

Revised Hydrologic and Hydraulic (H&H) Study Guidance



The State of Vermont has revised its [Hydrologic and Hydraulic \(H&H\) Study Guide](#). A hydrologic and hydraulic (H&H) study is the study of movement of water, including the volume and rate of flow, as it moves through a watershed, basin, channel, or man-made structure.

The guide outlines state and FEMA guidance regarding the contents of an H&H study and when it is necessary for FEMA Public Assistance projects. The guide was focused on Disaster DR4720, the July 2023 floods, and does not supersede any official guidance from Vermont state government or FEMA PAPPG v.4.

This resource offers basic information from the two-page guide. VLCT recommends municipalities view the revised full [H&H Study Guide](#).

When Is an H&H Study Required?

An H&H study is required when a **town highway structure** conveys a perennial stream. While recommended, an H&H study is not required for crossings that are not part of the transportation network. Bridge and culvert work on perennial stream crossing must confirm with the Vermont statewide DEC Stream Alteration Standard.¹

In Vermont, H&H studies must be conducted by VTrans or by **consultants for H&H studies, adhering to VTrans hydraulic standards** outlined in the 2015 VTrans Hydraulics Manual.²

What Must an H&H Study Include?

An H&H study must include:

- Identification of upstream and downstream impacts of alterations to the floodplain, including change to the extent or depth of the Special Flood Hazard



Area (SFHA) or changes to the Base Flood Elevation (BFE).

- General site description, including location, latitude and longitude, drainage basin, FIRM, regulatory mapped flood zone if applicable).
- Existing condition: pipe shape, material, length, inlet and outlet conditions, performance level.
- Proposed condition: pipe shape, size, material, length, inlet and outlet conditions, performance level.
- Will the proposed condition satisfy the local floodplain ordinance and local and state stormwater management requirements?
- Review by a professional engineer in the State of Vermont to ensure compliance with 44 CFR 60.3.

The analysis resulting from an H&H study will determine sizing and fish passage **requirements** for the structure. In addition, the analysis **may recommend** a structure type based on site constraints, provided it meets Vermont Codes and Standards for width, depth, embedment, fish passage, and hydraulic capacity.

What Additional Information is Provided in the Guide?

The guide also includes:

- information about when an H&H study is *not* required.
- a Structure Replacement Guide (illustration) from the Vermont Agency of Transportation illustrating state requirements for structures impacted during a storm event.
- a list of additional resources that offer policy guidance from the State and FEMA.

¹*Environmental Protection Rule* (Chapter 27), "Vermont Stream Alteration Rules," Agency of Natural Resources, Department of Environmental Conservation, Watershed



Management Division, River Management Program, March 10, 2017.

²*Hydraulic Manual*, Vermont Agency of Transportation, May 28, 2015.

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