



Arapahoe County Water and Wastewater Authority

13031 E Caley Avenue, Centennial, CO 80111 9364

Phone (303) 790-4830, Fax (303)790-9364

www.arapahoewater.org

ACWWA NOTES - WATER

1. AT LEAST FIVE (5) BUSINESS DAYS PRIOR TO THE START OF CONSTRUCTION, A PRE-CONSTRUCTION MEETING WILL BE HELD AT THE OFFICE OF THE AUTHORITY AND ATTENDED BY CONTRACTOR AND REPRESENTATIVES OF OTHER APPROVING AGENCIES. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT THE AUTHORITY.
2. THE CONTRACTOR IS RESPONSIBLE FOR NOTIFYING ALL CUSTOMERS POSSIBLY AFFECTED BY OUTAGE OF WATER DURING CONSTRUCTION.
3. ALL WATER CONSTRUCTION, MATERIALS, AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE AUTHORITY STANDARDS AND SPECIFICATIONS.
4. ALL WORK SHALL BE INSPECTED AND APPROVED BY PERSONNEL OF THE AUTHORITY. THE CONTRACTOR SHALL NOTIFY THE AUTHORITY INSPECTOR (303-790-4830) AT LEAST TWO (2) FULL BUSINESS DAYS PRIOR TO THE START OF CONSTRUCTION. ALL WORK SHALL BE INSPECTED AND APPROVED BY AUTHORITY PERSONNEL AND/OR AUTHORITY REPRESENTATIVES.
5. A METER SET REQUEST MUST BE GIVEN AT LEAST THREE (3) BUSINESS DAYS IN ADVANCE TO DATE OF METER INSTALLATION, ONCE PROBATIONARY ACCEPTANCE (PA) HAS BEEN GRANTED.
6. THE CONTRACTOR SHALL HAVE IN HIS POSSESSION AT ALL TIMES ONE (1) SIGNED COPY OF THE PLANS, WHICH HAVE BEEN APPROVED BY THE AUTHORITY.
7. METERS WILL NOT BE SET UNTIL ALL TAP FEES HAVE BEEN PAID, FLAT WORK COMPLETE AND PROBATIONARY ACCEPTANCE (PA) HAS BEEN GRANTED.
8. ONLY ONE CONNECTION TO EXISTING WATER SYSTEM WILL BE PERMITTED UNTIL TESTING AND DISINFECTION IS COMPLETE AND ACCEPTED.
9. ALL EXISTING VALVES TO BE OPERATED BY AUTHORITY PERSONNEL ONLY.
10. ALL PIPE LENGTHS ARE APPROXIMATE. LENGTHS INDICATED ON THE PLANS ARE BETWEEN CENTER OF FITTING TO CENTER OF FITTING.
11. SURFACED ACCESS ROADS SHALL BE CAPABLE OF WITHSTANDING THE IMPOSED LOADS OF FIRE APPARATUS AND ALL REQUIRED FIRE HYDRANTS SHALL BE INSTALLED AND SERVICEABLE PRIOR TO AND DURING CONSTRUCTION.
12. PRIOR TO INSTALLATION OF WATER MAINS, ROAD CONSTRUCTION MUST HAVE PROGRESSED TO AT LEAST THE "SUB-GRADE" STAGE. SUB-GRADE IS DEFINED AS AN ELEVATION OF NO MORE THAN SEVEN INCHES BELOW THE FINISHED STREET GRADE.
13. ALL WATER MAINS SHALL BE POLYVINYL CHLORIDE (PVC) PRESSURE PIPE, MANUFACTURED IN ACCORDANCE WITH AWWA C900, OR DUCTILE IRON, CLASS 50 PIPE. PVC PIPE TO BE USED FOR THE PURPOSE OF IRRIGATION (IE. NON-POTABLE, RE-USE, EFFLUENT) SHALL BE PURPLE IN COLOR. PVC SIZES 6 INCH, 8 INCH AND 12 INCH SHALL BE CLASS 150 DIMENSION RATIO 18 (DR 18). PIPE JOINTS SHALL BE MADE USING AN INTEGRAL BELL WITH AN ELASTOMERIC GASKET PUSH ON TYPE JOINT. SOLVENT CEMENT JOINTS ARE STRICTLY PROHIBITED.



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14. ALL WATER PIPE SHALL HAVE A TRACER WIRE. INSTALL 12 GAUGE TYPE UF SINGLE STRAND COPPER TRACER WIRE TO PIPE WITH 2-INCH WIDE PVC TAPE. SPLICING OF TRACER WIRE SHALL BE PER MANUFACTURE'S RECOMMENDATION. THE TRACER WIRE SHALL RUN TO A TEST STATION OR VALVE BOX LOCATED NEXT TO A FIRE HYDRANT.
15. ALL FIRE LINES AND FIRE HYDRANT LATERALS SHALL BE DUCTILE IRON PIPE (DIP), CLASS 50, IN ACCORDANCE WITH AWWA.
16. ALL DOMESTIC WATER MAINS SHALL HAVE 4.5 FEET MINIMUM COVER FROM FINISHED GRADE TO TOP OF PIPE.
17. ALL IRRIGATION WATER MAINS SHALL HAVE 6.5 FEET MINIMUM COVER FROM FINISHED GRADE TO TOP OF PIPE.
18. WHEN IT IS NECESSARY TO LOWER OR RAISE WATER LINES AT UTILITY CROSSINGS, A MINIMUM OF 1.50 FEET SHALL BE MAINTAINED VERTICALLY BETWEEN OUTSIDE OF PIPES.
19. IN ALL CASES MAINTAIN A 10-FOOT HORIZONTAL DISTANCE BETWEEN WATER AND SEWER LINES.
20. POTABLE WATERMAINS MUST BE INSTALLED ABOVE SANITARY SEWER LINES, STORM LINES, AND NONPOTABLE WATER LINES OR THESE LINES MUST BE ENCASED IN CONCRETE TEN FEET (10') TO BOTH SIDES OF THE POTABLE WATER LINE CROSSING.
21. MAINTAIN A MINIMUM HORIZONTAL SEPARATION OF THREE (3) FEET FROM EDGE OF CONCRETE CURB & GUTTER PAN OR FIVE (5) FEET FROM FLOW LINE.
22. DUCTILE AND PVC WATER MAINS SHALL MAINTAIN AT LEAST THE MINIMUM RADIUS RECOMMENDED BY THE MANUFACTURER, AND SHALL BE REVIEWED BY THE AUTHORITY. PIPE LAID WITH A RADIUS SMALLER THAN THAT RECOMMENDED BY THE MANUFACTURER SHALL USE HIGH DEFLECTION COUPLINGS AND MUST BE APPROVED BY THE AUTHORITY.
23. IRRIGATION WATER LINES SHALL HAVE PURPLE POLYETHYLENE WRAP, AND DOMESTIC WATER LINES SHALL HAVE CLEAR POLYETHYLENE WRAP INSTALLED AROUND ALL DUCTILE IRON PIPE, VALVES, FITTINGS, FIRE HYDRANT BARRELS, AND RODS AND CLAMPS. ALL POLYETHYLENE WRAP SHALL BE 8 MIL IN THICKNESS, PER AWWA STANDARD C105.
24. ALL FITTINGS SHALL BE MADE DUCTILE IRON AND SHALL BE FURNISHED WITH MECHANICAL JOINT ENDS. ALL FITTINGS SHALL HAVE A MINIMUM PRESSURE RATING OF 250 PSI.
25. ALL WATER BEND FITTINGS AND VALVES SHALL BE RODDED OR MECHANICALLY RESTRAINED. ALL RESTRAINT SHALL TERMINATE BEHIND THE FIRST AVAILABLE JOINT THAT MEETS OR EXCEEDS THE AUTHORITY STANDARDS FOR LENGTH OF RESTRAINED PIPE.
26. ALL WATER LINE VALVES SHALL BE SET AT THE PROPERTY LINE EXTENDED UNLESS OTHERWISE NOTED. THE VALVE SHALL BE LOCATED SO THAT VALVE DOES NOT LIE DIRECTLY OVER UNDERLAYING UTILITIES AND POSITIONED SO THAT SURFACE DRAINAGE DOES NOT INFILTRATE THE VALVE BOX. VALVE BOXES SHALL NOT BE SET IN CONCRETE CURB AND GUTTER PANS AND SHALL BE SET AT AN ELEVATION IN ACCORDANCE WITH COUNTY PAVING REQUIREMENTS.
27. ALL WATER VALVES USED IN THE AUTHORITY ARE TO BE "OPEN-LEFT" (COUNTER-CLOCKWISE).



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28. ALL BFV OPERATORS TO BE INSTALLED ON THE NORTH OR EAST SIDE OF THE VALVE UNLESS OTHERWISE NOTED.
29. FIRE HYDRANTS SHALL BE MUELLER CENTURION MODEL A-473, WATEROUS WB-67-250 OR AN M&H HYDRANT. FIRE HYDRANT ASSEMBLIES SHALL INCLUDE ALL PIPE, FITTINGS, VALVES, MATERIALS AND LABOR WHICH ARE NECESSARY TO INSTALL THE HYDRANT COMPLETE IN PLACE.
30. ALL BENDS, TEES, FIRE HYDRANTS, BLOWOFFS, AND PLUGS AT DEAD END MAINS SHALL BE PROTECTED FROM THRUST BY USING CONCRETE THRUST BLOCKS BASED ON 1,500 PSF MAXIMUM ALLOWABLE SOIL PRESSURE, (AREA DOUBLE THAT SHOWN ON THE AUTHORITY STANDARDS DRAWINGS). 90 DEGREE BENDS SHALL USE 1.4 TIMES THE AREA NOTED FOR TEES OR DEAD ENDS. ALL ABOVE LISTED ITEMS AND IN-LINE VALVES SHALL ALSO BE MECHANICALLY RESTRAINED USING EITHER MEGA-LUGS OR RODDING. THE MECHANICAL JOINT RESTRAINT DEVICES SHALL BE OF THE TYPE LISTED OR EQUAL, APPROVED BY THE AUTHORITY: FOR DUCTILE IRON PIPE: EBBA IRON, INC. MEGALUG 1100 SERIES (4" – 36"); UNI-FLANGE SERIES 1390 (4"-12"), UNIFLANGE SERIES 1400 (4"-12"), UNIFLANGE SERIES 1700 (4"-12"). FOR PVC PIPE: EBBA IRON, INC. MEGALUG 2000 PV SERIES (4" – 12"), EBBA IRON MEGALUG 1500 SERIES, UNI-FLANGE SERIES 1390 (4"-12"), UNIFLANGE SERIES 1500 (4"-12"). FIRE HYDRANT LATERALS AND FIRE LINES SHALL BE MECHANICALLY RESTRAINED USING RODDING OR MEGALUGS FOR THE FULL LENGTH OF THE LINE.
31. ALL CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,000 PSI.
32. ALL REINFORCING STEEL SHALL CONFORM TO THE MINIMUM REQUIREMENTS OF ASTM A-15, INTERMEDIATE GRADE.
33. COMPACTION OF ALL TRENCHES MUST BE ATTAINED AND COMPACTION TEST RESULTS SUBMITTED TO THE AUTHORITY'S ENGINEER. ALL BACKFILL SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY.
34. THE BEDDING MATERIAL SHALL BE CLEAN WELL GRADED SQUEEGEE SAND AND SHALL CONFORM TO THE FOLLOWING LIMITS WHEN TESTED BY MEANS OF LABORATORY SIEVES:

<u>SIEVE SIZE</u>	<u>TOTAL PERCENT PASSING BY WEIGHT</u>
3/8 INCH	100
NO. 200	0 – 5

35. THE WATER SYSTEM SHALL BE TESTED IN ACCORDANCE WITH THE AUTHORITY STANDARDS AND SPECIFICATIONS.
36. CHLORINATION AND FLUSHING: ALL WATER MAINS SHALL BE CHLORINATED IN ACCORDANCE WITH AWWA C651, "DISINFECTING WATER MAINS". THE PREFERRED METHOD IS TO USE SUFFICIENT CHLORINE TABLETS TO PRODUCE A 50 MG/L SOLUTION. THESE TABLETS SHOULD BE ADHERED TO THE TOP OF THE PIPE SECTION WITH PERMATEX CLEAR RTV. THE CHLORINATION OF ANY PIPELINE SHALL BE DONE PRIOR TO HYDROSTATIC TESTING. THE TOTAL RESIDUAL CHLORINE MUST BE BELOW 1.5 mg/L PRIOR TO HYDROSTATIC PRESSURE TESTING.
37. HYDROSTATIC TESTING: ALL WATER MAINS SHALL BE TESTED IN ACCORDANCE WITH AWWA C-600 SECTION 4 "HYDROSTATIC TESTING". ALL PIPE SHALL BE FIELD PRESSURE TESTED TO A MINIMUM OF 150 PSI OR DOUBLE THE OPERATING PRESSURE, WHICHEVER IS



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GREATER. ALL TESTING SHALL BE DONE IN THE PRESENCE OF AN AUTHORITY INSPECTOR. ALLOWABLE LEAKAGE FOR EACH SECTION OF PIPE BETWEEN LINE VALVES SHALL NOT EXCEED THE LEAKAGE RATE SET FORTH.

PIPE SIZE INSIDE DIAMETER	ALLOWABLE LEAKAGE PER 1000 FEET GALLONS PER HOUR	
	DIP	PVC
4"	0.37	0.33
6"	0.55	0.50
8"	0.74	0.66
12"	1.10	1.00

38. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND REPLACING ANY EXISTING SIGN, STRUCTURES, FENCES, ETC., ENCOUNTERED ON THE JOB AND RESTORING THEM TO THEIR ORIGINAL CONDITION.
39. ALL VALVE BOXES, FIRE HYDRANTS, AND RIMS SHALL BE ADJUSTED TO FINAL GRADE BY THE CONTRACTOR PRIOR TO ACCEPTANCE OF THE WATER DISTRIBUTION MAIN BY THE AUTHORITY.
40. A SAFE BACTERIOLOGICAL TEST MUST BE RECEIVED PRIOR TO PLACING THE LINE IN SERVICE.
41. INSTALLATION OF WATER SERVICE STUBS (3/4" THROUGH 2") SHALL INCLUDE PLACEMENT OF A CURB STOP AND STOP BOX IN THE PUBLIC RIGHT OF WAY, BETWEEN THE SIDEWALK OR CURB, AND THE PROPERTY LINE.
42. TAPPING SADDLES ARE REQUIRED FOR SERVICE CONNECTIONS 3/4" UP TO AND INCLUDING 2"; SADDLE TAPS PERMITTED ON WATER MAINS UP TO 16" IN DIAMETER AND SHALL USE A SADDLE AS DESCRIBED BELOW:
 - PVC WATER MAINS - SHALL BE CONNECTED WITH A WIDE BAND, SINGLE STRAP, BRASS-TAPPING SADDLE.
 - DUCTILE, CAST, OR AC WATER MAINS - SHALL BE DOUBLE STRAP, BRASS SADDLES.

CUT-IN TEES ARE REQUIRED FOR ALL CONNECTIONS 50% OR GREATER THAN EXISTING MAIN LINE PIPE DIAMETER. WET TAP TEE/SLEEVE CONNECTIONS ARE PERMITTED IF BRANCH LINE PIPE DIAMETER IS LESS THAN 50% OF EXISTING MAIN LINE PIPE DIAMETER. WET TAPS/SLEEVE CONNECTIONS TO AC PIPE ARE PROHIBITED.