

## **APPENDIX D**

### **SCDOT – Location and Hydraulic Design of Encroachments of Floodplains Checklist and Coordination**

**South Carolina Department of Transportation  
Location and Hydraulic Design of Encroachments on Floodplains Checklist**

23 CFR 650, this regulation shall apply to all encroachments and to all actions which affect base floodplains, except for repairs made with emergency funds. Note: These studies shall be summarized in the environmental review documents prepared pursuant to 23 CFR 771.

**I. PROJECT DESCRIPTION**

The South Carolina Department of Transportation (SCDOT) proposes to improve the Interstate 85 (I-85) corridor from approximately one-mile north of SC 18 (Exit 96) to US 29 (Exit 106) near the South Carolina/North Carolina State Line, a distance of approximately 10 miles located in Cherokee County, South Carolina. It is anticipated that the project would add travel lanes along the I-85 mainline and improve the operational efficiency and safety along various interchanges and ramps. The project need is based upon the existing and projected operating conditions associated with the current mainline and interchange facilities. Specifically, the projected traffic conditions along the mainline and existing configuration of the interchanges result in unacceptable operating conditions and deficiencies, including undesirable spacing between ramp intersections and side road intersections.

- A. Narrative Describing Purpose and Need for Project
- a. Relevant Project History:
  - b. General Project Description and Nature of Work (attach Location and Project Map):
  - c. Major Issues and Concerns:

The primary purpose of the project is to improve the operational efficiency of I-85 and correct geometric deficiencies along the various interchanges and overpasses by bringing them into compliance with current state and federal design standards. The secondary purpose of the project is to enhance the safety along the existing facilities.

The project need is based upon the existing and projected operating conditions associated with the current mainline and interchange facilities. Specifically, the projected traffic conditions along the mainline and existing configuration of the interchanges result in unacceptable operating conditions and deficiencies, including undesirable spacing between ramp intersections and side road intersections. This section of I-85 is currently experiencing deteriorating operational conditions, with many of the areas projected to be operating beyond capacity by the design year (2040). In addition, the current design and configurations of the interchanges include interconnection of the interchange ramps and access roads, along with numerous intersections and access points located within close proximity to the interchange ramps. These deficiencies create safety concerns due to congestion, undesirable movements, and vehicular conflicts.

Based on a study of the Flood Insurance Rate Maps (FIRM), published by the Federal Emergency Management Agency (FEMA), the proposed project would involve construction within the existing 100-year flood limits of adjacent waters. The FIRMs for the project area 45021C0185D and 45021C070D effective September 16, 2011 document special flood hazard area associated with the Broad River and Buffalo Creek.

B. Are there any floodplain(s) regulated by FEMA located in the project area?

Yes ☒

No ☐

C. Will the placing of fill occur within a 100-year floodplain?

Yes ☒

No ☐

D. Will the existing profile grade be raised within the floodplain?

Yes, ramp profiles within the Exit 100 interchange will be raised in conjunction with the new S-83 bridge over I-85. The profile increase results in localized fill within the 100-year floodplain of the Buffalo Creek. The fill is associated with the widening of I-85 and interchange improvements at Exit 100. The impacts from the fill are limited to the edges of the floodplain outside of the stream cross section. It is anticipated that the fill will impact the water surface elevations in the vicinity of S-83 and will require a CLOMR.

Fill within the Broad River floodplain is minor (<0.01 ac) and will have a minimal impact to the water surface elevations.

E. If applicable, please discuss the practicability of alternatives to any longitudinal encroachments.

The majority of fill impacts occurs because of the longitudinal encroachment of relocated ramps at Exit 100. The existing Frontage Road was eliminated from the design to reduce further encroachment of the floodplain. The use of other alternatives, ie. Retaining walls, reduced profile will continue to be evaluated through final development of the project. Many of these areas include substantial side slopes, which require detailed analysis regarding constructability, cost, and effectiveness of walls.

F. Please include a discussion of the following: commensurate with the significance of the risk or environmental impact for all alternatives containing encroachments and those actions which would support base floodplain development:

a. What are the risks associated with implementation of the action?

The project includes fill within floodplains and has the potential to result in increases to the water surface elevations of regulated floodplains. The impacted areas are generally located in undeveloped areas with major floodplain geometry/water surface elevations influenced by adjacent bridges. Final impacts to the regulated floodplain are dependent on the final design and required hydraulic analysis.

- b. What are the impacts on the natural and beneficial floodplain values?

The project will directly impact up to a total of approximately 2.6 acres of floodplains. These impacts will increase water surface elevations in the vicinity of the fill, however, are not expected to greatly impact the water surface elevations, thus would not result in any adverse or beneficial impacts to the floodplain.

- c. The support of probable incompatible floodplain development.

Potential impacts include steep fills located immediately adjacent to the existing and proposed roadway fills. The impacts will not support incompatible floodplain development.

- d. What measures were used to minimize floodplain impacts associated with the action?

Roadway slopes were minimized to acceptable design standards to minimize the roadway footprint to accommodate the required improvements.

- e. Were any measures used to restore and preserve the natural and beneficial floodplain values impacted by the action?

Not applicable

- G. Please discuss the practicability of alternatives to any significant encroachments or any support of incompatible floodplain development.

The impacts to the floodplain include placement of fill for the construction of I-85 and the interchange ramps at Exit 100. As such, fill will be limited to the areas necessary for roadway construction and is not considered a significant encroachment and would not support incompatible floodplain development.

The current design includes minor impacts to the Broad River Floodplain from placement of fill near the Broad River at the western end of the project. The existing bridge over the Broad River will be maintained and minor fill will be required to correct shoulder widths and grades to the bridge approaches.

The current design also includes impacts to floodplains associated with Buffalo Creek. Buffalo Creek crosses under I-85 north of the Exit 100 and flows adjacent to I-85 to its confluence with the Broad River. The I-85 bridge over Buffalo Creek will be retained and no new crossings are included.

In general, the majority of flow conveyance along natural streams occurs within the channel area. Overbank areas along streams provide additional flow capacity and flood relief during large storm events. The flow velocity in overbank areas is typically reduced, compared to channel flow, because of the topography (woods, brush, etc.). Therefore, floodplain areas outside of the main channel can be impacted without significant impacts to water surface elevations and floodplain limits. FEMA typically refers to these areas as the floodway and floodway fringe and FEMA regulations allow for impacts within the floodway fringe.

The current design will result in fill from the project within the floodplain limits. The fill impacts will be limited to overbank areas within the floodway fringe. Therefore, the project will not have a significant impact on the floodplain conditions along the project.

Hydraulic evaluations will be performed as part of the final design of the project. The design will be completed in accordance with SCDOT and FEMA regulations. If after the completion of the studies it is determined that a conditional letter of map revision (CLOMR) is needed, appropriate coordination with FEMA would take place.

- H. Were local, state, and federal water resources and floodplain management agencies consulted to determine if the proposed highway action is consistent with existing watershed and floodplain management programs and to obtain current information on development and proposed actions in the affected? Please include agency documentation.

To date, there has been no coordination with local, state, or federal agencies regarding the proposed project and its' impact on the watershed and floodplain. At the appropriate stage of project development (i.e. final design), a complete hydraulic study performed to SCDOT guidelines for Hydraulic Design Studies would be conducted to more precisely determine the effects of the project on the base floodplains. If after the completion of the studies it is determined that a conditional letter of map revision (CLOMR) is needed, appropriate coordination with FEMA would take place.