

PLUMBING SPECIFICATIONS FOR BAKERSFIELD CITY SCHOOL DISTRICT:

WATER PIPING AND FITTINGS BELOW GRADE

- ALL GATE VALVES 2 INCH AND LARGER SHALL BE FLANGED / MECHANICAL JOINT RESILIENT SEAT GATE VALVES.
- ALL GATE VALVES 1 1/2 INCHES AND SMALLER SHALL BE 150 NIBCO / STOCKHAM / CRANE OR EQUAL.
- NO BALL VALVES PERMITTED BELOW GRADE.
- ALL WATER LINES 2 INCH AND LARGER SHALL BE SCHEDULE 80 PVC, 4 INCH AND LARGER MAY BE PVC C900.
- ALL WATER LINES 1 1/2 INCHES AND SMALLER MAY BE SCHEDULE 40 PVC.
- ALL SOLVENT WELDED JOINTS TO BE MADE WITH GRAY, HEAVY-BODIED, MEDIUM-SETTING INDUSTRIAL GRADE PVC SOLVENT CEMENT.
- ALL PIPING THAT RISES UP FROM BELOW GRADE SHALL BE TYPE L COPPER WITH BRAZED JOINTS AND WRAPPED WITH 40 MILS OF PIPE WRAP TAPE. THE USE OF FEMALE PVC ADAPTERS IS PROHIBITED.
- ALL VALVE BOXES SHALL BE CHRISTY G5 OR EQUAL.
- ALL VALVES ARE TO BE SLEEVED WITH 6 INCH PIPE FROM VALVE TO 6 INCHES FROM THE TOP OF THE YARD BOX.

WATER PIPING AND FITTINGS ABOVE GRADE

- GATE VALVES TO BE NIBCO / STOCKHAM / CRANE OR EQUAL.
- BALL VALVES ARE TO HAVE LEVER HANDLES, TEE SEAT AND O-RING SEALS.
- ALL WATER LINE SHALL BE TYPE L COPPER PIPE WITH SOLDERED JOINTS / PRO PRESS OR EQUAL.
- ALL STUB OUT NIPPLES SHALL BE RED BRASS OR TYPE K COPPER.

SANITARY SEWER AND STORM DRAIN LINES BELOW GRADE

- ALL SEWER AND STORM DRAIN PIPING SHALL BE CAST IRON, SCHEDULE 40 PVC DWV, SCHEDULE 40 ABS DWV OR SDR 35 PIPE AND FITTINGS.
- ALL CLEAN OUTS SHALL BE INSTALLED WITH A WYE 1/8 BEND COMBINATION. ALL END OF RUN CLEAN OUTS AND CLEAN OUTS INSTALLED AT CHANGE OF DIRECTION SHALL BE INSTALLED WITH (2) 1/8 BENDS OR LONG SWEEP 1/4 BEND.
- ALL CLEAN OUT BOXES SHALL BE CHRISTY G5 OR EQUAL.

MISCELLANEOUS VALVES AND MATERIALS

- GAS VALVES SHALL BE RESUN LUBRICATED PLUG STYLE VALVE, DEZURIK SERIES 400 OR EQUAL.
- AT LOCATIONS WHERE CONSTRUCTION CHANNEL IS USED WITH COPPER PIPE, THE PIPING SHALL BE SECURED WITH CUSH-A CLAMP BRAND STRAP WITH INSERT OR EQUAL.
- CONDENSATE LINES SHALL BE TYPE M COPPER PIPE WITH SOLDERED OR PRO PRESS FITTINGS AND SHALL BE INSTALLED WITH PLUGGED CLEAN OUT TEES AT EVERY CHANGE OF DIRECTION. PROVIDE TRAPS AT ALL AIR CONDITIONING EQUIPMENT.
- ALL PIPING SHALL RUN PARALLEL WITH BUILDING SURFACES UNLESS APPROVED BY DISTRICT.

CITY OF BAKERSFIELD SEWER SPECIFICATIONS:

- GENERAL CONTRACTOR WILL FURNISH ALL MATERIAL, TOOLS, LABOR, EQUIPMENT AND SUPERVISION NECESSARY TO COMPLETE INSTALLATION.

- VCP INSTALLATION: (NOT ALLOWED FOR 8" PIPE SET AT 0.25%)

- MATERIALS: THE PIPE AND FITTINGS SHALL BE EXTRA STRENGTH VTRIFIED CLAY CONFORMING TO CURRENT ASTM DESIGNATION C-700, AND SHALL BE INSTALLED IN CONFORMANCE WITH THE PROVISIONS OF SECTION 71 OF THE STANDARD SPECIFICATIONS OF THE STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, CURRENT EDITION AND THE CURRENT ASTM DESIGNATION C-12.

B. JOINTS:

- THE PIPE AND FITTINGS SHALL HAVE A SOCKET END AND A SPIGOT END WITH COMPRESSION JOINTS CONFORMING WITH THE CURRENT ATSM DESIGNATION C-425.
- THE PIPE FITTINGS FOR 6", 8", 10" AND 12" SANITARY SEWER MAINS MAY BE PLAIN-WITH COMPRESSION COUPLINGS CONFORMING WITH THE CURRENT ATSM DESIGNATION C-425. EXCEPTING THAT A STAINLESS STEEL SHEAR RING AS MANUFACTURED BY MISSION CLAY PRODUCTS CORPORATION FOR THEIR "MAINLINE" BAND SEAL COMPRESSION COUPLING, OR APPROVED EQUAL, SHALL BE REQUIRED.
- THE PIPE AND FITTINGS FOR PRIVATE SANITARY SEWER HOUSE OR BUILDING LATERALS MAY BE PLAIN-END WITH COMPRESSION COUPLINGS CONFORMING WITH THE CURRENT ASTM DESIGNATION C-425. (STAINLESS STEEL SHEAR RINGS ARE NOT REQUIRED).

3. ABS PIPE INSTALLATION:

- MATERIALS: PIPE AND FITTINGS SHALL MEET THE REQUIREMENTS OF ASTM SPECIFICATIONS D 2680 AND D 2751. PIPE AND FITTINGS SHALL BE HOMOGENEOUS THROUGHOUT AND FREE FROM CRACKS, HOLES, FOREIGN INCLUSIONS OR OTHER INJURIOUS DEFECTS. FITTINGS SHALL BE INJECTION MOLDED AND SHALL BE INSTALLED IN LINE ON NEW PIPELINES; CUT-IN FITTINGS ARE NOT PERMITTED.

- JOINTS: ONLY USE SOLVENT WELDED JOINTS. THE ASSEMBLY OF JOINTS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHERE ABS PIPE CONNECTS TO VCP, USE COUPLINGS APPROVED BY THE CITY OF BAKERSFIELD.

- INSTALLATION: PIPE AND FITTINGS SHOULD BE INSTALLED IN ACCORDANCE WITH ASTM D 2321. ONLY CLASS I, II OR III EMBEDMENT MATERIALS WILL BE CONSIDERED SUITABLE.

4. PVC PIPE INSTALLATION:

- MATERIALS: PIPES AND FITTINGS SHALL MEET THE REQUIREMENTS OF ASTM SPECIFICATIONS D 3034 AND SDR 35. PIPE AND FITTINGS SHALL BE HOMOGENEOUS THROUGHOUT AND FREE FROM CRACKS, HOLES, FOREIGN INCLUSIONS OR OTHER INJURIOUS DEFECTS. FITTINGS SHALL BE INJECTION MOLDED AND SHALL BE INSTALLED IN LINE ON NEW PIPELINES; CUT-IN FITTINGS ARE NOT PERMITTED.

- JOINTS: USE ONLY ELASTOMERIC GASKET JOINTS. THE ASSEMBLY OF JOINTS SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS. WHERE PVC PIPE CONNECTS TO VCP, USE COUPLINGS APPROVED BY THE CITY OF BAKERSFIELD.

- INSTALLATION: PIPE AND FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D 2321. ONLY CLASS I OR II EMBEDMENT MATERIALS WILL BE CONSIDERED SUITABLE.

5. SYSTEM TESTING:

- INSTALLED PIPE SHALL BE TESTED IN ACCORDANCE WITH CHAPTER 1.3 OF THE SUBDIVISION DESIGN MANUAL AND WITH THE RECOMMENDATIONS OF THE MANUFACTURER AND ACCEPTABLE BY THE CITY OF BAKERSFIELD. 24 HOURS NOTICE WILL BE REQUIRED FOR TEST AND INSPECTION.

- WYE-FITTINGS SHALL BE INJECTION MOLDED IN-LINE AND SHALL BE USED FOR ALL LATERAL CONNECTIONS AND SHALL BE ROTATED A MINIMUM OF 23° AND A MAXIMUM OF 45° ABOVE THE HORIZONTAL PLANE RUNNING THROUGH THE CENTERLINE OF THE MAIN. WYE-FITTINGS ONLY SHALL BE USED FOR VCP. ALL SEWER STUBS SHALL BE CLOSED WITH A STANDARD PLASTIC PLUG (SOLVENT WELDED).

- THE MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF BAKERSFIELD DRAWING S-7 AND S-8 AND SECTION 70-1.02H AND 71-1.07 OF THE STANDARD SPECIFICATIONS OF THE STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, LATEST EDITION. THE CLEANOUTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF BAKERSFIELD STANDARD DRAWINGS S-20.

- ALL SEWER LATERALS TO BE 4" IN DIAMETER EXCEPT AS NOTED ON PLANS AND EXTEND 4 FEET BEYOND PROPERTY LINE.

- SURFACE MARKERS FOR SEWER LATERALS SHALL BE INSTALLED PER CITY OF BAKERSFIELD DRAWING SW-1.

- 24 HOUR NOTICE IS REQUIRED FOR TESTING AND INSPECTION.

- FOR CURVED PIPE: IDENTIFICATION TAPE DESIGNED FOR USE ON SEWERS SHALL BE PLACED ON TOP OF SEWER MAIN ALONG ITS ENTIRE LENGTH. IDENTIFICATION TAPE SHALL ALSO BE PLACED ON SEWER LATERALS EXTENDING 1 FOOT ABOVE SEWER MAIN TO RIGHT-OF-WAY LINE.

CITY OF BAKERSFIELD SEWER SPECIFICATIONS (CONT'D):

- SEWER FORCE MAIN PIPE:
 - POLYVINYL CHLORIDE PIPE (PVC) FOR SEWER FORCE MAIN SHALL BE CLASS 150 (DR18) OR CLASS 200 (DR14) AND SHALL COMPLY WITH AWWA SPECIFICATIONS FOR 12" AND LESS.
 - PVC JOINTS FOR SEWER FORCE MAIN SHALL HAVE ELASTOMERIC GASKET JOINTS, EITHER GASKET BELL AND SPIGOT TYPE OR PLAIN END WITH GASKET COUPLING TYPE.
 - FITTINGS: SPECIALS AND FITTING SHALL BE DUCTILE-IRON CONFORMING TO AWWA SPECIFICATION C100, CLASS D, EXCEPT THAT FITTING SHALL HAVE ALL BELL CONNECTIONS OF STANDARD AWWA DIMENSIONS OR SPECIAL DIMENSIONS AS REQUIRED, OR FITTINGS SHALL BE EQUIPPED WITH ADAPTERS OF THE PROPER CLASS FOR THE SIZE OF PIPE, AS RECOMMENDED BY THE PIPE MANUFACTURER, OR EQUAL. PROTECTIVE COATING SHALL BE IN ACCORDANCE WITH SECTION 5.15 OF THESE SPECIFICATIONS.

- CONTRACTOR SHALL VERIFY LOCATIONS AND ELEVATIONS OF EXISTING SEWER LINES THAT THE NEW SYSTEM TIES INTO. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER SO THAT ANY NECESSARY ADJUSTMENTS CAN BE MADE TO THE PLANS.

- PRIOR TO FINAL ACCEPTANCE, ALL SEWER LINES SHALL BE INSPECTED WITH VIDEO EQUIPMENT DESIGNED FOR THIS PURPOSE. THE TELEVISION CAMERA SHALL HAVE THE CAPABILITY TO ROTATE 360°, IN ORDER TO VIEW AND RECORD THE TOP AND SIDES OF THE PIPE, AS REQUIRED. THE VIDEO INSPECTION SHALL BE WITNESSED BY THE CONSTRUCTION INSPECTOR, WHO WILL ALSO INITIAL AND DATE THE "CHAIN OF CUSTODY" FORM. THE SUBDIVIDER SHALL IMMEDIATELY NOTIFY THE CITY OF ANY PIPE LOCATIONS REVEALED TO BE NOT IN COMPLIANCE WITH THE SPECIFICATIONS. A RECORDED VIDEO CASSETTE, THE COMPLETED "CHAIN OF CUSTODY" FORM AND A WRITTEN LOG (WHICH INCLUDES THE STATIONING, BASED ON THE STATIONING OF THE APPROVED PLANS, OF ALL CONNECTED LATERALS) OF THE INSPECTION SHALL BE PROVIDED FOR VIEWING, AND SHALL BE APPROVED BY THE CITY ENGINEER PRIOR TO ACCEPTANCE. AFTER ACCEPTANCE, THE VIDEO CASSETTE SHALL BECOME THE PROPERTY OF THE CITY.

- AN OPEN STREET PERMIT SHALL BE OBTAINED FROM THE CITY OF BAKERSFIELD PUBLIC WORKS DEPARTMENT FOR ANY WORK PERFORMED WITHIN EXISTING ACCEPTED STREET RIGHT-OF-WAY, UNLESS SECURED BY A SUBDIVISION AGREEMENT, SECURITY BASED ON AN APPROVED ENGINEER'S ESTIMATE FOR THE WORK PERFORMED WITHIN THE RIGHT-OF-WAY AND INSURANCE AS REQUIRED SHALL BE PROVIDED PRIOR TO ISSUANCE OF A BUILDING PERMIT.

- CLASS I BEDDING AND EMBANKMENT IS REQUIRED FOR ALL PLASTIC SEWER PIPE WITHIN THE PIPE ZONE.

- CONTRACTOR TO VERIFY POSITIVE SLOPE FROM MANHOLE PRIOR TO CONNECTING STUB. IF THE POSITIVE SLOPE DOES NOT EXIST, REPLACE STUB TO MANHOLE.

CITY OF BAKERSFIELD WATER SPECIFICATIONS:

CHAPTER V – MATERIALS

- PURPOSES: THIS CHAPTER ESTABLISHES MINIMUM ACCEPTABLE STANDARDS AND CRITERIA FOR MATERIALS TO BE USED IN CONSTRUCTION. SEE ALSO PLUMBING STANDARDS FOR BAKERSFIELD CITY SCHOOL DISTRICT. IN THE EVENT OF A CONFLICT BETWEEN THESE SPECIFICATIONS, THE PLANS, AND THE STANDARDS OF THE BAKERSFIELD CITY SCHOOL DISTRICT (DISTRICT), HEREIN, DISTRICT'S STANDARDS SHALL PREVAIL.

- QUALITY OF MATERIALS: ALL MATERIAL INCORPORATED INTO THE WORK SHALL BE NEW AND SHALL CONFORM TO THESE STANDARDS AND SPECIFICATIONS. NO MATERIAL SHALL BE INCORPORATED INTO THE WORK UNTIL IT HAS BEEN APPROVED BY THE INSPECTOR. ANY REJECTED MATERIAL SHALL BE IMMEDIATELY REMOVED FROM THE SITE.

- CERTIFICATE OF COMPLIANCE: A CERTIFICATE OF COMPLIANCE SHALL BE FURNISHED PRIOR TO THE USE OF ANY MATERIALS OR EQUIPMENT. THE CERTIFICATE SHALL BE SIGNED BY THE MANUFACTURER OF THE MATERIALS OR EQUIPMENT. A CERTIFICATE OF COMPLIANCE SHALL BE FURNISHED WITH EACH LOT OF MATERIAL DELIVERED TO THE WORK AND THE LOT SO CERTIFIED SHALL BE CLEARLY IDENTIFIED IN THE CERTIFICATE.

- POLYVINYL CHLORIDE PIPE (PVC): PVC PIPE SHALL BE MANUFACTURED FOR USE IN WATER SYSTEMS AND SHALL BE DESIGNATED AS CLASS 150 (DR18) OR CLASS 200 (DR14), AND SHALL COMPLY WITH AWWA C900-75 SPECIFICATIONS FOR 12" AND LESS, AND AWWA C905-88 FOR PIPE 14" TO 36" IN DIAMETER. OUTSIDE DIAMETER OF PVC PIPE SHALL BE EQUIVALENT TO CAST-IRON PIPE.

- PVC JOINTS: PVC PIPE SHALL HAVE ELASTOMERIC GASKET JOINTS, EITHER GASKET BELL AND SPIGOT TYPE OR PLAIN END WITH GASKET COUPLING TYPE.

- FITTINGS: SPECIALS AND FITTINGS SHALL BE CAST-IRON CONFORMING TO AWWA SPECIFICATION C100, CLASS D, EXCEPT THAT FITTING SHALL HAVE ALL BELL CONNECTIONS OF STANDARD AWWA DIMENSIONS OR SPECIAL DIMENSIONS AS REQUIRED, OR FITTINGS SHALL BE EQUIPPED WITH ADAPTERS OF THE PROPER CLASS FOR THE SIZE OF PIPE, AS RECOMMENDED BY THE PIPE MANUFACTURER, OR EQUAL. PROTECTIVE COATING SHALL BE IN ACCORDANCE WITH SECTION 5.15 OF THESE SPECIFICATIONS.

- COUPLINGS: RUBBER RING COUPLINGS SHALL BE "FLUID-TITE" AS MANUFACTURED BY KEASBEY & MATTISSON COMPANY OR "RING-TITE" AS MANUFACTURED BY JOHNS-MANVILLE COMPANY, OR EQUAL.

- FITTINGS: SPECIALS AND FITTINGS SHALL BE CAST IRON AS SPECIFIED IN SECTION 5.3.2 OF THESE SPECIFICATIONS.

- SMALL SIZE PIPE FOR BLOW-OFFS OR SIMILAR USES SHALL BE GALVANIZED STEEL CONFORMING TO ASTM DESIGNATION A-120.

- WELDED FITTINGS: STEEL WELDED FITTINGS SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A-234.

- FLANGES: STEEL PIPE FLANGES SHALL CONFORM TO THE REQUIREMENTS OF AWWA SPECIFICATION C-207.

- BOLTS: MATERIAL FOR BOLTS SHALL CONFORM TO THE REQUIREMENTS FOR OPEN HEARTH, FREE CUTTING GRADE BAR STEEL, ASTM DESIGNATION A-107. BOLTS SHALL HAVE A MINIMUM TENSILE STRENGTH OF 60,000 PSI. BOLT HEADS SHALL BE EITHER SQUARE OR HEXAGON AND NUTS SHALL BE COLD PRESSURED SEMI-FINISHED HEXAGON.

- GASKETS: FLANGED JOINTS SHALL BE PROVIDED WITH 1/16TH-INCH THICK GASKETS, CRANITE, OR EQUAL.

- SLEEVE-TYPE COUPLINGS: SLEEVE-TYPE COUPLINGS SHALL BE STYLE 38 DRESSER OR SMITH-BLAIR ADAPTER COUPLINGS OR APPROVED EQUAL, AND SHALL BE OF STEEL WITH STEEL BOLTS, WITHOUT CENTERING RING. THE MIDDLE RING SHALL BE NOT LESS THAN 1/4 INCH IN THICKNESS.

- VALVES: ALL VALVES SHALL BE CAST-IRON BODY, BRONZE MOUNTED, SOLID BRONZE INTERNAL WORKING PARTS WITH NON-RISING STEMS, AND SHALL BE OPENED BY TURNING COUNTER-CLOCKWISE. BRONZE SHALL BE GRADE 1 AND SHALL CONFORM TO ASTM-B-62 (85-5-5-5) BRONZE (85% COPPER, 5% ZINC, 5% LEAD, AND 5% TIN). VALVES SHALL BE DESIGNED FOR A MINIMUM WORKING PRESSURE OF 150 PSI. VALVES 2 INCHES AND LARGER SHALL CONFORM TO THE REQUIREMENTS OF AWWA C500, EXCEPT AS OTHERWISE PROVIDED IN THESE SPECIFICATIONS. VALVES SMALLER THAN 2 INCHES SHALL CONFORM TO THE REQUIREMENTS OF FEDERAL SPECIFICATION WW-V-54, EXCEPT AS OTHERWISE PROVIDED.

- TESTS: EACH VALVE SHALL HAVE THE MANUFACTURER'S INITIALS, PRESSURE RATING, AND YEAR OF MANUFACTURE CAST IN THE BODY. VALVES SHALL BE TESTED IN THE FACTORY AT A HYDRAULIC PRESSURE EQUAL TO TWICE THE SPECIFIED WATER WORKING PRESSURE. FACTORY TEST RESULTS SHALL BE SUPPLIED TO THE DISTRICT UPON REQUEST.

CITY OF BAKERSFIELD WATER SPECIFICATIONS (CONT'D):

- COATING: ALL VALVE BODIES AND CAST-IRON PORTIONS OF THE HOUSINGS AND EXTENSIONS SHALL BE COATED IN ACCORDANCE WITH SECTION 5.15 OF THESE SPECIFICATIONS.

- GATE VALVES: GATE VALVES SHALL BE DOUBLE-DISC, PARALLEL FACED AND SHALL HAVE A CLEAR WATERWAY EQUAL TO THE FULL NOMINAL DIAMETER OF THE PIPE. RESILIENT SEALED GATE VALVES IN ACCORDANCE WITH AWWA C509-87, ARE APPROVED FOR USE BY THE DEPARTMENT.

- VALVE BOXES: VALVE BOXES IN SIDEWALKS, PARKWAYS, AND OTHER AREAS SHALL CONSIST OF A CAST IRON VALVE BOX AND RISER AND A CAST IRON LOCKING COVER IN ACCORDANCE WITH THE STANDARD DETAILS. THE CAST-IRON COVERS SHALL BE HOT-DIPPED ASPHALT-COATED AND SHALL HAVE THE WORD "WATER" CAST IN THE TOP.

- IN ANY AREAS SUBJECT TO TRAFFIC, A CLASS "B" CONCRETE PAD SHALL BE POURED AROUND THE RISER IN ACCORDANCE WITH THE STANDARD DETAILS.

- WATER SERVICE PIPE AND TUBING: RESIDENTIAL WATER SERVICE PIPE SHALL BE COPPER WATER TUBING, COPPER WATER PIPE, OR POLYETHYLENE PLASTIC TUBING IN ACCORDANCE WITH THE STANDARD DETAILS AND THE DISTRICT SPECIFICATIONS.

- CORPORATION STOPS: ALL CORPORATION STOPS SHALL BE BRONZE OR BRASS, ROUND, WITH INLET FOR EITHER CORPORATION STOP (C.S.) THREAD FOR ASBESTOS-CEMENT, PVC OR CAST-IRON PIPE, OR IRON PIPE STANDARD (I.P.S.) THREAD FOR STEEL PIPE, AND OUTLET FOR THE TYPE OF SERVICE PIPE USED.

- METER STOPS: ALL METER STOPS SHALL BE BRONZE OR BRASS, WITH INLET FOR THE TYPE OF SERVICE PIPE USED, AND OUTLET FOR THE TYPE OF SERVICE PIPE OR METER COUPLING USED.

- FIRE HYDRANTS: FIRE HYDRANTS SHALL BE PURCHASED DIRECTLY FROM THE CITY OF BAKERSFIELD FIRE DEPARTMENT. FIRE HYDRANTS SHALL BE MUELLER COMPANY NO. A-24009 COMPLETE WITH PROPER BURY LENGTH, EXCEPT FIRE HYDRANTS SHALL BE JONES COMPANY J-344 WHERE ANGLE FIRE PLUGS HAVE BEEN INDICATED. HOSE THREADS SHALL BE NATIONAL STANDARD HOSE THREADS.

- PORTLAND CEMENT CONCRETE: PORTLAND CEMENT CONCRETE SHALL BE CLASS "B" AND SHALL CONTAIN A MINIMUM OF 5 SACKS (470 POUNDS) OF CEMENT PER CUBIC YARD. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS.

- MATERIALS FOR CONCRETE SHALL BE PORTLAND CEMENT CONFORMING TO ASTM SPECIFICATIONS FOR TYPE I OR TYPE II, WELL GRADED, SOUND, NON-REACTIVE AGGREGATE, AND CLEAN WATER.

- PROTECTIVE COATINGS: ALL VALVES, FLANGES, BOLTS, FITTINGS AND PIPING FOR INSTALLATION SHALL BE SHOP COATED AND FIELD REPAIRED AS NECESSARY PRIOR TO BACKFILLING IN CONFORMANCE WITH THE FOLLOWING SCHEDULE:

1. EXTERIOR SURFACES OF BURIED STEEL PIPE TO A POINT 4 INCHES ABOVE FINISH GRADE.	COAL TAR EPOXY OR CEMENT MORTAR	AWWA C 205
2. INTERIOR SURFACES OF STEEL PIPE.	COAL TAR EPOXY OR FUSION EPOXY	AWWA C 205
3. ALL EXPOSED FERROUS METAL SURFACES.	RED PRIMER	2 COATS
4. BURIED VALVES, COUPLINGS AND OTHER SURFACES NOT OTHERWISE DESIGNATED TO BE CEMENT MORTAR COATED.	COAL TAR ENAMEL	2 COATS 16 MILS

- SURFACES TO BE PAINTED OR COATED SHALL BE PROPERLY CLEANED WITH APPROVED EQUIPMENT BEFORE APPLICATION OF COATING MATERIALS. THE REMOVAL OF OIL OR GREASE SHALL BE ACCOMPLISHED WITH SUITABLE SOLVENTS BEFORE MECHANICAL CLEANING IS STARTED. ANY GRIT OR DUST REMAINING ON THE SURFACE FROM THE CLEANING OPERATIONS SHALL BE REMOVED BEFORE COATING MATERIALS ARE APPLIED.

- MISCELLANEOUS: MATERIALS OR EQUIPMENT NOT INCLUDED IN THESE SPECIFICATIONS SHALL BE IN ACCORDANCE WITH THE STANDARD DETAILS.

- SPECIAL EQUIPMENT OR MATERIALS NOT INCLUDED IN THE SPECIFICATIONS OR STANDARD DETAIL SHALL BE SUBMITTED TO THE DEPARTMENT FOR REVIEW AND APPROVAL.

CHAPTER VI – INSTALLATION OF WATER SYSTEM

- PURPOSE: THIS SECTION ESTABLISHES THE MINIMUM ACCEPTABLE STANDARDS FOR INSTALLATION AND CONSTRUCTION OF CITY OF BAKERSFIELD WATER IMPROVEMENTS, INCLUDING TRENCHING, CONSTRUCTION AND INSTALLATION.

- TRENCHING: THE MINIMUM WIDTH OF TRENCH SHALL BE OUTSIDE DIAMETER OF THE PIPE PLUS 12 INCHES. A MINIMUM OF 6 INCHES OF CLEARANCE SHALL BE PROVIDED FROM THE OUTSIDE FACE OF THE PIPE TO THE TRENCH WALL. EXCESSIVE TRENCH WIDTHS GREATER THAN 16 INCHES MORE THAN THE PIPE OUTSIDE DIAMETER SHALL BE AVOIDED WHENEVER POSSIBLE.

- PIPE DEPTH: FOR WATER MAINS AND SERVICES 12 INCHES AND LESS IN INSIDE DIAMETER A MINIMUM OF 30 INCHES OF COVER FROM TOP OF PIPE TO FINISHED GRADE, OR FOR PIPE LOCATED WITHIN STREETS, A MINIMUM OF 30 INCHES OF COVER FROM TOP OF PIPE TO CUTTER FLOWLINE, SHALL BE MAINTAINED. FOR WATER MAINS LARGER THAN 12 INCHES IN DIAMETER, 36 INCHES OF COVER SHALL BE MAINTAINED, MEASURED FOR THE VARIOUS PIPE LOCATIONS AS DEFINED IN THIS SECTION.

- WHEN WATER MAINS CROSS ROADWAYS THAT HAVE NOT BEEN CONSTRUCTED TO FULL ULTIMATE WIDTH, ADEQUATE TRENCH DEPTH SHALL BE PROVIDED SUCH THAT MINIMUM COVER REQUIREMENTS AS STATED ARE SATISFIED WHEN THE ROADWAY IS CONSTRUCTED TO ITS ULTIMATE WIDTH.

- TRENCH BOTTOM: THE BOTTOM OF TRENCH SHALL BE EXCAVATED TO THE ESTABLISHED GRADE LINE OF THE PIPE AND SHALL BE SMOOTH, EVEN AND FLAT FOR THE ENTIRE WIDTH OF TRENCH. AT EACH JOINT OF PIPE THE BOTTOM OF THE TRENCH SHALL BE RECESSED IN SUCH A MANNER AS TO BELIEVE THE PIPE BALL OR COUPLING OF ALL LOAD AND TO ENSURE CONTINUOUS BEARING ALONG THE PIPE BARREL.

- WHERE EXCAVATION ENCOUNTERS BOULDERS, ROCK, HARDPAN, OR OTHER HARD OR UNYIELDING MATERIAL, THE TRENCH SHALL BE EXCAVATED A MINIMUM OF 6 INCHES BELOW THE ESTABLISHED GRADE, AND BACKFILLED TO PROPER GRADE WITH MATERIAL ACCEPTABLE TO THE DISTRICT. BACKFILL MATERIAL SHALL BE COMPACTED TO 90% OF RELATIVE COMPACTION.

- WHERE EXCAVATION ENCOUNTERS SOFT, UNSTABLE, OR EXCESSIVELY WET MATERIAL, SUCH MATERIAL SHALL BE REMOVED TO A DEPTH AS DIRECTED BY THE ENGINEER, AND REPLACED WITH MATERIAL ACCEPTABLE TO THE DISTRICT.

- NUISANCE WATER: PIPE TRENCH AND ANY OTHER EXCAVATION SHALL BE KEPT ENTIRELY FREE OF WATER UNTIL ALL PIPE HAS BEEN PLACED AND APPROVED. WATER SHALL BE DISPOSED IN SUCH A MANNER AS TO NOT CAUSE INJURY TO PUBLIC OR PRIVATE PROPERTY, NOR CREATE A PUBLIC NUISANCE.

- BACKFILL: BACKFILL SHALL BE INITIALLY PLACED AND COMPACTED FROM THE PIPE BED OR FOUNDATION TO THE "SPRINGLINE" OF THE PIPE. BACKFILL SHALL BE SUFFICIENTLY RODDED OR HAND-TAMPED TO ENSURE REQUIRED COMPACTION IS OBTAINED ON ALL SIDES OF THE PIPE. SUBSEQUENT BACKFILL SHALL BE PLACED IN LAYERS NOT EXCEEDING 6 INCHES IN COMPACTED THICKNESS, AND SHALL BE COMPACTED BY APPROVED METHOD SO AS TO NOT CAUSE INJURY OR DISTURBANCE OF THE PIPE. FLOODING OF TRENCHES MAY BE PERMITTED BY THE DEPARTMENT PROVIDED FOUNDATION AND BACKFILL MATERIAL IS SUFFICIENTLY GRANULAR AND OPEN GRADED IN NATURE SUCH THAT REQUIRED COMPACTION MAY BE OBTAINED.

CITY OF BAKERSFIELD WATER SPECIFICATIONS (CONT'D):

- BACKFILL MATERIAL SHALL BE FREE OF ALL TRASH, DEBRIS, ROCKS LARGER THAN 3/4" IN ANY DIMENSION, ORGANIC OR OTHER DELETERIOUS MATERIAL. COMPACTION SHALL BE OBTAINED IN ACCORDANCE WITH THE STANDARD DETAILS. MAXIMUM DENSITY AND OPTIMUM MOISTURE SHALL BE DETERMINED IN ACCORDANCE WITH ASTM D-1557.

- COSTS OF COMPACTION TESTING SHALL BE BORNE BY THE DEVELOPER AND SHALL BE PERFORMED BY A COMPANY OR INDIVIDUAL PROPERLY LICENSED TO PERFORM SUCH WORK.

- TRENCH SAFETY: EXCAVATIONS SHALL BE SUPPORTED IN CONFORMANCE WITH THE RULES, ORDERS, AND REGULATIONS OF THE INDUSTRIAL ACCIDENT COMMISSION AND THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA.

- PIPE PLACEMENT & MATERIAL HANDLING: ALL PIPE AND PIPE MATERIAL SHALL BE HANDLED, STORED, LAID, BLOCKED AND JOINED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS EXCEPT AS OTHERWISE PROVIDED IN THE STANDARD DETAILS AND THESE SPECIFICATIONS.

- EVERY PRECAUTION SHALL BE TAKEN TO PREVENT FOREIGN MATERIAL FROM ENTERING THE PIPE DURING INSTALLATION. ALL OPEN ENDS OF PIPE SHALL BE PROPERLY COVERED AT THE END OF THE DAY TO PREVENT THE ENTRY OF FOREIGN MATTER, ANIMALS OR CHILDREN. NO TOOLS, RAGS, OR OTHER EQUIPMENT SHALL BE PLACED IN THE PIPE DURING INSTALLATION.

- HANDLING: HOISTING OF PIPE BY MECHANICAL MEANS SHALL REQUIRE USE OF A CLOTH BELT OR CONTINUOUS FIBER ROPE THAT DOES NOT SCRATCH THE PIPE SURFACE.

- PIPE SHALL BE CAREFULLY LOWERED INTO TRENCH SUCH THAT PIPE BEDDING OR FOUNDATION WILL NOT BE DISTURBED AND PIPE WILL NOT BE INJURED. ANY PIPE THAT IS MARRED, CRACKED, OR SCRATCHED FORMING A CLEAR DEPRESSION SHALL BE REJECTED.

- CAST IRON FITTINGS: CAST IRON FITTINGS SHALL BE LOWERED INTO TRENCH BY MECHANICAL MEANS. CAST IRON FITTINGS SHALL BE RUNG WITH A LIGHT HAMMER WHILE SUSPENDED TO DETECT CRACKS, AND SHALL BE INSPECTED FOR SCRATCHES OF THE SURFACE COATING AND OTHER DEFECTS.

- ANY MATERIAL REJECTED SHALL BE PROMPTLY REMOVED FROM THE SITE AND SHALL BE REPLACED WITH SUITABLE MATERIAL.

- WHEN THE SEAL BETWEEN THE PIPE AND THE BELL END OF THE FITTING IS MADE WITH A RIGID JOINTING MATERIAL, THE LENGTH OF THE PIPE SHALL NOT EXCEED 3 FEET, 3 INCHES FOR PIPE 6 INCHES AND LESS IN INSIDE DIAMETER. WHEN PIPE IS 9 INCHES AND MORE IN DIAMETER, THE LENGTH OF THE PIPE SHALL NOT EXCEED 6 FEET, 6 INCHES. WHEN A RUBBER RING-TYPE CAST-IRON FITTING IS USED TO MAKE THE JOINT, LENGTHS OF PIPE UP TO 13 FEET MAY BE USED FOR ENTERING BELLS OF FITTINGS.

- STORAGE: PVC PIPE SHALL NOT BE STACKED HIGHER THAN 4 FEET NOR STACKED WITH WEIGHT ON THE BELLS. IF PVC PIPE IS STORED FOR PROLONGED PERIODS IT SHALL BE PROTECTED FROM ULTRAVIOLET LIGHT BY COVERING.

- P.V.C. PIPE INSTALLATION: THE MANUFACTURER'S RECOMMENDATIONS SHALL BE STRICTLY ADHERED TO EXCEPT AS OTHERWISE PROVIDED HEREIN.

- THE BELL AND SPIGOT SHALL BE THOROUGHLY WIPED CLEAN JUST PRIOR TO COUPLING. THE RUBBER GASKET SHALL BE INSERTED, AND THE SPIGOT END SHALL BE LUBRICATED JUST PRIOR TO JOINING PIPES. THE RUBBER RING GASKET SHALL BE CHECKED FOR PROPER PLACEMENT WITH A FEELER GAGE AFTER JOINING PIPE.

- SPECIFICATIONS FOR LENGTHS OF P.V.C. PIPE ENTERING AND EXITING STRUCTURES, DEFLECTING PIPE, AND CUTTING PIPE SHALL CONFORM TO THE REQUIREMENTS OF A.C. PIPE IN SECTION 6.2.5 OF THESE SPECIFICATIONS.

- SETTING VALVES AND VALVE BOXES: VALVES SHALL BE SET TRULY PLUMB WITH VALVE BOXES DIRECTLY OVER THE WRENCH NUT OF THE VALVE. THE VALVE BOX SHALL NOT TRANSMIT SHOCK OR STRESS TO THE VALVE. AFTER BEING CORRECTLY POSITIONED FOR LINE AND GRADE, EARTH FILL SHALL BE CAREFULLY TAMPED AROUND THE VALVE BOX.

- SETTING AIR AND VACUUM RELIEF VALVE INSTALLATIONS: THE GATE VALVE IMMEDIATELY BELOW THE RELIEF VALVE SHALL BE SET TO THE GRADE INDICATED ON THE DRAWINGS OR APPROVED BY THE ENGINEER. SUFFICIENT CLEARANCE SHALL BE PROVIDED BELOW THE VALVE FOR THE INSTALLATION OF A CONCRETE PAD TO SUPPORT A PROTECTIVE ENCLOSURE.

- SETTING HYDRANTS AND ANGLE FIRE PLUGS: ALL HYDRANTS SHALL STAND PLUMB AND SHALL HAVE THEIR NOZZLES PARALLEL WITH OR AT RIGHT ANGLES TO THE CURB, WITH THE PUMPER NOZZLE FACING THE CURB, EXCEPT THAT HYDRANTS HAVING TWO HOSE NOZZLES 90 DEGREES APART SHALL BE SET WITH EACH NOZZLE FACING THE CURB AT AN ANGLE OF 45 DEGREES. HYDRANTS SHALL BE SET TO THE ESTABLISHED GRADE EXCEPT THAT WHERE NOT SHOWN, NOZZLES SHALL BE AT LEAST 18 INCHES ABOVE GROUND.

- UNLESS OTHERWISE NOTED ON THE DRAWINGS OR DIRECTED, EACH HYDRANT SHALL BE CONNECTED TO THE MAIN WITH A 6 INCH BRANCH LINE CONTROLLED BY AN INDEPENDENT 6 INCH GATE VALVE.

- THE BOWL OF EACH HYDRANT SHALL BE WELL BRACED AGAINST UNDISTURBED EARTH AT THE END OF THE TRENCH WITH CONCRETE BACKING.

- EACH ANGLE FIRE PLUG SHALL BE CONNECTED TO THE MAIN WITH A 4 INCH BRANCH LINE, CONTROLLED BY AN INDEPENDENT INCH GATE VALVE. ANGLE FIRE PLUG SHALL BE SET WITH THE 2-1/2 INCH OUTLET FACING THE CURB AND SHALL BE SET TO ESTABLISHED GRADE EXCEPT, THAT WHERE NOT SHOWN, NOZZLE SHALL BE AT LEAST 18 INCHES ABOVE GROUND.

- CONCRETE THRUST BLOCKS: CONCRETE THRUST BLOCKS SHALL BE INSTALLED ACCORDING TO THE STANDARD DETAILS AND SHALL BE POURED BETWEEN UNDISTURBED GROUND AND THE FITTING TO BE ANCHORED. THE CONCRETE SHALL BE PLACED SUCH THAT THE PIPE, VALVES, AND FITTINGS WILL BE ACCESSIBLE FOR REPAIRS.

CHAPTER VII – TESTING AND DISINFECTON

- PURPOSE: THIS CHAPTER OUTLINES DISINFECTON AND TESTING REQUIRED FOR ACCEPTANCE OF NEWLY CONSTRUCTED WATER SYSTEMS.

- HYDROSTATIC (LEAKAGE) TEST: AFTER COMPLETION OF THE PIPELINE INSTALLATION, THE LINE SHALL BE TESTED UNDER THE HYDROSTATIC PRESSURE TEST OF 150 PSI FOR A PERIOD OF NOT LESS THAN 4 HOURS FOR EACH SECTION OF PIPE TESTED. THE PRESSURE SHALL BE MAINTAINED BY RESTORING THE TEST PRESSURE WHENEVER IT FALLS AN AMOUNT OF 25 PSI. AT THE CONCLUSION OF THE 4 HOURS, THE TEST PRESSURE SHALL BE RESTORED AND ALL WATER USED DURING THE TESTS SHALL BE ACCURATELY MEASURED TO DETERMINE THE ACTUAL LEAKAGE.