PLACER COUNTY DEPARTMENT OF FACILITY SERVICES
ENVIRONMENTAL ENGINEERING DIVISION

SPECIFICATIONS FOR SEPTIC TANK EFFLUENT PUMPING (STEP) SYSTEM

Effective June 2008

1.0 GENERAL

On-site effluent pumping systems shall consist of the following: tank, effluent pump, controls, alarm, and appurtenances, as specified herein and as shown on the detail drawing (Attachment D). All materials furnished shall be new, and of the nature and quality specified herein. All construction shall follow Placer County codes.

1.1 MATERIALS

Within these specifications, where proprietary or "brand name" products are called for, no substitutions will be allowed unless approved by the Environmental Engineering Division in writing. Material submittals shall be provided to the Environmental Engineering Division for review and approval.

1.2 SITE PLAN

The property owner or designated representative shall submit one (1) site plan to scale to Environmental Engineering for review and approval prior to the County issuing a sewer permit. To submit a .pdf draft version of a site plan contact Kristy Ames at (530) 889-6856. In addition, the routing and location of building sewer line, effluent pressure line, power, and control conduit shall be shown, with average cover over the pipe noted. Other pertinent information such as property lines, home, and driveway location, easements, other utilities, etc. shall also be included on this site-plan (See **SITE PLAN REQUIREMENTS** – Attachment A).

For the Winchester Subdivision: *The Planning Department has approved the request to locate STEP systems outside of the building envelopes as of January 26, 2006, subject to the following:*

- *Consideration should be given to locating the systems such that they do not interfere with rock outcroppings, and do not cause disturbances within the driplines of native oak trees.*
- *Any proposals for systems interfering with rock outcropping or causing disturbances to the driplines of native oaks shall be reviewed by the Planning Department on a case-by-case basis.*

1.3 WORKMANSHIP AND MATERIAL WARRANTY

The installer shall, on the form provided herein (Attachment C), guarantee for a period of one (1) year, the workmanship and material for the on-site system in its entirety from the date of acceptance by Environmental Engineering Division or the date of the Building Department permit final, **whichever occurs last**.

1.4 ACCESSIBILITY OF THE SYSTEM

The STEP tank shall be located on the parcel between 12.5 feet and 50 feet from the middle of the access road (ex: Winchester Club Dr.) in a location pre-approved by Environmental Engineering. Should driveway access be necessary the driveway shall be designed for H-20 load rating (See Attachment A).

1.5 DOMESTIC WATER WELLS

The system and its discharge pipe shall not be closer than one hundred (100) feet to any private domestic water well.

2.0 TANKS

A. Tanks shall be pre-cast concrete. Tanks shall have been designed by a Registered Civil Engineer and approved for use in Placer County. All tanks shall be constructed in conformance the California Plumbing Code.

B. Tanks shall be designed for the following external loading:
Top - 300 pounds per square foot (psf)
Sides - 200 psf.

C. Walls, bottom and top of reinforced-concrete tanks shall be designed across the shortest dimension using one-way slab analysis. Stresses in each face of monolithically constructed tanks may be determined by analyzing the tank cross-section as a continuous fixed frame.

D. Walls and the bottom slab shall be poured monolithically.

E. Reinforcing steel shall be ASTMA-615 Grade 60, FY=60,000 psi. Details and placement shall be in accordance with ACI 315 and ACI 318.

F. Concrete shall be Type II ready mix conforming to ASTM C 150, and shall have a cement content of not less than six (6) sacks per cubic yard, and shall provide a minimum 28 day compressive strength of 2500 psi.

G. The tank shall be protected by applying a Thoro-Seal foundation coating or equivalent as approved by Environmental Engineering Districts on outside surfaces when ground water exists.

H. Tanks shall be vacuum tested prior to backfill.

1. When installation of the tank is complete, including inlet piping and risers, call (530) 886-4905 a minimum of 24 hours in advance to schedule the vacuum test.

2. The tank shall be vacuum tested for 3 minutes at 3 inches of mercury with zero loss of pressure.

3. Environmental Utilities will provide the equipment and perform the vacuum test.

4. The tank installer shall be present during the vacuum test in order make any necessary repairs.

5. The inlet piping and risers shall be secured to the tank before the vacuum test.

6. The test will be performed before backfill and after the holes for the pipes and electrical conduit are in place using bulkhead fittings.

7. The tank shall be empty of any water or equipment prior to the vacuum test.

I. Tanks shall be manufactured and furnished with a baffle in which there is no effluent slot. Effluent shall instead be discharged to the second compartment of the tank through an "n"-shaped piping device, as shown on the detail (Attachment D).

2.1 TANK SIZE

The liquid capacity of tanks shall conform to the following provisions for single family dwellings:

Number of Bedrooms	Min. Capacity Tank in gallons
1, 2, 3, or 4	1,200
5	1,500
6	1750

Add 250 gallons per additional bedroom.

2.2 RISERS AND LIDS

A. The riser shall be ribbed PVC as manufactured by ORENCO SYSTEMS, INC. 286 Colonial Road, Rosenberg, Oregon, 97470. **Risers shall be between twenty four (24) and thirty six (36) inches high and have a minimum nominal diameter of twenty four (24) inches.** Lids shall have a minimum of four bolts.

B. The riser for the pump compartment shall be equipped with the following:

1. One 1¼-inch diameter (IPS) threaded bulkhead fitting for the pump discharge, installed no less than eight inches form the top of the riser.

2. One 1½-inch diameter (IPS) threaded bulkhead fitting for electrical and controls to utility box. Install Duct seal at both ends of the conduit.

3. Gaskets bonded to the risers or lids.

C. Lids shall be furnished with each riser and shall be constructed of fiberglass with a non-skid finish. Lid latches shall be furnished with four hex head 304 series stainless steel bolts.

D. Riser Installation - Each riser shall be bonded to a mounting flange either preset in the top of the concrete tank or redheaded and epoxy grouted to the top of tank with a two-part epoxy available from ORENCO SYSTEMS INC or otherwise approved by the Engineer. The sealant shall be applied in accordance with the manufacturer's recommendations. Surfaces shall be clean prior to application. A bead of sealant shall

be laid completely around the bottom of the risers prior to mounting the risers on the top of the tank. After the risers are in place, a bead of sealant shall be run completely around the inside and outside base.

2.3 BACKFILLING OF TANKS

A. Tanks shall be fully supported on a level bed of six (6) inches of sand or ¾ inch crushed rock when ground water is present.

B. ***NO BACKFILL SHALL BE PLACED ON SIDES OR OVER THE TOP OF THE TANK UNTIL THE VACUUM TEST HAS BEEN WITNESSED AND APPROVED BY THE COUNTY.***

C. The backfill sand will be present on site at time of the vacuum test. After acceptance of the vacuum test, sand shall be placed and dandified by jetting in lifts not exceeding four (4) feet. The jet pipe shall be inserted at intervals of three (3) feet maximum. Sand used shall have a sand equivalent of not less than thirty (30) or otherwise approved by Environmental Engineering.

3.0 EFFLUENT PUMP SELECTION

A. Pumps for each individual installation shall be determined **by Environmental Engineering staff only** from the following tables. In making the pump selection, allowance must be made for pipe friction loss as well as elevation differential. On the chart below the manufacturer's model numbers are shown with their respective total dynamic head.

B. The pumps shall include the following: electrical quick disconnect, Franklin motor with type squirrel cage design, solid state starting switch sealed in starter, over-load protection in motor with automatic reset, type SO electrical cable with ground (NEC extra hard usage), 3,450 rpm, and a one year warranty from the manufacturer will need to be given to the Environmental Utilities inspector prior to final.

LOW HEAD EFFLUENT PUMP SELECTION (Head - Up to 100-ft)
Pumps shall have a nominal flow of ten (10) gpm and placed in a screen. All systems shall utilize a flow reducer.

Gould Sewer Pumps

T D H	MODEL #	Horsepower	Voltage
0’ - 23’	WE03L	1/3	125v or 230v
24’ - 42’	WE05H	1/2	230v
43’ - 57’	WE07H	3/4	230v
58’ - 70’	WE10H	1	230v
71’ - 89’	WE15H	1 1/2	230v

HIGH HEAD SUBMERSIBLE PUMP SELECTION (Head - Greater than 100-ft)
Pumps shall have a nominal flow of ten (10) gpm. Pumps shall be placed in a bio-tube filter unit.

4” Orenco Submersible Sewer Pumps

T D H	Model #	Horsepower	Voltage
90’ - 120’	P1005	1/2	230v
121’ - 160’	P1007	3/4	230v
161’ - 210’	P1010	1	230v
211’ - 240’	P2010	1	230v
241’ - 300	P2015	1 1/2	230v

3.1 PUMP SYSTEMS

Pump systems shall be installed with the following accessories, manufactured by ORENCO SYSTEMS: 1¼ inch diameter hose and valve assembly, which includes flexible PVC, hose with quick-disconnect fittings, PVC ball valve and check valve. Model MF-1 Float Tree Assembly includes three floats mounted on a PVC stem, which attaches to the pump vault and is accessible from the top of the riser.

When using flexible spa hose **do not** use glue fittings, use insert adaptors at both ends with 1¼ inch barbed fittings and stainless steel hose clamps.

Note: Well pumps may require four floats.

4.0 SERVICE LINE

A. The service line trench shall be solely for low pressure sewer.

B. The service line, leading from the tank to the public collection system, shall be constructed of 1½ inch SCH 40 PVC pressure pipe, installed with a minimum of eighteen (18) inches of cover.

C. Warning tape, three (3) inch minimum width, "Terra Tape", marked "CAUTION SEWER LINE BURIED BELOW", shall be placed in the trench during backfill, six (6) inches above the pipe.

D. A tracer wire shall be required from the tank to the service connection at the street.

E. Cleanouts shall be provided at intervals not to exceed one hundred (100) feet and one placed within five (5) feet of the pump tank on the effluent side.

F. The service line shall be water tested from the tank to the street connection by the Environmental Utilities inspector prior to backfill. Pressure to be determined by Environmental Engineering.

G. The line shall be purged with water to remove rocks and debris before final connection to the tank and service stub at the street connection after pressure test.

5.0 CONTROLS AND ALARM

Operating controls and emergency alarms shall be fabricated and installed as shown on the detailed drawing and as specified herein. All elements of the installation shall conform to applicable State and local codes and regulations.

A. Control panel shall be ORENCO SYSTEMS Simplex Control Panels, “S” Series, (Model S1 or S2 CT for low head pumps and S1 or S2 CTRO for high head well type pumps) with the following features:

1. A three-pole motor-start relay with 25A rating or greater, constructed of low arc tracking high-grade materials. Exposed metal parts shall be treated for corrosion resistance.

2. Audible alarm panel mount with a minimum of 80-dB sound pressure at 24 inches.

3. Visual alarm with a push-to-silence feature.

4. Automatic audio-alarm reset.

5. Fifteen-amp motor rated toggle switch, single-pole, and double throw with three positions: Manual (H), Automatic (AUTO) and Center (OFF).

6. NEMA 6P-rated, lockable enclosure with hinged cover.

7. Event counter.

B. Alarm circuit shall be wired separately from the pump, so that if the internal overload switch is tripped, the alarm will still function.

C. The pump control panel shall be mounted on the side of the house in view of and within fifty (50) feet of the tank. Where the tank is greater than fifty (50) feet from the house, a secondary alarm shall be mounted on the house and a control panel mounted on a four (4) foot redwood post.

5.1 CONNECTION WIRING

A. Wiring to connect the effluent pump to the panel shall be placed in Schedule 80 PVC conduit and conform to the respective manufacturers' recommendations and applicable codes and regulations.

B. All wire shall be type MTW, single strand. Splices and junction boxes will not be permitted within the access riser.

C. Splices shall be made in a splice box outside the riser, accessible directly from the ground.

D. Splices shall be made using SCOTCHCAST 82-A1 Cable Splice Kit.

E. Wiring shall be placed in PVC electrical conduit and shall have at least eighteen (18) inches of cover.

6.0 HOMEOWNERS RESPONSIBILITY

A. The home owner shall be responsible to maintain the service line from the house to the STEP system.

B. If there is a private secondary (Grinder Pump) tank on the property, the home owner shall be responsible for the maintenance of the private secondary tank.

C. The riser lids on the tank (round green lids) shall be left exposed at all times for maintenance by the Environmental Utilities. The alarm, hose bib and GFI outlet within twenty (20) feet of the tank shall be left visible at all times.

D. It is the responsibility of the home owner to contact the Environmental Utilities (530) 886-4913 should the alarm on the STEP system sound.

E. The STEP tank risers shall remain a minimum of two (2) inches above final grade and/or landscaping.

6.1 INSPECTIONS FOR SYSTEM

A. The Building Department (530) 745-3010 is responsible for inspections from the home plumbing to the STEP system.

B. The STEP system itself and the effluent line to the street connection will be inspected by Environmental Utilities (530) 886-4905 and maintained by Environmental Utilities after the one year warranty is complete.

ATTACHMENT A

PLACER COUNTY DEPARTMENT OF FACILITY SERVICES
ENVIRONMENTAL ENGINEERING DIVISION

STEP System SITE PLAN REQUIREMENTS

Date:_____ **District:**_____ **Lot #:**_____ **Parcel #:**_____

Address:_____

Note: Environmental Engineering shall approve Site plan *prior* to issuance of a Sewer Permit.
This site plan must include the following information:
SECTION A:
_____Scale (1" = 20') and show North arrow.
_____Plans shall show address, lot number and parcel number in the title bar with contact information.
_____Plans shall show the building envelope as well as all setbacks.
_____Show the entire property with accessibility from the main road, street, or cul-de-sac, etc.
_____The location of the alarm system must be visible from the tank **AND** within fifty feet. If more than fifty feet, or not visible from the tank, the master alarm and control panel will be mounted on a four (4) foot red wood post at the tank and a secondary alarm will be mounted at the house.
_____Service line and tank shall be a minimum of one hundred (100) feet from all water wells.
_____Location of the water hose bib shall be within twenty (20) feet of tank.
_____Location of 110 volt GFI outlet (20 amps) shall be within twenty (20) feet of tank.
_____Show the size of the tank (based on bedrooms – see above information on page 2.
_____If the effluent line runs under the pavement or other permanent structure, a sleeve will be required. Show the sleeve on the plans.
_____Easements – include all utility easements on the property.
_____Show all property lines, trees, rocks, creeks, drainage, etc.
_____Utilities – include all utilities (gas, electric, water, cable, etc) from the street connections to the house and to the tank, the alarm and the hose bib.
_____Location of secondary tank: include all lines running to and from that tank to the primary tank.
_____Provide a clear path from the paved access road to the tank.
_____**Note on plans that states:** If a utility crossing with sewer exists a minimum one foot vertical distance is required.
_____**Note on plans that states:** The location of the effluent sewer service line, including location and distances of all cleanouts (cleanouts must be located within five feet of the public connection side of the tank and every one hundred feet).
_____**Note on plans that states:** Forcemain sewer service line shall be five feet from all other utilities.
_____**Note on plans that states:** Horizontal distance from the far side of the tank to the middle of the access road shall be between 12.5 feet and 50 feet.
_____**Note on plans that states:** Vertical distance from the bottom of the tank to the surface of the access road shall be less than fifteen (15) feet.
_____**Final set of plans for approval** will need to contain two (2) 24 x 36 inch and two (2) 11 x 17 inch plans sent to Kristy Ames at Environmental Engineering – Mail to: 11476 C Ave, Auburn, CA 95603 or Drop off at: Facility Services 2855 2nd St., Auburn, CA

SECTION B – for driveway requirements only:
ALL ACCESS DRIVEWAYS SHALL BE PAVED AND H-20 LOAD RATING:
_____Minimum of twelve feet wide and not exceed a 10% slope with a vertical clearance of fifteen (15) feet.
_____Driveway shall have a fifty (50) foot minimum turning radius.
Note one of the following on the plans:
_____Eight-inch Portland cement concrete over 95% compacted sub grade with adequate drainage
_____Six-inch Portland cement concrete with 6"x 6" 10 gauge wire mesh or #4 rebar at eighteen (18) inches on center over 95% compacted sub grade with adequate drainage
_____Two and a half inch asphalt concrete over six-inch asphalt base driveway over 95% compacted sub grade with adequate drainage
_____Provide a structural section by a registered civil engineer

Approved by _____ Date _____

ATTACHMENT B

PLACER COUNTY DEPARTMENT OF FACILITY SERVICES
ENVIRONMENTAL ENGINEERING DIVISION

STEP SYSTEM CHECK LIST

LOT Number _____ Sewer Permit Numbers _____/_____ APN: _____

Address _____

INITIAL INSPECTION

- [ ] Correct size tank (_____)
- [ ] Tank vacuum tested
- [ ] Layout onsite follows approved plans in the folder
- [ ] Risers bonded to tank
- [ ] 18" minimum cover - free from rocks
- [ ] Bulkhead fittings on all openings

- [ ] 1½" Schedule 40 PVC with threaded nipple and threaded screw cap
- [ ] Cleanouts shall be one hundred (100) feet apart and within five (5) ft of effluent side of the tank

- [ ] 3" sand bedding and 6" sand for cover over discharge pipe (sand present on site for inspection)
- [ ] Sewer detector tape required 6" above PVC forcemain daylight into cleanouts – onsite for inspection
- [ ] Tracer Wire daylight into cleanout
- [ ] Pipe pressure tested with water 50 lbs
- [ ] Effluent pipe purged prior to hook up to street service connection – purged of rocks and debris

FINAL INSPECTION

- [ ] Check valve flow arrow toward main line
- [ ] **Valve at property line to be opened by County personnel only**
- [ ] Concrete box with a metal sewer lid on **ALL** cleanouts
- [ ] Location of GFI & hose bib within 20 feet
- [ ] Correct pump type size _____
- [ ] Alarm tested _____ low water _____ high water
- [ ] Float assembly with redundant off and within reach with handle of float tree
- [ ] S1 or S2 ***AND*** CT or CTRO type panel
- [ ] Event Counter # _____
- [ ] Pump panel alarm mounted at four (4) feet on _____ within 50 feet & **visible** from tank
- [ ] Total footage of wire (_____) run from Power Supply to pump
- [ ] Wire size for power supply to pump (_____)
- [ ] 1¼" flexible discharge hose. Use insert adaptors at both ends of flex hose with 1¼ inch barbed fittings with stainless steel hose clamps
- [ ] 1¼" ball valve
- [ ] 1¼" x 1½" reducer outside of riser
- [ ] 1¼" check valve
- [ ] Quick disconnect
- [ ] Concrete electrical splice box with a metal "Electrical" lid
- [ ] All electrical placed in SCH 80 conduit buried 18" min
- [ ] Rope connected directly to pump
- [ ] Motor leads long enough to remove pump
- [ ] Screen or bio-tubes able to be removed from tank
- [ ] 4 bolt lid and gasket in place
- [ ] Risers minimum 2" above **finished landscaped** grade – noted to contractor if landscaping not finished yet
- [ ] **Pump tested and passed**

- [ ] 90° elbow installed, 16" deep and 12" off bottom
- [ ] Two holes on elbow
- [ ] Baffle sealed

PLACER COUNTY DEPARTMENT OF FACILITY SERVICES
ENVIRONMENTAL ENGINEERING DIVISION

11476 "C" Avenue
Auburn, CA 95603

WORKMANSHIP & MATERIAL WARRANTY
For
Septic Tank Effluent Pumping (STEP) System

APN: _____

Subdivision: _____

Lot Number _____

Sewer Permit Numbers: _____/_____

Situs Address: _____

Date of Occupancy _____

The undersigned hereby agrees to repair or otherwise make good any defect in workmanship or materials that may develop in the above noted on-site septic tank effluent system, in its entirety, for a period of one (1) year from the certificate of occupancy date.

The undersigned further certifies that the above equipment fully meets the type, quality, design and performance requirements defined in the Specifications of the above project and that the equipment will satisfactorily perform the functions for which installed.

Contractor: _____ Title: _____

Signature: _____ Date: _____

Contractor's License #: _____ Telephone: _____

Name of Company: _____

Address: _____