STANDARDS AND SPECIFICATIONS FOR DOMESTIC WATER SYSTEMS

Revision date – October 7, 2016

IMPORTANT NOTICE
These standards are subject to revision.
Check with the department (listed below) for latest revision.

CITY OF BAKERSFIELD
WATER RESOURCES DEPARTMENT
DOMESTIC WATER DIVISION
1000 BUENA VISTA ROAD
BAKERSFIELD, CA 93311
(661) 326 - 3715
FAX (661) 852 - 2127

STANDARDS AND SPECIFICATIONS
FOR DOMESTIC WATER SYSTEMS

TABLE OF CONTENTS

CHAPTER I – GENERAL 1
1.1 SCOPE 1
1.2 DEFINITIONS 1
1.3 ABBREVIATIONS 1

CHAPTER II - PROCEDURES FOR SUBMISSION AND APPROVAL OF WATER SYSTEM PLAN 2
2.1 PURPOSE 2
2.2 PROCEDURE FOR PLAN SUBMISSION AND APPROVAL 2
2.3 PLAN FORMAT AND REQUIREMENTS 3

CHAPTER III - WATER SUPPLY REQUIREMENTS 5
3.1 PURPOSE 5
3.2 DOMESTIC FLOW 5
3.3 RESIDENTIAL AREAS 5
3.4 COMMERCIAL AND INDUSTRIAL 5
3.5 PARKS 5
3.6 GENERAL FIRE FLOW REQUIREMENTS 5
3.7 PIPE PRESSURE 5
3.8 TOTAL FLOW REQUIREMENT 6

CHAPTER IV - MISCELLANEOUS DESIGN CRITERIA 7
4.1 LOCATION OF PIPE 7
4.2 FIRE HYDRANTS 7
4.3 VALVE LOCATION 7
4.4 AIR AND VACUUM RELEASE VALVES 7
4.5 BLOWOFFS 7
4.6 WHARF HYDRANTS 8
4.7 PIPE DIAMETER 8
4.8 CONNECTIONS 8
4.9 CLEARANCE FROM SEWERS 8
4.10 SERVICE PIPE SIZE 8
4.11 THRUST DEVICES 8
4.12 FIRE PROTECTION SERVICE 9

CHAPTER V – MATERIALS 10
5.1 PURPOSE 10
5.2 QUALITY OF MATERIALS 10
5.3 POLYVINYL CHLORIDE PIPE (PVC) 10
5.4 MOLECULARLY ORIENTED PVC PRESSURE PIPE 10
5.5 STEEL PIPE 10
5.6 VALVES 11
5.7 VALVE BOXES 12
5.8 WATER SERVICE PIPE AND TUBING 12
5.9 CORPORATION STOPS 12
5.10 METER STOPS 12
5.11 FIRE HYDRANTS 12
5.12 PORTLAND CEMENT CONCRETE 12
5.13 STORAGE FACILITIES 12

5.14 VERTICAL TURBINE PUMPS 13
5.15 PROTECTIVE COATINGS 13
5.16 MISCELLANEOUS 13

CHAPTER VI - INSTALLATION OF WATER SYSTEM 14
6.1 PURPOSE 14
6.2 TRENCHING 14
6.3 PIPE PLACEMENT & MATERIAL HANDLING 15
6.4 BORING AND CASING 16

CHAPTER VII - TESTING AND DISINFECTION 17
7.1 PURPOSE 17
7.2 HYDROSTATIC (LEAKAGE) TEST 17
7.3 DISINFECTION OF WATER LINES 17
Table II - HTH tablet method 20
Table III - Strong chlorine solution - hand pump method 20
Table IV - Estimate of time to fill mainline 20
7.4 BACTERIOLOGICAL TESTS 20
7.5 FIRE FLOW TEST 20
7.6 COSTS FOR TESTING 21

APPENDIX
APPLICATION FOR WATER SERVICE
WATER AVAILABILITY FEES AGREEMENT
MAINLINE EXTENSION AGREEMENT
DEPARTMENT FEE SCHEDULE
CONTRACTOR CHECKLIST
STANDARD DETAILS

Plate No. W-1 - Standard pipe trench
Plate No. W-2 - Thrust block detail
Plate No. W-3 - Fire hydrant assembly
Plate No. W-3A – Typical main & water hydrant locations
Plate No. W-3B – Fire hydrant at parkway
Plate No. W-4 - Blowoff assembly - paved area
Plate No. W-5 – Combination air valve
Plate No. W-6 - Standard - blowoff assembly
Plate No. W-7 - Pipe bore & casing detail
Plate No. W-8 - Standard service connection - 1" to 2"
Plate No. W-9 - 3", 4", & 6" water service detail
Plate No. W-10 - 4" & larger turnout
Plate No. W-11 - Typical meter box location
Plate No. W-12 - Valve box detail
Plate No. W-13 - Canal crossing detail
Plate No. W-14 - Concrete saddle detail
Plate No. W-15 - Safety fence detail
Plate No. W-16 - Irrigation, fire service, and water service, requiring booster pump
Plate No. W-17 - Alternate air-gap installation requirements
Plate No. W-18 - Typical fire service detail
Plate No. W-19 – Under foundation riser detail

CITY OF BAKERSFIELD
WATER RESOURCES DEPARTMENT
DOMESTIC WATER DIVISION

STANDARDS AND SPECIFICATIONS
FOR DOMESTIC WATER SYSTEMS

CHAPTER I - GENERAL

1.1 SCOPE: These Standards and Specifications establish the minimum acceptable standards of water supply, design criteria, materials, construction methods and testing for water mains and water systems within the City of Bakersfield Domestic Water Service area.

1.2 DEFINITIONS: The following words, terms or pronouns used in place of them, shall be understood to have the meaning as given in this Section 1.2.

1.2.1 Department: The Water Resources Department, Domestic Water Division.

1.2.2 Manager: The Manager of Water Resources, Water Resources Department, City of Bakersfield.

1.2.3 Engineer: Civil Engineer registered in the State of California, employed by the Developer, who is responsible for the preparation and content of the Plans.

1.2.4 Inspector: The Inspector employed or contracted by the City of Bakersfield, Department of Water Resources, to perform inspection during construction.

1.2.5 Contractor: The person, firm or corporation constructing the water system improvements for the Developer.

1.3 ABBREVIATIONS: Whenever the following abbreviations are used they shall be understood to have the meaning as given in this Section 1.3:

AISC	American Institute of Steel Construction
AISI	American Iron & Steel Institute
ANSI	American National Standards Institute (formerly USASI, USAS, ASA)
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
CBC	California Building Code
CFC	California Fire Code
NFPA	National Fire Protection Association
CRSI	Concrete Reinforcing Steel Institute
NEMA	National Electrical Manufacturers Association
SSPC	Steel Structures Painting Council

CHAPTER II - PROCEDURES FOR SUBMISSION AND APPROVAL OF WATER SYSTEM PLANS

2.1 PURPOSE: The purpose of this chapter is to establish procedures for submittal, review, and approval of City of Bakersfield water system plans.

2.2 PROCEDURE FOR PLAN SUBMISSION AND APPROVAL: The following procedures, listed in order of normal occurrence, are required for approval of water system plans:

2.2.1 The Developer, or his duly authorized representative shall submit the tentative land subdivision map in accordance with the City of Bakersfield Land Division Ordinance and the State of California Subdivision Map Act. The Planning Department will route copies of the tentative map to the Water Resources Division and the Fire Department for placement of conditions on the map.

2.2.2 Commitment to Service: THIS SECTION INTENTIONALLY LEFT BLANK, RESERVED FOR LATER USE .

2.2.3 Submission of Plans: Potable and fire water system plans shall be prepared under the direct supervision of a Civil Engineer licensed by the State of California, and in accordance with these Standards and Specifications. The Developer shall submit two (2) sets to the Department and two (2) sets to the City of Bakersfield Fire Department for review.

2.2.4 The Developer may obtain the services of the Department for preparation of water system plans. The cost of plan preparation by the Department shall be borne solely by the Developer and shall be a percentage of the estimated installation costs as determined by the Department. Current percentages, as a basis of plan preparation costs, have been included in the Appendix of these standards. Up to eight weeks may be required for preparation of plans.

2.2.5 Agreements with the Water Resources Division: Upon Department approval of water system plans, the Developer shall execute "Water Availability Fees Agreement" and "Mainline Extension Agreement". Generic forms of these agreements have been included in the Appendix of these Standards.

2.2.6 Upon City approval of water system plans, the Developer shall retain original plans and forward two (2) sets of plans plus Autocad drawings to the Department. The cost estimate or bid proposal(s) must accompany the plans (prior to construction). The cost estimate or bid proposal(s) must contain bid item quantities and must match quantities shown on approved water plans.

2.2.7 A preconstruction meeting must take place between the contractor and the City's O & M contractor, California Water Service Company. This meeting must take place prior to any domestic water facilities construction.

2.2.8 Fees and Bonds: The Developer shall make payment of all required fees and provide bonds as required by the City of Bakersfield Public Works Department and the Domestic Water Division. All fees shall be paid prior to recordation of the final subdivision map. If no subdivision map is involved the fees shall be paid prior to commencement of construction. A minimum of 48 hours prior to the start of construction, the Developer shall submit to the Department a copy of the Engineer's estimate or a copy of the lowest responsible bidder's proposal, and the name, address and telephone number of the party responsible for payment of inspection fees. Current fee schedules and bonding requirements may be obtained at the Department office.

2.2.9 Insurance Requirements: Contractor must carry the following insurance: bodily injury and property damage liability insurance with limits of not less than One Million Dollars ($1,000,000.00) per occurrence, Two Million Dollars ($2,000,000.00) annual aggregate, insuring City of Bakersfield and California Water Service Company (CWS) against any and all liability for the death of or injury to any person and for the loss or damage to any property, respectively, which may arise by reason of acts done or omitted to be done in the course of installation of the facilities or which may result from such installation, and further insuring CWS against all costs and expenses incurred by CWS in resisting any claim which may be made against CWS for any such injury or damage to any persons or property. Each such policy (i) shall be issued by an insurance company approved by CWS, which is qualified to do and doing business in the State of California, (ii) shall name CWS as an additional insured, (iii) shall specify that it acts as primary insurance and that other insurance or self-insurance maintained by CWS shall be excess only and not contributing with insurance provided by contractor, (iv) shall provide that the policy shall not be canceled or altered without thirty (30) days prior notice to CWS, and (v) shall otherwise be in form satisfactory to CWS. Each such policy or a certificate thereof shall be delivered to CWS prior to start of any construction in connection with installation of the facilities.

An endorsement or certificate thereof to the workers' compensation insurance policy of contractor providing that the underwriter thereof waives all right of subrogation against CWS by reason of any claim arising out of or connected with installation of the facilities shall be delivered to CWS prior to construction. Said endorsement shall provide that it shall not be canceled or altered without thirty (30) days prior written notice to CWS.

2.2.10 Valid Contractor License Requirements: Contractor must provide CWS a photocopy of a valid license issued by the State of California for the construction of water supply mains and related facilities. Acceptable classifications will consist of either an "A" license (General Engineering Contractor) or a "C-34" (Pipeline Contractor).

2.3 PLAN FORMAT AND REQUIREMENTS: Water system plans shall be prepared in accordance with the following format.

2.3.1 Plan sheet size shall be 22" x 34" or 24" x 36". Lettering shall be a minimum of 1/8 inch in height. A disk containing the construction drawing must be included in AutoCad format.

2.3.2 Plans shall be signed and sealed by a registered Civil Engineer licensed by the State of California.

2.3.3 The first plan sheet or cover sheet shall contain a vicinity map, standard legend, a material take-off list, a signature block for the Water Resources Manager, City of Bakersfield, Domestic Water Division, and shall contain the note that California Water Service Company, as agent for inspection to the City shall be notified at least 24 hours prior to the start of construction. Note: Prior to construction, a preconstruction meeting with the contractor(s) and CWS must take place.

2.3.4 Scale for standard subdivision design shall not be less than 1 inch equal to 60 feet. Scale for mainline extension plans shall not be less than 1 inch equal to 100 feet.

2.3.5 Plans shall show the proposed locations and existing locations of water mains, fire services, fire hydrants, water services, blowoffs, air valves and any other facility appurtenant to the construction of the water system. Water main locations shall be referenced to the property line. The standard location shall be 2' outside the property line towards the centerline of the street. Alternate locations will be allowed upon approval of the Department. Curb and gutter flowlines shall be shown for reference. All lot numbers shall be included. Locations of existing and future utilities shall be shown on

the plans with any possible conflicts shown. All facilities referred to in this section must be constructed within the public utility easement (PUE) and not on private property without prior issuance of easement(s) and approval of the City of Bakersfield.

2.3.6 Plan view designs are acceptable for tracts or roadways where grade is specifically designed or established. Mainline extensions shall be prepared on a plan-profile basis when grade of adjacent roadways and alignments is unknown.

CHAPTER III - WATER SUPPLY REQUIREMENTS

3.1 PURPOSE: The purpose of this chapter is to establish the minimum acceptable flow, storage and pressure requirements for City of Bakersfield Water Systems.

3.2 DOMESTIC FLOW:

Average Daily Use:	185 gallons per capita per day (GPD)
Maximum Daily Use:	333 gallons per capita per day (GPD)
Peak Hour Use:	666 gallons per capita per day (GPD)

3.3 RESIDENTIAL AREAS: Each single-family R-1 shall be considered equal to 3.5 persons.

3.3.1 Multiple Family Residential: Flow requirements for Medium to High density residential areas such as an apartment, duplex, or triplex, shall be considered equal to 1.75 persons per dwelling unit.

3.4 COMMERCIAL AND INDUSTRIAL: Flow requirements for Commercial and Industrial shall be considered equal to 5, R-1 residences per acre. This does not include special equipment requirements such as cooling towers.

3.4.1 The Department reserves the right to modify the above criteria for Industrial and Commercial, as special circumstances may warrant.

3.5 PARKS: Flow requirements for Parks and other Landscaped areas shall be considered equal to 2, R-1 residences per acre.

3.6 GENERAL FIRE FLOW REQUIREMENTS:

Residential R-1:	1000 gpm for 2 hours
Residential R-2 to R-4:	2000 gpm for 2 hours
Commercial C-1:	2000 to 3500 gpm for 2 hours
Industrial M-1:	As needed based on design

3.6.1 The Department, in cooperation with the City of Bakersfield Fire Department, will provide the exact value of fire flow for specific commercial and industrial developments. Refer to 2013 California Fire Code Appendices BB & CC.

3.7 PIPE PRESSURE: Water distribution systems shall be designed to maintain normal operating pressures of not less than 20 pounds per square inch gauge (psig) under peak demand conditions listed in Section 3.8 of these Specifications. Pipe pressure shall not exceed 150 psig under any demand condition.

3.8 TOTAL FLOW REQUIREMENT: The Developer shall submit calculations prepared by a registered Civil Engineer to substantiate pressure, storage, and flow requirements have been met for the following scenarios.

3.8.1 The Maximum Daily Use shall be maintained for a period of three (3) days.

3.8.2 The Peak Hour Demand shall be maintained for two (2) hours.

3.8.3 The sum of one-half (1/2) of the Peak Hour Demand and the required Fire Flow or the Peak Hour Demand, whichever is greater, with the most critical well or pump inoperative, shall be maintained for a period of two (2) hours. Fire Flow shall be extracted at the most critical hydrant location.

3.8.4 Fire flow test reports shall be considered valid for a period of 12 months after the flow test date. Reports older than 12 months shall not be recognized as supporting documentation for hydraulic calculations for water-based fire protection systems.

CHAPTER IV - MISCELLANEOUS DESIGN CRITERIA

4.1 LOCATION OF PIPE: Except at street crossings, water mains shall be located behind the sidewalk in accordance with Department Standard W-1. A minimum of 42 inches of cover shall be maintained from top of pipe to finished grade for pipes 12 inches and less in diameter, and a minimum of 48 inches of cover shall be maintained for pipes larger than 12 inches in diameter. In street crossings, "finished grade" shall be gutter flowline grade.

4.2 FIRE HYDRANTS: Location and number of Fire Hydrants will be determined by the City Water Resources Department in conjunction with City Fire Department. In general, the following criteria for placement of Fire Hydrants will be followed.

4.2.1 Spacing of Fire Hydrants in Residential areas shall be a maximum of 500 feet. Whenever practical hydrants will be placed at intersections. Fire hydrants not located at intersections shall be located near the common property line to avoid interfering with driveways.

4.2.2 Spacing of Fire Hydrants in Commercial and Industrial areas shall not exceed 300 feet.

4.2.3 The last Fire Hydrant on a cul-de-sac or stub street shall not be more than one half the maximum allowable spacing from the end of the street.

4.2.4 Fire Hydrant location on Major Collectors and Arterials within residential areas shall be as needed.

4.2.5 Fire Hydrants shall not be allowed within pedestrian travel ways and shall have a 36” minimum clear operational radius from any and all obstructions.

4.2.6 Fire hydrant spacing is to be measured linearly along an improved roadway or Fire Department access road.

4.3 VALVE LOCATION: Valves shall be located such that tees and crosses may be isolated. Valves shall not be allowed in curb and gutter nor in streets.

4.3.1 Valve Spacing: Notwithstanding the aforementioned criteria, valve spacing shall not exceed 500 feet in residential blocks. Additional valves may be required as deemed necessary.

4.3.2 Valve Type: Gate valves are to be used for 12” and smaller pipe diameters. Butterfly type valves are to be used for any larger than 12” pipe diameters.

4.4 AIR AND VACUUM RELEASE VALVES: Automatic combination air release valves shall be installed at any location where air pockets may form. Barricades for air release valves shall be installed where considered necessary by the Department. Typically, air release valves will not be required where air pockets can be manually exhausted by water services or fire hydrants. Long main line extensions with high points will require air release valves.

4.5 BLOWOFFS: "Blowoffs" or "Flushouts" shall be installed at the end of dead-end mains terminating within street paving, and at low points where the slope of the line or flow velocity may cause sediment to settle.

4.6 WHARF HYDRANTS: Wharf Hydrants shall be installed at the terminus of mains which dead-end in non-paved areas, and future extension of the main line is probable.

4.7 PIPE DIAMETER: Minimum pipe diameter for water mains shall be 8 inches nominal inside diameter for interior tract typical grid design. Installation of fire hydrants will only be permitted on mainlines of 8 inches, or larger in size.

4.7.1 Typically, 12 inch mains will be required at half-section lines and 16 inch mains at section lines. Main line sizing may require hydraulic analysis to justify sizing.

4.8 CONNECTIONS: A minimum of two (2) separate water line connection points, to form a looped system, shall be required of each development.

4.8.1 Additional water line connections may be required for larger development or due to special conditions, as determined by the Department.

4.9 CLEARANCE FROM SEWERS: In accordance with State of California Water Resources Control Board Drinking Water and Environmental Management, horizontal separation of water mains from paralell sewer lines shall be a minimum of 10 feet and shall be a minmum of 4’ from parallel recycled or storm water lines.

4.9.1 In accordance with State of California Water Resources Control Board Drinking Water and Environmental Management, water mains, when crossing sewer recycled water or storm drain mains or service laterals, shall maintain a minimum of one foot of vertical clearance above the sewer, storm or recycled water pipe.

4.9.2 If a water main crosses below a sewer, storm, or recycled water main or service lateral, the sewerstorm or recycled water main shall be encased in hot-dipped, bituminous-coated Class 150 cast iron pipe with approved mechanical or flanged joints. The encasement shall extend a sufficient distance on each side of the water main to provide a minimum of 10 feet of horizontal clearance to the water main. When a water mainline crosses above or below a sewer, storm, or recycled water main, no water mainline fittings will be permitted within ten feet (10') of said crossing.

4.9.3 If a water main crosses above, but within one foot of a sewer, storm, or recycled water main or service lateral, the sewer, storm, or recycled water main shall be encased as described in Section 4.9.2, except that the encasement shall only be required to extend a sufficient distance to provide 4 feet of horizontal clearance to the water main.

4.10 SERVICE PIPE SIZE: Service pipe size shall be determined for each service connection.

4.10.1 Residential service pipes shall be a minimum of 1”(one inch) copper tubing for all services Actual size of service shall be determined by the total flow requirement. **All services shall be copper tubing.**

Lots	Less than or equal to	15,000 sf require	1” service
Lots	larger than	15,000 sf require	1 1/2” service
Lots	larger than	20,000 sf require	2” service

4.10.2 Any services other than residential requires calculations of water services demands to determine size. Minimum size shall be 1" (one inch) **copper**. Services are not to be used for construction water without prior authorization from City of Bakersfield Water Resources and shall be fitted with an appropriate backflow device upon approval.

4.10.2.1 **For any classification of services, other than residential, the domestic, landscaping and fire protection services shall be separate connections to City water system mains and shall be protected from back pressure and back siphonage and pressure drop by one of the following devices:** 1**)** Double check valve assembly. 2) Double check detector assembly. 3) reduced pressure principle backflow preventer. 4) Separation tank assembly.

4.11 THRUST DEVICES: Concrete thrust blocks shall be installed on all plugs, caps, fittings, and all bends of more than 5 degrees deflection in any plane. Thrust blocks for all typical situations shall be installed in accordance with the Standard Details.

4.11.1 Unusual situations will require submittal and approval of supporting calculations by a registered civil engineer. Thrust blocks shall be designed for a minimum static pressure of 200 psi. Allowable soil bearing pressure shall be determined by a soils engineer.

4.12 FIRE PROTECTION SERVICE: Except as provided under Sections 4.12.1 and 4.12.2 below, water supplies to fire protection systems, including but not limited to standpipes and automatic sprinkler systems, and booster pumped systems shall be protected from back-pressure, back-siphonage and pressure drop by the following testable devices: 1) Double check valve assembly 2) Double check detector assembly 3) Reduced pressure principle backflow preventer 4) Reduced pressure principle detector assembly 5) Separation tank assembly with slow opening and closing valves.

4.12.1 Where fire protection systems supplied from a potable water system include a fire department (siamese) connection which is located less than seventeen hundred (1700) feet from a non-potable water source that could be used by the fire department as a secondary water supply, the potable water supply shall be protected by one of the following: 1) Reduced pressure principle backflow preventer 2) Reduced pressure principle detector assembly. Note: Non-potable water sources include fire department vehicles carrying water of questionable quality or water that is treated with antifreeze, corrosion inhibitors, or extinguishing agents.

4.12.2 Where antifreeze, corrosion inhibitors, or other chemicals are added to a fire protection systems, the potable water system shall be protected by one of the following: 1) Reduced pressure principle backflow preventer 2) Reduced pressure principle detector assembly

4.12.3 Whenever a backflow device is installed in the potable water supply to a fire protection system, the hydraulic design of the system shall account for the pressure drop through the backflow device.

4.12.4 Under the discretion of the City of Bakersfield Fire Department where fire protection is required, a non-shared fire service connection to the City water main for each independent structure is required and shall be constructed as per Detail W-19.

4.12.5 Fire Department Connections shall be located on the address side of any applicable structure within 100’ of a public fire hydrant or 100’ from a private fire hydrant having a looped 2 point minimum system connection to the public water supply as per CFC and NFPA.

CHAPTER V - MATERIALS

5.1 PURPOSE: This chapter establishes minimum acceptable standards and criteria for materials to be used in construction of City of Bakersfield Water Systems.

5.2 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.

5.2.1 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.

5.3 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 Specifications for 12" and less, and AWWA C905 for pipe 14" to 36" in diameter. Outside diameter of PVC pipe shall be equivalent to cast-iron pipe.

5.3.1 PVC Joints: PVC pipe shall have elastomeric gasket joints, either gasket bell and spigot type or plain end with gasket coupling type.

5.3.2 Fittings: Specials and fittings shall be ductile-iron conforming to AWWA Specification C105, 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 and AWWA C105/A21.5.

5.3.3 Joint Deflection: Longitudinal joint pipe deflection shall not exceed 2 degrees or the pipe manufacturer's recommendations, whichever is more restrictive.

5.4 MOLECULARLY ORIENTED POLYVINYL CHLORIDE PRESSURE PIPE: Molecularly oriented polyvinyl chloride pressure pipe shall conform to AWWA Specification C909, Class 150, except as otherwise approved by the Department. Evidence that pipe has been tested as specified by AWWA Specification C909 shall be submitted to the Inspector if requested.

5.4.1 Fittings: Specials and fittings shall be ductile-iron as specified in Section 5.3.2 of these Specifications.

5.5 STEEL PIPE: Steel pipe shall be black steel conforming to AWWA Specification C202, and shall have a minimum wall thickness equal to the requirements of General Order No. 103 of the Public Utilities Commission, State of California.

5.5.1 Temporary Pipe: Temporary transmission steel pipe shall be double dipped with asphalt and wrapped with asbestos felt or fiberglass in conformance with Appendix B of said General Order No. 103.

5.5.2 Permanent Pipe: Permanent transmission steel pipe shall be lined and coated in accordance with Section 5.15 of these Specifications.

5.5.3 Small size pipe for blow-offs or similar uses shall be brass.

5.5.4 Steel Pipe Joints: Fittings and special fabrication, "specials", for pipes 4 inches and larger in diameter shall be of the same material and thickness as the pipe. "Specials" and fittings shall be made of standard steel tube turns with ends to accommodate the type of coupling specified for the pipe. Fittings shall be lined, coated and wrapped with mill paper as specified for the pipe. "Specials" and fittings that cannot be mechanically lined, coated and wrapped, shall be lined, coated and wrapped by hand, using the same materials as specified for the pipe, with the same number of applications or each material, carefully and smoothly applied. Cast-iron fittings conforming to these specifications may be used with transition fittings or adapters.

5.5.5 Welded Fittings: Steel welded fittings shall conform to the requirements of ASTM Designation A234.

5.5.6 Flanges: Steel pipe flanges shall conform to the requirements of AWWA Specification C207.

5.5.7 Bolts: Material for bolts shall conform to the requirements for open hearth, free cutting grade bar steel, ASTM Designation A575. 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.

5.5.8 Gaskets: Flanged joints shall be provided with 1/16 inch thick gaskets, Cranite, or equal.

5.5.9 Victaulic Couplings: When Victaulic couplings are indicated on the drawings, Style 77 Dresser Victaulic couplings, or an approved equal, shall be furnished. The victaulic coupling shall be designed for 150 psi, working pressure.

5.5.10 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.

5.6 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 B62 (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.

5.6.1 Tests: Each valve shall have the Manufacturer's initials, pressure rating, and year of manufacture cast in the body. Valves shall be tested at the factory at a hydraulic pressure equal to twice the specified water working pressure. Factory test results shall be supplied to the Department upon request.

5.6.2 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.

5.6.3 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, are approved for use by the Department.

5.6.4 Butterfly Valves: Butterfly valves shall be used for pipe diameters greater than 12". Butterfly valves shall be rubber-seated and shall comply with AWWA C504, Class 150-B gear operated unless otherwise approved by the Department. The disc shall be cast iron ASTM A126 Class B or ASTM A48 Class 40 in sizes 24" and smaller or ductile iron in conformance with ASTM A536 for 30" and larger, and shall rotate 90 degrees between the fully open and fully closed positions. Buna-N Rubber seats shall be securely held in-place by nickel cast-iron or type 316 stainless steel retaining segments, or shall be bonded to the body and meet test procedures outlined in ASTM D429 Method B.

5.6.5 Air and Vacuum Release Valves: Air and vacuum relief valves shall be equal to No. 31 automatic diaphragm valve as manufactured by CLA-VAL Co., Newport Beach, California.

5.7 VALVE BOXES: Valve boxes in sidewalks, parkways, and other areas shall consist of a cast iron valve box and riser and a cast iron 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.

All valve shall have a Class "B" concrete pad shall be poured around the riser in accordance with the Standard Details.

5.8 WATER SERVICE PIPE AND TUBING: Residential water service pipe shall be copper water tubing, copper water pipe, in accordance with the Standard Details and the following specifications:

5.8.1 Copper Water Tubing: Copper water tubing shall comply with ASTM B88-58, Type "K".

5.8.2 Copper Pipe: Copper pipe shall be seamless copper conforming to ASTM B42-58.

5.8.3 Water service pipe for services larger than 2 inches shall comply with the requirement of PVC as specified herein.

5.9 CORPORATION STOPS: All corporation stops shall be bronze or brass, round, with inlet for either corporation stop (C.S.) thread for PVC or ductile-iron pipe, or copper tubing standard (C.T.S.) thread for steel pipe, and outlet for the type of service pipe used.

5.10 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.

5.11 FIRE HYDRANTS: Fire hydrants shall be Jones 4048, Clow 850 type or approved equal with one 4" and one 2 ½" nozzles & proper bury length. Hose threads shall be National Standard Hose Threads.

5.12 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 ultimate compressive strength of 3,000 psi at 28 days.

5.12.1 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.

5.13 STORAGE FACILITIES: Storage facilities shall be considered a special design feature and shall be reviewed in light of special requirements.

5.14 VERTICAL TURBINE PUMPS: Vertical turbine pumps shall be considered a special design feature and shall be reviewed in light of special requirements.

5.15 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 C205
2.	Interior Surfaces of Steel Pipe.	Coal Tar Epoxy or Fusion Epoxy	AWWA C205
3.	All exposed ferrous metal surfaces.	Red primer	2 coats 3 mils
4.	Buried valves, couplings and other surfaces not otherwise designated to be cement mortar coated.	Coal Tar Enamel	2 coats 16 mils

All 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.

All underground metallic pipes shall be wrapped with 8 mil polywrap and all buried bolts shall be greased per AWWA C105/A21.5 standard.

5.16 MISCELLANEOUS: Materials or equipment not included in these Specifications shall be in accordance with the Standard Details.

5.16.1 Special equipment or materials not included in the Specifications or Standard Details shall be submitted to the Department for review and approval.

CHAPTER VI - INSTALLATION OF WATER SYSTEM

6.1 PURPOSE: This section establishes the minimum acceptable standards for installation and construction of City of Bakersfield Water Improvements, including trenching, construction and installation.

All facilities to be installed on the City of Bakersfield domestic water system must be installed by a contractor **approved by the City** and no part of the work may be sublet without the approval of the City. Contractor must have a current and valid license issued by the State of California for the construction of water supply mains and related facilities. Acceptable classifications will consist of either an "A" license (General Engineering Contractor) or a "C-34" license (Pipeline Contractor).

6.2 TRENCHING: Trenching shall not occur prior to curb and gutter installation within the tract boundary. The minimum width of trench shall be the 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. Pipe diameters of 12" and greater shall require a minimum of 12" of clearance from the outside face of the pipe to the trench wall for springline testing. Trenching shall avoid concrete obstacles with a one foot minimum clearance from outside diameter of pipe to any footings, light or pole bases or similar concrete or other existing or future obstacles. Excessive trench widths greater than 24 inches more than the pipe outside diameter shall be avoided whenever possible.

6.2.1 Pipe Depth: For water mains and services 12 inches and less in inside diameter, a minimum of 42 inches of cover from top of pipe to finished grade, or for pipe located within streets, a minimum of 42 inches of cover from top of pipe to gutter flowline, shall be maintained. For water mains larger than 12 inches in diameter, 48 inches of cover shall be maintained, measured for the various pipe locations as defined in this Section.

6.2.2 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.

6.2.3 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 Department. 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 Department.

6.2.4 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.

6.2.5 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. Compaction tests will be required for the springline on 12” diameter and larger 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.

Backfill material shall be free of all trash, debris, rocks larger than 3/4" in any dimension, organic or other deleterious material. Cement Slurry is not acceptable backfill material. Compaction shall be obtained in accordance with the Standard Details. Maximum density and optimum moisture shall be determined in accordance with ASTM D1557.

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.

6.2.6 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.

6.3 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.

6.3.1 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 each 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.

6.3.2 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. No pipe is allowed to be laid with deflections greater than manufacturer reccommendations in leiu of fittings.

6.3.3 Ductile Iron Fittings: Ductile iron fittings shall be lowered into trench by mechanical means. Ductile 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.

6.3.4 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.

6.3.5 PVC Pipe and Molecularly Oriented PVC Pipe Installation: The Manufacturer's recommendations shall be strictly adhered to except as otherwise provided herein.

6.3.6 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.

6.3.7 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.

6.3.8 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.

6.3.9 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. Hydrants shall be located at beginning or ending of curb returns or at property lines. Hydrants shall not be allowed within pedestrian access areas such as sidewalks or wheelchair ramps or other such areas presenting an obsticle to pedestrian traffic. Hydrants will be required to maintain a five foot clearance from any obstacle such a wall, fence, pole or landscaping in order to provide for proper valve operation.

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 4 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.

6.3.10 Concrete Thrust Blocks: Concrete thrust blocks shall be Class ‘B’, 5 sack (470 lb.) and 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.

6.4 BORING: All crossings requiring a pipe bore shall be cased and comply fully with the requirements set by Plate No. 7 in these specifications. All pipe sizes two inches (2") and larger shall require boring and casing.

CHAPTER VII - TESTING AND DISINFECTION

7.1 PURPOSE: This Chapter outlines disinfection and testing required for City of Bakersfield acceptance of newly constructed water systems.

7.2 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.

7.2.1 The Developer or Developer's Contractor shall provide suitable calibrated tanks for measurement of leakage and shall furnish necessary bulkheads, piping, pumps, power, labor, and shall perform all work required for filling the pipeline and for maintaining the required water pressure. The Department or Inspector will provide calibrated gages and will make necessary readings.

7.2.2 The Developer, at his own expense shall make all necessary repairs of the water system until the pipe is found to be satisfactory.

7.2.3 Allowable Leakage Rate: Regardless of the rate of leakage, a detectable leakage point source shall be fixed. PVC and Moleculary Oriented PVC Pipe: Maximum acceptable leakage rate is 10 gallons per day per inch pipe diameter per mile of pipe over a 24 hour period.

7.3 DISINFECTION OF WATER LINES: Note - The disposal of all chlorinated water generated from the procedures in this section shall be the Contractor's responsibility. The Contractor shall meet all local agency's requirements and dispose of all chlorinated water in a safe and lawful matter.

If dechlorination of the water is required, then the chlorinated water that is discharged to an open stream or storm drain shall be dechlorinated by water industry accepted methods. The dechlorinated water will be tested for chlorine residual to verify that no detectable amount of free chlorine is present. This testing will take place from the onset of discharging the water and at frequent intervals throughout the dewatering of the pipe.

7.3.1 Connection to Existing System: **The water system under construction shall remain separate from the existing City domestic water system.** Final "tie-ins" may only be connected after completion of disinfection procedures and acceptance of bacteriological test(s). After acceptance by City or its authorized representative, the Contractor shall make the final tie-in(s), connecting the new mains to the existing system. The Contractor must adjust from nominal line and grade to match existing facilities. The purpose of this procedure is to eliminate the strong chlorine solution used in the disinfection process and/or bacteria entering the City's existing domestic water system.

7.3.2 General Instructions:

1. After hydrostatic testing has been completed, the entire newly constructed water system including pipe, valves, fittings, hydrants, and other accessories shall be disinfected in accordance with AWWA C601 and as specified herein. Precautions shall be taken to prevent soiling of pipe, fittings, and other materials. Pipe and fittings shall be stored so as not to accumulate mud or water, and other material shall be stored in a clean, dry location. Particular care shall be taken to keep rubber gaskets and pipe ends clean.

2. All pipe shall be clean before lowering the pipe into the trench.

3. When the main is left unattended, even for a short time, the ends shall be plugged to prevent the entrance of foreign material or small animals.

4. Apply chlorine, using one of the methods described under "Chlorine Application Methods."

5. Isolate the main by closing valves and allow heavily chlorinated water to stand therein for a contact period of at least twenty-four hours.

6. At the end of the contact period, flush the main thoroughly. The test for chlorine should show no more chlorine in the water leaving the main than in the water entering the main.

7. The City's representative will collect a sample for bacteriological examination and send it to the laboratory. The sample should be taken from a service located near the end of the chlorinated section or from the sampling device.

8. If bacteriological tests are positive, the action to take will be noted on the laboratory report. Prompt attention to these orders is essential.

7.3.3 Chlorine Application Methods:

Method No. 1 - H.T.H. Tablet Method: This method is preferred for short jobs and for small diameter pipe of any kind. It cannot be used where trench water has entered the main. The main cannot be flushed prior to disinfection, so the method requires that the pipe be kept clean during laying.

Using Permatex No. 1 as an adhesive, fasten the required number of tablets (see Table II) to the top of each length of pipe. Tubes of Permatex may be purchased locally at any auto parts store. The tablets may be fastened to the pipe before it is placed in the trench provided the top of the pipe is marked to avoid the possibility that the pipe may be rotated.

In addition to the tablets, place 10 ounces of H.T.H. granules at the upstream end of the first length of pipe into which water will flow. This will insure that heavily chlorinated water flows into crevasses caused by couplings and valves. For long runs, this should be repeated about every 500 feet. When using "Dresser" or similar couplings, place additional H.T.H. granules in the annular space between the coupling and the pipe. Fill the pipe very slowly and proceed as outlined under the "General Instructions."

Method No. 2 - Liquid Bleach or H.T.H. Solution with Hand Pump: This method is general in scope and must be used when it is necessary to re-chlorinate an existing main. It may also be used on new mains, in which case place 10 ounces of H.T.H. granules at eh upstream end of the first length of pipe into which water will flow, and every 500 feet thereafter. This method consists of pumping a strong chlorine solution into water which is being used to fill the water main.

Equipment required includes an ordinary hand test pump, solution hose, and a five gallon or larger container to hold the strong chlorine solution. A Gould Hydraulic Test Pump is satisfactory. A compact and convenient assembly can be made by mounting the solution container and the pump on a suitable board with a pipe connection from the container to the suction side of the pump.

The strong chlorine solution can be made by mixing liquid Chlorine bleach (sodium hypochlorite) or H.T.H. granules (calcium hypochlorite) in a five-gallon or larger container in the proportions shown in Table III.

Liquid chlorine bleach is available in grocery stores as laundry bleach (Clorox, Purex, etc.) with a chlorine concentration of 5%. It is also available as high strength solution (for commercial laundries or swimming pool) with a chlorine concentration of approximately 12%. H.T.H. comes as granules which must be dissolved in water. Strong chlorine solutions should be handled with care. The solutions are dangerous to the eyes, irritating to the skin, and will damage shoes and clothes.

7.3.4 Procedure:

1. Choose a suitable filling rate and determine the time required to fill the water main from Table IV.

2. Compute the gallons of strong chlorine solution required by dividing 3 into the time required to fill the water main.

3. Use Table III to determine the strength of chlorine solution required.

4. Connect pump to water main to be disinfected. Use a corporation cock for this purpose and make connection at, or ahead of, the inlet end of the water main to be disinfected.

5. After flushing the line thoroughly, adjust the filling rate by measuring the time required to fill a five-gallon or other suitable container.

6. Pump strong chlorine solution into the line at a rate of one-gallon of strong solution per three minutes.

7. Continue pumping until a chlorine residual test on a sample taken from the discharge end of the water main being disinfected shows at least 25 ppm chlorine.

8. Then close filling valve or blow-off and stop pumping chlorine solution. Disconnect and flush pump thoroughly with fresh water.

9. During the disinfection process, all valves and other appurtenances shall be operated while the system is filled with heavily chlorinated water. Refer to "General Instructions" for the steps on flushing and sampling new water mains.

Special Note for Tapping Sleeves - Before a tapping sleeve is installed, the inside surface of the tapping sleeve must be heavily dusted with H.T.H. granules or swabbed with grocery store liquid bleach.

TABLE II
H.T.H. TABLET METHOD NO. 1 OF MAIN CHLORINATION

	DIAMETER OF PIPE					
LENGTH OF SECTION	2"	4"	6"	8"	10"	12"
	NUMBER OF TABLETS REQUIRED					
13' or less	1	1	2	2	3	5
18'	1	1	2	3	5	6
20'	1	1	2	3	5	7
30'	1	2	3	5	7	10
40'	1	2	4	6	9	14

TABLE III
STRONG CHLORINE SOLUTION HAND PUMP METHOD OF MAIN CHLORINATION

Flow rate at which water main is filled	Grocery store liquid bleach (Clorox, Purex, etc. - 5% CL2)	Commercial liquid bleach (Laundries, swimming pools - 12% CL2)	H.T.H.
GALLONS PER MINUTE	AMOUNT OF CHEMICAL TO MIX IN 5 GALLONS OF SOLUTION		
10 gpm	1 quarts	1 pint	2 ozs.
20 gpm	2 quarts	2 pints	4 ozs.
35 gpm	3 quarts	3 pints	5 ozs.
50 gpm	1 gallon	2 quarts	8 ozs.
75 gpm	1-1/2 gallons	3 quarts	12 ozs.
100 gpm	2 gallons	1 gallon	1 lb.

TABLE IV

Flow rate at which water main is filled (gallons per minute)	**DIAMETER OF PIPE BEING DISINFECTED (INCHES)**									
	2	4	6	8	10	12	14	16	18	20
(GPM)	TIME REQUIRED TO FILL 100 FEET OF PIPE (MINUTES)									
10	1.6	6.5	14.7	26.1	40.8	58.8	---	---	---	---
20	---	3.3	7.3	13.0	20.4	29.4	---	---	---	---
35	---	1.9	4.2	7.5	11.7	16.8	---	---	---	---
50	---	---	2.9	5.2	8.2	11.8	15.0	20.9	---	---
75	---	---	2.0	3.5	5.5	7.9	10.7	14.0	---	---
100	---	---	---	2.6	4.1	5.9	8.0	10.4	13.2	16.3

Table IV is used to estimate the time required to fill the pipe with chlorinated water. For example: A flow rate of 50 gpm will fill 700 feet of 8 inch pipe in, 7 x 5.2 = 36.4 minutes.

7.4 BACTERIOLOGICAL TESTS: The Department shall require a bacteriological test. Bacteriological tests shall be performed by a qualified laboratory and the requirements of such tests shall be in accordance with standards established by the State Department of Health Services.

7.5 FIRE FLOW TEST: The City of Bakersfield Water Resources Department will test newly constructed water systems to determine if minimum standards for the fire flow have been met.

7.6 COSTS FOR TESTING: The Developer or Developer's Contractor shall be responsible for all costs associated with the various acceptance tests and any necessary repairs, except as otherwise stated in these Specifications.

APPENDIX

Application for Water Service

Water Availability Fees Agreement

Mainline Extension Agreement

Department Fee Schedule

Contractor Checklist

Standard Details

APPLICATION FOR WATER SERVICE

Department of Water Resources
Domestic Water Division
1000 Buena Vista Road
Bakersfield, California 93311
Phone (661) 326 - 3715
Email: water@bakersfieldcity.us

Application for domestic water service
(Pursuant to Bakersfield Municipal Code 14.04.030 & 14.04.120)

THIS SECTION FOR OFFICE USE ONLY NOT FOR USE BY APPLICANT			
Date Paid		Inspection Fee @ 5% of Contractor Off-site Invoice	$
Date Paid		Meter Set Fee @ $10.00 each	$
Date paid		Water Availability Fees **(See instruction item No. 5)**	$
Date Paid		Fire Hydrants @$478 each	$

Instructions:

1) ***Please fill out the required fields of the application as indicated and check appropriate boxes which apply.***

2) ***Please return original completed application to City Water by e-mail or hard copy to the address as shown above. (Please note that fax applications are not acceptable).***

3) ***Along with the application please submit a clear and legible 8-1/2" X 11" map of property as well as a legal description of property on separate pages.***

4) ***A digital electronic file of City approved water plans as per the Domestic Water Service Agreement will be required to be submitted by the developer.***

5) ***Water Availability fee is determined by the date of map recordation for any gross acreage and / or at the date of building permit issued as per City of Bakersfield Municipal Code Sec. 14.04.120.***

Applicant is (**check one**): *owner* *builder* *tenant* *agent*

Address to which correspondence and invoices are to be mailed or delivered (**check one**): *Applicant* *Owner*

Applicant:

Name:	
Company:	
Street address:	
City, State, Zip Code:	
Phone #:	( )
Federal Tax I.D. No.	
Corporation?	Yes____ No____ (**Please Check One**)
Type of corporation	

Owner: (if different than applicant)

Name:	
Company:	
Street address:	
City, State, Zip Code:	
Phone #:	( )
Federal Tax I.D. No.	
Corporation?	Yes____ No____ (**Please Check One**)
Type of corporation	

Builder: (if different than applicant)

Name:	
Company:	
Street address:	
City, State, Zip Code:	
Phone #:	( )
Federal Tax I.D. No.	
Corporation?	Yes____ No____ (**Please Check One**)
Type of corporation	

Location Of Premises To Be Served: _____

(Tract, Parcel Map No. and phase): _____

Assessor's Parcel Map No. (APN #): _____

_____

Conditional Use Permit No. (CUP #):

Zoning =

Total Gross Acreage to be recorded (Do Not Use Net Acreage)

Map recording gross acres =

Vesting map date

Water Availability Fee per City of Bakersfield Municipal Code Sec. 14.04.120

Amount: $ Date Paid:

Has applicant applied for water service for this location before?: **Yes** **No** (**Please Check one**):

If so, under what location (Name,Tract, Parcel Map No.):

Date applicant will be ready for service

TEMPORARY

PERMANENT

Purpose for which service is to be used:

Size(s) of services desired:

Domestic

Fire

Landscape

Name: **Title:**

WATER AVAILABILITY FEES AGREEMENT

AGREEMENT NO. _____

DOMESTIC WATER SERVICE AGREEMENT

THIS AGREEMENT is made and entered into on **DATE** , by and between the **CITY OF BAKERSFIELD,** a California municipal corporation ("CITY" herein), and **OWNER NAME**, a **OWNER TYPE**, ("OWNER" herein) with regard to the development of property located at _____ ("PROPERTY" herein) .

R E C I T A L S

WHEREAS, CITY owns a water system known as the City of Bakersfield Domestic Water System, which can and will provide domestic and fire protection service to the PROPERTY; and

WHEREAS, OWNER proposes to sell, develop, or operate the PROPERTY within the City of Bakersfield Domestic Water Service Area and desires to construct or connect a new water service to the PROPERTY by means of mains and appurtenances, and by services (including service pipes, fittings, valves, housings and meter boxes); and

WHEREAS, installation of water service facilities and the furnishing of water service by means thereof are necessary and valuable adjuncts to the PROPERTY, and will materially increase the value of the PROPERTY; and

WHEREAS, CITY of Bakersfield Municipal Code provides that OWNER pay Water Availability Fees, which fee is set by the Bakersfield City Council and said fee is used to compensate CITY for the expenses incurred in procuring, securing and supplying a water source, storage facilities, transmission facilities and related capital expenses that are required to provide water service to the PROPERTY; and

WHEREAS, CITY of Bakersfield Municipal Code provides that CITY and OWNER must enter into a contract prior to written commitment to serve water to any area where Water Availability Fees are to be paid.

NOW, THEREFORE, incorporating the foregoing recitals herein, it is agreed as follows:

1. WATER SERVICE. Upon execution of this Agreement and subject to the terms and conditions hereinafter set forth, CITY has included the PROPERTY within the service area of the City of Bakersfield Domestic Water System and CITY can and will provide domestic water and water for fire protection service under prevailing water rates, which may be changed from time to time as CITY deems appropriate.

2. INSPECTION FEES. OWNER agrees to pay to CITY inspection fees based on five percent (5%) of the contractor's engineer's estimate for public water system installations for the development and Ten Dollars ($10.00) per water meter installed.

3. WATER AVAILABILITY FEES. OWNER agrees to pay to CITY water availability fees of _____ Dollars ($_____) per gross acre of the PROPERTY. As the PROPERTY contains _____ **GROSS ACRES**, OWNER shall pay to CITY _____ Dollars ($_____) for water availability fees. OWNER shall pay said fees in full to CITY before any water inspections will be allowed or any connection to the existing City Domestic Water Supply. Payment of fees is to be made to CITY prior to final acceptance and recordation of tract/parcel map. Failure to pay Water Availability Fees when due shall result in an additional ten percent (10%) administrative service charge and interest shall be added at the rate of one percent (1%) per month to any amount of fee which is delinquent. Should CITY resort to court action to collect amounts due, CITY shall be entitled to collect its reasonable costs and attorney's fees.

4. PROPERTY LIEN. OWNER shall execute a promissory note and deed of trust in the amount of the Water Availability Fees plus interest on said fees in an amount to be set by CITY. This deed of trust shall be recorded by CITY to ensure payment of the fees to CITY at the time of recording of the final map unless fees have already been paid in full. OWNER shall also pay the cost of a title insurance policy in the amount of the Water Availability Fees insuring that the deed of trust is a valid lien against the PROPERTY subject only to those exceptions approved by CITY. CITY will not issue a will serve letter until the deed of trust is recorded and insured. Once fees are paid, CITY will issue a reconveyance (full or partial depending on amount of fees paid) to remove all or part of a lien.

5. DIGITAL MAP OWNER shall submit a digital electronic file of the PROPERTY in a specified format (AUTOCAD 2006 minimum) acceptable to the City of Bakersfield Water Resources department. This file shall include a grading plan, a water plan, lot line bearings and distances, and a legal description of lot(s) to be used for any domestic water facility site(s). A USGS benchmark will also be referenced on the plans, and if street plans are approved the same USGS benchmark should be used.

6. NON-PAYMENT OF FEES. Failure to pay Water Availability Fees as required hereunder shall constitute a breach of this Agreement. Should breach occur, CITY may, in addition to all other remedies allowed in law or equity, stop or refuse further delivery of domestic water and fire protection to the PROPERTY, until such time as satisfactory

payment of all fees are made, and CITY may, at CITY's option, foreclose on any security interest given as security for fee payment.

7. REMEDIES. The remedies provided in this Agreement are cumulative and are in addition to any other remedies in law or equity which may be available to CITY. The election of one or more remedies shall not bar the use of other remedies unless the circumstances made the remedies incompatible.

8. GROUNDWATER. OWNER shall record a covenant for each lot prohibiting the OWNER or owners of the real property from pumping and taking groundwater from the PROPERTY for any use off the PROPERTY; or, however, such pumping and taking may be carried out by the authorized urban water purveyor which provides water services to the subdivided land, or any county-wide governmental entity with water banking powers, where such pumping is part of an adopted water banking program that will not have a significant adverse impact on groundwater levels or diminish the quality of water underlying the subdivision. The OWNER or owners of the real property shall waive their right to protest such prohibition. Covenant(s) shall also stipulate that if the water usage of the lot exceeds ten percent (10%) of the current estimated usage as based upon the current version of Standards and Specifications for Domestic Water systems, a new agreement with CITY will need to be fully accepted and executed before such change in demand is allowed.

9. WATER WELLS. If a water well has been identified as needed or required in the conditions of approval or site plan review set forth by CITY then the ownership of said well site location shall be transferred or established to the satisfaction of CITY before any connection to existing water transmission facilities or inspection of water pipe / connections will be done.

10. INDEMNITY. OWNER shall indemnify, defend, and hold harmless CITY, its officers, agents and employees against any and all liability, claims, actions, causes of action or demands whatsoever against them, or any of them, before administrative or judicial tribunals of any kind whatsoever, arising out of, connected with, or caused by OWNER'S employees, agents or independent contractors or companies in the performance of, or in any way arising from, the terms and provisions of this Agreement whether or not caused in part by a party indemnified hereunder, except as limited by California Civil Code Section 2782.

11. TITLE. OWNER shall have no title to, or ownership interest in, the CITY Domestic Water System or any part thereof whatsoever.

12. NOTICES. All notices relevant to this Agreement shall be given in writing and shall be sent by registered or certified mail, postage prepaid and addressed to the party to whom such notice is given at the following respective addresses:

To CITY: CITY OF BAKERSFIELD
Water Resources Department
1000 Buena Vista Road
Bakersfield, California 93311
ATTENTION: Water Resources

To OWNER: **OWNER NAME**
OWNER ADDRESS
OWNER CITY, STATE ZIP
OWNER E-MAIL
OWNER PHONE NUMBER

13. NATURE OF SERVICE. It is specifically recognized and intended by the parties hereto that in performing its obligations under this Agreement, OWNER shall not offer or perform any service on behalf of CITY unless specifically agreed to herein.

14. CORPORATE AUTHORITY. Each individual executing this Agreement represents and warrants they are duly authorized to execute and deliver this Agreement on behalf of the corporation or organization named herein and that this Agreement is binding upon said corporation or organization in accordance with its term.

15. COMPLIANCE WITH ALL LAWS. OWNER shall, at OWNER'S sole cost, comply with all of the requirements of municipal, state and federal authorities now in force, or which may hereafter be in force pertaining to this Agreement and shall faithfully observe in all activities relating to or growing out of this Agreement all municipal ordinances and state and federal statutes, rules or regulations now in force or which may hereafter be in force.

16. NO WAIVER OF DEFAULT. The failure of any party to enforce against another provision of this Agreement shall not constitute a waiver of that party's right to enforce any provision at a later time, and shall not serve to vary the terms of this Agreement.

17. ASSIGNMENT. Neither this Agreement nor any rights, interests, duties, liabilities, obligations or responsibilities arising out of, concerning or related in any way to this Agreement (including, but not limited to, accounts, actions, causes of action, claims, damages, demands, liabilities, losses, obligations, or reckonings of any kind or nature whatsoever, for compensatory or exemplary and punitive damages, or declaratory, equitable or injunctive relief, whether based on contract, equity, tort or other theories of recovery provided for by the common or statutory law) may be assigned or transferred by any party. Any such assignment is prohibited, and shall be unenforceable and otherwise null and void without the need for further action by the non-assigning party or parties.

18. BINDING EFFECT. The rights and obligations of this Agreement shall inure to the benefit of, and be binding upon, the parties to the contract and their heirs, administrators, executors, personal representatives, successors and assigns.

19. MERGER AND MODIFICATION. This Agreement sets forth the entire agreement between the parties and supersedes all other oral or written provisions. CITY shall have the sole right to terminate this agreement in whole or in part with or without cause at any time without the permission of OWNER upon 30 days written notice by the Water Resources Manager until such time as a permanent legal connection to the CITY water system is established.

20. EXECUTION. This Agreement is effective upon execution. It is the product of negotiation and all parties are equally responsible for authorship of this Agreement. Section 1654 of the California Civil Code shall not apply to the interpretation of this Agreement.

21. NON-INTEREST. No officer or employee of CITY shall hold any interest in this Agreement (California Government Code section 1090).

22. TAX NUMBERS.

OWNER's Federal Tax ID No. **FED TAX ID NUMBER**
OWNER is a corporation? **YES** _____ **NO** _____
(Please check one)

IN WITNESS WHEREOF, the parties thereto have executed this Domestic Water Service Agreement in the day and year first-above written.

"CITY"
CITY OF BAKERSFIELD

By:_____
HARVEY L. HALL
Mayor

"OWNER"

By:_____

Print Name: _____

Title: _____

APPROVED AS TO CONTENT:
WATER RESOURCES MANAGER

By:_____
ART CHIANELLO
Water Resources Manager

"PROPERTY OWNER"

By: _____

Print Name: _____

Title: _____

APPROVED AS TO FORM:
VIRGINIA GENNARO
City Attorney

By:_____
VIRGINIA GENNARO
City Attorney

COUNTERSIGNED:

By:_____
NELSON SMITH
Finance Director

MAINLINE EXTENSION AGREEMENT

WATER MAINLINE EXTENSION REFUND AGREEMENT

THIS AGREEMENT, made and entered into this _____ day of _____, 20__, by and between the person or persons listed in paragraph 1 hereof, hereinafter collectively referred to as "Applicant," and CITY OF BAKERSFIELD, a municipal corporation, hereinafter referred to as "City."

RECITALS

WHEREAS, the Applicant is the developer of that certain subdivision of real property situate, laying and being in the County of Kern, State of California, which is known as _____ in accordance with the map thereof filed in the Office of the County Recorder of said County on the day of _____ 20__, in Volume _____ of Maps at Page ___ and ___, and which is hereinafter referred to as the "Subdivision"; and

Applicant is now selling or proposes in the near future to sell lots in the Subdivision and/or Parcel Map and to this end desires to have water service available in the Subdivision and/or Parcel Map through and by means of mains and appurtenances, and by services (including service pipes, fittings, gates and housings thereof, and meter boxes), hereinafter referred to as the "Facilities," to be installed therein substantially as shown on that certain map prepared by Applicant attached hereto, marked Exhibit "A", and by this reference made a part hereof; and

Installation of the Facilities and the furnishing of water service by means thereof are necessary and valuable adjuncts to the sale of lots in the Subdivision, and will materially increase the value of said lots; and

Upon the terms and conditions herein set forth, Applicant is willing to install the Facilities, or cause the same to be installed, at its own expense, all in accordance with the provisions hereinafter set forth; and

Upon the terms and conditions herein set forth, City is willing to acquire the Facilities and is willing to furnish water service int he Subdivision and/or Parcel Map through and by means thereof at the rates and in accordance with the rules of City now in force or that may from time to time be lawfully established.

NOW, THEREFORE, for and in consideration of the premises and of the mutual covenants, agreements, terms and provisions herein contained, it is agreed as follows, to wit:

1. Applicant. The names, addresses and descriptions of the person or persons herein collectively referred to as "Applicant" are as follows:

Name	Address	Description

2. Applicable Rule. This agreement is entered into pursuant to the requirements and in accordance with the form of agreement and the various applicable provisions of City's Main Extension Rule, as amended, hereinafter referred to as the "Rule," in effect and on file with the City; a copy of the Rule is attached hereto, marked Exhibit "B" and by this reference made a part hereof. This agreement does not, therefore, require specific authorization of said City to carry out its terms and conditions.

3. Applicant's Deposit. City's cost relative to preparing or reviewing plans, specifications and cost estimates for the Facilities is $_____ and City's cost in supervising and inspecting installation of the Facilities is $_____. City hereby acknowledges receipt from Applicant of $_____, representing the total of said costs. Upon completion of installation of the Facilities, City will connect, or cause to be connected, the same to its existing mains and submit a

statement of the cost thereof to Applicant, which sum Applicant agrees to pay promptly to City. The aggregate amount of the foregoing costs is hereinafter referred to as Applicant's Deposit.

4. Installation of Facilities.

(a) Applicant agrees to install the Facilities, or cause the same to be installed, at its own expense on or before _____, 20__. The Facilities shall be installed strictly in accordance with the specifications attached hereto, marked Exhibit "C" and by this reference made a part hereof, and the installation thereof shall be subject to the approval of City in all respects. The Facilities shall installed Applicant or by a contractor, hereinafter referred to as "said contractor," selected by Applicant. City will perform, or cause to be performed, the work of connecting the Facilities to City's existing mains at the points designated on Exhibit "A" hereto.

(b) Installation of the Facilities shall be subject to the inspection and approval of City in all respects.

(c) Title to the Facilities shall vest in City in accordance with the provisions of paragraph 6 hereof.

(d) Applicant agrees to reimburse City upon demand for the cost to City of all replacements and repairs to the Facilities made necessary within one (1) year from completion of installation thereof by reason of defective materials or workmanship; and such reimbursement shall not be subject to refund hereunder. City's acceptance of the Facilities, as provided in paragraph 6 hereof, shall under no circumstances be deemed to constitute approval of such materials and workmanship for purposes of the preceding sentence.

(e) In the event Applicant prior to City's acceptance of the Facilities, as provided in paragraph 6 hereof, shall be unable to determine the size or location of any service (including service pipe, fittings, gates and housings therefor, and meter boxes) required in the Subdivision and/or Parcel Map, Applicant, or User, shall deposit with City the cost of such service at the time service is requested, and City shall install, or cause to be installed such service. The amount of any such deposit so made by Applicant or User shall be added to Applicant's Advance Subject to Refund determined pursuant to the provisions of paragraph 9 hereof.

5. Indemnity; Insurance.

(a) City shall not be responsible or held liable in any manner whatsoever for any injury or damage which may be done to any person or property in the course of installation of the facilities by or on behalf of Applicant or which may result from such installation, and Applicant agrees to indemnify City and hold free, safe and harmless of, from and against any and all liability for the death of, or injury to, any person and for the loss of, or damage to, any property which may arise by reason of acts done or omitted to be done in the course of installation of the Facilities by or on behalf of Applicant or which may result from such installation, and Applicant further agrees to reimburse City upon demand for all costs and expenses which City may incur in resisting any claim which may be made against City for any such injury or damage to any person or property. Applicant expressly agrees that the agreements contained in this paragraph shall survive the performance of the remainder of this agreement and shall remain in full force and effect notwithstanding such performance. Applicant further agrees that during the period beginning with the commencement of construction of the Facilities and terminating upon final acceptance of the same by City, the following insurance will be maintained in full force and effect by Applicant or said contractor (if the Facilities are to be installed by said contractor) without cost or expense to City: (i) Bodily injury liability insurance with limits of not less than Three Hundred Thousand Dollars ($300,000) per person and Five Hundred Thousand Dollars ($500,000) per occurrence, and (ii) property damage insurance with a limit of not less than One Hundred Thousand Dollars ($100,000) per accident, insuring City against any and all liability for the death of or injury to any person and for the loss of or damage to any property, respectively, which may arise by reason of acts done or omitted to be done in the course of installation of the Facilities or which may result form such installation, and further insuring City against all costs and expenses incurred by City in resisting any claim which may be made against City for any such injury or damage to any person or property. Each such policy (A) shall be issued by an insurance company approved in writing by

City, which is qualified to do and doing business in the State of California, (B) shall name City as an additional insured, (C) shall specify that it acts as primary insurance and that no insurance effected by City shall be called upon to cover a loss under the policy so procured or caused to be procured by Applicant, (D) shall provide that the policy shall not be canceled or altered without thirty (30) days' prior written notice to City and (E) shall otherwise be in form satisfactory to City. Each such policy or a certificate thereof shall be delivered to City concurrently with execution of this agreement.

(b) An endorsement or a certificate thereof to the workmen's compensation insurance policy of Applicant or said contractor (if the Facilities are to be installed by said contractor) providing that the underwriter thereof waives all right of subrogation against City by reason of any claim arising out of or connected with installation of the Facilities shall be delivered to City concurrently with execution of this agreement. Said endorsement shall provide that it shall not be canceled or altered without thirty (30) days' prior written notice to City.

6. Title to Facilities. Title to each part or portion of the Facilities shall pass to City forthwith as each such part or portion thereof shall be installed regardless of whether the same shall be installed by Applicant or said contractor and regardless of whether the same shall be attached to the balance of City's system, provided, however, that such passage of title shall under no circumstances be deemed to constitute acceptance by City of the Facilities as installed in accordance with said specifications, Exhibit "C" hereto. Such acceptance may only be effected by appropriate written notice from City to Applicant. Applicant warrants that upon such passage of title, the title shall be free and clear of and from any and all liens, charges and encumbrances whatsoever.

7. Street Grades. If the Facilities are installed in easements or right-of-ways where final grades have not been established or in streets whose grades have not been brought to those established by public authority prior to acceptance by City, Applicant, upon written notice by City, shall deposit with City forthwith the estimated cost, as determined by City, of relocating, raising or lowering the Facilities upon establishment of final grades. Adjustments of any difference between the amount so deposited and the actual cost of relocating, raising or lowering the Facilities shall be made within ten (10) days after City has ascertained such actual cost. The net deposit representing actual cost shall not be subject to refund. City will refund the entire deposit relating to such proposed relocation, raising or lowering when appropriate authority determines that such displacements are not required.

8. Applicant's Bond. Concurrently with execution of this agreement Applicant shall deliver to City a surety bond in the aggregate amount of $_____ in form satisfactory to City, issued by a bonding company approved in writing by City which is qualified to do and doing business in the State of California guaranteeing unto City (a) the performance by Applicant and said contractor of all the obligations contracted to be performed hereunder, (b) installation of the Facilities in accordance with the provisions hereof, (c) vesting in City of title to the Facilities in accordance with the provisions hereof, (d) reimbursement of the cost to City of all replacements and repairs to the Facilities made necessary within one (1) year from completion of installation thereof by reason of defective materials or workmanship, and (e) payment in full by Applicant or said contractor of the claims of all persons performing labor upon or furnishing materials or power to be used in the Facilities.

9. Applicant's Advance Subject to Refund. Applicant agrees that promptly upon completion of installation of the Facilities in accordance with said specifications, Exhibit "C" hereto, and acceptance of the same by City, Applicant will, at its own expense, furnish to City a reasonably detailed statement of the actual construction cost of the Facilities, including in said cost, (a) Applicant's Deposit, (b) the cost, if any, to Applicant of complying with the insurance requirements of paragraph 5 hereof, and (c) the cost, if any, to Applicant of the bond required by paragraph 8 hereof. The total amount of said actual cost as shown by said statement, or the sum

of $_____ (being the price quoted by City to Applicant in City's detailed estimate of the cost of installation of the Facilities), whichever is the lesser, shall be conclusively deemed to be the actual construction cost of the Facilities and is herein referred to as Applicant's Advance Subject to Refund.

10. Refund. Provided that Applicant is not in default hereunder, City agrees to make refunds hereunder to Applicant or such other party as may be entitled thereto in cash, without interest, for a period not to exceed forty (40) years from the date hereof in equal annual payments of 2 1/2% (two and one-half percent) of the advance until the principal amount of the contract has been fully repaid. Refund shall be made not later than June 30 each year beginning the year following execution of this agreement.

11. Service from Facilities. The Facilities were designed to serve _____ customers as shown on Exhibit "A" hereto.

12. Groundwater Rights. Applicant shall prepare and record an instrument or instruments that will quitclaim, grant and convey to City the rights, title and interest in the underlying groundwater, that is upon, in, under, produced from or located beneath said sub-division or parcel.

13. City's Right to Offset. In the event Applicant shall become entitled to a refund under the provisions of paragraphs 7, 10, or 11 of this agreement, City shall have the right at such time to offset against the amount then due Applicant hereunder the total amount of any indebtedness then due or owing by Applicant to City.

14. Notices. Any notice which it is herein provided may or shall be given by either party to the other shall be deemed to have been duly given when deposited in the United States mail, registered or certified, postage prepaid and addressed to the party to whom such notice is given at the following respective addresses:

To Applicant:

To City: City Hall
1600 Truxtun Avenue
Bakersfield, CA 93301

Either party, by notice given as hereinbefore provided, may change the address to which notice shall thereafter be addressed.

15. Nature of Obligations; Assignment. If more than one person is named in Paragraph 1 hereof, the obligations of the persons executing this agreement as Applicant shall be joint and several. Until Applicant shall notify City in writing to the contrary, all refunds hereunder shall be paid by City to _____. Applicant may assign this Agreement upon written notice to City at any time following determination of the amount of Applicant's Advance Subject to Refund. Any such assignment shall apply only to those refunds hereunder which become due more than thirty (30) days after the date of receipt by City of such notice of assignment. City will not make any single refund payment hereunder to more than one person.

16. Successors and Assigns. Subject to the provisions of the preceding paragraph 14, this agreement shall inure to the benefit of and shall bind the respective heirs, executors, administrators, successors and assigns of the parties hereto.

17. Jurisdiction of City. This Agreement, except for refund provisions, shall at all times be subject to such changes or modifications by the City of Bakersfield as said City may from time to time direct in the exercise of its jurisdiction.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement in duplicate the day and year first-above written.

CITY OF BAKERSFIELD WATER BOARD DOMESTIC WATER ENTERPRISE

APPROVED AS TO FORM:

By_____
Water Resources Manager

_____
City Attorney

COUNTERSIGNED:

Applicant

_____
Finance Director

By_____

DEPARTMENT FEE SCHEDULE

WATER AVAILABILITY FEES:

Prior to final recordation of the tract/parcel map for the subdivision, water availability fees for water service facilities are due and payable. Fees are authorized by Bakersfield Municipal Code 14.04.120 (B.) and set by the City of Bakersfield Water Board with concurrence of the Bakersfield City Council. The fee are subject to change at the time of recordation. The fees may be paid upon further sub-division or phasing of the parcels.

EXCESS FIRE FLOW FEES:

Normal fire flows have been determined to be 2500 gallons per minute (g.p.m.). Due to land use of the parcel, the City and/or County Fire Departments require fire flows in excess of the 2500 g.p.m. limit. The method for determining the fees is as follows:

$0.50/g.p.m./acre in excess of 2500 g.p.m. or equivalent facilities.

These fees are due and payable prior to recordation of the tract/parcel map.

INSPECTION FEES:

Prior to any construction, developer is required to submit at least forty-eight (48) hours in advance:

Six (2) sets of **approved** plans.

Cost estimate or contractor bid spreadsheet showing award of contract to lowest responsible bidder.

Name, address & telephone # of party responsible for payment of Inspection fees.

The City of Bakersfield will invoice for inspection fee based on five percent (5%) of cost estimate or contractor bid spreadsheet. In addition, a $10.00 meter installation fee for each service will be assessed for two (2) inch and less in size.

ENGINEERING FEES:

The developer may utilize the City's domestic water operations contractor to provide engineering plans and specifications for construction of water facilities. The City of Bakersfield will invoice for engineering fees based on four percent (5%) of the estimated total installed cost of the water facilities.

SCHEDULE OF RATES

EXHIBIT "A"

City of Bakersfield
Water Resources Department Domestic Water Division
Ashe, Fairhaven and Riverlakes Ranch Service Areas

Schedule of Rates

General Metered Service	Current Rates	
	Within City Limits	Fairhaven & Unincorpo-rated Areas
Quantity Rates:		
Per 100 cubic ft/month	$ 0.94	$1.18

Monthly Readiness-To-Serve Charge:			
5/8" x 3/4"	Service	$ 9.88	$ 12.85
1"	Service	$ 15.06	$ 19.58
1-1/2"	Service	$ 22.98	$ 29.87
2"	Service	$ 31.28	$ 40.67
3"	Service	$ 57.80	$ 75.14
4"	Service	$ 84.02	$ 109.22
6"	Service	$ 151.00	$ 196.30
8"	Service	$ 232.12	$ 301.75
10"	Service	$ 319.95	$ 415.94

Reconnection Fees	
Collect @ Door	$15.00
Reconnection	$25.00
After Hours	$65.00
Cage & Lock	$30.00
NSF	$10.00

Monthly Private Fire Protection Service Charge:			
1-1/2"	Connection	$ 9.33	$ 12.13
2"	Connection	$ 12.44	$ 16.17
3"	Connection	$ 18.66	$ 24.25
4"	Connection	$ 24.87	$ 32.34
6"	Connection	$ 37.30	$ 48.49
8"	Connection	$ 49.74	$ 64.66
10"	Connection	$ 62.17	$ 80.83
12"	Connection	$ 74.61	$ 97.00

"Monthly Readiness-To-Serve Charge" is applied to all services and any quantity of water used is an additional charge computed at the quantity rate.

Conditions of service remain the same.

S:RATESHEET-2016

CONTRACTOR CHECKLIST

CHECKLIST FOR CONTRACTOR WORK ON
CITY OF BAKERSFIELD (CBK) DOMESTIC WATER SYSTEM

Contractor must supply to California Water Service (CWS) prior to start of construction:

1. Contractor must provide company a photocopy of a valid license issued by the State of California for the construction of water supply mains and related facilities. Acceptable classifications will consist of either an "A" license (General Engineering Contractor) or a "C-34" license (Pipeline Contractors).

2. Contractor must carry the following insurance: bodily injury and property damage liability insurance with limits of not less than One Million Dollars ($1,000,000.00) per occurrence, Two Million Dollars ($2,000,000.00) annual aggregate, insuring Company against any and all liability for the death of or injury to any person and for the loss or damage to any property, respectively, which may arise by reason of acts done or omitted to be done in the course of installation of the Facilities or which may result from such installation, and further insuring Company against all costs and expenses incurred by Company in resisting any claim which may be made against Company for any such injury or damage to any person or property. Each such policy (i) shall be issued by an insurance company approved by Company, which is qualified to do and doing business in the State of California, (ii) shall name Company as an additional insured, (iii) shall specify that it acts as primary insurance and that other insurance or self-insurance maintained by Company shall be excess only and not contributing with insurance provided by Contractor, (iv) shall provide that the policy shall not be canceled or altered without thirty (30) days' prior notice to Company, and (v) shall otherwise be in form satisfactory to Company. Each such policy or a certificate thereof shall be delivered to Company prior to start of any construction in connection with installation of the facilities.

   An endorsement or a certificate thereof to the workers' compensation insurance policy of Contractor providing that the underwriter thereof waives all right of subrogation against Company by reason of any claim arising out of or connected with installation of the Facilities shall be delivered to Company prior to start of construction. Said endorsement shall provide that it shall not be cancelled or altered without thirty (30) days prior written notice to Company.

3. Inspection of material. CWS must have 48 hours advance notice.

4. Bid or cost sheet for project.

5. Require 6 sets of plans and specifications. Plans must be signed and approved by City Water Resources Department and Fire Department staff.

6. Arrange for preconstruction meeting. CWS must have a minimum of 48 hours notice.

7. Preconstruction meeting must be completed prior to construction. Be prepared to explain the time line on specific phases of construction such as excavation, thrust block, service tie-ins, hydro tests, disinfection, etc.

Contractor must have completed and/or accomplished prior to tie-in to existing domestic water system:

1. Provide verification of a Will Serve Letter applicable to the property for which water is to be supplied from the City of Bakersfield Water Resources Department. Water Availability fees, Inspection fees, and meter set fees shall be payed for prior to connection to City Water mains.

2. Installation of facilities must be done in accordance with current City of Bakersfield "Standards and Specification for Domestic Water Systems" and City of Bakersfield or Kern County Fire Department approved plans. All field changes must be made as per current standards.

3. Fire hydrants shall typically be installed at property lines or at curb radius. If this is not clear, have the inspector approve location(s) prior to installation.

4. Notify CWS 24 hours prior to loading line and performing the hydro test. Four (4) hour test at 150 psi. If below 140 psi. at any time, repairs must be made and test shall be repeated.

5. Notify CWS 24 hours prior to flushing line(s). CWS shall observe flushing of line(s).

6. Bacteriological sample to be taken at CWS directed locations. Samples are not to be taken on Friday, Saturday or Sunday. Be advised that due to holidays and unanticipated days off, results of bacteriological samples may take several days. Re-sampling may be necessary if tests are positive. Do not schedule other events so tight as to rely on the approval and acceptance of the domestic water system.

7. All services, meters, valve boxes and valve casings shall be exposed and to design grade.

8. CWS must be advised 48 hours in advance of the tie-in. The tie-in must be observed by CWS. After tie-in call or FAX for meter sets - schedule up to five (5) days for CWS personnel to perform meter sets.

9. All fittings and valves must be chlorinated during tie-in.

10. ALL existing domestic facilities (valves, etc.) are to be operated by CWS personnel only. Contractors and their employees shall not operate any existing facility.

11. Be advised: Inspection of facilities is to be performed on normal work days (Monday-Friday, 7:30a.m. - 4:30p.m. Holidays excluded). Any work performed by Contractor on weekends or holidays is subject to excavation for inspection.

12. All domestic or irrigation service requests shall be generated through California Water Service Commercial Office, phone number 396-2400.

I have read and understand the above checklist. The purpose of this checklist is to point out the most commonly forgotten items to be performed by the Contractor. This list is not meant to be all inclusive. I have been provided with and am familiar with the current City of Bakersfield "Standards and Specification for Domestic Water Systems".

Signature: _____

Company: _____

Tract or Parcel Map No.: _____

Date: _____

STANDARD DETAILS

Plate No. W-1 - Standard pipe trench

Plate No. W-2 - Thrust block detail

Plate No. W-3 - Fire hydrant assembly

Plate No. W-3A – Typical water main & fire hydrant locations

Plate No. W-3B – Fire hydrant at parkway

Plate No. W-4 - Blowoff assembly - paved area

Plate No. W-5 – Combination air valve

Plate No. W-6 - Standard - blowoff assembly

Plate No. W-7 - Pipe bore & casing detail

Plate No. W-8 - Standard service connection - 1" to 2"

Plate No. W-9 - 3", 4", & 6" water service detail

Plate No. W-10 - 4" & larger turnout

Plate No. W-11 - Typical meter box location

Plate No. W-12 - Valve box detail

Plate No. W-13 - Canal crossing detail

Plate No. W-14 - Concrete saddle detail

Plate No. W-15 - Safety fence detail

Plate No. W-16 - Irrigation, fire service, and water service, requiring booster pump

Plate No. W-17 - Alternate air-gap installation requirements

Plate No. W-18 - Typical fire service detail

Plate No. W-19 – Under Foundation Riser detail