

I-2513 B & D
Integrated Plan for
Communications,
Construction/
Demolition, and
River User Safety

INTEGRATED PLAN FOR COMMUNICATIONS, CONSTRUCTION/DEMOLITION, AND
RIVER USER SAFETY FOR THE I-26 ASHEVILLE CONNECTOR FROM I-40 TO
US 19/23/70 NORTH OF ASHEVILLE IN BUNCOMBE COUNTY, NORTH CAROLINA

STIP I-2513



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PRELIMINARY AND SUBJECT TO CHANGE

OCTOBER 2025

Table of Contents

I-26 CONNECTOR PROJECT OVERVIEW.....	3
GOALS OF THE STRATEGIC COMMUNICATIONS PLAN.....	5
Targeted Audiences	5
Implementation Strategies and Tactics.....	6
Communication Channels.....	7
Required Resources	7
Timeline for Implementation.....	7
STRUCTURES	8
I-40 over the French Broad River (Section C: FBR-1).....	8
I-40 over Hominy Creek (Section C: HC-1, HC-2, HC-5, HC-6).....	8
I-26 over Hominy Creek (Section C: HC-3, HC-4; Section AC: HC-7)	9
I-40/I-240 Smith Mill Creek and Emma Branch Bridges (Section B: SMC-1, SMC-2, SMC-3, SMC-4, SMC-5, SMC-6, SMC-7, SMC-8, SMC-9, EB-1, EB-2, EB-3, EB-4).....	10
I-26/I-240 Bridges over the French Broad River (Section B: FBR-2, FBR-3, FBR-4)	10
DEMOLITION AND CONSTRUCTION ACTIVITIES AND METHODS.....	11
Causeways	11
Access Roads	14
Construction Lighting.....	14
Demolition of Existing Structures	16
Bridge Summary	16
HYDRAULICS.....	16
Analysis	17
Stormwater and Erosion Control.....	17
Deck Drainage	17
AVOIDANCE AND MINIMIZATION	18
RIVER USER SAFETY	18
Signage.	18
River Navigational Markers/Aids	22
Monitors/Flaggers.....	22
Working Over Water	22

Boat/Skiff and Ring Buoys 22

Spill Control 23

Flooding..... 23

RSP Review 23

Appendix 24

I-26 CONNECTOR PROJECT OVERVIEW

The I-26 Connector project is an interstate freeway project that would connect I-26 in southwestern Asheville to US 19-23-70 in northwest Asheville and have a total length of approximately 7 miles. The I-26 Connector would extend I-26 from I-40 to US 19-23-70 and would allow for the eventual designation of I-26 from Charleston, South Carolina, to Johnson City, Tennessee, once a remaining section from the north end of this project to Mars Hill, North Carolina, is completed. The I-26 Connector would upgrade and widen I-240 from I-40 to Patton Avenue and then cross the French Broad River as a new freeway to US 19-23-70 slightly south of the Broadway interchange.

The project is broken into four sections. The Selected Alternative for the I-26 Connector Project includes Section C – Alternative F-1, Section A – Widening Alternative, and Section B – Alternative 4-B. The 2026-2035 NCDOT STIP further divides Section A into three sub-sections: AA – East of SR 1224 (Monte Vista Road) to pavement joint west of SR 3412 (Sand Hill Road), AB – I-40 / US 19 / US 23 (Smokey Park Highway) interchanges, and AC – North of I-40 to SR 3548 (Haywood Road). Additionally, a portion of Section B that includes improvements to Riverside Drive from Hill Street to Broadway Street is identified as Section D.

The French Broad River, Hominy Creek, Emma Branch, and Smith Mill Creek are bridged by existing and proposed roadways and lie within an area occupied by four federally protected species: gray bat (*Myotis grisescens*), Appalachian elktoe (*Alasmidonta raveneliana*), northern long-eared bat (*Myotis septentrionalis*), and Indiana bat (*Myotis sodalis*); as well as a species proposed for federal listing, the tricolored bat (*Perimyotis subflavus*, PESU) and an At-Risk Species little brown bat (*Myotis lucifugus*). For the purposes of securing compliance with Section 7 of the Endangered Species Act and preparing a Biological Assessment (BA) for review by the US Fish and Wildlife Service (USFWS), the NCDOT evaluated the various constraints associated with construction of new bridges, the replacement of existing bridges, and the expansion of roadways and impervious surfaces within the I-2513 project. NCDOT has coordinated with the US Army Corps of Engineers (USACE), USFWS, the Federal Highway Administration (FHWA), NC Division of Water Resources (NCDWR), and the NC Wildlife Resources Commission (NCWRC) to gain input on the considerations and likely construction methods.

NCDOT has identified that the two existing bridges over the French Broad River carrying I-40 will likely be replaced, as will three bridges carrying I-40 over the French Broad River and four bridges carrying I-240 over Hominy Creek. Twelve new bridges carrying I-240, I-240 ramps, and I-26 will be constructed on new location. (Note: these bridges may be identified separately; however, may be a part of a larger structure crossing multiple water bodies). Preliminary designs were used to establish potential impacts in a “worst- case scenario” given the current designs at the time. Sections B&D have been let as a design-build project, and as such, the final designs differ from those previously provided as preliminary.

This document provides a combined update to the previous versions of the Strategic Communications Plan and the Bridge Construction and Demolition Plan, and was created to cover the entire I-2513 project though primarily focuses on the current design for I-2513 Sections B&D. The likely structure type, possible construction and demolition staging, and the additional challenges associated with construction and demolition as currently known for Sections A&C are provided. Information presented for Section C is based on the preliminary designs that were utilized during project development, but as additional constructability details develop this document will be revised, as appropriate.

Features of Section C - Alternative F-1 include:

- Maintaining the existing I-26/I-40/I-240 interchange configuration and adding a loop and a ramp to provide for the missing movements.
- Reconstruction of I-40/US 19/23/74A (Smoky Park Highway) interchange, except Ramp A utilizing existing configuration, but realigning ramps on the north of I-40.
- I-40/NC 191 (Brevard Road) interchange maintains existing configuration.
- Full access to NC 191 (Brevard Road) along I-40 eastbound and westbound for traffic coming to and from I-26 and I-240.

Features of Section A – I-240 Widening Alternative include:

- Construct Ramp A at US 19/23 (Smokey Park Highway).
- Improves I-40 between the I-26/I-40/I-240 interchange and US 19/23 (Smokey Park Highway).
- Reconstruct the I-26/I-240 and NC 191 (Brevard Road) interchange to a diamond interchange that eliminates I-26 eastbound/I-240 westbound exit to NC 191 (Brevard Road).
- Upgrades the existing I-26/I-240 and SR 3556 (Amboy Road) interchange to a full interchange with a conventional diamond configuration.
- Extend SR 3556 (Amboy Road) over I-26/I-240 and continue parallel with I-26/I-240 to the existing intersection of NC 191 (Brevard Road).

Features of Section B - Alternative 4-B include:

- Upgrades the existing I-26/I-240 and US 19-23 Business (Haywood Road) interchange to a tight urban diamond interchange (TUDI) configuration.
- Upgrades the existing I-240 interchange with US 19/23/74A (Patton Avenue) to accommodate the connection for the new location portion of I-26.
- Crosses over the Crowne Plaza Resort golf course.
- Creates three new crossings over the French Broad River, to the north of the existing Captain Jeff Bowen Bridges. Two bridges would carry I-240 traffic, with the third carrying I-26.
- Separates I-240 traffic from Patton Avenue traffic across the Captain Jeff Bowen Bridges and includes construction on I-240 east of the French Broad River.

Features of Section D – Riverside Drive

- Upgrades include one 11-foot lane in each direction, one five-foot bicycle lane in each direction, and a 10-foot multi-use path on the west side of the roadway.
- Construct a buffer to the bicycle lane and add a concrete sidewalk to the east side of Riverside Drive, between the US 19/23 southbound retaining wall.

The project is needed to address traffic capacity problems along the existing I-240 corridor (future I-26), across the Captain Jeff Bowen Bridges to US 19/23/70. Presently numerous areas do not meet interstate design standards and cannot be designated I-26 without being improved. The project would improve

traffic flow, address substandard roadway features, and provide an interstate roadway through West Asheville for the I-26 Corridor.

As part of STIP Project I-2513, the project creates three new crossings over the French Broad River, to the north of the existing Captain Jeff Bowen Bridges (Section B). Construction of the spans will include a “safe passage lane” for river users to use during construction. Construction activities that require work to be done from the top of the bridge, such as setting girders, are expected to occur at night.

GOALS OF THE STRATEGIC COMMUNICATIONS PLAN

- Implement a diversified communication and outreach strategy in coordination with the City of Asheville, Buncombe County, N.C. Department of Parks and Recreation, RiverLink and other stakeholders that will relay the purpose of the I-26 Connector project as an integral part of the project. It will help ensure that river users and businesses dependent on the river understand the river will be open during construction with an area of safe passage for river users.
- Identify stakeholders using or benefiting from the French Broad River and understand their unique needs and concerns regarding river use during construction/demolition of the I-26 Connector.
- Inform citizens of NCDOT’s efforts to avoid and minimize disruptions to the river during construction/demolition.
- Provide thorough, up-to-date information regarding project progress and milestones throughout the life of the project.
- Provide information regarding river conditions at the I-26 Connector and any events that may cause a closure (e.g. flooding, overhead construction).
- Provide safety messaging similar to Work Zone Safety campaigns during construction. Remind I-26 and I-240 motorists of the purpose, need and benefits of the project.
- Use various social media platforms to engage the community in two-way dialogue regarding the project’s impacts, benefits and progress.
- Encourage river users to “know before you go” with X, Facebook, TIMS, 511, etc.

Targeted Audiences

Targeted audiences may include, but are not limited to the following:

- | | |
|--|--|
| <ul style="list-style-type: none">• Motorists• Tourists• Medical Facilities• Property owners along the River• Biltmore Estate | <ul style="list-style-type: none">• Land of Sky Regional Council• NC Department of Parks and Recreation• NC Wildlife Resources Commission |
| <p><i>River users including:</i></p> <ul style="list-style-type: none">• Individual paddlers/ paddling groups• Paddling/tubing/fly fishing businesses• River outfitters | <p><i>Civic groups:</i></p> <ul style="list-style-type: none">• RiverLink• MountainTrue• Asheville Greenworks• Clean Water for NC• Trout Unlimited• Sierra Club – WNC Chapter• American Whitewater |
| <p><i>Government officials:</i></p> <ul style="list-style-type: none">• Asheville City Council• Buncombe County Commissioners• Buncombe County Parks and Recreation• I-26 Connector Working Group | |

Implementation Strategies and Tactics

- Develop a construction safety plan for river users that includes signage and river markers to alert river users to the safe passage lane.
- Identify specific stakeholders and partner with RiverLink in contacting the parties.
- Provide opportunities for small group meetings with identified stakeholders. The meetings will include a brief, targeted presentation tailored to the NCDOT identified concerns of the group and provide an opportunity for questions and answers.
- Update and maintain the comprehensive project website, <https://www.ncdot.gov/projects/asheville-i-26-connector>
- Issue news releases as needed regarding project schedule, progress, impacts, and milestones.
- Provided a station regarding bridge construction at the Design Public Meeting held in November 2018. Include river businesses and property owners along the river in the mailing list.
- Place notification signs at public input locations upstream of the I-26 Connector through Buncombe County. Coordinate with NCWRC (<https://www.ncwildlife.gov/boating/boating-access-areas>) and NCDPR to update their information.
- Provide notification information to identified stakeholders.
- Continue to coordinate with RiverLink. A meeting was held with the group in November, 2018 which helped identify communication channels. Ongoing coordination may take place to update river users of the river status.
- Coordinate strategic social media campaigns.
- Use an established X feed for the project to keep the public informed of project progress, construction activities and project-related events. The postings will consist of specific information about the project, information about alternative routes, photos and videos of crews working efficiently, and any good news about the project. This effort will also include updates to river users regarding current and anticipated conditions on the rivers.
- Collaborate with project field personnel to document the progress of the project by posting photos to the department's Instagram, Pinterest and Flickr accounts. Links to the photos will be posted on X, Facebook and used in news releases.
- It is the responsibility of the NCDOT Division 13 project engineer office in charge of the project to update the Transportation Information Management System of all parts of the project that will affect motorists, such as a lane or road closures, temporary detours, etc. as they come up on the project schedule. Once posted on the NCDOT website in the Traveler Information section (where it remains until that closure or detour is over), and automatically generates a feed for the NCDOT X account that covers this area of the state, as well as for our 511 travel phone system.
- The project engineer office also has the responsibility of informing the NCDOT public relations officer of updates. The communications officer and the project engineer office decide whether they justify a news release. If it isn't something that would be sent as a full news release, the communications office or project engineer can send a brief email note to local recipients or post to social media each of these updates.
- It is also possible to arrange for the project engineer to send a weekly briefing to the public relations officer and local recipients — if project parameters are going to change week to week — with a look ahead of what is planned the following week, so the information can be distributed on a more local level than we are capable of doing through our traditional news release distribution system.
- All these steps are flexible and can be adjusted to the requirements of the construction.

Communication Channels

- Television stations — WLOS (ABC), WYFF (NBC), WMYA, WSPA (CBS), WYCW (CW), WHNS (FOX), WETP (PBS), WUNE (PBS)
- FM Radio Stations — Asheville: WCQS, WLFA, WOXL, WKSF, WTMT, WRES, WMYI, WSFM, WPVM, and WMIT ; Biltmore Forest: WOXL
- Newspapers — Asheville Citizen-Times, Mountain Xpress, and Biltmore Beacon
- Websites, blogs
- City government offices
- Libraries
- Local businesses
- West Asheville Business Association
- I-26 Connector Working Group

Required Resources

- Public Relations Officer employed by NCDOT, managed by the Communications Office, and located in the Division 13 Office in Asheville
- Community-based, on-the-ground local marketing and communications specialist
- Responsible for development, coordination and integration of communications including local social media efforts and traditional media marketing
- Partners with local media to promote awareness and ensure project understanding

Timeline for Implementation

- Fall 2018-Initiate Stakeholder Outreach
- The project team will continue to work with RiverLink, as done (or currently planned) on the I-4400/I-4700 project, to coordinate with the users. At the meeting the project team will give a short presentation summarizing the project and the safety plan for river users during the construction of bridges over the French Broad River.
- Hold Small Group Stakeholder Meetings: After identifying prominent businesses and other stakeholders that rely on access to the river, the project team will plan up to two meetings to gather input from stakeholders about the use of the river and how construction around the river will affect their operations. The project team plans to coordinate with stakeholder groups as well as locally distribute invitations to the meetings. The project team attended a meeting with RiverLink (11/14/2018) to identify and discuss the river user methods and common practices. The purpose of this meeting was to gather input from the public and other river users.

November 2018-Held Design Public Hearing and included station to address French Broad River bridge construction concerns.

February 2020-Final Environmental Impact Statement approved May 2023-Record of Decision approved.

2024 – Design-Build Let

Now through project construction-Regularly update stakeholders and public regarding progress, conditions of the river, etc.

STRUCTURES

I-40 over the French Broad River (Section C: FBR-1)

EXISTING

The existing two bridges carry I-40 utilizing eight spans. The bridges are approximately 575 feet long each and have a clear space between them of approximately 35 feet. Each structure has spread footings. The river is approximately 235 feet wide at this location. It is estimated that five bents are located in the waterway.

PROPOSED

The project is still in the preliminary design phase, therefore detailed bridge drawings are not currently available. The bridge pair is expected to be replaced in place by one bridge using three bents, each within the water. Property to the east is owned by the Biltmore Estate and is not available for use during construction. Each side of the river, beneath the bridge, has a greenway trail. Access to the site can be made by moving goods within the right-of-way of the existing roadway. Property to the west includes a power line right-of-way that may be utilized also. Access will occur parallel to the existing roadway, within the right-of-way. Areas adjacent to the bridges will be cleared to the right-of-way limits; however, this area would need to be cleared as part of typical construction process for this project.

For the purposes of establishing a “worst-case scenario” of impacts at this location, a 25x25-foot spread footing has been used for estimates because it covers more square footage of the river bottom. Using the basic estimate for a “worst case” spread footings may cover as much as 6,600 square feet in the river. Drilled shafts may also be used, but the construction method will ultimately be decided during final design. An uneven span arrangement will allow for avoidance of existing foundations, thereby limiting the river disturbance.

The current bridge foundations exist within the waterway of the French Broad River. During construction, the existing piers will be either removed or cut below water level. To accomplish this, causeways may need to be constructed that, for short durations, cover more than 50 percent of the river. It is estimated that causeways will be used to demolish the existing bridges and to build the new substructure, totaling up to 36,600 square feet coverage (temporary fill) of the riverbed. Further discussion of causeways can be found later in this document.

I-40 over Hominy Creek (Section C: HC-1, HC-2, HC-5, HC-6)

EXISTING

I-40 crosses Hominy Creek in two locations: over Upper Hominy Creek and over Lower Hominy Creek. The existing pair of bridges carrying I-40 eastbound and I-40 westbound over Lower Hominy Creek (HC-5) includes five spans each and are approximately 357 and 345 feet long, respectively. The existing bridges have two bents adjacent to the water’s edge currently. The structures have spread footings and the creek is approximately 50 feet wide at this location. The I-40 bridges crossing Upper Hominy Creek are adjacent to the I-26/I-40 interchange. The pair have 3 spans each. The I-40 eastbound bridge (HC-1) is 180 feet long while the westbound bridge (HC-2) is approximately 170 feet long. They currently each have three bents each, none of which are in the water, and are expected to be replaced in kind. The creek is approximately 50 feet wide at this location also.

PROPOSED

The project is still in the preliminary design phase, so detailed bridge drawings are not currently available. The existing bridges carrying I-40 across Lower Hominy Creek (HC-5) will be replaced by a single bridge in the same location. It is estimated that the bridge will have a total of five spans and one to two bents will be located at the water's edge. Causeways for demolition are anticipated, covering 825 square feet of creek bed, but none are anticipated for construction. No more than 50 percent of the width of the river will be blocked by the causeways at any point during demolition or construction.

The I-40 ramp to NC 191 will be constructed on new location (HC-6). No bents are expected to be located in the water at this location; the bridge is expected to span the creek and no causeways will be needed.

Access to the site may be available via the existing right-of-way. Additional access may be necessary via Hominy Creek Road; however this serves as a main access for the Buncombe County Transfer Station and will likely require an agreement with the county so as not to block access. Parallel access roads may need to be constructed adjacent to the roadway on the west bank, however the area where they may be constructed will be cleared during construction.

The pair of Upper Hominy Creek bridges carrying I-40 eastbound (HC-1) and I-40 (HC-2) westbound east of the I-40/I-26/I-240 interchange are also called for replacement. No new bents are expected in the water. No causeways are anticipated for demolition or construction of these bridges. Access to the site is available via the NCDOT right-of-way on both sides of the creek, and phased construction is expected.

I-26 over Hominy Creek (Section C: HC-3, HC-4; Section AC: HC-7)

EXISTING

I-26 crosses Upper Hominy Creek just west of Bear Creek Road (HC-3, HC-4), then it crosses Lower Hominy Creek near Brevard Road (HC-7). The existing pair of bridges over Upper Hominy Creek have 3 spans each. The bridge carrying the eastbound lanes is 170 feet long and the bridge carrying the westbound lanes is 200 feet long. The bridge pair over Lower Hominy Creek utilize 3 spans with continuous girders. They are 300 feet (eastbound) and 330 feet long (westbound). The creek is approximately 50 feet wide at both of these locations along Hominy Creek. The bridges spanning Lower Hominy Creek also span another, potentially historic, bridge. The historic bridge currently functions as a footbridge for greenway traffic and is closed to vehicles. This bridge has a single bent in the waterway of Hominy Creek and is in disrepair.

PROPOSED

The bridges over Upper Hominy Creek are expected to be replaced in kind, but widened to accommodate 3 lanes of traffic each. No bents are expected to be placed in the water at this location, and no causeways are anticipated for construction. The bents can currently be reached from land, so causeways needed during demolition would be minimal, if even needed at all. The bridges can be accessed via existing right-of-way in this vicinity.

The bridges over Lower Hominy Creek (HC-7) will be replaced with bridge structure that span the creek resulting in no bents in the stream. No causeways will be required for construction or demolition for these structures.

I-40/I-240 Smith Mill Creek and Emma Branch Bridges (Section B: SMC-1, SMC-2, SMC-3, SMC-4, SMC-5, SMC-6, SMC-7, SMC-8, SMC-9, EB-1, EB-2, EB-3, EB-4)

EXISTING

No bridges exist in the project construction area along Smith Mill Creek and Emma Branch. One existing culvert, carrying Resort Drive, will be removed as part of the project.

PROPOSED

Three bridges and associated ramps are proposed to cross the French Broad River north of existing I-26 (described below). In addition to crossing the French Broad River, the proposed structure will cross Smith Mill Creek and Emma Branch at 13 locations. No bridge bents are expected to be constructed within the waterway of Smith Mill Creek or other waterways. No causeways are anticipated for the Smith Mill Creek and Emma Branch bridges.

Access to the bridge construction site will be obtained by purchasing right-of-way. Construction activities associated with the structures are expected to occur wholly within the right-of-way. SR 1338 (Emma Road) crosses the alignment and may be needed for construction traffic. Special considerations may need to be taken to accommodate residences along Emma Road. Additionally, the alignment crosses the Norfolk Southern rail corridor and coordination with the rail will be necessary.

I-26/I-240 Bridges over the French Broad River (Section B: FBR-2, FBR-3, FBR-4)

EXISTING

There are no existing bridges carrying vehicle traffic over the French Broad River downstream of the Captain Jeff Bowen Bridges within the project study area. The project includes new location bridges to carry I-26 and I-240 over the French Broad River. A railroad bridge crosses the French Broad River upstream of the proposed new bridge crossing.

PROPOSED

Three bridges are proposed to cross the French Broad River north of existing I-26. The Captain Jeff Bowen Bridges that carry existing I-26/I-240/Patton Avenue over the river are to remain in place. The three new bridges include one bridge to carry I-26 (FBR-3), and two flyover bridges to carry I-240 eastbound (FBR-2) and westbound (FBR-4). The I-26 bridge is expected to be wide enough to carry four lanes of traffic in each direction, though only two through-lanes will be utilized. Additional space is necessary for shoulders and auxiliary lanes. Analyzing a “worst-case scenario” the footing size estimates for these bridges in the French Broad River are 380 square feet (FBR-2), 143 square feet (FBR-3), and 300 square feet (FBR-4), for a total of 13,125 square feet.

The two flyover bridges carrying I-240 eastbound and westbound are expected to have similar span lengths to the I-26 bridges. These two bridges will each be smaller than the I-26 bridge. They are expected to be approximately two lanes wide each.

These three bridges will require causeways during construction. Access to the crossing site is limited due to the railroad bridge to the west of the river.

Limited access may be available via Emma Road from the west, and by way of right-of-way from the south. “Top-down” construction will be considered as a viable construction method to reduce the access

requirements needed, but the decision on the method used will be made during final design development. Construction activities originating from the east bank of the river will utilize acquired right-of-way for staging and construction. Construction time in the river shall be reduced as much as possible, and causeways will remain in place for as short of a period as practicable.

Detailed construction methods and timelines/phasing are being developed during the final design process.

DEMOLITION AND CONSTRUCTION ACTIVITIES AND METHODS

At the time of this writing, Smith Mill Creek (Section B) has been proposed to be included on the 2022 303(d) list for North Carolina. Design Standards for Sensitive Waters (DSSW) will be used within one mile of the French Broad River and Environmentally Sensitive Areas will apply within 50 feet of the river to mitigate the amount of sediment and erosion that enters the French Broad River Environmentally Sensitive Areas (ESAs) require a 50-foot buffer. USFWS and USACE will have the opportunity to review the design of the SEC measures prior to construction. The NCDOT Design-Build Team will provide USFWS with the sediment and erosion control plan and allow 15 days for review upon acknowledgement of receipt of notice. A revegetation and monitoring plan shall be developed for the bridges once the project is complete.

Causeways

Due to the length of the bridges and the location of the existing and proposed interior bents, causeways will be required to provide construction access for some of the bridges. For the purposes of this report, causeway sizes are estimated based on the width of the bridge and the location of the bridge bents. The size, width, and length of the causeways will vary depending on the construction activities taking place. Causeways will be removed from the river when possible. With the exception of Section B French Broad River crossings discussed below, causeways will not restrict more than 50% of the river or stream flow of the other crossings of the French Broad River and Hominy Creek unless agreed upon by USACE and USFWS.

SPECIFIC DETAIL FOR SECTION B

Temporary causeways are needed to install work trestles in order to facilitate the construction of bridges (FBR-2, FBR-3, FBR-4) crossing the French Broad River. Interior bents span the river including 46 concrete drilled shafts supporting 14 interior bents for 5 bridges. The construction access constraints limit the ability to construct these elements from the river banks. Additionally, the river topography is constrained due to elevation on the west bank of the river along with two railroad tracks. All construction access will be from the eastern river bank and centered around a single transverse crossing with upstream and downstream causeway fingers. In order to construct the temporary work trestle needed for the new bridges, the flow of the French Broad River will be restricted to less than 50% during a period of approximately three weeks.

Causeways will be constructed along each side of the river in stages mirroring the construction of the bridge. The design of the causeways has been refined to maximize the free flow area of the river at all times. The phasing and construction sequencing will always maintain the central flow channel through the work bridge providing five (5) 39 foot spans with at least 8 feet of vertical clearance from the water's surface. At the location of the main transverse crossing, the French Broad River is approximately 320 feet wide. The work bridge spans a minimum of 160 feet and is connected on each end by a rock causeway on the eastern bank as the primary causeway entrance, and to the west bank as the causeway

terminus accessing fingers.

Causeway size will be reduced to the extent practicable during each phase of the construction, and the contractor will be required to use clean stone for the causeway material to minimize additional sediment input to the river. There are currently ten phases proposed in consideration of the various construction activities required. Each activity will optimize the causeway as efficiently as possible to minimize the durations of each phase.

The table below summarizes the anticipated sizes of the causeways in the river needed to perform demolition and construction of the bridges. Additionally, updated data for Section B & AC is included along with an explanation for the change. Figures illustrating causeway phasing for Section B are provided in the appendix.

TABLE 1. BRIDGE CONSTRUCTION CROSSINGS AND CAUSEWAY SIZE ESTIMATES

Crossing ID	Existing/ New Bridge	Section	Road Carried	Waterbody	Causeway 1 Size ^a	Causeway 2 Size ^a	Causeway 3 Size ^a	Demolition Causeway Size ^a	Total Causeway Area (ft ²) ^a	Updated Construction Causeway Area (ft ²)	Updated Demolition Causeway Size	Updated Combined Total Causeway Area (ft ²)	Reason For Change
HC-1	Existing	C	I-40 EB	Hominy Creek	0	0	0	N/A	0	0	N/A	0	--
HC-2	Existing	C	I-40 WB	Hominy Creek	0	0	0	N/A	0	0	N/A	0	--
HC-3	Existing	C	I-26 NB/I-240NB	Hominy Creek	0	0	0	N/A	0	0	N/A	0	--
HC-4	Existing	C	I-26 SB/I-240 SB	Hominy Creek	0	0	0	N/A	0	0	N/A	0	--
HC-5	Existing	C	I-40	Hominy Creek	0	0	0	55X15	825	0	55X15	825	--
FBR-1	Existing	C	I-40	French Broad River	200X90	100X90	0	60X160	36,600	27,000	60X160	36,600	--
HC-6	New	C	I-40 RAMP TO 191	Hominy Creek	0	0	0	N/A	0	0	N/A	0	--
HC-7	Existing	AC	I-26/I-240 NB AND SB	Hominy Creek	0	0	0	35X35	1,225	0	N/A	0	Reduced due to further design
NONE	Existing	C	NC 191	Hominy Creek	0	0	0	N/A	0	0	N/A	0	--
SMC-1	New	B	RESORT DRIVE	Smith Mill Creek	0	0	0	N/A	0	0	N/A	0	--
SMC-2	New	B	I-240 RAMPS	Smith Mill Creek	0	0	0	N/A	0	0	N/A	0	--
SMC-3	New	B	I-26	Smith Mill Creek	0	0	0	N/A	0	0	N/A	0	--
SMC-4	New	B	I-240 RAMPS	Smith Mill Creek	0	0	0	N/A	0	0	N/A	0	--
SMC-5	New	B	I-26	Smith Mill Creek	0	0	0	N/A	0	0	N/A	0	--
SMC-6	New	B	I-240/I-26 RAMPS	Smith Mill Creek	0	0	0	N/A	0	0	N/A	0	--
SMC-7	New	B	I-240 RAMPS	Smith Mill Creek	0	0	0	N/A	0	0	N/A	0	--
SMC-8	New	B	I-240 RAMPS	Smith Mill Creek	0	0	0	N/A	0	0	N/A	0	--
SMC-9	New	B	I-240 RAMPS	Smith Mill Creek	0	0	0	N/A	0	0	N/A	0	--
EB-1	New	B	I-240 RAMPS	Emma Branch	0	0	0	N/A	0	0	N/A	0	--
EB-2	New	B	I-26	Emma Branch	0	0	0	N/A	0	0	N/A	0	--
EB-3	New	B	I-240/I-26 RAMPS	Emma Branch	0	0	0	N/A	0	0	N/A	0	--
EB-4	New	B	I-240 RAMPS	Emma Branch	0	0	0	N/A	0	0	N/A	0	--
FBR-2	New	B	I-240 EB	French Broad River	350X130	260X60	150X80	N/A	73,100	136,125	N/A	136,125	Reduced due to further design
FBR-3	New	B	I-26 EB/WB	French Broad River	300X90	350X130	0	N/A	72,500		N/A		Reduced due to further design
FBR-4	New	B	I-240 WB	French Broad River	100X80	490X90	0	N/A	52,100		N/A		Reduced due to further design
TOTALS									236,350 ^a	163,125		173,550	

^a Causeway size is an estimated length times width in feet based on the 2018 preliminary designs and coordination with NCDOT Division 13 on 12/18/2018.

Access Roads

Generally, construction locations will be reached using existing roadways where possible and temporary access roads may be constructed to physically restricted locations. Access roads will be constructed where no existing right-of-way is available for use. The construction of the flyover bridges over the French Broad River will likely require the use of access roads due to vertical height restrictions near the site, and the constricted access due to the railroad line on the west bank of the French Broad River. Additional bridge-specific access road considerations are discussed above.

Construction Lighting

As part of its evaluation, NCDOT also took into consideration the time of day when construction and demolition may take place. It was determined that some work would likely need to be completed at night. These activities may include setting girders, drilling shafts, concrete pours, deck concrete pours, beam setting, construction material(s) stockpiling, and traffic shifts. The amount and type of lighting for all activities will be minimized to the extent possible. All lights will be directed towards the work area and will not shine out over any waterways and no nighttime lighting directed away from the work area will be permitted within 50 feet of the French Broad River, Hominy Creek, Emma Branch, or Smith Mill Creek between March 15 and November 15. Below is a list of some construction operations that may occur at night, as well as the likelihood and/or circumstances under which the operation may occur. Lighting considerations for each night operation are also included.

- Causeway construction – Will occur – Access road and causeway construction and removal may take place at night throughout the life of the project. This will allow the contractor to utilize the lower traffic volume to access the site. Installing the access roads and causeways at night allows longer-term operations to be constructed during daylight hours. Due to the easier site access the contractor may be able to construct the access roads and causeways more quickly. Lighting for this operation will likely consist of one to two light plants that will be used to directly light up the construction area. Care will be taken to not shine light directly out into the river or into the adjacent forest.
- Drilled shafts – Possible – This is dependent upon construction schedule, contract, and availability of the concrete plant.
 - Lighting for this operation will be at water level. Lights on the drill rig will be used, and one light plant may be used if needed. Only the active work area (where the hole is currently being drilled) will be lit. No lights will be shining down from the bridge deck during this operation.
- Concrete pours during hot weather – Will occur – Night pours of concrete are required during hot weather to achieve the proper cure. These pours may include elements such as bent caps, end bents, and barrier rail wall.
 - The use of lights for this operation will be minimal, because these will be small-area and short-duration (six hours or less) pours. Lights will generally be set up on the causeway, shining upward at the bridge member being poured. Small lights, such as headlamps, will be used on the structure. There will be pump truck and concrete trucks with headlights either on the bridge deck or on the causeway.
- Deck concrete pours from May to November (summer) – Will occur – Deck concrete pours are generally larger, more complex, and more time consuming than other types of concrete pours.
 - Of all potential night time operations, this will be the operation with the most lighting. The majority of lighting will be at bridge deck level, with lights shining toward the bridge rather than down toward the river. Any lighting that shines down toward the river or adjacent woods will be indirect and minimal.

- Headlights on concrete delivery trucks will also be used.
- Beam setting – Will occur – Setting beams at night is required due to the volume of daytime traffic and the need to maintain traffic.
 - Cranes sitting on either of the causeways or on the new or existing bridges will be used to set the beams for the new bridges. There will be a light plant on the structure where the truck with the beams is parked, either on the new or existing structure. These lights will be shining toward the truck. There will also be lights shining toward each structure where the beam ends sit.
 - It is difficult to determine if the lights will be placed on the causeway shining up toward the structure, or on the bridge deck shining down. This decision will need to be made on site at the time of the activity.
- Traffic shifts – Will occur – Traffic shifts will be necessary to construct the new bridges on existing location. These shifts will occur at night and be of short duration, and will likely require minimal lighting on the bridge. All other activities with traffic shifts will occur beyond the end bents of the bridge and will not be part of the work on the bridge or in the area of the river.

There are other operations that may occur at night; however, this would be evaluated after phasing and final design. The previously listed operations are not operations that occur on a regular schedule.

Demolition of Existing Structures

With the exception of Section B (discussed below), demolition of the existing bridges, including superstructure and interior bents, will occur in conjunction with the construction of the new bridges. The phases will be staggered to allow for traffic to be maintained during construction. It is anticipated that for existing bridges, traffic will be rerouted to accommodate construction.

Removal of the existing bridges shall be performed in a manner that prevents debris from falling into the water. The Contractor shall remove the bridges and submit plans for demolition in accordance with Article 402-2 of the Standard Specifications. However, if bridge material inadvertently ends up in the river, it will be removed.

The USFWS, USACE, NCDWR, and NCWRC will be notified two weeks prior to the start of bridge demolition, so they may have a representative on-site during that stage of the project if they choose to.

SPECIFIC DETAIL FOR SECTION B

Demolition of existing structures is anticipated at three locations for I-2513 Sections B. The Haywood Road interchange bridge over I-26, Patton Avenue (Bowen Bridges) partial demolition, and existing Patton Avenue bridge over I-26/I-240. The Haywood Road bridge demolition occurs after the construction of the new replacement structure on an adjacent alignment. The contractor will utilize standard construction and safety practices for removals. Deck removal will likely occur at night under lane closures in order to minimize falling debris on the traveling public on I-26 below. Substructure demolition will occur in protected construction areas and will not impact the traveling public. Work on the existing bridge of Patton Avenue over I-26 will occur after the traffic switch of I-26 mainline traffic onto the new I-26 bridge over French Broad River. Demolition will be performed in stages to facilitate traffic shifts on Patton Avenue. There will be no traffic below the structure. Partial demolition on the existing Patton Avenue bridges over the French Broad River (Bowen Bridges) includes removal of the pedestrian structure on the north side of the bridge, and removal and replacement of the existing exterior barriers on the north and south bridges. Demolition will occur over the French Broad River as well as Riverside Road and Emma Road below. All work will be performed from the deck of the existing bridge or with the use of overhanging equipment for access. Falsework will be utilized below the removals as a working platform and physical barrier to prevent debris from falling below.

Bridge Summary

The total area anticipated to be covered by causeways in all Waters of the US for new bridge construction and bridge replacements is 163,125 square feet, all of which will be in the French Broad River. The footing totals for the French Broad River resulting from I-2513 Sections B & D is 532 square feet.

HYDRAULICS

A review of flood map data of the study area and bridge vicinities indicates there are several residential and commercial structures that are currently located in the 100-year floodplain. During the construction of the proposed bridges, where causeways are used, they will create a temporary constriction in the flow of the river that will cause the upstream water surface elevation (WSE) to rise. The extent of the rise will be determined once the causeway phasing and bridge construction phasing is determined during final design. If the final design minimizes the number of bridge bents located in the waterways, the potential for debris to become lodged and the potential for a WSE rise as a result is lessened. Dangers to river users will also be lessened. Strides shall be made to minimize the number of bents in streams.

Analysis

Hydraulic analysis of the French Broad River will be performed in conjunction with final design. Impacts will be modeled using the USACE Hydrologic Engineering Center's River Analysis System (HEC-RAS) and the Bureau of Reclamation SRH-2D modeling software may be used for other I-2513 Sections. Per the USACE website, HEC-RAS "allows the user to perform one-dimensional steady flow, one-dimensional steady flow, and one- and two-dimensional unsteady flow calculations, sediment transport/mobile bed calculations, and water temperature/water quality modeling." Per the SRH-2D manual, "Sedimentation and River Hydraulics-Two-Dimensions (SRH-2D), is a two-dimensional (2D), depth-averaged, hydraulic and sediment transport mobile-bed model for simulating shallow waterways." For this project, models are under development to guide final design. The proposed designs and construction phasing will be input into the models and storm return periods will be run that will represent conditions during flood events along the French Broad River. Using the Flood Risk Information System (FRIS) database provided by the North Carolina Emergency Management (NCEM) and the Flood Inundation Mapping Alert Network (FIMAN) data, impacts to properties can be estimated, if present.

SPECIFIC DETAIL FOR SECTION B & D

Hydraulic analysis of the French Broad River will be performed in conjunction with final design. Impacts will be modeled using the USACE HEC-RAS for I-2513 B & D. The Design Build team is currently working on the analysis which when completed will be provided to NCDOT for review before ultimately being submitted to NC Floodplain Management for approval. This process will take approximately two-three months before it is finalized. Information pertaining to the FEMA compliance will be provided to the USACE and USFWS once available.

Stormwater and Erosion Control

Access roads, if needed, will use Design Standards for Sensitive Waters (DSSW) to mitigate the amount of sediment and erosion control material that enters the French Broad River, Smith Mill Creek, or Hominy Creek. The NCDOT Design-Build Team will provide USFWS with the sediment and erosion control plan and allow 15 days for review upon acknowledgement of receipt of notice. Roadway and bridge construction will be in accordance with appropriate permitting and stormwater plans.

Sediment and Erosion control plans are required to be in place prior to any ground disturbance. When needed, combinations of erosion control measures will be used to ensure protective measures are being implemented.

NCDOT is working with the US Geological Survey to install/monitor gages along the French Broad River to collect continuous streamflow, precipitation, and water-quality (temperature, conductance, and turbidity) data. The baseline information can be used to compare to water quality in the river during construction.

Deck Drainage

NCDOT makes every attempt to eliminate direct deck drainage into water bodies whenever federally protected aquatic species or sensitive habitats are present. It is anticipated that direct drainage into the French Broad River can be avoided by conveying runoff via the deck over water. Overland discharge via deck drains will provide treatment through vegetative conveyance or other stormwater BMPs.

AVOIDANCE AND MINIMIZATION

Project commitments have been developed through project development, design, and permitting. Due to the number of commitments, they have been consolidated into one spreadsheet that among other information, provides: the commitment, the source of the commitment, section applicability, responsible unit, and status. The project commitments spreadsheet will be made available for access.

RIVER USER SAFETY

Because the French Broad River, Hominy Creek, and Smith Mill Creek are regularly used for recreation, they cannot be closed for the life of construction. NCDOT shall commit to providing a safe passage lane for users of the French Broad River, Hominy Creek, and Smith Mill Creek. To do so, NCDOT shall employ safety measures, including catchment devices on overhead structures to prevent material from falling on river users. In addition, floating navigational aids will be used to guide river users to the safe passage lane and away from the causeways/construction zone. For new bridges, most work is expected to take place during the day. NCDOT will work with river users, businesses, and recreational river and civic groups to insure public notification of the temporary closures.

The safe passage lane for river users will be located in a portion of the river away from the causeways for the majority of the life of the project. NCDOT shall use a floating navigational aid to guide river users to the safe passage lane.

NCDOT shall commit to including a containment system on the overhead structures to prevent material from falling on river or greenway users, or in the water. NCDOT shall place steady-state red lights that are solar-powered on the causeway to alert river users to its location. Generators will not be used to provide power. These lights will be atop permanent structures, such as a pole, on each causeway for the duration of the project. The contractor will be responsible for maintaining these lights at all times during construction, replacing them as necessary.

It is expected that there will be times when the river, creeks or greenways must be closed for the safety of recreational users due to the type of work being done (e.g. setting girders, removal of bent caps). These closures are not expected to last more than two days and are expected to occur predominantly at night. Care will be taken to not close the waterways or greenways during known peak user times, particularly the Memorial Day, Fourth of July, and Labor Day weekends. During major storm events, portage will be provided while the work trestle is in place.

SPECIFIC DETAIL FOR SECTION B

Signage

Signage for Sections B will be installed and maintained by Archer Wright Joint Venture (AWJV), both upstream and downstream of the I-26 and I-240 Bridges to alert river users to construction. These signs will note that the last public pull out is at Craven Street Boating Access Area, located 0.58 mile upstream of the of the bridge.

These signs will be placed at the following locations; all are public with the exception of the privately owned launches marked with an asterisk (*). Additional private locations may be utilized with permission of the owner.

French Broad River Warning Sign Locations:

- Pearson Bridge River Access, 704 NC-251, Asheville, NC
- Craven Street Bridge Boating Access Area, 192 Riverside Dr, Asheville, NC
- River Arts District Steps, 119 Riverside Dr, Asheville, NC
- Jean Webb Park, 86 Riverside Dr, Asheville, NC
- Amboy Riverfront Park, 180 Amboy Rd, Asheville, NC
- Hominy Creek River Park, 220 Hominy Creek Rd, Asheville, NC
- Bent Creek River Park, 1610 Brevard Rd, Asheville, NC
- Corcoran Paige River Park, 9 Pinner Rd, Arden, NC
- Glen Bridge River Park, 77 Pinner Rd, Arden, NC
- Westfeldt Park, 83 Old Fanning Bridge Rd, Mills River NC
- Mills River Park, 124 Town Center Dr, Mills River, NC
- Horse Shoe River Access Park, 5437 Brevard Rd, Horse Shoe, NC
- Blantyre Park, 120 Grove Bridge Rd, Hendersonville, NC
- Penrose Boat Ramp, 500 Crab Creek Rd, Penrose, NC
- Pisgah Forest River Access, 3520 Wilson Rd, Pisgah Forest, NC
- Hap Simpson Park, 666 Greenville Hwy, Brevard, NC
- *Hannah Ford Campground-Headwaters Outfitters, 1017 Green Rd, Brevard, NC
- Island Ford River Access, 2753 Island Ford Rd, Brevard, NC
- Lyons Mountain River Access, Lyons Mountain Rd, Brevard, NC
- Champion Park River Access, Old Turnpike Rd, Rosman, NC
- *Headwaters Outfitters, 25 Parkway Rd, Rosman, NC

River Warning Signs to be utilized for the information of FBR users (at a minimum) are illustrated as follows:



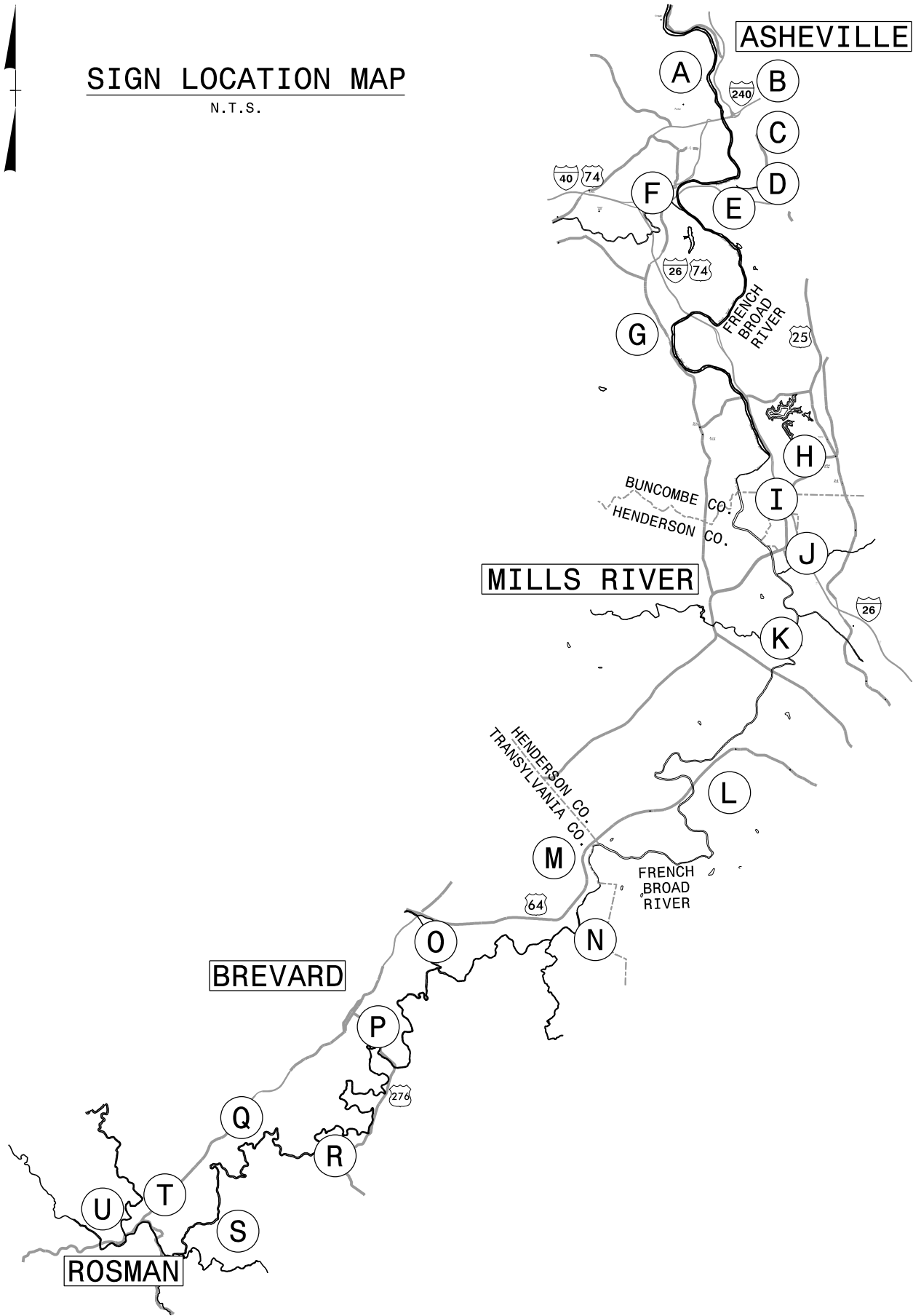
The sign example shown above is for illustrative purposes and will be revised to display I-2513 B&D information.

- Additional *Warning* or *Danger Do-Not-Enter* signage will be installed by AWJV on the causeway to warn river users away from potential construction related hazards and to prevent river users from using the causeway as a stopping point.

- Should work activities require closure of the river in the causeway during construction activities (e.g., girder placement, demolition activities, etc.), additional floating signage (similar to the below illustration) will be installed by AWJV to warn users of hazards and direct to nearest pull-out.



Refer to the NCDOT I-2513 B&D French Broad River Warning Sign Locations figure on the following page.



LOCATION

- A
- B
- C
- D
- E
- F
- G
- H
- I
- J
- K
- L
- M
- N
- O
- P
- Q
- R
- S
- T
- U

FACILITY

Pearson Bridge
River Access

Craven Street Bridge
Boating Access Area

River Arts District Steps

Jean Webb Park

Amboy Riverfront Park

Hominy Creek River Park

Bent Creek River Park

Corcoran Paige River Park

Glen Bridge River Park

Westfeldt Park

Mills River Park

Horse Shoe River Access Park

Blantyre Park

Penrose Boat Ramp

Pisgah Forest River Access

Hap Simpson Park

Hannah Ford Campground -
Headwaters Outfitters

Island Ford River Access

Lyons Mountain River Access

Champion Park River Access

Headwaters Outfitters

ADDRESS

704 NC-251
Asheville, NC

192 Riverside Dr
Asheville, NC

119 Riverside Dr
Asheville, NC

86 Riverside Dr
Asheville, NC

180 Amboy Rd
Asheville, NC

220 Hominy Creek Rd
Asheville, NC

1610 Brevard Rd
Asheville, NC

9 Pinner Rd
Arden, NC

77 Pinner Rd
Arden, NC

83 Old Fanning Bridge Rd
Mills River, NC

124 Town Center Dr
Mills River, NC

5437 Brevard Rd
Horse Shoe, NC

120 Grove Bridge Rd
Hendersonville, NC

500 Crab Creek Rd
Penrose, NC

3520 Wilson Rd
Pisgah Forest, NC

666 Greenville Hwy
Brevard, NC

1017 Green Rd
Brevard, NC

2753 Island Ford Rd
Brevard, NC

Lyons Mountain Rd
Brevard, NC

Old Turnpike Rd
Rosman, NC

25 Parkway Rd
Rosman, NC

LAT / LONG

35.60888° N
82.57812° W

35.58928° N
82.57107° W

35.58794° N
82.57008° W

35.58638° N
82.56818° W

35.56730° N
82.56913° W

35.55470° N
82.59097° W

35.50140° N
82.59312° W

35.45479° N
82.54695° W

35.45065° N
82.55566° W

35.42207° N
82.54171° W

35.38785° N
82.54944° W

35.32892° N
82.57509° W

35.29911° N
82.62229° W

35.26957° N
82.63670° W

35.25134° N
82.69944° W

35.21814° N
82.71989° W

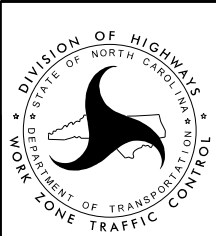
35.18490° N
82.77418° W

35.17811° N
82.75524° W

35.14940° N
82.79954° W

35.14588° N
82.82642° W

35.14361° N
82.83920° W



River Navigational Markers/Aids

- Steady-state “red” solar powered navigational lights erected by NCDOT on the causeway to alert river users shall be maintained in good working order during construction activities by AWJV.
- Navigation rope buoys will be utilized by AWJV in addition to signage prescribed above to mark and direct river traffic around hazardous construction work areas/activities.
- Rope buoys will be completely filled with urethane foam or other materials to prevent potential failure (i.e., sinking) which meet or exceed *United States Coast Guard* requirements.
- Rope buoys will be effectively secured against accidental or intentional displacement.
- Placement of rope buoys shall be pre-approved by AWJV Construction Management and the AWJV Health, Safety, and Environmental (HSE) department.

Monitors/Flaggers

- AWJV will provide trained monitors/flaggers to control river user access to hazardous construction work area/activities as needed.
- One or more monitors/flaggers will be staged upstream as needed to stop river use at limited times when working over the river via communications of handheld radios.
- AWJV monitors/flaggers shall be trained in Swiftwater/Flood Rescue (per NFPA 1670 or equivalent) to assist those river users that may be in distress when navigating the FBR through the causeway.
 - **Note:** At a minimum, trained monitors/flaggers shall participate in two emergency drills annually involving the rescue of a distress boater(s). The emergency drills shall be planned and executed by the AWJV HSE department.

Working Over Water

- AWJV shall erect a catchment device on the overhead structure from South of Old River Road to the opposite side of the FBR to prevent material from falling on river users, equestrians, bicyclists, or in the water.
- The catchment device shall be cleaned of debris and inspected by the responsible AWJV Construction Management on a daily/shift basis prior to the initiation of any work activity that day/shift. Any deficient conditions shall be brought to the immediate attention of the AWJV Construction Manager for repairs or replacement. Daily inspections shall be documented on the applicable Safety Task Assignment (STA). All Fall Protection will meet the criteria of the AWJV Site Safety Plan.

Boat/Skiff and Ring Buoys

- AWJV will provide a boat/skiff for emergency rescue operations, equipped with paddle or oars, four (4) adult and four (4) child life preservers, and a reach extension device.
 - **Note:** When utilized, the boat/skiff shall be manned by a minimum of two AWJV trained boater operators.
- If warranted by strong current conditions, the boat/skiff will be outfitted with motor.
- A safety line may be connected between the boat/skiff and a structural member capable of maintaining the position of the boat/skiff.

- Under all conditions, the boat/skiff must be located such that it is available for immediate use if an emergency arises. It will be kept secured and all pertinent personnel will be able to access as necessary. This will be discussed / implemented during morning meetings and all personnel will be privy to immediate needs during working operations
- Ring buoys (four total) will be strategically located on each side of the river both upstream and downstream of the causeway during construction activities. Each ring buoy shall be equipped at least 90-feet (27.4 m) of rescue line (and throw bag).
- Prior to use each day/shift, both the rescue boat/skiff and ring buoys will receive a visual daily inspection by the assigned personnel to ensure all rescue equipment is in good working condition. All deficiencies shall be brought to the attention of the AWJV HSE department. Inspections shall be documented on the associated STA.
- Both the rescue boat/skiff and ring buoys will receive a documented weekly inspection by the AWJV HSE department to ensure all rescue is in good working condition. Deficient items will be immediately taken out of service and repaired or replaced.

Spill Control

- Spill containment kits will be procured and strategically placed by AWJV where potential spill hazards into the FBR exist, i.e., cranes, heavy equipment, drill rigs, etc.
- Kits will be of sufficient size and type for the hazard being mitigated/cleaned up.
- Documented monthly inspections shall be conducted by the AWJV HSE department.
- All unplanned and/or uncontrolled spills of hazardous materials into the FBR shall be immediately reported to the AWJV Project Management Team, AWJV HSE, and NCDOT.
- Spill response personnel shall be appropriately trained by AWJV.

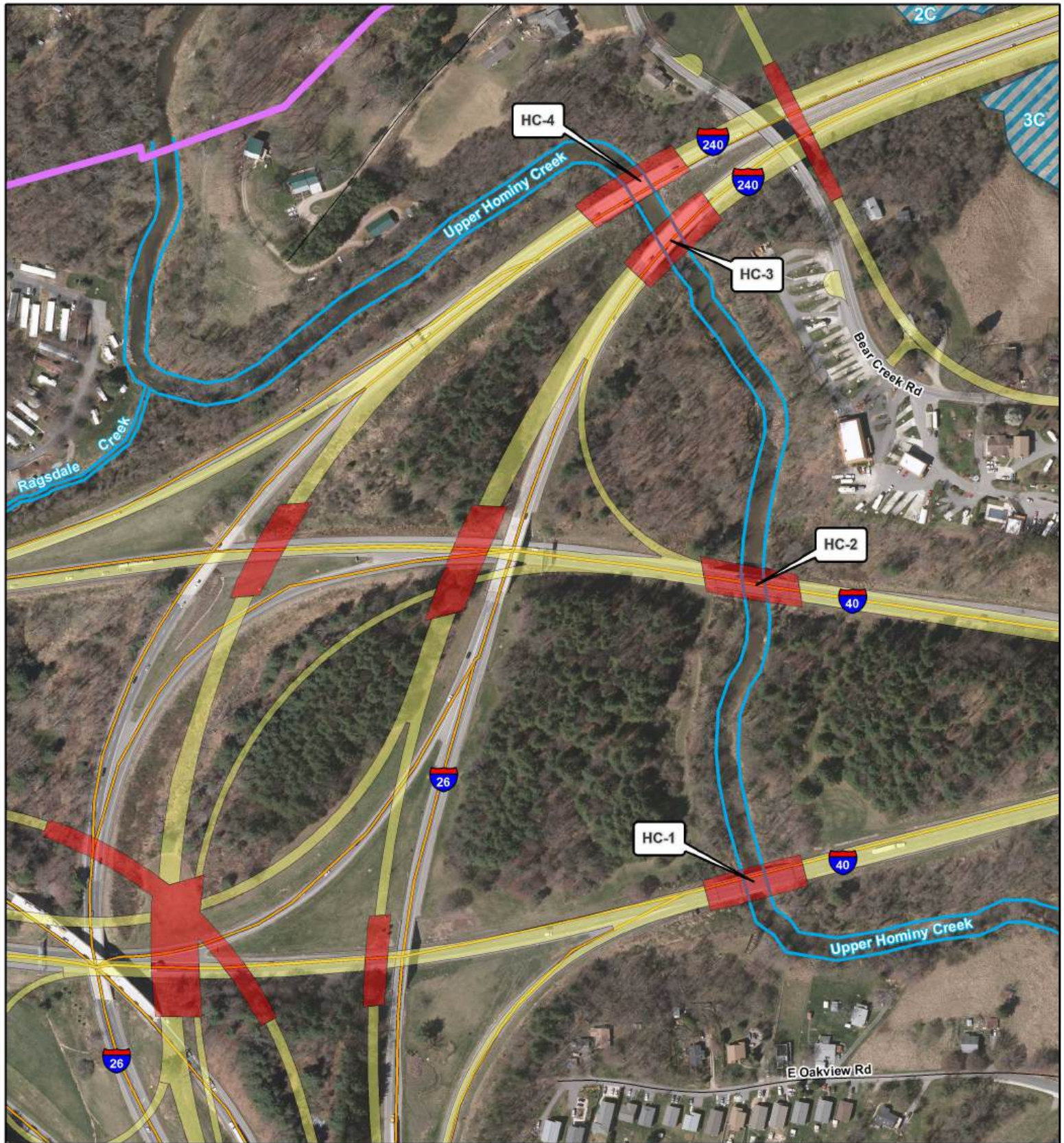
Flooding

- Any equipment on the causeways will be removed any time the water level is expected to rise to a point where the equipment could be flooded or during periods of long-term inactivity (two or more consecutive weeks). The only exception to this measure is that the drill rig and crane may be left in place for periods of inactivity; however, they must also be removed if the water level is expected to rise to a point where the drill rig and crane could be flooded.
- Once the water has returned to normal levels, an inspection of the causeway and surrounding areas shall be performed by AWJV Project Management, Construction Management, and HSE for new hazards as a result of the flooding. All new hazards shall be mitigated and/or controlled before resuming construction activities.

RSP Review

- The RSP shall be reviewed (at a minimum) annually and revised accordingly by the AWJV Project Management Team and HSE department for effectiveness in both process development and implementation. The review shall be documented and ensure that all deficient conditions and opportunities for improvement are identified and addressed.

Appendix



**NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION**

I-26 Asheville Connector
TIP Project I-2513
Buncombe County, NC

Legend

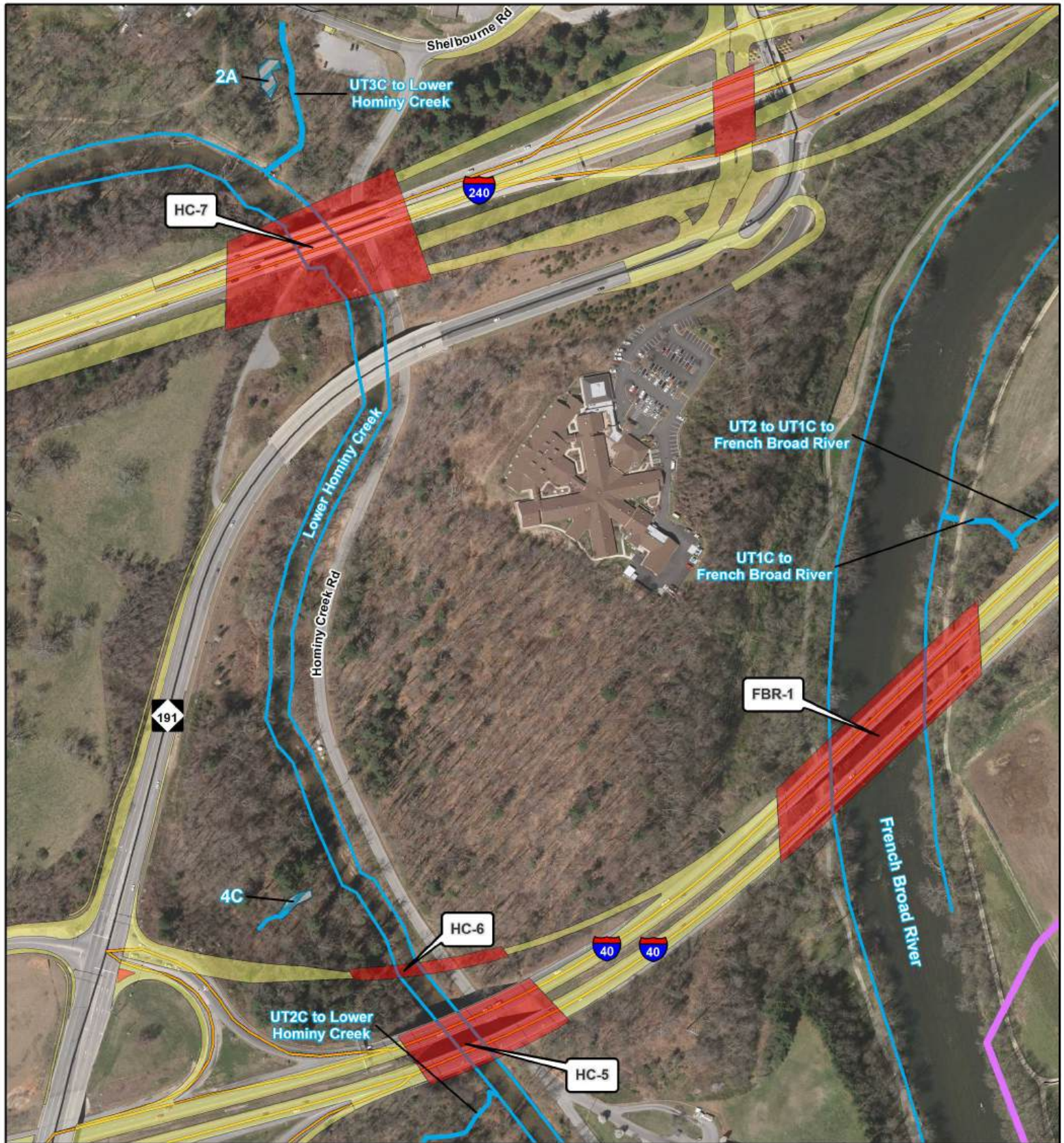
- | | |
|--------------------|-------------------|
| Action Area | Delineated Stream |
| Crossing | Interstate |
| Proposed Bridge | US Route |
| Proposed Roadway | NC Route |
| Delineated Wetland | Major Road |
| | Local Road |



0 150 300 600
Feet
1 in = 300 ft

**Figure 1A
Crossing Locations**

Source: NC OneMap, CALYX Engineers and Consultants
Map Date: 2/20/2019



**NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION**

I-26 Asheville Connector
TIP Project I-2513
Buncombe County, NC

Legend

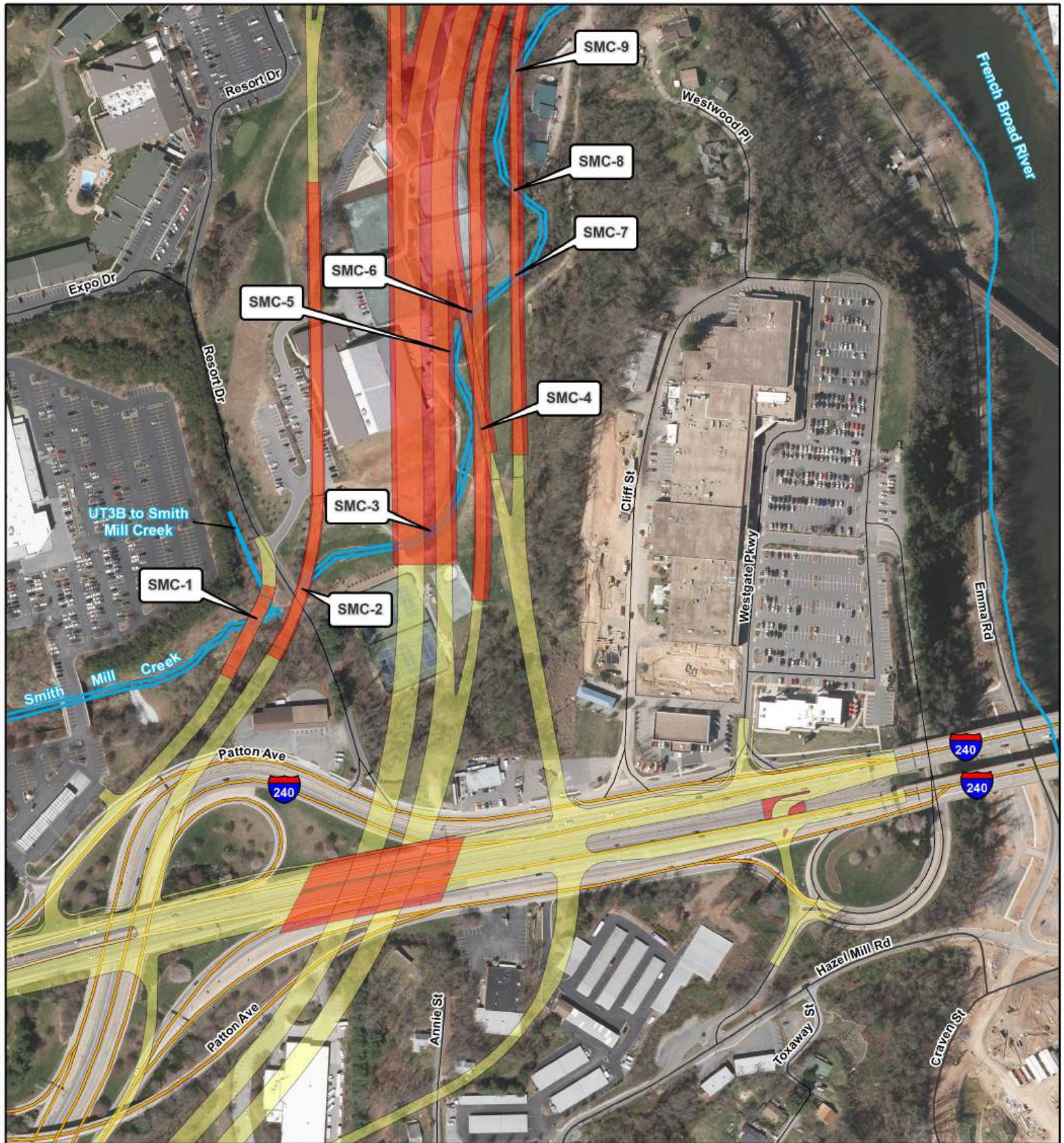
- | | |
|--|---|
|  Action Area |  Delineated Stream |
|  Crossing |  Interstate |
|  Proposed Bridge |  US Route |
|  Proposed Roadway |  NC Route |
|  Delineated Wetland |  Major Road |
| |  Local Road |



0 150 300 600
Feet
1 in = 300 ft

**Figure 1B
Crossing Locations**

Source: NC OneMap, CALYX Engineers and Consultants
Map Date: 2/20/2019



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

I-26 Asheville Connector
TIP Project I-2513
Buncombe County, NC

Legend



Action Area



Crossing



Proposed Bridge



Proposed Roadway



Delineated Wetland



Delineated Stream



Interstate



US Route



NC Route



Major Road



Local Road

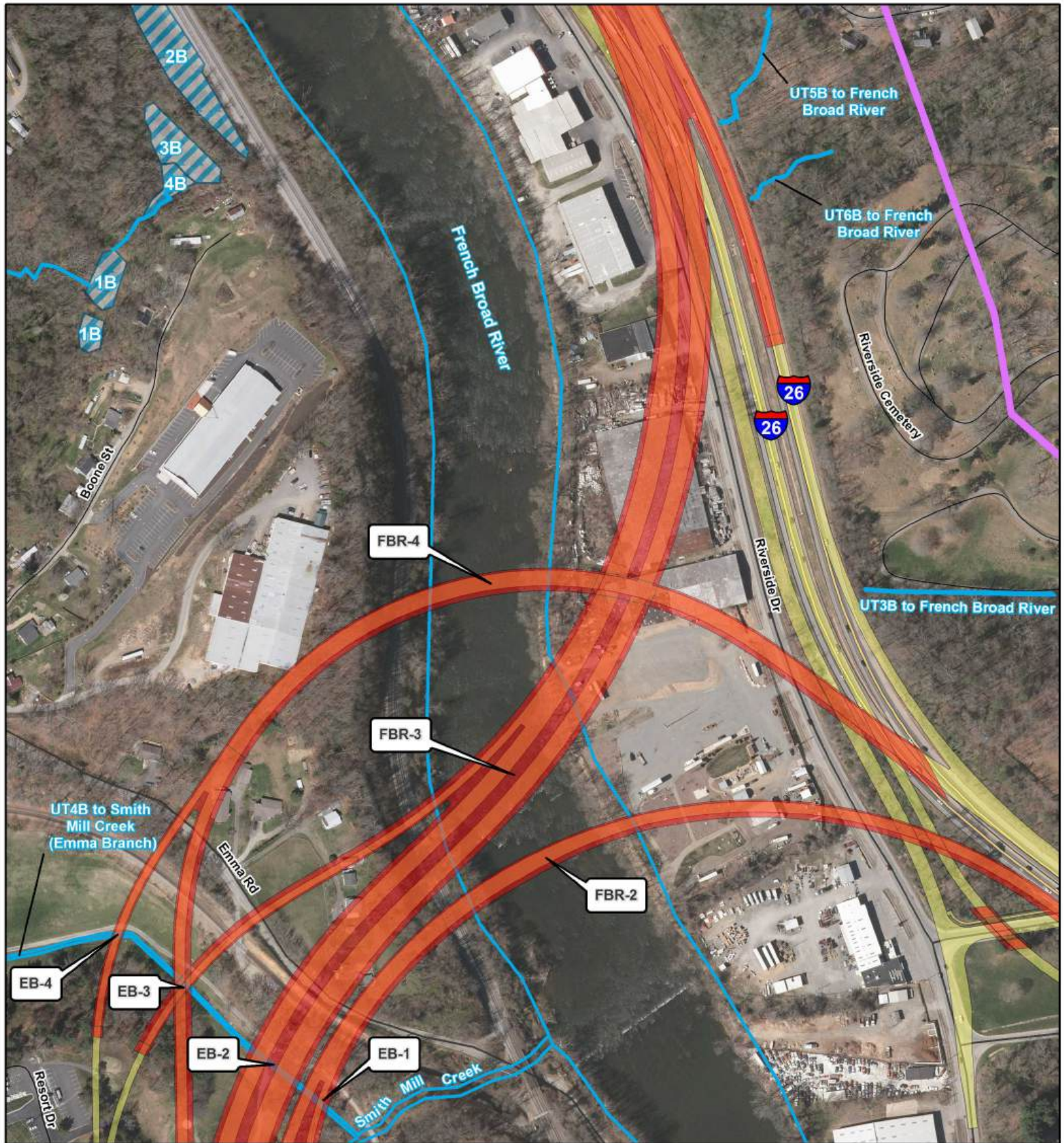


0 150 300 600
Feet

1 in = 300 ft

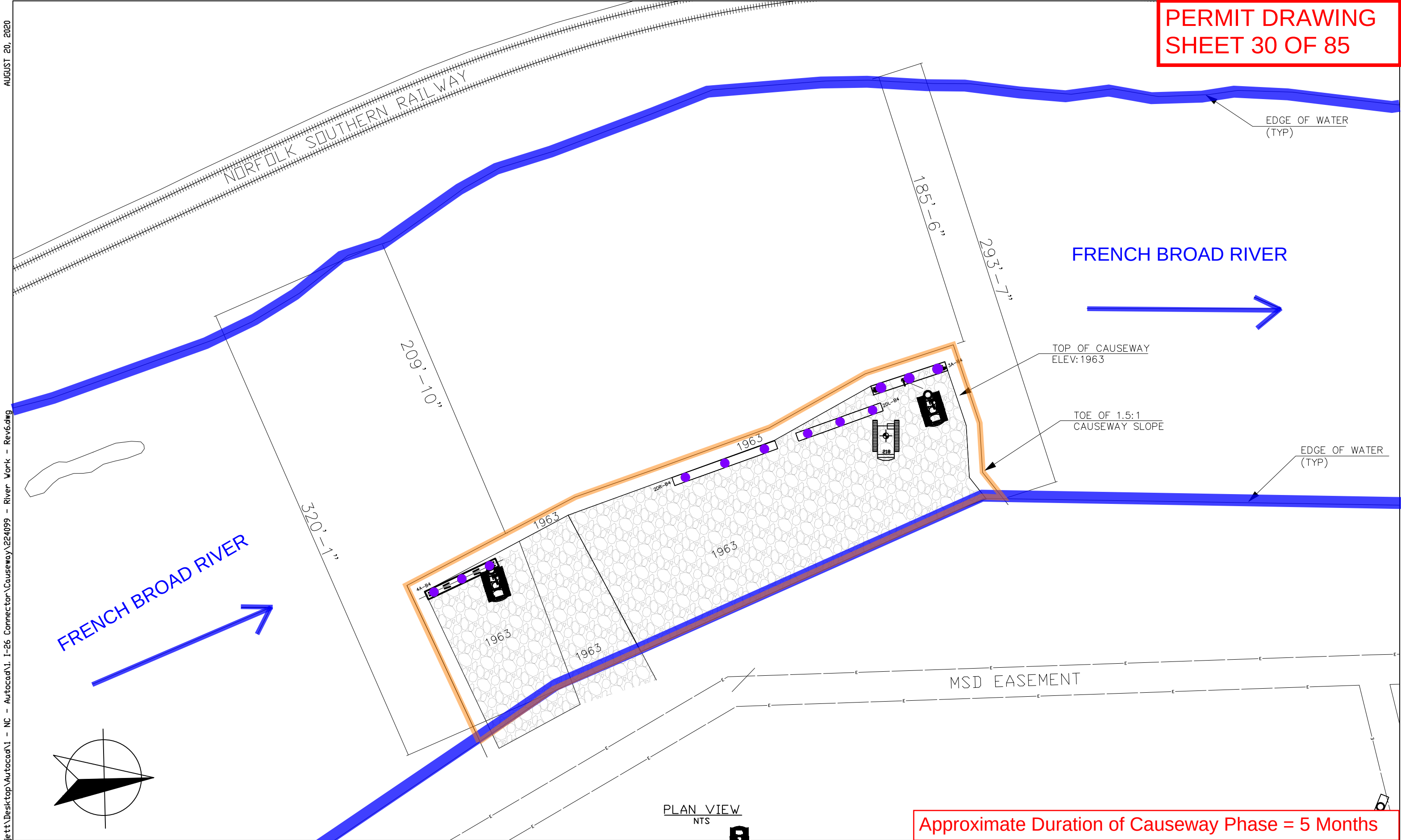
Figure 1C
Crossing Locations

Source: NC OneMap, CALYX Engineers and Consultants
Map Date: 2/20/2019



AUGUST 20, 2020

C:\Users\cody.jett\Desktop\Autocad\1 - NC - Autocad\1. I-26 Connector\Causeway\224099 - River Work - Rev6.dwg



FRENCH BROAD RIVER

FRENCH BROAD RIVER

MSD EASEMENT

PLAN VIEW
NTS

Approximate Duration of Causeway Phase = 5 Months

ISSUE		REVISIONS			SCALE		NTS		CAUSEWAY - P1A		ARCHER-WRIGHT JV		NC DEPARTMENT OF TRANSPORTATION	
		-	-	-	DRAWN		WCJ				554 RIVERSIDE DRIVE		ASHEVILLE I-26 CONNECTOR	
					CHECKED		JTH				ASHEVILLE, NC 28801			
					DATE									
					OWNER		NCDOT							
					GEN.CONTR.		ARCHER-WRIGHT JV							
													DWG NO: 2 OF 7	
													REV: 0	



C:\Users\jody\	ISSUE			REVISIONS			SCALE	NTS	CAUSEWAY - P1B		ARCHER-WRIGHT JV 554 RIVERSIDE DRIVE ASHEVILLE, NC 28801		NC DEPARTMENT OF TRANSPORTATION ASHEVILLE I-26 CONNECTOR	
	-	-	-	DRAWN	WCJ									
				CHECKED	JTH									
				DATE										
				OWNER	NCDOT									
				GEN. CONTR.	ARCHER-WRIGHT JV									
DWG NO: 1 OF 7													REV: 0	

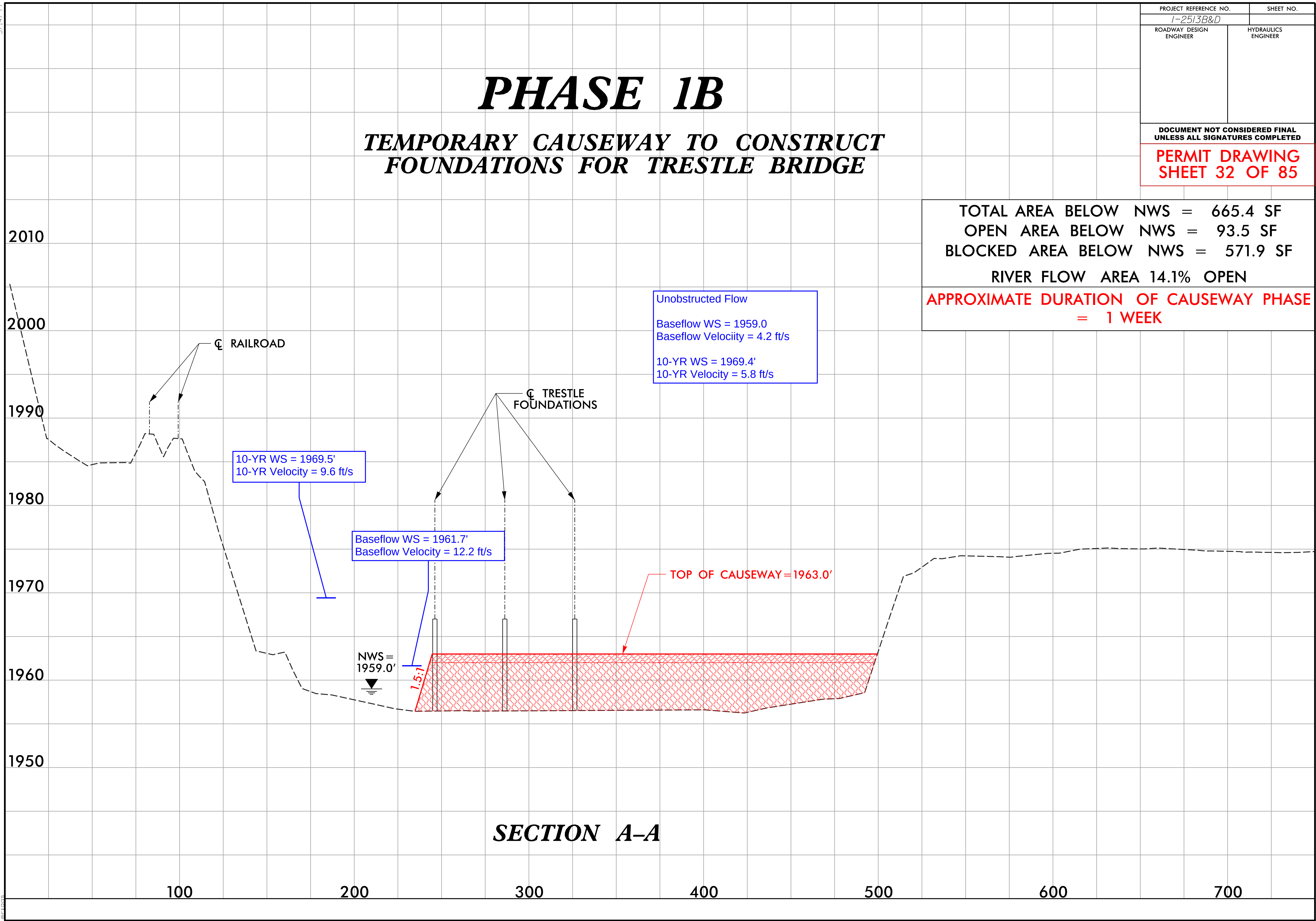
5/14/99

PROJECT REFERENCE NO.		SHEET NO.
I-25/3B&D		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
PERMIT DRAWING SHEET 32 OF 85		

PHASE 1B
TEMPORARY CAUSEWAY TO CONSTRUCT
FOUNDATIONS FOR TRESTLE BRIDGE

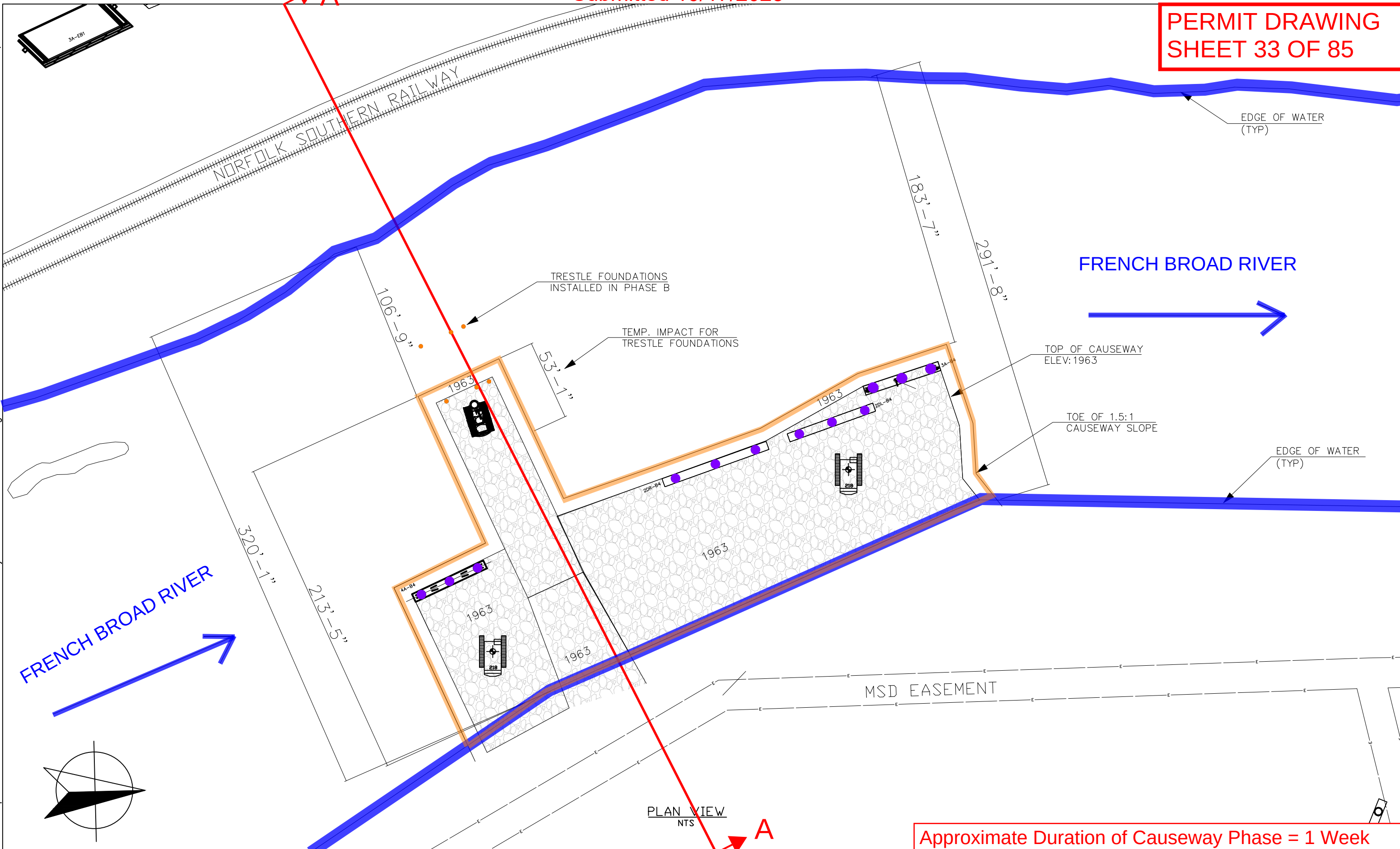
TOTAL AREA BELOW NWS = 665.4 SF
OPEN AREA BELOW NWS = 93.5 SF
BLOCKED AREA BELOW NWS = 571.9 SF
RIVER FLOW AREA 14.1% OPEN
APPROXIMATE DURATION OF CAUSEWAY PHASE
= 1 WEEK

10/9/2025
00:26:00
C:\Users\king\OneDrive\Documents\10-25\1-25\3B&D_hyd_4C_Causeway.XSL.dgn
8/10/2025



SECTION A-A

AUGUST 20, 2020
C:\Users\cody.jett\Desktop\Autocad\1 - NC - Autocad\1. I-26 Connector\Causeway\224099 - River Work - Rev6.dwg



Approximate Duration of Causeway Phase = 1 Week

ISSUE		REVISIONS			SCALE DRAWN NTS CHECKED WCJ DATE JTH OWNER NCDOT GEN.CONTR. ARCHER-WRIGHT JV		CAUSEWAY - P1C		 ARCHER-WRIGHT JV 554 RIVERSIDE DRIVE ASHEVILLE, NC 28801		 NC DEPARTMENT OF TRANSPORTATION ASHEVILLE I-26 CONNECTOR	
		-	-	-							DWG NO: 1 OF 7	REV: 0

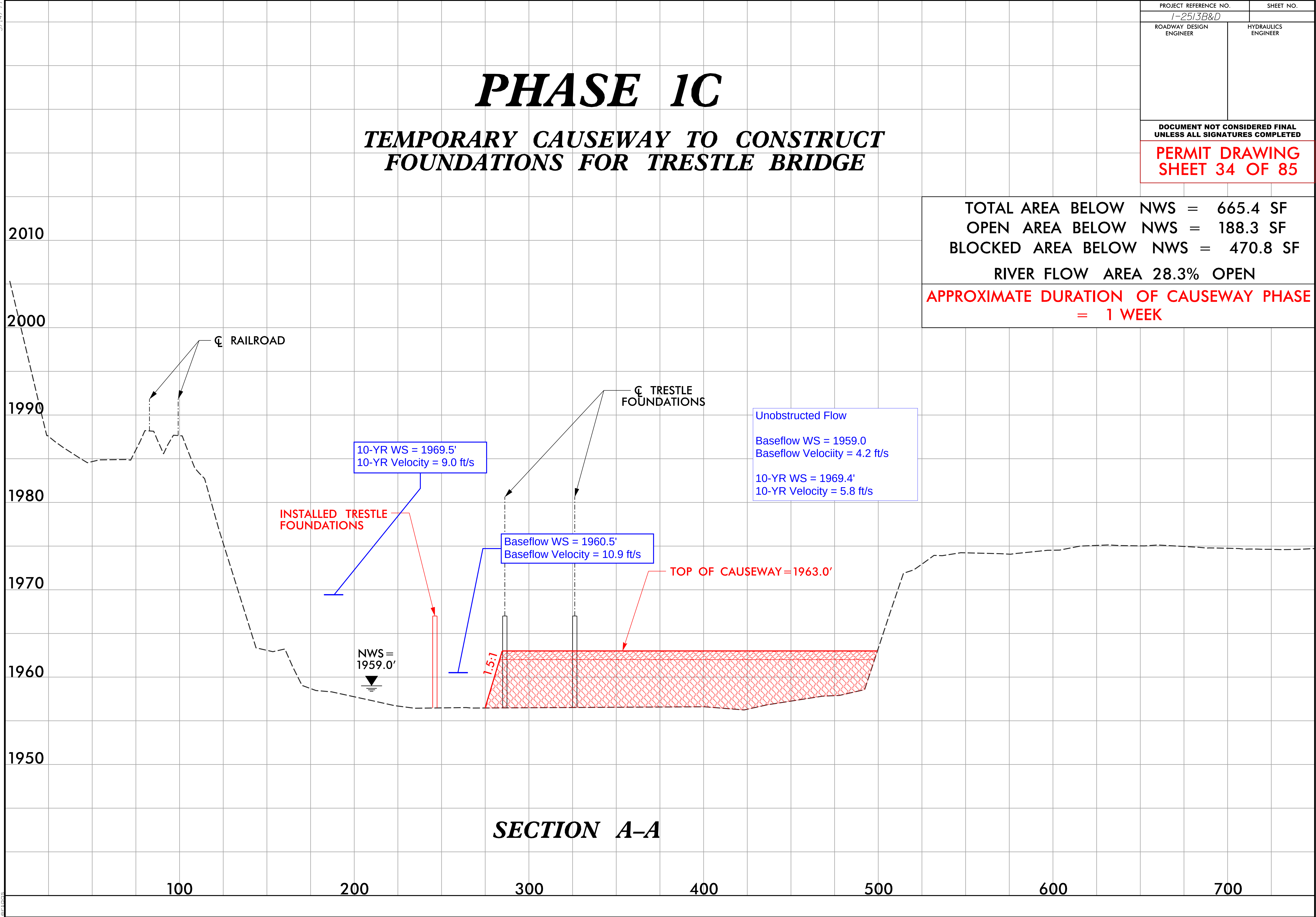
5/14/99

PROJECT REFERENCE NO.		SHEET NO.
I-25/3B&D		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
PERMIT DRAWING SHEET 34 OF 85		

PHASE 1C
TEMPORARY CAUSEWAY TO CONSTRUCT
FOUNDATIONS FOR TRESTLE BRIDGE

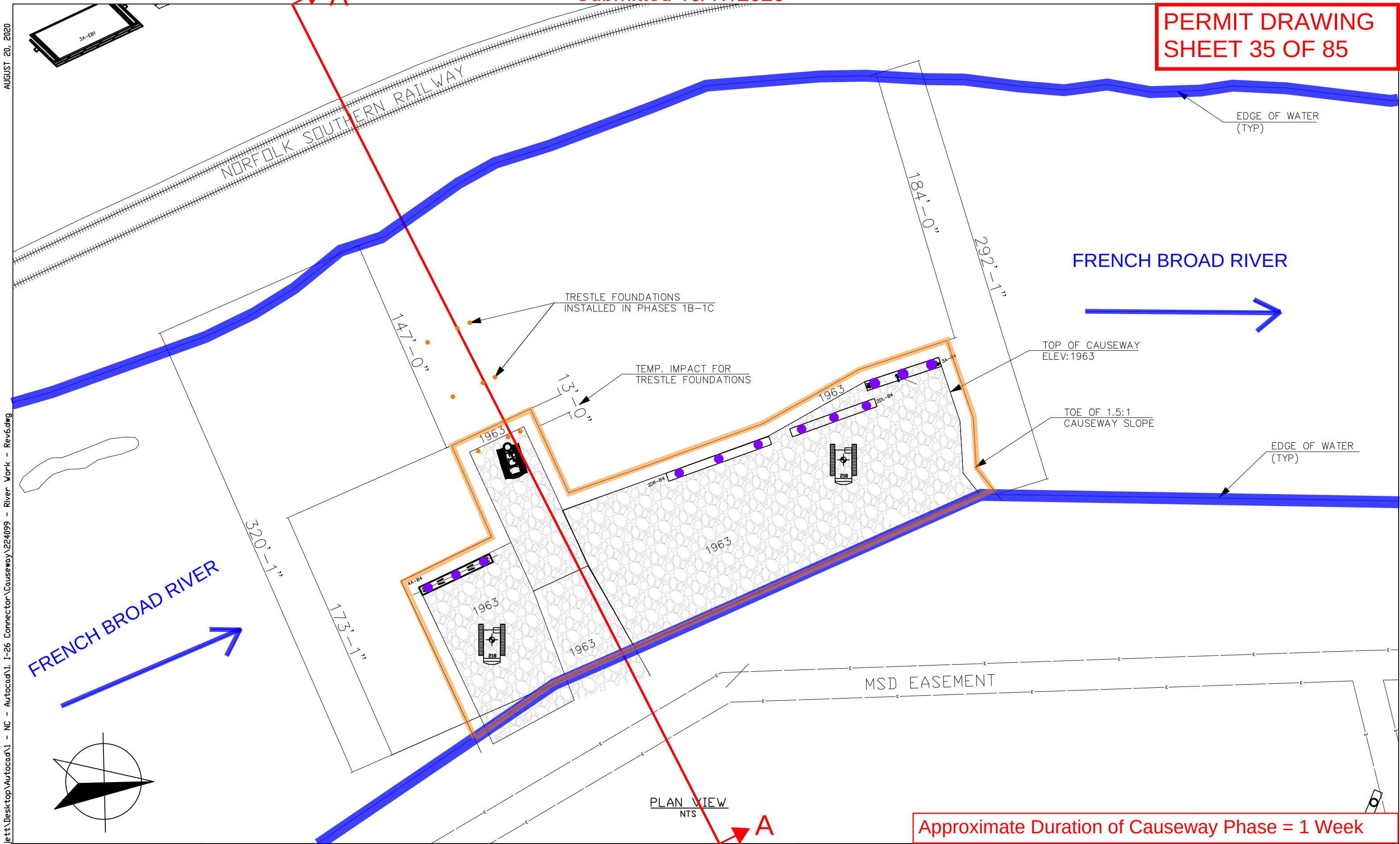
TOTAL AREA BELOW NWS = 665.4 SF
OPEN AREA BELOW NWS = 188.3 SF
BLOCKED AREA BELOW NWS = 470.8 SF
RIVER FLOW AREA 28.3% OPEN
APPROXIMATE DURATION OF CAUSEWAY PHASE
= 1 WEEK

10/9/2025
00:26:04
C:\Users\king\OneDrive\Documents\10-25\1-25\3B&D_hyd_4C_Causeway.XSL.dgn
8/10/2025



AUGUST 20, 2020

C:\Users\cody.jett\Desktop\Autocad\1 - NC - Autocad\1. I-26 Connector\Causeway\224099 - River Work - Rev6.dwg



FRENCH BROAD RIVER

FRENCH BROAD RIVER

Approximate Duration of Causeway Phase = 1 Week

ISSUE		REVISIONS			SCALE		NTS		CAUSEWAY - P1D		ARCHER-WRIGHT JV		NC DEPARTMENT OF TRANSPORTATION	
		-	-	-	DRAWN		WCJ				554 RIVERSIDE DRIVE		ASHEVILLE I-26 CONNECTOR	
					CHECKED		JTH				ASHEVILLE, NC 28801		REV: 0	
					DATE									
					OWNER		NCDOT							
					GEN.CONTR.		ARCHER-WRIGHT JV							

5/14/99

PROJECT REFERENCE NO.		SHEET NO.
1-2513B&D		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
PERMIT DRAWING SHEET 36 OF 85		

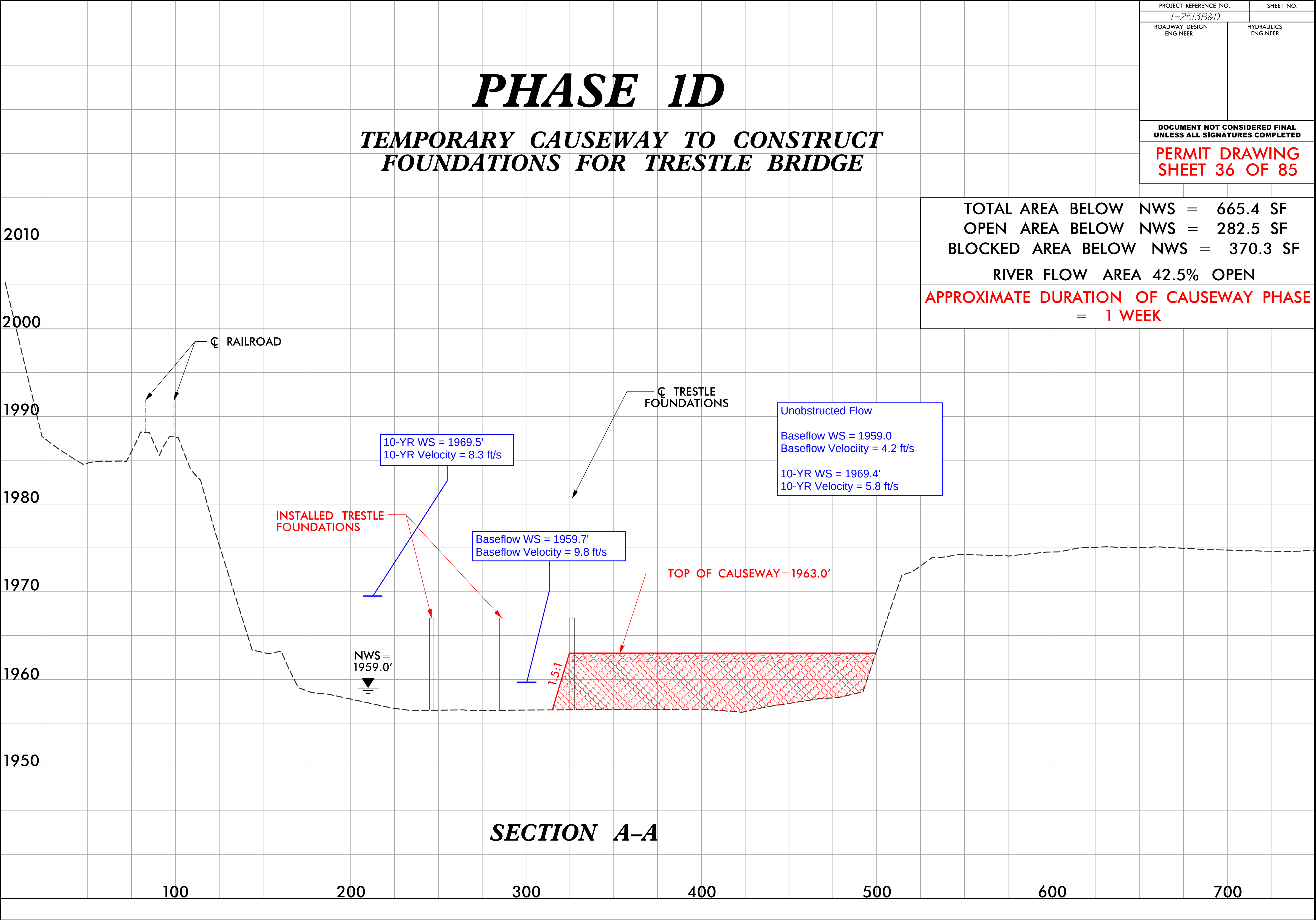
PHASE 1D

***TEMPORARY CAUSEWAY TO CONSTRUCT
FOUNDATIONS FOR TRESTLE BRIDGE***

TOTAL AREA BELOW NWS = 665.4 SF
OPEN AREA BELOW NWS = 282.5 SF
BLOCKED AREA BELOW NWS = 370.3 SF
RIVER FLOW AREA 42.5% OPEN

APPROXIMATE DURATION OF CAUSEWAY PHASE
= 1 WEEK

10/9/2025
00:26:00
C:\Users\king\OneDrive\Documents\10/9/2025\1-2513B&D_hyd_4C_Causeway.XSL.dgn



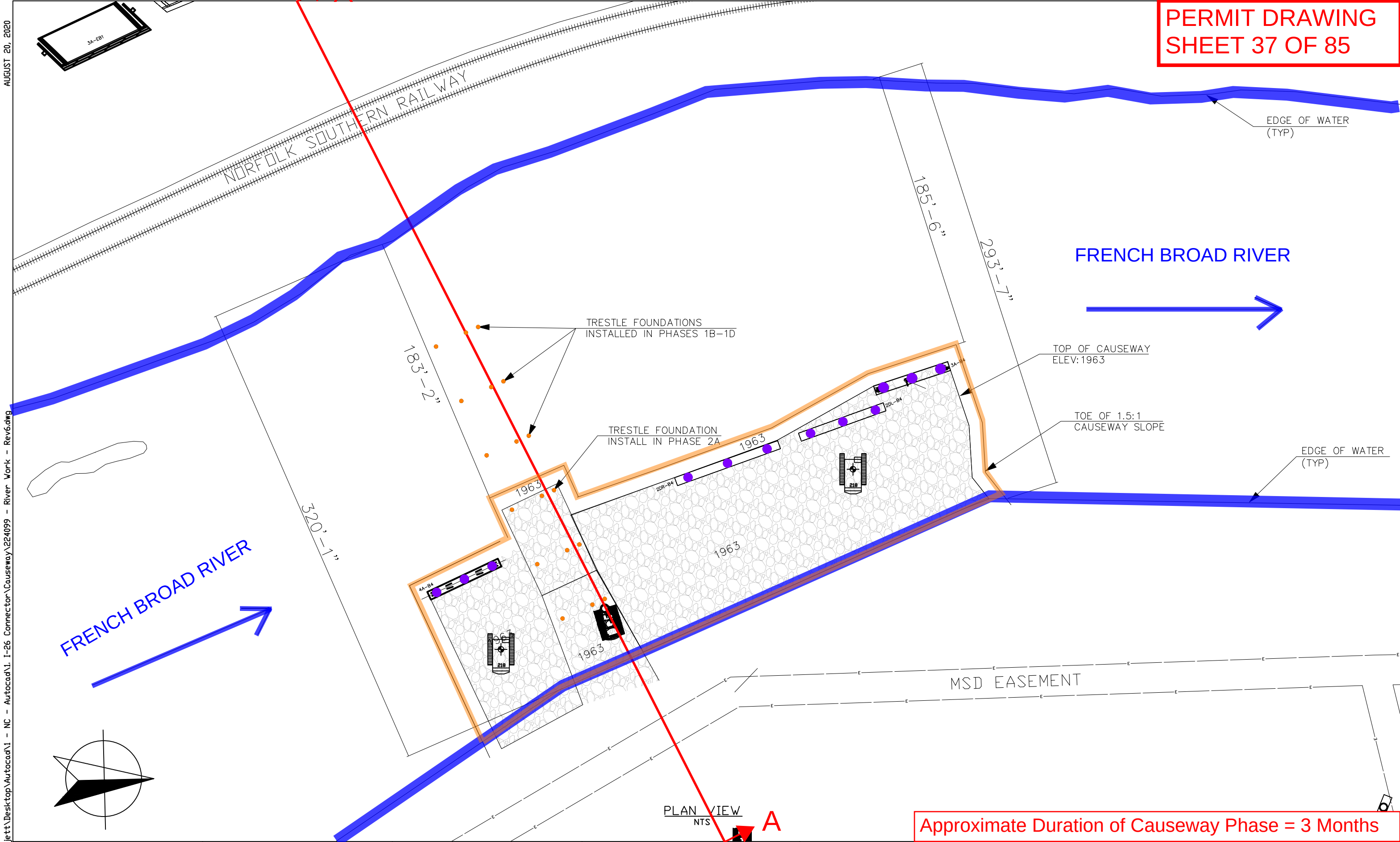
SECTION A-A

AUGUST 20, 2020

C:\Users\cody.jett\Desktop\Autocad\1 - NC - Autocad\1. I-26 Connector\Causeway\224099 - River Work - Rev6.dwg

Submitted 10/17/2025

PERMIT DRAWING
SHEET 37 OF 85



FRENCH BROAD RIVER

FRENCH BROAD RIVER

MSD EASEMENT

PLAN VIEW
NTS

A

Approximate Duration of Causeway Phase = 3 Months

ISSUE		REVISIONS			SCALE	NTS	CAUSEWAY - 2	 ARCHER-WRIGHT JV 554 RIVERSIDE DRIVE ASHEVILLE, NC 28801 	NC DEPARTMENT OF TRANSPORTATION ASHEVILLE I-26 CONNECTOR
-	-	-		DRAWN	WCJ				
				CHECKED	JTH				
				DATE					
				OWNER	NCDOT				
				GEN.CONTR.	ARCHER-WRIGHT JV				
						DWG NO: 2 OF 7			REV: 0

5/14/99

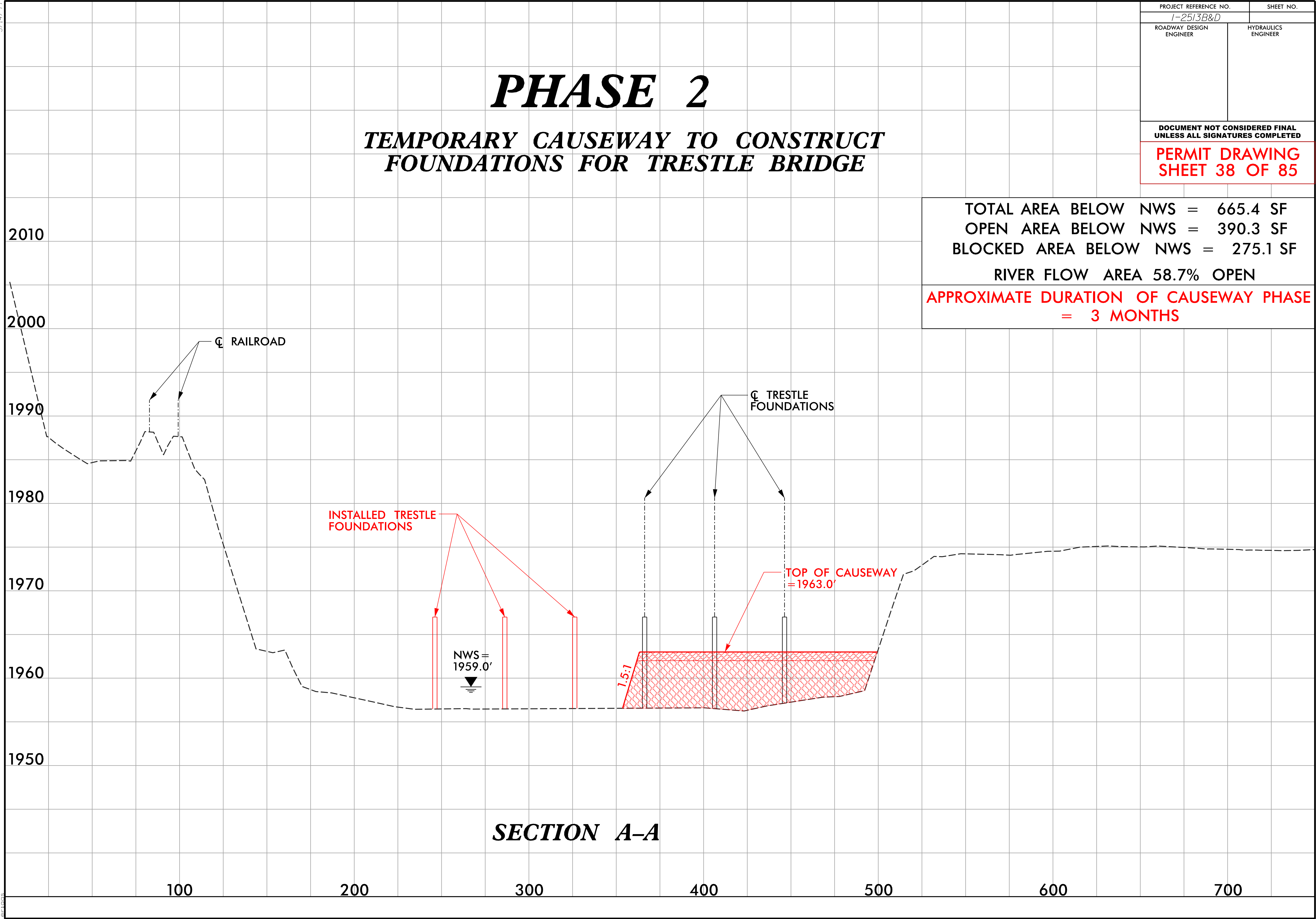
PROJECT REFERENCE NO.		SHEET NO.
1-2513B&D		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
PERMIT DRAWING SHEET 38 OF 85		

PHASE 2

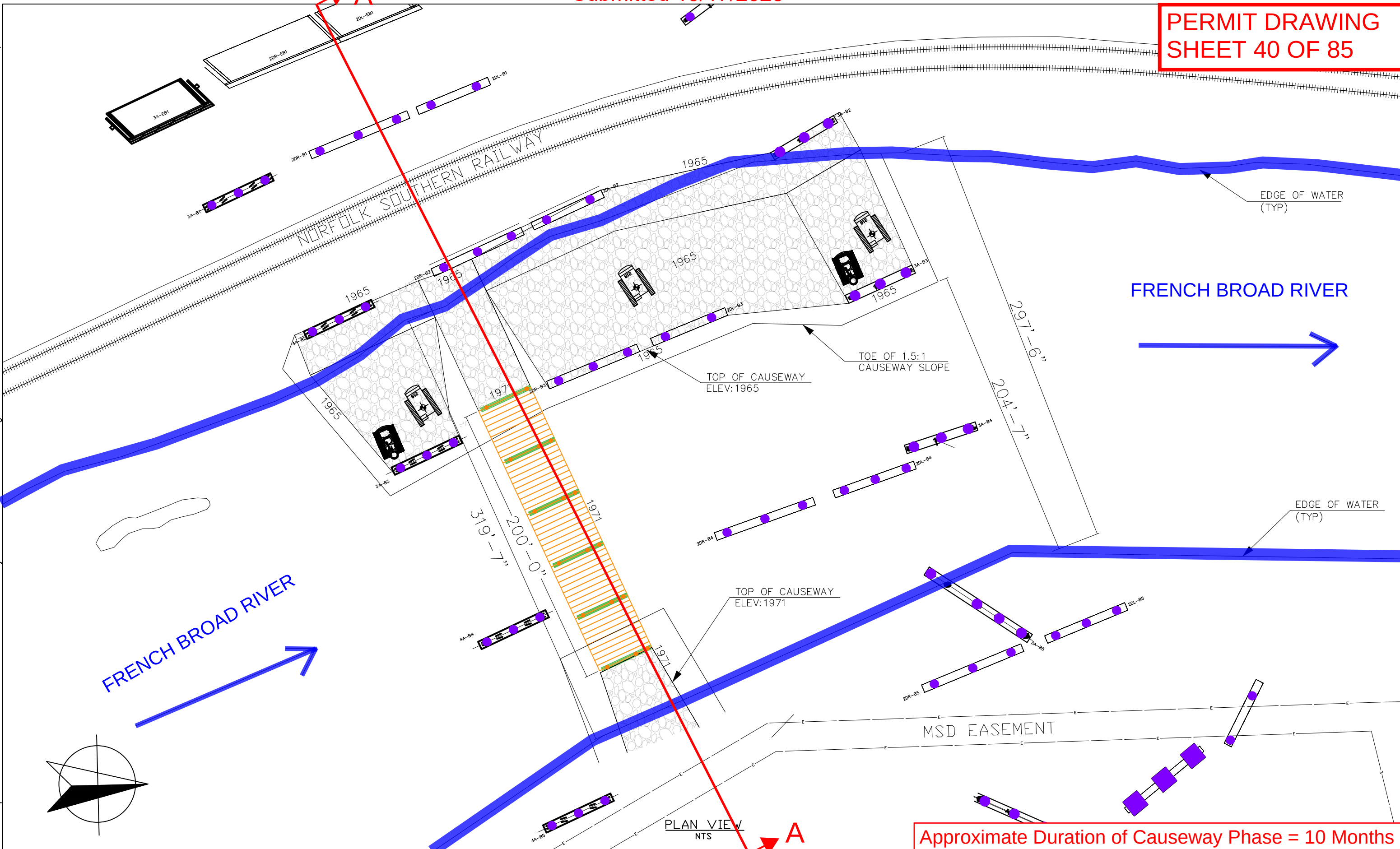
TEMPORARY CAUSEWAY TO CONSTRUCT FOUNDATIONS FOR TRESTLE BRIDGE

TOTAL AREA BELOW NWS = 665.4 SF
OPEN AREA BELOW NWS = 390.3 SF
BLOCKED AREA BELOW NWS = 275.1 SF
RIVER FLOW AREA 58.7% OPEN
APPROXIMATE DURATION OF CAUSEWAY PHASE
= 3 MONTHS

10/9/2025
07:26:24
C:\working\y-r-kpw01\eleni_riggs\dms99\25\1-2513B0_hyd_4C_Causeway.XSI.dgn
8/10/03



AUGUST 20, 2020
C:\Users\cody.jett\Desktop\Autocad\1 - NC - Autocad\1. I-26 Connector\Causeway\224099 - River Work - Rev6.dwg



ISSUE		REVISIONS			SCALE DRAWN CHECKED DATE OWNER GEN.CONTR.	NTS WCJ JTH NCDOT ARCHER-WRIGHT JV	CAUSEWAY - P4		ARCHER-WRIGHT JV 554 RIVERSIDE DRIVE ASHEVILLE, NC 28801		NC DEPARTMENT OF TRANSPORTATION ASHEVILLE I-26 CONNECTOR	
	-	-	-			DWG NO: 4 OF 7					REV: 0	

Approximate Duration of Causeway Phase = 10 Months

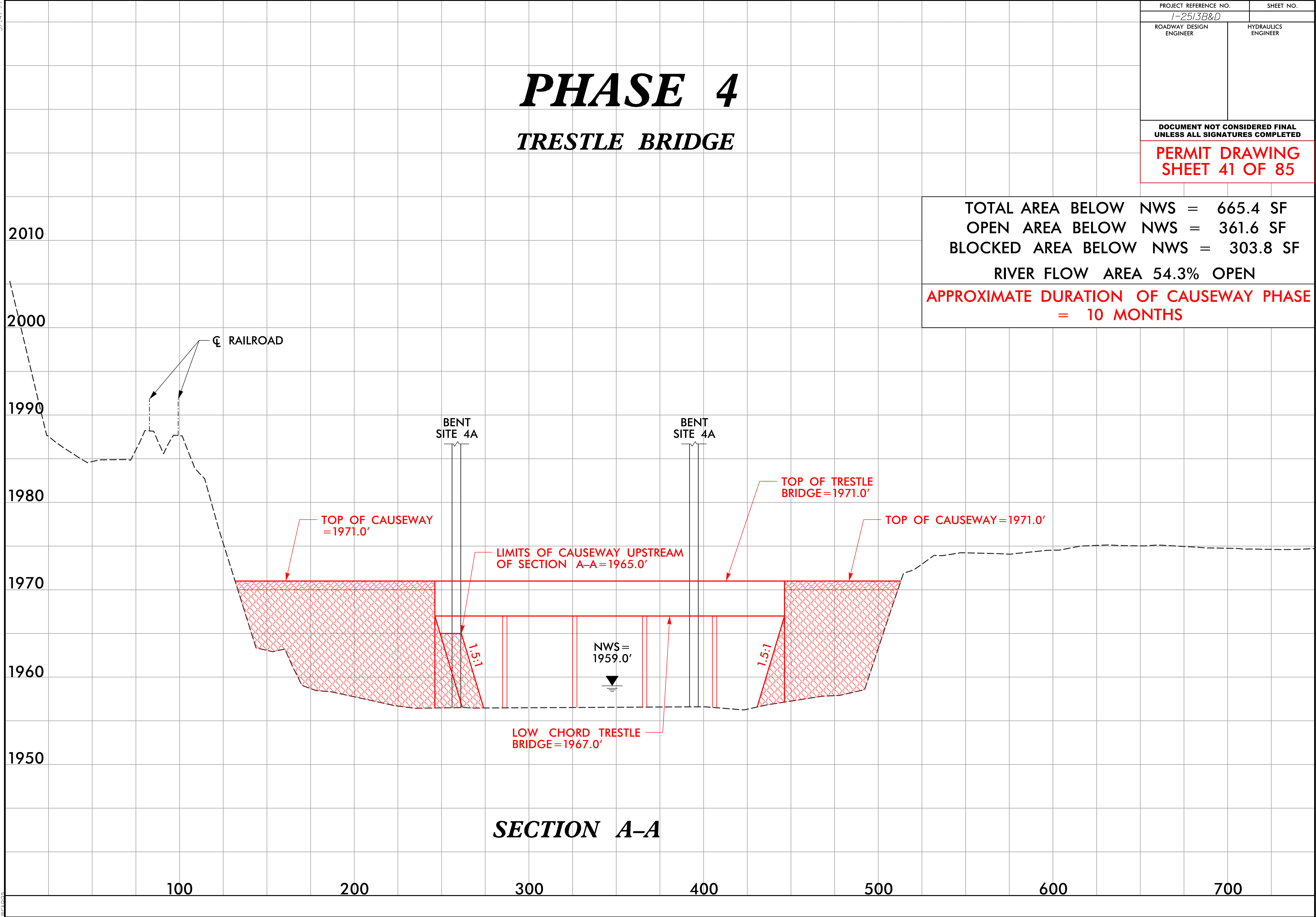
5/14/99

PROJECT REFERENCE NO.		SHEET NO.
1-2513B&D		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

PHASE 4
TRESTLE BRIDGE

TOTAL AREA BELOW NWS = 665.4 SF
OPEN AREA BELOW NWS = 361.6 SF
BLOCKED AREA BELOW NWS = 303.8 SF
RIVER FLOW AREA 54.3% OPEN
APPROXIMATE DURATION OF CAUSEWAY PHASE
= 10 MONTHS

10/9/2025
00:26:00
C:\Users\king\OneDrive\Documents\10-2513B&D\hyd_4C_Causeway.XSL.dgn

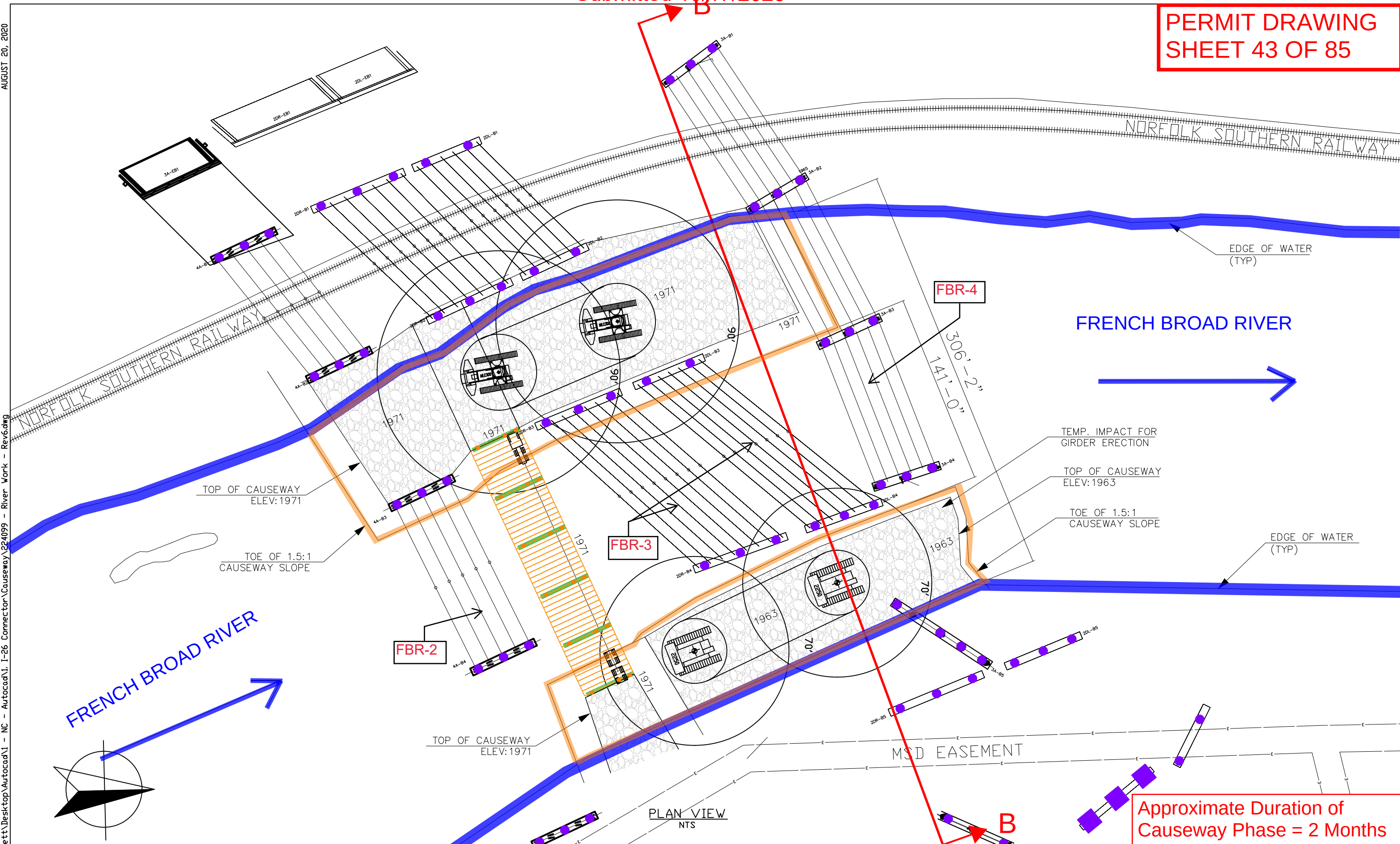




ISSUE	REVISIONS		
	-	-	-

10

PERMIT DRAWING
SHEET 43 OF 85



Approximate Duration of Causeway Phase = 2 Months

ISSUE	REVISIONS			SCALE	NIS
	-	-	-	DRAWN	WCJ
				CHECKED	JTH
				DATE	
				OWNER	NCDOT
				GEN. CONTR.	ARCHER-WRIGHT JV

CAUSEWAY - P6



ARCHER-WRIGHT JW
554 RIVERSIDE DRIVE
ASHEVILLE, NC 28801



NC DEPARTMENT OF TRANSPORTATION
ASHEVILLE I-26 CONNECTOR

DWG NO: 6 OF 7

REV: 0

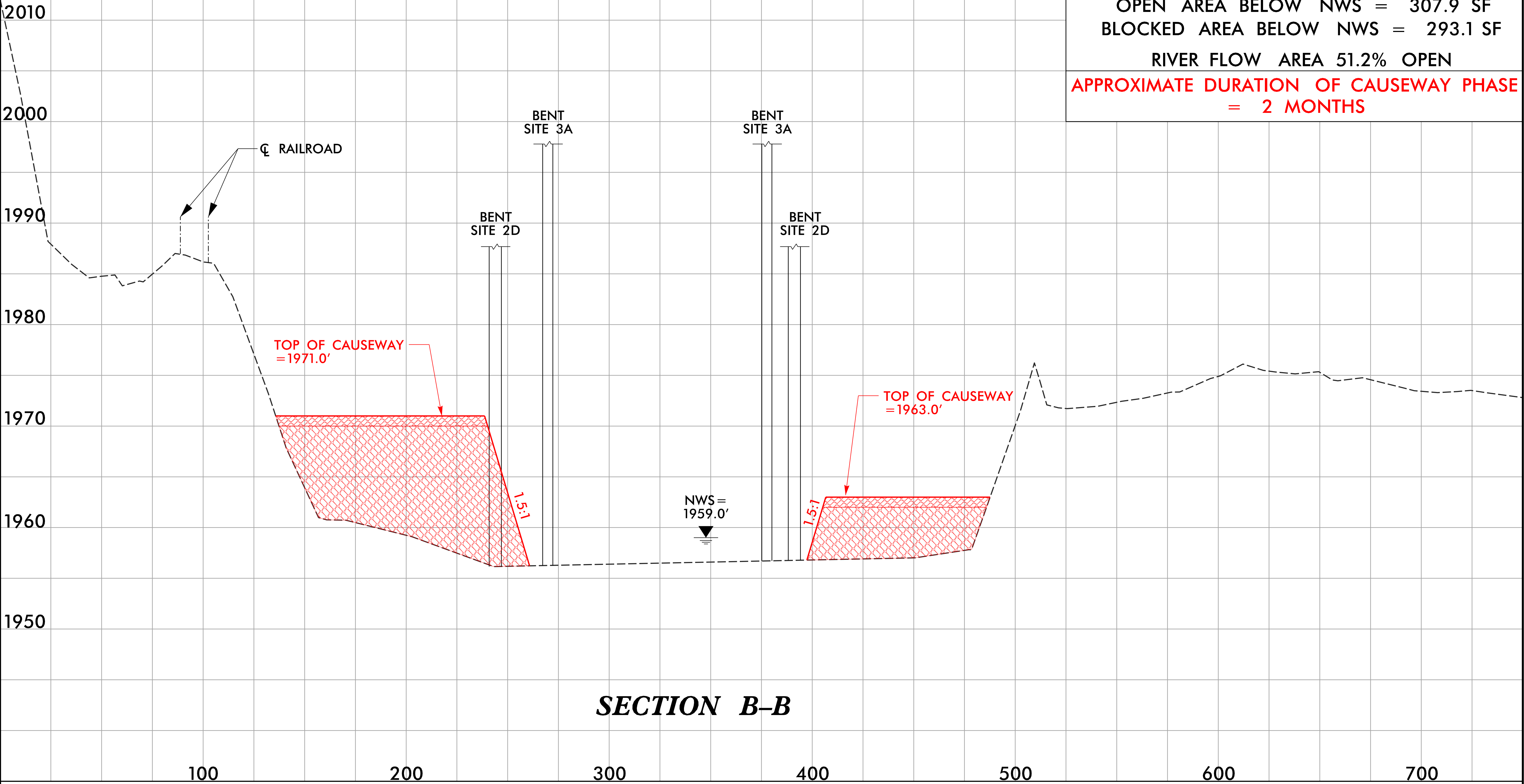
5/14/99
10/9/2025
00:00:00
C:\Users\king\OneDrive\Documents\10-2513B0_hyd_4C_Causeway.XSL.dgn
8/10/2025

PROJECT REFERENCE NO.		SHEET NO.
1-2513B&D		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
PERMIT DRAWING SHEET 44 OF 85		

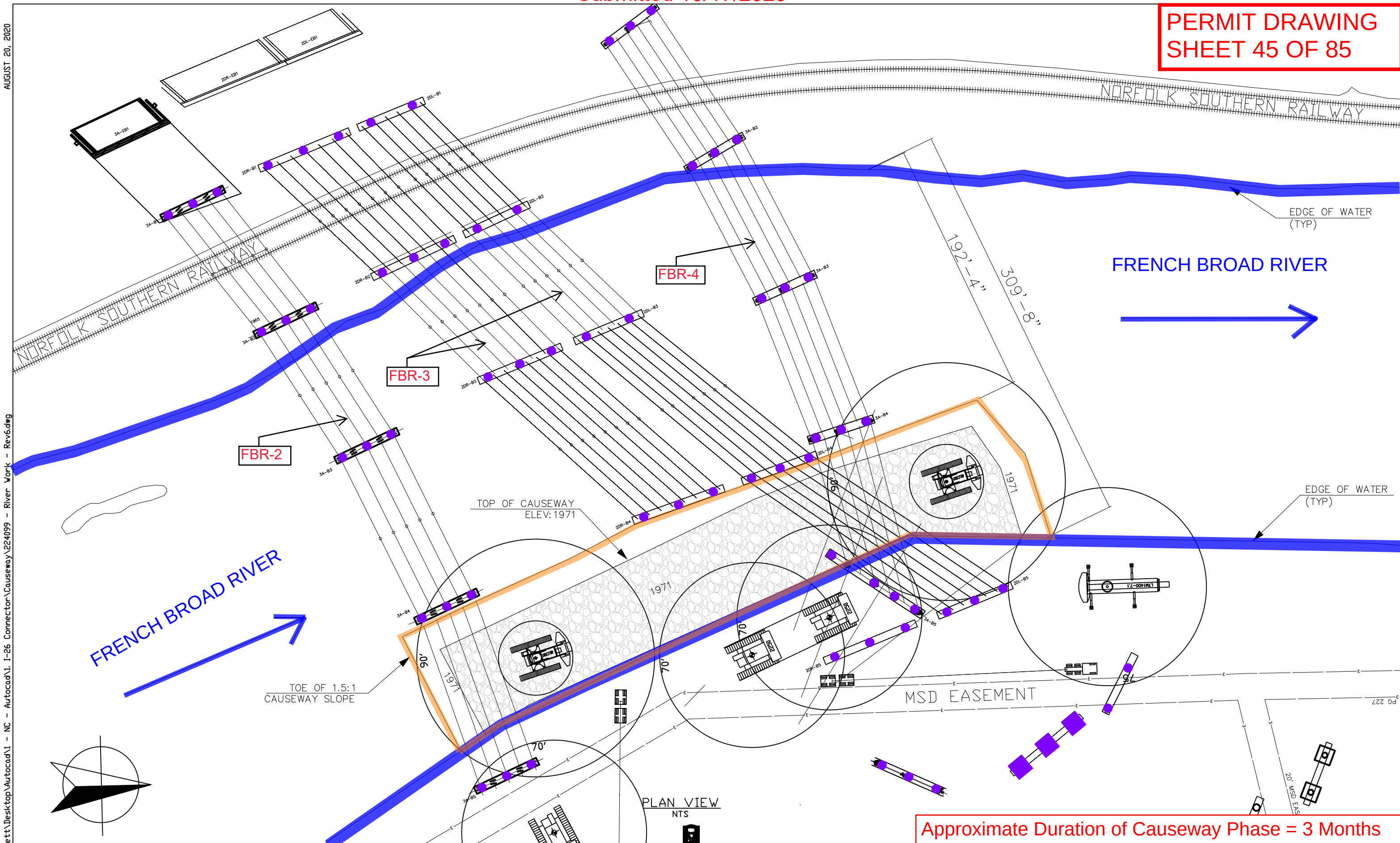
PHASE 6

PARALLEL CAUSEWAYS

TOTAL AREA BELOW NWS = 601.0 SF
OPEN AREA BELOW NWS = 307.9 SF
BLOCKED AREA BELOW NWS = 293.1 SF
RIVER FLOW AREA 51.2% OPEN
APPROXIMATE DURATION OF CAUSEWAY PHASE
= 2 MONTHS



SECTION B-B



Approximate Duration of Causeway Phase = 3 Months

C:\Users\ccody.j...	ISSUE			REVISIONS			SCALE	NTS
	-	-	-				DRAWN	WCJ
							CHECKED	JTH
							DATE	
							OWNER	NCDOT
							GEN CONTR	ARCHER-WRIGHT JV

CAUSEWAY - P7



ARCHER-WRIGHT JV

554 RIVERSIDE DRIVE
ASHEVILLE, NC 28801



NC DEPARTMENT OF TRANSPORTATION
ASHEVILLE I-26 CONNECTOR

DWG NO: 7 OF 7

REV: 0

I-2513 B & D Construction Causeway Responses

October 8, 2025

I-2513 B&D Temporary Causeways: Responses to Agencies' Questions.

This summary provides responses received from the regulatory and resource agencies related to the temporary causeway needed to install the work trestles to construct the new bridges over the French Broad River. Questions received were grouped by topic, however individual responses are provided in line with the original question.

General Questions

1. *What are the compelling reasons why more than 50% of the river flow needs to be restricted?*

Archer Wright Joint Venture (AWJV) has evaluated river access options and made several considerations for mitigating impacts to the French Broad River. The topography for river access is the first restriction. Elevation from the west side of the French Broad is approximately 30' to 40' above normal water with slopes 1.5:1 or steeper, primarily of rock and railroad ballast. Additionally, equipment access on the west side of the French Broad River from south of the project is restricted by the active railroad track and existing railroad bridge along Emma Road. Low and wide clearance under the railroad bridge is a physical barrier to providing the necessary construction equipment from the west side of the river. North of the project location there is no viable public access to traverse the river along the west bank.

2. *Why can't the restriction of more than 50% of the river flow be avoided?*

Limited to east side construction access, our team has elected to utilize a rock causeway that will restrict the river flow temporarily in order to install an elevated trestle. The French Broad River in the area of the project has shallow rock. The elevated trestle requires pilings to be drilled into the rock. The equipment required to drill in rock requires a solid foundation, which has been determined to be the rock causeway. The AWJV team will place causeway material to the minimum lateral dimension necessary to safely install the elevated trestle foundation at the extreme west of the trestle alignment. Upon pile installation, causeway materials will be removed east to the next pile location. This sequence will continue until all trestle foundations are installed. The French Broad River depth does not provide sufficient clearance for use of floating barges or other temporary platform for this installation. This methodology ensures that equipment can safely ingress and egress from the river in case of a flood event; provides a safe platform for construction operations; and limits the duration of maximum river flow blockage.

3. *Can you provide information to agencies demonstrating that restricting more than 50% of the river flow at any one time will not cause adverse effects to the river, aquatic life, or recreation?*

Impacts to aquatic life will be temporary. The rip rap will be removed and footprints will be restored to preconstruction elevations.

Water surface elevations and velocities for each phase of the causeway have been added to the causeway exhibits for the baseflow and 10-year storm discharges. Additionally, the unobstructed flow and velocities have been shown on the exhibits for comparison purposes. The duration for each phase has also been noted on the exhibits to indicate the limited time impact of the phase.

4. *How do you respond to Dave McHenry's comment/question in the chat regarding elevations upstream and downstream of the causeway?*

We were unable to access Dave's question from the 4C Meeting. Depending on what he asked, we may be able to provide elevation information related to the causeway.

5. *Why is this causeway configuration the only viable option for constructing the trestle bridge?*

It is anticipated that each trestle bent pile installation is scheduled to be completed within a 5 day period, including the removal of causeway materials. Each trestle span is 40'. Within a 15 day work period the causeway blockage would result in greater than 50% flow. Beyond this timeframe, phasing for causeways and temporary work platforms will provide at least 50% flow for the duration of work for all river sections in the work zone.

6. *What time of year is planned for causeway construction, and could this coincide with the summer rainy season?*

The schedule has not been finalized and AWJV is evaluating performing the work in late April of 2026, however this is subject to change. We understand the time of year concerns and will make every effort to begin causeway work prior to the start of the rainy season and river user's annual season however we cannot commit to doing so.

7. *How will river user safety be handled during construction?*

This is detailed in the I-2513 Draft 2025 Strategic Communications Plan.

8. *Can you provide any supporting figures and/or reports that depict these topics?*

Water surface elevations and velocities for each phase of the causeway has been added to the causeway exhibits for the baseflow and 10-year storm discharges. Additionally, the unobstructed flow and velocities have been shown on the exhibits for comparison purposes. The duration for each phase has also been noted on the exhibits to indicate the limited time impact of the phase.

Construction Plans and Coordination

9. *Has NCDOT provided the bridge construction and demolition (C&D) plan, river users plan, and communication plan?*

The I-2513 Draft 2025 Strategic Communications Plan, which updates and combines the bridge construction and demolition (C&D) plan and river users plan, is currently being reviewed by the USACE.

10. *Will the causeway phasing be shown in the bridge C&D plan and will a narrative be included explaining the expected duration of each phase?*

The draft causeway phasing plans will be replaced with the updated phasing plans included with this summary. The expected duration has been added to each phase's plansheet.

11. *How will this information be coordinated with FWS and COE for review of the causeway issue?*

This document along with the update causeway plans are being provided to the agencies.

Hydraulic and Environmental Impacts

12. *What are the anticipated hydraulic conditions (e.g., increased water surface levels and velocity) during high flow events when more than 50% of the river is blocked?*

Water surface elevations and velocities for each phase of the causeway have been added to the causeway exhibits for the baseflow and 10-year storm discharges. Additionally, the unobstructed flow and velocities have been shown on the exhibits for comparison purposes. The duration for each phase has also been noted on the exhibits to indicate the limited time impact of the phase.

13. *What level of rainfall or high flow event would result in overtopping of the causeway?*

Baseflow is estimated to be approximately 4,150 cfs. The causeway overtops with a discharge of 4,785 cfs during the most constrictive causeway phase. All causeway phases overtop during the 10-year storm as noted on the exhibits.

14. *Is scour expected from high flow events?*

The causeway is overtopped in relatively low storm events (less than 10-year). It is not anticipated that the causeway will contribute additional scour issues than what the river would experience on its own. Additionally, there was minimal scour during Hurricane Helene with record discharges due to the elevation of the rock in the river so we do not anticipate scour occurring due to the increased velocities while the causeway is in place.

15. *How will successive percentages of river flow blockage (e.g., 86% NWS blockage and subsequent phases) be phased and managed as work progresses?*

AWJV will utilize survey equipment to verify that the dimensions of the causeway maintain the required 50% river flow and that the causeway is constructed in accordance with the details provided in the drawings provided. Additionally, supplemental drawings have been provided to illustrate the subsequent phases of causeway construction during the temporary blockage period, when more than 50% of the river flow will be obstructed.

Causeway Phase-Specific Questions

16. For **Causeway Phase 1A** (PDF pages 35–36, Permit Drawing Sheets 30–31), which shows 14.1% of river flow open:

- *Is this a “short duration” restriction?*

Additional plansheets are included with this report showing subphases for Phase 1 for the construction of the trestle bridge. The 14.1% river flow is associated with Phase 1B which will only be in place for approximately 1 week.

- Will it be coordinated further with FWS and COE?

We are providing responses to the USFWS, USACE, NCDWR, and NCWRC via this document.

- How long is this phase expected to remain in place?

There will be a total of 3 weeks of temporary river flow restricted to greater than 50%.

- Phase 1B – 1 Week (14.1%)
- Phase 1C – 1 Week (28.3 %)
- Phase 1D – 1 Week (42.5 %)

- *What are the anticipated hydraulic conditions during this phase?*

Water surface elevations and velocities for each phase of the causeway has been added to the causeway exhibits for the baseflow and 10-year storm discharges. Additionally, the unobstructed flow and velocities have been shown on the exhibits for comparison purposes. The duration for each phase has also been noted on the exhibits to indicate the limited time impact of the phase.

- *How might lateral scour on the west bank be addressed, if it occurs?*

Our intent is to avoid lateral scour on the west bank. We are investigating the existing condition of the west bank to determine its current stability. We are also developing a plan to reduce the potential for impacts.

17. For **Causeway Phase 4** (PDF pages 43–44, Permit Sheets 38–39), which shows 51.2% of river flow open:

Given this is just over the 50% limit, how will precision in actual construction ensure compliance with not exceeding that threshold?

AWJV will utilize survey equipment to verify that the dimensions of the causeway maintain the required 50% flow and that the structure is constructed in accordance as detailed in the drawings provided.

Stream and Channel Design Details

18. In **Phase 1A**, what are the anticipated hydraulic conditions, especially regarding velocity increases and water drops? How might these affect river users and boaters?

Phase 1 has been divided into subphases as mentioned in previous sections. Changes in water surface levels and velocities are documented on the causeway plansheets. While river velocities increase during the causeway phase, they are not excessive. However, using methods discussed in the 2025 Strategic Communication Plan, in addition to the overall information about the work associated with the project-specifically the new bridges over the French Broad River, additional notifications of the restricted opening will be provided and river users will be encouraged to avoid this part the river while phases 1B, 1C, and 1D are in place.

19. For **Detail Y** (flat stream between sites 7 and 8), why is there no lining, and could coir be added even though the channel is almost flat?

Coir fiber matting can be added to that channel.

20. In **AE and AF channel change details** (e.g., Sheet 14 Y36, sites 11 and 24), why is there complete armoring with geotextile underlayment, especially on stream beds?

No rock is proposed in the stream bed, just along the stream banks.

21. Could the geotextile underlayment be removed from stream beds to improve rock embedment during construction?

Geotextile can be removed where rock is proposed in stream beds for better embedment.