

Appendix K—Floodplains Checklist and Bridge Risk Assessment Forms

**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

Description of the Project: The SCDOT, in consultation with the FHWA, has further refined RA1 resulting in the Refined Recommended Preferred Alternative to improve mobility and enhance traffic operations within the I-20/26/126 corridor. The primary purpose of the project is to implement a transportation solution(s) that would improve mobility and enhance traffic operations by reducing existing traffic congestion within the corridor while accommodating future traffic needs. The secondary purposes are to enhance safety, improve freight mobility, and improve system linkages while maintaining community and environmental impacts.

- 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 implement a transportation solution(s) that would improve mobility and enhance traffic operations by reducing existing traffic congestion within the corridor while accommodating future traffic needs. The secondary purposes are to enhance safety, improve freight mobility, and improve system linkages while maintaining community and environmental impacts.

Based on a study of the Flood Insurance Rate Maps (FIRM), published by the Federal Emergency Management Agency (FEMA), the proposed project will involve construction within the existing 100-year flood limits of adjacent waters. These waters include Saluda River, Broad River, Senn Branch, Stoop Creek, Moccasin Branch, and unnamed tributaries to Kinley Creek. The FIRMs for the project area crossings, 45063C0163G effective 2/9/2009, and firms 45079C0238L, 45603C0134G and 4579C0088L all effective 12/21/2017, document special flood hazard areas associated with these riverine systems.

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 interchange will be raised in conjunction with the new bridges over the Saluda River and Broad River. The profile increase will result in localized fill within the 100-year floodplain of the riverine systems. The impacts from the fill are limited to the edges of the floodplain outside of the river cross-section. It is anticipated that the fill will only have minor water surface elevations impacts, if any.

For the culverted systems, the culvert extension will be constructed at the grade of the existing culvert. It is anticipated that the fill will have minimal water surface elevations impacts.

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

All crossings are essentially perpendicular crossings and will be unavoidable. It is not anticipated that these crossings will result in significant impacts to the floodplain.

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 bridge crossings include ramps within floodplains but these ramps will be supported on piles with only minor fill needed, and therefore, should only result in minimal base floodplain elevation changes. The impacted areas are generally located in undeveloped areas with major floodplain geometry/water surface elevations influenced by adjacent bridges.

The culverted crossings will likely require culvert extensions that will be constructed within the floodplain. The culvert extensions will be designed to accommodate a 50-year storm event and checked for a 100-year storm event. Additional fill will be required for construction of the culvert extension.

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 Refined Recommended Preferred Alternative will cross approximately 24.55 acres of floodplains associated with the Saluda River, Broad River, Senn Branch, Stoop Creek, Moccasin Branch, and unnamed tributaries to Kinley Creek. Floodplain crossings predominantly occur near the Saluda River and the I-20/I-26 interchange. Approximately 17.18 acres of potential floodplain impacts are classified as Zone AE, while the remaining 7.37 acres are classified as Zone AE regulated floodways.

While all of the floodplain crossings will occur in areas of existing crossings, detailed flood studies of stream and river crossings will be required as part of the final roadway design. The bridges and culverts will be designed to FEMA standards and will provide clearances above the flood elevation, and therefore, an increase in flooding is not anticipated.

- c. The support of probable incompatible floodplain development.

Potential impacts include the construction of bridges and associated ramps, and culvert extensions. Minor fill may be needed to accommodate the ramps and culvert extensions. The impacts will not support incompatible floodplain development as the fill will be immediately adjacent to existing bridge and culvert crossings.

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

Various alternatives were analyzed from an engineering, environmental, and general public perspective. The design includes measures to avoid or minimize floodplain impacts through the use of piles instead of fill. Only minor fill will be needed to accommodate ramp construction. Impacts from culvert extensions will be immediately adjacent to existing structures.

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

No. The project is expected to have minimal effects on floodplain functions, water storage, or wildlife and fishery habitat. If conditions change based on final design and analysis then additional measures will be evaluated to preserve and/or restore floodplain values.

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

Numerous alternatives were developed and evaluated using specific criteria established through public involvement activities and engineering design. These alternatives were further reduced to the final two reasonable alternatives, and ultimately to a Refined Recommended Preferred Alternative, based on public involvement activities and reduced environmental impacts.

The design will include minor impacts to the Saluda River and Broad River floodplains from placement of fill for the bridge approaches and construction of associated ramps. Impacts to other regulated floodplains will occur due to the extension of culverts to accommodate the widening. All structures will be designed according to FEMA standards and will provide clearances above the flood elevation.

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 will 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.

The DEIS was coordinated with local, state, and federal officials who had the opportunity to review and comment on potential floodplain impacts. At the appropriate stage of project development (i.e. final design), a complete hydraulic study performed to SCDOT guidelines for Hydraulic Design Studies will 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 will take place.

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

COUNTY: Lexington

DATE: 01/25/2019

ROAD #: I-20

STREAM CROSSING: Saluda River

Purpose & Need for the Project:

The SCDOT, in consultation with the FHWA, has selected the Refined Recommended Preferred Alternative to improve mobility and enhance traffic operations within the I-20/26/126 corridor. The primary purpose of the project is to implement a transportation solution(s) that would improve mobility and enhance traffic operations by reducing existing traffic congestion within the corridor while accommodating future traffic needs. The secondary purposes are to enhance safety, improve freight mobility, and improve system linkages while maintaining community and environmental impacts.

I. FEMA Acknowledgement

Is this project located in a regulated FEMA Floodway? Yes No

Panel Number: 45063C0144J Effective Date: 07/05/2018 (See Attached)

II. FEMA Floodmap Investigation

FEMA Flood Profile Sheet Number 81P illustrates the existing 100 year flood:

- Passes under the existing low chord elevation.
 Is in contact with the existing low chord elevation.
 Overtops the existing bridge finished grade elevation.

III. No Rise/CLOMR Preliminary Determination

Preliminary assessment indicates this project may be constructed to meet the "No-Rise" requirements. A detailed hydraulic analysis will be performed to verify this assessment.

Justification:

[Empty box for justification]

Preliminary assessmnet indicates this project may require a CLOMR/LOMR. Impacts will be determined by a detailed hydraulic analysis.

Justification:

Final hydraulic design will be completed by the selected design build team, it is anticipated that a CLOMR/LOMR may be required based on preliminary studies.

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

IV. Preliminary Bridge Assessment

A. Locate Existing Plans

a. Bridge Plans Yes File No. 32.806.2 Sheet No. 5 (See Attached)
 No

b. Road Plans Yes File No. 32.806 Sheet No. 36 (See Attached)
 No

B. Historical Highwater Data

a. USGS Gage Yes Gage No. _____ Results: _____
 No

b. SCDOT/USGS Documented Highwater Elevations
 Yes Results: 177.0 (April 1964) NGVD 1929
 No

c. Existing Plans Yes See Above
 No

V. Field Review

A. Existing Bridge

Length: 657 ft. Width: 108 ft. Max. span Length: 73 ft.

Alignment: Tangent Curved

Bridge Skewed: Yes No Angle: 25

End Abutment Type: spill-through

Riprap on End Fills: Yes No Condition: Fair

Superstructure Type: Prestressed concrete bridge deck

Substructure Type: 3'6" concrete piers with 10'x15' footing

Utilities Present: Yes No
Describe: 4-4" conduits under the bridge between girders. Unknown utilities.

Debris Accumulation on Bridge: Percent Blocked Horizontally: <1 %
Percent Blocked Vertically: <1 %

Hydraulic Problems: Yes No
Describe: Oct. 2015 flood approached low chord, but no over-topping occurred.

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

V. Field Review (cont.)

B. Hydraulic Features

a. Scour Present: Yes No Location: Piers, footings visible.

b. Distance from F.G. to Normal Water Elevation: 28 ft.

c. Distance from Low Steel to Normal Water Elev.: 23 ft.

d. Distance from F.G. to High Water Elevation: 6 ft. 2015 Flood

e. Distance from Low Steel to High Water Elev.: 1 ft. 2015 Flood

f. Channel Banks Stable: Yes No

Describe: Heavy vegetation growing, and rip-rap protection on abutments.

g. Soil Type: Sand/silt

h. Exposed Rock: Yes No Location: None visible.

i. Give Description and Location of any structures or other property that could be damaged due to additional backwater.

There are several residences within 300' of the existing bridge on the western bank and a sewage treatment facility on the eastern bank immediately upstream of the bridge.

C. Existing Roadway Geometry

a. Can the existing roadway be closed for an On-Alignment Bridge Replacement
 Yes No

Describe: I-20 is a major interstate between Atlanta and Columbia.

If "yes", does the existing vertical and horizontal curves meet the proposed design speed criteria?

If "No", will the proposed bridge be:

- Staged Constructed
 Replaced on New Alignment

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

VI. Field Review (cont.)

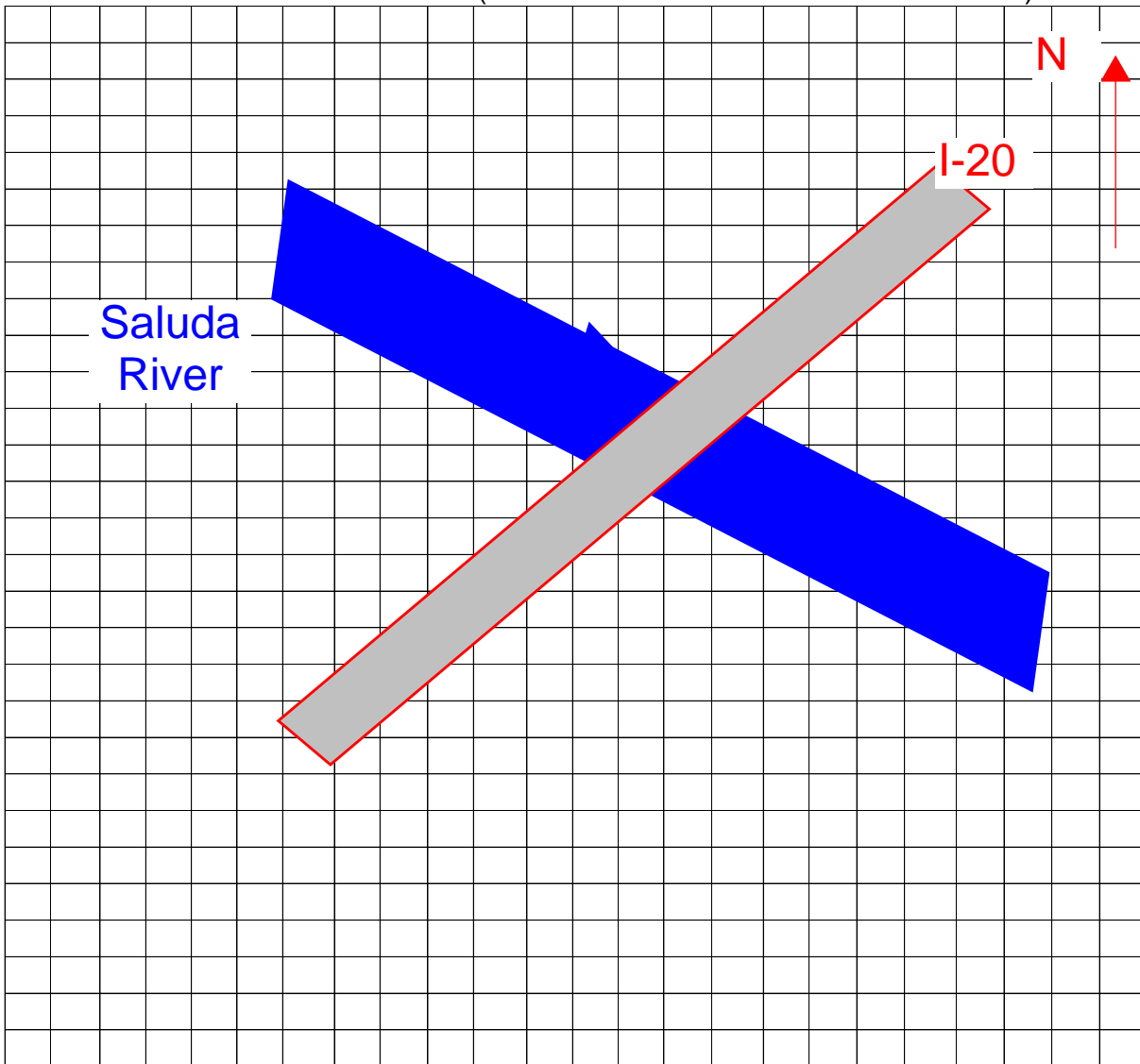
A. Proposed Bridge Recommendation:

Length: _____ ft. Width: _____ ft. Elevation: _____ ft.

Span Arrangement: _____

Notes: The proposed bridge geometry is anticipated to match the existing bridge.
Final design of the bridge will be completed by the selected design build team.
The design build team will be required to maintain existing low chord as a
minimum vertical requirement.

BRIDGE SITE DIAGRAM: (Show North Arrow and Direction of Flow)



Performed By: Thomas Miller

Title: Hydraulics Engineer

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

COUNTY: Richland

DATE: 01/25/2019

ROAD #: I-26

STREAM CROSSING: Saluda River

Purpose & Need for the Project:

The SCDOT, in consultation with the FHWA, has selected the Refined Recommended Preferred Alternative to improve mobility and enhance traffic operations within the I-20/26/126 corridor. The primary purpose of the project is to implement a transportation solution(s) that would improve mobility and enhance traffic operations by reducing existing traffic congestion within the corridor while accommodating future traffic needs. The secondary purposes are to enhance safety, improve freight mobility, and improve system linkages while maintaining community and environmental impacts.

I. FEMA Acknowledgement

Is this project located in a regulated FEMA Floodway? Yes No

Panel Number: 45079C0238L Effective Date: 12/21/2017 (See Attached)

II. FEMA Floodmap Investigation

FEMA Flood Profile Sheet Number 138P illustrates the existing 100 year flood:

- Passes under the existing low chord elevation.
 Is in contact with the existing low chord elevation.
 Overtops the existing bridge finished grade elevation.

III. No Rise/CLOMR Preliminary Determination

Preliminary assessment indicates this project may be constructed to meet the "No-Rise" requirements. A detailed hydraulic analysis will be performed to verify this assessment.

Justification:

[Empty box for justification]

Preliminary assessmnet indicates this project may require a CLOMR/LOMR. Impacts will be determined by a detailed hydraulic analysis.

Justification:

Final hydraulic design will be completed by the selected design build team, it is anticipated that a CLOMR/LOMR will be required based on preliminary studies.

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

IV. Preliminary Bridge Assessment

A. Locate Existing Plans

a. Bridge Plans Yes File No. 3240.378.1 Sheet No. 10 (See Attached)
 No

b. Road Plans Yes File No. 3240.378.1 Sheet No. 6-6A (See Attached)
 No

B. Historical Highwater Data

a. USGS Gage Yes Gage No. 02169000 Results: 14.26* (2015)
 No gage damaged

b. SCDOT/USGS Documented Highwater Elevations
 Yes Results: See USGS Open File Report 2015-1201
 No

c. Existing Plans Yes See Above
 No

V. Field Review

A. Existing Bridge

Length: 700 ft. Width: 123 ft. Max. span Length: 70 ft.

Alignment: Tangent Curved

Bridge Skewed: Yes No Angle: 50

End Abutment Type: spill-through

Riprap on End Fills: Yes No Condition: Fair

Superstructure Type: Concrete deck and girder

Substructure Type: 5' Square piers on 11'-6" footings

Utilities Present: Yes No
Describe:

Debris Accumulation on Bridge: Percent Blocked Horizontally: <1 %
Percent Blocked Vertically: <1 %

Hydraulic Problems: Yes No
Describe:

Oct. 2015 flood reached low chord, did not overtop, but Interstate had to be shut down for extended period.

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

V. Field Review (cont.)

B. Hydraulic Features

a. Scour Present: Yes No Location: None visible

b. Distance from F.G. to Normal Water Elevation: 21 ft.

c. Distance from Low Steel to Normal Water Elev.: 16 ft.

d. Distance from F.G. to High Water Elevation: 1 ft. 2015 Flood

e. Distance from Low Steel to High Water Elev.: N/A ft. 2015 Flood

f. Channel Banks Stable: Yes No

Describe:

Heavy vegetation growing, and rip-rap protection on abutments.
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g. Soil Type: Sand/silt

h. Exposed Rock: Yes No Location: None visible.

i. Give Description and Location of any structures or other property that could be damaged due to additional backwater.

There is a neighborhood along the southern bank and a water treatment facility on the northern bank approximately 1000' upstream of the I-26 bridge.
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C. Existing Roadway Geometry

a. Can the existing roadway be closed for an On-Alignment Bridge Replacement
 Yes No

Describe:

I-26 is a major interstate between Charleston and Greenville.

If "yes", does the existing vertical and horizontal curves meet the proposed design speed criteria?

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If "No", will the proposed bridge be:

Staged Constructed
 Replaced on New Alignment

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

VI. Field Review (cont.)

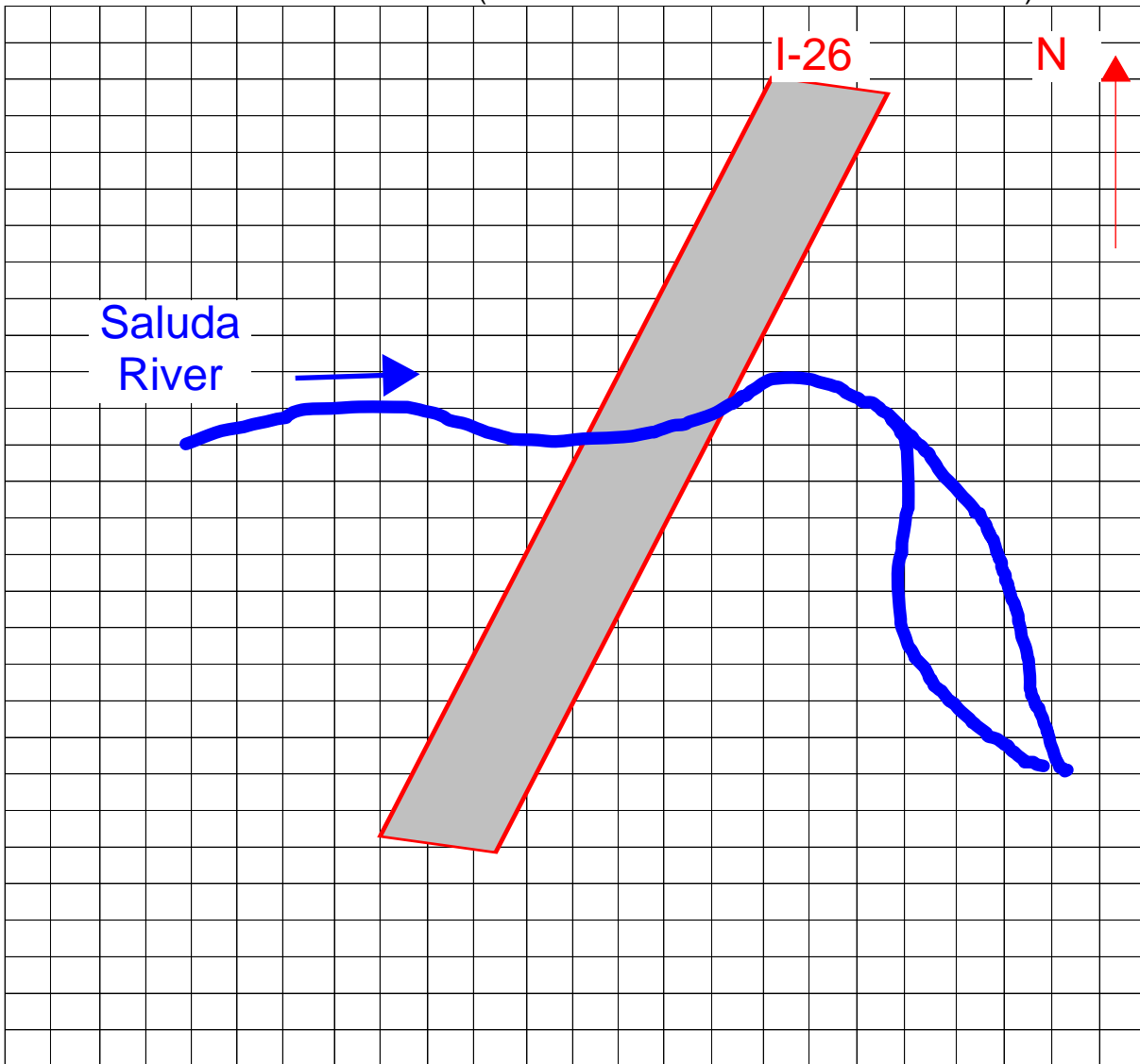
A. Proposed Bridge Recommendation:

Length: _____ ft. Width: _____ ft. Elevation: _____ ft.

Span Arrangement: _____

Notes: The proposed bridge geometry is anticipated to match the existing bridge.
Final design of the bridge will be completed by the selected design build team.
The design build team will be required to raise the low chord to meet minimum
freeboard requirements.

BRIDGE SITE DIAGRAM: (Show North Arrow and Direction of Flow)



Performed By: Thomas Miller

Title: Hydraulics Engineer

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

COUNTY: Lexington

DATE: 01/25/2019

ROAD #: I-20

STREAM CROSSING: Stoop Creek

Purpose & Need for the Project:

The SCDOT, in consultation with the FHWA, has selected the Refined Recommended Preferred Alternative to improve mobility and enhance traffic operations within the I-20/26/126 corridor. The primary purpose of the project is to implement a transportation solution(s) that would improve mobility and enhance traffic operations by reducing existing traffic congestion within the corridor while accommodating future traffic needs. The secondary purposes are to enhance safety, improve freight mobility, and improve system linkages while maintaining community and environmental impacts.

I. FEMA Acknowledgement

Is this project located in a regulated FEMA Floodway? Yes No

Panel Number: 45063C0161J Effective Date: 07/05/2018 (See Attached)

II. FEMA Floodmap Investigation

FEMA Flood Profile Sheet Number 117P illustrates the existing 100 year flood:

- Passes under the existing low chord elevation.
 Is in contact with the existing low chord elevation.
 Overtops the existing bridge finished grade elevation.

NOTE: Existing crossing is a triple 10x7' box culvert. Headwater elevations above top of culvert, but no overtopping of I-20.

III. No Rise/CLOMR Preliminary Determination

Preliminary assessment indicates this project may be constructed to meet the "No-Rise" requirements. A detailed hydraulic analysis will be performed to verify this assessment.

Justification:

[Empty box for justification]

Preliminary assessment indicates this project may require a CLOMR/LOMR. Impacts will be determined by a detailed hydraulic analysis.

Justification:

Final hydraulic design will be completed by the selected design build team, it is anticipated that a CLOMR/LOMR may be required based on preliminary studies.

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

IV. Preliminary Bridge Assessment

A. Locate Existing Plans

a. Bridge Plans Yes File No. 32.700 Sheet No. (See Attached)
 No

b. Road Plans Yes File No. 32.700 Sheet No. 16 (See Attached)
 No

B. Historical Highwater Data

a. USGS Gage Yes Gage No. Results:
 No

b. SCDOT/USGS Documented Highwater Elevations
 Yes Results:
 No

c. Existing Plans Yes See Above
 No

V. Field Review

A. Existing Bridge

Length: 303 ft. Width: 30 ft. Max. span Length: 7 ft.

Alignment: Tangent Curved Triple 10'x7'x303' RCBC

Bridge Skewed: Yes No Angle:

End Abutment Type: N/A, Wingwalls and concrete apron

Riprap on End Fills: Yes No Condition:

Superstructure Type: Reinforced Concrete Box Culvert

Substructure Type:

Utilities Present: Yes No

Describe:

Debris Accumulation on Bridge: Percent Blocked Horizontally: <10 %
Percent Blocked Vertically: <10 %

Hydraulic Problems: Yes No

Describe: Large storm events produce excessive backwater overtopping adjacent Berryhill Rd for existing conditions. I-20 does not overtop.

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

V. Field Review (cont.)

B. Hydraulic Features

a. Scour Present: Yes No Location: _____

b. Distance from F.G. to Normal Water Elevation: _____ 20 ft.

c. Distance from Low Steel to Normal Water Elev.: _____ N/A ft.

d. Distance from F.G. to High Water Elevation: _____ N/A ft. 2015 Flood

e. Distance from Low Steel to High Water Elev.: _____ N/A ft. 2015 Flood

f. Channel Banks Stable: Yes No

Describe: Heavy vegetation growing

g. Soil Type: Sand/silt

h. Exposed Rock: Yes No Location: None visible.

i. Give Description and Location of any structures or other property that could be damaged due to additional backwater.

Apartment complexes line the channel immediately upstream of the culvert. There is also a sewer line crossing several hundred feet upstream.

C. Existing Roadway Geometry

a. Can the existing roadway be closed for an On-Alignment Bridge Replacement
 Yes No

Describe: I-20 is a major interstate between Atlanta and Columbia.

If "yes", does the existing vertical and horizontal curves meet the proposed design speed criteria?

If "No", will the proposed bridge be:

- Staged Constructed
- Replaced on New Alignment

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

VI. Field Review (cont.)

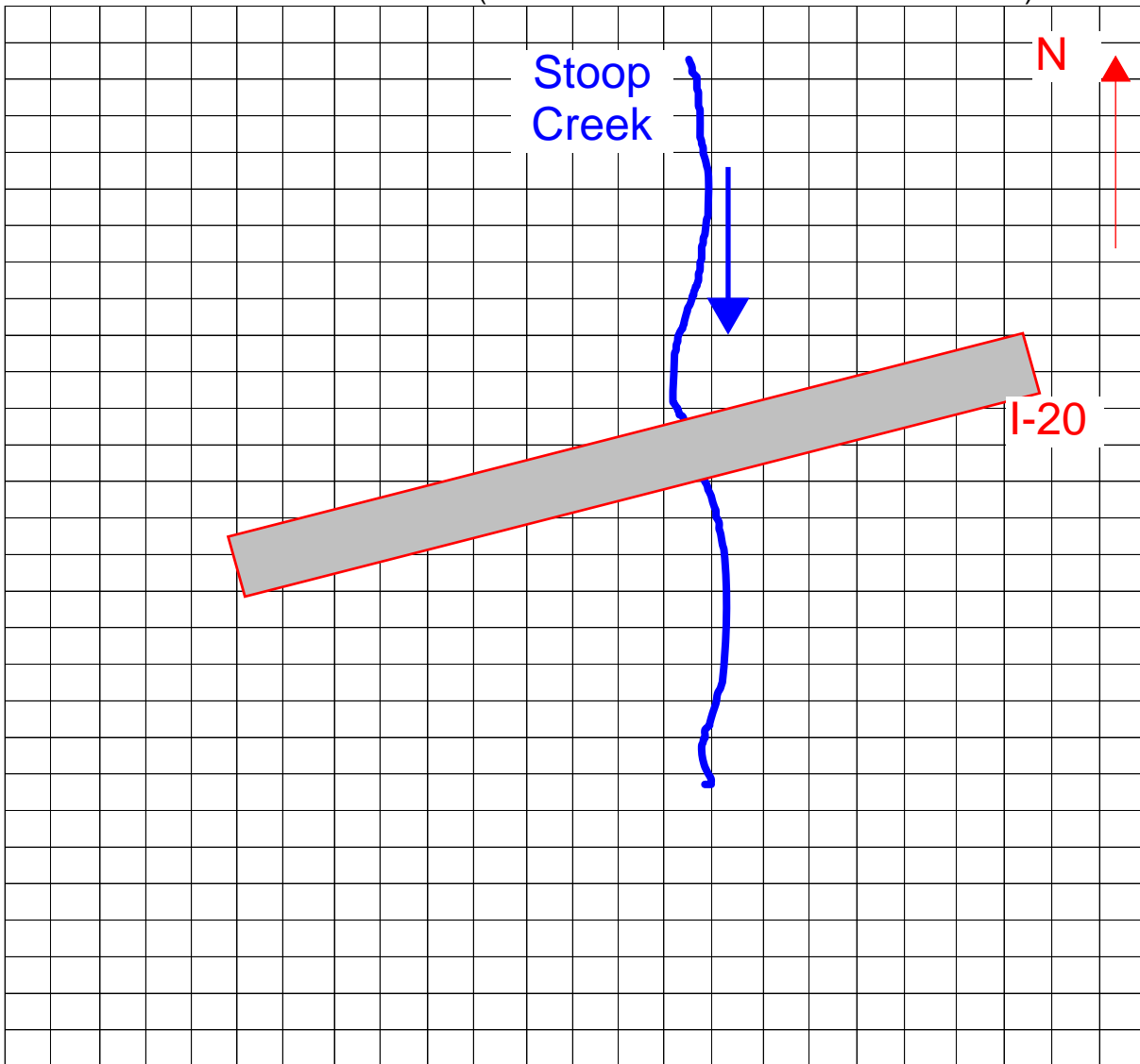
A. Proposed Bridge Recommendation:

Length: _____ ft. Width: _____ ft. Elevation: _____ ft.

Span Arrangement: _____

Notes: Final design of the bridge/culvert will be completed by the selected design build team. The design build team will be required to maintain match or lower existing headwater elevations.

BRIDGE SITE DIAGRAM: (Show North Arrow and Direction of Flow)



Performed By: Thomas Miller

Title: Hydraulics Engineer

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

COUNTY: Lexington

DATE: 01/25/2019

ROAD #: I-26

STREAM CROSSING: Stoop Creek

Purpose & Need for the Project:

The SCDOT, in consultation with the FHWA, has selected the Refined Recommended Preferred Alternative to improve mobility and enhance traffic operations within the I-20/26/126 corridor. The primary purpose of the project is to implement a transportation solution(s) that would improve mobility and enhance traffic operations by reducing existing traffic congestion within the corridor while accommodating future traffic needs. The secondary purposes are to enhance safety, improve freight mobility, and improve system linkages while maintaining community and environmental impacts.

I. FEMA Acknowledgement

Is this project located in a regulated FEMA Floodway? Yes No

Panel Number: 45063C0161J Effective Date: 07/05/2018 (See Attached)

II. FEMA Floodmap Investigation

FEMA Flood Profile Sheet Number 117P illustrates the existing 100 year flood:

- Passes under the existing low chord elevation.
 Is in contact with the existing low chord elevation.
 Overtops the existing bridge finished grade elevation.
NOTE: Existing double 10'x8' box culvert through I-26/St. Andrews interchange. Roadway overtops.

III. No Rise/CLOMR Preliminary Determination

Preliminary assessment indicates this project may be constructed to meet the "No-Rise" requirements. A detailed hydraulic analysis will be performed to verify this assessment.

Justification: [Empty box]

Preliminary assessmnet indicates this project may require a CLOMR/LOMR. Impacts will be determined by a detailed hydraulic analysis.

Justification: Final hydraulic design will be completed by the selected design build team, it is anticipated that a CLOMR/LOMR may be required based on preliminary studies.

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

IV. Preliminary Bridge Assessment

A. Locate Existing Plans

a. Bridge Plans Yes File No. 3240.415 Sheet No. _____ (See Attached)
 No

b. Road Plans Yes File No. 3240.415 Sheet No. _____ (See Attached)
 No

B. Historical Highwater Data

a. USGS Gage Yes Gage No. _____ Results: _____
 No

b. SCDOT/USGS Documented Highwater Elevations
 Yes Results: _____
 No

c. Existing Plans Yes See Above
 No

V. Field Review

A. Existing Bridge

Length: 1021 ft. Width: 20 ft. Max. span Length: 8 ft.

Alignment: Tangent Curved

Existing Double 10'x8' RCBC, culvert alignment begins at Fernandina Rd heading south under interchange ramp/loop & St. Andrews, then turns west under I-26.

Bridge Skewed: Yes No Angle: _____

End Abutment Type: Wingwalls and concrete apron

Riprap on End Fills: Yes No Condition: _____

Superstructure Type: Reinforced Concrete

Substructure Type: _____

Utilities Present: Yes No

Describe: [Empty box]

Debris Accumulation on Bridge: Percent Blocked Horizontally: <10 %
Percent Blocked Vertically: <10 %

Hydraulic Problems: Yes No

Describe: Excessive backwater, 2015 flood produced overtopping.

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

V. Field Review (cont.)

B. Hydraulic Features

a. Scour Present: Yes No Location: _____

b. Distance from F.G. to Normal Water Elevation: _____ 15 ft. F.G. refers to I-26E Loop to

c. Distance from Low Steel to Normal Water Elev.: _____ N/A ft. St. Andrews West

d. Distance from F.G. to High Water Elevation: _____ Overtopped ft. 2015 Flood

e. Distance from Low Steel to High Water Elev.: _____ N/A ft. 2015 Flood

f. Channel Banks Stable: Yes No
Describe:

Heavy vegetation growing.

g. Soil Type: Sand/silt

h. Exposed Rock: Yes No Location: None visible.

i. Give Description and Location of any structures or other property that could be damaged due to additional backwater.

Upstream reaches are heavily developed with residences lining the channel on both sides.
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C. Existing Roadway Geometry

a. Can the existing roadway be closed for an On-Alignment Bridge Replacement
 Yes No

Describe:

I-26 is a major interstate between Charleston and Greenville.

If "yes", does the existing vertical and horizontal curves meet the proposed design speed criteria?

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If "No", will the proposed bridge be:

- Staged Constructed
- Replaced on New Alignment

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

VI. Field Review (cont.)

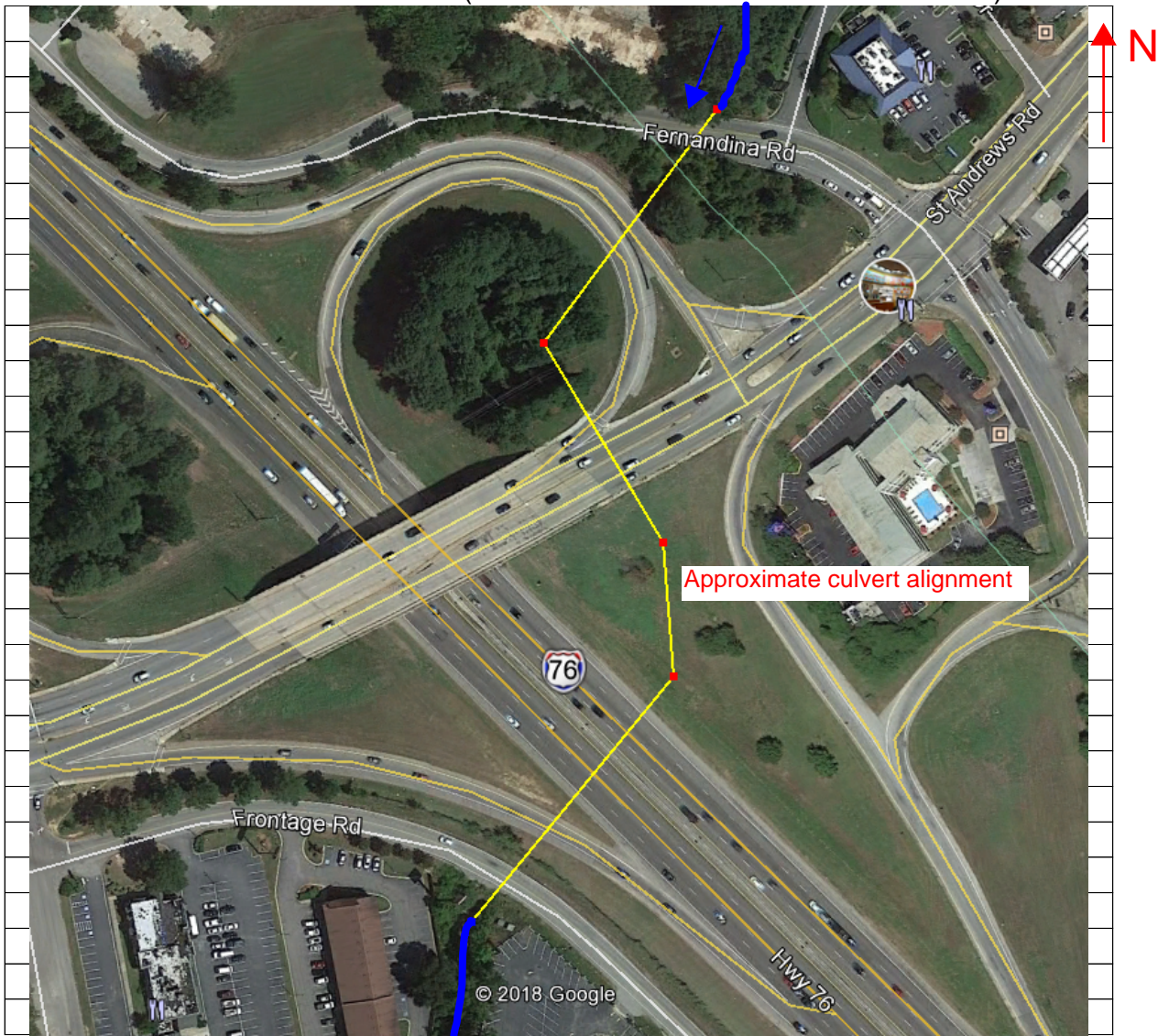
A. Proposed Bridge Recommendation:

Length: _____ ft. Width: _____ ft. Elevation: _____ ft.

Span Arrangement: _____

Notes: Final design of the bridge will be completed by the selected design build team.
The design build team will be required to match or lower existing headwater elevations.

BRIDGE SITE DIAGRAM: (Show North Arrow and Direction of Flow)



Performed By: Thomas Miller

Title: Hydraulics Engineer

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

COUNTY: Lexington

DATE: 01/25/2019

ROAD #: I-26

STREAM CROSSING: Kinley Creek Tributary 2

Purpose & Need for the Project:

The SCDOT, in consultation with the FHWA, has selected the Refined Recommended Preferred Alternative to improve mobility and enhance traffic operations within the I-20/26/126 corridor. The primary purpose of the project is to implement a transportation solution(s) that would improve mobility and enhance traffic operations by reducing existing traffic congestion within the corridor while accommodating future traffic needs. The secondary purposes are to enhance safety, improve freight mobility, and improve system linkages while maintaining community and environmental impacts.

I. FEMA Acknowledgement

Is this project located in a regulated FEMA Floodway? Yes No

Panel Number: 45063C0134J Effective Date: 07/05/2018 (See Attached)

II. FEMA Floodmap Investigation

FEMA Flood Profile Sheet Number 54P illustrates the existing 100 year flood:

- Passes under the existing low chord elevation.
 Is in contact with the existing low chord elevation.
 Overtops the existing bridge finished grade elevation.
NOTE: FEMA Flood Profile begins just beyond the downstream end of the RCBC crossing I-26.

III. No Rise/CLOMR Preliminary Determination

Preliminary assessment indicates this project may be constructed to meet the "No-Rise" requirements. A detailed hydraulic analysis will be performed to verify this assessment.

Justification: [Empty box]

Preliminary assessment indicates this project may require a CLOMR/LOMR. Impacts will be determined by a detailed hydraulic analysis.

Justification: Final hydraulic design will be completed by the selected D-B team, it is anticipated that a CLOMR/LOMR may be required based on preliminary studies.

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

IV. Preliminary Bridge Assessment

A. Locate Existing Plans

a. Bridge Plans Yes File No. _____ Sheet No. _____ (See Attached)
 No

b. Road Plans Yes File No. 32.761 Sheet No. 9H (See Attached)
 No

B. Historical Highwater Data

a. USGS Gage Yes Gage No. _____ Results: _____
 No

b. SCDOT/USGS Documented Highwater Elevations
 Yes Results: _____
 No

c. Existing Plans Yes See Above
 No

V. Field Review

A. Existing Bridge

Length: 271 ft. Width: 6 ft. Max. span Length: 6 ft.

Alignment: Tangent Curved **6'x6'x271' RCBC**

Bridge Skewed: Yes No Angle: 60

End Abutment Type: N/A, Wingwalls

Riprap on End Fills: Yes No Condition: _____

Superstructure Type: Reinforced Concrete Box Culvert

Substructure Type: _____

Utilities Present: Yes No
Describe:

Debris Accumulation on Bridge: Percent Blocked Horizontally: <1 %
Percent Blocked Vertically: <1 %

Hydraulic Problems: Yes No
Describe:

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

V. Field Review (cont.)

B. Hydraulic Features

a. Scour Present: Yes No Location: _____

b. Distance from F.G. to Normal Water Elevation: _____ 6 ft.

c. Distance from Low Steel to Normal Water Elev.: _____ N/A ft.

d. Distance from F.G. to High Water Elevation: _____ N/A ft.

e. Distance from Low Steel to High Water Elev.: _____ N/A ft.

f. Channel Banks Stable: Yes No
Describe:

Heavy vegetation growing.

g. Soil Type: Sand/silt _____

h. Exposed Rock: Yes No Location: None visible. _____

i. Give Description and Location of any structures or other property that could be damaged due to additional backwater.

A business building is located approximately 120' upstream of the box culvert. However, contours show the frontage road and I-26 would overtop prior to stormwater backing up to the building.
--

C. Existing Roadway Geometry

a. Can the existing roadway be closed for an On-Alignment Bridge Replacement
 Yes No

Describe:

I-26 is a major interstate between Charleston and Greenville.

If "yes", does the existing vertical and horizontal curves meet the proposed design speed criteria?

--

If "No", will the proposed bridge be:

- Staged Constructed
- Replaced on New Alignment

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

VI. Field Review (cont.)

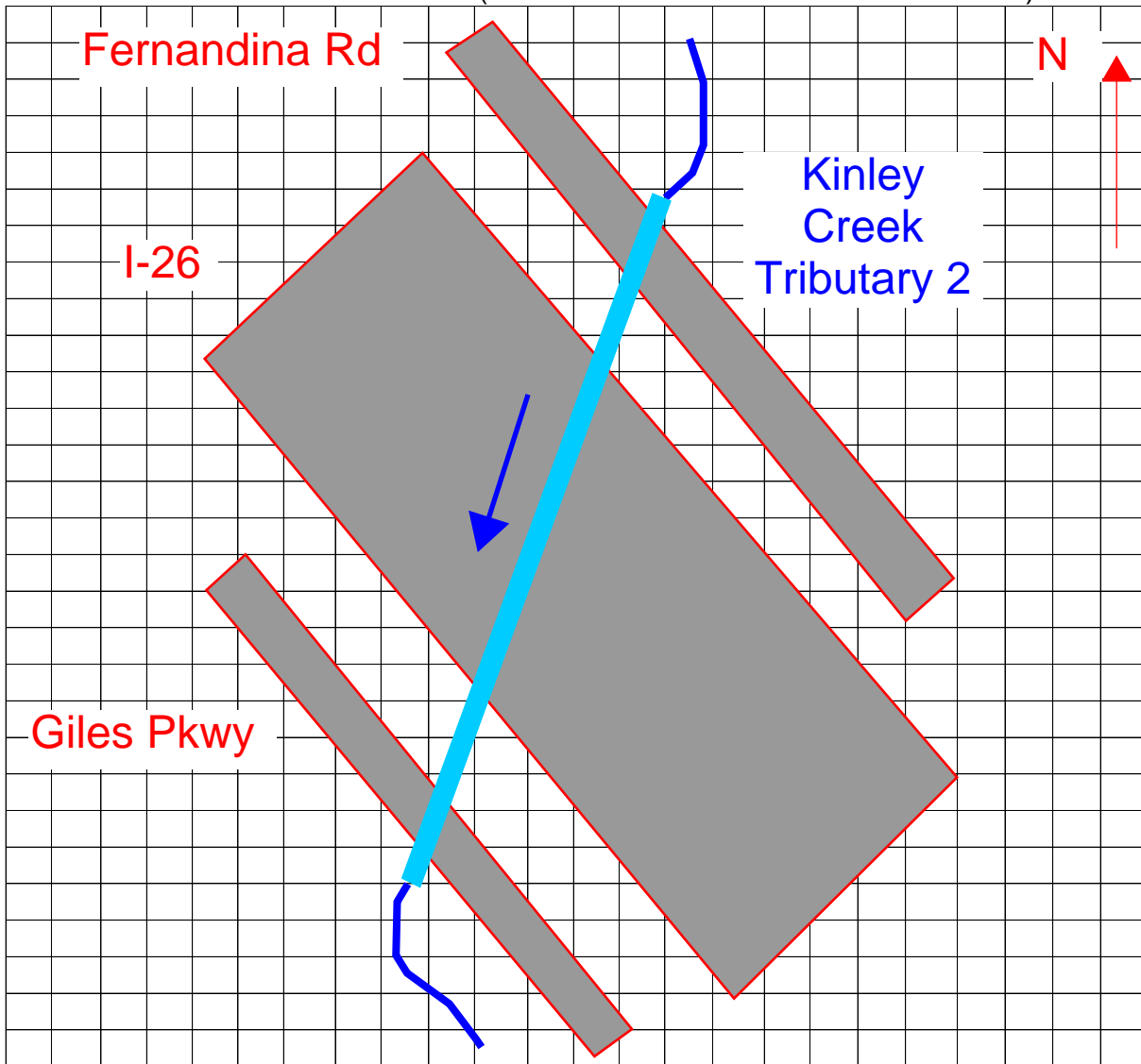
A. Proposed Bridge Recommendation:

Length: _____ ft. Width: _____ ft. Elevation: _____ ft.

Span Arrangement: _____

Notes: Final design of the bridge/culvert will be completed by the selected design build team. The design build team will be required to maintain match or lower existing headwater elevations.

BRIDGE SITE DIAGRAM: (Show North Arrow and Direction of Flow)



Performed By: Brandon Stokes

Title: Hydraulics Engineer

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

COUNTY: Richland

DATE: 01/25/2019

ROAD #: I-26

STREAM CROSSING: Moccasin Branch

Purpose & Need for the Project:

The SCDOT, in consultation with the FHWA, has selected the Refined Recommended Preferred Alternative to improve mobility and enhance traffic operations within the I-20/26/126 corridor. The primary purpose of the project is to implement a transportation solution(s) that would improve mobility and enhance traffic operations by reducing existing traffic congestion within the corridor while accommodating future traffic needs. The secondary purposes are to enhance safety, improve freight mobility, and improve system linkages while maintaining community and environmental impacts.

I. FEMA Acknowledgement

Is this project located in a regulated FEMA Floodway? Yes No

Panel Number: 45079C0206L Effective Date: 12/21/2017 (See Attached)

II. FEMA Floodmap Investigation

FEMA Flood Profile Sheet Number 104P illustrates the existing 100 year flood:

- Passes under the existing low chord elevation.
 Is in contact with the existing low chord elevation.
 Overtops the existing bridge finished grade elevation.

III. No Rise/CLOMR Preliminary Determination

Preliminary assessment indicates this project may be constructed to meet the "No-Rise" requirements. A detailed hydraulic analysis will be performed to verify this assessment.

Justification:

[Empty box for justification]

Preliminary assessment indicates this project may require a CLOMR/LOMR. Impacts will be determined by a detailed hydraulic analysis.

Justification:

Final hydraulic design will be completed by the selected design build team, it is anticipated that a CLOMR/LOMR may be required based on preliminary studies.

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

IV. Preliminary Bridge Assessment

A. Locate Existing Plans

a. Bridge Plans Yes File No. 40.151A 19
 No File No. 40.468A Sheet No. 11 (See Attached)

b. Road Plans Yes File No. 40.151A 19
 No File No. 40.468A Sheet No. 11 (See Attached)

B. Historical Highwater Data

a. USGS Gage Yes Gage No. _____ Results: _____
 No

b. SCDOT/USGS Documented Highwater Elevations
 Yes Results: _____
 No

c. Existing Plans Yes See Above
 No

V. Field Review

A. Existing Bridge

Length: 268 ft. Width: 6 ft. Max. span Length: 6 ft.

Alignment: Tangent Curved 6'x6'x268' RCBC

Bridge Skewed: Yes No Angle: _____

End Abutment Type: N/A, Wingwalls, Concrete Aprons

Riprap on End Fills: Yes No Condition: _____

Superstructure Type: Reinforced Concrete Box Culvert

Substructure Type: _____

Utilities Present: Yes No
Describe: _____

Debris Accumulation on Bridge: Percent Blocked Horizontally: <1 %
Percent Blocked Vertically: <1 %

Hydraulic Problems: Yes No
Describe: _____

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

V. Field Review (cont.)

B. Hydraulic Features

a. Scour Present: Yes No Location: _____

b. Distance from F.G. to Normal Water Elevation: _____ 11 ft.

c. Distance from Low Steel to Normal Water Elev.: _____ N/A ft.

d. Distance from F.G. to High Water Elevation: _____ N/A ft.

e. Distance from Low Steel to High Water Elev.: _____ N/A ft.

f. Channel Banks Stable: Yes No

Describe: Heavy vegetation growing on channel banks.

g. Soil Type: Sand/silt _____

h. Exposed Rock: Yes No Location: None visible. _____

i. Give Description and Location of any structures or other property that could be damaged due to additional backwater.

A business is located approximately 300' upstream outside of the banks and Broad River Road is approximately 600' upstream. The water would overtop I-26 prior to impacting building.

C. Existing Roadway Geometry

a. Can the existing roadway be closed for an On-Alignment Bridge Replacement
 Yes No

Describe:

I-26 is a major interstate between Charleston and Greenville.

If "yes", does the existing vertical and horizontal curves meet the proposed design speed criteria?

If "No", will the proposed bridge be:

Staged Constructed

Replaced on New Alignment

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

VI. Field Review (cont.)

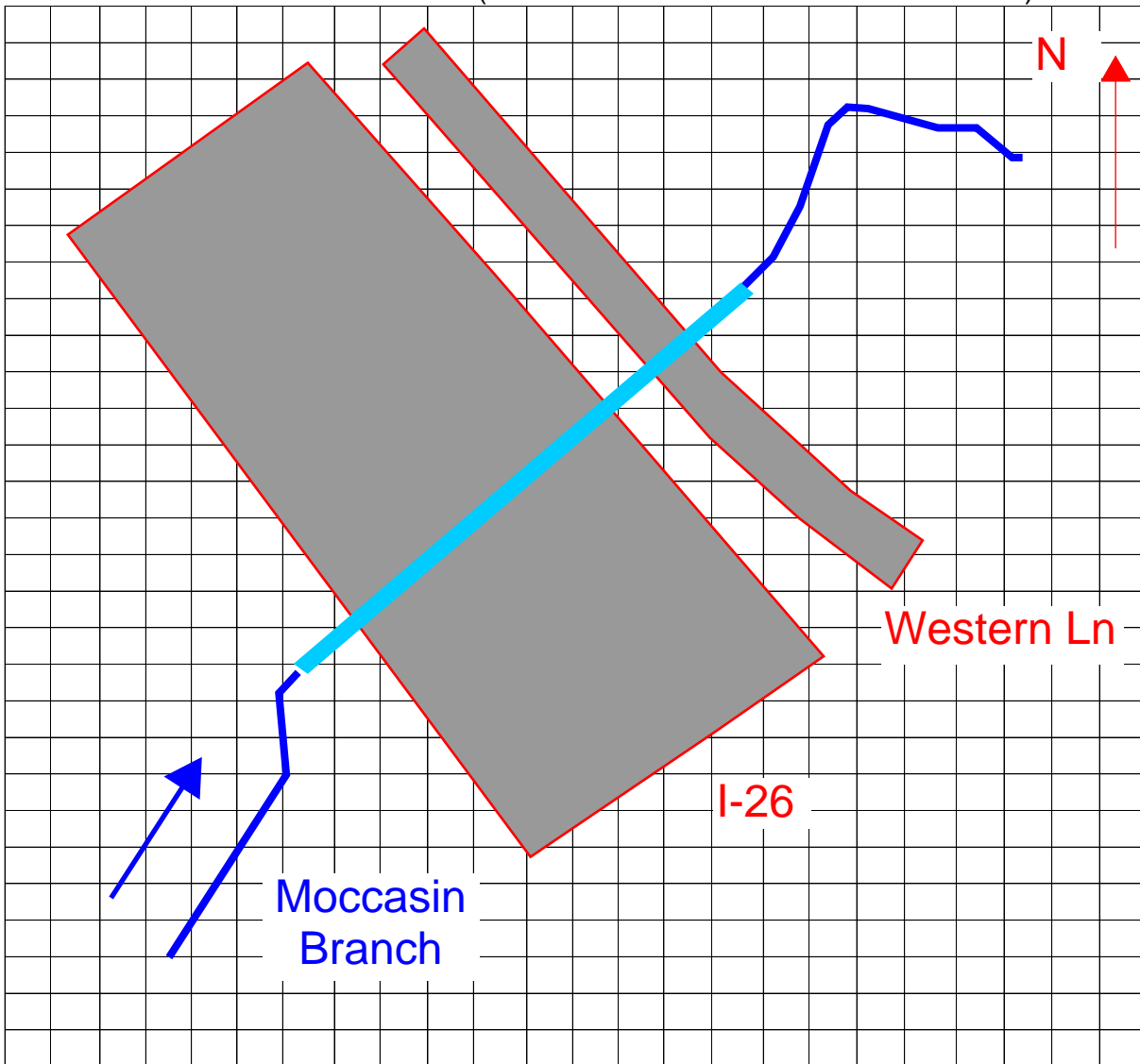
A. Proposed Bridge Recommendation:

Length: _____ ft. Width: _____ ft. Elevation: _____ ft.

Span Arrangement: _____

Notes: Final design of the bridge/culvert will be completed by the selected design build team. The design build team will be required to maintain match or lower existing headwater elevations.

BRIDGE SITE DIAGRAM: (Show North Arrow and Direction of Flow)



Performed By: Brandon Stokes

Title: Hydraulics Engineer

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

COUNTY: Lexington

DATE: 01/25/2019

ROAD #: I-26

STREAM CROSSING: Senn Branch

Purpose & Need for the Project:

The SCDOT, in consultation with the FHWA, has selected the Refined Recommended Preferred Alternative to improve mobility and enhance traffic operations within the I-20/26/126 corridor. The primary purpose of the project is to implement a transportation solution(s) that would improve mobility and enhance traffic operations by reducing existing traffic congestion within the corridor while accommodating future traffic needs. The secondary purposes are to enhance safety, improve freight mobility, and improve system linkages while maintaining community and environmental impacts.

I. FEMA Acknowledgement

Is this project located in a regulated FEMA Floodway? Yes No

Panel Number: 45063C0163J Effective Date: 07/05/2018 (See Attached)

II. FEMA Floodmap Investigation

FEMA Flood Profile Sheet Number 94P illustrates the existing 100 year flood:

- Passes under the existing low chord elevation.
 Is in contact with the existing low chord elevation.
 Overtops the existing bridge finished grade elevation.

NOTE: Existing crossing is a 10'x10' box culvert. Headwater elevation is above top of culvert, but not overtopping I-26.

III. No Rise/CLOMR Preliminary Determination

Preliminary assessment indicates this project may be constructed to meet the "No-Rise" requirements. A detailed hydraulic analysis will be performed to verify this assessment.

Justification:

[Empty box for justification]

Preliminary assessment indicates this project may require a CLOMR/LOMR. Impacts will be determined by a detailed hydraulic analysis.

Justification:

Final hydraulic design will be completed by the selected design build team, it is anticipated that a CLOMR/LOMR may be required based on preliminary studies.

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

IV. Preliminary Bridge Assessment

A. Locate Existing Plans

a. Bridge Plans Yes File No. _____ Sheet No. _____ (See Attached)
 No

b. Road Plans Yes File No. 40.251A / 32.870 40
3240.378 Sheet No. 87 (See Attached)
 No

B. Historical Highwater Data

a. USGS Gage Yes Gage No. _____ Results: _____
 No

b. SCDOT/USGS Documented Highwater Elevations
 Yes Results: _____
 No

c. Existing Plans Yes See Above
 No

V. Field Review

A. Existing Bridge

Length: 188 ft. Width: 10 ft. Max. span Length: 10 ft.

Alignment: Tangent Curved 10'x10'x188' RCBC

Bridge Skewed: Yes No Angle: _____

End Abutment Type: N/A, Wingwalls

Riprap on End Fills: Yes No Condition: _____

Superstructure Type: Reinforced Concrete Box Culvert

Substructure Type: _____

Utilities Present: Yes No
Describe: _____

Debris Accumulation on Bridge: Percent Blocked Horizontally: <1 %
Percent Blocked Vertically: <1 %

Hydraulic Problems: Yes No
Describe: _____

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

V. Field Review (cont.)

B. Hydraulic Features

a. Scour Present: Yes No Location: _____

b. Distance from F.G. to Normal Water Elevation: _____ 22 ft.

c. Distance from Low Steel to Normal Water Elev.: _____ N/A ft.

d. Distance from F.G. to High Water Elevation: _____ N/A ft.

e. Distance from Low Steel to High Water Elev.: _____ N/A ft.

f. Channel Banks Stable: Yes No

Describe: Heavy vegetation growing. Some erosion near wingwalls on upstream end.

g. Soil Type: Sand/silt

h. Exposed Rock: Yes No Location: None visible.

i. Give Description and Location of any structures or other property that could be damaged due to additional backwater.

The upstream reaches of the channel are wooded and undeveloped for approximately 1,300'. Stormwater would overtop I-26 prior to backing up to any structures.

C. Existing Roadway Geometry

a. Can the existing roadway be closed for an On-Alignment Bridge Replacement
 Yes No

Describe: I-26 is a major interstate between Charleston and Greenville.

If "yes", does the existing vertical and horizontal curves meet the proposed design speed criteria?

If "No", will the proposed bridge be:

Staged Constructed
 Replaced on New Alignment

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

VI. Field Review (cont.)

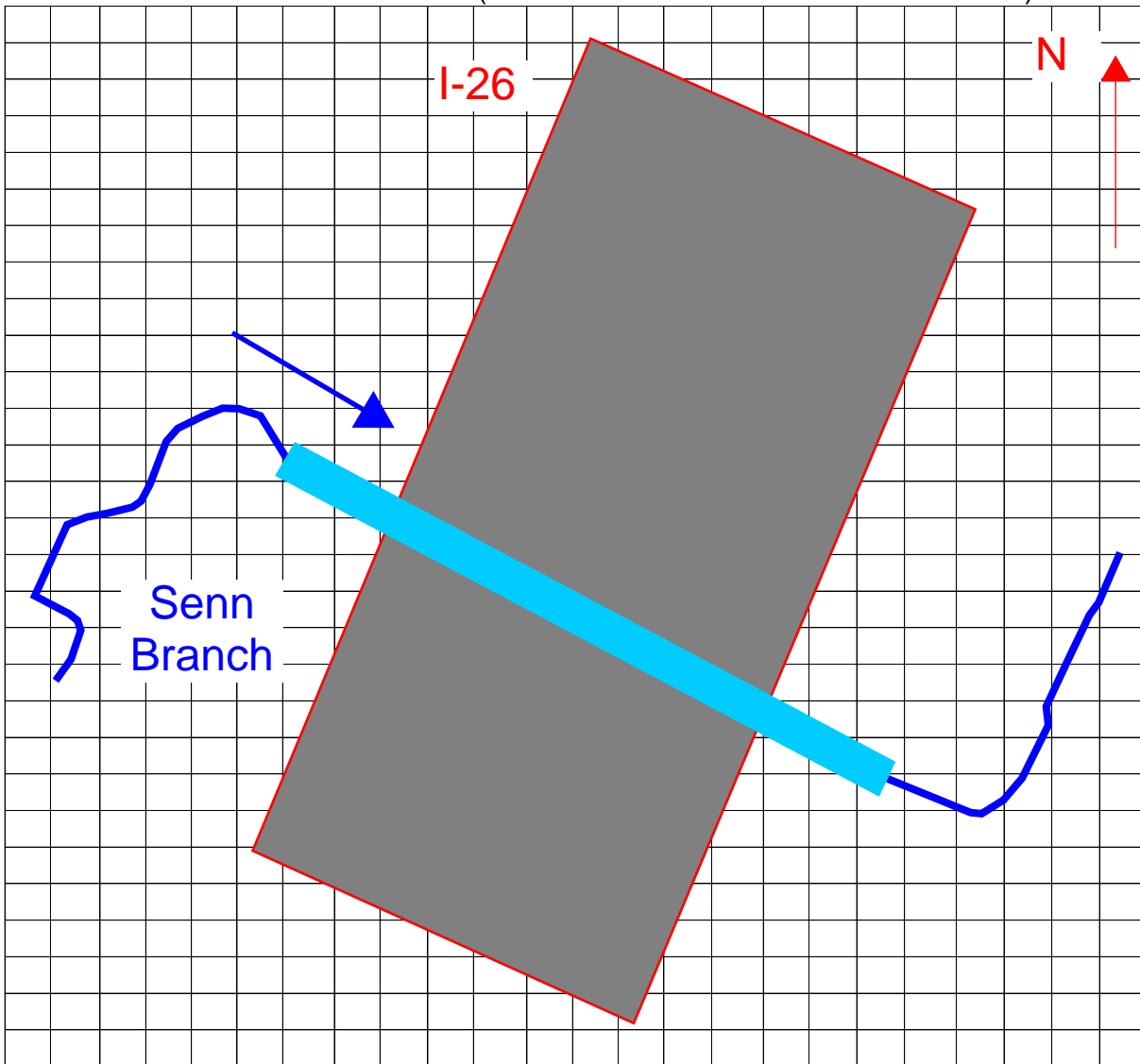
A. Proposed Bridge Recommendation:

Length: _____ ft. Width: _____ ft. Elevation: _____ ft.

Span Arrangement: _____

Notes: Final design of the bridge/culvert will be completed by the selected design build team. The design build team will be required to maintain match or lower existing headwater elevations.

BRIDGE SITE DIAGRAM: (Show North Arrow and Direction of Flow)



Performed By: Brandon Stokes

Title: Hydraulics Engineer