



WATER
STANDARD SPECIFICATIONS AND DETAILS

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Section 1: General

These Standard Specifications and Details provide minimum standards to guide the design and construction of water system improvements within Twain Harte Community Services District (District) that are to be dedicated to the public and accepted by the District for maintenance or operation. These Standard Specifications and Details shall apply to regulate and guide construction of water supply facilities and related public improvements within the jurisdiction of the District.

Work on public water distribution mains and on public water services shall be constructed by a licensed contractor, subject to inspection by the District, or by District personnel. The contractor shall follow all applicable District, County, State and Federal laws and regulations relating to construction of improvements.

All work on District facilities shall require a performance and completion bond equivalent to 100 percent of the value of the work, as estimated by a licensed professional engineer.

Improvements for acceptance by the Twain Harte Community Services District shall be installed in accordance with the approved improvement plans and specifications and these Standard Specifications and Details. In addition, work within the County road right-of-way shall be done to Siskiyou County requirements.

1.1 Related Documents

These criteria and standards are in addition to the requirements of the following District documents:

- Rules and Regulations Relating to Water Service.
- Policy and Procedure Manual:
 - Miscellaneous Fee Schedule
 - Development Improvement Standards
 - Project Approval
 - Development Agreements

1.2 Definitions

Terms used in this document are as defined in Rules and Regulations Relating to Water Service.

1.3 Order of Precedence

The following order of precedence shall apply should conflicts arise between these Standard Specifications and Details and other project documents:

- Project-specific conditions of approval by the Twain Harte Community Services District shall take precedence over these Standard Specifications and Details.
- These Standard Specifications and Details shall take precedence over all other documents for materials, installation and testing of facilities to be dedicated to the Twain Harte Community Services District.
- All other public works shall comply with the standards of the local permitting jurisdiction.

1.4 Periodic Updates and Modifications

The District may from time to time update or otherwise modify these standards. The user is responsible to confirm with the District that they are using the current standards subject to all updates and modifications prior to proceeding with a design submittal or application to the District for plan check and review. Failure to obtain and use the current standards may result in the rejection of a submittal and necessitate resubmittal at additional cost to the applicant.

1.5 Rights-of-Way

The extension or improvement of District water facilities shall be located only on land owned by the District in fee, in streets with an acceptable encroachment permit, existing public utility easements, or in an easement granted to the District. The applicant shall convey or grant to the District without cost such land and/or easements the District determines necessary for the facilities. The District may also require an easement for future extensions. Land conveyed to the District shall be free and clear of liens or encumbrances except encumbrances of record that are acceptable to the District.

An easement shall be granted to the District along the entire length of the Applicant's parcel except in cul-de-sacs, dead-end roadways or other situations where the District determines that the pipeline may terminate and remote service be provided.

Public utility easements shall be continuously maintained by the County, property owners' associations or others where the utilities and easements are not located in a publicly maintained road right-of-way.

The minimum permanent easement width shall be 20 feet; 10-feet each side of water main. Any needed temporary construction easements shall be obtained and paid for by the Applicant.

Section 2: Design Criteria

Design to these criteria without consideration to the actual project conditions does not guarantee plan approval. These Standards shall be considered minimum design criteria. The actual design parameters shall be established by the designer based on site-specific conditions. Design of any water system components not specifically addressed within the design criteria below shall be closely coordinated with and approved by the District.

2.1 Applicable Standards

The most current pertinent requirement of the following agencies and standards shall apply to design of water system components:

- Environmental Protection Agency Drinking Water Regulations
- Laws, codes and standards of the State of California, Department of Health Services relating to domestic water supply.
- General Order No. 103 of the California Public Utilities Commission.
- Title 17, Chapter V, Sections 7583 – 7622, California Administrative Code regarding cross-connections and backflow prevention.
- Uniform Fire Code.

In case of conflict between the requirements of these water system standards with the agencies and documents listed above, the District's standards shall govern unless otherwise approved in writing by the District or the District's Consulting Engineer.

2.2 Location of New Facilities

The location of new District facilities is subject to the District's approval of alignment, accessibility and safety of the facilities. All distribution main extensions shall extend to the far property line of the developed property and shall not dead-end unless specifically authorized by the District. Distribution mains shall abut all parcels served.

A public water service shall be installed for each proposed lot in any subdivision or tract. The District shall have final approval of location of water services relative to the property corners

2.3 Water Supply Pressure

Water distribution systems shall be designed so that normal operating pressures are no less than 70 pounds per square inch (psi) and no more than 140 psi where water services connect to the distribution mains. During periods of maximum day plus fire flow demand and/or peak hour demand, the pressure shall not be less than 20 psi within the distribution system.

2.4 Design Flows

Water demand and flow determination shall be based upon the most recent zoning unless growth in the area has experienced trends toward population concentration greater than present zoning allows. If the population trend exceeds present zoning, an estimate shall be made of the probable extent of such concentration and used as the basis for determining the water demand and pipeline flow rate.

2.4.1 Residential Demand

Water demand for residential units shall be determined from maximum potential build out of the tributary area and relative housing equivalent (HE) assignments as outlined in Ordinance 23.

- Average Day: Water use on average day shall be 778 gallons per day (gpd) per HE.
- Maximum Day: Water use on maximum day shall be 1,363 gpd per HE, based on a peaking factor of 1.75.
- Peak Hour: Water use on maximum hour will be 1,674 gpd per HE, based on a peaking factor of 2.15.

2.4.2 Non-Residential Demands

Design flows for non-residential uses shall be determined based upon the fixture unit demand for the facility, in accordance with the Uniform Plumbing Code requirements.

2.4.3 Fire Flow Demands

Required fire flows shall be determined by the Uniform Fire Code and the Twain Harte Fire Department. The minimum fire flow for single-family residential water systems is 1,500 gpm. Design shall assume fire flow demands to occur during maximum day flow conditions.

2.5 Distribution Mains

2.5.1 Size

Distribution mains shall be sized so that the minimum pressure requirements are met and maximum velocities do not exceed 5 feet per second (fps) for the maximum day scenario, and 10 feet per second for maximum day plus fire flow and peak hour flow scenarios. Distribution mains shall be a minimum of 6-inch in diameter. A new water distribution main shall not be connected to an upstream pipeline of smaller diameter.

The District may require the Applicant to perform hydraulic analyses to verify distribution main size. The Hazen-Williams formula shall be used in the analyses, using "C" value of 130.

The District may require that distribution mains be oversized to provide adequate flow capacity for future development.

2.5.2 Location

Location Relative to Sewer Line – Water distribution mains shall be designed to maintain a minimum 10-foot horizontal clearance between water and sewer mains. Water lines shall cross over sewer lines, with a minimum of one foot of clearance, as required by the California Department of Health Services. Every attempt should be made to keep the bottom of the water main at a higher elevation than the sewer main.

Construction in Paved Street – Water distribution mains and laterals constructed in asphalt concrete paved streets will require trench patching or overlay as required by the Siskiyou County Public Works Department or property owner, as applicable. New water mains shall be placed on the north side of the street for east to west running streets and west side of the street for streets running north to south where ever possible. The new water centerline shall be about 6 or 12 feet off the street centerline, outside vehicle tire wheel path to minimize trench settlement problems. In addition, this location will provide space for a sewer main in the streets.

Dead-End Alignments – Water distribution mains shall be looped wherever possible. Dead-end pipelines shall not be constructed except in cul-de-sacs, dead-end roadways or other situations where the District determines that the pipeline may terminate and remote service shall be provided. Dead-end pipelines shall be designed with fire hydrants located at the dead-end.

Minimum Cover – Water distribution mains shall be constructed with a minimum of 36-inches of cover.

2.6 Pipeline Appurtenances

2.6.1 Isolation Valves

A sufficient number of valves shall be provided to permit isolation of distribution main segments not more than 1,000 feet in length. Two (2) valves shall be installed at pipe tees and three (3) valves at pipe crosses.

2.6.2 Thrust Blocks and Restraints

Thrust blocks shall be provided at all pipeline fittings. The District may require restrained joints (in addition to thrust blocks) at critical locations.

2.6.3 Fire Hydrants

Fire hydrants shall be so located so that each residential lot is within 500 feet of a hydrant or each commercial building is within 300 feet of a hydrant. A fire hydrant shall also be located at the end of a dead-end pipeline. The setback of hydrants shall be determined by the District upon plan review. Hydrants shall be supplied by pipelines no less than 6-inch in diameter.

Note that in the design of the water system, a maximum delivery of 1,500 gpm may be assumed for any single hydrant of a type conforming to current District Standard Specifications and Details. Delivery of more than 1500 gpm must be accomplished with more than one hydrant.

2.6.4 Pipeline Low Points

A blow off hydrant or a fire hydrant shall be located at each low point of the distribution mains. Temporary blow offs may be used, subject to District approval, where the distribution main will be extended by the Applicant with the agreement period.

2.6.5 Pipeline High Points

An air/vacuum release valve shall be located at each high point in the distribution mains. If the distribution main is within a roadway, air release valve piping shall be piped off to the side of the roadway above the pipeline.

2.6.6 Sampling Stations

Depending on the size and location of the Applicant's proposed development, the Applicant may be required to provide one or more sampling stations. The location of sampling stations will be determined by the District on a case-by-case basis as part of the design review process.

2.6.7 Protective Bollards

Bollards are required adjacent to all above-ground backflow prevention devices and fire hydrants; removable bollards shall be provided as required by the District.

2.7 Water Services

Water services shall include the service pipe line, angle meter stop, meter box, but not the meter. Single or double meter boxes are allowed. The connection of the private water service into the public water service shall be made at the meter box.

2.7.1 Minimum Service Size

The size of the private water services shall be subject to the approval of the District. Under normal conditions the diameter shall be not less than three-quarter (3/4) inch unless approved by the District. For multifamily or commercial buildings the size will be based on a determination by the District after its analysis.

2.7.2 Customer Valves

An acceptable water shutoff valve and pressure regulating valve shall be installed on each private water service in a location acceptable to the District. Backflow prevention valves shall be installed on private water services if required by the District pursuant to the District Backflow and Cross Connection Ordinance. The property owner shall maintain valves on private water services.

2.8 New Pump Stations and Storage Tanks

When the estimated water delivery pressure to a newly proposed development project is less than 40 psi, the Applicant shall be required to provide, at the Applicant's expense and as determined necessary by the District, water pump station(s), water storage tank(s) and/or such other facilities to maintain adequate pressure and flow under high demand conditions. The District may require that these facilities include SCADA (Supervisory Control and Data Acquisition) systems. The district will either provide design or design oversight for pump stations and storage facilities.

Pump stations and storage tanks must be installed at locations predetermined by the District that represents the logical point of distribution that would serve the entire pressure zone. Site dimensions shall be sized to accommodate the ultimate reasonable development of the pressure zone in which the connection is located.

Pump stations shall be constructed to the minimum District pump station requirements or to the capacity needed to serve the ultimate reasonable development of the pressure zone in which the connections are located, whichever is greater. Minimum requirements shall include, but not be limited to, duplex pumps, backup power supply, and a building housing the control system.

To cover the increased cost for operation and maintenance of a pressurized system, an increased water rate or fee may apply to all customers within the pressure zone served by such pressurized system.

Section 3: Materials

3.1 Earthwork

3.1.1 Sand

Caltrans Standard Specifications, Paragraph 19-3.025B

3.1.2 Crushed Rock

Angular crushed rock, $\frac{3}{4}$ -inch maximum, per ASTM D 448, size no. 67. The grading requirements are as follows:

Sieve Size	Percent Passing
1"	100%
$\frac{3}{4}$ "	90% - 100%
$\frac{3}{8}$ "	20% - 55%
No. 4	0% - 10%
No. 8	0% - 5%

3.1.3 Aggregate Base

Caltrans Standard Specifications for Class 2, $\frac{3}{4}$ -inch maximum aggregate base (Caltrans Paragraph 26-1.02A).

3.1.4 Suitable Native Material

Suitable native material shall be excavated soil processed such that 100% is less than 3-inches in greatest dimension, and free from organic material. Suitable native material shall be capable of meeting a compaction and R-value as shown on the Standard Details. If an adequate quantity of suitable native material cannot be processed that meets the compaction and R-value requirements as specified, import materials shall replace these materials at no cost to the District.

3.1.5 Import Backfill

Imported non-expansive soil with liquid limit no greater than 40% and a plasticity index no greater than 15%, free from clods or rocks larger than 2 inches in greatest dimension, and free from organic material. Import backfill requirement shall be suitable to meet a compaction and R-value as shown on the Standard Details.

3.1.6 Slurry Cement Backfill

Slurry cement backfill shall consist of a fluid, workable mixture of aggregate, Portland cement and water, proportioned either by weight or by volume. Materials shall be machine-mixed in a pugmill, rotary drum or other approved mixer until the cement and water are thoroughly dispersed throughout the material. Slurry cement shall be placed within one hour after mixing. The water content shall be sufficient to produce a fluid, workable mix that will flow and can be pumped without segregation of the aggregate while being placed. Portland cement shall conform to the provisions of Caltrans Standard Specifications 90-2.01, "Portland Cement", except that testing will not be required. Not less than 188 pounds of cement shall be used for each cubic yard of slurry cement backfill produced. Grading of the aggregate shall be as follows:

U.S. Standard Sieve Size	Percentage Passing
1-½ "	100
1"	80-100
¾"	60-100
3/8"	50-100
No. 4	40-80
No. 100	10-40

3.1.7 Landscape Fill

Suitable native backfill free from chemicals, salts, or other materials harmful to plant growth. Material shall be loam type.

3.1.8 Trench Dam Concrete

Class A concrete conforming to the requirements specified in Section 03310.

3.1.9 Filter Fabric

Geotextile nonwoven polypropylene fabric with 5.0 oz. per square yard and 50 mil thickness. Manufacture Phillips Fibers Corp. Supac NP5 or equal.

3.2 Pipe and Fittings

Distribution main pipe material shall be as follows:

- 6-inch diameter (nominal) through 12-inch diameter (nominal):
 - Working pressure 180 psi or less – Polyvinyl chloride (PVC)
 - Working pressure over 180 psi – Ductile iron
- Larger than 12-inch diameter (nominal) – Ductile iron

3.2.1 Ductile Iron Pipelines

3.2.1.1 Pipe and Fittings

Pipe: Ductile iron, AWWA C151. Unless otherwise specified, provide push-on joints and minimum Pressure Class 250.

Fittings: Ductile iron only, AWWA C110 or AWWA C153. Gray cast iron fittings are not acceptable. Fittings shall be furnished by, or under the direct supervision of, the pipe manufacturer. Unless otherwise specified, provide push-on or mechanical joint fittings. Provide flanged joints only if a valve is adjacent to a fitting, or otherwise approved by the District.

Lining (pipe and fittings): Unless otherwise specified, cement mortar lining, AWWA C104, standard thickness, with seal coat.

3.2.1.2 Joint Restraint

- TR FLEX by United States Pipe & Foundry Company; Thrust-Lock by Pacific States Cast Iron Pipe Company; or equal.
- Connect pipe cut in the field, where necessary and when favorably reviewed by the Engineer, by TR FLEX Gripper Ring System by United States Pipe & Foundry Company; or equal.
- Mechanical joints: Restraining gland; EBAA Megalug Series 1100; or equal.

3.2.2 Polyvinyl Chloride (PVC) Pipelines

3.2.2.1 Pipe and Fittings

Pipe: Polyvinyl chloride, AWWA C900. Unless otherwise specified, provide push-on joints and Pressure Class 200.

Fittings: Ductile iron only, AWWA C110 or AWWA C153. Gray cast iron fittings are not acceptable. Fittings shall be furnished by, or under the direct supervision of, the pipe manufacturer. Unless otherwise specified, provide push-on or mechanical joint fittings.

3.2.2.2 Joint Restraint

- Ductile iron harness with ductile iron or cor-ten rods and bolts. Pressure rating of at least 150 psi. Series 1500 by EBBA Iron; equivalent by Uni-Flange; or equal for bell and spigot joints.
- Series 2000 by EBBA Iron; equivalent by Uni-Flange; or equal for restrained glands for mechanical joints.
- Restrained joint PVC couplings and mechanical gland adapters. Certa-Lok C900-RJ by CertainTeed; or equal.

3.3 Valves

3.3.1 Gate Valves

Resilient wedge, non-rising stem, AWWA C509, fusion bonded epoxy lined and coated, equipped with a 2-inch operating nut; American Flow Control Series 2500.

3.3.2 Butterfly Valves

AWWA C504, with epoxy interior lining and standard black asphalt varnish exterior coating; Pratt Groundhog, Mueller Linesal III or equal.

Valves shall be cast iron body with cast or ductile iron disk. Disk shall have Ni-Chrome or Type 316 stainless steel edge. Shaft shall be stainless steel, connected to the disk with a stainless steel pin or torque plug, and shall be scribed on both ends to indicate valve position. Valve seat shall be Buna-N. Certification shall be provided by the valve manufacturer stating the epoxy lining is Holiday free.

3.3.3 Fire Hydrant Components

5¼-inch dry barrel type, AWWA C502; American Darling B-62-B. Fire hydrants shall be painted with two coats safety yellow.

3.3.4 Air/Vacuum Release Valves

Combination air release valve; APCO Model 145C, equivalent by ValMatic, or equal. Air/vacuum valves shall be insulated.

3.3.5 Reduced Pressure Principle Backflow Preventers

Cla-Val Model RP-4, equivalent by Febco, Watts, or equal.

3.4 Appurtenances

3.4.1 Water Service Components

As shown in the Standard Details.

3.4.2 Warning Tape

2-inch-wide, detectable, inert, fade-resistant plastic film resistant to acids, alkalis, and other components likely to be encountered in soil. Tape shall be blue, imprinted with "CAUTION WATER MAIN BELOW"; Griffolyn Terra Tape; or equal.

3.4.3 Locating Wire

Provide #10 AWG, single-strand, soft drawn copper wire with 1/16-inch PVC insulation.

3.4.4 Copper Tubing

Copper tubing shall be seamless, annealed copper tube and shall conform to ASTM B88, Type K. Copper shall be grade UNS-C 122200. For diameters ranging from ¼" to 1", use Type K Roll Soft Copper. For diameters ranging from 1.25" to 2", use Type K Soft 20' Sticks. Tubing manufacturers includes: Cambridge-Lee, Mueller Streamline, or equal.

3.4.5 Valve Boxes

Valve boxes in street and other traffic areas shall be designed to H20 loading conditions. Valve boxes shall be precast concrete boxes with cast iron lids and shall be as manufactured by Christy, Brooks, or equal. Valve boxes shall be equipped with riser pipes securely installed directly over the center of the valve-operating nut.

3.4.6 Snow Poles

Snow poles shall be orange-colored, 0.375" X 1.25" composite fiberglass snow poles with high flexural strength and ultraviolet light resistance; Glasforms, Inc. (San Jose, CA) or equal.

3.4.7 Nuts and Bolts

Unless specified elsewhere in the Standard Specifications or Standard Details:

- Standard nuts and bolts that are included with fabricated pipeline fittings and appurtenances are generally acceptable; stainless steel nuts and bolts are not required.
- Steel bolts shall meet or exceed the requirements of ASTM A307 or ASTM F568; steel nuts shall meet or exceed the requirements of ASTM A563 or ASTM F563M..
- Iron bolts and nuts shall meet or exceed the requirements of ASTM A536, grade 65-45-12.

Section 4: Construction Standards

4.1 General

All work shall be performed in strict accordance with applicable law, including local ordinances, applicable OSHA, CALOSHA, California Civil Code, and California Department of Industrial Safety requirements. During construction, work shall be adequately guarded with barricades or lights so as to protect the public from hazards.

If available, the District will provide water to the Applicant for construction and cleaning; the Applicant shall rent a hydrant meter and pay for said water in accordance with District Policy 1060. The Applicant will be responsible for providing proper valves and backflow prevention devices at location(s) designated by the District.

4.1.1 Field Staking

If requested by the District, proposed facilities shall be field staked, for review by the District, prior to installation.

4.1.2 Repair of Damage

Any damage to the public water system shall be repaired to the satisfaction of the District, at the cost of the applicant. Streets, sidewalks, parkways and other property disturbed in the course of the work shall be restored to their prior condition.

4.1.3 Inspection

All work performed during the water main installation shall be subject to inspection by the District. The Applicant shall provide the District at least 72 hours notice prior to beginning any portion of work requiring inspection. The Applicant shall provide, at no cost to the District, access to the work for inspection, including but not limited to removal of temporary plating or backfill, and re-excavation. The Applicant shall not proceed with any subsequent phase of work until the previous phase has been inspected and approved by the District. Inspection and approval by the District shall be obtained during and/or at the completion of the following portions of work, as determined by the District:

- Trench excavation and pipe bedding installation.
- Placing pipe, fittings and structures, including identification tape on all water main and service lines.
- Placing of all restraints.
- Placing and compacting the pipe zone backfill.
- Backfilling balance of trench to grade. Copies of compaction test results shall be given to the District by the Applicant before final acceptance of the work.
- Hydrostatic testing of all mains and services.

- Disinfecting and flushing of pipelines.

Improvements installed without proper inspection shall be exposed and inspected as required by the District Inspector. Cost associated with such inspections will be the responsibility of the Applicant.

4.2 Earthwork

All distribution mains, public water services and other public facilities shall be installed by open trench construction unless otherwise approved by the District. Due to local soil conditions, trenchless construction methods are not generally successful.

Compaction by jetting methods is not allowed.

4.2.1 Excavation

Trenches shall be in a reasonably dry condition when pipe is laid. Dewatering, if necessary, shall commence when groundwater is first encountered and shall be continuous until the excavation is backfilled. Dewatering shall take place in a way that will prevent contamination by trench water. Applicant shall obtain any required permit for discharge of water to the sewer or storm drain as required by the County of Siskiyou and the Regional Water Quality Control Board. All water taken from the system shall be de-chlorinated prior to discharge to the storm drain system.

During inclement weather, trenches shall be excavated only as far as pipe can be laid and backfilled during the course of the day.

Where rocky, unyielding, or unsuitable foundation material is encountered, the subgrade shall be excavated a minimum of 12 inches below the pipe and the trench width shall be increased a minimum of 12 inches. The over-excavation shall be replaced with imported material.

Where the trench bottom is soft, yielding or unstable, the trench bottom shall be over-excavated. Three-quarter inch crushed rock shall be placed in the trench to provide a stable foundation. The rock is in addition to the required pipe bedding used in the pipe zone.

4.2.2 Bedding

Bedding shall provide uniform and continuous support along the barrel of the pipe. Bell holes shall be excavated per manufacturer's recommendations. The minimum depth of bedding material shall be provided under the bell. Care shall be taken to ensure that the bell hole is no larger than necessary to accomplish proper joint assembly. Blocking of the pipe is not permitted.

4.2.3 Backfill

No backfill shall be placed until the work has been inspected and approved by the District.

All trench backfill shall be mechanically compacted native soil, mechanically compacted imported fill, mechanically compacted aggregate base, or slurry material, as required by these Standard Specifications, the Standard Details, and by the County of Siskiyou.

Moisture content shall be controlled to obtain the optimum density for the native soil type encountered. All compaction testing shall conform to ASTM D1557-78 test methods. The quantity and location of compaction tests shall be determined by the District. Trench backfill compaction shall be tested and certified by the Applicant's licensed Geotechnical Engineer. Certification shall be provided to the District representative prior to the construction of surface improvements.

Compaction equipment shall be of a size and type satisfactory to the District. Impact-type pavement breakers or compactors (hydrahammers) shall not be used within 5 feet from the top of any type pipe. Material for mechanically compacted backfill shall be placed in horizontal lifts which, prior to compaction, shall not exceed eight (8) inches; this depth may be exceeded only upon recommendation of a licensed Geotechnical Engineer. The Applicant shall be responsible for verifying compaction requirements in each lift.

Slurry cement backfill shall be placed in accordance with Caltrans Standard Specifications Section 19-3.062.

Excess material and materials determined unsuitable for backfill by the District shall be removed from the project site.

4.3 Installation

Water facilities shall be installed in accordance with the requirements of applicable American Water Works Association (AWWA) standards, these Construction Standards and as recommended by the manufacture. The manufacture's guidelines shall be present at the construction site at all times.

Materials showing signs of physical damage or excessive ultraviolet exposure will be rejected and shall be immediately removed from the job site.

Facilities subject to freezing, including but not limited to above-ground backflow prevention assemblies, shall be protected from freezing by a heated enclosure, insulation using heat tape, or other suitable means acceptable to the District.

4.3.1 Pipelines

Care shall be taken when lowering pipe into the trench to protect the pipe from damage. Chains are not permitted. The pipe shall be laid carefully to the lines and grades shown without grade breaks, unless designed with such, or to minimum depths shown on the approved plans. If field

conditions exist such that the pipe may not be laid to the specified grade, the approved plans will require revisions prior to proceeding with construction.

Extreme care shall be taken when consolidating the backfill around the pipe zone. For pipe 12 inches in diameter and smaller, no more than one-half of the pipe shall be covered prior to shovel slicing the haunches of the pipe. For pipe greater than 12 inches in diameter, no more than the lesser of 6 inches or one-third of the pipe shall be covered prior to shovel slicing. Sufficient care shall be taken to prevent movement of the pipe during shovel slicing. Shovel slicing shall be witnessed by the District inspector prior to shading the pipe.

Valve riser and box shall be installed true and plumb over the valve to allow unrestricted valve operation from the surface. Valve box and riser shall be cleaned of any rocks, gravel, dirt or other materials possibly obstructing the valve operation.

4.3.2 Polyethylene Encasement

All underground metal (ductile iron, steel, copper, brass, etc.) shall be wrapped in 10 mils minimum thickness polyethylene encasement. Ductile iron pipe and fittings shall be polyethylene encased in accordance with AWWA C105. At the direction of the District, the Applicant shall repair damages to the polyethylene encasement as described within AWWA C-105 or shall replace all damaged polyethylene film sections.

4.3.3 Locating Wire and Warning Tape

A continuous locating wire shall be attached to mains, service lines and appurtenances as shown in the Standard Details and the following:

- Locating wire shall be continuous between main line valve boxes and fire hydrants.
- Locating wires through valve boxes shall be placed outside of riser, but inside the box.
- Locating wire in manholes and vaults shall be attached inside the facility within one foot of the rim.
- Splices in the locating wire shall be kept to a minimum, and shall be made with splicing devices approved by the District.

Warning tape shall be placed in all mainline trenches, on top of the trench "bedding zone" as shown in the Standard Details.

4.3.4 Water Services

Water services shall be installed in accordance with manufacturer's recommendations, the Standard Details and the following provisions:

- Service laterals shall be continuous from the distribution main to the service box.
- Taps, service saddles and fittings attached to distribution mains shall be separated by a minimum of 24 inches.

- Service saddles shall be wrapped in 10-mils minimum thickness polyethylene taped securely to the pipe.

4.4 Hydrostatic Testing

Applicant shall hydrostatically test all new pipelines in accordance with AWWA C600, Section 5.2. Leakage is defined as the quantity of water that must be added to the section of pipeline being tested to maintain the required test pressure for the test duration. Maximum allowable leakage shall be as specified in AWWA C600.

The District inspector will be present during the duration of the test. Applicant shall verify with the District inspector that all system valves are open prior to testing.

4.5 Disinfection

Applicant shall disinfect all water mains and interconnected piping after testing and before being placed into service to ensure their bacteriological safety. Disinfection shall be accomplished under the supervision of the Applicant by a person skilled and experienced in the operation of water systems. Following disinfection and flushing, the District will take water samples for bacteriological analysis of the water. If the specified bacteriological requirements are not satisfied, the disinfection procedure must be repeated until the requirements are met.

4.5.1 Distribution Mains

Distribution mains and other piping 3 inches in diameter and larger shall be disinfected in accordance with AWWA C651 as amended below:

- Forms of Chlorine: Sodium hypochlorite or calcium hypochlorite.
- Method: Continuous-Feed.

4.5.2 Small Pipelines

Pipelines less than 3 inches in diameter shall be disinfected as follows:

Preparation: Provide the system with a 1-inch minimum service cock or valve or other means to inject chlorine solution at a point within 2 or 3 feet of its junction with the supply source. When system is complete, thoroughly flush it by fully opening every outlet until clear water flows from all of them.

Disinfecting Agent: Sodium hypochlorite or calcium hypochlorite in sufficient quantities to produce chlorine concentration of at least 50 parts per million in the system.

Disinfecting Procedure:

- Connect a hand-operated pump, or other means of injecting the disinfecting agent, to 1-inch minimum service cock or valve or other injection device. Pump must provide a pressure greater than that of the supply system.

- With system completely full of water and supply valve open, proceed to adjust every outlet of system so that a trickle of water flows from each.
- Inject disinfectant slowly and continuously at an even rate, not in slugs, until a test at each outlet shows a free chlorine residual concentration of at least 50 parts per million.
- Close all outlets and valves, including valve connecting to supply line and 1-inch minimum service cock on solution injection connection. Maintain condition for 24 hours. After 24 hours test for residual chlorine at each outlet. The free residual chlorine concentration indicated should be not less than 10 ppm. If the indicated free chlorine concentration is less than 10 ppm, the disinfection procedure must be repeated until an approved result is obtained.

When the above procedure has been completed to the satisfaction of the Engineer, flush out entire system with fresh water until tests at all outlets show a residual of not more than 0.5 ppm.

4.5.3 Chlorine Residual Testing

Chlorine residual shall be tested in accordance with AWWA C651, Appendix A, DPD Drop Dilution Method.

4.5.4 Bacteriological Analyses of Water

After the completion of disinfecting procedure and final flushing, the District will obtain water samples for bacteriological analyses. Requirements for satisfactory disinfection of water supply are that bacteriological analyses (Heterotrophic plate count) indicate that water samples are negative for coliformnerogenes organisms, and that total plate count is less than 100 bacteria per cubic centimeter. If bacteriological analyses do not satisfy the above requirements, then disinfection procedure must be repeated until these requirements are met.

4.5.5 Disposal of Disinfection Solution

Dechlorinate and dispose of disinfection solution in accordance with applicable regulations. Take care to assure that chlorinated water is not spilled in drains.

4.6 Connection to Existing Facilities

Connection to existing District water facilities shall be made only upon approval of the District. Tie-ins may take place only after the newly constructed water system has successfully passed hydrostatic testing and bacteriological testing and has been approved for service by the District. Under no circumstances shall anyone other than a representative of the District open or close valves in a District operated system.

The Applicant shall tie-in new facilities to existing facilities:

- Care shall be taken to provide a clean, sanitary tie-in site.
- All tie-ins shall take place in the presence of the District inspector.
- Disinfection shall be in accordance with AWWA C651, Section 4.7

Section 5: Standard Details

The following is a list of Water Standard Details included in this section:

W-1	General Notes
W-2	Pipe Bedding
W-3	Concrete Encasement
W-4	Trench Zone Asphalt Paved Surface
W-5	Trench Zone Open Areas
W-6	Trench Dam
W-7	Carrier & Casing Pipes
W-8	Thrust Block Detail
W-9	Locating Wire Typical Layout
W-10	Tie-In Connections to Existing Facilities
W-11	Typical Gate Valve & Box Installation
W-12	Fire Hydrant Assembly
W-13	4" Diameter Steel Bollard – Removable
W-14	4" Diameter Steel Bollard
W-15	Blow Off Hydrant Assembly
W-16	2 Inch Temporary Blow Off Assembly
W-17	1 Inch & 2 Inch Air Release Valve Assembly
W-18	Water Quality Sampling Station
W-19	Water Service

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WATER SYSTEM GENERAL NOTES

NOTES:

1. APPLICANT SHALL NOT OPERATE EXISTING DISTRICT VALVES. ONLY DISTRICT STAFF SHALL CONDUCT PLANNED WATER SYSTEM SHUTDOWNS.
2. APPLICANT SHALL PROVIDE A MINIMUM OF 48 HOURS ADVANCE NOTICE OF A PLANNED WATER SHUTDOWN AND IS RESPONSIBLE TO REQUEST THE VALVE BE REOPENED FOLLOWING THE WORK.
3. PROVIDE THRUST RESTRAINT AT ALL BENDS, TEES, AND ENDS FOR BURIED PRESSURE PIPE.
4. APPLICANT SHALL LOCATE AND STAKE ALL PROPERTY CORNERS WHERE WATER SERVICES ARE TO BE INSTALLED.
5. APPLICANT SHALL PROVIDE ALL TESTING AND PAY FOR ALL DISTRICT INSPECTION COSTS.
6. EXISTING WATER AND SEWER LINES AND FACILITIES LOCATIONS PROVIDED BY THE DISTRICT ARE APPROXIMATE. APPLICANT IS RESPONSIBLE FOR DETERMINING THE EXACT FIELD LOCATIONS AND MAINTAINING THE FOLLOWING SEPARATIONS BETWEEN UTILITIES.
 - a. MINIMUM VERTICAL CLEARANCE BETWEEN A PRIVATE SEWER SERVICE AND A PRIVATE WATER SERVICE SHALL BE 12 INCHES AND THE WATER SERVICE SHALL BE ABOVE THE SEWER SERVICE.
 - b. MINIMUM VERTICAL CLEARANCE BETWEEN ALL NON-SEWER UTILITY CROSSINGS SHALL BE 12 INCHES.
 - c. MINIMUM HORIZONTAL CLEARANCE BETWEEN SANITARY AND STORM SEWER PIPELINES AND DISTRICT WATER LINES SHALL BE 10 FEET.
 - d. MINIMUM HORIZONTAL CLEARANCE SHALL BE 24 INCHES BETWEEN ALL NON-SEWER UTILITIES AND WATER.
 - e. MINIMUM COVER OVER WATER MAINS SHALL BE 36-INCHES UNLESS OTHERWISE DIRECTED BY THE DISTRICT.
7. WATER PIPELINES SHALL BE INSTALLED ON UNIFORM GRADES TO MINIMIZE HIGH SPOTS AND LOW SPOTS IN THE PIPE. THE DISTRICT MAY REQUIRE ADDITIONAL BURIAL DEPTH TO REDUCE THE USE OF AIR RELEASE VALVES AND BLOW-OFF ASSEMBLIES.
8. THE APPLICANT IS RESPONSIBLE FOR ALL TRAFFIC CONTROL. TRAFFIC CONTROL AND PAVEMENT CUTTING AND RESTORATION ARE UNDER THE JURISDICTION OF TUOLUMNE COUNTY.
9. THE APPLICANT SHALL NOTIFY UNDERGROUND SERVICES ALERT (USA) A MINIMUM OF 48 HOURS PRIOR TO START OF ANY EXCAVATION.
10. THE APPLICANT SHALL NOTIFY THE FIRE DEPARTMENT A MINIMUM OF 48 HOURS PRIOR TO ANY WATER SYSTEM SHUTDOWN THAT WILL SHUT OFF AN EXISTING FIRE HYDRANT.
11. NO SHUT DOWNS ARE TO BE SCHEDULED ON MONDAYS, WEEKENDS, OR HOLIDAYS.
12. SEE STANDARD SPECIFICATIONS FOR SAMPLING, FLUSHING AND TESTING REQUIREMENTS.

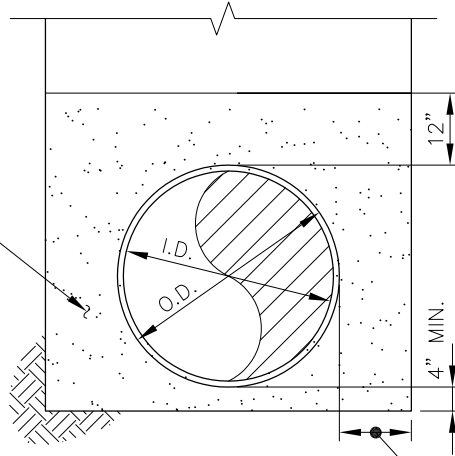


STANDARD DETAILS
NOT FOR CONSTRUCTION

Twain Harte Community Services District 22933 TWAIN HARTE DRIVE P.O. BOX 649 TWAIN HARTE, CA 95383	<h2 style="margin: 0;">GENERAL NOTES</h2>		W-1
	SCALE: NONE	APPROVED BY: SN	
	DATE: NOVEMBER 2006	DRAWN BY: RN	

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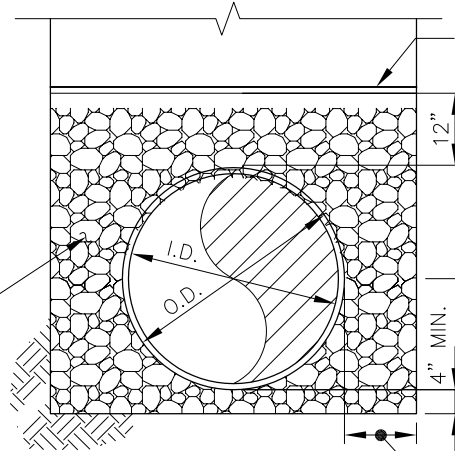
PIPE ZONE
SAND OR AB
COMPACT @ 93%



ALTERNATIVE 1

PIPE O.D. x 0.6
(MIN.) TO 12" MAX.

PIPE ZONE
3/4" CRUSHED ROCK
COMPACT @ 93%



ALTERNATIVE 2

PIPE O.D. x 0.6
(MIN.) TO 12" MAX.

NOTES:

1. SEE STANDARD SPECIFICATIONS FOR BEDDING MATERIAL REQUIREMENTS.
2. A VERTICAL TRENCH MAY NOT BE ABLE TO BE MAINTAINED. CONTRACTOR SHALL USE APPROPRIATE TRENCH SHORING AND OTHER EQUIPMENT TO MINIMIZE TRENCH WIDTH.
3. PROVIDE TRENCH DAMS PER DETAIL W-6 AT LOCATIONS SHOWN ON DRAWING PROFILE.



STANDARD DETAILS
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**Twain Harte Community
Services District**

22933 TWAIN HARTE DRIVE
P.O. BOX 649
TWAIN HARTE, CA 95383

PIPE BEDDING

SCALE: NONE

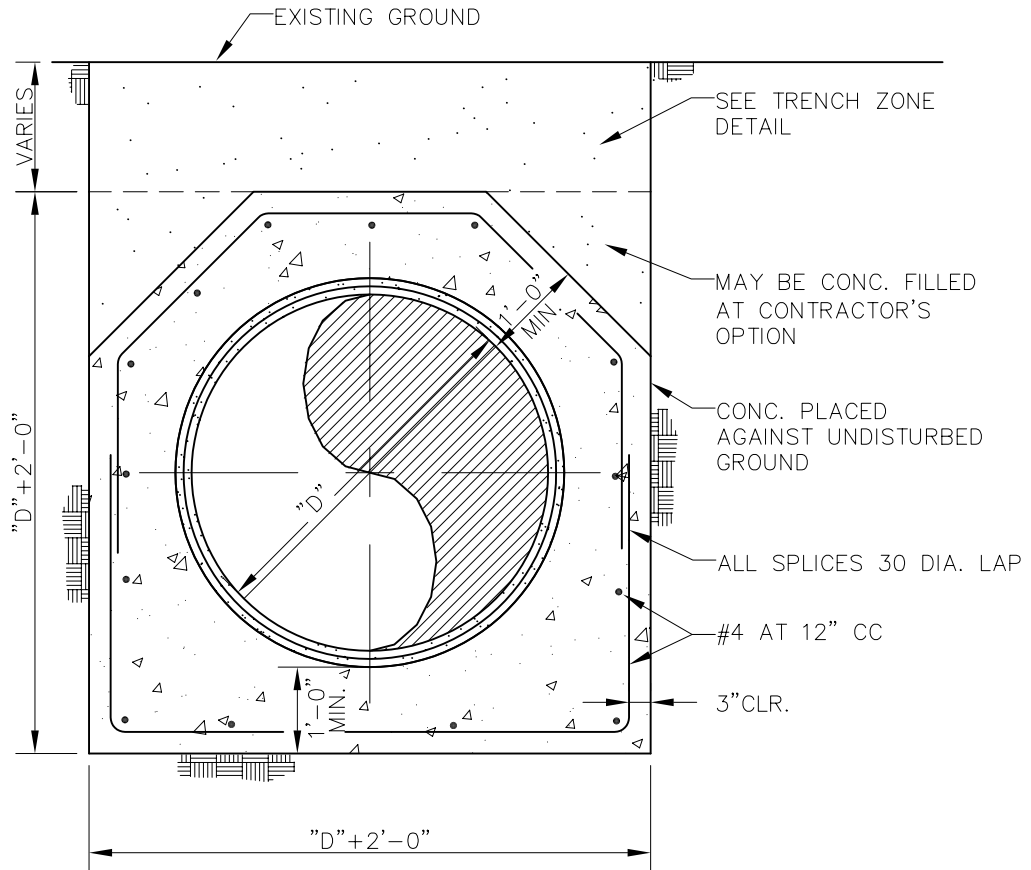
APPROVED BY: SN

DATE: NOVEMBER 2006

DRAWN BY: RN

W-2

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STANDARD DETAILS
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Twain Harte Community Services District

22933 TWAIN HARTE DRIVE
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TWAIN HARTE, CA 95383

CONCRETE ENCASEMENT

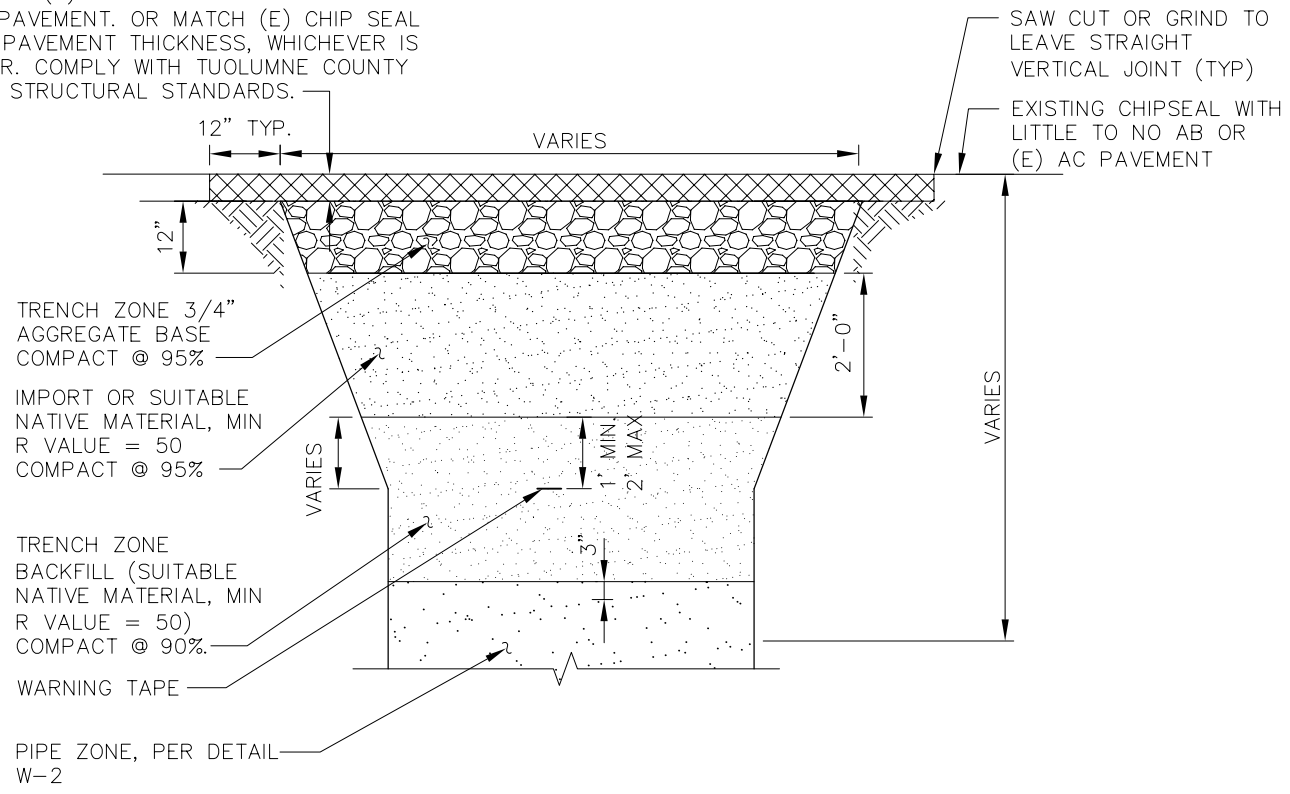
SCALE: NONE APPROVED BY: SN

DATE: NOVEMBER 2006 DRAWN BY: RN

W-3

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FOR (E) GRAVEL ROAD PROVIDE 6" THICK, 3/4" CRUSHED ROCK. FOR (E) CHIP SEAL PAVED OR (E) AC PAVED ROAD PROVIDE MIN. 3" AC PAVEMENT. OR MATCH (E) CHIP SEAL OR AC PAVEMENT THICKNESS, WHICHEVER IS GREATER. COMPLY WITH TUOLUMNE COUNTY STREET STRUCTURAL STANDARDS.



NOTE:

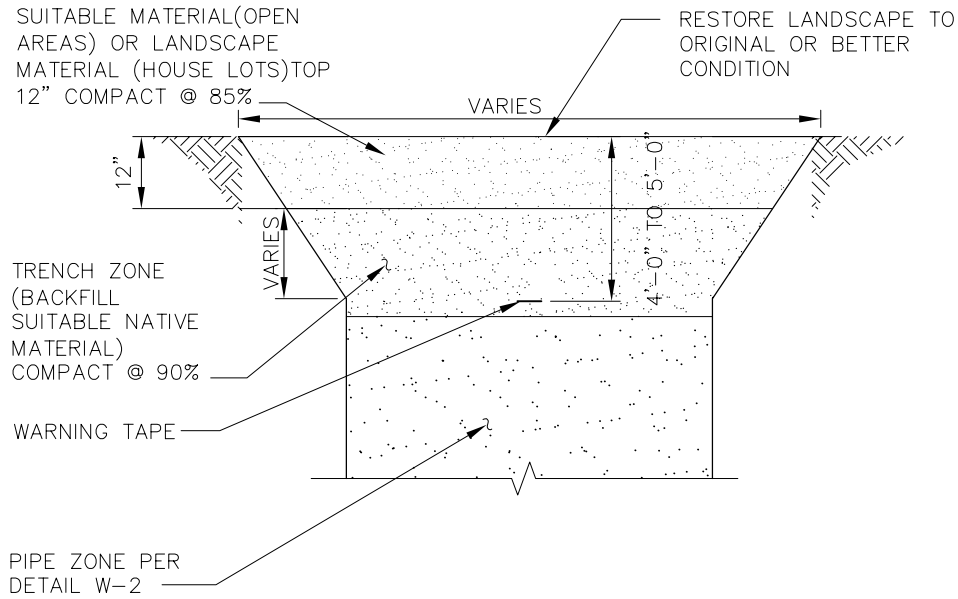
1. SEE STANDARD SPECIFICATIONS FOR BACKFILL MATERIAL REQUIREMENTS.
2. A VERTICAL TRENCH MAY NOT BE ABLE TO BE MAINTAINED. CONTRACTOR SHALL USE APPROPRIATE TRENCH SHORING AND OTHER EQUIPMENT TO MINIMIZE TRENCH WIDTH.
3. WORK IN COUNTY ROADS SHALL COMPLY WITH TUOLUMNE COUNTY STANDARDS, WHICH MAY REQUIRE SLURRY CEMENT BACKFILL.



STANDARD DETAILS
NOT FOR CONSTRUCTION

Twain Harte Community Services District 22933 TWAIN HARTE DRIVE P.O. BOX 649 TWAIN HARTE, CA 95383	TRENCH ZONE ASPHALT PAVED SURFACE		W-4
	SCALE: NONE DATE: NOVEMBER 2006	APPROVED BY: SN DRAWN BY: RN	

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NOTE:

1. SEE STANDARD SPECIFICATION FOR BACKFILL MATERIAL REQUIREMENTS.
2. A VERTICAL TRENCH MAY NOT BE ABLE TO BE MAINTAINED. CONTRACTOR SHALL USE APPROPRIATE TRENCH SHORING AND OTHER EQUIPMENT TO MINIMIZE TRENCH WIDTH.



STANDARD DETAILS
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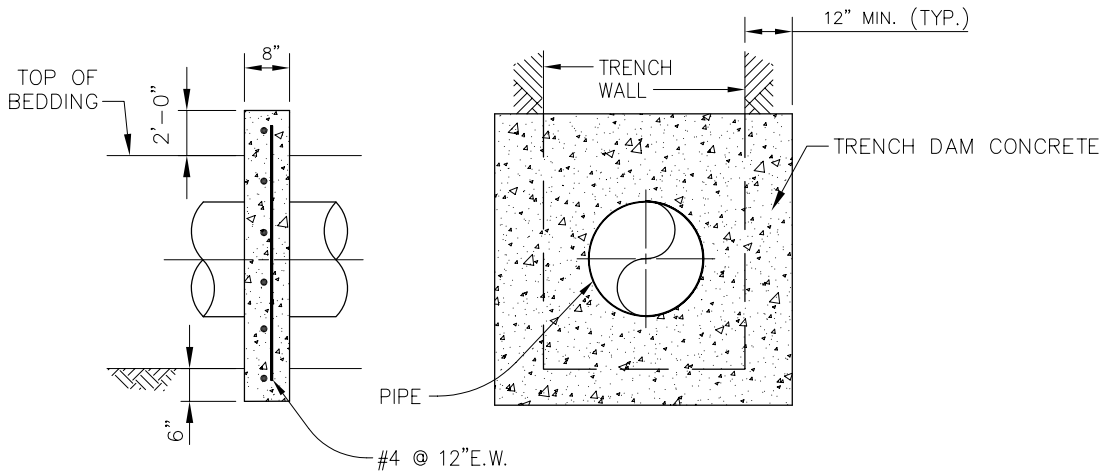
Twain Harte Community Services District

22933 TWAIN HARTE DRIVE
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TWAIN HARTE, CA 95383

TRENCH ZONE OPEN AREAS

SCALE: NONE	APPROVED BY: SN
DATE: NOVEMBER 2006	DRAWN BY: RN

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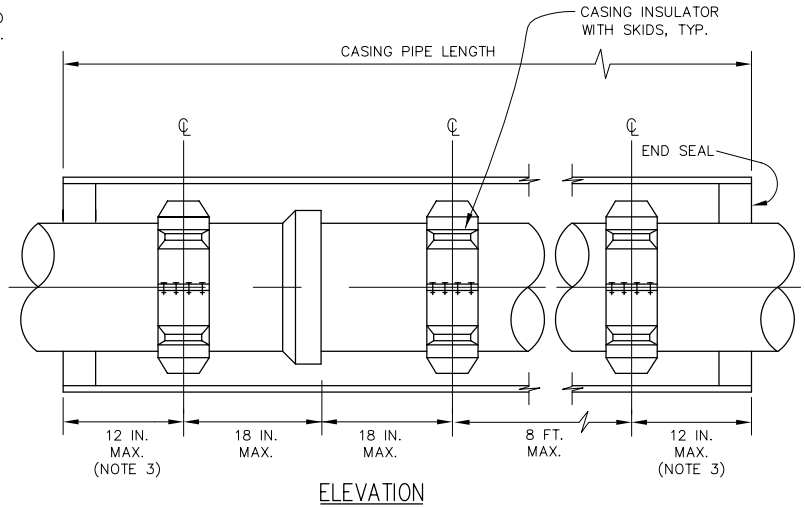
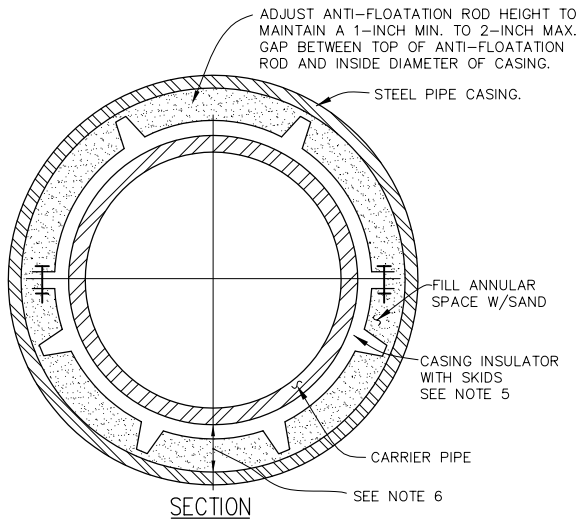
NOTE:

1. TRENCH DAMS ARE ONLY REQUIRED IF PIPE BEDDING ALTERNATIVE 2 IS USED. PROVIDE TRENCH DAMS AS SHOWN ON DRAWING PROFILES FOR PIPES WITH SLOPES GREATER THAN 4%.
2. TRENCH DAMS SHALL BE KEYED INTO UNDISTURBED SOIL 12" MIN. BEYOND TRENCH WALLS & 6" BELOW TRENCH BOTTOM.



STANDARD DETAILS
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Twain Harte Community Services District		TRENCH DAM	
22933 TWAIN HARTE DRIVE P.O. BOX 649 TWAIN HARTE, CA 95383		SCALE: NONE	APPROVED BY: SN
		DATE: NOVEMBER 2006	DRAWN BY: RN
			W-6



CASING NOTES:

1. SLOPE OR SHORE EXCAVATION WALL AS REQUIRED FOR SAFETY.
2. CARRIER PIPE SHALL BE TESTED BEFORE INSTALLATION OF END SEAL.
3. CASING INSULATORS WITH SKIDS SHALL BE INSTALLED WITHIN 12 INCHES OF EACH END OF STEEL CASING.
4. CASING INSULATORS SHALL BE SO BOLTED AROUND THE PIPE THAT THE SKIDS ARE LOCATED SYMMETRICALLY ABOUT THE VERTICAL AXIS OF THE PIPE.

5. CASING INSULATOR SHALL BE ANTI FLOTATION TYPE WITH 12 INCH WIDE BAND AS MANUFACTURED BY CALPICO MODEL M, PSI OR EQUAL.
6. CLEARANCE HEIGHT BETWEEN CARRIER PIPE O.D. AND BOTTOM OF CASING INSIDE WALL SHALL BE 3 INCHES.

CARRIER AND CASING PIPES DETAIL

N.T.S.



STANDARD DETAILS
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**Twain Harte Community
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CARRIER & CASING PIPES

SCALE: NONE

APPROVED BY: SN

DATE: NOVEMBER 2006

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W-7

Twain Harte Community Services District

22933 TWAIN HARTE DRIVE
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TWAIN HARTE, CA 95383

THRUST BLOCK DETAIL

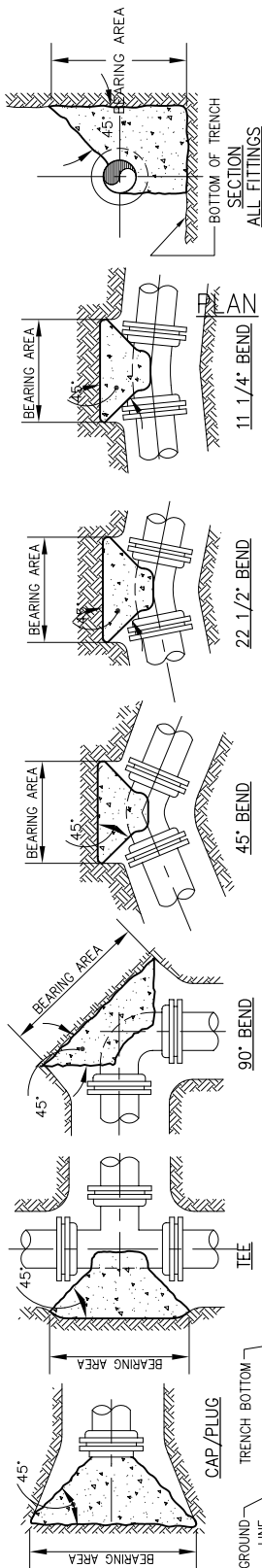
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APPROVED BY: SN

DATE: NOVEMBER 2006

DRAWN BY: RN

W-8



PIPE SIZE nominal	TEE / CAP OR PLUG		90 Degree BEND		45 Degree BEND		22.5 Degree BEND		11.25 Degree BEND			
	200	225	250	200	225	250	200	225	250	200	225	250
4	1.8	2.0	2.3	2.6	2.9	3.2	1.4	1.6	1.7	0.7	0.8	0.9
6	3.7	4.2	4.7	5.3	5.9	6.6	2.9	3.2	3.6	1.5	1.6	1.8
8	6.4	7.2	8.0	9.1	10.2	11.4	4.9	5.5	6.2	2.5	2.8	3.1
12	13.7	15.4	17.1	19.4	21.8	24.2	10.5	11.8	13.1	5.3	6.0	6.7
16	17.40	23.8	26.8	29.7	33.6	37.8	18.2	20.5	22.7	9.3	10.4	11.6
18	19.50	29.9	33.6	42.2	47.5	52.8	22.9	25.7	28.6	11.7	13.1	14.6
24	25.80	52.3	58.8	73.9	83.2	92.4	40.0	45.0	50.0	20.4	22.9	25.5

THRUST BLOCK REQUIREMENTS
BEARING AREA REQUIRED IN SQUARE FEET

- NOTES:
- ALL CONCRETE BLOCKING SHALL BE POURED AGAINST DRY, UNDISTURBED SUBGRADE. TABLE IS BASED ON 2000 POUNDS PER SQUARE FOOT ALLOWABLE SOIL BEARING. WEAKER SOIL WILL REQUIRE INCREASED BEARING AREA. SEE SOIL BEARING LOAD CHART.
 - KEEP CONCRETE CLEAR OF JOINTS AND ACCESSORIES. USE FORMING AS NECESSARY.
 - HORIZONTAL ANCHOR BLOCKING CONFIGURATIONS FOR FITTINGS NOT SHOWN SHALL HAVE PRIOR APPROVAL.
 - THE SQUARE FOOT AREAS REQUIRED FOR BEARING ARE CALCULATED BY THE FOLLOWING FORMULAS:

$$T = 2PA$$

$$T/K = BEARING AREA REQUIRED IN SQUARE FEET$$
 WHERE:
 T=THRUST IN POUNDS
 P=TEST PRESSURE IN PSI
 A=CROSS-SECTIONAL AREA OF PIPE IN SQUARE INCHES
 K=ASSUMED 2000 PSF SOIL BEARING PRESSURE
 - WRAP FITTINGS WITH 10 MIL POLYETHYLENE PRIOR TO BLOCK POUR.
 - FOR REDUCER USE 7 SF THRUST BLOCK.

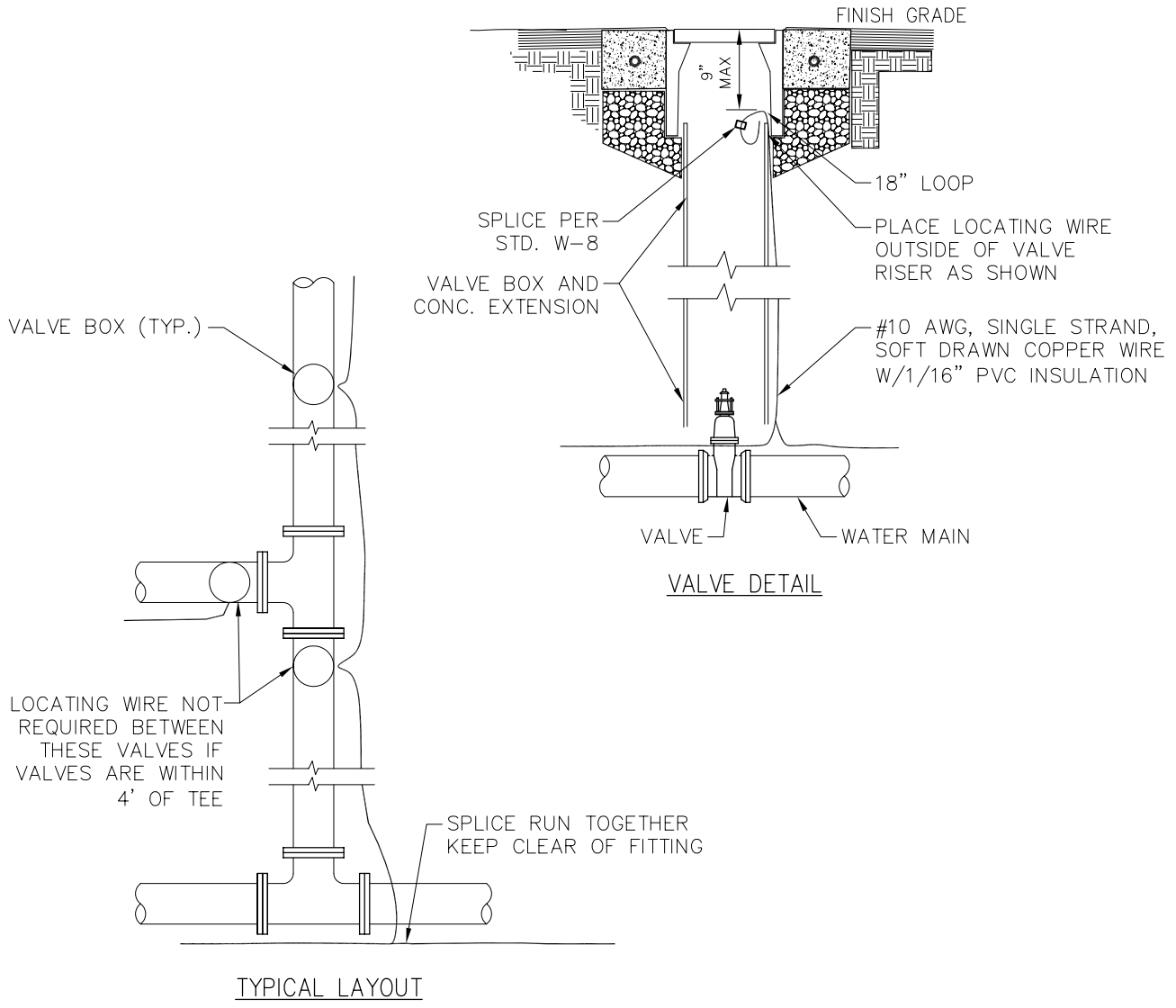
SAFE BEARING LOADS IN LBS/SQ. FT.

THE SAFE SOIL BEARING LOADS SHOWN BELOW ARE FOR HORIZONTAL THRUSTS WHEN THE DEPTH OF COVER OVER PIPE EXCEEDS 3 FEET.

SOIL	SAFE BEARING LOAD LBS/SQ. FT.
MUCK, PEAT, ETC	0
SOFT CLAY, SILT	1,000
SAND, SANDY SILT	2,000
SAND AND GRAVEL	3,000
SAND AND GRAVEL CEMENTED W/CLAY	4,000
HARD SHALE	10,000



STANDARD DETAILS
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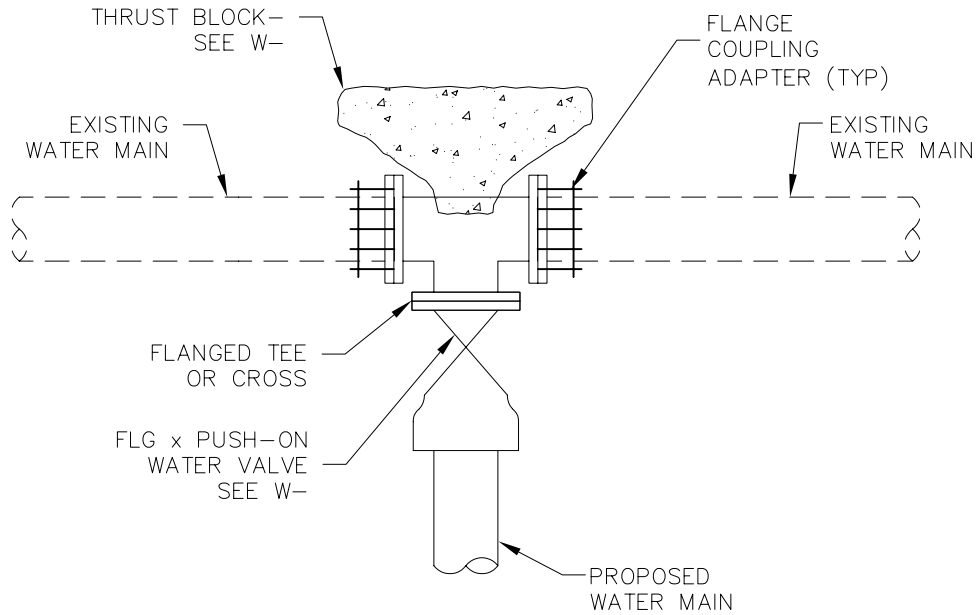
NOTES:

1. WIRE SHALL BE CONTINUOUS BETWEEN VALVE BOXES, EXCEPT AS NOTED.
2. LOCATING WIRE SHALL BE LAID ON TOP OF THE WATER MAIN, AND SHALL BE TAPED TO IT OR THE POLYETHYLENE ENCASEMENT (IF APPLICABLE) AT 10' INTERVALS AND TAPED AT ALL FITTINGS. TAPE SHALL BE 10 MIL POLYETHYLENE.
3. CONTRACTOR SHALL CONDUCT A CONTINUITY TEST ON ALL LOCATING WIRE SPLICES.



STANDARD DETAILS
NOT FOR CONSTRUCTION

Twain Harte Community Services District		LOCATING WIRE TYPICAL LAYOUT		W-9
22933 TWAIN HARTE DRIVE P.O. BOX 649 TWAIN HARTE, CA 95383		SCALE: NONE	APPROVED BY: SN	
		DATE: NOVEMBER 2006	DRAWN BY: RN	



NOTES:

1. TEE, COUPLINGS, GATE VALVES, AND ALL NEW OR EXPOSED PIPING SHALL BE WRAPPED WITH 10 MIL. MIN POLYETHYLENE ENCASEMENT.
2. DO NOT ALLOW ANY WATER TO ENTER EXISTING PIPE. ADHERE CHLORINE TABLETS TO TEE OR CROSS, THE NUMBER OF TABLETS SHALL BE AS DIRECTED BY THE DISTRICT. SPRAY EXISTING PIPE, ALL FITTINGS AND VALVES WITH A SOLUTION OF SUPER-CHLORINATED WATER JUST PRIOR TO INSTALLATION.



STANDARD DETAILS
NOT FOR CONSTRUCTION

Twain Harte Community Services District		TIE-IN CONNECTIONS TO EXISTING FACILITIES		W-10
22933 TWAIN HARTE DRIVE P.O. BOX 649 TWAIN HARTE, CA 95383		SCALE: NONE	APPROVED BY: SN	
		DATE: NOVEMBER 2006	DRAWN BY: RN	

NOTES:

1. TRACING WIRE THROUGH VALVE BOXES SHALL BE PLACED OUTSIDE OF RISER BUT INSIDE OF VALVE BOX. TRACING WIRE SHALL BE SPLICED INSIDE THE VALVE BOX PER (W-8) AND SHALL LOOP WITHIN THE VALVE BOX WITH 18" OF SLACK WIRE.
2. ALL GATE VALVES SHALL BE CENTERED AND PLUMB IN A CONTINUOUS PIECE OF 8" PVC C-900 RISER STOCK.
3. VALVE BOXES LOCATED IN A PAVED AREA SHALL BE PLACED IN A 6" X 6" CONCRETE COLLAR. VALVE BOX AND COLLAR SHALL BE SET TO FINAL FINISH GRADE IN PAVED AREAS AND 2" ABOVE FINISHED GRADE IN NON-PAVED AREAS.
4. INSTALL CONCRETE BLOCKING UNDER ENTIRE PERIMETER OF BOX.
5. VALVES AND FITTINGS SHALL BE WRAPPED IN 10 MIL POLYETHYLENE.
6. INSTALL TRENCH ADAPTER FOR ALL INSTALLATIONS WITH OPERATOR NUTS GREATER THAN 48" FROM FINISHED GRADE
7. GATE VALVES SHALL HAVE MECHANICAL JOINT ENDS WITH RESTRAINED GLANDS, EXCEPT WHEN ADJACENT TO A FLANGED FITTINGS PROVIDE FLANGED END (SHOWN).

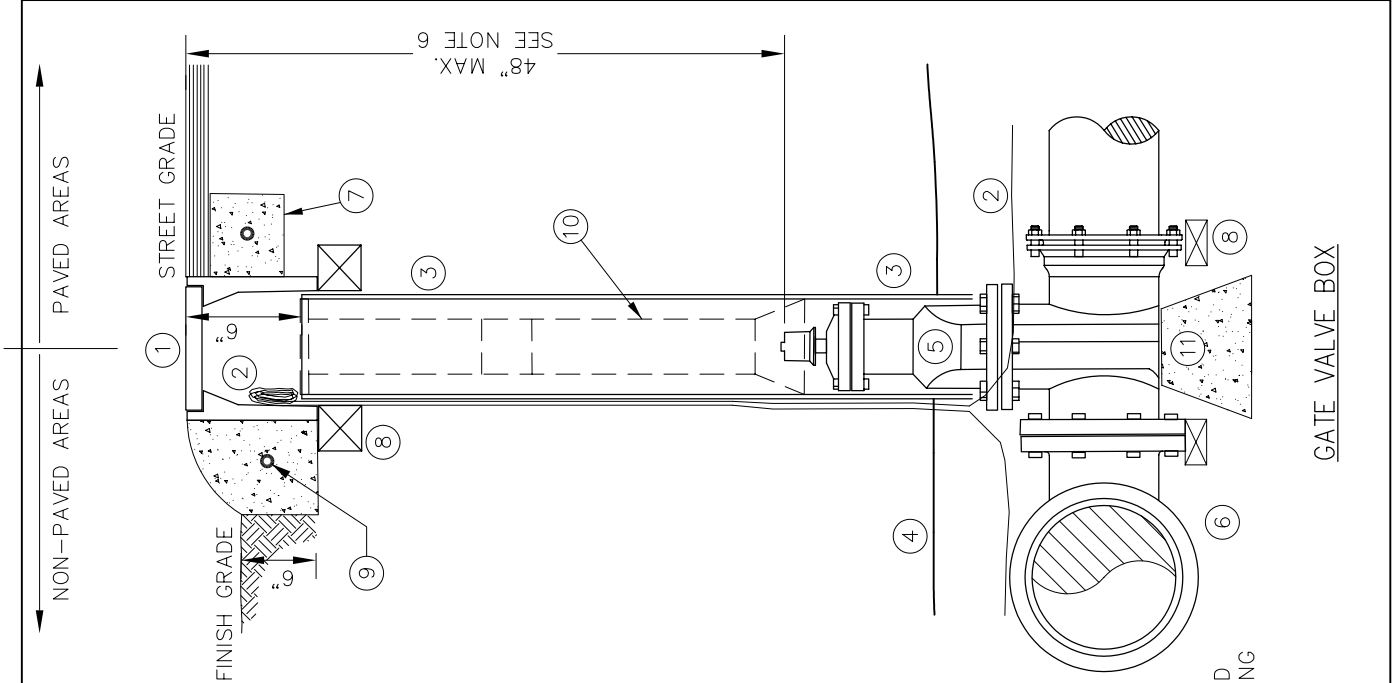
MATERIALS

- 1 CONCRETE VALVE BOX W/CAST IRON LID
- 2 #10 INSULATED LOCATING WIRE OUTSIDE RISER
- 3 8" RISER STOCK
- 4 PLASTIC BACKFILL TAPE
- 5 GATE VALVE - AMERICAN FLOW CONTROL SERIES 2500.
- 6 DUCTILE IRON TEE
- 7 CONCRETE COLLAR (SEE NOTES)

- 8 CONCRETE BLOCKING (SEE NOTES)
- 9 #4 REBAR AROUND CIRCUM. (TYP.)
- 10 AMERICAN FLOW CONTROL TRENCH ADAPTER (SEE NOTE 6)
- 11 CONCRETE VALVE SUPPORT FOR 12" AND LARGER GATE VALVES-3 SQ. FT BEARING AREA



STANDARD DETAILS
NOT FOR CONSTRUCTION



Twain Harte Community Services District

22933 TWAIN HARTE DRIVE
P.O. BOX 649
TWAIN HARTE, CA 95383

TYPICAL GATE VALVE & BOX INSTALLATION

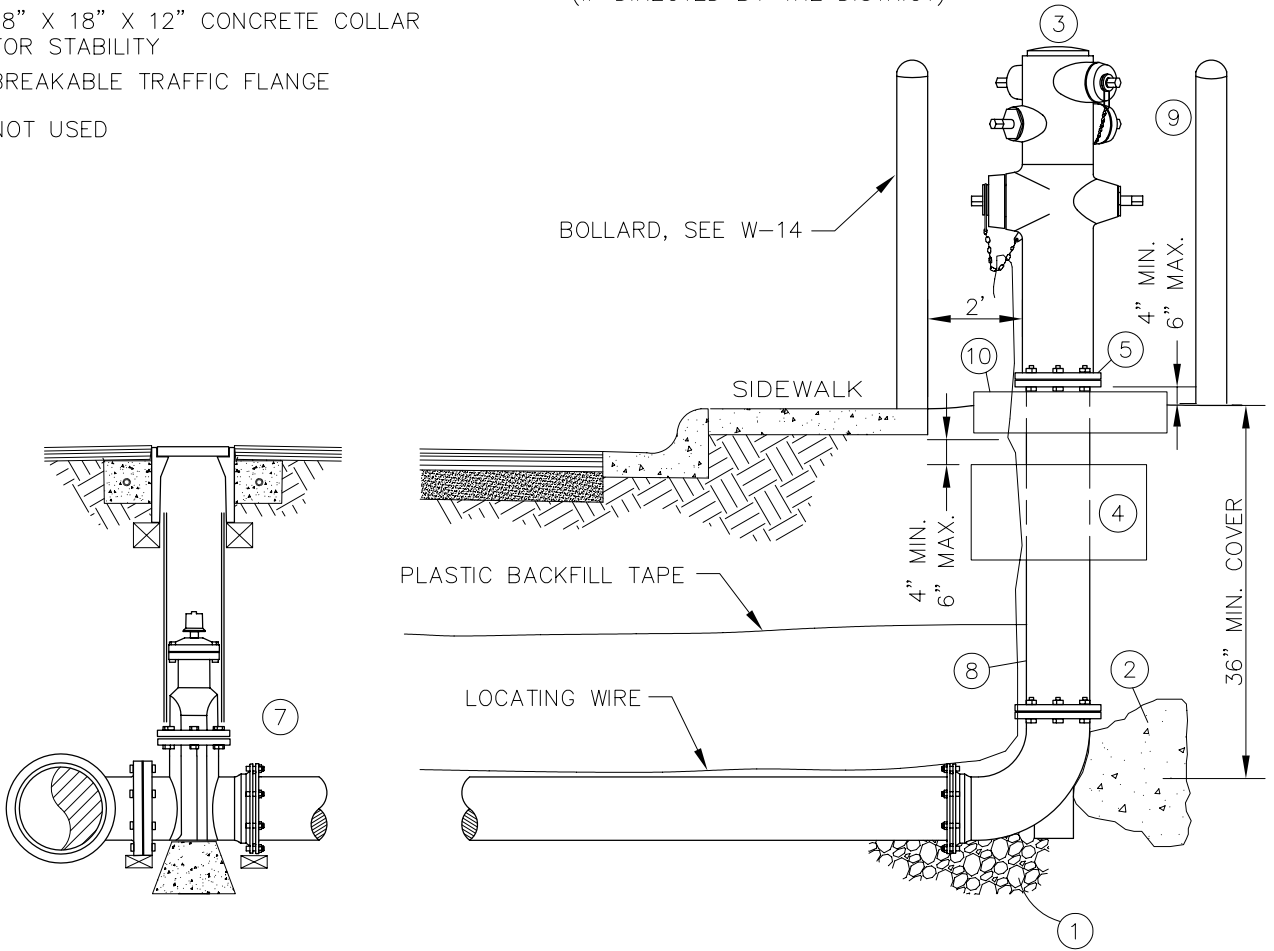
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DATE: NOVEMBER 2006	DRAWN BY: RN

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MATERIALS:

- ① 8 CU FT. OF 3/4" DRAIN ROCK
- ② THRUST BLOCK
- ③ FIRE HYDRANT - 5-1/4" DRY BARREL- AMERICAN DARLING B-62-B
- ④ 18" X 18" X 12" CONCRETE COLLAR FOR STABILITY
- ⑤ BREAKABLE TRAFFIC FLANGE
- ⑥ NOT USED
- ⑦ GATE VALVE PER (W-11)
- ⑧ FLANGE x MECHANICAL JOINT BURY
- ⑨ STEEL BOLLARDS PER (W-14)
- ⑩ 3' SQUARE x 4" THICK CONCRETE PAD (IF DIRECTED BY THE DISTRICT)



NOTES:

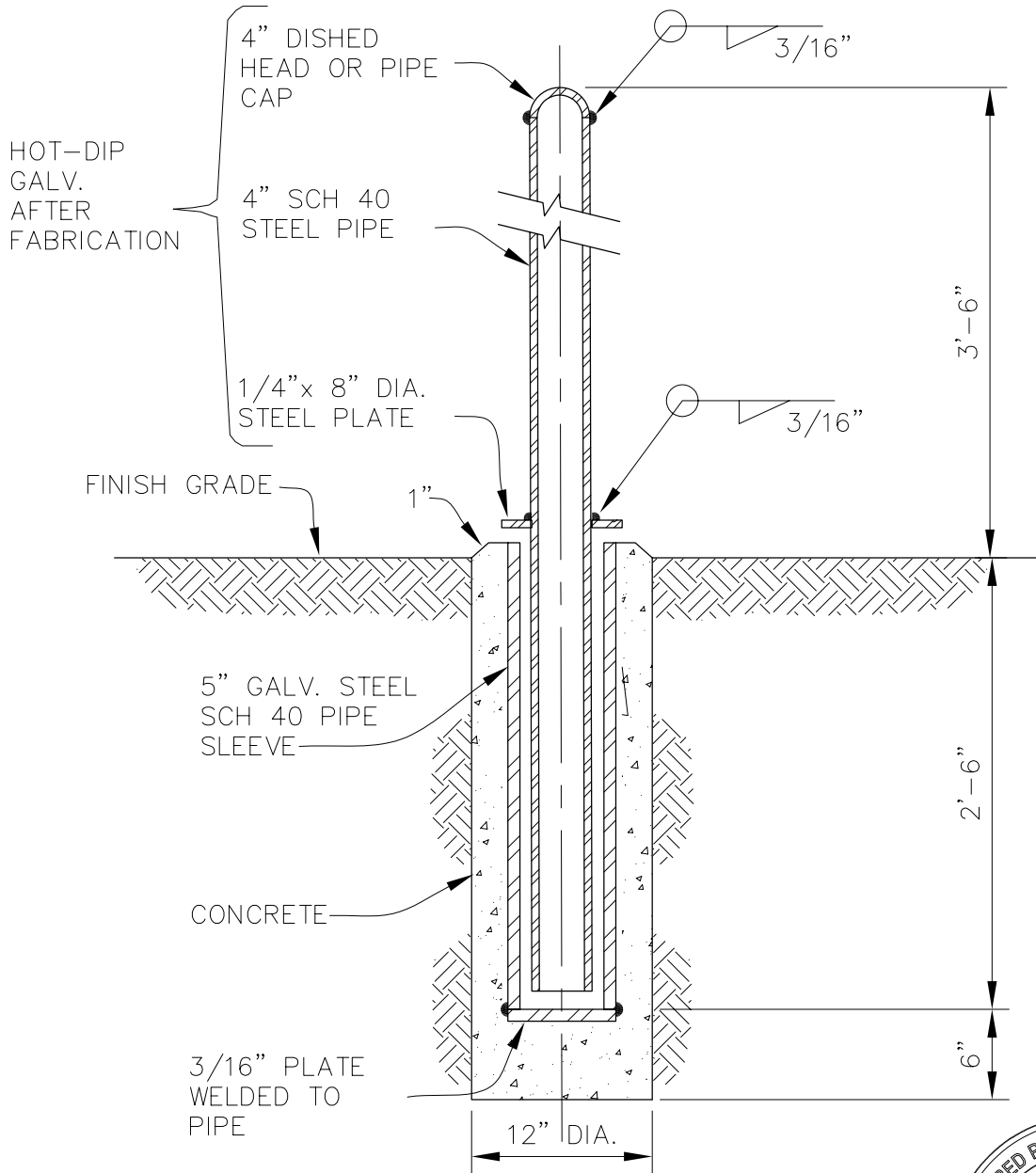
1. FITTINGS SHALL BE DUCTILE IRON
2. VALVES AND FITTINGS SHALL BE WRAPPED IN 10 MIL. OR THICKER POLYETHYLENE.
3. USE APPROVED RESTRAINING JOINTS FROM VALVE TO HYDRANT BURY.
4. A MINIMUM 3 FOOT CLEAR AREA SHALL BE MAINTAINED AROUND THE FIRE HYDRANT.
5. INSTALL A BLUE REFLECTOR, RECESSED IN THE ASPHALT, ON THE HYDRANT SIDE OF THE ROAD CENTER LINE. PAINT A 18" LONG X 6" WIDE ARROW, POINTING TOWARD THE HYDRANT.
6. SIZE OF HYDRANT LATERAL AND GATE TO BE DETERMINED BY THOCS D BASED ON LATERAL LENGTH.



STANDARD DETAILS
NOT FOR CONSTRUCTION

<p>Twain Harte Community Services District</p> <p>22933 TWAIN HARTE DRIVE P.O. BOX 649 TWAIN HARTE, CA 95383</p>	<p>FIRE HYDRANT ASSEMBLY</p>				
	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">SCALE: NONE</td> <td style="width: 50%;">APPROVED BY: SN</td> </tr> <tr> <td>DATE: NOVEMBER 2006</td> <td>DRAWN BY: RN</td> </tr> </table>	SCALE: NONE	APPROVED BY: SN	DATE: NOVEMBER 2006	DRAWN BY: RN
SCALE: NONE	APPROVED BY: SN				
DATE: NOVEMBER 2006	DRAWN BY: RN				
	<p style="font-size: 2em; font-weight: bold;">W-12</p>				

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STANDARD DETAILS
NOT FOR CONSTRUCTION

Twain Harte Community Services District

22933 TWAIN HARTE DRIVE
P.O. BOX 649
TWAIN HARTE, CA 95383

4 INCH DIAMETER STEEL BOLLARD REMOVABLE

SCALE: NONE

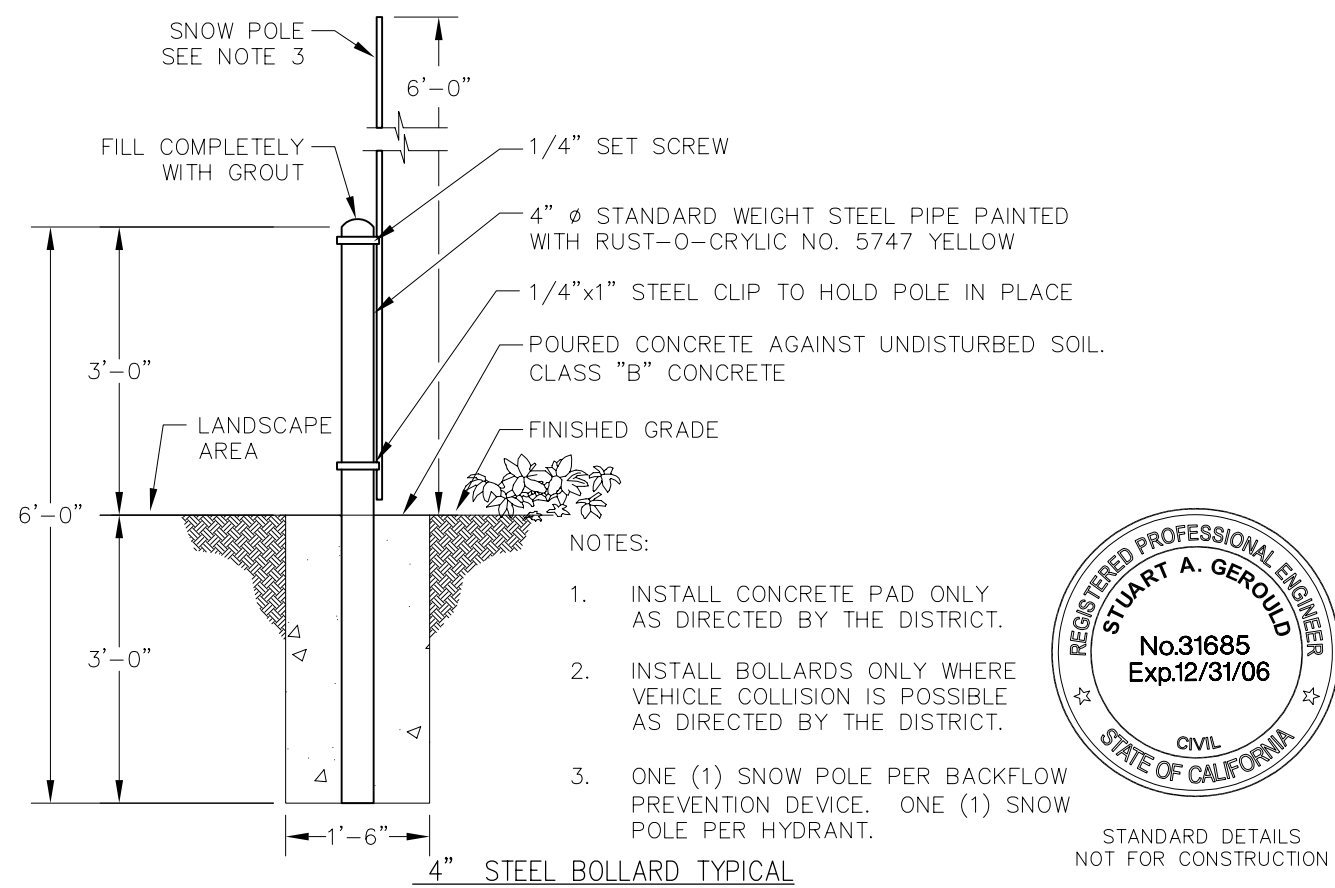
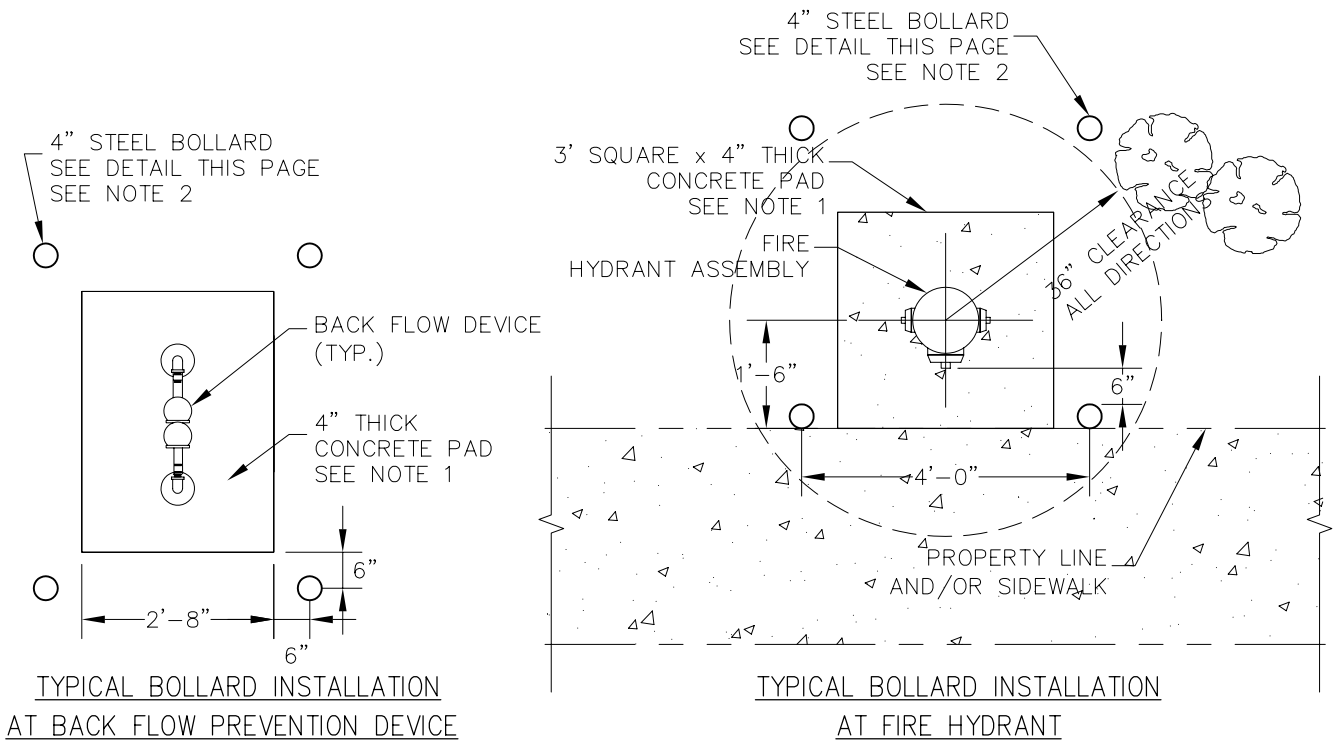
APPROVED BY: SN

DATE: NOVEMBER 2006

DRAWN BY: RN

W-13

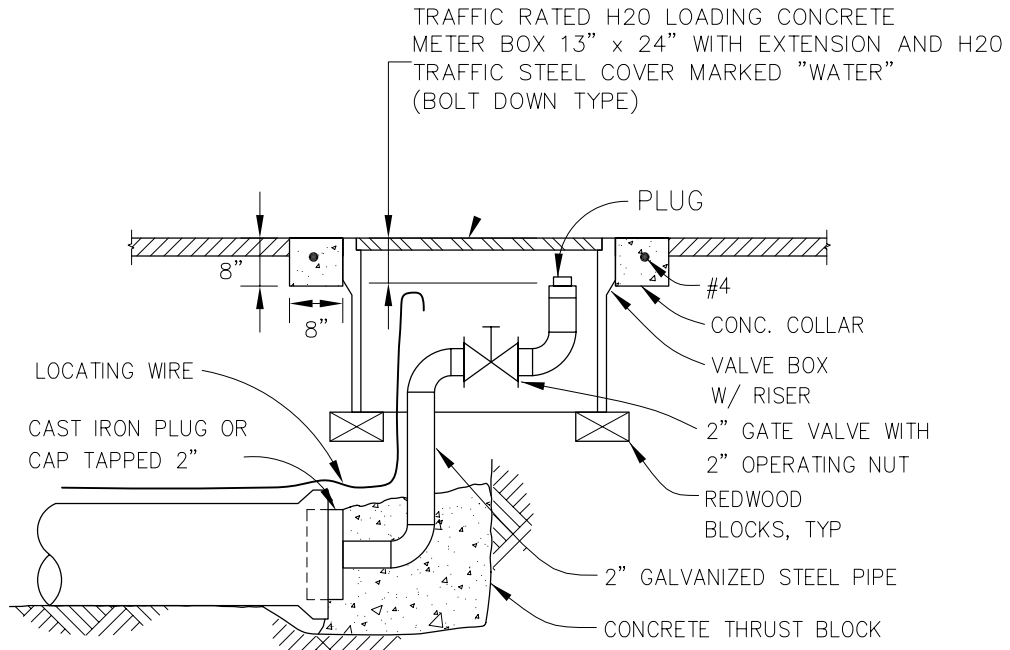
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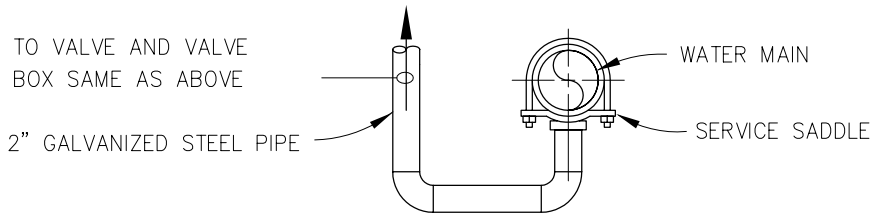
STANDARD DETAILS
NOT FOR CONSTRUCTION

Twain Harte Community Services District		4 INCH DIAMETER STEEL BOLLARD	
22933 TWAIN HARTE DRIVE P.O. BOX 649 TWAIN HARTE, CA 95383			
SCALE: NONE	APPROVED BY: SN	W-14	
DATE: NOVEMBER 2006	DRAWN BY: RN		

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BLOW-OFF AT END OF MAIN



BLOW-OFF AT INTERMEDIATE LOCATION

NOTE:

1. CONCRETE SUPPORT SHALL BE POURED AROUND THE TOP OF THE VALVE BOX AS SHOWN. OUTSIDE ROADWAYS THE TOP OF THE BOX SHALL BE 2" ABOVE FINISHED GRADE WITH CONC. COLLAR FLUSH WITH TOP OF BOX.
2. INSULATE PIPE IN BOX TO PROTECT FROM FREEZING.
3. ALL GALVANIZED STEEL PIPE EXPOSED TO EARTH OR CONCRETE SHALL BE WRAPPED WITH 10-MIL POLYETHYLENE SHEETING AND TAPED SECURELY.
4. PROVIDE MARKER POST.



STANDARD DETAILS
NOT FOR CONSTRUCTION

Twain Harte Community Services District

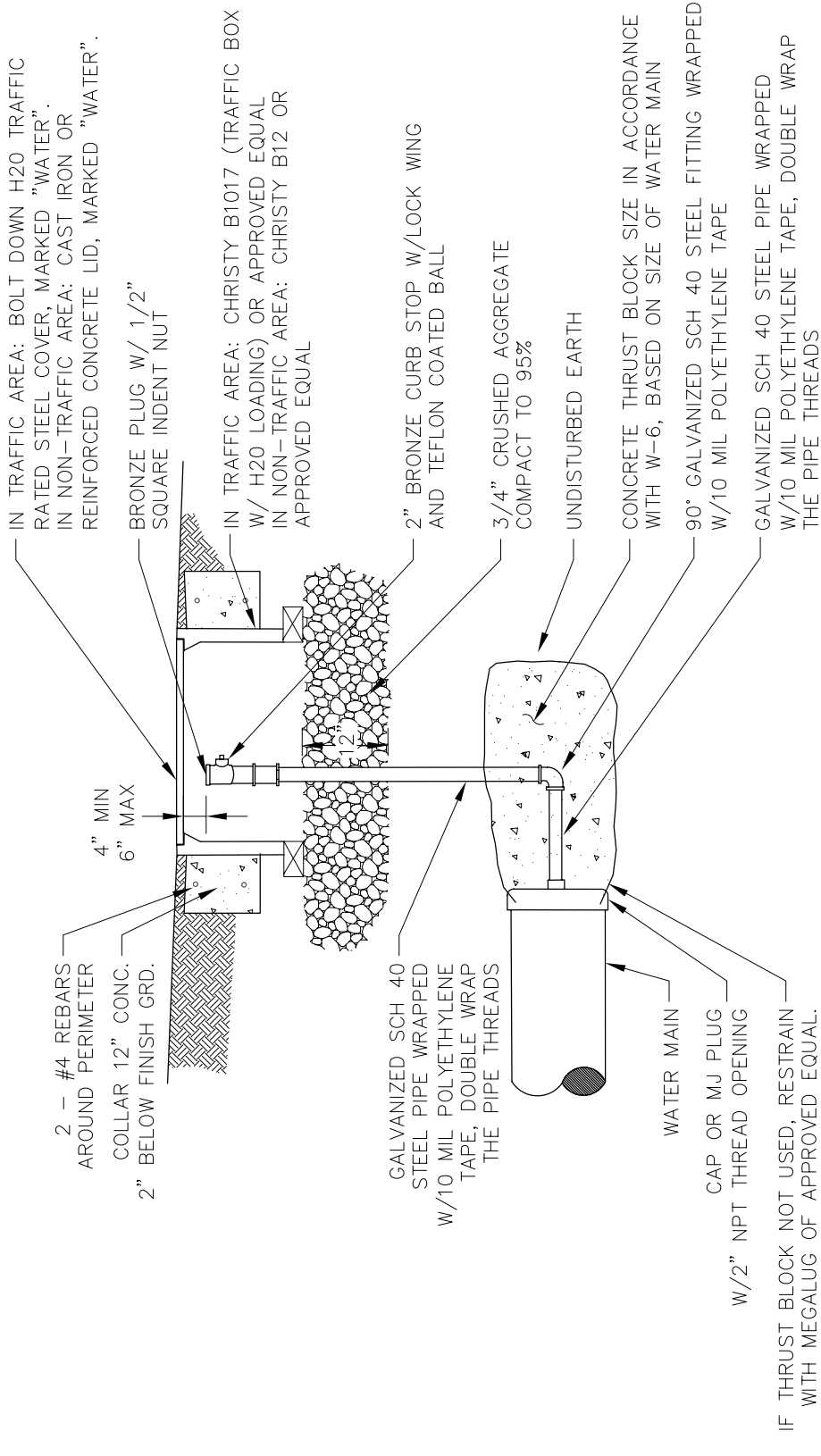
22933 TWAIN HARTE DRIVE
P.O. BOX 649
TWAIN HARTE, CA 95383

BLOW OFF HYDRANT ASSEMBLY

SCALE: NONE APPROVED BY: SN

DATE: NOVEMBER 2006 DRAWN BY: RN

W-15



NOTE: THIS DETAIL IS FOR TEMPORARY INSTALLATIONS ONLY, AS APPROVED BY THE DISTRICT.



STANDARD DETAILS
NOT FOR CONSTRUCTION

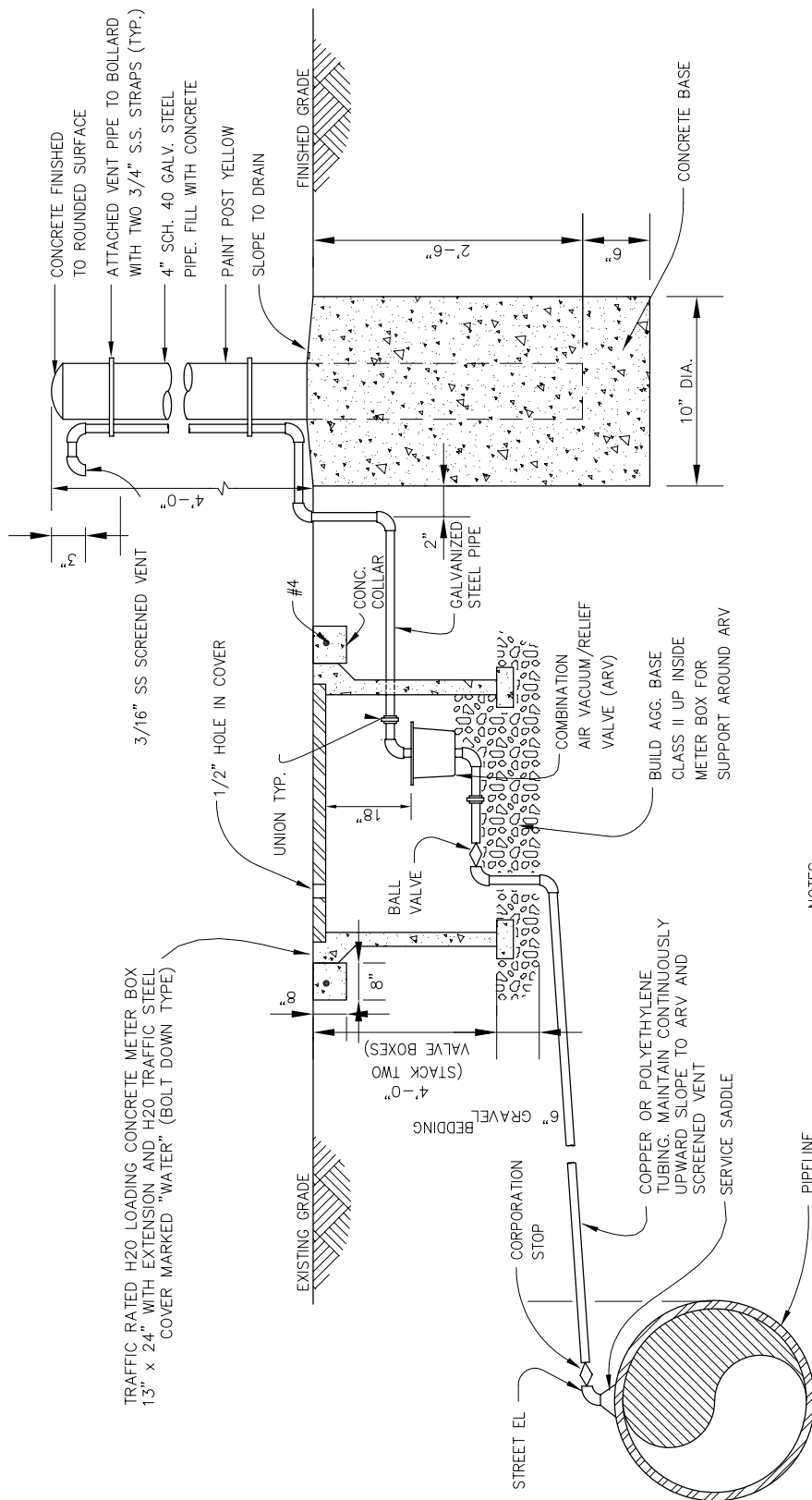
Twain Harte Community Services District

22933 TWAIN HARTE DRIVE
P.O. BOX 649
TWAIN HARTE, CA 95383

2 INCH TEMPORARY BLOW OFF ASSEMBLY

SCALE: NONE	APPROVED BY: SN
DATE: NOVEMBER 2006	DRAWN BY: RN

W-16



- NOTES:**
1. LOCATE VENT PIPE BEHIND SIDEWALK OR CURBS, AS APPLICABLE. IN OPEN AREAS, LOCATE VENT PIPE OUT OF DIRT, GRAVEL OR PAVED ROADWAY, AND PROVIDE MARKER POST.
 2. TAPE WRAP GALVANIZED STEEL PIPE WHERE BURIED.
 3. INSULATE ARV AND PIPE IN BOX TO PROTECT FROM FREEZING.
 4. SUPPORT SHALL BE POURED AROUND THE TOP OF THE VALVE BOX AS SHOWN. OUTSIDE ROADWAYS THE TOP OF THE BOX SHALL BE 2" ABOVE FINISHED GRADE WITH CONC COLLAR FLUSH WITH TOP OF BOX.
 5. PIPE, FITTINGS AND VALVES SHALL BE SAME SIZE AS ARV.



STANDARD DETAILS
NOT FOR CONSTRUCTION

Twain Harte Community Services District

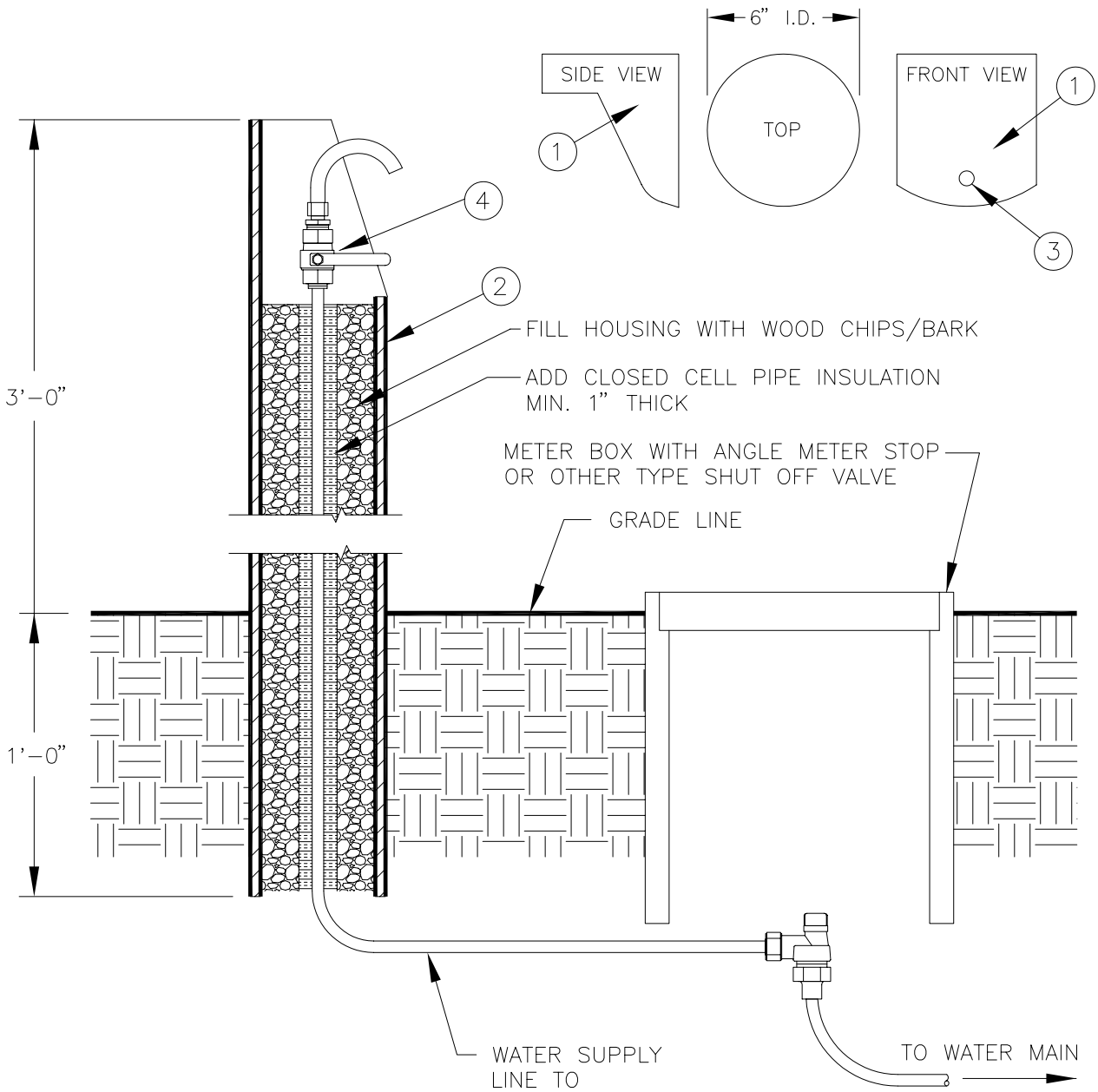
22933 TWAIN HARTE DRIVE
P.O. BOX 649
TWAIN HARTE, CA 95383

1 INCH & 2 INCH AIR RELEASE VALVE ASSEMBLY

SCALE: NONE	APPROVED BY: SN
DATE: NOVEMBER 2006	DRAWN BY: RN

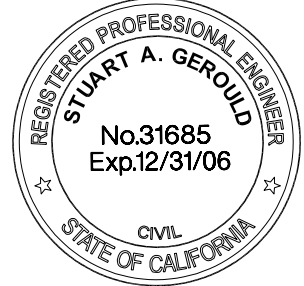
W-17

N:\2005\0570015.00\Twain Harte Standards\W-19WATERQUALITYSAMPLINGSTATION.dwg Nov 29, 2006 - 12:23pm



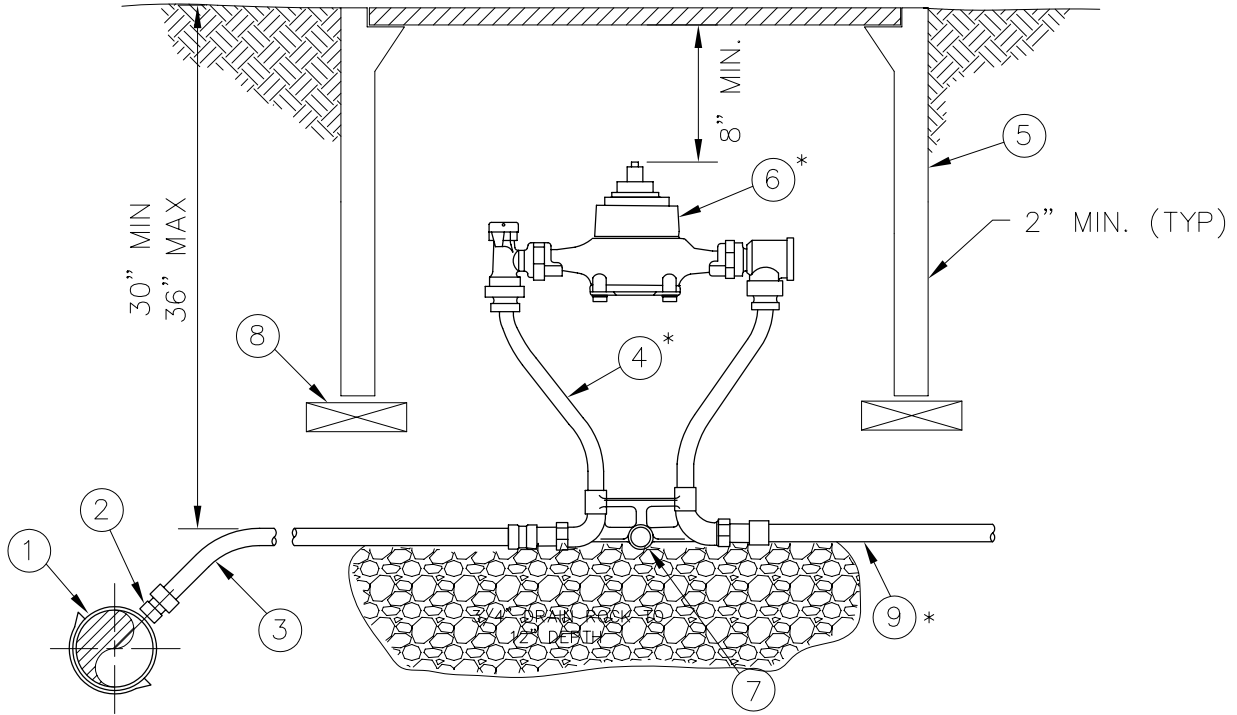
* WATER QUALITY SAMPLING STATION	
1	ALUMINUM LID
2	ALUMINUM HOUSING-6" DIA. (O.D.)
3	FLUSH MOUNTED LOCK
4	1/2" X 3/8" BALL VALVE

* ONLY ITEMS 1 THRU 4 INCLUDED



STANDARD DETAILS
NOT FOR CONSTRUCTION

Twain Harte Community Services District		WATER QUALITY SAMPLING STATION		W-18
22933 TWAIN HARTE DRIVE P.O. BOX 649 TWAIN HARTE, CA 95383		SCALE: NONE	APPROVED BY: SN	
		DATE: NOVEMBER 2006	DRAWN BY: RN	



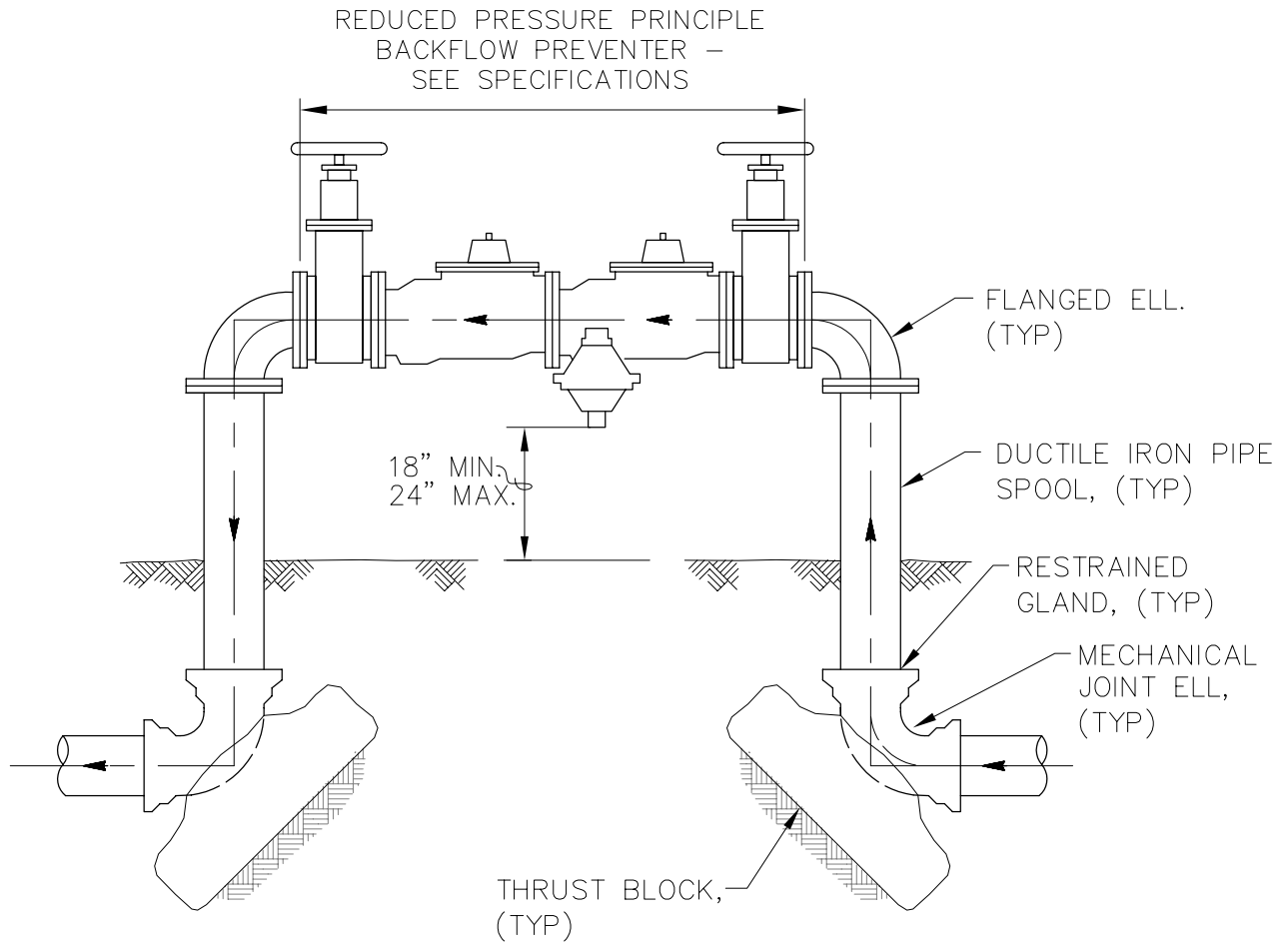
- ① SERVICE SADDLE – ROMAC 202S
- ② CORPORATION STOP – FORD FB1101-4
- ③ POLYETHYLENE PIPE – PE 3408, 200 PSI, 1” CTS
- ④ METER SETTER – FORD VBG73-18W – 48-44
- ⑤ METER BOX WITH METER READ LID
 SINGLE SERVICE – CHRISTY B16BOX WITH B16G (NON-TRAFFIC) OR B16-61G (TRAFFIC) LID
 DUAL SERVICE – CHRISTY B24BOX WITH B24G (NON-TRAFFIC) OR B24-61G (TRAFFIC) LID
- ⑥ METER – NEPTUNE T10 – 3/4” SL
- ⑦ SCH. 80 PVC THROUGH PIPE EYE WHEN AVAILABLE
- ⑧ 6” WIDE X 12” LONG X 4” THICK CONCRETE SUPPORT PAD
- ⑨ POLYETHYLENE PIPE – PE 3408, 200 PSI, 1” CTS (CUSTOMER PIPE)



STANDARD DETAILS
NOT FOR CONSTRUCTION

Twain Harte Community Services District		WATER SERVICE	
22933 TWAIN HARTE DRIVE P.O. BOX 649 TWAIN HARTE, CA 95383		SCALE: NONE	APPROVED BY: SN
		DATE: NOVEMBER 2006	DRAWN BY: RN
			W-19

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NOTE:
FREEZE PROTECTION NOT SHOWN -
SEE SPECIFICATIONS.



STANDARD DETAILS
NOT FOR CONSTRUCTION

**Twain Harte Community
Services District**

22933 TWAIN HARTE DRIVE
P.O. BOX 649
TWAIN HARTE, CA 95383

REDUCED PRESSURE BACKFLOW PREVENTER ASSEMBLY

SCALE: NONE

APPROVED BY: SN

DATE: NOVEMBER 2006

DRAWN BY: RN

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