

Section 5

**SPECIFICATIONS FOR SEWER LATERAL CONNECTION:  
MATERIALS & METHODS OF CONSTRUCTION**

---

---

**5.01 GENERAL**

Specifications for gravity flow sewer service (§5.03,) pressurized sewer service (§5.04,) and physical discontinuance of sewer service (§5.05) can be found in this section. Specifications for sewer main construction are in the latest edition of the District's Improvement Standards.

**5.01.1 Common Trench for Neighboring Services**

Neighboring structures shall not share a common pump, pressure sewer service or gravity sewer service. Two or more sewer services may be placed in a common trench on the common property line with a minimum of six (6) inches separation between lines. If the common trench is located on one, or the other homeowner's property, the Owner(s) on whose property the trench exists shall provide an easement to the District allowing the installation and maintenance of a sewer service lateral for the neighboring service lateral. The owners are responsible for all costs associated with preparation and recordation of the easement and for maintenance of the laterals within the easement.

Where two or more existing structures share an existing common service line, the Owners shall enter into a Common Service Agreement (see Exhibit 2.01) in accordance with §2.07.

**5.01.2 Commercial, Industrial, Public Use and Multiple-Unit Service Lines**

Commercial, industrial, public use and multiple-unit service lines must be submitted to and be approved by the District prior to the start of construction. The District will approve the size of pipeline and type of materials.

**5.01.3 Floor Drains**

Floor drains may not be connected to residential sewer services, whether in a mechanical room or garage or any other residential location. If a residential floor drain is encountered the Owner shall plug and cap the floor drains by pouring concrete into the drain with a District inspector present. A minimum of 18 inches of concrete, from trap to surface, shall be poured into the drain that leads to the sewer service.

Floor drains may be permitted for commercial services subject to District approval and SC-OR approval if pretreatment is required. .

**5.01.4 State Licensed Contractor**

A California State licensed contractor shall be responsible for the performance of all work connected with the installation of lower lateral services. Prior to start of work the Owner is required to provide the District with the name, address, and state license number of the contractor. The District shall not be responsible for work performed by the contractor. All contractors who work on sewer facilities

within District boundaries must post a certificate of insurance with the District that shows property damage and public liability in an amount satisfactory to the District. The District must be shown as the certificate holder and as additional insured, entitled to defense, including District's officers, employees, representatives and agents. Contractors must also provide proof of worker's compensation insurance.

**5.01.5 Owner-as-Contractor**

An Owner may choose to install his/her own upper lateral facilities. Prior authorization must be obtained from the District. The District shall not be responsible for work performed by Owner.

**5.02 METHODS OF CONSTRUCTION - GENERAL**

**5.02.1 Trench**

All trenching and pipe laying shall be done in conformance with the Construction Safety Orders as issued by the Division of Industrial Safety. Proper shoring is required in all trenches five (5) feet or more in depth. The District shall not complete inspection or approval unless proper shoring is achieved in accordance with the Division of Industrial Safety.

The trench shall be graded to achieve the minimum cover requirements as defined in Table 1:

**Table 1  
Minimum Cover Requirements: Gravity Sanitary Sewer Lower Lateral**

**Minimum Depth of Cover to Top of Pipe**

Type of Pipe	Standard Dimension Ration (SDR)	Pressure Rating	Traffic Area	Non-Traffic Area	With Engineering Analysis*
PVC	35	-	36"	24"	N/A
C-900 PVC	-	Class 150	36"	24"	12"
Ductile Iron	-	Class 350	36"	24"	6"

**Note:** Engineering analysis must prove that the alternate depth of cover is feasible considering all aspects of serviceability, including, but not limited to protection from freezing and crushing.

**5.02.2 Bedding, Backfill and Compaction**

Bedding, backfill and compaction shall conform to the following:

**5.02.2.1 Bedding -** Bedding material shall be placed from six (6) inches below the pipe to the springline of the pipe. Excavated material ("native") may not be used as bedding material. Bedding Material shall be Type I except as required below. When the bottom of the trench is wet or yielding, Type II bedding shall be used. All soft material shall be removed to the depth necessary to provide firm stable bedding. No material shall be placed above the spring line of

the pipe until the trench inspection is approved. Trench shall be dewatered and graded prior to laying pipe.

- a. **Type I Bedding Material** - Type I Bedding Material shall be imported clean sand. All material must pass a No. 3 sieve with no more than six percent (6%) passing a No. 200 sieve, or sandy pea gravel that shall have a grain size analysis within the following limits:

Passing 1" Sieve	100%
Passing ¾" Sieve	87-100%
Passing #4	30-65%
Passing #30	5-35%
Passing #200	0-12%

- b. **Type II Bedding Material** - Type II Bedding shall be imported pervious material and shall consist of natural sands, manufactured sand and or combinations thereof. Pervious backfill material shall conform to the following grading requirements:

Passing 2 inch sieve	100%
Passing #50	0 - 100%
Passing #100	0 - 8%
Passing #200	0 - 4%

**5.02.2.2 Backfill**

Backfill shall consist of initial backfill and intermediate backfill. Backfill within the roadway structural section shall conform to Butte County or City of Oroville Standards.

- a. **Initial Backfill** – Initial backfill shall be placed from the springline of the pipe to a point twelve (12) inches above the top of the pipe. Initial backfill material shall be the same type imported material used for pipe bedding. Initial backfill shall be placed after the bedding material has been placed and the pipe joints have been inspected and passed by the District inspector. Initial backfill shall be on-site prior to inspection by the District inspector.
- b. **Intermediate Backfill** - Intermediate backfill shall be placed from twelve (12) inches above the pipe to the surface. Intermediate backfill material shall be screened excavated (native) material, free from roots, organic matter, trash, and debris, and shall contain no rocks greater than three (3) inches in diameter. All material containing rocks shall have adequate fines to fill all voids. Where excavated material cannot meet this specification it should be properly disposed of and imported

backfill material used. Intermediate backfill shall only be placed after the line has been tested and approved by the District inspector. Excavations shall not remain open overnight outside of private property unless approved by the District. All trench backfill shall be completed within a maximum of five (5) working days.

#### **5.02.2.3 Compaction**

Bedding and backfill materials shall be compacted to a relative density of at least ninety percent (90%) of Modified Proctor Maximum Compaction (ASTM D 1557), unless otherwise required by the County of Butte or the City of Oroville.

#### **5.02.3 Tracer Wire**

Tracer wire must be installed on all upper laterals from the foundation cleanout to the property line cleanout, and shall surface at all mid-line cleanouts, in a continuous, unbroken manner. The District will test the wire for continuity. Following are minimum requirements:

- a. Tracer wire shall be 10 AWG minimum
- b. THW, THHW, TW or THWN wet location insulation
- c. Taped to the top of the pipe at five (5) foot intervals, and all bends
- d. If spliced, splices shall incorporate a U.L. listed underground splice kit

### **5.03 GRAVITY SEWER SERVICE**

#### **5.03.1 General**

The District shall accept gravity flow sewer service where feasible from all properties within the District boundaries that are capable of being developed.

##### **5.03.1.1 Codes Followed**

Material for and methods of construction of sewer services, mains and appurtenances shall be in accordance with the requirements of the most recent edition of the California Plumbing Code, the codes of the State of California, regulations of the County of Butte, City of Oroville and Rules and Construction Standards of the Lake Oroville Area Public Utility District.

##### **5.03.1.2 System Design**

A gravity sewer service shall consist of a gravity sewer pipe with a minimum slope of 2%, and clean outs as defined by Section 5.03.2.4.

##### **5.03.1.3 Owner's Responsibility**

The Owner shall design the system for the project. The proposed plans will be submitted to the District for review and permit approval.

##### **5.03.1.4 System Specifications**

The following requirements are intended to supplement the standard specifications for sewer service construction and are considered minimum

requirements. Where differences exist, the specifications contained herein prevail. Attached, Figure 5.03 is the Gravity Sewer Service Connection Detail.

## **5.03.2 Materials**

### **5.03.2.1 Sewer Service Pipe**

#### **5.03.2.1.1 Size**

The Upper Lateral sewer service shall be installed per California Plumbing Code. The Lower Lateral sewer service pipe shall be four (4) inches I.D. (inside diameter) minimum for a single-family residence, six (6) inches I.D. minimum for multiple-units, commercial, industrial and public use services.

#### **5.03.2.1.2 Acceptable Pipe Material**

Following are pipe materials that are acceptable for use as laterals:

- a. Polyvinyl Chloride Pipe (PVC) - PVC pipe shall be suitable for use as a gravity sewer conduit, have a maximum SDR of 35 and shall conform to and meet the requirements of ASTM, D-3034. The pipe shall be bell and spigot type. Joints for PVC pipe shall be "O" ring rubber gasket type or Johns-Manville "Ring-Tite" or equal. The rubber gasket shall be of special composition rubber recommended for sewer service. Maximum joint deflection shall be one (1) degree.
- b. Polyvinyl Chloride Pipe (PVC) C-900 - PVC C-900, Class 150 pipe shall conform to AWWA Standard C-900 for four (4) inch through 12 inch pressure water pipe or equal.
- c. Ductile Iron Pipe (DIP) Class 50 (class 51 for 4" DIP) Ductile iron pipe shall conform to the ANSI Specifications A.21.51, and AWWA C151 for Tyton joint pipe. Rubber gasket joints shall conform to ANSI A.21.11. Pipe shall be lined with Protecto 401 or approved equal.
- d. Acrylonitrile-Butadiene-Styrene (ABS) may be used for upper lateral only.

#### **5.03.2.1.3 Unacceptable Pipe Material**

Following are pipe materials that are NOT acceptable for use as sewer services:

- a. Orangeburg is NOT an acceptable pipe material. If encountered in the field, it must be removed and replaced with pipe of an approved material.
- b. Acrylonitrile-Butadiene-Styrene (ABS) is NOT acceptable for lower lateral . If encountered in the field, it must be removed and replaced with approved pipe

#### **5.03.2.2 Lower Lateral Pipe Material in Traffic Areas**

Where the sewer service will have less than three (3) feet minimum cover in traffic areas, either PVC C-900 or ductile iron pipe shall be used (refer to Table 1, Page 5-2.)

### **5.03.2.3 Flexible Couplings**

Flexible couplings shall be an elastomeric sleeve-type reducing or transition coupling with corrosion-resistant-metal tension band and tightening mechanism, specifically designed for joining underground non-pressure piping. Couplings shall be selected for joining the pipe materials and sizes being coupled. Flexible couplings may be Fernco Inc., Mission Rubber Company, or approved equal.

### **5.03.2.4 Cleanouts**

Cleanouts shall be installed in accordance with the following:

- a. Location – At a minimum, a standard two way cleanout shall be accessible and maintained within five (5) feet of the structure, outside the building foundation (Figure 5.04), and two (2) double combo property line cleanouts (Figure 5.05) shall be installed within five (5) feet of the property line, on the Owner’s property.
- b. Spacing - Cleanouts shall be spaced at the rate of one for every 100 feet of line see Figure 5.06 for single cleanout assembly.
- c. Size - Cleanouts shall be the same size as the line served.
- d. At Bends of 90 Degrees– Cleanouts shall be placed at all bends of 90 degrees or as approved by the District (See Figure 5.07). Bends of over 90 degrees are not allowed.
- e. Aggregate of Bends - An additional cleanout shall be provided for each aggregate change of direction exceeding one hundred and thirty-five (135) degrees.
- f. Caps – Cleanouts shall have an approved watertight cap or plug of the same material as the pipe.
- g. Box - Cleanouts shall be set in a rectangular concrete box, B-9, B-12 or equal. Boxes in travel area shall be H20 rated.
- h. Lids - All boxes must have a metal lid stamped “SEWER.” Lids must be installed to grade. Lids in travel area shall be H20 load rated

#### **5.03.2.4.1 Property Line Cleanouts**

Two (2) double combo property line cleanouts, in accordance with Figure 5.05, shall be installed on the following:

- a. All new or replacement sewer services, whether residential, commercial, industrial, multiple-unit or public use.
- b. All existing sewer services that are being upgraded, and have no wye installed at the property line.
- c. At Owner’s request.

### **5.03.2.5 Backwater Valves**

The installation of a backwater valve may prevent wastewater from backing-up through the sewer service into the structure being served. Installation and maintenance of backwater valves is the sole responsibility of the Owner. The District is not responsible for damage beyond the District’s control including backflow of sewage into any residential, multiple-unit, commercial, industrial or public use buildings. (See also §6.)

Backwater valves shall be installed in accordance with the following:

- a. Minimum size - Backwater valves shall be four (4) inch ID minimum, Rectorseal Clean Check® Extendable Backwater Valve or approved equal. District shall approve the backwater valve.
- b. Accessible - Backwater valves shall be located where they will be accessible for inspection and repair at all times.
- c. Joint laterals - Backwater valves may be required where residential, multiple-unit, commercial, industrial or public use sewer services are connected to a joint lateral.
- d. Fixtures below manhole cover elevation - Backwater valves shall be installed where plumbing fixtures with overflow rims are located below the elevation of the next upstream manhole cover.
- e. Pressure Relief Pop-Off Valve - Where backwater valves are required to be installed, they shall be accompanied by a pressure relief pop-off valve located at the immediately upstream cleanout. Pop-off valve shall be Jones Stephens Corp. Sewer Popper™ Cleanout and Relief Valve or approved equal.
- f. Combined gravity flow and pressure systems - Backwater valves shall be installed inside or near the foundation if a pressurized sewer service transitions into the Owner's gravity system outside of the foundation.
- g. Upon determination by the General Manager - Where the General Manager determines a backwater valve may be necessary.

**5.03.3 Method of Construction:  
Upper and Lower Lateral Sewer Service, Gravity Flow**

**5.03.3.1 Slope**

Slope shall be a minimum of two (2) percent, 1/4 inch per foot, and lay true to line and grade.

**5.03.3.2 Bends**

Where bends are necessary in the construction of the upper and lower laterals, the following requirements shall be met:

- a. Cleanouts shall be placed at all bends of 90 degrees, or as approved by the District
- b. Bends shall not exceed ninety (90) degrees
- c. Offset Coupling of Bends – Bends in a gravity sewer line may be offset coupled to avoid the placement of a cleanout. Two (2) 22.5 degree bends may be substituted for a 45 degree bend if the two (2) 22.5 degree fittings are coupled no less than two (2) feet apart. The use of two (2) fittings that are offset-coupled may not exceed 45 degrees. Offset couplings may be used in series subject to the restrictions outlined in “Aggregate of Bends” below.

- d. Aggregate of Bends – Cleanouts shall be placed within five (5) feet downstream of a series of bends of less than 45 degrees each, which in aggregate equal but do not exceed 90 degrees. A cleanout may not be required if the last bend in aggregate is within 20 feet of a midline or property line cleanout.

#### **5.03.3.3 Common Trench**

Common trenches are not allowed on the lower lateral. Upper lateral service sewers placed in a common trench with water services should be avoided.

#### **5.03.3.4 Testing for Leakage**

Upper lateral shall be either air-pressure tested or water tested for leakage in accordance with §6.03.

### **5.04 PRESSURIZED SEWER SERVICE**

#### **5.04.1 General**

In some instances, the sewer main is higher than the sewer outlet on a residence, or a gravity system cannot be made available for such reasons as physical or environmental constraints. In these instances to obtain sewer service, the Owner must design and install a privately owned and operated pressure system.

#### **5.04.3 Codes Followed**

Pressurized systems shall be installed in accordance with the requirements of the most recent edition of the California Plumbing Code, the codes of the State of California, regulations of the County of Butte, City of Oroville and Rules and Construction Standards of the Lake Oroville Area Public Utility District.

#### **5.04.4 System Design**

A pressurized system shall consist of a gravity sewer, a wastewater holding tank, proper venting, one or more pumps, a force main, electrical controls and an alarm system. Plumbing should be designed for optimum location of pump and discharge line to sewer with minimum pumping head. Figure 5.08 is an example of a typical residential pump system.

#### **5.04.5 Owner's Responsibility**

The Owner shall have a California licensed engineer design the pressurized system for the project. The proposed plans must be submitted to the District for review and permit approval, and accompanied by a standard application form for a pressurized system.

It is the responsibility of the Owner to prevent sewage backup during power failures. The Owner should consider the installation of additional storage to provide backup for power failures of short duration. Installation of an automatic water shut-off valve with manual override that activates during a power failure is recommended to help prevent sewage backup.



Emergency power generation should also be considered to provide uninterrupted service. If auxiliary power is not supplied, at a minimum the Owner should provide a terminal block at the control panel for providing power from a portable generator.

The District recommends that the Owner establish a preventative maintenance program that would include a service agreement with a local plumbing contractor.

**5.04.6 System Specifications**

The following requirements are intended to supplement the standard specifications for individual pressure sewer system construction, and are considered minimum requirements. Where differences exist, the specifications contained herein shall prevail. Attached, Figure 5.09 is the Pressure Sewer Service Connection detail.

**5.04.6.1 Flow Rate**

The pressurized system shall be capable of meeting the required minimum flow rate at the total dynamic head characteristic of the system. The required minimum flow rate shall maintain a minimum discharge velocity of 2.5-ft/sec in the discharge line during pumping, with a minimum discharge capacity of 20 gallons per minute (gpm.)

**5.04.7 Materials**

**5.04.7.1 Pumping Chamber**

The pumping chamber (wastewater wet well) shall be constructed of leak-proof materials and shall be impervious to infiltration of surrounding waters and exfiltration of contained wastes. Minimum pumping chamber reserve capacity shall be as shown in Table 2.

**Table 2  
Pumping Chamber Capacity**

Type of Service	Minimum Pump Chamber Capacity
Single-Family Residential	150 Gallons
Multi-Unit Residential, Commercial, Industrial or, Public Use	250 Gallons

**5.04.7.2 Pump Types**

There are two types of pump designs that are acceptable for installation within the District:

- a. **Submersible Sewage Ejector:** A non-clog submersible pump. In single dwelling units, the pump must be able to pass a one and one-half (1-1/2) inch diameter sphere, requiring a minimum two (2) inch discharge line. In multiple-units, commercial, industrial and public use occupancy, the pump must be able to pass a two (2) inch diameter sphere, requiring a minimum three (3) inch discharge line.

- b. Grinder Pump:** A submersible pump with a solids grinding attachment, similar to a garbage disposal, which produces pulverized sewage. In single dwelling units, a minimum two (2) inch discharge line is required. Multiple-units, commercial, industrial and public use occupancy require a minimum three (3) inch discharge line.

**5.04.7.3 Dual Pump Systems**

To allow for redundancy in event of overload or mechanical failure, the Owner may install two pumps in parallel with appropriate valves and piping to allow discharge through a common discharge line. The dual pumps shall function independently in case of overload or mechanical failure. The standby pump (lag pump) shall be controlled in a manner that it will automatically take place of the first pump (lead pump) in the event of a failure. An alternating circuit shall be installed to ensure that each pump is exercised and fully functional and to balance the wear on each pump. The wastewater wet well shall hold a minimum of 150 gallons per dwelling unit. Tank volume for multiple-unit, commercial, industrial and public use shall be determined on an individual basis.

Dual pump systems are required in multiple-unit residential, commercial, industrial and public use occupancy.

**5.04.7.4 Discharge Pipe**

The minimum discharge pipe size shall be as shown in Table 3.

**Table 3  
Discharge Pipe Size: Pressurized Sewer Service**

Type of Service	Minimum Pipe Size with Grinder Pump	Minimum Pipe Size with Submersible Pump
Single-Family Residential	2"	2"
Multi-Unit Residential, Commercial, Industrial, or Public Use	3"	3"

The materials required for the buried discharge piping shall be a minimum of Class 200 pressure pipe in ductile iron lined with Protecto 401 or approved equal, polyethylene or Schedule 40 PVC pressure pipe. PVC Schedule 80, Class 200 or equivalent pressure pipe is acceptable for exposed discharge piping in and adjacent to the pump station.

**5.04.7.5 Valves**

Discharge pipes shall have a check valve, a bypass valve and an isolation gate or ball valve located as close to each other and the pumping unit as practical; and, readily accessible and protected from freezing.

#### **5.04.7.6 Check Valves**

Check valves shall be swing check style, rated for use in sewage applications, and shall be pressure rated to a minimum of 200 psi. Check valves shall be located on the discharge line as close to the pump as practical, and must be accessible. Unions may be used in the installation of check valves for the convenience of repair and replacement. In dual pump systems, check valves are required on both individual pump discharge lines before they are joined.

#### **5.04.7.7 Check Valve Bypass Line**

A check valve bypass line shall be installed between the check valve and the isolation gate valve. The bypass shall be installed with an approved tee fitting, gate valve (same type as isolation valve) and pipe of the same size as the discharge line. Horizontal bypass return line shall be installed with a slight slope so that it will drain completely and shall be protected from freezing. The bypass line shall enter the wet well above the high water level line and be sealed appropriately where it enters the wet well. Bypasses on dual pump systems shall be installed separately between each check valve and isolation valve but may use a common drain return line to the wet well.

#### **5.04.7.8 Isolation Gate Valve or Ball Valve**

Isolation gate or ball valves shall be full-way type with working parts of corrosion resistant metal and shall have a body of cast iron or brass. The gate or ball valve shall be the same size as the discharge piping and have a minimum pressure rating of 200 psi. In dual pump systems isolation valves are required on both individual pump discharge lines before they are joined.

#### **5.04.7.9 Cleanouts**

No cleanouts shall be located on the pressure system discharge line. Where a pressure system transitions to a gravity system within the foundation, a standard cleanout shall be located on the gravity system leaving the structure within five (5) feet of the foundation. Where a pressure system exits the foundation, a standard cleanout shall be located within five (5) feet downstream of the transition from pressure to gravity. A cleanout shall be located at the property line only if the pressure line has transitioned to gravity at or prior to the property line (see Figure 5.09.)

#### **5.04.7.10 Alarm System**

An audible and visual alarm system should be installed, where it can be seen and heard at all times. The alarm system shall continuously signal when the sewage level in the pumping chamber exceeds a predetermined safe level.

Remote alarm systems shall be installed in all contributing units of multiple-unit residential, commercial, industrial or public use.

Annual alarm tests are recommended as part of an annual pump system maintenance program.

**5.04.8 Method of Construction:  
Sewer Service, Pressurized System**

**5.04.8.1 Common Trench**

Pressurized sewer service discharge lines shall not be placed in a common trench with water or gas services. At the discretion of the District Engineer, other utilities may be included in the trench with pressurized sewer service discharge lines. Where a water service is located less than ten (10) feet horizontally from a pressurized sewer system, a backflow prevention assembly, approved by the water service provider, shall be installed at the water meter for that service. Owner shall submit a common trench detail for approval, which shall be considered on a case-by-case basis.

**5.04.8.2 Testing for Leakage**

The discharge piping must be air-tested at 10 psi for 10 minutes in accordance with § 6. Where possible, the pressure service shall be drained prior to testing. There shall be no detectable leakage.

**5.04.8.3 Water Service Cross-Connection Control and  
Pressurized Sewer Service**

**5.04.8.3.1 Commercial, Industrial and Public Use Services**

In accordance with Title 17, §7604, where a pressurized sewage system is installed at commercial, industrial or public use facilities, the Owner shall install a backflow prevention assembly, approved by the water provider, at the meter or point of service on all water services for cross-connection protection.

**5.04.8.3.2 Residential Services**

Where a pressurized sewage system is located within close proximity of a water service or main, the Owner shall install a backflow prevention assembly, approved by the water service provider, on all water services to protect from potential cross-connections.

**5.05 PHYSICAL DISCONTINUANCE OF SEWER SERVICE**

Before upper lateral sewer service is discontinued, the Owner shall apply for and obtain a Permit from the District to cut and cap the upper lateral, at the discretion of the District. The Owner must pay fees according to Exhibit 10.01.

**5.05.1 Remodel**

Where a structure or a portion of a structure will be removed or demolished, sewer service shall be physically disconnected. The Owner must cut and cap the upper lateral in accordance with § 5.05.3.

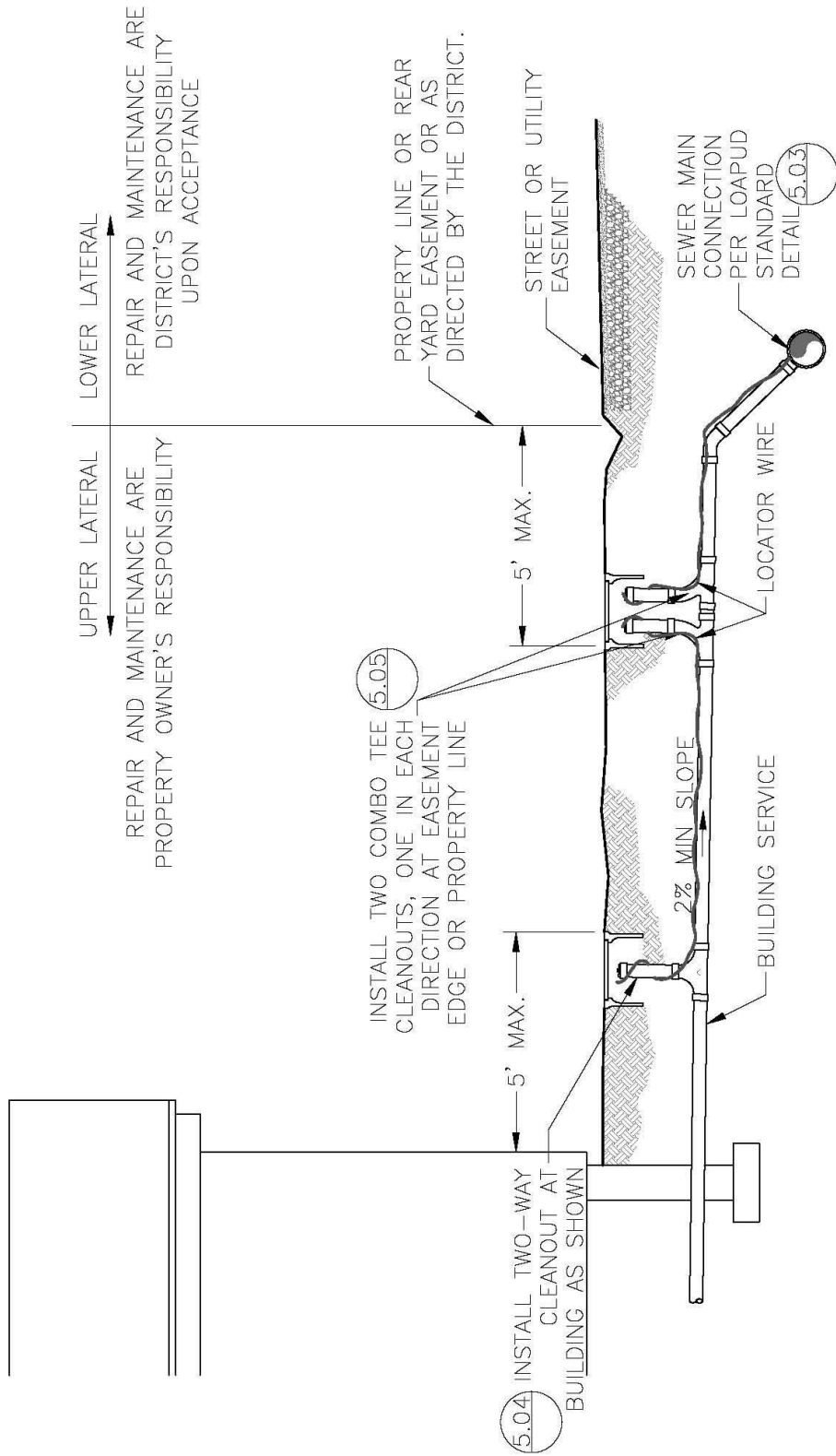
**5.05.2 Permanent Removal of Sewer Service**

Where an Owner chooses to permanently remove sewer service, the Owner must cut and cap in accordance with §5.05.3.

### **5.05.3 Upper Lateral Sewer Abandonment**

To abandon an existing residential, commercial, industrial or public use sewer service, the upper lateral must be cut and capped at the upstream side of the property line cleanout, within five (5) feet of the cleanout, or at a location as determined by the District. At least a two (2) foot section of the sewer service must be removed.

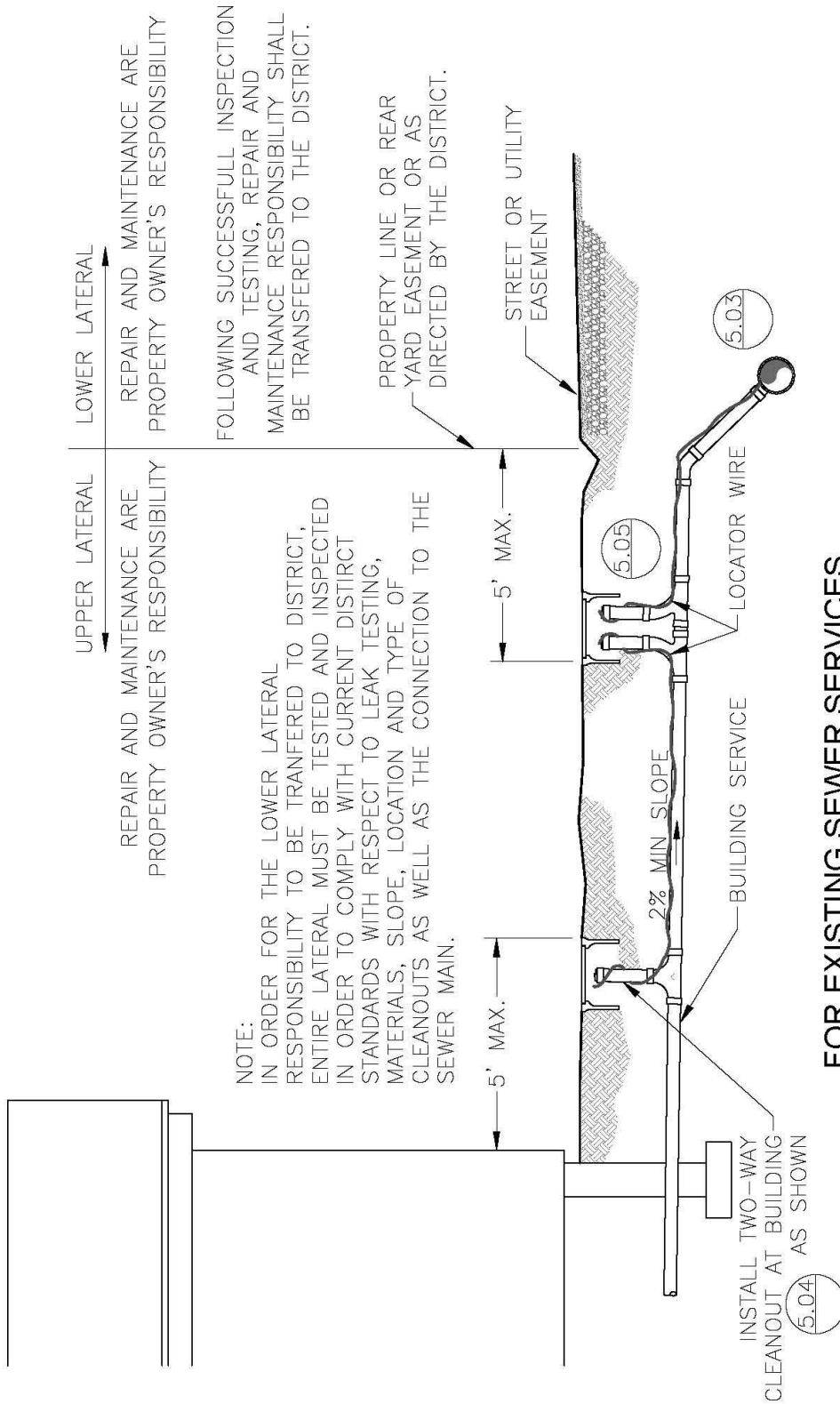
Both ends of the line must be capped or plugged with a District-approved direct-bury cap or plug, which must be witnessed by a District inspector prior to pouring concrete. A single 60-pound bag (minimum) of mixed concrete shall be poured onto the downstream side of the abandoned upper lateral, following District inspection of the installed cap.



**FOR NEW SEWER SERVICES**

APPROVED: DECEMBER 2011

<p><b>FIGURE 3.01</b> <b>FIGURE 5.01</b></p>	<p><b>SEWER MAINTENANCE AND REPAIR RESPONSIBILITIES FOR NEW SEWER SERVICES</b></p>	<p><b>Sauers Engineering, Inc.</b> Civil and Environmental Engineers 440 Lower Grass Valley Road, Suite A, Nevada City, CA 95959 Telephone (530) 265-8021</p> <p><b>LAKE OROVILLE AREA PUBLIC UTILITY DISTRICT</b> 1960 ELGIN STREET OROVILLE, CA 95966 TEL. (530) 533-2000</p>
--	--	---



**FOR EXISTING SEWER SERVICES**

APPROVED: DECEMBER 2011

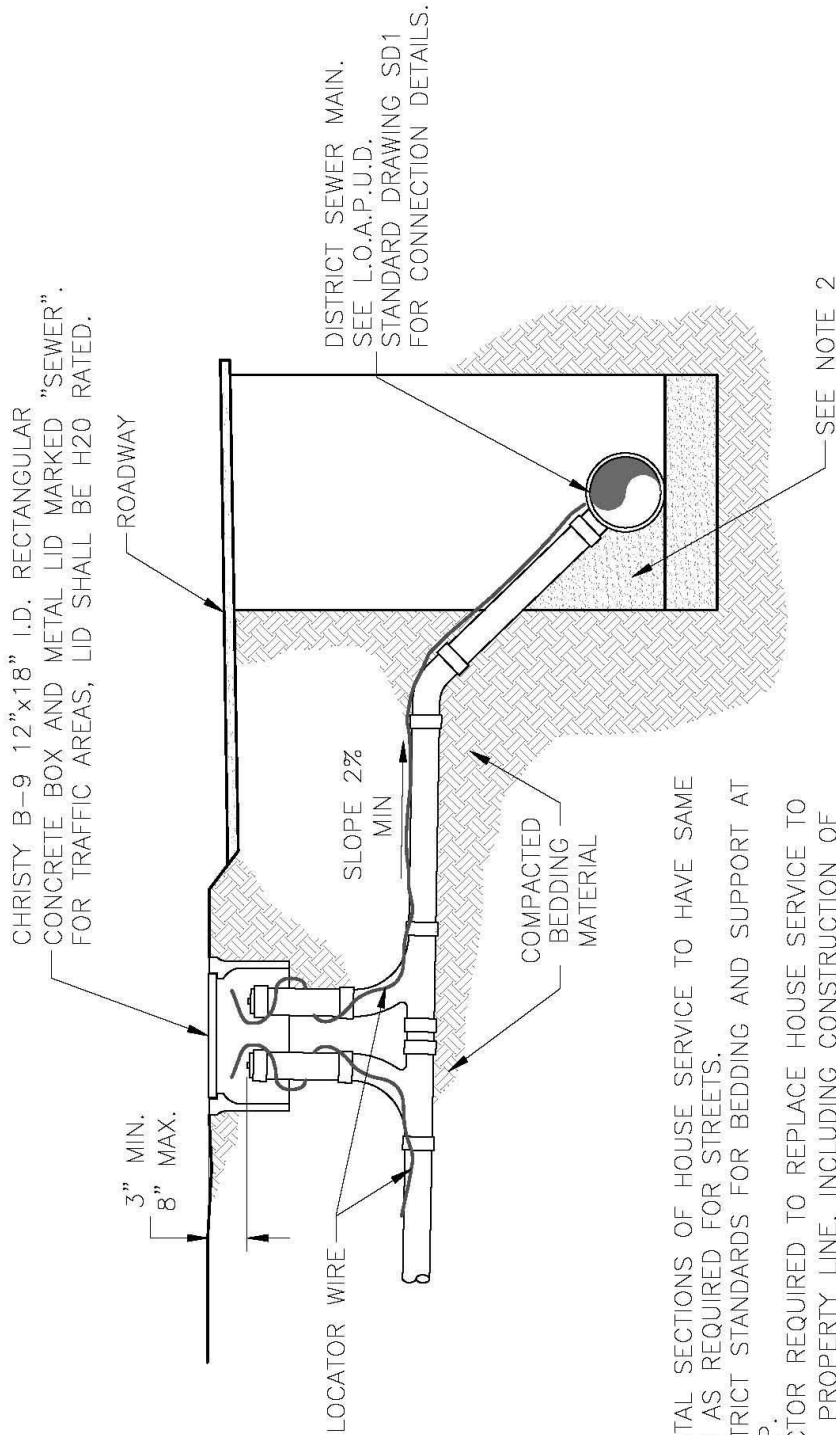
**Sauers Engineering, Inc.**  
 Civil and Environmental Engineers  
 440 Lower Grass Valley Road, Suite A, Nevada City, CA 95959  
 Telephone (530) 265-8021

**LAKE OROVILLE PUBLIC UTILITY DISTRICT**

1960 ELGIN STREET  
 OROVILLE, CA 95966  
 TEL. (530) 533-2000

**SEWER MAINTENANCE AND REPAIR RESPONSIBILITIES FOR EXISTING SEWER SERVICES**

**FIGURE 3.02**  
**FIGURE 5.02**



NOTES:

1. HORIZONTAL SECTIONS OF HOUSE SERVICE TO HAVE SAME BEDDING AS REQUIRED FOR STREETS.
2. SEE DISTRICT STANDARDS FOR BEDDING AND SUPPORT AT MAIN TAP.
3. CONTRACTOR REQUIRED TO REPLACE HOUSE SERVICE TO R/W OR PROPERTY LINE, INCLUDING CONSTRUCTION OF CLEANOUT WHERE REQUIRED.
4. LOCATOR WIRE ATTACHED TO TOP OF LATERAL PIPE, CONTINUOUS ALONG ENTIRE LENGTH OF LATERAL PIPE, BEGINNING AT BUILDING CLEANOUT AND TERMINATING AT PROPERTY LINE CLEANOUT

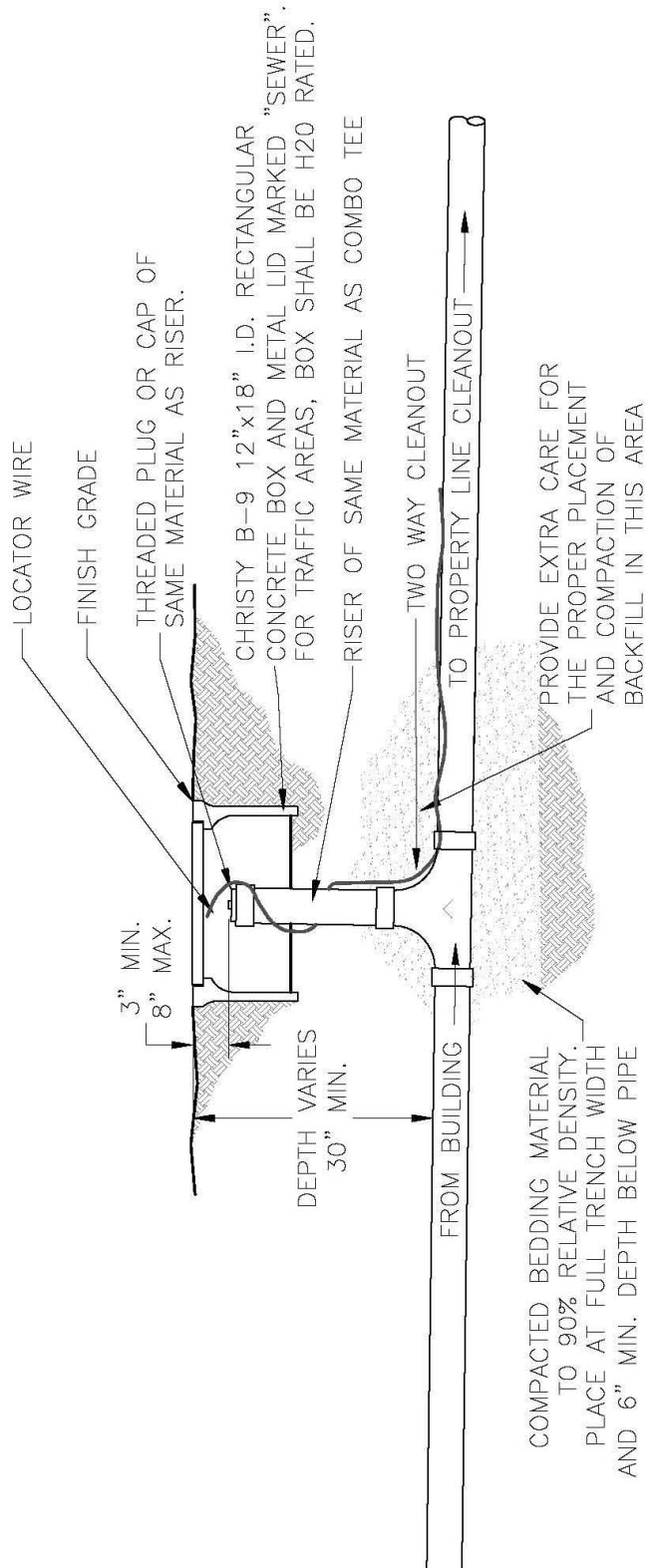
APPROVED: DECEMBER 2011

**Sauers Engineering, Inc.**  
 Civil and Environmental Engineers  
 440 Lower Grass Valley Road, Suite A, Nevada City, CA 95959  
 Telephone (530) 268-8021

**LAKE OROVILLE AREA**  
 PUBLIC UTILITY DISTRICT  
 1960 ELGIN STREET  
 OROVILLE, CA 95966  
 TEL. (530) 533-2000

GRAVITY SEWER SERVICE CONNECTION DETAIL  
 FIGURE 5.03





APPROVED: DECEMBER 2011

FIGURE  
5.04

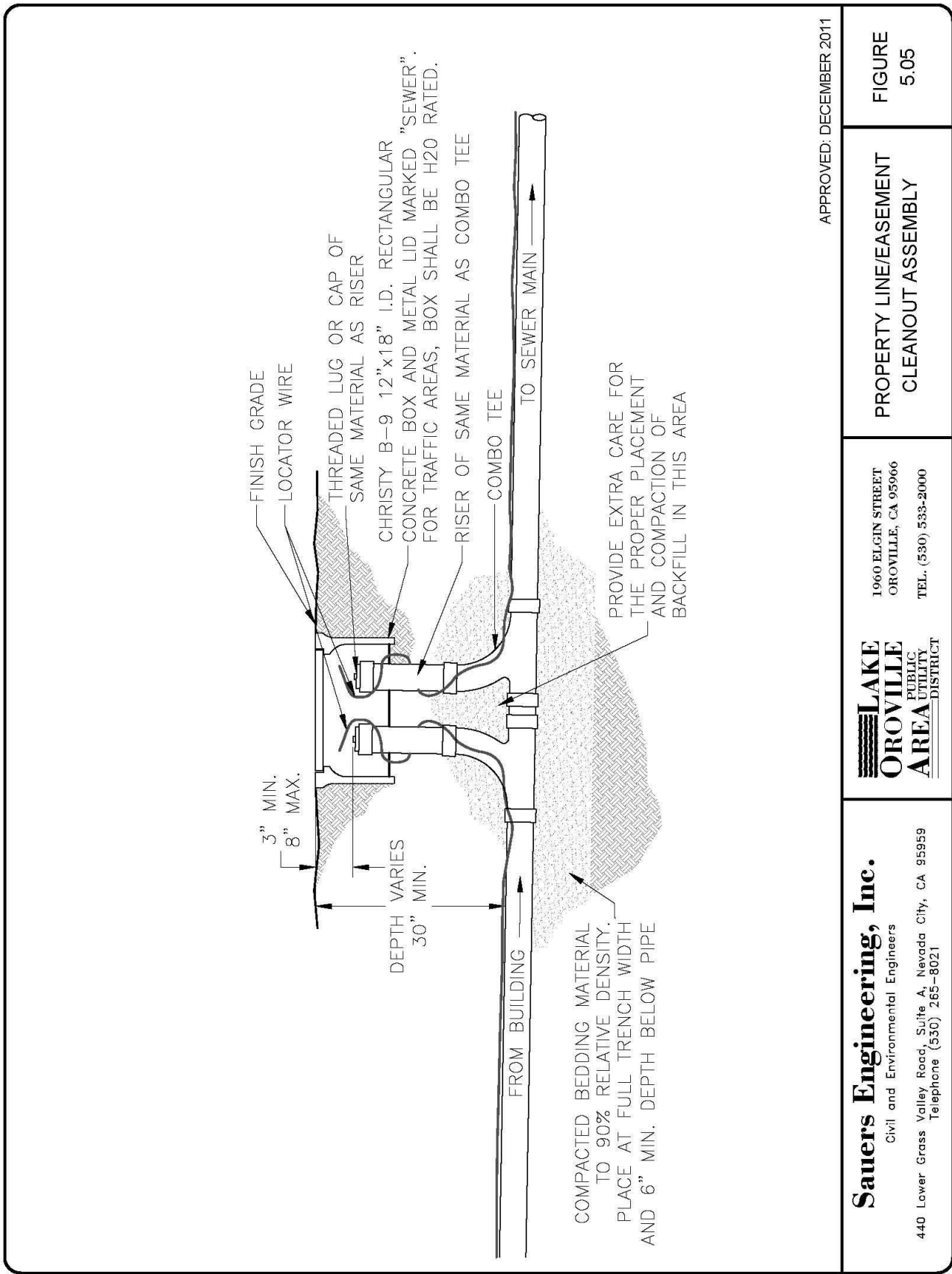
BUILDING CLEANOUT -  
TWO-WAY

1960 ELGIN STREET  
OROVILLE, CA 95966  
TEL. (530) 533-2000



**Sauers Engineering, Inc.**

Civil and Environmental Engineers  
440 Lower Grass Valley Road, Suite A, Nevada City, CA 95959  
Telephone (530) 265-8021



**Sauers Engineering, Inc.**  
 Civil and Environmental Engineers  
 440 Lower Grass Valley Road, Suite A, Nevada City, CA 95959  
 Telephone (530) 265-8021

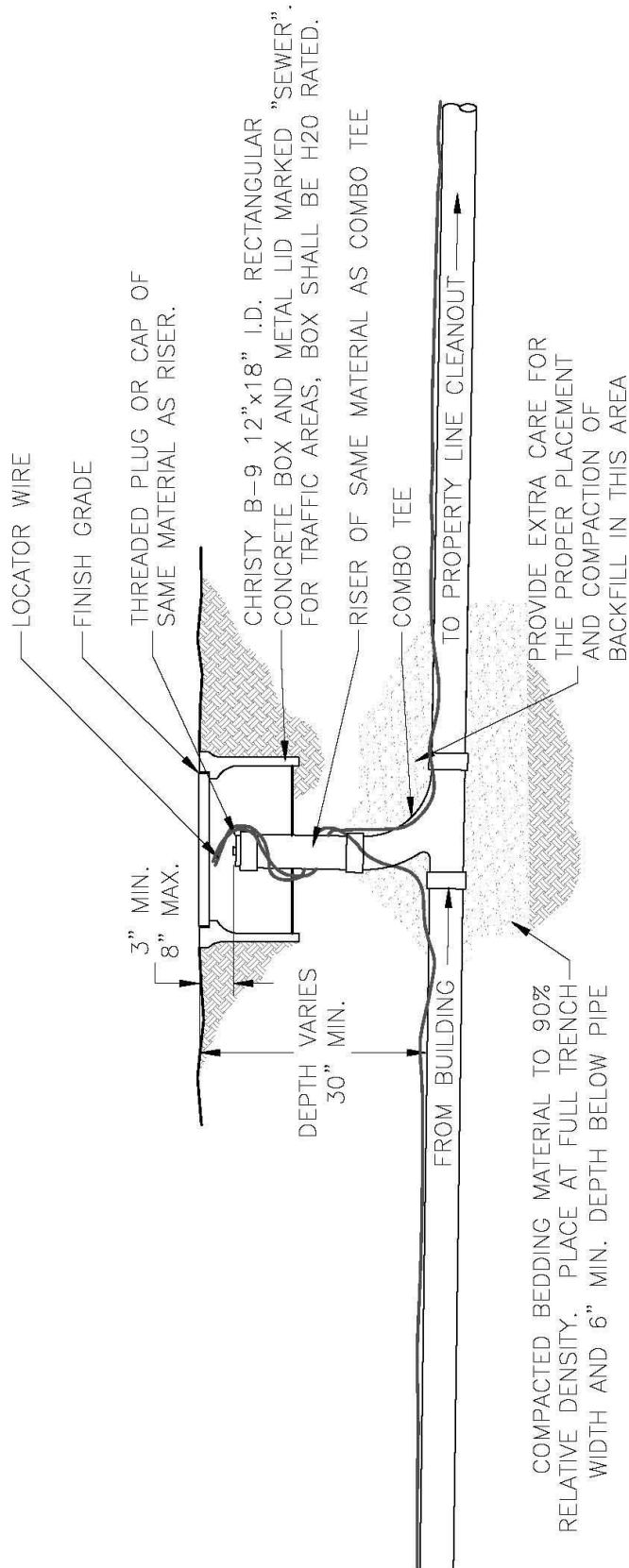


1960 ELGIN STREET  
 OROVILLE, CA 95966  
 TEL. (530) 533-2000

PROPERTY LINE/EASEMENT  
 CLEANOUT ASSEMBLY

FIGURE  
 5.05

NOTE:  
FOR LATERAL SPANS GREATER  
THAN 100', WHERE ADDITIONAL  
CLEANOUTS ARE REQUIRED



COMPACTED BEDDING MATERIAL TO 90%  
RELATIVE DENSITY. PLACE AT FULL TRENCH  
WIDTH AND 6" MIN. DEPTH BELOW PIPE

APPROVED: DECEMBER 2011

FIGURE  
5.06

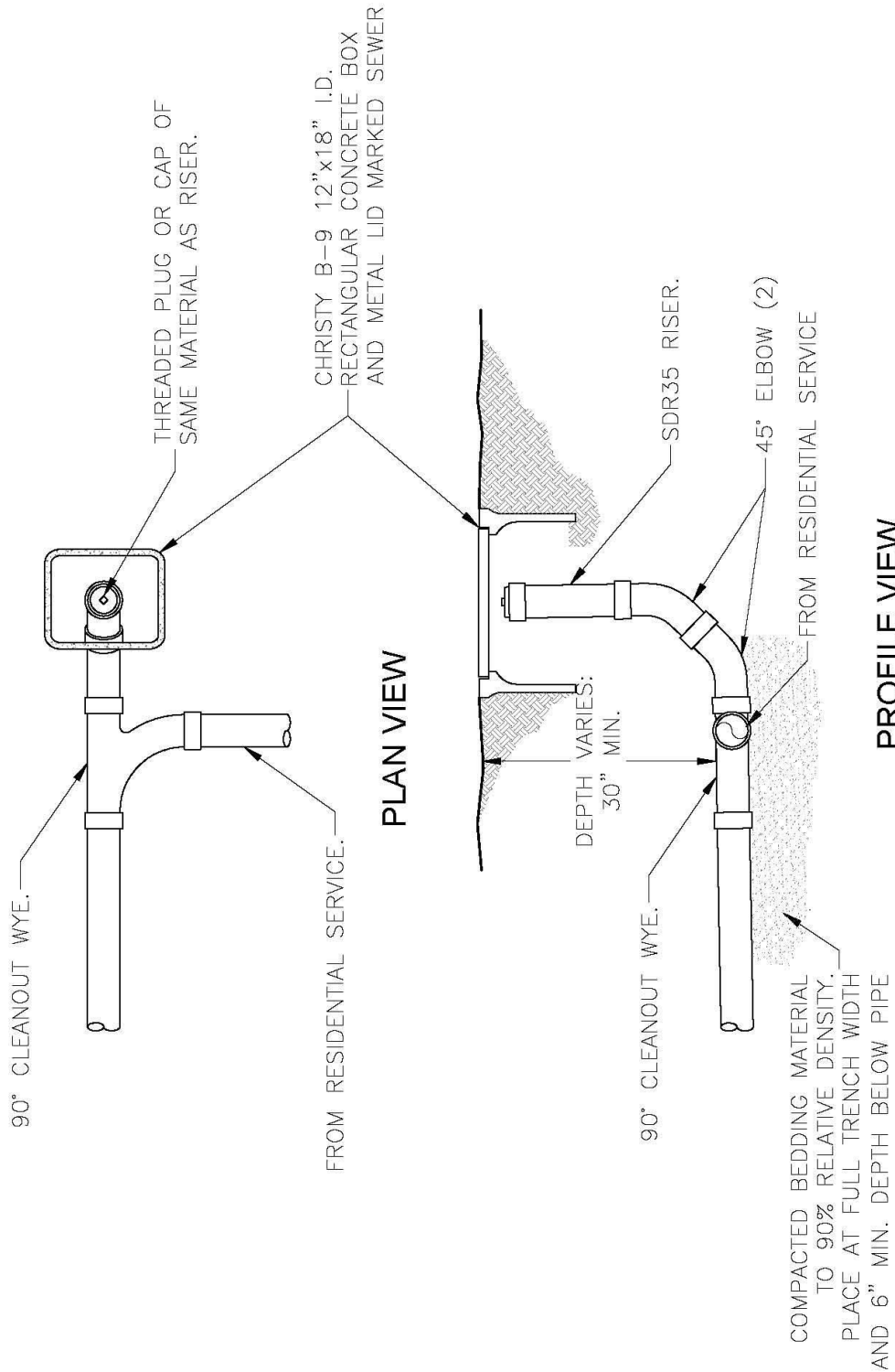
SINGLE CLEANOUT  
ASSEMBLY

1960 ELGIN STREET  
OROVILLE, CA 95966  
TEL. (530) 533-2000



**Sauers Engineering, Inc.**

Civil and Environmental Engineers  
440 Lower Grass Valley Road, Suite A, Nevada City, CA 95959  
Telephone (530) 263-8021



PLAN VIEW

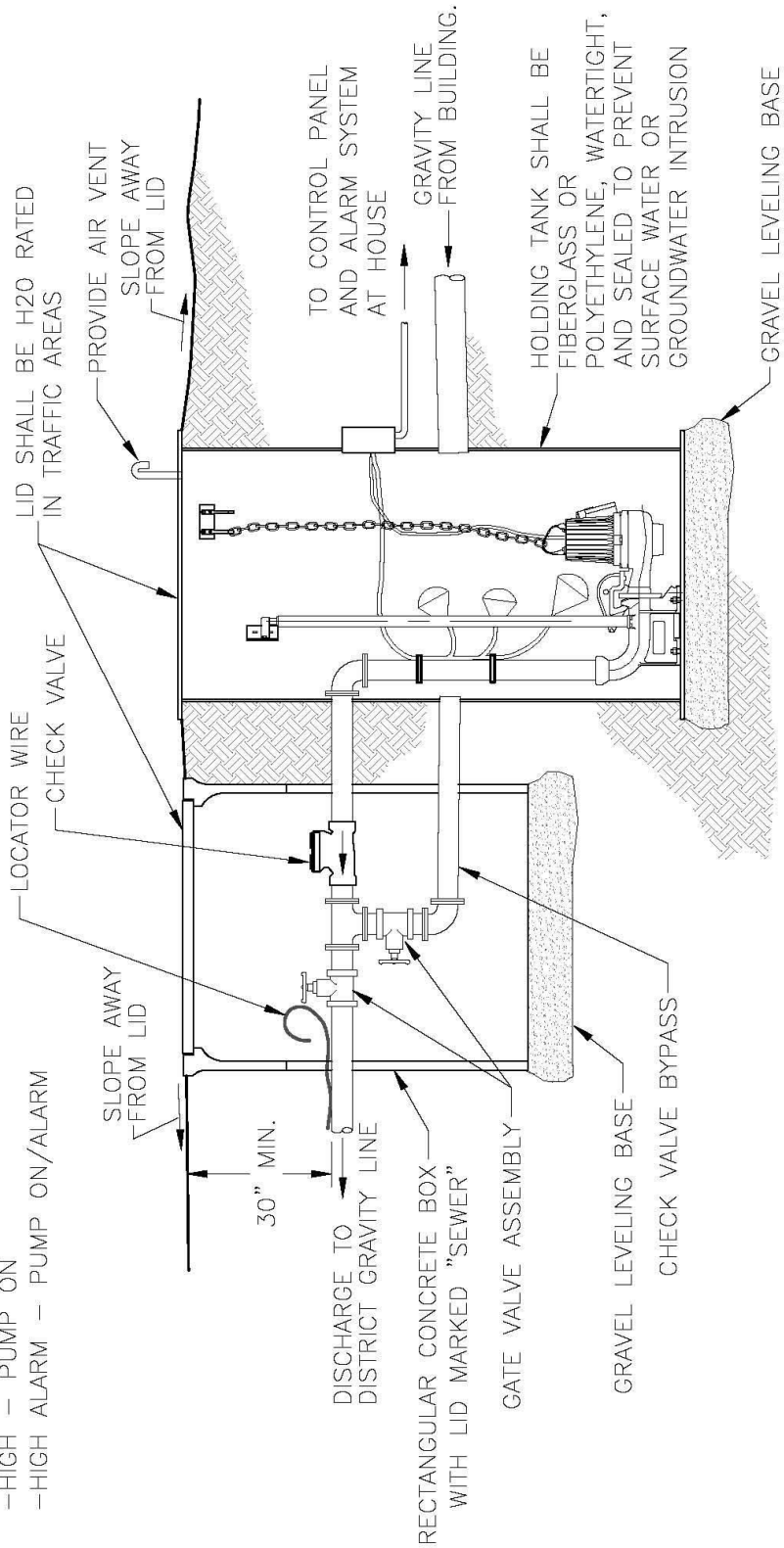
PROFILE VIEW

APPROVED: DECEMBER 2011

<p><b>Sauers Engineering, Inc.</b> Civil and Environmental Engineers 440 Lower Grass Valley Road, Suite A, Nevada City, CA 95959 Telephone (530) 263-8021</p>	<p><b>LAKE OROVILLE AREA PUBLIC UTILITY DISTRICT</b> 1960 ELGIN STREET OROVILLE, CA 95966 TEL. (530) 533-2000</p>	<p>SPECIAL SEWER CLEANOUT - 90°</p>	<p>FIGURE 5.07</p>
---	---	---	------------------------

NOTES:

1. INSTALL VAULT AND PUMP AS SHOWN AND IN ACCORDANCE WITH THE BUTTE COUNTY STANDARDS.
2. PUMP CONTROL SHALL HAVE THREE LEVEL SENSING SWITCHES:
  - LOW - PUMP OFF
  - HIGH - PUMP ON
  - HIGH ALARM - PUMP ON/ALARM



APPROVED: DECEMBER 2011

**Sauers Engineering, Inc.**

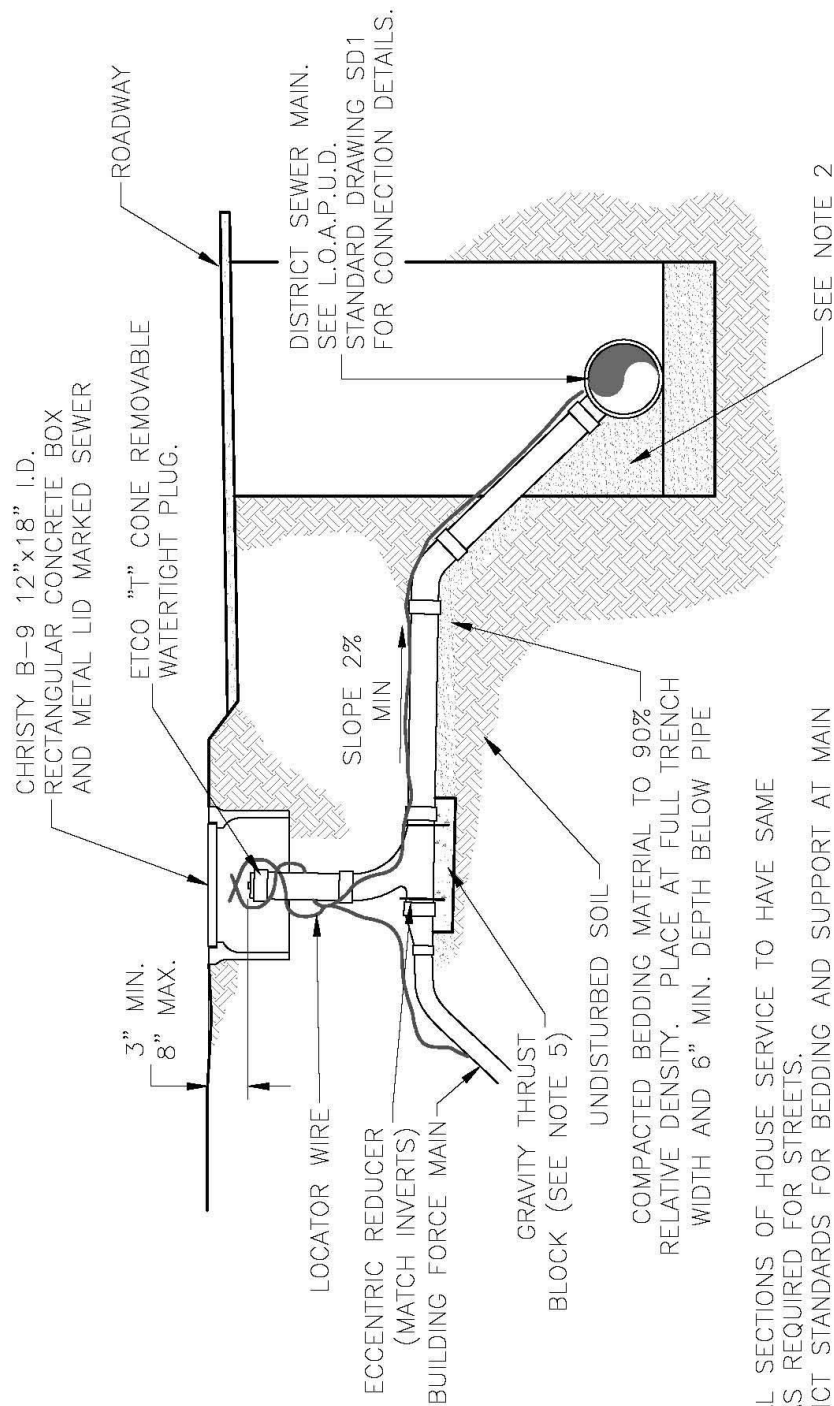
Civil and Environmental Engineers  
 440 Lower Grass Valley Road, Suite A, Nevada City, CA 95959  
 Telephone (530) 265-8021



1960 ELGIN STREET  
 OROVILLE, CA 95966  
 TEL. (530) 533-2000

**SINGLE RESIDENTIAL  
 PUMP SYSTEM**

**FIGURE  
 5.08**



NOTES:

1. HORIZONTAL SECTIONS OF HOUSE SERVICE TO HAVE SAME BEDDING AS REQUIRED FOR STREETS.
2. SEE DISTRICT STANDARDS FOR BEDDING AND SUPPORT AT MAIN TAP.
3. CONTRACTOR REQUIRED TO REPLACE HOUSE SERVICE TO R/W OR PROPERTY LINE, INCLUDING CONSTRUCTION OF CLEANOUT WHERE REQUIRED.
4. LOCATOR WIRE ATTACHED TO TOP OF FORCE MAIN. CONTINUOUS ALONG ENTIRE LENGTH OF FORCE MAIN, BEGINNING AT BUILDING CLEANOUT AND TERMINATING AT PROPERTY LINE CLEANOUT.
5. SECURE WYE FITTING WITH 1/2" ϕ REBAR STRAP. HOOK ENDS OF REBAR WITHIN THRUST BLOCK

APPROVED: DECEMBER 2011

**Sauers Engineering, Inc.**

Civil and Environmental Engineers

440 Lower Grass Valley Road, Suite A, Nevada City, CA 95959  
Telephone (530) 265-8021



1960 ELGIN STREET  
OROVILLE, CA 95966  
TEL. (530) 533-2000

**PRESSURE SEWER SERVICE  
CONNECTION DETAIL**

**FIGURE  
5.09**

CHRISTY B-9 18"x27.5" I.D. RECTANGULAR  
CONCRETE BOX AND METAL LID MARKED "SEWER".  
FOR TRAFFIC AREAS, BOX SHALL BE H20 RATED.

CLEANOUT WITH PRESSURE  
RELIEF POP-OFF VALVE

4" MIN.  
8" MAX.

DEPTH VARIES  
30" MIN.

FINISH GRADE  
LOCATOR WIRE

THREADED LUG OR CAP OF  
SAME MATERIAL AS RISER

DISTRICT MAY ALSO REQUIRE PRESSURE  
RELIEF POP-OFF VALVE ON COLLECTION  
SYSTEM SIDE DEPENDING ON LOCATION.

RISER OF SAME MATERIAL AS COMBO TEE

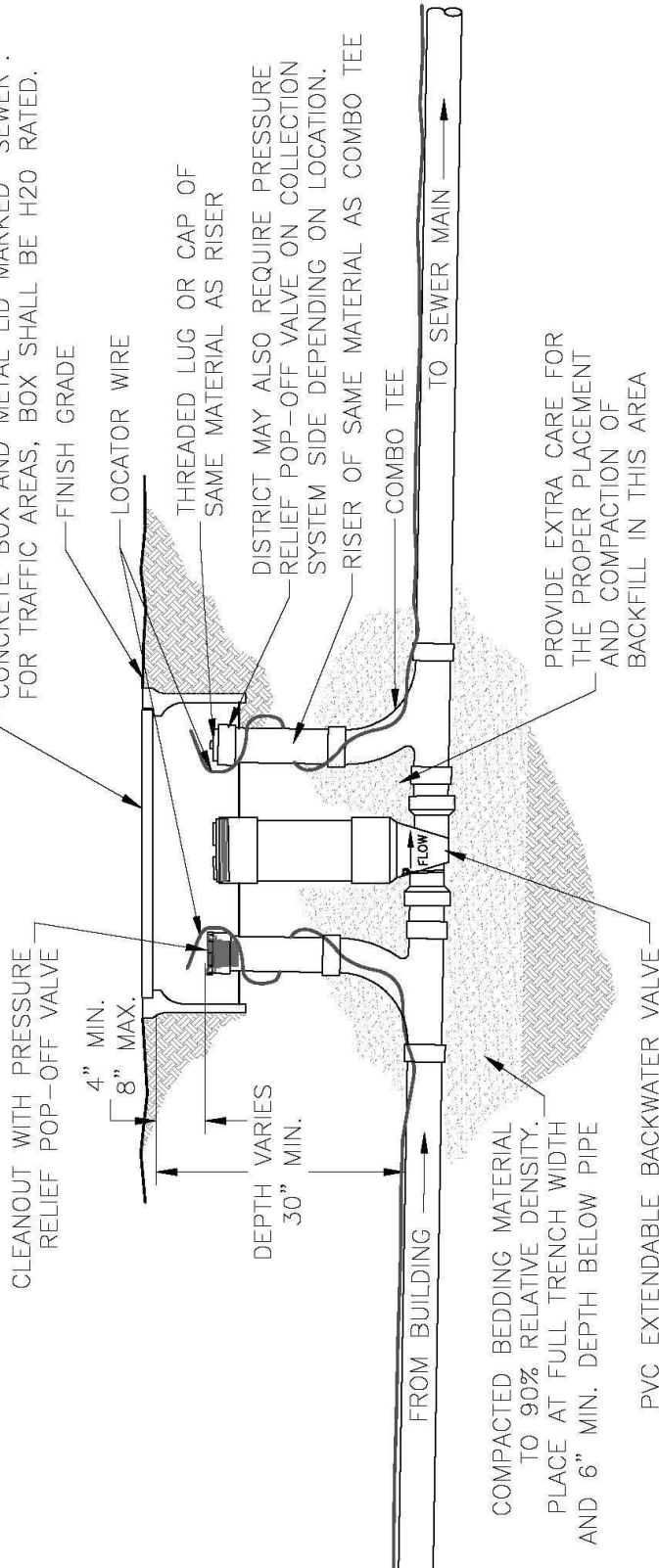
COMBO TEE

TO SEWER MAIN

COMPACTED BEDDING MATERIAL  
TO 90% RELATIVE DENSITY.  
PLACE AT FULL TRENCH WIDTH  
AND 6" MIN. DEPTH BELOW PIPE

PVC EXTENDABLE BACKWATER VALVE

PROVIDE EXTRA CARE FOR  
THE PROPER PLACEMENT  
AND COMPACTION OF  
BACKFILL IN THIS AREA



APPROVED: DECEMBER 2011

**Sauers Engineering, Inc.**

Civil and Environmental Engineers

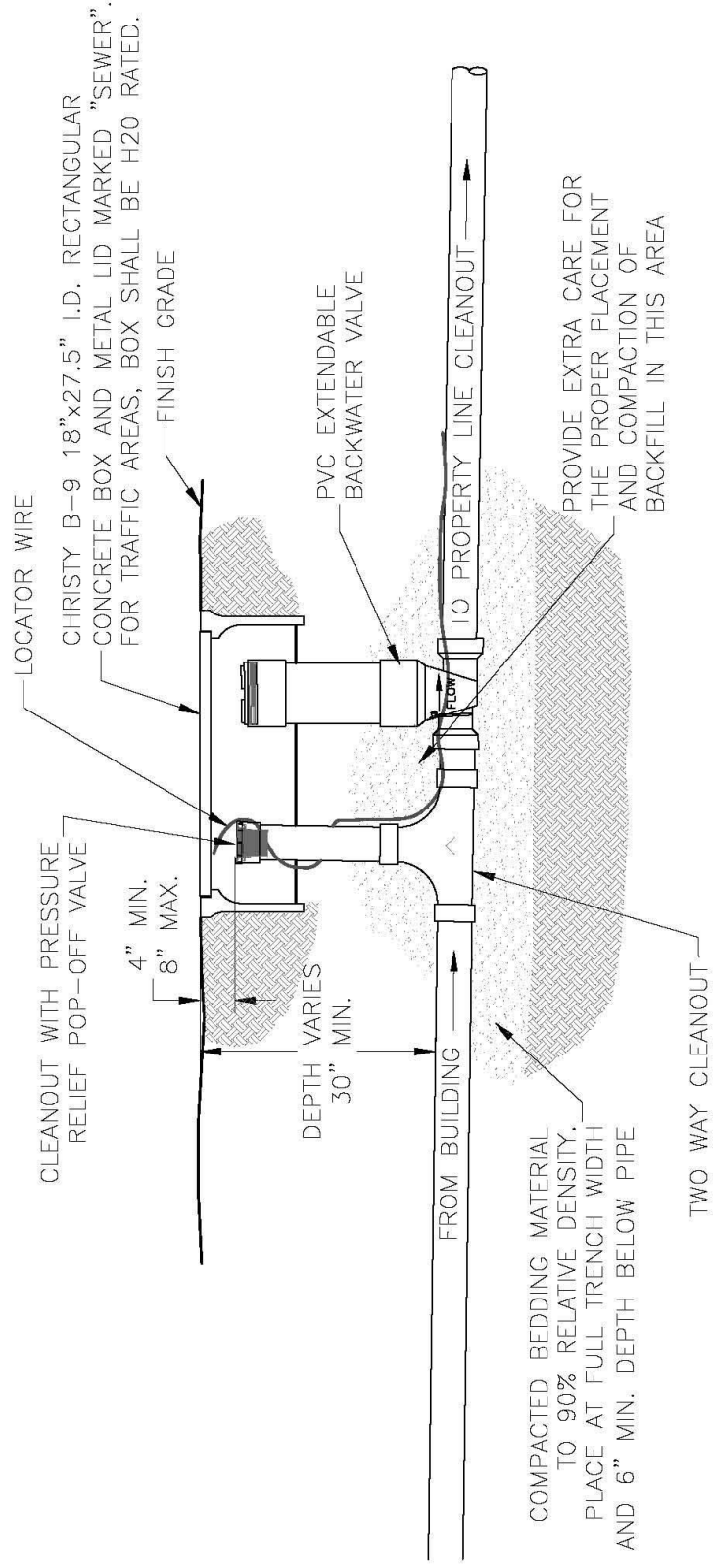
440 Lower Grass Valley Road, Suite A, Nevada City, CA 95959  
Telephone (530) 265-8021

**LAKE OROVILLE AREA**  
PUBLIC UTILITY DISTRICT

1960 ELGIN STREET  
OROVILLE, CA 95966  
TEL. (530) 533-2000

SERVICE BACKFLOW  
PREVENTION AND OVERFLOW  
CONTROL DEVICE AT  
PROPERTY LINE

FIGURE  
5.10



COMPACTED BEDDING MATERIAL TO 90% RELATIVE DENSITY. PLACE AT FULL TRENCH WIDTH AND 6" MIN. DEPTH BELOW PIPE

PROVIDE EXTRA CARE FOR THE PROPER PLACEMENT AND COMPACTION OF BACKFILL IN THIS AREA

APPROVED: DECEMBER 2011

**Sauers Engineering, Inc.**  
 Civil and Environmental Engineers  
 440 Lower Grass Valley Road, Suite A, Nevada City, CA 95959  
 Telephone (530) 265-8021

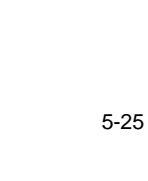
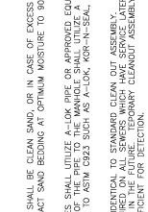
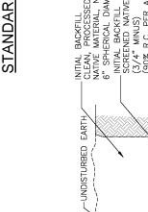
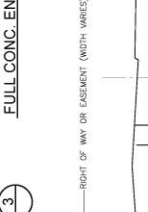
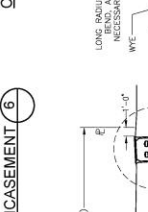
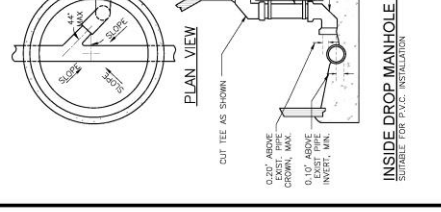
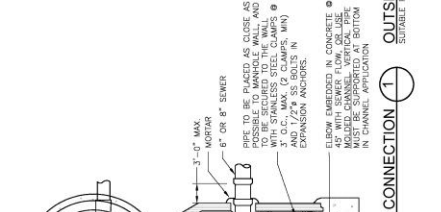
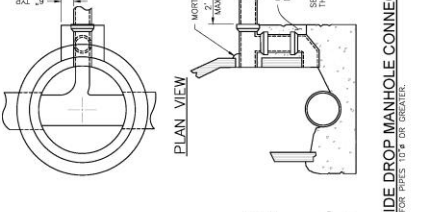
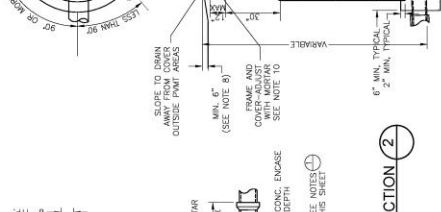
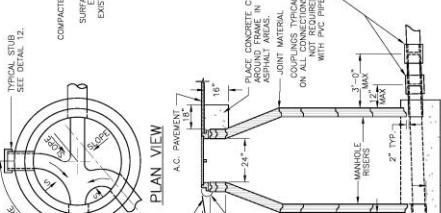
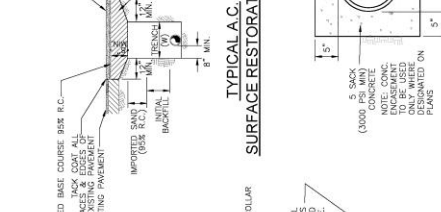
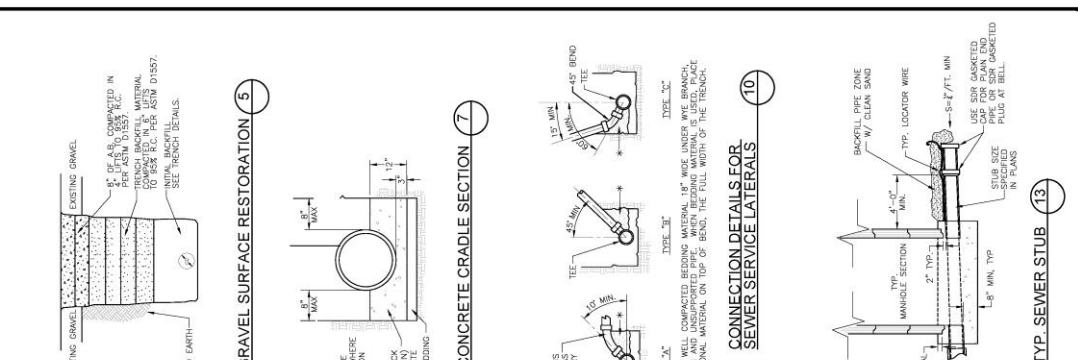


1960 ELGIN STREET  
 OROVILLE, CA 95966  
 TEL. (530) 533-2000

**SERVICE BACKFLOW PREVENTION AND OVERFLOW CONTROL DEVICE AT BUILDING**

**FIGURE 5.11**





**GENERAL NOTES**

1. ALL TRENCHES AND BACKFILL SHALL BE CLEAN BAYS, USE IN CASE OF EXCESS WATER PER ASTM D-1557.
2. CONNECTIONS OF PIPE TO MANHOLES SHALL UTILIZE A-LOCK PIPE OR APPROVED EQUAL.
3. TEMPORARY CLEAN OUT SHALL BE IDENTICAL TO STANDARD CLEAN OUT ASSEMBLY AND ARE PLANNED FOR EXTENSION IN THE FUTURE. TEMPORARY CLEANOUT ASSEMBLIES SHALL INCLUDE LOCATOR WIRE SUFFICIENT FOR DETECTION.
4. ALL TRENCHES SHALL BE PROTECTED FROM WATER IN THE TRENCH BY LIGHT AND SPECIFIC TYPE OF MATERIAL TO BE SPECIFIED BY LOA-PUD ENGINEER. CONCRETE EROSION PROTECTION SHALL BE PROVIDED FOR ALL TRENCHES.
5. PIPE SHALL STOP AT INSIDE FACE OF MANHOLE FOR SANDS BE CONDENSING THROUGH MANHOLE. IF PIPE LAND CONTINUOUS, TOP PA'S SHALL BE REMOVED AFTER BASE IS POWDED.
6. USE OF ECCENTRIC COUPLERS ON SHALLOW (FLAT TOP) MANHOLES SUBJECT TO APPROVAL BY LOA-PUD ENGINEER.
7. FIBERGLASS MANHOLES WILL BE PERMITTED.
8. MANHOLE UDS SHALL EXTEND 12\"/>

**CONNECTION DETAILS FOR SEWER SERVICE LATERALS**

TYPE "A"  
TYPE "B"  
TYPE "C"

LONG RADIUS BEND NECESSARY  
WYE  
TEE  
45° BEND  
1.5\"/>

**SEWER SERVICE GEOMETRY**

SLOPE TO DRAIN AWAY FROM COVER TO ADJACENT DRIVEWAYS  
3\"/>

12\"/> VARIES 6\"/>-12\"/>  
A.C. PAVEMENT  
R.C. CONCRETE  
WATER TIGHT END PLUG (REMOVABLE)  
EXTRA CARE TO BE TAKEN TO PROPERLY ADJACENT AND COMPACTION OF ALL EARTH IN THIS AREA  
45° BEND  
2\"/> MIN. TYPICAL  
8\"/> MIN. TYP.

**STANDARD CLEANOUT ASSEMBLY**

SEE NOTE 3

FOR BRIDGES PLANS SCALE 1/2\"/> IN INCHES  
FOR OTHER PLANS SCALE 1\"/> IN INCHES  
VERT. SCALE: 1\"/> IN INCHES  
HORIZ. SCALE: 1\"/> IN INCHES

**SEWER SERVICE GEOMETRY**

SLOPE TO DRAIN AWAY FROM COVER TO ADJACENT DRIVEWAYS  
3\"/>

12\"/> VARIES 6\"/>-12\"/>  
A.C. PAVEMENT  
R.C. CONCRETE  
WATER TIGHT END PLUG (REMOVABLE)  
EXTRA CARE TO BE TAKEN TO PROPERLY ADJACENT AND COMPACTION OF ALL EARTH IN THIS AREA  
45° BEND  
2\"/> MIN. TYPICAL  
8\"/> MIN. TYP.

**CONNECTION DETAILS FOR SEWER SERVICE LATERALS**

TYPE "A"  
TYPE "B"  
TYPE "C"

LONG RADIUS BEND NECESSARY  
WYE  
TEE  
45° BEND  
1.5\"/>

**SEWER SERVICE GEOMETRY**

SLOPE TO DRAIN AWAY FROM COVER TO ADJACENT DRIVEWAYS  
3\"/>

12\"/> VARIES 6\"/>-12\"/>  
A.C. PAVEMENT  
R.C. CONCRETE  
WATER TIGHT END PLUG (REMOVABLE)  
EXTRA CARE TO BE TAKEN TO PROPERLY ADJACENT AND COMPACTION OF ALL EARTH IN THIS AREA  
45° BEND  
2\"/> MIN. TYPICAL  
8\"/> MIN. TYP.

**STANDARD CLEANOUT ASSEMBLY**

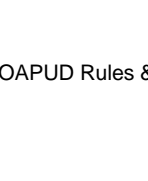
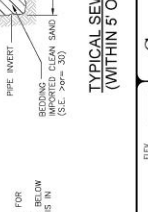
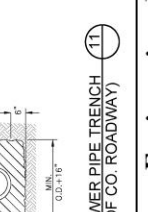
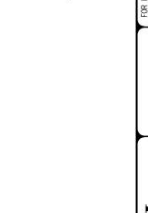
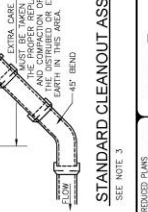
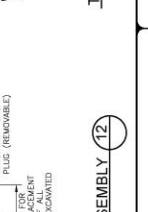
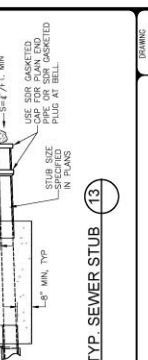
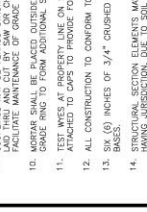
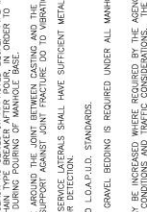
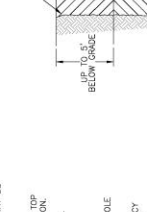
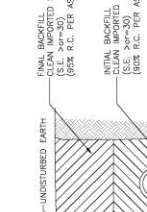
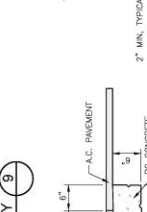
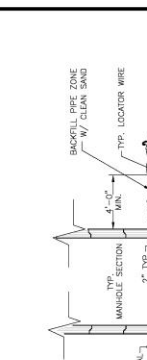
SEE NOTE 3

FOR BRIDGES PLANS SCALE 1/2\"/> IN INCHES  
FOR OTHER PLANS SCALE 1\"/> IN INCHES  
VERT. SCALE: 1\"/> IN INCHES  
HORIZ. SCALE: 1\"/> IN INCHES

**SEWER SERVICE GEOMETRY**

SLOPE TO DRAIN AWAY FROM COVER TO ADJACENT DRIVEWAYS  
3\"/>

12\"/> VARIES 6\"/>-12\"/>  
A.C. PAVEMENT  
R.C. CONCRETE  
WATER TIGHT END PLUG (REMOVABLE)  
EXTRA CARE TO BE TAKEN TO PROPERLY ADJACENT AND COMPACTION OF ALL EARTH IN THIS AREA  
45° BEND  
2\"/> MIN. TYPICAL  
8\"/> MIN. TYP.



DESIGNED BY	DATE
DRAWN BY	DATE
CHECKED BY	DATE
APPROVED BY	DATE
PROJECT NO.	DATE
DATE	DATE

FOR BRIDGES PLANS SCALE 1/2\"/> IN INCHES  
FOR OTHER PLANS SCALE 1\"/> IN INCHES  
VERT. SCALE: 1\"/> IN INCHES  
HORIZ. SCALE: 1\"/> IN INCHES

**Sauers Engineering, Inc.**  
Civil and Environmental Engineers  
440 Lower Gross Valley Road, Suite A, Nevada City, CA 95959  
Telephone (530) 765-8071

**LAKE OROVILLE AREA AUTHORITY DISTRICT**  
1960 HELEN STREET  
OROVILLE, CA 95966  
TEL. (530) 533-2000

**LOAPUD STANDARD DETAILS**

**TYP. SEWER STUB**

**CONNECTION DETAILS FOR SEWER SERVICE LATERALS**

**SEWER SERVICE GEOMETRY**

**STANDARD CLEANOUT ASSEMBLY**

