

## NCDOT Hydraulic Design Requirements for Greenway Accommodation

- Greenway projects and greenway accommodations inside NCDOT Right of Way as well as projects funded by NCDOT are subject to review. All drainage calculations for greenway drainage features must be provided to the Hydraulics Unit for review and approval. Plans, Cross sections (Typical Sections) and Profiles should be included. Plans should include existing contours. There is no specified minimum design frequency requirement; although, a minimum 2-year design frequency is generally recommended.
- If an existing culvert is retrofitted to be used for a pedestrian crossing, an appropriate hydraulic analysis will be required. Maintenance Agreements shall be addressed through the encroachment process with the District Engineer. If an existing bridge will be used for the pedestrian crossing, the Hydraulics Project Manager will evaluate the design and coordinate with the Division to determine if it is acceptable. A more detailed analysis may be needed to determine bank stability and the effects of any special grading that is proposed adjacent to the stream bank.
- A hydraulic design report is required for all greenway bridges or culvert drainage structures. If a major drainage structure (greater than 72-inch diameter pipe) that is associated with the greenway accommodation is under a NCDOT roadway, the standard NCDOT Bridge (or Culvert) Survey and Hydraulic Design Report (BSR or CSR) is recommended. For minor cross-drainage structures, the NCDOT Pipe Data Sheet or similar documentation may be used.
- Scour should be evaluated for greenway bridges over streams and calculations provided. NCDOT Sub Regional Tier Guidelines for scour should be followed, unless documentation is provided of a risk assessment analysis justifying a lesser design standard.
- If the greenway crosses a FEMA-regulated stream or encroaches into a designated Special Flood Hazard Area (SFHA) floodway, a hydraulic study must be performed. Documentation of approval by the local governing agency (e.g. No-Rise Certification, CLOMR, etc.) must be provided. Where the greenway accommodation is associated with a NCDOT Highway Drainage Structure involving a FEMA-Regulated Stream, the procedures outlined in *NCDOT Guidelines for Drainage Studies and Hydraulic Design* must be followed to ensure compliance with National Flood Insurance Program (NFIP) Regulations.
- For all greenway projects involving new built-upon area within NCDOT's Right-of-Way or easement, the NPDES Post-Construction Stormwater Program (PCSP) will apply. Greenway projects are classified as a type of roadway project under the PCSP workflows. Greenway projects are not considered travel lanes as defined in the PCSP. The engineer is responsible for following all appropriate workflows outlined in the PCSP to determine stormwater management requirements. In most cases, the PCSP will only require minimum measures be implemented unless a Toolbox BMP is required through coordination with a reviewing regulatory agency.