

# **Stormwater Challenges in the Mad River Watershed: Town Road Access & Drainage**

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## **Introduction to Private Drives and Stormwater**

The Mad River Watershed encompasses some of the steepest terrain in Vermont with a high concentration of rural roads, resort development in sensitive headwater areas and village development closely flanking the river, as well as a typical residential development pattern that skirts under the State permitting threshold. Aside from large development projects, stormwater management has fallen largely to the five municipalities that the Mad River Valley encompasses. Water running down a driveway or private road directly onto the public highway can erode the shoulder and road surface. Improperly installed driveways and driveway culverts are a major contributor to stormwater pollution as well as a source of roadway flood damage. Driveway and private road culverts that are too small or improperly installed can impede the flow of water in a roadside ditch leading to a backup of water causing the road surface to wash out or the driveway culvert to blowout, causing damage to the town road.

According to the "Framework for Action on Stormwater: Ridge to River Phase 1 Final Report" prepared by Stone Environmental in May, 2016, private driveways represent 147 miles of transportation infrastructure in the Mad River watershed - or half again the length the road network, which encompasses 291 miles. Of the total driveway network, 60 miles have slopes in excess of 15%, representing about two-fifths of driveways on a watershed basis. Included in this report is a table that summarizes the length and density of driveways with slopes over 15% by sub-watershed (Table 11 and Map 15). Because of these topographical and regional factors, the stormwater runoff challenges presented by driveway and private road accesses onto the Mad River Valley municipal road system account for more hydrologically connected road segments that are a risk to water quality than the statewide average.

A recent GIS exercise performed by the Vermont Agency of Natural Resources determined that private driveways have the potential to cause or contribute runoff that causes erosion in municipal rights of way on a statewide basis. The study revealed that approximately 40% of the municipal road segments statewide (5083 miles) are hydrologically connected to surface waters and are a risk to water quality. Of those road segments, approximately 740 miles are connected to private driveways. The GIS exercise used statewide e-911 driveway data that does not take into account private roads, which would invariably increase the erosion potential. The steepness of the terrain in the Mad River Valley magnifies this risk to water quality and potential flood damage.

The Vermont Local Roads Program estimates in their "Road Design and Maintenance Handbook" that statewide, local highway departments spend over 25% of their budgets for drainage-related roadway projects. Improperly constructed and maintained driveway and private road access points can result in drainage problems and related damage from flood events,

especially in watersheds like the Mad River, where the elevation rises and falls from steep ridges to river lowlands. Poor driveway and private road design and construction contribute to flash flood damage by increasing the flows in roadside ditches. In addition, poor driveways and private roads can be a continual source of erosion, clogging town ditches and culverts and contributing to the sedimentation of surface waters.

## **Regulatory Authorities**

### **A. Title 19 V.S.A. § 1111**

Any work within the limits of a municipal highway ROW (for example, construction of a driveway, installation of a culvert, excavation of a ditch or re-grading) requires a permit as authorized under the state's highway law, Title 19 V.S.A., under section 1111(b). Therefore, an access permit is needed anytime a developer or property owner wants to put in a driveway or private road that enters onto a public highway. Although state law does not specify who is required to maintain private drives or roads, it does stipulate that it is unlawful to ". . . obstruct a ditch, culvert, or drainage course that drains a highway, or fill or grade the land adjacent to a highway so as to divert the flow of water onto the highway right-of-way..." without a written permit. It is also important to note that the permit is not limited to new driveways or private roads entering onto a public highway, but any work done within the public right of way.

One objective of Title 19 § 1111(b) is to prevent landowners adjacent to town roads from making alterations to their land that would negatively impact the drainage of state and town highways. Any work done within the limits of a state or town highway right of way (for example, construction of a driveway or private road access, excavation of a ditch, or re-grading) requires a permit under Title 19 § 1111(b). The Vermont Agency of Transportation issues the permit in the case of State highways, and the municipal legislative body (Selectboard), or its designee (Road Foreman or Commissioner) issues the permit in the case of town highways.

Vermont's highway law also states that a municipality's legislative body or designee may "lay out, establish, construct, or cause to be constructed and maintained a method for diverting excess surface water from the town highway across the lands of any person . . . if deemed necessary for the public good" in accordance with Title 19 V.S.A. § 950. It is important to note that actions taken under this authority may be construed as an exercise of eminent domain. A challenge could result in a procedural process (notice, hearing, site visit, written decision, and right of appeal) and may require a town choosing this course of action to pay monetary damages.

### **B. Department of Environmental Conservation Municipal Roads General Permit**

In 2015, the Vermont legislature passed Act 64, the Vermont Clean Water Act, which includes several new water quality programs that address some of the State's chronic water quality issues. The Municipal Roads General Permit was one of the programs created by Act 64 aimed at addressing stormwater runoff from municipal roads, both paved and unpaved. Under the new Municipal Roads General Permit (MRGP), municipalities must implement customized, multi-year municipal plans to stabilize their road drainage systems.

In the current draft MRGP framework, it is important to note that the permit's jurisdiction is limited to the municipal highway right-of-way, leaving any authority to regulate drainage from

adjacent lands into the road drainage system to the towns. Under the existing draft, if road erosion is present and driveways are contributing to the stormwater pollution, all driveway culverts in the effected road segment must be upgraded to a minimum of 15 inches and the driveway headwalls must be stabilized if the absence of such structures is contributing to the problem. In this way, the MRGP requirements for desired driveway upgrades will apply retroactively, rather than "from this point forward" as is the way when new bylaws or ordinances are adopted. The permit does not, however, indicate who is responsible for managing the upgrade.

With the onset of the State's Municipal Road General Permit, it is particularly important for towns to take a look at their town highway access policies or ordinances, road and bridge standards, zoning, and subdivision standards to see what, if any, written authority exists giving the town control over drainage into the public right-of-way. Included in Section F of this document is a *Draft Model Municipal Highway ROW Access and Drainage Standards* that serves as a starting point for towns looking to implement the State's Municipal Road General Permit and road related best management practices.

### **C. Driveway and private road access policies and ordinances**

Town requirements for driveway and private road access permission can be outlined in a highway access policy or ordinance which establishes minimum standards for the access design, construction and maintenance. It is a useful tool for controlling drainage, reducing damage, mitigating erosion, decreasing maintenance and saving the town money and time. Some Vermont towns adopt comprehensive Highway Ordinances, which can also address issues such as safety, town highway classification, road acceptance, sidewalks, parking, loading and other issues associated with various types of development, especially commercial development.

It is in these access policies and ordinances that some towns have included standards effecting damages to town roads from improper maintenance on behalf of the adjoining property owner. For example, the Town of Winhall includes the following in their Comprehensive Highway Ordinance:

#### *Damage To Town Highways:*

*In the event damage is caused by improper construction, maintenance or grading it shall be the responsibility of the property owner to make the necessary repairs upon negotiation in writing by the Town. If such repairs are not made within thirty (30) days, the town shall take whatever steps are necessary to insure the interests of the Town and secure the expenses involved. (Town of Winhall)*

Although not as specific, the Town of Waitsfield includes the following language in their Driveway Access Policy:

*The property owner shall maintain the highway access to the satisfaction of the Town.*

### **D. VTrans Road and Bridge Standards**

The VTrans Road and Bridge Standards address water quality associated with roadway run-off. Adoption of these standards is voluntary, and the five towns encompassing the Mad River Valley Watershed have adopted the standards. In order to be in compliance with the VTrans Road and

Bridge Standards, any new road that will be conveyed to the municipality must be constructed to comply with the minimum of these standards.

The VTrans Road and Bridge Standards include minimum erosion control measures relevant to ditches, slopes, culverts and road crowning that, for the most part, dovetail with the upcoming Municipal Road General Permit Standards, including a requirement that all new driveways have a minimum culvert diameter of 15 inches. The VTrans Road and Bridge Standards also reiterate the requirement under 19 V.S.A. § 1111 that towns must review all new drive accesses and development roads where they intersect town roads, and suggest that towns reference VTrans A-76 Standards for Town and Development Roads and B-71 Standards for Residential and Commercial Drives.

The VTrans Road and Bridge Standards were not updated in the 2017 - 2019 version of "The Orange Book" *Handbook for Local Officials*. According to State officials the Road and Bridge Standards will be updated in "The Orange Book" after the DEC Municipal Road General Permit described above goes into effect.

### **VTrans Road and Bridge Standards in the Mad River Valley Watershed**

All five towns have adopted the VTrans Road and Bridge Standards. Therefore the following standards pertaining to culverts, ditches and slopes have been adopted by reference:

#### **a. Culverts**

1. The minimum culvert diameter for a driveway is 15 inches.
2. Replacement of existing culverts and any new (development road) culvert must have a minimum culvert diameter of 18 inches.
3. Culvert headwalls shall be installed at the inlet and outlet of all culverts where there is erosion or undermining or where it is expected to occur.
4. Culverts conveying intermittent or perennial waters are subject to the Vermont DEC Stream Alteration Permit. Applicants shall seek advice from the State Stream Alteration Engineer when stream crossings are involved.

#### **b. Ditches and Slopes**

1. Ditches shall be turned out to avoid direct outlet into surface waters.
2. Ditches with slopes of less than 5% may be seeded and mulched. Ditches with slopes greater than 5% must be stone lined or constructed with stone check dams.
3. Driveways and development roads shall be graded to promote sheeting of water off of the road surface. This generally means a 1/4 inch - 1/2 inch per foot crown for gravel roads and a 1/8 inch - 1/4 inch per foot crown for paved roads.

### **E. Subdivision and/or Zoning Regulations**

Highway access, driveway and development road standards can also be included in a Town's subdivision and/or zoning regulations. The language can reference other adopted standards, such as the VTrans Road and Bridge Standards or the Town's Highway Access Policy. When issuing permits, the zoning administrator or other permitting authority can stipulate that the applicant obtain an access permit from the selectboard before the zoning permit is valid.

Driveways are specifically addressed in one form or another in the zoning regulations of all five towns encompassing the Mad River Valley Watershed. Unlike the other 4 towns in the watershed where driveway and development road accesses are reviewed by road foremen, Warren's town highway access is reviewed through zoning. See Warren's Zoning Bylaw- most recently updated 2013, below.

#### **F. Vermont Agency of Agriculture Food and Markets' Required Agricultural Practices Rule**

According to the Vermont Agency of Agriculture Food and Markets' Required Agricultural Practices (RAPs) Rule, ditches shall be buffered from croplands by a minimum of 10 feet of perennial vegetation. On or before January 15, 2018, the Secretary of Agriculture, Food and Markets shall amend the RAPs in order to include requirements addressing subsurface tile drainage. As part of the rule amendment process, the Secretary may also evaluate the current status of effectiveness of the RAPs, and may consider additional changes, as appropriate, to meet the water quality goals of the State.

#### **G. Regulatory Review of Stormwater and Water Quality Language**

As a part of this effort, the regulatory documents of the five watershed towns were reviewed. Specifically, the review looked at the applicable stormwater and water quality language in the most current subdivision and/or zoning regulations, focusing on stormwater, slope, surface water protection & driveways (where specifically addressed).

#### **Fayston Zoning Bylaw - 2012**

##### **Stormwater**

In Section 3.4 - Erosion and Sediment Control and Stormwater Management, all development requiring a municipal land use permit and forestry is subject to application provisions requiring:

- (1) An existing condition site assessment providing baseline information on features including slope profiles showing existing gradients, soil types, tree canopy and other vegetation, natural waterbodies, wetlands and site features that aid in stormwater management including natural drainage ways and forested and vegetated lands located on stream and wetland buffers;
- (2) An erosion and sediment control plan that incorporates accepted management practices as recommended by the state in the most recent editions of the Low Risk Handbook for Erosion Prevention and Sediment Control or The Vermont Standards and Specifications for Erosion Prevention and Sediment Control, or the most recent Agency of Natural Resources standards as determined by the DRB.

This section includes detailed guidelines and a stipulation that the DRB or Zoning Administrator may require that the application materials be prepared by a qualified professional. The DRB or Zoning Administrator may require that the application materials be prepared by a qualified professional.

Also included are Low Impact Development (LID) Standards and Guidelines for Stormwater Management and the statement: "The use of LID design approaches shall be implemented to the

maximum extent practical given the site's soil characteristics, slope, and other relevant factors. To the extent that LID design approaches are not proposed in the stormwater management plan, as required in Section 3.4(C), the applicant shall provide a full justification and demonstrate why the use of LID approaches is not possible before proposing to use conventional structural stormwater management measures which channel stormwater away from the development site." Standards are statements that express the development and design intentions of this article. The guidelines suggest a variety of means by which the applicant might comply with the standards.

Under the General Subdivision Standards in Section 6.2, A storm water drainage system shall be provided that is designed to control and manage storm water collected on all proposed roads and/or parking areas in accordance with Section 6.5 of these regulations. Generally, roadbeds, shoulders, ditches and culverts shall be designed and maintained in conformance with the Vermont Better Backroads Manual, as most recently amended.

### **Slope**

Development on steep slopes equal to or in excess of 15% shall be sited and constructed, and slopes stabilized to minimize risks to surface and ground waters and to protect neighboring properties from damage. With the exception of land development associated with the operation, maintenance and expansion of an alpine ski resort, development shall not take place on slope gradients of 25% or more. All development on slopes equal or in excess of 15% is subject to Conditional Use Review.

Under the General Subdivision Standards in Section 6.2, subdivision boundaries, lot layout and development envelopes shall be located and configured to minimize adverse impacts to areas of the parcel that have slopes greater than 15%, to prevent disturbance to slopes in excess of 25%, and to avoid the placement of structures on prominent hilltops and ridgelines.

### **Driveways**

Under Section 3.1 - Access, Driveway and Frontage Driveways shall be constructed to town driveway standards (Vermont Agency of Transportation's B-71 Standards for Commercial and Residential Driveways) unless otherwise required or allowed under subdivision or conditional use review. No driveway shall exceed a slope of 3% within 35 feet of the center line of a road, or shall intersect with a road at an angle of less than 70° within 35 feet of the center line of a road. Access onto town highways is subject to the approval of the Fayston Selectboard. Access permits must be obtained prior to the issuance of a zoning permit.

### **Surface Water Protection**

Under Section 3.13 - Streams and wetlands, a vegetated buffer strip shall be maintained for a minimum of 50 feet from wetlands, streams, brooks and rivers.

## **Moretown Zoning Bylaw- August, 2016**

### **Stormwater**

Section 4.15 Erosion and Sediment Control and Stormwater Management requires that:

- (1) an existing condition site assessment providing baseline information on features including slope profiles showing existing gradients, soil types, tree canopy and other vegetation, natural waterbodies, wetlands and site features that aid in stormwater management including natural drainage ways and forested and vegetated lands located on stream and wetland buffers, and
- (2) An erosion and sediment control plan that incorporates accepted management practices as recommended by the state.

The section includes detailed EPSC standards as well as Low Impact Development (LID) Standards and Guidelines for Stormwater Management, and states "The use of LID design approaches shall be implemented to the maximum extent practical given the site's soil characteristics, slope, and other relevant factors. To the extent that LID design approaches are not proposed in the stormwater management plan the applicant shall provide a full justification and demonstrate why the use of LID approaches is not possible before proposing to use conventional structural stormwater management measures which channel stormwater away from the development site."

### **Slope**

Section 4.15(E) deals with steep slopes and applies to development involving site disturbance, excavation, filling or regrading of 1000 or more square feet of land with a slope of 15% or more, and driveways and roads on land that exceeds an average of 12% or more over any 50-foot section. Development meeting these conditions is subject to conditional use review and approval by the DRB and requires an erosion prevention and sediment control plan as well as other review standards.

No site disturbance or development shall take place on very steep slopes - 25% or more - with the exception of (1) limited site improvements necessary to facilitate development on contiguous land with a slope of less than 25%

Conditional use approval for development on steep slopes requires a submission and DRB approval of an engineering plan prepared by a qualified professional engineer licensed by the State of Vermont.

### **Surface Water Protection**

Section 411 requires a minimum 50 foot undisturbed buffer strip measured from the top of bank on all streams and rivers. For development subject to conditional use review, the minimum required setback and/or undisturbed buffer strip distances may be increased as appropriate based on site, slope or soil conditions and the nature of the proposed use.

A naturally vegetated buffer strip shall be maintained, of at least seventy-five (75) feet in uniform width, for Class Two wetlands, and one hundred (100) feet in uniform width, for Class One wetlands. No development, dredging, ditching or manipulation of vegetation will be

permitted within neither the buffer strip nor within the wetland, unless in conformance with the Vermont Wetlands Rules.

Site development plans are required for applications requiring conditional use review, and must include, among other things, existing features, including prominent topographic features and areas of steep slope (15% or greater); surface waters, wetlands and associated buffers; designated floodplain and source protection areas; land cover; and critical habitat areas and historic sites.

### **Driveways**

Except where referenced in Section 4.15(E) with regard to slope, town highway access is covered by an application and permit. The application form includes the following: Directions, Restrictions & Conditions: The landowner is responsible for maintaining and replacing any culverts installed in the town right-of-way. Also included on the application form is the following: This application & permit does not relieve you of obligations to comply with State of Vermont permit requirements or regulations or other requirements of the Moretown Zoning Ordinance.

## **Waitsfield Zoning Bylaw- 2016**

### **Stormwater**

The Conditional Use review standards in Section 5.03 include the following language with regard to stormwater management: Stormwater runoff shall not result in adverse impacts to neighboring properties, town roads, or water quality in nearby surface waters. A stormwater management and/or erosion control plan, prepared by a licensed engineer, may be required as appropriate and incorporated as a condition to approval. Such plan shall be prepared in accordance with Best Management Practices (BMPs) for managing stormwater and controlling erosion, as defined by the Vermont Agency of Natural Resources. Under conditional use review, permeable surface for proposed parking areas are encouraged to limit stormwater runoff.

### **Slope**

Areas with a slope of 15% or greater must be included on site plans for conditional use applications. The land to be developed under conditional use review must be able to support the intended use without undue adverse impacts to significant natural features (e.g. wetlands, wildlife habitat, steep slopes, groundwater, headwater streams), as determined from the Waitsfield Town Plan, and/or through site analysis. An environmental assessment may be required to determine potential adverse impacts and associated mitigation measures.

General standards for PUDs stipulate that land with a slope of 25% or greater shall not be included in the calculation for allowed density bonuses. The Development Review Board may otherwise reduce the allowed overall density if steepness of slope, ledges, low or wet areas or other physical features limit the site's ability to support development.

### **Surface Water Protection (and slope)**

Section 3.12 requires a naturally vegetated buffer maintained from the banks of streams and rivers, and the shores of ponds formed by in-stream impoundments in streams and rivers. The width is based on slope and waterbody type.

Slope of land adjacent to stream bank	River and Stream Setback
0-8%	50 ft.
9-15%	75 ft.
15-20%	90 ft.
20 - 30%**	100 ft.
Headwater streams	150 ft.

\*\*Add 20 feet for each additional 10% of slope

### **Driveways**

The access management and driveway standards in Section 3.02 do not address drainage into the public right-of-way. Waitsfield's Curb Cut Policy does not address drainage issues.

Although not specific to drainage, the Town of Waitsfield includes the following language in its Driveway Access Policy:

*The property owner shall maintain the highway access to the satisfaction of the Town.*

## **Warren Zoning Bylaw- most recently updated 2013**

### **Stormwater**

Warren's zoning regulations have stormwater standards for subdivisions. The DRB can require stormwater management plans and erosion prevention and sediment control plans prepared by a licensed Vermont engineer as necessary to protect surface waters and neighboring properties. The plans must be in accordance with the most recently amended Vermont Stormwater Management Manual and Vermont Handbook for Erosion Prevention and Sediment Control. The subdivision standards in Section 7.5 include detailed site and design and layout standards to control stormwater runoff and control erosion.

### **Surface Water Protection**

The subdivision standards also include a design process (Table 7.1) to protect conservation areas, which includes the following steps: 1. Identify Conservation Areas, 2. Identify Potential Development Areas, 3. Identify Building Sites and Envelopes, 4. Layout Roads Driveways and Utilities, and 5. Identify Proposed Lot Boundaries.

Section 3.13 Surface Water Protection requires a 50 foot buffer from lakes and ponds greater than an acre, wetlands, streams and rivers. The regulations also call for a 100 foot setback for buildings and structures (of which the 50 foot vegetated buffer is part) unless a DRB approval allows otherwise (and after meeting a number of criteria). Setbacks and buffers can be increased during the conditional use review process depending on the site, slope, soil conditions and the nature of the proposed use.

### **Slope and Driveways**

Unlike the other 4 towns in this review, Warren's curb cuts are reviewed through zoning. Section 3.4, titled Erosion Control & Development on Steep Slopes, applies to development involving site disturbance, excavation, filling or regarding of 1000 or more square feet of land with a slope of 15% or more, and driveways and roads on land that exceeds an average of 12% or more over any 50-foot section. Development meeting these conditions is subject to conditional use review and approval by the DRB and requires an erosion prevention and sediment control plan as well as other review standards.

No site disturbance or development shall take place on very steep slopes - 25% or more - with the exception of (1) limited site improvements necessary to facilitate development on contiguous land with a slope of less than 25% and (2) the operation, maintenance and expansion of ski lifts and trails associated with an alpine ski facility.

Subsection (E) titled Liability states that "In the event that alterations in topography and drainage result in damage to neighboring or downstream properties, the applicant shall assume all liability for such damage. The Town of Warren shall be held harmless from any resulting claims for damage resulting from the applicant's actions, whether or not such actions conform to any plan approved by the town."

## **Duxbury – 2011, current as of January, 2017**

One of the purposes stated in the 2011 Duxbury Zoning Ordinance is to "Ensure that the selection, design, creation, and use of development is reasonably safe and accomplished in a manner that is consistent with public wellbeing, does not impair flood plain services or the stream corridor." This is accomplished primarily through zoning district restrictions (as opposed to standards) in the majority of the total acreage in Duxbury.

### **Zoning District Restrictions**

Uses in the Ecological Reserve Lands District comprising 3,224 acres 2500 feet at or above sea level, is restricted to the maximum extent allowed by the law. Agricultural and forestry uses are permitted, as will uses such as hunting, cross country skiing, hiking and nature study. Structures associated with low intensity uses may be conditionally permitted, provided they do not destroy the natural vegetative cover or cause undue erosion. No seasonal or residential structures whatsoever are permitted in this district.

The Timber Management and Wildlife District comprising 11,332 acres between 1500 and 2500 feet above sea level includes the headwaters of the Dowsville, Crossett and Ridley Brooks. Structures of any kind require conditional use approval and residential construction may be permitted with a minimum lot size of 25 acres per unit.

The State Farm District comprising 482 acres is divided into eight sections. Within two of the sections totaling 164 acres, single family residential development must be in PUDs. The 92 acre Camels Hump / River Road parcel is reserved for conservation with no residential development allowed. The 38 acre Plateau parcel segment permits recreation not requiring structures and agriculture and allows extraction of sand, gravel and soil as a conditional use. The Wetland Segment comprises 101 acres which is "encouraged to be permanently reserved for conservation, agriculture or forestry by transferring either full ownership or development rights to a land trust approved by the Development Review Board". Permitted uses include agriculture, sustained yield forestry, not including processing and sawmill operations, education not requiring structures, recreation not requiring structures and temporary structures serving outdoor recreation, education or agriculture.

That leaves the Forest/Recreational, Rural /Agriculture and Village Districts totaling 12,459 acres subject to their district's minimal lot sizes and maximum building coverage with no general standard for surface water setbacks or stormwater management except as follows below:

### **Surface water protection**

In Article 4, Section 4, Sewage Disposal Standards, the Duxbury Zoning Ordinance states: "No sewage disposal system or any portion thereof shall be placed within fifty feet of the shoreline (normal mean watermark) of any stream, brook, river, pond, bog, swamp or marsh or within 100 feet of any drinking water supply." However, since setbacks from sewage disposal systems cannot be singled out unless all development is similarly setback (as of 2007 when on-site sewage disposal became under State jurisdiction), this setback may not be technically enforceable.

Under the PUD general standards in Article 4, Section 1.6, in order for the Development Review Board to approve a PUD application, the PUD shall: "Make appropriate provisions for preservation of streams and streambanks, steep slopes, wet areas, soils unsuitable for development, forested areas and unique natural and manmade features." Section 1.8 sets out special review and design requirements for PUDs in the State Farm District as follows: "Development shall be laid out and designed to protect Crossett Brook. A buffer equal to either fifty (50) feet or that required by State regulations, whichever is larger, shall be preserved along both sides of the brook. Within this buffer, no construction shall take place and no vegetation shall be removed without explicit approval by the Development Review Board." This is the only mention of a vegetated buffer in the Duxbury zoning ordinance.

### **Stormwater**

The only mention of steep slopes, provisions to prevent discharges to nearby surface waters or drainage systems or erosion control is in Section 7 pertaining to the extraction of sand, gravel and soil.

## **Duxbury Zoning Bylaw- Draft January, 2017**

### **Stormwater**

In Section 5.10, Use Regulations and Standards apply to the alteration of existing grade and land disturbance in all permitted, conditional and accessory uses town-wide. Included in the permit application must be an outline of the locations and types measures to be utilized to prevent erosion and the discharge of sediment to protected areas of surface waters (riparian buffers), roadway and driveway drainage systems, and down slope areas of adjacent properties.

The Administrative Officer or DRB, as applicable, shall impose any conditions determined to be necessary to prevent erosion, retain sediment on the site, and prevent discharge of sediment to surface waters or to lands down slope of the project. Such conditions may include, without limitation:

1. Requirements the applicant utilize Best Management Practices as described in the "Vermont Low Risk Site Handbook for Erosion Prevention and Sediment Control," as most recently amended
2. Phasing of the project to limit the amount of concurrent earth disturbance and achieve soil stabilization as soon as practicable
3. Submission of a plan for the rehabilitation of the site at the conclusion of operations, including grading, seeding and planting, fencing, drainage or other appropriate measures.
4. Provision of a sufficient bond or other binding financial instrument adequate to assure compliance.

Under Section 6.6 Site Plan Review Standards: "The site plan provides for safe and effective measures to minimize erosion, prevent flooding on downstream or adjacent properties, and protect the quality of surface waters; the use of green infrastructure measures and stormwater management practices consistent with the Vermont Stormwater Management Manual is encouraged."

In Section 7.4 Subdivision and PUD Standards for Approval, Stormwater Management - Temporary and permanent storm water management and erosion control measures consistent with the Vermont Low-Risk Site Handbook for Erosion Prevention and Sediment Control and Vermont Stormwater Management Manual shall be incorporated into subdivision design and layout to control surface runoff and prevent sedimentation and water pollution on-site and downstream from the proposed subdivision or PUD. The DRB may require independent technical review of construction or post-construction stormwater management measures.

### **Surface Water Protection**

The new draft zoning bylaw adds Section 4.6 Wetland and Stream Corridor Standards, which apply to all districts except the Village District. Lands which meet the following must be left in an undisturbed, vegetated condition:

1. Fifty feet (50') horizontal distance in either direction from the top of bank of a stream or river.
2. Fifty feet (50') horizontal distance of the perimeter of a Class 1 or Class 2 wetland.
3. Fifty feet (50') horizontal distance from the top of bank of a lake or pond.
4. Fifty feet (50') of the perimeter of a vernal pool

5. (5)Three hundred feet (300') horizontal distance from the perimeter of any Class A(1) Ecological Water.

### **Slope**

In Section 7.4 Subdivision and PUD Standards for Approval, Protection of Steep Slopes, Prominent Hilltops and Ridgelines, Subdivision boundaries, lot layout and development envelopes shall be located and configured to minimize adverse impacts to areas of the parcel that have slopes greater than fifteen percent (15%), to prevent disturbance to slopes in excess of twenty-five percent (25%), and to avoid the placement of structures on prominent hilltops and ridgelines. Methods for avoiding such adverse impacts may include the following:

1. Locating development envelopes to exclude these features;
2. Minimizing or eliminating areas of excavation, filling and development on slopes in excess of twenty-five percent.
3. Locating and configuring development envelopes so that the height of any structure placed on the site after subdivision will not visually exceed the height of the adjacent tree canopy serving as the visual backdrop to the structure, and is located down-slope of ridgelines and prominent hilltops.
4. Using or sharing existing accesses and rights-of-way where feasible when developing access roads, including the conversion of logging roads to private roads or driveways, and utility corridors;
5. Leaving land characterized by steep slopes, shallow soils, prominent knolls and ridgelines undeveloped.

### **Driveways**

Section 6.11 covers access permits. All private roads, private driveways and rights-of-way proposed to intersect a Town road, and all culverts within or adjacent to the public right-of-way, shall conform with the Town Highway and Bridge Standards as most recently adopted by the Duxbury Select Board. The Town of Duxbury has a curb cut permit application process, which is signed off by the Road Foreman and the Selectboard.

## **F. Draft Model Municipal Highway ROW Access and Drainage Standards**

These Model Municipal Highway ROW Access and Drainage Standards are minimum standards aimed at preventing unlawful drainage and siltation from adjacent lands outside of the public right-of-way from damaging municipal roads and impacting road drainage systems. These standards are intended to be incorporated into a Town's existing process for reviewing new drive accesses and development roads where they intersect town roads as well as any work adjacent to the town highway that affects the contours of the land and drainage conditions within the town ROW.

The model standards are not comprehensive. They do not address traffic volumes, deceleration lanes, traffic impact studies, parking, loading and other issues associated with various types of development, especially commercial development. The standards do not address safety considerations outside of those connected with drainage. The text of this model is a compilation of excerpts from various Vermont town ordinances and policies as well as guidance prepared by the Vermont Local Roads Program and assistance summarized in the VTrans "Orange Book" *Handbook for Local Officials*. The model standards are intended to provide a starting point for towns to consider.

Incorporating the Model Municipal Highway ROW Access and Drainage Standards into a town's existing access review procedures can help to meet the road drainage system upgrades required by the Municipal Road General Permit by addressing and controlling "run-on" into the town road drainage system from outside of the right-of-way.

## **Draft Model Municipal Highway ROW Access and Drainage Standards**

### **I. Authority.**

Chapter 19 V.S.A. §1111(b) authorizes municipal legislative bodies or their designee the power to review all new drive accesses and development roads where they intersect town roads in order to control the use and protect town roads from damage. The Selectboard or their designee may stipulate other conditions for portions of driveways and development roads outside the right-of-way where the activity may affect the integrity of the municipal highway drainage system. For purpose of these standards, the municipal highway right-of-way drainage system consists of the network of culverts, ditches, pipes, swales, gutters and other man-made and natural courses for draining stormwater runoff from the Town of \_\_\_\_\_'s municipal roads.

### **II. Purpose:**

These standards ensure that activities and modifications affecting the Town of \_\_\_\_\_'s highway system are regulated and that any damaging effects are mitigated under the direction of the Town of \_\_\_\_\_'s legislative body or designee to safeguard the public investment and support the Town's ability to comply with State and Federal regulations, as necessary. In addition to these standards, the two most recent versions of the Vermont Agency of transportation standard sheets B-71, Standards for Residential and Commercial Drives and A-76, Standards for Town and Development Roads, shall serve as a guide.

### **III. Scope and Applicability.**

A. These standards apply to all owners of property abutting the municipal highway right-of-way drainage system in the Town of \_\_\_\_\_ including dedicated easements for municipal highway drainage.

B. These standards regulate the location and construction of entrances onto the town highway right-of-way and improvements and modifications of land adjacent to the town highway right-of-way.

C. Property owners abutting the municipal highway right-of-way shall be responsible to control activities upon and maintain the owned property in such a manner as to not cause or contribute to obstructions in the municipal highway right-of-way drainage system that would restrict, block or prohibit the free, open and continuous flow of water through the municipal highway right-of-way drainage system.

D. Any interference with the regular maintenance or condition of the municipal highway right-of-way shall be subject to correction by the Town of \_\_\_\_\_ and upon direction of town's legislative body or designee, done at the owner's expense.

#### **IV. Use of Town Highway.**

A. No construction or installation may take place in the town highway right-of-way without obtaining a Highway Access and Public Right-of-Way Use Permit from the Town of \_\_\_\_\_'s legislative body or designee.

B. It shall be unlawful to:

1. Fill or grade the land adjacent to a highway so as to divert the flow of water onto or off of the municipal highway right-of-way.
2. Obstruct or clog a ditch, culvert or drainage course that drains a municipal highway.
3. Contribute to flash flooding by increasing stormwater runoff flowing into a municipal highway drainage system.
4. Alter private property to increase stormwater drainage on to a municipal highway right-of-way, or alter the municipal highway right-of-way to decrease historical municipal highway drainage rights on to private property.

#### **V. Permit Required.**

A. Driveway and development road accesses, or the construction of other drainage ditch crossings allowing access across a municipal highway right-of-way, whether temporary or permanent, require an access permit. This is in part to insure that any such construction is performed in such a manner that maintains the integrity and functionality of the municipal highway right-of-way drainage system.

B. No person shall make any excavation, or fill, or install any culvert or conduit, or in any other manner alter or disturb the municipal highway right-of-way drainage system without a permit from the town.

C. No person shall cause water to be discharged from eaves or cellar drains, or from storm sewers or ditches, into the Town of \_\_\_\_\_'s right-of-way drainage system without a permit from the town.

D. The Town of \_\_\_\_\_'s legislative body or designee may require a permit for improvements deemed necessary or desirable to ameliorate drainage conditions, subject to the standards and limitations identified herein, or to support the town's ability to comply with State and Federal regulations, as necessary. Topography, location and the characteristics of the municipal highway make each piece of property unique. The town's legislative body or their delegated authority shall exercise discretion in applying this requirement so as not to impose any permit condition which is an undue burden on the owner of the adjacent land relative to the benefit to the community and the town's ability to comply with State and Federal regulations.

#### **VI. Permitting Process.**

A. Applicants must submit a completed Highway Access and Public Right-of-Way Use Application Form to the Town of \_\_\_\_\_'s legislative body or designee.

B. No construction shall take place until the Town of \_\_\_\_\_'s legislative body or designee has issued a Highway Access and Public Right-of-Way Use Permit.

C. A completed application consists of all responses to questions on the application and the payment of the administrative fee of \$\_\_\_\_\_.

D. Where a pre-existing driveway is overly steep or poorly crowned leading to damage to the town road system and the town's inability to comply with State and Federal regulation, as necessary, the Town of \_\_\_\_\_'s legislative body or their delegated authority may require remediation at the property owner's expense. (Westford)

E. Where existing municipal highways, bridges, and / or associated stormwater infrastructure are inadequate to serve a proposed development, the Town of \_\_\_\_\_'s legislative body or their delegated authority may condition the road access permit on the applicant paying to upgrade the road or infrastructure to the minimum standard necessary to support the town's ability to comply with State and Federal regulations, as necessary. (Westford)

F. The municipal highway right-of-way drainage/ road access permit will be issued only after the Town of \_\_\_\_\_'s designated authority makes an onsite inspection of the proposed construction or mitigation activity to assure that the standards and limitations identified herein will be met. Upon inspection and evaluation, the proposed construction will be rejected, approved, or approved with conditions. In difficult cases, the town may require professionally engineered designs.

G. Permits shall expire one year from the date of approval, unless otherwise stated.

#### **VII. Damage to Town Highways.**

In the event damage is caused by improper construction, maintenance or grading, it shall be the responsibility of the property owner to make the necessary repairs upon negotiation in writing by the town. If such repairs are not made within 30 days, the Town shall take whatever steps are necessary to insure the interests of the Town and secure the expenses involved. (Winhall)

**VIII. General Standards.**

A. Any new road regulated by and/or to be conveyed to the Municipality shall be constructed according to at least the minimum standards found in the most recent version of the Vermont Agency of Transportation's Town Road and Bridge Standards.

B. Driveway construction and design shall conform to the most recent version of the Vermont Agency of Transportation's B-71 Standards for Residential and Commercial Drives.

D. Development road construction and design shall conform to the most recent version of the Vermont Agency of Transportation's A-76 Standards for Town and Development Roads

E. The owner/contractor shall contact Dig Safe prior to any excavation, especially in the right-of-way. (Cornwall)

**IX. Sample Minimum Drainage Standards**

*Note: These are excerpts from various Vermont town ordinances and policies as well as guidance prepared by the Vermont Local Roads Program and the VTrans Town Road and Bridge Standards. They provide a starting point for towns to consider.*

**A. Culverts**

1. The minimum culvert diameter for a driveway is 15 inches. (VTrans Road and Bridge Standards)

*Note: Many towns require minimum 18 inch driveway culverts, e.g. Driveway culverts shall have a minimum diameter of 18 inches. The final size shall be determined based on the size of the drainage watershed above the culvert. (Cambridge)*

2. Replacement of existing culverts and any new culvert must have a minimum culvert diameter of 18 inches. (Vtrans Road and Bridge Standards)

*Note: Many towns require the type, length and diameter of culverts to be determined on an individual basis by the legislative body or designee.*

3. Culverts for watersheds greater than 20 acres should be referred to a professional trained in hydrology for sizing and design of the culvert. (Cambridge)

4(a). Culvert headwalls shall be installed at the inlet and outlet of all culverts where there is erosion or undermining or where it is expected to occur. (Vtrans Road and Bridge Standards)

OR

4(b). Any culvert that exceeds 24 inches in diameter will require the installation of a headwall. (Cornwall)

OR

4(c). Headwalls shall be installed at the inlet of all culverts and may be either reinforced concrete eight inches thick, large flat rock tightly placed, or large cemented rock. (Cambridge)

5(a). Repair, replacement and maintenance of culverts in the right-of-way is the responsibility of the property owner. (Winhall)

OR

5(b). Once installed by the property owner, the maintenance of all culverts is the responsibility of the town. (Cambridge)

OR

5(c). The property owner will purchase the culvert and the town will install it, after which the maintenance of the culvert is the responsibility of the town. (Cornwall)

6. Culverts conveying intermittent or perennial waters are subject to the Vermont DEC Stream Alteration Permit. Applicants shall seek advice from the State Stream Alteration Engineer when stream crossings are involved. (VTrans Road and Bridge Standards)

## B. Ditches and Slopes

1. Driveways and development roads cannot interrupt the natural or ditch flow of drainage water. Drainage from any approach to the right-of-way must not be dispersed onto the surface of the town highway. (Westford)

2. Property owners should daylight driveway ditches onto their own property before intersecting with the town right-of-way. (VT Local Roads)

3. Ditches shall be turned out to avoid direct outlet into surface waters. (VTrans Road and Bridge Standards)

5. Driveways and development roads shall be graded to promote sheeting of water off of the road surface. This generally means a 1/4 inch - 1/2 inch per foot crown for gravel roads and a 1/8 inch - 1/4 inch per foot crown for paved roads. (Wilmington)

6. Ditches shall be a minimum of 6 inches below the base of the driveway or development road and shaped to prevent erosion. (Cambridge)

7. Ditches with slopes of less than 5% may be seeded and mulched. Ditches with slopes greater than 5% must be stone lined or constructed with stone check dams. (VTrans Road and Bridge Standards)

8(a). The grade of the development road or driveway shall not exceed 10% within 20 feet of any municipal road intersection. (Westford)

OR

8(b). Driveways and development roads shall not have slopes greater than 8%. Drives with slopes up to 10% may be allowed provided they are paved and ditched to prevent erosion. (Hyde Park)

### C. Surface Materials

1. Driveways shall have a minimum of 15 inches of base material; development roads must have a minimum of 18 inches of base material. (Westford)

2. Gravel drives and development roads shall have a minimum of 5 inches of top layer material. (Westford)

OR

3. Gravel drives should have a minimum aggregate surface course of 6 inches. (Vermont Local Roads)

4. The Legislative body or designee may require development roads be paved with a minimum of two inches of bituminous concrete. (Vermont Local Roads)

### D. Approach to Public Road

1. Entrances should be constructed with no more than 3% grade away from the road for a distance of at least 20 feet. (Vermont Local Roads)

2. Culverts under driveways and development roads should be placed away from the road as for as practical while maintaining good drainage. (Vermont Local Roads)

3. Driveways and development roads should intersect the highway at a preferred angle of 90 degrees but no less than 60 degrees. (Vermont Local Roads)

### E. Bank Stabilization (Vermont Local Roads)

1. All banks and slopes adjacent to driveways and development roads shall at a minimum be stabilized by seeding and mulching.

2. In situations where banks will erode in spite of seeding the town may require other methods for stabilizing soils, such as the use of structural materials and plants.