

Issue 54: Perched Streams

Issue

The detail provided in the digital LiDAR data set has revealed many NC streams have overbank areas that are at lower elevations than the stream banks or even the channel invert. In the steep terrain of the mountains and in isolated locations in the piedmont the lower overbank elevations occasionally result in streams that have an overbank that is lower than the channel banks for a significant distance perpendicular to the stream. As a result, any flooding that exceeds the channel banks will be diverted from the main channel flow and will act as a separate flooding source along an area that is at map-scale or larger. These overbank areas typically do not have channels and may or may not reconnect to the main channel.

Standard HEC-RAS modeling and mapping techniques used by the NCFMP Engineering and Mapping Contractors (EMCs) do not adequately account for these physical settings. Exclusion of the overbank areas from the HEC-RAS model may overestimate BFE and inclusion of the overbank areas in the HEC-RAS model results in cross-sections that do not bound the flooding (i.e. the flood level is higher than the ground elevation at the end of the cross-section).

Recommendations

Streams that have a reach with overbanks areas that are both lower than the channel and do not reconnect with the stream shall be modeled with split-flow analysis. The following supporting data shall be submitted for each reach:

- 1) A separate HEC-RAS model for the split-flow reach;
- 2) The area shall be studied with limited detail methods unless the main channel is scoped to be studied by detail methods and the split flow discharges are equivalent to discharges for an area greater than one (1) square mile;
- 3) Lateral weir discharge calculations detailing how the main channel and split flow discharges were determined;
- 4) Energy grade line comparisons for the split flow reach and the main channel at the upstream confluence. Tie-in within 0.5 feet will be required;
- 5) For split-flow reaches that rejoin the main channel downstream, energy grade line comparisons for the split flow reach and the main channel at the upstream confluence. Tie-in within 0.5 feet will be required; and
- 6) GIS mapping for the split-flow reach. The EMC shall review the Guidelines and Specifications (G&S) regarding mapping the reach as an AE zone or an AO zone (G&S Appendix E: Guidance for Shallow Flooding Analyses and Mapping).

The split flow area will be mapped as provided in the G&S and all supporting data will be included in the Technical Support Data Notebook and the area and analysis shall be noted in the Flood Insurance Study.

Discussion Summary

Date Discussed: N/A

Discussion Attendees: N/A

Summary of Discussion

N/A

Final Guidelines

See Recommendations above

Points of Contact

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