

Lake Wise Info Sheet



DRIVEWAYS & LAKE ROADS

Low impact lake access

Description.

Lake friendly driveways are those that are minimized, not eroding, have proper surface materials, shed water quickly, avoid water running down the driveway, and divert as much runoff as possible to stable vegetated areas and away from surface waters. These road maintenance practices save money in the long-term, prevent repairs and replacement, and reduce susceptibility of flash flood damage.

Shoreland Best Management Practices for Lake-friendly Living.

Benefits

- Water Quality
- Prevents Erosion
- Slow, Spread, Sink Stormwater
- Small spaces
- Low Cost
- Low Maintenance
- Protection & Resiliency

VT DEC suggested BMPs for shorelands & BMPs under the VTrans Better Roads Program

Related Info Sheets:

- Turnouts & Rock Aprons
- Water Bars & Open-top Culverts
- Check Dams



Road runoff is dispersed and absorbed by nearby stable vegetated buffers.

Applicability.

These practices can be applied to all driveways, especially in areas near lakes and other waterways. They are relatively simple and preventative to maintain structural integrity of roadways and reduce erosion and sedimentation of nearby surface waters which causes many adverse effects to water quality and aquatic species.

Driveway Crowning.

Create a high point that runs lengthwise along the center of the road with gentle slopes that shed water to outer edges as sheet flow (water flows evenly across the ground surface as opposed to concentrated channel flows that cause rills and gullies). This is one of the quickest ways to get water off the road and prevent erosion.



A crowned driveway encourages sheetflow of runoff to stable upslope drainage ditches and downslope buffers, minimizing erosion of road surface.

VERMONT

DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WATERSHED MANAGEMENT DIVISION



Graphics by Greenleaf Design, LLC



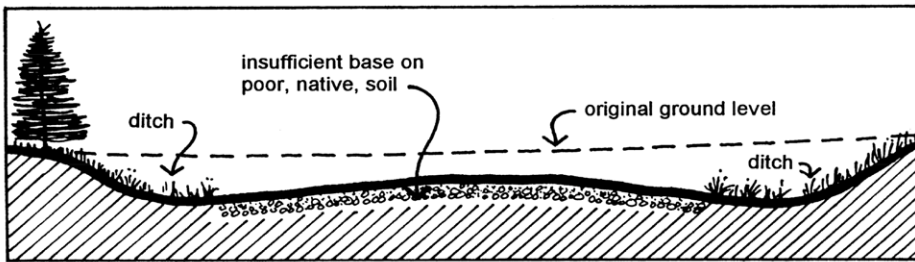
How to: driveway crowning.

1. Measure the width of your driveway. The highest point of the driveway should generally be the center, though some driveways can be crowned from the edges (called super-elevating). Crown roads approximately $\frac{1}{2}$ inch for each foot from the center of the roadway to the outside edge (or for the entire width for driveways crowned on the edge). For example, a 12-foot wide driveway will have a 3-inch-high crown in the center or a 6" high crown (super-elevation) on one side, gently sloping to the other side. A crown slope of $\frac{3}{4}$ -inch per foot may be necessary for steeper sections to counteract the tendency of water to travel downhill over the road surface.
2. Pour a layer of "crusher run" gravel in the center of the driveway. Ensure that gravel is not rounded as this gravel will be pushed off the driveway easily. See below for more information on proper gravel choices.
3. Spread the gravel out using a metal rake, shaping the crown to the calculated height, and smoothing down the edges towards the sides of the driveway.

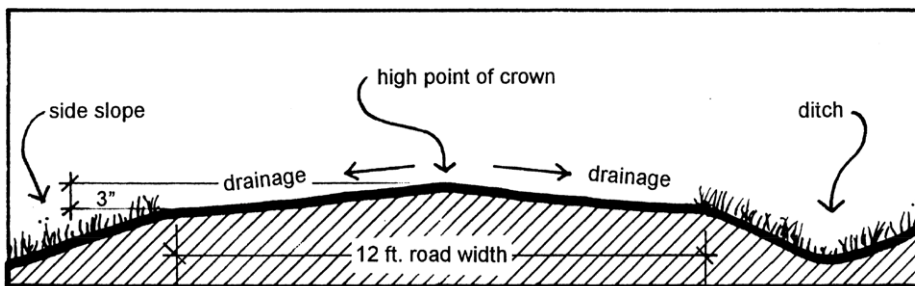
Materials.

- Measuring tape
- Stakes, level, and string or laser level to measure grade
- Shovel and Metal rake
- 'Crusher Run' Gravel (blend of crushed stone and stone dust)
- Optional: Grader
- Optional: Bucket loader

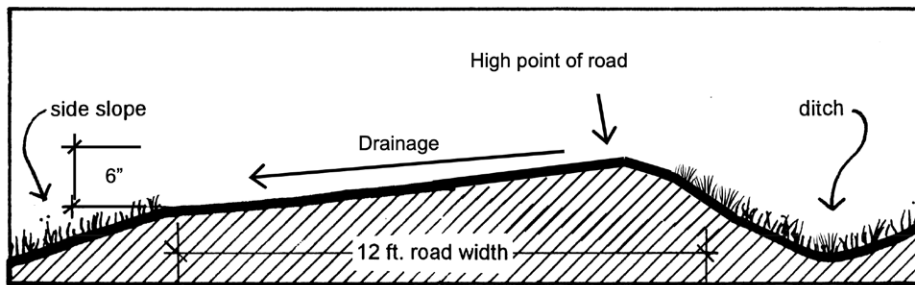
Section view of a poorly constructed road, below ground level.



Section view of a properly crowned road and ditching.



Section view of a super-elevated crowned road.



ME DEP Gravel Road Maintenance Manual

Maintenance.

Inspect the driveway after large rain events and in the spring. If the crown is not maintained, recrown the driveway.

Crowning should be done annually because snow plowing and normal use flattens the road over the course of a year.

In many cases, gravel that has been pushed to the edges of the road can be raked back towards the center to reform the crown.





ReAgg LLC

Rounded bank run gravel.



Ebyland LLC

Angular crushed gravel.



VT Lake Wise Program

Proper Surface Materials.

Driveway materials should include gravel and fines (silt and clay particles). Gravel provides strength and has large voids that provide good drainage. Fines fill the voids between the gravel and make it more cohesive, decreasing infiltration of water into the road.

It is important to have a range of different sized materials as well as the right ratios so the particles “lock” together and prevent movement and rutting, which creates a well-graded road. Crushed gravel has angular edges and is recommended, whereas bank run gravel is rounded and not recommended. Stone dust is recommended to bind the material and make a smooth surface. ‘Crusher run’ gravel is a blended mix of crushed stone and stone dust and makes an ideal driveway surface material.

With the right ratios, these materials form a highly durable surface that can be graded and resist erosion.

Note: avoid treated slate or gravel that may have oils which can runoff into the lake.

Loose surface material generally indicates a lack of fines. Soft roads are generally indicative of either too many fines, the road base being too low in relation to the water table, or not having a sufficient base layer. See the Gravel Road Maintenance Guide for more info.

Drainage Ditches.

Description. Ditches are constructed to convey stormwater runoff away from roads to an appropriate outlet without causing erosion or sedimentation of surface waters. A stable ditch needs to be shaped and lined using the appropriate vegetative or structural material to slow and filter stormwater and not erode.

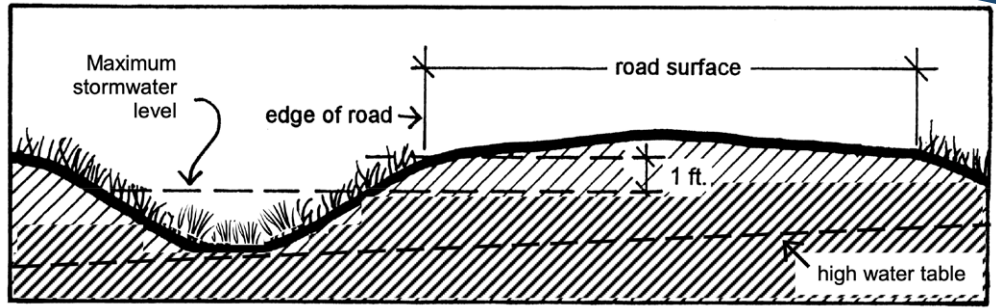
Applicability. Driveways where the surrounding areas do not promote distributed sheet flow. Efficient removal of runoff from the roadway will help preserve the road bed and banks. Well-designed ditches maximize removal of sediments and other pollutants from runoff before it reaches surface waters. They also cut maintenance costs by minimizing the need for cleaning and regrading.

Note: a contractor will often be hired to construct ditches. If that is the case, ensure that your contractor understands how to properly construct a ditch to protect water quality. See the following steps.





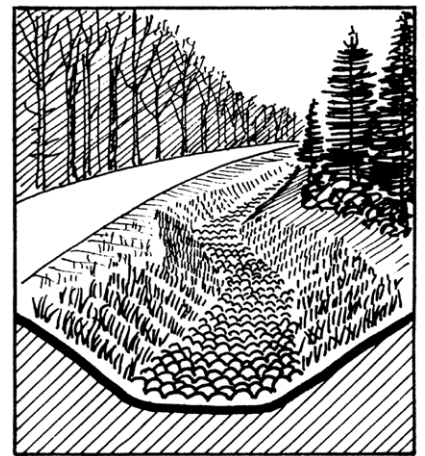
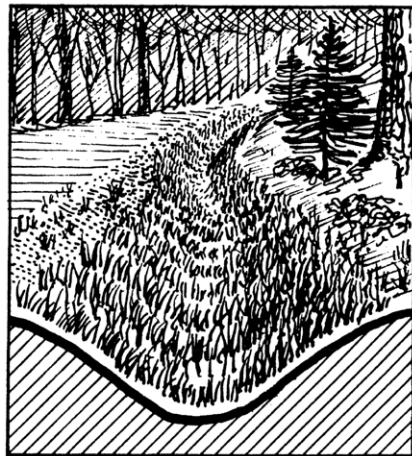
Level of water flow should always remain at least 1 foot below road surface.



Ditch Types.

Slope Range (percent)	Lining Material (square feet)	Required Infrastructure
0 - <5	Grass	-
5 - <8	Grass	Check dams Cross culvert and/or Turnouts
	2-6" minus stone	7.5" rock depth
8 - 10	6-8" minus stone	7.5" rock depth
>10	6-12" minus stone	12" rock depth

Adapted from the Municipal Road General Permit (MRGP) Ditch Requirements.



Plant grass for ditches <5%; Install rock for 5% or steeper sloped ditches.

MEDEP Gravel Road Maintenance Manual

How to: drainage ditches.

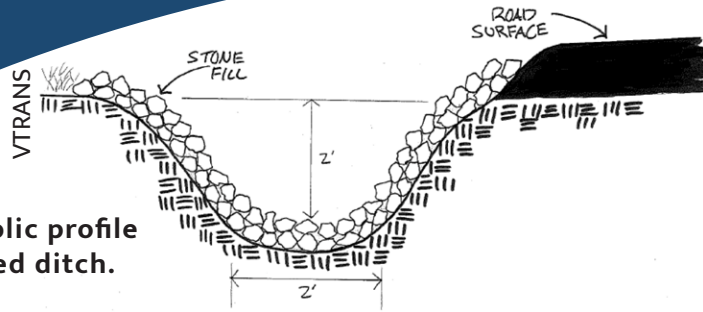
- Using the table above, determine the appropriate ditch type for your property. If the ditch will be seeded, construct the ditch earlier in the growing season such as the spring so that the vegetation can establish.
- Locate ditches on the up-slope side of the road to prevent water from flowing onto the road from uphill and on the down-slope side of the road to capture and transport water from the road surface.
- Design and grade ditch and bank side slopes at a maximum 2:1 (horizontal:vertical) ratio.
- Excavate a ditch deep enough to drain the road base and handle expected runoff, typically about 1.5 to 2 feet deep. As a rule, when the ditch is conveying stormwater, the water should never be higher than 1 foot below the top of the ditch.

The ditch should be slightly rounded (parabolic shape preferred) or trapezoidal and at least 2 feet wide to help slow and disperse water rather than channelize it in a "V" shape.

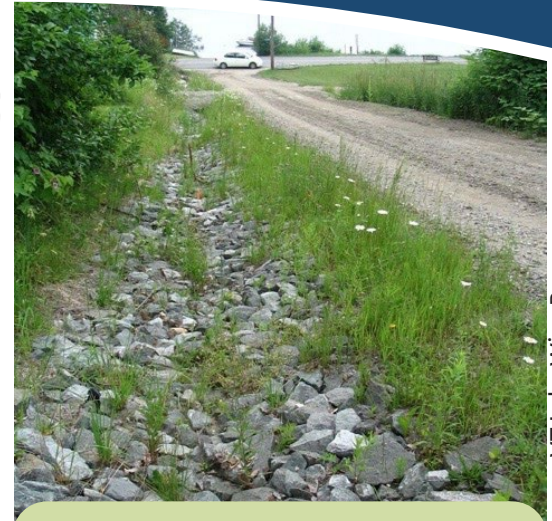
Be a good neighbor - discuss drainage options with land-owners whom may be affected by the runoff.

Materials.

- ✿ Rubber-tired excavator with articulated bucket
- ✿ 2-12" stone (see table)
- ✿ Grass or conservation seed mix
- ✿ Erosion control blankets or straw/hay mulch
- ✿ Nonwoven geotextile fabric (for stone-lined ditches)



Proper parabolic profile of a stone-lined ditch.



VT Lake Wise Program

How to: drainage ditches.

5. For ditches with a slope of 5-percent or lower, seed grass or a conservation mix on all bare soil. Use straw mulch or erosion control blankets to stabilize soil and seed to allow plant establishment. Use erosion control blankets especially when site conditions require side slopes steeper than 2:1.

Seed and stabilize ditches as soon as possible after construction to prevent erosion and to maintain the ditch profile. Vegetated ditches installed after September 15th should be stabilized with either erosion control blankets or hydroseeding to provide adequate protection for winter.

6. For ditches with a 5-percent slope or greater, line with non-woven geotextile fabric to protect underlying soil from eroding. Then, install stone and seed bare soil with grass. Place stone below the height of the shoulder so that grading and other maintenance operations don't disturb the stone lining.

7. Ditches should convey water away from the road and prevent standing water, which can weaken the road.

Outlet ditches into stable vegetated areas where possible (see **Turnouts & Rock Aprons**). Do not channel road drainage directly into streams, lakes, or wetlands because of the harmful effects of nutrients and sediments to water quality – no matter how well your road is maintained. Do not channel towards wells or septic systems. Direct road runoff away periodically; slow it, spread it out, and soak it in as close to the source as possible.

For ditches with steep backslopes: stabilize with conservation seed, erosion control blankets, and plantings of woody shrubs that will stabilize the soil (See **Live Stakes & Fascines**).


Maintenance.


Inspect the ditches after large rain events and in the spring. Remove large obstructions, leaves, and other debris periodically. If any damage or erosion occurs, repair as soon as possible.

If the stone becomes filled up with sediment over time, remove, clean out sediment, and replace with clean stone. Regrade ditches only when necessary. Prevent uphill erosion and on backslopes to reduce maintenance needs.

If erosion is occurring at the ditch outlet, stabilize the erosion and replant the area with native vegetation - consider a Rock Apron.

For more information...

 **Gravel Road Maintenance Manual: A Guide for Landowners on Camp and Other Gravel Roads (ME DEP, 2016)**

 **The Vermont Better Roads Manual (VTRANS, 2019)**

