Table 1-
Percolation Test Results

<table>
<thead>
<tr>
<th>Hole Number</th>
<th>Time (Min.)</th>
<th>Beginning measurement</th>
<th>Final Measurement</th>
<th>Perc. Rate(Min/In.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>11.00</td>
<td>11.375</td>
<td>26.7</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>11.375</td>
<td>11.750</td>
<td>26.7</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>11.750</td>
<td>12.00</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>12.000</td>
<td>12.250</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>12.250</td>
<td>12.500</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>12.500</td>
<td>12.750</td>
<td>40.0</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>12.375</td>
<td>12.750</td>
<td>26.7</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>12.750</td>
<td>13.000</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>13.000</td>
<td>13.250</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>13.250</td>
<td>13.500</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>13.500</td>
<td>13.750</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>na</td>
<td>na</td>
<td>#VALUE!</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>10.375</td>
<td>10.750</td>
<td>26.7</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>10.750</td>
<td>11.000</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>11.000</td>
<td>11.250</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>11.250</td>
<td>11.500</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>11.500</td>
<td>11.750</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>11.750</td>
<td>12.000</td>
<td>40.0</td>
</tr>
</tbody>
</table>

Design Calculations:
Average percolation rate during the final 10 minute period 'T' = 40.0 min/in

Design Flow: Q= 7 bedrooms x 2 persons/br x 75gpd/person x 1.5 (max) = 1575 GPD

Absorption Area Formula: A = (Square root of 'T') x Q / 5 = 6.3 x 1575 / 5 = 1992 sq.ft.

Increase of field area due to 1 - washing machine = 40%
Increase of field area due to 1 - garbage disposal / grinder = 20%
Decrease of field area due to use of infiltrator sidewinder chamber system = 35%

Area A = 1992 sf x 1.6 x 0.65 = 2072 SF

Use 140 standard chamber units (Infiltrators or Biodiffusers),
Use two trenches at
5 - units wide by 14 - units long

Leach Field Filter Material = Native clayey sand with gravel soil**

Field Length = 87.5 feet
Field Width = two separate trenches at 15 feet each = 30 feet

** To be inspected by designing engineer.
Log of Septic System Soil Profile Hole
- Lot 6, Block 6, Filing 2 in Sunset Ridge Subdivision

Topsoil - Dark brown to black, moist, humic

Approximate Test Hole Depth at 24" below ground surface.

Clayey Sand with Gravel - Medium brown, dense to very dense, low plasticity, average moisture content, up to rounded cobble sized material.

* Groundwater was not encountered in the test hole shown.

Vertical Scale: 1" = 1'

Figure 1
Area Map for the Subject Property

Subject Property:
Lot 6, Block 6, Filing 2

Map by Grand City Gov't

North
Site Location Map
- Proposed Residence on Lot 6 of Block 6 in Filing 2, Sunset Ridge Subdivision

MAP - PER INSTALLATION

Future Garage

Proposed Well Location

Future Driveway

Proposed Dwelling Location

4-inch diameter PVC cleanout / inspection portal locations

2000-gallon, watertight, concrete septic tank with at least two separate compartments. An 8-inch diameter effluent filter and high water level alarm assembly are required on the second compartment outflow pipe.

500-gallon, watertight, concrete auto-siphon dosing tank equipped with dual alternating siphons as per design specs on Figure 5.

Proposed absorption trenches at 15-feet wide by 87.5-feet long each. Percolation test hole locations varied throughout the absorption trench areas.

Scale: 1"=50'

Figure 3
System Layout

For: Beckman/Pritchard Residence
Location: Lot 6 of Blk 6, Fil. 2 in Sunset Ridge Sub'div.
Date: 12/15/2004

4-inch diameter inspection/cleanout portal location

Access lids should be located at finished ground surface for inspections and maintenance

4-inch diameter inspection/cleanout portal location

Finished Grade

Reduce 4" PVC to 2" PVC prior to manifold construction.

Infiltrator system
10 units @ 3' = 30' wide
14 units @ 6.25' = 87.5' long

6 foot minimum length from tank to trench. Slope = 2% minimum

2000 gallon 2-compartment Concrete Septic Tank with Add'l 500 gallon Dosing Chamber

Finished Grade should be 6" overfill to accommodate for settlement

4 - inch diameter inspection portal location

4 - inch diameter properly bedded SCH40 pipe 5 - feet long

Base of leach field at 24" Min.

at least 4 - feet of native undisturbed clayey sand with gravel soil

12" Minimum cover

2-inch perforated SCH40 PVC with 3/8" perforations at 6 O'Clock every 24" linearly. Seal open end with an endcap with a 3/8" weep hole at 6 O'Clock.

10 units @ 3' = 30' wide
14 units @ 6.25' = 87.5' long

TYPICAL PROFILE THROUGH EACH TRENCH

Figure 4
### 2000 Gal. Two Compartment Septic Tank

**Note:** N.T.S

- **MONOLITHIC TANK** meets ASTM-C-913 Spec. for water and waste water structures.
- Butyl rubber sealant meets Fed. Spec. SS-S-210A. (Optional per requirement.)
- Plumbing shown in diagram provided with tank.
- It is the system engineer's requirement to determine VOLUME, LOADING and RETURN TIME.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Capacities (gallons)</th>
<th>Approximate Weights</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>L</td>
<td>H</td>
</tr>
<tr>
<td>6'-8&quot;</td>
<td>12'-8&quot;</td>
<td>5'-10&quot;</td>
</tr>
</tbody>
</table>

---

**Front Range Precast Concrete, Inc.**
5439 N. Foothills Highway
Boulder, Colorado 80302
(303) 442-3207, (800) 783-3207, FAX (303) 442-3209
www.frontrangeprecast.com

**Typical Concrete Septic Tank Detail**

**Effluent Filter Installed in Chamber B**

Figure 5
500 Gal. Dual Alternating Auto Siphon Chamber

Note: N.T.S

- Butyl rubber sealant meets Fed. Spec. SS-S-210A, provided with tank.
- Plumbing shown in diagram provided with tank.
- It is the system engineer's requirement to determine VOLUME, LOADING and RETURN TIME.

### Gross Volume

<table>
<thead>
<tr>
<th>Gross Volume</th>
<th>Net Volume</th>
<th>Discharge Per Cycle</th>
<th>Outlet A</th>
<th>Height</th>
<th>Weight Tank/Lid</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 Gal.</td>
<td>423 Gal.</td>
<td>180 Gal.</td>
<td>26&quot;</td>
<td>6'10&quot;</td>
<td>7920 lbs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>235 Gal.</td>
<td>20&quot;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Butyl Rubber Sealant

21" clear insert access

24" Push Seal Gasket typical

Front Range Precast Concrete, Inc.
5439 N. Foothills Highway
Boulder, Colorado 80302
(303) 442-3207, (800) 783-3207, FAX (303) 442-3209
www frontrangeprecast.com

Typical Concrete Siphon Tank Detail

- Figure 6
8 - Inch Diameter Effluent Filter and High Water Level Alarm Detail

- Effluent Filter Should be Installed in the Second Compartiment of the Primary tank

- PVC Splice Box with Cord Grips
- Fiberglass Gasketed Lid with Stainless Steel Bolts
- PVC Riser with Grommet(s) (bond to tank adapter with recommended adhesive)
- Filter Cartridge Handle (field cut to desired height)
- Tank Adapter (cast or bolted)
- Vent Orifice
- Effluent Discharge
- Modulating Discharge Orifices
- Filter Cartridge
- Vault Inlet Ports

FT0800 Series Biotube Effluent Filter

Figure 7
How-To-Select
Step 1: Refer to the "Features versus Panel Type" selection chart for alarm panels on page 3-6 at the end of this section. Determine which features are required, and match them up to the Alarm Panel type that will support them.

Liquid Level Alarm, AMAHW and AMLAHW Series
AMAHW Alarm Panels are used with mechanical or mercury float switches and feature a red light and audio alarm (with automatic reset of audio silence). Suitable for use as a stand-alone unit or as a remote alarm; rain tight enclosure allows both outdoor and indoor installation. UL listed. Order signal float switch separately.

Single-Gang Box Alarms, AMSGBA Series
AMSGBA Alarms are used in standard-gang boxes, as a remote alarm. For indoor use only. Order signal float switch separately.

Liquid Level Alarm, AMSENTI and AMSENTIi Series
AMSENTI Sentinel I Alarm Panels are low voltage (9V) with AC transformer that plugs into 115V wall socket. AMSENTI Sentinel II Alarm Panels are low voltage (9V) battery powered (battery included). Red light and audio alarm (with test/silence/auto operation). Thermoplastic enclosure for indoor installation only. Suitable for use with any dry contact signal. UL listed power supply. Order float switch separately.

Standard Control Panels
Orenco's Standard Control Panels are specifically designed for use with onsite treatment systems, such as effluent pumping systems and sand filters. Whether you need a single or multiple pump system, Orenco has a control panel to fit your system requirements. Advanced programmable logic technology is available as standard in our MVP line of control panels, incorporating many timing and logic functions, such as multiple timing intervals to adjust for changing flow conditions.

Nomenclature

Indicates options (should appear in the following order):
IR = intrinsically safe relay (not A and ASF)
PT = programmable timer (not A and ASF)
RO = redundant off
CS = current sensor
DS = disconnect switch
RA = remote alarm (dry contact)
TS = test switch
HT = heater
ETM = elapsed time meter
CT = counter
PRL = pump run light
PL = power light
SA = surge arrester

Indicates voltage:
1 = 115V
2 = 230V

Indicates panel series:
A = simplex alarm panel
ASF = sand filter alarm panel
S = simplex control panel
SSF = sand filter control panel
DS = double simplex
DAX = duplex alternating

Effluent Filter High Water Level Alarm Information

Figure 8