Quick4® Chambers Installed in Large Soil Absorption System for Luxury Home Development

Poor soils and steep waterfront lots eliminate individual drainfields as a wastewater treatment option.

Project
LSAS system for luxury home development including 33,000 SF of Quick4 Standard chambers

Installation Date
December 2006

Engineers
Ray Kimball
Inland Northwest Consultants
Post Falls, ID

Contractor/Installer
Scott Sullens
Ken Harding
ACI
Coeur d'Alene, ID

Permitting Agency
Panhandle Health District

Owner
Jerry Hanson
The Crossings
Priest River, ID

Design Specifications

Soil Type: A-2B soil groups

Distribution Type: Pressure distribution system with 3600 LF of trench. Lateral spacing at 9 ft center-to-center

Drainfields: 1700 Quick4 Standard chambers in two fully constructed drainfields with reserve area

Total Trench Area: 33,000 SF

Design Flow: 9720 GPD

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1-800-221-4436
www.infiltratorsystems.com

The Crossings at Willow Bay near Priest River, Idaho is a high end residential development of 76 home sites. The desirable waterfront location for many of the lots coupled with a marina and recreational facilities make it a popular development for those looking for year-round and seasonal homes. A challenge was soon faced as many of the sites did not have suitable soils for drainfield disposal and were situated on steep waterfront lots complicating the design of the wastewater treatment system.

Luckily, there were several large tracts of open space nearby with excellent soils and mild slopes. Infiltrator® Quick4 chambers were the immediate choice for this Large Soil Absorption Systems (LSAS) project because of their ability to follow the contour of the land and to meet the standards dictated by the Panhandle Health District.

Although there was room available, the desire to maintain the open space in a natural state, as well as economic concerns, drove the design towards a gravelless chamber system. State regulations allow for a 40% reduction in drainfield size with chamber systems. This reduced the drainfield size to 2.3 acres, which could be accommodated in an existing meadow.

Daily loading was based on 300 gallons per day per home and 1,320 gpd for the marina facility. Total daily loading was 9,720 gpd with A-2B soil groups. This placed the system in the Large Soil Absorption System category. The constraints of the LSAS regulations require that two complete drainfields be constructed, each sized to be able to handle the total daily loading. In addition, area for a third drainfield must be kept in reserve. In all, 1700 Quick4 Standard chambers were installed for the system. The system covers more than 3.5 acres including setbacks to accommodate the soil conditions and the requirement for area for three drainfields.

The system was designed so that each home would pump from an individual septic tank to a common force main, which led to the LSAS site. That force main discharges to a 1000 gallon holding/dosing tank equipped with a float activated duplex pump system. The pump system alternates between constructed drainfields, dosing approximately 200 gallons per cycle to 3600 liner feet of trench. Lateral spacing is at nine feet center-to-center. Each drainfield consists of six modules, with each module comprised of six laterals. An Orenco Systems® Inc. distributing valve cycles the dosing through each module to maintain even distribution throughout the system.

Even in frigid weather, construction progressed quickly with a single three man crew installing between 400 and 500 feet of drainfield per day. Construction of the drainfield was completed in December of 2006, in a little over three weeks. As part of ongoing system operation and maintenance, a visual and audible alarm was installed onsite and at the caretaker's residence.