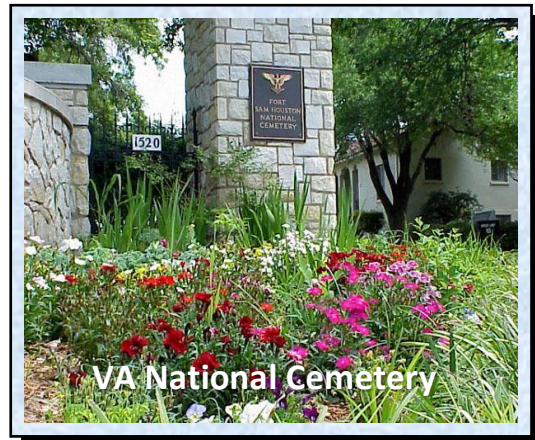
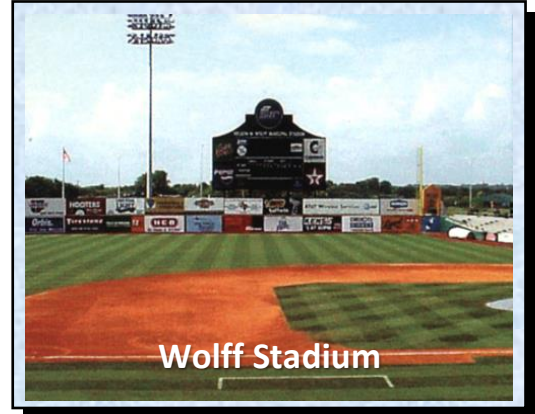


SAWS RECYCLED WATER USER HANDBOOK



December 2020

This handbook is intended to be a reference. All proposed work shall require review and approval by SAWS. Effort will be made by SAWS to update this document as the changes occur. However, it is ultimately the responsibility of the users to verify with SAWS the latest changes prior to any design and construction work.

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Chapter 1 Introduction

Thank you for your consideration of responsible stewardship of our natural resources and your interest in the Recycled Water Program provided by the San Antonio Water System (SAWS). Participation in this program allows you the opportunity to irrigate valuable landscapes and turf when potable drinking water is restricted during times of critical periods. This is possible because recycled water is not subject to drought management or critical period water restrictions, including the Aquifer Management Plan found in Division 4, Article IV, of Chapter 34 of the City Code. In addition, the recycled water provided by SAWS is generally lower in price than the potable water. Finally, its consistent and high quality makes it a reliable water source for commercial and industrial applications.

1.1 SAWS Recycled Water History

In historical sense, ground water supplies were the primary source of water for San Antonio, Texas. Droughts of record and recent droughts have driven the goal of diversifying the City's water resources. The recycling of treated municipal wastewater has been an essential element of SAWS conservation and recycling strategies designed to reduce the use of potable groundwater for non-potable applications. One of the major goals of this strategy was to replace the use of groundwater for irrigation and stream augmentation, thus, preserve the integrity of the Edwards Aquifer that underlies much of south-central Texas. Another foundational goal of the strategy was to acquire permitted ground water from Edwards Aquifer Customers who held permitted withdrawal rights. Market forces changed this programmed component. However, in recent decades SAWS has been able to diversify its water portfolio which not only includes Edwards Aquifer ground water but also the ground water from other regional aquifers, surface water, aquifer storage and recovery (known as "ASR"), and of course, the recycled water.

In 1993, the SAWS Board of Trustees adopted a Water Conservation and Reuse Plan which included the recycled water as a component of the plan. By 1995, SAWS staff was directed by the Board to start the process of developing the plan. A team of consulting/engineering firms were selected to provide professional services for a water recycling project including project management, conceptual engineering, design services and construction management. A public relations team was also brought on board to assist SAWS in conducting public information fairs to provide residents of San Antonio and Bexar County with opportunities for providing input and information exchange on the plan. As a result

of the public input, the team completed the alignment of the recycled water main transmission routes that would serve the potential recycled water Customers.

Construction of the recycled water system pipeline network began in 1998. Initially, the recycled water would be supplied from the Salado Creek and Leon Creek Water Recycling Centers (WRC). Salado Creek WRC would serve the eastern portion of the SAWS service area and the Leon Creek WRC would serve the western portion of the SAWS service area. Also in the plan were various interconnect pipelines. In 2006, the Salado WRC was decommissioned, and the Steven M. Clouse WRC became the main source of recycled water supply for the eastern part of the service area. The decommissioning of the Salado Creek WRC was possible because of a planned interconnect pipeline. The northern interconnect pipeline became operational in 2009, and linked the upper Leon Creek WRC distribution system to the Salado Creek WRC distribution system allowing supplemental recycled water to flow from the west to the east of the service area. The last project was the Medio Creek WRC interconnected to the western system in 2010 to bring a redundant supply to the SAWS Recycled Water Program.

Currently, recycled water is supplied from the Steven M. Clouse, Leon Creek and Medio Creek WRCs. These facilities use state of the art treatment processes that employ advanced physical, biological and chemical principles to remove the unwanted contaminants from the raw wastewater. The quality of SAWS recycled water is very high, and can be used for a number of beneficial purposes (other than direct human consumption). The final product is colorless, odorless, and virtually indistinguishable from Edwards Aquifer water or other potable supplies.

The WRCs, in total, generate a firm yield of about 125,000 acre-feet of highly treated recycled water on an annual basis. SAWS goal is to distribute 25,000 acre-feet per year of Type I recycled water for consumptive uses. Delivery of recycled water to City Public Service (CPS) Energy for use in production of electrical power has an annual contract volume of 50,000 acre-feet. In addition, SAWS has a pending bed and banks authorization application that, if approved, would dedicate 50,000 acre-feet of effluent each year to instream flow purposes in the San Antonio River.

If you have questions or comments about the program, please call (210) 233.3673, or write to:

San Antonio Water System
Recycled Water Program
2800 U.S. Hwy. 281 North
P.O. Box 2449
San Antonio, TX 78298-2449

Recycled water can be used for non-drinking purposes such as commercial, industrial and manufacturing activities which help sustain a vibrant economy to support our quality of life. SAWS Recycled Water Program is designed with a capacity to distribute up to 35,000 acre-feet a year of recycled water to commercial and industrial businesses in San Antonio. This volume would substitute equal amounts of potable water.

1.1.1 SAWS Recycled Water Service Areas

Figure 1.1 presents a map of the SAWS recycled water service areas.

1.2 Purpose and Intent of Recycled Water User’s Handbook

This Recycled Water User’s Handbook is made available to prospective recycled water Users (also referred to as recycled water Customers) that could beneficially use recycled water service from SAWS for their respective commercial, industrial, and environmental purposes; it is not for residential (single family dwellings) use at this time.

The handbook is intended as a stand-alone compiled document to assist the recycled water Customers and the Design Engineers to plan, design and construct their offsite and onsite recycled water systems. The purpose of this Handbook is to ensure uniformity in design concepts, format, methodology, procedures, construction materials and quality of work products on existing and new recycled water projects in San Antonio, Texas area, consistent with the rules and regulations that govern the use of recycled water within the State of Texas. It is the intent of this document to ensure compliance with the policies and rules related to the use of recycled water provided by SAWS, applicable City of San Antonio (COSA) codes, and the Texas Administrative Code (TAC) / Texas Commission on Water Quality (TCEQ) rules and regulations. **This document is not intended to supersede the existing codes, laws and regulations of the State of Texas concerning the currently approved use of recycled water; it is simply intended to support them from SAWS perspective as the recycled water Producer and Provider.**

This Handbook does not limit the responsibility of the Customers and Design Engineers; it assists them in providing professionally sound, efficient, uniform and workable criteria and requirements for proposed recycled water improvements. For areas not addressed in this Handbook, the Customers and Design Engineers should use good engineering judgment and practices when addressing design and construction related issues.

1.3 Definitions

The following are definitions of some of the terms used in this document:

Air Gap: The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet conveying water to a tank, fixture, receptor, sink, or other assembly and the flood level rim of the receptacle. The vertical, physical separation must be at least twice the diameter of the water supply outlet, but never less than 1.0 inch.

American National Standards Institute (ANSI) Standards: The latest editions of applicable standards of the American National Standards Institute, Inc.

American Society of Mechanical Engineers (ASME) Standards: The latest edition of applicable standards of the ASME.

American Society for Testing and Materials (ASTM) Standards: The latest edition of the applicable standards as approved and published by the ASTM.

American Water Works Association (AWWA) Standards: The latest edition of the applicable standards as approved and published by the AWWA.

Backflow Prevention: Where required to protect public health and safety, it shall be unlawful to make any recycled water connection without authorization from San Antonio Water System.

Beneficial Use: An economic use of wastewater in accordance with the purposes, applicable requirements, and quality criteria of 30 TAC Chapter 210, and that takes the place of potable and/or raw water that could otherwise be needed from another source.

Cross-connection: A physical connection between a public water system and either another supply of unknown or questionable quality, any source which may contain contaminating or polluting substances, or any source of water treated to a lesser degree in the treatment process.

User (Customer): Individual or entity that has executed an agreement for use of recycled water.

Distribution System: A system of pipes that conveys potable water from a treatment plant to the consumers. The term includes pump stations, ground and elevated storage tanks, potable water mains, and potable water service lines and all associated valves, fittings, and meters, but excludes potable water Customer service lines.

Double Check Valve Assembly: Consists of two internally loaded check valves, either spring-loaded or internally weighted, installed as a unit between two tightly closing resilient-seated shutoff valves as an assembly. The test cocks located on the assembly are for testing its function in a backflow situation.

Drinking Water: All water distributed by any agency or individual, public or private, for the purpose of human consumption or which may be used in the preparation of foods or beverages or for the cleaning of any utensil or article used in the course of preparation or consumption of food or beverages for human beings. The term "drinking water" shall also include all water supplied for human consumption or used by any institution catering to the public.

Edwards Aquifer: That portion of an arcuate belt of porous, water bearing, predominantly carbonate rocks known as the Edwards and Associated Limestones in the Balcones Fault Zone trending from west to east to northeast in Kinney, Uvalde, Medina, Bexar, Comal, Hays, Travis, and Williamson counties; and composed of the Salmon Peak Limestone, McKnight Formation, West Nueces Formation, Devil's River Limestone, Person Formation, Kainer Formation, Edwards Formation, and Georgetown Formation. The permeable aquifer units generally overlie the less-permeable Glen Rose Formation to the south, overlie the less-permeable Comanche Peak and Walnut formations north of the Colorado River, and underlie the less-permeable Del Rio Clay regionally. (See 30 TAC Chapter 213 [relating to Edwards Aquifer].)

Edwards Aquifer Recharge Zone: Generally, that area where the stratigraphic units constituting the Edwards Aquifer crop out, and including the outcrops of other geologic formations in proximity to the Edwards Aquifer, where caves, sinkholes, faults, fractures, or other permeable features would create a potential for recharge of surface waters into the Edwards Aquifer. The recharge zone is identified as that area designated as such on official maps located in the offices of the commission and the Edwards Underground Water District. (See 30 TAC Chapter 213 [relating to Edwards Aquifer].)

Illegal Connection: It shall be unlawful to make connection to any recycled or potable water connection without authorization from the San Antonio Water System.

Nuisance: Any distribution, storage or use of recycled water that is/may be injurious or adversely affects the human health or welfare, animal life, vegetation or property, or interferes with the normal use and enjoyment of animal life, vegetation or property.

Offsite Facilities: San Antonio Water System recycled water system, including the water meter.

Onsite Facilities: Customer's recycled water facilities downstream from the water meter.

Pantone: A color standard system referenced in the American Water Works Association Guidelines for Distribution of Non-potable Water.

Permit or Permitted: A written document issued by TCEQ or executive director in accordance with 30 TAC Chapter 305 (relating to Consolidated Permits) which, by its conditions, may authorize the permittee to construct, install, modify, or operate, in accordance with stated limitations, a specified facility for waste discharge, including a wastewater discharge permit.

Producer: A person or entity that produces recycled water by treating domestic/municipal wastewater in accordance with a permit or other authorization by TCEQ, to meet the quality criteria established by TCEQ.

Provider: A person or entity that distributes recycled water to a User(s) of recycled water. The recycled water provider may also be a recycled water producer.

Recycled Water/Reuse Water/Reclaimed Water/Non-potable Water: The terms are identical, and any reference to reuse water/reclaimed water/non-potable water refers to recycled water and vice versa. It is domestic or municipal wastewater that has been (tertiary) treated to a quality suitable for a beneficial use.

Residential Use/User: Single family dwellings or Users, excluding multi-family developments.

Type I Recycled Water: This type of use includes irrigation or other uses in areas where the public may be present during the time when irrigation takes place or other uses where the public may come in contact with the recycled water. The following types of uses would be considered Type I uses:

- (A) Residential irrigation, including landscape irrigation at individual homes.
- (B) Urban uses, including irrigation of public parks, golf courses with unrestricted public access, school yards, or athletic fields.
- (C) Use of reclaimed water for fire protection, either in internal sprinkler systems or external fire hydrants.
- (D) Irrigation of food crops where the applied reclaimed water may have direct contact with the edible part of the crop, unless the food crop undergoes a pasteurization process.
- (E) Irrigation of pastures for milking animals.

(F) Maintenance of impoundments or natural water bodies where recreational activities, such as wading or fishing, are anticipated even though the water body was not specifically designed for such a use.

(G) Toilet or urinal flush water.

(H) Other similar activities where the potential for unintentional human exposure may occur.

The following conditions apply to the types of uses of reclaimed water. At a minimum, the reclaimed water producer shall only transfer reclaimed water of the following quality as described for each type of specific use:

(i) for Type I reclaimed water uses, reclaimed water on a 30-day average shall have a quality of:

BOD ₅ or CBOD ₅	5 mg/l
Turbidity	3 NTU
Fecal coliform or <i>E. coli</i>	20 CFU/100 ml*
Fecal coliform or <i>E. coli</i>	75 CFU/100 ml**
<i>Enterococci</i>	4 CFU/100 ml*
<i>Enterococci</i>	9 CFR/100 ml**

* 30-day geometric mean

** maximum single grab sample

Type II Recycled Water: Use of reclaimed water where contact between humans and the reclaimed water is unlikely. This type of use includes irrigation or other uses in areas where the public is not present during the time when irrigation activities occur or other uses where the public would not come in contact with the reclaimed water. The following are examples of uses that would be considered Type II uses.

(A) Irrigation of sod farms, silviculture, limited access highway rights of way, and other areas where human access is restricted or unlikely to occur. The restriction of access to areas under irrigation with reclaimed water could include the following:

(i) The irrigation site is considered to be remote.

(ii) The irrigation site is bordered by walls or fences and access to the site is controlled by the owner/operator of the irrigation site.

(iii) The irrigation site is not used by the public during the times when irrigation operations are in progress. Such sites may include golf courses, cemeteries, and landscaped areas surrounding commercial or industrial complexes. The "syringing" or "wetting" of greens and tees on golf courses shall be allowable under Type II so long as the "syringing" is done with hand-held hoses

as opposed to automatic irrigation equipment. The public need not be excluded from areas where irrigation is not taking place. For example, irrigation of golf course fairways at night would not prohibit the use of club house or other facilities located a sufficient distance from the irrigation.

(iv) The irrigation site is restricted from public access by local ordinance or law with specific standards to achieve such a purpose.

(B) Irrigation of food crops where the reclaimed water is not likely to have direct contact with the edible part of the crop, or where the food crop undergoes pasteurization prior to distribution for consumption.

(C) Irrigation of animal feed crops other than pasture for milking animals.

(D) Maintenance of impoundments or natural water bodies where direct human contact is not likely.

(E) Soil compaction or dust control in construction areas where application procedures minimize aerosol drift to public areas.

(F) Cooling tower makeup water. Use for cooling towers which produce significant aerosols adjacent to public access areas may have special requirements.

(G) Irrigation or other non-potable uses of reclaimed water at a wastewater treatment facility.

Any Type I reclaimed water may also be utilized for any of the Type II uses.

For Type II reclaimed water use, reclaimed water on a 30-day average shall have a quality of:

(i) for a system other than pond system:

BOD ₅	20 mg/l
or CBOD ₅	15 mg/l
Fecal coliform or <i>E. coli</i>	200 CFU/100 ml*
Fecal coliform or <i>E. coli</i>	800 CFU/100 ml**
<i>Enterococci</i>	35 CFU/100 ml*
<i>Enterococci</i>	89 CFU/100 ml**
* 30-day geometric mean	
** maximum single grab sample	

(ii) for a pond system:

BOD ₅	30 mg/l
Fecal coliform or <i>E. coli</i>	200 CFU/100 ml*

Fecal coliform or <i>E. coli</i> (not to exceed)	800 CFU/100 ml**
<i>Enterococci</i>	35 CFU/100 ml*
<i>Enterococci</i>	89 CFU/100 ml**
* 30-day geometric mean	
** Maximum single grab sample	

Wastewater Main: Any pipe or constructed conveyance which receives flow from one or more wastewater laterals.

San Antonio Water System: The public agency that is both the producer and provider of the recycled water.

Supply Line: Pipelines conveying raw water to be treated for drinking purposes in accordance with Texas Administrative Code rules and regulations.

Unauthorized Use/Use Without a Meter: Any use of recycled water without the authority of the San Antonio Water System, and a meter designed for use with recycled water and approved by the San Antonio Water System shall be deemed unauthorized use and unlawful.

Unauthorized User/Cross-Connection: Any use of recycled water whereby there is actual or potential cross-connection with any potable water source shall be unlawful. It is unlawful to allow recycled water to enter any potable water system at any time, including but not limited to flushing of mains, pipes and potable water systems.

Unauthorized Use/Tools and Equipment: It shall be unlawful for any person, including the San Antonio Water System personnel, to make use of any tool, device, equipment or object for potable water service where that tool, device, equipment or object has come in physical contact with the recycled water.

Unauthorized Use/Self Restoration: It shall be unlawful for any person to restore recycled water service to any person or entity that has been shut off by the San Antonio Water System for any reason, unless written authorization is given in advance.

Unauthorized Use/Unlawful Use of Separate Water Service: It shall be unlawful for any person to connect a house, building or irrigation system to the potable or recycled water service connection for a separate house, building or irrigation system without authorization from the San Antonio Water System, or to maintain such connection or to use potable or recycled water from such a connection, regardless of intent.

Water Main: Any pipeline, except for Customer service lines, within the distribution system in accordance with the Texas Administrative Code rules and regulations.

1.4 Regulatory Requirements

In June of 1997, SAWS Recycled Water Program was approved by the TCEQ. According to this program, SAWS is the Producer and the Provider of the recycled water, and has responsibilities accordingly. TCEQ identified SAWS recycled water as Type I recycled water. If you have questions or comments on our program call (210) 233.3673 or write to:

San Antonio Water System
Recycled Water Program
2800 U.S. Hwy. 281 North
P.O. Box 2449
San Antonio, TX 78298-2449

In general, the Producer, Provider and Customer of recycled water will distribute and use recycled water in accordance with the established rules and regulations outlined in 30 TAC Chapter 210 and the rules/guidelines developed by SAWS and other regulatory agencies that have similar or additional rules and codes on recycle water systems and recycled water use. As being both the recycled water Producer and Provider, SAWS will assure the construction of the recycled water distribution lines and systems and the minimum recycled water quality are in accordance with the 30 TAC / TCEQ rules and regulations.

The recycled water Customer is required to use the recycled water provided by SAWS in accordance with the 30 TAC / TCEQ rules and regulations, and maintain and provide records and documents required by both TCEQ and SAWS. SAWS cannot be found in violation of the 30 TAC / TCEQ rules and regulations for the misuse of the recycled water by a Customer if SAWS shuts off the transfer of the recycled water upon knowledge of such misuse regardless of any Customer contract provisions. SAWS will notify the TCEQ Executive Director in five (5) days of knowledge of recycled water use that was not authorized. TCEQ Executive Director will take action according to the agency's rules and regulation on such misuse. Please refer to *30 TAC Chapter 210 – The Use of Reclaimed Water* presented in Appendix A for this agency's rules and regulations on recycled water systems and use.

Below is a summary of general requirements outlined in the 30 TAC Chapter 210 – The Use of Reclaimed Water rules and regulations:

- Recycling of untreated wastewater is prohibited.

- No nuisance conditions will result from the distribution, use and/or storage of recycled water.
- Recycled water will not degrade ground water quality.
- Recycled water managed in ponds for storage will be designed to prevent discharge into waters of the state, except for discharges resulting from rainfall events or in accordance with a permit issued by TCEQ.
- Recycled water may be stored in leak-proof, fabricated tanks.
- All exposed piping and piping within a building will be either purple pipe or be painted purple, and stenciled in white with a warning reading “NON-POTABLE WATER.”
- All buried piping will be one of the following: manufactured in purple, painted purple, taped with purple metallic tape or bagged in purple.
- Separation distances will be observed per the TCEQ directions.
- Where recycled water is stored, signs will be posted reading, in both English and Spanish, "RECYCLED WATER, DO NOT DRINK" or similar warning.
- No recycled water will be used over the Edwards Aquifer recharge zone/transition zone.
- Back-flow protection is required and proper assembly installed, 12.0 inches above ground and painted in purple.

Please note that (i) the definition of recycled water applies to reclaimed, reuse and non-potable water, and (ii) the recycled water system, including offsite and onsite facilities, is separate and independent of any potable water system.

It should also be noted that, per the COSA code, SAWS only allows below-grade bibbs with quick couplers with keys. All visible parts and appurtenances including the lids/covers, valves, pipes, etc. must be painted purple.

1.5 General Responsibilities

In general, the recycled water systems must be designed and installed per the *SAWS Standard Specifications for Construction, Item No 110 – Recycled Water System* presented in Appendix B. *30 TAC Chapter 210 – The Use of Reclaimed Water* presented in Appendix A provides the ultimate rules and regulations on the design and construction of recycled water systems.

The design of the offsite recycled water facilities, including the preparation of construction contract documents (plans and specifications), will be conducted under the direction of a responsible Professional Engineer (PE) registered in the State of Texas who has seal and signature privileges. Similarly, the design of onsite facilities that will use recycled water and the preparation of construction contract documents will be under the direction of a responsible Professional Engineer or a Landscape Architect registered in the State of Texas.

1.6 References

All onsite and offsite recycled water facilities must conform to the requirements of this Handbook, other applicable SAWS requirements, and 30 TAC / TCEQ rules and regulations, American Society of Mechanical Engineers (ASME), American Society for Testing and Materials (ASTM), American National Standard Institute (ANSI), and/or American Water Works Association (AWWA) applicable requirements for use of recycled water. Any recycled water improvements must also comply with these requirements, conditions and standards. All new recycled water systems must comply with the related and most current design standards and construction specifications.

RECYCLED WATER MAP

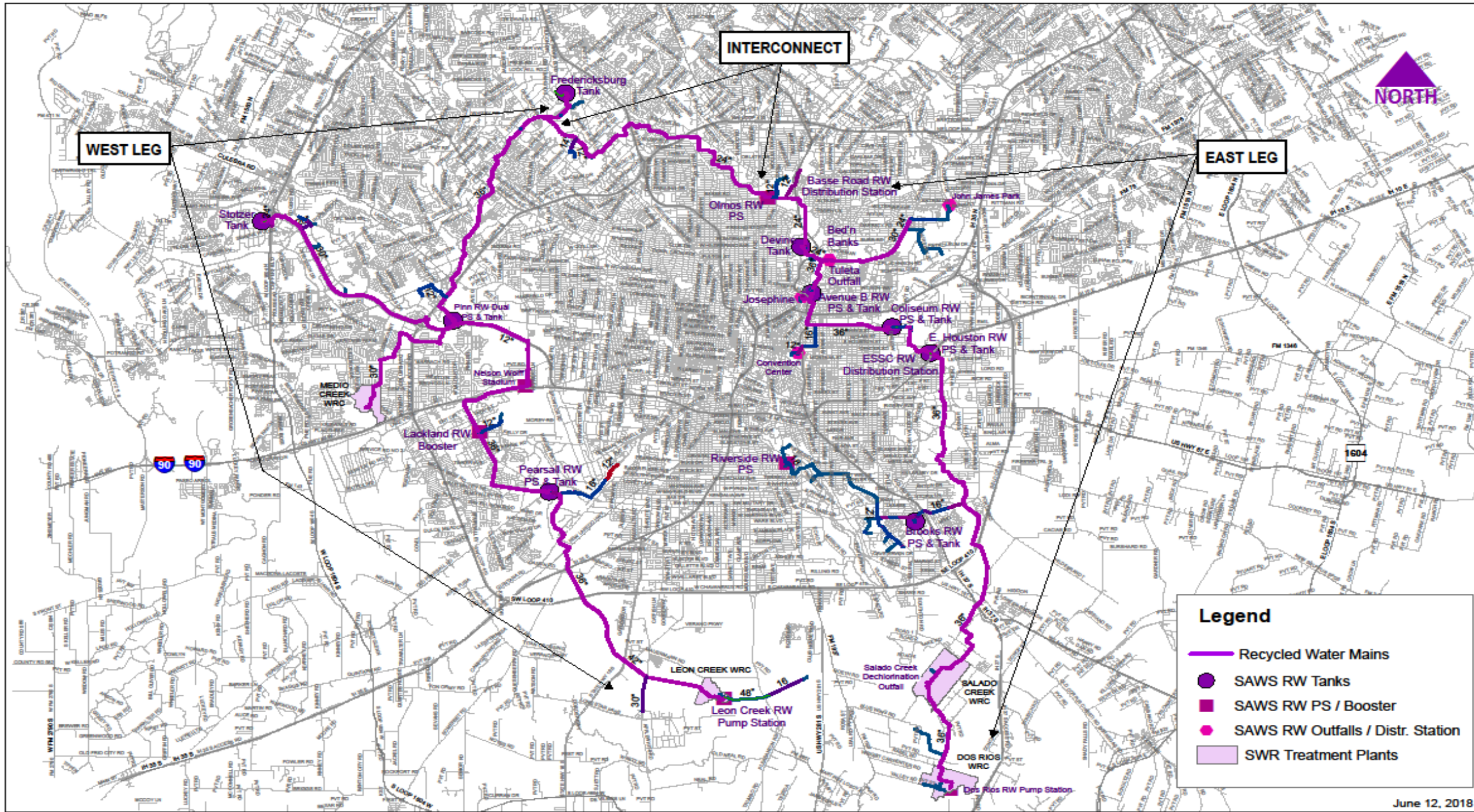


Figure 1.1 SAWS Recycled Water Service Area Map

Chapter 2 Offsite Recycled Water Facilities

Offsite recycled water facilities in this Handbook refer to the SAWS recycled water system, including the water meter.

When applicable, in accordance with 30 TAC Chapter 210 (relating to General Provisions), the design of recycled water conveyance systems which will convey the recycled water to a Customer will be submitted to the Executive Director of the TCEQ, and must receive an approval. The design of the recycled water systems must meet the requirements of Chapter 210 (relating to General Requirements for Production, Conveyance and Use of Reclaimed Water). Where a municipality (such as SAWS) is the plan review authority for the recycled water systems which transport recycled water, in accordance with Chapter 210, in lieu of the TCEQ, design submittal may not be subject to submittal to the TCEQ, and instead must be approved by the municipality (SAWS).

SAWS Standard Specifications for Construction, Item No. 110 – Recycle Water System presented in Appendix B provides general guidance on description, materials, installation and payment of recycled water systems.

2.1 Pipeline Pressure

SAWS determines the service pressure requirements through recycled water network modeling, and it may vary for each recycled water Customer. For SAWS recycled water service pressure, refer to the Customer Service Agreement. The design of the recycle water systems should be based on the available pressure specified in the Customer Service Agreement. SAWS will not be responsible to boost the pressure in the recycle system when the desired recycled water service pressure is not available for onsite facilities not previously served from the potable water systems. In the same way, if the recycled water service pressure is too high, it will also be the Customer's responsibility to provide a pressure regulator downstream of the meter to obtain the correct pressure and not SAWS.

Following are other pressure related requirements to be complied with:

- The maximum interior working pressure of buried and above ground recycled water service lines will not exceed 160 psi.
- All recycled water pipes and fittings will have a working pressure rating of minimum 150 psi.

- Final plans and specifications will describe required pressure testing for all installed recycle water force mains. Minimum test pressure will be 1.5 times the maximum design pressure.
- Allowable leakage rates will be determined as described in 30 TAC Chapter 217 relating to Pressure Sewer Systems.

2.2 Pipeline Size

Recycled water lines that transport recycled water under pressure (force mains) will need to be sized according to acceptable engineering practices for the needs of the recycled water Customers. The Design Engineer should consider methods to prevent or maintain lines to mitigate the effect of the deposition of solids in these lines.

Gravity flow recycled water lines will need to meet the requirements of 30 TAC Chapter 217 relating to General Requirements and High Velocity Protection. The Design Engineer should consider methods to prevent high velocity scour or maintain line fluid velocity to mitigate the effects of the deposition of solids in the gravity lines.

2.3 Pipeline Materials

All pipe materials used in the improvement, adjustment, removal and/or construction of the recycled water systems will meet the latest edition of *SAWS Specifications for Water and Sanitary Sewer Construction* requirements (i.e., use of polyvinyl chloride [PVC; C-900 or C-905 class], high density polyurethane [HDPE], concrete steel cylinder [CSC], ductile iron [DI] and steel pipes, trenching, excavation, etc.), except as otherwise noted. This general specification can be downloaded directly from the SAWS official website (please see the link provided in Chapter 5 of this Handbook). All pipes will be identified in the technical specifications with appropriate ASTM, ANSI or AWWA standard numbers for both quality control (dimensions, tolerance) and installation (bedding or backfill).

Pipes specified for recycled water force mains will be of a type having an expected life at least as long as that of the pump station (25 to 50 years), and will be suitable for the recycled water being pumped and operating pressure to which it will be subjected.

2.4 Separation Distances from Other Utilities

Separation distances are required between recycled water pipes and the water and sewer pipes. Where a crossing has to occur, the pipe with the highest quality product should be located above the

other lines, preferentially, potable water pipe being above the recycled water pipe, and the recycled water pipe being above the sewer main.

SAWS *Standard Specifications for Construction, Item No. 812 – Water Main Installation* presented in Appendix B provides guidance on recycled water line installation. This specification follows the 30 TAC Chapter 210 requirements.

2.4.1 Separation for Recycled Water

The 30 TAC Chapter 210 specifies the separation requirements for the recycled water as follows:

- Recycled water pipes will be separated from potable water pipes by a horizontal distance of at least 9.0 feet.
- Where the 9.0 feet separation distance cannot be achieved, the recycled water pipes must meet the line separation requirements of 30 TAC Chapter 290 (relating to Water Hygiene).
- Where a recycled water line parallels a sewer line, the recycled water line will meet the requirements of 30 TAC Chapter 210 relating to pipe pressure, size and materials or the gravity flow recycled line requirements of 30 TAC Chapter 217 relating to General Requirements and High Velocity Protection. The recycled water line will be such that the horizontal separation distance will be 3.0 feet (outside to outside) with the recycled water line at the level of or above the sewer line. Recycled water lines which parallel sewer lines may be placed in the same benched trench.
- Where a recycled water line crosses a sewer line, the requirements of 30 TAC Chapter 290 relating to Location of Water Lines will be followed, with “recycled water line” substituted in 30 TAC Chapter 290 relating to Location of Water Lines for “water line.” Please see below the applicable section of the 30 TAC Chapter 290.

2.4.2 Separation for Recycled Water in Relation to Potable Water

The 30 TAC Chapter 290 specifies the separation requirements for the recycled water lines in relation to potable water lines. The following rules apply to installations of water lines, wastewater mains or laterals, and other conveyances/appurtenances identified as potential sources of contamination. Furthermore, all ratings specified shall be defined by ASTM or AWWA standards unless stated otherwise. New mains, service lines, or laterals are those that are installed where no main, service line, or lateral previously existed, or where existing mains, service lines, or laterals are replaced with pipes of different size or material.

- New water line installation - parallel lines. (Substitute “recycled water line” for “water line.”)
 - Where a new potable water line parallels an existing, non-pressure or pressure rated wastewater main or lateral and the professional engineer (PE) licensed in the State of Texas is able to determine that the existing wastewater main or lateral is not leaking, the new potable water line will be located at least 2.0 feet above the existing wastewater main or lateral, measured vertically, and at least 4.0 feet away, measured horizontally, from the existing wastewater main or lateral. Every effort will be exerted not to disturb the bedding and backfill of the existing wastewater main or lateral.
 - Where a new potable water line parallels an existing pressure-rated wastewater main or lateral and it cannot be determined by the licensed professional engineer if the existing line is leaking, the existing wastewater main or lateral will be replaced with at least 150 psi pressure-rated pipe. The new potable water line will be located at least 2.0 feet above the new wastewater line, measured vertically, and at least 4.0 feet away, measured horizontally, from the replaced wastewater main or lateral.
 - Where a new potable water line parallels a new wastewater main, the wastewater main or lateral will be constructed of at least 150 psi pressure-rated pipe. The new potable water line will be located at least 2.0 feet above the wastewater main or lateral, measured vertically, and at least 4.0 feet away, measured horizontally, from the wastewater main or lateral.
- New water line installation - crossing lines. (Substitute “recycled water line” for “water line.”)
 - Where a new potable water line crosses above a wastewater main or lateral, the segment of the water line pipe will be centered over and must be perpendicular to the wastewater main or lateral such that the joints of the water line pipe are equidistant and at least 9.0 feet horizontally from the centerline of the wastewater main or lateral. When crossing an existing wastewater main or lateral and it is disturbed or shows signs of leaking, the wastewater main or lateral will be replaced for at least 9.0 feet in both directions (18.0 feet total) with at least 150 psi pressure-rated pipe embedded in cement stabilized sand for the total length of one pipe segment plus 12.0 inches beyond the joint on each end.
 - ♦ The potable water line will be at least 2.0 feet above an existing, non-pressure rated wastewater main or lateral.

- ♦ The potable water line will be at least 6.0 inches above an existing, pressure-rated wastewater main or lateral.
- Where a new potable water line crosses a new, non-pressure rated wastewater main or lateral, the segment of the water line pipe will be centered over and shall be perpendicular to the wastewater main or lateral such that the joints of the water line pipe are equidistant and at least 9.0 feet horizontally from the centerline of the wastewater main or lateral. The potable water line will be at least 2.0 feet above the wastewater main or lateral. Whenever possible, the crossing will be centered between the joints of the wastewater main or lateral. The wastewater pipe will have a minimum pipe stiffness of 115 psi at 5 percent deflection. The wastewater main or lateral will be embedded in cement stabilized sand for the total length of one pipe segment plus 12.0 inches beyond the joint on each end. The materials and method of installation will conform to one of the following options:
 - ♦ Within 9.0 feet horizontally of either side of the water line, the wastewater pipe and joints will be constructed with pipe material having a minimum pressure rating of at least 150 psi. An absolute minimum vertical separation distance of 2.0 feet will be provided. The wastewater main or lateral will be located below the water line.
 - ♦ All sections of wastewater main or lateral within 9.0 feet horizontally of the water line will be encased in an 18.0-foot (or longer) section of pipe. Flexible encasing pipe will have a minimum pipe stiffness of 115 psi at 5 percent deflection. The encasing pipe will be centered on the water line and will be at least two nominal pipe diameters larger than the wastewater main or lateral. The space around the carrier pipe will be supported at five-foot (or less) intervals with spacers or be filled to the spring line with washed sand. Each end of the casing will be sealed with watertight non-shrink cement grout or a manufactured watertight seal. An absolute minimum separation distance of 6.0 inches between the encasement pipe and the water line will be provided. The wastewater line will be located below the water line.
- When a new water line crosses under a wastewater main or lateral, the water line will be encased or constructed of ductile iron or steel pipe with mechanical or welded joints as appropriate. An absolute minimum separation distance of 1.0 foot between the water line and the wastewater main or lateral will be provided. When a new water line crosses under a

wastewater main, the procedures in 30 TAC Chapter 217 relating to Pipe Design must be followed.

- Where a new potable water line crosses a new, pressure rated wastewater main or lateral, one segment of the water line pipe shall be centered over and will be perpendicular to the wastewater line such that the joints of the water line pipe are equidistant and at least 9.0 feet horizontally from the center line of the wastewater main or lateral. The potable water line will be at least 6.0 inches above the wastewater main or lateral. Whenever possible, the crossing will be centered between the joints of the wastewater main or lateral. The wastewater pipe will have a minimum pressure rating of at least 150 psi. The wastewater main or lateral will be embedded in cement stabilized sand for the total length of one pipe segment plus 12.0 inches beyond the joint on each end.
- Where cement stabilized sand bedding is required, the cement stabilized sand will have a minimum of 10 percent cement per cubic yard of cement stabilized sand mixture, based on loose dry weight volume (at least 2.5 bags of cement per cubic yard of mixture). The cement stabilized sand bedding will be a minimum of 6.0 inches above and 4.0 inches below the wastewater main or lateral. The use of brown coloring in cement stabilized sand for wastewater main or lateral bedding is recommended for the identification of pressure rated wastewater mains during future construction.

2.4.3 Separation for Recycled Water in Relation to Sewer Lines

The 30 TAC Chapter 217 specifies the separation requirements for the water supply line (recycled water) from the sewer lines as follows:

- Separation distances.
 - Collection system pipes must be installed in trenches separate from water supply trenches.
 - Wherever possible, a collection system pipe must be located below a water supply pipe. If a collection system pipe cannot be located below a water supply pipe, the owner must justify in the engineering report why it is not possible to locate the collection system pipe below the public water supply pipe.
 - Wherever possible, collection system pipes and manholes must be located at least 9.0 feet from all water supply pipes. If a collection system pipe or manhole cannot be located at least

9.0 feet away from a water supply pipe, the owner must justify in the engineering report why it is not possible to provide at least 9.0 feet of separation. The Table C.1 in Figure: 30 TAC 217.53 (d)(3) provides a reference that apply if a collection system pipe or manhole cannot be located at least 9.0 feet away from a water supply pipe.

- If a collection system pipe is located above a water supply pipe and runs parallel to the water supply pipe, each portion of the collection system pipe within 9.0 feet of the water supply pipe must be encased. The casing pipe must be constructed of at least 150 psi pressure class pipe:
 - ◆ That encases the entire length of collection system pipe that is within 9.0 feet of the water supply pipe;
 - ◆ That is sealed at both ends with cement grout or a manufactured seal;
 - ◆ That is at least two nominal sizes larger than the wastewater collection pipe; and
 - ◆ That is supported by spacers between the collection system pipe and the encasing pipe at a maximum of 5.0-foot intervals.
- If a collection system pipe crosses above a water supply pipe, each portion of the collection system pipe within 9.0 feet of the water supply pipe must either be encased in a casing pipe, or must be constructed using at least 150 psi pressure class pipe.
 - ◆ A casing pipe for a collection system pipe that crosses above a water supply pipe must be constructed of at least 150 psi pressure class pipe:
 - ✓ That is sealed at both ends with cement grout or a manufactured seal;
 - ✓ That is at least two nominal sizes larger than the wastewater collection pipe; and
 - ✓ That is supported by spacers between the collection system pipe and the encasing pipe at a maximum of 5.0-foot intervals.
 - ◆ A collection system pipe that crosses above a water supply pipe must be constructed of at least 150 psi pressure class, corrosion-resistant, non-brittle pipe and must use manufacturer-approved adapters. Gasketed joints, compression joints, and other non-bonded joints must be designed to seal at atmospheric pressure.
- If a collection system pipe is located below a water supply pipe and runs parallel to the water supply pipe, each portion of the collection system pipe within 9.0 feet of the water supply pipe

must either be constructed using at least 150 psi pressure class pipe or must be encased in a casing pipe.

- ♦ A collection system pipe that runs parallel to and below a water supply pipe must be constructed of at least 150 psi pressure class, corrosion-resistant, non-brittle pipe:
 - ✓ That is located at least 2.0 vertical feet below the water supply pipe;
 - ✓ That is located at least 4.0 horizontal feet away from the water supply pipe; and
 - ✓ That includes joints that are designed to seal at atmospheric pressure.
- ♦ A casing pipe for a collection system pipe that runs parallel below a water supply pipe must be constructed of at least 150 psi pressure class pipe:
 - ✓ That is sealed at both ends with cement grout or a manufactured seal;
 - ✓ That is at least two nominal sizes larger than the wastewater collection pipe; and
 - ✓ That is supported by spacers between the collection system pipe and the encasing pipe at a maximum of 5.0-foot intervals.

2.5 Recycled Water Line Cover

Even though there are no specific requirements for the recycled water lines, a minimum of 4.0-foot cover will be provided over the top of the pipe to the finished grade unless otherwise approved. A minimum of 12.0-inch initial backfill will be provided from the top of the pipe. All trench walls will have to be vertical. The depth of cover on the service lines, however, will be considered by SAWS on a case-by-case basis.

The horizontal alignment of the existing water mains, sewer lines, laterals shown in any recorded plans will have to be field verified prior to excavation.

2.6 Pipeline Color and Tapes

All exposed (aboveground) recycled water piping and recycled water piping within a building will be either purple pipe or painted purple (Pantone 512 or 522). All exposed recycled water piping should be stenciled in white with a warning reading "NON-POTABLE WATER." All buried recycled water piping will be one of the following: manufactured in purple, painted purple, taped with purple metallic tape, or bagged in purple.

PVC piping has the color already incorporated into the pipe during manufacturing. For CSC pipe, the purple dye can be added to the mortar during the manufacturing of the pipe (as is the practice for most of the large diameter pipes in the transmission lines belonging to SAWS). Where DI pipe is the choice of pipe material, purple sleeves can be used to provide corrosion control and identify the water main as the recycled water main. Likewise, HDPE pipe can be ordered with purple stripes integral to the pipe.

All exposed or buried recycled water piping constructed at a wastewater treatment facility is exempt from these color-coding requirements.

2.7 Recycled Water Valves and Boxes

The recycled water system will have all of the appurtenances that are typical to the potable water system. Almost all appurtenances are available in purple color.

All valves used in recycled water construction will open left (counter clockwise). Valve castings are standard steel castings with a special heavy-duty cover. All valve covers on offsite recycled water transmission pipelines are non-interchangeable with potable water covers. All valve covers will be square to distinguish them from potable water valve covers, and will indicate “open left” unless otherwise specified. All recycled water valve covers must be painted purple in accordance with 30 TAC Chapter 210.

Valve boxes for light traffic will be the standard concrete or fiber glass box with a special cover. Valve boxes for traffic areas will be of heavy-duty traffic design. All valve covers on offsite recycled water transmission pipelines are non-interchangeable with potable water pipeline covers, and must have a recognizable inscription cast on the top surface.

Per the COSA code, SAWS only allows below-grade bibbs with quick couplers with keys. All visible parts and appurtenances including the lids/covers, valves, pipes, etc. must be painted purple.

Detail DD-110-10 included at the end of the *SAWS Standard Specifications for Construction, Item No. 110 – Recycle Water System* presented in Appendix B provides typical SAWS valve and valve box details.

2.8 Blow-off, Air and Vacuum Assemblies

Either an in-line or end-of-line blow-off drain assembly will be installed to remove water or sediment from the recycled water pipeline. Blow-off assemblies will be installed in a low point of the pipeline.

The pipeline tap for the assembly will be no closer than 18.0 inches from a valve, coupling, joint, or fitting unless it is at the end of the pipeline. The discharge from blow-offs will be designed to drain into a sewer. Discharge of recycled water to storm drains is restricted. If there is no sewer that can receive the discharge from a blow-off, SAWS must be consulted regarding acceptable alternatives.

Air and vacuum valves will be provided in high points, and sized accordingly.

All below ground appurtenances for blow-off and air and vacuum valve assemblies will be consistently color-coded purple to differentiate recycled water facilities from potable water and/or wastewater systems.

SAWS Standard Specifications for Construction Item No. 844 Blow-off Assemblies, Item No. 846 Air Release Assemblies, and the details DD-844-01 through DD-844-05 and DD-846-01 and DD-846-02 included at the end of these standard specifications provide information for such systems to be used in recycled water applications. The standard specifications and the details are presented in Appendix B.

2.9 Meters

In most cases, SAWS sets the recycled water meter. 2.0-inch and smaller meters must be set within the public rights-of-way if possible. Otherwise, they must be set in a minimum 5.0-foot by 5.0-foot water meter easements.

3.0-inch and larger meters may be set in a minimum 10.0-foot by 12.0-foot exclusive water meter easements. Meters must be located 1.0-foot inside the property line or 1-foot outside of the easement inside the property line.

Recycled water meter easements must be located continuous with public rights-of-way unless approved by SAWS. An access easement a minimum of 15.0-foot wide is required when the meter is not contiguous with a public right-of-way.

2.10 Storage Tanks

All ground level and elevated storage tanks for recycled water will be designed, installed and constructed in accordance with current AWWA standards with reference to materials to be used and construction practices to be followed, except for health-based standards strictly related to potable water storage and contact practices, where appropriately less restrictive standards may be applied.

Recycled water storage tanks may have potable water connections for makeup from potable water sources. In all cases and under all circumstances, an approved air gap separation must be provided between the storage tank and the potable water discharge point. A copy of the proposed air gap assembly plans needs to be submitted for SAWS review and approval.

Where potable water is to be used for make-up to a storage tank, the flow must be controlled from the remote supervisory control and data acquisition (SCADA) system. Flow and pump run, stop, and/or fail status information, where applicable, must be available at the remote SCADA system.

The water level in each tank must be determined and electrical conductivity must be determined in tanks that receive potable water for makeup. Water level and conductivity status must be available at the remote SCADA system.

2.11 Recycled Water Signage for Offsite Facilities

Per TCEQ (and SAWS), one of the following requirements must be met by the recycled water Producer, Provider or Customer for the recycled water transmission system facility entrance:

- The recycled water system sign will be an 18.0-inch x 24.0-inch size plate with chamfered corners (no sharp edges). These signs will be posted at all recycled water transmission system pump stations and storage tank facilities. If the recycled water and potable water storage tanks are co-located, the recycled water signs will have to be posted at the recycled water storage tank. If the recycled water facilities are in a gated location, the signs will be posted at the entrance fastened to the fence below the facility signs. Angle brackets will have to be used to fasten the signs to the fences. All signs will be both in English and Spanish, reading “Reclaimed Water, do not Drink” or similar warnings.
- If there will be no signage, the area will have to be secured to prevent access by public.

The text and logo will be as shown in the details included in Appendix C. The sign outline, text and logos will be 99 Bright Purple high performance vinyl coloring manufactured by Arlon or equivalent, while the background will be pre-finished aluminum Matte White manufactured by Wrisco Industries, Inc. or equivalent.

2.12 Recycled Water Quality

The recycled water quality furnished to the Customers by SAWS will be in compliance with parameters established by TCEQ for Type I usage under 30 TAC Chapter 210. As stated in 30 TAC Chapter 210.33(1), the minimum recycled water quality for Type I is:

BOD ₅ or CBOD ₅	5 mg/L ¹
Turbidity	3 NTU ¹
Fecal Coliform	20 CFU/100 ml ²
Fecal Coliform	75 CFU/100 ml ³

¹ thirty day average (not to exceed)

² geometric mean (the nth root, usually the positive nth root, of a product of n factors)

³ single grab sample (not to exceed)

In addition to the requirements identified in 30 TAC Chapter 210, SAWS will also assure the following parameters:

Ammonia Nitrogen	≤ 2.0 mg/L
pH	6.0 - 9.0 Standard Units
Total Suspended Solids (TSS)	≤ 15 mg/L
Total Dissolved Solids (TDS)	≤ 1,500 mg/L
Sodium Adsorption Ratio (SAR)	≤ 5.0 meq/L
Residual Sodium Carbonate (RSC)	≤ 1.50 meq/L

These additional parameters are three month running averages. The Recycled Water Service Agreement provides actions should these levels be exceeded.

2.12.1 Sampling and Analysis

SAWS will sample the recycled water at a minimum of twice per week prior to distribution to a Customer to assure that the water quality is in accordance with intended contracted use. The results of the sampling analysis will be made available to the recycled water Customer.

SAWS will carry out periodic fecal coliform sampling at designated locations throughout the recycled water distribution system as an additional mechanism to ensure the quality of the recycled water to be delivered.

Chapter 3 Onsite Recycled Water Facilities

3.1 General Requirements

Onsite recycled water facilities in this Handbook refer to the Customer's recycled water facilities downstream from the water meter.

All onsite recycled water facilities that benefit specifically from the use of recycled water are provided by the recycled water Customer at its own expense. The Customer is responsible for the operation and maintenance of the recycled water system downstream of SAWS point of connection with the Customer, unless such responsibility is clearly outlined in the Recycled Water Service Agreement.

The Customer, at its own expense, can make any modification to its potable water system on the premises required by SAWS, to permit the use of recycled water service, including the installation of approved backflow preventers by SAWS.

Onsite recycled water facilities may be designed to accommodate the use of recycled water in areas where SAWS may supply recycled water in the future, even though recycled water service may not be immediately available when the design area is ready for construction. Provision may be made for connecting to the recycled water system when it becomes available. In the interim, potable water may be supplied to onsite facilities through an approved temporary potable water connection. Such temporary connection to the potable water system is provided, at a minimum, by an approved reduced pressure backflow prevention device installed by the Customer to the satisfaction of SAWS and TCEQ.

Per 30 TAC Chapter 210, the application of recycled water on public access facilities (such as through irrigation) will be controlled by agreement with SAWS or by local ordinance. The Customer will provide reasonable control of the application rates for recycled water applied to irrigation areas. These controls will encourage the efficient use of recycled water and avoid excessive application of it may result in surface runoff or excessive percolation below the root zone.

The irrigation operations will be managed in a manner to minimize the inadvertent contact of reclaimed water with humans. The irrigation practices will be designed so as to prevent incidental ponding or standing water except where local farming conditions and the accepted irrigation delivery systems and cropping patterns are such that, as an unavoidable consequence of such conditions, systems, and patterns, there will be standing water. The irrigation systems that use recycled water

will be designed so that the irrigation spray does not reach any privately-owned premises outside the designated irrigation area or reach public drinking fountains.

Per TCEQ, the recycled water distribution systems must be designed to prevent operation by unauthorized personnel, and the recycled water must not be used to fill swimming pools, hot tubs, wading pools, or other structures designed for contact recreation.

3.1.1 Irrigation Using Recycled Water

Irrigation systems will be designed and operated to minimize ponding and/or runoff. In existing systems, alterations, such as change of sprinkler nozzles or operating pressure may be required. Irrigation systems must use part-circle sprinklers along boundaries, sidewalks, and buildings to prevent over-spraying onto adjacent properties or unintended uses. Food crops irrigated with recycled water can be eaten by humans if the food item is substantially processed or other irrigation means are used other than spray irrigation. User agrees to take steps to minimize the risk of inadvertent human exposure to the Recycled Water.

For recycled water Customers that will use recycled water for irrigation purposes, SAWS will require soil samples collected and analyzed prior to the recycled water service. Sampling and cost of the soil analyses will be handled by SAWS. The results of the sampling analysis will be made available to each recycled water Customer. In addition, the recycled water Customers must obtain a permit from SAWS and the COSA Plumbing Inspection Department before any modifications may be made to your on-site recycled water system, including extensions or reductions. Irrigation with recycled water can be used during the curtailment of potable water. However, no day time irrigation with any water source including recycled water is allowed between 11:00 am and 7:00 pm per the City Code. Irrigation systems using recycled water will adhere to watering times and days per SAWS Conservation Ordinance as presented in Appendix D.

3.1.2 Industrial and Commercial Applications Using Recycled Water

SAWS recycled water can be used for commercial and industrial applications other than irrigation, and it is not surprising that this area of recycling comprises the newest, most innovative, and fastest growing applications for recycled water. Examples of these usages are process water, dust control and soil compaction, concrete mixing, manufacturing, laundries, and vehicle washing to name a few. Each potential recycled water Customer's specific recycled water needs will be evaluated by SAWS on a case by case basis.

3.1.3 Record Keeping and Reporting

The recycled water Customers will need to establish, report, and maintain certain records and documents required by TCEQ. TCEQ requires SAWS, as the provider, to report the volume of recycled water delivered to each Customer and the quality of recycled water delivered to each Customer on a monthly basis.

3.1.3.1 Notification Requirements

The Customer will agree to notify SAWS by telephone, e-mail or fax of any recycled water use that is not authorized, including, but not limited to, spills, leaks, discharges, or releases of a material volume of recycled water into or adjacent to the waters of the State. The only exception is when the discharge or spill is caused by rainfall events or in accordance with a permit issued by the TCEQ.

Telephonic or faxed notice must be given to SAWS within 24 hours of obtaining knowledge of any such spill, leak, discharge, or release. SAWS personnel will then assist in (i) assessing the extent of the unauthorized discharge and (ii) aid in determining what reports, if any, need to be made as well as assist in making the reports. SAWS will then provide written notice to TCEQ within 5 working days of obtaining knowledge of any such spill, leak, discharge, or release. To assist the Customers in collecting information, an example of the Spill Reporting Form for the above-mentioned requirements can be found in Appendix E of this document. Notification contacts are as follows:

San Antonio Water System
2800 U.S. Hwy. 281 North
San Antonio, Texas 78212
Phone Number: (210) 704-7297(SAWS)
Fax Number: (210) 233-4156 Attn: Dispatcher

In addition, the Customers must obtain a permit from SAWS and the COSA Plumbing Inspection Department before any modifications may be made to your on-site recycled water system, including extensions or reductions. The Customers must also obtain the written consent of SAWS before changing the intended purpose or location of use of SAWS recycled water. SAWS encourages all recycled water Customers to take steps to prevent unauthorized access to your recycled water system. As the User of recycled water, the Customers are solely responsible for any use of SAWS recycled water not authorized under your SAWS Recycled Water Agreement and/or 30 TAC Chapters 210 and 290.

SAWS and the recycled water Customers will archive all records for a period of no less than five years. The recycled water Customers will archive copies of the recycled water contracts, records of volume

of recycled water delivered, and recycled water and soil analyses. In the event of enforcement actions or litigation, certain records could be required for longer periods.

3.1.4 Site Supervisor

The recycled water Customers are required to designate a site supervisor. This individual will primarily be responsible to prevent cross-connections and to serve as a single contact for SAWS, regulatory agencies such as TCEQ and employees at the facility. The site supervisor will also have oversight for all records, signage and training of employees on the proper usage of recycled water.

When choosing the site supervisor, the Customers should consider the following qualities:

- Knowledge of operational and maintenance activities.
- Authority to modify or change system to prevent cross-connections and protect public health.
- Understanding of local and 30 TAC / TCEQ rules and regulations governing the use of recycled water.
- Available for contact by regulatory agencies and employees, and can communicate on numerous topics related to the application of recycled water.

3.2 Pressure Criteria

When reasonable recycled water service pressure is not available for onsite facilities not previously served from potable water systems, the Customer is responsible for providing booster pumps to increase the pressure. If the recycled water service pressure is too high, it is also the Customer's responsibility to provide a pressure regulator downstream of the meter to obtain the correct pressure.

3.3 Separation

The same criteria in Chapter 2 Offsite Water Recycling Facilities of this Handbook will apply. Recycled water piping will be separated from potable water piping by a horizontal distance of at least 9.0 feet. Where the 9.0 foot separation distance cannot be achieved, the recycled water piping will meet the line separation requirements of 30 TAC Chapter 290 of this title (relating to Water Hygiene).

Where a recycled water line parallels a sewer line, the recycled water line will be constructed in accordance with 30 TAC Chapter 210. The horizontal separation distance will have to be 3.0 feet

(outside to outside) with the recycled water line at the level of or above the sewer line. Recycled water lines which parallel sewer lines may be placed in the same benched trench.

Where a recycled water line crosses a sewer line, the requirements of 30 TAC Chapter 290 (relating to Location of Water Lines) will have to be followed, with "recycled water line" substituted in 30 TAC Chapter 290 (relating to Location of Water Lines) for "water line."

3.4 Identification of Pipes and Fittings

New onsite recycled water piping will be identified as recycled water pipelines by using a purple color code that differentiates them from potable water pipelines. All piping and valves will also be appropriately labeled or continuously taped with appropriate identification.

Per the COSA code, SAWS only allows below-grade bibbs with quick couplers with keys. All visible parts and appurtenances including the lids/covers, valves, pipes, etc. must be painted purple.

Approved use areas for recycled water service will also be posted with precautionary notices to warn the public.

When converting an existing potable water pipeline to recycled water usage, the potable water pipeline will be accurately located and tested in coordination with SAWS and regulatory agencies such as TCEQ, and the necessary actions will have to be taken to bring the water line and appurtenances into compliance with this Handbook. If the existing pipeline is approved by SAWS and the regulatory agencies, except for pipe identification, the line can be considered approved for recycled water service. If the acceptability of the existing line cannot be verified, the line must be uncovered and inspected, and deficiencies identified before use. However, all replacements of an existing recycled water irrigation system will have to be color-coded for identification in accordance with this Handbook.

3.5 Pipeline Color and Tapes

All exposed recycled water piping and recycled water piping within a building will be either purple pipe or painted purple. All buried recycled water piping will be one of the following: manufactured in purple, painted purple, taped with purple metallic tape, or bagged in purple. All exposed recycled water piping should be stenciled in white with a warning reading "NON-POTABLE WATER."

Per the COSA code, SAWS only allows below-grade bibbs with quick couplers with keys. All visible parts and appurtenances including the lids/covers, valves, pipes, etc. must be painted purple.

All exposed or buried recycled water piping constructed at a wastewater treatment facility is exempt from these color-coding requirements.

When converting (retrofitting) an existing irrigation system that is buried, all exposed appurtenances (spray heads, valves, etc.) will be replaced with appropriate purple color markings to identify them as recycled water system.

3.6 Recycled Water Signage for Onsite Facilities

The recycled water signs will be posted at all points of use such as cooling towers, golf courses, landscaped areas, etc., and will be clearly visible to all Customers. One of the following requirements must be met for the recycled water point of use:

- The recycled water system sign will be an 18.0-inch x 12.0-inch size plate with chamfered corners (no sharp edges). The text and logo will be as shown in the detail in Appendix C. The font to be used in the signs will be Helvetica-Medium. The sign outline, text and logos will be 99 Bright Purple high performance vinyl coloring manufactured by Arlon or equivalent, while the background will be pre-finished aluminum Matte White manufactured by Wrisco Industries, Inc. or equivalent.
- If there will be no signage, the area will have to be secured to prevent access by public.

Please refer to Appendix C for more details on the sign.

3.6.1 Recycled Water Connection Signs

The recycled water signs will be posted at all Customers' onsite storage facilities. The recycled water system sign will be a 12.0-inch x 12.0-inch size plate with chamfered corners (no sharp edges). The text and logo will be as shown in the details in Appendix C. The font to be used in the signs will be Helvetica-Medium. The sign outline, text and logos will be 99 Bright Purple high performance vinyl coloring manufactured by Arlon or equivalent, while the background will be pre-finished aluminum Matte White manufactured by Wrisco Industries, Inc. or equivalent. Please refer to Appendix C for more details on the sign.

Chapter 4 Recycled Water Service Initiation

4.1 Site Visit

Following the initial request from a recycled water Customer (or Applicant) to connect to the SAWS recycled water system, representatives from SAWS will schedule an initial site evaluation. An initial site walk-through is the first step in evaluating any site for compatibility with recycled water. The purpose of the site walk-through visit is to verify the recycle facility layout to determine the general feasibility of servicing the site with recycled water and to determine backflow prevention and cross-connection requirements for both recycled water and the potable water system.

4.2 Evaluation and Approval

From the information obtained from the site walk-through visit, SAWS will decide whether additional information is needed to determine the appropriateness of using recycled water at the proposed site. Should additional information be required from the prospective Customer, the Customer will provide the requested information in a timely manner. Upon determination by SAWS that the site is appropriate for the use of recycled water, a Recycled Water Service Agreement will be executed between SAWS and the Customer.

4.3 Recycled Water Service Agreement

Each recycled water Customer has varying needs and requirements in order to be served recycled water. Before connecting to the SAWS recycled water system, the Customer must have a signed Recycled Water Service Agreement. This agreement serves as a written contract that stipulates the terms and conditions of the recycled water service. These stipulations may be different for each Customer depending on the service requirements. The Recycled Water Service Agreement definitively outlines the Customer-specific terms and conditions. It also spells out the desired recycled water flow and pressure. A generic copy of this agreement is presented in Appendix F.

In order to receive the written Recycled Water Service Agreement from SAWS, the recycled water Customer should submit the following to SAWS:

- Any applicable fees
- Construction plans and specifications

- Plan review

Upon the approval of the connection counter service application by SAWS, a general counter permit (GCP) to proceed with the construction work will be issued by SAWS. Any work done by the recycled water Customer before the permit to proceed with construction is performed at the Customer's risk that the permit may not be issued and expense. The Customer will also have to obtain an on-site plumbing permit from COSA.

Recycled water transferred from SAWS, who is the Producer and the Provider, to the Customer is done on a demand only basis in order that the recycled water is not provided during the times it cannot be beneficially used in accordance with the 30 TAC / TCEQ rules and regulations. In a similar fashion, the recycled water Customer may refuse the delivery of such water from SAWS at any time.

The recycled water Customer will establish, report and maintain certain records and documents required by SAWS and TCEQ. Please refer to 30 TAC Chapter 210 for more information. The TCEQ along with SAWS requires a clear indication of the means for compliance with 30 TAC Chapter 210, including documentation that a Customer will be apprised of the responsibilities under 30 TAC Chapter 210 as part of a Recycled Water Service Agreement.

4.3.1 Recycled Water Rates

SAWS recycled water rates are structured to make the recycled water service attractive to the Customers. The rate for recycled water supplied to the Customers are as set forth in Article VIII, Chapter 34 of the City Code, as it may be amended.

There is a monthly meter charge based upon the size of the meter, and recycled water rates may be subject to amendment in the future. It is recommended that a separate recycled water irrigation meter is installed to assure that no sewer charge is imposed. Most importantly, the recycled water Customers do not have to pay SAWS water supply fee or the Edwards Aquifer Authority (EAA) fee. This can be a significant factor when evaluating the recycled water Customers' participation in the SAWS Recycled Water Program.

4.4 Training

The recycled water Customer is expected to attend a training session relating to the background for SAWS Recycled Water Program, Customer's responsibilities and applicable rules and regulations along with the initiation of recycled water service. The annual training is provided by SAWS usually early in

the year, and also includes education on lawful/unlawful uses of recycled water, rules and regulations governing the operation and maintenance of onsite recycled water systems and emergency notification procedures in the event of breaks, leaks, spills and cross-connections, and will answer any questions pertaining to the use of recycled water.

Chapter 5 Recycled Water Construction, Start-up and Inspections

5.1 Construction Plans, Specifications and Standard Details

5.1.1 Customer Plans and Specifications

The design and construction of all recycled water systems and components will be done in accordance with the latest versions of SAWS construction specifications and standard detail, except as otherwise noted. These documents may be found in SAWS official website http://www.saws.org/business_center/specs. Recycled water mains will also be designed and installed as required by 30 TAC Chapters 210, 217 and 290 rules and regulations, or most applicable approved equal provision. The Texas Code of Ordinances, Chapter 34, Article VIII – Recycled Water Service and Rates document, presented in Appendix G, will also be followed.

Whenever in the opinion of SAWS, plans and specifications are required to show the nature and character of the construction for which the application is made, the Customer will furnish such plans and specifications to SAWS for review and approval. Any work done on the existing or proposed recycled water distribution systems will be accomplished with the latest edition of the SAWS *Specifications for Water and Sanitary Sewer Construction*, except as otherwise noted. This document can be found in the SAWS official website link provided above. Such plans and specifications (also referred to as construction contract documents) will detail all proposed construction from the SAWS recycled water meter to the place of use of the recycled water. **All plans and specifications must be reviewed and approved by SAWS Backflow Prevention Department personnel prior to the start of any work.**

After SAWS review, the Customer will address the comments and submit to SAWS the final plans for approval for construction. The plans must be drawn in accordance with the SAWS *Standard Specifications for Construction, Item No. 110 – Recycled Water System* as presented in Appendix B.

SAWS will review the data submitted by the Customer within thirty (30) working days of actual receipt. If SAWS, in its discretion, determines that the application (including the plans and specifications) does not conform with the requirements, SAWS will note, in writing, all objections on the application and/or plans or on an attachment thereto and shall return the submitted plans and specifications with the basis for the rejection to the Customer. The Customer will have thirty (30) days from the date the application was returned to Customer to modify and resubmit the application and plans based on

SAWS comments. SAWS and the Customer may continue the review procedure for one property up to three (3) submissions to SAWS without payment of added fees. Thereafter, a re-submitted application fee may be required.

Note: As the engineer of record, the Design Engineer will assume the full responsibility for project-specific use of the SAWS standard specifications and details. When preparing the construction contract plans and specifications, the Design Engineer is advised against to just assume that these standard specifications and details automatically meet all project requirements. It is the Design Engineer's responsibility to make all the necessary quality checks and controls, appropriate adaptations and refinements as applicable to his/her project in hand.

5.1.2 Standard Notes for Inclusion on Customer Drawings

Following are some general notes that Customers may include in their construction plans:

1. The locations and depths of existing utilities, piping and structures shown on the plans are approximate only. The contractor shall verify the exact location and depths of all public or private utilities, including but not limited to, water, sewer, telephone, fiber optic lines, site lighting electric, secondary electric, primary electrical duct banks, landscape irrigation facilities, and gas lines whether shown on plans or not. Any utility conflicts that arise should be communicated to the Construction Inspector and Design Engineer immediately and prior to construction. The contractor shall contact 1-800-DIG-TEST a minimum of 48 hours prior to the start of construction. Any damage to existing utilities shall be the sole responsibility of the contractor, and the repair shall be at contractor's sole expense whether the utility is shown on these plans or not, including those that may not be shown on the DIG-TEST program.
2. The contractor shall fully be responsible for any and all damage done to the existing public or private utility lines that are to remain, including but not limited to, water lines, wastewater collection systems and storm lines. During construction, all damages shall be repaired in accordance with the owning authorities' standards. No separate pay item.
3. The contractor shall repair or replace any damaged improvements, curbs, fences, landscaping, driveways, sidewalks, and streets. Paving shall be better than or equal to the existing conditions.
4. The contractor shall remove and replace existing fences as needed for construction. The contractor shall maintain fences during construction. Replacement of fencing shall be to an equal of better than prior to construction.

5. The contractor shall submit to the Construction Inspector a course of action plan for the occurrence of an accidental spill of fuel or other substances that may be considered hazardous during construction.
6. All trenching and backfilling shall be done in accordance with *SAWS Standard Specifications for Construction, Item No. 550 – Trench Excavation Safety Protection* and *Item No. 804 – Excavation, Trenching and Backfilling* presented in Appendix B. When in paved streets, they shall be covered with a temporary all-weather surface at the end of each work day.
7. Excavation around the utility lines such as gas and electric may have to be done by hand digging due to safety concerns per *SAWS Standard Specifications for Construction, Item No. 812 – Water Main Installation* presented in Appendix B.
8. The contractor shall provide for adequate trench safety systems that comply with, at a minimum, Occupational Health and Safety Administration (OSHA) standards for trench excavations, specifically standards governing the presence and activity of individuals working in and around excavated trenches.
9. Adequate drainage shall be maintained at all times during construction. Any drainage ditch or structure disturbed during construction shall be restored to the satisfaction of the construction inspector. All construction storm runoff shall comply with the National Pollutant Discharge Elimination System (NPDES) requirements.
10. No substitution of pipe materials from those specified is allowed without prior approval by the Construction Inspector.
11. The contractor shall comply with 30 TAC Chapters 210, 217 and 290 for all recycled water/sanitary sewer crossings and all recycled water/potable water crossings.
12. The contractor shall comply with the SAWS standards, COSA standards, TXDOT standards, OSHA standards, and all applicable laws of the State of Texas.
13. Onsite cross-connection between recycled water pipelines and potable water pipelines is strictly prohibited.
14. Final connection to the proposed recycled water main shall not be made until the proposed public recycled water main has been released by the Construction Inspector for tie-in and use. Prior to tie-ins, any shutdowns of any existing mains of any size shall be coordinated with the Construction

Inspector at least one week or more in advance of the shutdown. As required, the contractor shall also submit a sequence of work as related to the tie-ins, and shall not proceed with any tie-in work until the sequence of work is approved by the Construction Inspector and/or by the Design Engineer.

15. When recycled water mains are installed in the vicinity of potable water lines, great care shall be taken to not allow cross-connection.
16. All valves shall open left with square cover labeled “recycled water.”
17. Contractor shall coordinate with the Construction Inspector and obtain all required permits including right-of-way and street cut permits. The contractor shall meet with the Inspector prior to the start of construction within the city right-of-way to confirm issuance of all proper permits prior to the start of construction within the city right-of-way.
18. No work shall be performed within the TXDOT right-of-way without approved TXDOT permits.
19. The contractor shall coordinate with the Construction Inspector prior to any tree removal.
20. The contractor shall provide barriers to protect any trees and any other plant life designated to remain within the construction area.
21. The contractor shall establish a uniform (i.e., evenly distributed, without large bare areas) vegetative cover at the construction site as soon as possible and prior to the final occupancy through seeding and watering.
22. The design and location for RECYCLED WATER – DO NOT DRINK signs must be called out on the drawings.
23. The contractor shall prevent fugitive dust violations by watering the construction site as necessary.
24. The contractor shall submit a traffic control plan during all phases of construction to protect and/or improve the flow of traffic as necessary.
25. The contractor shall not place any waste materials, debris in the 100-year flood plain without first obtaining an approved flood plain permit.
26. The contractor shall dispose of all debris offsite immediately. Disposal by burning shall be strictly prohibited.

27. It is the contractor's responsibility and expense to coordinate and acquire his own staging area including parking area to accommodate his own construction personnel's vehicles.
28. Unless otherwise noted in the construction plans and specifications, refer to SAWS website for standard SAWS construction specifications and details.

5.1.3 Information to be called out on Customer Plans and Specifications

In general, the plans, drawn to scale, should show the existing and/or new facilities to be used for distributing, controlling and applying recycled water to the site, all potable water lines and facilities buildings and other areas to be irrigated or recycled water usage to be located in these areas, and evidence that soil infiltration capacity and water rates have been assessed.

More specifically, the construction contract documents (plans and specifications) must, at a minimum, include the following information:

- The proposed recycled water service/application area,
- The proposed facility location,
- The sizes and types of all recycled water pipelines and service connections,
- Valves and valve boxes,
- Flow requirements (gallons per minute) and estimated annual recycled water requirement (acre-feet),
- Meter size,
- Service pressure required at the meter,
- Topographic contours (or elevation differences in the area served by the meter),
- Drainage pattern,
- 100-year flood plain boundaries, and
- Other onsite facilities (such as wells).

It is also very important that these construction contract documents include the layout of all existing potable water pipelines, wastewater mains, storm water drains and ditches, etc. including any areas from which the recycled water is being specifically excluded.

The plans should indicate whether there are or will be any drinking fountains and/or designated outdoor eating areas on the site. All public facilities such as comfort stations, drinking fountains, outdoor eating areas, etc. will need to be protected from the spray and/or misting by the recycled water.

If onsite recycled water facilities will include landscape irrigation, the following data for the materials to be used in the irrigation system must be included in the plans:

- A pipe schedule listing the pipe sizes and materials of construction,
- Valve types and/or sizes,
- Information on sprinkler heads (sprinkler radius, operating pressure [psi], flow [gpm or gph], sprinkler pattern, manufacturer/model number, and all other pertinent information), and
- Estimates of application rates, acreage to be irrigated, soil texture and infiltration rate, and information on the pressure requirement, hourly delivery rate, and the wetting pattern of the sprinklers.

5.1.4 Applicable Specifications List

- SAWS Specifications for Water and Sanitary Sewer Construction
- Item No. 110 Recycled Water System
- Item No. 550 Trench Excavation Safety Protection
- Item No. 804 Excavation, Trenching and Backfill
- Item No. 812 Water Main Installation
- Item No. 824 Service Supply Lines
- Item No. 832 Tapping Sleeves and Valves
- Item No. 833 Meter and Meter Box Installation
- Item No. 840 Water Tie-ins
- Item No. 844 Blow-off Assemblies
- Item No. 846 Air Release Assemblies

5.1.5 Applicable Standard Details List

- Recycled Water System Signage
- DD-110-10 Recycled Water Valve Detail
 - Valve Box Detail
- DD-804-01 Sanitary Sewer Pipe Laid in Trench
- DD-804-02 Trench Compaction Detail
- DD-812-00 Pipe Couplings
- DD-812-01 Potable and Recycled Water Main Detail
- DD-824-01 Copper Service Installation Tapping Schedule
- DD-824-02 Service Relay, Service Relocation ¾" thru 2"
- DD-824-03 Service Reconnection ¾" thru 2"
- DD-824-04 Service Arrangement in Cul-De-Sac
- DD-824-05 Typical Service Arrangement
- DD-833-01 Typical Meter Box Location (Residential)
- DD-833-03 Service Installation w/ Pressure Reducing Valve
- DD-844-02 2" Permanent Blow-off
- DD-844-05 4" Permanent Blow-off
- DD-846-01 Installation of 1" Air Release Valve
- DD-846-02 Installation of 2" Air Release Valve
 - Swing Connection Detail
 - Flushing Point Assembly
 - Customer Connect Detail
 - Combination Air Valve Detail

5.2 Construction Requirements

5.2.1 Cross-Connection and Backflow Prevention

A cross connection is any connection between the public potable water supply and another water supply of unknown quality or any source which may contain contaminating or polluting substances. The cross-connection requirements are designed to protect the public potable water system from contamination. The recycled water Customer agrees to comply with all the provisions and requirements at the Customer's expense. SAWS will prohibit or discontinue the service to the Customer if the Customer maintains an actual or potential hazard to the public potable water system or if the Customer's plumbing is susceptible to cross-connection(s) unless adequate protection against backflow is provided to the satisfaction of SAWS.

The recycled water Customer's responsibility for preventing contamination of the potable water system begins at the Customer's potable water service connection. When it is determined by SAWS that a backflow prevention assembly is required for the protection of the public potable water system, the Customer will properly install onsite an approved backflow prevention assembly at each service connection and/or at the hazard point, test annually or more often in those instances where successive inspections indicate repeated failure, and properly repair and maintain such assemblies as required herein and/or as required by the most recent SAWS *Cross Connection Control and Backflow Prevention Program* manual that can be located on SAWS website, and 30 TAC Chapters 210 or 290. The Customer further agrees to provide SAWS, before recycled water service is initiated and thereafter upon request by SAWS, information to allow SAWS to determine the degree of hazard to the public potable water system presented by the Customer's onsite recycled water system or any other actual or potential contamination hazard that may exist on the Customer's site. Such information shall include plumbing, construction, building and irrigation plans and any other information SAWS reasonably deems necessary to make the determination.

The Customer will also cause all backflow prevention assemblies used for health hazard protection to be inspected and tested by a certified backflow prevention tester to ensure that it is in proper operating condition at the time of installation (and before initiation of service), at the time of any repairing or relocation (and before resuming operations thereof), and at the completion of each year of service. The Customer will maintain accurate records of tests and repairs made to backflow prevention assemblies and provide SAWS with copies of such records via the SAWS Test and Maintenance Report (T&M report) form within 10 days of the inspection, test or maintenance. Re-

pipng and relocation of any assembly shall require prior written approval of SAWS. SAWS reserves the right to perform periodic tests on backflow prevention assemblies on the Customer's site.

5.2.2 Backup Water Source and Swivel Ell Connection

It is understood that SAWS recycled water supply is subject to interruption and that at times the Customer may be required to meet the recycled water needs with a backup supply of potable water. When the recycled water supply is temporarily unavailable, potable water may be used as an emergency source of supply. This is acceptable only in cases where there is an unplanned, short-term interruption of the recycled water service. No concurrent use of the potable water supply and the recycled water supply will be allowed. Prior to construction of any facilities, written approval will need to be obtained from SAWS.

The potable water supply must never be directly connected to the recycled water supply. To ensure that this requirement is achieved, a swivel-ell connection is used to preclude connecting both sources to the use area at the same time. The switch between potable water and recycled water must be done only through an air-gap separation between the potable water supply line and the recycled water line. If a storage tank with appropriate air gap from the potable water source is not provided for the recycled water system, a "swivel-ell" connection is necessary to allow augmentation of the supply with potable water.

In an emergency, the swivel-ell is switched from the normal recycled water connection to the potable connection. This procedure is reversed once the recycled water supply is restored. The potable water supply must be protected by a reduced pressure principle backflow preventer. In no case will it be acceptable for the potable supply to be directly connected to a recycled water supply.

The design, maintenance, and operation of swivel-ell connections will be in compliance with SAWS standards. A copy of the swivel-ell connection will be submitted to SAWS for review and approval.

The detail of a swivel-ell connection is presented in *Swing Connection* detail in Appendix B.

5.2.3 Flushing Point Assembly

In case a recycle line needs to be drained once in service, a flushing point assembly may be provided near a sewer manhole. However, a gate valve that to left should also be provided on the recycle line to isolate/protect it. A flush point discharge no less than 6.0-inch diameter (preferably 8.0-inch) should be provided. It should be close proximity (10.0 to 20.0 feet) to a sewer manhole that can receive the

drained water. A quick coupler with a pressure rated discharge assembly should also be provided. The quick coupler assembly must be in a “traffic rated” box that is large enough to connect, disconnect, and repair/replace the coupling at the flange, as necessary.

The detail of a flush point assembly is presented in Flush Point Assembly detail in Appendix B.

5.2.4 Valves and Controls

All valves on the recycled system will be secured from unauthorized use. They will be operable with special tools available to authorized personnel. All recycled water systems must have a master cutoff valve located near the service connection.

If automatic controllers are used:

- A drawing of the area served by the controller will be sealed in plastic and placed in the controller box.
- The controller box will be keyed to allow access only by authorized personnel.

5.2.5 System Identification

The on-site recycled water system will be identified using purple pipe or purple tape whenever feasible. In new developments, all subsurface piping and fixtures will be marked in purple. During conversion of existing potable systems, all exposed subsurface piping and fixtures will be marked. All above ground parts of the recycled water system, including valves, valve boxes and covers, controllers, piping, quick couplers or other outlets and related appurtenances will be marked in accordance with SAWS specifications.

The new onsite potable water system will be identified using tape green with white lettering or blue with black lettering marked “potable water buried below” attached to the pipe. All new fire line services will be identified using tape red with black lettering marked “fire line buried below” attached to the pipe. All above ground parts of the potable water system or fire line services including valves, valve boxes and covers, piping or other outlets and related appurtenances will be marked in accordance with SAWS specifications.

The existing onsite potable water system will need to be identified using tape green with white lettering or blue with black lettering marked “potable water buried below” whenever the pipe is exposed for repair or modification. All existing fire line services will be identified using tape red with

black lettering marked “fire line buried below” whenever the pipe is exposed for repair or modification. All above ground parts of the potable water system or fire line services including valves, valve boxes and covers, piping or other outlets and related appurtenances, must be marked in accordance with SAWS specifications.

5.2.6 Public Notification

All sites using recycled water will prominently display signs reading in both English and Spanish, "RECYCLED WATER. DO NOT DRINK" or similar warning. Signs may be educational in nature. Also, all exposed piping should be purple, stenciled in black with a warning reading “RECYCLED WATER. DO NOT DRINK.”

Golf courses using recycled water may want to consider notices with language similar to that above on score cards.

5.3 Inspections during Construction

Representatives of SAWS and other regulatory agencies will have access to the site at all times. The Customer is required to notify SAWS (Construction Inspections and Backflow Prevention Department) at the following points during construction and at other times as requested.

5.4 System Start-up and Required Testing

Upon final inspection and approval of the system by SAWS, the final testing phase will commence. Multiple tests will be conducted, not limited to, Customer Service inspection (CSI) and two way shut down test, the backflow prevention assembly, cross-connection control, dye testing, and ponding, runoff and over-spraying.

5.5 Construction Conformity

All onsite recycled water facilities are subject to periodic inspection by SAWS or other regulatory agencies as applicable. Upon satisfactory completion and inspection of the constructed recycled water lines, SAWS will issue a Final Acceptance Letter.

5.6 Backflow Prevention Assembly and Cross-connection Annual Testing

The backflow prevention assembly on potable water lines will be tested upon installation. Thereafter, at least once each year, the devices will be tested. Testing will also be required whenever assembly(s) are relocated, repaired or overhauled or if the supply is changed in any way.

These tests shall be performed by a certified tester approved by SAWS, and the results will be provided to SAWS.

A dye test will be requested and monitored by SAWS to test for possible cross-connections with the potable water system. Following a compliance dye test, a cross-connection dye test may be repeated each time a system change is made. Periodic dye tests may also be required by SAWS or regulatory agencies.

If an annual shut-down/dye test/pressure test(s) cannot be performed on-site of the recycled water Customer's facility, the recycled water Customer will need to furnish a Letter of Demarcation (LOD) to SAWS indicating there are no cross-connections on the site. This LOD will need to be signed and sealed by a Professional Engineer licensed in the State of Texas.

More details on backflow prevention can be found in the SAWS Cross-Connection Control and Backflow Prevention Program manual. This manual is located in SAWS website.

Appendices

Appendix A: 30 TAC Chapter 210 - The Use of Reclaimed Water

SUBCHAPTER A: GENERAL PROVISIONS
§§210.1 - 210.9
Effective February 12, 1997

§210.1. Applicability.

This chapter applies to the reclaimed water producer, provider, and user. If the entity which is the producer of the reclaimed water is the same as the user, then the use of reclaimed water is permissible only if the use occurs after the wastewater has been treated in accordance with the producer's wastewater permit and the permit provides for an alternative means of disposal during times when there is no demand for the use of the reclaimed water. This chapter does not apply to treatment or disposal of wastewater permitted by the commission in accordance with the requirements of Chapter 305 of this title (relating to Consolidated Permits), or to the user of such treated wastewater identified in the producer's wastewater discharge permit authorizing disposal by irrigation. This chapter does not apply to those systems authorized under Chapter 285 of this title (relating to On-Site Wastewater Treatment) which utilizes surface irrigation as an approved disposal method.

Adopted January 8, 1997

Effective February 12, 1997

§210.2. Purpose and Scope.

(a) The purpose of this chapter is to establish general requirements, quality criteria, design, and operational requirements for the beneficial use of reclaimed water which may be substituted for potable water and/or raw water. As defined and specified in this chapter, the requirements must be met by producers, providers, and/or users of reclaimed water. Specific use categories are defined with corresponding reclaimed water quality requirements. These criteria are intended to allow the safe utilization of reclaimed water for conservation of surface and ground water; to ensure the protection of public health; to protect ground and surface waters; and to help ensure an adequate supply of water resources for present and future needs.

(b) The commission has defined other types of reclaimed water activity in separate regulations, including §309.20 of this title (relating to Land Disposal of Sewage Effluent) and §297.1 of this title (relating to Definitions). These regulations do not modify those definitions. The term reclaimed water is limited in scope for the purpose of this rule as defined in §210.3 of this title (relating to Definitions).

(c) Approval by the executive director of a reclaimed water use project under this chapter does not affect any existing water rights. If applicable, a reclaimed

water use authorization in no way affects the need of a producer, provider and/or user to obtain a separate water right authorization from the commission.

(d) Reclaimed water projects approved under this chapter do not require a new or amended waste discharge permit from the commission except as provided in §210.5 of this title (relating to Permits Required). Persons who desire to develop projects not specifically authorized by this chapter may seek authorization pursuant to provisions of Subchapter D or apply for a new or amended waste discharge permit under Chapter 305 of this title (relating to Consolidated Permits).

Adopted January 8, 1997

Effective February 12, 1997

§210.3. Definitions.

The following words and terms when used in this chapter shall have the following meanings unless the context clearly indicates otherwise.

(1) Beneficial use--An economic use of wastewater in accordance with the purposes, applicable requirements, and quality criteria of this chapter, and which takes the place of potable and/or raw water that could otherwise be needed from another source. The use of reclaimed water in a quantity either less than or the economically optimal amount may be considered a beneficial use as long as it does not constitute a nuisance.

(2) BOD₅--Five-day biochemical oxygen demand.

(3) CBOD₅--Five-day carbonaceous biochemical oxygen demand.

(4) CFU--Colony forming units.

(5) Domestic wastewater--Waste and wastewater from humans or household operations that are discharged to a wastewater collection system or otherwise enters a treatment works. Also, this includes waterborne human waste and waste from domestic activities such as washing, bathing, and food preparation, including greywater and blackwater, that is disposed in an on-site wastewater system as defined in Chapter 285 of this title (relating to On-Site Wastewater Treatment).

(6) DRASTIC--A classification system for comparing land units on the basis of their vulnerability to ground-water pollution, a detailed description of which is found in Appendix 1 of this chapter.

Figure: 30 TAC §210.3(6)

DRASTIC - An Approach to Ground-Water Pollution Potential Mapping

DRASTIC was developed as a tool for comparing land units on the basis of their vulnerability to ground-water pollution. Artificial classification of natural systems, including aquifers, has been used for years. A system for ranking ground-water pollution potential which took into consideration a relatively large number of parameters had not been developed, however. Through a consensus process, a group sponsored by the National Water Well Association and the Robert S. Kerr Environmental Research Laboratory developed the methodology described in limited detail here.

DRASTIC is a systematic approach for assessing the ground-water pollution potential of hydrogeologic settings. The DRASTIC system is a methodology which involves delineation of hydrogeologic settings and data analysis to develop a single index number which represents the sensitivity of that setting to ground-water pollution potential. The system to some degree depends on subjective, but skilled judgement by the user (Texas Water Commission, 1989).

Hydrogeologic settings are delineated based on seven parameters which are used to develop an index number for each setting. The parameters have been organized to create the acronym DRASTIC.

DRASTIC stands for:

- D - Depth to water
- R - Annual recharge
- A - Aquifer media
- S - Soil media
- T - Topography
- I - Vadose zone impact
- C - Hydraulic conductivity

After index numbers are developed, maps can be constructed to present a graphic display of the pollution potential. Two maps can be generated using the DRASTIC methodology, a map depicting general vulnerability to ground-water pollution and another specifically aimed at pollution from certain agricultural practices.

A generic contaminant is used for this methodology. The contaminant is introduced at the land surface as a solid or liquid and travels to the aquifer with recharge waters derived from precipitation. Mobility of the contaminant is assumed to be equal to that of groundwater and attenuation processes are assumed to go on in the soil, Vadose zone and aquifer.

Parameters used in the DRASTIC system are divided into ranges with corresponding ratings. Rating values depend on the impact of the factor on contamination potential. The general and agricultural DRASTIC evaluations use the same ranges and rating values, but the weighting of parameters changes. Weighting represents an attempt to define the relative importance of each factor in its ability to affect pollution transport to and within the aquifer and it creates the differences between the general and agricultural indices (Texas Water Commission, 1989).

Two pollution potential numbers, one for generalized pollution sources and one for pollution due to agricultural activities, are derived for each hydrogeologic setting. The formula for the index number is:

$$I = (Dr \times Dw) + (Rr \times Rw) + (Ar \times Aw) + (Sr \times Sw) + (Tr \times Tw) + (Ir \times Iw) + (Cr \times Cw)$$

I = DRASTIC index number
D, R, A, S, T, I, C - parameters
r - rating
w - weight

Maps are labeled with designations for the hydrogeologic settings and pollution potential numbers and the indices are then divided into ranges for color coding of the final maps.

More detailed information may be found in *DRASTIC: A standardized system for evaluating ground water pollution potential using hydrogeologic settings*: U.S. Environmental Protection Agency, EPA/600/2-87/035, authored by L. Allen, T. Bennett, J. H. Lehr, R. J. Petty and G. Hackett.

(7) Edwards Aquifer--That portion of an arcuate belt of porous, water bearing, predominantly carbonate rocks known as the Edwards and Associated Limestones in the Balcones Fault Zone trending from west to east to northeast in Kinney, Uvalde, Medina, Bexar, Comal, Hays, Travis, and Williamson counties; and composed of the Salmon Peak Limestone, McKnight Formation, West Nueces Formation, Devil's River Limestone, Person Formation, Kainer Formation, Edwards Formation, and Georgetown Formation. The permeable aquifer units generally overlie the less-permeable Glen Rose Formation to the south, overlie the less-permeable Comanche Peak and Walnut formations north of the Colorado River, and underlie the less-permeable Del Rio Clay regionally. (See Chapter 213 of this title (relating to Edwards Aquifer).)

(8) Edwards Aquifer Recharge zone--Generally, that area where the stratigraphic units constituting the Edwards Aquifer crop out, and including the outcrops of other geologic formations in proximity to the Edwards Aquifer, where caves, sinkholes, faults, fractures, or other permeable features would create a

potential for recharge of surface waters into the Edwards Aquifer. The recharge zone is identified as that area designated as such on official maps located in the offices of the commission and the Edwards Underground Water District. (See Chapter 213 of this title (related to Edwards Aquifer).)

(9) Food crop--Any crops intended for direct human consumption.

(10) Initial holding pond--An impoundment which first receives reclaimed water from a producer at the quality levels established by this chapter, not including subsequent holding ponds.

(11) Geometric mean--The n^{th} root of the product of all measurements made in a particular period of time, for example in a month's time, where n equals the number of measurements made. In the alternative, the geometric mean can also be computed as the antilogarithm of the sum of the logarithm of each measurement made. Where any measurement using either computation method equals zero, it must be substituted with the value of one.

(12) l--Liter.

(13) Landscape impoundment--Body of reclaimed water which is used for aesthetic enjoyment or which otherwise serves a function not intended to include contact recreation.

(14) Leak detection system--A system or device designed, constructed, maintained, and operated with a pond that is capable of immediately detecting a release of leachate or reclaimed water that migrates through a liner. The system may typically include a leachate collection system along with either leak detection sensors or view ports.

(15) Municipal wastewater--Waste or wastewater discharged into a publicly owned or a privately owned sewerage treatment works primarily consisting of domestic waste.

(16) mg/l--Milligram per liter.

(17) NTU--Nephelometric turbidity units.

(18) Nuisance--Any distribution, storage, or use of reclaimed water, in such concentration and of such duration that is or may tend to be injurious to or which adversely affects human health or welfare, animal life, vegetation, or property, or which interferes with the normal use and enjoyment of animal life, vegetation, or property.

(19) On-channel pond--An impoundment wholly or partially within a definite channel of a stream in which water flows within a defined bed and banks, originating from a definite source or sources. The water may flow continuously or intermittently, and if intermittently, with some degree of regularity, dependent on the characteristics of the source or sources.

(20) Permit or permitted--A written document issued by the commission or executive director in accordance with Chapter 305 of this title (relating to Consolidated Permits) which, by its conditions, may authorize the permittee to construct, install, modify, or operate, in accordance with stated limitations, a specified facility for waste discharge, including a wastewater discharge permit.

(21) Pond system--Wastewater facility in which primary treatment followed by stabilization ponds are used for secondary treatment and in which the ponds have been designed and constructed in accordance with applicable design criteria. (See Chapter 317 of this title (relating to the Design Criteria for Sewerage Systems).)

(22) Producer--A person or entity that produces reclaimed water by treating domestic wastewater or municipal wastewater, in accordance with a permit or other authorization of the Agency, to meet the quality criteria established in this chapter.

(23) Provider--A person or entity that distributes reclaimed water to a user(s) of reclaimed water. For purposes of this chapter, the reclaimed water provider may also be a reclaimed water producer.

(24) Reclaimed water--Domestic or municipal wastewater which has been treated to a quality suitable for a beneficial use, pursuant to the provisions of this chapter and other applicable rules and permits.

(25) Restricted landscaped area--Land which has vegetative cover to which public access is controlled in some manner. Access may be controlled by either legal means (e.g. state or city ordinance) or controlled by some type of physical barrier (e.g., fence or wall). Example of such areas are: golf courses; cemeteries; roadway rights-of-way; median dividers.

(26) Restricted recreational impoundment--Body of reclaimed water in which recreation is limited to fishing, boating and other non-contract recreational activities.

(27) Single grab sample--An individual sample collected in less than 15 minutes.

(28) Spray irrigation--Application of finely divided water droplets using artificial means.

(29) Subsequent holding pond--A pond or impoundment which receives reclaimed water from an initial holding pond where the quality of the water changes after management in the initial holding pond, due to factors which may include:

(A) the addition of water occurs such as contributions from surface water or ground water sources, but not including contributions of reclaimed water, domestic wastewater, or municipal wastewater;

(B) some type of utilization of the reclaimed water for a beneficial use occurs; or

(C) commingling of reclaimed water with surface water runoff where it occurs between storage in an initial holding pond and the subsequent holding pond.

(30) Surface irrigation--Application of water by means other than spraying so that contact between the edible portion of any food crop and the irrigation water is prevented.

(31) Type I reclaimed water use--Use of reclaimed water where contact between humans and the reclaimed water is likely.

(32) Type II reclaimed water use--Use of reclaimed water where contact between humans and the reclaimed water is unlikely.

(33) Unrestricted landscaped area--Land which has had its plant cover modified and access to which is uncontrolled. Examples of such areas are: parks; school yards; greenbelts; residences.

(34) User--Person or entity utilizing reclaimed water for a beneficial use, in accordance with the requirements of this chapter. A reclaimed water user may also be a producer or a provider.

Adopted January 8, 1997

Effective February 12, 1997

§210.4. Notification.

(a) Before providing reclaimed water to another for a use allowable under this chapter, the reclaimed water provider shall notify the executive director and obtain written approval to provide the reclaimed water. The notification shall include:

(1) a description of the intended use of the reclaimed water, including quantity, quality, origin, and location and purpose of intended use;

(2) a clear indication of the means for compliance with this chapter, including documentation that a user will be apprised of their responsibilities under this chapter as a part of the water supply contract or other binding agreement;

(3) evidence in a water supply contract or other binding agreement of the provider's authority to terminate reclaimed water use that is noncompliant with this chapter; and

(4) an operation and maintenance plan that is required under ordinance or is to be a part of the water supply contract or other binding agreement, where applicable, and which shall contain, as a minimum, the following:

(A) a labeling and separation plan for the prevention of cross connections between reclaimed water distribution lines and potable water lines;

(B) the measures that will prevent unauthorized access to reclaimed water facilities (eg., secured valves);

(C) procedures for monitoring reclaimed water transfers and use;

(D) steps the user must utilize to minimize the risk of inadvertent human exposure;

(E) schedules for routine maintenance;

(F) a plan for carrying out provider employee training and safety relating to reclaimed water treatment, distribution, and management; and

(G) contingency plan for remedy of system failures, unauthorized discharges, or upsets.

(b) If the provider is not the producer, a description of the origin of the reclaimed water, its quality based upon the parameters contained in the underlying waste discharge permit(s), and a signed agreement from the producer authorizing the transfer of the reclaimed water to the provider. If applicable, a reclaimed water provider or user may need to obtain a separate water right authorization from the commission.

(c) A producer who chooses to use reclaimed water for a beneficial use only within the boundaries of a wastewater treatment facility permitted by the commission, may do so without notification otherwise required by this section. In

such instances, the producer is still required to comply with all applicable requirements of this chapter pertaining to the reclaimed water use.

(d) If effluent is to be used for irrigation within the Edwards Aquifer recharge zone, plans and specifications for the disposal system must be submitted to the executive director for review and approval prior to construction of the facility in accordance with Chapter 213 of this title (relating to Edwards Aquifer).

(e) Major changes from a prior notification for use of reclaimed water must be approved by the executive director. A major change includes:

(1) a change in the boundary of the approved service area not including the conversion of individual lots within a subdivision to reclaimed water use;

(2) the addition of a new producer;

(3) major changes in the intended use, such as conversion from irrigation of a golf course to residential irrigation; or

(4) changes from either Type I or Type II uses to the other.

Adopted January 8, 1997

Effective February 12, 1997

§210.5. Authorization for the Use of Reclaimed Water.

(a) Prior to discharging any reclaimed water to the waters in the state, the provider or user shall obtain a permit from the commission in accordance with the requirements of Chapter 305 of this title (relating to Consolidated Permits) except as provided for by §210.22(g) of this title (relating to General Requirements).

(b) The executive director may require a reclaimed water user to apply for and obtain a permit to utilize reclaimed water if the reclaimed water use poses potential or actual adverse impacts upon human health, soil and ground water resources, or aquatic life.

(c) For purposes of this chapter, no permit issued pursuant to Chapter 305 of this title (relating to Consolidated Permits) will be required for additional treatment required to meet the quality standards of §210.33 of this title (relating to Quality Standards for Using Reclaimed Water), unless such additional treatment results in a discharge of wastewater into waters in the state.

(d) A reclaimed water provider or user who accepts effluent meeting the Type II quality criteria and that must also meet the Type I quality criteria for a proposed use must provide additional treatment for the proposed new use. The additional

manner of treatment must be authorized by the executive director. The provider or user must notify and be granted an authorization from the executive director prior to engaging in such activity. Examples of such additional treatment may include processes for disinfection or filtration of the reclaimed water. Such authorization may be granted by the executive director after review of the proposed plans and specifications submitted to the executive director for the additional treatment. This request for authorization may be submitted to the executive director along with the notification required by §210.4 of this title (relating to Notification).

(e) If a provider or user elects to treat reclaimed water supplied by the provider or producer, respectively, to a quality better than the minimum standards of this chapter for the same use, such treatment does not require a permit or other additional authorization by the executive director.

(f) Any sewage sludge generated as a result of reclaimed water treatment undertaken pursuant to this section shall be managed in accordance with the requirements of Chapter 312 of this title (relating to Sludge Use, Disposal and Transportation).

Adopted January 8, 1997

Effective February 12, 1997

§210.6. Responsibilities.

The producer of reclaimed water will not be liable for misapplication of reclaimed water by users, except as provided in this section. Both the reclaimed water provider and user have, but are not limited to, the following responsibilities:

(1) The reclaimed water producer shall:

(A) transfer reclaimed water of at least the minimum quality required by this chapter at the point of delivery to the user for the specified use;

(B) sample and analyze the reclaimed water and report such analyses in accordance with §210.34 and §210.36(b) of this title (relating to Sampling and Analysis and Record keeping and Reporting, respectively); and

(C) notify the executive director in writing within five (5) days of obtaining knowledge of reclaimed water use not authorized by the executive director's reclaimed water use approval.

(2) The reclaimed water provider shall:

(A) assure construction of reclaimed water distribution lines or systems in accordance with this chapter and in accordance with §210.25 of this title (relating to Special Design Criteria for Reclaimed Water Systems);

(B) transfer reclaimed water of at least the minimum quality required by this chapter at the point of delivery to the user for the specified use;

(C) notify the executive director in writing within five (5) days of obtaining knowledge of reclaimed water use not authorized by the executive director's reclaimed water use approval; and

(D) not be found in violation of this chapter for the misuse of the reclaimed water by the user if transfer of such water is shut off promptly upon knowledge of misuse regardless of contract provisions.

(3) The reclaimed water user shall:

(A) use the reclaimed water in accordance with this chapter; and

(B) maintain and provide records as required by §210.36(a) of this title (relating to Recordkeeping and Reporting).

Adopted January 8, 1997

Effective February 12, 1997

§210.7. Transfer and Conveyance of Reclaimed Water.

Reclaimed water transferred from a provider to a user shall be done on a demand only basis in order that the water is not provided during times it cannot be beneficially used in accordance with this chapter. The reclaimed water user may refuse delivery of such water at any time. However, this section is not intended to change any obligation the user may have by contract or ordinance. All reclaimed water transferred to a user must be of at least the treatment quality for the use specified in §210.32 of this title (relating to Specific Uses of Reclaimed Water).

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Effective February 12, 1997

§210.8. Restrictions.

This chapter does not convey or alter any property right and does not grant any exclusive privilege.

Adopted January 8, 1997

Effective February 12, 1997

§210.9. Enforcement.

If a person or entity fails to comply with the terms of this chapter, the executive director may require the entity to apply for and obtain a permit or permit amendment. The commission may also issue an enforcement order requiring

remedial measures and the assessment of administrative penalties pursuant to §26.019 and §26.136 of the Texas Water Code. The commission may also seek civil penalties and injunctive relief in a court of competent jurisdiction as provided by §26.123 of the Texas Water Code.

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Effective February 12, 1997

**SUBCHAPTER B: GENERAL REQUIREMENTS FOR THE PRODUCTION,
CONVEYANCE, AND USE OF RECLAIMED WATER**

**§§210.21 - 210.25
Effective February 12, 1997**

§210.21. Applicability.

This subchapter establishes general requirements applicable to producers, providers, and users of reclaimed water. This subchapter also establishes requirements and specifications for transfer, storage, and irrigation using reclaimed water and design criteria of reclaimed water systems. Additionally, this subchapter establishes requirements and specifications necessary to minimize discharges of waste into or adjacent to waters in the state.

Adopted January 8, 1997

Effective February 12, 1997

§210.22. General Requirements.

(a) Reuse of untreated wastewater is prohibited.

(b) Food crops that may be consumed raw by humans shall not be spray irrigated. Food crops including orchard crops that will be substantially processed prior to human consumption may be spray irrigated. Other types of irrigation that avoid contact of reclaimed water with edible portions of food crops are acceptable.

(c) There shall be no nuisance conditions resulting from the distribution, the use, and/or storage of reclaimed water.

(d) Reclaimed water shall not be utilized in a way that degrades ground water quality to a degree adversely affecting its actual or potential uses.

(e) Reclaimed water managed in ponds for storage must be prevented from discharge into waters in the state, except for discharges directly resulting from rainfall events or in accordance with a permit issued by the commission. All other discharges are unauthorized. If any unauthorized overflow of a holding pond occurs causing discharge into or adjacent to waters in the state, the user or provider, as appropriate, shall report the noncompliance. A written submission of such information shall also be provided to the TNRCC regional office and to the Austin Office, Water Enforcement Section (MC-149), within five (5) working days of becoming aware of the overflow. The written submission shall contain a description of the noncompliance and its cause; the potential danger to human health or safety, or the environment; the period of noncompliance, including exact dates and times; if the noncompliance has not been corrected, the anticipated time it is expected to

continue; and, steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance, and to mitigate its adverse effects.

Adopted January 8, 1997

Effective February 12, 1997

§210.23. Storage Requirements for Reclaimed Water.

(a) Except for authorized on-channel ponds, storage facilities for retaining reclaimed water prior to use shall not be located within the floodway.

(b) Except as provided by subsection (e) of this section, all initial holding ponds must be lined in accordance with either subsection (c) or (d) of this section, as appropriate.

(c) All initial and subsequent holding ponds containing Type I and Type II effluent, located within the recharge zone of the Edwards Aquifer, as defined in Chapter 213 of this title (relating to Edwards Aquifer), and all initial holding ponds containing Type II effluent, located in a vulnerable area as defined by a rating of 110 or greater on the statewide "*Ground-Water Pollution Potential - General, Municipal, and Industrial Sources*" (DRASTIC) map (as shown in Figure 1 of this chapter), shall conform to the following requirements:

(2) Soils used for pond lining shall be free from foreign material such as paper, brush, trees, and large rocks;

(3) All soil liners must be of compacted material, at least 24 inches thick, compacted in lifts no greater than 6 inches thick and compacted to 95% of Standard Proctor Density. In-situ clay soils meeting the soils liner requirements shall be excavated and re-compacted a minimum of 6 inches below planned grade to assure a uniformly compacted finished surface.

(4) Soil liners must meet the following particle size gradation and Atterberg limits:

(A) 30% or more passing a number 200 mesh sieve; and

(B) a liquid limit of 30% or greater; and a plasticity index of 15 or greater and have a permeability less than or equal to 1×10^{-7} cm/sec;

(5) Synthetic membrane linings shall have a minimum thickness of 40 mils with a leak detection system. In situ liners at least 24 inches thick meeting a permeability less than or equal to 1×10^{-7} cm/sec are acceptable alternatives;

(6) Certification shall be furnished by a Texas Registered Professional Engineer that the pond lining meets the appropriate criteria prior to utilization of the facilities; and

(7) Soil embankment walls shall have a top width of at least five feet. The interior and exterior slopes of soil embankment walls shall be no steeper than one foot vertical to three feet horizontal unless alternate methods of slope stabilization are utilized. All soil embankment walls shall be protected by a vegetative cover or other stabilizing material to prevent erosion. Erosion stops and water seals shall be installed on all piping penetrating the embankments.

(d) All initial holding ponds designed to contain Type I effluent, located outside of the recharge zone of the Edwards Aquifer, and Type II effluent, located in areas in the state not identified in subsection (c) of this section shall conform to the following requirements:

(1) The ponds, whether constructed of earthen or other impervious materials, shall be designed and constructed so as to prevent groundwater contamination;

(2) Soils used for pond lining shall be free from foreign material such as paper, brush, trees, and large rocks;

(3) All soil liners must be of compacted material having a permeability less than or equal to 1×10^{-4} cm/sec, at least 24 inches thick, compacted in lifts no greater than 6 inches each;

(4) Synthetic membrane linings shall have a minimum thickness of 40 mils. In situ liners at least 24 inches thick meeting a permeability less than or equal to 1×10^{-4} cm/sec are acceptable alternatives;

(5) Certification shall be furnished by a Texas Registered Professional Engineer that the pond lining meets the appropriate criteria prior to utilization of the facilities; and

(6) Soil embankment walls shall have a top width of at least five feet. The interior and exterior slopes of soil embankment walls shall be no steeper than one foot vertical to three feet horizontal unless alternate methods of slope stabilization are utilized. All soil embankment walls shall be protected by a vegetative cover or other stabilizing material to prevent erosion. Erosion stops and water seals shall be installed on all piping penetrating the embankments.

(7) An alternative method of pond lining which provides equivalent or better water quality protection than provided under this section may be utilized with the prior approval of the executive director.

(8) A specific exemption may be obtained from the executive director if, after the review of data submitted by the reclaimed water provider or user, as appropriate, the executive director determines containment of the reclaimed water is not necessary, considering:

(A) soil and geologic data, and ground water data, including its quality, uses, quantity and yield; and

(B) adequate demonstration that impairment of ground water for its actual or potential use will be prevented.

(e) Reclaimed water may be stored in leak-proof, fabricated tanks.

(f) Subsequent holding ponds utilized for the receipt and storage of reclaimed water of a quality that could cause or causes a violation of a surface water quality standard or impairment of ground water for its actual or intended use will also be subject to the storage requirements of this section.

§210.24. Irrigation Using Reclaimed Water.

(a) The reclaimed water user shall provide reasonable control of the application rates for reclaimed water applied to irrigation areas. These controls shall encourage the efficient use of reclaimed water and avoid excessive application of reclaimed water that results in surface runoff or excessive percolation below the root zone.

(b) The reclaimed water provider or user, as applicable shall determine and document typical irrigation demands for the proposed use based on type of vegetation and land area to be irrigated. As one alternative, a typical method for determining irrigation needs is shown in Table 1 of this section. However, other alternative methods may be used.

Figure: 30 TAC §210.24(b)

TABLE 1
WATER BALANCE EXAMPLE
(All Units are Inches of Water per Acre of Irrigated Area)

Month	a Average Precipitation	b Average Runoff	Ri Average Infil- trated Rainfall	c Evapo- Transp- iration	d Required Leaching	Total Water Needs (5)+ (6)	Effluent Needed in Root Zone (7)-(4)	e Evapo- ration from Reservoir Surface	f Effluent to be Applied to Land (8)/K	g Consumption from Reservoir (9)+(10)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Jan.	2.11	0.40	1.71	0.80	0.00	0.80	0.00	0.02	0.00	0.02
Feb.	2.43	0.57	1.86	1.20	0.00	1.20	0.00	0.01	0.00	0.01
Mar.	2.02	0.36	1.66	2.80	0.20	3.00	1.34	0.09	1.58	1.67
Apr.	3.19	1.03	2.16	3.40	0.22	3.62	1.46	0.05	1.72	1.77
May	4.19	1.74	2.45	6.10	0.64	6.74	4.29	0.10	5.05	5.15
June	3.30	1.10	2.20	6.50	0.76	7.26	5.06	0.20	5.95	6.15
July	2.20	0.45	1.75	6.70	0.87	7.57	5.82	0.34	6.85	7.19
Aug.	2.12	0.41	1.71	4.60	0.51	5.11	3.40	0.34	4.00	4.34
Sept.	3.58	1.30	2.28	5.10	0.50	5.60	3.32	0.19	3.91	4.10
Oct.	3.09	0.96	2.13	4.10	0.35	4.45	2.32	0.14	2.73	2.87
Nov.	2.23	0.46	1.77	2.10	0.06	2.16	0.39	0.07	0.46	0.53
Dec.	2.34	0.52	1.82	1.00	0.00	1.00	0.00	0.03	0.00	0.03
	32.80	9.30	23.50	44.40	4.11	48.51	27.40	1.58	32.25	33.83

Table 1 Footnotes

a. Up-to date rainfall and evaporation data sets are available from the Texas Natural Resources Information System.

b. Runoff should be determined by an acceptable method such as the Soil Conservation Service method found in SCS Technical Releases No. 55. For calculation purposes only, a CN value of 74 was assumed for good pasture with Class "C" soils.

c. Suggested source of values is the "Bulletin 6019, Consumptive Use of Water by Major Crops in Texas", Texas Board of Water Engineers.

d. In low rainfall areas, this is the required leaching to avoid salinity build-up in the soil where:

$$L = \frac{C_e}{C_1 - C_e} (E - R_i)$$

R_i = Infiltrated rainfall
C₁-C_e

C_e = Electrical conductivity of effluent

C₁ = Maximum Allowable Conductivity of Soil Solution (Table 3)

E = Evapotranspiration

For calculation purposes only, C_e is measured to be 1.5 millimhos/cm @ 25° and C_1 is 10.0 (Bermuda Grass)

- e. Net evaporation from reservoir surface. For the purpose of calculation, an assumption must be made as to the ratio of irrigated land area to reservoir surface area. For this example problem, the necessary reservoir area was assumed to be 17% of the irrigated area. If, after all calculations are made, the reservoir dimensions do not seem reasonable, then a new assumption must be made and the calculations repeated. Values in column (9) are adjusted to be inches per irrigated acre.
- f. K is the irrigation efficiency which for this example is taken to be 0.85.
- g. The total of this column together with the expected annual volume of effluent will determine the acreage of irrigated land required.

(c) The reclaimed water provider shall be responsible for conducting periodic audits of appropriate controls implemented by reclaimed water users. Other typical irrigation operational considerations that must be addressed include the following:

(1) Irrigation of Food Crops.

(A) Irrigation of edible crops that will be peeled, skinned, cooked, or thermally processed before consumption is allowed. Direct contact of the reclaimed water with such crops is allowed.

(B) Irrigation of citrus fruit is allowed. Direct contact of the reclaimed water with citrus is allowed.

(C) Irrigation of edible crops that will not be peeled, skinned, cooked, or thermally processed before consumption is allowed if an indirect application method is used which will preclude the direct contact with the reclaimed water. For instance, a ridge and furrow, drip irrigation, or a subsurface distribution system may be used to irrigate such above ground crops. However, these methods would not be suitable for crops such as carrots or radishes.

(D) Irrigation of edible crops that will not be peeled, skinned, cooked, or thermally processed before consumption that allows for direct contact of the reclaimed water on the crop is prohibited.

(2) Irrigation of pastures used by animals milked for human consumption shall be conducted in a manner to avoid contact of reclaimed water with such animals.

(3) Irrigation of landscaped areas:

(A) Application of reclaimed water on public access facilities shall be controlled by agreement with the reclaimed water provider or by local ordinance.

(B) Reclaimed water may not be used to fill swimming pools, hot tubs, wading pools, or other structures designed for contact recreation.

(d) General irrigation requirements.

(1) A provider or user designing or operating an irrigation system using reclaimed water is responsible for ensuring that reclaimed water overflow, crop stress, and undesirable soil contamination by a salt does not occur. To prevent such occurrences, the provider or user is required to consider, evaluate, and respond appropriately to the following factors as the need arises:

(A) Precipitation inputs to the water balance should utilize the average monthly precipitation based on past rainfall records.

(B) The consumptive use requirements (evapotranspiration losses) of the crop system should be developed on a monthly basis. The method of determining the consumptive use requirement shall be documented by the provider or user as a part of the water balance study and the records of the study maintained for possible commission review.

(C) A leaching requirement, calculated as shown in Table 1 of this section, shall be included in the water balance study when the total dissolved solids concentration of the reclaimed water presents the potential for developing excessive soil salinity buildup due to the long term operation of the irrigation system.

(2) The irrigation site must be maintained with a vegetative cover or be under cultivation during times when reclaimed water is being applied.

(3) The irrigation practices shall be designed so as to prevent incidental ponding or standing water except where local farming conditions and the accepted irrigation delivery systems and cropping patterns are such that, as an unavoidable consequence of such conditions, systems, and patterns, there will be standing water.

(4) Irrigation application rates and application times shall be developed so as to minimize "wet grass" conditions in unrestricted landscaped areas during the periods the area could be in use.

(5) Irrigation systems shall be designed so that the irrigation spray does not reach any privately-owned premises outside the designated irrigation area or reach public drinking fountains.

(6) There shall be no application of effluent when the ground is water saturated or frozen.

(7) Distribution systems must be designed to prevent operation by unauthorized personnel.

(8) Irrigation operations shall be managed in a manner to minimize the inadvertent contact of reclaimed water with humans.

(9) Operational or tailwater controls shall be provided to preclude discharge of reclaimed water from irrigation sites.

Adopted January 8, 1997

Effective February 12, 1997

§210.25. Special Design Criteria for Reclaimed Water Systems.

(a) All hose bibs and faucets shall be painted purple and designed to prevent connection to a standard water hose. Hose bibs shall be located in locked, below grade vaults which shall be clearly labeled as being of non-potable quality. As an alternative to the use of locked, below grade vaults with standard hose bib services, hose bibs may be placed in a non-lockable service box which can only be operated by a special tool so long as the hose bib is clearly labeled as non-potable water, in accordance with subsection (b) of this section.

(b) One of the following requirements must be met by the user or provider, for any area where reclaimed water is stored or where there exist hose bibs or faucets:

(1) Signs having a minimum size of eight inches by eight inches, as shown in Figure 1, shall be posted at all storage areas and on all hose bibs and faucets reading, in both English and Spanish, "Reclaimed Water, Do Not Drink" or similar warning.

FIGURE 1: 30 TAC §210.25(b)(1)



DO NOT DRINK THE WATER

NO TOMAR EL AGUA

(2) The area shall be secured to prevent access by the public.

(c) Reclaimed water piping shall be separated from potable water piping by a horizontal distance of at least nine feet. Where the nine foot separation distance cannot be achieved, the reclaimed water piping must meet the line separation requirements of Chapter 290 of this title (relating to Water Hygiene).

(d) Where a reclaimed water line parallels a sewer line, the reclaimed water line shall be constructed in accordance with subsection (e) or (f) of this section. The horizontal separation distance shall be three feet (outside to outside) with the reclaimed water line at the level of or above the sewer line. Reclaimed water lines which parallel sewer lines may be placed in the same benched trench. Where a reclaimed water line crosses a sewer line, the requirements of §290.44(e)(5)(B) of this title (relating to Location of Water Lines) shall be followed, with "reclaimed water line" substituted in §290.44(e) of this title (relating to Location of Water Lines) for "water line."

(e) Reclaimed water lines which transport reclaimed water under pressure shall be sized according to acceptable engineering practices for the needs of the reclaimed water users. The designer shall consider methods to prevent or maintain lines to mitigate the effect of the deposition of solids in such lines. Pipe specified for reclaimed water force mains shall be of a type having an expected life at least as long as that of the lift station and shall be suitable for the reclaimed water being pumped and operating pressure to which it will be subjected. All pipe shall be identified in the technical specifications with appropriate American Society for Testing and Materials, American National Standard Institute, or American Water Works Association (AWWA) standard numbers for both quality control (dimensions, tolerance, and installation such as bedding or backfill). All pipes and fittings shall have a minimum working pressure rating of 150 pounds per square inch. Final plans and specifications shall describe required pressure testing for all installed reclaimed water force mains. Minimum test pressure shall be 1.5 times the maximum design pressure. Allowable leakage rates shall be determined as described in §317.2(d)(4) of this title (relating to Pressure Sewer Systems).

(f) Gravity flow reclaimed water lines shall meet the requirements of §317.2(a) of this title (relating to General Requirements) and §317.2(c) of this title (relating to High Velocity Protection). The designer shall consider methods to prevent high velocity scour or maintain line fluid velocity to mitigate the effects of the deposition of solids in the gravity conveyance.

(g) All exposed piping and piping within a building shall be either purple pipe or painted purple. All buried piping installed after the effective date of these rules shall be one of the following: manufactured in purple, painted purple, taped with purple metallic tape, or bagged in purple. All exposed piping should be stenciled in white with a warning reading "NON-POTABLE WATER." All exposed or buried reclaimed water piping constructed at a wastewater treatment facility is exempt from the color coding requirements of this section.

(h) When applicable, in accordance with §317.1(a)(3) - (4) of this title, (relating to General Provisions), the design of distribution systems which will convey reclaimed water to a user shall be submitted to the executive director and must receive an approval. The design of the distribution systems must meet the requirements of Chapter 317 of this title (relating to Design Criteria for Sewerage Systems). Where a municipality is the plan review authority for certain sewer systems which transport primarily domestic waste, in accordance with §317.1(a)(5) of this title, in lieu of the commission, design submittal will not be subject to submittal to the commission and instead must be approved by the municipality. Materials shall be submitted for approval by the executive director in accordance with the Texas Engineering Practice Act (Article 3271a, Vernon's Annotated Texas Statutes).

(i) All ground level and elevated storage tanks shall be designed, installed, and constructed in accordance with current AWWA standards with reference to materials to be used and construction practices to be followed, except for health-based standards strictly related to potable water storage and contact practices, where appropriately less restrictive standards may be applied.

Adopted January 22, 1997

Effective February 12, 1997

**SUBCHAPTER C: QUALITY CRITERIA AND SPECIFIC USES FOR RECLAIMED
WATER**

**§§210.31 - 210.36
Effective November 26, 2009**

§210.31. Applicability.

This subchapter applies to the reclaimed water producer, the reclaimed water provider and the reclaimed water user. This subchapter sets the specific uses, the quality standards, as well as the monitoring, record keeping, and reporting standards for reclaimed water.

Adopted January 8, 1997

Effective February 12, 1997

§210.32. Specific Uses of Reclaimed Water.

Numerical parameter limits pertaining to specific reclaimed water use categories are contained in §210.33 of this title (relating to Quality Standards for Using Reclaimed Water). These limits apply to reclaimed water before discharge to initial holding ponds or a reclaimed water distribution system. It shall be the responsibility of the reclaimed water producer to establish that the reclaimed water meets the quality limits at the sample point for the intended use in accordance with the monitoring requirements identified in §210.34 of this title (relating to Sampling and Analysis).

(1) Type I Reclaimed Water Use. This type of use includes irrigation or other uses in areas where the public may be present during the time when irrigation takes place or other uses where the public may come in contact with the reclaimed water. The following types of uses would be considered Type I uses:

(A) Residential irrigation, including landscape irrigation at individual homes.

(B) Urban uses, including irrigation of public parks, golf courses with unrestricted public access, school yards, or athletic fields.

(C) Use of reclaimed water for fire protection, either in internal sprinkler systems or external fire hydrants.

(D) Irrigation of food crops where the applied reclaimed water may have direct contact with the edible part of the crop, unless the food crop undergoes a pasteurization process.

(E) Irrigation of pastures for milking animals.

(F) Maintenance of impoundments or natural water bodies where recreational activities, such as wading or fishing, are anticipated even though the water body was not specifically designed for such a use.

(G) Toilet or urinal flush water.

(H) Other similar activities where the potential for unintentional human exposure may occur.

(2) Type II Reclaimed Water Use. This type of use includes irrigation or other uses in areas where the public is not present during the time when irrigation activities occur or other uses where the public would not come in contact with the reclaimed water. The following are examples of uses that would be considered Type II uses.

(A) Irrigation of sod farms, silviculture, limited access highway rights of way, and other areas where human access is restricted or unlikely to occur. The restriction of access to areas under irrigation with reclaimed water could include the following:

(i) The irrigation site is considered to be remote.

(ii) The irrigation site is bordered by walls or fences and access to the site is controlled by the owner/operator of the irrigation site.

(iii) The irrigation site is not used by the public during the times when irrigation operations are in progress. Such sites may include golf courses, cemeteries, and landscaped areas surrounding commercial or industrial complexes. The "syringing" or "wetting" of greens and tees on golf courses shall be allowable under Type II so long as the "syringing" is done with hand-held hoses as opposed to automatic irrigation equipment. The public need not be excluded from areas where irrigation is not taking place. For example, irrigation of golf course fairways at night would not prohibit the use of club house or other facilities located a sufficient distance from the irrigation.

(iv) The irrigation site is restricted from public access by local ordinance or law with specific standards to achieve such a purpose.

(B) Irrigation of food crops where the reclaimed water is not likely to have direct contact with the edible part of the crop, or where the food crop undergoes pasteurization prior to distribution for consumption.

(C) Irrigation of animal feed crops other than pasture for milking animals.

(D) Maintenance of impoundments or natural water bodies where direct human contact is not likely.

(E) Soil compaction or dust control in construction areas where application procedures minimize aerosol drift to public areas.

(F) Cooling tower makeup water. Use for cooling towers which produce significant aerosols adjacent to public access areas may have special requirements.

(G) Irrigation or other non-potable uses of reclaimed water at a wastewater treatment facility.

(3) Any Type I reclaimed water may also be utilized for any of the Type II uses identified in paragraph (2) of this section.

Adopted January 8, 1997

Effective February 12, 1997

§210.33. Quality Standards for Using Reclaimed Water.

The following conditions apply to the types of uses of reclaimed water. At a minimum, the reclaimed water producer shall only transfer reclaimed water of the following quality as described for each type of specific use:

(1) for Type I reclaimed water uses, reclaimed water on a 30-day average shall have a quality of:

Figure: 30 TAC §210.33(1)

BOD ₅ or CBOD ₅	5 mg/l
Turbidity	3 NTU
Fecal coliform or <i>E. coli</i>	20 CFU/100 ml*
Fecal coliform or <i>E. coli</i>	75 CFU/100 ml**
<i>Enterococci</i>	4 CFU/100 ml*
<i>Enterococci</i>	9 CFR/100 ml**

* 30-day geometric mean

** maximum single grab sample

(2) for Type II reclaimed water use, reclaimed water on a 30-day average shall have a quality of:

(A) for a system other than pond system:

Figure: 30 TAC §210.33(2)(A)

BOD ₅	20 mg/l
or CBOD ₅	15 mg/l
Fecal coliform or <i>E. coli</i>	200 CFU/100 ml*
Fecal coliform or <i>E. coli</i>	800 CFU/100 ml**
<i>Enterococci</i>	35 CFU/100 ml*
<i>Enterococci</i>	89 CFU/100 ml**

* 30-day geometric mean

** maximum single grab sample

(B) for a pond system:

Figure: 30 TAC §210.33(2)(B)

BOD ₅	30 mg/l
Fecal coliform or <i>E. coli</i>	200 CFU/100 ml*
Fecal coliform or <i>E. coli</i> (not to exceed)	800 CFU/100 ml**
<i>Enterococci</i>	35 CFU/100 ml*
<i>Enterococci</i>	89 CFU/100 ml**

* 30-day geometric mean

** maximum single grab sample

§210.34. Sampling and Analysis.

The reclaimed water producer shall sample the reclaimed water prior to distribution to a user to assure that the water quality is in accord with the intended contracted use. Analytical methods shall be in accord with those specified in Chapter 319 of this title (relating to Monitoring and Reporting). The minimum sampling and analysis frequency for reclaimed water for the applicable parameters identified in §210.33 of this title (relating to Quality Standards for the Use of Reclaimed Water) is as follows:

(1) Type I Reclaimed Water Uses twice per week.

(2) Type II Reclaimed Water Uses once per week.

Adopted January 8, 1997

Effective February 12, 1997

§210.35. Guidelines for Certain Distribution Systems.

The commission recommends that a provider or user maintain a plan to carry out periodic fecal coliform sampling within certain reclaimed water distribution piping systems. Such a plan does not need the approval or review of the commission. This periodic sampling should occur in instances where residential irrigation, including landscape irrigation at individual homes occurs, or where specific urban uses such as irrigation of public parks, school yards, or athletic fields occurs. The plan should specify activities by the provider or user to respond to human health threats if undesirable fecal coliform test results or trends are detected.

Adopted January 8, 1997

Effective February 12, 1997

§210.36. Record Keeping and Reporting.

The reclaimed water provider and user shall maintain records on site for a period of five years.

(1) Records to be maintained by the provider include:

(A) copies of notifications made to the commission concerning reclaimed water projects.

(B) as applicable, copies of contracts made with each reclaimed water user (this requirement does not include reclaimed water users at residences that have separate distribution lines for potable water).

(C) records of volume of water delivered to each reclaimed water user per delivery (this requirement does not apply to reclaimed water users at residences that have separate distribution lines for potable water).

(D) reclaimed water quality analyses.

(2) The reclaimed water provider or producer shall report to the commission on a monthly basis the following information on forms furnished by the executive director. Such reports are due to the commission by the 20th day of the month following the reporting period.

(A) volume of reclaimed water delivered to a user or provider.

(B) quality of reclaimed water delivered to a user or provider reported as a monthly average for each quality criteria except those listed as "not to exceed" which shall be reported as individual analyses.

Adopted January 22, 1997

Effective February 12, 1997

**SUBCHAPTER D: ALTERNATIVE AND PRE-EXISTING RECLAIMED WATER
SYSTEMS**

**§§210.41 - 210.46
Effective February 12, 1997**

§210.41. Applicability of Alternate Reclaimed Water Proposals.

In the event a reclaimed water provider or user proposes to design, construct, or operate a reclaimed water system or to utilize reclaimed water in a manner other than authorized in these rules, the provisions of this subchapter shall apply.

Adopted January 8, 1997

Effective February 12, 1997

§210.42. Request to Executive Director.

(a) If a reclaimed water provider or user proposes to design, construct, or operate a reclaimed water system or to utilize reclaimed water in a manner other than authorized in these rules, the provider or user shall file a request with the executive director, in addition to the notification filed pursuant to §210.4 of this title (relating to Notification), identifying the alternative proposal and requesting approval by the executive director.

(b) The request shall be in writing and shall include information necessary or useful in assisting the executive director in acting on the request for approval of the alternate reclaimed water proposal.

Adopted January 8, 1997

Effective February 12, 1997

§210.43. Action on Alternative Reclaimed Water Proposals.

The executive director shall review an alternate reclaimed water proposal filed under §210.42 of this title (relating to Request to Executive Director). Within 60 days, the executive director shall identify in writing to the requestor any additional information necessary for the executive director to act on the request, and provide the requestor sufficient time to provide such information. Following the receipt of such information, the executive director shall act on the request, either granting or denying the proposal, in whole or in part. If no additional information is requested, the executive director shall act on the request within 60 days, either granting or denying the proposal, in whole or in part.

Adopted January 8, 1997

Effective February 12, 1997

§210.44. Pre-existing Reclaimed Water Systems.

A reclaimed water system not already authorized by a commission permit or other written approval, existing on the effective date of these rules, where construction began prior to June 25, 1990, is authorized under this chapter if the provider or user of such a system provides a detailed description of the system to the executive director pursuant to the notification procedures of §210.4 of this title (relating to Notification) and the system is approved by the executive director. Such notification must occur within ninety (90) days of the effective date of these rules. The system is authorized unless the executive director requests additional information pursuant to §210.45 of this title (relating to Actions on Pre-existing Reclaimed Water Systems) or denies such authorization pursuant to the provisions of §210.46 of this title (relating to Denial of Request).

Adopted January 8, 1997

Effective February 12, 1997

§210.45. Action on a Pre-existing Reclaimed Water System.

(a) The executive director may request a reclaimed water user to submit additional information concerning a pre-existing reclaimed water system to be authorized under this subchapter. The additional information may be requested in order to evaluate the potential for significant water quality problems or potential for significant risks to the health or safety of the public, including the need of a project to conform to one or more of the requirements of this chapter. Such request shall be provided in writing to the proposed reclaimed water user within 60 days of the receipt of the notification and shall provide the proposed user not less than 30 days to provide such additional information.

(b) Following the receipt of such information, the executive director shall act on the request, either granting or denying the proposal, in whole or in part. If no additional information is requested, the executive director shall act on the request within 60 days, either granting or denying the proposal, in whole or in part.

Adopted January 8, 1997

Effective February 12, 1997

§210.46. Denial of Request.

The executive director shall not grant an alternate reclaimed water proposal or grant authorization to a pre-existing reclaimed water system which could pose a significant threat to water quality or which represents a significant risk to human health or safety.

Adopted January 22, 1997

Effective February 12, 1997

**SUBCHAPTER E: SPECIAL REQUIREMENTS FOR USE
OF INDUSTRIAL RECLAIMED WATER**
§§210.51 - 210.60
Effective December 11, 2002

§210.51. Applicability, Purpose, and Scope.

(a) A person proposing to use industrial wastewater as industrial reclaimed water may obtain authorization under this subchapter if all of the requirements of the subchapter are met. The purpose of this subchapter is to establish the applicable requirements for industrial reclaimed water use which may be used instead of potable water or raw water. As defined and specified in this subchapter, the requirements must be met by the producers, providers, and users of industrial reclaimed water. These requirements are intended to allow the safe utilization of reclaimed water for conservation of surface water and groundwater, to ensure the protection of public health, to protect surface water and groundwater from contamination, and to help ensure an adequate supply of water resources for present and future needs.

(b) This subchapter establishes the following requirements for producers, providers, and users of industrial reclaimed water:

- (1) general requirements applicable to producers, providers, and users;
- (2) requirements and specifications for transfer, storage, irrigation, and other end uses;
- (3) requirements and specifications necessary to minimize the impact of discharge of waste into or adjacent to water in the state;
- (4) specific uses of industrial reclaimed water;
- (5) standards for the quality of industrial reclaimed water;
- (6) standards for monitoring and recordkeeping; and
- (7) payment of fees.

(c) The requirements of this subchapter to obtain an authorization do not apply to the end use of industrial reclaimed water when the end use is authorized by permit, including, but not limited to, a Texas Pollutant Discharge Elimination System permit or a Texas Land Application permit, or by commission rules other than those in this subchapter. The end uses of industrial wastewater that are subject to the requirements of this subchapter include landscape irrigation, dust suppression, soil

compaction, impoundment maintenance, or industrial wastewater that is otherwise land applied for a beneficial purpose. When a use of industrial reclaimed water is regulated under Chapter 335 of this title (relating to Industrial Solid Waste and Municipal Hazardous Waste), that use shall comply with the requirements of Chapter 335 of this title in addition to the requirements of this subchapter.

(d) Internal recycling systems, closed loop systems, and systems that use industrial wastewater as makeup water within a facility are not subject to the requirements of this subchapter.

(e) The use of industrial wastewater as industrial reclaimed water as authorized by this subchapter does not require an amendment of any issued industrial wastewater discharge permit to recognize the activity authorized under this subchapter. Effluent limitations in the industrial wastewater discharge permit remain in effect for and during industrial reclaimed water use activities.

(f) Industrial reclaimed water projects approved under this subchapter do not require a new or amended permit from the commission except as provided by §210.5 of this title (relating to Authorization for the Use of Reclaimed Water). To develop projects not specifically authorized by this subchapter, a person may seek authorization for a new or amended waste discharge permit under Chapter 305 of this title (relating to Consolidated Permits).

(g) Nothing in this subchapter shall alter any requirement to obtain a water right authorization.

Adopted November 20, 2002

Effective December 11, 2002

§210.52. Definitions.

The following words and terms, when used in this subchapter, have the following meanings unless the context clearly indicates otherwise.

(1) Blowdown--The discharge of recirculating water for the purpose of discharging materials contained in the water, the further buildup of which would cause concentration in amounts that could damage or impair machinery, equipment, or systems.

(2) CFR--Code of Federal Regulations.

(3) Commingled wastewater--Industrial wastewater that contains any amount of domestic wastewater.

(4) Containing--When the pollutant(s) of concern are measured at levels that exceed the minimum analytical level.

(5) Discharge--The release or disposal of waste into or adjacent to any water in the state that in itself or in conjunction with any other discharge or activity causes, continues to cause, or will cause pollution of any of the water in the state.

(6) Dioxins and furans--Tetra, penta, hexa, hepta, and octa-chlorinated dibenzo dioxins and furans.

(7) End use--Landscape irrigation, soil compaction, dust suppression, impoundment maintenance, or industrial wastewater that is otherwise land applied in accordance with all applicable regulations.

(8) Industrial reclaimed water--Any industrial wastewater which has been treated, if necessary, to a quality suitable for land application for beneficial use.

(9) Industrial wastewater--A non-domestic or non-municipal wastewater.

(10) Land application--The discharge of waste adjacent to water in the state.

(11) MGD--Million gallons per day.

(12) Minimum analytical level (MAL)--The lowest concentration at which a particular substance can be quantitatively measured in the matrix of concern (i.e., wastewater) with a defined precision level, using approved analytical methods.

(13) Non-contact cooling water--Water used for cooling which does not come into direct contact with any raw material, intermediate product, waste product, by-product, or finished product.

(14) On-site--The use of industrial reclaimed water within the boundaries of the industrial facility or within the boundaries of property that is contiguous to the facility and owned or operated by the producer.

(15) Once-through cooling water--Water passed through main cooling condensers in one or two passes for the purpose of removing waste heat.

(16) Playa lake--A shallow (generally less than one meter deep), isolated, naturally ephemeral approximately circular lake located in an enclosed basin in the High Plains and West Central Plains areas of the state.

(17) POTW--Publicly-owned treatment works.

(18) Priority pollutants--The pollutants as listed in 40 CFR Part 122, Appendix D, Tables 2 and 3, plus 2,3,7,8-Tetrachlorodibenzo-p-dioxin and asbestos.

(19) Process wastewater--Any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.

(20) Producer--A person who produces industrial reclaimed water as identified in this subchapter.

(21) SU--Standard units.

(22) Tail water--The runoff of irrigation water from the lower end of an irrigated field.

Adopted November 20, 2002

Effective December 11, 2002

§210.53. Wastes Eligible for Coverage.

(a) Level I eligibility. A producer is eligible for Level I authorization if the producer uses any of the following wastes on-site and has a primary disposal method as an alternative to reuse and an end use listed in §210.56(b) of this title (relating to Authorization Requirements):

(1) air conditioner condensate; compressor condensate; steam condensate; or condensate that forms externally on steam lines and is not process wastewater;

(2) washwater from washing whole fruits and vegetables;

(3) non-contact cooling water;

(4) once through cooling water;

(5) water treatment filter backwash;

(6) water from routine external washing of buildings, conducted without the use of detergents or other chemicals;

(7) water from routine washing of pavement conducted without the use of detergents or other chemicals and where spills or leaks of toxic or hazardous waste have not occurred (unless spilled material has been removed);

(8) cooling tower blowdown with a total dissolved solids concentration less than 2,000 milligrams per liter; or

(9) wastewater with measured effluent concentrations at or below threshold levels listed in the figure contained in this paragraph that is not a waste source listed in §210.54(a) of this title (relating to Wastes Not Eligible for Coverage). For all other priority pollutants in 40 CFR Part 122 Appendix D, Tables II and III, the threshold level is set at the minimum analytical level.

Figure: 30 TAC §210.53(a)(9)

Threshold Levels for Industrial Reclaimed Water					
Table 1					
Parameter	Threshold (mg/l)	MAL (mg/l)	Parameter	Threshold (mg/l)	MAL (mg/l)
Conventionals & Nonconventionals			Metals		
Total Organic Carbon	55	-	Copper, total	0.030	0.010
Oil and Grease	10	-	Lead, total	0.015	0.005
Total Dissolved Solids	2000	-	Manganese	0.05	--
Nitrate Nitrogen	10	-	Mercury, total	0.0002	0.0002
Metals			Nickel, total	0.030	0.010
Antimony, total	0.09	0.03	Selenium, total	0.030	0.010
Arsenic, total	0.030	0.010	Silver, total	0.006	0.002
Barium, total	0.030	0.010	Thallium, total	0.030	0.010
Beryllium, total	0.015	0.005	Zinc, total	0.015	0.005
Cadmium, total	0.003	0.001	Cyanide,	0.200	---

(b) Level II eligibility. A producer is eligible to apply for Level II authorization for any of the following:

(1) industrial reclaimed water containing pollutant concentration levels which exceed threshold levels listed in the figure contained in subsection (a)(9) of this section, but which is not a listed waste in §210.54(a) of this title;

(2) industrial reclaimed water that contains any amount of domestic wastewater;

(3) the proposed end use of industrial reclaimed water is not on-site;

(4) the proposed end use is not listed in §210.56(b)(2) of this title; or

(5) the disposal method proposed as an alternative to reuse is not listed in §210.56(b)(1) of this title.

§210.54. Wastes Not Eligible for Coverage.

(a) The following wastes are not eligible for authorization under this subchapter regardless of effluent quality or end use:

(1) wastewater containing radioactive material regulated under Texas Health and Safety Code, Chapter 401;

(2) wastewater containing dioxin and furans;

(3) wastewater containing pesticides;

(4) wastewater classified as or which is characteristically hazardous as defined by 40 Code of Federal Regulations (CFR) Part 261;

(5) process wastewater regulated under 40 CFR Parts 400 - 471 with the following exceptions:

(A) Part 405 - dairy products processing;

(B) Part 406 - grain mills;

(C) Part 407 - canned and preserved fruits and vegetables;

(D) Part 408 - canned and preserved seafood processing;

(E) Part 409 - sugar processing;

(F) Part 411 - cement manufacturing;

(G) Part 417 - soap and detergent manufacturing;

(H) Part 423 - steam electric power generating;

(I) Part 434 - coal mining;

(J) Part 436 - mineral mining and processing;

(K) Part 454 - gum and wood chemicals manufacturing; and

(L) Part 460 - hospital;

(6) septic tank waste, chemical toilet waste, grit trap waste, or grease trap waste;

(7) barge cleaning washwater;

(8) air scrubber wastewater;

(9) any wastewater where a permit by rule authorized under Chapter 321 of this title (relating to Control of Certain Activities by Rule) or commission-issued general permit for land application is available; or

(10) remediated/contaminated groundwater generated from facilities where process wastewater is prohibited for use as listed in paragraph (5) of this subsection.

(b) Producers who could otherwise be eligible to obtain authorization under this chapter, but who do not implement all required applicable conditions of this authorization must apply for and obtain permit coverage.

(c) Discharges into or adjacent to water in the state shall not be authorized under this chapter where prohibited by applicable rules including, but not limited to, Chapter 213 of this title (relating to Edwards Aquifer); Chapter 311 of this title (relating to Watershed Protection); and Chapter 335 of this title (relating to Industrial Solid Waste and Municipal Hazardous Waste).

(d) Any user proposing to irrigate or store wastewater within the boundaries of a playa lake may not obtain authorization under this subchapter and must obtain a Texas Pollutant Discharge Elimination System discharge permit for authorization to discharge into a playa lake.

Adopted November 20, 2002

Effective December 11, 2002

§210.55. Application Requirements for Authorization.

(a) Level I authorization. Producers eligible for Level I authorization under this subchapter are authorized to use industrial reclaimed water without any notification or approval by the executive director. Effluent sampling is not required for wastes listed in §210.53(a)(1) - (8) of this title (relating to Wastes Eligible for Coverage) with the exception of cooling tower blowdown which must meet the 2,000 milligrams per liter threshold level for total dissolved solids.

(b) Level II authorization. Producers requesting Level II authorization for industrial reclaimed water activities under this subchapter must submit a complete application to the executive director on a form approved by the executive director to request authorization. The use of industrial reclaimed water shall not begin until written authorization is received from the executive director. The application shall include, at a minimum, the following information:

- (1) the legal names and addresses of the user, provider, and producer;
- (2) contact representative for the applicant and telephone number;
- (3) specific description of the producer's and user's facility location including physical address;
- (4) specific description of the proposed industrial reclaimed water use site (if different than the producer's site);
- (5) the proposed end use for the industrial reclaimed water;
- (6) description of the waste source of the industrial reclaimed water;
- (7) the primary disposal method which would be used as an alternative to re-use;
- (8) the volume of industrial reclaimed water proposed for end use and the frequency of application;
- (9) effluent testing results;
- (10) the location of the producer's and user's site in relation to the Edwards Aquifer, if applicable, and;
- (11) liner certification, if applicable.

(c) If the end use is not on-site, the producer shall also provide all information described in §210.4 of this title (relating to Notification).

Adopted November 20, 2002

Effective December 11, 2002

§210.56. Authorization Requirements.

- (a) Requirements in other subchapters.

(1) Paragraphs (2) - (6) of this subsection do not apply to commingled water. The commingled wastewater is subject to all requirements of §§210.1 - 210.9 of this title (relating to Applicability; Purpose and Scope; Definitions; Notification; Authorization for the Use of Reclaimed Water; Responsibilities; Transfer and Conveyance of Reclaimed Water; Restrictions; and Enforcement), §§210.21 - 210.25 of this title (relating to Applicability; General Requirements; Storage Requirements for Reclaimed Water; Irrigation Using Reclaimed Water; and Special Design Criteria for Reclaimed Water Systems), and §§210.31 - 210.36 of this title

(relating to Applicability; Specific Uses of Reclaimed Water; Quality Standards for Using Reclaimed Water; Sampling and Analysis; Guidelines for Certain Distribution Systems; and Record Keeping and Reporting).

(2) Except as specified in this subchapter, the requirements for a reclaimed water producer, provider, and user described in Subchapters A - D of this chapter (relating to General Provisions; General Requirements for the Production, Conveyance, and Use of Reclaimed Water; Quality Criteria and Specific Uses For Reclaimed Water; and Alternative and Pre-Existing Reclaimed Water Systems) apply to a producer, provider, and user of industrial reclaimed water.

(3) A producer, provider, or user of industrial reclaimed water is not required to treat industrial water or hold a permit for treatment and disposal as described in §210.1 and §210.5(a) of this title.

(4) A producer who uses industrial reclaimed water on-site only is not required to comply with §210.4 of this title. The producer must comply with all applicable requirements of this subchapter pertaining to the industrial reclaimed water use.

(5) The requirements of §210.25(e), (f), and (h) of this title do not apply to the producer, provider, or user of industrial reclaimed water used on-site only.

(6) The requirements of §§210.22(a) and (e) and 210.31 - 210.36 of this title, do not apply to the producer, provider, or user of industrial reclaimed water.

(b) General requirements. Producers required to obtain Level I authorization to use industrial reclaimed water under this subchapter must comply with the following:

(1) have an authorized means of disposal as an alternative to reuse, which includes one or more of the following:

(A) have authority to discharge under a permit;

(B) have authority to route to a publicly-owned treatment works (POTW); or

(C) have the ability to recycle the industrial reclaimed water in a manner that does not discharge into or adjacent to water in the state;

(2) have an end use which includes one or more of the following and is on-site:

- (A) irrigation, including landscape irrigation;
- (B) fire protection;
- (C) dust suppression and soil compaction;
- (D) maintenance of impoundments;
- (E) irrigation of non-food crops, including, but not limited to, sod farms and silviculture; and
- (F) irrigation of pastures for milking animals.

(3) If the producer's facility is within the service area of a POTW, the producer must provide notice to the POTW of the producer's intent to use industrial wastewater under this subchapter.

(4) The distribution, use, and storage of industrial reclaimed water may not cause or result in nuisance conditions.

(5) The producer, provider, and user also shall comply with all applicable rules under Chapter 335 of this title (relating to Industrial Solid Waste and Municipal Hazardous Waste).

(c) Eligible Level I authorizations not able to meet §210.56(b). If the producer is eligible for Level I authorization but cannot meet the requirements of subsection (b) of this section, the producer shall submit an application for a Level II authorization to use reclaimed water.

(d) Industrial reclaimed limitations for Level II authorizations.

(1) The producer shall comply with the limitations and monitoring frequencies outlined in subparagraphs (A) - (C) of this paragraph for an authorization request which has been approved by the executive director:

(A) total organic carbon is limited to 55 milligrams per liter and shall be monitored once per month by grab sample;

(B) pH is limited to a minimum of 6.0 standards units (su) and a maximum of 9.0 su and shall be monitored once per week by grab sample; and

(C) the executive director may include additional limitations or increased monitoring frequencies based on information provided by the applicant, or any other available information.

(2) Sampling shall be conducted only if industrial reclaimed water use occurs during the monitoring period. If industrial reclaimed water use occurs less than the specified frequency, samples shall be obtained during use.

(e) General or individual permits. Level II authorization does not change any general or individual permit limits or requirements for an industrial wastewater discharge activity.

(f) Irrigation requirements.

(1) The provider or user shall comply with all requirements regarding irrigation in §210.24 of this title, as well as the requirements of this subchapter.

(2) Irrigation practices shall be designed and managed to prevent contamination of groundwater or surface water and to prevent the occurrence of nuisance conditions. Tail water control facilities shall be provided, where necessary, to prevent the discharge of any industrial reclaimed water from irrigated lands into or adjacent to water in the state.

(3) No industrial reclaimed water may be land applied when the ground is frozen or saturated or during rainfall events.

(4) When applying industrial reclaimed water to land, a buffer area must be maintained around water wells to prevent the possibility of waste transport to groundwater via the well or well casing. Industrial reclaimed water shall not be applied within 250 feet of a private water well (used for domestic or irrigation use) or 500 feet of a public water supply well.

(5) The user shall provide adequate maintenance of the irrigation facilities to ensure that the facilities are in good working condition.

(g) Storage requirements.

(1) All industrial reclaimed water retention, holding, and transfer ponds shall be operated in such a manner as to maintain a minimum freeboard of two feet.

(2) Ponds shall not be used for disposal.

(h) Liner requirements. Under Level I and Level II authorizations, industrial reclaimed water is considered equivalent to Type I reclaimed water. The producer, provider, or user shall comply with liner requirements outlined in §210.23 of this title.

(i) Off-site use.

(1) Any proposed use of industrial reclaimed water which is not considered on-site must comply with the requirements in the following sections in addition to the applicable requirements of this subchapter:

- (A) §210.4 of this title;
- (B) §210.6 of this title;
- (C) §210.7 of this title; and
- (D) §210.25 of this title.

(2) If the producer provides domestic water or wastewater services to the public such as at a university, hospital, hotel, or similar institution then all exposed or buried piping receiving industrial reclaimed water constructed within the boundaries of the industrial facility is exempt from the color coding requirements of §210.25 of this title.

(j) Authorization to use industrial reclaimed water. Authorization to use industrial reclaimed water is separate from the general and individual permit requirements for wastewater discharges under Chapter 205 and Chapter 305 of this title (relating to General Permits for Waste Discharges; and Consolidated Permits).

Adopted November 20, 2002

Effective December 11, 2002

§210.57. Sampling and Record Keeping Requirements.

(a) Level I authorizations. No additional sampling or monitoring is required by the producer, user, or provider other than the requirements already established in this subchapter.

(b) Level II authorizations.

(1) Sampling.

(A) The producer shall sample the reclaimed water after final treatment, if any, but before distribution to a provider or user and analyze such samples to assure that the water quality meets the limitations required by the authorization. The producer shall sample for the parameters listed in §210.56(d) of this title (relating to Authorization Requirements) and any additional parameters required by the executive director in the authorization.

(B) If any of the sample results exceed the limitations in the authorization, the producer may not use the wastewater, may not route the

industrial wastewater to a user or provider, and shall use the means of disposal instead of reuse. The producer has the option to provide additional treatment to meet the limitations and, if the limitations are met, the water may be used as industrial reclaimed water.

(C) Analytical methods for the analyses shall meet the requirements specified in Chapter 319 of this title (related to General Regulations Incorporated into Permits).

(D) Monitoring samples and measurements shall be taken at times and in a manner so as to be representative of the monitored activity.

(2) Recordkeeping requirements.

(A) The producer shall maintain records of notifications made to the executive director under this subchapter concerning industrial reclaimed water use.

(B) The producer shall maintain records of all monitoring activities. These records shall be readily available for inspection by the executive director for a minimum period of five years. Records of monitoring activities shall include:

- (i) date, time, and place of sample or measurement;
- (ii) identity of individual who collected the sample or made the measurement;
- (iii) date of analysis;
- (iv) identity of the individual and laboratory who performed the analysis;
- (v) the technique or method of analysis; and
- (vi) the results of the analysis or measurement.

(C) The user shall maintain an operating log which records irrigation activities and shall be readily available for inspection by the executive director for a minimum period of five years. The operating log shall record irrigation activities which include:

- (i) the volume of industrial reclaimed water used for irrigation each day; and

(ii) the actual surface area wetted each day.

Adopted November 20, 2002

Effective December 11, 2002

§210.58. Existing Authorizations.

(a) A person who has obtained executive director written approval to use industrial reclaimed water under this subchapter is authorized to continue as currently authorized.

(b) If a person is no longer authorized under a Level I authorization, the producer shall obtain authorization for the reuse of industrial wastewater within 180 days of the effective date of this subchapter.

Adopted November 20, 2002

Effective December 11, 2002

§210.59. Executive Director Denial or Suspension Authorization.

(a) The executive director may deny or suspend an authorization request to use industrial reclaimed water under this subchapter based on potential or actual adverse impact to the environment or on close proximity to a public park, school, recreational area, spring, aquifer, water supply well, surface water supply intake, water treatment plant intake, potable water storage facility, sewage treatment plant, or other location of concern. A determination of potential adverse impact may arise from consideration of such factors as, but not limited to, proposed flow rate, production rate, industrial reclaimed water quality, nature of the groundwater, soils, or geology of the disposal area. In making a determination of potential adverse impacts, the executive director may also consider such other factors, as he deems appropriate.

(b) The following requirements apply to suspensions of authorizations.

(1) The suspension issued under this subchapter will include a statement that requires the executive director to provide written notice to a person stating that the executive director intends to suspend a person's authority to use reclaimed water under the authorization, including:

(A) a brief statement of the basis for this decision under this subsection;

(B) a statement by the executive director of whether the person shall immediately cease the use of industrial reclaimed water; and

(C) a deadline for obtaining authorization under Texas Water Code (TWC), Chapter 26.

(2) The executive director may require the person whose authorization to use reclaimed water is suspended to apply for and obtain an individual permit.

(3) The executive director may suspend authorization to use industrial reclaimed water under an existing authorization issued under this subchapter for the following reasons:

(A) the quantity of industrial reclaimed water used, the type of waste or reclaimed water, or the type of operation does not comply with this chapter;

(B) the use, irrigation, or discharge causes a violation of the Texas Surface Water Quality Standards; or

(C) the wastewater used as industrial reclaimed water contains pollutants that cause or contribute to significant adverse effects on water quality. In making this determination, the executive director shall consider the following factors:

(i) the location of the end use for industrial reclaimed water;

(ii) the volume of wastewater used as industrial reclaimed water;

(iii) the quantity and nature of pollutants contained in the wastewater used as industrial reclaimed water;

(iv) whether the use of industrial reclaimed water would adversely affect groundwater quality, inconsistent with the policy specified in TWC, §26.401; and

(v) other factors relating to the protection of water quality.

(c) The compliance history of the producer, provider, and user will be evaluated prior to approval of any Level II authorization under this subchapter. Authorization may be suspended or denied or additional requirements may be established based on the evaluation of compliance history as outlined in Chapter 60 of this title (relating to Compliance History).

§210.60. Fees.

Each application submitted to the executive director for Level II authorization under this subchapter shall include a fee of \$100.

Adopted November 20, 2002

Effective December 11, 2002

SUBCHAPTER F: USE OF GRAYWATER AND ALTERNATIVE ONSITE WATER
§§210.81 - 210.85
Effective December 29, 2016

§210.81. Applicability.

(a) This subchapter applies to graywater and alternative onsite water generated and used at a private residence, commercial facility, industrial facility, institution, or agriculture facility regardless of the disposal method for other wastewater.

(b) This subchapter does not apply to reclaimed water which is regulated by Subchapters A - E of this chapter (relating to General Provisions; General Requirements for the Production, Conveyance, and Use of Reclaimed Water; Quality Criteria and Specific Uses for Reclaimed Water; Alternative and Pre-Existing Reclaimed Water Systems; and Special Requirements for Use of Industrial Reclaimed Water).

(c) This subchapter does not regulate the design, construction, or operation of on-site sewage facilities (OSSFs) but instead regulates the design, construction, and operation of alternative water reuse systems, combined reuse systems, and graywater reuse systems that may be located at a site that uses an OSSF. The design, construction, and operation of OSSFs are regulated by Chapter 285 of this title (relating to On-Site Sewage Facilities).

(d) An existing graywater system shall comply with the requirements of this subchapter as they existed on the date installation was completed. The previous version of this subchapter is continued in effect for this purpose.

(e) This subchapter does not authorize the diversion or impoundment of state water, as defined in Chapter 297 of this title (relating to Water Rights, Substantive).

Adopted December 7, 2016

Effective December 29, 2016

§210.82. Definitions and General Requirements.

(a) Definitions. For the purposes of this subchapter, the following terms have the following meanings.

(1) Alternative onsite water--rainwater, air-conditioner condensate, foundation drain water, stormwater, swimming pool backwash and drain water, or reverse osmosis reject water. Cooling tower blowdown is regulated by Subchapter E

of this chapter (relating to Special Requirements for Use of Industrial Reclaimed Water); therefore, for the purposes of this subchapter, all references to alternative onsite water do not include cooling tower blowdown. Reverse osmosis reject water generated at industrial facilities, commercial facilities, and institutions is regulated by Subchapter E of this chapter; therefore, for the purposes of this subchapter, all references to alternative onsite water do not include reverse osmosis reject water generated at industrial facilities, commercial facilities, and institutions. Reverse osmosis reject water generated at private residences and agriculture facilities may be used in accordance with this subchapter.

(2) Alternative water reuse system--a system designed and constructed to store and distribute one or more sources of alternative onsite water. An alternative water reuse system shall not contain, store, or distribute any graywater.

(3) Combined reuse system--a system designed and constructed to store and distribute graywater and one or more sources of alternative onsite water.

(4) Graywater-- wastewater from showers, bathtubs, handwashing lavatories, sinks that are used for disposal of household or domestic products, sinks that are not used for food preparation or disposal, and clothes-washing machines. Graywater does not include wastewater from the washing of material, including diapers, soiled with human excreta or wastewater that has come into contact with toilet waste.

(5) Graywater reuse system--a system designed and constructed to store and distribute graywater only. A graywater reuse system shall not contain, store, or distribute any source of alternative onsite water.

(b) Alternative water reuse systems. The following requirements apply to alternative water reuse systems used at a private residence, industrial facility, commercial facility, institution, or agriculture facility.

(1) Water from an alternative water reuse system may be reused for beneficial purposes including but not limited to landscape irrigation, gardening, composting, foundation stabilization, and toilet and urinal flushing. An alternative water reuse system may store and use either a single source or a combination of sources of alternative onsite water, and in any volume.

(2) Reverse osmosis reject water generated at an industrial facility, commercial facility, or an institution is prohibited from being stored and used in an alternative water reuse system. Reverse osmosis reject water generated by an industrial facility, commercial facility, or an institution is regulated by Subchapter E of this chapter.

(3) Reuse of water from an alternative water reuse system does not require authorization from the commission if used in accordance with this subchapter. The property owner is responsible for ensuring that the alternative water reuse system is properly operated and maintained to comply with the requirements of this subchapter.

(4) Water from an alternative water reuse system must be applied at a rate that will not result in ponding or pooling, or cause runoff across the property lines or onto any paved surface.

(5) Water from an alternative water reuse system shall not be applied using a spray distribution system except in accordance with the following conditions.

(A) Water from the spray distribution system must be applied at times when people and pets are not actively using the distribution area.

(B) Water from the spray distribution system must not be applied during rainfall events, when the ground is frozen, or within 24 hours after one-half inch or more of rain.

(C) Water from the spray distribution system must be applied at a rate to prevent ponding, puddling, or runoff.

(D) Water from the spray distribution system must not be sprayed or allowed to drift off the property.

(E) The spray distribution system must not be connected to a potable or raw water irrigation system unless suitable backflow prevention is provided to protect the potable or raw water system.

(F) The spray distribution system must be inspected and repaired as needed to prevent discharges to water in the state or off the property.

(6) The storage and use of water from an alternative water reuse system must not create a nuisance, threaten human health, or damage the quality of surface water or groundwater.

(7) Swimming pool backwash and drain water cannot be used within five days of adding chemicals for shock or acid treatment.

(8) Water from an alternative water reuse system that is used for toilet or urinal flushing must meet the following requirements. Property owners may

refer to the regulatory guidance document that is required by the Texas Health and Safety Code, §341.039, for assistance in complying with these requirements.

(A) For residential toilet or urinal flushing, *Escherichia coli* (*E. coli*) must be less than 14 most probable number (MPN) or colony-forming units (CFU) per 100 milliliters for 30-day geometric mean and less than 240 MPN or CFU per 100 milliliters maximum single grab sample. For industrial, commercial, or agricultural toilet or urinal flushing, *E. coli* must be less than 2.2 MPN or CFU per 100 milliliters for 30-day geometric mean and less than 200 MPN or CFU per 100 milliliters maximum single grab sample.

(B) Total suspended solids must be less than 10.0 milligrams per liter for 30-day geometric mean and less than 30.0 milligrams per liter maximum single grab sample.

(C) All exposed piping and piping carrying alternative onsite water within a building must be either purple pipe or painted purple; all buried piping must be either manufactured in purple, painted purple, taped with purple metallic tape, or bagged in purple; and all exposed piping must be stenciled in yellow with a warning reading "NON-POTABLE WATER." An alternative water reuse system that stores only rainwater, commonly referred to as a rainwater harvesting system, and uses the water for potable purposes in accordance with §290.44 of this title (relating to Water Distribution) is exempt from this subparagraph.

(9) An alternative water reuse system cannot have a physical connection to an organized wastewater collection system or an on-site sewage facility (OSSF). When the system reaches capacity, it is allowed to overflow onto the ground only if the overflow is caused by inflow of rainwater or stormwater. Overflow under these conditions is exempt from the requirement of paragraph (4) of this subsection.

(10) An alternative water reuse system may be subject to backflow prevention requirements in §290.44 of this title to protect public water supply systems from cross-contamination.

(c) Graywater reuse systems and combined reuse systems. The following requirements apply to all graywater reuse systems and combined reuse systems.

(1) Construction of a graywater reuse system or a combined reuse system, including storage and distribution systems, must comply with this subchapter and any requirements of the local permitting authority.

(2) Water from a graywater reuse system or a combined reuse system must be applied at a rate that will not result in ponding or pooling and will not cause runoff across the property lines or onto any paved surface.

(3) The storage and use of water from a graywater reuse system or a combined reuse system must not create a nuisance, threaten human health, or damage the quality of surface water or groundwater.

(4) A graywater reuse system or combined reuse system may be subject to backflow prevention requirements in §290.44 of this title to protect public water supply systems from cross-contamination.

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Effective December 29, 2016

§210.83. Residential Use of Graywater and Alternative Onsite Water.

(a) An authorization from the commission is not required for the residential use of graywater and alternative onsite water from a graywater reuse system or a combined reuse system when the total combined average is less than 400 gallons per day and the water is used in accordance with this subchapter. Unless directed by the executive director, an authorization from the commission is not required for the residential use of graywater and alternative onsite water from a graywater reuse system or a combined reuse system when the total combined average is greater than or equal to 400 gallons per day and the water is used in accordance with this subchapter.

(b) The graywater and alternative onsite water must originate from a private residence.

(c) Water from a graywater reuse system or a combined reuse system may only be used at the private residence for the following purposes:

- (1) to minimize foundation movement and cracking;
- (2) for gardening;
- (3) for composting;
- (4) for landscaping; or
- (5) for toilet or urinal flushing.

(d) Graywater reuse systems and combined reuse systems are not authorized to overflow onto the ground under any circumstance.

(1) Graywater reuse systems must be designed and constructed so that the storage tank required by subsection (e) of this section overflows to an organized wastewater collection system or an on-site sewage facility (OSSF) unless prohibited by Chapter 285, Subchapter H of this title (relating to Disposal of Graywater). The graywater must enter the organized wastewater collection system or OSSF through either one air gap or two backflow valves or backflow preventers.

(2) Combined reuse systems must be designed and constructed so that 100% of the graywater can be diverted to an organized wastewater collection system or an OSSF, unless prohibited by Chapter 285, Subchapter H of this title, prior to entering the storage tank required by subsection (e) of this section. Graywater must be diverted to the organized wastewater collection system or OSSF during periods of non-use of the system or if the storage tank required by subsection (e) of this section reaches 80% capacity. The graywater must enter the organized wastewater collection system or the OSSF through either one air gap or two backflow valves or backflow preventers.

(3) Combined reuse systems that store stormwater, rainwater, and/or foundation drain water must have an automatic shutoff system to stop the inflow of stormwater, rainwater, and foundation drain water into the combined reuse system. The automatic shutoff system must activate when the storage tank required by subsection (e) of this section reaches 80% capacity.

(e) Except as authorized by subsection (j) of this section, graywater reuse systems and combined reuse systems must store the water in tanks and the tanks must:

- (1) be clearly labeled as non-potable water;
- (2) restrict access, especially to children;
- (3) eliminate habitat for mosquitoes and other vectors;
- (4) be able to be cleaned; and

(5) meet the structural requirements of §210.25(i) of this title (relating to Special Design Criteria for Reclaimed Water Systems).

(f) Graywater reuse systems and combined reuse systems must use piping that meets the piping requirement of §210.25 of this title.

(g) Water from a graywater reuse system or a combined reuse system shall not be applied using a spray distribution system except in accordance with the following conditions.

(1) Water from the spray distribution system must meet the following limits: *Escherichia coli* (*E. coli*) must be less than 14 most probable number (MPN) or colony-forming units (CFU) per 100 milliliters for 30-day geometric mean and less than 240 MPN or CFU per 100 milliliters maximum single grab sample.

(2) Water from the spray distribution system must be applied at times when people and pets are not actively using the distribution area.

(3) Water from the spray distribution system must not be applied during rainfall events, when the ground is frozen, or within 24 hours after one-half inch or more of rain.

(4) Water from the spray distribution system must be applied at a rate to prevent ponding, puddling, or runoff.

(5) Water from the spray distribution system must not be sprayed or allowed to drift off property.

(6) The spray distribution system must not be connected to a potable or raw water irrigation system unless suitable backflow prevention is provided to protect the potable or raw water system.

(7) The spray distribution system must be inspected and repaired as needed to prevent discharges to water in the state or off property.

(h) The property owner is responsible for ensuring that the graywater reuse system or combined reuse system is properly operated and maintained to achieve the following requirements. Monitoring and recordkeeping for *E. coli* and total suspended solids is not required. Property owners may refer to the regulatory guidance document that is required by the Texas Health and Safety Code, §341.039, for assistance in complying with these requirements.

(1) Graywater and alternative onsite water shall be treated to remove debris such as lint, leaves, twigs, and branches prior to entering the storage tank by use of a 50 mesh screen.

(2) Swimming pool backwash and drain water cannot be used within five days after adding chemicals for shock or acid treatment.

(3) Water from a graywater reuse system or a combined reuse system that is used for toilet or urinal flushing must meet the following requirements.

(A) *E. coli* must be less than 14 MPN or CFU per 100 milliliters for 30-day geometric mean and less than 240 MPN or CFU per 100 milliliters maximum single grab sample.

(B) Total suspended solids must be less than 10.0 milligrams per liter for 30-day geometric mean and less than 30.0 milligrams per liter maximum single grab sample.

(C) All exposed piping and piping carrying graywater and/or alternative onsite water within a building must be either purple pipe or painted purple; all buried piping must be either manufactured in purple, painted purple, taped with purple metallic tape, or bagged in purple; and all exposed piping must be stenciled in yellow with a warning reading "NON-POTABLE WATER."

(i) Builders of private residences are encouraged to:

(1) install plumbing in new housing to collect graywater and alternative onsite water from all allowable sources, taking into consideration end-use requirements and maintaining sufficient blackwater waste flow; and

(2) design and install a subsurface distribution system around the foundation of new housing to minimize foundation movement or cracking.

(j) Property owners who have been disposing of wastewater from residential clothes-washing machines, otherwise known as laundry graywater, directly onto the ground prior to January 6, 2005, may continue disposing of laundry graywater under the following conditions.

(1) The disposal area must not create a nuisance or threaten human health.

(2) Surface ponding must not occur in the disposal area.

(3) The disposal area must support plant growth or be sodded with vegetative cover.

(4) The disposal area must have limited access and use by residents and pets.

(5) Laundry graywater that has been in contact with human or animal waste must not be disposed onto the ground surface.

(6) Laundry graywater must not be disposed onto an area where the soil is wet.

(7) A lint trap must be affixed to the end of the discharge line.

(8) The system has not been altered after January 6, 2005, has not created a nuisance, and does not discharge graywater from any source other than clothes-washing machines.

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§210.84. Industrial, Commercial, or Institutional Use of Graywater and Alternative Onsite Water.

(a) For the purposes of this section, alternative onsite water does not include reverse osmosis reject water, as this source of water is regulated by Subchapter E of this chapter (relating to Special Requirements for Use of Industrial Reclaimed Water).

(b) An authorization from the commission is not required for the use of graywater and alternative onsite water from a graywater reuse system or a combined reuse system at an industrial facility, commercial facility, or institution. Treatment required by this section does not require authorization from the commission.

(c) The graywater and alternative onsite water must be generated and used onsite.

(d) Graywater reuse systems and combined reuse systems are not authorized to overflow onto the ground under any circumstances.

(1) Graywater reuse systems must be designed and constructed so that 100% of the graywater can be diverted to an organized wastewater collection system, on-site sewage facility (OSSF), authorized outfall in a wastewater discharge permit, or authorized disposal area in a Texas Land Application Permit (TLAP). The graywater must be diverted to the organized wastewater collection system, OSSF, authorized outfall in a wastewater discharge permit, or authorized disposal area in a TLAP during periods of non-use of the graywater reuse system or if the system reaches maximum capacity. The graywater must enter the organized wastewater system or OSSF through either one air gap or two backflow valves or backflow preventers.

(2) Combined reuse systems must be designed and constructed so that 100% of the graywater can be diverted to an organized wastewater collection system, OSSF, authorized outfall in a wastewater discharge permit, or authorized disposal area in a TLAP prior to entering the combined reuse system. Graywater must be diverted to the organized wastewater collection system, OSSF, authorized outfall in a wastewater discharge permit, or authorized disposal area in a TLAP during periods of non-use of the system or if the combined reuse system reaches 80% capacity. The graywater must enter the organized wastewater collection system or the OSSF through either one air gap or two backflow valves or backflow preventers.

(3) Combined reuse systems that store stormwater, rainwater, and/or foundation drain water must have an automatic shutoff system to stop the inflow of stormwater, rainwater, and foundation drain water into the combined reuse system. The automatic shutoff system must activate when the combined reuse system reaches 80% capacity.

(e) Water from a graywater reuse system or a combined reuse system may be used onsite for the following activities.

(1) Process water. Water from a graywater reuse system or a combined reuse system that is used for process water must be treated to a standard that allows the water to be used in operational processes.

(2) Landscape maintenance. Water from a graywater reuse system or a combined reuse system that is used for landscape maintenance must meet the following limits.

(A) If the water will be applied in areas with public access, the water must meet the following limits:

(i) *Escherichia coli* (*E. coli*), 20 most probable number (MPN) or colony-forming units (CFU) per 100 milliliters (ml), 30-day geometric mean; or

(ii) *E. coli* (not to exceed), 75 MPN or CFU per 100 ml, single grab sample.

(B) If the water will be applied in areas with restricted access to the public, the water must meet the following limits:

(i) *E. coli*, 200 MPN or CFU per 100 ml, 30-day geometric mean; or

(ii) *E. coli* (not to exceed), 800 MPN or CFU per 100 ml, single grab sample.

(3) Dust control. Water from a graywater reuse system or a combined reuse system that is used for dust control must meet the *E. coli* limits in paragraph (2)(B) of this subsection.

(4) Toilet or urinal flushing. Water from a graywater reuse system or a combined reuse system that is used for toilet or urinal flushing must meet the following requirements.

(A) *E. coli* must be less than 2.2 MPN or CFU per 100 ml for 30-day geometric mean and less than 200 MPN or CFU per 100 ml maximum single grab sample.

(B) Total suspended solids must be less than 10.0 milligrams per liter for 30-day geometric mean and less than 30.0 milligrams per liter maximum single grab sample.

(C) All exposed piping and piping carrying graywater and/or alternative onsite water within a building must be either purple pipe or painted purple; all buried piping installed after January 6, 2005, must be either manufactured in purple, painted purple, taped with purple metallic tape, or bagged in purple; and all exposed piping must be stenciled in yellow with a warning reading "NON-POTABLE WATER."

(5) Other uses. Water from a graywater reuse system or a combined reuse system that is used for other similar activities must:

(A) meet the *E. coli* limits in paragraph (2)(A) of this subsection if used in a way that the public may come into contact with the water; or

(B) meet the *E. coli* limits in paragraph (2)(B) of this subsection if used in a way that the public will not come into contact with the water.

(f) Water from a graywater reuse system or a combined reuse system that is required to meet the *E. coli* limits in subsection (e) of this section must be monitored for *E. coli* at least monthly. These records must be maintained at the site and be readily available for inspection by the commission for a minimum of five years.

§210.85. Agricultural Use of Graywater and Alternative Onsite Water.

(a) An authorization from the commission is not required for the use of graywater and alternative onsite water from a graywater reuse system or a combined reuse system for agricultural purposes. Treatment required by this section does not require authorization from the commission.

(b) The graywater and alternative onsite water must be generated and used onsite.

(c) Graywater reuse systems and combined reuse systems are not authorized to overflow onto the ground under any circumstances.

(1) Graywater reuse systems must be designed and constructed so that 100% of the graywater can be diverted to an organized wastewater collection system or on-site sewage facility (OSSF), unless prohibited by Chapter 285, Subchapter H of this title (relating to Disposal of Graywater). The graywater must be diverted during periods of non-use of the graywater reuse system or if the system reaches maximum capacity. The graywater must enter the organized wastewater collection system or OSSF through either one air gap or two backflow valves or backflow preventers.

(2) Combined reuse systems must be designed and constructed so that 100% of the graywater can be diverted to an organized wastewater collection system or OSSF, unless prohibited by Chapter 285, Subchapter H of this title prior to entering the combined reuse system. Graywater must be diverted to the organized wastewater collection system or OSSF during periods of non-use of the system or if the combined reuse system reaches 80% capacity. The graywater must enter the organized wastewater collection system or the OSSF through either one air gap or two backflow valves or backflow preventers.

(3) Combined reuse systems that store stormwater, rainwater, and/or foundation drain water must have an automatic shutoff system to stop the inflow of stormwater, rainwater, and foundation drain water into the combined reuse system. The automatic shutoff system must activate when the combined reuse system reaches 80% capacity.

(d) Water from a graywater reuse system or a combined reuse system may be used for the following activities.

(1) Process water. Water from a graywater reuse system or a combined reuse system that is used for irrigation and other agricultural purposes may be treated to a standard that allows the water to be used in operational processes.

(2) Landscape maintenance. Water from a graywater reuse system or a combined reuse system that is used for landscape maintenance must meet the following limits.

(A) If the water will be applied in areas with public access, the water must meet the following limits:

(i) *Escherichia coli* (*E. coli*), 20 most probable number (MPN) or colony-forming units (CFU) per 100 milliliters (ml), 30-day geometric mean; or

(ii) *E. coli* (not to exceed), 75 MPN or CFU per 100 ml, single grab sample.

(B) If the water will be applied in areas with restricted access to the public, the water must meet the following limits:

(i) *E. coli*, 200 MPN or CFU per 100 ml, 30-day geometric mean; or

(ii) *E. coli*, 800 MPN or CFU per 100 ml, single grab sample.

(3) Dust control. Water from a graywater reuse system or a combined reuse system that is used for dust control must meet the *E. coli* limits in paragraph (2)(B) of this subsection.

(4) Irrigation of fields. Water from a graywater reuse system or a combined reuse system that is used to irrigate fields where edible crops are grown or fields that are pastures for milking animals, the water must meet the *E. coli* limits in paragraph (2)(A) of this subsection. *E. coli* limits do not apply to graywater and alternative onsite water that is used to irrigate fields other than those where edible crops are grown or fields that are pastures for milking animals.

(5) Toilet or urinal flushing. Water from a graywater reuse system or a combined reuse system that is used for toilet or urinal flushing must meet the following requirements.

(A) *E. coli* must be less than 2.2 MPN or CFU per 100 ml for 30-day geometric mean and less than 200 MPN or CFU per 100 ml maximum single grab sample.

(B) Total suspended solids must be less than 10.0 milligrams per liter for 30-day geometric mean and less than 30.0 milligrams per liter maximum single grab sample.

(C) All exposed piping and piping carrying graywater and/or alternative onsite water within a building must be either purple pipe or painted purple; all buried piping must be either manufactured in purple, painted purple, taped with purple metallic tape, or bagged in purple; and all exposed piping must be stenciled in yellow with a warning reading "NON-POTABLE WATER."

(6) Other uses. Water from a graywater reuse system or a combined reuse system that is used for other similar activities must:

(A) meet the *E. coli* limits in paragraph (2)(A) of this subsection if used in a way that the public may come into contact with the water; or

(B) meet the *E. coli* limits in paragraph (2)(B) of this subsection if used in a way that the public will not come into contact with the water.

(e) Water from a graywater reuse system or a combined reuse system that is required to meet the *E. coli* limits in subsection (d) of this section must be monitored for *E. coli* at least monthly. These records must be maintained at the site and be readily available for inspection by the commission for a minimum period of five years.

Adopted December 7, 2016

Effective December 29, 2016

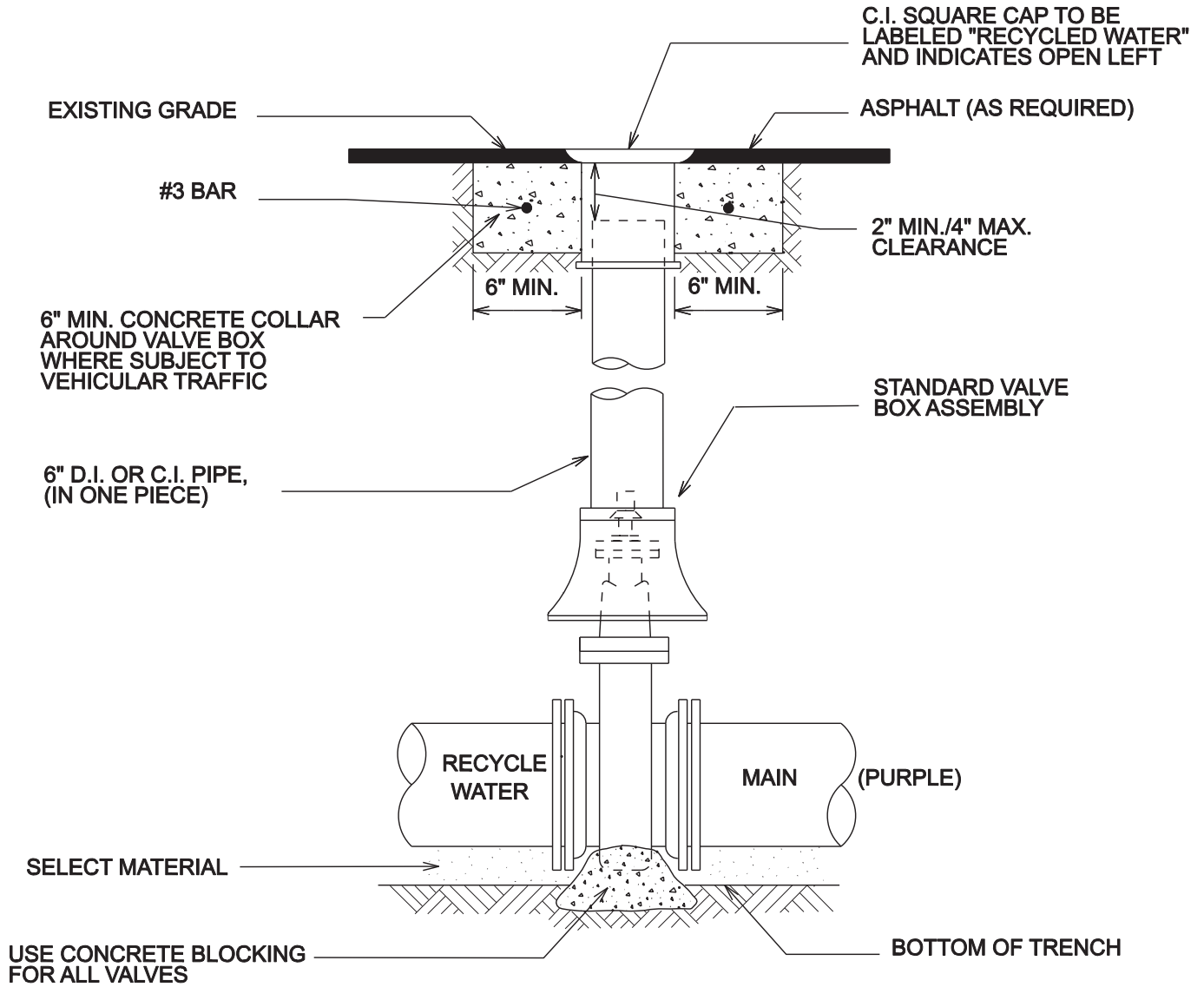
Appendix B: SAWS Standard Specifications and Details

San Antonio Water System Standard Specifications for Construction

**ITEM NO. 110
RECYCLED WATER SYSTEM**

- 110.1 DESCRIPTION:** Any work done on the existing or proposed recycled water distribution system shall be accomplished with the SAWS Standard Specifications for Water, except as otherwise noted. All proposed contract documents must be reviewed and approved by SAWS Backflow Prevention personnel prior to the start of any work.
- 110.2 MATERIAL:** All material used in the improvement, adjustment, removal and/or construction of the recycled water system shall meet SAWS Standard Specifications for Water requirements and standards (i.e., uses of CSC pipe, trenching and excavation, etc.), except as otherwise noted, and must be wrapped or painted with pantone 512 color.
- 110.3 INSTALLATION:** The installation of any recycle water system components shall be done in accordance with the SAWS Standard Specifications for Water, except as otherwise noted. Recycled Water mains shall also be installed at the TCEQ required separation distance between sewer and/or water mains as required by Texas Administrative Code (TAC) rules to include: The latest provision of 30 TAC § chapters 210, 290, and 217, or most applicable approved equal provision.
- 110.4 PAYMENT:** All work shall be paid in accordance with the other applicable specifications.

- End of Specification -



2 **INSTALLATION OF NON-GEARED GATE VALVE**
 WITH VALVE BOX AND EXTENSION NO SCALE

NOTES:

1. ALL VALVES FOR RECYCLED WATER MAINS SHALL OPEN LEFT (COUNTER CLOCKWISE).
2. ALL VALVE COVERS SHALL BE SQUARE AND SHALL INDICATE OPEN LEFT.

PROPERTY OF
SAN ANTONIO WATER SYSTEM
 SAN ANTONIO, TEXAS

RECYCLED WATER
VALVE DETAIL

APPROVED
 APRIL 2014

REVISED

DD-110-10

SHEET
1 OF **1**

San Antonio Water System Standard Specifications for Construction

ITEM NO. 550

TRENCH EXCAVATION SAFETY PROTECTION

550.1 **DESCRIPTION:** This item shall govern the trench excavation safety protection required for the construction of all trench excavation protection systems to be utilized in the project and including all additional excavation and backfill necessitated by the protection system.

A trench shall be defined as a narrow excavation made below the surface of the ground or pavement. In general, the depth is greater than the width, but the width of a trench is not greater than 15 feet. If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet or less (measure at the bottom of the excavation), the excavation is also considered to be a trench. In addition, "Trench Excavation Protection" will not be limited to these applications, but may be used whenever deemed expedient and proper to ensuing work.

550.2 **CONSTRUCTION:** Trench excavation safety protection shall be accomplished as required by the latest provision of Part 1926, Subpart P - Excavations, Trenching, and Shoring of the Occupational Safety and Health Administration (OSHA) Standards and Interpretations, or the most applicable approved equal provision, as may be amended.

550.3 **MEASUREMENT:** Trench Excavation Safety Protection shall be measured by the linear foot along the centerline of any OSHA defined trench that may be entered by personnel and is not greater than 15 feet wide, including manholes and other structures.

550.4 **PAYMENT:** Payment for Trench Safety Excavation Protection, measured as prescribed above, shall be made at the unit price bid per linear foot of Trench Excavation Safety Protection regardless of the depth of the trench.

Payment shall include all components of the Trench Excavation Safety Protection System which can include, but not be limited to, sloping, sheeting, trench boxes or trench shields, sheet piling, cribbing, bracing, shoring, dewatering or temporary diversion and proper recapture and transportation of water to provide adequate drainage. Payment shall also include the additional excavation and backfill required, any jacking, jack removal, and removal of the trench supports after completion.

Payment of all work prescribed under this item shall be full compensation for all additional excavation and backfill associated with the item; for any retention by

San Antonio Water System Standard Specifications for Construction

Contractor of structural design/geotechnical/safety/equipment consultant; for furnishing, placing and removing all shoring, sheeting, or bracing; for dewatering or temporary diversion and proper recapture and transportation of water; for all jacking and jack removal; and for all other labor, material, tools, equipment and incidentals necessary to complete this portion of the work.

- End of Specification -

San Antonio Water System Standard Specifications for Construction

ITEM NO. 804

EXCAVATION, TRENCHING AND BACKFILL

804.1 **DESCRIPTION:** This section shall govern the excavation, trenching, and backfilling for water, sanitary sewer, and recycled water construction, unless otherwise noted in the contract documents. The work shall include all necessary drainage, dewatering, pumping, bailing, sheeting, shoring and incidental construction. All existing utilities shall be protected from damage during the excavation and backfilling of trenches and, if damaged, shall be replaced by the Contractor at his expense. Unless otherwise shown in the contract documents, all excavation shall be unclassified and shall include all materials encountered regardless of their nature or the manner in which they are removed, to include but not limited to rock, stone, sand, organic material, or whatever material is encountered. The Contractor shall at all times conform to the latest applicable provision of subpart “P” entitled “Excavation, Trenching, and Shoring of OSHA Safety and Health Regulations for Construction”, or most applicable approved equal provision. An excavation plan submittal signed and sealed by a Texas licensed professional engineer shall be submitted for review and acceptance by the Owner or Engineer, if applicable, one week prior to start of actual construction activities where the planned excavation is 20 feet or greater.

804.2 **SUBMITTALS:** Submit any applicable manufacturer’s product data, instructions, recommendations, and certifications.

804.3 **EXCAVATION:** The Contractor shall perform all excavation of every description and of whatever substances, including rock, encountered to the lines and grades shown in the contract documents or determined by the Engineer. During excavation, material suitable for backfilling shall be stockpiled in orderly manner a sufficient distance from the banks of the trench to avoid overloading and to prevent slides or cave-ins. All excavated materials not required or suitable for backfill shall be removed and properly disposed of by the Contractor or as directed by the Engineer. Grading shall be done as may be necessary to prevent surface water from flowing into trenches or other excavations, and any water accumulating therein shall be removed by pumping or by other approved methods.

Sheeting and shoring shall be installed in accordance with all applicable safety requirements for the protection of the work, adjoining property, and for the safety of all personnel. Unless otherwise indicated, excavation shall be by open cut, whether by hand, backhoe, ram-hoe, rock saw, or whatever method as necessary. Short sections of a trench may be tunneled, if in the opinion of the Engineer, the pipe or structure can be safely and properly installed or constructed, and backfill

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can be properly compacted in such tunnel sections.

1. Archaeological (Unidentified Archaeological Sites): If the Contractor should encounter a section of an archeological feature, such as a acequia (early Spanish irrigation ditch) or any other archaeological deposits during construction operations, the Contractor must stop excavation immediately and contact the SAWS Inspector, who will call the City Historic Preservation Officer at (210) 299-8303 for an archaeological investigation as per Section 35-432.3 of the City Code, "Unidentified Sites Archaeological." The Contractor cannot begin excavation again without written permission from SAWS. If more than three days are required for investigation (not including holidays and weekends) and the Contractor cannot work on other project scope items, the Contractor will be permitted to negotiate for additional construction time. The Contractor shall submit a request in writing within ten days after date of the first notice. If the time required for investigation does not exceed three days for each event, contract duration will not be extended.
2. Safety Devices: The Contractor shall provide and maintain barricades, flags, torches, and other safety devices as required by local, state, and federal codes and ordinances and conduct work to create a minimum inconvenience to the public. Temporary suspension of work does not relieve responsibility for the above requirements.
3. Safety and Health Regulations: The Contractor shall at all times conform to all of the latest applicable regulations of Subpart "P" entitled "Excavation, Trenching, and Shoring of OSHA Safety and Health Regulations for Construction," or most applicable approved equal provisions, and all other applicable state and local rules and regulations

804.4

TRENCHING:

1. Trench walls shall be vertical. The practice of undercutting at the bottom or flaring at the top will not be permitted except where it is justified for safety or at the Engineer's and/or Inspector's direction. In special cases, where trench flaring is required, the trench walls shall remain vertical to a depth of at least 1 foot above the top of the pipe.

The trench bottom shall be square or slightly curved to the shape of the trenching machine cutters. The trench shall be accurately graded along its entire length to provide uniform bearing and support for each section of pipe installed upon the bedding material. Bell holes and depressions for

San Antonio Water System Standard Specifications for Construction

joints shall be dug after the trench bottom has been graded and bedding installed. The pipe shall rest upon the new bedding material for its full length.

Where over-excavation occurs and when not as directed by the Engineer or Inspector, the under-cut trench shall be restored to grade at no cost to SAWS by replacement with a material conforming to the requirements of the bedding material or a material approved by the Engineer.

The depth of cuts indicated on the cut sheets, as furnished by the Engineer, are from the off-set or cut hub elevation to the invert, or as indicated otherwise therein.

Minimum Width of Trench: The minimum width of pipe trenches, measured at the crown of the pipe, shall be not less than 12 inches greater than the exterior diameter of the pipe, exclusive of bells. The minimum base width of such trench shall be not less than 12 inches greater than the exterior diameter of the pipe, exclusive of special structures or connections. Such minimum width shall be exclusive of trench supports and not greater than the width at the top of the trench.

Maximum Width of Trench: The maximum allowable width of trench for pipelines measured at the top of the pipe shall be the outside diameter of the pipe (exclusive of bells or collars) plus 24 inches. A trench wider than the outside diameter plus 24 inches may be used without special bedding if the Contractor, at his sole expense, furnishes pipe of the required strength to carry additional trench load. Such modifications shall be submitted to the Inspector and approved in writing. Whenever such maximum allowable width of trench is exceeded, except as provided for in the contract documents, or by written approval of the Engineer, the Contractor, at his sole expense, shall encase the pipe in concrete from trench wall to trench wall, or with other approved pipe bedding material. Any excavation wider than this maximum width or subsequent surface or paving work, will be done at the Contractor's sole expense.

The depth of cut as indicated on the cut sheet for pay purposes may be more or less than the actual excavated depth. The variation is based on the surface elevation prior to the Contractor's operation and the invert of the sewer line.

2. When unsuitable bearing materials such as water, silt, muck, trash, debris or rock in ledge, boulder or coarse gravel (particle size larger than 1- $\frac{3}{4}$

San Antonio Water System Standard Specifications for Construction

inch) is encountered at the bearing level, the Contractor shall over-excavate and remove such materials to a depth no less than 6 inches below the bottom of the pipe and replace it with a material conforming to the requirements of Paragraph 804.5.2.a, 804.6, or as approved by the Engineer and/or Inspector.

3. Dewatering: Prevent surface water and subsurface or groundwater from flowing into excavations and from flooding project site and surrounding area.
 - a. The Contractor shall not allow water to accumulate in excavations or at subgrade level. Remove water to prevent softening of foundation bottoms and soil changes detrimental to stability of subgrades and foundations. Provide and maintain dewatering system components necessary to convey water from excavations.
 - b. Convey water removed from excavation and rainwater to collecting or runoff areas away from buildings and other structures. Establish and maintain temporary drainage ditches and other diversions outside excavation limits. Do not use trench excavations as temporary drainage ditches.
 - c. Dewatering devices shall be provided by the Contractor with filters to prevent the removal of fines from the soil. Should the pumping system draw fines from the soil, the Inspector shall order immediate shutdown, and remedial measures will be the responsibility of the Contractor.
 - d. Upon completion of the dewatering work, the Contractor shall remove all equipment and leave the construction area in a neat, clean, condition that is acceptable to the Inspector
 - e. The Contractor shall maintain groundwater table at least 12 inches below the finished excavation subgrade.
 - f. Dewatering Performances. Performances of the dewatering system for lowering groundwater shall be measured by observation wells on piezometers installed in conjunction with the dewatering system, and these shall be documented at least daily. The Contractor shall maintain a log of these readings and submit them to the Inspector.

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No direct payment shall be made for costs associated with dewatering. All costs in connection therewith shall be included in the applicable contract price for the item to which the work pertains.

804.5 BACKFILLING SANITARY SEWER TRENCHES:

1. General: Trenches shall not be backfilled until the construction structures or appurtenances, as installed, conform to the requirements specified. Where specified, only the secondary backfilling may incorporate excavated materials approved for backfilling, consisting of earth, loam, sandy clay, sand and gravel, soft shale or other approved materials, free from large clods of earth or stones. Where pipe is specially coated or sleeve/tape wrapped for protection against corrosion, care shall be taken not to damage the coating or sleeve/tape wrap.

Where a trench has been improperly backfilled, or where settlement occurs, the identified section shall be excavated to a depth and length 50 feet beyond the failed area, then refilled and compacted to the grade and compaction level required. The use of sand backfill shall not be allowed. All compaction within the secondary backfill zone shall be such that the apparent dry density of each layer shall be not less than 98% from the top of the initial backfill to the bottom of pavement section. The pavement (asphalt) section shall have 95% compaction density with a maximum dry density at + or - 2% optimum moisture content as determined by tests on samples as outlined in the latest provisions of TX-DoT Testing Method Tex 113-E or most applicable approved equal provisions, unless otherwise shown on the contract documents. At the time of compaction, the water content shall be at optimum moisture content, + or - 2% points.

See Table 1 at the end of this specification for an outline of the bedding and initial backfill requirements for various pipe types.

2. Sanitary Sewer Backfilling: Backfilling for sanitary sewers is divided into three (3 separate zones: (a) bedding: the material in the trench bottom in direct contact with the bottom of the pipe; (b) initial backfill: the backfill zone extending from the surface of the bedding to a point 1 foot above the top of the pipe; and (c) secondary backfill: the backfill zone extending from the initial backfill surface to the top of the trench. Materials and placement for each of the zones shall be as described herein.
 - a. Bedding:

San Antonio Water System Standard Specifications for Construction

- (1) Stable Material: Existing stable material present during excavation includes:

Trench bottom (free of water, muck, debris);

Rock in boulder, ledge or coarse gravel (particle size not larger than 1- ¾ inch) formations;

Coarse sand and gravels with maximum particle size of 1- ¾ inch, various graded sands and gravels containing small percentages of fines, generally granular and non-cohesive either wet or dry; and

Fine sands and clayey gravels; fine sand, sand-clay mixtures, clay and gravel-clay mixtures.

- (2) Unstable Material: Existing unstable materials are silt, muck, trash or debris in the trench bottom bearing level; rock on boulder ledge or coarse gravel (particle size larger than 1- ¾ inch) formations.

- (3) Bedding Material: The existing material at the bearing level shall be removed and replaced to a minimum depth of 6 inches or 1/8 of the outside diameter of the pipe, whichever is greater, with bedding material. The bedding material shall extend up the sides of the pipe sufficient to embed the lower quadrant of the pipe. The bedding material shall be composed of well-graded, crushed stone or gravel conforming to the following requirements unless modified by the Engineer in writing.

<u>Sewer Gravel</u>	<u>Percent</u>
Passing 1- ½ inch sieve	100
Passing 1 inch sieve	95 to 100
Passing 1/2" inch sieve	25 to 60
Passing No. 4 sieve	0 to 10
Passing No. 8 sieve	0 to 5

- (4) Over Excavation: Where the trench bottom has been over

San Antonio Water System Standard Specifications for Construction

excavated beyond the limits as defined in Item No. 848, "Sanitary Sewers," due to removal of unstable material, the pipe shall be concrete-encased. Encasement shall extend from the trench wall to trench wall and be a minimum of 6 inches above the top of pipe. No separate pay item (See Item No. 858).

- (5) Reduced Excavation: Where the trench bottom is not excavated in accordance with the specification due to rock or other hard under lying materials, then the pipe shall be concrete encased as defined in Item No. 858, "Concrete Encasement."
- (6) Consolidating Backfill Material: The Initial Bedding material shall be consolidated to assure it is incorporated from the bottom of the trench up to the pipe centerline. A hand-held vibrator, commonly used for concrete work, can be used for this purpose. The vibrator shall be inserted every 3 feet on each side of the pipe.

- b. Initial Backfill: Initial backfill is defined as backfill having a thickness in its compacted state from the surface of the bedding to a point 1 foot above the top of the pipe.

Initial backfill shall consist of gravel which conforms to the requirements of Item No. 804.5.2. a (3).

For sewer lines up to 24 inches in diameter initial backfill material shall be placed in two separate lifts above the bedding material the pipe is set on. The first lift shall be spread uniformly and simultaneously on each side and under the bottom quadrant of the pipe to the mid-point or spring line of the pipe.

Consolidate the Initial Backfill material as per section 804.5.2.(6).

Placement of the first lift of initial backfill shall be subject to inspection and approval prior to placement of second lift, which shall extend from the spring line of the pipe to a minimum of 1 foot above the top of the pipe. The second lift shall be evenly spread in a similar manner as the first lift.

For diameters larger than 24 inches, initial backfill material shall

San Antonio Water System Standard Specifications for Construction

be evenly and simultaneously spread alongside, under the lower quadrant the pipe and over the pipe in 12 inch lifts to a point sufficient to a minimum of 1 foot above the top of the pipe.

Consolidate the Initial Backfill material as per section 804.5.2.(6).

- c. Secondary Backfill: Secondary backfill is defined as backfill from 1 foot above the top of the pipe to the top of the trench or bottom of pavement section. Secondary backfill shall be constructed in accordance with details shown in the construction documents.

Secondary backfill shall generally consist of materials removed from the trench and shall be free of brush, debris and trash. Rock or stones having a dimension larger than 6 inches at the largest dimension shall be sifted out and removed before the material is used in the secondary backfilling zone. Secondary backfill material shall be primarily composed of compactible soil materials. The secondary backfill material shall be placed in maximum 12 inch loose lifts or as directed by the Design Engineer and/or Inspector.

- d. Trench Surface Restoration: The surface of the backfilled trench shall be restored to match the previous existing conditions. This shall include final grading, placement of topsoil and seeding, placement of sod (such as at homes or businesses that had maintained grass), or other unprepared and prepared surfaces.

Trenches in alleys actively being used by vehicles (such as trash pickup, vehicle parking, etc.) shall be restored by grading and compacting to 98% or higher with a minimum of 4 inches of flex-base materials for the entire width of the alley. Asphaltic materials shall have a compaction density of 95%. Alleys not actively used by vehicles shall be graded and compacted to 98% or higher from the top of the initial backfill to the bottom of the pavement section, then spread grass seed for entire width of the alley.

Trenches in paved streets shall be covered with a temporary all-weather surface to allow for vehicular traffic until the final asphalt/concrete paving is complete. This surface shall be a minimum of 4 inches compacted and rolled asphaltic black base, either hot-mix or cold-mix applied. It is the Contractor's

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responsibility to maintain this surface until the final street restoration is complete. Temporary street striping may also be required. This surface must be removed prior to final asphaltting. All street work shall be done in accordance with the latest City of San Antonio Public Works' (or other city as applicable) construction specifications.

Included in this requirement is replacement of any curbs or sidewalks damaged or removed during the construction.

No separate payment for the surface restoration is permitted. The cost for this work must be included in the appropriate bid item.

804.6 BACKFILLING POTABLE WATER TRENCHES: Mains and service line trenches shall be excavated in accordance with Item No. 804.3 and Item No. 804.4 for placement of potable water appurtenances.

1. Bedding/Initial Backfilling: The bedding and initial backfill materials for concrete steel cylinder pipe (CSC), ductile iron pipe (DI), HDPE Pipe, Wrapped Steel Pipe, and Polyvinyl Chloride Pipe (PVC) in all nominal diameters shall be composed of well graded crushed stone or gravel conforming to the following requirements unless modified by the Engineer.

Modified Grade 5 gravel:

<u>MODIFIED GRADE 5</u>	<u>PERCENT</u>
Retained on 1/2" sieve	0
Retained on 3/8" sieve	0-5
Retained on No. 4 sieve	20-80
Retained on No. 10 sieve	75-100
Retained on No. 20 sieve	98-100

The quantity and thickness of materials lifts and compaction of initial backfill materials shall be in accordance with the provisions of Item No. 804.5.2.b and Item No. 804.6.1.

Where copper services (3/4" – 2") copper are installed, initial backfill shall be sand conforming to the following requirements: Natural sand or sand produced from crushed gravel or crushed rock maximum 1/4-inch; 95 percent shall pass No. 4 sieve, free from clay and organic material, with a maximum 8 percent passing the No. 200 sieve. Larger services utilizing DI pipe or PVC (C-900) pipe shall be backfilled the same as mains.

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2. Secondary Backfill: Secondary backfill materials for all types and sizes of pipe shall be as defined in Item No. 804.5.2. (c), "Secondary Backfill." Secondary backfill materials shall be placed and compacted in accordance with the provisions of Item No. 804.5.2. (c), "Secondary Backfill."
3. Trench Surface Restoration: Trench surface restoration shall be accomplished as defined in Item No. 804.5.2. (d).

804.7 DISPOSAL OF EXCAVATED MATERIALS: Any excess excavated material, not utilized after all fill requirements have been met, shall become the responsibility of the Contractor. The Contractor shall dispose of it by hauling and wasting outside the limits of the rights-of-way or easements of this project and of public thoroughfares and water courses, in conformity with pertinent City, County, State and Federal codes and ordinances and in a manner meeting the approval of the Engineer.

804.8 QUALITY CONTROL:

1. The Contractor shall procure, store, and place materials from either onsite or offsite sources which comply with the specified requirements.
2. Quality Assurance Testing: The Owner shall have such tests and inspections as he may desire performed by a nationally-accredited, independent testing laboratory for his guidance and control of the work. Payment for such tests shall be the responsibility of the Owner, including the material proctor tests and density tests. The Contractor shall request testing work performed by the Owner by notifying the Owner of the areas available by Station Numbers or Dimensions and Lift Numbers. The Contractor shall provide access to the test area, associated trench excavation safety protection, and backfilling of the test areas. The frequency and location of testing shall be determined solely by the Owner. The Owner may test any lift of fill at any time, location, or elevation.
3. Quality Control Testing: The Contractor shall be responsible for compaction in accordance with the appropriate Specification. Compaction tests will be done at one location point randomly selected or as indicated by the SAWS Inspector/Test Administrator, per each 12 inch loose lift per 400 linear feet. The inspector shall determine the depth at which the density test shall be taken. All depths shall be considered for testing without a predetermined maximum or minimum.

San Antonio Water System Standard Specifications for Construction

Note: Tests requirements above are indicated as a minimum requirement, but maybe subjected to follow more stringent requirements as established by other appropriate agencies (such as City of San Antonio Public Works Right-of-Way Management Plan, etc.).

Note: Any failed test shall require the Contractor to remove and replace that layer of backfill to 50 feet from either side from the failed test location. The Contractor will also be required at no cost to SAWS to provide two additional tests at the replaced location where the initial test failed and at one location point, randomly selected or as indicated by the SAWS Inspector/Test Administrator.

Note: Sanitary Sewer Laterals will be subject to compaction tests at the discretion of the SAWS Inspector/Test Administrator within 400 linear foot segments. Any failed test shall require the Contractor to remove and replace failed backfill. The Contractor will also be required at no additional cost to SAWS to provide one test at the replaced location where the initial tests failed.

The Contractor shall be responsible for all costs associated with the proctor and density tests, and for providing to SAWS and Consultant, if applicable, verification that necessary compaction levels were achieved. These tests shall be performed by a nationally-accredited, independent testing laboratory. .

The Contractor shall provide access to the test area, associated trench excavation safety protection, and backfilling of the test areas at the Contractor's expense.

The Owner will determine in-place density and moisture content by any one or combination of the following methods: The latest provisions of ASTM D2922 (density of soil and soil aggregate in-place by nuclear methods – shallow depth), D1556 (density and unit weight of soil in-place by sand cone method), D2216 (lab density of water content of soil and rock), D3017 (water content of soil and rock – shallow depth in-place by nuclear methods) or most applicable approved equal provisions.

804.9 MEASUREMENT: Excavation, Trenching and Backfill will not be measured for payment.

804.10 PAYMENT: No direct payment shall be made for incidental costs associated with quality control testing, excavation, trenching and backfilling for water mains

San Antonio Water System Standard Specifications for Construction

and sanitary sewers, and all costs in connection therewith shall be included in the applicable contract price for the item to which the work pertains.

**TABLE 1
BEDDING AND INITIAL BACKFILL REQUIREMENTS**

	UNSTABLE		STABLE*		ROCK	
	Bedding	Initial Backfill	Bedding	Initial Backfill	Bedding	Initial Backfill
WATER	6" or D/8	1.0' above pipe	6" or D/8	1.0' above pipe	6" or D/8	1.0' above pipe
CSC	Modified Grade 5	Modified Grade 5	Modified Grade 5	Modified Grade 5	Modified Grade 5	Modified Grade 5
DI	Modified Grade 5	Modified Grade 5	Modified Grade 5	Modified Grade 5	Modified Grade 5	Modified Grade 5
PVC	Modified Grade 5	Modified Grade 5	Modified Grade 5	Modified Grade 5	Modified Grade 5	Modified Grade 5
HDPE	Modified Grade 5	Modified Grade 5	Modified Grade 5	Modified Grade 5	Modified Grade 5	Modified Grade 5
WSP	Modified Grade 5	Modified Grade 5	Modified Grade 5	Modified Grade 5	Modified Grade 5	Modified Grade 5
SEWER	6"	1.0' above pipe	6"	1.0' above pipe	6"	1.0' above pipe
RIGID	sewer gravel	sewer gravel	sewer gravel	sewer gravel	sewer gravel	sewer gravel
FLEXIBLE	sewer gravel	sewer gravel	sewer	sewer gravel	sewer gravel	sewer gravel

San Antonio Water System Standard Specifications for Construction

			gravel			

* When the native material encountered is clean sand, this material may be utilized for bedding and initial backfill at the Engineer's direction.

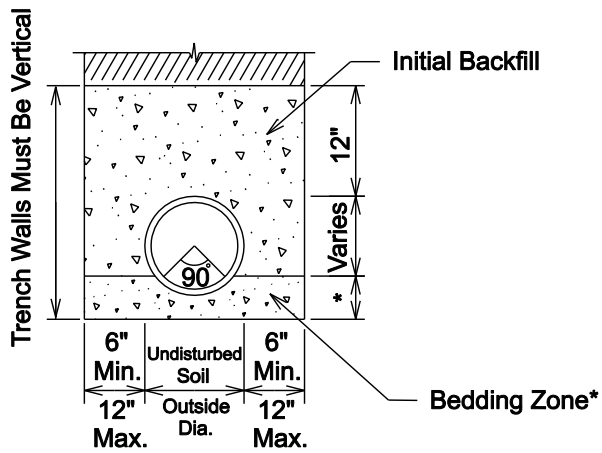
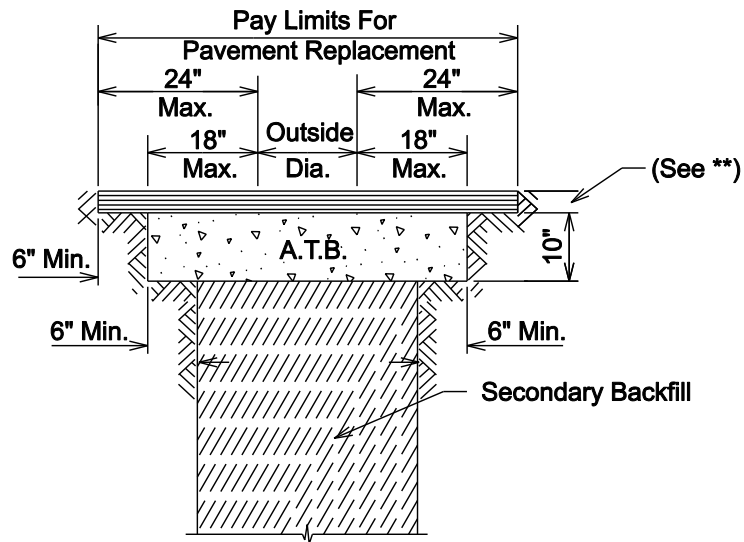
HDPE = High Density Polyethylene Pipe. WSP = Tape Wrapped Steel Pipe.

D = Outside Diameter of Pipe.

Modified Grade 5 --- rounded rock

--- See Item No. 804.6.1 for gradation

Sewer Gravel --- See Item No. 804.5.2. a (3)

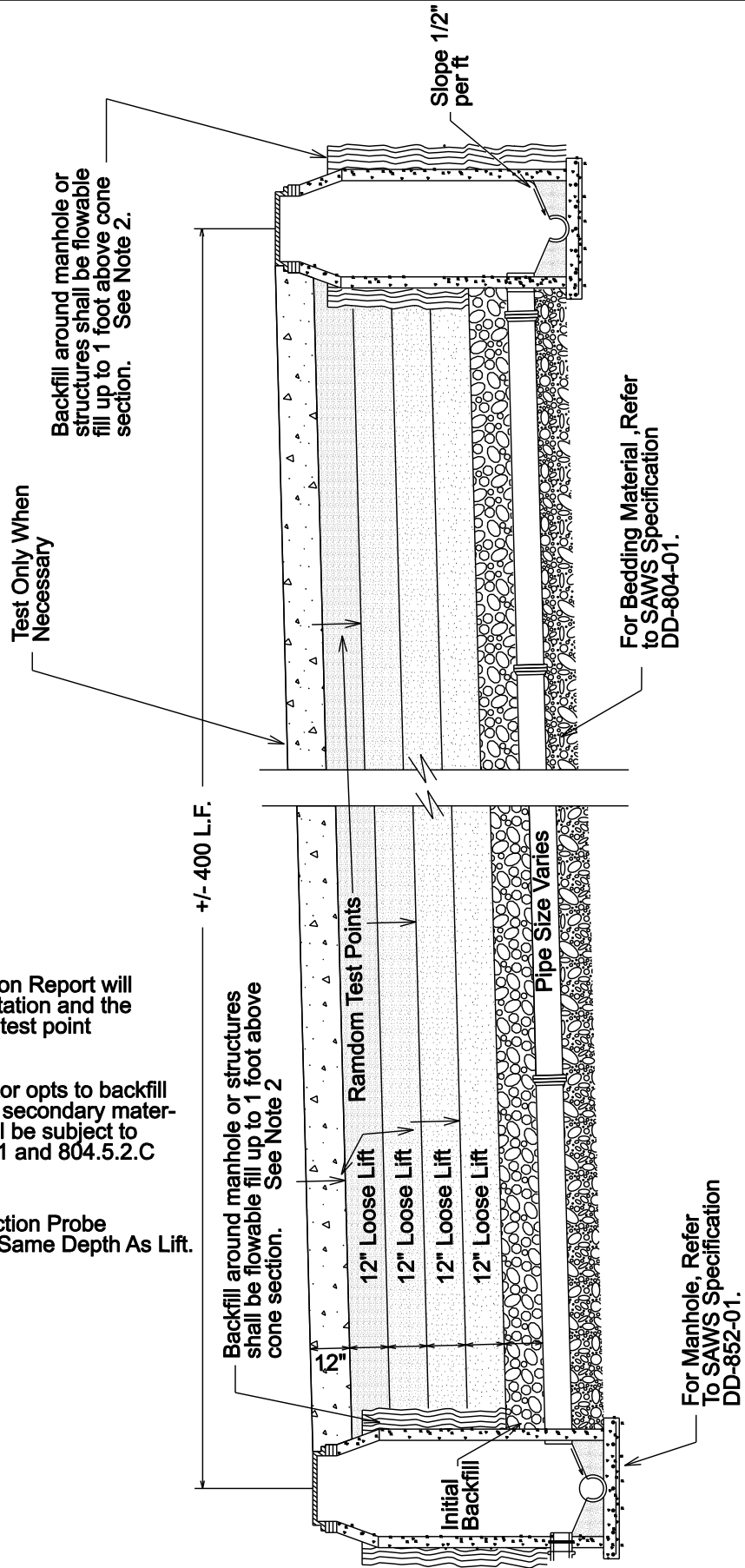


* Sewer Gravel 6" Min. or 1/8 O.D. of the pipe, whichever is greater.

In areas of over excavation, encasement shall extend from trench wall to trench wall. Pay Limits shall not exceed 12" max. as shown on detail. Additional encasement shall be incidental.

** Min 2" HMAC Type "D" for trench repair in Local / Residential streets.

** Min 3" HMAC Type "C" for trench repair in Collector / Arterial streets.



NOTES:

1. The Compaction Report will indicate the station and the depth of each test point
2. When Contractor opts to backfill with approved secondary material, all work will be subject to section 804.5.1 and 804.5.2.C & 2.D.
3. Insure Compaction Probe Penetrates To Same Depth As Lift.

PROPERTY OF
SAN ANTONIO WATER SYSTEM
 SAN ANTONIO, TEXAS

**TRENCH COMPACTION
 DETAIL**

APPROVED
 MARCH 2008

REVISED
 APRIL 2014

DD-804-02

SHEET
 1 OF 1

San Antonio Water System Standard Specifications for Construction

**ITEM NO. 812
WATER MAIN INSTALLATION**

- 812.1 DESCRIPTION:** This item shall consist of water main installation in accordance with these specifications and as directed by the Inspector.
- 812.2 SUBMITTALS:** Contractor shall submit manufacturer's product data, installation instructions, recommendations, shop drawings, and any required installer certification(s).
- 812.3 MATERIALS:** The materials for water main installation shall conform to the specifications contained within the latest revision of SAWS Material Specifications "Ductile Iron Pipe," Item No. 05-11, "Steel Water Pipe," Item No. 05-30, "PVC C-900 Water Pipe," Item No. 05-12, "PVC C-905 Water Pipe," Item No. 819-01, "PVC C-909 Water Pipe," Item No. 05-13, and "Reinforced Concrete Water Pipe Steel Cylinder Type", Item No. 05-20. The pressure rating for pipe materials apply to any work performed in SAWS Pressure Zones 9-16 shall be in accordance with Table HP-1, "High Pressure Zones." Minimum pressure rating for all pipes in high pressure zones shall be 200 psi.
1. PVC water pipe shall be blue in color. PVC pipe markings shall include:
 - a. Manufacturer's name or trademark;
 - b. Standard to which it conforms;
 - c. Pipe size;
 - d. Material designation code;
 - e. Pressure rating;
 - f. SDR number or schedule number;
 - g. Potable water laboratory seal or mark attesting to suitability for potable water;
 - h. A certifier's mark may be added; and
 - i. Manufactured date (installation shall not exceed one year from this date)

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2. White-colored PVC pipe is acceptable if labeled in accordance with item 1.

812.4 CONSTRUCTION:

1. Start of Work: The Contractor shall start his work at a tie-in or point designated by the Inspector. Pipe shall be laid with bell ends facing in the direction of pipe laying, unless otherwise authorized or directed by the Inspector. All valves and fire hydrants must be installed as soon as pipe laying reaches their established location. All pipe shall be installed to the required lines and grades with fittings, valves, and hydrants placed at the required locations. Spigots shall be centered in bells or collars, all valves and hydrant stems shall be set plumb, and fire hydrant nozzles shall face as per SAWS standard details or as directed by the Engineer. No valve or other control on the existing system shall be operated for any purpose by the Contractor unless a representative of SAWS is present.
2. Crossing Other Underground Lines: New water mains crossing any other utility shall have a minimum of 30 inches of cover over the top of the pipe, unless otherwise waived or modified by the Engineer. Excavation around other utilities shall be done by hand for at least 12 inches all around. Any damage to the protective wrap on gas lines or electrodes shall be reported immediately to the CPS Energy, phone (210) 353-4357. Any damage to other utilities shall be reported to their proper governing entity. In both these cases of utility damage, Contractor shall also promptly notify the Inspector.
3. Pipe Separation - Parallel Lines:
 - a. Where a new potable waterline parallels an existing, non-pressure or pressure-rated wastewater main or lateral and the licensed professional engineer licensed in the State of Texas is able to determine that the existing wastewater main or lateral is not leaking, the new potable waterline shall be located at least two feet above the existing wastewater main or lateral, measured vertically, and at least four feet away, measured horizontally, from the existing wastewater main or lateral. Every effort shall be exerted not to disturb the bedding and backfill of the existing wastewater main or lateral.

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- b. Where a new potable waterline parallels an existing pressure-rated wastewater main or lateral and it cannot be determined by the licensed professional engineer if the existing line is leaking, the existing wastewater main or lateral shall be replaced with at least 150 psi pressure-rated pipe. The new potable waterline shall be located at least two feet above the new wastewater line, measured vertically, and at least four feet away, measured horizontally, from the replaced wastewater main or lateral.
- c. Where a new potable waterline parallels a new wastewater main, the wastewater main or lateral shall be constructed of at least 150 psi pressure-rated pipe. The new potable waterline shall be located at least two feet above the wastewater main or lateral, measured vertically, and at least four feet away, measured horizontally, from the wastewater main or lateral.

4. Pipe Separation - Crossing Lines:

- a. Where a new potable waterline crosses an existing, non-pressure-rated wastewater main or lateral, one segment of the waterline pipe shall be centered over the wastewater main or lateral such that the joints of the waterline pipe are equidistant and at least nine feet horizontally from the centerline of the wastewater main or lateral. The potable waterline shall be at least two feet above the wastewater main or lateral. Whenever possible, the crossing shall be centered between the joints of the wastewater main or lateral. If the existing wastewater main or lateral is disturbed or shows signs of leaking, it shall be replaced for at least nine feet in both directions (18 feet total) with at least 150 psi pressure-rated pipe.
- b. Where a new potable waterline crosses an existing, pressure-rated wastewater main or lateral, one segment of the waterline pipe shall be centered over the wastewater main or lateral such that the joints of the waterline pipe are equidistant and at least nine feet horizontally from the centerline of the wastewater main or lateral. The potable waterline shall be at least six inches above the wastewater main or lateral. Whenever possible, the crossing shall be centered between the joints of the wastewater main or lateral. If the existing wastewater main or lateral shows signs of leaking, it shall be replaced for at least nine feet in both directions (18 feet total) with at least 150 psi pressure-rated pipe.

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- c. Where a new potable waterline crosses a new, non-pressure-rated wastewater main or lateral and the standard pipe segment length of the wastewater main or lateral is at least 18 feet, one segment of the waterline pipe shall be centered over the wastewater main or lateral such that the joints of the waterline pipe are equidistant and at least nine feet horizontally from the centerline of the wastewater main or lateral. The potable waterline shall be at least two feet above the wastewater main or lateral. Whenever possible, the crossing shall be centered between the joints of the wastewater main or lateral. The wastewater pipe shall have a minimum pipe stiffness of 115 psi at 5.0% deflection. The wastewater main or lateral shall be embedded in cement stabilized sand for the total length of one pipe segment plus 12 inches beyond the joint on each end.

- d. Where a new potable waterline crosses a new, non-pressure-rated wastewater main or lateral and a standard length of the wastewater pipe is less than 18 feet in length, the potable water pipe segment shall be centered over the wastewater line. The materials and method of installation shall conform with one of the following options:
 - (1) Within nine feet horizontally of either side of the waterline, the wastewater pipe and joints shall be constructed with pipe material having a minimum pressure-rating of at least 150 psi. An absolute minimum vertical separation distance of two feet shall be provided. The wastewater main or lateral shall be located below the waterline.

 - (2) All sections of wastewater main or lateral within nine feet horizontally of the waterline shall be encased in an 18-foot (or longer) section of pipe. Flexible encasing pipe shall have a minimum pipe stiffness of 115 psi at 5.0% deflection. The encasing pipe shall be centered on the waterline and shall be at least two nominal pipe diameters larger than the wastewater main or lateral. The space around the carrier pipe shall be supported at five-foot (or less) intervals with spacers or be filled to the springline with washed sand. Each end of the casing shall be sealed with watertight non-shrink cement grout or a manufactured watertight seal. An absolute minimum separation distance of six inches between the encasement pipe and the

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waterline shall be provided. The wastewater line shall be located below the waterline.

5. Pipe Grade: Water mains 16" or smaller shall have a minimum of 48 inches of cover from the proposed final finish ground/street/elevation and 60 inches of cover when the main is installed in an unpaved area or under the pavement where there are no existing/proposed curb or existing drainage facilities. Water mains 20" and above shall have a minimum of 60 inches of cover over the top of the pipe from the proposed final finish ground/street/elevation unless otherwise waived or modified by the Engineer. Pipe grades shall be as required by the plans or as directed by the Engineer. Grades shall be met as specified by Item No. 804 "Excavation, Trenching and Backfilling." Precaution shall be taken to ensure that the pipe barrel has uniform contact with the cushion material for its full length except at couplings. The couplings shall not be in contact with the original trench bottom prior to backfilling. Cushion material shall be placed under the coupling and compacted by hand prior to backfilling so as to provide an even bearing surface under the coupling and pipe. Changes in grade shall be made only at joints.
6. Cushion and Cushion Materials: Prior to placing pipe in a trench, the trench shall have been excavated to the proper depth as required in Item No. 804 "Excavation, Trenching, and Backfilling." Approved imported materials or Engineer-approved materials selected from suitable fines derived from the excavation shall be smoothly worked across the entire width of the trench bottom to provide a supporting cushion.
7. Structures to Support Pipe: When either the Inspector or Engineer note that the material at the bottom of a trench is unstable or unsuitable, it shall be removed and replaced with approved material which may be properly compacted in place to support the pipe. The Contractor shall also construct a foundation for the pipe consisting of piling, concrete beams, or other supports in accordance with plans prepared by the Engineer. Extra compensation will be allowed for the Contractor for the additional work done. All claims for extra compensation must first be agreed to by SAWS, prior to any such work occurring. In this event it shall be paid for in accordance with the provisions of ARTICLE VI. CONTRACT CHANGES of the General Conditions of the Contract.
8. Lowering Pipe and Appurtenances into Trench: Proper implements, tools, and facilities satisfactory to the Inspector shall be provided and used by

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the Contractor for the safe and convenient completion of work. All pipe, fittings, valves, and hydrants shall be carefully lowered into the trench piece by piece, by means of a derrick, ropes, or other suitable tools or equipment in such a manner as to prevent damage to water main materials and protective coatings, polywrap sleeving, and linings. Under no circumstances shall water main materials, pipes, fittings, etc., be dropped or dumped into the trench. Extreme care shall be taken to avoid damaging polywrap films. No chains or slings shall be allowed unless the entire sling is wrapped with a protective nylon web sock.

9. Pipe Laying: Every precaution shall be taken to prevent foreign material from entering the pipe during installation. Under adverse trenching conditions, work stoppage for more than 24 hours and/or as otherwise required by the Engineer, a manufactured cap/plug is to be used to prevent any foreign type material entering the pipe. The cap/plug shall be left in place until it is connection to an adjacent pipe. The interior of each pipe shall be inspected for foreign material or defects, and the pipe shall be cleaned or rejected if any defects are found, respectively.

After placing a length of pipe in the trench, the jointed end shall be centered on the pipe already in place, forced into place, brought to correct line and grade, and completed in accordance with these requirements. The pipe shall be secured in place with approved backfill material tamped around it. Pipe and fittings which do not allow a sufficient and uniform space for joints shall be rejected by the Engineer and/or Inspector and shall be replaced with pipe and fittings of proper dimensions. Precautions shall be taken to prevent dirt or other foreign matter from entering the joint space.

At times when pipe laying is halted, the open end of pipe in the trench shall be closed by a watertight plug or other means approved by the Inspector. Pipe in the trench which cannot temporarily be jointed shall be capped or plugged at each end to make it watertight. This provision shall apply during all periods when pipe laying is not in progress. Should water enter the trench, the seal shall remain in place until the trench is pumped completely dry. The Contractor shall provide all plugs and caps of the various sizes required.

10. Deviations in Line or Grade: Wherever obstructions not shown in the contract documents are encountered during the progress of the work and interfere to an extent that an alteration in the plan is required, the Engineer shall have the authority to change the plans and direct a deviation from the

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line and grade or to arrange with the owners of the structures for the removal, relocation, or reconstruction of the obstructions. Any deviation from the line shall be accomplished by the use of appropriate bends unless such requirement is specifically waived by the Engineer. These deviations shall clearly and accurately be reflected in the Contractor's submittal of their redline drawings for permanent recording purposes.

Whenever it is necessary to deflect pipe from a straight line, the deflection shall be as directed by the Engineer and as described herein. In no case shall the amounts shown in Table 812-1, "Maximum Deflections of Ductile Iron Pipe" and Table 812-2, "Maximum Deflections of Concrete Steel Cylinder Pipe," be exceeded.

11. Cutting Pipe: The cutting of pipe for inserting valves, fittings, or closure pieces shall be accomplished in a neat and workmanlike manner so as to produce a smooth end at right angles to the axis of the pipe. The recommendations of the pipe manufacturer shall be strictly followed by the Contractor. Only qualified and experienced workmen shall be used and, under no circumstances, shall a workman not equipped with proper safety goggles, helmet and all other required safety attire be permitted to engage in this work.

Asbestos Cement (AC): No field cutting, breaking, or crushing will be allowed on AC pipe. Repairs to AC pipe shall be accomplished by removing one full joint of AC pipe and replacing with appropriate PVC or Ductile Iron pipe and fittings. All work associated with removing and disposing of AC pipe shall conform to the provisions of Item No. 3000, "Handling of Asbestos Cement Pipe."

All cuts made on ductile-iron pipe shall be done with a power saw. The cuts shall be made at right angles to the pipe axis and shall be smooth. The edges of the cut shall be finished smoothly with a hand or machine tool to remove all rough edges. The outside edge of pipe should be finished with a small taper at an angle of about 30 degrees. Solid sleeves or cast couplings shall be allowed on precast/prefab vaults only. All other fire line services shall be installed with full joints of pipe.

To facilitate future repair work on water mains, no sections less than 3 feet in length between fittings shall be allowed.

12. Joint Assembly:

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- a. Rubber Gasketed Joints: The installation of pipe and the assembly of rubber gasketed joints for ductile iron pipe, concrete and steel cylinder pipe shall conform to the pipe manufacturer's assembly instructions. The method of inserting spigot ends of pipe in bells or collars known as "stabbing" shall not be permitted with pipe larger than 6 inches in size. Spigot ends of pipe larger than 6 inches in size must be properly inserted in the joint by means of suitable pushing/pulling devices or an approved manufacture's method.
- b. Mechanical Couplings: Mechanical couplings shall be assembled and installed according to the standards recommended by the manufacturer.

Mechanical coupling consists of a cylindrical steel middle ring, two steel follower rings, two rubber compound gaskets, and a set of steel bolts. The middle ring is flared at each end to receive the wedge-shaped gasket which is compressed between the middle ring flare and the outer surface of the pipe by pressure exerted on the follower rings through the bolt circle.

Prior to the installation of the mechanical coupling, the pipe ends shall be cleaned by wire brush or other acceptable method to provide a smooth bearing surface for the rubber compression gasket. The pipe shall be marked to align the end of the coupling which will center it over the joint. After positioning, the nuts shall be drawn up finger tight. Uniform pressure on the gaskets shall be applied by tightening alternate bolts on the opposite side of the circle in incremental amounts. Final tensioning shall be accomplished with a torque wrench and in a manner similar to the tightening procedure. The coupling shall then be left undisturbed for 24 hours to allow the gaskets to "pack in." Final torque check shall then be made prior to coating and wrapping the joint. Table 812-3 ("Torque for Mechanical Couplings)," sets forth the proper torque for various sized mechanical couplings and is included for the convenience of the Contractor.

- c. Restraint Joints: Restraint Joints shall be installed as shown on the plans or as directed by the Engineer. Installation shall conform to the manufacturer's recommendation.

13. Abandonment/Removal of Old Mains: Regarding planned main

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abandonment, the Contractor shall accomplish all cutting, capping, plugging, and blocking necessary to isolate those existing mains retained in service from those abandoned. The open ends of abandoned mains and all other openings or holes in such mains occasioned by cutting or removal of outlets shall be blocked off by manually forcing cement grout or concrete into and around the openings in sufficient quantity to provide a permanent substantially watertight seal. Abandonment of old, existing water mains will be considered subsidiary to the work required, and no direct payment will be made.

When specified or shown otherwise in the contract documents, Contractor shall remove the main and all related appurtenances that are to be replaced, or will no longer be in service, and all effort to accomplish this requirement will be considered subsidiary to the work required, and no direct payment will be made.

14. Abandoned Valves: Valves abandoned in the execution of the work shall have the valve box and extension packed with sand to within 8 inches of the street surface. The remaining 8 inches shall be filled with 2,500 psi concrete or an equivalent sand-cement mix and finished flush with the adjacent pavement or ground surface. The valve covers shall be salvaged and returned to the Owner.
15. New/Existing Valves: At no time during the project work shall any valves be covered or rendered inaccessible for operation due to any activities by the Contractor. Any work during construction activities will be suspended until this requirement is met. No claims for cost or schedule delays will be accepted.

812.5 MEASUREMENT: Water main installed will be measured by the linear foot for each size and type as follows:

Measurements will be from the center line intersection of runs and branches of tees to the end of the valve of a dead end run.

Measurements will also be between the center line intersection of runs and branches of tees. Where the branch is plugged for future connection, the measurement will include the entire laying length of the branch or branches of the fitting.

The measurement of each line of pipe of each size will be continuous and shall include the full laying lengths of all fittings and valves installed between the ends

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of such line except that the laying length of reducers will be divided equally between the connected pipe sizes. Lines leading to a tapping connection with an existing main will be measured to the center of the main tapped.

812.6 PAYMENT: Payment for water main installed will be made at the unit price bid per linear foot of pipe of the various sizes installed by the open cut method. Such payment shall also include excavation, selected embedment material, backfill, compaction, polyethylene sleeve, hauling and disposition of surplus excavated material, including all existing pipe, fittings, appurtenances to be abandoned or removed (where specified or shown in the contract documents)

Removed AC pipe shall be manifested and disposed of in accordance with Item No. 3000, "Handling Asbestos Cement Pipe."

TABLE 812-1					
MAXIMUM DEFLECTIONS OF DUCTILE-IRON					
Nominal Pipe Diameter	Maximum Deflection Angle	Maximum Deflection In Inches		Approximate Radius Of Curve In Inches	
		18 Ft.	20 Ft.	18 Ft.	20 Ft.
6"	4°25'	16.7	18.5	234	260
8"	3°51'	14.6	16.2	268	297
10"	3°42'	14.0	15.5	279	310
12"	3°08'	11.9	13.2	327	363
16"	2°21'	8.8	9.7	440	488
20"	1°55'	7.2	8.0	540	600
	1°35'	6.0	6.7	648	720

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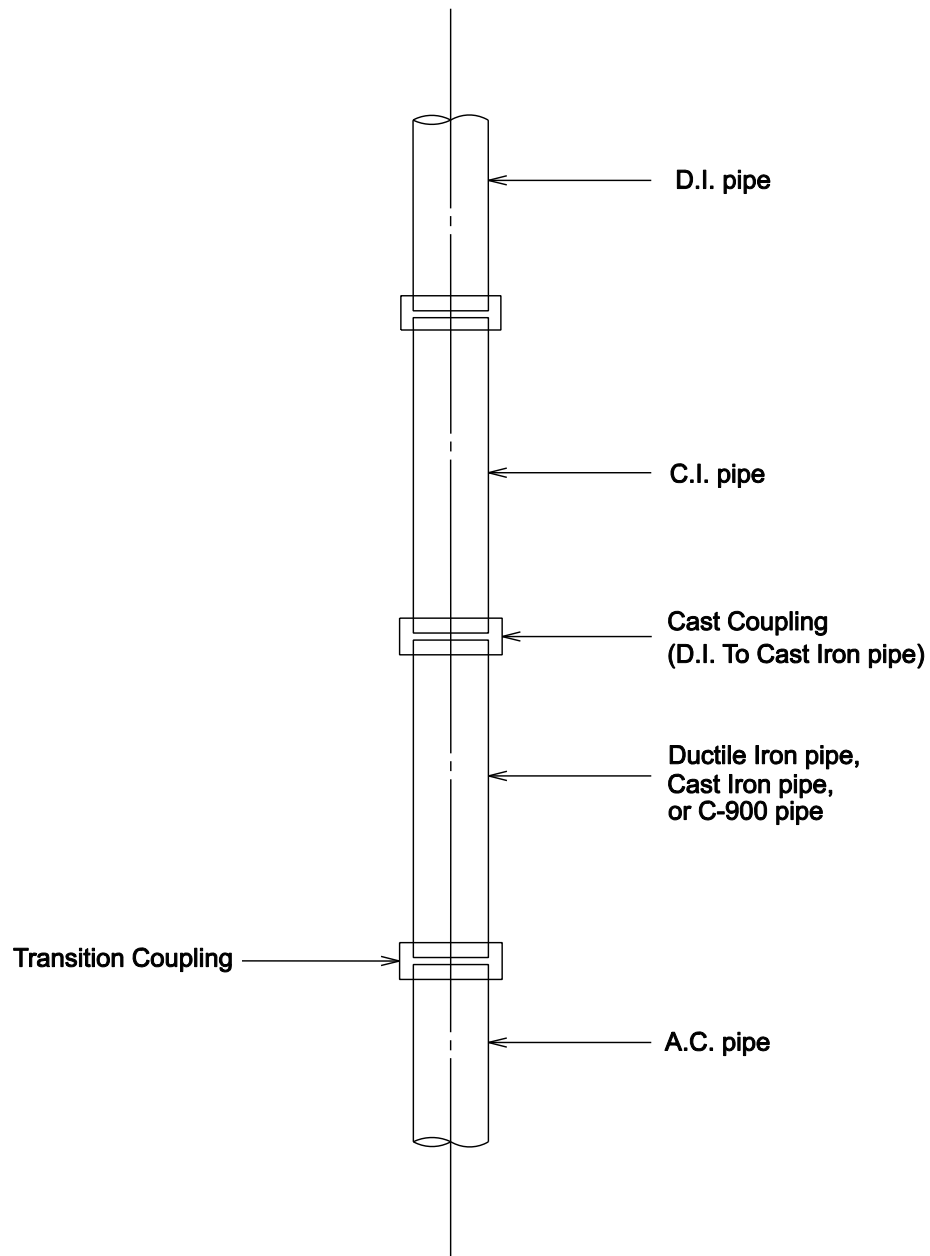
TABLE 812-2					
MAXIMUM DEFLECTIONS OF CONCRETE STEEL CYLINDER					
Nominal Pipe Diameter	Maximum Deflection Angle	Maximum Deflection In Inches		Approximate Radius Of Curve In Inches	
		16 Ft.	20 Ft.	16 Ft.	20 Ft.
16"	2°20'	--	9.8	--	500
20"	1°52'	--	7.8	--	600
24"	1°34'	--	6.6	--	750
30"	1°16'	--	5.3	--	900
36"	1°02'	--	4.3	--	1100
42"	0°54'	--	3.8	--	1300
48"	0°47'	2.6	--	1170	--
54"	0°44'	2.5	----	1237	--
60"	0°54'	3.0		1024	-

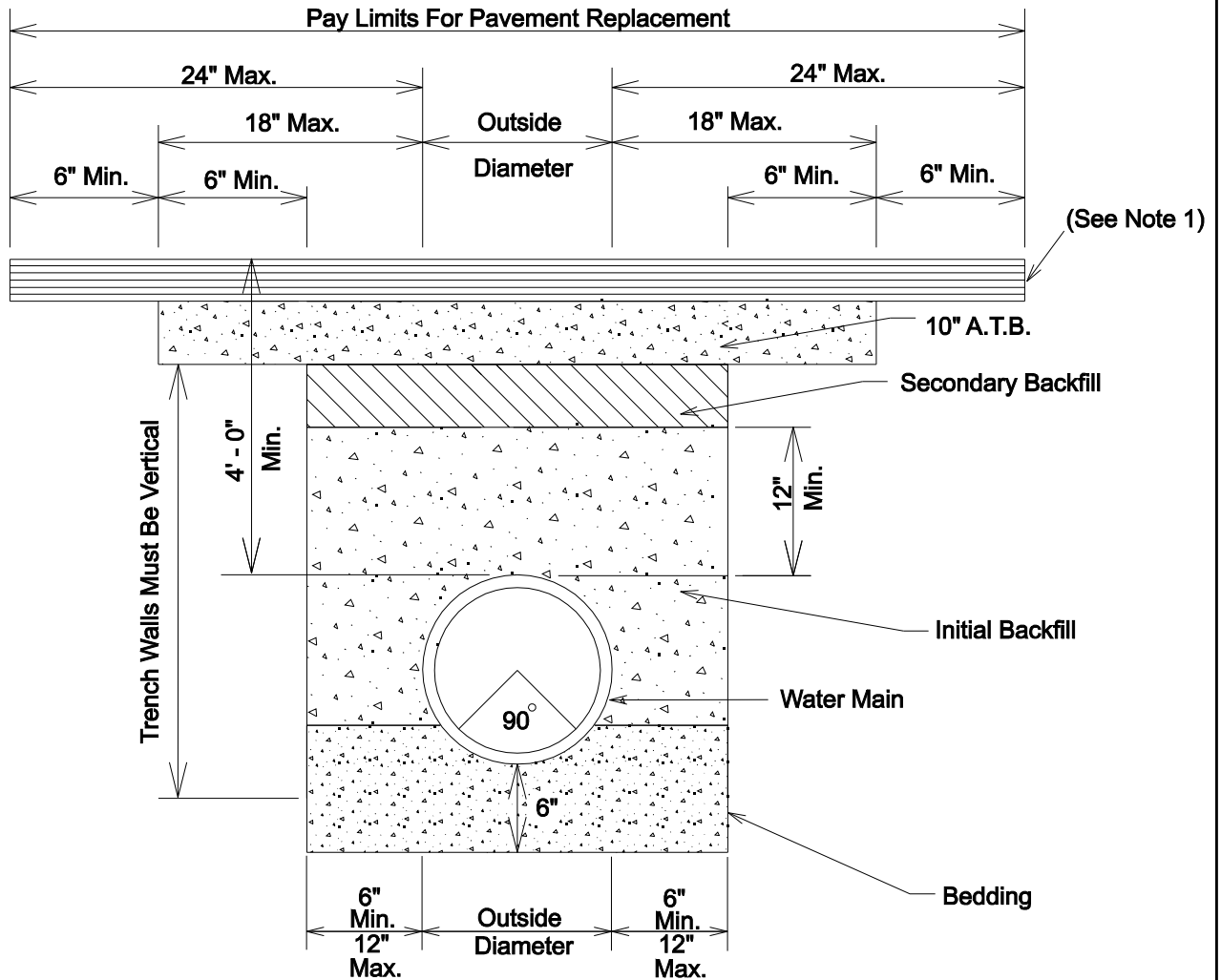
TABLE 812-3		
TORQUE FOR MECHANICAL COUPLINGS		
	Bolt	

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Coupling Size	Diameter	Torque
2" to 24"	5/8"	75 ft-lb
2" to 24"	3/4"	90 ft-lb
30" & 36" (1/4" x 7" Middle Rings)	5/8"	65 ft-lb
30" thru 36" (3/8" & heavier Middle Rings)	5/8"	70 ft-lb
30" to 48"	3/4"	80 ft-lb
48" to 72"	3/4"	70 ft-lb

- End of Specification -





1) REPLACEMENT OF SURFACE LAYER SHALL BE OF THE TYPE AND THICKNESS BASED ON FUNCTIONAL CLASSIFICATION.

a. Min 2" HMAC Type "D" for trench repair in Local / Residential streets.

b. Min 3" HMAC Type "C" for trench repair in Collector / Arterial streets.

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ITEM NO. 824
WATER SERVICE SUPPLY LINES

824.1 **DESCRIPTION:** This item shall consist of water service supply lines adjustment and installation in accordance with these specifications and as directed by the Engineer.

824.2 **MATERIALS:** The materials for water service supply lines installation and adjustment shall conform to the specifications contained within the latest revision of SAWS' Material Specification Item Nos. 21-10, "Brass Gate Valves," 15-40, "Brass Goods," 15-01, "Copper Tubing," and 100-30, "Service Saddles."

824.3 **CONSTRUCTION:**

1. General: Service supply lines and fittings, meter boxes and appurtenances shall conform to the Material Specifications and shall be installed by the Contractor as specified herein, or as directed by the Engineer and in accordance with the DD-824 Standard Drawing Series.
2. Designation of Service Supply Lines: A service supply line located between the water main and the inlet side of the water meter is designated as a "water service line." A service supply line located between the outlet side of the water meter to the point of connection within the limits of the Customer's lot or property is designated as the "Customer's yard piping" and is covered under Item No. 822 of these specifications. Services 2 inches and smaller are designated "small services." Services 4 inches and larger are designated "large services."
3. Service Relays: New transfer main(s) to which services are to be relayed, and are on the same side of the streets as the Customer's meter, are defined as "short relays." New transfer main(s) to which services are to be relayed, and are on the opposite side of the street from the Customer's meter, are defined as "long relays."

Service Reconnects: New transfer main(s) to which services are to be reconnected, and on the same side of the street as the old main, are defined as "short reconnects." Existing services on the opposite side of the street to the new main shall be defined as a "long reconnects."

4. Service Relocates: Service Relocates are defined as services that are relocated from an alley or street to a side or front street. New transfer main(s) to which services are to be relocated, and are on the same side of

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the street as the Customer's new meter box location, are designated as "short relocates." New transfer main(s) to which services are to be relocated, and are on the opposite side of the street from the Customer's new meter box location, are designated as "long relocates."

5. New Services: If a new main is required to be extended to provide water service for new Customers, the service lines laid to the new main shall be designated as "new services." New laid main(s) to which new services are on the same side of the street as the Customer's new meter box location, are designated as "new short services." New laid main(s) to which new services on the opposite side of the street from the Customer's new meter box location, are designated as "new long services."
6. New Unmetered Services: New unmetered services are defined as services that are installed on existing or new mains to provide service to platted vacant lots. Where the new or existing main to which new unmetered services are being installed, is on the same side of the street as the Customer's new or existing meter box location (Inspector is to set location of new meter box if no existing meter box is set), the services to be laid are designated "new unmetered short services." Where the new or existing water main to which new unmetered services are installed, is on the opposite side of the street from the Customer's new or existing meter box location (Inspector is to set location of new meter box if no existing meter box is set), the services to be laid are designated "new unmetered long service." New unmetered long services and new unmetered short services will not include "Customer's yard piping," and no meter will be set.
7. Tap Holes: Tap holes are defined as excavations at existing mains, which are required in association with replacements of water service lines by pulling, boring or jacking operations.

All backfill material shall be as specified for all associated main and service line trench excavation.

For service lines and tap holes, payment for bedding, initial backfill and secondary backfill shall be included in the various sizes of each service placed.

8. Service Line Installation: Unless otherwise notified, service relays, service reconnects, service relocates and new services shall be installed as described herein, and in the DD-824 Standard Drawing Series. Unless otherwise indicated, existing meter and meter box relocation shall be

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included in the service line installation.

All service line installation shall include a dielectric union to be installed within the meter box on the outlet side of the meter, as shown in the DD-824 Standard Drawing Series.

Cutting, excavation, backfill and replacement of pavement shall be done as specified herein and in accordance with applicable sections of the City of San Antonio Specification Item No. 511, "Cutting and Replacing Pavements (Trench Repair), and Item No. 804, "Excavation, Trenching, and Backfill." The minimum trench width for small service lines shall be 8 inches, while the minimum trench width for large service lines shall be the nominal pipe diameter plus 16 inches, except when specified otherwise by the Engineer. For $\frac{3}{4}$ inch to 2 inch Service lines, the minimum bury depth shall be 3 feet. For services greater than 2 inches, the minimum depth of bury shall be 4 feet.

All service lines shall be installed in accordance with the DD-824 Standard Drawing Series, SAWS' Standard Material Specification Item No. 100-30, except that two strap service saddle clamps shall be installed for all tap connections made on water mains located within boundaries of Pressure Zones 9 through 16.

The Contractor shall use precaution to protect and preserve the polyethylene wrap around ductile-iron water mains when installing service corporations. The required method is: wrap pipe tape around the pipe, over the polywrap, in the area to be tapped. The tap shall be made through the tape and polywrap. It is not necessary to remove and replace polywrap. All exposed pipe, corporation, and the first three feet of the service, shall be wrapped and taped to achieve a complete seal. In addition, a sand envelope shall extend over and around the connection to a depth of 8 inches above the main.

Small service lines shall be embedded in sand in accordance with Item No. 804, "Excavation, Trenching and Backfill."

When approved by the Inspector, the Contractor may lay the new service line from the corporation stop to the curb stop or angle valve. Upon completion, the Contractor shall isolate the new service line by closing the curb stop or angle valve until the meter box is set.

9. Splicing: A long service line single slice may be permitted by means of a 3-part compression or flared coupling only when approved in advance by

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the Inspector, provided the location of the splice is not under pavement or concrete. The segment added is required to be the same material as the existing service line, unless otherwise directed by the Inspector. Splicing short service lines will not be permitted.

10. Boring or Jacking Service Lines: Service lines which cross paved streets may be installed at the Contractor's option by boring or jacking operations. Where it becomes necessary to widen the main trench section to accommodate a bore pit, such widening shall not extend more than one additional foot into the traffic side of the street.
11. Tapping Asbestos Cement (AC) Pipe: All necessary service line tapping of AC pipe shall be completed during the period immediately before or after hydrostatic pressure testing operations so that subsequent flushing will maximize the elimination of contaminants associated with the tapping process. Direct tapping will not be allowed. Service saddles must be used when tapping AC pipe. Drill tools shall be used for services less than 2 inches. Shell type drills shall be used for all services 2 inches and greater.

The tapping of AC pipe must be done in accordance with manufacturers' recommendations and done only with tap machine having a built in flush valve and the flush valve must be open during the entire procedure.

12. Abandonment of Service Lines: The Contractor shall accomplish all cutting, capping, and plugging necessary to isolate new service lines transferred to new and existing mains from those abandoned, including service lines designated in the contract documents as "tap plug" and "tap kill." The corporation stop for an abandoned service line tapped on a ferrous main shall be removed, and the tap at the main shall be plugged with an appropriately sized brass plug. For a non-ferrous main, the corporation stop shall not be removed from the main. Instead, the corporation stop shall be closed and the flared nut shall be removed from the corporation stop. After the appropriately sized copper disc is inserted inside the flared nut, replace the flared nut on the corporation stop. The Contractor shall salvage copper service line tubing, brass fittings, and other materials as directed by the Inspector and return them to the Owner.
13. Tapping PVC (C-900) Pipe: Tapping of PVC pipe must be done in accordance with Uni-Bell procedures. Direct tapping will not be allowed. All drill cutting tools must be the "shell type" with internal teeth or double slots which will retain the coupon. The shell cutters must be designed for C-900 pipe, thus having sufficient root depth to handle the heavier walled pipe.

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14. Small Service Lines: Copper tubing shall be used for ¾ inch through 2 inch service lines. Brass fittings for ¾ inch and 1 inch service lines shall be of the flared or compression type for the use with Type 'K' soft annealed copper tubing. Brass fittings for 1½ inch and 2 inch lines shall be of the flared or compression type for use with type 'K' soft annealed copper tubing, except as modified by subsection No. 824.39.

Copper tubing shall be cut squarely by using an approved cutting tool and by avoiding excessive pressure on the cutting wheels which might bend or flatten the pipe walls. Following the copper tubing cut, but before flaring, a reamer shall be used to remove the inside rolled lip from the tubing. Flared ends shall be expanded by the use of a flaring tool using care to avoid splitting, crimping, or overstressing the metal. Pipe adjacent to the fittings shall be straight for at least 10 inches. Bending of tubing shall be accomplished by using an appropriate sized bending tool. No kinks, dents, flats, or crimps will be permitted, and should such occur, the damaged section shall be cut out and replaced. When compression fittings are used, the copper tubing shall be cut squarely prior to insertion into the fitting. Final assembly shall be in accordance with the manufacturer's recommendations.

15. Small Service Lines on New Mains: Installation of new copper service lines shall consist of all excavation through miscellaneous material encountered; trench excavation protection; drilling and tapping the new main with an approved tapping machine; setting the curb stop or angle valve at the meter; laying the new copper service line at the specified depth between the main and the meter and its tie-in at the corporation and the curb stop or the angle valve; relocating the existing meter and installing a new meter box in accordance with Item No. 833, "Meter and Meter Box Installation."; backfilling the trench with approved selected material and disposal of surplus excavated material; capping the tap hole with asphalt treated base, including the outer limits of the main trench line with service line trench; cutting and replacing pavements, curbing and sidewalks of all types over the limits of the main line trench and the completed service line trench.
16. Reconnecting Service Lines: Both old and new water mains at existing service line connections, as shown in the contract documents, shall be exposed. The old main shall be exposed for the purpose of gaining access to the existing service corporation stop and the new main for the purpose of installing the new corporation stop. The new main shall be exposed for the purpose of being drilled and tapped with an approved tapping machine,

San Antonio Water System Standard Specifications for Construction

a new corporation stop installed under pressure, and the trench extended laterally to expose a sufficient length of the existing service line to provide slack to bend it into position for tying to the new corporation stop. After suitable notification to the Customer, the Contractor shall "kill" the existing service by closing the corporation stop, removing the existing flare nut, inserting inside the existing flared nut an appropriately-sized copper disc and replacing the existing flared nut on the corporation stop if the main is non-ferrous, or plugging the existing service line at the main if the main is ferrous. The Contractor shall then immediately open the stop and restore water service to the Customer. Where it is not possible to obtain sufficient length in the existing service to tie directly to the new main, at the direction of the Inspector, the Contractor shall splice the necessary length of new tubing and tie it to the existing service by means of a compression coupling at a point as close as practicable to the new main.

Cutting and bending of the tubing, introduction of slack to compensate for soil movement, and completion of the installation shall be as specified in subsection No. 824.17, "Relaying Service Lines."

Where old and new mains are on opposite sides of the street, service lines may be installed under the street pavement by boring rather than trenching.

17. Relaying Service Lines: The existing or new mains shown in the contract documents shall be exposed and opposite location stakes placed onsite at the direction of the Inspector. The existing or new main shall: be drilled and tapped with an approved tapping machine, a new corporation stop installed, and the trench extended laterally to the location specified for the meter box. The existing meter shall be reset and the meter box and base shall be installed at its staked location and perpendicular to the corporation stop in the water main. The meter box location shall not vary more than 24 inches in any direction from its staked location. The service line shall be installed with sufficient slack to compensate for soil movement. Where the location of the existing meter is not changed, the new service line shall be extended from the main to the existing meter, a new curb stop installed at the end of the service line, and connected to the inlet side of the meter. If disturbed, the existing meter box shall be reset to correct grade. Long service relays may be placed under the street pavement by boring or jacking rather than trenching.
18. Single Service Line - Dual Meters: The single service line - dual meter installation shall consist of a 1" copper service line reducing to two $\frac{3}{4}$ inch

San Antonio Water System Standard Specifications for Construction

copper service lines at a tee which shall be set in line with the front edge of meter boxes for $\frac{5}{8}$ inch and $\frac{3}{4}$ inch meters. A single service line with dual meters shall be installed in those new residential developments where new $\frac{5}{8}$ inch and $\frac{3}{4}$ inch meters are required and in main replacement work, where it is necessary to change the location of existing $\frac{5}{8}$ inch and $\frac{3}{4}$ inch meters. Single service line - dual meter materials and installation requirements shall conform to requirements established herein See DD824-05 Standard Drawing Series.

19. Small Service Lines on Existing Mains: The work involved in the installation of new copper service lines on existing mains shall consist of jacking, boring, tunneling, and, where authorized, open trench operations; all excavation through whatever material encountered; trench excavation protection; using the existing corporation when approved by the Inspector; tapping the existing main and installing the new corporation and setting the curb stop or angle valve at the meter; relocating the existing meter and installing a new meter box in accordance with Item No. 833, "Meter and Meter Box Installation;" abandoning the existing corporation stop, removing the existing flared nut, inserting inside the existing flared nut an appropriately-sized copper disc and replacing the existing flared nut on the corporation stop, if the main is non-ferrous, or plugging the existing service line at the main if the main is ferrous; installing the new service line at the same grade as the existing service line or at the specified grade between the main and the existing meter and its tie-in at the corporation and the curb stop; disposal of surplus excavated material; capping the tap hole with asphalt treated base including the outer limits of the main line trench and the service line trench; cutting and replacing all surfaces of whatever type encountered over the completed service line trench; restoration of the site.
20. Large Service Lines: Ductile iron pipe and cast iron fittings used for metered service lines and non-metered fire service lines larger than 2inch shall be installed in accordance with the applicable provisions of Item No. 812, "Water Main Installation," except where otherwise approved by the Engineer.
21. Large Service Lines on New Mains: Work involved in the installation of a new metered service lines and non-metered fire service lines shall consist of all excavation through whatever material encountered, trench excavation protection, installing tees, pipe and fittings of various sizes including main line and service line valves, valve boxes, ductile iron pipe, fittings, in accordance with the associated DD-824 Standard Drawing Series, and reaction block, backfilling with approved selected material,

San Antonio Water System Standard Specifications for Construction

cutting and replacing pavements, curbing, and sidewalks of all types over the limits of the main line trench and the completed ductile iron service line.

22. Large Service Lines on Existing Mains: The work involved in the installation of the new metered service lines and non-metered fire service lines shall consist of all excavation through whatever material encountered, trench excavation protection, cutting-in tees and installing tapping sleeves and valves, pipe and fittings of various sizes including main line and service valves, valves boxes, ductile iron pipe, fittings and reaction block required, backfilling with approved selected material, cutting and replacing pavements, curbing, and sidewalks of all types over the limits of the main line trench and the completed ductile iron service line.

824.4

MEASUREMENT:

1. Reconnect Short Service will be measured by the unit of the various types and sizes of each service line reconnected.
2. Relay Short Service will be measured by the unit of the various types and sizes of each service line relayed.
3. Relay Long Service will be measured by the unit of the various types and sizes of each service line relayed.
4. Relocate Short Service will be measured by the unit of the various types and sizes of each service line relocated.
5. Relocate Long Service will be measured by the unit of the various types and sizes of each service line relocated.
6. New Short Service will be measured by the unit of the various types and sizes of each new service line installed.
7. New Long Service will be measured by the unit of the various types and sizes of each new service line installed.
8. New Un-metered Short Service will be measured by the unit of the various type and sizes of each new un-metered service line installed.
9. New Un-metered Long Service will be measured by the unit of the various type and sizes of each new un-metered service line installed.

San Antonio Water System Standard Specifications for Construction

824.5 **PAYMENT:** Payment for a Reconnect will be made at the unit price for each service line of the various sizes reconnected. Such payment shall also include excavation, trench excavation protection, hauling and disposition of surplus excavated materials, sand backfill, cutting pavement and surface structures of whatever type encountered and replacement with whatever type specified, and copper tubing and fittings of the various sizes used in the service line reconnection.

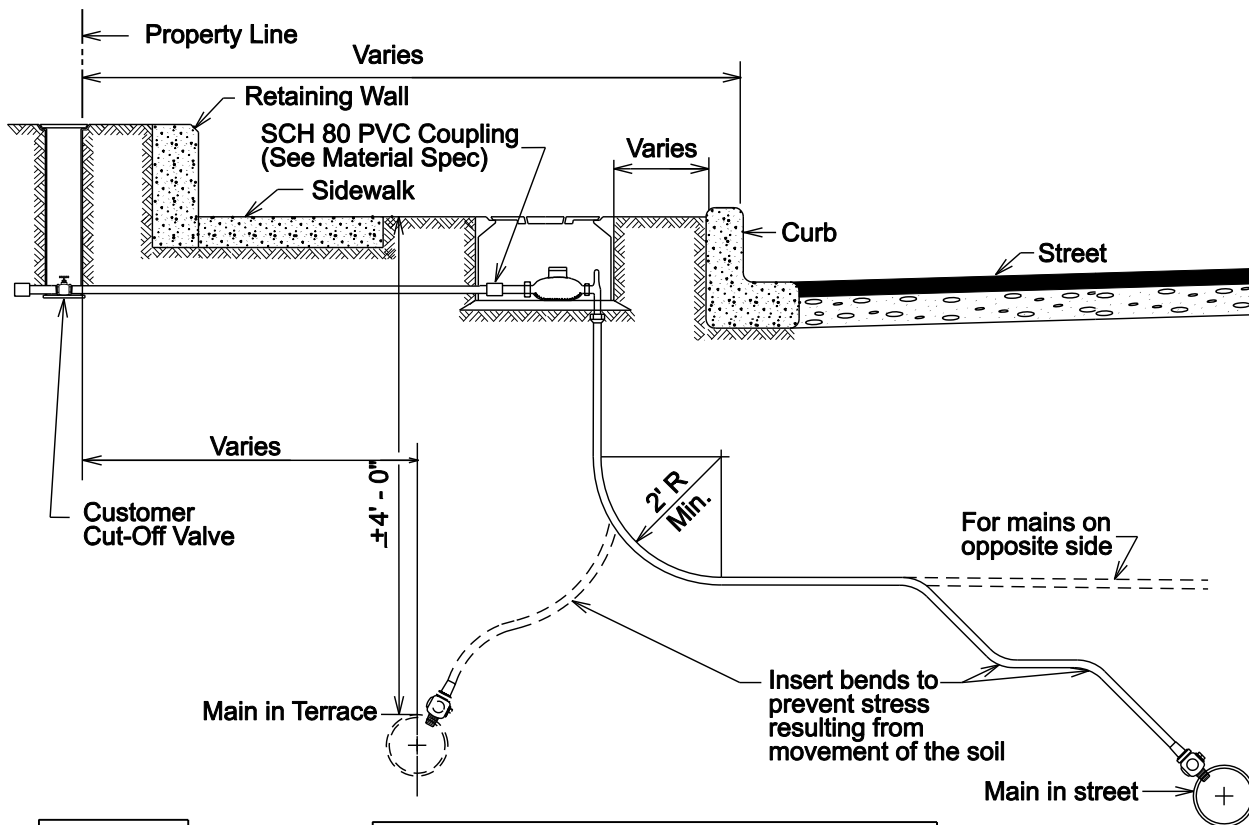
Payment for a Relay Short and Long Service will be made at the unit price for each service line of the various sizes relayed. Payment shall include reconnection of new service to the existing meter and the adjustment of the meter, meter box, and Customer valve. Such payment shall also include excavation, trench excavation protection, hauling and disposition of surplus excavated materials, sand backfill, cutting pavement and surface structures of whatever type encountered and replacement with whatever type specified, and copper tubing and fittings of the various sizes used in the service line relay.

Payment for a Relocate Short and Long Service will be made at the unit price bid for each service line of the various sizes relocated. Such payment shall also include excavation, trench excavation protection, hauling and disposition of surplus excavated materials, sand backfill, meter box relocation, cutting pavement and surface structures of whatever type encountered and replacement with whatever type specified, and copper tubing and fittings of the various sizes used in the service line relocation.

Payment for a New Short and Long Service will be made at the unit price bid for each new service line of the various sizes installed. Such payment shall also include excavated materials, trench excavation protection, sand backfill, cutting pavement and surface structures of whatever type encountered and replacement with whatever type specified, meter box, meter template, copper tubing and fittings of the various sizes used in the new service line installation.

Payment for a New Unmetered Short and New Unmetered Long Service will be made at the unit price bid for each new unmetered service line of the various sizes installed. Such payment shall also include excavated materials, trench excavation protection, sand backfill, cutting in pavement and surface structures of whatever type encountered and replacement with whatever type specified, meter box, meter template, copper tubing and fittings, of the various sizes used in the new unmetered service line installation.

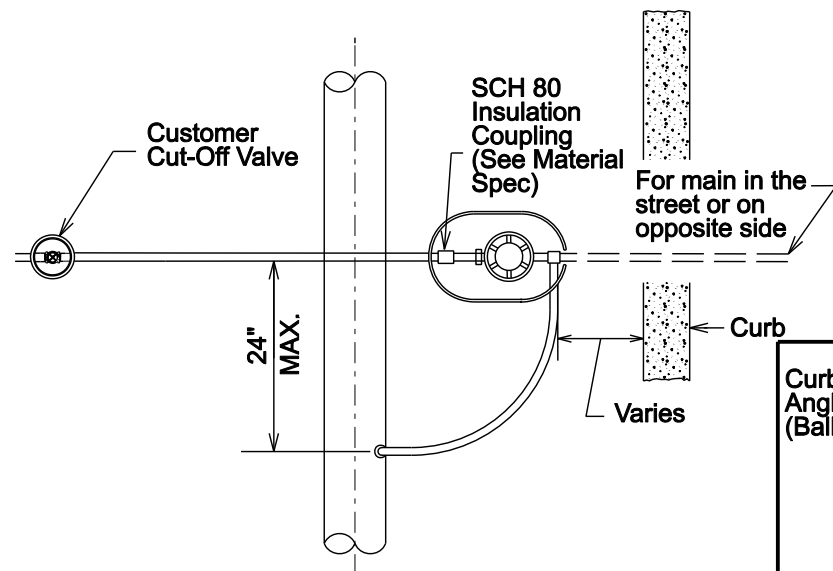
- End of Specification -



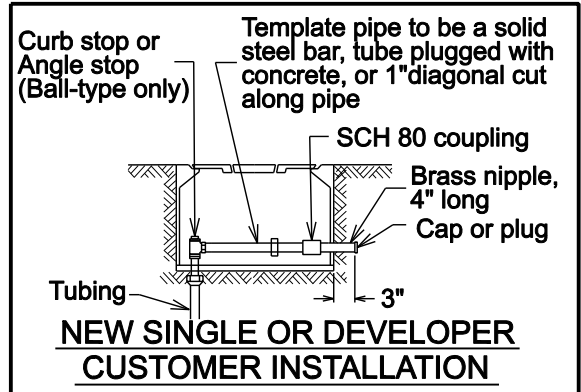
Insulation
Coupling
Component
579 - 3/4"
1580 - 1"

METER / METER BOX SCHEDULE	
Meter Size	Meter Box
5/8", 3/4" & 1"	C.I. Oval, SAWS Material Specification 10-30

Note:
See Tapping Schedule
DD-824-01 Sheet 3 of 3



IMPROVED STREET
5/8" THRU 1" SERVICE



**NEW SINGLE OR DEVELOPER
CUSTOMER INSTALLATION**

PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

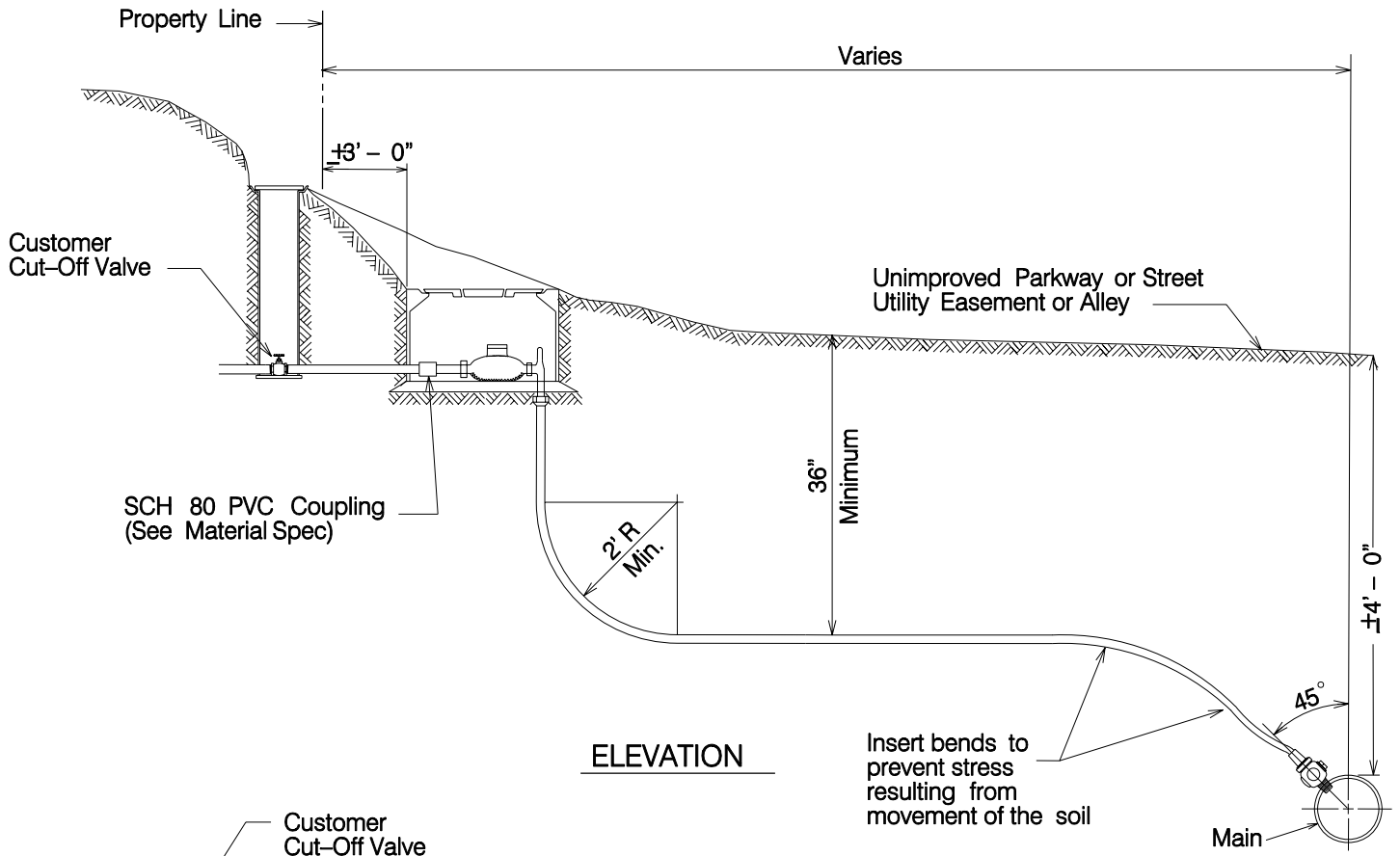
**COPPER
SERVICE INSTALLATION
MAIN IN TERRACE**

APPROVED
MARCH 2008

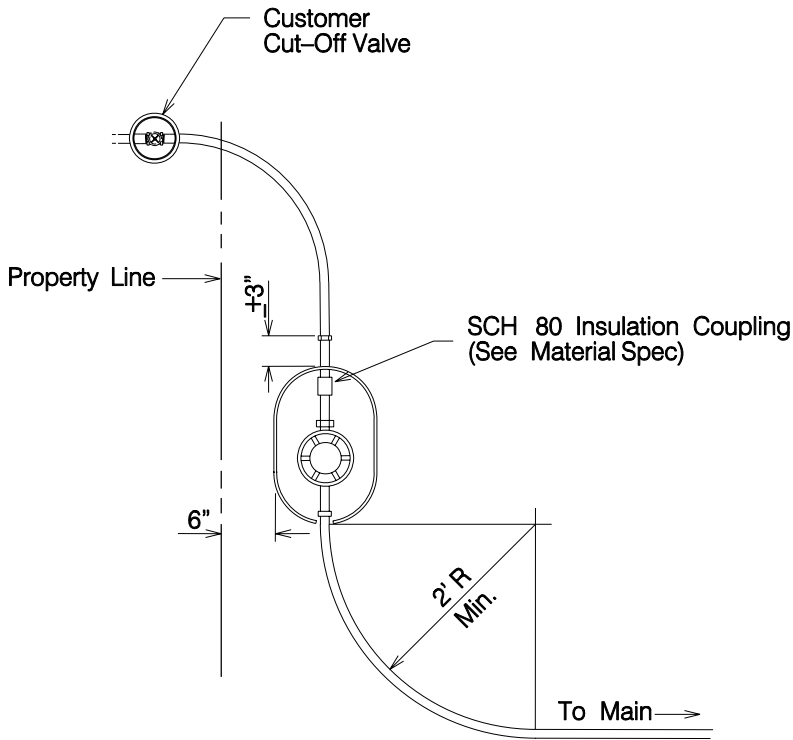
REVISED
APRIL 2014

DD-824-01

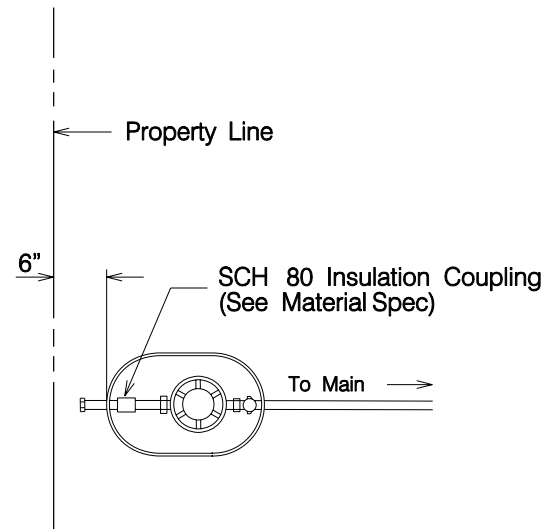
SHEET
1 OF **3**



ELEVATION



PARTIAL PLAN



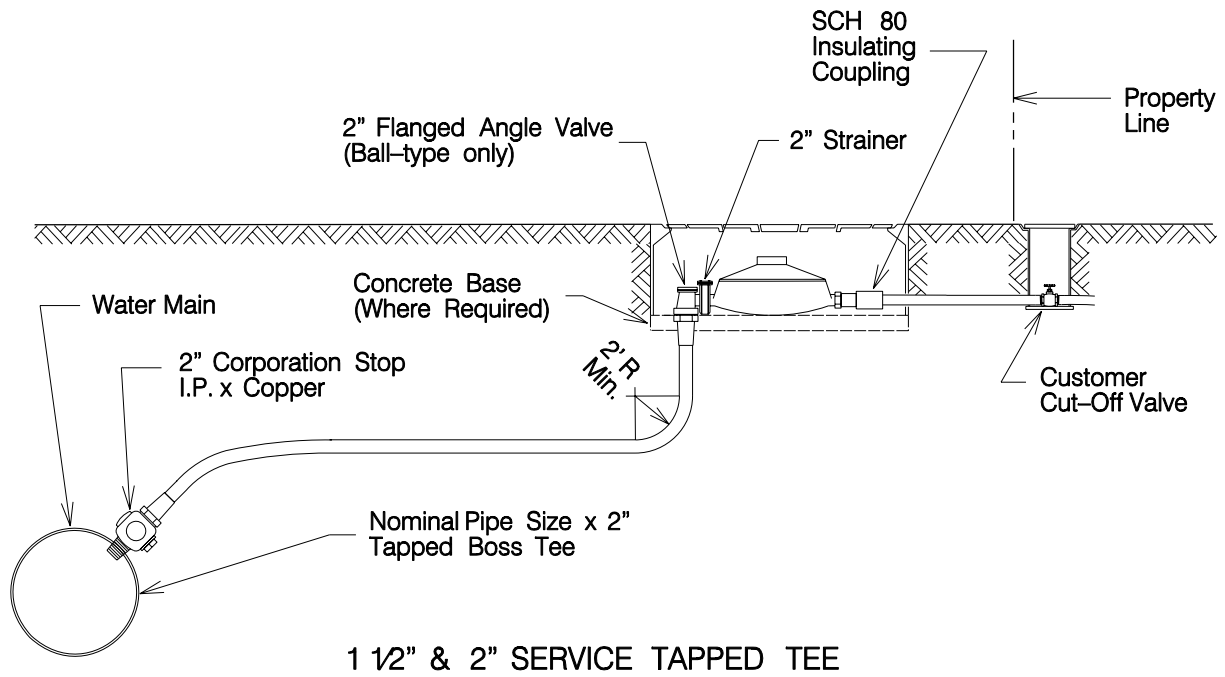
PARTIAL PLAN

UNIMPROVED STREET
58" THRU 1" SERVICE

PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	COPPER SERVICE INSTALLATION UNIMPROVED STREET	APPROVED	REVISED
		March 2008	
		DD-824-01	
		SHEET 2 OF 3	

PIPE TAPPING SCHEDULE

PIPE DIAMETER	SERVICE SIZE			
	3/4"	1"	1 1/2"	2"
6" A.C.	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle
6" C.I. or D.I.	Tap	Tap	Tap With Service Saddle	Tap With Service Saddle
8" A.C.	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle
8" C.I. or D.I.	Tap	Tap	Tap With Service Saddle	Tap With Service Saddle
8" PVC	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle
10" A.C.	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle
10" C.I. or D.I.	Tap	Tap	Tap With Service Saddle	Tap With Service Saddle
10" PVC	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle
12" A.C.	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle
12" C.I. or D.I.	Tap	Tap	Tap With Service Saddle	Tap With Service Saddle
12" PVC	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle
16" A.C.	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle
16" C.I. or D.I.	Tap	Tap	Tap With Service Saddle	Tap With Service Saddle



Note:
For direct tap to main, see Tapping Schedule

PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

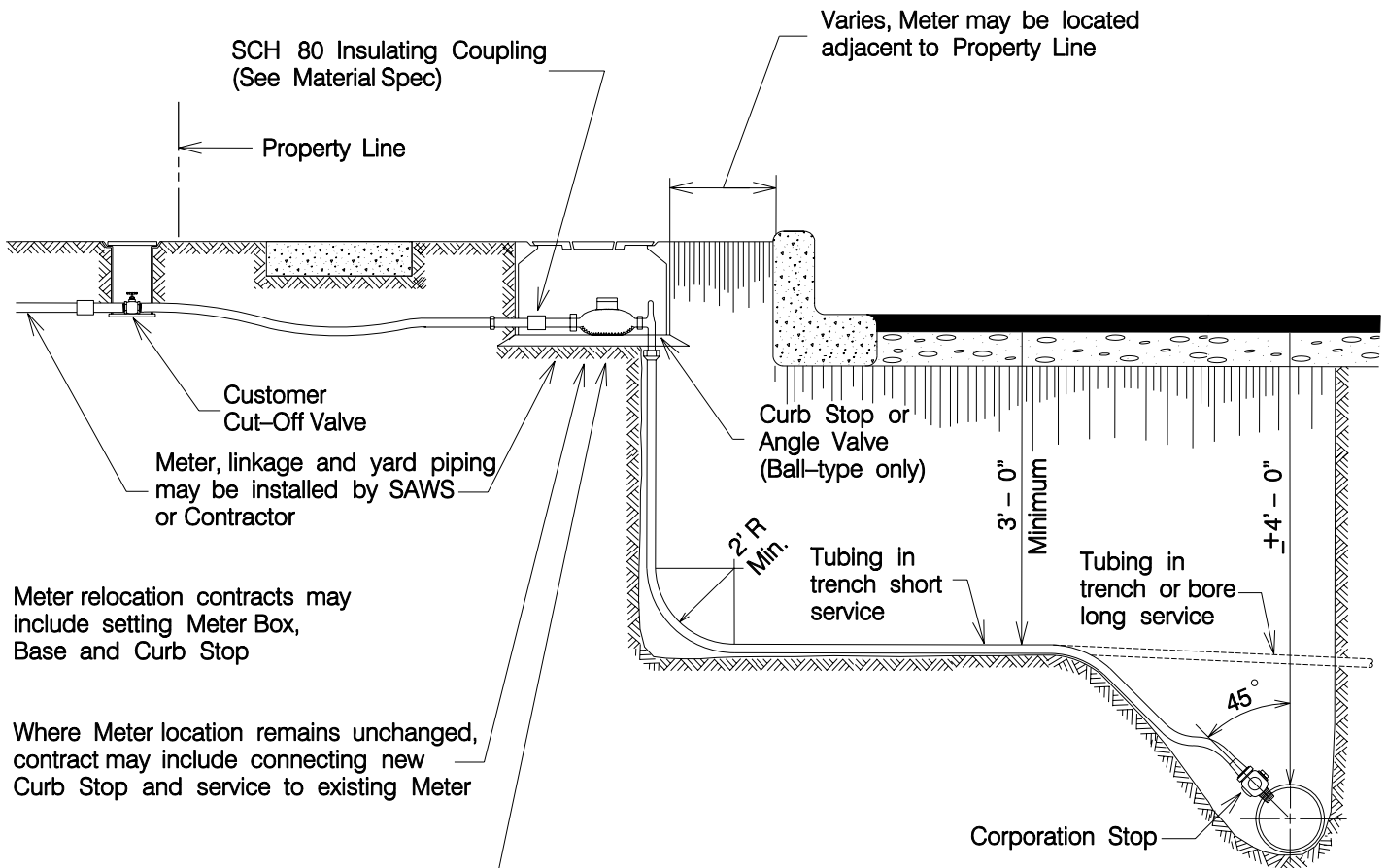
**COPPER
SERVICE INSTALLATION
TAPPING SCHEDULE**

APPROVED
March 2008

REVISED

DD-824-01

SHEET
3 OF 3



Meter relocation contracts may include setting Meter Box, Base and Curb Stop

Where Meter location remains unchanged, contract may include connecting new Curb Stop and service to existing Meter

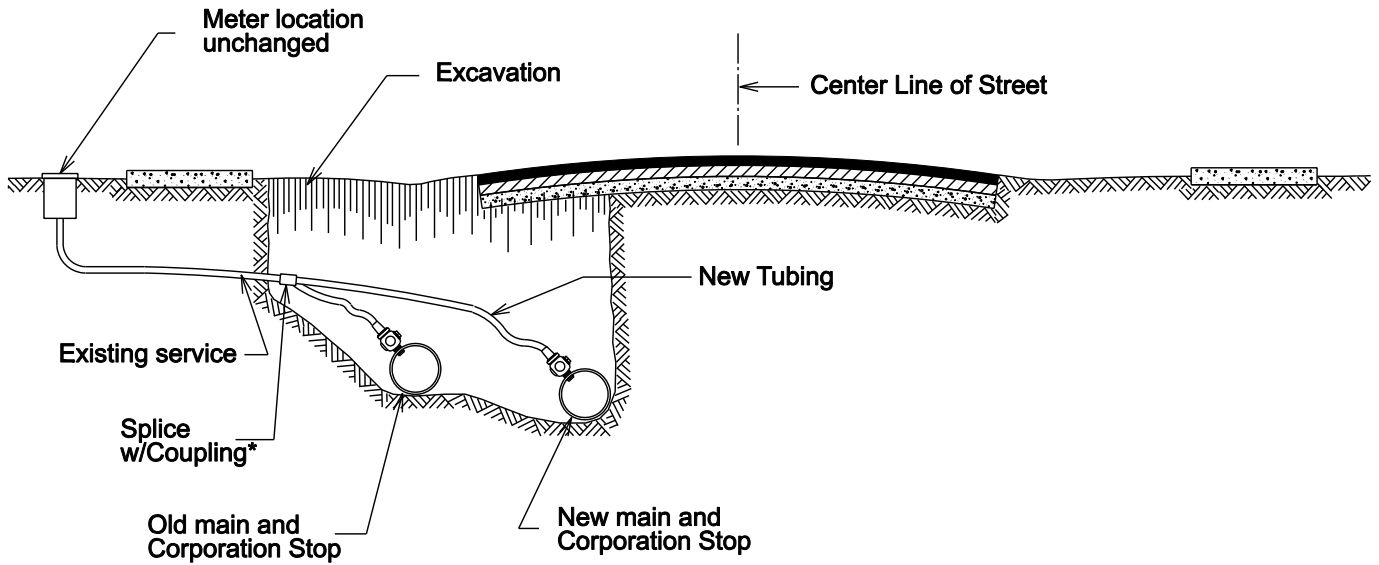
On new single or developer customer installations, See DD-824-01 Sheet 1 of 3

Note:
See Tapping Schedule
DD-824-01 Sheet 3 of 3

SERVICE RELAY, SERVICE AND
METER RELOCATION

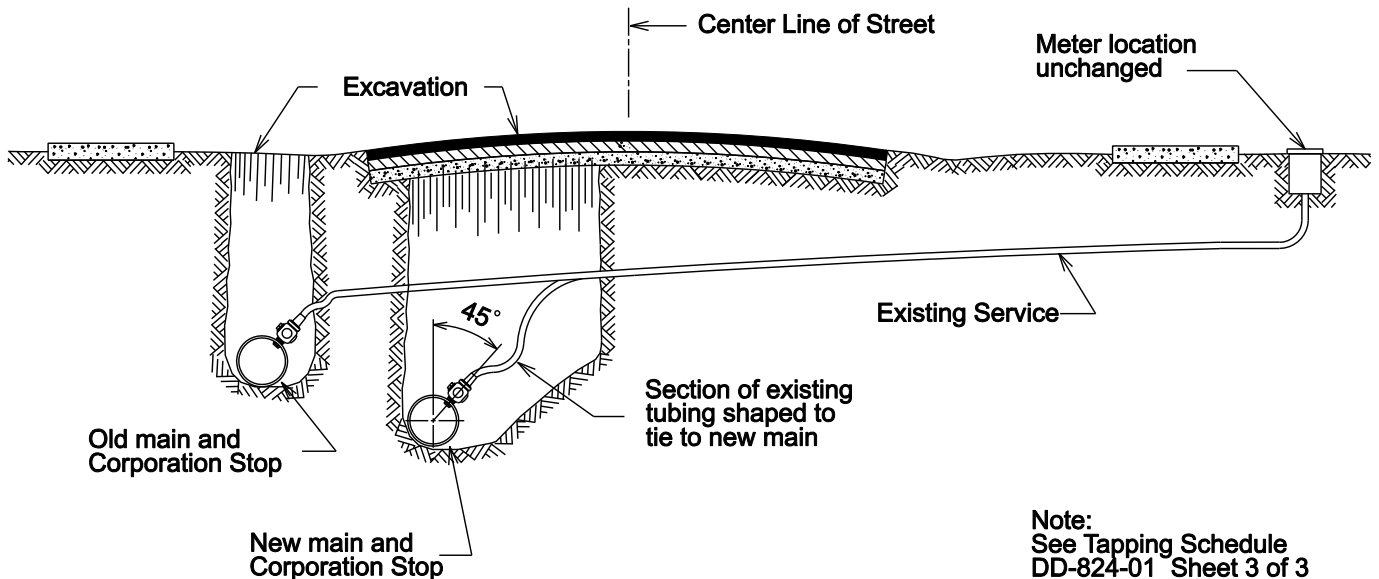
PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	SERVICE RELAY, SERVICE RELOCATION 3/4" THRU 2"	APPROVED	REVISED
		March 2008	
DD-824-02			SHEET 1 OF 1

* No splicing shall be accepted where the service line occurs under any pavement or impervious cover.



Note:
Sections are representative of curbed street also, except meter near curb.

**SHORT RECONNECTION BETWEEN
OLD AND NEW MAINS, SAME SIDE
METER ON SAME SIDE**



Note:
See Tapping Schedule
DD-824-01 Sheet 3 of 3

**LONG RECONNECTION BETWEEN
OLD AND NEW MAINS, SAME SIDE
METER ON OPPOSITE SIDE**

PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

SERVICE RECONNECTION
3/4" THRU 2"

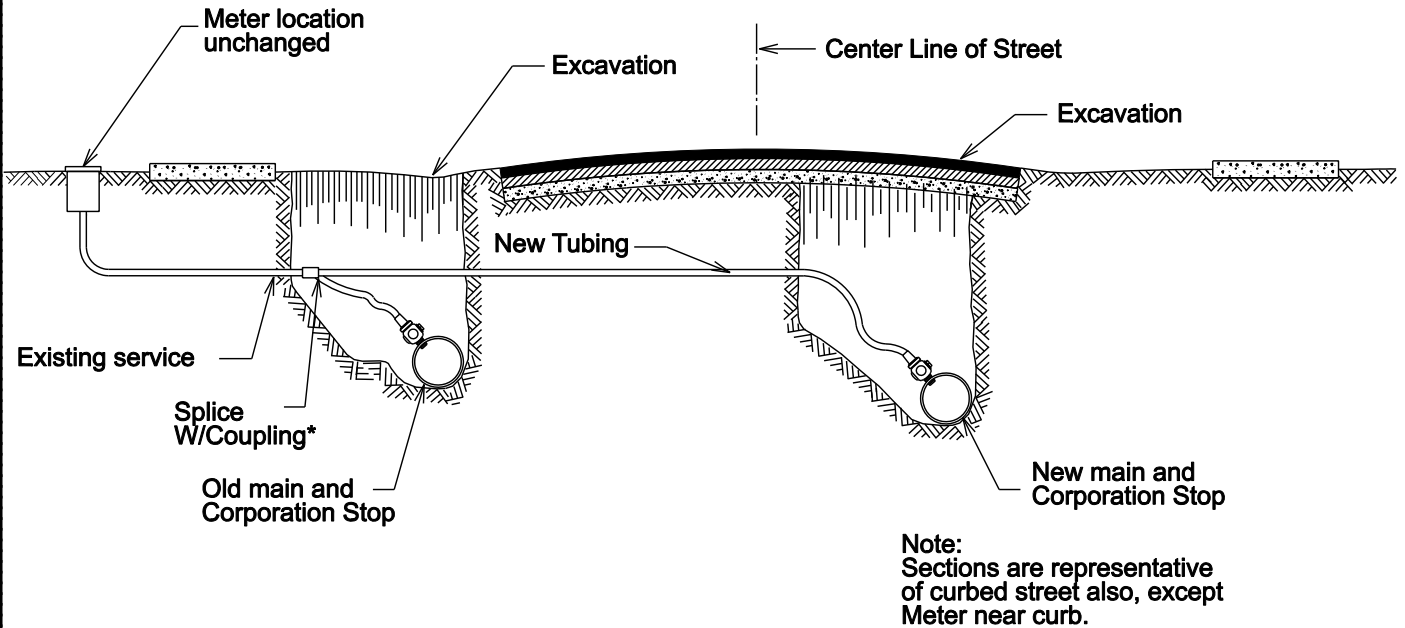
APPROVED
MARCH 2008

REVISED
APRIL 2014

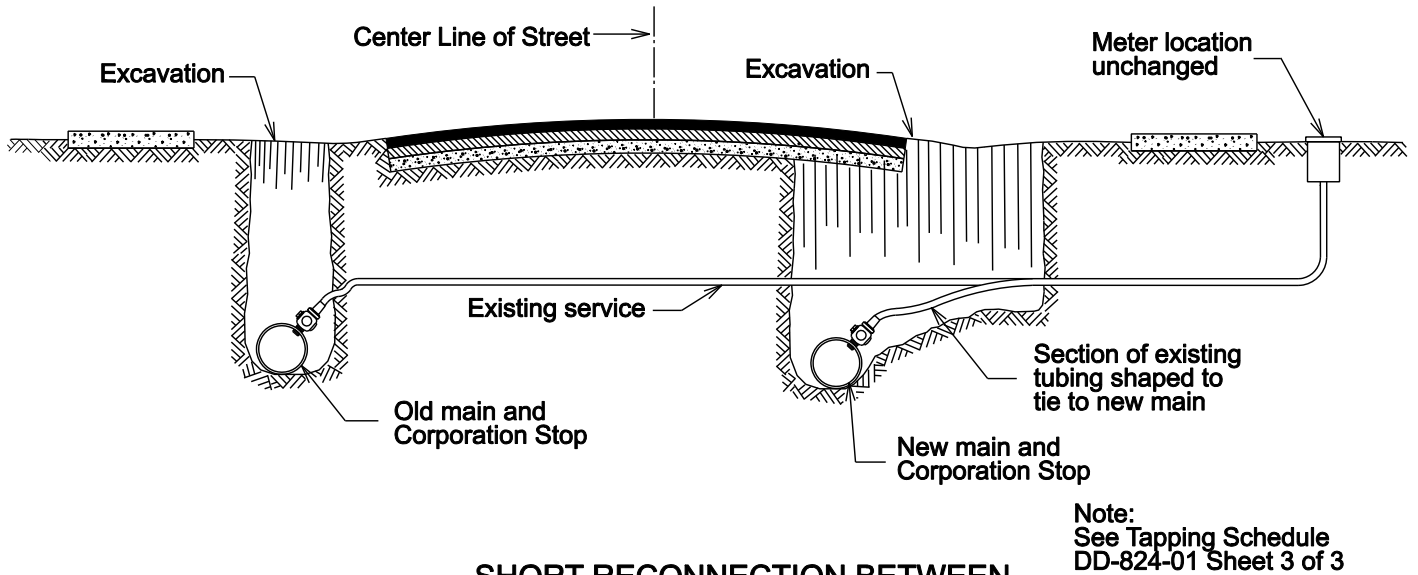
DD-824-03

SHEET
1 OF 2

* No splicing shall be accepted where the service line occurs under any pavement or impervious cover.



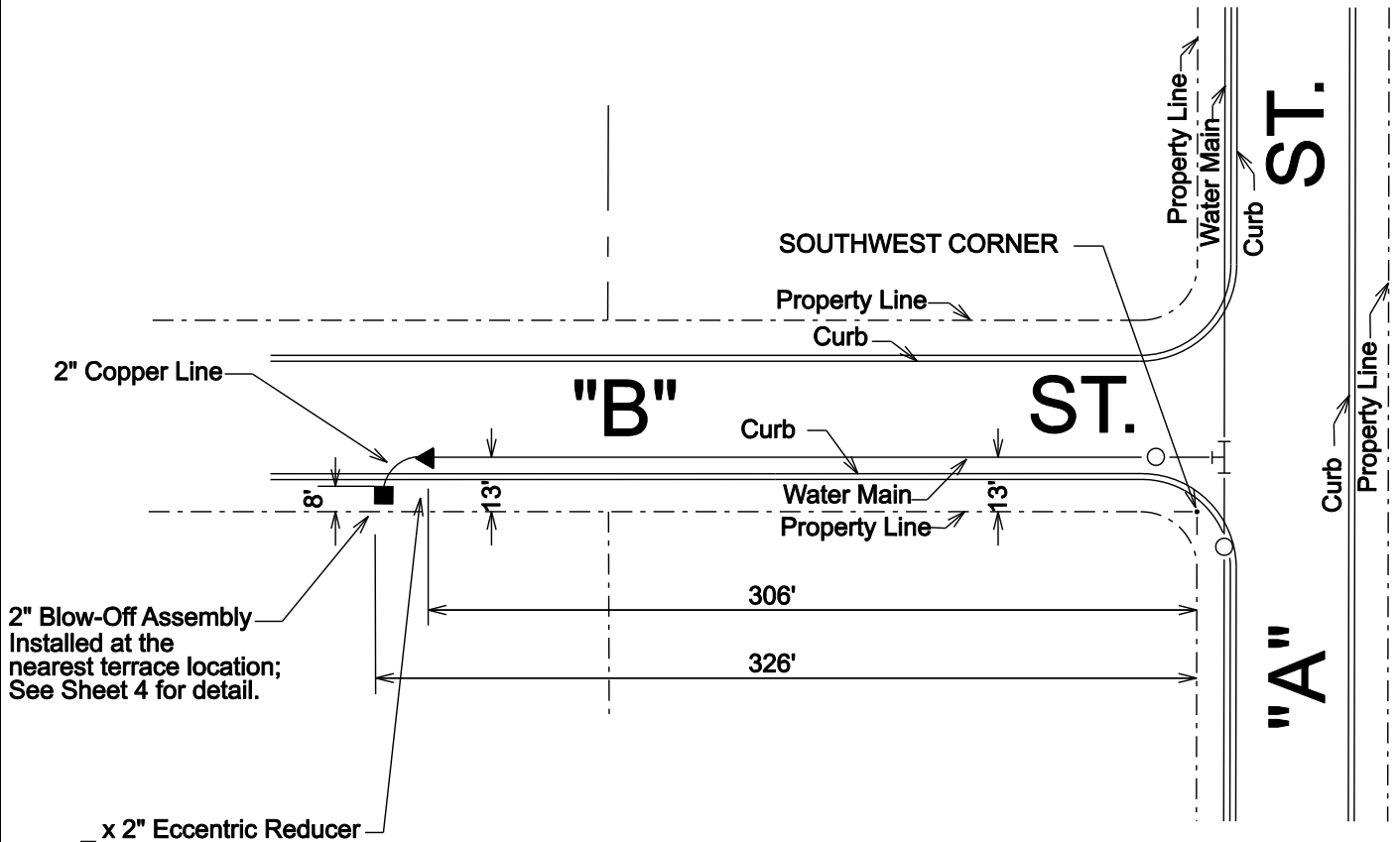
**LONG RECONNECTION BETWEEN
OLD MAIN AND METER ON OPPOSITE SIDE
OF STREET FROM NEW MAIN**



**SHORT RECONNECTION BETWEEN
NEW MAIN AND METER ON OPPOSITE
SIDE OF STREET FROM OLD MAIN**

Note:
See Tapping Schedule
DD-824-01 Sheet 3 of 3

PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	SERVICE RECONNECTION 3/4" THRU 2"	APPROVED	REVISED
		MARCH 2008	APRIL 2014
		DD-824-03	SHEET 2 OF 2



2" Blow-Off Assembly
Installed at the
nearest terrace location;
See Sheet 4 for detail.

_ x 2" Eccentric Reducer

BLOW-OFF MEASUREMENT: From the Southwest Corner of "A" St. and "B" St. West 306' and North 13' to Eccentric Reducer, and West 326' and South 8' to Blow-Off Assembly Box.

PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

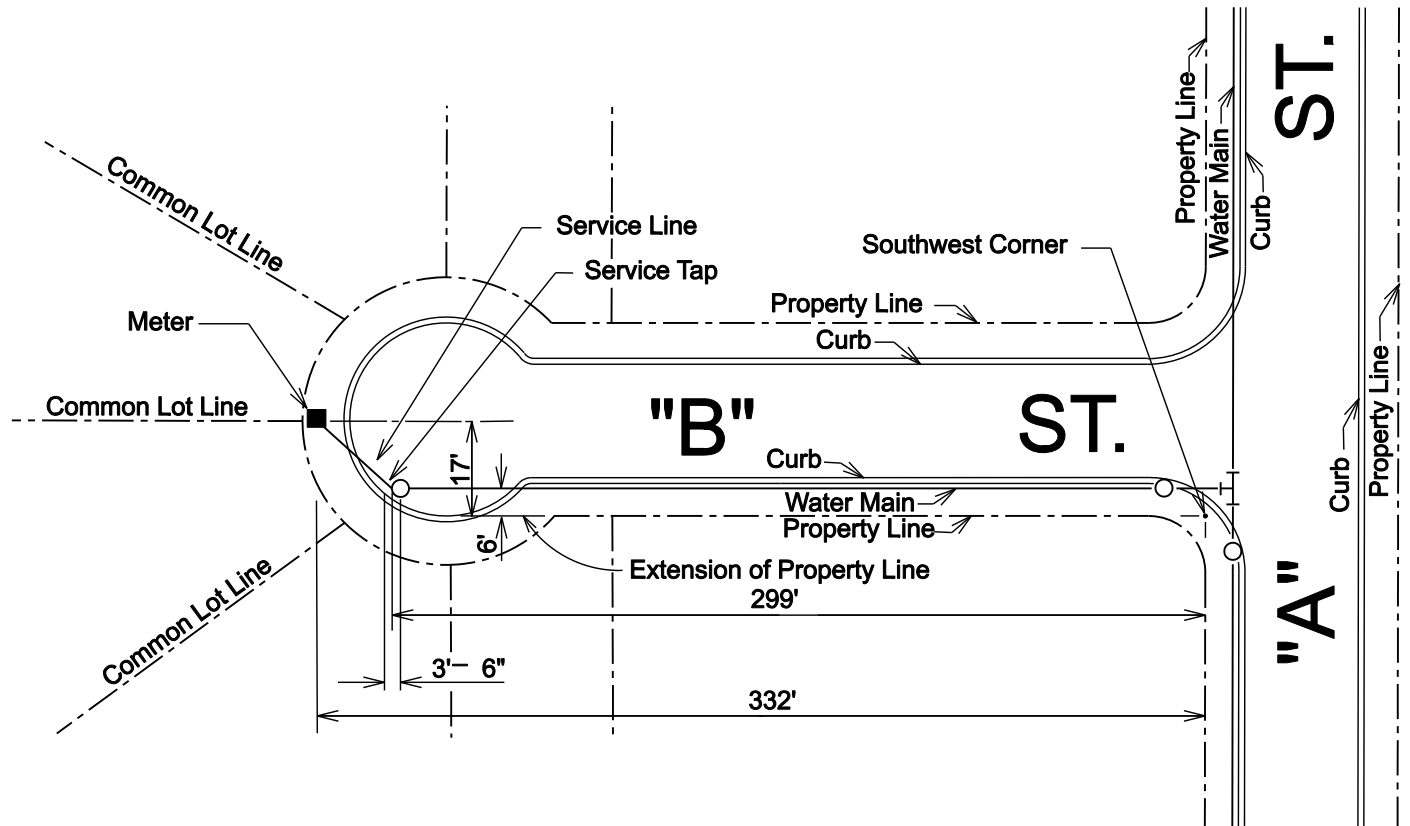
**TYPICAL BLOW-OFF
ARRANGEMENT ON
DEAD END MAINS**

APPROVED
MARCH 2008

REVISED
APRIL 2014

DD-824-04

SHEET
1 OF 5



SERVICE MEASUREMENT: From the Southwest Corner of "A" St. and "B" St. West 299' and North 6' to Tap, and West 332' and North 17' to Meter

PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

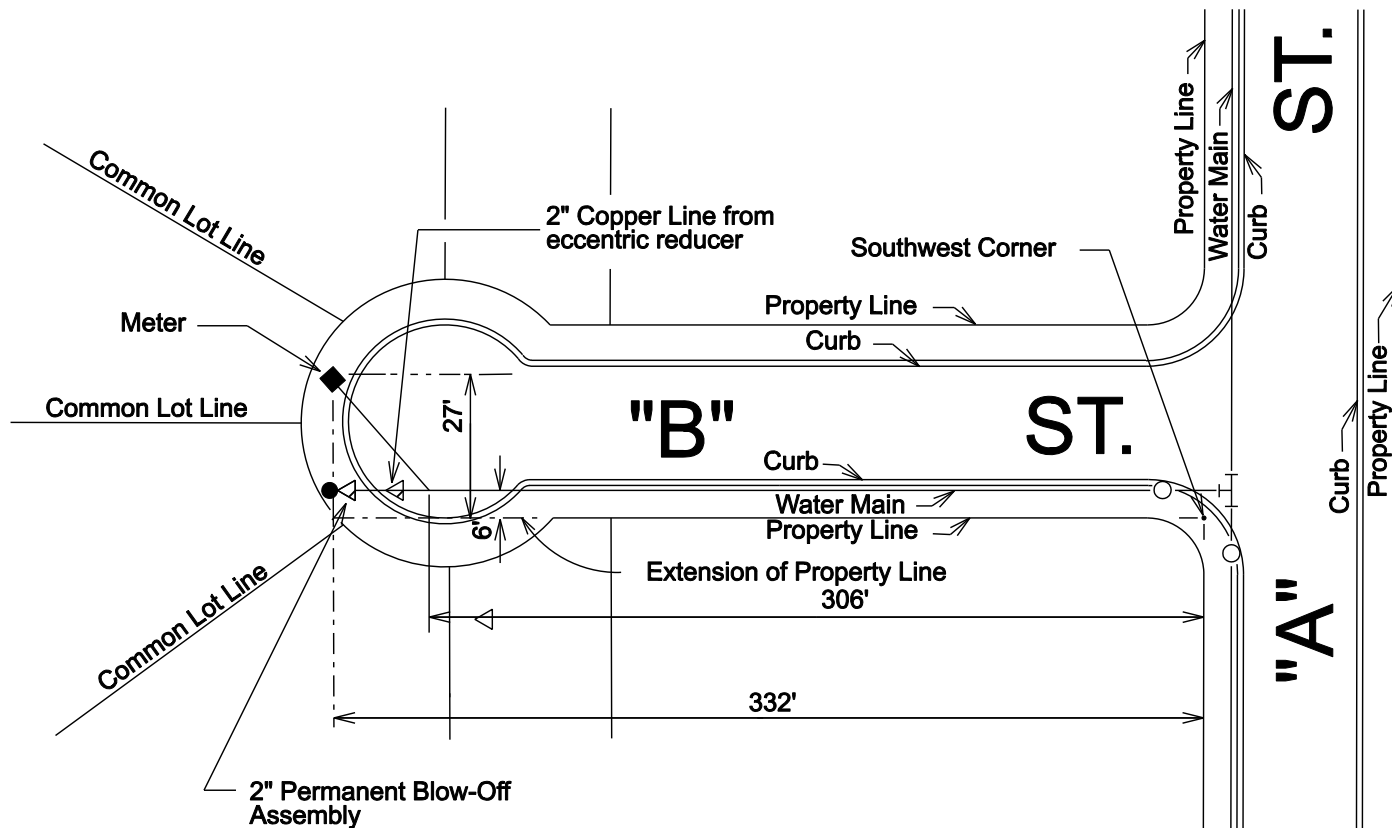
TYPICAL SERVICE
ARRANGEMENT IN
CUL-DE-SAC

APPROVED
MARCH 2008

REVISED
APRIL 2014

DD-824-04

SHEET
3 OF 5



BLOW OFF MEASUREMENT:

From the Southwest Corner of "A" St. and "B" St. West 306' and North 6' to end, of eccentric reducer, and West 332' and North 27' to assembly box.

PROPERTY OF
SAN ANTONIO WATER SYSTEM
 SAN ANTONIO, TEXAS

**TYPICAL 2" BLOW-OFF
 ARRANGEMENT ON
 DEAD END MAINS**

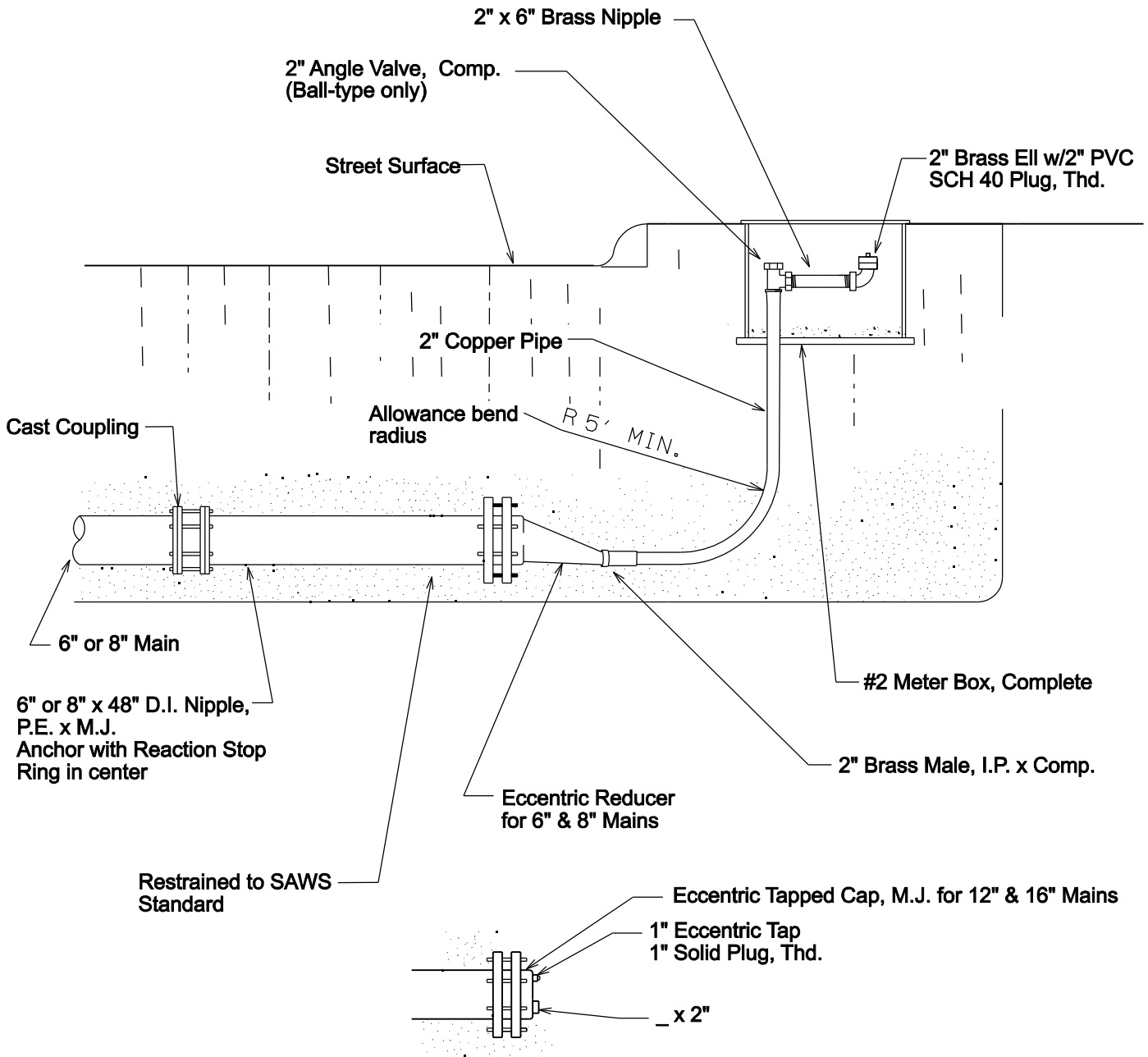
APPROVED
 MARCH 2008

REVISED
 APRIL 2014

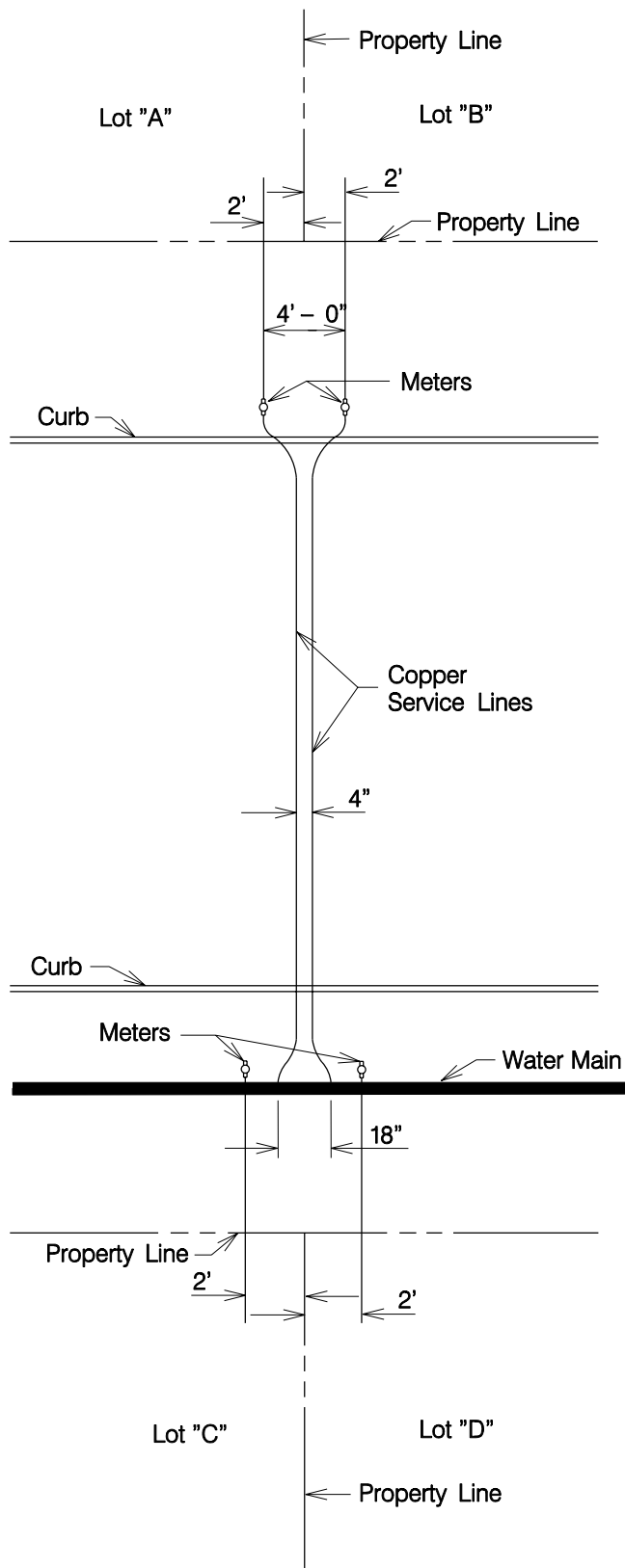
DD-824-04

SHEET
4 OF **5**

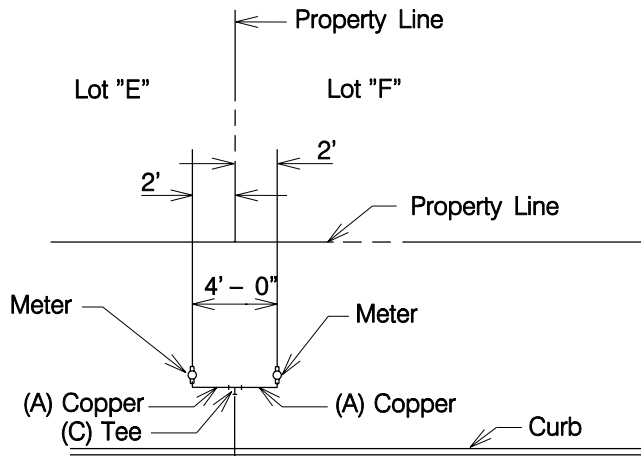
Notes:
 All ferrous metal surfaces
 in accordance with Item No. 814.



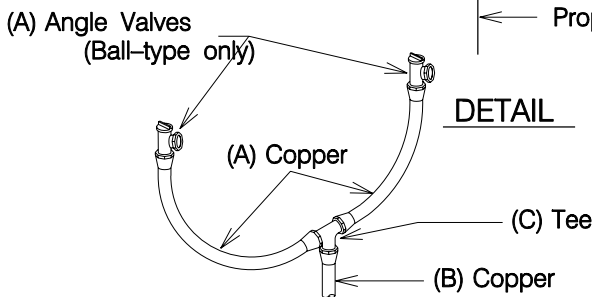
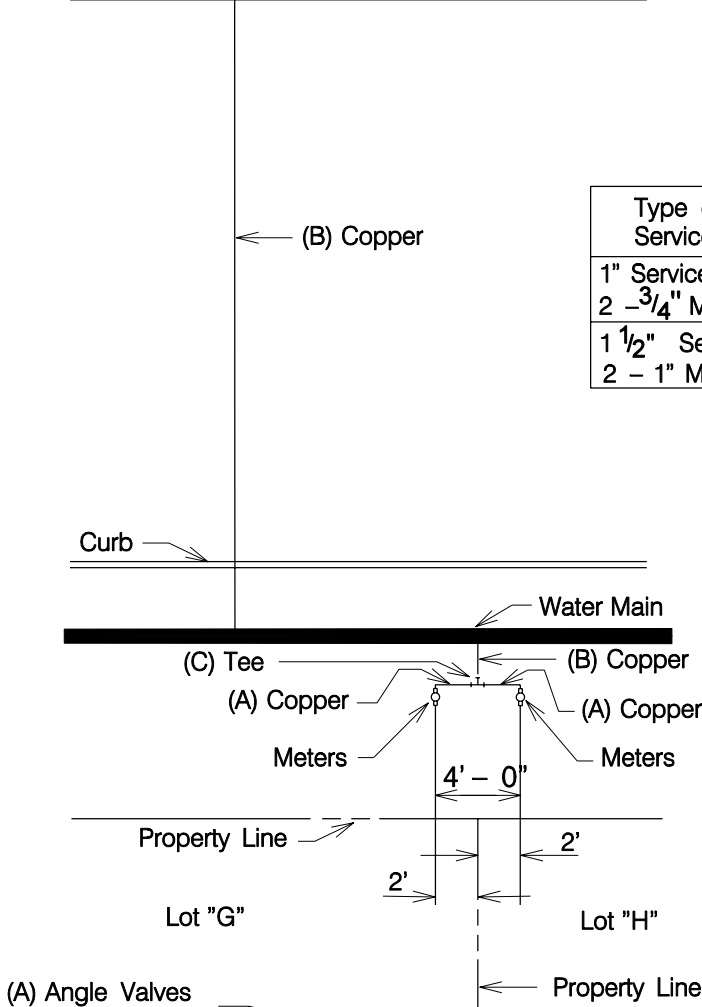
PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	2" PERMANENT BLOW-OFF ASSEMBLY	APPROVED	REVISED
		MARCH 2008	APRIL 2014
		DD-824-04	



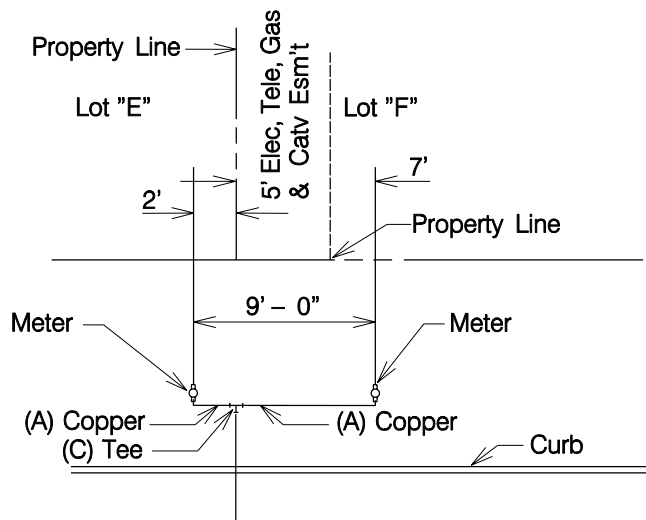
SINGLE SERVICE LINE – SINGLE METER



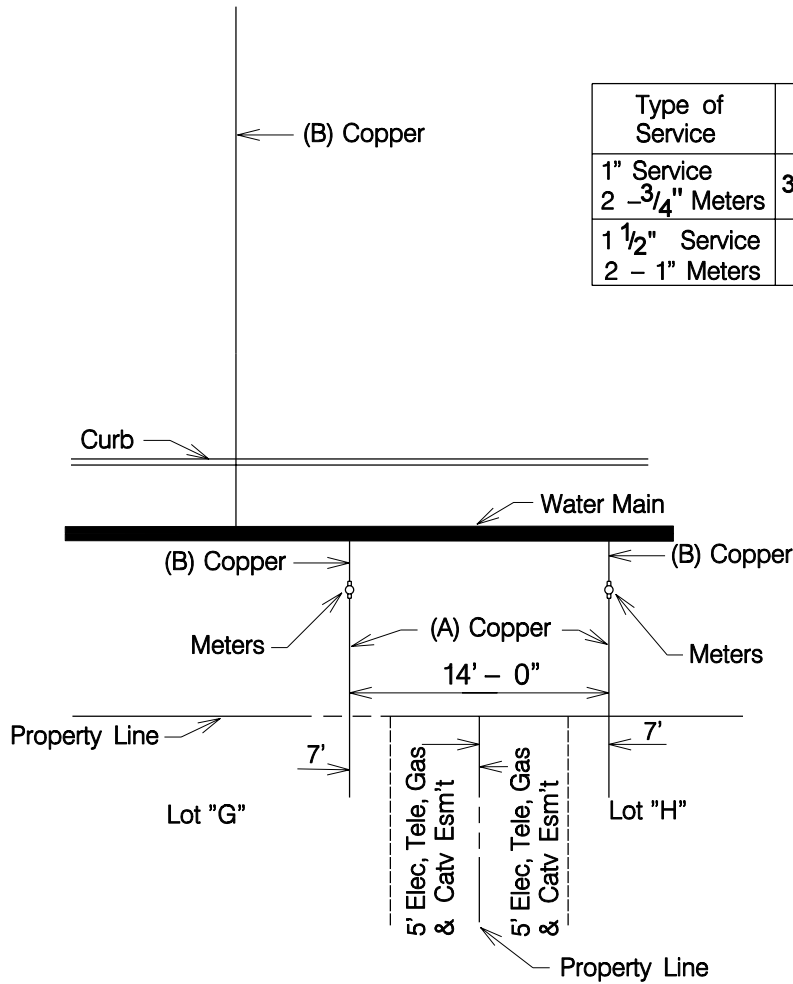
Type of Service	A	B	C
1" Service 2 - 3/4" Meters	3/4"	1"	3/4" x 3/4" x 1"
1 1/2" Service 2 - 1" Meters	1"	1 1/2"	1" x 1" x 1 1/2"



SINGLE SERVICE LINE - DUAL METER

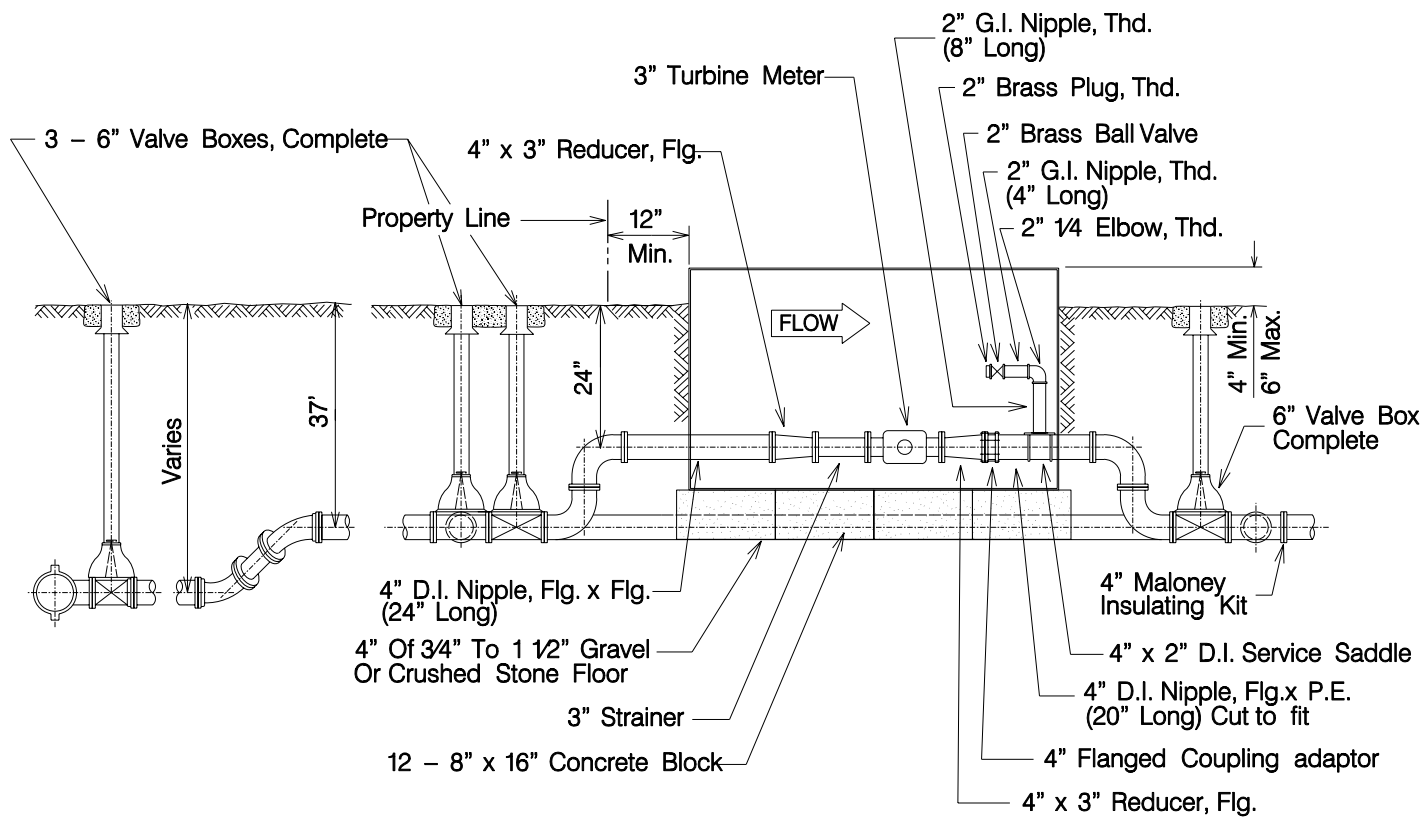
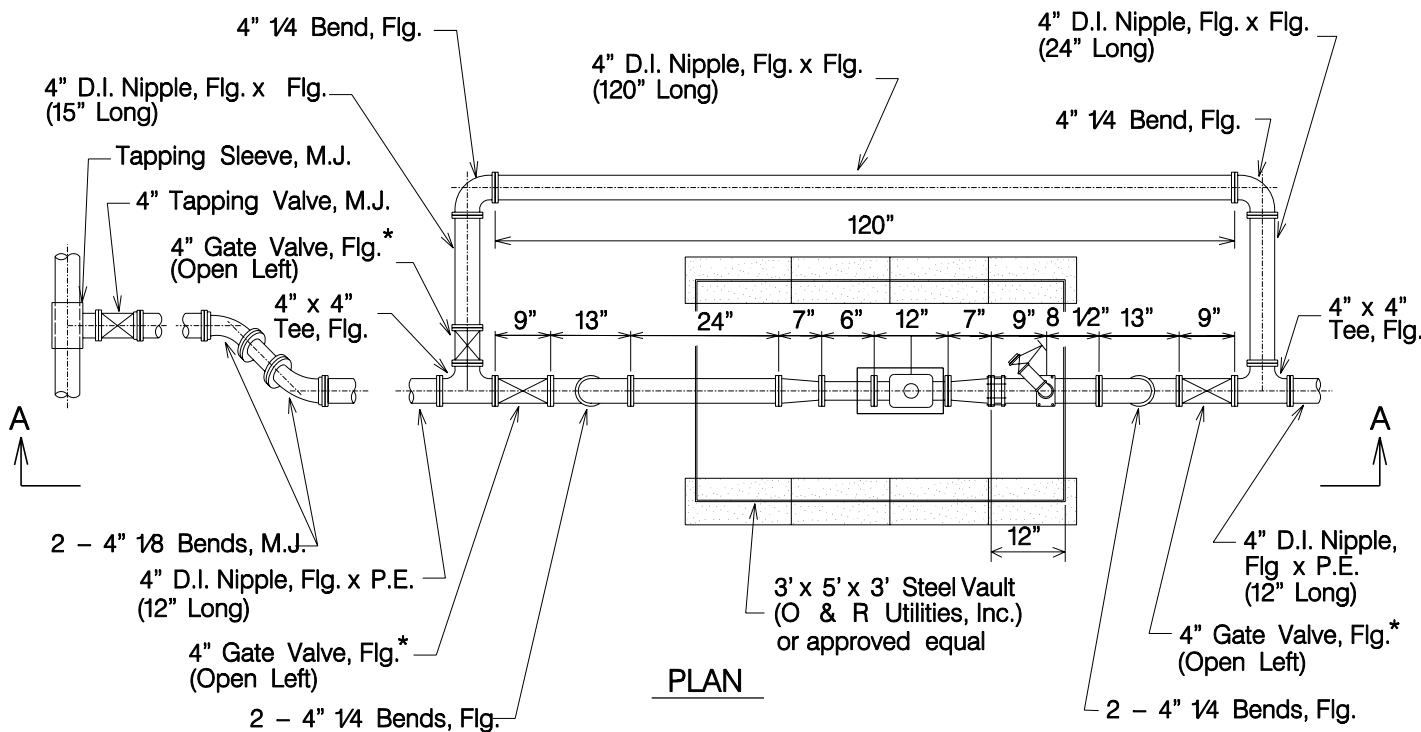


SINGLE SERVICE LINE - DUAL METER W/EASEMENT



Type of Service	A	B	C
1" Service 2 - 3/4" Meters	3/4"	1"	3/4" x 3/4" x 1"
1 1/2" Service 2 - 1" Meters	1"	1 1/2"	1" x 1" x 1 1/2"

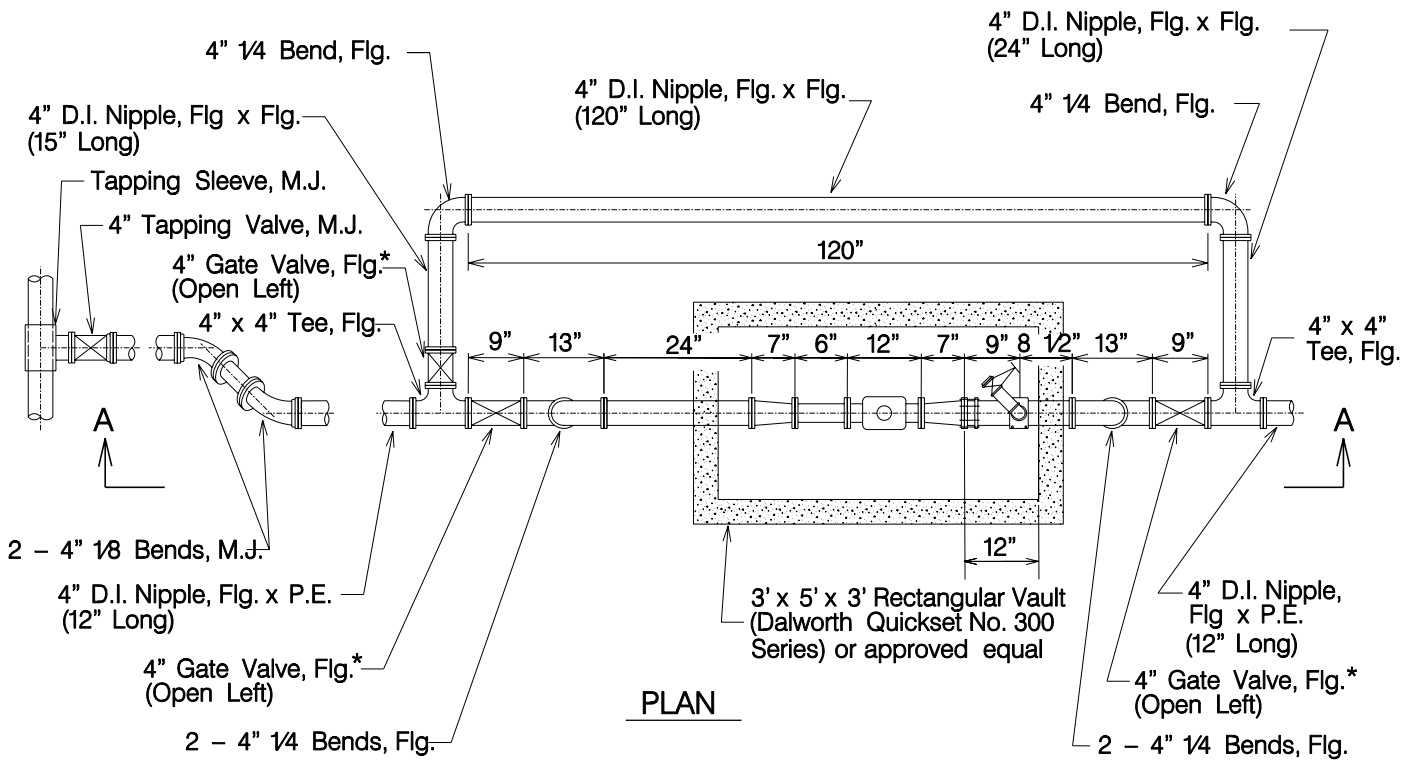
SINGLE SERVICE LINE W/EASEMENT



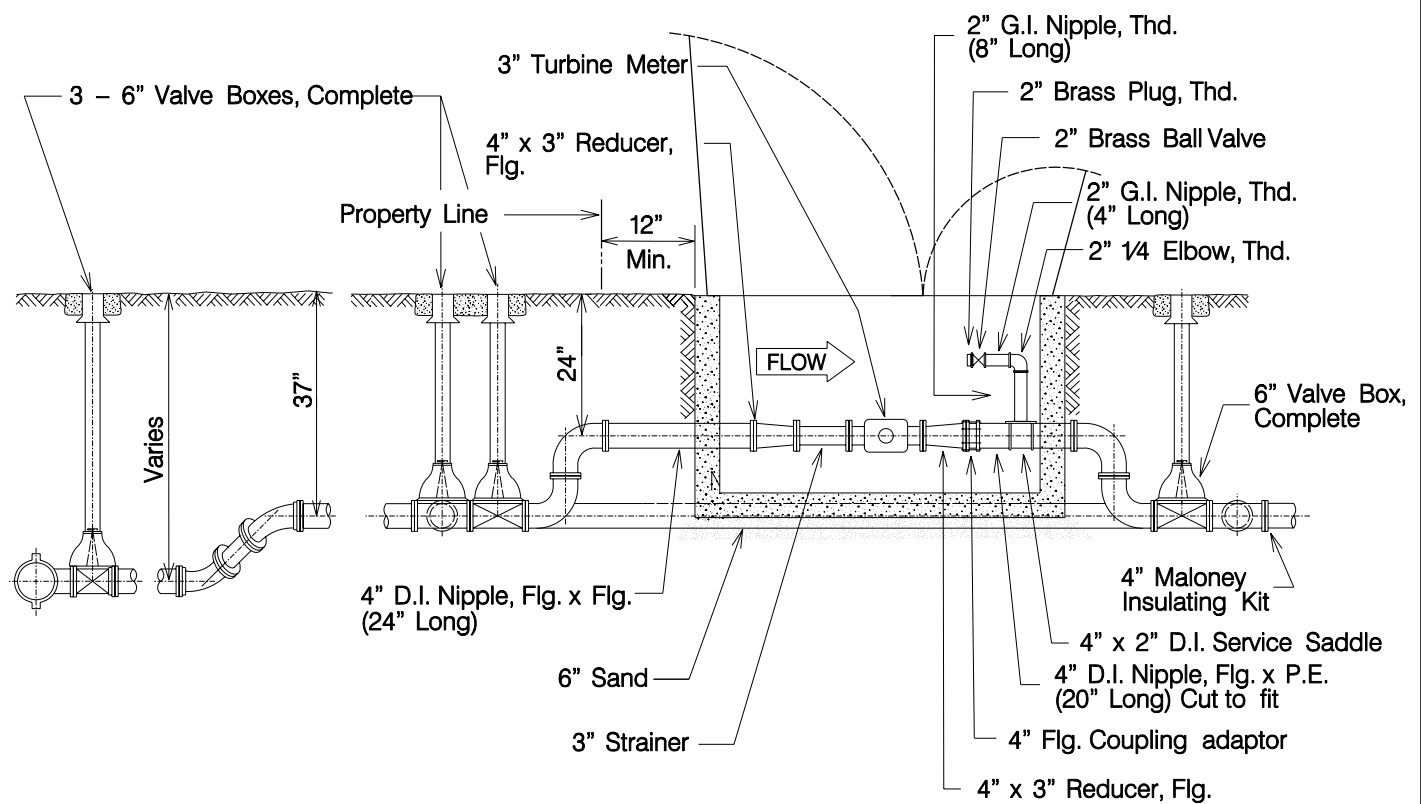
**3' x 5' x 3' STEEL VAULT
(NON-TRAFFIC BEARING LOCATION)**

* Resilient Seat

PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	3" TURBINE METER INSTALLATION	APPROVED	REVISED
		March 2008	
		DD-824-06	
		SHEET 1 OF 2	



PLAN

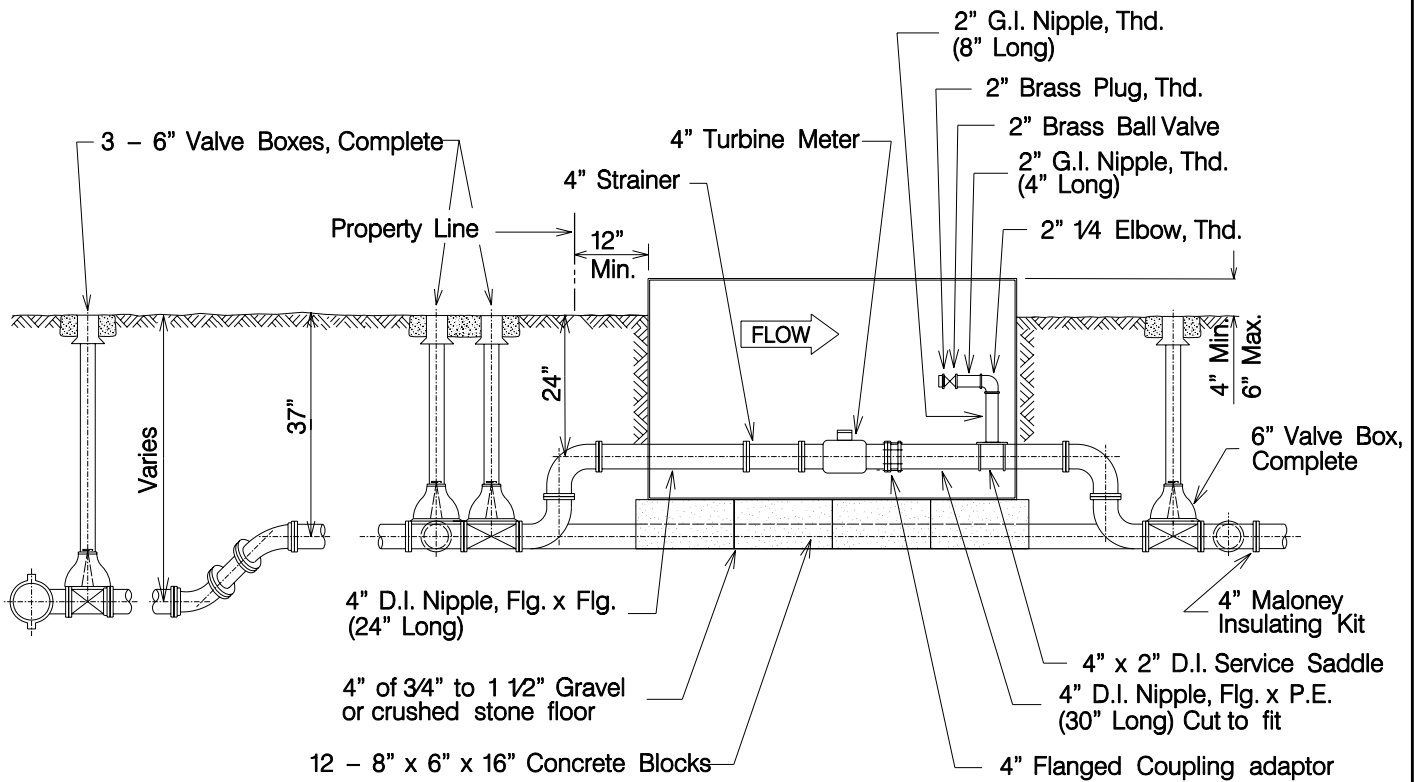
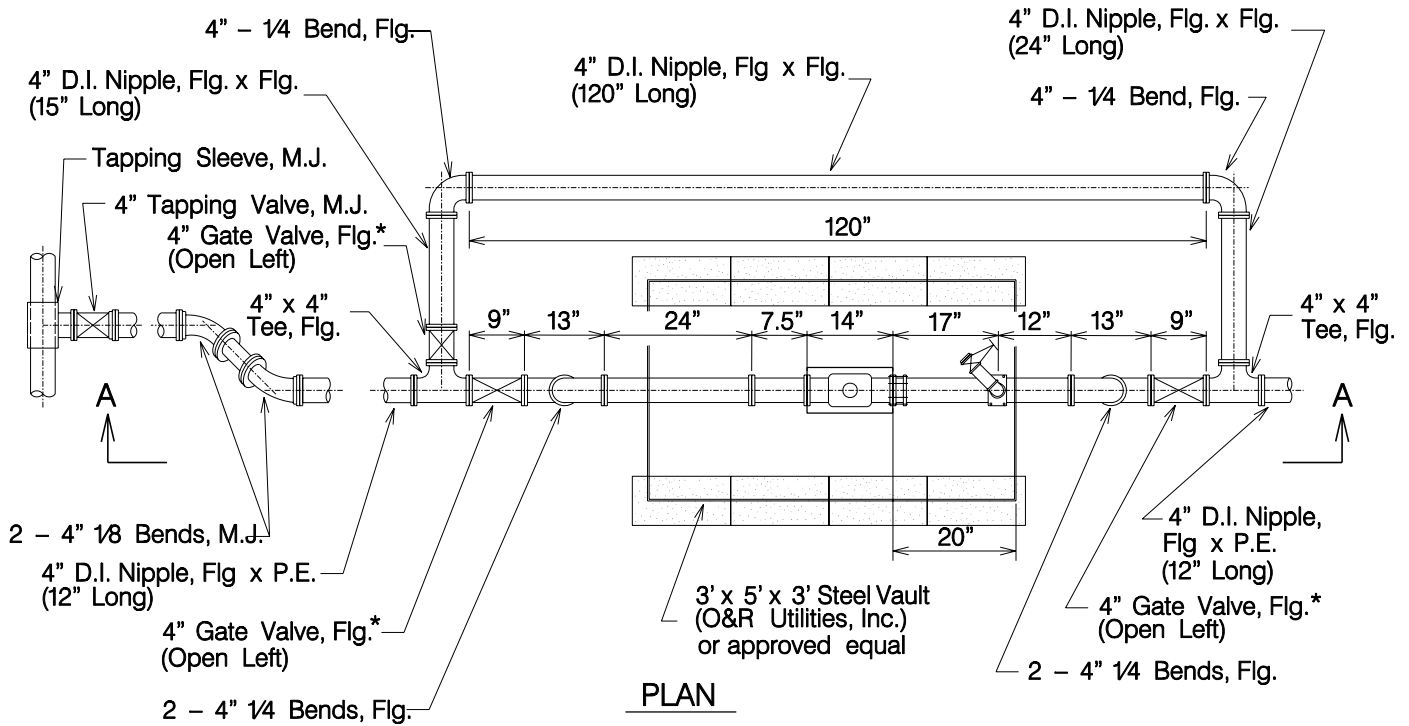


SECTION A-A

**3' x 5' x 3' RECTANGULAR CONCRETE VAULT
(TRAFFIC BEARING LOCATION)**

* Resilient Seat

PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	3" TURBINE METER INSTALLATION	APPROVED	REVISED
		March 2008	
		DD-824-06	
		SHEET 2 OF 2	



**3' x 5' x 3' STEEL VAULT
(NON-TRAFFIC BEARING LOCATION)**

* Resilient Seat

PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

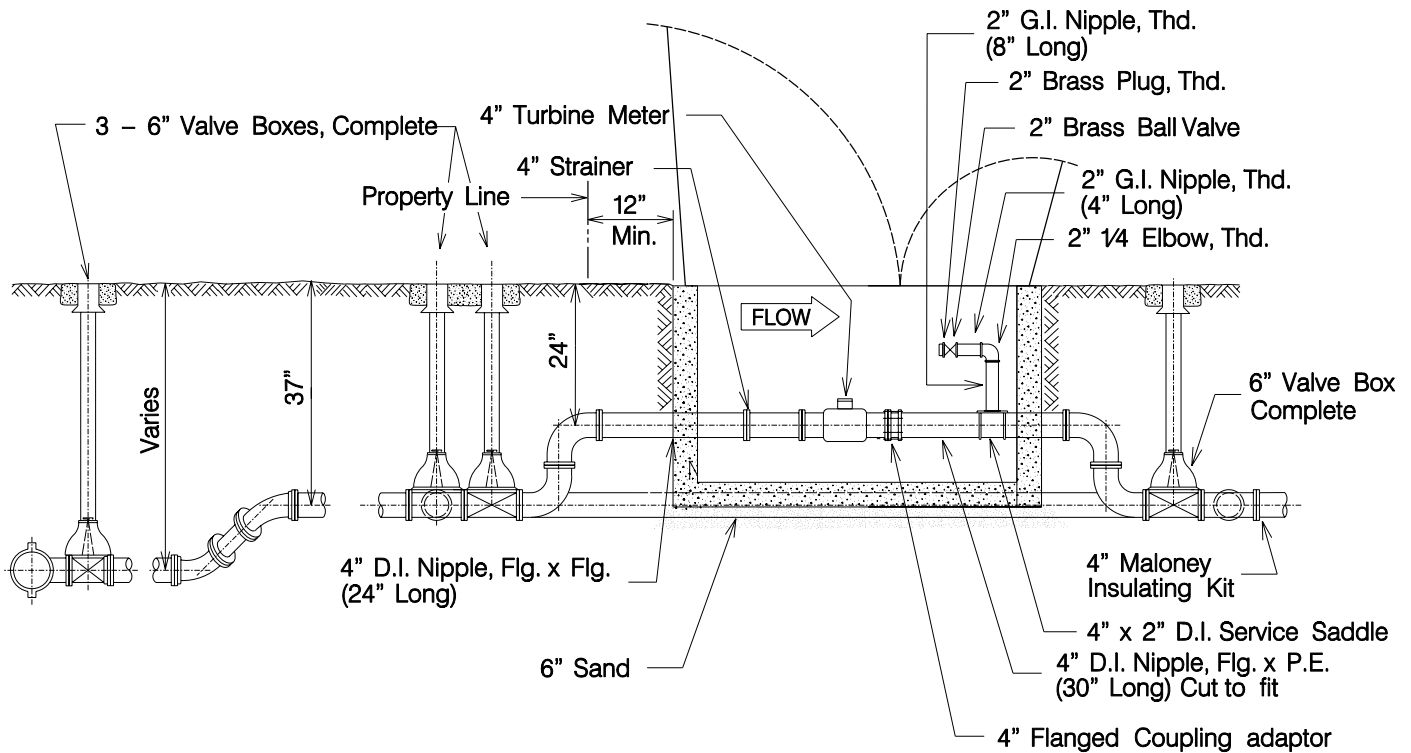
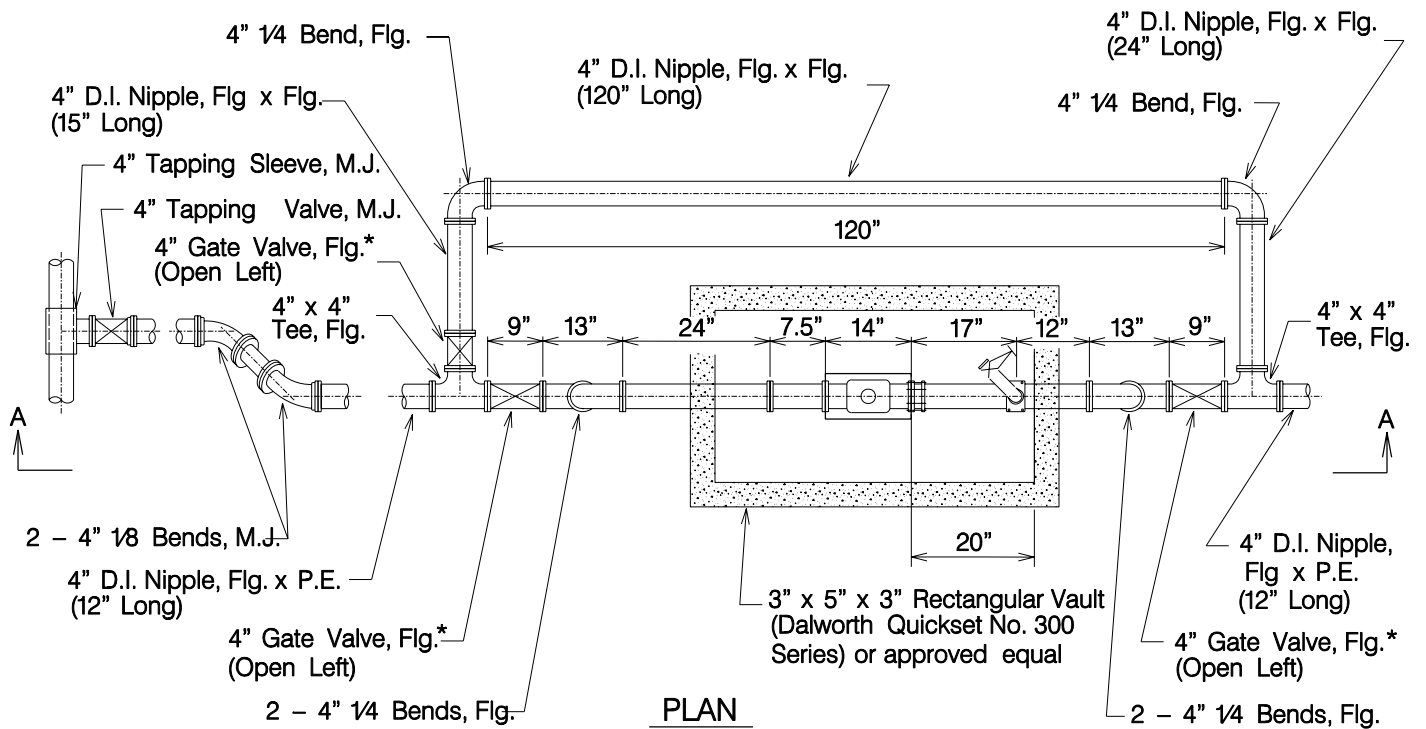
**4" TURBINE
METER INSTALLATION**

APPROVED
March 2008

REVISED

DD-824-07

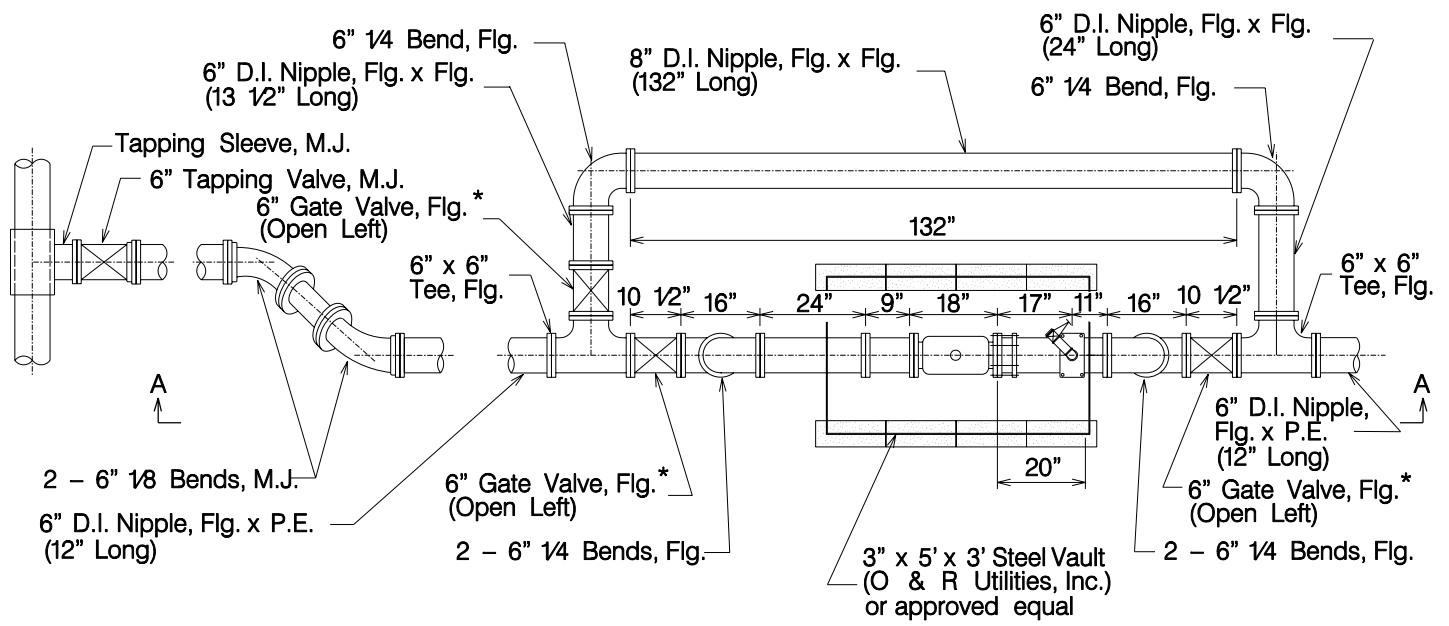
SHEET
1 OF 2



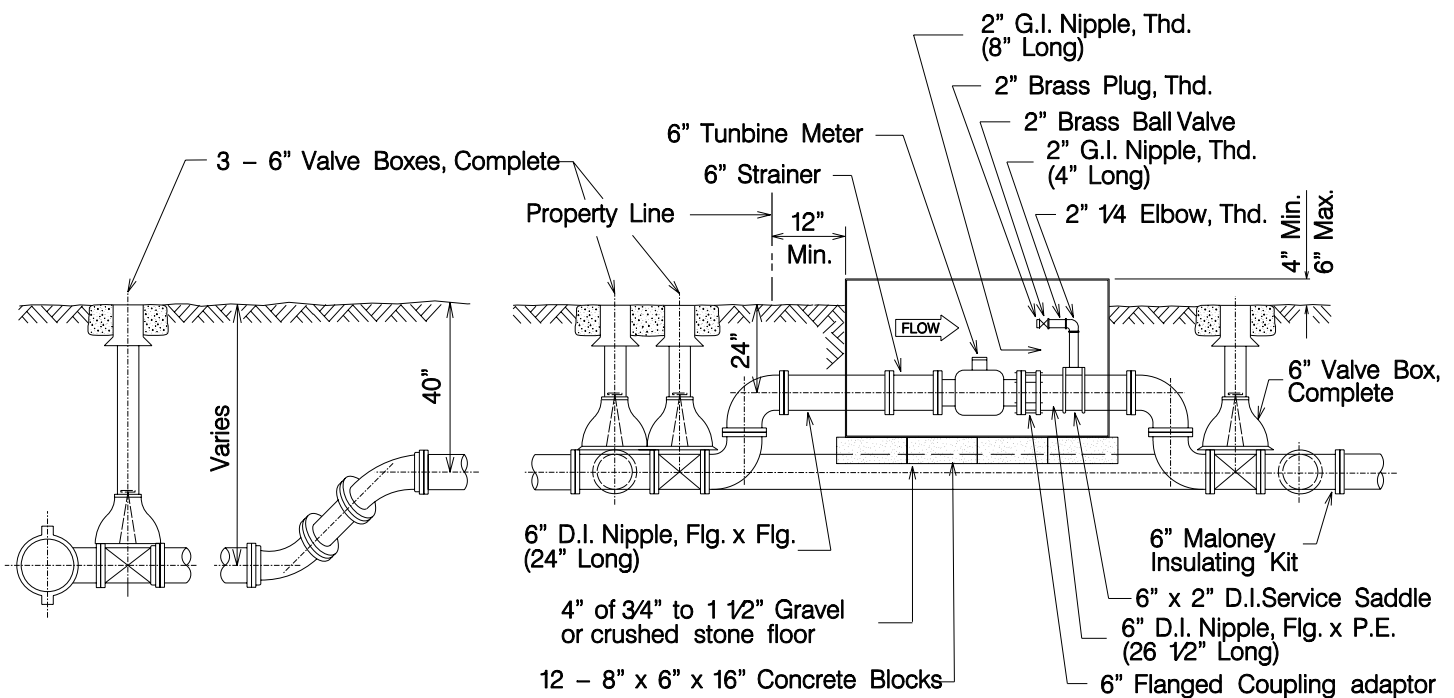
**3' x 5' x 3' RECTANGULAR CONCRETE VAULT
(TRAFFIC BEARING LOCATION)**

* Resilient Seat

PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	4" TURBINE METER INSTALLATION	APPROVED	REVISED
		March 2008	
		DD-824-07	
			SHEET 2 OF 2



PLAN

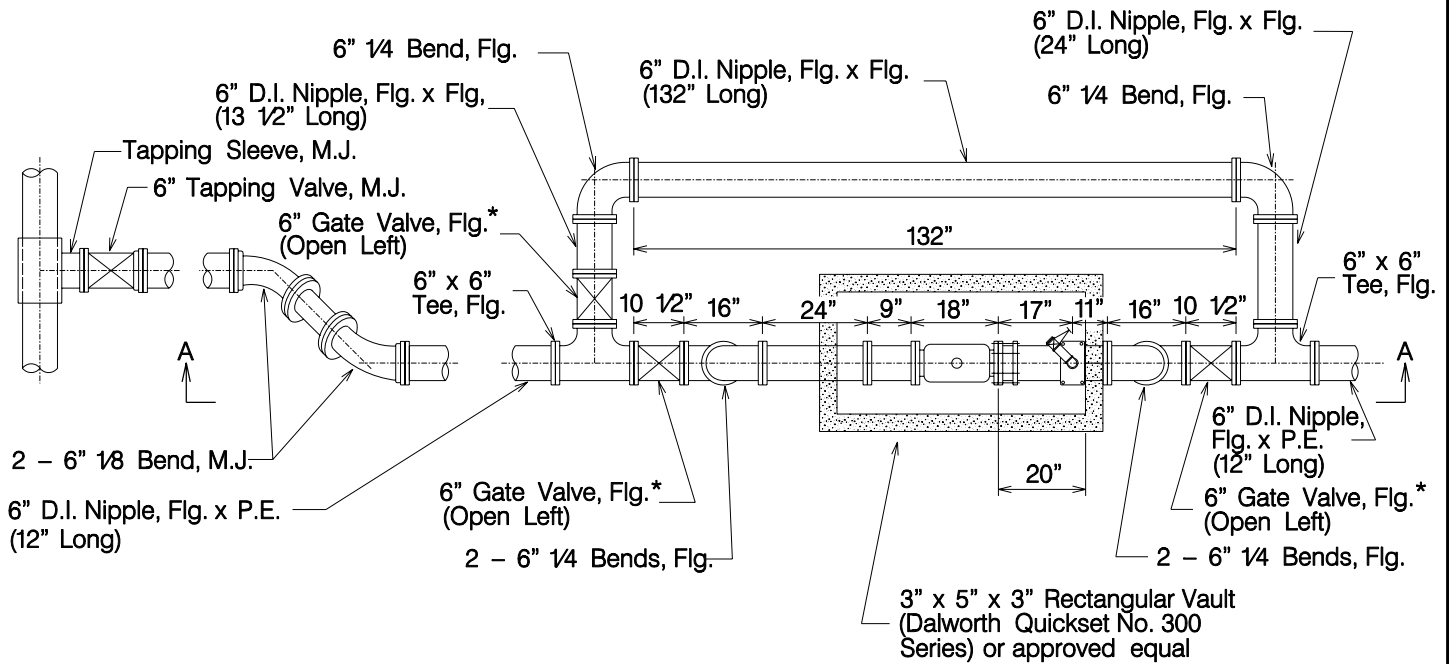


SECTION A-A

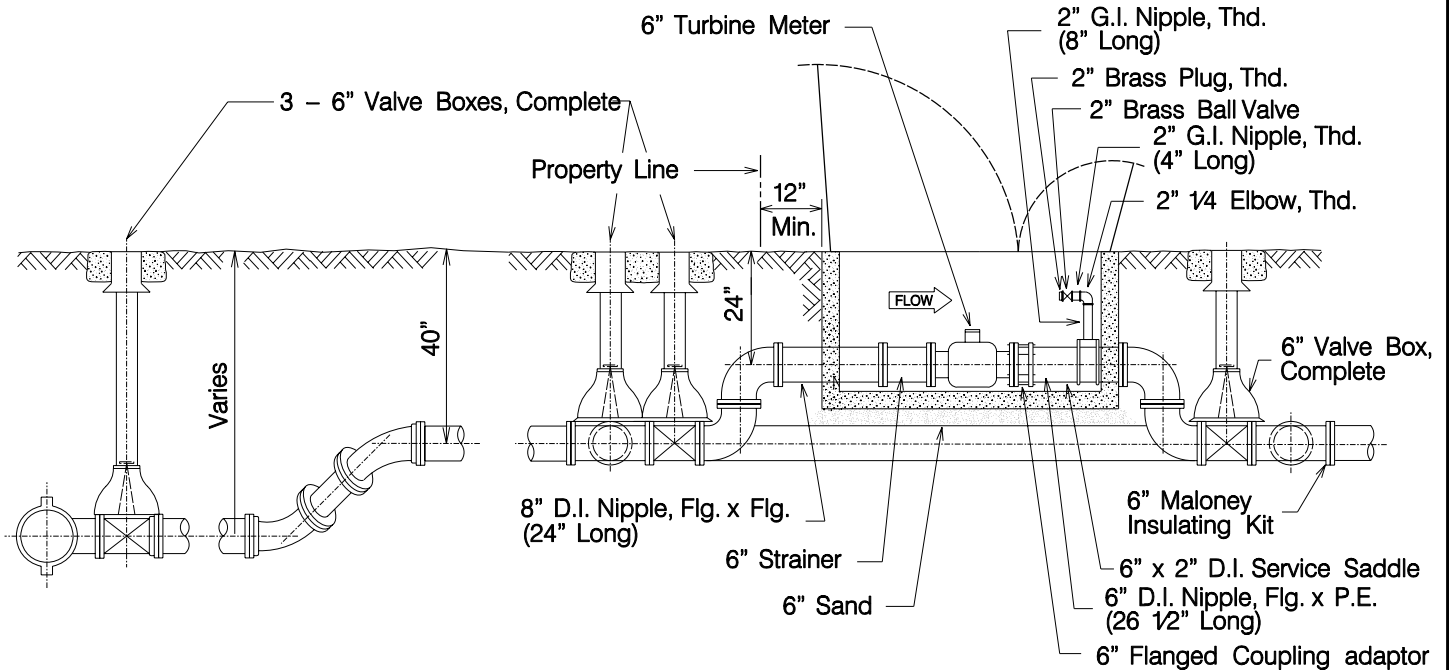
3' x 5' x 3' STEEL VAULT
(NON-TRAFFIC BEARING LOCATION)

* Resilient Seat

PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	6" TURBINE METER INSTALLATION	APPROVED	REVISED
		March 2008	
		DD-824-09	



PLAN

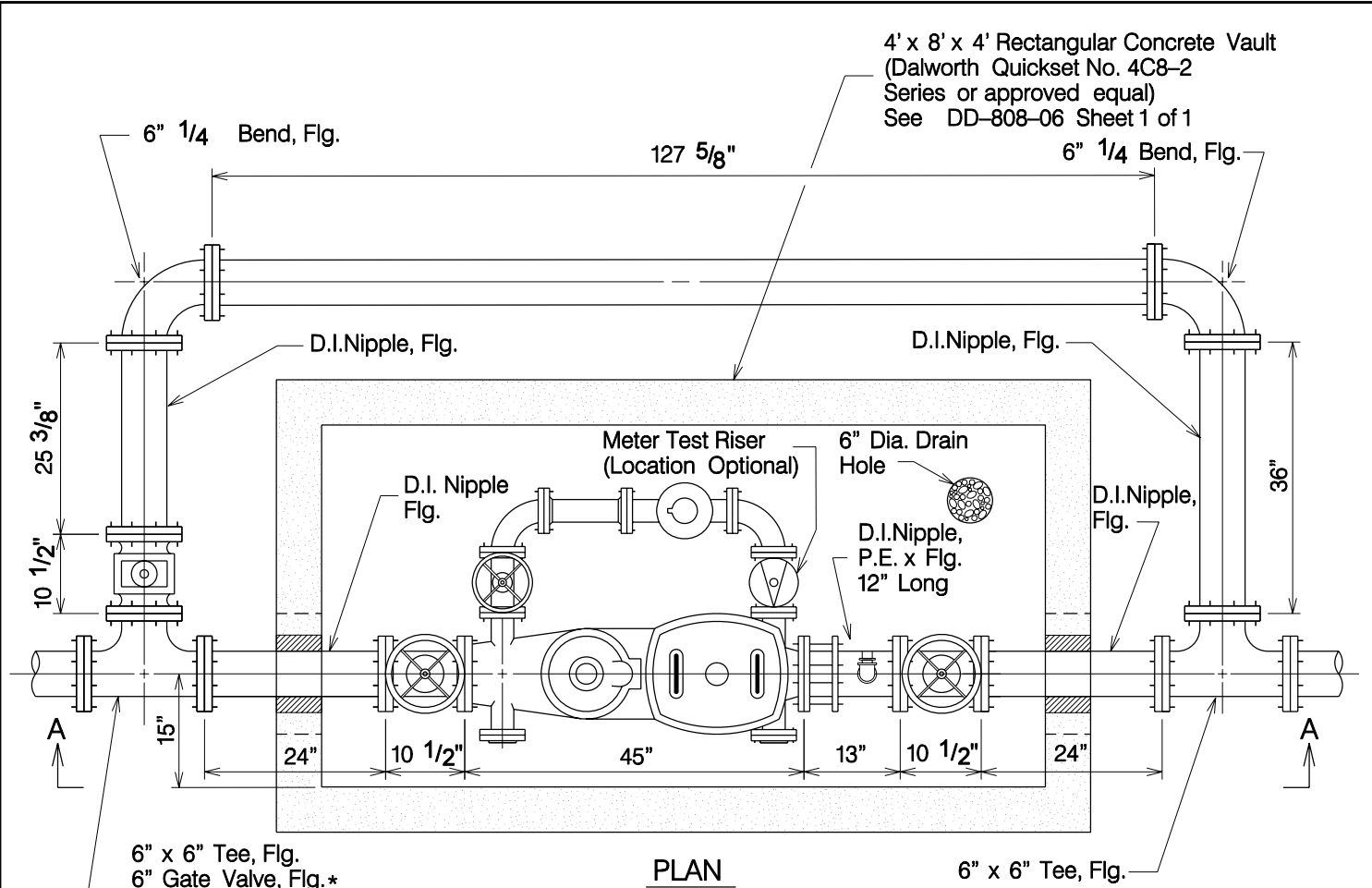


SECTION A-A

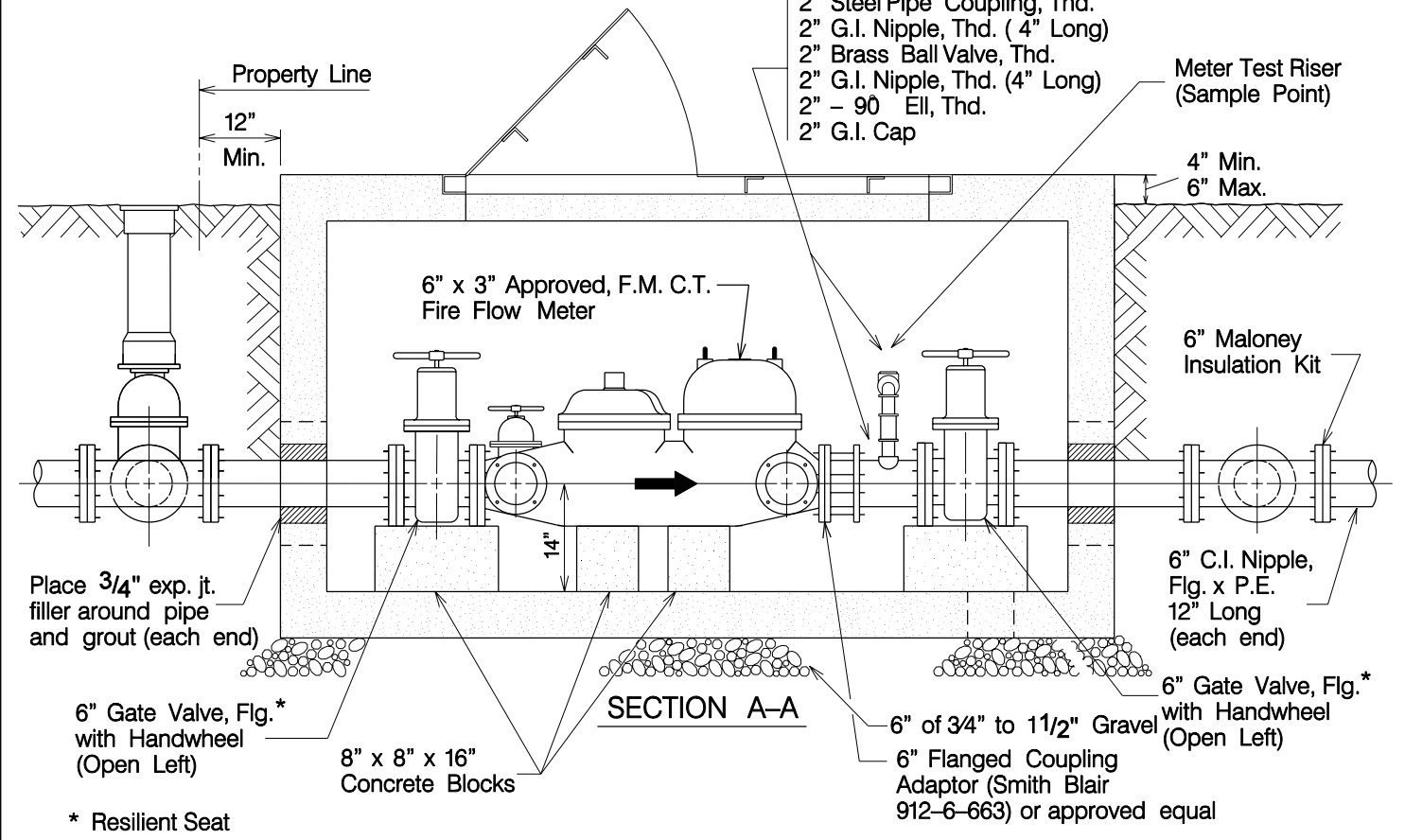
**3' x 5' x 3' RECTANGULAR CONCRETE VAULT
(TRAFFIC BEARING LOCATION)**

* Resilient Seat

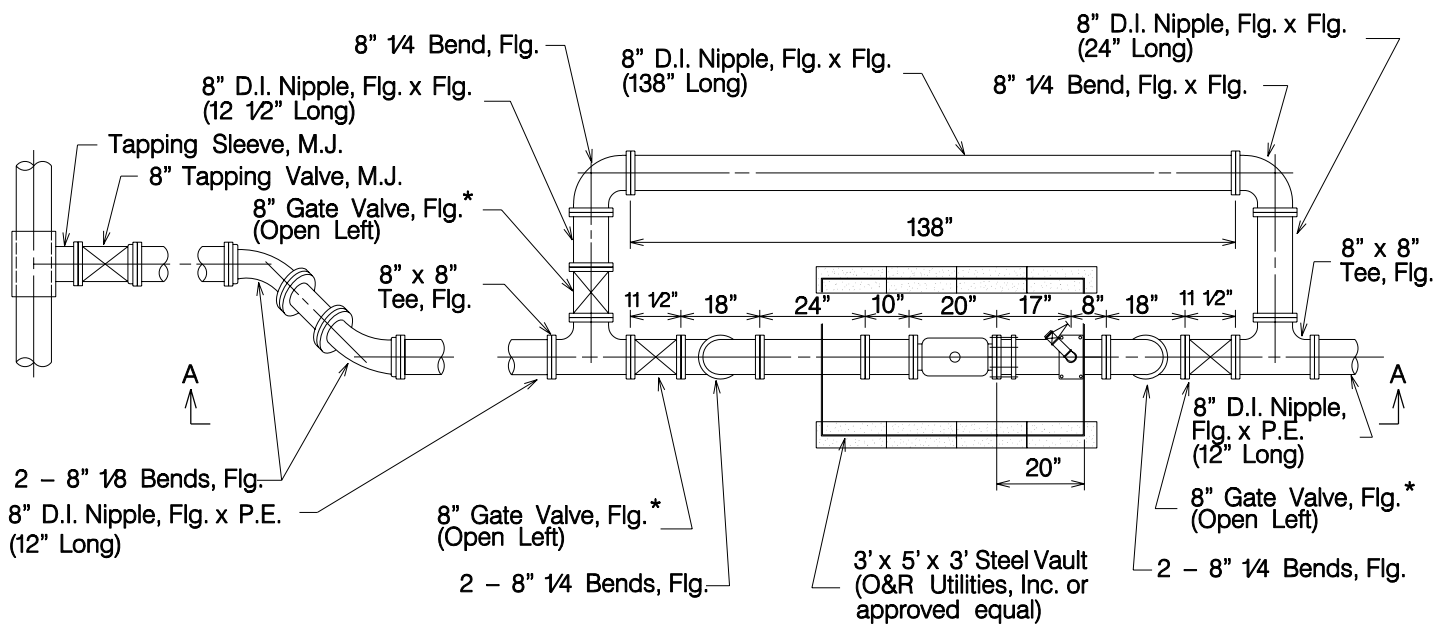
PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	6" TURBINE METER INSTALLATION	APPROVED	REVISED
		March 2008	
DD-824-09			SHEET 2 OF 2



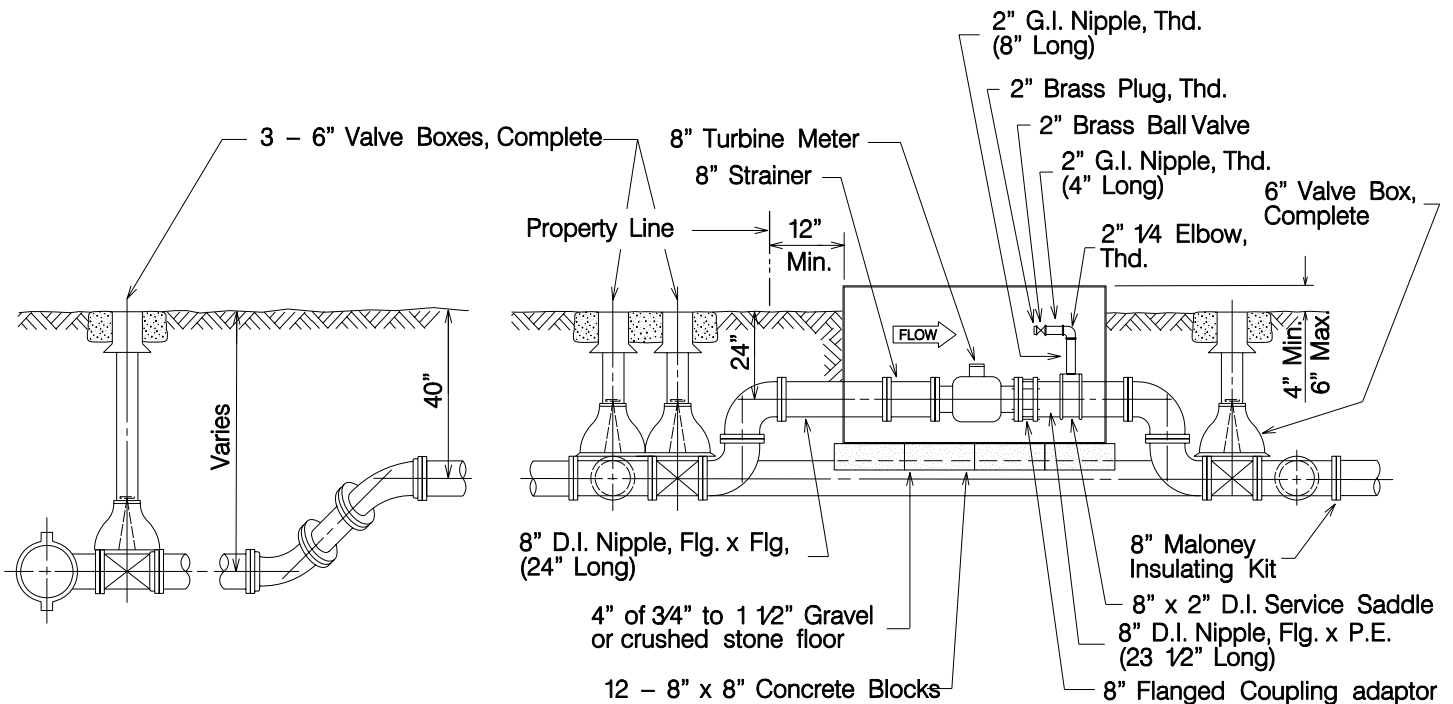
- CONTRACTOR FURNISHED**
- 2" Steel Pipe Coupling, Thd.
 - 2" G.I. Nipple, Thd. (4" Long)
 - 2" Brass Ball Valve, Thd.
 - 2" G.I. Nipple, Thd. (4" Long)
 - 2" - 90° Ell, Thd.
 - 2" G.I. Cap



PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	6" X 3" FIRE FLOW METER INSTALLATION	APPROVED	REVISED
		March 2008	
		DD-824-10	
		SHEET 1 OF 1	



PLAN



SECTION A-A

3' x 5' x 3' STEEL VAULT
(NON-TRAFFIC BEARING LOCATION)

* Resilient Seat

PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

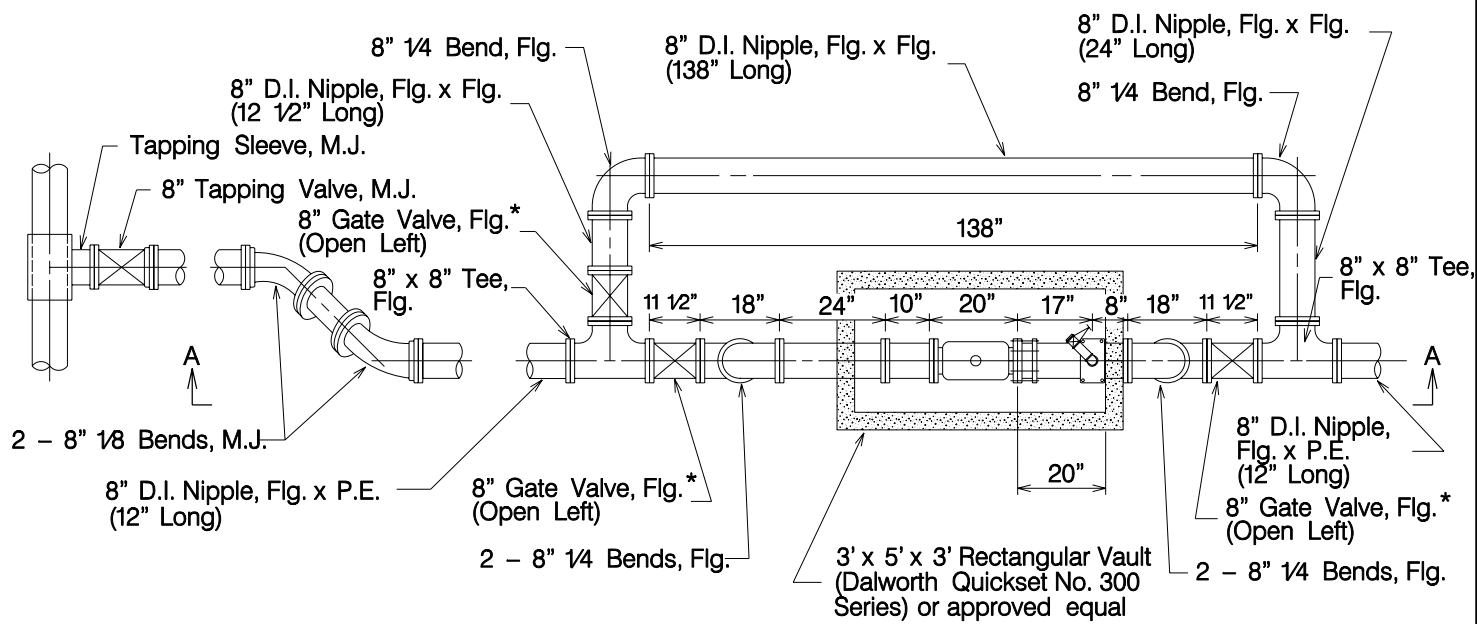
8" SERVICE WITH AN
8" TURBINE METER

APPROVED
March 2008

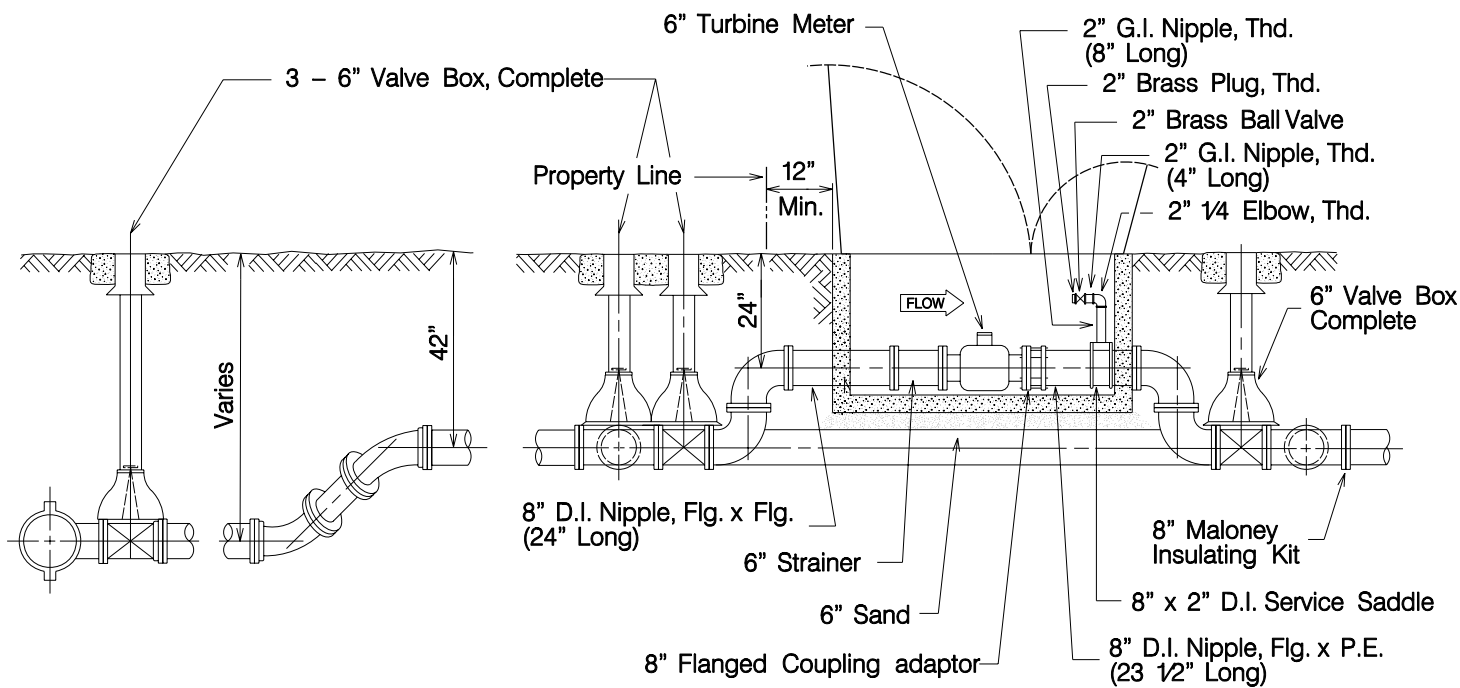
REVISED

DD-824-12

SHEET
1 OF 2



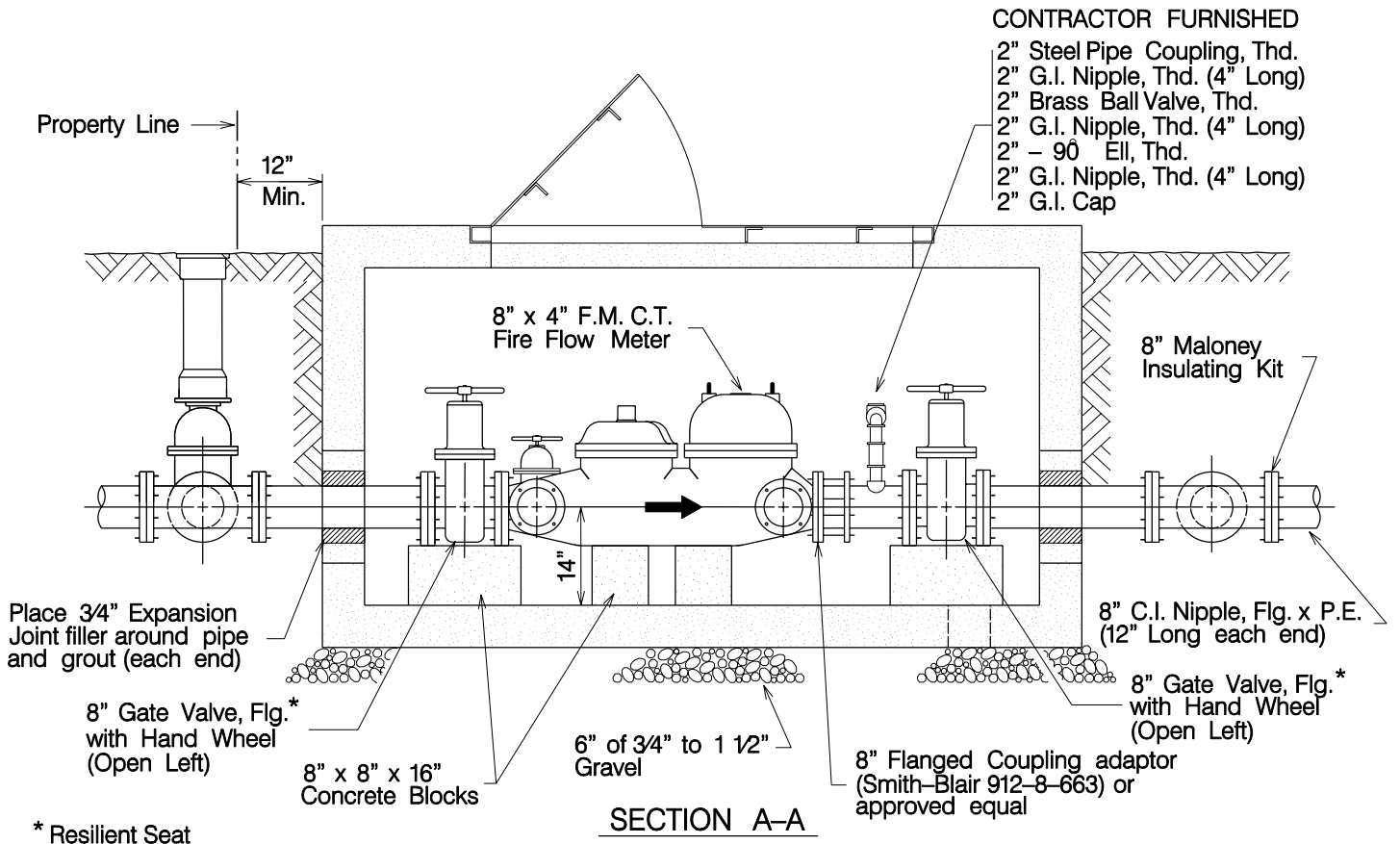
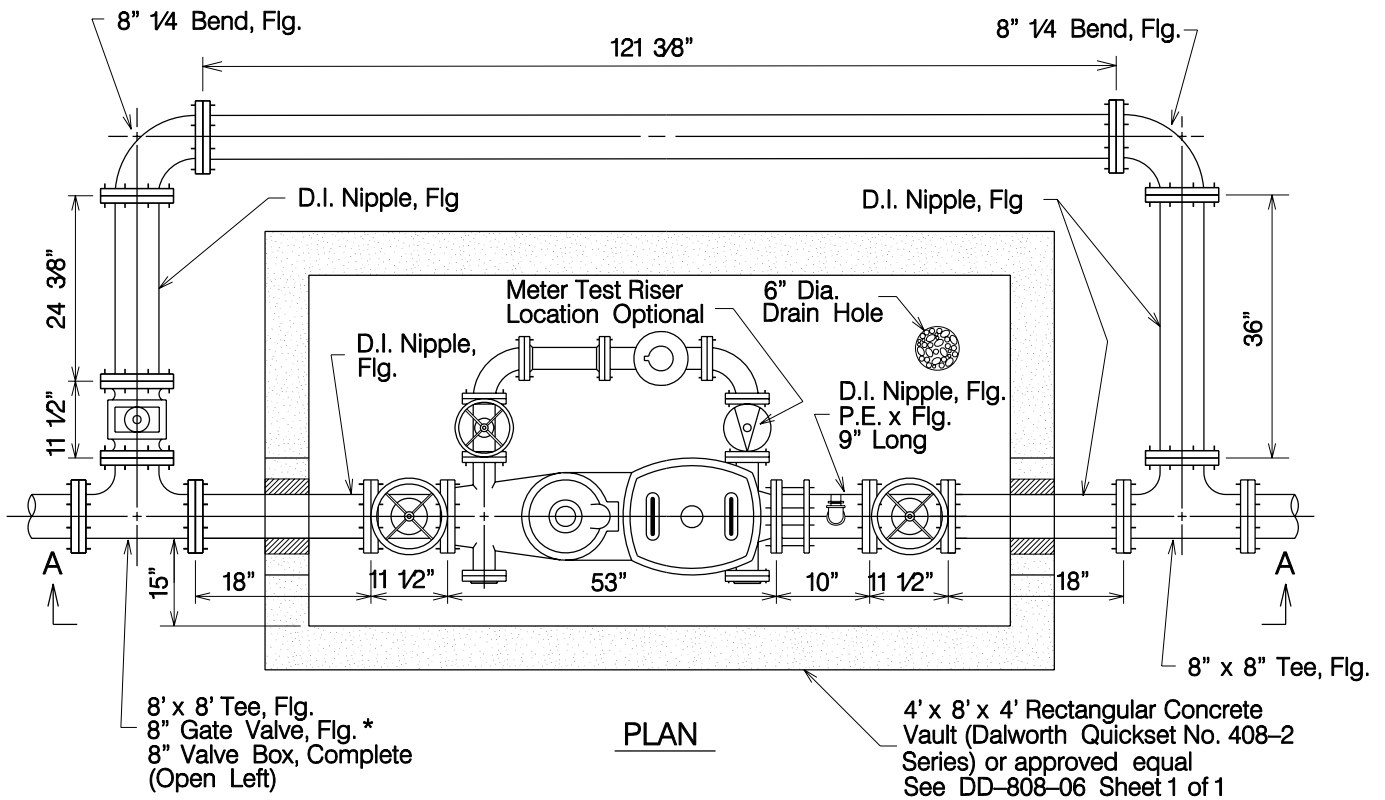
PLAN



SECTION A-A

* Resilient Seat

3' x 5' x 3' RECTANGULAR CONCRETE VAULT
(TRAFFIC BEARING LOCATION)



PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

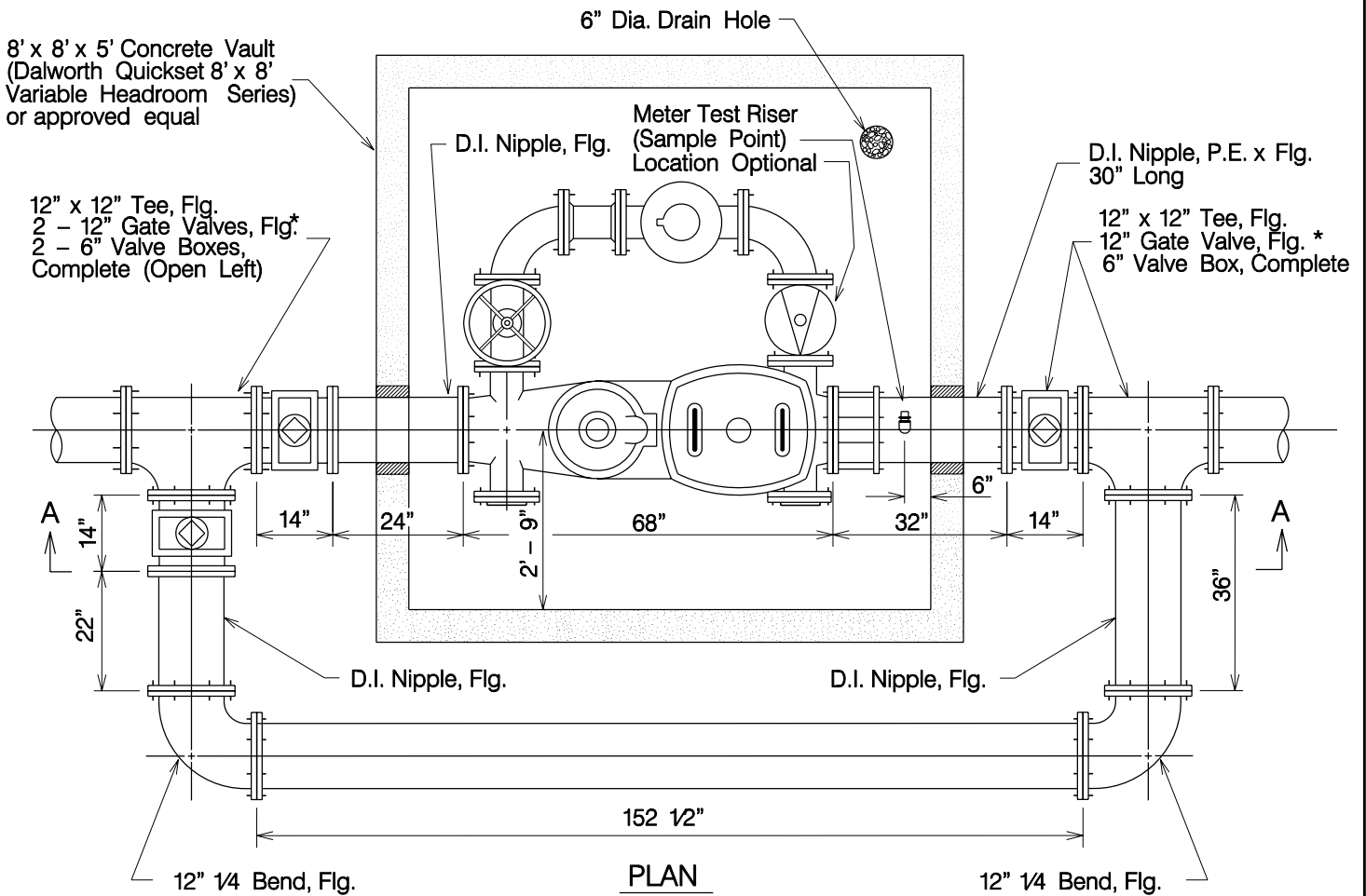
**8" X 4" FIRE FLOW
METER INSTALLATION**

APPROVED
March 2008

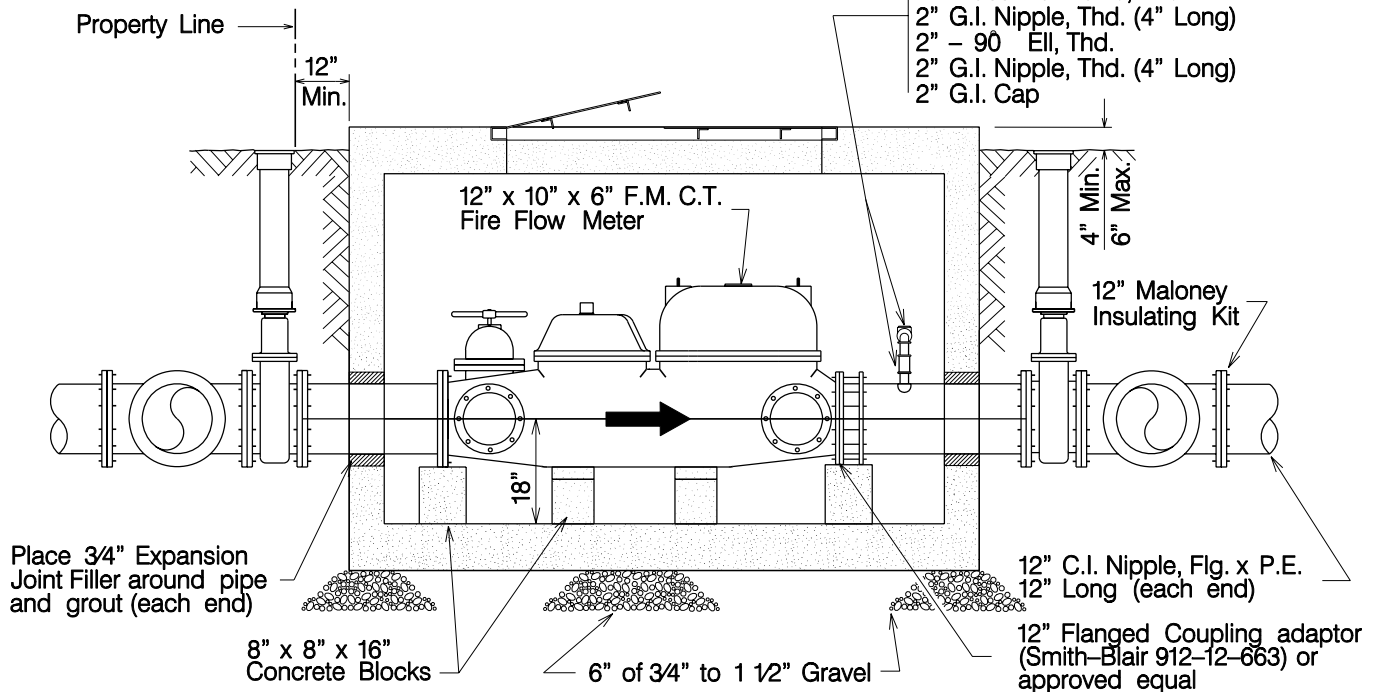
REVISED

DD-824-13

SHEET
1 OF 1



- CONTRACTOR FURNISHED
- 2" Steel Pipe Coupling, Thd.
 - 2" G.I. Nipple, Thd. (4" Long)
 - 2" Brass Ball Valve, Thd.
 - 2" G.I. Nipple, Thd. (4" Long)
 - 2" - 90° Ell, Thd.
 - 2" G.I. Nipple, Thd. (4" Long)
 - 2" G.I. Cap



* Resilient Seat

PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

**12" X 10" X 6 FIRE FLOW
METER INSTALLATION**

APPROVED
March 2008

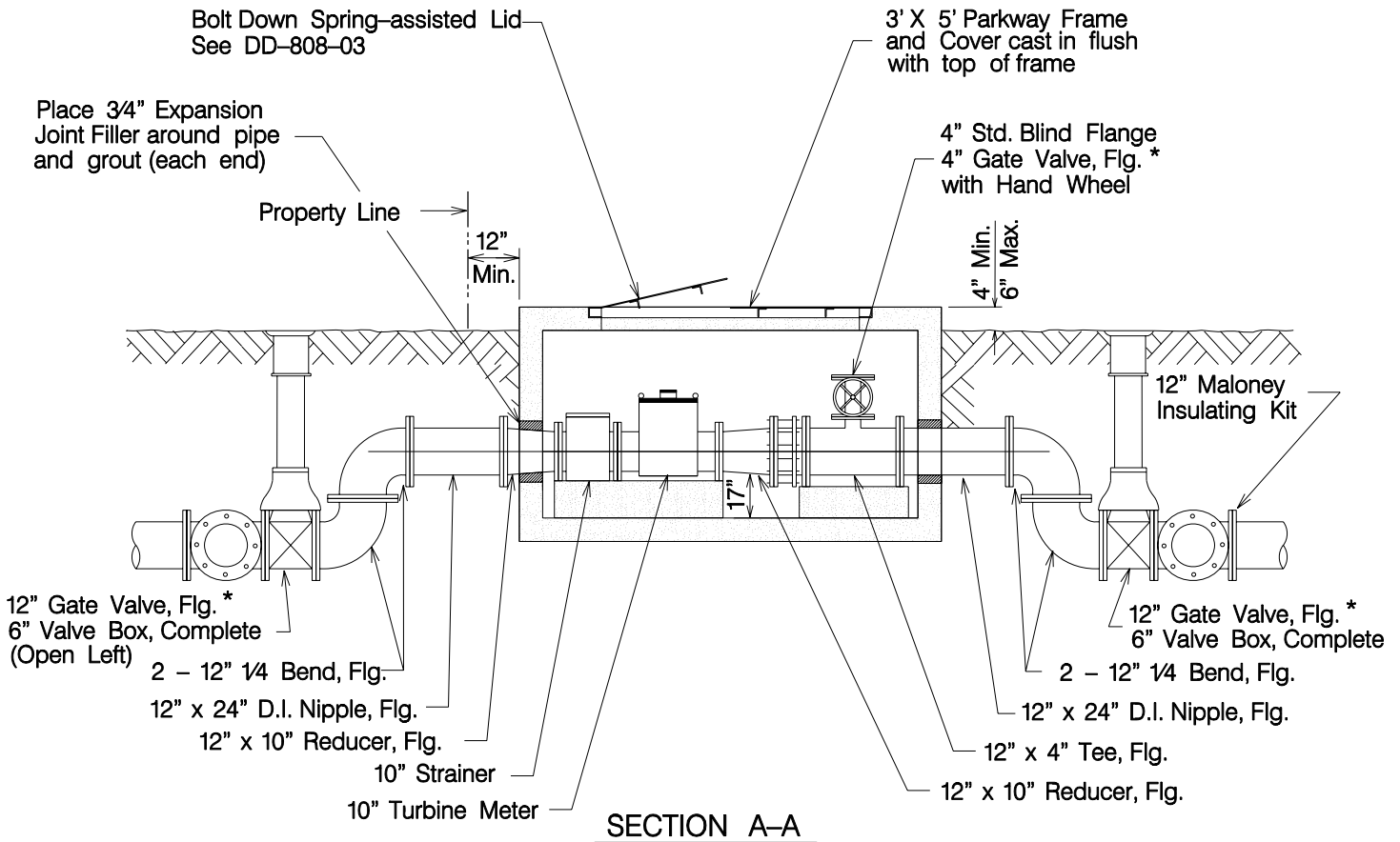
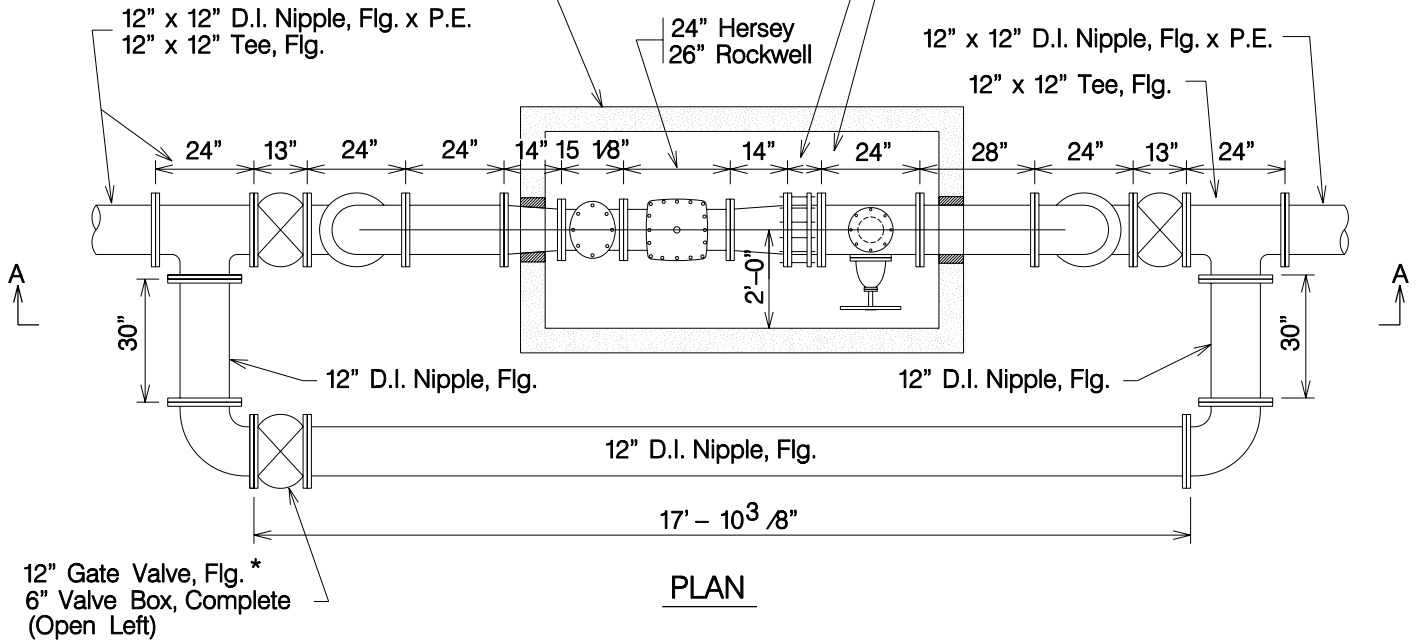
REVISED

DD-824-14

SHEET
1 OF 1

4' x 8' x 4' Rectangular Concrete Vault
(Dalworth Quickset No. 408-2 Series)
(Non-Traffic Bearing) or approved equal
See DD-808-06 Sheet 1 of 1

12" Flanged Coupling adaptor
12" D.I. Nipple, Flg. x P.E.
10 7/8" with Rockwell Meter
12 7/8" with Hersey Meter



* Resilient Seat

PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

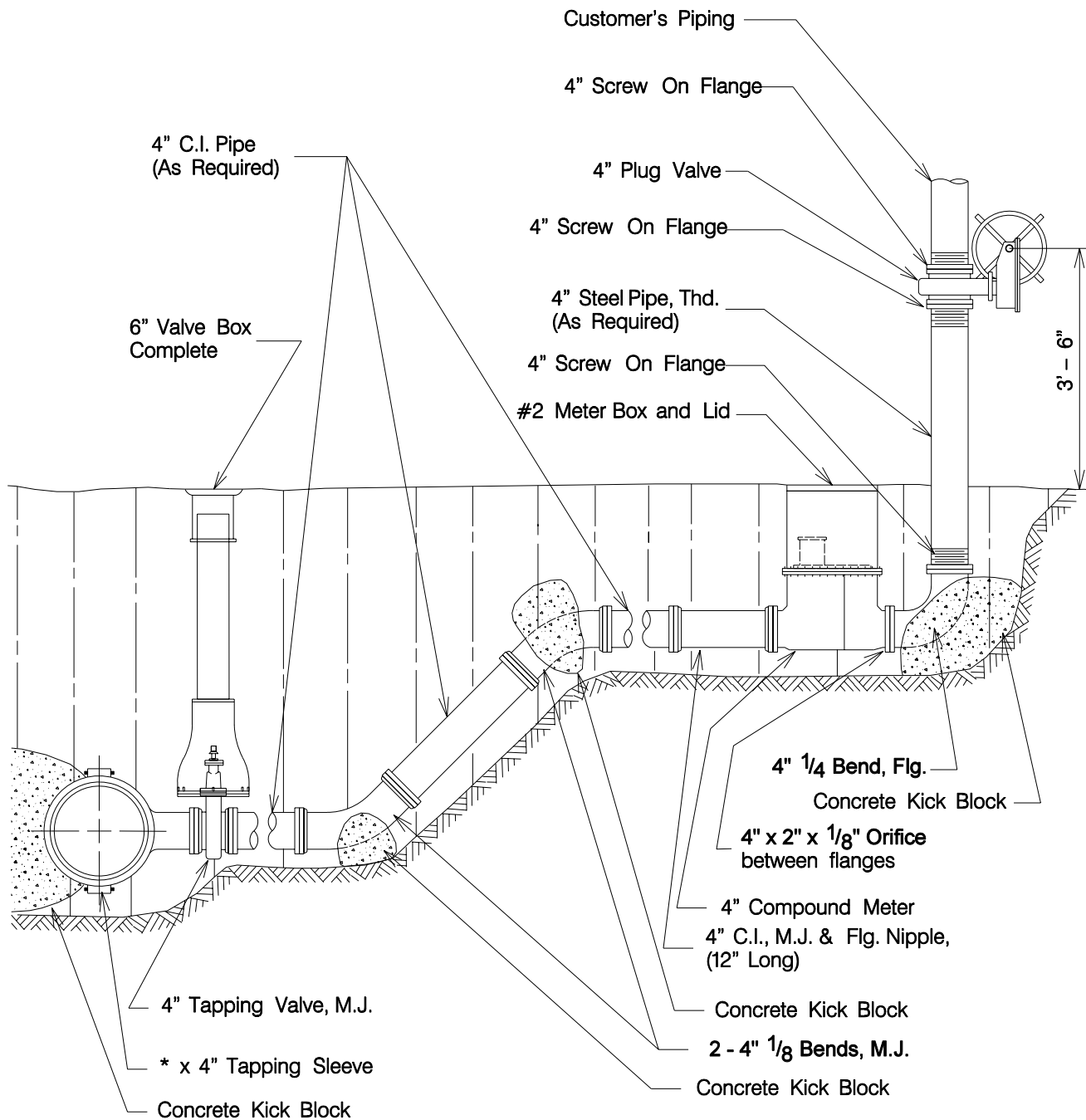
12" SERVICE WITH
10" TURBINE METER

APPROVED
March 2008

REVISED

DD-824-15

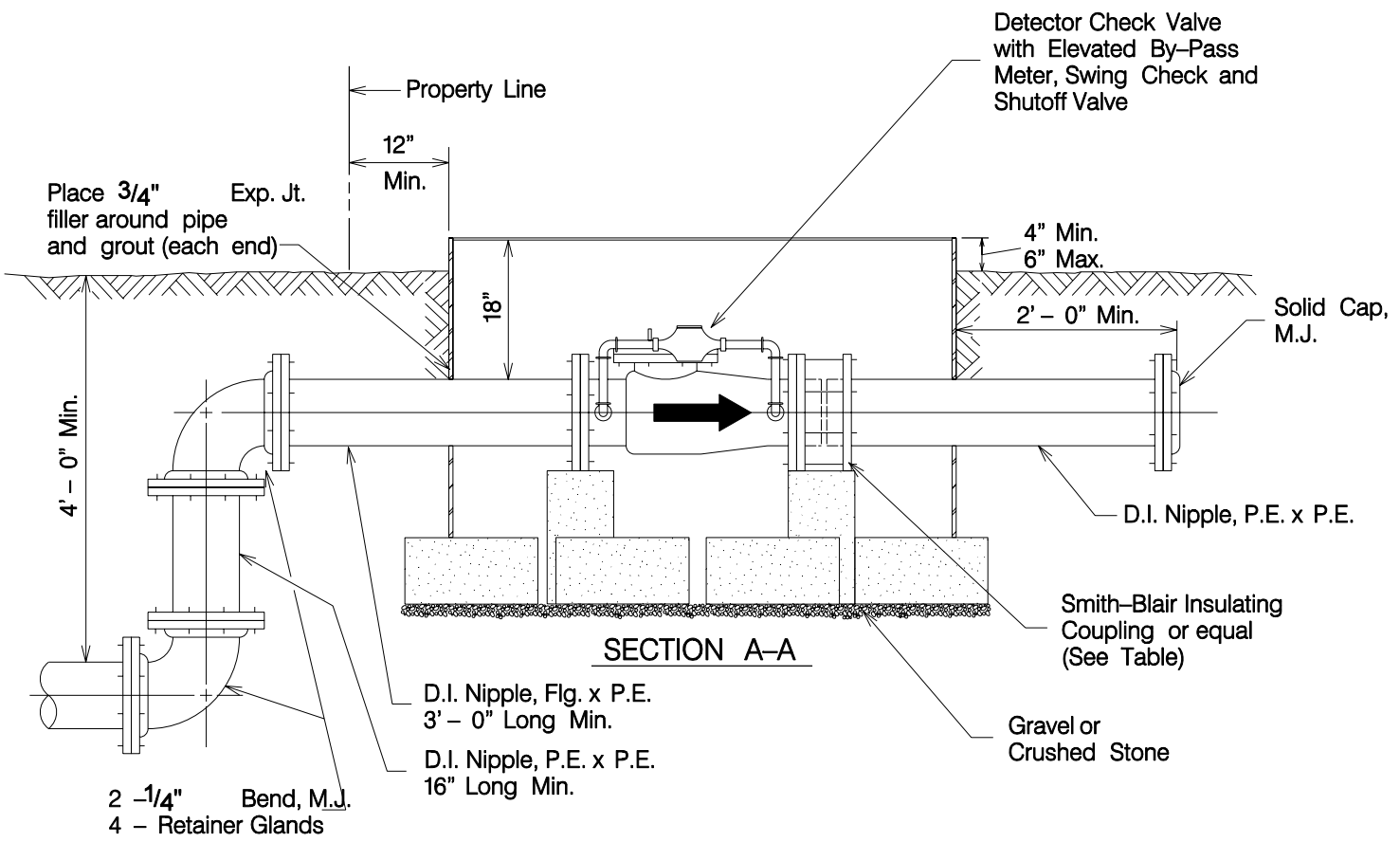
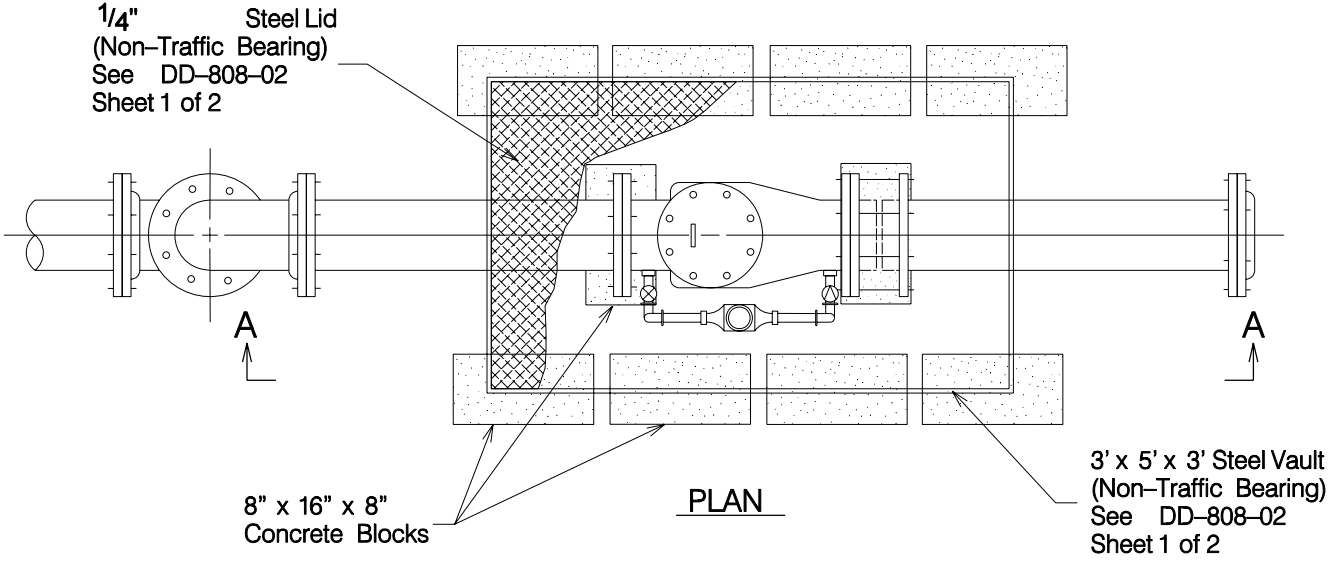
SHEET
1 OF 1



NOT TO SCALE

* Existing main size and type

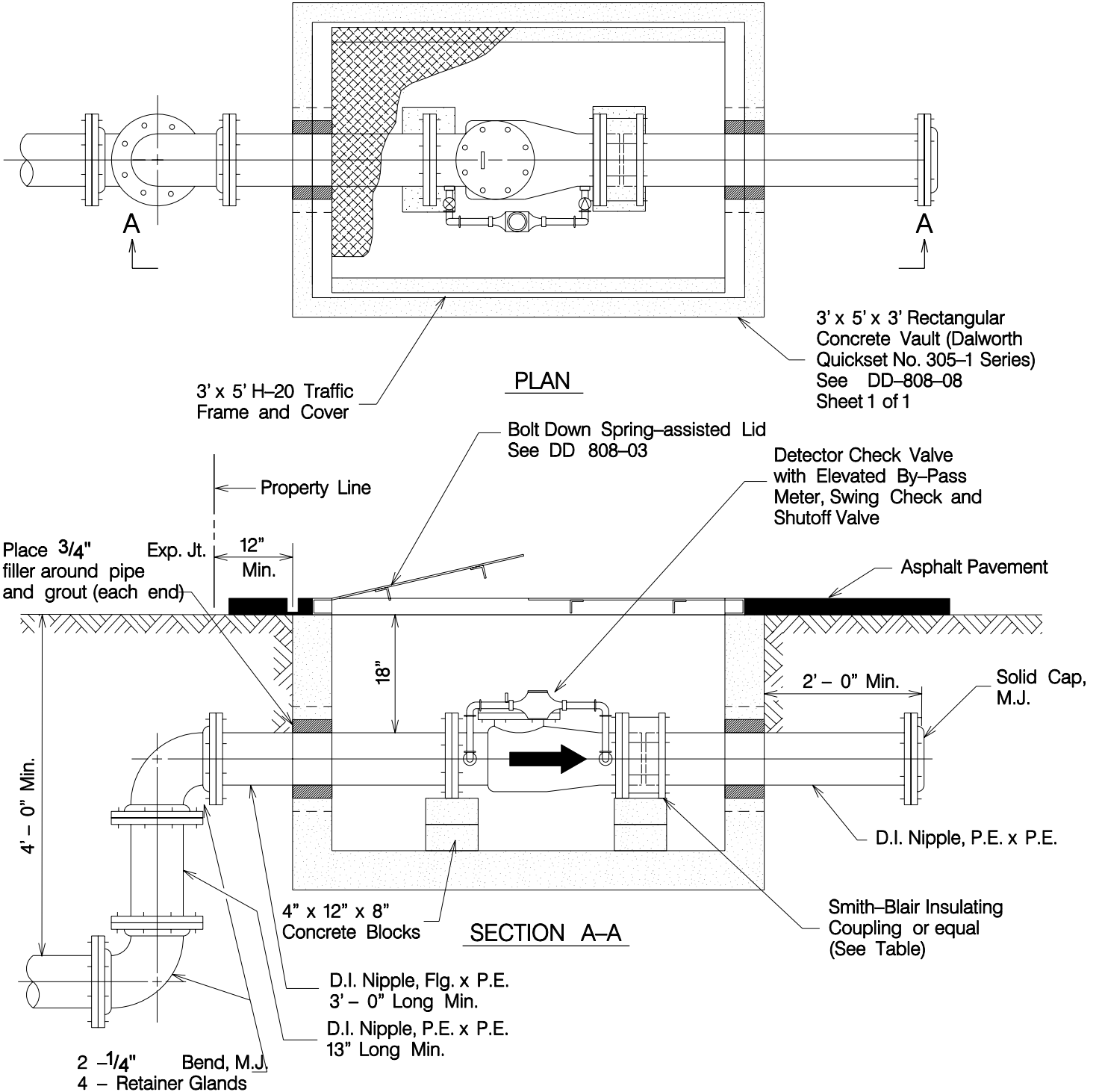
PIPE DIAMETER	DETECTOR CHECK	BY-PASS METER	SMITH-BLAIR COUPLING
6"	6"	3/4"	1932-6-690
8"	8"	1"	932-8-905



3' x 5' x 3' RECTANGULAR STEEL VAULT (NON-TRAFFIC BEARING LOCATION)

PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	6" & 8" DETECTOR CHECK FOR FIRE LINE	APPROVED	REVISED
		March 2008	
		DD-824-17	
		SHEET 1 OF 2	

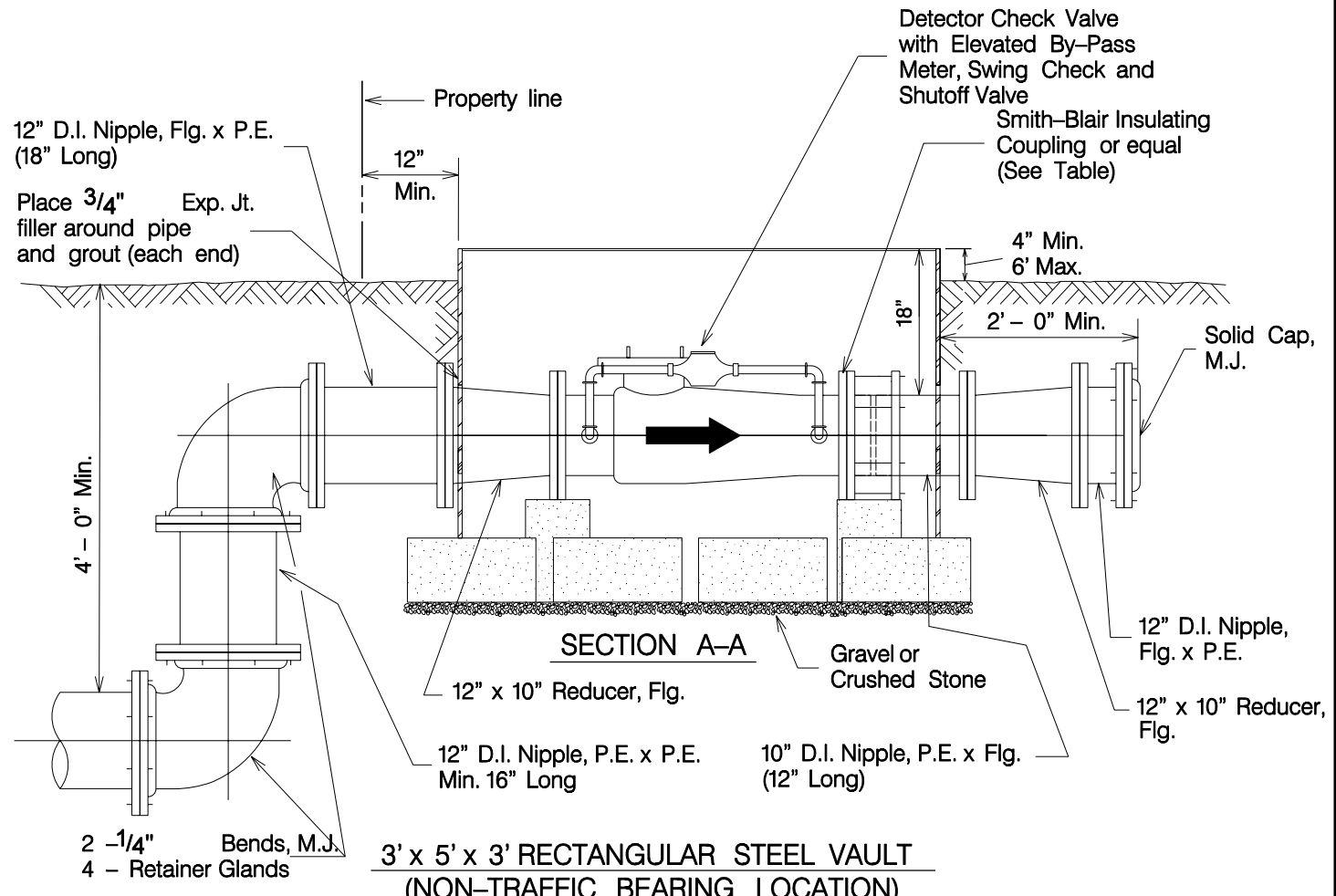
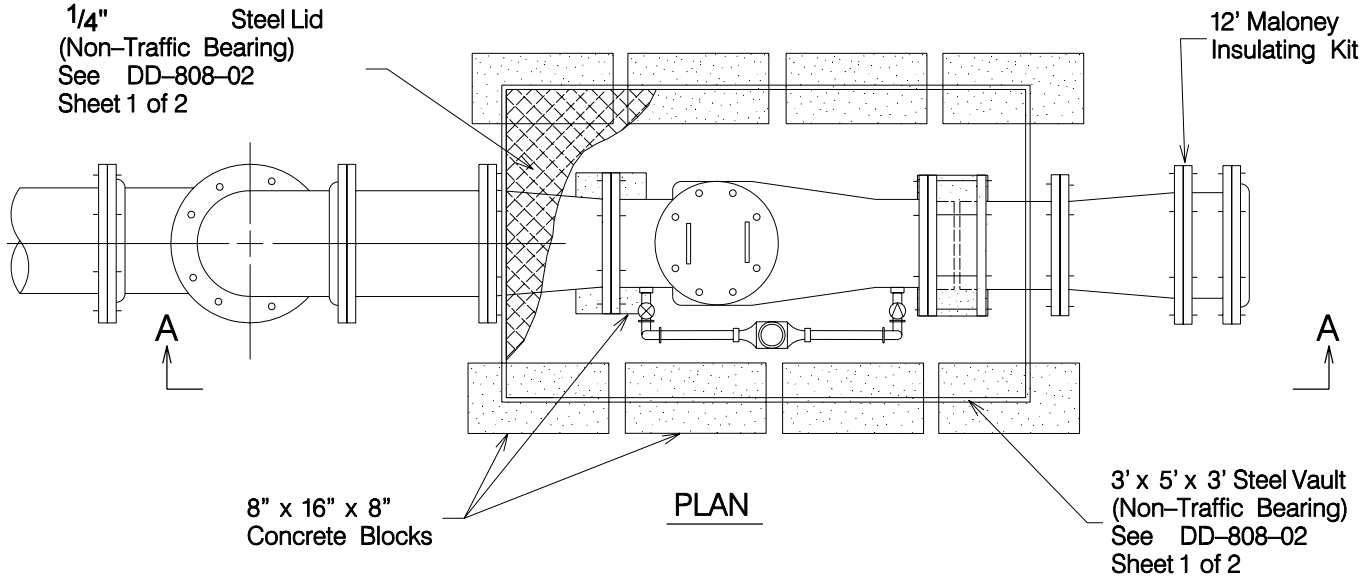
PIPE DIAMETER	DETECTOR CHECK	BY-PASS METER	SMITH-BLAIR COUPLING
6"	6"	3/4"	1932-6-690
8"	8"	1"	932-8-905



**3' x 5' x 3' RECTANGULAR CONCRETE VAULT
(TRAFFIC BEARING LOCATION)**

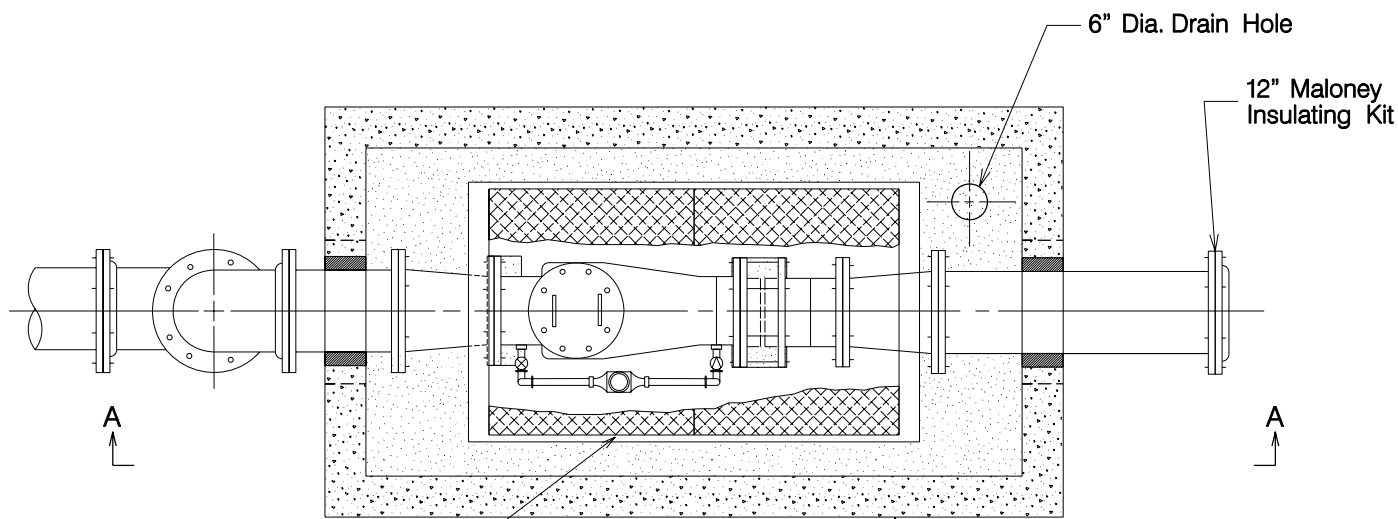
PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	6" & 8" DETECTOR CHECK FOR FIRE LINE	APPROVED	REVISED
		March 2008	
		DD-824-17	
		SHEET 2 OF 2	

PIPE DIAMETER	DETECTOR CHECK CHECK	BY-PASS METER	SMITH-BLAIR COUPLING
10"	10"	1"	912-10-663



PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	10" X 12" DETECTOR CHECK FOR FIRE LINE	APPROVED	REVISED
		March 2008	
		DD-824-18	
		SHEET 1 OF 2	

PIPE DIAMETER	DETECTOR CHECK	BY-PASS METER	SMITH-BLAIR COUPLING
10"	10"	1"	912-10-663



PLAN

3' x 5' H-20 Traffic Frame and Cover (2-Piece Cover)

4' x 8' x 3' Rectangular Concrete Vault (Dalworth Quickset No. 408-1 Series) or approved equal See DD-808-09 Sheet 1 of 1

Bolt Down Spring-assisted Lid See DD-808-03

Detector Check Valve with Elevated By-Pass Meter, Swing Check and Shutoff Valve

Smith-Blair Flanged Coupling Adaptor (See Table)

Asphalt Pavement

Place 3/4" filler around pipe and grout (each end)

Exp. Jt.

12" Min.

Property Line or Utility Easement

12" Solid Cap, M.J.

4' - 0" Min.

C.I. Nipple, P.E. x P.E.

SECTION A-A

3/4" to 1 1/2" Gravel Bed - 6" Deep

12" x 10" Reducer, Fig.

10" D.I. Nipple, P.E. X Fig. 12" Long

5" x 15" x 7" Concrete Blocks

2 - 1/4" Bends, M.J.
4 - Retainer Glands

12" x 10" Reducer, Fig.

12" D.I. Nipple, Fig. x P.E. 18" Long

12" D.I. Nipple, P.E. x P.E. Min. 16" Long

**4' x 8' x 3' RECTANGULAR CONCRETE VAULT
(TRAFFIC BEARING LOCATION)**

PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

**10" X 12" DETECTOR CHECK
FOR FIRE LINE**

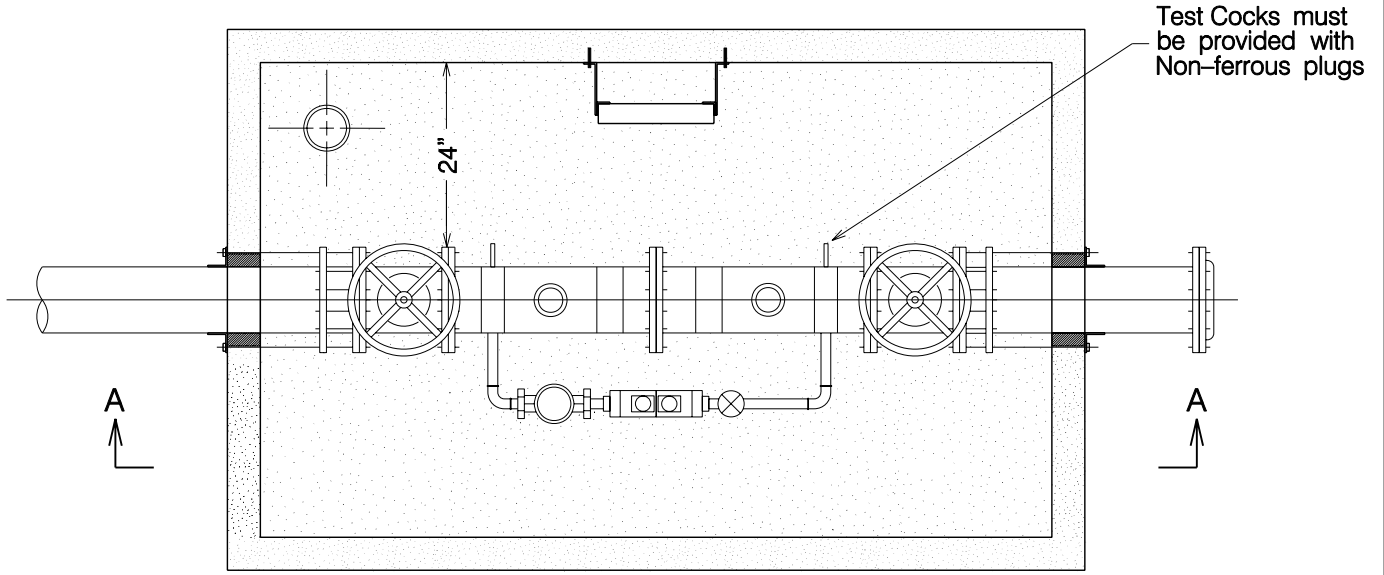
APPROVED
March 2008

REVISED

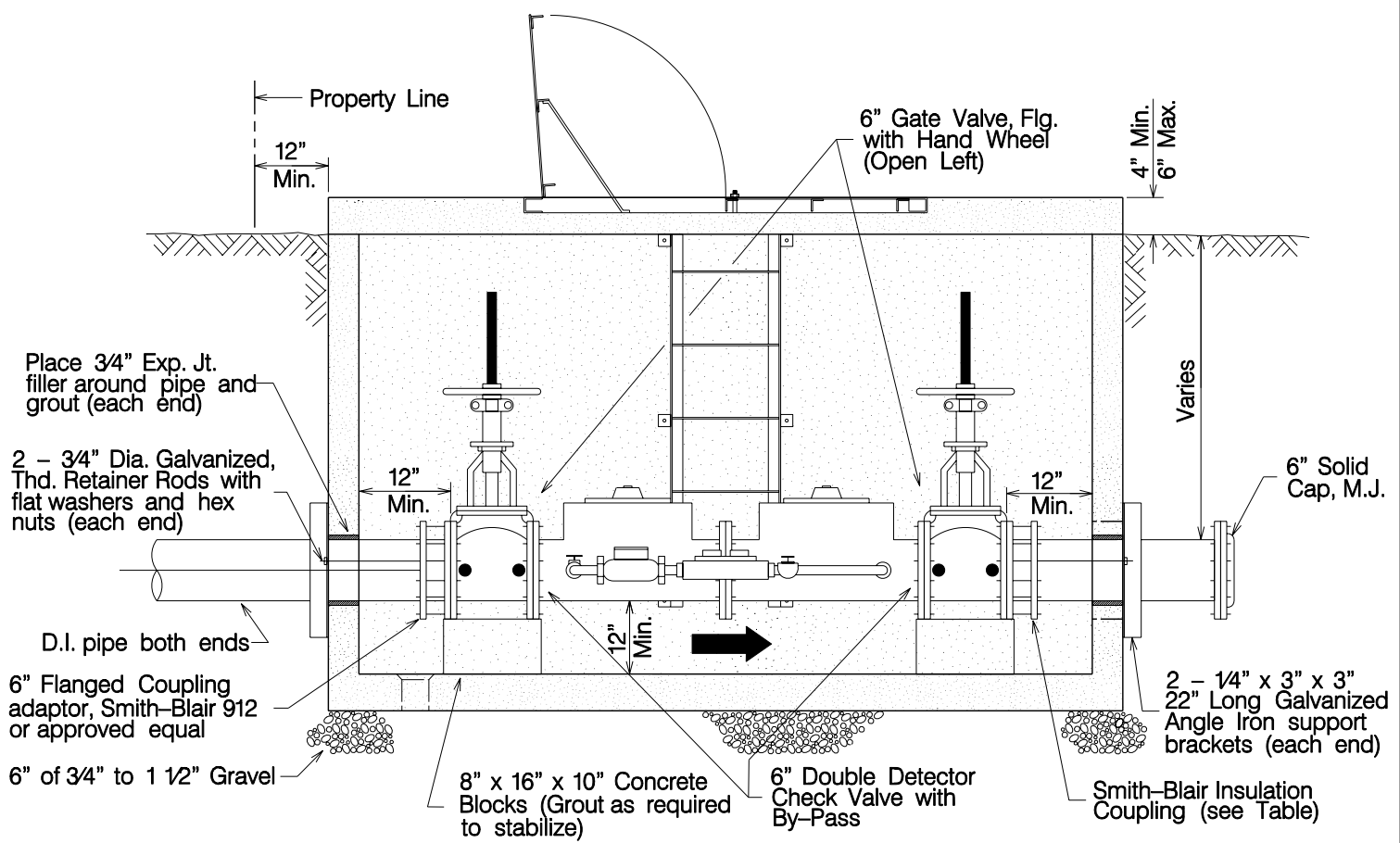
DD-824-18

SHEET
2 OF 2

Pipe Diameter	Double Detector Check	By-Pass Meter	Smith-Blair Coupling
6"	6"	5/8" - 3/4"	1932-6-690
8"	8"	5/8" - 3/4"	932-8-905



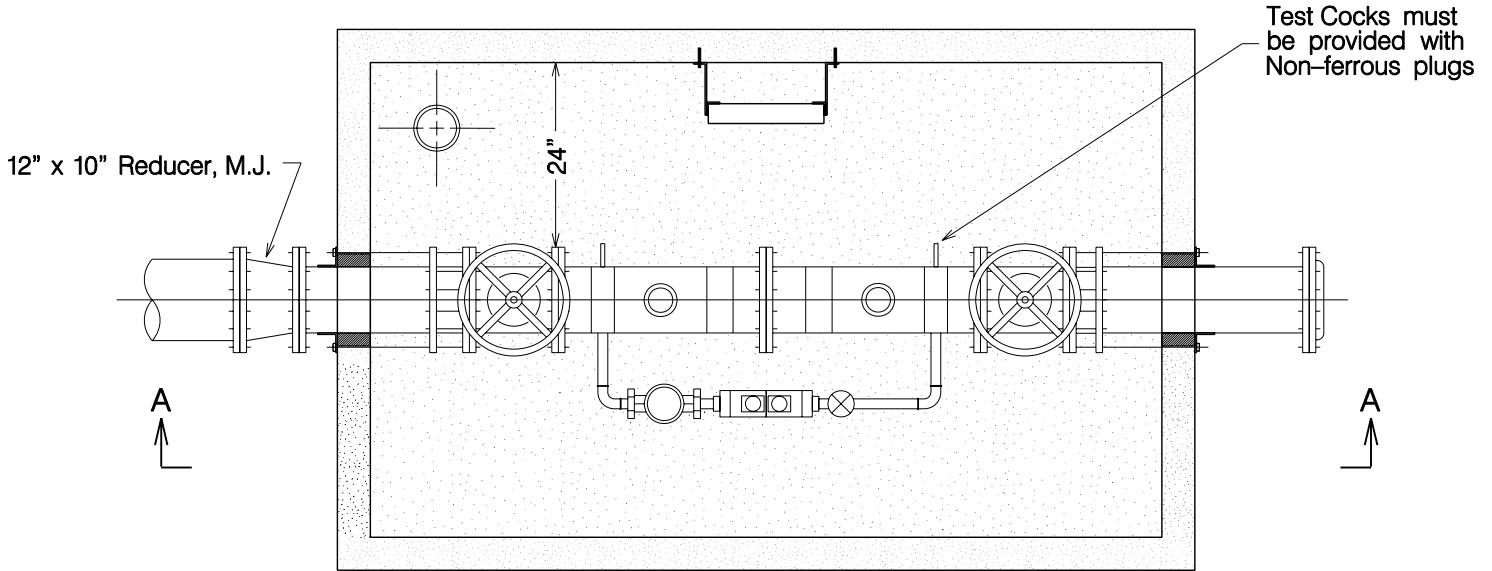
PLAN



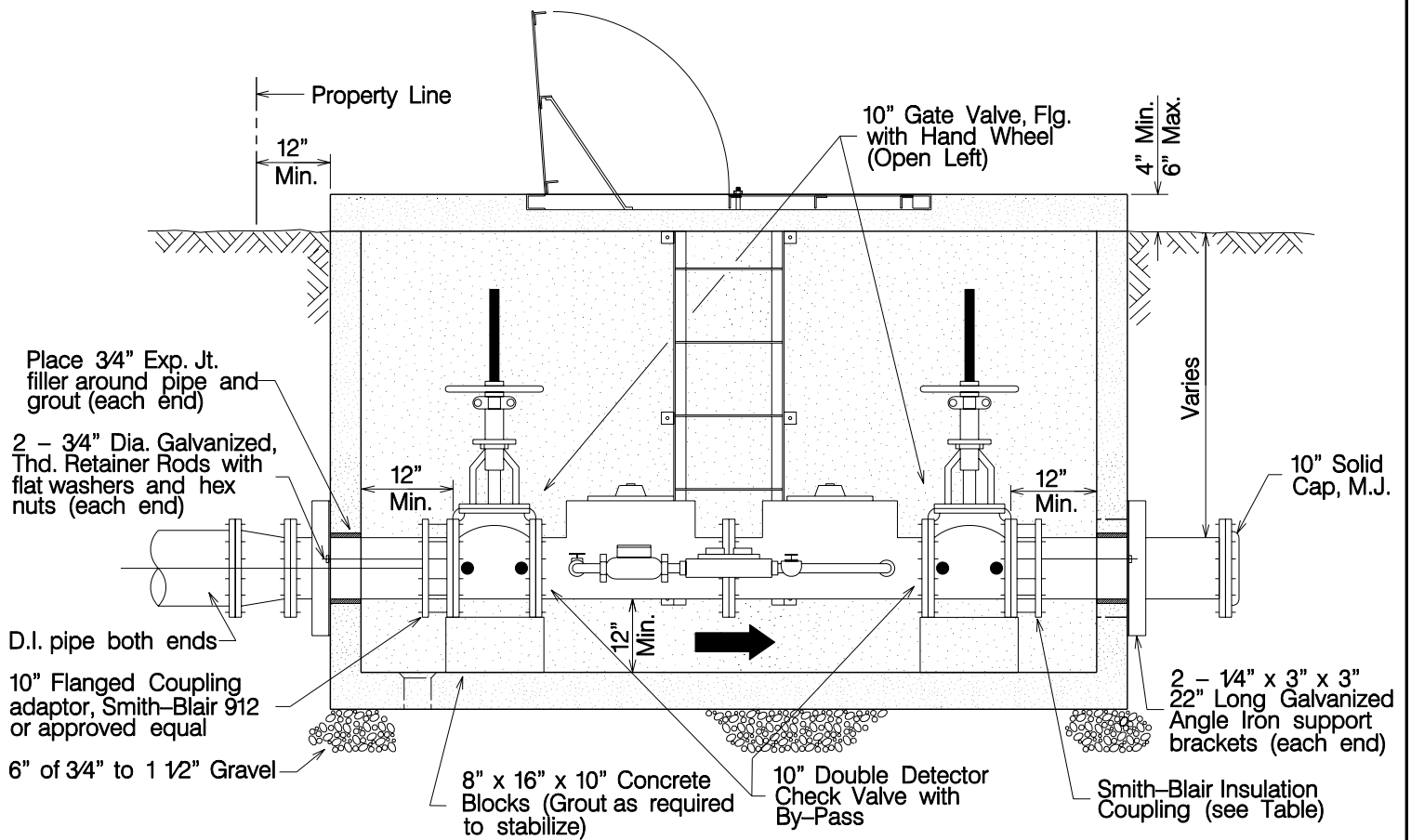
SECTION A-A

- Notes:
1. Tamper switches may be required by Fire Code.
 2. Assemblies must be U.L. Listed for Fire Protection purposes.

Pipe Diameter	Double Detector Check	By-Pass Meter	Smith-Blair Coupling
12"	10"	58" - 3/4"	932-10-1110



PLAN



SECTION A-A

Notes:

1. Tamper switches may be required by Fire Code.
2. Assemblies must be U.L. Listed for Fire Protection purposes.

PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

10" DOUBLE CHECK (DCDA)
DETECTOR ASSEMBLY
INSTALLATION

APPROVED
March 2008

REVISED
June 2009

DD-824-20

SHEET
1 OF 1

San Antonio Water System Standard Specifications for Construction

**ITEM NO. 832
TAPPING SLEEVES AND VALVES**

- 832.1 DESCRIPTION:** This item shall consist of tapping sleeves and valves installed in accordance with these specifications and as directed by the Engineer. The use of size on size taps shall not be permitted. Only cut-in tees shall be used within the system, unless otherwise approved.
- 832.2 SUBMITTALS:** Contractor shall submit manufacturer's product data, instructions, recommendations, shop drawings, and certifications.
- 832.3 MATERIALS:** The materials for tapping sleeves and valves shall conform to the specifications contained within the latest revision of SAWS' Material Specification Item Nos. 100-35, "Tapping Sleeves," and 21-02, "Resilient Seated Gate Valves and Tapping Valves."
- 832.4 CONSTRUCTION:** The installation work involved in tapping sleeves and valves shall consist of: excavation, backfilling the excavation with approved selected material, tapping sleeve, approved reaction blocking conforming to Standard Drawing DD-839, tapping valve, valve box assembly, concrete collar (where subjected to street traffic), and cast iron lid. New taps will not be permitted closer than 2 feet of a joint or existing tap. The use of a shell-type cutter shall be required when tapping sleeves and valves. Whenever working on potable or recycle water systems, the shell cutter shall be disinfected with bleach prior to the start of work. The cutting edge shall be sharp and round. Any defective cutters shall be rejected by the Inspector.
- All the tapping sleeves shall be air tested to 50 psi prior to tapping the main line.
- The valve box shall be placed in such a manner to prevent shock or stress from being transmitted to the valve. Valve boxes shall be centered over the valve's operating nut with the box cover flush with the finished pavement surface or located at another level as directed by the Inspector. Valve boxes located in streets or other areas subject to vehicular traffic shall be provided with concrete collars as shown in the accompanying standard drawings. Collars around such valve boxes shall be formed and finished off neatly and in a sound workmanlike manner.
- 832.5 MEASUREMENT:** Tapping Sleeves, Valves, and Boxes will be measured by the unit of each such assembly of the various sizes of tapping sleeves, valves and boxes approved and installed.
- 832.6 PAYMENT:** Payment for Tapping Sleeves and Valves, complete with boxes, will be made at the unit price bid for each such assembly of the various types and sizes of valves and valve boxes installed and approved. Such payment shall also include: excavation, selected embedment material, anti-corrosion embedment

San Antonio Water System Standard Specifications for Construction

when specified, hauling, and disposition of surplus excavated material, backfill, concrete collar at the valve box where subjected to vehicular traffic, ductile iron riser pipe, cast iron boot, packing, tar paper, concrete grout, concrete reaction blocking, protective coating material for bolts, nuts, and ferrous surfaces, and polyethylene sleeve, where required.

- End of Specification -

San Antonio Water System Standard Specifications for Construction

**ITEM NO. 833
METER AND METER BOX INSTALLATION**

833.1 DESCRIPTION: This item shall consist of meter and meter box installation and adjustment installed in accordance with these specifications and as directed by the Engineer.

833.2 SUBMITTALS: Contractor shall submit manufacturer's product data, instructions, recommendations, shop drawings, and certifications.

833.3 MATERIALS: The materials for meter and meter box installation and adjustment shall conform to the specifications contained within the latest revision of SAWS' Material Specification Item No. 10-30, "Meter Boxes."

833.4 CONSTRUCTION:

1. Physical movement of existing meters and meter boxes to new locations may be required where service lines are transferred to new mains in conjunction with main replacement work. Unless specified otherwise, the Contractor shall move existing meters and meter boxes and reconnect and adjust customer's yard piping as part of transferring service lines. A dielectric coupling (PVC schedule 80) shall be installed within the meter box between the meter and the customer's yard piping.

Round and oval meter boxes with round covers shall be salvaged and returned to the Owner by the Contractor. The Contractor shall also replace the salvaged meter boxes with the new, appropriately styled oval plastic meter box with oval cover, or rectangular meter box. Unless otherwise specified, the old service line shall be abandoned after the existing meter has been reset in the existing or new meter box.

Where meter boxes are installed in sidewalks or driveways, the Contractor shall install a number one meter box (2 pieces) as shown in the Material Specifications Item No. 10-30 and the DD-833 Standard Drawing Series.

New meters will be set by the Owner where mains are extended and new services lines are installed for new or initial customer service. In lieu of the new meter, the Contractor shall furnish and install a meter template in accordance with the DD-833 Standard Drawing Series. Contractor shall make a 1 inch diagonal cut thru the wall of the template.

Meter and meter box configuration, shall have the meter set horizontal, approximately 6 inches below the top of meter box, so that the meter is above the bottom of the meter box and in-line with the meter box lid opening. The top of the meter box shall be flush with the existing ground

San Antonio Water System Standard Specifications for Construction

surface. All excess soil above the meter coupling, meter flange and meter nuts inside the meter box shall be removed so that the meter register is clearly visible. The Contractor shall exercise special precautions during excavation at the existing meter location in order to minimize the disturbance of the customer's yard piping. However, if the existing meter elevation is low, the Contractor shall raise the existing meter to conform to the correct configuration indicated herein. Adjustment of meter to proper grade is incidental to the construction and will not be paid for separately.

Where required, pressure reducing valves shall be installed by the customer in accordance with the Uniform Plumbing Code and shall be placed beyond the outlet side of the meter, but not within the Owner's meter box. The pressure reducing valve shall be the property of the water user who will be responsible for its installation, maintenance, and replacement, as required.

2. The meter box adjustment shall not exceed 10 linear feet from the existing box.

833.5 **MEASUREMENT:** Relocation of meters and boxes will be measured by the unit of the various types and sizes of meters and boxes relocated.

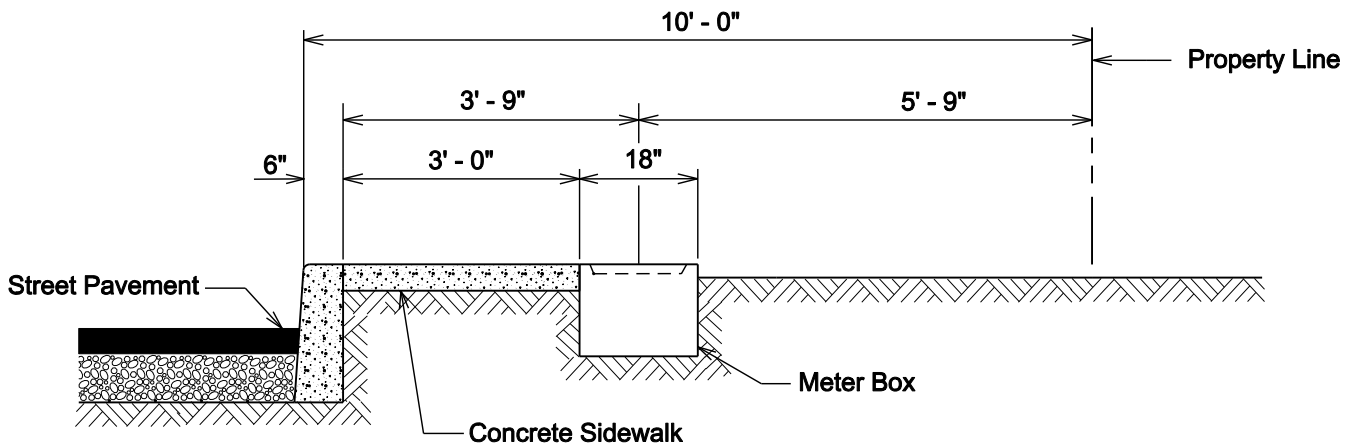
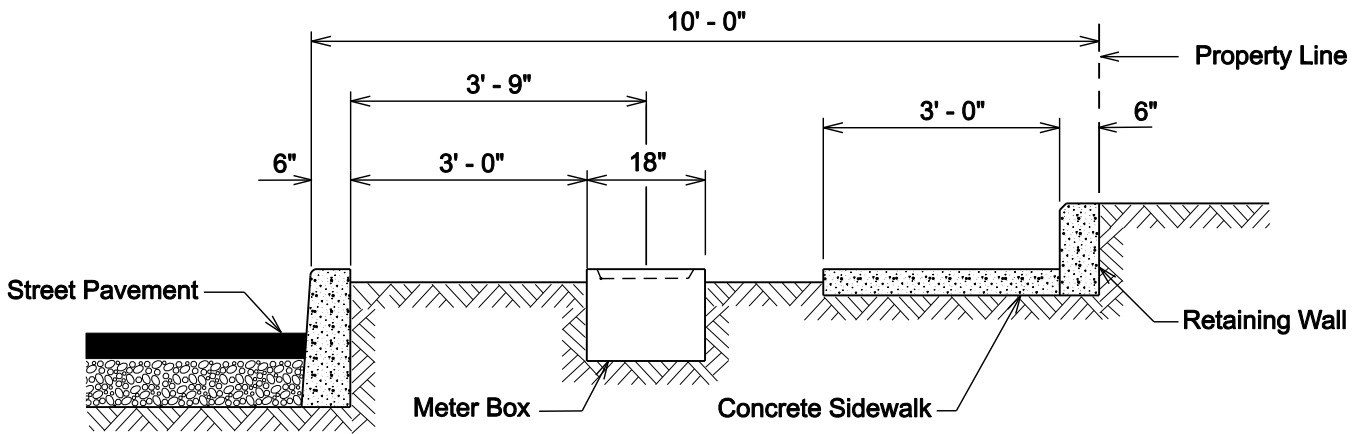
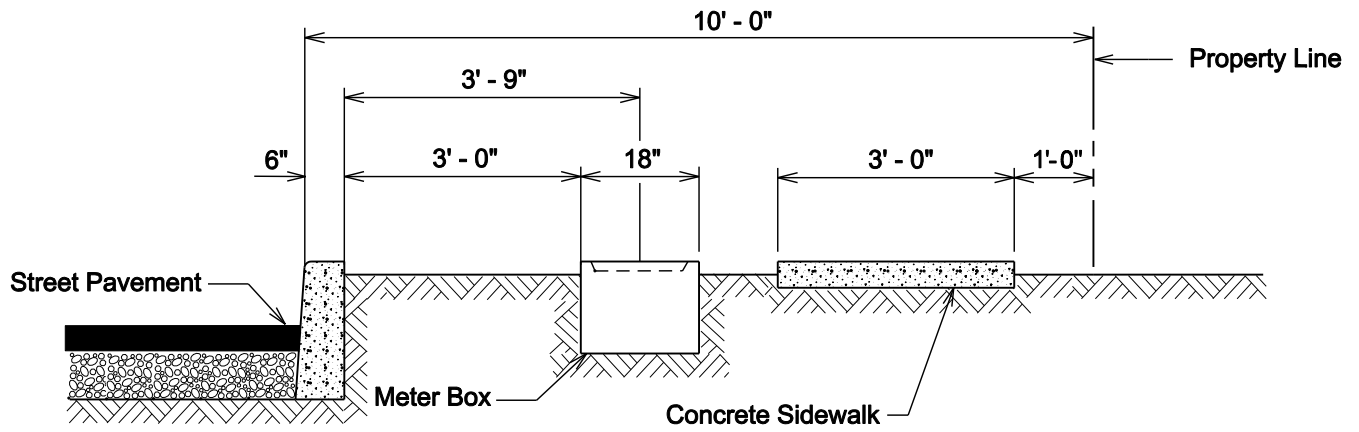
833.6 **PAYMENT:** Payment for "Existing Meter and Existing Meter Box Relocation ($\frac{5}{8}$ inch through 2 inch meter)" will be made at the unit price bid for each existing meter and existing meter box relocated. Such payment shall also include; excavation, hauling and disposition of surplus materials, sand backfill, removal and replacement of yard piping with copper tubing of the various types and sizes and in the quantities necessary to complete the connection and adjustment between the relocated existing meter and existing meter box, and the existing yard piping.

Payment for "Existing Meter and New Meter Box Relocation ($\frac{5}{8}$ inch through 2 inch meter)" will be made at the unit price bid for each existing meter relocated to a new meter box. Such payment shall also include excavation, hauling and disposition of surplus materials, sand backfill, removal and replacement of whatever type surface structure encountered, salvaging the existing meter box, reconnection and adjustment of yard piping with copper tubing of the various types and sizes and in the quantities necessary to complete the connection between the relocated existing meter and new meter box, and the existing yard piping.

Payment for number one meter box installation in sidewalks and driveways shall be paid in the amount of difference between the standard meter box and the number one box.

San Antonio Water System Standard Specifications for Construction

- End of Specification -



Note:
Meter Box location in commercial and industrial areas will be as directed by the Inspector.

PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

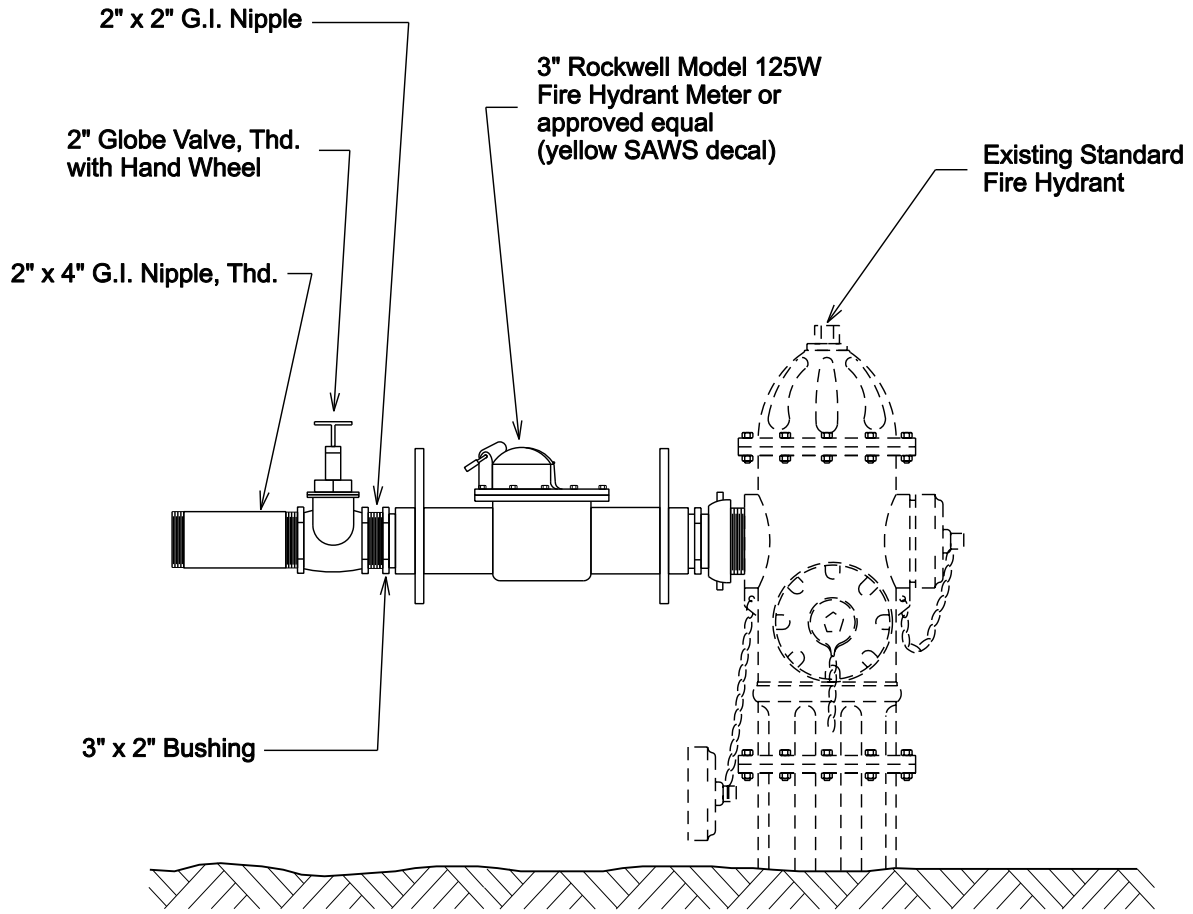
**TYPICAL
METER BOX LOCATION**

APPROVED
MARCH 2008

REVISED
APRIL 2014

DD-833-01

SHEET
1 OF **1**



NOT TO SCALE

PROPERTY OF
SAN ANTONIO WATER SYSTEM
 SAN ANTONIO, TEXAS

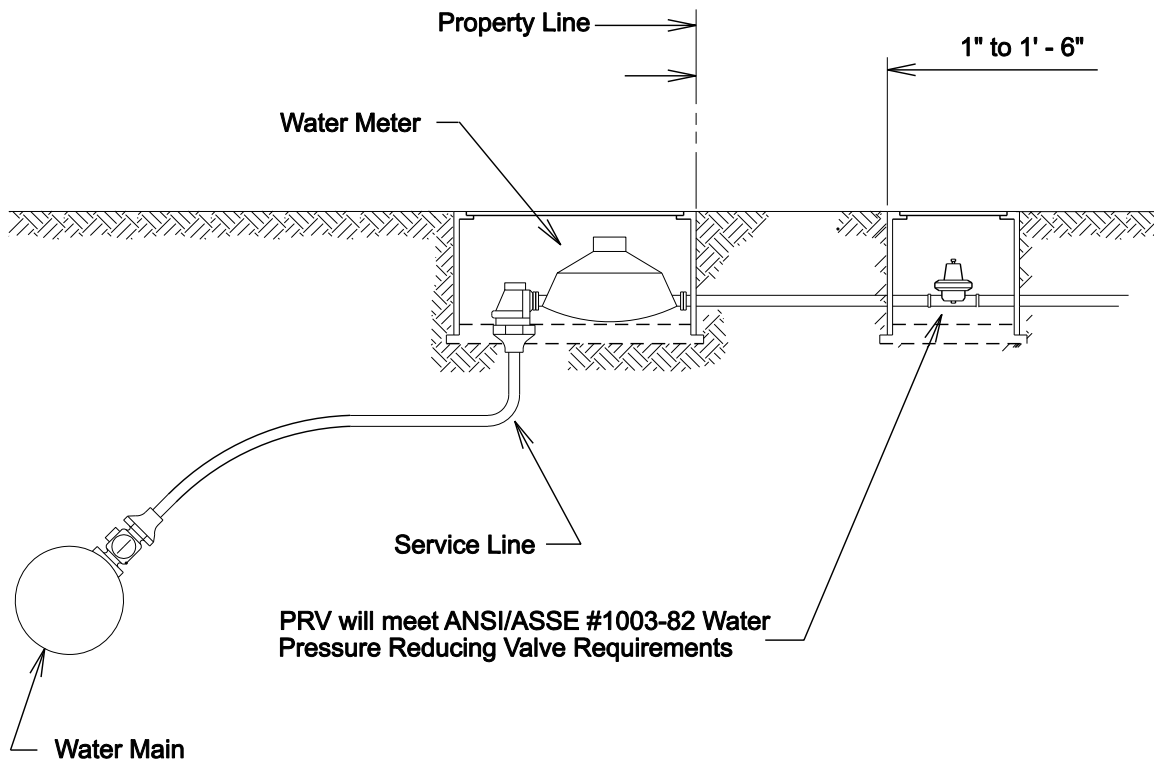
**TEMPORARY 3"
 FIRE HYDRANT
 METER**

APPROVED
 MARCH 2008

REVISED
 APRIL 2014

DD-833-02

SHEET
 1 OF 1



**3/4" THRU 2" SERVICE
PRESSURE REDUCING VALVE**

Note:
For Tapping Schedule, See DD-824-01 Sheet 3 of 3.

PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

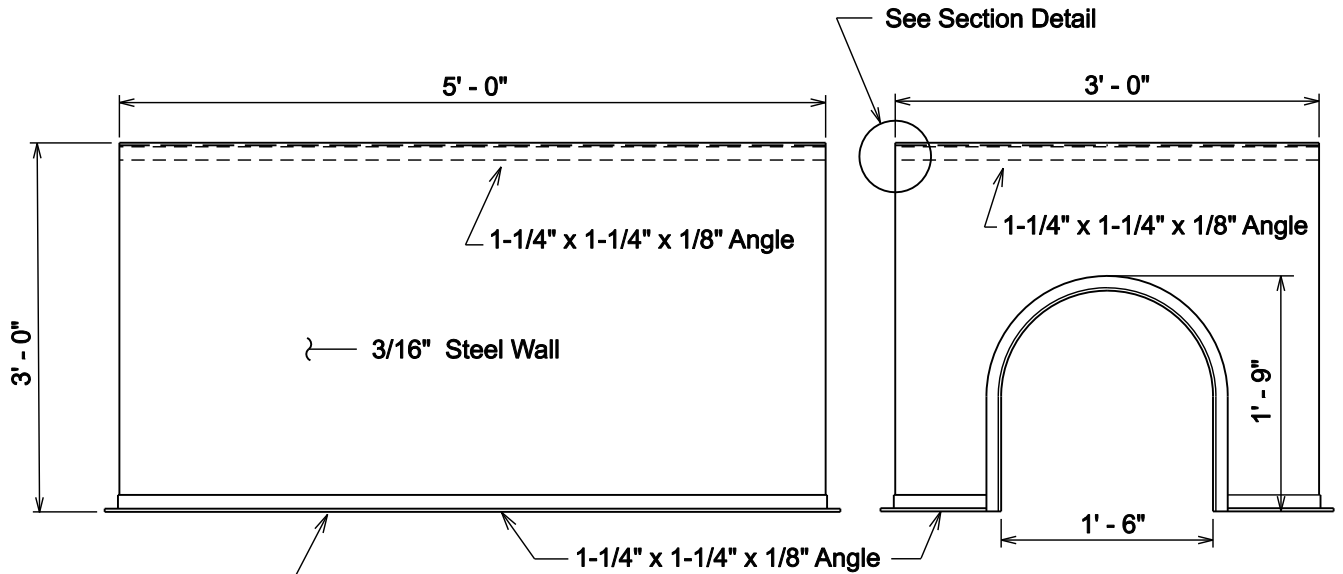
**SERVICE INSTALLATION
WITH PRESSURE
REDUCING VALVE**

APPROVED
MARCH 2008

REVISED
APRIL 2014

DD-833-03

SHEET
1 OF **1**

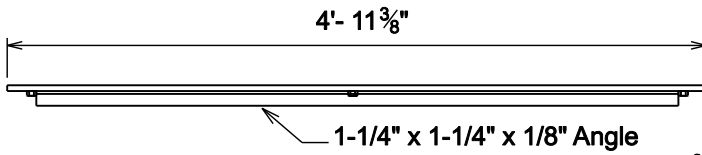


3' x 5' x 3' Steel Vault
Non-Traffic Bearing
(O & R Utilities, Inc.)
or approved equal

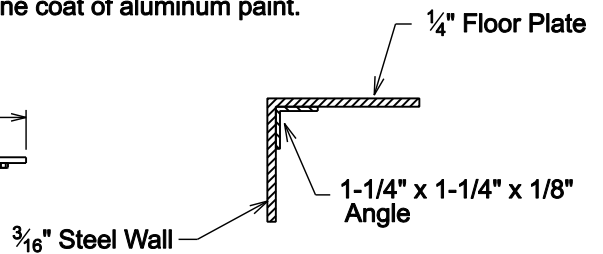
SIDE VIEW
Without Cover

END VIEW
Without Cover

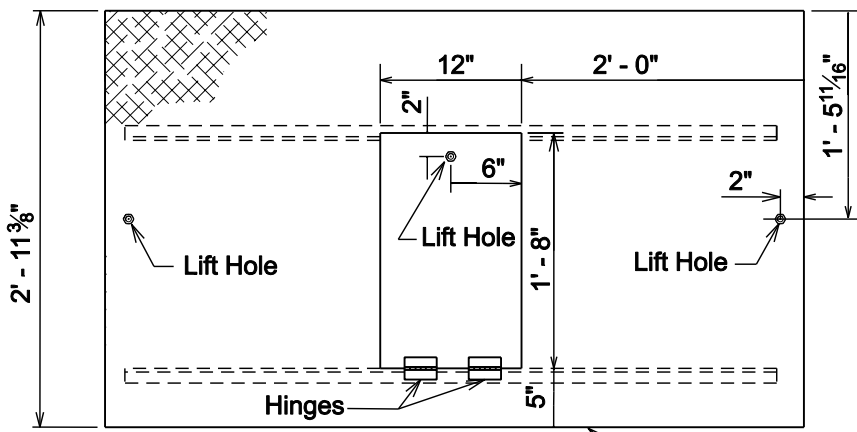
Note:
Paint inside of vault with one coat of rust-inhibitive
primer and outside with one coat of rust-inhibitive
primer plus one coat of aluminum paint.



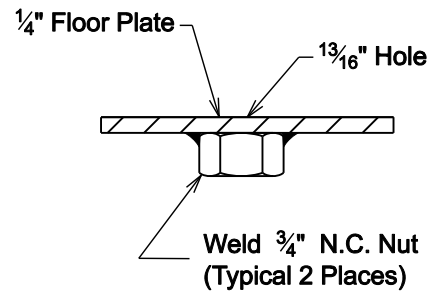
COVER
REFER TO SAWS MATERIAL SPECIFICATIONS
FOR ACCEPTABLE PRODUCTS



SECTION DETAIL



STEEL COVER



LIFT HOLE

**3' x 5' x 3' RECTANGULAR STEEL VAULT
(NON-TRAFFIC BEARING LOCATION)**

San Antonio Water System Standard Specifications for Construction

**ITEM NO. 840
WATER TIE-INS**

- 840.1** **DESCRIPTION:** This item shall consist of water main tie-ins installed in accordance with these specifications and as directed by the Engineer.
- 840.2** **MATERIALS:** The materials for water main tie-ins shall conform to the specifications contained within the latest revision of SAWS' Material Specifications for all appropriate items.
- 840.3** **CONSTRUCTION:** The Contractor shall make tie-ins from new water mains to existing water mains as shown in the contract documents or as directed by the Engineer. The Contractor shall be responsible for all shutdowns and isolation of the existing mains; cutting pipe for the connection; dewatering the excavation; customer notification of the shutdown; and all other requirements as directed by the Inspector in order to provide completion of this effort in a safe and secure manner. Work performed by the Contractor on mains 16 inches and larger, will require operation of any valves by SAWS forces. Therefore ample coordination beforehand (2 work days) shall be provided by the Contractor for this interaction to occur. All tie-ins shall be done after normal work hours, (8am-5pm). During construction, the planned shutdown and tie-in work shall be coordinated through and approved by the Inspector with a minimum of two weeks prior notice of such activity and accomplished at a time which will be at the least inconvenience to the customers. No additional compensation will be provided for tie-ins accomplished after normal working hours.
- 840.4** **MEASUREMENT:** Tie-ins will be measured by the unit of each such assembly of the various sizes of tie-ins installed at the proposed main to be accepted.
- 840.5** **PAYMENT:** Payment for "Tie-ins" will be made at the unit price bid for each tie-in of the various types and sizes completed from an existing main to the proposed main to be accepted. Such payment shall include; shut-down and isolation of the existing main to which the new main is to be connected, cutting pipe for the connection, dewatering the excavation, and customer notification of service interruption where required. Connections between new and existing mains which are made with tapping sleeves and valves and by cutting-in tees will be processed as a no separate pay item.

- End of Specification -

San Antonio Water System Standard Specifications for Construction

ITEM NO. 844
BLOW-OFF ASSEMBLIES

844.1 **DESCRIPTION:** This item shall consist of blow-off assemblies installed in accordance with these specifications and as directed by the Engineer.

844.2 **MATERIALS:** The materials for blow-off assemblies, installation and adjustment shall conform to the specifications contained within the latest revision of SAWS' Material Specification.

844.3 **CONSTRUCTION:** Permanent and temporary blow-off assemblies shall be installed where shown on the plans and/or at locations designated by the Engineer/Owner and at the end of all dead end mains in accordance with the Texas Administrative Code (TAC) rules to include 30 TAC § 290.44.(d)(5), (6).

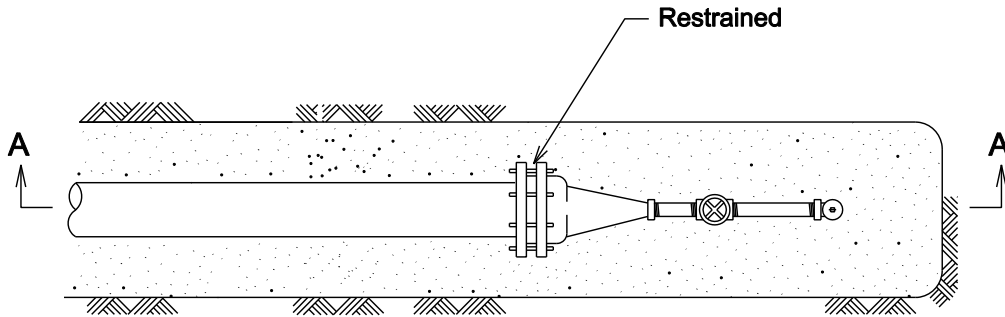
The permanent blow-off shall consist of the following: all galvanized iron pipe, valve, and fittings of the various sizes shown on the plans, 6 inch valve box assembly and concrete collar around the valve box. The temporary blow-off shall consist of the following; all galvanized iron pipe, valve and fittings of the various sizes shown on the plans. Valve box shall be raised or installed to finished grade and installed in accordance with Standard Drawing DD-844 Series.

844.4 **MEASUREMENT:** Permanent Blow-off assemblies will be measured by the unit of each such assembly of the various sizes of permanent blow-offs installed.

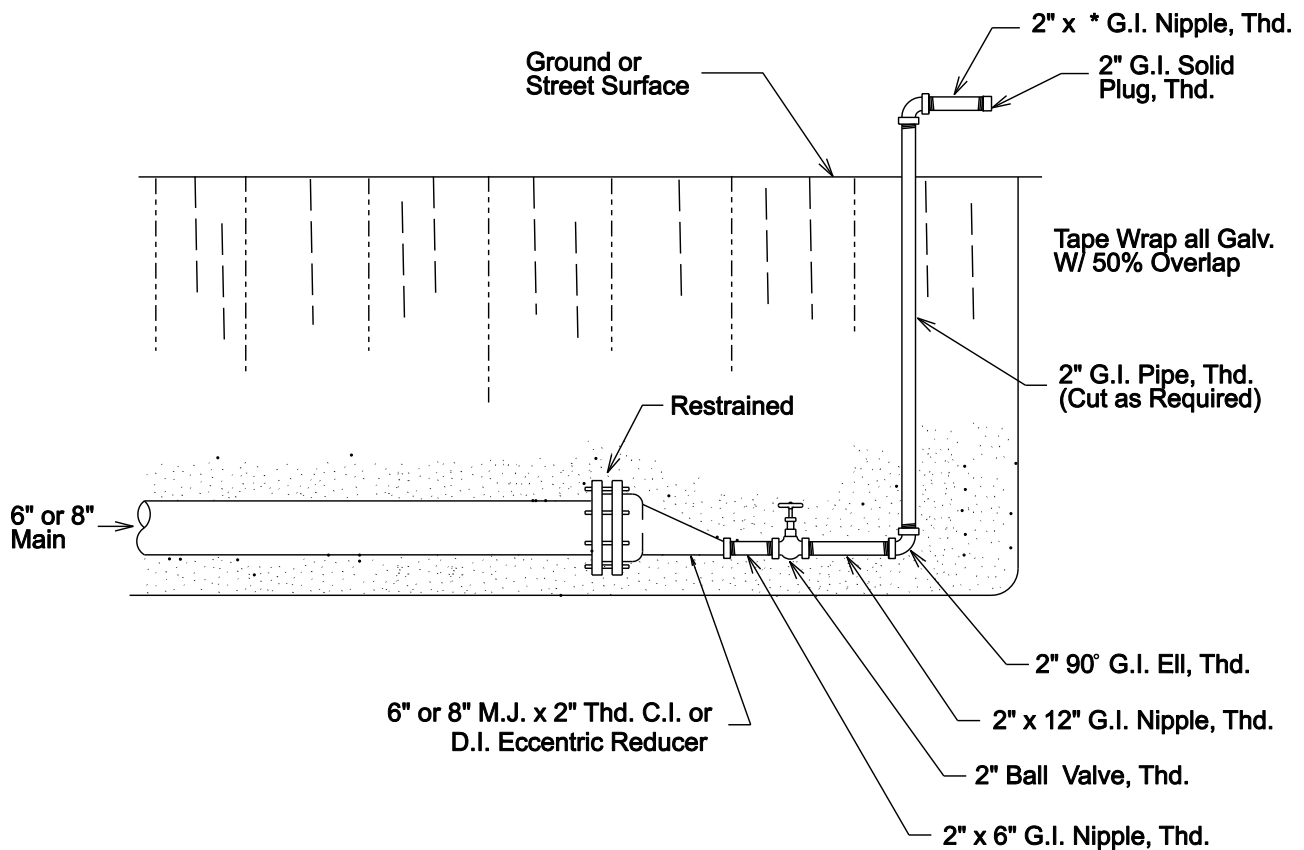
Temporary Blow-off assemblies will be measured by the unit of each such assembly of the various sizes of temporary blow-offs installed.

844.5 **PAYMENT:** Payment for Permanent and Temporary Blow-off will be made at the unit price bid for each such assembly of the various types and sizes installed in accordance with the details shown in the Standard Drawing DD-844 Series. Such payment shall also include excavation, selected embedment material, anti-corrosion embedment when specified, and the hauling and disposition of surplus excavated materials. Payment for eccentric reducers and eccentrically tapped caps and flanges will be made under Item No. 836, "Grey-Iron and Ductile-Iron Fittings," while payment for the pipe nipple with reaction stop ring will be made under Item No. 812, "Water Main Installation,"

- End of Specification -



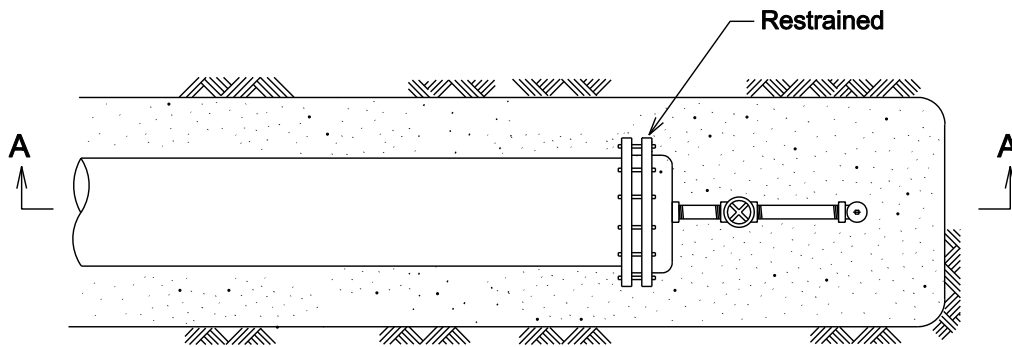
PLAN



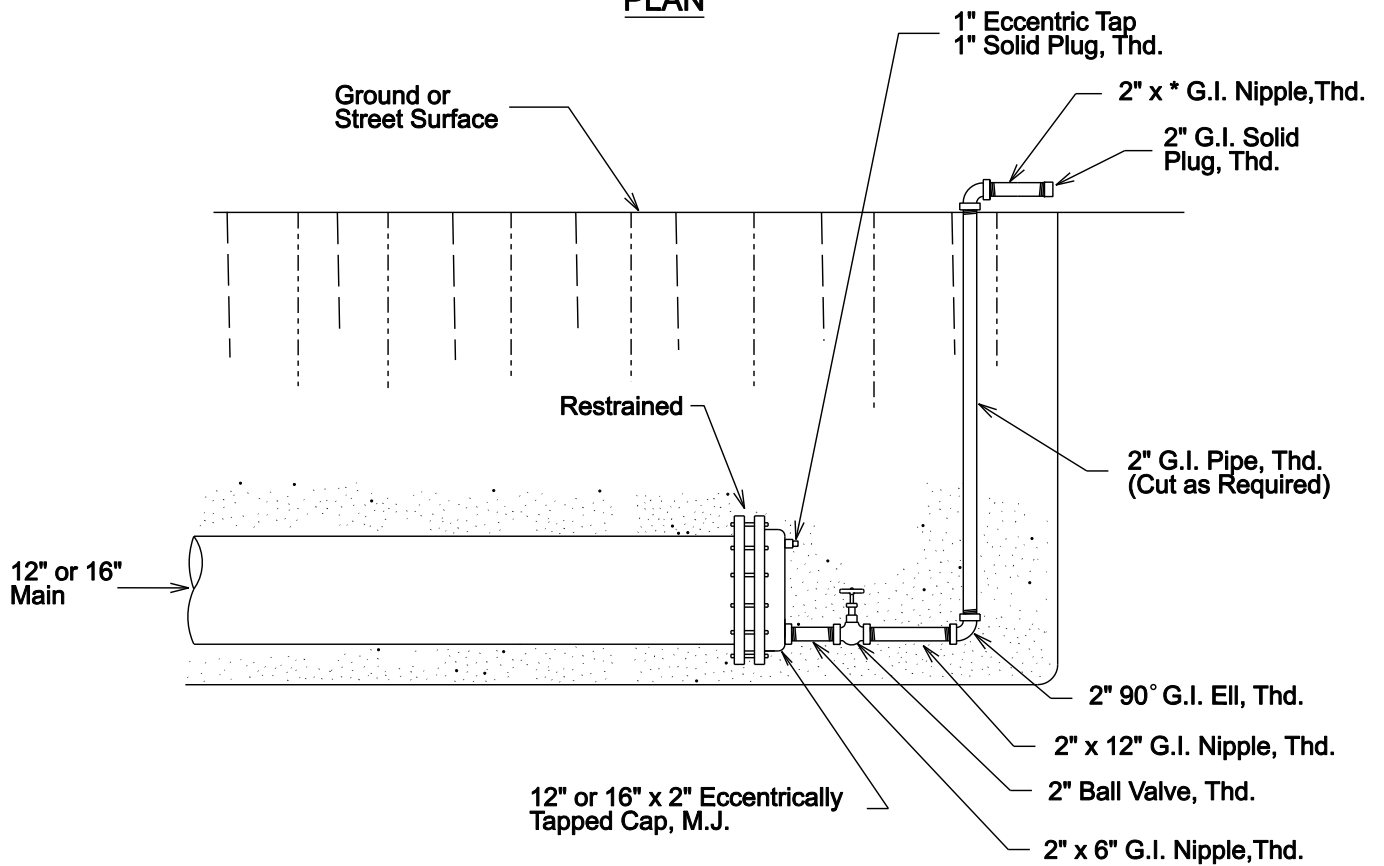
SECTION A-A

* Cut as required to extend beyond excavation

PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	2" TEMPORARY BLOW-OFF ASSEMBLY ON 6" & 8" D.I. MAINS	APPROVED	REVISED
		MARCH 2008	APRIL 2014
		DD-844-01	SHEET 1 OF 4



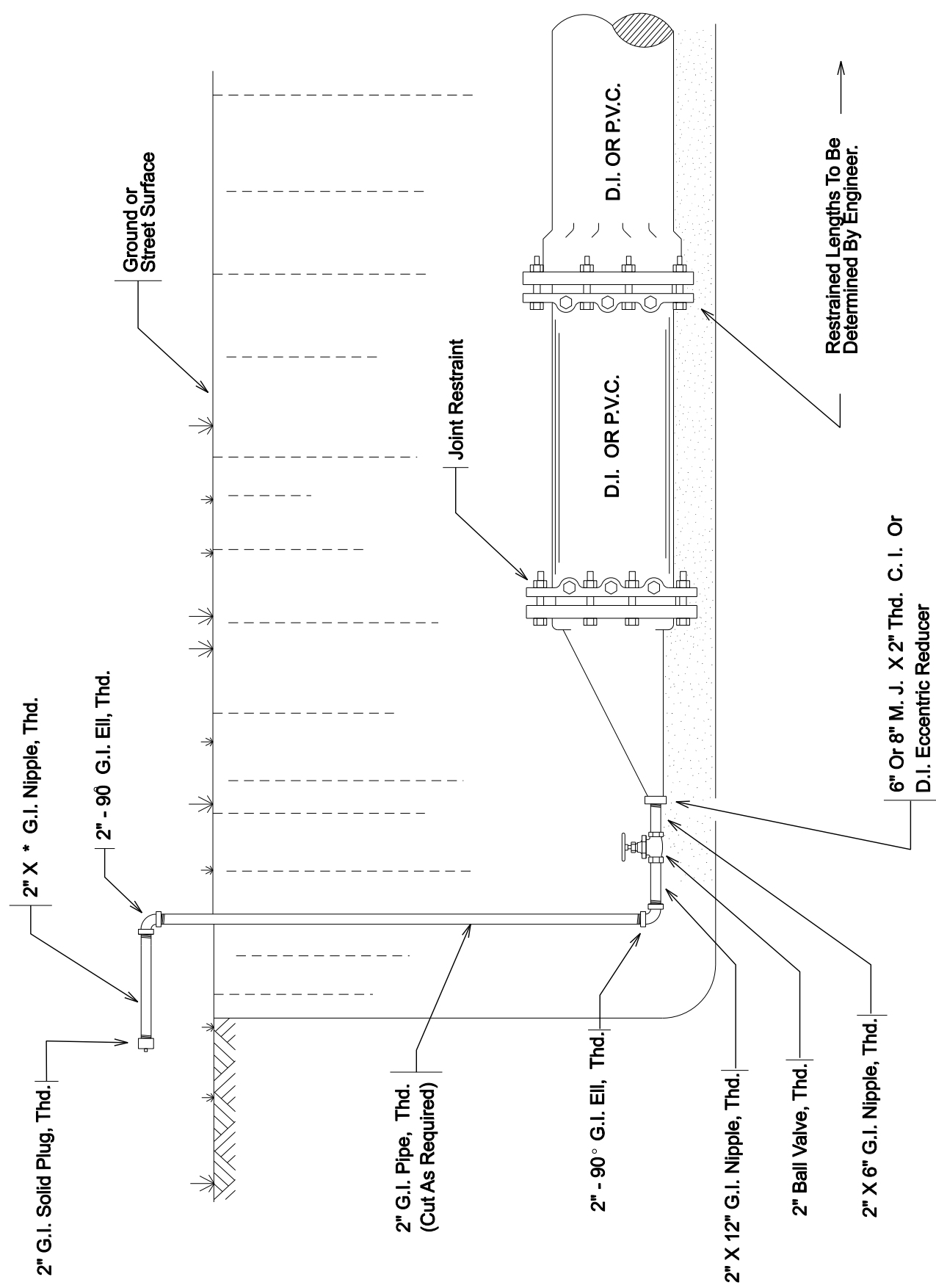
PLAN



SECTION A-A

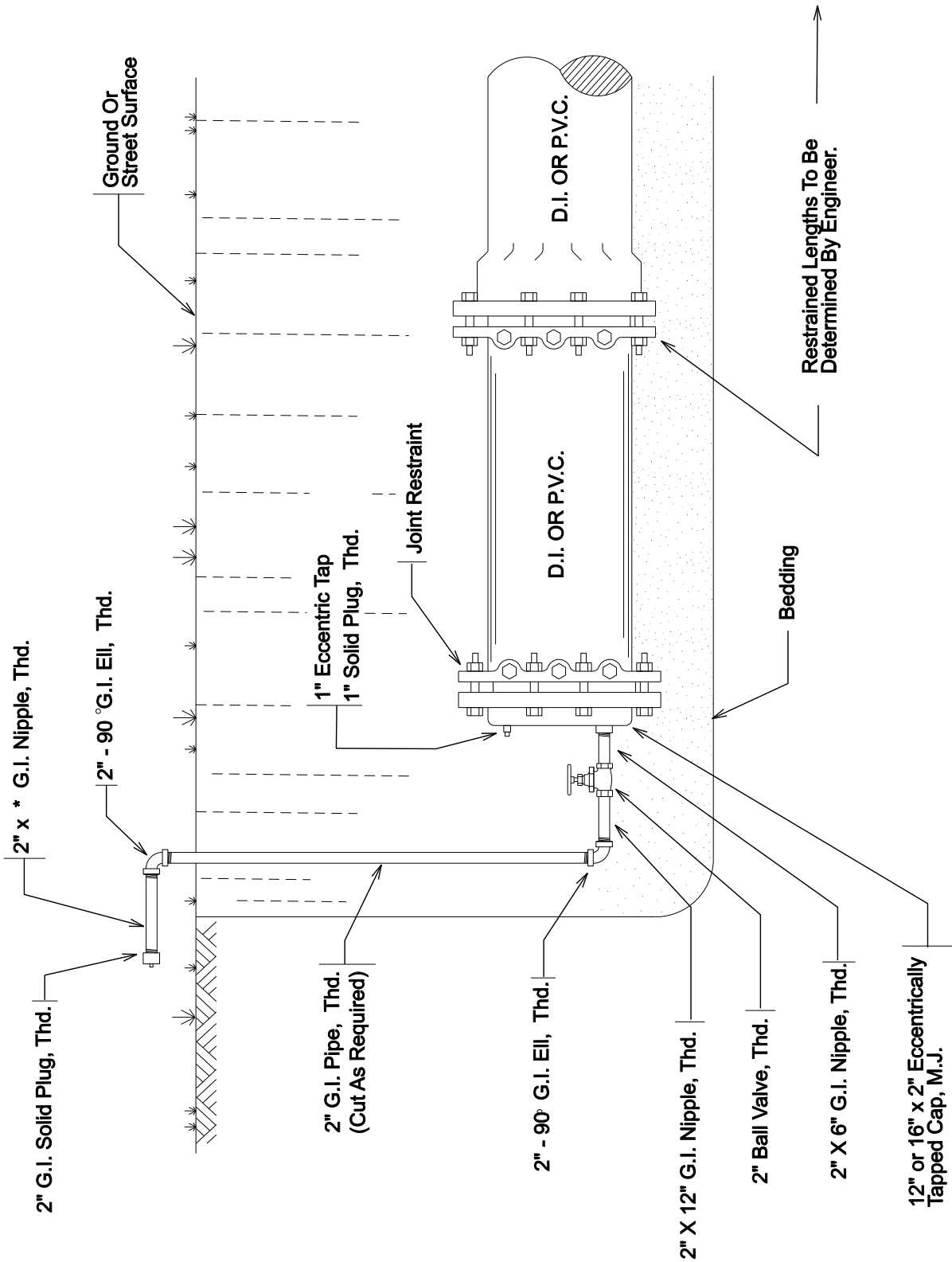
* Cut as required to extend beyond excavation.

PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	2" TEMPORARY BLOW-OFF ASSEMBLY ON 12" & 16" D.I. MAINS	APPROVED	REVISED
		March 2008	APRIL 2014
		DD-844-01	



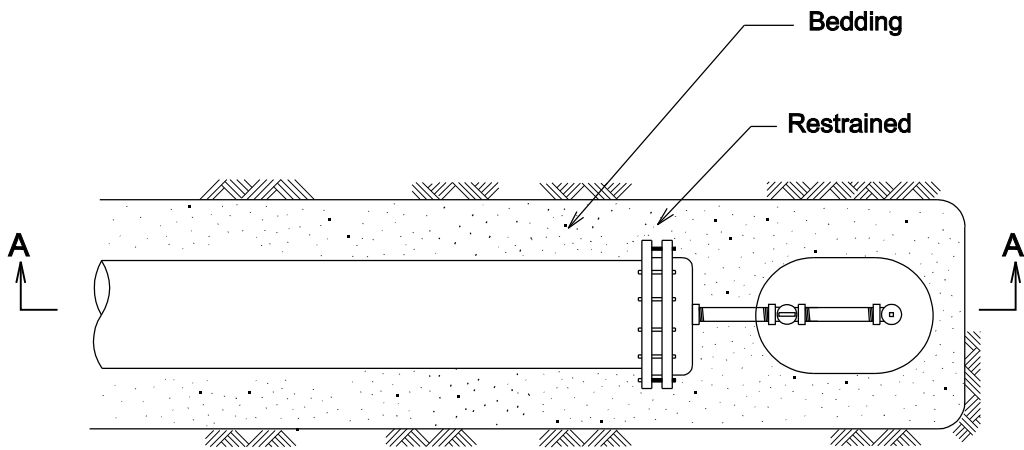
* Cut as required to extend beyond excavation.

PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	2" (TEMPORARY) BLOW-OFF ASSEMBLY ON 6" & 8" D. I./P.V.C. MAINS (JOINT RESTRAINT)	APPROVED	REVISED
		MARCH 2008	APRIL 2014
DD-844-01		SHEET 3 OF 4	

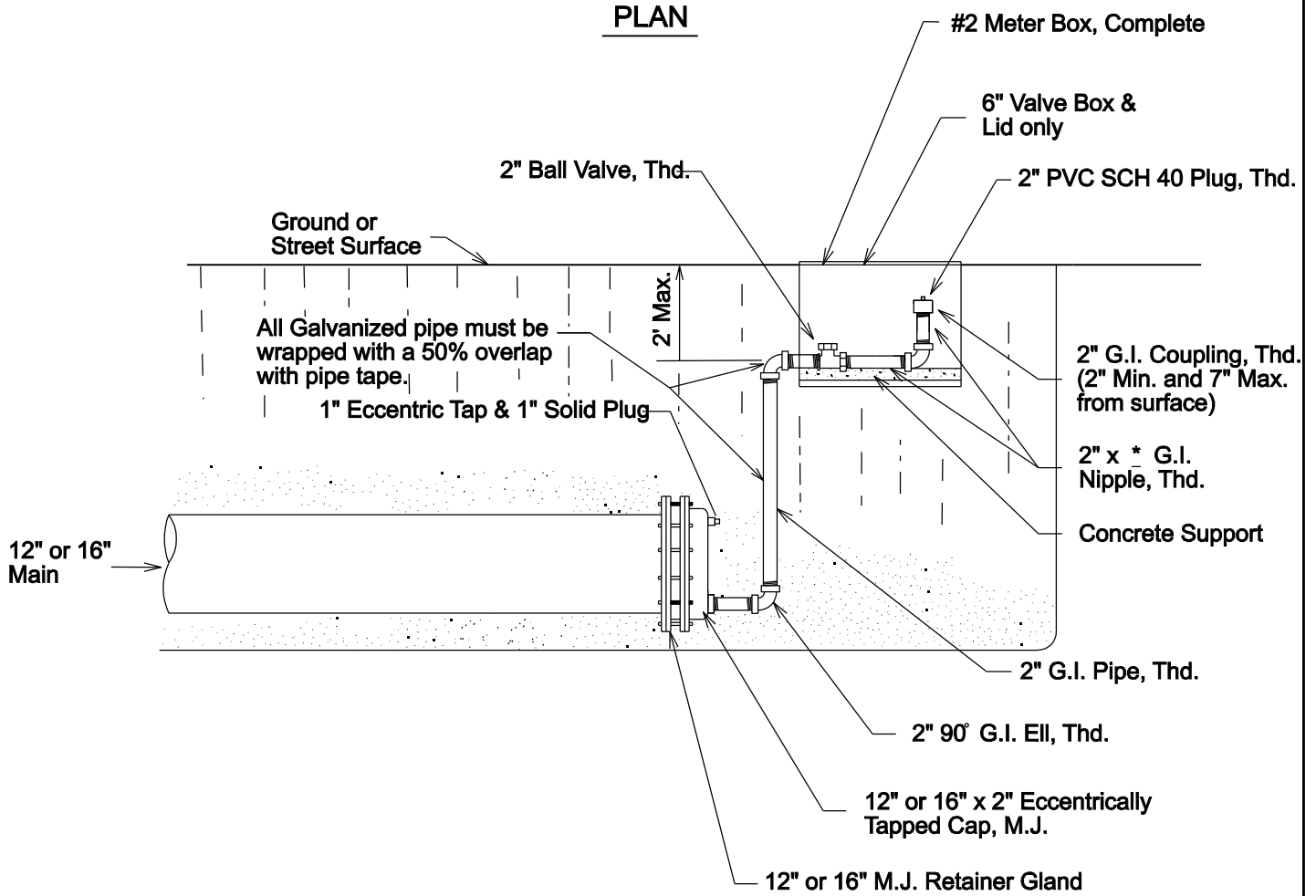


* Cut as required to extend beyond excavation.

PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	2" (TEMPORARY) BLOW-OFF ASSEMBLY ON 12" & 16" D. I./P.V.C. MAINS (JOINT RESTRAINT)	APPROVED	REVISED
		MARCH 2008	APRIL 2014
		DD-844-01	
		SHEET 4 OF 4	



PLAN



SECTION A-A

* Cut to fit in meter box.

PROPERTY OF
SAN ANTONIO WATER SYSTEM
 SAN ANTONIO, TEXAS

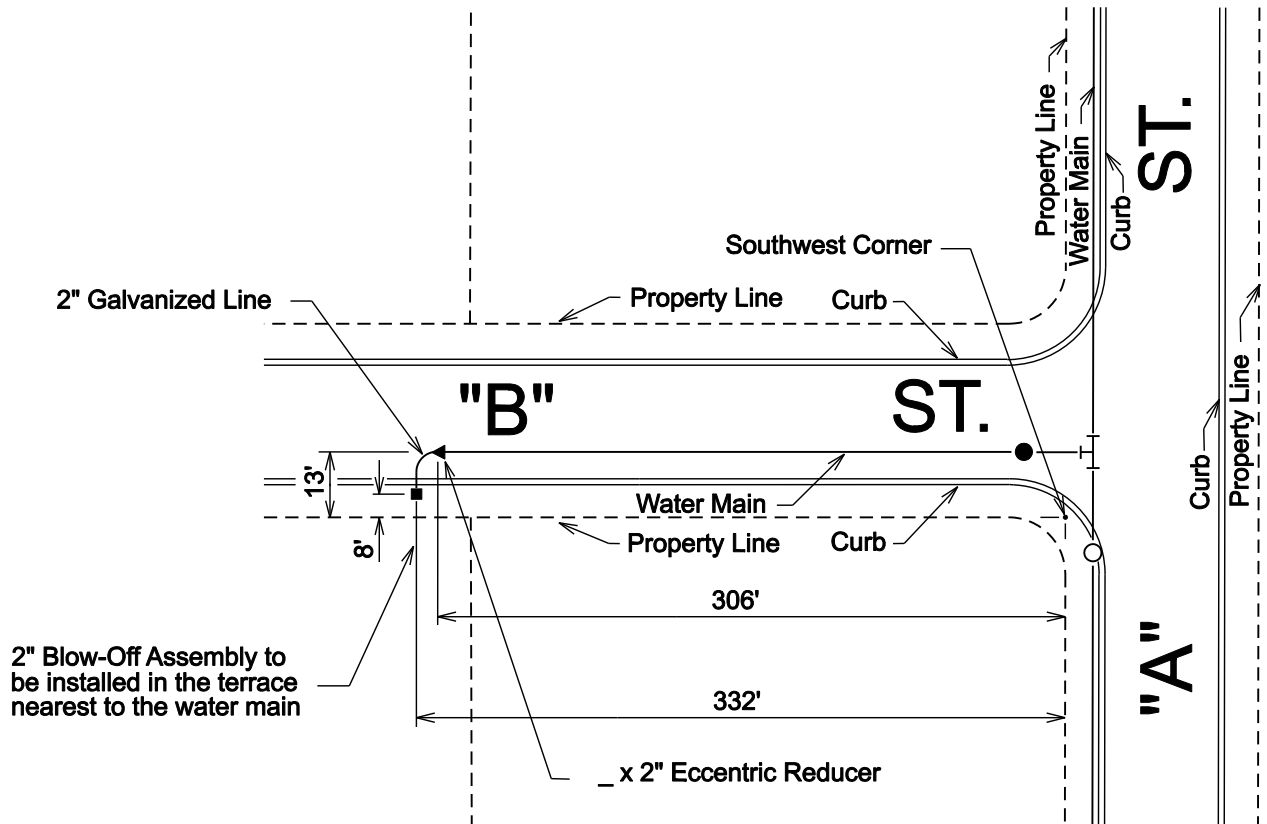
**2" PERMANENT
 BLOW-OFF ASSEMBLY
 ON 12" & 16" MAINS**

APPROVED
 MARCH 2008

REVISED
 APRIL 2014

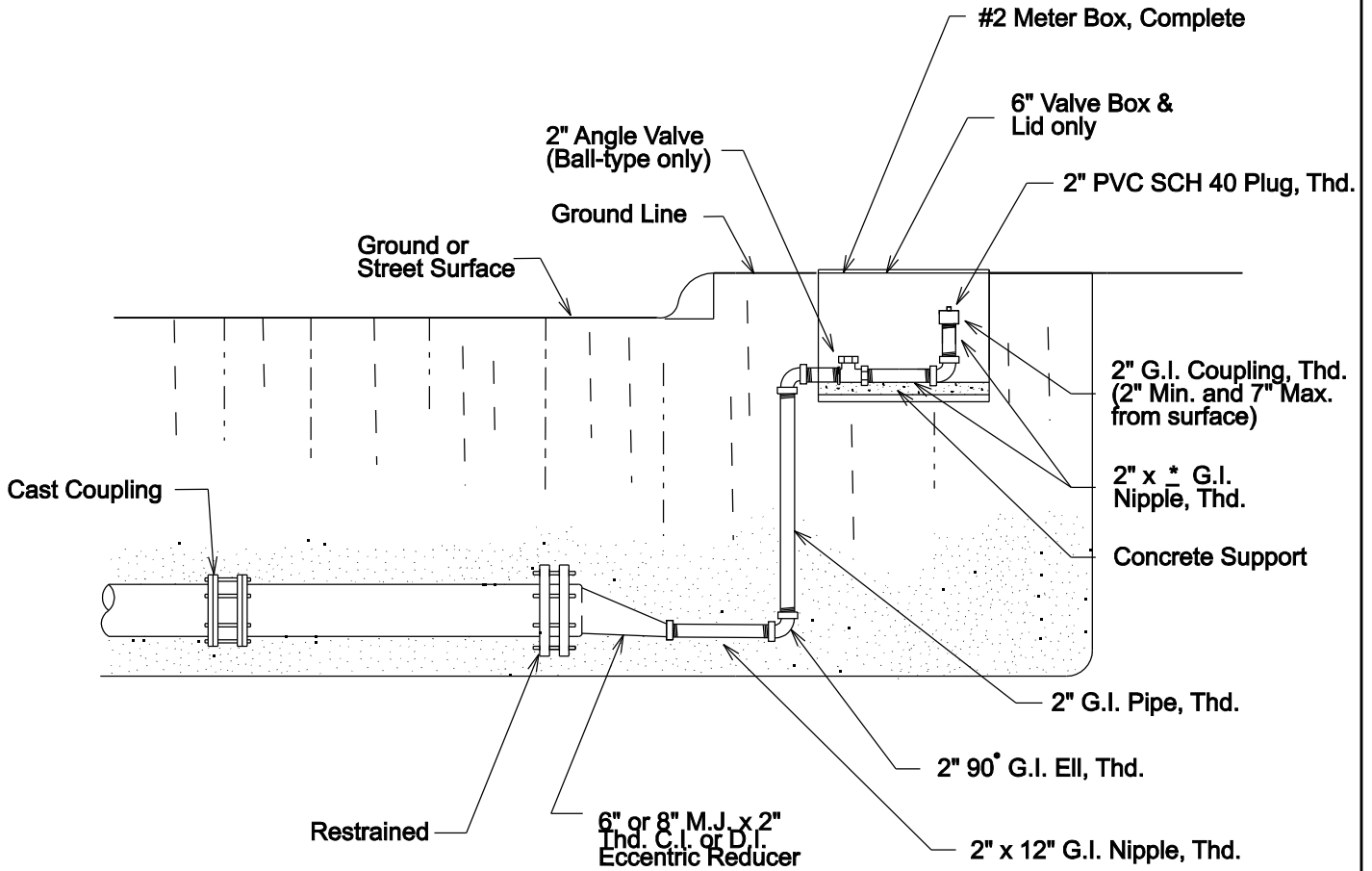
DD-844-02

SHEET
1 OF 5



BLOW-OFF MEASUREMENT: From the Southwest Corner of "A" St. and "B" St. West 306' and North 13' to Eccentric Reducer, and West 332' and North 8' to Blow-Off Assembly

PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	TYPICAL BLOW-OFF ARRANGEMENT ON DEAD END MAINS	APPROVED	REVISED
		MARCH 2008	APRIL 2014
		DD-844-02	



* Cut to fit in meter box.

PROPERTY OF
SAN ANTONIO WATER SYSTEM
 SAN ANTONIO, TEXAS

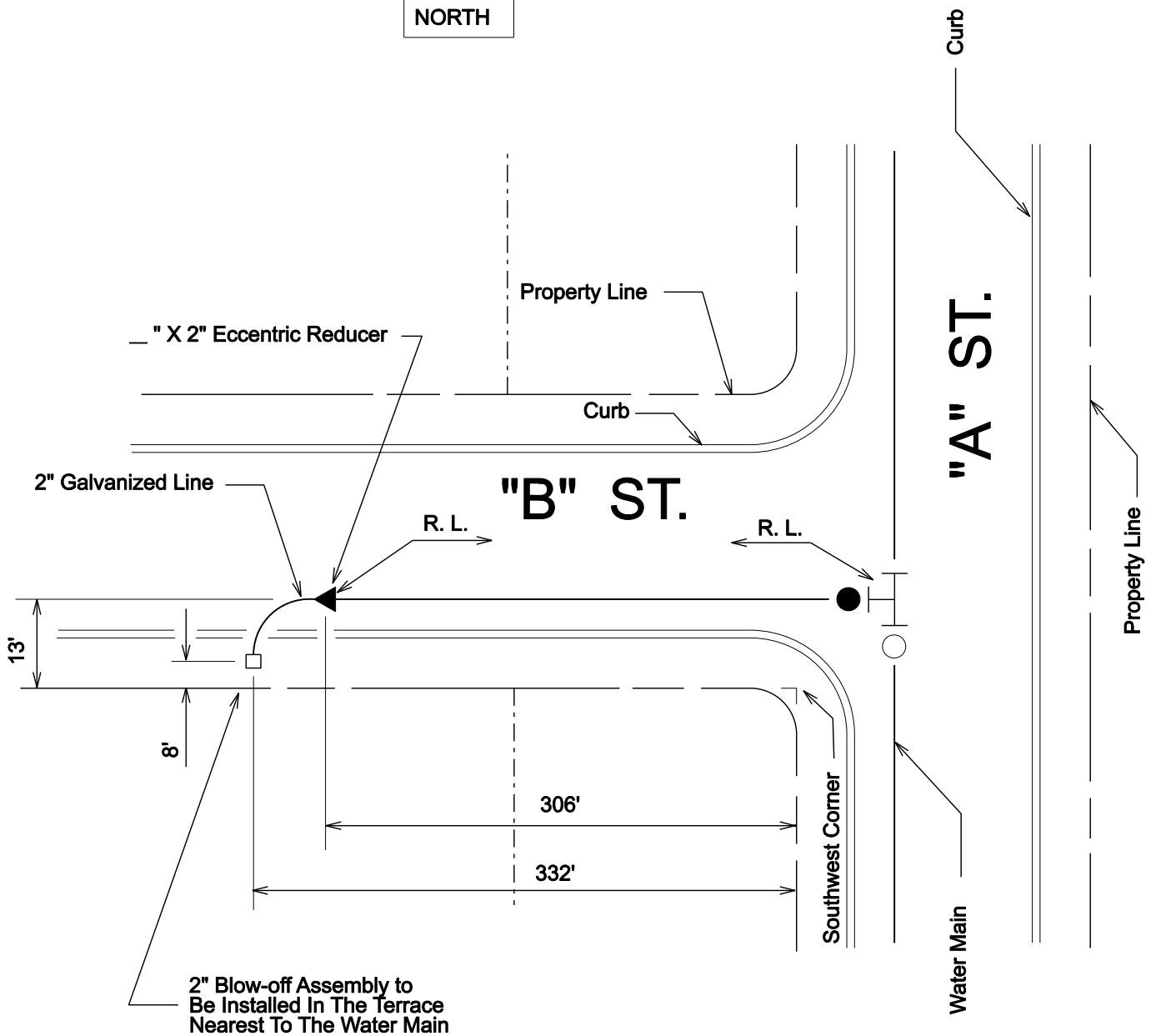
**2" PERMANENT
 BLOW-OFF ASSEMBLY
 ON 6" & 8" MAINS**

APPROVED
 MARCH 2008

REVISED
 APRIL 2014

DD-844-02

SHEET
3 OF 5



2" BLOW-OFF MEASUREMENT:
 FROM THE SOUTHWEST CORNER OF "A" ST. AND "B" ST.
 WEST 306' AND NORTH 13' TO ECCENTRIC REDUCER, AND
 WEST 332' AND NORTH 8' TO BLOW-OFF ASSEMBLY

R. L. = RESTRAINED LENGTHS TO BE
 DETERMINED BY ENGINEER.

PROPERTY OF
SAN ANTONIO WATER SYSTEM
 SAN ANTONIO, TEXAS

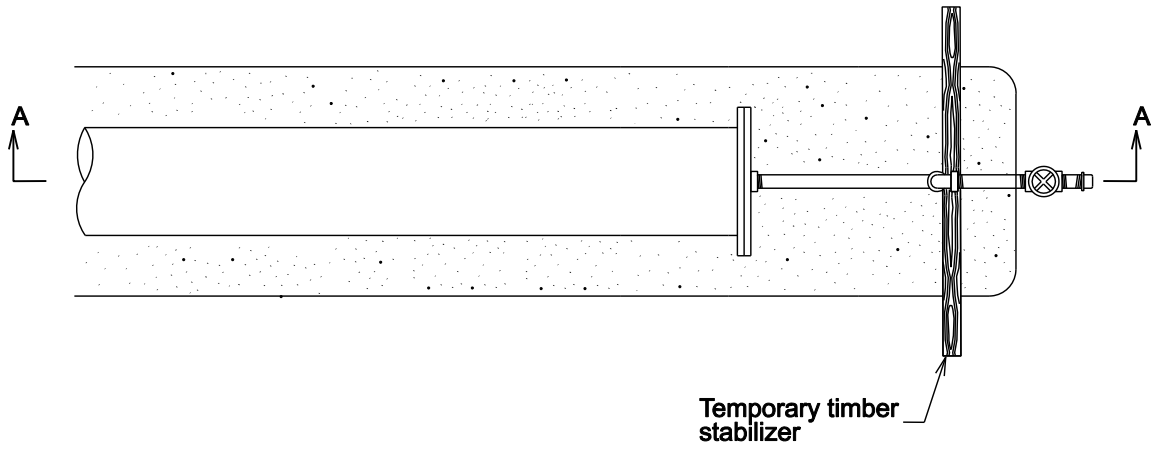
**TYPICAL BLOW-OFF
 ARRANGEMENT ON
 DEAD END MAINS
 (JOINT RESTRAINT)**

APPROVED
 MARCH 2008

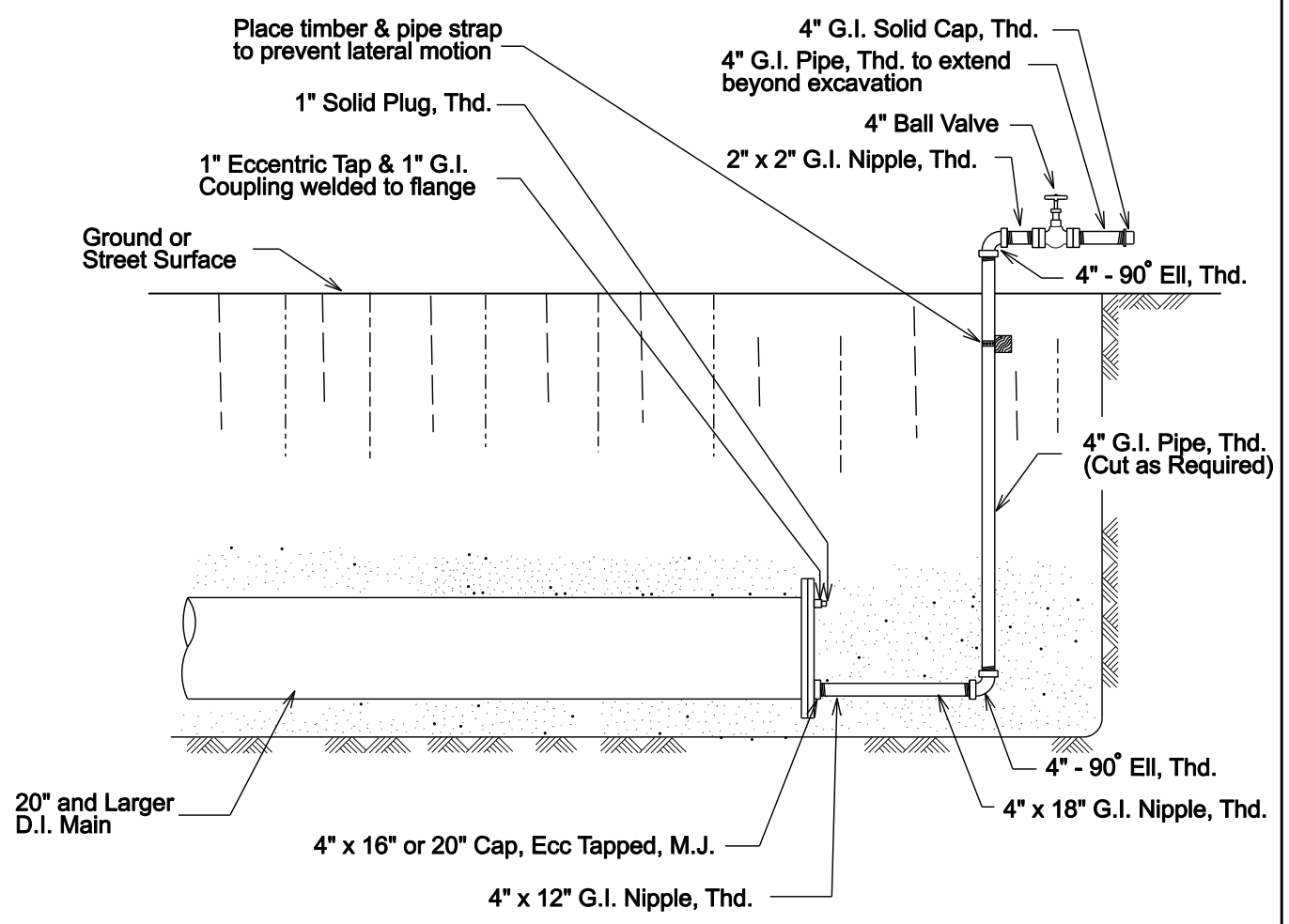
REVISED
 APRIL 2014

DD-844-02

SHEET
4 OF **5**

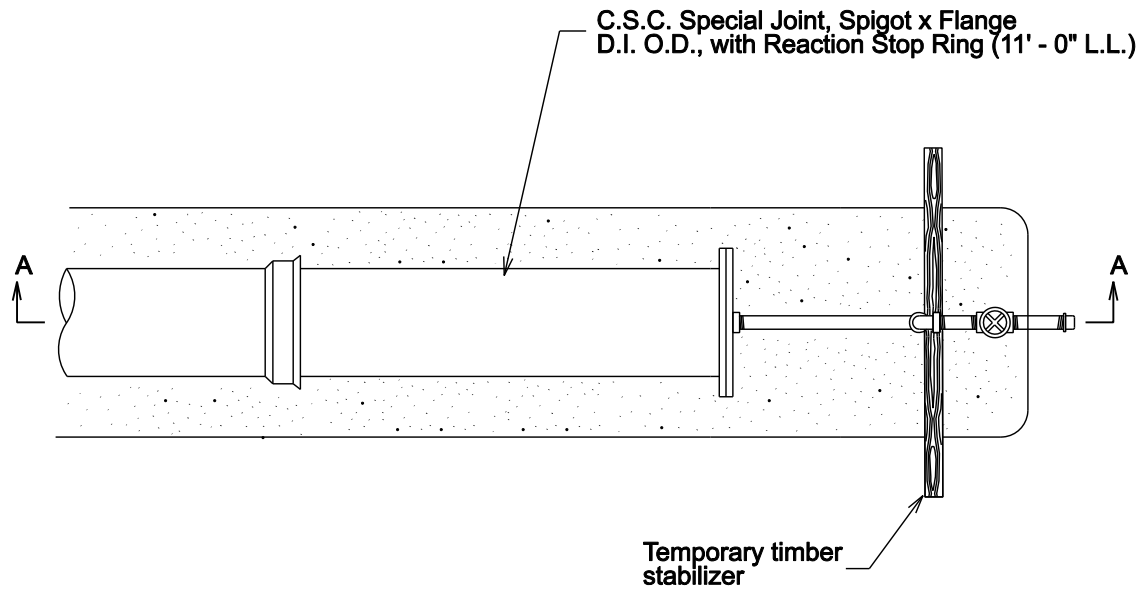


PLAN

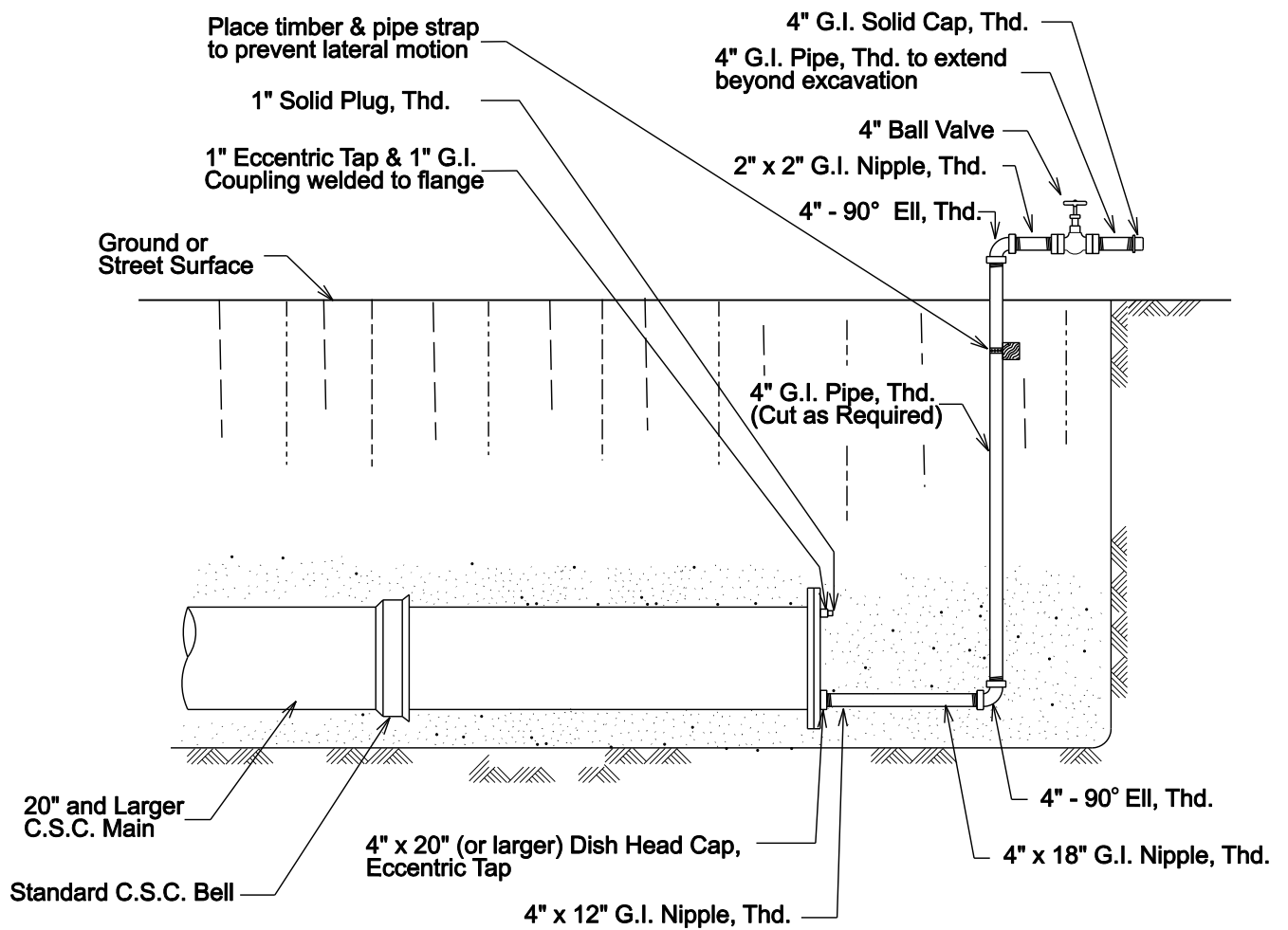


SECTION A-A

PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	4" TEMPORARY BLOW-OFF ASSEMBLY 20" AND LARGER D.I. MAIN	APPROVED	REVISED
		MARCH 2008	APRIL 2014
		DD-844-04	



PLAN



SECTION A-A

PROPERTY OF
SAN ANTONIO WATER SYSTEM
 SAN ANTONIO, TEXAS

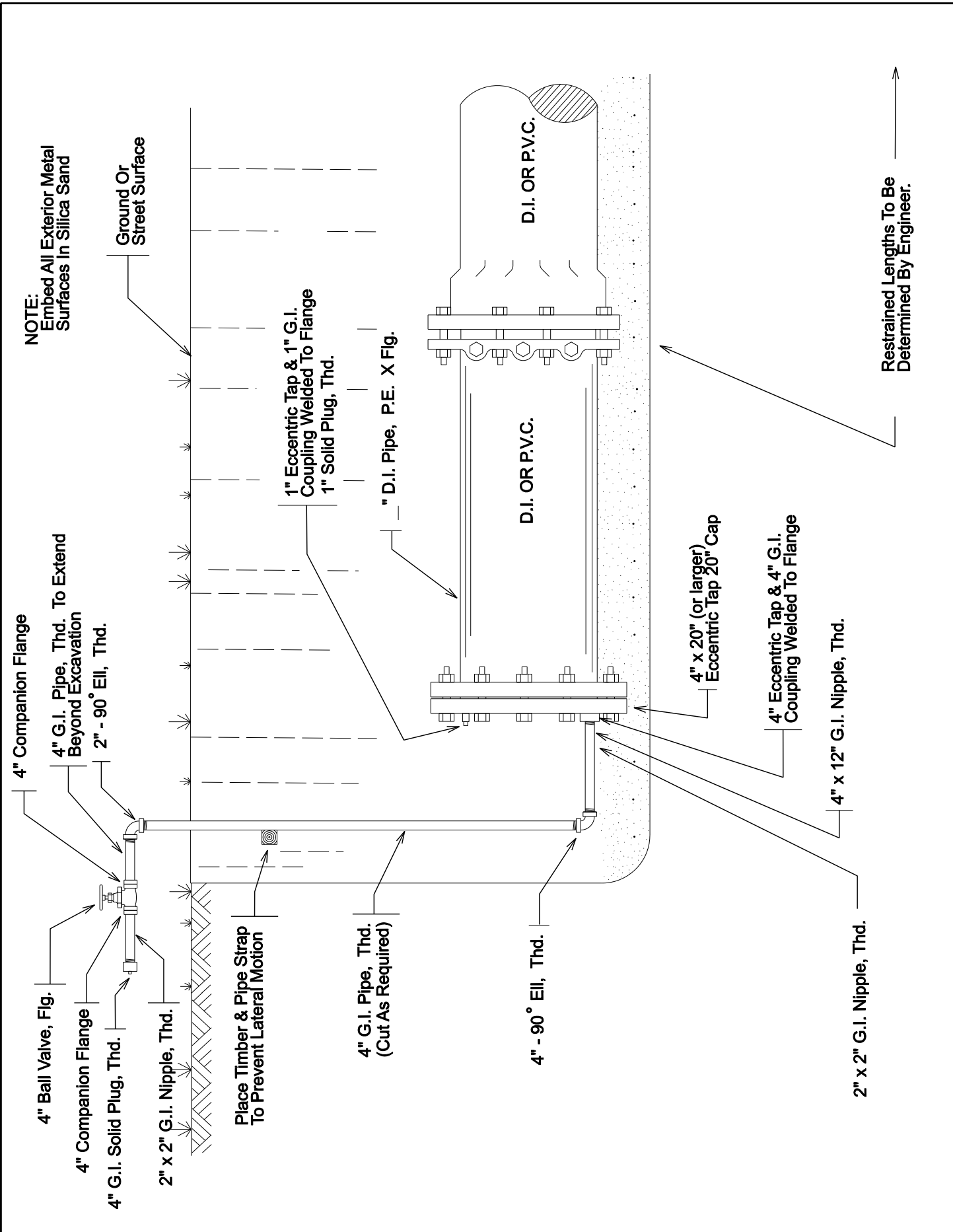
**4" TEMPORARY
 BLOW-OFF ASSEMBLY
 20" AND LARGER C.S.C. MAIN**

APPROVED
 MARCH 2008

REVISED
 APRIL 2014

DD-844-04

SHEET
2 OF 4



PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

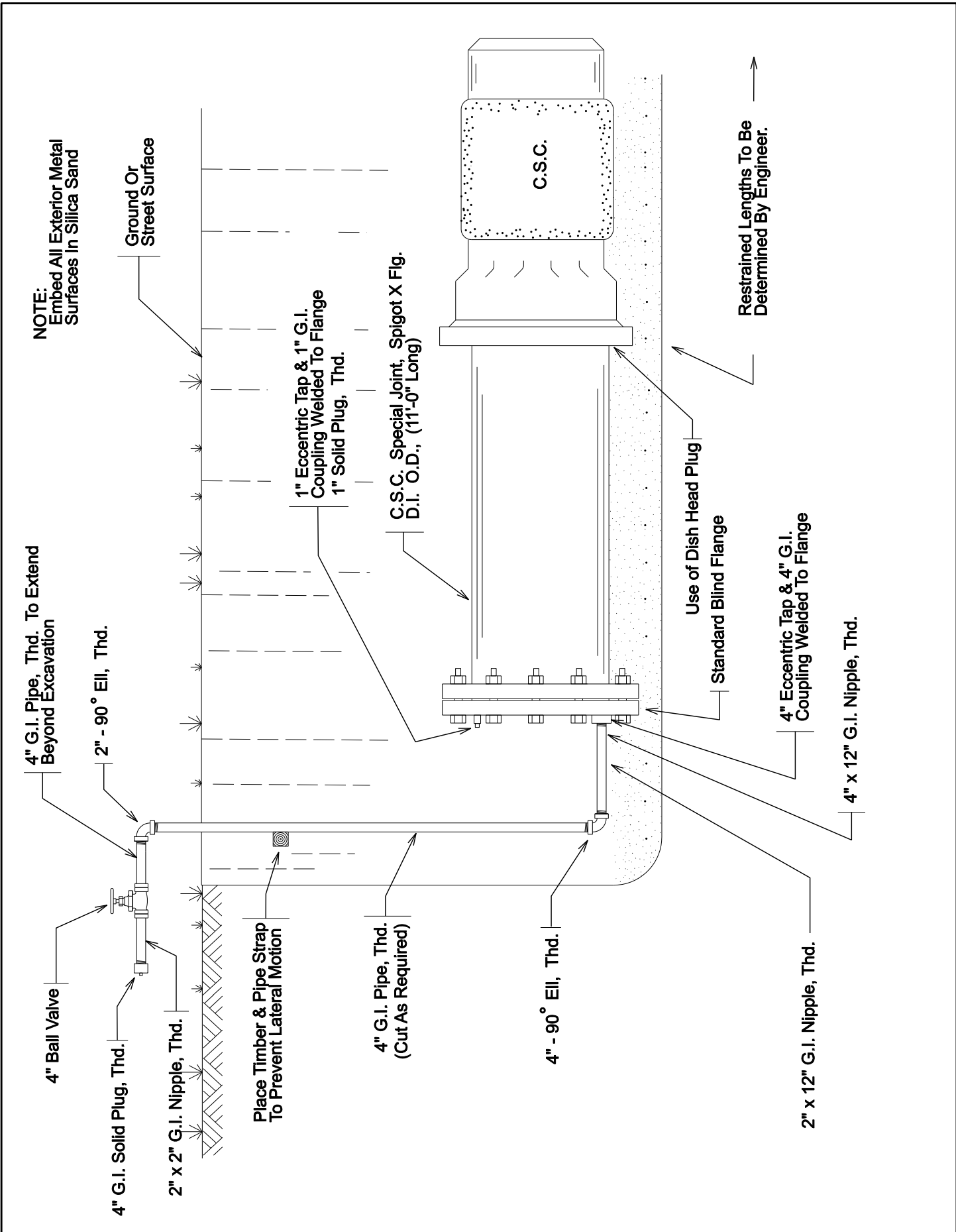
**4" (TEMPORARY)
BLOW-OFF ASSEMBLY 20"
AND LARGER D. I./P.V.C. MAIN
(JOINT RESTRAINT)**

APPROVED
MARCH 2008

REVISED
APRIL 2014

DD-844-04

SHEET
3 OF **4**



NOTE:
Embed All Exterior Metal
Surfaces In Silica Sand

Restrained Lengths To Be
Determined By Engineer.

4" G.I. Pipe, Thd. To Extend
Beyond Excavation

2" - 90° Ell, Thd.

4" Ball Valve

4" G.I. Solid Plug, Thd.

2" x 2" G.I. Nipple, Thd.

Place Timber & Pipe Strap
To Prevent Lateral Motion

4" G.I. Pipe, Thd.
(Cut As Required)

4" - 90° Ell, Thd.

2" x 12" G.I. Nipple, Thd.

1" Eccentric Tap & 1" G.I.
Coupling Welded To Flange
1" Solid Plug, Thd.

C.S.C. Special Joint, Spigot X Fig.
D.I. O.D., (11'-0" Long)

C.S.C.

Use of Dish Head Plug
Standard Blind Flange

4" Eccentric Tap & 4" G.I.
Coupling Welded To Flange

4" x 12" G.I. Nipple, Thd.

PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

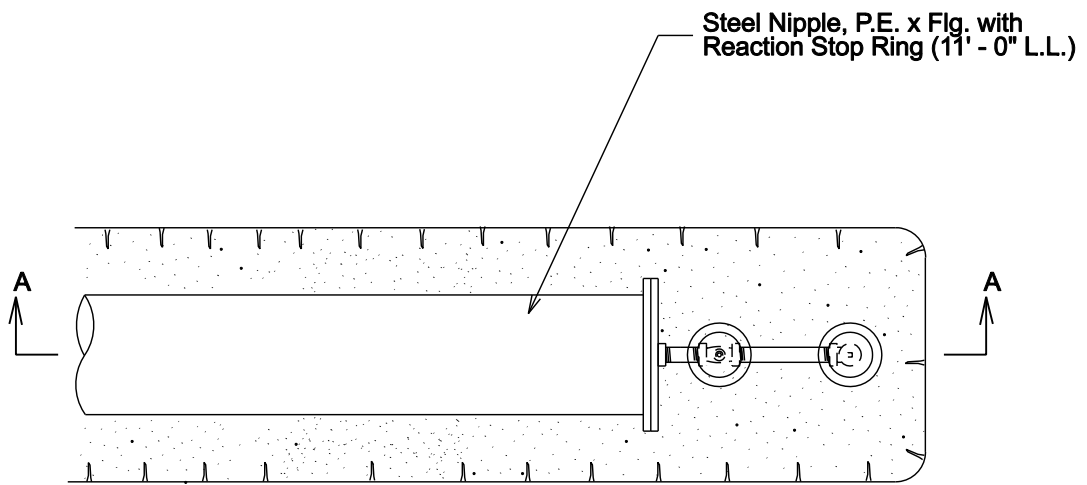
**4" (TEMPORARY)
BLOW-OFF ASSEMBLY**
20" AND LARGER C.S.C. MAIN
(JOINT RESTRAINT)

APPROVED
MARCH 2008

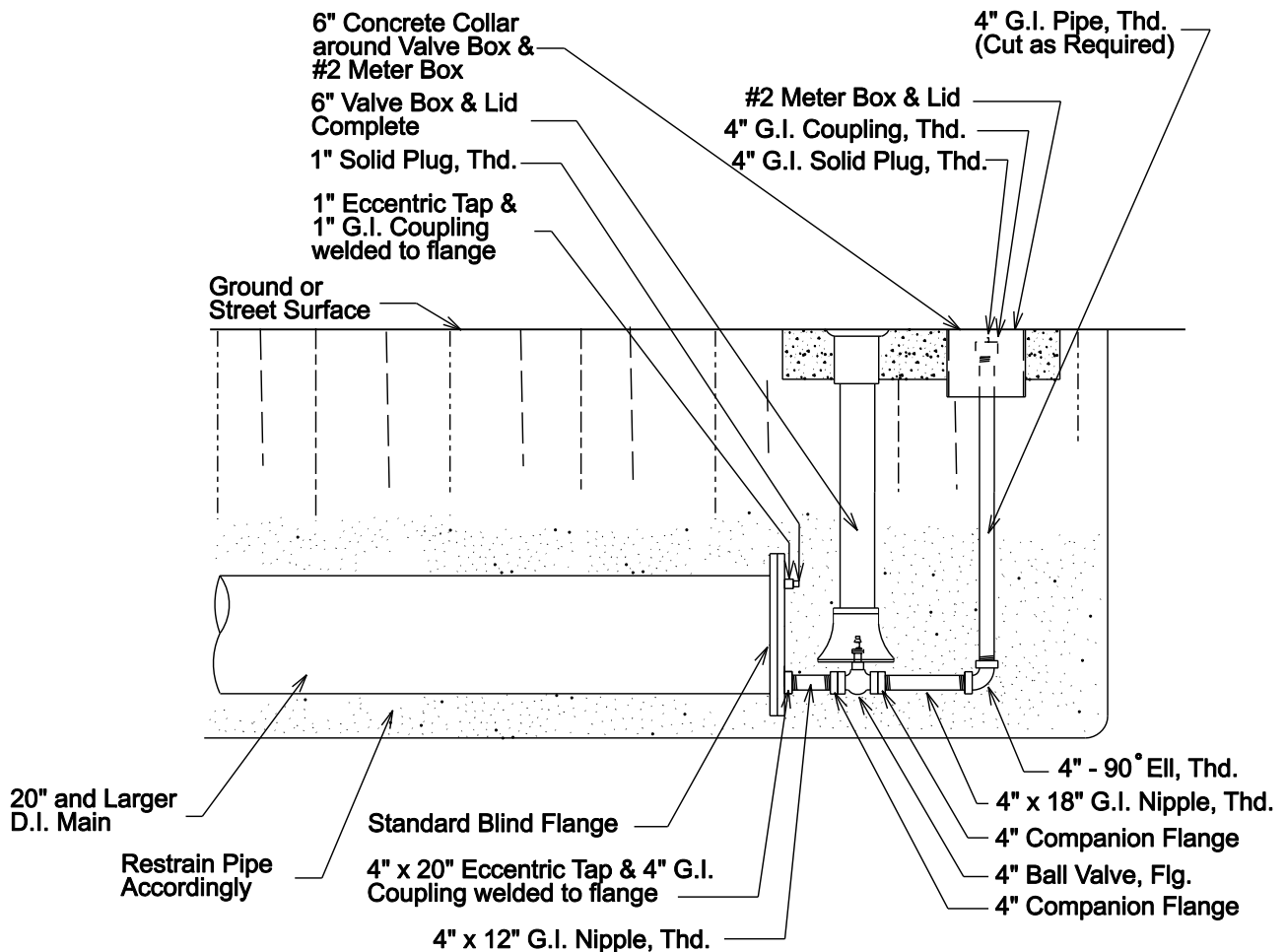
REVISED
APRIL 2014

DD-844-04

SHEET
4 OF **4**



PLAN



SECTION A-A

PROPERTY OF
SAN ANTONIO WATER SYSTEM
 SAN ANTONIO, TEXAS

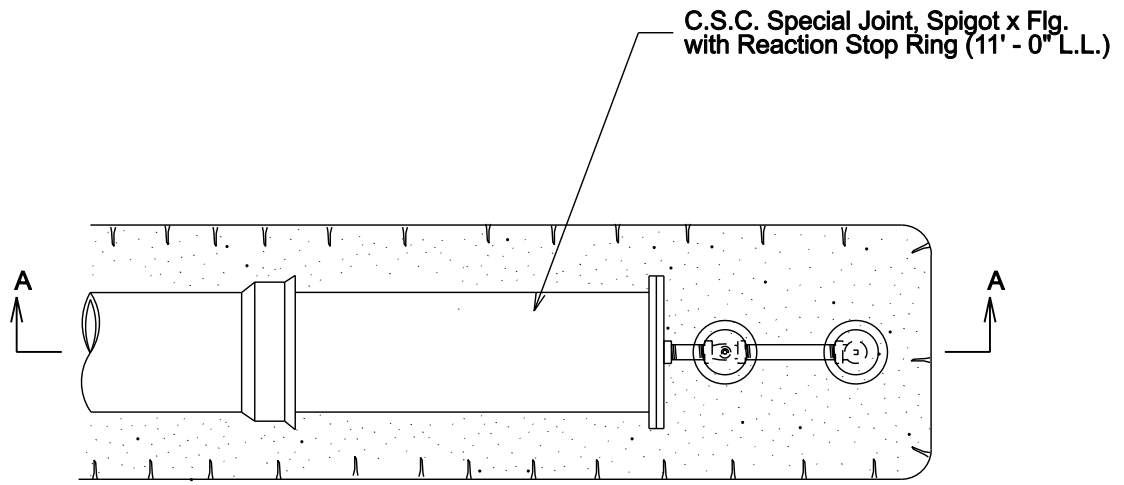
**4" PERMANENT
 BLOW-OFF ASSEMBLY
 20" AND LARGER D.I. MAIN**

APPROVED
 MARCH 2008

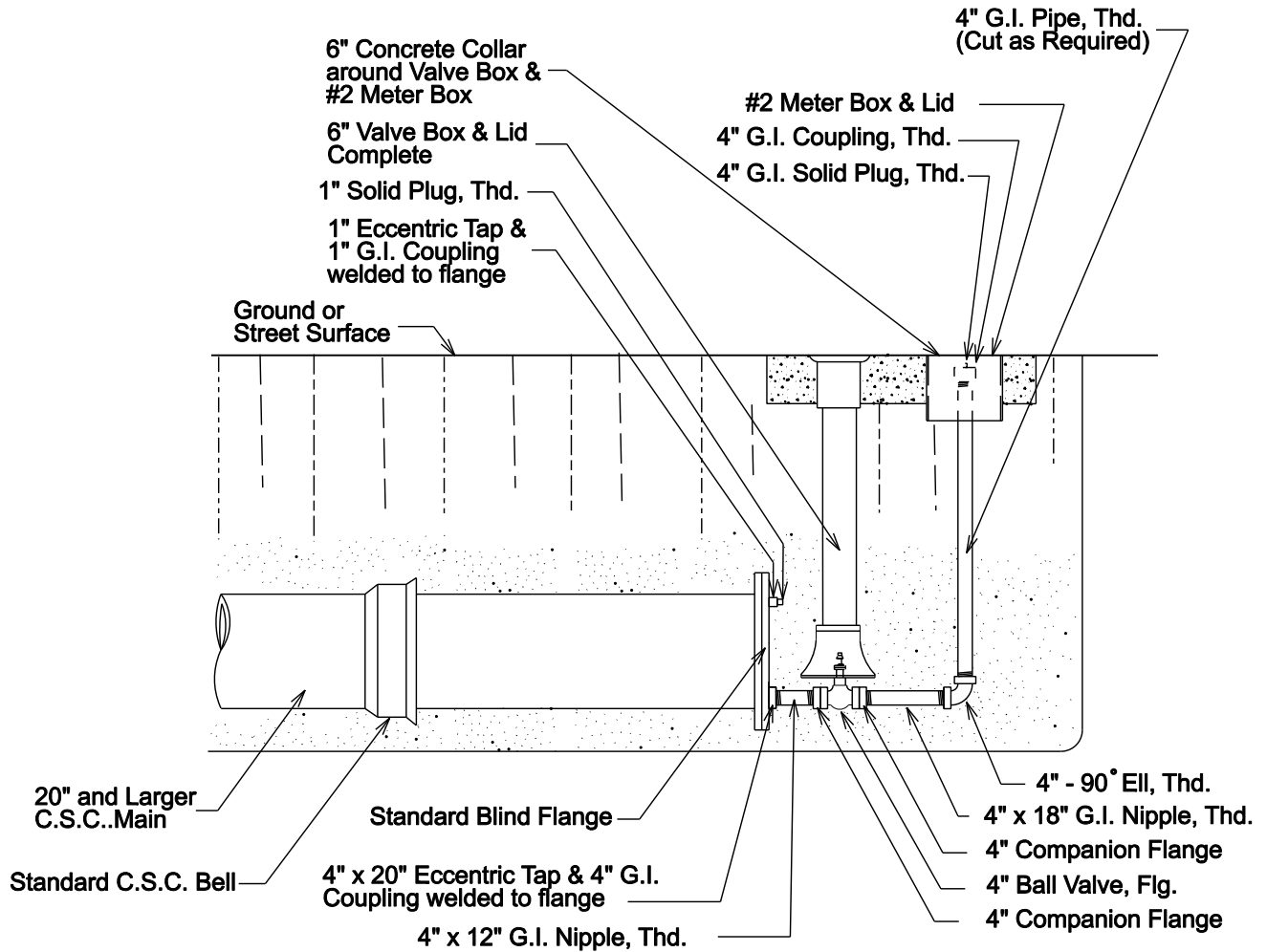
REVISED
 APRIL 2014

DD-844-05

SHEET
1 OF 4



PLAN



SECTION A-A

PROPERTY OF
SAN ANTONIO WATER SYSTEM
 SAN ANTONIO, TEXAS

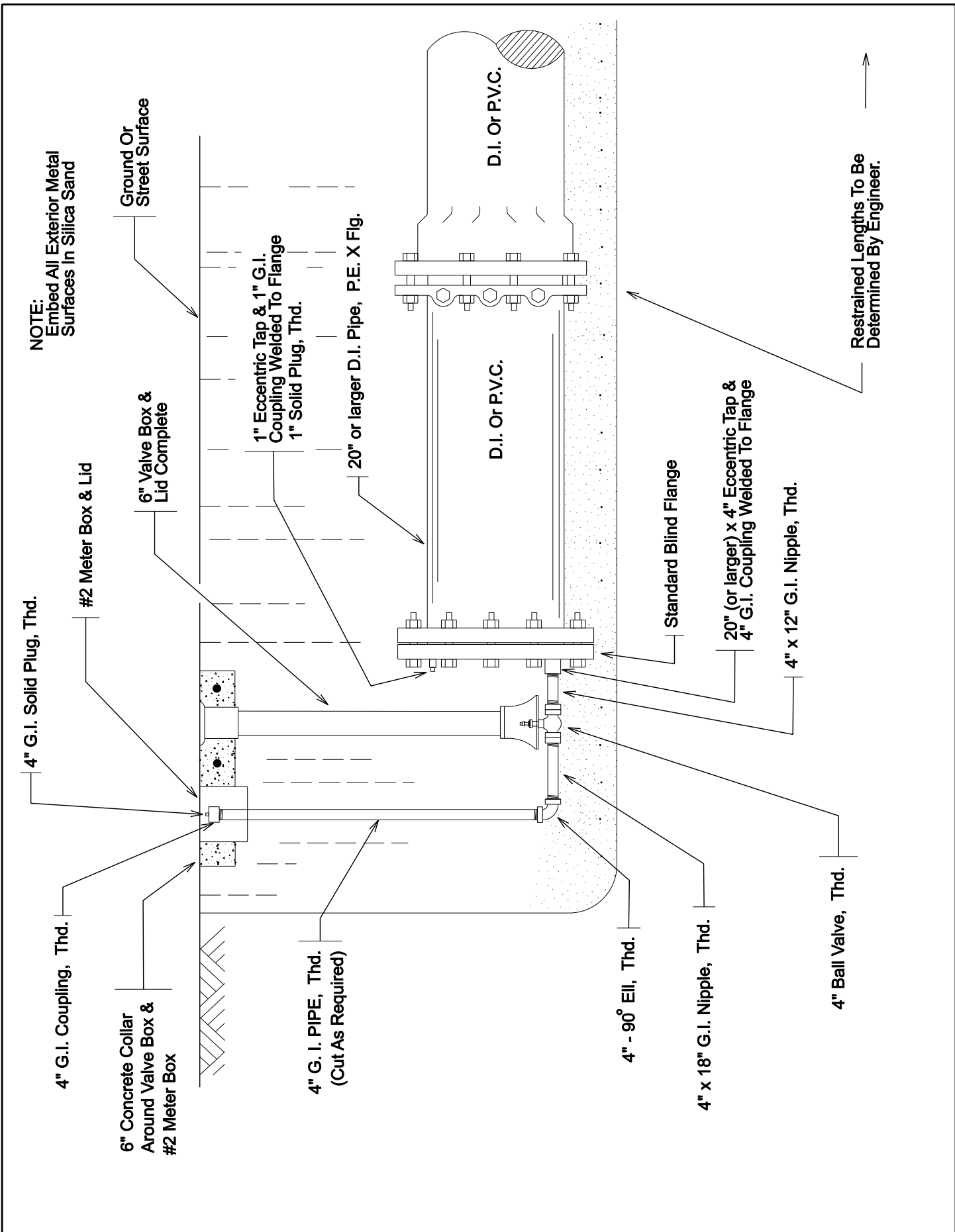
**4" PERMANENT
 BLOW-OFF ASSEMBLY
 20" AND LARGER C.S.C. MAIN**

APPROVED
 MARCH 2008

REVISED
 APRIL 2014

DD-844-05

SHEET
2 OF 4



PROPERTY OF
SAN ANTONIO WATER SYSTEM
 SAN ANTONIO, TEXAS

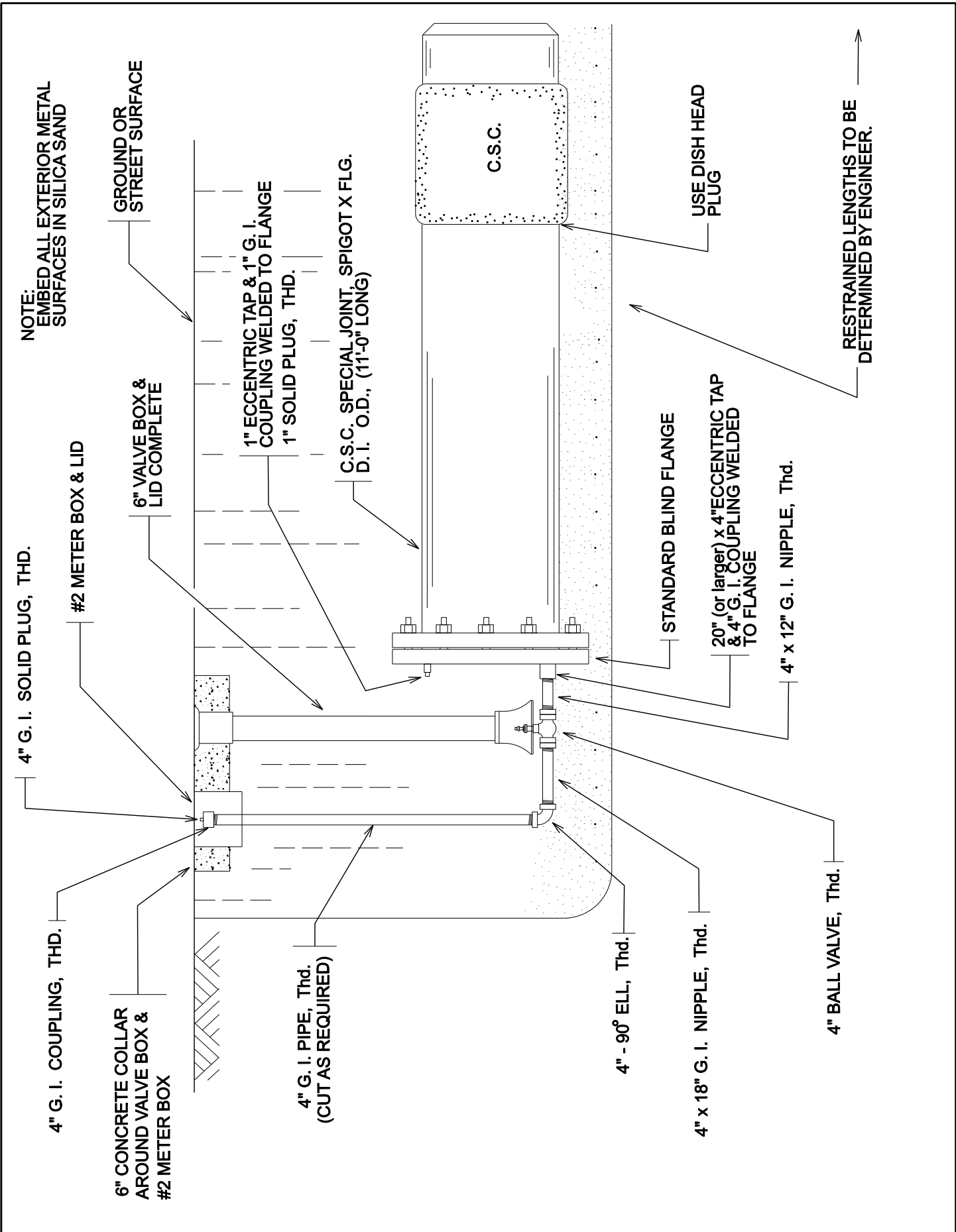
**4" (PERMANENT)
 BLOW-OFF ASSEMBLY 20"
 AND LARGER D. I./P.V.C. MAIN
 (JOINT RESTRAINT)**

APPROVED
 MARCH 2008

REVISED
 APRIL 2014

DD-844-05

SHEET
3 OF 4



PROPERTY OF
SAN ANTONIO WATER SYSTEM
 SAN ANTONIO, TEXAS

**4" (PERMANENT)
 BLOW-OFF ASSEMBLY**
 20" AND LARGER C.S.C. MAIN
 (JOINT RESTRAINT)

APPROVED
 MARCH 2008

REVISED
 APRIL 2014

DD-844-05

SHEET
4 OF 4

San Antonio Water System Standard Specifications for Construction

ITEM NO. 846
AIR RELEASE ASSEMBLIES

846.1 **DESCRIPTION:** This item shall consist of air release assemblies installed in accordance with these specifications and as directed by the Engineer.

846.2 **SUBMITTALS:** Contractor shall submit manufacturer's product data, instructions, recommendations, shop drawings, etc.

846.3 **MATERIALS:** The materials for air release assemblies installation and adjustment shall conform to the specifications contained within the latest revision of SAWS' Material Specification 29-01, "Air Release, Vacuum and Combination Air Valves."

846.4 **CONSTRUCTION:** Air release assemblies shall be installed at the location shown in the contract documents or as directed by the Engineer.

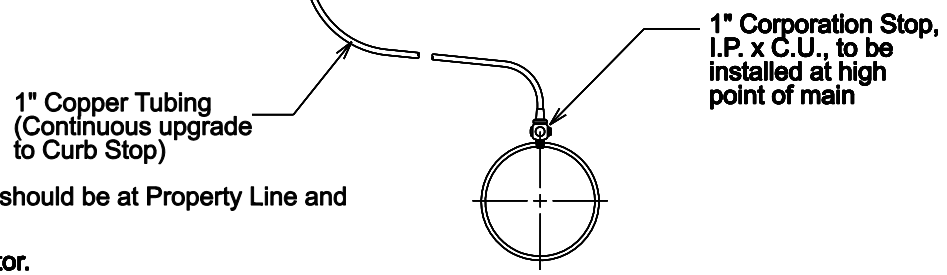
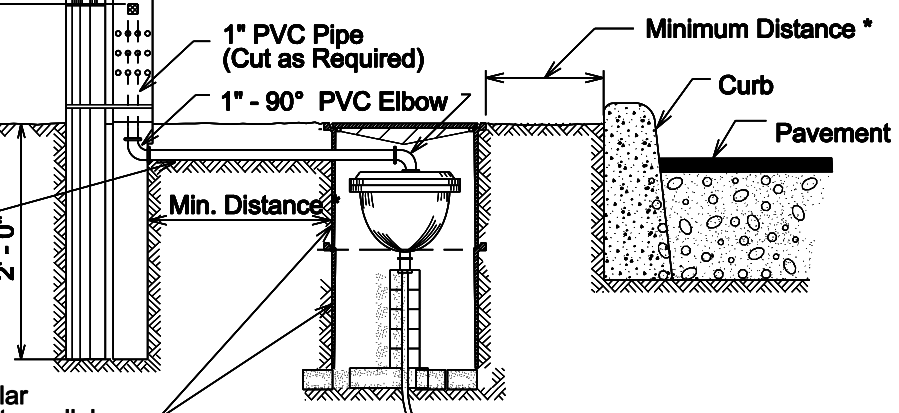
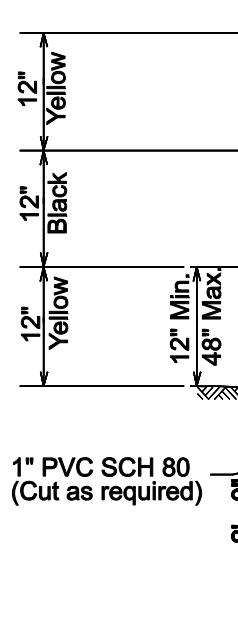
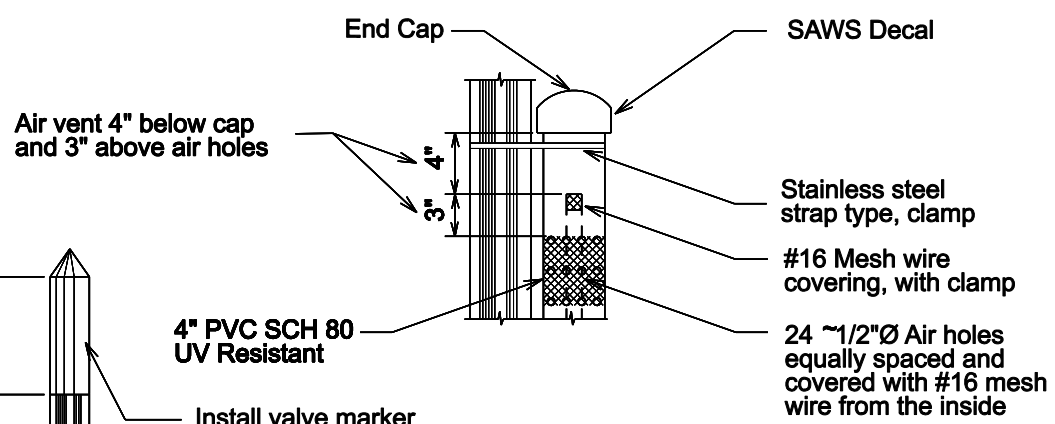
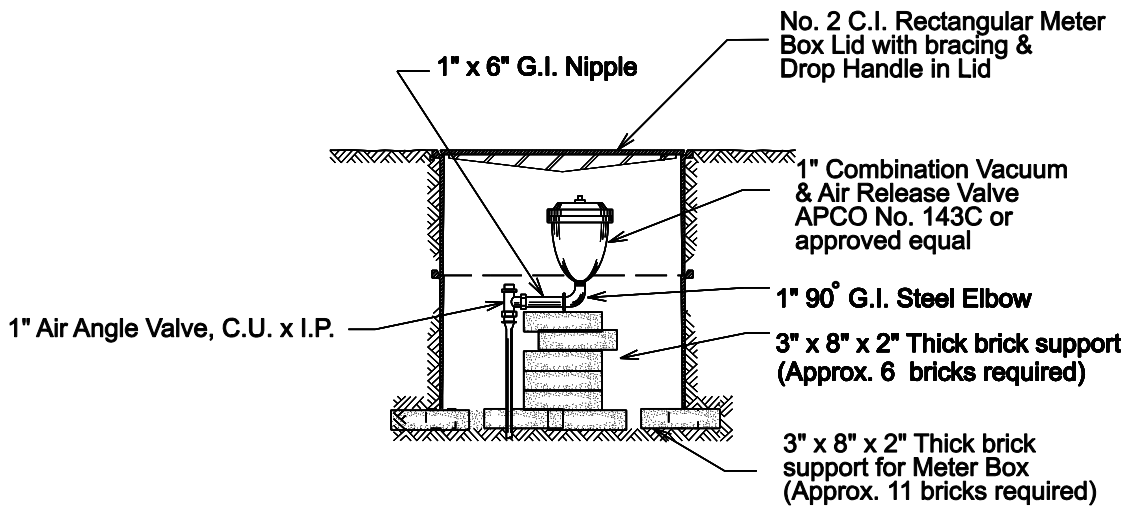
Air release assemblies in an open trench water main installation shall be installed in accordance with Standard Drawing DD-846 Series and shall include the valve, valve boxes, tapping saddle, pipe, fittings, accessories and appurtenances. It shall also include the service line and tap to the main line. Air release assemblies installed in parkways or easements and adjacent to street pavements shall be installed in accordance with Standard Drawing DD 846-01, sheet 2 of 2, regardless of size.

Air release assemblies installed on steel pipe attached to a bridge structure shall include the outlet on the steel pipe, valve, valve box, pipe, fittings, security enclosure, accessories and appurtenances.

846.5 **MEASUREMENT:** Air release assemblies will be measured by the unit of each such assembly of the various sizes of air release assemblies installed.

846.6 **PAYMENT:** Payment for air release assemblies will be made at the unit price bid for each such assembly of the various sizes installed in accordance with the details shown in the Standard Drawing DD-846 Series. Such payment shall also include: excavation, selected embedment material, anti-corrosion embedment when specified, hauling and disposition of surplus excavated materials, blocking, and various types and sizes of meter boxes.

- End of Specification -

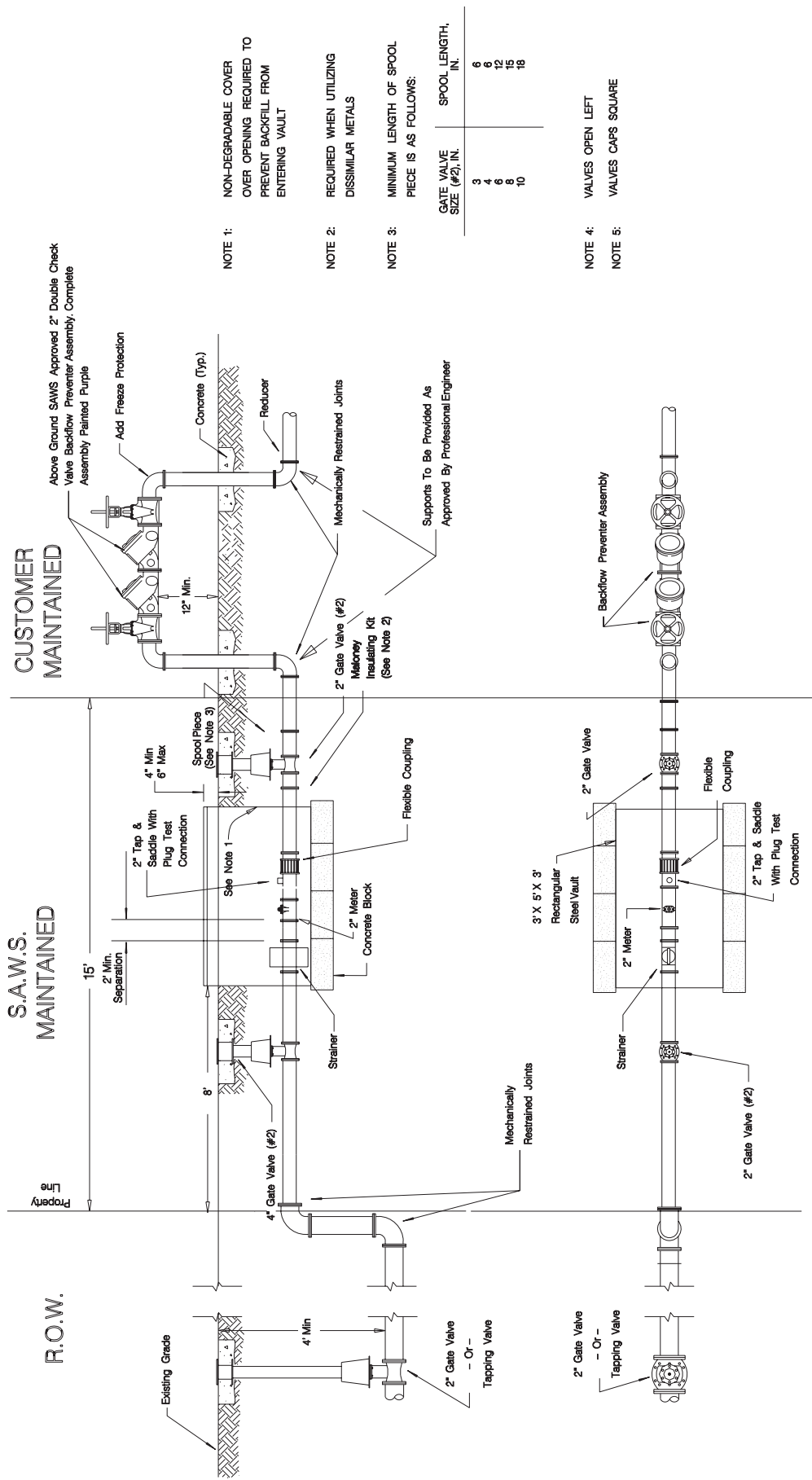


Note: In rural areas, riser should be at Property Line and at maximum height.

* Per direction from inspector.

PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	INSTALLATION OF 1" AIR RELEASE VALVE	APPROVED	REVISED
		March 2008	APRIL 2014
DD-846-01			SHEET 1 OF 1

2" pipe, 2" meter
TRAFFIC AREA



NOTE 1: NON-DEGRADABLE COVER OVER OPENING REQUIRED TO PREVENT BACKFILL FROM ENTERING VAULT

NOTE 2: REQUIRED WHEN UTILIZING DISSIMILAR METALS

NOTE 3: MINIMUM LENGTH OF SPOOL PIECE IS AS FOLLOWS:

GATE VALVE SIZE (#2), IN.	SPOOL LENGTH, IN.
3	6
4	6
6	12
8	12
10	18

NOTE 4: VALVES OPEN LEFT

NOTE 5: VALVES CAPS SQUARE

PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

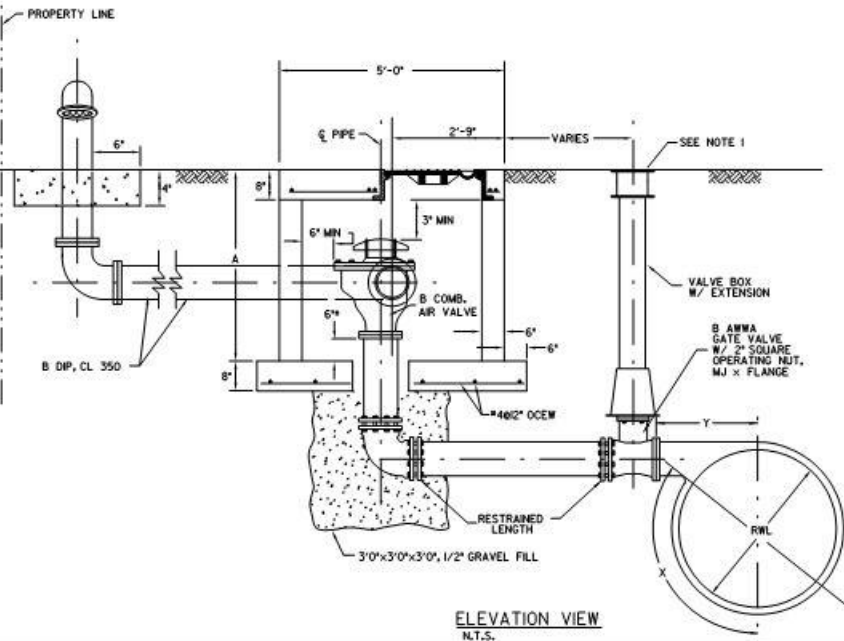
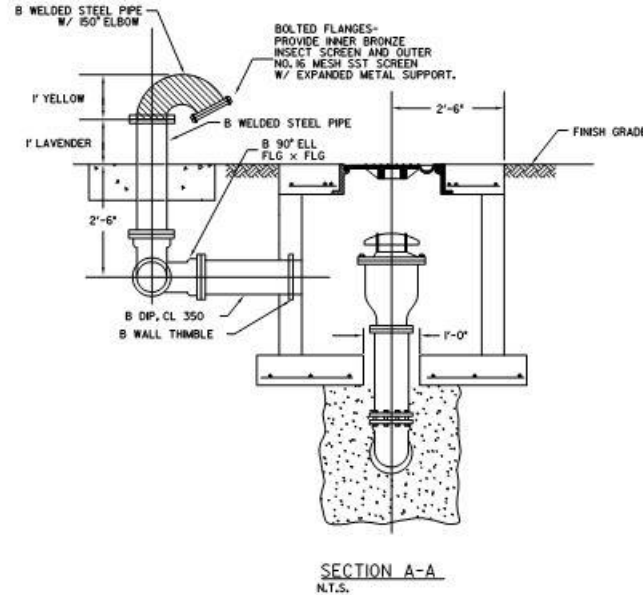
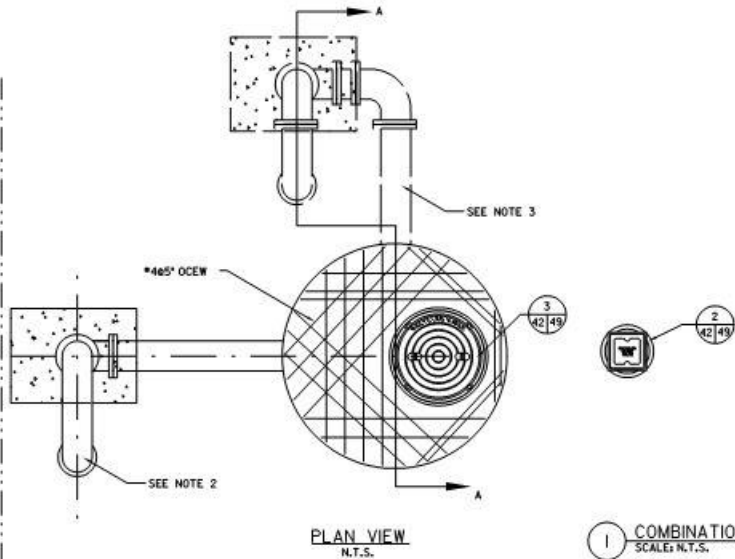
RECYCLE WATER
2" X 2" METER AND
DOUBLE CHECK VALVE
BACKFLOW PREVENTER

APPROVED
March 2008

REVISED

DD-110-03

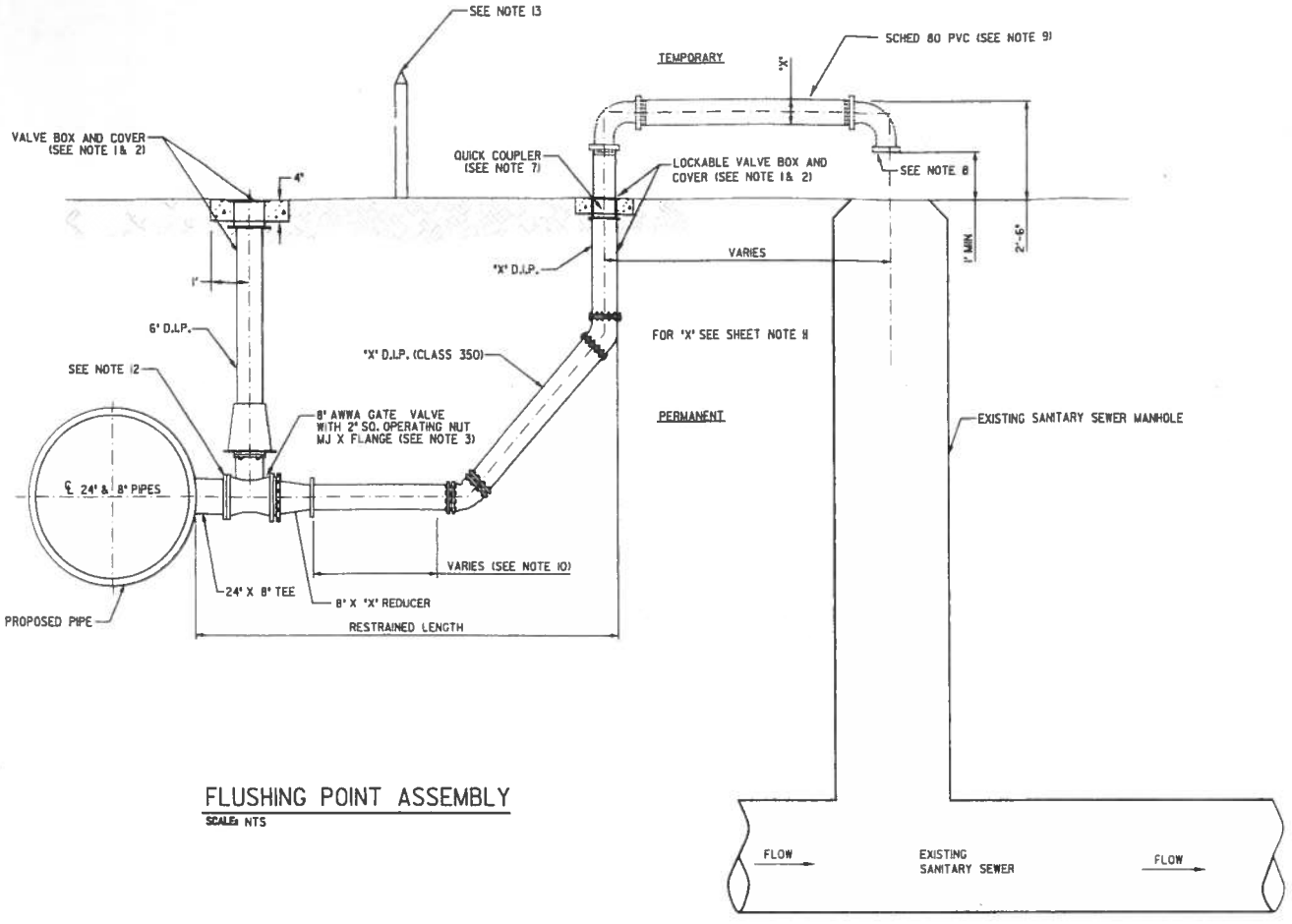
SHEET
1 OF 1



NOTES:

1. LOCATION MAY BE WITHIN PAVEMENT, DEPENDENT ON PIPELINE ALIGNMENT.
2. VENT SHOULD BE LOCATED NEXT TO AND PARALLEL TO PROPERTY LINE UNLESS PIPELINE IS WITHIN SAWS EASEMENT.
3. VENT CAN BE INSTALLED PARALLEL TO RWL IF THERE IS INSUFFICIENT SPACE BETWEEN THE AIR RELEASE VALVE VAULT AND THE PROPERTY/EASEMENT LINE.

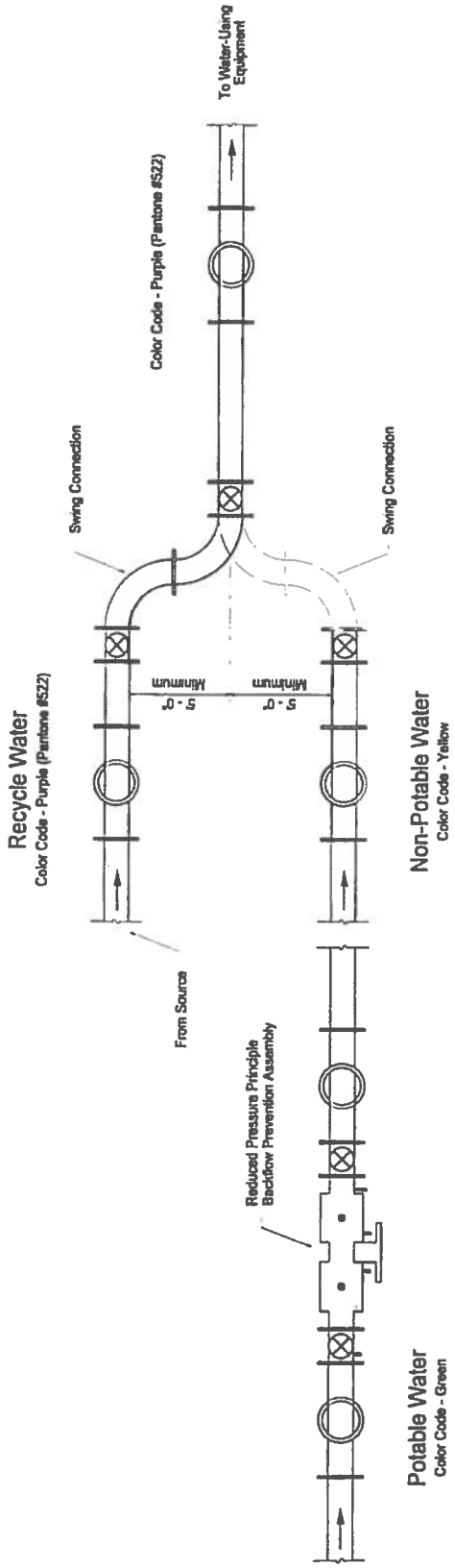
AIR VALVE SIZE	A	B	TABLE OF DIMENSIONS							
			X				Y			
			MAIN LINE SIZE							
			42"	36"	30"	24"	42"	36"	30"	24"
8"	3'-2"	8"	47 3/8"	39 3/8"	31 1/2"	23 5/8"	31 3/8"	28 3/8"	25 3/8"	22 3/8"
6"	3'-2"	6"	50 3/8"	42 1/8"	34 3/8"	26 1/8"	31 3/8"	28 3/8"	25 3/8"	22 3/8"
4"	2'-8"	4"	53 3/8"	44 3/8"	36 3/8"	28 3/8"	28 3/8"	25 3/8"	22 3/8"	19 3/8"
3"	2'-8"	3"	54 3/8"	46 1/8"	37 3/8"	29 3/8"	28 3/8"	25 3/8"	22 3/8"	19 3/8"
2"	2'-8"	2"	56 3/8"	47 1/8"	39 1/8"	31 3/8"	28 3/8"	25 3/8"	22 3/8"	19 3/8"



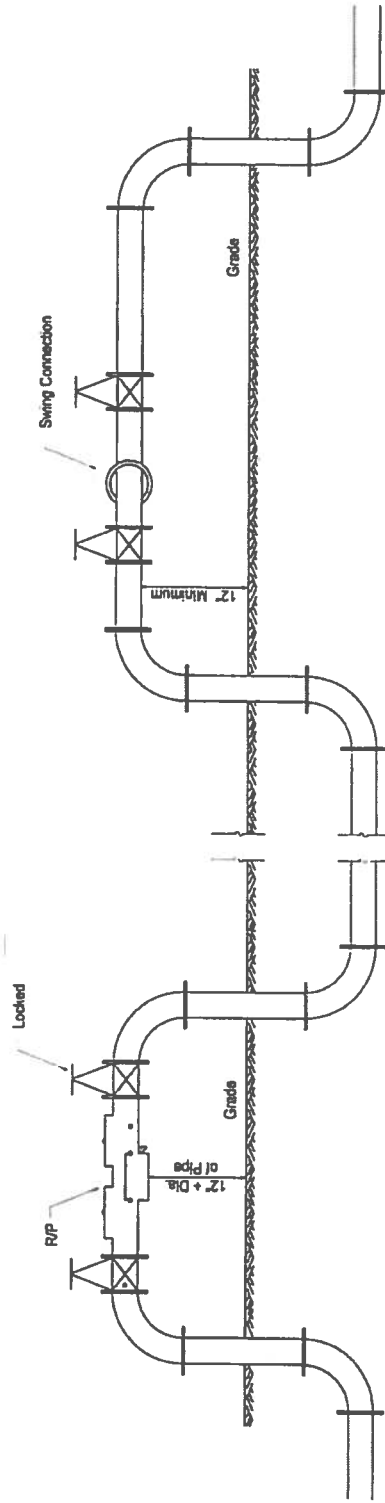
FLUSHING POINT ASSEMBLY

SCALE: NTS

SWING CONNECTION



PLAN VIEW



ELEVATION

Note: Swing Connections will not be allowed where more than one Recycle service is present

Appendix C: Recycled Water Signage

**Recycled Water
Connection**

12" X 12"

**Recycled
Water**

**DO NOT
DRINK**

**Agua
Reciclada**

**NO TOME
EL AGUA**



Recycled Water
Point Use

18" X 12"



Helping Secure Our Water Future

**WE USE
RECYCLED
WATER**

**USAMOS
EL AGUA
RECICLADA**

Recycled Water
Facility Entrance

24" X 18"



Recycled Water Station Name

RECYCLED WATER FACILITY	FACILIDAD DE AGUA RECICLADA
--	--

Appendix D: SAWS Conservation Ordinance

Chapter 34 WATER AND SEWERS*

***Charter references:** Authority of city to acquire and maintain property for water and sewer systems, § 3, par. 13(1), (23); powers with respect to sanitary sewer system, § 3, par. 10; public works department, § 60 et seq.

Cross references: Buildings generally, § 6-1 et seq.; fire prevention, § 11-1 et seq.; flood plains, § 12-1 et seq.; swimming pools, § 15-186 et seq.; standards and specifications for mobile home parks, § 18-61 et seq.; swimming in city parks, § 22-86; fishing in city parks, § 22-101; plumbing, § 24-1 et seq.; streets and sidewalks, § 29-1 et seq.; subdivisions, § 30-1 et seq.; zoning, § 35-1 et seq.

State law references: Authority of home rule cities to enact ordinances more stringent than minimum state standards with respect to water and sewage, Vernon's Ann. Civ. St. art. 4477-1, § 23.

Art. IV. Water Conservation and Reuse, §§ 34-271--34-425

Div. 1. Regulated Activities, §§ 34-272--34-286

Div. 2. Water Waste Enforcement, §§ 34-287--34-300

Div. 3. Reserved, §§ 34-301--34-315

Div. 4. Drought Management Plan, §§ 34-316--34-350

Div. 5. Reserved, §§ 34-351--34-425

ARTICLE IV. WATER CONSERVATION AND REUSE*

***Editor's note:** Ord. No. 80574, § 14, adopted Aug. 4, 1994, repealed former Art.

IV, §§ 34-271--34-283, relative to liquid waste transportation and disposal regulations, which derived from Ord. No. 64987, adopted May 7, 1987; and Ord. No. 69740, adopted June 29, 1989. Said Ord. No. 80574 enacted new provisions regarding similar subject matter which have been included in this chapter as Division 4 of Article V, § 34-511 et seq.

Sec. 34-271. Definitions.

As used in this Chapter 34 Article 4 Divisions 1-4, the following terms shall have the following meanings:

Advanced plan means:

a) As it related to athletic fields, submitted to and approved by SAWS, an irrigation schedule based on precipitation rates for irrigation systems that allows athletic fields to be irrigated more than one day a week.

b) As it relates to water features , submitted to and approved by SAWS, owner certification that the water feature is in good working order, to include the Outdoor water feature conservation plan and advanced monitoring methods that allow the operator to receive real time data regarding water use.

Agricultural irrigation means irrigation for the purpose of growing crops commercially for human consumption or to use as feed for livestock or poultry.

Air conditioning system(s) means a mechanical system generally consisting of a compressor, thermostat and duct work permanently installed in a building for the purpose of controlling humidity and temperature. For the purposes of this

division, an air conditioning system does not include window units.

Athletic field means a sports playing field, the essential feature of which is turf grass, used primarily for organized sports for schools, professional sports, or sanctioned league play.

Automatic irrigation controller means a device that automatically activates and deactivates an irrigation system at times selected by the operator.

Automatic pool drain/ overflow system means the removal of pool/ spa surface water through the use of overflows and surface water collection systems of various design and manufacture.

Automatic pool fill means a water level sensing device that can control a valve to add make-up water to a pool, spa, or water feature.

Automatic pool shut-off means the action of the automatic pool fill system is automatically turned off when desired water level is attained

Backwash/Backwashing means the process of cleansing the filter medium and/or elements by the reverse flow of water through the filter.

Base usage means the average monthly total water usage for the three (3) lowest months of November and December and the following January and February during each of the three (3) consecutive twelve-month periods preceding the commencement of the user's use of water.

Basic plan means:

a) As it relates to athletic fields, submitted to and approved by SAWS, an irrigation schedule for athletic fields that allows each athletic field at a particular location to be irrigated one day a week.

b) As it relates to water features, submitted to and approved by SAWS, owner certification that the water feature is in good working order to including the Outdoor water feature conservation plan.

Beneficial use means the amount of water that is economically necessary for a purpose not otherwise prohibited by the city, state or federal law or regulation, when reasonable intelligence and reasonable diligence is used in applying water for that purpose.

Blowdown meter means a meter that tracks the amount of water discharged from a cooling tower system.

Bucket means a deep, cylindrical container holding five (5) gallons or less, used singly by one person.

Cartridge pool filter means a filter that utilizes a porous element that acts as a filter medium.

Certified vehicle wash facility means a vehicle wash facility that meets the requirements of SAWS certified vehicle wash program.

Commercial dining facility means a business that serves prepared food and beverages to be consumed on the premises.

Computer controlled irrigation system (CCIS) means a system comprised of a computer controller (digital operating system), software, interface modules, satellite field controllers, soil sensors,

weather station, or similar devices that is capable of achieving maximum efficiency and conservation in the application of water for irrigation. A CCIS, at a minimum, should be designed to:

- (1) Prevent over watering, flooding, pooling, evaporation and run-off, and
- (2) Prohibit sprinkler system from applying water at an rate exceeding the soil holding capacity of the land under irrigation.

Concentration means re-circulated water that has elevated levels of total dissolved solids as compared to the original make up water.

Conductivity controller means a device used to measure the conductivity of total dissolved solids in the water of a cooling system and control the discharge of water in order to maintain efficiency.

Conforming means a golf course that has a CCIS in place and is utilizing the system to achieve maximum conservation and the goals of this division. Conforming facilities shall have a conservation plan approved and on file with SAWS.

Conservation department means the Conservation Department of the San Antonio Water System.

Cooling tower means an open water recirculation device that uses fans or natural draft to draw or force air to contact and cool water through the evaporative process.

Dedictory Instrument means a governing instrument for the establishment, maintenance, and operation of a residential subdivision,

planned unit development, condominium, townhouse regime, or any similar planned development. Texas Real Property Code, Sec. 202.007(1).

Diatomaceous earth pool filter means a filter that utilizes a coating of diatomaceous earth (DE) or other filter media over a porous fabric as its filter medium.

Director of conservation means the director of the department of conservation of the San Antonio Water System.

Drip irrigation means an irrigation system (drip, porous pipe, etc.) that applies water at a predetermined controlled low-flow levels directly to the roots of the plant.

Drought for this article is not intended to be limited to any meteorological definition of the term. "Drought" is intended to have broad meaning and refers to any condition, whether man-made or natural, where the available water supply or resources are not meeting the water demand, or if the water supply or resources are being depleted at a faster rate than they are being replenished.

Evaporative shields means soft floating pads that have contact with the pool water surface to reduce evaporation, small enough and flexible enough not to present an entrapment or injury hazard to bathers.

Evapotranspiration rate (ET rate) means the rate which the combination of evaporation from soil surface and transpiration from vegetation will occur for specific climatic conditions.

Existing landscaping plant means a landscaping plant existing after such period of time as to accomplish an establishment and maintenance of growth.

Extra-territorial jurisdiction (ETJ) means the area adjacent to the City of San Antonio city limits where the City has regulatory control as provided for by the State of Texas.

Fountain means an artificially created jet or stream of water, a structure, often decorative, from which a jet or stream of water issues.

Golf course means an irrigated and landscaped playing area made up of greens, tees, fairways, roughs and related areas used for the playing of golf.

Hand-held hose means a hose physically held by one person, fitted with a manual or automatic shutoff nozzle.

Health care facility means any hospital, clinic, nursing home or other health care or medical research facility.

Hose-end sprinkler means a sprinkler that applies water to landscape plants that is piped through a flexible, movable hose.

Household use means the use of water, other than uses in the outdoor category, for personal needs or for household purposes, such as drinking, bathing, heating, cooking, sanitation or cleaning, whether the use occurs in a residence or in a commercial or industrial facility.

Impervious surface means any structure or any street, driveway, sidewalk, patio or other surface area covered with asphalt, concrete, brick, paving, tile or other material preventing water to penetrate the ground.

Indoor water feature means any water feature located entirely in a conditioned space.

Industrial use means the use of water for or in connection with commercial or industrial activities, including but not limited to, manufacturing, bottling, brewing, food processing, scientific research and technology, recycling, production of concrete, asphalt, and cement, commercial uses of water for tourism, entertainment, and hotel or motel lodging, generation of power other than hydroelectric, and other business activities.

Irrigation system means a system of fixed pipes and emitters or heads that apply water to landscape plants or turfgrass, including, but not limited to, in-ground and permanent irrigation systems.

Irrigation system analysis means a zone-by-zone analysis of an irrigation system that, at a minimum, includes a review of the following elements:

- (1) Design appropriateness for current landscape requirements;
- (2) Irrigation spray heads and valves;
- (3) Precipitation rates expressed in inches per hour;
- (4) Annual maintenance plan that includes irrigation system maintenance, landscape maintenance, and a basic summer and winter irrigation scheduling plan.

(5) Location and account numbers of meters supplying the irrigation system should be described or identified on a map

(6) Location and verification of functional rain sensor

Irrigation suspension program (ISP) means a program administered by the Edwards Aquifer Authority pursuant to which agricultural irrigators within the Edwards Aquifer Authority's boundaries voluntarily agree to suspend some irrigation use of the underground water from the Edwards Aquifer in consideration for payments voluntarily funded by ISP participants.

Irrigation system, also referred to as an in-ground or permanent irrigation system, means a system with fixed pipes and emitters or heads that apply water to landscape plants.

Lake, lagoon or pond means an artificially created body of fresh or salt water.

Landscaping plant means any member of the Plant kingdom (Plantae), including any tree, shrub, vine, herb, flower, succulent, groundcover or grass species, that grows or has been planted out-of-doors.

Landscape watering means the application of water to any landscaping plant member for growth or maintenance, but for purposes of this article does not include essential use without waste of water by a commercial landscape nursery to the extent the water is used for production rather than decorative landscaping.

Large property means a tract of land or several tracts of land managed as a group such as commonly found in neighborhood common areas or medians and street setbacks commonly found associated with commercial development regardless of the number of meters or individual parcel sizes associated with the property that equals or exceeds five (5) acres in size and has an irrigation system covering all or a portion of the property.

Large use property means any property that uses 1 million gallons of water or more for irrigation purposes in a single calendar year.

Low-flow toilet means a tank toilet that uses one and sixth-tenths (1.6) gallons of water or less per flush.

Livestock means cattle, sheep, goats, hogs, poultry, horses, and game, domestic, exotic and other animals and birds, including zoo animals, used for commercial or personal purposes.

Livestock use means the use of water for drinking by or washing of livestock.

Maintenance level means the level of water in a swimming pool required for proper operation of circulation and filter equipment for the swimming pool.

Make-up meter means a meter that measures the amount of water entering a cooling tower system.

msl means elevation above mean sea level.

Mulch means any material such as bark, leaves, straw or other materials left loose

and applied to the soil surface to reduce evaporation.

Multi-Family means residential properties consisting of more than 2 individual dwellings

New landscape means any contiguous area where new landscape plant(s) are installed where no other planted plants currently exists. A new plant(s) added to an existing landscape is not considered a new landscape for the purposes of an establishment variance.

New landscaping plant means any plant or seed planted in or transplanted to an area within such period of time as to accomplish a reasonable establishment and maintenance of growth. Application of grass seed to an existing stand of grass or turf is not considered new landscaping for the purposes of this chapter.

Non-conforming means a golf course that is not conforming. Non-conforming golf courses must follow the reduction measures and guidelines set forth in section 34-332.

Non-potable tank means a tank installed to capture water generated on the property from rainwater, storm water, cooling towers, air condition condensate or other process that generates secondary water use as maybe found through an industrial process with the intent to use that captured water again on site.

Non-residential means a property, facility location, or owner that is not residential.

Non-residential water feature means a water feature associated with a non-residential facilities including but not limited to shopping centers, hotels, apartments, health care facility, schools, home and property owner associations, governmental entities

NPDES/TPDES permit holders means those entities that have valid state or federal permits commonly referred to as NPDES or TPDES [National Pollutant Discharge Elimination System/Texas Pollutant Discharge Elimination System] permits to satisfy requirements of the federal Clean Water Act.

On-site reclaim water means water generated on the property from rainwater, storm water, cooling towers, air condition condensate or other process that generates secondary water use as maybe found through an industrial process with the intent to use that captured water again on site.

Organic material means organic substances in differing Stages of decay.

Other outdoor use means the use of water outdoors for the maintenance, cleaning and washing of structure and mobile equipment, including automobiles and boats, or the washing of streets, driveways, sidewalks, patios and other similar areas.

Outdoor water feature conservation plan means a plan submitted to and approved by the SAWS Conservation department that includes owner contact information monthly water use, surface area, location, reduced hours of operation through the use of timers, and certified and verified by SAWS to be in good working order.

Park means a non-residential or multi-family tract of land, other than a golf course, maintained by a city, private organization, or individual, as a place of beauty or public recreation and available for use to the general public.

Person means any individual, corporation (including a government corporation), organization, state or federal governmental subdivision or agency, political subdivision of a state, interstate agency or body, business, trust, partnership, limited partnership, association, firm, company, joint stock company, joint venture, commission or any other legal entity.

Pervious hardscape means patios, pathways and other areas where firm footing is desired, constructed in such a way that allows for water to penetrate the ground. Examples include flagstone set in sand and wood plank decks, but exclude concrete slab patios and sidewalks or pavers set with mortar and generally defined as impervious.

Pervious surface means any ground surface that can absorb water or other liquids.

Pool skimmer means a device installed in the pool or spa that permits the removal of floating debris and surface water to the filter.

Pool water features means fountains, spray jets, waterfalls, spillways, and similar water aerating devices, systems, or arrangements. Features not used for the sanitizing or filtration of the pool water.

Positive shut-off means a valve that is held in a closed position by system pressure until overridden by an outside force.

Power production use means the use of water for steam generation and the use of water for cooling and for replenishment of cooling reservoirs.

Power washer means a machine that uses water or a water-based product applied at high pressure to clean impervious surfaces.

Precipitation rate means the speed at which a sprinkler or irrigation system applies water. Precipitation rates are measured in inches per hour or inches per minute.

Prescribed hours for sprinkling means the hours of 12:00 a.m. and 11:00 a.m. and 7:00 p.m. and midnight when the Aquifer Management Plan, Article IV, Division 4 is not in effect, and during the hours specified therein when the Aquifer Management Plan Division 4 is in effect.

Private residential swimming pool means any swimming pool located on private property under the control of the homeowner, the use of which is limited to swimming or bathing by the homeowner's family or invited guests.

Property address means the street address of a property, unless multiple street addresses are served by a single meter, in which case the mailing address will be used.

Public swimming pool means any swimming pool, other than a private residential swimming pool, intended to be used collectively by persons for

swimming or bathing, operated by any person as defined herein, whether owner, lessee, operator, licensee, or concessionaire, regardless of whether a fee is charged for such use. The term includes, but is not limited to, apartment community pools, condominium association pools and community association pools

Public Park means as a place of beauty or public recreation owned by a governmental entity that collects sales or property for the property tax and available for use to the general public.

Rain sensor means a functioning device that detects the presence of precipitation and automatically interrupts an irrigation cycle and inhibits future irrigation cycles by means of an adjustable reset delay.

Recycled water means municipal wastewater which has been treated to a quality suitable for a beneficial use in accordance with applicable law.

Requestor means a person who requests a variance under this article.

Residential means a single or multi-family dwelling unit containing two (2) or fewer family units.

Residential landscape plan means a plan submitted to SAWS Conservation department for the purposes of seeking a variance to Sec 34-273(2)c and identifies specific plants, includes irrigation plans meeting all requirements found in Ch 34 Article 4 herein and TAC, Title 30, Part 1, Chapter 344.

Residential water feature means a water feature located at a residential dwelling.

River, stream or brook, means an artificially created flow of water in a channel or bed, as a brook, rivulet or small river.

Sand media filter means a filter using sand or sand and gravel as a filter medium. Also known as sand filters.

SAWS means the San Antonio Water System.

Soaker hose means a flexible hose that is designed to slowly emit water across the entire length and connect directly to a flexible hose or spigot. Does not include hose that by design or use sends a fine spray in the air. It is not considered drip irrigation.

Soil holding capacity means the amount of moisture in the soil that can occur without becoming saturated.

Spa means any sub structure associated with a swimming pool often described as a hot tub.

Sprinkler means an emitter that applies water to the landscape plants in a stream or spray that travels through the air. Sprinkler irrigation can be applied by an irrigation system or hose-end sprayer or a perforated hose that sprays water in the air.

Summer dormancy means the ability of turfgrass to survive without water for a period of sixty (60) consecutive days during the months of May through September in Bexar and the adjacent counties. Turfgrass with summer dormancy capabilities approved for use are set forth in the approved plant list. The approved plant list, as may be amended from time to time, shall be

available from SAWS and located at www.saws.org/conservation.

Swimming pool means any structure, basin, chamber, or tank including hot tubs, containing an artificial body of water for swimming, diving, or recreational bathing, and having a depth of two (2) feet or more at any point.

TCEQ means Texas Commission on Environmental Quality.

TDS means total dissolved solids.

Trigger level means the mean sea level of the Edwards Aquifer as indicated by the J-17 index well and/or as defined by the Edwards Aquifer Authority.

Turfgrass or turf means perennial ground cover plants and grasses that are adapted to regular mowing and foot traffic through management.

Vacuum system means a system, often consisting of a pump, chamber, and tubes, that is used to create a vacuum for any of a variety of purposes, including but not limited to medical, dental and industrial applications.

Vanishing edge pools means a water-feature detail in which water flows over the edge of at least one of the pool walls and is collected in a catch basin. Also known as negative edge pools.

Variance administrator means staff person in the department of Conservation responsible for administering and hearing variance requests under this article.

Vegetable garden means any non-commercial vegetable garden planted

primarily for household use; "non-commercial" includes incidental direct selling of produce from such a vegetable garden to the public.

Vehicle wash facility. A permanently-located business that washes vehicles with water or water-based product, including but not limited to self-service car washes, full-service car washes, roll-over/in-bay style car washes, and fleet maintenance wash facilities.

Vehicle wash fundraiser means any special-purpose vehicle wash event for which a fee is charged or donation accepted.

Waste means water used without obtaining maximum beneficial use thereof. Waste shall also include, but not be limited to, causing, suffering, or permitting a flow of water used for landscape watering to run into any river, creek or other natural water course or drain, superficial or underground channel, bayou, or unto any sanitary or storm sewer, any street, road or highway or other impervious surface, or upon the lands of another person or upon public lands. Waste shall also include, but not be limited to, any discharge of water used for commercial, industrial, municipal or domestic purposes to any storm, sanitary sewer, or septic system without the user first having obtained maximum beneficial use thereof. Waste shall also include, but not be limited to, failure to repair any controllable leak on property located within the San Antonio city limits or a water or waste water customer of SAWS located in the City of San Antonio ETJ.

Water means and includes, but not be limited to, potable water supplied by a

water purveyor, potable water withdrawn from any groundwater well, surface water from any river, creek, natural watercourse, pond, lake or reservoir, and recycled water supplied by a water purveyor.

(Ord. No. 92179, § 1, 7-27-00; Ord. No. 92503, § 1, 9-14-00)

Water conservation plan means a written document that must include proof of irrigation efficiency of sixty (60) percent or greater and demonstrate specific measures to be taken to reduce consumption to meet the reduction goal established for each Stage as described in Division 4. A plan includes plant material, precipitation rates and irrigation schedules with run times. SAWS Conservation department may, on a case by case basis, waive the requirements for irrigation efficiency and/or submission of a water conservation plan.

Water feature means an artificially created body of water for aesthetic use including but not limited to fountains, waterfalls, ponds, lagoons, rivers, streams, and brooks as further defined herein.

Water flow restrictor means an orifice or other device through which water passes at a restricted rate.

Water holding capacity means the amount of moisture in the soil that can occur without becoming saturated.

Water utility use means water used for withdrawal, treatment, remediation, transmission and distribution by the water utility.

Waterfall means an artificially created steep descent of water from a height, cascade.

Watering day means a day designated for landscape watering limited to the standard 24-hour period of 12:00 a.m. to midnight. Thus, if it is Stage I and Wednesday is a designated watering day, the period of time referenced is Wednesday morning between 12:01 a.m. to 11:00 a.m., and Wednesday evening between 7:00 p.m. and midnight.

Wildlife habitat water feature means an established aquatic wildlife habitat that has actively sustained a variety of wildlife in a deliberative, inclusive ecosystem including plant material in and around the water, and fish in the water.

Xeriscape means a landscape consisting of a maximum of fifty (50) percent turfgrass, with the remaining percentage of landscape incorporating low water use plants and/or pervious hardscape. The approved plant list, as may be amended from time to time, shall be available from SAWS Conservation department and located at www.saws.org/conservation.

Zonal irrigation system means an irrigation system which segregates by station areas of shrubs, ground cover, bedding plants, and turf to accommodate a diversity of watering requirements. (Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

DIVISION 1. REGULATED ACTIVITIES

Sec. 34-272. Activities to be regulated on and after effective dates.

The following activities shall be regulated in the manner set out herein on and after the respective dates indicated in the sections and subsections. A person affected by such regulations may request a variance in the manner set out in section 34-276. A violation of this section and subsections shall be subject to the enforcement provisions set out in section 34-277. It shall be and is hereby declared unlawful for any person to violate, refuse or fail to implement the requirements of this division.

(1) *Prescribed hours for sprinkling.*

Sprinkling with an irrigation system or hose end sprinkler is allowed between the hours of 12:01 a.m. and 11:00 a.m. and 7:00 p.m. and midnight when Article IV, Division 4 is not in effect.

(2) *Power washers.*

a. Effective January 1, 2006, a person who uses a power washer in any commercial manner or for compensation shall register with the director of conservation, and obtain a certificate for such use.

b. Exempted from this requirement are persons who use power washers for personal use at their own home and homebuilders who are performing a one-time clean up at a newly constructed house.

c. Holders of NPDES/TPDES permits are deemed certified.

Comment. This comment does not have force of law, but is offered for clarification only. The intent of this registration protocol is to complement and make effective mandates necessary to critical period conservation rules found elsewhere in this Code. The conservation rules in question are intended to prevent water waste under certain circumstances when critical periods are observed. Examples of persons subject to year round registration are those hired, employed or contracted to clean sidewalks, parking lots, commercial/public buildings and other impervious areas associated with commercial or domestic properties; professional painters; businesses using their own in-house power washers such as chain

stores, grocery stores, and any other entity, public or private.

(2) *Vehicle wash fundraisers.* Effective March 1, 2005, any vehicle wash fundraiser shall be conducted at a vehicle wash facility using such facility's equipment.

(Ord. No. 100322, § 1(Att. A), 1-20-05)

Sec. 34-273. Activities to be regulated on and after January 1, 2006.

Except as provided by a specific and alternative application date, particularly systems analysis, the following activities shall be regulated in the manner set out herein on and after January 1, 2006. A person affected by such regulations may request a variance in the manner set out in section 34-277. A violation of this section and subsections shall be subject to the enforcement provisions set out in section 34-278. It shall be and is hereby declared unlawful for any person to violate, refuse or fail to implement the requirements of this division.

(1) *Minimum irrigation area and flow direction.* Newly installed irrigation systems using pop-up spray or rotor technology shall not be used in landscaped areas which have both:

a. Dimensions less than five (5) feet in length and/or width; and,

b. Impervious pedestrian or vehicular traffic surfaces along two (2) or more perimeters.

(2) *Pop-up sprays.* Where pop-up sprays and rotor heads are allowed in newly installed irrigation systems:

a. They must direct flow away from any adjacent impervious surface; and

b. Shall not be placed within four (4) inches from an impervious surface; and

c. Irrigation systems newly installed after January 1, 2010 in residential dwellings may not cover more than 10,000 square feet

of landscape with spray or rotor irrigation heads. The use of drip irrigation or micro-sprays may be used to expand the coverage size upon approval of the residential landscape plan by SAWS.

(3) Annual irrigation system analysis for athletic fields, golf courses, large use and large properties.

a. An annual irrigation system analysis shall be required for all athletic fields, golf courses, large use and large properties and shall be submitted in writing to the SAWS Conservation Department on or before May 1st of each year. Golf courses, athletic fields, and large properties that meet the definition of large use and large use properties regardless of size including residential properties must have a licensed irrigator sign-off on the annual irrigation system analysis to document that the system does not have ongoing leaks, that any leaks found in the course of the audit have been repaired and that its operation does not result in water waste. Golf courses, other than those utilizing recycled water for irrigation in accordance with an agreement with SAWS, shall comply with residential irrigation requirements on areas other than tee boxes, fairways and greens.

b. Municipal tenants and lessees of golf courses, sports and athletic playing fields, and any other municipally owned properties, shall be responsible for compliance with this section and subsection. SAWS shall look directly to such tenants and lessees for compliance unless the municipality concedes by contractual agreement with the tenant/lessee to assume the tenant/lessee's responsibility for compliance.

(3) Cooling towers. Effective January 1, 2006:

a. Cooling towers, not utilizing recycled water, shall operate a minimum of four (4) cycles of concentration.

b. Newly constructed cooling towers shall be operated with conductivity controllers, as well as make-up and blowdown meters.

c. Cooling tower owners of existing cooling towers shall register their cooling tower with

the SAWS Conservation department by May 1 2013. New cooling towers shall be registered with the SAWS Conservation Department prior to the start of operation.

(4) Ice machines. Newly installed ice machines shall not be single pass water-cooled.

(5) Commercial dining facilities.

Commercial dining facilities shall:

a. Serve water only upon request.

b. Utilize positive shut-offs for hand-held dish-rinsing wands.

c. Utilize water flow restrictors for all garbage disposals.

(6) Vehicle wash facilities.

a. Vehicle wash facilities, commencing operation on or after January 1, 2006, using conveyerized, touchless, and/or rollover in-bay technology shall reuse a minimum of fifty (50) percent of water from previous vehicle rinses in subsequent washes.

b. Vehicle wash facilities, commencing operation on or after January 1, 2006, using reverse osmosis to produce water rinse with a lower mineral content, shall incorporate the unused concentrate in subsequent vehicle washes.

c. Regardless of date of operation commencement, self-service spray wands used shall emit no more than three (3) gallons of water per minute.

d. Vehicle wash facilities shall utilize self-service, rollover in-bay or conveyor washing technology with catchment systems and oil-water separators that are intended to treat wastewater prior to entering the sanitary sewer. Such systems shall be designed and maintained to prevent runoff into streets, storm drains and/or local creeks and tributaries.

(7) Vacuum systems. Vacuum systems shall not be water-cooled with single-pass potable water when alternative systems are available.

(8) Certain Plumbing Fixtures.

When installing certain plumbing fixtures on or after January 1, 2010; gravity flush toilets, bathroom aerators, showerheads, urinals; in any location, residential, commercial, industrial, or institutional, the fixtures will meet or exceed the following performance standards; and where the Environmental Protection Agency has accepted that specific plumbing fixtures by make and model, meet or exceed the WaterSense standards, such fixtures installed will be from the most current listing available at the time of installation:

- a.** Gravity flush toilets shall have a maximum average water use of no more than 1.28 gallons per flush.
- b.** Faucet aerators for bathrooms shall have a maximum water flow of 1.5 gallons per minute.
- c.** Showerheads shall have a maximum water flow of 2.0 gallons per minute. All associated valves must be appropriate to the flows.
- d.** Urinals shall have a maximum water use of 0.5 gallons per flush.

(9) Coin Operated Washing Machines.

- a.** All newly installed, leased or released coin/card operated washing machines, including but not limited to those that might be found in laundry-mats, apartment houses, dorms or communal use situations shall be selected from Consortium for Energy Efficiency (CEE) that meet or exceed the most current highest water and energy standards as determined by the CEE.
- b.** In any case all coin/card operated washing machines must meet or exceed the most current highest water and energy standards as determined by the CEE, by January 1, 2020.

(10) Hot water lines.

Buildings without dedicated hot-water return lines with runs exceeding 20 feet between the heating element and the end use fixture shall be insulated with R-4 sleeve insulation.

(11) Pool construction requirements on or after May 1, 2013.

- a.** Private residential swimming pools shall not be installed with sand media filters.
- b.** Pool water features installed with public swimming pools or private residential swimming pools must be designed so that the water feature can be turned off without affecting the filtering capabilities of the pool.
- c.** Pools with shared water between the pool and a spa shall be designed so that water can be shared without the necessity of an above ground water feature that cannot be turned off. If a water feature between the spa and the pool exists, the default setting will be for it to be turned off.
- d.** Automatic pool fill features must be designed so that they may be turned off in both public swimming pools and private residential swimming pools.
- e.** Automatic pool fill features must include an automatic pool shut-off feature.
- f.** Vanishing or negative edge pools must be designed with catch basins large enough to prevent splashing that leads to increased water use.
- g.** Backwash systems must be designed so they may be turned off.
- h.** Pool skimmers should be managed in such a way as to minimize water consumption. The range of allowable water within the skimmer fill range should allow for several inches of evaporative loss prior to filling.
- i.** All residential swimming pools shall have a hose end timer installed at the nearest hose bib location. In addition, a hose bib back-flow prevention device will be connected to the hose bib fixture nearest to the pool.
- j.** Pool companies that provide installation and/or maintenance services within the jurisdiction of this code must provide in writing to every customer specific information on maintenance requirements that include an emphasis on preventative measures for keeping pool water quality high and alternatives to draining pools to correct water quality problems unless draining is needed for physical repair.

(12) Non-potable tank registration.

a. All non-residential non-potable tank owners shall register tanks if combined storage on a single property is over 5000 gallons or there is potable water back-up, with the SAWS Conservation department by May 1, 2013 or prior to the start of operation if installed after May 1, 2013. Tanks that are utilized in industrial processing are exempt from this requirement.

b. All residential non-potable tank owners with potable water back-up, or in excess of 1000 gallons in size shall register their tanks with the SAWS Conservation department by May 1, 2013 or prior to the start of operation if installed after May 1, 2013.

(13) Non-residential Water Features.

Non-residential water features installed after May 1, 2013 are required to be separately metered or sub-metered.

(Ord. No. 100322, § 1(Att. A), 1-20-05)

Sec. 34-274. Other activities to be regulated on and after January 1, 2006.

The following activities shall be regulated in the manner set out herein on and after January 1, 2006. A person affected by such regulations may request a variance in the manner set out in section 34-276. A violation of this section and subsections shall be subject to enforcement provisions set out in section 34-277. It shall be and is hereby declared unlawful for any person to violate, refuse or fail to implement the requirements of this division.

(1) Condensate collection. Newly constructed commercial buildings installing air conditioning systems on and after January 1, 2006, shall have a single and independent condensate wastewater line to collect condensate wastewater to provide for future utilization as:

a. Process water and cooling tower make-up, and/or

b. Landscape irrigation water.

c. Any other beneficial on-site use.

d. Condensate wastewater shall not be allowed to drain into a storm sewer, roof drain overflow piping system, public way, or impervious surface.

(2) Rain sensors. Effective January 1, 2006, rain sensors shall be installed and maintained in good working order on all irrigation systems equipped with automatic irrigation controllers.

(Ord. No. 100322, § 1(Att. A), 1-20-05)

Sec. 34-275. Landscaping regulations generally applicable on and after January 1, 2006.

Except as specifically provided with alternative effective dates, persons affected by the regulations set out herein below shall comply on and after January 1, 2006, and may request a variance to such regulations in the manner set out in section 34-276. A violation of this section and subsections shall be subject to the enforcement provisions set out in section 34-277. It shall be and is hereby declared unlawful for any person to violate, refuse or fail to implement the requirements of this division.

(1) Xeriscape option. Effective January 1, 2006, homebuilders and/or developers subdividing lots and/or constructing new single family residential homes shall offer a xeriscape option in any series of landscaping options offered to prospective home buyers.

(2) Model. Effective January 1, 2006, homebuilders and/or developers who construct model homes for a designated subdivision shall have at least one model home per subdivision landscaped according to a xeriscape design.

(3) Zonal system. In-ground irrigation systems installed on and after January 1, 2006, shall be zonal irrigation systems.

(4) Turfgrass soil support.

a. Turfgrass installed during or associated with new construction on and after January 1, 2006, shall have a minimum of four (4) inches of soil under the turfgrass.

b. Drainage utility projects, water and power utility projects, public property maintenance or repair, and those governmental activities necessary to NPDES/TPDES compliance with federal or state rules and regulations implementing the federal Clean Water Act; or governmental actions to comply with the Americans with Disabilities Act, shall not be deemed new construction for purposes of this subsection.

(5) Turfgrass dormancy qualities. Turfgrass installed after January 1, 2007, shall have summer dormancy capabilities. A requirement to irrigate turfgrass that has summer dormancy capabilities is not allowed.

(6) Irrigation system use, setting and schedule recommendations.

All irrigators installing irrigation systems permitted by the City of San Antonio or on property subject to this article shall provide to the irrigation system owner in writing a recommended seasonal irrigation schedule and instructions on how to use the irrigation system and set the controller. Seasonal schedules provided will be approved by SAWS Conservation Director or designee. The schedule will be affixed to the irrigation controller or an adjacent wall.

(7) Required City of San Antonio Irrigation Permits.

a. Where irrigation permits are required by the City of San Antonio, it is the responsibility of the licensed irrigator to ensure permits are secured. Failure to secure and pay for a permit as required for irrigation work is subject to penalties as described in Sec. 34-277 in addition to penalties that may be assessed under the City of San Antonio Unified Development Code.

b. If an irrigation system is found to be installed by an unlicensed individual or company, other than a homeowner working

on his or her own residence, an additional violation may be issued under Sec. 34-277 in addition to penalties that may be assessed under the City of San Antonio Unified Development Code.

c. Failure to properly supervise installation of irrigation work by an on-site licensed irrigator or licensed irrigation technician is subject to penalties as described in Sec 34-277 in addition to penalties that may be assessed under the City of San Antonio Unified Development Code.

(8) Dedicatory Instruments.

a. A dedicatory instrument may not require the installation of an irrigation system.

b. A dedicatory instrument may not require turfgrass to be planted or irrigated

Legal comment. This comment does not have force of law, but is provided here for informational purposes only. The Texas Property Code, Chapter 202, Section 202.001, et. seq., entitled "Certain Restrictive Covenants," reflects a growing public interest in water conservation and its relationship to the public health, safety, and welfare.

Texas Property Code, Chapter 202, Section 202.007, provides that a property owners association may not include or enforce a provision in a dedicatory instrument that prohibits or restricts a property owner from implementing certain efficient irrigation systems, including underground drip or other drip systems. Any dedicatory instrument provision, attempting to restrict a property owner from installing such efficient systems, is void. Therefore, such restrictions, running counter to certain conservation efforts, cannot be enforced. Texas Real Property Code, Sec. 202.007(b). *Added by Acts 2003, 78 th Legislature, chapter 1024, § 1, Effective, September 1, 2003.*

As used within the Texas Property Code, "dedicatory instrument" means a governing instrument for the establishment,

maintenance, and operation of a residential subdivision, planned unit development, condominium, townhouse regime, or any similar planned development. Texas Real Property Code, Sec. 202.007(1).

The Texas Property Code also allows that a property owners' association may restrict the type of turf used by a property owner in the planting of new turf [in the future] in order to encourage or require water conserving turf.

According to the Texas Property Code, property owners' associations may regulate, by dedicatory instrument or other legal means, installation of efficient irrigation systems, including establishing visibility limitations for aesthetic purposes.

The SAWS endorses and advocates the use of dedicatory instruments and other legal obligations among private parties which understandings may support and promote a culture of water conservation.
(Ord. No. 100322, § 1(Att. A), 1-20-05)

Sec. 34-276. Variances.

The authority to grant a variance and an appeal from such variance to the provisions of this division, is hereby delegated to the San Antonio Water System in the manner described herein. A determination by the San Antonio Water System pursuant to this section shall be deemed final for purposes of appeal. Appeal procedures are detailed below.

(1) Variance. A person who is affected by these provisions may seek a variance in the manner set out herein. A person shall request a variance within thirty (30) days of the date a provision becomes apparently applicable to that person's activities and/or properties. For example, a person will have standing to seek a variance within thirty (30) days following receipt of a formal (citation) or informal notice of violation; prior to a notice of violation; or at the discretion of the variance administrator when, in the administrator's judgment, to deny standing

to pursue a variance would clearly deny the applicant an opportunity to have justice and equity done for the applicant's case. In the latter situation, for purposes of justice and equity, the standard for allowing a variance application to be heard or considered are the common notions of rightness and fair play.

(2) Time, date, place. A person seeking a variance under these provisions shall make such request in writing to the conservation department. Such request shall be reviewed by the variance administrator. If the application, on its face, warrants a variance, the administrator may grant the request without hearing. Otherwise, the administrator shall review such request within thirty (30) days of receipt and shall inform the requestor in writing of the time, date and place for variance hearing, if necessary.

(3) Representation and notice of SAWS' response, first hearing. The requestor may be represented by a duly authorized representative and may introduce such evidence as the requestor believes to be relevant. The administrator and appropriate conservation department personnel shall hear the request. The requestor shall receive written notification by the administrator within thirty (30) days of the date of the hearing whether such variance is granted or denied.

(4) Appeal. In the event the variance is granted, the decision of the administrator shall be final. Should the variance be denied, however, the requestor shall have ten (10) days from receipt of the denial of the variance to seek an appeal in writing. Within thirty (30) days of the written request for an appeal from the denial of a variance, the director shall hear the appeal. The requestor shall be informed in writing of the time, date and place where such appeal shall be heard. The requestor and/or his authorized representatives may present evidence to the director why such appeal should be granted. The director shall inform the requestor within thirty (30) days of the date of the

hearing of the appeal whether the appeal has been granted or denied. The determination of the director shall be final and shall be in writing. If a judicial appeal is pursued, applicant must take such appeal to district court or other court of competent jurisdiction within thirty (30) days of the director's final determination, which further appeal shall be pursued under appropriate standards of the substantial evidence rule.

(5) Variance qualifications. Variances to the regulated activities in this division 1 may be issued through the department of conservation's variance administrator provided that the general intent of this division has been met, and compliance with Article IV, Division 1, is proven to be impracticable to accomplish and to cause unnecessary hardship. The criteria to determine hardship shall include, but not be limited to, a showing of level of capital outlay and technical complexity in relation to conservation benefit to be derived, and time and effort required to accomplish compliance with this division.

(6) Specific criteria to be used for the granting of variances. The SAWS director of conservation shall also develop specific criteria to be used for the granting of variances from the provisions of this division, which are appropriate to the provision for which a variance is being sought. Such criteria shall be applied equally to each request for variance under a particular provision. A requestor shall be furnished with the criteria to be utilized by the administrator and/or director prior to his/her variance application and/or appeal being heard.

(Ord. No. 100322, § 1(Att. A), 1-20-05)

Sec. 34-277. Enforcement.

(a) The president/CEO or his designee of the San Antonio Water System is hereby authorized to enforce this division in the manner and to the extent allowed by law, including, but not limited to, filing

complaints with the city municipal prosecutor's office for such violations, serving notices of violations of this division, and filing civil enforcement actions. Such authorization does not diminish the city attorney's authority in regard to enforcement of Chapter 34 provisions.

(b) Responsible Party. For purposes of this division, the San Antonio Water System water and/or waste water customer, property owner, occupant, or resident, of the property where a violation is observed shall be the responsible party for a violation of the provisions of this division unless an alternate person is designated by the named meter holder and accepts responsibility and it is documented in writing by both the alternate individual and the meter holder. If there is no meter, the property owner, occupant, or resident, shall be the responsible party.

(c) The president/CEO or his or her designee is authorized and instructed to commence any action, in law or in equity, including the filing of criminal charges, deemed necessary for the purpose of enforcing this division. The San Antonio Water System president/CEO or the designee may seek civil penalties, as may be allowed by statute, and any other legal or equitable relief available under common law, Chapter 54 of the Texas Local Government Code as it may be amended to address the subject matter of this division, or any other applicable city, state or federal code or statute.

(d) Criminal. Any person violating any provision of this Division 1 of Article IV shall be guilty of a class C misdemeanor and upon citation and conviction, shall be punished by a fine not less than fifty dollars (\$50.00) and not more than one hundred dollars (\$100.00) for the first offense; a fine not less than two hundred and fifty dollars (\$250.00) and not more than five hundred dollars (\$500.00) for the second offense; a fine of not less than one thousand dollars (\$1,000.00) and not more than two thousand dollars (\$2,000) for the third and additional

offenses. Each violation of a particular section of this division shall constitute a separate offense, and each day an offense continues shall be considered a new violation for purposes of enforcing this division.

(e) Civil. Civil penalties, imposed by courts of competent jurisdiction in civil actions for violations of this division, may also be assessed as may be allowed by applicable state law in any amount to be authorized by the state. Under Chapter 54 of the Texas Local Government Code, SAWS and the office of the city attorney may presently pursue civil enforcement for injunctive relief and the imposition of one thousand dollars (\$1,000.00) per day civil penalties appropriately imposed by the Court. This statutory remedy is in addition to the city's common law right to bring civil actions for injunctive relief to stop harmful acts, independent of authority found in the Texas Local Government Code.

(f) If, for any reason, any section, sentence, clause or part of this division is held legally invalid, such judgment shall not prejudice, affect, impair or invalidate the remaining sections of this division, but shall be confined to the specific section, sentence, clause, or part of this division held legally invalid.

(Ord. No. 100322, § 1(Att. A), 1-20-05)
Secs. 34-278--34-286. Reserved.

DIVISION 2. WATER WASTE ENFORCEMENT*

***Editor's note:** Ord. No. 92179, § 1, adopted July 27, 2000, amended Div. 2 in its entirety, in effect repealing and reenacting said division to read as herein setout. The former Div. 2, §§ 34-287-34-300 pertained to wasting water and derived from Ord. No. 17390, §§1-8, adopted March 20, 1952; Ord. No. 17692, § 1, adopted May 29, 1952; Code 1959, §§41-30--41-36; Ord. No.

80574, § 7, adopted Aug. 4, 1994; Ord. No. 83703, § 1, adopted Feb. 29, 1996.

Sec. 34-287. Reserved

Sec. 34-288. Violations.

It shall be a violation punishable by city municipal fine for any San Antonio Water System water and/or waste water service customer, property owner, occupant, resident, or their designee within the city of San Antonio or its extraterritorial jurisdiction, to intentionally, knowingly, recklessly, or criminally negligently allow or cause water waste, to allow or cause landscape watering outside the prescribed hours for landscape watering, or to allow or cause any violation of any provision of this Article .

(Ord. No. 92179, § 1, 7-27-00; Ord. No. 2008-10-02-0885, § 3(Exh. A), 10-2-08)

Sec. 34-289. Continued violations.

At locations of repeated or continued violations, the President/CEO of the San Antonio Water System shall have the authority to discontinue the supply of potable water to the registered meter holder.

(Ord. No. 92179, § 1, 7-27-00)

Sec. 34-290. Enforcement personnel.

The President/CEO or the designee of the San Antonio Water System is hereby authorized to enforce this division in the manner and to the extent allowed by law, including, but not limited to, filing complaints with the city municipal prosecutor's office for such violations, serving notices of violations of this division and filing civil enforcement actions.

(Ord. No. 92179, § 1, 7-27-00)

Sec. 34-291. Education and enforcement.

As the success of conservation generally, and specifically of this , Article IV , depends largely on public cooperation, SAWS policies shall implement customer education

programs and shall establish and maintain a water conservation "hot line," so that the public may provide the San Antonio Water System with information relating to violators.

(Ord. No. 92179, § 1, 7-27-00)

Sec. 34-292. Defenses to prosecution.

(a) It shall be a defense to prosecution that landscape watering was performed on any plant or seed planted in or transplanted to an area with a valid new landscape variance from SAWS as described in Sec. 34-332.

(b) It shall be a defense to prosecution that landscape watering was performed by a commercial enterprise in the business of growing or maintaining plants for sale, such as plant nurseries; provided, however, that such landscape watering shall be performed solely for the establishment, growth, and maintenance of such plants and without waste as defined in Sec. 34-271.

(Ord. No. 92179, § 1, 7-27-00; Ord. No. 92503, § 1, 9-14-00)

Sec. 34-293. Responsible Party

For purposes of this article, the San Antonio Water System water and/or waste water customer, property owner, occupant, or resident of the property where a violation is observed shall be the responsible party for a violation of the provisions of this Article unless an alternate person is designated by the named meter holder and accepts responsibility and it is documented in writing by both the alternate individual and the meter holder. If there is no meter, the property owner, occupant, or resident shall be the responsible party. . .

(Ord. No. 92179, § 1, 7-27-00)

Sec. 34-294. Additional enforcement remedies.

The President/CEO or his or her designee is authorized and instructed to commence any action, in law or in equity, including the filing of criminal charges, deemed necessary for the purpose of enforcing this division. The SAWS President/CEO or the designee

may seek civil penalties and any other legal or equitable relief available under common law, Chapter 54 of the Texas Local Government Code or any other applicable city, state or federal code or statute.

(Ord. No. 92179, § 1, 7-27-00; Ord. No. 92503, § 1, 9-14-00)

Sec. 34-295. Penalties.

Criminal. Any person violating any provision of this Article IV, Divisions 1- 4, shall be guilty of misdemeanor and upon citation therefore and conviction thereof, shall be punished by a fine not less than fifty dollars (\$50.00) and not more than one hundred dollars (\$100.00) for the first offense, a fine not less than two hundred and fifty dollars (\$250.00) and not more than five hundred dollars (\$500.00) for the second offense, and a fine not less than one thousand dollars (\$1,000.00) and not more than two thousand dollars (\$2,000.00) for the third or any additional offense. Each violation of a particular section of this Article IV, shall constitute a separate offense, and each day an offense continues shall be considered a new violation for purposes of enforcing this division.

Civil. Civil penalties for violations of this division or of the Aquifer Management Plan, Article IV, Division 4, may also be assessed as allowed by applicable state law in an amount not to exceed one thousand dollars (\$1,000.00) per violation. Each violation of a particular section of this division or of the Aquifer Management Plan Article IV, Division 4, shall constitute a separate violation, and each day a violation continues shall be considered a new violation for purposes of enforcing this division.

(Ord. No. 92179, § 1, 7-27-00)

Sec. 34-296. Nuisance.

The violation of any part of this division shall be a nuisance which may be abated and enjoined by SAWS. Any person creating a public nuisance shall be subject to the provision of the Code governing such nuisances, including reimbursing SAWS for

any costs incurred in removing, abating or remedying said nuisance. The owner of any property where said nuisance has occurred shall be liable to the city, acting through and on behalf of SAWS, for the cost of such abatement and shall pay such cost on demand and the city, acting through and on behalf of SAWS, shall have a right to file a lien on the property to secure payment of the cost of such abatement.

(Ord. No. 92179, § 1, 7-27-00)

Sec. 34-297. Access to premises.

SAWS and all persons or agents employed thereby shall, at all reasonable hours, have free access to premises to ascertain if water is being wasted within the corporate limits of the city or the extraterritorial jurisdiction or the extent of jurisdictional authority and whether provisions of the Water Conservation and Reuse Article IV have been, and are being, complied with in all respects.

(Ord. No. 92179, § 1, 7-27-00)

Sec. 34-298. Access to information.

Any water purveyor operating within the corporate limit of the city shall provide enforcement personnel of SAWS, upon request, with the identity, mailing address and telephone number of any person in whose name a water meter is registered or customer account is maintained.

(Ord. No. 92179, § 1, 7-27-00)

Sec. 34-299. Severability.

If, for any reason, any section, sentence, clause or part of this division is held legally invalid, such judgment shall not prejudice, affect, impair or invalidate the remaining sections of this division, but shall be confined to the specific section, sentence, clause, or part of this division held legally invalid.

(Ord. No. 92179, § 1, 7-27-00)

Sec. 34-300. This article to prevail if conflict.

In the event any section of this article conflicts in effect or application with any other section of the Code or ordinance, the section(s) of this article shall prevail.

(Ord. No. 92179, § 1, 7-27-00)

DIVISION 3. RESERVED*

***Editor's note:** Ord. No. 92179, § 1, adopted July 27, 2000, repealed Div. 3, §§ 34-301--34-309, which pertained to restrictions on landscape watering, and derived from Ord. No. 80574, § 6, adopted Aug. 4, 1994.

Secs. 34-301--34-315. Reserved.

DIVISION 4. DROUGHT MANAGEMENT PLAN*

***Editor's note:** Ord. No. 2007-02-08-0149, § 1(Exh. A), adopted February 8, 2007, amended division 4 in its entirety to read as herein set out. Formerly, division 4 pertained to the aquifer management plan, and derived from Ord. No. 80574, § 12, adopted August 4, 1994; Ord. No. 82533, § 1, adopted July 20, 1995; Ord. No. 83703, §§ 2--5, adopted February 29, 1996; Ord. No. 83860, §§ 2--7, adopted March 28, 1996; Ord. No. 84082, §§ 1, 2, adopted May 9, 1996; Ord. No. 84286, § 6, adopted July 18, 1996; Ord. No. 85945, § 1, adopted April 24, 1997; Ord. No. 91738, § 1, adopted May 4, 2000; Ord. No. 92179, § 1, adopted July 27, 2000; Ord. No. 92503, § 1, adopted September 14, 2000.

Sec. 34-316. Adoption of a drought management plan, water use reduction measures, and aquifer stage conditions applicable within the corporate limits of the city and its extraterritorial jurisdiction.

The drought management plan, including the water use reduction measures and associated implementation conditions set out therein, is hereby adopted and applicable throughout the corporate limits of the city regardless of water source and its extraterritorial jurisdiction where the San Antonio Water System may provide water and waste water service.

(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07; Ord. No. 2008-10-02-0885, § 3(Exh. A), 10-2-08)

***Editor's note:** Ord. No. 2008-10-02-0885, § 3(Exh. A), adopted October 2, 2008, changed the title of § 34-316 from "Adoption of a drought management plan, water use reduction measures, and aquifer stage conditions" to "Adoption of a drought management plan, water use reduction measures, and aquifer stage conditions applicable system-wide, including within the corporate limits of the city and its extraterritorial jurisdiction."

Sec. 34-317. Reserved

Sec. 34-318. Bases of water use reduction measures and aquifer stage conditions.

The water use reduction measures shall be based on the aquifer stage conditions or other condition considerations specified in section 34-319. The aquifer stage conditions shall be based on the Edwards Aquifer water levels in well AY-68-37-203 in the city (also known as "Dodd Field Test Well" or "J-17") as set out in section 34-322, or on aquifer water quality or other aquifer, seasonal or weather conditions not based on water levels in J-17 (set out in section 34-324).

(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Sec. 34-319. Implementation and termination of water use reduction measures and stages, generally.

1. Implementation of water use reduction measures. When the aquifer falls to six hundred sixty-five (665) feet above msl, city and SAWS staff shall begin preparations for public awareness, education and enforcement of the respective stage provisions.

(a) Stage I. Stage I water use reduction measures shall be declared to be in effect when the aquifer level at J-17 drops to six hundred sixty (660) feet msl. based on a 10 day rolling average calculated and determined by the Edwards Aquifer Authority the SAWS .

(b) Stage II Implementation. Stage II water use reduction measures shall be declared to be in effect when the aquifer level in the index well J-17 falls to six hundred fifty (650) feet above msl based on a 10 day rolling average calculated and determined by the Edwards Aquifer Authority.

(c) Stage III Implementation. Stage III water use reduction measures may be implemented when well J-17 falls to six hundred forty (640) feet above msl. based on a 10 day rolling average calculated and determined by the Edwards Aquifer Authority. Alternatively, Stage III may be implemented before or after the J-17 levels described above based on the following conditions set forth in Subsection 2.

(d) Stage IV Implementation.

After a monitoring period of thirty (30) days once Stage III is declared, and due consideration of all of the conditions described below in Subsection 2, the city manager, or designee, in consultation with SAWS president/CEO or designee, may declare or delay Stage IV . Specific water use reduction measures are set out in

section 34-332 and shall cover the categories of regulated uses, applicable stages and corresponding required water use reduction measures.

(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

2. Conditions for the implementation of water use reduction measures.

One or more of the following conditions may trigger the implementation of water use reduction measures by the city manager or designee, in consultation with SAWS president/CEO or designee:

(a) The review of conditions to determine whether SAWS is able to comply with the applicable regulations governing water supply withdrawals based upon consideration of water supplies, pumping trends, seasonal adjustments and current and forecast precipitation.

(b) Consideration of water resource water quality or other seasonal or weather conditions not based on water levels in J-17, or other conditions as determined by the city.

(c) Whenever Edwards aquifer quality measures thirty (30) percent TDS above historical average and above the maximum TDS value for any public supply water well warrant additional measures to protect the aquifer.

(d) City council may determine that other aquifer, water resource, seasonal, or weather conditions not based on water levels in J-17 warrant additional restrictions. The city council may declare the city impose additional

restrictions for all water uses including a prohibition of sprinkler irrigation.

3. Termination of mandatory water use reduction measures.

(a). *Stage I Termination.* When the aquifer level at J-17 rises to six hundred sixty (660) feet msl SAWS shall monitor the consistency and conditions of Edwards aquifer levels for the next fifteen (15) days to determine if termination of water use reductions measures is warranted, unless conditions significantly change to warrant an earlier or later review for stage termination or extension. After this monitoring period, the city manager, or designee, in consultation with SAWS president/CEO, or designee, may declare the measures terminated.

(b). *Stage II Termination.* When the aquifer level at J-17 rises to six hundred fifty (650) feet msl SAWS shall monitor the consistency and conditions of Edwards aquifer levels for the next fifteen (15) days to determine if termination of water use reductions measures is warranted, unless conditions significantly change to warrant an earlier or later review for stage termination or extension. After this monitoring period, the city manager, or designee, in consultation with SAWS president/CEO, or designee, may declare the measures terminated.

(c) *Stage III Termination.* When the Edwards aquifer levels remain above six hundred forty (640) msl. for fifteen (15) consecutive days conditions will determine if all restrictions are terminated or extended or if a previous less restrictive stage will apply.

(d) Stage IV Termination. When Stage III is terminated then termination of Stage IV will occur at the end of the current billing cycle in which the termination takes place.

Sec. 34-320. Declaration and termination of water use reduction measures; notice by publication required.

(a) The city manager, in consultation with SAWS, is hereby authorized to declare that each "trigger level" or other condition has been reached as described in section 34-319 and that the water use reduction measures and each respective stage are in effect.

(b) Notices of the implementation and termination of the water use reduction measures and each of the various stages, as appropriate, shall be publicly announced and published in a daily newspaper for a minimum of one (1) day. The implementation or termination

of the measures and each of the stages shall become effective immediately upon publication of the respective notice.

(c) Notice of the termination of the water use reduction measures and each of its various stages, as appropriate, shall be publicly announced and published in a daily newspaper for a minimum of one (1) day. Termination of the measures and each of its stages shall become effective immediately upon publication of the respective notice.

(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Sec. 34-321.

(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Sec. 34-322. Reserved. (Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Sec. 34-323. Designated landscape irrigation times and days.

During any period when stage restrictions have been declared to be in effect, irrigation with a sprinkler or irrigation system of existing landscape on any property (other than golf courses and athletic fields, the restrictions for which are set out in section 34-332) may occur only on certain designated days and at certain times, as follows:

1. Stage I, II, III, IV landscape irrigation days. For Stage I, II, III, and IV the landscape irrigation days for residential and commercial properties will be according to the street address and according to the following schedule. If the last digit of the street address ends in:

- 0 or 1 the irrigation day is Monday,**
- 2 or 3 the irrigation day is Tuesday,**
- 4 or 5 the irrigation day is Wednesday,**
- 6 or 7 the irrigation day is Thursday,**
- 8 or 9 the irrigation day is Friday.**

If there is no street address associated with the property such as a parkway or if there is more than one (1) street address associated with a single contiguous property the irrigation day is Wednesday.

2. Stage I landscape irrigation times and methods. For Stage I the following times and associated irrigation methods apply: Irrigation with a soaker hose, hose-end sprinkler or in-ground irrigation system is allowed on the day specified in subsection (1) between the hours of 12:00 a.m. to 11:00 a.m. and 7:00 p.m. to midnight. Landscape irrigation with a, handheld hose, drip irrigation system or five-gallon bucket is allowed at any time on any day.

3. Stage II landscape irrigation times and methods. For Stage II the following times and associated irrigation methods apply: Irrigation with a soaker hose, hose-end sprinkler or in-ground irrigation system is allowed on the day specified in subsection (1) between the hours of 7:00 a.m. to 11:00 a.m. and 7:00 p.m. to 11:00 p.m. Landscape irrigation with a drip irrigation system or five-gallon bucket is allowed during Stage II hours on any day. Landscape irrigation with a handheld hose is allowed at any time on any day.

4. Stage III landscape irrigation times and methods. For Stage III, the following times and associated irrigation methods apply: Irrigation with a soaker hose, hose-end sprinkler or in-ground irrigation system is allowed on the day specified in subsection (1) every other week beginning on the second Monday after Stage III has been declared, between the hours of 7:00 a.m. to 11:00 a.m. and 7:00 p.m. to 11:00 p.m. Landscape irrigation with a drip irrigation system or five-gallon bucket is allowed on every Monday, Wednesday and Friday during Stage III hours. Landscape irrigation with a handheld hose is allowed at any time on any day.

5. Stage IV landscape irrigation and methods. For Stage IV, Stage III landscape irrigation restrictions remain in effect. In addition, a drought surcharge is assessed on all water accounts of SAWS, in accordance with section 34-128. Additional restrictions on water use may be established at the discretion of the city council.
(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Sec. 34-324. Reserved.

(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Secs. 34-325--34-331. Reserved.

Sec. 34-332. Specific water use reduction measures.

Specific water use reduction measures, their corresponding stages and scope are set out in table A Stage I, table B Stage II, table C Stage III Stage IV, below

Table A--Stage I Restrictions

TABLE INSET:

<i>Stage</i>	<i>Measures For</i>	<i>Scope of Restrictions</i>
I	Essential Services	Fire-fighting and medical uses-no restrictions. Reductions in fire hydrant and sewer line flushing encouraged.
I	Water Utility Use	Water utilities are encouraged to implement voluntary measures, such as improving leak detection surveys and repair

		programs and stabilizing and equalizing system pressure.
I	Power Production	Water used for power production shall be voluntarily reduced.
I	Military	Compliance with mandatory reduction measures for those uses in the outdoor, essential and utility categories.
I	Agriculture	The escape of irrigation tailwater, as that term is commonly used in the agricultural community, is prohibited. Water loss through percolation in transmission canals is prohibited.
I	Live Stock Use	Reduction of water use by any means available is encouraged.
I	Industrial, Commercial, and Other	<p>A. Reduction of water use by any means available is encouraged. Compliance with the mandatory demand reduction measures is required for those uses in the outdoor category, including landscape watering, swimming pools, hot tubs and similar facilities, golf courses, aesthetic uses such as water features; such restrictions specifically include industrial users, as well as all others.</p> <p>B. Use of gray water, treated wastewater or reuse water, cooling tower blow down, condensate water is a defense to prosecution. Alternate on-site reclaimed sources may be approved through variance on a case by case basis.</p> <p>C. If one hundred (100) percent use of treated wastewater (recycled water), reuse water, reclaimed water, gray water, condensate, or cooling tower blow down will be used, signs identifying this property as using recycled or reclaimed water source must be posted on site at a location where the general public can view it.</p>
I	Hotels, Motels, Bed and Breakfasts	Hotels, motels, and B&B's encouraged to voluntarily offer the option of a "no linen/towel change" program.
I	Households	Reduction of water use by any means available is encouraged. Compliance with the mandatory demand reduction measures shall be achieved for those uses in the outdoor category, such as landscape watering, swimming pools, hot tubs, pressure washing and similar facilities.

I	Swimming Pools, Hot Tubs	<p>A. All swimming pools other than public swimming pools must be covered with an effective evaporation cover or screen or evaporation shields covering at least twenty-five (25) percent of the surface of the pool when the pool is not in active use. Active use includes necessary maintenance that requires removal of the cover, screen, or shields. Active use of public, commercial and apartment pools is whenever the pool is not officially closed.</p> <p>B. Auto fill feature turned off.</p>
I	Water Features	<p>A. Residential: All residential water features are allowed without prohibition.</p> <p>B. Non-Residential: SAWS Conservation department may verify the condition of a water feature to determine if it is in good working order.</p> <p>1) All indoor water features in good working order allowed without prohibition.</p> <p>2) All water features that meet the definition of Wildlife Habitat water features Sec. 34-271 in good working order allowed without prohibition with Basic variance approved by SAWS Conservation.</p> <p>3) All outdoor water features that have a water surface area of less than 1000 square feet prior to Stage I declarations and in good working order with an approved Basic variance from SAWS Conservation are allowed without prohibition.</p> <p>4) All water features confirmed by SAWS to be using one hundred (100) percent treated wastewater (recycled water), reuse water, reclaimed water, gray water, condensate, or cooling tower blow down or other on-site reclaim water and in good working order with a Basic variance approved by SAWS Conservation are allowed without prohibition. Signs identifying this property as using recycled or reclaimed water source must be posted on site at a location where the general public can view it.</p> <p>5) All outdoor water features that do not meet the conditions described in B 1-4 above must have a Basic variance and outdoor water feature conservation plan approved by SAWS Conservation that includes limiting hours of operation to a maximum of 8 hours of 24 hour period before they are allowed to operate in Stage I or Stage II.</p> <p>6) Outdoor water features that do not meet the conditions described in B 1-4 and would like to be considered for expanded operated hours from 8 hours in a 24 hour period to 12</p>

		hours of operation in a 24 hour period during Stage I and II may apply for an Advanced variance to the SAWS Conservation department prior to implementation of the extended hours.
I	Pressure or Power Washing	<p>Residential: Residential property owners may personally pressure wash their property without a variance for health and safety or in preparation of maintenance such as for house painting if they perform the work themselves. Water is never allowed to run into the street or otherwise off the property.</p> <p>Non- Residential: Pressure washing of non-residential property allowed for health and safety by a properly registered employee or a pressure washing company (sec. 34-272). A variance from the SAWS Conservation department is required prior to work and all conditions of the variance must be followed.</p>
I	Vehicle and Equipment Washing	<p>A. Citizens are encouraged to wash their vehicles no more than twice a month.</p> <p>B. Residential: washing of vehicles and mobile equipment (e.g., washing vehicle at a residence) is permitted only on Saturday or Sunday with a pressure washer, hand-held hose equipped with an automatic shut-off nozzle, or bucket of five (5) gallons or less, without waste.</p> <p>C. Fleet managers are encouraged to only wash those vehicles as is necessary for health and safety.</p> <p>D. Use of treated wastewater (recycled water), reuse water, reclaimed water, gray water, condensate, or cooling tower blow down is a defense to prosecution and may be use for vehicle washing any day. Alternate on-site reclaimed sources may be approved through variance for the SAWS Conservation Department on a case by case basis.</p>
I	Landscape Irrigation for Existing Plants	<p>A. Landscape watering using sprinkler or irrigation systems is permitted only on designated landscape watering days (subsection 34-323(1)). For Stage I the following times and associated irrigation methods apply: Irrigation with a hose-end sprinkler or in-ground irrigation system is allowed on the day specified in subsection 34-323(1) between the hours of 12:00 a.m. to 11:00 a.m. and 7:00 p.m. to midnight. Landscape irrigation with a soaker hose, handheld hose, drip irrigation system or five (5) gallon bucket is allowed at any time on any day.</p> <p>B. A user may file with SAWS a request for an exception to the designated days and times. The request must include: (1) a statement indicating compelling reasons why the user is unable to meet the specific designated watering times and days; (2) a water conservation plan demonstrating a significant overall reduction of water use, and (3) evidence of having filed with</p>

		<p>SAWS the annual irrigation check up required for properties that are five (5) acres or more and have in-ground irrigation (section 34-273.2). The water conservation plan must also include proof of irrigation efficiency of sixty (60) percent or greater and demonstrate specific measures to be taken to reduce consumption to meet the reduction goal established for Stage I, II, III, and IV. SAWS may, on a case by case basis, waive the requirements for irrigation efficiency and/or submission of a water conservation plan. Upon the approval of the water conservation plan as set forth herein, the user may be granted an exception.</p> <p>C. The one hundred (100) percent use of treated wastewater (recycled water), reuse water, reclaimed water, gray water, condensate, or cooling tower blow down is a defense to prosecution and may be used to irrigate any day without waste, that include allowing water to run down the street, parking lot, or adjacent property. Alternate on-site reclaimed sources may be approved through variance from the SAWS Conservation Department on a case by case basis.</p> <p>D. If one hundred (100) percent use of treated wastewater (recycled water), reuse water, reclaimed water, gray water, condensate, or cooling tower blow down will be used during additional days allowed in subsections 34-323(1)--(7) signs identifying this property as using recycled or reclaimed water source must be posted on site at a location where the general public can view it.</p>
I	Landscape Irrigation for New Landscapes	<p>A. Installation of new landscapes is permitted with a variance which shall only be granted if all applicable provisions including section 34-273, 34-274.2 and section 34-275 are verified by SAWS, including zonal irrigation systems if a permanent irrigation system is installed, a minimum of four (4) inches of soil under turf, model home with xeriscape and xeriscape option offered by builder on file with SAWS Conservation Department.</p> <p>B. Landscape watering permitted to maintain adequate growth until established on newly installed landscapes, generally five (5) weeks. Property owners should submit electronically on-line at www.saws.org to the SAWS Conservation Department their name, address where the new landscape is to be installed and the date of installation in order to receive a confirmation electronic email from SAWS. A copy of the confirmation must be posted at a place visible from the street at the property the variance was received at.</p> <p>Thereafter, landscape watering using sprinkler or irrigation</p>

		<p>systems for landscaping plants is permitted only on the day and times associated with the current stage in effect at the termination of the variance.</p> <p>C. The one hundred (100) percent use of gray water, treated wastewater or reuse water, condensate water, cooling tower blow down may be used to irrigate any day between the hours of 7:00 p.m. and 11:00 a.m. without waste, that include allowing water to run down the street, parking lot, or adjacent property. Alternate on-site reclaimed sources may be approved through variance from the SAWS Conservation Department on a case by case basis.</p> <p>D. If one hundred (100) percent use of treated wastewater (recycled water), reuse water, reclaimed water, gray water, condensate, or cooling tower blow down will be used during additional days allowed in subsections 34-323(1)-(7) signs identifying this property as using recycled or reclaimed water source must be posted on site at a location where the general public can view it.</p>
I	Golf Courses	<p>Golf Courses shall be required to submit a water conservation plan and shall have on file with SAWS the annual irrigation check Up as described in section 34-273.2 and shall be defined as "conforming" or "non-conforming" and shall reduce water usage under the following terms:</p> <p>A. All landscape out-of--play areas such as may be found around a club house or entryway shall follow general landscape irrigation restrictions (subsections 34-323(1)--(3)).</p> <p>B. All in-play areas may be irrigated with a sprinkler or irrigation system between the hours of 12:00 a.m. to 11:00 a.m. and 7:00 p.m. to midnight.</p> <p>C. Conforming golf courses shall implement a ten (10) percent reduction in the replacement of daily evapotranspiration rate ("ET rate") or soils daily water holding capacity, achieved by use of an existing and properly operating CCIS (as defined) capable of achieving such water conservation goals.</p> <p>D. A non-conforming golf course shall not use more than 1.8 times the base usage. If not separately metered an irrigation audit showing precipitation rates and run times along with a conservation plan shall be submitted and approved by SAWS for the purpose of establishing acceptable irrigation run times and days as approved by SAWS.</p> <p>E. The one hundred (100) percent use of treated wastewater (recycled water), reuse water, reclaimed water, gray water, condensate, or cooling tower blow down, gray water, treated wastewater or reuse water, condensate water, cooling tower blow down is a defense to prosecution and may be used to irrigate any day without waste. Alternate on-site reclaimed</p>

		<p>sources may be approved through variance from the SAWS Conservation Department on a case by case basis.</p> <p>F. If one hundred (100) percent use of treated wastewater (recycled water), reuse water, reclaimed water, gray water, condensate, or cooling tower blow down, gray water, treated wastewater or reuse water, condensate water, cooling tower blow will be used during additional days or hours allowed in subsections 34-323(1)--(5) signs identifying this property as using recycled or reclaimed water source must be posted on site at a location where the general public can view it.</p>
I	Public Parks	<p>A. Public park owner/operators shall be required to submit a water conservation plan and have on file with the SAWS Conservation Department an irrigation checkup as required by section 34-273.(2).</p> <p>B. Public parks shall limit irrigation with an irrigation system to those days and times required by subsections 34-323(1)-(3)</p> <p>C. The one hundred (100) percent use of treated wastewater (recycled water), reuse water, reclaimed water, gray water, condensate, or cooling tower blow down is a defense to prosecution and may be used to irrigate any day between the house of 7:00 pm and 11:00 am without waste, that include allowing water to run down the street, parking lot, or adjacent property. Alternate on-site reclaimed sources may be approved through variance from the SAWS Conservation Department on a case by case basis.</p> <p>D. If one hundred (100) percent use of treated wastewater (recycled water), reuse water, reclaimed water, gray water, condensate, or cooling tower blow down will be used during additional days allowed in subsections 34-323(1)--(3) signs identifying this property as using recycled or reclaimed water source must be posted on site at a location where the general public can view it.</p>
I	Athletic Fields	<p>A. An athletic field shall either irrigate according to a basic plan or an advanced plan. Plans shall be on file and approved by SAWS in advance of use. The advanced plan showing precipitation rates and run times along with a conservation plan shall be submitted and approved by SAWS for the purpose of establishing acceptable irrigation run times and days as approved by SAWS. A basic plan outlines which day of the week (Monday--Friday) which athletic field would be irrigated.</p> <p>B. All landscape out-of--play areas such as may be found around a club house or entryway shall follow general landscape irrigation restrictions (subsections 34-323(1)--(5)).</p>

Table B--Stage II Restrictions

<i>Stage</i>	<i>Measures For</i>	<i>Scope of Restrictions</i>
II	In General	Stage I restrictions remain the same except as added to or replaced below.
II	Hotels, Motels, Bed and Breakfasts	Hotels, motels and B&B's must offer and clearly notify guests of a "no linen/towel change" program.
II	Swimming Pools, Hot Tubs.	<p>A. Draining permitted only onto pervious surface, or onto pool deck where the water is transmitted directly to a previous surface, only if:</p> <ol style="list-style-type: none"> 1. Draining excess water from pool due to rain in order to lower water to maintenance level; 2. Repairing, maintaining or replacing pool component that has become hazardous; or 3. Repairing pool leak <p>Refilling of public swimming pool permitted only if pool has been drained for the repairs, maintenance or replacement set out in items 2 or 3 above.</p>
II	Landscape Irrigation for Existing Landscapes	<p>Landscape watering using sprinkler or irrigation systems is permitted only on designated landscape watering days (subsection 34-323(1)). For Stage II the following times and associated irrigation methods apply: Irrigation with a soaker hose, hose-end sprinkler or in-ground irrigation system is allowed on the day specified in subsection 34-323(1) between the hours of 7:00 a.m. to 11:00 a.m. and 7:00 p.m. to 11:00 p.m. Landscape irrigation with a drip irrigation system or five-gallon bucket is allowed during Stage II hours on any day. Landscape irrigation with a handheld hose is allowed at any time on any day.</p>
II	Landscape Irrigation for New Landscapes	<p>A. Installation of new landscapes is permitted with a variance which shall only be granted if all applicable provisions including section 34-273, 34-274.2 and section 34-275 are verified by SAWS, including zonal irrigation systems if a permanent irrigation system is installed, a minimum of four (4) inches of soil under turf, model home with xeriscape and xeriscape option offered by builder on file with SAWS Conservation Department.</p> <p>B.. Landscape watering permitted to maintain adequate growth until established on newly installed landscapes, generally five (5) weeks. Property owners should submit electronically on-line at www.saws.org to the SAWS Conservation Department their name, address where the new landscape is to be installed and the date of installation in order to receive a confirmation electronic</p>

		<p>email from SAWS. A copy of the confirmation must be posted at a place visible from the street at the property the variance was received at.</p> <p>Thereafter, landscape watering using sprinkler or irrigation systems for landscaping plants is permitted only on the day and times associated with the current Stage in effect at the termination of the variance.</p> <p>C.. The one hundred (100) percent use of gray water, treated wastewater or reuse water, condensate water, cooling tower blow down is a defense to prosecution and may be used to irrigate any day without waste. Alternate on-site reclaimed sources may be approved through variance from the SAWS Conservation Department on a case by case basis.</p> <p>D.. If one hundred (100) percent use of treated wastewater (recycled water), reuse water, reclaimed water, gray water, condensate, or cooling tower blow down will be used during additional days or hours allowed in subsections 34-323(1)--(7) signs identifying this property as using recycled or reclaimed water source must be posted on site at a location where the general public can view it.</p>
<p>II</p>	<p>Golf Courses</p>	<p>Golf Courses shall be required to submit a water conservation plan and shall have on file with SAWS the annual irrigation checkup as described in section 34-273.2 and shall be defined as "conforming" or "non-conforming" and shall reduce water usage under the following terms:</p> <p>A. All landscape out-of--play areas such as may be found around a club house or entryway shall follow general landscape irrigation restrictions (subsections 34-323(1)--(3)).</p> <p>B. All in-play areas may be irrigated with a sprinkler or irrigation system between the hours of 12:00 a.m. to 11:00 a.m. and 7:00 p.m. to midnight.</p> <p>C. Conforming golf courses shall implement a twenty (20) percent reduction in the replacement of daily evapotranspiration rate ("ET rate") or daily soil-holding capacity, achieved by use of an existing and properly operating CCIS (as defined) capable of achieving such water conservation goals.</p> <p>D. A non-conforming golf course shall not use more than 1.6 times the base usage. If not separately metered an irrigation audit showing precipitation rates and run times along with a conservation plan shall be submitted and approved by SAWS for the purpose of establishing acceptable irrigation run times and days as approved by SAWS.</p> <p>E. The one hundred (100) percent use of treated wastewater (recycled water), reuse water, reclaimed water, gray water, condensate, or cooling tower blow down is a defense to prosecution and may be used to irrigate any day between the</p>

		hours of 7:00 pm and 11:00 am and without waste. Alternate on-site reclaimed sources may be approved through variance from the SAWS Conservation Department on a case by case basis. F. If one hundred (100) percent use of treated wastewater (recycled water), reuse water, reclaimed water, gray water, condensate, or cooling tower blow down will be used during additional days allowed in subsections 34-323(1)-(4) signs identifying this property as using recycled or reclaimed water source must be posted on site at a location where the general public can view it.
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Table B--Stage III Restrictions

TABLE INSET:

<i>Stage</i>	<i>Measures For</i>	<i>Scope of Restrictions</i>
III	In General	Stage I, II restrictions remain the same except as added to or replaced below.
III	Industrial, Commercial, and Other	Additional reductions may be imposed by the city council if conditions warrant.
III	Hotels, Motels, Bed and Breakfasts	Hotels, motels, B&B's must limit linen/towel changes to once every three (3) nights or for the entire stay, whichever is shorter, except for health and safety.
III	Vehicle and Equipment Washing	During Stage III any vehicle wash facility that is not certified as a SAWS certified vehicle wash facility will not be able to operate. Upon receiving certification vehicle wash facilities may resume operating hours.
III	Landscape Irrigation for Existing Landscapes	Landscape watering using sprinkler or irrigation systems is permitted only on designated landscape watering days (subsection 34-323(1)). For Stage III the following times and associated irrigation methods apply: Irrigation with a soaker hose, hose-end sprinkler or in-ground irrigation system is allowed the day specified in subsection 34-323(1) every other week beginning on the first Monday after the Stage III has been declared, between the hours of 7:00 a.m. to 11:00 a.m. and 7:00 p.m. to 11:00 p.m. Landscape irrigation with a drip irrigation system or five-gallon bucket is allowed on every Monday, Wednesday and Friday during Stage III hours. Landscape irrigation with a handheld hose is allowed at any time on any day.
III	Landscape Irrigation for	A. Installation of new landscapes is permitted only if less than fifty (50) percent of the available landscape area is planted with

	New Landscapes	turf, all applicable provisions of section 34-273, 34-274.2 and section 34-275, including proper horticultural practices such as the use of mulch and zonal irrigation systems if a permanent irrigation system is installed and a minimum of four (4) inches of soil under turf. In addition, drip systems in mulched beds are required. B. A user may file with SAWS a request to install more than fifty (50) percent turf. The request must include: (1) a statement or plan describing the landscaping plan; and (2) a statement indicating how the landscaping plan will achieve the goals of this chapter. Upon the approval of the alternate landscaping plan as set forth herein, the user may be granted an exception.
III	Water Features	1) Water features that are required to have a basic variance and outdoor water feature conservation plan approved by SAWS Conservation must reduce their hours of operation to a maximum of 4 hours a day in Stage III. 2) Outdoor water features that would like to be considered for expanded operated hours from 4 hours in a 24 hour period to 8 hours of operation in a 24 hour period during Stage III may apply for an Advanced variance to the SAWS Conservation department prior to implementation of the extended hours.
III	Golf Courses	A. A conforming golf courses shall implement a thirty (30) percent reduction (or twenty (20) percent reduction, if the conforming golf course is an ISP participant) in replacement of daily ET rate or soils daily water holding capacity, achieved by use of an existing and properly operating CCIS (as defined) capable of achieving such water conservation goals. B. A non-conforming golf course shall not use more than 1.4 times the base usage. If not separately metered an irrigation audit showing precipitation rates and run times along with a conservation plan shall be submitted and approved by SAWS for the purpose of establishing acceptable irrigation run times and days as approved by SAWS.

Table D--Stage IV Restriction

TABLE INSET:

<i>Measures For</i>	<i>Scope of Restrictions</i>
In General	The most restrictive requirements of either Stage I, II or III restrictions remain the same except as added to or replaced below.
Commercial Surcharge	A surcharge is assessed on all irrigation accounts and assumed irrigation (section 34-124) of the San Antonio Water System as described in section 34-128. Surcharge is to remain

	in effect for a minimum of one (1) complete billing month. The surcharge shall remain in effect if Stage IV is still in effect at the beginning of the next billing month.
Residential Surcharge	A surcharge is assessed on all water accounts of the San Antonio Water System as described in section 34-128. Surcharge is to remain in effect for a minimum of one complete billing month. The surcharge shall remain in effect if Stage IV is still in effect at the beginning of the next billing month.
Additional Restrictions	Additional restrictions including but not limited to a ban on lawn watering with irrigation systems or hose end sprinklers may be established at the discretion of the city council.

(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Sec. 34-333. Severability.

If, for any reason, any section, sentence, clause or part of this division is held legally invalid, such judgment shall not prejudice, affect, impair or invalidate the remaining sections of this division, but shall be confined to the specific section, sentence, clause, or part of this division held legally invalid.

(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Sec. 34-334. This division to prevail if conflict.

In the event any section of this division conflicts in effect or application with any other section of a City Code or ordinance, the section(s) of this division shall prevail.

(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Secs. 34-335--34-350. Reserved.

DIVISION 5. RESERVED.

Appendix E: SAWS Recycled Water Spill Reporting Form

Water Quality Noncompliance Notification

Unauthorized Discharge of Wastewater Reportable Effluent Violation Other

General Information

Entity Name: San Antonio Water System Telephone # 233-3578
 Permitte Subscriber
TNRCC Region: _____ County: Bexar Permit Number: _____

Noncompliance Summary

Description of Noncompliance (include location, discharge route, and estimated volume if an unauthorized discharge):

Cause of Noncompliance: _____

Duration: Start _____ End _____
(Time) (Date) (Time)
Or expected to be Corrected _____
(Date)

Potential Dangers to Human Health and Safety or the Environment _____

Actions Taken

Monitoring Data: Data should be attached or submitted to TNRCC when available.
_____ yes _____ no Field Measurements
_____ yes _____ no Laboratory Samples
_____ yes _____ no Fish Kill, If yes, estimated number killed: _____

Actions Taken to Mitigate Adverse Effects: _____

Actions Taken to Correct the Problem and Prevent Recurrence: _____

Verification Information

Information Reported By: _____ / _____
(Name) (Title)
Date Reported: 06/04/18 Signature: _____

TCEQ 0501 (November 5, 2002) *If the noncompliance is an unauthorized discharge from a wastewater collection system, use the permit number of the treatment plant to which the collection system is tied.

Appendix F: SAWS Customer Agreement

**SAN ANTONIO WATER SYSTEM
RECYCLED WATER SERVICE AGREEMENT**

Effective Date:

Contract No.

PROVIDER:

**San Antonio Water System (SAWS)
2800 U.S. Hwy 281 North
P.O. Box 2449
San Antonio, Texas 78212-2449**

USER:

San Antonio, Texas 782_____

For the consideration provided herein, SAWS agrees to supply and User agrees to accept, store and use recycled water service in accordance with the terms and conditions of this Recycled Water Service Agreement (the "Agreement"). This Agreement incorporates and is subject to all of the terms and conditions set out herein as well as all of the following: all applicable Attachments and Appendices attached hereto; the SAWS Recycled Water User's Handbook (the "User's Handbook"), as it may be amended from time to time; the SAWS Cross Connection Control and Backflow Prevention Program, as it may be amended from time to time; and all applicable local, state, and federal statutes, ordinances, and regulations, as they may be amended, now or hereafter in effect ("Applicable Laws"), including, without limitation, Chapter 210 of Title 30 of the Texas Administrative Code and Article VIII of Chapter 34 of the City of San Antonio Code (the "City Code").

This Agreement contains and is subject to the provisions of the Appendices indicated below. In the event of a conflict between this Agreement and any applicable Appendices, the provisions of the applicable Appendices shall control.

Appendix One - Conversion Benefits:	Applicable?	yes <input type="checkbox"/>	no <input checked="" type="checkbox"/>
Appendix Two - Exchange Documents:	Applicable?	yes <input type="checkbox"/>	no <input checked="" type="checkbox"/>
Appendix Three - Other:	Applicable?	yes <input type="checkbox"/>	no <input checked="" type="checkbox"/>

1. Use.

a. General. User covenants and agrees to use the recycled water provided under this Agreement (the "Recycled Water") only as authorized by Applicable Laws, and in accordance with the User's Handbook and the SAWS Cross Connection Control and Backflow Prevention Program.

b. Specific. Notwithstanding other uses authorized under Chapter 210 of Title 30 of the Texas Administrative Code or Chapter 34 of the City Code, User agrees to use the Recycled Water only for construction, commercial, industrial, or irrigation purposes and in accordance with all the terms and conditions of this Agreement. User agrees to use the Recycled Water only for the purpose(s) and in the location(s) described in Attachment A hereto. User agrees to obtain SAWS' written consent prior to using the Recycled Water for a purpose or at a location not described in Attachment A. Any changes to the purpose and location of use of the Recycled Water must be reflected in a substitute Attachment A and attached hereto. User agrees to take steps to minimize the risk of inadvertent human exposure to the Recycled Water. SAWS may terminate this Agreement immediately, in its sole discretion, if SAWS determines that User has failed to use the Recycled Water in accordance with Applicable Laws, this Agreement, and/or Attachment A.

2. Quantity

SAWS and User agree to the delivery and use of Recycled Water in accordance with the specifications set forth on Attachment B hereto.

3. Point of Delivery; Service Pressure.

a. Point of Delivery. Title to the Recycled Water shall pass from SAWS to User at the points of delivery, which shall be at the meter connections on User's premises ("Points of Delivery"). The amount of Recycled Water received by User shall be determined by and based upon monthly meter readings performed by SAWS.

b. Service Pressure. SAWS agrees to deliver to User Recycled Water at no less than the minimum pressure set forth in Attachment A. User shall supply, install and maintain at User's sole expense all equipment to obtain User's desired pressure if the pressure designated in Attachment A is not adequate for User's purposes.

4. User's Recycled Water System.

a. Design, Construction and Maintenance. At User's sole expense, User shall design, install, construct, maintain, and operate all portions of the recycled water transportation, holding and distribution facilities on User's side of the Points of Delivery (the "Onsite System"), except that SAWS shall install the meters (or alternative measurement devices approved by SAWS) at SAWS' sole expense. User must ensure that the Onsite System, at all times while this Agreement is in effect, complies with Applicable Laws. SAWS reserves the right to conduct periodic site visits to analyze and test potable water and Recycled Water and to perform any other tests or inspections it deems necessary to ensure operational compliance of the Onsite System.

b. Inspections, Permits, Certifications. User shall be solely responsible for timely obtaining all necessary permits, approvals, and certificates from SAWS, the appropriate municipal or county plumbing department, and any other applicable governmental agencies for all activities relating to the Onsite System, including but not limited to, materials, construction, modifications, notifications, facility testing, violations, and emergency response, as such may be required by this Agreement, Applicable Laws, or SAWS policy.

5. Reports, Inspections, Soil Analysis, and Conservation Requirements.

a. Reports. User acknowledges that SAWS is required to submit monthly reports to the TCEQ pursuant to Chapter 210 of Title 30 of the Texas Administrative Code, regarding the quantity, quality, purpose and location of use of Recycled Water.

b. Inspection of Premises. User agrees to permit authorized representatives of SAWS or any other governmental agency with jurisdiction to inspect User's premises for the purpose of verifying compliance with this Agreement and all Applicable Laws. Inspections shall occur at reasonable times or during normal business hours. User acknowledges that by conducting inspections of User's premises or Onsite System, including backflow prevention assemblies, SAWS is not acting on behalf of the TCEQ or any other governmental body with jurisdiction to regulate User's use of Recycled Water or Onsite System, and such inspections or certifications by SAWS do not relieve User from its obligation to ensure that its use of Recycled Water or the Onsite System is in compliance with this Agreement or Applicable Laws.

c. Soil Analysis. In the event User utilizes the Recycled Water for irrigation purposes, User agrees to allow SAWS reasonable access to User's premises to collect soil samples prior to the initiation of recycled water service and as may be requested by SAWS thereafter. If requested in writing by User, SAWS shall allow the

samples to be split with User and provide User with copies of all information obtained by SAWS from the analysis of SAWS samples.

d. Conservation Plan. Prior to the initiation of Recycled Water service, User shall develop and provide to SAWS a water conservation plan for recycled water use acceptable to SAWS. If the User (a) fails to develop a conservation plan acceptable to SAWS, or (b) fails to implement provisions of the approved conservation plan within one year of the Effective Date of this Agreement, SAWS may terminate this Agreement and recover reasonable expenses incurred in preparing to initiate service, including, without limitation, delivery lines and meters.

e. Exemption from Aquifer Management Plan. Pursuant to Section 34-1278 of the City Code, as amended, Recycled Water provided under this Agreement is exempt from compliance with the specific water use reduction measures set forth in Section 34-332 of the City Code. Pursuant to Section 34-332 of the City Code (Measures for Landscape Irrigation: New and Established Plants), as amended, the use of Recycled Water is a defense to prosecution for irrigation of landscape outside the designated landscape watering days and times established by Section 34-323 of the City Code.

6. Rates and Payments.

The rate, applicable fees and payment obligations applicable to User's purchase of Recycled Water under this Agreement shall at all times be as then set forth in Chapter 34 of the City Code, as it may be amended. User agrees to pay for the Annual Amount set forth on Attachment B if the Annual Amount is available from SAWS in the designated Monthly Volumes whether or not taken by User. SAWS will bill User annually no later than December 31 of each year during the term of this Agreement for that portion of the Annual Amount not taken by User, offset by any amount not available from SAWS in the designated Monthly Volumes, during the preceding consecutive twelve month period.

7. Interruption of Service.

a. Substitute Water. SAWS shall not be liable for any interruptions in User's Recycled Water service. In the event of any interruption of service not caused by Force Majeure (Section 10) or due to User's breach of any provision in this Agreement, SAWS shall deliver to User substitute water at the Points of Delivery, in the amount and of the quality then required by this Agreement, and at the Recycled Water rates then applicable to User. Substitute water shall mean, as designated by SAWS: potable water from the SAWS potable water system, or recycled water from any other source delivered through the SAWS recycled water system ("Substitute Water"). SAWS will notify User prior to delivering potable water as Substitute Water.

b. User's Breach. SAWS may interrupt Recycled Water service at any time if SAWS determines that User is in breach of any provision in this Agreement. If SAWS interrupts service pursuant to this subsection, User shall have 30 days to cure the breach to the satisfaction of SAWS. If User fails to cure the breach to the satisfaction of SAWS in the period provided, SAWS shall have the right to immediately terminate this Agreement. The provisions of this Section are not intended to limit the rights of SAWS contained in Section 8 of this Agreement.

8. Termination.

a. With Notice. Except as otherwise provided herein, either party may terminate this Agreement by giving the other party 180 days written notice of intent to terminate.

b. Unauthorized Use. Notwithstanding any provision in this Agreement to the contrary, SAWS may terminate this Agreement immediately if SAWS determines that the use of the Recycled Water is not in strict compliance with this Agreement or Applicable Laws, as each may be amended.

c. Onsite System. Notwithstanding any provision in this Agreement to the contrary, SAWS may terminate this Agreement immediately if SAWS determines that the Onsite System is not in strict compliance with this Agreement or Applicable Laws, as each may be amended.

d. Nonpayment. In the event User fails to timely pay for Recycled Water in accordance with this Agreement, SAWS may interrupt service and terminate this Agreement as authorized by Chapter 34 of the City Code. Service will not be interrupted for failure to pay an amount contested in good faith by User and in accordance with SAWS' established procedures, so long as User timely pays all other charges due and not in dispute. All billing inquiries, disputes and decisions to terminate recycled water service for nonpayment shall be resolved in accordance with SAWS' established policies as such policies may be amended from time to time.

e. Conveyance of Premises. SAWS may terminate this Agreement immediately if User leases, sells, or conveys to another entity ownership, control or possession of all or parts of the land on which all or part of the Onsite System is located; provided, however, that SAWS may, in its discretion and on conditions it may require, permit this Agreement to be assigned to such other entity if the entity will use the Annual Amount of Recycled Water for the same purposes and in the same locations as established in the applicable Attachments hereto, all in accordance with this Agreement.

9. Liability; Indemnification.

a. User's Liability. User shall be solely responsible for any and all claims, damages, deaths, losses, injury, fines, penalties, suits and liability of every kind, including environmental liability, arising from the use, distribution or discharge of the Recycled Water, whether such use is intended or accidental, or authorized by this Agreement and Applicable Laws or otherwise. User shall be solely responsible for any and all claims, damages, deaths, losses, injury, fines, penalties, suits and liability of every kind arising from or relating to the design, installation, construction, connection, maintenance, operation and modification of the Onsite System, regardless as to whether the Onsite System was released for service by SAWS.

b. **INDEMNIFICATION.** TO THE EXTENT PERMITTED BY APPLICABLE LAW, USER AGREES TO INDEMNIFY AND HOLD HARMLESS THE CITY OF SAN ANTONIO, SAWS, AND THEIR EMPLOYEES, OFFICERS, AGENTS AND REPRESENTATIVES ("CITY/SAWS REPRESENTATIVES") FROM AND AGAINST ANY AND ALL CLAIMS, LOSSES, DAMAGES, FINES, PENALTIES, CAUSES OF ACTION, SUITS, AND LIABILITY OF EVERY KIND, INCLUDING ENVIRONMENTAL LIABILITY, ALL EXPENSES OF LITIGATION, COURT COSTS, AND ATTORNEYS' FEES, FOR INJURY TO OR DEATH OF ANY PERSON, OR FOR DAMAGE TO ANY PROPERTY, ARISING OUT OF OR IN CONNECTION WITH USER'S DISTRIBUTION, USE AND/OR STORAGE OF THE RECYCLED WATER PROVIDED HEREUNDER, AND/OR THE DESIGN, INSTALLATION, CONSTRUCTION, CONNECTION, MAINTENANCE, MODIFICATION OR OPERATION OF USER'S ONSITE SYSTEM, INCLUDING WHEN CAUSED, IN WHOLE OR PART, BY USER, THIRD PARTIES, OR BY THE CONTRIBUTORY NEGLIGENCE OF CITY/SAWS REPRESENTATIVES. IT IS THE EXPRESSED INTENT OF THE PARTIES HERETO THAT THE INDEMNITY PROVIDED FOR IN THIS PARAGRAPH IS AN INDEMNITY BY USER TO INDEMNIFY AND PROTECT CITY/SAWS REPRESENTATIVES FROM THE NEGLIGENT ACTS OF THE USER, THIRD PARTIES, AND CITY/SAWS REPRESENTATIVES, EXCEPT WHEN CAUSED BY THE SOLE NEGLIGENCE OF CITY/SAWS REPRESENTATIVES.

10. Force Majeure.

a. Generally. If SAWS or User are rendered unable by Force Majeure to carry out, in whole or in part, its respective obligations under this Agreement, including the provision of Substitute Water, or acceptance of the Minimum Amount of Recycled Water, then during the pendency of such Force Majeure but for no longer period, the obligations of SAWS or User, as the case may be, shall be excused to the extent of such Force Majeure and SAWS shall not be liable for any loss or damage for delay, for nonperformance, or for interruption of service due to Force Majeure. For purposes of this Agreement, Force Majeure means any act or event not reasonably within SAWS' control, including, but not limited to, breaks, malfunctions or sabotage of SAWS' treatment, distribution, wastewater collection or sanitary sewer systems or facilities, pumps, pipelines, mains, or machinery of any kind, unauthorized dumping of contaminants in SAWS' wastewater collection system or sanitary sewer system, Acts of God, an act or omission of an act by any governmental authority, war, riot, insurrection, strikes, acts of a public enemy, orders of any kind of the federal, state or local government, or any civil or military authority, blockades, embargoes, sabotages, terrorist acts, epidemics, landslides, lightning, earthquakes, fires, hurricanes, storms, floods, washouts, droughts which result in an outflow of less than 116 m.g.d total discharge from all SAWS recycling plants, arrests, restraint of government and people, civil disturbances, or explosions.

b. CPS Priority Rights. User understands and agrees that City Public Service ("CPS") has priority rights to receive recycled water under an existing agreement between CPS and SAWS. Accordingly, User understands and agrees that there may be Force Majeure events in which SAWS may be unable to deliver Recycled Water to User in the quantities set forth in this Agreement as a result of complying with CPS priority rights. Any such event shall be deemed a Force Majeure event under the terms of this Agreement.

11. Miscellaneous.

a. Complete Agreement. This Agreement, including all Applicable Laws, User's Handbook and the SAWS Cross Connection Control and Backflow Prevention Program, and all the Attachments and all applicable Appendices hereto constitute the complete and entire agreement between the parties regarding the subject matter hereof. This Agreement supersedes and cancels all prior agreements relating to this subject, whether written or oral, unless expressly stated in this Agreement.

b. Severability. In case any one or more provisions, or parts of provisions, contained in this Agreement shall for any reason be held to be invalid, illegal or unenforceable in any respect, such invalid, illegal or unenforceable provision, or part thereof, shall not affect any other provision hereof, and this Agreement shall be construed by a court, giving effect to the general intent and specific directives of the parties so as not to be invalid, illegal or unenforceable. In the event such provision, or part thereof, cannot be reformed or construed to be valid, legal, or enforceable, this Agreement shall be construed as if such invalid, illegal or unenforceable provision had never been contained herein.

c. Performance of Contract. The obligations and undertaking of each of the parties to this Agreement shall be performed or deemed to be performed in San Antonio, Bexar County, Texas, and shall be construed in accordance with Texas law.

d. No Third-Party Beneficiaries. The parties hereto are entering into this Agreement solely for the benefit of themselves, their successors and permitted assigns, and agree that nothing herein shall be construed to confer any right, privilege or benefit on any person or entity other than the parties hereto, their successors and their permitted assigns. The parties hereby agree that this Agreement does not run with the land.

e. Assignment. This Agreement may not be assigned by User except as may be permitted under Section 8(e) herein (Conveyance of User Premises).

f. Waiver. Any waiver at any time by either party with respect to a default or other matter arising in connection with this Agreement shall not be deemed a waiver with respect to any subsequent default or matter.

g. Captions. The captions and headings appearing in this Agreement are inserted merely to facilitate reference and are not to be considered a part of this Agreement and in no way shall they affect the interpretation of any of the provisions of this Agreement.

h. Approvals. All approvals and agreements by either party that are required or contemplated under this Agreement must be in writing unless other means are specifically permitted, and must be signed by the person authorized to give such approvals and make such agreements for that party.

i. Notices. All notices under this Agreement shall be in writing unless otherwise required or permitted, and shall be mailed or faxed to the address or number provided in this subsection. All notices shall be effective on the date actually received or, if faxed the day faxed, provided an electronic confirmation of receipt is received. For purposes of billings and payments, the mailing addresses of the parties shall, until changed as hereinafter provided, be as follows:

As to User:
Attention:

P.O. Box _____
San Antonio, Texas 782_____

As to SAWS:
San Antonio Water System
Attention:
2800 U.S. Hwy 281 North
San Antonio, Texas 78212-2449

j. Cumulative Remedies. Except as expressly limited herein, the parties shall have all remedies, at law or equity, for any cause of action based on this Agreement.

IN WITNESS WHEREOF, the parties have caused this Agreement to be duly executed in multiple counterparts, each of which shall constitute an original effective the _____ day of _____, 2018 ("Effective Date").

Customer Name
By:

Date

Date

Draft Document

ATTACHMENT A

Purpose and Location of Use, Service Pressure

Contract No.

Effective Date of this Attachment:

1. Specific Use. Recycled Water shall be used exclusively for the purposes described below. Mark all applicable:

- Commercial
- Industrial
- Irrigation (including all agricultural purposes)
- Landscape Maintenance (Excluding all residential uses)
- Other - Specify: _____

2. Purpose. Describe the purposes of Recycled Water use: Landscape irrigation.

3. Location. Map attached: yes no. Describe the boundaries in which Recycled Water will be used:

4. Service Pressure. SAWS will deliver Recycled Water at no less than _____ pounds per square inch at each Point of Delivery.

Does this Attachment A supersede another Attachment A?: Yes No

If yes, what is the Effective Date of the superseded Attachment A? _____

If yes, execution by authorized SAWS representative is required.

SAWS Representative

Date

ATTACHMENT B

Annual Amount and Monthly Volumes

Contract No. _____

Effective Date of this Attachment: _____

User's Total Maximum Annual Quantity ("Annual Amount")	00.0 acre-feet per year
Gallons Per Minute Peak: 000 GPM	
MONTHLY VOLUMES	
January	0.00 acre feet per month
February	0.00 acre feet per month
March	0.00 acre feet per month
April	0.00 acre feet per month
May	0.00 acre feet per month
June	0.00 acre feet per month
July	0.00 acre feet per month
August	0.00 acre feet per month
September	0.00 acre feet per month
October	0.00 acre feet per month
November	0.00 acre feet per month
December	0.00 acre feet per month

Please note the following:

- a. Annual Amount. SAWS agrees to convey and transfer to User and User agrees to take from SAWS, Recycled Water up to the maximum quantity set forth herein per contract year (the "Annual Amount"), and in the monthly volumes set forth herein. User further agrees to take at least 75 percent of the Annual Amount in each 12 month period (the "Minimum Amount").
- b. Rate of Delivery. SAWS will deliver Recycled Water on a continuous basis during each twenty-four hour period at a rate consistent with User's anticipated hourly, daily, monthly, and/or annual utilization of Recycled Water as set forth herein.
- c. Adjustment of Annual Amount. If User fails to take the Minimum Amount for any two consecutive 12 month periods, for reasons other than rainfall or default or nonperformance by SAWS, SAWS may reduce the Annual Amount to an amount that reflects the User's actual historical usage over the previous 12 months or as mutually agreed upon by the parties. Months in which the applicable rates for the Recycled Water exceed the applicable rates for potable water by more than 25 percent, or months in which the Recycled Water is subject to water reduction measures (the "Disqualified Months") shall not be considered for purposes of determining whether User takes the Minimum Amount within an applicable period; provided, however, that the next month following the Disqualified Months shall be considered consecutive to the month preceding the Disqualified Months. SAWS may in its discretion increase the Annual Amount, if requested in writing by User, based on availability and other factors related to the provision of recycled water. All adjustments to the Annual Amount must be reflected in a substitute Attachment B and attached hereto.

Does this Attachment B supersede another Attachment B?: Yes No

If yes, what is the Effective Date of the superseded Attachment B? _____

If yes, execution by authorized SAWS representative is required.

SAWS Representative

Date

LOCATION MAP

Draft Document

Appendix G: Texas Code of Ordinances Ch. 34, Article VIII - Recycled Water Service and Rates

ARTICLE VIII. - RECYCLED WATER SERVICE AND RATES⁽¹⁷⁾

DIVISION 1. - GENERALLY

Sec. 34-1141. - Purpose of recycled water program.

The purpose of the SAWS' recycled water program is the replacement of Edwards Aquifer water usage with recycled water for non-potable uses of water thereby making the Edwards Aquifer water available for other uses. A fundamental goal of the program is the acquisition by SAWS of Edwards Aquifer water withdrawal rights from customers who are Edwards Aquifer water withdrawal rights owners. SAWS seeks to acquire such Edwards Aquifer withdrawal rights by exchange for a contractual commitment to deliver equivalent quantities of recycled water that unlike Edwards Aquifer water is not subject to reduction during drought periods.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1142. - Contracting for purchase of recycled water.

SAWS and customers desiring to purchase recycled water from SAWS shall be required to enter into a written recycled water contract setting forth, the terms and conditions upon which such transaction will be consummated. The recycled water contracts shall comply with the provisions of this article VIII, as well as any other applicable laws, rules and regulations.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1143. - Authorized uses of recycled water.

Recycled water shall be used exclusively for commercial, industrial, irrigation, landscape maintenance, streamflow enhancement and other specific uses described in the recycled water contract between SAWS and a customer. Recycled water use shall be in compliance, where applicable, with 30 Texas Administrative Code, Chapter 210, et seq.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1144. - Prohibited uses of recycled water.

Recycled water shall not be used for drinking, food preparation, domestic purposes or any type of human consumption. A violation of this section may be cause for the immediate termination of a recycled water contract between SAWS and a customer.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1145. - Prohibited sales of recycled water.

It shall be unlawful for any person to sell recycled water to any other person for any purpose other than an authorized purpose described in section 34-1143.

(Ord. No. 87597, § 1, 3-26-98)

Secs. 34-1146—34-1160. - Reserved.

DIVISION 2. - QUALITY

Sec. 34-1161. - Generally.

- (a) All recycled water supplied, treated, transmitted and distributed by SAWS shall be in compliance with the parameters established by TNRCC for Type I usage under 30 Texas Administrative Code, Chapter 210 et seq. The minimum recycled water quality will be as follows:

BOD ₅ or CBOD ₅	5 mg/L
Turbidity	3 NTU
Fecal Coliform	20 CFU/100 ml *
Fecal Coliform	75 CFU/100 ml **

* Geometric mean (the nth root, usually the positive nth root, of a product of n factors)

** Single grab sample (not to exceed).

- (b) SAWS shall provide periodic recycled water quality data to all recycled water customers. Specific recycled water quality issues and specific treatment requirements unique to any customer may be addressed by SAWS and the individual customers in recycled water contracts.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1162. - Supplying below standard recycled water to another.

It shall be unlawful for any person to supply any other person with recycled water which does not comply with the recycled water standards described in section 34-1161.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1163. - Analyses of recycled water required.

At a minimum, every official or other person responsible for any recycled water supply, who furnishes recycled water for any authorized recycled water use, shall have at least one (1) sanitary analysis of a representative sample of recycled water from the distribution system made twice weekly and shall retain records for a minimum of three (3) years.

(Ord. No. 87597, § 1, 3-26-98)

Secs. 34-1164—34-1180. - Reserved.

DIVISION 3. - SYSTEM

Sec. 34-1181. - Definitions.

Conversion benefit shall mean the sum of money paid by SAWS to, or cost incurred by SAWS specifically to the benefit of:

- (1) An existing customer of SAWS who contracts to purchase recycled water thereby reducing the existing customer's utilization of Edwards Aquifer water; and
- (2) Any customer who exchanges with SAWS all or part of the customer's Edwards Aquifer water withdrawal rights for recycled water from SAWS.

Distribution main shall mean a recycled water main offsite to a customer which is constructed at the expense of the recycled water customer and which connects one (1) or more customers with a SAWS transmission main. Distribution mains terminate at (1) the point of connection with a customer's recycled water meter, and (2) the point of connection with SAWS' transmission mains. All distribution mains (including the recycled water meter connecting to a customer's onsite recycled water main) accepted by SAWS become the property of SAWS at the time the distribution main is accepted.

Edwards exchange customer shall mean a customer who exchanges Edwards Aquifer water withdrawal rights for a like volume of recycled water and who filed a request for recycled water service with SAWS. An Edwards exchange customer can only exchange Edwards Aquifer water withdrawal rights which have been recognized by the Edwards Aquifer Authority, either pursuant to (1) interim authorization, (2) an initial regular permit, or (3) a regular permit, under 31 Texas Administrative Code, Chapter 705 et seq. An Edwards exchange customer may exchange all or a portion of its permitted Edwards Aquifer water withdrawal rights. A transfer of permitted Edwards Aquifer water withdrawal rights from an Edwards exchange customer to SAWS must be approved by the Edwards Aquifer Authority pursuant to 31 Texas Administrative Code, Chapter 705, Subchapter H or such future regulations as the state or Edwards Aquifer Authority may promulgate. In order to qualify for Edwards exchange customer status, the transfer of Edwards Aquifer water withdrawal rights to SAWS must be perpetual and unconditional. An Edwards exchange customer will only be provided recycled water in an amount which is equal to the Edwards Aquifer water withdrawal right which is transferred to SAWS. An Edwards exchange customer is not required to exchange the entirety of its Edwards Aquifer water withdrawal right, only that portion the Edwards exchange customer wishes to exchange for recycled water.

Existing customer shall mean a potable water customer of SAWS on June 30, 1997, who filed a request for recycled water service with SAWS.

Onsite recycled water mains shall mean any recycled water transport or distribution lines on the customer's side of the recycled water meter. Onsite recycled water mains are built by the customer and subject to permitting, SAWS and 30 Texas Administrative Code, Chapter 210 et seq. minimum standards and inspection as set out in the SAWS water recycling standards.

Transmission main shall mean a recycled water main including pumping and monitoring facilities built at the expense of SAWS.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1182. - Extensión policy.

SAWS will design and construct all recycled water transmission mains, recycled water treatment facilities, and recycled water pumping facilities SAWS determines are necessary and appropriate for providing recycled water to SAWS' recycled water customers. Recycled water shall be sold to customers whose water purchase volumes and/or decreases in Edwards Aquifer water withdrawals volumes due to recycled water purchases make it practicable and beneficial, in SAWS' opinion, to provide recycled water to the customer.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1183. - SAWS not obligated to proceed.

- (a) In no event shall SAWS be obligated to proceed with the construction, maintenance or operation of the recycled water system, or any part thereof, unless there are sufficient funds available, or if in the opinion of the board of trustees of SAWS, the main extension or recycled water operation is not in the public interest.
- (b) The decision of the chief executive officer of SAWS, or his designee, shall be final in the determination of line size, approval of plans and specifications, the decision to enter into a recycled water contract with a customer and the availability of funds for construction and/or reimbursement for construction of oversize lines.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1184. - Specifications for service connections.

The specifications for recycled water service connections shall conform to the standards set by SAWS.

Sec. 34-1185. - Cross connections with potable water mains prohibited.

- (a) It shall be unlawful for any person to make or to maintain any cross connection or to allow any cross connection to exist at any place under the control of any person.
- (b) The term "cross connection," as used in this section, is any mechanical union or any hydraulic union which, under any condition, might pass recycled water into the potable water supply system. Any switchover system potentially allowing use of

potable water as a temporary substitute for recycled water if recycled water is not available shall be built to ensure that recycled water does not back flow into the potable water system.

- (c) To ensure the complete separation of a customer's onsite potable water system from the lines supplying recycled water, SAWS will require an inspection of the customer's onsite potable water system by the local plumbing inspection department having jurisdiction prior to supplying recycled water. Facilities located outside incorporated city limits and not having access to municipal plumbing inspections, shall have the inspection conducted by a state licensed water protection specialist or a TNRCC approved customer service inspector. The SAWS backflow prevention section shall be notified of and participate in the inspections. The inspections will involve procedures to be established by SAWS. The inspections and any recommended piping modifications shall be completed prior to commencement of the recycled water service. A reinspection shall be conducted every three (3) years or as deemed necessary by the local plumbing inspection department and/or SAWS.

(Ord. No. 87597, § 1, 3-26-98)

Secs. 34-1186—34-1200. - Reserved.

DIVISION 4. - RECYCLED WATER MAIN CONSTRUCTION

Sec. 34-1201. - Distribution mains.

- (a) In the event a recycled water customer desires the extension of distribution mains to provide the customer with recycled water service, the customer shall bear all costs of extending the distribution main from the transmission main to the customer's property line. The size of such distribution mains are to be determined by SAWS, in its discretion, based on the customer's expected recycled water purchases.
- (b) SAWS shall review and approve the location of all recycled water distribution mains, as well as the plans and specifications for recycled water distribution mains and associated improvements including without limitation, pumps, monitoring devices and storage facilities. All construction of distribution mains shall be performed by the customer or a contractor selected by the customer, provided,

however, that the customer or contractor shall furnish a performance bond, executed by a corporate security authorized to do business in the state and maintaining an agent in Bexar County upon whom service of citation may be had. Such performance bond shall be in an amount equal to the total construction cost under the contract. The bond shall be in favor of SAWS and the customer and shall assure (1) completion of all construction required under the contract in full conformity with the plans and specifications approved by SAWS; (2) maintenance of such construction for a period of at least ninety (90) days after acceptance of construction by SAWS; and (3) payment in full by contractor of all subcontractors and materialmen providing labor and/or material in connection with the construction of the distribution main. All construction work on the distribution main shall be subject to inspection by city and SAWS officials and representatives. In no event shall any portion of any distribution main installed in an excavation be covered over unless and until it has been inspected and approved by SAWS.

- (c) Upon completion of construction of a recycled water distribution main and receipt of evidence acceptable to SAWS that all costs and fees for construction of the distribution main have been paid in full and all liens released, SAWS shall issue a written certificate of acceptance of the specific distribution main by SAWS, whereupon the distribution main covered by the acceptance certificate shall be the property of SAWS.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1202. - Distribution main oversizing.

SAWS may require that a distribution main being constructed by a recycled water customer be increased in diameter to a diameter larger than reasonably necessary to provide adequate recycled water service to a customer's property as a condition of approving the customer's plans and specifications for the distribution main. SAWS shall, upon completion of a distribution main constructed by a customer which meets SAWS' required sizing, reimburse the customer the reasonable incremental cost of the construction of the larger mains. The customer's responsibility for a share of the total cost of the oversized main will be limited to the greater of the scheduled charge for a six-inch main or prorated share of the total cost of the oversize main. Cost sharing for distribution mains shall be based on the following examples:

Example 1:

Required recycled water size main, 8 inches	Flow capacity, 848 GPM
Oversize recycled main constructed, 16 inches	Flow capacity, 3,393 GPM
Length of main constructed=	1,980 feet
Cost per linear foot=	\$ 33.33/foot
Total main construction cost=	66,003.00

Prorated customer share of main cost:

$$848 / 3393 = 0.2499$$

$$0.2499 \times \$66,003.00 = \$16,494.00$$

Customer pays cost of six-inch main or prorated cost of \$16,494.00, whichever is greater.

Example 2:

Required recycled water size main, 16 inches	Flow capacity, 3,393 GPM
Oversize recycled main constructed, 20 inches	Flow capacity, 5,729 GPM
Length of main constructed=	2,013 feet
Cost per linear foot=	\$ 49.76/foot
Total main construction cost=	\$104,655.00

Prorated customer share of main cost:

$$3393 / 5729 = 0.5922$$

$$0.5922 \times \$104,655.00 = \$61,976.00$$

Customer pays prorated cost of \$61,976.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1203. - Oversize distribution main—Construction.

Any distribution main construction by a customer which includes oversizing of a distribution main at the request of SAWS and for which oversizing the customer is to be reimbursed by SAWS shall be advertised for bids in the manner generally required for SAWS construction. All qualified bids submitted shall be publicly opened and let in the same manner as other SAWS construction contracts are bid and let. The construction contract shall be between the customer and contractor. Prior to commencement of the work under the contract for construction of an oversize distribution main, the contractor must have supplied SAWS with:

- (1) A copy of the fully-executed construction contract for the distribution main. The contract shall provide that SAWS is a beneficiary of the contract with rights to enforce such contract and that all warranties of the contractor under the contract also extend to SAWS once SAWS has accepted the distribution main. The contractor shall agree that SAWS may enforce any guaranty of contractor's work without joinder of the contractor;
- (2) An original executed copy of the payment and performance bond naming SAWS as an additional insured;
- (3) A sales tax certificate; and
- (4) Evidence that all insurance requested by SAWS is in place and where required evidence that SAWS is an additional insured. The minimum insurance requirements shall be the same as those required by SAWS from general contractors for a similar size project.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1204. - Same—Payment.

Any oversize reimbursement computed pursuant to section 34-1202 above shall be paid by SAWS to the customer who constructed and paid for the oversize distribution main, unless the customer and SAWS have previously agreed in writing to the payment of the oversize reimbursement in the manner set forth in section 34-1205 below. The payment shall be made within thirty (30) days of the final acceptance of the oversize distribution main by SAWS.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1205. - Same—Deferred reimbursement of costs by credit application.

SAWS and a customer may agree in writing at any time before SAWS' acceptance of oversize work by SAWS that the oversize reimbursement will be paid by SAWS to the customer by SAWS, allowing the customer to apply the oversize reimbursement on a dollar-for-dollar basis as a credit against twenty (20) percent of the customer's recycled water bill each month until the oversize reimbursement credits are fully utilized.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1206. - Same—Third party use.

If a customer wishes to connect to a distribution line oversized at SAWS' expense, then SAWS, as a condition of allowing the customer to acquire recycled water from the oversize distribution main, shall require the customer to pay SAWS a prorata share of the distribution main's oversize costs based on a ratio of available oversize flow capacity and the contracted monthly purchases or expected monthly purchases of the customer.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1207. - Same—Requirements for reimbursement.

In no event shall a customer be entitled to receive oversize distribution main credit reimbursements unless the customer has complied with all conditions and obligations of the customer's recycled water contract and all applicable laws. SAWS shall provide customers with the form of the certification required from the customer before SAWS will accept the oversize distribution main.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1208. - Distribution main constructed by SAWS.

SAWS may, at its discretion, construct distribution mains at its cost and expense where SAWS determines that such extensions are beneficial to the growth of the recycled water system and are practical in light of projected revenue, expected acquisition of Edwards Aquifer water withdrawal rights and/or impact of Edwards Aquifer water pumping reductions that will result from the availability of the distribution main. In said event, SAWS may charge recycled water customers their prorata share of the distribution main built at SAWS' expense. The customer's prorata share shall be based on the total capacity of the distribution main to the capacity to be used by the customer's system, but in no event less than the volume contracted for by the customer in relationship to the capacity of the main. If a customer oversizes its system for future expansion, the customer's share of the distribution main cost will be based on the projected volumes of recycled water to be purchased by the customer.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1209. - Where mains may be located.

All recycled water mains and other recycled water infrastructure which are owned by SAWS shall be constructed in or located:

- (1) On SAWS, city, county or state-owned property, including any public street or alley or any platted or publicly owned drainage facility;
- (2) Within the boundaries of any SAWS, city, county or state-owned creek or river bed; or
- (3) Within a platted or otherwise dedicated easement or right-of-way which has been granted to SAWS, the city, the county or the state and recorded in the real property records of the county in which the land is located.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1210. - Public property requirement.

Where SAWS, as part of its recycled water transportation and distribution system, requires pumps, treatment facilities, storage, testing sites or other facilities, all such facilities including all access roads to them, shall be located on public land or within an easement properly granted SAWS for such purpose as evidenced by a written instrument recorded in the real property records of the county in which it is located.

(Ord. No. 87597, § 1, 3-26-98)

Secs. 34-1211—34-1230. - Reserved.

DIVISION 5. - CONSTRUCTION PERMITS AND INSPECTION

Sec. 34-1231. - Private construction permit required.

- (a) Before any customer shall apply for a permit for connection to the SAWS recycled water system, the customer must have completed application to SAWS and obtained a permit from SAWS to connect to the recycled water system. At the time of application the customer/applicant shall have completed the following:
- (1) *Fees.* Pay to SAWS the fees specified in the SAWS recycled water specifications. The application fee is non-refundable and is not applied to recycled or other water purchases.
 - (2) *Drawings and specifications.* Whenever in the opinion of SAWS, drawings and specifications are required to show definitely the nature and character of the construction for which the application is made, the customer shall furnish such drawings (to scale) and specifications for the customer construction to SAWS for review and approval. Such drawings and specifications shall detail all proposed construction from the SAWS recycled water meter to the place of use of the recycled water.
 - (3) *Plan review.* SAWS shall review the data submitted by the customer/applicant within thirty (30) working days of actual receipt. If SAWS, in its discretion, determines that the application (including the plans and specifications) does not conform with the requirements of this article, SAWS shall note, in writing, all objections on the application and/or plans or on an attachment thereto and shall return the submitted plans and specifications with the basis for the rejection to the customer/applicant. The customer/applicant shall have thirty (30) days from the date the application was returned to the

customer/applicant to submit the plans to modify and resubmit the plans and application based on SAWS' comments. SAWS and the customer/applicant may continue the review procedure for one (1) property up to three (3) submissions to SAWS without payment of added fees. Thereafter a resubmitted application fee as specified in the SAWS recycled water specifications shall be required.

- (4) *Recycled water contract.* The customer/applicant and SAWS shall have executed a contract for the purchase of recycled water by the customer/applicant from SAWS.
- (b) Upon the approval of an application, a permit to proceed with the construction work shall be issued. Any work done by a customer/applicant before the permit to proceed with construction is performed at the customer/applicant's expense and risk that the permit will not be issued. A construction permit issued under this article shall be valid for six (6) months from the later of (1) the date of issue of the permit, or (2) if the permit issued contains a notation that SAWS provided mains to which the customer/applicant's work is to be connected are not then available, six (6) months after SAWS notifies the customer/applicant that SAWS provided mains for services of the customer/applicant are ready and available for connection to customer/applicant's work. If work is begun within the six-month period, SAWS may extend the permit for an additional six (6) months on such terms as SAWS deems appropriate.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1232. - Installation and inspection.

- (a) *Construction requests.* All privately-constructed mains shall be installed in strict compliance with the construction requirements of the SAWS recycled water specifications set forth in the SAWS recycled water specifications.
- (b) *Inspection.* After installation, but prior to covering, all privately-constructed mains shall be inspected by SAWS to ensure that all construction is in accordance with SAWS recycled water specifications. It is the duty of the customer to provide reasonable notice to SAWS when a main is or will be ready for inspection.
- (c) *Reinspection.* If the SAWS inspector finds that the main is not in accordance with SAWS recycled water specifications, then the customer shall make the necessary corrections and the work shall be submitted for reinspection. The work shall be

available for reinspection within ten (10) days of the date the customer or its representative is notified of the revisions required. For each reinspection the applicant shall pay a reinspection fee as specified in SAWS recycled water specifications.

- (d) *Certification.* Upon satisfactory completion and inspection of a main, SAWS shall issue a certificate of construction conformity. The issuance of such certificate shall evidence SAWS' acceptance of the distribution main and appurtenant improvements on SAWS' side of the recycled water meter as the property of SAWS. Such certificate is solely for the benefit of the customer and SAWS and shall not be relied upon by any third party.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1233. - Unaccepted work.

- (a) *Nonconforming work.* Any work determined by SAWS or a local plumbing inspection department for onsite work, in their sole discretion, to be inferior in quality and not in conformance with the approved plans and specifications shall be replaced or corrected immediately. If the work is not corrected within ten (10) days (or such longer period as SAWS may have agreed to in writing, but not more than sixty (60) days), then the permit shall be revoked and no further permits shall be issued to the customer until the rejected work fully complies with all applicable requirements and is accepted by SAWS.
- (b) *Revocation of permit.* SAWS or a local plumbing inspection department for onsite work, may revoke a permit in the event there have been any false statements or misrepresentations as to any material fact in connection with an application or plans on which the permit approval was based, or if unaccepted work is not corrected within the sixty-day cure period.

(Ord. No. 87597, § 1, 3-26-98)

Secs. 34-1234—34-1250. - Reserved.

DIVISION 6. - ONSITE IMPROVEMENTS

Sec. 34-1251. - Inspection.

All onsite recycled water distribution piping within the city shall be installed by a licensed and bonded plumbing contractor. A permit and inspection by the city building inspections department shall be required. All piping and installation shall be in accordance and comply with Section 603 and Appendix J of the adopted Uniform Plumbing Code (UPC) or other adopted standards.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1252. - Conversion benefit—Existing customers.

- (a) If a SAWS existing customer contracts to purchase recycled water from SAWS in lieu of using Edwards Aquifer water, then the existing customer may be entitled to financial assistance for the cost of infrastructure improvements determined by SAWS to be necessary and appropriate for converting to recycled water.
- (b) The financial assistance shall be extended only to the extent available and will initially be made available only to existing customers and Edwards exchange customers. If additional funds for financial assistance remain available after existing customers and Edwards exchange customers have had an opportunity to utilize financial assistance, financial assistance may be made available, at the discretion of SAWS, to other customers.
- (c) SAWS will credit the existing customer a one-time conversion benefit for approved onsite and/or distribution main recycled water system improvements equal to the sum of nine hundred dollars (\$900.00) per acre foot of water per year that the existing customer contracts with SAWS to take. The conversion benefit shall be computed utilizing the average acre feet of water the existing customer contracts to purchase during the initial five (5) years of the recycled water purchase contract, not to exceed the customer's peak historic use, as the multiplier of the nine-hundred-dollar figure.
- (d) The conversion benefit may be used only by an existing customer to pay for the existing customer's offsite and onsite improvements for use of recycled water, including but not limited to distribution mains; meters and appurtenances thereto; connection of the recycled water system from the meter to the common distribution points of recycled water on the existing customer's property; retrofit of irrigation and other water systems to take water from the separate recycled water source rather than from the existing Edwards water source; costs of modifying equipment to use the recycled water (e.g., pressure adjustments); storage facilities

for recycled water to be stored onsite for use during peak demand periods when there is determined by SAWS to be a benefit to the entire recycled water system from such storage; and switchover equipment allowing the existing customer to switch from the recycled water source to a substitute water source should recycled water not be available. The conversion benefit shall be used to pay first for the cost of a distribution main to be built at the existing customer's expense and secondly, to the extent of any conversion benefit remaining, for the cost of the existing customer's onsite improvements. Conversion benefit may be used to pay for both design and construction costs.

- (e) SAWS may approve use of the conversion benefit funds for specialized recycled water equipment based on existing customer's needs. Such additional authorized uses for the funds may include onsite testing facilities for recycled water quality or water quality improvement facilities. Conversion benefit funds may be used only for construction and equipping such specialized recycled water facilities, but specifically not to reimburse the existing customer's operating and maintenance costs for the water quality and/or recycled water monitoring procedures.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1253. - Same—Edwards exchange customers.

An Edwards exchange customer may be entitled to receive a conversion benefit payment, because of its transfer of Edwards Aquifer water withdrawal rights to SAWS, in addition to any conversion benefit the Edwards exchange customer might qualify for as an existing customer for SAWS potable water. An Edwards exchange customer's additional conversion benefit may be computed by multiplying nine hundred dollars (\$900.00) by the number of acre feet of Edwards Aquifer water withdrawal rights the owner has transferred to SAWS. In addition to the permitted use of conversion benefits set out in this article, the Edwards exchange customer may use the conversion benefit payment to cap or plug closed wells and to construct onsite transportation facilities from the recycled water main to the points of use of the recycled water.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1254. - Same—Payment.

A conversion benefit shall be credited when all of the following have occurred:

- (1) The existing customer or Edwards exchange customer has executed a recycled water contract with SAWS specifying the volume of recycled water anticipated to be purchased each year for not less than five (5) years;
- (2) The existing customer or Edwards exchange customer agrees to pay all costs associated with recycled water service not covered by SAWS;
- (3) The existing customer or Edwards exchange customer has prepared and submitted to SAWS a water conservation plan which is to be implemented within one (1) year;
- (4) The existing customer or Edwards exchange customer has completed all onsite and offsite retrofitting which is to be paid for by conversion benefit funds, as well as any other onsite work reasonably necessary to begin use of the recycled water in accordance with the approved recycled water plan within six (6) months; and
- (5) The Edwards exchange customer has completed the transfer of Edwards Aquifer water withdrawal rights which establish its Edwards exchange customers status and such transfer has been fully approved by the Edwards Aquifer Authority pursuant to 31 Texas Administrative Code, Chapter 705, Subchapter H.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1255. - Same—Refund.

If a customer fails to perform all conditions for payment of a conversion benefit and such breach continues uncured for sixty (60) days after written notice of the breach by SAWS, then SAWS may require the immediate refund of the conversion benefit, which sum shall be payable to SAWS on demand.

(Ord. No. 87597, § 1, 3-26-98)

Secs. 34-1256—34-1270. - Reserved.

DIVISION 7. - SERVICE

Sec. 34-1271. - Priority for certain new recycled water customers.

SAWS will prioritize its provision of recycled water service, where possible, to potential new customers as follows:

- (1) First priority shall be given to potential customers who are U.S. military installations and potential customers located in the areas of former U.S. military installations;
- (2) Second priority shall be given to potential customers located in economic enterprise zones or associated with economic development projects targeted by SAWS, the city or Bexar County;
- (3) Third priority shall be given to potential customers who are Edwards exchange customers;
- (4) Fourth priority shall be given to potential customers who are current SAWS potable water customers and who will be replacing the use of potable water for nonpotable with recycled water for such purposes; and
- (5) Fifth priority shall be given to all remaining potential customers.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1272. - Delivery of recycled water.

Specific conditions relating to the delivery point, delivery quantities and pressure, metering requirements and maintenance responsibilities will be set forth for each recycled water customer in the recycled contract for such customer.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1273. - Quantity of recycled water delivered.

The quantity and rate of delivery of recycled water to be purchased by any customer shall be set forth in the recycled water contract between SAWS and such customer.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1274. - Quality of recycled water delivered.

If any time the recycled water available from SAWS fails to meet the requirements of 30 Texas Administrative Code, Chapter 210 et seq., SAWS shall, upon the request of the customer, provide the customer substitute water of at least comparable quality in a quantity equal to the quantity of contracted recycled water that SAWS is unable to provide, at rates not to exceed the rate for recycled water then applicable.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1275. - Reliability of recycled water service.

SAWS will provide recycled water on a regular basis in such quantities set forth in the recycled water contract between SAWS and each customer. Recycled water service may be interrupted in the event of recycled water main or pipeline breaks or repairs, recycled water main or pipeline construction or upgrades, or due to acts of God or other extraordinary circumstances. In the event of any interruption in recycled water service, SAWS shall provide substitute water of comparable quality to each affected customer at rates not to exceed the rate for recycled water then applicable. Except as specified in this article, SAWS shall not be liable for an interruption in recycled water service.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1276. - SAWS' duty to supply substitute water.

If after a customer has performed all of its obligations under its contract to purchase the recycled water, including construction of a distribution main and onsite improvements, SAWS is unable to provide the quantity of contracted recycled water for any reason, SAWS shall, upon request of the customer, provide the customer substitute water of at least comparable quality in a quantity equal to the quantity of contracted recycled water that SAWS is unable to provide, at rates not to exceed the rate for recycled water then applicable.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1277. - Interruption in service to Edwards exchange customers.

- (a) If SAWS is unable to provide recycled water in compliance with the terms of an Edwards exchange customer's recycled water contract, or substitute water of at least comparable quality in a quantity equal to the quantity of contracted recycled water that SAWS is unable to provide, an Edwards exchange customer may, at the

Edwards exchange customer's cost and expense, withdraw and utilize Edwards Aquifer water under the Edwards Aquifer water withdrawal right which has been transferred to SAWS in an amount equal to the lesser of:

- (1) The Edwards exchange customer's actual onsite beneficial use without waste, as that term is defined under Edwards Aquifer Authority regulations set forth at 31 Texas Administrative Code 703.1(B); or
 - (2) The quantity specified in the Edwards exchange customer's recycled water contract with SAWS.
- (b) The right to the Edwards exchange customer to utilize a portion of SAWS Edwards Aquifer water withdrawal right after an interruption of service is expressly conditioned on no objection to the procedure being made by the Edwards Aquifer Authority. It shall be the joint duty of the Edwards Aquifer exchange customer who utilizes a portion of the SAWS Edwards Aquifer water withdrawal right pursuant to this section and of SAWS to notify the Edwards Aquifer Authority of the Edwards exchange customer's intention to do so.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1278. - Exemption from reduction measures.

The quantity of recycled water which SAWS agrees to provide pursuant to any recycled water contract between SAWS and a recycled water customer shall be exempt from compliance with the specific water use reduction measures set forth in article IV, division 4 of this chapter (Aquifer Management Plan), but not from other provisions in this chapter. In the event a recycled water customer purchases recycled water from SAWS in excess of the contracted amount, SAWS, as it determines to be necessary, may reduce such customer's purchase of the recycled water in excess of the contracted amount.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1279. - Disconnection for noncompliance.

It shall be the duty of SAWS to disconnect the recycled water service from any place where provisions of 30 Texas Administrative Code, Chapter 210 et seq. or of this article or of the recycled water contract in question are violated.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1280. - Unlawful connection with recycled water main.

It shall be unlawful for any person who is not a party to a valid recycled water contract to bore or drill into any recycled water main or make attachments to or connections with any recycled water service pipe.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1281. - Unlawful taking of recycled water.

It shall be unlawful for any person who is not a party to a valid recycled water contract to make an attachment to any recycled water main, service line or branches thereof or to otherwise take recycled water therefrom.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1282. - Maintenance of recycled water service pipes.

All persons using recycled water furnished by SAWS shall keep their recycled water service system in good repair, so as to prevent leakage. Maintenance is the owner's responsibility. All customer onsite transportation, holding and distribution facilities for recycled water shall comply with the standards of 30 Texas Administrative Code, Chapter 210 et seq.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1283. - Damage to recycled water system.

It shall be unlawful for any person, in any way, to intentionally or carelessly break, deface or in any manner damage or destroy any recycled water main, service line or branch thereof or any hydrant, meter, standpipe or other property belonging to the city, SAWS or others, and used in connection with the collection, treatment, metering, storage, supply, transmission and distribution of recycled water.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1284. - Title to recycled water service apparatus.

Title to all recycled water meters, curb-cocks and appurtenances that are attached through service lines or branches thereof to the recycled water mains of the SAWS recycled water system, including the meter and enclosing curb-cock boxes, shall be vested in the city for the singular use and benefit of the SAWS board of trustees. No person other than a duly authorized agent or representative of the board of trustees of SAWS shall open the meter or curb-cock or appurtenances thereto. SAWS shall maintain, repair and replace all meters, curb-cocks and appurtenances in connection therewith at its cost and expense.

(Ord. No. 87597, § 1, 3-26-98)

Secs. 34-1285—34-1300. - Reserved.

DIVISION 8. - RATES AND CHARGES

Sec. 34-1301. - Establishment of rates.

The rates and charges for recycled water service which will be applied to all recycled water consumption beginning on or about January 1, 2017 are set out in Schedule F to this chapter and shall be the lawful rates for recycled water service to be charged by the system.

(Ord. No. 87597, § 1, 3-26-98; Ord. No. 90733, § 1, 10-21-99; Ord. No. 96658, § 1(Att. 1), 10-31-02; Ord. No. 2015-11-19-0956, § 4(Att. I), 11-19-15, Res. No. 16-302, Att. III)

Sec. 34-1302. - Credits for retrofit costs.

To the extent existing customers and Edwards exchange customers incur approved retrofit costs as described in the SAWS recycled water specifications, such existing customers and Edwards exchange customers shall be entitled to a credit against their recycled water bill. To the extent the existing customers are seasonal users of recycled water, the credit received pursuant to this section for retrofit costs shall be annualized and applied against recycled water during the months the water is used.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1303. - Discount rates for recycled water utilized in certain operations.

(a)

The purpose of this provision is to allow an alternate method of establishing a recycled water rate for customers who utilize recycled water in certain operations. To qualify for this method a customer/applicant must file with SAWS a report by a registered professional engineer detailing the increased volume of recycled water used in the customer/applicant's specific operation compared with the volume of potable water used in the customer/applicant's specific operation as a result of a lesser water quality of recycled water that will be utilized for the specific operation and including a proposed monthly flow recommendation. If the report is acceptable to SAWS, at its discretion, the rate for recycled water provided to the applicant/customer for operations will be discounted to reflect the increased usage so that the total cost to the customer/applicant will be the same as if the customer/applicant utilized an amount of recycled water equal to its prior use of non-recycled water in the customer/applicant to specific operation.

- (b) The SAWS flat rate sewer program set forth in section 34-226.2 of this chapter may also be available to cooling tower customers. The flat rate sewer program provides for an alternate method of establishing a sewer charge for users. A flat rate sewer account may be established for any recycled water user upon determination by the SAWS customer service department that the costs to administer the account would not exceed the projected annual savings to the user.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1304. - Remedies for breach.

In the event of breach of a recycled water contract by any customer, specifically including but not limited to failure to pay SAWS, SAWS may impose each of the charges described in subsections 34-1232(a)–(f), inclusive, against a customer for each account of SAWS serving the customer. Fees shall be assessed against each customer on a service by service basis.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1305. - Calculation of quantity of recycled water delivered.

The amount of recycled water received by a customer shall be based on monthly meter readings performed by SAWS.

(Ord. No. 87597, § 1, 3-26-98)

Secs. 34-1306—34-1320. - Reserved.

DIVISION 9. - ENFORCEMENT

Sec. 34-1321. - Authority.

SAWS' legal department is hereby granted the authority to seek legal and/or equitable remedies for violations of this division, including the filing of criminal charges. For the purpose of enforcing this division the SAWS' environmental counsel shall represent the city in civil enforcement actions, by and through SAWS, and is hereby authorized to seek legal and/or equitable remedies against any person or entity which is reasonably believed to be violating or to have violated this division. A legal proceeding pursued under this division does not constitute a waiver by SAWS of any right the city may have to join in a legal action originating from an alternative source of law. SAWS may commence such actions for appropriate legal and/or equitable relief in courts having proper jurisdiction and may seek civil penalties and any other legal or equitable relief available under common law, V.T.C.A., Local Government Code ch. 54, under V.T.C.A., Water Code § 26.124, or any other applicable local, state, or federal code or statute.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1322. - Penalties.

- (a) *Criminal.* A conviction for violation of this division shall constitute a class C misdemeanor. A person convicted of a violation of this division shall be fined not less than two hundred dollars (\$200.00) nor more than two thousand dollars (\$2,000.00) per violation. Each violation of a particular section of this division shall constitute a separate offense, and each day an offense continues shall be considered a new violation for purposes of enforcing this division.
- (b) *Civil.* A civil penalty in an amount not to exceed one thousand dollars (\$1,000.00) per violation of this division may be imposed. Each violation of a particular section of this division shall constitute a separate offense, and each day such an offense continues shall be considered a new violation for purposes of assessing civil penalties and otherwise enforcing this division. All civil penalties collected by

reason of enforcing this division shall be deposited in the water quality and environmental education and enforcement account as established by article I, division 8 of this chapter.

(Ord. No. 87597, § 1, 3-26-98)

Sec. 34-1323. - Authority of city attorney to enforce.

The grant of the authority set out in this section shall in no way diminish the authority and responsibility of the office of the city attorney to ensure that this division is properly and diligently enforced, to prosecute violations of this division, and to defend the legality of this division if challenged.

(Ord. No. 87597, § 1, 3-26-98)

Secs. 34-1324—34-1340. - Reserved.