

Technical Proposal



S-197 over South Tyger River



S-51 over Snow Creek



S-133 over Little Cane Creek



S-168 over Little Choestoea Creek



S-168 over Tributary to Choestoea Creek




Bridge Package 21

Design-Build Project

Oconee and Spartanburg Counties, South Carolina | Contract ID 5368980

December 1, 2025



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4.1 Technical Proposal Narrative





1 Project Delivery and Approach

1.a Delivery & Approach | Assurances and Ability to Complete the Project within the Required Timeframe

The **Wright Brothers-RK&K Team**, including our dedicated subcontractor, **Reeves Construction Company**, maintain a reputation for delivering projects on time and within budget. Backed by experience and a deep bench of seasoned experts, we will execute an efficient, on-time, cost-effective, and ultimately successful delivery of Bridge Package 21. Our valuable internal resources, in combination with trusted subcontractors, allow us to effectively drive the schedule. We will implement proven techniques and innovation, including lessons learned on successful SCDOT DB projects, planning for long lead times on materials, utility relocations, permitting, construction access, and erosion control. In keeping with our SOQ approach, our team will seek to maximize concurrent execution of multiple sites. Construction on the sites will take into consideration right of way, permitting, and utility relocation schedules. Construction on the sites will overlap as shown on our [Schematic Schedule](#) (page 3) and in more detail within [Appendix A.3 - CPM Schedule](#).

To demonstrate our assurance and ability to deliver the project as scheduled, the Wright Brothers-RK&K Team commits to a substantial completion of 752 days after NTP as shown, as shown in [Appendix B - Quality Credit Matrix](#).

■ **Convenient Geographical Location** | Adding to our ability to ensure schedules are met, this Bridge Package is optimally located for our team, with Wright Brothers based in Charleston, TN and a major office location in Asheville, NC, RK&K located in Columbia, SC), Reeves (Duncan, SC), and S&ME (Greenville, SC), as well as other consultant members which are located in Columbia, SC. This convenient location provides us with the ability to streamline project delivery and provide additional resources as needed to support progress or recover time due to unanticipated delays.

| Snapshot Phases for Design and Construction | |
|--|---|
| Design Schedule | The sequence of Design and Construction have been coordinated to advance the sites with minimal utility impacts and ROW acquisitions to construction at the soonest opportunity. This reduces costs due to escalations and provides overall schedule certainty. |
| | Upon Public Announcement of the Bid Results, RK&K will begin design work early (at-risk) to accelerate the project schedule. |
| | We anticipate that the design will be completed for all sites less than 12 months from NTP. |
| Construction | Construction will begin at the S-133 Bridge over Little Cedar Creek, as it is the site with the fewest critical utility relocations to complete. Early clearing and closure for bridge demolition have been scheduled in compliance with environmental moratoriums. The crews planned for work at S-133 will proceed to construct the two bridges at S-168 for all sites will be completed. |
| | Our dedicated subcontractor Reeves Construction will construct bridge S-197 over South Tyger River as the second bridge in our Construction Phasing, independent of the other bridge resources and schedule. |
| | Construction of the bridge at S-51 over Snow Creek will occur with an additional, independent bridge crew to allow for significant utility relocations and optimize schedule flexibility. Construction of this bridge will overlap with construction at the other sites. |
| SUBSTANTIAL COMPLETION MILESTONE - WBC has committed to achievement of Early Substantial Completion within 752 days of NTP (792 allowed in RFP). | |



■ **Providing Schedule Certainty** | A major risk to schedule certainty is third-party delays, especially utility relocations. To address this and align with



SCDOT's goals, we will accelerate design efforts to enable a January 2027 construction start, with early site clearing and utility relocations beginning in October 2026. . This approach supports early site completion and allows more time for permitting, right-of-way acquisition, and utility coordination (see Utility Conflict Table).

Avoiding winter construction inefficiencies and final asphalt placement during restricted seasons will further enhance schedule reliability.

We are aware that lead times for precast concrete elements, steel, and utility materials (pipe, conduit, cable) have grown, making early coordination essential. To mitigate delays, our team maintains frequent, detailed communication with suppliers and subcontractors to coordinate resources across multiple bridge sites. We will issue multiple ready-mix purchase orders and pursue delivery agreements with independent haulers to ensure supply reliability. We have enlisted the excellent consulting services of Keitt Consulting and

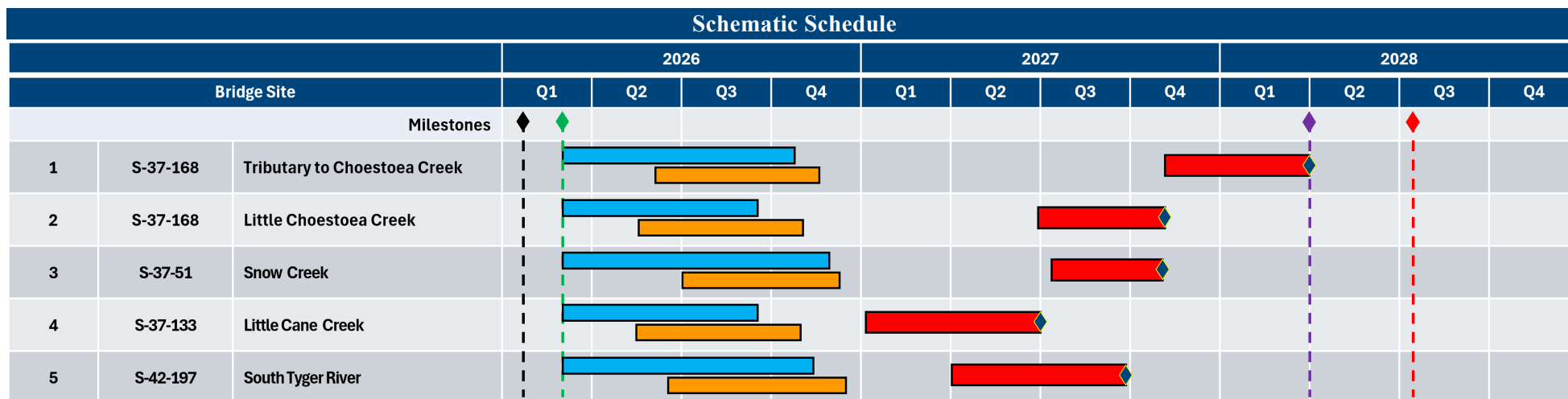
PAN to streamline utility coordination and ROW acquisition, respectively, ensuring completion of these tasks on a prompt and predictable schedule. If needed, our Team will deploy overtime, extra shifts, and additional resources to stay on schedule. Our approach is grounded in transparency, proactive planning, and proven methods that focus on prioritizing safety, quality, cost, and time.

■ **Project Schedule** | Our Team has developed a proposed schedule to successfully deliver each bridge within the contractual time frame as illustrated by



the [Schematic Schedule](#) on Page 3. A more detailed schedule is included in [Appendix A.3 - CPM Schedule](#). The overall duration reduction along with other project schedule enhancements are discussed further within [Appendix B - Quality Credit Matrix](#).

| Utility Conflicts | | | | | |
|-------------------|---|---------------------------|-----------------|--------------|---------------------|
| | Bridge Site | Utility | Act 36 Eligible | Prior Rights | Relocation Facility |
| 1 | S-168 over Tributary to Choestoea Creek | Blue Ridge Electric | N/A | NO | YES |
| | | AT&T | N/A | NO | NO |
| | | Upcountry Fiber | N/A | NO | YES |
| | | Pioneer Water | YES | NO | NO |
| 2 | S-168 over Little Choestoea Creek | Blue Ridge Electric | N/A | NO | YES |
| | | AT&T | N/A | NO | YES |
| | | Upcountry Fiber | N/A | NO | YES |
| | | Pioneer Water | YES | NO | YES |
| 3 | S-51 over Snow Creek | Blue Ridge Electric | N/A | NO | YES |
| | | AT&T | N/A | NO | YES |
| | | Upcountry Fiber | N/A | NO | YES |
| | | Pioneer Water | YES | NO | YES |
| | | Fort Hill Natural Gas | N/A | NO | YES |
| 4 | S-133 over Little Cane Creek | Central Electric | N/A | YES | NO |
| | | Blue Ridge Electric | N/A | NO | YES |
| | | Oconee Fiber | N/A | NO | YES |
| | | AT&T | N/A | NO | NO |
| | | City of Walhalla Water | YES | NO | NO |
| 5 | S-197 over South Tyger River | Laurens Electric | N/A | YES | YES |
| | | AT&T | N/A | NO | NO |
| | | Charter | N/A | NO | YES |
| | | Woodruff -Roebuck Water | YES | NO | YES |
| | | Piedmont Natural Gas | N/A | NO | NO |
| | | Carolina Gas Transmission | N/A | NO | NO |



Design ROW/ Permitting / Utility Coordination Construction

◆ Bid Opening (1/22/26)

◆ Anticipated NTP (3/5/26)

◆ Interim Bridge Completions

◆ Wright Brothers Substantial Completion – 752 days (3/27/28)

◆ SCDOT Contract Completion Date – 792 days (5/5/28)

1.b Design Approach and How it Minimizes Right-of-way



The Wright Brothers-RK&K Team is focused on SCDOT's goal of minimizing right-of-way, which includes minimizing impacts to driveways and businesses.

■ Key Design Decisions & Controlling Criteria

The key design decisions and controlling criteria that dictated our design approach are summarized in the table at the bottom right. Our team has designed many similar bridges that have been successfully constructed and will follow the SCDOT standards.

| Design Decisions and Controlling Criteria | |
|---|--|
| Key Design Decisions | Controlling Criteria |
| <ul style="list-style-type: none"> Best fit profile | <ul style="list-style-type: none"> Profiles were optimized in conjunction with hydro and structural requirements to minimize earthwork and construction limits. |
| <ul style="list-style-type: none"> Minimize earthwork | <ul style="list-style-type: none"> Profile and typical section with a hinged front slope beyond clear zone limits. |
| <ul style="list-style-type: none"> Increase safety | <ul style="list-style-type: none"> Upgrade to latest guardrail standards, relocate drives away from bridges, ensure adequate sight distance, and provide adequate clear zone. |
| <ul style="list-style-type: none"> Bridge length, span configuration, superstructure type, and toe of fill | <ul style="list-style-type: none"> Minimum setback from top of channel banks. |
| <ul style="list-style-type: none"> Bridge foundation type and location | <ul style="list-style-type: none"> Foundations selected and sized based on bridge loading, soil conditions, and overhead clearance constraints. |
| <ul style="list-style-type: none"> Bridge size | <ul style="list-style-type: none"> SCDOT Hydraulic Requirements and FEMA No-Rise Certificate. |
| <ul style="list-style-type: none"> Road and bridge profile | <ul style="list-style-type: none"> Pass the 100-Year discharge to prevent pressure flow scour (which would produce additional scour) and meet SCDOT Hydraulic Requirements. |



Lessons Learned from Previous Bridge Replacements

| | |
|--------------|--|
| Bridges | SCDOT has issued new Bridge Standards which we have used and performed load ratings. |
| | Newly issued Instructional Memos provide asphalt thicknesses for the varying structure types and lengths, however these should be verified with final design camber. |
| | In superelevated sections for cored slabs and box beams, the cap shall be appropriately detailed as offset from the centerline to correctly locate beams. Additionally, a station and offset table is beneficial to avoid confusion on pile placement. |
| Roadway | SCDOT prefers the highest number in the range of clear zone limits shown in the AASHTO Roadside Design Guide. |
| | Utilization of hinged slopes to minimize ROW and Environmental impacts at S-51 & S-168 Tributary. |
| | Matching existing cross slopes at begin/end project limits to minimize project length and right of way impacts. |
| Hydraulics | Driveways to be relocated where MASH guardrail impedes existing location. |
| | Matching existing overtopping is not achievable due to superstructure depth. |
| | Match existing bridge opening as closely as possible to minimize impacts |
| Geotechnical | Flank bridge with cross line pipes to match existing headwater when overtopping cannot be achieved. |
| | It is beneficial to perform more borings than required in PCDM 11 for Low Volume bridges where there are variations in top of rock elevations. |
| | Scour should not be below the top of rock elevation where non-scourable crystalline rock is present, and the scour line should be adjusted accordingly. |
| | Pre-drilling is preferred if borings indicate rock within 15' of bottom of cap. |
| | Geogrid (fabrics are used for separation, but not stabilization) may be required for slope stability to address liquefaction concerns and/or the anticipated scour. |
| | Evaluate the criteria for determination of the point of fixity to estimate a more realistic driven pile embedment at end bents. |

■ **Minimized Right of Way Impacts** | The Wright Brothers-RK&K Team has implemented several strategies to reduce right-of-way impacts while still meeting RFP requirements. Our team minimized construction constraints in order to avoid unnecessary impacts to utility and environmental concerns. These minimizations led to shortened approach lengths, which produced overall smaller project footprints. These smaller footprints not only minimized the impacts on the right of way, but they also kept two of the five bridges below one acre of impacts and removed the requirement for SCDES Notice of Intent (NOI) at these sites. Our teams' efforts also eliminated the need for ROW on five tracts completely when compared to the department's conceptual designs. Substantial effort was also put into obtaining No-Rise Certificates, removing the need for drainage easements. The minimizations to right-of-way are detailed in the table below.

| Minimizing Right-of-way Impacts | | | | | | | |
|---------------------------------|---|------------------------------|----------------|----------------|--------------------|--------------|--------------|
| Bridge Site | | Total Approach Length (feet) | | | ROW Needed (Acres) | | |
| | | SCDOT Concept | RK&K Concept | Reduction | SCDOT Concept | RK&K Concept | Reduction |
| 1 | S-168 over Tributary to Choestoea Creek | 751.08 | 754.00 | 2.92 | 0.76 | 0.60 | -0.16 |
| 2 | S-168 over Little Choestoea Creek | 688.85 | 540.00 | -148.85 | 1.01 | 0.72 | -0.28 |
| 3 | S-51 over Snow Creek | 660.50 | 509.00 | -151.50 | 0.29 | 0.11 | -0.18 |
| 4 | S-133 over Little Cane Creek | 1082.35 | 545.00 | -537.35 | 1.59 | 0.76 | -0.83 |
| 5 | S-197 over South Tyger River | 1049.80 | 895.00 | -154.80 | 0.52 | 0.21 | -0.31 |
| Total Minimization | | 4232.58 | 3243.00 | -989.58 | 4.16 | 2.40 | -1.76 |



Design Completed to Date | During our field investigations, we identified critical challenges and risks, including utility conflicts, hydraulic conditions, right-of-way constraints, environmental considerations, roadway geometry, tie-in locations, and constructability. These elements have been considered in the current design and our solutions align with our proven methodology on similar projects, which allows our Team to confidently meet the project schedule.



Roadway | The roadway approaches for each site have been designed to account for horizontal and vertical geometries, in conjunction with pavement designs, to account for shoulders, fill slopes, guardrail warrants, drainage ditches, and construction limits while establishing NPDES limits.



Hydrology | Four of the five bridges are within FEMA Zone AE and have been designed to achieve "No-Rise" certificates.

The discharges for the 25-year, 100-year and 500-year events have been

determined by StreamStats for South Carolina and compared to those provided by the FEMA Studies. The discharges have been incorporated in HEC-RAS with the predetermined cross sections along with additional cross sections needed to remove errors or warnings in the Corrected Effective Models (CEM). The CEM models were used to analyze the Natural, Existing, Proposed and Sensitivity Models. The preliminary designs for all the proposed bridges have less than one foot of backwater as compared to the Natural Model and meets or reduces the backwater of the Existing Model.

| Roadway Design Tasks | Completed | Hydraulic Design Tasks | Completed |
|--|------------|---|------------|
| Preliminary Design | ✓ | Field Inspection | ✓ |
| Right of Way Design | ✓ | Hydrologic Analysis | ✓ |
| Completed Cross Sections | ✓ | Roadside Drainage Design | 80% |
| Completed Construction Limits | ✓ | Erosion/Sediment Control | 65% |
| Identified and Minimized New ROW Impacts | ✓ | Natural, Existing & Proposed HEC-RAS Models | 70% |
| Driveway Relocations / Tie-ins | ✓ | Triple Profile Plotted | ✓ |
| Slopes and NPDES Permissions Identified | ✓ | FEMA "No-Rise" Certification | 50% |
| Prepare Right of Way Plans for Approval | ✓ | Scour Analysis | 50% |
| Final Design and RFC Plans | 65% | Final Design and RFC Plans | 65% |

| Preliminary Hydraulic Design Assessment | | | | | |
|---|---|--------------|---|---|-------------------|
| Bridge Site | | FEMA Comment | | Design Comment | |
| 1 | S-168 over Tributary to Choestoea Creek | Zone X | N/A - Not FEMA | FATC to reduce bridge length from 160-ft to 150-ft bridge | Low Volume Bridge |
| 2 | S-168 over Little Choestoea Creek | Zone AE | Designed to achieve "No-Rise" Certificate | No pressure flow for 100-year event, conceptual bridge and span lengths verified and used | Low Volume Bridge |
| 3 | S-51 over Snow Creek | Zone AE | Designed to achieve "No-Rise" Certificate | FATC to reduce bridge length from 140-ft to 120-ft bridge | Standard Design |
| 4 | S-133 over Little Cane Creek | Zone AE | Designed to achieve "No-Rise" Certificate | FATC to reduce bridge length from 200-ft to 170-ft bridge | Standard Design |
| 5 | S-197 over South Tyger River | Zone AE | Designed to achieve "No-Rise" Certificate | FATC to reduce bridge length from 210-ft to 200-ft bridge | Standard Design |



Bridges | The tables below illustrate the status and details of our team's proposed structures design. These structures include the use of our approved ATCs located in [Appendix C - Approved Formal ATCs](#).

| Bridge Design Tasks | | Completed | Preliminary Bridge Details | | | | | | |
|---|--|-----------|----------------------------|---|---------------------|--------------------------------|--------------|-------------|-------------------|
| | | | Bridge Site | | Superstructure Type | Foundation Type | Length (ft.) | Width (ft.) | Span Arrangement |
| Layout bridges to meet RFP requirements | | ✓ | 1 | S-168 over Tributary to Choestoea Creek | AASHTO Type IV | Steel H Piles | 115 | 30.25 | Single |
| Select superstructure type | | ✓ | | | | | | | |
| Design preliminary superstructure | | ✓ | 2 | S-168 over Little Choestoea Creek | Box Beam | Steel H Piles | 100 | 30 | Single |
| Design preliminary substructure | | ✓ | | | | | | | |
| Compute elevations | | 25% | 3 | S-51 over Snow Creek | 54" Florida I-Beam | Steel H Piles | 120 | 36.25 | Single |
| Design final superstructure | | --- | | | | | | | |
| Design final substructure | | --- | 4 | S-133 over Little Cane Creek | Cored Slab/Box Beam | Steel H Piles / Drilled Shafts | 170 | 36 | Multi (40-100-30) |
| Final Bill of materials | | --- | | | | | | | |
| Produce AASHTOWare Load Rating | | --- | 5 | S-197 over South Tyger River | Cored Slab/Box Beam | Steel H Piles / Drilled Shafts | 200 | 36 | Multi (50-100-50) |
| | | | | | | | | | |



Geotechnical | Initial geotechnical design tasks have been completed as noted in the table to the right. Foundation types, sizes, and depths are preliminary and based on the limited subsurface information provided. SCDOT provided a minimum number of borings at each bridge. Our team proposes to perform additional borings before and after the bridge and also in proximity to the proposed bents to meet the requirements presented in the Geotechnical Design Manual, and to supplement and verify the boring information provided. Our thorough knowledge of the subsurface conditions will also minimize construction issues related to foundation installation, which will improve schedule certainty.

| Geotechnical Design Tasks | Completed |
|--|-----------|
| Assess borings provided by SCDOT | ✓ |
| Liquefaction screening | ✓ |
| Select foundation types | ✓ |
| Preliminary foundation depths | ✓ |
| Drill additional borings | 40% |
| Final foundation depths | --- |
| Preliminary and Final Bridge Geotechnical Reports | --- |
| Preliminary and Final Roadway Geotechnical Reports | --- |

1.c Proposed Design Submittal Process



The Wright Brothers-RK&K Team understands how to effectively and efficiently navigate the Department's design submittal process. We maintain a proven track record of delivering compliant, high-quality submissions that meet or exceed expectations.



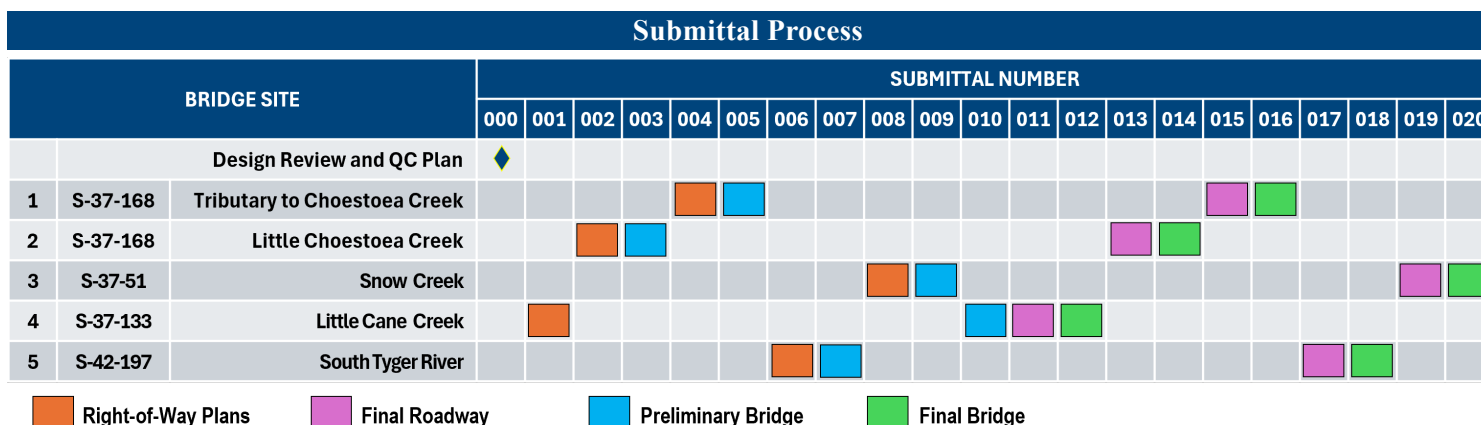
Our conceptual roadway plans are essentially at the right-of-way stage. With SCDOT's approval, our team proposes starting roadway submittals with the right-of-way submittal packages. RK&K has been extremely successful with this approach, including the delivery of

24 bridges through SCDOT's Closed and Load Restricted Bridge Packages 2020-1 and 2021-1. By eliminating the Preliminary Roadway Package, our team could eliminate up to 175 days from the design review schedule.

■ **Design Submittal Packages** | Our design submittal packages for each individual bridge will be in accordance with the RFP and all SCDOT submittal requirements and standards. The submittals will be assembled for each bridge site to facilitate complete and efficient reviews by SCDOT. The sequence and types of each submittal are detailed in the Submittal Process Chart for each location above and in [Appendix A.3 - CPM Schedule](#).

■ Quality Control & Constructability

Reviews | All submittals will undergo rigorous Quality Control and Constructability Reviews prior to submittal to SCDOT. To streamline the review process, we will utilize our Design Quality Management Plan (DQMP) that has been used successfully on numerous design-build projects to ensure the Quality of all design deliverables.




| Design Review Process |
|---|
| Wright Brothers & RK&K Complete design QA/QC process detailed in Design Quality Control Plan. |
| RK&K Prepare deliverable package for submittal using D-B file naming convention and flattening PDF to facilitate Bluebeam review. |
| RK&K Submit package (max of one every 5 business days) via ProjectWise and notify SCDOT via email. |
| SCDOT Initiate design review and provide comments within 15 business days. |
| Wright Brothers & RK&K Review all comments – Design leads contact review team for clarifications, as needed. |
| RK&K Respond to comments in Bluebeam within 5 business days. Design leads provide clear, detailed responses. SCDOT notified via email that all comments have been addressed. |
| SCDOT Update the status for each comment within 5 business days. |



2 Innovation and Added Value



With a focus on project schedule and minimizing impacts to utilities, right-of-way, and traffic, the Wright Brothers-RK&K Team delivers clear and quantifiable innovations and added value to both SCDOT and the traveling public. Each of these items are non-conditional commitments beyond the requirements of the RFP and/or are provided by our innovative solutions. **These items detail more than \$1.1 Million in cost savings and 40 days saved in addition to considerable risk elimination and self-imposed penalties.** These benefits are summarized in the following table and further detailed in [Appendix B - Quality Credit Matrix](#).

|  Innovation and Added Value This chart illustrates the many innovations and added value provided to SCDOT and this project. | | S = Schedule U = Utilities R = ROW | T=Traffic SF = Safety O = Other | Risk Mitigation |
|---|---|--|---------------------------------------|-----------------|
| Approach | | | | |
| ▪ Reduced overall project substantial completion duration from 792 to 752 days. A reduction of 40 days. | | | | S |
| ▪ Aggressively pursue early construction dates for the sites least impacted by critical utility relocations, such as S-133. | | | | S, U |
| ▪ For our Proposal Design, our Team has reduced bridge deck area by over 3,500 SF (13%), reduced roadway limits by over 750 LF (20%), and reduced ROW acquisition by 1.76 AC (42%). Throughout Final Design, we will continue to pursue opportunities to optimize the project, reduce impacts, and accelerate the schedule. | | | | S, SF |
| Means and Methods | | | | |
| ▪ Perform early clearing under flagging operations for utility relocations. | | | | S, U |
| ▪ Make early contract commitments to material suppliers due to supply chain challenges. | | | | S |
| ▪ Utilize specialized equipment, such as WBC's beam launcher, to minimize cost and resolve access concerns for large cranes. | | | | S, SF |
| ▪ Issue multiple purchase orders to ready mix concrete suppliers to ensure delivery as scheduled. | | | | S, T |
| ▪ Substructure foundation elements for S-133 (drilled shafts) were selected to permit the use of low-overhead drilling equipment, addressing the risk of conflict with major power transmission facilities. Micropiles were also investigated and may be utilized if found to be a feasible alternative. | | | | U, SF |
| ▪ Aggressively pursue and manage multiple active bridge sites to enable flexibility in project scheduling. | | | | S |
| ▪ Strategically start bridge sites to schedule in-season completion of asphalt surface mixes. | | | | S |
| Design Elements | | | | |
| Bridges | ▪ FATC 2 - Reduced bridge length on S-197 over Tyger River from 210-ft to 200-ft. | | | S, U, R, O |
| | ▪ FATC 3 - Reduced bridge length on S-133 over Little Cane Creek from 200-ft to 170-ft. | | | S, U, R, O |
| | ▪ FATC 6 - Reduced bridge length on S-51 over Snow Creek from 140-ft to 120-ft. | | | S, U, R, O |
| | ▪ S-51: Elimination of a bent and utilization of girder/deck construction. This enhances quality and reduces long-term maintenance. | | | O |
| | ▪ S-168 over Tributary to Little Choestoea Creek: Elimination of a bent and utilization of girder/deck construction. This enhances quality and reduces long term maintenance. | | | O |



| | | |
|------------|---|------------|
| Roadway | ▪ FATC 4 - Allow sag vertical curve on S-133 over Little Cane Creek. | S, U, R, O |
| | ▪ S-51: Reduced project limits to avoid impact to McClane Farm Road. | R, U |
| | ▪ S-133: Avoids impacts to wetlands on Tract 6 by reducing bridge length and height. | S, R |
| | ▪ S-168: Minimizes driveway relocation with PreMash curved guardrail. | SF, T |
| Hydraulics | ▪ FATC 2 - Reduced bridge length on S-197 over Tiger River from 210-ft to 200-ft. | S, U, R, O |
| | ▪ FATC 3 - Reduced bridge length on S-133 over Little Cane Creek from 200-ft to 170-ft. | S, U, R, O |
| | ▪ FATC 6 - Reduced bridge length on S-51 over Snow Creek from 140-ft to 120-ft. | S, U, R, O |
| Geotech | ▪ FATC 5 - Utilize geotextile reinforcement for slope stability. | S |
| | ▪ FATC 5 - Steepened slopes to minimize environmental impacts and rock excavation on S-133 over Little Cane Creek. | S, O |
| | ▪ Our Team will conduct additional exploratory borings at each site to verify design analysis and reduce potential delays in construction resulting from unanticipated subsurface conditions. | S, O |

Approach

| | |
|---|-------|
| ▪ Reduced overall project substantial completion duration from 792 to 752 days. A reduction of 40 days. | S |
| ▪ Aggressively pursue early construction dates for the sites least impacted by critical utility relocations, such as S-133. | S, U |
| ▪ For our Proposal Design, our Team has reduced bridge deck area by over 3,500 SF (13%), reduced roadway limits by over 750 LF (20%), and reduced ROW acquisition by 1.76 AC (42%). Throughout Final Design, we will continue to pursue opportunities to optimize the project, reduce impacts, and accelerate the schedule. | S, SF |

Approved Formal ATCs Being Incorporated Into the Project

| | |
|---|---------------|
| FATC 2 - Reduced bridge length on S-197 over Tiger River from 210-ft to 200-ft | |
| ▪ Reduces construction cost by \$80,000, minimizes impacts to right-of-way, utilities, and environmental concerns. | S, U, R, O |
| FATC 3 – Reduced bridge length on S-133 over Little Cane Creek from 200-ft to 170-ft | |
| ▪ Reduces cost by \$125K, shortens site construction schedule by one week, minimizes impacts to right-of-way, utilities, and environmental concerns. | S, T, U, R, O |
| FATC 4 – Allows a sag vertical curve on S-133 over Little Cane Creek | |
| ▪ Lowers the bridge over 4-ft, reducing the amount of approach work (including 2,500 CY of borrow excavation), and impacts to right of way and utilities associated with the higher profile. Reduces cost by \$120,000 and shortens the site construction schedule by one week. | S, T, U, R, O |
| FATC 5 – Steepened slopes on S-133 over Little Cane Creek | |
| ▪ Reduces schedule risk, minimizes environmental impacts and rock excavation. More economical than the use of earth retaining structures, the rip rap slopes (reinforced with geogrid) require minimal long-term maintenance, Reduces cost of mitigation credits by over \$50,000 and reduces schedule risk for USACE permitting. | S, R, O |
| FATC 6 – Reduced bridge length on S-51 over Snow Creek from 140-ft to 120-ft | |
| ▪ Reduces cost by \$155K, shortens site construction schedule by three weeks, minimizes impacts to right-of-way, utilities, and environmental concerns. | S, T, U, R, O |

a. Ability to Meet Schedule Goals

| |
|---|
| ▪ Wright Brothers's commitment to reaching early Substantial Completion on the Project will be accomplished by utilizing two to three of our 18 bridge crews and through our pre-planning process. With over 750 employees and 500 pieces of construction equipment, constructing two or three bridges concurrently for this contract is well within Wright Brothers's capabilities. |
| ▪ The commitment of Reeves to construct the Bridge on S-197 over South Tiger River will further enhance our Team's capabilities, dedicating the crews and resources of an additional qualified firm to complete significant work independent of the other bridge sites. |
| ▪ RK&K is committed to executing the design sequence as shown in our Schematic Schedule on Page 3 and in Appendix A.3 - CPM Schedule . We are confident in our ability to achieve this schedule and will begin design work at our risk prior to the official NTP by SCDOT to ensure success. The design for all sites will be completed within 9 months from NTP. |
| ▪ Wright Brothers and RK&K's personnel, subcontractors, and subconsultants have a history in successful delivery complex Design-Build projects with critical schedules. Our Team's deep understanding of the complexities and challenges to be addressed will be a benefit for the successful on-time completion of SCDOT's Bridge Package 21. |



- Key subconsultants have been tapped to perform geotechnical investigation and design (S&ME), utility coordination (Keitt), and ROW acquisition (PAN). These trusted, qualified subconsultants will coordinate daily with our construction and design team, advancing critical tasks in conjunction with design and ensuring no gaps in information as they have done on several of our prior projects together.

b. Avoiding/Minimizing Impacts to Utilities

- The [Utility Conflicts Table](#) on Page 2 summarizes the utilities present at each site and the key issues that our Team will navigate with the coordination services of our subconsultant Keitt Consulting, LLC.
- Central Electric Coop owns a 44kV transmission line parallel to the S-133 bridge and a Blue Ridge Coop 3-phase distribution line is attached to the Central poles. Both owners have indicated that these lines can be de-energized for construction under certain conditions. Oconee Focus owns a buried fiber that is aerial crossing the stream. By reducing the bridge profile and project limits, we have reduced the extent of the fiber relocation by approximately 370 LF.
- At S-51, Blue Ridge Coop and Upcountry are located on poles that required relocation, but our Teams' design eliminates impacts to the existing poles and will only require setting one additional pole to remove the diagonal crossing. By optimizing the profile and reducing project limits, our Team has reduced underground relocations for AT&T and Fort Hill Natural Gas by approximately 100 LF.
- At S-197, our Team will coordinate with Piedmont Natural Gas and WRWD to determine a cut-and-cap or relocation strategy to facilitate the bridge replacement. By reducing the bridge length (FATC #2), we have reduced underground relocations by approximately 55 LF. Coordination of Laurens Electric and Spectrum/Charter relocations will be critical to begin work at this site.
- Blue Ridge Electric has existing 3 phase electric poles along S-168 and will have to be relocated along with Upcountry Fiber. Underground facilities for AT&T and Pioneer Water will need to be relocated at S-168 over Little Choestoea, but these will benefit from our Team's optimization of profile and reduction of project limits by 135 LF.

c. Avoiding/Minimizing Impacts to ROW

- The [Right-of-way Table](#) on Page 4 summarizes our right-of-way reductions and highlights specific areas we have brought impacts back within existing row.
- Through our Team's FATC #5, we have not only reduced ROW impacts, we have mitigated significant environmental impacts. This ATC utilizes geotextile reinforcement to steepen a fill slope and avoid significant impacts to a jurisdictional wetland. The reduction in mitigation credits is anticipated to provide cost savings of \$50,000.
- Our FATCs and other design refinements have significantly reduced ROW acquisition from 4.16 Total Acres shown in the SCDOT Conceptual Plans to 2.40 Total Acres, for a total reduction of 1.76 Acres for the five (5) bridge sites. We were also able to eliminate acquisition of 5 tracts on the project.

d. Minimizing Impacts to Traffic

- Our FATCs result in an anticipated 5-week reduction in road and bridge closures, which will provide a corresponding reduction in impacts to traffic.
- Our Construction Phasing plan includes the concurrent design and replacement of multiple bridges in the Package. By utilizing design and construction resources efficiently, this will accelerate completion of the overall project and provide use of the new facilities to the traveling public as soon as possible.
- By utilizing single span, concrete girder bridges at S-168 over Tributary to Little Choestoea Creek and S-51 over Snow Creek, our Team has eliminated significant geotechnical risk in the design and construction of bridge foundations for intermediate bents. This will significantly reduce the likelihood of delays incurred by unexpected geotechnical conditions once construction begins and ensure on-time opening of the roadway closure.
- Our Team's use of single span girder bridges at S-168 over Tributary to Little Choestoea Creek and S-51 over Snow Creek will also significantly reduce the number of girders (permitted loads) hauled to each site when compared to the cored slab and box beam bridges, which are typically delivered over multiple days due to the volume of trucks required.
- Our Team's FATC #4 significantly reduced borrow excavation necessary to complete the S-133 over Little Cane Creek bridge by approximately 2,500 CY, eliminating the hauling of 250 triaxle loads on SCDOT infrastructure in proximity to the project and associated traffic and environmental impacts.

Appendix A

Conceptual Plans



Appendix A.1

Roadway Plans



CONCEPTUAL ROADWAY PLANS
FOR
OCONEE COUNTY
PROJECT ID. P042511



PROJECT ID. P042511
ROAD S-168 (LITTLE CHOESTOE RD.)
STA. 80+86.00 TO STA. 88+40.00
SEE SHEET 6

| ENVIRONMENTAL PERMIT INFORMATION | | | |
|----------------------------------|------------------|------------------|------------------------------------|
| USACE PERMIT | <u> </u> YES | <u> X </u> NO | |
| NEPA DOCUMENT | <u> X </u> YES | <u> </u> NO | |
| 401 CERTIFICATION | <u> </u> YES | <u> X </u> NO | |
| OCRM CAP | <u> </u> YES | <u> X </u> NO | |
| NAVIGABLE WATERS | <u> </u> SC | <u> </u> USCG | <u> </u> USACE <u> X </u> N/A |

ALL UTILITIES MAY NOT BE A MEMBER OF SC811

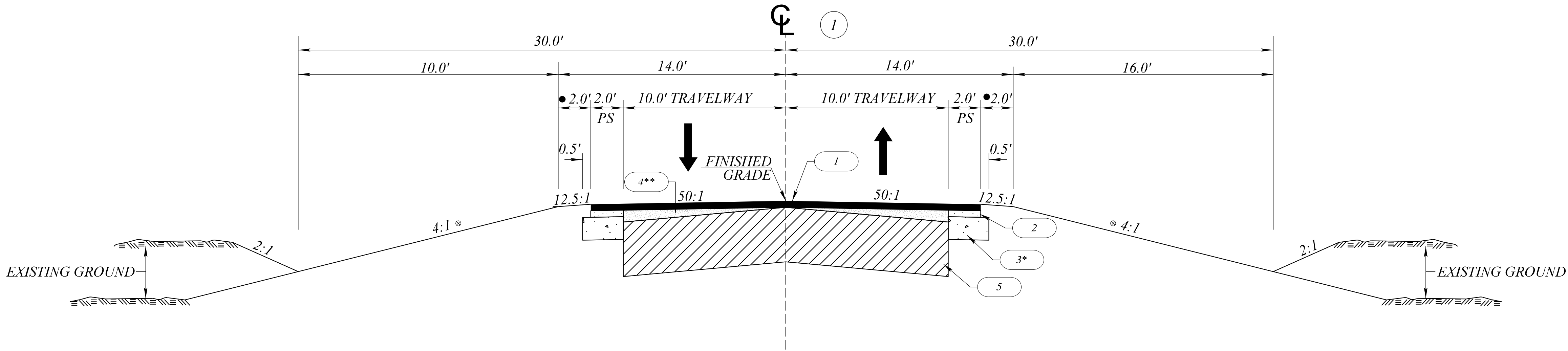
TRUCKS 6 %

NOTE: EXCEPT AS MAY OTHERWISE BE SPECIFIED ON THE PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIALS AND WORKMANSHIP ON THIS PROJECT SHALL CONFORM TO THE SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2025 EDITION) AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF FINAL RFP.

NOTE: BRIDGE PLANS BOUND UNDER SEPARATE COVER

Designs may be obtained from the
SCDOT Regional Production Group

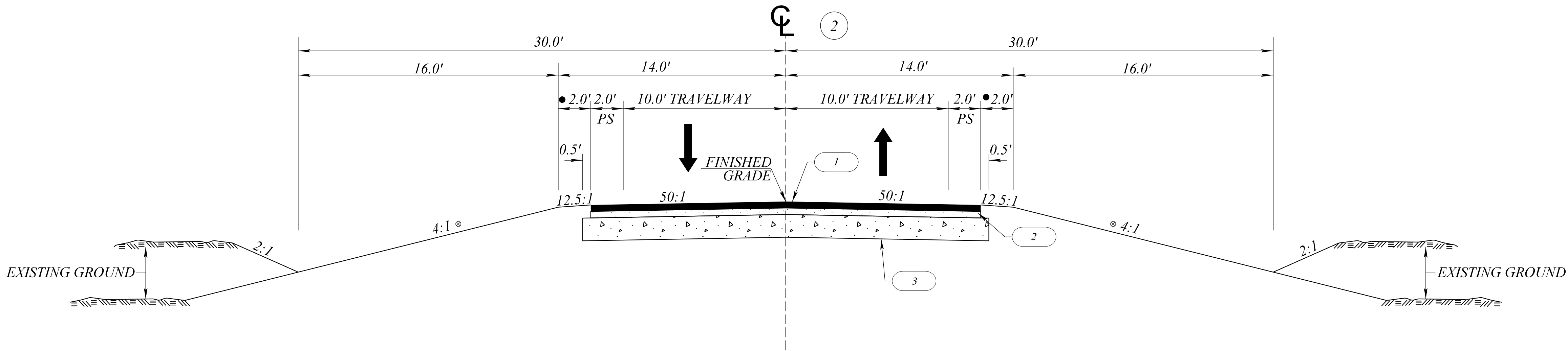




USE THIS SECTION ON:

S-168 FROM STA. 81+80.00 TO STA. 82+50.00

S-168 FROM STA. 87+00.00 TO STA. 87+78.00



USE THIS SECTION ON:

S-168 FROM STA. 82+50.00 TO STA. 85+13.00 (BEGIN BRIDGE)

S-168 FROM STA. 86+28.00 (END BRIDGE) TO STA. 87+00.00

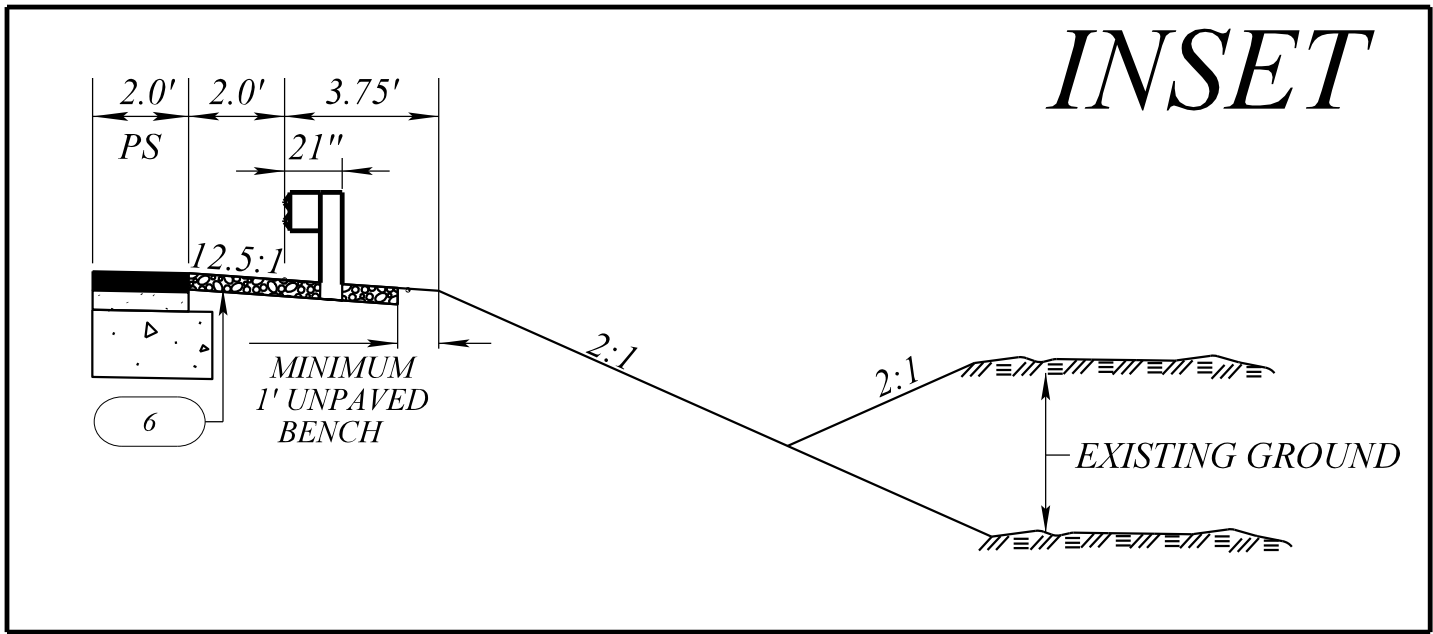
⊗ THIS SLOPE MAY BE VARIED WHEN A DEEPER DITCH IS NECESSARY FOR DRAINAGE PURPOSES.

- ADDITIONAL 3.75' WHERE MASH GUARDRAIL IS USED. PAVE EARTH SHOULDER TO NON-MOW STRIP. SEE INSET.

NOTE: PAVEMENT DESIGN PROVIDED IN FINAL RFP PER SCDOT

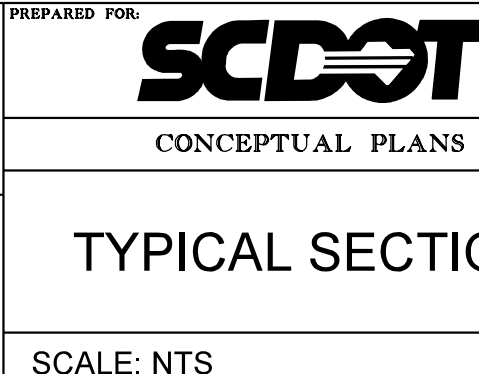
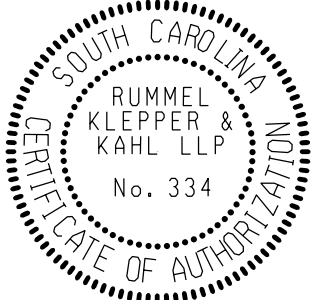
LEGEND

- | | | |
|---|--|---|
| 1 | | HOT MIX ASPHALT SURFACE COURSE TYPE C (175 LBS/SY) |
| 2 | | HOT MIX ASPHALT INTERMEDIATE COURSE TYPE C (200 LBS/SY) |
| 3 | | HOT MIX ASPHALT BASE COURSE TYPE B (650 LBS/SY) * IN AREAS WHERE EXISTING PAVEMENTS ARE WIDENED OUTSIDE THE TRAVEL LANES USE 600 PSY OF SHOULDER WIDENING MATERIAL |
| 4 | | HOT MIX ASPHALT SURFACE TYPE E FOR BUILDUP AND LEVELING 0" TO 1.5" ** HOT MIX ASPHALT INTERMEDIATE TYPE B FOR BUILDUP AND LEVELING FOR GREATER THICKNESSES |
| 5 | | EXISTING PAVEMENT - RETAIN |
| 6 | | 4" HOT MIX ASPHALT SURFACE COURSE TYPE B (GUARDRAIL NON-MOW STRIP) |



INSET

| FUNCTIONAL CLASS | DESIGN SPEED | FROM STA. | TO STA. |
|-------------------------------|--------------|-----------|----------|
| S-168 : RURAL - LOCAL GROUP 4 | 50 | 81+80.00 | 87+78.00 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |



| FED. RD. DW. NO. | STATE | COUNTY | PROJECT ID | ROUTE NO. | SHEET NO. |
|---------------------|-------|--------|------------|--------------|--------------|
| 3 | S.C. | OCONEE | P042511 | S-168 | 5B |

S-168 (LITTLE CHOESTOE RD.)
OVER TRIBUTARY TO CHOESTOE CREEK

S-168 EXISTING

Beginning chain S168 description

Point 1 N 999,942.0570 E 1,378,604.4370 Sta 71+07.80

Course from 1 to PC S168_C1 S 47° 52' 06.02" E Dist 218.4324

Curve Data

Curve S168_C1
P.I. Station 73+36.44 N 999,788.6782 E 1,378,773.9962
Delta = 0° 12' 14.81" (RT)
Degree = 1° 00' 00.00"
Tangent = 10.2057
Length = 20.4113
Radius = 5,729.5780
External = 0.0091
Long Chord = 20.4113
Mid. Ord. = 0.0091
P.C. Station 73+26.23 N 999,795.5246 E 1,378,766.4276
P.T. Station 73+46.64 N 999,781.8050 E 1,378,781.5403
C.C. N 995,546.4395 E 1,374,922.8174
Back = S 47° 52' 06.02" E
Ahead = S 47° 39' 51.21" E
Chord Bear = S 47° 45' 58.61" E

Course from PT S168_C1 to PC S168_C2 S 47° 39' 51.21" E Dist 1,941.9977

Curve Data

Curve S168_C2
P.I. Station 96+28.60 N 998,244.9643 E 1,380,468.3891
Delta = 32° 40' 06.91" (RT)
Degree = 4° 56' 21.45"
Tangent = 339.9615
Length = 661.4023
Radius = 1,160.0000
External = 48.7902
Long Chord = 652.4794
Mid. Ord. = 46.8209
P.C. Station 92+88.64 N 998,473.9196 E 1,380,217.0859
P.T. Station 99+50.04 N 997,916.5800 E 1,380,556.3526
C.C. N 997,616.4352 E 1,379,435.8558
Back = S 47° 39' 51.21" E
Ahead = S 14° 59' 44.30" E
Chord Bear = S 31° 19' 47.76" E

Course from PT S168_C2 to 2 S 14° 59' 44.30" E Dist 153.2198

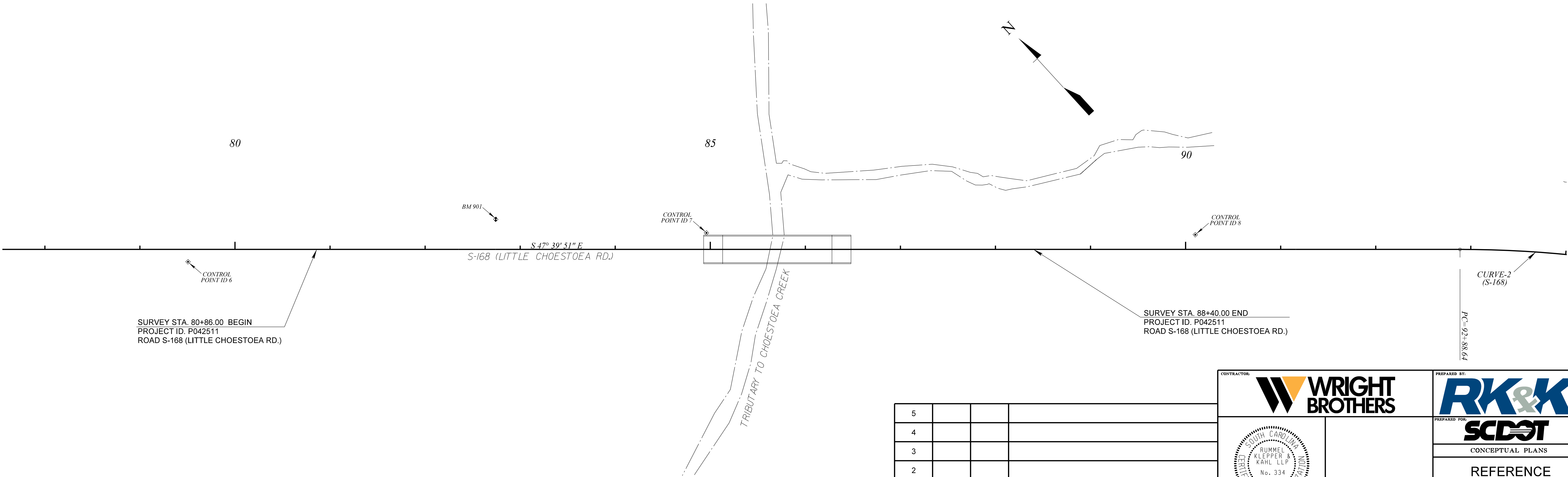
Point 2 N 997,768.5780 E 1,380,595.9976 Sta 101+03.26

Ending chain S168 description

CURVE DATA

CURVE S168_C1
P.I. = 73+36.44
Δ = 0° 12' 15" (RT)
D = 1° 00' 00"
T = 10.21'
L = 20.41'
E = 0.01'
R = 5,729.58'
D.S. = 50 MPH
eMAX = MATCH. EXIST.
e = MATCH. EXIST.
P.C. - LG% = MATCH. EXIST.
P.T. - LG% = MATCH. EXIST.

CURVE S168_C2
P.I. = 96+28.60
Δ = 32° 40' 07" (RT)
D = 4° 56' 21"
T = 339.96'
L = 661.40'
E = 48.79'
R = 1,160.00'
D.S. = 50 MPH
eMAX = MATCH. EXIST.
e = MATCH. EXIST.
P.C. - LG% = MATCH. EXIST.
P.T. - LG% = MATCH. EXIST.



| | | | |
|----------|----|------|-------------------------|
| 5 | | | |
| 4 | | | |
| 3 | | | |
| 2 | | | |
| 1 | | | |
| REV. NO. | BY | DATE | DESCRIPTION OF REVISION |

CONTRACTOR:

PREPARED FOR:

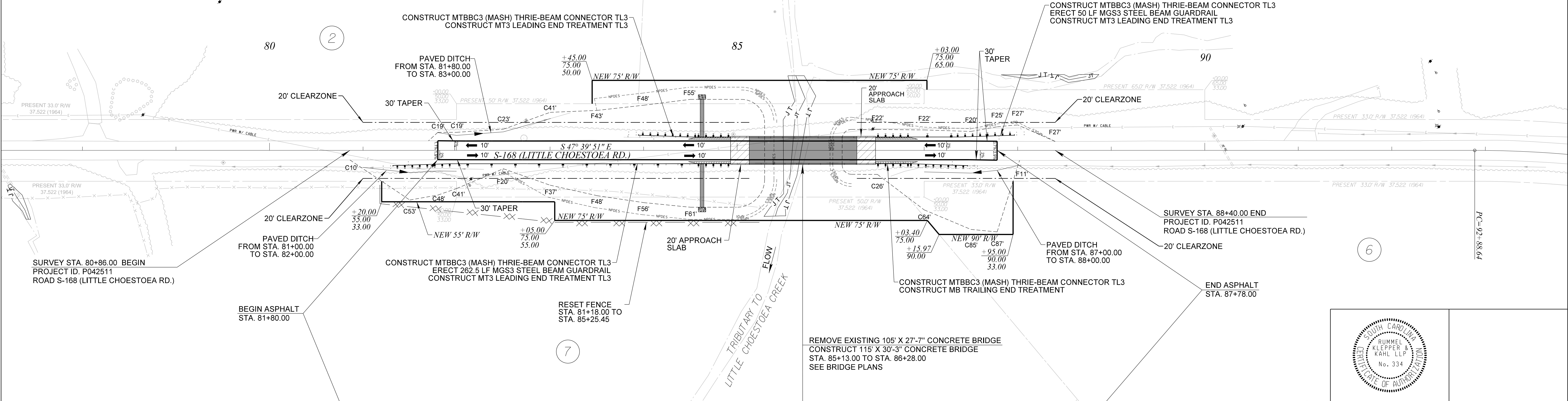
SCDOT
CONCEPTUAL PLANS
REFERENCE DATA SHEET
SCALE: 1" = 50'

| UTILITY OWNERS | | | | |
|----------------|-----------------|----------------|------------------------------|--------------|
| ELECTRIC | BLUE RIDGE COOP | JAMES BURRELL | JAMES.BURRELL@BLUERIDGE.COOP | 864-647-6663 |
| TELECOM | AT&T | DAVID POLI | DP2170@ATT.COM | 704-526-7054 |
| TELECOM | UPCOUNTRY FIBER | GABE BOLDING | GABE.BOLDING@BLUERIDGE.COOP | 864-898-2040 |
| WATER | PIONEER WATER | BRAD WHITFIELD | BWHITFIELD@PIONEERWATER.NET | 864-973-1307 |

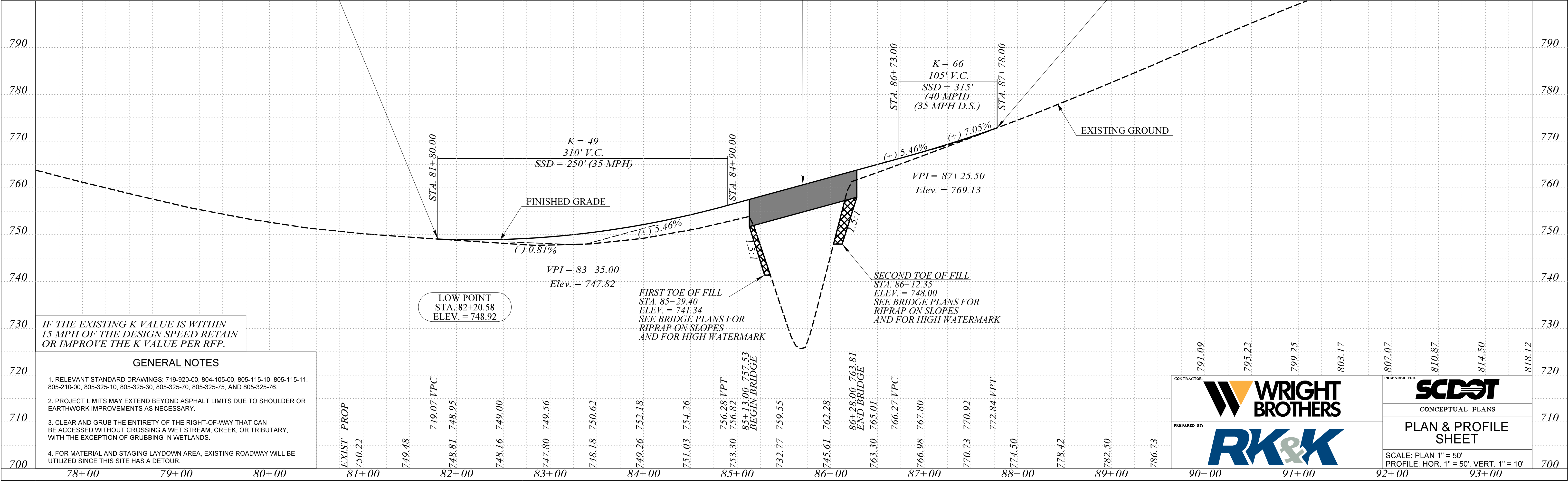
S-168 (LITTLE CHOESTOE RD.)
OVER TRIBUTARY TO CHOESTOE CREEK

| FED. ROAD DIST. NO. | STATE | COUNTY | PROJECT ID | ROUTE NO. | SHEET NO. |
|---------------------|-------|--------|------------|-----------|-----------|
| 3 | S.C. | OCONEE | P042511 | S-168 | 6 |

| PLAN | DATE | BY | DATE | BY | DATE |
|-----------|------|----|------|----|------|
| PLAN | | | | | |
| NOTE BOOK | | | | | |
| No. | | | | | |



| PLAN | DATE | BY | DATE | BY | DATE |
|-----------|------|----|------|----|------|
| PLAN | | | | | |
| NOTE BOOK | | | | | |
| No. | | | | | |



IF THE EXISTING K VALUE IS WITHIN 15 MPH OF THE DESIGN SPEED RETAIN OR IMPROVE THE K VALUE PER RFP.

GENERAL NOTES

- RELEVANT STANDARD DRAWINGS: 719-920-00, 804-105-00, 805-115-10, 805-115-11, 805-210-00, 805-325-30, 805-325-70, 805-325-75, AND 805-325-76.
- PROJECT LIMITS MAY EXTEND BEYOND ASPHALT LIMITS DUE TO SHOULDER OR EARTHWORK IMPROVEMENTS AS NECESSARY.
- CLEAR AND GRUB THE ENTIRETY OF THE RIGHT-OF-WAY THAT CAN BE ACCESSED WITHOUT CROSSING A WET STREAM, CREEK, OR TRIBUTARY, WITH THE EXCEPTION OF GRUBBING IN WETLANDS.
- FOR MATERIAL AND STAGING LAYDOWN AREA, EXISTING ROADWAY WILL BE UTILIZED SINCE THIS SITE HAS A DETOUR.

CONTRACTOR:
WRIGHT BROTHERS

PREPARED BY:
RK&K

SCDOT
CONCEPTUAL PLANS

PLAN & PROFILE SHEET

SCALE: PLAN 1" = 50'
PROFILE: HOR. 1" = 50', VERT. 1" = 10'

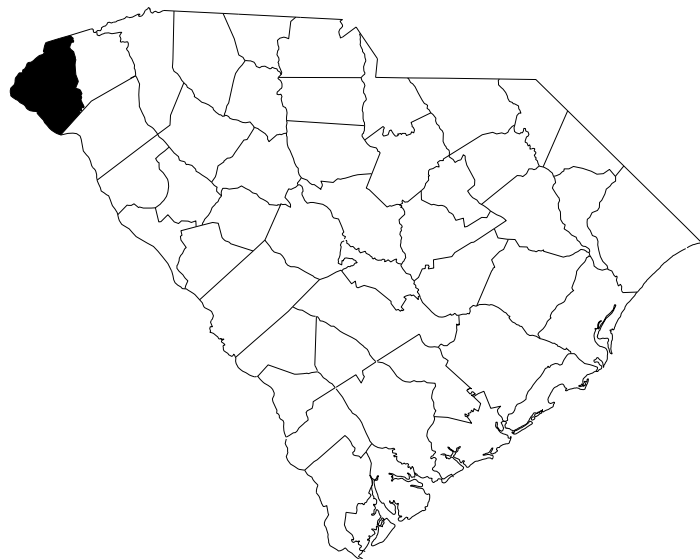
INDEX OF SHEETS

| SHEET NO. | DESCRIPTION | SHEET SUBTOTALS |
|----------------|-------------------------|-----------------|
| 1 | TITLE SHEET | 1 |
| 3 | TYPICAL SECTION | 1 |
| 5B | REFERENCE DATA SHEET | 1 |
| 6 | PLAN AND PROFILE SHEETS | 1 |
| TOTAL SHEETS = | | 4 |



CONCEPTUAL ROADWAY PLANS
FOR
OCONEE COUNTY
PROJECT ID. P042512

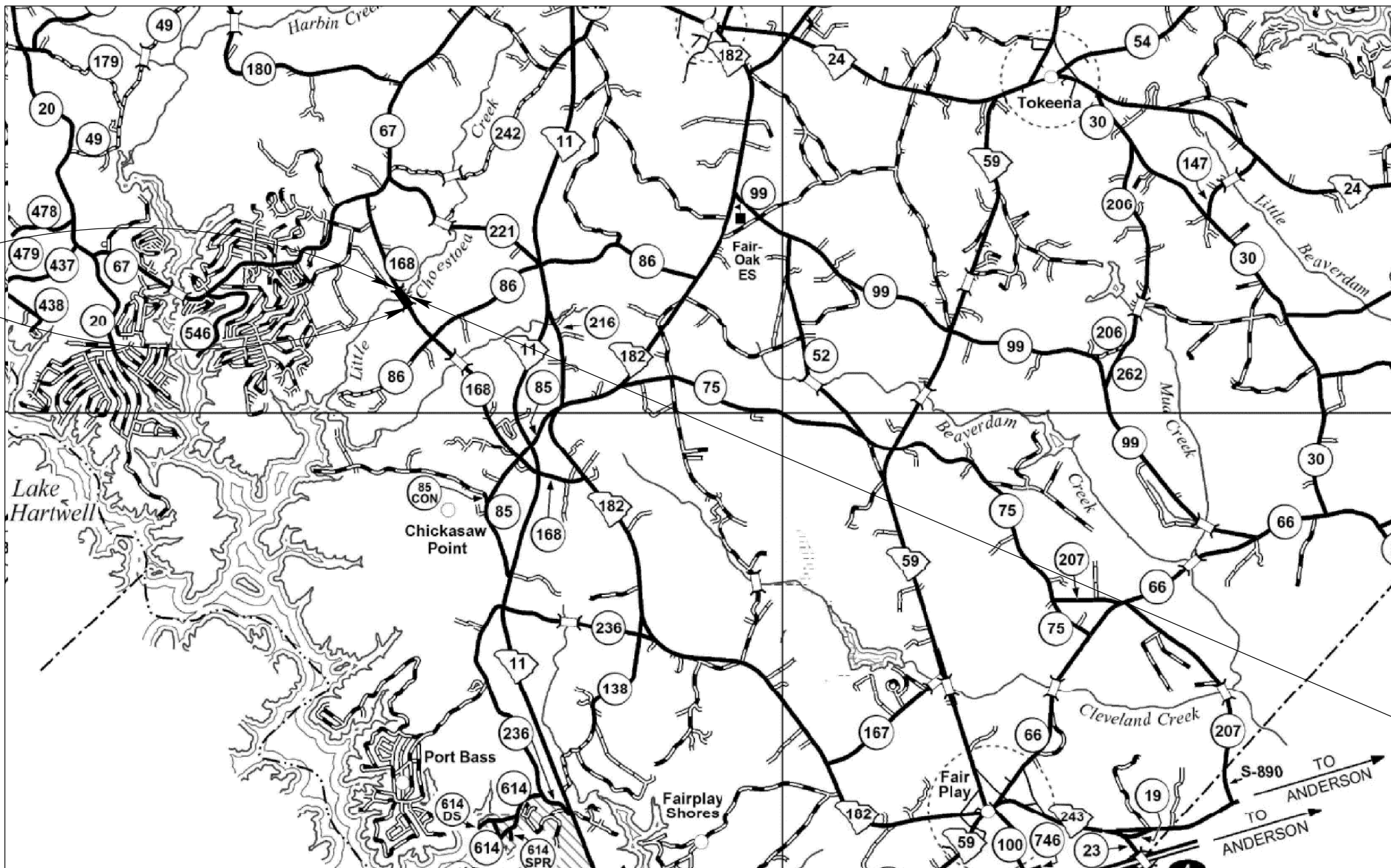
S-37-168 (LITTLE CHOESTOE RD.)
BRIDGE APPROACHES OVER LITTLE CHOESTOE CREEK



MAP SHOWING LOCATION OF
OCONEE COUNTY IN SOUTH CAROLINA

PROJECT ID. P042512
ROAD S-168 (LITTLE CHOESTOE RD)
STA. 43+75.00 TO STA. 48+90.00
SEE SHEET 6

BEGIN
END



OCONEE COUNTY MAP

LAYOUT

SCALE = N.T.S.

| | S-168 | TOTAL |
|-------------------------|-------|-------------|
| NET LENGTH OF ROADWAY | 0.079 | 0.079 MILES |
| NET LENGTH OF BRIDGES | 0.018 | 0.018 MILES |
| NET LENGTH OF PROJECT | 0.097 | 0.097 MILES |
| LENGTH OF EXCEPTIONS | 0.000 | 0.000 MILES |
| GROSS LENGTH OF PROJECT | 0.097 | 0.097 MILES |

EQUALITIES IN STATIONING
NONE

NOTE: EXCEPT AS MAY OTHERWISE BE SPECIFIED ON THE PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIALS AND WORKMANSHIP ON THIS PROJECT SHALL CONFORM TO THE SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2025 EDITION) AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF FINAL RFP.

NOTE: BRIDGE PLANS BOUND UNDER SEPARATE COVER

CONSTRUCT 100' X 30' CONCRETE BRIDGE
STA. 45+75.00 TO STA. 46+75.00
(SEE BRIDGE PLANS)

Design Reference for these plans is the:

2021

SCDOT Roadway Design Manual

Design Reference for these plans is the:

LVB

Supplemental Design Criteria For
Low Volume Bridge Replacement Projects

Hydraulic Design Reference for these plans is the:

2009

Edition of SCDOT's "Requirements for
Hydraulic Design Studies"

NPDES PERMIT INFORMATION

Disturbed Area = 1.2 Acre(s)

Project Area = 3.2 Acre(s)

Approximate Location of Roadway is

Begin

Latitude 34°34'11.4"N

Longitude 83°04'08.0"W

End

Latitude 34°34'07.1"N

Longitude 83°04'04.7"W

Hydraulic and NPDES Design
provided by:

RK&K

Designs may be obtained from the
SCDOT Regional Production Group

ENVIRONMENTAL PERMIT INFORMATION

| | | |
|-------------------|------------------------|---------|
| USACE PERMIT | ___YES | __X_NO |
| NEPA DOCUMENT | __X_YES | ___NO |
| 401 CERTIFICATION | ___YES | __X_NO |
| OCRM CAP | ___YES | __X_NO |
| NAVIGABLE WATERS | ___SC ___USCG ___USACE | __X_N/A |

3 DAYS BEFORE DIGGING IN
SOUTH CAROLINA

CALL 811

SOUTH CAROLINA 811 (SC811)
WWW.SC811.COM

ALL UTILITIES MAY NOT BE A MEMBER OF SC811

RAILROAD INVOLVEMENT?
YES / NO

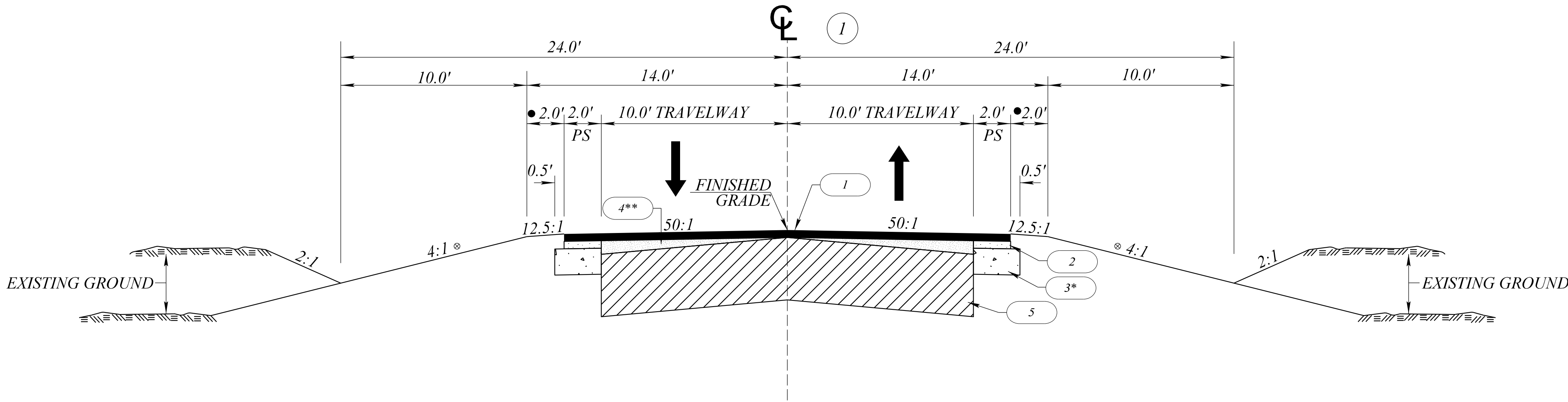
TRAFFIC DATA

2025 ADT 650

2045 ADT 950

TRUCKS 6 %

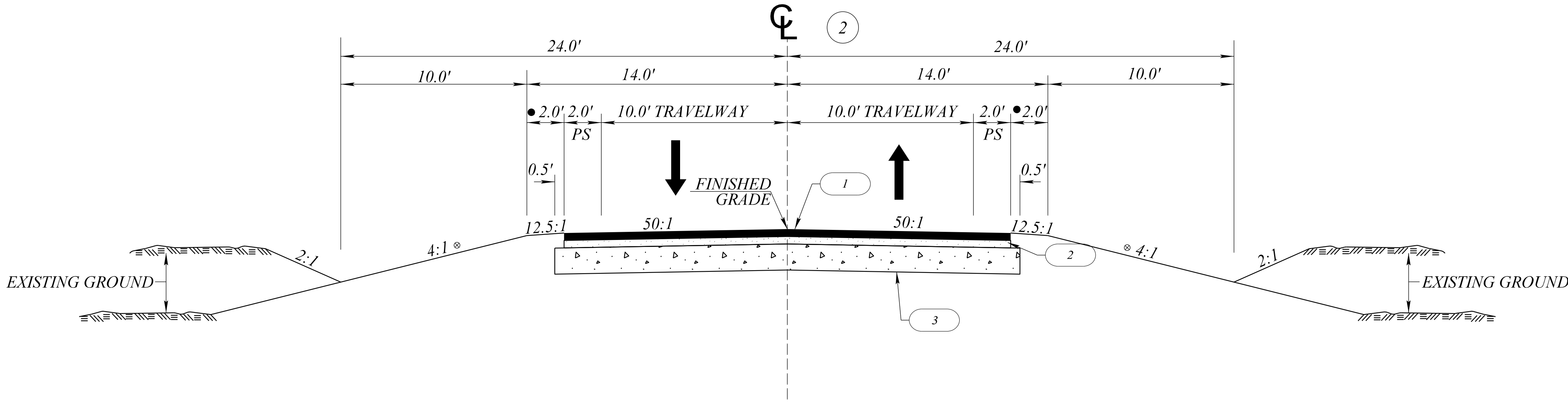




USE THIS SECTION ON:

S-168 FROM STA. 43+75.00 TO STA. 44+75.00

S-168 FROM STA. 48+00.00 TO STA. 48+90.00



USE THIS SECTION ON:

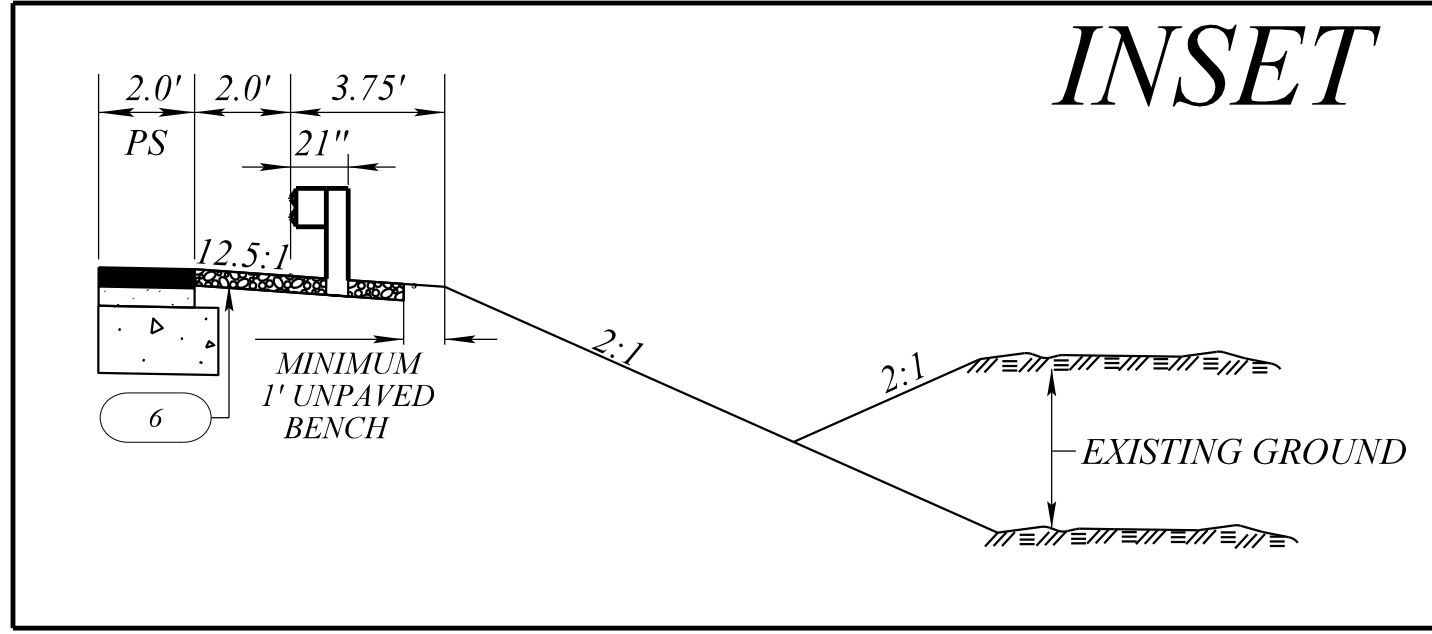
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S-168 FROM STA. 46+75.00 (END BRIDGE) TO STA. 48+00.00

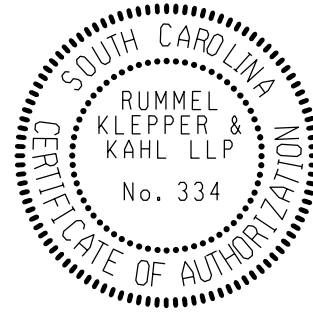
- ⊗ THIS SLOPE MAY BE VARIED WHEN A DEEPER DITCH IS NECESSARY FOR DRAINAGE PURPOSES.
- ADDITIONAL 3.75' WHERE MASH GUARDRAIL IS USED. PAVE EARTH SHOULDER TO NON-MOW STRIP. SEE INSET.
- NOTE: PAVEMENT DESIGN PROVIDED IN FINAL RFP PER SCDOT

LEGEND

- | | | |
|---|--|--|
| 1 | | HOT MIX ASPHALT SURFACE COURSE TYPE C (175 LBS/SY) |
| 2 | | HOT MIX ASPHALT INTERMEDIATE COURSE TYPE C (200 LBS/SY) |
| 3 | | HOT MIX ASPHALT BASE COURSE TYPE B (650 LBS/SY) * IN AREAS WHERE EXISTING PAVEMENTS ARE WIDENED OUTSIDE THE TRAVEL LANES USE 600 PSY OF SHOULDER WIDENING MATERIAL |
| 4 | | HOT MIX ASPHALT SURFACE TYPE E FOR BUILDUP AND LEVELING 0" TO 1.5" ** HOT MIX ASPHALT INTERMEDIATE TYPE B FOR BUILDUP AND LEVELING FOR GREATER THICKNESSES |
| 5 | | EXISTING PAVEMENT - RETAIN |
| 6 | | 4" HOT MIX ASPHALT SURFACE COURSE TYPE B (GUARDRAIL NON-MOW STRIP) |



| FUNCTIONAL CLASS | DESIGN SPEED | FROM STA. | TO STA. |
|-------------------------------|--------------|-----------|----------|
| S-168 : RURAL - LOCAL GROUP 4 | 50 | 43+75.00 | 48+90.00 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |



| | |
|------------------|-------------------|
| CONTRACTOR: | PREPARED FOR: |
| | CONCEPTUAL PLANS |
| PREPARED BY: | TYPICAL SECTION |
| SCALE: NTS | |

| FED. RD. DIST. NO. | STATE | COUNTY | PROJECT ID | ROUTE NO. | SHEET NO. |
|--------------------|-------|--------|------------|-----------|-----------|
| 3 | S.C. | OCONEE | P042512 | S-168 | 5B |

S-168 (LITTLE CHOESTOE RD.)
OVER LITTLE CHOESTOE CREEK

S-168 DRIVEWAY 2 PROPOSED

Beginning chain DW2_PROP description

Course from PT DW_C22 to PC DW_C_PROP_C1 S 6° 15' 10.18" W Dist 53.2627

| Curve Data | | | |
|-------------------|-----------------------|------------------|----------------|
| *-----* | | | |
| Curve DW2_PROP_C1 | | | |
| P.I. Station | T2+26.74 N | 1,001,612.6830 E | 1,377,529.8773 |
| Delta | = 49° 21' 35.30" (RT) | | |
| Degree | = 40° 55' 32.00" | | |
| Tangent | = 64.3333 | | |
| Length | = 120.6088 | | |
| Radius | = 140.0000 | | |
| External | = 14.0739 | | |
| Long Chord | = 116.9135 | | |
| Mid. Ord. | = 12.7883 | | |
| P.C. Station | 11+62.41 N | 1,001,676.1324 E | 1,377,540.5053 |
| P.T. Station | 12+83.02 N | 1,001,579.4227 E | 1,377,474.8088 |
| C.C. | N | 1,001,699.2608 E | 1,377,402.4290 |
| Back | = S 9° 30' 32.50" W | | |
| Ahead | = S 58° 52' 07.80" W | | |
| Chord Bear | = S 34° 11' 20.15" W | | |

Course from PT DW2_PROP_C1 to 9 S 58° 52' 07.80" W Dist 51.5109

Point 9 N 1,001,552.7917 E 1,377,430.7162 Sta 13+34.53

Ending chain DW2_PROP description

CURVE DATA

| CURVE DW2_C1 | CURVE DW2_C2 | CURVE DW2_C3 | CURVE DW2_C4 |
|----------------------|----------------------|----------------------|----------------------|
| P.I. = 10+14.60 | P.I. = 10+98.34 | P.I. = 11+75.82 | P.I. = 12+26.74 |
| Δ = 22° 16' 48" (LT) | Δ = 24° 11' 00" (LT) | Δ = 36° 38' 06" (RT) | Δ = 20° 56' 50" (RT) |
| D = 93° 09' 50" | D = 110° 11' 03" | D = 141° 28' 16" | D = 36° 43' 41" |
| T = 12.11' | T = 11.14' | T = 13.41' | T = 28.84' |
| L = 23.91' | L = 21.95' | L = 25.90' | L = 57.03' |
| E = 1.18' | E = 2.16' | E = 2.64' | E = 2.64' |
| R = 61.50' | R = 52.00' | R = 40.50' | R = 156.00' |

| CURVE DW2_PROP_C1 |
|----------------------------|
| P.I. = 12+26.74 |
| Δ = 49° 21' 35.30" (RT) |
| D = 40° 55' 32.00" |
| T = 64.33' |
| L = 120.60' |
| E = 14.07' |
| R = 140.00 |
| D.S. = 20 MPH |
| eMAX = MATCH. EXIST. |
| e = MATCH. EXIST. |
| P.C. - LG% = MATCH. EXIST. |
| P.T. - LG% = MATCH. EXIST. |

S-168 DRIVEWAY 2 EXISTING CONT.

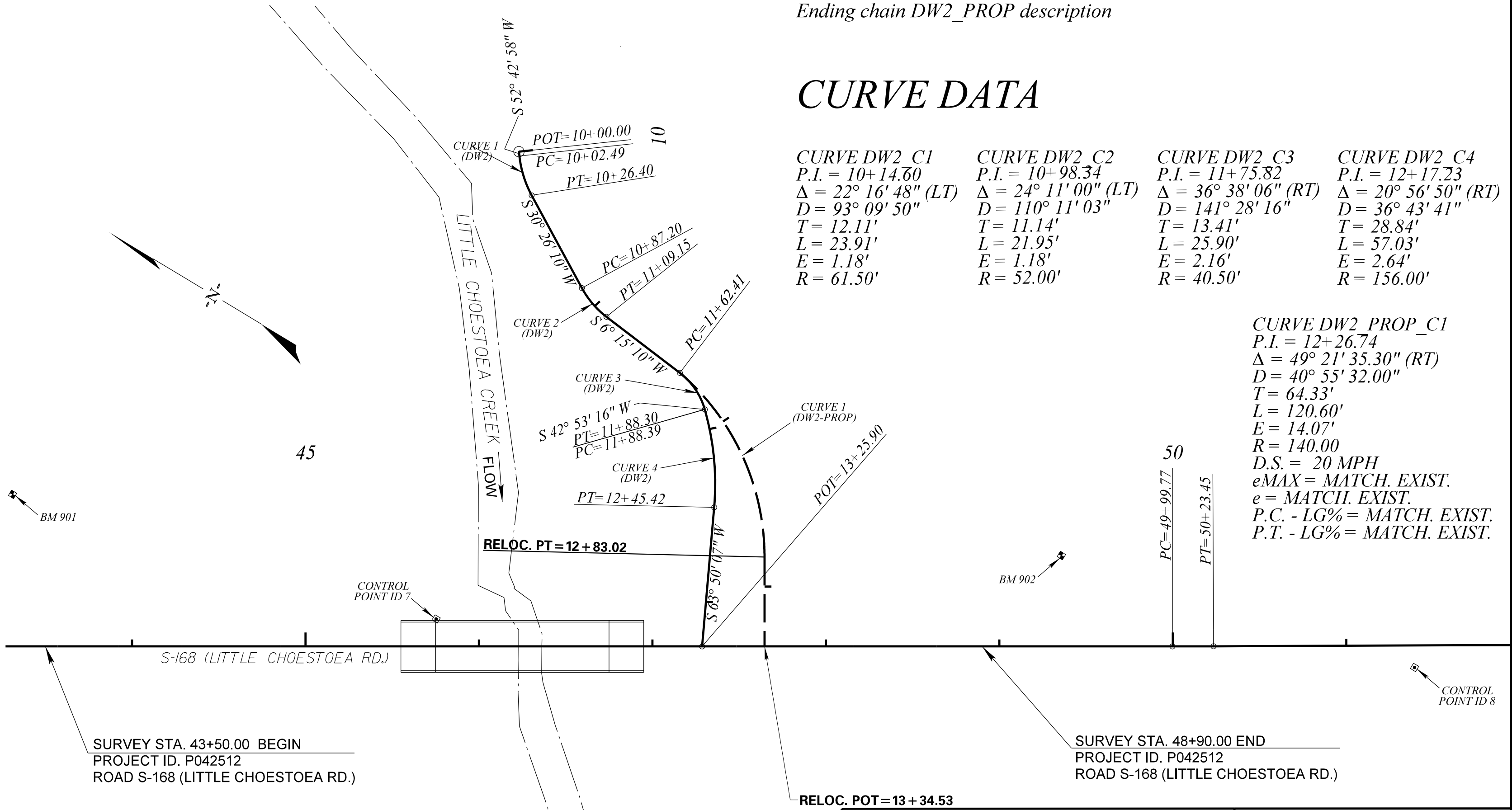
Course from PT DW2_C3 to PC DW2_C4 S 42° 53' 16.35" W Dist 0.0874

| Curve Data | | | |
|--------------|-----------------------|------------------|----------------|
| *-----* | | | |
| Curve DW2_C4 | | | |
| P.I. Station | 12+17.23 N | 1,001,631.7868 E | 1,377,510.2340 |
| Delta | = 20° 56' 50.22" (RT) | | |
| Degree | = 36° 43' 41.03" | | |
| Tangent | = 28.8387 | | |
| Length | = 57.0335 | | |
| Radius | = 156.0000 | | |
| External | = 2.6432 | | |
| Long Chord | = 56.7164 | | |
| Mid. Ord. | = 2.5992 | | |
| P.C. Station | 11+88.39 N | 1,001,652.9165 E | 1,377,529.8606 |
| P.T. Station | 12+45.42 N | 1,001,619.0702 E | 1,377,484.3504 |
| C.C. | N | 1,001,759.0848 E | 1,377,415.5615 |
| Back | = S 42° 53' 16.48" W | | |
| Ahead | = S 63° 50' 06.70" W | | |
| Chord Bear | = S 53° 21' 41.59" W | | |

Course from PT DW2_C4 to 6 S 63° 50' 06.70" W Dist 80.4782

Point 6 N 1,001,583.5830 E 1,377,412.1189 Sta 13+25.90

Ending chain DW2 description



S-168 EXISTING

Beginning chain S168 description

Point 168001 N 1,003,025.7925 E 1,376,669.0456 Sta 31+01.15

Course from 168001 to PC S168_C1 S 20° 16' 11.83" E Dist 315.2503

| Curve Data | | | |
|---------------|-----------------------|------------------|----------------|
| *-----* | | | |
| Curve S168_C1 | | | |
| P.I. Station | 36+82.59 N | 1,002,480.3631 E | 1,376,870.4810 |
| Delta | = 10° 51' 40.36" (LT) | | |
| Degree | = 2° 02' 46.60" | | |
| Tangent | = 266.1871 | | |
| Length | = 530.7789 | | |
| Radius | = 2,800.0000 | | |
| External | = 12.6243 | | |
| Long Chord | = 529.9846 | | |
| Mid. Ord. | = 12.5677 | | |
| P.C. Station | 34+16.40 N | 1,002,730.0654 E | 1,376,778.2622 |
| P.T. Station | 39+47.18 N | 1,002,252.5107 E | 1,377,008.0994 |
| C.C. | N | 1,003,700.1080 E | 1,379,404.8602 |
| Back | = S 20° 16' 11.83" E | | |
| Ahead | = S 31° 07' 52.20" E | | |
| Chord Bear | = S 25° 42' 02.01" E | | |

Course from PT S168_C1 to PC S168_C2 S 31° 07' 52.20" E Dist 1,052.5906

| Curve Data | | | |
|---------------|----------------------|------------------|----------------|
| *-----* | | | |
| Curve S168_C2 | | | |
| P.I. Station | 50+11.61 N | 1,001,341.3721 E | 1,377,558.4096 |
| Delta | = 0° 14' 12.56" (LT) | | |
| Degree | = 1° 00' 00.00" | | |
| Tangent | = 11.8411 | | |
| Length | = 23.6822 | | |
| Radius | = 5,729.5780 | | |
| External | = 0.0122 | | |
| Long Chord | = 23.6822 | | |
| Mid. Ord. | = 0.0122 | | |
| P.C. Station | 49+99.77 N | 1,001,351.5079 E | 1,377,552.2878 |
| P.T. Station | 50+23.45 N | 1,001,331.2616 E | 1,377,564.5733 |
| C.C. | N | 1,004,313.6940 E | 1,382,456.7262 |
| Back | = S 31° 07' 52.20" E | | |
| Ahead | = S 31° 22' 04.76" E | | |
| Chord Bear | = S 31° 14' 58.48" E | | |

Course from PT S168_C2 to PC S168_C3 S 31° 22' 04.76" E Dist 750.8147

| Curve Data | | | |
|---------------|----------------------|------------------|----------------|
| *-----* | | | |
| Curve S168_C3 | | | |
| P.I. Station | 59+33.99 N | 1,000,553.8070 E | 1,378,038.5376 |
| Delta | = 6° 46' 15.37" (LT) | | |
| Degree | = 2° 07' 19.44" | | |
| Tangent | = 159.7223 | | |
| Length | = 319.0728 | | |
| Radius | = 2,700.0000 | | |
| External | = 4.7202 | | |
| Long Chord | = 318.8872 | | |
| Mid. Ord. | = 4.7119 | | |
| P.C. Station | 57+74.27 N | 1,000,690.1847 E | 1,377,955.3969 |
| P.T. Station | 60+93.34 N | 1,000,428.1829 E | 1,378,137.1773 |
| C.C. | N | 1,002,095.6228 E | 1,380,260.7696 |
| Back | = S 31° 22' 04.76" E | | |
| Ahead | = S 38° 08' 20.13" E | | |
| Chord Bear | = S 34° 45' 12.44" E | | |

Course from PT S168_C3 to 168002 S 38° 08' 20.13" E Dist 58.0465

Point 168002 N 1,000,382.5284 E 1,378,173.0252 Sta 61+51.39

Ending chain S168 description

S-168 DRIVEWAY 2 EXISTING

Beginning chain DW2 description

Point 5 N 1,001,821.4580 E 1,377,601.7099 Sta 10+00.00

Course from 5 to PC DW2_C1 S 52° 42' 58.10" W Dist 2.4873

| Curve Data | | | |
|--------------|-----------------------|------------------|----------------|
| *-----* | | | |
| Curve DW2_C1 | | | |
| P.I. Station | 10+14.60 N | 1,001,812.6153 E | 1,377,590.0953 |
| Delta | = 22° 16' 47.96" (LT) | | |
| Degree | = 93° 09' 49.93" | | |
| Tangent | = 12.1104 | | |
| Length | = 23.9148 | | |
| Radius | = 61.5000 | | |
| External | = 1.1810 | | |
| Long Chord | = 23.7644 | | |
| Mid. Ord. | = 1.1588 | | |
| P.C. Station | 10+02.49 N | 1,001,819.9513 E | 1,377,599.7309 |
| P.T. Station | 10+26.40 N | 1,001,802.1737 E | 1,377,583.9604 |
| C.C. | N | 1,001,771.0192 E | 1,377,636.9854 |
| Back | = S 52° 42' 58.10" W | | |
| Ahead | = S 30° 26' 10.14" W | | |
| Chord Bear | = S 41° 34' 34.12" W | | |

Course from PT DW2_C1 to PC DW2_C2 S 30° 26' 10.14" W Dist 60.7950

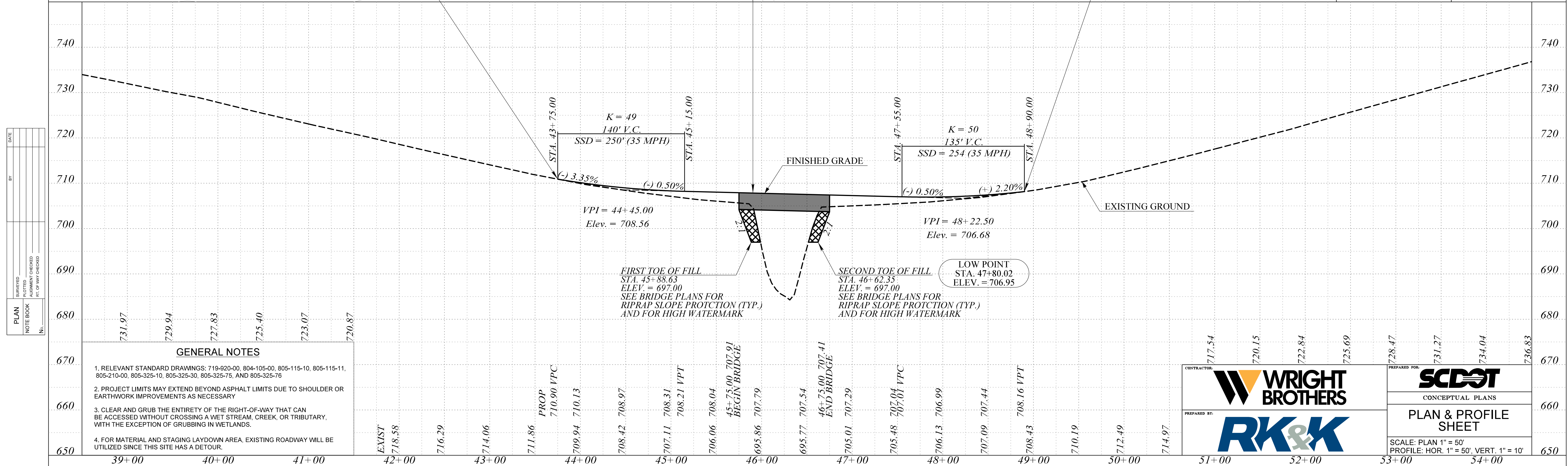
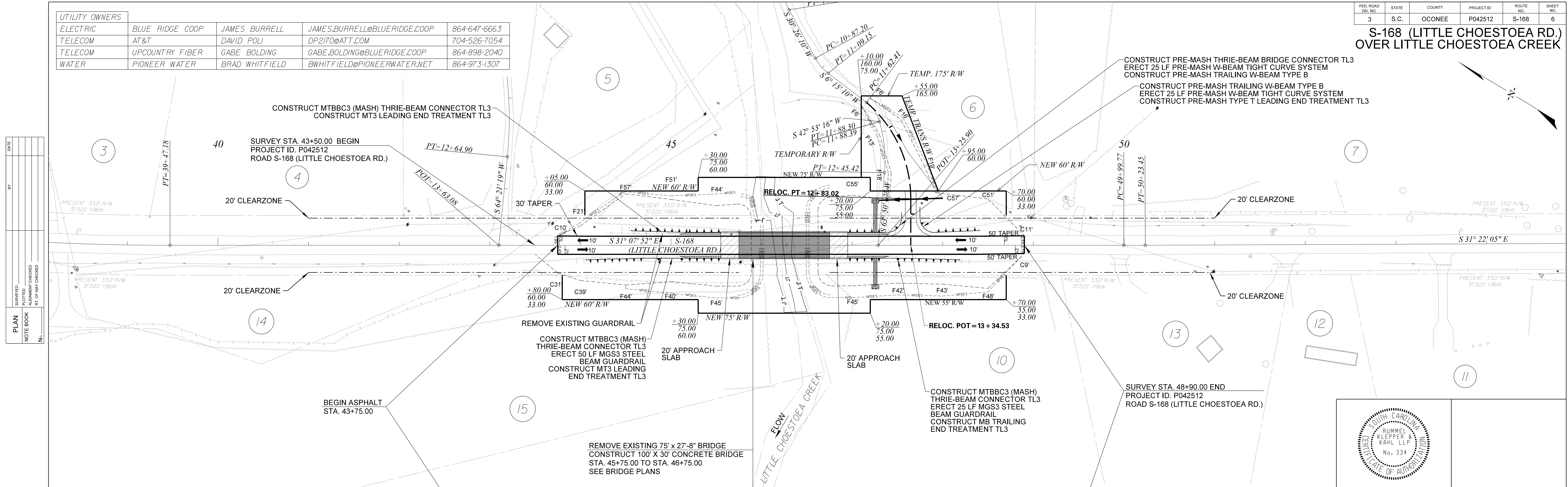
| Curve Data | | | |
|--------------|-----------------------|------------------|----------------|
| *-----* | | | |
| Curve DW2_C2 | | | |
| P.I. Station | 10+98.34 N | 1,001,740.1519 E | 1,377,547.5198 |
| Delta | = 24° 10' 59.96" (LT) | | |
| Degree | = 110° 11' 03.09" | | |
| Tangent | = 11.1399 | | |
| Length | = 21.9481 | | |
| Radius | = 52.0000 | | |
| External | = 1.1799 | | |
| Long Chord | = 21.7855 | | |
| Mid. Ord. | = 1.1537 | | |
| P.C. Station | 10+87.20 N | 1,001,749.7566 E | 1,377,553.1630 |
| P.T. Station | 11+09.15 N | 1,001,729.0782 E | 1,377,546.3065 |
| C.C. | N | 1,001,723.4146 E | 1,377,597.9971 |
| Back | = S 30° 26' 10.14" W | | |
| Ahead | = S 6° 15' 10.18" W | | |
| Chord Bear | = S 18° 20' 40.16" W | | |

Course from PT DW2_C2 to PC DW2_C3 S 6° 15' 10.18" W Dist 53.2627

| Curve Data | | | |
|--------------|-----------------------|------------------|----------------|
| *-----* | | | |
| Curve DW2_C3 | | | |
| P.I. Station | 11+75.82 N | 1,001,662.8043 E | 1,377,539.0450 |
| Delta | = 36° 38' 06.30" (RT) | | |
| Degree | = 141° 28' 15.82" | | |
| Tangent | = 13.4079 | | |
| Length | = 25.8958 | | |
| Radius | = 40.5000 | | |
| External | = 2.1617 | | |
| Long Chord | = 25.4569 | | |
| Mid. Ord. | = 2.0522 | | |
| P.C. Station | 11+62.41 N | 1,001,676.1324 E | 1,377,540.5053 |
| P.T. Station | 11+88.30 N | 1,001,652.9805 E | 1,377,529.9201 |
| C.C. | N | 1,001,680.5434 E | 1,377,500.2463 |
| Back | = S 6° 15' 10.18" W | | |
| Ahead | = S 42° 53' 16.48" W | | |
| Chord Bear | = S 24° 34' 13.33" W | | |

| FED. ROAD DIV. NO. | STATE | COUNTY | PROJECT ID | ROUTE NO. | SHEET NO. |
|-----------------------|-------|--------|------------|--------------|--------------|
| 3 | S.C. | OCONEE | P042512 | S-168 | 6 |

S-168 (LITTLE CHOESTOE RD.)
OVER LITTLE CHOESTOE CREEK



CONCEPTUAL ROADWAY PLANS
FOR
OCONEE COUNTY
PROJECT ID. P041166



PROJECT ID. P041166
ROAD S-51 (SNOW CREEK RD.)
STA. 109+31.00 TO STA. 114+40.00
SEE SHEET 6

END
BEGIN



OCONEE COUNTY MAP

LAYOUT

SCALE = N.T.S.

| | S-51 | TOTAL |
|-------------------------|-------|-------------|
| NET LENGTH OF ROADWAY | 0.074 | 0.074 MILES |
| NET LENGTH OF BRIDGES | 0.022 | 0.022 MILES |
| NET LENGTH OF PROJECT | 0.096 | 0.096 MILES |
| LENGTH OF EXCEPTIONS | 0.000 | 0.000 MILES |
| GROSS LENGTH OF PROJECT | 0.096 | 0.096 MILES |

EQUALITIES IN STATIONING
NONE

NOTE: EXCEPT AS MAY OTHERWISE BE SPECIFIED ON THE PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIALS AND WORKMANSHIP ON THIS PROJECT SHALL CONFORM TO THE SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2025 EDITION) AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF FINAL RFP.

NOTE: BRIDGE PLANS BOUND UNDER SEPARATE COVER

Design Reference for these plans is the:

2018

AASHTO "A Policy on Geometric Design of
Highways and Streets"

Design Reference for these plans is the:

2021

SCDOT Roadway Design Manual

Hydraulic Design Reference for these plans is the:

2009

Edition of SCDOT's "Requirements for Hydraulic Design Studies"

NPDES PERMIT INFORMATION

Disturbed Area = 0.8 Acre(s)

Project Area = 0.8 Acre(s)

Approximate Location of Roadway is

Begin

Latitude 34°37'23.6"N

Longitude 82°59'41.6"W

End

Latitude 34°37'27.5"N

Longitude 82°59'38.1"W

Hydraulic and NPDES Design
provided by:

RK&K

Designs may be obtained from the
SCDOT Regional Production Group

3 DAYS BEFORE DIGGING IN SOUTH CAROLINA

CALL 811

SOUTH CAROLINA 811 (SC811)
WWW.SC811.COM

ALL UTILITIES MAY NOT BE A MEMBER OF SC811

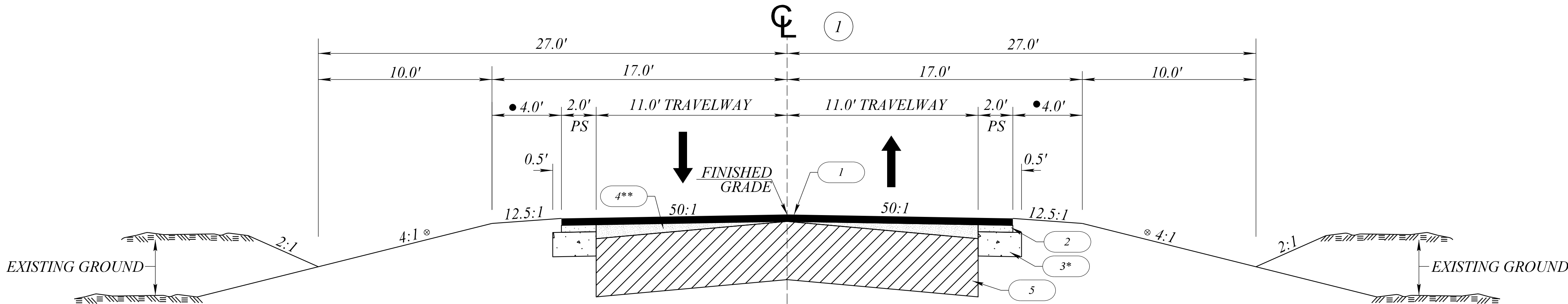
RAILROAD INVOLVEMENT?
YES / NO

TRAFFIC DATA

2025 ADT 1,400

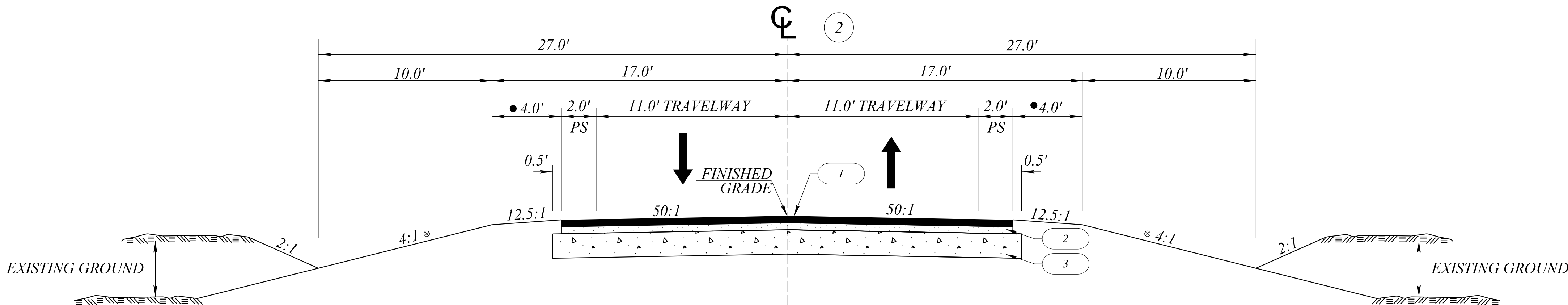
2045 ADT 1,900

TRUCKS 9 %



USE THIS SECTION ON:

S-51 FROM STA. 109+31.00 TO STA. 110+00.00
S-51 FROM STA. 113+75.00 TO STA. 114+21.00



USE THIS SECTION ON:

S-51 FROM STA. 110+00.00 TO STA. 110+74.00 (BEGIN BRIDGE)
S-51 FROM STA. 111+94.00 (END BRIDGE) TO STA. 113+75.00

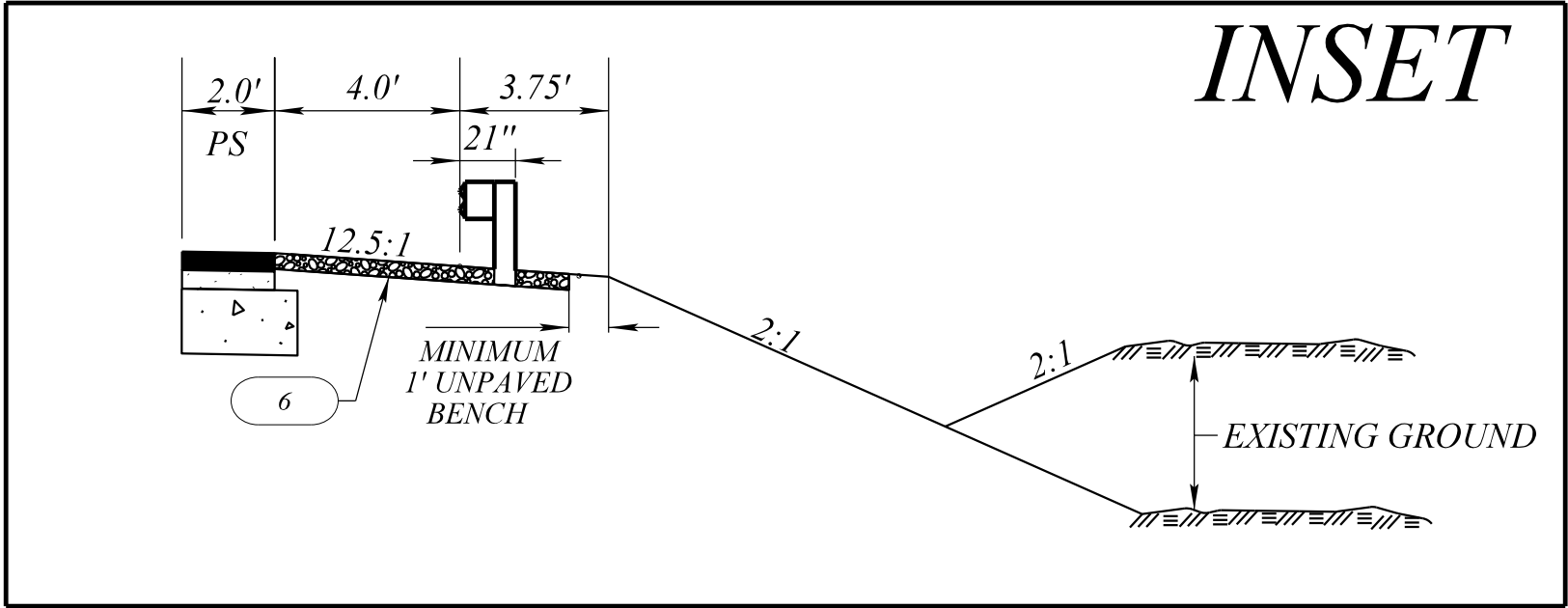
⊗ THIS SLOPE MAY BE VARIED WHEN A DEEPER DITCH IS NECESSARY FOR DRAINAGE PURPOSES.

- ADDITIONAL 3.75' WHERE MASH GUARDRAIL IS USED. PAVE EARTH SHOULDER TO NON-MOW STRIP. SEE INSET.

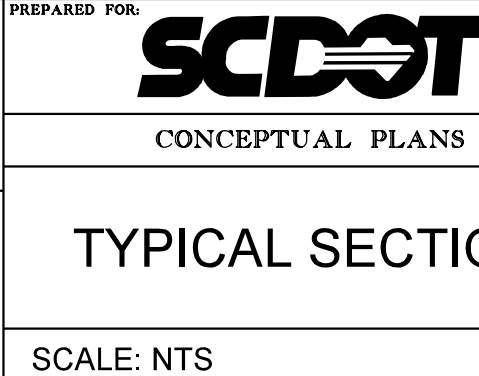
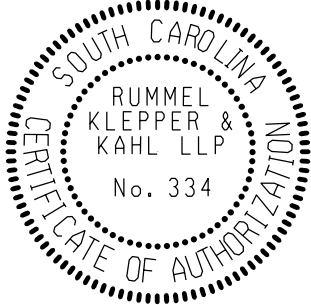
NOTE: PAVEMENT DESIGN PROVIDED IN FINAL RFP PER SCDOT

LEGEND

- | | | |
|---|--|---|
| 1 | | HOT MIX ASPHALT SURFACE COURSE TYPE C (175 LBS/SY) |
| 2 | | HOT MIX ASPHALT INTERMEDIATE COURSE TYPE C (200 LBS/SY) |
| 3 | | HOT MIX ASPHALT BASE COURSE TYPE B (850 LBS/SY) * IN AREAS WHERE EXISTING PAVEMENTS ARE WIDENED OUTSIDE THE TRAVEL LANES USE 600 PSY OF SHOULDER WIDENING MATERIAL |
| 4 | | HOT MIX ASPHALT SURFACE TYPE E FOR BUILDUP AND LEVELING 0" TO 1.5" ** HOT MIX ASPHALT INTERMEDIATE TYPE B FOR BUILDUP AND LEVELING FOR GREATER THICKNESSES |
| 5 | | EXISTING PAVEMENT - RETAIN |
| 6 | | 4" HOT MIX ASPHALT SURFACE COURSE TYPE B (GUARDRAIL NON-MOW STRIP) |



| FUNCTIONAL CLASS | DESIGN SPEED | FROM STA. | TO STA. |
|--------------------------------|--------------|-----------|-----------|
| S-51 : RURAL - MAJOR COLLECTOR | 40 | 109+31.00 | 114+21.00 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |



| FED. RD. OR. NO. | STATE | COUNTY | PROJECT ID | ROUTE NO. | SHEET NO. |
|---------------------|-------|--------|------------|--------------|--------------|
| 3 | S.C. | OCONEE | P041166 | S-51 | 5B |

S-51 (SNOW CREEK RD.)
OVER SNOW CREEK

S-51 EXISTING

Beginning chain S51 description

Point 1 N 1,019,589.4103 E 1,399,880.6031 Sta 95+90.96

Course from 1 to PC S51_C1 N 2° 33' 07.16" E Dist 2.2136

Curve Data

Curve S51_C1
P.I. Station 97+02.92 N 1,019,701.2588 E 1,399,885.5882
Delta = 16° 17' 40.34" (LT)
Degree = 7° 28' 27.13"
Tangent = 109.7459
Length = 218.0104
Radius = 766.5806
External = 7.8159
Long Chord = 217.2765
Mid. Ord. = 7.7370
P.C. Station 95+93.17 N 1,019,591.6217 E 1,399,880.7017
P.T. Station 98+11.18 N 1,019,807.8630 E 1,399,859.5170
C.C. N 1,019,625.7544 E 1,399,114.8813
Back = N 2° 33' 07.17" E
Ahead = N 13° 44' 33.18" W
Chord Bear = N 5° 35' 43.01" W

Course from PT S51_C1 to PC S51_C2 N 13° 44' 33.18" W Dist 467.9547

Curve Data

Curve S51_C2
P.I. Station 106+23.85 N 1,020,597.2649 E 1,399,666.4604
Delta = 51° 03' 11.20" (RT)
Degree = 7° 56' 14.81"
Tangent = 344.7114
Length = 643.1931
Radius = 721.8414
External = 78.0842
Long Chord = 622.1253
Mid. Ord. = 70.4621
P.C. Station 102+79.14 N 1,020,262.4215 E 1,399,748.3499
P.T. Station 109+22.33 N 1,020,871.4352 E 1,399,875.4021
C.C. N 1,020,433.9018 E 1,400,449.5271
Back = N 13° 44' 33.18" W
Ahead = N 37° 18' 38.02" E
Chord Bear = N 11° 47' 02.42" E

Course from PT S51_C2 to PC S51_C3 N 37° 18' 38.02" E Dist 626.9895

Curve Data

Curve S51_C3
P.I. Station 118+19.77 N 1,021,585.2202 E 1,400,419.3685
Delta = 24° 17' 33.01" (LT)
Degree = 4° 33' 35.00"
Tangent = 270.4449
Length = 532.7627
Radius = 1,256.5628
External = 28.7739
Long Chord = 528.7812
Mid. Ord. = 28.1298
P.C. Station 115+49.32 N 1,021,370.1187 E 1,400,255.4424
P.T. Station 120+82.08 N 1,021,848.7144 E 1,400,480.2884
C.C. N 1,022,131.7654 E 1,399,256.0204
Back = N 37° 18' 38.02" E
Ahead = N 13° 01' 05.02" E
Chord Bear = N 25° 09' 51.52" E

Course from PT S51_C3 to 2 N 13° 01' 05.02" E Dist 570.7331

Point 2 N 1,022,404.7791 E 1,400,608.8507 Sta 126+52.82

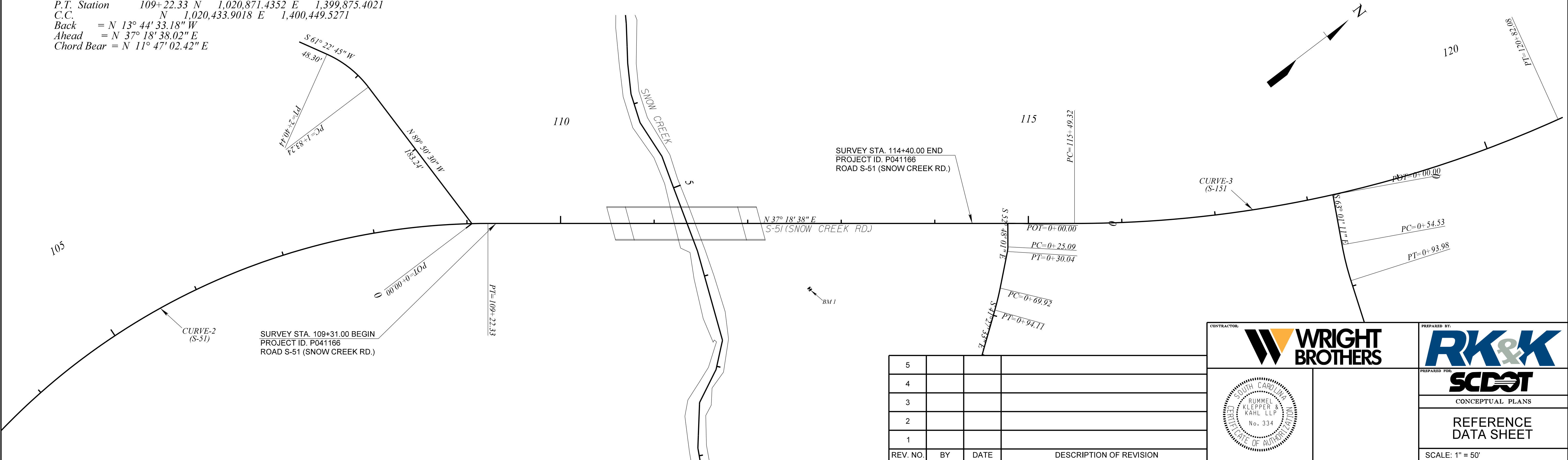
Ending chain S51 description

CURVE DATA

CURVE S51_C1
P.I. = 97+02.92
Δ = 16° 17' 40" (LT)
D = 7° 28' 27"
T = 109.75'
L = 218.01'
E = 7.82'
R = 766.58'
D.S. = 40 MPH
eMAX = MATCH. EXIST.
e = MATCH. EXIST.
P.C. - LG% = MATCH. EXIST.
P.T. - LG% = MATCH. EXIST.

CURVE S51_C2
P.I. = 106+23.85
Δ = 51° 03' 11" (RT)
D = 7° 56' 15"
T = 344.71'
L = 643.19'
E = 78.08'
R = 721.84'
D.S. = 40 MPH
eMAX = MATCH. EXIST.
e = MATCH. EXIST.
P.C. - LG% = MATCH. EXIST.
P.T. - LG% = MATCH. EXIST.

CURVE S51_C3
P.I. = 118+19.76
Δ = 24° 17' 33" (LT)
D = 4° 33' 35"
T = 270.44'
L = 532.76'
E = 28.77'
R = 1,256.56'
D.S. = 40 MPH
eMAX = MATCH. EXIST.
e = MATCH. EXIST.
P.C. - LG% = MATCH. EXIST.
P.T. - LG% = MATCH. EXIST.

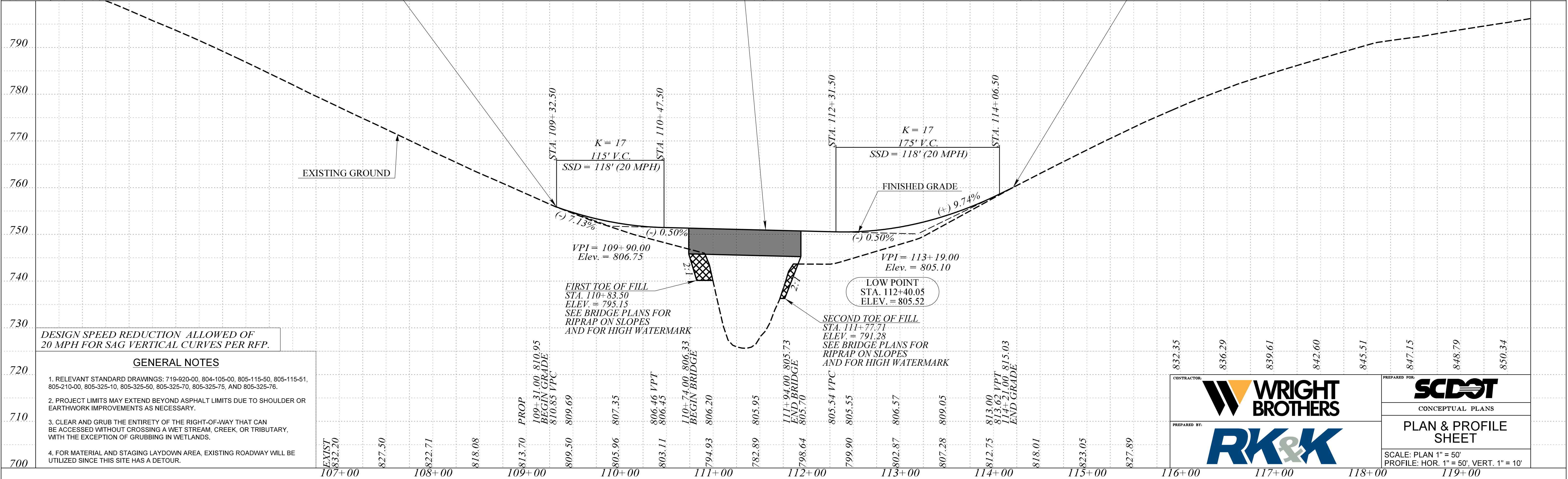
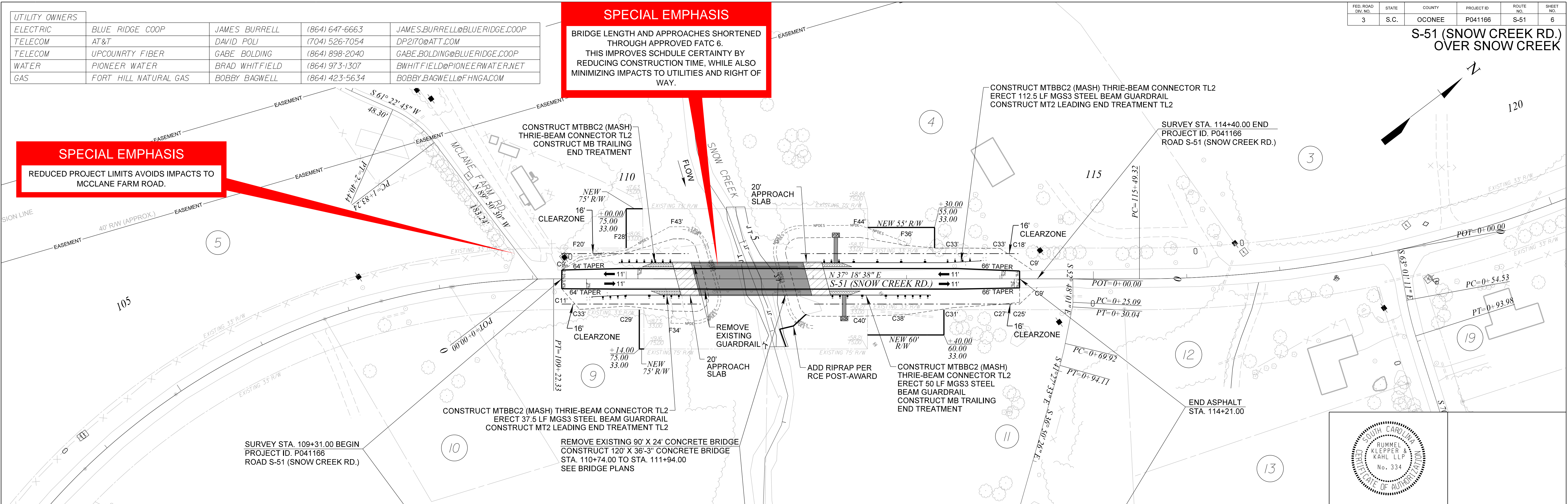





S-51 (SNOW CREEK RD.)
OVER SNOW CREEK

SPECIAL EMPHASIS

REDUCED PROJECT LIMITS AVOIDS IMPACTS TO
MCCLANE FARM ROAD.

BRIDGE LENGTH AND APPROACHES SHORTENED
THROUGH APPROVED FATC 6.
THIS IMPROVES SCHEDULE CERTAINTY BY
REDUCING CONSTRUCTION TIME, WHILE ALSO
MINIMIZING IMPACTS TO UTILITIES AND RIGHT OF
WAY.



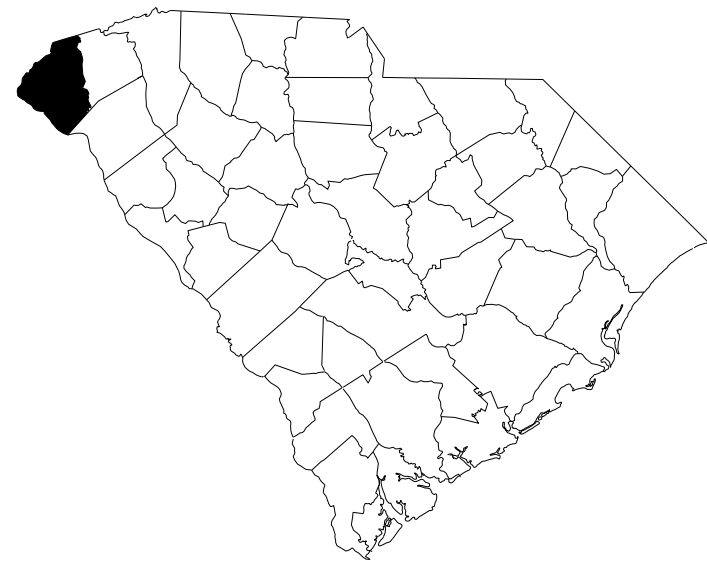
| | |
|---|--|
| CONTRACTOR:  WRIGHT BROTHERS | PREPARED FOR:  |
| | CONCEPTUAL PLANS |
| PREPARED BY:  | PLAN & PROFILE SHEET |
| | SCALE: PLAN 1" = 50' PROFILE: HOR. 1" = 50', VERT. 1" = 10' |

INDEX OF SHEETS

| SHEET NO. | DESCRIPTION | SHEET SUBTOTAL |
|----------------|-------------------------|----------------|
| 1 | TITLE SHEET | 1 |
| 3 | TYPICAL SECTION | 1 |
| 5B | REFERENCE DATA SHEET | 1 |
| 6 | PLAN AND PROFILE SHEETS | 1 |
| TOTAL SHEETS = | | 4 |



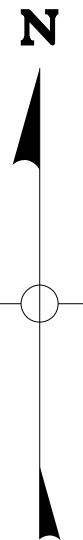
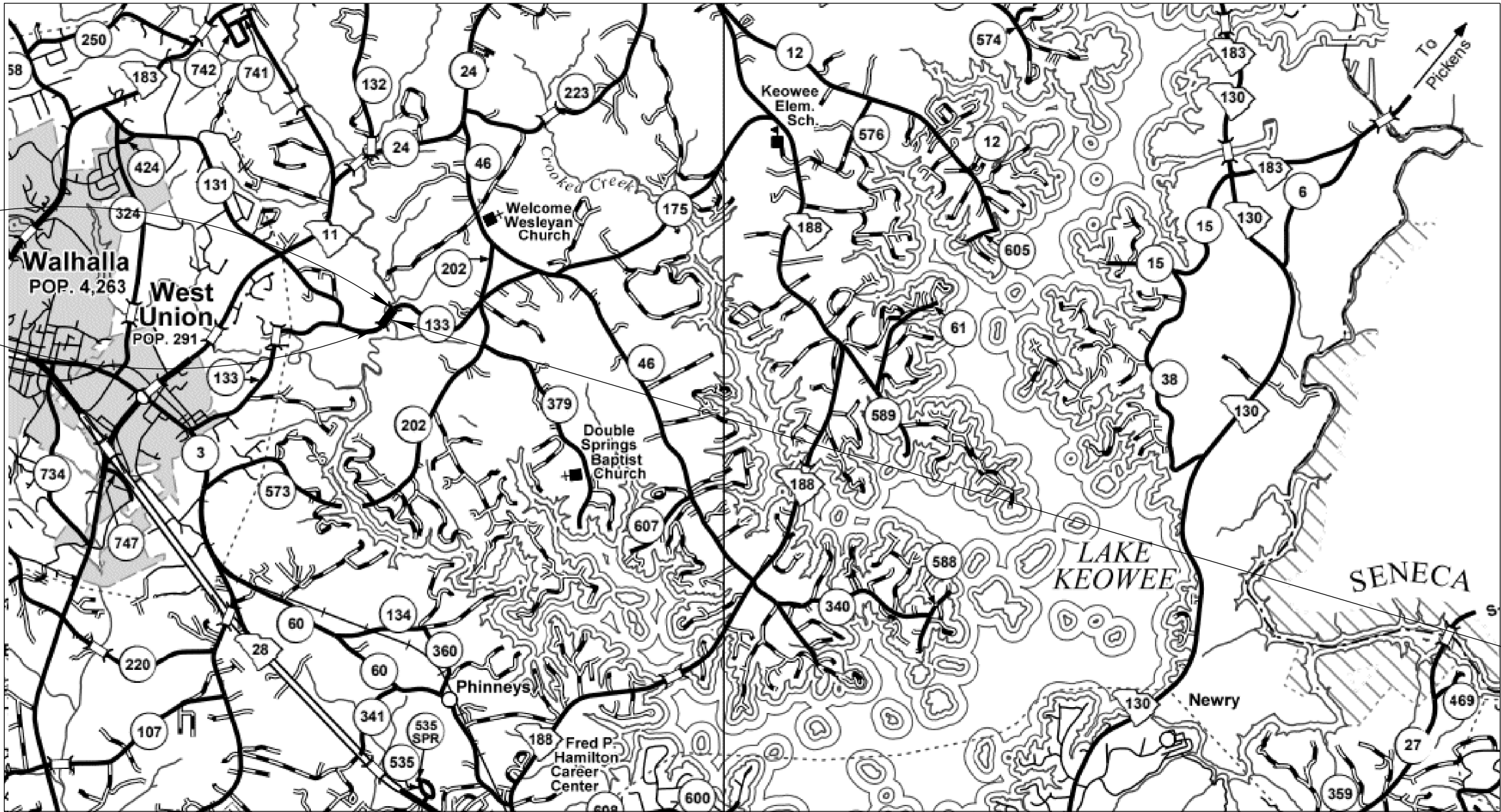
CONCEPTUAL ROADWAY PLANS
FOR
OCONEE COUNTY
PROJECT ID P041167
S-37-133 (BURNS MILL RD.)
BRIDGE APPROACHES OVER LITTLE CANE CREEK



MAP SHOWING LOCATION OF
OCONEE COUNTY IN SOUTH CAROLINA

PROJECT ID. P041167
ROAD S-133 (BURNS MILL RD.)
STA. 33+15.00 TO STA. 38+60.00
SEE SHEETS 6

BEGIN
END



CONSTRUCT 170' X 36' CONCRETE BRIDGE
STA. 34+58.50 TO STA. 36+28.50
(SEE BRIDGE PLANS)

Design Reference for these plans is the:

2018

AASHTO "A Policy on Geometric Design of
Highways and Streets"

Design Reference for these plans is the:

2021

SCDOT Roadway Design Manual

Hydraulic Design Reference for these plans is the:

2009

Edition of SCDOT's "Requirements for
Hydraulic Design Studies"

NPDES PERMIT INFORMATION

Disturbed Area = 0.6 Acre(s)
Project Area = 0.6 Acre(s)

Approximate Location of Roadway is
Begin
Latitude 34°46'10.5"N
Longitude 83°00'39.3"W
End
Latitude 34°46'04.9"N
Longitude 83°00'43.6"W

Hydraulic and NPDES Design
provided by:
RK&K
Designs may be obtained from the
SCDOT Regional Production Group

| ENVIRONMENTAL PERMIT INFORMATION | | | |
|----------------------------------|----------|---------|-------------------|
| USACE PERMIT | ___YES | ___X NO | |
| NEPA DOCUMENT | ___X YES | ___NO | |
| 401 CERTIFICATION | ___YES | ___X NO | |
| OCRM CAP | ___YES | ___X NO | |
| NAVIGABLE WATERS | ___SC | ___USCG | ___USACE ___X N/A |

3 DAYS BEFORE DIGGING IN
SOUTH CAROLINA

CALL 811

SOUTH CAROLINA 811 (SC811)
WWW.SC811.COM
ALL UTILITIES MAY NOT BE A MEMBER OF SC811

RAILROAD INVOLVEMENT?
YES / NO

| TRAFFIC DATA | |
|--------------|-------|
| 2025 ADT | 1,900 |
| 2045 ADT | 2,600 |
| TRUCKS | 4 % |

OCONEE COUNTY MAP

LAYOUT

SCALE = N.T.S.

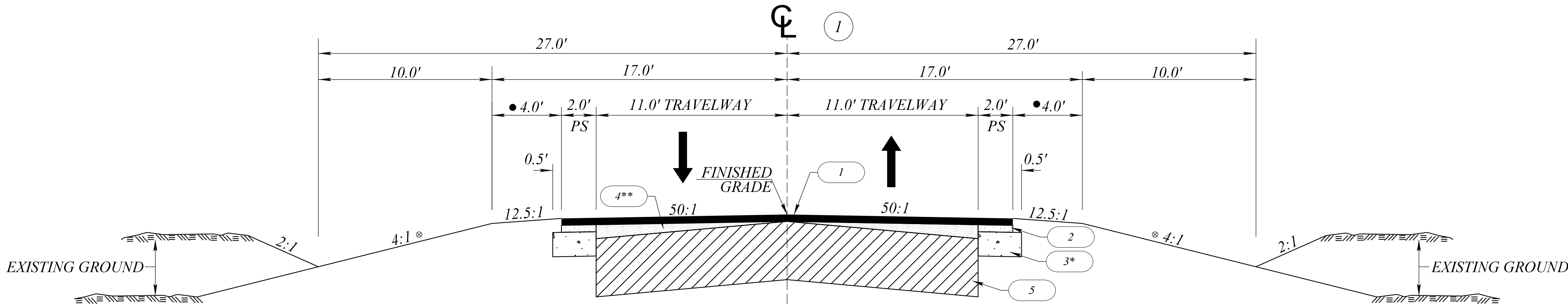
| | S-133 | TOTAL |
|-------------------------|-------|-------------|
| NET LENGTH OF ROADWAY | 0.071 | 0.071 MILES |
| NET LENGTH OF BRIDGES | 0.032 | 0.032 MILES |
| NET LENGTH OF PROJECT | 0.103 | 0.103 MILES |
| LENGTH OF EXCEPTIONS | 0.000 | 0.000 MILES |
| GROSS LENGTH OF PROJECT | 0.103 | 0.103 MILES |

EQUALITIES IN STATIONING
NONE

NOTE: EXCEPT AS MAY OTHERWISE BE SPECIFIED ON THE PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIALS AND WORKMANSHIP ON THIS PROJECT SHALL CONFORM TO THE SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2025 EDITION) AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF FINAL RFP.

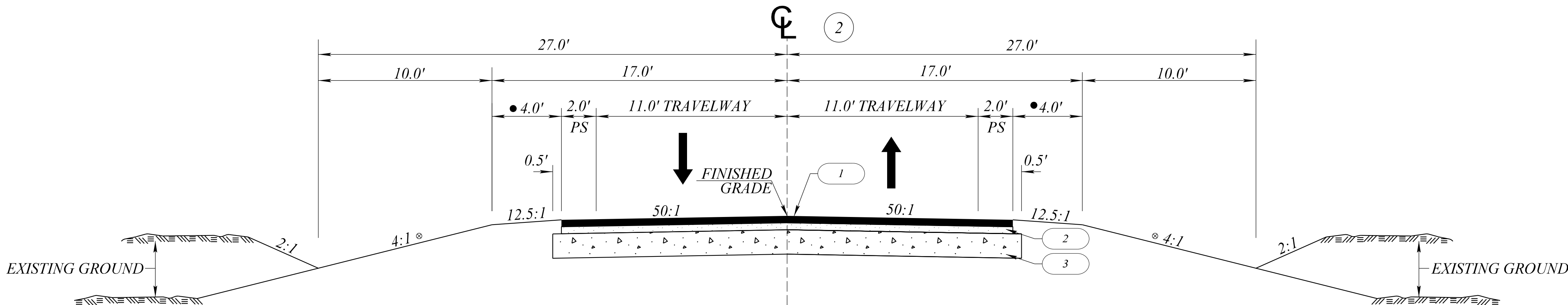
NOTE: BRIDGE PLANS BOUND UNDER SEPARATE COVER





USE THIS SECTION ON:

S-133 FROM STA. 33+ 60.00 TO 34+ 25.00
S-133 FROM STA. 37+ 25.00 TO 37+ 92.00



USE THIS SECTION ON:

S-133 FROM STA. 34+ 25.00 TO STA. 34+ 58.50 (BEGIN BRIDGE)
S-133 FROM STA. 36+ 28.50 (END BRIDGE) TO STA. 37+ 25.00

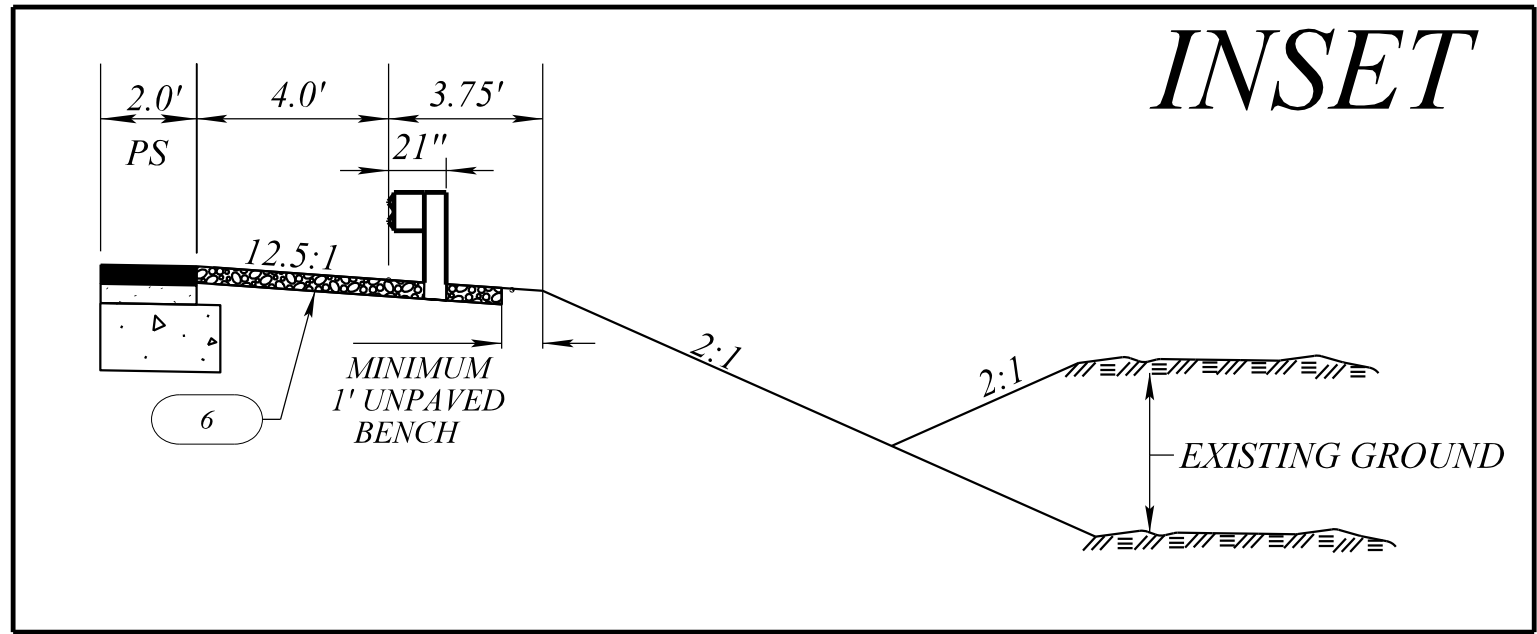
⊗ THIS SLOPE MAY BE VARIED WHEN A DEEPER DITCH IS NECESSARY FOR DRAINAGE PURPOSES.

- ADDITIONAL 3.75' WHERE MASH GUARDRAIL IS USED. PAVE EARTH SHOULDER TO NON-MOW STRIP. SEE INSET.

NOTE: PAVEMENT DESIGN PROVIDED IN FINAL RFP PER SCDOT

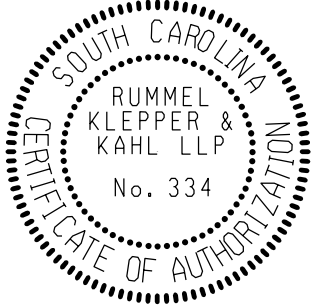
LEGEND

- | | | |
|---|--|--|
| 1 | | HOT MIX ASPHALT SURFACE COURSE TYPE C (175 LBS/SY) |
| 2 | | HOT MIX ASPHALT INTERMEDIATE COURSE TYPE C (200 LBS/SY) |
| 3 | | HOT MIX ASPHALT BASE COURSE TYPE B (850 LBS/SY) |
| 4 | | HOT MIX ASPHALT SURFACE TYPE E FOR BUILDUP AND LEVELING 0" TO 1.5" |
| 5 | | EXISTING PAVEMENT - RETAIN |
| 6 | | 4" HOT MIX ASPHALT SURFACE COURSE TYPE B (GUARDRAIL NON-MOW STRIP) |



INSET

| FUNCTIONAL CLASS | DESIGN SPEED | FROM STA. | TO STA. |
|-------------------------------|--------------|-----------|-----------|
| S-133 : RURAL - LOCAL GROUP 4 | 35 | 33+ 60.00 | 37+ 92.00 |
| | | | |
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| FED. RD. DIV. NO. | STATE | COUNTY | PROJECT ID | ROUTE NO. | SHEET NO. |
|-------------------|-------|--------|------------|-----------|-----------|
| 3 | S.C. | OCONEE | P041167 | S-133 | 5B |

S-133 (BURNS MILL RD.)
OVER LITTLE CANE CREEK

S-133 EXISTING

Beginning chain S133 description

Point 3 N 1,073,885.9420 E 1,397,389.6435 Sta 17+28.33

Course from 3 to PC S133_C1 N 58° 32' 37.51" W Dist 99.9996

Curve S133_C1
P.I. Station 19+90.63 N 1,074,022.8242 E 1,397,165.8887
Delta = 9° 43' 00.08" (RT)
Degree = 3° 00' 02.03"
Tangent = 162.3035
Length = 323.8287
Radius = 1,909.5000
External = 6.8853
Long Chord = 323.4408
Mid. Ord. = 6.8606
P.C. Station 18+28.33 N 1,073,938.1265 E 1,397,304.3399
P.T. Station 21+52.16 N 1,074,129.6741 E 1,397,043.7186
C.C. N 1,075,567.0043 E 1,398,300.8074
Back = N 58° 32' 37.51" W
Ahead = N 48° 49' 37.43" W
Chord Bear = N 53° 41' 07.47" W

Course from PT S133_C1 to PC S133_C2 N 48° 49' 37.43" W Dist 203.2408

Curve S133_C2
P.I. Station 25+63.61 N 1,074,400.5496 E 1,396,734.0050
Delta = 45° 13' 00.01" (LT)
Degree = 11° 27' 32.96"
Tangent = 208.2153
Length = 394.5899
Radius = 500.0000
External = 41.6213
Long Chord = 384.4296
Mid. Ord. = 38.4228
P.C. Station 23+55.40 N 1,074,263.4744 E 1,396,890.7340
P.T. Station 27+49.99 N 1,074,385.8667 E 1,396,526.3081
C.C. N 1,073,887.1114 E 1,396,561.5670
Back = N 48° 49' 37.43" W
Ahead = S 85° 57' 22.56" W
Chord Bear = N 71° 26' 07.43" W

Course from PT S133_C2 to PC S133_C3 S 85° 57' 22.56" W Dist 107.9891

Curve S133_C3
P.I. Station 31+02.82 N 1,074,360.9860 E 1,396,174.3582
Delta = 53° 06' 00.02" (LT)
Degree = 11° 41' 34.86"
Tangent = 244.8391
Length = 454.1173
Radius = 490.0000
External = 57.7647
Long Chord = 438.0391
Mid. Ord. = 51.6731
P.C. Station 28+57.98 N 1,074,378.2515 E 1,396,418.5878
P.T. Station 33+12.10 N 1,074,155.3127 E 1,396,041.5248
C.C. N 1,073,889.4714 E 1,396,453.1416
Back = S 85° 57' 22.56" W
Ahead = S 32° 51' 22.54" W
Chord Bear = S 59° 24' 22.55" W

Course from PT S133_C3 to PC S133_C4 S 32° 51' 22.54" W Dist 548.0102

Curve S133_C4
P.I. Station 43+01.20 N 1,073,324.4298 E 1,395,504.9018
Delta = 62° 38' 00.00" (RT)
Degree = 7° 54' 10.32"
Tangent = 441.0958
Length = 792.5395
Radius = 725.0000
External = 123.6404
Long Chord = 753.6631
Mid. Ord. = 105.6269
P.C. Station 38+60.11 N 1,073,694.9654 E 1,395,744.2110
P.T. Station 46+52.64 N 1,073,366.6272 E 1,395,065.8290
C.C. N 1,074,088.3021 E 1,395,135.1861
Back = S 32° 51' 22.54" W
Ahead = N 84° 30' 37.46" W
Chord Bear = S 64° 10' 22.54" W

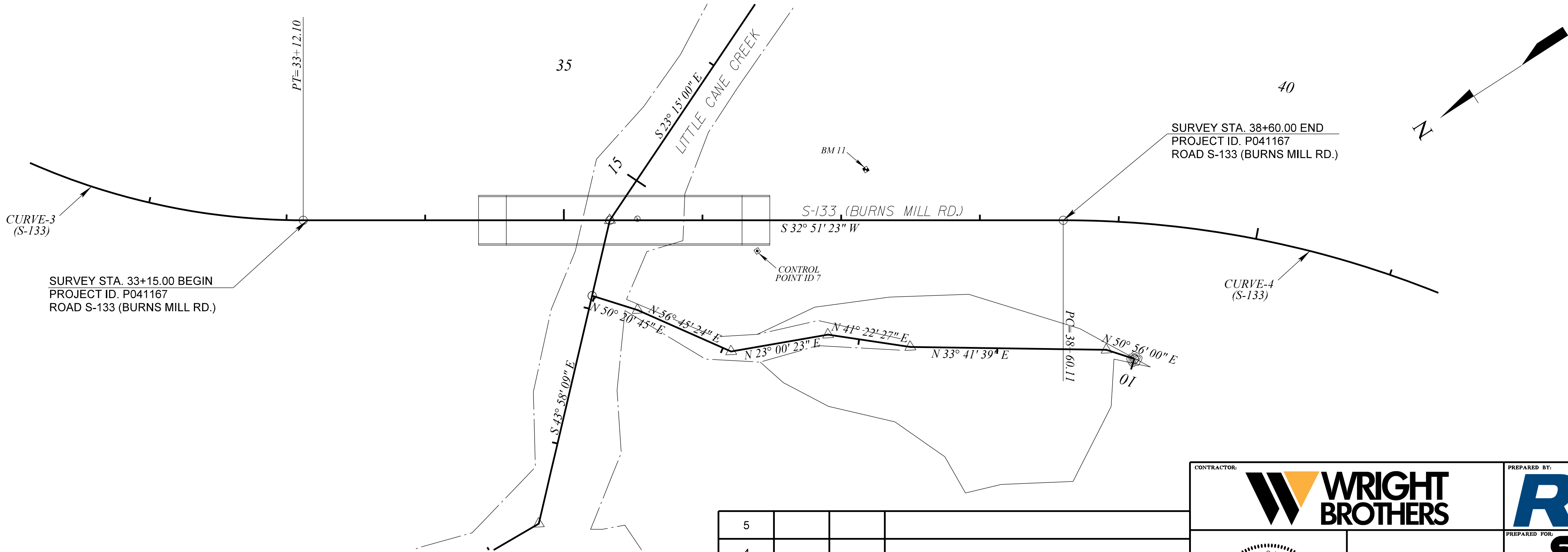
Course from PT S133_C4 to 4 N 84° 30' 37.46" W Dist 368.4042

Point 4 N 1,073,401.8706 E 1,394,699.1145 Sta 50+21.05

Ending chain S133 description

CURVE DATA

| | | | |
|--|---|---|---|
| CURVE S133_C1 P.I. = 19+90.63 Δ = 9° 43' 00" (RT) D = 3° 00' 02" T = 162.30' L = 323.83' E = 6.89' R = 1,909.50' D.S. = 35 MPH eMAX = MATCH. EXIST. e = MATCH. EXIST. P.C. - LG% = MATCH. EXIST. P.T. - LG% = MATCH. EXIST. | CURVE S133_C2 P.I. = 25+63.61 Δ = 45° 13' 00" (LT) D = 11° 27' 33" T = 208.22' L = 394.59' E = 41.62' R = 500.00' D.S. = 35 MPH eMAX = MATCH. EXIST. e = MATCH. EXIST. P.C. - LG% = MATCH. EXIST. P.T. - LG% = MATCH. EXIST. | CURVE S133_C3 P.I. = 31+02.82 Δ = 53° 06' 00" (LT) D = 11° 41' 35" T = 244.84' L = 454.12' E = 57.76' R = 490.00' D.S. = 35 MPH eMAX = MATCH. EXIST. e = MATCH. EXIST. P.C. - LG% = MATCH. EXIST. P.T. - LG% = MATCH. EXIST. | CURVE S133_C4 P.I. = 43+01.20 Δ = 62° 38' 00" (RT) D = 7° 54' 10" T = 441.10' L = 792.54' E = 123.64' R = 725.00' D.S. = 35 MPH eMAX = MATCH. EXIST. e = MATCH. EXIST. P.C. - LG% = MATCH. EXIST. P.T. - LG% = MATCH. EXIST. |
|--|---|---|---|



| | | | |
|----------|----|------|-------------------------|
| 5 | | | |
| 4 | | | |
| 3 | | | |
| 2 | | | |
| 1 | | | |
| REV. NO. | BY | DATE | DESCRIPTION OF REVISION |

| | | | |
|------------------------|--|-----------------------------|--|
| CONTRACTOR: | | PREPARED BY: | |
| | | PREPARED FOR: | |
| | | CONCEPTUAL PLANS | |
| | | REFERENCE DATA SHEET | |
| | | SCALE: 1" = 50' | |

| FED. ROAD DIST. NO. | STATE | COUNTY | PROJECT ID | ROUTE NO. | SHEET NO. |
|---------------------|-------|--------|------------|-----------|-----------|
| 3 | S.C. | OCONEE | P041167 | S-133 | 6 |

S-133 (BURNS MILL RD.)
OVER LITTLE CANE CREEK

| UTILITY OWNERS | | | | |
|----------------|------------------|---------------|----------------|------------------------------|
| ELECTRIC | BLUE RIDGE COOP | JAMES BURRELL | (864) 647-6663 | JAMES.BURRELL@BLUERIDGE.COOP |
| TELECOM | AT&T | DAVID POLI | (704) 526-7054 | DP2170@ATT.COM |
| TELECOM | OCONEE FOCUS | GABE BOLDING | (864) 898-2040 | GABE.BOLDING@BLUERIDGE.COOP |
| WATER | CITY OF WALHALLA | SCOTT PARRIS | (864) 638-4343 | SPARRIS@CITYOFWALHALLA.COM |
| SEWER | CITY OF WALHALLA | SCOTT PARRIS | (864) 638-4343 | SPARRIS@CITYOFWALHALLA.COM |

SPECIAL EMPHASIS

STEEPENED SLOPES IMPLEMENTED AT SITE THROUGH APPROVED FATC 5. USING 1.5:1 SLOPES ALLOWED OUR TEAM TO MINIMIZE ROCK EXCAVATION AND RIGHT OF WAY IMPACTS ASSOCIATED WITH IMPLEMENTING FLATTER SLOPES AT THIS LOCATION.

SPECIAL EMPHASIS

BRIDGE LENGTH AND APPROACHES SHORTENED THROUGH APPROVED FATC 3. THIS IMPROVES SCHEDULE CERTAINTY BY REDUCING CONSTRUCTION TIME, WHILE ALSO MINIMIZING IMPACTS TO UTILITIES AND RIGHT OF WAY.

SPECIAL EMPHASIS

STEEPENED SLOPES IMPLEMENTED AT SITE THROUGH APPROVED FATC 5. USING 1.5:1 SLOPES ALLOWED OUR TEAM TO AVOID IMPACTS TO THIS JURISDICTIONAL WETLAND AVOIDING COSTLY WETLAND MITIGATION CREDIT PURCHASES.

SPECIAL EMPHASIS

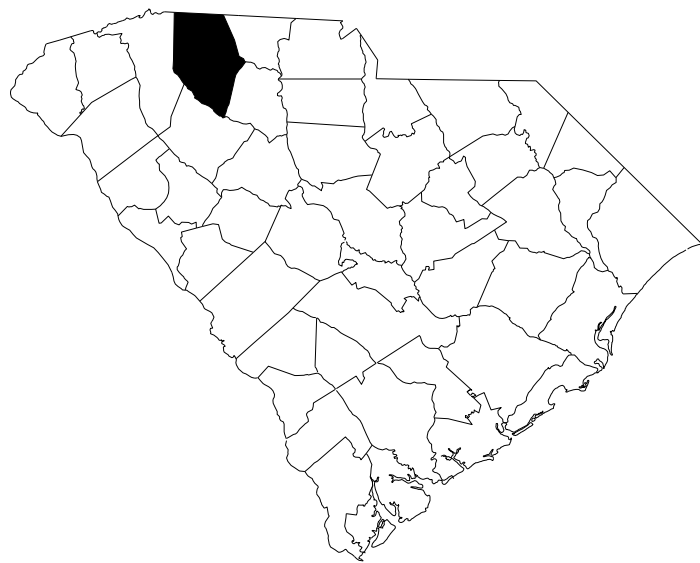
SAG VERTICAL CURVE IS ALLOWED ON BRIDGE THROUGH APPROVED FATC 4. THIS ALLOWED OUR TEAM TO OPTIMIZED THE ROADWAY PROFILE MINIMIZING IMPACTS TO UTILITIES AND RIGHT OF WAY.

GENERAL NOTES

- RELEVANT STANDARD DRAWINGS: 719-920-00, 804-105-00, 805-115-50, 805-115-51, 805-210-00, 805-325-10, 805-325-50, 805-325-70, 805-325-75, AND 805-325-76.
- PROJECT LIMITS MAY EXTEND BEYOND ASPHALT LIMITS DUE TO SHOULDER OR EARTHWORK IMPROVEMENTS AS NECESSARY.
- CLEAR AND GRUB THE ENTIRETY OF THE RIGHT-OF-WAY THAT CAN BE ACCESSED WITHOUT CROSSING A WET STREAM, CREEK, OR TRIBUTARY, WITH THE EXCEPTION OF GRUBBING IN WETLANDS.
- FOR MATERIAL AND STAGING LAYDOWN AREA, EXISTING ROADWAY WILL BE UTILIZED SINCE THIS SITE HAS A DETOUR.

INDEX OF SHEETS

| SHEET NO. | DESCRIPTION | SHEET SUBTOTAL |
|----------------|-------------------------|----------------|
| 1 | TITLE SHEET | 1 |
| 3 | TYPICAL SECTION | 1 |
| 5B | REFERENCE DATA SHEET | 1 |
| 6 | PLAN AND PROFILE SHEETS | 1 |
| TOTAL SHEETS = | | 4 |



MAP SHOWING LOCATION OF
SPARTANBURG COUNTY IN SOUTH CAROLINA

PROJECT ID. P041164
S-197 (OLD SPARTANBURG HWY)
STA. 64+40.00 TO STA. 73+35.00
SEE SHEET 6

| ENVIRONMENTAL PERMIT INFORMATION | | | | |
|----------------------------------|----------|---------|----------|--------|
| USACE PERMIT | ___YES | ___X NO | | |
| NEPA DOCUMENT | ___X YES | ___NO | | |
| 401 CERTIFICATION | ___YES | ___X NO | | |
| OCRM CAP | ___YES | ___X NO | | |
| NAVIGABLE WATERS | ___X SC | ___USCG | ___USACE | ___N/A |

3 DAYS BEFORE DIGGING IN
SOUTH CAROLINA

CALL 811

SOUTH CAROLINA 811 (SC811)
WWW.SC811.COM
ALL UTILITIES MAY NOT BE A MEMBER OF SC811

RAILROAD INVOLVEMENT?
YES / NO

TRAFFIC DATA

2025 ADT 1,200

2045 ADT 1,600

TRUCKS 5 %



CONCEPTUAL ROADWAY PLANS
FOR
SPARTANBURG COUNTY
PROJECT ID. P041164

S-42-197 (OLD SPARTANBURG HWY)
BRIDGE APPROACHES OVER SOUTH TYGER RIVER



SPARTANBURG COUNTY MAP

LAYOUT

SCALE = N.T.S.

| | S-197 | TOTAL |
|-------------------------|-------|-------------|
| NET LENGTH OF ROADWAY | 0.132 | 0.132 MILES |
| NET LENGTH OF BRIDGES | 0.037 | 0.037 MILES |
| NET LENGTH OF PROJECT | 0.169 | 0.169 MILES |
| LENGTH OF EXCEPTIONS | 0.000 | 0.000 MILES |
| GROSS LENGTH OF PROJECT | 0.169 | 0.169 MILES |

EQUALITIES IN STATIONING
NONE

NOTE: EXCEPT AS MAY OTHERWISE BE SPECIFIED ON THE PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIALS AND WORKMANSHIP ON THIS PROJECT SHALL CONFORM TO THE SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2025 EDITION) AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF FINAL RFP.

NOTE: BRIDGE PLANS BOUND UNDER SEPARATE COVER



A COLAS COMPANY



| SHEET NO. | TOTAL SHEETS |
|-----------|--------------|
| 1 | 4 |

Design Reference for these plans is the:

2018

AASHTO "A Policy on Geometric Design of
Highways and Streets"

Design Reference for these plans is the:

2021

SCDOT Roadway Design Manual

Hydraulic Design Reference for these plans is the:

2009

Edition of SCDOT's "Requirements for
Hydraulic Design Studies"

NPDES PERMIT INFORMATION

Disturbed Area = 1.3 Acre(s)

Project Area = 3.3 Acre(s)

Approximate Location of Roadway is

Begin

Latitude 34°49'16.7"N

Longitude 82°00'45.7"W

End

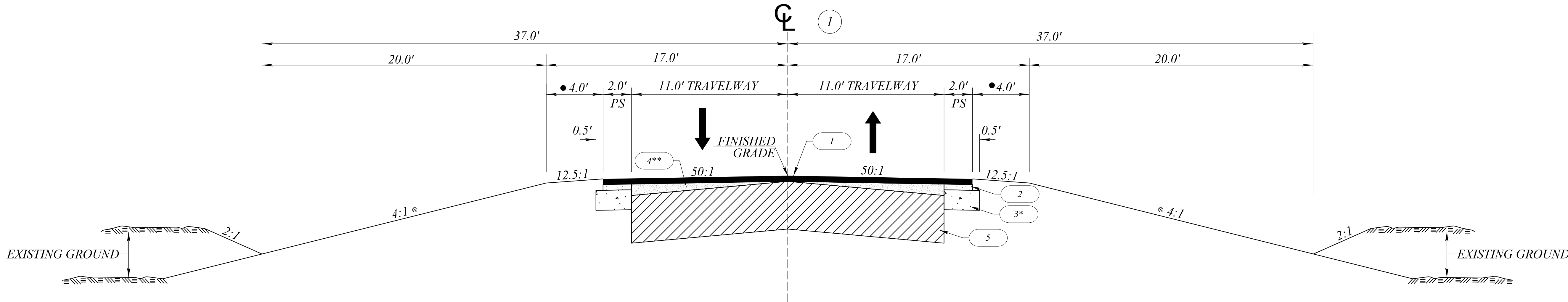
Latitude 34°49'24.6"N

Longitude 82°00'49.7"W

Hydraulic and NPDES Design
provided by:

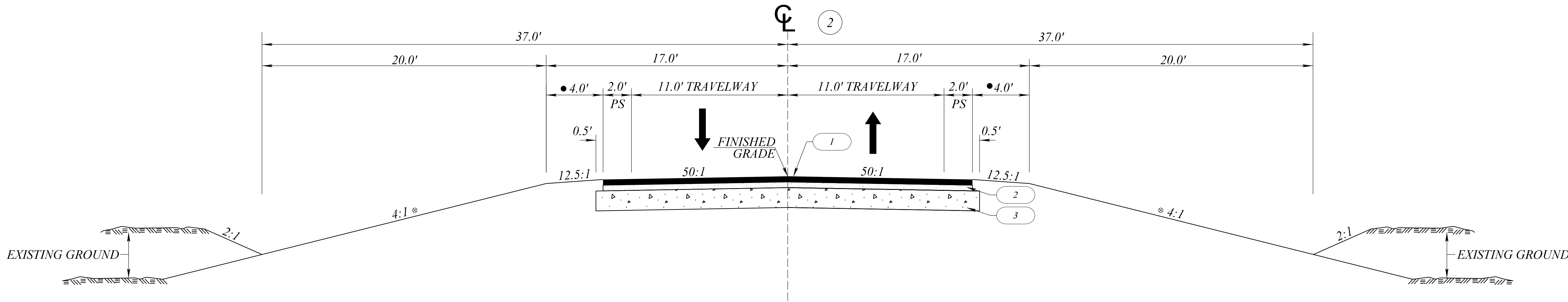
RK&K

Designs may be obtained from the
SCDOT Regional Production Group



USE THIS SECTION ON:

S-197 FROM STA. 64+ 40.00 TO STA. 65+ 25.00
S-197 FROM STA. 72+ 50.00 TO STA. 73+ 35.00



USE THIS SECTION ON:

S-197 FROM STA. 65+ 25.00 TO STA. 67+ 90.00 (BEGIN BRIDGE)
S-197 FROM STA. 69+ 90.00 (END BRIDGE) TO STA. 72+ 50.00

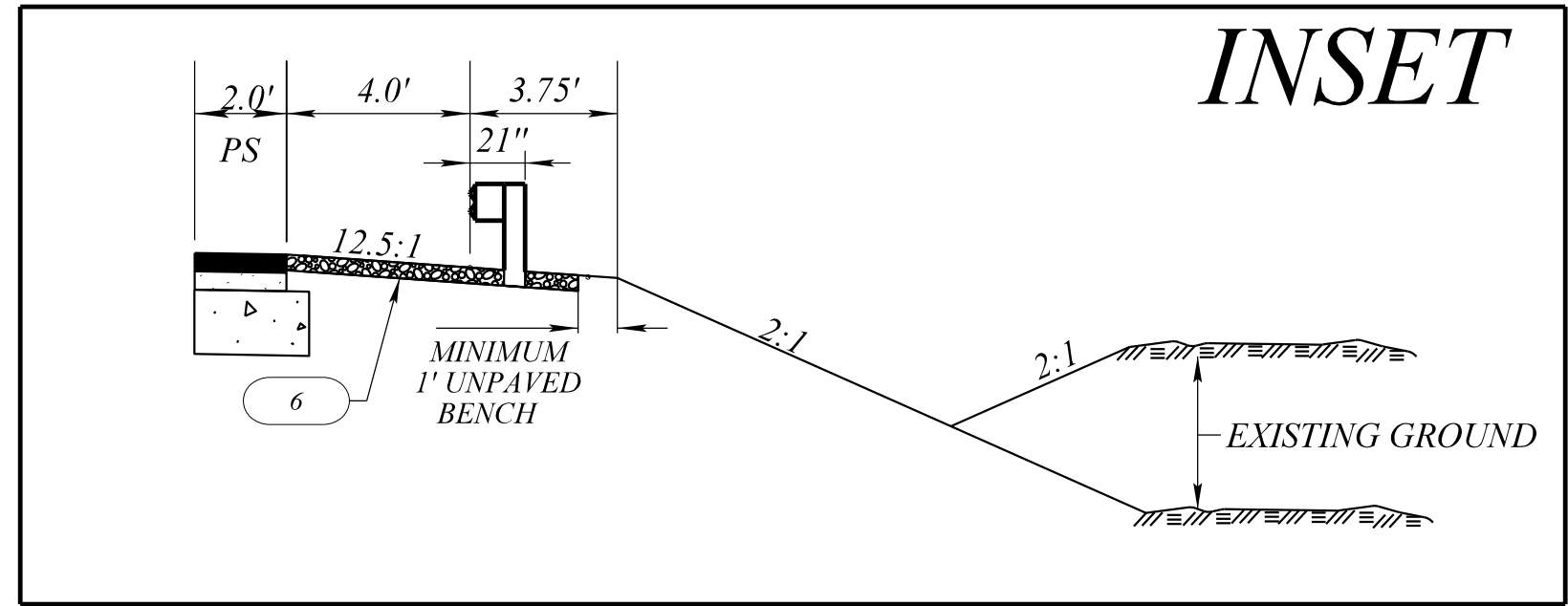
⊗ THIS SLOPE MAY BE VARIED WHEN A DEEPER DITCH IS NECESSARY FOR DRAINAGE PURPOSES.

- ADDITIONAL 3.75' WHERE MASH GUARDRAIL IS USED. PAVE EARTH SHOULDER TO NON-MOW STRIP. SEE INSET.

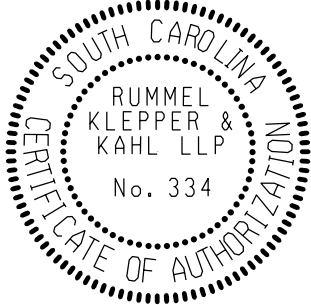
NOTE: PAVEMENT DESIGN PROVIDED IN FINAL RFP PER SCDOT

LEGEND

- | | | |
|---|--|--|
| 1 | | HOT MIX ASPHALT SURFACE COURSE TYPE C (175 LBS/SY) |
| 2 | | HOT MIX ASPHALT INTERMEDIATE COURSE TYPE C (200 LBS/SY) |
| 3 | | HOT MIX ASPHALT BASE COURSE TYPE B (650 LBS/SY) |
| 4 | | HOT MIX ASPHALT SURFACE TYPE E FOR BUILDUP AND LEVELING 0" TO 1.5" |
| 5 | | EXISTING PAVEMENT - RETAIN |
| 6 | | 4" HOT MIX ASPHALT SURFACE COURSE TYPE B (GUARDRAIL NON-MOW STRIP) |



| FUNCTIONAL CLASS | DESIGN SPEED | FROM STA. | TO STA. |
|---------------------------------|--------------|-----------|-----------|
| S-197 : RURAL - MAJOR COLLECTOR | 45 | 64+ 40.00 | 73+ 35.00 |
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|--------------|-----------------|---------------|------------------|
| CONTRACTOR: | REEVES | PREPARED FOR: | SCDOT |
| PREPARED BY: | RK&K | | CONCEPTUAL PLANS |
| | | | TYPICAL SECTION |
| | | | SCALE: NTS |

| FED. RD. DIV. NO. | STATE | COUNTY | PROJECT ID | ROUTE NO. | SHEET NO. |
|-------------------|-------|-------------|------------|-----------|-----------|
| 3 | S.C. | SPARTANBURG | P041164 | S-197 | 5B |

S-197 (OLD SPARTANBURG HWY)
OVER SOUTH TYGER RIVER

S-197 EXISTING

Beginning chain S197 description

Point 1 N 1,087,538.5769 E 1,695,866.1216 Sta 52+95.50

Course from 1 to 2 N 7° 08' 26.90" E Dist 358.4913

Point 2 N 1,087,894.2876 E 1,695,910.6850 Sta 56+53.99

Course from 2 to PC S197_C1 N 6° 26' 38.78" E Dist 197.2023

Curve Data

Curve S197_C1
P.I. Station 60+27.16 N 1,088,265.1006 E 1,695,952.5674
Delta = 7° 08' 38.63" (RT)
Degree = 2° 01' 57.22"
Tangent = 175.9684
Length = 351.4808
Radius = 2,818.8945
External = 5.4870
Long Chord = 351.2532
Mid. Ord. = 5.4764
P.C. Station 58+51.19 N 1,088,090.2440 E 1,695,932.8178
P.T. Station 62+02.67 N 1,088,436.1436 E 1,695,993.9097
C.C. N 1,087,773.8685 E 1,698,733.9020
Back = N 6° 26' 38.78" E
Ahead = N 13° 35' 17.41" E
Chord Bear = N 10° 00' 58.09" E

Course from PT S197_C1 to PC S197_C2 N 13° 35' 17.41" E Dist 186.2818

Curve Data

Curve S197_C2
P.I. Station 65+70.63 N 1,088,793.8000 E 1,696,080.3577
Delta = 50° 28' 41.92" (LT)
Degree = 14° 52' 00.67"
Tangent = 181.6739
Length = 339.5360
Radius = 385.3928
External = 40.6741
Long Chord = 328.6611
Mid. Ord. = 36.7912
P.C. Station 63+88.95 N 1,088,617.2113 E 1,696,037.6750
P.T. Station 67+28.49 N 1,088,939.1006 E 1,695,971.3020
C.C. N 1,088,707.7560 E 1,695,663.0695
Back = N 13° 35' 17.41" E
Ahead = N 36° 53' 24.51" W
Chord Bear = N 11° 39' 03.55" W

Course from PT S197_C2 to 3 N 36° 53' 24.51" W Dist 282.8595

Point 3 N 1,089,165.3282 E 1,695,801.5064 Sta 70+11.35

Course from 3 to PC S197_C3 N 34° 28' 29.07" W Dist 19.9999

Curve Data

Curve S197_C3
P.I. Station 72+27.77 N 1,089,343.7437 E 1,695,679.0006
Delta = 50° 09' 43.65" (RT)
Degree = 13° 39' 07.69"
Tangent = 196.4250
Length = 367.4306
Radius = 419.6836
Long Chord = 355.8078
Mid. Ord. = 39.5724
P.C. Station 70+31.35 N 1,089,181.8157 E 1,695,790.1856
P.T. Station 73+98.78 N 1,089,532.8522 E 1,695,732.1117
C.C. N 1,089,419.3746 E 1,696,136.1626
Back = N 34° 28' 29.07" W
Ahead = N 15° 41' 14.58" E
Chord Bear = N 9° 23' 37.24" W

Course from PT S197_C3 to PC S197_C4 N 15° 41' 14.58" E Dist 198.9142

Curve Data

Curve S197_C4
P.I. Station 77+21.61 N 1,089,843.6580 E 1,695,819.4014
Delta = 10° 32' 57.14" (LT)
Degree = 4° 16' 07.09"
Tangent = 123.9167
Length = 247.1329
Radius = 1,342.2500
External = 5.7079
Long Chord = 246.7840
Mid. Ord. = 5.6837
P.C. Station 75+97.69 N 1,089,724.3570 E 1,695,785.8958
P.T. Station 78+44.83 N 1,089,967.0768 E 1,695,830.4991
C.C. N 1,090,087.2859 E 1,694,493.6428
Back = N 15° 41' 14.58" E
Ahead = N 5° 08' 17.44" E
Chord Bear = N 10° 24' 46.01" E

Course from PT S197_C4 to 4 N 5° 08' 17.44" E Dist 645.4477

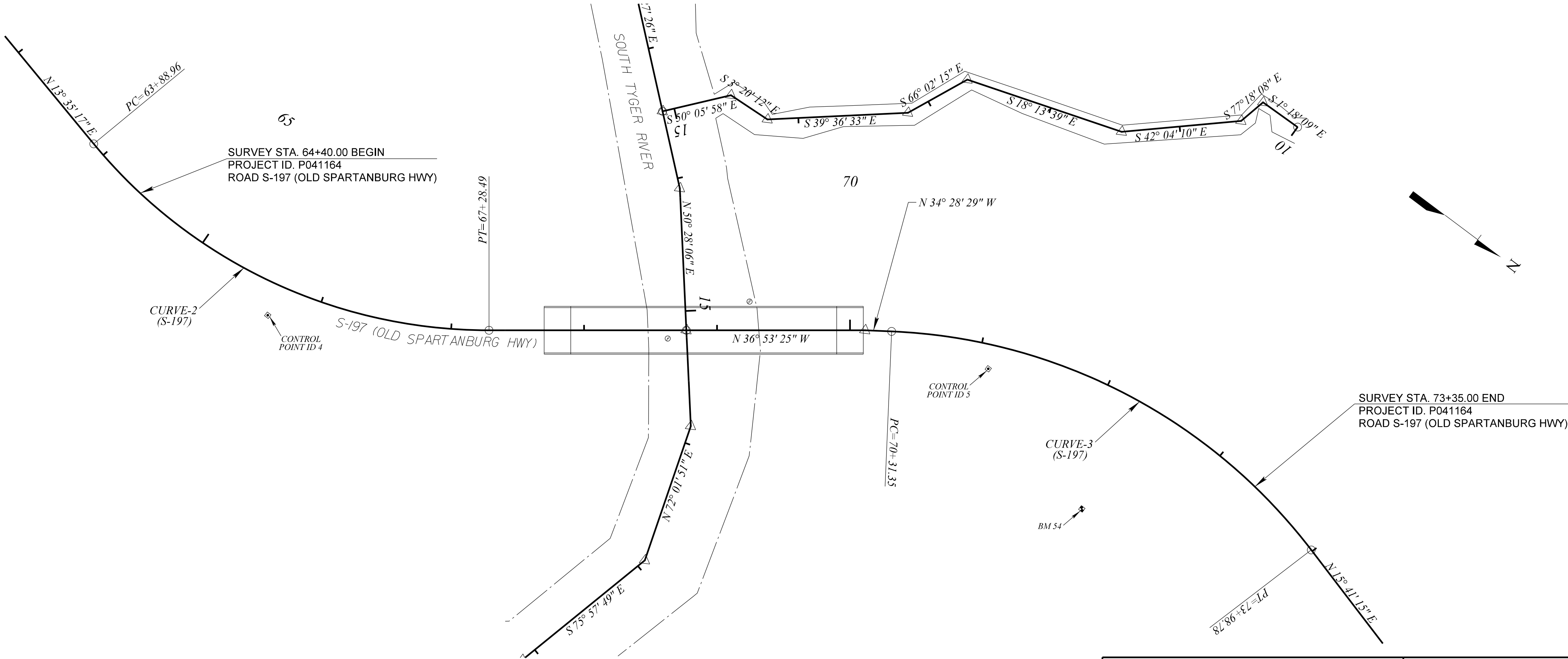
Point 4 N 1,090,609.9308 E 1,695,888.3041 Sta 84+90.27

Ending chain S197 description

CURVE DATA

CURVE S197_C2
P.I. = 65+70.63
Δ = 50° 28' 42" (LT)
D = 14° 52' 01"
T = 181.67'
L = 339.54'
E = 40.67'
R = 385.39'
D.S. = 35 MPH
eMAX = 6.0%
e = 6.0%
P.C. - LG% = 0.62%
P.T. - LG% = 0.62%

CURVE S197_C3
P.I. = 72+27.78
Δ = 50° 09' 44" (RT)
D = 13° 39' 08"
T = 196.43'
L = 367.43'
E = 43.69'
R = 419.68'
D.S. = 35 MPH
eMAX = 6.0%
e = 6.0%
P.C. - LG% = 0.62%
P.T. - LG% = 0.62%



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| 1 | | | |
| REV. NO. | BY | DATE | DESCRIPTION OF REVISION |

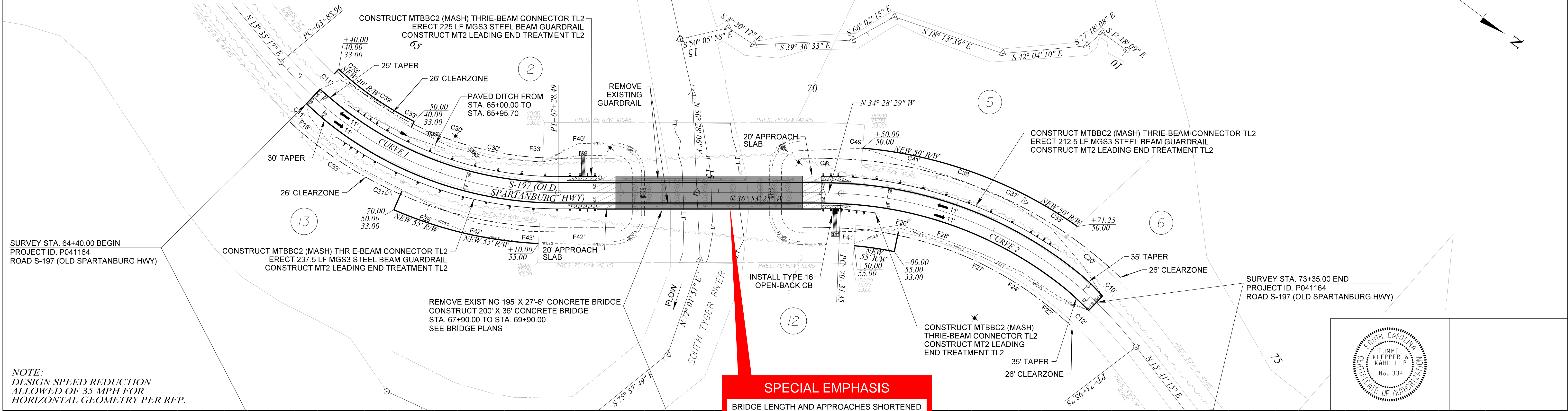
CONTRACTOR:
REEVES

PREPARED FOR:
SCDOT
CONCEPTUAL PLANS
REFERENCE DATA SHEET
SCALE: 1" = 50'

| UTILITY OWNERS | | | | |
|----------------|---------------------------------|------------------|----------------------------|----------------|
| ELECTRIC | LAURENS ELECTRIC COOP | JEFF SATTERFIELD | JEFFS@LAURENSELECTRIC.COM | (864) 449-0021 |
| TELECOM | AT&T | DAVID POLI | DP2170@ATT.COM | (704) 526-7054 |
| CATV | CHARTER | LANCE ROPER | LANCE.ROPER@CHARTER.COM | (864) 494-4822 |
| WATER | WOODRUFF-ROEBUCK WATER DISTRICT | CHARLIE WILSON | CWILSON@WRWD.ORG | (864) 251-3395 |
| GAS | PIEDMONT NATURAL GAS | JASON HUFF | JASON.HUFF@DUKE-ENERGY.COM | (864) 419-4103 |
| GAS | CAROLINA GAS TRANSMISSION | MATTHEW WALKER | MATTHEW.WALKER@BHEGTS.COM | (803) 394-9262 |

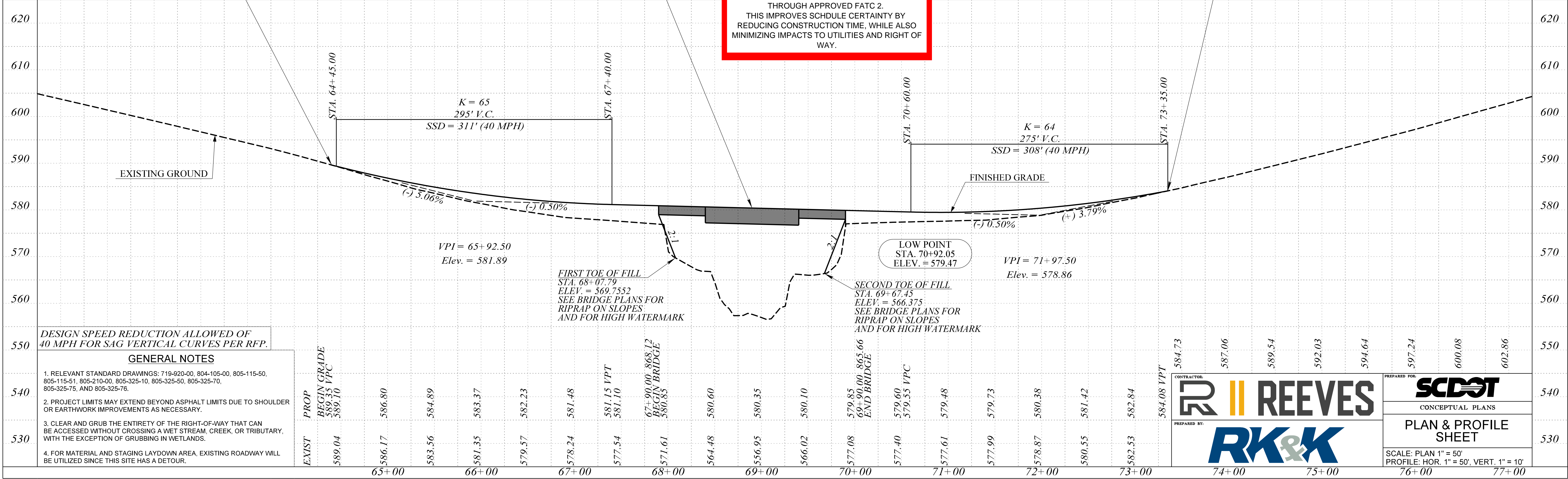
| FED. ROAD DIST. NO. | STATE | COUNTY | PROJECT ID | ROUTE NO. | SHEET NO. |
|---------------------|-------|-------------|------------|-----------|-----------|
| 3 | S.C. | SPARTANBURG | P041164 | S-197 | 6 |

S-197 (OLD SPARTANBURG HWY)
OVER SOUTH TYGER RIVER



NOTE:
DESIGN SPEED REDUCTION
ALLOWED OF 35 MPH FOR
HORIZONTAL GEOMETRY PER RFP.

SPECIAL EMPHASIS
BRIDGE LENGTH AND APPROACHES SHORTENED
THROUGH APPROVED FATC 2.
THIS IMPROVES SCHEDULE CERTAINTY BY
REDUCING CONSTRUCTION TIME, WHILE ALSO
MINIMIZING IMPACTS TO UTILITIES AND RIGHT OF
WAY.



DESIGN SPEED REDUCTION ALLOWED OF
40 MPH FOR SAG VERTICAL CURVES PER RFP.

GENERAL NOTES

- RELEVANT STANDARD DRAWINGS: 719-920-00, 804-105-00, 805-115-50, 805-115-51, 805-210-00, 805-325-10, 805-325-50, 805-325-70, 805-325-75, AND 805-325-76.
- PROJECT LIMITS MAY EXTEND BEYOND ASPHALT LIMITS DUE TO SHOULDER OR EARTHWORK IMPROVEMENTS AS NECESSARY.
- CLEAR AND GRUB THE ENTIRETY OF THE RIGHT-OF-WAY THAT CAN BE ACCESSED WITHOUT CROSSING A WET STREAM, CREEK, OR TRIBUTARY, WITH THE EXCEPTION OF GRUBBING IN WETLANDS.
- FOR MATERIAL AND STAGING LAYDOWN AREA, EXISTING ROADWAY WILL BE UTILIZED SINCE THIS SITE HAS A DETOUR.

| EXIST | PROP |
|--------|---|
| | BEGIN GRADE 589.35 VPC 589.10 |
| 589.04 | |
| 65+00 | 586.17 586.80 |
| 66+00 | 583.56 584.89 |
| | 581.35 583.37 |
| 579.57 | 582.23 |
| 67+00 | 578.24 581.48 |
| 577.54 | 581.15 VPT 581.10 |
| 68+00 | 67+90.00, 868.12 BEGIN BRIDGE 580.85 |
| 564.48 | 580.60 |
| 69+00 | 556.95 580.35 |
| 566.02 | 580.10 |
| 70+00 | 579.85 579.85 69+90.00, 865.66 END BRIDGE |
| 577.40 | 579.60 579.55 VPC |
| 71+00 | 577.61 579.48 |
| 577.99 | 579.73 |
| 72+00 | 578.87 580.38 |
| 580.55 | 581.42 |
| 73+00 | 582.53 582.84 |

CONTRACTOR:

PREPARED BY:

PREPARED FOR:

CONCEPTUAL PLANS

PLAN & PROFILE SHEET

SCALE: PLAN 1" = 50'
PROFILE: HOR. 1" = 50', VERT. 1" = 10'

Appendix A.2

Bridge Plans



INDEX OF SHEETS

- 1. TITLE SHEET
- 2. BRIDGE PLAN AND PROFILE
- 3. END BENTS 1 AND 2
- 4. SUPERSTRUCTURE TYPICAL SECTION



SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

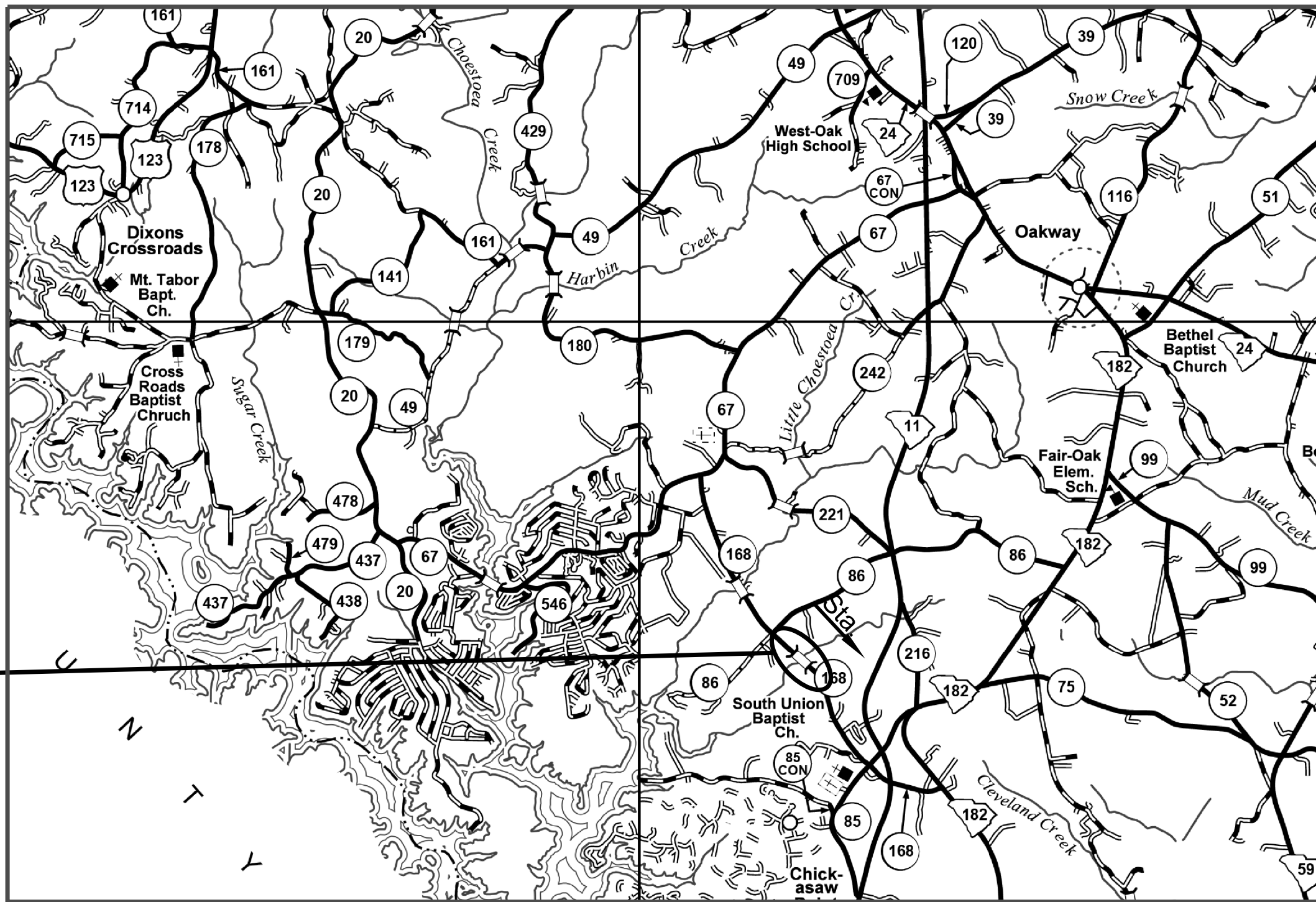


CONCEPTUAL PLANS
FOR
OCONEE COUNTY
PROJECT ID P042511
ROUTE S-37-168 (LITTLE CHOESTOE A ROAD)
REPLACE BRIDGE OVER TRIBUTARY TO CHOESTOE A CREEK

DESIGN REFERENCE FOR THESE PLANS IS THE:

LVB

SUPPLEMENTAL DESIGN CRITERIA FOR
LOW VOLUME BRIDGE REPLACEMENT PROJECTS



SITE LOCATION

=N=

APPROXIMATE LOCATION OF BRIDGE IS

LATITUDE 34°- 33' - 43" N

LONGITUDE 83°- 03' - 38" W

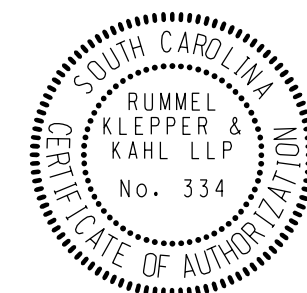


LAYOUT

| | | |
|-------------------------|-------|-------|
| NET LENGTH OF ROADWAY | 0.000 | MILES |
| NET LENGTH OF BRIDGES | 0.021 | MILES |
| NET LENGTH OF PROJECT | 0.021 | MILES |
| LENGTH OF EXCEPTIONS | 0.000 | MILES |
| GROSS LENGTH OF PROJECT | 0.021 | MILES |

NOTE: EXCEPT AS MAY OTHERWISE BE SPECIFIED ON THE PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIALS AND WORKMANSHIP ON THIS PROJECT SHALL CONFORM TO THE SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF LETTING.

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FOR CONSTRUCTION

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

3 DAYS BEFORE DIGGING IN
SOUTH CAROLINA

CALL 811

SOUTH CAROLINA 811 (SC811)

WWW.SC811.COM

ALL UTILITIES MAY NOT BE A MEMBER OF SC811

ASSET ID NOT ASSIGNED

TRAFFIC DATA

2025 ADT 650 V.P.D.

2045* ADT 950* V.P.D.

TRUCKS 6 %

* DESIGN TRAFFIC DATA

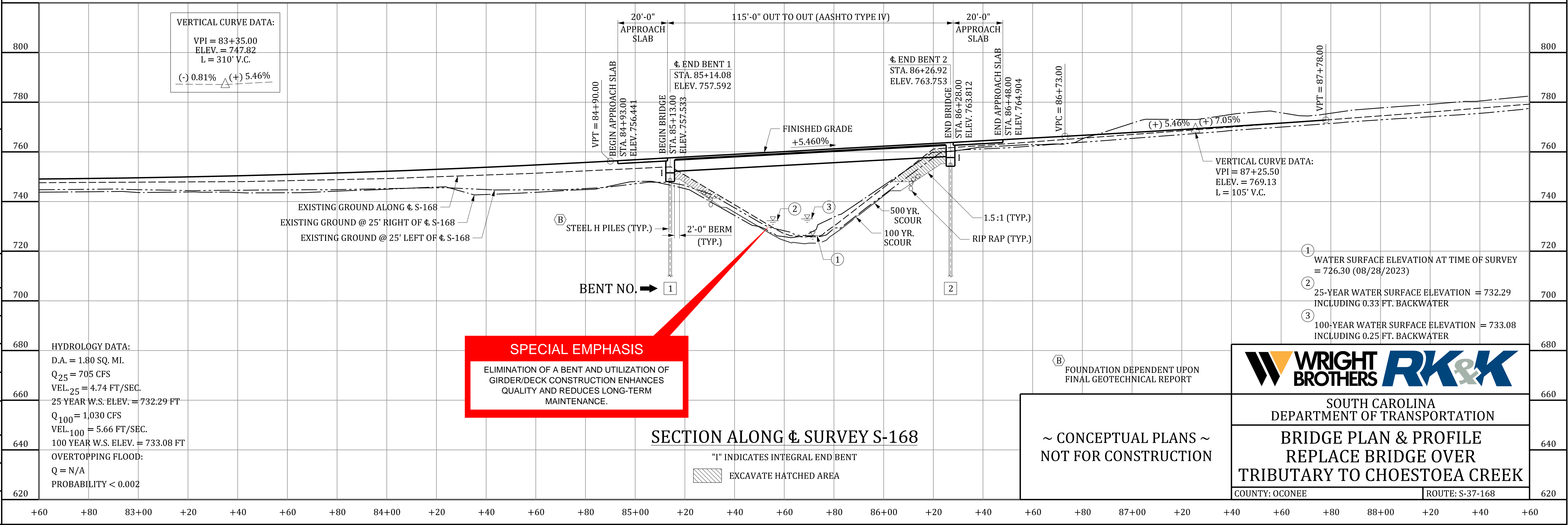
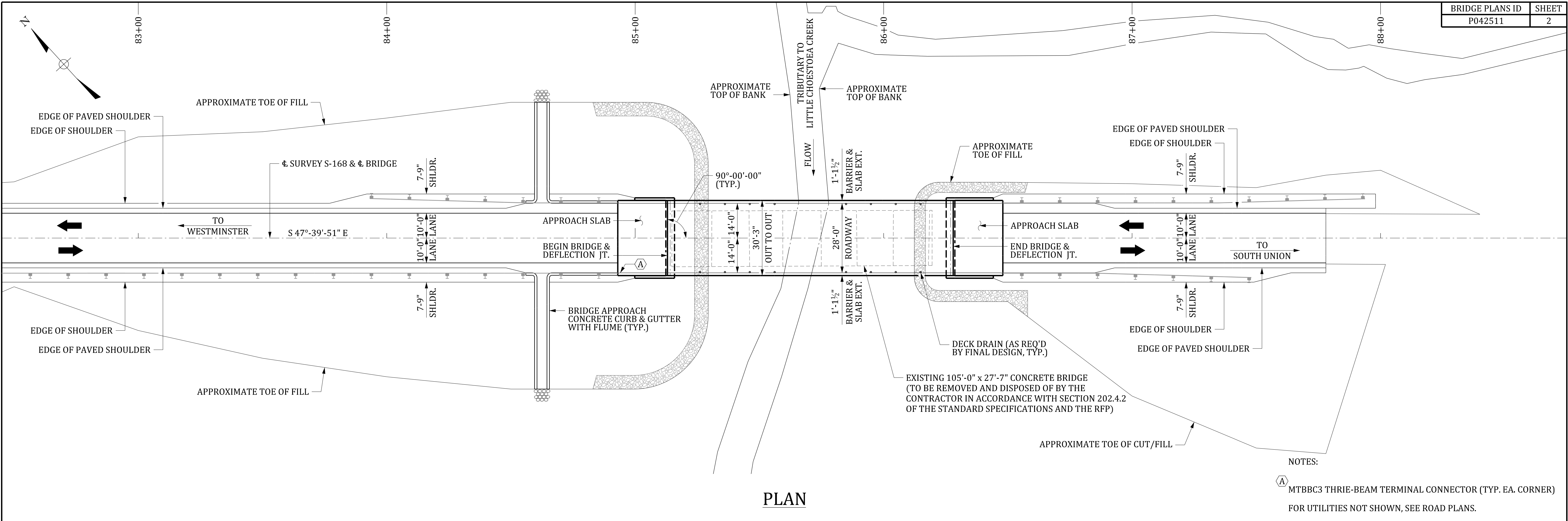
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| REVIEWED | DR. | WST | KSH | 08-25 |
| | BY | CHK. | DATE | |

11/25/2025 12:12:21 PM 02_P042511_S-168-T Bridge Plan and Profile.dgn

| REVIEWED: | | KSH | 10-25 |
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| QUAN. | WST | KSH | 10-25 |
| DR. | DES. | BY | CHK. |
| DES. | CHK. | DATE | |

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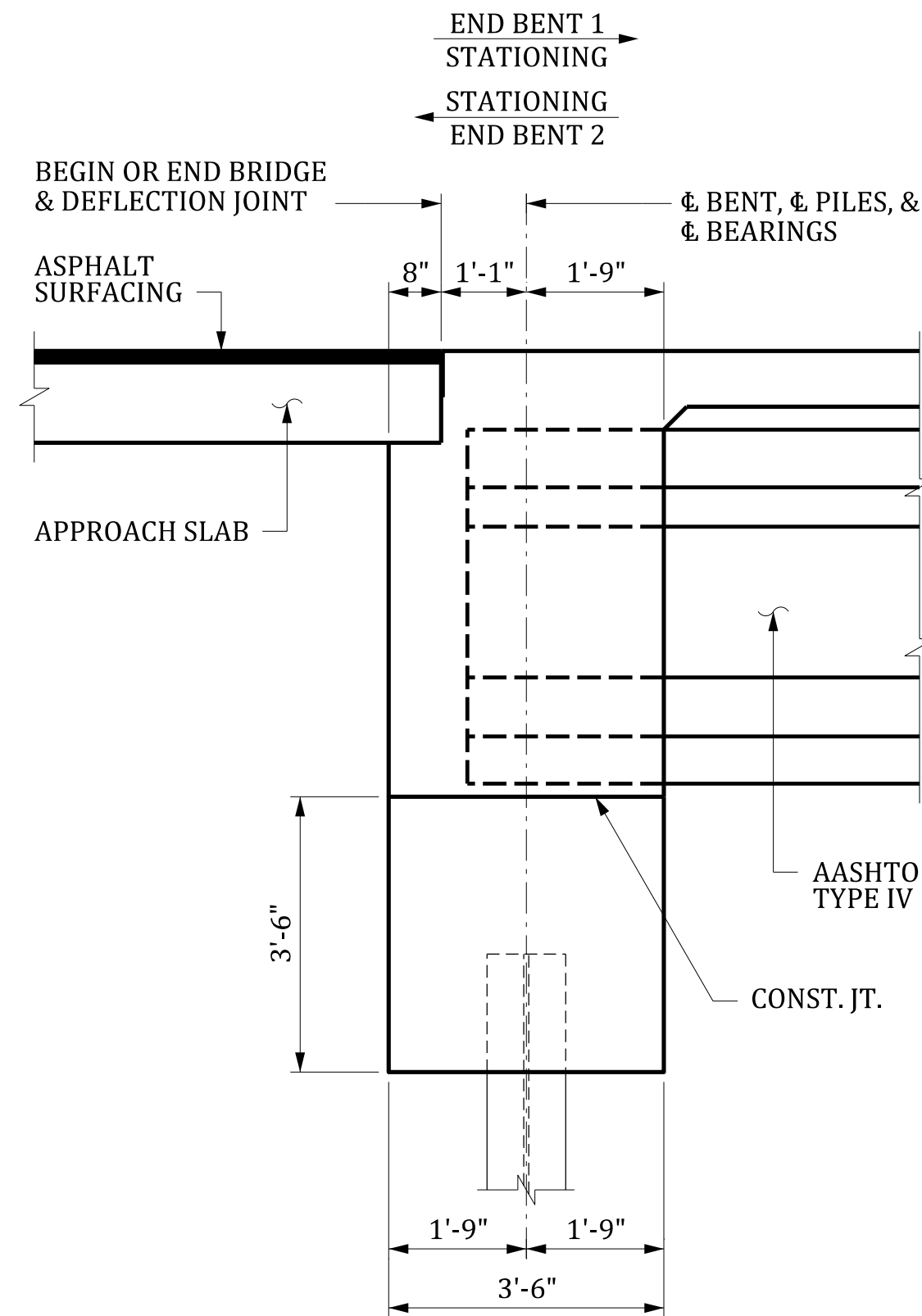
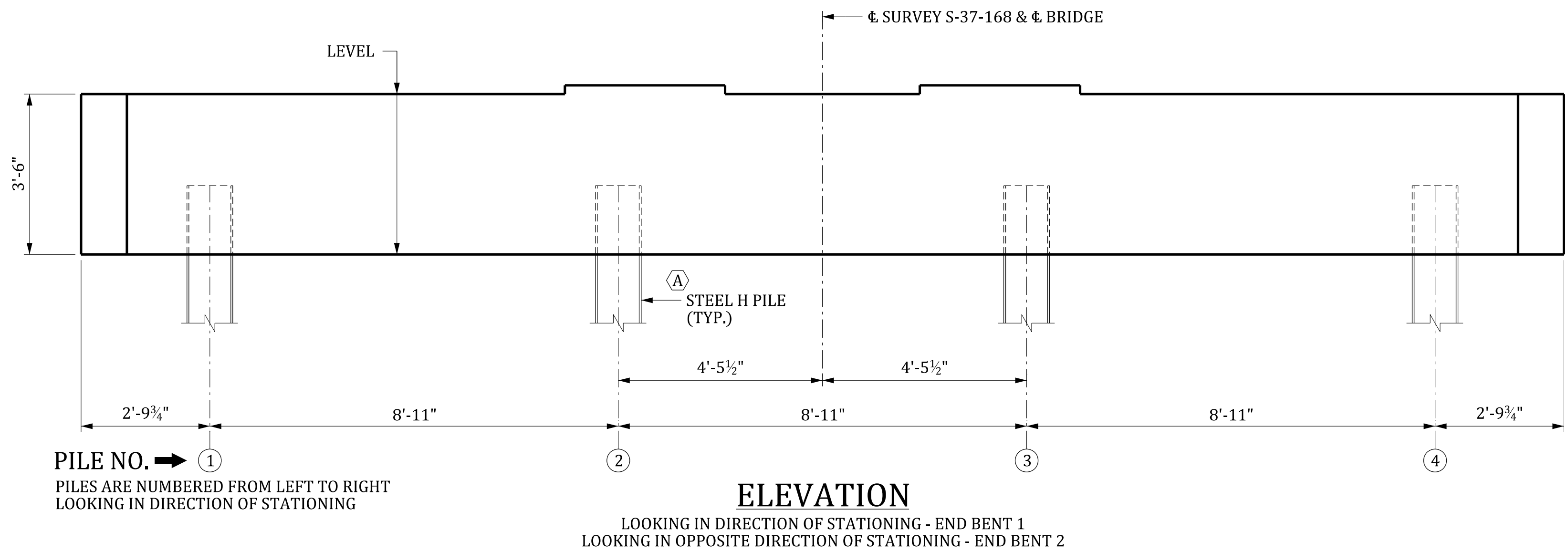
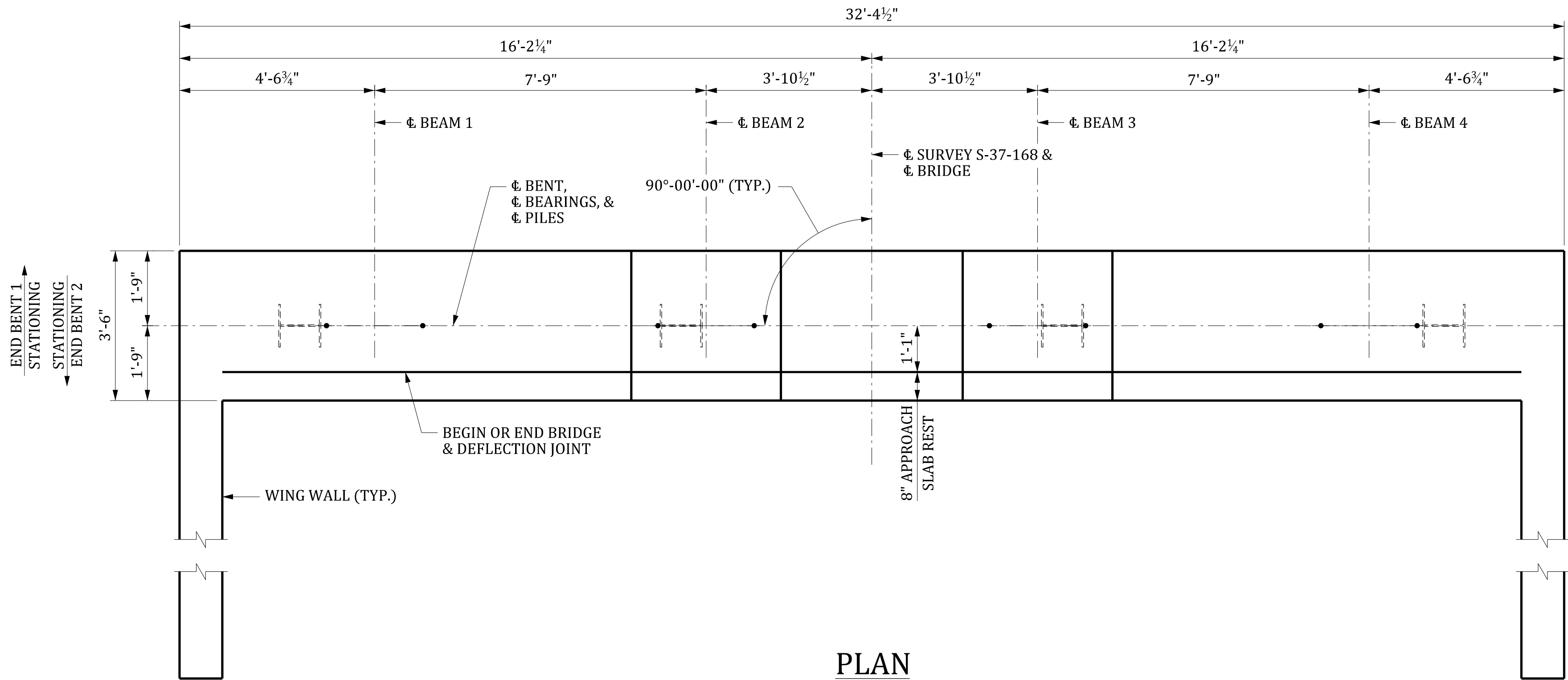
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| | BY | CHK. | DATE |
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FOUNDATION DEPENDANT UPON FINAL GEOTECHNICAL REPORT

~ CONCEPTUAL PLANS ~ NOT FOR CONSTRUCTION

WRIGHT BROTHERS

RK&K

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

END BENTS 1 AND 2

COUNTY: OCONEE ROUTE: S-37-168

11/25/2025 11:55:16 AM 04_P042511_S-168-T_Typical_Section.dgn

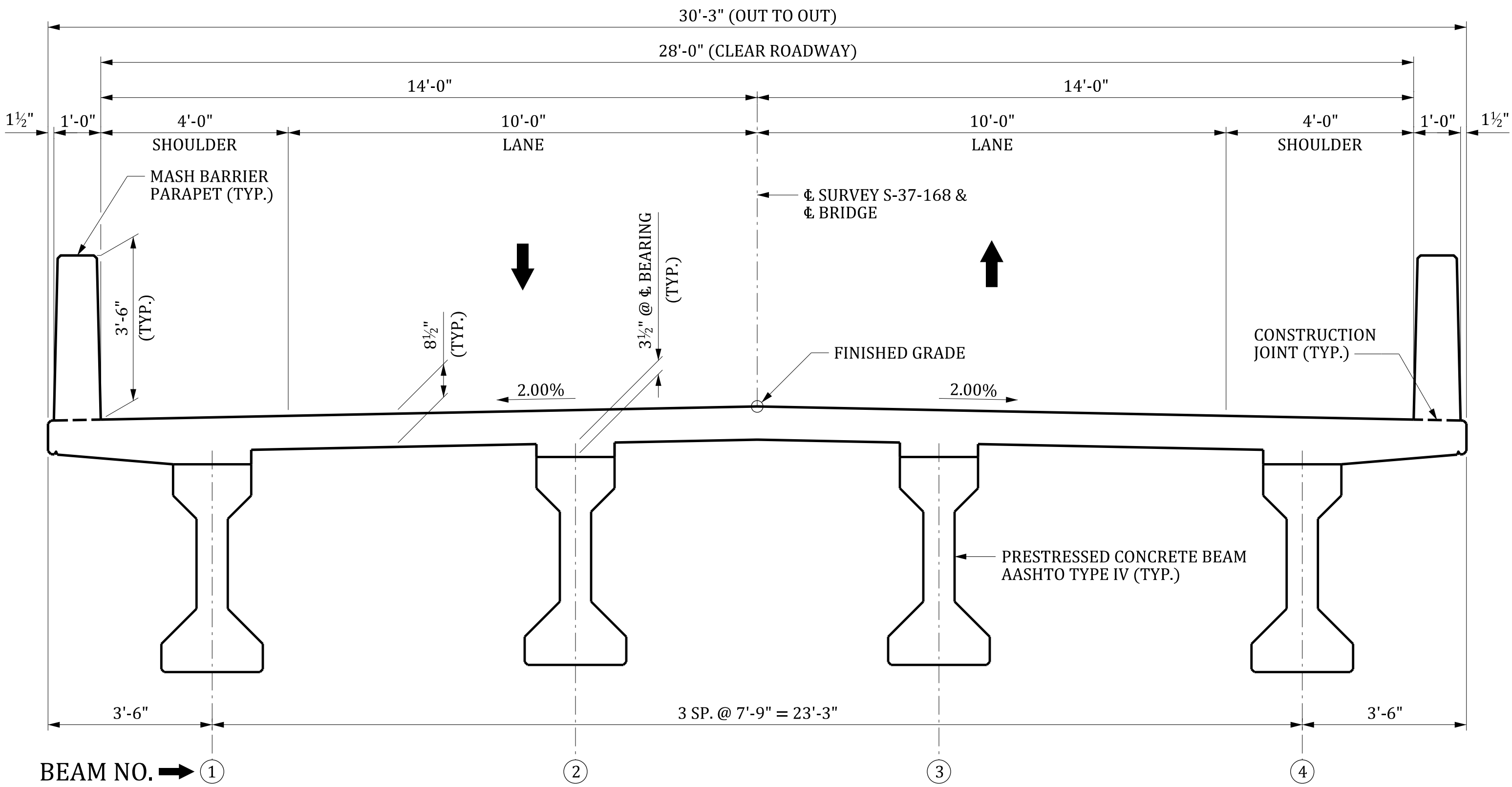
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SUPERSTRUCTURE TYPICAL SECTION
LOOKING IN DIRECTION OF STATIONING

~ CONCEPTUAL PLANS ~
NOT FOR CONSTRUCTION

WRIGHT BROTHERS

RK&K

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SUPERSTRUCTURE
TYPICAL SECTION

COUNTY: OCONEEROUTE: S-37-168

1. TITLE SHEET
2. BRIDGE PLAN AND PROFILE
3. END BENTS 1 AND 2
4. SUPERSTRUCTURE TYPICAL SECTION



SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

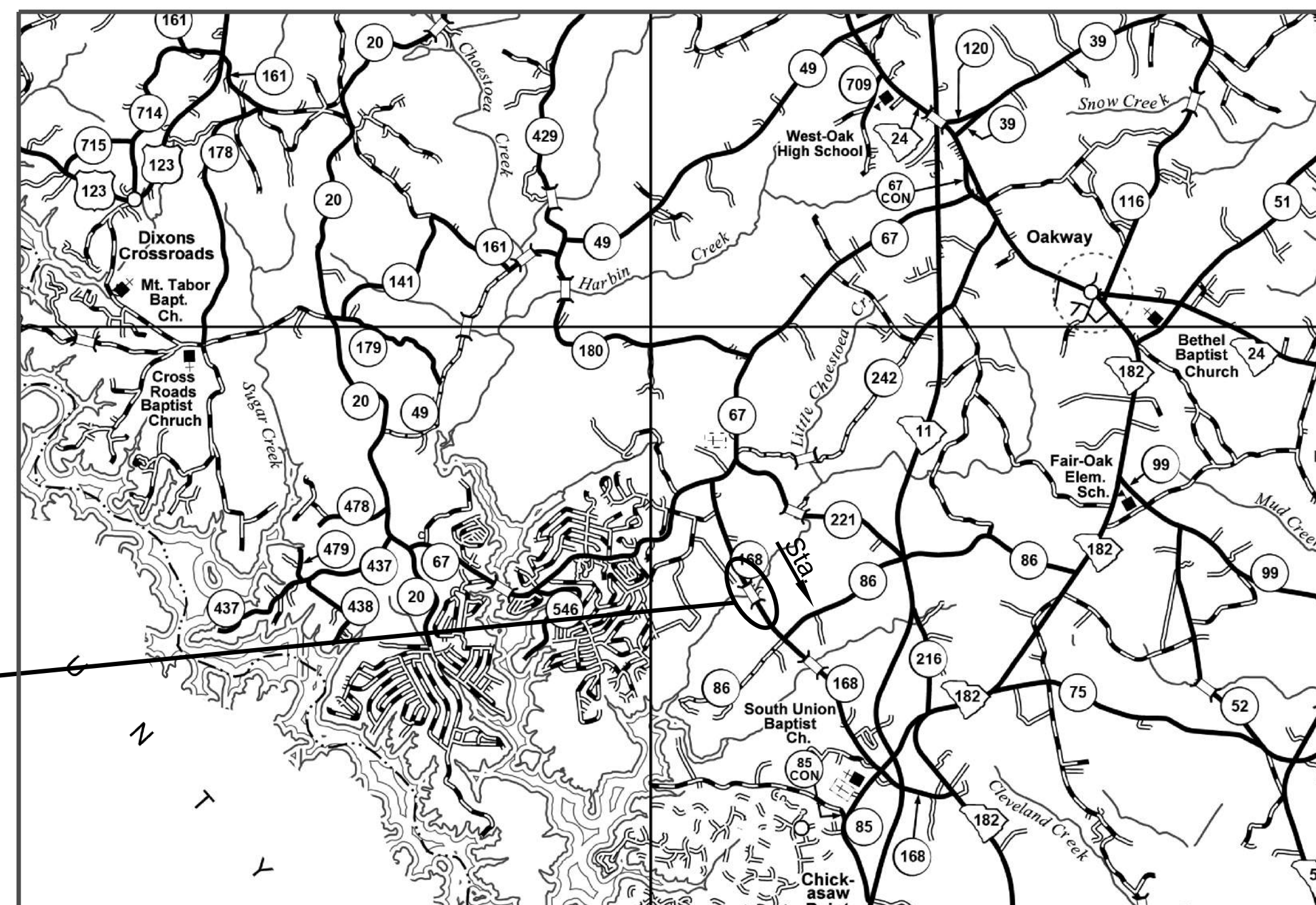


CONCEPTUAL PLANS
FOR
OCONEE COUNTY
PROJECT ID P042512
ROUTE S-37-168 (LITTLE CHOESTOE A ROAD)
REPLACE BRIDGE OVER LITTLE CHOESTOE A CREEK

DESIGN REFERENCE FOR THESE PLANS IS THE:

LVB

SUPPLEMENTAL DESIGN CRITERIA FOR LOW VOLUME BRIDGE REPLACEMENT PROJECTS



SITE LOCATION

$$-N$$

APPROXIMATE LOCATION OF BRIDGE IS

LATITUDE 34°- 34' - 09" N

LONGITUDE 83°- 04' - 07" W

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SOUTH CAROLINA 811 (SC811)
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ASSET ID NOT ASSIGNED

TRAFFIC DATA

2025 ADT 650 V.P.D.

2045* ADT 950* V.P.D.

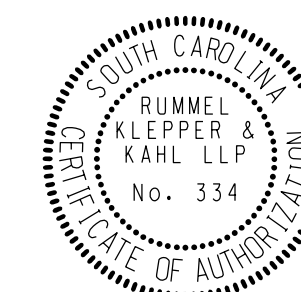
TRUCKS 6 %

* DESIGN TRAFFIC DATA

LAYOUT

| | | |
|-------------------------|-------|-------|
| NET LENGTH OF ROADWAY | 0.000 | MILES |
| NET LENGTH OF BRIDGES | 0.018 | MILES |
| NET LENGTH OF PROJECT | 0.018 | MILES |
| LENGTH OF EXCEPTIONS | 0.000 | MILES |
| GROSS LENGTH OF PROJECT | 0.018 | MILES |

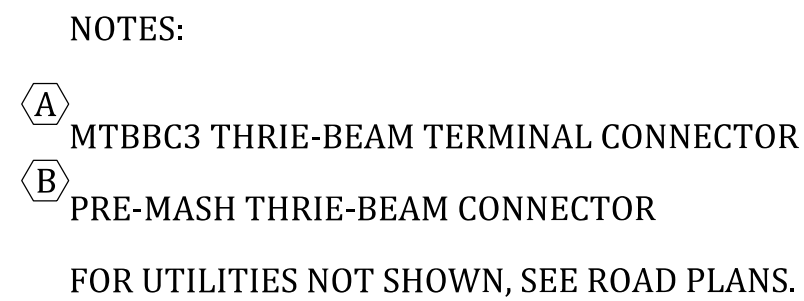
NOTE: EXCEPT AS MAY OTHERWISE BE SPECIFIED ON THE PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIALS AND WORKMANSHIP ON THIS PROJECT SHALL CONFORM TO THE SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF LETTING.

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FOR CONSTRUCTION

~ CONCEPTUAL PLANS ~
NOT FOR CONSTRUCTION





SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BRIDGE PLAN & PROFILE REPLACE BRIDGE OVER LITTLE CHOESTOE CREEK

COUNTY: OCONEE

ROUTE: S-37-168

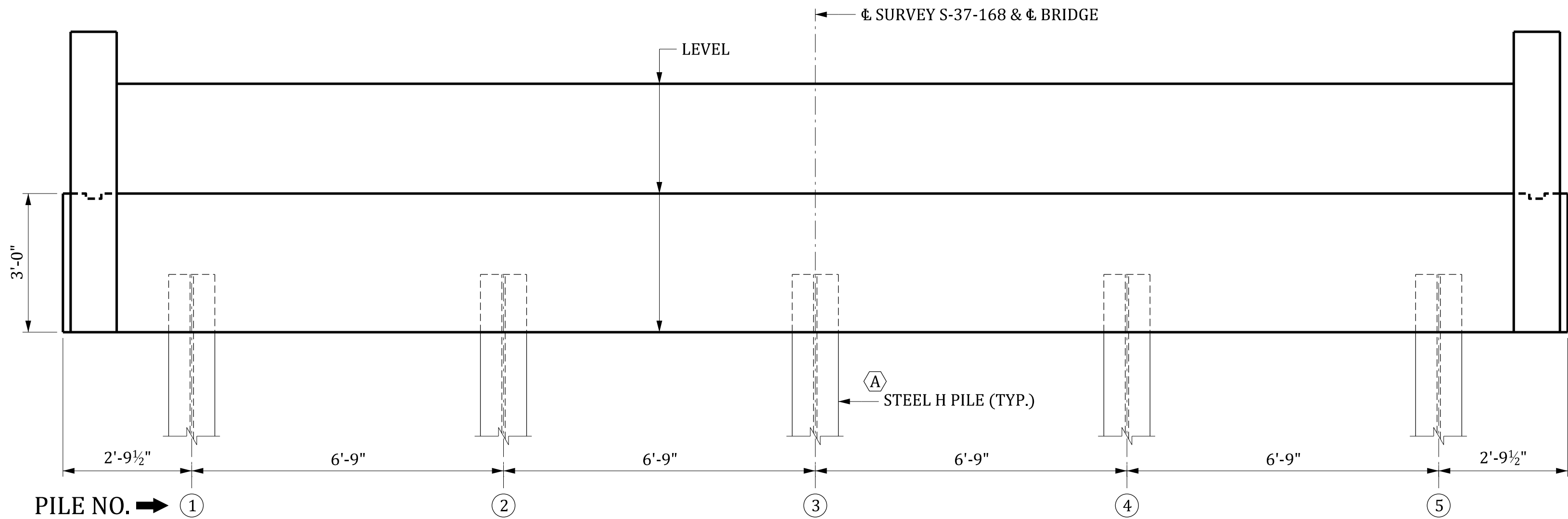
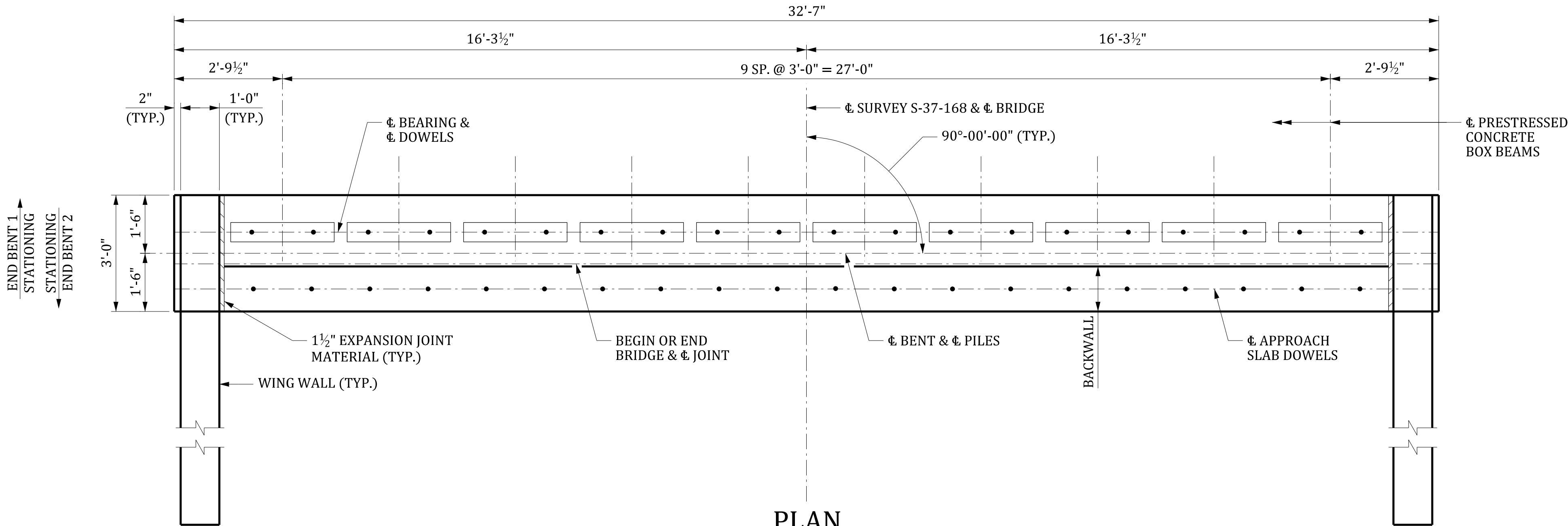
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| DR. | WST | KSH 10-25 |
| DES. | BY | CHK. DATE |

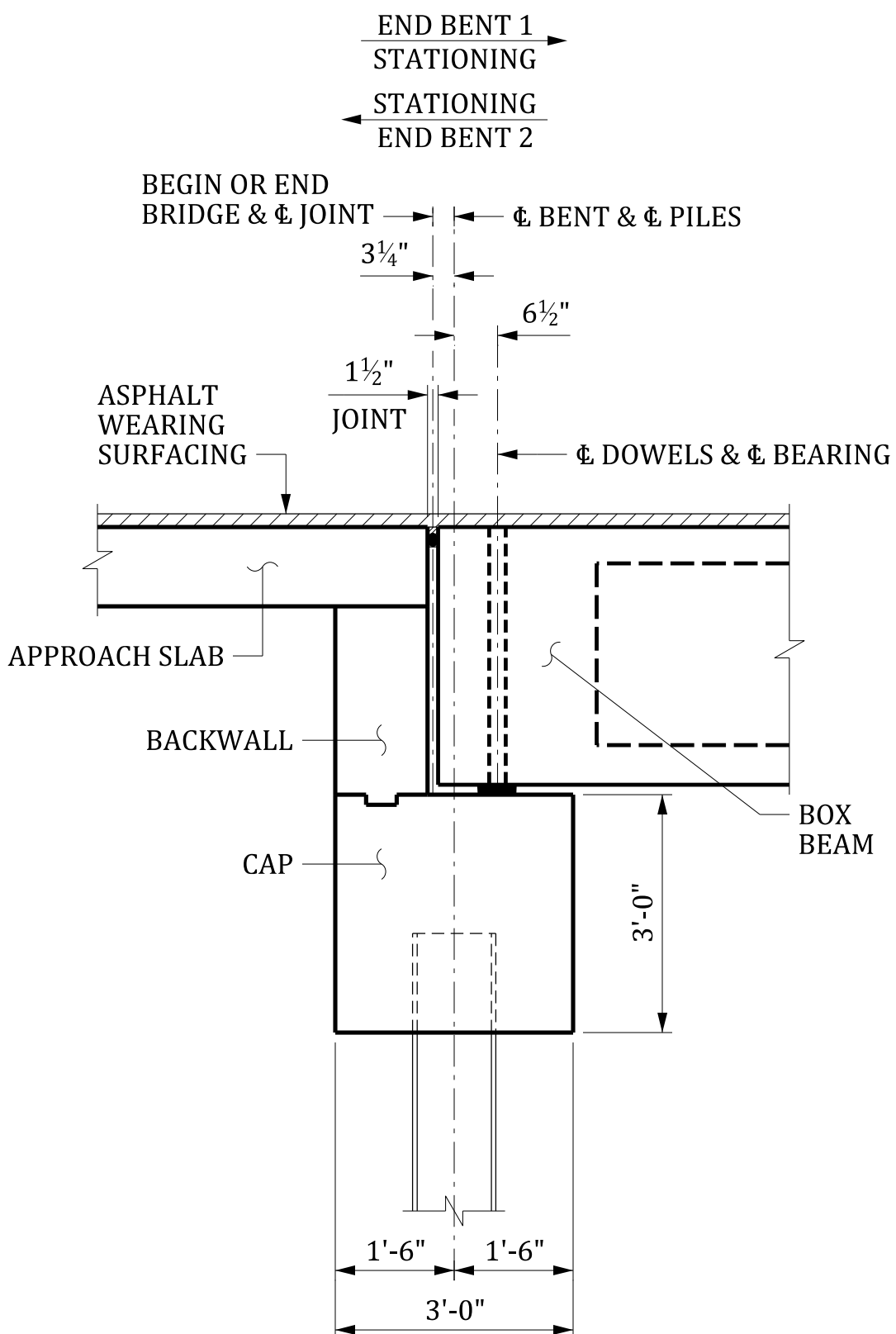
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| BY | CHK. | DATE | DESCRIPTION OF REVISION |
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PILE NO. ➡ ➊
PILES ARE NUMBERED FROM LEFT TO RIGHT
LOOKING IN DIRECTION OF STATIONING

LOOKING IN DIRECTION OF STATIONING - END BENT 1
LOOKING IN OPPOSITE DIRECTION OF STATIONING - END BENT 2



(A) FOUNDATION DEPENDANT UPON
FINAL GEOTECHNICAL REPORT

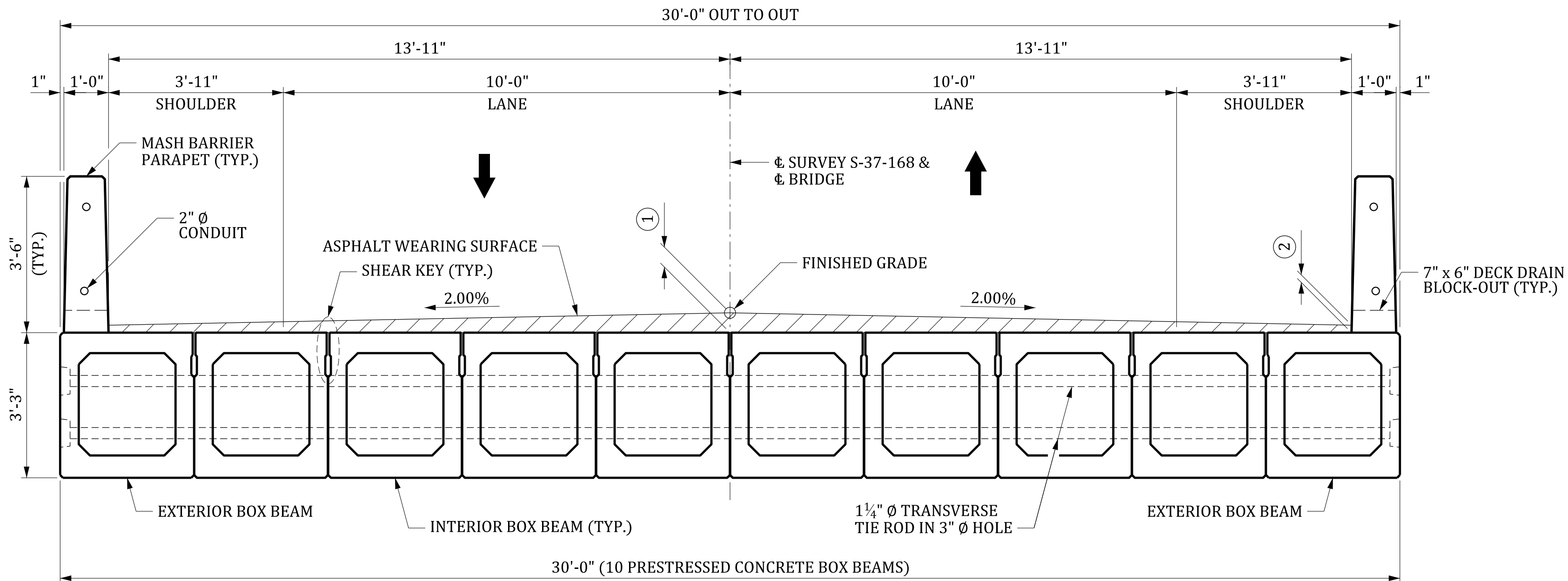
~ CONCEPTUAL PLANS ~
NOT FOR CONSTRUCTION



SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

END BENTS 1 AND 2

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TYPICAL SECTION
LOOKING IN DIRECTION OF STATIONING

- ① 5 3/8" MIN. AT MIDSPAN
7 5/8" MAX. AT BEARING (DUE TO CAMBER)
- ② 2" MIN. AT MIDSPAN
3 15/16" MAX. AT BEARING (DUE TO CAMBER)

~ CONCEPTUAL PLANS ~
NOT FOR CONSTRUCTION

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

**SUPERSTRUCTURE
TYPICAL SECTION**

COUNTY: OCONEE | ROUTE: S-37-168

INDEX OF SHEETS

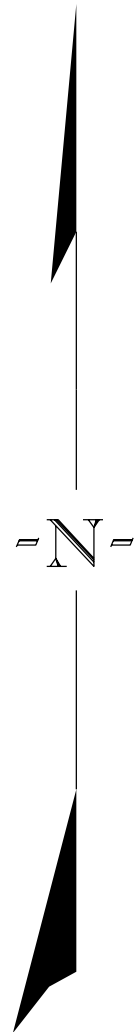
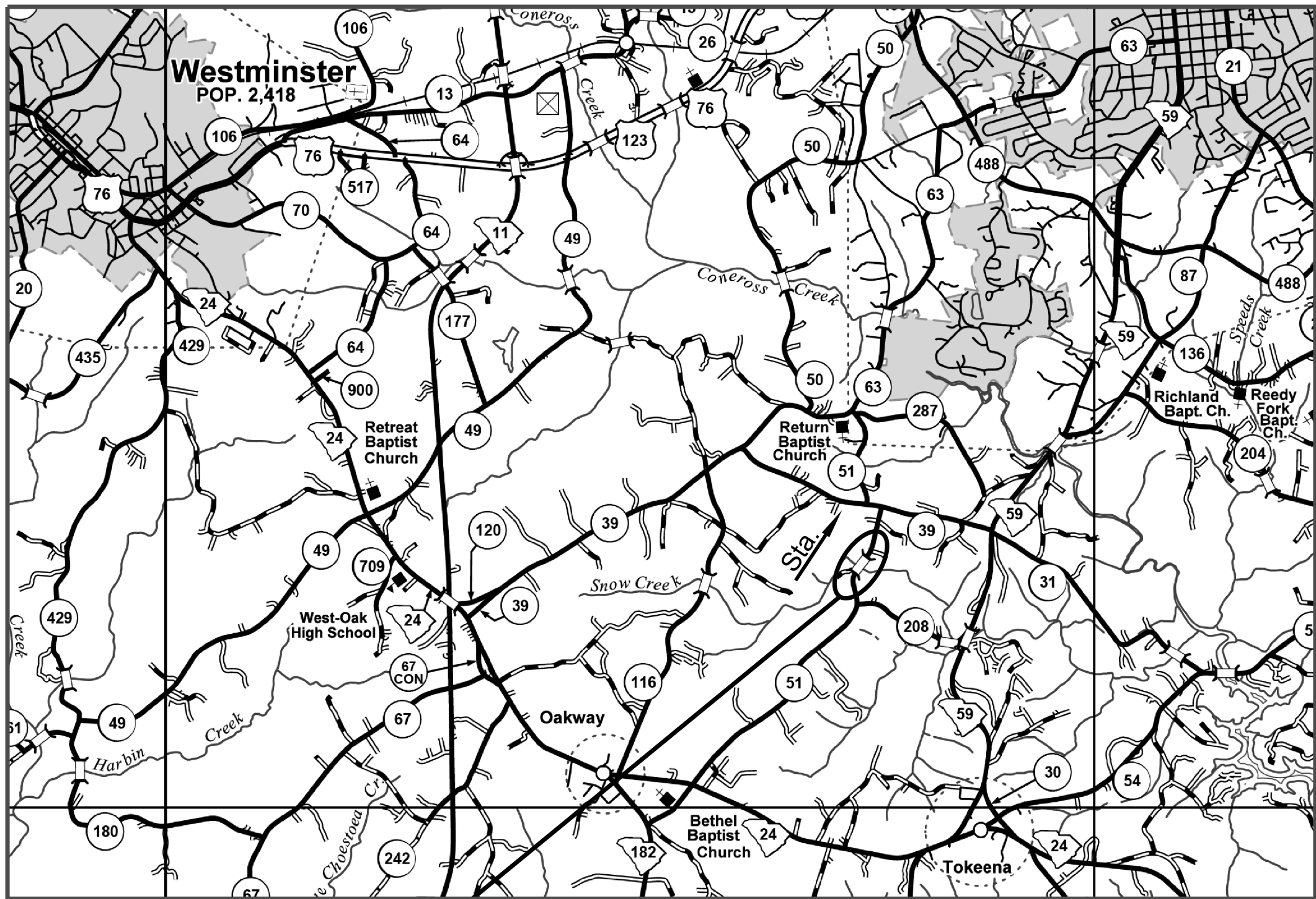
- 1. TITLE SHEET
- 2. BRIDGE PLAN AND PROFILE
- 3. END BENTS 1 AND 2
- 4. SUPERSTRUCTURE TYPICAL SECTION



SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION



CONCEPTUAL PLANS
FOR
OCONEE COUNTY
PROJECT ID P041166
ROUTE S-37-51 (SNOW CREEK ROAD)
REPLACE BRIDGE OVER SNOW CREEK



APPROXIMATE LOCATION OF BRIDGE IS

LATITUDE 34°- 37' - 25" N
LONGITUDE 82°- 59' - 40" W

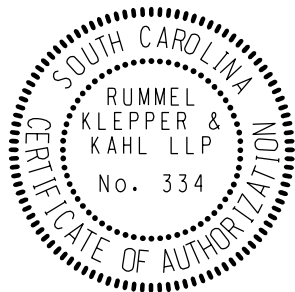


SITE LOCATION LAYOUT

| | | |
|-------------------------|-------|-------|
| NET LENGTH OF ROADWAY | 0.000 | MILES |
| NET LENGTH OF BRIDGES | 0.022 | MILES |
| NET LENGTH OF PROJECT | 0.022 | MILES |
| LENGTH OF EXCEPTIONS | 0.000 | MILES |
| GROSS LENGTH OF PROJECT | 0.022 | MILES |

NOTE: EXCEPT AS MAY OTHERWISE BE SPECIFIED ON THE PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIALS AND WORKMANSHIP ON THIS PROJECT SHALL CONFORM TO THE SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF LETTING.

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FOR CONSTRUCTION

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ASSET ID NOT ASSIGNED

TRAFFIC DATA

2025 ADT 1,400 V.P.D.

2045* ADT 1,900* V.P.D.


TRUCKS 9 %

* DESIGN TRAFFIC DATA


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DR. WST KSH 10-25
BY CHK. DATE

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| QUAN. | | |
| DR. | WST | KSH 10-25 |
| DES. | | |
| | BY | CHK. DATE |





WRIGHT BROTHERS



SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

SUPERSTRUCTURE TYPICAL SECTION

COUNTY: OCONEE

ROUTE: S-37-51

INDEX OF SHEETS

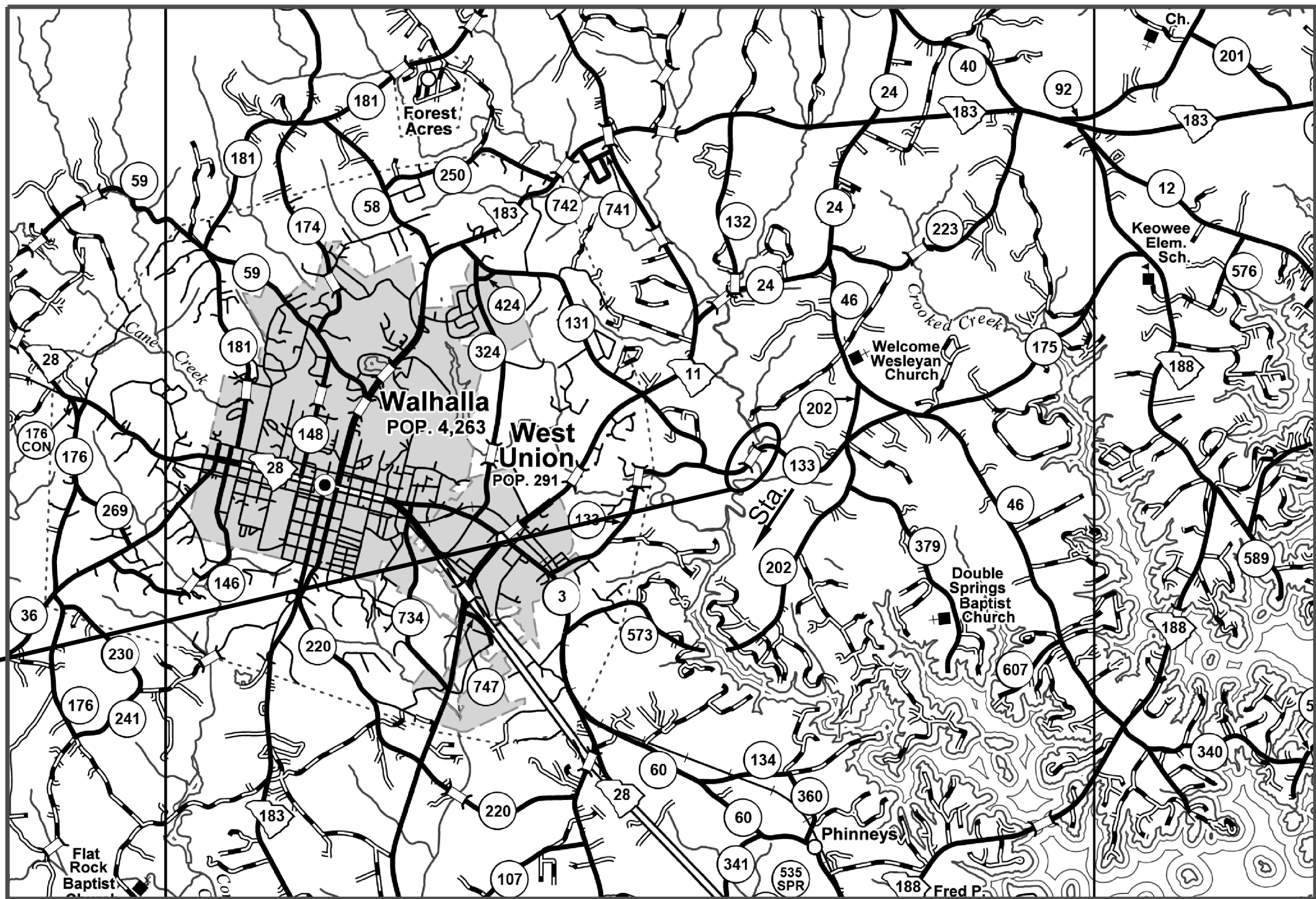
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- 2. BRIDGE PLAN AND PROFILE
- 3. END BENTS 1 AND 4
- 4. INTERIOR BENTS 2 AND 3
- 5. SUPERSTRUCTURE TYPICAL SECTIONS



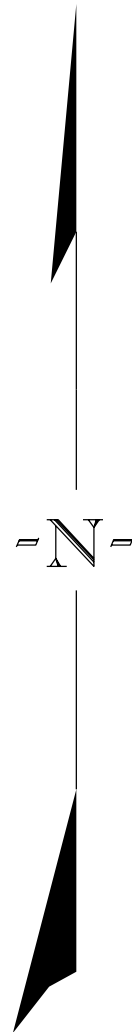
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION



CONCEPTUAL PLANS
FOR
OCONEE COUNTY
PROJECT ID P041167
ROUTE S-37-133 (BURNS MILL ROAD)
REPLACE BRIDGE OVER LITTLE CANE CREEK



SITE LOCATION



APPROXIMATE LOCATION OF BRIDGE IS

LATITUDE 34°- 46' - 08" N

LONGITUDE 83°- 00' - 41" W

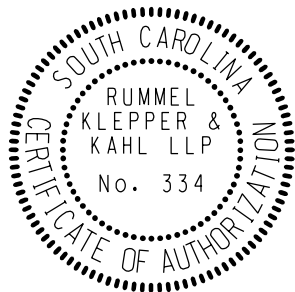


LAYOUT

| | | |
|-------------------------|-------|-------|
| NET LENGTH OF ROADWAY | 0.000 | MILES |
| NET LENGTH OF BRIDGES | 0.032 | MILES |
| NET LENGTH OF PROJECT | 0.032 | MILES |
| LENGTH OF EXCEPTIONS | 0.000 | MILES |
| GROSS LENGTH OF PROJECT | 0.032 | MILES |

NOTE: EXCEPT AS MAY OTHERWISE BE SPECIFIED ON THE PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIALS AND WORKMANSHIP ON THIS PROJECT SHALL CONFORM TO THE SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF LETTING.

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TRAFFIC DATA

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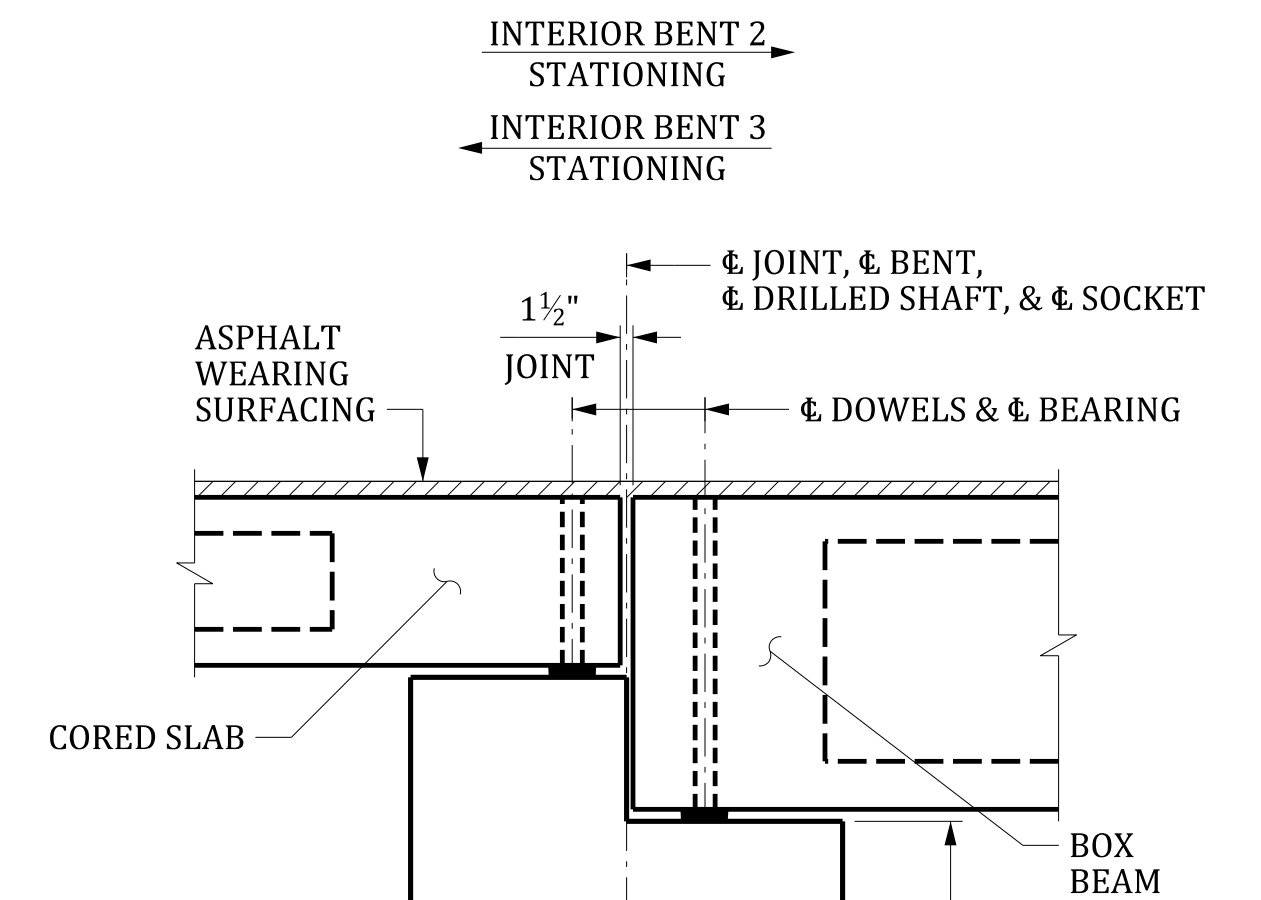
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TRUCKS 4 %

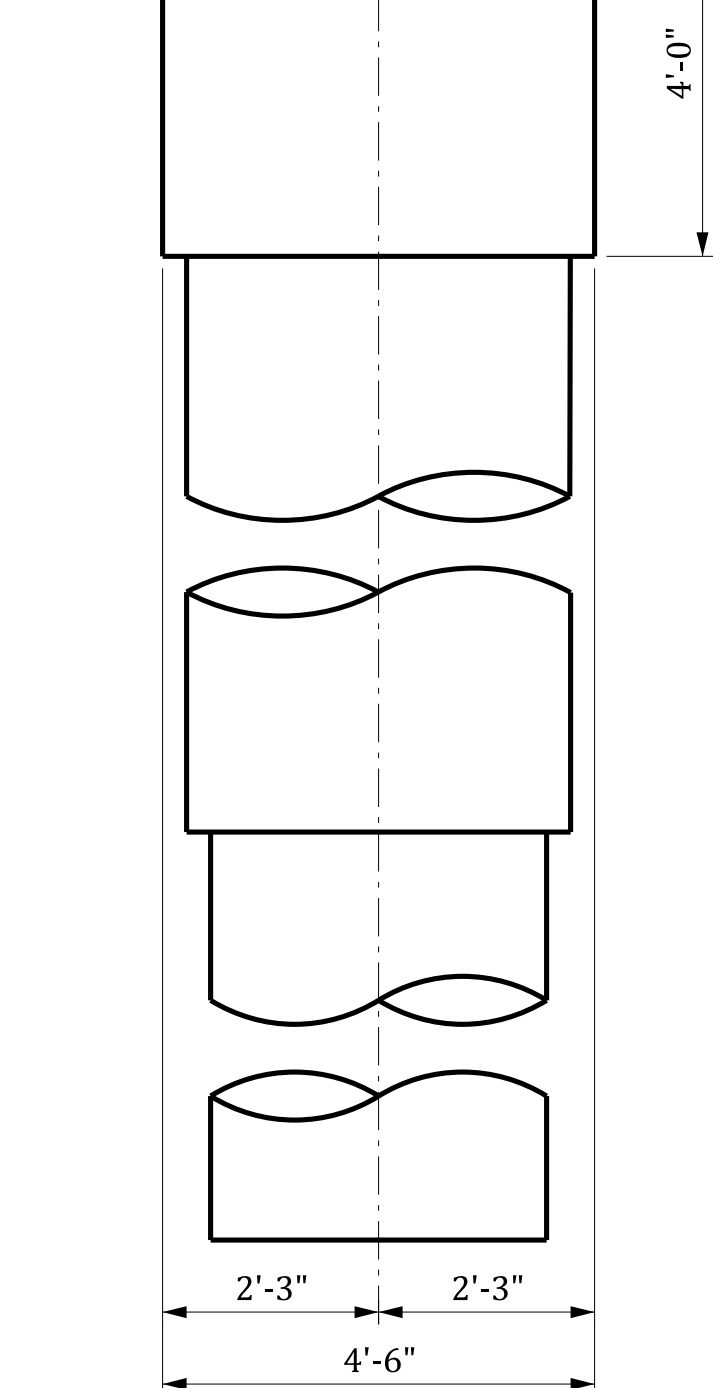
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| REVIEWED | DR. | WST | KSH | 10-25 |
| | BY | CHK. | DATE | |



INTERIOR BENT 2 SHOWN, INTERIOR BENT 3 SIMILAR BY ROTATION



LOOKING IN DIRECTION OF STATIONING - INTERIOR BENT 2
LOOKING IN OPPOSITE DIRECTION OF STATIONING - INTERIOR BENT 3

~ CONCEPTUAL PLANS ~
NOT FOR CONSTRUCTION

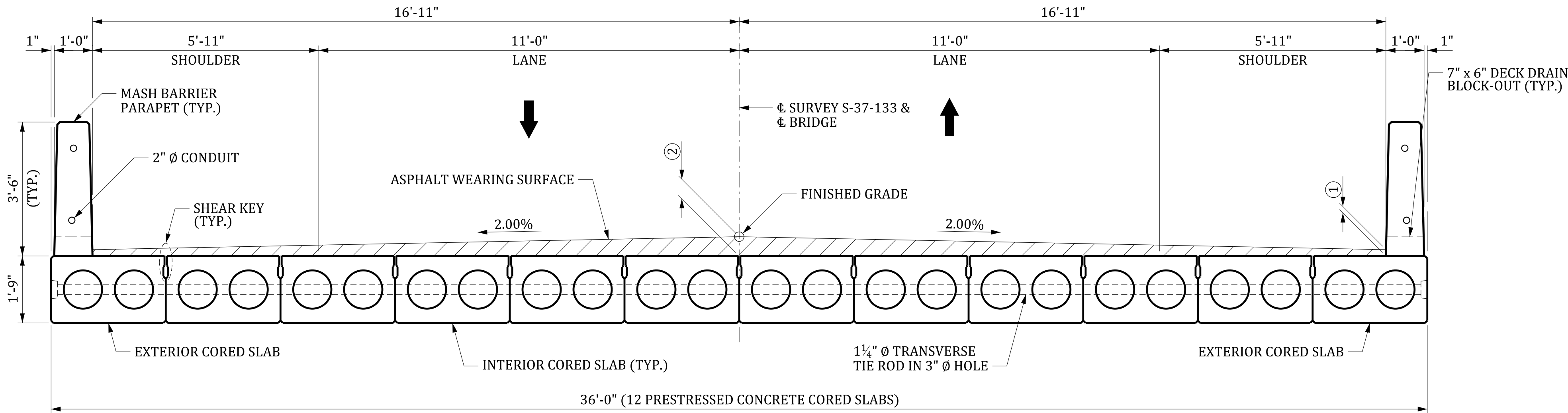


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| DES. | | |
| | BY | CHK. DATE |

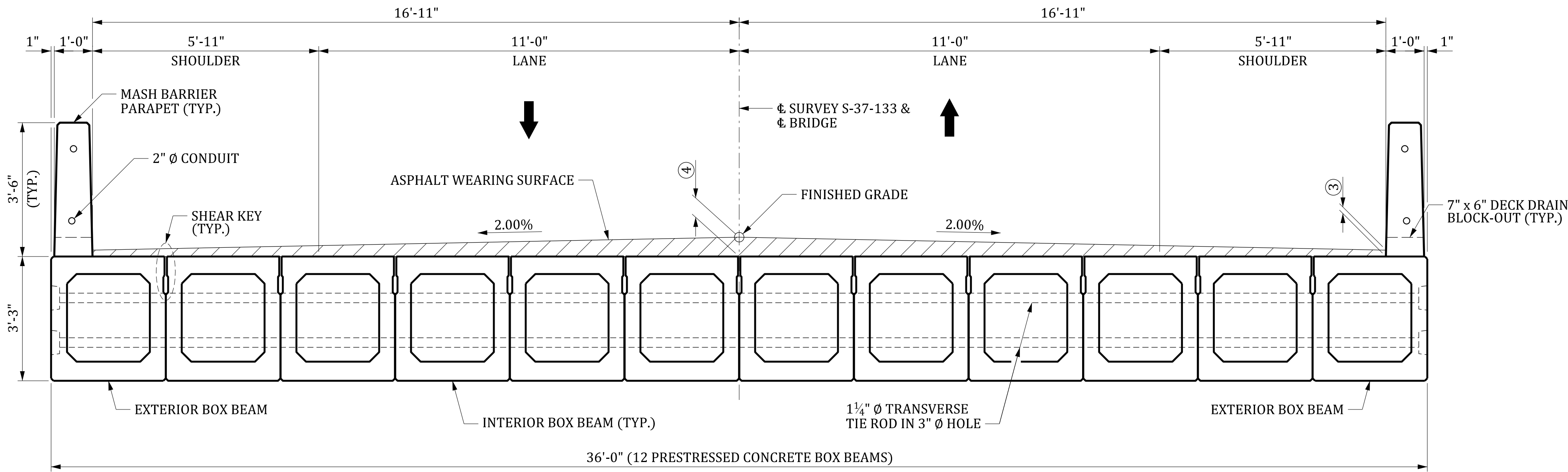
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| | BY | CHK. | DATE | DESCRIPTION OF REVISION | |

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|-----------------|-------|
| BRIDGE PLANS ID | SHEET |
| P041167 | 5 |



TYPICAL SECTION - SPANS 1 AND 3
LOOKING IN DIRECTION OF STATIONING


- ① SPAN 1:
2" MIN. AT MIDSPAN
3¹³/₁₆" MAX. AT ∇ BEARING (DUE TO CAMBER AND VERTICAL CURVE ORDINATE)
- SPAN 3:
2" MIN. AT MIDSPAN
2³/₈" MAX. AT ∇ BEARING (DUE TO CAMBER)
- ② SPAN 1:
6³/₄" MIN. AT MIDSPAN
7⁷/₈" MAX. AT ∇ BEARING (DUE TO CAMBER AND VERTICAL CURVE ORDINATE)
- SPAN 3:
6¹/₁₆" MIN. AT MIDSPAN
6⁷/₁₆" MAX. AT ∇ BEARING (DUE TO CAMBER)



TYPICAL SECTION - SPAN 2
LOOKING IN DIRECTION OF STATIONING

- ③ 2" MIN. AT MIDSPAN
3¹⁵/₁₆" MAX. AT ∇ BEARING (DUE TO CAMBER)
- ④ 6¹/₁₆" MIN. AT MIDSPAN
8" MAX. AT ∇ BEARING (DUE TO CAMBER)

~ CONCEPTUAL PLANS ~
NOT FOR CONSTRUCTION



SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

**SUPERSTRUCTURE
TYPICAL SECTION**

COUNTY: OCONEE ROUTE: S-37-133

INDEX OF SHEETS

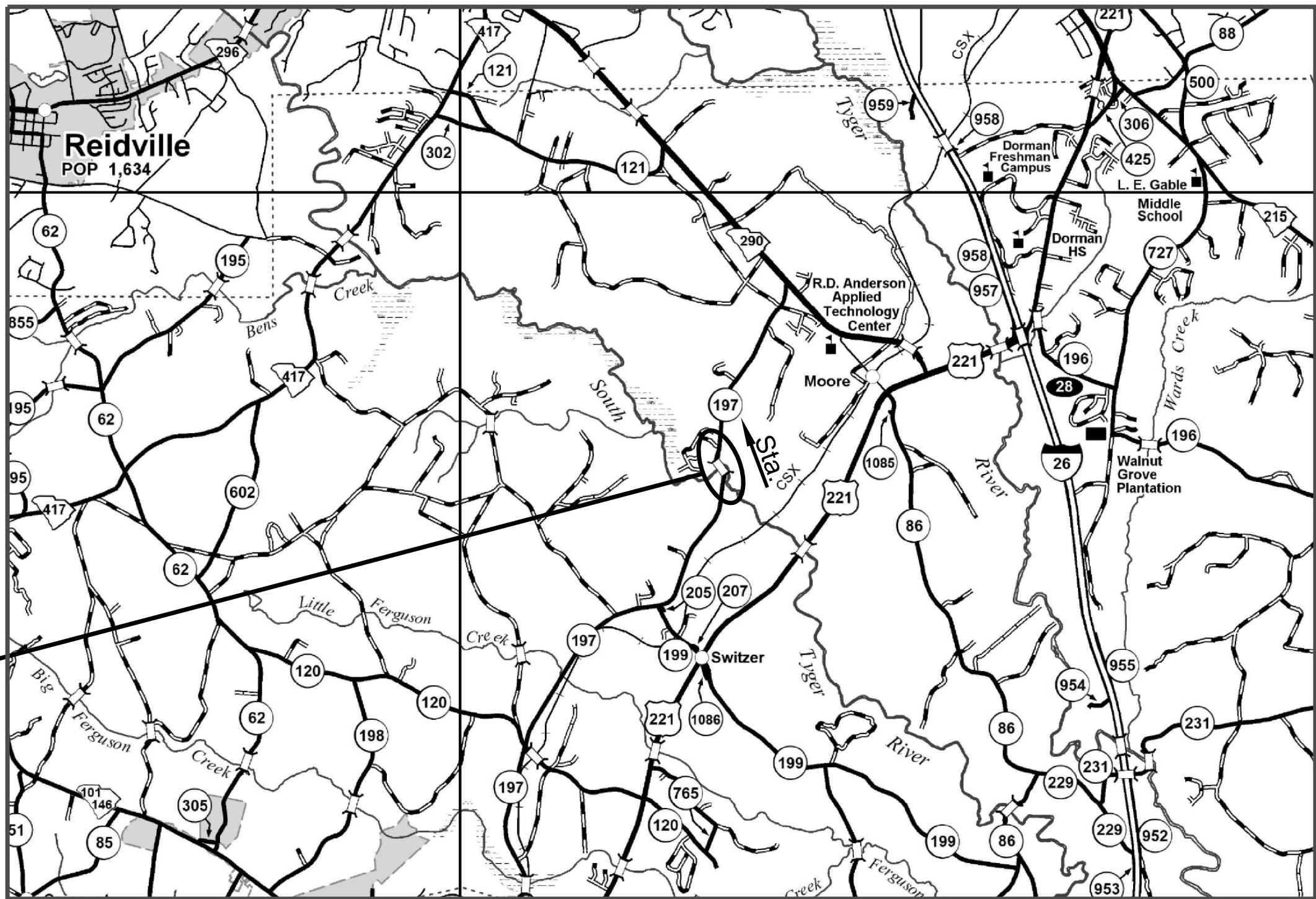
- 1. TITLE SHEET
- 2. BRIDGE PLAN AND PROFILE
- 3. END BENTS 1 AND 4
- 4. INTERIOR BENTS 2 AND 3
- 5. SUPERSTRUCTURE TYPICAL SECTION



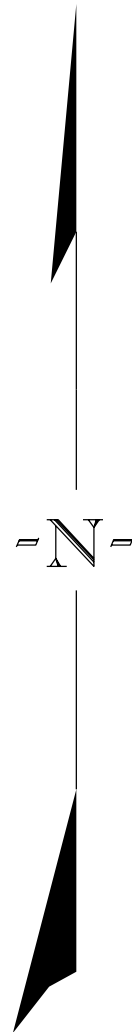
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION



CONCEPTUAL PLANS
FOR
SPARTANBURG COUNTY
PROJECT ID P041164
ROUTE S-42-197 (OLD SPARTANBURG HWY)
REPLACE BRIDGE OVER SOUTH TYGER RIVER



SITE LOCATION



APPROXIMATE LOCATION OF BRIDGE IS

LATITUDE 34°- 49' - 21" N
LONGITUDE 82°- 00' - 48" W



A COLAS COMPANY

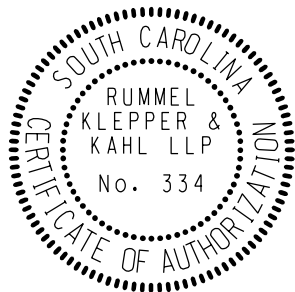


LAYOUT

| | | |
|-------------------------|-------|-------|
| NET LENGTH OF ROADWAY | 0.000 | MILES |
| NET LENGTH OF BRIDGES | 0.037 | MILES |
| NET LENGTH OF PROJECT | 0.037 | MILES |
| LENGTH OF EXCEPTIONS | 0.000 | MILES |
| GROSS LENGTH OF PROJECT | 0.037 | MILES |

NOTE: EXCEPT AS MAY OTHERWISE BE SPECIFIED ON THE PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIALS AND WORKMANSHIP ON THIS PROJECT SHALL CONFORM TO THE SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF LETTING.

CONSULTING ENGINEERING
FIRM



ENGINEER OF RECORD
FOR CONSTRUCTION

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

3 DAYS BEFORE DIGGING IN

SOUTH CAROLINA

CALL 811

SOUTH CAROLINA 811 (SC811)

WWW.SC811.COM

ALL UTILITIES MAY NOT BE A MEMBER OF SC811

ASSET ID NOT ASSIGNED

TRAFFIC DATA

2025 ADT 1,200 V.P.D.

2045* ADT 1,600* V.P.D.

TRUCKS 5 %

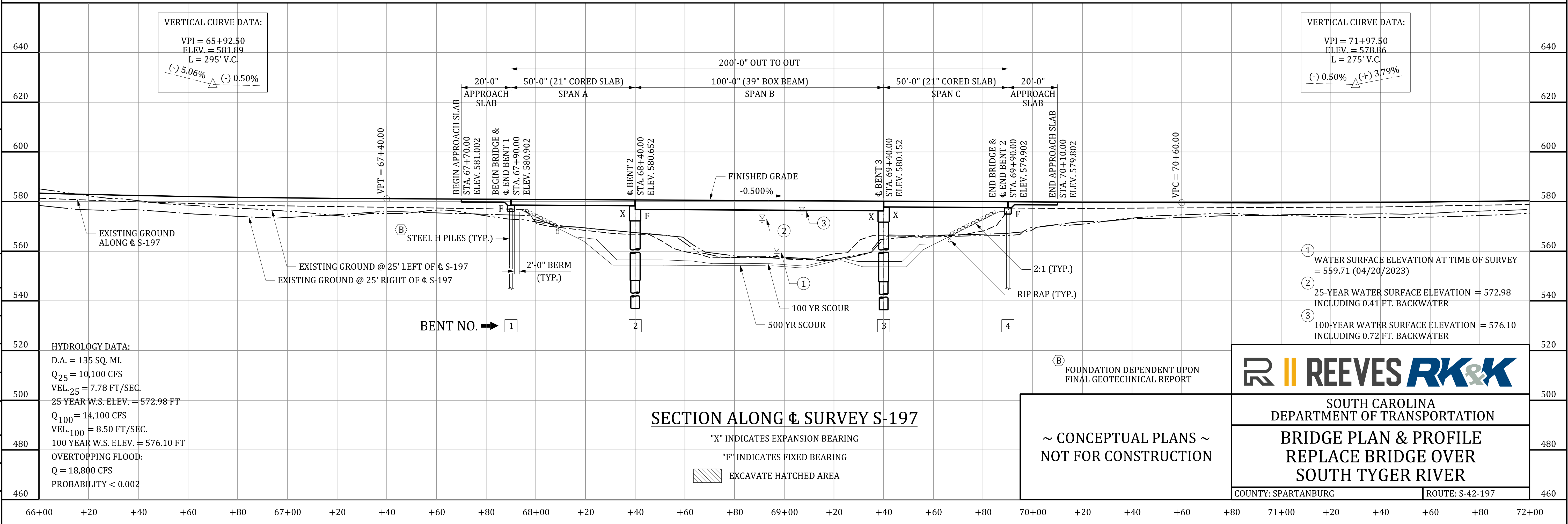
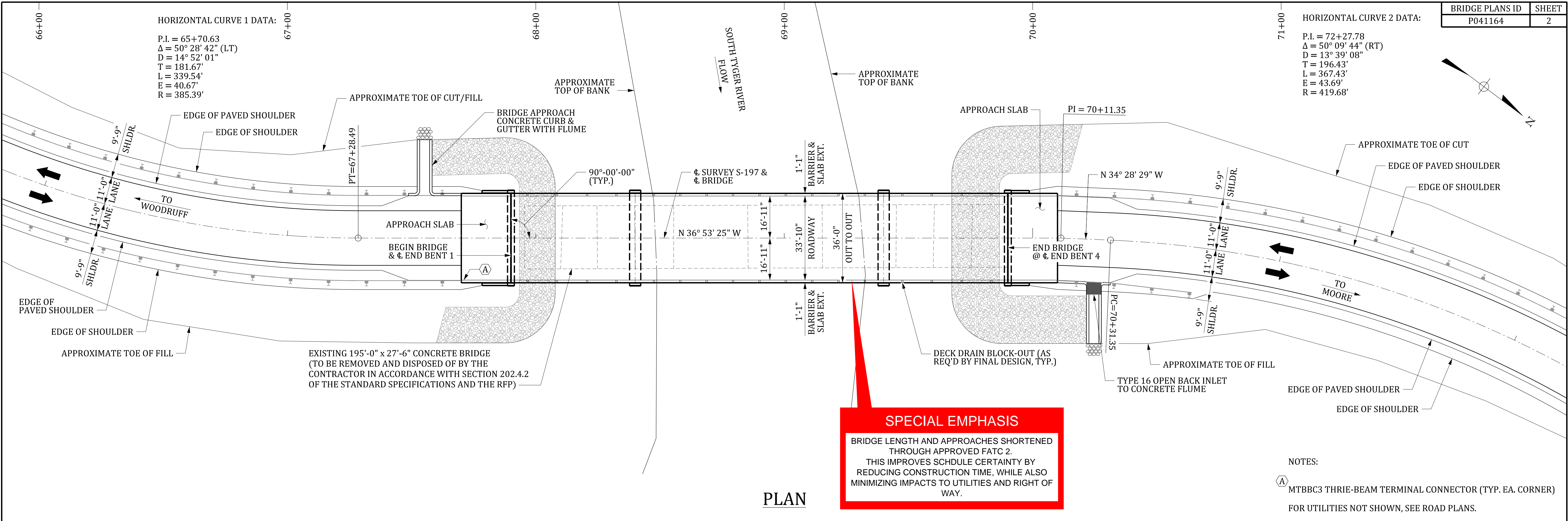
* DESIGN TRAFFIC DATA

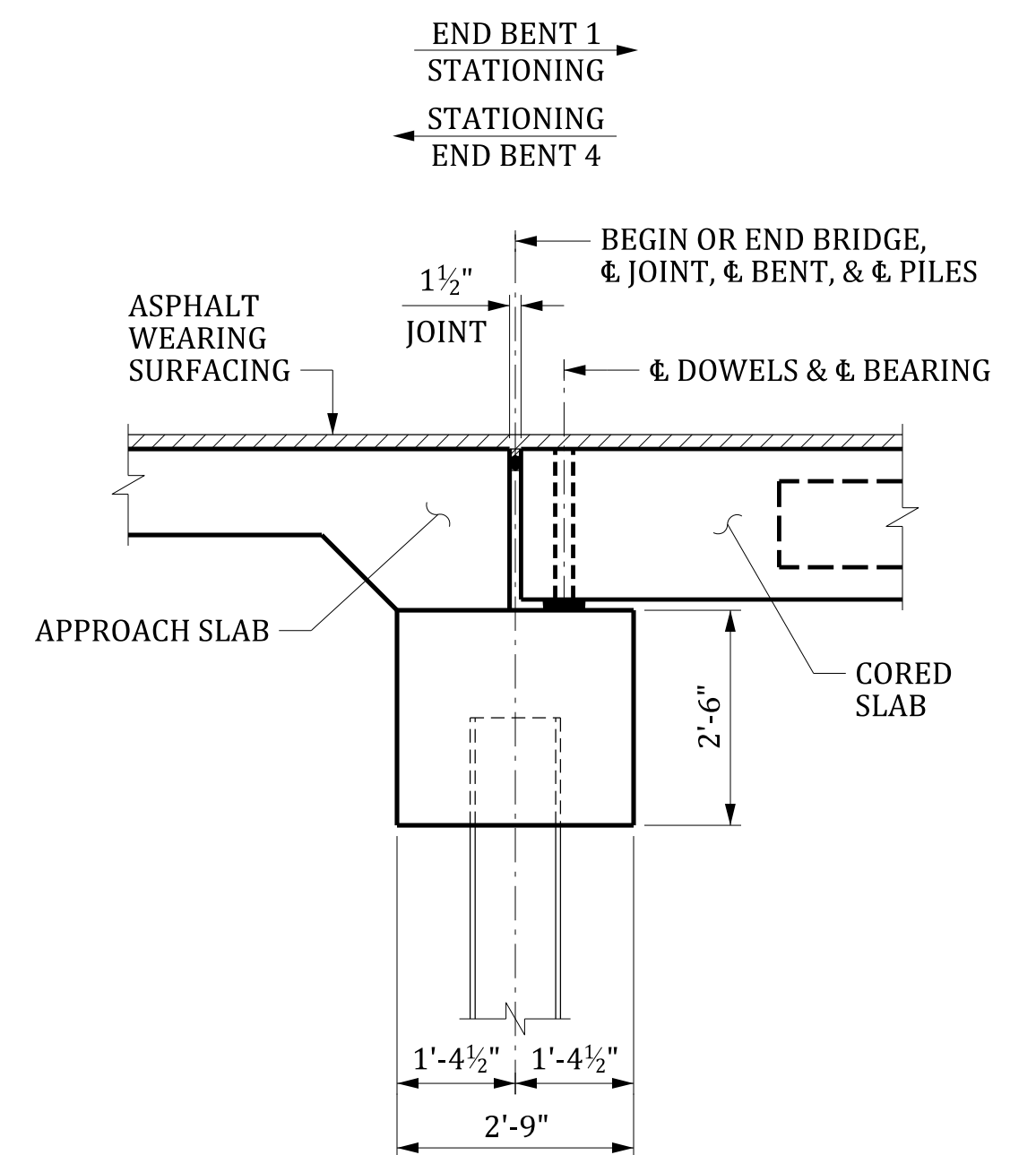
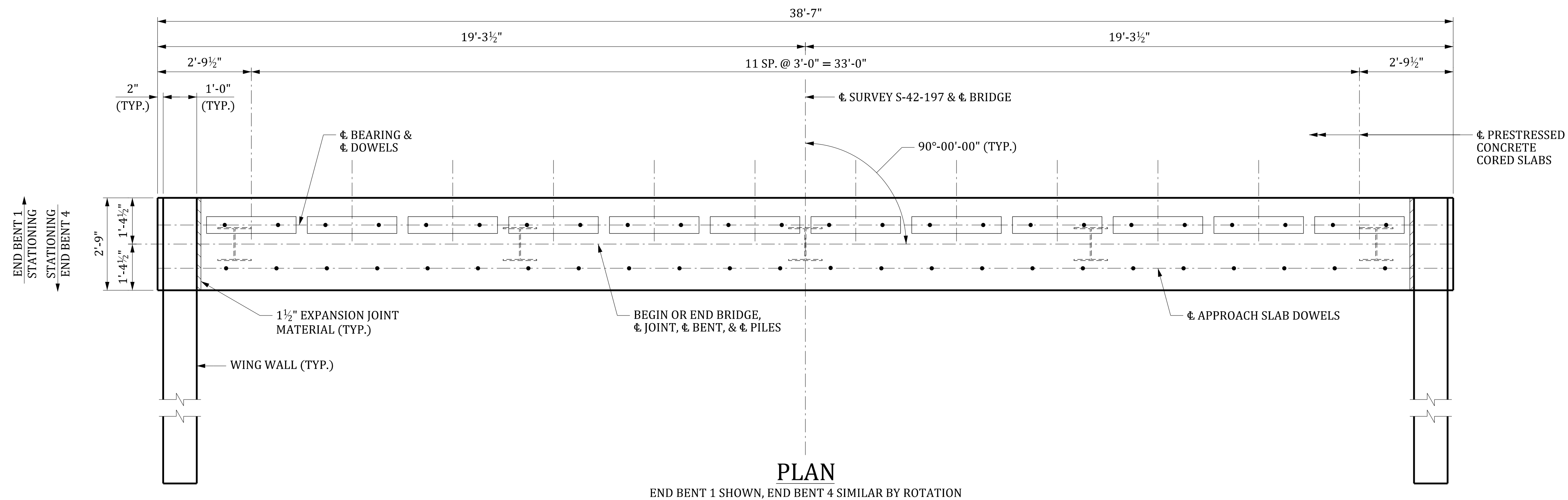
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REVIEWED
DR. WST BY KSH 10-25 DATE
CHK.

11/25/2025 2:07:32 PM 02_P041164_S-197_Bridge Plan and Profile.dgn

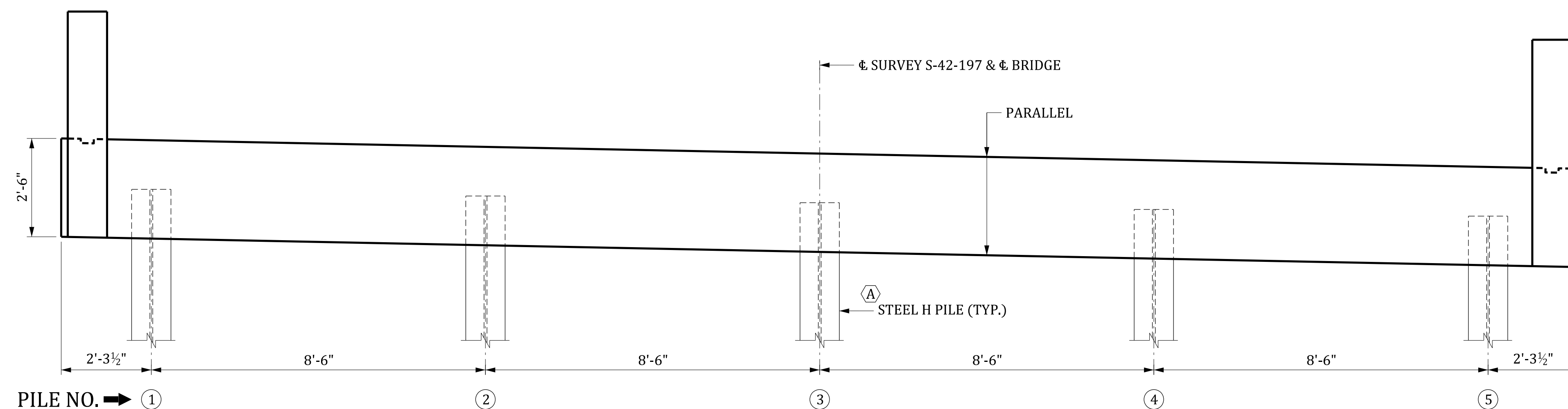
| REVIEWED: | | KSH | 10-25 |
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| QUAN. | REV. | WST | KSH |
| DR. | REV. | BY | CHK. |
| DES. | REV. | DATE | DATE |

| REV. | BY | CHK. | DATE | DESCRIPTION OF REVISION |
|------|----|------|------|-------------------------|
| | | | | |
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SECTION THRU BENT



ELEVATION

LOOKING IN DIRECTION OF STATIONING - END BENT 1
LOOKING IN OPPOSITE DIRECTION OF STATIONING - END BENT 4

A FOUNDATION DEPENDANT UPON
FINAL GEOTECHNICAL REPORT

~ CONCEPTUAL PLANS ~
NOT FOR CONSTRUCTION



SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

END BENTS 1 AND 4

COUNTY: SPARTANBURG

ROUTE: S-42-197

| | | | |
|-----------|------|------|-------|
| REVIEWED: | | KSH | 10-25 |
| QUAN. | | | |
| DR. | WST | KSH | 10-25 |
| DES. | | | |
| BY | CHK. | DATE | |

| | | |
|------------|------------|--------------------------------------|
| 11/25/2025 | 2:11:40 PM | 03_P041164_S-197_End Bents_1 & 4.dgn |
| REV. | | |
| REV. | | |
| | BY | CHK. |
| | | DATE |
| | | DESCRIPTION OF REVISION |

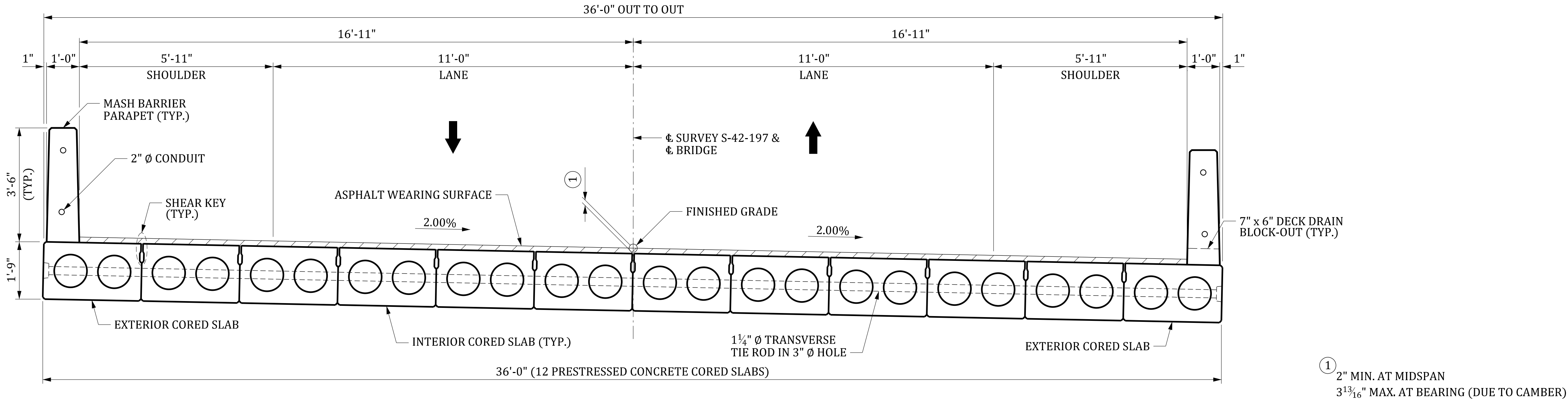
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| REV. | | | | | |
| | BY | CHK. | DATE | DESCRIPTION OF REVISION | |

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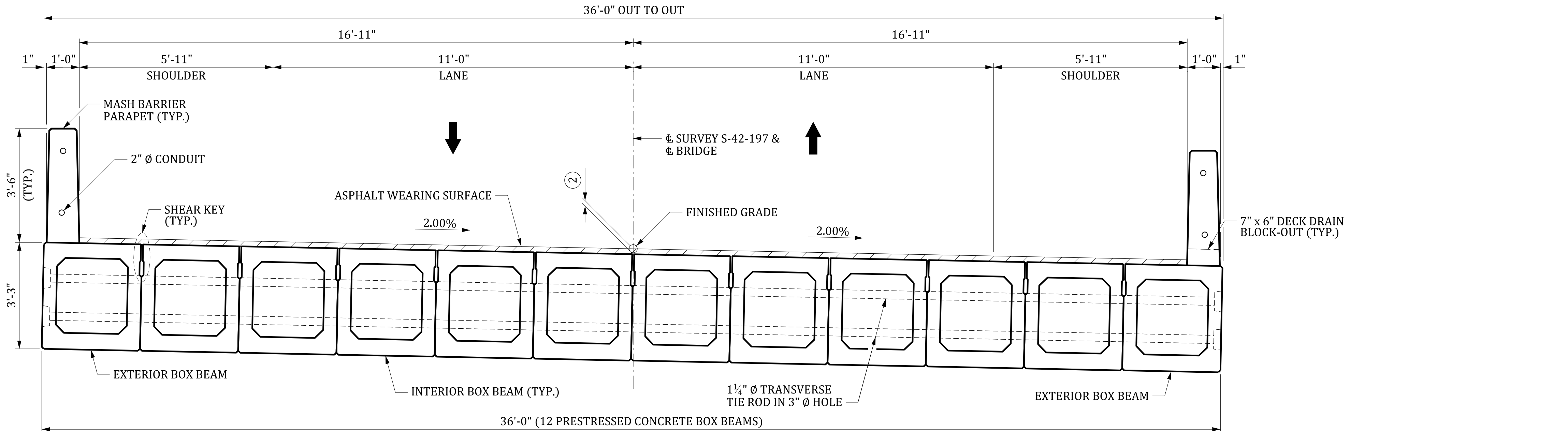
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| DR. | WST | KSH 10-25 |
| DES. | | |
| | BY | CHK. DATE |

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| REV. | | | | | |
| | BY | CHK. | DATE | DESCRIPTION OF REVISION | |

| | |
|-----------------|-------|
| BRIDGE PLANS ID | SHEET |
| P041164 | 5 |



TYPICAL SECTION - SPANS 1 AND 3
LOOKING IN DIRECTION OF STATIONING



TYPICAL SECTION - SPAN 2
LOOKING IN DIRECTION OF STATIONING

~ CONCEPTUAL PLANS ~
NOT FOR CONSTRUCTION



SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

**SUPERSTRUCTURE
TYPICAL SECTION**

COUNTY: SPARTANBURG ROUTE: S-42-197

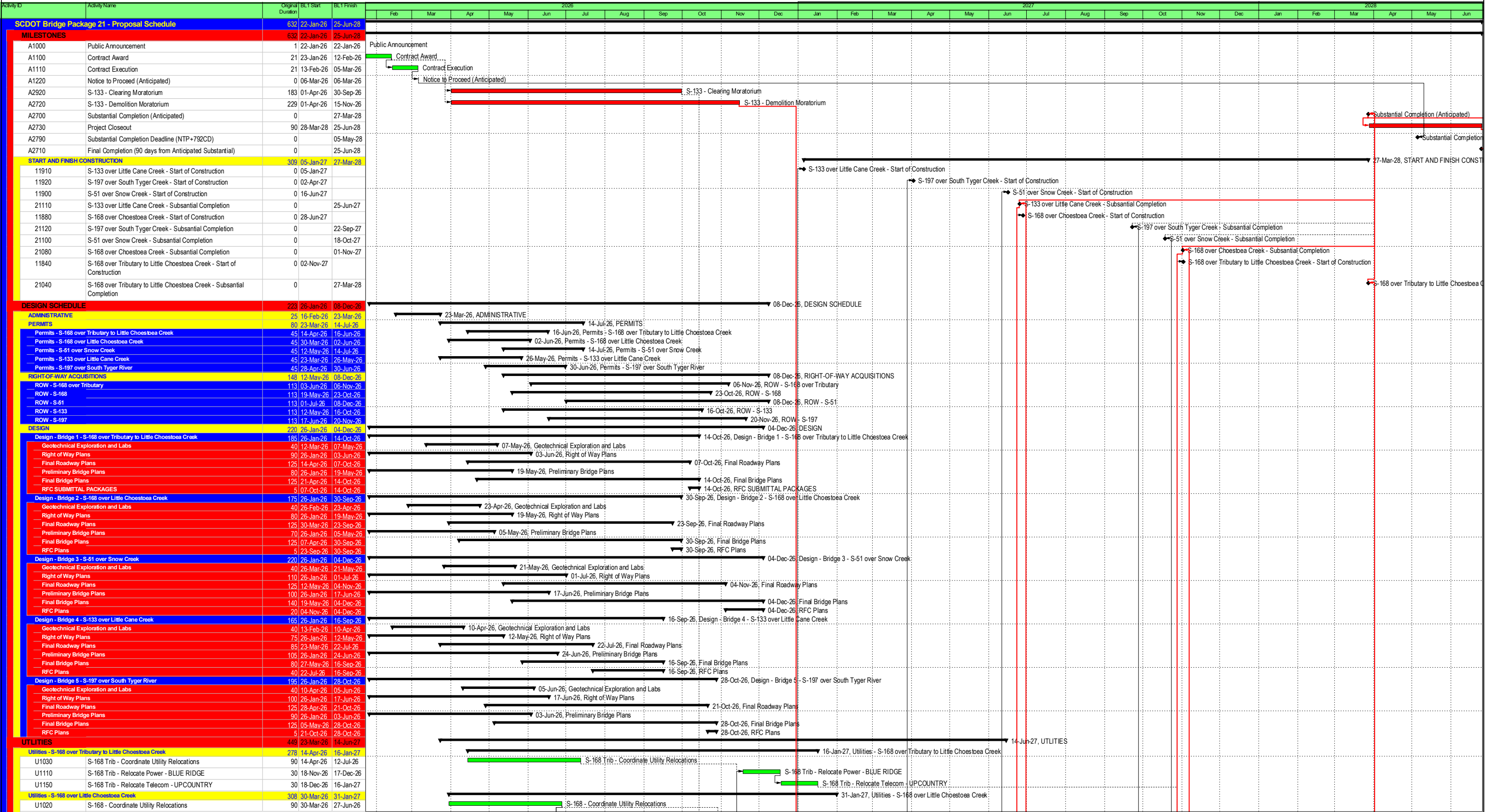
Appendix A.3

CPM Schedule



SCDOT Bridge Package 21 - Proposal Schedule

Wright Brothers Construction Company, Inc.



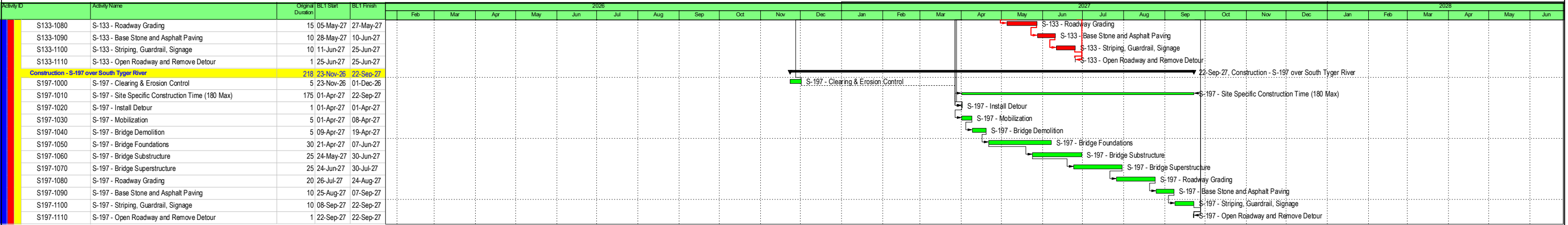
Remaining Level of Effort Remaining Work Milestone
Actual Work Critical Remaining Work Summary

Wright Brothers Construction Company, Inc.



SCDOT Bridge Package 21 - Proposal Schedule

Wright Brothers Construction Company, Inc.



Appendix B

Required Forms, and Confidential and Proprietary Information Page List



12. STIPEND ACKNOWLEDGEMENT FORM

Stipend Acknowledgement Form

Bridge Package 21 Oconee and Spartanburg Counties

Proposer: Wright Brothers Construction Company, Inc.

ADDRESS: 1500 Lauderdale Memorial Hwy, Charleston TN 37310

The undersigned Proposer, hereby:

☐

Waives the stipend for this Project.

☒

Accepts the stipend for this Project.

By accepting the stipend for this Project, Proposer agrees:

1) to execute and include the Stipend Agreement in Article XIII of the RFP with its RFP response;

2) to submit an invoice with FEIN number for the stipend amount to the SCDOT POC after SCDOT's posting of the Notice of Award on SCDOT's Design-Build Website.;

3) to transfer all rights to its Work Product used to develop the Proposal as of the date of this acknowledgement. "Work Product" means all submittals, including ATCs, ideas, innovations, solutions, methods, processes, design concepts, materials, electronic files, marked up drawings, cross sections, quantity lists and intellectual property, made by Proposer during the RFP process, including the Proposal, exchange of information during the pre-Proposal and post-Proposal period.

SCDOT will pay the stipend to each eligible unsuccessful Proposer, who has signed a Stipend Agreement, within ninety (90) days after execution of the Contract or the decision to not award a contract.

11/12/2025

Date

J. Mitchell Simpson, P.E.

Print Name

Wright Brothers Construction Company, Inc.

Proposer

13. STIPEND AGREEMENT

STIPEND AGREEMENT
Contract ID: 5368980
Bridge Package 21
Oconee and Spartanburg Counties

THIS STIPEND AGREEMENT (the "Agreement") is made and entered into as of the 12 day of November, 2025 by and between the SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION (hereinafter "SCDOT"), and Wright Brothers Construction Company, Inc. ("Proposer"), with reference to the following facts:

SCDOT issued a Request for Proposal ("RFP") for design and construction of the above-referenced Design-Build Project ("Project"), pursuant to procurement authority granted in Section 57-5-1625 of the S.C. Code of Laws, 1976, as amended. The RFP provided for payment of stipends as provided herein. Capitalized terms used, but not defined, have the meanings ascribed in the RFP.

NOW, THEREFORE, Proposer hereby agrees as follows:

1. Work Product.

1.1 Proposer shall prepare and submit a responsible and responsive Technical Proposal and Cost Proposal that conforms in all material respects to the requirements and provisions of the RFP, as determined by SCDOT, and are timely received by SCDOT in accordance with the RFP Milestone Schedule.

1.2 By signing this Stipend Agreement, Proposer agrees to transfer full and complete ownership to SCDOT of all Work Product. The Work Product (as defined below) shall become the property of SCDOT without restriction or limitation on its use, without further compensation or consideration, and can be used in connection with this Project or any future projects by SCDOT. Neither Proposer nor any of its team members shall copyright any of the material developed under this Agreement.

1.3 The term "Work Product" shall mean the Proposal and all material, electronic files, marked up drawings, cross sections, quantity lists, submittals, alternative technical concepts (ATC), ideas, innovations, solutions, methods, processes, design concepts, Trade Secrets or confidential information, and intellectual property, made by or produced for Proposer in the development and submission of the Technical and Cost Proposal, including exchanges of information during the pre-Proposal and post-Proposal period.

2. Compensation and Payment.

2.1 A stipend to Proposer for the Work Product described herein shall be \$40,000.00 and is payable to Proposer that was determined to be responsible and (1) submitted a responsive Technical Proposal and responsive Cost Proposal to the RFP which is not selected for award of this Project, or (2) was awarded the Contract but the Contract was terminated by SCDOT for convenience after the Submittal of Proposal Due Date (See Final RFP Milestone schedule) but prior to the Notice to Proceed #1. Responsibility of Proposers and responsiveness of the Technical Proposal and Cost Proposal will be determined by SCDOT as a condition of payment.

2.2 SCDOT will pay the stipend to Proposer as follows, subject (as applicable) to the following conditions:

(a) Proposer has submitted this signed Stipend Agreement, unchanged with its response to the RFP.

(b) After posting of the Notice of Award on SCDOT's Design-Build Website, Proposer has submitted to SCDOT an invoice, with FEIN Number, for the Stipend amount.

(c) After execution of the Contract or the decision not to award a contract, SCDOT will pay the invoice for the stipend amount to the unsuccessful Proposer meeting the criteria of Section 2.1 within 90 calendar days of receipt of the invoice from Proposer.

(d) If the procurement is suspended or cancelled prior to the Proposal Due Date (see FINAL RFP Milestone schedule), no stipend will be paid to Proposer.

(e) After the submittal of Proposals, but prior to award, if the procurement is cancelled, all Proposers that provide a responsive Technical Proposal and Cost Proposal to the final RFP and submitted a signed Stipend Agreement with their RFP shall receive the stipend

(f) In the event of a Best and Final Offer, only one stipend will be paid to each Proposer that executed a Stipend Agreement and met the other criteria and conditions herein.

(g) No stipends will be paid for submitting RFQ responses.

(h) No stipends will be paid to a Proposer who withdraws at any time from this procurement.

2.3 Acceptance by the Proposer of payment of the stipend amount from SCDOT shall constitute a waiver by Proposer of any and all right, equitable or otherwise, to bring any claim in connection with this procurement, procurement process, award of the Contract, or cancellation of this procurement.

2.4 The Proposer awarded the contract shall be not eligible to receive a stipend.

2.5 If Proposer elects to waive payment of the stipend, SCDOT will not use the ideas or information contained in that Proposer's Proposal for this Project. However, the Proposer's Proposal will be subject to the South Carolina Freedom of Information Act.

3. Indemnities.

3.1 Subject to the limitations contained in Section 3.2, Proposer shall indemnify, protect and hold harmless SCDOT and its directors, officers, employees and contractors from, and Proposer shall defend at its own expense, all claims, costs, expenses, liabilities, demands, or suits at law or equity arising, in whole or in part, from the negligence or willful misconduct of Proposer or any of its agents, officers, employees, representatives or subcontractors or breach of any of Proposer's obligations under this Agreement.

3.2 This indemnity shall not apply with respect to any claims, demands or suits arising from use of the Work Product by SCDOT.

4. Compliance With Laws.

4.1 Proposer shall comply with all federal, state, and local laws, ordinances, rules, and regulations applicable to the work performed or paid for under this Agreement and covenants and agrees that it and its employees shall be bound by the standards of conduct provided in applicable laws, ordinances, rules, and regulations as they relate to work performed under this Agreement. Proposer agrees to incorporate the provisions of this paragraph in any subcontract into which it might enter with reference to the work performed pursuant to this Agreement.

4.2 The Proposer agrees (a) not to discriminate in any manner against an employee or applicant for employment because of race, color, religion, creed, age, sex, marital status, national origin, ancestry or disability of a qualified individual with a disability; (b) to include a provision similar to that contained in subsection (a) in any subcontract; and (c) to post and to cause subcontractors to post in conspicuous places available to employees and applicants for employment, notices setting forth the substance of this clause.

5. Assignment.

Proposer shall not assign this Agreement without SCDOT's prior written consent. Any assignment of this Agreement without such consent shall be null and void.

6. Miscellaneous.

6.1 Proposer and SCDOT agree that Proposer, its team members, and their respective employees are not agents of SCDOT as a result of this Agreement.

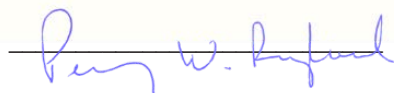
6.2 This Agreement, together with the RFP, as amended from time to time, the provisions of which are incorporated herein by reference, embodies the entire agreement of the parties. There are no promises, terms, conditions, or obligations other than those contained herein or in the RFP, and this Agreement shall supersede all previous communications, representation, or agreements, either oral or written, between the parties hereto.

6.3 It is understood and agreed by the parties hereto that if any part, term, or provision of this Agreement is by the courts held to be illegal or in conflict with any law of the State of South Carolina, the validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the Agreement did not contain the particular part, term, or provisions to be invalid.

6.4 This Agreement shall be governed by and construed in accordance with the laws of the State of South Carolina.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

Witness:



Recommended:

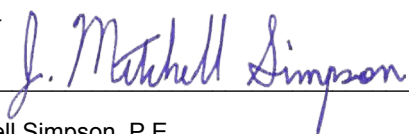
Penny W. Ragland

{INSERT NAME}

South Carolina Department of Transportation

By: _____
{INSERT NAME}
Preconstruction Alternative Delivery Engineer

Proposer

By:  _____

J. Mitchell Simpson, P.E.

Print Name

11. EQUAL EMPLOYMENT OPPORTUNITY CERTIFICATION

(COMPLETE THIS SECTION FOR FEDERAL PROJECTS ONLY) EQUAL EMPLOYMENT OPPORTUNITY PERFORMANCE

Select the Certification that applies to the PROPOSER:

Certification (☒) or Certification (☐)

Select the appropriate responses in the applicable Certification:

Certification (1): Pursuant to 41 C.F.R. §60-1.7(b)(1), Previous Equal Employment Opportunity Performance

Certification, as the Prospective Prime Contractor, I HEREBY CERTIFY THAT I:

(a) **(HAVE)** / ~~HAVE NOT~~ developed and filed an Affirmative Action Program pursuant to 41C.F.R. §60-2 and/or 60-4;

(b) **(HAVE)** / ~~HAVE NOT~~ participated in a previous contract or subcontract subject to the equal opportunity clause;

(c) **(HAVE)** / ~~HAVE NOT~~ filed with the Joint Reporting Committee, the Director of Office of Federal Contract Compliance, or the Equal Employment Opportunity Commission, all reports due under the applicable filing requirements,

OR

Certification (2): I, HEREBY CERTIFY that as the Prospective Prime Contractor submitting this Proposal, **(CLAIM / DO NOT CLAIM)** exemption from the submission of the Standard Form 100 (EEO-1) due to the fact that it employs a total of less than fifty (50) employees under C.F.R. §60-1.7, or qualifies for an exempted status under 41 C.F.R. §60-1.5.

I FURTHER CERTIFY that the above Certification will be made part of any Subcontract Agreement, or other agreement involved with this project.

Executed on Nov 12, 20 25 .

Signed: J. Mitchell Simpson
(Officer/PROPOSER)

Title: President/CEO

Company: Wright Brothers Construction Company, Inc.

Address: 1500 Lauderdale Memorial Hwy, Charleston TN 37310

Note: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b)(1)), and must be submitted by PROPOSERS only in connection with contracts which are subject to the equal opportunity clause. Contracts that are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally, only contracts of \$10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by Executive Orders or their implementing regulations.

Proposers, Primary Members, or proposed Subcontractors (any tier) and Consultants who have participated in a previous contract subject to the Executive Orders and have not filed the required reports shall note that 41 CFR 60-1.7(b)(1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

10. NON-COLLUSION CERTIFICATION**NON-COLLUSION CERTIFICATION****Contract ID: 5368980**

IN ACCORDANCE WITH THE PROVISIONS OF S.C. CODE ANN. §§ 39-3-10 ET. SEQ., 39-5-10 ET. SEQ., 15 U.S.C. §45; 23 C.F.R. §635.112(F); AND 28 U.S.C. §1746, I HEREBY ACKNOWLEDGE THAT I AM AN OFFICER OF THE PROPOSER FIRM AND, UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE UNITED STATES AND SOUTH CAROLINA, DECLARE, BY MY CERTIFICATION BELOW, THAT THE FOLLOWING IS TRUE AND CORRECT, AND FURTHER, THAT THIS JOINT-VENTURE, FIRM, PARTNERSHIP, ASSOCIATION OR CORPORATION, OR ANY OTHER LEGAL ENTITY HAS NOT, EITHER DIRECTLY OR INDIRECTLY, ENTERED INTO ANY AGREEMENT, PARTICIPATED IN ANY COLLUSION, OR OTHERWISE TAKEN ANY ACTION IN RESTRAINT OF FREE COMPETITIVE BIDDING IN CONNECTION WITH THE SUBMISSION OF A BID PROPOSAL ON THE ABOVE REFERENCED PROJECT.

BY CHECKING THIS BOX ☒ , I CERTIFY THAT I HAVE READ, UNDERSTAND, ACCEPT, AND ACKNOWLEDGE ALL OF THE ABOVE STATEMENTS.

Executed on November 12, 2025
(Date)

Signed: *J. Mitchell Simpson*
(Officer/Proposer)

President/CEO, Wright Brothers Construction Company, Inc.
(Title)

1500 Lauderdale Memorial Hwy
(Address)

Charleston TN 37310



South Carolina
Department of Transportation

NOTICE TO PROPOSERS

Bridge Package 21
Design-Build – Contract ID 5368980
Oconee and Spartanburg Counties

October 7, 2025

NOTICE TO PROPOSERS - Enclosed is **Addendum 1** to the Request for Proposals (RFP) for the Bridge Package 21 design-build project. The information provided in this notice and the addendum shall be made part of the contract documents.

The **yellow** highlights identify the revisions associated with Addendum 1.

This addendum is being issued in order to provide clarification and additional information for the project. The following sections of the RFP contain revisions:

- Request for Proposals Instructions
- Agreement
 - Section IV.A.1.c
 - Section 2, DBE Goal
- Exhibit 4a
- Exhibit 4b
- Exhibit 4e
- Exhibit 4z
- Exhibit 5

Proposers are responsible for reviewing the Addendum and determining if any prior approved ATCs are affected by the revisions. The Proposer must submit a request for approval of all additional variances required within five (5) business days of receipt of the Addendum.



NOTICE OF RECEIPT
Bridge Package 21
Design-Build – Contract ID 5368980
Oconee and Spartanburg Counties

Addendum 1

The information in this addendum shall be made part of the contract documents. PROPOSERS are instructed to incorporate the information into the previously provided RFP documents.

PROPOSERS are required to sign this document and enclose it with their Technical Proposal. Receipt of this signed document by The South Carolina Department of Transportation serves as confirmation that the PROPOSER has received and incorporated this Addendum into the contract documents.

Confirmation Statement:

I, the PROPOSER confirm that I have received this addendum package and have incorporated the information provided in the addendum into the contract documents.



PROPOSER's Signature

November 12, 2025

Date

J. Mitchell Simpson, P.E.

Printed Name

For: Wright Brothers Construction Company, Inc.
Design-Build Team Name





South Carolina
Department of Transportation

NOTICE TO PROPOSERS

Bridge Package 21
Design-Build – Contract ID 5368980
Oconee and Spartanburg Counties

October 24, 2025

NOTICE TO PROPOSERS - Enclosed is **Addendum 2** to the Request for Proposals (RFP) for the Bridge Package 21 design-build project. The information provided in this notice and the addendum shall be made part of the contract documents.

The **yellow** highlights identify the revisions associated with Addendum 1. The **green** highlights identify the revisions associated with Addendum 2.

This addendum is being issued in order to provide clarification and additional information for the project. The following sections of the RFP contain revisions:

- Agreement
- Exhibit 4a
- Exhibit 4b
- Exhibit 4e
- Attachment B: Hydrology

Proposers are responsible for reviewing the Addendum and determining if any prior approved ATCs are affected by the revisions. The Proposer must submit a request for approval of all additional variances required within five (5) business days of receipt of the Addendum.



NOTICE OF RECEIPT
Bridge Package 21
Design-Build – Contract ID 5368980
Oconee and Spartanburg Counties

Addendum 2

The information in this addendum shall be made part of the contract documents. PROPOSERS are instructed to incorporate the information into the previously provided RFP documents.

PROPOSERS are required to sign this document and enclose it with their Technical Proposal. Receipt of this signed document by The South Carolina Department of Transportation serves as confirmation that the PROPOSER has received and incorporated this Addendum into the contract documents.

Confirmation Statement:

I, the PROPOSER confirm that I have received this addendum package and have incorporated the information provided in the addendum into the contract documents.



PROPOSER's Signature

November 12, 2025

Date

J. Mitchell Simpson, P.E.

Printed Name

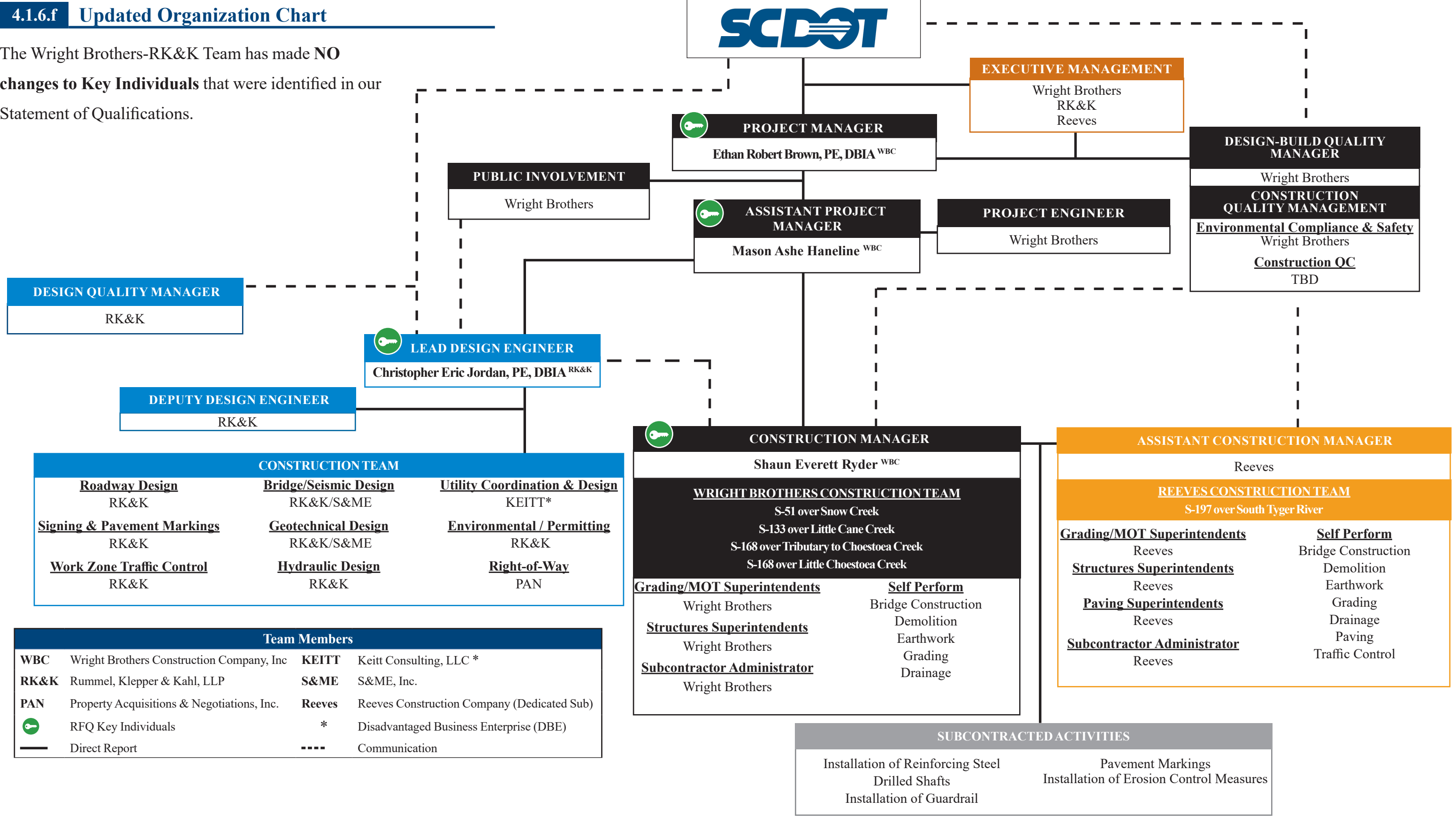
For: Wright Brothers Construction Company, Inc.
Design-Build Team Name





4.1.6.f Updated Organization Chart

The Wright Brothers-RK&K Team has made **NO** changes to **Key Individuals** that were identified in our Statement of Qualifications.





Proposers Statement

Bridge Package 21

Design-Build Project - Contract ID 5368980

Oconee and Spartanburg Counties South Carolina

The Proposed Key Individuals identified in the original organizational chart in the Wright Brothers-RK&K Statement of Qualifications, will be available barring any unforeseen circumstances, at the earliest of the times and durations identified in the RFQ and RFP, until expiration of the Warranty Period, or such earlier date as the Contract is terminated or SCDOT releases, in writing, such Key Individual from this requirement

Proposed Key Individuals:

Ethan Robert Brown, PE, DBIA, Project Manager

Mason Ashe Haneline, Assistant Project Manager

Shaun Everett Ryder, Construction Manager

J. Mitchell Simpson, PE - President/CEO,
Wright Brothers Construction Company, Inc.

11/24/2025

Ethan Robert Brown, PE, DBIA
Project Manager

11/24/2025

State: Tennessee

County: Bradley

I, Summer J. Cavitt, a Notary Public for Said County and State, do hereby certify that **Mitchell Simpson & Ethan Brown** personally appeared before me this day and acknowledged the due execution of the foregoing statement. witness my hand and official seal this 24 day of November, 2025.

Notary Public

SINCE 1961

1500 LAUDERDALE MEMORIAL HWY • CHARLESTON, TN 37310

www.wbcci.com

PROPOSERS STATEMENT

Bridge Package 21

Design-Build Project - Contract ID 5368980

Oconee and Spartanburg Counties, South Carolina

Proposed Key Individual, **Christopher Eric Jordan, PE, DBIA**, Lead Design Engineer identified in the original organizational chart in the Wright Brothers-RK&K Statement of Qualifications, will be available barring any unforeseen circumstances, at the earliest of the times and durations identified in the RFQ and RFP, until expiration of the Warranty Period, or such earlier date as the Contract is terminated or SCDOT releases, in writing, such Key Individual from this requirement.

B. Keith Skinner
B. Keith Skinner, PE – Partner, RK&K

11/24/2025

Ethan Robert Brown
Ethan Robert Brown, PE, DBIA Project Manager

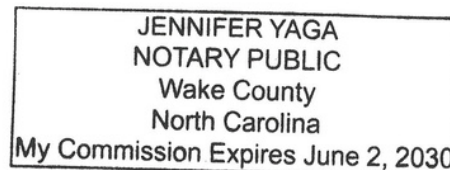
11/24/2025

State: North Carolina
County: Wake

I, Jennifer Yaga, a Notary Public for Said County and State, do hereby certify that B. Keith Skinner, PE personally appeared before me this day and acknowledged the due execution of the foregoing statement. witness my hand and official seal this 24th day of November, 2025.

My commission expires June 2, 2030.

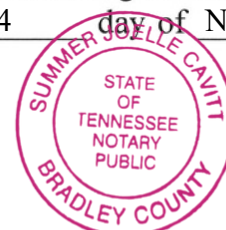
Jennifer Yaga
Notary Public



State: Tennessee
County: Bradley

I, Summer J. Cavitt, a Notary Public for Said County and State, do hereby certify that Ethan Brown personally appeared before me this day and acknowledged the due execution of the foregoing statement. witness my hand and official seal this 24 day of November, 2025.

Summer J. Cavitt
Notary Public





4.1.6.g Confidential and Proprietary Information Page List (Section 4.4)

The Team of Wright Brothers (Lead Contractor) and RK&K. (Lead Designer) do not deem any of the information within this submittal as confidential or proprietary.



South Carolina Department of Transportation

Columbia, South Carolina

South Carolina Department

Of

Transportation

Prime Contractor

Prequalification Certificate

This Certifies that your company has complied with the rules and regulations of the Department and the State of South Carolina, and subject to the rules and regulations for a prime contractor, is declared eligible to submit a bid and be awarded any construction contract issued by the Department, subject to obtaining proper bonds and insurance acceptable to the Department and complying with all other statutory and contract requirements.

ALL BIDS SUBMITTED TO THE DEPARTMENT MUST BE IN THE NAME AS SHOWN BELOW.

VENDOR NAME

WRIGHT BROTHERS CONSTRUCTION COMPANY, INC.

Vendor ID:

1WR001

Date Issued:

November 7, 2024

Expiration Date:

December 31, 2025

Approved By:

Prequalification and Contracts Coordinator



4.1.6.i A copy of the joint venture organizational agreement

Our Team is not a partnership, limited partnership, joint venture, or other association.

SCDOT Bridge Package 21 Quality Credit Matrix

| Number | Description | Added Value/Benefits | Cost/Schedule Impacts | Self-imposed Assurance |
|--------|---|--|---|---|
| 1 | Substantial Completion | WBC is committed to completing the project within 752 days of NTP. | Reduces project overhead costs and the overall project duration is reduced by 40 days. Estimated cost savings of \$152,000. | Additional LDs of \$1000 per day for which the project is not substantially complete (Agreement Section IV.D.2) for a total of \$3,800 per day. |
| 2 | Right-of-Way Reduction | Our FATCs and other design refinements have significantly reduced ROW acquisition from 4.16 Total Acres shown in the SCDOT Conceptual Plans to 2.40 Total Acres, for a total reduction of 1.76 Acres for the five (5) bridge sites. We were also able to eliminate acquisition of 5 tracts on the project. | Reduction in ROW Acquisition will increase schedule certainty and will reduce cost for SCDOT. | |
| 3 | Reduction of Closure Durations | Our FATCs and other design refinements resulted in shortening bridge closures by a total of 5 weeks for the 5 sites combined. | Reduced impacts to nearly 80,000 trips by reducing bridge closure durations on S-133 and S-51. | |
| 4 | Reduction of Utility Impacts | Our FATCs and other design refinements resulted in shortening the project limits at all sites, which avoids utility impacts or reduces the extent when relocations are necessary. | Utility Coordination scope and cost will be reduced by reducing project limits and slopes to avoid or minimize relocations. | |
| 5 | Elimination of Jurisdictional Wetland Impacts at S-133 | Our design eliminates JD impacts for slope construction at S-133 reducing significant environmental impacts and eliminating the need for mitigation costs and a USACE permit | Increases schedule certainty and reduces cost by over \$50,000 for mitigation credits that are no longer needed. | |
| 6 | Optimized Bridge S-168 over Tributary to Little Choestoea | Reduced bridge length using a single span of girders with cast-in-place deck in lieu of cored slabs/box beams and eliminated an interior bent. Increased service life of structure (10+ years) and reduced life cycle costs. | Increased schedule certainty and reduced construction cost by \$400,000. Reduced future rehabilitation costs by \$265,000 (68% of 2024 FHWA Replacement Cost per sf). | |

| Number | Description | Added Value/Benefits | Cost/Schedule Impacts | Self-imposed Assurance |
|--------|---|--|---|------------------------|
| 7 | Optimized Bridge S-168 over Tributary to Little Choestoea | Reduced bridge length using a single span of concrete girders, eliminating an interior bent. Reduced life cycle maintenance costs for drift and debris removal. | Reduced future maintenance costs by \$60,000 (estimated \$10,000/each every 5 years for 30 years). | |
| 8 | FATC #2 | S-197 over Tyger River - Reduced bridge length | Reduced cost by \$80,000. | |
| 9 | FATC #3 | S-133 over Little Cane - Reduced bridge length | Reduced cost by \$125,000 and shortened construction schedule by 1 week. | |
| 10 | FATC #4 | S-133 over Little Cane - Reduced borrow excavation by approximately 2,500 CY, eliminating the hauling of 250 triaxle loads on SCDOT infrastructure in proximity to the project and associated traffic and environmental impacts. | Reduced construction cost by \$120,000 and shortened construction schedule by 1 week. | |
| 11 | FATC #5 | S-133 over Little Cane - Steepened slopes with geotechnical reinforcement to reduce environmental impacts. | Reduced cost by over \$50,000 for mitigation credits and increases schedule certainty. | |
| 12 | FATC #6 | S-51 over Snow Creek - Reduced bridge length using a single span of concrete girders with cast-in-place deck in lieu of cored slabs/box beams and eliminated an interior bent. Increased service life of structure (10+ years) and reduced life cycle costs. | Reduced construction schedule by 3 weeks by eliminating an interior bent and reduced construction cost by \$155,000. Reduced future rehabilitation costs by \$138,000 (68% of 2024 FHWA Replacement Cost per sf). | |
| 13 | FATC #6 | S-51 over Snow Creek - Reduced bridge length using a single span of concrete girders, eliminating an interior bent. Reduced life cycle maintenance costs for drift and debris removal. | Reduced future maintenance costs by \$60,000 (estimated \$10,000/each every 5 years for 30 years). | |

Appendix C

*Approved Formal ATCs being incorporated
into the Proposer's Cost Proposal*



Formal Alternative Technical Concepts Submittal Form

Project: Bridge Package 21

Project ID: 5368980

ATC No.: 2

Priority: High

Team: WBCC-RK&K

Date: 10/8/25

Description (required):

Reduce bridge length on S-197 over Tyger River from 210-ft to 200-ft.

Usage:

Our team is proposing to use a three span [50-100-50] 200-ft long bridge with a 100-ft channel span.

Deviations (required):

Attachment B; Hydro; 3. Package 21 Bridge Length

Justification:

Upon an in-depth review of the site and the preliminary hydraulic model results, our team has determined that a 200-ft three span bridge meets the requirements of the RFP at this site. Included with this ATC is a Bridge Hydraulic Analysis Report and Bridge Plan and Profile for supporting justification. These documents show we meet the minimum setbacks to top of bank as well as meeting the hydraulic requirements for freeboard and backwater.

Schedule:

No anticipated schedule savings associated with this ATC.

Impacts:

A shorter bridge minimizes impacts to right-of-way, utilities, and environmental concerns.

History:

The bridge will be designed in accordance with SCDOT requirements just as all bridges have been designed previously for the Department.

Risks:

No additional risks anticipated.

Formal Alternative Technical Concepts Submittal Form

Project: Bridge Package 21

Project ID: 5368980

ATC No.: 2

Priority: High

Team: WBCC-RK&K

Date: 10/8/25

Costs (required):

A reduction in bridge length will provide anticipated cost savings of \$80,000.00.

Quality:

No reduction in quality anticipated.

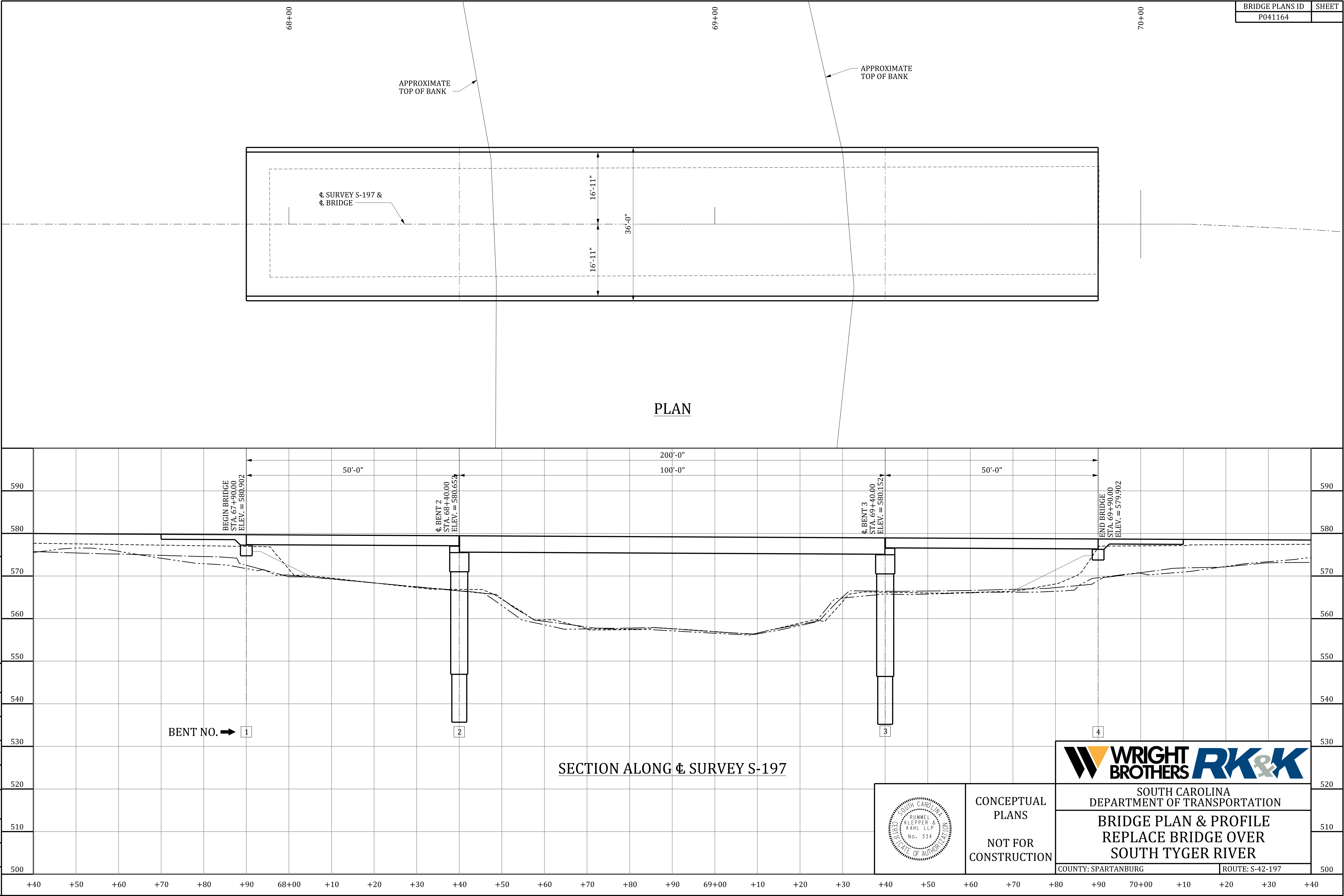
Operations & Maintenance:

The shorter bridge will reduce operations and maintenance costs over the life of the bridge.

10/3/2025 2:08:30 PM 02_P041164_Bridge Plan and Profile.dgn

| | | |
|-----------|-------|---------------|
| REVIEWED: | KSH | 08-25 |
| | QUAN. | |
| | DR. | CBH KSH 08-25 |
| | DES. | |
| | BY | CHK. DATE |

| | | | | | |
|------|----|------|------|-------------------------|--|
| REV. | | | | | |
| REV. | | | | | |
| REV. | | | | | |
| | BY | CHK. | DATE | DESCRIPTION OF REVISION | |



Spartanburg County S-42-197 (Old Spartanburg Highway) Over South Tyger River

Bridge Hydraulics Analysis for Alternative Technical Concept (ATC)

The analysis presented in this document covers evaluation and comparison of bridge hydraulic performance of the original SCDOT proposed design and the ATC design option under consideration for the S-42-197 bridge replacement over South Tyger River in Spartanburg County.

I. INTRODUCTION

The Request for Proposal (RFP) includes a preliminary bridge hydraulic analysis for the existing bridge over South Tyger River on S-42-197 in Spartanburg County, SC in the Project Information Package (PIP). The RFP Attachment B/Hydro section calls for a minimum bridge length of 210-ft with a minimum channel span of 100-ft over South Tyger River. Our Team has performed an independent preliminary bridge hydraulic analysis for the S-42-197 bridge and proposes an Alternative Technical Concept (ATC), reducing the minimum bridge length to 200-ft from the required 210-ft minimum. The proposed bridge will have a span configuration of 50'-100'-50'. All pertinent data and supporting documentation are provided below.

II. DESIGN CRITERIA

- Design Storm Event: 25-Year
- Overtopping: The 4% AEP (25-year event) shall be conveyed with no road overtopping. The 1% AEP (100-year event) shall be conveyed with no road overtopping and maintain free surface flow.
- Freeboard: Shall not be less than 2 feet above the proposed 4% AEP (25-year event). Free surface flow shall be maintained through the Bridge for frequencies up to and including the 1% AEP (100-year event) which on occasion may require a freeboard greater than the minimum 2 feet of freeboard above the design event.
- Backwater: Shall be designed so that backwater for the 1% AEP flood is one foot or less when compared to the unrestricted or natural conditions and shall not create more backwater than the existing bridge.
- Low Chord: The design high-water elevation for evaluating freeboard and determining the minimum low chord elevation shall represent the highest water-surface elevation upstream of the bridge before it begins to draw down through the bridge. The low chord of a replacement bridge shall not be below the low chord of the existing bridge.
- Abutments: Provide a minimum 10-foot abutment setback from the top of the channel bank and at a point where the projection of the spill through slope will not intersect the channel not including the thickness of the riprap of abutment slope. To achieve setback criteria, a bench may be cut lower than the surveyed top-of-bank elevation, provided that the bench is cut higher than the ordinary-high-water elevation used for the environmental jurisdictional stream delineation.
- Piers: Per the RFP, a minimum 5-foot setback may be utilized on S-197 if needed.

III. MODEL UPDATES

The preliminary model provided in the PIP was updated using the guidance of the HEC-RAS Hydraulic Reference Manual Version 5.0 dated February 2016. Below is a list of updates that were completed by RK&K during the hydraulic design process. All models and subsequent updates were run in HEC-RAS version 6.6.

- In existing and proposed conditions, ineffective flow locations and elevations were adjusted using the ratios provided in the HEC-RAS Hydraulic Reference Manual. The ineffective elevations were set to match the low point of the roadway on the left and right respectively.
- The existing bridge was modified to have spill through abutments set at a 1:1 slope.
- In existing conditions, the upstream and downstream embankment side slopes were updated to 1:1.

- The existing 1' bridge rail was added to the model. And the roadway deck profile was updated based on the most recent survey provided by SCDOT.
- The Bridge Modeling Approach was updated for the Low Flow Methods to not include the Yarnell equations.
- The proposed bridge was modified to have spill through abutments set at a 2:1 slope. The sloped abutments have a 2-ft riprap bench located 2-ft below the low chord.
- The proposed bridge model was edited for the correct structure depth and correct bridge rail height determined from RK&K's structures department.
- The proposed bridge length was reduced from a 210-ft bridge to a 200-ft bridge.
- The proposed pier locations were updated for the new span arrangement, 50'-100'-50'. The proposed pier width was set to 4 ft.
- The proposed roadway grade was added to the deck cross section.

IV. CONCLUSION AND RESULTS

The results from the HEC-RAS analysis demonstrate that a 200-ft multi-span bridge will meet the RFP requirements. RK&K's proposed bridge model shows a reduction in 100-year backwater from 1.27' to 0.72' in proposed conditions. Table 1 shows a summary of the design criteria for the S-42-197 crossing over Little Cane Creek.

Table 1: Summary of Results

| <u>CRITERIA**</u> | <u>SCDOT RFP Existing Model*</u> | <u>SCDOT RFP Model*</u> | <u>RK&K Existing Model</u> | <u>RK&K Revised Model</u> |
|-------------------------|--------------------------------------|-----------------------------|------------------------------------|-----------------------------------|
| 25-Year WSEL | 572.32 | 572.24 | 573.13 | 572.98 |
| 100-Year WSEL | 575.38 | 575.15 | 576.65 | 576.10 |
| 100-Year Backwater (ft) | 1.04 | 0.81 | 1.27 | 0.72 |
| 25-Year Freeboard (ft) | 1.85 | 2.94 | 2.68 | 3.33 |
| Low Chord Elevation | 574.17 | 575.18 | 575.81 | 576.31 |
| Bridge Length (ft) | 195 | 210 | 195 | 200 |
| Span Arrangement | 7 @ 15', 3 @ 30' | 50'-100'-60' | 7 @ 15', 3 @ 30' | 50'-100'-50' |

**All values for the SCDOT RFP Model were pulled from the Preliminary Hydraulics Report.*

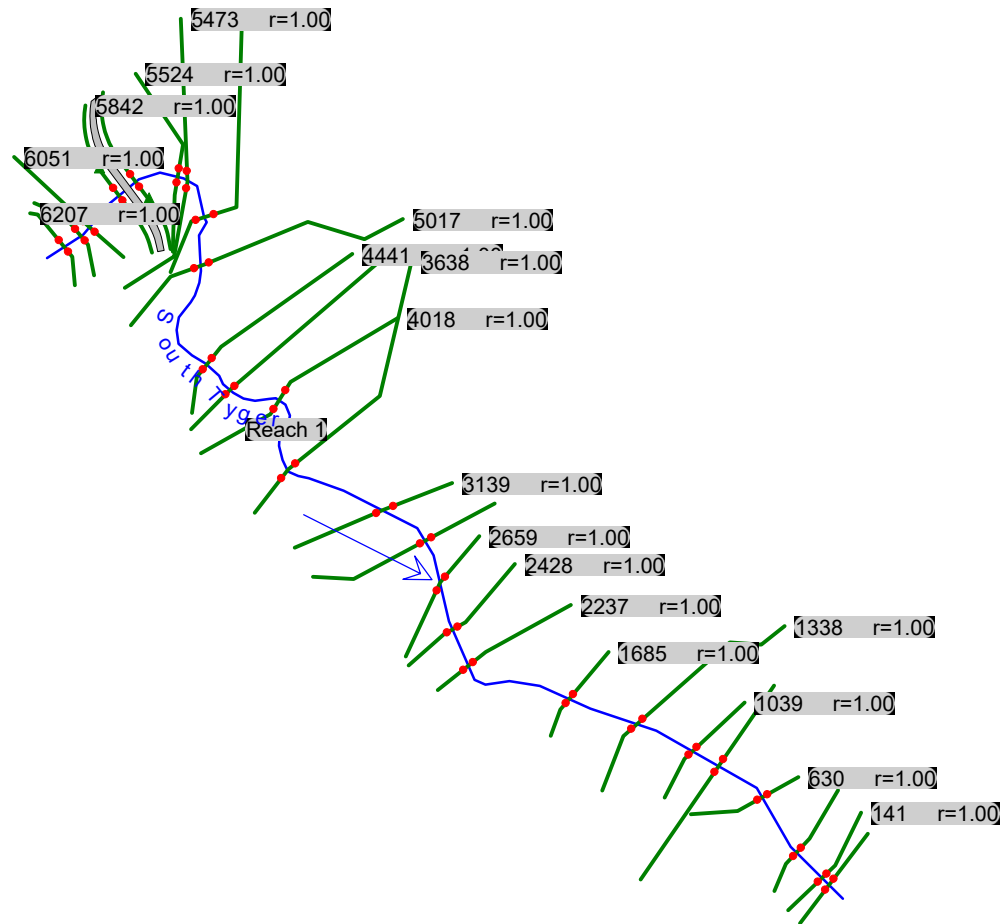
***Water surface elevations and freeboard are based on the approach cross section.*

V. ATTACHMENTS

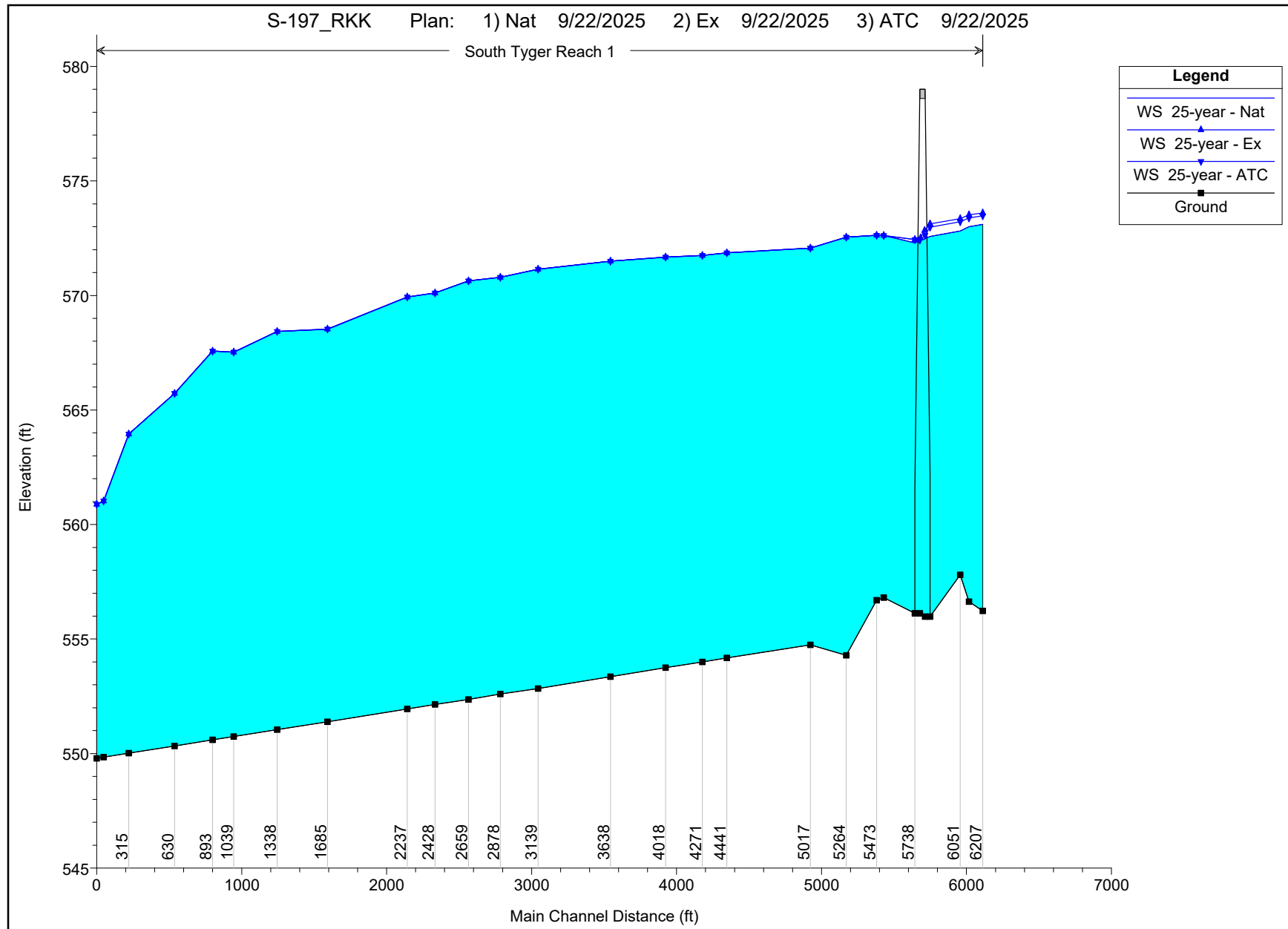
- Attachment A: RK&K Proposed Model HEC-RAS Outputs

Attachment A: RK&K Proposed Model HEC-RAS Outputs

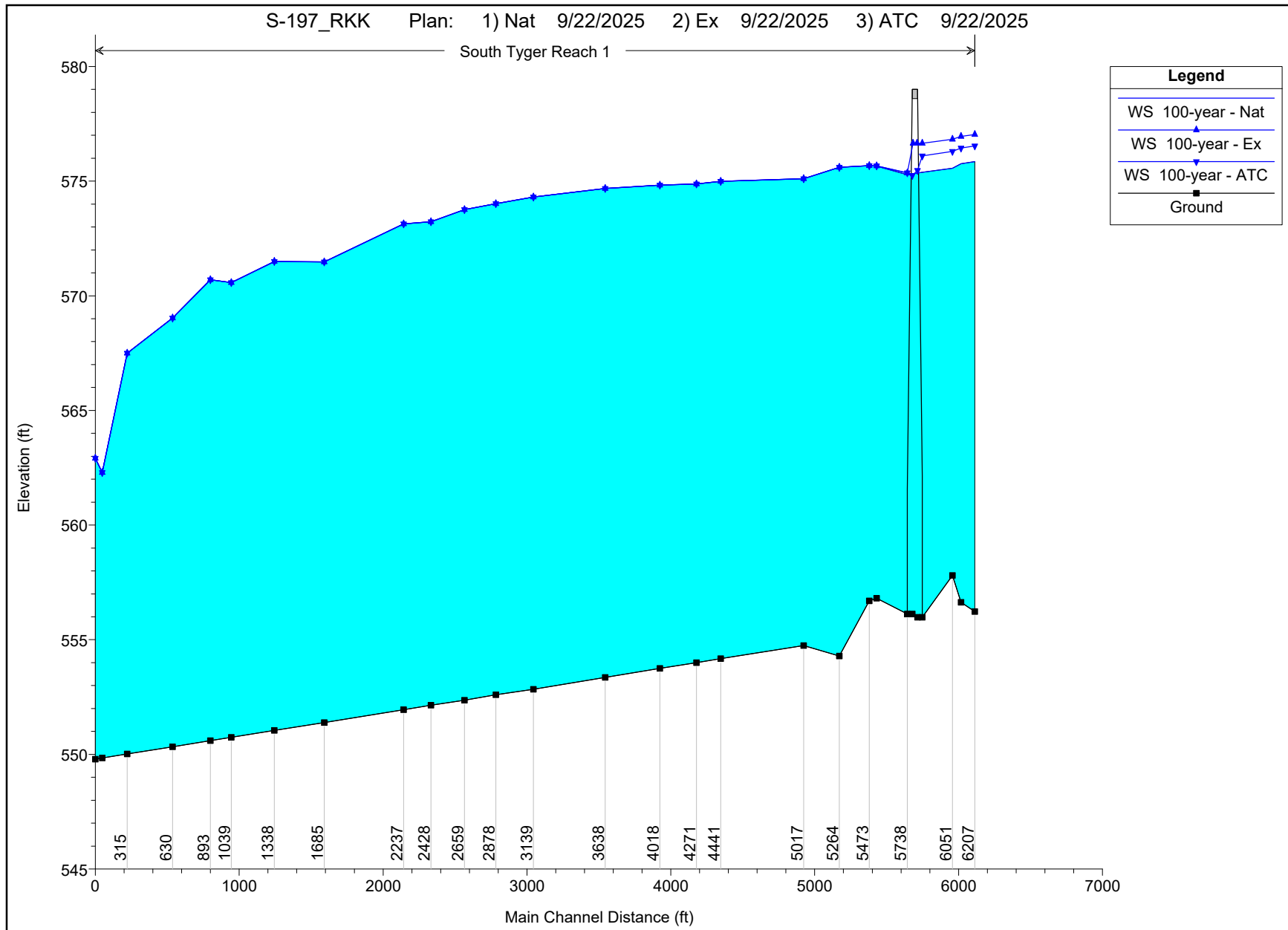
Spartanburg S-42-197 (Old Spartanburg Hwy) over South Tyger River HEC-RAS Schematic



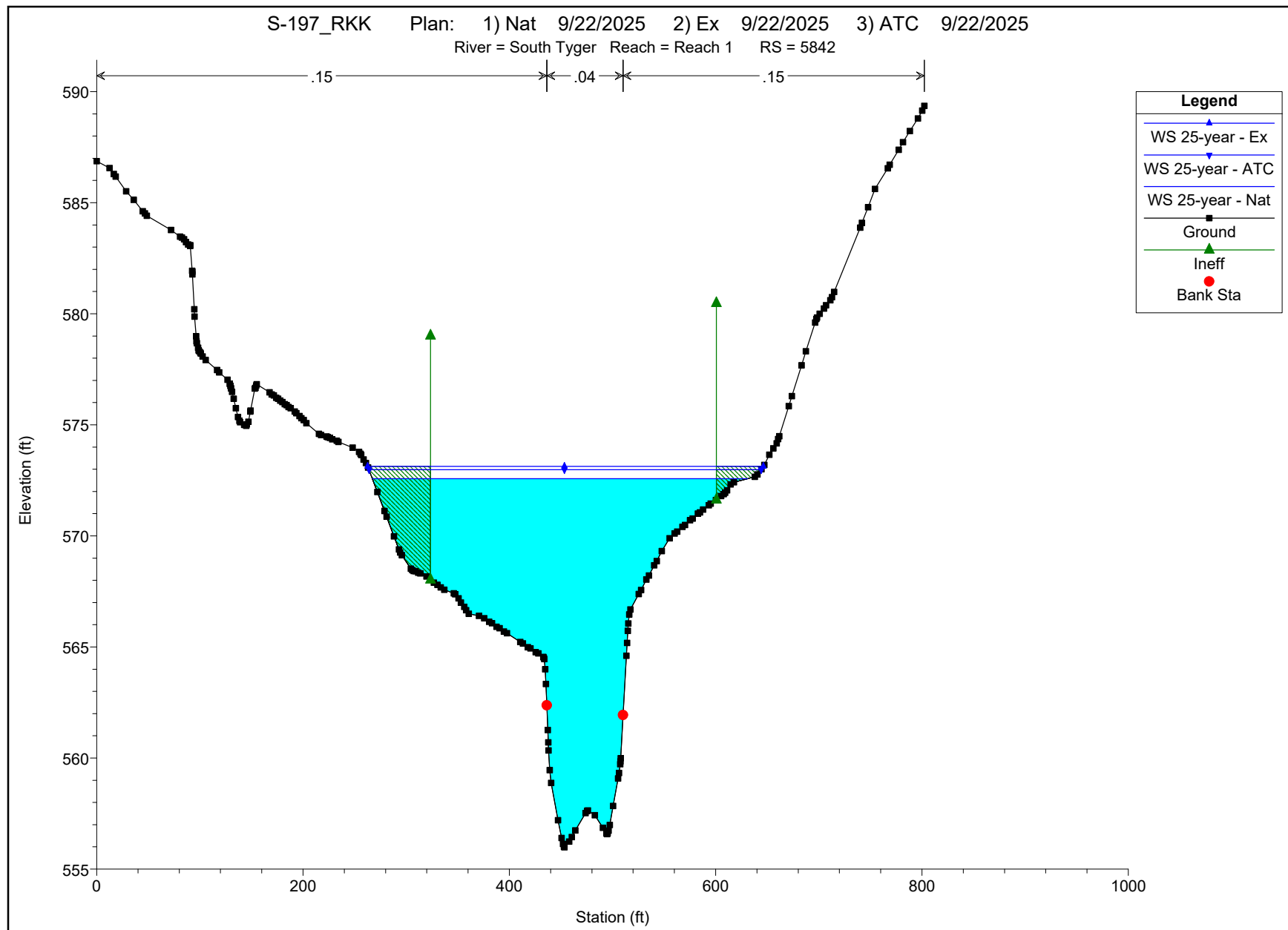
Spartanburg S-42-197 (Old Spartanburg Hwy) over South Tyger River 25 Year Profile



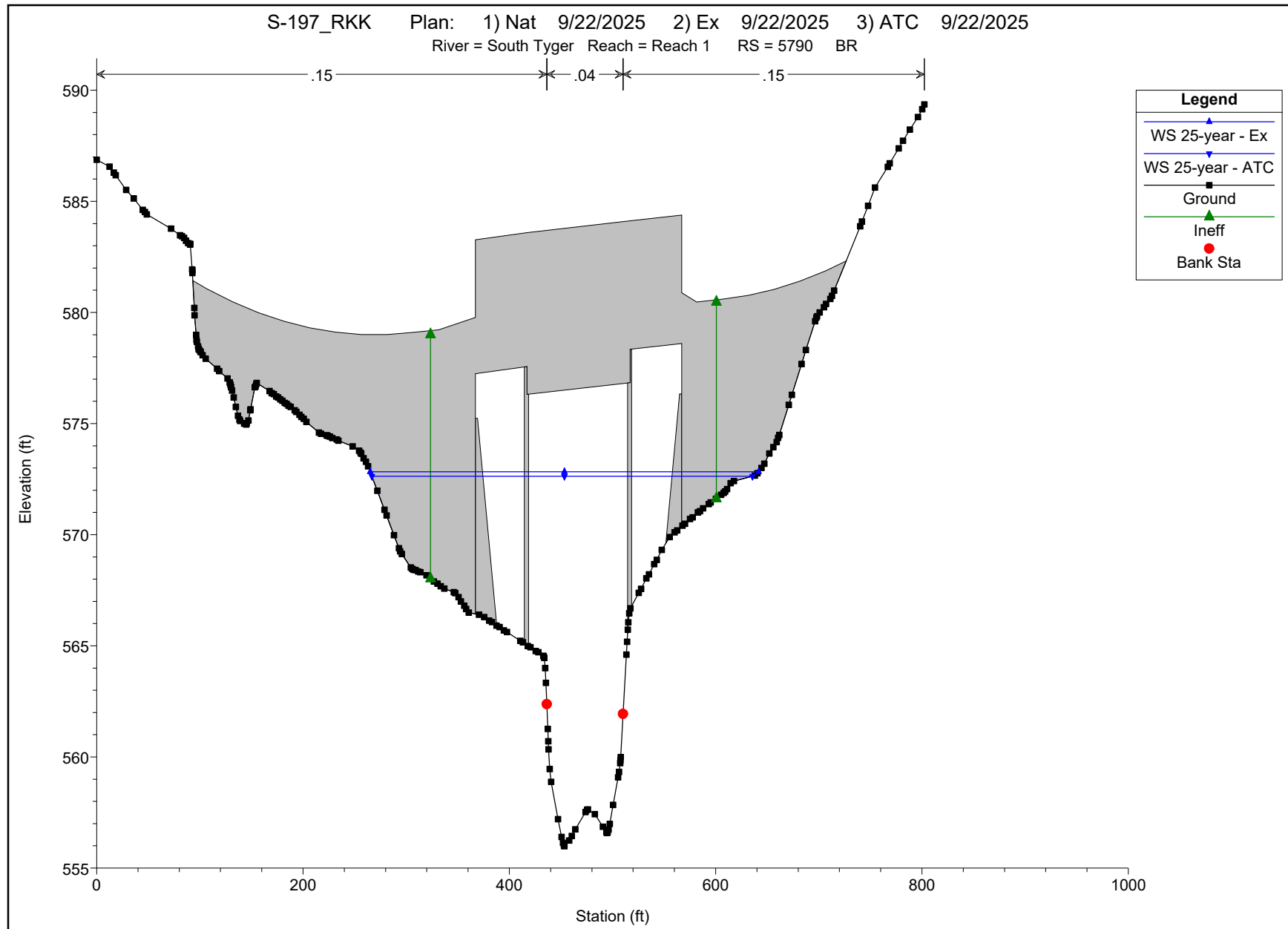
Spartanburg S-42-197 (Old Spartanburg Hwy) over South Tyger River 100 Year Profile



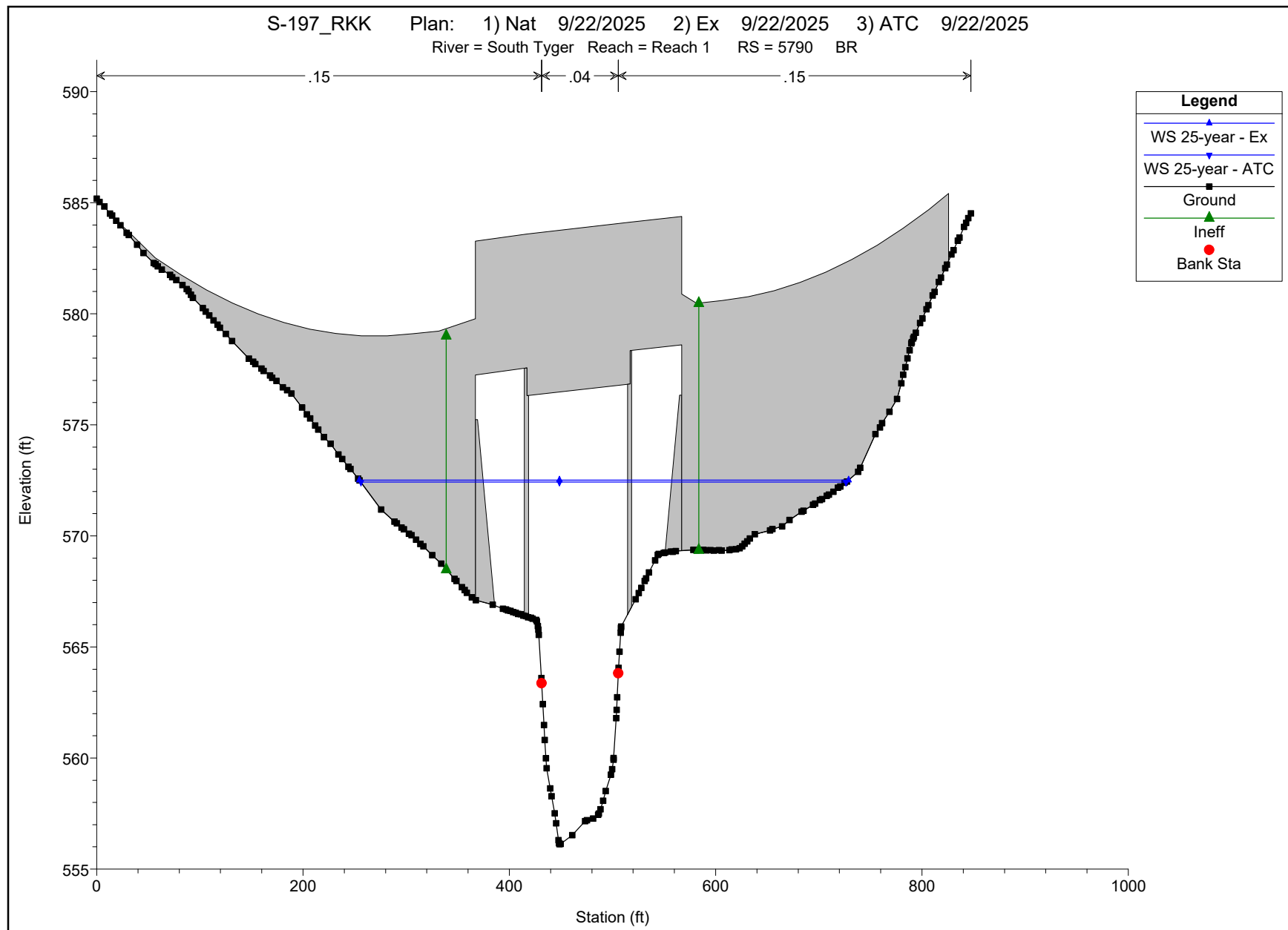
Spartanburg S-42-197 (Old Spartanburg Hwy) over South Tyger River 25 Year Cross Sections



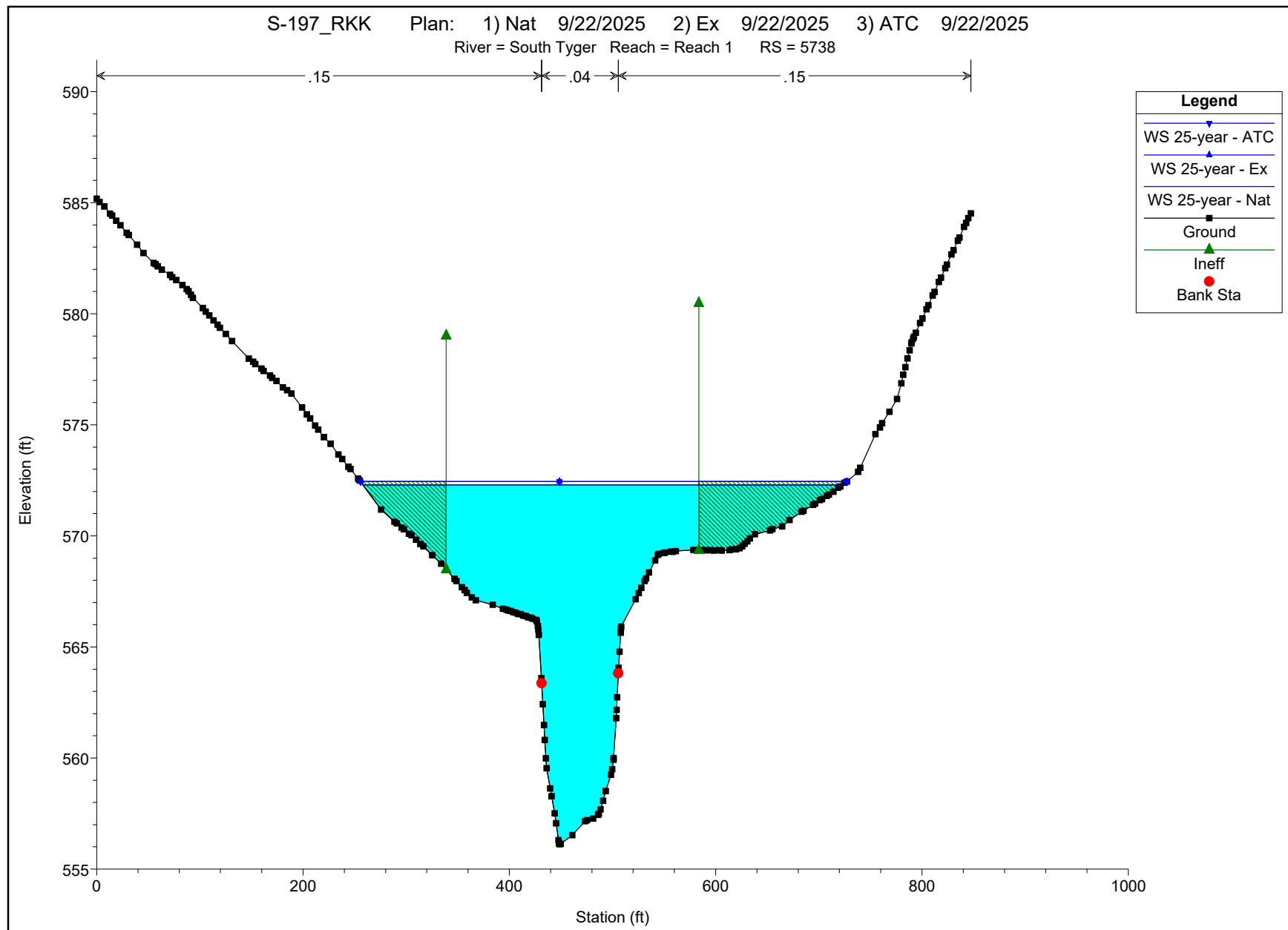
Spartanburg S-42-197 (Old Spartanburg Hwy) over South Tyger River 25 Year Cross Sections



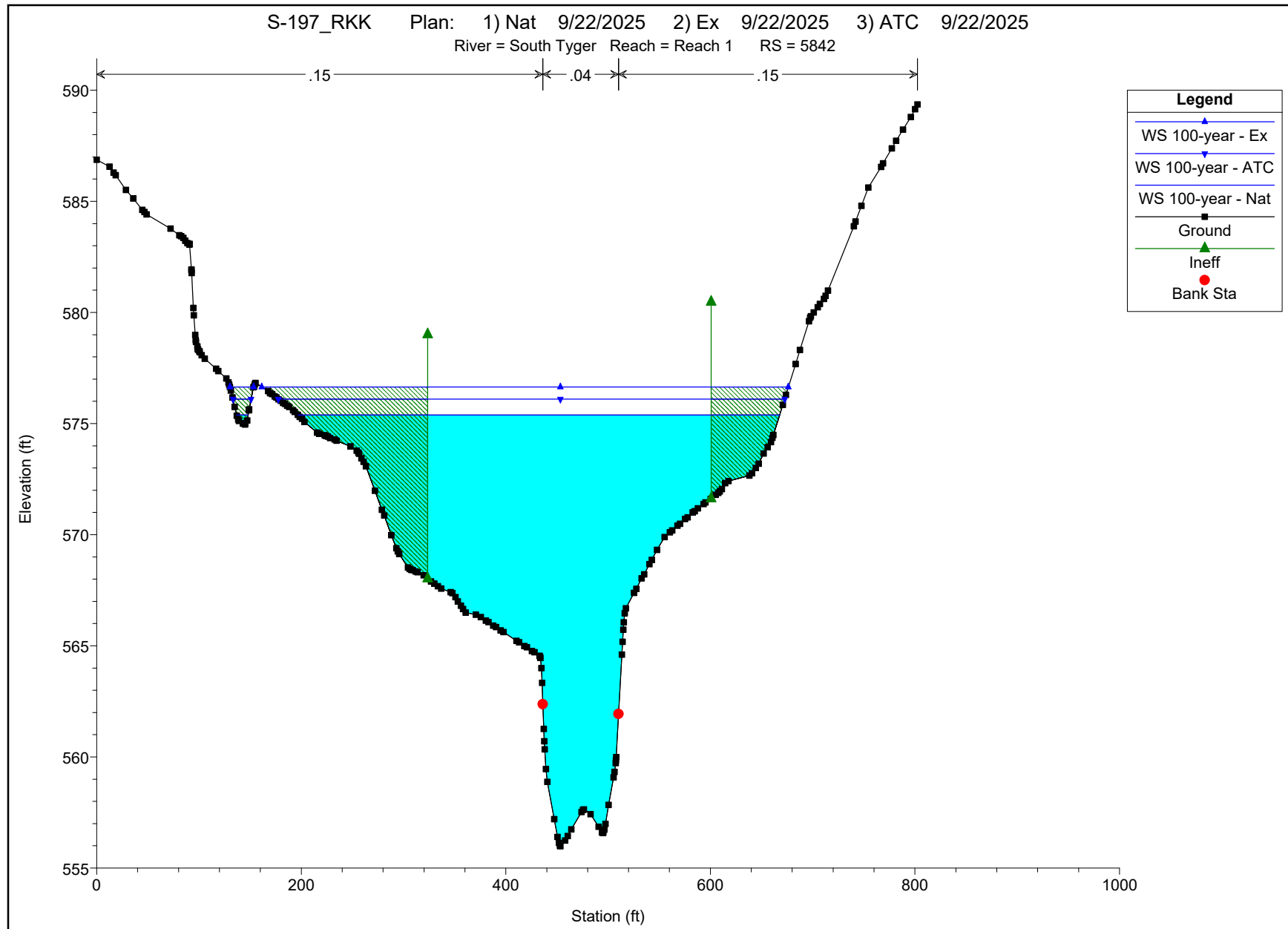
Spartanburg S-42-197 (Old Spartanburg Hwy) over South Tyger River 25 Year Cross Sections



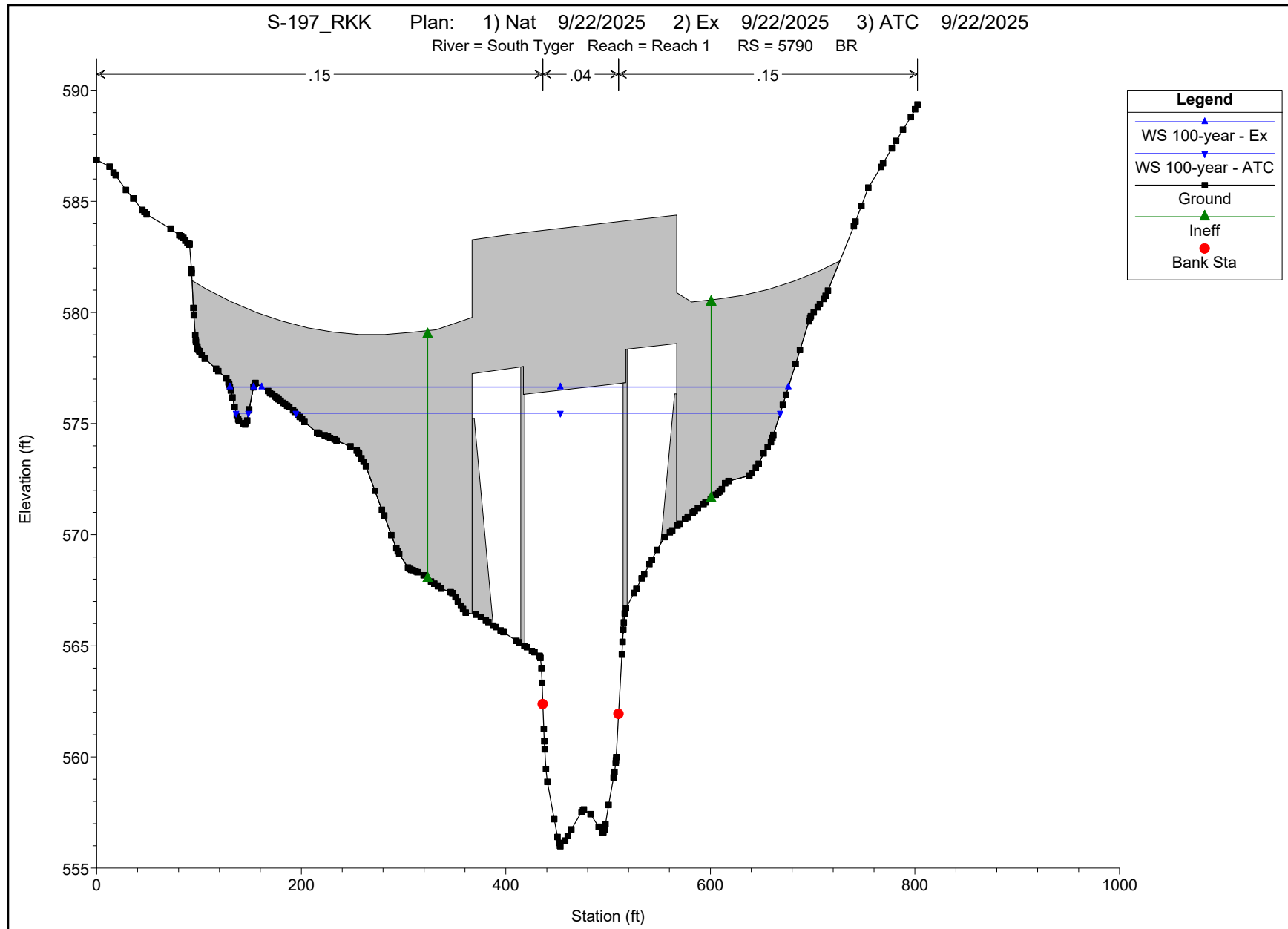
Spartanburg S-42-197 (Old Spartanburg Hwy) over South Tyger River 25 Year Cross Sections



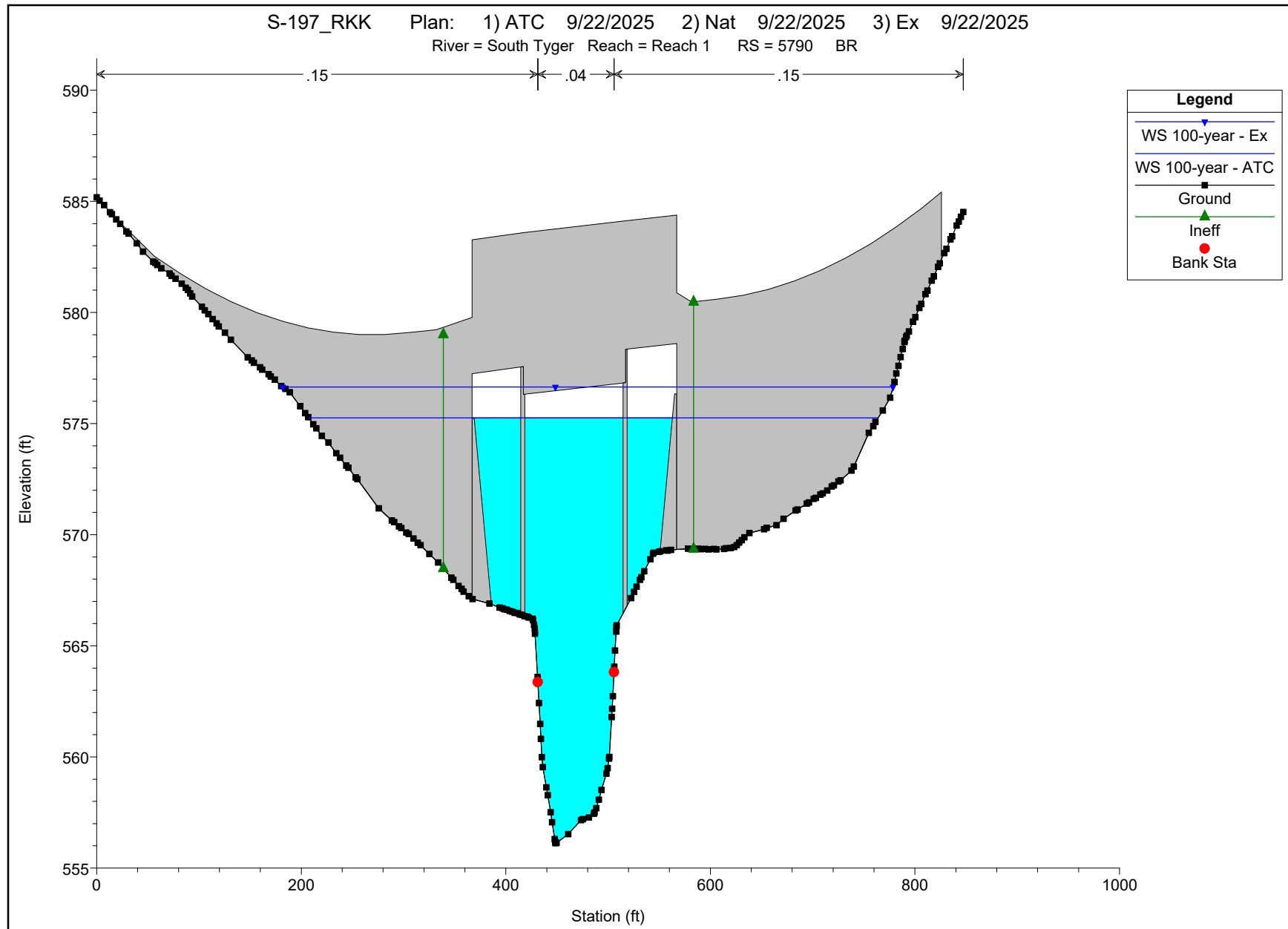
Spartanburg S-42-197 (Old Spartanburg Hwy) over South Tyger River 100 Year Cross Sections



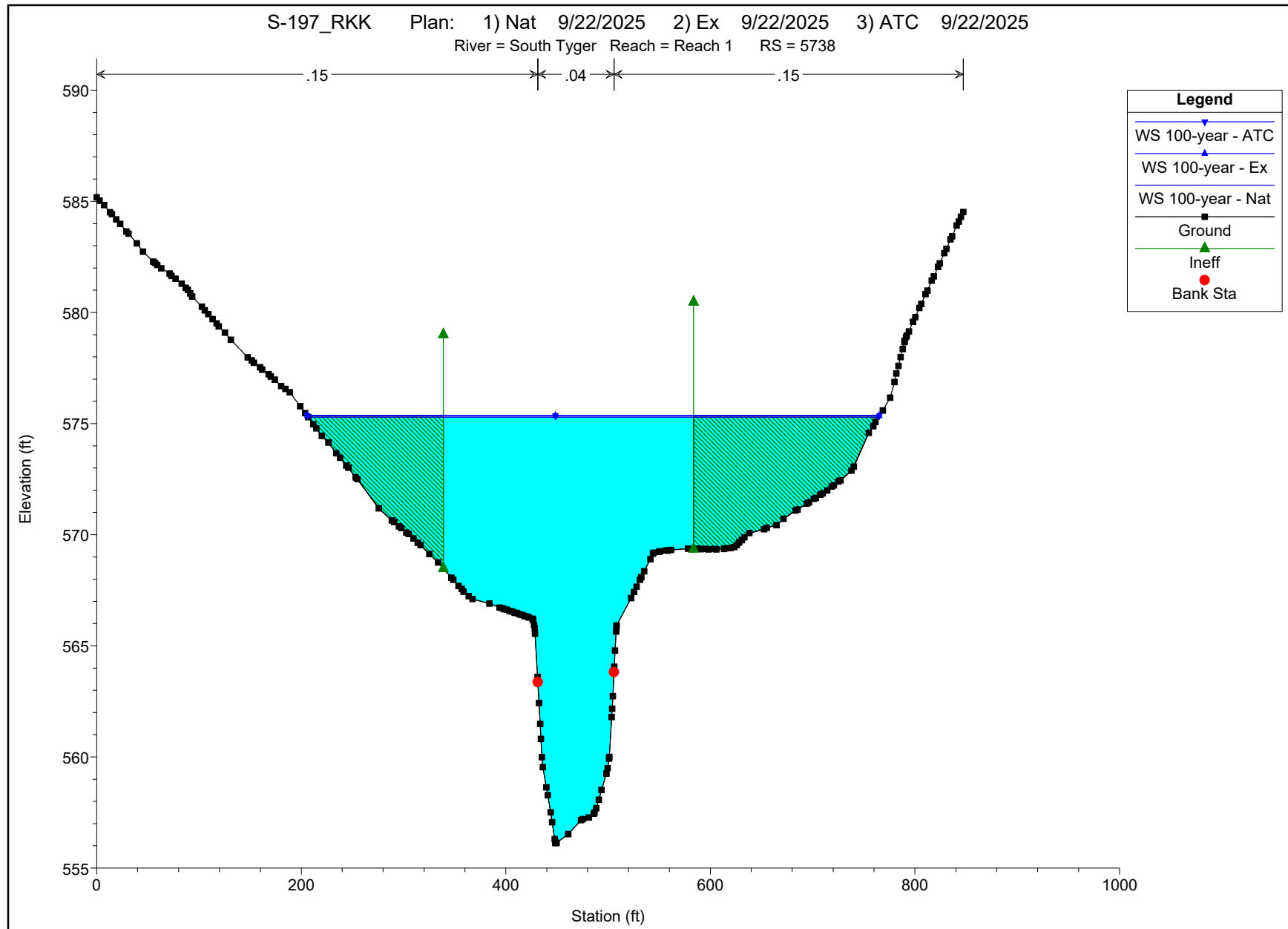
Spartanburg S-42-197 (Old Spartanburg Hwy) over South Tyger River 100 Year Cross Sections



Spartanburg S-42-197 (Old Spartanburg Hwy) over South Tyger River 100 Year Cross Sections



Spartanburg S-42-197 (Old Spartanburg Hwy) over South Tyger River 100 Year Cross Sections



Spartanburg S-42-197 (Old Spartanburg Hwy) over South Tyger River 25-Year Output Table

HEC-RAS River: South Tyger Reach: Reach 1 Profile: 25-year

| Reach | River Sta | Profile | Plan | Q Total (cfs) | Min Ch El (ft) | W.S. Elev (ft) | Crit W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Chnl (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # Chl |
|---------|-----------|---------|------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 6207 | 25-year | Nat | 10100.00 | 556.23 | 573.11 | | 574.03 | 0.001338 | 8.21 | 2138.89 | 243.54 | 0.37 |
| Reach 1 | 6207 | 25-year | Ex | 10100.00 | 556.23 | 573.61 | | 574.45 | 0.001182 | 7.88 | 2261.15 | 246.49 | 0.35 |
| Reach 1 | 6207 | 25-year | ATC | 10100.00 | 556.23 | 573.48 | | 574.34 | 0.001220 | 7.96 | 2229.10 | 245.72 | 0.35 |
| Reach 1 | 6111 | 25-year | Nat | 10100.00 | 556.63 | 573.00 | | 573.89 | 0.001327 | 8.08 | 2180.40 | 251.22 | 0.37 |
| Reach 1 | 6111 | 25-year | Ex | 10100.00 | 556.63 | 573.52 | | 574.32 | 0.001164 | 7.74 | 2310.35 | 252.95 | 0.35 |
| Reach 1 | 6111 | 25-year | ATC | 10100.00 | 556.63 | 573.38 | | 574.21 | 0.001204 | 7.82 | 2276.43 | 252.46 | 0.35 |
| Reach 1 | 6051 | 25-year | Nat | 10100.00 | 557.80 | 572.81 | | 573.79 | 0.001593 | 8.43 | 2018.32 | 247.76 | 0.40 |
| Reach 1 | 6051 | 25-year | Ex | 10100.00 | 557.80 | 573.36 | | 574.24 | 0.001380 | 8.05 | 2154.30 | 254.35 | 0.37 |
| Reach 1 | 6051 | 25-year | ATC | 10100.00 | 557.80 | 573.22 | | 574.12 | 0.001432 | 8.15 | 2118.67 | 252.61 | 0.38 |
| Reach 1 | 5842 | 25-year | Nat | 10100.00 | 555.98 | 572.57 | | 573.46 | 0.001328 | 8.03 | 2309.28 | 363.78 | 0.37 |
| Reach 1 | 5842 | 25-year | Ex | 10100.00 | 555.98 | 573.13 | 566.04 | 573.94 | 0.001164 | 7.70 | 2253.85 | 383.72 | 0.34 |
| Reach 1 | 5842 | 25-year | ATC | 10100.00 | 555.98 | 572.98 | 566.06 | 573.81 | 0.001202 | 7.78 | 2246.37 | 380.20 | 0.35 |
| Reach 1 | 5738 | 25-year | Nat | 10100.00 | 556.12 | 572.30 | | 573.30 | 0.001583 | 8.47 | 2297.55 | 464.74 | 0.39 |
| Reach 1 | 5738 | 25-year | Ex | 10100.00 | 556.12 | 572.44 | 566.22 | 573.47 | 0.001583 | 8.53 | 1869.35 | 471.20 | 0.39 |
| Reach 1 | 5738 | 25-year | ATC | 10100.00 | 556.12 | 572.45 | 566.22 | 573.47 | 0.001570 | 8.49 | 1909.78 | 471.43 | 0.39 |
| Reach 1 | 5524 | 25-year | Nat | 10100.00 | 556.81 | 572.62 | | 572.83 | 0.000579 | 5.03 | 4575.91 | 692.16 | 0.24 |
| Reach 1 | 5524 | 25-year | Ex | 10100.00 | 556.81 | 572.62 | | 572.83 | 0.000579 | 5.03 | 4576.67 | 692.19 | 0.24 |
| Reach 1 | 5524 | 25-year | ATC | 10100.00 | 556.81 | 572.62 | | 572.83 | 0.000579 | 5.03 | 4576.62 | 692.19 | 0.24 |
| Reach 1 | 5473 | 25-year | Nat | 10100.00 | 556.69 | 572.63 | | 572.79 | 0.000400 | 4.27 | 5044.28 | 788.07 | 0.20 |
| Reach 1 | 5473 | 25-year | Ex | 10100.00 | 556.69 | 572.63 | | 572.79 | 0.000400 | 4.27 | 5045.14 | 788.09 | 0.20 |
| Reach 1 | 5473 | 25-year | ATC | 10100.00 | 556.69 | 572.63 | | 572.79 | 0.000400 | 4.27 | 5045.09 | 788.09 | 0.20 |
| Reach 1 | 5264 | 25-year | Nat | 10100.00 | 554.29 | 572.55 | | 572.71 | 0.000401 | 4.29 | 7903.86 | 1127.40 | 0.20 |
| Reach 1 | 5264 | 25-year | Ex | 10100.00 | 554.29 | 572.55 | | 572.71 | 0.000401 | 4.28 | 7905.10 | 1127.42 | 0.20 |
| Reach 1 | 5264 | 25-year | ATC | 10100.00 | 554.29 | 572.55 | | 572.71 | 0.000401 | 4.28 | 7905.03 | 1127.42 | 0.20 |
| Reach 1 | 5017 | 25-year | Nat | 10100.00 | 554.75 | 572.07 | | 572.54 | 0.000835 | 6.45 | 3890.90 | 495.45 | 0.29 |
| Reach 1 | 5017 | 25-year | Ex | 10100.00 | 554.75 | 572.07 | | 572.54 | 0.000835 | 6.45 | 3891.50 | 495.46 | 0.29 |
| Reach 1 | 5017 | 25-year | ATC | 10100.00 | 554.75 | 572.07 | | 572.54 | 0.000835 | 6.45 | 3891.47 | 495.46 | 0.29 |
| Reach 1 | 4441 | 25-year | Nat | 10100.00 | 554.17 | 571.86 | | 572.08 | 0.000491 | 5.08 | 6885.66 | 906.96 | 0.23 |
| Reach 1 | 4441 | 25-year | Ex | 10100.00 | 554.17 | 571.86 | | 572.09 | 0.000490 | 5.08 | 6886.94 | 906.99 | 0.23 |
| Reach 1 | 4441 | 25-year | ATC | 10100.00 | 554.17 | 571.86 | | 572.09 | 0.000490 | 5.08 | 6886.83 | 906.99 | 0.23 |
| Reach 1 | 4271 | 25-year | Nat | 10100.00 | 554.00 | 571.74 | | 572.00 | 0.000531 | 5.47 | 6500.44 | 805.76 | 0.24 |
| Reach 1 | 4271 | 25-year | Ex | 10100.00 | 554.00 | 571.74 | | 572.00 | 0.000531 | 5.47 | 6501.57 | 805.77 | 0.24 |
| Reach 1 | 4271 | 25-year | ATC | 10100.00 | 554.00 | 571.74 | | 572.00 | 0.000531 | 5.47 | 6501.47 | 805.77 | 0.24 |
| Reach 1 | 4018 | 25-year | Nat | 10100.00 | 553.75 | 571.67 | | 571.85 | 0.000419 | 4.26 | 6709.58 | 882.44 | 0.20 |
| Reach 1 | 4018 | 25-year | Ex | 10100.00 | 553.75 | 571.68 | | 571.85 | 0.000419 | 4.26 | 6710.87 | 882.46 | 0.20 |
| Reach 1 | 4018 | 25-year | ATC | 10100.00 | 553.75 | 571.68 | | 571.85 | 0.000419 | 4.26 | 6710.77 | 882.46 | 0.20 |
| Reach 1 | 3638 | 25-year | Nat | 10100.00 | 553.36 | 571.50 | | 571.69 | 0.000423 | 4.41 | 6512.11 | 819.92 | 0.21 |
| Reach 1 | 3638 | 25-year | Ex | 10100.00 | 553.36 | 571.50 | | 571.69 | 0.000423 | 4.41 | 6513.41 | 819.94 | 0.21 |
| Reach 1 | 3638 | 25-year | ATC | 10100.00 | 553.36 | 571.50 | | 571.69 | 0.000423 | 4.41 | 6513.31 | 819.94 | 0.21 |
| Reach 1 | 3139 | 25-year | Nat | 10100.00 | 552.84 | 571.15 | | 571.46 | 0.000461 | 5.15 | 4523.03 | 487.99 | 0.22 |
| Reach 1 | 3139 | 25-year | Ex | 10100.00 | 552.84 | 571.15 | | 571.46 | 0.000461 | 5.15 | 4523.87 | 488.00 | 0.22 |
| Reach 1 | 3139 | 25-year | ATC | 10100.00 | 552.84 | 571.15 | | 571.46 | 0.000461 | 5.15 | 4523.81 | 488.00 | 0.22 |
| Reach 1 | 2878 | 25-year | Nat | 10100.00 | 552.60 | 570.79 | | 571.29 | 0.000796 | 6.77 | 4184.41 | 526.96 | 0.29 |
| Reach 1 | 2878 | 25-year | Ex | 10100.00 | 552.60 | 570.80 | | 571.29 | 0.000795 | 6.77 | 4185.43 | 526.97 | 0.29 |
| Reach 1 | 2878 | 25-year | ATC | 10100.00 | 552.60 | 570.80 | | 571.29 | 0.000796 | 6.77 | 4184.78 | 526.97 | 0.29 |
| Reach 1 | 2659 | 25-year | Nat | 10100.00 | 552.36 | 570.64 | | 571.13 | 0.000632 | 6.17 | 3209.86 | 336.94 | 0.26 |
| Reach 1 | 2659 | 25-year | Ex | 10100.00 | 552.36 | 570.64 | | 571.13 | 0.000632 | 6.16 | 3210.53 | 336.97 | 0.26 |
| Reach 1 | 2659 | 25-year | ATC | 10100.00 | 552.36 | 570.64 | | 571.13 | 0.000632 | 6.16 | 3210.45 | 336.97 | 0.26 |
| Reach 1 | 2428 | 25-year | Nat | 10100.00 | 552.14 | 570.11 | | 570.91 | 0.001140 | 8.10 | 2810.41 | 332.67 | 0.35 |
| Reach 1 | 2428 | 25-year | Ex | 10100.00 | 552.14 | 570.11 | | 570.91 | 0.001139 | 8.10 | 2811.20 | 332.71 | 0.35 |
| Reach 1 | 2428 | 25-year | ATC | 10100.00 | 552.14 | 570.11 | | 570.91 | 0.001139 | 8.09 | 2811.81 | 332.71 | 0.35 |
| Reach 1 | 2237 | 25-year | Nat | 10100.00 | 551.95 | 569.93 | | 570.69 | 0.001071 | 7.86 | 3223.65 | 477.45 | 0.34 |
| Reach 1 | 2237 | 25-year | Ex | 10100.00 | 551.95 | 569.93 | | 570.69 | 0.001070 | 7.86 | 3224.90 | 477.51 | 0.34 |
| Reach 1 | 2237 | 25-year | ATC | 10100.00 | 551.95 | 569.93 | | 570.69 | 0.001070 | 7.86 | 3225.09 | 477.51 | 0.34 |
| Reach 1 | 1685 | 25-year | Nat | 10100.00 | 551.39 | 568.53 | | 569.89 | 0.001778 | 9.91 | 1756.19 | 208.02 | 0.43 |
| Reach 1 | 1685 | 25-year | Ex | 10100.00 | 551.39 | 568.53 | | 569.89 | 0.001776 | 9.91 | 1756.96 | 208.06 | 0.43 |
| Reach 1 | 1685 | 25-year | ATC | 10100.00 | 551.39 | 568.53 | | 569.89 | 0.001776 | 9.91 | 1756.96 | 208.06 | 0.43 |
| Reach 1 | 1338 | 25-year | Nat | 10100.00 | 551.04 | 568.43 | | 569.22 | 0.001084 | 7.64 | 2387.26 | 291.32 | 0.34 |
| Reach 1 | 1338 | 25-year | Ex | 10100.00 | 551.04 | 568.43 | | 569.23 | 0.001074 | 7.63 | 2394.07 | 291.41 | 0.34 |
| Reach 1 | 1338 | 25-year | ATC | 10100.00 | 551.04 | 568.43 | | 569.23 | 0.001074 | 7.63 | 2394.07 | 291.41 | 0.34 |
| Reach 1 | 1039 | 25-year | Nat | 10100.00 | 550.74 | 567.52 | | 568.77 | 0.001779 | 9.87 | 2134.17 | 267.64 | 0.43 |

HEC-RAS River: South Tyger Reach: Reach 1 Profile: 25-year (Continued)

| Reach | River Sta | Profile | Plan | Q Total (cfs) | Min Ch El (ft) | W.S. Elev (ft) | Crit W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Chnl (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # Chl |
|---------|-----------|---------|------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 1039 | 25-year | Ex | 10100.00 | 550.74 | 567.53 | | 568.78 | 0.001775 | 9.86 | 2136.42 | 267.71 | 0.43 |
| Reach 1 | 1039 | 25-year | ATC | 10100.00 | 550.74 | 567.53 | | 568.78 | 0.001775 | 9.86 | 2136.42 | 267.71 | 0.43 |
| Reach 1 | 893 | 25-year | Nat | 10100.00 | 550.60 | 567.58 | | 568.43 | 0.001292 | 7.96 | 2397.73 | 326.89 | 0.36 |
| Reach 1 | 893 | 25-year | Ex | 10100.00 | 550.60 | 567.57 | | 568.44 | 0.001328 | 8.01 | 2383.62 | 326.86 | 0.37 |
| Reach 1 | 893 | 25-year | ATC | 10100.00 | 550.60 | 567.57 | | 568.44 | 0.001328 | 8.01 | 2383.62 | 326.86 | 0.37 |
| Reach 1 | 630 | 25-year | Nat | 10100.00 | 550.33 | 565.73 | 561.58 | 567.83 | 0.003066 | 12.06 | 1376.72 | 266.86 | 0.56 |
| Reach 1 | 630 | 25-year | Ex | 10100.00 | 550.33 | 565.73 | 561.58 | 567.83 | 0.003067 | 12.06 | 1376.38 | 266.81 | 0.56 |
| Reach 1 | 630 | 25-year | ATC | 10100.00 | 550.33 | 565.73 | 561.58 | 567.83 | 0.003067 | 12.06 | 1376.38 | 266.81 | 0.56 |
| Reach 1 | 315 | 25-year | Nat | 10100.00 | 550.02 | 563.96 | 561.33 | 566.63 | 0.004447 | 13.53 | 1129.85 | 179.69 | 0.66 |
| Reach 1 | 315 | 25-year | Ex | 10100.00 | 550.02 | 563.95 | 561.33 | 566.62 | 0.004451 | 13.54 | 1129.28 | 179.61 | 0.66 |
| Reach 1 | 315 | 25-year | ATC | 10100.00 | 550.02 | 563.95 | 561.33 | 566.62 | 0.004451 | 13.54 | 1129.29 | 179.61 | 0.66 |
| Reach 1 | 141 | 25-year | Nat | 10100.00 | 549.84 | 561.02 | 560.81 | 565.39 | 0.009945 | 17.01 | 709.96 | 97.04 | 0.94 |
| Reach 1 | 141 | 25-year | Ex | 10100.00 | 549.84 | 561.03 | 560.81 | 565.39 | 0.009900 | 16.99 | 711.23 | 97.12 | 0.94 |
| Reach 1 | 141 | 25-year | ATC | 10100.00 | 549.84 | 561.03 | 560.81 | 565.39 | 0.009901 | 16.99 | 711.19 | 97.12 | 0.94 |
| Reach 1 | 94 | 25-year | Nat | 10100.00 | 549.79 | 560.89 | 560.49 | 564.79 | 0.009602 | 15.96 | 703.37 | 97.31 | 0.91 |
| Reach 1 | 94 | 25-year | Ex | 10100.00 | 549.79 | 560.89 | 560.49 | 564.79 | 0.009602 | 15.96 | 703.37 | 97.31 | 0.91 |
| Reach 1 | 94 | 25-year | ATC | 10100.00 | 549.79 | 560.89 | 560.49 | 564.79 | 0.009602 | 15.96 | 703.37 | 97.31 | 0.91 |

Spartanburg S-42-197 (Old Spartanburg Hwy) over South Tyger River 100-Year Output Table

HEC-RAS River: South Tyger Reach: Reach 1 Profile: 100-year

| Reach | River Sta | Profile | Plan | Q Total (cfs) | Min Ch El (ft) | W.S. Elev (ft) | Crit W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Chnl (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # Chl |
|---------|-----------|----------|------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 6207 | 100-year | Nat | 14100.00 | 556.23 | 575.86 | | 576.99 | 0.001380 | 9.30 | 2831.88 | 260.50 | 0.39 |
| Reach 1 | 6207 | 100-year | Ex | 14100.00 | 556.23 | 577.03 | | 577.98 | 0.001084 | 8.60 | 3142.11 | 268.44 | 0.35 |
| Reach 1 | 6207 | 100-year | ATC | 14100.00 | 556.23 | 576.53 | | 577.56 | 0.001199 | 8.88 | 3009.33 | 265.07 | 0.36 |
| Reach 1 | 6111 | 100-year | Nat | 14100.00 | 556.63 | 575.76 | | 576.85 | 0.001355 | 9.13 | 2894.02 | 270.50 | 0.38 |
| Reach 1 | 6111 | 100-year | Ex | 14100.00 | 556.63 | 576.96 | | 577.87 | 0.001056 | 8.42 | 3224.23 | 280.19 | 0.34 |
| Reach 1 | 6111 | 100-year | ATC | 14100.00 | 556.63 | 576.45 | | 577.43 | 0.001171 | 8.71 | 3082.97 | 276.00 | 0.36 |
| Reach 1 | 6051 | 100-year | Nat | 14100.00 | 557.80 | 575.57 | | 576.75 | 0.001579 | 9.46 | 2751.54 | 288.90 | 0.41 |
| Reach 1 | 6051 | 100-year | Ex | 14100.00 | 557.80 | 576.83 | | 577.80 | 0.001197 | 8.64 | 3124.69 | 303.24 | 0.36 |
| Reach 1 | 6051 | 100-year | ATC | 14100.00 | 557.80 | 576.30 | | 577.35 | 0.001342 | 8.97 | 2965.12 | 297.36 | 0.38 |
| Reach 1 | 5842 | 100-year | Nat | 14100.00 | 555.98 | 575.38 | | 576.40 | 0.001290 | 8.88 | 3482.29 | 482.19 | 0.37 |
| Reach 1 | 5842 | 100-year | Ex | 14100.00 | 555.98 | 576.65 | 568.54 | 577.52 | 0.001010 | 8.22 | 3203.19 | 538.38 | 0.33 |
| Reach 1 | 5842 | 100-year | ATC | 14100.00 | 555.98 | 576.10 | 568.58 | 577.03 | 0.001122 | 8.50 | 3110.93 | 512.77 | 0.35 |
| Reach 1 | 5738 | 100-year | Nat | 14100.00 | 556.12 | 575.28 | | 576.25 | 0.001325 | 8.79 | 3832.33 | 557.28 | 0.37 |
| Reach 1 | 5738 | 100-year | Ex | 14100.00 | 556.12 | 575.35 | 568.89 | 576.55 | 0.001514 | 9.42 | 2551.53 | 559.36 | 0.40 |
| Reach 1 | 5738 | 100-year | ATC | 14100.00 | 556.12 | 575.36 | 568.94 | 576.53 | 0.001491 | 9.35 | 2623.02 | 559.67 | 0.39 |
| Reach 1 | 5524 | 100-year | Nat | 14100.00 | 556.81 | 575.66 | | 575.83 | 0.000392 | 4.71 | 6776.77 | 752.28 | 0.20 |
| Reach 1 | 5524 | 100-year | Ex | 14100.00 | 556.81 | 575.66 | | 575.83 | 0.000391 | 4.71 | 6777.78 | 752.30 | 0.20 |
| Reach 1 | 5524 | 100-year | ATC | 14100.00 | 556.81 | 575.66 | | 575.83 | 0.000391 | 4.71 | 6777.51 | 752.30 | 0.20 |
| Reach 1 | 5473 | 100-year | Nat | 14100.00 | 556.69 | 575.67 | | 575.80 | 0.000276 | 4.04 | 7552.98 | 868.09 | 0.17 |
| Reach 1 | 5473 | 100-year | Ex | 14100.00 | 556.69 | 575.67 | | 575.80 | 0.000276 | 4.04 | 7554.15 | 868.12 | 0.17 |
| Reach 1 | 5473 | 100-year | ATC | 14100.00 | 556.69 | 575.67 | | 575.80 | 0.000276 | 4.04 | 7553.88 | 868.12 | 0.17 |
| Reach 1 | 5264 | 100-year | Nat | 14100.00 | 554.29 | 575.60 | | 575.74 | 0.000303 | 4.23 | 11422.30 | 1179.02 | 0.18 |
| Reach 1 | 5264 | 100-year | Ex | 14100.00 | 554.29 | 575.60 | | 575.74 | 0.000303 | 4.23 | 11423.80 | 1179.02 | 0.18 |
| Reach 1 | 5264 | 100-year | ATC | 14100.00 | 554.29 | 575.60 | | 575.74 | 0.000303 | 4.23 | 11423.45 | 1179.02 | 0.18 |
| Reach 1 | 5017 | 100-year | Nat | 14100.00 | 554.75 | 575.11 | | 575.60 | 0.000734 | 6.83 | 5510.90 | 579.15 | 0.28 |
| Reach 1 | 5017 | 100-year | Ex | 14100.00 | 554.75 | 575.11 | | 575.60 | 0.000734 | 6.83 | 5511.71 | 579.18 | 0.28 |
| Reach 1 | 5017 | 100-year | ATC | 14100.00 | 554.75 | 575.11 | | 575.60 | 0.000734 | 6.83 | 5511.50 | 579.17 | 0.28 |
| Reach 1 | 4441 | 100-year | Nat | 14100.00 | 554.17 | 574.99 | | 575.18 | 0.000390 | 5.11 | 9798.82 | 954.13 | 0.21 |
| Reach 1 | 4441 | 100-year | Ex | 14100.00 | 554.17 | 574.99 | | 575.19 | 0.000390 | 5.11 | 9800.16 | 954.14 | 0.21 |
| Reach 1 | 4441 | 100-year | ATC | 14100.00 | 554.17 | 574.99 | | 575.19 | 0.000390 | 5.11 | 9799.81 | 954.14 | 0.21 |
| Reach 1 | 4271 | 100-year | Nat | 14100.00 | 554.00 | 574.88 | | 575.11 | 0.000439 | 5.59 | 9083.03 | 848.09 | 0.22 |
| Reach 1 | 4271 | 100-year | Ex | 14100.00 | 554.00 | 574.88 | | 575.11 | 0.000439 | 5.59 | 9084.27 | 848.10 | 0.22 |
| Reach 1 | 4271 | 100-year | ATC | 14100.00 | 554.00 | 574.88 | | 575.11 | 0.000439 | 5.59 | 9084.01 | 848.10 | 0.22 |
| Reach 1 | 4018 | 100-year | Nat | 14100.00 | 553.75 | 574.83 | | 574.99 | 0.000329 | 4.34 | 9568.35 | 930.04 | 0.19 |
| Reach 1 | 4018 | 100-year | Ex | 14100.00 | 553.75 | 574.83 | | 575.00 | 0.000329 | 4.34 | 9569.77 | 930.05 | 0.19 |
| Reach 1 | 4018 | 100-year | ATC | 14100.00 | 553.75 | 574.83 | | 575.00 | 0.000329 | 4.34 | 9569.49 | 930.05 | 0.19 |
| Reach 1 | 3638 | 100-year | Nat | 14100.00 | 553.36 | 574.68 | | 574.86 | 0.000345 | 4.55 | 9209.41 | 887.84 | 0.19 |
| Reach 1 | 3638 | 100-year | Ex | 14100.00 | 553.36 | 574.68 | | 574.87 | 0.000345 | 4.55 | 9210.82 | 887.86 | 0.19 |
| Reach 1 | 3638 | 100-year | ATC | 14100.00 | 553.36 | 574.68 | | 574.87 | 0.000345 | 4.55 | 9210.55 | 887.85 | 0.19 |
| Reach 1 | 3139 | 100-year | Nat | 14100.00 | 552.84 | 574.31 | | 574.66 | 0.000436 | 5.63 | 6100.21 | 510.30 | 0.22 |
| Reach 1 | 3139 | 100-year | Ex | 14100.00 | 552.84 | 574.31 | | 574.66 | 0.000436 | 5.62 | 6101.08 | 510.32 | 0.22 |
| Reach 1 | 3139 | 100-year | ATC | 14100.00 | 552.84 | 574.31 | | 574.66 | 0.000436 | 5.62 | 6100.93 | 510.31 | 0.22 |
| Reach 1 | 2878 | 100-year | Nat | 14100.00 | 552.60 | 574.02 | | 574.50 | 0.000685 | 7.06 | 5929.34 | 555.39 | 0.28 |
| Reach 1 | 2878 | 100-year | Ex | 14100.00 | 552.60 | 574.02 | | 574.51 | 0.000684 | 7.06 | 5930.36 | 555.40 | 0.28 |
| Reach 1 | 2878 | 100-year | ATC | 14100.00 | 552.60 | 574.02 | | 574.50 | 0.000685 | 7.06 | 5929.63 | 555.40 | 0.28 |
| Reach 1 | 2659 | 100-year | Nat | 14100.00 | 552.36 | 573.76 | | 574.35 | 0.000636 | 6.91 | 4312.13 | 368.56 | 0.27 |
| Reach 1 | 2659 | 100-year | Ex | 14100.00 | 552.36 | 573.76 | | 574.35 | 0.000636 | 6.91 | 4312.81 | 368.58 | 0.27 |
| Reach 1 | 2659 | 100-year | ATC | 14100.00 | 552.36 | 573.76 | | 574.35 | 0.000636 | 6.91 | 4312.67 | 368.58 | 0.27 |
| Reach 1 | 2428 | 100-year | Nat | 14100.00 | 552.14 | 573.23 | | 574.13 | 0.001089 | 8.87 | 3916.05 | 374.06 | 0.35 |
| Reach 1 | 2428 | 100-year | Ex | 14100.00 | 552.14 | 573.23 | | 574.13 | 0.001089 | 8.86 | 3916.80 | 374.09 | 0.35 |
| Reach 1 | 2428 | 100-year | ATC | 14100.00 | 552.14 | 573.23 | | 574.13 | 0.001088 | 8.86 | 3917.34 | 374.09 | 0.35 |
| Reach 1 | 2237 | 100-year | Nat | 14100.00 | 551.95 | 573.14 | | 573.89 | 0.000943 | 8.28 | 4851.25 | 561.14 | 0.33 |
| Reach 1 | 2237 | 100-year | Ex | 14100.00 | 551.95 | 573.14 | | 573.90 | 0.000943 | 8.28 | 4852.42 | 561.18 | 0.33 |
| Reach 1 | 2237 | 100-year | ATC | 14100.00 | 551.95 | 573.14 | | 573.90 | 0.000943 | 8.28 | 4852.57 | 561.18 | 0.33 |
| Reach 1 | 1685 | 100-year | Nat | 14100.00 | 551.39 | 571.48 | | 573.12 | 0.001803 | 11.16 | 2406.65 | 231.76 | 0.45 |
| Reach 1 | 1685 | 100-year | Ex | 14100.00 | 551.39 | 571.48 | | 573.13 | 0.001802 | 11.15 | 2407.28 | 231.78 | 0.45 |
| Reach 1 | 1685 | 100-year | ATC | 14100.00 | 551.39 | 571.48 | | 573.13 | 0.001802 | 11.15 | 2407.28 | 231.78 | 0.45 |
| Reach 1 | 1338 | 100-year | Nat | 14100.00 | 551.04 | 571.49 | | 572.41 | 0.001051 | 8.46 | 3339.01 | 326.46 | 0.34 |
| Reach 1 | 1338 | 100-year | Ex | 14100.00 | 551.04 | 571.49 | | 572.41 | 0.001043 | 8.44 | 3345.51 | 326.53 | 0.34 |
| Reach 1 | 1338 | 100-year | ATC | 14100.00 | 551.04 | 571.49 | | 572.41 | 0.001043 | 8.44 | 3345.51 | 326.53 | 0.34 |
| Reach 1 | 1039 | 100-year | Nat | 14100.00 | 550.74 | 570.58 | | 571.98 | 0.001686 | 10.79 | 2992.17 | 294.44 | 0.43 |

HEC-RAS River: South Tyger Reach: Reach 1 Profile: 100-year (Continued)

| Reach | River Sta | Profile | Plan | Q Total (cfs) | Min Ch El (ft) | W.S. Elev (ft) | Crit W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Chnl (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # Chl |
|---------|-----------|----------|------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 1039 | 100-year | Ex | 14100.00 | 550.74 | 570.58 | | 571.98 | 0.001684 | 10.78 | 2993.95 | 294.50 | 0.43 |
| Reach 1 | 1039 | 100-year | ATC | 14100.00 | 550.74 | 570.58 | | 571.98 | 0.001684 | 10.78 | 2993.95 | 294.50 | 0.43 |
| Reach 1 | 893 | 100-year | Nat | 14100.00 | 550.60 | 570.70 | | 571.63 | 0.001165 | 8.58 | 3475.30 | 363.92 | 0.36 |
| Reach 1 | 893 | 100-year | Ex | 14100.00 | 550.60 | 570.70 | | 571.63 | 0.001191 | 8.62 | 3461.54 | 363.88 | 0.36 |
| Reach 1 | 893 | 100-year | ATC | 14100.00 | 550.60 | 570.70 | | 571.63 | 0.001191 | 8.62 | 3461.54 | 363.88 | 0.36 |
| Reach 1 | 630 | 100-year | Nat | 14100.00 | 550.33 | 569.04 | | 571.09 | 0.002507 | 12.50 | 2391.69 | 324.77 | 0.52 |
| Reach 1 | 630 | 100-year | Ex | 14100.00 | 550.33 | 569.04 | | 571.09 | 0.002507 | 12.50 | 2391.69 | 324.77 | 0.52 |
| Reach 1 | 630 | 100-year | ATC | 14100.00 | 550.33 | 569.04 | | 571.09 | 0.002507 | 12.50 | 2391.69 | 324.77 | 0.52 |
| Reach 1 | 315 | 100-year | Nat | 14100.00 | 550.02 | 567.49 | 564.11 | 570.13 | 0.003407 | 13.90 | 1886.60 | 241.13 | 0.60 |
| Reach 1 | 315 | 100-year | Ex | 14100.00 | 550.02 | 567.49 | 564.11 | 570.13 | 0.003407 | 13.90 | 1886.60 | 241.13 | 0.60 |
| Reach 1 | 315 | 100-year | ATC | 14100.00 | 550.02 | 567.49 | 564.11 | 570.13 | 0.003407 | 13.90 | 1886.60 | 241.13 | 0.60 |
| Reach 1 | 141 | 100-year | Nat | 14100.00 | 549.84 | 562.29 | 562.29 | 568.80 | 0.012762 | 20.87 | 854.05 | 139.72 | 1.09 |
| Reach 1 | 141 | 100-year | Ex | 14100.00 | 549.84 | 562.29 | 562.29 | 568.80 | 0.012762 | 20.87 | 854.05 | 139.72 | 1.09 |
| Reach 1 | 141 | 100-year | ATC | 14100.00 | 549.84 | 562.29 | 562.29 | 568.80 | 0.012762 | 20.87 | 854.05 | 139.72 | 1.09 |
| Reach 1 | 94 | 100-year | Nat | 14100.00 | 549.79 | 562.91 | 562.89 | 567.93 | 0.009611 | 18.17 | 951.26 | 174.12 | 0.95 |
| Reach 1 | 94 | 100-year | Ex | 14100.00 | 549.79 | 562.91 | 562.89 | 567.93 | 0.009611 | 18.17 | 951.26 | 174.12 | 0.95 |
| Reach 1 | 94 | 100-year | ATC | 14100.00 | 549.79 | 562.91 | 562.89 | 567.93 | 0.009611 | 18.17 | 951.26 | 174.12 | 0.95 |

Formal Alternative Technical Concepts Submittal Form

Project: Bridge Package 21

Project ID: 5368980

ATC No.: 3

Priority: High

Team: WBCC-RK&K

Date: 10/28/25

Description (required):

Reduce bridge length on S-133 over Little Cane Creek from 200-ft to 170-ft.

Usage:

Our team is proposing to use a three span [40-100-30] 170-ft long bridge with a 100-ft channel span.

Deviations (required):

Attachment B; Hydro; 3. Package 21 Bridge Length and the minimum span length requirement in RFP Exhibit 4b; 2.1.6.

Justification:

Upon an in-depth review of the site and the preliminary hydraulic model results, our team has determined that a 170-ft three span bridge meets the hydraulic requirements of the RFP at this site. Included with this ATC is a Bridge Hydraulic Analysis Report and Bridge Plan and Profile for supporting justification. These documents show we meet the minimum setbacks to top of bank as well as meeting the hydraulic requirements for freeboard and backwater.

The reduced bridge length hydraulically compares to the existing conditions bridge with the water surface elevations and flow characteristics. Bench cuts are placed to mimic the existing bridge conditions, it's our opinion allowing flow in the bench cuts is not necessary.

Schedule:

We anticipate 1 week of schedule reduction due to reduced bridge length.

Impacts:

A shorter bridge minimizes impacts to right-of-way, utilities, and environmental concerns.

History:

The bridge will be designed in accordance with SCDOT requirements just as all bridges have been designed previously for the Department.

Formal Alternative Technical Concepts Submittal Form

Project: Bridge Package 21

Project ID: 5368980

ATC No.: 3

Priority: High

Team: WBCC-RK&K

Date: 10/28/25

Risks:

No additional risks anticipated.

Costs (required):

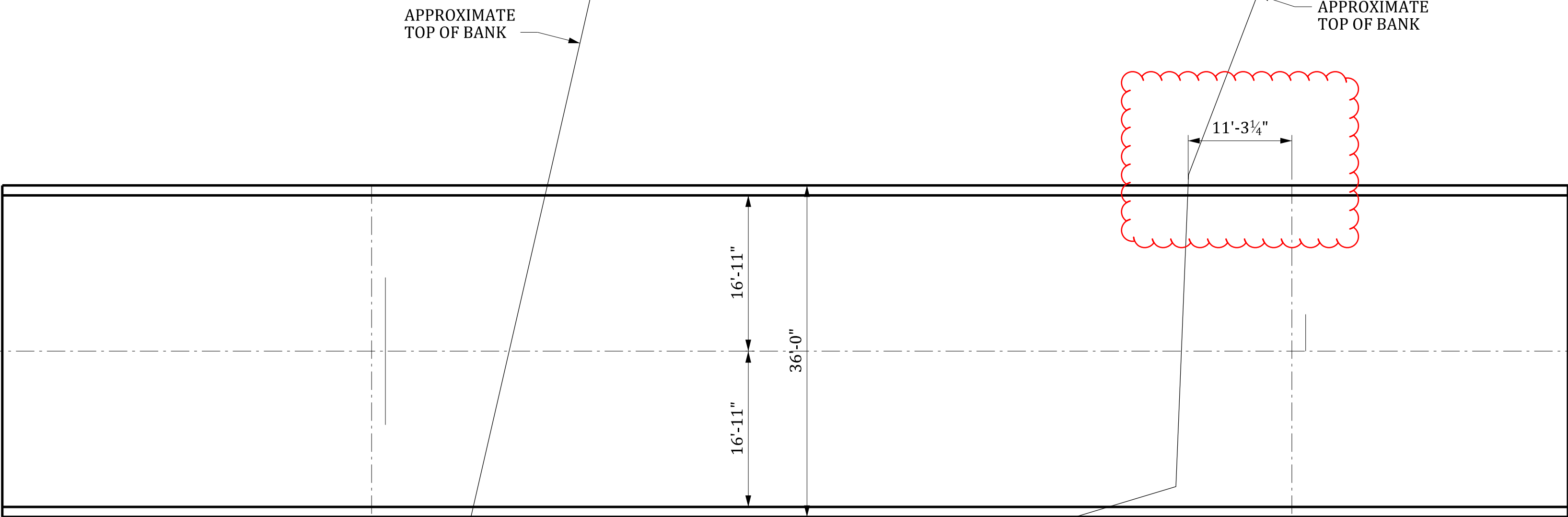
A reduction in bridge length will provide anticipated cost savings of \$125,000.00

Quality:

No reduction in quality anticipated.

Operations & Maintenance:

The shorter bridge will reduce operations and maintenance costs over the life of the bridge.



| Table 1: Summary of Results | | | | |
|-----------------------------|------------------------------|---------------------|------------------------|-----------------------|
| CRITERIA** | SCDOT RFP Existing Model* | SCDOT RFP Model* | RK&K Existing Model | RK&K Revised Model |
| 25-Year WSEL | 850.44 | 850.33 | 849.98 | 849.86 |
| 100-Year WSEL | 852.60 | 852.24 | 852.05 | 851.94 |
| 100-Year Backwater (ft) | 0.61 | 0.25 | 0.10 | 0.00 |
| 25-Year Freeboard (ft) | 5.39 | 16.40 | 6.14 | 12.19 |
| Low Chord Elevation | 855.83 | 866.73 | 856.12 | 862.05 |
| Bridge Length (ft) | 120 | 200 | 120 | 170 |
| Span Arrangement | 4 @ 30' | 60'-100'-40' | 4 @ 30' | 40'-100'-30' |

*All values for the SCDOT RFP Model were pulled from the Preliminary Hydraulics Report.
**Water surface elevations and freeboard are based on the approach cross section.

PLAN

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Oconee County S-37-133 (Burns Mill Rd) Over Little Cane Creek

Bridge Hydraulics Analysis for Alternative Technical Concept (ATC)

The analysis presented in this document covers evaluation and comparison of bridge hydraulic performance of the original SCDOT proposed design and the ATC design option under consideration for the S-37-133 bridge replacement over Little Cane Creek in Oconee County.

I. INTRODUCTION

The Request for Proposal (RFP) includes a preliminary bridge hydraulic analysis for the existing bridge over Little Cane Creek on S-37-133 in Oconee County, SC in the Project Information Package (PIP). The RFP Attachment B/Hydro section calls for a minimum bridge length of 200-ft with a minimum channel span of 100-ft over Little Cane Creek. Our Team has performed an independent preliminary bridge hydraulic analysis for the S-37-133 bridge and proposes an Alternative Technical Concept (ATC), reducing the minimum bridge length to 170-ft from the required 200-ft minimum. The proposed bridge will have a span configuration of 40'-100'-30'. All pertinent data and supporting documentation are provided below.

II. DESIGN CRITERIA

- Design Storm Event: 25-Year
- Overtopping: The 4% AEP (25 year event) shall be conveyed with no road overtopping. The 1% AEP (100 year event) shall be conveyed with no road overtopping and maintain free surface flow.
- Freeboard: Shall not be less than 2 feet above the proposed 4% AEP (25 year event). Free surface flow shall be maintained through the Bridge for frequencies up to and including the 1% AEP (100 year event) which on occasion may require a freeboard greater than the minimum 2 feet of freeboard above the design event.
- Backwater: Shall be designed so that backwater for the 1% AEP flood is one foot or less when compared to the unrestricted or natural conditions and shall not create more backwater than the existing bridge.
- Low Chord: The design high-water elevation for evaluating freeboard and determining the minimum low chord elevation shall represent the highest water-surface elevation upstream of the bridge before it begins to drawdown through the bridge. The low chord of a replacement bridge shall not be below the low chord of the existing bridge.
- Abutments: Provide a minimum 10 foot abutment setback from the top of the channel bank and at a point where the projection of the spill through slope will not intersect the channel not including the thickness of the riprap of abutment slope. To achieve setback criteria, a bench may be cut lower than the surveyed top-of-bank elevation, provided that the bench is cut higher than the ordinary-high-water elevation used for the environmental jurisdictional stream delineation.
- Pier: Provide a minimum 5-foot setback from the top of the channel bank to the centerline of the pier (pile or column) on the overbank for Low Volume Criteria sites if unable to utilize a single span for the bridge crossing.

III. MODEL UPDATES

The preliminary model provided in the PIP was updated using the guidance of the HEC-RAS Hydraulic Reference Manual Version 5.0 dated February 2016. Below is a list of updates that were completed by RK&K during the hydraulic design process. All models and subsequent updates were run in HEC-RAS version 6.6.

- In existing and proposed conditions, ineffective flow locations and elevations were adjusted using the ratios provided in the HEC-RAS Hydraulic Reference Manual. The ineffective elevations were set to match the low point of the roadway on the left and right respectively.
- The existing bridge was modified to have spill through abutments set at a 1:1 slope.
- In existing conditions, the upstream and downstream embankment side slopes were updated to 1:1.
- The existing 1' bridge rail was added to the model. And the roadway deck profile was updated based on the most recent survey provided by SCDOT.
- The Bridge Modeling Approach was updated for the Low Flow Methods to not include the Yarnell equations.
- The proposed bridge was modified to have spill through abutments set at a 2:1 slope. The sloped abutments have a 2-ft riprap bench located 2-ft below the low chord.
- The proposed bridge model was edited for the correct structure depth and correct bridge rail height determined from RK&K's structures department.
- The proposed bridge length was reduced from a 200-ft multi-span bridge to a 170-ft bridge.
- The proposed pier locations were updated for the new span arrangement, 40'-100'-30'. The proposed pier width was set to 4 ft.
- The proposed roadway grade was added to the deck cross section.

IV. CONCLUSION AND RESULTS

The results from the HEC-RAS analysis demonstrate that a 170-ft multi-span bridge will meet the RFP requirements. RK&K's proposed bridge model shows a reduction in 100-year backwater from 0.10' to 0.00' in proposed conditions. Table 1 shows a summary of the design criteria for the S-37-133 crossing over Little Cane Creek.

Table 1: Summary of Results

| <u>CRITERIA**</u> | <u>SCDOT RFP Existing Model*</u> | <u>SCDOT RFP Model*</u> | <u>RK&K Existing Model</u> | <u>RK&K Revised Model</u> |
|-------------------------|--------------------------------------|-----------------------------|------------------------------------|-----------------------------------|
| 25-Year WSEL | 850.44 | 850.33 | 849.98 | 849.86 |
| 100-Year WSEL | 852.60 | 852.24 | 852.05 | 851.94 |
| 100-Year Backwater (ft) | 0.61 | 0.25 | 0.10 | 0.00 |
| 25-Year Freeboard (ft) | 5.39 | 16.40 | 6.14 | 12.19 |
| Low Chord Elevation | 855.83 | 866.73 | 856.12 | 862.05 |
| Bridge Length (ft) | 120 | 200 | 120 | 170 |
| Span Arrangement | 4 @ 30' | 60'-100'-40' | 4 @ 30' | 40'-100'-30' |

*All values for the SCDOT RFP Model were pulled from the Preliminary Hydraulics Report.

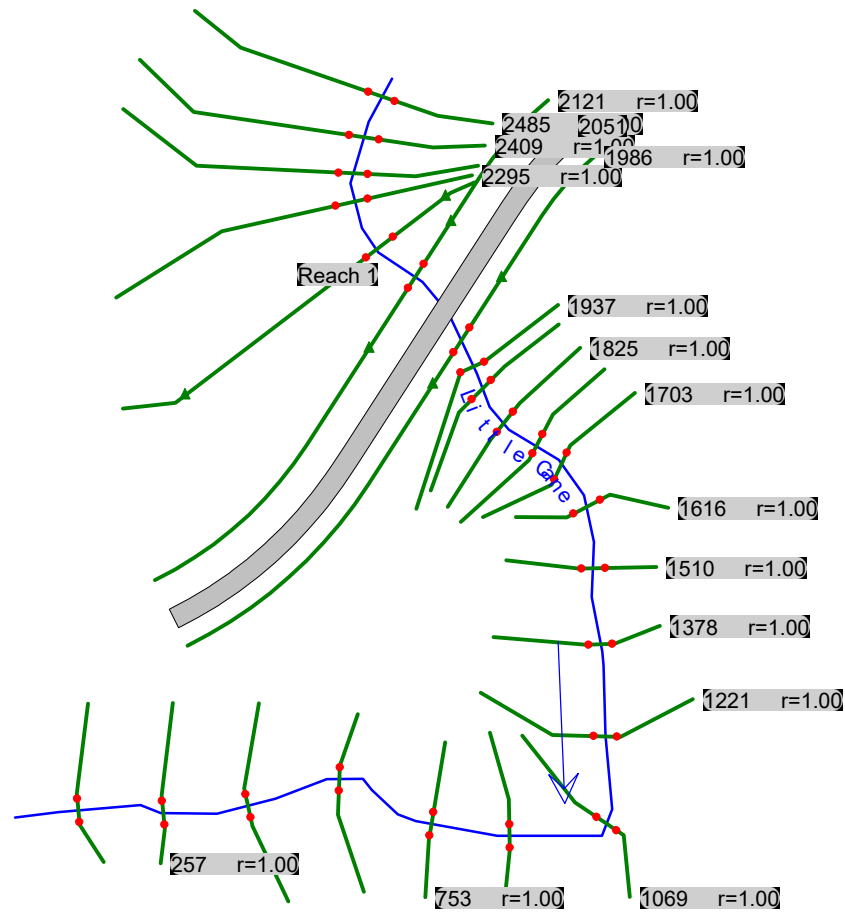
**Water surface elevations and freeboard are based on the approach cross section.

V. ATTACHMENTS

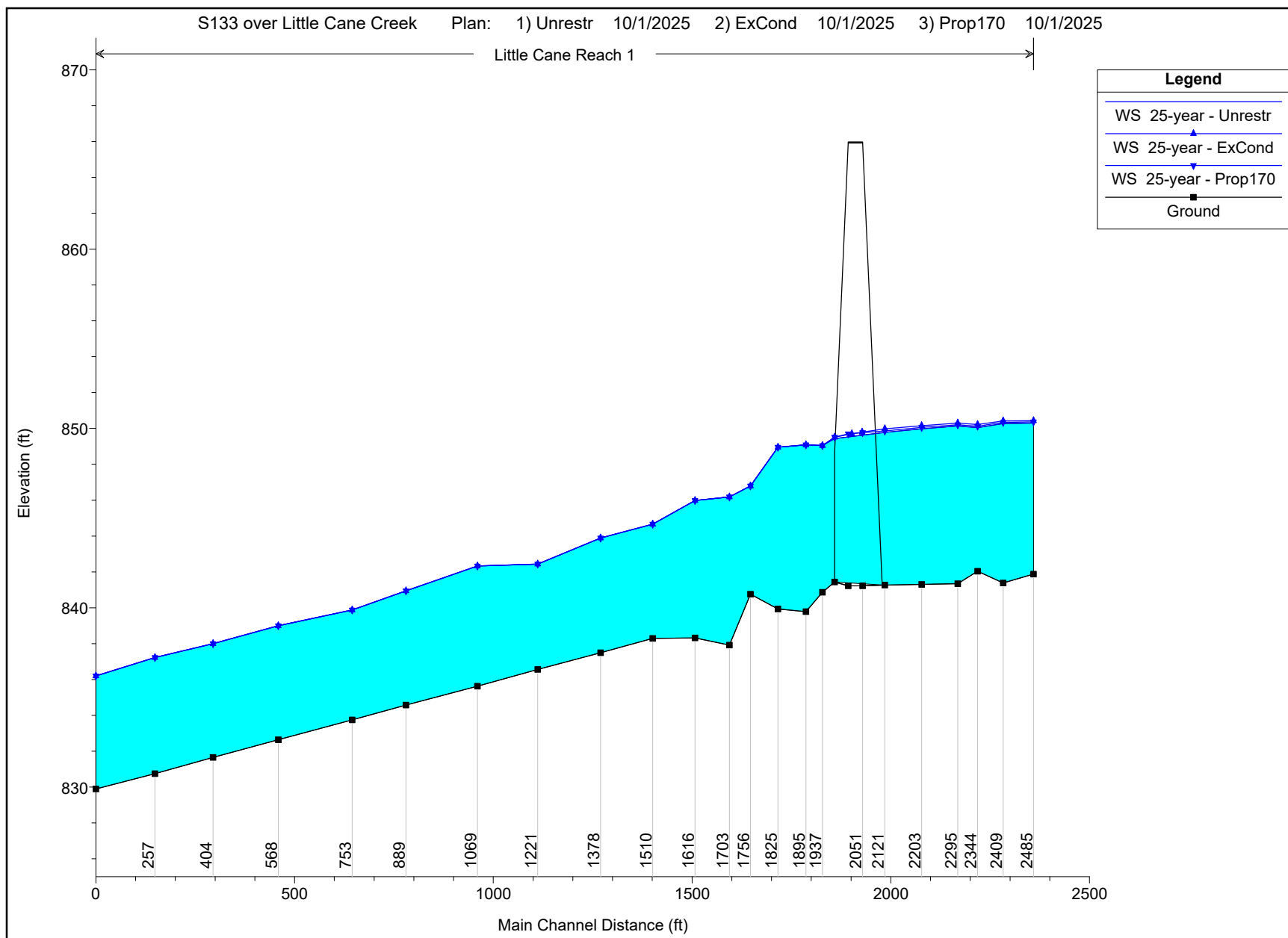
- Attachment A: RK&K Proposed Model HEC-RAS Outputs

Attachment A: RK&K Proposed Model HEC-RAS Outputs

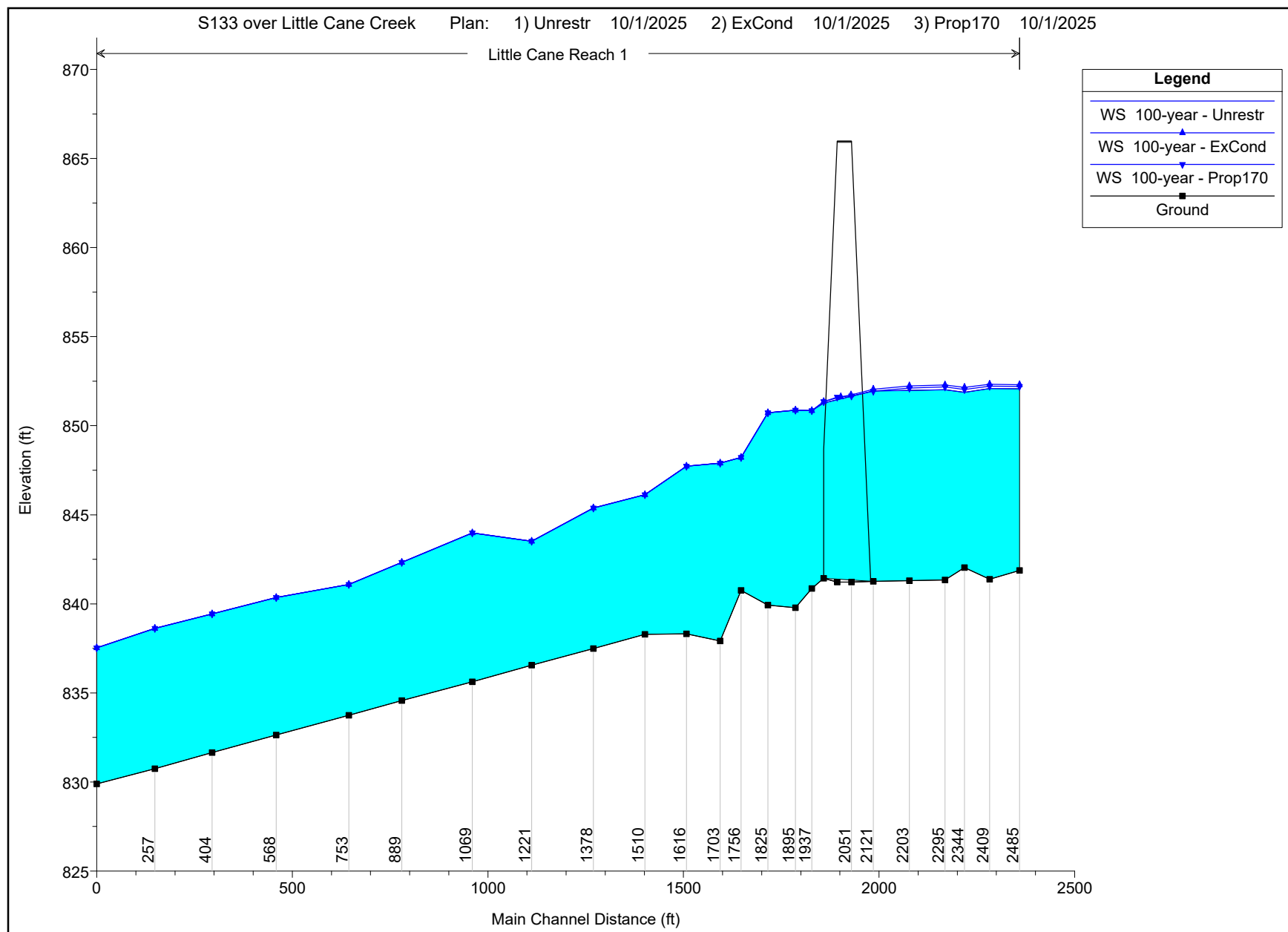
Oconee S-133 (Burns Mill Road) over Little Cane Creek HEC-RAS Schematic



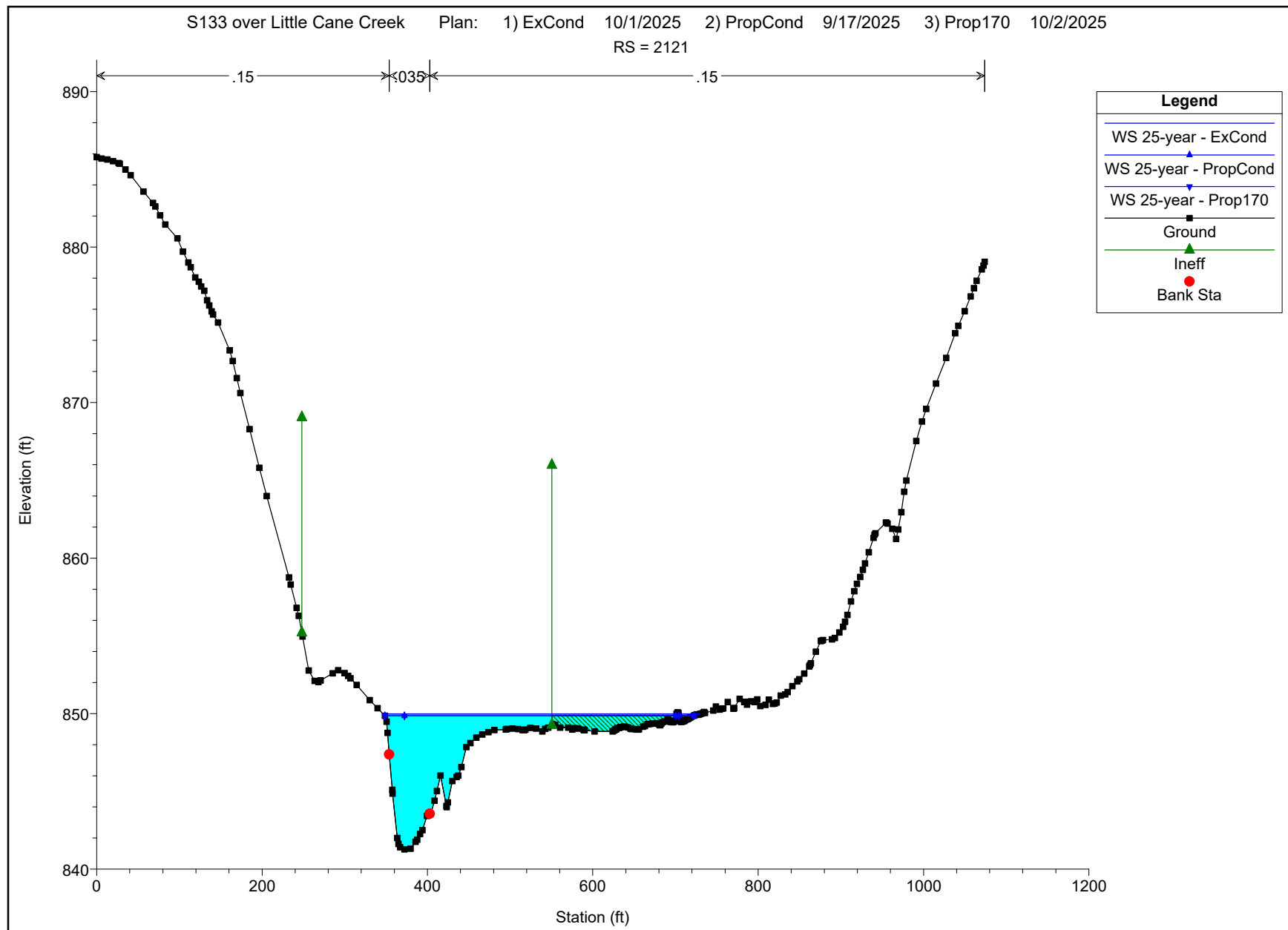
Oconee S-133 (Burns Mill Rd) over Little Cane Creek HEC-RAS 25-Year Profile



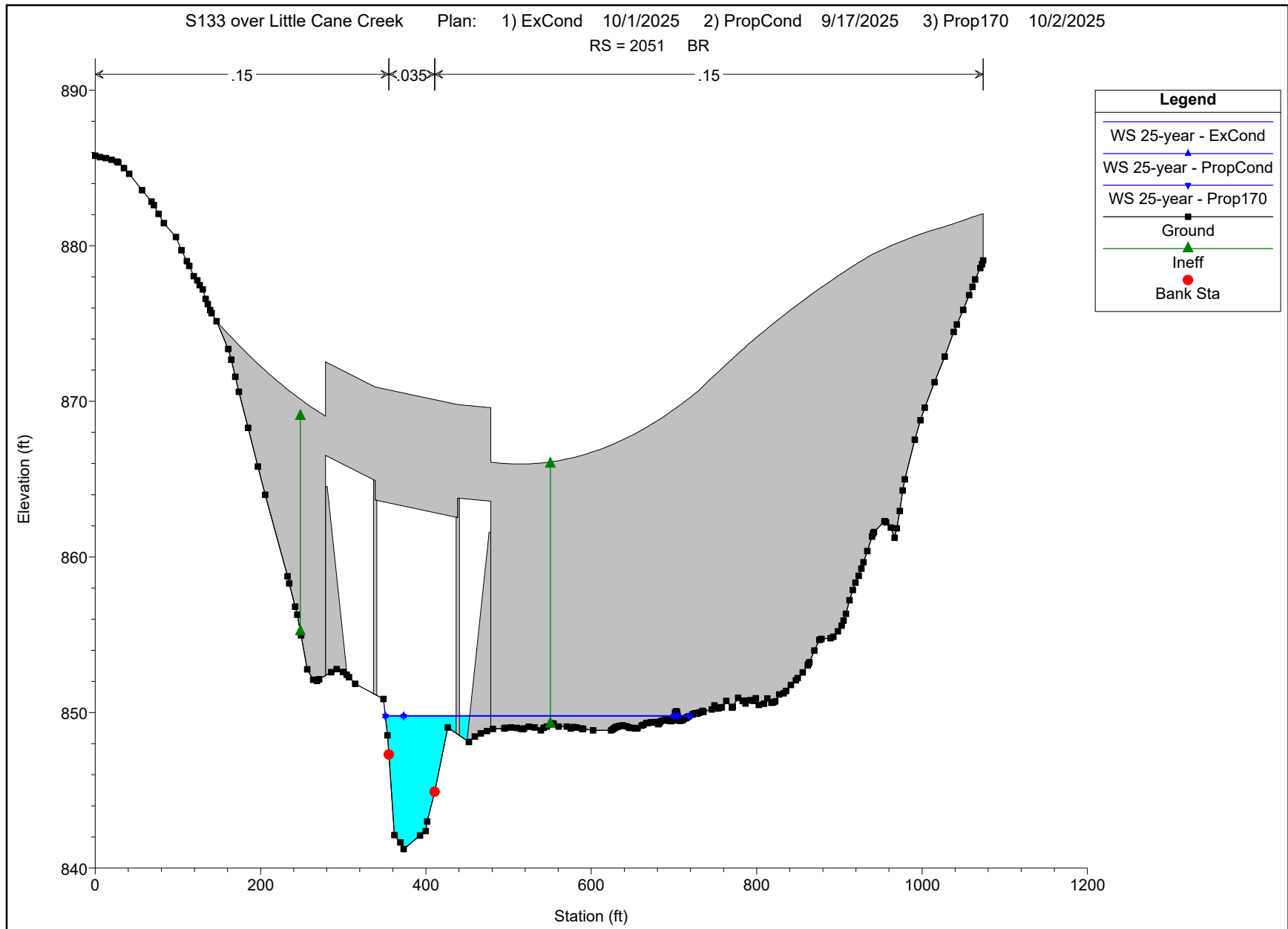
Oconee S-133 (Burns Mill Rd) over Little Cane Creek HEC-RAS 100-Year Profile



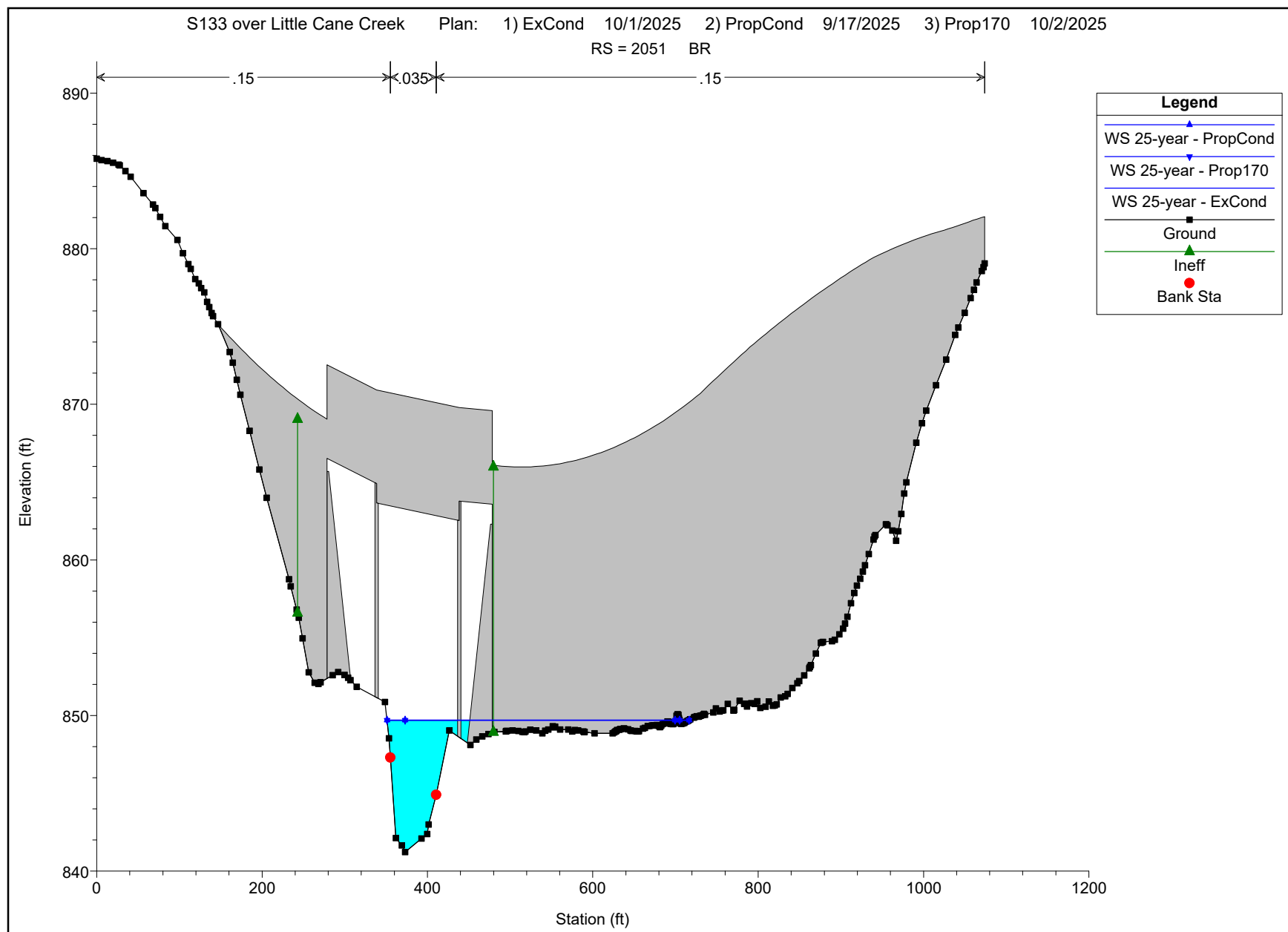
Ocone S-133 (Burns Mill Rd) over Little Cane Creek HEC-RAS 25-Year Cross Sections



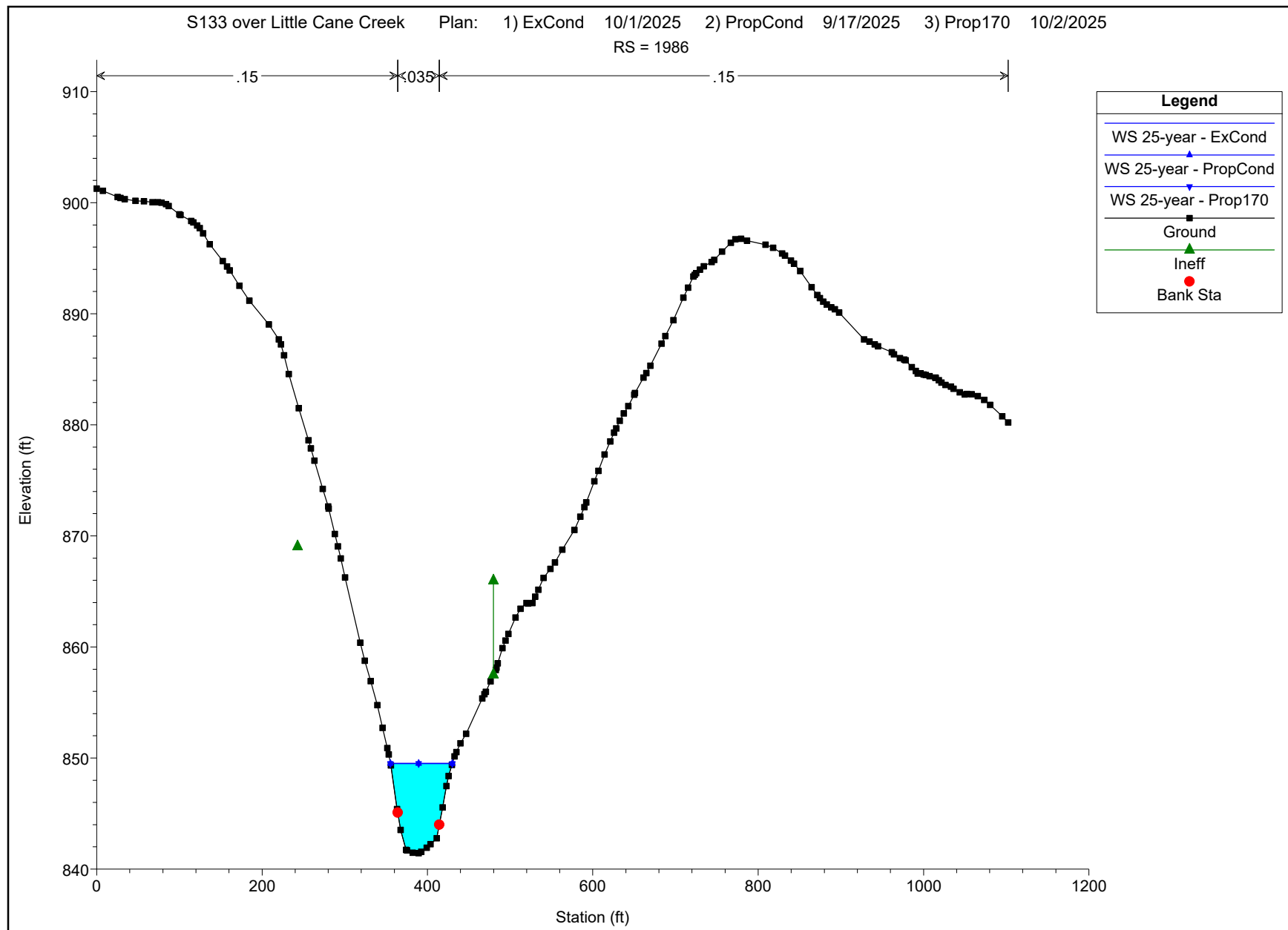
Ocone S-133 (Burns Mill Rd) over Little Cane Creek HEC-RAS 25-Year Cross Sections



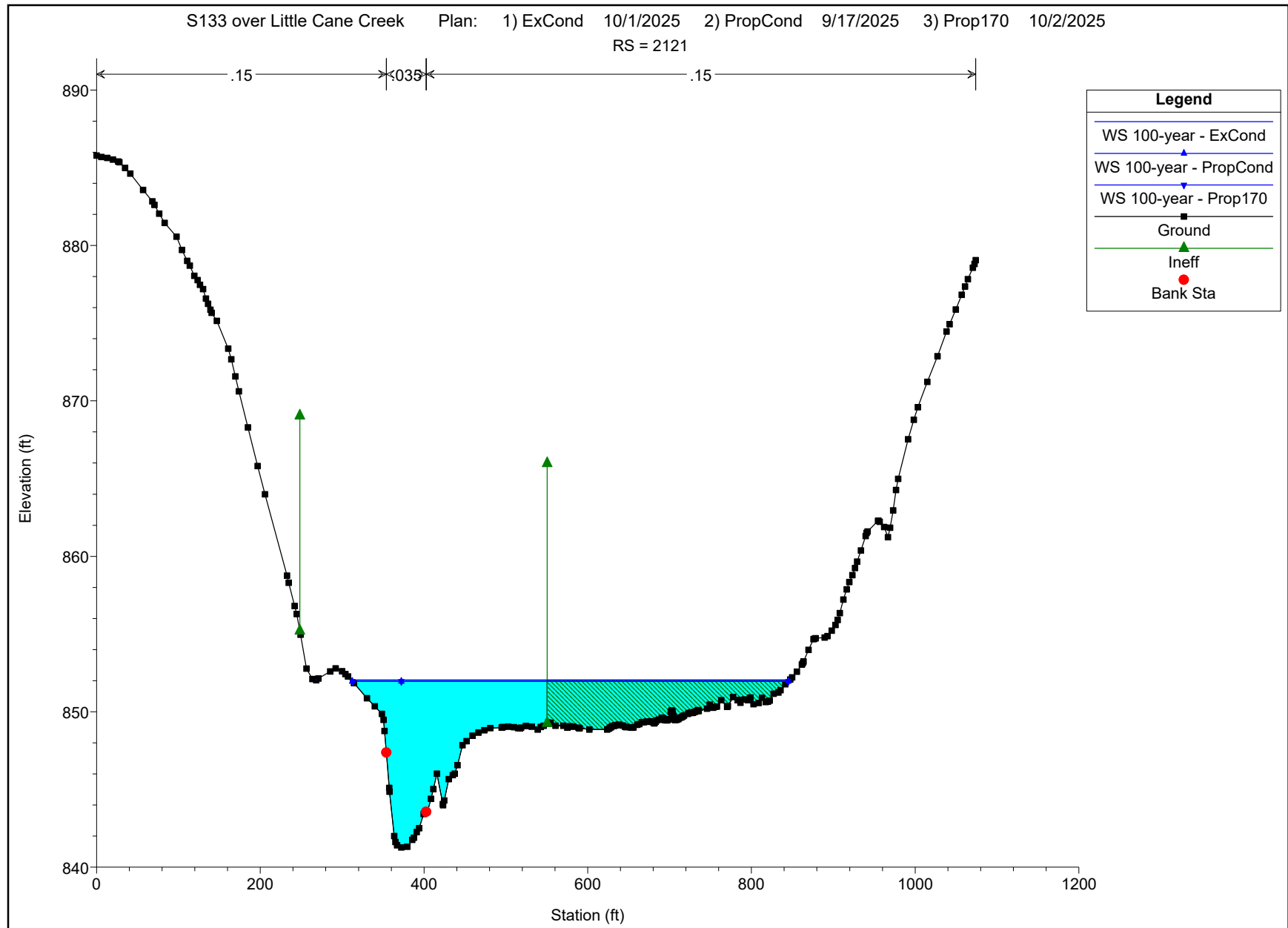
Ocone S-133 (Burns Mill Rd) over Little Cane Creek HEC-RAS 25-Year Cross Sections



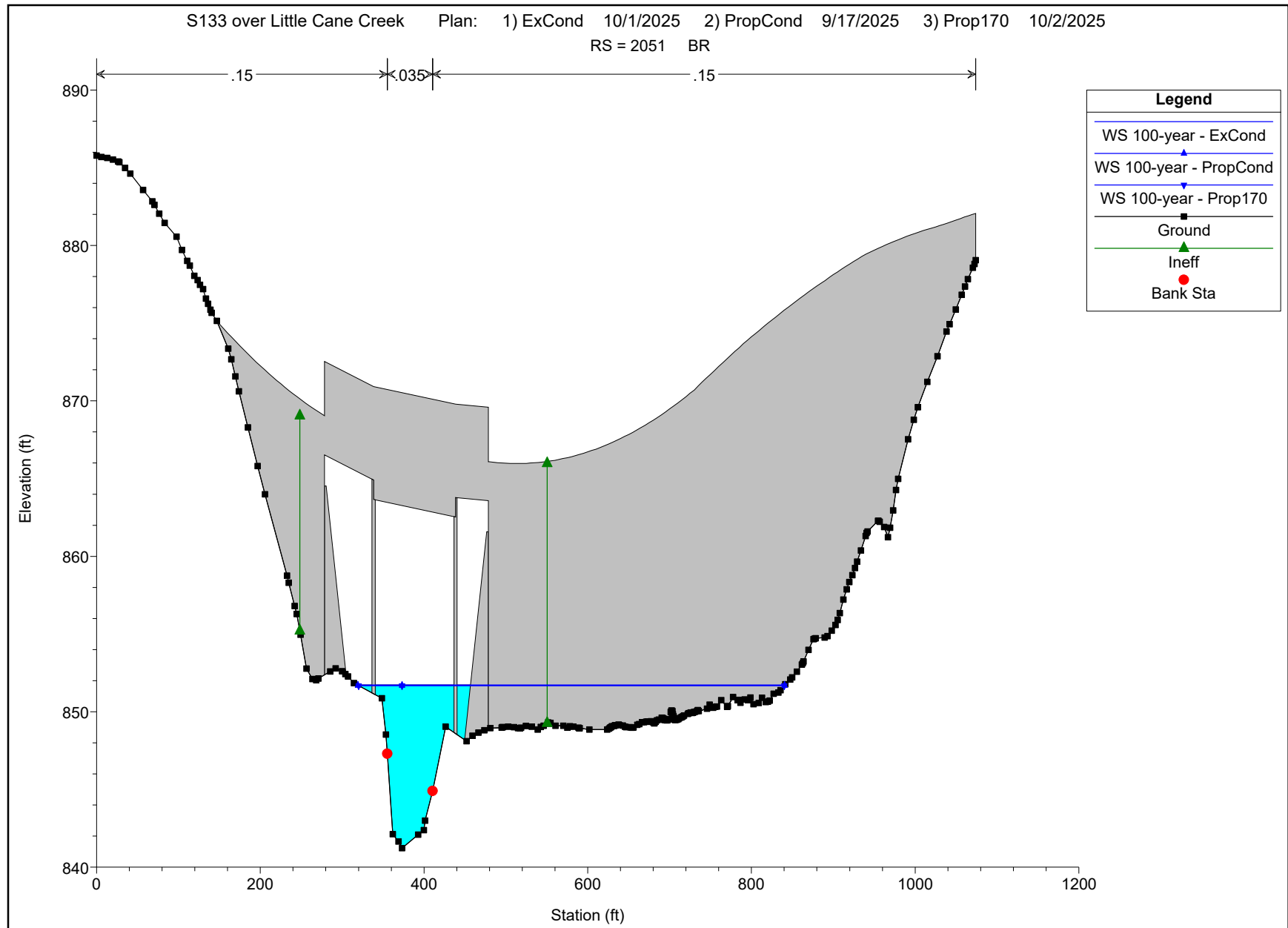
Ocone S-133 (Burns Mill Rd) over Little Cane Creek HEC-RAS 25-Year Cross Sections



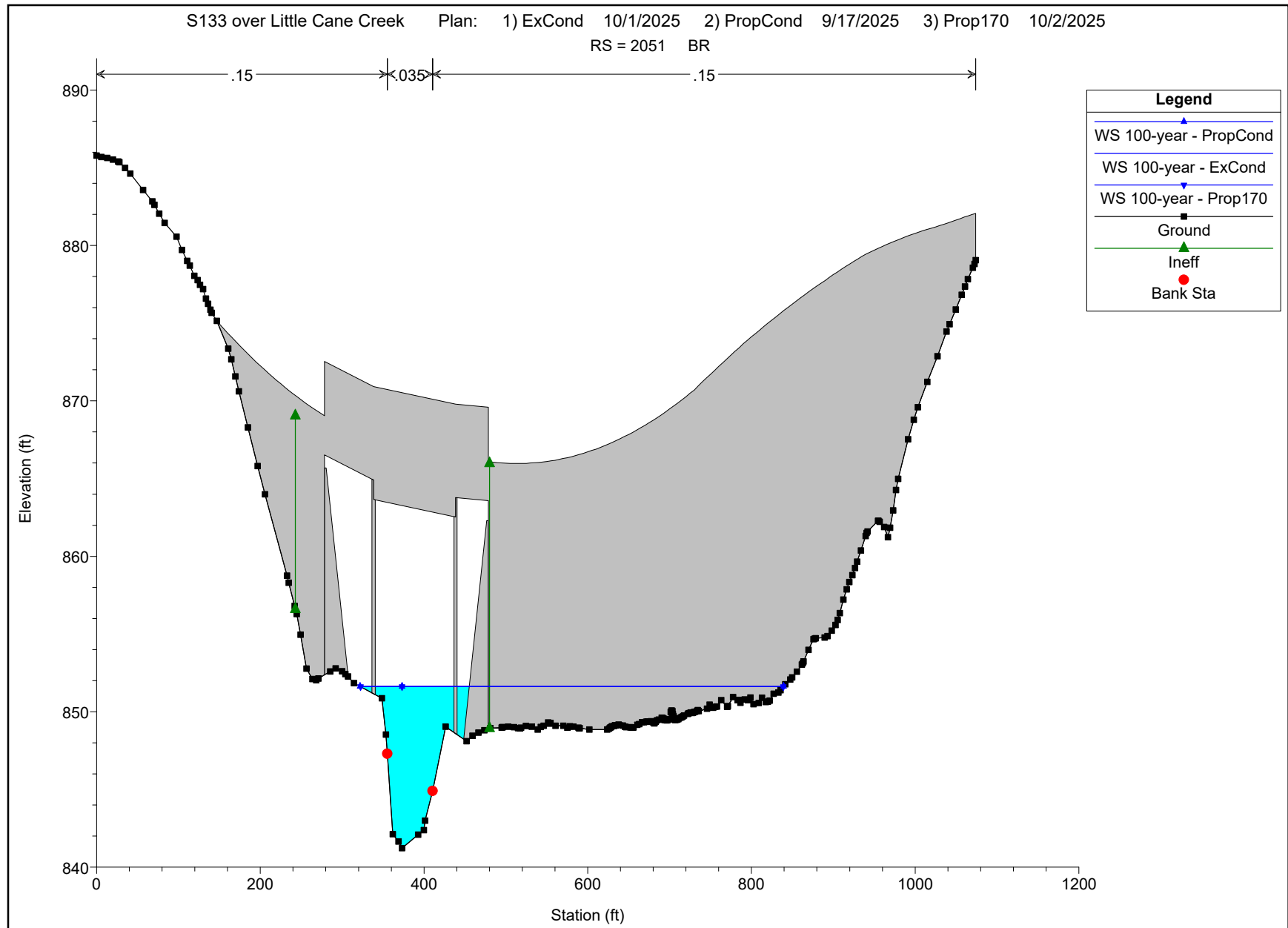
Ocone S-133 (Burns Mill Rd) over Little Cane Creek HEC-RAS 100-Year Cross Sections



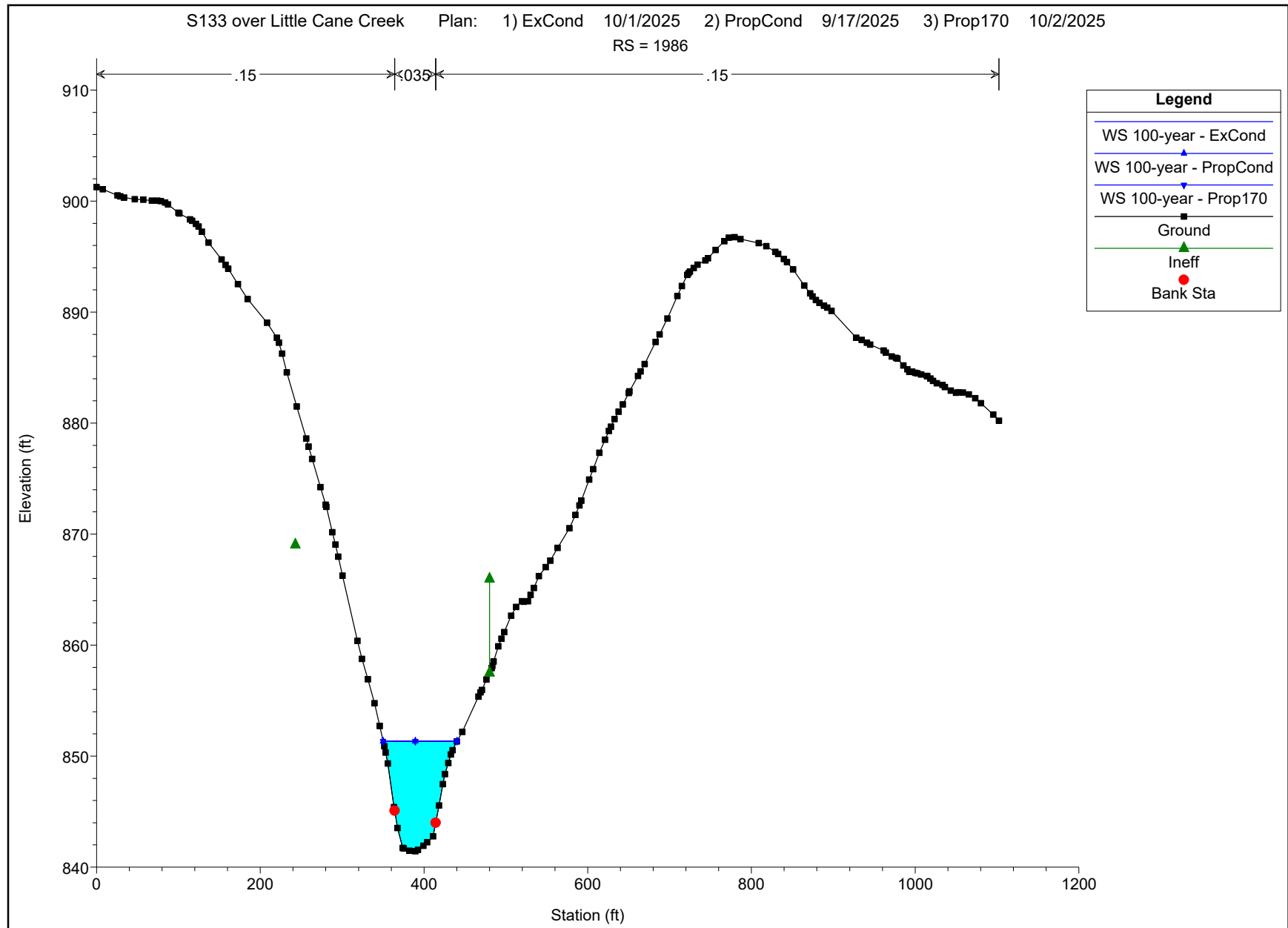
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Oconee S-133 (Burns Mill Rd) over Little Cane Creek HEC-RAS 100-Year Cross Sections



Oconee S-133 (Burns Mill Rd) over Little Cane Creek HEC-RAS 25-Year Output Table

HEC-RAS River: Little Cane Reach: Reach 1 Profile: 25-year

| Reach | River Sta | Profile | Plan | Q Total (cfs) | Min Ch El (ft) | W.S. Elev (ft) | Crit W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Chnl (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # Chl |
|---------|-----------|---------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 2485 | 25-year | Unrestr | 2520.00 | 841.87 | 850.29 | | 851.22 | 0.002769 | 7.75 | 347.82 | 69.74 | 0.52 |
| Reach 1 | 2485 | 25-year | ExCond | 2520.00 | 841.87 | 850.44 | | 851.33 | 0.002579 | 7.58 | 358.03 | 72.08 | 0.51 |
| Reach 1 | 2485 | 25-year | Prop170 | 2520.00 | 841.87 | 850.36 | | 851.27 | 0.002678 | 7.67 | 352.55 | 70.83 | 0.52 |
| Reach 1 | 2409 | 25-year | Unrestr | 2520.00 | 841.38 | 850.27 | | 850.98 | 0.001945 | 6.75 | 393.10 | 68.13 | 0.44 |
| Reach 1 | 2409 | 25-year | ExCond | 2520.00 | 841.38 | 850.42 | | 851.10 | 0.001815 | 6.61 | 403.32 | 69.57 | 0.43 |
| Reach 1 | 2409 | 25-year | Prop170 | 2520.00 | 841.38 | 850.34 | | 851.03 | 0.001883 | 6.68 | 397.86 | 68.74 | 0.44 |
| Reach 1 | 2344 | 25-year | Unrestr | 2520.00 | 842.04 | 850.05 | | 850.84 | 0.002182 | 7.14 | 382.41 | 77.68 | 0.47 |
| Reach 1 | 2344 | 25-year | ExCond | 2520.00 | 842.04 | 850.22 | | 850.97 | 0.002014 | 6.97 | 396.16 | 85.70 | 0.46 |
| Reach 1 | 2344 | 25-year | Prop170 | 2520.00 | 842.04 | 850.13 | | 850.90 | 0.002101 | 7.06 | 388.71 | 81.90 | 0.47 |
| Reach 1 | 2295 | 25-year | Unrestr | 2520.00 | 841.34 | 850.13 | | 850.68 | 0.001377 | 5.94 | 464.35 | 120.01 | 0.38 |
| Reach 1 | 2295 | 25-year | ExCond | 2520.00 | 841.34 | 850.30 | | 850.82 | 0.001279 | 5.81 | 485.58 | 137.25 | 0.37 |
| Reach 1 | 2295 | 25-year | Prop170 | 2520.00 | 841.34 | 850.21 | | 850.74 | 0.001330 | 5.88 | 473.94 | 128.31 | 0.38 |
| Reach 1 | 2203 | 25-year | Unrestr | 2520.00 | 841.30 | 849.98 | | 850.54 | 0.001550 | 6.05 | 443.90 | 100.74 | 0.40 |
| Reach 1 | 2203 | 25-year | ExCond | 2520.00 | 841.30 | 850.15 | 846.74 | 850.69 | 0.001429 | 5.91 | 467.77 | 168.92 | 0.39 |
| Reach 1 | 2203 | 25-year | Prop170 | 2520.00 | 841.30 | 850.05 | 846.74 | 850.61 | 0.001496 | 5.99 | 452.98 | 134.25 | 0.39 |
| Reach 1 | 2121 | 25-year | Unrestr | 2520.00 | 841.26 | 849.78 | | 850.39 | 0.001729 | 6.51 | 755.71 | 365.63 | 0.42 |
| Reach 1 | 2121 | 25-year | ExCond | 2520.00 | 841.26 | 849.98 | 846.81 | 850.54 | 0.001564 | 6.30 | 669.72 | 380.87 | 0.41 |
| Reach 1 | 2121 | 25-year | Prop170 | 2520.00 | 841.26 | 849.86 | 846.81 | 850.45 | 0.001661 | 6.43 | 661.53 | 370.23 | 0.42 |
| Reach 1 | 1986 | 25-year | Unrestr | 2520.00 | 841.44 | 849.44 | | 850.15 | 0.001891 | 6.83 | 420.44 | 74.32 | 0.45 |
| Reach 1 | 1986 | 25-year | ExCond | 2520.00 | 841.44 | 849.51 | 846.49 | 850.21 | 0.001825 | 6.75 | 426.13 | 74.84 | 0.44 |
| Reach 1 | 1986 | 25-year | Prop170 | 2520.00 | 841.44 | 849.51 | 846.49 | 850.21 | 0.001825 | 6.75 | 426.13 | 74.84 | 0.44 |
| Reach 1 | 1937 | 25-year | Unrestr | 2520.00 | 840.86 | 849.05 | | 850.05 | 0.002855 | 8.09 | 359.77 | 74.16 | 0.54 |
| Reach 1 | 1937 | 25-year | ExCond | 2520.00 | 840.86 | 849.05 | | 850.05 | 0.002855 | 8.09 | 359.77 | 74.16 | 0.54 |
| Reach 1 | 1937 | 25-year | Prop170 | 2520.00 | 840.86 | 849.05 | | 850.05 | 0.002855 | 8.09 | 359.77 | 74.16 | 0.54 |
| Reach 1 | 1895 | 25-year | Unrestr | 2520.00 | 839.78 | 849.08 | | 849.89 | 0.002110 | 7.25 | 379.49 | 65.76 | 0.47 |
| Reach 1 | 1895 | 25-year | ExCond | 2520.00 | 839.78 | 849.08 | | 849.89 | 0.002110 | 7.25 | 379.49 | 65.76 | 0.47 |
| Reach 1 | 1895 | 25-year | Prop170 | 2520.00 | 839.78 | 849.08 | | 849.89 | 0.002110 | 7.25 | 379.49 | 65.76 | 0.47 |
| Reach 1 | 1825 | 25-year | Unrestr | 2520.00 | 839.93 | 848.96 | | 849.75 | 0.001898 | 7.16 | 392.15 | 65.94 | 0.45 |
| Reach 1 | 1825 | 25-year | ExCond | 2520.00 | 839.93 | 848.96 | | 849.75 | 0.001898 | 7.16 | 392.15 | 65.94 | 0.45 |
| Reach 1 | 1825 | 25-year | Prop170 | 2520.00 | 839.93 | 848.96 | | 849.75 | 0.001898 | 7.16 | 392.15 | 65.94 | 0.45 |
| Reach 1 | 1756 | 25-year | Unrestr | 2520.00 | 840.76 | 846.80 | 846.80 | 849.32 | 0.010284 | 12.80 | 216.90 | 52.84 | 0.98 |
| Reach 1 | 1756 | 25-year | ExCond | 2520.00 | 840.76 | 846.80 | 846.80 | 849.32 | 0.010284 | 12.80 | 216.90 | 52.84 | 0.98 |
| Reach 1 | 1756 | 25-year | Prop170 | 2520.00 | 840.76 | 846.80 | 846.80 | 849.32 | 0.010284 | 12.80 | 216.90 | 52.84 | 0.98 |
| Reach 1 | 1703 | 25-year | Unrestr | 2520.00 | 837.91 | 846.18 | | 847.08 | 0.002792 | 7.67 | 366.94 | 69.75 | 0.53 |
| Reach 1 | 1703 | 25-year | ExCond | 2520.00 | 837.91 | 846.18 | | 847.08 | 0.002792 | 7.67 | 366.94 | 69.75 | 0.53 |
| Reach 1 | 1703 | 25-year | Prop170 | 2520.00 | 837.91 | 846.18 | | 847.08 | 0.002792 | 7.67 | 366.94 | 69.75 | 0.53 |
| Reach 1 | 1616 | 25-year | Unrestr | 2520.00 | 838.32 | 845.97 | | 846.84 | 0.002625 | 7.49 | 370.98 | 72.54 | 0.52 |
| Reach 1 | 1616 | 25-year | ExCond | 2520.00 | 838.32 | 845.97 | | 846.84 | 0.002625 | 7.49 | 370.98 | 72.54 | 0.52 |
| Reach 1 | 1616 | 25-year | Prop170 | 2520.00 | 838.32 | 845.97 | | 846.84 | 0.002625 | 7.49 | 370.98 | 72.54 | 0.52 |
| Reach 1 | 1510 | 25-year | Unrestr | 2520.00 | 838.29 | 844.66 | | 846.35 | 0.006012 | 10.47 | 260.65 | 54.43 | 0.76 |
| Reach 1 | 1510 | 25-year | ExCond | 2520.00 | 838.29 | 844.66 | | 846.35 | 0.006012 | 10.47 | 260.65 | 54.43 | 0.76 |
| Reach 1 | 1510 | 25-year | Prop170 | 2520.00 | 838.29 | 844.66 | | 846.35 | 0.006012 | 10.47 | 260.65 | 54.43 | 0.76 |
| Reach 1 | 1378 | 25-year | Unrestr | 2520.00 | 837.49 | 843.89 | | 845.56 | 0.005912 | 10.41 | 255.37 | 50.69 | 0.75 |
| Reach 1 | 1378 | 25-year | ExCond | 2520.00 | 837.49 | 843.89 | | 845.56 | 0.005912 | 10.41 | 255.37 | 50.69 | 0.75 |
| Reach 1 | 1378 | 25-year | Prop170 | 2520.00 | 837.49 | 843.89 | | 845.56 | 0.005912 | 10.41 | 255.37 | 50.69 | 0.75 |
| Reach 1 | 1221 | 25-year | Unrestr | 2520.00 | 836.55 | 842.44 | 841.96 | 844.45 | 0.008026 | 11.42 | 238.61 | 53.78 | 0.86 |
| Reach 1 | 1221 | 25-year | ExCond | 2520.00 | 836.55 | 842.44 | 841.96 | 844.45 | 0.008026 | 11.42 | 238.61 | 53.78 | 0.86 |
| Reach 1 | 1221 | 25-year | Prop170 | 2520.00 | 836.55 | 842.44 | 841.96 | 844.45 | 0.008026 | 11.42 | 238.61 | 53.78 | 0.86 |
| Reach 1 | 1069 | 25-year | Unrestr | 2520.00 | 835.63 | 842.32 | | 843.34 | 0.003823 | 8.64 | 532.78 | 149.36 | 0.61 |
| Reach 1 | 1069 | 25-year | ExCond | 2520.00 | 835.63 | 842.32 | | 843.34 | 0.003823 | 8.64 | 532.78 | 149.36 | 0.61 |
| Reach 1 | 1069 | 25-year | Prop170 | 2520.00 | 835.63 | 842.32 | | 843.34 | 0.003823 | 8.64 | 532.78 | 149.36 | 0.61 |
| Reach 1 | 889 | 25-year | Unrestr | 2520.00 | 834.57 | 840.94 | 840.03 | 842.46 | 0.005612 | 10.11 | 331.29 | 84.70 | 0.73 |
| Reach 1 | 889 | 25-year | ExCond | 2520.00 | 834.57 | 840.94 | 840.03 | 842.46 | 0.005612 | 10.11 | 331.29 | 84.70 | 0.73 |
| Reach 1 | 889 | 25-year | Prop170 | 2520.00 | 834.57 | 840.94 | 840.03 | 842.46 | 0.005612 | 10.11 | 331.29 | 84.70 | 0.73 |
| Reach 1 | 753 | 25-year | Unrestr | 2520.00 | 833.75 | 839.88 | 839.18 | 841.61 | 0.006654 | 10.71 | 293.91 | 79.12 | 0.79 |
| Reach 1 | 753 | 25-year | ExCond | 2520.00 | 833.75 | 839.88 | 839.18 | 841.61 | 0.006654 | 10.71 | 293.91 | 79.12 | 0.79 |
| Reach 1 | 753 | 25-year | Prop170 | 2520.00 | 833.75 | 839.88 | 839.18 | 841.61 | 0.006654 | 10.71 | 293.91 | 79.12 | 0.79 |
| Reach 1 | 568 | 25-year | Unrestr | 2520.00 | 832.64 | 838.99 | | 840.41 | 0.005384 | 9.88 | 372.26 | 98.09 | 0.72 |
| Reach 1 | 568 | 25-year | ExCond | 2520.00 | 832.64 | 838.99 | | 840.41 | 0.005384 | 9.88 | 372.26 | 98.09 | 0.72 |
| Reach 1 | 568 | 25-year | Prop170 | 2520.00 | 832.64 | 838.99 | | 840.41 | 0.005384 | 9.88 | 372.26 | 98.09 | 0.72 |
| Reach 1 | 404 | 25-year | Unrestr | 2520.00 | 831.65 | 837.99 | 837.17 | 839.50 | 0.005644 | 10.10 | 346.66 | 98.08 | 0.73 |
| Reach 1 | 404 | 25-year | ExCond | 2520.00 | 831.65 | 837.99 | 837.17 | 839.50 | 0.005644 | 10.10 | 346.66 | 98.08 | 0.73 |
| Reach 1 | 404 | 25-year | Prop170 | 2520.00 | 831.65 | 837.99 | 837.17 | 839.50 | 0.005644 | 10.10 | 346.66 | 98.08 | 0.73 |

Oconee S-133 (Burns Mill Rd) over Little Cane Creek HEC-RAS 100-Year Output Table

HEC-RAS River: Little Cane Reach: Reach 1 Profile: 100-year

| Reach | River Sta | Profile | Plan | Q Total (cfs) | Min Ch El (ft) | W.S. Elev (ft) | Crit W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Chnl (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # Chl |
|---------|-----------|----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 2485 | 100-year | Unrestr | 3610.00 | 841.87 | 852.07 | 849.15 | 853.21 | 0.002531 | 8.65 | 546.02 | 196.09 | 0.52 |
| Reach 1 | 2485 | 100-year | ExCond | 3610.00 | 841.87 | 852.30 | 849.15 | 853.38 | 0.002306 | 8.41 | 593.12 | 211.35 | 0.50 |
| Reach 1 | 2485 | 100-year | Prop170 | 3610.00 | 841.87 | 852.21 | 849.15 | 853.31 | 0.002407 | 8.53 | 572.58 | 207.54 | 0.51 |
| Reach 1 | 2409 | 100-year | Unrestr | 3610.00 | 841.38 | 852.09 | | 852.98 | 0.001844 | 7.63 | 596.55 | 186.09 | 0.45 |
| Reach 1 | 2409 | 100-year | ExCond | 3610.00 | 841.38 | 852.32 | 848.41 | 853.15 | 0.001677 | 7.40 | 649.87 | 283.53 | 0.43 |
| Reach 1 | 2409 | 100-year | Prop170 | 3610.00 | 841.38 | 852.22 | | 853.08 | 0.001744 | 7.50 | 625.20 | 231.28 | 0.44 |
| Reach 1 | 2344 | 100-year | Unrestr | 3610.00 | 842.04 | 851.87 | 848.48 | 852.84 | 0.002015 | 8.00 | 643.68 | 279.03 | 0.47 |
| Reach 1 | 2344 | 100-year | ExCond | 3610.00 | 842.04 | 852.15 | 848.48 | 853.04 | 0.001792 | 7.70 | 726.87 | 326.99 | 0.45 |
| Reach 1 | 2344 | 100-year | Prop170 | 3610.00 | 842.04 | 852.03 | 848.48 | 852.96 | 0.001883 | 7.83 | 690.85 | 310.36 | 0.46 |
| Reach 1 | 2295 | 100-year | Unrestr | 3610.00 | 841.34 | 852.02 | | 852.67 | 0.001251 | 6.57 | 914.82 | 446.62 | 0.38 |
| Reach 1 | 2295 | 100-year | ExCond | 3610.00 | 841.34 | 852.29 | | 852.88 | 0.001118 | 6.33 | 1044.79 | 510.74 | 0.36 |
| Reach 1 | 2295 | 100-year | Prop170 | 3610.00 | 841.34 | 852.18 | | 852.79 | 0.001173 | 6.43 | 988.62 | 507.21 | 0.37 |
| Reach 1 | 2203 | 100-year | Unrestr | 3610.00 | 841.30 | 851.97 | | 852.53 | 0.001185 | 6.24 | 1234.15 | 566.50 | 0.36 |
| Reach 1 | 2203 | 100-year | ExCond | 3610.00 | 841.30 | 852.23 | 847.80 | 852.74 | 0.001057 | 6.00 | 1268.25 | 601.09 | 0.35 |
| Reach 1 | 2203 | 100-year | Prop170 | 3610.00 | 841.30 | 852.12 | 847.80 | 852.64 | 0.001109 | 6.10 | 1240.73 | 580.71 | 0.35 |
| Reach 1 | 2121 | 100-year | Unrestr | 3610.00 | 841.26 | 851.95 | | 852.39 | 0.001048 | 6.03 | 1766.04 | 532.77 | 0.34 |
| Reach 1 | 2121 | 100-year | ExCond | 3610.00 | 841.26 | 852.05 | 847.84 | 852.62 | 0.001225 | 6.56 | 1079.63 | 537.45 | 0.37 |
| Reach 1 | 2121 | 100-year | Prop170 | 3610.00 | 841.26 | 851.94 | 847.84 | 852.52 | 0.001258 | 6.60 | 1099.68 | 532.47 | 0.38 |
| Reach 1 | 1986 | 100-year | Unrestr | 3610.00 | 841.44 | 851.27 | | 852.17 | 0.001795 | 7.73 | 569.14 | 89.32 | 0.45 |
| Reach 1 | 1986 | 100-year | ExCond | 3610.00 | 841.44 | 851.36 | 847.66 | 852.24 | 0.001735 | 7.65 | 577.13 | 90.21 | 0.45 |
| Reach 1 | 1986 | 100-year | Prop170 | 3610.00 | 841.44 | 851.36 | 847.66 | 852.24 | 0.001735 | 7.65 | 577.13 | 90.21 | 0.45 |
| Reach 1 | 1937 | 100-year | Unrestr | 3610.00 | 840.86 | 850.84 | | 852.07 | 0.002633 | 9.05 | 507.38 | 90.44 | 0.54 |
| Reach 1 | 1937 | 100-year | ExCond | 3610.00 | 840.86 | 850.84 | | 852.07 | 0.002633 | 9.05 | 507.38 | 90.44 | 0.54 |
| Reach 1 | 1937 | 100-year | Prop170 | 3610.00 | 840.86 | 850.84 | | 852.07 | 0.002633 | 9.05 | 507.38 | 90.44 | 0.54 |
| Reach 1 | 1895 | 100-year | Unrestr | 3610.00 | 839.78 | 850.87 | | 851.92 | 0.002072 | 8.29 | 507.76 | 78.15 | 0.48 |
| Reach 1 | 1895 | 100-year | ExCond | 3610.00 | 839.78 | 850.87 | | 851.92 | 0.002072 | 8.29 | 507.76 | 78.15 | 0.48 |
| Reach 1 | 1895 | 100-year | Prop170 | 3610.00 | 839.78 | 850.87 | | 851.92 | 0.002072 | 8.29 | 507.76 | 78.15 | 0.48 |
| Reach 1 | 1825 | 100-year | Unrestr | 3610.00 | 839.93 | 850.73 | | 851.78 | 0.001946 | 8.30 | 519.61 | 78.38 | 0.47 |
| Reach 1 | 1825 | 100-year | ExCond | 3610.00 | 839.93 | 850.73 | | 851.78 | 0.001946 | 8.30 | 519.61 | 78.38 | 0.47 |
| Reach 1 | 1825 | 100-year | Prop170 | 3610.00 | 839.93 | 850.73 | | 851.78 | 0.001946 | 8.30 | 519.61 | 78.38 | 0.47 |
| Reach 1 | 1756 | 100-year | Unrestr | 3610.00 | 840.76 | 848.23 | 848.23 | 851.32 | 0.009279 | 14.27 | 298.07 | 61.05 | 0.97 |
| Reach 1 | 1756 | 100-year | ExCond | 3610.00 | 840.76 | 848.23 | 848.23 | 851.32 | 0.009279 | 14.27 | 298.07 | 61.05 | 0.97 |
| Reach 1 | 1756 | 100-year | Prop170 | 3610.00 | 840.76 | 848.23 | 848.23 | 851.32 | 0.009279 | 14.27 | 298.07 | 61.05 | 0.97 |
| Reach 1 | 1703 | 100-year | Unrestr | 3610.00 | 837.91 | 847.90 | | 849.02 | 0.002556 | 8.60 | 494.95 | 79.35 | 0.53 |
| Reach 1 | 1703 | 100-year | ExCond | 3610.00 | 837.91 | 847.90 | | 849.02 | 0.002556 | 8.60 | 494.95 | 79.35 | 0.53 |
| Reach 1 | 1703 | 100-year | Prop170 | 3610.00 | 837.91 | 847.90 | | 849.02 | 0.002556 | 8.60 | 494.95 | 79.35 | 0.53 |
| Reach 1 | 1616 | 100-year | Unrestr | 3610.00 | 838.32 | 847.73 | | 848.79 | 0.002384 | 8.37 | 509.17 | 85.15 | 0.51 |
| Reach 1 | 1616 | 100-year | ExCond | 3610.00 | 838.32 | 847.73 | | 848.79 | 0.002384 | 8.37 | 509.17 | 85.15 | 0.51 |
| Reach 1 | 1616 | 100-year | Prop170 | 3610.00 | 838.32 | 847.73 | | 848.79 | 0.002384 | 8.37 | 509.17 | 85.15 | 0.51 |
| Reach 1 | 1510 | 100-year | Unrestr | 3610.00 | 838.29 | 846.12 | 845.06 | 848.30 | 0.005835 | 11.94 | 344.83 | 60.64 | 0.77 |
| Reach 1 | 1510 | 100-year | ExCond | 3610.00 | 838.29 | 846.12 | 845.06 | 848.30 | 0.005835 | 11.94 | 344.83 | 60.64 | 0.77 |
| Reach 1 | 1510 | 100-year | Prop170 | 3610.00 | 838.29 | 846.12 | 845.06 | 848.30 | 0.005835 | 11.94 | 344.83 | 60.64 | 0.77 |
| Reach 1 | 1378 | 100-year | Unrestr | 3610.00 | 837.49 | 845.38 | 844.22 | 847.54 | 0.005704 | 11.87 | 335.06 | 56.26 | 0.77 |
| Reach 1 | 1378 | 100-year | ExCond | 3610.00 | 837.49 | 845.38 | 844.22 | 847.54 | 0.005704 | 11.87 | 335.06 | 56.26 | 0.77 |
| Reach 1 | 1378 | 100-year | Prop170 | 3610.00 | 837.49 | 845.38 | 844.22 | 847.54 | 0.005704 | 11.87 | 335.06 | 56.26 | 0.77 |
| Reach 1 | 1221 | 100-year | Unrestr | 3610.00 | 836.55 | 843.51 | 843.30 | 846.36 | 0.008996 | 13.62 | 301.48 | 70.85 | 0.94 |
| Reach 1 | 1221 | 100-year | ExCond | 3610.00 | 836.55 | 843.51 | 843.30 | 846.36 | 0.008996 | 13.62 | 301.48 | 70.85 | 0.94 |
| Reach 1 | 1221 | 100-year | Prop170 | 3610.00 | 836.55 | 843.51 | 843.30 | 846.36 | 0.008996 | 13.62 | 301.48 | 70.85 | 0.94 |
| Reach 1 | 1069 | 100-year | Unrestr | 3610.00 | 835.63 | 843.98 | | 845.07 | 0.003191 | 9.23 | 799.34 | 170.55 | 0.58 |
| Reach 1 | 1069 | 100-year | ExCond | 3610.00 | 835.63 | 843.98 | | 845.07 | 0.003191 | 9.23 | 799.34 | 170.55 | 0.58 |
| Reach 1 | 1069 | 100-year | Prop170 | 3610.00 | 835.63 | 843.98 | | 845.07 | 0.003191 | 9.23 | 799.34 | 170.55 | 0.58 |
| Reach 1 | 889 | 100-year | Unrestr | 3610.00 | 834.57 | 842.33 | 841.29 | 844.25 | 0.005487 | 11.50 | 457.45 | 98.86 | 0.75 |
| Reach 1 | 889 | 100-year | ExCond | 3610.00 | 834.57 | 842.33 | 841.29 | 844.25 | 0.005487 | 11.50 | 457.45 | 98.86 | 0.75 |
| Reach 1 | 889 | 100-year | Prop170 | 3610.00 | 834.57 | 842.33 | 841.29 | 844.25 | 0.005487 | 11.50 | 457.45 | 98.86 | 0.75 |
| Reach 1 | 753 | 100-year | Unrestr | 3610.00 | 833.75 | 841.09 | 840.52 | 843.38 | 0.006931 | 12.42 | 400.33 | 96.56 | 0.83 |
| Reach 1 | 753 | 100-year | ExCond | 3610.00 | 833.75 | 841.09 | 840.52 | 843.38 | 0.006931 | 12.42 | 400.33 | 96.56 | 0.83 |
| Reach 1 | 753 | 100-year | Prop170 | 3610.00 | 833.75 | 841.09 | 840.52 | 843.38 | 0.006931 | 12.42 | 400.33 | 96.56 | 0.83 |
| Reach 1 | 568 | 100-year | Unrestr | 3610.00 | 832.64 | 840.35 | 839.31 | 842.11 | 0.005224 | 11.17 | 510.36 | 105.05 | 0.73 |
| Reach 1 | 568 | 100-year | ExCond | 3610.00 | 832.64 | 840.35 | 839.31 | 842.11 | 0.005224 | 11.17 | 510.36 | 105.05 | 0.73 |
| Reach 1 | 568 | 100-year | Prop170 | 3610.00 | 832.64 | 840.35 | 839.31 | 842.11 | 0.005224 | 11.17 | 510.36 | 105.05 | 0.73 |
| Reach 1 | 404 | 100-year | Unrestr | 3610.00 | 831.65 | 839.43 | 838.43 | 841.24 | 0.005244 | 11.26 | 495.87 | 109.69 | 0.73 |
| Reach 1 | 404 | 100-year | ExCond | 3610.00 | 831.65 | 839.43 | 838.43 | 841.24 | 0.005244 | 11.26 | 495.87 | 109.69 | 0.73 |
| Reach 1 | 404 | 100-year | Prop170 | 3610.00 | 831.65 | 839.43 | 838.43 | 841.24 | 0.005244 | 11.26 | 495.87 | 109.69 | 0.73 |

Formal Alternative Technical Concepts Submittal Form

Project: Bridge Package 21

Project ID: 5368980

ATC No.: 4

Priority: High

Team: WBCC-RK&K

Date: 10/8/25

Description (required):

Allow sag vertical curve on S-133 over Little Cane Creek.

Usage:

We are proposing to use place a sag vertical curve across the anticipated three span [40-100-30] 170-ft box beam and cored slab bridge being placed on S-133 over Little Cane Creek. Should FATC 03 not be approved, we would still like to use this ATC to allow a sag vertical curve over the final proposed bridge configuration.

Deviations (required):

Bridge Design Manual Section 12.3.2.6; Bridge Design Memorandum DM0524

Justification:

By allowing a sag vertical curve in this location, we can lower the bridge over 4-ft reducing the amount of approach work, and impacts to right of way and utilities associated with the higher profile. The low point of the curve will be approximately 36-ft from the end of the bridge using this lower profile.

Placing the vertical curve on the bridge will require extra asphalt on the box beams. The assumptions discussed in Structural Drawings and Details IM704-ABB (including camber, concrete strengths, final allowable tension limit, and future wearing surface) were considered in addition to the extra asphalt. We have confirmed the SC 100' box beam standard with extra asphalt will still have passing Load Rating factors.

Reeves is a major sub on this project for Wright Brothers and they have constructed six bridges in previous bridge packages that have sag vertical curves over box beams (see History for a list). They will work closely with WBCC to ensure the following information for construction means and methods in constructing these sites. Before beginning the paving operation and before the slip form is placed for the bridge parapet wall, the Project Engineer takes profile shots of the final grade for the bridge deck in 10-ft increments on each side of the bridge and the elevations are recorded in a field notebook. This allows them to ensure the barrier wall height of 42-in above the riding surface is obtained, and that the drains are placed in the proper locations. The slip form is then placed and the parapet wall is constructed. The elevations are then written on the deck and on top of the parapet wall as reference for the paving crew. The Project Engineer remains on site during the paving operation to QC the elevations between each lift.

Next they begin paving the build up with intermediate asphalt making multiple passes and continuously checking the elevations between passes. Once the build up passes are complete, they take one last grid of profile shots to ensure the thickness needed at each end for the surface course. Those thicknesses are marked on the deck for the paving crew to follow ensuring the final surface elevation is accurate to the design.

Formal Alternative Technical Concepts Submittal Form

Project: Bridge Package 21

Project ID: 5368980

ATC No.: 4

Priority: High

Team: WBCC-RK&K

Date: 10/8/25

Schedule:

Schedule savings due to reduction in borrow excavation TBD.

Impacts:

Allowing the sag VC on the bridge will lower our roadway profile thereby reducing right of way, utility and environmental impacts at this site. This ATC also reduces the length of roadway construction, borrow excavation, and asphalt pavement quantities.

History:

The RK&K Team has successfully designed and Reeves Construction has successfully constructed six bridges that have sag vertical curves over Prestressed Concrete Adjacent Box Beam structures, listed below. Example plans are included as attachments to this FATC.

CLRB20 - Abbeville S-96 bridge over Shanklin Creek (2021)

CLRB21 - Cherokee S-97 over Goforth Creek (2023)

CLRB21 - Cherokee S-119 over Bear Creek (2023)

CLRB21 - Chester S-300 South over Little Rocky Branch (2023)

CLRB21 - Fairfield S-214 over Little Creek (2023)

BP30 - Greenwood S-230 over Townsend Creek (2025)

Risks:

No additional risks associated with the ATC.

Costs (required):

Reduced costs to right of way and utility relocations. Reduced cost of borrow material and asphalt pavement for roadway construction. Cost savings TBD.

Quality:

No impacts to quality.

Formal Alternative Technical Concepts Submittal Form

Project: Bridge Package 21

Project ID: 5368980

ATC No.: 4

Priority: High

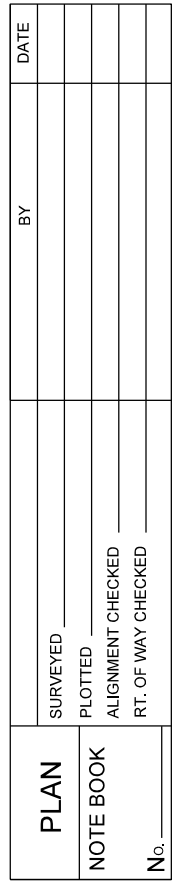
Team: WBCC-RK&K

Date: 10/8/25

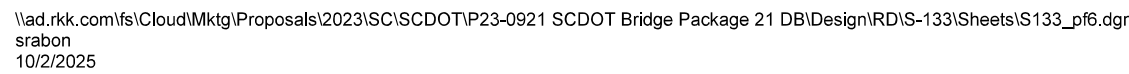
Operations & Maintenance:

The lowered profile will make access for bridge repairs and maintenance easier and reduce operations and maintenance costs over the life of the bridge.

S-133 (BURNS MILL RD.)
OVER LITTLE CANE CREEK



REMOVE EXISTING BRIDGE
CONSTRUCT 170' X 36' CONCRETE BRIDGE
STA. 34+58.50 TO STA. 36+28.50
SEE BRIDGE PLANS



| | | | |
|-----------|--------------------------|----------|------------|
| PLAN | SURVEYED _____ | BY _____ | DATE _____ |
| | PLOTTED _____ | | |
| | ALIGNMENT CHECKED _____ | | |
| NOTE BOOK | RT. OF WAY CHECKED _____ | | |
| No. _____ | | | |



5368980_WBCC-RK&K_FATC04_S133_SagVerticalCurve
Previous Project Examples

| PLAN | DATE |
|-----------|------|
| REVISION | BY |
| NOTED | DATE |
| ALIGNED | DATE |
| RC OF WAY | DATE |
| RC OF WAY | DATE |

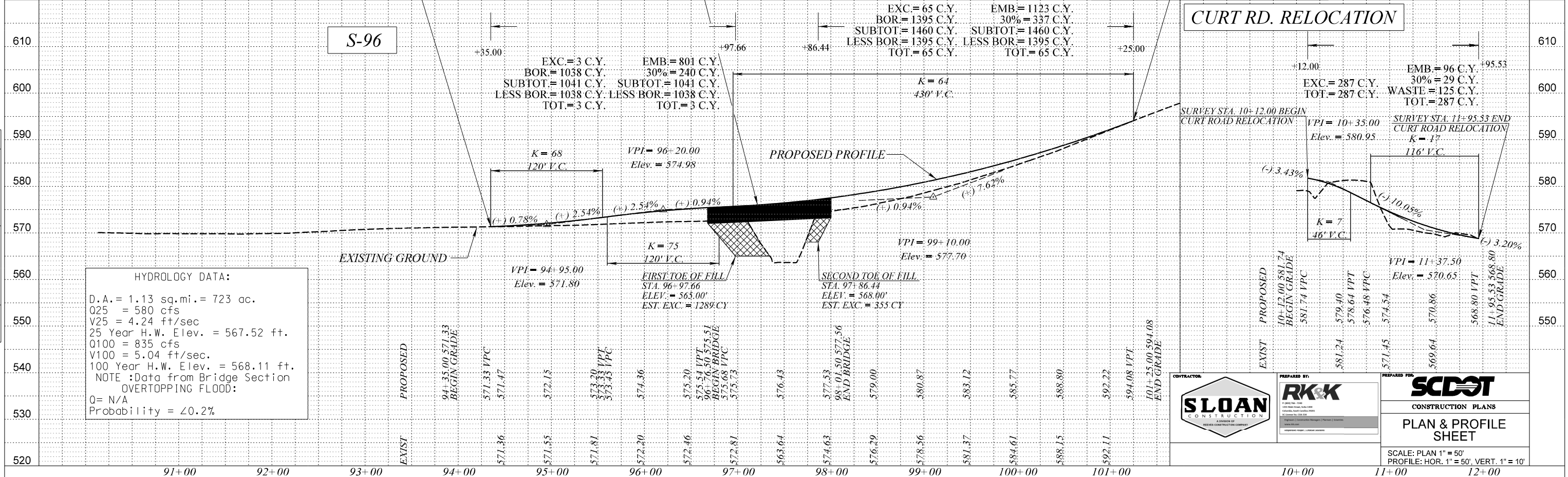
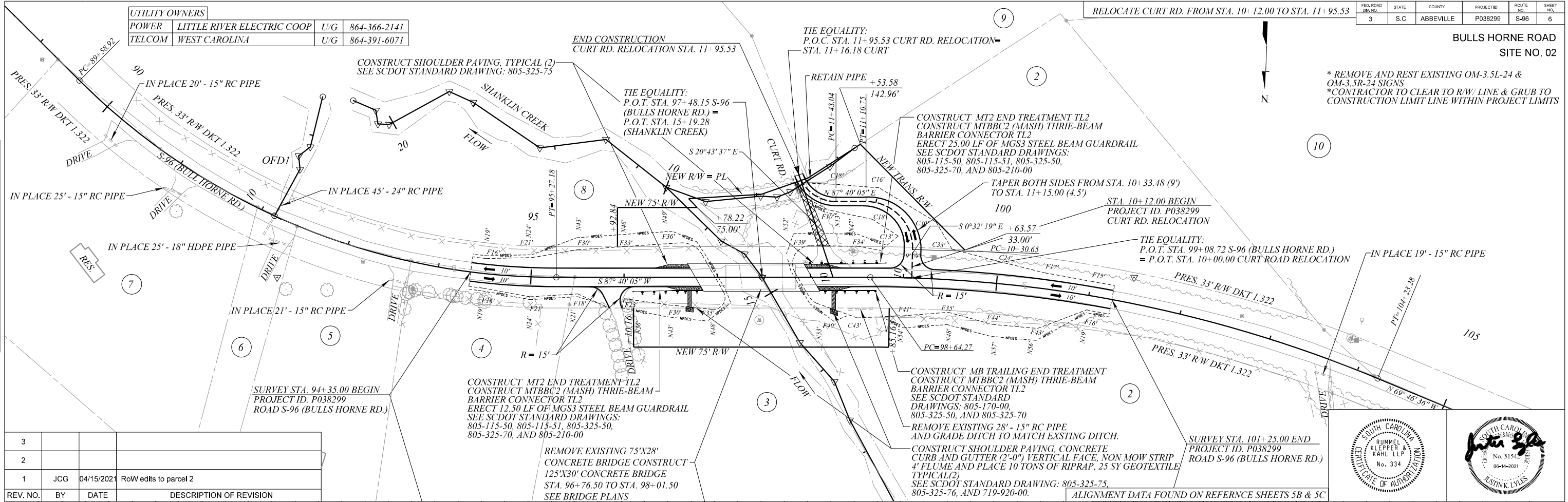
| PLAN | DATE |
|-----------|------|
| REVISION | BY |
| NOTED | DATE |
| ALIGNED | DATE |
| RC OF WAY | DATE |
| RC OF WAY | DATE |

| UTILITY OWNERS | | | |
|----------------|----------------------------|-----|--------------|
| POWER | LITTLE RIVER ELECTRIC COOP | U/G | 864-366-2141 |
| TELCOM | WEST CAROLINA | U/G | 864-391-6071 |

| FED. ROAD DIST. NO. | STATE | COUNTY | PROJECT ID | ROUTE NO. | SHEET NO. |
|---------------------|-------|-----------|------------|-----------|-----------|
| 3 | S.C. | ABBEVILLE | P038299 | S-96 | 6 |

BULLS HORNE ROAD
SITE NO. 02

* REMOVE AND REST EXISTING OM-3.5L-24 & OM-3.5R-24 SIGNS
* CONTRACTOR TO CLEAR TO R/W LINE & GRUB TO CONSTRUCTION LIMIT LINE WITHIN PROJECT LIMITS

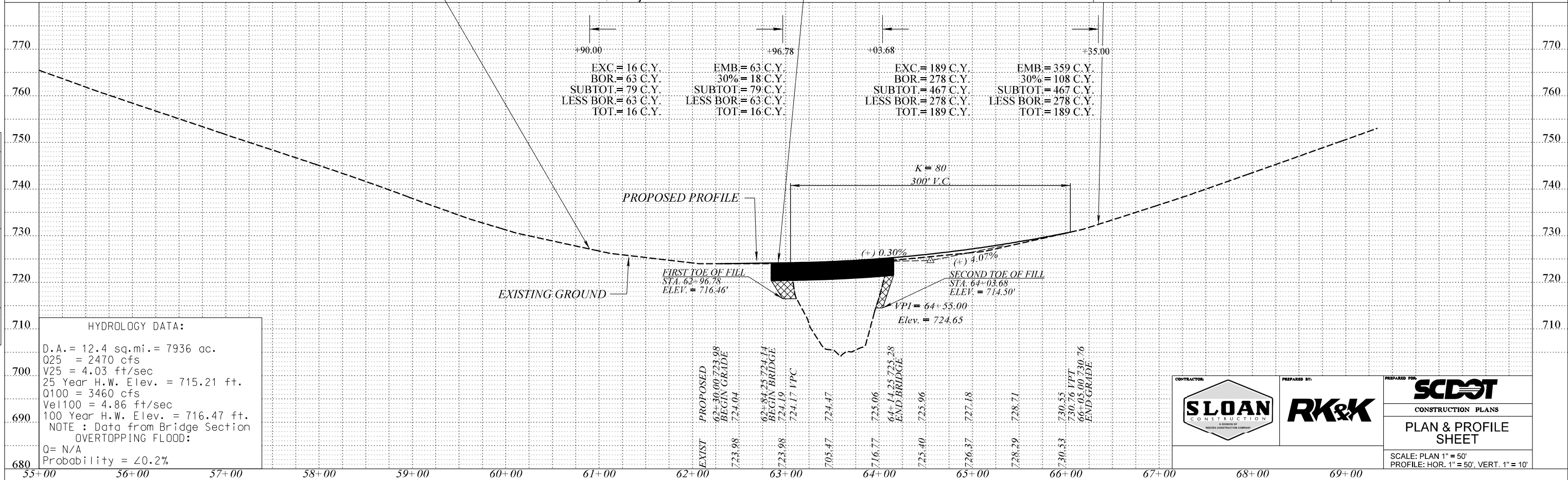
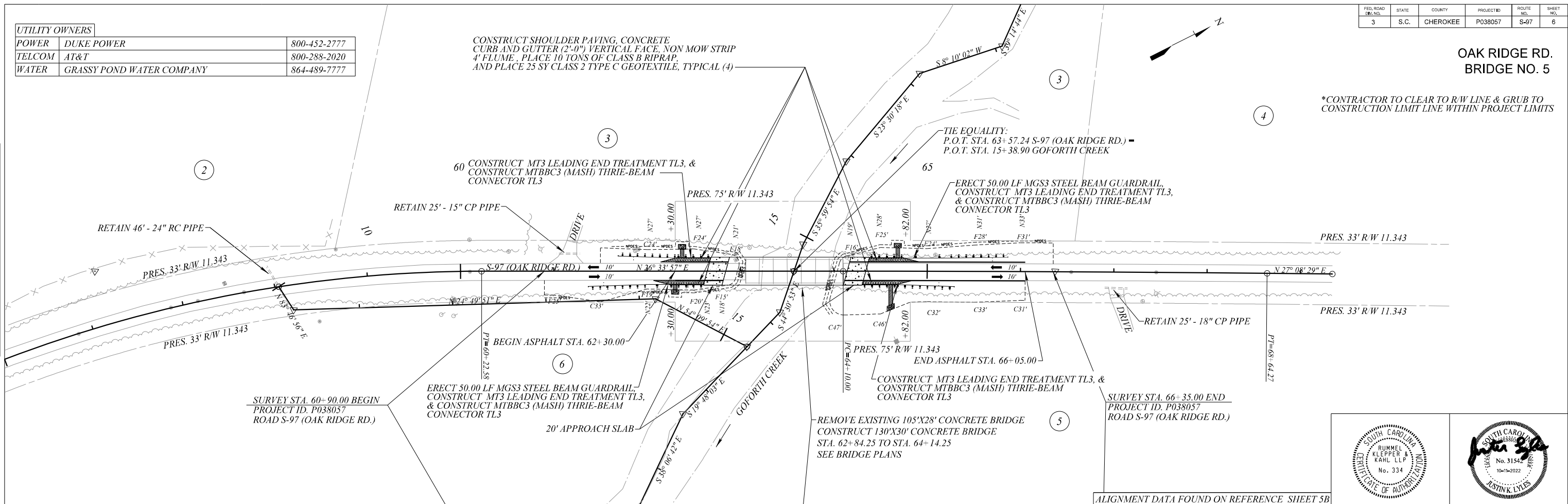
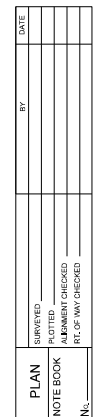


| FED. ROAD DIST. NO. | STATE | COUNTY | PROJECT ID | ROUTE NO. | SHEET NO. |
|------------------------|-------|----------|------------|--------------|--------------|
| 3 | S.C. | CHEROKEE | P038057 | S-97 | 6 |

OAK RIDGE RD.
BRIDGE NO. 5

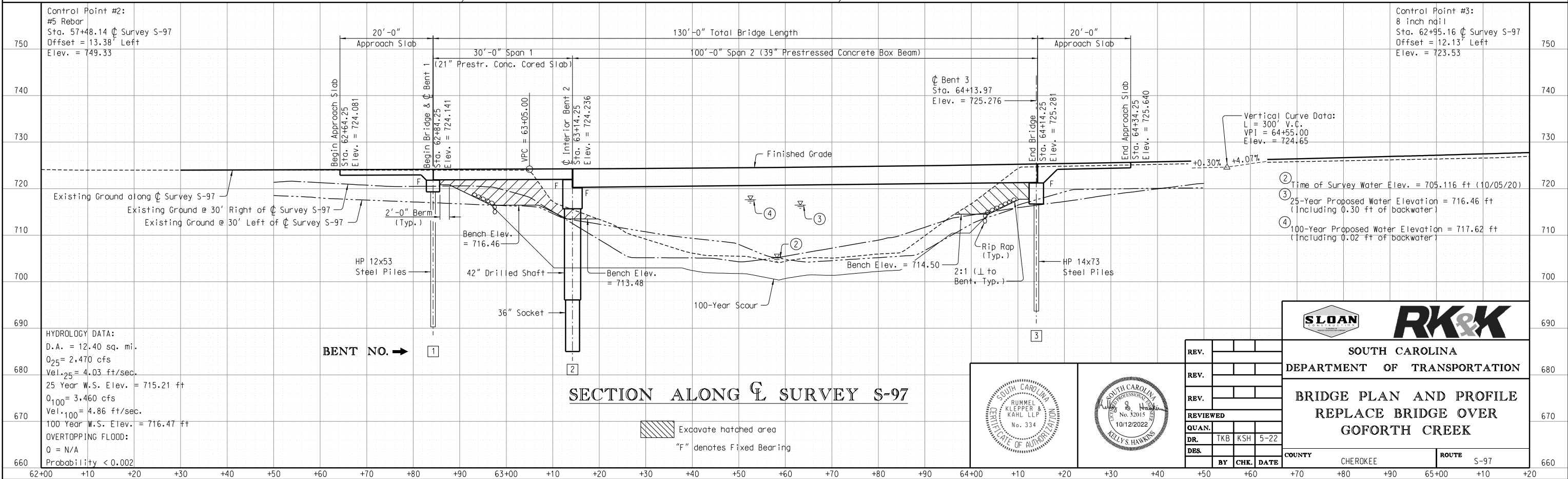
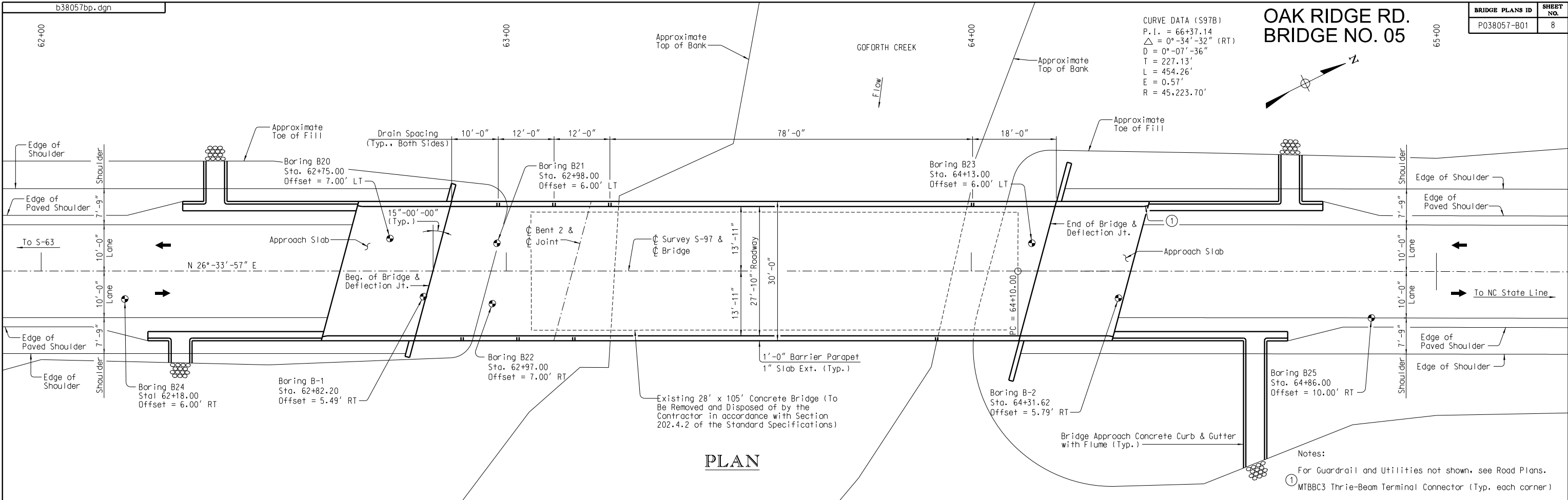
**CONTRACTOR TO CLEAR TO R/W LINE & GRUB TO CONSTRUCTION LIMIT LINE WITHIN PROJECT LIMITS*

| UTILITY OWNERS | | |
|----------------|---------------------------|--------------|
| POWER | DUKE POWER | 800-452-2777 |
| TELCOM | AT&T | 800-288-2020 |
| WATER | GRASSY POND WATER COMPANY | 864-489-7777 |



5368980_WBCC-RK&K_FATC04_S133_SagVerticalCurve
Previous Project Examples

CLRB 2021-1 Cherokee S-97 over GoForth Creek
Roadway Plan and Profile



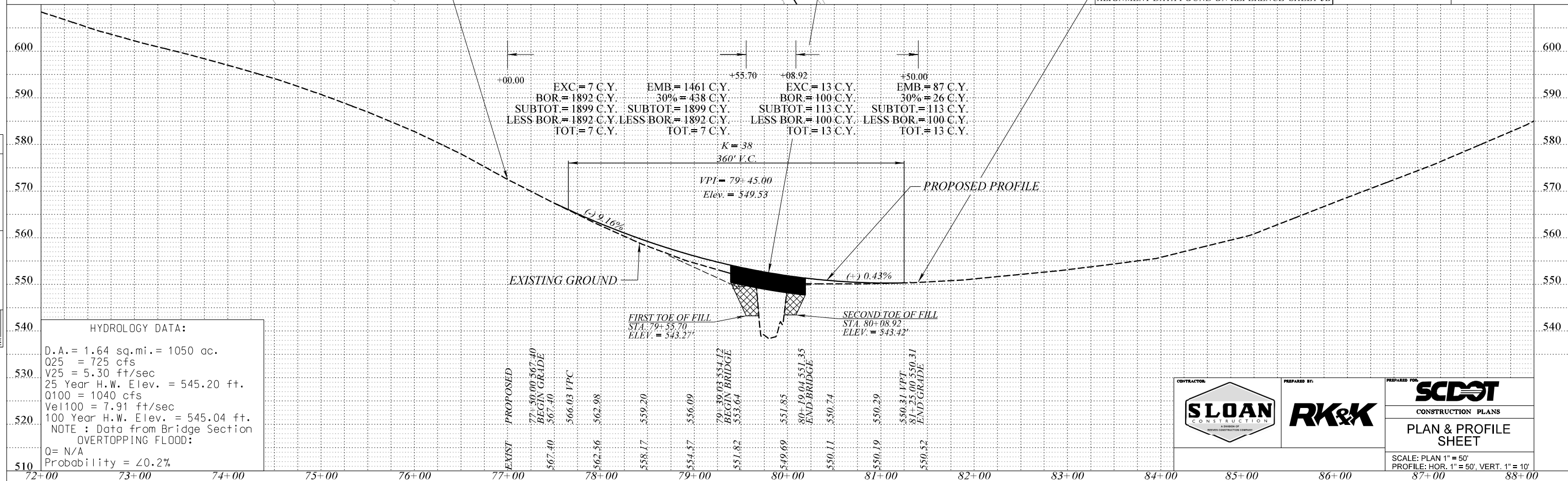
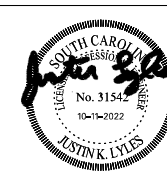
5368980_WBCC-RK&K_FATC04_S133_SagVerticalCurve
Previous Project Examples

CLRB 2021-1 Cherokee S-97 over GoForth Creek
Bridge Plan and Profile

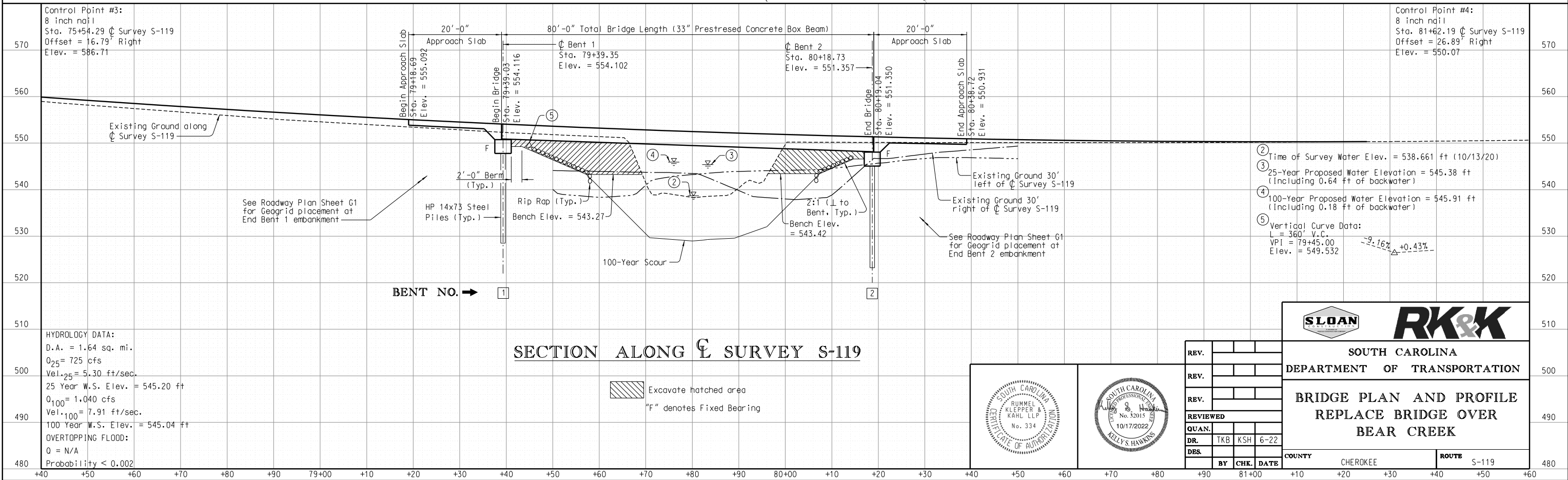
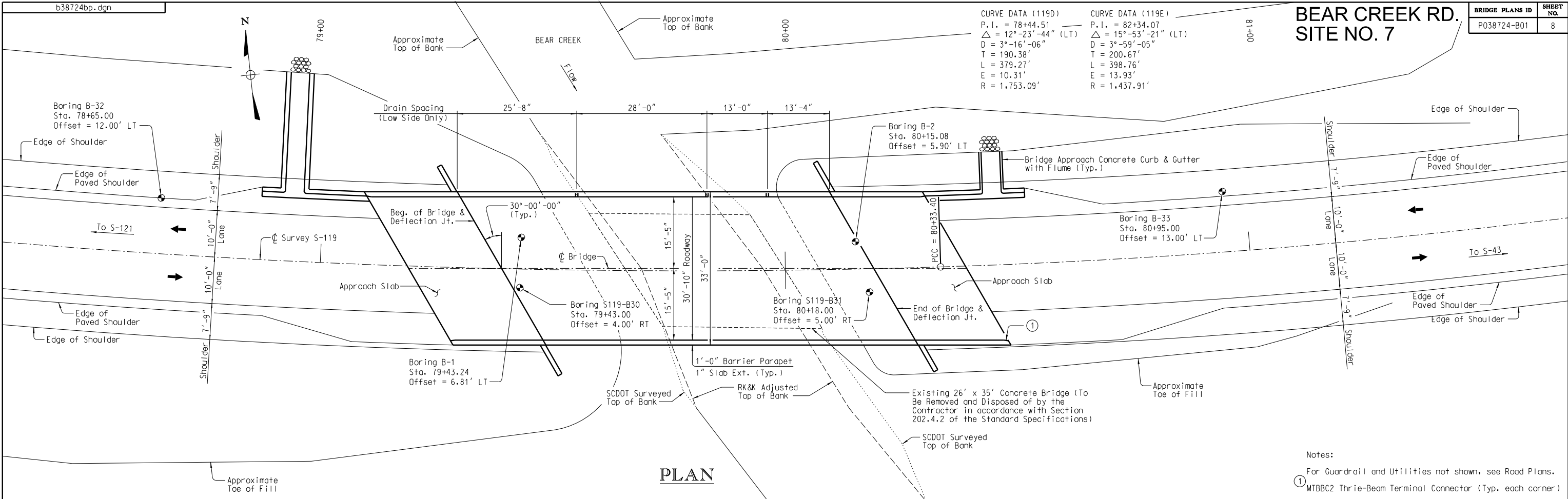
10/3/2022 1:30:41 PM

| FED. ROAD DIST. NO. | STATE | COUNTY | PROJECT ID | ROUTE NO. | SHEET NO. |
|---------------------|-------|----------|------------|-----------|-----------|
| 3 | S.C. | CHEROKEE | P038724 | S-119 | 6 |

**CONTRACTOR TO CLEAR TO R/W/ LINE & GRUB TO CONSTRUCTION LIMIT LINE WITHIN PROJECT LIMITS*



CLRB 2021-1 Cherokee S-119 over Bear Creek
Roadway Plan and Profile

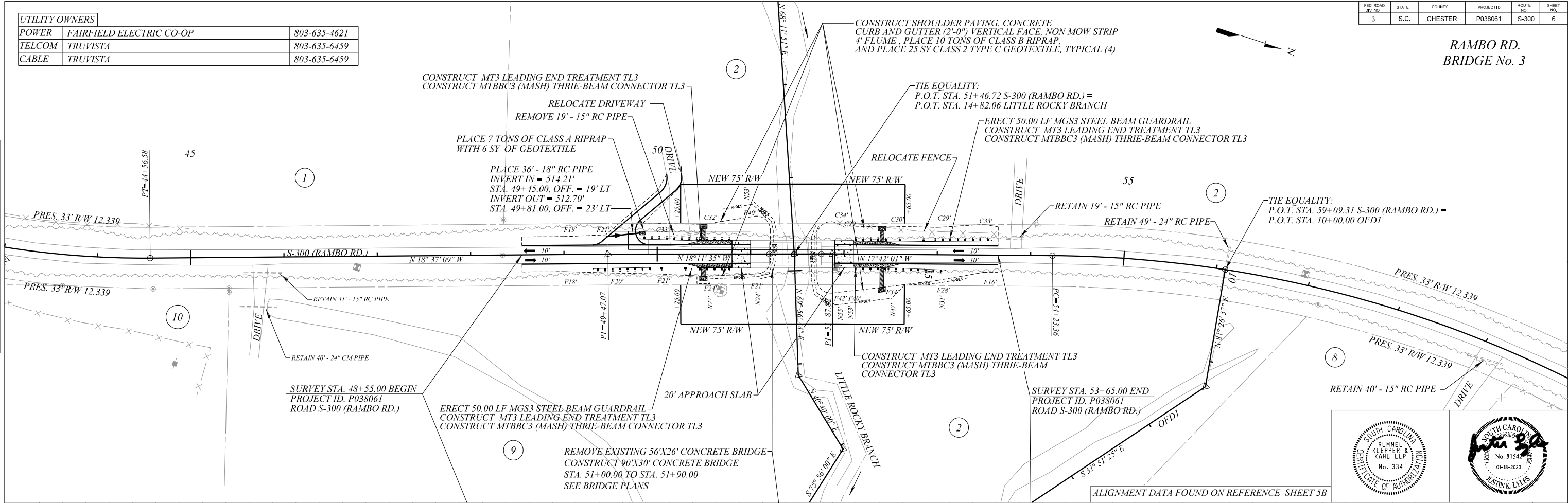


| UTILITY OWNERS | | |
|----------------|--------------------------|--------------|
| POWER | FAIRFIELD ELECTRIC CO-OP | 803-635-4621 |
| TELCOM | TRUVISTA | 803-635-6459 |
| CABLE | TRUVISTA | 803-635-6459 |

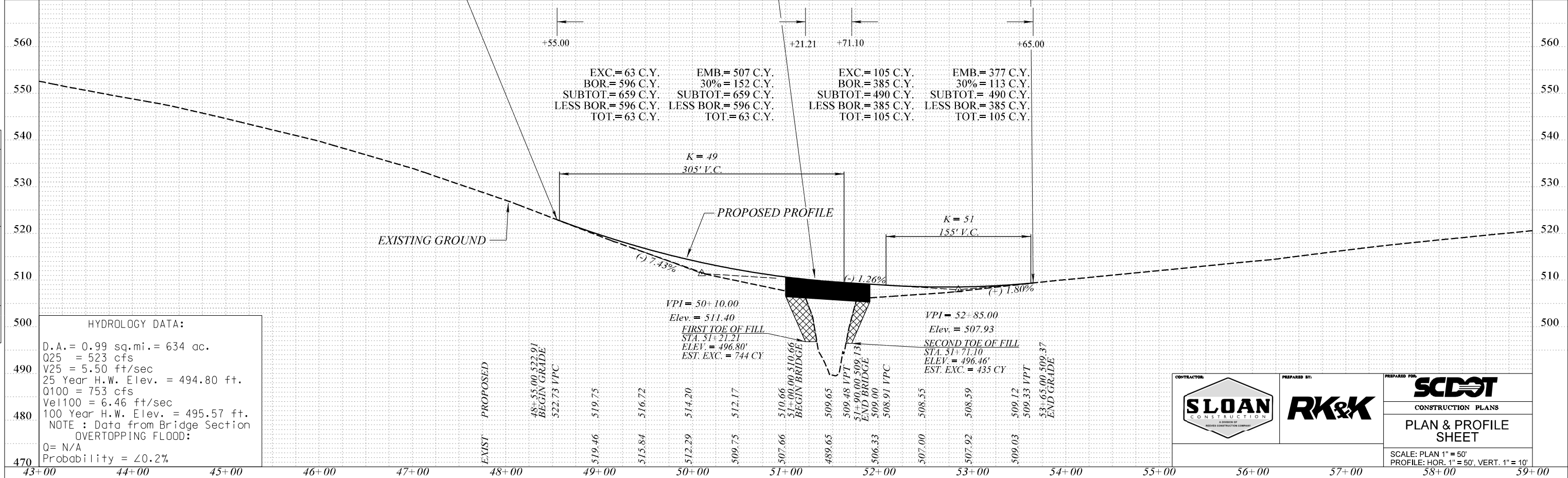
| FED. ROAD DIST. NO. | STATE | COUNTY | PROJECT ID | ROUTE NO. | SHEET NO. |
|---------------------|-------|---------|------------|-----------|-----------|
| 3 | S.C. | CHESTER | P038061 | S-300 | 6 |

RAMBO RD.
BRIDGE No. 3

| PLAN | SURVEYED | PLOTTED | ALIGNED | CHECKED | DATE |
|------|----------|---------|---------|---------|------|
| NO. | | | | | |

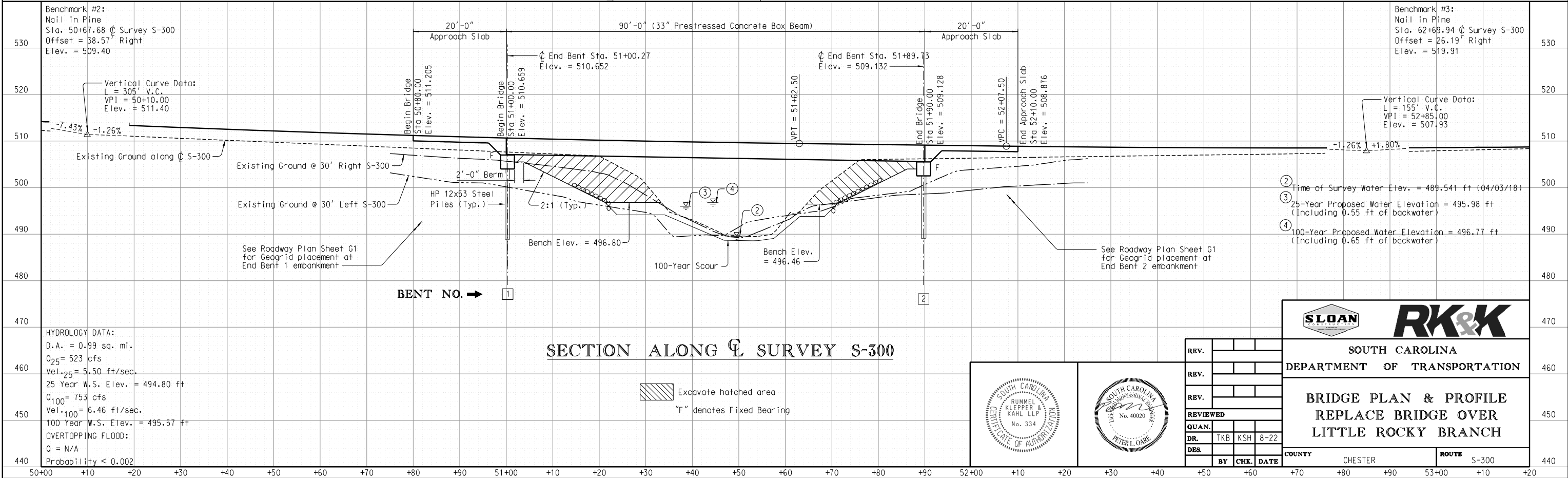
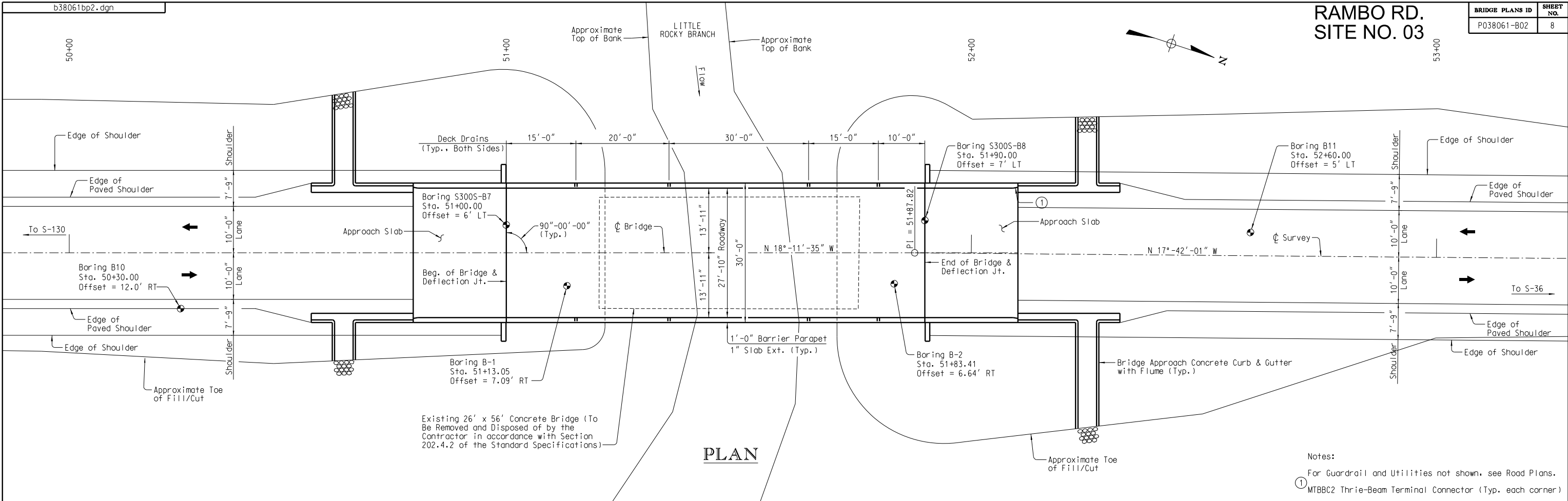


| PLAN | SURVEYED | PLOTTED | ALIGNED | CHECKED | DATE |
|------|----------|---------|---------|---------|------|
| NO. | | | | | |



5368980_WBCC-RK&K_FATC04_S133_SagVerticalCurve
Previous Project Examples

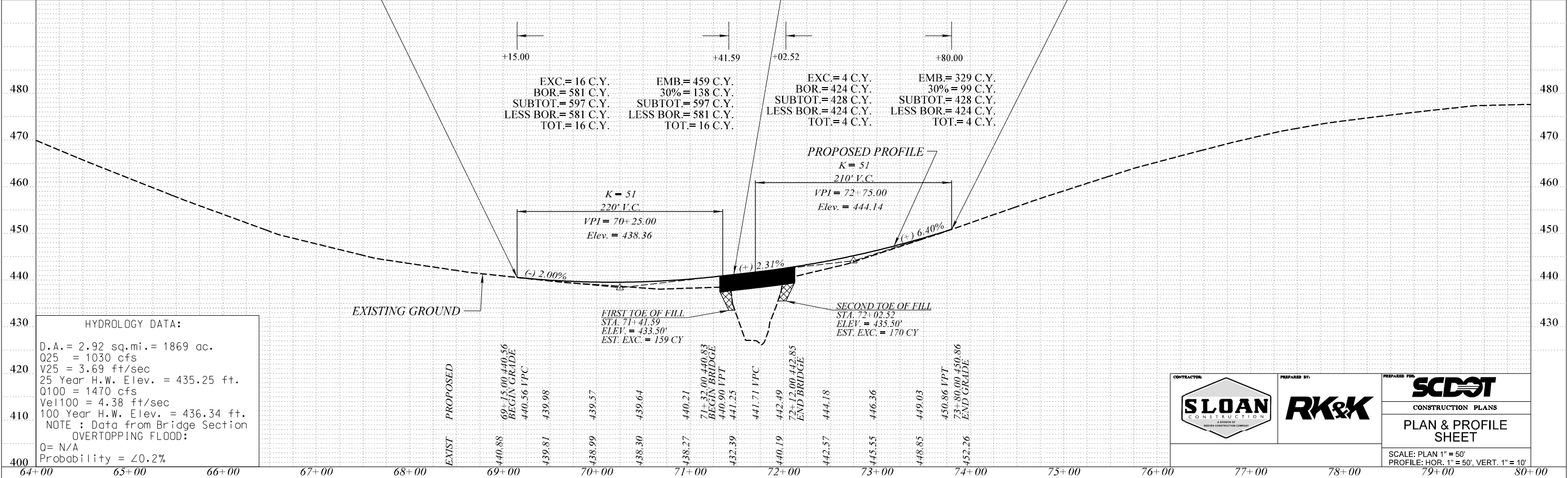
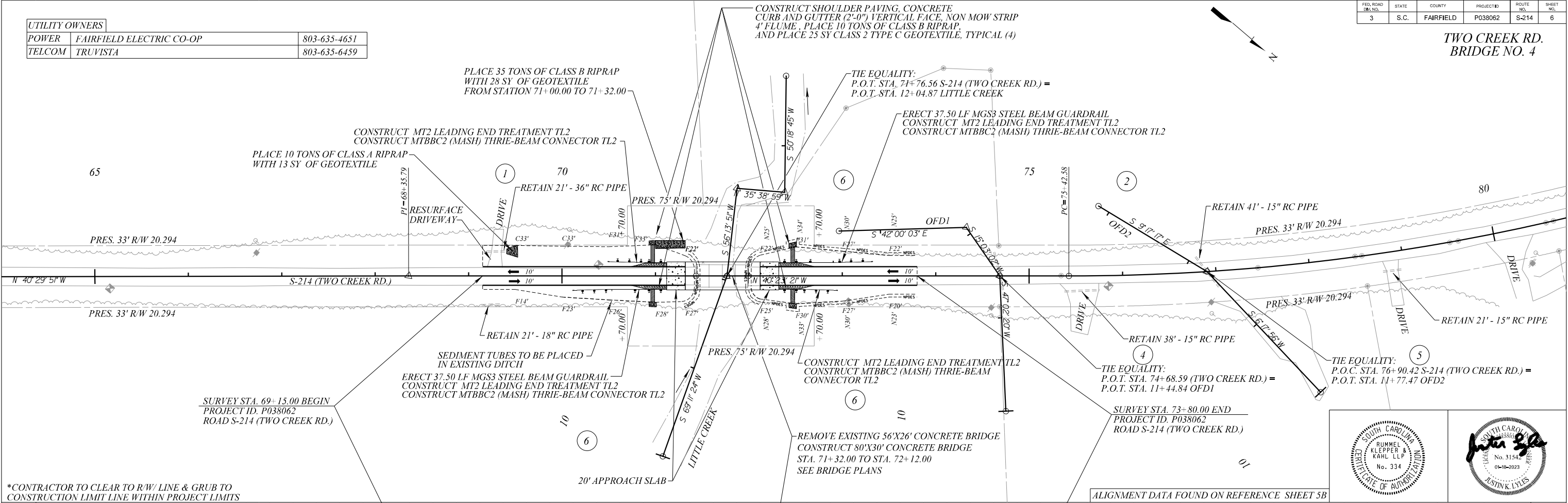
CLRB 2021-1 Cherokee S-300 South over Little Rocky Branch
Roadway Plan and Profile

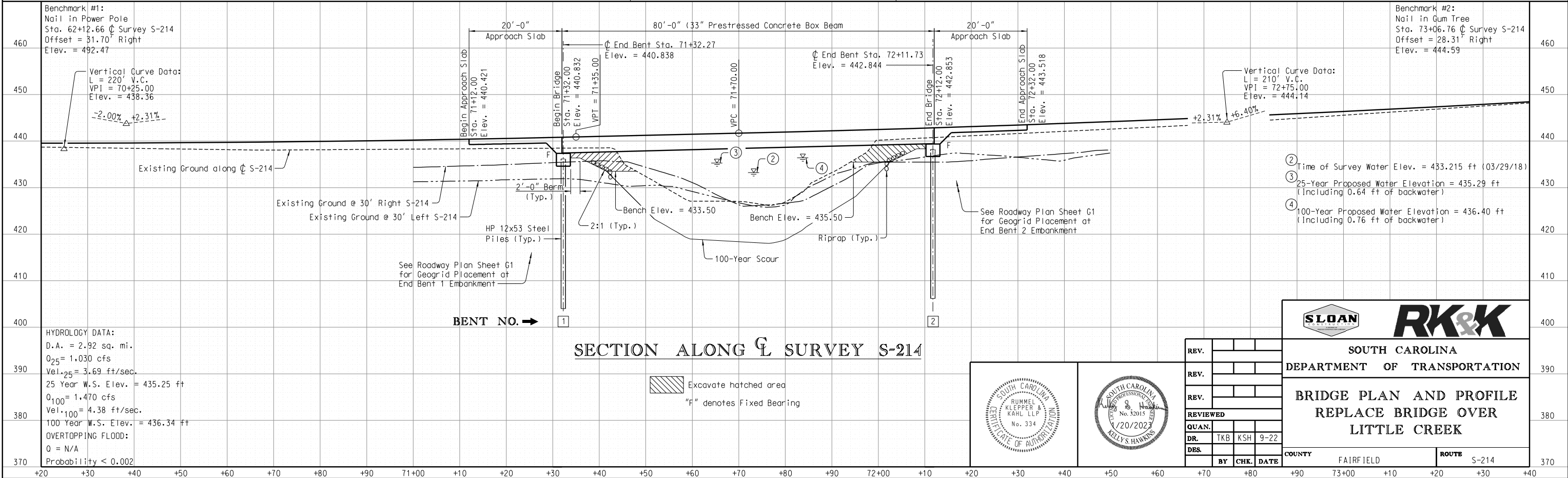
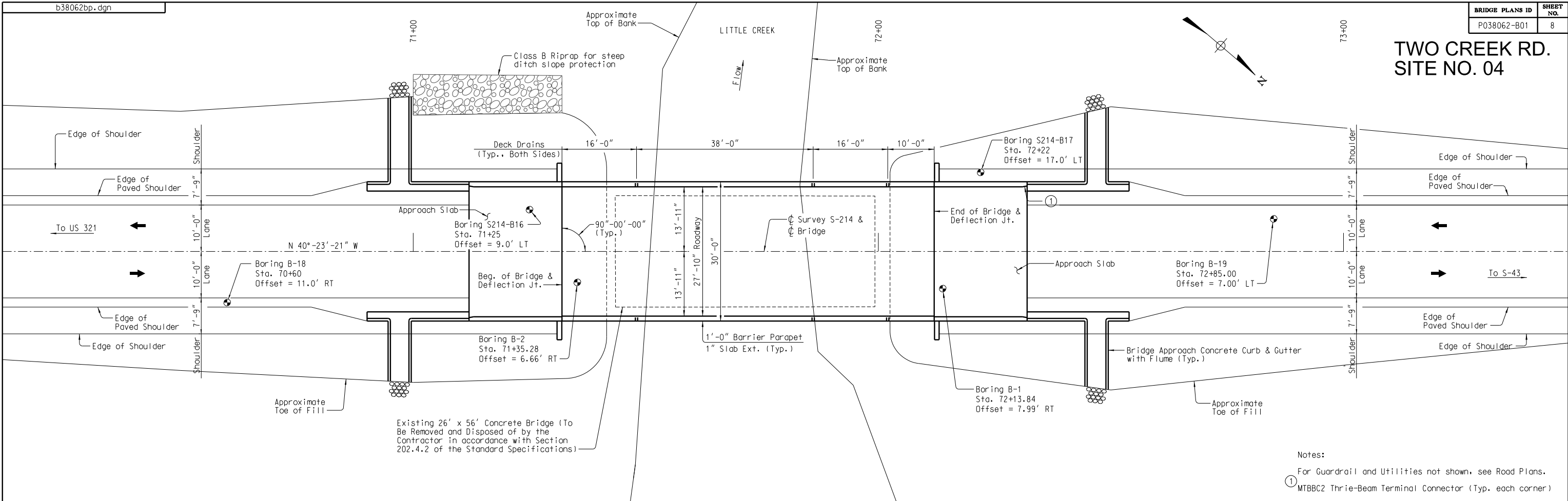


| UTILITY OWNERS | | |
|----------------|--------------------------|--------------|
| POWER | FAIRFIELD ELECTRIC CO-OP | 803-635-4651 |
| TELCOM | TRUVISTA | 803-635-6459 |

| FED. ROAD DIST. NO. | STATE | COUNTY | PROJECT ID | ROUTE NO. | SHEET NO. |
|---------------------|-------|-----------|------------|-----------|-----------|
| 3 | S.C. | FAIRFIELD | P038062 | S-214 | 6 |

TWO CREEK RD.
BRIDGE NO. 4





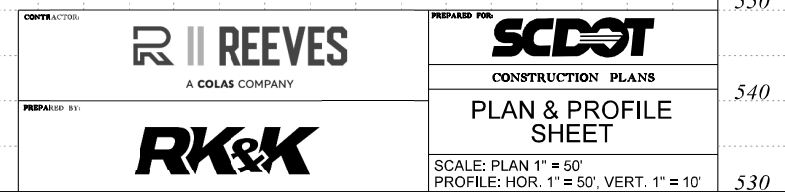
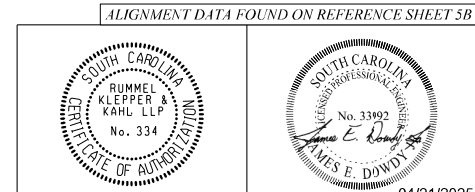
5368980_WBCC-RK&K_FATC04_S133_SagVerticalCurve
Previous Project Examples

CLRB 2021-1 Fairfield S-214 over Little Creek
Bridge Plan and Profile

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| | | | | | |
|-----------------------|-------|-----------|------------|--------------|--------------|
| FED. ROAD DIV. NO. | STATE | COUNTY | PROJECT ID | ROUTE NO. | SHEET NO. |
| 3 | S.C. | GREENWOOD | P043995 | S-230 | 6 |

S-230 Curve 2
P.I. = 72+45.86
 $\Delta = 15^\circ 54' 37''$ (LT)
 $D = 3^\circ 21' 42''$
T = 238.18'
L = 473.30'
E = 16.56'
R = 1,704.45'
D.S. = 35 MPH
eMAX = 6%
e = 3.2%
P.C. - LG% = 0.62
P.T. - LG% = 0.62



Formal Alternative Technical Concepts Submittal Form

Project: Bridge Package 21

Project ID: 5368980

ATC No.: 5

Priority: High

Team: WBCC-RK&K

Date: 11/4/25

Description (required):

This ATC proposes sections of steepened 1.5H:1V embankment slopes to be used to minimize environmental impacts and rock excavation on S-133 over Little Cane Creek. The construction detail will incorporate Rip Rap facing to ensure stability.

Usage:

Steepened slope locations will be limited to areas where 2:1 slopes create environmental impacts and constructibility issues. The attached conceptual roll plot shows the planned locations that 1.5:1 slopes will be implemented. Geotextile reinforcement will be utilized for slope stability in all new 1.5:1 fill slopes.

Deviations (required):

RFP Exhibit 4f Section 2.2

Justification:

The use of steepened slopes will be more economical than the use of earth retaining structures, or additional environmental and right-of-way impacts. For all embankment fill slopes steeper than 2:1, geotextile reinforcement will be included to protect against deeper stability failure planes.

Schedule:

A reduction in schedule can be realized with the elimination of mitigation. This reduces the time necessary for permit reviews and mitigation purchase. Total reduction time TBD.

Impacts:

The steepened slopes will be used to keep project environmental impacts within allowable limit for use of the General Permit and eliminate Jurisdictional impacts requiring mitigation.

History:

SCDOT routinely uses slopes up to 1.5:1 where project constraints require, geotechnical stability performance limits can be met, and maintenance considerations are addressed.

Formal Alternative Technical Concepts Submittal Form

Project: Bridge Package 21

Project ID: 5368980

ATC No.: 5

Priority: High

Team: WBCC-RK&K

Date: 11/4/25

Risks:

Steepened slopes present greater potential for slope deformation and creep and superficial erosion. In addition, geotextile reinforcement will be included on all embankment fill slopes steeper than 2:1 to protect against deeper stability failure planes.

Costs (required):

The use of steepened slopes will reduce the project costs reducing the amount of earthwork necessary, both cut and fill. The steepened slopes also reduce JW impacts shown on the roll plot.

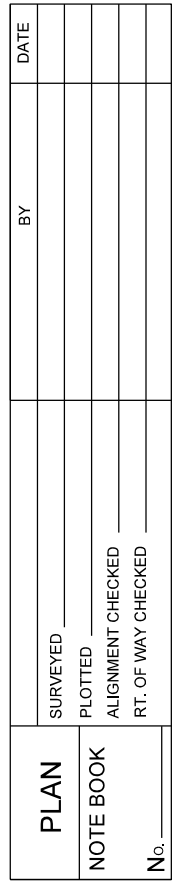
Quality:

The Rip Rap slopes will also require minimal long-term maintenance.

Operations & Maintenance:

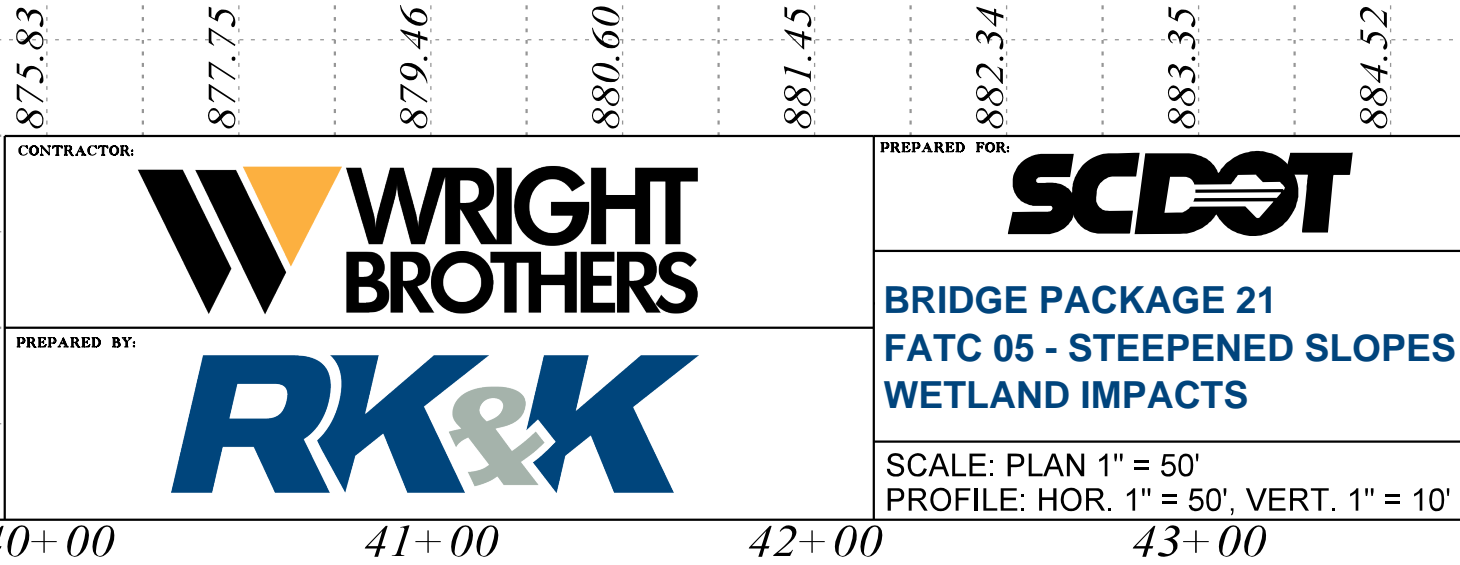
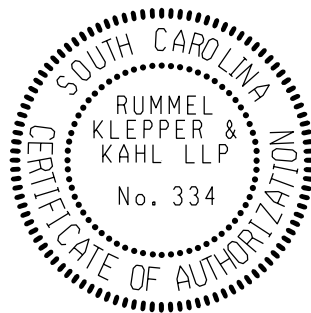
The steepened slopes will reduce The Department's operations and maintenance of the project corridor by using Rip Rap slopes rather than vegetated slopes that require mowing or retaining structures that require inspections and maintenance.

S-133 (BURNS MILL RD.)
OVER LITTLE CANE CREEK



REMOVE EXISTING BRIDGE
CONSTRUCT 170' X 36' CONCRETE BRIDGE
STA. 34+58.50 TO STA. 36+28.50
SEE BRIDGE PLANS

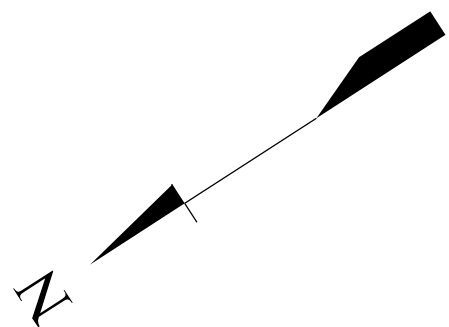
Anticipate 1,240 sf of wetland impacts using 2:1 slopes at this location shown in green.



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10/2/2025

| FED. ROAD DIST. NO. | STATE | COUNTY | PROJECT ID | ROUTE NO. | SHEET NO. |
|---------------------|-------|--------|------------|-----------|-----------|
| 3 | S.C. | OCONEE | P041167 | S-133 | 6 |

S-133 (BURNS MILL RD.)
OVER LITTLE CANE CREEK



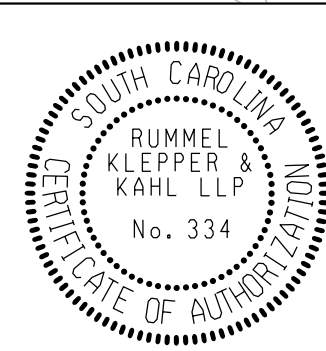
Anticipate needing 5,790 sf of ROW on this quadrant using 1.5:1 slopes shown in yellow.

Additional 3,500 of ROW needed to use 2:1 slopes shown in green.

Anticipated ROW impacts are reduced significantly when using 1.5:1 slopes. The SW quadrant is reduced by approximately 4,300 sf and the NE quadrant is reduces by approximately 3,500 sf for a total savings of 7,800 sf.

Additional 4,300 of ROW needed to use 2:1 slopes shown in green.

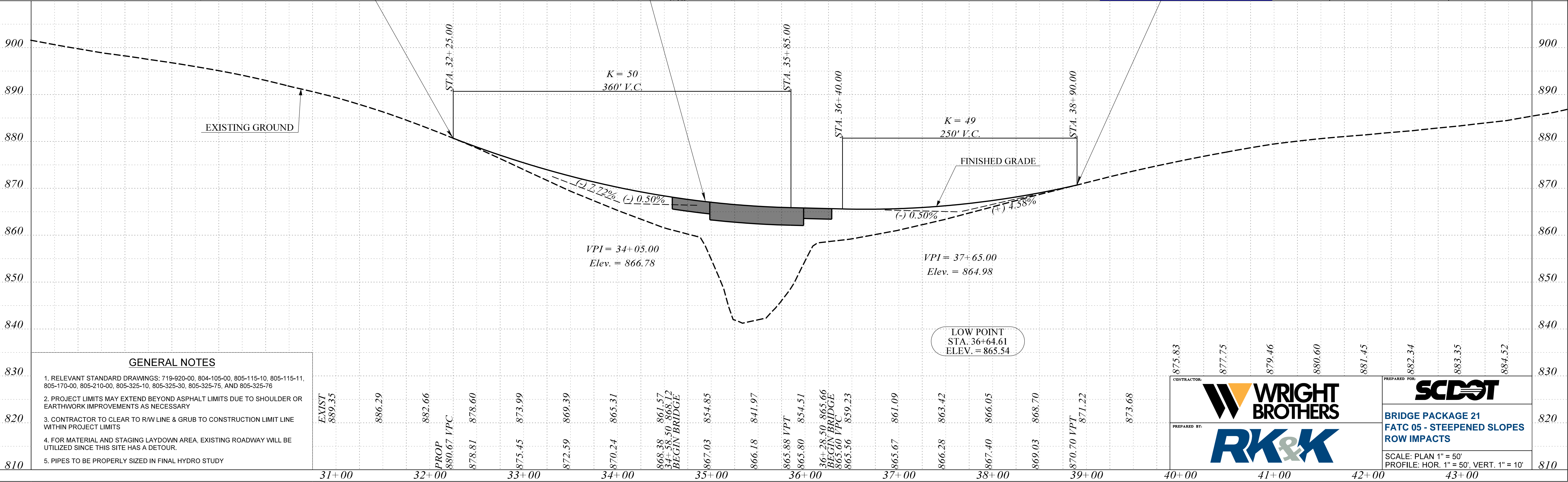
Anticipate needing 2,080 sf of ROW on this quadrant using 1.5:1 slopes shown in yellow.



SURVEY STA. 32+25.00 BEGIN
PROJECT ID. P041167
ROAD S-133 (BURNS MILL RD.)

REMOVE EXISTING BRIDGE
CONSTRUCT 170' X 36' CONCRETE BRIDGE
STA. 34+58.50 TO STA. 36+28.50
SEE BRIDGE PLANS

SURVEY STA. 38+90.00 END
PROJECT ID. P041167
ROAD S-133 (BURNS MILL RD.)



GENERAL NOTES

1. RELEVANT STANDARD DRAWINGS: 719-920-00, 804-105-00, 805-115-10, 805-115-11, 805-170-00, 805-210-00, 805-325-10, 805-325-30, 805-325-75, AND 805-325-76
2. PROJECT LIMITS MAY EXTEND BEYOND ASPHALT LIMITS DUE TO SHOULDER OR EARTHWORK IMPROVEMENTS AS NECESSARY
3. CONTRACTOR TO CLEAR TO RAW LINE & GRUB TO CONSTRUCTION LIMIT LINE WITHIN PROJECT LIMITS
4. FOR MATERIAL AND STAGING LAYDOWN AREA, EXISTING ROADWAY WILL BE UTILIZED SINCE THIS SITE HAS A DETOUR.
5. PIPES TO BE PROPERLY SIZED IN FINAL HYDRO STUDY

EXIST
889.35

886.29

882.66

PROP

880.67 VPC

878.81

873.99

869.39

865.31

861.57

34+58.50

868.12

BEGIN BRIDGE

867.03

854.85

866.18

841.97

865.88 VPT

854.51

865.66

36+28.50

865.60 VPC

865.23

861.09

863.42

866.05

868.70

871.22

873.68

875.83

877.75

879.46

880.60

881.45

882.34

883.35

884.52

CONTRACTOR: **WRIGHT BROTHERS**

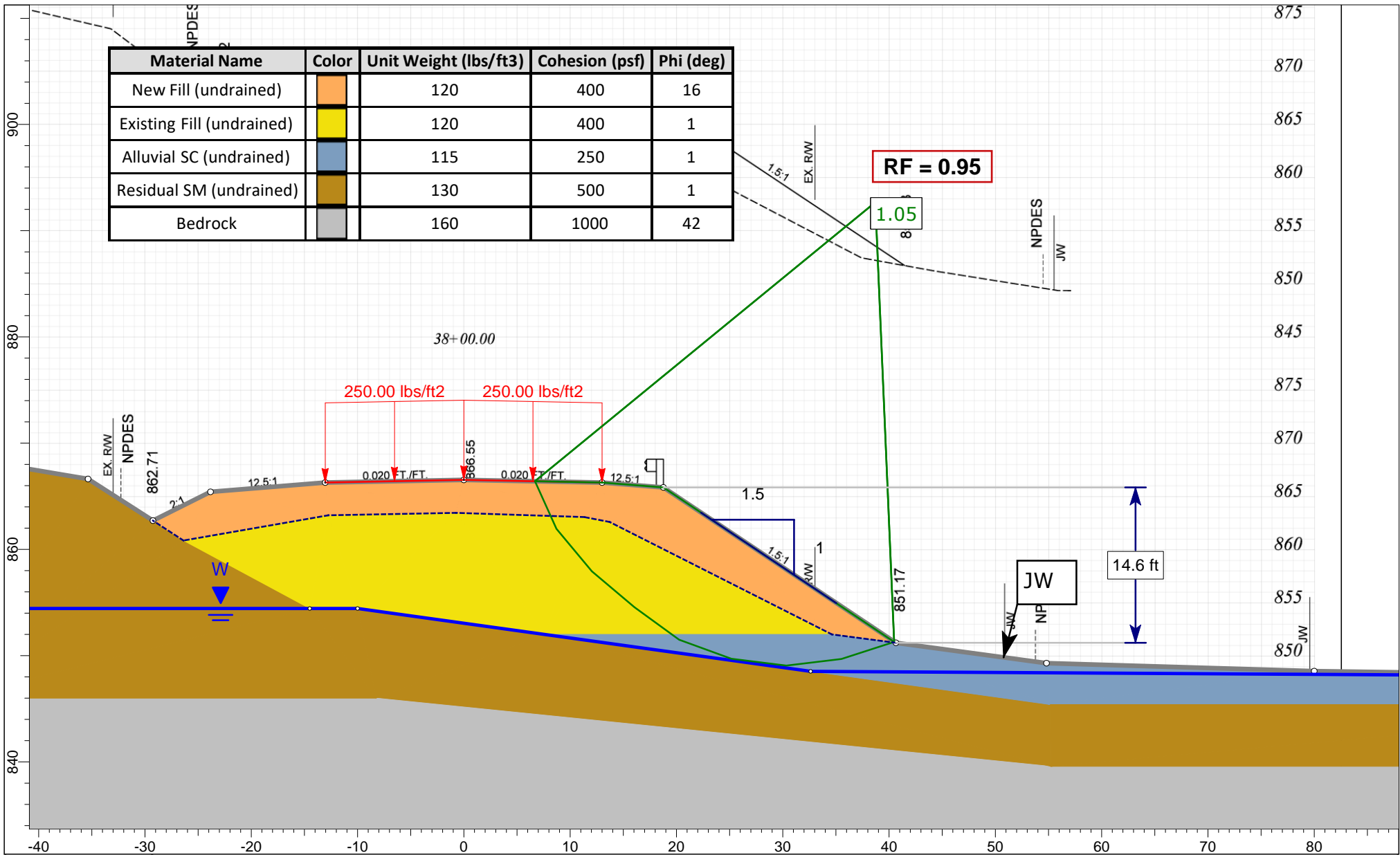
PREPARED BY: **RK&K**

PREPARED FOR: **SCDOT**

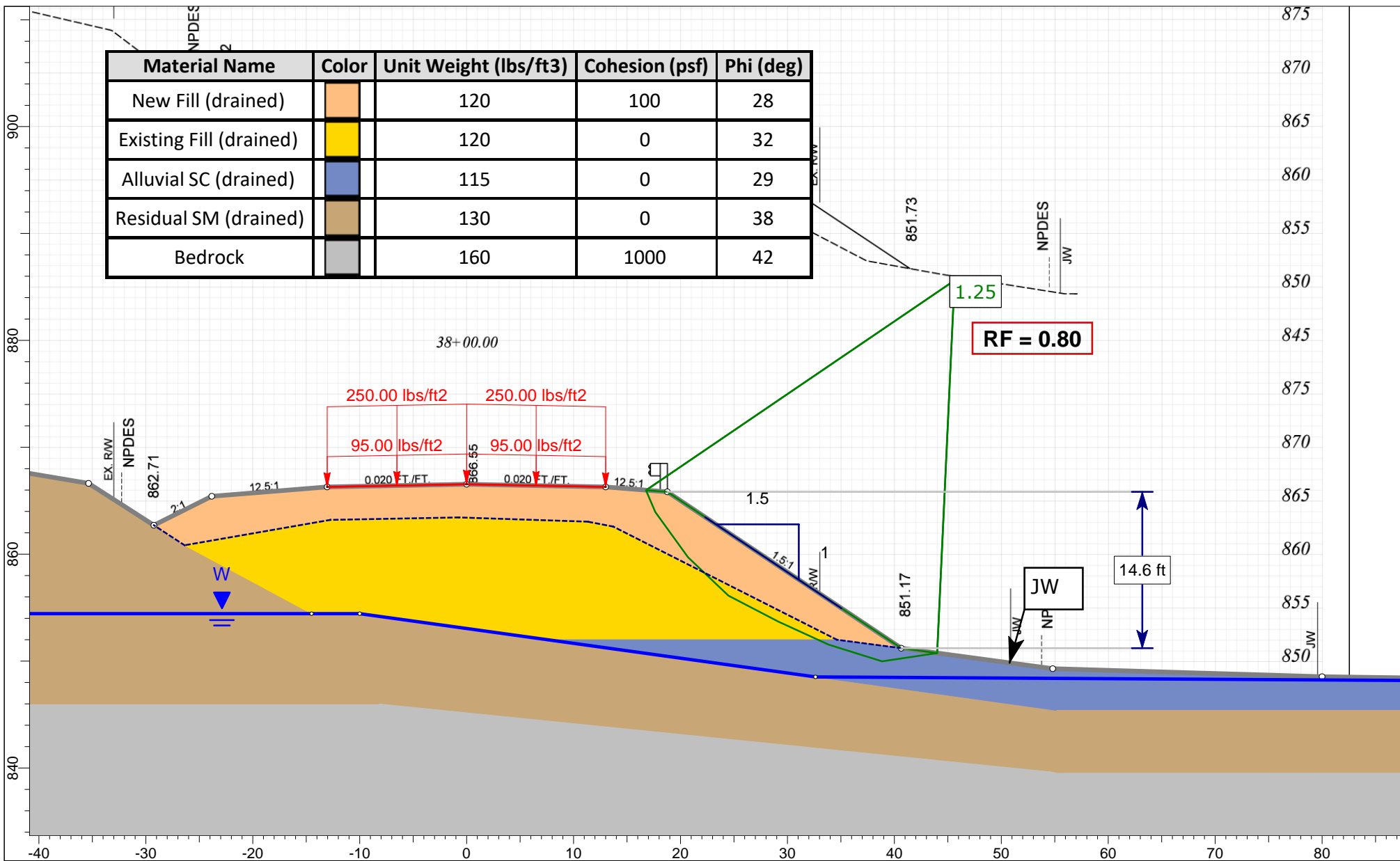
BRIDGE PACKAGE 21
FATC 05 - STEEPENED SLOPES
ROW IMPACTS

SCALE: PLAN 1" = 50'
PROFILE: HOR. 1" = 50', VERT. 1" = 10'

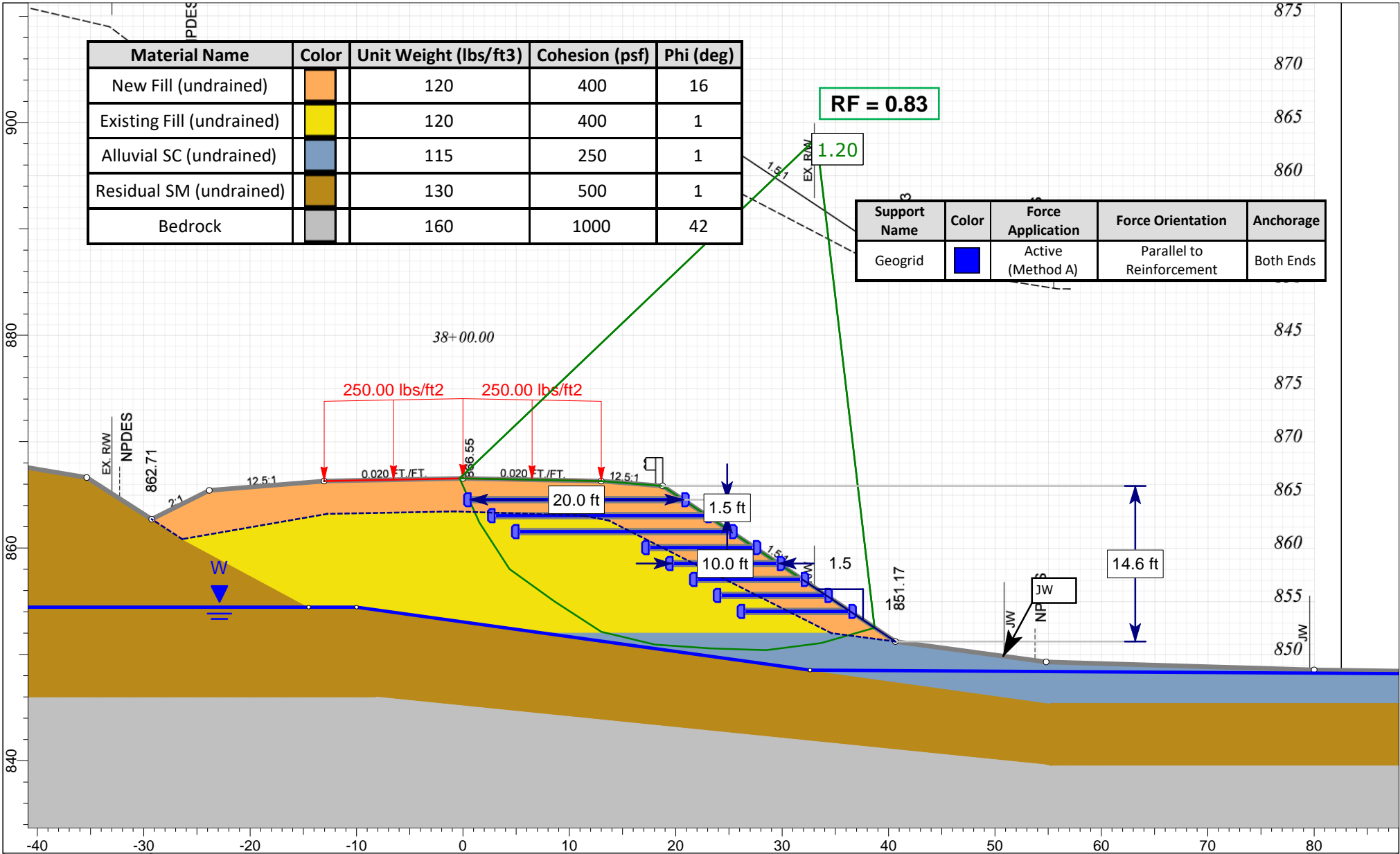
S-133 Proposed 1.5H:1V Slope *without* RSS Reinforcement (Short-Term Condition)



S-133 Proposed 1.5H:1V Slope *without* RSS Reinforcement (Long-Term Condition)



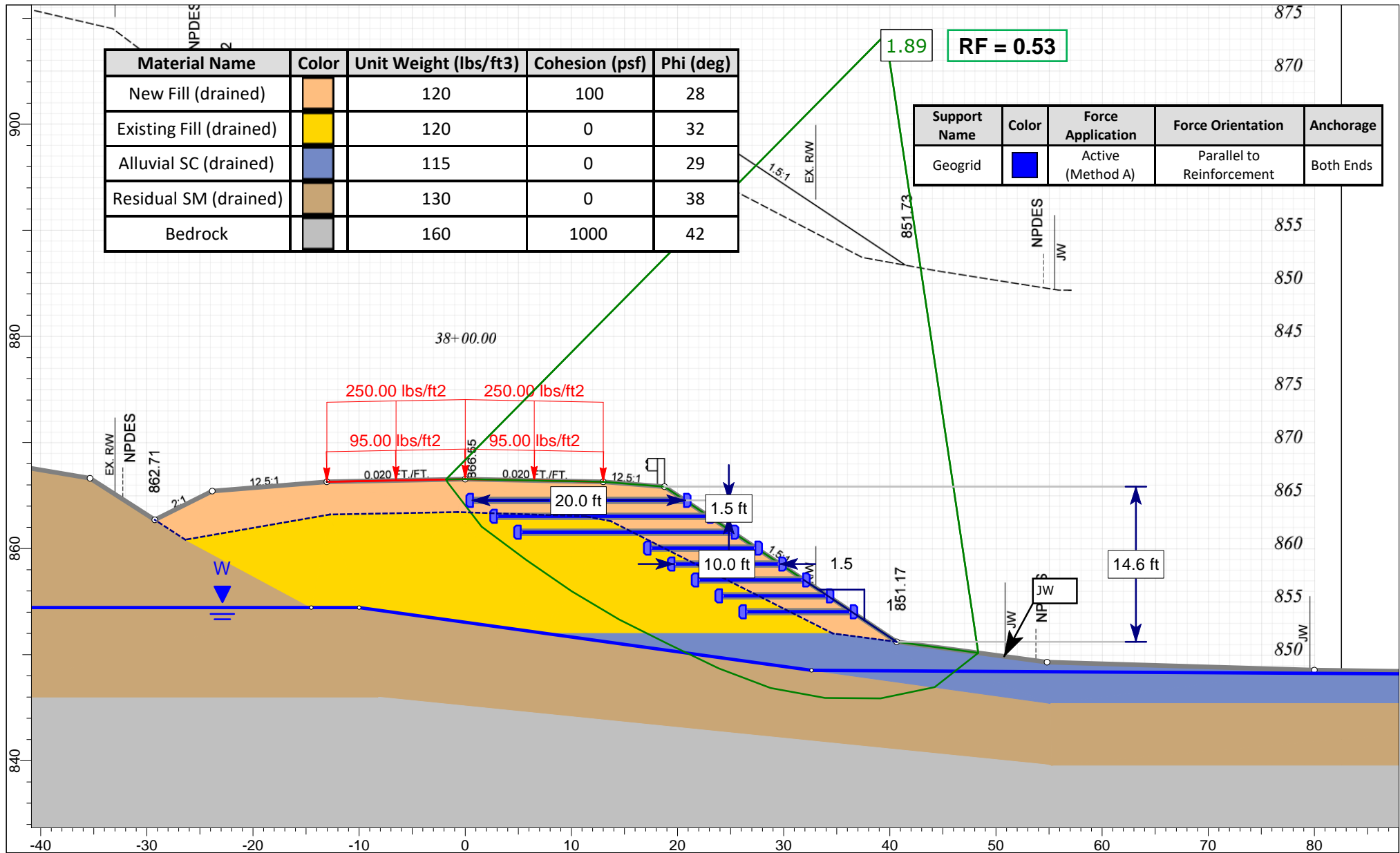
S-133 Proposed 1.5H:1V Slope *with* RSS Reinforcement (Short-Term Condition)





S-133 Proposed 1.5H:1V Slope with RSS Reinforcement (Long-Term Condition)

| Material Name | Color | Unit Weight (lbs/ft3) | Cohesion (psf) | Phi (deg) |
|-------------------------|-------|-----------------------|----------------|-----------|
| New Fill (drained) | | 120 | 100 | 28 |
| Existing Fill (drained) | | 120 | 0 | 32 |
| Alluvial SC (drained) | | 115 | 0 | 29 |
| Residual SM (drained) | | 130 | 0 | 38 |
| Bedrock | | 160 | 1000 | 42 |

| Support Name | Color | Force Application | Force Orientation | Anchorage |
|--------------|-------|-------------------|---------------------------|-----------|
| Geogrid | | Active (Method A) | Parallel to Reinforcement | Both Ends |



| | | | | | |
|--|-------------------------------------|-------------------------------|--------------------|------------------------------------|---------|
|  | Project | | | | |
| | S-133 Bridge Over Little Cane Creek | | | | |
| | Analysis | | | Slope Stability Analysis | |
| | Description | | | Sta 37+50 - Long Term (Reinforced) | |
| | Drawn By | | | J. Gathro | |
|  | Project Number | | P041167 (25600638) | | Company |
| | Company | | S&ME, Inc. | | |
| | Figure | | 4 | | |
| Location | | Oconee County, South Carolina | | File Name | |
| 25600638 SCDOT BP21 RSS.slmd | | Date | | 9/30/2025 | |

Formal Alternative Technical Concepts Submittal Form

Project: Bridge Package 21

Project ID: 5368980

ATC No.: 6

Priority: High

Team: WBCC-RK&K

Date: 10/28/25

Description (required):

Reduce minimum bridge length on S-51 over Snow Creek from 140-ft to 120-ft.

Usage:

Our team is proposing to reduce the minimum bridge length for the S-37-51 bridge over Snow Creek from 140-ft to 120-ft. The proposed bridge for this site will be a single span using 54-in FIB girders and a cast in place deck. The proposed bridge layout is included in the Bridge and Roadway plan and profile sheets in our attached documentation.

Deviations (required):

Attachment B; Hydro; 3. Package 21 Bridge Length

Justification:

Upon an in-depth review of the site and the preliminary hydraulic model results, our team has determined that a 120-ft single span bridge meets the requirements of the RFP at this site. Included with this ATC is a Bridge Hydraulic Analysis Report and Bridge Plan and Profile for supporting justification. These documents show we meet the minimum setbacks to top of bank as well as meeting the hydraulic requirements for freeboard and backwater. Utilizing the single span bridge will allow the team to lower the profile slightly and reduce costs associated with an additional interior bent.

Schedule:

We anticipate 4 weeks of schedule reduction due to reduced bridge length and elimination of an interior bent.

Impacts:

A shorter bridge minimizes impacts to right-of-way, utilities, and environmental concerns.

History:

Girder bridges are typical superstructure types for SCDOT. The bridge will be designed in accordance with SCDOT requirements just as all bridges have been designed previously for the Department.

Formal Alternative Technical Concepts Submittal Form

Project: Bridge Package 21

Project ID: 5368980

ATC No.: 6

Priority: High

Team: WBCC-RK&K

Date: 10/28/25

Risks:

No additional risks anticipated with this ATC.

Costs (required):

A reduction in bridge length and removal of an interior bent will provide anticipated cost savings of \$155,000.00.

Quality:

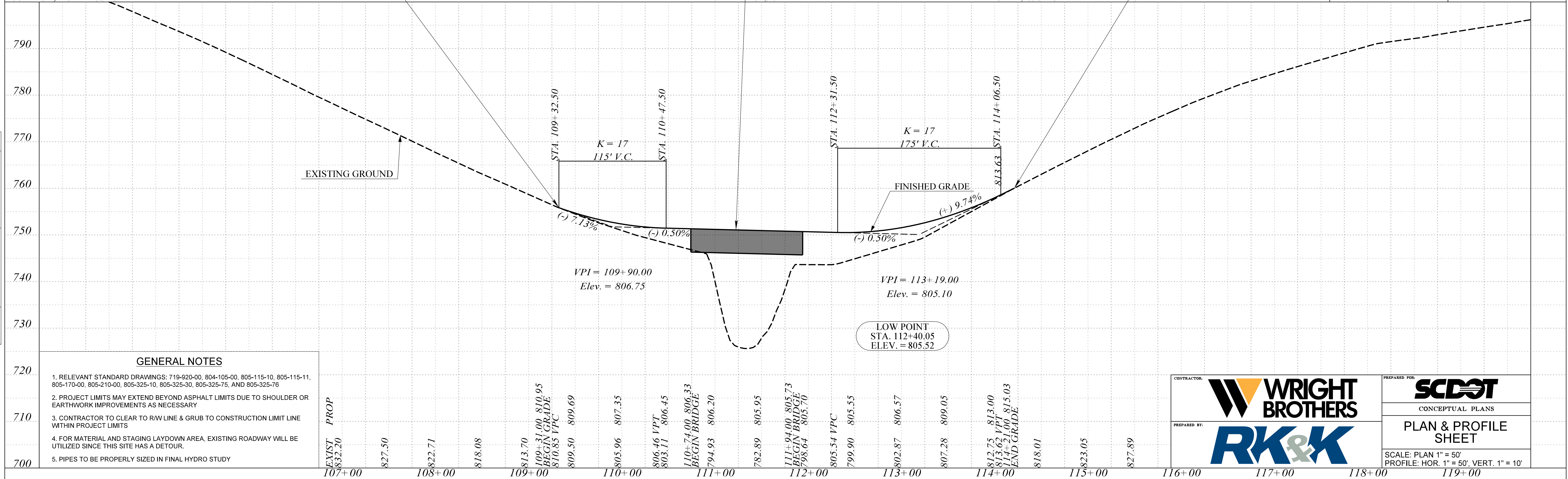
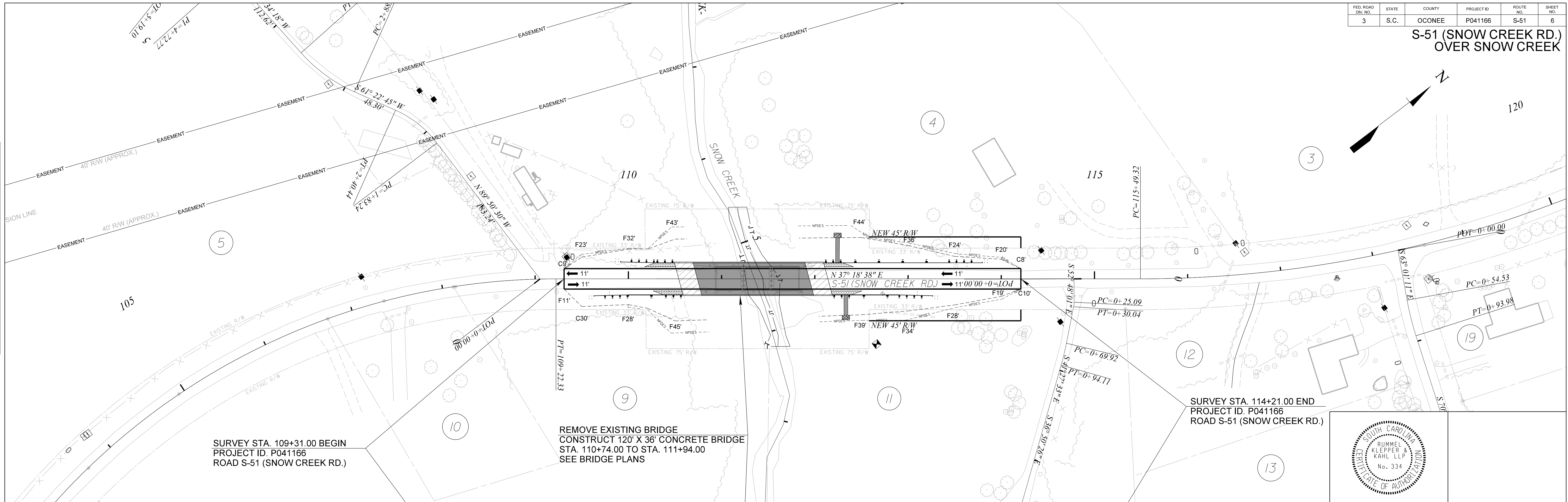
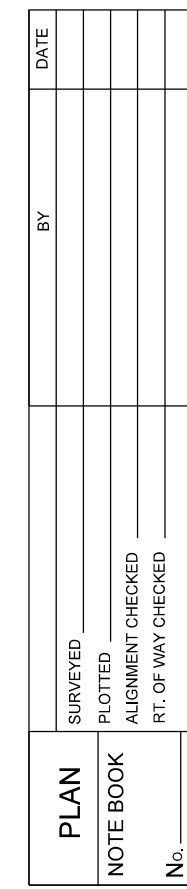
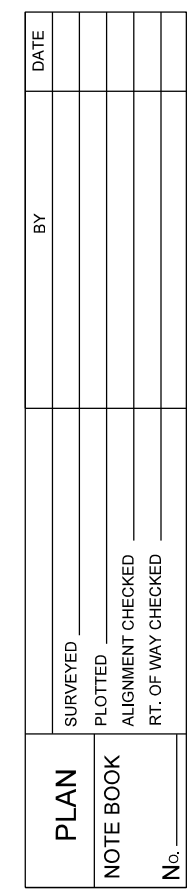
Improved quality with construction of a girder bridge and cast in place deck.

Operations & Maintenance:

The cost and frequency of structure maintenance will be significantly reduced by the concrete deck in lieu of asphalt overlay and elimination of an intermediate bent.

| FED. ROAD DIV. NO. | STATE | COUNTY | PROJECT ID | ROUTE NO. | SHEET NO. |
|-----------------------|-------|--------|------------|--------------|--------------|
| 3 | S.C. | OCONEE | P041166 | S-51 | 6 |

S-51 (SNOW CREEK RD.)
OVER SNOW CREEK

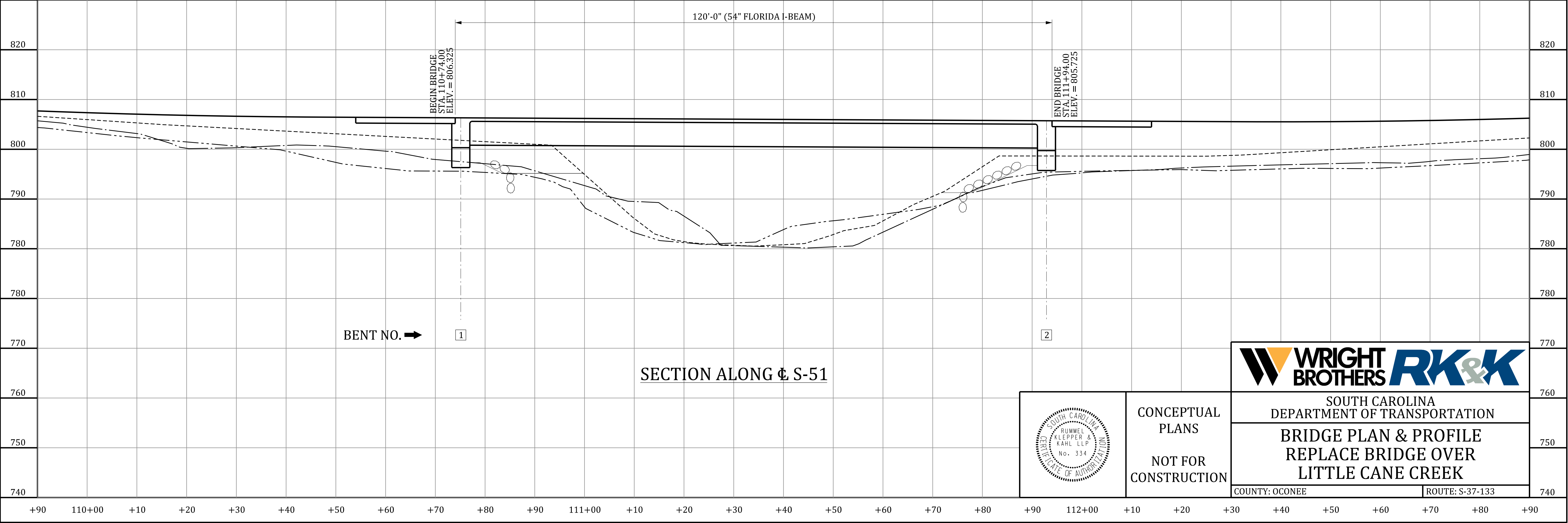


\\ad_rkk.com\fs\Cloud\l\mktg\Proposals\2023\SC\SCDOT\P23-0921 SCDOT Bridge Package 21 DB\Design\RD\IS-51\Sheets\IS51_pf6.dgn
sraibon
10/2/2025

10/2/2025 10:59:27 AM 02_P041166_Bridge Plan and Profile.dgn

| | | |
|-----------|-----|-----------|
| REVIEWED: | KSH | 08-25 |
| QUAN. | | |
| DR. | CBH | KSH 08-25 |
| DES. | | |

| | | | | | |
|------|------|------|-------------------------|--|--|
| REV. | | | | | |
| REV. | | | | | |
| REV. | | | | | |
| BY | CHK. | DATE | DESCRIPTION OF REVISION | | |



Oconee County S-37-51 (Snow Creek Rd) Over Snow Creek

Bridge Hydraulics Analysis for Alternative Technical Concept (ATC)

The analysis presented in this document covers evaluation and comparison of bridge hydraulic performance of the original SCDOT proposed design and the ATC design option under consideration for the S-37-51 bridge replacement over Snow Creek in Oconee County.

I. INTRODUCTION

The Request for Proposal (RFP) includes a preliminary bridge hydraulic analysis for the existing bridge over Snow Creek on S-37-51 in Oconee County, SC in the Project Information Package (PIP). The RFP Attachment B/Hydro section calls for a minimum bridge length of 140-ft with a minimum channel span of 100-ft over Snow Creek. Our Team has performed an independent preliminary bridge hydraulic analysis for the S-37-51 bridge and proposes an Alternative Technical Concept (ATC), reducing the minimum bridge length to 120-ft from the required 140-ft minimum. The proposed bridge will have a single span configuration. All pertinent data and supporting documentation are provided below.

II. DESIGN CRITERIA

- Design Storm Event: 25-Year
- Overtopping: The 4% AEP (25 year event) shall be conveyed with no road overtopping. The 1% AEP (100 year event) shall be conveyed with no road overtopping and maintain free surface flow.
- Freeboard: Shall not be less than 2 feet above the proposed 4% AEP (25 year event). Free surface flow shall be maintained through the Bridge for frequencies up to and including the 1% AEP (100 year event) which on occasion may require a freeboard greater than the minimum 2 feet of freeboard above the design event.
- Backwater: Shall be designed so that backwater for the 1% AEP flood is one foot or less when compared to the unrestricted or natural conditions and shall not create more backwater than the existing bridge.
- Low Chord: The design high-water elevation for evaluating freeboard and determining the minimum low chord elevation shall represent the highest water-surface elevation upstream of the bridge before it begins to drawdown through the bridge. The low chord of a replacement bridge shall not be below the low chord of the existing bridge.
- Abutments: Provide a minimum 10 foot abutment setback from the top of the channel bank and at a point where the projection of the spill through slope will not intersect the channel not including the thickness of the riprap of abutment slope. To achieve setback criteria, a bench may be cut lower than the surveyed top-of-bank elevation, provided that the bench is cut higher than the ordinary-high-water elevation used for the environmental jurisdictional stream delineation.
- Pier: Provide a minimum 5-foot setback from the top of the channel bank to the centerline of the pier (pile or column) on the overbank for Low Volume Criteria sites if unable to utilize a single span for the bridge crossing.

III. MODEL UPDATES

The preliminary model provided in the PIP was updated using the guidance of the HEC-RAS Hydraulic Reference Manual Version 5.0 dated February 2016. Below is a list of updates that were completed by RK&K during the hydraulic design process. All models and subsequent updates were run in HEC-RAS version 6.6.

- In unrestricted conditions, all ineffective flow locations were removed.

- Revised expansion and contraction coefficients to 0.1/0.3 for all unrestricted cross sections.
- In existing and proposed conditions, ineffective flow locations and elevations were adjusted using the ratios provided in the HEC-RAS Hydraulic Reference Manual. The ineffective elevations were set to match the low point of the roadway on the left and right respectively.
- The proposed bridge was modified to have spill through abutments set at a 2:1 slope. The sloped abutments have a 2-ft riprap bench located 2-ft below the low chord.
- The proposed bridge length was reduced from a 140-ft multi-span bridge to a 120-ft single span bridge.

IV. CONCLUSION AND RESULTS

The results from the HEC-RAS analysis demonstrate that a 120-ft single-span bridge will meet the RFP requirements. RK&K's proposed bridge model shows a reduction in 100-year backwater from 0.43' to 0.26' in proposed conditions. Table 1 shows a summary of the design criteria for the S-37-51 crossing over Snow Creek.

Table 1: Summary of Results

| <u>CRITERIA**</u> | <u>SCDOT RFP</u> <u>Existing Model*</u> | <u>SCDOT RFP</u> <u>Model*</u> | <u>RK&K Existing</u> <u>Model</u> | <u>RK&K Revised</u> <u>Model</u> |
|-------------------------|--|-----------------------------------|--|---|
| 25-Year WSEL | 788.33 | 788.18 | 788.33 | 788.05 |
| 100-Year WSEL | 789.30 | 789.20 | 789.30 | 789.13 |
| 100-Year Backwater (ft) | 0.43 | 0.33 | 0.43 | 0.26 |
| 25-Year Freeboard (ft) | 7.03 | 14.82 | 7.03 | 14.95 |
| Low Chord Elevation | 795.36 | 803.00 | 795.36 | 803.00 |
| Bridge Length (ft) | 90 | 200 | 90 | 120 |
| Span Arrangement | 3 @ 30' | 100'-40' | 3 @ 30' | 1 @ 120' |

**All values for the SCDOT RFP Model were pulled from the Preliminary Hydraulics Report.*

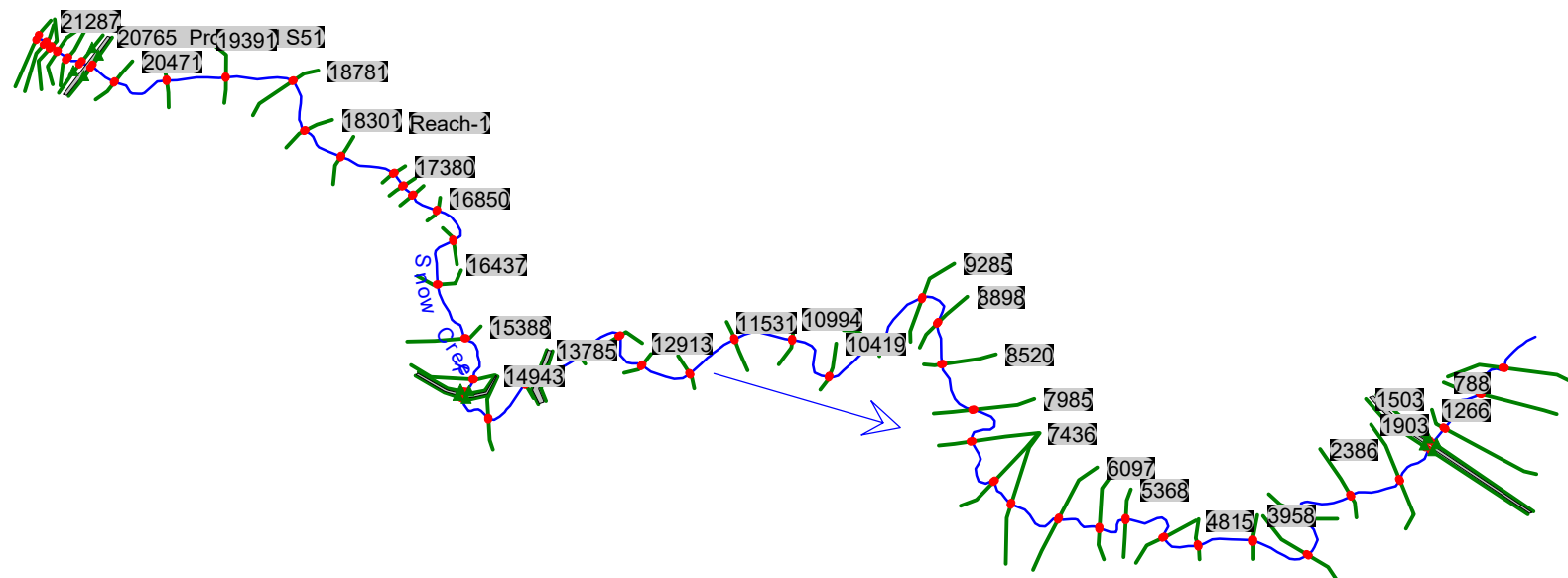
***Water surface elevations and freeboard are based on the approach cross section.*

V. ATTACHMENTS

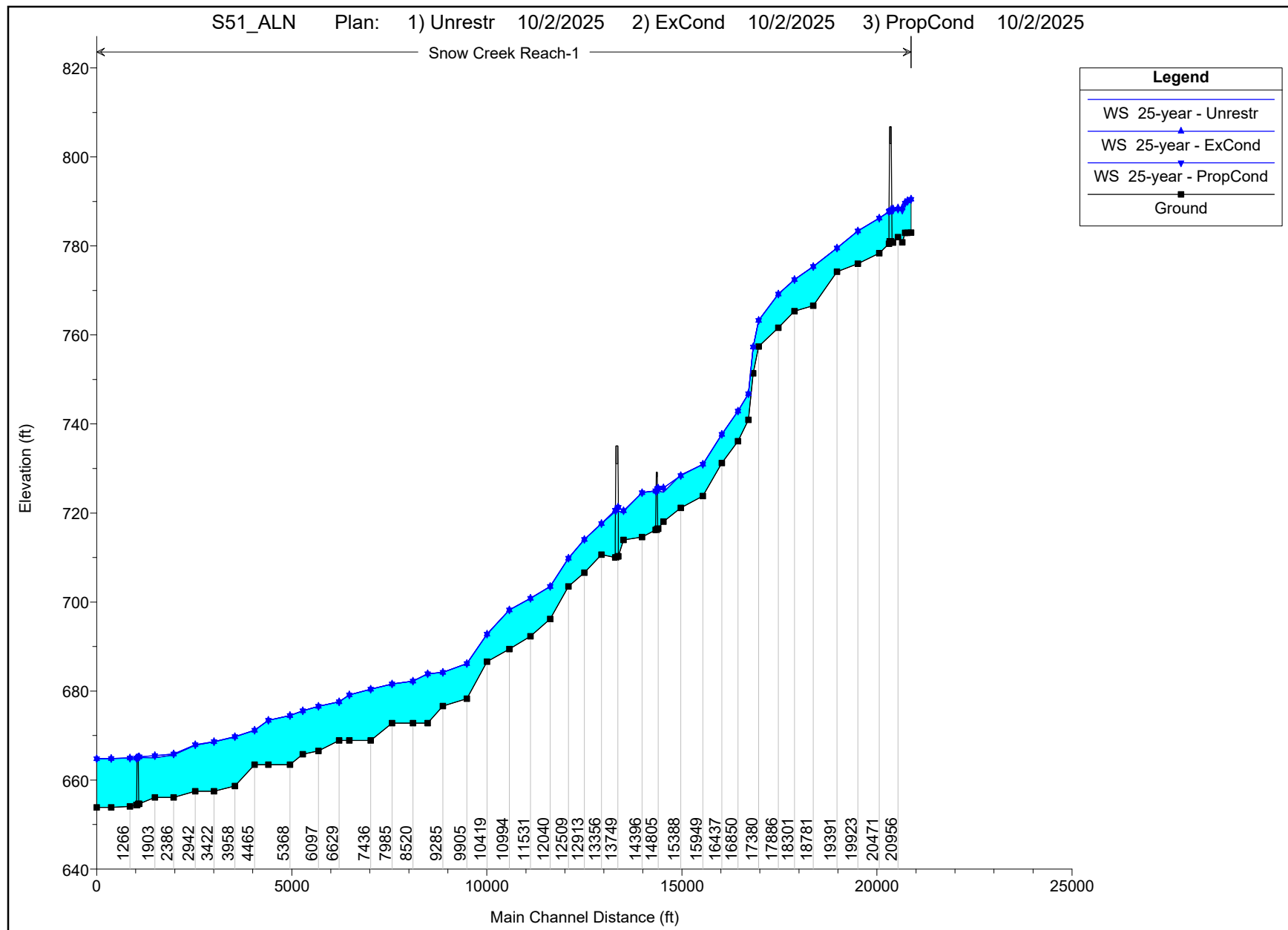
- Attachment A: RK&K Proposed Model HEC-RAS Outputs

Attachment A: RK&K Proposed Model HEC-RAS Outputs

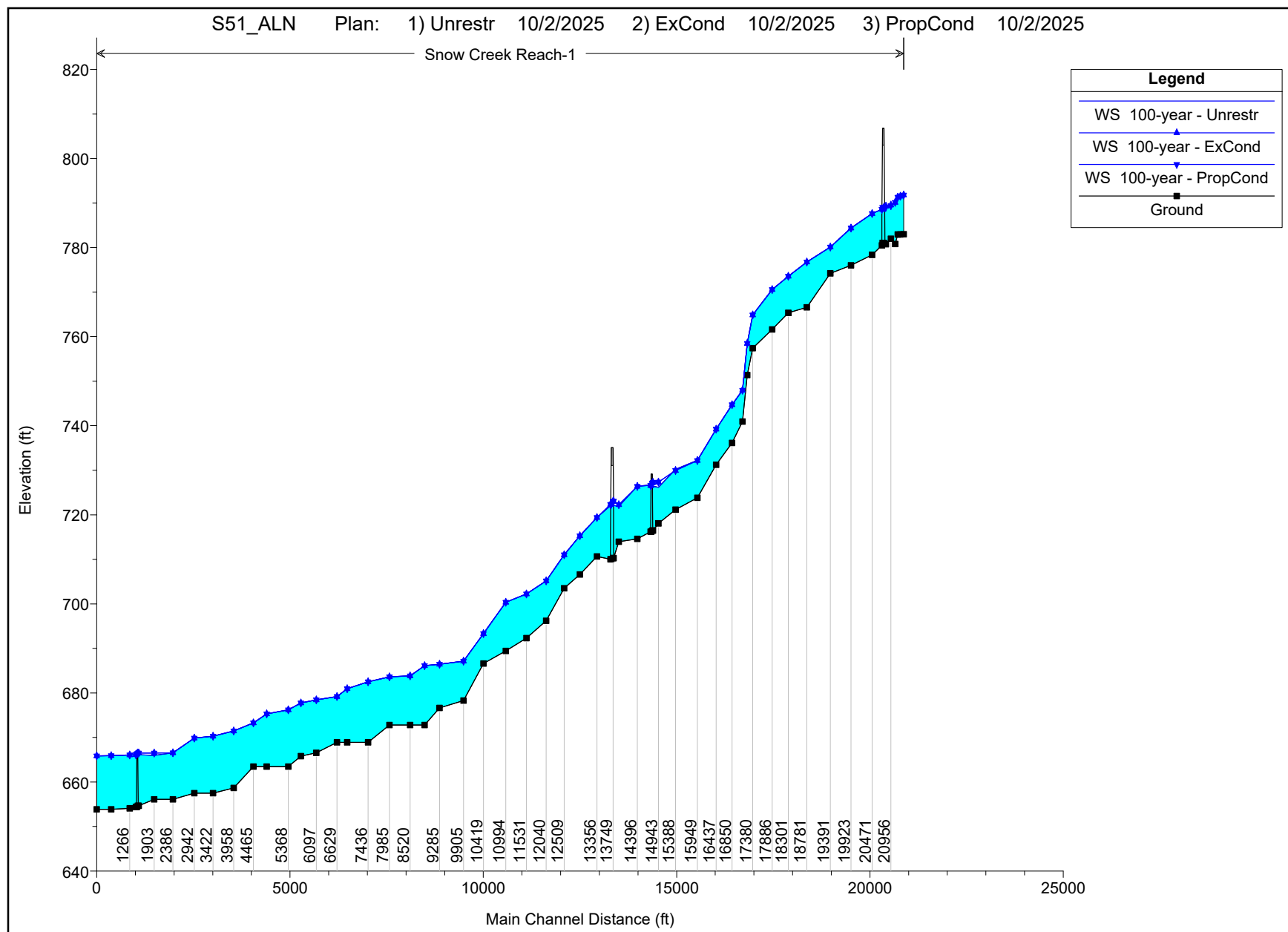
Oconee S-51 (Snow Creek Road) over Snow Creek HEC-RAS Schematic



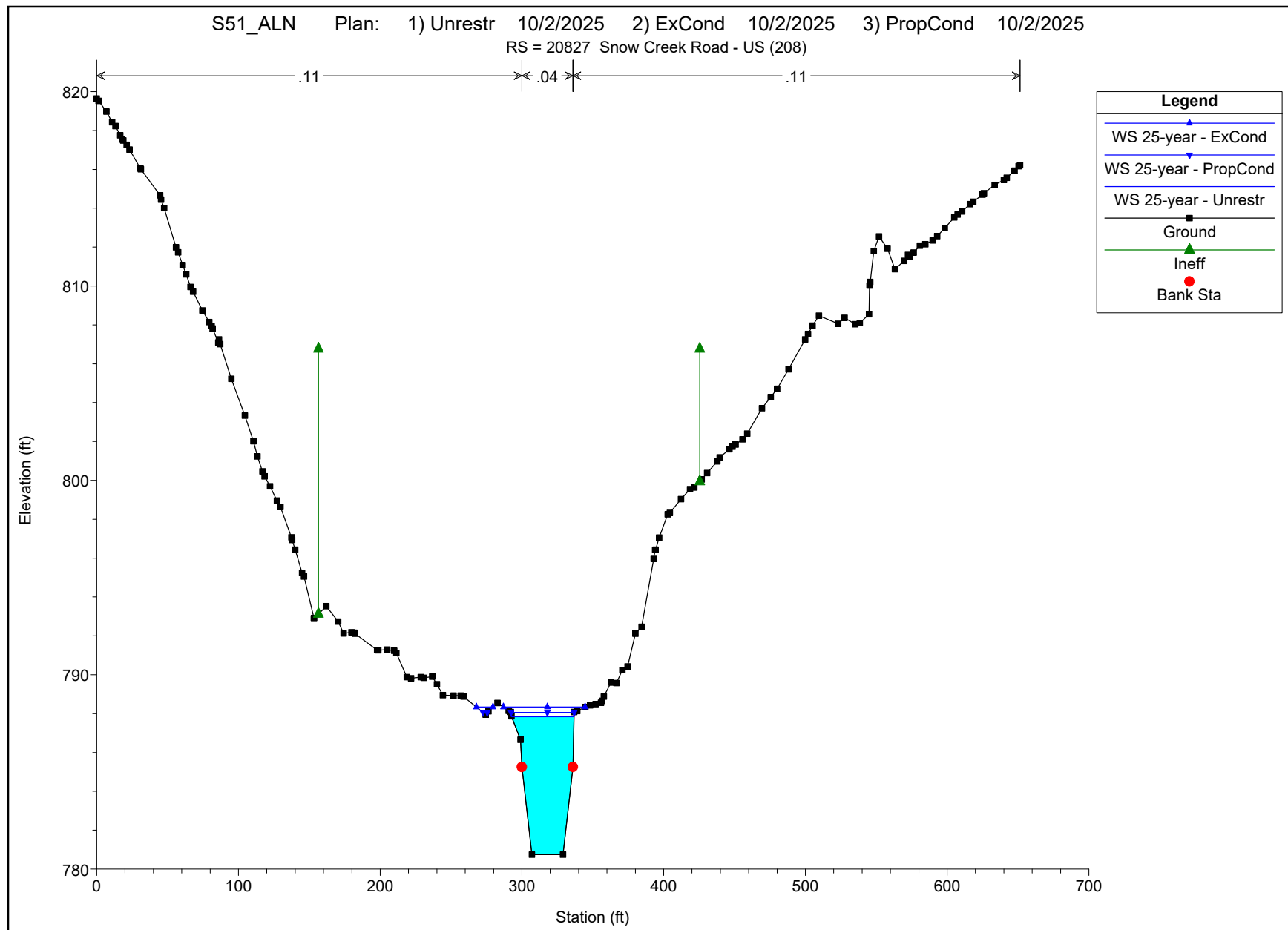
Oconee S-51 (Snow Creek Rd) over Snow Creek HEC-RAS 25-Year Profile



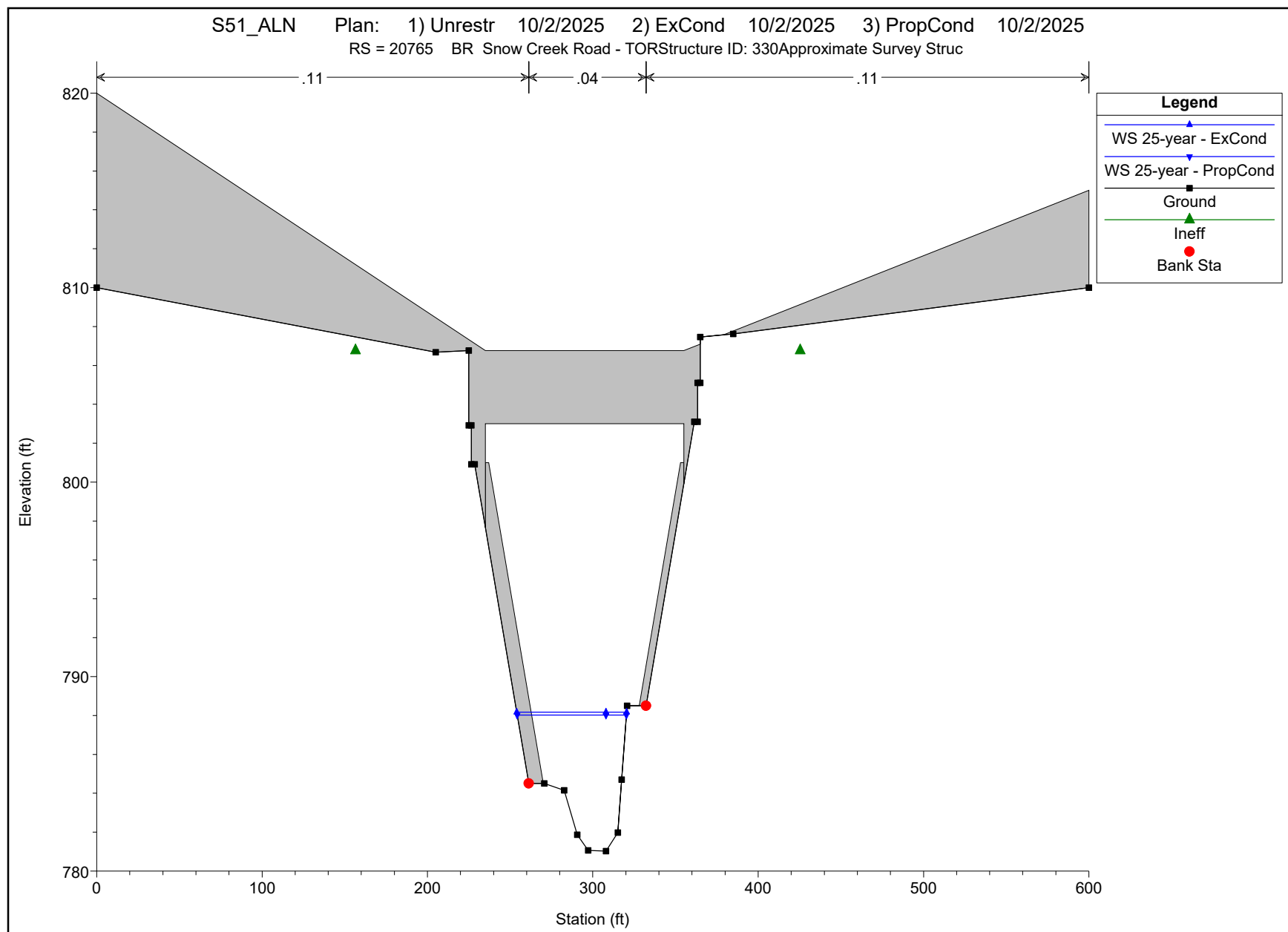
Oconee S-51 (Snow Creek Rd) over Snow Creek HEC-RAS 100-Year Profile



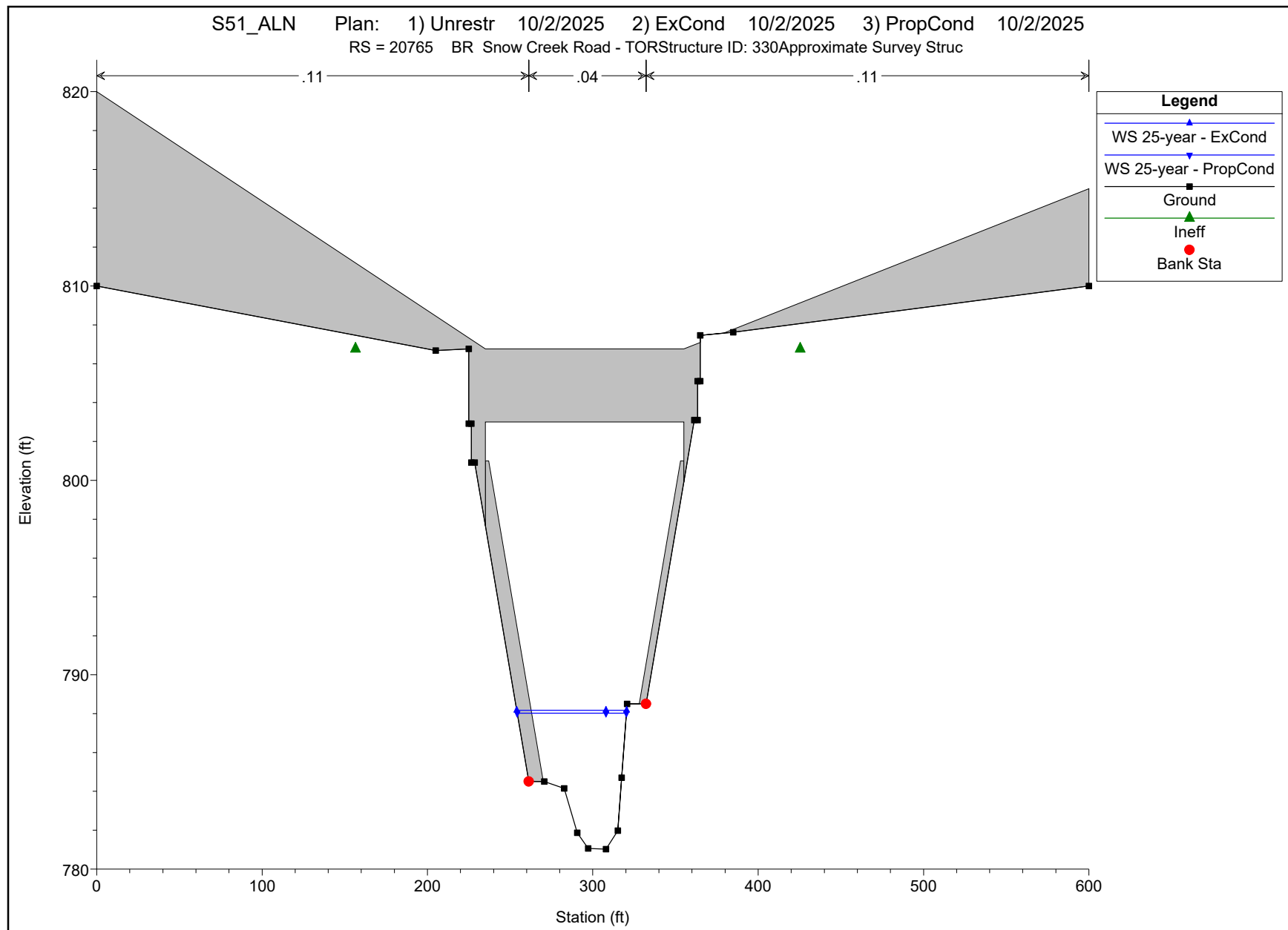
Oconee S-51 (Snow Creek Rd) over Snow Creek HEC-RAS 25-Year Cross Sections



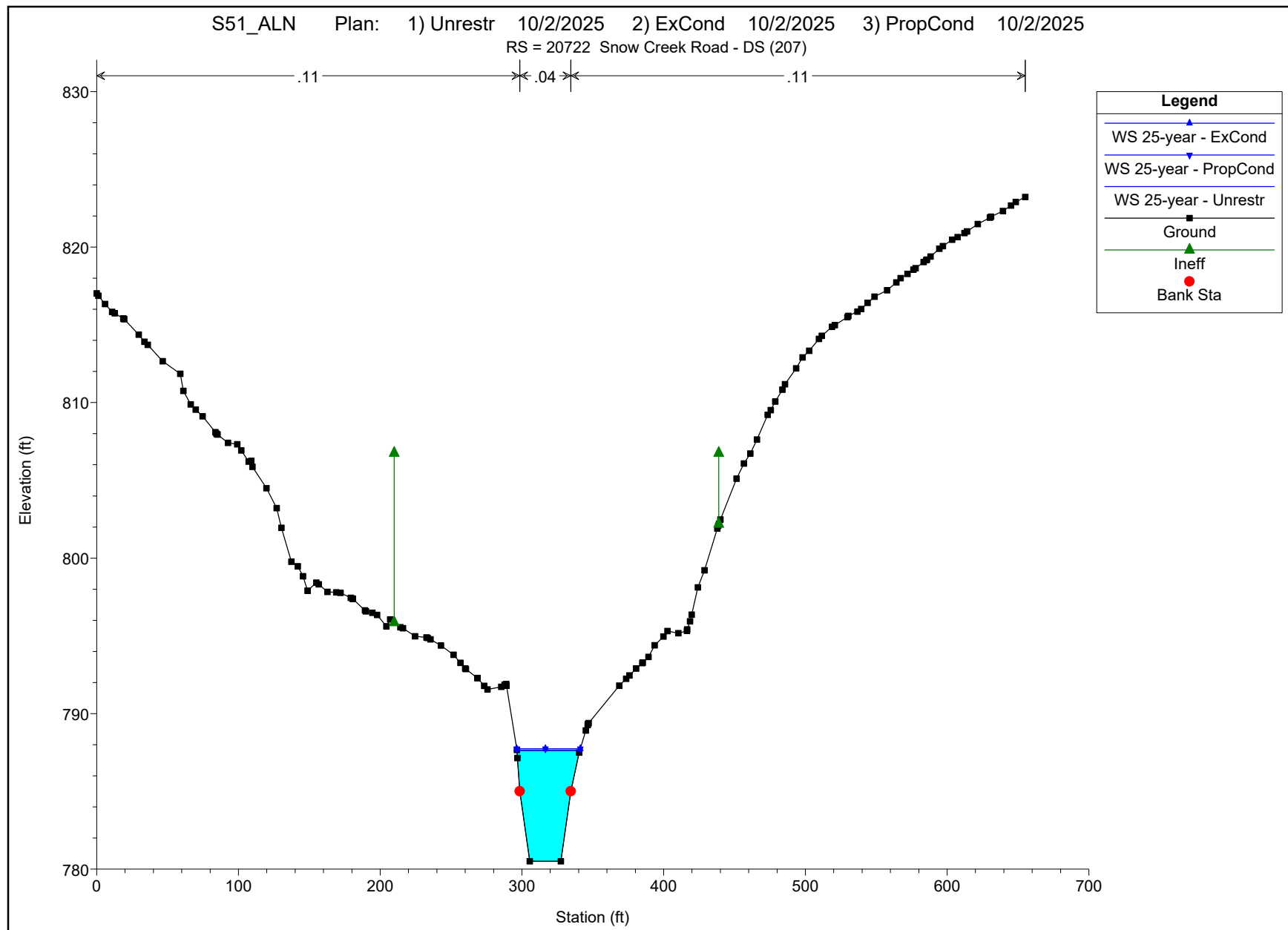
Oconee S-51 (Snow Creek Rd) over Snow Creek HEC-RAS 25-Year Cross Sections



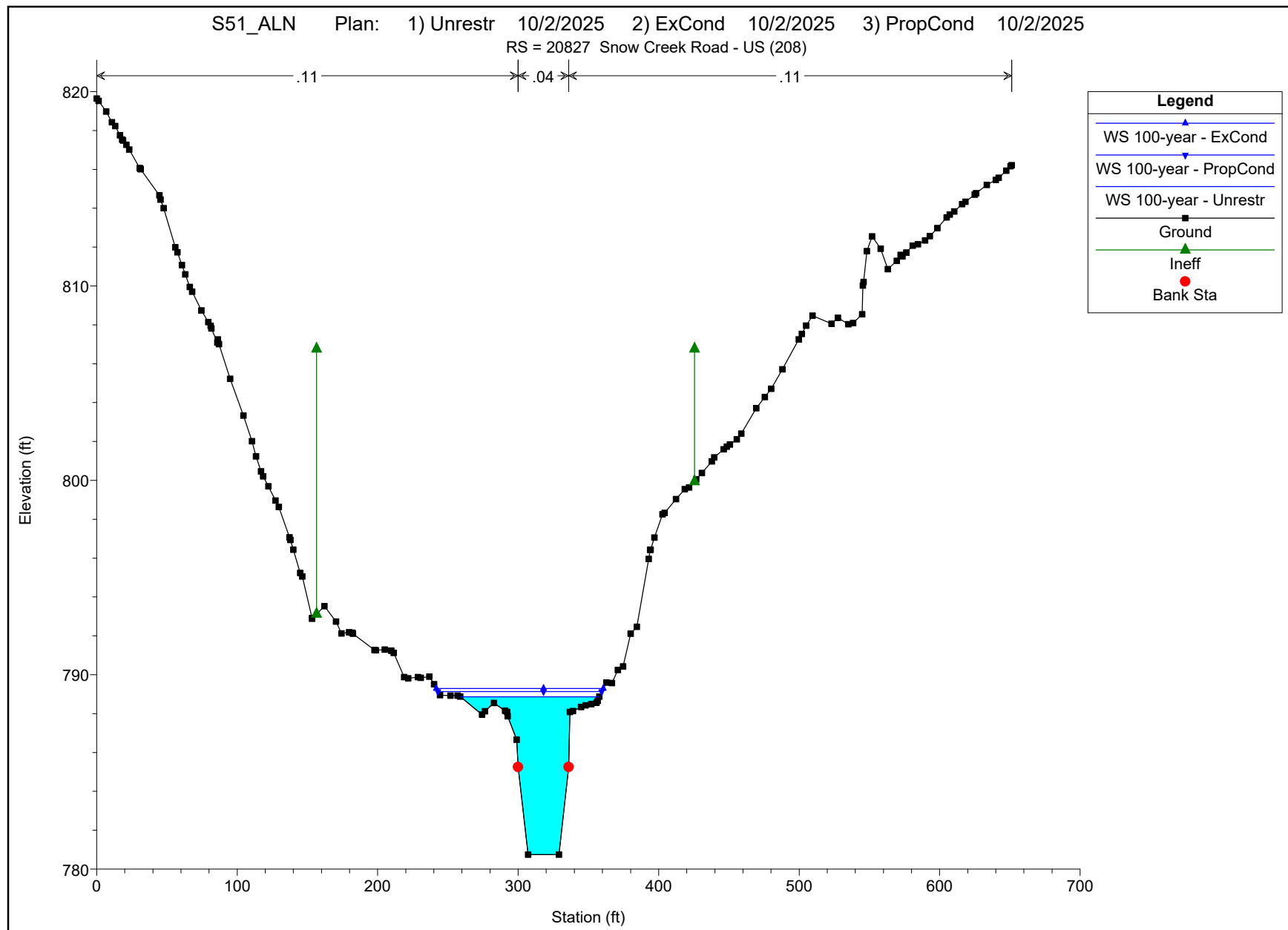
Oconee S-51 (Snow Creek Rd) over Snow Creek HEC-RAS 25-Year Cross Sections



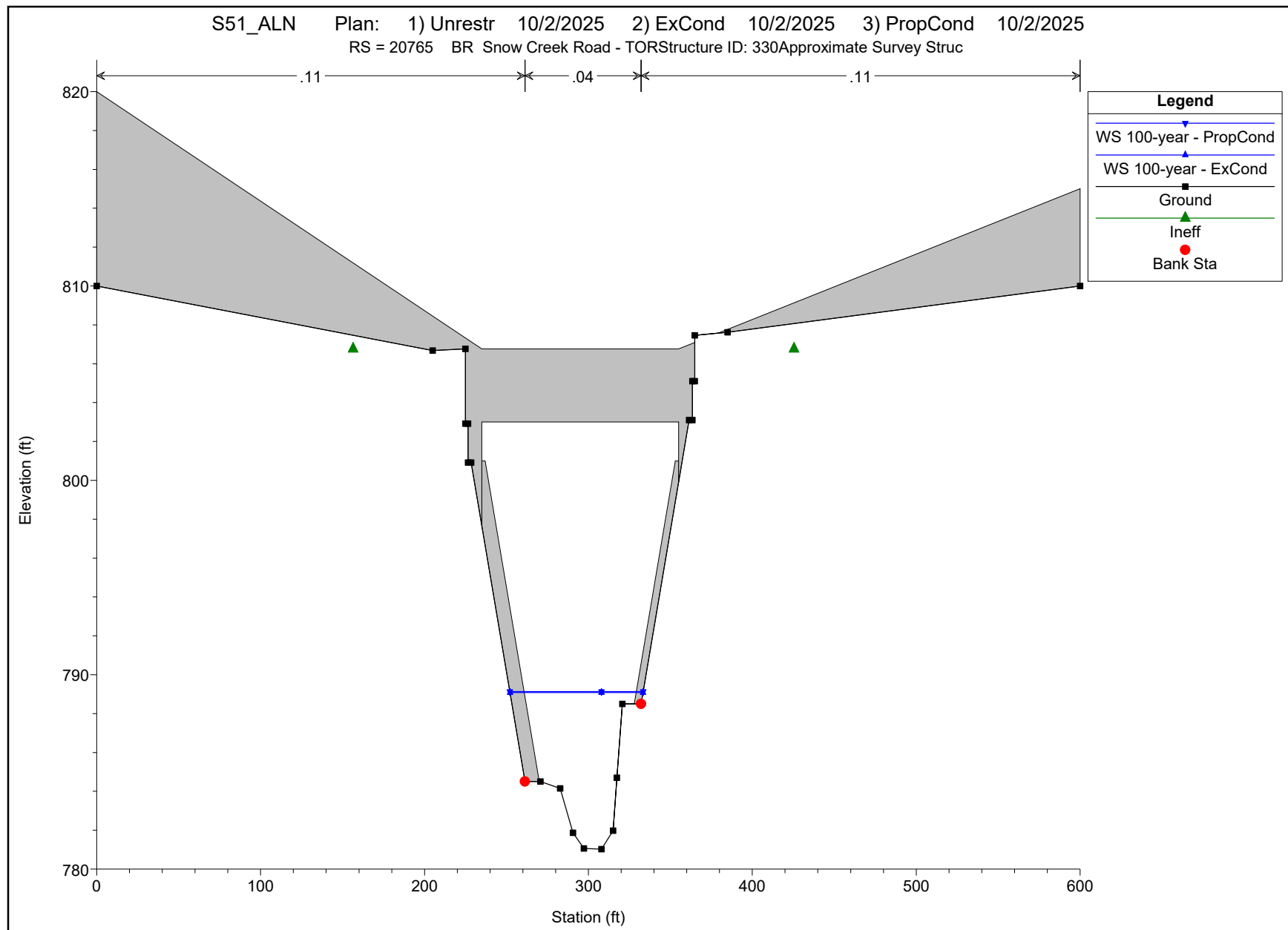
Oconee S-51 (Snow Creek Rd) over Snow Creek HEC-RAS 25-Year Cross Sections



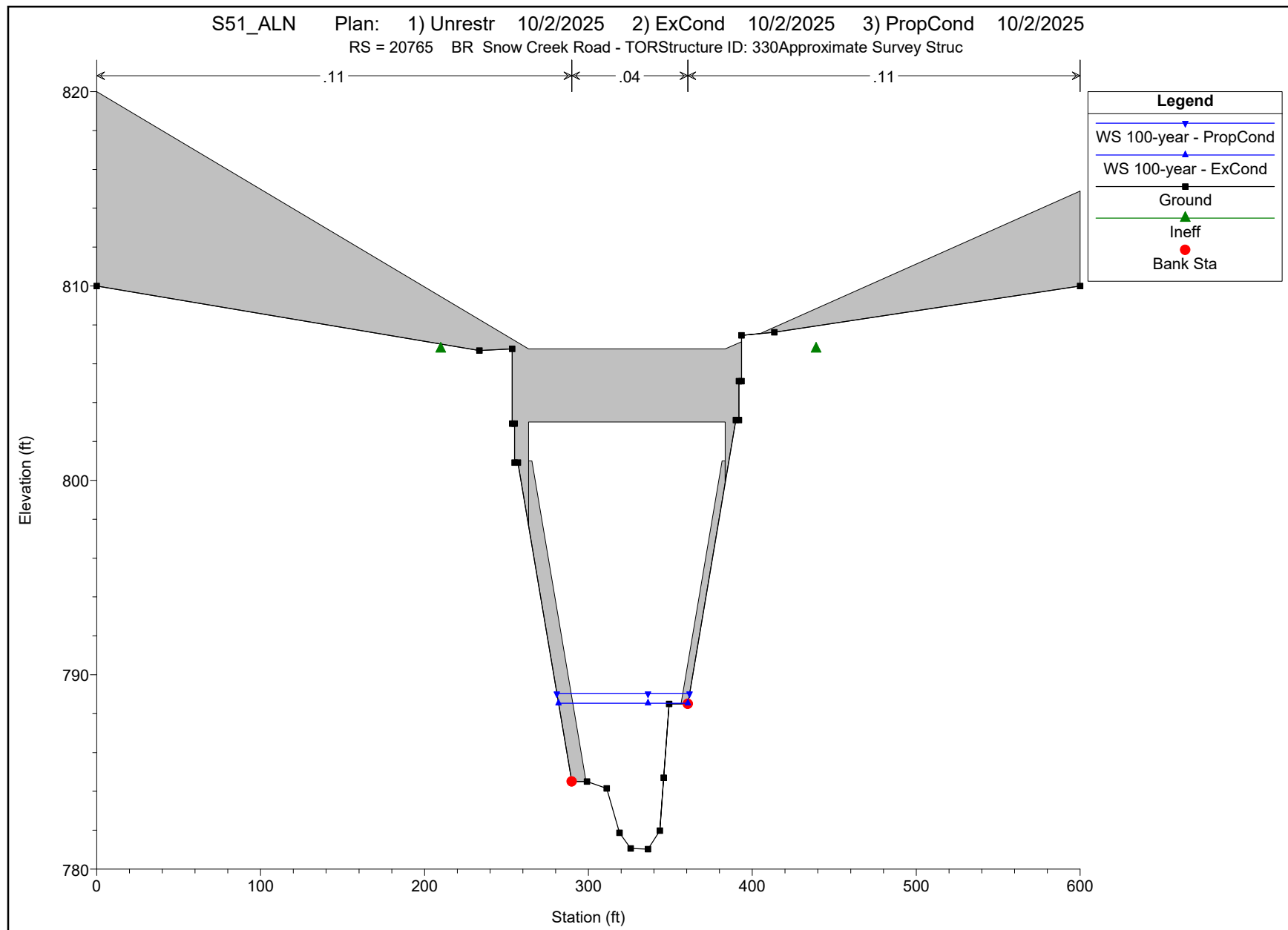
Ocone S-51 (Snow Creek Rd) over Snow Creek HEC-RAS 100-Year Cross Sections



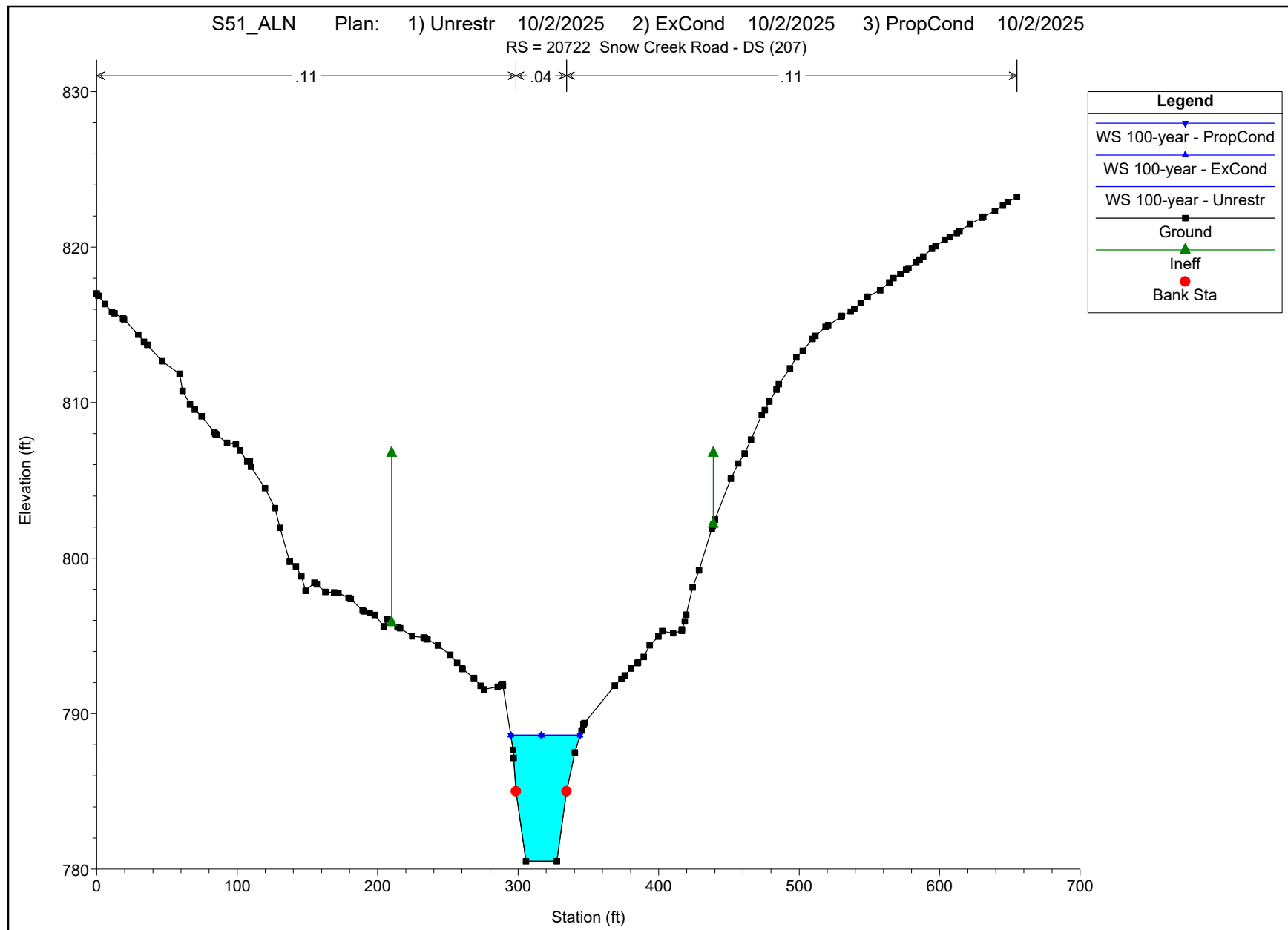
Oconee S-51 (Snow Creek Rd) over Snow Creek HEC-RAS 100-Year Cross Sections



Oconee S-51 (Snow Creek Rd) over Snow Creek HEC-RAS 100-Year Cross Sections



Oconee S-51 (Snow Creek Rd) over Snow Creek HEC-RAS 100-Year Cross Sections



Oconee S-51 (Snow Creek Rd) over Snow Creek HEC-RAS 25-Year Output Table

HEC-RAS River: Snow Creek Reach: Reach-1 Profile: 25-year

| Reach | River Sta | Profile | Plan | Q Total (cfs) | Min Ch El (ft) | W.S. Elev (ft) | Crit W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Chnl (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # Chl |
|---------|-----------|---------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach-1 | 21287 | 25-year | Unrestr | 1220.00 | 783.00 | 790.43 | | 790.65 | 0.000933 | 3.79 | 407.84 | 195.40 | 0.26 |
| Reach-1 | 21287 | 25-year | ExCond | 1220.00 | 783.00 | 790.54 | | 790.75 | 0.000875 | 3.71 | 429.24 | 208.79 | 0.26 |
| Reach-1 | 21287 | 25-year | PropCond | 1220.00 | 783.00 | 790.46 | | 790.67 | 0.000920 | 3.78 | 412.39 | 199.18 | 0.26 |
| Reach-1 | 21199 | 25-year | Unrestr | 1220.00 | 782.97 | 790.01 | | 790.50 | 0.002612 | 5.66 | 282.39 | 172.66 | 0.42 |
| Reach-1 | 21199 | 25-year | ExCond | 1220.00 | 782.97 | 790.16 | | 790.60 | 0.002340 | 5.46 | 308.36 | 177.75 | 0.40 |
| Reach-1 | 21199 | 25-year | PropCond | 1220.00 | 782.97 | 790.04 | | 790.52 | 0.002549 | 5.62 | 288.08 | 174.16 | 0.42 |
| Reach-1 | 21134 | 25-year | Unrestr | 1220.00 | 782.97 | 789.58 | 787.38 | 790.28 | 0.003313 | 6.86 | 252.14 | 156.92 | 0.49 |
| Reach-1 | 21134 | 25-year | ExCond | 1220.00 | 782.97 | 789.79 | 787.38 | 790.42 | 0.002861 | 6.52 | 289.25 | 193.99 | 0.46 |
| Reach-1 | 21134 | 25-year | PropCond | 1220.00 | 782.97 | 789.63 | 787.38 | 790.31 | 0.003203 | 6.78 | 260.14 | 164.97 | 0.48 |
| Reach-1 | 21065 | 25-year | Unrestr | 1220.00 | 780.79 | 787.87 | 787.08 | 789.80 | 0.009515 | 11.76 | 145.51 | 42.17 | 0.79 |
| Reach-1 | 21065 | 25-year | ExCond | 1220.00 | 780.79 | 788.55 | 787.08 | 790.04 | 0.006634 | 10.46 | 184.05 | 73.62 | 0.67 |
| Reach-1 | 21065 | 25-year | PropCond | 1220.00 | 780.79 | 788.06 | 787.08 | 789.86 | 0.008582 | 11.38 | 154.40 | 48.96 | 0.75 |
| Reach-1 | 20956 | 25-year | Unrestr | 1230.00 | 782.00 | 788.04 | | 788.77 | 0.004323 | 7.02 | 216.22 | 61.98 | 0.54 |
| Reach-1 | 20956 | 25-year | ExCond | 1230.00 | 782.00 | 788.52 | | 789.11 | 0.003157 | 6.36 | 247.88 | 69.18 | 0.47 |
| Reach-1 | 20956 | 25-year | PropCond | 1230.00 | 782.00 | 788.27 | | 788.93 | 0.003701 | 6.69 | 231.18 | 65.50 | 0.50 |
| Reach-1 | 20827 | 25-year | Unrestr | 1230.00 | 780.75 | 787.84 | | 788.31 | 0.002091 | 5.48 | 230.50 | 44.05 | 0.39 |
| Reach-1 | 20827 | 25-year | ExCond | 1230.00 | 780.75 | 788.33 | 784.90 | 788.73 | 0.001619 | 5.07 | 256.19 | 69.31 | 0.35 |
| Reach-1 | 20827 | 25-year | PropCond | 1230.00 | 780.75 | 788.05 | 784.90 | 788.49 | 0.001870 | 5.30 | 239.88 | 47.54 | 0.37 |
| Reach-1 | 20722 | 25-year | Unrestr | 1230.00 | 780.50 | 787.64 | | 788.09 | 0.002032 | 5.43 | 236.36 | 44.46 | 0.38 |
| Reach-1 | 20722 | 25-year | ExCond | 1230.00 | 780.50 | 787.74 | 784.65 | 788.18 | 0.001920 | 5.33 | 241.09 | 44.98 | 0.37 |
| Reach-1 | 20722 | 25-year | PropCond | 1230.00 | 780.50 | 787.74 | 784.65 | 788.18 | 0.001920 | 5.33 | 241.09 | 44.98 | 0.37 |
| Reach-1 | 20471 | 25-year | Unrestr | 1230.00 | 778.38 | 786.26 | 784.50 | 787.27 | 0.004982 | 9.16 | 298.16 | 166.18 | 0.58 |
| Reach-1 | 20471 | 25-year | ExCond | 1230.00 | 778.38 | 786.26 | 784.50 | 787.27 | 0.004982 | 9.16 | 298.16 | 166.18 | 0.58 |
| Reach-1 | 20471 | 25-year | PropCond | 1230.00 | 778.38 | 786.26 | 784.50 | 787.27 | 0.004982 | 9.16 | 298.16 | 166.18 | 0.58 |
| Reach-1 | 19923 | 25-year | Unrestr | 1230.00 | 775.99 | 783.37 | 782.37 | 784.37 | 0.005631 | 9.31 | 279.06 | 92.47 | 0.61 |
| Reach-1 | 19923 | 25-year | ExCond | 1230.00 | 775.99 | 783.37 | 782.37 | 784.37 | 0.005631 | 9.31 | 279.06 | 92.47 | 0.61 |
| Reach-1 | 19923 | 25-year | PropCond | 1230.00 | 775.99 | 783.37 | 782.37 | 784.37 | 0.005631 | 9.31 | 279.06 | 92.47 | 0.61 |
| Reach-1 | 19391 | 25-year | Unrestr | 1230.00 | 774.20 | 779.54 | 779.54 | 780.43 | 0.009996 | 9.95 | 361.44 | 197.38 | 0.77 |
| Reach-1 | 19391 | 25-year | ExCond | 1230.00 | 774.20 | 779.54 | 779.54 | 780.43 | 0.009996 | 9.95 | 361.44 | 197.38 | 0.77 |
| Reach-1 | 19391 | 25-year | PropCond | 1230.00 | 774.20 | 779.54 | 779.54 | 780.43 | 0.009996 | 9.95 | 361.44 | 197.38 | 0.77 |
| Reach-1 | 18781 | 25-year | Unrestr | 1230.00 | 766.56 | 775.39 | 773.17 | 776.11 | 0.003150 | 7.87 | 377.79 | 205.48 | 0.47 |
| Reach-1 | 18781 | 25-year | ExCond | 1230.00 | 766.56 | 775.39 | 773.17 | 776.11 | 0.003150 | 7.87 | 377.79 | 205.48 | 0.47 |
| Reach-1 | 18781 | 25-year | PropCond | 1230.00 | 766.56 | 775.39 | 773.17 | 776.11 | 0.003150 | 7.87 | 377.79 | 205.48 | 0.47 |
| Reach-1 | 18301 | 25-year | Unrestr | 1230.00 | 765.35 | 772.44 | 771.58 | 773.81 | 0.007536 | 10.49 | 228.10 | 81.77 | 0.70 |
| Reach-1 | 18301 | 25-year | ExCond | 1230.00 | 765.35 | 772.44 | 771.58 | 773.81 | 0.007536 | 10.49 | 228.10 | 81.77 | 0.70 |
| Reach-1 | 18301 | 25-year | PropCond | 1230.00 | 765.35 | 772.44 | 771.58 | 773.81 | 0.007536 | 10.49 | 228.10 | 81.77 | 0.70 |
| Reach-1 | 17886 | 25-year | Unrestr | 1290.00 | 761.64 | 769.21 | 767.55 | 770.77 | 0.007077 | 10.69 | 211.43 | 100.60 | 0.69 |
| Reach-1 | 17886 | 25-year | ExCond | 1290.00 | 761.64 | 769.21 | 767.55 | 770.77 | 0.007077 | 10.69 | 211.43 | 100.60 | 0.69 |
| Reach-1 | 17886 | 25-year | PropCond | 1290.00 | 761.64 | 769.21 | 767.55 | 770.77 | 0.007077 | 10.69 | 211.43 | 100.60 | 0.69 |
| Reach-1 | 17380 | 25-year | Unrestr | 1290.00 | 757.38 | 763.26 | 763.26 | 765.59 | 0.015452 | 13.30 | 149.79 | 40.47 | 0.98 |
| Reach-1 | 17380 | 25-year | ExCond | 1290.00 | 757.38 | 763.26 | 763.26 | 765.59 | 0.015452 | 13.30 | 149.79 | 40.47 | 0.98 |
| Reach-1 | 17380 | 25-year | PropCond | 1290.00 | 757.38 | 763.26 | 763.26 | 765.59 | 0.015452 | 13.30 | 149.79 | 40.47 | 0.98 |
| Reach-1 | 17239 | 25-year | Unrestr | 1290.00 | 751.40 | 757.32 | 757.32 | 759.19 | 0.013113 | 12.31 | 183.52 | 55.98 | 0.90 |
| Reach-1 | 17239 | 25-year | ExCond | 1290.00 | 751.40 | 757.32 | 757.32 | 759.19 | 0.013113 | 12.31 | 183.52 | 55.98 | 0.90 |
| Reach-1 | 17239 | 25-year | PropCond | 1290.00 | 751.40 | 757.32 | 757.32 | 759.19 | 0.013113 | 12.31 | 183.52 | 55.98 | 0.90 |
| Reach-1 | 17119 | 25-year | Unrestr | 1290.00 | 740.91 | 746.78 | 746.78 | 748.64 | 0.013321 | 12.33 | 179.97 | 57.96 | 0.91 |
| Reach-1 | 17119 | 25-year | ExCond | 1290.00 | 740.91 | 746.78 | 746.78 | 748.64 | 0.013321 | 12.33 | 179.97 | 57.96 | 0.91 |
| Reach-1 | 17119 | 25-year | PropCond | 1290.00 | 740.91 | 746.78 | 746.78 | 748.64 | 0.013321 | 12.33 | 179.97 | 57.96 | 0.91 |
| Reach-1 | 16850 | 25-year | Unrestr | 1290.00 | 736.13 | 742.90 | 742.90 | 745.14 | 0.011306 | 12.53 | 148.89 | 52.52 | 0.86 |
| Reach-1 | 16850 | 25-year | ExCond | 1290.00 | 736.13 | 742.90 | 742.90 | 745.14 | 0.011306 | 12.53 | 148.89 | 52.52 | 0.86 |
| Reach-1 | 16850 | 25-year | PropCond | 1290.00 | 736.13 | 742.90 | 742.90 | 745.14 | 0.011306 | 12.53 | 148.89 | 52.52 | 0.86 |
| Reach-1 | 16437 | 25-year | Unrestr | 1290.00 | 731.24 | 737.69 | 737.69 | 739.62 | 0.011271 | 12.10 | 181.79 | 59.43 | 0.85 |
| Reach-1 | 16437 | 25-year | ExCond | 1290.00 | 731.24 | 737.69 | 737.69 | 739.62 | 0.011271 | 12.10 | 181.79 | 59.43 | 0.85 |
| Reach-1 | 16437 | 25-year | PropCond | 1290.00 | 731.24 | 737.69 | 737.69 | 739.62 | 0.011271 | 12.10 | 181.79 | 59.43 | 0.85 |
| Reach-1 | 15949 | 25-year | Unrestr | 1290.00 | 723.79 | 730.90 | 730.29 | 732.95 | 0.009618 | 11.95 | 147.17 | 33.89 | 0.80 |
| Reach-1 | 15949 | 25-year | ExCond | 1290.00 | 723.79 | 730.95 | 730.29 | 732.96 | 0.009406 | 11.86 | 148.60 | 34.03 | 0.79 |
| Reach-1 | 15949 | 25-year | PropCond | 1290.00 | 723.79 | 730.95 | 730.29 | 732.96 | 0.009406 | 11.86 | 148.60 | 34.03 | 0.79 |
| Reach-1 | 15388 | 25-year | Unrestr | 1290.00 | 721.14 | 728.59 | | 729.23 | 0.003959 | 7.91 | 317.71 | 64.62 | 0.52 |
| Reach-1 | 15388 | 25-year | ExCond | 1290.00 | 721.14 | 728.43 | | 729.11 | 0.004325 | 8.14 | 307.38 | 64.15 | 0.54 |
| Reach-1 | 15388 | 25-year | PropCond | 1290.00 | 721.14 | 728.43 | | 729.11 | 0.004325 | 8.14 | 307.38 | 64.15 | 0.54 |
| Reach-1 | 14943 | 25-year | Unrestr | 1290.00 | 718.05 | 724.69 | 724.18 | 726.47 | 0.010012 | 11.63 | 161.37 | 43.51 | 0.80 |
| Reach-1 | 14943 | 25-year | ExCond | 1290.00 | 718.05 | 725.61 | 724.18 | 726.82 | 0.005917 | 9.77 | 209.87 | 69.65 | 0.63 |
| Reach-1 | 14943 | 25-year | PropCond | 1290.00 | 718.05 | 725.61 | 724.18 | 726.82 | 0.005917 | 9.77 | 209.87 | 69.65 | 0.63 |

Oconee S-51 (Snow Creek Rd) over Snow Creek HEC-RAS 100-Year Output Table

HEC-RAS River: Snow Creek Reach: Reach-1 Profile: 100-year

| Reach | River Sta | Profile | Plan | Q Total (cfs) | Min Ch El (ft) | W.S. Elev (ft) | Crit W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Chnl (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # Chl |
|---------|-----------|----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach-1 | 21287 | 100-year | Unrestr | 1760.00 | 783.00 | 791.82 | | 792.05 | 0.000840 | 4.10 | 760.22 | 300.33 | 0.26 |
| Reach-1 | 21287 | 100-year | ExCond | 1760.00 | 783.00 | 791.82 | | 792.05 | 0.000840 | 4.10 | 760.22 | 300.33 | 0.26 |
| Reach-1 | 21287 | 100-year | PropCond | 1760.00 | 783.00 | 791.82 | | 792.05 | 0.000840 | 4.10 | 760.22 | 300.33 | 0.26 |
| Reach-1 | 21199 | 100-year | Unrestr | 1760.00 | 782.97 | 791.52 | | 791.92 | 0.001833 | 5.57 | 618.26 | 263.35 | 0.37 |
| Reach-1 | 21199 | 100-year | ExCond | 1760.00 | 782.97 | 791.52 | | 791.92 | 0.001833 | 5.57 | 618.26 | 263.35 | 0.37 |
| Reach-1 | 21199 | 100-year | PropCond | 1760.00 | 782.97 | 791.52 | | 791.92 | 0.001833 | 5.57 | 618.26 | 263.35 | 0.37 |
| Reach-1 | 21134 | 100-year | Unrestr | 1760.00 | 782.97 | 791.31 | | 791.79 | 0.001991 | 6.28 | 629.50 | 245.06 | 0.40 |
| Reach-1 | 21134 | 100-year | ExCond | 1760.00 | 782.97 | 791.31 | | 791.79 | 0.001991 | 6.28 | 629.50 | 245.06 | 0.40 |
| Reach-1 | 21134 | 100-year | PropCond | 1760.00 | 782.97 | 791.31 | | 791.79 | 0.001991 | 6.28 | 629.50 | 245.06 | 0.40 |
| Reach-1 | 21065 | 100-year | Unrestr | 1760.00 | 780.79 | 790.12 | 790.12 | 791.49 | 0.005494 | 10.79 | 459.81 | 253.58 | 0.63 |
| Reach-1 | 21065 | 100-year | ExCond | 1760.00 | 780.79 | 790.12 | 790.12 | 791.49 | 0.005494 | 10.79 | 459.81 | 253.58 | 0.63 |
| Reach-1 | 21065 | 100-year | PropCond | 1760.00 | 780.79 | 790.12 | 790.12 | 791.49 | 0.005494 | 10.79 | 459.81 | 253.58 | 0.63 |
| Reach-1 | 20956 | 100-year | Unrestr | 1790.00 | 782.00 | 789.10 | 787.52 | 790.12 | 0.004788 | 8.36 | 303.48 | 177.32 | 0.59 |
| Reach-1 | 20956 | 100-year | ExCond | 1790.00 | 782.00 | 789.55 | 787.52 | 790.35 | 0.003573 | 7.56 | 386.50 | 194.22 | 0.51 |
| Reach-1 | 20956 | 100-year | PropCond | 1790.00 | 782.00 | 789.40 | 787.52 | 790.27 | 0.003933 | 7.81 | 358.51 | 188.46 | 0.54 |
| Reach-1 | 20827 | 100-year | Unrestr | 1790.00 | 780.75 | 788.87 | | 789.57 | 0.002609 | 6.78 | 303.79 | 98.76 | 0.44 |
| Reach-1 | 20827 | 100-year | ExCond | 1790.00 | 780.75 | 789.30 | 785.89 | 789.90 | 0.002104 | 6.32 | 352.58 | 119.00 | 0.40 |
| Reach-1 | 20827 | 100-year | PropCond | 1790.00 | 780.75 | 789.13 | 785.89 | 789.78 | 0.002289 | 6.50 | 333.11 | 116.61 | 0.42 |
| Reach-1 | 20722 | 100-year | Unrestr | 1790.00 | 780.50 | 788.58 | | 789.29 | 0.002674 | 6.83 | 280.42 | 49.21 | 0.45 |
| Reach-1 | 20722 | 100-year | ExCond | 1790.00 | 780.50 | 788.60 | 785.64 | 789.32 | 0.002641 | 6.81 | 281.70 | 49.34 | 0.45 |
| Reach-1 | 20722 | 100-year | PropCond | 1790.00 | 780.50 | 788.60 | 785.64 | 789.32 | 0.002641 | 6.81 | 281.70 | 49.34 | 0.45 |
| Reach-1 | 20471 | 100-year | Unrestr | 1790.00 | 778.38 | 787.63 | | 788.46 | 0.004050 | 9.20 | 567.39 | 217.66 | 0.54 |
| Reach-1 | 20471 | 100-year | ExCond | 1790.00 | 778.38 | 787.63 | | 788.46 | 0.004050 | 9.20 | 567.39 | 217.66 | 0.54 |
| Reach-1 | 20471 | 100-year | PropCond | 1790.00 | 778.38 | 787.63 | | 788.46 | 0.004050 | 9.20 | 567.39 | 217.66 | 0.54 |
| Reach-1 | 19923 | 100-year | Unrestr | 1790.00 | 775.99 | 784.38 | 783.58 | 785.65 | 0.006511 | 10.92 | 380.24 | 109.58 | 0.67 |
| Reach-1 | 19923 | 100-year | ExCond | 1790.00 | 775.99 | 784.38 | 783.58 | 785.65 | 0.006511 | 10.92 | 380.24 | 109.58 | 0.67 |
| Reach-1 | 19923 | 100-year | PropCond | 1790.00 | 775.99 | 784.38 | 783.58 | 785.65 | 0.006511 | 10.92 | 380.24 | 109.58 | 0.67 |
| Reach-1 | 19391 | 100-year | Unrestr | 1790.00 | 774.20 | 780.12 | 780.12 | 781.13 | 0.011125 | 11.27 | 482.38 | 214.62 | 0.83 |
| Reach-1 | 19391 | 100-year | ExCond | 1790.00 | 774.20 | 780.12 | 780.12 | 781.13 | 0.011125 | 11.27 | 482.38 | 214.62 | 0.83 |
| Reach-1 | 19391 | 100-year | PropCond | 1790.00 | 774.20 | 780.12 | 780.12 | 781.13 | 0.011125 | 11.27 | 482.38 | 214.62 | 0.83 |
| Reach-1 | 18781 | 100-year | Unrestr | 1790.00 | 766.56 | 776.77 | | 777.36 | 0.002622 | 7.92 | 853.84 | 453.31 | 0.44 |
| Reach-1 | 18781 | 100-year | ExCond | 1790.00 | 766.56 | 776.77 | | 777.36 | 0.002622 | 7.92 | 853.84 | 453.31 | 0.44 |
| Reach-1 | 18781 | 100-year | PropCond | 1790.00 | 766.56 | 776.77 | | 777.36 | 0.002622 | 7.92 | 853.84 | 453.31 | 0.44 |
| Reach-1 | 18301 | 100-year | Unrestr | 1790.00 | 765.35 | 773.55 | 773.21 | 775.20 | 0.008166 | 12.04 | 329.24 | 114.65 | 0.75 |
| Reach-1 | 18301 | 100-year | ExCond | 1790.00 | 765.35 | 773.55 | 773.21 | 775.20 | 0.008166 | 12.04 | 329.24 | 114.65 | 0.75 |
| Reach-1 | 18301 | 100-year | PropCond | 1790.00 | 765.35 | 773.55 | 773.21 | 775.20 | 0.008166 | 12.04 | 329.24 | 114.65 | 0.75 |
| Reach-1 | 17886 | 100-year | Unrestr | 1870.00 | 761.64 | 770.55 | 770.50 | 772.15 | 0.006619 | 11.55 | 378.16 | 144.26 | 0.69 |
| Reach-1 | 17886 | 100-year | ExCond | 1870.00 | 761.64 | 770.55 | 770.50 | 772.15 | 0.006619 | 11.55 | 378.16 | 144.26 | 0.69 |
| Reach-1 | 17886 | 100-year | PropCond | 1870.00 | 761.64 | 770.55 | 770.50 | 772.15 | 0.006619 | 11.55 | 378.16 | 144.26 | 0.69 |
| Reach-1 | 17380 | 100-year | Unrestr | 1870.00 | 757.38 | 764.85 | 764.85 | 767.47 | 0.013102 | 14.42 | 224.06 | 54.40 | 0.94 |
| Reach-1 | 17380 | 100-year | ExCond | 1870.00 | 757.38 | 764.85 | 764.85 | 767.47 | 0.013102 | 14.42 | 224.06 | 54.40 | 0.94 |
| Reach-1 | 17380 | 100-year | PropCond | 1870.00 | 757.38 | 764.85 | 764.85 | 767.47 | 0.013102 | 14.42 | 224.06 | 54.40 | 0.94 |
| Reach-1 | 17239 | 100-year | Unrestr | 1870.00 | 751.40 | 758.47 | 758.47 | 760.68 | 0.013012 | 13.83 | 250.81 | 63.28 | 0.93 |
| Reach-1 | 17239 | 100-year | ExCond | 1870.00 | 751.40 | 758.47 | 758.47 | 760.68 | 0.013012 | 13.83 | 250.81 | 63.28 | 0.93 |
| Reach-1 | 17239 | 100-year | PropCond | 1870.00 | 751.40 | 758.47 | 758.47 | 760.68 | 0.013012 | 13.83 | 250.81 | 63.28 | 0.93 |
| Reach-1 | 17119 | 100-year | Unrestr | 1870.00 | 740.91 | 747.94 | 747.94 | 750.13 | 0.013022 | 13.80 | 251.54 | 64.82 | 0.93 |
| Reach-1 | 17119 | 100-year | ExCond | 1870.00 | 740.91 | 747.94 | 747.94 | 750.13 | 0.013022 | 13.80 | 251.54 | 64.82 | 0.93 |
| Reach-1 | 17119 | 100-year | PropCond | 1870.00 | 740.91 | 747.94 | 747.94 | 750.13 | 0.013022 | 13.80 | 251.54 | 64.82 | 0.93 |
| Reach-1 | 16850 | 100-year | Unrestr | 1870.00 | 736.13 | 744.73 | 744.73 | 746.83 | 0.008525 | 12.79 | 272.61 | 83.63 | 0.78 |
| Reach-1 | 16850 | 100-year | ExCond | 1870.00 | 736.13 | 744.73 | 744.73 | 746.83 | 0.008525 | 12.79 | 272.61 | 83.63 | 0.78 |
| Reach-1 | 16850 | 100-year | PropCond | 1870.00 | 736.13 | 744.73 | 744.73 | 746.83 | 0.008525 | 12.79 | 272.61 | 83.63 | 0.78 |
| Reach-1 | 16437 | 100-year | Unrestr | 1870.00 | 731.24 | 739.21 | 739.21 | 741.14 | 0.009369 | 12.74 | 300.93 | 87.46 | 0.80 |
| Reach-1 | 16437 | 100-year | ExCond | 1870.00 | 731.24 | 739.21 | 739.21 | 741.14 | 0.009369 | 12.74 | 300.93 | 87.46 | 0.80 |
| Reach-1 | 16437 | 100-year | PropCond | 1870.00 | 731.24 | 739.21 | 739.21 | 741.14 | 0.009369 | 12.74 | 300.93 | 87.46 | 0.80 |
| Reach-1 | 15949 | 100-year | Unrestr | 1870.00 | 723.79 | 732.26 | 731.90 | 734.96 | 0.010412 | 13.99 | 196.25 | 38.61 | 0.85 |
| Reach-1 | 15949 | 100-year | ExCond | 1870.00 | 723.79 | 732.21 | 731.90 | 734.96 | 0.010655 | 14.10 | 194.30 | 38.43 | 0.86 |
| Reach-1 | 15949 | 100-year | PropCond | 1870.00 | 723.79 | 732.21 | 731.90 | 734.96 | 0.010655 | 14.10 | 194.30 | 38.43 | 0.86 |
| Reach-1 | 15388 | 100-year | Unrestr | 1870.00 | 721.14 | 730.19 | | 731.00 | 0.003948 | 9.02 | 440.30 | 131.73 | 0.53 |
| Reach-1 | 15388 | 100-year | ExCond | 1870.00 | 721.14 | 729.97 | | 730.80 | 0.004245 | 9.19 | 413.86 | 98.28 | 0.55 |
| Reach-1 | 15388 | 100-year | PropCond | 1870.00 | 721.14 | 729.97 | | 730.80 | 0.004245 | 9.19 | 413.86 | 98.28 | 0.55 |
| Reach-1 | 14943 | 100-year | Unrestr | 1870.00 | 718.05 | 726.17 | 725.57 | 728.28 | 0.009491 | 12.99 | 254.31 | 95.14 | 0.81 |
| Reach-1 | 14943 | 100-year | ExCond | 1870.00 | 718.05 | 727.35 | 725.57 | 728.66 | 0.005272 | 10.61 | 376.58 | 155.72 | 0.62 |
| Reach-1 | 14943 | 100-year | PropCond | 1870.00 | 718.05 | 727.35 | 725.57 | 728.66 | 0.005272 | 10.61 | 376.58 | 155.72 | 0.62 |



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