

ROAD & BRIDGE STANDARDS

VILLAGE OF LUDLOW, VERMONT

In order to:

- Provide for the safety and welfare of the traveling public
- Save public funds over the long term
- Prevent hazardous conditions that could threaten life or property
- Reduce the avoidable dangers that we expose our emergency forces to
- Prevent undue soil erosion
- Protect water quality

The Village of Ludlow hereby adopts the following Road & Bridge Standards which shall apply to all future road and bridge construction or reconstruction done within the town. (Unless State or Federal funding regulations govern over this document).

The standards listed here are considered minimum and are presented for purposes of guiding construction and maintenance personnel. The Ludlow Village Board of Trustees reserves the right to modify the standards for a particular project, where, because of unique physical circumstances or conditions, including topographical or other physical conditions, there is no possibility that the project can be completed in strict conformance with the provisions of these Road & Bridge Standards, and that the modification is therefore necessary for the project to be completed in a reasonable manner. The modification must be the least variance from the standards possible to afford the relief necessary to permit the project to be completed. In modifying the standards for a particular project the Village Board of Trustees may require other reasonable measures in order to mitigate and minimize foreseen adverse effects of the modification. Fiscal reasons are not a basis for modification of the standards.

Access Permit

An Access Permit is required for all future private road and bridge construction or reconstruction done within the town where the road joins a town road. An access permit is required for any future driveway construction or reconstruction done within the town where the road joins a town road.

Ditches

Soil exposed during ditch and slope maintenance shall be protected from erosion by stabilizing it as soon as practical by seeding and mulching or by placing fiber mats or stone. Priority should be given to areas vulnerable to erosion immediately adjacent to or discharging to surface waters and/or roadway drainage facilities). Roadside ditches, public or private, shall be vegetated or lined with rock as follows:

- Seed and mulch ditches with slopes less than 5%.
- Install fiber mat and seed ditches with slopes of 5% or less.
- Vegetation must be established and monitored. If vegetation is not established within 10 days of placement, install biodegradable non-welding matting with seed.

- Install angular stone on with slopes over 5%, using filter fabric when necessary
- Stoneline ditches more than 5% with check dams in accordance with VT Standards and Specifications for Erosion Prevention & Sedimentation Control.
- Create parabolic (wide “U” shaped) ditches where possible when constructing new or substantially reconstructing ditches, rather than narrow “V” shaped ditches. Ditches with gradual side slopes (maximum 2H: 1V ratio) and a wide bottom (at least 2 feet) are preferred.
- Use biodegradable, non-welded matting to stabilize side-slopes where slopes are greater than 1:2 apply seed and mulch to any raw or exposed side-slope if slopes are less than or equal to 1:1.
- Ditches should be turned out to avoid direct outlet into surface waters. There must be adequate outlet protection at the end of the turnout, either a structural (rock) or vegetative filtering area.
- Departing from Codes & Standards for cost effective reasons is permissible with written permission only from VTrans Operations.
- When constructing new or substantially reconstructing side slopes, use appropriately sized stone armament on slopes that are 1:1 ½ or greater. If perennial streams are affected by the toe of the slope the project must conform to the statewide Stream Alteration standards.

Water shall be diverted out of ditches:

- Every 300 feet on roads having a slope of 1-2%
- Every 150 feet on roads having a slope of 3-10%
- Every 100 feet on roads with slopes over 10%

Culverts and Bridges

On any project, except as provided herein for driveways, the minimum roadway culvert diameter will be eighteen (18) inches. All culverts shall be installed according to standard construction practice or manufacturer's instructions. Culverts must be new and may be either sixteen (16) gauge galvanized steel or Sherlock polyethylene silt tight to meet ASTMII standards, must have guideposts at each edge of the traveled way and must have headers. Class 1, 2 or 3 public roads and all private roads with discernible slope shall have at least one eighteen (18) inch cross culvert every 500 feet. This minimum shall be increased to a cross culvert at least:

- Every 400 feet on roads with slopes of 1-2%
- Every 300 feet on roads with slopes of 3-5%
- Every 200 feet on roads with slopes of 5-10%
- Every 100 feet on roads with slopes over 10%

Repair of existing bridges and culverts and new bridges and culverts will be designed in accordance with the VTrans Hydraulics manual and, in the case of perennial streams, conform to the statewide Stream Alteration Standards.

The capacity determination shall also take into account specific site conditions such as

the importance of the road functioning during critical events, historic ice formation, high debris and/or sediment loads and downstream development at risk, which may necessitate larger or heavier structures. Placement of spans in perennial streams will conform to statewide stream alteration standards.

The installation of any culvert or bridge must be inspected and approved by the Ludlow Municipal Manager or in his/her absence the Highway Foreman.

All new bridges will be constructed with two lanes.

Guardrail

When roadway, culvert, bridge or retaining wall construction or reconstruction projects result in hazards such as foreslopes, drop offs, or fixed obstacles within the designated clear-zone, a roadside barrier such as a guardrail shall be installed. The most current version of the AASHTO Roadside Design Guide will govern the analysis of the hazard and the subsequent treatment of that hazard.

Road Configuration, Base and Grading

- The right of way for a road shall be a minimum of fifty (50) feet, and the traveled portion shall be constructed in the middle of the right of way.
- Grades will not exceed twelve (12) percent. Grades between eight (8) and twelve (12) percent must be surfaced with black-top, as follows: Black-top surface of bituminous concrete hot-mix compacted to three and one-half (3.5) inches, with a width of twenty (20) feet and where the black-top ends the crushed gravel shall meet the grade of the black-top.
- Roads shall have curves no greater than eleven to twenty-one (11 to 21) degrees, with each curve properly banked. Approval of the curve and banking must be obtained from the Municipal Manager or in his/her absence the Highway Foreman.
- New roads being joined to an existing paved town road must be black-top surfaced with bituminous concrete for at least the first one-hundred-fifty (150) feet from the edge of the traveled way of the paved town road.
- Subbase under new or substantially reconstructed paved road will have fifteen (15) inches of subbase material.
- All new road accesses to a town road shall slope away at 3% from the town highway for a distance of no less than twenty (20) feet.
- Dead End roads shall have a turn around area of a minimum of seventy-five (75) foot radius at the terminus. With the approval of the Highway, Fire, Ambulance and Police Departments of the Town & Village of Ludlow, the location and dimensions of a hammer-head turn around on private roads may be constructed using a hammer-head turn around in lieu of the required seventy-five (75) foot radius turn around.
- Prior to laying the gravel the right of way shall be clear of all stumps and rubbish.
- The traveled portion of the road shall have a minimum shoulder to shoulder width of twenty-four (24) feet.
- On all curves where the drop is ten (10) feet or more with a slope of less than one (1) to four (4), guard rails must be installed in accordance with federal standards.
- All gravel roads shall have at least fifteen (15) inches of processed bank run gravel

with no stone larger than nine (9) inches, and three (3) six (6) inches of crushed gravel with no stone larger than one-and-one-quarter (1 1/4) inches, which must be compacted, and such roads must be graded so that water does not remain on the road surface, and have adequate space for shoulders and ditching without creating unstable uphill or downhill slopes. The ditch line must be lower than the bottom of the bank run gravel. Each layer of the gravel must be inspected by a licensed engineer for thickness and compaction, and certified by such licensed engineer that each layer meets the thickness required over the length of the road and meets generally recognized standards in the industry for compaction. In addition, each layer must be inspected and approved by the Ludlow Municipal Manager or in his/her absence the Highway Foreman.

Driveways

The minimum diameter for culverts under any driveway access, permanent or temporary, on to a town highway shall be fifteen (15) inches, must be new, shall be a minimum of thirty (30) feet in length, may be either sixteen (16) gauge steel or Sherlock polyethylene silt tight to meet ASTM standards, must have guideposts at each edge of the traveled way and must have headers. All driveway accesses shall also slope away at 3% from the town highway for a distance of no less than twenty (20) feet.

Driveways and Private Roads

New private roads, regardless of whether or not intended to be taken over by the town, and the first twenty (20) feet of new driveways, shall be constructed and maintained to these Road & Bridge Standards including ditches, culverts and bridges. These standards shall also apply to temporary roads that drain onto town highways.

The Ludlow Village Board of Trustees has the authority in its sole discretion to accept or refuse to accept any road as a town road.

Special Conditions

- The permit holder shall take all precautions to safeguard the traveling public from commencement until the work is completed.
- Backfill shall be compacted, tested and certified by a licensed engineer to prevent settlement of the road surface.
- Gravel, base and surface courses shall be replaced, if disturbed by the permit holder.
- All new drainage pipes within road right of way shall be inspected and approved by the Ludlow Municipal Manager or in his/her absence the Highway Foreman before trenches are backfilled.
- Paving existing gravel drives requires a separate and additional Access Permit. No structure or parking is permitted within the road right of way.
- All construction and material costs shall be the liability of the permit holder.
- All applicable Village Zoning and Flood Hazard Regulations and all state laws and regulations, including the State Environmental Control Commission regulations must be met.
- The permit holder shall be liable and responsible for any damage, repair or maintenance of the road, bridge, drain, ditch, slope, post or culvert, including headers,

within the road right of way. No effluent from septic tank or leach field will be allowed to drain onto any road right of way.

Adoption

Since April 4, 2011, town roads have been regulated pursuant to the highway specifications adopted by the Village of Ludlow Board of Trustees. These Road & Bridge Standards supersede those highway specifications, and on the adoption of the Road & Bridge Standards by the Village Trustees, those highway specifications shall be, and are hereby, rescinded.

The foregoing Road & Bridge Standards are hereby adopted by the Village Board of Trustees of the Village of Ludlow, Vermont this 4th day of February, 2014.

**Village of Ludlow
Board of Trustees**

Robert Gilmore, Chairman
David Rose
Richard Harrison