

Municipal Roads General Permit (MRGP)- Open Drainage Roads Road Erosion Inventory (REI) Supplement (Starting May 1, 2023)

<http://dec.vermont.gov/watershed/stormwater/permit-information-applications-fees/municipal-roads-program>)

Use: for the assessment of Vermont DEC Municipal Roads General Permit standards for Open Drainage Roads. For Closed Drainage Roads, use the inventory and app (link above). For hybrid paved roads, such as paved with ditches and catch basins, use this inventory template.

Inventory Timing: Avoid conducting field inventory assessments during snow covered conditions through the end of mud season, as these conditions may skew assessment results.

Field Maps- Field Form Questions (* indicates required fields):

Name*:

Organization*:

Date of Assessment:

Municipality:

Assessment Reason*: Reassessment or Work Completed or Storm Damage or DEC Staff Assessment

Segment ID: (auto populated)

Segment length: (auto populated)

Road Name:

Town highway number: (optional)

Hydrologically-connected: Yes or No or Segment not town highway

Assessor Notes: Hydrologically-connected- evaluate all hydrologically-connected road segments that appear on the ANR Natural Resources Atlas (<https://anrmaps.vermont.gov/websites/anra5/>) at the time of that the REI is conducted. All hydrologically-connected municipal road segments depicted on the ANR Atlas shall be field visited, walked and evaluated using the DEC REI template. **“Drive-by” segment assessments are not acceptable.** Additionally, the applicant may propose to add or remove road segments from its REI based on an evaluation of the following criteria:

- Municipal road within 100' to a water of the state or wetland;
- Municipal road that bisects a water of the state or wetland or a defined channel;
- The municipal road segment is uphill from, and drains to, a municipal road that bisects a water of the state or wetland, or defined channel and should be included in the REI to accurately capture the extent of the stormwater watershed. The ANR Atlas connected roads layer is a GIS-based proximity analysis and often will underestimate these types of connected segments. Please be sure to add these segments in the field if you find them, especially if adjacent to ANR Atlas connected mapped segments.
- If a road segment appears on the ANR Atlas and none of the above conditions are observed in the field, persons conducting inventories may propose to re-classify a segment as not connected. Alternately, if none of the above conditions are observed in the field, but the segment is likely to discharge to waters or wetlands, a permittee shall propose to add this segment to the inventory following a field evaluation.

Is there evidence of sedimentation into a water resource from the segment? *

(NEW) Yes or No

Road Type* Paved Road with catch basin or Paved Road with open ditches or Gravel Road with open ditches or Class 4 Road (see REI Supplement last page)

ANR Atlas Slope: (auto populated based on initial REI) Option to re-calculate

Assessor Notes: Measuring road slope- measure road segment slopes in the field with clinometer/inclinometer, digital level, or equivalent (cell phone slope app is not appropriate). **Be sure to set your digital level to the correct units setting- in percent slope and not degrees.** Take 3 measurements of areas that are typical of the segment, take an average of those 3 measurements. If there is a very steep section of the segment longer than 65' in length, and likely over 8% slope, be sure to measure that slope as one of your 3 measurements, even if the rest of the segment is a lower gradient.

Capture Photo: (optional)

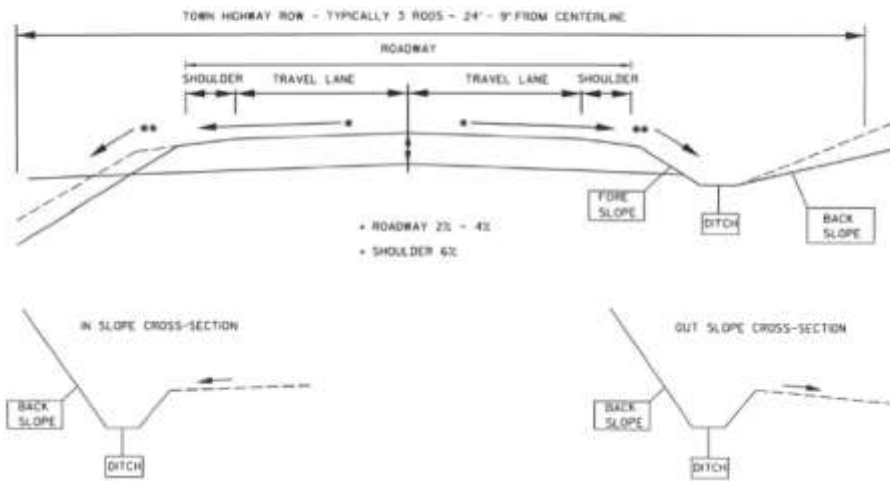
Assessment Notes: (optional)

Erosion Types*: (for all REI questions)

Gully erosion= depth of 12"+

Rill Erosion= depth of 1" to <12"

TOWN HIGHWAY TYPICAL



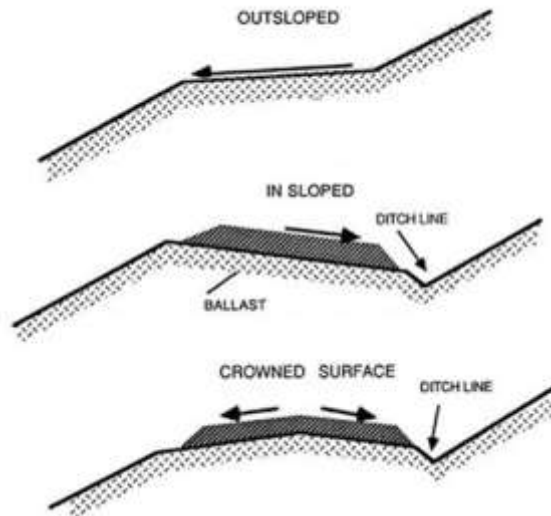
Roadway Crown/Travel Lane: * (not applicable for paved roads)

A-1: Is 90% of the segment in-sloped, out-sloped or properly crowned? (2% or greater crown slope) *: **Yes** or **No**

A-2: Erosion Type Present* (within the travel lane)
Gully or **Rill** or **Sheet Flow**/none

Assessor Notes: Measure crown with digital level between the road center and edge of travel lane

Out-sloped, in-sloped, and crowned diagram:



Measuring road crown (can also use digital level)

Grader Berm/Windrow: * (not applicable for paved roads)

B-1: Is 90% of the segment (both sides of the road) without grader berm/windrow? *
Yes or No

B-2: Erosion Type Present:
Gully or Rill or Sheet Flow/none

Assessor Notes: MRGP language- "Grader and plow berms shall be removed to allow precipitation to shed from the travel lane into the road drainage. Roadway runoff shall flow in a distributed manner to the drainage ditch or filter area and there shall be no grader berms or evidence of a secondary ditch. Shoulder berms may remain in place if the road crown is in-sloped or out-sloped to the opposite side of the road from the berm side of the road."

Grader berm



Secondary ditch



Road Drainage Standards: *

C-1: Is 90% of the segment (both sides of the road) allowed to shed water in a distributed manner, when shoulder is lower than road, to a forested or vegetated filter area or ditch that is;

Distributed flow- If no back slope exists or the toe of back slope is outside right-of-way (more than 25' from the road center).

Drainage ditch standards- if distributed flow is not possible, roadway runoff may enter a drainage ditch, stabilized as follows:

- For roads with slopes of 0% - <5% - Grass-lined ditch
- For roads with slopes of 5% - <8%:
 - Stone-lined ditch, or
 - Grass-lined ditch with stone check dams, or
 - Grass-lined ditch if installed with disconnection practices such as cross culverts and/or turnouts to reduce road stormwater runoff volume, at least **two** cross culverts or turnouts per segment disconnecting road Stormwater out of the road drainage network into vegetated areas or spaced every 164'.
- For roads with slopes $\geq 8\%$; Stone-lined ditch required.

C-1: Answer * (above question based on slope): **Yes or No**

C-2: Erosion Type Present *: Gully or Rill or Sheet Flow/None

Assessor Notes: MRGP language- “If appropriate, bioretention areas, level spreaders, armored shoulders, and sub-surface drainage practices may be substituted for the above Road Drainage Standards.”

Example of high road shoulder



Example of distributed flow, low shoulder



Conveyance Areas/Turn-out:

D-1: Do drainage ditch outlets and conveyance areas shed water in a distributed manner?

If not, stabilize with grass or stone if slopes are 5% or greater:

- All practices in place or
- Practice absent but needed in one or more area or
- None present

D-2: Erosion Type Present- Gully or Rill or Sheet Flow/None

Assessor Notes: First determine if turnout/conveyance area is a hydro bisect or hydro parallel

Hydro bisect- where the road bisects a water resource (i.e.. perennial or intermittent stream crossing) or

Hydro parallel- road is parallel to a water resource.

For hydro bisect- see diagram below. Evaluate each of the 4 possible areas where road runoff can enter the water resource to determine if each area meets this standard.

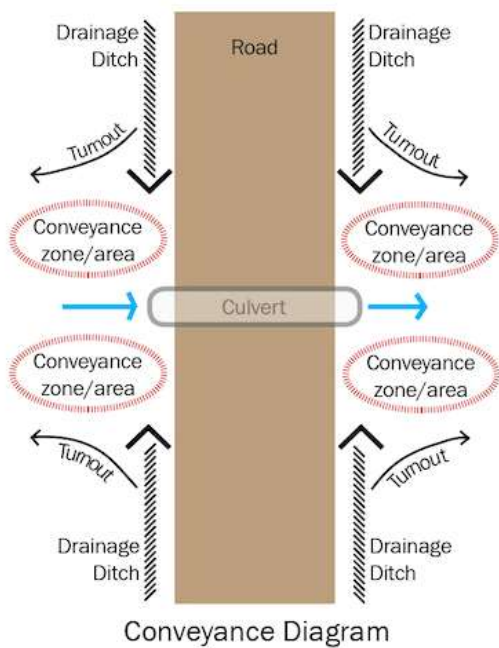
For hydro parallel- evaluate each turnout.

Assessor Notes: Measure bank slope if distributed flow is not in place-measure the bank where the ditch outlet/turnout is located (not road slope). Measure with digital level.

Practice question will be met if one of the following:

- Distributed flow or
- For conveyances with slopes of 0% - <5%, stabilize with grass or
- For conveyances with slopes $\geq 5\%$, stabilize with stone.

Example of an armored turnout at a Hydro bisect site



Non-Perennial Stream Culverts

Are there existing driveway, drainage, or intermittent stream culverts along the road segment or absent but needed?

Yes or No

E-1: Culvert Type*: Driveway or Drainage or Intermittent stream (New)

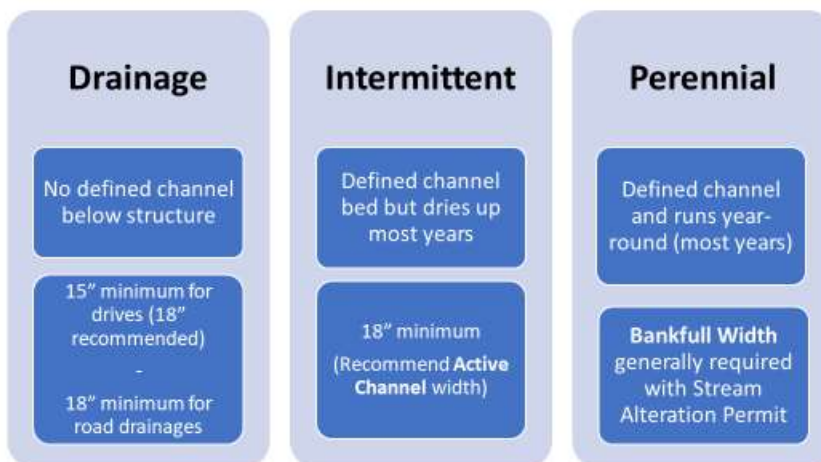
E-2: Culvert Status*: Existing or Absent

E-3: Erosion type present *: Gully or Rill or Sheet/None

E-4: Culvert condition *:

- Fully obstructed or failing or
- 50% or more obstructed or
- Less than 50% obstructed

What type of culvert is it??



Perennial Stream Characterizations

A perennial stream may be characterized by any of the following:

- Direct observation or compelling evidence obtained that surface flow is uninterrupted (or flowing 10 months of the year flow or more, except during drought periods).
- Presence of one or more geomorphic characteristics typically associated with perennial streams including:
 - a. Bed forms; i.e. riffles, pools, runs, gravel bars, other depositional features, bed armor layer
 - b. Bank erosion and/or bed scour
 - c. Indications of waterborne debris and sediment transport
 - d. Defined bed and banks in a valley setting

- Watershed size greater than 0.25 square miles, although some perennial streams may be located in smaller watersheds. (See DEC map layers)
- Presence of aquatic organisms (fish and macroinvertebrates) requiring uninterrupted flow for survival
- Base flows are primarily supported by groundwater recharge as indicated by bank seeps, springs or other indicators
- Disconnected surface flow within a singular channel; e.g. limited sub-surface flow

Any work to replace, retrofit or otherwise alter the streambank or bed of a perennial stream may require a DEC Stream Alteration Permit. Please contact the DEC Stream Alteration Engineer before undertaking any such project.

Barriers to Implementation (optional)

Document the following that would fully or partially impede standards implementation:

- **Historic stone walls** (linear feet)
- **Historic large trees** (linear feet)
- **Buried utilities** (linear feet)
- **Wetland** (linear feet)
- **Lakeshore vegetation** (linear feet)
- **Excessive ledge** (linear feet)
- **Public Safety Consideration** (linear feet)
- **Other** (Place listed on the Vermont Historic Register)

Assessor Notes: Note that the above reasons would most likely impact the Road Drainage Standard. For example- it may be difficult to fully construct a drainage ditch or lower road shoulders if there is a historic stone wall, large historic trees or buried utilities that would fully or partially impede the implementation of such projects. Please measure linear feet as indicated.

Class 4 Roads

F-1: Is gully erosion (12”+) present in the segment? * Yes or No

Gully erosion (repeat feature for each area of gully erosion):

Location* (along the road cross section)

- Length (ft)
- Width (ft)
- Average Depth (ft)

Notes (optional)

Barriers to Implementation (see above)