

**PROCEDURES FOR PRIVATE, INDIVIDUAL LOT, SEWAGE PUMP
APPROVAL AND INSTALLATION**

1.0 BEFORE THE DESIGN PHASE BEGINS:

- 1.1 Contact the Central Contra Costa Sanitary District (Central San) Permit Counter at (925) 229-7371 for information, applications, fee quotes, etc.
- 1.2 Provide Central San with sufficient information to determine that a pump is required for sewer service and that a gravity system which meets Central San standards cannot be installed.
- 1.3 If a sewage pump is required, the property owner of the site or their representative (engineer, supplier, etc.) shall design the sewage pumping system.
- 1.4 A pump installed within the Central San service area shall be reviewed and approved by Central San prior to installation.

2.0 DESIGN / REVIEW PHASE:

- 2.1 The owner/representative shall obtain an information packet from the Central San Permit Counter or by calling (925) 229-7371.
- 2.2 The owner/representative shall prepare a plot plan/sketch for the site. The plot plan/sketch shall include a plan and profile of the private pump and pressure sewer system with sufficient information to determine a system curve. The pressure sewer diameter and type shall be specified on the profile. If the pressure sewer will connect to a private gravity sewer the private gravity sewer pipe diameter, slope, distances and elevations are required on the plot plan/sketch. The pump manufacturer, model number, and pump curve shall also be submitted.
- 2.3 The owner/representative shall prepare a sewage pumping system design to meet Central San requirements. See Central San Standard Specifications for Design and Construction.
- 2.4 The owner/representative shall complete and submit the Individual Lot Sewage Pumping System sheet, pumping system information sheet (including pump head calculations), plot plan/sketch, pump curve, catalog cut sheets to show the equipment that will be installed at the site, and electrical drawings showing the required controls and alarms. The Individual Lot Sewage Pumping System plan check fee shall be paid with the first submittal to Central San.
- 2.5 The Engineer at Central San will review the submitted information, request additional information if necessary, and/or require changes for conformance with Central San's specifications.

3.0 CONSTRUCTION PHASE:

- 3.1 The Owner shall engage a properly licensed Contractor to install the pump system, including electrical.
- 3.2 The Owner or Contractor shall pay all applicable fees and charges. Please contact the Central San Permit Counter at (925) 229-7371 to receive a quote for the current amount of these fees.
- 3.3 For exterior pump installations, the Contractor shall obtain a pump system installation permit from Central San, and an electrical inspection permit from the city or county building code enforcement department prior to construction. All sewer work outside the footprint shall be inspected by Central San. The properly licensed Contractor shall pull the pump system permit prior to starting any sewer work, including trenching and excavating.
- 3.4 For interior pump installations, the local building department shall permit and inspect the pump installation. If any sewer work is to occur outside the foot print of the building, a Central San permit shall be pulled prior to the start of any exterior sewer work, including trenching and excavating. All sewer work outside the footprint shall be inspected by Central San.
- 3.5 The Contractor shall notify Central San inspection staff at (925) 229-7373 at least one day prior to starting any work.
- 3.6 The Contractor shall notify the Central San inspector of the specific construction schedule. The Central San Inspector will specify the points during the installation process when inspection is required
- 3.7 At least one business day prior to the day each phase of the work is ready for inspection, the Contractor shall call the Central San Inspection Section at (925) 229-7373 to request that the inspection be scheduled.

SEWAGE PUMPING SYSTEM REQUIREMENTS

GENERAL

All design and installation shall be done in conformance with the general requirements of Cal OSHA, current applicable electrical, plumbing, and building codes, and Central Contra Costa Sanitary District Code, Standard Specifications, procedures and requirements.

The minimum requirements for a private, individual lot, outside sewage pumping system are specified in the following paragraphs. Central San accepts no responsibility for the design, operation, and maintenance of such privately owned and operated systems.

All equipment and accessories shall be standard manufactured items, and those coming in direct contact with sewage shall be specifically manufactured for sewage use by a company regularly engaged in the manufacture and assembly of similar units for a minimum of five (5) years. Manufacturer's specifications for pump systems, including electrical controllers, sumps, etc., shall be submitted to Central San for review and approval prior to the start of any work.

For uses other than service to an individual residential unit, installations require dual pumps (duplex systems) designed to function independently in case of overload or mechanical failure. Duplex systems may be used for individual residential units at the owner's option.

PUMPS

Unless allowed by Central San by "Special Approval," the pump shall be approved for sewage service by a Nationally Recognized Testing Laboratory (NRTL) such as Underwriters Laboratories (UL Listed) and/or CSA, shall carry an NRTL label for this use, and shall be one of the types described below:

1. Centrifugal, non-clog, vertical column with enclosed shaft.
2. Submersible, centrifugal, non-clog.
3. Submersible, centrifugal, grinder pump.
4. Positive displacement, grinder pump.

The pump selected shall produce a velocity in the force main of 3 to 5 feet per second when pumping against the non-surcharged head at sump Low Water Level (LWL). If the pump discharge line is to be connected to the house plumbing, a grinder pump with a maximum 1-1/2 inch discharge must be used and the maximum flow rate shall not exceed 20 gpm. If the pump discharge line connects to an outside side sewer the maximum flow rate shall be 50 gpm.

If pump type 1) or 2) is used, the impeller shall be a non-clog type and shall be capable of passing a 2-inch sphere, and the pump discharge line shall be at least 2-inches in diameter.

If pump Type 3) or 4) is used, the pump discharge shall be at least 1-1/4 inches in diameter. The grinder shall be constructed of long-lasting, low maintenance material that is capable of reducing all components in normal domestic sewage (including "foreign objects," such as

paper, wood, plastic, glass, rubber, etc.) to finely divided particles which will pass freely through the passages of the pump, force main, and fittings.

For installations with dual pumps (duplex systems), an alternator shall be provided to automatically alternate the starting of the lead pump on each operating cycle so that each pump is assured of equal operating time. An alarm shall be activated in the event the lead pump is unable to maintain proper level and the lag pump is called to run.

PUMP SUMP

The sump shall be cylindrical in configuration with a minimum diameter of 36-inches. Sump pumps serving an entire single family residence shall have a minimum volume of 60 gallons.

The pump sump shall be made of one of the following materials:

1. Asphalt-coated steel (prefabricated 3/16-inch steel plate); with tank surface protected with a minimum of 0.10-inch thick corrosion barrier;
2. Filament wound fiberglass, minimum ¼-inch wall thickness with tank interior surface protected with a minimum of 0.10-inch thick, resin-rich, corrosion barrier;
3. PVC T-lock lined reinforced concrete pipe; or
4. High-density polyethylene;
5. A Central San-approved alternate.

Sumps with an anti-floatation flange shall be installed, according to manufacturers recommendations, if the calculated buoyant force exceeds 0.75 times the weight of the sump assuming the groundwater surface is one foot (1') below existing grade. As a minimum, the collar shall be weighted with 0.2 cubic yards of concrete ballast.

The sump shall have a 4-inch minimum inlet and an outlet at least the size of the pump discharge. The invert of the inlet shall be 6-inches above the High Water Alarm (HWA) set-point elevation. A standard cleanout with a backwater overflow prevention device shall be placed immediately upstream of the inlet stub of the sump.

The pump sump cover shall be epoxy coated steel plate (1/2 inch minimum thickness), heavy cast iron or manufacturer's standard molded plastic made to accommodate the pump (if column type) with an opening for the electrical conduits, vent, and an inspection plate. The cover shall be designed to support reasonably anticipated dead and live loads, including impact (H-20 required for traffic areas). The top of the cover shall be 3-inches above the surrounding ground surface in non-traffic areas. The sump cover shall be securely anchored to the pump sump by stainless steel bolts, and all joints between the component parts shall be sealed with gasketed covers that are gas tight.

MOTOR

Motors for column-type pumps shall be a drip-proof vertical type, totally enclosed, weather protected, and shall conform to the standards of NEMA.

Explosion proof pump and motor assemblies shall be approved by an NRTL and listed as explosion proof for Class 1 Division 1 groups C and D installations. Explosion proof pumps constructed with a separate thermal overload protection switch in the motor and a moisture-sensing seal failure probe shall have these devices connected to sensors and an alarm in the control panel according to the manufacturers requirements.

LEVEL CONTROLS

The pump's level controls shall be the ball and rod mechanical float switch mounted above the lid, or if mounted in the sump, or weighted type switches sealed within polypropylene shell(s) with neoprene-covered cable, pressure sensing diaphragm, or a Central San-approved alternate.

Each pump level control shall be wired directly and independently to terminals within the control panel. Each pump and the level control/alarm system shall be on separate electrical circuit breakers.

The following level control switches shall be provided:

1. A "High Water Alarm (HWA)" switch set to alarm a minimum of six inches (6") below the invert elevation of the gravity inlet sewer from the house and start the "lag" pump in a duplex system.
2. A "Pump On" (High Water Level (HWL)) switch set to start the single pump in a simplex system or the "lead" pump in a duplex system at a reasonable elevation below the HWA.
3. A "Pump Off" (Low Water Level (LWL)) switch set to turn off the pump(s) at a reasonable elevation above the LWA. The distance between the HWL and LWL shall be great enough to allow the pump to run for at least 30 seconds during each pump cycle.
4. A "Low Water Alarm" (LWA) switch wired to a redundant fail-safe circuit cutoff in the control panel that will shut off the pump at an elevation above the pump inlet and activate an alarm.

INTRINSICALLY SAFE CIRCUITS

Level control and alarm system circuit wiring connected to level switches in the tank shall be listed as intrinsically safe by an NRTL such as UL or CSA. The circuits shall reduce the power to the pilot devices and alarms to a value incapable of releasing sufficient thermal or electrical energy to ignite a hazardous environment. Separate conduits shall be run between the sump and the control panel for the level switch wiring and the motor power wiring. Both conduits will have explosion proof seals to prevent sewer gasses from migrating to the control panel.

ALARM SYSTEMS

The alarm system shall be mounted within the building(s) that is (are) served by the pump or in conjunction with the control panel adjacent to the pump and shall provide a visible pilot light and audible alarm with silencer to alert the occupant. An exterior alarm shall be for outside operation. The alarm system shall be on a separate circuit from the pump motor(s). When activated by a high water or low water condition, the alarm system shall remain latched until manually acknowledged and cleared.

CONTROL PANEL

The control panel shall be mounted external to the pump sump. The panel shall have a NEMA 1 classification when mounted inside a building or a minimum NEMA 3R classification when mounted outside a building.

ELECTRICAL WORK

All electrical work shall conform to the technical and permitting requirements of the applicable Building Code enforcement jurisdiction for the location of the house being served.

OPTIONAL HIGH-WATER OVERFLOW PIPE

The installation of a high-water overflow pipe is optional. If installed, the pipe shall extend to a sanitary sewer main. A check valve shall be installed in the line.

DISCHARGE LINE

The pressure portion of the discharge line, including the isolation valve, check valve, cleanout and mechanical couplings shall be in the same size as the pump discharge line. The valves and discharge line connecting the gate valve, check valve, cleanout and mechanical couplings inside the sump shall be DWV brass, copper or galvanized steel pipe (SCH 40), or approved alternative. The isolation valve shall be operable from grade and shall be placed in a utility box if outside the sump.

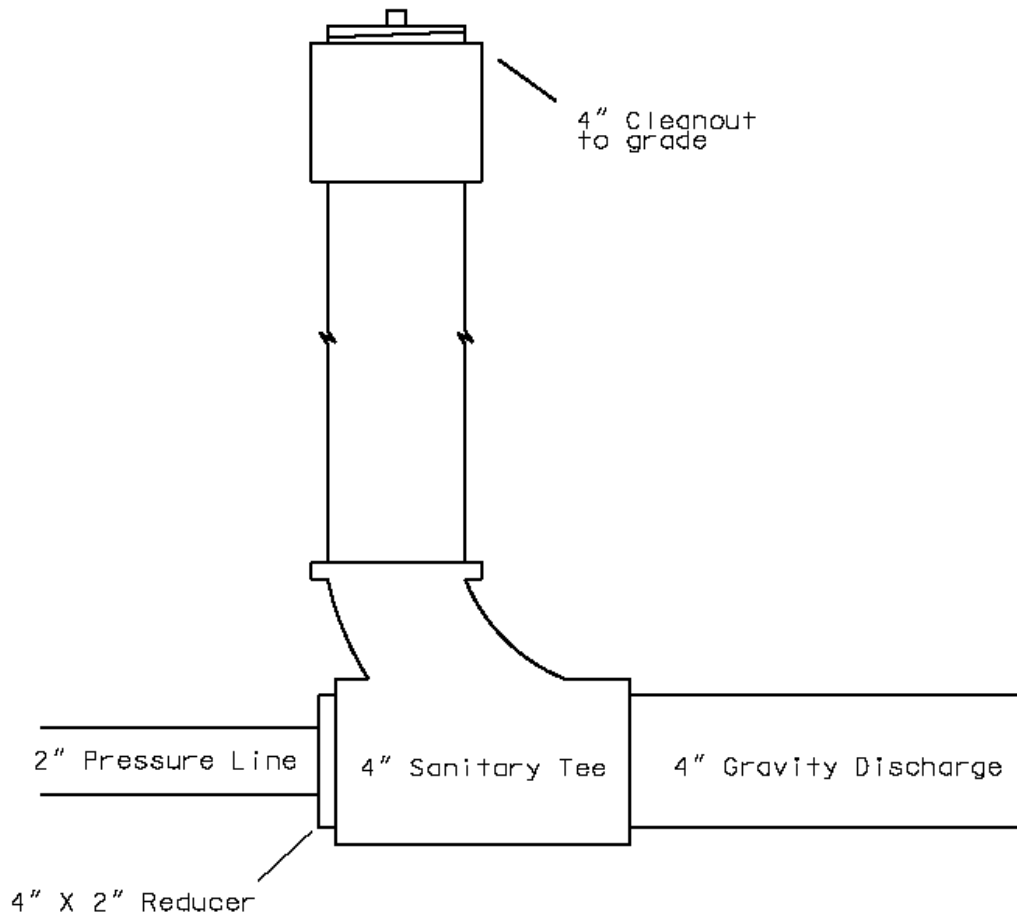
The remaining portion of the pressure discharge line to the gravity private side sewer shall be PVC (SCH 40), or high-density polyethylene (SDR 11) conforming to Central San's Standard Specifications and shall meet Central San depth and bedding requirements for side sewers. All bends shall be extra long radius ($R_{\min} = 9$ inches).

The gravity portion of the discharge line shall meet Central San requirements for private side sewers. If the discharge line connects directly to a sewer main, the gravity portion of the discharge line shall extend at least five (5) feet into the parcel being served. A wye/45 degree or combo with cleanout shall be placed where the discharge line transitions from pressure to gravity as shown below.

TESTING

When tested, the force main shall test at a minimum of 1-1/2 times the operating pressure or 60 pounds, whichever is less.

Pressure to Gravity Discharge



- Sanitary Tee shall be Wye, Sanitary Tee, or Combo Wye.
- For commercial properties, 6-inch sanitary tee, cleanout and gravity line is required.
- Reducer size will depend on diameter of pressure line and sanitary tee used.
- Solvent weld type joints shall be used for PVC pipe.

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INDIVIDUAL LOT SEWAGE PUMPING SYSTEM

**CCCSD
Use Only**

Today's Date: _____

App No _____

Job No _____

Grid No _____

5019 Imhoff Place, Martinez, CA 94553

Permits: (925) 229-7371

Fax: (925) 689-7259

permits@centralsan.org

Property Owner:

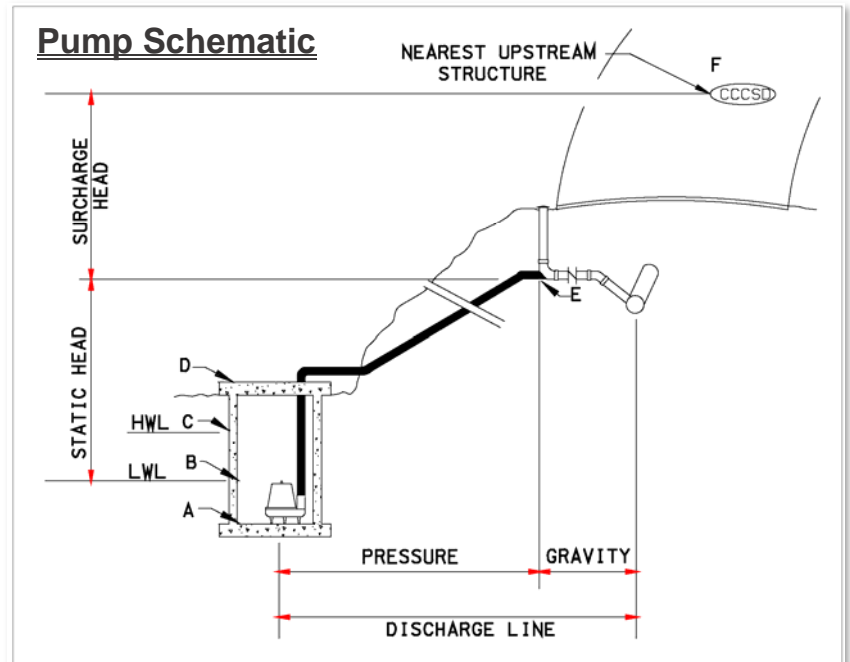
Property Location:

APN: _____

Mailing Address:

Sewer Contractor:

Engineer: _____



EQUIPMENT DATA

1. Pump Manufacturer _____ Model # _____
 2. Pump Capacity _____ GPM @ _____ TDH (Attach pump curve)
 3. Pump Type _____
 4. Pump discharge size: _____ inches and will pass a _____ inch sphere.
 5. Motor HP _____ RPM _____ PHASE _____ VOLTS _____
 6. Pump Sump Manufacturer _____ Diameter x Height _____ x _____
 7. Tank Material _____ Cover Material _____
- DISTRIBUTOR NAME: _____ BY: _____ DATE: _____
- PHONE # _____

CENTRAL SAN USE ONLY (do not write below line)

Procedure

Date

By

1. Plot plan submitted: _____

2. Elevation and distances checked: _____

3. Equipment data submitted: _____

4. Reviewed and approved: _____

5. Engineer plan review: _____

PUMPING SYSTEM INFORMATION

Applicant to complete this form in full. Schematic drawing for the project required with your submittal. Applicant may need to contact pump distributor for information. All elevations shall be based on the same reference elevation.

PROFILE & PLAN

Sump invert elevation (point A on pump schematic) _____ Ft.
 Motor top elevation _____ Ft.
 Low Water Alarm/redundant off elevation (LWA) _____ Ft.
 Pumps off/LWL elevation (point B on pump schematic) _____ Ft.
 Lead pump on/HWL elevation (point C on pump schematic) _____ Ft.
 Lag pump on elevation _____ Ft.
 High Water Alarm elevation (HWA) _____ Ft.
 Sump Inlet invert elevation _____ Ft.
 Surrounding surface elevation _____ Ft.
 Sump cover elevation (point D on pump schematic) _____ Ft.
 Pressure line invert elevation at discharge to gravity sewer (point E on pump schematic) _____ Ft.
 Upstream manhole rim elevation (point F on pump schematic) _____ Ft.
 Pressure line distance _____ Ft.

EQUIPMENT INFORMATION

Centrifugal Pump Yes _____ No _____
 Non-Clog Pump Yes _____ No _____ Grinder Pump Yes _____ No _____
 Submersible Pump Yes _____ No _____ Explosion-proof Yes _____ No _____
 Redundant Low-level cutoff before pump exposed Yes _____ No _____
 Simplex Control System Yes _____ No _____ Intrinsically safe Yes _____ No _____
 Duplex Control System Yes _____ No _____ Intrinsically safe Yes _____ No _____
 Sump Material: _____
 Force Main Size and Material: _____
 Force Main Inside Diameter: _____

NUMBER OF EACH PIPE FITTING

Check Valve _____	22.5 degree ells _____
Gate/Plug Valve _____	Wyes _____
Clean out _____	Tees _____
90 degree ells _____	Reducers _____
45 degree ells _____	Increasesers _____

FLOW INFORMATION

Number of residential units for residential development _____
 Type of business and building square footage for commercial development _____

Individual Lot Pump Systems

Material Type(s): Individual Lot Pump Sumps and Pipe Materials

Description:

VENDOR	SUMP	PIPE MATERIAL
E-One	D-Series, W-Series, I-Series and G-Series	HDPE (SDR 11) or PVC (Sch 40 or 80)
Liberty	24XX- Series, 36XX Series	HDPE (SDR 11) or PVC (Sch 40 or 80)
Aqua Pro	SG-Series, DG-Series	HDPE (SDR 11) or PVC (Sch 40 or 80)

Notes:

1. All individual lot Pumping Systems shall comply with Standard Specification Section 15.13100. Pumping systems include pump(s), sump, pressure line, alarm/control components and panel, isolation valves, and check valves.
2. Individual parts of Pumping Systems will not be pre-approved.
3. All systems shall be sized to accommodate expected flows and sewer depths.
4. Vendors and sumps are not limited to the ones listed above.
5. Check with Central San Permit Section regarding pumping systems for other than individual lot pumping systems.