

Three test pits and a profile hole (four pits total) were advanced on the lot, three in the relatively flat area where the buildings are expected to be situated. The profile hole was advanced somewhat downslope to the north of the proposed building pad, in the logical location for the OWTS absorption field. The pits were advanced using a crawler mounted excavator.

All three test pits revealed 12 to 24 inches of very slightly moist, medium brown sandy, slightly silty loam, topsoil overlying a native, moderately dense, very slightly moist medium sand subsoil which extended to the maximum depth explored of eight feet.

The fourth test pit (the profile hole) revealed approximately 30 inches of similar, moderately moist topsoil overlying subsoils similar to those exposed in the first three test pits, but less dense, and containing small amounts of silt and clay. The profile hole was advanced to a depth of nine feet, and revealed no signs of free ground water and no bedrock.

No bedrock or free water was encountered in any of the four test pits.

Our experience with similar soils, taken together with our observations in the test pits, have led us to form the opinion that the moderately dense sand subsoil observed in the first three test pits will provide stable bearing for the foundations of both of the proposed structures. We also concluded that the site and the subsoil observed in the profile hole are, in fact, suitable for the installation of an OWTS with a leach field of the type of design detailed below.

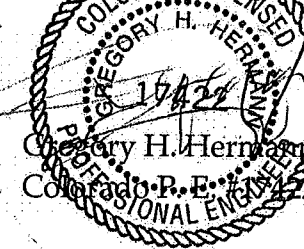
Spread footers for both of the proposed structures should be designed to bear on the moderately dense sand subsoil observed in the first three test pits, with a maximum net bearing pressure of 2.0 KSF. No minimum dead load will be necessary on any of the footers. Any retaining structures should be designed to retain pressure equivalent to that which would be exerted by a fluid weighing 40 PCF.

The footers for both foundations must be surrounded with a footer drain constructed using 4" diameter D-2729 perforated PVC pipe (with the perforations located at 4 and 8 'o'clock'), bedded and covered with 3/4" screened rock, which in turn must be wrapped in a geo-fabric such as 'Mirafi' #140N. Both footer drains must run from a pair of clean-outs, have a minimum 1% slope around the foundation to a corner opposite the clean-outs, and at that point be wye'd together to drain to daylight via a non-perforated 4" diameter PVC pipe. These drains must be located at a low enough grade so that it will prevent

We re-emphasize that no free ground water was observed in either the profile hole or in the other test pits, and the observed subsoil in the profile hole extended more than four feet below the expected design elevation of the bottom of the proposed absorption trenches without encountering any free ground water.

Thank you for the opportunity to have been of professional service to you in this matter.

Sincerely,  
Bear Valley Design, Ltd.



**Structural Notes--Lonesome Bear Ranch, Barn/Bunkhouse, Routt County,**  
**Colorado**

1. All concrete shall contain six 90 pound sacks of Type II cement per cubic yard,  $\frac{3}{4}$  inch maximum size aggregate, 2% to 4% entrained air, and shall be placed in full accordance with all provisions of the current version of ACI-318.
2. All reinforcing steel shall conform to ASTM A-615, Grade 60
3. Design slab on grade floor load is 250 lbs./sq. ft., live;
4. Design nominal snow load is 80 lbs./sq. ft.
5. Design wind load is 90 mph, per IRC 'Exposure B' requirements at a density altitude of 7,200 ft., mean sea level.
6. Design earthquake is per IRC 'Zone B' requirements.
7. Design soil conditions are 2.0 KiP/sq. ft., maximum net bearing and 0.0 KiP/sq. ft., minimum dead load, per Bear Valley Design, Ltd. Letter dated June 27, 2019.
8. All details enumerated in the letter referenced in 7. Must be executed in full.
9. The steel ('red iron') frame building above the foundation is to be designed, engineered, certified, and fabricated by others. Installation of the building and anchor bolts in the foundation is to be per the building mfg'r's. sizing and layout dimensions and specifications
10. Heating plans to be provided on a design/build basis by mechanical contractor.
11. Electrical plans to be provided on a design/build basis by electrical contractor.
12. Plumbing plans to be provided on a design/build basis by plumbing contractor.
13. All above grade, enclosed portions of the building are to be insulated using spray-on, 2 part urethane foam insulation, with minimum R values of R-50 in the roof and R-30 in the exterior walls.

