 4" BEDDING MATERIAL UNDER WATER LINES OF LESS THAN 2" DIAMETER. REMOVE ALL LOOSE MATERIAL BEFORE INSTALLING BEDDING.

 <p>PINERY WATER & WASTEWATER DISTRICT Quality Water for Life</p>	
TRENCH DETAIL	
DRAWN: KAW	CHECKED: BM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: WATER05C	

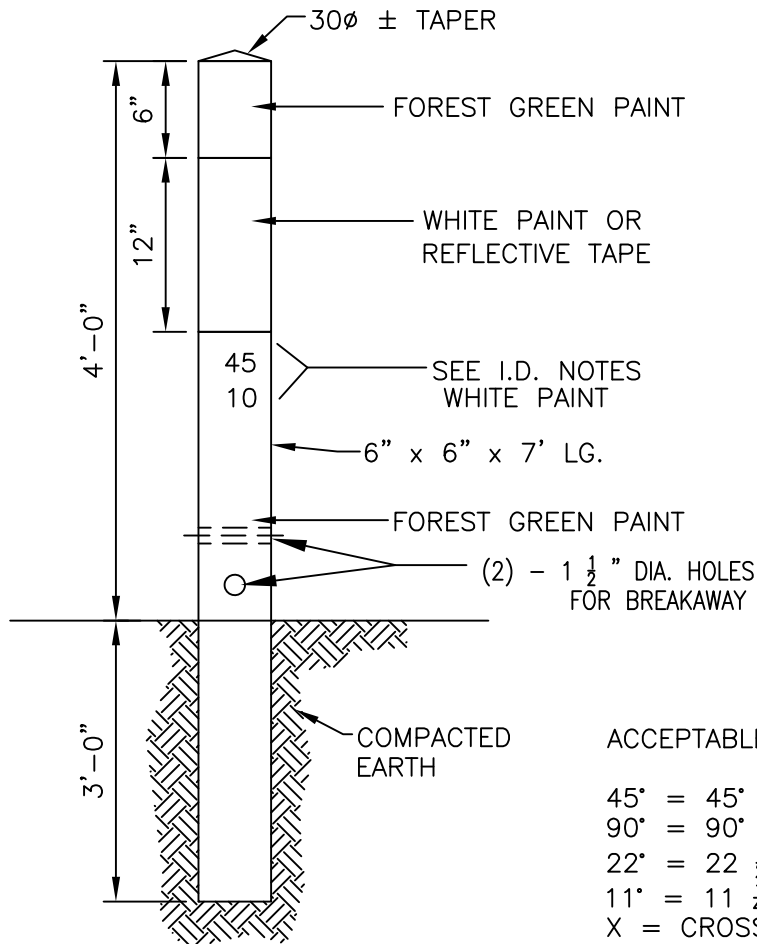


ROUND VENT SCREEN



RESIDENTIAL VENT ASSEMBLY

DRAWN: KAW	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: WATER06	



REDWOOD POST

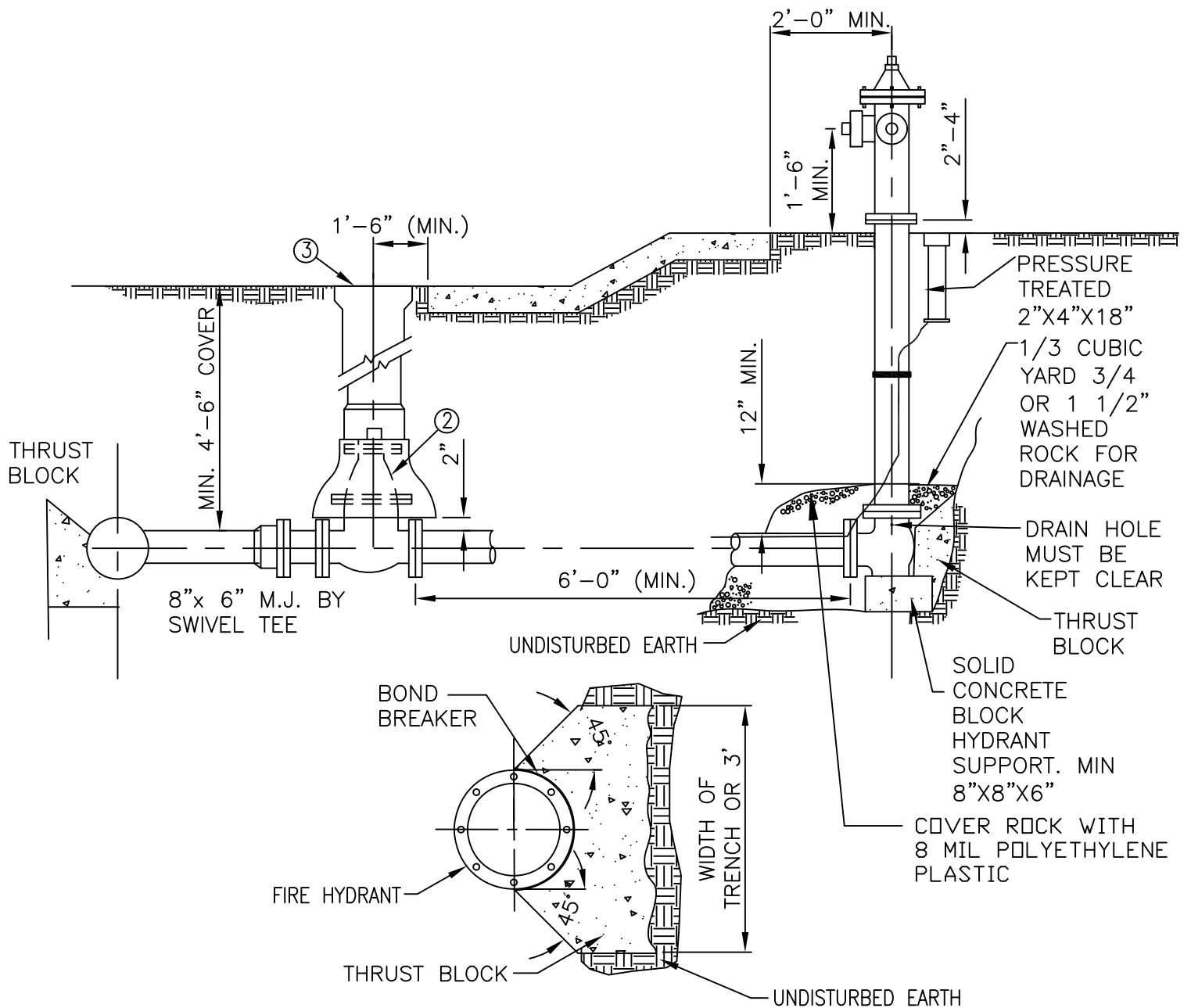
ACCEPTABLE MARKER POST ABBREVIATIONS

- 45° = 45° BEND
- 90° = 90° BEND
- 22° = 22 1/2° BEND
- 11° = 11 1/4° BEND
- X = CROSS
- T = TEE
- WL = STRAIGHT RUN (1000' MAX)
- MH = MANHOLE
- P = PLUG
- TWB = TRACER WIRE BOX
- BFV = BUTTERFLY VALVE
- GV = GATE VALVE
- AV = AIR VACCUM VALVE
- PRV = PRESSURE REDUCING VALVE
- BO = BLOW-OFF
- RAW = RAW WATER LINE
- WTR = POTABLE WATER LINE

I.D. NOTES:

1. LETTERS TO BE 2" HIGH CAPITAL PER TABLE.
2. ROUTE LETTERS IN WOOD POST AND PAINT WHITE. 7/16" MAX. ROUTER BIT SHALL BE USED.
3. LETTERING SHALL FACE OBJECT.
4. NUMBER ABOVE INDICATES DEGREES OF BEND.
5. NUMBER BELOW LETTER INDICATES DISTANCE TO OBJECT.
6. SEE PLANS FOR LOCATIONS OF MARKER POSTS. MARKER POSTS SHALL BE PROVIDED FOR ALL APPURTENANCES LISTED AND LOCATED OUTSIDE OF PAVEMENT.

<p>PINERY WATER & WASTEWATER DISTRICT Quality Water for Life</p>	
MARKER POST DETAIL	
DRAWN: KAW	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: WATER07	



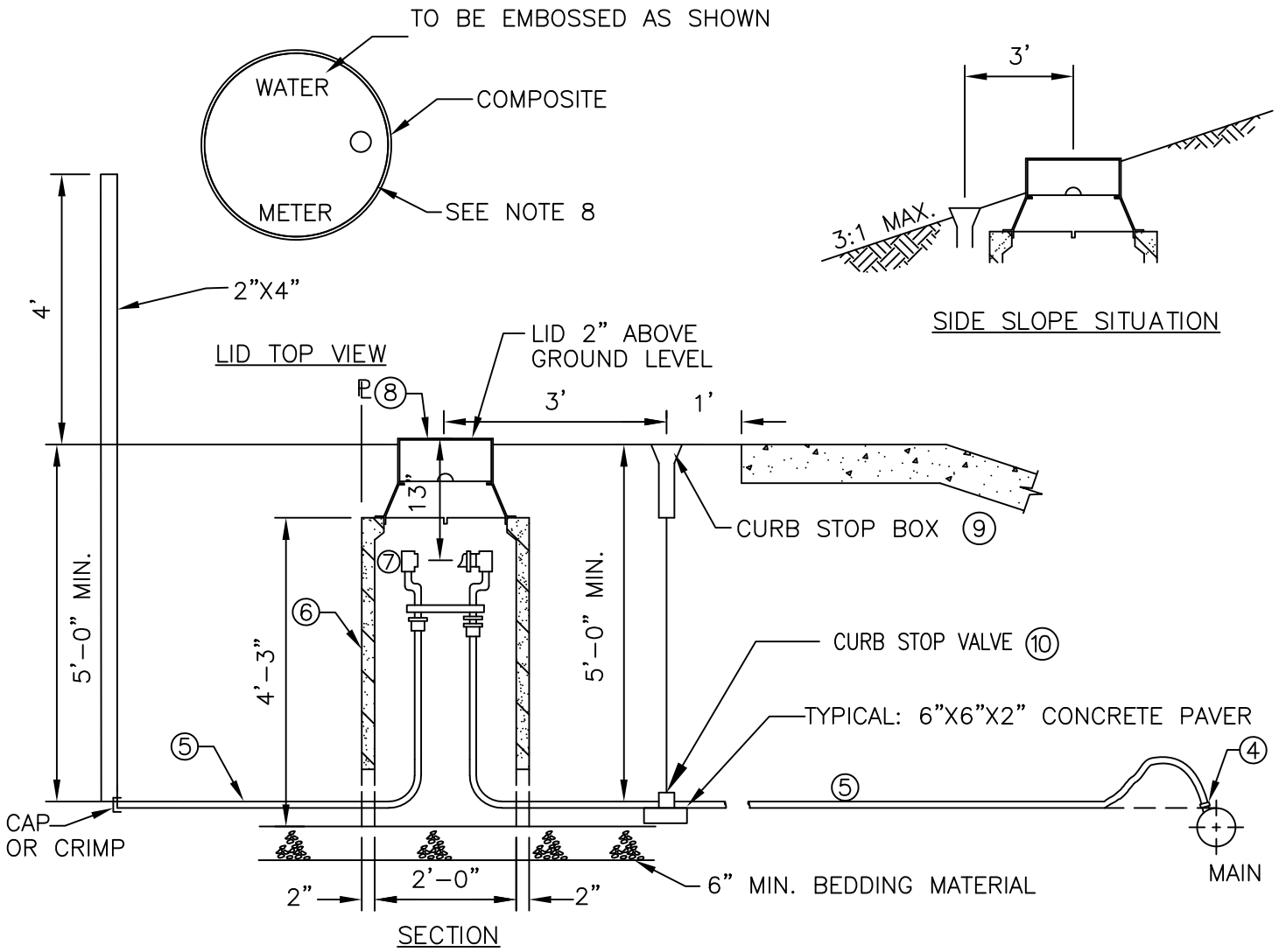
NOTES:

1. FIRE HYDRANT SHALL BE AMERICAN AVK SERIES 2700.
2. 6" MJ NRS GATE VALVE (AWWA C509) W/ 2" OPER. NUT. EPOXY COAT INSIDE & OUT. CLOSE CLOCKWISE.
3. TYLER 6860 SERIES 3-PIECE CAST IRON VALVE BOX WITH 160 BASE OR STAR PIPE PRODUCTS VB-0006 SERIES WITH 160 BASE.
4. ALL FITTINGS AND D.I.P. TO BE WRAPPED IN 8 MIL POLYETHYLENE.
5. JOINT RESTRAINTS SHALL BE USED BETWEEN VALVE AND HYDRANT.
6. NO HORIZONTAL OR VERTICAL BENDS PERMITTED IN HYDRANT BRANCH.
7. HYDRANT BASE AND DRAINAGE ROCK SHALL BE COVERED W/ LOOSE SHEET OF POLYETHYLENE TO EXCLUDE BACKFILL FROM ROCK VOIDS.
8. LOCATE HYDRANTS 5' BEHIND P.C. OR P.T. OF CURB RETURNS OR AT LOT LINES IF NOT AT STREET INTERSECTIONS.
9. TRACER WIRE REQUIRED (SEE TRACER WIRE DETAIL WATER13).




HYDRANT ASSEMBLY DETAIL

DRAWN: KAW	RK
DATE: 02/03/2020	
SCALE: NO SCALE	
FILE NO: WATER08	



NOTES / ITEM DESCRIPTIONS:

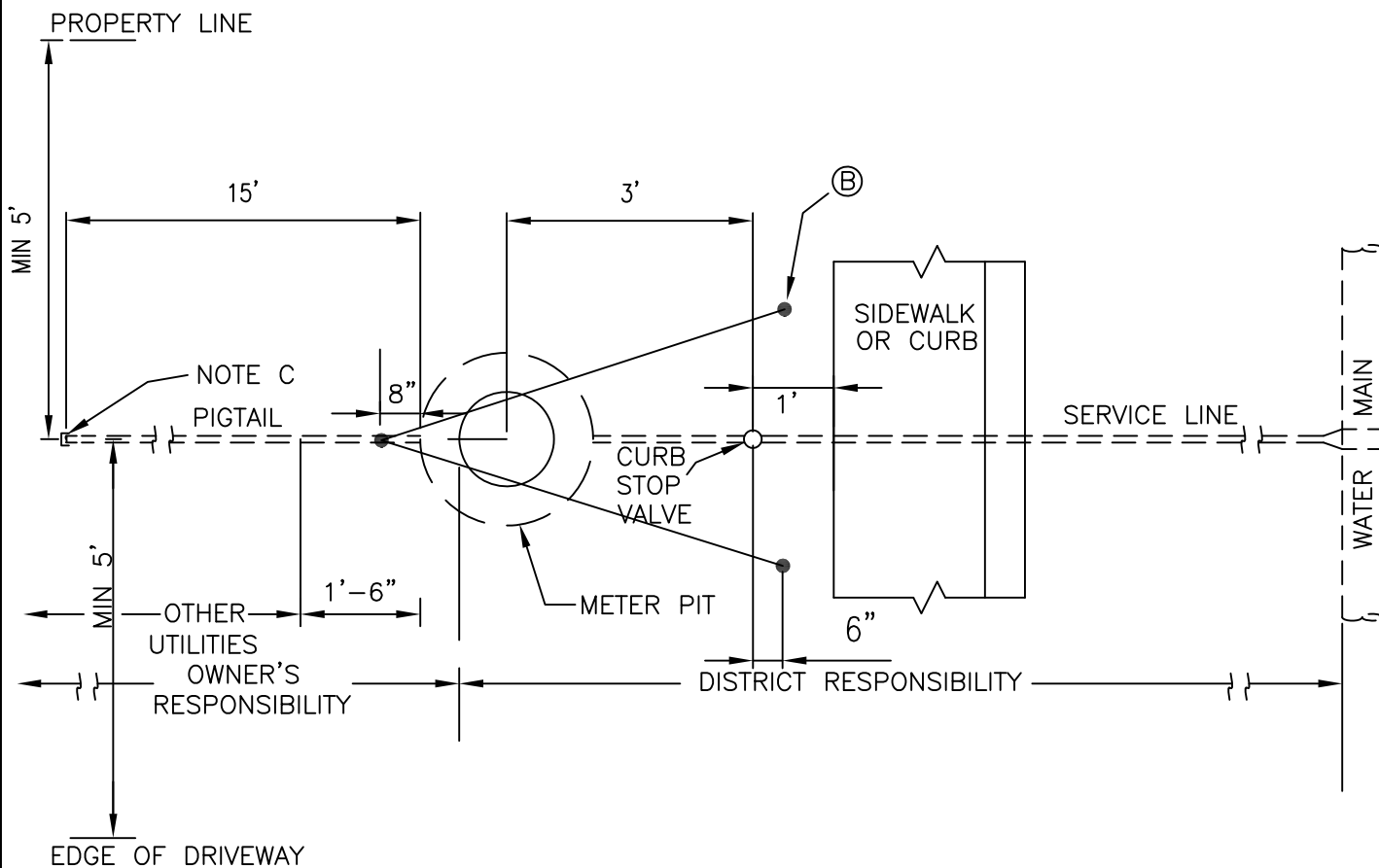
1. LOCATE SERVICE LINE AT 90° TO FRONT PROPERTY LINE UNLESS PLANS SHOW OTHERWISE.
2. WATER METER FURNISHED AND INSTALLED BY THE DISTRICT.
3. SERVICE LINE MUST BE INSPECTED BY DISTRICT AND TESTED EXPOSED FOR 1 HOUR PRIOR TO BACKFILLING.
4. SERVICE SADDLE: FOR C900 OR C905 PVC, USE FORD S90. FOR DIP, USE FORD DOUBLE BRONZE STRAP 202B. CORP STOP VALVE: USE FORD FB1000-CC OR FORD FB600-CC THREAD BY FLARE COPPER OUTLET, REPLACE FLARE NUT WITH FORD C04-G COUPLING WITH FORD SLC COPPER WASHER. ALL METALLIC MAINS REQUIRE FORD SL SERVICE INSULATOR.
5. 3/4" OR 1" TYPE "K" COPPER SERVICE LINE, AS NOTED ON PLANS. EXTEND 15' BEYOND BACK OF METER PIT (SEE DETAIL WATER09B) AND MARK LOCATION. LINE IS TO BE STRAIGHT FROM MAIN TO METER PIT. BED COPPER TUBING IN SQUEEGEE, 6" BELOW AND 12" ABOVE.
6. 24" I.D. CONCRETE METER PIT CONSTRUCTED W/ ONE 12" AND ONE 36" RING OR FOUR 12" SECTIONS. ADJUSTMENT RINGS (2" TO 6" HIGH) SHALL BE INSERTED BETWEEN TWO TOP RINGS.
7. METER YOKE: WITH CHECK VALVE FORD VBH82-12W-44-33G.
8. METER PIT HOOD AND COVER - FORD W3H-T AND NICOR TYPE A
9. 12.25" COMPOSITE LID WITH BADGER METER WITH TRACE RADIO READ COVER OPTION. INNER LID FORD MODEL W3BPD.
10. TYLER SERIES 6505 BOX.
11. CURB STOP VALVE: USE FORD B44-333G.
12. ALL FITTINGS SHALL HAVE COMPRESSION (PACK JOINT) ENDS.
13. ALL BRASS PIPE AND FITTINGS SHALL BE LOW-LEAD OR LEAD FREE.
14. METER COVER SHALL BE SET 2" ABOVE FINAL GRADE.



PINERY
WATER & WASTEWATER DISTRICT
Quality Water for Life

3/4" AND 1" RESIDENTIAL METER SETTING
SHEET 1 OF 3

DRAWN: KAW	CHECKED: RK
DATE: 01/2020	
SCALE: NO SCALE	
FILE NO: WATER09A	



TYPICAL PLAN WITH SIDEWALK

NOTES:

- A. SHOULD ANY SITUATION ARISE OTHER THAN SHOWN CONCERNING THE DEPTH, CONSTRUCTION OR LOCATION OF SERVICE LINE OR METER, CALL 303-841-2797
- B. THREE SIX FOOT METAL FENCE POSTS, 4 FOOT EXPOSED WITH 4 FEET HEAVY DUTY TALL PLASTIC BARRIER FENCING TO PROTECT METER PIT AND CURB STOP BOX.
- C. CRIMP OR CAP END OF PIGTAIL. INSTALL 2" X 4" AT END OF WATER SERVICE PER DETAIL WATER09A.



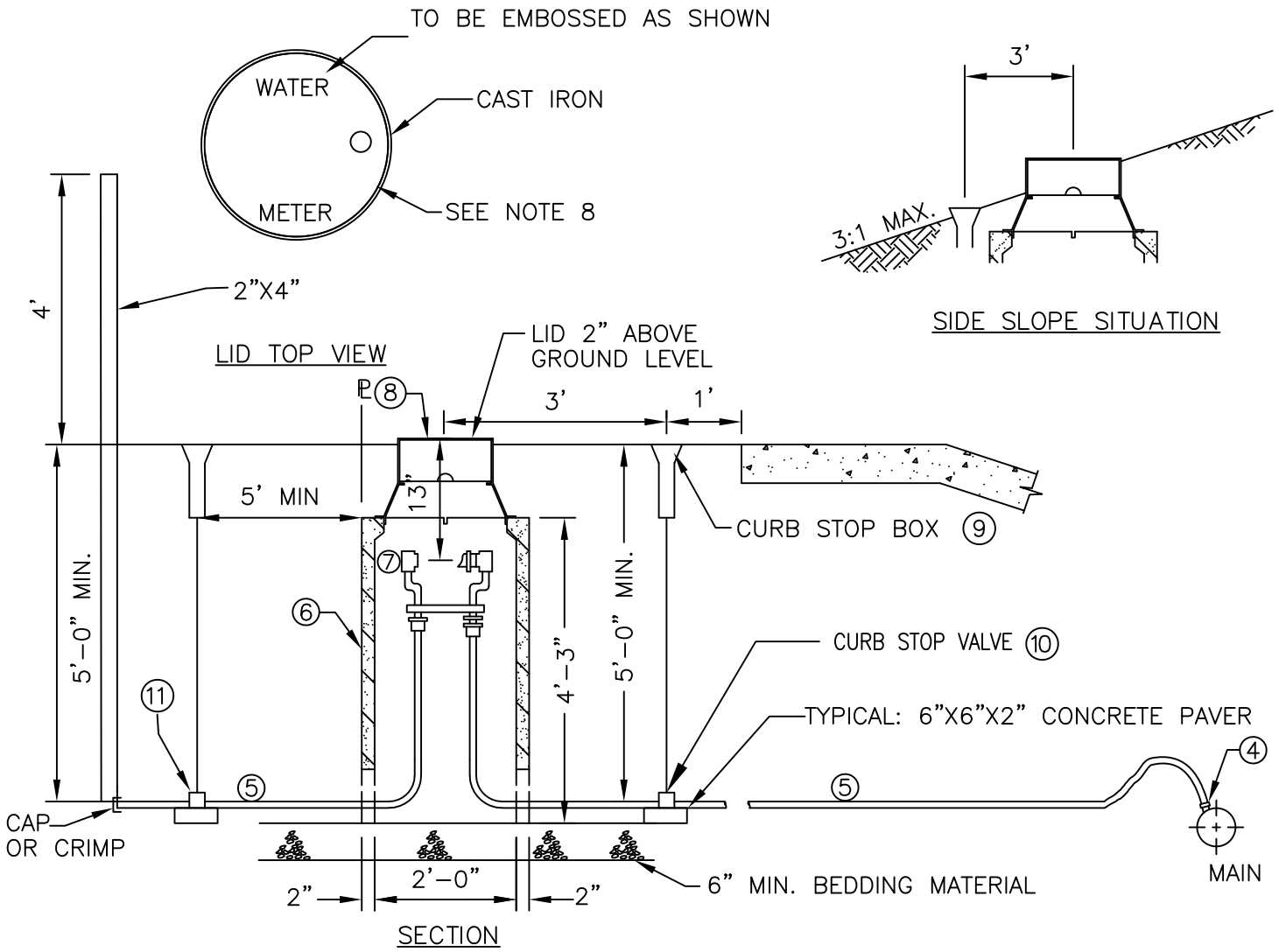
3/4" AND 1" RESIDENTIAL AND IRRIGATION METER SETTING SHEET 3 OF 3

DRAWN: KAW CHECKED: PRM

DATE: 06/2017


SCALE: NO SCALE

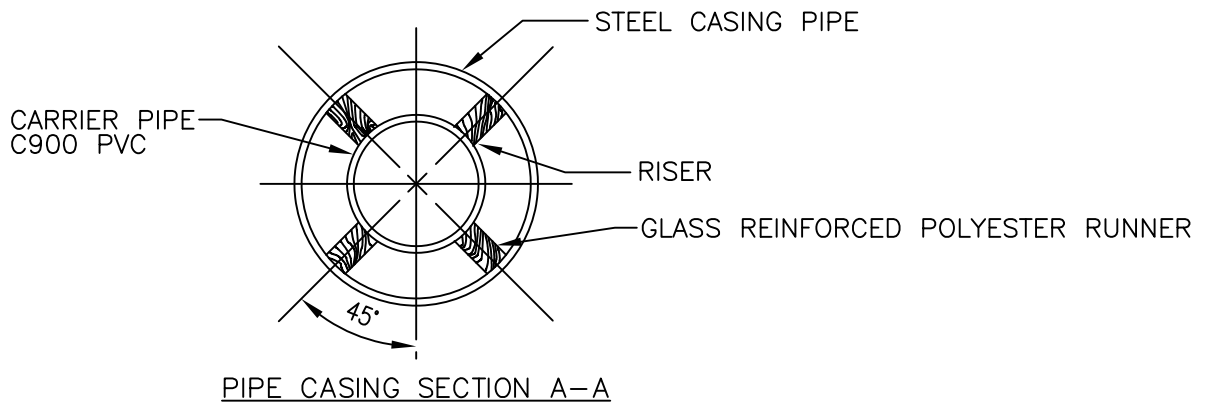
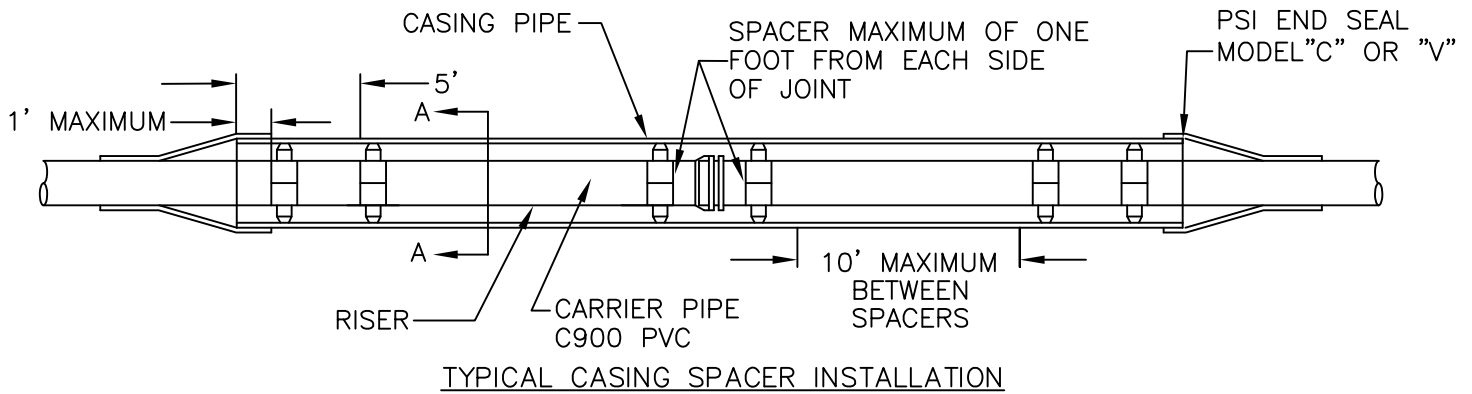
FILE NO: WATER09B



NOTES / ITEM DESCRIPTIONS:

1. LOCATE SERVICE LINE AT 90° TO FRONT PROPERTY LINE UNLESS PLANS SHOW OTHERWISE.
2. WATER METER FURNISHED AND INSTALLED BY THE DISTRICT.
3. SERVICE LINE MUST BE INSPECTED BY DISTRICT AND TESTED EXPOSED FOR 1 HOUR PRIOR TO BACKFILLING.
4. SERVICE SADDLE: FOR C900 OR C905 PVC, USE FORD S90. FOR DIP, USE FORD DOUBLE BRONZE STRAP 202B. CORP STOP VALVE: USE FORD FB1000-CC OR FORD FB600-CC THREAD BY FLARE COPPER OUTLET, REPLACE FLARE NUT WITH FORD C04-G COUPLING WITH FORD SLC COPPER WASHER. ALL METALLIC MAINS REQUIRE FORD SL SERVICE INSULATOR.
5. 3/4" OR 1" TYPE "K" COPPER SERVICE LINE, AS NOTED ON PLANS. EXTEND 15' BEYOND BACK OF METER PIT (SEE DETAIL WATER09B) AND MARK LOCATION. LINE IS TO BE STRAIGHT FROM MAIN TO METER PIT. BED COPPER TUBING IN SQUEEGEE, 6" BELOW AND 12" ABOVE.
6. 24" I.D. CONCRETE METER PIT CONSTRUCTED W/ ONE 12" AND ONE 36" RING OR FOUR 12" SECTIONS. ADJUSTMENT RINGS (2" TO 6" HIGH) SHALL BE INSERTED BETWEEN TWO TOP RINGS.
7. METER YOKE: WITH CHECK VALVE FORD VBH82-12W-44-33G.
8. METER PIT HOOD AND COVER - FORD W3H-T WITH BADGER METER WITH TRACE RADIO READ COVER OPTION. INNER LID FORD MODEL W3BPD.
9. TYLER SERIES 6505 BOX.
10. CURB STOP VALVE: USE FORD B44-333G.
11. CURB STOP VALVE: USE FORD B11-333SW-NL STOP WASTE VALVE 3/4"
12. INSTALL DISTRICT APPROVED BACKFLOW PREVENTION DEVICE DOWN-STREAM OF STOP AND WASTE VALVE.
13. NO CONNECTIONS OR TEE BETWEEN METER AND BACKFLOW PREVENTION DEVICE.

 PINERY WATER & WASTEWATER DISTRICT <i>Quality Water for Life</i>	
3/4" AND 1" IRRIGATION METER SETTING SHEET 2 OF 3	
DRAWN: KAW	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: WATER09C	



CARRIER PIPE NOMINAL DIA.	CASING PIPE*	
	MIN. O.D.	MIN. WALL THICK
4"	12"	0.188"
6"	16"	0.250"
8"	18"	0.282"
12"	22"	0.344"
16"	28"	0.406"
20"	32"	0.469"

* OR AS REQUIRED BY REGULATORY AGENCY

NOTES:

1. CASING SPACERS SHALL BE F.E. MALONY MODEL 59 OR PSI CASING SPACER.
2. FILL ANNULAR SPACE WITH SAND OR LEAN CEMENT TO MEET CDOT REQUIREMENTS. TEST PIPE PRIOR TO ANNULAR SPACE.
3. END SEALS SHALL BE 80 MIL MINIMUM HEAT SHRINK SLEEVES.



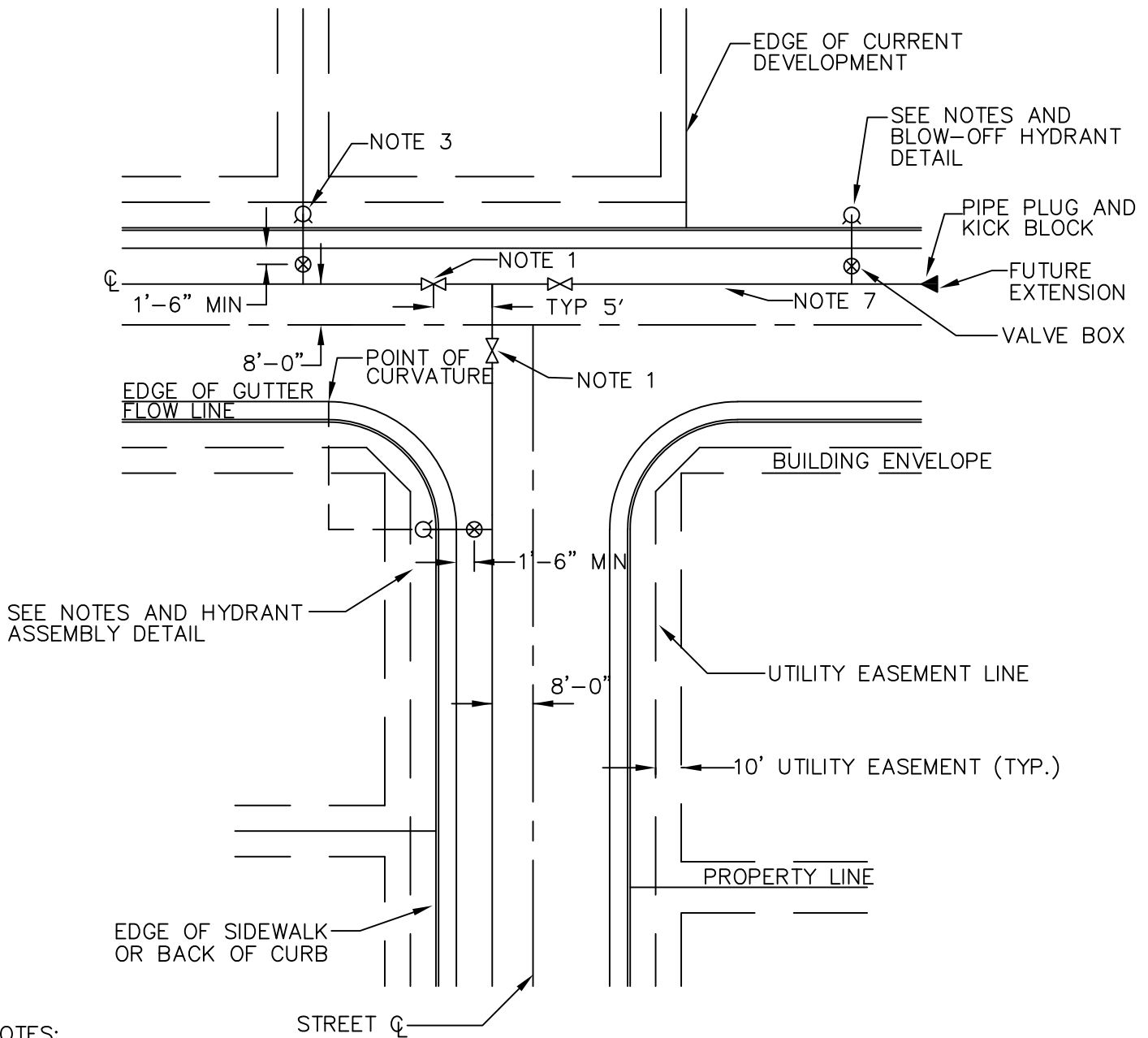
MAIN IN CASING PIPE
FOR ROADWAY CROSSING

DRAWN: KAW | CHECKED: WJM

DATE: 06/2017

SCALE: NO SCALE

FILE NO: WATER10



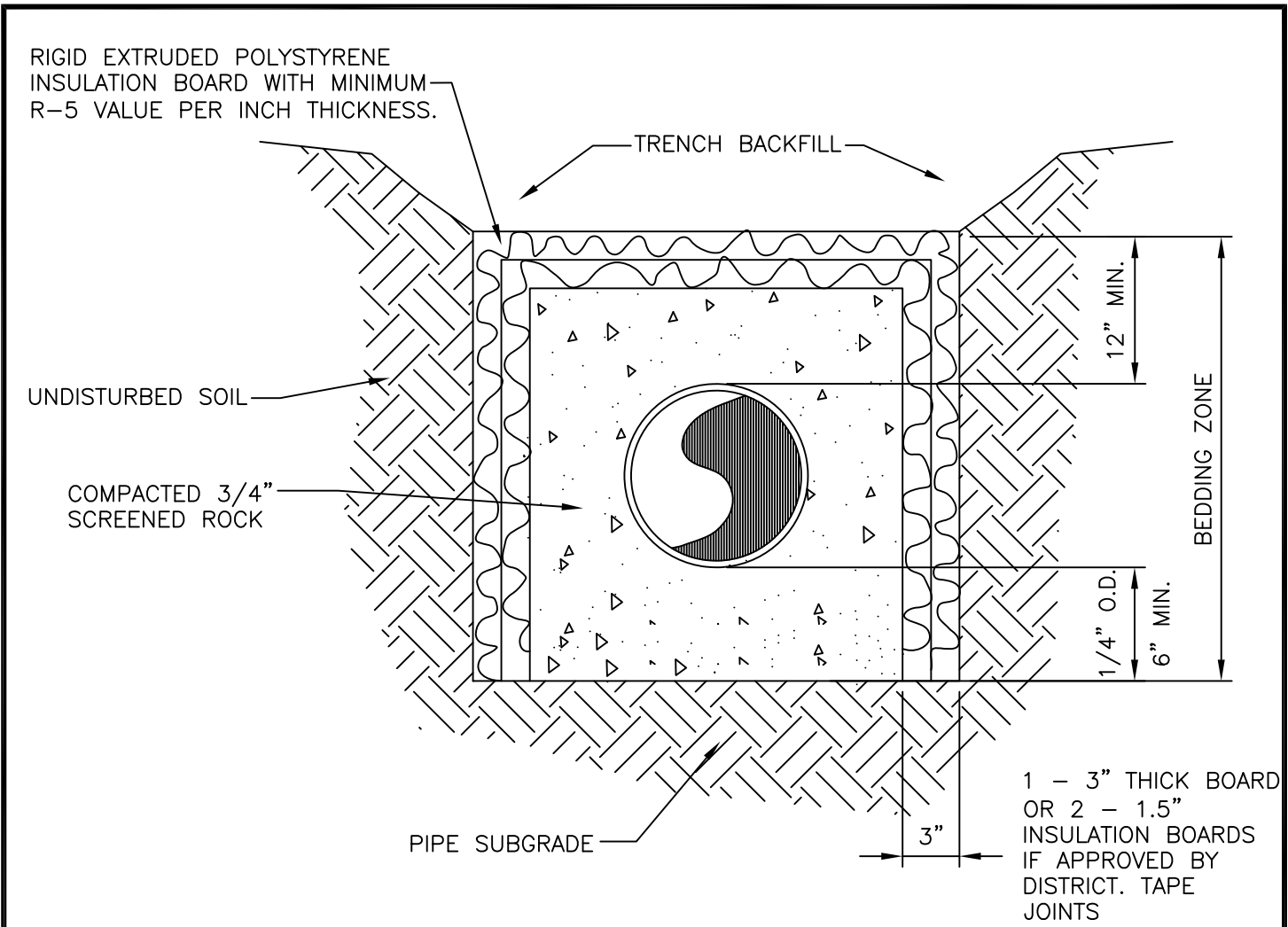
NOTES:

1. VALVES AT STREET INTERSECTIONS SHALL BE LOCATED 5' FROM THE INTERSECTION POINT.
2. FIRE HYDRANT AT CORNERS LOCATED (TO CENTER) AT FROM POINT OF CURVATURE 2 FEET BEHIND EDGE OF CONCRETE.
3. FIRE HYDRANTS NOT LOCATED AT STREET CORNERS SHALL BE LOCATED ON PROPERTY LINE EXTENSION.
4. CENTER OF FIRE HYDRANT SHALL BE LOCATED 2 FEET BEHIND EDGE OF CONCRETE AND NO LESS THAN 1.5 FEET IN FRONT OF UTILITY EASEMENT BOUNDARY. CONTACT THE DISTRICT OFFICE IF SUCH SPACING IS NOT POSSIBLE.
5. CENTER OF HYDRANT VALVE AND BLOW-OFF HYDRANT VALVE LOCATED 1.5 FEET MINIMUM IN FRONT OF EDGE OF GUTTER PAN.
6. WHERE NO CURB AND GUTTER EXISTS, CENTER OF FIRE HYDRANT AND BLOW-OFF HYDRANT SHALL BE LOCATED 8 FEET BEHIND EDGE OF ROADWAY PAVEMENT AND NO LESS THAN 1.5 FEET IN FRONT OF UTILITY EASEMENT BOUNDARY. CONTACT THE DISTRICT OFFICE IF SUCH SPACING IS NOT POSSIBLE.
7. FOR LINES THAT WILL BE EXTENDED IN THE FUTURE, LOCATE TEMPORARY BLOW-OFF HYDRANT TWO FULL PIPE LENGTHS BEYOND EDGE OF CURRENT DEVELOPMENT.



PIPING AT STREET INTERSECTIONS


DRAWN: KAW	CHECKED: WJM
DATE: 06/2018	
SCALE: NO SCALE	
FILE NO: WATER11	

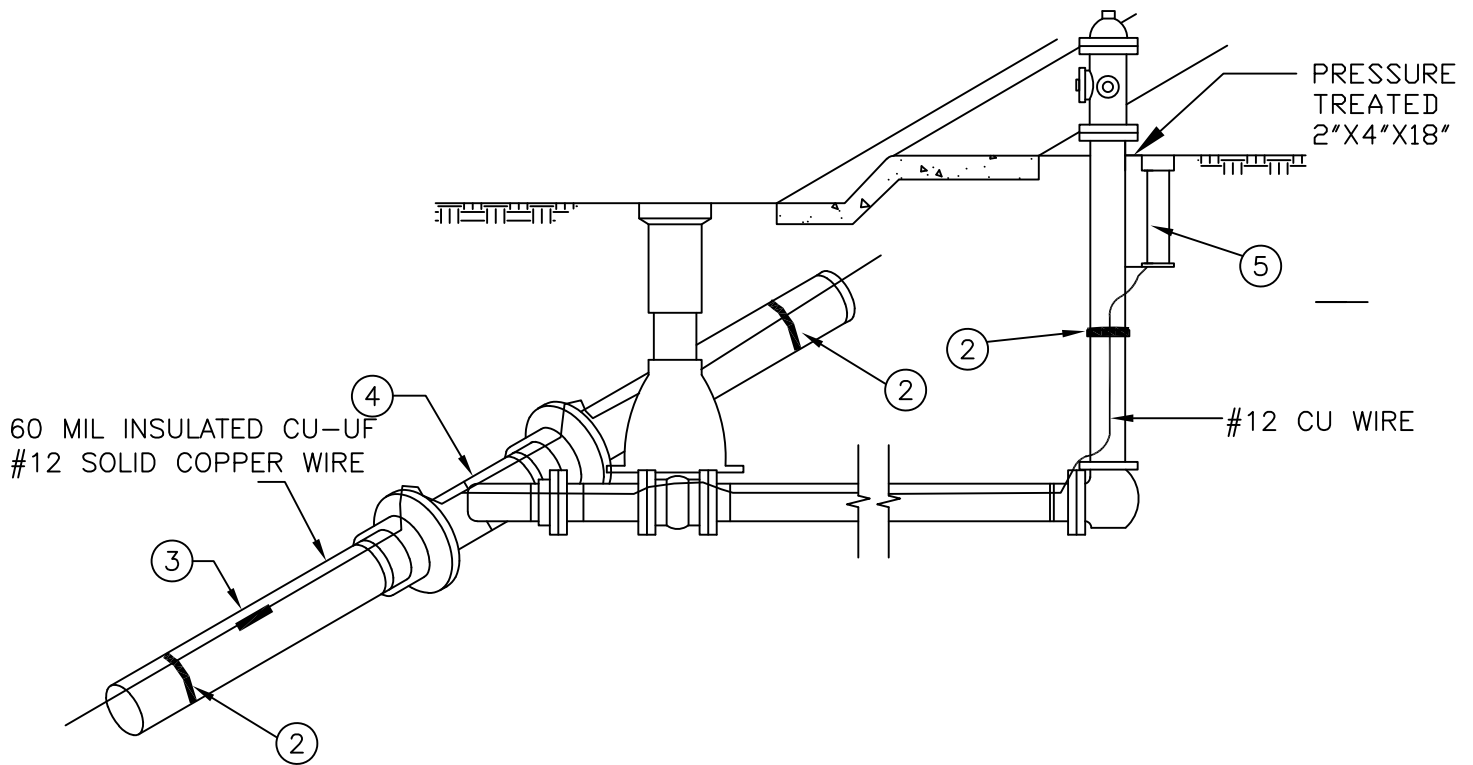


SECTION

GENERAL NOTES:

1. SEE WATER PIPE BEDDING DETAIL FOR BACKFILL MATERIAL AND COMPACTION SPECIFICATIONS.
2. INSULATION SHALL BE INSTALLED ON ALL PIPE THAT DOES NOT MEET MIN. COVER REQUIREMENTS.
3. INSULATION SHALL BE INSTALLED ON ALL PIPE THAT IS WITHIN TWO FEET OF ANY DRAINAGE CULVERT. THIS APPLIES TO THE BOTTOM OF THE PIPE IF IT CROSSES OVER TOP OF CULVERT.
4. STYROFOAM INSULATION BOARD TO EXTEND 5 FEET BEYOND THE OUTSIDE OF NON-INSULATED CROSSING PIPE.

 <p>PINERY WATER & WASTEWATER DISTRICT <i>Quality Water for Life</i></p>	
WATER PIPE INSULATION DETAIL	
DRAWN: KAW	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: WATER12	



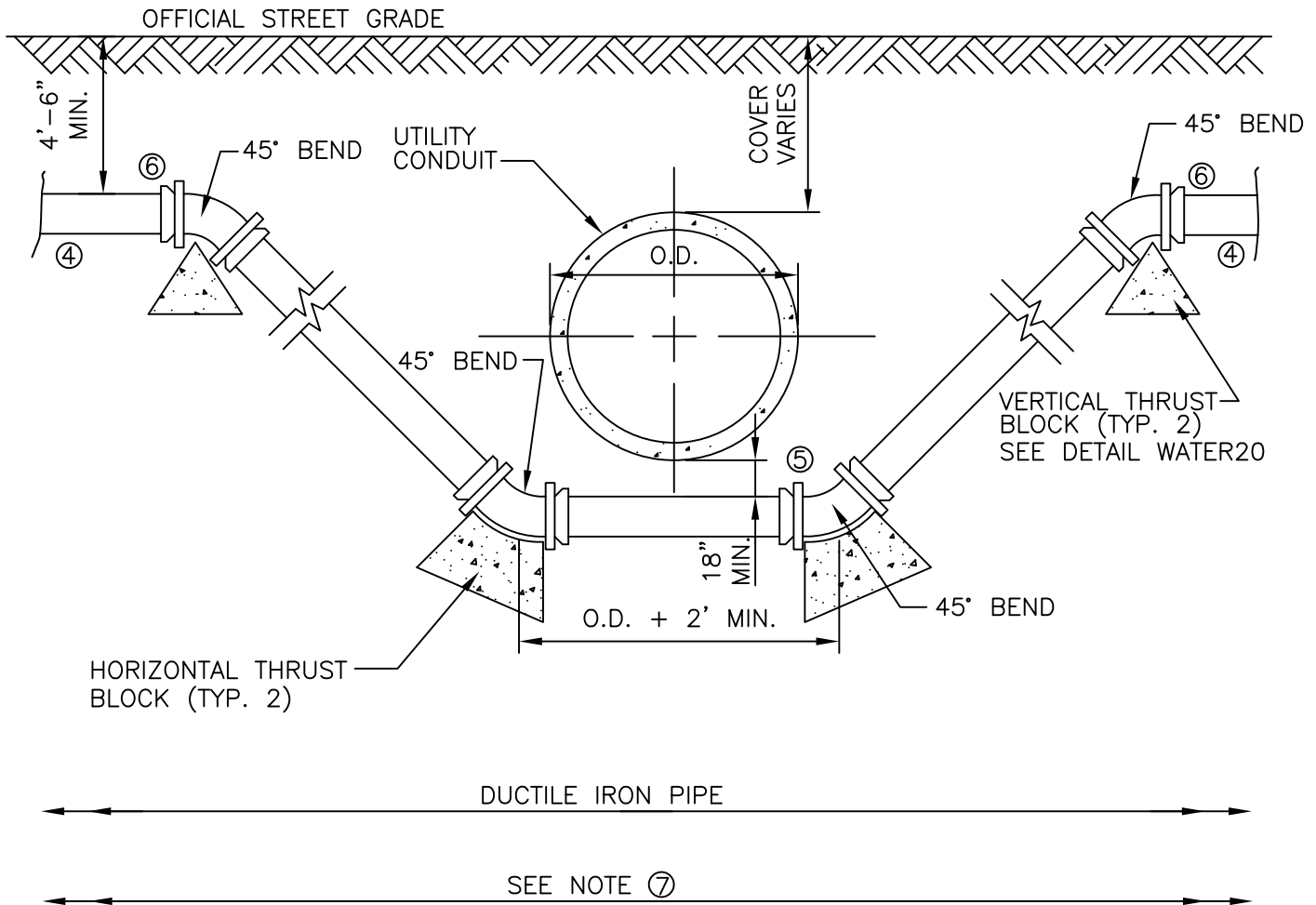
NOTES:

1. INSTALL TRACER WIRE ON ALL PIPE. TERMINATE LEADS AT EACH HYDRANT OR AT VALVE BOX IF DETAIL WATER26B IS CALLED OUT.
2. TAPE TRACER WIRE ON EACH SIDE OF FITTINGS AND AT 3-FOOT CENTERS ALONG TOP OF PIPE WITH POLYKEN CORP. TAPE 2" WIDE, 10 MIL OR EQUAL. TAPE SHALL EXTEND ALL THE WAY AROUND THE PIPE.
3. USE NO. 12 COPPER CONNECTOR, 3M DIRECT BURY SPLICE KIT (DBR KIT) OR EQUAL.
4. DO NOT SPLICE TRACER WIRE AT HYDRANT TEE.
5. 18" LONG BY 2.5" PVC TERMINATION BOX W/ CAST IRON LID (MINI BOX C.P. TEST SERVICES OR EQUAL). CONNECT WIRES TO TERMINATION BOARD AND COIL TWO FEET OF EACH TRACER WIRE FEED INSIDE TEST STATION.
6. CONTRACTOR SHALL NOTIFY DISTRICT INSPECTOR PRIOR TO TESTING.




TRACER WIRE DETAIL

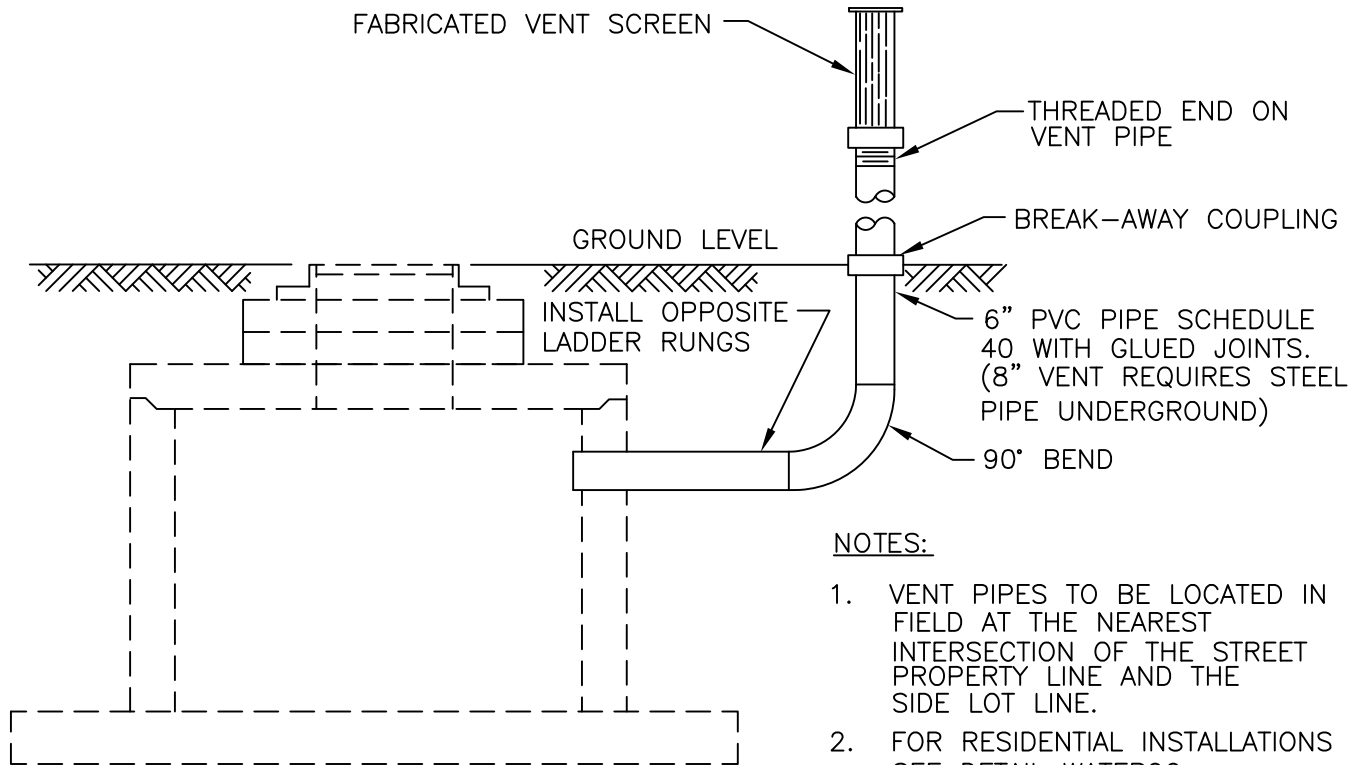
DRAWN: KAW	CHECKED: RK
DATE: 02/03/2020	
SCALE: NO SCALE	
FILE NO: WATER13	



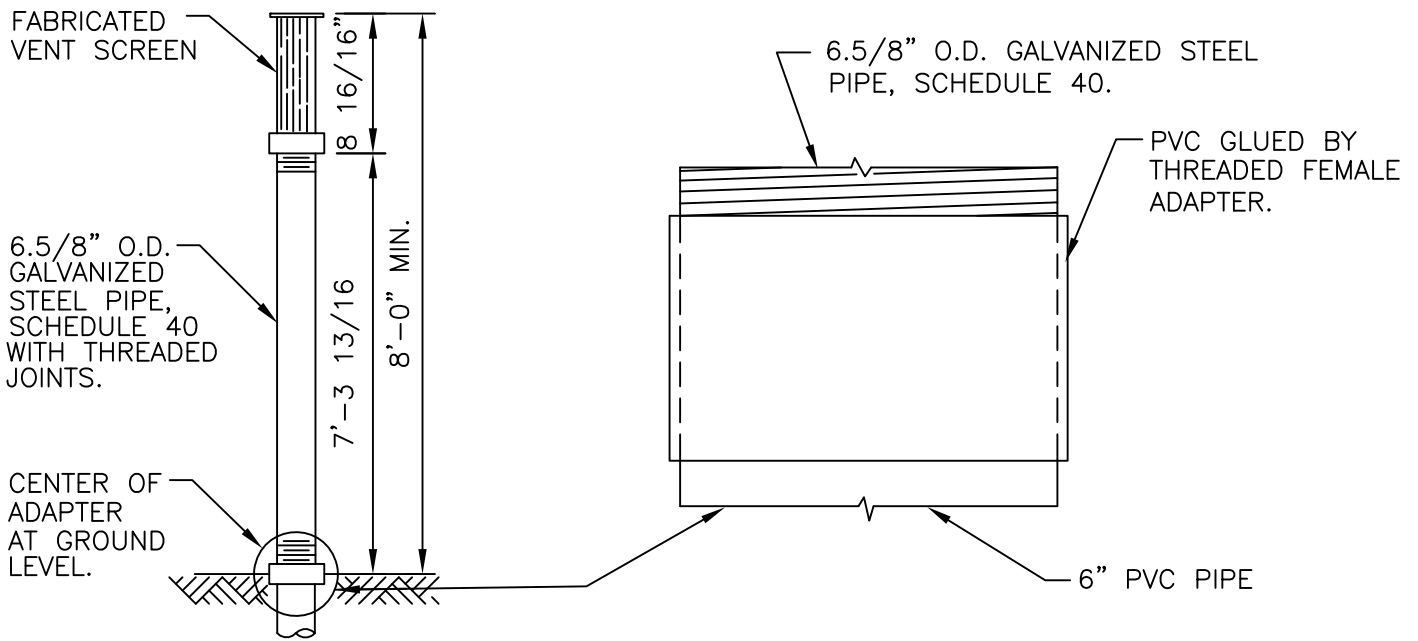
NOTES:

1. ALL WATER MAINS WHICH CROSS UNDER OTHER UTILITIES SHALL BE DUCTILE IRON.
2. CATHODIC PROTECTION SHALL BE AS REQUIRED IN ACCORDANCE WITH THESE ENGINEERING STANDARDS.
3. A BORED CROSSING MAY BE REQUIRED BY THE DISTRICT.
4. ONE FULL LENGTH OF DIP PRECEDING AND POST 45 DEGREE BEND IS REQUIRED.
5. IF STORM PIPE SEPARATION IS LESS THAN 18 INCHES, PROVIDE RIGID INSULATION BETWEEN PIPES PER DETAIL. IF SEWER PIPE SEPARATION IS LESS THAN 18 INCHES, SEWER LINE SHALL BE C900 AND ENCASED PER CONCRETE ENCASEMENT DETAIL.
6. AIR RELEASE / AIR VACUUM VALVES (COMBINATION VALVES) MUST BE PROVIDED AT ALL HIGH POINTS FOR WATER TRANSMISSION LINES WITHOUT SERVICE CONNECTIONS.
7. MJ JOINT RESTRAINTS GLANDS AND THRUST BLOCKS REQUIRED.
8. COLORADO DEPARTMENT OF HEALTH AND ENVIRONMENT REGULATIONS SHALL APPLY IN ADDITION TO DISTRICT REQUIREMENTS.
9. THIS DETAIL TO BE USED FOR ALL DEPRESSIONS REGARDLESS OF WHETHER ONE OR TWO SIDED.
10. 20' OF DUCTILE IRON PIPE IS REQUIRED PRE AND POST DEPRESSION

 PINERY WATER & WASTEWATER DISTRICT <i>Quality Water for Life</i>	
WATERLINE DEPRESSION	
DRAWN: KAW	CHECKED: PRM
DATE: 06/2018	
SCALE: NO SCALE	
FILE NO: WATER14	



VENT PIPE INSTALLATION



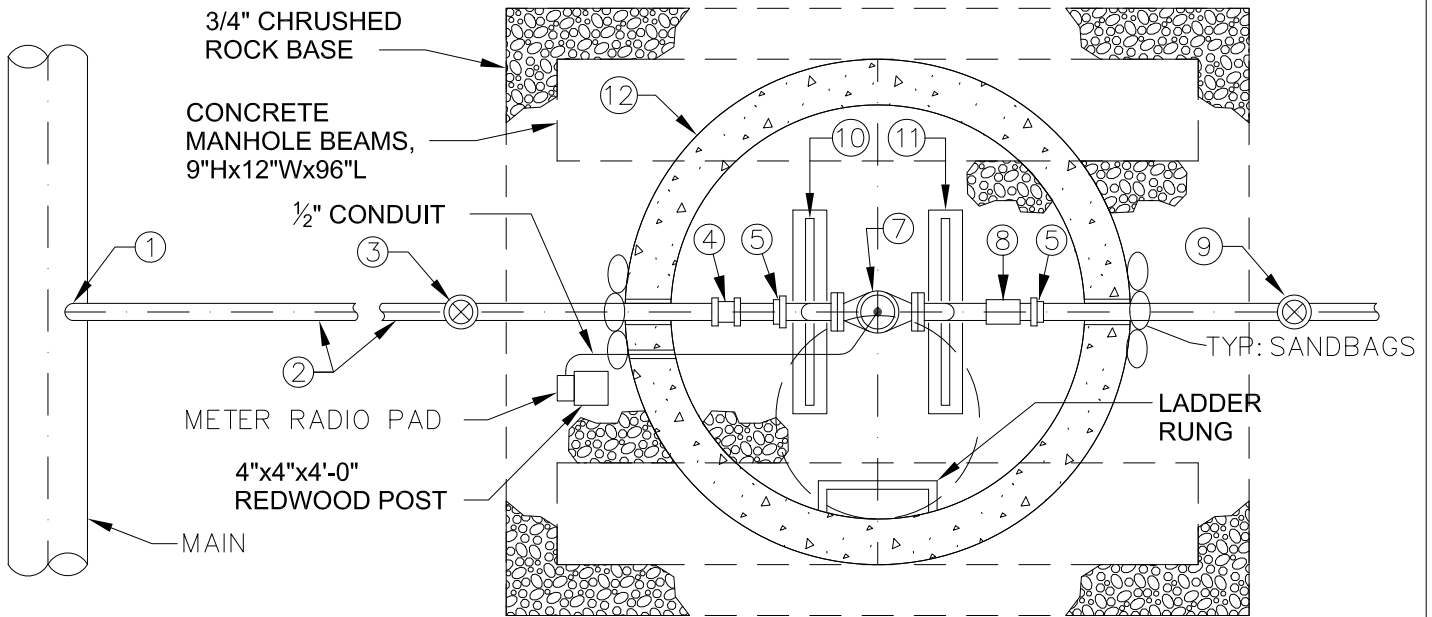
HEAVY DUTY VENT ASSEMBLY

DRAWN: KAW | CHECKED: PRM

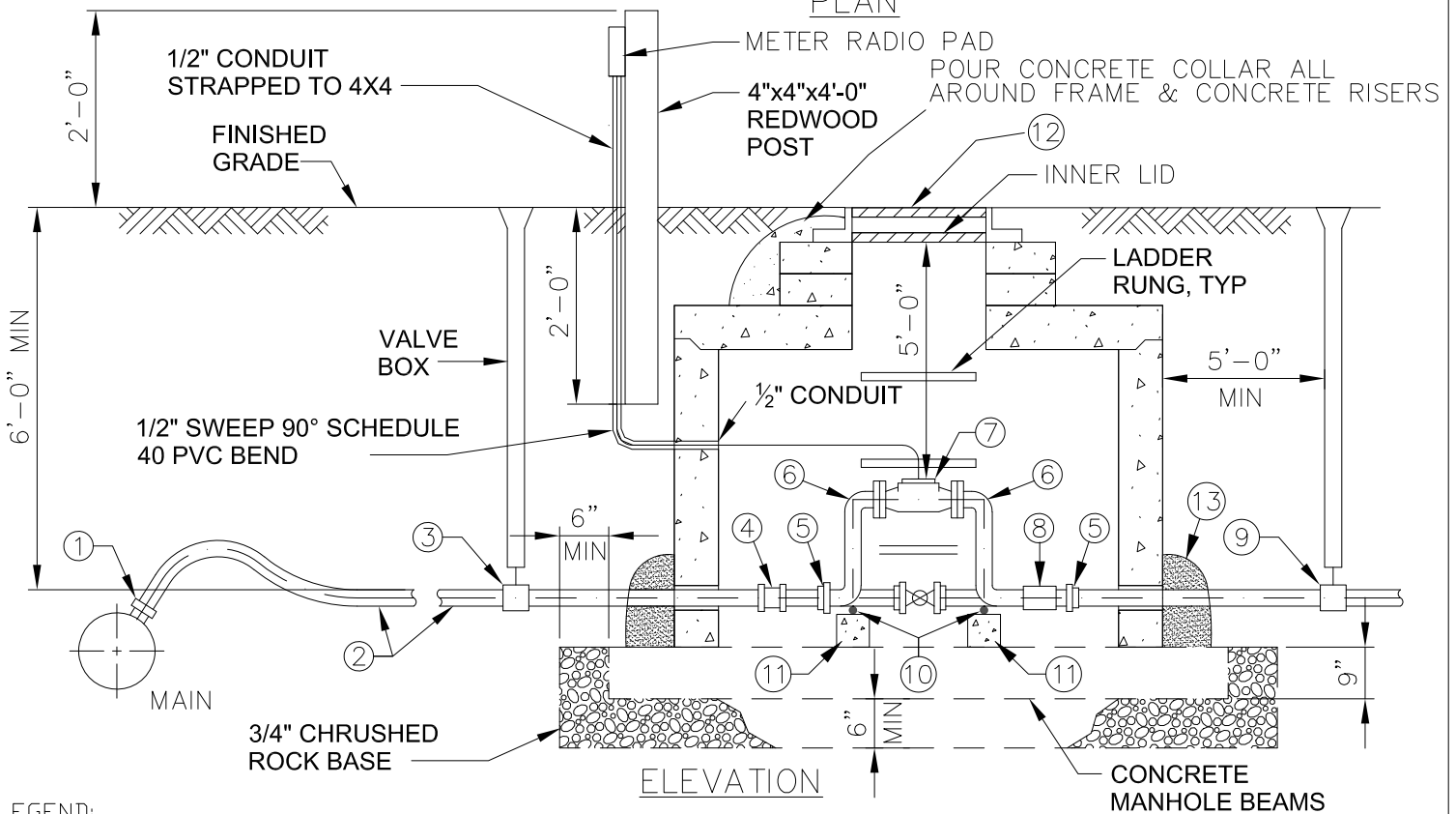
DATE: 06/2017

SCALE: NO SCALE

FILE NO: WATER15



PLAN



ELEVATION

LEGEND:

1. BRONZE SERVICE SADDLE AND CORPORATION STOP VALVE, SEE WATER16B
2. TYPE K COPPER TUBING
3. CURB STOP W/ SUPPORT BLOCK
4. COMPRESSION COUPLING
5. MALE IRON PIPE TO COMPRESSION COUPLING
6. 12" COPPERSETTER / METER YOKE, SEE TABLE
7. METER UNIT - SUPPLIED BY PROPERTY OWNER, INSTALLED BY CONTRACTOR
8. CHECK VALVE - CONTACT DISTRICT FOR BACKFLOW PREVENTION DEVICE REQUIREMENTS PRIOR TO PROCURING
9. CURB STOP AND VALVE BOX, INSTALL ON ALL IRRIGATION SYSTEMS
10. 1" X 23" LONG PIPE THROUGH COPPERSETTER FOR SUPPORT
11. CONCRETE BLOCK SUPPORTS 4"x4"x24"
12. 60" FLATTOP MANHOLE WITH 24" LID, NEENAH R1758-C WITH INNER LID OR CASTINGS INC MH475FPCI WITH INNER LID 1"-2" ABOVE FINAL GRADE
13. SANDBAG MANHOLE CUTOUT TO PREVENT SQUEEGEE OR SOIL FROM ENTERING VAULT.



OUTSIDE SETTING FOR 1-1/2" AND 2" METER WITH CHECK VALVE AND BYPASS IN MANHOLE SHEET 1 OF 2

DRAWN: PAU CHECKED: PRM

DATE: 06/2017

SCALE: NO SCALE

FILE NO: WATER16A

FORD 1-1/2" AND 2" METER SETTING FITTINGS

ITEM	DESCRIPTION	QTY	1-1/2"	2"
1	SERVICE SADDLE, OUTLET AWWA TAPER	1	202BS FOR C900 / 905 PVC, 202B FOR DIP & ACP	202BS FOR C900 / 905 PVC, 202B FOR DIP & ACP
1	BALLCORP CORPORATION STOP VALVE	1	FB1000-6-Q-NL (SPECIAL OUTLET THREADS REQUIRES SUITABLE TAPPING TOOL ADAPTER)	FB1000-7-Q-NL (SPECIAL OUTLET THREADS REQUIRES SUITABLE TAPPING TOOL ADAPTER)
3	BALL VALVE CURB STOP VALVE	1	B44-666-Q-NL & QT67 2" VALVE OPERATING NUT	B44-777-Q-NL & QT67 2" VALVE OPERATING NUT
4	PACK-JOINT COUPLING	1	C44-66-Q-NL	C44-77-Q-NL
5	PACK-JOINT COUPLING	2	C84-66-Q-NL	C84-77-Q-NL
6	COPPERSETTER (YOKE)	1	VBB76-12-11-66-G-NL (NO BYPASS)	VBB76-12-11-77-G-NL (NO BYPASS)
7	WATER METER	1	BADGER M120 W/ORION RADIO W/ GASKETS AND STAINLESS STEEL BOLTS & NUTS	BADGER M170 W/ORION RADIO W/ GASKETS AND STAINLESS STEEL BOLTS & NUTS
8	CHECK VALVE W / BRASS 3" LONG NO LEAD NIPPLE	1	HS11-666-NO (CONTACT DISTRICT, MAY NT BE REQUIRED)	HS11-777-NL (CONTACT DISTRICT, MAY NOT BE REQUIRED)
9	PACK-JOINT COUPLING	2	C84-66-Q-NL	C84-77-Q-NL

MUELLER COMPANY 1-1/2" AND 2" METER SETTING FITTINGS

ITEM	DESCRIPTION	QTY	1-1/2"	2"
1	SERVICE SADDLE, OUTLET AWWA TAPER	1	H-13000 FOR C900 PVC, BR2S FOR C905 PVC, BR2B FOR DIP & ACP	H-13000 FOR C900 PVC, BR2S FOR C905 PVC, BR2B FOR DIP & ACP
1	CORPORATION STOP VALVE	1	B-25008N	B-25008N
3	BALL VALVE CURB STOP VALVE W / PACK-JOINT	1	B-25209N & B-20299 (2" BRASS SQUARE NUT ADAPTER)	B025209N & B-20299 (2" BRASS SQUARE NUT ADAPTER)
4	COMPRESSION CONNECTOR COUPLING	1	H-15403N	H-15403N
5	COMPRESSION CONNECTOR ADAPTER (MIPT X PACK-JOINT)	2	H-15428N	H-15428N
6	METER YOKE	1	B-2422-00N	B-2422-00N
7	WATER METER	1	BADGER M120 W/ORION RADIO W / GASKETS AND STAINLESS STEEL BOLTS & NUTS	BADGER M170 W/ORION RADIO W/ GASKETS AND STAINLESS STEEL BOLTS AND NUTS
8	CHECK VALVE W/BRASS 3" LONG - NO LEAD NIPPLE	1	H-14243N (CONTACT DISTRICT, MAY NOT BE REQUIRED)	H-14243N (CONTACT DISTRICT, MAY NOT BE REQUIRED)
9	BALL VALVE CURB STOP VALVE W/STOP & WASTE FEATURE	1	H-10284N & B-20299 (2" BRASS SQUARE NUT ADAPTER)	H-10284N & B-20299 (2" BRASS SQUARE NUT ADAPTER)
9	COMPRESSION CONNECTOR ADAPTER (MIPT X PACK-JOINT)	2	H-15428N	H-15428N

NOTES:

1. MANHOLE BASE MEAMS REQUIRED
2. 60" DIAMETER ASTM C-478 MANHOLE REQUIRED
3. ALL FITTINGS AND BRASS SHALL BE LEAD FREE
4. NO CONCRETE FLOOR IN MANHOLE
5. NO CHANGES IN PIPE DIAMETER SHALL BE MADE FROM THE WATER MAIN TO FIVE FEET BEYOND THE MANHOLE ON THE OUTLET SIDE. NO OTHER CONNECTIONS ARE PERMITTED
6. THE DISTANCE BETWEEN STEPS SHALL BE 12" ON CENTER AND UNIFORM
7. MANHOLE WALL PENETRATIONS SHALL BE ROUTED WITH NON-SHRINK GROUT
8. METER YOKE SHALL NOT BE HIGHER THAN 12" AND SHALL NOT HAVE A BYPASS
9. CONTACT DISTRICT PRIOR TO ORDERING WATER METER TO DISCUSS SPECIFIC REQUIREMENTS
10. CURB STOP BOXES SHALL BE TYLER 6500 SERIES



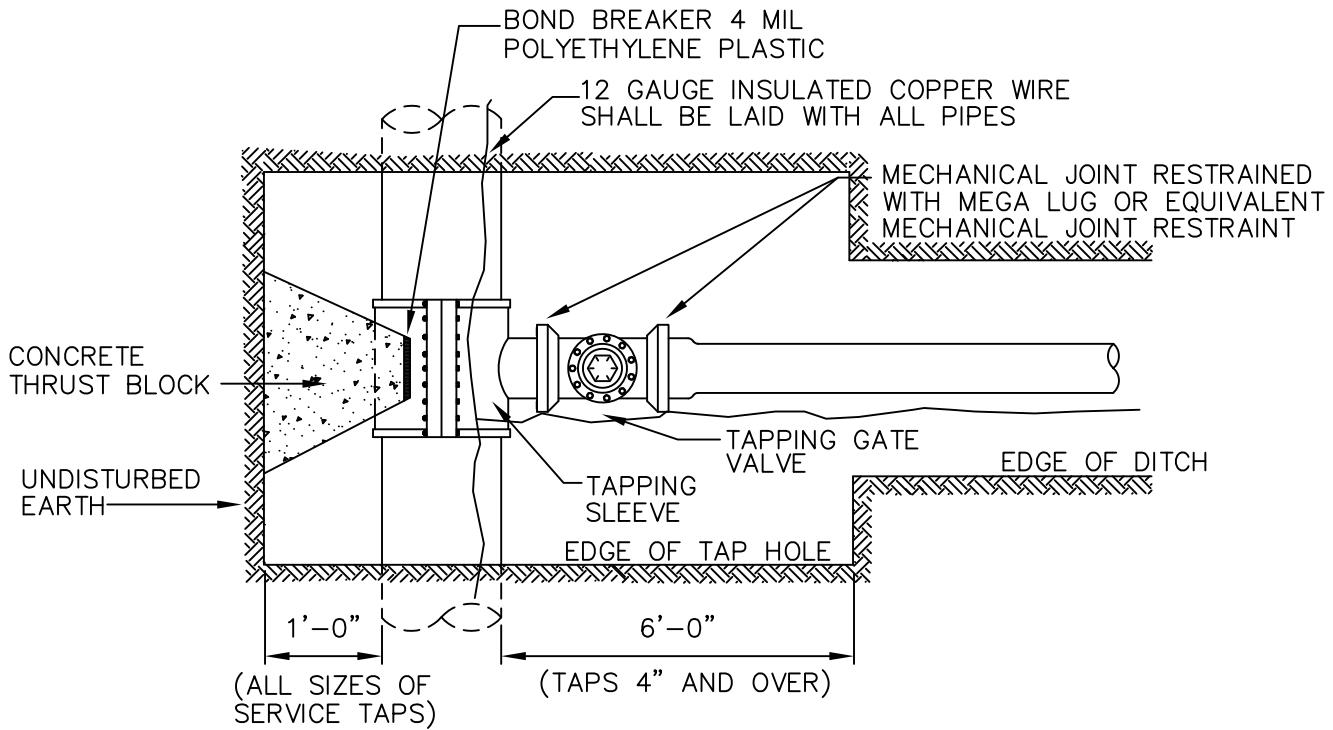
OUTSIDE SETTING FOR 1-1/2" AND 2"
METER

DRAWN: PAU CHECKED: PRM

DATE: 06/2017

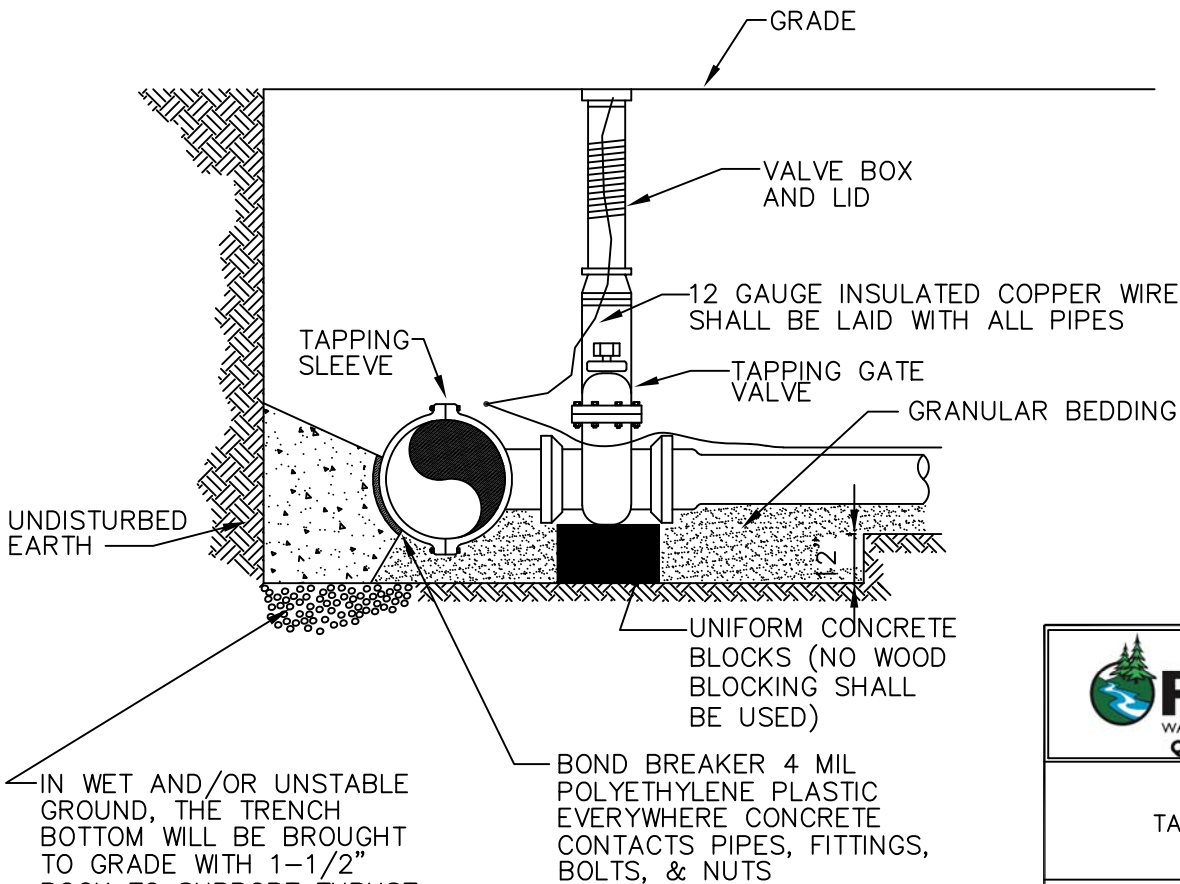
SCALE: NO SCALE

FILE NO: WATER16B



PLAN

12 GAUGE INSULATED COPPER WIRE SHALL BE LAID WITH ALL PIPES



ELEVATION

IN WET AND/OR UNSTABLE GROUND, THE TRENCH BOTTOM WILL BE BROUGHT TO GRADE WITH 1-1/2" ROCK TO SUPPORT THRUST BLOCK

NOTE: RUN AND BRANCH OF SAME SIZE SHALL NOT BE TAPPED



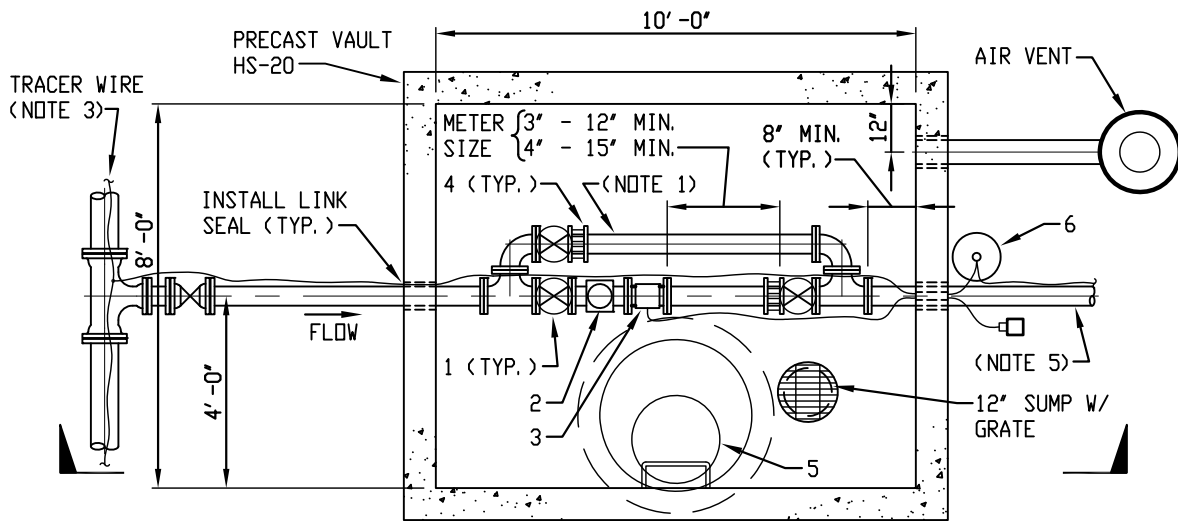
TAPPING DETAIL

DRAWN: KAW | CHECKED: WJM

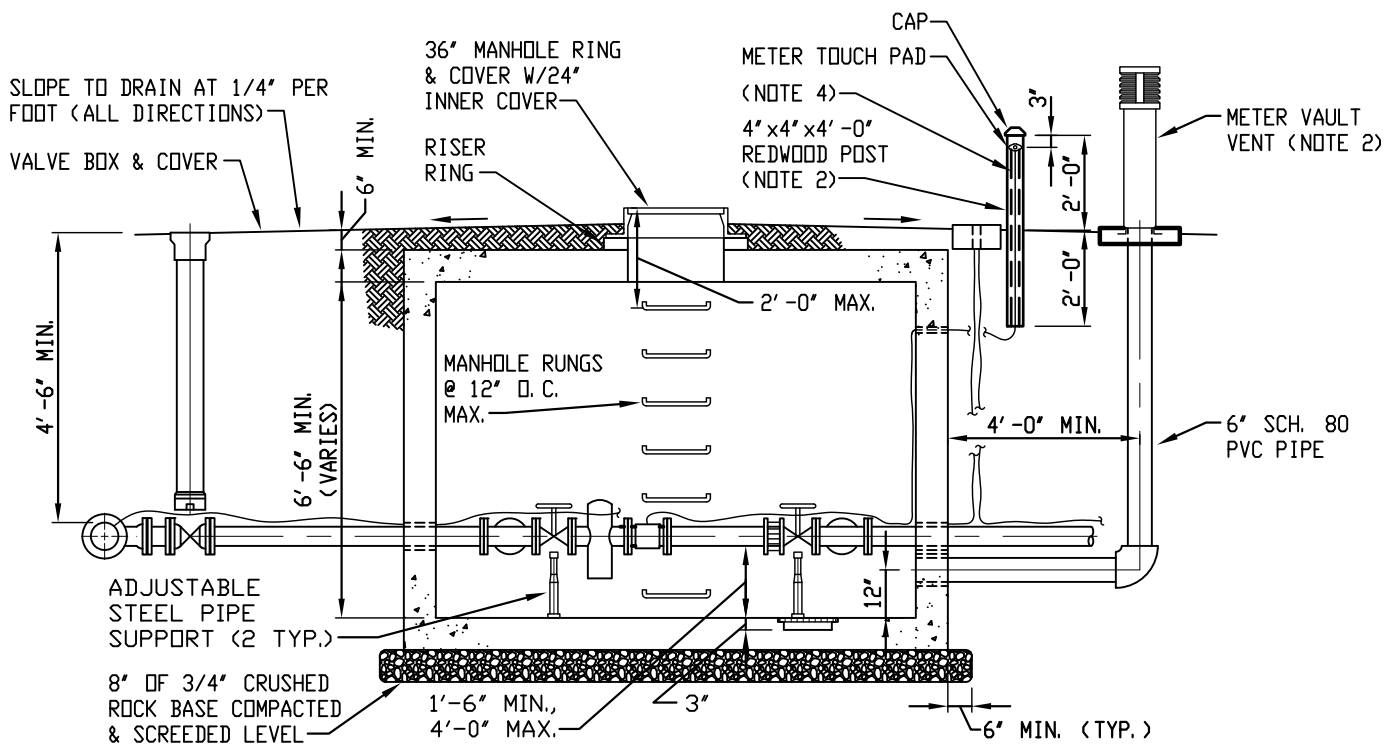
DATE: 06/2018

SCALE: NO SCALE

FILE NO: WATER17



PLAN



SECTION

MATERIAL LIST:

1. GATE VALVE SHALL BE AFC SERIES 2500 OR MUELLER SERIES 2360 - OPEN LEFT.
2. STRAINER SHALL BE INVENSYS METERING SYSTEMS.
3. FLOW METER SHALL BE INVENSYS COMPOUND SHR-ECR/WP OR "W" TURBO-ECR/WP. CONTACT DISTRICT FOR DETAILS.
4. FLANGE ADAPTER SHALL BE EBAA IRON SALES, SERIES 2100, MIN. 1/2" GAP BETWEEN MATING FLANGE.
5. MANHOLE RING & COVER SHALL BE DEETER NO. 1191-A. APPLY MASTIC BETWEEN FRAME, RISER & VAULT.
6. C.P. TEST SERVICES, MINI-BOX WITH 12" DIA. BY 6" DEEP CONCRETE PROTECTION COLLAR.

NOTES:

1. ALL INTERIOR D. I. PIPE & FITTINGS SHALL BE FLANGED. INTERIOR DIP SHALL BE CLASS 53, PRIME COATED. APPLY TWO COATS TNEC SERIES 66 HI-BUILD EPOXOLINE 4.0 TO 6.0 MILS PER COAT. COLOR, TRUE BLUE SAFETY, 11SF. DO NOT PAINT METER, STRAINER OR PRE-EPOXY COATED FITTINGS.
2. ACTUAL LOCATION OF TOUCH-READ POST AND AIR VENT COULD BE UP TO 20 FEET FROM VAULT & AIR VENT MAY REQUIRE ADDITIONAL 6" HORIZONTAL BEND. DISTRICT/OWNER TO DETERMINE LOCATION.
3. TRACER WIRE SHALL RUN THROUGH VAULT. CONNECT TO TEST STATION AND RUN TO END OF SERVICE LINE.
4. ROUTER 3/8" BY 3/8" GROOVE LENGTHWISE IN TOUCH-READ POST TO PROTECT WIRE.
5. BACKFLOW PREVENTION DEVICE REQUIRED DOWNSTREAM OF METER. CONTACT DISTRICT FOR DETAILS.



3" & 4" METER VAULT

DRAWN: TWL	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: WATER18	

NOTE: THRUST BLOCKS FOR PIPE LARGER THAN 12" TO BE SPECIFICALLY DESIGNED BY ENGINEER. FORMS SHALL BE 3/8" PLYWOOD.

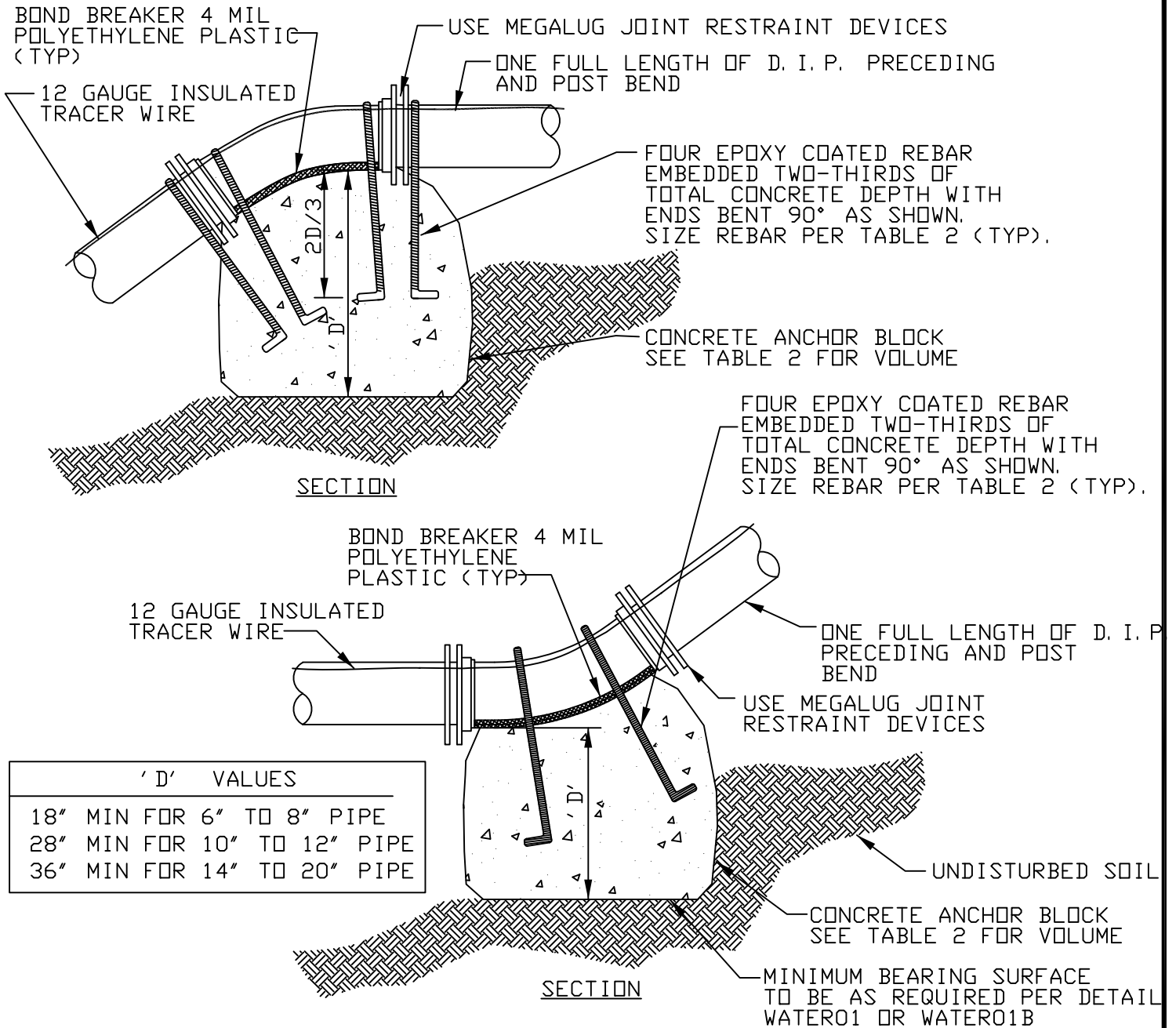


TABLE 2
MINIMUM CUBIC YARDS OF CONCRETE

SIZE OF PIPE	BENDS				REBAR NUMBER	REBAR GRADE
	11 1/4°	22 1/2°	45°	90°		
6"	0.7	1.0	2.0	N/A	4	40
8"	1.0	2.0	3.5	N/A	4	40
10"	1.5	3.0	5.0	N/A	4	40
12"	2.0	4.0	7.0	N/A	5	40
16"	3.5	6.5	12.0	N/A	5	60
20"	5.0	10.0	19.0	N/A	6	60

N/A = NOT ALLOWED

BASED ON 225 PSI

VERTICAL THRUST BLOCK

DRAWN: KAW CHECKED: PRM

DATE: 06/2017

SCALE: NO SCALE


FILE NO: WATER20

JOINT RESTRAINT DEVICES SHALL BE INSTALLED ON ALL FITTINGS AND AT JOINTS ON EITHER SIDE OF FITTINGS FOR THE DISTANCE SHOWN IN THE FOLLOWING TABLE. FIRE HYDRANTS AND BLOWOFFS SHALL BE RESTRAINED FROM THE BRANCH TEE TO THE FIRE HYDRANT.

LENGTH OF RESTRAINT (MINIMUM)							
FITTING	DIAMETER OF PIPE						
	6"	8"	10"	12"	14"	16"	20"
90° BEND	27'	36'	42'	50'	83'	94'	114'
45° BEND	11'	15'	18'	21'	36'	50'	61'
22 1/2° BEND	6'	7'	9'	10'	17'	19'	23'
11 1/4° BEND	3'	4'	4'	5'	8'	9'	11'
TEE – BRANCH	SEE DETAIL WATER21B						
TEE – RUN	NOT REQUIRED						
VALVE	52'	69'	83'	98'	112'	127'	174'
PLUG/CAP	52'	69'	83'	98'	112'	127'	174'

JOINT AND BELL RESTRAINT DEVICES SHALL BE MANUFACTURED BY EBAA IRON SALES, INC., OR FORD METER BOX COMPANY, INC. FOR MJ FITTINGS USE EBAA MEGALUG SERIES 2000PV OR FORD UNIFLANGE SERIES 1500. FOR BELL RESTRAINTS USE EBAA SERIES 1500 ON PVC C900, EBAA SERIES 2800 ON PVC C905 OR FORD UNIFLANGE SERIES 1390.

BASED ON 225 PSI (150 PSI INTERNAL PRESSURE AND 75 PSI WATER HAMMER). THE 14" THRU 20" PIPE INCLUDES A 1.5 SAFETY FACTOR.

 <p>PINERY WATER & WASTEWATER DISTRICT <i>Quality Water for Life</i></p>	
<p>PIPE JOINT RESTRAINT FOR PVC PIPE</p>	
DRAWN: KAW	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: WATER21A	

THIS TABLE IS USED TO DETERMINE THE LENGTH OF RESTRAINT REQUIRED ON THE BRANCH LINE FOR TEE FITTINGS. THE ENTIRE BRANCH LINE OF BLOWOFFS AND FIRE HYDRANTS SHALL BE RESTRAINED.

LENGTH OF RESTRAINT FOR TEE BRANCH (MINIMUM)						
DIA. OF RUN	DIAMETER OF BRANCH					
	6"	8"	10"	12"	14"	16"
8"	30'	52'	69'	87'	103'	118'
10"	25'	48'	66'	84'	100'	116'
12"	19'	44'	63'	81'	98'	114'
14"	14'	39'	59'	78'	95'	112'
16"	8'	35'	56'	75'	93'	110'

JOINT AND BELL RESTRAINT DEVICES SHALL BE MANUFACTURED BY EBAA IRON SALES, INC. OR FORD METER BOX COMPANY, INC. FOR MJ FITTINGS USE EBAA MEGALUG SERIES 2000PV OR FORD UNIFLANGE SERIES 1500. FOR BELL RESTRAINTS USE EBAA SERIES 1500 ON PVC C900, EBAA SERIES 2800 ON C905 OR FORD UNIFLANGE SERIES 1390.



TEE RESTRAINT
FOR PVC PIPE

DRAWN: KAW | CHECKED: PRM

DATE: 06/2017

SCALE: NO SCALE

FILE NO: WATER21B

JOINT RESTRAINT DEVICES SHALL BE INSTALLED ON ALL FITTINGS AND AT JOINTS ON EITHER SIDE OF FITTINGS FOR THE DISTANCE SHOWN IN THE FOLLOWING TABLE. FIRE HYDRANTS AND BLOWOFFS SHALL BE RESTRAINED FROM THE BRANCH TEE TO THE FIRE HYDRANT.

LENGTH OF RESTRAINT (MINIMUM)						
FITTING	DIAMETER OF PIPE					
	6"	8"	10"	12"	14"	16"
90° BEND	30'	39'	47'	55'	63'	72'
45° BEND	12'	16'	19'	23'	26'	30'
22 1/2° BEND	6'	8'	9'	11'	13'	14'
11 1/4° BEND	3'	4'	5'	5'	6'	7'
TEE – BRANCH	SEE DETAIL WATER21D					
TEE – RUN	NOT REQUIRED					
VALVE	81'	107'	128'	152'	173'	196'
PLUG/CAP	81'	107'	128'	152'	173'	196'

JOINT AND BELL RESTRAINT DEVICES SHALL BE MANUFACTURED BY EBAA IRON SALES, INC., OR FORD METER BOX COMPANY, INC. FOR MJ FITTINGS USE EBAA MEGALUG SERIES 1100 OR FORD UNIFLANGE SERIES 1400. FOR BELL RESTRAINTS USE EBAA SERIES 1500TD-4"-12" AND EBBA 1700 14-24" OR FORD UNIFLANGE SERIES 1450.



PIPE JOINT RESTRAINT
FOR DUCTILE IRON PIPE

DRAWN: KAW | CHECKED: PRM

DATE: 06/2017

SCALE: NO SCALE

FILE NO: WATER21C

THIS TABLE IS USED TO DETERMINE THE LENGTH OF RESTRAINT REQUIRED ON THE BRANCH LINE FOR TEE FITTINGS. THE ENTIRE BRANCH LINE OF BLOWOFFS AND FIRE HYDRANTS SHALL BE RESTRAINED.

LENGTH OF RESTRAINT FOR TEE BRANCH (MINIMUM)						
DIA. OF RUN	DIAMETER OF BRANCH					
	6"	8"	10"	12"	14"	16"
8"	47'	81'	108'	134'	158'	183'
10"	38'	74'	102'	130'	155'	180'
12"	30'	68'	97'	126'	151'	176'
14"	21'	61'	92'	121'	147'	173'
16"	13'	55'	87'	117'	144'	170'

JOINT AND BELL RESTRAINT DEVICES SHALL BE MANUFACTURED BY EBAA IRON SALES, INC. OR FORD METER BOX COMPANY, INC. FOR MJ FITTINGS USE EBAA MEGALUG SERIES 1100 OR FORD UNIFLANGE SERIES 1400. FOR BELL RESTRAINTS USE EBAA SERIES 1500TD-4"-12" AND EBBA 1700 14-24" OR FORD UNIFLANGE SERIES 1450.



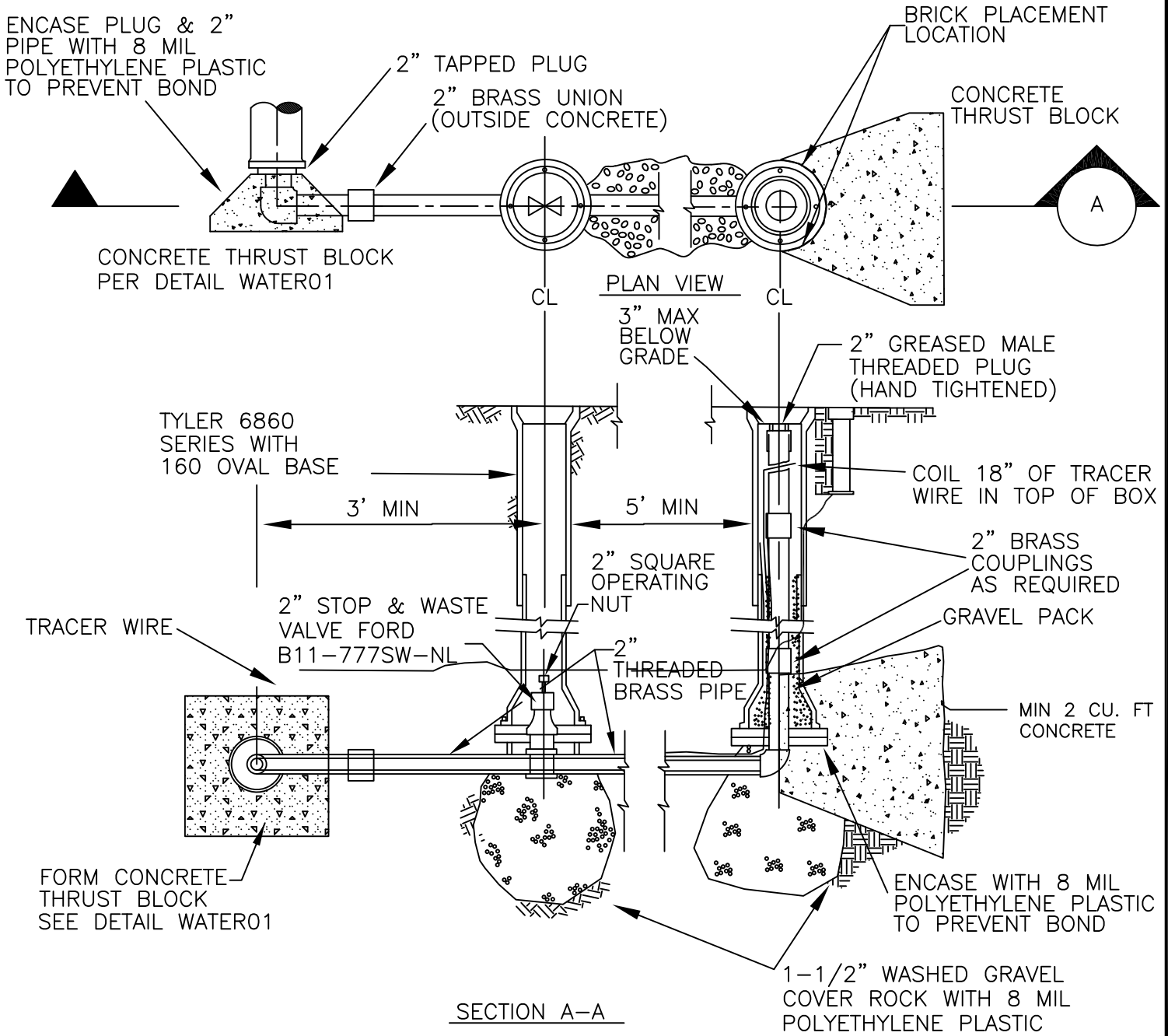
TEE RESTRAINT
FOR DUCTILE IRON PIPE

DRAWN: KAW | CHECKED: PRM

DATE: 06/2017

SCALE: NO SCALE

FILE NO: WATER21D



NOTES:

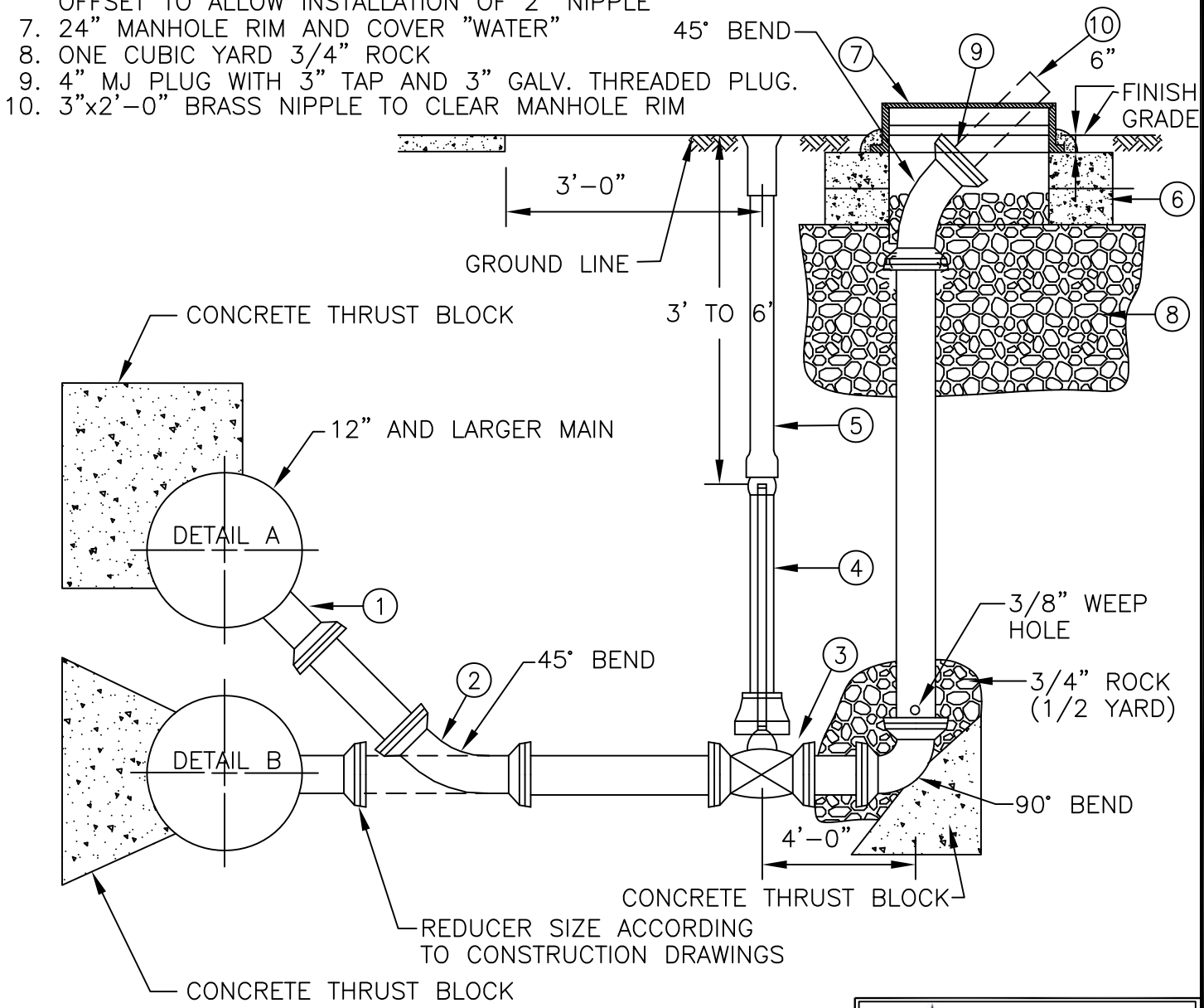
1. ALL 2" PIPE & FITTINGS SHALL BE THREADED LEAD FREE OR LOW LEAD BRASS.
2. ALL BLOW-OFFS & TEMPORARY BLOW-OFFS SHALL HAVE TWO FORMED THRUST BLOCKS. THRUST BLOCKS AT TEND OF PIPE TO BE SIZED PER WATER01 OR WATER 01B. THRUST BLOCKS AT 90° BEND OF BRASS PIPE REQUIRES 3 CUBIC FEET OF CONCRETE WITH 1.5 SQ-FT MINIMUM BEARING SURFACE.
3. IF GREATER THAN 5'-0" TO TOP OF VALVE OPERATING NUT, PROVIDE OPERATING EXTENSION ROD. TOP OF EXTENSION ROD SHALL BE 3'-6" TO 4'-6" BELOW TOP OF VALVE BOX. OPERATING EXTENSION RODS SHALL BE ONE PIECE, NOT MULTIPLE RODS BOLTED, WELDED OR CONNECTED TOGETHER IN ANY OTHER FASHION.
4. DRILL TWO $\frac{3}{8}$ " SCREWS ON VALVE OPERATING EXTENSION ROD.
5. IF BLOW-OFF ASSEMBLY IS LOCATED OUTSIDE OF PAVED AREA, USE WATER26A & WATER26B.




STANDARD 2" ϕ
BLOW-OFF INSTALLATION

DRAWN: DLH	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: WATER 22	

1. 6"x4" PE x PE REDUCER
2. 4" 45 DEGREE BEND
3. 4" GATE VALVE. IF USING A VALVE OPERATING EXTENSION, DRILL TWO 3/8" DIAMETER 1/4" DEEP INTO THE VALVE OPERATING NUT TO ACCEPT 3/8" SCREWS ON VALVE OPERATING EXTENSION.
4. IF GREATER THAN 5'-0" PROVIDE OPERATING NUT EXTENSION WITH CENTERLINE RING AND TIGHTEN SCREWS ON VALVE OPERATING NUT. SEE NOTE 3. TOP OF EXTENSION SHALL BE PLACED 4'-0" FROM TOP OF BOX.
5. TYLER 6860 SERIES VALVE BOX
6. 12"x24" CONCRETE ADJUSTMENT GRADE RINGS OFFSET TO ALLOW INSTALLATION OF 2" NIPPLE
7. 24" MANHOLE RIM AND COVER "WATER"
8. ONE CUBIC YARD 3/4" ROCK
9. 4" MJ PLUG WITH 3" TAP AND 3" GALV. THREADED PLUG.
10. 3"x2'-0" BRASS NIPPLE TO CLEAR MANHOLE RIM



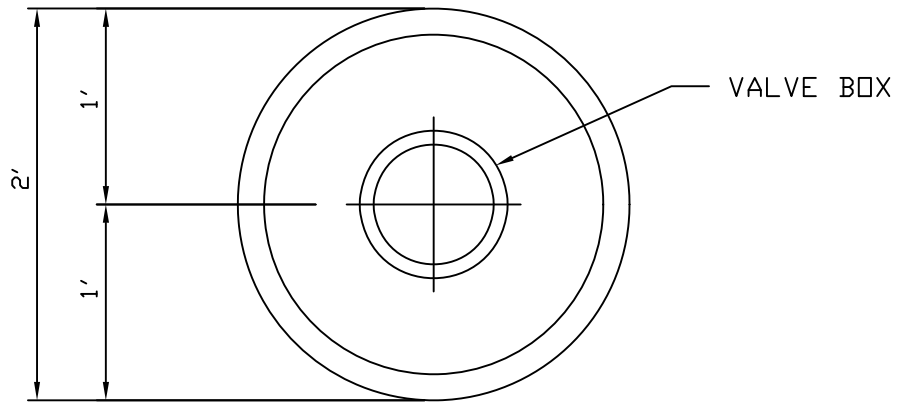
NOTES:
 DETAIL A USED AT LOW POINTS ALONG TRANSMISSION LINES.
 DETAIL B USED AT DEAD-ENDS OR FUTURE EXTENSIONS ON TRANSMISSION LINES.
 ALL FITTINGS ARE MJ. AND ALL PUSH-ON PIPE TO BE RESTRAINED WITH MEGA-LUG JOINT RESTRAINT DEVICES.
 ALL PIPING 4" D.I.P. PRESSURE CLASS 350.
 ALL PIPING TO BE POLYETHYLENE WRAPPED.



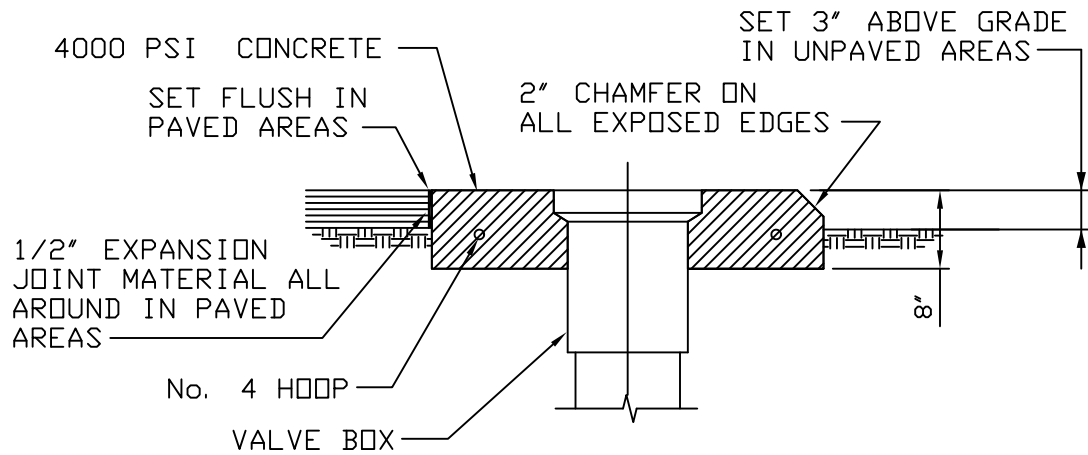
PINERY
WATER & WASTEWATER DISTRICT
Quality Water for Life

4" TRANSMISSION LINE
BLOW-OFF INSTALLATION

DRAWN: KAW	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: WATER 23	



PLAN



SECTION

NOTES:

1. USE 1'-6" DIAMETER COLLAR FOR TRACER WIRE BOX COLLARS.
2. USE 24" SONOTUBE TO FORM CONCRETE.
3. TRUCK MIX CONCRETE REQUIRED, NO BAG MIX PERMITTED.



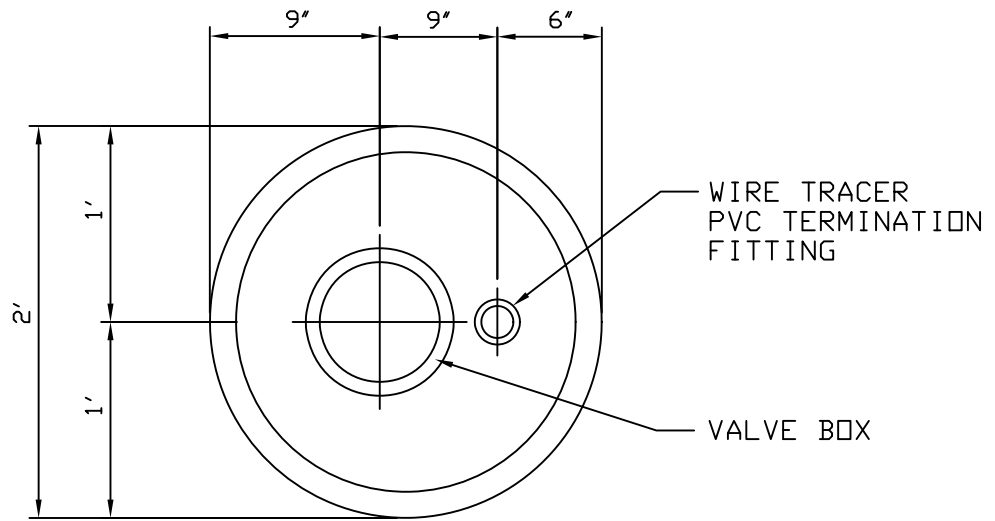
CONCRETE COLLAR
FOR VALVE BOX

DRAWN: PAU CHECKED: PRM

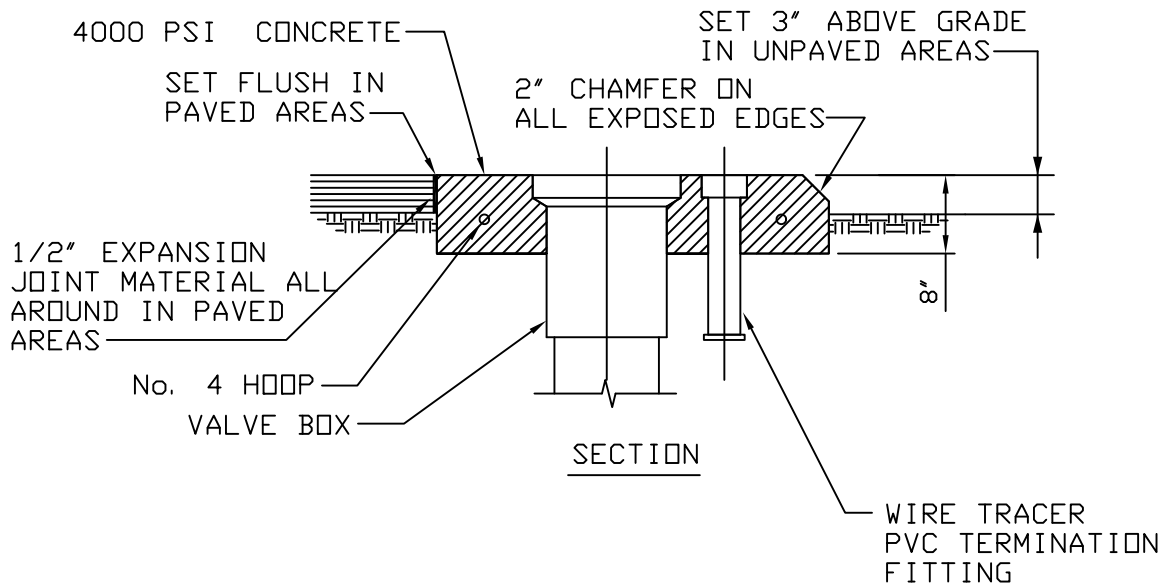
DATE: 06/2017

SCALE: NO SCALE

FILE NO: WATER26A




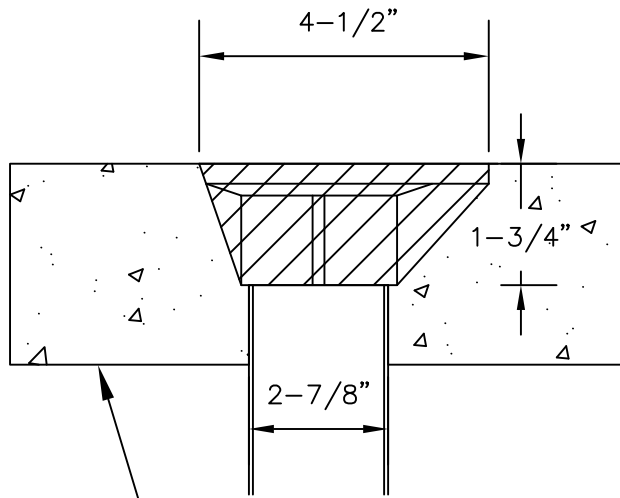
PLAN



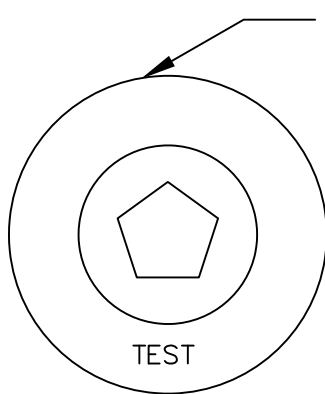
SECTION

1. USE 24" SONOTUBE TO FORM CONCRETE.
2. TRUCK MIX CONCRETE REQUIRED, NO BAG MIX PERMITTED.

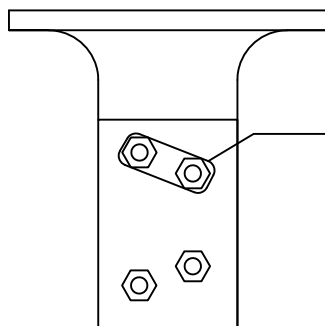
 PINERY WATER & WASTEWATER DISTRICT <i>Quality Water for Life</i>	
CONCRETE COLLAR FOR VALVE BOX AND TRACER WIRE TERMINATION BOX	
DRAWN: PAU	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: WATER26B	



30" SQ. X 6" THICK
CONCRETE COLLAR
(EXCEPT IN
PAVEMENT) WITH #4
REBAR AT 3" FROM
OUTSIDE PERIMETER
OR USE FIBROUS
CONCRETE - SEE
DETAIL WATER26A.



CP TEST SERVICES
-VALVCO MINI TEST
STATION W/4 TERMINALS



BONDING STRAP PER NOTE 2.

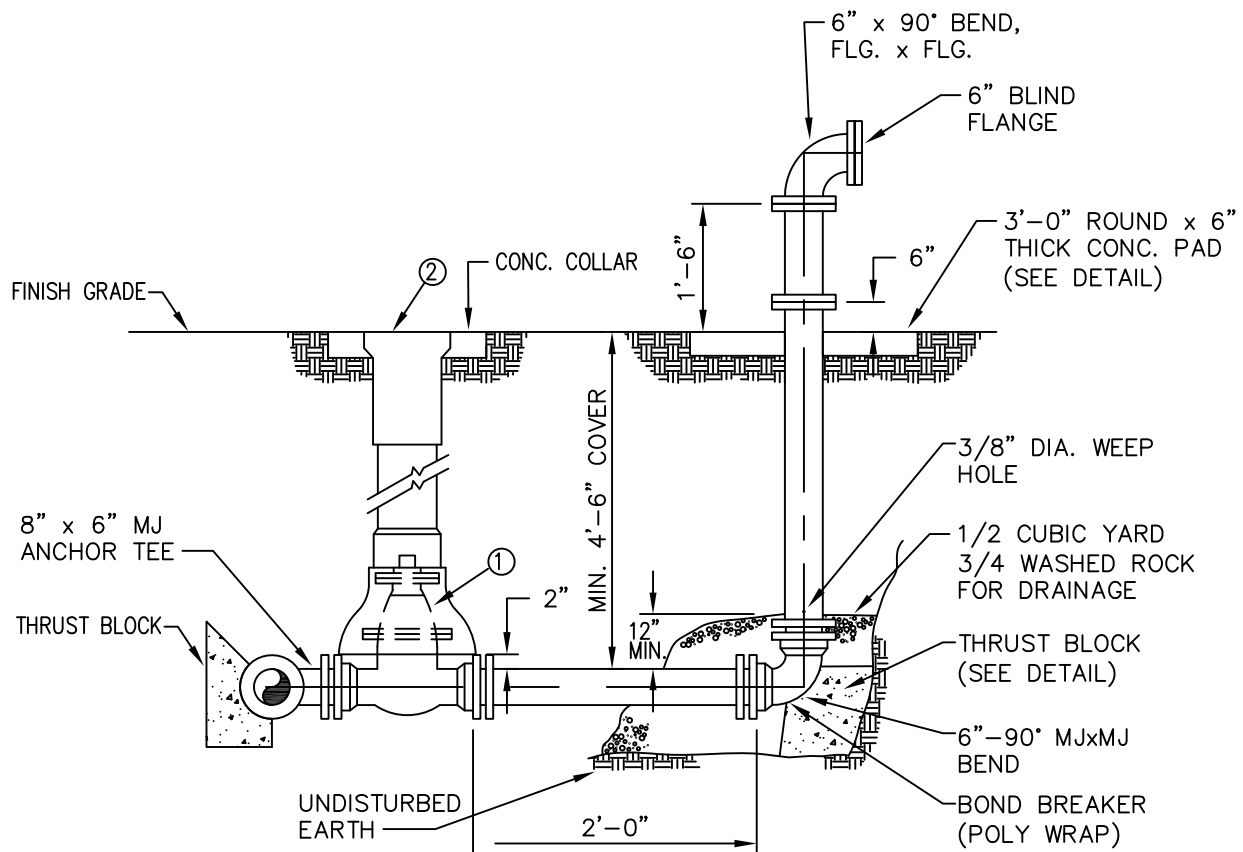
NOTES:

1. SPACE TRACE WIRE BOXES AT 1000 FT. MAXIMUM SPACING.
2. FURNISH AND INSTALL ONE BONDING STRAP PART NUMBER 01-11900 BETWEEN TERMINALS PRIOR TO CONNECTING TRACER WIRES.
3. LEAD WIRES INSIDE THE TEST STATION VAULT SHALL BE PROVIDED WITH SUFFICIENT SLACK TO LIFT THE TERMINAL BOARD A MINIMUM OF 18" ABOVE THE VAULT TO ALLOW ACCESS TO THE CONNECTIONS YET ALLOW THE TERMINAL BOARD AND LID TO BE INSTALLED IN THE VAULT WITHOUT BINDING ON THE SLACK WIRES.




TRACER WIRE TEST STATION

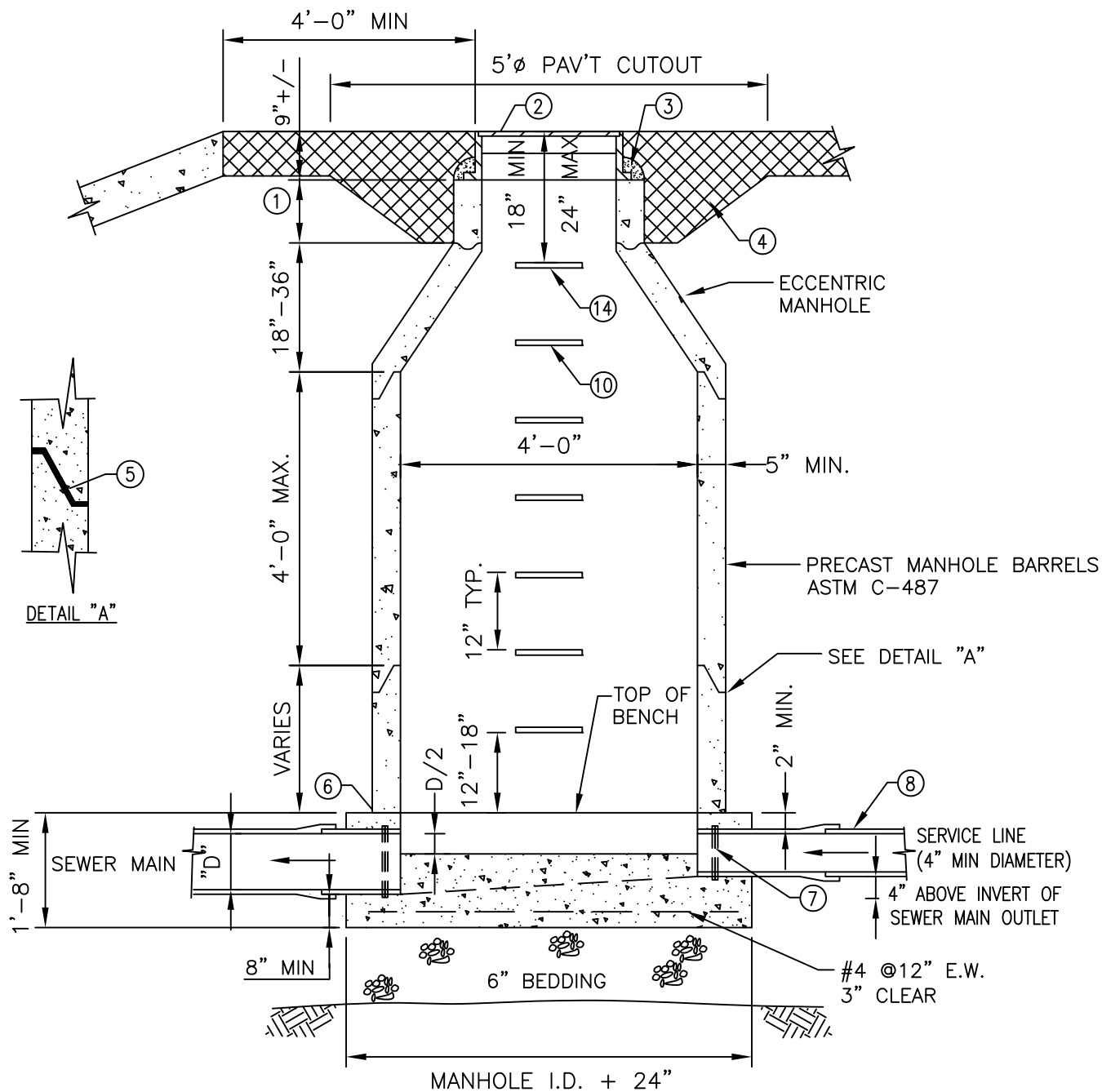
DRAWN: KAW	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: WATER28	



NOTES:


1. M.J. TEE OR END OF WATER MAIN. SEE DRAWINGS FOR SIZE AND CONFIGURATION.
2. VALVE BOX, TYLER SERIES 6860 SCREW TYPE WITH #160 BASE.
3. VALVE OPERATOR EXTENSION ROD REQUIRED IF VALVE NUT EXCEEDS 4.5 FEET DEEP. ATTACH EXTENSION ROD TO 2" OPERATOR WITH 2-3/8" SETSCREWS. 2" OPERATOR ON VALVE OPERATOR EXTENSION SHALL BE 3 FEET BELOW TOP OF VALVE BOX.
4. ALL DIP PIPE AND FITTINGS BELOW GRADE SHALL BE WRAPPED IN 8 MIL POLYETHYLENE.
5. COVER ALL 3/4" DRAINAGE ROCK WITH 8 MIL POLYETHYLENE TO PREVENT SOIL PLUGGING.
6. INSTALL BREAK-AWAY BOLTS AND OR BREAK-AWAY FLANGE.
7. THRUST BLOCKS PER DETAIL. ALL PIPE JOINTS SHALL BE RESTRAINED WITH EBBA 1500TD FOR 4" -12" OR 1700 FOR 14" -24".
8. ALL CONCRETE SHALL COME FROM CONCRETE PLANT, NO BAGGED CONCRETE ALLOWED.
9. TYLER SERIES 6500 CURB STOP BOX FORD 202B-962-CCD3 SERVICE SADDLE, FORD FB1000-3-G-NL CORPORATION VALVE, FORD B44-333-Q-NL CURB STOP VALVE IF REQUIRED BY DISTRICT

 PINERY WATER & WASTEWATER DISTRICT <i>Quality Water for Life</i>	
BLOWOFF HYDRANT ASSEMBLY	
DRAWN:	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: WATER30	



NOTES:

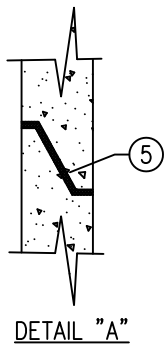
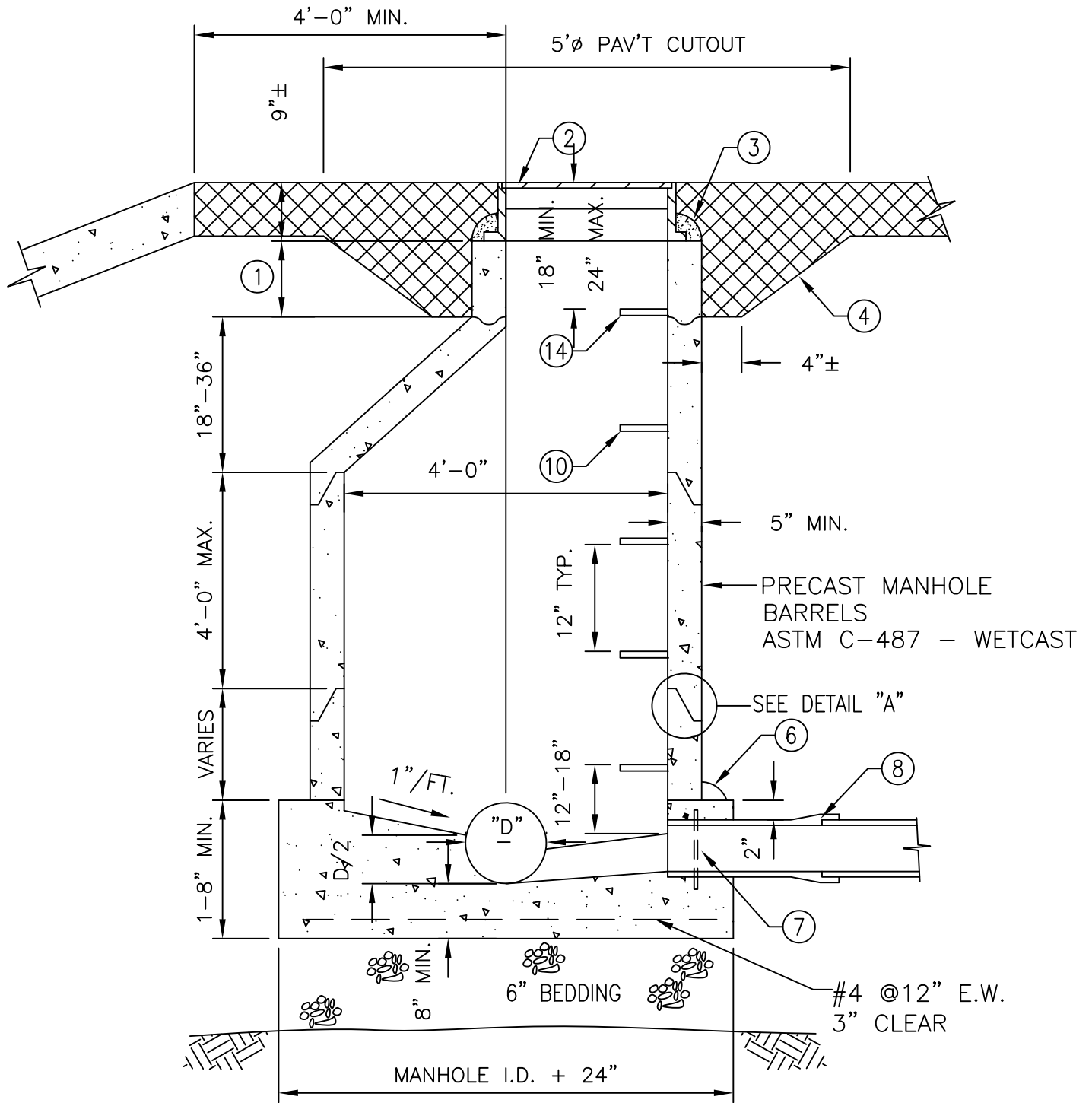
- A. DIRECT SERVICE LINE CONNECTION TO MANHOLE PERMITTED ONLY AT DEAD-END MANHOLES ON CUL-DE-SACS.
- B. ALL NOTES TO THE STANDARD 4' Ø MANHOLE DETAIL (SEWER 02) SHALL APPLY TO THIS DETAIL.
- C. SERVICE LINE SHALL ENTER MANHOLE DIRECTLY OPPOSITE AND IN DIRECT LINE WITH SEWER MAIN.
- D. ONLY ONE SERVICE LINE CONNECTION PERMITTED PER MANHOLE.



PINERY
WATER & WASTEWATER DISTRICT
Quality Water for Life

SERVICE CONNECTION TO DEAD-END
4'Ø MANHOLE

DRAWN: KAW	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: SEWER01	



STANDARD 4' DIA. MANHOLE
(FOR 8" TO 18" DIA. PIPE)
SEE SEWER 02A FOR NOTES

DRAWN: KAW

CHECKED: PRM

DATE: 06/2017

SCALE: NO SCALE

FILE NO: SEWER02

NOTES:

1. FINAL GRADE ADJUSTMENT OF MANHOLE COVERS AND FRAME ASSEMBLIES SHALL BE COMPLETED USING 2" TO 6" CONCRETE RISER RINGS. THE HEIGHT OF THE RISER RINGS SHALL BE SELECTED TO HAVE AS FEW JOINTS AS POSSIBLE. GROUT THE INSIDE JOINTS WITH NON-SHRINK GROUT. EPOXY COAT THE GROUT AND THE ENTIRE INSIDE OF THE RISER RING. INSTALL BUTYL RUBBER SEALANT, CONSEAL 102 OR EQUAL BETWEEN TOP CONCRETE RISER AND THE CAST IRON OR ALUMINUM MANHOLE FRAME.
2. DENVER HEAVY PATTERN 24" RING & COVER (NEENAH R-1706 OR EQUAL). LID MARKED "SEWER". IN UNPAVED AREAS, USE ALUMINUM MANHOLE COVERS WITH CAM LOCK. FINAL ELEVATION OF COVER IN UNPAVED AREAS SHALL BE 6" ABOVE FINAL GRADE.
3. DISTRICT MAY REQUIRE OUTSIDE PROTECTION OF MANHOLE RINGS FOR SPECIFIC CONDITIONS. OUTSIDE PROTECTION CONSISTS OF A CONCRETE COLLAR POURED AND FORMED AROUND THE GRADE RINGS EXTENDING 6" BELOW MANHOLE FRAME AND BOTTOM GRADE RING (CONE SECTION OF MANHOLE).
4. REPLACE PAVEMENT CUT-OUT WITH FULL DEPTH ASPHALT OR CONCRETE TO MATCH PAVEMENT. CUT OUT TO TOP OF CONE SECTION.
5. TWO FULL BEDS OF BITUMINOUS MASTIC, CONSEAL 102, REQUIRED AT EACH JOINT. HEAT CONCRETE AND MASTIC WHEN DAYTIME TEMP IS BELOW 45°F. TAPE OUTSIDE JOINT WITH 6" WIDE MASTIC TAPE.
6. FOR BASES POURED IN PLACE SET BOTTOM SECTION IN FULL BED OF MASTIC AND SEAL OUTSIDE JOINT WITH NON-SHRINK GROUT.
7. RUBBER WATERSTOP GASKET WITH STAINLESS STEEL CLAMP. EMBED IN CONCRETE.
8. PLACE JOINT 5' FROM WALL FOR ALL PIPES ENTERING MANHOLE.
9. SET CONE SO RING AND COVER ARE FURTHEST FROM SWALE OR CURB.
10. LOCATE STEPS ABOVE BEST BENCH SO FAR AS POSSIBLE. STEPS BY MA INDUSTRIES INC., MODEL NO. PS2-PF6.
11. PLUMB MANHOLES TO WITHIN $\frac{1}{8}$ ".
12. SERVICE LINE CONNECTION TO DEAD-END MANHOLE SHALL BE 4" ABOVE THE INVERT OF THE SEWER (ONLY WHEN APPROVED BY DISTRICT IN WRITING).
13. MUST WITHSTAND H-20 TRAFFIC LOADING.
14. FIRST MANHOLE STEP TO BE 18" TO 24" BELOW TOP OF COVER.
15. IF MANHOLE FAILS VACUUM TEST, MUST FILL BARREL SECTION JOINTS WITH NON-SHRINK GROUT THEN EPOXY GROUT AND 3" ABOVE AND BELOW GROUT.
16. PACK PIPE BOOT WITH NON SHRINK GROUT AND CONTOUR TO MANHOLE WALL SURFACE ALL AROUND PIPE, PACK GROUT UNDERNEATH PIPE INVERT. EPOXY COAT ALL GROUT AND 3" BEYOND EDGE OF GROUT.
17. ADDITIONAL CONSTRUCTION REQUIREMENTS CAN BE FOUND IN SANITARY SEWER SYSTEM NOTES.



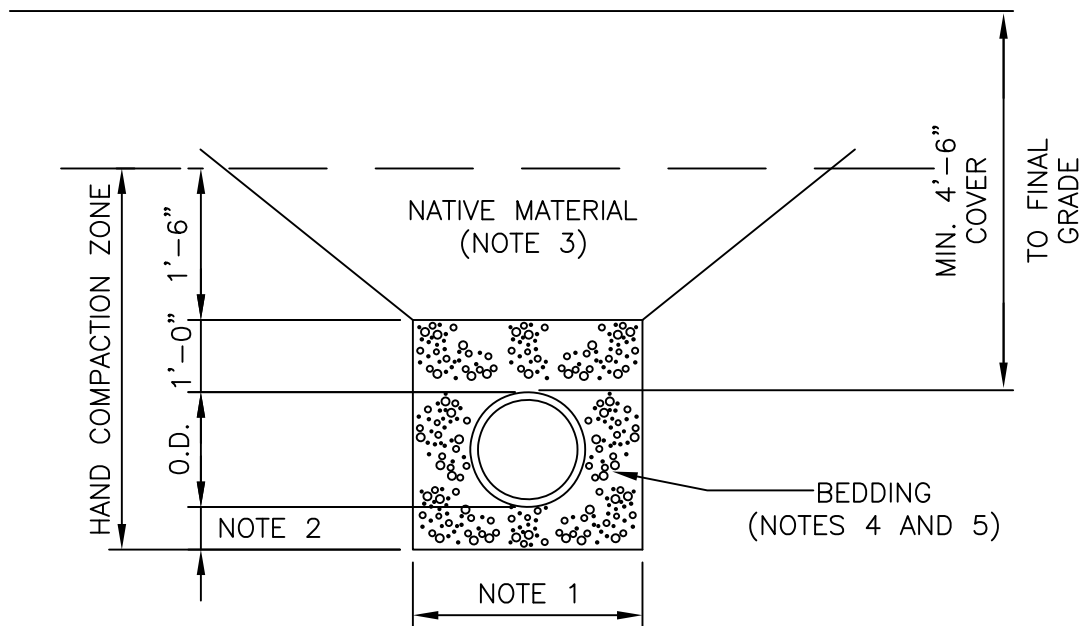
NOTES FOR STANDARD 4'
DIAMETER MANHOLE
(FOR 8" TO 18" DIA PIPE)

DRAWN: KAW CHECKED: PRM

DATE: 02/2018

SCALE: NO SCALE


FILE NO: SEWER02A

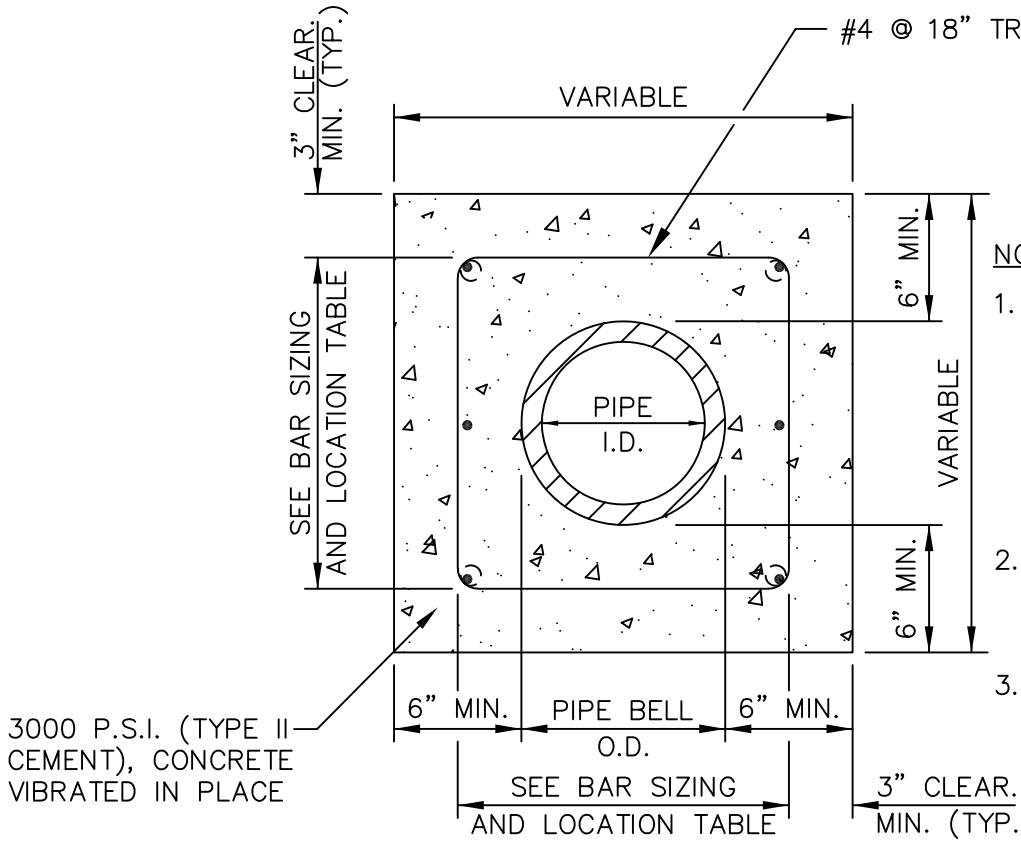


GRANULAR BEDDING

NOTES:

1. TRENCH WIDTH SHALL BE 12"–18" EACH SIDE OF PIPE BELL.
2. 6" BEDDING REQUIRED IF ALL LOOSE MATERIAL IS REMOVED FROM THE TRENCH BOTTOM, OTHERWISE 12" BEDDING REQ'D.
3. PLACE MIN. OF 12" BEDDING MATERIAL AND 18" OF NATIVE MATERIAL OVER PIPE BEFORE USING OTHER THAN HAND COMPACTION EQUIPMENT.
4. GRANULAR BEDDING MUST BE THOROUGHLY WORKED UNDER PIPE HAUNCHES FOR FULL PIPE LENGTH.
5. IF TRENCH BOTTOM IS UNSTABLE, FOLLOW DEWATERING REQUIREMENTS ON COVER SHEET.
6. THE SQUEEGEE BEDDING ABOVE THE PIPE SHALL BE LEVEL ACROSS THE WIDTH OF THE ENTIRE TRENCH. MOUNDING OF SQUEEGEE TO OBTAIN MIN. 12" OF BEDDING ABOVE THE PIPE IS NOT ACCEPTABLE.

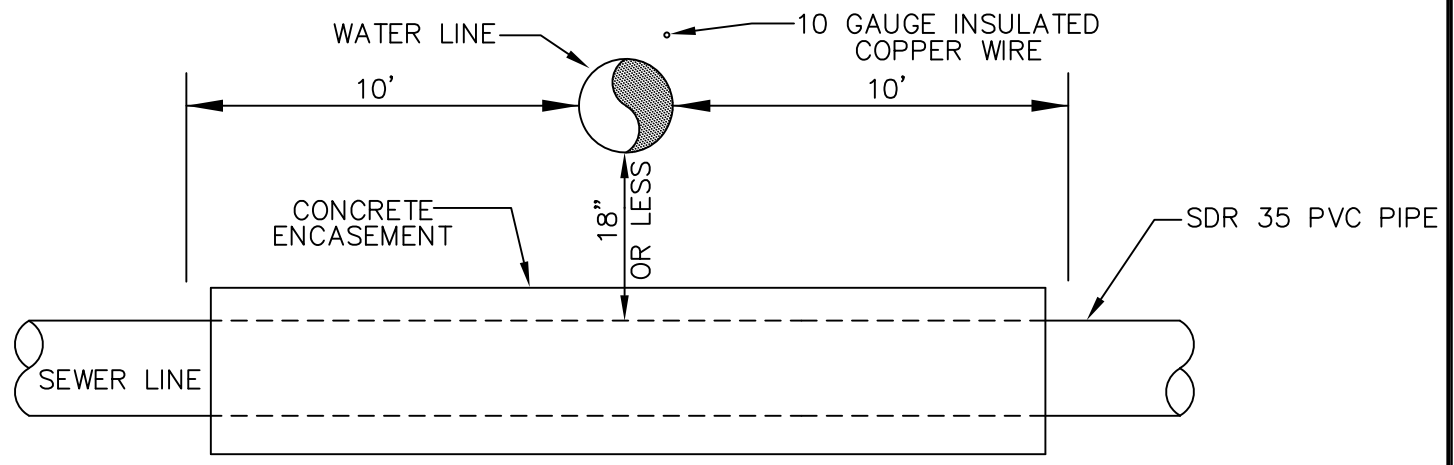
 PINERY WATER & WASTEWATER DISTRICT <i>Quality Water for Life</i>	
SEWER TRENCH DETAIL	
DRAWN: KAW	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: SEWER03	



NOTES:

1. C900 PVC PIPE MAY BE SUBSTITUTED FOR CONCRETE ENCASED SDR 35. WHEN USING PVC 900 A 20 FOOT SECTION MUST BE CENTERED ON SEWER LINE SO BELLS ARE 10 FEET FROM SEWER LINE CENTER.
2. SUPPORT PIPE WITH 6" TALL CONCRETE BLOCKS (HOLES TO SIDE) . FOUR BLOCKS PER 14-FT STICK OF PIPE.
3. FORM SIDES WITH PLYWOOD BEFORE POURING.


3000 P.S.I. (TYPE II CEMENT), CONCRETE VIBRATED IN PLACE



REINFORCEMENT STEEL

PIPE I.D.	LONGITUDINAL BARS – LOCATION		
6 IN.	4-NO. 4 BARS	1 EACH	CORNER
8 IN.	4-NO. 4 BARS	1 EACH	CORNER
10 IN.	8-NO. 4 BARS	3 EACH	SIDE
12 IN.	8-NO. 4 BARS	3 EACH	SIDE
15 IN.	8-NO. 4 BARS	3 EACH	SIDE
18 IN.	8-NO. 4 BARS	3 EACH	SIDE
21 IN.	12-NO. 4 BARS	4 EACH	SIDE
24 IN.	12-NO. 4 BARS	4 EACH	SIDE
27 IN.	12-NO. 4 BARS	4 EACH	SIDE
30 IN.	12-NO. 4 BARS	4 EACH	SIDE
33 IN.	12-NO. 4 BARS	4 EACH	SIDE
36 IN.	16-NO. 4 BARS	5 EACH	SIDE

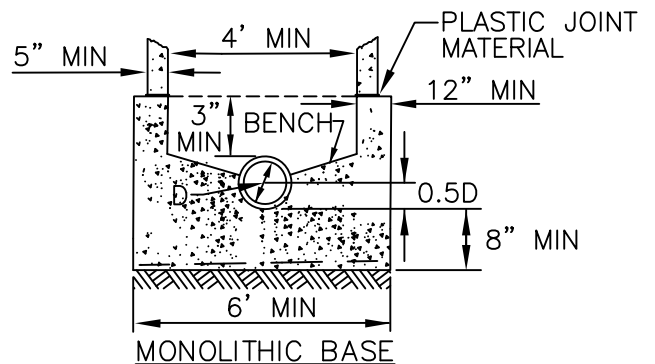
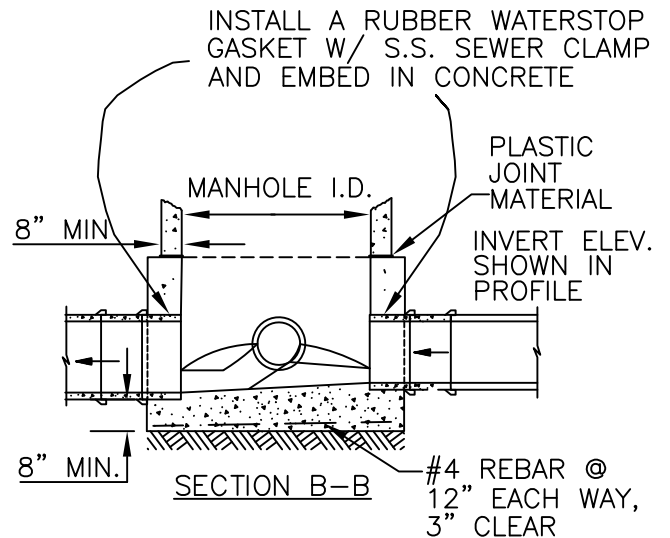
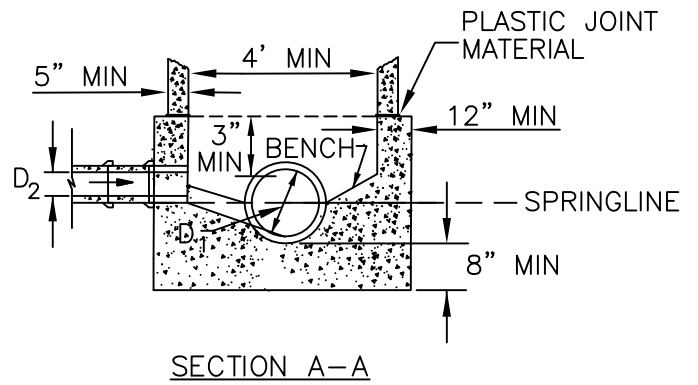
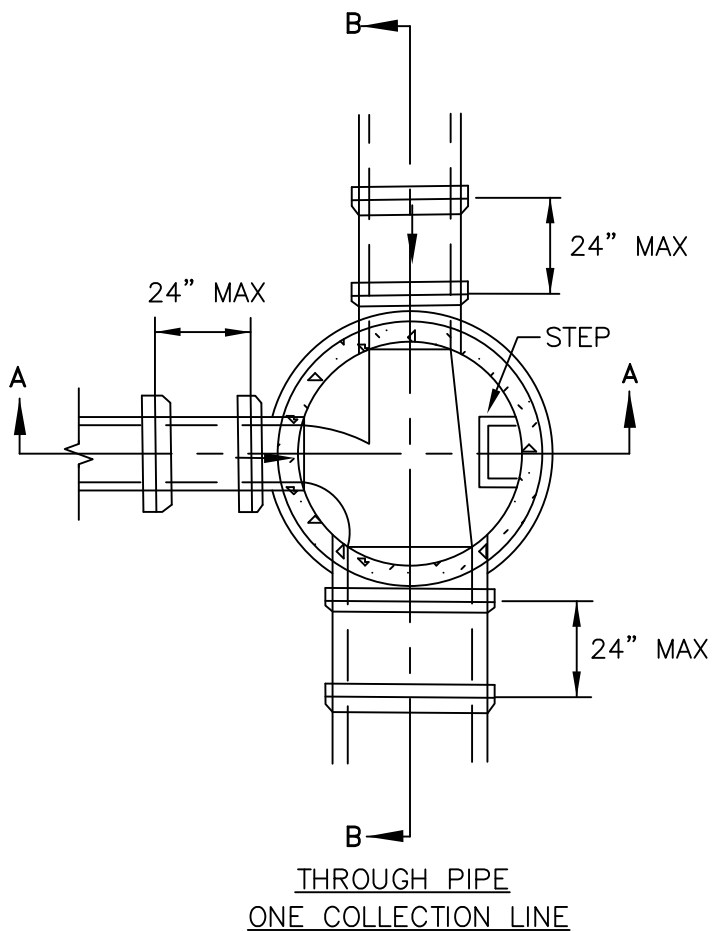
NOTE:
THE DISTRICT SHALL REVIEW THIS DETAIL FOR USE ON A CASE BY CASE BASIS. SPECIAL ENCASEMENTS MAY BE REQUIRED AT CREEK CROSSINGS AND CONDUIT CROSSINGS.



PINERY
WATER & WASTEWATER DISTRICT
Quality Water for Life

CONCRETE ENCASEMENT

DRAWN: KAW	CHECKED: WJM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: SEWER04	



NOTES

1. THE MANHOLE SHALL DROP A MIN. OF 0.2 FEET OR AS SHOWN ON THE PLAN & PROFILE.
2. BENCHES SHALL SLOPE 1 INCH/FOOT.
3. THERE SHALL BE A PIPE JOINT WITHIN 2 FEET OF THE EDGE OF THE MANHOLE BASE.
4. THE OUTSIDE WALLS SHALL BE FORMED TO THE DESIGNED SHAPE.
5. THE TOP OF THE BASE SHALL BE LEVEL IN ALL CASES.
6. STEPS SHALL BE LOCATED ABOVE THE BEST BENCH
7. PROVIDE #4 REBAR AT 12" EACH DIRECTION, 3" CLEAR



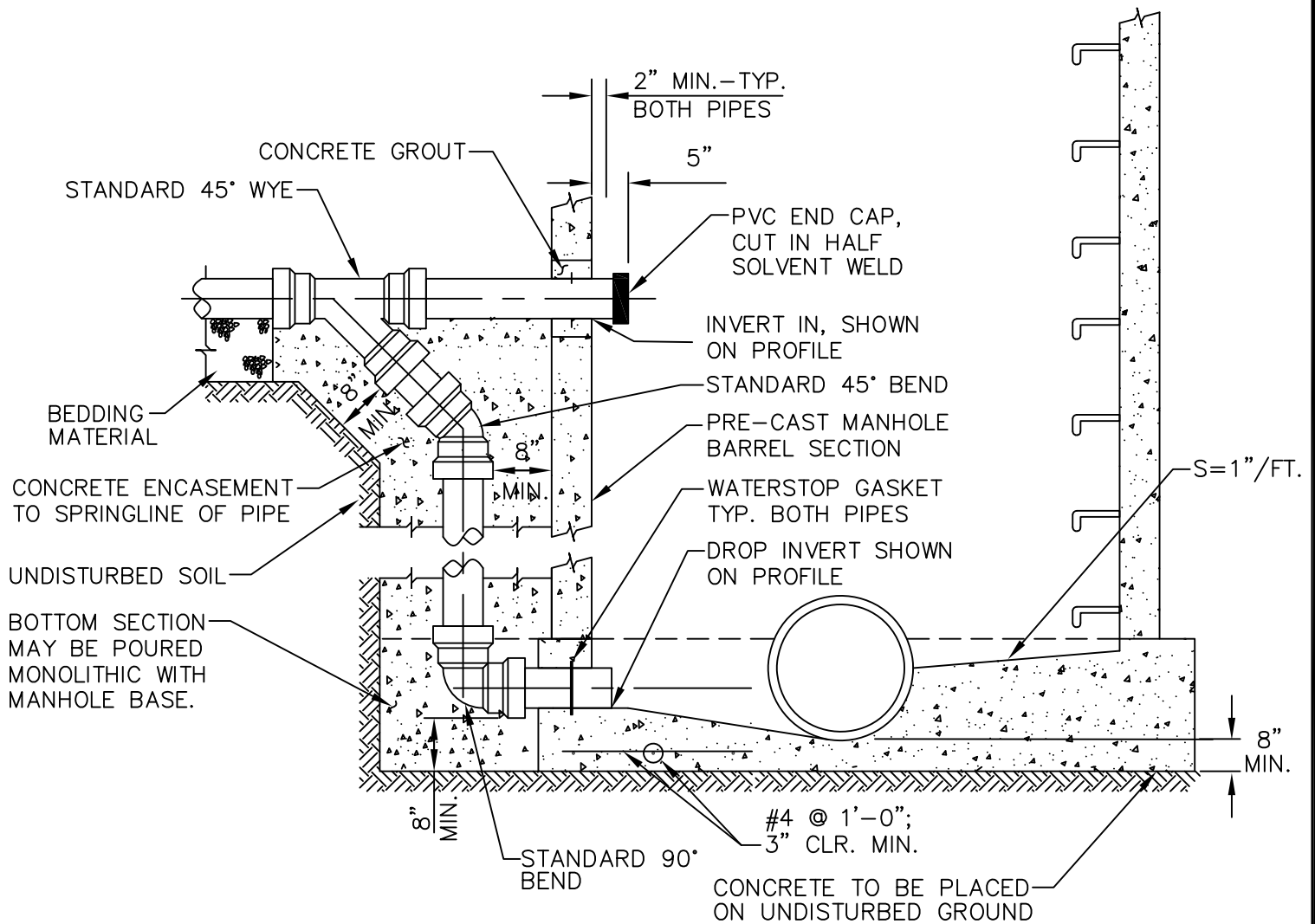
MANHOLE BASE & DEFLECTOR
4'Ø MANHOLE

DRAWN: KAW CHECKED: PRM

DATE: 06/2017

SCALE: NO SCALE

FILE NO: SEWER05



NOTES:

1. P.V.C. (ASTM D-3034 SDR-35) OR AWWA C900 OR D.I. PIPE AND FITTINGS SHOWN; DETAILS SIMILAR FOR ALL OTHER TYPES OF PIPE.
2. CONCRETE ENCASUREMENT SHALL BE CLASS II, TYPE III-VIBRATED AND MAY BE POURED MONOLITHIC WITH MANHOLE BASE MIN. 8" THICK ALL AROUND DROP.
3. ALL DROP MANHOLES SHALL BE LINED WITH SIKAGARD 62 (20 MIL MIN.-APPLIED IN 4-7 MIL LAYERS). PRIOR TO LINING, THE MANHOLE SHALL HAVE A PURGE COAT (SAND-CEMENT RUB) TO FILL SURFACE POCKETS.
4. DIAMETER OF DROP PIPE SHALL NOT BE LESS THAN THE LINE DIAMETER.
5. ANY DROP OVER 3'-0" REQUIRES VERTICAL AND HORIZONTAL REINFORCEMENT (#4 @ 1'-6" O.C.-3" CLEAR) IN ADDITION TO THE REINFORCEMENT SHOWN.
6. MAXIMUM ALLOWABLE DROP SHALL BE SUBJECT TO THE APPROVAL OF THE DISTRICT ENGINEER.
7. WALL OPENING SHALL BE PRECAST BLOCK OUT, 1" LARGER THAN PIPE DIAMETER ALL AROUND.



OUTSIDE DROP MANHOLE

DRAWN: KAW	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: SEWER06	

PRE CAST MANHOLES SHALL BE INSTALLED PLUMB WITH PROPER INVERT SLOPE

SEE DTL. BELOW

STEPS @ 12" O.C.

CONT. INVERT PER MANHOLE BASE DETAIL

2' MAX.

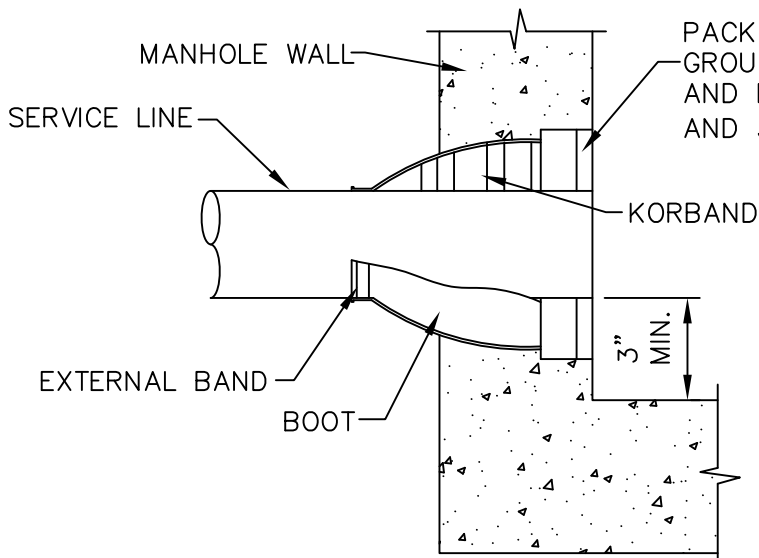
12" MIN.

6"

INSTALL PRE CAST BASE ON 6" OF APPROVED BEDDING MATERIAL LEVELING COURSE ON UNDISTURBED SUBGRADE

BASE AND RISER SECTIONS TO BE CAST INTEGRALLY

#4 @ 12" O.C. E.W.



PACK WITH NON-SHRINK GROUT AROUND PIPES AND INVERT. EXPOXY COAT GROUT AND 3" ABOVE AND BELOW

CORED OPENING SIZE SHOULD BE AS RECOMMENDED BY MFG. FOR PIPE SIZE REQ'D

KOR-N-SEAL DETAIL
(ASTM C-443)



PRE-CAST MANHOLE BASE

DRAWN: KAW

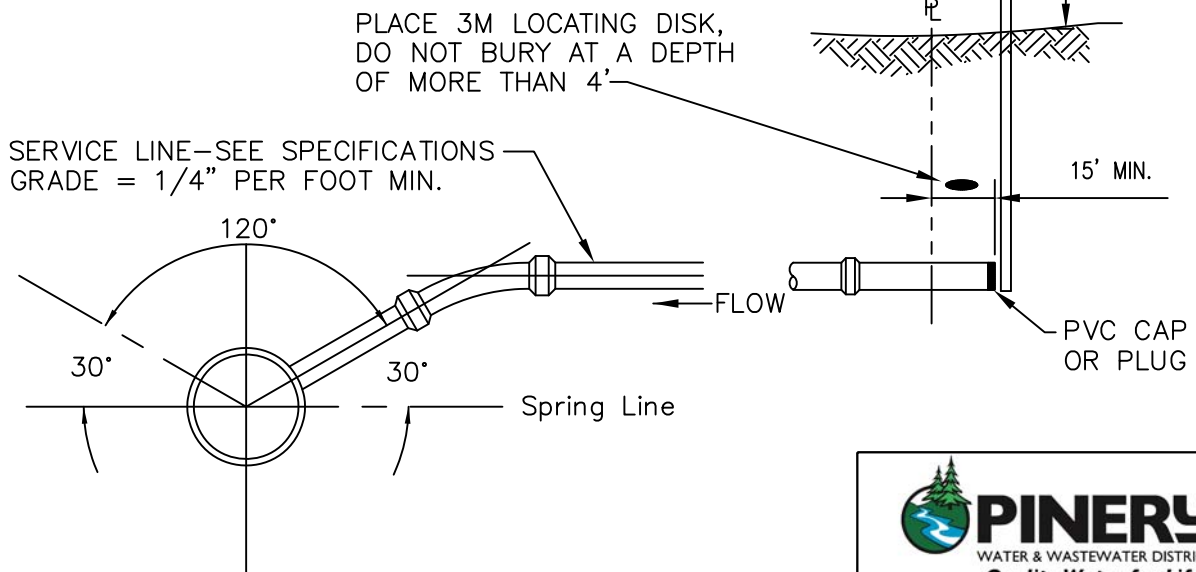
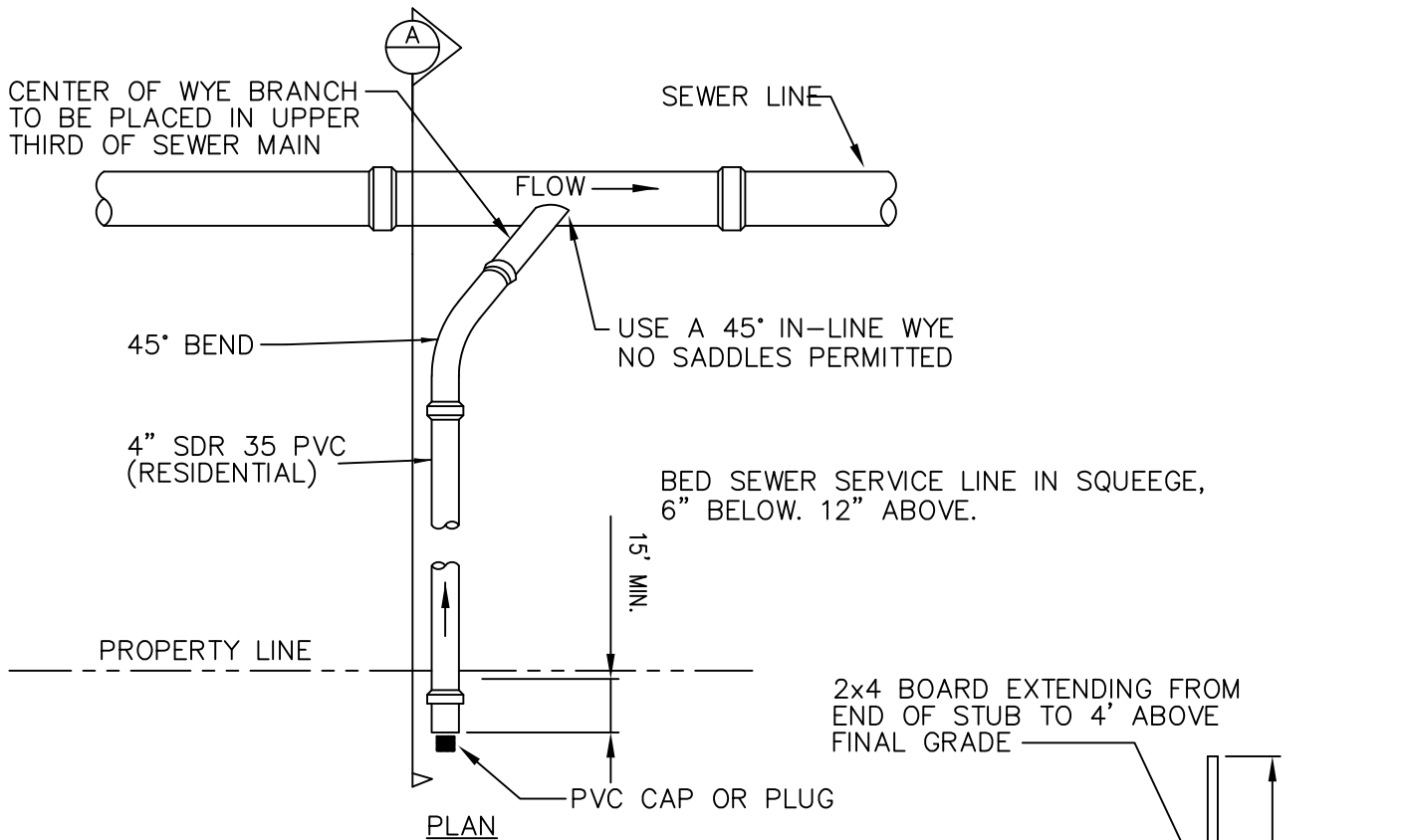
CHECKED: PRM

DATE: 06/2017

SCALE: NO SCALE

FILE NO: SEWER09

MINIMUM SEPARATION BETWEEN TAPS SHALL BE 18"



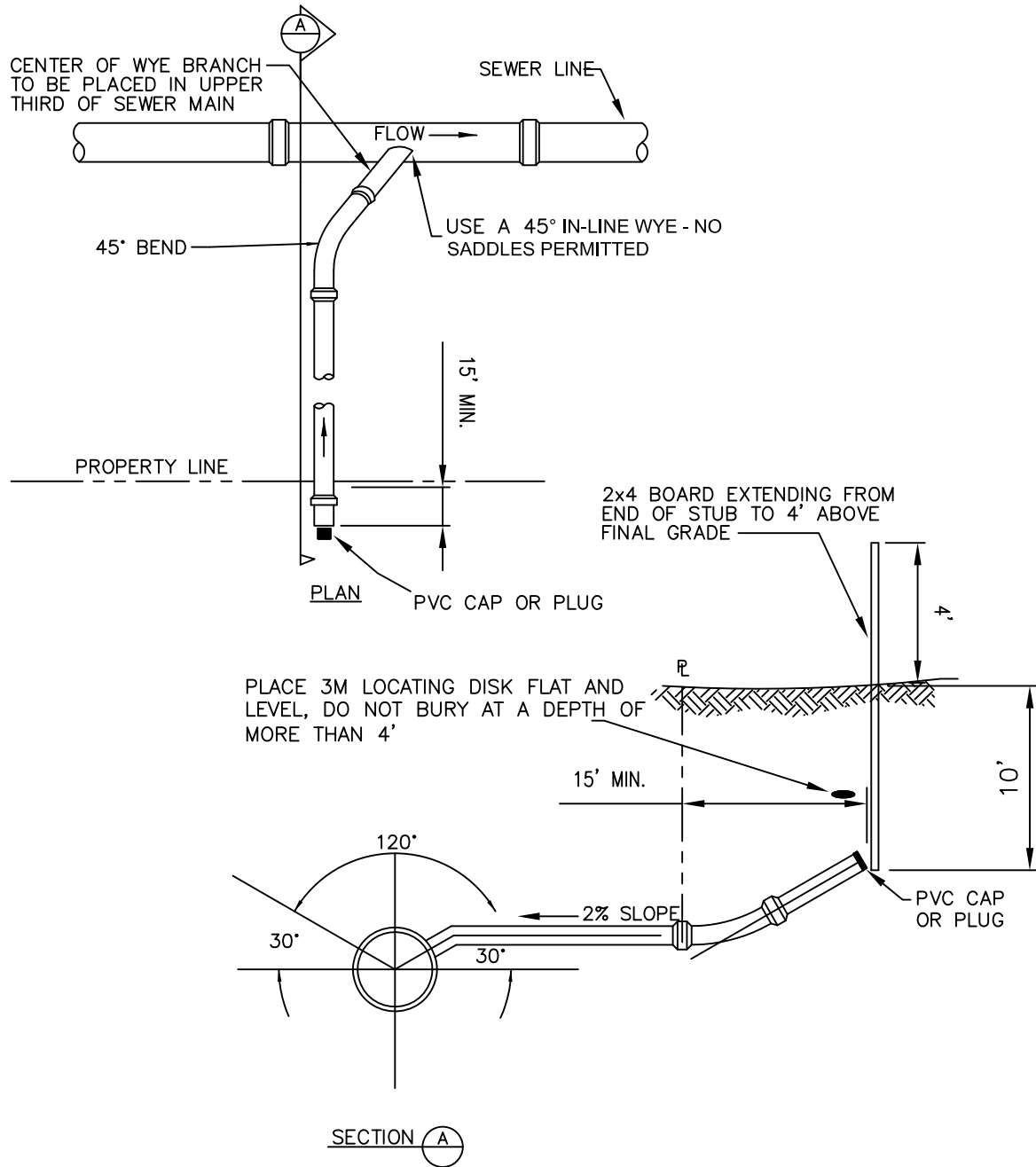
SECTION A



SEWER SERVICE CONNECTION

DRAWN: KAW	CHECKED: RK
DATE: 08/2020	
SCALE: NO SCALE	
FILE NO: SEWER10	

NOTE: MINIMUM SEPARATION BETWEEN TAPS SHALL BE 18"



SEWER SERVICE CONNECTION

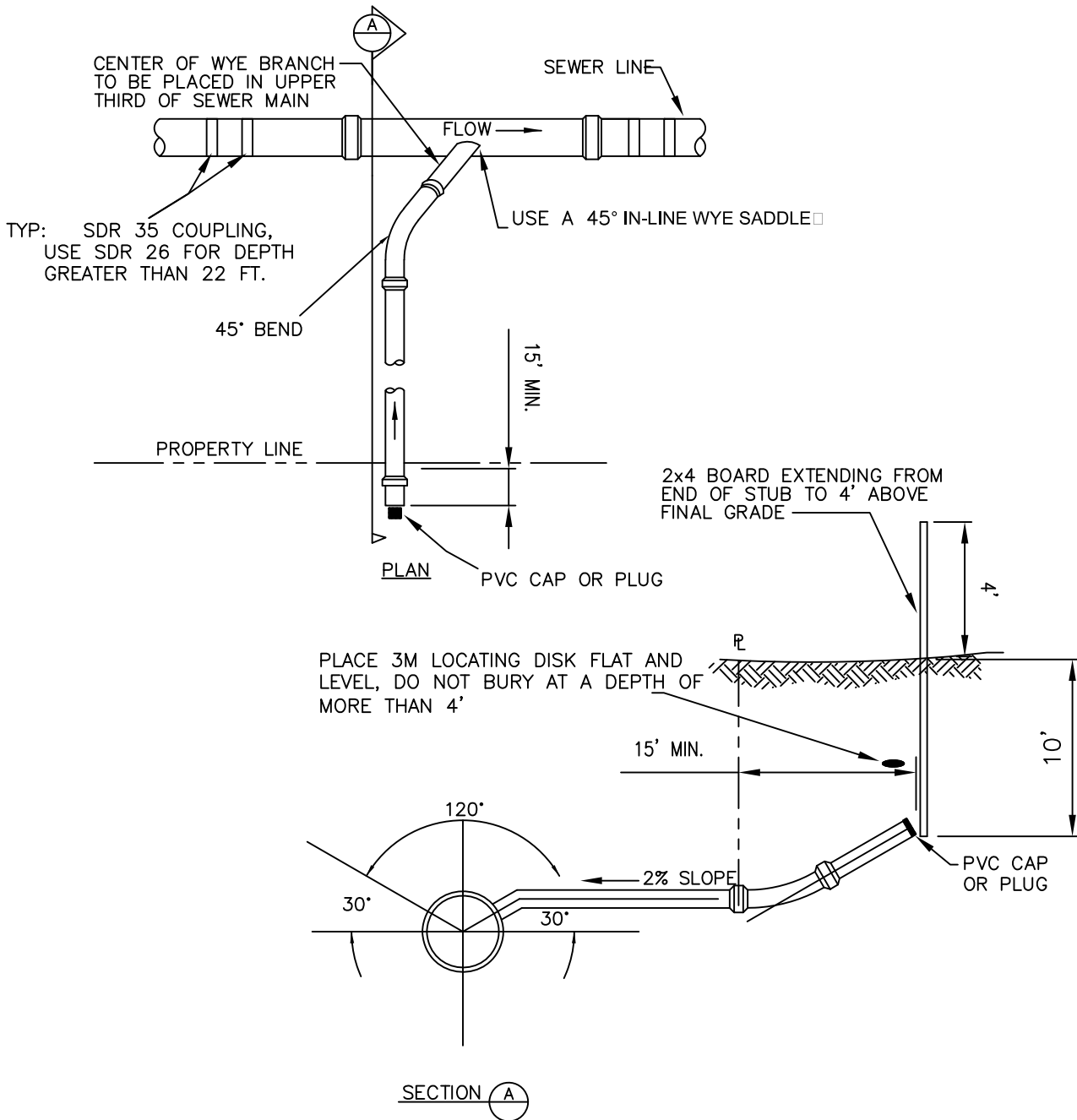
DRAWN: KAW | CHECKED: PRM

DATE: 06/2017

SCALE: NO SCALE

FILE NO: SEWER10A

NOTE: MINIMUM SEPARATION BETWEEN TAPS SHALL BE 24"



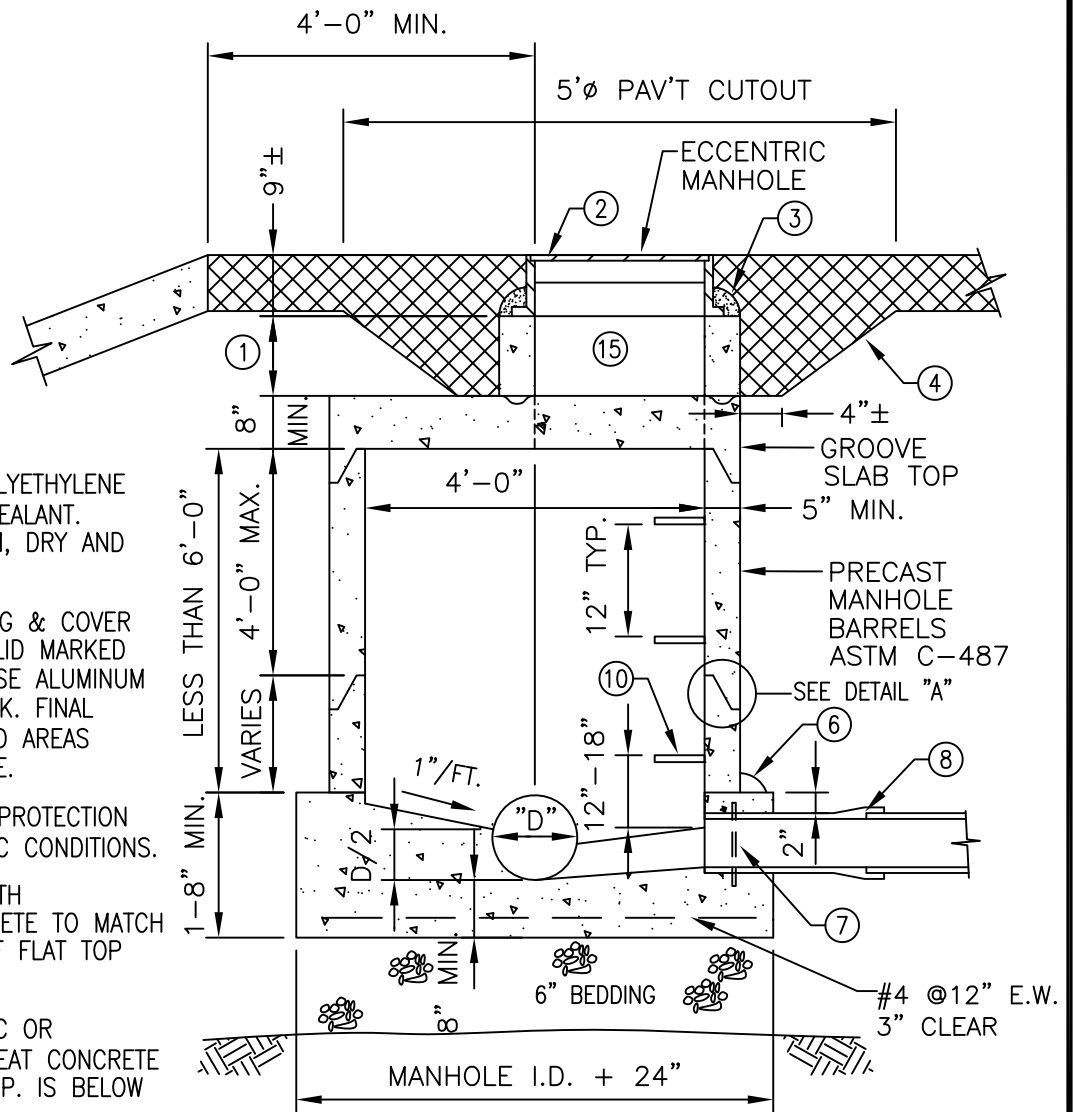
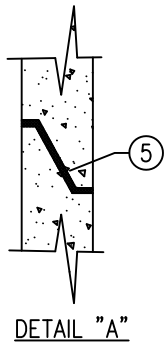
SEWER SERVICE
CONNECTION – CUT INTO
EXISTING LINE

DRAWN: KAW | CHECKED: PRM

DATE: 06/2017

SCALE: NO SCALE

FILE NO: SEWER10B



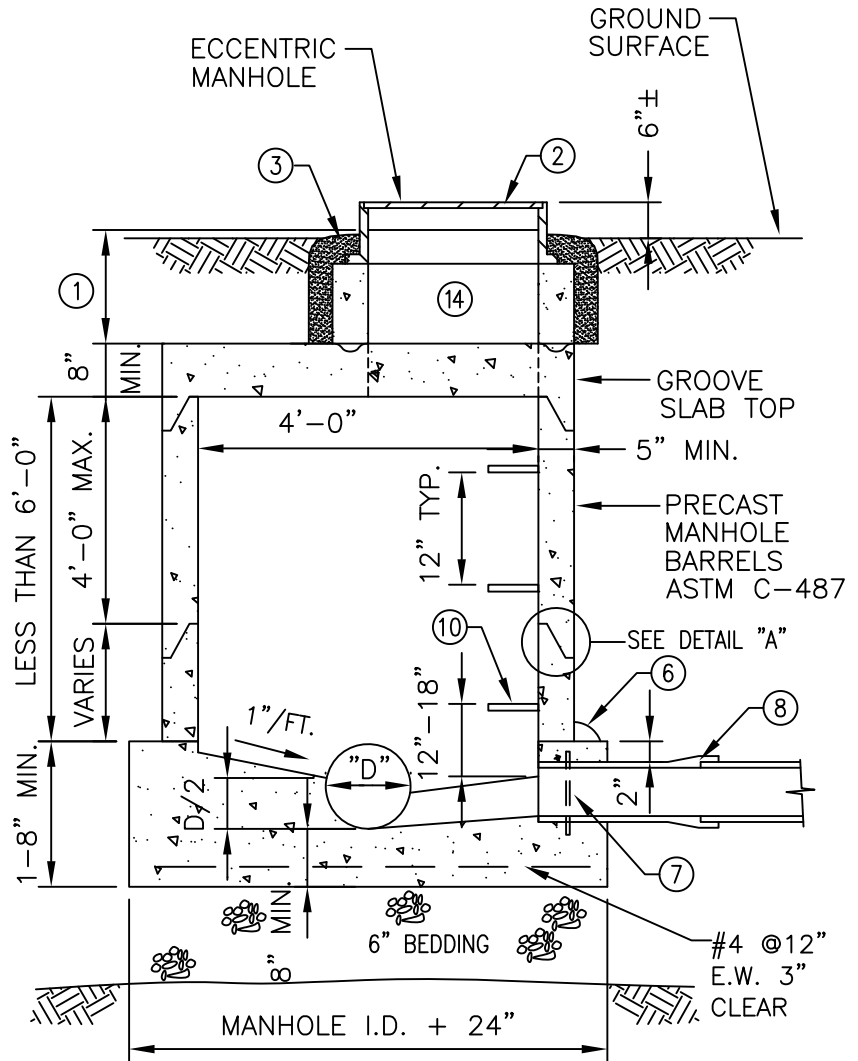
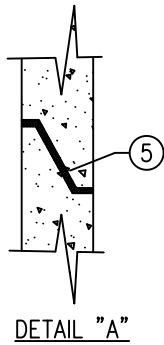
NOTES:

1. 4" TO 10" OF HIGH DENSITY POLYETHYLENE MANHOLE RINGS SET IN BUTYL SEALANT. ENTIRE SURFACE SHALL BE WARM, DRY AND CLEAN.
2. DENVER HEAVY PATTERN 24" RING & COVER (NEENAH R-1706 OR EQUAL). LID MARKED "SEWER". IN UNPAVED AREAS USE ALUMINUM MANHOLE COVERS WITH CAM LOCK. FINAL ELEVATION OF COVER IN UNPAVED AREAS SHALL BE 6" ABOVE FINAL GRADE.
3. DISTRICT MAY REQUIRE OUTSIDE PROTECTION OF MANHOLE RINGS FOR SPECIFIC CONDITIONS.
4. REPLACE PAVEMENT CUT-OUT WITH FULL-DEPTH ASPHALT OR CONCRETE TO MATCH PAVEMENT. CUT OUT TO TOP OF FLAT TOP SECTION.
5. FULL BED OF BITUMINOUS MASTIC OR PLASTIC SEALING COMPOUND. HEAT CONCRETE AND SEALANT WHEN DAYTIME TEMP. IS BELOW 45°F.
6. SET BOTTOM SECTION IN FULL BED OF MASTIC AND SEAL OUTSIDE JOINT W/ NON-SHRINK GROUT.
7. RUBBER WATERSTOP GASKET W/ STAINLESS STEEL CLAMP. EMBED IN CONCRETE.
8. PLACE JOINT 2' FROM WALL FOR ALL PIPES ENTERING MANHOLE.
9. SET CONE SO RING AND COVER ARE FURTHEST FROM SWALE OR CURB.
10. LOCATE STEPS ABOVE BEST BENCH SO FAR AS POSSIBLE. STEPS BY MA INDUSTRIES, INC., MODEL NO. PS2-PF6.
11. PLUMB MANHOLES TO WITHIN 1/8" /'.
12. SERVICELINE CONN. TO DEAD-END MANHOLE SHALL BE 4" ABOVE THE INVERT OF THE SEWER.
13. FLAT TOP COVERS SHALL BE USED WHERE THE DISTANCE FROM THE INVERT BENCH TO THE TOP IS LESS THAN SIX FEET.
14. MUST WITHSTAND H-20 TRAFFIC LOADING.
15. FIRST MANHOLE STEP TO BE 18" TO 24" BELOW TOP OF COVER.



4'Ø MANHOLE
WITH FLAT TOP COVER
(FOR 8" TO 18"Ø PIPE)

DRAWN: KAW	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: SEWER11A	



NOTES:

1. 4" TO 10" OF HIGH DENSITY POLYETHYLENE MANHOLE RINGS SET IN BUTYL SEALANT. ENTIRE SURFACE SHALL BE WARM, DRY AND CLEAN.
2. DENVER HEAVY PATTERN 24" RING & COVER (NEENAH R-1706 OR EQUAL). LID MARKED "SEWER". IN UNPAVED AREAS USE ALUMINUM MANHOLE COVERS WITH CAM LOCK. FINAL ELEVATION OF COVER IN UNPAVED AREAS SHALL BE 6" ABOVE FINAL GRADE.
3. DISTRICT MAY REQUIRE OUTSIDE PROTECTION OF MANHOLE RINGS FOR SPECIFIC CONDITIONS.
4. FLAT TOP COVERS SHALL BE USED WHERE THE DISTANCE FROM THE INVERT BENCH TO THE TOP IS LESS THAN 6 FEET.
5. FULL BED OF BITUMINOUS MASTIC OR PLASTIC SEALING COMPOUND. HEAT CONCRETE AND SEALANT WHEN DAYTIME TEMP. IS BELOW 45°F.
6. SET BOTTOM SECTION IN FULL BED OF MASTIC AND SEAL OUTSIDE JOINT W/ NON-SHRINK GROUT.
7. RUBBER WATERSTOP GASKET W/ STAINLESS STEEL CLAMP. EMBED IN CONCRETE.
8. PLACE JOINT 2' FROM WALL FOR ALL PIPES ENTERING MANHOLE.
9. SET CONE SO RING AND COVER ARE FURTHEST FROM SWALE OR CURB.
10. LOCATE STEPS ABOVE BEST BENCH SO FAR AS POSSIBLE. STEPS BY MA INDUSTRIES, INC., MODEL NO. PS2-PF6.
11. PLUMB MANHOLES TO WITHIN 1/8" /'.
12. SERVICELINE CONN. TO DEAD-END MANHOLE SHALL BE 4" ABOVE THE INVERT OF THE SEWER.
13. MUST WITHSTAND H-20 TRAFFIC LOADING.
14. FIRST MANHOLE STEP TO BE 18" TO 24" BELOW TOP OF COVER.



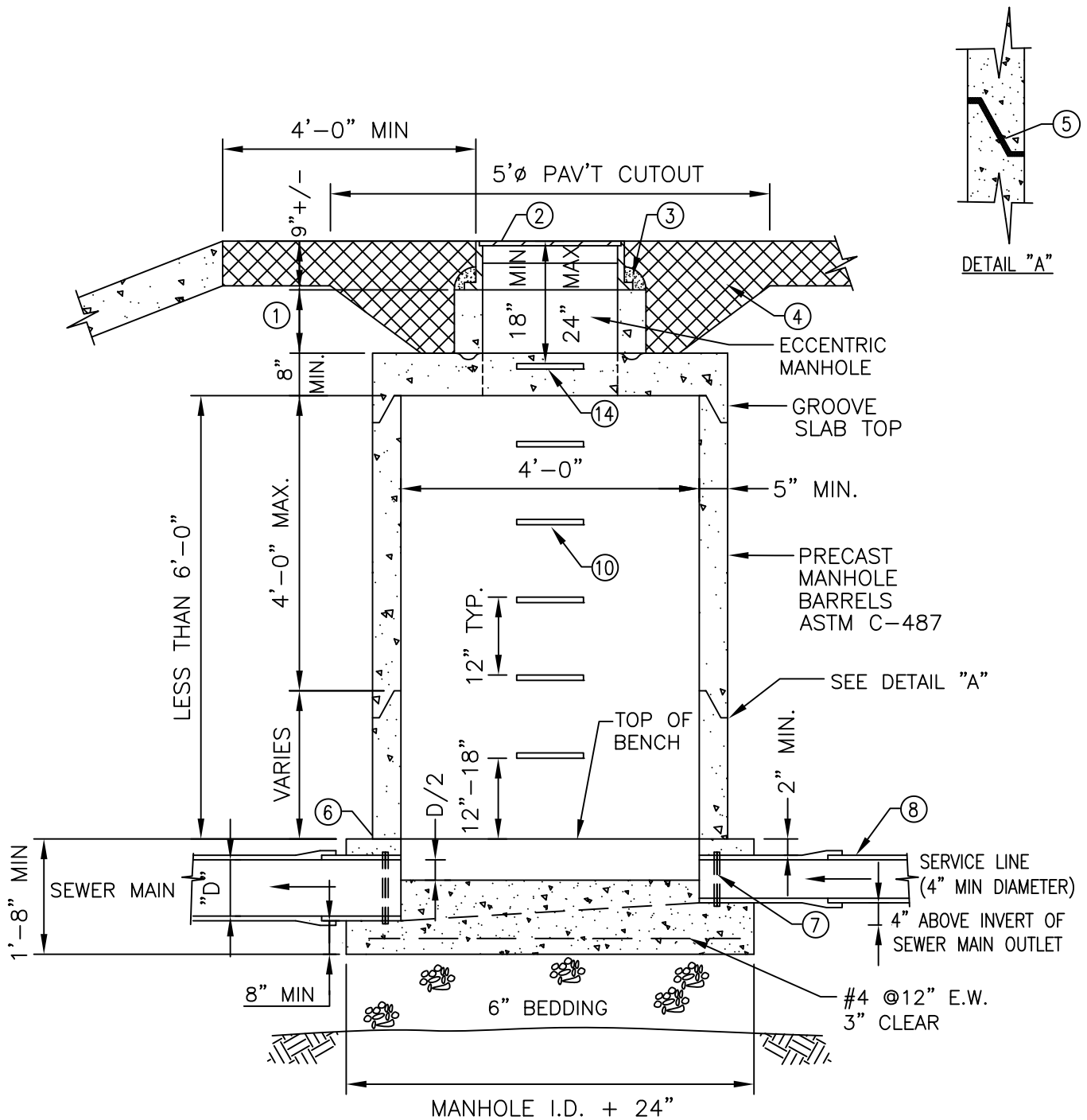
4'Ø MANHOLE
WITH FLAT TOP COVER
(FOR 8" TO 18"Ø PIPE)

DRAWN: KAW CHECKED: PRM

DATE: 06/2017

SCALE: NO SCALE

FILE NO: SEWER11B



NOTES:

- A. DIRECT SERVICE LINE CONNECTION TO MANHOLE PERMITTED ONLY AT DEAD-END MANHOLES ON CUL-DE-SACS.
- B. FLAT TOP MANHOLES SHALL BE USED WHERE THE DISTANCE FROM THE INVERT BENCH TO THE TOP IS LESS THAN SIX FEET.
- C. ALL NOTES TO THE STANDARD 4' ϕ MANHOLE DETAIL (SEWERO2) SHALL APPLY TO THIS DETAIL.
- D. SERVICE LINE SHALL ENTER MANHOLE DIRECTLY OPPOSITE AND IN DIRECT LINE WITH SEWER MAIN.
- E. ONLY ONE SERVICE LINE CONNECTION PERMITTED PER MANHOLE.
- F. MUST WITHSTAND H-20 TRAFFIC LOADING.



SERVICE CONNECTION TO DEAD-END
4' ϕ MANHOLE WITH FLAT TOP COVER

DRAWN: KAW	CHECKED: PRM
DATE: 06/2017	
SCALE: NO SCALE	
FILE NO: SEWER12	