ROARING FORK WATER & SANITATION DISTRICT

RULES AND REGULATIONS

(Amended and Restated
Effective April 16, 2019)

Adopted by the Board of Directors
at its regular meeting held April 16, 2019

ROARING FORK WATER AND SANITATION DISTRICT

Rules and Regulations Amendments

TABLE OF CONTENTS

ARTICLE 1

1.00 - General

.01 - SCOPE: These Rules and Regulations shall govern the operations and functions of the Roaring Fork Water and Sanitation District.

.02 - PURPOSE: The purpose of these Rules and Regulations is to provide for the administration and operation of the Water and Sewer Systems of the Roaring Fork Water and Sanitation District.

.03 - POLICY: The Rules and Regulations hereinafter set forth will serve the public in securing the health, safety, prosperity, security, and general welfare of the inhabitants of the Roaring Fork Water and Sanitation District.

.04 - PENALTY: Unless otherwise specifically stated in these rules and regulations, the penalty for violation of any of these Rules and Regulations shall be a fine of two hundred and fifty dollars ($250.00) for each day the violation continues. In addition, the violator shall be liable for reimbursement to the District of any and all actual costs and/or damages the District may incur as a result of the violation, including without limitation, legal and engineering fees.

.05 - DISTRICT ACTION AT CUSTOMER EXPENSE: The Rules and Regulations of the District require District Customers to take certain actions at their own expense. In the event that a Customer fails or refuses to take such action, unless it is necessary for the District to act immediately to protect the health, safety, and welfare of the general public, the District shall mail a written notice to the Customer or the owner of the property on which District service is or will be received. The notice shall request that the required action be taken within the time specified in the applicable Rule or Regulation or, if no time is specified in the Rules and Regulations, then within a reasonable time as set forth in the notice. If the Customer still has not taken the required action within the allotted time, then the Customer shall be in violation of this section and shall be subject to the penalty provisions of Section 1.04, above. The District may, but is not obligated to, take the required action and bill the expense to the Customer. The District shall be entitled to pursue all remedies granted to it by these Rules and Regulations and Colorado law for collection of the amounts due to it for taking such required actions on behalf of the Customer.

.06 - WAIVER FOR CAUSE: At its sole discretion, the Board of Directors may waive or modify any requirement, penalty, or liability for costs imposed by these Rules and Regulations. Such waiver or modification shall be only for good cause shown in a written application to the Board and must not cause the applicant or District to violate any federal, state, or local laws. Good cause shown shall include but not be limited to:

(A) Evidence that strict enforcement of the requirement, penalty, or liability would result in severe hardship, financial or otherwise, which would outweigh the benefits to the District from such strict enforcement; or

(B) Evidence that the applicant will provide or has provided a benefit or benefits to the District that will outweigh the positive impacts of strict enforcement.

.07- EFFECTIVE DATE: These Rules and Regulations as Amended and Restated effective April 16, 2019 shall be effective upon the stated date and shall govern and control the relationship between the District and its Customers from the date forward, subject to further amendments by the District. Reference herein to the Rules and Regulations shall mean these Rules and Regulations as Amended and Restated.

.08- AMENDMENT: These Rules and Regulations may be amended at any time and such amendment shall be effective as prescribed by the Board at the time of such Amendment, and if not prescribed at the time of Amendment, the Amendment shall be effective immediately upon adoption by the District Board.

.09- INSPECTION OR PURCHASE FEES: These Rules and Regulations shall be available to the public for inspection at the District's office, on the District's website (www.rfwsd.com), and at the offices of the Attorney for the District. A copy shall also be available for purchase at the District's cost of copy and assembly as determined from time to time by the District Board.

End Article 1

ARTICLE 2

2.00 - Definitions

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

.01 - ACTUAL COST: All direct costs applicable to the construction of a given facility, including surveys, construction, construction observation, preliminary and design engineering, inspection, administrative and legal costs, plan approval fees, as-built drawings, and other costs necessary for completion.

.02 - APPURTENANT: Belonging to, accessory, or incident to, adjunct, appended or annexed to.

.03 - AS-BUILT DRAWINGS: Accurate drawings representing the final installed location of water and/or sewer lines which have been installed in accordance with an agreement or understanding with the District, and further described in 3.04 of the Technical Specifications and Procedures of the District in Appendix B.

.04 - AUTHORIZED REPRESENTATIVE: A person employed or designated by the District who is authorized by the Board of Directors to conduct activities and other duties on behalf of the District.

.05 - BEDROOM: Any room in a building or other structure that is used predominantly for sleeping accommodations.

.06 - BOARD and BOARD OF DIRECTORS: The duly elected Board of Directors of the District, which acts as the governing body of the District.

.07 - BUILDING DRAIN: That part of the lowest horizontal piping of a building drainage system from the stack or horizontal branch, exclusive of storm sewer, extending to a point not less than five feet (5') outside of the building wall.

.08 - COLLECTOR SEWER LINE: Any sewer line designed to collect the flow from two or more sewer service lines in a subdivision, planned unit development, or other defined residential, commercial, or industrial area, and to transport that collected flow to a sewer main.

.09 - CONNECTION: Any physical connection of a service line to a pre-approved stubout or a sewer main, regardless of whether water use actually commences at the time of connection, and regardless of whether the service line is connected to the structure to be served.

.10 - CONTRACTOR: Any person, firm or corporation authorized by the District to perform work and to furnish materials within the District.

.11 - CONVEYANCE OF WATER RIGHTS: The legal process by which legal title to water rights to be dedicated is transferred to the District by appropriate deed.

.12 - CUSTOMER: Any person, company, corporation or governmental authority or agency: (1) authorized to use water or connect to the District Sewer System under a permit issued by

the Board of Directors; (2) owning EQRs under the Free Tap Program; or (3) owning EQRs purchased pursuant to a Prepaid Tap Agreement.

.13 - DEDICATION: An appropriation of an interest in land or water to some public use, made by the owner, and accepted for such use by or on behalf of the public.

.14 - DEPOSIT: Cash, letters of credit, payment and/or performance bonds, or other security for performance, as required by these Rules and Regulations, or as approved by the Board in its sole discretion.

.15 - DEVELOPER: Any person who owns land and seeks to have the land served by the District, other than an individual Customer.

.16 - DISTRICT: The Roaring Fork Water and Sanitation District.

.17 - DISTRICT ENGINEER: Person or firm that has contracted to do engineering work for the District.

.18 - DUPLEXES: Residential structures composed of two Single-Family Residential Units.

.19 - EQUIVALENT RESIDENTIAL UNIT (EQR): A standard of measurement used by the District in calculating fees and water dedication requirements, based on the amount of water used and/or consumed and sewage produced by a Single Family Residential Unit.

.20 - EVAPO-TRANSPIRATIVE SEWER: Any sewer system that processes or disposes of liquid or solid wastes by evaporation from the earth's surface to the atmosphere or by transpiration through plants.

.21 - EXTENSIONS OF SERVICE: Any extension of the District's water utility for which a fee is assessed.

.22 - HISTORICAL USE AFFIDAVIT: A document that sets forth the following information concerning a water right or rights proposed for dedication to the District:

(A) The name(s) and address(es) of the owners of the water rights proposed for dedication;

(B) A legal description of the land to be annexed or provided with the District's water service;

(C) The total number of acres to be annexed or provided with the District's water service;

(D) The total numbers of acres presently being irrigated and/or intended to remain in irrigation;

(E) A copy of all decrees concerning all water rights appurtenant to the property and/or all water rights proposed for dedication;

(F) A copy of any legal decree or judgment which affects the title of those water rights entered since the owner received title to the water rights appurtenant to the property and/or proposed for dedication;

(G) A copy of the documents by which the owner receives title to the water rights appurtenant to the property and/or proposed for dedication;

(H) A copy of all diversion records for the water rights proposed for dedication; and

(I) The owner's statement as to the historical use of the water rights appurtenant to the property and/or proposed for dedication.

.23 - INCLUSIONS: The act of attaching, adding, joining, or uniting a parcel of land to the legal boundaries of the District.

.24 - INTERCEPTOR or TRUNK LINE: A sewer line larger than eight inches (8") in size.

.25 - IRRIGATED GREEN SPACE: Any lawn, garden, landscaped area, or open space irrigated by water from the District potable water system.

.26 - KITCHEN: Any room used to cook, heat, or prepare food, as may be evidenced by the use or existence of the following items: sinks, refrigerators, places for food storage, stoves, ovens, microwave ovens, or hot plates. The Board reserves the right, in its discretion, to designate a given room as a kitchen; provided, however, that the existence of a stove, oven, or microwave oven within a room also containing a sink and refrigerator shall conclusively establish said room as a kitchen.

.27 - LICENSED PLUMBER or PIPE LAYER: The person who has been bonded and provided a license to work by the State of Colorado.

.28 - LINE CONNECTION AGREEMENT: An agreement between the District and a Customer which identifies the terms and conditions by which a Developer or Customer is permitted to connect to the District Water and/or Sewer System and receive water and/or sewer service therefrom.

.29 - LINE EXTENSION AGREEMENT: An agreement between the District and a Customer which identifies the terms and conditions by which the parties agree to extend the District Water and/or Sewer System lines and permit the Customer to connect to the District Water and/or Sewer System and receive water and/or sewer service therefrom.

.30 - LINE EXTENSION FEES: Fees charged by the District pursuant to Article 9 of these Rules and Regulations and determined by the Board of Directors, based on the size in acres of the property to be served by the new connection, the zoning of the property, the existing and potential uses of the property, the potential EQR demand from the property, and any other similar, relevant factors which the Board of Directors believes should be considered in arriving at an equitable reimbursement to the Developer.

.31 - MANAGER OR ADMINISTRATOR: The person, if any, retained by the Board to administer and supervise the affairs of the District and its employees.

.32 - MAY is permissive.

.33 - PERMIT: Written permission of the Board of Directors to connect to a public sewer and/or water main of the District pursuant to the Rules and Regulations of the District.

.34 - PERSON: Shall mean any individual, firm, company, society, corporation, association, partnership, group, or Developer.

.35 - PLAT: A map or chart, prepared by a surveyor licensed by the State of Colorado, of a piece of land subdivided into lots with streets, alleys, roads, easements, and other such avenues of transportation delineated thereon and drawn to a scale.

.36 - PREPAID TAP AGREEMENTS: Either Tap Purchase Agreements or System Development Fee Purchase Agreements, whereby certain Customers of the District have agreed to purchase a specified number of EQRs of service from the District over specified periods of time at specified prices.

.37 - PRE-TREATMENT FACILITIES: Structures, devices, or equipment approved by the District and installed for the purpose of removing harmful or prohibited substances from wastes discharged into a District sewer main.

.38 - RAW WATER: Water that has not been treated and is not fit for human consumption and that is primarily intended for irrigation uses.

.39 - REPLAT: To make a change in an original plat.

.40- SAMPLING: The collection of sewage and/or water samples for analysis.

.41 - SECONDARY RESIDENTIAL UNITS: Guest houses, separate apartments attached to Single Family Residential Units, and other separate residential units associated with Single Family Residential Units and containing their own separate kitchens.

.42 - SEWAGE: Any liquid waste which may contain organic or inorganic material in suspension or solution originating from within residential, commercial, or industrial buildings, which is discharged into the District Sewer System.

.43 - SEWAGE TREATMENT WORKS: Those devices, facilities or locations to which the District sewage is conveyed by sewer mains for the purpose of reducing the pollution content and from which point the sewage effluent leaves the District's sewer facilities.

.44 - SEWER MAIN: A sewer line owned by the District and installed in a public street or special easement.

.45 - SEWER SERVICE LINE: The pipe or line connecting the Customer's structure to the District's Sewer System and which is owned by the Customer from the Customer's structure to the Sewer Main.

.46 - SEWER SYSTEM: All facilities owned by the District and used for collecting, pumping, treating, and disposing of sewage.

.47 - SHALL is mandatory.

.48 - SINGLE FAMILY RESIDENTIAL UNIT: All single-family homes, individually-billed mobile homes, mobile homes on single lots, and mobile homes established as permanent residences which have no more than one (1) kitchen.

.49 - SUBDIVIDE: To separate a tract of land into two or more lots, tracts, parcels, sites, separate interests in common, condominium interests or other divisions for the purpose, whether immediate or future, of transfer of ownership, building, or other development, or for street use by reference to such subdivision or recorded plat thereof.

.50 - SUFFICIENT LEGAL PRIORITY: Indicates that water rights proposed for dedication may reasonably be expected to provide a dependable water supply throughout the season of use in the amount for which they are decreed. In making this determination, factors to be considered shall include, but not be limited to, the adjudication date and appropriation date of the water rights, the decreed use or uses, the historic use of the water under the decree, the physical flow available, and the administration practices of the State Engineer.

.51 - TAP: The connection of a service line to a pre-approved stubout or a water and/or sewer main.

.52 - TAP FEE: The fee charged by the District for connecting to the District's lines, used to amortize the District's capital investment.

.53- TESTING: The analysis of samples of waste water and/or water.

.54 - TRANSFER OF WATER RIGHTS: The conveyance of legal title to water rights to the District, as well as all actions required under the laws of the State of Colorado to be brought in the Water Court to ensure that a dedication requirement is fulfilled. Such action may include, but is not limited to, a change in the type, place, or time of use, a change in the point of diversion, a change from a fixed point of diversion to alternate or supplemental points of diversion, a change from alternate or supplemental points of diversion to a fixed point of diversion, a change in the means of diversion, a change in the place of storage, a change from direct application to storage and subsequent application, a change from storage and subsequent application to direct application, a change from a fixed place of storage to alternate places of storage, or any combination such changes. The term includes transfer of conditional as well as absolute water rights.

.55 - USER: Any person to whom water and/or sewer service is served, whether renter, record owner, corporation, company, individual, etc.

.56 - VIOLATION: Any failure to follow, uphold, or comply with the requirements of these Rules and Regulations, intentionally or unintentionally, by act of commission or omission, whether or not the violator knew of the existence of the Rule or Regulation. Unless otherwise stated, each day that a Violation continues shall be considered a separate Violation, subject to the penalties which apply.

.57 - WATER MAIN: A water line owned by the District and installed in a public street or special easement, including all structures to and including the curb stop valve.

.58 - WATER RIGHT: A decreed right to use in accordance with its priority a certain portion of the waters of the State of Colorado by reason of appropriation.

.59 - WATER METER: A device owned by the Customer which measures the volume and flow of water from the District's Water System to the Customer's Structure and as more fully described in Article 4 of these Rules and Regulations.

.60 - WATER SERVICE LINE: The pipe or line connecting the Customer's structure to the District's Water System and owned by the Customer.

.61 - WATER SYSTEM: All facilities owned by the District and used for collecting, pumping, treating, and disposing of water.

.62 - WATER WORKS: All facilities owned by the District for transporting, distributing, storing, pumping, treating or measuring water.

.63 - XERISCAPING: A type of landscaping which emphasizes the conservation of water and the use of drought resistant native plants.

End Article 2

ARTICLE 3

3.00 - Ownership and Operation of Facilities

.01 - POLICY: The District is a Colorado Special District, formed and functioning under the authority of C.R.S. §§ 32-1-101 et. seq. The District was created for the distribution of water for domestic and other uses, for the collection and treatment of sewage from District Customers, and for the maintenance, repair and replacement of all mains, hydrants, valves, and necessary service facilities.

The District shall endeavor to plan for, capitalize and build adequate capital improvements as demand occurs, and shall operate and maintain the Districts' facilities in a sound and economical manner.

It is the District's basic policy that all water and sewer mains and trunk or interceptor lines shall be public sewers and that service lines and taps shall be installed, owned and maintained by the Customer; provided, however, the District shall reserve and always have a right of access to such service lines, curb stops and other facilities as necessary to carry out its functions. The installation and maintenance and repair of the service line is the responsibility of the Customer.

.02 - LIABILITY: No claim for damage shall be made against the District by reason of any of the following: breaking of any service or supply line, pipe, cock, or meter by any employee, contractor or subcontractor of the District; the unauthorized acts of any employee, contractor or subcontractor of the District; failure or interruption of water or sewer service or supply; shutting off or turning on water in the water mains; the making of connections or extensions; damage caused by water running or escaping from open or defective faucets; broken or frozen service pipes or other facilities not owned by the District; damage from an inoperative or failed fire hydrant; damage from fire protection systems including sprinklers installed in the Customer's structure(s) or damage to water heaters, boilers, or other appliances resulting from shutting water off, or from turning it on, or from inadequate, high, or fluctuating pressures; or for doing anything to the Water System of the District deemed necessary by the Board of Directors or its agents. Further, the District shall not be liable or responsible for the consequences of its failure or refusal to accept additional or new service which would exceed the capacity of the District's facilities. The District hereby reserves the right to cut off the water supply or disconnect the sewer service at any time, for any reason deemed appropriate including, but not limited to, any violation of these Rules and Regulations or Board policies as set forth in the District minutes. This paragraph shall not relieve the District from liability for negligence of its employees, contractors or subcontractors, if such liability would otherwise have existed.

No claim for damage shall be made against the District by reason of the following:

(A) Blockage in the system causing the backup of waste water;

(B) Damage caused by "smoking" of lines to determine drainage connections to District lines;

(C) Breakage of water and/or sewer mains or service lines by District personnel or third parties; or

(D) Interruption of water and/or sewer service and the conditions resulting therefrom where said interruption of service is brought about by request of

claimant, interruption of electrical service or by circumstances beyond the District's control.

.03 - OWNERSHIP: Upon acceptance, all existing and future water and/or sewer mains, connected with and forming an integral part of the District Water and Sewer Systems, shall become the property and responsibility of the District. Said ownership will remain valid whether the water and/or sewer mains are constructed, financed, paid for, or otherwise acquired by the District, or by other persons.

That portion of all existing and future water service lines extending from the water main to and including the curb stop valve which shall be located as prescribed in Appendix B shall be the property of the District. That portion of the service line from the building to the curb stop valve shall be the property of the Customer. The Customer's obligation to bear the expense of installing and maintaining said water service line shall remain valid whether the service lines are constructed, financed, paid for, or otherwise acquired by the District or any other person.

That portion of all existing and future sewer service lines extending from the main to each unit or building connected with and forming an integral part of the District Sewer System shall be and become the property of the Customer. The Customer's ownership of and responsibility to bear the expense of installing and maintaining said sewer service line shall exist whether the service lines are constructed, financed, paid for, or otherwise acquired by the District or by another person.

Any provision herein to the contrary notwithstanding, the District reserves and shall at all times have a right of access to all service lines and other facilities necessary for the District to carry out its lawful functions.

.04 - POWERS AND AUTHORITY OF AGENTS: The Manager/Administrator and other duly authorized representatives, agents or employees of the District, bearing proper credentials and identification, shall be permitted to enter upon all properties receiving water and/or sewer service from the District for the purpose of inspection, observations, measurement, sampling, and testing, or any other reasonable purpose in accordance with the provisions of these Rules and Regulations. The right of entry shall include the right by authorized District employees or agents to verify fixtures, bedrooms, irrigated areas, and install, read, or otherwise gather data from water meter(s) on a Customer's property in order to assist the District in analyzing individual sewage production by the Customer. In addition, upon request, a Customer shall provide the District with any applicable water meter records which document the Customer's water usage, and shall consent to the District obtaining the Customer's water meter records from applicable entities possessing such records.

Such entry upon the property of Customers shall only be made after reasonable notice and during reasonable business hours. Subject to the above provisions, all owners and tenants of property connected to District Water and/or Sewer Systems shall be deemed to have agreed to entry onto such property for the purposes set forth.

End Article 3

ARTICLE 4

4.00 - Use of District Water System

No person shall uncover, make any connection with or opening into, use, alter, or disturb any public water main or appurtenances without first obtaining a Tap Permit from the District. All installations for water service from the District shall be made in accordance with these Rules and Regulations, the specifications and procedures set forth in Appendix B, and all federal, state, county and local requirements. Every permanent connection to the District Water System must be inspected by a representative of the District before it is covered. The District shall receive at least forty-eight (48) hours' notice of such inspections and shall charge the fees set forth in Section 7.12 for such inspections. If a connection to the District Water System is covered before inspection, it must be excavated for inspection at the Customer's expense. The District will mail to the owner of the property on which the uninspected connection is located a written request that such connection be excavated for inspection. If the connection is not excavated for inspection within ten (10) days from the date the request is mailed, the District shall excavate and inspect the new connection at the owner's expense.

.01- RESPONSIBILITIES OF THE CUSTOMER: Each Customer shall be responsible for maintaining that portion of the water service line extending from the curb valve to each unit or building. Each Customer shall also be responsible for ensuring that curb boxes remain accessible for inspection by the District or its Authorized Representative or agent. Leaks or breaks in such service line must be repaired by the Customer within seventy-two (72) hours after notification of such condition by the District. If satisfactory progress toward repairing the said leak has not been accomplished within such time period, the District's authorized representative may shut off the water service until the leaks or breaks have been repaired. The authority of the District or other appropriate water service provider to shut off a Customer's water service for such purposes shall be deemed consented to by the Customer at the time water and/or wastewater treatment service is provided by the District. Any provision herein to the contrary notwithstanding, the District may, but is not required to, take immediate steps to repair any service line, leak or break which the District determines, in its sole discretion, to constitute an emergency. In such event the District shall recover the cost of such repair from the Customer owning such service line. If the Customer fails to pay any costs for which the Customer is responsible within thirty (30) days of the District mailing notice thereof to the Customer, the District may take such action as is necessary to collect such costs, including the imposition and foreclosure of a lien on the Customer's property, and the District shall be entitled to recover all costs of such collection, including reasonable attorneys' fees, late charges and interest.

All persons having boilers and/or other appliances on their premises depending on pressure or water or on a continual supply of water shall provide, at their own expense, suitable safety devices to protect themselves and their property against a stoppage of water supply or loss of pressure.

.02 - PROTECTION FROM DAMAGE; VIOLATIONS OF RULES AND REGULATIONS: No person shall break, damage, destroy, uncover, deface or tamper with any portion of the District Water System. Any person who shall violate the provisions of this section may be charged pursuant to applicable state statute or local regulation, and upon conviction thereof shall be fined in an amount as established by the court for each violation. In addition to other penalties expressly provided in these Rules and Regulations, any person violating this section of the Rules and Regulations shall also be subject to a fine of five hundred dollars ($500.00) per occurrence.

Any person violating any of the provisions of these Rules and Regulations shall, in addition to any and all other remedies and penalties provided for herein or at law or equity, become liable to the Board for any expense, loss or damage occasioned by reason of such violation, including attorneys' and engineering fees and costs.

.03 - WATER METERS: A primary water meter as described herein shall be required for each dwelling unit receiving water from the District:

(A) Primary Water Meters: Prior to the receipt of water service from the District, the Customer must install, at his or her expense, a primary volumetric water flow meter. The meter and installation shall meet the specifications and procedures set forth in Appendix B. Each Customer shall be responsible for the repair and maintenance of his or her meter and any defective or inoperable meter shall be repaired within fourteen (14) days following discovery of the need of such repair. If a meter cannot be read for any reason, the Customer will be charged the greater of either a flat rate of one hundred dollars ($100.00) per month per EQR; or a standard rate based upon average monthly water use as determined by the District at its sole discretion for any month in which a meter is found defective or inoperable. The Customer can return to a meter rate once the meter is fixed and inspected and approved by the District. The District shall, in its sole discretion, elect which billing method to use. In the event a defective meter is not repaired or replaced by a Customer within the 14 day period as provided, the District may invoke the procedure set forth in Section 7.16 hereof to suspend or revoke service pending repair or replacement of the defective meter.

(B) Inspection: All new water meters must be installed per specifications and inspected by an Authorized Representative of the District. The Customer must notify the District within fourteen (14) days of being issued a Certificate of Occupancy to schedule an inspection of the meter. Until such time as the meter is inspected, the Customer will be charged the greater of either a flat rate of one hundred dollars ($100.00) per month per EQR from the date the Certificate of Occupancy is issued; or a standard rate based upon average monthly water use of customers with similar EQRs as determined by the District. The District shall, in its sole discretion, elect which billing method to use. In the event an inspection is not scheduled within 14 days, the District may invoke the procedure set forth in Section 7.16 hereof to suspend or revoke service pending inspection of the new meter.

(C) Sub-Meters: Subject to the sub-meter requirement contained in subsection (F), below, Customers may install sub-meters for their own use. A sub-meter is any meter whose flow reading constitutes a portion of the flow reading of a primary water meter. Customers may install sub-meters for any lawful purpose at their own expense. Customers are fully responsible for any damage to the Water System or water leakage resulting from the installation of a sub-meter. No sub-meter shall be installed on the supply side of the primary water meter. The supply side shall mean in this context any point on the service line or the District line closer to the source of District water than the primary water meter. Customers desiring to install additional water meters on the supply side of their primary water meter to service a property or portion of a property to

which a meter reading already applies, or would apply, must apply for additional water taps, creating additional primary meters. Regardless, of the number of sub-meters or their respective readings, Customer water on the Water System as part of the installation of a sub-meter shall comply with the District Rules and Regulations, including without limitation Appendix B, except that, subject to the requirements of subsection (F), remote readout shall not be required on sub-meters.

(D) Notification: In the event a Customer elects to install a sub-meter, the District shall be so informed in writing prior to the installation and the location of any proposed readout of the sub-meter shall be reviewed and approved by the District to avoid confusion with the primary meter. All sub-meters shall be clearly labeled as sub-meters.

(E) Readings: The District shall be under no obligation to read or record sub-meter readings, but the District may in its own discretion do so. Normally sub-meters shall not be read by the District.

(F) Car Washes: All car washes that are part of a larger service station or structure, or otherwise are not equipped with a separate, primary water flow meter, shall have installed a sub-meter, by which water flow to the car wash can be separately metered. A remote readout shall be installed with all car wash sub-meters. The installation of car wash sub-meters shall comply with the District Rules and Regulations, including, without limitation, the requirements of Appendix B. The Customer shall be responsible for the repair and maintenance of his or her car wash sub-meter and any defective or inoperable sub-meter shall be repaired or replaced within thirty (30) days following discovery or notice from the District of the need of such repair. In the event a defective car wash sub-meter is not repaired or replaced by a Customer within the 30-day period, as provided, such repair or replacement may be completed by the District and the cost thereof charged to the Customer.

All car washes included within the District after the effective date of these Rules and Regulations which are not in compliance with the requirements of this subsection (F), shall have until the first of the following events occurs: (1) the car wash is sold; or (2) the expiration of five years from the date of inclusion to comply with the requirements of this subsection (F) for separate water metering.

.04 - BACKFLOW PREVENTION DEVICES: All water service installations, shall include backflow/cross connection prevention devices. Such devices shall be installed in accordance with Chapter X of the District Specifications and Procedures set forth in Appendix B and in accordance with the most recently adopted building code of the applicable governing jurisdiction. The Customer shall notify the District within 14 days of being issued a Certificate of Occupancy to schedule an inspection of the device. As of January 7, 2004, new water service installations will be inspected by an Authorized Representative for compliance with the District's requirements for backflow prevention and shall be tested annually by a certified backflow technician contained on the District's list of certified technicians and shall be available upon request. All water service installations installed prior to February 20, 2007 without a backflow/cross connection prevention device, are required to install said device in accordance with this section within ninety (90) days of being provided written notice

from the District, which device shall be inspected by the District. In the event an inspection is not scheduled within 14 days, the District may invoke the procedure set forth in Section 7.16 hereof to suspend or revoke service pending inspection of the backflow/cross connection prevention device.

.05 - PRESSURE REDUCING VALVES: All Customers, if required by applicable law, code or regulation, shall install a pressure reducing valve at the water meter location in accordance with Appendix B and any applicable code or regulation. All Customers shall determine County Building Code requirements for such valves. The Board of Directors of the District may, at its discretion, waive the requirements under this section.

.06 - RAIN SENSORS: Effective January 2005, all new Customers who use the District's potable water for outdoor irrigation uses are required to install a Hunter Wireless Rain-Clik Rain Sensor, or other similar sensor as may be determined by the District, which will interrupt the cycle of an automatic irrigation system controller when a specific amount of rainfall has occurred. Such sensor shall be available for inspection by an Authorized Representative of the District.

.07 - IRRIGATION OF COMMON AREAS, OPEN SPACE, PARKS, VACANT LAND: Connections to the District potable Water System for the purposes of irrigating parks, open spaces, vacant land surrounding any structure connected to District lines, and common areas in subdivisions containing Single Family Residential Units or Duplexes, shall be subject to all Rules and Regulations of the District. Those Rules and Regulations include the requirements of applications for service, water rights dedications, and metering; penalties for unauthorized connections; and charges for Tap Fees, Line Extension Fees, inspection fees, and service charges. Tap Fees for such connections shall be calculated in accordance with Section (D)(1) of the EQR schedule at Appendix A. Service charges shall be calculated pursuant to Section 7.06 of these Rules and Regulations.

.08 - USE OF WATER FROM DISTRICT HYDRANTS – FIRE FIGHTING AND TESTING: Water from District hydrants may be used for fire fighting or testing, on the following conditions:

(A) For purposes of testing of a District hydrant, the user must give prior notice to the District of the time, place, approximate amount of water to be used, and method to be used for measuring the water. The user shall measure the water used with a hydrant meter. A hydrant valve and meter, provided by the District, must be used so that the main hydrant valve is not repeatedly opened and closed.

(B) When water from the District hydrants is used by the Carbondale and Rural Fire Protection District, any other fire protection entity, or any person for fire fighting purposes, the person or fire protection entity shall provide the District with an estimate of the total gallons of water used and the name and address of the property owner for whose benefit the water was used. The property owner may be required to reimburse the District for the cost of all water used for fire fighting purposes.

.09 - USE OF WATER FROM DISTRICT HYDRANTS – OTHER USES: Water from District hydrants may be used for other uses including construction uses and dust suppression, upon the following conditions:

(A) Water for construction or other purposes may be taken only from one or

more fire hydrants designated by the District especially for such purposes, and only upon the terms and conditions specified by the District in connection with the designation of the hydrant(s). Any person wishing to take water from a fire hydrant must first contact to the District to determine which hydrant may be used for the intended purpose and set up an account with the District for such purposes. Any person who uses water from District hydrants without authorization, or who fails to comply with the rules set out in this section, shall be subject to the remedies of the District set out in Section 7.15 of these Rules and Regulations, including a fine of five hundred dollars ($500.00) per unauthorized use.

(B) The user must give prior notice to the District of the time, place, approximate amount of water to be used, and method to be used for measuring the water. The user shall measure the water used with a hydrant meter. A hydrant valve and meter, provided by the District, must be used so that the main hydrant valve is not repeatedly opened and closed.

(C) Within five days after completion of the use of water from District hydrants, the user or Customer shall submit a complete accounting of the use, along with full payment, to the District either by filling out a form located at the hydrant or contacting the District Office. The price for water used from District hydrants shall be calculated pursuant to Section 7.06 of these Rules and Regulations.

.10 - WATER USE RESTRICTIONS:

(A) The District shall have the authority to impose voluntary and/or mandatory water use restrictions. Notice of the implementation of any such water restrictions, and the terms thereof, shall be given to District Customers, by published notice in a newspaper of general circulation within the District or by first class mail, postage prepaid. Upon implementation of any water use restrictions, all commercial and residential Customers of the District shall comply with the adopted watering schedule for lawn and water irrigation from the District's system. Customers with newly installed landscaping may be exempted from the watering schedule upon the application for and approval of a special permit by the District, for a fee of fifteen dollars ($15.00). The District Administrator is authorized to review and approve special permit applications. Special permits for newly sodded lawns, new trees and gardens will not exceed fourteen (14) consecutive days. Special permits for newly seeded lawns will not exceed twenty-five (25) consecutive days. Special permit holders are subject to the watering hour restrictions set forth herein.

(B) Penalties. Any violation of any adopted water use restriction (watering on the wrong day or time) subjects the offender to the following penalties:

(i)	First Violation:	Written warning.
(ii)	Second Violation:	$ 25 fine.
(iii)	Third Violation:	$ 50 fine.
(iv)	Fourth Violation:	$100 fine.
(v)	Fifth Violation:	$500 fine.

Successive violations are determined per irrigation season, and not from year to year. Upon discovery of a violation, the District shall provide the Customer with written notice of the violation and assessment of a penalty, if applicable, by certified mail, except notice of a first violation will be sent by regular mail. After a notice of a violation has been given, each day of continued violation is a separate offense. Penalties may be imposed by any of the District's employees or consultants, and payment of penalties is due within thirty (30) days of the date of mailing the notice thereof by the District, unless a written appeal is filed with the Board of Directors within said thirty days. The decision of the Board of Directors on appeals shall be final. Until paid, all penalties imposed hereunder constitute a perpetual lien against the subject property pursuant to Section 7.13 of the District's Rules and Regulations and C.R.S. § 32-1-1001(j), which lien may be foreclosed in the manner provided by law for foreclosure of mechanics liens.

(C) Emergency Curtailment: In the event of an emergency, the Board shall have the authority to restrict any or all of the following (in any order deemed appropriate by the Board):

(i) Any and all outside water use;
(ii) Car washes;
(iii) High volume water users;
(iv) All commercial water use;
(v) All residential water use, according to schedule set forth in A and B above;

In the event an emergency is declared and the provisions are implemented, the enalties and procedures set forth in subsection B apply; provided, however, the penalties will be doubled.

End Article 4

ARTICLE 5

5.00 - Use of District Sewer System

No unauthorized person or entity shall uncover, make any connection with or opening into, use, discharge into, alter, or disturb any sewer main or appurtenance without first obtaining a written permit from the District. All installations for sewer service from the District shall be made in accordance with these Rules and Regulations, the specifications and procedures set forth in Appendix B, and all federal, state, county and local requirements. All work upon or in connection with any portion of the District Sewage System or any service lines or facilities which connect to thereto shall be by a contractor of Public Health and Environment and these Rules and Regulations. Every permanent connection to the District Sewer System must be inspected by a representative of the District before it is covered. The District shall charge the fees set forth in Section 7.12 for such inspections, which shall be performed upon receipt of at least forty-eight (48) hours' notice to the District. If a permanent connection to the District Sewer System is covered before inspection, it must be excavated for inspection at the Customer's expense. The District will mail to the owner of the property on which the uninspected connection is located a written request that the connection be excavated for inspection. If the connection is not excavated for inspection within ten (10) days after such request is sent, the District will excavate and inspect the connection at the owner's expense.

.01 - RESPONSIBILITIES OF THE CUSTOMER: Each Customer shall be responsible for maintaining the entire length of the service line serving his or her property and ensuring that sewer cleanouts remain accessible for inspection by the District's Authorized Representative. Leaks, stoppage, or breaks in such service line must be repaired by the Customer within seventy-two (72) hours after notification of such condition by the District. If satisfactory progress toward repairing said leak, stoppage, or break has not been completed within such time period, the District's authorized representative may shut off the Customer's water service until the sewer leaks, stoppage, or breaks have been repaired. The authority of the District or other appropriate water service provider to shut off a Customer's water service for such purposes shall be deemed consented to by the Customer at the time water and/or wastewater treatment service is provided by the District. Any provision herein to the contrary notwithstanding, the District may, but is not required to, take immediate steps to repair any service line leak, stoppage or break which the District, may, but is not required to, take immediate steps to repair any service line leak, stoppage or break which the District, in its sole discretion, considers to constitute a health hazard or emergency. In such event, the District shall recover the cost of such repair from the Customer owning such service line. If the Customer fails to pay any costs for which the Customer is responsible within thirty (30) days of the District mailing notice thereof to the Customer, the District may take such action as is necessary to collect such costs, including the imposition and foreclosure of a lien on the Customer's property, and the District shall be entitled to recover all costs of such collection, including reasonable attorneys' fees and costs.

.02 - DISCHARGE RESTRICTIONS - GENERAL: Except as hereinafter provided, no person shall discharge, or cause to be discharged, to any sewer main, any waste prohibited by these Rules and Regulations, or any harmful waters or wastes, whether liquid, solid, or gas, capable of causing obstruction to the flow in sewer lines, damage or hazard to structures, equipment or personnel of the sewage works; inhibiting the biological activity in the waste water treatment facilities; otherwise interfering with the proper operation of the sewage works; constituting a hazard through exposure to the District sewer effluent; or causing the District to be in violation of federal, state or local laws.

.03 - DISCHARGE RESTRICTIONS - PROHIBITED WASTES: Any person or entity found to be discharging the wastes prohibited by this section shall be fined five hundred dollars

($500.00) for each day such prohibited discharge continues and for each subsection violated, along with all other remedies available at law or equity, including damages, attorneys' fees and costs. No person or entity shall discharge or cause to be discharged into the District Sewer System the following wastes:

(A) Water from storm drains, roof drains, window well drains, drainage collection systems, foundation drains, sumps, surface runoff, sub-surface drainage, or cooling processes.

(B) Any oil, grease, or other similar petroleum product which is not water soluble. Such prohibited wastes shall include diluted wastes of such nature, including but not limited to, water or wastes containing grease, oil, hydrocarbons, fatty acids, soaps, fats, or waxes which exceed 50 mg/1 as determined by solvent (Freon) extraction.

(C) Explosive materials, including but not limited to, gasoline, kerosene, naphtha, benzene, toluene, xylene, ethers, alcohols, ketones, aldehydes, peroxides, chlorates, perchlorates, bromates, carbides, hydrides and sulfides. Such limitation shall additionally include any waste capable of raising the Lower Explosive Limit (L.E.L.) of the ambient atmosphere in any sewer to five percent (5%) for any two (2) successive readings or to ten percent (10%) for any single reading on an explosion hazard meter.

(D) Any solid or viscous substance in quantities or sizes capable of causing obstruction to the flow in the sewer lines or other interference with the proper operation or the District Sewer System, such as, but not limited to, ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastic, wood, unground garbage, whole blood, cattle manure, hair and fleshings, entrails, grit, brick, cement, onyx, carbide, and shredded or whole paper products other than tissue, toilet paper, and other products intended for toilet disposal.

(E) Any waste having a temperature higher than one hundred fifty (150°) degrees Fahrenheit (66°C).

(F) Any waste having a Ph value lower than 5.5 or greater than 9.0.

(G) Any toxic substance, or substance requiring pretreatment, as those terms are defined in 40 Code of Federal Regulations § 403, as amended from time to time, unless otherwise covered under this section.

(H) Any radioactive wastes or isotopes.

(I) Any noxious or malodorous substance capable of creating a public nuisance.

(J) Any wastes having a color concentration in excess of thirty (30) color units, based on the Platinum Cobalt Scale.

(K) Any wastes having a flash point lower than one hundred eighty-seven degrees

Fahrenheit (187°F) (86°C) as determined by the Tagliabue (Tag.) closed-cup method.

(L) Any waste having a five (5) day Biochemical Oxygen Demand which may contain more than 1,000 parts per million by weight as averaged during any twelve (12) hour period.

(M) Any wastes containing phenolic compounds over 5 mg/1 expressed as phenol.

(N) Any cyanides or compounds capable of liberating hydrogen cyanide in excess of 1 mg/l expressed as hydrogen cyanide from any individual outlet.

(O) Any wastes containing sulfides over 3 mg/l expressed as hydrogen sulfide.

(P) Any wastes containing toxic or poisonous substances having a twenty-four (24) hour proportionate composite sample concentration, at point of discharge, in excess of the following:

1.	Total Chromium	as	Cr	7.5 mg/l
2.	Copper	as	Cu	4.5 mg/l
3.	Nickel	as	Ni	15.0 mg/l
4.	Cadmium	as	Cd	1.2 mg/l
5.	Zinc	as	Zn	12.0 mg/l
6.	Iron	as	Fe	15.0 mg/l
7.	Lead	as	Pb	15.0 mg/l
8.	Arsenic	as	As	0.25 mg/l
9.	Manganese	as	Mn	0.25 mg/l
10.	Selenium	as	Se	0.05 mg/l
11.	Silver	as	Ag	0.25 mg/l
12.	Mercury	as	Hg	0.10 mg/l

(Q) Any waste that would cause a violation of the District's Discharge Permit.

(R) Floor drains and garage drains shall not be discharged into sanitary sewers.

.04 - DISCHARGES WHERE SPECIAL AUTHORIZATION IS REQUIRED: The District Tap Permit allows discharge into the District Sewer System, through a specified sewer tap, of sewage not otherwise restricted or prohibited by these Rules and Regulations. Discharges of swimming pool water or hot tub water, must be specifically authorized by the District Administrator, Tap Permit or other written permit. The Tap Permit for swimming pools or hot tubs shall specify the hours when such pools may be drained into the District Sewer System, and may include limits on the amount of chlorine (expressed as mg/1) in such discharge.

.05 - DISCHARGE RESTRICTIONS - SPECIAL REVIEW: On written application from a Customer, the Board of Directors may, at its discretion, specially review a request to discharge into the District Sewer System any waste otherwise prohibited under this Article. Said written application shall include an analysis of the types, amounts, concentrations, and times of discharge of each prohibited waste, and an analysis of the impact of such discharge on the District Sewer System, including the District's sewer effluent. After consultation with the District Engineer, the Board may

allow discharge of the prohibited waste, provided such discharge does not violate, or cause the District to violate, federal, state, county or local laws.

If approved, the Board may prescribe the times, places, concentrations, total amounts, fees and charges, and any other conditions under which such prohibited waste may be discharged. When necessary in the opinion of the Board, the Customer shall provide, at his or her expense, such pretreatment facilities as may be necessary to treat such prohibited waste prior to discharge to the sewer main. Plans, specifications, and any other pertinent information relating to proposed pretreatment facilities shall be submitted for the approval of the District and of the State Board of Health, and no construction of such facilities shall be commenced until such approval is obtained in writing. Where pretreatment facilities are provided for any prohibited waste, they shall be maintained in continuously efficient operation by the Customer, at his or her own expense.

When required by the District, the Customer served by a service line carrying prohibited wastes shall install and maintain, at his or her expense, a suitable control access hole in the service line to facilitate observation, sampling and measurement of the wastes. The access hole shall be installed by the Customer and maintained at the Customer's expense. In the event that no special access hole has been required, the control access hole shall be considered to be the nearest down-stream access hole in the sewer main to the point at which the service line is connected.

Grease, oil and sand interceptors of a design set forth in Appendix B or the Uniform Building Code as adopted by the relevant local jurisdiction shall be provided when, in the opinion of the Board, or its designated representative, they are necessary for the proper handling of prohibited waste or liquid wastes containing grease in excessive amount, or any flammable wastes, sand and other harmful ingredients. However, such interceptors shall not be required for dwelling units, unless such waste is generated by said units. Where installed, they shall be maintained by the Customer, at his or her expense, in continuously efficient operation at all times.

All measurements, tests, and analysis of the characteristics of waters and wastes shall be determined in accordance with "Standard Methods for the Examination of Water and Waste Water," latest edition, and shall be determined at the control access hole, or upon suitable samples taken at said control access hole. Test results shall be available to the Customer at the District office.

.06 - DISCHARGE RESTRICTIONS - PORTABLE TOILET WASTES: No person or entity shall discharge portable toilet wastes, discharges from recreational vehicles, pumped septic wastes or other septage into the District Sewer System.

.07 - GREASE TRAPS, OIL SEPARATORS REQUIRED: Certain dischargers shall be required to install grease traps or oil separators as part of their connection to the District Sewer System, as detailed in the specifications and procedures set forth in Chapter XI of Appendix B.

.08 - PROTECTION FROM DAMAGE; VIOLATIONS OF RULES AND REGULATIONS: No person shall break, damage, destroy, uncover, deface or tamper with any portion of the District Sewer System. Any person who shall violate the provisions of this section may be charged pursuant to applicable state statute or local regulation, and upon conviction thereof, shall be fined in an amount as established by the court for each violation. Any person violating this section of the Rules and Regulations shall also be subject to a fine of five hundred dollars ($500.00) per occurrence, in addition to other penalties expressly provided in these Rules and Regulations.

Any person violating this section of the Rules and Regulations shall, in addition to any and all

other remedies and penalties provided for herein or at law or equity, become liable to the Board for any expense, loss or damage occasioned by reasons of such violation, including attorneys' and engineering fees and costs.

End Article 5

ARTICLE 6

6.00 - Application for Service

.01 - INCLUSION: Except as hereafter provided, or in accordance with an Out-of-District Sewer Service Agreement included within the District Service Plan, and subject to these Rules and Regulations, service shall be provided only to persons whose property is included within the District. It shall be incumbent upon the applicant to furnish satisfactory evidence of inclusion whenever such evidence is requested by the District. Evidence shall consist of a tax receipt, or certificate in lieu thereof, received from and signed by the County Treasurer. The District shall determine in its discretion whether satisfactory evidence of inclusion has been presented.

An applicant owning land both within and outside the boundaries of the District who desires service must include into the District all of his or her land contiguous to the parcel upon which service is desired, unless the District determines, in its discretion, otherwise.

The District's standard form of inclusion petition will be furnished to the applicant upon request. The applicant shall be required to execute a Special Fee and Cost Reimbursement Agreement (in the form set forth in Appendix C) prior to the District's review of the petition. Inclusion of property shall be accomplished in accordance with the provisions of C.R.S. §§ 32-1-401, et seq., and all costs in connection therewith, including legal and engineering fees, publication and recording costs and all other actual costs incurred by the District, shall be borne by the applicant.

Any applicant for inclusion into the District may be required to enter into a pre-inclusion agreement with the District pursuant to C.R.S. § 32-1-402(1)(c) as a condition of the District's approval of the inclusion petition. Said pre-inclusion agreement shall set forth the respective rights and obligations of the applicant and the District with respect to fees, charges, the construction of water and/or sewer mains, and other terms and conditions under which the applicant's property may be included in the District. Any inclusion petition and/or pre-inclusion agreement provided to the applicant by the District shall be signed and returned to the District by the applicant within forty-five (45) days following receipt by the applicant. If the pre-inclusion agreement is not executed and returned to the District by the applicant within forty-five (45) days from receipt thereof, the District's prior approval of the agreement shall be null and void and of no further force and effect, and a new request for approval of the inclusion petition and/or pre-inclusion agreement shall be required; provided, however, that the District may extend said 45-day execution deadline prior to its expiration for an additional thirty (30) days upon good cause shown by the applicant.

.02 - SERVICE OUTSIDE THE DISTRICT: The District may, in its sole discretion, furnish service to properties located outside the District Boundaries, but, under no circumstances shall the District construct any water and/or sewer mains, at its own expense, to service such properties. No service shall ever be provided to properties located outside the District Boundaries, except upon the express written consent of the District. The District shall not be required to extend service outside of the District's Boundaries.

Charges for furnishing service and taps outside the District Boundaries shall be at the minimum rate of one and a half (1.5) times the current service charges for in-District service as provided for in the Fee Schedule in Appendix A, as the same may be amended from time to time, or as agreed upon by the District and Customer. These Rules and Regulations shall be applicable to all property owners outside the District who are furnished water and/or sewer service by the District. No

connection to the District Water and/or Sewer System shall be permitted until the property owner has agreed in writing to the District Rules and Regulations; provided, however, that the Board of Directors, in its discretion, may charge the higher fees provided for herein for properties not located within the District.

.03 - APPLICATION FOR WATER AND/OR SEWER SERVICE: Any owner of property who desires to have the privilege of water and/or sewer service from the District, whether such person intends to make use of EQRs purchased directly from the District or EQRs purchased under a Prepaid Tap Agreement shall submit an application for water and/or sewer service to the District along with any supporting documentation required thereby. The application shall be on the District's standard form and shall contain at a minimum the following:

(A) Name, address, and phone number of applicant;

(B) Name, address, and phone number of owner of the premises where said connection is to be made or drain or line is to be laid;

(C) The Customer's consent to entry and water use record availability pursuant to § 3.05 and consent to water shut off pursuant to §§ 5.01 and 6.01 of these Rules and Regulations;

(D) The Customer's consent to abide by and be bound by these Rules and Regulations, as amended from time to time;

(E) Information about the structure(s) to be served to calculate the EQR of sewer service requested, including a plumbing or mechanical plan showing all fixtures with a statement of the proposed use of those fixtures, if so requested by the District.

The application shall be accompanied by any Tap Fee required by these Rules and Regulations. Upon approval, the District shall issue a Tap Permit to the applicant. No tap onto the District Water and/or Sewer System shall be allowed until: the required Tap Fee has been paid; a Tap Permit has been issued; and any and all other applicable fees have been paid. Tap Fees shall be non-refundable, unless expressly agreed to otherwise by the Board. Approved tap permits may be issued after a processing period of five business days.

As noted above, EQRs may be purchased from the District under a Prepaid Tap Agreement (which agreement may take the form of a Tap Purchase Agreement or a System Development Fee Purchase Agreement). In the event the District determines that a Prepaid Tap Agreement shall be entered into by and between the District and a property owner, and following approval of such agreement by the District, said agreement shall be executed and returned to the District by the subject property owner within forty-five (45) days from receipt of the agreement. If said Prepaid Tap Agreement is not executed and returned to the District by the property owner within forty-five (45) days from receipt thereof, the District's prior approval of the agreement shall be null and void and of no further force and effect, and a new request for approval of the Prepaid Tap Agreement shall be required; provided, however, that the District may extend said 45-day execution deadline prior to its expiration for an additional thirty (30) day period upon good cause shown by the property owner.

.04 - DENIAL OF APPLICATION FOR SERVICE: The District reserves the right to deny service for any or all of the following reasons:

(A) The connection of the system to the applicant's existing plumbing would constitute a cross-connection to an unsafe water supply;

(B) There has been misrepresentation in the application as to the property and fixtures contained in the property, or the use to be made of the water supply;

(C) The service applied for would create an excessive demand or adverse impact on the District Water and/or Sewer System, unless the Customer proposes a means to eliminate such excessive demand or adverse impact to the satisfaction of the District;

(D) The Customer has violated these Rules and Regulations;

(E) The District does not have any remaining uncommitted capacity in its water and/or sewer system or any of its other water and/or sewer facilities to provide service to the Customer, as determined by the District.

.045 - WATER AND SEWER SERVICE REQUIRED: It is the policy of the District that all Customers connect to both the District's water and sewer services. The District reserves the right to deny service to any Customer that requests only water or sewer service. Water or sewer service shall only be provided separately if in accordance with an Out-of-District Sewer Service Agreement included within the District's Service Plan or under exceptional circumstances and upon the express written approval of the Board of Directors. Exceptional circumstances shall include but are not limited to the following:

(A) Financial hardship; and

(B) Pre-existing well or septic tank in good working condition and in full compliance with all local and state laws and regulations. Provided, however, that the District shall require that connection to the non-connected service (i.e. the pre-existing well and/or septic tank) occur by a date certain or upon failure of the well and/or septic tank, whichever occurs first.

Notwithstanding the foregoing, the District reserves its right under C.R.S. § 32-1-1006(1)(A)(I) to compel the owner of premises located within the District boundaries and within four hundred feet of a District Water or Sewer Line to connect to the District lines whenever necessary for the protection of public health.

.05 - CHANGE IN CUSTOMER SERVICE: A Customer shall file an amended Application for Water and/or Sewer Service with the District prior to making any increase in the size of a structure served by the District or in the type of service received. Examples of such changes are the construction of additions to houses or other buildings, changes in use of an existing structure, adding water using fixtures or appliances, or connecting or additional connections to the District's lines. The District shall collect any additional water rights dedications, tap fees and/or service charges due and owing retroactive to the date of any such change. Customers purchasing real property in the District are strongly encouraged to verify that the amount and type of service for which the District is currently charging is consistent with the type and amount of service which the seller purports to have paid for and wishes to convey. At any time the Board may review actual water and/or sewer usage to determine if such actual usage is greater than that implied by the number of EQR units assessed to the

user at the time his application for service was accepted. Winter water use records may be utilized for this purpose. If the Board finds greater actual water and/or sewer usage the user shall be assessed a greater number of EQR units to reflect his actual water and/or sewer usage and shall be charged an additional tap fee. In no event shall a refund, credit, or rebate of Tap Fees or Line Extension Fees previously paid be permitted in the event of a decrease in the type or amount of service.

.06 - TRANSFER OF EQR CREDITS: EQR credits obtained by direct purchase from the District are considered appurtenant to the structure and/or land for which they were obtained and may not be transferred.

.07 - TEMPORARY CONNECTIONS: At the discretion of the Board of Directors, temporary connections to the District Water and/or Sewer System may be permitted, pursuant to terms and conditions established by the Board. Any person wishing to make such a temporary connection must first make an application for service to the District, pay the fees required, have the application approved, and have a Tap Permit issued before making any connection. Each temporary connection shall be subject to inspection by a representative of the District. Unauthorized connections shall be subject to the penalties set forth at Section 7.15.

Temporary connections of construction trailers or non-permanent construction buildings to the District Water System and/or Sewer System may be made for periods not to exceed six months, pursuant to the terms of this Section 6.07. At the time of making the application for water and/or sewer service, the applicant shall pay the Tap Fee for 1.0 EQR of water and/or sewer service and demonstrate that a Tap Fee for at least 1.0 EQR of water and/or sewer service has been paid for the building under construction.

The construction trailer or non-permanent construction building shall thereafter be assigned an EQR value of 1.0 for purposes of calculating monthly water and/or sewer service charges, which charges shall be assessed at two (2) times the monthly rate then in effect. If the applicant pays directly the Tap Fee for 1.0 EQR of water and/or sewer service, that amount shall be credited against the full Tap Fees due and payable for the building under construction. The water service line for a temporary connection to the District Water System shall be no greater than three-quarters of an inch (3/4") in diameter.

End Article 6

ARTICLE 7

7.00 - Fees and Charges

The information contained in this section is pertinent to all charges of whatever nature to be levied for provision of water and/or sewer service inside the District. Said rates and charges shall be established by the Board and shall remain in effect until modified by the Board under the provisions of these Rules and Regulations and under the applicable statutes of the State of Colorado. Nothing contained herein shall limit the Board from modifying rates and charges or from modifying any classification.

.01 - APPLICATION OF THIS ARTICLE: The rates, charges and other information shown herein shall apply only to Customers inside the District and shall in no way obligate the District to provide service outside the District Boundaries under any of the conditions contained in this Article.

.02 - TYPE OF SERVICE: Water service shall be metered by the District. Unless otherwise stated, charges and fees for water and/or sewer service shall be based on the number of EQRs of service calculated in accordance with the EQR Schedule in Appendix A. The charge per EQR shall be at the rates in the District's fee schedule, as the same may be amended from time to time.

.03 - TAP FEE: Except as otherwise determined by the Board, or as set forth in a written agreement between the District and a Customer or Developer, a Tap Fee shall be charged to all Customers of the District. All Tap Fees shall be assessed as provided for in the EQR Schedule at Appendix A, as the same may be amended from time to time, or, to the extent Tap Fees or charges are set or determined in the Prepaid Tap Agreements, as provided therein. Customers shall provide full payment to the District for the Tap Fee based upon the anticipated EQRs and as identified by the EQR Schedule or Prepaid Tap Agreement prior to any physical connection to the District's Water and/or Sewer System. The Customer shall than remit any additional amount that may be required based upon the end construction, within 60 days after the County issues a Certificate of Occupancy.

When any person adds to an existing building, changes the use of a building, or enlarges or expands the use of water and wastewater service from the District such addition, enlargement or expansion shall be subject to the payment of an applicable supplemental Tap Fee to be computed based upon the change in the EQR Schedule at Appendix A. Any reduction in service from the District resulting in a decrease in the calculated EQR rate shall not be subject to any refund of Tap Fee. Upon receipt by the District of payment for Tap Fees, a Tap Permit shall be provided to the Customer. Except as otherwise provided in a specific written agreement, the standard District Tap Fees shall be as set forth in the Fee Schedule in Appendix A, as the same may be amended from time to time. No tap onto, or service from, the District's Water and/or Sewer System shall be allowed until any Tap Fee required by these Rules and Regulations has been paid and a Tap Permit has been issued. Tap Fees shall be non-refundable, unless otherwise expressly agreed by the Board.

.04 - SERVICE CHARGE: Full service charges, calculated under the District's Fee Schedule and EQR Schedule, attached hereto as Appendix A and as may be amended from time to time, shall commence and accrue from the date the Customer makes physical connection to the District Water and/or Sewer System. Service fees during construction and before a Certificate of Occupancy is issued by the County will be charged on a quarterly basis according to the rates identified in Appendix A as may be amended from time to time. Once a Certificate of Occupancy is issued for the building and a

copy of the Certificate is provided to the District, the Customer shall be entitled to a 50 percent refund of the service fees paid during the construction period.

Upon issuance of a Certificate of Occupancy and for any given month, service charges shall be based on the EQR value applicable during that month to the property being served, and any changes in EQR values shall also result in adjustments in monthly service charges. The Customer shall be liable to the District for payment of such service charges from the date of physical connection, regardless of whether the Customer actually receives or uses District water or sewer service by means of said connection. District sewer charges shall be as provided in the Fee Schedule in Appendix A.

District quarterly water service charges shall be based on an increasing block rate structure, the EQR value applicable to the property, and the quantity of water used during that quarter. The ascending rate structure is set forth in the Fee Schedule in Appendix A. In addition to the above water service rates, the Customer will be assessed a base rate as set forth in the Fee Schedule in Appendix A.

Service charges which accrue on or after the date the certificate of occupancy is issued shall be due and payable whether or not the premises are occupied. There shall be no right to refund, rebate, or credit for such charges, except as otherwise stated in this Article.

.05 - PRESSURE ZONE OR OTHER SURCHARGES: Where any defined part of the District depends for its potable water or sewer service on a pumping station or discrete facility owned and maintained by the District, the Board of Directors may establish and charge such Customers a monthly pressure zone surcharge. The zone surcharge shall be based on the pro-rata cost to each applicable Customer of the pumping station or other facility and its maintenance, or other service provided by the District.

.06 - PER-GALLON SERVICE CHARGES: Per-gallon service charges for irrigation water service and for water service from District hydrants shall be as set forth in the Fee Schedule in Appendix A.

.07 - AMENDED TAP FEES: In those situations where a prospective Customer applies for a connection permit for service to a structure not defined in Appendix A, or where, in the Board's opinion, said structure represents a classification not contemplated in the establishment of the previously defined Tap Fees, the Board shall, at its sole discretion, establish a fair, reasonable and equitable Tap Fee for said structure.

.08 - AMENDED MONTHLY SERVICE CHARGES: In those situations where, in the Board's sole discretion, the monthly service charges shown in the previous articles do not represent a fair, reasonable and equitable charge for the intended use, the Board, at its sole discretion, may adjust said rates.

.09 - STANDBY FEES: The District shall have the authority to adopt and charge standby fees upon amendment to these Rules and Regulations.

.10 - PAYMENT OF SERVICE CHARGES: All accounts shall be in the name of the owner of property. Statements for service charges are directed to the owner rather than the occupant unless the owner otherwise notifies the District.

When a Customer receives service for a number of units which are provided water service

through one water meter, the District shall send only one bill to the Customer for water and sewer service for such units. In no event shall the District bill the owners of individual units within a multiple-use area unless service to each unit is metered separately.

Statements for service charges shall be rendered to Customers at intervals to be established by the District, but not more frequently than monthly nor less frequently than quarterly. Charges for such things as late payments, turn-on, and turn-off shall be included in the statements. Statements shall be mailed before the specified billing period and shall be due and payable in full fifteen (15) days after the date of the statement. Payments will be deemed late thirty-one (31) days after the date of the statement and will be assessed a late charge of one and one-half percent (1.5%) for each month, or part thereof, in which such charge remains unpaid. If any charges remain unpaid for thirty-one (31) days or more, the District may give the Customer written notice that the Customer's water and/or sewer service may be suspended or revoked if the delinquent charges are not paid in full within fifteen (15) days after the postmark on such notice. Such notice shall also give notice of hearing in accordance with the provisions set out in section 7.16, below.

In addition to the District's right to suspend or revoke service as provided in this paragraph, the District may enforce the Customer's payment obligations by any and all other lawfully available means, including suits for collection and/or foreclosure of the District's lien on the Customer's property. In any event, the District shall be entitled to recover all costs incurred in the collection of delinquent payments, including reasonable attorney's fees, recording fees, filing fees and court costs. Any deposit received by the District for service to the Customer may be applied against delinquent payments.

.11 - PAYMENT OF TAP FEES: Tap Fees due under Prepaid Tap Agreements shall be subject to the due dates, penalties, and interest charges set forth in those agreements. In addition to the penalty provided for in Section 7.15, late payments of Tap Fees not arising under Prepaid Tap Agreements shall be subject to a late charge of one percent and one-half percent (1.5%) for each month, or part thereof, in which the fee remains unpaid. Statements, letters, notices, or other documents concerning unpaid Tap Fees shall be directed to the owner of the property for which the fee is due. Regardless of any rental agreement, lease agreement, or any other contractual agreement between an owner and occupant, the owner of a property for which a Tap Fee is due shall remain solely liable for payment of that fee.

.12 - MISCELLANEOUS COSTS AND EXPENSES: All costs and expenses incident to the installation and connection of water and/or sewer service lines shall be borne by the Customer. In addition, the Customer shall indemnify the Board for any loss or damage that may directly or indirectly be occasioned by the installation of the water and/or sewer service line. No work by District personnel shall be done on Saturdays, Sundays, or holidays unless written permission is granted by the Manager/Administrator. Miscellaneous fees and charges for District services are set forth in the Fee Schedule in Appendix A.

.13 - LIABILITY FOR PAYMENT COLLECTION; PERPETUAL LIEN: All fees, rates, tolls, penalties, or charges of the District shall be paid by the owner of the property served. The District shall not be bound by any agreement between an owner and occupant concerning payment of charges, regardless of whether the District has been notified of the agreement. Until paid, all fees, rates, tolls, penalties, and charges shall constitute a first and perpetual lien on or against the property served, and any such lien may be foreclosed in the manner provided by law.

The District shall have the right to collect from any Customer who is delinquent in payment of the Customer's account, all legal, court and other costs and expenses necessary to or incidental to the

collection of said account, including reasonable attorneys' fees, filing fees and other costs, and recording fees. A fee in the amount set forth in the Fee Schedule in Appendix A shall be imposed on any check tendered to the District which, upon presentment to the bank for payment, is returned unpaid due to insufficient funds, an overdrawn or closed account, or for whatever reason. Such fee shall accrue each time a check is returned unpaid.

.14 - SELLER'S AND BUYER'S RESPONSIBILITIES: The District assumes no responsibility for agreements between sellers and buyers of property within the District or District's Service Area. It shall be the responsibility of the buyer to ascertain whether appropriate fees and charges for the type and amount of service received from the District have been paid by the seller. Regardless of ownership, failure of the District to collect fees and charges at the time of the issuance of permits, or any other act or omission of the District, unpaid fees and charges shall constitute a first and perpetual lien on and against the property which lien may be foreclosed as provided by law and these Rules and Regulations.

.15 - UNAUTHORIZED USE OR CONNECTIONS: Any person who makes a connection to or otherwise uses the District's water, or discharges into the District Sewer System without first paying the appropriate fees and obtaining the appropriate permits shall be fined five hundred dollars ($500.00) for each unauthorized use or connection. This fine shall be in addition to the District's right to charge for all services used, and to any and all other remedies which the District may have.

In addition, the District may require and/or carry out immediate disconnection of the service, in which event the District shall be entitled to collect any and all costs and damages incurred by the District as a result thereof, including the fees set forth in paragraphs F(1), (2), and (3) of the Fee Schedule in Appendix A; or the District may authorize connection on such terms and conditions as the District may approve. Should the District be required to pursue any legal proceeding or process with regard to unauthorized connection to the District's system or unauthorized use of District water, the person making the unauthorized use or connection shall be liable for all attorneys' fees, filing fees, recording costs, court costs or other legal expenses incurred by the District.

Any unauthorized reconnection, unblocking, or turning back on of District water or sewer service after it has been disconnected, blocked, or turned off pursuant to this section shall constitute an additional unauthorized use or connection, subject to an additional fine of five hundred dollars ($500.00).

.16 - SUSPENSION OR REVOCATION OF SERVICE; ASSESSMENT OF FINES OR PENALTIES: The District shall have the authority to suspend or revoke water and/or sewer service upon non-payment of fees owing to the District, or upon any failure to comply with the Rules and Regulations of the District. The District shall also have the authority to assess fines and penalties as provided in these Rules and Regulations. In the event of said non-payment of obligations or other violation of these Rules and Regulations, the Customer shall be given written notice of a hearing to determine whether the Customer is in violation of his payment obligations to the District or in violation of these Rules and Regulations and to determine whether to suspend or revoke water and/or sewer service, or to assess a fine or penalty. The notice shall be sent by regular and certified mail to the Customer's billing address at least fifteen (15) days before the date of the hearing and shall specify the date, time, and place of the hearing, as well as the alleged violation and the reason or reasons for revocation of service and/or the possible fine or penalty to be assessed. The hearing shall be held by the District at a regular or special meeting of the Board of Directors at which time the Customer shall have an opportunity to present testimony and evidence to the Board. Within fifteen (15) days of the

conclusion of the hearing, the Board shall issue a written Memorandum of Decision, which decision shall be final. Thereafter, the District may revoke service to the property by turning off, disconnecting, or blocking the water and/or sewer lines serving the property. Such actions shall be subject to the fees set forth in in Appendix A and shall include fees for hearing notification and hearing and any other applicable fees. The fee for disconnection of sewer service shall be one hundred and fifty dollars ($150.00) each plus the District's actual costs of disconnection, and, upon disconnection of sewer service, the District shall notify the local building authority.

Any Customer who after notification fails to appear at the public hearing on their past due account or other alleged violation of the Rules and Regulations and has not paid the account to the satisfaction of the Board or otherwise corrected the violation within the allotted time will be assessed a fine in the amount of one hundred and fifty dollars ($150.00) for the cost of the public hearing. The Board may also suspend or revoke service if necessary.

Any unauthorized reconnection, unblocking, or turning back on of District water or sewer service after it has been disconnected, blocked, or turned off pursuant to this section shall constitute an unauthorized use or connection pursuant to Section 7.15 above, subject to the five hundred dollar ($500.00) fine under that section.

.17 - TURN-OFF SERVICE: Customers desiring that their service be turned off, disconnected, or blocked for such purposes as vacancy of rental property, or construction shall pay the fees set forth in paragraph F(2) of the Fee Schedule in Appendix A. Any unauthorized reconnection, unblocking, or turning back on of District water or sewer service after it has been disconnected, blocked, or turned off pursuant to this section shall constitute an unauthorized use or connection pursuant to Section 7.14 above, subject to the five hundred dollar ($500.00) fine under that section.

.18 - REIMBURSEMENT OF COSTS AND FEES TO DISTRICT: Any person requesting inclusion or exclusion of property from the District, constructing a line extension project, or undertaking any other activity requiring preparation of plats or plans, legal and engineering review and advice, inspections, filing or recording fees, or other out-of-pocket expenses by the District shall be required to reimburse the District for all such costs and fees. Such person shall be required, prior to commencement of the project or activity, to enter into a Special Fee and Cost Reimbursement Agreement substantially similar to that set forth in Appendix C. Pursuant to that agreement, the person shall make such deposit as the Board, in its sole discretion, deems appropriate.

End Article 7

ARTICLE 8

8.00 - Main Line Extensions

All line extensions shall be made under the observation of the District's engineer and constructed according to the District's specifications and procedures set forth in Appendix B, these Rules and Regulations, and all federal, state, county and local requirements

.01 - MAIN SIZES: The minimum size water main line shall be eight inches (8") in diameter and the minimum size sewer main line shall be eight inches (8") in diameter, except as specifically authorized by the Board.

.02 - APPLICATION FOR LINE EXTENSION: The fees and charges provisions of Article 7 of these Rules and Regulations are also applicable to this Article 8.

It shall be unlawful for any person to construct a line extension within the jurisdiction of the Board without first having made formal application to the Board for approval and having complied with these Rules and Regulations and any other requirements set forth by the Board.

.03 - LINE EXTENSION AGREEMENTS: All line extensions for District water and/or sewer service shall require the execution of a Line Extension Agreement or Line Connection Agreement, in a form approved by the attorney for the District and by the Board, and shall be made under the observation of the District's engineer. Such Agreement shall set forth the respective rights and obligations of the parties regarding the provision of District water and sewer service to the subject property.

Any Line Extension or Line Connection Agreement entered into by and between the District and a property owner following approval of the agreement by the District shall be executed and returned to the District by the property owner within forty-five (45) days from receipt of the agreement. If the Line Extension Agreement is not executed and returned to the District by the property within forty-five (45) days from receipt thereof, the District's prior approval of the agreement shall be null and void and of no further force and effect, and a new request for approval of the agreement shall be required; provided however, that the District may extend said 45-day execution deadline prior to its expiration for an additional thirty (30) days upon good cause shown by the property owner.

.04 - LOCATION OF LINE EXTENSIONS AND ADDITIONS: Line extensions shall be installed in roads or streets which the County, State Highway Department or other public agency have accepted for maintenance as public rights-of-way, or in easements granted to the District. Prior to the acceptance of water and/or sewer mains by the District, all easements necessary for the installation and maintenance of such mains shall be platted or conveyed to the District by warranty deed duly recorded in the County real estate records.

.05 - PROCEDURE FOR LINE EXTENSION CONSTRUCTION BY DEVELOPER: Plans for line extensions shall be submitted to the Board along with an application for a line extension. All plans and specifications which must be approved by the Board must be submitted to the Board at least twenty-one (21) days prior to a regularly scheduled Board meeting. Said plans shall be reviewed and approved for compliance with the District's service plan and Rules and Regulations and the costs associated for the District's determination of compliance shall be reimbursed by the Customer to the District.

(A) SECURITY/IMPROVEMENTS GUARANTY:

Any Developer constructing a water and/or sewer line extension may be exempted from posting a sewer improvements guaranty, provided the District, in its sole discretion, determines such Developer satisfies the following requirements:

(i) The Developer provides adequate assurances and documentation establishing that such Developer has posted adequate security with another public entity pursuant to a Subdivision Improvements Agreement ("SIA") where such SIA provides for:

(a) a guarantee amount sufficient to cover the cost of all necessary water and/or sewer improvements;

(b) written approval by the District of water and/or sewer improvements prior to release of the portion of the guarantee covering the water and/or sewer improvements by the public entity; and

(c) a provision requiring the District to be a named beneficiary as to the value of all improvements to be dedicated to the District; or the Developer provides adequate assurances and documentation establishing that the property to be served with District water and/or sewer improvements is the Developer's residence or business, and that the property is not held for speculative purposes.

and;

(ii) The Developer requests and receives a written release of water and/or sewer improvements guaranty from the District. The District maintains the right to terminate the water and/or sewer improvements guaranty exemption in the event a surety bond provided another public entity is prematurely released and the District determines the necessary water and/or sewer improvements are not complete.

(B) CONSTRUCTION OBSERVATION: The Developer shall retain, at his sole expense, a licensed professional engineer for appropriate on-site observation to ensure that all sewer improvements are constructed to the satisfaction of the District. Construction observation fees incurred by the District on water and sewer improvements constructed by a Developer shall be paid by the Developer. Such fees shall include the costs of reasonable review of drawings and specifications, meetings, inspections, administration and any other time reasonably required of the District's engineer, attorney, manager, or other authorized representative.

(C) AS-BUILT DRAWINGS, DEPOSIT, FORFEITURE: Developer shall submit, at the Developer's cost, Reproducible As-Built Drawings, prepared and submitted according to the specifications and procedures set forth in

Section 3.05 of Chapter I of Appendix B, electronic images in a format accepted by the District, of the interiors of the extended sewer lines and written reports of lamp tests and vacuum tests (hereinafter collectively referred to as "Electronic Images ") and a summary of actual costs incurred by the Developer for the line extension project. No line extension project shall be approved, and no extended water and/or sewer mains shall be accepted by the District until satisfactory As-Built Drawings/Electronic Images for the project are received by the District and approved by the District Engineer, which review shall be completed within thirty (30) days of submission by the Developer. The District may deny service through any sewer main or sewer line extension until the above requirements have been met and the main line extension has been accepted by the Board. Submitted Electronic Images of sewer lines shall become the property of the District upon acceptance of the extended sewer lines.

At the same time and in addition to the deposit required under Section 8.05 for the cost of a line extension project, the Developer shall deposit with the District an amount to be determined by the Board, but at least five thousand dollars ($5,000) in cash, to ensure that satisfactory As-Built Drawings and Electronic Images for the project are submitted to and approved by the District. The amount to be deposited with the district shall increase based upon the estimated EQRs in the amount of one hundred dollars ($100.00) per anticipated EQR for each EQR over fifty (50) according to the EQR schedule or in an amount determined by the Board. Said Deposit shall not be released back to the Developer until satisfactory As-Built Drawings and Electronic Images are submitted by the Developer and approved by the District Engineer.

In the event that satisfactory As-Built Drawings and Electronic Images are not received by the District within thirty (30) days of the completion of construction, as required by the above provisions, the District shall mail a written notice to the Developer. The notice shall specify the date, time, and place of a hearing in which the Board will consider forfeiture of the As-Built Drawings/Electronic Images Deposit, and the reasons why forfeiture may be required. The notice shall be mailed not less than ten (10) days before the hearing, to the last known address of the Developer. At the hearing, the Developer shall be allowed to present testimony and other evidence. If in the opinion of the Board the Developer's failure to submit acceptable As-Built Drawings/Electronic Images should not be excused, the As-Built Drawings/Electronic Images deposit shall be forfeited as liquidated damages. Such forfeiture of the As-Built Drawings/Electronic Images deposit shall be ordered by formal written resolution of the Board, and said Deposit shall be used to obtain acceptable As-Built Drawings/Electronic Images of the project; provided however, the Developer shall be responsible for the actual cost of the As-Built Drawings/ Electronic Images if such costs is greater than the deposit.

(D) WARRANTY: Developer shall submit a warranty guaranteeing to the District that the facilities have been constructed in a good and workmanlike manner for a period of two (2) years from the date of acceptance of the facility by the District. The guarantee shall be in a format acceptable to the District and shall be secured, if required, by the District in the form of security acceptable to the

District.

(E) ACCEPTANCE OF LINE EXTENSIONS: Upon the completion of construction, installation, and connection of a line extension, the Developer shall certify to the Board that these Rules and Regulations have been complied with and request the District to accept the facilities. The District Engineer shall confirm in writing to the Board that such facilities have been constructed and installed in accordance with these Rules and Regulations and in accordance with the applicable provisions of federal, state, county, and local laws. Upon satisfactory completion of the above requirements, the District shall formally accept the line extension by a motion entered in the minutes of the Board of Directors. Such acceptance, if given, shall constitute dedication by Developer of such facilities to the District. The parties agree that the District is under no obligation to provide water and/or sewer service to Developer until acceptance and dedication. The Developer shall, upon the District's acceptance, convey such lines and all appurtenances to the District, free and clear of all liens and encumbrances, by Bill of Sale.

.06 - SPECIAL STRUCTURES: Special structures required to insure proper operation of line extensions shall be constructed from designs of the District's engineer in consultation with the Developer and the cost of construction shall be the responsibility of the Developer.

.07 - OVERSIZING: The District may, when it determines that it is appropriate to accommodate future service needs, require the construction of water and/or sewer mains of a size larger than the minimum sizes otherwise required by the District for service to a Developer's property. Participation by District in the cost of installation of oversized mains shall be at the sole discretion of the District.

.08 - PRESERVATION OF GRAVITY SEWER SYSTEM: In those instances where pumping stations and force mains are required, the sewer system shall be so designed as to permit eventual connection into a gravity system with a minimum of expense. Where practicable, easements shall be provided and lines constructed to connect into the gravity system. The District may, in its discretion, require deposits to insure the eventual construction of gravity lines.

.09 - EXTENSION OF MAIN LINE TO DESIGNATED POINT REQUIRED: The Customer or Developer shall extend any water and/or sewer main line constructed pursuant to this article to a point on the property to be designated by the Board, so that the District Water and Sewer Systems may continue beyond such property. The Board shall determine the point to which each new main line shall be extended based on the advice of the District Engineer, in accordance with the District Service Plan and the logical extension of service to adjoining properties. The Board shall also take into consideration pre-existing easements and rights-of-way, and Developer-dedicated easements and rights-of-way in designating the point to which each main line shall be extended.

.10 - MAIN OR LINE EXTENSION CONSTRUCTION BY DISTRICT: Notwithstanding any provision of this Article, the District itself may, in its discretion, extend mains under such conditions as the Board deems appropriate. The Board shall oversee such line extension projects, and, in conjunction with the District engineer and attorney, carry out all necessary planning, evaluation of bids, selection of contractors, financing, right-of-way acquisition, inspections and preparation of As-Built Drawings. Where water and/or sewer mains cannot be installed in a street, private drive or common area, and must be installed in easements along adjacent pieces of property,

the mains will terminate at point on the line or corner of the property being served which requires the least amount of construction by the District.

.11 - EXTENSIONS OF WATER AND/OR SEWER MAINS TO SERVE UNPLATTED PROPERTY, INSIDE THE DISTRICT: Extension of water and/or sewer mains to serve property already in the District, but not part of a platted subdivision, shall be financed by the Developer or Customer who constructs the mains, subject to the right of reimbursement as hereinafter provided, as otherwise provided by future agreement, or as provided in Prepaid Tap Agreements.

.12 - EXTENSIONS OF WATER AND/OR SEWER MAINS OUTSIDE THE DISTRICT LIMITS: No water and/or sewer mains shall be extended outside the District limits, except with the purpose of servicing property that is within the District (across islands, or between peninsulas). Exceptions may be granted upon the express consent of the Board of Directors under the terms of a revocable permit.

.13 - CONNECTING WATER MAIN LOOPS: Connecting water main loops and cross-ties within a subdivision shall be constructed and paid for by the Developer. If the connecting loop is such that property outside the subdivision abuts such loops or ties, and connections are made to such lines, the reimbursement provision of Article 9 of these Rules and Regulations shall apply.

.14 - SOIL COMPACTION TESTS: Whenever a Developer or Customer seeking water or sewer service from the District is required to obtain a road cut permit from a governmental entity to install a water or sewer line in an existing public road, such person shall be required to provide the District engineer with soil compaction tests from a registered soils engineer. The soils engineer shall conduct a minimum of one test for each layer or lift for each two hundred and fifty (250) linear feet or less of trench during construction as determined by the District's engineer, to confirm that ninety-five percent (95%) of maximum density based upon ASTM D69 or AASHTO T99 has been achieved. The District engineer will refuse to accept or approve mains which have been installed in public roads if such compaction tests results are not submitted and approved by the District's engineer.

End Article 8

ARTICLE 9

9.00 - Line Extension Fees and Reimbursements

.01 - LINE EXTENSION FEES: In addition to the District's Tap Fee, the District may collect a Line Extension Fee from all Developers or Customers desiring to connect to the District Water and/ or Sewer System. The Line Extension Fee shall be based on the size in acres of the property to be served by the new connection, the zoning of the property, the existing and potential uses of the property, the potential EQR demand from the property, and any other factors which the Board of Directors believes should be considered in arriving at an equitable reimbursement; provided, however the District's collection of Line Extension Fees under this Article shall not be construed as an obligation to provide operations, maintenance, repair, or replacement of such line extensions.

The Line Extension Fee charged against the benefited property shall not exceed the actual cost, including engineering fees, of the extension. Interest will not be allowed. All Line Extension Fees charged pursuant to this section should be due and payable at the time a Tap Permit or Line Extension Agreement is issued. The District may charge an administrative fee for collection and reimbursement of Line Extension Fees, not to exceed one hundred dollars ($100.00) per EQR. The District will use its best efforts to collect such fees; provided however, the District shall not be liable for the failure to collect such fees.

.02 - REIMBURSEMENTS: The District may pay to the constructor of a water or sewer main line, extension fees collected on such line for a period of five (5) years after execution by the Developer and District of the contract for extension of such line. Upon application prior to the termination of the initial five-year period, and upon District approval, such reimbursements shall continue for a maximum of five (5) additional years. The Developer's right to such reimbursement shall permanently cease at that time, regardless of the amount of reimbursement received. In no event shall the reimbursement exceed the constructor's total construction cost of the water and/or sewer main line.

.03 - COST RECOVERY PROVISION IN LINE EXTENSION AGREEMENT: A Line Extension Fee shall not be collected by the District or reimbursed to any Developer unless the District and Developer have previously entered into a written Line Extension Agreement containing provisions setting forth at least the following:

(A) The amount of each Line Extension Fee to be charged.

(B) The Developer's right to reimbursement by means of the Line Extension Fees.

(C) The procedure by which the District shall collect the Line Extension Fees and forward them to the Developer, including time limitations.

(D) The right of the District to retain an administrative fee not to exceed $100 per EQR from each Line Extension Fee collected.

(E) The District's obligation to use its best efforts to collect Line Extension Fees. In addition, however, an agreement that the Developer will not hold the District itself liable for non-payment of the Line Extension Fees, or for any failure to collect the Line Extension Fees.

All terms and conditions of the Line Extension Agreement shall comply with Articles 8 and 9 of these Rules and Regulations.

End Article 9

ARTICLE 10

10.00 - Water Right Dedication Requirements

.01 - INTENT AND PURPOSE: It is the intent and purpose of this Article to require the dedication of water rights prior to the extension of treated water service to new Customers; to ensure that the quantity of water so dedicated be equal to the quantity of water ultimately required to satisfy the uses of the new Customers; to thereby assure an adequate and stable supply of water to District service area; to prevent the abandonment of water rights to the detriment of the District; to ensure the financial stability of the District water utility; and to promote the general welfare of the public.

.02 - BASIC DEDICATION REQUIREMENTS:

(A) A dedication or transfer of direct flow and/or storage water rights to the District shall be required prior to the approval of the inclusion of any land within the District or prior to all extensions of treated water service outside the District's boundaries.

(B) The dedication requirement shall be calculated on forms provided by the District in accordance with the EQR Schedule in Appendix A and Section C below. Such forms shall be accompanied by an historical use affidavit. For those persons whose total EQR value, for purposes of compliance with subsection (C) or (D) of this section, is greater than 30 EQR, no historical use affidavit shall be required; however, an engineering analysis acceptable to the District of the historic use of the water rights proposed for dedication shall be required.

(C) The basic dedication requirement for District water service with standard sewer shall be 0.2 acre-feet per year of historic consumptive use from a water right of sufficient legal priority for each EQR of water use calculated under the EQR Schedule in Appendix A.

(D) Except as stated below, the basic dedication requirement for District water service with evapo-transpirative sewer shall be 1.0 acre-feet per year of historic consumptive use from a water right of sufficient legal priority, for each EQR of water use calculated under the EQR Schedule in Appendix A. With regard to any EQR value assigned by the EQR Schedule for irrigated green space, the basic dedication shall be 0.20 acre-feet per EQR.

(E) The basic dedication requirement for raw water or other uses not listed under the EQR Schedule in Appendix A shall be the quantity of water that ultimately will be required to satisfy the use or uses contemplated by the user. If a party required to dedicate water pursuant to this Article can establish by a preponderance of the evidence that his or her actual use will be less than that calculated under the EQR Schedule, that party shall only be required to dedicate the lesser amount.

(F) The person seeking approval of annexation, resubdivision, replatting, or the extension of treated water service outside the District, whether or not that person will be the ultimate user(s), shall satisfy the basic requirement.

(G) Sufficient water rights shall be dedicated so as to enable the District to divert a quantity of water, at any point of diversion it may determine, adequate to allow total consumptive use by the District of the quantities of water calculated under subsection (B) hereof.

.03 - PROCEDURE:

(A) In accordance with the basic requirements set forth in Section 10.02, the Board of Directors shall determine, after consultation with a person or persons skilled in the knowledge of water rights, whether the water rights proposed for dedication pursuant to the provisions of these Rules and Regulations will be of sufficient priority under the laws of the state to ensure the District's ability to meet the service demands of the new user. This determination will be aided by a historic use affidavit or engineering report which shall be provided by the new user.

(B) The Board of Directors shall have the right, in its sole discretion, to accept or reject any water rights proposed for dedication, which it determines to be without sufficient legal priority. If the Board of Directors determines that the water rights proposed for dedication fail to satisfy the basic dedication requirement, or that additional water rights cannot at this time be put to beneficial use or for other good cause are not needed, the following alternatives, or combination thereof, may be used to otherwise satisfy the basic dedication requirement:

(i) The person required to comply with the basic dedication requirement may pay to the District a cash amount to be determined by the Board in its discretion.

(ii) The Board of Directors may, in its discretion, negotiate with the new user to establish other terms or conditions by contract, which shall constitute compliance with the basic dedication requirement of this Article.

(C) The new user shall dedicate the appropriate water rights to the District by filing with the Board of Directors an offer thereof. It is the intent of this Article that no water service shall be extended to a new user until the appropriate water rights have been dedicated to the District. However, if there are matters pending resolution in the water court concerning the water rights to be dedicated, or if there is other delay beyond the control of the new user, the Board of Directors shall have the discretion to approve the extension of such water service prior to the dedication of water rights to the District.

(D) The new user shall bear all costs and expenses attendant to the dedication of water rights to the District, including legal and engineering fees, filing and recording costs.

.04 - AGRICULTURAL AND OPEN SPACE PROPERTY: This subsection shall apply if the owner of property proposed to be annexed, resubdivided, replatted, or to be served with water

service outside the District's boundaries desires to retain the land, or any portion thereof, in agricultural production or as open space prior to development. Such owner shall be permitted to lease back on an annual basis, and for irrigation, stock water, aesthetic, recreational, or historic purposes only, the water rights transferred pursuant to this Article. The terms of the lease shall be negotiated with the Board of Directors.

.05 - EXCEPTIONS: This Article does not apply to the extension of new treated water service for which the basic dedication requirement has been previously been fulfilled.

End Article 10

ARTICLE 11

11.00 - Raw Water Irrigation

.01 - RAW WATER IRRIGATION: It is the policy of the Board of Directors that use of the District's potable Water System for irrigation of all existing parks and irrigated green space should be discouraged. Furthermore, the use of the District's potable Water System for irrigation of all new parks and irrigated green space associated with any new development is prohibited, except in compliance with the provisions of this Article. It is the intent of this prohibition to encourage the use of raw water irrigation, and any use of the District's potable water supply for irrigation purposes in violation of this Article shall be subject to the penalties provided for in Section 1.04 of these Rules and Regulations.

(A) Any Developer applying for water service from the District and submitting for approval a proposed Water System, shall submit with its preliminary drawings and plans, as provided in Article 1 of Appendix B of these Rules and Regulations, a report on the feasibility of raw water irrigation on the land to be served by the District. Such report shall list any irrigation water rights owned by the Developer, and shall discuss the Developer's ability to deliver its irrigation water rights to the land to be served by the District. A map showing any irrigation ditches pipelines or other irrigation facilities, which may serve the land, shall accompany the report. The report shall also contain an analysis of various alternatives for raw water irrigation service to the land, including a discussion of the feasibility of using ditches, pipes, wells, and any combination thereof for raw water irrigation of parks and irrigated green space. This analysis shall estimate the costs of various alternatives for raw water irrigation. Finally, in the event the Developer does not own any irrigation water rights at the time of submittal of its preliminary drawings, plans and report, such report shall also discuss the feasibility of raw water irrigation of parks and irrigated green space through a lease of raw water irrigation rights from the District, the use of wells, or a combination thereof, and shall discuss the existing and/or potential infrastructure for delivering raw irrigation water to the land.

(B) The Board of Directors may, in its discretion, require the dedication of irrigation water rights necessary to implement any raw water irrigation plan. Any such dedication shall be in addition to compliance with the provisions of Article 10 concerning dedication for connection to the District's potable Water System. Furthermore, the Board of Directors, in its discretion, may require the dedication of existing irrigation ditches, pipelines, and appurtenant facilities if it determines that raw water irrigation is feasible on the land proposed to be served by the District. In the event the District and the Developer determine and agree that the parks and irrigated green space within the land to be served shall be irrigated with raw water, and an infrastructure for this purpose does not exist, the District and the Developer shall enter an agreement upon the design, construction and payment of such infrastructure, including ditches and/or pipelines, flow meters, and appurtenant facilities through which lands will be served. In the construction of such an infrastructure, the Board of Directors in its discretion may require the Developer to oversize any ditches, pipelines or appurtenant facilities at the Developer's expense in order to allow the District to deliver raw irrigation water to other water users in the

District. If the Developer oversizes raw water irrigation facilities, it shall be entitled a

rebate for the costs of oversizing, to be paid by surcharges upon future users of the oversized facilities. The District may, but is not obligated to, participate financially in the planning and construction of any raw water irrigation system established under this Article. All raw water irrigation facilities shall be designed and constructed in a manner that allows each Customer to take its raw irrigation water without disturbing the flow of irrigation water to other Customers. Customers shall pay the rates for raw irrigation water as established from time to time by the Board of Directors.

(C) If the District and the Developer determine and agree that the parks and irrigated green space within the land shall be served by raw water irrigation rights, and the Board of Directors approves such plan, then all parks and irrigated green space within the lands served shall be irrigated solely from the raw water source. This restriction, if imposed, shall be a covenant running with the land, and in the event the Developer subdivides the property, this restriction shall be a covenant running with each parcel thereby created, and shall be binding upon the owners of each parcel. In the event the Developer establishes an association for its development, the enforcement of this covenant shall be the responsibility of the association, which shall assess penalties for violations of the same which are at least as stringent as the penalties contained in Section 1.04 of these Rules and Regulations. The Developer and/or Association shall enforce any restriction on the use of raw irrigation water, including those contained in the covenants for the land and any agreement between the District and the Developer.

(D) The District shall have the right to refuse potable water service to any Developer until compliance with the provisions of this section.

(E) At its sole discretion, the Board of Directors may waive or modify the requirements of this section. Such waiver or modification shall be for good cause only, shown in writing to the Board, and shall include, but not be limited to, the following:

(i) Evidence that strict enforcement of any requirement in this section would result in severe hardship, financial or otherwise, which would outweigh the benefits to the District from such enforcement;

(ii) Evidence that the parks and irrigated green space within the lands sought to be served by the District cannot practically, feasibly or economically be irrigated with raw water; or

(iii) Evidence that the Developer will provide or has provided a benefit or benefits to the District that will outweigh the impacts of enforcement of this section.

End Article 11

APPENDIX A

RFWSD FEE SCHEDULE, APRIL 2019

A.	Standard District Tap Fees		
	1.	Water	$3,700/EQR
	2.	Sewer	$6,500/EQR
B.	District Sewer Charges (per quarter)		$139.00
C.	District Water Service Charges (per quarter)		
	1.	Customer Fee	$70.00
	2.	Rate Block 1: 0-31,500 gallons	$1.70/1,000 gallons
	3.	Rate Block 2: 31,501 – 135,000 gallons	$2.00/1,000 gallons
	4.	Rate Block 3: 135,001 – 206,300 gallons	$3.00/1,000 gallons
	5.	Rate Block 4: 206,301 and above	$5.00/1,000 gallons
D.	Per-Gallon Service Charges		
	1.	For irrigation water service	See above
	2.	For water service from District fire hydrants	$5/1,000 gallons
	3.	For water service from District fire hydrants used by the Carbondale Fire District for fire fighting purposes	N/A
E.	Construction Fees		
	1.	District Water Service (per quarter)	$70.00 *
	2.	District Sewer Service (per quarter)	$139.00 *

* Fees during construction (date of connection through date of Certificate of Occupancy) are billed at the base rates for water ($70) and sewer ($139). A 50% refund is issued for service fees paid during this time once construction is complete and a copy of the Certificate of Occupancy is presented to the District.

F.	Miscellaneous Fees and Charges		
	1.	Each inspection of a water or sewer connect.	$50.00/each
	2.	Each water or sewer disconnect, line blocking or unblocking physically carried out by District personnel (does not include location, excavation, and materials)	$150.00/each
	3.	For hearing notification	$50/each
	4.	For hearings	$150.00/each
	5.	For final readings	N/C
	6.	Location, excavation and materials	Actual Cost
G.	Returned Check Fee (for each time a check is returned unpaid)		$20.00
H.	Out-of-District Rates		N/A

CLASS OF USE	EQR VALUE

A. RESIDENTIAL CLASSIFICATIONS

1. Single-Family Residential Units.
Single family homes, individually billed mobile homes, mobile homes on single lots, and mobile homes established as permanent residences (no more than one (1) kitchen per unit). 1.00

(a) For irrigated green space, such as lawns and gardens, see Section (D)(2) below.

(b) For irrigation of common areas or parks in subdivisions of single-family residential units, see Section (D)(1) below.

(c) For each bedroom above four 0.15

NOTE: Swimming pools, hot tubs, and spas are additional, per Section D(3) below.

2. Secondary Residential Units.

Guest houses, separate apartments attached to single-family residential units, and other separate residential units associated with single-family residential units and containing their own separate kitchens, use multi-family residential unit classification below. See Paragraph (A)4 below

3. Duplexes. Residential structures composed of two (2) single-family residential units of substantially the same square footage and number of bedrooms. 2.00

(a) For irrigated green space, such as lawns and gardens, see Section (D)(2) below.

(b) For irrigation of common areas or parks in subdivisions of duplexes, see Section (D)(1) below.

NOTE: Rental privileges of all kinds are not included in the above values. Only one kitchen is permitted in each single family unit and in each half of a duplex. If a residence has more than one kitchen, then additional EQR values should be assigned in accordance with the values given for multi-family residential units. Swimming pools, hot tubs, and spas are additional per Section D(3) below.

4. Multi-Family Residential Units.

Apartments, condominiums, townhouses, and similar facilities in the same complex, and small cabins in courts not associated

with motels.

NOTE: Values exclude more than one kitchen per unit; swimming pools, hot tubs, and spas are additional. Values include common laundry facilities or individual laundry hook-ups.

(a)	Up to four bedroom units	1.00
(b)	Each additional bedroom	0.15
(d)	For irrigated green space, such as lawns and lawns and gardens, see Section (D)(2) below	

5. Transient Residential Units.

Hotels, motels, mobile home parks, dormitories, recreational vehicle parks, short-term rental units in residences, bed and breakfast establishments and similar facilities.

NOTE: Values include laundry facilities in mobile homes. Otherwise, laundry facilities, central kitchen facilities, and swimming pools, hot tubs and spas are additional. Room counts shall include rooms furnished to employees. Values for recreational vehicle parks include central bath house facility, but not laundry, retail, or restaurant spaces.

(a)	Manager's unit, use multi-family or single-family Residential Unit classification as applicable (per unit).	See Paragraph 1&2 Above
(b)	Motels, hotels, and rooming houses without kitchen facilities	
	i. Rooms having not more than two (2) beds (per rental unit)	0.30
	ii. Rooms having more than two (2) beds per rental unit (per additional bed)	0.15
(c)	Motels with kitchen facilities	
	i. Units having not more than two (2) available beds (per each available bed)	0.40
	ii. Units having more than two (2) available bed spaces (per each available bed)	0.50

CLASS OF USE			EQR VALUE
(d)	Mobile home parks (per each available space or per living unit).		1.00
(e)	Dormitories without cooking facilities (per each rental bed)		0.5
(f)	Recreational vehicle parks (spaces filled by recreational vehicles on a year-round basis shall be evaluated under the "mobile home park" category)		
	i.	Camping or vehicle spaces without sewer hookup (per space)	0.50
	ii.	Camping or vehicle spaces with sewer hookup (per space)	1.00
	iii.	Camper dump station	By Special Review
(g)	Add for central laundry facilities (per washing machine or available hookup)		1.05
(h)	Add for central kitchen facilities per Section B(1)		
(i)	For irrigated green space, such as lawns and garden, see Section (D)(2) below		

NOTE: Initial Tap Fees, System Development Fees, and monthly service charges for all Multi-Family Residential Units and Transient Residential Units, during construction, shall be calculated on the basis of 1.0 EQRs of service per building. Said initial Tap Fees and System Development Fees shall be paid by the Customer to the District at the time the user submits an application for a tap permit, which shall occur prior to the issuance of a building permit by the County or Town, and prior to physical connection to the District's Water or Sewer Systems, whichever occurs first. The balance of the Tap Fees and System Development Fees for all Multi-Family Residential Units and Transient Residential Units, calculated according to this Section A, shall be due and payable immediately upon receipt of the temporary or permanent Certificate of Occupancy for the structure in question. Service charges accruing after receipt of the temporary or permanent Certificate of Occupancy shall be adjusted in accordance with section 7.04 of these Rules and Regulations.

B. COMMERCIAL CLASSIFICATIONS

1. Restaurants, Bars, Banquet Rooms and Drive-Ins

CLASS OF USE			EQR VALUE
	(a)	Restaurants and bars (per 10 seats)	0.65
	(b)	Banquet rooms (per 10 seats)	0.35
2.	Laundromats (commercial laundries evaluated per (B)(4) and (B)(5) below)		
	(a)	Per building, use (B)(4) below.	
	(b)	Per washing machine or available hookup	0.50
3.	Service Stations		
	(a)	Per fuel nozzle	0.40
4.	Car Washes		
	(a)	For each bay/rack where cars can be washed.	
		i. Manual bay	3.15
		ii. Automatic bay	15.60
5.	Office Buildings		0.5 EQR/1,000SF
6.	Retail/Department Buildings		1.0 EQR 1,000 SF
7.	Warehouse/Industrial Buildings		0.3 EQR/1,000 SF
8.	Grocery Stores. (per 1000 square feet or part thereof)		0.20
9.	Irrigated Green Space. For irrigated green space, such as lawns and garden, see Section (D)(2) below.		
10.	Commercial establishments, which use District water for process water, shall be assessed an additional 1 EQR per 350 gal/day of actual water use.		

NOTE: Initial Tap Fees, System Development Fees, and monthly service charges for all Commercial Classifications, during construction, shall be calculated on the basis of 1.0 EQRs of service per building. Said initial Tap Fees and System Development Fees shall be paid by the Customer to the District at the time the user submits an application for a tap permit, which shall occur prior to the issuance of a building permit by the County or Town, and prior to physical connection to the District's Water or Sewer Systems, whichever first occurs. The balance of the Tap Fees and System Development Fees for all Commercial Classifications, calculated according to this Section B, shall be due and payable immediately upon receipt of the temporary or permanent, whichever first occurs, Certificate of Occupancy

for the commercial structure in question. Service charges accruing after receipt of the temporary or permanent Certificate of Occupancy shall be adjusted in accordance with section 7.04 of these Rules and Regulations.

In any instance in which it is unclear which EQR value to assign to a commercial structure, the lowest EQR value for commercial classifications shall be used, subject to later adjustment at the Board's sole discretion. Any change in use of a commercial structure may be subject to increased fees and charges in accordance with Section 6.05 of these Rules and Regulations.

C. CHURCH AND SCHOOL CLASSIFICATIONS

1. Churches. (per 100 seats; rectories or other living areas are additional) 1.00

2. Schools. Day care centers, public and private day schools including administrative centers, warehouses, buildings for equipment repair and/or storage (such as for buses). Swimming pools, hot tubs, spas and similar facilities are additional. Staff includes teachers, librarians, custodians, and administrative personnel associated with school functions.

   (a) Without gym or cafeteria (per 50 potential students and staff) 1.50

   (b) Without gym but with cafeteria, or with gym but without cafeteria (per 50 potential students and staff) 2.00

   (c) With gym and cafeteria (per 50 potential students and staff) 3.00

3. Irrigated Green Space. For irrigated green space such as lawns and garden, see Section (D)(2) below

NOTE: Initial Tap Fees, System Development Fees, and monthly service charges for all Church and School Classifications, during construction, shall be calculated on the basis of 1.0 EQRs of service per building. Said initial Tap Fees and System Development Fees shall be paid by the Customer to the District at the time the user submits an application for a tap permit, which shall occur prior to the issuance of a building permit by the County or Town, and prior to physical connection to the District's Water or Sewer Systems, whichever first occurs. The balance of the Tap Fees and System Development Fees for all Church and School Classifications, calculated according to this Section C, shall be due and payable immediately upon receipt of the temporary or permanent, whichever first occurs, Certificate of Occupancy for the structure in question. Service charges accruing after receipt of the temporary or permanent Certificate of Occupancy shall be adjusted in accordance with

section 7.04 of these Rules and Regulations.

CLASS OF USE	EQR VALUE

D. SPECIAL CLASSIFICATIONS

1. Common Areas, Parks and Vacant Lands. (For each 1,000 square feet or fraction thereof, of irrigated green space) 0.15

2. Irrigated Green Space.

   (a) Single-family residential units (including associated secondary residential units), duplexes, and multi-family residential units shall be allowed 5,000 square feet of irrigated green space for each 1.0 EQR otherwise calculated under this schedule.

   (b) For each additional 1000 square feet or fraction thereof of irrigated green space above the allowed amount, add 0.15

3. Swimming Pools, Hot Tubs, Spas

   (a) Separate buildings which house swimming pools or hot tubs, and which are not covered by any other classification in this fee schedule, shall be evaluated under Section (B)(4), above, as well as the following:

   (b) Swimming pools, per 25,000 gallons of capacity (lesser amounts shall be prorated accordingly) 1.00

   (c) Hot tubs and spas, greater than 500 gallons 0.20 per 500 gallons

4. Unclassified Uses. For any water use or water-using structure or appliance not otherwise covered by this schedule, the Board of Directors shall determine the EQR value on a case-by-case basis according to anticipated water use and consumption.

END OF APPENDIX A

A P P E N D I X - B

ROARING FORK
WATER & SANITATION DISTRICT

RULES AND REGULATIONS

April 2019

Prepared By:

Schmueser Gordon Meyer, Inc.
118 W. 6th St., Suite 200
Glenwood Springs, CO 81601

I N D E X

I. SUBMITTAL INFORMATION

1.00 GENERAL

1.01 Scope. This section shall cover the required submittal material necessary for the Roaring Fork Water and Sanitation District to review a water and sewer project to ensure that it confirms to these regulations. Included in this section are the requirements on preliminary, final and as-built drawings, specifications, soils reports, and other supporting documents. Finally, this section will cover the submission and review procedures to be followed for the District. Upon request of a Developer, and after consultation with the District Engineer, the District may approve variances from the Technical Specifications and Procedures contained herein. See Rules and Regulations for procedures.

2.00 PRELIMINARY DRAWING REQUIREMENT

2.01 General. This section shall include the requirements necessary for preliminary drawing submittal, specifications, calculations and soils reports.

2.02 Title Sheet. The first sheet of the drawings shall be the title sheet and shall have the following shown thereon.

A. Location map, North arrow, numerical and graphical scale.

B. Index to sheet of the drawings.

C. General notes.

D. Title block. The title block should not include the words "Title Sheet," but should contain the project name and a description of the information shown thereon.

E. Title sheet shall be stamped “Preliminary Not for Construction”

2.03 Plan. The following items shall be included on all plan drawings.

A. Scale: *Use a maximum scale of* one inch = 50 feet. Show scale numerically and graphically.

B. North arrow.

C. Show outline of water and sewer main and service lines. Show centerline of water and sewer line with appropriate ties to centerline of street or survey control lines, curbs, property lines or right-of-way lines *and easement lines. .*

D. Show right-of-way or easement lines, street centerline and name, property lines, curbs, gutters, cross gutters, sidewalks, driveways, paving and other improvements, existing and proposed.

E. On each sheet of the plan, show a sufficient number of typical sections to give the relative location of surface and underground improvements with respect to proposed sewer main. Indicate size, type and other appurtenant data for all improvements.

F. Drawings shall be on standard 24 inch x 36 inch sheets.

G. Utilities, sewers and storm drains.

1. Indicate the type, size and ownership of all existing utilities in streets or rights-of-way or rights-of-way in which the water and sewer lines are to be connected. Tie utilities, sewers, house connections and storm drains to streets rights-of-way centerline or to street property line.

2. Indicate portions of existing utilities that are to be abandoned because of water and sewer construction.

H. Details. At intersections where tees, crosses, valves and concrete reaction blocks are to be provided, or at any other sections of the lines where a large number of fittings will be involved, show a large scale view of the appurtenances with dimensions to each separate fitting.

2.04 Calculations. One set of calculations supporting the design criteria used shall be furnished with the preliminary drawings. Each sheet of calculations shall be dated and have the name or initials of individual making the calculations. All calculations shall be by a professional engineer registered in the State of Colorado.

2.05 Soils Report. A soils investigation report shall be provided with the preliminary drawings. Sufficient subsurface exploration borings and analyses shall be made to permit the Roaring Fork Water and Sanitation District to make an adequate assessment of any soil problems that may be encountered. The soil investigation report shall contain the findings and supporting data for the following:

A. The relative density type and extent of material to be encountered.

B. Excavation problems.

C. Location and extent of excavation.

D. The suitability of excavated materials for use as backfill or bedding.

E. The compaction characteristics of the soils.

F. The groundwater level and conditions.

G. The earth resistivity, moisture content, pH, degree of variation, presence of sulfates, and the likelihood of stray, direct currents.

H. Test Holes. The depth of test holes shall be at least two feet below the proposed pipeline elevation. The spacing of test holes shall be a minimum of 600 feet or where unusual conditions exist. The spacing shall be such to adequately define soil.

I. The soils report shall make recommendation on the consolidation, hydrocompaction shrinkage potential

2.06 Surveys. All the existing conditions, including rights-of-way easements and horizontal and vertical control information, shall be prepared by a registered land surveyor in the State of Colorado.

3.00 SUBMISSION AND REVIEW PROCEDURE

3.01 Procedures. This section shall cover the procedures and time frame necessary to submit water and sewer drawings to the Roaring Fork Water and Sanitation District.

3.02 Preliminary Drawing Review.

A. One set of blueprints and specifications, on paper and electronic format, of the proposed water and sewer system accompanied by one set of supporting data shall be submitted to the District at least 45 days prior to a regular meeting of the Board. The preliminary drawings and specifications of the proposed water and sewer system shall be reviewed in general and, if in acceptable form for processing, shall be referred by the District Administrator to the following offices and interested persons for study and recommendation at least 30 days prior to a regular Board meeting.

1. The District Engineer (SGM, Inc.)
2. Garfield County
3. Roaring Fork Water & Sanitation District

When transmitting the preliminary drawings and specifications for review, the District shall indicate to the reviewing agency the date and time of the District meeting at which the proposed water and sewer system will be discussed and formal action taken by the Board.

B. At the regular meeting of the Board at which the proposed water and sewer system is to be considered, the Board shall review all written and oral recommendations presented and shall, upon diligent evaluation of the facts, approve or disapprove the preliminary plans for the proposed sewer system.

C. Should the Board approve the preliminary plans, written notice of said approval shall be transmitted to the Applicant along with any modifications required by the District. Such approval of preliminary plans shall permit the Applicant to prepare final construction drawings in accordance with the standards established by the Board and incorporate any modifications required by the District.

3.03 Final Drawing Review.

A. Final drawings and specifications shall be prepared in the form prescribed for preliminary drawing requirements. In addition, the title sheet shall provide a space for certification of construction approval by the Board of the Roaring Fork Water and Sanitation District.

B. Final drawings consisting of four sets of prints, one set of drawings in electronic format and the AutoCAD file for the project shall be submitted to the Board for final review at least 10 days prior to a regular meeting of the Board.

C. If the final drawings are found to be in compliance with the District's standards and these regulations and any modifications requested by the Board, the District

shall recommend approval of the plans at the next regular Board meeting.

D. If the final drawings and specifications are found not be to be in compliance with the District standards and any modifications requested by the Board, the District Engineer shall recommend disapproval of the plans and submit a written itemization of the deficiencies at the next regular meeting of the Board. Non-conformity of the final plans with the District's standards and requirements of the Board may result in disapproval of the project by the District.

E. The Applicant is strongly advised against receiving construction bids or beginning construction until certification of approval of final plans and specifications has been received from the District.

3.04 Construction Procedures**.** Following final approval of the plan(s) by the District, the Applicant may proceed with construction. In addition, to all construction requirements contained in other portions of the Specifications, the Applicant and their Contractor shall observe the following:

A. A mandatory pre-construction meeting shall occur 48 hours prior to any excavation. Participants may include, but are not limited to, the following: Representatives of the Contractor, Excavator, Engineer, Applicant and District.

B. In the event that said construction does not commence within 6 months of the approval date, the plans must be resubmitted for review and approval. If construction on the main installation is halted for more than 6 months, plans must be resubmitted for review and approval.

3.05 Record Drawings. Two sets of record drawings, one set of drawings in an acceptable electronic format and the AutoCAD file of the project shall be submitted to the District within 30 days of completion of construction. The record drawings shall be prepared according to the following general requirements:

A. A certified survey shall be provided to the District that shall show the location of the sewer line to permanent physical objects located in the field. All valves, tees, curb boxes, hydrants, storage tanks and pump stations and other major appurtenances shall be given two swing ties to a physical permanent object in the field. In all cases, the distance from sewer line and appurtenance items shall be dimensioned to rights-of-way easements and property lines.

B. The benchmarks or benchmarks used on the project to determine sewer line depth shall be shown on the drawings and shall be based on U.S.G.S datum.

C. All sewer lines shall have manhole rim and invert elevations, percent slope and horizontal distance of each line between manholes shown. Sewer service lines stubbed to property lines shall have two swing ties provided to permanent objects and shall be marked with fence posts.

D. Manufacturer's literature and product data, including catalog sheets and descriptive literature for all materials and equipment used, shall be provided with record drawings.

E. CADD files shall be submitted to the District in AutoCAD format, either on an

acceptable electronic media or e-mailed. Data shall contain GPS points that can be easily incorporated into the District's GIS database.

F. All sewer main lines 8 inch or larger shall be televised. The video shall have a running footage meter showing the exact footage from the entry manhole. The video shall be provided with a log showing the location of all defects and service lines.

End of Section I

II. WATER TRANSMISSION AND DISTRIBUTION LINES

1.00 GENERAL

1.01 Scope. This section shall include all materials, labor, equipment and miscellaneous items necessary to install all raw water, potable water transmission and distribution pipelines and appurtenances as specified herein for the Roaring Fork Water and Sanitation District.

1.02 Protection of Work. All pipe, fittings, valves and equipment shall be carefully handled, stored and protected to prevent damage to materials, protective coatings and linings. At no time shall such materials be dropped or dumped into the trench.

Precautions shall be taken to prevent foreign matter from entering the pipe, fittings and valves prior to and during installation. No debris, tools, clothing or any other material shall be placed in the pipe during installation. Whenever pipe installation is suspended, either temporarily or overnight, the open end of the pipe shall be sealed with a watertight plug to prevent the entrance of trench water, debris or foreign matter into the pipeline system.

Under no circumstances shall trench water be allowed to enter the pipeline. When water is present in the trench, the plug shall remain in place until the trench is pumped dry. Whenever trench water becomes evident, measures shall be taken to prevent pipe flotation.

If, in the opinion of the Engineer, the Contractor is incapable of keeping the pipe free of foreign matter during installation, the Engineer shall require the Contractor to protect the pipe ends with water tight plugs until the start of the joining operation.

2.00 MATERIALS

2.01 General. This item covers the types of materials that will be required for the construction and installation of water lines. All materials used shall be new, of the best quality available, and conform to applicable standards as indicated herein.

2.02 Ductile Iron Pipe and Fittings.

A. Ductile Iron Pipe.

1. Reference Standard - ANSI, 21.51/AWWA C151, latest revision.

2. Thickness Class - Minimum Class 52 unless design conditions warrant higher-class pipe.

3. Pipe joints shall be push-on joints except where specifically shown or detailed otherwise.

4. Restrained joint pipe shall be Griffin Snap Lok or approved equal.

B. Fittings.

1. Type - All fittings shall be mechanical joint except where specifically shown or detailed otherwise.

2. Reference Standard - ANSI/AWWA C153 for flanged mechanical joint and push-on joints (3 inch - 24 inch).

3. Material - Ductile iron.

4. Pressure Rating - 350 psi.

C. Joints.

1. Mechanical, Reference Standard - ANSI A 21.53/AWWA C153 (latest revision).

2. Push-on, Reference Standard - ANSI A 21.52/AWWA C153, latest revision.

3. Flanged, Reference Standard - ANSI B 16.1, Class 125, latest revision.

D. Gaskets.

1. Type - Rubber ring gaskets shall be suitable for the specified pipe sizes and pressure.

2. Reference Standard - AWWA C111, latest revision.

3. Lubricant - A non-toxic vegetable soap lubricant shall be supplied with the pipe.

E. Protective coatings – Refer to Detail 1.

1. Underground Service - Manufacturer's standard bituminous coating - minimum 1 mil thickness.

2. Polyethylene Film Envelope - Polyethylene encasement shall conform to AWWA C105, latest edition, or ANSI A.21.5. Film shall be Class C with a nominal thickness of 8 mils. Tape for securing the film shall have a minimum thickness of 8 mils and a minimum width of 1 inch. The polyethylene film shall be free of streaks, pinholes, tears or blisters.

F. Protective Lining.

1. Type - Cement mortar.

2. Reference Standard -ANSI A 21.4/AWWA C104, latest revision.

3. Thickness - Standard.

G. Couplings.

1. Style - Solid sleeve.

H. Tracer Wire

1. Tracer wire shall be 12 gauge or larger, insulated, stranded copper installed on all water mains. All splices shall be watertight and underground.

3.00 INSTALLATION

3.01 General. All transmission and distribution lines to be dedicated to the Roaring Fork Water and Sanitation District, shall be located a minimum of ten feet inside a public easement. The location of water lines within side lot line easements or rear lot easements is discouraged. Refer to Detail 11.

When site conditions allow, the water line should be located outside paved areas. At all times, water lines shall be located so that District maintenance personnel can easily maintain and operate those lines.

Easements or rights-of-way used during installation of water mains shall be a minimum width of 25 feet, 12.5 feet on either side of centerline. In dredge areas and other special conditions, a wider easement may be required.

3.02 Pipeline Depth. The minimum depth of bury of water mains shall be as follows: (Depth of bury equals depth to top of pipe).

A. Mains shall be buried a minimum depth of 5.5 feet or 66 inches (below existing or proposed grade) in all locations.

B. When water mains are to be located underneath storm drains, culverts or any other submerged air space, the required depth of bury shall be 5.5 feet deeper than crossing elevation. This is necessary to ensure that the water line is beyond the frost depth associated with the storm drain culvert, etc. In some cases, the District engineer may allow insulation in place of increased depth where water lines cross under one of the above.

3.03 Cleaning and Inspection. Clean all pipe, fittings, valves and related materials thoroughly of all foreign material; inspect for cracks, flaws, or other defects prior to installation. Mark all defective, damaged or unsound materials with bright marking crayons or paint and remove from job site. Of particular concern should be the gasket groove in the pipe bell. All spurs, excess paint, and any other defects within the gasket groove shall be either removed or repaired, or the pipe shall be deemed unacceptable.

The Contractor shall take all necessary precautions to prevent any construction debris from entering the water lines during construction of water lines and appurtenances. If debris shall enter the distribution system, the Contractor shall furnish all labor and materials necessary to clean the system. Under no circumstances will the Contractor flush the debris into an existing distribution system.

3.04 Installation. Pipe shall be laid in straight sections with bell ends facing the direction of laying unless otherwise directed by the District. Where pipe is laid on grade of 1% or greater, the installation shall proceed uphill with the bell ends facing upgrade. The pipeline shall be installed so that a continuous positive or negative grade is maintained between high and low points to avoid air pockets. At no time will a high point in the line be acceptable unless an air and vacuum valve is installed to relieve air pockets. Jointing of the pipe shall be made in accordance with the directions of the manufacturer of the pipe and the manufacturer of the couplings. The allowable pipe deflection per joint shall not exceed the maximum deflection tolerances specified by the manufacturer.

Pipe shall be lowered into the trench with ropes, slings or machinery. Under no circumstances should the pipe be pushed off the bank and allowed to fall into the trench.

In joining the pipe, the exterior four inches of the pipe end (at the spigot), and the inside of the adjoining bell shall be thoroughly cleaned to remove oil, grit, tar and other foreign material. The gasket shall be placed in the bell so it will spring into its proper position inside the pipe bell. A thick film of the non-toxic joint lubricant shall be applied over the entire surface of the gasket. The spigot end of the pipe shall then be wiped clean and inserted into the bell to contact the gasket. The pipe shall be pushed all the way into the bell by crowbar or by jack and choker slings. Extreme care shall be exercised when joining the pipe to avoid damaging the bell or rolling the gasket. The bell end of the pipe shall be protected by a piece of wood when pushing the pipe. Generally, every pipe has a depth of insertion stripe on the spigot end. The pipe shall be inserted to the full depth of the stripe. Check bells for rolled gasket with feeler gauge.

The cutting of pipe for fittings or closure pieces shall be done in a neat and workmanlike manner to prevent damage to the pipe or lining. All cuts should leave a smooth end at right angles to the axis of the pipe. Flame cutting on pipe, by means of an oxyacetylene torch, will not be allowed. Once a pipe is cut, the cut end shall be beveled free of spurs, which may damage rubber gaskets.

3.05 Connection to Existing Water Facilities. All main line connections between existing and proposed piping shall be made during non-business hours or at a time, which is acceptable to the District. All shut-offs shall be planned 24 hours in advance and all persons affected by the shut-off shall be given a 24-hour notice. Take all precautions to prevent contamination when making connections to existing potable water lines. No trench water, mud, or other contaminating substances shall be permitted to enter the pipeline.

3.06 Future Connections. At intersections, dead-end runs, or other locations where the possibility may exist for a future connection, a tee or cross and a valve should be provided. In addition, the stub out must extend to the property line. This procedure allows a future connection to be made while keeping the existing main line in service at all times. In each case, the valve shall be properly restrained to the tee or cross, using restraining rods with eyebolts. In addition, a concrete reaction block will be placed on the plugged end of the valve.

3.07 Protection of Water Supplies. Water lines shall be located a minimum of 10 feet horizontally from existing or proposed sewer mains. Wherever the sewer line crosses above or within 18 inches beneath the water lines, the sewer line shall be made impervious by any of the three methods listed below also refer to Detail 13:

A. **Method 1.** Twenty feet of AWWA DR18 C-900 PVC, shall be used for sewer pipe and centered over the water main. The joints between the sewer pipe and the placement

pipe (DIP or PVC) shall be encased in a concrete collar. The concrete collar will be a minimum of 1 foot thick, centered on the joint.

B. **Method 2.** Twenty feet of AWWA DR18 C-900 PVC, shall be used for sewer pipe and centered over the water main. The joints between the sewer pipe and the placement pipe (DIP or PVC) shall be sealed with solid sleeves with transition gaskets.

C. **Method 3.** The sewer pipe shall be reinforced with concrete encasement. The encasement shall be at least six inches thick on either side of the water main, and extend 10 feet each side of the water main. In all cases, select granular backfill shall be used to prevent any settling of the higher pipe.

All work should be in strict conformance with the Colorado Department of Health's *"Design Criteria for Potable Water Systems".*

3.08 Reaction Anchor and Blocking. Concrete thrust blocks shall be provided as shown in Detail 2 for all tees, elbows, plugs, reducers, valves, fire hydrants, and crosses if one or more sides of the cross are plugged. The bearing area of the block shall be at least equal to that stated on the attachment. The bearing surface shall be against undisturbed earth. The block shall be placed normal to the thrust as show on the drawings. Concrete for thrust blocks shall have a 28 day 3,000 psi compressive strength. (NOTE: No other materials other than concrete may be used in thrust blocks).

If the concrete has not had sufficient time to cure (e.g., restoring water service), the Contractor shall be required to use temporary bracing for added strength. Use of additional wood bracing will help prevent fitting and valves from leaking or "blowing off" when water pressure is restored to the main line.

Whenever a concrete thrust block is placed, wood or plastic sheets shall be used to prevent concrete from adhering to nuts and bolts. Any concrete splattering onto a nut or bolt will be removed before the line is backfilled.

3.09 Tracer Wire. Electrical tracing wire shall be required on all water mains. The wire shall be taped to the top of the pipe at 10 foot intervals to prevent dislocation of the wire during backfilling. The tracer wire shall be extended to the surface at all valves and fire hydrants. The wire shall be extended towards the ground on the outside of the valve box until the wire is within 4 inches of the top of the lid, at which point it shall be brought back inside the box and securely fastened. Sufficient slack in the outside of the wire shall be provided to compensate for any future adjustment to the valve box. The tracer wire shall be continuity tested prior to acceptance of the pipeline.

4.00 SIZING OF MAINS

4.01 General. All main water lines shall be sized for peak hour flow plus fire flows required by the Carbondale Rural Fire Protection District at a 20 psi residual flow. Minimum size shall be 8 inches in diameter.

End of Section II

III. WATER SERVICE LINES AND APPURTENANCES

1.00 GENERAL

1.01 Scope. This section shall include furnishing all materials, labor, equipment and miscellaneous items necessary to install all water service lines and appurtenances as specified herein for the District. Note: The District will own and maintain that portion of the service line from the main line up to and including the curb valve. The curb valve shall be placed on the property line; however, at all times, it will fall on the District side of the property line. All work and materials from the curb valve to the building shall be in conformance to the most recently adopted Uniform Plumbing Code.

2.00 MATERIALS

2.01 Copper Service Pipe.

A. Reference Standard - ASTM B88, latest revision, Type K soft.

B. Size - See 3.06 below.

C. Do not use any pipe lubricants for service line fittings.

2.01 Eagle Pure Core HDPE Service Pipe.

A. Reference Standard - AWWA C901, latest revision.

B. Material - SDR9 CTS, HDPE 2408, ASTM D2239 and ASTM D2737.

C. Size - See 3.06 below.

2.03 Corporation Stops.

A. Material - Brass or bronze.

B. Size - Same as copper service line.

C. Reference Standard - AWWA C800, latest revision.

D. Inlet - Threaded CC type.

E. Outlet - Compression fittings.

2.04 Service Saddles.

A. Materials - Bronze service clamp, 'O' ring gasket, double strap, IPS thread.

B. The District will require saddles to be installed.

2.05 Curb Stop.

A. Materials - Cast bronze body, resilient 'O' ring seals, standard tee head operator, Teflon ball valve type.

B. Inlet - Compression fitting.

C. Outlet - Compression fitting.

D. Standard reference AWWA C800, latest revision.

E. Manufacturer's reference - Mueller B25204.

2.06 Curb Box.

A. 0.75 inch to 1 inch, Manufacturer's reference - Mueller H-10314 or equal.

B. 1.25 inch to 1.5 inch, Manufacturer's reference - Mueller H-10336 or equal.

C. Curb box must be traffic rated when located within traffic areas.

2.07 Couplings.

A. Materials - Compression fittings.

3.00 INSTALLATION

3.01 Service Line Installation. All trenching, backfilling and compaction shall conform to Section VI of these regulations. All service lines shall be disinfected and pressure tested as per Sections VII and VIII of these regulations. Refer to Detail 3.

3.02 Service Line Depth. A depth of bury for all service lines shall be a minimum of 5.5 feet.

3.03 Tapping Pressurized Mains. All 0.75 inch – 1.5 inch taps on pressurized mains shall be made by the District. Those greater than 1.5 inches shall be performed by others with acceptable tapping equipment.

3.04 Tapping Unpressurized Mains. All taps on unpressurized mains (new subdivision mains) shall be performed by the District. Upon special request, District may allow Contractor to tap main.

3.05 Permits. A road cut permit for excavation in Garfield County streets, alleys and easements must be completed prior to tap. Forty-eight hour notice is required by the District prior to making taps and locating lines. Taps and locations will not be done without a water application filled out by Customer.

3.06 Service Line Sizing. Service lines are to be sized by Customer but the maximum copper service line allowed will be 1.5 inches. The maximum allowed HDPE service line will be 2 inches. The customer is encouraged to have an engineer size the service line. The District will not provide this service.

3.07 Tracer Wire. Electrical tracing wire shall be required on all service lines. The wire shall be taped to the top of the pipe at 10 foot intervals to prevent dislocation of the wire during backfilling. The tracer wire shall be extended to the surface at all curb stops. The wire shall be

extended towards the ground on the outside of the curb box until the wire is within 4 inches of the top of the lid, at which point it shall be brought back inside the box and securely fastened. Sufficient slack in the outside of the wire shall be provided to compensate for any future adjustment to the curb box. The tracer wire shall be continuity tested prior to acceptance of the pipeline.

3.08 Final Inspection. The final inspection shall be scheduled with the District forty-eight hours in advance. The inspection will include inspection of the service connection, water meter, backflow device, rain sensor, curb valve and sewer cleanout.

4.00 METERS

4.01 Type. Magnetic drive, sealed register, radio read meter interface unit. Turbo meters for 3 inch and larger.

4.02 Manufacturer's Reference. Neptune T10 Brass Meter with E-coder and Radio Read MIU

4.03 Installation. Install all meters in a horizontal position with a suitable holding device to support piping, meter and provide electrical bond when meter is taken out for testing. Pre-manufactured holding devices or yolks are available which cut down labor time to install meter. Install in building where meter and pressure reducing valve will not freeze. Upon final inspection, if the meter is not able to be read by radio from the street, the MIU may need to be relocated on an outside wall at least six feet above grade where it is freely accessible and where falling or melting snow will not cover it (stucco construction can prevent the meters from being read by radio).

Turbine meters should be installed with five pipe diameters upstream or downstream of bends, valves, PRV's, check valves or any other fitting that causes turbulence.

4.04 Meter Inspection. The water meter must be inspected by the District at final inspection after it is installed and before the Certificate of Occupancy is issued.

5.00 PRESSURE REDUCING VALVE (PRV) (Required in-house)

5.01 Manufacturer's Reference. Watts U-5-B or equal.

5.02 Installation. Install upstream of the meter on 1 inch and 0.75 inch meters only. Install downstream of the meter for 1.25 inch and larger meters. Allow for easy access to strainer and cleanout plug.

5.03 Pressure Testing. Downstream pressure to be set at 40 to 75 psi.

5.04 Inspection. PRV will be inspected during final inspection.

6.00 CHECK VALVE

6.01 Type. Rubber seat and spring assist.

6.02 Manufacturer's Reference. Ford H series or equal.

7.00 BACKFLOW PREVENTION DEVICE

7.01 Type. Double check backflow preventer or as required by state law

7.02 Manufacturer's Reference. Febco

7.03 Installation. Backflow prevention device must be installed after the meter.

7.04 Inspection. Backflow preventer will be inspected during final inspection.

End of Section III

IV. FIRE PROTECTION FACILITIES

1.00 GENERAL

1.01 Scope. This section shall include furnishing all materials, labor, equipment and miscellaneous items necessary to install fire hydrants as specified herein for the Roaring Fork Water and Sanitation District.

2.00 MATERIALS

2.01 Fire Hydrants.

A. Type - Dry barrel, traffic model with breakaway flange bolts and coupling.

B. Reference Standard - AWWA C502, latest revision

C. Outlet Size - One 4.5 inch NST, two 2.5 inch NST

D. Hydrant Size – 5.5 feet or greater, from bury line to top of pipe

E. Inlet Size - 6 inch

F. Operation – 1.5 inch pentagonal national standard operating nut, open counter-clockwise, lubricating reservoir.

G. Depth of Bury – 5.5 feet minimum

H. Additional Requirements - Furnish hydrant complete with pipe and tee, 6 inch restrained mechanical joint gate valve and thrust blocks. Hydrant shall be restrained to the hydrant tee by 0.75 inch threaded rods protected from corrosion by the use of an approved bituminous coating. Furnish hydrant with bronze seat and lubrication reservoir. If the hydrant valve is located at the main then a 6 inch MJ x MJ swivel tee shall be used.

J. Manufacturer's Reference - "Mueller" Centurion A423
"Kennedy" K-81A Guardian

K. Color - Hydrant to be painted red above the bury line.

L. Pressure Rating - 250 psi

3.00 INSTALLATION

3.01 Hydrant Spacing. The development density and type of development shall determine the spacing of fire hydrants that each hydrant is to serve. In a low-density residential area, the maximum spacing of fire hydrants shall not exceed 500 feet. In medium to high-density residential areas, the maximum spacing shall not exceed 400 feet. In commercial and high-risk areas, the spacing shall not exceed 300 feet. The maximum distance from commercial buildings to hydrants shall be 150 feet, and shall be based on hose length.

3.02 Location. Fire hydrants shall be located whenever possible at an intersection and in a public right-of-way or a utility easement. There shall be a minimum of 1.5 feet between outlet nozzle and back of curb or sidewalk. In all cases, hydrants shall be located out of the direct flow of pedestrian and vehicular traffic. Wherever possible, hydrants located consecutively along a street shall be placed on opposite sides of the street so that stringing fire hoses across a street during a fire can be kept to a minimum. Hydrants shall be placed at all intersections, at end of cul-de-sacs and at all dead-end runs. Hydrant location shall be approved by Carbondale Rural Fire Protection District.

3.03 Installation. The bury line shall be located at finished grade. If the previously mentioned conditions are not met after the hydrant is installed and the street is at final grade, the hydrant must be brought to proper grade by installing extensions or other modifications as required. Bag all hydrants that are not in service. If the hydrants have been accepted by the District and the hydrant needs to be raised due to Homeowner landscaping problems then the cost of the hydrant raising will be the responsibility of the homeowner. Refer to Detail 4.

3.04 Hydrant Appurtenances. All fire hydrants shall be connected to the main line by means of a mechanical joint tee with 6 inch Class 52 ductile iron pipe branch piping to hydrant. Each fire hydrant shall have a 6 inch valve on the branch pipe conforming to standards as outlined under Section V of these standards. The 6 inch gate valve shall not be located in the sidewalk, curb line, or gutter of the proposed street and shall be rodded to the main tee. Refer to Detail 4.

3.05 Hydrant Restraint. The hydrant shall be restrained to the main line with 0.75 inch all-thread rod extending from the main line tee to the 6 inch valve and then from the 6 inch valve to the hydrant. The 0.75 inch rods shall be tied to each joint with the use of eyebolts. A bitumastic coating (to prevent corrosion) shall be liberally applied to the all thread rod and eye bolts. In addition, the hydrant and main line tee shall be provided with concrete thrust blocks. Refer to Detail 2.

3.06 Dry Barrel Type Drainage. All hydrants shall be provided with a minimum of 0.33 cubic yard of 0.75 inch screened, crushed rock and shall be placed under the weep hole outlet to assure proper drainage. The crushed rock shall be encased in separator fabric to prevent the mitigation of fines. Prior to the screened rock being placed under the weep hole outlet, the area around the weep holes on the hydrant will be covered with plastic sheeting allowing enough room under the sheeting for the hydrant to drain and also preventing concrete from entering the weepholes.

3.07 Inspection. Prior to backfilling around the hydrant, a visual test shall be conducted to ensure the proper operation of the weep holes. The hydrant shall be partially opened and then closed. Water trapped in the hydrant barrel section should begin to drain. If water is not draining, the well holes should be cleared of any obstructions restricting the flow of water.

End of Section IV

V. VALVES

1.00 GENERAL

1.01 Scope. This section shall include furnishing all materials, labor, equipment, and miscellaneous items necessary to install gate valves, butterfly valves, air release and vacuum valves, and valve boxes as specified herein for the Roaring Fork Water and Sanitation District.

2.00 GATE VALVES

2.01 Materials.

A. Resilient seat.

1. Size - As shown on plans up to 12 inch (14 inch and larger shall be butterfly valves).

2. Reference Standard - AWWA C509, latest revision.

3. Style - Body, bonnet, and wedge: Cast iron, ASTM A126, Class B or Ductile iron, ASTM A536 Grade 65-45-12.

4. Pressure Rating - 200 psi.

5. Wrench Nut - Two-inch square, open by turning to the left (counter-clockwise).

6. Stem - Non-rising.

7 Manufacturer's Reference - Mueller.

2.02 Location. Whenever possible, water main valves shall be located at street intersections. Valves must be placed on all runs of a tee or cross. For instance, each cross shall have four valves located at the intersection while tees shall have three valves located at the intersection. Valves shall be located at the intersection. Valves shall be located at the end of all dead-end intersections for future connections.

2.03 Valve Spacing. Valves on cross-connecting or looped mains shall be spaced such that no single break shall require more than 500 feet of line to be out of service at one time. All distribution mains connecting to transmission mains must be valved at the tie-in.

2.04 Installation. All gate valves shall be installed with the 2 inch operating nut plumb and true with the vertical and centered within the valve box. District personnel will inspect the valve and valve box after installation to ensure that a valve key can easily be set on the operating nut. The operating nut shall be within 6 feet of finished grade or an extension must be provided attached to the nut. Refer to Details 5 and 6.

3.00 BUTTERFLY VALVES

3.01 Materials.

A. Reference Standard - AWWA C-504, latest revision.

B. Type - Rubber-seated, tight closing type.

C. Ends - Both ends shall be mechanical joint for direct bury. Valves in vaults shall be flanged.

D. Valve Body - Shall be high strength cast iron ASTM A 126, Class B with 18-8 type 304 stainless steel body seat.

E. Operator - Valve operator shall be of the traveling nut type, sealed, gasketed and lubricated for underground service. Operating nut shall be two-inch square and shall open left (counter clockwise).

F. Rated Working Pressure - Class 150B, 150 psi. Above 150 psi working pressure, use Class 250B or equal.

G. Manufacturer's Reference - Mueller Line Seal III.

4.00 AIR RELEASE AND VACUUM VALVES

4.01 General. This specification covers all air release, vacuum valves or combination air release valves. The type of valve used shall be dependent upon the conditions under which it will operate.

4.02 Materials.

A. Size - To be designed by Engineer for proper application.

B. Body - Cast iron.

C. Float - Stainless steel.

D. Seat - Buna-N.

E. Pressure Rating - 200 psi.

4.03 Locations. Air release, vacuum valves or combination air release valves shall be installed on transmission and long distribution lines to permit efficient filling or draining of long pipelines. In addition, they should provide protection against vacuum and shall continuously vent pockets of air accumulated in the pipeline. The type of valve shall depend upon the intended use of operation.

4.04 Installation. Air release, vacuum valves or combination release valves shall always be installed at the extreme high point of the distribution or transmission line. These valves shall be installed in a precast manhole vault with the fitting as shown in Detail 7.

5.00 VALVE BOXES

5.01 Materials.

A. Material - Cast iron.

B. Type - Three piece, screw type.

C. Size – 5.25 inch diameter.

D. Cover - Deep socket type with the word "Water" cast in the top.

E. Base - No. 160 type with 20.5 inch wide oval base.

F. Valve Markers - For valves that fall outside of road pavement and shoulders, install a 6 foot long, green "carsonite" marker or green metal “T” stake on all new valves. Marker shall have valve decal at top.

5.02 Installation. Valve boxes shall be installed plumb and true, and centered over the 2 inch operating nut. Bricks shall be placed under the flange of the valve box bottom so that at no time loadings on the valve box will be transmitted to the valve. Valve box lid to be placed 0.25 inch - 0.5 inch below grade when located in asphalt or concrete. A debris cap shall be installed as close as possible to the cast iron cap without interfering with the operation of the cap. Refer to Details 5 and 6.

End of Section V

VI. TRENCHING, BACKFILLING AND COMPACTION

1.00 GENERAL

1.01 Scope. This section shall include all labor, materials, equipment, and miscellaneous items necessary to perform all excavation, backfilling and compaction of underground waterlines and appurtenances as specified herein for the Roaring Fork Water and Sanitation District.

It shall be the Contractor's responsibility to secure all required excavation permits and pay all costs thereof.

1.02 Protection of Work.

A. All excavation shall be protected by barricades, lights, signs, etc., as required by governing federal, state and local safety codes and regulations. Under no circumstances will more than 20 feet of trench be left open at night. Any trench left open at night will be protected by a temporary snow fence barricade and reflective tape.

B. Sheeting, Shoring and Bracing - Where trench walls are not excavated at a stable slope, the Contractor shall provide and maintain sheeting sufficient to prevent caving, sliding or failure and property or bodily damage.

Under normal construction conditions, sheeting shall be removed as work progresses. Sheeting shall remain installed if directed by the District or if pipe does not have sufficient strength to support backfill based on trench width as defined by the sheeting.

The Contractor shall be held solely responsible for any violations of applicable safety standards. Particular attention is called to minimum requirements of OSHA and State of Colorado Occupational Safety and Health laws.

C. Site Drainage - Excavation to be protected from surface water at all times.

2.00 MATERIALS

2.01 Embedment Materials. Pipeline embedment materials shall comply with the appropriate material as listed below and as illustrated in Detail 8.

A. Class 6 Aggregate Base Course - Use for all distribution and transmission mains. In addition, use for all water service lines. Densely compacted 0.75 inch Class 6 aggregate, 4 inches below bottom of pipe with densely compacted 0.75 inch Class 6 aggregate to 12 inches above top of pipe.

2.02 Backfill Material.

A. Characteristics - made of materials free from debris, organic matter from frozen material. Uniformly graded sufficient to allow proper compaction.

B. No boulders greater than 6 inches in diameter in top 12 inches of backfill; bottom, 12 inches; or sides, 12 inches.

Generally, no boulder greater than 12 inches in diameter in remainder of trench.

3.00 METHODS AND PROCEDURES

3.01 Site Preparation.

A. Clearing - Remove all vegetation, stumps, roots, organic matter, debris and other miscellaneous structures and materials from work site.

B. Topsoil Removal - Strip existing topsoil from all areas to be disturbed by construction. Topsoil to be stockpiled separately from excavated materials.

C. Pavement Removal - Asphalt and bituminous pavements to be cut to the full depth of pavement. The vertical face of the cut shall be a straight line parallel to the limit of excavation. Cuts shall be made with a flat-bladed air hammer, concrete saw, or as approved by the District Operator. The method used should provide a straight, true cut. All asphalt located within trench limits to be hauled off site.

Concrete pavements, including curbs, gutters and sidewalks, to be saw cut to the full depth of pavement at the nearest construction joint. The vertical face of the cut shall be a straight line parallel to the limit of excavation.

All pavement removal shall be disposed of off site. Broken pavement shall not to be used in backfill material.

3.02 Trench Excavation.

A. Limits of Excavation - Trenches to be excavated along lines and grades as approved by the District. Trench widths for pipe loading shall be measured 12 inches above top of pipe.

Minimum trench width shall be the outside diameter of the pipe or conduit plus 16 inches.

Maximum trench width to be the outside diameter of the pipe or conduit plus:
(1) 24 inches for outside pipe diameter of 24 inches or less.
(2) 30 inches for outside pipe diameter of greater than 24 inches.

Trench excavation shall not to be completed more than 100 feet in advance of pipe installation. Backfill shall be completed within 20 feet of pipe installation by the end of any working day.

B. Groundwater Control - Contractor to maintain facilities on site to remove all groundwater from trench. Water shall be kept at least 12 inches below the trench bottom, to a point such that a firm base for pipe or conduit installation exists.Facilities shall be maintained until all concrete is cured and backfilling is in

place at least 24 inches above anticipated water levels before water removal is discontinued. All water removal shall be subject to approval by the District.

C. Stockpile Excavated Material - Excavated material to be stockpiled so as to not endanger the work or public safety. Maintain existing vehicular and pedestrian traffic with minimum disruption. Maintain emergency access and access to existing fire hydrants and water valves. Maintain natural drainage courses and street gutters.

3.03 Bottom Preparation.

A. Where soils are suitable and have adequate strength, bottom to be graded and hand-shaped such that the pipe barrel rests uniformly on embedment material.

B. Bell Holes - Material to be removed to allow installation of all fittings and joint projections without affecting placement of pipe.

C. Over-Excavation - Whenever trench is over-excavated to eliminate point bearing rocks or stones or when undisturbed grade tolerances of 0.1 foot is exceeded, the Contractor is to re-establish grade using aggregate bedding materials.

D. Unstable Materials - Materials that are not capable of supporting super-imposed loadings are defined as unstable materials. Should unstable materials be encountered during excavation, immediately notify the District. If unstable material is encountered, the trench bottom shall be over-excavated (minimum 6 inches) and backfilled with clean 2 inch to 6 inch rock with filter fabric installed around it to prevent migration of fines. The rock backfill provides increased water movement and helps stabilize the trench bottom.

E. Rock Excavation - Rock shall be removed to a 4-inch depth below in bottom pipe grading. Additionally, all rock loosened during jacking, blasting, etc., shall be removed from the trench.

3.04 Backfilling.

A. Tamping Equipment - Except immediately next to the pipe, mechanical or air operated tamping equipment is to be used. Hand equipment, such as T-bar, is to be used next to pipe if necessary. Care is to be taken when compacting under, alongside and immediately above pipe to prevent crushing, fracturing, or shifting of the pipe. The Contractor is to note densities required for materials being backfilled and shall use appropriate approved equipment to obtain those densities.

B. Moisture Control - Generally, maintain moisture of the backfill material within 2% of optimal moisture content as determined by ASTM D 698. Maintain close tolerances as needed to obtain densities required.

C. Compaction - Maximum density (100%) based upon ASTM D698 or AASHTO T99.

1) Bedding Material. Includes material used for over-excavation of any kind: 95% Standard Proctor.

2) Select Material: 95% Standard Proctor.

3) Backfill beneath existing or proposed pavements, roadways, sidewalks, curbs, utility lines and other improvements or within 5 feet horizontally of such improvements 95% Standard Proctor.

4) Backfill within public or designated right-of-way: 90% Standard Proctor or as shown on the Drawings for those areas outside of No. 3 above.

5) Backfill within undeveloped, green or designated area: 85% Standard Proctor.

D. Placing Backfill - The maximum loose lifts of backfill material to be as follows (use smaller lifts where necessary to obtain required densities):

1) Bedding and select material: 6 inches;

2) Backfill Material: 12 inches where 95% compaction required; 24 inches where less than 95% compaction required.

E. Maintenance of Backfill - Contractor to maintain all backfill in a satisfactory condition during the extent of the contract and warranty period. The Contractor will be responsible for repairing any deterioration or settlement of the road surface. The District will issue notification of the required repairs. All costs for repair and all liability, as a result of surface deterioration or settlement, shall be the responsibility of the Contractor.

3.05 Surface Restoration. All existing surface improvements and site disturbed or damaged during construction to be restored to a condition equal to pre-construction condition. All restoration costs are considered incidental to the excavation and backfill.

A. Improvements - Replace, repair or reconstruct all improvements as required. Work will not be accepted until the District accepts restoration and all affected property owners. Improvements include, by example, other utilities, culverts, structures, curb & gutter, mailboxes, signs, etc.

B. Roadways - All roadways to be restored to original condition with the following minimum depths required:

1) Minimum base course material on gravel roadways or minimum depth gravel on hard surface roadways to be 12 inches.

2) Minimum bituminous surfacing to be 3 inches.

3) Minimum concrete paving to be 6 inches.

C. If any pavement, street, shrubbery, sod, rock, fences, poles or other property surface structures have been damaged, removed or disturbed by Contractor or subcontractor of Contractor, whether deliberately or through failure to employ standards, such property and structures shall be replaced or repaired to the

District's satisfaction, at the expense of the Contractor.

4.00 QUALITY CONTROL - FIELD

4.01 Compaction. It should be fully understood that it will be the sole responsibility of the Contractor to achieve the specified densities for all embedment and backfill materials placed. Contractor will be responsible for ensuring that correct methods are being used for the placement and compaction of said materials. Correct backfill methods include, but are not limited to:

A. Use of proper equipment for existing soil condition encountered.

B. Moisture content of existing soils; determination if water should be added or if soil should be air-dried to reduce moisture content.

C. Thickness of backfill lift.

Contractor may, at their own expense, have an approved geotechnical engineer monitor the methods of backfill and compaction used to ensure that the desired densities are being obtained.

4.02 Inspection and Testing. Inspection and testing to be performed at the direction of the District. Contractor to cooperate fully with all persons engaged in testing. Contractor shall excavate as required to allow testing. Contractor shall backfill all test excavations in accordance with these regulations.

4.03 Density Testing and Control.

A. Reference Standards - Density/moisture relationships to be developed for all soil types encountered according to ASTM D698 or AASHTO T99.

B. Field Testing - Testing for density during compaction operations to be done in accordance with ASTM D2922 using nuclear density methods.

C. Frequency of Testing - Minimum of one (1) test for each 100 feet of trench or as directed by the District. Contractor to excavate to depths required by Engineer for testing and backfill test holes to density specified. Testing to be paid for by the Contractor.

End of Section VI

VII. PRESSURE TESTING AND FLOW TESTING

1.00 GENERAL

1.01 Scope. This section shall include furnishing all materials, labor, equipment and miscellaneous items necessary to perform pressure and leakage tests all distribution, transmission and service lines as specified herein for the District.

1.02 Hydrostatic Tests. Pressure and leakage tests shall be conducted on all newly laid pipe and service lines. Contractor to furnish all the necessary equipment and materials to conduct the test. Contractor shall test through fire hydrants if possible and will be responsible for installing the appropriate taps as approved by the District engineer if a hydrant is not available used.

The test shall be conducted between valved sections of the pipeline, or as approved by the District. Water service lines will be tested up to the closed curb stop. A visual inspection of the water service connection, at the water main and at the curb stop, will be performed to check the leakage; thus, Contractor shall not backfill the corporation and curb stop connections until inspection by District representative has been completed and accepted.

Furnish the following equipment and material for the tests:

Amount	Description
2	Approved graduated containers.
2	Pressure gauges.
1	Hydraulic force pump approved by the District.
1	Additional 0.75 inch pressure tap for District's gauge.
1	Suitable hose and suction pipe as required.

Conduct the tests after the trench has been backfilled or partially backfilled with the joints left exposed for inspection, or when completely backfilled, as permitted by the District. Where any section of pipe is provided with concrete reaction blocking, do not make the pressure tests until at least 5 days have elapsed after the concrete thrust blocking is installed. If High-Early cement is used for the concrete thrust blocking, the time may be cut to 2 days.

Conduct pressure test in the following manner unless otherwise approved by the District: After the trench has been backfilled as specified, fill the pipe with water, expelling all air during the filling. The test pressure shall be 1.5 times normal static system working pressure of the pipe at the point of lowest elevation (test minimum 150 psi).

A. Duration

1. The duration of each pressure test shall be two hours, unless otherwise directed by the District.

B. Procedure

1. Slowly fill the pipe with water and allow to stand for 24 hours. Expel all air from the pipe. Apply and maintain the specified test pressure by continuous pumping in necessary for the entire test period. The test pressure shall be calculated for the point of lowest elevation, or as specified by the District. The pump suction shall be in a barrel or similar device, or metered so the amount of water required to maintain the test pressure may be measured accurately.

2. Before the line is pressurized, the District shall verify that all the necessary main line valves are open or closed with regard to the section of line being tested. In addition, the District shall verify that all hydrant valves are open.

C. Leakage

1. Leakage shall be defined as the quantity of water necessary to hold the specified test pressure for the duration of the test period. No pipe installation will be accepted if the leakage is greater than the number of gallons per hour as determined by the following formula:

$$L = \frac{SD\sqrt{P}}{148{,}000}$$

In the above formula:

L = Allowable leakage, in gallons per hour.
S = The length of pipe being tested, in feet.
D = Nominal diameter of pipe, in inches.
P = Average test pressure during the leakage test, in pounds per square inch gauge.

D. Correction of Excessive Leakage

1. Should any test of pipe laid disclose leakage greater than that allowed, locate and repair the defective joints or pipe until the leakage of a subsequent test is within the specified allowance.

E. Flow Test

1. After new main has been leak tested, the line shall be flushed by opening 1 or more fire hydrants for approximately 10 minutes or until sediment has been flushed from system.

End of Section VII

VIII. DISINFECTION OF POTABLE WATER LINES

1.00 GENERAL

1.01 Disinfection. The following procedure shall apply to all main extensions within the District service area. Pipe extensions shall be chlorinated in accordance with AWWA C600 and C651 *Standard for Disinfecting Water Mains.*

THE CHLORINATION OF THE FINISHED PIPELINE SHALL BE DONE PRIOR TO THE INSTALLATION OF ANY SERVICE TAPS.

Before filling the pipe with water, the pipe shall be clean and *free of* debris to the satisfaction of the District.

The District shall perform disinfecting by chlorination of the pipe prior to acceptance. The chlorinating agent and method of application shall be in accordance with AWWA C651. The Contractor shall provide material for disinfecting of water mains.

If the tablet method of chlorination is used, during construction, calcium hypochlorite granules shall be adhered, with a CDPHE approved adhesive, to the inside top of every stick of pipe. The quantity of granules shall be as shown in the table below. This method may be used only if the pipes and appurtenances have been kept cleaned and dry during construction. This method is **not be used** on solvent welded plastic or on screwed joint steel pipe because of the danger of fire or explosion from the reaction of the joint compound with the calcium hypochlorite.

65% CALCIUM HYPOCHLORITE GRANULES

To be placed at the beginning of main and at each 500-foot interval.

Pipe Diameter	Ounces
4"	0.5
6"	1.0
8"	2.0
12"	4.0
16" and larger	8.0

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 24 hours. At the end of the 24-hour period, the water in the pipeline shall be tested by the District to ensure residual chlorine content of not less than 25 mg/l. The pipeline shall then be tested by the District thoroughly flushed to remove the heavily chlorinated water and/or debris. Care shall be taken in flushing the pipeline to prevent property damage and danger to the public. Discharge of highly coordinated water shall not be released to any stream or watercourse. Samples of water will be collected for bacteriological examination and residual chlorine content testing before the pipeline is put into service. The District will do testing of residual chlorine and bacteriological sampling and testing.

If the continuous feed method of chlorination is used, the Contractor is to provide the written

procedure to the District Inspector for acceptance of the method at least 48 hours prior to starting the work.

No main that has been disinfected and flushed shall stand stagnant for more than 15 days without being reflushed and a new disinfecting test performed, passed and approved by the District. **No main shall be tapped until the main has been flushed of all highly chlorinated water.**

1.02 Discharging Chlorinated Water. Contractor or Developer shall not discharge chlorinated water to any water body until the chlorine is neutralized and eliminated.

End of Section VIII

IX. SPECIAL CONSTRUCTION

1.00 GENERAL

1.01 Scope. This section shall include the design and construction of aerial crossings, river crossings, storage tanks, pressure reducing vaults and booster stations. Because each of these structures will require an engineered design to meet field conditions and individual design criteria, this section will not attempt to provide complete design guidelines and specifications. Rather, it will provide a general listing of guidelines that must be followed unless the District approves an equivalent alternative.

2.00 AERIAL CROSSING

2.01 General. This section shall cover the design criteria to be used on aerial crossings, including water lines suspended from existing and proposed bridges, and lines aerially supported over steep canyons and arroyos. In both of the above crossings, an underground or river crossing will be required unless special circumstances render the below grade alternative prohibitive. If it is determined that a bridge crossing is acceptable to the District, and then the following design criteria shall be followed.

2.02 Pipe Supports. If pipe is to be supported from an existing bridge, a structural analysis shall be performed to determine if the bridge can withstand the additional loading. If being installed on a new bridge, then additional pipe loading should be included as a dead load consideration.

Pipe shall be supported with a pipe hanger that allows longitudinal movement. Support shall be an adjustable steel yoke pipe roll or approved equal. In addition, a horizontal support from pipe hanger to the bridge shall be provided so that the pipe assembly will not move horizontally due to wind loads, etc. The spacing of the pipe hangers shall depend upon the maximum recommended load of hanger.

2.03 Pipe Insulation. Aerial pipelines shall be prevented from freezing by pipe insulation. The insulation R-value and thickness shall be designed to a generally accepted standard for the Roaring Fork Water and Sanitation District area. The insulation should have a minimum R-value of 20. The insulation shall be non-absorbing to water.

2.04 Insulation Protection. Provide an aluminum jacket with moisture barrier strapped with stainless steel bands. Jacketing thickness shall be a minimum of 16 mil. Provide insulation protection shields.

2.05 Pipe. Provide Class 52 ductile pipe with flanged joints, ANSI A.21.15, AWWA C 115, latest revision.

2.06. Expansion Coupling. Provide a restrained expansion coupling between each rigidly supported point of the pipe. Follow all manufacturer's recommendations when installing. Expansion couplings shall be accessible to water department personnel for maintaining and making adjustments in couplings.

2.07 Air and Vacuum Vaults. If bridge crossing is at a high point in line, install all air and

vacuum valves appropriate for design conditions.

2.08 Isolation Valves. An isolation valve shall be provided on either end of the bridge. If a break occurs, the line can be easily isolated.

2.09. Accessibility. Generally, the pipe should be placed in a location where personnel can easily access and maintain the pipe.

3.00 RIVER CROSSINGS

3.01 General. This section covers the design criteria to be used on river crossings.

3.02 Encasement. Pipe shall be encased in concrete for the length of pipe underneath high water mark.

3.03 Pipe. For river crossing, the pipe joints shall be push-on joints with joint restraint, Class 52 D.I.P. Manufacturer's reference - Griffin Snap-Lok pipe or approved equal by District Engineer.

3.04 Bend Restraint. All vertical bends shall be restrained with vertical reaction blocks and all thread rods between bends or between bends and concrete thrust tie.

3.05 Permits. Generally, a river crossing will require a 404 Permit or Nationwide Utilities Permit from the Army Corps of Engineers. The Applicant should begin the permit process as soon as possible, as the process can take from 30-90 days to secure the permit.

4.00 STORAGE RESERVOIRS

4.01 General. This section covers the design criteria to be used on storage reservoirs. The District may allow either a buried concrete or aboveground steel reservoir. The District reserves the right to require either a concrete or steel tank depending on the field conditions, size and location of the tank. The District shall determine the size and location of the storage tanks.

4.02 Foundation Design. A soil and geological report shall be provided which makes recommendations on the required foundation.

4.03 Structural Design. Complete structural design, with calculations and shop drawings submitted by a professional engineer shall be provided. If a welded steel tank is provided, it shall conform to AWWA D100, latest revision.

4.04 CDPHE Requirements. All Colorado Department of Public Health and Environment, Water Quality Control Division "Design Criteria for Potable Water Systems" shall be followed.

4.05 Flow Measuring. A magnetic flow meter capable of measuring flow in both directions shall be provided. Two remote recording charts with totalizers shall be provided at the District office. The flow meter shall be housed in a vault outside the tank. The vault shall conform to the same basic requirements as a PRV vault (see Section 5.00 of this section). The vault shall contain heat, lights and two 110-volt outlets. Install lightning arresters on mag meter power sensor lines to eliminate surge and transient voltages (located at both ends).

4.06 Tank Insulation. Not Applicable.

4.07 Steel Tank Painting. Use an AWWA approved paint system for tank interior and exterior coating on all steel tanks. Painting shall conform to AWWA D102, latest revision.

5.00 PRESSURE REDUCING VAULTS (PRV) – Detail 9

5.01 General. This section shall cover the design criteria to be used on pressure reducing vaults. The District shall determine the location of PRV's.

5.02 PRV Valve. The PRV valve shall be a Clayton valve as manufactured by the Cla-Valve Company. The main valve shall be a single seated, hydraulically operated, pilot controlled, diaphragm-type globe valve.

5.03 Pilot Control System. Cast bronze ASTM B62 with 303 stainless steel trim. Install isolation cocks, closing and opening speed control and strainers on pilot controls.

5.04 Pressure Gauges. Install two stainless steel, liquid-filled, hermetically sealed pressure gauges with pressure snubbers, and isolation cocks. Locate at main inlet and outlet of vault so that if one PRV is isolated, gauges will still register.

5.05 Bypass Piping. Install a bypass around main PRV valve so that mainline can be filled and service maintained with PRV valve out of service. Bypass shall be installed with an isolation valve.

5.06 Pressure Relief Valve. If damaging downstream pressure can result when PRV is stuck in open position, then a pressure relief valve shall be installed on downstream side of PRV on either the main line or bypass line. Pressure relief valve shall be piped to daylight.

5.07 Isolated Valves. Install isolation resilient seat gate valves inside of vault so that main PRV valve can be isolated.

5.08 Air Release. Install an air release and vacuum valve on both inlet and outlet of pipe in vault. Each air release valve to have an isolation valve.

5.09 PRV Vault. All valves, appurtenances and pipe to be enclosed in a concrete or steel vault. Install link seal or equivalent between pipe inlets, outlets and vault wall. Provide frost-proof aluminum manhole lid marked "Water" on concrete vaults. Plastic covered steel MH rungs shall be provided on concrete vault with the first step not being greater than 18 inches from finished grade. Install concrete supports under PRV and tees. All vaults to be provided with one 110-volt outlet and a drain that daylights.

5.10 Fittings. All main line fittings shall be ductile iron flanged fittings.

6.00 Waterline Insulation – Detail 11

6.01 General. This section shall cover the installation to be used on water lines when insulation is required. The District engineer will approve the use of insulation on waterlines if the conditions will not allow the waterline to be buried deep enough to obtain 5.5 feet of depth below the lowest storm drain pipe.

6.02 Installation. In areas where 5.5 feet of depth is unable to be obtained between the waterline and the lowest storm drain pipe insulation can be approved by the District

engineer. The insulation shall encase the waterline 4 feet in either direction of the crossing. Four inch thick polystyrene (Blue board) shall be installed1 foot away from the pipe on both sides and the top. Contractor shall provide a minimum of 18 inches between the top of the insulation and the invert of the storm drain.

7.00 Transmission Line Tapping – Detail 12

7.01 General. This section shall cover the installation of a distribution line water tap onto a pressurized transmission main.

7.02 Installation. Tapping a pressurized transmission main for a new distribution line will only be allowed when the transmission line can not be shut down to install a traditional Tee and 3 valves. Pressurized taps will only be performed by contractors approved by the District. Tapping sleeve shall be stainless steel to prevent corrosion and shall be covered with 4 mil polyethylene plastic with a 0.75 inch tap for pressure testing. Gate valve shall be flange by MJ with a mega-lug or approved equal and with standard valve box as shown in Detail 5. A Thrust block shall be installed behind the tapping sleeve and shall be sized according to the Detail 2 for a Tee of 250 psi or less.

7.03 Testing. Tapping sleeve shall be air tested to gate valve with 1.5 times normal working pressure or 150 psig; whichever is greater for 5 minutes.

7.04 Manufacture's Reference. Cascade CST - EX

8.00 Pipe Jacking/Boring – Details 14 – 15

8.01 General. This section shall cover the installation of utilities within a pipe casing that has been jacked or bored. Refer to Details 15 and 16 for design and installation details.

9.00 Water Meter Vault – Detail 16

9.01 General. This section shall cover the design criteria to be used on water meter vaults. Refer to Detail 16 for water meter vault details.

End of Section IX

X. BACKFLOW PREVENTION

1.00 GENERAL

1.01 Scope. This section shall include the use of backflow prevention devices to prevent cross connection.

1.02 Requirements. All work within the District must comply with the current requirements under Colorado law for prevention of cross connections and backflows. Such laws include, but are not limited to, Colorado Department of Health Statutes, C.R.S. ' 25-1-114(h); Colorado Primary Drinking Water Regulations, S.C.C.R. 1003-1 (Article 12); and the *"Colorado Department of Health Cross Connection Manual"*.

In general, the law states that it is illegal to have or to maintain a cross connection on a public water supply. Cross connection is defined as any connection which would allow water to flow from any pipe, plumbing fixture or water system into a water system supplying drinking water to the public.

1.03 Public Education. The Roaring Fork Water and Sanitation District will educate system users about the potential health risk that cross-connections pose, with an emphasis on cross-connections. Contact the District Administrator regarding public education.

1.04 Types of Cross Connections. The following are common (but not limited to) cross connections and required devices to prevent backflow:

A. Hose bibs - Vacuum breaker
B. Irrigation lines/systems
C. Fire sprinkler systems
D. Boiler systems
E. Dishwashers
F. Solar homes using potable water as heat source
G. Any building over 3 stories tall

1.05 Backflow Preventers. Be advised that each cross connection will require different types of backflow prevention devices, and is beyond the scope of these regulations. District personnel must give approval of backflow preventers.

1.06 Annual Testing. Article 12 requires that backflow prevention devices be tested annually by a certified backflow prevention technician. Contact District Operator for a list of certified backflow prevention technicians.

End of Section X

XI. SANITARY SEWER LINES

1.00 GENERAL

1.01 Scope. Work under this section shall include furnishing all materials, labor and tools necessary to perform all installation, cleaning and testing of all sanitary sewer lines and appurtenances as specified herein and shown on the Drawings.

1.02 Protection of Work. All pipe, fittings and equipment shall be carefully handled, stored and protected in such a manner as to prevent damage to materials. At no time shall such materials be dropped or dumped into trench.

Precaution shall be taken to prevent foreign matter from entering the pipe and fittings prior to and during installation. Place no debris, tools, clothing or other materials in the pipe during installation.

At such time as pipe installation is suspended, either temporarily or over night, the open end of the pipe shall be sealed with a watertight plug to prevent entrance of trench water, debris or foreign matter. A mechanical-type fitting shall be used for this seal. At no time shall duct tape or any other tape be used for this seal.

Under no circumstances shall trench water be allowed to enter the pipeline. When water is present in the trench, the seal shall remain in place until such time the trench is pumped dry. Whenever trench water becomes evident, adequate measures shall be taken to prevent pipe flotation. Contractor shall bear all costs associated with keeping trench free of liquids.

If, in the opinion of the Engineer, the Contractor is incapable of keeping the pipe free of foreign matter during installation, the Engineer shall require the Contractor to protect the pipe ends with water tight plugs until the start of the joining operation.

2.00 MATERIALS

this item covers the types of materials that will be allowed for the construction and installation of sewer lines. All materials used shall be new, of the best quality available and conform to applicable standards as indicated herein.

2.01 Ductile Iron Pipe and Fittings. Not permitted for gravity lines.

2.02 Polyvinyl Chloride (PVC) Pipe and Fittings (Gravity Main)

A. PVC Pipe, through 15 inch diameter.

1. Material Reference Standard - ASTM D1784
2. Pipe Reference Standard - ASTM D3034
3. Class – SDR-35
4. Markings - Manufacturer's name, nominal size, PVC classification, Type PSM, SDR-35, PVC gravity sewer pipe, ASTM D3034 and code number, green coloring dyed into PVC.

B. PVC Pipe, 18 inch to 27 inch diameter.

1. Material Reference Standard - ASTM D1784
2. Pipe Reference Standard - ASTM F679
3. PS 46 PVC Sewer Pipe and ASTM F679. Green coloring dyed into PVC.
4. Variance - PVC piping meeting the stiffness requirement of ASTM F679 but not meeting wall thickness requirement will be allowed under specification. Manufacturers will be required to provide a list of at least 5 similar projects with references in which pipe has been successfully used and laboratory testing data showing the pipe meets the structural requirements of ASTM F679.

C. Restrained Joint PVC Pipe, through 16 inch diameter.

1. Material Reference Standard - ASTM D1784
2. Class – SDR-32.5
3. Manufacture's Reference – CertainTeed - Certa-Lok Yelomine
4. Markings - Manufacturer's name, nominal size, PVC classification, SDR-32.5, PVC gravity sewer pipe.

D. Fittings

1. Type - PVC push-joint
2. Materials - ASTM D1784
3. Reference Standard - ASTM D3034 or ASTM F679

E. Joints

1. Type - push-on rubber gasket
2. Gasket reference standard - ASTM F477

2.03 Force Main

A. PVC Pipe.

1. Materials - ASTM D 1784, Type 1, Grade 1, PVC 1120, 2000 psi design stress.
2. Reference Standard - AWWA C-900.
3. Class - 150 (DR-18), (or, dependent upon internal pressure, may require Class 200).
4. Markings - Manufacturer's name, nominal size, class pressure rating, PVC 1120, NSF logo, identification code.
5. Specialties - Electrical tracing wire, 14 gauge solid copper insulated wire.
6. Size - Shall conform to outside diameter of DIP.

B. Fittings.

1. Type - All fittings shall be restrained mechanical joint except where specifically shown or detailed otherwise. Fittings in a vault shall be flanged.
2. Reference Standard -.AWWA/ANSI C153/A 21.53
3. Pressure Rating - 350 psi

4. Gasket Reference Standard - AWWA C-111
5. Fittings shall be coated with Permafuse epoxy coating inside and out.

B. Ductile Iron Pipe.

1. Reference Standard - ANSI 21.51/AWWA C151, latest edition.
2. Thickness Class - 52
3. Pipe joints shall be push on joints, except where specifically shown or detailed otherwise.
4. Pressure Rating - 350 psi

C. Fittings

1. Type - All fittings shall be mechanical joint.
2. Reference Standard - ANSI/AWWA C153, latest edition, for mechanical "compact" joints.
3. Material - Ductile iron
4. Pressure Rating - 350 psi
5. Fittings shall be coated with Permafuse epoxy coating inside and out.

D. Joints

1. Mechanical, Reference Standard - ANSI A. 21.53/AWWA C153, latest edition.
2. Push-on, Reference Standard - ANSI A 21.15/AWWA C115, Class 125.
3. Flanged, Reference Standard - ANSI B 16.1, Class 125

E. Gaskets

1. Type - Rubber-ring gasket for gravity main.
2. Type - Rubber-ring Field-Lok gasket, or equal, for force main shall be suitable for the specified pipe sizes and pressure
3. Reference Standard - AWWA C111, latest edition.
4. Lubricant - A non-toxic vegetable soap lubricant shall be supplied with the pipe.

F. Protective Coating

1. Underground Service - Manufacturer's standard bituminous coating - minimum 1 mil thickness.
2. Polyethylene Film Envelope - Polyethylene encasement shall conform to AWWA C105, latest edition, or ANSI A.21.5. Film shall be Class C with a nominal thickness of 8 mils. Tape for securing the film shall have a minimum thickness of 8 mils and a minimum width of 1 inch. The polyethylene film shall be free of streaks, pinholes, tears or blisters.

G. Protective Lining - Gravity Main

1. Type - Cement mortar
2. Reference Standard - ANSI A 21.4/AWWA C104, latest edition.
3. Thickness - Standard

H. Protective Lining - Force Main

1. Type - Lining designed for sewer service equal to Protecto 401 by Clow or Permafuse epoxy coating.

2.04 Small Diameter, Low Pressure Sewerline less than 4 inch.

A. Pipe Materials

1. High density Polyethylene pipe & fittings, HDPE 3408 Plastics Pipe Institute, DR9
2. Polyvinyl Chloride pipe (PVC) ASTM D-1784 & D-2241, DR21, 200 psi

B. Joints

1. Butt fusion for HDPE
2. Gasketed for PVC, 2 inch and larger; solvent weld for 12 inch and smaller.

C. Appurtenances

1. Air/Vacuum valve - Crispin SU20 sewage air/vacuum or approved equal
2. Isolation valve - PVC ball valve or approved equal.

2.05 Concrete for Thrust Blocks and Encasing of Pipe. Concrete for thrust blocks and for encasing the sewer pipeline shall have 28-day compressive strength of not less than 3000 psi.

2.06 Manholes. Details A, B, C, D

A. Concrete Rings/Cones

1. Type - Precast
2. Reference Standard - ASTM C478
3. Size - Four-foot or five-foot inside diameter

B. Manhole Bases

1. Shall be precast or cast-in-place, depending upon local jurisdiction standards, with integrally cast-in water stops. Tee tops of base shall be at least 12 inches above top of pipe.
2. Reference Concrete Standard – ASTM C478

C. Manhole Steps. Manhole steps shall conform to ASTM C478-94 and shall be steel reinforced copolymer polypropylene with materials conforming to the following:

Materials:

1. The deformed steel reinforcing bar shall be 2 inch conforming to ASTM A-615 Grade 60.
2. The copolymer polypropylene shall conform to ASTM D4101-92b

PP0344B33534Z02.

3. Manufacturer's Reference: M.A. Industries Model PS1-PF, or approved equal.

D. Joints

1. Type - Rub'r Nek preformed gasket as manufactured by K.T. Snyder Co., Inc, Houston, Texas, or equal.
2. Cement Mortar Material Reference Standard - One part Portland cement, Type II, modified with three parts of sand. Cement mortar to be used with concrete grade rings only.

E. Grade Adjustment Rings

1. Type - Precast ASTM C150 Type II modified concrete.
2. Size - Not less than 6 inch wide x heights to allow for two-inch adjustments.
3. Alternate - HDPE grade rings.
4. Manufacturer's reference: Ladtech, Inc., or approved equal.

F. Frame and Cover.

1. Material Reference - Grey Iron, ASTM A48-83, Class 35B, traffic bearing.
2. Cover - Stamped with "SEWER"," machined bearing surface with ring.
3. Type - Heavy, weight of cover greater than 140 pounds.
4. Manufacturer Reference -Castings MH-400-24CI.

2.07 Sewer Service Line Materials.

A. Full Body Wyes - Required for all new and existing sewer line construction.

1. Material - ASTM D3034 PVC
2. Strength - for use with SDR-35
3. Joint - Slip-on rubber gasket

2.08 Shear Gates. Not applicable.

2.09 Flap Gate. Not applicable.

2.10 Butterfly Valves. Not applicable.

2.11 Gate Valves . Not applicable.

2.12 Valve Boxes. Not applicable.

2.13 Tracer Wire. Tracer wire shall be 12 gauge insulated stranded copper wire. Tracer Wire shall be installed on all sewer mains and services. Wire continuity to be tested prior to pipeline being accepted.

3.00 METHODS AND PROCEDURES

3.01 Cleaning and Inspection. Clean all pipe, fittings and related materials thoroughly of all foreign material and inspect for cracks, flaws or other defects prior to installation. Mark all defective, damaged or unsound materials with bright marking crayon or paint and remove from job site.

The Contractor shall take all necessary precautions to prevent any construction debris from entering the sewer lines during construction. If this debris should enter the pipeline system, the Contractor shall furnish all labor and materials necessary to clean the system. Under no circumstances will the Contractor flush the debris into an existing sanitary sewer system.

3.02 Placement of Pipe.

A. Laser Beam. All sanitary sewer pipes must be installed with a laser. If bending of the beam due to air temperature variations becomes apparent with "in pipe" units, a fan shall be provided to circulate air in the pipe. Air velocity shall not be so excessive as to cause pulsating or vibrating of the beam. If, in the opinion of the Engineer, the beam cannot be accurately controlled, this method of setting line and grade shall be abandoned.

3.03 Pipe Embedment. Detail E

A. Placing embedment material - Refer to Section XII for placement methods.

B. Embedment Classes - Refer to Section XII for embedment materials for each class listed below:

1. Class A - Use of all PVC, DIP, CMP and Concrete pipelines.

2. Class B - Use where indicated on the Drawings and where improper trenching or unexpected trench conditions require its use as determined by the Engineer.

3.04 Pipe Installation.

A. Installation of Ductile Iron Pipe Lines. Not applicable.

B. Installation of Polyvinyl Chloride (PVC) Pipe.

1. Pipe Handling. Pipe should be carefully lowered into the trench to avoid pipe falling into trench.

2. Pipe Laying. Pipe shall be laid true to line and grade, in an uphill direction, with bell ends facing in the direction of laying. When pipe laying is not in progress, a watertight plug shall close the open end of the pipe.

3. Joining the Pipe. The outside of the spigot and the inside of the bell shall be thoroughly wiped clean. Set the rubber ring in the bell with the marked edge facing toward the end of the bell. Lubricate the spigot end using a thin film of the manufacturer-supplied lubricant. Push the pipe spigot into the bell. Position the completed joint so that the mark on the pipe end is

in line with the end of the bell.

4. Pipe Cutting. The cutting of pipe for manholes or for fittings, or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe or lining and so as to leave a smooth end at right angles to the axis of the pipe. Bevel the end of the pipe with a beveling tool after the pipe is field cut. Place a clearly visible position mark at the correct distance from the end of the field-cut pipe.

5. Solvent Weld or Butt Fusion Joints. All cutting and field fabrication shall be done according to printed recommendations of the pipe manufacturer or associated pipe manufacturer organizations. Piping shall be cleaned to the extent required for joint completion.

C. Installation of Slipline Pipe. Not applicable.

3.05 Sewer Manhole Installation. Details A, B, C, D

A. General. Manholes shall be furnished and installed to depths and dimensions shown on the Construction Drawings and/or staked in the field. Manholes shall be constructed of precast concrete rings in accordance with details shown on the Construction Drawings.

B. Connections to Manholes. Connection of manhole with pipe shall be made with flexible connector detail. In addition, extra care shall be taken by grouting or other means of sealing to assure positive watertight manholes around the inlet or outlet pipes.

C. Manhole Floor and Inverts. Manhole bases shall be constructed to conform to the details shown on the Drawings. The invert channels shall be smooth and semi-circular in shape, conforming to the inside of the incoming and outgoing sewer pipelines. Changes in direction of flow shall be made with a smooth curve of as large a radius as the size of the manhole will permit. Changes in size and grade of the channels shall be made gradually and evenly. Where large differences in invert elevations exist, sloped flow channels shall be formed so the wastewater does not undergo a vertical drop. The invert channels may be formed directly in the concrete of the manhole base. The floor of the manhole outside the channel shall be smooth and shall slope toward the channels.

D. Finish Grade and Adjustment. To bring the manhole cover to the correct elevation, the top section of each manhole shall be constructed of pre-cast concrete grade adjustment rings. These rings shall be not less than 6 inch wide and furnished in heights to allow for 2 inch adjustments. Grade adjustment with rings shall be 8 inch maximum and 2 inch minimum. All rings shall be grouted in place with non-shrink grout.

Finish Grade and Adjustment HDPE Alternate. High-density polyethylene grade rings may also be used to bring manhole cover to correct elevation. Grade rings shall be molded from HDPE as defined in ASTM Specification D1248-84. Available thicknesses are 1.25 inch, 1.50 inch, 2.00 inch 4.00 inch and a sloped thickness 0.75 inch x 1.50 inch. When this alternate is used, pavement slope

should be matched using one or more sloped rings. Manufacturer's reference - Ladtech, Inc., or approved equal.

Grade rings shall be a combined maximum height of 1 foot. If more than 1 foot of grade rings are required then a 1 foot manhole section shall be installed along with grade rings.

E. Manhole Stubs. Stubs shall extend approximately 24 inch from the outside face of the manhole and shall be capped or plugged with manufactured fittings to form a watertight installation.

F. Manhole Steps. Manholes steps shall be installed so that the first step is a maximum of 18 inches from finished grade. The steps below the first step shall be installed within 1 inch horizontally of the first step. This will be measured by hanging a plumb bob from a corner of the top step and measuring from that line to the same corner of each step.

3.06 Connection to Existing Sewer Facilities. Connections to existing sewer facilities where live flows exist shall be made only after prior consultation with and receipt of written permission from the District Engineer. No bypass of sewage to the surface will be allowed in the completion of this connection. All connections between pipes of different materials shall be made with approved manufactured connectors.

3.07 Protection of Water Supplies. Sewer lines shall be located a minimum of 10 feet horizontally from existing or proposed water mains. Where the sewer line crosses above the waterline, or is less than 18 inches vertically below the invert of the water line, or is less than 10 feet horizontally from the water main, the sewer line shall be made impervious by either of the methods listed below or as shown in Detail 14.

A. The sewer pipe shall be reinforced with a concrete encasement. The encasement shall be at least 6 inches thick on all sides of the sewer pipe and extend 10 feet on either side of the water main. Use three No. 4 rebar the length of the encasement.

B. Install one piece of C-900 PVC pipe centered over the waterline with a solid sleeve coupler with transition gaskets

C. Install a ground collar over the two sewer joints on either side of the water crossing. The grout collar shall be around the entire perimeter of the joint.

If clearance is less than 12 inches vertically, the space between the water and sewer mains shall be filled by 3,000 psi concrete.

In all cases, bedding material shall be used to prevent any settling of the higher pipe.

3.08 Service Connections. Customer service connections shall be installed in accordance with Detail F. After the service connection is installed, the end shall be plugged watertight with a manufactured plug and marked with a stake except as shown otherwise on the Drawings.

4.00 FIELD QUALITY CONTROL

4.01 Alignment and Grade. Sewer pipelines will be checked by the Engineer to determine whether any displacement of the pipe has occurred after the trench has been backfilled. The test will be as follows:

A light will be flashed between manholes, or if the manholes have not yet been constructed, between the locations of the manholes, by means of a flashlight. If the illuminated interior of the pipeline shows poor alignment, displaced pipe, earth or other debris in the pipe, or any other kind of defect, the defects as determined by the Engineer shall be remedied by the Contractor at their own expense. Test will be repeated after completion of backfilling and any poor alignment, displaced pipe, or other defects determined by the Engineer, shall be corrected.

4.02 Leakage Test. Sewerlines shall be tested using a low-pressure air test only; water tests will not be allowed. Only after the sanitary sewers, including appurtenances and sanitary laterals, water mains and water services have been installed and backfilled to finish grade, shall the Contractor proceed with an air test on the installed facilities.

A. Low Pressure Air Test Procedure. The section of sewerline to be tested should be flushed and cleaned prior to conducting the low-pressure air test. This serves to clean out any debris, wet the pipe, and produce more consistent results. Isolate the section of sewerline to be tested by means of inflatable stoppers or other suitable test plugs. One of the plugs should have an inlet tap, or other provision for connecting a hose to a portable air control source.

   If the test section is below the groundwater level, determine the height of the ground water above the spring line of the pipe at each end of the test section and compute the average. For every foot of groundwater above the pipe spring line, increase the gauge test pressure by 0.43 pounds per square inch. Connect the air hose to the inlet tap and a portable air control source. The air equipment should consist of necessary valves and pressure gauges to control the rate at which air flows into the test section and to enable monitoring of the air pressure within the test section. Also, the testing apparatus should be equipped with a pressure relief device to avoid the possibility of loading the test section with the full capacity of the compressor. Locate valves and gauges above ground.

   Add air slowly to the test section until the pressure inside the pipe is raised to 5.0 psig greater than the average backpressure of any groundwater that may be over the pipe. After a pressure of 5.0 psig is obtained, regulate the air supply so that the pressure is maintained between 4.5 and 5.0 psig (above the average ground water back pressure) for a period of 2 minutes. This allows the air temperature to stabilize in equilibrium with the temperature of the pipe walls. The pressure will normally drop slightly until temperature equilibrium is obtained.

   Determine the rate of air loss by the time/pressure drop method. After the 2 minute air stabilization period, the air supply is disconnected and the test pressure allowed decreasing to 4.5 psig. The time required for the test pressure to drop from 4.5 psig to 4.0 psig is determined by means of a stopwatch and this time interval is then compared to the required time in the attached table to determine if the rate of air loss is within the allowable time limit. If the time is equal to or greater than the times indicated in the tables, the pipeline shall be deemed acceptable.

Nominal Pipe Size (Inches)	Minimum Test Time (min/100 feet)
3	0.2
4	0.3
6	0.7
8	1.2
10	1.5
12	1.8
15	2.1
18	2.4
21	3.0
24	3.6
27	4.2
30	4.8
33	5.4
36	6.0

Upon completion of the test, open the bleeder valve to allow air to escape. Plugs should not be removed until all air pressure in the test section has been released. During this time, no one should be allowed in the trench or manhole while the pipe is being decompressed. Air test shall also include service lines and appurtenances.

4.03 Manhole Inspection. During the construction of the manholes, the Contractor shall, in accordance with good practice, ensure that no earth, sand, rocks or other foreign material exists on the joint surfaces during assembly of the section. The Engineer shall check each manhole to determine whether the manhole fulfills the requirements of the approved Drawings and Specifications.

A. Visual Examination. The Engineer shall visually check each manhole, both exterior and interior, for flaws, cracks, holes, or other inadequacies that might affect the operation or watertight integrity of the manhole. Should any inadequacies be found, the Contractor, at their own expense, shall make any repairs deemed necessary by the Engineer.

B. Leakage Test. All manholes shall be tested for leakage and all tests shall be witnessed by the Engineer. The leakage test shall be conducted after the manhole has been backfilled to finished grade and shall be carried out in the following manner:

1. Stub-outs, manhole boots and pipe plugs shall be secured to prevent movement while the vacuum is drawn.

2. Installation and operation of vacuum equipment and indicating devices shall be in accordance with equipment specifications for which performance information has been provided by the manufacturer and

approved by the Engineer.

3. A measured vacuum of 10 inches of mercury shall be established in the manhole. The time for the vacuum to drop to 9 inch of mercury shall be recorded.

4. Acceptance standards for leakage shall be established from the elapsed time for a negative pressure change from 10 inches to 9 inches of mercury. The maximum allowable leakage rate for a 4 foot diameter manhole shall be in accordance with the following:

MANHOLE DEPTH	MINIMUM ELAPSED TIME FOR A PRESSURE CHANGE OF 1 INCH Hg
10 ft. or less	60 seconds
> 10 ft. but < 15 ft.	75 seconds
> 15 ft. but < 25 ft.	90 seconds

For manholes 5 feet in diameter, add an additional 15 seconds and for manholes 6 feet in diameter, add an additional 30 seconds to the time requirements for 4 foot diameter manholes.

5. If the manhole fails the test, necessary repairs shall be made and the vacuum test and repairs shall be repeated until the manhole passes the test or the manhole shall be tested in accordance with the standard exfiltration test and rated accordingly.

4.04 Deflection Test for Non-Rigid Pipe. The maximum allowable pipe deflection for a completely backfilled, non-rigid sewer pipe shall not exceed 5 percent of the nominal internal pipe diameter. Deflections in non-rigid pipe shall be checked by measurement or by pulling a mandrel with the minimum allowable diameter through the pipe. The minimum allowable diameter shall be equal to the minimum interior diameter of the pipe, as specified in the applicable portions of the ASTM Standard Specifications or the pipe manufacturer's recommendations, minus 5 percent of the minimal interior diameter of the pipe. Those sections of non-rigid pipe with deflections greater than the maximum allowable 5 percent shall not be acceptable and the Contractor will remove and replace these sections at their own expense.

Deflection tests will be run if in the opinion of the Engineer testing is warranted. The program for testing shall be mutually determined by the Engineer and the Contractor. The Contractor shall furnish all labor, tools and equipment necessary to make the tests and to perform any work incidental thereto.

4.05 Pressure Testing of Force Main and Low Pressure, Small Diameter Sewerline. Make pressure and leakage tests on all newly laid pipe. Furnish all necessary equipment and material, make all taps in the pipe as required, and conduct the tests. The tests shall be conducted between valved sections of the pipeline, or as approved by the Engineer. The Engineer will monitor the tests.

Furnish the following equipment and material for the tests:

Amount	Description
2	Approved graduated containers
2	Pressure gauges
1	Hydraulic force pump approved by the Engineer
1	Additional 0.5 inch pressure tap for Engineer's test gauge
	Suitable hose and suction pipe as required

Conduct the tests after the trench has been completely backfilled. Where any section of pipe is provided with concrete reaction blocking, do not make the pressure test until at least 5 days have elapsed after the concrete thrust blocking is installed. If high-early cement is used for the concrete thrust blocking, the time may be cut to 2 days.

Conduct pressure test in the following manner, unless otherwise approved by the District Engineer: after the trench has been backfilled, fill the pipe with water, expelling all air during the filling. The test pressure shall be 1.5 times normal working pressure at the point of lowest elevation of the test gauge.

A. Duration

1. The duration of each pressure test shall be 2 hours, unless otherwise directed by the District Engineer.

B. Procedure

1. Slowly fill the pipe with water and allow to stand for 24 hours. Expel all air from the pipe. Allow and maintain the specified test pressure by continuous pumping if necessary for the entire test period. The test pressure shall be calculated for the point of lowest elevation, or as specified by the District Engineer. The pump suction shall be in a barrel or similar device, or metered so that the amount of water required to maintain the test pressure may be measured accurately.

2. Before the line is pressurized, the Engineer shall verify that all necessary main line valves are open or closed with regard to the section of line being tested.

C. Leakage

1. Leakage shall be defined as the quantity of water necessary to hold the specified test pressure for the duration of the test period. No pipe installation will be accepted if the leakage is greater than the number of gallons per hour as determined by the following formula:

$$L = \frac{SD\sqrt{P}}{148{,}000}$$

In the above formula:

L = Allowable leakage, in gallons per hour.
S = The length of pipe being tested, in feet.
D = Nominal diameter of pipe, in inches.
P = Average test pressure during the leakage test, in pounds per square inch gauge.

D. Correction of Excessive Leakage

1. Should any test of pipe laid, reveal leakage greater than that allowed, locate and repair the defective joints or pipe until the leakage of a subsequent test is within the specified allowance.

4.06 Televising Main. All sewer connection lines 8 inches or larger shall be televised. The video shall have a running footage meter showing the exact footage from the entry manhole. The electronic copy shall be provided with a log showing the location of all defects and service lines.

Installed sewerline shall be re-televised at the end of the warranty period to verify that no movement has occurred.

5.00 DESIGN CRITERIA - GRAVITY SEWER

5.01 Sizing. All collection sewer lines shall be designed to flow approximately half full at peak flow. One hundred gallons per capita day shall be used as the per capita contribution for average daily flow. A peaking factor of 4.0 shall be used for peak flow. Minimum line size shall be 8 inches.

5.02 Velocities. All velocities shall be maintained between 2.5 fps and 15 fps. Minimum velocity shall be 2 fps.

5.03 Slope. Minimum sewer line slopes shall be as follows:

8"	0.004 ft/ft
10"	0.003 ft/ft
12"	0.0022 ft/ft
15"	0.0015 ft/ft
18"	0.0012 ft/ft
21"	0.0010 ft/ft
24"	0.0009 ft/ft
27"	0.0008 ft/ft

5.04 Distances. The distance between manholes shall not exceed 400 feet, unless approved by the District Engineer. Manholes shall be required on all changes in grade or alignment.

5.05 Curved Sewer. Not Allowed.

5.06 Small Diameter Pressure Sewerlines. Under special conditions, such as low tributary population, or areas where it may be determined by the District, that central lift stations are not

applicable, small diameter pressure sewer technology may be used. Small diameter technology may include pressure, vacuum and small diameter, gravity sewers.

The Engineer shall submit an integrated plan for review and approval. That plan shall include the design of main line sewers and their appurtenances, service lines and on-site pumping systems. Components of the integrated design shall include, but not be limited to, the following:

A. The District will maintain a list of acceptable manufacturers for these integrated systems. Those manufacturers' lists may be obtained from the District office.

B. The on-site pumping system shall include a simplex or duplex, effluent or grinder pump, alarm and monitoring controls, an effluent pipe check valve, a means to isolate the on-site pumping systems during maintenance and a minimum 20 foot usable access easement to allow inspection by District personnel.

C. The service line shall include a shutoff means to allow extension of the service line onto individual properties after the main system is in operation.

D. The main line sewer system shall include air and vacuum release valves with vaults at high points, pressure cleanouts at high points (in combination with air release and vacuum valve vault), pressure cleanouts at intersections and pressure cleanouts at minimum 1,000 foot intervals. Pressure cleanouts shall be installed in a standard manhole for access.

E. The system design shall provide for minimum cleansing velocities of 2 fps at design conditions. Minimum cleansing velocities shall be maintained at less than design flow conditions where excessive headloss at design flows are not introduced. It is recognized that minimum cleansing flows may not be maintained during the early stages of build-out. A plan shall be prepared to address operations during the times when cleansing velocities cannot be maintained. This plan should investigate multiple main lines, odor control facilities and increased maintenance requirements.

6.00 GREASE INTERCEPTORS

6.01 General. Because of the impact of grease on the District's lines and treatment plant, grease interceptors are required on establishments preparing or serving food.

All grease interceptors shall be new and the interceptor and its installation shall be in conformance with the latest edition of the Uniform Plumbing Code except as modified herein.

6.02 Requirements For Grease Interceptors. An approved type grease interceptor complying with the provisions of this section shall be installed in the waste line leading from sinks, drains and other fixtures or equipment in the following establishments: Restaurants, cafes, lunch counters, cafeterias, bars and clubs; hotels, hospitals, factory or school kitchens, or other establishments where grease may be introduced into the drainage or sewage system. A grease interceptor is not required for individual dwelling units or for any private living quarters.

6.03 Specifications and Procedures For Grease Interceptors.

A. Plans shall be submitted to and approval obtained from the District prior to the installation of any grease interceptor in any establishment set forth in Subsection 6.02.

B. No grease interceptor shall be installed which has an approved rate of flow of more than 55 gallons per minute, except when specially approved by the District.

C. No grease interceptor shall be installed which has an approved rate of flow of less than 20 gallons per minute.

D. Each plumbing fixture or piece of equipment connected to a grease interceptor shall be provided with an approved type flow control or restricting device installed in a readily accessible and visible location in the tail piece or drain outlet of each such fixture. Flow control devices shall be so designed that the total flow through such device or devices shall at no time be greater than the rated capacity of the interceptor. No flow control device having adjustable or removable parts shall be approved.

E. Each grease interceptor required by this section shall have an approved rate of flow which is not less than that given in the District's EQR schedule for the total number and size of fixtures connected thereto or discharging thereunto. The total capacity in gallons from fixtures discharging into any interceptor shall not exceed 2.5 times the flow rate of the subject interceptor.

Any grease interceptor installed or located in such a manner that the inlet is more than 4 feet lower in elevation that the outlet of any fixture discharging into such interceptor, shall have an approved rate of flow which is not less than 50 percent greater than that given in the District's EQR schedule.

F. No more than 4 separate fixtures shall be connected to or discharged into any 1 grease interceptor.

G. For the purpose of this section, the term "fixture" shall mean and include each plumbing fixture, appliance, apparatus or other equipment required to be connected to or discharged into a grease interceptor by any provision of this section.

H. Each grease interceptor shall be vented as required by the Uniform Plumbing Code and each fixture discharging into a grease interceptor shall be individually trapped and vented in an approved manner, expect that an approved type grease interceptor may be used as a fixture trap for a single fixture when the horizontal distance between the fixture outlet and the grease interceptor does not exceed 4 feet and the vertical tail pipe or drain does not exceed 2 feet.

I. Each grease interceptor shall be installed and connected so that it shall be at all times easily accessible for inspection, cleaning and removal of the intercepted grease.

J. Interceptors shall be maintained in efficient operating conditions by periodic removal of the accumulated grease. No such collected grease shall be introduced into any drainage piping, public or private sewer, and it shall be disposed of in an environmentally safe manner. Maintence and inspection shall occur every 6 months or as approved by the District and the records shall be provided to the District once a year.

K. Each grease interceptor shall be constructed of durable material satisfactory to the District and shall have a full size, gas tight cover that can be easily and readily removed.

L. No water-jacketed grease interceptor shall be approved or installed.

M. Each grease interceptor shall have an approved water seal of not less than 2 inches in depth or the diameter of its outlet, whichever is greater.

N. No grease interceptor required by this section shall be installed until the type and model of each size thereof has been approved by the District.

O. The District may require such tests as may be necessary to determine the grease collecting efficiency of the various types and kinds of grease interceptors to establish the rate of flow or other rating thereof. Such test requirements may be revised or modified from time to time as may be deemed necessary by the District. A list of approved and acceptable interceptors shall be kept on file in the office of the District.

P. No grease interceptor shall be installed which does not comply in all respects with a type or model of each size approved and accepted by the District. Whenever it shall come to the attention of the District that any grease interceptor does not so comply, the District shall immediately suspend or revoke such approval.

7.00 CLEANOUTS

All service lines shall have a minimum of 1 cleanout, and then 1 cleanout per 100 feet of pipeline length. A cleanout consisting of a wye the diameter of the service line shall be provided at the property line between the building being served and the main line. The upper 24 inch of the vertical riser shall be cast or ductile iron and at grade in unimproved areas, finished driveways, sidewalks, etc., and be plugged with a water-tight cast iron plug (see Details G and H).

End of Section XI

XII. TRENCHING, BACKFILLING AND COMPACTION

1.00 GENERAL

1.01 Scope. Work to be performed under this section shall include all labor, equipment, materials and miscellaneous items necessary to perform all excavation, backfilling and compaction of underground pipelines, conduits, cables and appurtenances shown on the Drawings and specified herein.

All work within the rights-of-way of the Federal Government of the Colorado Division of Highways, County Governments or Municipal Governments shall be done in compliance with requirements issued by those agencies. All such requirements shall take precedence over these Specifications. It shall be the Contractor's responsibility to secure all required excavation permits and pay all costs thereof. Contractor will be required to obtain necessary road cut permits.

1.02 Field Conditions.

A. Existing Utilities. Underground utilities, except service lines, known to the Engineer have been shown on the Drawings. Locations are approximate only and may prove to be inaccurate. The Contractor is responsible for verification of the existence, location and protection of all utilities within the construction area.

Before commencing with work, the Contractor shall notify all public and private companies who may have utilities within the project limits. The Contractor shall coordinate with these entities all excavation performed. The Contractor shall obtain all permits required by utility owners.

In the event of damage to any existing utility, the Contractor shall be solely responsible for the repair and payment for repair of all such damage.

The Contractor shall make arrangements for and pay all costs for relocation of utilities requiring relocation as indicated on the Drawings. Should utility obstructions, not shown on the Drawings, be encountered and require relocation, the Contractor shall notify the Owner and the Engineer and shall make arrangements necessary for such relocation. The Owner shall pay the costs for such relocation.

B. Existing Improvements. The Contractor shall restore or protect from damage all existing improvements encountered in performance of the work. Improvements damaged, as a result of this work shall be restored to original condition or better, as determined by the Engineer.

Adjacent property shall be protected by the Contractor from any damage. The Contractor shall be held solely liable for any damage to adjacent property and shall be responsible for all costs resulting from repair of such damage.

C. Soil Conditions. It shall be the responsibility of the Contractor to examine soil conditions and characteristics, including the presence of groundwater that will be encountered within the limits of construction.

1.03 Protection of Work.

A. Safety. All excavation shall be protected by barricades, lights, signs, etc., as required by governing federal, state and local safety codes and regulations.

B. Sheeting, Shoring and Bracing. Where trench walls are not excavated at a stable slope, the Contractor shall provide and maintain support sufficient to prevent caving, sliding or failure and property or bodily damage. Any damage due to inadequate support shall be repaired at the sole expense of the Contractor.

Under normal construction conditions, support shall be removed as work progresses. Support shall remain installed if directed by the Engineer or if pipe does not have sufficient strength to support backfill based on trench width as defined by the sheeting. Sheeting shall not be removed after the start of backfilling.

Use of a movable trench shield or coffin box will not be allowed where pipe strength is insufficient to support backfill as defined by the trench width after the trench shield is removed.

The Contractor shall be held solely responsible for any violation of applicable safety standards. Particular attention is called to minimum requirements of OSHA and Colorado Occupational Safety and Health (COSH).

C. Site Drainage. Excavation to be protected from surface water at all times. At no time shall excavated area be allowed to fill with storm water runoff. Contractor shall provide proper, temporary drainage structures at their cost to detour runoff from excavated areas.

1.04 Blasting. No blasting shall be permitted without written consent of the Engineer. Blasting shall be done only after Engineer receives permission from the appropriate governmental authority(ies). Blasting shall be performed only by properly licensed, experienced individuals and in a manner such that no damage to any property or persons will occur due to either the blast or debris. Contractor shall provide proof of insurance as required by these Specifications, the governing authority or as required by Engineer prior to any blasting. All damage, as the result of blasting shall be repaired, at the Contractor's expense, to the satisfaction of the Engineer. All earth or rock loosened by blasting shall be removed from excavations prior to proposed construction.

1.05 Construction in Streets. When construction operations are located within streets make provisions at cross streets and walks for free passage of vehicles and pedestrians. Do not block streets or walks without prior approval.

1.06 Submittals.

A. Bedding Material

1. Submit sieve analysis

B. Select Fill

1. Submit sieve analysis

2.00 MATERIALS

2.01 Embedment Material. Pipeline embedment material shall comply with the appropriate classes as listed below and as illustrated in the approved Construction Drawings:

A. Class A - Use for all PVC, DIP, CMP and concrete pipe under normal construction conditions.

1. Characteristics - Densely compacted Class 6 aggregate granular foundation of depth shown on Typical Details with densely compacted Class 6 aggregate 12 inches above top of pipe.

B. Class B - Use where improper trenching or unexpected trench conditions require its use as determined by the Engineer.

1. Characteristics - Concrete cradle foundation with densely compacted Class 6 aggregate base backfill to 12 inches above top of pipe, or densely compacted Class 6 aggregate granular foundation with concrete arch cover to 6 inches above top of pipe.

* 3/4 inch screened rock shall not be used unless approved by the District Engineer.

2.02 Select Material. Subject to approval by the Engineer, select material shall be allowed in place of the aggregate backfill for Class A when excavation and soil conditions allow, but only if approved by Engineer.

Contractors shall bid project based upon Class A. If Class B or select material is used, price adjustments shall be made.

A. Characteristics - Soil materials free from rocks, clods, and organic material.

2.03 Concrete for Embedment. Shall be 2,000 psi concrete (28- day compressive strength).

2.04 Backfill Material.

A. Characteristics - Native materials free from debris, organic matter and frozen material. Uniformly graded sufficient to allow proper compaction.

B. Gradation - No boulders greater than 6 inch diameter in top 12 inches of backfill. Generally, no boulders greater than 12 inch diameter in remainder of trench.

3.00 METHODS AND PROCEDURES

3.01 Site Preparation.

A. Clearing. Remove all vegetation, stumps, roots, organic matter, debris and other miscellaneous structures and materials from project site. Dispose of off site.

B. Topsoil Removal. Strip existing topsoil from all areas to be disturbed by construction. Topsoil to be stockpiled separately from excavated materials.

3.02 Trench Excavation.

A. Limits of Excavation. Trenches to be excavated along lines and grades shown on the Drawings, or as modified in the field by the Engineer. Trench widths for pipe loading to be measured 12 inches above top of pipe.

Minimum trench width to be the outside diameter of the pipe or conduit plus 16 inches.

Maximum trench width to be the outside diameter of the pipe or conduit plus 24 inches for all pipes or conduits with outside diameter of 24 inches or less, and plus 30 inches for all pipes or conduits with outside diameters greater than 24 inches.

If maximum trench width is exceeded, Contractor will provide at their expense, higher strength pipe or special bedding including concrete at the direction of the Engineer.

Trench excavation not to be completed more than 100 feet in advance of pipe installation. Backfill to be completed within100 feet of pipe installation.

B. Groundwater Control. Contractor to maintain facilities on-site to remove all groundwater from trench and keep water at least 12 inches below the trench bottom, to a point such that a firm base for pipe or conduit installation exists.

C. Facilities shall be maintained until all concrete is cured and backfilling is in place at least 24 inches above anticipated water levels before water removal is discontinued; all water removal shall be subject to approval by the Engineer.

D. Stockpile Excavated Material. Excavated material to be stockpiled so as not to endanger the work or public safety. Maintain existing vehicular and pedestrian traffic with minimum disruption. Maintain emergency access and access to existing fire hydrants and water valves. Maintain natural drainage courses and street gutters.

Backfill material to be segregated from stockpiled topsoil and unusable backfill materials.

E. Excavation for Appurtenances. Excavation to be done in accordance with these Specifications and as shown on the approved Drawings. Adequate working clearances to be maintained around appurtenances. Provisions for base and

bottom preparations shall apply to all appurtenances.

Precautions to be taken to maintain trench widths in the vicinity of adjacent pipelines and conduits.

3.03 Bottom Preparation.

A. Undisturbed Foundation. Where soils are suitable and have adequate strength, bottom to be graded and hand-shaped such that pipe barrel rests uniformly on undisturbed soil. All rocks or stones that may result in a point bearing on the pipe shall be removed.

Undisturbed grades shall be within 0.1 feet tolerance. Soils for final pipe grade placed within these limits shall be fine granular (100% passing No. 4 sieve) or may be native materials, hand compacted to 95% maximum density.

B. Bell Holes. Material to be removed to allow installation of all fitting and joint projections without affecting placement of pipe.

C. Over excavation. Whenever trench is over-excavated to eliminate point bearing by rocks or stones or when undisturbed grade tolerances of 0.1 foot are exceeded, the Contractor is to re-establish grade using Class 6 aggregate bedding material. Compaction shall be 95% maximum density. All work to re-establish grade shall be at the Contractor's expense.

D. Unstable Materials. Materials that are not capable of supporting super-imposed loadings are defined as unstable materials. Should unstable materials be encountered during excavation, immediately notify Engineer. If, in the opinion of the Engineer, unstable soil excavation is required and the Contractor could not have reasonably been expected to discover the existence of such materials during their site investigation, then a contract price for Unstable Soil Excavation shall be negotiated between Owner and Contractor. No payment shall be made for materials excavated prior to notification of the Engineer and negotiation of payment for extra work.

Inclusion of a bid item for Unstable Soil Excavation indicates such excavation is anticipated. The Contractor is to notify the Engineer prior to any unstable soil excavation; no payment shall be made for excavation prior to authorization of Engineer.

E. Rock Excavation. Rock excavation shall be defined as removal of boulders in excess of 3 cubic yards of solid or fractured rock, which makes hand shaping of the bottom impossible and which requires techniques, such as blasting or jacking for removal, other than those which are being employed by the Contractor or are normally used in trench excavation, such as use of backhoes, trenchers, draglines, etc. Should unanticipated rock conditions be encountered, immediately notify the Engineer. If in the opinion of the Engineer, rock excavation is required and the Contractor has in fact made a diligent and determined effort to remove the material using normal excavation procedures as stated above, and the Contractor could not have reasonably been expected to determine the existence of such material during their site investigation, then a contract price for rock excavation shall be negotiated between the Contractor and the Owner. No

payment shall be made for excavation performed prior to determination of a negotiated price.

Rock shall be removed to a 4 inch depth below grade. Additionally, all rock loosened during jacking, blasting, etc., shall be removed from the trench. For payment purposes, maximum trench width to be paid for shall be as defined in Subsection 3.02, A. Maximum depth to be paid for shall be 12 inch below required grade. All over-excavation shall be replaced as specified in Subsection 3.03, C.

Inclusion of a bid item for rock excavation indicates such excavation is anticipated. Contractor to notify Engineer prior to any rock excavating; no payment shall be made for excavation prior to notification.

3.04 Backfilling.

A. Tamping Equipment. Except immediately next to the pipe, mechanical or air operated tamping equipment to be used. Hand equipment, such as T-bar to be used to pipe if necessary. Care to be taken when compacting under, along side and immediately above pipe to prevent crushing, fracturing shifting of the pipe. The Contractor is to note densities required for materials are or being backfilled and shall use appropriate approved equipment to obtain those densities.

Wheel rolling is not considered to be an adequate compaction technique to meet these Specifications and will not be allowed. Where 85% compaction is required, wheel rolling may be considered. Before acceptance, the Contractor shall backfill a portion of the trench and pay for density testing to verify adequacy of the proposed backfill techniques.

A hydro hammer may be allowed to obtain the specified density up to 4 feet in depth. The Contractor will be required to re-excavate those areas that have been tamped so that density tests can be taken to insure that the specified density is being obtained full depth.

B. Moisture Control. Generally maintain moisture of backfill material with 2% of optimum moisture content as determined by ASTM D698. Maintain closer tolerances as needed to obtain densities required.

C. Compaction. Maximum density (100%) based on ASTM D698 or AASHTO T99.

1. Bedding Material, including material used for over-excavation of any kind: 95%.

2. Select Material: 95%

3. Backfill beneath existing or proposed pavement, roadways, sidewalks, curbs, utility lines and other improvements or within 5 feet horizontally of such improvements: 95%.

4. Backfill within public or designated right-of-way: 90% or as shown on the approved Drawings.

5. Backfill within undeveloped, green or undesignated area: 85%.

6. Backfill for any fill over overcut grading in areas of lot/home construction: 95%.

D. Placing Backfill. The maximum loose lifts of backfill material to be as follows: use smaller lifts where necessary to obtain required densities:

1. Bedding and select material: 6 inches (or see Section 3.03A).

2. Backfill Material: 12 inches where 95% compaction required; 24 inch where less than 95% compaction required.

E. Backfilling Appurtenances. Backfilling to be done generally at the same time as adjacent pipelines. Backfilling procedure to conform to this section. Use special techniques or materials as shown on drawings.

F. Disposal of Excess Excavation. Contractor to dispose of excess excavation off site. The Owner shall have the right to elect to have the excess excavation disposed of at a designated site within the project limits. Excavation may be wasted on-site only if approved by the Engineer. Disposal in any case shall be the sole responsibility of the Contractor.

G. Jetting. Jetting and water inundation are generally not permitted methods of compaction. The Engineer may allow jetting under certain field conditions. Techniques including depth of lifts, amount of water to be used, penetration of hose jet, etc., shall be at the direction of the Engineer. No jetting will be allowed on materials with a 200 minus gradation of greater than 15%. Contractor shall pay cost of all water used, soil classification testing and retesting or recompaction required. No jetting shall be done prior to written approval and direction of the Engineer.

H. Maintenance of Backfill. Contractor to maintain all backfill in a satisfactory condition during the extent of the contract and warranty period. All surface deterioration determined to be the responsibility of the Contractor and the Contractor upon notice by the Owner shall repair all settlement at once. All costs for repair and all liability, as a result of surface deterioration or settlement, shall be the responsibility of the Contractor.

I. Clay Barrier Water Stops. Because of the presence of ground water, a clay barrier may be required to be installed full depth in trench in place of all bedding material and backfill. This barrier shall be full depth and two feet thick and installed every 100 linear feet of trench. Clay barrier installation shall be considered incidental to the pipe installation and not paid for separately.

3.05 Surface Restoration. All existing surface improvements and site conditions disturbed or damaged during construction to be restored to a condition equal to pre-construction condition. All restoration costs are considered incidental to excavation and backfill.

A. Improvements. Replace, repair or reconstruct all improvements as required. Work will not be accepted until restoration is accepted by Engineer and all affected property owners. Improvements include, by example, other utilities, culverts, structures, curb and gutter, mailboxes, signs, sprinkler systems, etc.

B. Final Grading. The Contractor is to re-establish existing final grade or finish final grades as modified and shown on the approved Drawings. The Contractor is to backfill to proper subgrade elevation with backfill material to allow placement of surface improvements or materials.

C. Roadways. All roadways to be restored to original condition with material types removed. Materials and methods to conform to applicable portions of current Colorado Department of Transportation (CDOT) specifications. Additional requirements are:

1. Minimum base course material on gravel roadways or minimum depth gravel on hard surface roadways to be 8 inch, unless shown otherwise on approved Drawings.

2. Minimum bituminous surfacing to be 3 inch unless shown otherwise on approved Drawings.

3. Minimum concrete pavement surfacing to be 6 inch, unless shown otherwise on approved Drawings.

4.00 QUALITY CONTROL - FIELD

4.01 Compaction. It should be fully understood that it will be the sole responsibility of the Contractor to achieve the specified densities for all embedment and backfill material placed. Contractor will be responsible for ensuring that correct methods are being used for the placement and compaction of said materials. Correct backfill methods include, but are not limited to:

A. Use of proper equipment for existing soil condition encountered.

B. Moisture content of existing soils; determination if water should be added or if soil should be air dried to reduce moisture content.

C. Thickness of backfill lift. Contractor may, at their own expense, have an approved geotechnical engineer monitor the methods of backfill and compaction used to ensure that the desired densities are being obtained. Inspection and testing will be performed as directed by the District. Testing will be conducted as a quality control check to verify the Contractor's compliance with the standards indicated the Specifications.

4.02 Inspection and Testing. Inspection and testing to be performed at the direction of the Engineer. Contractor to cooperate fully with all persons engaged in testing. Contractor to excavate as required to allow testing. Contractor to backfill all test excavations in accordance with these Specifications. Any areas, which require a specified density, including fill, backfill, trenches, embankments, road base, hot bituminous pavement, backfill for structures, shall be tested.

4.03 Density Testing and Control.

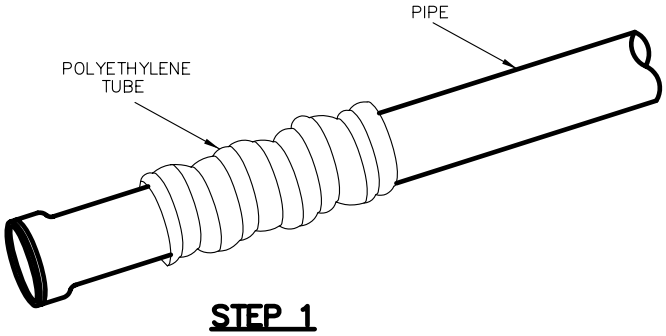
A. Reference Standards. Density/moisture relationships to be developed for all soil types encountered according to ASTM D698 or AASHTO T99.

B. Field Testing. Testing for density during compaction operations to be done in accordance with ASTM D2922 using nuclear density methods.

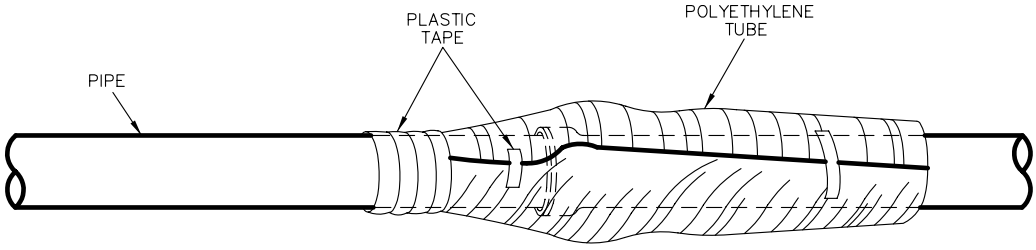
C. Frequency of Testing. Minimum of 1 test every 250' trench per lift or as directed by Engineer. Contractor to excavate to depths required by District for testing and backfill test holes to density specified.

D. Retesting. In the event of failure to meet compaction criteria, Contractor shall re-excavate and re-backfill at direction of District. All retesting to be paid for by Contractor and to be performed by soils testing firm approved by the District.

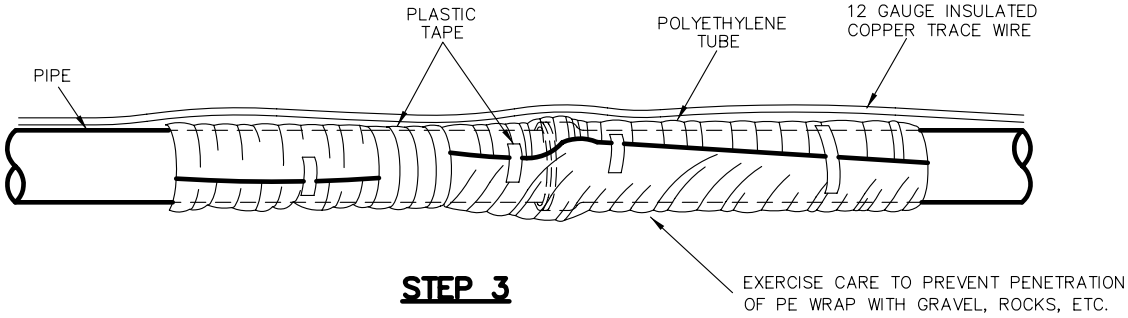
End of Section XII



STEP 1



STEP 2



STEP 3

FIELD INSTALLATION – POLYETHYLENE WRAP

WHERE SPECIFICALLY REQUIRED FOR SOIL APPLICATIONS

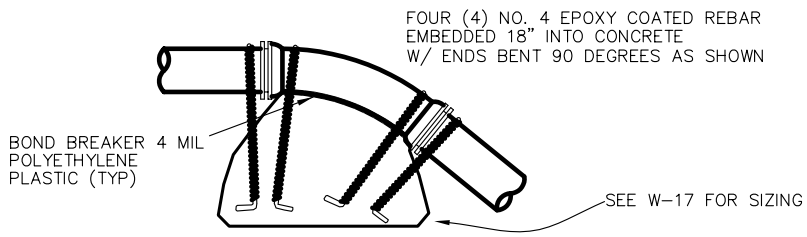
STEP 1 – PLACE TUBE OF POLYETHYENE MATERIAL ON PIPE PRIOR TO LOWERING IT INTO PLACE

STEP 2 – PULL THE TUBE OVER THE LENGTH OF THE PIPE. TAPE TUBE TO PIPE AT JOINT. FOLD MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH TAPE TO HOLD THE PLASTIC TUBE IN PLACE.

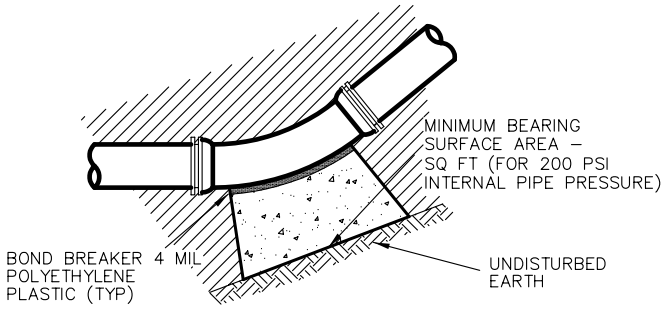
STEP 3 – OVERLAP FIRST TUBE WITH ADJACENT TUBE AND SECURE WITH PLASTIC ADHESIVE TAPE. THE POLYETHYLENE TUBE MATERIAL COVERING THE PIPE SHALL BE LOOSE. EXCESS MATERIAL SHALL BE NEATLY DRAWN UP AROUND THE PIPE BARREL, FOLDED ON TOP OF PIPE AND TAPED IN PLACE.

POLYETHYLENE WRAP

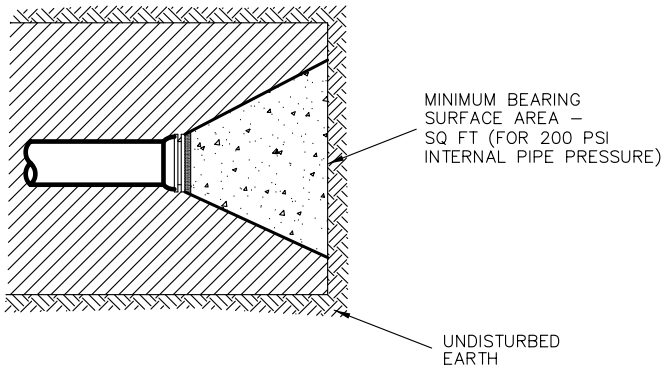
DETAIL "1"



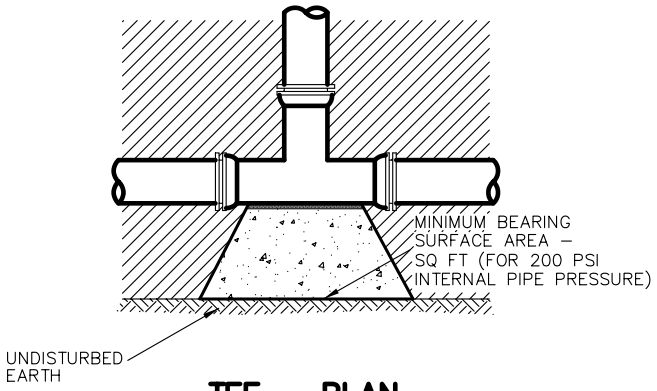
VERTICAL THRUST BLOCK – SECTION



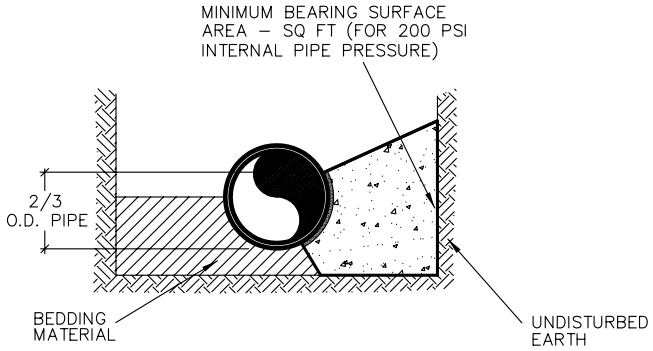
BENDS – PLAN



DEAD END – PLAN



TEE – PLAN



TYPICAL CROSS SECTION

MINIMUM BEARING SURFACE (SF)
FOR 200 PSI AND LESS

SIZE OF PIPE	BENDS				TEE OR DEAD END
	11-1/4°	22-1/2°	45°	90°	
6"	1.3	2.5	5.0	9.0	6.4
8"	1.3	2.5	5.0	9.0	6.4
10"	1.9	3.8	7.4	13.7	9.7
12"	2.7	5.4	10.5	19.3	13.7
16"	4.7	9.3	9.1	33.6	23.8
20"	7.2	14.3	28.0	51.8	36.6

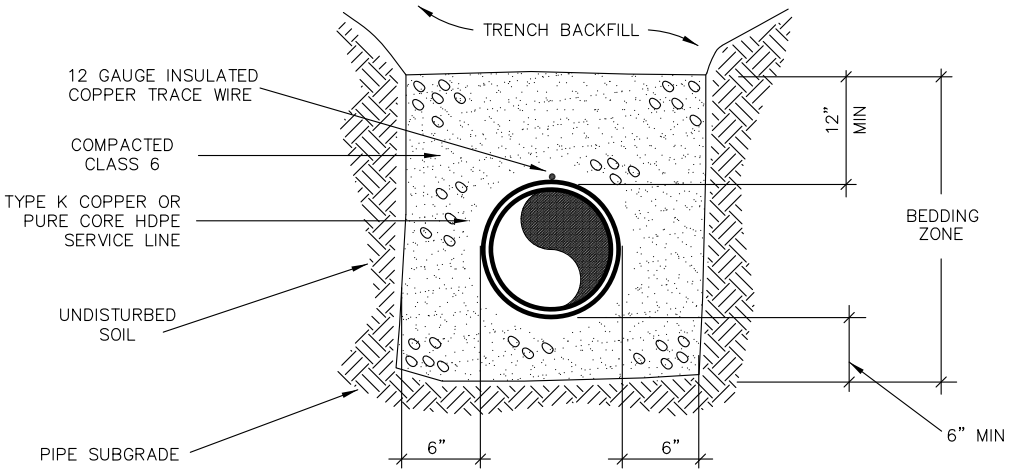
MINIMUM BEARING SURFACE (SF)
FOR 250 PSI AND LESS

SIZE OF PIPE	BENDS				TEE OR DEAD END
	11-1/4°	22-1/2°	45°	90°	
6"	1.6	3.1	6.2	11.4	8.0
8"	1.6	3.1	6.2	11.4	8.0
10"	2.4	4.7	9.25	17.1	12.0
12"	3.4	6.7	13.1	24.2	17.1
16"	5.8	11.6	22.7	42.0	29.7
20"	9.0	17.9	35.0	64.8	45.8

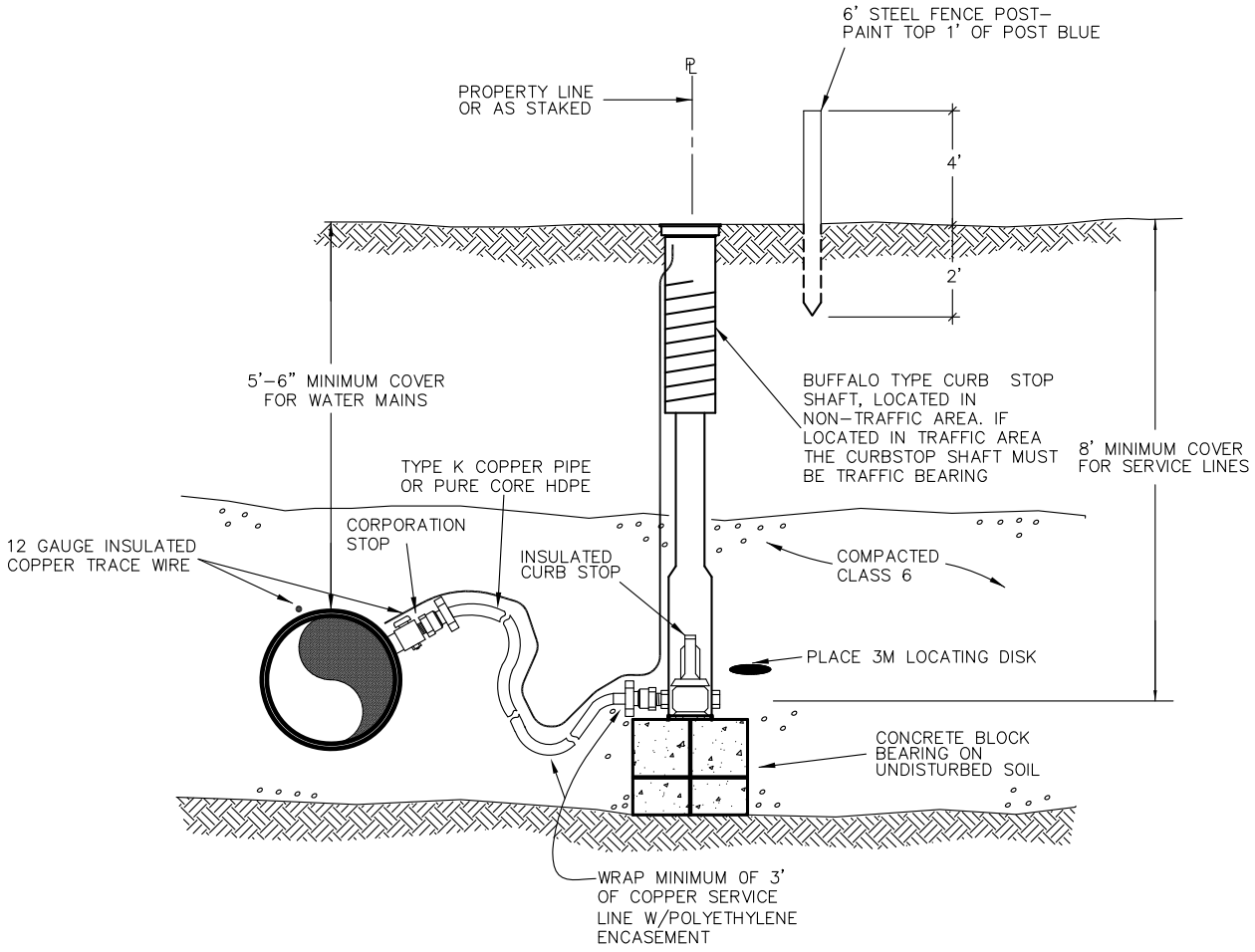
NOTES:
1. FOR 200 PSI INTERNAL PRESSURE, INCLUDING WATER HAMMER
2. MEGALUG RESTRAINTS MAY BE USED IN CONJUNCTION WITH THRUST BLOCKS WITH PRIOR APPROVAL FROM THE DISTRICT
3. MINIMUM AREA REQUIRED WILL BE THAT OF AN 8-INCH MAIN
4. ALL THRUST BLOCKS SHALL BE FORMED. THE MINIMUM THICKNESS FORM MATERIAL SHALL BE 3/8" PLYWOOD
5. BEARING AREA BASED ON SOIL BEARING PRESSURE OF 2000 lb/sf
6. CONCRETE SHALL HAVE A 28 DAY COMPRESSION STRENGTH OF 3000 psi

CONCRETE THRUST BLOCKS

DETAIL "2"



SERVICE STUB-OUT BEDDING



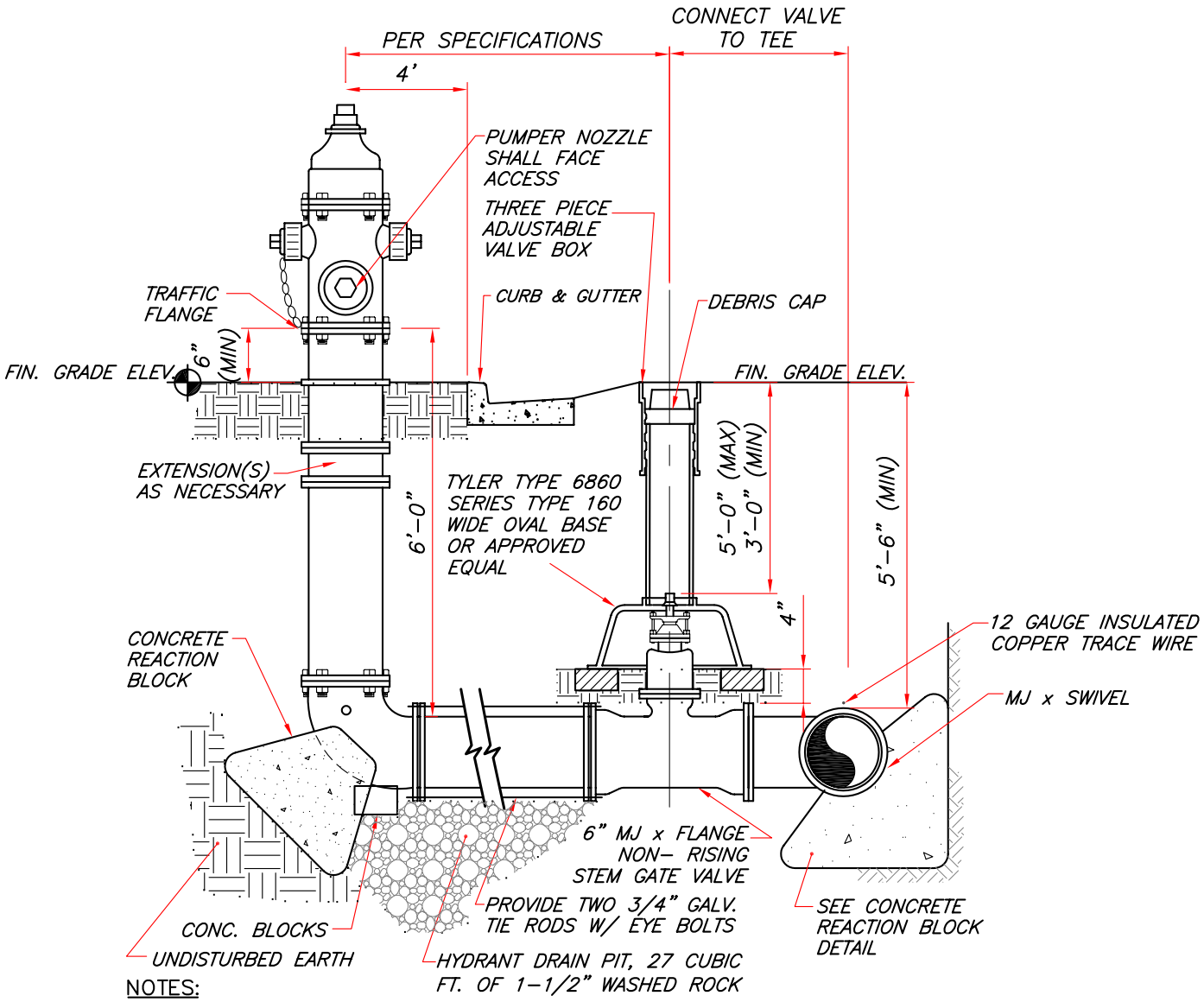
ELEVATION

GENERAL NOTES

1. CURB STOP TO BE LOCATED AT THE PROPERTY LINE OR AT THE EDGE OF EASEMENT-WHICHEVER IS CLOSER TO THE MAIN.
2. CURBSTOP - ALL FITTINGS SHALL BE COMPRESSION FITTINGS.
3. CURBSTOP - MANUFACTURER REFERENCE MUELLER B25204 OR APPROVED EQUAL.

WATER SERVICE STUB OUT

DETAIL "3"



NOTES:

1) ALL JOINTS FROM MAIN TO HYDRANT SHALL BE RESTRAINED MECHANICAL JOINTS OR FLANGED JOINTS.

2) HYDRANT, VALVE AND FITTINGS TO BE 250 P.S.I. RATED.

3) POLYETHYLENE WRAP SHALL COVER D.I.P. ASSEMBLY FROM HYDRANT BASE TO WATER MAIN.

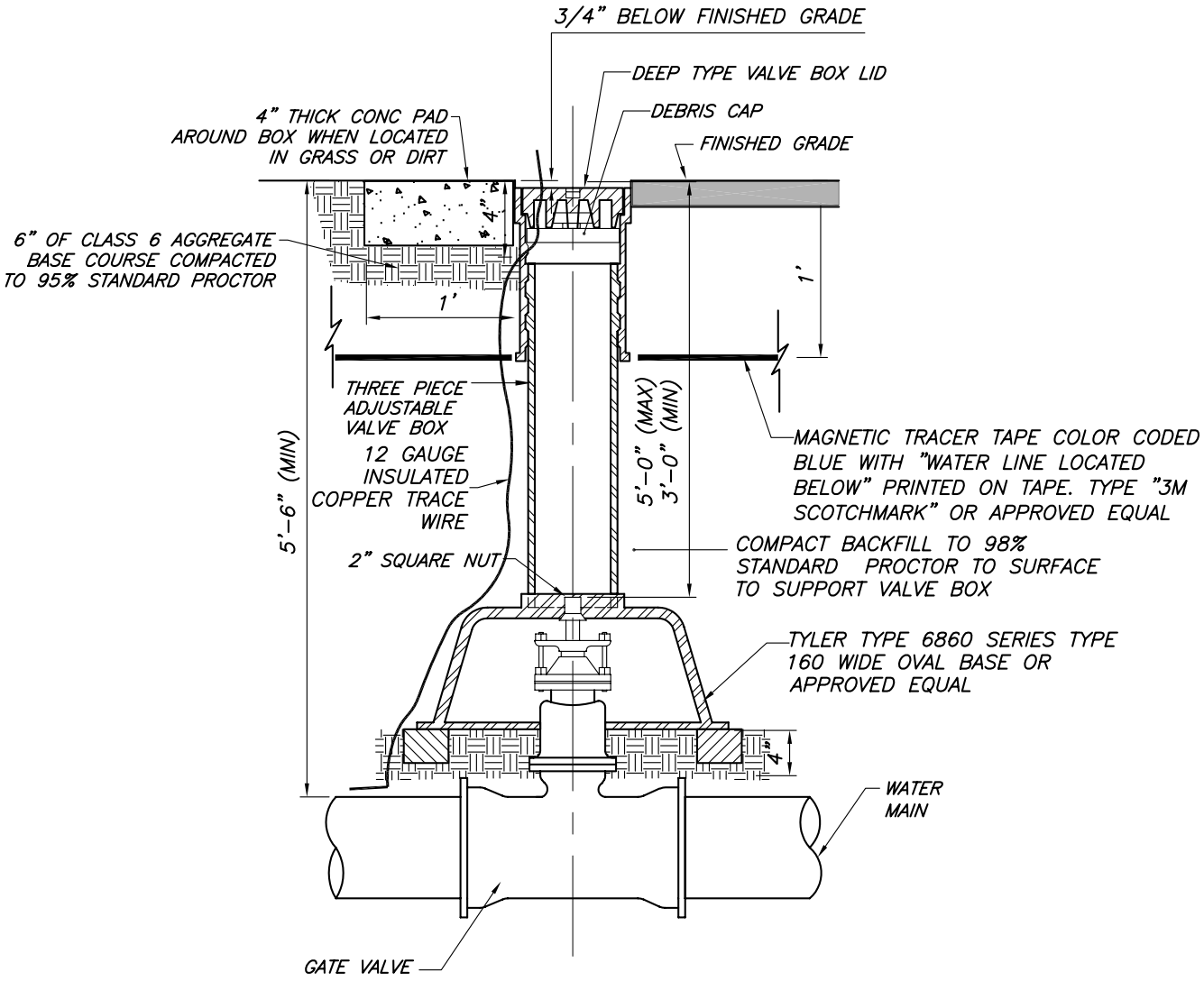
4) ALL HYDRANT LEAD PIPING TO BE 6" CLASS 250 D.I.P. UNLESS OTHERWISE NOTED

5) CENTERLINE OF HYDRANT TO BE 4'-0" FROM BACK OF CURB UNLESS OTHERWISE NOTED.

6) INSTALL VALVE STEM EXTENSION AS NEEDED TO INSURE THE DISTANCE FROM VALVE BOX LID TO TOP OF NUT SHALL NOT EXCEED 5'-0"

FIRE HYDRANT ASSEMBLY INSTALLATION DETAIL

DETAIL "4"



TYPICAL GATE VALVE

NOTES:

1. ALL VALVES ADJACENT TO FITTING SHALL BE MJ. IN LINE VALVES TO BE MJ x MJ. DESIGN LOCATIONS OF VALVES ARE OUTSIDE OF CONCRETE, CURB/GUTTER AND VALLEY PANS.

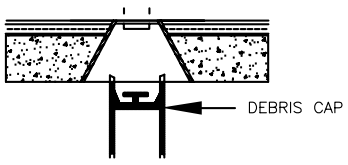
2. INSTALLED VALVES WHICH CONFLICT WITH CONCRETE AREAS SHALL BE RELOCATED AT THE CONTRACTOR'S EXPENSE.

3. THIS DETAIL DOES NOT APPLY TO HYDRANT ASSEMBLY VALVES.

4. INSTALL VALVE STEM EXTENSION AS NEEDED TO INSURE THE DISTANCE FROM VALVE BOX LID TO TOP OF NUT SHALL NOT EXCEED 5'–0"

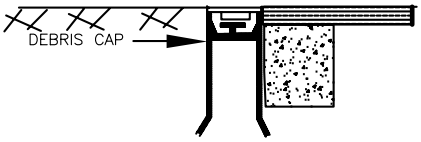
5. THE TRACER WIRE SHALL BE EXTENDED TO THE SURFACE AT ALL VALVES AND FIRE HYDRANTS. THE WIRE SHALL BE EXTENDED TOWARDS THE GROUND ON THE OUTSIDE OF THE VALVE BOX UNTIL THE WIRE IS WITHIN FOUR INCHES (4") OF THE TOP OF THE LID, AT WHICH POINT IT SHALL BE BROUGHT BACK INSIDE THE BOX AND SECURELY FASTENED. SUFFICIENT SLACK IN THE OUTSIDE OF THE WIRE SHALL BE PROVIDED TO COMPENSATE FOR ANY FUTURE ADJUSTMENT TO THE VALVE BOX.

DETAIL "5"



TYPE "A"

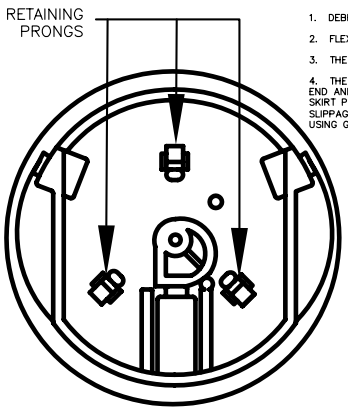
TYPE "B"



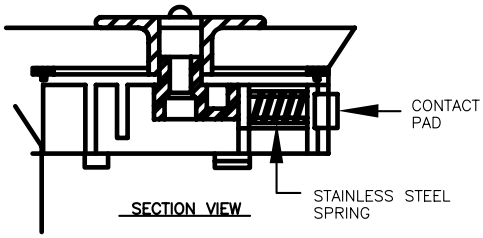
TYPE "C"

NOTES

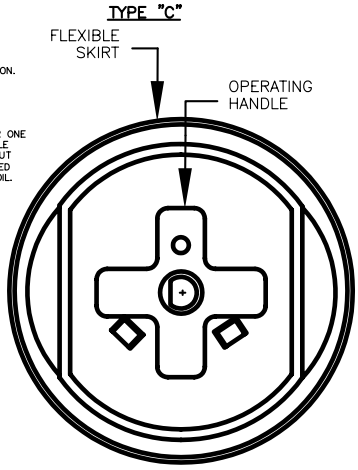
1. DEBRIS CAP SHALL BE INSTALLED AS CLOSE UNDER THE CAST IRON COVER WITHOUT INTERFERING WITH COVER OPERATION.
2. FLEXIBLE SKIRT SHALL BE TRIMMED TO PROVIDE A SMOOTH CONTACT WITH THE INTERIOR DIAMETER OF THE PIPE.
3. THE DEBRIS CAP SHALL BE MANUFACTURED BY SW SERVICES, INC., PHOENIX, ARIZONA OR EQUAL.
4. THE DEBRIS CAP SHALL BE COMPRISED OF A HOLLOW MEMBER HAVING A CYLINDRICAL OUTER SURFACE, A CLOSURE FOR ONE END AND THREE POINT RESILIENT CONTACT PADS PROJECTING FROM THE OUTER SURFACE. THE CAP SHALL HAVE A FLEXIBLE SKIRT PROVIDING AN OUTWARD SEAL PREVENTING DEBRIS FROM GETTING PAST THE CAP. THE CAP MUST WITHSTAND, WITHOUT SLIPPAGE, A MINIMUM VERTICAL FORCE OF 50 POUNDS, AT A LOADING RATE OF 1.0 IN/ MINUTE. THE CAP SHALL BE MOLDED USING GENERAL ELECTRIC ABS #HIM 4500. THE CAP SHALL HAVE RETAINING PRONGS TO RETAIN A STANDARD LOCATING COIL.



BOTTOM VIEW



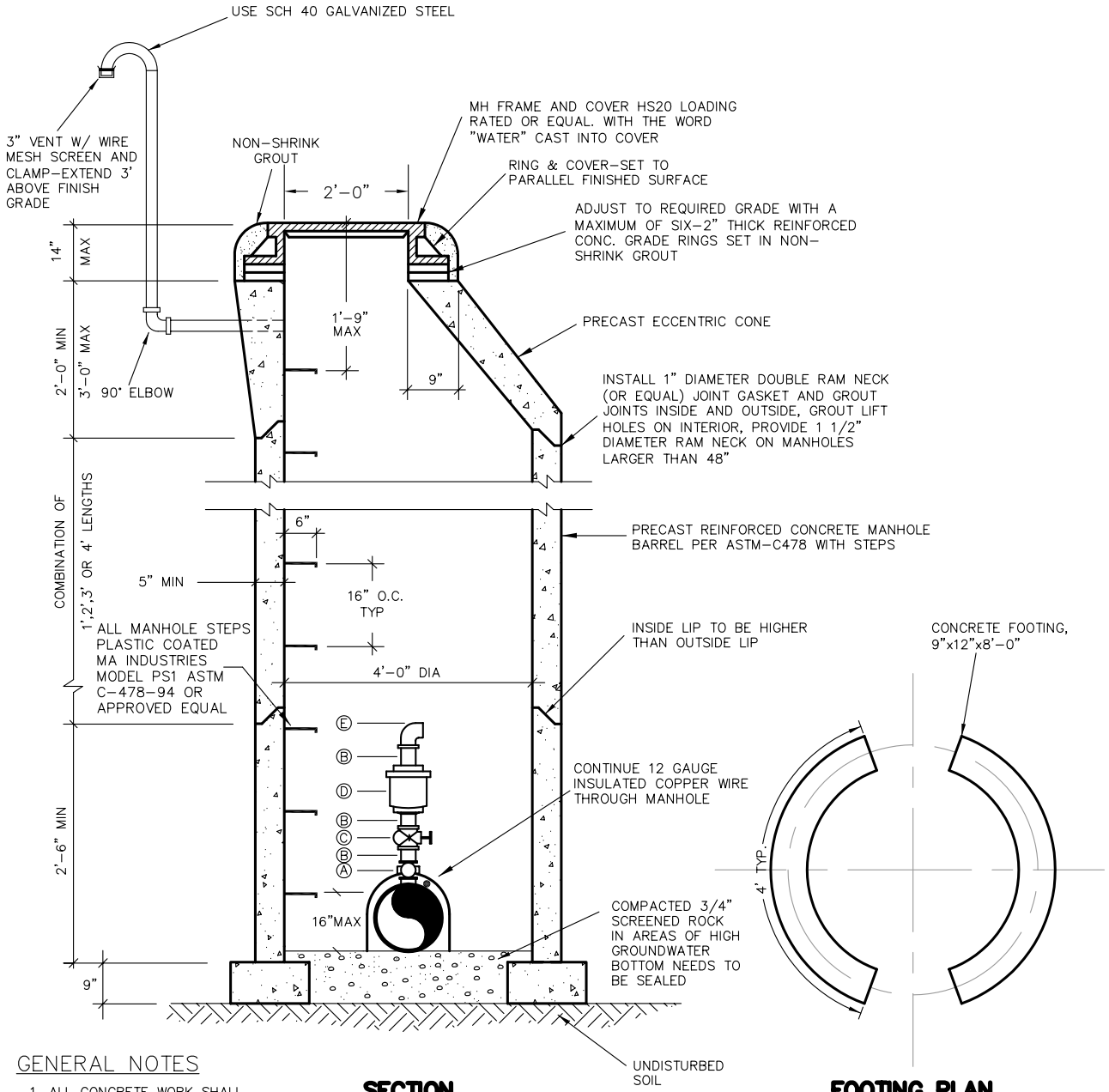
SECTION VIEW



TOP VIEW

DEBRIS CAP INSTALLATION

DETAIL "6"



SECTION

FOOTING PLAN

GENERAL NOTES

1. ALL CONCRETE WORK SHALL COMPLY WITH LATEST ACI–318 SPECIFICATIONS
2. AIR VALVE ASSEMBLY LARGER THAN 2" SIZE SHALL BE SPECIALLY DESIGNED AND MEET WATER DEPARTMENT REQUIREMENTS

2" COMBINATION AIR VALVE & MANHOLE

LEGEND

Ⓐ 2" CORPORATION TAPERED THREADS INLET

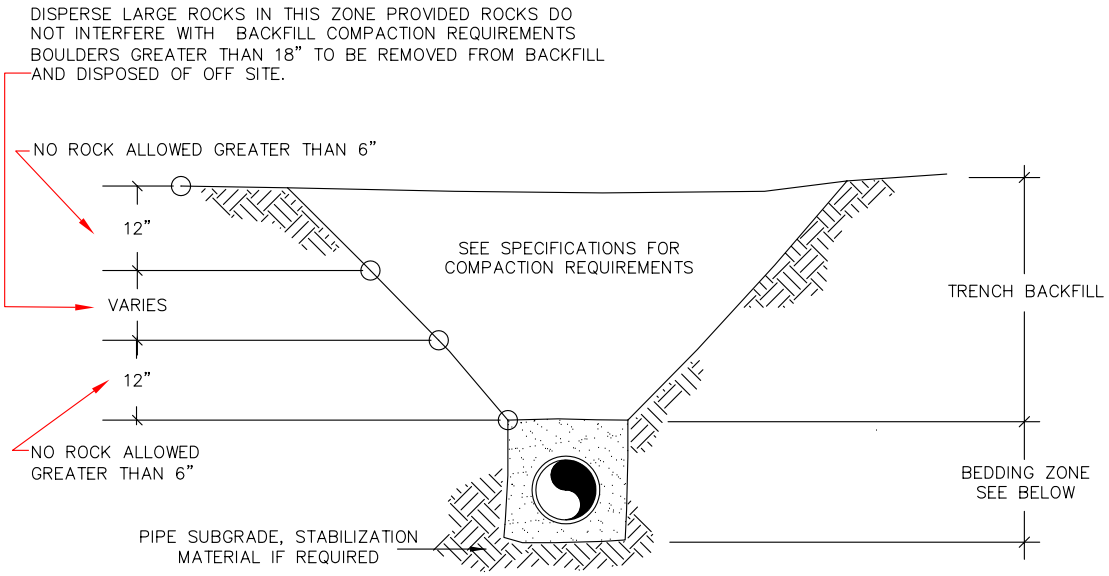
Ⓑ 2" X 4" THREADED BRASS NIPPLE

Ⓒ 2" THREADED GATE VALVE WITH WHEEL (CRANE OR NIBCO)

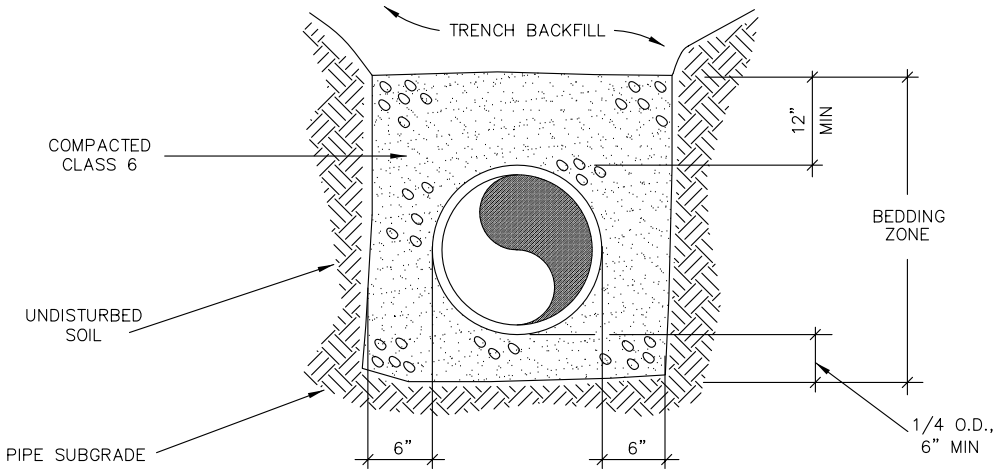
Ⓓ 2" THREADED INLET APCO 144 AIR AND VACUUM RELEASE VALVE

Ⓔ 2" X 90° PLASTIC ELBOW

DETAIL "7"



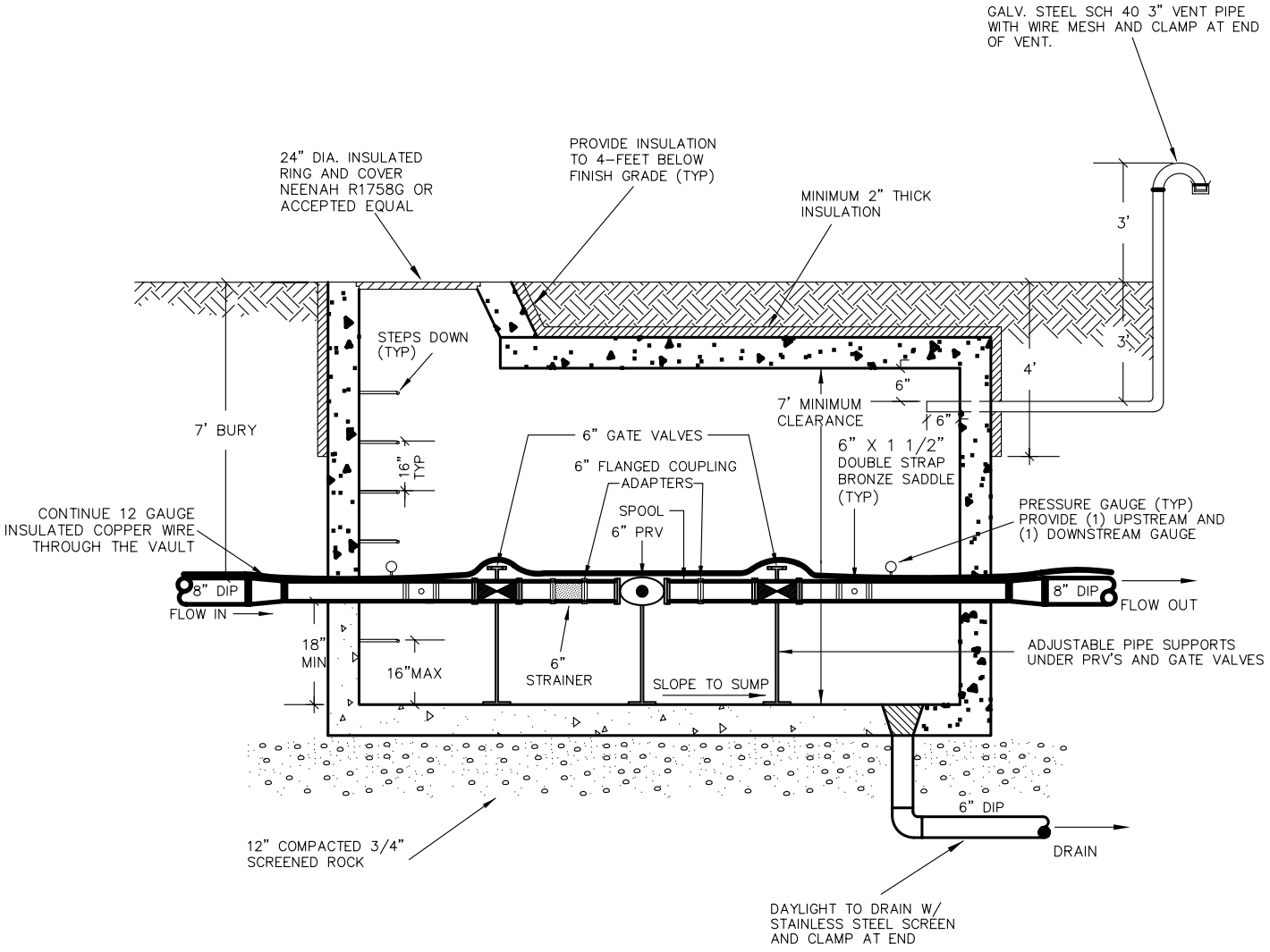
TRENCH ZONES



PIPE BEDDING ZONE

WATER PIPE BEDDING

DETAIL "8"



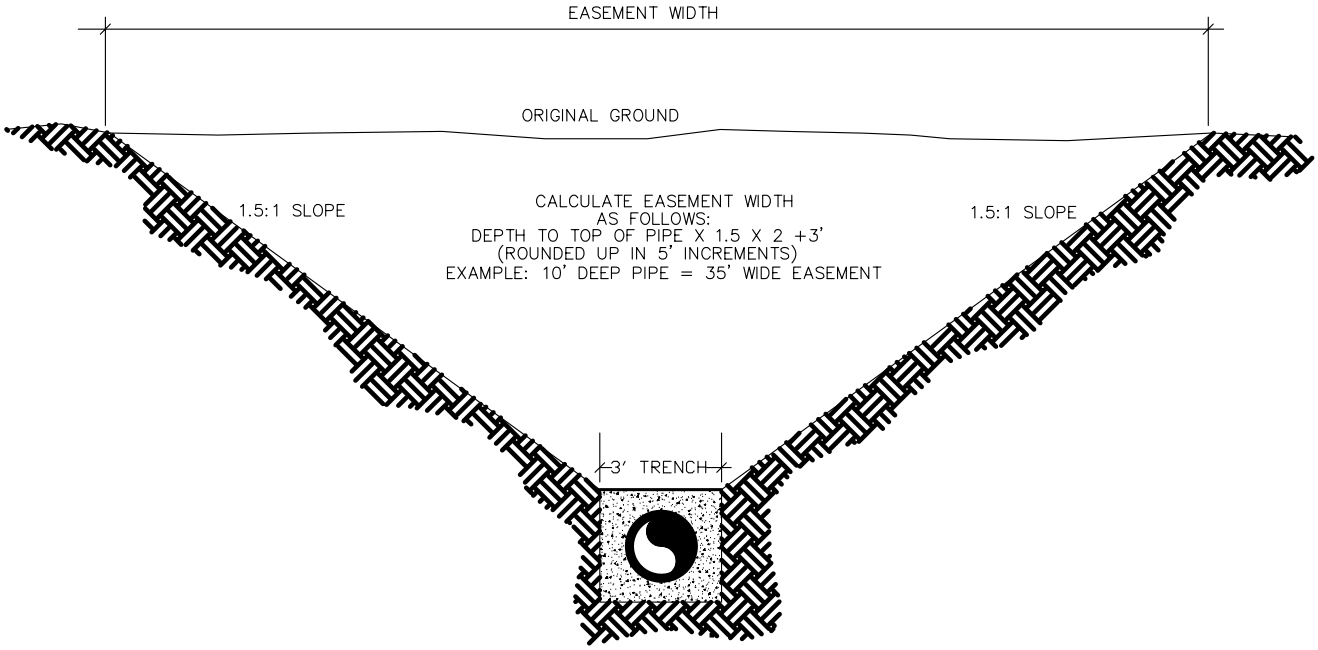
ELEVATION

NOTES

1. VAULT SHALL BE PRECAST CONCRETE AND CAPABLE OF WITHSTANDING HS 20-44 TRAFFIC LOADING CONDITIONS
2. WHERE PIPES PENETRATE WALLS, USE LINK SEAL OR FILL ANNULAR SPACE W/ NON-SHRINK GROUT
3. COAT ALL EXTERIOR VAULT SURFACES WITH BITUMINOUS DAMPROOFING
4. ALL 1 1/2" PIPE SHALL BE BRASS W/ALL OTHER PIPE AND FITTINGS BEING FLANGED DUCTILE IRON
5. ALL TIE-RODS SHALL BE 3/4" ALL-THREAD OR MEGA-LUGS ON EXTERIOR CONNECTIONS
6. CONTRACTOR SHALL SUBMIT VAULT PIPING SCHEMATIC W/ VAULT DIMENSIONS PRIOR TO ORDERING
7. IT SHALL BE THE OWNER'S RESPONSIBILITY TO VERIFY ALL PRV SIZING AND PRESSURE SETTINGS SIZES OF PRV'S SHOWN IS FOR ILLUSTRATION PURPOSES ONLY
8. THE DISTRICT SHALL APPROVE FINAL SIZING OF ALL PRV'S AND VALVES

MAIN LINE PRV VAULT

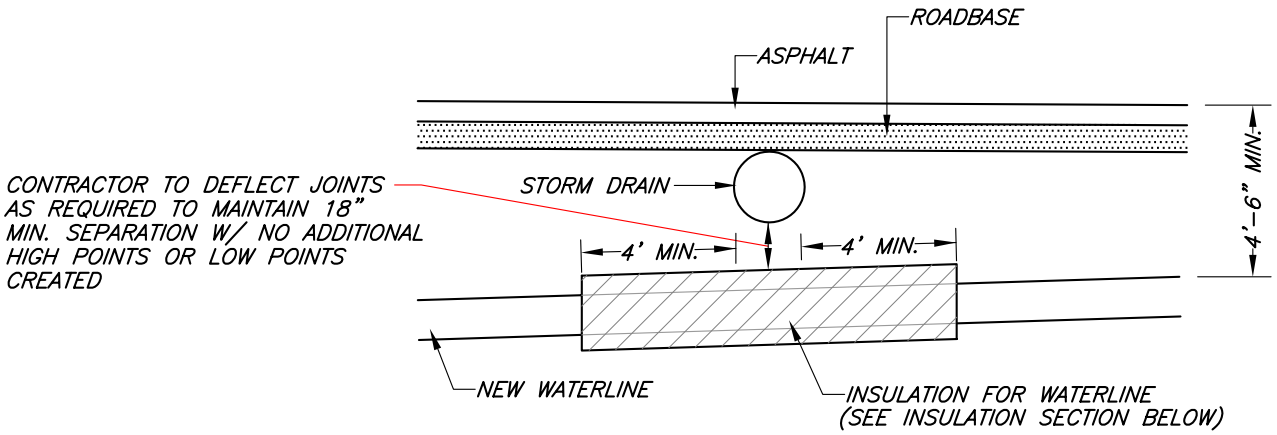
DETAIL "9"



MINIMUM EASEMENT WIDTH

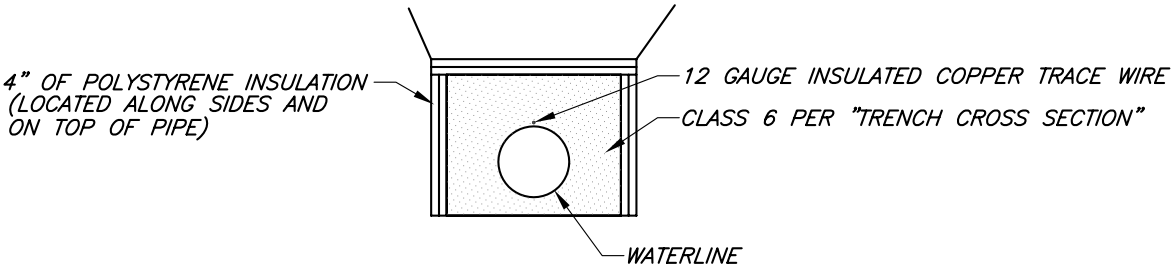
EASEMENT WIDTH

DETAIL "10"



ELEVATION
WATERLINE/CULVERT CROSSING

NO SCALE

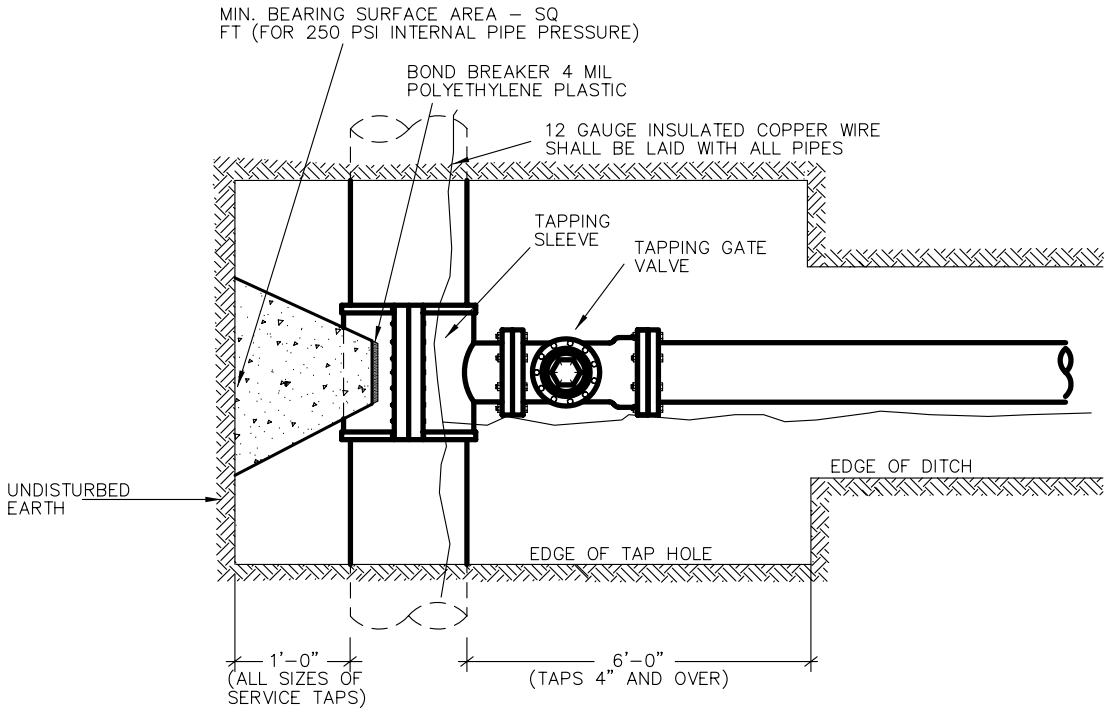


INSULATION SECTION

NO SCALE

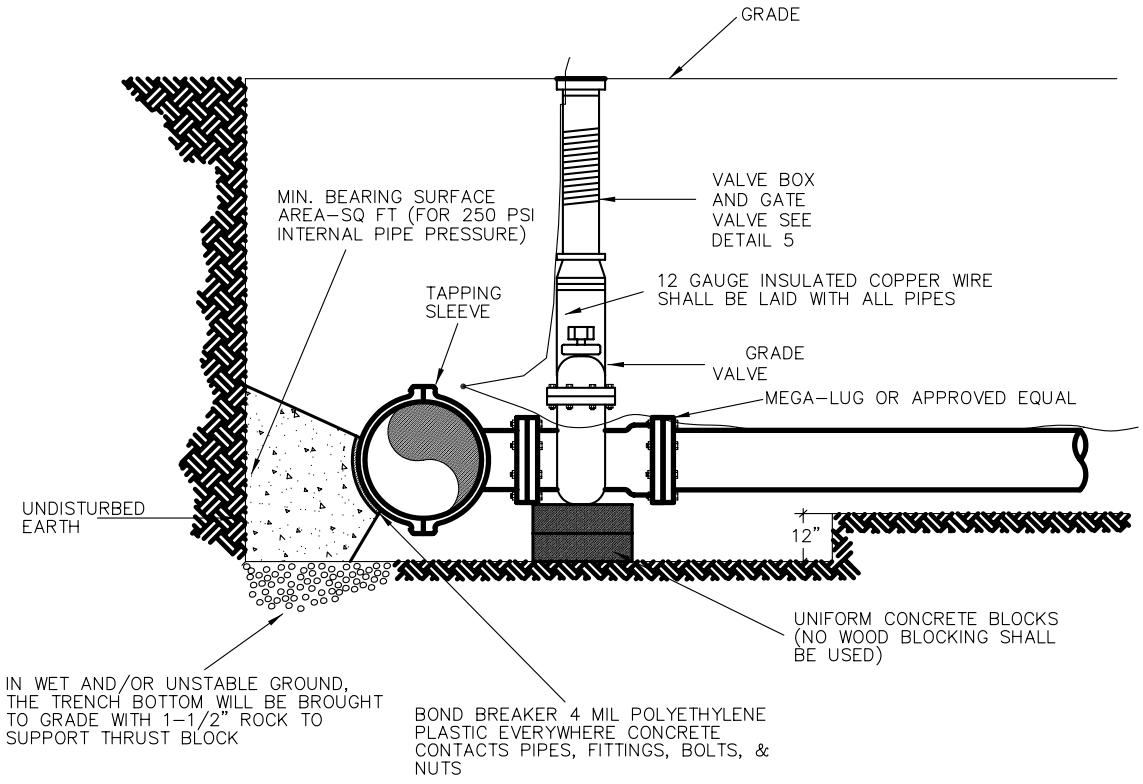
INSULATION DETAIL

DETAIL "11"



PLAN

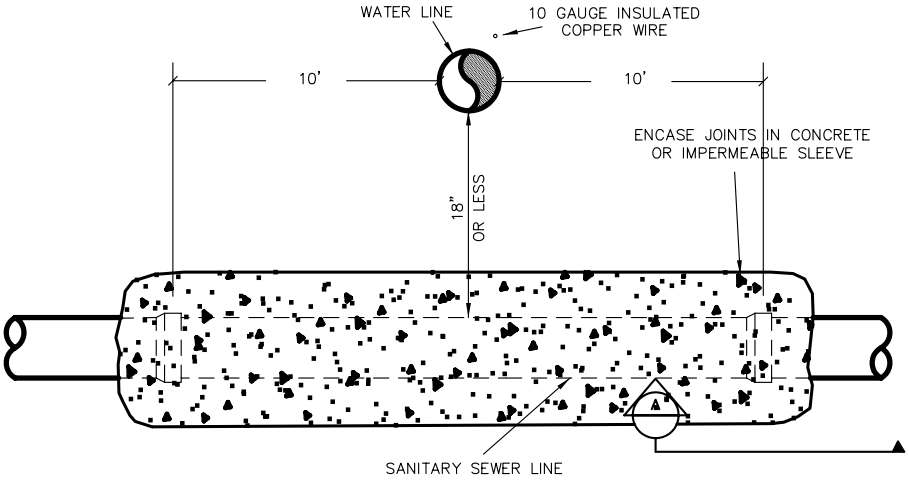
12 GAUGE INSULATED COPPER WIRE SHALL BE LAID WITH ALL PIPES



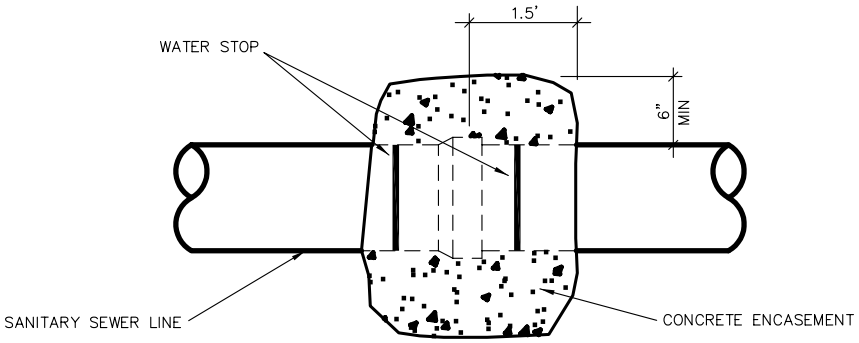
ELEVATION

TAPPING DETAIL

DETAIL "12"



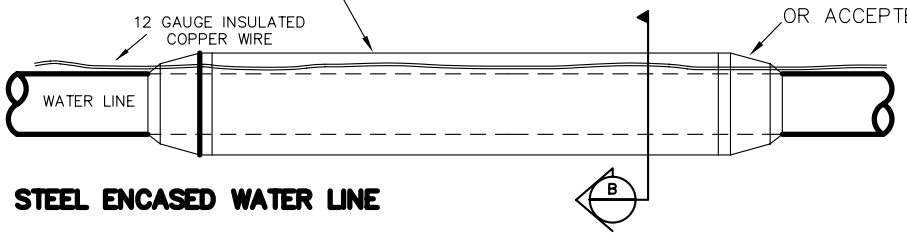
IF WATERLINE IS 18" OR LESS ABOVE SEWER OR IF WATER LINE IS BELOW THE SEWER LINE, INSTALL CONCRETE ENCASEMENT. ENCASEMENT MUST EXTEND UNTIL THE WATER AND SEWER PIPE ARE SEPARATED BY MORE THAN 10 FEET. IN LIEU OF CONCRETE ENCASEMENT C900 PVC PRESSURE PIPE OR YELOMINE PRESSURE PIPE MAY BE SUBSTITUTED.



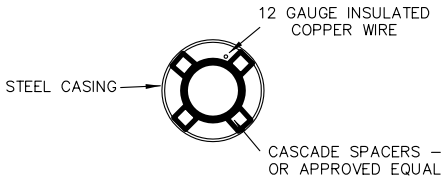
SECTION A

STEEL CASING THICKNESS AND COATING PER REGULATORY AGENCY

HIGH DENSITY RUBBER CASING WITH 3/4" WIDE STAINLESS STEEL STRAPS. PIPELINE SEAL AND INSULATOR CO. MODEL W OR ACCEPTED EQUAL.



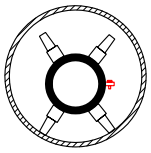
STEEL ENCASED WATER LINE



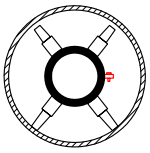
SECTION B

CONCRETE & STEEL PIPE ENCASEMENT

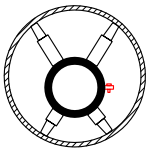
DETAIL "13"



STANDARD

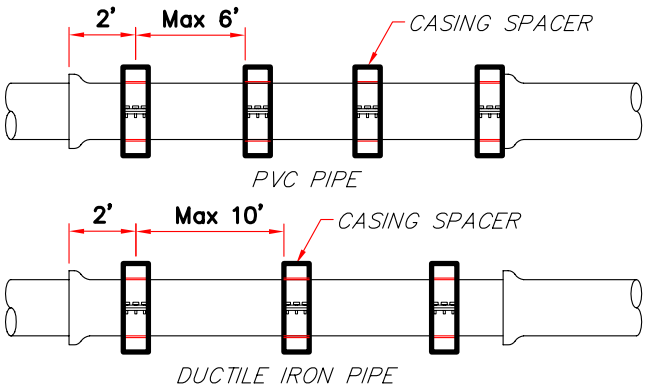


CENTERED

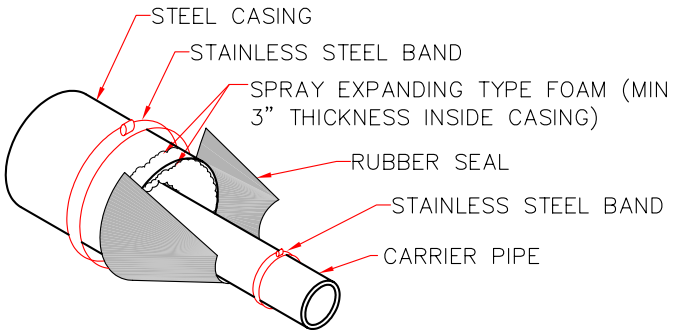


RESTRAINED

BASIC POSITIONS



PLACEMENT OF SPACERS ON CARRIER PIPE



END SEAL

NOTES:

1.) GENERAL: ONE SPACER SHALL BE PLACED NOT MORE THAN TWO FEET FROM EACH END OF THE CASING SUBSEQUENT SPACERS SHALL BE PLACED AT 10' INTERVALS WITHIN THE CASING.

2.) PVC CARRIER: ONE SPACER SHALL BE PLACED ON THE SPIGOT END OF EACH SEGMENT AT THE LINE MARKING THE LIMIT OF INSERTION INTO THE BELL. WHEN THE JOINT IS COMPLETE, THE SPACER SHALL BE IN CONTACT WITH THE BELL OF THE JOINT SO THAT THE SPACER PUSHES THE JOINT AND RELIEVES COMPRESSION WITHIN THE JOINT. SUBSEQUENT SPACERS SHALL BE PLACED AT 6' INTERVALS.

3.) CARRIER PIPE SHALL BE INSERTED WITHIN CASING BY USE OF MODEL CCS STAINLESS STEEL CASING SPACERS AS MANUFACTURED BY CASCADE WATERWORKS MFG. CO. OF YORKVILLE, IL OR APPROVED EQUAL BY DISTRICT ENGINEER.

4.) ALL PIPE JOINTS LOCATED WITHIN THE CASING AND THE FIRST JOINT EITHER SIDE OF CASING SHALL BE RESTRAINED BY USING SNAP LOCK TYPE GASKETS MANUFACTURED BY US PIPE OR APPROVED EQUAL BY DISTRICT ENGINEER. ALL RESTRAINED PIPE IS TO BE TYPE TYTON–JOINT AS MANUFACTURED BY US PIPE OR APPROVED EQUAL BY DISTRICT ENGINEER. ALL RESTRAINED PIPE IS TO BE INSTALLED USING THE RESTRAINED POSITION OF CARRIER INSTALLATION.

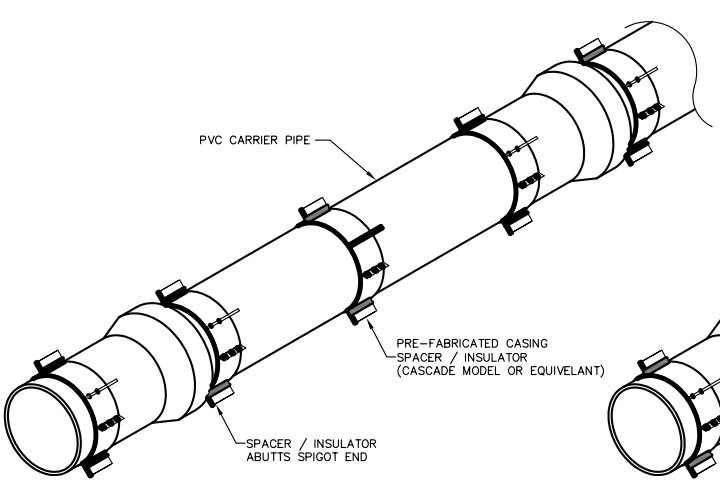
5.) CONTRACTOR TO INSTALL PER SPECIFICATIONS SUPPLIED BY CASCADE WATERWORKS MANUFACTURING COMPANY OR APPROVED EQUAL BY DISTRICT ENGINEER.

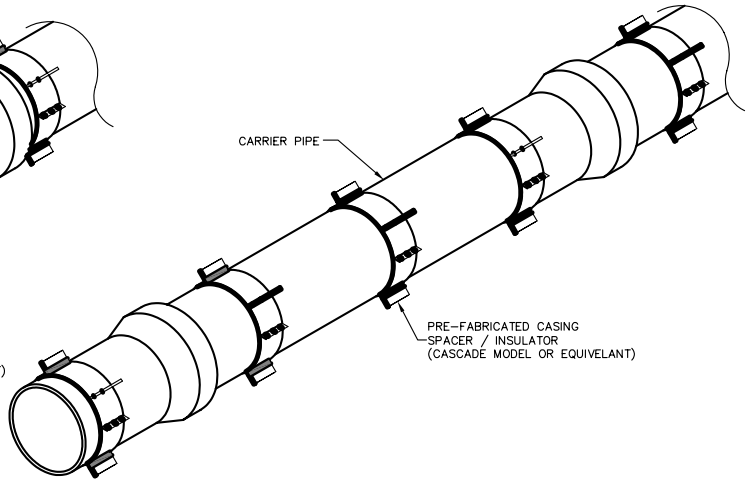
PIPE ENCASEMENT DETAIL

NTS

PIPE ENCASEMENT DETAIL

DETAIL "14"



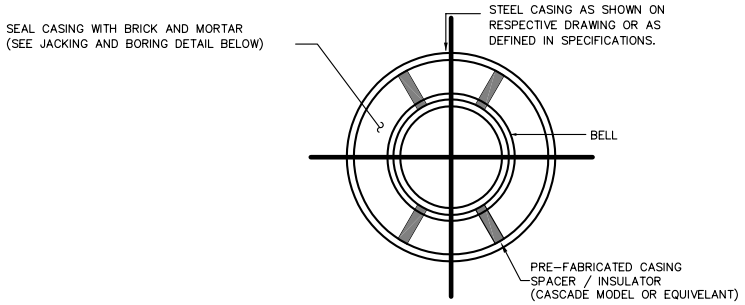


GENERAL NOTES:

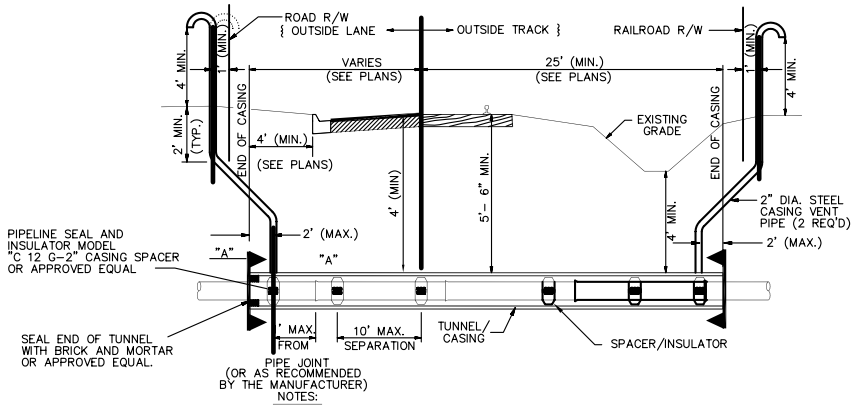
1. ONE SPACER SHALL BE PLACED NOT MORE THAN TWO FEET FROM EACH END OF THE CASING. SUBSEQUENT SPACERS SHALL BE PLACED AT 10' ENTRVALS WITHIN CASING
2. PVC CARRIER: ONE SPACER SHALL BE PLACED ON THE SPIGOT END OF EACH SEGMENT AT THE LINE MARKING THE LIMIT OF INSERTION INTO THE BELL WHEN THE JOINT IS COMPLETE, THE SPACER SHALL BE IN CONTACT WITH THE BELL OF THE JOINT SO THAT THE SPACER PUSHES THE JOINT AND RELIEVES COMPRESSION WITHIN THE JOINT. SUBSEQUENT SPACERS SHALL BE PLACED AT 6' INTERVALS

RECOMMENDED PLACEMENT
ON PVC PIPE

RECOMMENDED PLACEMENT
ON OTHER PIPE



SECTION "A"



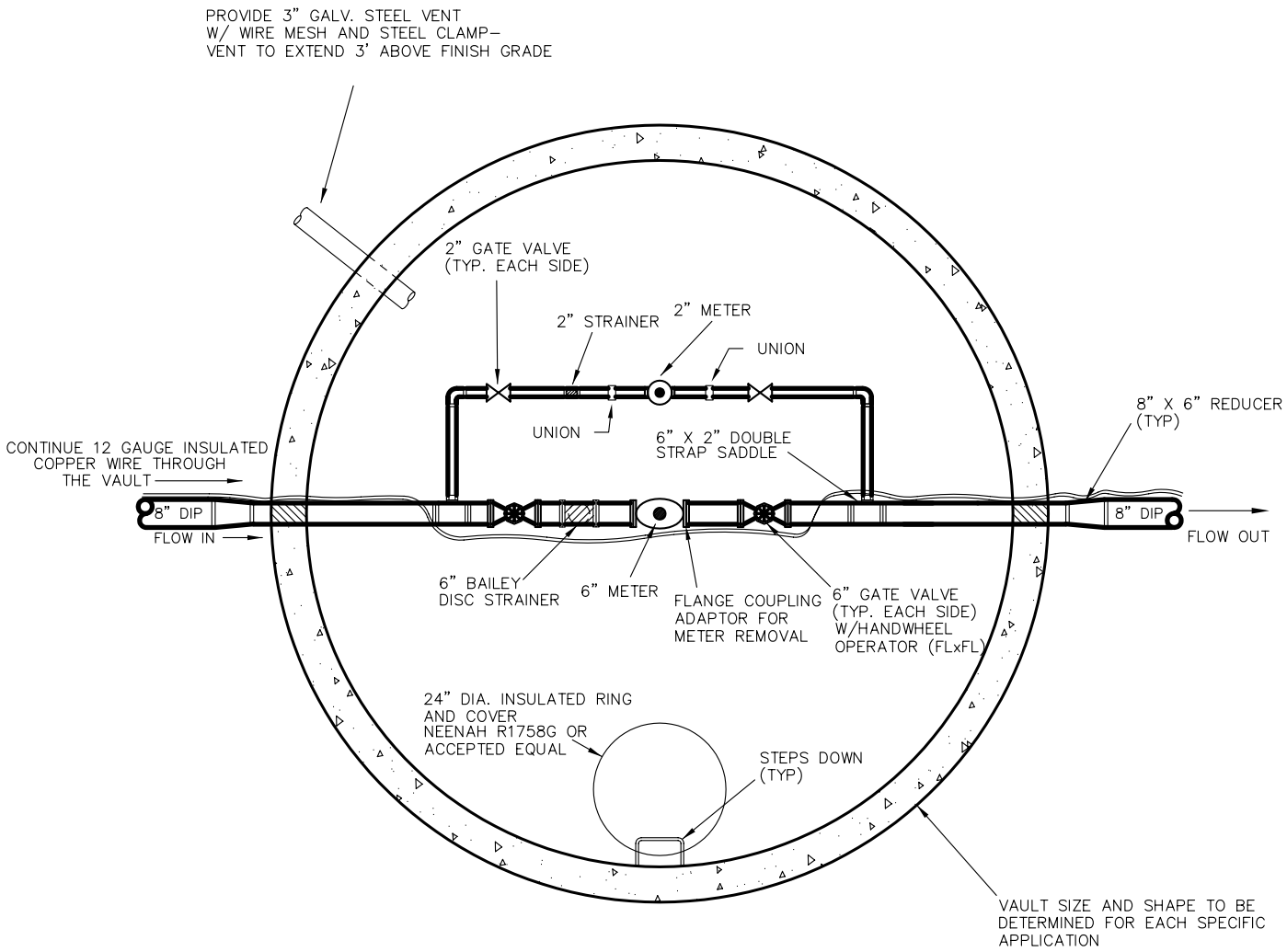
NOTES:

1. WATER MAIN TO BE RESTRAINED THROUGH TUNNEL / CASING.
2. PIPELINE SHALL BE PROMINENTLY MARKED AT RAILROAD RIGHT-OF-WAY BY SIGNS WORDED, "HIGH PRESSURE MAIN BURIED BELOW".
3. VENT PIPES SHALL BE FITTED WITH SCREENED DOWN-TURNED ELBOWS.
4. VENT PIPES SHALL BE INSTALLED ONLY IF TUNNEL / CASING IS NOT FILLED.

JACK AND BORE DETAILS FOR CROSSINGS

N.T.S.

DETAIL "15"



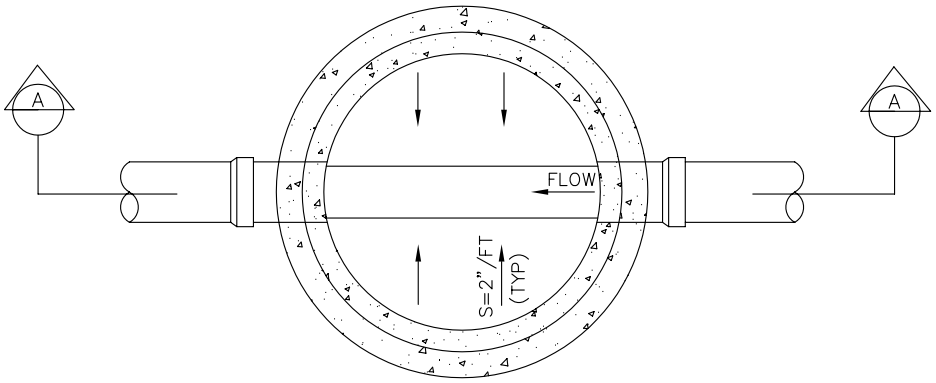
PLAN

NOTES

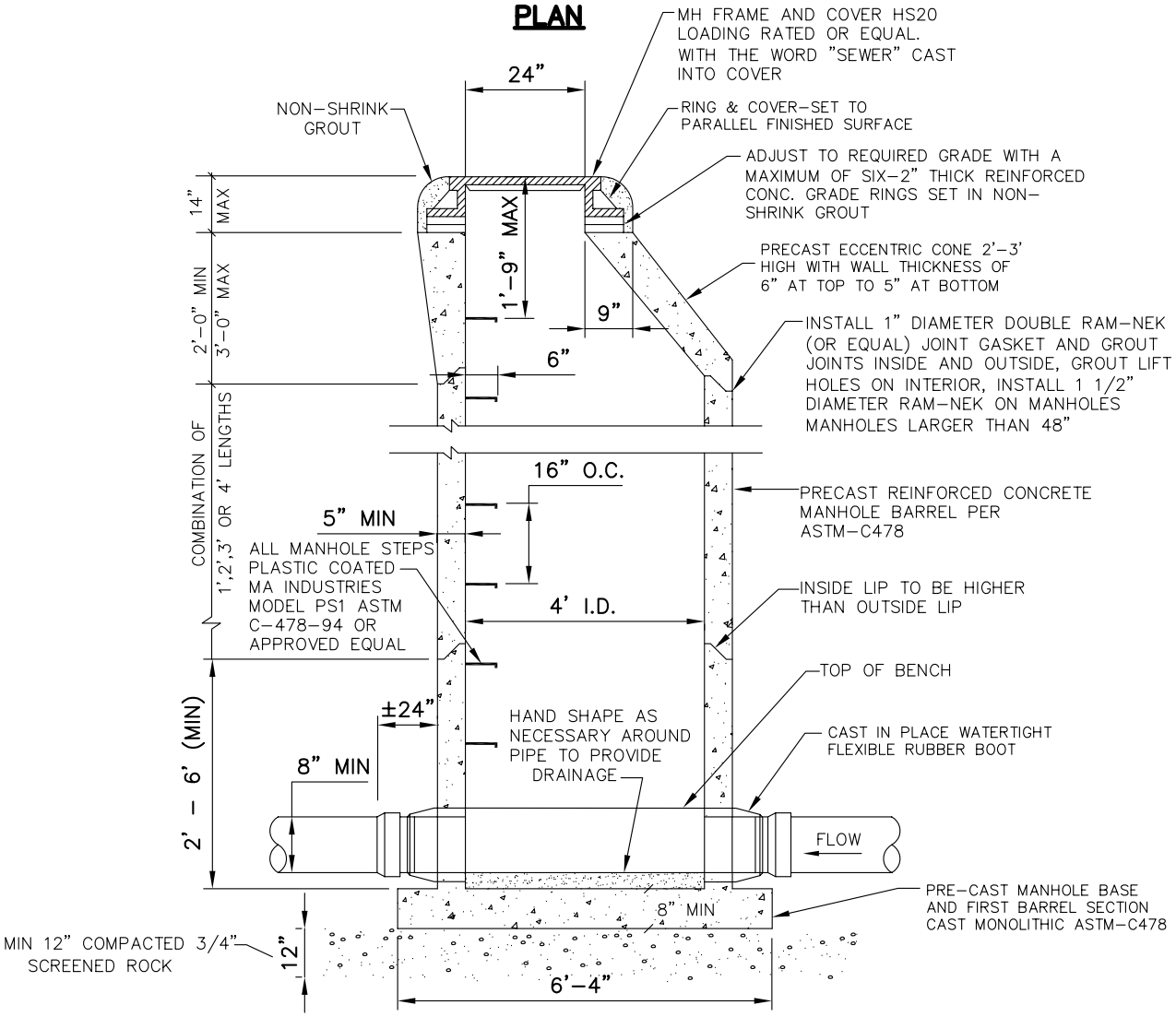
1. VAULT SHALL BE PRECAST CONCRETE AND CAPABLE OF WITHSTANDING HS 20–44 TRAFFIC LOADING CONDITIONS
2. WHERE PIPES PENETRATE WALLS, USE LINK SEAL OR FILL ANNULAR SPACE W/ NON–SHRINK GROUT
3. COAT ALL EXTERIOR VAULT SURFACES WITH BITUMINOUS DAMPROOFING
4. ALL 2" PIPE SHALL BE BRASS W/ALL OTHER PIPE AND FITTINGS BEING FLANGED DUCTILE IRON
5. ALL TIE–RODS SHALL BE 3/4" ALL–THREAD OR MEGA–LUGS ON EXTERIOR CONNECTIONS
6. CONTRACTOR SHALL SUBMIT VAULT PIPING SCHEMATIC W/ VAULT DIMENSIONS TO DISTRICT PRIOR TO ORDERING MATERIALS OR EQUIPMENT

WATER METER

DETAIL "16"



PLAN

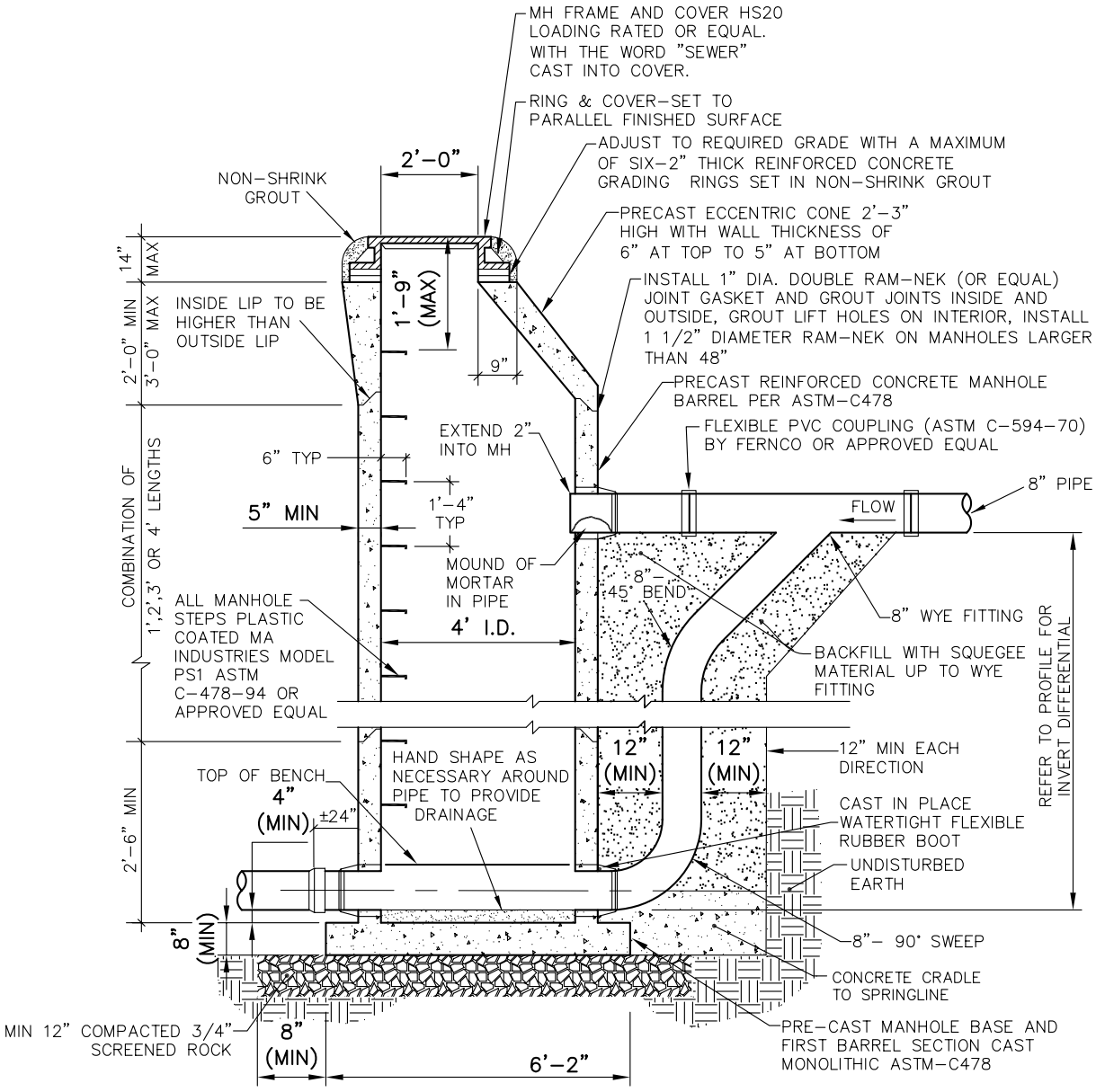


SECTION (A)

STANDARD MANHOLE

GENERAL NOTE
1. ALL CONCRETE WORK SHALL COMPLY WITH LATEST CI-318 SPECIFICATIONS
2. USE 5' I.D. WHEN PIPE SIZE 15"- 24".

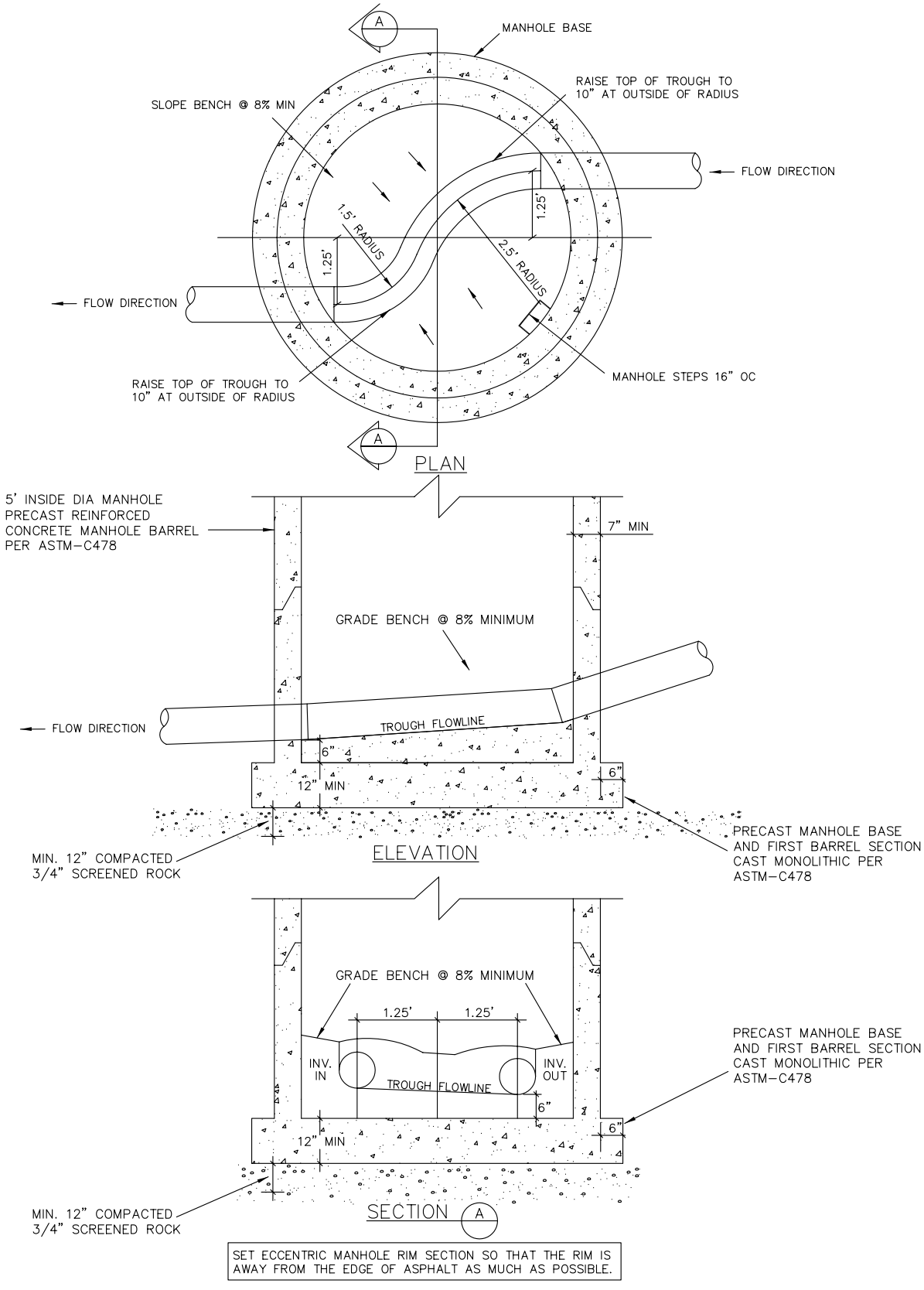
DETAIL "A"



DROP MANHOLE

GENERAL NOTES:
1. ALL CONCRETE WORK SHALL COMPLY WITH LATEST CI–318 SPECIFICATIONS
2. USE 5' I.D. WHEN PIPE SIZE 15" – 24"

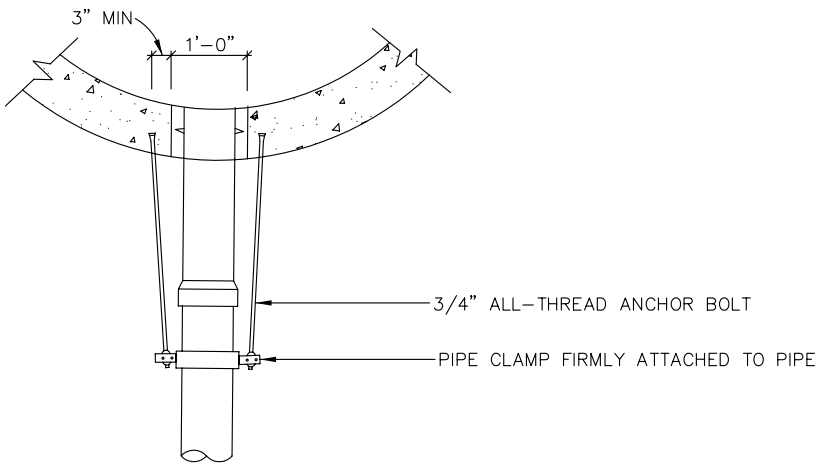
DETAIL "B"



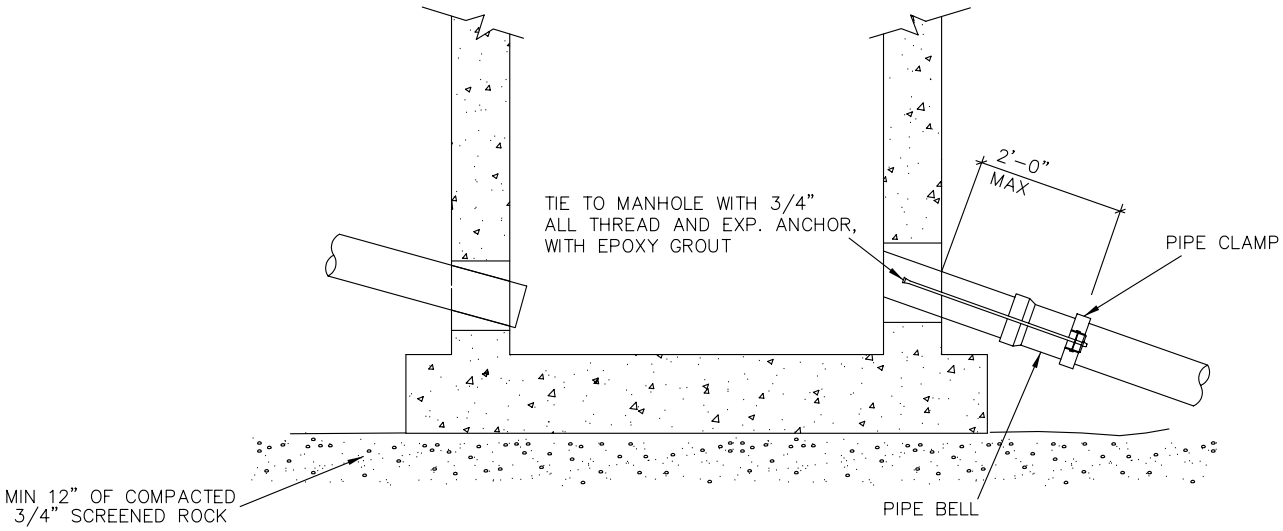
SET ECCENTRIC MANHOLE RIM SECTION SO THAT THE RIM IS AWAY FROM THE EDGE OF ASPHALT AS MUCH AS POSSIBLE.

ENERGY DISSIPATOR MANHOLE

DETAIL "C"



TOP VIEW

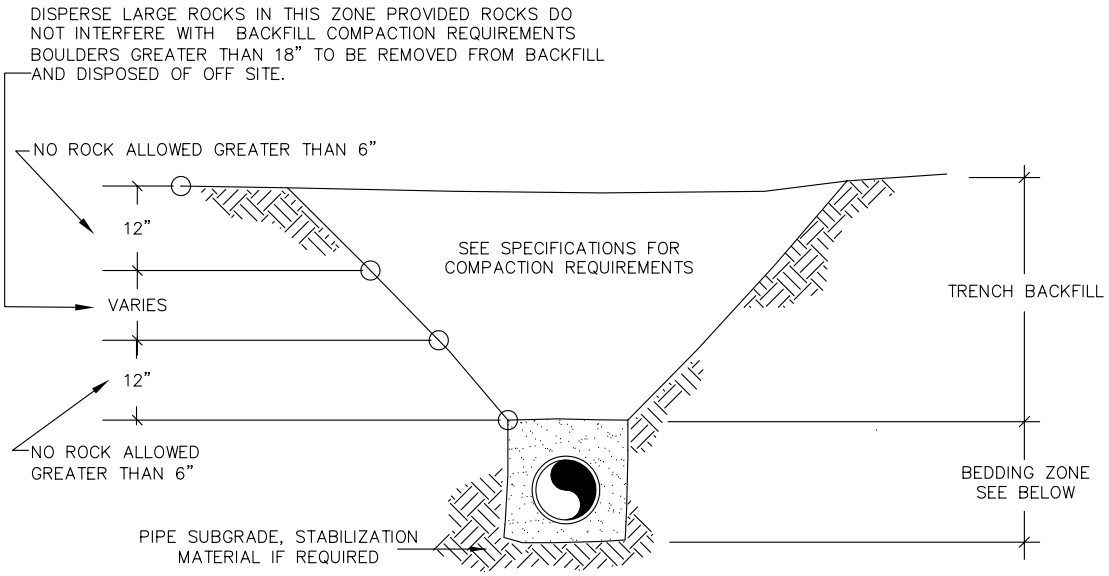


ELEVATION

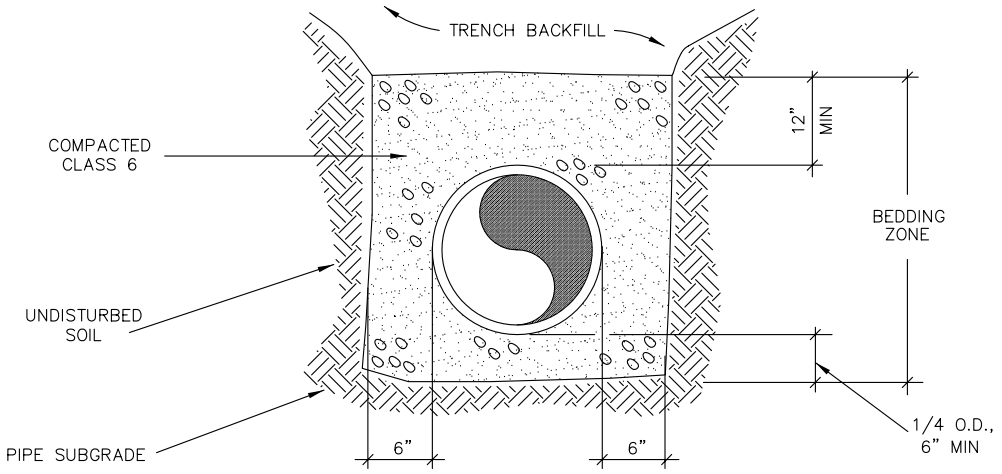
NOTE: ANCHOR MANHOLES ARE REQUIRED WHERE PIPE SLOPE EXCEEDS 20% EXITING THE MANHOLE ONLY

ANCHOR MANHOLE

DETAIL "D"



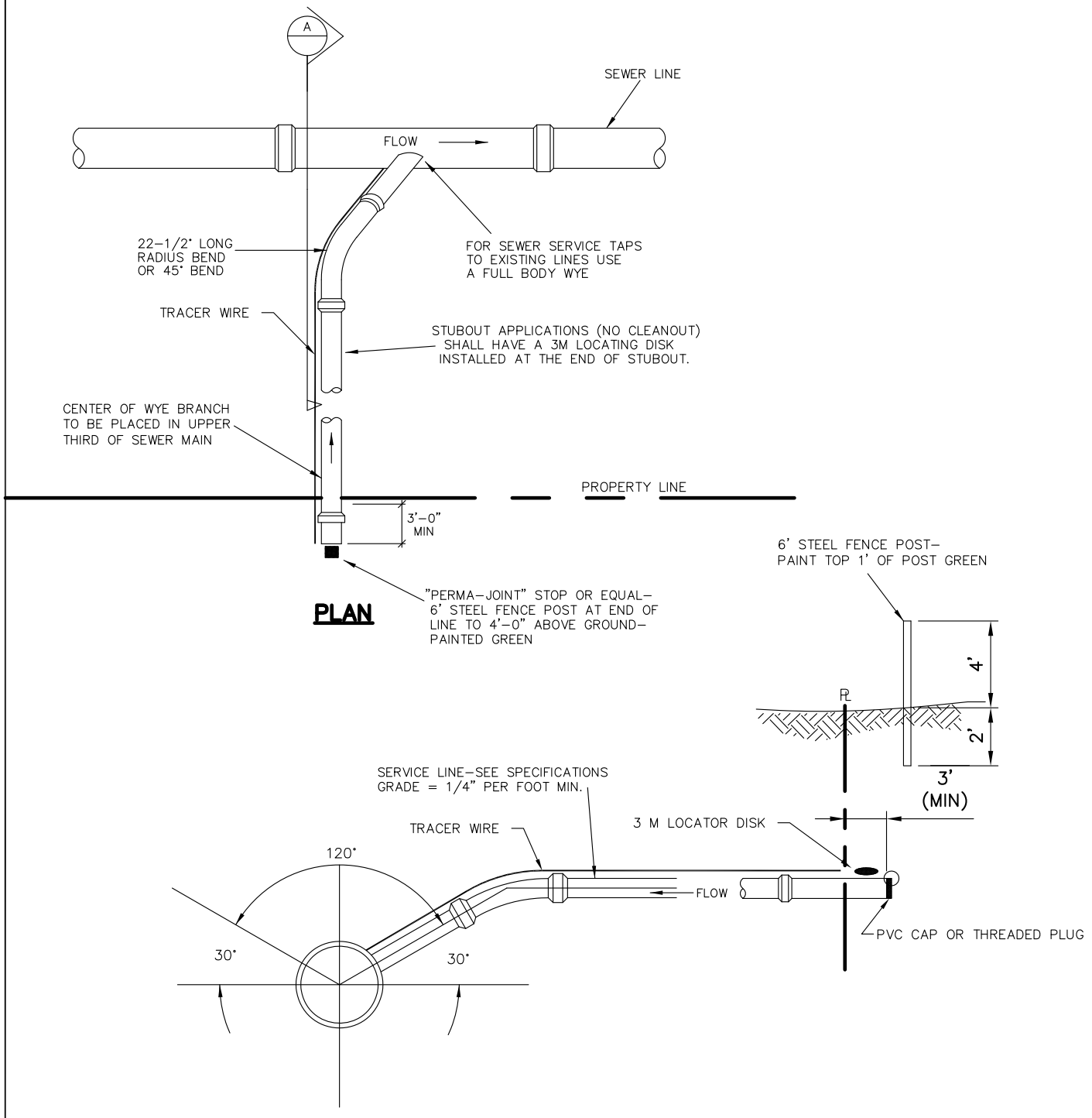
TRENCH ZONES



PIPE BEDDING ZONE

SEWER PIPE BEDDING

DETAIL "E"

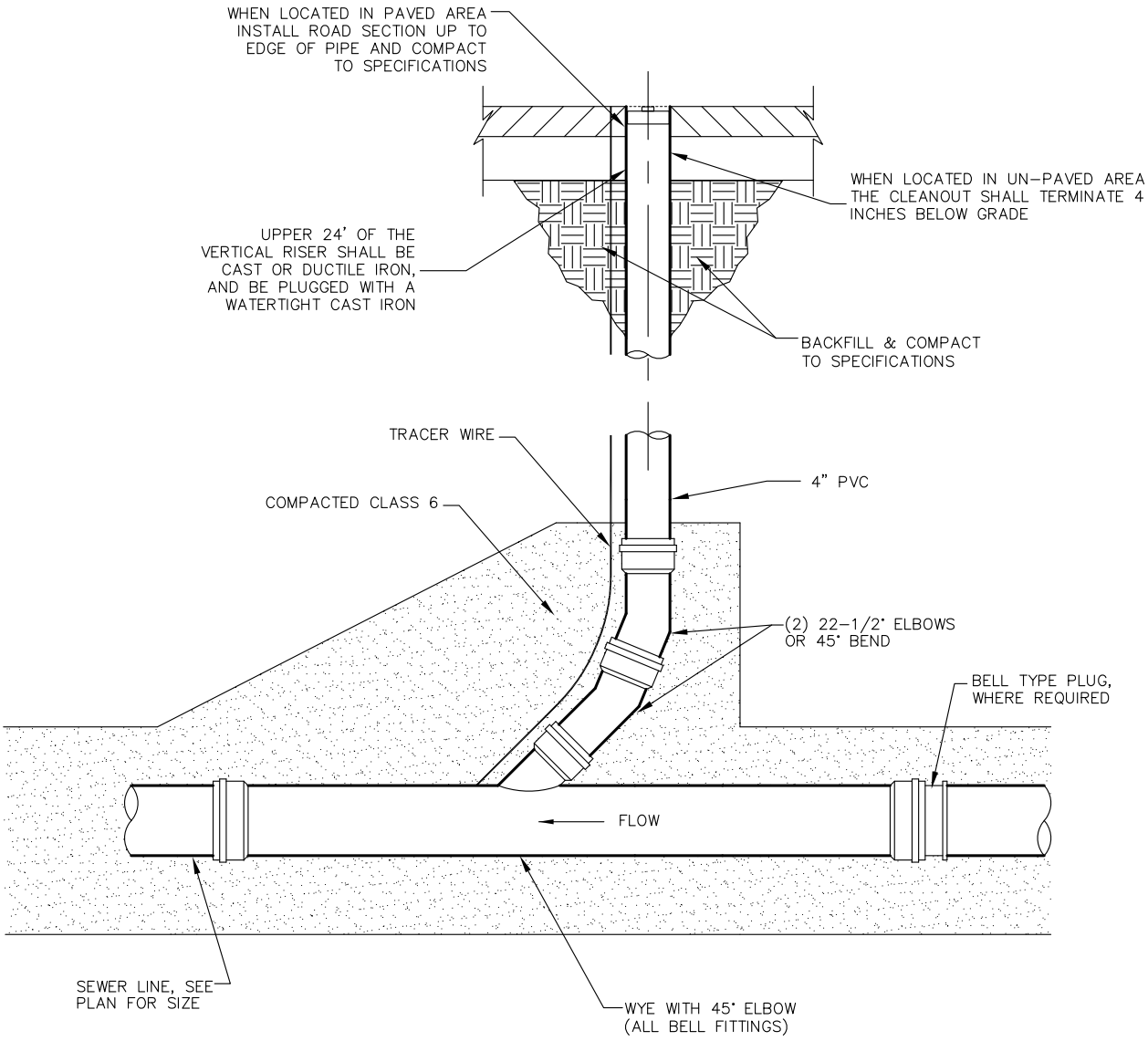


SEWER SERVICE CONNECTION

NOTES:

1. MINIMUM SEPARATION BETWEEN TAPS SHALL BE 18"
2. BACKFILL UNDER WYE TO BE CLASS 6 AGGREGATE BASE COURSE. 95% COMPACTION DENSITY PER ASTM D-698.

DETAIL "F"

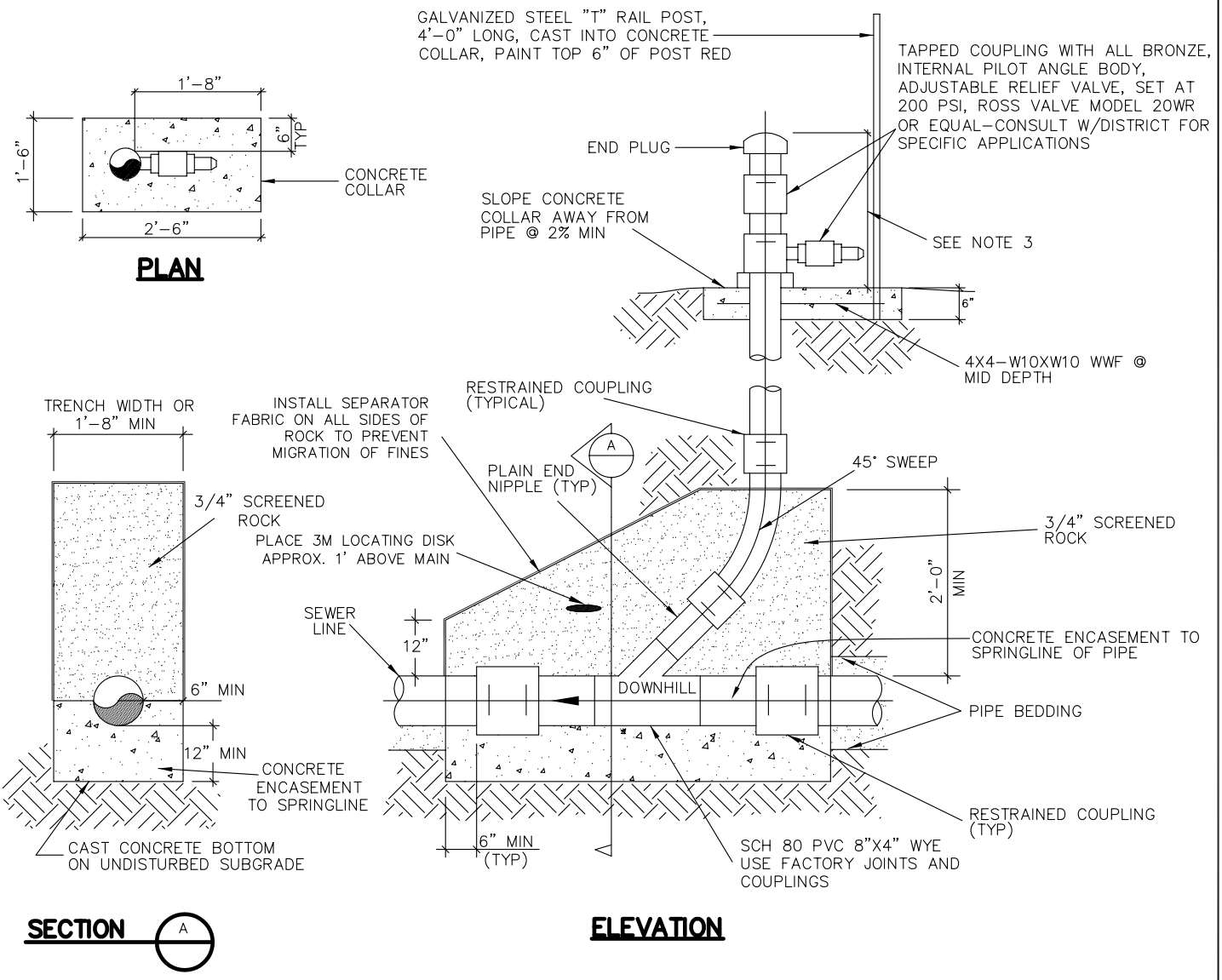


SEWER CLEAN-OUT

NOTES:

1. FOR SKIWAY APPLICATIONS WHERE MANHOLE AND RINGS ARE USED TO COVER CLEANOUT, 3M LOCATING DISK SHALL ALSO BE INSTALLED 1' TO 2' BELOW MANHOLE RING AND COVER

DETAIL "G"



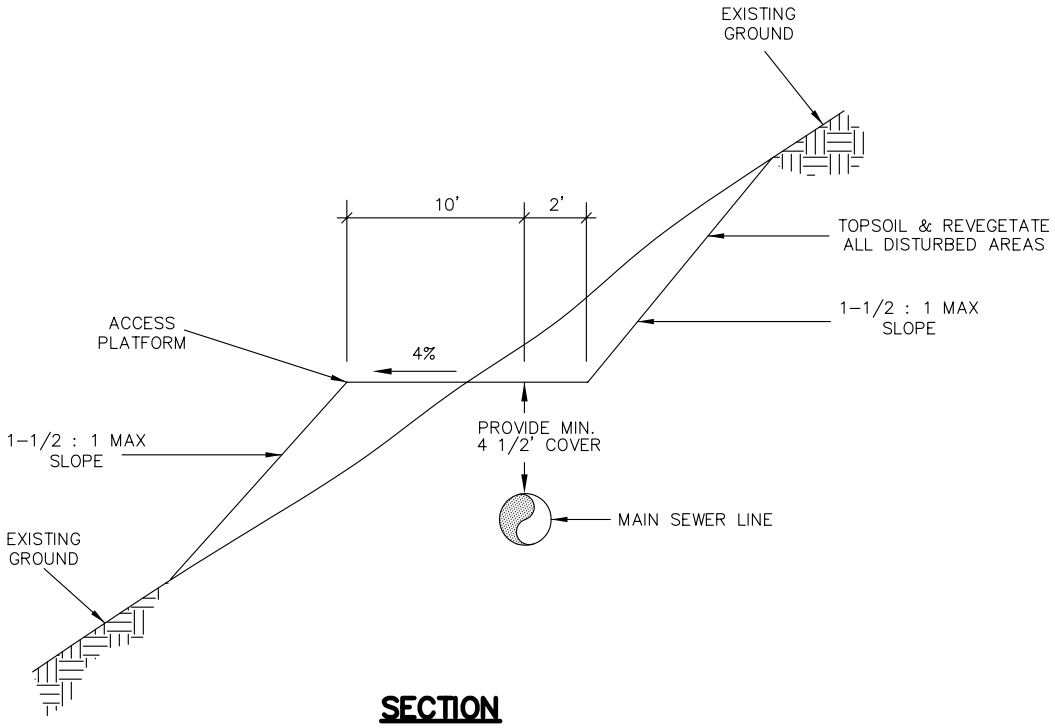
PRESSURE CLEAN-OUT

NOTES:

1. ENTIRE WYE SECTION AND ADJACENT COUPLINGS TO BE ENCASED IN CONCRETE
2. ENTIRE PRESSURE CLEANOUT SHALL BE PRESSURE RATED AT 200 PSIG MINIMUM
3. MAINTAIN MINIMUM HEIGHT REQUIRED FOR REMOVAL OF END PLUG FITTING ONLY
4. PRESSURE CLEANOUTS ARE REQUIRED AT THE BOTTOM MOST LOCATIONS WHERE PRESSURES MAY EXCEED BURSTING PRESSURE OF THE PIPE
5. FOR SKIWAY APPLICATIONS WHERE MANHOLE AND RINGS ARE USED TO COVER CLEANOUT, 3M LOCATING DISK SHALL ALSO BE INSTALLED 1' TO 2' BELOW MANHOLE RING AND COVER.

DETAIL "H"

CONSTRUCT HAMMERHEAD OR 90° SIDEARM TURN–AROUND AT THE END OF ALL DEAD END SEWER LINES. SEE TURN AROUND DETAIL



SECTION

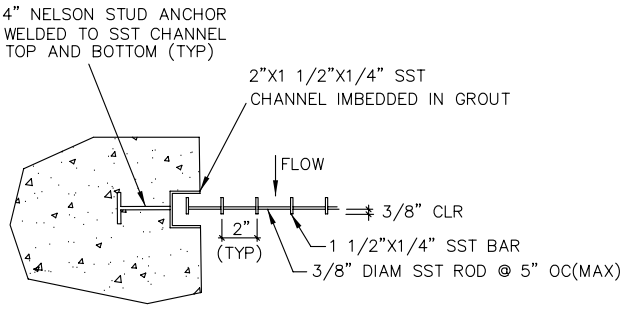
SEWER MAINTENANCE ACCESS

NOTES:

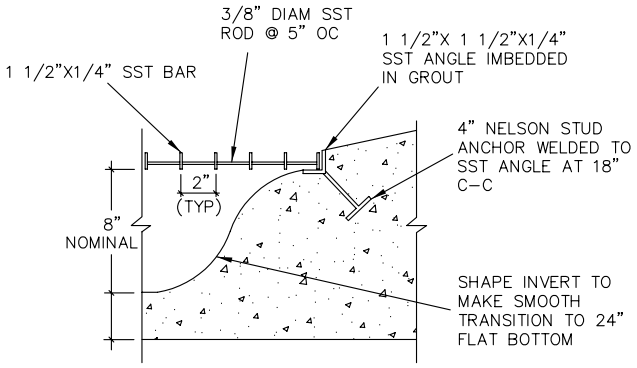
1. THE CONTRACTOR SHALL GRADE ALL OFFROAD SEWER LINE TRENCHES TO PROVIDE ACCESS PLATFORM.

2. ACCESS PLATFORMS SHALL BE GRADED TO MATCH ROAD GRADES TO PROVIDE VEHICULAR ACCESS AT ALL ROAD AND PLATFORM ACCESS INTERSECTIONS. MAXIMUM GRADE FOR BACKLOT ACCESS SHALL BE 7%.

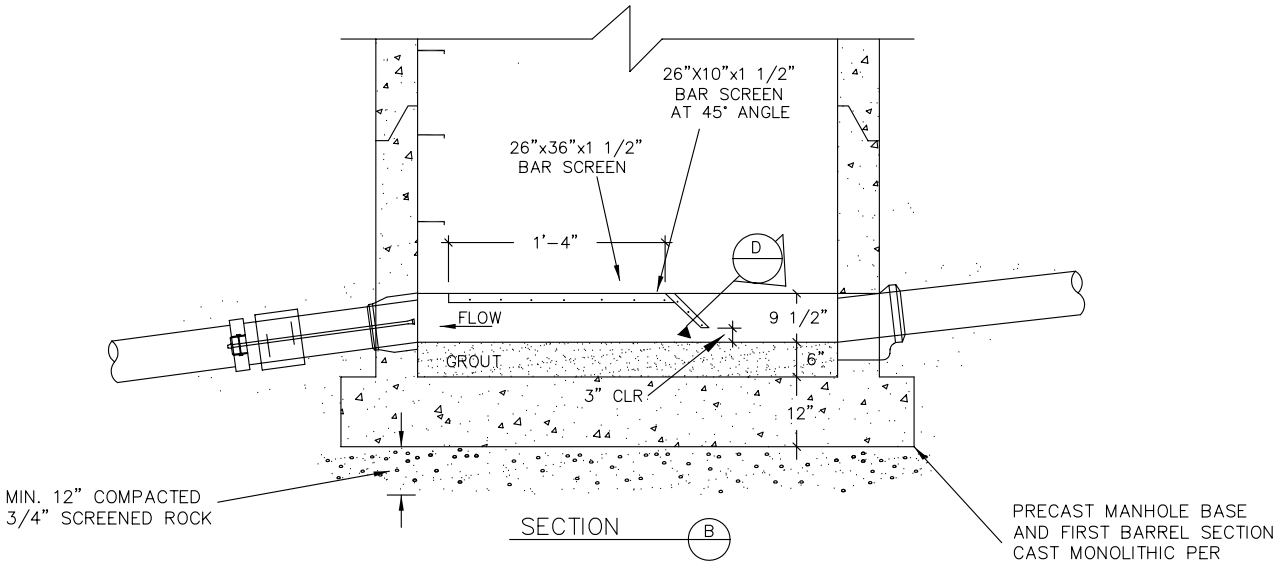
DETAIL "I"



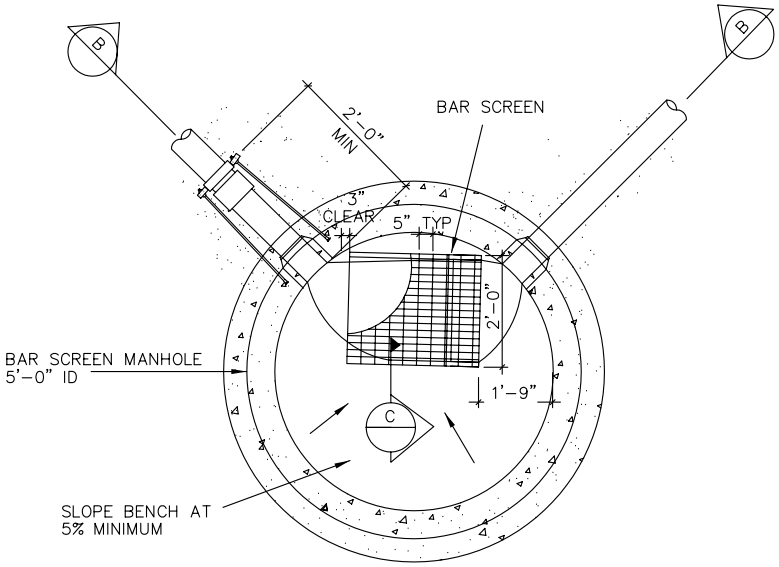
SECTION D



SECTION C



SECTION B



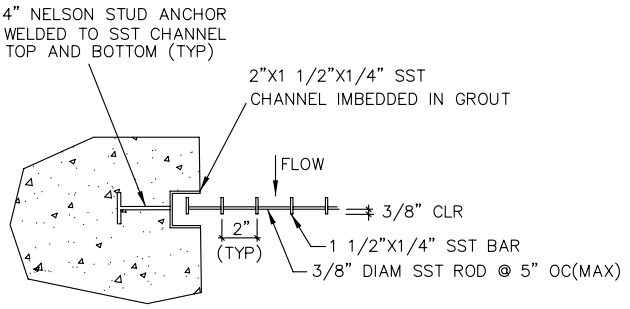
PLAN

NOTES:

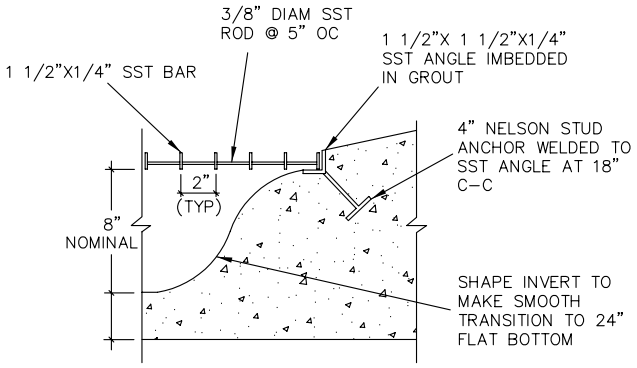
1. USE TYPICAL BAR SCREEN MANHOLE OR A DISTRICT APPROVED EQUAL

2. THE DISTRICT WILL NOT ALLOW THREE-WAY BAR SCREEN MANHOLES

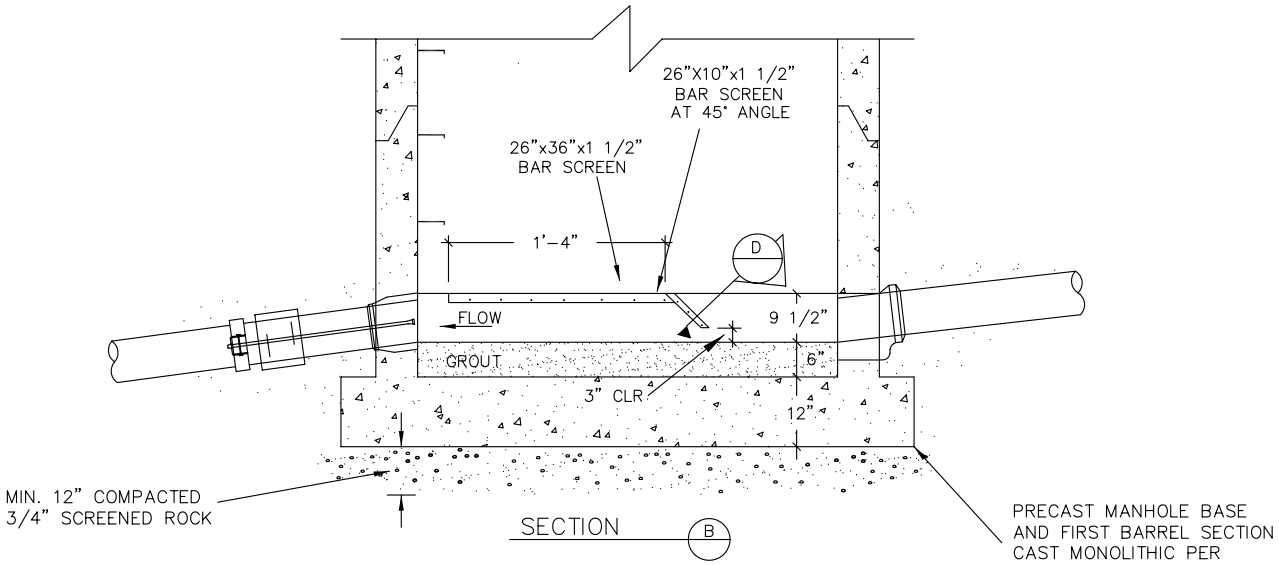
90 BAR SCREEN MANHOLE



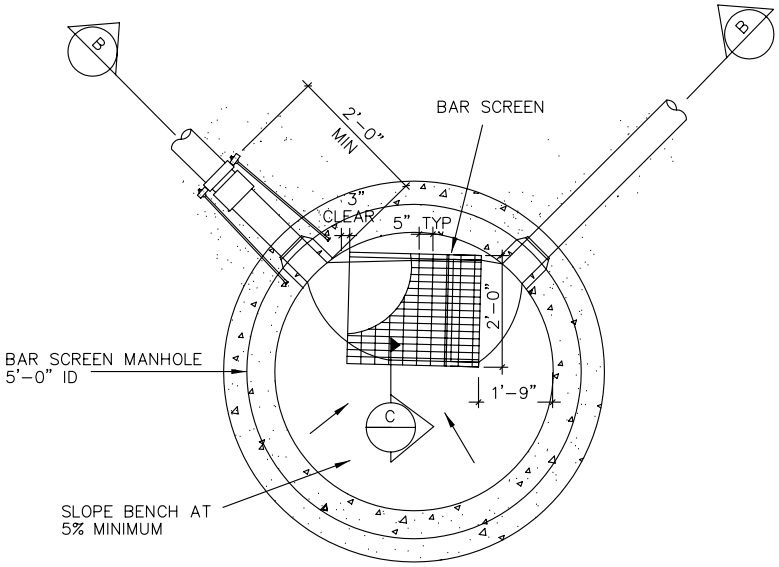
SECTION D



SECTION C



SECTION B



PLAN

NOTES:

1. USE TYPICAL BAR SCREEN MANHOLE OR A DISTRICT APPROVED EQUAL

2. THE DISTRICT WILL NOT ALLOW THREE-WAY BAR SCREEN MANHOLES

90 BAR SCREEN MANHOLE

APPENDIX C

ROARING FORK WATER AND SANITATION DISTRICT
SPECIAL FEE AND COST REIMBURSEMENT AGREEMENT

This Special Fee and Cost Reimbursement Agreement ("Agreement") is entered into by and between the Roaring Fork Water and Sanitation District, P.O. Box 1002, Glenwood Springs, CO 81602 (hereinafter "District") and _____ whose address is _____ _____, (hereinafter "Petitioner").

WITNESSETH:

WHEREAS, the District is a Colorado special district and quasi-municipal corporation formed and functioning under the authority of C.R.S. §§ 32-1-101, *et seq.*, and C.R.S. §§ 31-35-401, *et seq.*, providing potable water and sanitary sewer service;

WHEREAS, Petitioner is the owner of certain real property described in Exhibit A attached hereto and incorporated by this reference and desires to undertake those projects described in Paragraph 1;

WHEREAS, Petitioner's activity will cause the District to incur additional costs and may require review by the District and its staff of those certain activities;

WHEREAS, the District may seek reimbursement for providing services to District customers as well as engineering, legal fees, and other fees incurred in providing and review of Petitioner's project(s); and

WHEREAS, the Board of Directors of the District and Petitioner desire to set forth their agreements and understandings concerning this matter and set forth a mechanism for providing such reimbursement.

AGREEMENTS:

NOW THEREFORE, in consideration of the mutual covenant and promises of the parties, and for other good and valuable consideration, the adequacy and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. Petitioner desires to undertake the following projects or activities involving the District or its Water and Sewer Systems (mark all that apply):

___ Inclusion into the District
___ Exclusion from the District

___ Water line extension
___ Sewer line extension
___ Other (describe) _____

2. The activity or project being undertaken by Petitioner will require the District to provide the following special services or incur the following costs:

___ Engineering review and advice
___ Legal review and advice
___ Review or preparation of plats or plans
___ Inspections
___ Recording fees
___ Filing fees
___ Publication costs
___ Other (describe) _____

3. Petitioner agrees to the pay the District in full for all special services provided or actual costs incurred by the District in relation to the project or activity described above, on receipt of an itemized billing for those services from the District. All such amounts are due with 30 days of the date of the bill, with interest on any overdue amounts to be assessed at 1.0 % per month. In the event that such amounts remain unpaid 30 days after the date they are billed, the District reserves the right to cease supplying any and all services being provided, including but not limited to water and sewer service or, review and processing of applications for service, inclusion, exclusion, and line extension. In the event the District is forced to pursue collection of any amounts due and unpaid under this provision, it shall be entitled to collect attorneys fees, filing, and recording fees incurred in such collection efforts in addition to the unpaid amounts due, plus interest.

4. Petitioner agrees to provide a deposit to the District in the amount of $ _____.___, at the time of making the initial application for the item(s) identified in Paragraph 1 above. The District shall not commence to provide any of the services desired by the Petitioner, or advance any costs, until the District receives this deposit. Any amount by which the Petitioner's deposit exceeds the cost assessed under this Section shall be refunded to the Petitioner within a reasonable time after final action has been taken on the project. Petitioner shall pay any amount that exceeds the deposit to the District as provided in Paragraph 3 of this Agreement.

5. Payment of the special fees set forth above shall not be considered to be made in exchange for the District's favorable action on the application. The District reserves the right to approve or deny an application.

6. This Agreement constitutes the entire and complete agreement between the parties on the subject matter herein. All prior and contemporaneous negotiations and understandings between the parties are embodied and merged into this Agreement.

7. This Agreement may be amended from time to time by amendments made by the parties in written form and executed in the same manner as this Agreement.

8. This Agreement shall be binding upon and inure to the benefit of the parties and their assigns and successors in interest.

9. If any covenant, term, condition, or provision under this Agreement shall, for any reason, be held to be invalid or unenforceable, the invalidity or unenforceability of such covenant, term, condition or provision shall not affect any other provision of this Agreement.

10. The parties agree and intend that this Agreement shall run with the land described in Exhibit A attached hereto and be a burden upon that property until final payment has been made to the District of all fees due and payable under this Agreement, or until the earlier termination of this agreement. The District, in its discretion, may record this Agreement with the County Clerk and Recorder of the county in which the property described in Exhibit A is located.

IN WITNESS WHEREOF, the parties have executed this Special Fee and Cost Reimbursement Agreement on the day and year adjacent to the respective signatures.

Roaring Fork Water & Sanitation District

By: _____
___(title)_____

_____
Date

Attest:

_____
Secretary

_____
Date

By: _____
Petitioner

_____
Date

State of Colorado)
)
County of _____)

Acknowledged and subscribed before me this ____ day of _____, 200__, by _____, Petitioner.

WITNESS my hand and official seal.

My Commission expires: _____

Notary Public

_____