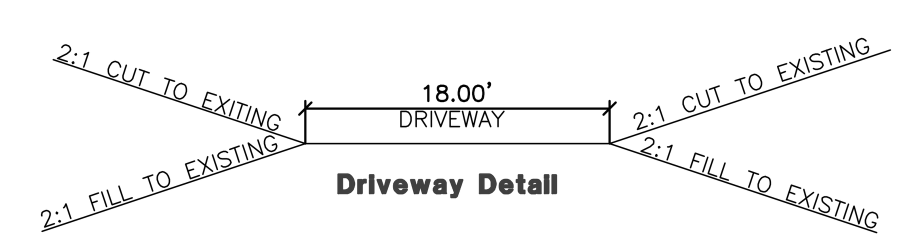
Reeve & Associates, Inc. - Solutions You Can Build On

Proprietary Notice
This document contains information proprietary to Reeve and Associates, Inc. It may not be disclosed to others for any purpose or used for installation purposes without the written permission of Reeve and Associates, Inc.



Driveway Detail

Site Preparation and Construction

The procedures used in the construction of a mound system are just as critical as the design of the system. Good design with poor construction will result in system failure. It should be emphasized that the soil must only be worked when the moisture content is low to avoid compaction and puddling. Consequently, installations shall be made only when the soil is as dry as required. The approved construction plan must be followed.

Design approval before construction shall be accomplished by the Weber/Morgan District Health Department. All site inspections before, during, and after the construction shall be accomplished by the Weber/Morgan District Health Department.

Installation shall be completed only by installers certified by the Weber/Morgan District Health Department

Note: If construction on the mound system is to begin after the commencement of construction of the edifice to be served by the mound system, the area of the mound construction is to be staked and covered by a tarp to prevent construction or vehicular traffic from traveling within the designated area.

Equipment – Proper equipment is essential. Small track-type tractors are best. A wheeled tractor will too easily rut up the plowed area during the initial phases of sand placement, resulting in compaction, localized overloading and possible early failure. Also, maneuvering wheeled tractors in the filter media is considerably more difficult.

Construction Procedures – The following is a step by step procedure for mound system construction which has been tried and proven. If these procedures are followed, the potential for future problems should be minimized and the mound system should function properly. Other techniques may also work satisfactorily, but the basic principles of mound system design, construction and operation should not be violated.

1. Check the moisture content of the soil at 7–8 inches deep. If it is too wet, smearing and compaction will result, reducing the infiltration capacity of the soil. Soil moisture can be determined by rolling a soil sample between the hands. If it rolls into a wire, the site is too wet to prepare. If it crumbles, site preparation can proceed. If the site is too wet to prepare, do not proceed until the soil moisture decrease.
2. Stake out the mound area on the site according to the system design, so the infiltration bed runs parallel to the contours. Reference stakes offset from the corner stakes are recommended in case corner stakes are disturbed during construction. If the site conditions now do not allow for layout according to the approved design, contact the designer and/or the local health officer.
3. Measure the average ground elevation along the up-slope edge of the bed or the upper trench and reference this to a benchmark for future use. This is necessary to determine the bottom elevation of the bed.
4. Determine where the pipe from the pumping chamber connects to the distribution system in the filter media. The location and size of this transport pipe is determined from the pressure distribution guideline.
5. Trench and lay the effluent pipe from the pumping chamber to the mound. Cut and cap the pipe one foot beneath the ground surface. Lay pipe below frost line or sloping uniformly back to the pumping chamber so that it drains after dosing.

   Back fill and compact the soil around the pipe to prevent back seepage of effluent along pipe. This step must be done before plowing to avoid compaction and disturbance of the surface.
6. Cut trees to ground level, remove excess vegetation by mowing. Rake cut vegetation if it is, or will become, matted. Prepare the site using a moldboard plow and plowing parallel to contours.

   The function of this preparation is to provide a cleared ground surface with a series of vertical channels to enhance transfer of moisture from the sand fill to the original soil, while inhibiting lateral movement at the sand-soil interface. In addition the vertical furrows aids in stabilizing the sand at the sand-soil interface. In addition the vertical furrows aids in stabilizing the sand at the sand-soil interface in an interlocking fashion.

   The site should be plowed in a direction so that the plow throws the soil up-slope. Use a plow with as many bottoms as possible to reduce the number of driven-in furrows which result in the compaction of the subsoil. A chisel plow or a disk plow may be used if a moldboard plow is not available. Hand spading the surface is also an acceptable alternative and may be the preferred method on some sites. Rototilling is not a acceptable substitute and must not be done.

   The important point is that a rough, un-smeared surface should be left, especially in fine textured soils. Careful observation is required to assure that the soil moisture content is not too high such that the soil surface is smeared by the action of the plow. Plowing should not proceed until the soil is sufficiently dry so as not to smear in the plowing process.

   If stumps remain, care must be taken in preparing the site. The sod layer should be broken up, yet the top soil should not be pulverized. The objective of this step is to break up any surface mat that could impede the vertical flow of liquid into the native soil.

   Immediate construction after plowing is desirable. Avoid rutting and compaction of the plowed area by traffic. If it rains after the plowing is completed, wait until the soil dries out before continuing construction.
7. Reset the corner stakes, if necessary, using the off-set reference stakes and locate the bed or trench areas by staking their boundaries.
8. Extend the effluent pipe from the pump chamber (which had previously been cut off) to several feet above the ground surface.
9. Place the filter media (ASTM C33 sand) (media less than 20% > 2mm, less than 5% < 0.053mm) which has been properly selected around the edge of the plowed area. Keep the wheels of trucks off plowed areas. Avoid traffic on the down-slope side of the mound system. Work from the end and up-slope sides. This will avoid compacting the soils on the down-slope side, which, if compacted, would affect lateral movement away from the mound and possibly cause surface seepage at the toe of the mound.
10. Move the filter media into place using a small track type tractor with a blade. Do not use a tractor/backhoe having rubber-tired wheels. Always keep a minimum of 6 inches of filter media beneath tracks to prevent compaction of the natural soil.
11. Place the filter media to the required depth, i.e., to the top of the bed. Shape sides to the desired slope.
12. With the blade of the tractor form the infiltration bed. Hand level the bottom of the bed to within approx.. 1/2 inch.
13. Place the course aggregate in the bed. Level the aggregate to the design depth.
14. Place the distribution pipes, as determined from the pressure distribution guidelines, on the aggregate. Connect the manifold to the pipe from the pumping chamber. Slope the manifold to the effluent pipe. Lay the laterals fairly level, removing large rises and dips.
15. Pressure test the distribution system for uniformity of flow.
16. Place 2 inches of aggregate over the distribution pipe.
17. Install one or more anchored standpipes (4 inch PVC, anchored, with the bottom foot perforated, and with gravel or geotextile around the perforations). At least one shall be in the down-slope portion of the mound with the bottom at the original surface and the top extending just beneath the final grade of the mound, covered with the specified sprinkler valve box at the locations specified. The standpipes allow observations to be made of the water levels.

    This can be done now at this point in the installation, digging the hole with an auger, or be anchored in place after the original surface has been plowed and before the filter media is placed.
18. Place an approved synthetic filter fabric or geotextile over the aggregate.
19. Place the soil for the cap and topsoil on the top of the bed. This may be a subsoil or a topsoil. An initial depth of 18 inches in the center and 12 inches at the outer edge of the bed is desired. This creates a slope which assists the surface run-off of precipitation. Also, this layer provides some frost protection. Do not drive over the top of the bed as the distribution system may be damaged.
20. Landscape, seed or sod the mound system.
21. Due to the topography and the location of this subdivision all owners will accept responsibility for any storm water runoff from the road adjacent to this property.

Operation and Maintenance

1. The system owner shall be responsible for the continuous safe operation and maintenance of the system which includes routine and preventative maintenance, approved by the Weber/Morgan District Health Department.
2. Scum and sludge levels in the septic tank and other pretreatment devices as well as the pump should be inspected routinely and pumped when necessary. On the average septic tanks and pump chambers should be pumped every 2 to 3 years.
3. Periodic inspections of the systems performance are required. Liquid levels in the standpipes or piezometers should be checked and examinations made for any seepage around the toe of the fill.
4. Avoid any traffic in the fill area and that designated as reserve area. No vehicular or livestock traffic should be permitted. With lawn care equipment, such as riding lawn mowers or tractor, be careful not to travel on the mound, or the down-slope area, when the soil is saturated, as during the wet wintertime. Winter traffic on the fill should be avoided to minimize frost penetration in colder areas and to minimize compaction in other areas.
5. Good water conservation plan within the residence or establishment will help assure that the fill system will not be overloaded. Low volume flush toilets and reduced flow showerheads and faucets is recommended.
6. Should the pump chamber overfill as the result of a pump malfunction or power outage, one large dose at the time of current restoration or pump repair may result in the overloading of the Mound System. It is recommended that the pump chamber be pumped by a certified sludge hauler before pump cycling begins. In the event of this condition, the designer should be notified at once.
7. Performance monitoring of the system shall begin 90 days following installation; there after at six (6) month intervals, or at the time of problem, complaint, failure or question regarding site specific landscaping in close proximity to the Mound System or reserve area.
8. Neglect or improper use such as overloading the design rate, poor maintenance of the vegetative cover, inappropriate cover over the fill system or inappropriate activity over the fill can result in reduced operational life span and adverse effects on the public health.

Reeve & Associates, Inc.
5160 SOUTH 1500 WEST, RIVERDALE, UTAH 84405
TEL: (801) 621-3100 FAX: (801) 621-2666 www.reeve-assoc.com
LAND PLANNERS * CIVIL ENGINEERS * LAND SURVEYORS
TRAFFIC ENGINEERS * STRUCTURAL ENGINEERS * LANDSCAPE ARCHITECTS

REVISIONS

DATE	DESCRIPTION

5935 Old Snow Basin Road

HUNTSVILLE, WEBER COUNTY, UTAH

Mound Treatment System

REGISTERED PROFESSIONAL ENGINEER 375328 J. NATE REEVE STATE OF UTAH

Project Info.
Engineer: NATE REEVE
Drafter: TYLER PRIDEMORE
Begin Date: MARCH 2017
Name: 5935 OLD SNOW BASIN ROAD MOUND SYSTEM
Number: 6838-01

Sheet 1 of 2 Sheets

3/6/2017 | jmeyers | G:\6838 Thomas Quinn\01 – 5935 Old Snow Basin Rd., Huntsville\Improvements\Old Snow Basin Road Home imp.dwg

THESE PLANS AND SPECIFICATIONS ARE THE PROPERTY OF REEVE & ASSOCIATES, INC., 5160 SOUTH 1500 WEST RIVERDALE, UTAH 84405, AND SHALL NOT BE PHOTOCOPIED, RE-DRAWN, OR USED ON ANY PROJECT OTHER THAN THE PROJECT SPECIFICALLY DESIGNED FOR, WITHOUT THEIR WRITTEN PERMISSION. THE OWNERS AND ENGINEERS OF REEVE & ASSOCIATES, INC. DISCLAIM ANY LIABILITY FOR ANY CHANGES OR MODIFICATIONS MADE TO THESE PLANS OR THE DESIGN THEREON WITHOUT THEIR CONSENT.