STRASBURG SANITATION & WATER DISTRICT

AMENDED AND RESTATED RULES AND REGULATIONS

WITH DESIGN STANDARDS

ADOPTED DECEMEBER 6, 2016

STRASBURG SANITATION & WATER DISTRICT

RULES AND REGULATIONS

The Board of Directors of the Strasburg Sanitation & Water District hereby declares that the following Rules and Regulations have been prepared and adopted to provide for the construction, administration and operation of the water and sanitary sewage systems of the District. The Rules and Regulations shall be effective on the date of adoption.

The Board of Directors reserves the right to make any lawful additions and/or revisions in these Rules and Regulations when and as they may become advisable to properly manage the District and to promote the peace, health, safety and welfare of the people residing in the District. These Rules and Regulations are supplementary to, and are not to be construed as, any abridgement of any lawful rights of the Board as outlined in the Colorado Revised Statutes governing special districts, including the right to disconnect or to refuse permission to connect any water or sewer service for violation of these Rules and Regulations or the plumbing code of the State of Colorado.

Adopted the 6th day of December, 2016

By: _____
President

Attest:

_____
Secretary

AMENDED AND RESTATED RULES AND REGULATIONS OF STRASBURG SANITATION & WATER DISTRICT

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SECTION 1 - GENERAL EXPLANATORY MATERIAL

1.1 AUTHORITY. The District is a quasi-municipal corporation and political subdivision of the State of Colorado, with those powers of a public or quasi-municipal corporation that are specifically granted for carrying out the objectives and purposes of the District under Article 1 of Title 32 of the Colorado Revised Statutes (the "Special District Act").

1.2 SCOPE. These Rules and Regulations have been adopted and promulgated pursuant to § 32-1-1001(1)(m), C.R.S. and shall be treated and considered as new and comprehensive regulations, governing the operations and functions of the District as of the effective date stated herein.

1.3 POLICY. It is hereby declared that the Rules and Regulations hereinafter set forth will serve a public use and are necessary to insure and protect the health, safety, prosperity, security, and general welfare of the Customers and residents of the District.

1.4 PURPOSE. The purpose of these Rules and Regulations is to provide for the orderly financing, control, construction, management, and operation of the water supply and distribution systems, the sanitary sewer collection and treatment systems, and transmission systems of the District, including additions, extensions and connections thereto.

1.5 INTENT OF CONSTRUCTION. It is intended that these Rules and Regulations shall be liberally construed to effectuate the general purposes set forth herein, and that each and every part thereof is separate and distinct from all other parts. Nothing contained herein shall be so construed as to prejudice or affect the right of the District to secure the full benefit and protection of any law which is now enacted or may subsequently be enacted by the Colorado General Assembly pertaining to the governmental or proprietary affairs of the District.

1.6 AMENDMENT. It is specifically acknowledged that the District shall retain the power to amend these Rules and Regulations as it deems appropriate and such amendments shall be entered in the minutes of the District and periodically incorporated in printed copies of these Rules and Regulations. Prior notice of these amendments shall not be required to be provided by the District when exercising its amendment powers.

1.7 DEFINITIONS. Unless the context indicates otherwise, the meaning of terms used herein shall be as follows:

> Actual Cost shall mean all direct costs applicable to the construction of a given facility, including surveys, preliminary and design engineering, construction, inspection, administrative, regulatory agency fees, bond fees, all required easements and/or rights-of-way, plan approval fees, "as-built" drawings, attorneys' fees, engineering fees, and other costs necessary for completion.
>
> Board of Directors shall mean the governing body of the Strasburg Sanitation & Water District.
>
> B.O.D. (Denoting 5-Day, 20 degrees centigrade Biochemical Oxygen Demand) shall mean the amount of oxygen which is utilized in the aerobic decomposition of sewage

under laboratory procedures in accordance with the current "Standard Methods for the Examination of Water and Wastewater."

Customer shall mean any person, company, partnership, corporation or governmental entity or agency authorized to use the District's water or sewer systems under a Tap Certificate or otherwise authorized by the Board of Directors or the Manager.

Developer shall mean the Person(s), firm, joint venture, partnership or corporation that is the owner or operator of land that seeks to have the land served by the District.

District shall mean the Strasburg Sanitation & Water District, acting through the Board of Directors or its designee.

Engineer shall mean the engineering firm, or duly authorized representative (engineer), designated by the District to act on its behalf in all engineering and related matters. This item includes an Inspector employed by the Engineer.

EQR This is an abbreviation for Equivalent Residential Unit, which is an average amount of water necessary to serve, or wastewater generated from, a single-family detached residential dwelling unit or equivalent with a 3/4" water tap.

Feasibility Study shall mean a study prepared at the expense of an applicant desiring water and/or wastewater service from the District that evaluates the financial and technical feasibility for a particular land development to connect to the centralized water and/or sanitary sewer system.

Industrial Waste shall mean the liquid wastes from industrial processes as distinct from sanitary sewage.

Inspector shall mean the Manager, Engineer, agent, officers, employees of the District or other person so designated by the Manager or Engineer to perform inspections pursuant to these Rules and Regulations.

Local Facilities are those facilities constructed by a Developer and dedicated to the District, which are generally designed to serve individual subdivisions or plats and which connect with a Water Main or Sewer Main in accordance with Appendix B hereto. Examples of such Local Facilities include water distribution systems and collector sewer lines, but do not include Service Lines.

Manager; District Manager shall mean the manager of the District or the District authorized facilities operator, or an authorized agent.

Owner shall mean the land's record title holder.

Oversize Costs are part of the costs of Local Facilities to be installed within, or for, a subdivision, but which the District has also assigned a transmission or collection function which results in the need for a larger pipeline. Oversize costs are the difference between the Actual Costs of the size line required by the District and the size required by the

Developer; however, for purposes of determining oversize, the minimum size shall be assumed to be 8-inch diameter for water and 8-inch for sanitary sewer. Engineering and inspection costs are assumed to be proportional to estimated or experienced construction costs. Incremental costs will be allowed for line fittings, valves, manholes and other appurtenances (if a size increase is required).

Person shall mean any individual, firm, company, association, society, corporation or group.

Regional Facilities shall mean those facilities generally serving all or a substantial portion of the District's service areas as a whole. Examples of Regional Facilities include water sources, water treatment plants and tanks, water and sewer transmission and collection lines, trunk sewers, sewage treatment plants, lift stations and outlet works.

Septic System shall mean a septic tank and leach field not connected to a public sewer.

Service Area shall mean the service area of the District as generally depicted on the map attached to the Service Plan, as now or hereafter amended.

Service Charges shall mean each of the charges and fees, excluding Sewer and Water Tap Fees and System Development Fees, identified in Appendix A, that the District adopts to inspect, maintain and operate the Regional Facilities and supply water and sewer service to Customers. The Service Charges may change from time to time at the District's discretion.

Service Line shall mean the privately owned sewer and/or water line connecting the Local Facilities or Main Lines to a building, unit or Customer and shall include the tap, building drain, corporation cock, and curb valve. The minimum sized service line for water shall be ¾" and the minimum sized service line for sanitary sewer shall be 4".

Service Plan shall mean the Service Plan or Statement of Purposes of the Strasburg Sanitation & Water District, as approved by the appropriate County, and as amended from time-to-time in accordance with Colorado law.

Sewer or Sewer Main shall mean a District owned sewer pipeline, carrying sanitary sewage or approved industrial wastes only, and shall be installed in a public street or easement.

Sewage shall mean any liquid waste containing animal or vegetable matter in suspension or solution from residences, commercial buildings, institutions and industrial establishments.

Shall is mandatory; may is permissive.

Suspended Solids shall mean the weight of filterable solids in milligrams present in one liter of Sewage.

System Development Fee shall mean the total of the Water System Development Fee and the Sewer System Development Fee as individually defined in the definition in Appendix A attached hereto. This fee is a one-time contribution required of new Customers (or existing Customers having a change of use requiring additional services or line capacities) to be used for capital investment in Regional Facilities.

Tap Application shall mean an application, in a form provided by the District, which is submitted to the District by a Developer, Owner, or other Person for the purpose of connecting to and receiving service from the District's water and/or sewer systems.

Tap Certificate shall mean written permission of the Board of Directors authorizing connection to a Water Main or Sewer Main of the District granting the applicant a license to use the water and sewer system or to receive water or sewer service from the system owned, operated or served by the District as the same is defined in the Rules and Regulations.

Tap Fee shall mean the cost of inspection of physical connection to District water or sewer systems, as set forth in Appendix A.

Water Main shall mean a District-owned water pipeline, carrying potable water only and shall be installed in a public street or easement.

Water Resource Charge shall mean the fee to be imposed on property within the District and/or included in the District in the future for development of the District's water resources. This fee is imposed if water rights conveyed to the District by the property owner or Developer are not adequate to serve the intended uses of the property in question. This charge is a one-time contribution required of new Customers (or existing Customers having a change of use requiring additional water usage) to be used for investment in water supplies for the District.

SECTION 2 - OWNERSHIP AND OPERATION OF FACILITIES

2.1 OWNERSHIP OF WATER AND RETURN FLOWS. The District shall have sole dominion, control, right and use of all water supplied through the water system, subject to reasonable, one-time use thereof by its Customers in compliance with applicable water service Tap Certificates and these Rules and Regulations. Such dominion and control shall continue without interruption as to all wastewater, return flows, runoff, sewage or tailwater attributable to or originating in water supplied through the water system. The District shall have the exclusive right to recapture such return flows or claim credit therefrom for exchange, replacement, augmentation, substitute supply, or any other lawful purpose, and the District's dominion and control over water shall continue to attach to all such return flows even after they return to the ground. All return flows from water supplied through the water system remain the property of the District. The District retains the sole authority to determine the yield of all water, water rights, and augmentation plans that are offered to the District for any purpose.

2.2 RESPONSIBILITIES OF DISTRICT FOR CONSTRUCTION OF FACILITIES. It is the District's responsibility to plan, finance, design, and construct all designated Regional Facilities. The District will only construct such facilities or portions thereof when the Board has made a determination that such construction is economically feasible. Such determination may require Owners/Developers to prepay or guarantee future payment of System Development Fees or provide such other guarantees as the Board may determine necessary.

2.3 RESPONSIBILITIES OF OWNER, DEVELOPER AND CUSTOMER FOR CONSTRUCTION OF FACILITIES. It is the Owner/Developer's responsibility to finance, design, and construct all Local Facilities. Such facilities shall be constructed in accordance with plans and specifications approved by the District's Engineer and the appropriate County or other entity having jurisdiction. The Owner/Developer shall pay the Actual Cost of all such facilities, including costs associated with the District Engineer’s review of the project.

It is the responsibility of the Customer or its builder to pay the Actual Cost and construct all Service Lines and appurtenances. Such Service Lines shall be constructed in accordance with standards approved by the District and the appropriate County, and must be inspected and approved by the District prior to use.

2.4 RESPONSIBILITIES FOR MAINTENANCE OF FACILITIES. After construction and upon acceptance by the District of the Local Facilities, the District will be responsible for the maintenance, operation, repair and replacement of the Regional and Local Facilities (except as provided during the warranty period).

Service Lines shall be maintained as described in Section 4.4 herein.

Each Customer is responsible for complying with the District's Cross-Connection and Backflow Control Regulation as set forth herein. Each Customer having boilers and/or other appliances on its premises, depending upon pressure or water in pipes, or on a continual supply of water shall provide, at its own expense, suitable safety devices to protect such Customer and such Customer's property against a stoppage of water supply or loss of pressure. The District

disclaims any liability or responsibility for any damage resulting from a Customer's failure to equip the Customer's property.

Water meters shall be the property of the District. The District shall, at its own expense, have the right to access, install, set, test, remove, repair or replace water meters. It shall be the duty of each Customer to notify the District's operator if the water meter for such Customer's property is defective. If any meter fails to register in any period, the Customer shall be charged the average monthly consumption, as shown by the meter for the same month during the preceding two (2) years or such amount as will most closely approximate actual usages, as determined by the District.

2.5 OWNERSHIP OF FACILITIES. All existing and future Regional and Local Facilities connected to the District's system and accepted for operation and maintenance by the District pursuant to these Rules and Regulations shall become and are the property of the District, unless any contract with an Owner or Customer expressly provides otherwise.

That portion of all Service Lines extending from the Local Facilities to each unit or building for each Customer that is connected to the District's water or sewer system is the property of the Owner/Customer, regardless of whether the District might construct, finance, pay for, repair, maintain or otherwise affect the Customer's Service Line(s). The construction of and connection of any Service Line shall be done in compliance with these Rules and Regulations, including the mandate that all Service Lines be inspected, for a fee paid by the Customer, by the District or its contractors prior to commencement of service. The Owner/Customer's ownership of the Service Line shall not entitle the Customer to make unauthorized uses of the District's systems once the Service Line has been connected. All uses of the Local Facilities, Service Lines, or any appurtenances thereto at any time after the initial connection to the District system shall be subject to these Rules and Regulations.

2.6 LIMITATION OF LIABILITY OF DISTRICT. No claim for damage shall be made against the District, its agents or contractors by reason of the following: Blockage in the system causing the backup of sewage; damage caused by "smoking" of lines to determine drainage connections to District lines; breakage of Water Main Lines or Sewer Main Lines by District personnel or others; interruption of water or sewer service and damage resulting therefrom; breaking of any collection or distribution line, pipe, valve or meter by any employee or contractor of the District; failure of the water supply; shutting off or turning on water; making of connections or extensions; damage caused by water running or escaping from open or defective faucets; burst Service Lines and other facilities not owned by the District; damage to water heaters, boilers or other appliances resulting from shutting water off, or for turning it on, or from inadequate or sporadic pressures, or for doing anything to the systems of the District deemed necessary by the Board of Directors or its agents. The District shall have no responsibility for notification to Customers of any of the foregoing conditions. The District reserves the right to temporarily discontinue service to any property at any time for any reason deemed necessary or appropriate by the Board of Directors or its designated representatives. The District shall have the right to revoke service to any property for violations of these Rules and Regulations in accordance with the procedures set forth in these Rules and Regulations.

2.7 RIGHT OF ENTRY. The District Manager, Inspector, agent, officers, employees of the District, or other Person so designated by the District Manager, bearing proper credentials and identification, shall be permitted to enter upon all properties served by the District for the purpose of inspection, observation, measurement, sampling, and testing, in accordance with the provisions of these Rules and Regulations. The granting of Right of Entry by the Owner, Customer, and occupants is a condition precedent and a condition subsequent to the provision of water and sewer service by the District.

2.8 MODIFICATION, WAIVER AND SUSPENSION OF RULES. The Board or the District Manager acting on instructions of the Board shall have the sole authority to waive, suspend, or modify these Rules and Regulations, and any such waiver, suspension, or modification must be in writing, signed by the Board or the District Manager. Such waiver shall not be deemed an amendment of the Rules and Regulations. No waiver will be deemed a continuing waiver.

2.9 WATER RIGHTS. All Owners within the boundaries of the District are deemed to have given their consent to the District for the withdrawal and use of any and all groundwater underlying the District. The District shall be deemed to own all Water Rights for property located within the District, unless a written agreement stating otherwise is executed by the District and the property owner.

SECTION 3 - CONDITIONS OF USE OF UTILITY SYSTEMS

3.1 WHO MAY USE. The District will use its best efforts to provide water in sufficient quantity and of acceptable quality for its Customers. The District cannot and does not guarantee a quantity of water to be available to meet the demand that may arise nor does it guarantee water pressures sufficiently high to operate sprinkler systems, automatic household appliances or other equipment dependent upon water pressure for their operation. Accordingly, it can be anticipated that from time to time certain limitations and conditions may be imposed by the District with respect to the use of the water system and the ability to make new connections when requested.

Potable water and sanitary sewer services will be furnished subject to the District's Rules and Regulations and only to property included within, and subject to fees, charges and taxation by the District. It shall be incumbent upon the applicant to furnish satisfactory evidence that the property served is within the boundaries of the District whenever such evidence is requested by the District. Satisfactory evidence shall consist of a tax receipt or certification in lieu thereof received and signed by the County Treasurer. An exception to this rule requires a special service contract approved by the Board.

3.2 COMMITMENT TO SERVE. A request submitted to the District by an Owner/Developer for a commitment to serve the property with water and/or sewer services will be granted by the District only upon compliance with all Rules and Regulations and payment of all Tap Fees, System Development Fees, Service Charges, and other applicable fees.

3.3 INCLUSIONS. A Person owning land outside the boundaries of the District who desires service must include the entirety of the parcel for which service is requested within the boundaries of the District. A condition of inclusion is that the property owner dedicate all water rights appurtenant to the land to be included. In the event such water is not sufficient to provide service to the property then the Person must make a cash payment in lieu of such dedication, the cash in lieu shall be paid according to the schedule of rates and fees attached hereto as Appendix A. A formal request for inclusion within the District shall be made to the District on its standard form, accompanied by a non-refundable payment in an amount as set forth in the District's fee schedule for legal fees and the estimated costs of publication. Any additional costs or fee which may be incurred by the District shall be assessed and paid prior to consideration of the inclusion of the property by the Board.

3.4 SERVICE OUTSIDE THE DISTRICT. No service shall ever be provided to property outside of the District except pursuant to the terms of a written agreement with the District approved by the Board of Directors. This is an exception to the general rule that the property must be included within the boundaries of the District, and such exception is in the District's sole discretion. Charges for furnishing service outside of the District shall be at the discretion of the Board of Directors, but no service shall be furnished to property outside of the District unless the charge therefor equals at least the sum of the cost of service, the estimated mill levy, the Water Resource Charge, and the System Development Fees for which such property would be responsible if it were a part of the District. Any service provided to property shall be subject to these Rules and Regulations and any other agreements that the Board believes is in the best interest of the District. In every case where the District furnishes service to

property outside the District, the District reserves the right to discontinue the service when, in the judgment of the Board of Directors, it is in the best interest of the District to do so. An exception to this rule requires specific reference in a service contract approved by the Board of Directors.

3.5 APPLICATION FOR SERVICE. All applicants for connection to and service by the District's systems must submit a Tap Application to the District and pay required fees and deposits. No applicant shall begin work to connect to the District's systems until the Tap Application is approved by the District. A duplicate copy of the approved Tap Application must be filed with the Building Department of the County in which the property is located. The location of the water meter and the remote reading device shall be indicated on all applications for service.

If a fire protection water sprinkler system is to be used, a plan of the system is to accompany the Tap Application and is subject to the approval of the District. All fire sprinkler systems shall meet NFPA requirements and additionally shall meet the requirements of applicable fire protection district, County, and State building and fire protection codes.

No taps into the District's systems will be permitted or made during non-business hours without written approval of the District Manager.

All plan sets that provide for construction shall have the following disclaimer note placed on the cover sheet immediately adjacent to the District approval block: "The Strasburg Sanitation & Water District does not take any liability nor maintenance responsibility for foundation." All plan sets for construction within the District shall also have a review acknowledgment signature block for the District.

All information requested on the Tap Application must be completed, and a diagram of the meter and tap location included. Should any information disclosed on the application prove at any time to be false, or should the applicant omit any information, the District shall have the right to reassess the System Development Fees originally charged at the rate current to the discovery by the District of the false or omitted information, and/or disconnect the service in question, and/or back-charge the property in question for service fees that may be due and owing, and/or charge any other or additional fee or penalty specified in these Rules and Regulations. Any reassessment shall be due and payable, together with any penalties or other additional fees charged, and together with late fees, penalties and interest at the maximum legal rate on the entire balance, upon and from the date of the original Tap Application.

The District may require an applicant to pay a deposit at the time a Tap Application is submitted to defray the anticipated costs associated with the District's review of the project, including, but not limited to, expenses related to engineering, legal, title work, and filing fees. The amount of the deposit shall be determined by the Board and set forth in Appendix A, as may be amended from time to time. In the event the deposit amount is depleted prior to final issuance or denial of a Tap Certificate, the District may require additional amounts be deposited until further work is performed by the District. Deposit amounts not incurred by the District shall be refunded to the applicant after final approval or denial of a Tap Certificate.

Once all work that is the subject of the Tap Application has been completed, the District will perform a final inspection of the work. If the District approves the work, it will sign the Tap Application, which shall act to convert the Tap Application into a Tap Certificate.

3.6 FAILURE TO CONNECT. The Customer's right to connect to the District systems shall terminate and any System Development Fees paid shall be forfeited if the tap is not connected to the District's facilities within 12 months of the payment of the System Development Fees unless (1) the property owner begins to pay and continues to pay the minimum service charge imposed for that tap for each and every month, commencing with the first billing cycle after the 12-month period has passed, or (2) the property owner and District have entered into a written agreement providing for a connection time longer than 12 months.

3.7 DENIAL OF APPLICATION. The District reserves the exclusive right to deny application for service when, in the opinion of the Board, the service applied for would create an excessive seasonal or other demand on the Regional or Local Facilities. Denial may also be based upon an unresolved obligation between the District and the applicant, inadequate documentation of easements for Main Lines or other facilities that service the property, failure to comply with the requirements of these Rules and Regulations, or any other reason the Board of Directors feels is in the best interests of the District.

3.8 CANCELLATION OF APPLICATION. The District reserves the right to revoke any prior approval of a Tap Application before service has been provided, and thereafter for any violation of these Rules and Regulations or violation of any contractual obligation to the District by the Customer.

3.9 MOVED OR DESTROYED BUILDINGS. When buildings are moved or destroyed, the original tap authorization shall terminate and no credit shall be authorized for System Development Fees and other fees paid previously with respect to said building. However, the original tap shall remain in good standing, provided that uninterrupted payment of the District's minimum service charge (as the same may be amended from time to time) is timely made. If payment of the minimum service charge ceases for any reason, said tap shall be in violation of these Rules and Regulations and the tap shall be revoked. Non-payment for over thirty (30) days of the billing cycle shall be considered cessation of payment of the minimum service charge resulting in revocation of the tap.

3.10 CHANGE IN CUSTOMER'S EQUIPMENT, SERVICE OR USE OF PROPERTY. No change in the Customer's equipment, service or use of property served shall be made without the prior notification of and approval by the District. Any such change that, in the opinion of the District, will increase the burden placed on the District's systems shall require a redetermination of the System Development Fees, Water Resource Charge, monthly service charge, and other fees of the District, and a payment by the Customer of any additional amount of such fees that result from the redetermination. System Development Fees and/or Water Resource Charges previously paid with respect to the property in question shall be credited against the redetermined System Development Fees and/or Water Resource Charges so that only the unpaid portion of any redetermined fees and charges shall be due; provided, however, that redeterminations resulting in a conclusion that the System Development Fees, Water Resource Charges monthly service charges, and other fees of the District, if assessed currently, would be in an amount less than that originally paid shall not result in a refund or credit of any kind to the Customer. The District may also require physical changes in the facilities through which the services connect to the property as a result of the Customer’s proposed changes. Any violation of these requirements shall result in the assessment of an unauthorized connection fee, as provided

in Appendix A, and possible revocation of services. The District shall take those steps authorized by these Rules and Regulations and Colorado law regarding the collection of said fees. Any Customer believed to have changed the equipment, service, or use of their property in violation of these Rules and Regulations shall be notified of such belief by the District, and shall be notified of the District's intent to assess any additional System Development Fees, service or unauthorized connection fees, and shall be afforded ten (10) business days in which to respond to the District's notice. Failure to respond as required herein within the ten (10) day period shall be deemed a conclusive admission of the nature and extent of the change, and such additional System Development Fees, service and unauthorized connection fees as are deemed appropriate by the District shall be assessed against the property in question and shall be collected as provided under these Rules and Regulations and Colorado law. To defer the collection of said fees, and as a prerequisite to the right to hearing as provided for in these Rules and Regulations, any response by the Customer must, in addition to being provided within ten (10) business days, include permission to make such inspection of the property in question as the District Manager or his representatives deem necessary to clearly establish the nature of equipment, service and use of the property in question.

3.11 UNAUTHORIZED CONNECTIONS AND FEES. No person shall be allowed to connect onto the sewer or water systems or to enlarge or otherwise change equipment, service or use of property without prior payment of System Development Fees, approval of application for service, and adequate supervision and inspection of the taps by District representatives. Any such connection, enlargement, or change shall be deemed an unauthorized connection. Upon the discovery of any unauthorized connections, the then-current System Development Fees shall become immediately due and payable, and the property shall automatically be assessed an unauthorized connection fee.

The unauthorized connection fee is an amount equal to twice the then-current System Development Fees that would be due for such property. The District shall send written notice to the Owner(s) of the property benefited by such connections stating that an unauthorized connection has been made between the Owner(s)' property and the District facilities. The Owner(s) shall then have ten (10) business days from the date of the notice to pay the then-current System Development Fees. If that fee is paid within the ten (10) business day period, the unauthorized connection fee shall be waived by the District. In the event the then-current System Development Fees are not paid within the ten (10) business day period, a notice of revocation of service shall be sent and service shall be disconnected pursuant to these Rules and Regulations.

Once discontinued, service may be returned to the property only upon receipt by the District of both the unauthorized connection fee and the then-current System Development Fees, and any turn-on/turn-off fees, service charges or any other charges that may be due. The District also reserves such rights of foreclosure as may be provided by law for the collection of unpaid fees and charges of the District. To defer the collection of said fees, and as a prerequisite to the right to hearing pursuant to these Rules and Regulations, any response by the Customer must, in addition to being provided in ten (10) business days, include permission to make such inspection of the property in question as the District deems necessary to conclusively establish clearly the nature of equipment, service, and use of the property in question. The District may exercise any and all rights provided by law, including foreclosure rights, for the collection of unpaid fees and charges of the District.

3.12 REVOCATION OF SERVICE. Service shall be revocable by the District upon non-payment of any valid fees or charges owing to the District or upon any violation of these Rules and Regulations. In the event of a proposed revocation of service, the Customer shall be given not less than ten (10) business days advance notice in writing of the revocation, which notice shall set forth:

a. The reason for the revocation;

b. That the Customer has the right to contact the District, and the manner in which the District may be contacted for the purpose of resolving the obligations; and

c. That there exists an opportunity for a hearing in accordance with Section 7 of these Rules and Regulations.

If the obligations are not resolved or a request for a hearing, accompanied by a deposit equal to the amount of any fees and charges specified in the notice, is not received by the District within ten (10) business days, the District shall disconnect the service and the Customer shall be assessed the cost of the disconnection. The customer's deposit for service, if any, shall be applied against the outstanding obligation.

3.13 REVOCATION OF TAP RIGHTS FOR NON-PAYMENT. The right to connect to the District's system and receive services shall be revocable by the District upon non-payment of any District fees owing to the District and remaining unpaid for a period of ninety (90) days, whether or not the Customer has actually connected to the District's system. Such revocations shall be conducted in accordance with Section 3.12 above. If the right to connect to the District's systems is revoked, the Customer may reacquire such tap rights only by reapplying for service in accordance with Section 3.5 above and after paying all fees due and owing the District and the then-current System Development Fees charged by the District under these Rules and Regulations.

3.14 TURN-ONS/TURN-OFFS OF SERVICE. All turn-ons and turn-offs of water or sewer service through a curb valve on a Service Line that has been connected to the District's water or sewer system pursuant to a written Tap Certificate issued by the District shall be performed only by District personnel regardless of the ownership of the curb valve or Service Line and regardless of the circumstances respecting the turn-on or turn-off. The District shall assess a single turn-off/turn-on charge in an amount as set forth in its fee schedule as provided in Appendix A for any such turn-off and turn-on performed except when the service is performed for Customers requiring maintenance to their Service Line, in which case there shall be no charge. Except for those turn-offs/turn-ons specifically provided for by these Rules and Regulations, the District will provide this service only for (1) a tap for new construction, one time prior to the occupancy of the building served, and (2) for Customers requiring service to be turned off for maintenance of a Service Line. All other requests for a turn-off or turn-on of District service may be granted or denied by the Manager in his/her sole discretion. Violation of this Section and/or failure to pay the fee shall result in the assessment against the property served of a penalty as set forth in the District's fee schedule, in addition to the turn-on/turn-off fee, and in addition to the penalties provided for unauthorized tampering with the District's system in these Rules and Regulations.

3.15 JOINT SERVICE. Except with respect to services existing on the date of the adoption of these Rules and Regulations, water and sewer service shall be furnished jointly, unless separate service is specifically authorized by the Board.

SECTION 4 - WATER AND SEWER SYSTEMS

4.1 UNAUTHORIZED TAMPERING WITH SYSTEMS.

4.1.1 No unauthorized Person shall uncover, use, alter, disturb, or make any connection with or opening onto, use, alter, or disturb the potable water or sewer system without first obtaining a written Tap Certificate from the District. Unauthorized uses of the District's systems include, but are not limited to, an unauthorized turn-on or turn-off of potable water or a tampering with or in any way modifying any meter, even though the same may be performed on a privately owned and maintained service line. No Person shall maliciously, willfully or negligently, break, damage, destroy, uncover, deface or tamper with any portion of the District's system.

4.1.2 There shall be no tampering with water meters. If the Customer knows or has reason to believe that a water meter has been tampered with, bypassed, or is inaccurate or defective, the Customer shall notify the District within thirty (30) days. If the District is not notified within thirty (30) days, the Customer will be charged the highest monthly usage occurring during the twenty four (24) months prior to the first occurrence of tampering, bypass or inaccurate or defective reading for each month after the occurrence; or a greater or less amount if deemed necessary by the District until the water meter is replaced. The District may charge the Customer for the repair or replacement of water meters and appurtenant facilities that are damaged due to tampering.

4.1.3 Any Person violating any of the provisions of these Rules and Regulations shall become liable to the District for any expense, loss or damage occasioned by reason of such violation, and upon non-payment thereof at the demand of the District Manager, shall be assessed a penalty in an amount set forth in the District's fee schedule, which penalty shall be a lien upon the violator's property, as allowed by Section 32-1-1001, C.R.S.

4.2 WATER SYSTEMS. The District's potable water system has been planned and constructed to provide potable water service for residential, limited commercial, light industrial and fire protection uses. Persons wanting to use the water systems for an industrial or high-demand commercial water supply, which could be expected to require large quantities of potable water or unusual demand rates, shall be required to submit demand data as to water use before a Tap Certificate will be issued; said Tap Certificate may contain use limitations as determined necessary by the Board. No taps will be permitted or made during non-business hours without specific, written approval of the District Manager/water operator.

4.2.1 Cross-Connection/Dual Supply. Water from the District's potable system and any other source shall be distributed through systems entirely independent of each other, and cross-connection between such supplies is prohibited. A cross-connection is defined as any physical arrangement whereby the District's water supply is connected, directly or indirectly, with the District or any other nonpotable or unapproved water supply system, sewer drain, well, conduit, pool, reservoir, plumbing fixture or other device which contains or may contain any contaminated water, liquid or other waste of unknown, nonpotable or unsafe quality that could impart a contaminant to the District's water supply as a result of backflow. Where a potential of backflow is present, a protective device or system acceptable to the District shall be

installed to prevent its occurrence. All such facilities shall be maintained in accordance with District standards or reasonable industry practices.

4.2.2 Vacuum Breaker System. All automatic lawn sprinkler systems shall be equipped with an approved vacuum breaker installation and are subject to regular inspection by the District. The District may require separate metering of fire protection and sprinkler systems.

4.2.3 Codes. All plumbing installations shall be designed and installed in conformity with the latest edition of the "Manual, Cross-Connection Control", published by the Colorado Department of Public Health and Environment. All backflow preventer installations shall be as approved by the District. The Customer shall install, operate, test and maintain the backflow preventer as required by the District.

4.2.4 Fire Protection Systems. Dedicated fire protection system taps shall be subject to payment of System Development and Tap Fees as stated in the schedule of fees in Appendix A. A plan of the system shall accompany the application and shall be subject to the approval of the District. All fire sprinkler systems shall meet NFPA requirements and additionally shall meet the requirements of all the applicable fire protection district, City, County and State building and fire protection codes. Fire protection systems shall conform to the requirements of Section 5.6 and 3.5 of these Rules and Regulations.

4.3 SEWER SYSTEM. All proposed connectors to the District's sewer system shall complete a Feasibility Study and upon completion and review by the District's engineer, sewer facilities and service arrangements for those portions of the Service Area may be provided by the District after pursuant to a Tap Permit and payment of the requisite System Development Fees and Service Charges. The sewer facilities will be constructed to coincide with development needs.

Septic systems (ISDS) may not be utilized within the District except by special permit and agreement with the District. District Customers maintaining individual septic systems shall comply with certain maintenance requirements with respect to the individual septic systems so that the system does not adversely impact the District's water supply. The District will have the right to inspect the individual septic systems during construction as well as during operation to insure compliance. No septic systems will be allowed without written approval of the health department having jurisdiction over the property in question.

The sanitary sewer system is for the disposal of water contaminated by biodegradable wastes. No person shall make connection of roof downspouts, exterior foundation drains, areaway drains, surface drains or other sources of surface runoff or groundwater to a building sewer or building drain that in turn is connected directly or indirectly to the District's sanitary sewer system. The prohibitions against unauthorized discharge of wastes proscribed in this Section include the dumping or pumping of wastes directly into the District's manholes without the prior written consent of the District Manager.

All plan sets that provide for subdrain construction shall have the following disclaimer note placed on the cover sheet immediately adjacent to the District approval block: "Strasburg Sanitation and Water District does not take any discharge from or maintenance responsibility for

foundation subdrains." In order to protect the District's sewage system from damage, destruction, deterioration, misuse or malfunction and to guard against health hazards and the creation of public nuisance the following regulations shall apply relative to the discharge of sewage containing deleterious wastes.

4.3.1 Specially Regulated Wastes

a. Industrial Wastes. No Person or Persons shall discharge or cause to be discharged any industrial waste of any type into the District's sanitary sewer system unless prior written permission is received from the District and applicable fees are paid.

b. Inflow/Infiltration. No Person or Persons shall discharge or cause to be discharged into the sanitary sewer of the District, storm water drainage from ground surface, roof ladders, catch basins, or any other source, or sub-surface drainage or ground water.

c. Other Wastes. Industrial cooling water, unpolluted process waters, bakery/restaurant wastes, car washing wastes, swimming pool drainage and floor drainage from enclosed and covered areas may be connected to the sanitary sewerage system only by a special Tap Certificate from the District and payment of all applicable fees.

1. A Tap Certificate for such purpose will be considered by the District based upon an application containing the following general information:

   A. Name and address of owner.

   B. Location of property for which the request is made.

   C. Description of the facility or operation requested for connection.

   D. Estimated quantities and qualities of the waste to be discharged including maximum rates.

   E. Plans and specifications of related waste generating processes and any pretreatment processes.

2. The District may issue Tap Certificates for the connections conditioned upon the following but not limited to:

   A. The construction of flow measuring and/or sampling devices.

   B. The construction of valves or gates to stop flows on an emergency basis.

   C. The construction of grease, oil and sand traps, or other pretreatment facilities.

D. Submittal of appropriate cleaning/removal schedules and approval of same by the District.

4.3.2 <u>Prohibited Wastes</u>. Toxic or non-biodegradable waste or any wastes which make the effluent not within state standards after providing conventional treatment shall not be discharged into the sewer systems. No drain accepting discharge from vehicle wash racks, filling stations, restaurants or other building sewers as specified by the District shall be connected to any sewer service line unless the discharge first passes through an acceptable grease, sand or oil interceptor. Except as provided herein, no Person shall discharge or cause to be discharged any of the following described waters or wastes to any public sewer:

a. Any liquid or vapor having temperatures higher than 104 degrees Fahrenheit.

b. Any water or waste which may contain more than 100 ppm by weight of animal or vegetable fat, oil or grease.

c. Any gasoline, benzene, naphtha, fuel oil, other flammable or explosive liquid, solid, gas, oil or grease.

d. Any garbage that has not been properly shredded to less than 1/2-inch in the largest dimension.

e. Any ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastic, wood, paunch manure, or any other solid or viscous substance capable of causing obstruction to the flow in sewers or other interference with the proper and normal operation of the sewage or treatment works or otherwise violate the treatment plant discharge permit requirements.

f. Any waters or wastes having pH lower than 5.0 or higher than 9.0, or having any other corrosive or toxic property capable of causing damage or hazard to structures, equipment or personnel of the sewage works.

g.. Any water or wastes containing a toxic or poisonous substance in sufficient quantity to injure or interfere with any sewage treatment process, constitute a hazard to humans, animals or fish, create any hazard in the receiving waters of the sewage treatment plant effluent or violate discharge permit requirements.

h. Any waters or wastes containing suspended solids of such character and quantity that unusual attention or expense is required to handle such materials at the sewage treatment plant.

i. Any noxious substances or malodorous waste, waters, gases or substance capable of creating a public nuisance, either in the public sewer or at the sewage treatment plant.

j. A 5-day B.O.D. concentration greater than 300 ppm.

k. A concentration of more than 300 ppm of Suspended Solids.

l. Concentrated wastes from septic tanks and portable sanitary devices.

m. A peak flow rate greater than 4 times the average flow rate.

n. Any chemicals having a 24-hour proportionate composite sample concentration at the point of discharge in excess of the following:

Cadmium	0.10	mg/l
Chromium	5.0	mg/l
Copper	3.0	mg/l
Cyanides	2.0	mg/l
Iron	15.0	mg/l
Phenol	10.0	mg/l
H2s (Hydrogen Sulfide)	1.0	mg/l
Zinc	2.0	mg/l

o. Any hazardous chemicals.

4.3.3 Pretreatment. Where necessary, and the District determinations shall be final, the Customer shall provide, at its expense, such preliminary treatment as may be necessary. Where preliminary treatment facilities are provided for any waste or water, they shall meet with the approval of the Board and the Water Quality Control Division for adequacy of design, and once built, shall be maintained continuously in satisfactory and effective operation by the Customer. When required by the Board, the Owner of any property served by a Service Line or Main carrying industrial wastes shall install a suitable control manhole or monitoring point in the building sewer to facilitate observation, sampling, and measurement of the wastes. Such manhole or monitoring point shall be accessible, safely located, and constructed in accordance with plans and specifications approved by the District. The manhole or monitoring point shall be installed and maintained by the Owner at its expense.

In addition to the foregoing requirements for District purposes, the Customer shall also comply with those Regulations attached hereto as Appendix B.

4.3.4 Sump Pumps and Surface Water Drainage. No plumbing fixture, device, facility, construction or plumbing system shall be installed within any building or improvement which will provide a connection between the sanitary sewer system of the District, directly or indirectly which will allow draining ground or surface waters into the sanitary sewer system of the District. No physical connections shall be permitted whereby a Sewer Service Line is connected to a sump pump or other facility in such a manner that through the

manipulation of valves or because of lack of back pressure valves, or because of any other arrangement, it is possible to drain flood, overflow, drain, storm or groundwater, directly or indirectly, into the sewer system of the District. Any Person having connected, or having permitted to be connected such a forbidden system to a Service Line or the Sewer Main of the District, may be summarily ordered to disconnect such forbidden device or pumping system at his cost, and upon failure to do so, the District may forthwith disconnect any Service Line from the property containing such a forbidden device or pumping system at the Sewer Main of the District, reconnection of which shall be subject to the same requirements of section 3.1 of these Rules and Regulations and proof that such improper and illegal connection or device has been removed and will not thereafter be reconnected to the sanitary sewer system of the District.

4.3.5 Construction and Cleaning of Grease, Oil and Sand Traps. Grease, oil and sand interceptors shall be provided at the sole cost and expense of the Customer when, in the opinion of the District Manager or Engineer, they are necessary for the proper handling of liquid wastes containing greases, oil, etc., in excessive amounts, or any flammable wastes, sand or other harmful ingredient. All interceptors shall be located as to be readily available and accessible for cleaning and inspection. Grease and oil interceptors shall be in an accessible location for maintenance and inspection and shall be constructed of impervious materials capable of withstanding abrupt and extreme changes in temperature. They shall be watertight, and, if necessary as determined by the District, gastight and vented and otherwise comply with standards and drawings as set forth in Appendix B and approved by the District's Engineer. Where installed, all grease and oil and sand interceptors shall be maintained by the Customer at its expense, in continually efficient operation at all times. The District requires monthly or otherwise regularly scheduled cleaning and pumping of any grease traps as approved by the District. Periodic inspections shall be made of sand and grease traps and interceptors, and in the event the Customer is in violation of these Rules and Regulations, the Customer shall be liable for payment of a penalty in an amount as set forth in the District's fee schedule, Appendix A.

4.3.6 Swimming Pools. No public or private swimming pool shall be connected to the sewer system without first obtaining a special Tap Certificate from the District. Such Tap Certificate shall define and specify the hours during which water may be discharged from such pools into the sewer system and prescribe the fees and charges thereof.

4.4 RESPONSIBILITIES OF THE CUSTOMER.

4.4.1 Water Service Line Maintenance. The District shall be responsible, at its expense, for maintaining, repairing, and replacing Water Service Lines from the Main Lines to the discharge or effluent side of the yoke located on a Water Service Line. Each Customer shall be responsible, at its expense, for maintaining, repairing and replacing all other portions of the Water Service Lines. Damage or breaks in the Customer's portion of a Water Service Line shall be repaired by the Customer within 72 hours from the time of notification of such condition by the District. If satisfactory progress toward repairing the leak has not been made by the time specified, the District shall have the authority to repair, or have repaired, the Water Service Line and shall charge the Customer all resulting costs thereof. The District shall have a lien against the property of such Customer or Owner securing payment of such costs.

If repairs to Customer's portion of a Water Service Line require access to the water meter pit, the Customer shall not perform the repairs. Instead, the District will perform repairs, or portions thereof, that require access to the meter pit and will bill the Customer for the Actual Cost of such repair work. It shall remain the Customer's responsibility to notify the District of the need for such repairs.

4.4.2 Sewer Service Line Maintenance. Each Customer shall be responsible for maintaining, repairing, and replacing the entire length of his or her Sewer Service Lines. Excess infiltration leaks or breaks in the Sewer Service Lines shall be repaired by the Customer within 72 hours from the time of notification of such condition by the District. If satisfactory progress toward repairing the leak has not been made by the time specified, the District shall have the authority to repair, or have repaired, the lines and shall charge the Customer all resulting costs thereof. The District shall have a lien against the property of such Customer or Owner securing payment of such costs.

4.5 ENFORCEMENT.

a. The responsibility of cleaning and maintaining all grease interceptors, sand and oil traps shall be the Customer's and/or Owner's responsibility. Grease interceptors and sand and oil traps shall be inspected periodically by the District's operator in responsible charge and if not properly maintained, the District will initiate procedures to obtain compliance with these Rules and Regulations.

b. The charge for these inspections to the Customer and/or Owner shall be a direct pass-on of the expense to the District and shall be billed directly by the District for all costs incurred by the District in inspecting the property.

c. Discharge of Sewage in any manner in violation of the Rules and Regulations is hereby declared a public nuisance and may be corrected or abated as directed by the District.

d. Whenever a discharge of Sewage or the operation of a grease interceptor or sand or oil trap is in violation of the provisions of these Rules and Regulations or otherwise causes or threatens to cause a condition of contamination, pollution or nuisance, the District will issue a 72 hours' written notice to correct the practice. If the practice is not corrected within such time, the District may notify the Colorado Department of Public Health and Environment and turn off water service or effect disconnection of the sanitary sewage Service Line from the District's system until such time as the District has received adequate assurances that any and all violations of the District's Rules and Regulations will cease and will not occur in the future. If the violation is not corrected after notice, reconnection shall be subject to Section 3 of these Rules and Regulations.

e. When a discharge of wastes causes an obstruction, damage or any other impairment to the District facilities, the District may assess charges against the Customer and/or Owner for the work required to clean or repair the facility and add such charge to the Customer and/or Owner's sewer service charge, and the District shall have such remedies for the collection

of such costs as it has for the collection of sewer service charges until paid shall constitute a perpetual lien against the property.

f. Any person who intentionally or negligently violates any provisions of these Rules and Regulations or conditions set forth in Tap Certificates duly issued shall be liable civilly to the District. The District may petition the District Court to impose, assess and recover such sums.

g. In order to effect its powers, the District may enter upon private property for the purpose of inspection and maintenance of sanitary and waste disposal facilities and may terminate service to property in which a violation of any of these Rules and Regulations is found to exist.

SECTION 5 - SERVICE EXTENSION POLICIES

5.1 GENERAL POLICY. New service will be furnished only after all of the following conditions are satisfied:

- The proposed new service area/Customer is included within the boundaries of Strasburg Sanitation & Water District, or the Board has approved a written agreement for out-of-District Customers; and
- Regional Facilities needed to serve the area/Customer have been provided by the District after payment of any applicable costs by the Customer; and
- All Local Facilities needed to serve the area/Customer are in place and have had design and construction approval by the District's Engineer and all governmental entities having jurisdiction; and
- The applicable Tap Certificates have been applied for and approved and all required Tap Fees, System Development Fees, and other applicable fees have been paid; and
- The Customers' Service Lines have been installed in accordance with District Standards and construction approved by the Manager.

No privately owned wells or other water supply systems, septic tanks or other individual sewage disposal system, or on-site facilities shall be planned or constructed within the boundaries of the District without the express written consent of the District and written approval of the Tri-County Health Department. Violation of the provisions of this paragraph shall result in revocation of all Tap Certificates applicable to the property in question and imposition of a fine in the amount of $5,000. The District shall be entitled to recover all costs and attorneys' fees incurred as a result of such violation and any hearings, appeals or litigation related to such violation. Privately owned wells existing as of January 1, 2000 shall be permitted to continue in operation until such time as a replacement well bore is required after which the well shall be capped and abandoned pursuant to the requirements of the Colorado State Engineer's office.

5.2 REGIONAL FACILITIES. If the District determines that it can construct the Regional Facilities necessary to serve a land development, the Developer shall provide the District with adequate lead time to permit the reasonable construction of any needed Regional Facilities. The District may require financial commitments from Developers in order to incur the expense of planning and constructing required Regional Facilities.

Upon a determination of economic feasibility by the Board, and a determination by the Board that the best interests of the District will be served, the District may enter into an Agreement related to such Regional Facilities with a Developer or Owner and may construct or acquire, on such terms and conditions it deems appropriate, the water and sewer Regional Facilities.

5.3 LOCAL FACILITIES.

5.3.1 Ownership. All Local Facilities may, at the discretion of the District and only after expiration of the warranty period, final inspection and acceptance, be owned by the District.

If the Local Facilities are to be transferred to the District, the Developers/Owners who have completed construction of water and sewer lines shall, before these lines are approved by the District for preliminary acceptance: 1) prepare a bill of sale or deed conveying the Local Facilities and appurtenances to the District, free and clear of all liens and encumbrances; 2) furnish a bond, letter of credit or other surety in a form and amount approved by the District to cover all maintenance for two years from the date of acceptance of the lines by the District; 3) provide any and all easements and rights-of-way reasonably requested by the District, without cost; and, 4) attach a summary of the actual original cost of all deeded facilities, complete with verified invoices. At the end of the two-year maintenance period, the District, upon application of the Developer or Owner, shall conduct a final inspection of the improvements. When all punch list items are completed to the satisfaction of the District Manager, the District may accept the lines for ownership, operation, and maintenance responsibilities.

5.3.2 Pipeline Sizing. Water distribution pipelines and collection sewer pipelines shall be sized adequately to serve the development tract for which they are designed. Where the distribution or collection lines also have a transmission or collection function serving areas outside of the subject tract, as determined by the District, then the District may require that the lines be oversized. In such case, the District may contribute to the Actual Cost up to an amount equal to the extra cost of over sizing, as provided in Section 6.2.3. In no case shall Water Mains of 8-inch diameter or less, Sewer mains of less than 12", or storm sewer pipelines 30" or less, be considered as having a transmission function.

5.3.3 Preliminary Design Procedures. Water distribution and collection system planning may at the Developer's option and expense be accomplished by the District or by an Engineer registered in Colorado. All preliminary plans and final designs must be prepared by or reviewed by the District's Engineer and approved by the Board. The District Engineer or Inspector shall perform prescribed inspection services at the Developer's expense.

Any Developer desiring to have water and/or sewer service extended shall fill out a main extension application available in the District's office and submit both the application and the feasibility study to the District for review. After preliminary review and approval, the Developer may proceed with final design. Normally, during the preliminary review phase the pipeline sizing will be reviewed and oversize requirements, if any, established. It is noted that water and sewer system planning may also require approval by other governmental agencies, including the local fire departments. The Developer is responsible for obtaining any necessary governmental approvals and paying the costs thereof as well as resolving any differences in design requirements imposed by the District.

5.3.4 Easements/Rights-of-Way. All Water and Sewer Mains must be installed in trenches containing no other conduits except that the Developer may install subsurface drain lines in conjunction with the sanitary sewer lines when approved by the District. The line and depth of such installations shall be as determined by the District's Engineer. The topography and

alignment of such rights-of-way shall be suitable for main installation as determined by the District's Engineer.

Preliminary and final planning shall be such that adequate space and easement reservations shall be made available permanently to the District without charge, as approved by the District Engineer.

5.3.5 Final Design. The extension application and final design documents will be furnished to the District Engineer for review.

The submittal shall include construction drawings, specifications and other contract documents. These documents shall be prepared by the District's Engineer or a registered engineer acceptable to the District. In all cases, the contract documents must be reviewed and approved by the District. Plan and profile drawings shall be on a horizontal scale 1" = 50' (other scales may be accepted, as determined by the District Engineer). All elevations must be USGS datum. Elevations of existing District facilities shall be field verified in the final design at the Developer's expense. Designs and specifications must include the provisions included as Appendix B with other detailed provisions as required by good engineering practice, all subject to the Board's approval.

Designs for potable water and sanitary sewer extensions shall be submitted for review at least forty (40) days before approval is expected. Plans, specifications and easements submitted for Board approval must be complete and meet with the approval of the District Engineer. Design approvals are valid for 12 months from the date of Board approval unless otherwise specifically noted in the approval. If construction is not substantially complete by that time, resubmittal of the plans may be required and new construction may not be initiated without the District Manager's approval.

5.3.6 Construction Phase. After all approvals have been granted, the Developer must have the extensions constructed in strict accordance with the approved design and inspected by the District's Engineer or Inspector.

The District Engineer or Inspector will inspect the extensions, at the Developer's expense, to assure good quality construction, installation materials and practices, in general conformity with the approved plans and specifications. The District Engineer or Inspector will not handle or be responsible for other construction phase inspection-related services (e.g., staking easement and/or line locations, measuring quantities, preparing pay estimates, and administrative or management-type relations with the contractor), unless the District's Engineer is used for design or unless a contract for services is executed with the District.

The Developer shall schedule a pre-construction conference on the job site with the District Engineer/Inspector prior to construction. The Developer shall notify the District seven (7) business days prior to beginning construction and thereafter keep the Engineer or Inspector informed of the construction schedule. No work may be covered, hidden or completed without the presence and approval of the Engineer/Inspector. Any Engineer/Inspector time or expense caused by the Contractor failing to work according to the proposed schedule shall be charged to the project as part of the Actual Cost.

Construction staking shall be completed prior to the installation of the potable water or sewer lines. All staking shall be maintained throughout the installation of the water or sewer lines. Staking shall include easement or right-of-way stakes and cut/offset stakes (50 max. spacing unless otherwise approved).

5.3.7 As-Built Drawings. Accurate "as-built" drawings (sealed by the Design Engineer) showing adequate ties to physical facilities must be provided at the completion of work by the Owner/Developer's Engineer. The District or its Engineer shall be provided with a reproducible set of "as-built" drawings on mylar. These may be the original tracings or photographic reproducibles.

As-built drawings shall furnish information in a manner similar to the approved standard drawing "Typical As-Built Information" in Appendix B attached hereto.

5.3.8 Maintenance. The District operates and maintains all potable Water Mains and Sewer Mains within the District which have been completed, accepted, and deeded to the District, except that the Developer shall provide for a two-year warranty period, beginning at the time of preliminary acceptance by the District.

5.4 TAP CERTIFICATE REQUIRED. The right to take and use water distributed and the right to discharge sanitary sewage through the facilities of the District shall exist only pursuant to a Tap Certificate. No physical connection may be made or modified to any such facilities or to any privately or publicly owned extension thereof for any purpose unless a Tap Certificate shall have first been obtained authorizing the use for which such a connection is sought.

Notwithstanding the issuance of a Tap Certificate, the District reserves the full power and authority to determine all matters in connection with the control and use of water from the District's water system and sewage in the District's sewer system.

5.4.1 Separate Tap Certificates. No water user in or upon any premises to which water is supplied under a Tap Certificate for such premises, shall supply or allow water to be supplied for use on any other premises unless a Tap Certificate for use on such other premises shall have been procured. Nor shall any sewer user similarly allow discharge of wastes generated from an offsite property to a sewer connection located on his property.

A separate Tap Certificate is required for each and every building using water, and/or discharging sewage.

The Water and Sewer Service Lines to any structure served by the District must be independent of the Service Line to any other structure, except where the structures involved comprise an undivided unit with no potential for separate ownership. Individual water service and meters will be required for each individual Owner, unless a specific exemption has been granted by the Board.

5.4.2 Increased Services for Existing Customers. Any water Customer/Owner expanding his building(s) or otherwise increasing water demand, must apply for a modified Tap Certificate if an increase in service size is determined to be required.

Any sewer Customer/Owner expanding his building or otherwise increasing Sewage flows so that the number of equivalent units will be increased, must apply for a modified Tap Certificate, whether or not the actual Service Line size is increased.

In these cases, the Owner shall pay incremental System Development Fees at the rate in effect at the time the modified Tap Certificate is issued.

5.4.3 Transfer of Tap Certificates. Tap Certificates attach to the designated premises only. They are not affected by changes in the ownership of the licensed premises and are usable only in accordance with the terms of the Tap Certificate.

Neither Tap Certificates nor the associated System Development Fees are transferable to other properties.

5.5 TAP CERTIFICATE ISSUANCE. A Tap Certificate to take and use water from the District's system and/or a Tap Certificate to discharge sanitary sewage to the District's systems may only be issued under the following conditions:

5.5.1 Application. The applicant or his/her agent shall submit a signed, written application for service on a form supplied by the District and presented to the Board of Directors or their authorized agent and shall contain the following information.

a. A description of the premises to be served under the Tap Certificate by reference to land survey, or by designation of Lot and Block, or other legal description adequate to define the area to be served by convenient references.

b. A description of the building, or buildings, to be constructed and their purpose. If the buildings are to be used for commercial or industrial purposes (any use other than residential) then the applicant shall furnish an estimate of expected peak and average flow loads, with calculations and information as required by the District Engineer. The applicant must also provide a description of the waste to be received by the District's collection system.

c. An acknowledgement and agreement by the applicant that use under the Tap Certificate must be as limited and defined by applicable law and Rules and Regulations of the District.

d. If a use is proposed which could result in high rate service demands, then the Manager may require that the applicant submit additional information regarding demands or load rates.

e. A copy of the Tap Permitt applicable to the property to be served and evidence that no uncured deficiencies are outstanding pursuant to the terms of such System Development Fees Agreement.

5.5.2 Payment of Capital Fees. Prior payment of:

a. Standard District tapping/inspection fees.

b. Standard District Water System Development Fees and Sewer System Development Fees for the appropriate number of equivalent units. Normally, simultaneous payment for all applicable District fees, including water and sanitary sewage, will be required.

c. Water Resource Charge for real property to be served.

5.5.3 Payment of Connection Fees. Prior payment of:

a. Water and sewer connection fees which are administratively set to cover the cost of Service Line and tapping inspection by the District, and for any Service Line materials furnished by the District.

5.5.4 Prepurchase of System Development Fees. A Developer/Owner may prepurchase System Development Fees pursuant to agreement with the District. The rights derived by payment of such fees shall be as set forth in the agreement and as stated on the Certificate. Any prepurchase of System Development Fees shall be subject to the District's sole discretion.

5.6 FIRE PROTECTION SERVICE. A Tap Certificate to take and use water from the water system for private fire protection service is granted only upon the following conditions:

a. The applicant shall have secured a Tap Certificate for water service from the District.

b. The applicant shall have specified with particularity, the fire protection facilities for which water service is desired.

c. The applicant shall have executed an agreement adequate to control the use of the fire protection facilities to assure that they will not be used for any purpose other than extinguishing hostile or unfriendly fires, unless specifically exempted by the District Board. Each direct fire protection service line shall be equipped with an approved flow detection device. These facilities are subject to inspection at the District's discretion. The applicant shall have obtained all approvals, written or otherwise, as required by the appropriate County or other applicable jurisdiction.

d. If the water is to be supplied for fire protection through the Service Line through which water is supplied for other purposes, the fire protection facilities shall be so installed as to prevent the use of water through such facilities for any purpose other than fighting hostile or unfriendly fires.

e. The District assumes no obligation for adequacy of fire protection service.

The only use for which water may be taken from fire protection facilities under Tap Certificate is to extinguish hostile or unfriendly fires. Any other use of water from such facilities shall be deemed as unauthorized use of water for which a Tap Certificate for fire protection service may be suspended or revoked. The District may require that a fire protection system be separately metered.

5.7 SERVICE LINES AND CONNECTIONS.

5.7.1 Design - Construction. Services shall not be used until inspected and approved by the District Manager. Cost for this inspection service is included in the Tap Fees as set forth in Appendix A. Services shall be designed and constructed according to the Public Utility Design and Construction Specifications contained in Exhibit B.

5.7.2 Pressure Regulating and Relief Valves. All Water Service Lines shall be equipped with a line-pressure regulating valve, except in areas specifically exempted by the District's Engineer. Pressure regulating valves shall be upstream of all uses. Installation in the meter pit is acceptable to the District if the pit and piping are designed to permit convenient servicing of the meter. The pressure regulating valve shall be set for a downstream pressure not exceeding 80 psi. A water pressure relief valve shall be installed on the plumbing of every Customer. The valve shall be provided with a discharge line to a drain in any areas where discharge could cause damage.

5.7.3 Service Lines. Each individual commercial structure hereinafter connected shall pay for an individual potable water and/or sewer tap and install separate Service Lines for each commercial structure. Each individual residential structure hereinafter connected shall pay for an individual potable water and/or sewer tap and install separate Service Lines for each residential structure. Any variance from this requirement must be authorized by obtaining written approval of the Board of Directors of the District.

SECTION 6 - RATES AND CHARGES

6.1 GENERAL. The District is authorized to assess and collect fees, rates, tolls, assessments and user charges for water and sewer services within and outside the boundaries of the District. The District has entered into an Intergovernmental Agreement with the Eastern Adams County Water and Sanitation District and may enter into other intergovernmental agreements with other governmental entities to provide for the provision of water and sanitary sewer service and the payment of Fees and Charges.

6.2 TAPPING FEES. Water and sewer tapping fees are set to cover the actual cost of inspection and records processing for connecting the taps and installing Service Lines. Tapping fees are set administratively by the District Manager, based on actual cost experience. If multiple inspections are required because of poor installation or poor scheduling on the part of the contractor, the District Manager may increase a specific tapping fee to cover the actual cost increase.

6.3 INSPECTION FEES. Water and Sewer Inspection Fees are set to cover the actual cost of inspection and records processing for connecting the taps and installing service lines. Inspection Fees are set administratively by the District Manager, based on actual cost experience. If multiple inspections are required because of poor installation or poor scheduling on the part of the contractor, the District Manager may increase a specific Inspection Fee to cover the actual cost increase. The District may elect to furnish water meters (for standardization and convenience purposes) to Service Line installers or Customers. In this case the Inspection Fees will be set to also cover the actual costs of the furnished meters.

6.4 EQUIVALENT RESIDENTIAL UNIT (EQR) SCHEDULES. For the setting of certain fees the District has found it convenient to establish Equivalent Residential Unit Schedules. The base for this schedule is an average detached single-family residence, or its equivalent. The schedules are given in the following tables. Note that Table 6.3.1 is applicable only to calculation of monthly sewer charges.

TABLE 6.3.1
EQUIVALENT RESIDENTIAL UNIT (EQR) SCHEDULE –
WATER AND SEWER UTILITIES

Class of User	**EQR**
A. RESIDENTIAL CLASSIFICATIONS	
1. Single-family Residential Units (per each) Single-family Homes, individually billed mobile homes, mobile homes on single lots, mobile homes established for permanent residences.	1.0
Note: Subrental privileges of all kinds are prohibited.	
2. Multi-family Residential Units. Apartments, condominiums, townhouses, and similar facilities in the same complex; all units intended for long-term rental or ownership.	
• Small sized unit. Shall not have more than one bedroom and one bathroom.	0.5
• Medium sized unit. Shall not have more than 2 bedrooms or 2 bathrooms.	0.75
• Large sized unit. Shall not have more than 3 bedrooms and 2 1/2 bathrooms.	0.90
• Any larger single unit.	1.0
3. Transient Residential Units Hotels, motels, mobile home parks, dormitories, recreational vehicle parks, and similar facilities.	
Note: Includes: laundry facilities in mobile homes; swimming pools and laundry facilities (except those in mobile homes) are additive; room counts shall include rooms furnished to employees; each billing unit shall have a minimum of one Manager's unit.	
a. Manager's Unit (per each)	0.80
b. Motels, hotels and rooming houses without kitchen facilities	
- with not more than 2 bed spaces per room (per each rental room)	0.20
- with more than 2 bed spaces per room (per each room)	0.35
c. Motels with kitchen facilities	
- with not more than 2 bed spaces per unit (per each rental unit)	0.3
with more than 2 bed spaces per room (per each room)	0.4
d. Dormitories (per each rental bed space)	0.1

Class of User	EQR
e. Recreational vehicle parks	
i. camping or vehicle spaces without sewer hookup (per space)	0.17
ii. camping or vehicle spaces with sewer hookup (per space)	0.20
iii. If a store is present add for store in accordance with paragraph B.2.b., of this Table 6.4.1	

Note: Spaces which have year-round mobile home to be evaluated per mobile home park

f. Mobile Homes in Park-with laundry	0.80/space
g. Add for laundry facilities (or available hookup) in each building, % of total EQR served	20.0%

B. COMMERCIAL CLASSIFICATION

1. Restaurants and Bars

Restaurants, bars, lounges, banquet rooms and drive-ins

a. Restaurants and bars first 20 seats (per 10 seats); all	1.0
remaining seats (per 10 seats)	0.5
b. Banquet Rooms (per 10 seats)	0.25
c. Drive-ins (per car stall)	0.20
d. Drive through take out service window	.5

2. Commercial Buildings

Office buildings, retail sales buildings, multiple use buildings, Laundromats, service stations, shops, garages and similar facilities

Note: No process water will be allowed to enter the sewer.

a. Offices and office buildings (per 1,000 s.f. of gross floor area)	0.50
b. Retail sales area (per 1,000 s.f. of gross sales and display area)	0.30
c. Laundromats (per washing machine)	0.50
d. Service stations (a set of pumps is defined as a fueling space (not more than one nozzle for each available type of fuel)	
- first set of pumps	1.0
- each additional set of pumps (per set)	0.6
- add for each bay/rack where cars can be washed	1.0
e. Non-retail work areas such as garages, machine shops (per each 10 employees)	0.7

C. CHURCH AND SCHOOL CLASSIFICATIONS

1. Churches (per 100 seats)

Class of User	EQR
Note: Rectories, social areas with kitchen facilities are additive	1.0
2. Schools	
Day care centers, public and private day schools	
Note: Includes teachers, librarians, custodians and administrative personnel associated with the school function; administrative centers, warehouses equipment (such as buses) repair and/or storage centers, swimming pools and similar facilities are additive	
a. Without gym and without cafeteria (per 50 students)	1.40
b. Without gym and with cafeteria or with gym and without cafeteria (per 50 students)	1.75
c. With gym and cafeteria (per 50 students)	2.10

D. MISCELLANEOUS CLASSIFICATIONS

1. Swimming pools and wading pools	
Note: A permanent sign must be placed prominently at all pool filter installations stating that pools are not to be drained without permission from the District Manager, that pool draining rates will be subject to approval of the District, and that draining shall be limited to the hours between 11 p.m. and 6 a.m. the next day	
. a. Private pools associated with single-family residential units (per 40,000 gallons of pool volume)	
b. Pools associated with multi-family and transient residential units (per 40,000 gallons of pool volume)	0.40
c. Commercial and public pools. Total EQR to be computed from pool volume and per capita capacity as follows:	0.80
• first 40,000 gallons of pool volume	1.05
• each additional 40,000 gallon capacity	0.75
2. Recreational Vehicle Waste Disposal Stations	
The operator of the disposal facility shall provide a means acceptable to the District of counting the number of times the disposal facilities are used.	1.0

The District shall review and approve charges made to users of dumping facilities by facility owners; no system development fees will be assessed for camper dump facilities, and the District reserves the right to cease service to such facilities at any time.

3. Medical Hospital	
Note: Includes staff and administrative personnel associated with the hospital function	
• per bed	0.60
4. Public Restrooms (per toilet or urinal)	.20

Class of User	EQR

E. OTHER CLASSIFICATIONS

Equivalents shall be established on an individual basis for all users other than those identified in Classifications A, B, C, and D above. Industrial users will be subject to the requirements of the Environmental Protection Agency as those requirements pertain to assessment of users charges and cost recovery (refer to 40 C.F.R., Section 35 (1987)).

F. GENERAL NOTES.

1. Each Customer of the system will be charged a minimum of 1 EQR for purposes of defraying fixed costs.

6.5 WATER SYSTEM DEVELOPMENT FEES. These are one-time fees designed to provide recovery of capital investment attributable to Regional Facilities of the District's water systems.

Water System Development Fees shall be assessed based on Service Line and meter size, except that a minimum fee will be established for multi-family use, regardless of actual service size. The current fee schedule is included in Appendix A. Water System Development Fees are not applicable to fire protection Service Lines for water Customers. Where Service Lines also serve a fire protection function, the District Engineer will estimate the size line required for potable use only.

6.6 WATER RESOURCE FEE. This is a charge designed to provide funding for acquisition of water resources for use in providing water service to the District as further described in Appendix A.

6.7 SEWER SYSTEM DEVELOPMENT FEE. These are fees designed to provide recovery of capital investment attributable to Regional Facilities of the District's sewer system.

Sewer System Development Fees shall be assessed based on water Service Line and meter size, except that a minimum fee will be established for multi-family use, regardless of actual service size. The current fees are as provided in Appendix A.

6.8 SERVICE CHARGES. The Schedule of Fees and Charges attached hereto as Appendix A sets forth the current fees and charges applicable to services currently provided by the District. Such fees and charges shall remain in effect until modified by the Board in accordance with these Rules and Regulations and applicable laws. Nothing contained herein shall limit the Board from modifying fees and charges from time to time per separate agreement if deemed by the Board of Directors to be in the best interests of the District. Revised fees adopted by the District will become a part of these Rules and Regulations.

6.9 PAYMENT OF FEES AND SERVICE CHARGES.

6.9.1 Billing. It is the policy of the District to bill all monthly service charges in arrears. The District shall have the right to issue only one (1) bill for a multi-unit structure or development off the Service Line that is not separately metered. When a condominium or homeowners' association exists for a number of units receiving service from the District, said association shall receive an invoice for all units included in the association. Any other structure with more than one (1) residential or commercial unit off the Service Line which is not separately metered shall establish one (1) responsible party for billing.

6.9.2 Due Date. The Customer shall pay to the District the full amount invoiced by the fifteenth of the month in which the invoice was issued. Where the Customer believes said statement is in error, the Customer must file within fifteen (15) days after the statement date, in writing, a notice to the District of the presumed error and request a clarification from the Manager. Upon review by the Manager and re-submittal and/or revision of the statement, payment shall be due no later than fifteen (15) days from the date of the resubmitted statement.

6.9.3 Penalty for Late Payments. At any time the Customer is fifteen (15) days tardy in payment of any fees or charges due the District, the District shall have the right to assess an interest charge at a rate of one percent (1%) per month on the unpaid balance plus a late fee as adopted by the Board of Directors of the District. The District shall further have the right, in its sole discretion, to terminate service to any Customer who becomes thirty (30) days or more tardy in payment for amounts due the District, following the opportunity for a hearing as set forth in Section 3.12 and Section 7 of these Rules and Regulations. The District also has the right to assess to any Customer who is tardy in payment of its account all legal, court, disconnection, and other costs necessary to or incidental to the collection of said account.

6.9.4 Collection of Delinquent Amounts. In addition to any other means of collecting delinquent fees, rates, tolls, penalties, charges or assessments made or levied solely for water and sewer service, including charges for availability of such service, the District may certify the delinquent amounts to the County Treasurer for collection in the same manner as property taxes. The District shall charge a fee in the amount stated in Appendix A for the administrative costs of this collection method, which fee shall be added to all delinquent amounts, including other penalties and interest charges, before certification.

6.10 SEWER SERVICE CHARGES. District sewer system operating revenues are primarily derived from sewer service charges. Service charges shall be based on a flat rate schedule, using the appropriate EQR value.

6.10.1 High Strength Sewage. The service charges rates given in Appendix A are based on Sewage strength similar to normal domestic wastes. For any commercial or process water use where high strength wastes may be expected (above 230 mg/1 BOD, and 230 mg/1 SS) the District reserves the right to require installation of a sampling point, as approved by the District Engineer, and to charge a premium fee. Such premium shall be determined by the Manager based on current treatment costs plus the administrative costs of sampling, testing, and billing.

6.11 ADJUSTMENT OF SERVICE CHARGES. In those situations where, in the Board's sole discretion, the fees and charges shown on Appendix A do not represent a fair, reasonable, and equitable charge for the intended use, the Board, in its sole discretion, may adjust said fees and charges.

6.12 CONNECTING LINES, OVERSIZING AND REBATES. Where a proposed development is not contiguous to existing development, the District may require the Developer to construct any intervening connecting water or sewer lines. In this case, the District will set an amount for maximum rebate, being the approved actual cost of the connecting line. This rebate amount will be assigned to Owners of the intervening property if, in the opinion of the District, the intervening Owners can make reasonable use of the line in the future. Future Developers or Customers in the intervening area shall be required to rebate the actual cost, or a *pro rata* portion thereof, before connecting other Mains or Service Lines to the subject line.

6.12.1 Oversize. Where the District requires that a line be oversized for future users, the District may pay for oversize directly. However, if the Board determines it infeasible to participate immediately in such oversize, then the actual cost of the oversize may be considered a rebatable amount. At the discretion of the Board of Directors, the District may pay such rebate from the income obtained from future Customers located in an area determined by the District to have benefited from the oversize pursuant to an oversizing agreement approved by the District Board of Directors.

6.12.2 Rebate Amounts. Where the Developer did not have the facilities installed after advertised bids, the actual cost shall be as estimated by the District's Engineer and approved by the Board. In case of disputed eligibility of costs, the Board's decision will be final. In case of disputed method of rebate, a rational proposal shall be prepared by the District Engineer and approved by the Board; the Board's decision shall be final. No interest shall be allowed when determining rebate amounts. A rebate agreement will be made for a maximum period of ten (10) years from the date of facilities acceptance.

6.13 TRANSFER OF SYSTEM DEVELOPMENT FEES.

6.13.1 Transfer Requirements. No System Development Fee paid on behalf of one property, or any portion thereof, may be transferred to any other property unless there is a separate written authorization from the District for the transfer and the following conditions are met:

a. The Owner requesting the transfer is the common owner of the property for which the System Development Fee has been paid and the property to which the transfer of the System Development Fee or portion thereof is being requested;

b. The Owner requesting the transfer has no outstanding unpaid accounts with the District and has previously maintained a good credit record with the District;

c. The property to which the System Development Fee initially applied has never been connected to the District's system; and

d. The Owner requesting the transfer has filed an application for service for the property to which the System Development Fee is to be transferred.

Any approval of a request for transfer of a System Development Fee shall be in the sole discretion of the District. Upon payment of all applicable fees and approval of a request for transfer of a System Development Fee, the Tap Certificate issued for the property to which the System Development Fee initially applied shall be canceled, and a new Tap Certificate shall be issued with respect to the property to which the System Development Fee is transferred.

6.13.2 Transfer Fee. Unless a separate written agreement provides otherwise, the Owner requesting the transfer shall pay to the District the difference between the System Development Fee which would otherwise be charged on the date the transfer is requested for the property to which transfer is being sought, and the System Development Fee previously paid, but in no event shall the District make a credit or refund.

6.14 CONSTRUCTION WATER CHARGE. Any person who desires to have water service available at the premises for individual building sites for construction use prior to the time a meter may be properly set and protected from damage, shall pay the full Tap Fee and have a temporary meter installed. Occupancy of the premises shall not occur until a permanent meter shall have been installed.

For other requests for construction water, the District at its discretion may provide a fire hydrant meter and permit connection on a designated hydrant after receipt of a written request for temporary construction water service and a cash deposit in an amount to be set by the District Manager. The cash deposit shall cover the value of the meter and prepayment of two months anticipated water use. Such service may be curtailed by the District at any time; and no Tap Fee is required for this service. The District shall read the meter, normally monthly (or at more frequent intervals at the District's option), and bill for water used. Payment shall be made within 10 days of receipt of the bill. Water gallonage charges shall be in accordance with the regular commercial schedule with a base fee of not less than the 1-inch size commercial meter to cover billing costs. At the cessation of service the District will refund the deposit less any damages to the meter and any outstanding charges. Any shortage shall be promptly paid by the user.

For all construction water accounts, a non-refundable start-up charge will also be assessed, as provided in Appendix A.

6.15 PENALTIES FOR FORECLOSURE PROCEEDINGS. At any time it becomes necessary for the District, following efforts to collect overdue payments of any fee or charge assessed by the District under these Rules and Regulations and/or Colorado law, to initiate foreclosure proceedings as allowed by Section 32-1-1001(1)(j)(I), C.R.S., as amended, the District shall in each such case assess a foreclosure fee against the subject property in an amount as set forth in the District's fee schedule which fee shall be payable in full upon assessment and shall be included in the amount then being foreclosed. Payment of said foreclosure fee and any and all other fees outstanding against the subject property shall be a precondition to the resumption of service to that property.

SECTION 7 - HEARING AND APPEAL PROCEDURES

7.1 APPLICATION. The hearing and appeal procedures established by this Section shall apply to all complaints concerning the interpretation, application or enforcement of the Rules and Regulations of the District, as they now exist or may hereafter be amended. The hearing and appeal procedures established by this Section shall not apply to the following complaints:

a. Complaints arising out of the interpretation of the terms of District contracts;

b. Complaints which arise with regard to personnel matters, and

c. Any other complaint which does not concern the interpretation, application, or enforcement of the Rules and Regulations of the District.

7.2 INITIAL COMPLAINT - RESOLUTION. Complaints must be presented in writing to the Manager or such representative as may be designated by the District concerning the interpretation, application or enforcement of Rules and Regulations of the District. Upon receipt of a complaint, the Manager or the designated representative, after a full and complete review of the allegations contained in the complaint, shall take such action and/or shall make such determination as may be warranted and shall notify the complainant of the action or determination by mail within fifteen (15) days after receipt of the complaint.

7.3 HEARINGS BEFORE THE BOARD. In the event the complainant disagrees with the determination of the Manager or the designated representative, the complainant may, within fifteen (15) days from the date of the mailing of the determination, file with the District a written request for a hearing before the Board. The request for a hearing shall set forth with specificity the facts or exhibits presented at the formal hearing upon which the complainant intends to rely, and shall contain a brief statement of the complainant's reasons for the complaint. The Manager or the designated representative shall compile a written record consisting of all exhibits or other physical evidence reviewed in making his or her determination, and a copy of the written determination. The Board shall hold a formal hearing on the complaint at the next regularly scheduled meeting held no earlier than ten (10) days after the filing of the complainant's request for a hearing. At the hearing, the Manager or the designated representative and the complainant shall be entitled to present all evidence that is, in the Board's view, relevant and material to the dispute, and to examine and cross-examine witnesses. The Board may establish rules and procedures governing the hearing. A record of the hearing shall be maintained.

7.4 BOARD'S FINDINGS. Based on the record established, the Board shall issue a written decision concerning the disposition of the dispute presented to it and shall cause notice of the decision to be hand delivered or sent by U.S. Mail to the complainant within thirty (30) days after the hearing. Such decision shall constitute the final administrative action of the District and no appeal shall lie from the decision of the Board. The Board’s decision shall be final and binding upon the District and the complainant.

7.5 NOTICE. A complainant shall be given notice of any hearing before the Board by U.S. Mail at least seven (7) calendar days prior to the date of the hearing, unless the complainant requests or agrees to a hearing in less time. When the District is made aware that a complainant is represented by an attorney, notice of any action, finding, determination, decision or order affecting the complainant shall also be served upon the attorney.

7.6 COSTS AND ATTORNEYS' FEES. In the event the prior decisions of the District are upheld, the District shall be entitled to recover its costs and attorneys' fees from the complainant. In the event of any litigation undertaken contrary to this Section, the District shall be entitled to recover its costs and attorney fees from the complainant.

SECTION 8 – MISCELLANEOUS

8.1 SIGNS. No billboard, sign, notice or advertisement, whether of a permanent or temporary nature, shall be constructed or posted within any easement, right of way, roadway or other property belonging to the District.

8.2 CONSTRUCTION WITHIN EASEMENTS.

8.2.1 Prohibition. No structure or facility of any type shall be constructed within, under or over, or which encroach any easement, right-of-way or dedication granted in favor of the District, or public easements, rights-of-way or dedications which benefit the District (collectively referred to in this Section 8.2 as "District Easements"), without the express written consent of the Board.

8.2.2 Variances. Upon written application to the Board, the Board may, after consultation with the District Engineer and in the Board's sole discretion, grant written variances to allow construction within, under or over District Easements. All variances must be signed by the property owner to be benefited and shall specify that the property owner will indemnify and hold the District harmless from any damage to the landowner's structure or facilities, or any landscaping, located within District Easements which may occur as a result of the District's exercise of its easement rights, including the excavation of such easement. Such variance shall be recorded with the Clerk and Recorder of the applicable county and will constitute covenants which run with the land.

8.2.3 Removal of Unauthorized Structures. The District, in its sole discretion, may remove any unauthorized structure or facilities and all landscaping located within, under or over, or which encroach on any District Easement, which are inconsistent with the District's use of such easement, at the sole cost of the property owner. Such cost shall include reasonable attorneys' fees and damages incurred by the District. The District shall not be responsible for repair or replacement of unauthorized structures or facilities, or any landscaping, if such is required as a result of the District's exercise of its easement rights.

8.2.4 Private Use of Easements. Except where the language of a District Easement so provides, private use of District Easements incompatible with the District's rights is prohibited.

8.3 SEVERABILITY. If any provision of these Rules and Regulations, or its application to any person or circumstances is held invalid, the application of such provision to other persons or circumstances, and the remainder of these Rules and Regulations shall not be affected thereby.

8.4 MODIFICATION, WAIVER AND SUSPENSION OF RULES. The Board of Directors or the Manager, acting on instructions of the Board, shall have the sole authority to waive, suspend or modify the application of these Rules and Regulations, and any such waiver, suspension or modification must be in writing, signed by the Board or the Manager and shall not be deemed an amendment of the Rules and Regulations. No waiver, suspension or modification of any one occasion shall constitute a waiver, suspension or modification on any subsequent or other occasion.

8.5 MANHOLES. No Person shall cover or obstruct a manhole of the District without prior written authorization of the District. In the event a manhole is covered without the District's prior authorization, the District may enter upon the property to uncover the manhole and perform any related activities; any and all costs related to the uncovering of the manhole shall be the sole responsibility of the Person or Owner, and the District shall be entitled to reimbursement from the Person or Owner for such costs borne by the District.

8.6 ENTERPRISE.

8.6.1 Establishment. The District operates and owns the Strasburg Sanitation and Water District Water Activity Enterprise, which was established by Resolution No. 2012-1 of the Board of Directors on April 10, 2012 to provide retail and wholesale water and wastewater services and to acquire water rights ("Water Activities").

8.6.2 Enterprise Activities and Facilities. The Enterprise shall manage, operate, use, maintain, and conduct all Water Activities, services, and facilities of the District. The Enterprise is authorized to use, operate, improve, extend, enlarge, repair, replace, acquire, dispose of, encumber, contract with respect to, and otherwise control and supervise all activity, facilities and property of the District. All facilities, property, and assets utilized by the Enterprise shall remain the property of the District.

8.6.3 Governing Board. The Board of Directors of the District shall be the governing board of the Enterprise ("Enterprise Board"). The Enterprise Board shall conduct the business of the Enterprise in the manner and following the same procedures as the Board of Directors. All public business of the Enterprise shall be conducted only during regular or special meetings of the Board of Directors at which a quorum is present. The record of proceedings of the Enterprise Board may be incorporated into the minutes of the Board of Directors of the District. No additional oaths, bonds, or other qualifications shall be required of the Enterprise Board. All activities of the Enterprise and actions of the Enterprise Board shall be governed by and made subject to all requirements, privileges, immunities, protections, limitations, and other provisions of law relating to the Board of Directors.

8.6.4 Powers. The Enterprise Board may, without limitation, exercise the District's legal authority relating to Water Activities. Such authority shall include the powers set forth in the Special District Act that are consistent with the business operations of an enterprise under TABOR and that are necessary to operate the Enterprise.

8.6.5 Taxes. The Enterprise shall have no power to levy or assess any tax which is subject to TABOR or to direct the District to exercise its taxing powers on behalf of the Enterprise.

8.6.6 Grants. The Enterprise shall not accept or receive any revenue in grants from the District, state or any local government, unless authorized by the Board of Directors, and any such grants shall be less than ten percent of the annual revenues of the Enterprise.

8.6.7 Contracts. All contracts relating to Water Activities shall be approved by the Enterprise Board and executed by one or more District officers on behalf of the Enterprise. Any pre-existing contract relating to Water Activities shall be deemed to have been approved and entered into by the Enterprise Board.

8.6.8 Revenue. All revenue for Water Activities services and facilities provided by the Enterprise, including rates, fees, tolls, charges, and any other legally available income of the Enterprise shall be collected, used, and expended for Water Activities purposes as determined by the Enterprise Board. Rates for services and facilities shall be established by the Enterprise Board and collected and enforced in accordance with state law.

8.6.9 Enterprise Fund. An Enterprise Fund shall be established to separately account for all revenue and expenditures of the Enterprise.

8.6.10 Continuation of Enterprise. Nothing in this Section shall be deemed to limit the authority of the Enterprise Board to utilize other policies or procedures for operating or continuing the Water Activities in accordance with TABOR. If any provision of this Section is determined to be invalid or in violation of the enterprise qualification provisions of TABOR or the Colorado Revised Statutes, this Section shall be enforced to the extent possible to preserve the benefits afforded to an enterprise under TABOR and Section 37-45.1-101, *et seq.*, C.R.S.

8.7 IDENTITY THEFT PREVENTION PROGRAM. The District shall comply with the Identity Theft Prevention Program attached as Appendix C.

These Rules and Regulations are adopted this 13th day of December, 2016, by the Board of Directors of the Strasburg Sanitation and Water District.

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Secretary

APPENDIX A

STRASBURG SANITATION & WATER DISTRICT
SCHEDULE OF UTILITY RATES AND FEES

A-1 TAPPING FEES. This fee is intended to cover the cost of the District's inspection of the physical tap and installation of the customer's service line, entering the tap location on the District's as-built drawing set, and other ancillary services needed in connection with a new tap.

If the District elects to furnish water meters, then the actual cost of the meter and related materials required for installation will be added to the water tapping fees. If repeat inspection services are required due to unacceptable installation or improper scheduling, then the District will charge additional fees based on hourly rates and expenses incurred.

TAPPING FEE SCHEDULE

WATER

Line / Meter Size	Fee
3/4″	$70.00
1″	$100.00
1 1/2″	$110.00
2″	$125.00
3″ & larger	$150.00

SEWER

Service Line	Fee
4″	$85.00
6″& larger	$120.00

A-2 SYSTEM DEVELOPMENT FEES. This fee is a one-time contribution required of new customers (or existing customers having change of use) to be used for capital investment in Regional Facilities and District operations. This fee shall be due at the time of application for service.

WATER SDF SCHEDULE

Single Family detached residence or equivalent with 3/4″ service line **	$3,100.00

Fees for the following tap sizes will be calculated at the stated EQR values multiplied by the SDF amount stated above for water and below for sewer.	
3/4″ Size	1 EQR
1″ Size	2 EQR
1 1/2″ Size	4 EQR
2″ Size	8 EQR
3″ Size	18 EQR
4″ Size	36 EQR
Larger than 4″ as determined by District	

* The System Development Fee shall increase by $100 per SDF each January 1st, beginning January 1 of 2007

** Note: In low pressure areas (having a static pressure less than 40 psi) designated by the District Engineer, the Manager may permit the use of a 1″ tap at the same fee

WATER RESOURCE FEE
(required if water rights conveyed to the District by property owner are not adequate.)

This fee is to be paid upon inclusion within the Service Area of the District or if change in use, by separate agreement with the District and shall equal the actual cost of acquisition of sufficient water rights (new or out of the District's reserves) to serve the proposed use or change in use of the property, attorney's fees, engineering fees, court costs and all related expenses.

SANITARY SEWER SDF SCHEDULE

Per EQR Connected per schedule above	$2,400.00*
EACMD System Surcharge per EQR	$8,000.00

* The System Development Fees shall increase by $100.00 per SDF each January 1st beginning January 1 of 2007.

A-3 SERVICE CHARGES. To be billed monthly to all customers.

WATER CHARGES

Base Rate	$8.00 / EQR / mo
Usage Rate	$1.80 / 1000 gallons

SEWER CHARGES

The EQR determination for monthly sewer service charges shall be according to the EQR schedule located at Table 6.3.1 of the Rules and Regulations

- Customers connected or having reserved taps prior to September 20, 2000	$24.31* / month / EQR connected
- Customers connected after September 20, 2000 (subject to Eastern Adams County Metropolitan District ("EACMD") sewer treatment surcharge)	$34.00 / month / EQR connected **

* Subject to Cost of Living Index (Denver Metro) increase each year and any other District increases.

** Subject to changes in the EACMD surcharge and any District increases.

A-4 STANDBY FEES. To be billed monthly to each customer having purchased a water or sewer tap and having not connected such tap to the District's facilities.

- WATER STANDBY FEE shall equal the "Base Rate" shown in A-3.

- SEWER STANDBY FEE shall equal the District portion of the Sewer charge.

Please contact the District offices for determination of exact standby charge to apply

A-5 MISCELLANEOUS FEES.

Inclusion Fees*	
Less than 1/2 acre	$500.00
1/2 acre up to 5 acres	$1000.00
5 acres up to 10 acres	$2,000.00
over 10 acres	$5,000.00
* plus all costs of publication of notices and engineering and attorneys fees incurred by District to process application	

Formal Hearing Fee	$250.00 per application / plus all staff, engineering and attorneys fees
Sand and Grease Intercepter Inspection Fee	$100.00 per inspection
Turn-On / Turn-Off of Service	$100.00 per service
Penalty for Violation of Rules	$1,500.00 * per incident * in addition to all other penalties and charges
Foreclosure Fee	$2,000.00 * per incident * plus staff, engineers and attorneys fees
Unauthorized Connection Fee	2 times the then current System Development Fee
Penalty for Unauthorized Tampering with District Systems or Meters	$2,000.00 plus actual cost of damage, expense and loss to District
Construction Water Charge ($25.00 account set-up charge applies)	$50.00 / month, flat rate for in-building construction use $10.00 per 1,000 gallons plus $500.00 meter deposit (refundable) for bulk hydrant water

APPENDIX B

PUBLIC UTILITY DESIGN AND CONSTRUCTION SPECIFICATIONS FOR WATER DISTRIBUTION AND WASTEWATER COLLECTION

STRASBURG SANITATION AND WATER DISTRICT

PO Box 596
Strasburg, CO 80136-0596
(303) 622-4443

EXHIBIT B TO RULES AND REGULATIONS

PUBLIC UTILITY DESIGN AND
CONSTRUCTION SPECIFICATIONS

FOR
WATER DISTRIBUTION
AND
WASTEWATER COLLECTION

Number: _____ Issued to:

Address:

		Date of Original Issue	Date of Latest Revision
Part I	Water System Standard Specifications		10/31/16
Part II	Wastewater Collection System Standard Specifications		10/31/16

PART I

WATER SYSTEM STANDARD SPECIFICATIONS

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PART I

WATER SYSTEM STANDARD SPECIFICATIONS

CHAPTER 1 - Distribution System Design and Layout

1.01 General. The purpose of this chapter is to provide information for the design and layout of a water distribution system acceptable to the District.

1.02 Quality of the Distribution System. The purpose of these Standard Specifications is to ensure that only proven high quality materials are installed using first class workmanship. Determination of the best materials and constructions methods are based upon lowest life cycle costs, not upon lower initial costs. Sizing and layout of the system are parts of the total consideration of design, operation and maintenance of a water supply system that yields optimum quality service at the lowest total cost to the customer.

1.03 Sizing of Distribution Mains. All mains shall be sized large enough to provide for domestic, irrigation, and fire protection flows to the area requesting service and shall meet the following requirements:

The District reserves the right to size mains to provide service for projected future needs. In business and industrial areas main sizes may be increased in adherence to the recommendations of the Insurance Services Organization to provide adequate fire flows.

Planned Building Groups may be treated the same as Industrial and Business areas because of the high fire risk.

All water mains shall be sized in accordance with the following criteria:

- Flow velocity shall not exceed two feet (2') per second on a peak day demand day.
- Flow velocity shall not exceed five feet (5') per second on a peak demand day during fire flow conditions. Fire flow requirements shall be determined by the Fire Protection District and submitted to the District in writing.
- Minimum design pressure shall be thirty-five (35) PSI, maximum design pressure shall be one hundred and twenty (120) PSI for all flow ans static conditions.
- Minimum diameter of water mains is eight inches (8") wherever fire hydrants are connected. Smaller lines may be accepted only where no fire hydrants are located upon approval by the District Engineer.

1.04 Fire Protection.

a. Fire Hydrants. The number and location of fire hydrants in a given area is determined by the District. Normal practice is to install fire hydrants on the corners of street intersections. If fire hydrants are to be installed at locations other than street intersections, they shall be located on lines which are established by extending property lot sidelines into the streets. Any other proposed location must be approved by the District. See Standard Drawing No. 1.

Fire hydrant branch lines shall be set at right angles to street mains. The hydrant shall be set at the end of the branch line and shall face the branch line. No horizontal or vertical bends or offsets shall be used in installing fire hydrant branch lines unless approved by the District. Under no circumstances shall any size or manner of tap be made on a fire hydrant branch line between the hydrant and hydrant valve.

b. Private Mains. When required in business, industrial and building group areas where increased fire protection is necessary, private fire mains and hydrants may be needed. Location of these facilities to be determined and approved by the District.

Private mains shall be treated as large service lines and will require valves to be installed at the connection point to the "District Main" and at the property line. Domestic service, irrigation and/or fire sprinkler lines may be extended to the buildings and area providing all service line and meter installation requirements are complied with.

All private main extensions shall be limited to single platted lots. Extensions will not be allowed to cross lot lines for the purpose of serving two or more platted lots and building complexes. Responsibility for a private main must remain with one property and one ownership.

Private main extensions, to include fire hydrants, shall be installed in accordance with these Specifications and shall be inspected by the District.

1.05 Pumping Facilities. Booster pumping facilities may be allowed on mains supplying water from the District Distribution System only where specifically authorized by the District. The District will prohibit the installation of pumping facilities where, in its opinion, such installations would be injurious to the operation, or future operation, of the District's system.

All proposed booster pumping facilities shall be considered as a special feature and will be dealt with on an individual case basis. This may include pressure testing of the total installation when determined necessary by the District.

1.06 Storage Facilities. Water storage reservoirs are required throughout the distribution system to maintain adequate supply during peak demand periods. Storage reservoirs may also be required adjacent to and on the suction side of pumping facilities. The size, location and type of storage reservoirs shall be determined by the District. All proposed storage facilities shall be considered a special feature and will be dealt with on an individual case basis.

1.07 Layout of the Distribution System.

Width Requirements for District Installations. All District mains shall be installed in dedicated public streets of 50 feet minimum width. When the District determines it is not possible or feasible for an installation to be made in a dedicated street, the installation shall be made in a right-of-way or easement. The conditions under which such an exception will be allowed will be determined for each individual case, and only rights-of-way and easements which conform to the requirements of the District will be accepted. The minimum width right-of-way or easement which will be accepted by the District is a twenty foot (20') exclusive or a forty foot (40') non-exclusive right-of-way or easement. If at the determination of the District, it is not feasible to meet the above requirements, installations may be made in streets, alleys, rights-of-way or easements of other widths when authorized by the District Manager.

Dedicated Streets. Pipe alignment shall be parallel to property lines. Normal practice is to lay the pipe on the south side or the west side of the street, 10 feet from the center line of the street. In any case, pipe alignment shall always be within an established roadway, between the limits of the curb and gutter. Minimum clearance for the edge of the gutter pan shall be 4 feet in all cases.

Fire Hydrants. All fire hydrants will be installed within dedicated streets or in the rights-of-way or easements as herein above defined. See Standard Drawing No. 1. Fire hydrants shall be installed only at location designated by the District.

1.08 Line Valves. Line valves are required approximately every 400 feet in the distribution system. Where blocks exceed 400 feet in length, one or more line valves may be required between intersections. Street intersections carrying heavy traffic, or containing major water distribution mains in both directions may require as many as four (4) valves, one in each direction. All tee intersections of distribution mains, with the exception of hydrant tees, will require a minimum of two (2) line valves. Where necessary, the Inspector shall require the installation of additional line valves in order to avoid exposing existing customers to high chlorine residual during disinfection of pipelines. See Standard Drawing No. 2.

1.09 Connections to Mains for Fire Sprinkler Lines. Sprinkler heads found in hotels, motels, public assembly places, warehouses, etc. are supplied by a fire line. The fire line shall be sized by the persons responsible for the structure it protects. The District will not size fire lines.

1.10 Clearance and Encasement Design for Sanitary and Storm Sewer Crossings. Normal design and construction practice shall provide for at least 24 inches separation between the crown of a sewer pipe and the bottom of the water main where the water main is laid over or above a sanitary sewer. Where a sewer passes over or is less than 24 inches under a water main, one of the following design and construction procedures shall be followed:

a. One length of pipe at least 20 feet long shall be constructed in the sewer and centered over or under the water main. Joints between the sewer pipe and the special pipe should be encased in a concrete collar at least 6 inches thick and extending at least 6 inches either side of the joint. This shall be in addition to the use of a pre-manufactured adapter coupling such as a Mission, Fernco or Caulder coupling with stainless steel tightening bands.

b. Reinforced concrete encasement shall be installed around the sewer pipe. In general, the encasement shall be a minimum of 12 inches thick and extend a distance of 10 feet either side of the center of the water main.

Where water mains pass under sewers in addition to one of the two items above, the following shall be accomplished to provide protection:

a. A vertical separation of at least 24 inches between the invert of the sewer and the top or crown of the water main.

b. Adequate structural support for the sewer pipe to prevent excessive deflection of joints and settling on and breaking the water main.

As previously stated in these Specifications, parallel installations of water mains with sanitary sewer shall provide for a 10 foot horizontal separation. Where special conditions exist which prohibit a horizontal separation of 10 feet, a water main may be laid closer to a sanitary sewer provided that:

a. It is constructed in a separate trench with undisturbed soil material between the water main and the sewer main.

b. The elevation of the crown of the sewer is at least 24 inches below the bottom of the water main pipe. Such separation shall be undisturbed or compacted soil material.

c. Where a minimum of 24-inch vertical separation cannot be obtained, the sewer shall be constructed of materials and with joints that are equivalent to water main standards of construction.

CHAPTER 2 - Materials

2.01 Materials and Testing. Detailed technical specifications for purchase or approval of materials are included in this chapter. All materials shall conform to this Specification and to all limitations on acceptable makes and styles.

All materials furnished shall be new and undamaged. Everything necessary to complete all installations in accordance with the Standards of the District shall be furnished and installed whether shown on approved drawings or not; and all installations shall be completed as fully operable, functioning parts of the District's system.

Acceptance of materials, or the waiving of inspection thereof, shall in no way relieve the applicant of the responsibility for furnishing materials meeting the requirements of the Specifications.

New water industry products or materials will be tested, if it is the opinion of the District that the product or material has some merit. The District will establish the criteria for testing or evaluating the product. The District reserves the right to accept or reject any product or material regardless of the test results.

2.02 Size of Mains. The size of mains shall be in accordance with Section 1.03 of these Specifications.

2.03 Distribution System Piping. The District has established minimum design safety factors and materials for system piping. The following minimum AWWA pressure classes for acceptable types of pipe are required:

a. Pipe Pressure Classes/Rating
Ductile Iron Pipe (DIP)
Class 350, all system pressures up to 30"
Meet requirements of AWWA Standard C151

Polyvinyl Chloride Pipe (PVC)
AWWA C900, DR14 greater than 130 psi, less than 175 psi static pressure (12 inches or less)
AWWA C900, DR 18 less than 130 psi static pressure (12 inches or less)
AWWA C905, DR 25 (12" or greater)

b. Ductile Iron Pipe

1. General. All ductile iron pipe shall be manufactured in accordance with AWWA Standard C151 and ANSI A21.51 "Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids," with the following additional requirements or exceptions.

2. Size of Pipe. This specification shall cover ductile iron pipe in 4-inch, 6-inch, 8-inch, 10-inch, 12-inch, 16-inch, 20-inch, 24-inch, and 30-inch nominal diameters.

3. Joint Type. "Push-on single gasket" type conforming with applicable requirements of AWWA Standard C111 and ANSI A21.11, "Rubber-Gasket Joints for Ductile-Iron and Cast-Iron Pressure Pipe and Fittings."

4. Class and Type. Pipe furnished under this specification shall conform to the following thickness classes as a minimum:

4" - 30" Diameter: Class 350

5. Pipe Length. Pipe furnished under this specification shall have normal laying lengths of either 18 feet or 20 feet. Random lengths are not acceptable.

6. Material Strength. Iron used in the manufacture of pipe furnished under this specification shall have 60/42/10 physicals.

7. Cement Mortar Lining. Pipe furnished under this specification shall have standard thickness cement mortar linings in accordance with AWWA Standard C104 and ANSI A21.4, "Cement-Mortar Lining For Ductile-Iron Pipe and Fittings for Water."

c. Polyvinyl Chloride Pipe

1. General. All polyvinyl pipe shall be manufactured in accordance with AWWA Standard C900, "Polyvinyl Chloride (PVC) Pressure Pipe, 4-Inch Through 12-Inch, For Water," with the following additional requirements or exceptions. For PVC pipe sized 15" through 24", pipe shall be manufactured in accordance with AWWA Standard C905.

2. Size of Pipe. This specification shall cover polyvinyl chloride pipe in 4-inch through 24-inch nominal diameters with ductile iron equivalent outside diameters.

3. Joint Type. Pipe joints shall be made using an integral bell with an elastomeric gasket push-on type joint.

4. Pipe Length. Each length of pipe will be a standard laying length of 20 feet. Random lengths shall not be acceptable.

5. Manufacturer. The only PVC pipe approved for installation within the District's water distribution system shall be:

(a) JM Eagle, municipal PVC water pipe, DR-25, DR-18 and DR-14, meeting specifications AWWA C-900 & C-905, NSF 61 approved, minimum Cell Class 12454, ASTM Resin Specification D-1784.

(b) Diamond Plastic Corporation, municipal PVC water pipe, DR-25, DR-18 and DR-14, meeting specifications AWWA C-900 & C-905, NSF 61 approved, minimum Cell Class 12454, ASTM Resin Specification D-1784.

(c) North American Pipe Corporation, municipal PVC water pipe, DR-25, DR-18 and DR-14, meeting specifications AWWA C-900 & C-905, NSF 61 approved, minimum Cell Class 12454, ASTM Resin Specification D-1784.

2.04 Pipe Fittings. All ductile iron fittings used in the District's water distribution system shall meet the latest AWWA Standard C110 and ANSI A21.10 or AWWA Standard C153 and ANSI A21.53.

All fittings shall be furnished with mechanical joint ends and shall conform to the following:

a. General. All ductile iron fittings shall be manufactured in accordance with the following AWWA Standards: C104, "Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water"; C110, "Ductile Iron and Gray Iron Fittings, 3-Inch Through 48-Inch for Water and Other Liquids"; C111, "Rubber-Gasket Joints for Ductile-Iron and Cast-Iron Pressure Pipe and Fittings"; C153, "Ductile-Iron Compact Fittings, 3 In. Through 16 In., for Water and Other Liquids"; with the following additional requirements or exceptions.

b. Cement Mortar Lining. All sizes of ductile iron fittings shall be furnished with a cement-mortar lining of standard thickness as defined in referenced specifications and given a seal coat of bituminous material and remain in accordance with AWWA standard C104

c. Type of Joint. All fittings shall be furnished with mechanical joint ends conforming to referenced specifications.

d. Thickness Class. All fittings shall be 350 psi pressure rating and shall conform to the dimensions and weights shown in the tables of referenced specifications.

e. Material. All fittings shall be made from ductile iron. No PVC joints will be allowed.

2.05 Gate Valves. Gate valves shall be the same size as the main. Valves shall open to the left (counterclockwise). Gate valves shall conform to the following:

a. General. All valves shall be manufactured in accordance with AWWA Standard C509 with the following additional requirements or exceptions.

b. Valve Description. Valves shall be resilient wedge, ductile iron body, fully bronze-mounted, with non-rising stem, resilient seat and epoxy lined.

c. Service. All valves shall be suitable for frequent operation as well as service involving long periods of

inactivity. The operating pressure for all sizes shall be 200 psi. If valve is larger than 14", it shall meet the requirements of AWWA Standard C515 and be modified to meet 250 psi working pressure.

d. Valve Stems. Valve stems shall be threaded so that the valve can be opened by turning to the left (counterclockwise). The stem shall be non-rising and be sealed with "0" ring packing. All valves shall be equipped with a 2-inch square wrench nut.

e. Extension Stems. Provide wherever operating nuts are 5 feet or more below grade. The stems shall consist of solid steel shafting with O.D. not less than O.D. of valve stem or galvanized steel pipe with I.D. not less than O.D. of valve stem. Connect to valve by flexible socket coupling bolted through the extension and operating nut on the valve.

f. Types of End Connections. All valves shall have a mechanical joint end with gasket, gland and fasteners conforming to the ANSI A21.11 (AWWA Standard C111, "Rubber-Gasket Joints for Ductile-Iron and Cast-Iron Pressure Pipe and Fittings"). Plain rubber gaskets shall be used except that in certain conditions, the District may require the use of special rubber gaskets.

g. Manufacturer. Because of the problems associated with stocking repair parts for all makes of valves, only the following makes are acceptable for use in the District's distribution system:

New Style Mueller
M&H
Waterous (Series 2500)

2.06 Valve Boxes. All buried valves shall be provided with a 6-inch cast iron valve box, slip type. The valve box shall be of a design which will not transmit shock or stress to the valve and shall have enough extension capability to be raised to final street grade. Valve boxes shall conform to the following:

a. General. The manufacturer of valve box components shall be experienced in their design and construction, shall be regularly engaged in their manufacture and shall have produced valve boxes which have given successful service for a period of at least five (5) years. See standard drawing No. 3

b. Materials. Valve box parts shall be made of gray cast iron.

Use of an aluminum alloy as a casting material is not acceptable.

c. Approved Patterns. Valve boxes shall be the three-piece adjustable slip type and only the following pattern acceptable:

Tyler Slip Type 6-Inch Cast Iron Valve Box Assembly Series 6855 or equal.

d. Coating. Box, cover and base coated by dipping in asphalt varnish.

e. Cover. Deep socket type with the word "WATER" cast in top for water applications.

2.07 Fire Hydrants. Within the District's distribution system where maintenance, repair, replacement, and parts stocking is the responsibility of the District, only one (1) hydrant as listed is acceptable.

a. General. All fire hydrants shall be designed and manufactured in strict compliance with AWWA Standard C502, "AWWA Standard for Dry-Barrel Fire Hydrants." All references made in this specification are to the above standard unless otherwise noted.

b. Acceptable Brand and Service Limitations:

Mueller Super Centurion 200 - Static Pressure Less than 200 PSI

c. Size of Hydrant. Hydrants shall have a main valve opening size of 5-1/4 inches and shall be ordered for a 5-foot 6-inch bury unless otherwise approved by the District or designated otherwise on the drawings.

Hydrant bury will be measured from the bottom of the hydrant lateral pipe to finish grade line. Hydrant bury shall be adjusted to provide the minimum required cover on all portions of the hydrant lateral piping.

d. Type of Hydrant. All hydrants shall be the traffic model type. Hydrants shall be the three-way type with one (1) pumper nozzle and two (2) hose nozzles all located on the same horizontal plane.

e. Inlet Connection. Hydrant base shall be provided with a mechanical joint inlet to accommodate 6-inch diameter ductile iron pipe, all in accordance with ANSI A21.11 (AWWA Standard C111, "Rubber Gasket Joints for Ductile-Iron and Cast Iron Pressure Pipe and Fittings"). Incorporated into the base shall be two (2) lugs for rodding or strapping of pipe.

f. Main Valve Assembly. The main valve of the hydrant shall be 5-1/4-inch diameter compression type which closes with the water pressure.

Gasket for valve shall be a replaceable type fabricated of a resilient material, with a threaded bottom plate or nut, complete with seal to prevent leakage of the hydrant shaft.

The valve assembly shall include one or more drain valves which will work automatically with the main valve and drain the barrel when the main valve is in the closed position.

All parts of the main valve assembly shall be so designed that removal of the assembly from the barrel is accomplished without excavation in accordance with Section 3.10 of these specifications.

g. Operating Shaft Nut. The operating nut shall have a pentagon cross section. Bushings in the bonnet shall be so constructed that it will prevent the operating nut from traveling during opening or closing operation; the bushing shall house a gasket or seal to prevent moisture or foreign material from entering the lubricant reservoir.

The hydrant shall open by turning the operating nut to the left in a counter-clockwise direction and shall have an arrow on top of the bonnet to designate the direction of opening.

h. Pumper Nozzle and Cap. The pumper nozzle shall be 4-1/2 inch nominal diameter with four threads per inch (National Standard). Threads shall be right-hand.

Nozzle cap shall be furnished with a synthetic rubber gasket installed in a retaining groove and the dimensions and shape of the nozzle cap nut shall be the same as the operating shaft nut.

Nozzle caps shall be furnished with security chains with one end of each securely attached to the upper barrel section of the hydrant.

All nozzle caps shall be removed by turning counterclockwise.

i. Hose Nozzles and Caps. The two hose nozzles shall be 2-1/2 inch nominal diameter with seven and one-half threads per inch (National Standard). Threads shall be right-hand. Each hose nozzle shall include a nozzle cap with nut, security chain and shall be removed by turning counterclockwise.

j. Color. The upper exposed section of the hydrant above ground shall be painted Rustoleum 1210 - Fire Hydrant Red or equal. The buried portion of the hydrant shall be given a bituminous coating in accordance with Section 681 of AWWA Standard C106.

2.08 Corrosion Protection Systems. The testing of the corrosiveness of the soil which a water main passes through may be required by the District. If so required, the testing shall be accomplished by the Applicant. The need for protection will be determined by the District based on the information submitted by the Applicant and/or other information available to the District.

a. Polyethylene Encasement Material. If determined by the District as a requirement, the pipe, fittings, rods, and appurtenances shall be wrapped in polyethylene in accordance with Section 3.26. Polyethylene Material shall conform to the following:

(1) General. A polyethylene encasement material shall be manufactured in accordance with AWWA Standard C105, "Polyethylene Encasement For Gray and Ductile Cast-iron Piping For Water And Other Liquids," with the following additional requirements or exceptions.

(2) Materials. The raw material used to manufacture polyethylene film shall be Type 1, Class A, Grade E-1, in accordance with A.S.T.M. Standard Designation D-1248.

Tensile Strength	1200 PSI minimum
Elongation	300% minimum
Dielectric Strength	800 V/Mil Thickness minimum
Thickness	0.008" (8 mils) minimum Nominal with minus tolerance not exceeding 10% of nominal
Melt Index	0.4 maximum

b. Cathodic Protection.

(1) Where DIP is used the entire pipe and fitting system shall be bonded continuously. A minimum of 17 lbs (sacrificial anode) per 400 feet of distribution line is required at separation not to exceed 400 feet. Additionally fire hydrant sets and fitting and/or valve clusters must have a minimum of 9 lbs (sacrificial anode) per grouping with groupings not to exceed 4 fittings/valves. See standard drawings.

(2) Where PVC is used each fitting requires a minimum of 1 lb (sacrificial anode) per each fitting. Additionally, fire hydrant sets must have a minimum of 9 lbs (sacrificial anode). If fitting groups are bonded, each grouping must have a minimum 9 lbs (sacrificial anode) per grouping with groupings not to exceed 4 fittings/valves. See standard drawings.

2.09 Concrete Thrust Blocks, Anchors and Structures. Concrete thrust blocks and anchors shall be sized for the internal pipe pressure and soil bearing capacity. Standard sizes and shapes of thrust blocks and anchors are shown on Sheets 8 of the Standard Drawings.

Thrust reaction blocking shall be concrete of a mix not leaner that 1 part cement to 2-1/2 parts sand and 5 parts stone, and having a compressive strength of not less than 3000 psi after 28 days. See Section 3.20 of these Specifications. The concrete and any required reinforcement shall meet the following criteria:

a. Materials:

Cement. All cement used shall be Portland Cement acceptable under the "Standard Specifications and Tests for Portland Cement," ASTM Designation C150 of the American Society for Testing and Materials. Cement used shall be Type II.

Aggregates. All the fine and coarse aggregates shall meet soundness requirements, deleterious substance limits and grading limits as set forth in the latest edition of "Standard Specifications for Concrete

Aggregates" ASTM Designation C33. The limits for deleterious substances and physical property requirements of the course aggregates shall be selected for the applicable class designation from those listed under severe weathering regions, Table 3, ASTM Designation C33. The maximum size aggregate that is practical for the structure design and placing conditions shall be used in the concrete.

Water. The water used in all concrete shall be free from objectionable quantities of silt, organic matter, alkali, salts, and other impurities.

Admixtures. An air-entraining agent shall be used in all concrete. The agent used shall conform to "Standard Specification for Air-Entraining Admixtures for Concrete," ASTM Designation C260. The amount of air-entraining agent used shall be such as will affect the entrainment of 5% ± 1% of volume of the concrete.

A water-reducing admixture (WRA) may be used unless otherwise noted by the District. The admixture shall conform to ASTM Designation C494 for Type A or Type D chemical admixture, shall contain no calcium chloride, and shall be compatible with the cement being used.

The Contractor shall be responsible for any difficulties arising or damages occurring as a result of the selection and use of any admixture such as a delay or difficulty in concrete placing or damage to concrete during form removal.

b. Concrete Quality. All Concrete shall have a minimum 28-day compressive strength of 3,000 psi and a maximum slump of 4 inches.

c. Testing. When determined necessary by the District, field control tests consisting of aggregate gradation tests, slump tests, air content tests, and making compression test cylinders, shall be performed by qualified personnel in the presence of the Inspector.

d. Concrete Reinforcement. Reinforcements shall be accurately formed and shall be free from loose rust, scale and contaminants which reduce bond. Unless otherwise shown on the drawings or specified herein, all requirements shall conform to the latest ACI Standard 318 and the International Building Codes.

Reinforcements shall be accurately positioned on supports, spacers, hangers, or other reinforcements and shall be secured in place with wire ties or suitable clips.

e. Reinforcement Material. All deformed reinforcing bars shall conform to ASTM Standard A615, Grade 60.

2.10 Mechanical Joint Restraint. Mechanical joint pipe restraints may be used for restraining fittings, valves and hydrants to reduce the installation of concrete reverse anchors, thrust reaction blocks and/or steel tie rods; however, anchors, thrust blocks and/or tie rods will still be required where indicated on plans and standard drawings.

a. When mechanical joint pipe restraints are installed on ductile iron pipe, the length of pipe to be restrained shall be determined in accordance with the "Ductile Iron Pipe Research Association" (DIPRA) Recommendations, "Thrust Restraint Design for Ductile Iron Pipe." See Standard Drawings Nos. 14 and 15.

Ductile iron pipe shall be restrained with Series 1100 mechanical joint ductile iron retainer glands manufactured by EBAA Iron Sales, Inc. or an approved equivalent.

b. Polyvinyl chloride (PVC) pipe may be restrained with the use of mechanical joint restraints subject to approval of the District. Refer to Standard Drawings for typical installation details.

PVC pipe mechanical joint restraints shall be series 2000 PV Megalug Retainer Glands manufactured by EBAA Iron Sales, Inc. or an approved equivalent.

2.11 Casing Pipe. Installation of mains through rights-of-way or easements of others, such as highways, railroads, etc., may require casing pipes for bores. The type of casing material and its properties will be specified by the agency granting permission to cross. Such crossing shall be subject to approval by the District to avoid conflicts in requirements or standards between the District and the persons or agency granting permission to cross. See Section 3.24 of these Specifications.

2.12 Responsibility for Materials.

a. Material Furnished by Contractor. The Contractor shall be responsible for all material furnished by him/her and shall replace at his/her own expense all such material found defective or damaged in handling after delivery by the manufacturer. This shall include the furnishing of all material and labor required for the replacement of installed material discovered defective prior to final acceptance of the work and materials found defective during the warranty period.

b. Responsibility for Safe Storage. The Contractor shall be responsible for the safe storage of material furnished by or to him/her, and accepted by him/her and intended for the work, until it has been incorporated in the completed project. The interior of all pipe, fittings, and other accessories shall be kept free from dirt and foreign matter at all times. Valves and hydrants shall be drained and stored in a manner that will protect them from damage by freezing.

2.13 Handling of Materials.

a. Hauling of Materials. All materials furnished by the Contractor or to the Contractor shall be delivered and distributed at the job site by the Contractor.

All pipe, valves, fittings, hydrants and accessories shall be loaded and unloaded by lifting so as to avoid shock or damage. Under no circumstances shall materials be dropped. Pipe shall not be skidded or rolled against pipe already unloaded.

b. Unloading at the Site of Work. When distributing the material at the site of work, each piece shall be unloaded opposite or near the place where it is to be installed in the trench.

c. Care of Coatings and Linings. All materials shall be so handled that the coating and lining will not be damaged. If, however, any part of the coating or lining is damaged, the replacement or repair of the damaged material shall be done to the satisfaction of the District. All material handling equipment and material handling methods shall be approved by the District.

2.14 Pressure Accessories.

a. Pressure Gauges.

1.	Type:	Dial, liquid filled
2.	Range:	Downstream: 0 to 150 psi
		Upstream: 0 to 300 psi
3.	Accuracy:	3% full scale range
4.	Dial size:	3-1/2" diameter
5.	Accessories:	Isolation ball valve on nipple; snubbers on nipple
6.	Design basis:	U.S. Gauge P580L-1

CHAPTER 3 - Pipe Installation

3.01 Approval by the District. Throughout these Specifications many handling and installation procedures, tools, equipment, and materials will require approval by the District. Approval by the District shall in no manner render the District liable for any injuries suffered or equipment damaged. Approval by the District is used solely as a means to insure quality control and safety.

Safety of workers shall be provided as required by the Occupational Safety and Health Act (OSHA). The Contractor is solely responsible for job safety.

3.02 Handling of Materials. Pipe and fittings shall be loaded and unloaded by lifting so as to avoid shock or damage. Under no circumstances shall such material be dropped. If, however, any part of the coating or lining is damaged, the replacement or repair of the damaged pipe shall be done to the satisfaction of the District. Any pipe or fittings that are not acceptable to the District shall be removed from the job site immediately. All pipe handling equipment and pipe handling methods shall be approved by the District in conjunction with the methods and equipment recommended by the manufacturer.

3.03 Inspection and Preparation of Pipe and Fittings. Before placing pipe in the trench, each pipe or fitting shall be thoroughly cleaned of all foreign material, kept clean at all times thereafter, and carefully examined for cracks and other defects before installation. Bell ends and spigot ends are to be examined with particular care. Defective pipe or fittings shall be laid aside for inspection by the District Inspector who will prescribe corrective repairs or rejection.

All lumps, blisters and excess coating shall be removed from the bell-and-spigot end of each pipe and fitting, and the outside of the spigot and the inside of the bell shall be wire brushed and wiped clean, dry and free from oil and grease before the pipe or fitting is installed. Dirt and any other material must be removed from the barrel of the pipe before installation.

3.04 Cutting and Fitting of Pipe. Pipe shall be cut, whenever necessary, to conform to location of fittings, line or grade. All cuts shall be straight and true, and in a workmanlike manner so as to leave a smooth end without damaging the pipe or its cement lining. All burrs shall be removed from the ends of cut pipe, and the end lightly rasped or filed. All tools used in cutting pipe shall be approved by the District.

3.05 Pipe Joint Lubrication. Joint lubricant shall be supplied by the pipe manufacturer, and approved by the District. Joint lubricant shall be non-toxic, and water soluble.

3.06 Pipe Alignment and Grade. In laying pipe, the intent is to lay to a set line and grade within a tolerance of 3 inches plus or minus. On slopes of zero grade, the intent is to lay to grade. Fittings, valves and hydrants shall be installed at staked locations and elevations; spigots centered in bells; and all valve and hydrant stems plumb.

In new developments, street right-of-way and/or property line and lot corner points must be set and in visible evidence before water installations can proceed. In existing areas sufficient right-of-way, property or easement delineation must be recovered or established before water installation can proceed. Offset stakes for alignment and grade shall be set by the Contractor's, Owner's or Developer's engineer. Any replacement of stakes shall be at the expense of the Contractor, Owner or Developer.

When laying pipe on curves, the intent is to lay to the staked alignment. The pipe shall be kept in alignment by placing all deflecting joints or bends on the curve. Short lengths shall be used as necessary to accomplish the curvature without exceeding individual deflections specified by the District. See Standard Drawing No. 10. Bends shall be used whenever individual deflections exceed those specified by the District.

For pipes with an internal diameter of 10 inches or less, the depth of fill over the pipe measured from the proposed finish grade over the pipeline to the top of the pipe shall be a minimum of 4.5 feet and maximum of 5.5 feet unless otherwise specified. All pipes with an internal diameter of 12 inches or more shall be installed to the depth shown on the required plan and profile drawings.
If difficulties arise when crossing an interference and where specifically approved by the District or its Inspector, deviations from the above minimum and maximum depths of cover may be permitted.

Any changes in alignment and grade must be authorized by the Inspector and shall be accomplished by the installation of additional fittings. "Breaking" of joints is permitted only when installing pipe on horizontal or vertical curves.

Pipe shall be laid with the bell ends facing in the direction of laying, unless directed otherwise by the District. Where pipe is to be installed on a grade of ten percent (10%) or greater, the laying shall start at the bottom and shall proceed upward with the bell ends of the pipe upgrade.

3.07 Deviation From Alignment and Grade Occasioned by Other Structures. Whenever obstructions not shown on the plans interfere to such an extent that alteration in the plans is required, the District shall have the authority to determine the best method of correction. The District may order a deviation from the line and grade of the structures and/or removal, relocation and reconstruction of the obstructions.

3.08 Temporary Bulkheads. Whenever the pipe is left unattended, temporary plugs shall be installed at all openings. Temporary plugs shall be of such design as to prevent water, debris, children and animals from entering the pipe. All temporary plugs shall be provided by the Contractor and approved by the Inspector.

3.09 Frost. No pipe or appurtenant structure shall be installed upon a foundation into which frost has penetrated, or at any time when the Inspector deems there is danger of ice formation or frost penetration at the bottom of the excavation. No pipe or appurtenant structure shall be installed unless backfilling can be completed before the formation of ice and frost.

3.10 Earthwork. See standard drawing No. 9 for typical pipe trench and earthwork requirements.

a. Embedment Materials. All water and sanitary sewer mains are to receive one of the following embedment materials extending from the bottom of the excavation to 12 inches over the pipeline.

(1) Concrete. The pipeline embedment with concrete shall utilize concrete having a 28-day compressive strength of a minimum of 3000 psi and other characteristics as set forth in these Specifications.

(2) Granular Material. Well-graded, crushed stone or gravel meeting the requirements of ASTM C33, Gradation 67 (3/4" to No.4).

(3) Fine Granular Material. Natural or manufactured sand meeting the following requirements:

Well-Graded Sand

Sieve Size	Total Percent Passing by Weight
3/8	100
No. 4	95 – 100
No. 8	80 – 100
No. 16	50 – 85
No. 30	25 – 60
No. 50	10 – 30
No. 100	2 - 10

(4) **Squeege Sand**

Sieve Size	Total Percent Passing by Weight
3/8 inch	100
No. 200	0 - 5

(5) Selected Backfill. Selected soil free from rocks, clods or stones greater than 1-1/2" in any dimension as approved by the District's representative. Granular material, fine

granular material or squeege sand may be substituted for selected backfill.

b. Backfill Materials

(1) Suitable Material. Soil obtained from the excavation that is free of frozen material, stumps, roots, brush, other organic matter, debris and other items. In addition, suitable material shall meet the following requirements:

(2) Upper Portion of Trench. Material placed within one (1) foot of pavement subgrade or finished surface in unimproved areas shall be soil free from rocks, greater than 6 inches in nominal diameter.

(3) Other Portions of Trench. Material within 6 inches below and 12 inches above the pipe shall contain particles of a size to conform to the embedment class required but in no case shall it contain rocks greater than 1-1/2 inches in any dimension. From a point 12 inches above the pipeline to within one (1) foot of the pavement subgrade or finished surface in unimproved areas, maximum size of any rock in the trench backfill shall be 18 inches nominal diameter.

(4) Public Highways. Provide and install material in conformance with the Colorado Department of Transportation requirements where they do not conflict with other provisions of these regulations. Should a conflict exist, submit a request for clarification to the District in writing prior to proceeding with work.

(5) Flowable Fill. At the District's option, or if required by the right-of-way's governing body, utility trench backfill meeting the following requirements (flowable fill), may be used in lieu of native backfilling in any excavation regardless of width or depth. Concrete slurry type full depth backfill will not be allowed within the public right-of-way. Compaction and testing of utility trench backfill will not be required if material meeting the following specification is used:

FLOWABLE FILL SPECIFICATIONS

Ingredient	**lbs / cubic yard**
Cement	43 (0.47 sack)
Water	325 (39 gallons or as needed)
Coarse Aggregate (Size #57)	1700
Sand (ASTM C-33)	1845

c. Trench Backfilling and Compacting

(1) Place backfilled material above embedment materials in a manner to prevent damage or misalignment of the pipeline. Place in lifts of a thickness necessary to acquire the specified backfill density or in conformance with other regulatory requirements. Backfilled material shall conform to the requirements of Section 3.10.b of these specifications.

(2) Backfill Density Requirements. Unless otherwise specified or required by local governing authority, all backfill should be placed in a manner to achieve the density specified below.

- State Highway
  100% of maximum in shoulder areas
  Flowable Fill within all paved areas

- Paved roadways, sidewalks and other areas to receive pavement
  95% of maximum density for entire trench depth

- Gravel roadways
  95% of maximum density for entire trench depth

- Sodded or lawn areas over a dedicated easement or right-of-way
  90% of maximum density

- Zone 6" below to 12" above pipe
  95% of maximum density for all pipelines

- Adams / Arapahoe County
  100% of maximum in paved areas parallel to traffic
  95% in shoulder areas
  Flowable Fill in paved areas perpendicular to traffic

d. Field Quality Control

(1) Density Testing and Control. Density testing as may be required by the District's representatives shall be the responsibility of the Contractor and/or Developer. Results of such density testing shall be reported directly to the District by the testing agency. All reports shall be submitted with the seal and signature of a registered professional engineer experienced in the testing of soil materials.

(2) Soil Compaction Tests. Conduct in accordance with the requirements of ASTM D698-07 or AASHTO T99, "Standard Method of Test for Moisture Density Relations of Soils Using a 5.5 lb. Rammer and a 12 inch Drop." Use method A, B, C or D as appropriate on soil condition and judgment of the testing laboratory. Samples tested shall be representative of materials to be placed (or altered). Obtain optimum moisture density curve for each type of material or combination of materials encountered or utilized. Use test results as a basis for compaction control. Testing includes Atterberg Limits, grain size determination and specific gravity.

3.11 Lowering of Material Into the Trench. Proper implements, tools and facilities satisfactory to the District shall be provided and used by the Contractor for the safe and convenient performance of the work. All pipe, fittings, valves and hydrants shall be carefully lowered into the trench piece by piece by means of a derrick, ropes, or other suitable tools or equipment, in such a manner as to prevent damage to water main materials and their protective coatings and linings. Under no circumstances shall water main materials be dropped or dumped into the trench.

If damage occurs to any pipe, fitting, valve, hydrants or water main accessories in handling, the damage shall be immediately brought to the attention of the Inspector. The Inspector shall prescribe corrective repairs or rejection of the damaged items.

3.12 Laying of Pipe. Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the line. If the pipe laying crew cannot put the pipe into the trench and in place without getting earth into it, the Inspector may require that before lowering the pipe into the trench, a heavy, tightly woven canvas bag of suitable size shall be placed over each end and left there until the connection is to be made to the adjacent pipe. During laying operations, no debris, tools, clothing or other materials shall be placed in the pipe.

As each length of pipe is placed in the trench, the spigot end shall be centered in the bell and the pipe forced home with a slow steady pressure without jerky or jolting movements and brought to correct line and grade. The pipe shall be secured in place with approved backfill material tamped under it except at the bells. Precautions shall be taken to prevent dirt from entering the joint space. No wooden blocking shall be left at any point under the pipeline.

No pipe shall be laid when, in the opinion of the District, trench conditions are unsuitable.

3.13 Ductile Iron Pipe. There is only one nominal dimension of the spigot outside diameter and the bell inside diameter for each size of push-on joint pipe. In some existing older pipelines, some variation in outside spigot diameter may exist. When connecting to an existing line, care should be exercised to ensure that the outside diameter of the existing line is the same as the outside diameter of the push-on joint or mechanical joint pipe being installed, otherwise a special adapter to join the two lines may be necessary.

a. Push-On Joint. Immediately before joining two lengths of ductile iron pipe, the inside of the bell, and the outside of the spigot end, and the rubber gasket shall be thoroughly cleaned to remove oil, grit, excess coating and other foreign matter. The rubber shall be flexed inward and inserted in the gasket recess of the bell socket. Since different manufactured brands of pipe require different types of gaskets, the Contractor shall exercise caution to ensure that the correct type of gasket is used.

A thin film of approved gasket lubricant shall be applied to either the inside face of the gasket, or the spigot end of the pipe, or both.

The spigot end of the pipe shall be placed in the bell end with care to prevent the joint from contacting the ground. Pipe furnished without a depth mark on the spigot end shall be marked before assembly to assure insertion to full depth of the joint. The pipe shall be kept in straight alignment and the joint shall be completed by pushing the pipe home with a slow, steady pressure without jerky or jolting movements by using a forked tool or jack-type tool or other device approved by the District. If pipe is pushed home with a backhoe bucket, a wooden shield must be placed between the backhoe bucket and the end of the pipe. The spigot end of field cut pipe lengths shall be filed, or ground to resemble the spigot end of such pipe as manufactured.

Upon completion of joining push-on joint pipe, an inspection shall be made to assure that the gasket is correctly aligned in the gasket recess of the bell socket and not twisted or turned.

Whenever it is necessary to deflect push-on joint pipe, the amount of deflection shall not exceed the maximum deflections specified by the District. See Standard Drawing No. 10.

b. Mechanical Joint Pipe. Before joining mechanical joint cast or ductile iron fittings to ductile iron pipe, the outside of the spigot, the inside of the bell and the rubber gasket shall be thoroughly cleaned to remove oil, grit, excess coating, and other foreign matter.

Normal practice is to lubricate the joint with a soap solution; however, in cold weather the joint may be assembled dry if approved by the Inspector. Extreme care should be exercised in making dry joints.

The cast iron gland shall be slipped on the spigot end of the pipe with the lip extension of the gland toward the socket, or bell end. The rubber gasket shall be placed on the spigot end with the thick edge toward the gland.

The pipe shall be pushed in until the spigot end fully penetrates the bell. The gasket shall then be pressed into place within the bell evenly around the entire joint. The cast iron gland shall be moved along the pipe into position for bolting; the bolts inserted and the nuts screwed finger tight, then tightened with a torque limiting wrench. Torques for the various sizes of bolts shall be as follows:

Bolt Size	Ft. Lbs.
5/8 inch	45-60
3/4 inch	75-90
1 inch	85-100
1-1/4 inch	105-120

Nuts spaced 180 degrees apart shall be tightened alternately in order to produce equal pressure on all parts of the gland.

Whenever it is necessary to deflect mechanical joint pipe, the amount of deflection shall not exceed the maximum deflections specified by the District. See Standard Drawing No. 10.

3.14 Polyvinyl Chloride Pressure Pipe.

a. Elastomeric Gasket Joint. Immediately before joining two lengths of PVC pipe, the inside of the bell or coupling, the outside of the spigot and the elastomeric gasket shall be thoroughly cleaned to remove all foreign material.

Lubrication of the joint and rubber gasket shall be done in accordance with the pipe manufacturer's specifications.

Care shall be taken that only the correct elastomeric gasket, compatible with the annular groove of the bell, is used. Insertion of the elastomeric gasket in the annular groove of the bell or coupling must be in accordance with the manufacturer's recommendations. Pipe that is not furnished with a depth mark shall be marked before assembly to assure that the spigot end is inserted to the full depth of the joint.

The spigot and bell or coupling shall be aligned and pushed until the reference line on the spigot is flush with the end of the bell or coupling. Pushing shall be done in a smooth, steady motion. Upon completion of joining the pipe, an inspection shall be made to assure that the gasket is correctly aligned in the gasket recess of the bell socket and not twisted or turned.
Deflection may not be allowed at the joints of some PVC pipe. When these types of pipe are to be installed, bends shall be used where deflection is required.

Installation of PVC pipe will be in accordance with the manufacturer's recommendation. A solid No. 12 coated copper wire will be attached to all PVC pipe for the purpose of future location. See Standard Drawing No. 7.

b. Pipe Storage. Pipe stored outside, and exposed to sunlight for more than thirty (30) days shall be covered with an opaque material such as canvas. Clear plastic sheets shall not be used to cover pipe. Air circulation shall be provided under the covering.

c. Handling of Pipe in Cold Weather. PVC pipe has reduced flexibility and impact resistance as temperatures approach and drop below freezing. Extra care should be used in handling and installing PVC pipe during cold weather.

3.15 Installation of Valves. Valves shall be handled in such a manner as to prevent any injury or damage. All joints shall be thoroughly cleaned before installation.

Valves shall be located at the points on the main as indicated on Standard Drawing No. 2, unless specified otherwise by the District.

Valves shall be set and joined to the pipe in the manner previously specified for cleaning, laying and joining push-on and mechanical joint pipe. Valves shall be set in such a manner that the valve stems are plumb. If necessary to provide a firm subgrade or surface on which to install a valve, solid precast concrete blocks or a cast-in-place concrete pad may be placed beneath the valve body. If cast-in-place concrete is used, extreme care shall be taken to assure that flange bolts are not constrained by the concrete. No wood blocking will be allowed.

Valves shall be operated prior to installation to ensure good operating condition.

Where necessary, the Inspector shall require the installation of additional valves not shown on the plans. See Section 1.08 of these Specifications.

3.16 Valve Boxes.

a. Installation. A valve box shall be provided for every valve. The valve box shall not transmit shock or stress to the valve, and shall be centered and plumb over the operating nut of the valve, with the box cover set to the required elevation. It will be the responsibility of the Developer to insure that valve boxes are plumb and raised to the proper elevation.

Paving of any street requires that all existing valve boxes be located and prepared for final raising to the finish street surface as shown on Standard Drawing No. 3.

b. Inspection. Prior to paving, a final inspection is required and can be arranged by contacting the District. Inspections should be requested twenty-four (24) hours in advance of need.

3.17 Installation of Fittings. All fittings in the District's Water Distribution system shall be mechanical joint in compliance with the material specification. Fittings shall be set and joined in the manner described in Section 3.13.b of these Specifications.

The use of "wyes" in main extensions or private pipe extensions is strictly prohibited except in special installations as directed by the District.

3.18 Fire Hydrants.

a. Installation. All hydrants shall be staked for location and grade. Final location and grade shall be in accordance with the approved drawings. Offset stakes not further than 12 feet from the fire hydrant are acceptable. All hydrants shall stand plumb and be installed as indicated on Standard Drawing No. 1.

Each hydrant shall be connected to the main by a 6-inch branch line. An independent 6-inch gate valve shall be installed on each fire hydrant branch.

No service line connections shall be installed between the fire hydrant and the fire hydrant control valve.

b. Anchorage. The bowl of each hydrant shall be well braced against the unexcavated earth at the end of the trench with a concrete thrust block. The bottom of the hydrant bowl and the hydrant valve shall be supported with eighteen by eighteen by four inch (18"x18"x4") pre-cast concrete blocking slabs. The hydrant shall be tied to the hydrant valve and the hydrant valve tied to the tee with anchor pipe or with two, 3/4-inch all thread galvanized rods as shown on Standard Drawing No. 1.

Mechanical joint pipe restraints in conformance with Section 2.10 of these Specifications may be used in lieu of all-thread rods.

Whenever a fire hydrant is installed at the termination point of a main extension (such as in a cul-de-sac), then tie rods and concrete reverse anchors will be required for both the fire hydrant valve (which in this case is also a line valve on the main) and the fire hydrant lateral or branch line connected to the fire hydrant. See Standard Drawing No. 1. Additional concrete anchors or tie rods may be required at the direction of the Inspector.

If bends are needed to bring a hydrant to a desired horizontal or vertical position, special concrete reverse anchors, anchor pipe, mechanical joint pipe restraints or all thread tie back rods, or a combination of all these along with a riser may be required. In any case, a riser no longer than 2 feet will be acceptable and it will be the Contractor's responsibility to set the safety flange at the proper grade.

c. Drainage. Whenever a hydrant is set, drainage shall be provided at the base of the hydrant by placing rock from the bottom of the trench, to at least 12 inches above the barrel flange of the hydrant, and to a distance of 12 inches around the elbow. The minimum distance from the bottom of the trench to the bottom of the hydrant elbow shall be 6 inches. The minimum of rock placed shall be 1/3 cubic yard. The rock shall be a well-graded gravel, cobble, or crushed rock, free of dirt.

d. Hydrant Protection in Corrosive Soils. In areas where soil resistivity requires corrosion protection, all ductile iron branch lines and hydrants shall be protected. All pipe, rods and fittings, from finished ground level on the hydrant barrel up to and including the tee, shall be encased in polyethylene wrap. The type of polyethylene and manner in which it is to be installed shall conform to Section 3.26 of these Specifications. Bedding material shall be as specified in Section 3.10 of these Specifications. All fire

hydrants to be cathodically protected with a 9 lb anode.

3.19 Dead Ends and Blow Offs. All dead ends on new mains shall be closed with cast iron plugs or caps; such dead ends shall be equipped with suitable concrete anchors and blow off facilities.

The Contractor shall furnish, install or remove temporary blow offs at locations shown on the drawings or designated by the District. See Standard Drawing No. 12.

The Contractor shall install permanent blow offs where indicated on the drawings. A permanent blow off is defined as one which will be left in place at the completion of all proposed installations. Refer to Standard Drawing No. 12.

3.20 Thrust Blocks and Anchors.

a. Installation. Thrust blocks and/or anchors shall be constructed at all bends, tees, plugs and fittings which require reaction support due to unbalanced line thrust. Care shall be taken not to block outlets or to cover bolts, nuts, clamps or other fittings or to make them inaccessible. The Standard Drawing No. 8, shows the size and shape of thrust blocks and anchors. Bearing surface areas are minimum areas to bear against the undisturbed trench wall. If in the opinion of the District, the soil bearing capacity is not sufficient to provide adequate restraint based on minimum bearing areas shown on the Standard Drawings, then the minimum bearing area shall be increased to a size that will ensure adequate restraint. In every instance, the thrust block or anchor shall bear against undisturbed earth. When it is impossible, through over excavation or other cause, to pour a thrust block or anchor against undisturbed earth, harness rods or mechanical joint pipe restraints shall be required to anchor the fittings to the main.

   Thrust blocks will be required on large taps regardless of whether a tapping sleeve or tapping saddle is used.

   All debris, water or ice shall be removed from the place to be occupied by the concrete. Concrete shall not be placed on frozen subgrade. Concrete shall be placed in the presence of the Inspector unless inspection has been waived prior to the placement.

b. Form Work for Thrust Blocks and Anchors. All forming for concrete thrust blocks and anchors will be done by bulkheading around the shape of the thrust block or anchor with burlap or reinforced paper sacks filled with sand or earth. Sacks shall be of a size easily handled when full, and shall be left in place in the trench. Wood forms may be used in some cases; however, all wood will be removed before backfilling.

   No horizontal struts or braces required for trench shoring shall remain in the concrete thrust blocks. Prior to placing concrete, the forms and ditch bank shall be inspected and approved by the Inspector.

c. Concrete and Curing Time. Thrust blocks shall be concrete of a mix not leaner than 1 part cement to 2-1/2 parts sand and 5 parts stone, and having a compressive strength of not less than 3,000 psi after 28 days.

   Minimum curing time for concrete thrust blocks regardless of additives shall be thirty-six (36) hours for anchors containing 2 cubic yards or less, forty-eight (48) hours for anchors containing more than 2 cubic yards but less than 6 cubic yards, and seventy-two (72) hours for anchors containing more than 6 cubic yards but less than 12 cubic yards. Anchors containing more than 12 cubic yards will be cured as directed by the District Inspector. Curing time for anchors having flanged rods or other accessories embedded in them for the purpose of tying pipe and/or fittings directly to the anchor will require approximately twenty-five percent (25%) additional curing time.

   No water main will be charged or pressurized without the approval of the Inspector. All thrust blocks and anchors must meet the minimum curing time unless, under certain circumstances, the Inspector may elect to shorten or extend the time of curing.

d. Compaction of Fill Over Thrust Blocks and Anchors. Backfill may be placed over thrust blocks and anchors once the surface has set sufficiently to resist the weight of the backfill. However, no tamping or

compacting shall be allowed above the thrust block or anchor for a minimum of thirty-six (36) hours after placement or as directed by the Inspector.

3.21 Vaults. Vaults may be precast or poured-in-place and shall be constructed in accordance with these Standard Specifications. Precast vaults shall be so designed that all joints and corners are waterproof. Precast and poured-in-place vaults shall be made waterproof after construction by use of sealants, epoxies or other approved methods. All dimensions, locations and elevations shall be coordinated by the Developer and Contractor and meet the requirements of the District.

Concrete footers shall be required as indicated on the drawings.

All vaults shall be constructed to meet H.S. 20-44 traffic loading conditions and 300 psf surcharge load.

3.22 Harness Rods. Harness rods and lugs shall be used at all bends and fittings where thrust blocks cannot be used due to existing field conditions or where harness rods and lugs are specifically required by these Specifications, installation plans, or the Inspector.

3.23 Bridging and Encasement of Pipe. Under certain conditions when the water main is to be installed over or under an existing or proposed utility or structure, the District may require bridging or encasement of the pipe.

If, in the opinion of the District, there exists the possibility of settlement of the pipe being installed over an existing utility or structure, then bridging of the pipe shall become necessary. This condition shall also apply to other underground utilities or structures being installed over existing water mains. The District shall determine the size and location of the concrete bridging. 3.24 Encasement or Sleeve Pipe. Wherever it is necessary to provide an encasement or sleeve for the water main, the water main shall not be inserted into the encasement or sleeve pipe without providing insulating skids for each joint of the water main. Insulating skids shall be of a type such as the "P.S.I. Model A12 Steel Casing Insulators" or equivalent. In addition, no encasement or sleeve pipe shall be installed without protecting the ends of the pipe with adequate open joint masonry which will deter dirt and debris from entering, but at the same time will allow water to escape from the encasement or sleeve pipe. Encasement pipes shall be protected both inside and out with corrosion resistant materials having a bituminous base. Encasement or sleeve pipe, size, length, type and sidewall thickness will be determined by the District.

3.24 Connections to the District's System.

a. Connections. Connections to the District system shall be in a neat and workmanlike manner. An Inspector shall be present at all times during the construction of the connection. The connection is subject to approval by the District. Under no circumstances shall a non-disinfected main, which cannot be isolated, be connected to an existing distribution main in service.

b. Tapping Existing Mains. The Contractor shall be responsible for making or arranging for all taps for main extensions. Permits for service taps shall only be issued to a master plumber unless otherwise approved by the District. The Contractor shall notify the District a minimum of twenty-four (24) hours prior to tapping. Once the tap is complete, the Contractor shall be responsible for protection of the tapping sleeve or saddle and the tapping valve against freezing or other damage. The Contractor shall also be responsible for all backfill, compaction, paving, curb and gutter, etc.

c. Operation of Valves. In connecting to the District's system, it may be necessary to operate existing valves.

Valves on the District's system that must be operated to make a connection shall be operated by District personnel only. The Contractor shall give the Inspector forty-eight (48) hours' notice to arrange for operating valves. Both the Contractor and the Inspector shall be present when the valves are operated.

d. Interruption of Service. Installation of a connection that will require closing existing valves may cause an interruption of water service to existing District customers. Affected customers must be notified

twenty-four (24) hours in advance.

The District Inspector will arrange for all notification to both residential customers and the fire department; however, the Contractor will be responsible to furnish the Inspector all necessary information as to the date and time the interruption will begin and the total time required to complete the installation.

A normal interruption shall be a maximum of two hours. If the interruption will be greater than two hours, the work shall be done in a manner to minimize the inconvenience to customers, such as working at night in a continuous operation until service is restored. A connection which will require an interruption longer than two hours shall be subject to review by the District as to the appropriate timing of the connection.

If, in the process of installing a connection, there exists an industry or building in the area that cannot be out of water, such as a hospital or other special customer, appropriate means shall be taken to provide and convey water. The water and means of conveyance shall be approved by the District.

3.25 Corrosion Protection Systems.

a. Dissimilar Materials. Insulation shall be installed as required by the District. Particular care shall be taken to insulate between dissimilar materials.

b. Insulating Joints. Whenever it is necessary to join pipe of dissimilar metal, or when designated by the District, a method of insulating against the passage of electrical current shall be provided. Special care shall be exercised during the installation of these joints to prevent electrical conductivity across the joints. See Section 2.08 of these Specifications.

c. Polyethylene Encasement Material. Whenever designated by the District, the metallic pipe and all appurtenances shall be wrapped in polyethylene. The polyethylene encasement shall prevent contact between the pipe and bedding material, but is not intended to be a completely air-tight and water-tight enclosure.

Prolonged exposure to sunlight will eventually deteriorate polyethylene film. Exposure to sunlight shall be kept at a minimum. See Standard Drawing No. 4.

The polyethylene shall have a minimum wall thickness of eight (8) mils and conform to the specification set forth in this part.

A 2-inch wide, ten-mil thickness polyethylene pressure-sensitive tape shall be used to close seams, secure to pipe or hold overlaps.

Polyethylene pipe wrap material shall be applied to line pipe in the manner shown on Standard Drawing No. 4.

Damage to polyethylene wrapped pipe in the trench prior to and during backfill shall be repaired to the satisfaction of the District.

Before the Contractor taps a water main, the trench, pipe and polyethylene wrapping shall be in a state of readiness. The Contractor digging the trench shall repair or replace any damaged polyethylene prior to tapping.

d. Insulating from Concrete. Areas of metal pipe and appurtenances which are to be in contact with concrete thrust blocks, bridging blocks, anchors or encasement may be required by the District to be protected against corrosion prior to installing concrete. The following types of protection systems are acceptable:

(1) Application of cold-applied mastic coating with high electrical resistivity, similar to Roskote

Mastic A-51, manufactured by Royston Laboratories.

(2) Application of a cold-applied primer and corrosion resistant pipe wrap, similar to the primer and pipe tape manufactured by the Protecto Wrap Company.

Other proposed protection systems may be accepted following review and approval of the District.

3.26 Disinfection. The following procedure shall apply to all main extensions within the District's water service area. Pipe extensions shall be chlorinated in accordance with AWWA C651, "Disinfecting Water Mains." The Contractor shall provide material for disinfection of all water mains.

Calcium hypochlorite granules with a minimum of 65 percent available chlorine or 5-g calcium hypochlorite tablets shall be used for disinfection. Application rates shall comply with AWWA C651.

The following table denotes the amount of calcium hypochlorite granules to be placed at the beginning and end of the main and at 500-foot intervals to obtain disinfection.

Pipe Size	Calcium Hypochlorite Granules (ozs.)
4"	0.5
6"	1.0
8"	2.0
12"	4.0

The following table denotes the number of 5-g calcium hypochlorite tablets required per 20-foot joint for dose of 25 mg/l. Chlorine tablets shall be attached to the inside top of the pipe using a water based, non-toxic glue (DOW 78) just prior to the pipe installation of the trench.

Pipe Size	No. of Tablets
4"	1
6"	2
8"	4
10"	6
12"	7
16”	13

After the calcium hypochlorite has been placed in the pipeline by the Contractor, disinfection must be completed within ten (10) calendar days.

After the pipe is filled with water and chlorine, and unless approved otherwise by the District, the chlorinated water shall be held in contact with the pipe for twenty-four (24) hours. At the end of the twenty-four (24) hour period, the water in the pipeline shall be tested by the District to ensure a residual chlorine content of not less than twenty-five (25) mg/l.

The pipeline shall then be thoroughly flushed to remove the heavily chlorinated water. Care shall be taken in flushing the pipeline to prevent property damage and danger to the public.

Samples of water will be collected for bacteriological examination and residual chlorine content testing before the pipe is put into service. Testing of residual chlorine and sampling will be done by the District.

No main which has been disinfected and flushed shall stand stagnant for more than fifteen (15) days without being reflushed.

3.27 Pressure Testing. All mains and appurtenances shall be subject to pressure testing performed by the

Contractor. All mains shall be subjected to a test pressure of 150 psi at the lowest point in the portion of the system being constructed. The test pressure shall be placed on the pipeline and the line isolated from other water sources. After a two (2) hour period, water shall be added to the line to return the pressure to the specified test pressure. The quantity of water required to return the pressure to the specified level will be measured.

The maximum allowable leakage at the specified test pressure shall not exceed ten (10) gallons per day per inch of pipe diameter (inside diameter) per mile of pipe.

ALLOWABLE LEAKAGE

Pipe Diameter	Allowable leakage in 2 hours, Gallons				
	250 psi	225 psi	200 psi	175 psi	150 psi
4"	0.47	0.45	0.95	0.40	0.37
6"	0.71	0.68	0.64	0.59	0.55
8"	0.95	0.90	0.85	0.80	0.74
12"	1.42	1.35	1.28	1.19	1.10
16"	1.90	1.80	1.70	1.59	1.47
20"	2.37	2.25	2.12	1.98	1.84
24"	2.85	2.70	2.55	2.38	2.21

3.28 Acceptance and Release for Taps. A new main shall be accepted by the District and released for taps when the following conditions have been met:

a. The main and all appurtenances have been installed to the satisfaction of the Inspector and all pertinent notes and measurements have been made.

b. Disinfection has been completed and the main has been flushed, charged and received a passing bacteriological test.

c. Pressure testing has been completed satisfactorily.

d. All tapping methods have been approved by the District.

e. As constructed record drawings and other supporting information shall be furnished to the District within two weeks of the completion of construction of any pipeline segment. The District shall find the record documents satisfactory before permitting the main to be put in service and accepted for maintenance.

3.29 Acceptance of Mains and Service Lines Including Curb Stops.

a. Preliminary Acceptance. Preliminary acceptance of mains will be granted by the District following the Developer's completion of all curbs, gutters, grading and paving, plus all curb stop and street valve boxes being set at proper grade.

b. Final Acceptance. Approximately one year following the preliminary acceptance, the District will reinspect the curb stop and street valve boxes for centering, plumb and grade. The Contractor and Developer will be notified of any defects in materials and workmanship and these defects must be promptly corrected in accordance with these Specifications. Corrections must be made immediately. If no defects are found or corrections are made as required by the Inspector, a letter of acceptance will be issued, following receipt of proper documents giving clear title to all mains and appurtenances. Service lines beyond the corporation stop on the main are the property of the Developer and/or Owner. Preliminary and final acceptance can be granted in phases of development after all the conditions of current specifications have been met.

The Developer shall be responsible for repairing any deficiencies in the workmanship for a period of one

year after preliminary acceptance. This shall include but not necessarily be limited to removal and replacement of surfacing materials (pavement, curb and gutter, sidewalk) which are damaged due to soil settlement.

c. Repair and Maintenance prior to Final Acceptance. Repair and maintenance of mains and services prior to final acceptance by the District will be the sole responsibility of the Developer and/or Contractor. Repair and maintenance will be accomplished to the current specifications of the District.

d. Meters. Meters will be maintained by the District from the time of installation.

CHAPTER 4 - Service Lines and Meters

4.01 All New Service Lines and, Where Applicable, Service Line Replacements.

a. Required water plans must be approved by the District and all water connection and tapping charges due must be paid before water taps will be made. All replacement water taps are subject to the water tap fee unless otherwise approved by the District.

b. Tapping permits must be applied for at the District Office and paid for at least 24 hours prior to tapping.

c. All service taps on water mains within the water distribution system shall be accomplished by the Contractor, who shall notify the District a minimum of 48 hours prior to tapping.

d. No water taps shall be made unless property corners are clearly marked so measurements of taps and curb boxes can be made at the time of tapping.

e. Excavation of the tapping hole is the responsibility of the Contractor and shall be done in accordance with these Standard Specifications.

f. Minimum normal size tap for a water service is 3/4 inch. The Contractor shall be responsible for furnishing all necessary materials. For service line sizes in excess of 2 inches, the corporation shall be a tapping valve and the curb stop shall be a gate valve.

g. Cribbing, sheeting or sloping of the banks of tapping holes is the responsibility of the Contractor and will be in accordance with the rules and regulations of the Colorado Department of Public Health and Environment, Water Quality Control Division, 4300 Cherry Creek Drive South, Denver, Colorado 80246-1530, and OSHA as applicable.

h. Barricading of tapping holes is the responsibility of the Contractor and shall be in accordance with construction, installation and repair of right-of-way openings for subsurface utilities for work within the Strasburg Sanitation and Water District or other applicable regulatory agency.

i. Backfilling and compaction of tapping holes shall meet the specifications of the governing body in whose jurisdiction work is being done; i.e., Strasburg Sanitation and Water District, Adams County, Arapahoe County, or State of Colorado.

j. Replacement of Existing Corporation Stops: Where an existing corporation stop is to be replaced with a new corporation stop of equal or larger size, the Owner of the property shall be responsible, at his/her expense, to have the old corporation stop excavated and shall contact the District which will shut off the old corporation at no expense to the Owner. Backfill, compaction and replacing of the corporation stop following shut off by the District is the responsibility of the property Owner at his/her expense.

k. Abandoning Existing Taps: Where an existing water tap is to be abandoned, the Owner of the property shall be responsible, at his/her expense, to have the corporation stop excavated and then contact the District which will shut off the corporation at no expense to the Owner. Backfill and compaction will be

the responsibility of the property Owner at his/her expense.

l. Multiple Service Taps: No service line within the District's water service area will serve more than one customer. Each house, building or business shall have an individual tap and service line from the water main to the house, building or business, and an individual meter.

4.02 Water Service Line Excavations for All New and Replacement Service Lines.

a. Excavation, safety and backfilling to include proper compaction of water service line ditches are the responsibility of the Contractor all in accordance with the specifications of the governing body in whose jurisdiction the work is being done; i.e., Strasburg Sanitation and Water District, Adams County, Arapahoe County, or State of Colorado.

b. Water service line ditches must enter the lot as near ninety degrees (90°) to the property line as is practical and not at an extreme angle unless otherwise approved.

c. Water Service Line Ditches and Separation of Water Service and Building Sewer: Except as permitted below, the water service line and the building drain or building sewer shall be not less than 10 feet apart horizontally and shall be separated by undisturbed or compacted earth. Such a separation shall be maintained in all public rights-of-way and easements. The water service line may be placed in the same trench with the building drain or building sewer provided approval is given by the District and the following conditions are met:

(1) The bottom of the water service line at all points shall be at least 18 inches above the top of the sewer line at its highest point. The water service line and building sewer shall be separated by a clear horizontal distance of no less than 24 inches.

(2) The water service line shall be placed on a solid shelf excavated at one side of the common trench.

(3) No joints in the water service line shall be permitted between the corporation stop and the curb stop without prior approval of the District. In no case will soldered joints be allowed.

(4) The materials and joints of sewer and water service lines shall be installed in such a manner and shall possess the necessary strength and durability to prevent the escape of solids, liquids and gases there from under all known adverse conditions such as corrosion, strains due to temperature changes, settlement, vibrations and superimposed loads.

4.03 Service Line Installation and Material for All New and Replacement Service Lines.

a. An expansion loop as shown in Standard Drawing No. 16 must be left in the service line where it is connected to the corporation stop at the water main to allow for expansion and contraction. Existing water services or taps which are not 3/4-inch or larger and do not consist of polyethelyne or that will not meet the specifications referred to in this section will not be permitted. If the existing tap has been deleted from the water system at the time of demolition, under no circumstances will the District allow a service to be reconnected. It would constitute a new tap and service.

b. Water service lines shall conform to the following minimum diameter.
1) 3/4-inch diameter for townhomes (attached single family) and patio homes, single family residential.
2) Multi-family and commercial service lines shall be sized in accordance with the applicable local building code and subject to the review and approval of the District.
3) Minimum diameters described above may be increased to provide for satisfactory delivery pressures as determined by the District.

c. Water service line material between the corporation and the curb stop shall be as follows:

Plastic pipe will be Pure-Core Blue or Driscoplex 5100 Ultra-Line HDPE pipe Dr7, two hundred (200) PSI with stainless steel stiffeners.

d. Water service line joints – all joints shall be comprised of flared compression fittings. However, now joints will be allowed between the corp stop and the curb stop, curb stop and meter, and then meter to residence.

(1) Copper tubing shall have flared fittings as manufactured by the Mueller Co.

(2) No sweat or welded joints shall be allowed underground.

(3) Dissimilar type of material - copper tubing to galvanized iron

(a) Iron pipe O.D. x copper tube size O.D.
(b) Insulating coupling
(c) Romac Industries, Inc., Style 702 compression coupling
(d) Rockwell/Smith Blair adapter gasket for steel pipe to copper tubing
(e) Equivalent product of other manufacturers

e. All water service lines shall have a minimum cover of 5 feet except at the expansion loop and will be determined by the street cut and/or by the finished grade of the property.

f. Water service lines from the corporation to the curb stop shall have a maximum cover of 6 feet unless otherwise approved.

g. Where a 1-1/2-inch or larger water service line crosses another utility or any underground structure, the water service line shall preferably pass over the other utility or structure, but in no instance shall there be less than 6 inches clearance between the water service and the other utility or structure. The space between the water service line and the utility or structure shall be backfilled with sand when the clearance is less than 12 inches.

Where any water service line passes under a sewer main, the sewer main shall be constructed of cast iron or Schedule 40 polyvinyl chloride (PVC) pipe for 6 feet each side of the water service line.

h. HDPE service lines shall be the same size from the corporation stop to the curb stop or secondary valve. Then, if necessary, the size of the service line may be increased or reduced only after the curb stop or secondary valve to the meter by one size. HDPE service lines shall be installed horizontally in a "snake-like" laying configuration to allow for both expansion / contraction movement of the pipe in the trench. The HDPE service line shall consist of one (1) piece of continuous pipe from the corporation stop to the curb stop / secondary valve with no fittings or connections allowed. The curb stop / secondary valve may not be placed under concrete or paved driveway areas. If the service line needs to be extended to accommodate moving the curb stop / secondary valve out of a concrete of paved area, the valve must be abandoned, poly wraped in full open position and the new valve will be routed to the closes edge of the concrete.

i. 12 gauge insulated solid core tracer wire, as specified herein, shall be extended from the main to the foundation of the house / structure. Tracer wire shall be extended up the outside of the curb stop box, as specified herein and approximately eighteen inches (18") at foundation.

j. Tapping saddle: A tapping saddle shall be used on all service line connections to the water distribution system. Tapping saddles shall have the following characteristics:

(1) Double strap
(2) Brass body
(3) Brass straps
(4) AWWA tapered thread pattern (cc)
(5) Acceptable manufacturer: Mueller Co., Typical Catalog No. BR-2-B-0684-CC-100 for 6" pipe, 3/4" tap; Romac 202 BS; same series for larger sizes

k. Corporation stop

(1) Conform to AWWA C800
(2) AWWA tapered thread pattern inlet (cc)

(3) Flared compression fitting outlet for PE tubing
(4) Same size inlet and outlet
(5) Acceptable manufacturers: Mueller Co., Catalog No. H-15000; Ford FB-1001-NL; McDonald 74701 B

l. New service lines on single family units will be installed to enter the property 10 feet inside the front property line farthest from the garage and/or driveway unless otherwise approved by the District.

4.04 Curb Stop and Curb Box for All New and Replacement Service Lines.

a. All service lines, regardless of size, must have a curb stop and curb box installed in accordance with the Standard Drawings. The curb box shall be centered over the curb stop and shall be plumb. The following location will be accepted by the District:

All curb stop boxes will be installed 6 inches from the public right-of-way line unless designated otherwise by the District.

b. The curb stop supplied by the Contractor shall be installed in accordance with of these Specifications.

c. The responsibility of the Contractor for the curb box ends only when sidewalks, curbs, driveways, etc. have been installed and all backfilling and compaction has been completed. They are subject to review for alignment at the end of the one-year warranty period.

d. Curb stops: Mueller Co. Model H-15204; McDonald 6100-33 (for each respective line size), Ford B46 Series (333 through 777 for ¾" through 2").

e. Curb boxes: Tyler series or equal. Enlarged bases required for 1-1/2-inch and 2-inch curb stops.

4.05 Water Meters - General

a. All water supplied by the District to a newly developed property must be metered except for fire lines. All water meters shall become the property of the District.

b. All water meters are supplied and installed by the Owner or customer. If repair or replacement is necessary during the warranty period, the replacement meter will be accomplished by the District at the builder's expense. If repair or replacement is necessary after expiration of the warranty period, the District shall accomplish such repair or replacement.

c. Acceptable locations for 3/4-inch water meters shall be limited to outside water meter pits, basement, utility room or utility closets unless otherwise approved. Locations for 1-1/2-inch or larger water meters shall be approved by the District prior to installation of the water meter loop.

d. Water meter locations selected shall provide adequate protection against freezing.

e. Water meters installed in the District shall be the Invensys SR II

(1) 3/4-inch diameter:
(2) Other sizes: As approved by District
(3) Bronze body

4.06 Inside Water Meter Installations Only

a. Inside residential water meter locations must be in the basement or other lowest level of the residence. When installed in a crawl space with an earth floor, a rock-filled sump, 1-1/2' deep, 1-1/2' in diameter shall be installed beneath the meter location. Where plastic pipe is used for inside installations, plastic will not be used within 3 feet of the meter loop.

b. Inside 3/4-inch water meter locations shall be such that the water meter is unobstructed on one side, easily accessible for reading or servicing, with a minimum of 8 inches clearance around the remainder of the meter with a minimum of 3 feet of clearance above the meter. Meter locations shall not require stooping or crawling to gain access to the meter. Meters will not be installed in attic spaces and shall be on or near the floor. Approval prior to construction for crawl space installation may be granted by the District.

c. Inside 3/4-inch water meter loop installations shall include an inlet and outlet valve as shown on Standard Drawings. Inlet and outlet valves shall be full opening water way, straight or angle body meter ball valves.

d. Water main installations shall incorporate necessary backflow prevention devices as specified herein.

4.07 Water Meter Pit Installations Only

a. The locations of the meter pit for 3/4-inch through 1-inch water meters will be one foot (1') inside of the curb stop. If a problem arises on the location, the location will be determined by the District.

b. The Standard Drawings may be used as a guide for planning of meter pit installations.

4.08 Combined Domestic and Fire Line Water Meters

a. Only meters approved by the National Board of Fire Underwriters shall be installed in water lines providing both domestic and fire service. Requests to install a meter in a water line providing both domestic and fire demands should be made to the District a minimum of 90 days in advance of construction.

b. Unless otherwise approved by the District, a combined domestic and fire line meter must be installed in a pit large enough to accommodate the meter, meter bypass and all valves and piping, all in accordance with Standard Drawings.

c. The location of the meter pit must be approved by the District in advance of construction.

d. Meter pits must have an approved ring and cover of sufficient size (25-1/2 inches minimum) opening for installation and removal of the meter.

e. The meter loop (3-inch through 6-inch) must set on the floor of pit, not the riser. The maximum depth of the meter pit (inside dimension) shall be 8 feet. The minimum depth of the meter pit (inside dimension) shall be 7 feet.

f. Water meter loops for combined domestic and fire line water meters must have both inlet and outlet valves.

g. Water meters must have a bypass around the meter of sufficient size to supply the property while the meter is being serviced.

4.09 Water Regulators

a. Where required by the District, a water regulator designed for 150 psi shall be installed in all domestic service lines. Refer to the Standard Drawings.

b. One regulator must be installed upstream of the water meter. The customer may also install another regulator downstream of any irrigation supply branch line, downstream of the meter.

4.10 Inspection of Services for All New and Replacement Service Lines

a. Water service lines shall be inspected by the District and the inspection shall include an inspection of the service line from the curb stop to the foundation and an inspection of the meter installation to include all

of those items contained within Sections 4.01 through 4.10 of these Specifications. The trench backfill compaction shall meet the requirements of these Specifications.

4.11 Repair and Replacement of Existing Service Lines

a. Responsibility. The property Owner is responsible for the repair and maintenance of the water service line from the curb stop to the house or other building.

b. Leaks occurring on a water service line between the curb stop and the house or building shall be repaired as necessary to include backfilling and restoration of property at the property owner's expense. However, the District will, if requested to do so, shut off the water service line at the curb stop. To preclude unnecessary waste of water, if repairs are not initiated within a reasonable period of time, the District may, at its discretion, shut off the water service until repairs have been affected.

c. The property owner is responsible for all damages that may occur to other property, real or personal, including property of the District, that were caused by failure to repair and maintain the water service line, or from leaks occurring on a water service line or from bursting or other failure of the water line.

d. Leaks occurring between the curb stop and the corporation shall be repaired by the District.

e. When a doubt exists concerning the location of a leak, the District will determine the general location of the leak. This will be done by turning off the service at the curb stop. When this action causes the leak to stop flowing, the homeowner or property Owner will be responsible for repair of the line at a location between the curb stop and the structure served. When the leak continues to flow after turn off, the District will be responsible for repair of the line at a location between the curb stop and the main.

4.12 Service Line - General Notes

a. All work on fabrication and installation of meter boxes shall conform to the following codes, latest edition:

International Building Code
Building Code for Reinforced Concrete (ACI)
American Welding Society Specifications

All material or components considered defective by the District shall be rejected and immediately removed from the site at no expense to the District.

The Contractor shall verify and coordinate the dimensions of all openings, meters, inserts, etc., with the District and manufacturer.

CHAPTER 5 - Water Service Quality Control Regulations

5.01 General. This document is adopted by the Strasburg Sanitation and Water District to promote and sustain the high quality of drinking water furnished to the District's water customers; to protect the public potable water supply system of the District from the possibility of contamination or pollution by backflow, back-siphonage or backpressure; to promote the elimination or control of existing cross connections, actual or potential; and to provide for the maintenance of a continuing program of cross connection control.

a. The authority to implement and maintain this program of cross connection control is contained in the following legislative actions:

(1) Colorado District of Health Law C.R.S. 1973 Title 25-1-114.

(2) Colorado Primary Drinking Water Regulations Section 11.1.2 (Hazardous Cross Connection).

(3) Cross Connection Control, Colorado District of Health, 1983.

(4) Occupational Safety and Health Administration Federal Register #202 Part 2, Page 22234,

Subpart J.

(5) U.S. Environmental Protection Agency, Cross Connection Control Manual (1973) E.P.A. - 43070-73-002 Section 3.

(6) Uniform Plumbing Code of the International Plumbing and Mechanical Officials, Chapter 10, Sections 1001, 1002, 1003.

(7) Strasburg Sanitation & Water District Resolution.

b. Reference manuals adopted for guidelines on cross connection control:

(1) Manual of Cross Connection Control, Foundation for Cross Connection Control and Hydraulic Research, University of California.

(2) Cross Connection Control, Colorado District of Health.

(3) Cross Connection Control Committee, Pacific Northwest Section AWWA Manual of Accepted Procedures and Practices.

(4) Recommended Practice for Backflow Prevention and Cross Connection Control AWWA Manual M-14.

(5) Definitions of terms used in this regulation are those contained in "Manual of Cross Connection Control," Foundation for Cross Connection Control and Hydraulic Research, University of California.

c. General Requirements

(1) Backflow prevention devices are to be installed in an accessible location to facilitate maintenance, testing and repair. Standard Drawings show various installations.

(2) All backflow devices shall be installed immediately downstream of the water meter.

(3) Before installing the backflow prevention device, pipelines should be thoroughly flushed to remove foreign material.

(4) In no case will it be permissible to have connections or tees between the meter and service line backflow prevention device.

(5) In no case will it be permissible to connect the relief valve discharge on reduced pressure zone devices into a sump, sewer, drainage ditch, etc.

(6) Backflow prevention valves are not to be used for the inlet or outlet valve of the water meter. Backflow preventer test cocks should never be used as supply connections and should be plugged except when being tested.

(7) In order to ensure that backflow prevention devices continue to operate satisfactorily, it will be necessary that they be tested at the time of installation. Testing shall be required on reduced pressure zone devices and all testable devices. Such tests will be conducted in accordance with the Colorado Cross-Connection Control Manual. The contractor accomplishing installation shall be responsible for initial testing of the new equipment. Reporting of testing procedures and results shall be made by the contractor to the District on forms provided by the District.

Refer to the section titled "Testing and Maintenance" in these Standard Specifications for periodic testing of all testable devices.

(8) Schools, restaurants and other commercial buildings and users shall have a double-check valve assembly Irrigation systems shall have a reduced pressure zone device with a pressure type vacuum breaker.

d. Standards for Backflow Prevention Devices

(1) Any backflow prevention device required herein shall be of a model and size approved by the

District. The term "APPROVED BACKFLOW PREVENTION DEVICE" shall mean a device that has been manufactured in full conformance with the standards established by the American Water Works Association (AWWA) entitled:

AWWA C506-Standards for Reduced Pressure Principle and Device, current edition, and have met completely the laboratory and field performance specifications of the Foundation for Cross Connection Control and Hydraulic Research (FCCC & HR) of the University of Southern California established by:

Specifications of Backflow Prevention Devices, 7th Edition, August 1985; Revised, or the most current issue.
AWWA and FCCC & HR Standards and Specifications have been adopted by the District. Final approval shall be evidenced by a "Certificate of Approval" issued by an approved testing laboratory certifying full compliance with said AWWA Standards and FCCC & HR Specifications.

(2) Only "Approved Backflow Prevention Devices" shall be used. In general, the District will consider acceptance of devices manufactured by the following manufacturers:

Ford Meter Box Company
FEBCO
Mueller Co.
Watts

(3) Backflow devices used on fire lines shall have 0.S. & Y. valves and be listed by the National Fire Protection Association.

e. Installation

(1) Backflow prevention devices shall be installed in accordance with manufacturer's recommendations.

(2) Backflow prevention device installations shall be inspected and approved for use by the District. Inspections can be scheduled by calling (303) 622-4443.

(3) All reduced pressure zone backflow devices shall be installed in a horizontal position. Double check valves on residential diameter services may be installed in any position provided the device is accessible for maintenance, removal and replacement. Other installations shall be subject to the individual review and approval of the District.

(4) A pressure vacuum breaker shall only be used where the device is never subjected to backpressure and installed a minimum of 12 inches above the highest piping or outlet downstream of the device in a manner to preclude backpressure.

(5) An atmospheric vacuum breaker shall be used only where the device is:

(a) never subjected to continuous pressure, and
(b) installed on the discharge side of the last control valve and above the point of usage, and
(c) installed with the air inlet in a level position and a minimum of 6 inches above the highest piping on outlet it is protecting.

(6) A single check valve is not considered to be a backflow prevention device.

(7) Double check valve assemblies may be installed in below grade vaults when these vaults are properly constructed in accordance with Standard Drawings.

(8) Reduced pressure backflow preventers will be installed above ground. The unit should be placed at least 12 inches above the finish grade to allow clearance for the repair work. A concrete slab at finish grade is recommended. Proper drainage should be provided for the relief valve and may be piped away from the location, provided it is readily visible from above grade and the relief valve is separated from the drain line by a minimum of double the diameter of the supply line. A modified vault installation may be used if constructed with ample side clearances. Freezing is a

major problem in this area. Precautions should be taken to protect above ground installations.

(9) Reduced pressure zone backflow preventer may be installed in a basement provided with an adequate drain with an effective opening of twice the diameter of the device.

f. Testing and Maintenance

(1) lt will be the duty of the customer/user at any premises where the backflow prevention devices are installed to have certified inspections and operational tests made of the devices at least once per year. In those specific instances where the District deems the hazard to be great enough, it will require certified inspections at more frequent intervals. These inspections and tests shall be at the expense of the water user and shall be performed by water utility personnel or by a certified technician approved by the District, the Colorado Department of Health, or the Water Distribution and Wastewater Collection Systems Certification Council.

2) The customer shall notify the District 48 hours in advance of when the tests are to be performed so that the District's representative may witness the tests if so desired. The devices shall be repaired, overhauled or replaced at the expense of the customer/user whenever the device(s) are found to be defective. Records of all such tests, repairs and overhauls shall be kept, with a copy sent to the District.

(3) The customer may request a private certified tester to perform the annual test and furnish the District with a copy of the test, pursuant to the aforementioned stipulation.

(4) Existing devices shall be sealed by the technician performing the test at the completion of the test.

(5) All testing gauges shall be checked for accuracy and be kept in good operating condition.

(6) The District retains the authority to test or otherwise check the installation and operation of any backflow device.

(7) The customer may request that the District perform the test for a fee as indicated on the following schedule. The District will not perform any repairs; this must be accomplished by certified personnel from the private sector.

All backflow prevention devices 3/4" - 2"	$35.00
Reduced pressure assemblies 2" - 10"	$40.00
Double check assemblies 2" - 10"	$50.00

g. Right of Entry

The District water utility representative(s) assigned to inspect premises relative to possible hazards shall carry proper credentials of his/her office, upon exhibit of which he or she shall have the right of entry during usual business hours to inspect any and all buildings and premises for cross connections in the performance of his or her duties.

This right of entry shall be a condition of water service in order to provide assurance that the continuation of service to the premises will not constitute a menace to health, safety and welfare of the people throughout the District's potable water distribution system. Where building security is required, the backflow device should be located in an area not subject to security.

h. Violations

(1) Failure of the customer to cooperate in the installation, maintenance, testing or inspection of backflow prevention devices required by this regulation shall be grounds for the discontinuance of water service to the premises or the requirement for an air-gap separation from the public potable water system.

(2) Service of water to any premises may be discontinued by the District after written notification if unprotected cross connections exist on the premises, or if any defect is found in an installed backflow prevention device, or if a backflow prevention device has been removed or bypassed. Service shall not be restored until such conditions or defects are corrected.

(3) Discontinuance of service may be summary, immediate and without written notice whenever, in the judgment of the General Manager, such action is necessary to protect the purity of the public potable water supply or the safety of the water system.

5.02 Cross Connection Control & Backflow Prevention - Criteria List

a. Abbreviations

A/G - Air Gap Separation
R/P - Reduced Pressure Zone Device
D/C - Double Check Valve Assembly
P.T.V.B. - Pressure Type Vacuum Breaker

b.

Type of Establishment	Device Required
Apartments and condominiums - 4 stories or more	R/P
Apartments and condominiums - 4 stories or less	D/C
Auxiliary water systems	R/P
Belted meter installations	R/P
Buildings - 4 stories or more	R/P
Cafeteria, restaurant, or any food handling establishment	R/P
Car Wash	R/P
Child day care center	R/P
Fire Line (toxic chemicals added)	R/P
Fire Line (no chemicals)	D/C
Food processing/packing plant	R/P
Greenhouse	R/P
Hospital, dental or medical facility	R/P
Hotels and motels - single and multi-structures, 3-stories & less	D/C
Irrigation System	R/P - P.T.V.B.
Kennels - dog/cat	R/P
Laboratory- chemical or medical	R/P
Laundromat	R/P
Lease space (shopping centers, warehouse, main water supply)	R/P
Manufacturing/Processing Plant	R/P
Mobile equipment (landscape, lawn, tree spraying, water hauling)	A/G variance by review only
Morgue, mortuary, or autopsy facility	R/P
Nursing home/retirement home	R/P
Office or warehouse except as otherwise described herein	D/C
Pet shops	R/P
Photo developing lab	R/P
Planned Unit Development	R/P
Plating facilities	R/P
Printing shop	R/P
Private well supply	A/G

Type of Establishment	Device Required
Recirculated water	R/P
Reflecting ponds, swimming pools, fountains, open ponds, etc.	R/P
Residences, single-family including townhomes	D/C
Schools - Colleges w/Lab	R/P
Sewage treatment plant	R/P

Solar system	R/P by review
Transportation terminal	R/P
Veterinary Services	R/P

NOTE: Other types of establishments may require protection via air gaps or backflow prevention devices depending on the equipment and/or plumbing arrangements utilized therein. These shall be considered individually, at the discretion of the District. All of the establishments listed below will require review by the District and a determination made as to the need for a backflow prevention device.

Barber shop or college
Beauty shop or college
Buildings - three stories or less
Department store

PART II

WASTEWATER COLLECTION SYSTEM STANDARD SPECIFICATIONS

CHAPTER 1 - General

1.01 Authority. These Specifications are promulgated by the Strasburg Sanitation and Water District. The interpretation, enforcement, and revision of these Specifications is hereby delegated to the General Manager of the District.

1.02 Effective Date of Specifications. These Specifications shall be in effect fifteen (15) calendar days after adoption by the District board and shall supersede all former standard specifications for installation of sanitary sewer mains within the District.

1.03 Revisions, Amendments or Additions. These Specifications may be revised, amended or added to. Such revisions, amendments and additions shall be binding and in full force and effect when adopted in the manner set forth in Section 1.02.

1.04 District Control. These Specifications will apply to the installation, operation and maintenance of all wastewater collection facilities under the control of the Strasburg Sanitation and Water District.

1.05 Organization and Interpretation of Specifications. These Specifications are composed of written Standards of Engineering Practice, Material Specifications and Standard Drawings. The interpretation of any section or of differences between sections, when appropriate, shall be made by the General Manager of the District and his/her interpretation shall be binding and controlling in its application.

1.06 Definitions. As used in these Specifications, or in any of the drawings where these Specifications govern, unless the context shall otherwise require, the following words defined shall have the meanings herein ascribed:

a. District Manager. The Manager of the District or his/her designated representative.

b. Engineer. The Engineer or consultant of the District, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

c. Collection System. Sewer mains, together with all appurtenant and necessary manholes, clean outs, taps, service pipes, and associated materials, property and equipment collecting sanitary sewage from individual customers.

d. Wastewater Main or Sanitary Main. That portion of the wastewater system which collects sewage from users to the District wastewater treatment plant, excluding service lines.

e. Service Line. The sewage collection pipeline extending from the premises down to and including the connection to the wastewater or sanitary main.

f. Applicant for System Extension. Any person, association, corporation, entity, or government agency desiring sanitary sewer service for premises under their control, often a subdivider, a developer or an owner.

g. Main Extension. Extensions to the existing collection system network.

h. Contractor. In the context of these Specifications a person or persons, co-partnership or corporation employed by an applicant for the purpose of installing wastewater system extensions or replacements.

i. Inspector. The authorized representative of the District assigned to the project.

j. Standard Drawings. District Standard Drawings are a part of these Specifications.

k. District. The Strasburg Sanitation and Water District responsible for overseeing the wastewater system's operations.

1.07 Abbreviations. All references to documents or specifications shall be the latest edition or revision thereof:

a.	ASTM	American Society for Testing and Materials
b.	ANSI	American National Standards Institute
c.	NSF	National Sanitation Foundation
d.	OSHA	Occupational Safety and Health Act
e.	USGS	United States Geological Survey
f.	CIP	Cast Iron Pipe
g.	DIP	Ductile Iron Pipe
h.	PVC	Polyvinyl Chloride-Plastic Pipe

CHAPTER 2 - Design Provisions

2.01 Planning Considerations. The land use and population densities approved for the District shall be used to determine wastewater facility design parameters. Where approved master plans do not exist, the following criteria shall be used unless specific approval for other criteria has been given by the District.

a. Design Period: The sewer systems shall be designed for the estimated ultimate tributary population. The tributary areas shall be studied to determine the area for each projected land use.

b. Population densities including public use lands:

(1) Single-family units at 2.8 persons per unit.
(2) Multi-family and condominiums at 2.1 persons per unit.
(3) Four (4) single-family units per acre.
(4) Sixteen (16) multi-family cluster housing or condominiums per acre.

c. Per capita flows: Sewer systems shall be designed on the basis of not less than the following unless other values are specifically authorized by the District:

(1) One hundred (100) gallons per person per day.

(2) Three hundred (300) gallons per capita per day peak flow for submains and laterals.

(3) Two hundred fifty (250) gallons per capita per day peak flow for main trunk, interceptor or outfall sewers.

(4) Infiltration of 100 gallons per day per inch of diameter per mile per manhole run for new systems. New system installations which will service a portion of the existing collection system will require an infiltration/bleeding allowance as established by the District.

(5) Commercial land uses at 1400 gallons per acre per day with a peak factor of 2.

(6) Industrial land uses at 1600 gallons per acre per day with a peak factor of 3.

(7) Public use, park and open space at 1000 gallons per day with a peak factor of 2.

2.02 Minimum Size. No public sewer shall be less than 8 inches in diameter. No building sewer shall be less than 4 inches in diameter.

2.03 Minimum Depth. In general, sewers shall be designed deep enough to drain basements and to prevent freezing. No public mains shall be less than 5 feet deep measured from the top of pipe unless special protection is required. Special protection shall consist of:

(a) Less than 5 feet but more than 3 feet of cover requires ductile iron, cast iron, reinforced concrete encasement or arch.

(b) Less than 3 feet of cover requires ductile iron or cast iron with reinforced concrete encasement.

No building sewer shall be less than 5 feet deep in traffic areas without similar special protection listed above except that concrete driveways may be substituted for protection of service lines.

2.04 Minimum Slopes. All sewers shall be designed to transport average sewage flows at mean velocities of 2 feet per second based on a Manning's roughness factor of 0.013. The slope between manholes shall be uniform. In no case shall the slope be less than the following for sewer mains and services:

MINIMUM GRADE TABLE

Services

Pipe Diameter	Slope
4 Inches	2% or 1/4 inch per foot
4 Inches	Ductile iron or cast iron pipe - 1% or l/8 inch per foot
6 Inches	1% or 1/8 inch per foot

Mains and Services

Pipe Diameter	Slope
8 Inches	.50%
10 Inches	.35%
12 Inches	.29%
15 Inches	.23%
18 Inches	.17%
24 Inches	.13%

2.05 High Velocity Protection. In the case of sewers where the slopes are such that over 15 percent grades are attained, special provisions as determined by the District shall be made to prevent excessive erosion of material surfaces or displacement by impact. Such high velocity protection shall be shown on detail drawings and approved by the District on a case-by-case basis.

2.06 Alignment. Standard location for sewers, unless some major interference prevents, is along the centerline of the street, easement or right-of-way. In streets less than 36 feet wide and alleys, the standard location shall be parallel to but removed 2 feet from the center line. Manholes shall be located so as to prevent storm water entrance. Proposed sewer lines which may conflict with the placement of other underground facilities will require prior approval of the sewer placement location by the controlling agencies whose facilities are affected. Locations other than those specified will require specific approval of the District.

2.07 Pipe Alignment in Manholes

a. Intersections. All pipes shall have free discharge into the collection system. Where possible, the flow line of the intersecting pipe shall be the spring line (horizontal center of pipeline) of the collection sewer. All manhole inverts shall be designed with a 0.1 foot drop except for changes in alignment in excess of 30° shall have a 0.3 foot drop in the invert through the manhole. Changes in direction at intersections shall not be greater than 90°.

When the intersecting pipe is smaller in diameter than the pipe exiting the manhole, the crown or inside-top of the intersecting pipe shall match the crown or inside-top of the main pipe entering the manhole. In no case shall the difference in elevation between the flowline of the pipe exiting the manhole and the flowline of the intersecting sewer be less than 0.3 feet.

b. Increasing Size. When sewers are increased in size with no intersecting sewers, the invert of the larger sewer shall be lowered sufficiently to maintain the same energy gradient.

2.08 Manhole Location. Manholes shall be installed at the end of each line, at all pipeline intersections, changes in grade, size, alignment and at distances not greater than 400 feet. Manholes must be located to allow unassisted and unrestricted access by District maintenance vehicles. Lines and manholes located in areas where access, in the opinion of the District, is not possible, will not be approved for construction.

2.09 Manhole Details

a. Manhole Sizes. The inside diameter of the manhole shall not be less than 4 feet on lines 8 inches through 10 inches in diameter; not less than 5 feet on lines 12 inches through 18 inches in diameter; not less than 6 feet on lines in excess of 24 inches in diameter for standard design manholes (see Drawing No. 2 for standard manhole design).

b. Drop Manholes. External drop manholes will be permitted only in extreme and special conditions where approval has been granted by the District. As a general criteria, a minimum difference in elevation of 4 feet between the inlet and outlet is required before considering use of external drop manhole design. The external drop sections must be totally encased in reinforced concrete and placed on an adequate foundation. Developer shall submit design of proposed drop manhole to District for approval.

c. Manhole Channels. The flow channel shall be made to conform to the slope and shape of the sewer pipe entering and exiting the manhole. The channel shall be formed from cast-in-place concrete to a cross-section matching the circular pipes. The channel shall be constructed with vertical walls from a point one-half the pipe diameter above the channel flowline as shown in the standard drawings. At intersections with other lines, channels shall be formed with a curve to minimize turbulence. The flow channel shall be constructed to have a depth equal to the pipe diameter. Refer to Drawing No. 2.

d. Manhole Gaskets. The pipes entering and exiting the manhole shall be equipped with a manhole gasket placed around the pipe and cast in the base. If a precast base is used, a watertight seal shall be obtained by use of a premanufactured rubber gasket in the precast base section equal to a Kor-N-Seal boot.

e. Rings and Covers. The ring and cover shall be constructed of cast iron for traffic bearing conditions and cast aluminum or cast iron for non-traffic bearing conditions. All manholes located outside of dedicated street or alley rights-of-way will be designed and constructed with a locking type cover and the ring bolted to the concrete cone. Grade adjustment rings or blocks between the ring and cover and the concrete cone cap shall not exceed 6 inches. See Standard Drawings Nos. 4 and 5.

f. Watertightness. Precast concrete manhole joints shall be made watertight. Manholes of brick or segmented block shall not be used in the sanitary sewer system.

(1) Each precast manhole segment shall be joined with a rubber "O" ring, Ram-Nek, Con-Seal or similar approved material. A double application of Ram-Nek, or equal, is required in areas where groundwater is present or could be present.

(2) All interior concrete manhole surfaces above the flow channel shall receive a 3/8" to 1/2" thick coating of cement grout. Concrete surfaces shall be thoroughly wetted and damp prior to the application of cement grout. Liquid membrane curing compound shall be applied to the finished cement grout surface to facilitate proper curing. Where exterior cement grouting is required, it shall be applied prior to the application of dampproofing material and the liquid membrane curing compound shall be deleted. Exterior cement grout shall be film cured utilizing polyethylene sheets.

(3) All exterior concrete manhole surfaces shall be coated with coal tar dampproofing material.

Where ground water is present or, in the opinion of the District, groundwater could be present, all exterior concrete manhole surfaces shall also receive a 3/8" to 1/2" thick coating of cement grout. The need for exterior cement grouting will be determined by the District.

(4) Dampproofing materials shall be applied to clean, dry surfaces in accordance with the coating manufacturer's written instructions/recommendations and the following:

1. Preparation
   a. Examine surfaces to receive dampproofing to assure conditions are satisfactory for application of materials
   b. Remove dirt, dust, sand, grit, mud, oil, grease and other foreign matter
   c. Brush down surfaces to remove all loose scale, fins, dust, etc.
   d. Complete surface preparation in accordance with manufacturer's recommendations

2. Application
   a. General
      1) Apply in three (3) coats with high pile rollers or by spray equipment
         a) Minimum air pressure: 90 psi
         b) Spray apply in a fine mist
      2) Provide adequate forced ventilation when applying coating in enclosed spaces
      3) Do not use benzol or other volatile solvents for thinning coating
   b. First coat
      1) Apply only when surface of concrete is dry and at a suitable temperature for adequate penetration
      2) Thin as recommended by manufacturer
      3) Apply for maximum penetration
      4) Absorbed by concrete within 5 to 30 minutes of application so no continuous film remains on surface
   c. Second coat: Cover surface with 5 mil film
   d. Third coat: Produce a high gloss 5 mil film
   e. Cure material as recommended by manufacturer
   f. Do not cover with backfill until installation is accepted by inspector

g. Stub Outs from Manholes. Stub outs from manholes shall not exceed 40 feet except for lines which will be extended in the future. Whenever practical, designs to complete the manhole run shall be submitted to the District Superintendent for review to insure proper grade and alignment for future construction. Future extension of stub outs shall be of like material using the same grade and alignment.

h. Design Features for Deep Manholes. Manholes which are more than sixteen (16) feet from the finished cover to the pipe invert shall be considered deep manholes subject to special design. The items given below shall be given special attention and subject to approval by the District.

(1) Intermediate platforms constructed with manhole shaft offsets shall be governed by the OSHA regulations. Regardless of the application of OSHA regulations, an offset intermediate platform will be required on any manhole greater than 24-feet in depth at no more than 12-foot intervals.

(2) Structural integrity of precast or cast-in-place concrete structures shall be verified and certified by the responsible design professional for all manholes in excess of 16-feet in depth. Specific attention shall be given to concrete thickness, reinforcing design and concrete strength.

2.10 Relation to Water Mains. Sewer lines shall be located a minimum of 10 feet horizontally from existing or proposed water mains and the sewer lines shall be a minimum of 18 inches clear distance vertically below the water main. If this clear distance is not feasible, the crossing must be designed and constructed so as to protect the water main from potential cross connections and minimize the potential for structural damage to either pipeline. Minimum protection shall consist of the installation of an impervious and structural sewer as follows:

a. Where the sewer pipe is above the water main, regardless of separation, one length of ductile iron pipe at least 18 feet long centered over the water main and jointed to the sanitary sewer pipe with a manufactured adapter specifically for such jointing shall be installed. It shall include rubber gasketed fittings with stainless steel tightening bands. The joints shall be enclosed in a concrete collar at least 6 inches thick and extending at least 6 inches either side of the joint.

b. Where the sewer is beneath the water main but less than 18 inches clear distance vertically, the sewer pipe of any material shall be encased in reinforced concrete. Encasement shall be at least 6 inches thick and extend a distance of 10 feet on either side of the water main crossing. Reinforcing shall consist of a minimum of four No. 4 bars placed at quarter points around the pipe being encased.

The above-described protection from potential cross connections shall apply to service lines as well as sanitary sewer mains where the above described protection and special installation is required.

2.11 Stream and Drainage Channel Crossings

a. All stream and drainage channel crossings shall be ductile iron pipe encased in reinforced concrete where the installation is below the flow line of the stream or drainage channel.

b. Crossings less than 4 feet below existing or proposed channel bottoms shall be supported by reinforced concrete caissons constructed in accordance with the approved special design.

c. Where the pipeline crossing will be above the stream or drainage channel flow line, special approval and design will be required by the District. All details of the design shall be submitted to the District for review and approval.

2.12 Railroad and Highway Crossings

a. All work shall be accomplished in accordance with the appropriate permit issued by the responsible agency having jurisdiction over the work.

b. Crossings under railroads and highways shall consist of polyvinyl chloride (PVC), ductile iron or coal tar enamel lined steel pipe (carrier pipe) laid inside a steel pipe conduit (casing pipe), which is placed beneath the track or roadway. The steel conduit pipe (casing pipe) shall be jacked horizontally through the ground on substantially the grade of the sewer, with due allowance for the bells or joints of the carrier pipe. As the pipe is jacked along, the earth shall be excavated from the face and removed so that it will not be necessary to force the pipe through solid ground. Specifications for materials and installation of the railroad or highway agency shall govern.

c. The casing pipe diameter for 16-inch and smaller carrier pipes shall be a minimum of 8 inches larger than the carrier pipe and the casing pipe diameter for larger than 16-inch diameter carrier pipe shall be a minimum of 12 inches larger than the carrier pipe.

d. After the conduit has been completed, the carrier pipe shall be placed inside and blocked in exact position and grade with a support at least every 8 feet and behind each bell or coupling. A minimum of three blocks or other points of support shall be installed to prevent displacement by floating.

e. Each end of the casing pipe shall then be plugged tight around the carrier pipe and inside the casing pipe. The plug may consist of an 8-inch brick wall laid up with Portland cement mortar or a prefabricated rubber boot with stainless steel tightening bands specifically for sealing casing pipe ends.

2.13 Service Lines (Building Sewers)

a. Service lines and stub outs from main sewers shall be extended to each property at a point 5 feet inside the property line and generally 5 feet above the low lot corner.

b. Stub outs from a sewer main may be made to an unoccupied lot provided it is part of an officially platted and recorded subdivision. Such stubs shall be extended to 5 feet inside property line and plugged with a watertight and airtight cap or plug insert. Plugging or capping shall be sufficient to perform air testing of the pipeline. Records of the depth and location of the end of the service stub shall be recorded by party responsible for construction and submitted to the District for future reference.

c. Four-inch diameter service lines shall have a maximum length of 250 feet. A 4-inch diameter cleanout shall be installed on the service lines where the total length exceeds 100 feet and at 75 foot intervals thereafter up to a maximum of 250 feet in length. The cleanout shall have a proper waterproof cap. For cleanout access, a prefabricated formed wye with a riser pipe shall be installed to the finished grade.

Service lines projected to be longer than 250 feet in length shall have pipe 6 inches in diameter or as otherwise required by the District. Provisions for cleanouts shall also apply to pipelines 6 inches in diameter.

d. No service line within the District's service area will serve more than one property or customer. Each house, building or business shall have an individual connection to the sewer main and service line from the main to the structure served.

e. All service lines for commercial buildings or multi-family buildings shall be no less than 6-inches in diameter.

f. Any service line requiring 3 or more bend fittings between the sewer main line and building served shall be constructed with a cleanout at intervals specified above. If 3 or more bend fittings are required in a service line with a length less than 100 feet, a cleanout shall be installed at the midpoint of that section.

2.14 Pump Station Design Parameters. Design of pump stations within the District's collection system shall be accomplished on a case by case basis. Pump stations shall not be used wherever gravity sewer service is available. Preliminary considerations and a rationale for the need of the pump station shall be reviewed in detail with the District's Manager and Engineer prior to proceeding with preliminary and final design. Lift station design shall be in accordance with the Colorado Department of Health and Environment's latest design criteria manual. As general guidelines for planning purposes, any pump station considered by the District must include, but is not necessarily limited to the following design features:

a. Dry pit or wet well mounted pumping equipment.
b. Multiple pumps.
c. Standby power generation or dual source of power supply.
d. Ventilation , heating and dehumidification equipment.
e. Automatic controls.
f. Remote alarm system for operating functions.

2.15 Sanitary Sewerage Plan Submittal Requirements

a. Plans and Specifications. Three (3) copies of all plans and specifications for facilities to be installed under these rules and regulations shall be furnished to the District. One (1) copy will be returned to the applicant when approved by the District and bear evidence of such approval or comments requiring correction.

b. Plan Content. As a minimum, the following information shall be required on all plans.

(1) Plan View: The plan view shall show streets, alleys, rights-of-way and utility easements with the location and size of the sewers, locations and distance between manholes, the slope and other appurtenances indicated. It is desirable for plans to show the proposed size and location of service stubs and the location of all existing or proposed underground utilities and structures located within 20 feet horizontally or vertically, of the centerline of the proposed sewer extension. (The scale is optional, however, 1"=50' is commonly used.)

(2) Profile View: The profile view with vertical and horizontal grids shall show the existing ground surface (grey scale) and proposed surface (solid). Also, show the proposed sewer with elevations of manhole rims and inverts, the distance and grade between manholes and elevations of utility crossings.

(3) Detail drawings: Special detail drawings, made to scale, shall clearly show the nature of design and construction of the following:

(a) Special sewer appurtenances such as non-standard manholes, inverted siphons and elevated sewers.
(b) Special joints and utility or storm sewer crossings.

(c) Stream and drainage channel crossings with elevations of normal high and low water levels.

c. Supporting Data: Submit with the plans and specifications all necessary supporting data to fully describe the proposed installation. This data shall include but not necessarily be limited to a copy of the recorded plat of the subdivision in which the improvements are proposed to be installed and copies of dedicated rights-of-way and easements in which improvements are proposed to be installed. Submit copies of necessary permits from other governmental or private agencies having jurisdiction in the area of the proposed work.

Should a site application for a collection system extension be required by the Colorado Department of Health, the individual party responsible for construction of the facility shall also be responsible for obtaining this site approval.

d. Upon completion of construction and prior to acceptance by the District, two (2) copies of "as-constructed" plans shall be submitted to the District for record. The two (2) copies shall be complete with all "as-constructed" information together with a certification by the party responsible for construction that all data thereon is accurate and represents actual "as-constructed" conditions. One (1) copy shall be a transparency suitable for reproduction. "As-constructed" plans shall be submitted within two weeks of completion of the sanitary sewer construction in any identifiable phase of a development. No authorization to connect to the system or discharge to the system will be allowed until the "as-constructed" documents have been received and accepted by the District.

e. All plans, specifications and supporting documents shall be prepared by or under the direct supervision of a professional engineer registered to practice in the State of Colorado. All plans and specifications shall bear the seal and registration number and name of said registered professional engineer.

2.16 Sewage System and Trench and Foundation Drains

a. In no case shall any trench drains, foundation drain or other drainage fixture be connected to the District's system which may introduce any wastewater other than sanitary sewage into the system.

b. All piping material incorporated into the District's sanitary sewage system shall not be white unless utilizing Schedule 40 PVC. At the time of the preparation of these specifications, the predominant pipe color is green. All trench or foundation drainage piping shall be white to preclude accidental cross-connection of the drainage systems.

CHAPTER 3 - Pipe and Manhole Materials

3.01 PVC Pipe and Fittings (Polyvinyl Chloride)

a. Conformance

ASTM 3034; Standard Dimension Ratio (SDR) shall be maximum of 35.

b. Joints

ASTM D3212; Bell and spigot, push-on with single rubber gasket.

Jointing of dissimilar pipe materials shall be accomplished with a specially manufactured rubber connection with stainless steel tightening bands (Mission Rubber Company, Fernco or equivalent).

Solvent Cement Joints may be used for 4-inch and 6-inch pipe.

c. Length of Joints

The length of joints for flexible conduits shall not exceed 12-1/2 feet for grades less than one percent.

d. Criteria for Acceptance. Pipe which has any of the following visual defects will not be accepted.

(1) Improperly formed pipe such that pipe intended to be straight has an ordinate, measured from the concave side of the pipe exceeding 1/16 inch per foot of length.

(2) Pipe which is out-of-round to prohibit proper jointing.

(3) Improperly formed bell and spigot ends or bells which are less than 1-1/2 inches in length.

(4) Pipe which is fractured, cracked, chipped or damaged in any manner.

(5) Pipe that has been damaged during shipment or handling.

(6) Pipe or fittings not properly marked as required by the following specifications.

e. Marking of Material. The following shall be clearly shown on the exterior of the pipe:

(1) Manufacturer's name.
(2) Appropriate ASTM designation.
(3) Appropriate SDR number of 4-inch and 6-inch pipe.
(4) Homemark.

f. Material Handling and Storage. Avoid damage to pipe from impact, bending, compression or abrasion during handling and storage.

Store pipe on flat surface which provides even support for the pipe barrel with bell end overhanging. Do not stack pipe higher than 5 feet. Do not store pipe and fittings in direct sunlight for extended periods (greater than two to three weeks). Any discoloration of the pipe material shall be evidence of ultraviolet damage and shall be reason for rejection and the removal from the project.

Ship rubber gaskets in cartons and store in a clean area away from grease, oil, ozone producing electric motors, heat and the direct rays of the sun.

Use only nylon protected sling to handle pipe. The use of hooks, bare cables or chains will not be permitted.

For pipe slopes less than one percent, the maximum pipe joint length shall be 13 feet.

g. All PVC pipe installed in the District's sanitary sewer system including mains and services shall be non-white in color. White sewer pipe shall not be acceptable as trench and foundation drain piping used in the District shall be white to better assure that there is no accidental connection between the two separate drainage systems.

h. PVC pipe shall not be installed at depths in excess of fourteen (14) feet without specific approval of the District.

3.02 Ductile Iron Pipe

a. Conformance

ANSI 21.51; Thickness Class 50, unless otherwise required for internal or external loading.
Fittings shall conform to ANSI 21.10 for flanged, mechanical joints and push-on joints (AWWA C110 or C153).

b. Joints

(1) Mechanical Joint: ANSI A21.11
(2) Push-On: ANSI A21.11
(3) Flanged: ANSI B16.1, 125 lb. drilling
(4) Rubber Gaskets: AWWA C111 (ANSI A21.11)

c. Protective Coatings

(1) Exterior Coating: Manufacturer's standard coating approximately 1 mil thick.

(2) Interior Lining: Interior lining shall consist of standard thickness, cement mortar in conformance with ANSI A21.4 standards.

d. Criteria for Acceptance. In addition to any deficiencies covered by the reference specifications above, any of the following visual defects will not be accepted.

(1) Improperly formed pipe such that pipe intended to be straight has an ordinate, measured from the concave side of the pipe exceeding 1/16 inch per foot of length.

(2) Pipe which is out-of-round to prohibit proper jointing.

(3) Pipe which is fractured, cracked, chipped or damaged in any manner.

(4) Pipe that has been damaged during shipment or handling.

(5) Pipe which has lining which is fractured, cracked, chipped or damaged in any manner and would not provide satisfactory service under the conditions intended.

e. Marking of Material & Certification of Manufacturer. All materials shall be marked with the name of the manufacturer of origin. Manufacturer will provide a certification to the District that all products supplied to the project site are in conformance with these specifications.

f. Material Handling and Storage. Handle pipe fittings and accessories using lifting hoist or skidding to avoid shock or damage. Do not drop such materials. Do not allow pipe unloaded on skidways to be skidded or rolled into pipe previously unloaded. Protect the pipe coatings and linings from damage during delivery and handling.

3.03 Manholes. Except as otherwise specifically approved by the District, manholes shall be precast concrete and manufactured in accordance with the referenced specifications. See standard drawing No. 4.

a. Conformance

Precast concrete in conformance with ASTM C478.

b. Size of Manholes

Size of Sewer Main	Inside Diameter of Manhole
Up to 10 inches	4'
12 through 18 inches	5'
24 inches and above	6'

c. Cement

All cement used in manhole construction shall be Type II or Type IILA. All concrete shall have a 28-day compressive strength of at least 4,000 pounds per square inch (psi).

Rubber gasketed joints for pre-cast manhole sections shall be an R-4 joint and designed in accordance with ASTM C443.

Manhole joints may be joined with flexible plastic/rubber gaskets constructed of Ram-Nek, Rubber-Nek, Con-Seal or equivalent.

3.04 Cast-in-Place Concrete. All cast in place concrete utilized in sanitary sewer construction shall have a minimum compressive strength of 3000 psi at 28 days unless specifically required otherwise by the project.

a. Aggregates

Conform to ASTM C33, maximum size shall be 3/4 inch nominal diameter.

b. Cements

Portland Cement in accordance with ASTM C150, Type II or IILA will be used for all concrete.

c. Admixtures

Air entraining admixtures will be permitted in conformance to ASTM C260. Maximum entrained air shall be 6.5% and minimum shall be 5.0%. Water reducing and retarding admixtures may be utilized with the specific approval of the District. Such admixtures shall be in conformance with ASTM C493. Flyash or calcium chloride are not permitted for use.

d. Water/Cement Ratio

Maximum water cement ratio shall be 0.45.

e. Slump

Maintain within the following limits:
1" minimum, 3" maximum for all concrete to be incorporated in sanitary sewerage facilities.

3.05 Castings

a. Cast Iron

(1)	Conformance:	ASTM A48
(2)	Applicable Items:	Manhole rings and covers with non-slip surface with "SEWER" cast in the cover. Combined weight will not be less than 300 pounds. Ring shall he a minimum of 4 inches in height.

3.06 Steps. All manholes shall have steps at a maximum of 16 inches vertical spacing unless otherwise specifically directed by the District.

a.	Conformance:	Federal Spec. QQ-A-200/8.
b.	Material:	Aluminum with drop front design or safety nosing and non-skid grooves.
c.	Width:	12 inches.
d.	Capacity:	1000 pounds at 6 inches from wall. 1500 pounds at 4 inches from wall.

OR

a. Material: Plastic (co-polymer polypropylene) with 1/2" diameter Grade 60 steel reinforcement as manufactured by M.A. Industries, Inc.

b. Design Equipment: PS-2-PFS Manhole Step with non-skid grooves and safety nosings or drop front design.

3.07 Cement Mortar

Conformance: ASTM A270, Type M.

3.08 Cement Grout

a. Cement

Portland Cement in accordance with ASTM C150, Type II or II LA

b. Sand

Clean, well-graded, natural sand in accordance with ASTM C33

c. Proportioning

One part Portland Cement, 2½ parts sand, by weight, with minimum water required for placement and hydration

3.09 Non-Shrink Grout — Approved commercial factory mix product made especially for intended use. Utilize non-metallic chemical grout for non-shrink applications.

3.10 Dampproofing Material — Coal tar solution type coating; Tnemec "47-461 Foundation Coating," International "Intertuf 100," Carboline "Bitumastic Super Service Black" or similar approved material

CHAPTER 4 - Pipe Installation

4.01 Earthwork. See Standard Water Distribution Drawing No. 9 for typical pipe trench detail. See Standard Wastewater Collection System drawing No. 1 for bedding detail.

a. Embedment Materials. All water and sanitary sewer mains are to receive one of the following embedment materials extending from the bottom of the excavation to 12 inches over the pipeline.

(1) Concrete. The pipeline embedment with concrete shall utilize concrete having a 28-day compressive strength of a minimum of 3000 psi and other characteristics as set forth in these Specifications.

(2) Granular Material. Well-graded, crushed stone or gravel meeting the requirements of ASTM C33, Gradation 67 (3/4" to No.4).

(3) Fine Granular Material. Natural or manufactured sand meeting the following requirements:

Well-Graded Sand

Sieve Size	Total Percent Passing by Weight
3/8	100
No. 4	95 – 100
No. 8	80 – 100
No. 16	50 – 85
No. 30	25 – 60
No. 50	10 – 30
No. 100	2 – 10

(4) **Squeege Sand**

Sieve Size	Total Percent Passing by Weight
3/8 inch	100
No. 200	0 - 5

(5) Selected Backfill. Selected soil free from rocks, clods or stones greater than 1-1/2" in any dimension as approved by the District's representative. Granular material, fine granular material or squeege sand may be substituted for selected backfill.

b. Backfill Materials

(1) Suitable Material. Soil obtained from the excavation that is free of frozen material, stumps, roots, brush, other organic matter, debris and other items. In addition, suitable material shall meet the following requirements:

(2) Upper Portion of Trench. Material placed within one (1) foot of pavement subgrade or finished surface in unimproved areas shall be soil free from rocks, greater than 6 inches in nominal diameter.

(3) Other Portions of Trench. Material within 6 inches below and 12 inches above the pipe shall contain particles of a size to conform to the embedment class required but in no case shall it contain rocks greater than 1-1/2 inches in any dimension. From a point 12 inches above the pipeline to within one (1) foot of the pavement subgrade or finished surface in unimproved areas, maximum size of any rock in the trench backfill shall be 18 inches nominal diameter.

(4) Public Highways. Provide and install material in conformance with the Colorado Department of Transportation requirements where they do not conflict with other provisions of these regulations. Should a conflict exist, submit a request for clarification to the District in writing prior to proceeding with work.

(5) Flowable Fill. At the District's option, or if required by the right-of-way's governing body, utility trench backfill meeting the following requirements (flowable fill), may be used in lieu of native backfilling in any excavation regardless of width or depth. Concrete slurry type full depth backfill will not be allowed within the public right-of-way. Compaction and testing of utility trench backfill will not be required if material meeting the following specification is used:

FLOWABLE FILL SPECIFICATIONS

Ingredient	**lbs / cubic yard**
Cement	43 (0.47 sack)
Water	325 (39 gallons or as needed)
Coarse Aggregate (Size #57)	1700
Sand (ASTM C-33)	1845

c. Trench Backfilling and Compacting

(1) Place backfilled material above embedment materials in a manner to prevent damage or misalignment of the pipeline. Place in lifts of a thickness necessary to acquire the specified backfill density or in conformance with other regulatory requirements. Backfilled material shall conform to the requirements of Section 3.10.b of these specifications.

(2) Backfill Density Requirements. Unless otherwise specified or required by local governing authority, all backfill should be placed in a manner to achieve the density specified below.

- State Highway
  100% of maximum in shoulder areas
  Flowable Fill within all paved areas

- Paved roadways, sidewalks and other areas to receive pavement
  95% of maximum density for entire trench depth

- Gravel roadways
  95% of maximum density for entire trench depth

- Sodded or lawn areas over a dedicated easement or right-of-way
  90% of maximum density

- Zone 6" below to 12" above pipe
  95% of maximum density for all pipelines

- Adams / Arapahoe County
  100% of maximum in paved areas parallel to traffic
  95% in shoulder areas
  Flowable Fill in paved areas perpendicular to traffic

d. Field Quality Control

(1) Density Testing and Control. Density testing as may be required by the District's representatives shall be the responsibility of the Contractor and/or Developer. Results of such density testing shall be reported directly to the District by the testing agency. All reports shall be submitted with the seal and signature of a registered professional engineer experienced in the testing of soil materials.

(2) Soil Compaction Tests. Conduct in accordance with the requirements of ASTM D698-07 or AASHTO T99, "Standard Method of Test for Moisture Density Relations of Soils Using a 5.5 lb. Rammer and a 12 inch Drop." Use method A, B, C or D as appropriate on soil condition and judgment of the testing laboratory. Samples tested shall be representative of materials to be placed (or altered). Obtain optimum moisture density curve for each type of material or combination of materials encountered or utilized. Use test results as a basis for compaction control. Testing includes Atterberg Limits, grain size determination and specific gravity.

4.02 Pipe Laying

a. Begin pipe laying at the lowest point, unless directed otherwise by the District, and install the pipe with

the spigot ends pointing in the direction of flow.

b. Unless required or directed otherwise by the District, lay all pipe straight between changes in alignment and at uniform grade between changes in grade or slope.

c. As each length of pipe is placed in the trench, the joint shall be completed in accordance with the pipe manufacturer's recommendations and the pipe shall be brought to the correct line and grade. The offset at the invert shall be less than 1% of the inside pipe diameter.

d. The length of joints for curvilinear sewer shall be determined by the radius using joint deflection not exceeding the manufacturer's recommendations, three degree couplings or a combination of both. Bending of the pipe material to achieve the curvature shown on the plans shall not be permitted.

e. Secure the pipe in place with Class B bedding material tamped under and around the pipe. Do not walk on small diameter conduit or otherwise disturb any conduit after jointing has been completed.

f. All foreign matter or soil shall be removed from the inside of the pipe before it is lowered into its position in the trench and shall be kept clean at all times during and after laying. All openings along the line of the sewer shall be securely closed and during suspension of work at any time, suitable pipe plugs or closures shall be placed to prevent water, soil or other materials from entering the pipeline.

4.03 Fittings, Couplings, Wyes and Saddles

a. Fittings, couplings, wyes and saddles shall be the same material as the pipeline or as specifically manufactured for a particular installation.

b. Jointing of dissimilar materials shall be permitted only with approval of the District representative. Jointing of such dissimilar materials shall be through the use of fittings, couplings, wyes, saddles, adapters or adhesives specifically manufactured for such transitions.

4.04 Service Lines. See Standard Drawing No. 7

a. Prepare subgrade in accordance with Part III of these regulations.

b. Connect all service lines to mains with a tee or tee saddle in the top one-half of the sewer main. Connections made in the lower half or at mid-point of the main shall have prior approval of the District and may require the installation of a backflow prevention device.

c. Connection of service lines to mains
   1) Tee saddles with rubber gaskets to be placed between the saddle and the main line of pipe, secured in place with stainless steel bands are required.
   2) Connection to the main line piping shall be made by cutting a hole using the appropriate hole template, tapping machine or hole saw no more than ¼-inch larger in diameter than the template outline.
   3) A 1/8 or 1/16 bend shall be used from the tee fitting to attain the desired grade and slope for the service line piping.
   4) The tee saddle shall be furnished with an intergal rubber gasketed bell.
   5) All service line piping between the main line and the property line of the property to be serviced shall be pipe in accordance with these specifications with intergal rubber gasketed pushon joints.
   6) In general, no change in horizontal alignment will be permitted between the connection at the main line and the property line of the property being serviced.

d. Service line connections shall be separated by a minimum of 3 feet measured center to center along the main.

e. Plug all service line stubs with water and air tight cap or plug unless the service line will be immediately connected to a building sewer.

Where new street construction is proposed immediately following construction of sanitary sewer facilities, extend the service line to 5 feet inside the property line, install the appropriate plug and mark with a vertical wood marker extending above the surface and having dimensions of 2" x 4" minimum.

f. The Contractor and/or Developer shall provide complete as-built information on each service line connection installed within his/her work. As a minimum this information shall include the location of the connection to the main referenced to the nearest manhole or other permanent improvement, the location of the end of the service line stub, the direction of the service line as it relates to surrounding permanent surface improvements, the size, the material of construction and the date and name of the installer. All such information shall be provided to the District's representatives for incorporation into the District's permanent records.

g. Connection of service lines and service line construction shall be accomplished by experienced, qualified personnel with adequate equipment. The District's representative shall have authority to reject work and may not permit work to be accomplished unless done by qualified personnel.

4.05 Manholes

a. Cast-in-place concrete manhole base

1) Prepare the subgrade and excavation in accordance with the specifications.

2) Provide reinforcing, grade 60 reinforcing bar, No. 4 at 12-inches on center each way for manholes 12-feet or less in depth. Place steel at 8-inches on center each way on manholes in excess of 12 feet in depth.

3) Place concrete against undistributed soil to the depth, thickness and other dimensions shown on detailed drawings.

4) Finish and cure the cast-in-place concrete for a minimum period of 24 hours prior to placing precast manhole sections on the cast-in-place base.

5) Maintain ground water below the bottom of the cast-in-place concrete for a minimum period of 24 hours following placement of concrete by maintaining pumping equipment in operation below the subgrade of the manhole base.

6) Concrete shall contain a minimum of 564 lbs of Type 2 portland cement per cubic yard (6 sacks mix), be placed with a maximum slump of 2 inches with maximum size course aggregate of ¾-inch (ASTM C33).

b. Provide segmental precast concrete barrel sections a maximum of 4 feet in length with preformed flexible gasket material between each barrel section as jointing material or install rubber gaskets in precast R-4 joint grooves per manufacturer's recommendations.

c. Provide dampproofing of all manhole joints.

1) Provide interior dampproofing consisting of a 3/8" to ½" thick layer of cement grout extending a minimum of 4" each side of all manhole segment joints. Work the cement grout in the joint to completely fill all voids.

2) Provide exterior dampproofing consisting of a 3/8" to ½" thick layer of cement grout extending a minimum of 4" each side of all manhole segment joints. Work the cement grout in the joint to completely fill all voids.

3) When ground water is present or potentially present in the opinion of the District representatives, a double application of Ram-Nek, or equal, and an application of cold tar epoxy dampproofing

material shall be applied to the completed manhole structure after installation of cement grout and prior to backfilling. During construction of all dampproofing measures ground water shall be maintained below the subgrade elevation in the manhole excavation during the time sufficient for all materials to properly cure, no less than 24 hours.

d. Provide one, one (1) foot high barrel section beneath a reducing ring or cone cap to bring the manhole ring and cover to within 6 inches of desired grade.

e. Provide precast concrete 2-inch-high grade adjustment rings to bring the ring and cover to desired grade. A maximum of three grade adjustment rings are permitted. A maximum dimension of 2 feet shall be permitted between the manhole ring and the top manhole step.

f. Where the manhole base is constructed from cast-in-place concrete, the sewer pipes entering the base shall be cut to length to match the inside of the manhole barrel and set to grade. Manhole gaskets shall be placed over the pipe and centered between the end of the pipe and the outside of the cast-in-place base. The cast-in-place base shall then be constructed to the lines and grades required by the District's standard specifications and the accepted plans. Sewer pipe shall not be laid through the manhole base and the concrete base and/or invert placed around the pipe.

   Where preformed rubber "boots" such as Kor-N-Seal boots are used in precast manhole bases, manhole gaskets on the pipe are not required.

g. Where intersecting pipelines or pipelines requiring deflections at manholes require that the invert of the manhole be shaped to match the pipe cross sections, such construction shall be accomplished in accordance with the detail drawings of these specifications. Form the flow line configuration of intersecting pipes to allow for free uninterrupted flow of sanitary sewage through and out of the manhole. All channel inverts shall be finished smooth by steel troweling. All inverts shall be placed and finished with a single pour of cast-in-place concrete. Placement of grout and/or other material to repair and/or reshape the manhole invert shall not be permitted unless specifically approved by the District's representative.

h. Cast-in-place bases for manholes shall be constructed in a manner to provide for a smooth level surface on which vertical barrel sections shall be placed. Completely watertight joints shall be made utilizing preformed flexible gasket material or a precast concrete base section may be utilized. The manhole shall be constructed such that no single section varies from true vertical by more than two percent of the section length.

i. All manholes constructed in the District shall have the ring and cover elevations set at final street grades or at a point not more than 6 inches above the existing ground in non-traffic areas unless directed otherwise by the District. The Developer/Contractor shall be responsible for adjusting the manhole rings and covers to the final elevations.

j. In areas where street paving will be placed, the manhole ring adjustment shall be accomplished in a two-step process prior to placement of pavement. The manhole ring shall be constructed 0.5 feet below finished pavement surface elevation. Pavement shall then be placed in accordance with the applicable rules, regulations and specifications. Following completion of paving, the sanitary sewer manhole rings will be raised by the Developer/Contractor to finished grade in accordance with the specifications of the District.

k. The ring shall be adjusted with precast concrete rings a maximum of 0.5 feet in height. Cement grout shall be placed to adjust the ring to conform to the surface. A concrete collar shall be placed around the adjusting rings and the ring of the manhole up to a point 2 inches below finished grade. Paving material shall then be placed over the concrete and match the surrounding pavement surface. Tack coat material shall be placed between new and existing asphaltic concrete surfaces, the manhole casting and the concrete collar.

CHAPTER 5 - Testing of Pipelines and Appurtenances

5.01 Infiltration. Use where ground water may be above the pipeline invert.

a. Infiltration tests shall be conducted on each segment of the sanitary sewer system where it could be anticipated that ground water may rise above the flow line of the pipeline. Tests shall be conducted by placing an approved calibrated V-notch weir in the line just above the next lower manhole and plugging the line just above the next higher manhole. Sufficient time will be allowed to permit the water level behind the weir to stabilize before reading. Any foreign material hanging to the weir will be dislodged before reading. Successive readings shall be taken until consistent results are obtained.

b. The maximum allowable infiltration shall be 100 gallons per day per inch of pipe diameter per mile of pipe.

c. Each segment of pipeline between manholes or other major appurtenances must satisfy and pass the infiltration tests.

d. Should it be determined that the infiltration rate is in excess of that permitted by these regulations, any repair and/or replacement of pipelines, manholes or other appurtenances shall be at the Contractor's and/or Developer's expense. Satisfactory repair and replacement shall be accomplished prior to the consideration of acceptance of any facility by the District.

e. The Contractor and/or Developer will furnish all labor, equipment and materials required to accomplish such testing.

5.02 Air Test. All segments of sanitary sewer mains shall be subjected to an air pressure test. Where ground water levels are above the conduit, increase the test pressures given below to compensate for the pressure on the conduit from the ground water.

a. The Contractor may conduct an initial air test of the sewer main line after compaction of the backfill but prior to the installation of any service lines. Such tests shall be considered for the Contractor's convenience in quality control of the project construction. Final consideration for acceptance of the sanitary sewer by the District shall be based on satisfactory completion of testing with all service line stubs installed.

b. Preparation of Tests: Flush and clean the sewer line prior to testing in order to wet the pipe surfaces and produce more consistent results. Plug and brace all openings in the main sewer line and the upper end of any connections. Check all pipe plugs with a soap solution to detect any air leakage. If leaks are found, release the air pressure, eliminate the leaks and start the test procedure over again.

c. Procedure of Test: Add air until the internal pressure of the sewer line is raised to approximately 4.0 psi gage at which time the flow of air shall be reduced and the pressure maintained between 3.5 and 4.5 psi gage for a sufficient time to allow the air temperature to come to equilibrium with the temperature of the pipe.

d. After the temperature has stabilized the pressure shall be permitted to drop to 3.5 psi gage at which time a stop watch or a sweep second hand watch shall be used to determine the time lapse required for the air pressure to drop to 3.0 psi gage.

e. If the time lapse is less than that shown in the table, the Contractor shall make the necessary corrections to reduce the leakage to acceptable limits.

f. If the time lapse exceeds that shown in the table, the pipe shall be presumed to be within acceptable limits for leakage.

Pipe Dia.(in.)	Minimum Time (min:sec)	Length For Minimum Time (ft.)	Time for Longer Length (L, ft.) (sec)	LENGTH (ft.)			
				100	200	300	400
4	1:53	597	0.190L	1:53	1:53	1:53	1:53
6	2:50	398	0.427L	2:50	2:50	2:50	2:51
8	3:47	298	0.760L	3:47	3:47	3:48	5:04
10	4:43	239	1.187L	4:43	4:43	5:56	7:54
12	5:40	199	1.709L	5:40	5:42	8:33	11:24
15	7:05	159	2.671L	7:05	8:54	13:21	17:48
18	8:30	133	3.846L	8:30	12:49	19:14	25:38
21	9:55	114	5.235L	9:55	17:27	26:11	34:54
24	11:20	99	6.837L	11:24	22:48	34:11	45:35
27	12:45	88	8.653L	14:25	28:51	43:16	57:42

Safety: The air test may be dangerous if proper precautions are not taken. All plugs must be sufficiently braced to prevent blowouts and the pipeline must be completely vented before attempting to remove the plugs.

As a safety precaution, pressurizing equipment shall be provided with a regulator setting of 5 psi to avoid over-pressurizing and damaging an otherwise acceptable line.

5.03 Alignment Testing

a. Each section of pipeline on a linear alignment between manholes will be subject to testing by lamping by the District's representatives to determine where proper alignment has been accomplished and whether any displacement of the pipe has occurred during construction.

The Contractor and/or Developer shall provide suitable assistance to the District's representative in accomplishing this work. The Contractor and/or Developer shall be responsible for repairing any alignment, displaced pipe or other defects discovered during this testing in accordance with these specifications.

b. For pipelines installed at grades less than 1%, a minimum of 90% of the full pipe cross section shall be visible at the opposite end of the segment being observed.

c. For pipelines installed at grades greater than 1%, a minimum of 75% of the full pipe cross section at the opposite end of the segment shall be observed.

d. The determination of the acceptability of the pipeline alignment by lamping shall rest solely with the District's representative and his decision shall be final.

e. Pipelines not meeting the requirements of the alignment tests shall be completely excavated, removed, and re-laid on prepared bedding material, backfilled and compacted in accordance with these specifications and then subjected to infiltration, air pressure and alignment testing.

5.04 Deflection Tests

a. Proper construction in accordance with these specifications and the manufacturer's recommendations should result in a vertical deflection of the pipe less than 5% of the internal diameter. At the option of the District, the Contractor and/or Developer may be required to perform testing to determine conformance with this requirement.

b. Should the District determine that deflection testing is required, the Contractor and/or Developer shall provide all necessary equipment, labor and other facilities. Data supplied by the pipe manufacturer's representative for dimensional quality shall be utilized.

c. Should the vertical deflection of the pipe be found to exceed 5% of the internal diameter, the Contractor will remove the pipe, install proper bedding, replace the pipeline material and properly place and compact all backfill material in accordance with these specifications. Any areas removed and replaced shall be subject to infiltration, air pressure and alignment testing.

5.05 Vacuum Tests

a. All manholes shall be vacuum tested prior to CCTV inspection operation and acceptance by the District Engineer.

b. All lift holes and pipes penetrating the manhole are to be plugged, sealed, braced, and secured. A vacuum will be drawn and the vacuum drop over a specified time period will be reported.

c. An effective seal is required between the vacuum base and the manhole rim.

d. The test head gauge should be placed at the top of the manhole or per the manufacturer's recommendations.

e. A vacuum of 10 inches of mercury should be drawn within the manhole, vacuum line valve closed, and vacuum pump shut off. The time should be recorded for the vacuum to drop to 9 inches of mercury.

f. The manhole vacuum test is considered passing if the time for the vacuum drop in mercury exceeds the values indicated in the following table.

Depth of Manhole (ft.)	Diameter of Manhole (ft.) Time (sec.)			
	4'	5'	6'	
8	20	26	33	
10	25	33	41	
12	30	39	49	
14	35	46	57	
16	40	52	67	
18	45	59	73	
20	50	65	81	
22	55	72	89	
24	59	78	97	
26	64	85	105	
28	69	91	113	
30	74	98	121	

g. If a manhole fails the initial vacuum test, then the District Engineer shall be informed of repairs, the manhole supplier should be notified of defects, repairs shall be made, and the manhole retested until a satisfactory test is obtained.

5.06 Internal Video Inspection

a. All sewer main construction in the District shall be inspected with internal video camera and recording equipment.

1) Coordination with the District shall be required as to cleaning and/or flushing prior to any internal video inspection.

b. All costs of the internal video inspection shall be borne by the Contractor and/or Developer.

c. The individual and/or company and permanent video tape recording shall be subject to the acceptance and approval of the District.

APPENDIX C

STRASBURG SANITATION AND WATER DISTRICT
IDENTITY THEFT PREVENTION PROGRAM

This Identity Theft Prevention Program (this **"Program"**) has been adopted by the Strasburg Sanitation and Water District (the **"District"**) board of directors to comply with the Red Flags Rules located at 16 C.F.R. 681 and required by the Fair and Accurate Credit Transactions Act of 2003 which become effective November 1, 2009.

For the purposes of this Program, "**Identity Theft**" means any fraud committed or attempted using the personal identifying information of another person. "**Personal Identifying Information**" means any name or number that may be used, alone or in conjunction with any other information, to identify a specific person, including, but not limited to, any:

1. Name, social security number, date of birth, official government issued identification or number;
2. District account number;
3. Financial information such as bank account number or credit card number; or
4. Any unique electronic identification number, address or routing code.

Section 1 – "Red Flags"

The following shall be considered "Red Flags" relevant to the District.

1. **Suspicious Documents**
   a. Identification documents that appear to be altered or forged;
   b. Photographs or physical descriptions on documents that do not match the appearance of the person presenting the identification; or,
   c. Information on identification documents is not consistent with readily accessible information that is on file, such as a signature card or a recent check.

2. **Suspicious Personal Identifying Information**
   a. A Social Security Number (SSN) provided is the same as that of another person;
   b. Failure or refusal to provide Personal Identifying Information upon request; or,
   c. Personal Identifying Information is not consistent with other information on file.

3. **Notice from Customers of Possible Identity Theft**
   Notification from a customer, victim, law enforcement authority, or any person that a fraudulent account has been opened for a person is engaged in identity theft.

Section 2 – Detecting Red Flags

District staff shall identify any Red Flags by examining documents carefully in the event any Personal Identifying Information is required in a transaction.

Section 3 – Response to Attempted/Suspected Fraudulent Use of Identity

Any District employee who detects a Red Flag must notify the District's administrator. If the administrator determines that the Red Flag evidences a risk of identity theft he or she will make reasonable efforts to notify the affected individual.

If identity theft has occurred, the Administrator may mitigate loss by:

1. Changing account numbers, passwords, security codes or security devices;
2. Close accounts; or
3. Take other actions deemed necessary.

Upon request, the administrator shall disclose to the affected individual the following information:

1. The type of identifying information involved;
2. The following telephone number that the person can call for further information and assistance;
    a. Local Law Enforcement,
    b. Federal Trade Commission: (Toll Free) 877-438-4338 or www.consumer.gov/idtheft
    c. Credit Reporting Agencies:
        i. Equifax: (800) 525-6285 or http://www.equifax.com
        ii. Experian: (800) 397-3742 or http://www.experian.com
        iii. TransUnion: (800) 916-8800 or http://www.transunion.com

Section 4 – Periodic Updates to the Program

The Administrator will update the Program periodically to reflect changes in risks to customers or to the safety and soundness of the District.

Section 5 – Employee Training

All employees with access to any customer Personal Identifying Information will be trained to identify and respond to Red Flags.