S-294 OVER WILSONS CREEK, ANDERSON COUNTY

S-53 OVER LITTLE ROCKY CREEK, CHESTER COUNTY

S-108 OVER BROWN CREEK, CHESTERFIELD COUNTY

S-765 OVER HANGING ROCK CREEK, LANCASTER COUNTY

REQUEST FOR PROPOSAL

Design Build Project - Contract ID 8862230

BRIDGE PACKAGE 15

ANDERSON, CHESTER, CHESTERFIELD, AND LANCASTER COUNTIES

January 31, 2023

SCDOT

Submitted by:

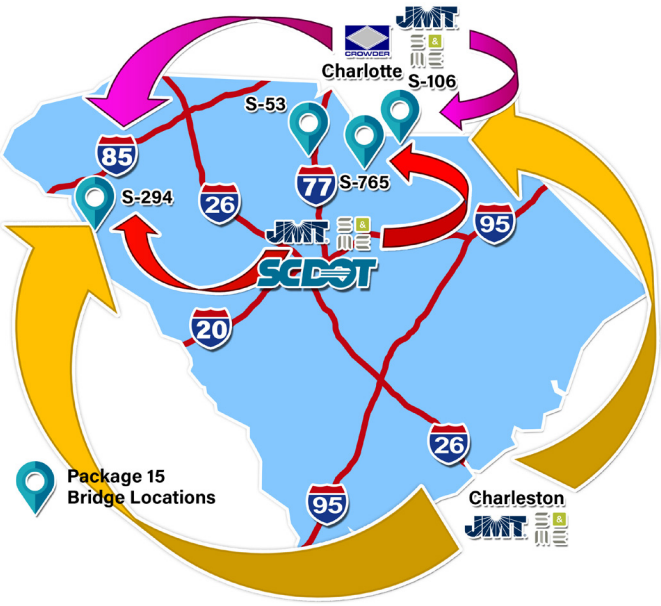
CROWDER

JMT

4.1 TECHNICAL PROPOSAL

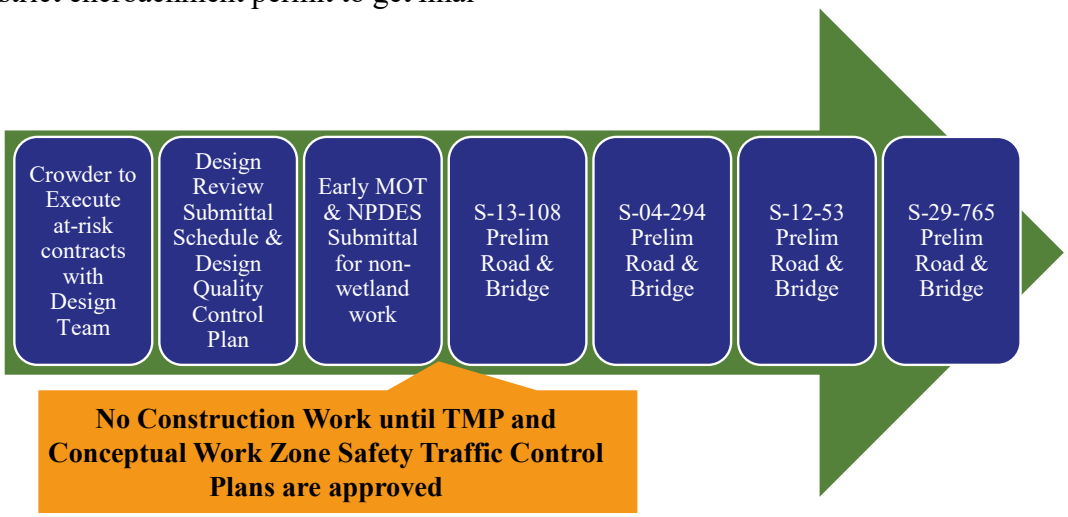
1.0 PROJECT DELIVERY & APPROACH

1a. Project Delivery & Approach & Assurances to Complete Project Within Required Time-frame



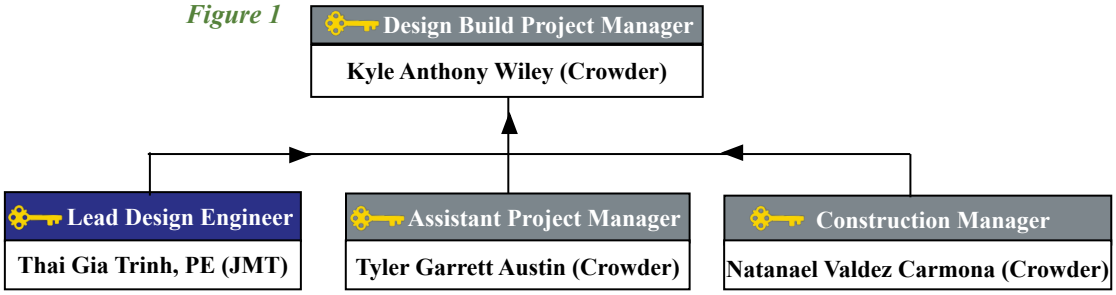
Project Delivery: The CROWDER-JMT Team will design and manage the project from Crowder's Heavy Civil Division Office in Charlotte, NC and from JMT's offices in Charleston & Columbia, SC. The Package 15 bridge sites are centrally located to our team, SCDOT headquarters, and the District Office allowing for effective communication, planning, and collaboration through face-to-face meetings as required, and through virtual meetings as are more commonplace now. We understand the RFP schedule requirements and are prepared to take steps to meet it. Immediately following the public announcement, Crowder will execute a design subcontract with JMT, and them to S&ME. Crowder will do this at-risk, to accelerate the design process, rather than waiting for the signed SCDOT contract to allow for the achievement of RFC plans, and for construction to start, at Bridges S-13-108 and S-04-294 as soon as possible.

JMT will first submit the Design Review Submittal Schedule and the Design Quality Control (QC) Plan for approval by SCDOT to pave the way for the official submittal process to begin. JMT will then expedite early MOT and NPDES submittals for clearing & grubbing and non-permanent activities; similar to what was done on our SC-4 project. While JMT initiates their submittals, S&ME will submit the additional geotechnical sampling plan for approval as well as the District encroachment permit to get final GDP compliant information at all the bridges ASAP. These early submittals will then be followed by a logical preparation and submittal of all the remaining RFP Exhibit 4z documents in correlation to the sequence of work.



Prior to beginning any construction activities, permanent or temporary, Crowder will submit the Traffic Management Plan, and Conceptual Work Zone Traffic Control plans for the entire project to SCDOT for review, comment, and approval. Submittals related to both design and construction will get an internal QC review before submission to SCDOT to reduce the likelihood of errors, minimize comments, and eliminate extended reviews that may create schedule uncertainty.

Figure 1



Project Approach: The CROWDER-JMT Team, displayed in ***Figure 1***, understands starting construction is dependent on design submittal approvals and permitting. Early construction activities are planned to provide the groundwork for bridge and roadway construction. Crowder will mobilize adequate construction equipment and dedicate an appropriate number of field personnel. At times, multiple crews will be working concurrently. Crowder plans to work a minimum of five 10-hour days and utilize additional crews if needed based on progress. Crowder will develop a cost loaded, project master schedule. It will include all construction activities and material deliveries. It will also establish critical risk components to help stay abreast of, and manage, the schedule. This effectively eliminates the risk of schedule slippage. The master schedule will also include subcontractor schedules and design submittals. Crowder will communicate with subcontractors and suppliers to maintain an expedited completion of this project.

Our Team's approach to this job, and all design-build jobs, is to identify critical items at each site, especially in regard to third-party involvement, during the RFP phase and be ready to engage these entities effectively upon award. To this end, we have already identified key schedule and cost drivers at each site such as R/W, Permits, FEMA Impacts and Utilities that will immediately be tackled. These are shown in ***Table 1*** below.

Table 1: Anticipated Project 3rd Party Coordination

Bridge Description	County	# R/W Tracts	Permit Type	FEMA	Impacted Utilities
S-294 over Wilsons Creek	Anderson	11	GP	No Impact	None
S-53 over Little Rocky Creek	Chester	8	GP	No Impact	E/T/G
S-108 over Brown Creek	Chesterfield	9	GP	N/A	None
S-765 over Hanging Rock Creek	Lancaster	6	GP	No Impact	T

GP - General Permit E - Electric W - Water NOI - Notice of Intent T - Telecome G - Gas
#GP anticipated to be required for potential rip-rap impacts to stream at base of flume

Crowder, JMT, & S&ME commit to meeting the SCDOT's defined completion schedule

"Thoroughly enjoyed the collaborative relationship with Crowder and the SCDOT Headquarters and District staff to deliver this project quickly and effectively. All parties worked very well together throughout the process and I feel the project was a big success in both process and delivery.
- Michael Pitts, SCDOT PM
Regarding SC 4 Bridge Replacement DB Project

Assurance and Ability to Complete the Project within the Required Time Frame: Crowder has the appropriate financial, equipment, personnel, and technological resources on hand and available to meet and exceed the needs of this project. Crowder's available capacity is $300 million versus a total bonding capacity of $800 million. Crowder Heavy Civil maintains 10 structures crews and 3 grading/drainage crews and associated equipment, with plans of growing our division over the next few years in response to the federal infrastructure bill. For this project Crowder will commit a minimum of 2 structures crews and 2 grading crews. Furthermore, Crowder will allocate additional resources as necessary to ensure any unforeseen schedule impacts are recovered so the project is completed on time to meet SCDOT and public expectations.

In addition to the abundance of Crowder's construction-related resources, the design team has the staff capacity to perform the work in a timely and efficient manner. JMT's "SCDOT-DB project" experienced engineers have capacity to meet the design schedule demands of this project, having no current other SCDOT Design-Build work on-going. In fact, JMT is not currently part of any team that submitted for the I-95/I-26 interchange, so therefore immediately ready to start work for Package 15 upon notice of selection. Although not anticipated for this project, Crowder's and JMT's offices are all within reasonable proximity to enable staff co-location if and as needed during the design phase.

JMT's capacity of experienced resources increased last year with our acquisition of Vaughn & Melton to include having survey, SUE, and utility coordination all under the JMT roof.

Our RFQ defined and committed Key Staff of Design Build Project Manager, Assistant Project Manager, Lead Design Engineer, and Construction Manager have been integrally involved with developing the best delivery approach to this Package 15 project during the RFP process. Quality, safety, value, and constructability have consistently been at the forefront of our design decisions. Upon award, these same managers will finalize constructible designs, turn them into comprehensive submittals, and then execute these designs on site. This will allow for an expeditious project start-up without introducing new management to the project. Not to be overlooked is the importance of the design staff that have assisted in the design development while working under these managers. The same JMT and S&ME design staff and geotechnical engineers that developed the RFP design

will also transition into final design upon award of the contract to maintain continuity and quality in the design related submittals to SCDOT. By providing this level of integration during the RFP phase, our Team will be able to strategically ensure all necessary materials and resources are procured and in place when needed, enabling our team to start the project as soon as possible and remain on schedule through completion.

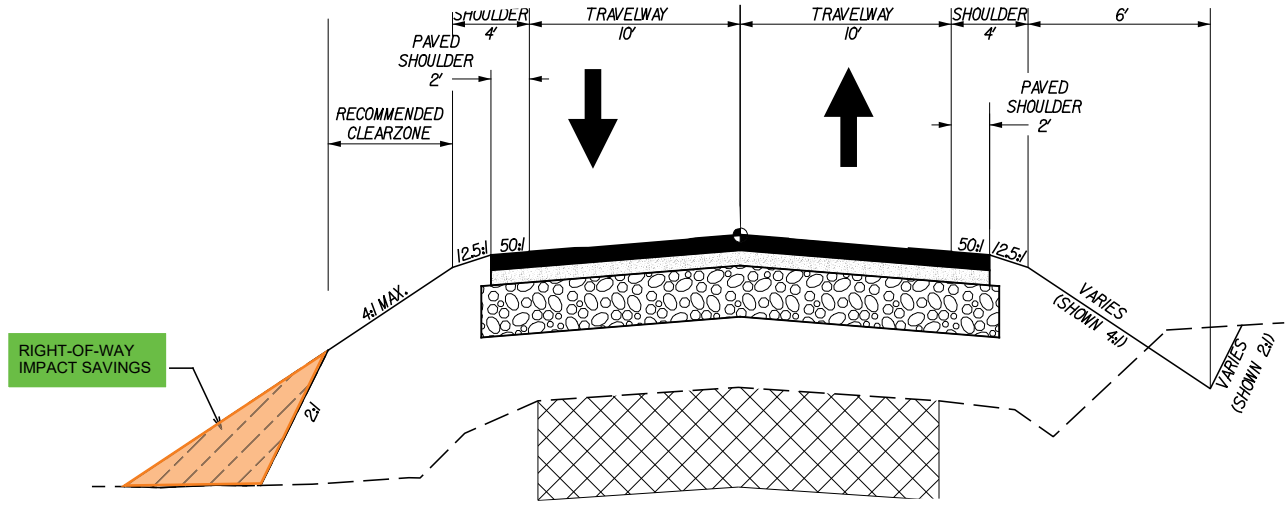
1b. Approach to Design and How it Minimized the Need for New Right-of-Way on The Project

The design team's approach to minimizing the need for R/W is highlighted in ***Table 2***. We have preserved the existing horizontal and vertical geometry to the greatest extent possible.

Table 2: Impact Minimizing Techniques
• Maintain existing centerlines to eliminate R/W that would be required under relocation centerlines.
• Optimization of vertical alignment by utilization of box beams for all bridges.
• Maintain existing K-values where possible, improve profiles where required using the allowable RFP criteria.
• Minimization of bridge lengths to minimize required 75' R/W from bridge ends.
• Use guardrail and 2:1 slopes where practical, preserve existing drainage ditches and outfalls to the greatest extent possible.
• Implement low volume criteria on allowable sites to match context of existing roadway and tie shoulder sections.

	R/W Impact Reduction in Acres		
	Concept Design	Crowder Team	Savings
S-765	**0.525**	**0.317**	**0.208**
S-53	**1.921**	**1.316**	**0.605**
S-108	**0.547**	**0.315**	**0.232**
S-294	**2.566**	**2.465**	**0.101**

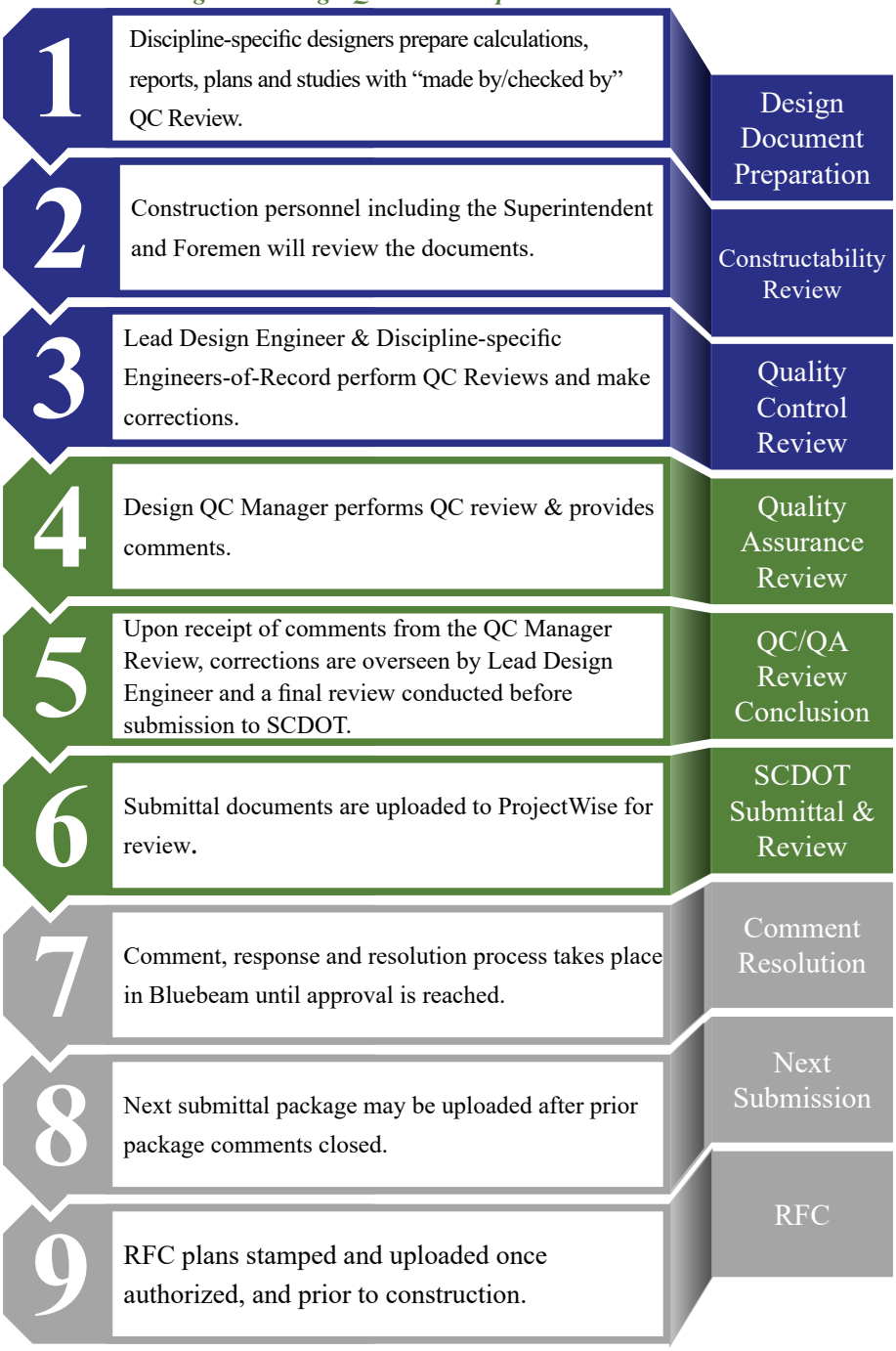
For vertical changes in grade, we have applied the criteria from the RFP while keeping the profiles as low as possible to minimize the extents and width of impacts. Since all the new bridges are longer than the existing bridges, new R/W will be required at each bridge end to meet the RFP requirements of 75'. We will use engineering judgment and the low volume criteria (where applicable) to define clear zones. This minimizes the R/W required for fill slopes through floodplain and causeway areas. We will provide shallower, traversable, ditches where required to tie in the roadway profile.



1.c Proposed Design Submittal Process to Conduct Efficient and Complete Reviews and Relationship to Proposed Project Phasing

As Crowder and JMT successfully demonstrated on the Emergency Bridge Replacement 2020-2 project (SC-4 over South Edisto River), we will submit a comprehensive Design Submittal Schedule and Design QC Plan in accordance with RFP Exhibit 4z soon after the public announcement to allow for formal submittal reviews as soon as practical. Early and frequent discussions among design, construction, and SCDOT allowed for a smooth transition from design to SCDOT review to implementation on that SC-4 project. Crowder and JMT's philosophy of open communication allows our team to collaborate well with SCDOT and quickly answer questions and resolve any issue before they become a schedule or cost driving factor. The 2020-2 Emergency Bridge Replacement Project (SC- 4/SC302 over the South Edisto River) provides a prime example of the Crowder-JMT Teams' commitment to partnering and communication with the department in upfront identification and mitigation of project risk.

Figure 2. Design QC Plan 9 Step Review Process



Early in the SC-4 pursuit process, the potential for hard pile driving conditions was identified by the design team. This was discussed with Crowder and flagged as a potential risk to the construction schedule. Our Team realized that pre-auguring would be required if hard driving conditions were encountered during construction

activities, potentially resulting in significant delays to production. To mitigate this risk, the Crowder-JMT Team had early conversations with SCDOT construction and pre-construction staff before project kickoff. Multiple installation procedures and pile driving plans, for either expected condition, were evaluated upfront, ensuring an efficient path forward for approval no matter the site conditions encountered. The upfront communication ensured there would be no "surprises" to any of the project stakeholders. When hard driving conditions were actually encountered partially through construction, the necessary pre-auguring plan had already been discussed, and accounted for, and the construction team was able to swiftly react and proceed with little impact to the schedule. This resulted in "on-time" performance and no schedule or cost impact to the project, the Design-Build team, or the SCDOT.

Successful SC 4 Design-Build Project Delivery Team

Our Team will carry this proven process into execution on Bridge Package 15 project to maintain SCDOT expectations of Schedule and Cost certainty, on-site collaboration, RFP compliance, and quality delivery. JMT will develop and implement a Design QC Plan to clearly outline lines of communication, design reviews, as well as Constructability Reviews by Crowder. With four separate sites, the Design QC plan is critical to ensure consistency in design and detailing to maximize construction efficiency in the field. To streamline the submittals each site will be packaged into Preliminary Road and Bridge Plans, R/W Plans, Final Road and Bridge Plans, and RFC Road and Bridge Plans. No more than one new submittal package will be uploaded to ProjectWise within five (5) business days. Each submittal will allow for the review time frame set in the RFP. Submittals will be complete packages with all the required documents as defined in RFP Exhibit 4z.

Tables 3 and 4, on the following page**,** shows anticipated deliverables in a logical sequence with construction activities and phasing to allow efficient reviews by SCDOT.

Table 3: Project Schedule

	Bridge Number & Description	County	Utilities	2023 MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	2024 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	2025 JAN
				Engineering/Design							Bridge & Road Construction Engineering/Design						Bridge Construction						Bridge & Road Construction			
1	S-13-108 Outen Road over Brown Creek	Chesterfield	None		D	D	D	D	D	D	BR	BR	BR	RD	RD											
2	S-04-294 East Broad Street over Wilsons Creek	Anderson	None		D	D	D	D	D	D	BR	BR	BR	BR	RD	RD										
3_b	S-12-53 Ross Dye Road over Litter Rocky Creek	Chester	E/T/G		D	D	D	D	D	D	D	D	D	D	D	D	BR	BR	BR	BR	BR	BR	BR	RD	RD	RD
4_b	S-29-765 Hanging Rock Church Road over Hanging Rock Creek	Lancaster	T					D	D	D	D	D	D	D	D	D	BR	BR	BR	BR	BR	RD	RD			

Legend:
D - Design BR - Bridge Construction RD – Road Construction E – Electric G – Gas T – Telecom
a – Each bridge will be a separate design submittal package. A minimum 5-day stagger will be provided between each bridge submittal package.
b – Due to long lead times for relocations, Bridges 3 & 4 are scheduled to be built near the end of the project to allow time for the utility coordination and relocation

"JMT has worked very well to keep submittals on or ahead of schedule period. Shop drawings and load ratings files were completed in a timely manner to ensure bridge construction activities would not be impacted."

-Michael Pitts, SCDOT PM
Regarding Crowder- JMT
SC 4 Bridge Replacement DB Project

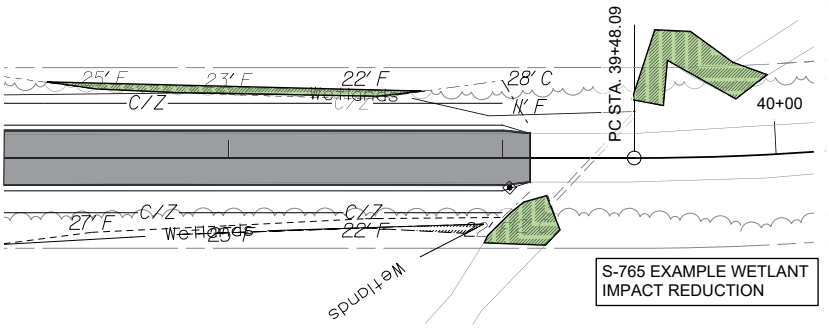
Table 4: Design Submittal Package Schedule

Bridge No.	Design Submittal Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	PR		RW		FN		RFC									
2		PR		RW		FN		RFC								
3									PR		RW		FN		RFC	
4										PR		RW		FN		RFC

PR = Preliminary Roadway & Bridge Submittal Package
RW = Roadway R/W Submittal Package
FN = Final Roadway & Bridge Submittal Package
RFC = RFC Roadway & Bridge Submittal Package
With prior approval from SCDOT Preliminary and R/W submittal packages for all bridges may be combined to streamline review and approval.

2.0 Proposer's Innovation and Added Value to the Project That Clearly Provides Additional Benefit to SCDOT or the Public

Crowder-JMT is confident that we have provided the absolute best solutions to add value and that meet or exceed all SCDOT goals for this project, while providing minimal impacts to the surrounding community. The stated goal in Section 2.2 of the RFP is to create schedule certainty, cost certainty, minimize environmental impacts, and complete the project with no change orders. Crowder is always transparent and has a partnering mindset on projects with the SCDOT where we strive to avoid change orders or claims if at all possible. Our Crowder-JMT collaborative team accomplished this on SC4 and will do so on this project. Below is a sample of how we have worked to minimize stream and wetland impacts on this project by applying the low volume criteria (here applicable) with sound engineering judgement.



	Example Stream and Wetland Savings			
	Concept Design		Crowder Team	
	Stream (LF)	**Wetland (Acres)**	**Steam (LF)**	**Wetland (Acres)**
S-53	**47**	**0.0131**	**37**	**0.0102**
S-765	**138**	**0.0591**	**23**	**0.092**

Please see The Quality Credit Matrix in Appendix B for the Crowder Team's commitments beyond the minimum requirements of the RFP. We have listed our Team's innovative features and practices (including ATC's) that are not standard or customary to the industry but will still allow us to safely, efficiently, and effectively deliver the project.

In addition to the Quality Credit Matrix item, our Team has addressed the items the SCDOT noted to be considered high risk to the Project.

Ability to meet project schedule goals including milestone schedule dates	Our team has provided a schedule demonstrating our commitment to be substantially complete within 630 calendar days from NTP. We also commit to meeting individual bridge construction timeframes as identified in Section IV CONTRACT TIME of the Agreement
Minimize impacts to SCDOT right of way acquisition costs	As discussed earlier in the proposal, our Team has preserved the existing horizontal and vertical geometry to the greatest extent possible while adhering to RFP criteria. Since all the new bridges are longer than the existing bridges, new R/W will be required at each bridge end to meet the RFP requirements of 75'. We have used engineering judgement and the low volume criteria (where applicable) to define clear zones and minimize R/W required for fill slopes through floodplain and causeway areas. We also plan to provide shallow, traversable, ditches where required to tie in the roadway profile.
Avoid or minimize impacts to utilities	Since no utilities are impacted at S-294 and S-108, these are scheduled for construction first to allow time to achieve relocations where necessary at S-12-53 (Electric/Telecom/Gas) and S-29-765 (Telecom)where impacts were unavoidable.

S-294 OVER WILSONS CREEK, ANDERSON COUNTY

S-53 OVER LITTLE ROCKY CREEK, CHESTER COUNTY

S-108 OVER BROWN CREEK, CHESTERFIELD COUNTY

S-765 OVER HANGING ROCK CREEK, LANCASTER COUNTY

APPENDIX A.1: CONCEPTUAL ROADWAY PLANS

SHEET NO.	TOTAL SHEETS
1	4

INDEX OF SHEETS

1. Title Sheet
2. Roadway Typical Section
3. Reference Dataa Sheet
4. Roadway Plan and Profile

South Carolina Department of Transportation

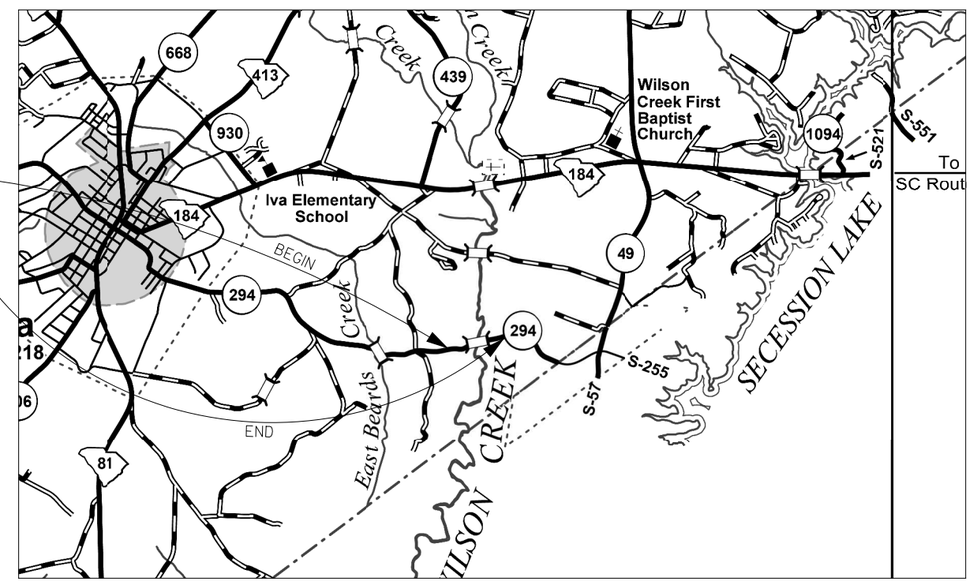
Design Reference for these plans is the:

LVB

Supplemental Design Criteria For
Low Volume Bridge Replacement Projects

PROPOSED PLANS FOR ANDERSON COUNTY PROJECT ID: 8862230 S-294 (E. BROAD ST.) REPLACE BRIDGE OVER WILSONS CREEK

PROJECT ID 8862230
S-294 FROM
STA. 13+75.00 TO
STA. 25+40.00



LAYOUT

-N-

Approximate Location of Bridge is

Latitude	34°- 17' - 44"
Longitude	82°- 37' - 09"

ASSET ID 2650

TRAFFIC DATA

2020 ADT 150 V.P.D.

2042 ADT 219 V.P.D.

TRUCKS 2 %

NET LENGTH OF ROADWAY	0.198	MILES
NET LENGTH OF BRIDGES	0.023	MILES
NET LENGTH OF PROJECT	0.221	MILES
LENGTH OF EXCEPTIONS	0.000	MILES
GROSS LENGTH OF PROJECT	0.221	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 (2007 EDITION) AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF THE FINAL RFP.

CROWDER

CONSULTING ENGINEERING FIRM

JMT

235 Magrath Darby Blvd.
Suite 275
Mt. Pleasant, SC 29464

ENGINEER OF RECORD

CONCEPTUAL PLANS

NOT FOR CONSTRUCTION

FOR CONSTRUCTION : _____ _____
DATE

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	ANDERSON	8862230	S-294	2

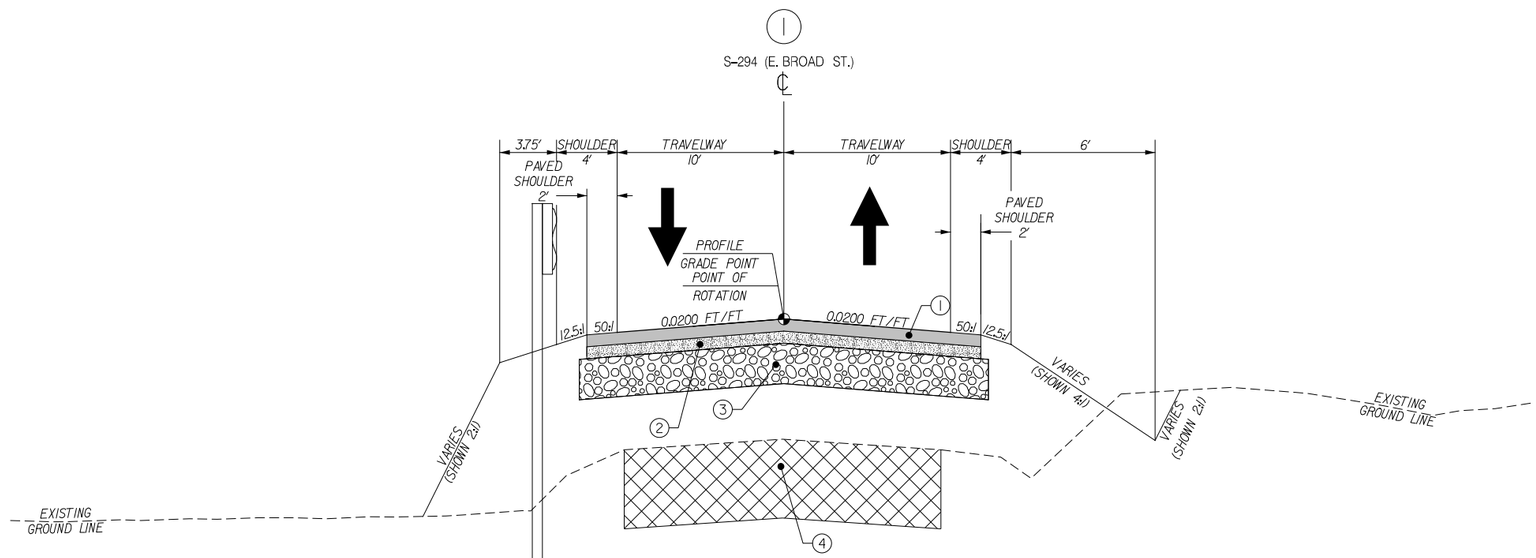
TYPICAL SECTION OF IMPROVEMENT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
COLUMBIA, SC

NOTES:

1. SIDE SLOPES MAY BE VARIED WHEN A DEEPER DITCH IS NECESSARY FOR DRAINAGE PURPOSES, USING A MINIMUM SLOPE OF 12.5:1 AND A MAXIMUM SLOPE OF 4:1. WHERE A DEEPER DITCH THAN PROVIDED BY A 4:1 IS NECESSARY, THE DITCH SHALL BE PLACED FARTHER FROM THE CENTERLINE CONTINUING THE 4:1 SLOPE TO PROVIDE FOR THE NECESSARY DEPTH WHERE POSSIBLE. SEE CROSS SECTIONS FOR ACTUAL DITCH SLOPES, WIDTHS, AND ELEVATIONS.

   FILL SLOPES:
   0' TO 5' HEIGHT 6:1
   5' TO 10' HEIGHT 4:1
   OVER 10' HEIGHT 2:1

2. 2:1 IS THE MAXIMUM FOR SIDE SLOPES AND BACK SLOPES.
3. SLOPE VARIES SEE CROSS SECTIONS FOR SLOPES.
4. ADD 3.75' WHERE GUARDRAIL IS NEEDED. PROVIDE ASPHALT NON-MOW STRIP UUNDER GUARDRAIL IN ACCORDANCE WITH THE SPECIAL PROVISIONS. SEE PLANS AND CROSS SECTIONS FOR LOCATION OF GUARDRAIL.
5. IF PROPOSED PAVEMENT SURFACE IS MORE THAN 12 INCHES BUT LESS THAN 2' ABOVE THE EXISTING PAVEMENT IT IS TO BE SCARIFIED, REMIXED, AND COMPACTED AS SUBGRADE. SEE SPEC. 205.4.5. IF THE EXISTING ASPHALT IS BELOW 24" UNDER THE ROAD IT CAN BE LEFT IN PLACE AND IF IT IS WITHIN LESS THAN 12" OF THE ROAD IT MUST BE REMOVED.
6. DO NOT DISTURB BEYOND PRESENT R/W BOUNDARIES UNLESS OTHERWISE NOTED.



USE THIS SECTION:
S-294
FROM STA. 13+75.00 TO STA. 20+22.00
FROM STA. 21+42.00 TO STA. 25+40.00

NOTE:
BRIDGE FROM STA. 20+22.00 TO STA. 21+42.00

LEGEND	
1	HOT MIX ASPHALT SURFACE COURSE TYPE "C" (150 PSY)
2	HOT MIX ASPHALT INTERMEDIATE COURSE TYPE "C" (175 PSY)
3	GRADED AGGREGATE BASE COURSE 8" UNIFORM
4	EXISTING PAVEMENT (REMOVE OR SCARIFY)

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

DESIGN SPEED		
ROUTE	FUNCTIONAL CLASSIFICATION	MPH
S-294	RURAL MAJOR COLLECTOR	35

EXCEPTIONS TO DESIGN SPEED			
ROUTE	STA. TO STA.		MPH

PLANS PREPARED BY: 335 MAGRATH DARBY BLVD. SUITE 275 MT. PLEASANT, SC 29464 (843) 556-2624

JMT

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

TOPO. _____ DATE _____
DWG. _____ DATE _____ GROUP _____ - _____
R/W _____ DATE _____

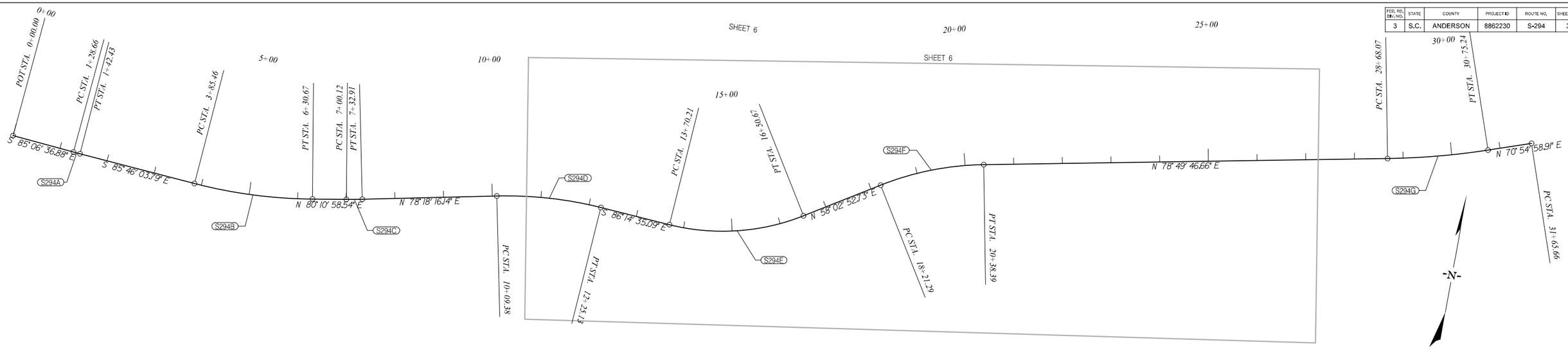
SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION
ROAD DESIGN COLUMBIA, S.C.

ANDERSON COUNTY
S-294 (E. BROAD ST.) OVER WILSON CREEK

TYPICAL SECTIONS

SCALE: N.T.S. RTE. S-294

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	ANDERSON	8862230	S-294	3



℄ S-294 (E. BROAD ST.)

BEGINNING CHAIN S294 DESCRIPTION

POINT S29401 N 899,382.5290 E 1,509,008.7455 STA 0+00.0000

COURSE FROM S29401 TO PC S294A S 85° 06' 36.8755" E DIST 128.6604

CURVE DATA

CURVE S294A
P.I. STATION 1+35.5456 N 899,370.9753 E 1,509,143.7977
DELTA = 0° 39' 26.9128" (LT)
DEGREE = 4° 46' 28.7339"
TANGENT = 6.8851
LENGTH = 13.7701
RADIUS = 1,200.0000
EXTERNAL = 0.0198
LONG CHORD = 13.7701
MID. ORD. = 0.0198
P.C. STATION 1+28.6604 N 899,371.5621 E 1,509,136.9377
P.T. STATION 1+42.4306 N 899,370.4671 E 1,509,150.6641
C.C. N 900,567.1948 E 1,509,239.2242
BACK = S 85° 06' 36.8755" E
AHEAD = S 85° 46' 03.7882" E
CHORD BEAR = S 85° 26' 20.3318" E

COURSE FROM PT S294A TO PC S294B S 85° 46' 03.7882" E DIST 243.0326

CURVE DATA

CURVE S294B
P.I. STATION 5+08.6849 N 899,343.4375 E 1,509,515.9197
DELTA = 14° 02' 57.6734" (LT)
DEGREE = 5° 43' 46.4806"
TANGENT = 123.2218
LENGTH = 245.2075
RADIUS = 1,000.0000
EXTERNAL = 7.5632
LONG CHORD = 244.5936
MID. ORD. = 7.5064
P.C. STATION 3+85.4631 N 899,352.5313 E 1,509,393.0339
P.T. STATION 6+30.6706 N 899,364.4472 E 1,509,637.3371
C.C. N 900,349.8044 E 1,509,466.8340
BACK = S 85° 46' 03.7882" E
AHEAD = N 80° 10' 58.5384" E
CHORD BEAR = N 87° 12' 27.3751" E

COURSE FROM PT S294B TO PC S294C N 80° 10' 58.5384" E DIST 69.4527

CURVE DATA

CURVE S294C
P.I. STATION 7+16.5173 N 899,379.0844 E 1,509,721.9268
DELTA = 1° 52' 42.3998" (LT)
DEGREE = 5° 43' 46.4806"
TANGENT = 16.3940
LENGTH = 32.7850
RADIUS = 1,000.0000
EXTERNAL = 0.1344
LONG CHORD = 32.7836
MID. ORD. = 0.1344
P.C. STATION 7+00.1233 N 899,376.2891 E 1,509,705.7729
P.T. STATION 7+32.9083 N 899,382.4076 E 1,509,737.9804
C.C. N 900,361.6463 E 1,509,535.2697
BACK = N 80° 10' 58.5384" E
AHEAD = N 78° 18' 16.1386" E
CHORD BEAR = N 79° 14' 37.3385" E

COURSE FROM PT S294C TO PC S294D N 78° 18' 16.1386" E DIST 276.4673

℄ S-294 (E. BROAD ST.)

CURVE DATA

CURVE S294D
P.I. STATION 11+17.9127 N 899,460.4521 E 1,510,114.9916
DELTA = 15° 27' 08.7763" (RT)
DEGREE = 7° 09' 43.1008"
TANGENT = 108.5370
LENGTH = 215.7567
RADIUS = 800.0000
EXTERNAL = 7.3291
LONG CHORD = 215.1034
MID. ORD. = 7.2626
P.C. STATION 10+09.3756 N 899,438.4505 E 1,510,008.7079
P.T. STATION 12+25.1324 N 899,453.3403 E 1,510,223.2954
C.C. N 898,655.0595 E 1,510,170.8764
BACK = N 78° 18' 16.1386" E
AHEAD = S 86° 14' 35.0851" E
CHORD BEAR = N 86° 01' 50.5267" E

COURSE FROM PT S294D TO PC S294E S 86° 14' 35.0851" E DIST 145.0784

CURVE DATA

CURVE S294E
P.I. STATION 15+15.1620 N 899,434.3365 E 1,510,512.7018
DELTA = 35° 42' 32.1811" (LT)
DEGREE = 12° 43' 56.6236"
TANGENT = 144.9512
LENGTH = 280.4574
RADIUS = 450.0000
EXTERNAL = 22.7694
LONG CHORD = 275.9403
MID. ORD. = 21.6727
P.C. STATION 13+70.2108 N 899,443.8343 E 1,510,368.0620
P.T. STATION 16+50.6681 N 899,511.0460 E 1,510,635.6917
C.C. N 899,892.8672 E 1,510,397.5477
BACK = S 86° 14' 35.0851" E
AHEAD = N 58° 02' 52.7337" E
CHORD BEAR = N 75° 54' 08.8243" E

℄ S-294 (E. BROAD ST.) - SUPERELEVATION TABLE

CURVE	DS	RAD. (FT)	e Max	e	P.C. - LG	P.T. - LG	NOTE
S294D	35 MPH	800.00	6 %	4.0 %	N/A	0.62 %	***
S294E	35 MPH	450.00	6 %	5.2 %	0.62 %	0.62 %	****

*** TIES INTO FULL SUPER ELEVATION OF EXISTING CURVE.

**** SUPER ELEVATION TRANSITION HELD AT REMOVE ADVERSE CROWN ACROSS BRIDGE THEN TRANSITIONS TO NORMAL CROWN.

℄ S-294 (E. BROAD ST.)

COURSE FROM PT S294F TO PC S294G N 78° 49' 46.6563" E DIST 829.6821

CURVE DATA

CURVE S294G
P.I. STATION 29+71.8180 N 899,861.5169 E 1,511,897.0113
DELTA = 7° 54' 47.7429" (LT)
DEGREE = 3° 49' 10.9871"
TANGENT = 103.7493
LENGTH = 207.1687
RADIUS = 1,500.0000
EXTERNAL = 3.5837
LONG CHORD = 207.0041
MID. ORD. = 3.5752
P.C. STATION 28+68.0687 N 899,841.4178 E 1,511,795.2274
P.T. STATION 30+75.2374 N 899,895.4375 E 1,511,995.0588
C.C. N 901,313.0010 E 1,511,504.6368
BACK = N 78° 49' 46.6563" E
AHEAD = N 70° 54' 58.9134" E
CHORD BEAR = N 74° 52' 22.7849" E

COURSE FROM PT S294G TO PC S294H N 70° 54' 58.9135" E DIST 90.4226

CURVE DATA

CURVE S294H
P.I. STATION 33+32.7333 N 899,979.6253 E 1,512,238.4033
DELTA = 31° 07' 13.1117" (RT)
DEGREE = 9° 32' 57.4677"
TANGENT = 167.0733
LENGTH = 325.8911
RADIUS = 600.0000
EXTERNAL = 22.8270
LONG CHORD = 321.8999
MID. ORD. = 21.9904
P.C. STATION 31+65.6600 N 899,925.0010 E 1,512,080.5120
P.T. STATION 34+91.5511 N 899,944.7842 E 1,512,401.8034
C.C. N 899,357.9756 E 1,512,276.6808
BACK = N 70° 54' 58.9134" E
AHEAD = S 77° 57' 47.9749" E
CHORD BEAR = N 86° 28' 35.4692" E

ENDING CHAIN S294 DESCRIPTION

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

PLANS PREPARED BY: 235 MAGRATH DARBY BLVD. SUITE 275 MT. PLEASANT, SC 29464 (843) 556-2624

JMT

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

TOPO. _____ DATE _____
DWG. _____ DATE _____ GROUP ____ - ____
R/W _____ DATE _____

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION
ROAD DESIGN COLUMBIA, S.C.

ANDERSON COUNTY
S-294 (E. BROAD ST.) OVER WILSON CREEK

REFERENCE DATA SHEET /
PLAN SHEET LAYOUT

SCALE: 1" = 100' RTE. S-294

FED. ROAD DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	ANDERSON	8862230	S-294	4

NOTE: NO PRESENT R/W INDICATED FROM SURVEY.

NOTE: MATERIAL STAGING AND LAYDOWN WILL BE HANDLED FROM THE EXISTING ROADBED DURING CLOSURE

CONSTRUCT STIFFNESS TRANSITION MT BBC2
CONSTRUCT LEADING END TREATMENT MT2

END CONSTRUCTION
℄ S-294 POT STA. 25+40.00

BEGIN CONSTRUCTION
℄ S-294 POC STA. 13+75.00

REMOVE EXISTING CONC. BRIDGE
CONSTR. 120' X 33' CONC. BRIDGE
STA. 20+22.00 TO STA. 21+42.00 WITH 20'
CONC. APPROACH SLAB EACH END.
(SEE BRIDGE PLANS)

A — CONST. BRIDGE APPROACH SHOULDER PAVING, CONC. CURB & GUTTER (2'-0") VERTICAL FACE WITH FLUME INLET, 4' SLOPE FLUME AND PLACE 10 TONS RIPRAP (CLASS B) AND 25 SY GEOTEXTILE (CLASS 2) TYPE C, PER STD. DWGS. 719-920-00, 803-325-70, 805-325-75, 805-325-76

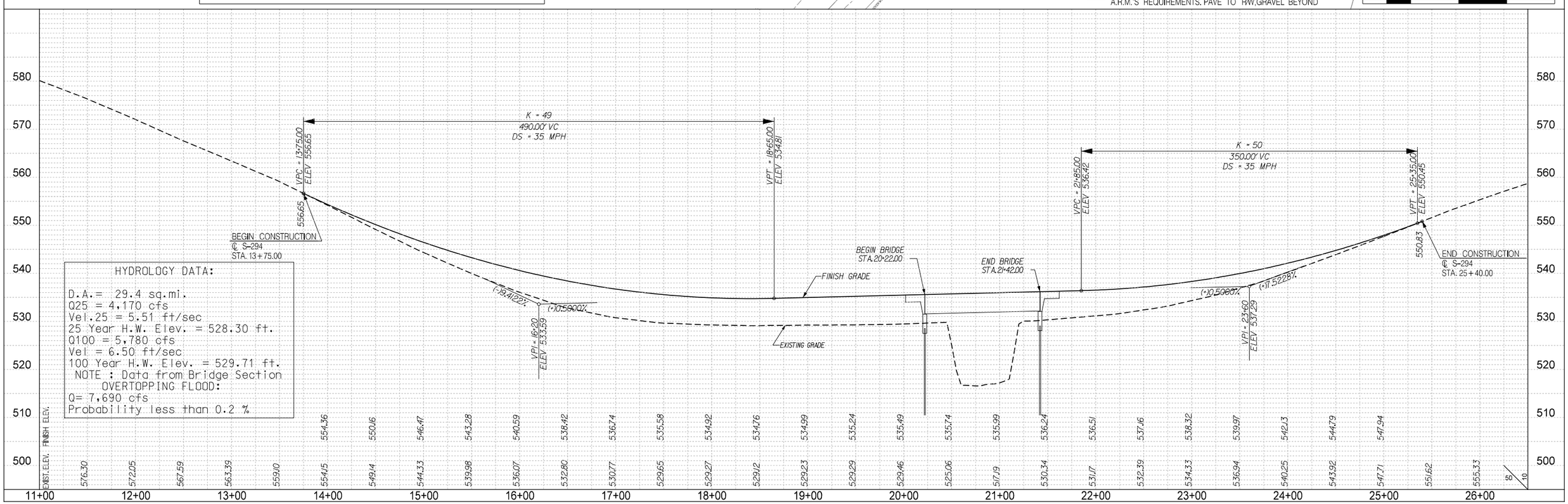
B — CONST. BRIDGE APPROACH SHOULDER PAVING, CONC. CURB & GUTTER (2'-0") VERTICAL FACE

C — DRIVEWAY GRADING REQUIRED FOLLOWING A.R.M.'S REQUIREMENTS. PAVE TO R/W, GRAVEL BEYOND

ALIGNMENT CONTROL CAN BE FOUND ON REFERENCE SHEET

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

0 50 100 150 200



HYDROLOGY DATA:

D.A.= 29.4 sq.mi.
Q25 = 4,170 cfs
Vel.25 = 5.51 ft/sec
25 Year H.W. Elev. = 528.30 ft.
Q100 = 5,780 cfs
Vel = 6.50 ft/sec
100 Year H.W. Elev. = 529.71 ft.
NOTE : Data from Bridge Section
OVERTOPPING FLOOD:
Q= 7,690 cfs
Probability less than 0.2 %

engpro.dgn

SHEET NO.	TOTAL SHEETS
1	3

INDEX OF SHEETS

1. Title Sheet
2. Roadway Typical Section
3. Roadway Plan and Profile

SCDOT

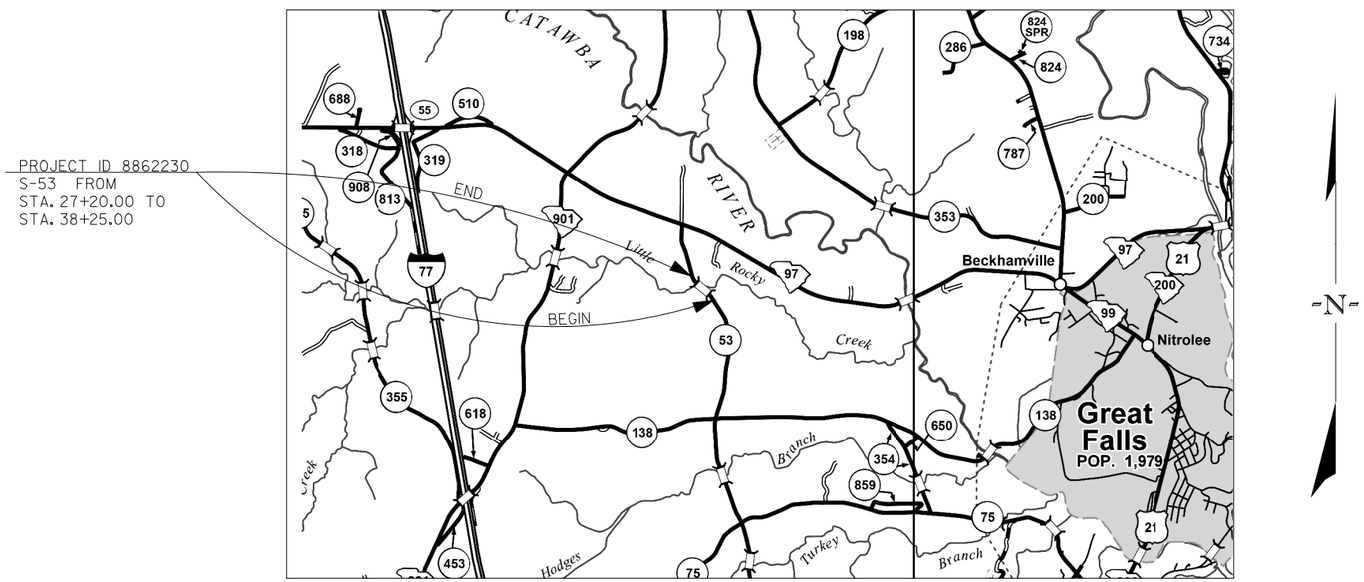
South Carolina Department of Transportation

PROPOSED PLANS FOR CHESTER COUNTY PROJECT ID: 8862230 S-53 (ROSS DYE RD.) REPLACE BRIDGE OVER LITTLE ROCKY CREEK

Design Reference for these plans is the:

2021

SCDOT Roadway Design Manual



LAYOUT

Approximate Location of Bridge is

Latitude	34°- 35' - 23"
Longitude	80°- 58' - 26"

ASSET ID 5909

TRAFFIC DATA

2020	ADT	550	V.P.D.	
2042	ADT	803	V.P.D.	
TRUCKS	9	%		

NET LENGTH OF ROADWAY	0.144	MILES
NET LENGTH OF BRIDGES	0.065	MILES
NET LENGTH OF PROJECT	0.209	MILES
LENGTH OF EXCEPTIONS	0.000	MILES
GROSS LENGTH OF PROJECT	0.209	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 (2007 EDITION) AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF THE FINAL RFP.

CROWDER

CONSULTING ENGINEERING FIRM

JMT

235 Magrath Darby Blvd.
Suite 275
Mt. Pleasant, SC 29464

ENGINEER OF RECORD

CONCEPTUAL PLANS

NOT FOR CONSTRUCTION

FOR CONSTRUCTION : _____ _____ DATE

TYPICAL SECTION OF IMPROVEMENT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
COLUMBIA, SC

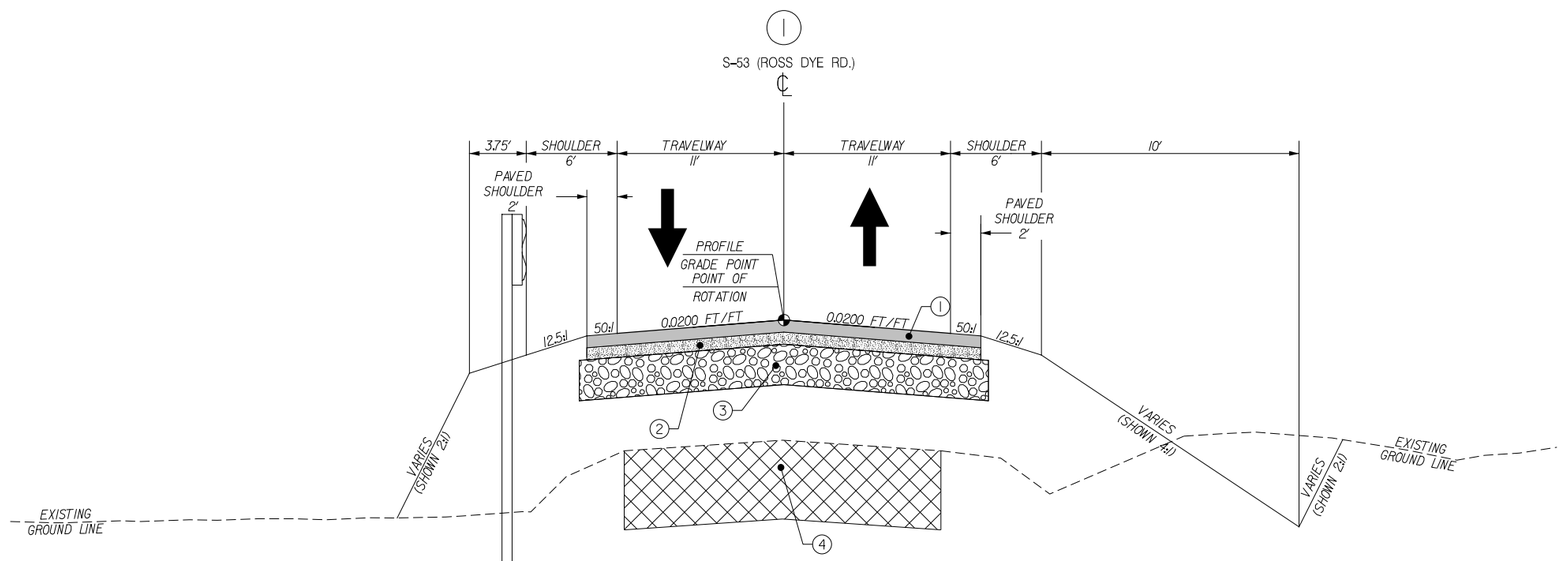
FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	CHESTER	8862230	S-53	2

NOTES:

1. SIDE SLOPES MAY BE VARIED WHEN A DEEPER DITCH IS NECESSARY FOR DRAINAGE PURPOSES, USING A MINIMUM SLOPE OF 12.5:1 AND A MAXIMUM SLOPE OF 4:1. WHERE A DEEPER DITCH THAN PROVIDED BY A 4:1 IS NECESSARY, THE DITCH SHALL BE PLACED FARTHER FROM THE CENTERLINE CONTINUING THE 4:1 SLOPE TO PROVIDE FOR THE NECESSARY DEPTH WHERE POSSIBLE. SEE CROSS SECTIONS FOR ACTUAL DITCH SLOPES, WIDTHS, AND ELEVATIONS.

   FILL SLOPES:
   0' TO 5' HEIGHT 6:1
   5' TO 10' HEIGHT 4:1
   OVER 10' HEIGHT 2:1

2. 2:1 IS THE MAXIMUM FOR SIDE SLOPES AND BACK SLOPES.
3. SLOPE VARIES SEE CROSS SECTIONS FOR SLOPES.
4. ADD 3.75' WHERE GUARDRAIL IS NEEDED. PROVIDE ASPHALT NON-MOW STRIP UUNDER GUARDRAIL IN ACCORDANCE WITH THE SPECIAL PROVISIONS. SEE PLANS AND CROSS SECTIONS FOR LOCATION OF GUARDRAIL.
5. IF PROPOSED PAVEMENT SURFACE IS MORE THAN 12 INCHES BUT LESS THAN 2' ABOVE THE EXISTING PAVEMENT IT IS TO BE SCARIFIED, REMIXED, AND COMPACTED AS SUBGRADE. SEE SPEC. 205.4.5. IF THE EXISTING ASPHALT IS BELOW 24" UNDER THE ROAD IT CAN BE LEFT IN PLACE AND IF IT IS WITHIN LESS THAN 12" OF THE ROAD IT MUST BE REMOVED.
6. DO NOT DISTURB BEYOND PRESENT R/W BOUNDARIES UNLESS OTHERWISE NOTED.



USE THIS SECTION:
S-53
FROM STA. 27+20.00 TO STA. 30+22.00
FROM STA. 33+67.00 TO STA. 38+25.00

NOTE:
BRIDGE FROM STA. 30+22.00 TO STA. 33+67.00

LEGEND

1. HOT MIX ASPHALT SURFACE COURSE TYPE "C" (175 PSY)
2. HOT MIX ASPHALT INTERMEDIATE COURSE TYPE "C" (300 PSY)
3. GRADED AGGREGATE BASE COURSE 10" UNIFORM
4. EXISTING PAVEMENT (REMOVE OR SCARIFY)

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

DESIGN SPEED

ROUTE	FUNCTIONAL CLASSIFICATION	MPH
S-53	RURAL MAJOR COLLECTOR	45

EXCEPTIONS TO DESIGN SPEED

ROUTE	STA. TO STA.		MPH

PLANS PREPARED BY: 235 MAGRATH DARBY BLVD. SUITE 275 MT. PLEASANT, SC 29464 (843) 556-2624

JMT

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

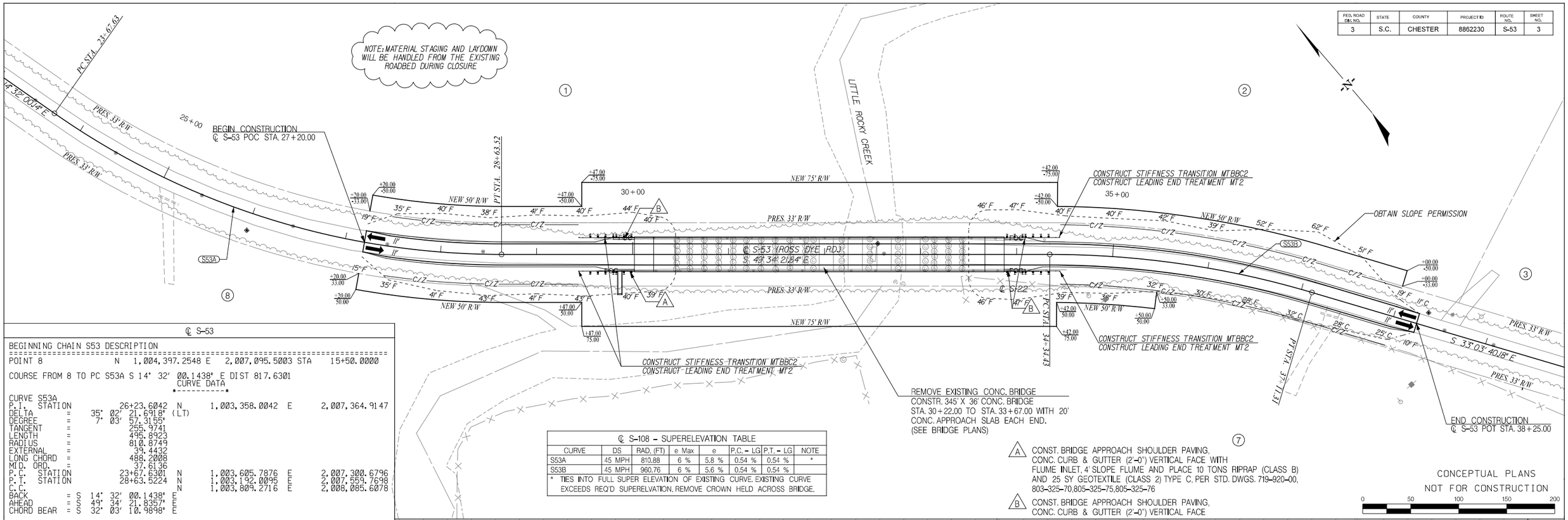
TOPO. _____ DATE _____
DWG. _____ DATE _____ GROUP _____ - _____
R/W _____ DATE _____

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION
ROAD DESIGN COLUMBIA, S.C.

CHESTER COUNTY
S-53 (ROSS DYE RD.)
OVER LITTLE ROCKY CREEK
TYPICAL SECTIONS

SCALE: N.T.S. RTE. S-53

FED. ROAD DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	CHESTER	8862230	S-53	3



℄ S-53

```
BEGINNING CHAIN S53 DESCRIPTION
==========================================================================
POINT 8                N   1,004,397.2548 E   2,007,095.5003 STA    15+50.0000

COURSE FROM 8 TO PC S53A S 14° 32' 00.1438" E DIST 817.6301
                                  CURVE DATA
                                 •----------•

CURVE S53A
P.I.   STATION              26+23.6042  N      1,003,358.0042  E      2,007,364.9147
DELTA        =      35° 02' 21.6918" (LT)
DEGREE       =       7° 03' 57.3155"
TANGENT      =               255.9741
LENGTH       =               495.8923
RADIUS       =               810.8749
EXTERNAL     =                39.4432
LONG CHORD   =               488.2008
MID. ORD.    =                37.6136
P.C.   STATION              23+67.6301  N      1,003,605.7876  E      2,007,300.6796
P.T.   STATION              28+63.5224  N      1,003,192.0095  E      2,007,559.7698
C.C.                                    N      1,003,809.2716  E      2,008,085.6078
BACK         = S  14° 32' 00.1438" E
AHEAD        = S  49° 34' 21.8357" E
CHORD BEAR   = S  32° 03' 10.9898" E

COURSE FROM PT S53A TO PC S53B S 49° 34' 21.8357" E DIST 570.9114
                                  CURVE DATA
                                 •----------•

CURVE S53B
P.I.   STATION              35+73.8356  N      1,002,731.3840  E      2,008,100.4814
DELTA        =      16° 30' 41.6542" (RT)
DEGREE       =       5° 57' 49.0373"
TANGENT      =               139.4019
LENGTH       =               276.8715
RADIUS       =               960.7548
EXTERNAL     =                10.0607
LONG CHORD   =               275.9145
MID. ORD.    =                 9.9564
P.C.   STATION              34+34.4338  N      1,002,821.7836  E      2,007,994.3645
P.I.   STATION              37+11.3053  N      1,002,614.5529  E      2,008,176.5299
C.C.                                    N      1,002,090.4285  E      2,007,371.3321
BACK         = S  49° 34' 21.8357" E
AHEAD        = S  33° 03' 40.1814" E
CHORD BEAR   = S  41° 19' 01.0085" E

COURSE FROM PT S53B TO 20 S 33° 03' 40.1814" E DIST 1,062.5801

POINT 20               N   1,001,724.0165 E   2,008,756.2034 STA    47+73.8854
==========================================================================
ENDING CHAIN S53 DESCRIPTION
```

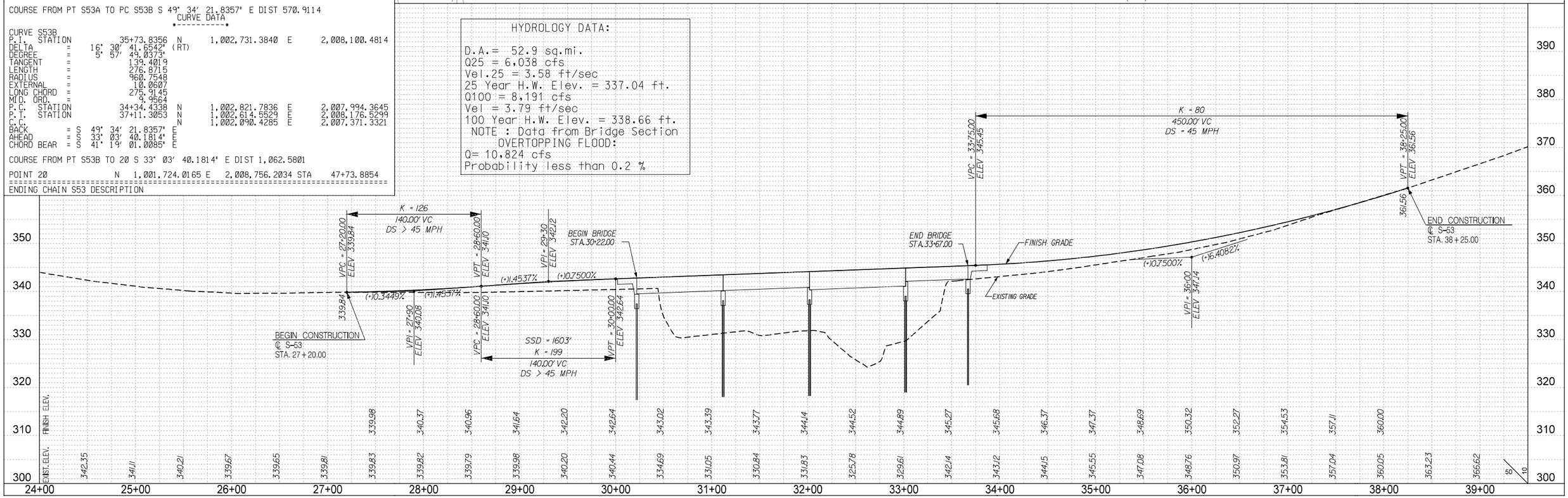
℄ S-108 - SUPERELEVATION TABLE

CURVE	DS	RAD. (FT)	e Max	e	P.C. - LG	P.T. - LG	NOTE
S53A	45 MPH	810.88	6 %	5.8 %	0.54 %	0.54 %	*
S53B	45 MPH	960.76	6 %	5.6 %	0.54 %	0.54 %	

* TIES INTO FULL SUPER ELEVATION OF EXISTING CURVE. EXISTING CURVE EXCEEDS REQ'D SUPERELVATION. REMOVE CROWN HELD ACROSS BRIDGE.

HYDROLOGY DATA:

D.A.= 52.9 sq.mi.
Q25 = 6,038 cfs
Vel.25 = 3.58 ft/sec
25 Year H.W. Elev. = 337.04 ft.
Q100 = 8,191 cfs
Vel = 3.79 ft/sec
100 Year H.W. Elev. = 338.66 ft.
NOTE : Data from Bridge Section
OVERTOPPING FLOOD:
Q= 10,824 cfs
Probability less than 0.2 %



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SHEET NO.	TOTAL SHEETS
1	3

INDEX OF SHEETS

1. Title Sheet
2. Roadway Typical Section
3. Roadway Plan and Profile

SCDOT

South Carolina Department of Transportation

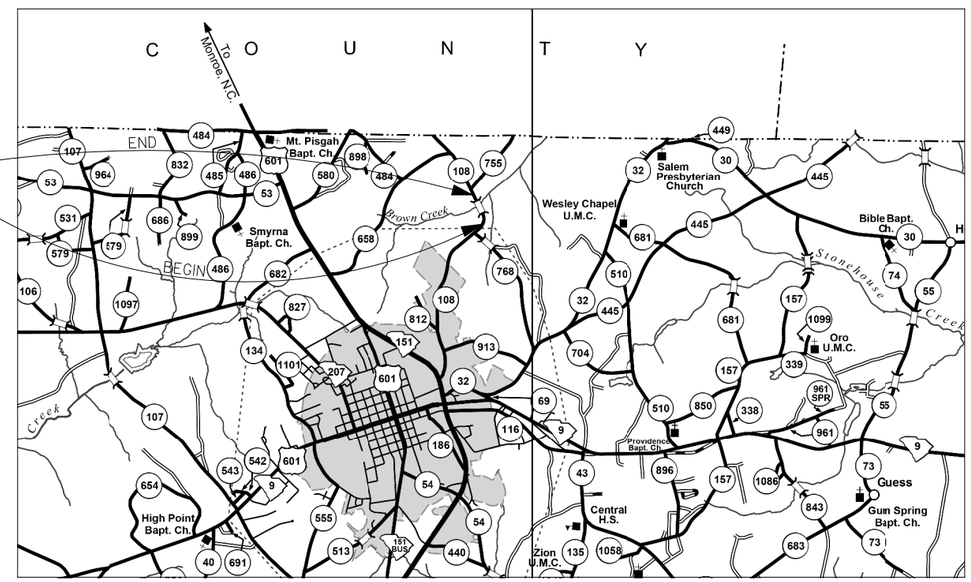
Design Reference for these plans is the:

LVB

Supplemental Design Criteria For
Low Volume Bridge Replacement Projects

PROPOSED PLANS FOR CHESTERFIELD COUNTY PROJECT ID: 8862230 S-108 (OUTEN ST.) REPLACE BRIDGE OVER BROWN CREEK

PROJECT ID 8862230
S-108 FROM
STA. 113+65.00 TO
STA. 121+70.00



LAYOUT

N

Approximate Location of Bridge is

Latitude	34°- 48' - 13"
Longitude	80°- 22' - 32"

ASSET ID 7228

TRAFFIC DATA

2020 ADT 75 V.P.D.

2042 ADT 115 V.P.D.

TRUCKS 5 %

NET LENGTH OF ROADWAY	0.138	MILES
NET LENGTH OF BRIDGES	0.014	MILES
NET LENGTH OF PROJECT	0.152	MILES
LENGTH OF EXCEPTIONS	0.000	MILES
GROSS LENGTH OF PROJECT	0.152	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 (2007 EDITION) AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF THE FINAL RFP.

CROWDER

CONSULTING ENGINEERING FIRM

JMT

235 Magrath Darby Blvd.
Suite 275
Mt. Pleasant, SC 29464

ENGINEER OF RECORD

CONCEPTUAL PLANS

NOT FOR CONSTRUCTION

FOR CONSTRUCTION : _____ _____ DATE

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	CHESTERFIELD	8862230	S-108	2

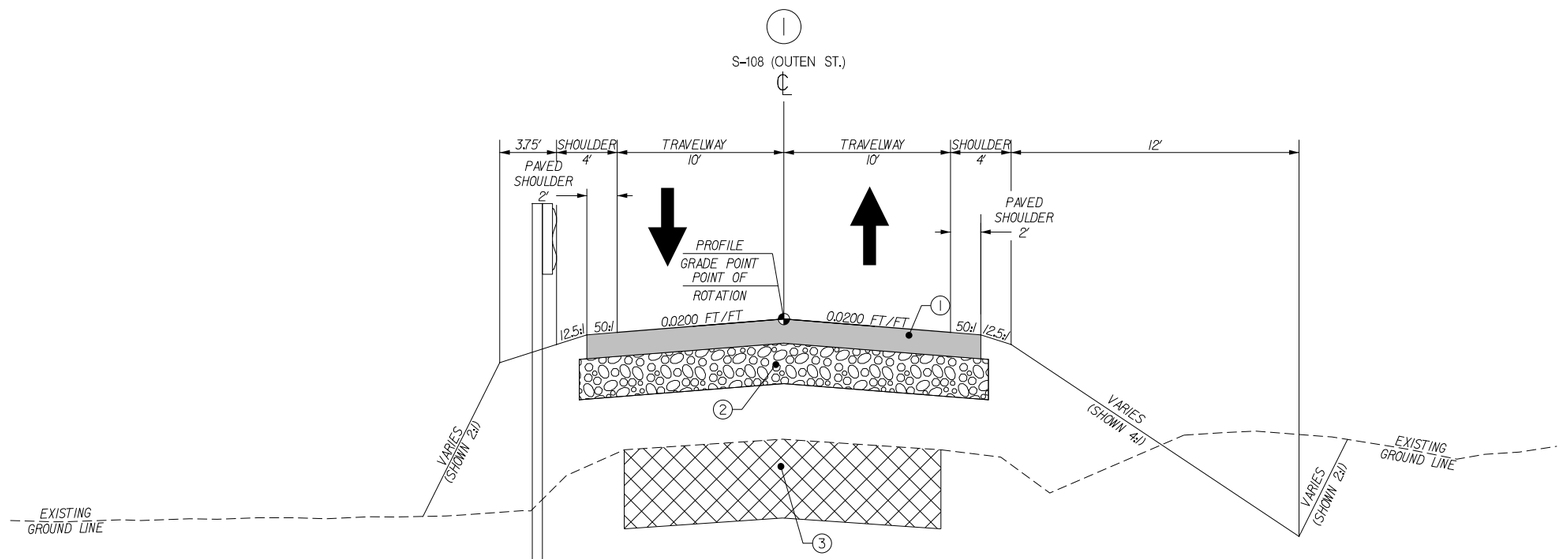
TYPICAL SECTION OF IMPROVEMENT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
COLUMBIA, SC

NOTES:

1. SIDE SLOPES MAY BE VARIED WHEN A DEEPER DITCH IS NECESSARY FOR DRAINAGE PURPOSES, USING A MINIMUM SLOPE OF 12.5:1 AND A MAXIMUM SLOPE OF 4:1. WHERE A DEEPER DITCH THAN PROVIDED BY A 4:1 IS NECESSARY, THE DITCH SHALL BE PLACED FARTHER FROM THE CENTERLINE CONTINUING THE 4:1 SLOPE TO PROVIDE FOR THE NECESSARY DEPTH WHERE POSSIBLE. SEE CROSS SECTIONS FOR ACTUAL DITCH SLOPES, WIDTHS, AND ELEVATIONS.

   FILL SLOPES:
   0' TO 5' HEIGHT 6:1
   5' TO 10' HEIGHT 4:1
   OVER 10' HEIGHT 2:1

2. 2:1 IS THE MAXIMUM FOR SIDE SLOPES AND BACK SLOPES.
3. SLOPE VARIES SEE CROSS SECTIONS FOR SLOPES.
4. ADD 3.75' WHERE GUARDRAIL IS NEEDED. PROVIDE ASPHALT NON-MOW STRIP UUNDER GUARDRAIL IN ACCORDANCE WITH THE SPECIAL PROVISIONS. SEE PLANS AND CROSS SECTIONS FOR LOCATION OF GUARDRAIL.
5. IF PROPOSED PAVEMENT SURFACE IS MORE THAN 12 INCHES BUT LESS THAN 2' ABOVE THE EXISTING PAVEMENT IT IS TO BE SCARIFIED, REMIXED, AND COMPACTED AS SUBGRADE. SEE SPEC. 205.4.5. IF THE EXISTING ASPHALT IS BELOW 24" UNDER THE ROAD IT CAN BE LEFT IN PLACE AND IF IT IS WITHIN LESS THAN 12" OF THE ROAD IT MUST BE REMOVED.
6. DO NOT DISTURB BEYOND PRESENT R/W BOUNDARIES UNLESS OTHERWISE NOTED.



USE THIS SECTION:
S-108
FROM STA. 113+65.00 TO STA. 117+69.00
FROM STA. 118+44.00 TO STA. 121+70.00

NOTE:
BRIDGE FROM STA. 117+69.00 TO STA. 118+44.00

LEGEND	
1	HOT MIX ASPHALT SURFACE COURSE TYPE "C" (175 PSY)
2	GRADED AGGREGATE BASE COURSE 8" UNIFORM
3	EXISTING PAVEMENT (REMOVE OR SCARIFY)

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

DESIGN SPEED		
ROUTE	FUNCTIONAL CLASSIFICATION	MPH
S-108	RURAL LOCAL GROUP 4	45

EXCEPTIONS TO DESIGN SPEED			
ROUTE	STA. TO STA.		MPH

PLANS PREPARED BY: 235 MAGRATH DARBY BLVD. SUITE 275 MT. PLEASANT, SC 29464 (843) 556-2624

JMT

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

TOPO. _____ DATE _____
DWG. _____ DATE _____ GROUP ____ - ____
R/W _____ DATE _____

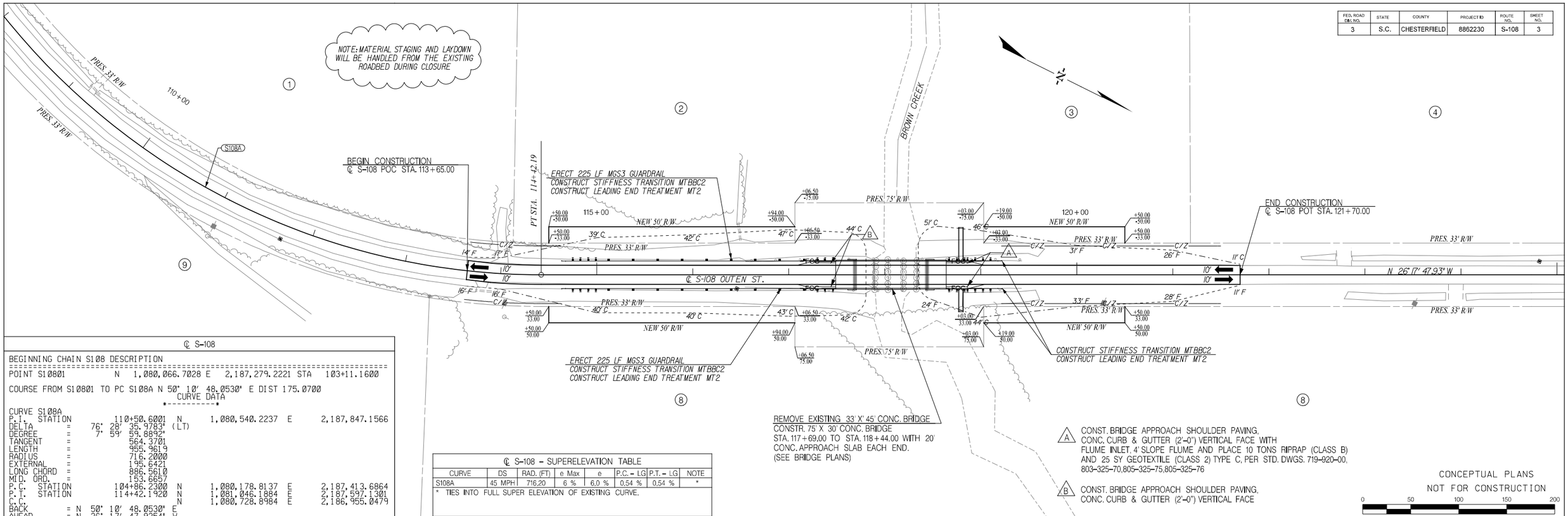
SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION
ROAD DESIGN COLUMBIA, S.C.

CHESTERFIELD COUNTY
S-108 (OUTEN ST.) OVER BROWN CREEK

TYPICAL SECTIONS

SCALE: N.T.S. RTE. S-108

FED. ROAD DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	CHESTERFIELD	8862230	S-108	3



℄ S-108

BEGINNING CHAIN S108 DESCRIPTION

POINT S10801 N 1,080,066.7028 E 2,187,279.2221 STA 103+11.1600

COURSE FROM S10801 TO PC S108A N 50° 10' 48.0530" E DIST 175.0700

CURVE DATA

CURVE S108A
P.I. STATION 110+50.6001 N 1,080,540.2237 E 2,187,847.1566
DELTA = 76° 28' 35.9783" (LT)
DEGREE = 7° 59' 59.8892"
TANGENT = 564.3701
LENGTH = 955.9619
RADIUS = 716.2000
EXTERNAL = 195.6421
LONG CHORD = 886.5610
MID. ORD. = 153.6657
P.C. STATION 104+86.2300 N 1,080,178.8137 E 2,187,413.6864
P.I. STATION 114+42.1920 N 1,081,046.1884 E 2,187,597.1301
C.C. N 1,080,728.8984 E 2,186,955.0479
BACK = N 50° 10' 48.0530" E
AHEAD = N 26° 17' 47.9254" W
CHORD BEAR = N 11° 56' 30.0638" E

COURSE FROM PT S108A TO S10802 N 26° 17' 47.9254" W DIST 1,868.9696

POINT S10802 N 1,082,721.7428 E 2,186,769.1416 STA 133+11.1616

ENDING CHAIN S108 DESCRIPTION

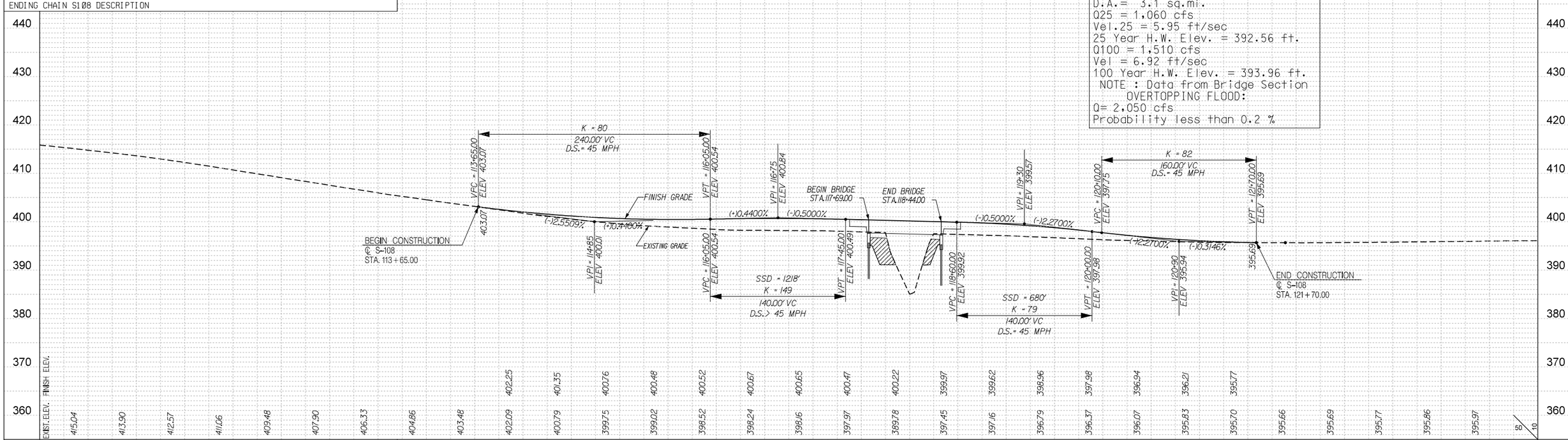
℄ S-108 - SUPERELEVATION TABLE

CURVE	DS	RAD. (FT)	e Max	e	P.C. - LG	P.T. - LG	NOTE
S108A	45 MPH	716.20	6 %	6.0 %	0.54 %	0.54 %	*

* TIES INTO FULL SUPER ELEVATION OF EXISTING CURVE.

HYDROLOGY DATA:

D.A. = 3.1 sq.mi.
Q25 = 1,060 cfs
Vel.25 = 5.95 ft/sec
25 Year H.W. Elev. = 392.56 ft.
Q100 = 1,510 cfs
Vel = 6.92 ft/sec
100 Year H.W. Elev. = 393.96 ft.
NOTE : Data from Bridge Section
OVERTOPPING FLOOD:
Q= 2,050 cfs
Probability less than 0.2 %



engpro.dgn

SHEET NO.	TOTAL SHEETS
1	3

INDEX OF SHEETS

1. Title Sheet
2. Roadway Typical Section
3. Roadway Plan and Profile

SCDOT

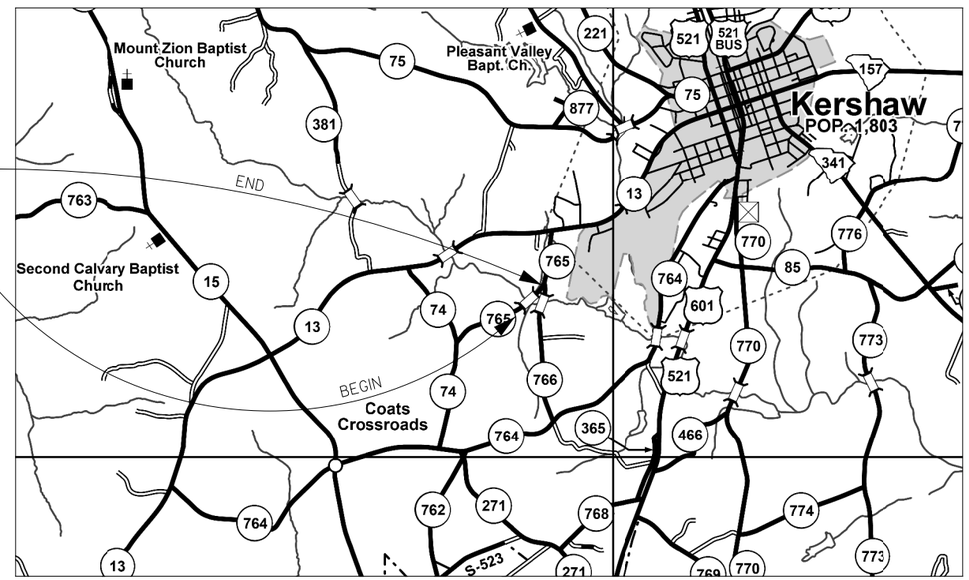
South Carolina Department of Transportation

Design Reference for these plans is the:

LVB

Supplemental Design Criteria For
Low Volume Bridge Replacement Projects

PROPOSED PLANS FOR LANCASTER COUNTY PROJECT ID: 8862230 S-765 (HANGING ROCK CHURCH RD.) REPLACE BRIDGE OVER HANGING ROCK CREEK



LAYOUT

Approximate Location of Bridge is

Latitude	34°- 31' - 35"
Longitude	80°- 36' - 37"

ASSET ID 2771

TRAFFIC DATA

2020 ADT 210 V.P.D.

2042 ADT 256 V.P.D.

TRUCKS 5 %

NET LENGTH OF ROADWAY	0.097	MILES
NET LENGTH OF BRIDGES	0.040	MILES
NET LENGTH OF PROJECT	0.137	MILES
LENGTH OF EXCEPTIONS	0.000	MILES
GROSS LENGTH OF PROJECT	0.137	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 (2007 EDITION) AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF THE FINAL RFP.

CROWDER

CONSULTING ENGINEERING FIRM

JMT

235 Magrath Darby Blvd.
Suite 275
Mt. Pleasant, SC 29464

ENGINEER OF RECORD

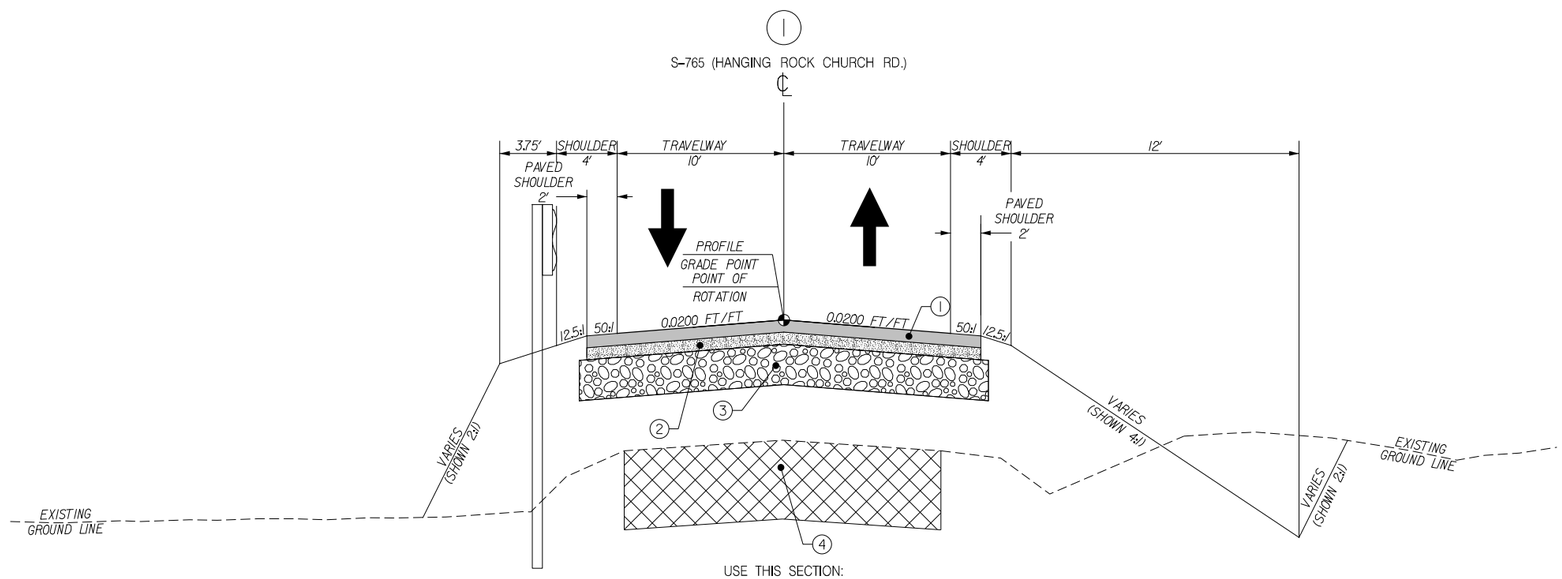
CONCEPTUAL PLANS

NOT FOR CONSTRUCTION

FOR CONSTRUCTION : _____ _____
DATE

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	LANCASTER	8862230	S-765	2

TYPICAL SECTION OF IMPROVEMENT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
COLUMBIA, SC



USE THIS SECTION:
S-765
FROM STA. 31+85.00 TO STA. 33+73.50
FROM STA. 35+83.50 TO STA. 39+10.00

NOTE:
BRIDGE FROM STA. 33+73.50 TO STA. 35+83.50

NOTES:

1. SIDE SLOPES MAY BE VARIED WHEN A DEEPER DITCH IS NECESSARY FOR DRAINAGE PURPOSES, USING A MINIMUM SLOPE OF 12.5:1 AND A MAXIMUM SLOPE OF 4:1. WHERE A DEEPER DITCH THAN PROVIDED BY A 4:1 IS NECESSARY, THE DITCH SHALL BE PLACED FARTHER FROM THE CENTERLINE CONTINUING THE 4:1 SLOPE TO PROVIDE FOR THE NECESSARY DEPTH WHERE POSSIBLE. SEE CROSS SECTIONS FOR ACTUAL DITCH SLOPES, WIDTHS, AND ELEVATIONS.

   FILL SLOPES:
   0' TO 5' HEIGHT 6:1
   5' TO 10' HEIGHT 4:1
   OVER 10' HEIGHT 2:1

2. 2:1 IS THE MAXIMUM FOR SIDE SLOPES AND BACK SLOPES.

3. SLOPE VARIES SEE CROSS SECTIONS FOR SLOPES.

4. ADD 3.75' WHERE GUARDRAIL IS NEEDED. PROVIDE ASPHALT NON-MOW STRIP UUNDER GUARDRAIL IN ACCORDANCE WITH THE SPECIAL PROVISIONS. SEE PLANS AND CROSS SECTIONS FOR LOCATION OF GUARDRAIL.

5. IF PROPOSED PAVEMENT SURFACE IS MORE THAN 12 INCHES BUT LESS THAN 2' ABOVE THE EXISTING PAVEMENT IT IS TO BE SCARIFIED, REMIXED, AND COMPACTED AS SUBGRADE. SEE SPEC. 205.4.5. IF THE EXISTING ASPHALT IS BELOW 24" UNDER THE ROAD IT CAN BE LEFT IN PLACE AND IF IT IS WITHIN LESS THAN 12" OF THE ROAD IT MUST BE REMOVED.

6. DO NOT DISTURB BEYOND PRESENT R/W BOUNDARIES UNLESS OTHERWISE NOTED.

LEGEND

1. HOT MIX ASPHALT SURFACE COURSE TYPE "C" (150 PSY)
2. HOT MIX ASPHALT INTERMEDIATE COURSE TYPE "C" (175 PSY)
3. GRADED AGGREGATE BASE COURSE 8" UNIFORM
4. EXISTING PAVEMENT (REMOVE OR SCARIFY)

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

DESIGN SPEED

ROUTE	FUNCTIONAL CLASSIFICATION	MPH
S-765	RURAL LOCAL GROUP 4	40

EXCEPTIONS TO DESIGN SPEED

ROUTE	STA. TO STA.		MPH

PLANS PREPARED BY: 235 MAGRATH DARBY BLVD. SUITE 275 MT. PLEASANT, SC 29464 (843) 556-2624

JMT

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

TOPO. _____ DATE _____
DWG. _____ DATE _____
R/W _____ DATE _____

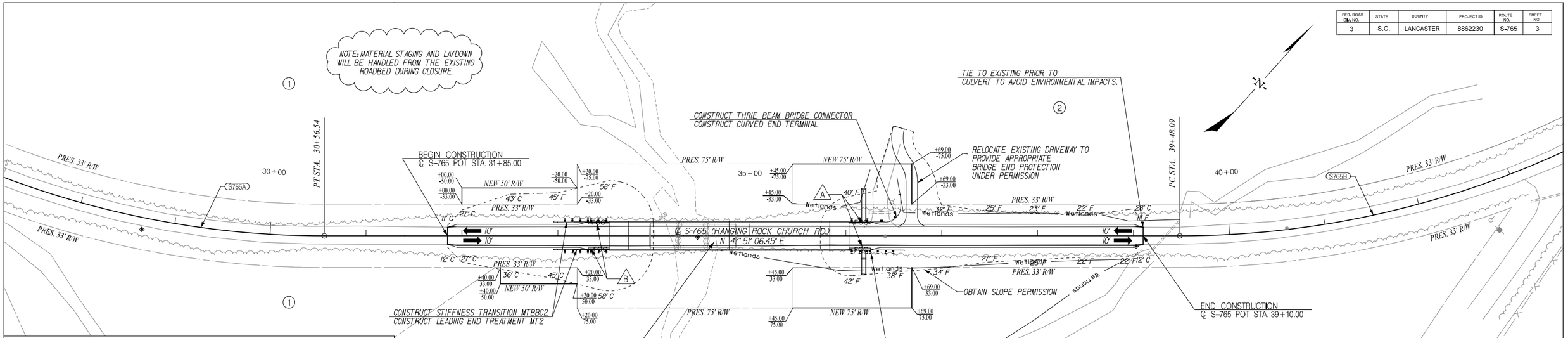
GROUP _____ - _____

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION
ROAD DESIGN COLUMBIA, S.C.

LANCASTER COUNTY
S-765 (HANGING ROCK CHURCH RD.)
OVER HANGING ROCK CREEK
TYPICAL SECTIONS

SCALE: N.T.S. RTE. S-765

FED. ROAD DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	LANCASTER	8862230	S-765	3



℄ S-765

BEGINNING CHAIN S765 DESCRIPTION

POINT S76501 N 979,643.2327 E 2,116,468.6213 STA 23+86.9000

COURSE FROM S76501 TO S76502 N 78° 53′ 37.8934" E DIST 53.8367

POINT S76502 N 979,653.6031 E 2,116,521.4497 STA 24+40.7367

COURSE FROM S76502 TO PC S765A N 80° 13′ 48.8336" E DIST 81.2192

CURVE DATA

CURVE S765A
P.I. STATION 27+96.5954 N 979,713.9886 E 2,116,872.1476
DELTA = 32° 22′ 42.3871" (LT)
DEGREE = 6° 03′ 24.3609"
TANGENT = 274.6395
LENGTH = 534.5829
RADIUS = 945.9796
EXTERNAL = 39.0606
LONG CHORD = 527.4980
MID. ORD. = 37.5117
P.C. STATION 25+21.9559 N 979,667.3852 E 2,116,601.4910
P.T. STATION 30+56.5388 N 979,898.2856 E 2,117,075.7685
C.C. N 980,599.6457 E 2,116,440.9682
BACK = N 80° 13′ 48.8336" E
AHEAD = N 47° 51′ 06.4465" E
CHORD BEAR = N 64° 02′ 27.6400" E

COURSE FROM PT S765A TO PC S765B N 47° 51′ 06.4465" E DIST 891.5520

CURVE DATA

CURVE S765B
P.I. STATION 42+94.5217 N 980,729.0349 E 2,117,993.6232
DELTA = 39° 52′ 46.5488" (LT)
DEGREE = 5° 59′ 59.9516"
TANGENT = 346.4309
LENGTH = 664.6614
RADIUS = 954.9318
EXTERNAL = 60.8975
LONG CHORD = 651.3258
MID. ORD. = 57.2468
P.C. STATION 39+48.0908 N 980,496.5622 E 2,117,736.7754
P.T. STATION 46+12.7522 N 981,072.1177 E 2,118,041.6706
C.C. N 981,204.5596 E 2,117,095.9677
BACK = N 47° 51′ 06.4465" E
AHEAD = N 7° 58′ 19.8977" E
CHORD BEAR = N 27° 54′ 43.1721" E

COURSE FROM PT S765B TO S76503 N 7° 58′ 19.8977" E DIST 70.2304

POINT S76503 N 981,141.6694 E 2,118,051.4110 STA 46+82.9826

ENDING CHAIN S765 DESCRIPTION

℄ S-765 - SUPERELEVATION TABLE							
CURVE	DS	RAD. (FT)	e Max	e	P.C. - LG	P.T. - LG	NOTE
S765A	40 MPH	945.98	6 %	5 %	0.58%	0.58 %	****
S765B	40 MPH	954.93	6 %	5 %	0.58 %	0.58 %	****

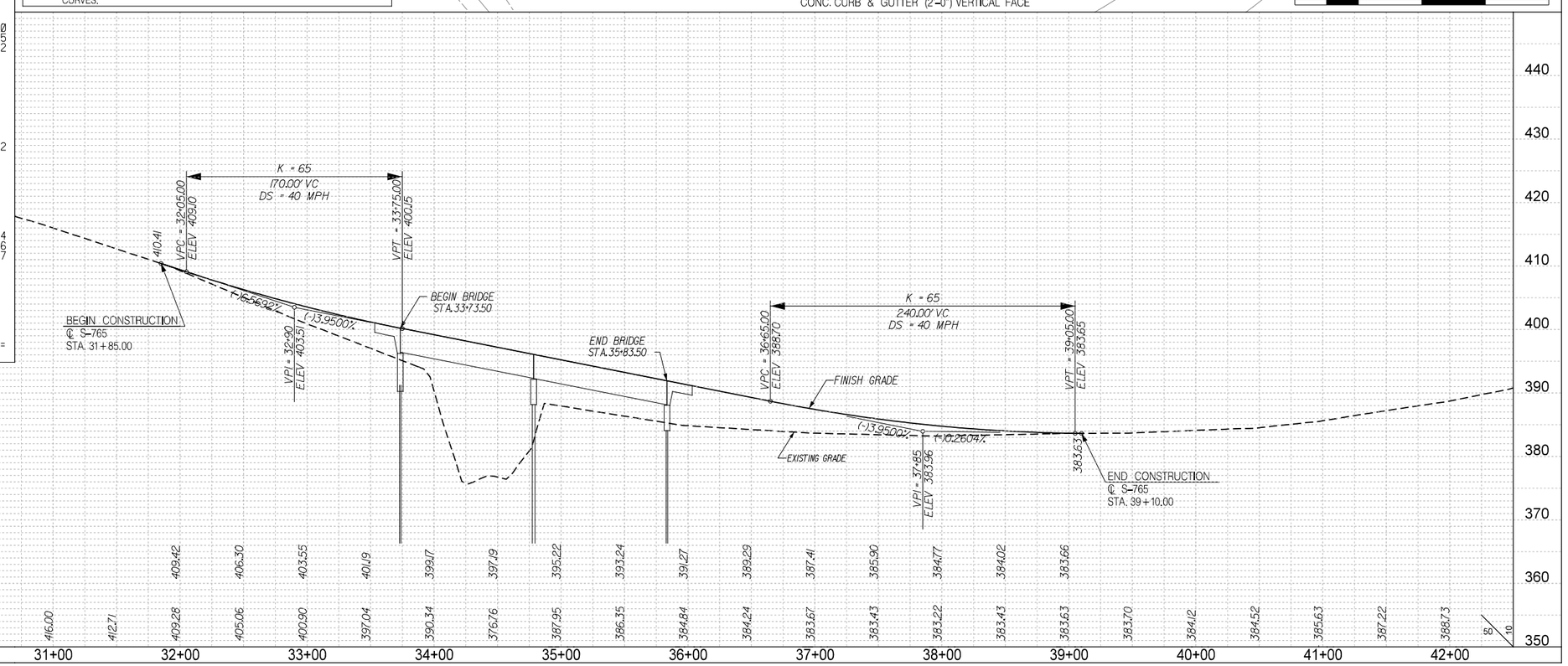
**** TIES INTO SUPER ELEVATION TRANSITION TANGENT BETWEEN EXISTING CURVES.

A CONST. BRIDGE APPROACH SHOULDER PAVING, CONC. CURB & GUTTER (2'-0") VERTICAL FACE WITH FLUME INLET, 4' SLOPE FLUME AND PLACE 10 TONS RIPRAP (CLASS B) AND 25 SY GEOTEXTILE (CLASS 2) TYPE C, PER STD. DWGS. 719-920-00, 803-325-70,805-325-75,805-325-76

B CONST. BRIDGE APPROACH SHOULDER PAVING, CONC. CURB & GUTTER (2'-0") VERTICAL FACE

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

0 50 100 150 200



HYDROLOGY DATA:

D.A.= 12 sq.mi.
Q25 = 2,251 cfs
Vel.25 = 2.29 ft/sec
25 Year H.W. Elev. = 383.97 ft.
Q100 = 3,215 cfs
Vel = 2.76 ft/sec
100 Year H.W. Elev. = 385.13 ft.
NOTE : Data from Bridge Section
OVERTOPPING FLOOD:
Q= 3,200 cfs
Probability less than 1.0 %

engpro.dgn

S-294 OVER WILSONS CREEK, ANDERSON COUNTY

S-53 OVER LITTLE ROCKY CREEK, CHESTER COUNTY

S-108 OVER BROWN CREEK, CHESTERFIELD COUNTY

S-765 OVER HANGING ROCK CREEK, LANCASTER COUNTY

APPENDIX A.2: CONCEPTUAL BRIDGE PLANS

BRIDGE PLANS ID	SHEET NO.
P8862230-B01	1

INDEX OF SHEETS

1. TITLE SHEET
2. S-294 PLAN & PROFILE
3. S-294 TYPICAL SECTION

SCDOT

South Carolina Department of Transportation

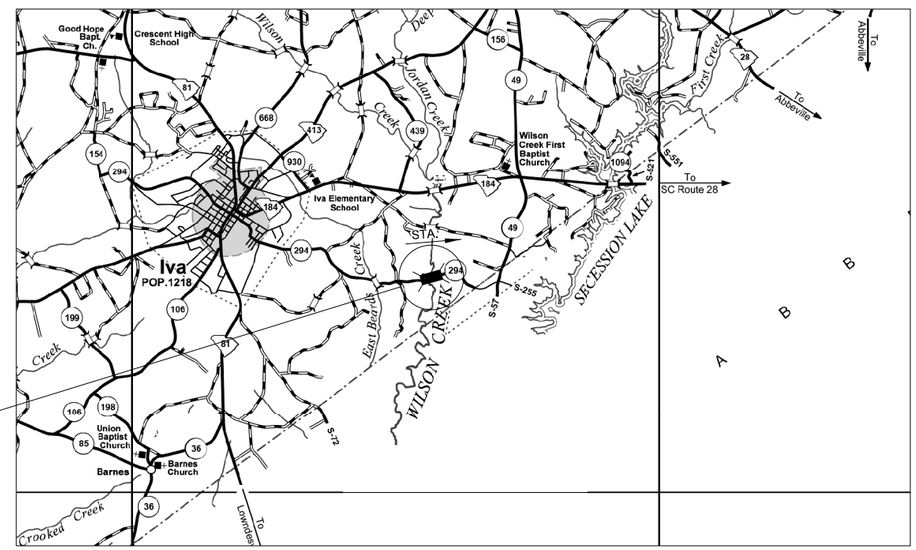
Design Reference for these plans is the:

LVB

Supplemental Design Criteria For
Low Volume Bridge Replacement Projects

PROPOSED PLANS FOR

ANDERSON COUNTY
PROJECT ID P8862230-B1
STATE ROUTE S-294 (EAST BROAD STREET)
REPLACE BRIDGE OVER WILSONS CREEK



SITE LOCATION

LAYOUT

-N-

Approximate Location of Bridge is

Latitude	34°-17'-44" N
Longitude	82°-37'-09" W

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 2650

TRAFFIC DATA

2020 ADT 150 V.P.D.

2040* ADT 219* V.P.D.

TRUCKS 2 %

*DESIGN TRAFFIC DATA

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 (2007 EDITION) AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF THE FINAL RFP.

CONSULTING ENGINEERING FIRM

JMT

235 Magrath Darby Blvd.
Suite 275
Mt. Pleasant, SC 29464

ENGINEER OF RECORD

CONCEPTUAL PLANS

NOT FOR CONSTRUCTION

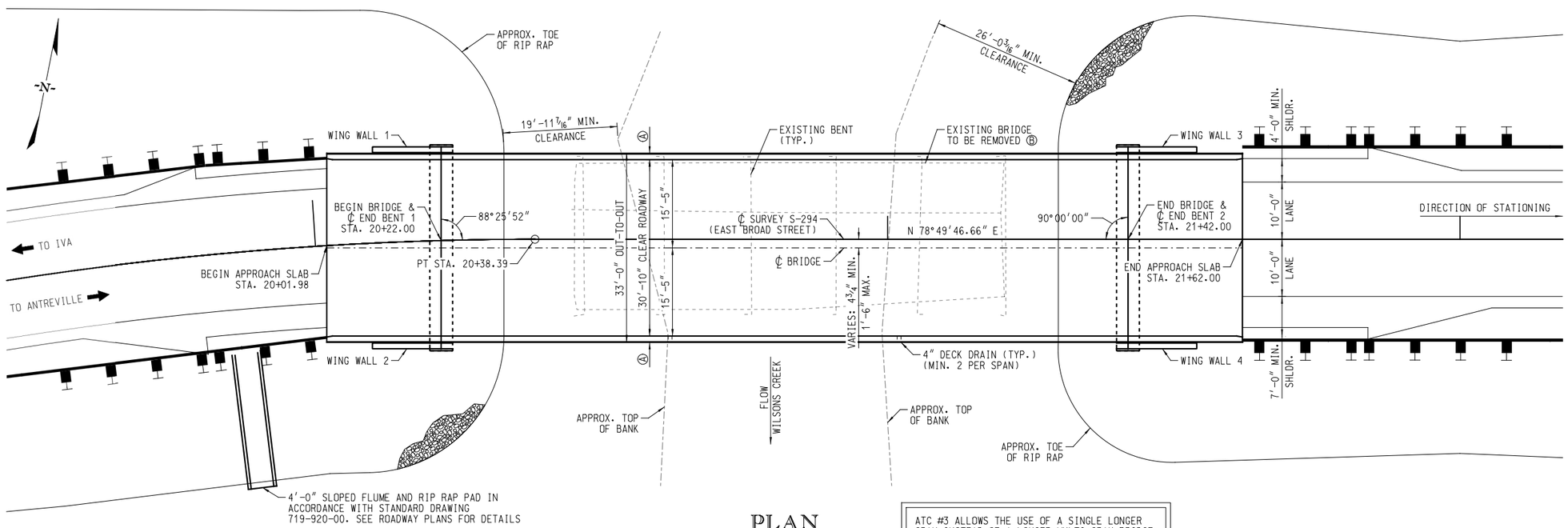
FOR CONSTRUCTION : _____ _____ DATE

LBryant
1/31/2023
$FILES$

REVIEWED			
DR.	LMB	TGT	01-23
		BY	CHK	DATE
	TGT	-----	

S-294 Plan and Profile.DGN

BRIDGE PLANS ID	SHEET NO.
P8862230-B01	2



PLAN

ATC #3 ALLOWS THE USE OF A SINGLE LONGER SPAN INSTEAD OF A LONGER MULTI-SPAN BRIDGE.

ATC #4 ALLOWS USE OF AASHTO BIV FOR LONGER SPANS ON S-294 AND S-765.

NOTES:

Ⓐ INCLUDES 1'-0" MASH BARRIER PARAPET AND 1" SLAB EXTENSION.

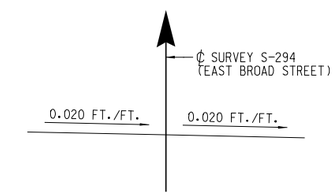
Ⓑ REMOVE AND DISPOSE OF EXISTING 27'-6" X 75'-0"± 5-SPAN SIMPLE CONCRETE SLAB BRIDGE AND APPURTENANCES IN ACCORDANCE WITH SECTION 202.4.2 OF THE STANDARD SPECIFICATIONS.

MATERIAL STAGING AND LAYDOWN WILL BE HANDLED FROM THE EXISTING ROADBED DURING CLOSURE

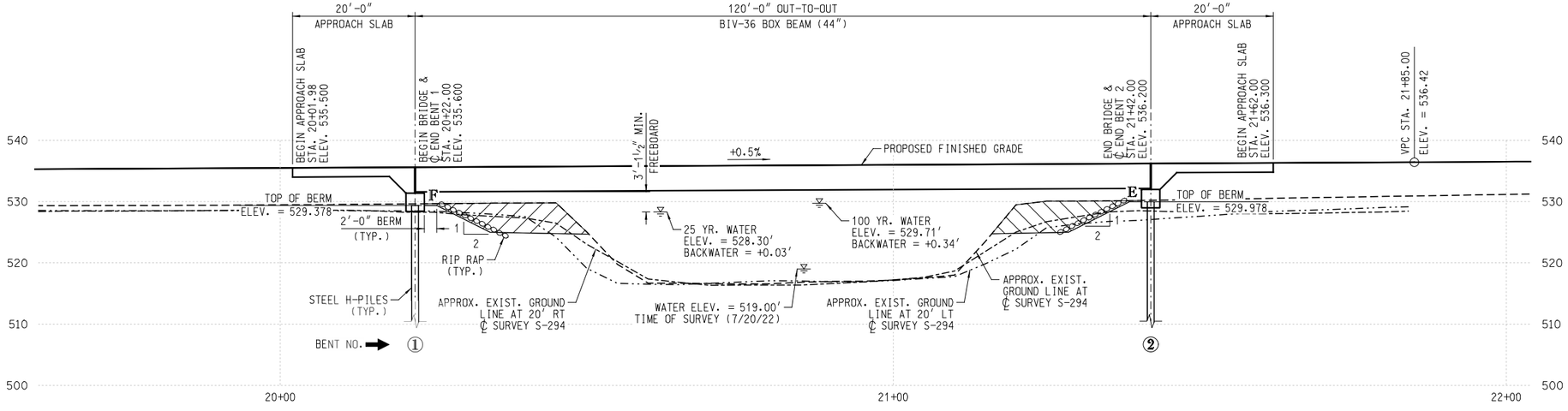
HYDROLOGY DATA:

DA = 29.4 sq mi
Q_{25} = 4,170 CFS
Vel_{25} = 5.51 FT/SEC
25 Year Flow Area = 901.1 SF
Q_{100} = 5,780 CFS
Vel_{100} = 6.50 FT/SEC
100 Year Flow Area = 1,057.4 SF
100 YR. BACKWATER = 0.34 FT

Overtopping Flood:
Q = 7,690 CFS
Probability < 0.2%



SUPERELEVATION SKETCH



SECTION ALONG ℄ SURVEY S-294

VERTICAL CURVE DATA

PVI = 16+20
ELEV. = 533.59
V.C. = 490

PVI = 23+60
ELEV. = 537.29
V.C. = 350

-9.41% +0.50% +7.52%

HORIZONTAL CURVE DATA

P.I. = 19+31.04
= 20°46'54" (RT.)
Dc = 9°34'21"
T = 109.75'
L = 217.10'
E = 9.98'
R = 598.54'

BENCHMARKS S-294

Point	Survey S-294 Station	Survey S-294 Offset	Northing	Easting	Elev.	Description
BM2	20+47.88	59.44LT	899740.841	1510979.058	527.911	
BM1	20+97.38	21.58LT	899380.551	1509306.782	632.963	

Legend
E = Expansion Bearing
F = Fixed Bearing
= Excavate Hatched Area
= Boring
= Benchmark

CONCEPTUAL PLANS

NOT FOR CONSTRUCTION

REV.			
REV.			
REV.			
REVIEWED	TGT		
QUAN.			
DR.	LMB	PDR	01-23
DES.	LMB	PDR	01-23
	BY	CHK.	DATE

JMT
235 MAGRATH DARBY BLVD, SUITE 275
MT. PLEASANT, SC 29464
(843) 556-2624

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

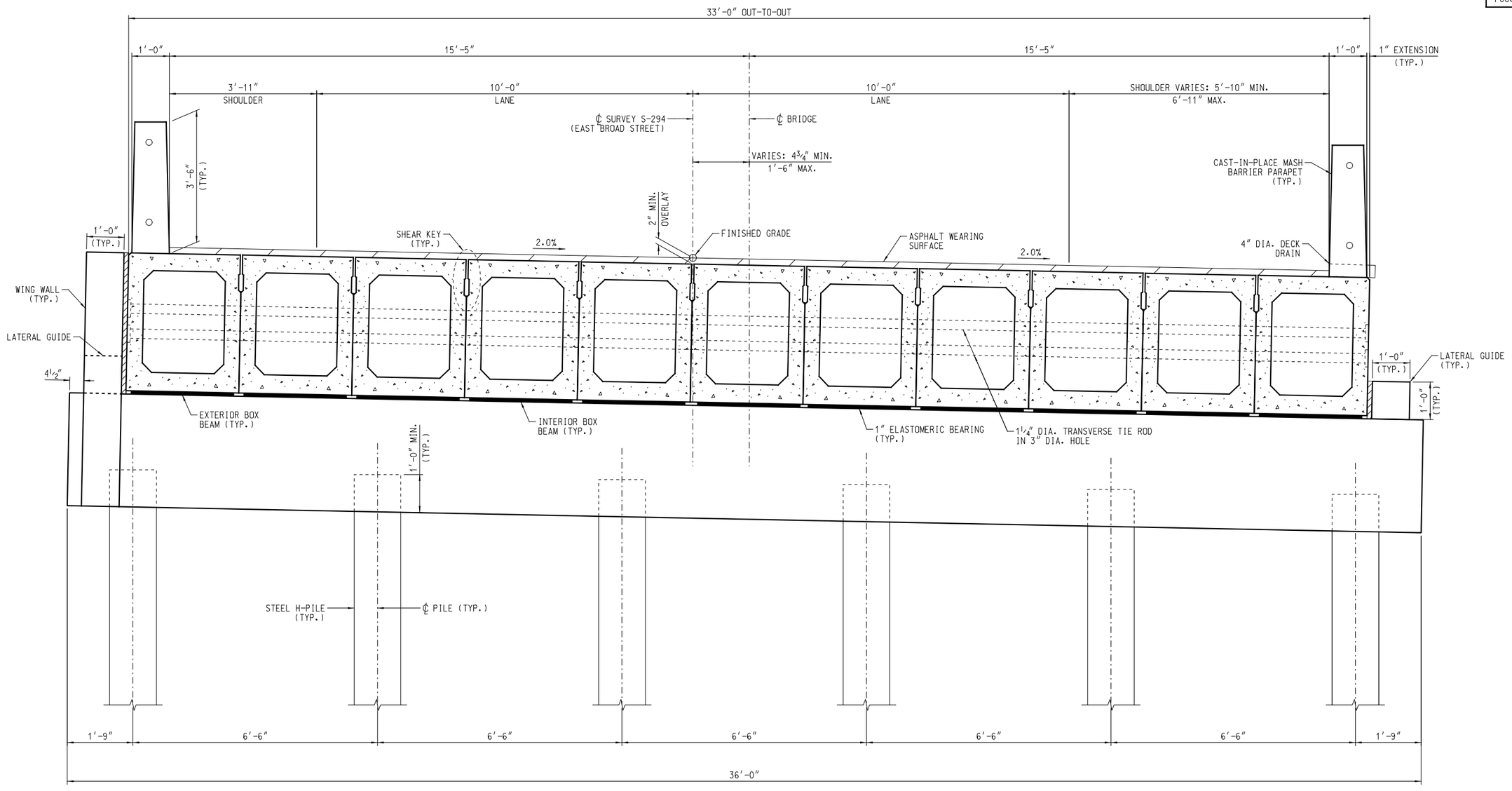
S-294 BRIDGE PLAN & PROFILE

COUNTY: ANDERSON
ROUTE: S-294

1/31/2023

S-294 Typical Section.DGN

BRIDGE PLANS ID	SHEET NO.
P8862230-B01	3



TYPICAL SECTION

(LOOKING IN DIRECTION OF STATIONING)

ATC #4 ALLOWS USE OF AASHTO BIV FOR LONGER SPANS ON S-294 AND S-765.

Legend
- E = Expansion Bearing
- F = Fixed Bearing
- = Excavate Hatched Area
- = Boring
- = Benchmark

CONCEPTUAL PLANS

NOT FOR CONSTRUCTION

REV.			
REV.			
REV.			
REVIEWED	TGT		
QUAN.			
DR.	LMB	PDR	01-23
DES.	LMB	PDR	01-23
	BY	CHK.	DATE

JMT
235 MAGRATH DARBY BLVD.
SUITE 275
MT. PLEASANT, SC 29464
(843) 556-2624

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

S-294
TYPICAL SECTION

COUNTY: ANDERSON

ROUTE: S-294

1/31/2023

BRIDGE PLANS ID	SHEET NO.
P8862230-B02	1

INDEX OF SHEETS

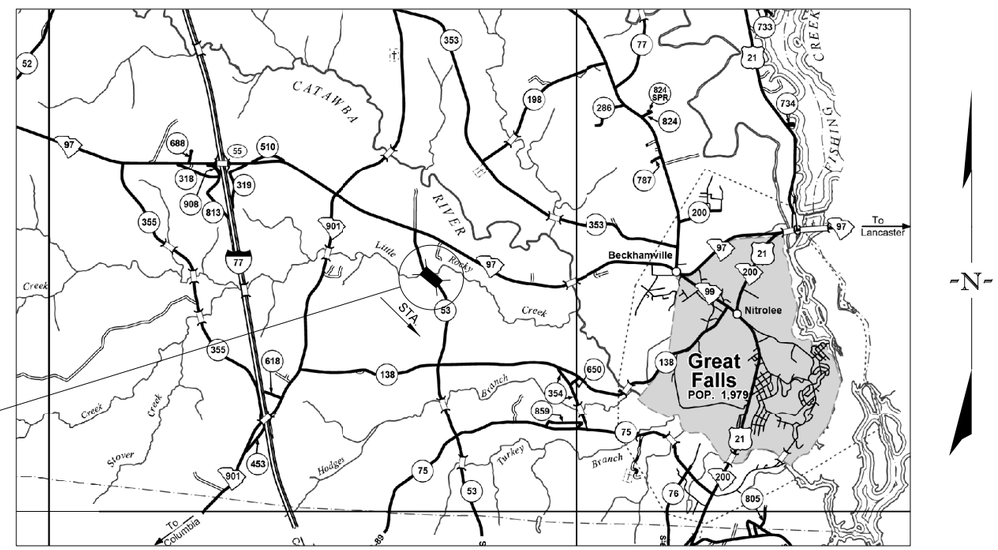
1. TITLE SHEET
2. S-53 PLAN AND PROFILE
3. S-53 TYPICAL SECTION-I
4. S-53 TYPICAL SECTION-II

SCDOT
South Carolina Department of Transportation

PROPOSED PLANS FOR

CHESTER COUNTY
PROJECT ID P8862230-B02
STATE ROUTE S-53 (ROSS DYE ROAD)
REPLACE BRIDGE OVER LITTLE ROCKY CREEK

SITE LOCATION



LAYOUT

Approximate Location of Bridge is	
Latitude	34°-35'-24" N
Longitude	80°-58'-26" W

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 5909

TRAFFIC DATA

2020	ADT	550	V.P.D.	
2040*	ADT	803*	V.P.D.	
TRUCKS	9	%		

*DESIGN TRAFFIC DATA

NET LENGTH OF ROADWAY	0.000	MILES
NET LENGTH OF BRIDGES	0.065	MILES
NET LENGTH OF PROJECT	0.065	MILES
LENGTH OF EXCEPTIONS	0.000	MILES
GROSS LENGTH OF PROJECT	0.065	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 (2007 EDITION) AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF THE FINAL RFP.

CONSULTING ENGINEERING FIRM

JMT

235 Magrath Darby Blvd.
Suite 275
Mt. Pleasant, SC 29464

ENGINEER OF RECORD

CONCEPTUAL PLANS

NOT FOR CONSTRUCTION

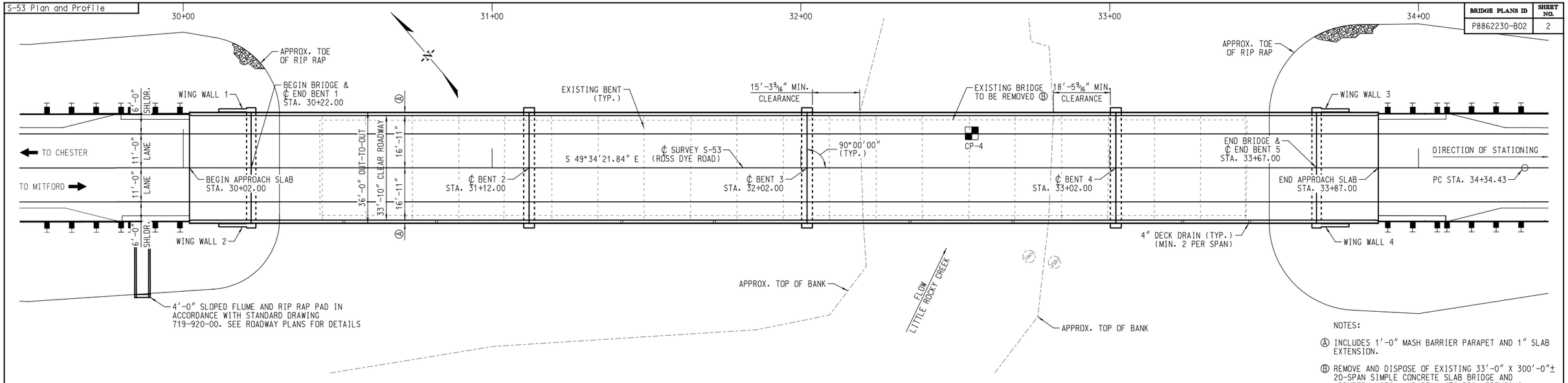
FOR CONSTRUCTION: _____ _____ DATE

LBryant
1/31/2023
$FILESS

REVIEWED			
DR.	LMB	TGT	-----
	BY	CHK	DATE

S-53 Plan and Profile

BRIDGE PLANS ID	SHEET NO.
P8862230-B02	2



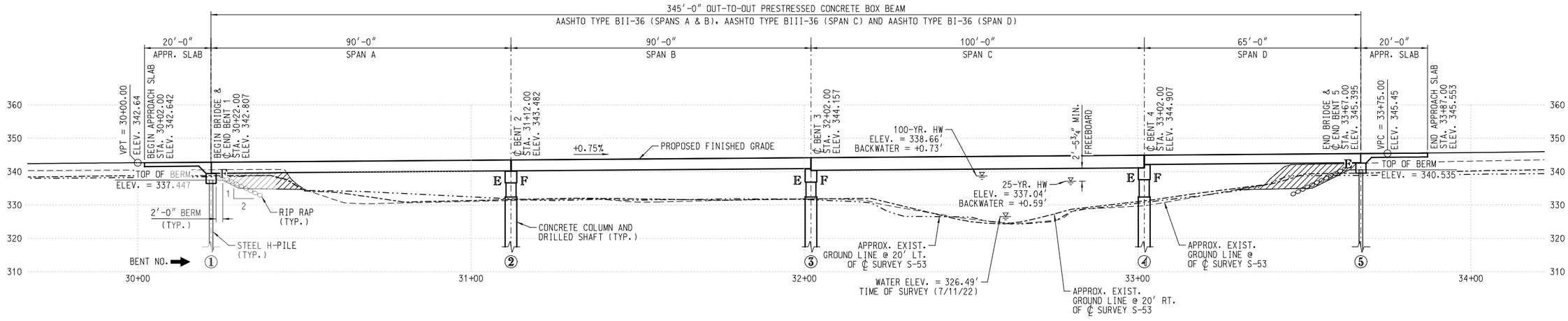
PLAN

NOTES:

Ⓐ INCLUDES 1'-0" MASH BARRIER PARAPET AND 1" SLAB EXTENSION.

Ⓑ REMOVE AND DISPOSE OF EXISTING 33'-0" X 300'-0"± 20-SPAN SIMPLE CONCRETE SLAB BRIDGE AND APPURTENANCES, AND REMNANTS FROM PREVIOUS STRUCTURES IN ACCORDANCE WITH SECTION 202.4.2 OF THE STANDARD SPECIFICATIONS.

MATERIAL STAGING AND LAYDOWN WILL BE HANDLED FROM THE EXISTING ROADBED DURING CLOSURE.

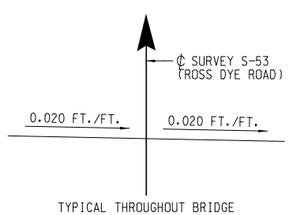


SECTION ALONG ℄ SURVEY S-53

HYDROLOGY DATA:

DA = 52.9 sq mi
Q_{25} = 6,038 CFS
Vel_{25} = 3.58 FT/SEC
25 Year Flow Area = 1,846 SF
Q_{100} = 8,191 CFS
Vel_{100} = 3.79 FT/SEC
100 Year Flow Area = 2,307 SF
100 YR BACKWATER = 0.68 FT

Overtopping Flood:
Q = 10,824 CFS
Probability < 0.2%



TYPICAL THROUGHOUT BRIDGE

SUPERELEVATION SKETCH

VERTICAL CURVE DATA

PVI = 29+30
ELEV. = 342.12
V.C. = 140

PVI = 36+00
ELEV. = 347.14
V.C. = 450

+1.45% +0.75% +6.40%

Legend

E = Expansion Bearing
F = Fixed Bearing
= Excavate Hatched Area
= Boring
= Benchmark

CONCEPTUAL PLANS

NOT FOR CONSTRUCTION

REV.			
REV.			
REV.			
REVIEWED	TGT		
QUAN.			
DR.	LMB	PDR	01-23
DES.	LMB	PDR	01-23
	BY	CHK.	DATE

JMT
235 MAGRATH DARBY BLVD.
SUITE 275
MT. PLEASANT, SC 29464
(843) 556-2624

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

S-53 PLAN & PROFILE

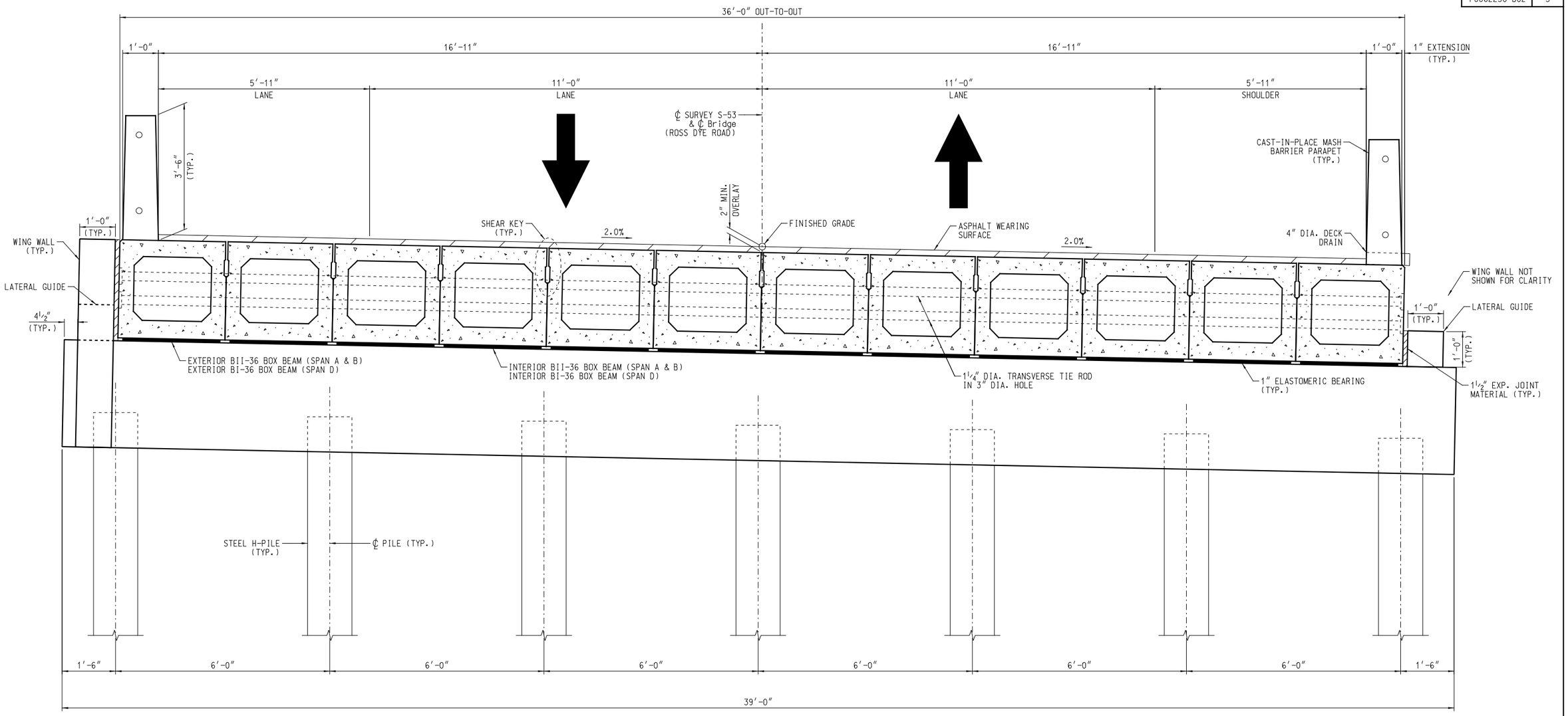
COUNTY: CHESTER

ROUTE: S-53

1/31/2023

S-53 Typical Section-I.DGN

BRIDGE PLANS ID	SHEET NO.
P8862230-B02	3



TYPICAL SECTION

(LOOKING IN DIRECTION OF STATIONING)
END BENT 1 SHOWN, END BENT 5 SIMILAR

Legend
- E = Expansion Bearing
- F = Fixed Bearing
- = Excavate Hatched Area
- = Boring
- = Benchmark

CONCEPTUAL PLANS

NOT FOR CONSTRUCTION

REV.			
REV.			
REV.			
REVIEWED	TGT		
QUAN.			
DR.	LMB	PDR	01-23
DES.	LMB	PDR	01-23
	BY	CHK.	DATE

JMT.
235 MAGRATH DARBY BLVD.
SUITE 275
MT. PLEASANT, SC 29464
(843) 556-2624

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

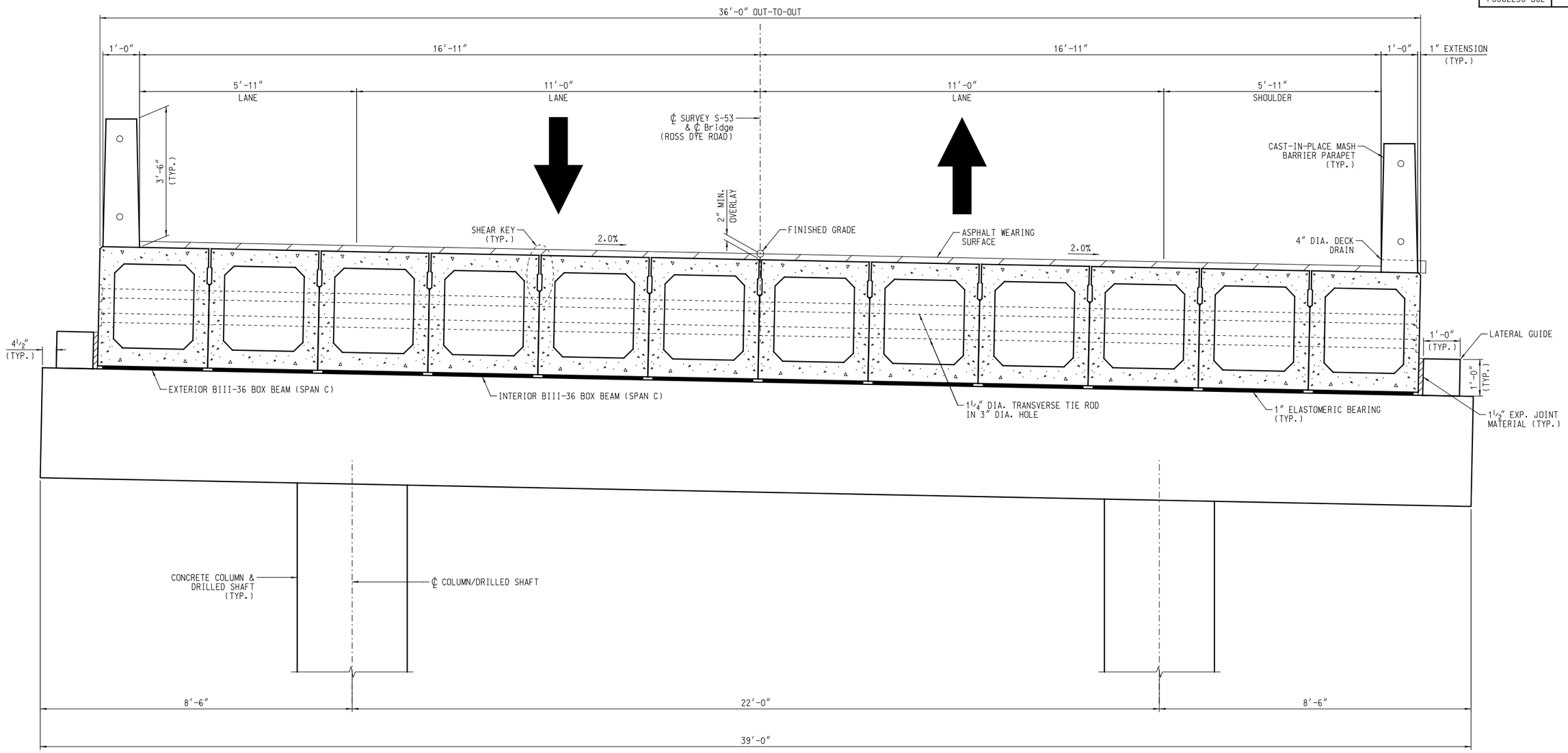
S-53
TYPICAL SECTION-I

COUNTY: CHESTER
ROUTE: S-53

1/31/2023

S-53 Typical Section-II.DGN

BRIDGE PLANS ID	SHEET NO.
P8862230-B02	4



TYPICAL SECTION

(LOOKING IN DIRECTION OF STATIONING)
BENT 3 SHOWN, BENT 2 & 4 SIMILAR

Legend
- E = Expansion Bearing
- F = Fixed Bearing
- = Excavate Hatched Area
- = Boring
- = Benchmark

CONCEPTUAL PLANS

NOT FOR CONSTRUCTION

REV.			
REV.			
REV.			
REVIEWED	TGT		
QUAN.			
DR.	LMB	PDR	01-23
DES.	LMB	PDR	01-23
	BY	CHK.	DATE

JMT.
235 MAGRATH DARBY BLVD.
SUITE 275
MT. PLEASANT, SC 29464
(843) 556-2624

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

S-53
TYPICAL SECTION-II

COUNTY: CHESTER
ROUTE: S-53

1/31/2023

BRIDGE PLANS ID	SHEET NO.
P8862230-B03	1

INDEX OF SHEETS

1. TITLE SHEET
2. S-108 PLAN & PROFILE
3. S-108 TYPICAL SECTION

South Carolina Department of Transportation

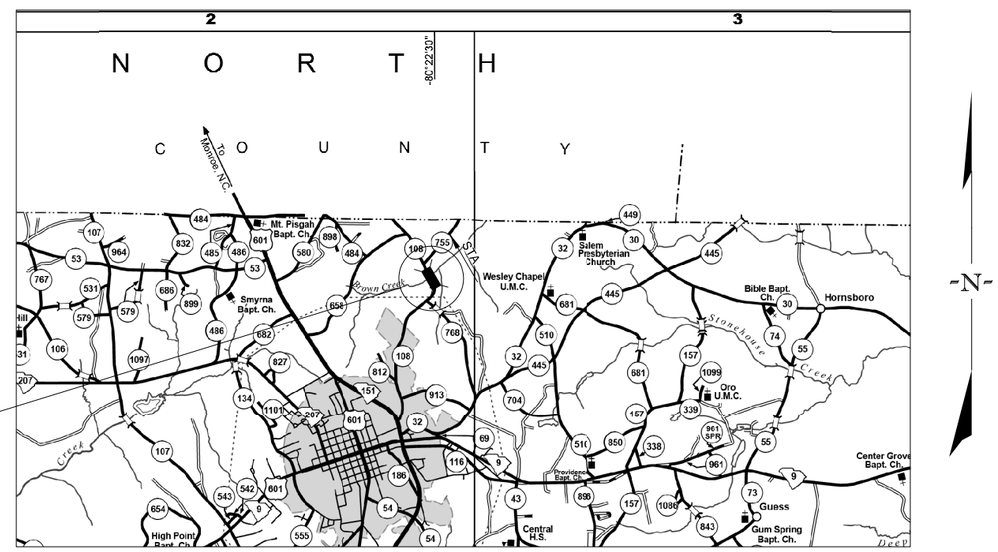
Design Reference for these plans is the:

LVB

Supplemental Design Criteria For
Low Volume Bridge Replacement Projects

PROPOSED PLANS FOR

CHESTERFIELD COUNTY
PROJECT ID P8862230-B03
STATE ROUTE S-108 (OUTEN ROAD)
REPLACE BRIDGE OVER BROWN CREEK



SITE LOCATION

LAYOUT

Approximate Location of Bridge is

Latitude	34°-48'-14" N
Longitude	80°-22'-32" W

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 7228

TRAFFIC DATA

2020 ADT 75 V.P.D.

2040* ADT 115* V.P.D.

TRUCKS 5 %

*DESIGN TRAFFIC DATA

NET LENGTH OF ROADWAY	0.000	MILES
NET LENGTH OF BRIDGES	0.014	MILES
NET LENGTH OF PROJECT	0.014	MILES
LENGTH OF EXCEPTIONS	0.000	MILES
GROSS LENGTH OF PROJECT	0.014	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 (2007 EDITION) AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF THE FINAL RFP.

CONSULTING ENGINEERING FIRM

JMT

235 Magrath Darby Blvd.
Suite 275
Mt. Pleasant, SC 29464

ENGINEER OF RECORD

CONCEPTUAL PLANS

NOT FOR CONSTRUCTION

FOR CONSTRUCTION : _____ _____
DATE

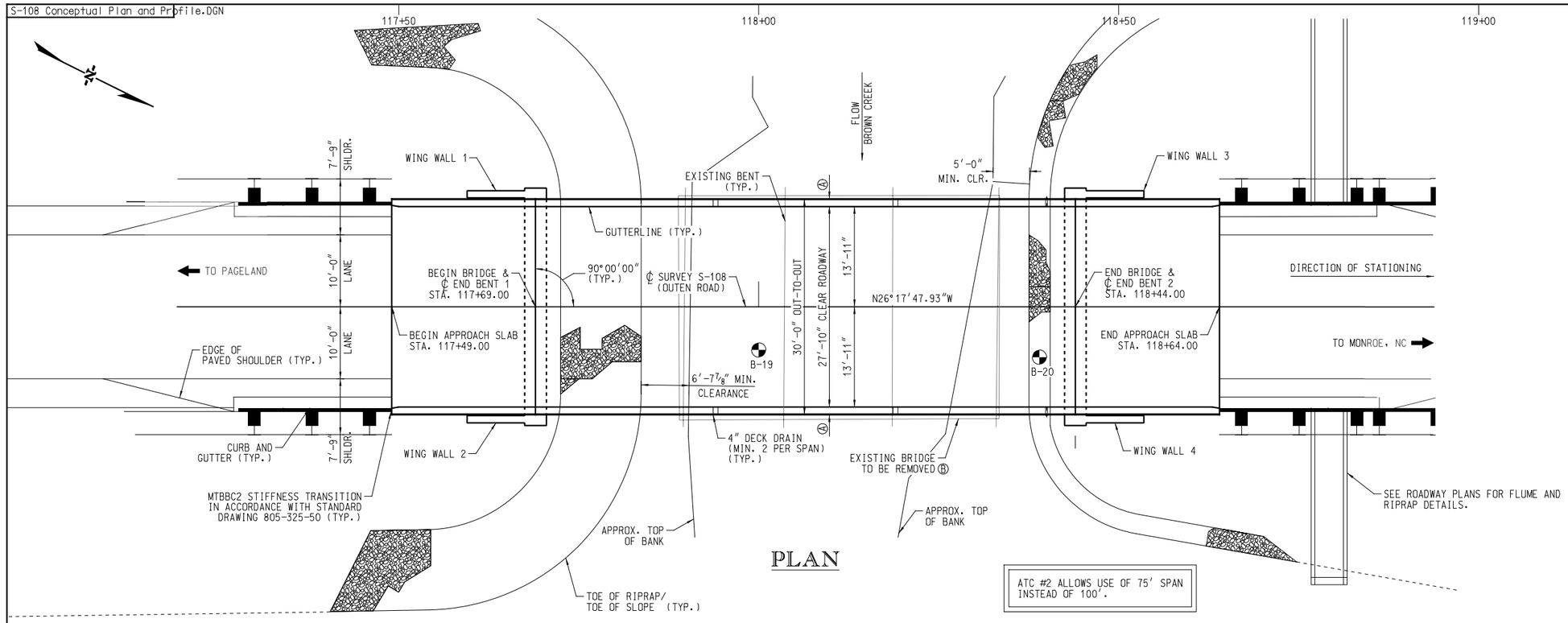
LByant
1/31/2023
$FILESS

REVIEWED			
DR.	LMB	TGT	01-23
	BY	CHK	DATE

TGT

S-108 Conceptual Plan and Profile.DGN

BRIDGE PLANS ID	SHEET NO.
P8862230-B03	2



PLAN

ATC #2 ALLOWS USE OF 75' SPAN INSTEAD OF 100'.

NOTES:

Ⓐ INCLUDES 1'-0" MASH BARRIER PARAPET AND 1" SLAB EXTENSION.

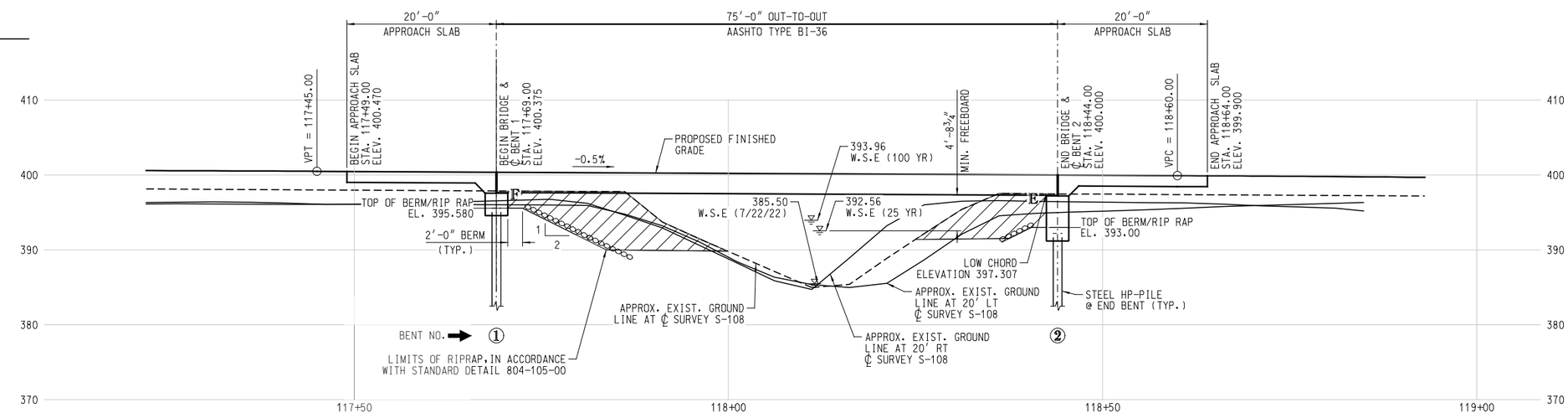
Ⓑ REMOVE AND DISPOSE OF EXISTING 33'-0" X 45'-0"± 3-SPAN SIMPLE CONCRETE SLAB BRIDGE AND APPURTENANCES IN ACCORDANCE WITH SECTION 202.4.2 OF THE STANDARD SPECIFICATIONS.

MATERIAL STAGING AND LAYDOWN WILL BE HANDLED FROM THE EXISTING ROADBED DURING CLOSURE.

HYDROLOGY DATA:

DA = 3.1 sq mi
Q_{25} = 1,060 CFS
Vel_{25} = 7.91 FT/SEC
25 Year Flow Area = 149.8 SF
Q_{100} = 1,510 CFS
Vel_{100} = 6.92 FT/SEC
100 Year Flow Area = 224.5 SF
100 YR BACKWATER = 1.60 FT

Overtopping Flood:
Q = 2,050 CFS
Probability < 0.2%



SECTION ALONG ℄ SURVEY S-108

VERTICAL CURVE DATA

PVI = 116+75	PVI = 119+30
ELEV. = 400.84	ELEV. = 399.57
V.C. = 140	V.C. = 140

+0.44% △ -0.50% △ -2.27%

HYDROLOGY DATA:

DA = 3.1 sq mi
Q_{25} = 1,060 CFS
Vel_{25} = 7.91 FT/SEC
25 Year Flow Area = 149.8 SF
Q_{100} = 1,510 CFS
Vel_{100} = 6.92 FT/SEC
100 Year Flow Area = 224.5 SF

Overtopping Flood:
Q = 2,050 CFS
Probability < 0.2%

Borings

Boring	℄ SURVEY S-108			
	STATION	OFFSET	LATITUDE	LONGITUDE
B-19	117+81	6' RT	34.80375	-80.37560
B-20	118+39	7' RT	34.80389	-80.37568

Legend
E = Expansion Bearing
F = Fixed Bearing
= Excavate Hatched Area
= Boring
= Benchmark

CONCEPTUAL PLANS

NOT FOR CONSTRUCTION

	BY	CHK.	DATE
REV.			
REV.			
REV.			
REVIEWED	TGT		
QUAN.			
DR.	LMB	PDR	01-23
DES.	LMB	PDR	01-23

JMT.
235 MAGRATH DARBY BLVD, SUITE 275
MT. PLEASANT, SC 29464
(843) 556-2624

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

S-108 PLAN & PROFILE

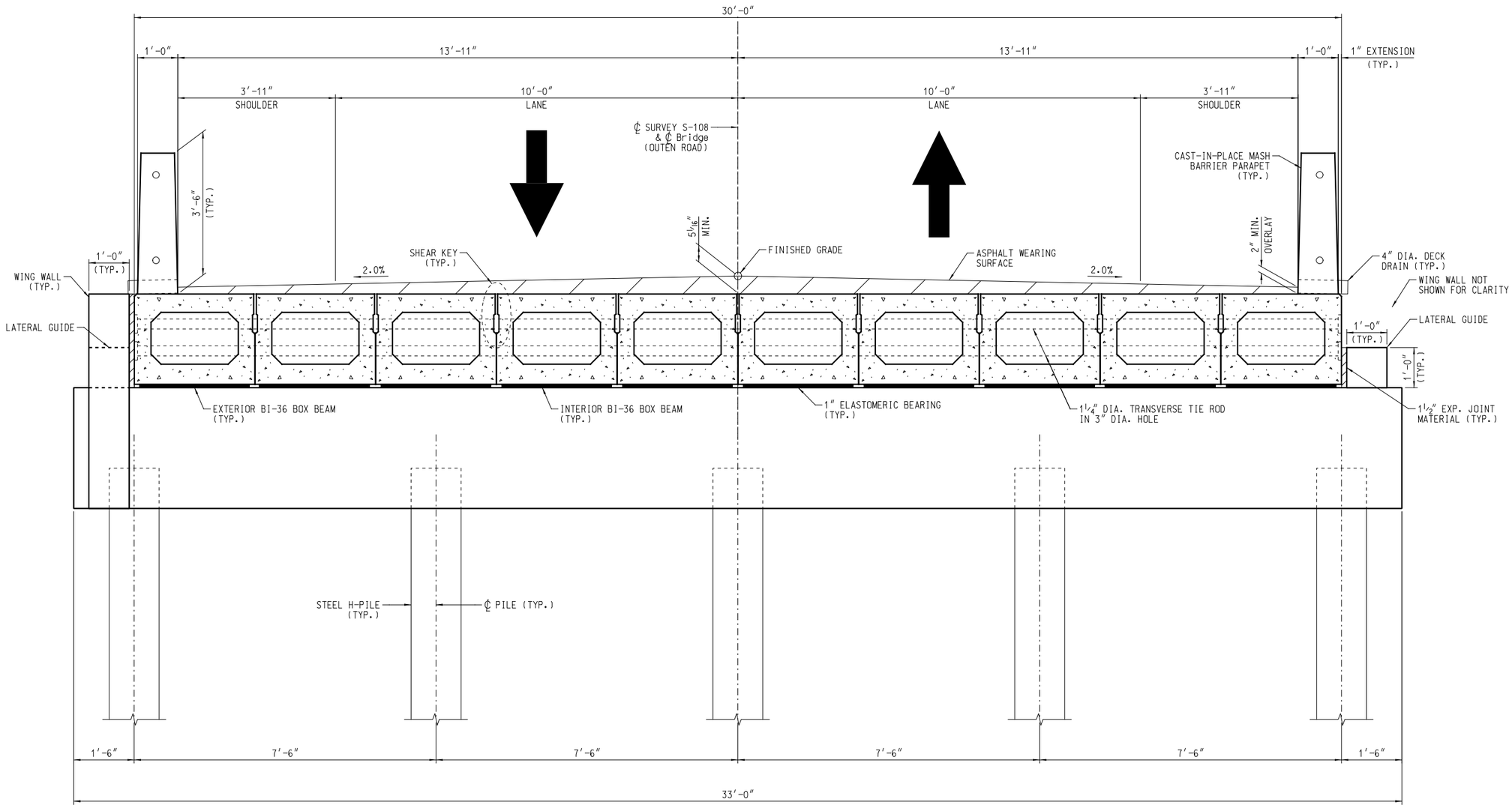
COUNTY: CHESTERFIELD

ROUTE: S-108

1/31/2023

S108_TYPICAL SECTION.dgn

BRIDGE PLANS ID	SHEET NO.
P8862230-B03	3



TYPICAL SECTION

(LOOKING IN DIRECTION OF STATIONING)
END BENT 1 SHOWN, END BENT 2 SIMILAR

Legend
- E = Expansion Bearing
- F = Fixed Bearing
- = Excavate Hatched Area
- = Boring
- = Benchmark

CONCEPTUAL PLANS

NOT FOR CONSTRUCTION

REV.			
REV.			
REV.			
REVIEWED	TGT		
QUAN.			
DR.	LMB	PDR	01-23
DES.	LMB	PDR	01-23
	BY	CHK.	DATE

JMT
235 MAGRATH DARBY BLVD.
SUITE 275
MT. PLEASANT, SC 29464
(843) 556-2624

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

S-108
TYPICAL SECTION

COUNTY: CHESTERFIELD
ROUTE: S-108

1/31/2023

BRIDGE PLANS ID	SHEET NO.
P8862230-B04	1

INDEX OF SHEETS

1. TITLE SHEET
2. S-765 PLAN & PROFILE
3. S-765 TYPICAL SECTION-I
4. S-765 TYPICAL SECTION-II

SCDOT
South Carolina Department of Transportation

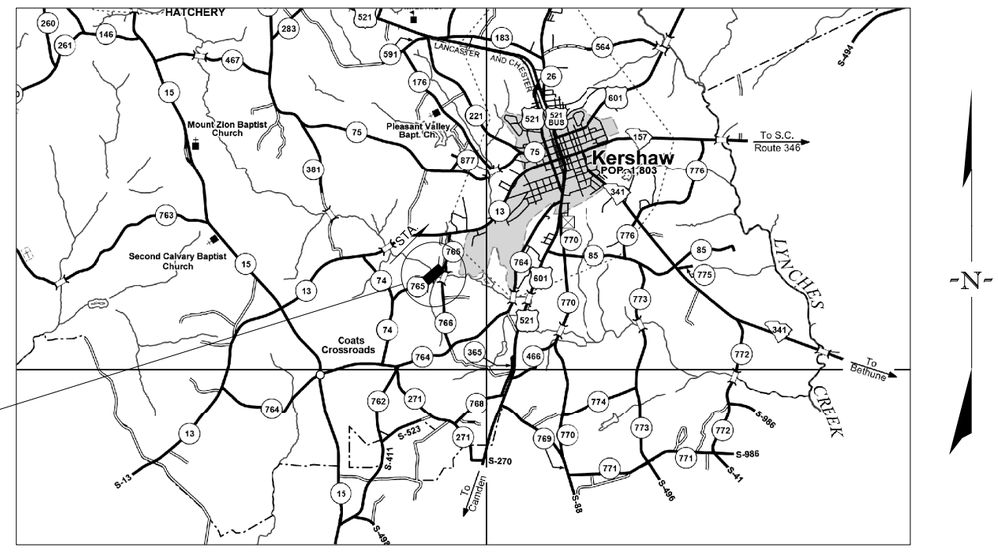
Design Reference for these plans is the:

LVB

Supplemental Design Criteria For
Low Volume Bridge Replacement Projects

PROPOSED PLANS FOR

LANCASTER COUNTY
PROJECT ID P8862230-B04
STATE ROUTE S-765 (HANGING ROCK CHURCH ROAD)
REPLACE BRIDGE OVER HANGING ROCK CREEK



SITE LOCATION

LAYOUT

Approximate Location of Bridge is

Latitude	34°-31'-36" N
Longitude	80°-36'-37" W

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 2771

TRAFFIC DATA

2020	ADT	210	V.P.D.	
2040*	ADT	256*	V.P.D.	
TRUCKS		5	%	

*DESIGN TRAFFIC DATA

NET LENGTH OF ROADWAY	0.000 MILES
NET LENGTH OF BRIDGES	0.039 MILES
NET LENGTH OF PROJECT	0.039 MILES
LENGTH OF EXCEPTIONS	0.000 MILES
GROSS LENGTH OF PROJECT	0.039 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 (2007 EDITION) AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF THE FINAL RFP.

CONSULTING ENGINEERING FIRM

JMT

235 Magrath Darby Blvd.
Suite 275
Mt. Pleasant, SC 29464

ENGINEER OF RECORD

CONCEPTUAL PLANS

NOT FOR CONSTRUCTION

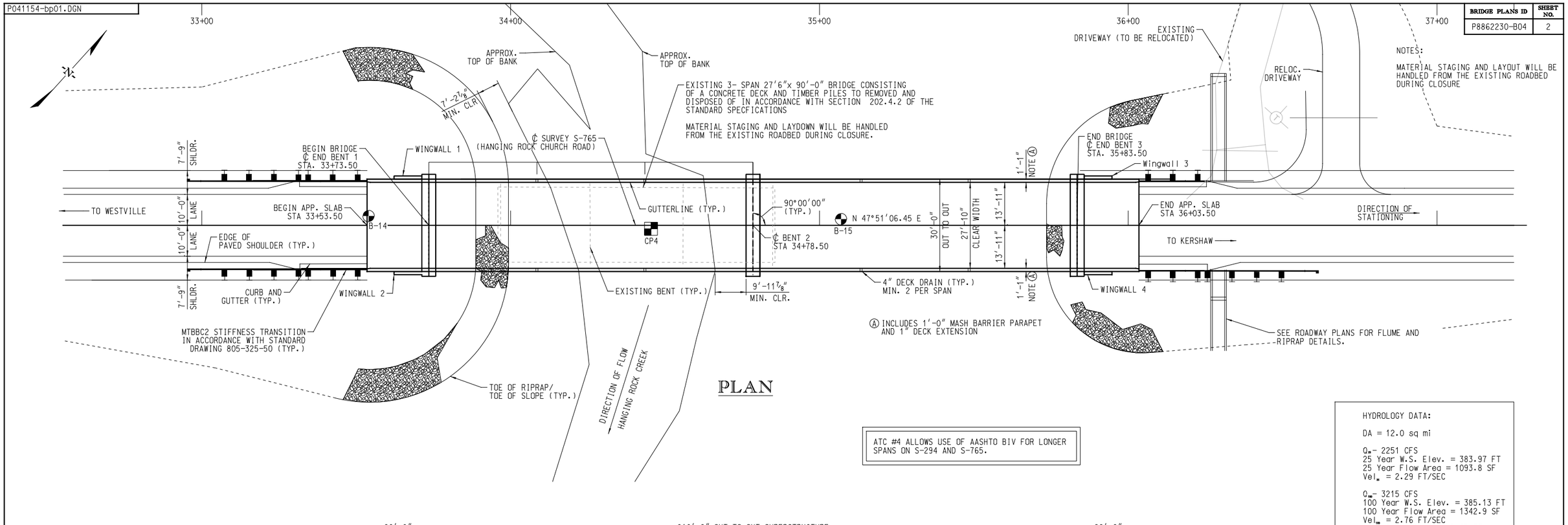
FOR CONSTRUCTION: _____ _____ DATE

LBryant
1/31/2023
$FILES$

REVIEWED			
DR.	LMB	TGT	01-23
	BY	CHK	DATE

P041154-bp01.DGN

BRIDGE PLANS ID	SHEET NO.
P8862230-B04	2



NOTES:

MATERIAL STAGING AND LAYOUT WILL BE HANDLED FROM THE EXISTING ROADBED DURING CLOSURE

PLAN

ATC #4 ALLOWS USE OF AASHTO BIV FOR LONGER SPANS ON S-294 AND S-765.

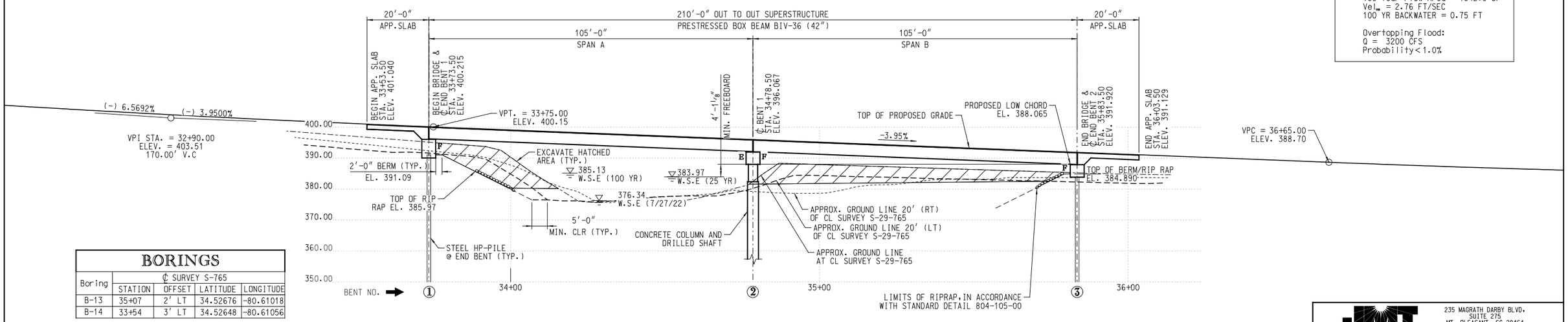
HYDROLOGY DATA:

DA = 12.0 sq mi

Q_{25} = 2251 CFS
25 Year W.S. Elev. = 383.97 FT
25 Year Flow Area = 1093.8 SF
Vel_{25} = 2.29 FT/SEC

Q_{100} = 3215 CFS
100 Year W.S. Elev. = 385.13 FT
100 Year Flow Area = 1342.9 SF
Vel_{100} = 2.76 FT/SEC
100 YR BACKWATER = 0.75 FT

Overtopping Flood:
Q = 3200 CFS
Probability < 1.0%



SECTION ALONG ℄ SURVEY S-765

BORINGS

Boring	℄ SURVEY S-765			
	STATION	OFFSET	LATITUDE	LONGITUDE
B-13	35+07	2' LT	34.52676	-80.61018
B-14	33+54	3' LT	34.52648	-80.61056

CONTROL POINTS S-765

Point	Survey S-765		Northing	Easting	Elev.	Description
	Station	Offset				
4	34+45.48	1.11	980158.4618	2117364.8750	390.78	CP-4 8" NAIL

Legend
E = Expansion Bearing
F = Fixed Bearing
= Excavate Hatched Area
= Boring
= Benchmark

CONCEPTUAL PLANS

NOT FOR CONSTRUCTION

REV.			
REV.			
REV.			
REVIEWED	TGT		
QUAN.			
DR.	LMB	PDR	01-23
DES.	LMB	PDR	01-23
	BY	CHK.	DATE

JMT.
235 MAGRATH DARBY BLVD. SUITE 275
MT. PLEASANT, SC 29464
(843) 556-2624

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

S-765 PLAN & PROFILE

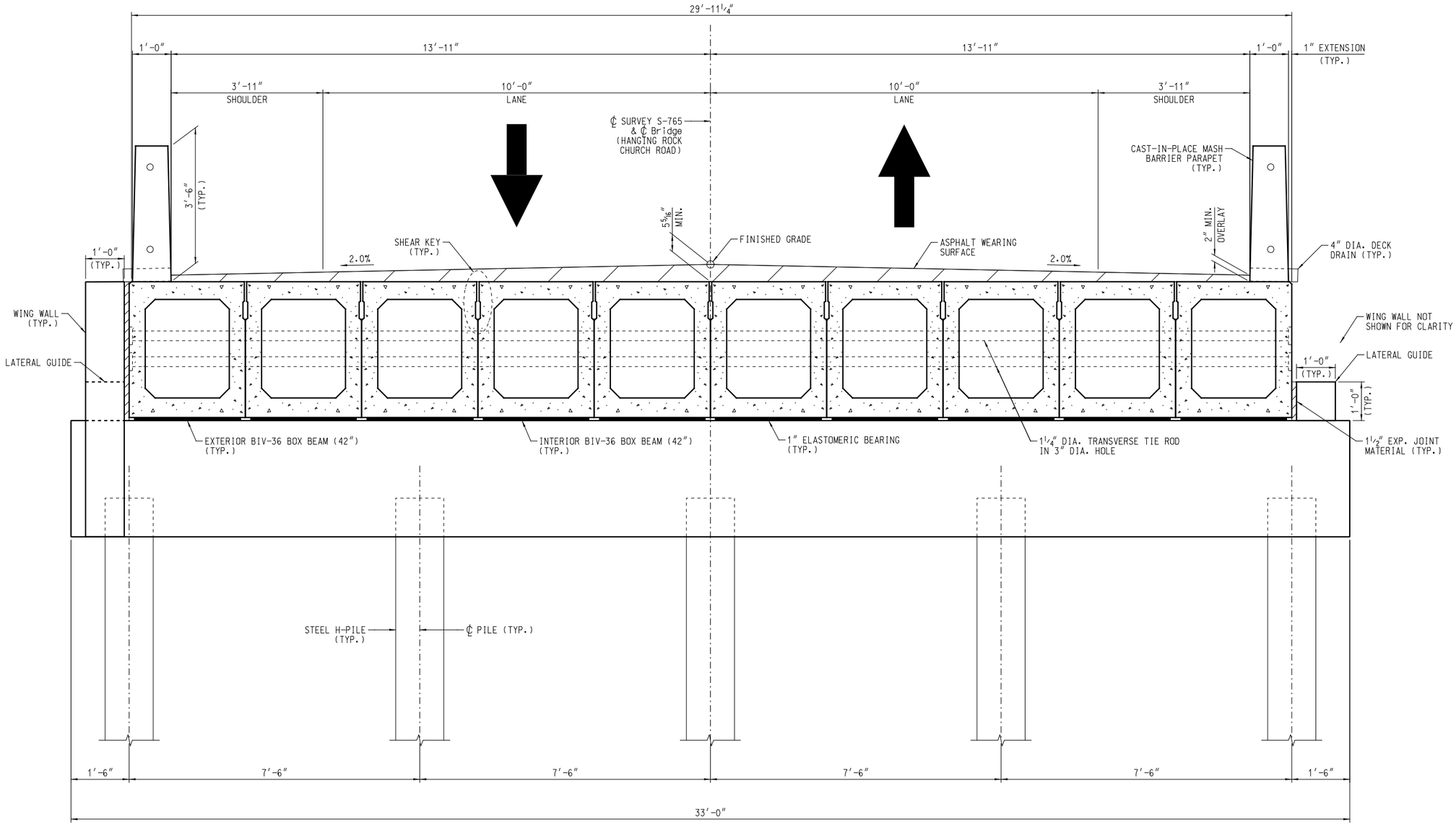
COUNTY: LANCASTER

ROUTE: S-765

1/31/2023

S-765 Typical Section-I.DGN

BRIDGE PLANS ID	SHEET NO.
P8862230-B04	3



TYPICAL SECTION

(LOOKING IN DIRECTION OF STATIONING)
END BENT 1 SHOWN, END BENT 3 SIMILAR

Legend
- **E** = Expansion Bearing
- **F** = Fixed Bearing
- = Excavate Hatched Area
- = Boring
- = Benchmark

CONCEPTUAL PLANS

NOT FOR CONSTRUCTION

REV.			
REV.			
REV.			
REVIEWED	PDR		
QUAN.			
DR.	LMB	PDR	01-23
DES.	LMB	PDR	01-23
	BY	CHK.	DATE

JMT
235 MAGRATH DARBY BLVD.
SUITE 275
MT. PLEASANT, SC 29464
(843) 556-2624

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

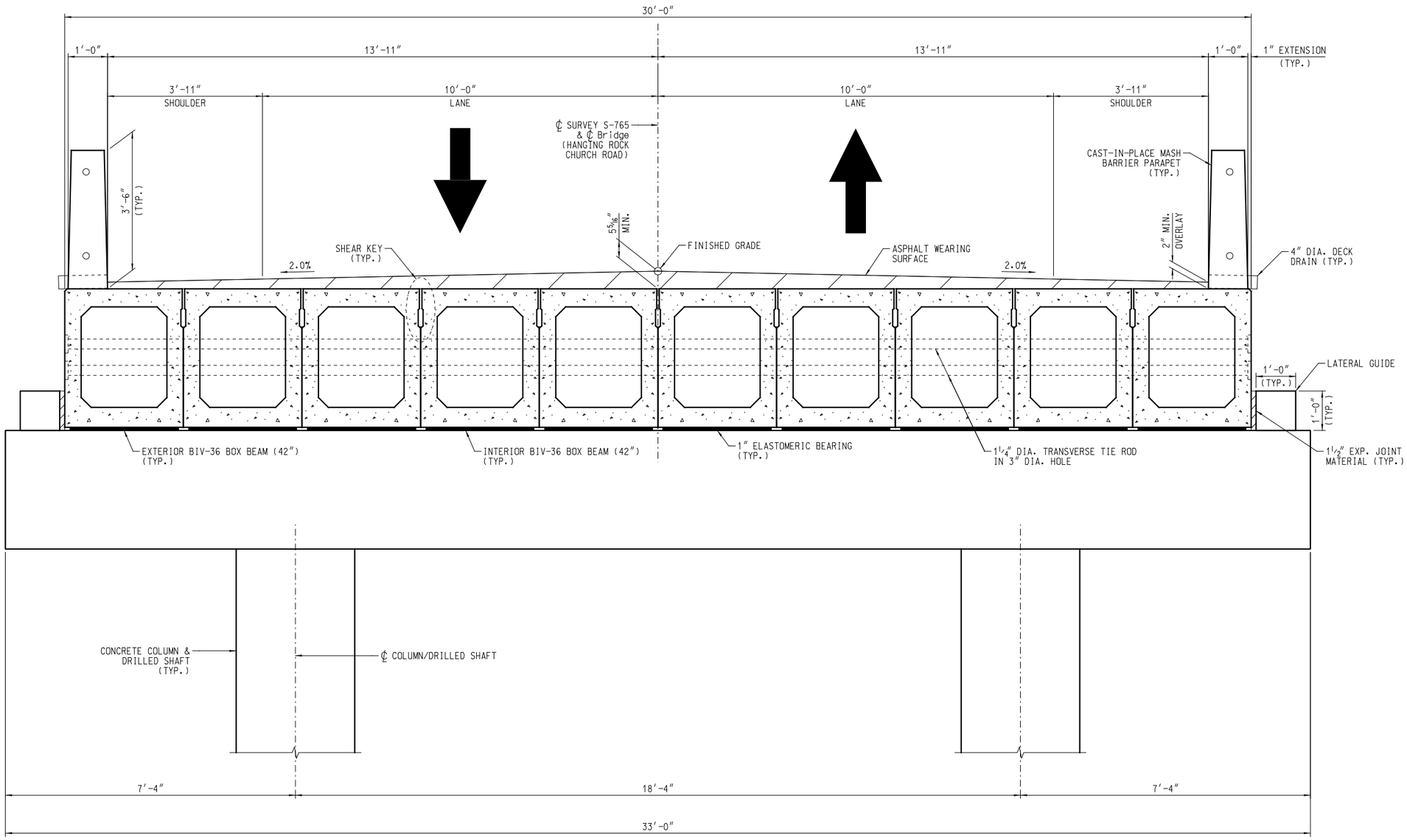
S-765
TYPICAL SECTION-I

COUNTY: LANCASTER
ROUTE: S-765

1/31/2023

S-765 Typical Section-II.DGN

BRIDGE PLANS ID	SHEET NO.
P8862230-B04	4



TYPICAL SECTION

(LOOKING IN DIRECTION OF STATIONING)
INTERIOR BENT 2

Legend
- **E** = Expansion Bearing
- **F** = Fixed Bearing
- = Excavate Hatched Area
- = Boring
- = Benchmark

CONCEPTUAL PLANS

NOT FOR CONSTRUCTION

REV.			
REV.			
REV.			
REVIEWED	PDR		
QUAN.			
DR.	LMB	PDR	01-23
DES.	LMB	PDR	01-23
	BY	CHK.	DATE

JMT.
235 MAGRATH DARBY BLVD.
SUITE 275
MT. PLEASANT, SC 29464
(843) 556-2624

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

S-765
TYPICAL SECTION-II

COUNTY: LANCASTER
ROUTE: S-765

1/31/2023

S-294 OVER WILSONS CREEK, ANDERSON COUNTY

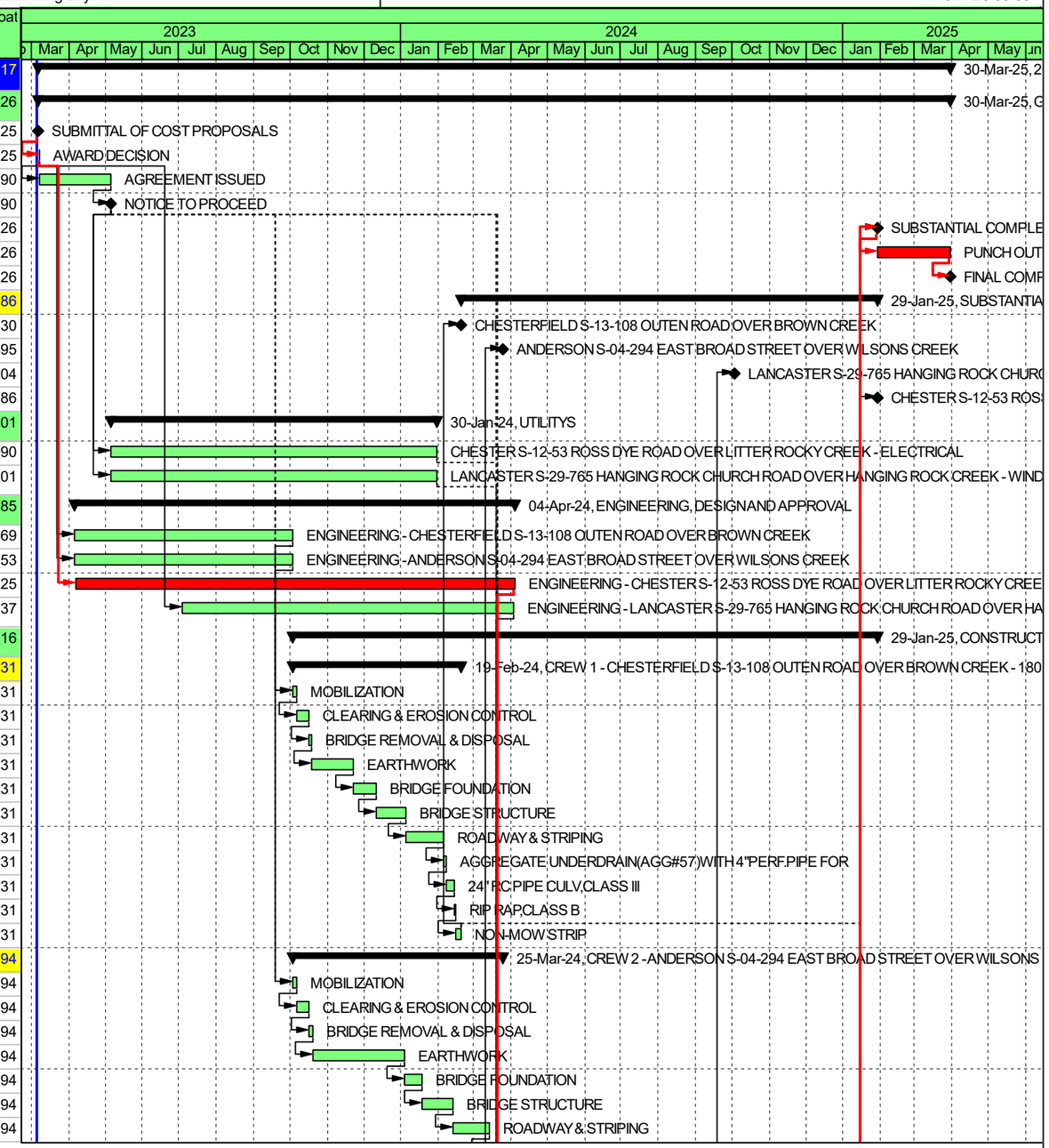
S-53 OVER LITTLE ROCKY CREEK, CHESTER COUNTY

S-108 OVER BROWN CREEK, CHESTERFIELD COUNTY

S-765 OVER HANGING ROCK CREEK, LANCASTER COUNTY

APPENDIX A.3: CPM SCHEDULE

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float
2023-03-06 SCDOT Design Build Bridge Package 15		474	06-Mar-23	30-Mar-25	17
GENERAL MILESTONES		755	06-Mar-23	30-Mar-25	26
A9010	SUBMITTAL OF COST PROPOSALS	0	06-Mar-23		25
A9020	AWARD DECISION	1	07-Mar-23	07-Mar-23	25
A9270	AGREEMENT ISSUED	60	07-Mar-23	05-May-23	90
A9030	NOTICE TO PROCEED	0	06-May-23		90
A9040	SUBSTANTIAL COMPLETION	0	29-Jan-25		26
A9050	PUNCH OUT	60	29-Jan-25	30-Mar-25	26
A9060	FINAL COMPLETION	0		30-Mar-25	26
SUBSTANTIAL COMPLETION ROLLUP		345	19-Feb-24	29-Jan-25	86
A9300	CHESTERFIELD S-13-108 OUTEN ROAD OVER BROWN CREEK	0		19-Feb-24	430
A9330	ANDERSON S-04-294 EAST BROAD STREET OVER WILSONS CRI	0		25-Mar-24	395
A9320	LANCASTER S-29-765 HANGING ROCK CHURCH ROAD OVER HAI	0		03-Oct-24	204
A9290	CHESTER S-12-53 ROSS DYE ROAD OVER LITTER ROCKY CREEK	0		29-Jan-25	86
UTILITYS		270	06-May-23	30-Jan-24	201
A9240	CHESTER S-12-53 ROSS DYE ROAD OVER LITTER ROCKY CREEK	270	06-May-23	30-Jan-24	90
A9250	LANCASTER S-29-765 HANGING ROCK CHURCH ROAD OVER HAI	270	06-May-23	30-Jan-24	201
ENGINEERING, DESIGN AND APPROVAL		366	05-Apr-23	04-Apr-24	185
A9160	ENGINEERING - CHESTERFIELD S-13-108 OUTEN ROAD OVER BF	182	05-Apr-23	03-Oct-23	369
A9190	ENGINEERING - ANDERSON S-04-294 EAST BROAD STREET OVE	182	05-Apr-23	03-Oct-23	153
A9150	ENGINEERING - CHESTER S-12-53 ROSS DYE ROAD OVER LITTEI	365	06-Apr-23	04-Apr-24	25
A9180	ENGINEERING - LANCASTER S-29-765 HANGING ROCK CHURCH I	275	04-Jul-23	03-Apr-24	137
CONSTRUCTION		301	03-Oct-23	29-Jan-25	16
CREW 1 - CHESTERFIELD S-13-108 OUTEN ROAD OVER BROWN CREEK -		85	03-Oct-23	19-Feb-24	231
A3001	MOBILIZATION	3	03-Oct-23	06-Oct-23	231
A9080	CLEARING & EROSION CONTROL	5	06-Oct-23	16-Oct-23	231
A3002	BRIDGE REMOVAL & DISPOSAL	2	16-Oct-23	18-Oct-23	231
A3006	EARTHWORK	22	18-Oct-23	22-Nov-23	231
A3008	BRIDGE FOUNDATION	10	22-Nov-23	11-Dec-23	231
A3007	BRIDGE STRUCTURE	15	11-Dec-23	05-Jan-24	231
A3005	ROADWAY & STRIPING	18	05-Jan-24	05-Feb-24	231
A3009	AGGREGATE UNDERDRAIN(AGG#57)WITH 4"PERF.PIPE FOR	2	05-Feb-24	07-Feb-24	231
A3004	24" RC PIPE CULV,CLASS III	5	07-Feb-24	14-Feb-24	231
A3010	RIP RAP,CLASS B	1	14-Feb-24	15-Feb-24	231
A3011	NON-MOW STRIP	2	15-Feb-24	19-Feb-24	231
CREW 2 - ANDERSON S-04-294 EAST BROAD STREET OVER WILSONS CRE		107	03-Oct-23	25-Mar-24	94
A6001	MOBILIZATION	3	03-Oct-23	06-Oct-23	94
A9110	CLEARING & EROSION CONTROL	5	06-Oct-23	16-Oct-23	94
A6002	BRIDGE REMOVAL & DISPOSAL	3	16-Oct-23	19-Oct-23	94
A6004	EARTHWORK	44	19-Oct-23	03-Jan-24	94
A6006	BRIDGE FOUNDATION	10	03-Jan-24	18-Jan-24	94
A6005	BRIDGE STRUCTURE	15	18-Jan-24	12-Feb-24	94
A6003	ROADWAY & STRIPING	21	12-Feb-24	14-Mar-24	94

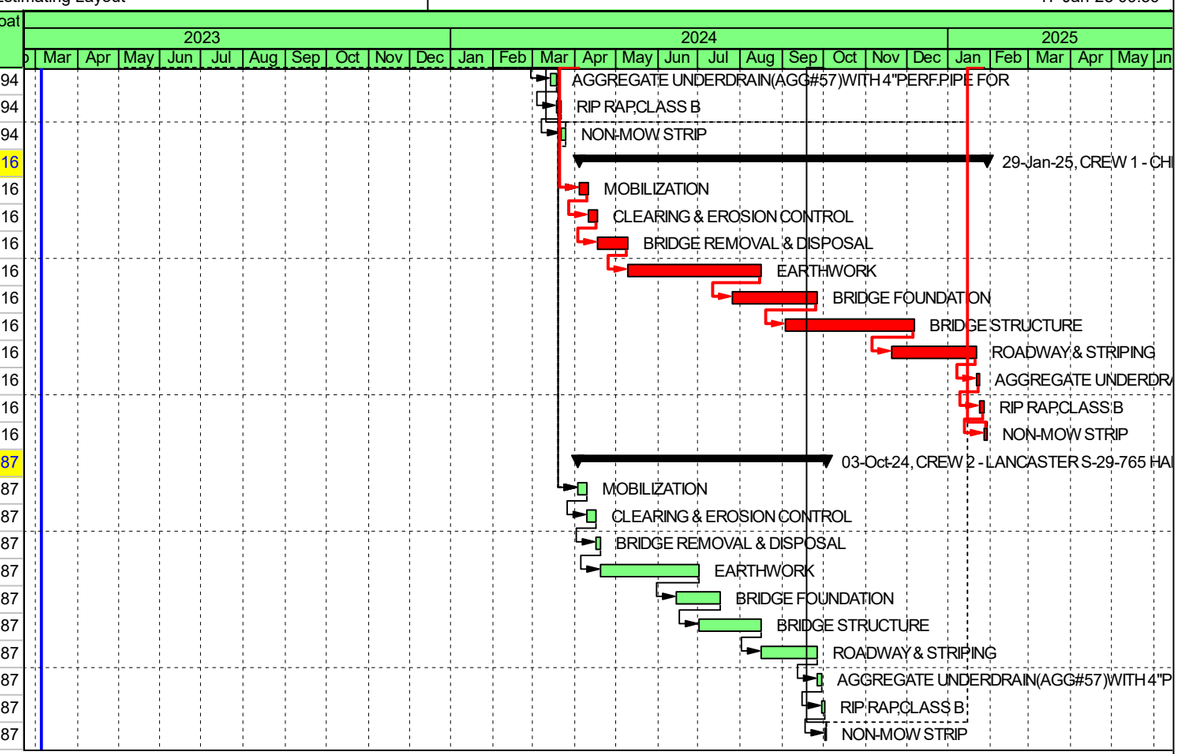


Actual Work | Critical Remaining Work | Summary
Remaining Work | Milestone

TASK filter: All Activities

© Oracle Corporation

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float
A6007	AGGREGATE UNDERDRAIN(AGG#57)WITH 4"PERF.PIPE FOR	2	14-Mar-24	18-Mar-24	94
A6008	RIP RAP,CLASS B	3	18-Mar-24	22-Mar-24	94
A6009	NON-MOW STRIP	2	22-Mar-24	25-Mar-24	94
CREW 1 - CHESTER S-12-53 ROSS DYE ROAD OVER LITTER ROCKY CREEI		186	04-Apr-24	29-Jan-25	16
A2001	MOBILIZATION	3	04-Apr-24	10-Apr-24	16
A9070	CLEARING & EROSION CONTROL	5	10-Apr-24	17-Apr-24	16
A2002	BRIDGE REMOVAL & DISPOSAL	15	17-Apr-24	10-May-24	16
A2004	EARTHWORK	62	10-May-24	16-Aug-24	16
A2006	BRIDGE FOUNDATION	40	25-Jul-24	26-Sep-24	16
A2005	BRIDGE STRUCTURE	60	03-Sep-24	06-Dec-24	16
A2003	ROADWAY & STRIPING	36	20-Nov-24	21-Jan-25	16
A2007	AGGREGATE UNDERDRAIN(AGG#57)WITH 4"PERF.PIPE FOR	2	21-Jan-25	24-Jan-25	16
A2008	RIP RAP,CLASS B	1	24-Jan-25	27-Jan-25	16
A2009	NON-MOW STRIP	2	27-Jan-25	29-Jan-25	16
CREW 2 - LANCASTER S-29-765 HANGING ROCK CHURCH ROAD OVER H/		116	03-Apr-24	03-Oct-24	87
A5001	MOBILIZATION	3	03-Apr-24	09-Apr-24	87
A9100	CLEARING & EROSION CONTROL	5	09-Apr-24	16-Apr-24	87
A5002	BRIDGE REMOVAL & DISPOSAL	3	16-Apr-24	19-Apr-24	87
A5004	EARTHWORK	45	19-Apr-24	01-Jul-24	87
A5006	BRIDGE FOUNDATION	20	14-Jun-24	17-Jul-24	87
A5005	BRIDGE STRUCTURE	30	01-Jul-24	16-Aug-24	87
A5003	ROADWAY & STRIPING	25	16-Aug-24	26-Sep-24	87
A5007	AGGREGATE UNDERDRAIN(AGG#57)WITH 4"PERF.PIPE FOR	2	26-Sep-24	30-Sep-24	87
A5008	RIP RAP,CLASS B	2	30-Sep-24	01-Oct-24	87
A5009	NON-MOW STRIP	2	01-Oct-24	03-Oct-24	87



Actual Work | Critical Remaining Work | Summary
Remaining Work | Milestone

TASK filter: All Activities

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S-294 OVER WILSONS CREEK, ANDERSON COUNTY

S-53 OVER LITTLE ROCKY CREEK, CHESTER COUNTY

S-108 OVER BROWN CREEK, CHESTERFIELD COUNTY

S-765 OVER HANGING ROCK CREEK, LANCASTER COUNTY

APPENDIX B: REQUIRED FORMS AND CONFIDENTIAL AND PROPRIETARY INFORMATION

10. NON-COLLUSION CERTIFICATION

NON-COLLUSION CERTIFICATION

Project ID: 8862230

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 [X], I CERTIFY THAT I HAVE READ, UNDERSTAND, ACCEPT, AND ACKNOWLEDGE ALL OF THE ABOVE STATEMENTS.

Executed on January 31, 2023
(Date)

Signed: _____
(Officer/Proposer)

George F. Ellis, Executive Vice President
(Title)

Crowder Construction Company
(Address)

PO Box 30007, Charlotte, NC 28230

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 (1) [X] or Certification (2) [ ]

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 1/31, 20 23 .

Signed: _____ (Officer/PROPOSER) George F. Ellis

Title: Exec. Vice President

Company: Crowder Construction Company

Address: PO Box 30007, Charlotte, NC 28230

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.

12. STIPEND ACKNOWLEDGEMENT FORM

Stipend Acknowledgement Form

Bridge Package 15
Anderson, Chester, Chesterfield, and Lancaster County

Proposer: Crowder Construction Company

ADDRESS: PO Box 30007, Charlotte, NC 28230

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.

January 31, 2023
Date

Proposer

George F. Ellis, Exec. Vice President
Print Name

13. STIPEND AGREEMENT

STIPEND AGREEMENT
Project ID: 8862230
Bridge Package 15
Anderson, Chester, Chesterfield, and Lancaster County

THIS STIPEND AGREEMENT (the "Agreement") is made and entered into as of the 31st day of January, 2023 by and between the SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION (hereinafter "SCDOT"), and Crowder Construction Company ("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 $30,000.00 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:

_____
Brad Reynolds
Design-Build Program Manager

Witness:

SOUTH CAROLINA DEPARTMENT
OF TRANSPORATION

By: _____
{INSERT NAME}
Design-Build Engineer

Proposer

Crowder Construction Company
Name of Proposer

By: _____

Its: George F. Ellis
Executive Vice President

South Carolina
Department of Transportation

NOTICE OF RECEIPT

Bridge Package 15
Design-Build – Contract ID 8862230
Anderson, Chester, Chesterfield, and Lancaster 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

January 31, 2023
Date

George F. Ellis, Executive Vice President
Printed Name

For: Crowder/JMT
Design-Build Team Name

South Carolina
Department of Transportation

NOTICE OF RECEIPT

Bridge Package 15
Design-Build – Contract ID 8862230
Anderson, Chester, Chesterfield, and Lancaster 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.

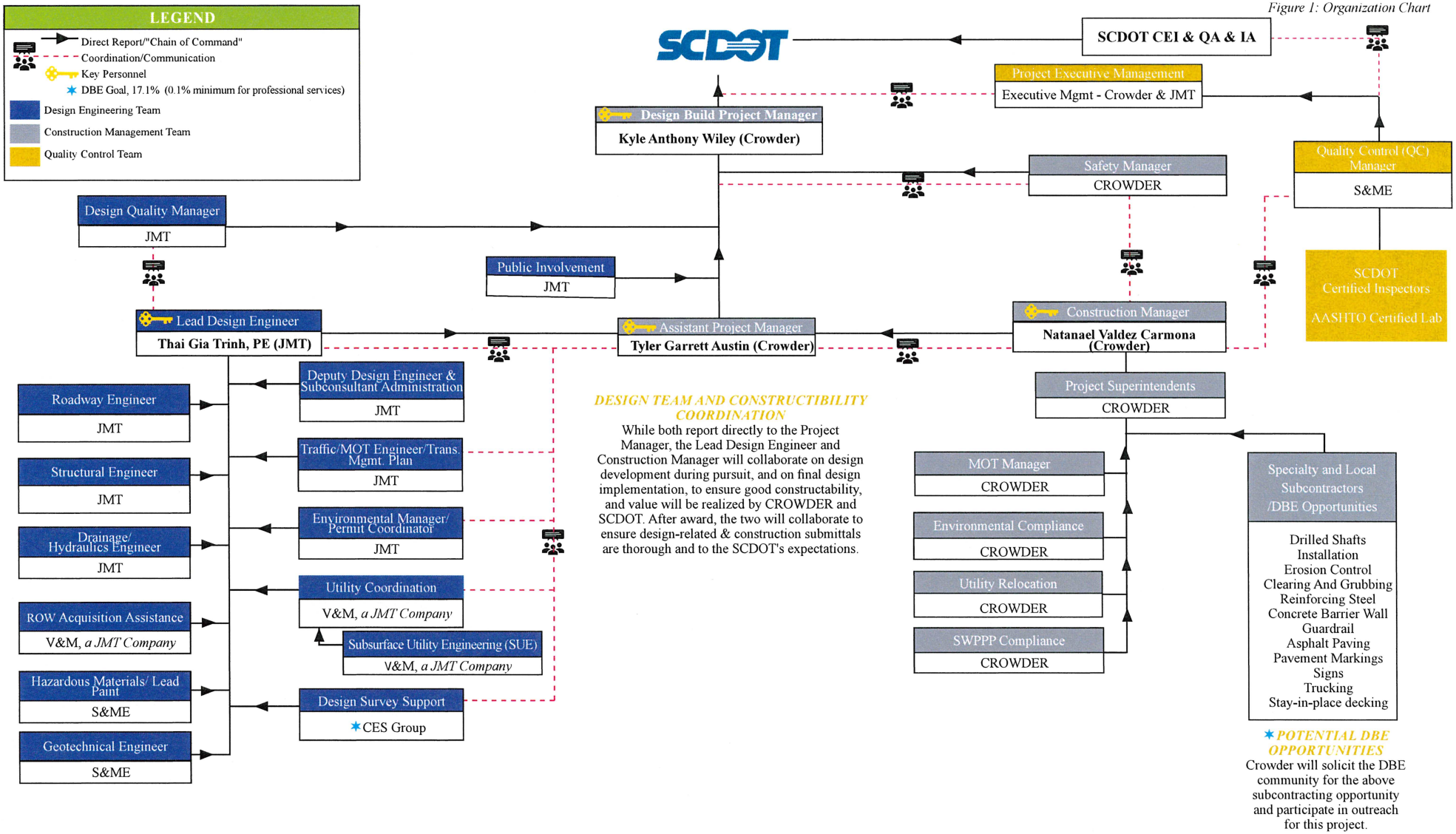
PROPOSER's Signature

January 31, 2023
Date

George F. Ellis, Executive Vice President
Printed Name

For: Crowder/JMT
Design-Build Team Name

Figure 1: Organization Chart



All key personnel identified will meet requirements of the RFQ and the SCDOT's quality and schedule expectations. Crowder Construction Company and JMT confirms availability of key staff for the duration of the project.

PO Box 30007 (28230-0007)
6409 Brookshire Boulevard (28216)
Charlotte, North Carolina
Telephone: 704.332.8184 Fax 704.372.9946
www.crowderusa.com

CROWDER CONSTRUCTION COMPANY

PROPOSERS STATEMENT

Bridge Package 15
Design-Build Project
Contract ID 8862230
Anderson, Chester, Chesterfield, and Lancaster Counties

Proposed Key Individual, Kyle Anthony Wiley, Design Build Project Manager, and Tyler Garrett Austin, Assistant Project Manager, and Natanael Valdez Carmona, Construction Manager, all of which are identified in the original organizational chart in the Crowder Construction Company/JMT 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.

Kyle Anthony Wiley, Design Build Project Manager — January 31, 2023

George F. Ellis, Executive Vice President — January 31, 2023

State: North Carolina
County: Mecklenburg

I, Teresa W. Matthews, a Notary Public for Gaston County, North Carolina, do hereby certify that Kyle Anthony Wiley and George F. Ellis, personally appeared before me this day and acknowledged the due execution of the foregoing statement. witness my hand and official seal this 31st day of January 2023.
My commission expires August 1, 2025.

Notary Public

TERESA W. MATTHEWS
NOTARY PUBLIC
GASTON COUNTY, N.C.

PROPOSERS STATEMENT

Bridge Package 15
Design-Build Project
Contract ID 8862230
Anderson, Chester, Chesterfield, and Lancaster Counties

Proposed Key Individual, Thai Trinh, PE, Lead Design Engineer, who is identified in the original organizational chart in the Crowder Construction Company/JMT 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.

James Kevin O'Connor, PE, JMT Vice President — January 31, 2023

Kyle Anthony Wiley, Design Build Project Manager — January 31, 2023

State: South Carolina
County: Charleston

I, Lorrin Lenarz, a Notary Public for Charleston County, South Carolina, do hereby certify that James Kevin O'Connor, personally appeared before me this day and acknowledged the due execution of the foregoing statement. witness my hand and official seal this 31st day of January 2023. My commission expires September 27, 2028.

Notary Public

State of South Carolina
Notary Public
Lorrin Lenarz
My Commission Expires 9/27/2028

State: North Carolina
County: Mecklenburg

I, Teresa W. Matthews, a Notary Public for Gaston County, North Carolina, do hereby certify that Kyle Anthony Wiley, personally appeared before me this day and acknowledged the due execution of the foregoing statement. witness my hand and official seal this 31st day of January 2023.My commission expires August 1, 2025.

Notary Public

TERESA W. MATTHEWS
NOTARY PUBLIC
GASTON COUNTY, N.C.

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 regualtions 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.

CROWDER CONSTRUCTION COMPANY

Vendor ID: **1CR007**

Issued : **April 26, 2022**

Expires: **May 31, 2023**

Approved By: Maria A. Dennis
Prequalification Coordinator

Quality Credit - Innovation and Added Value to the Project				
Number	Description	Added Value Benefits	Cost/Schedule Impact	Self-Imposed Assurance
1	Crowder has had ZERO final completion LD's in the last 15 years by prioritizing scheduling and document control with Primavera P6 & Procore.	Crowder utilizes a standard for project management which includes intentionally redundant procedures, current technology, and experienced and tenured construction professionals to manage schedules. Team planning considering individual crew productivity and experience, coupled with Primavera P6 and Procore software allow for alternate plan implementation with delays outside of our control. This proven process allows us to quickly adjust resources to both control expense and maintain schedule which has resulted in ZERO final completion LD's in the last 15 years.	A high degree of cost and schedule certainty is demonstrated by Crowder's past 15 years of work.	Not Applicable
2	Mitigate current industry supply chain delays and interruptions by locking in procurement lead times with early letters of intent to fabricators.	Locking in lead times and mobilization dates is a key risk to this project. The CROWDER-JMT team is prepared to utilize long standing established relationships with key material vendors and subcontracts and early Letters of Intent to lock in critical dates early in the project. We are prepared to issue early release of submittal and deliverable orders shortly after bid day to ensure vendors are able to move forward as soon as possible to lock in their delivery dates.	A high degree of schedule certainty is maintained by using this mitigation.	Any increase in cost due to not locking in key material items will be adsorbed by Crowder.
3	Develop and implement customized work plans for each specific site and its associated tasks to maximize crew efficiency and mitigate potential schedule impacts.	Work plans will be developed for internal use by key individuals such as the QC managers, project manager, superintendent, foreman, and/ or subcontractors responsible for each operation. Each work plan will be customized for major tasks. Task-specific work plans will include information such as crew size, required equipment, a job hazard analysis, task specific drawings, submittals/shop drawings, RFI's, sequence of work, sampling & testing procedures, lift plans, and additional specific information including but not limited to mix designs and/or crane charts.	A well-documented and thoroughly thought-out plan customized for each work site ensures the closest adherence to cost and schedule goals are maintained.	Crowder will adsorb the cost impacts associated with planning mistakes. Furthermore, Crowder will ensure any schedule slippage is recovered via a schedule recovery plan submitted to the Owner, should any schedule slippage occur.

Number	Description	Added Value Benefits	Cost/Schedule Impact	Self-Imposed Assurance
4	Support early coordination/ interaction the SCDOT may want to initiate with land owners prior to start of the formal R/W acquisition process.	Our Team will provide displays and any necessary documents for SCDOT to coordinate with potential impacted residents/businesses upon NTP, to help make these entities aware of the project.	Understanding concerns from potential impacted residents and businesses well ahead of schedule will ensure a high degree of schedule stability.	Not Applicable.
5	Utilize temporary relocations where advantageous to the construction process and where it minimizes disruptions to service of utility.	Temporary relocations will also be evaluated and discussed with utility companies if feasible. For example, on one of the past emergency DB package 6, Richland County, Crowder provided temporary pile supports to temporarily relocate an AT&T line from the bridge to facilitate demolition and construction without waiting for the final relocation.	Early mobilization to specific jobsites could be garnered by the use of this mitigation. This would result in an early completion of certain project sites.	Not Applicable.
6	Accounting system that provides a one stop shop to the project financials.	Crowder utilizes powerful COINS OA, cloud-based software which houses Accounts Payable, Accounts Receivable, Payroll, Benefits and Project Budgets. The cost accounting system is audited annually and provides real time project status and can be accessed from anywhere with an Internet connection. Project Managers use it to track costs to their jobs and to forecast project expenses in relation to commitments at any point in time. The budget used in COINS is based on the estimate created in HCSS.	Cost and forecasting certainty is maintained and any extra or additional cost can be easily tracked and provided to SCDOT for review.	Not Applicable.

Number	Description	Added Value Benefits	Cost/Schedule Impact	Self-Imposed Assurance
7	Design team will follow appropriate low volume design criteria (with the exception of S-53 over Little Rock Creek) so that anticipated work limits and slope tie-ins will stay within the SCDOT expectancy for R/W that might have been anticipated and budgeted to be purchased.	SCDOT's "Supplemental Design Criteria for Low Volume Bridge Replacements" and the criteria presented within the final RFP to allow for either current K-Values or values within 15mph of the RFP design speed which helps minimize impacts to R/W. Applying "New Design" standards would increase impacts to R/W.	Assurance that the SCDOT's R/W purchase budget will not need to increase during the life cycle of the project.	Our proposal design reduces the Concept Design ROW impacts, for all sites, from 5.559 acres to 4.413 acres, therefore creating a net savings to SCDOT of 1.146 acres. Because of this reduction, Crowder is committed to absorb any R/W cost over and above the SCDOT expectancy at all sites except S-53. S-53 is not being warranted because our design reduces the necessary ROW due to not correcting the curve superelevation, due to it already being adequate However if SCDOT required it to be done, we don't anticipate the ROW growing beyond what the concept plans call for.
8	The design-build team has applied the appropriate standards for all side slopes at the bridge locations. Our design-build team is committed to collaborating with SCDOT on potential R/W cost saving measures as we did on SC-4 bridge replacement.	Upon award and contracting on Crowder and JMT's SC-4 project, the SCDOT requested the approached roadway slopes to be steepened from the 4:1 presented by the design-builder to 2:1 in order to reduce the amount of R/W the SCDOT had anticipated purchasing through their own preliminary design. This saved the project R/W acquisition costs. Our Team will be open to making design changes on this project should similar opportunities arise under the low volume bridge criteria.	Potential for lowering R/W cost to the SCDOT	Not Applicable.
9	Utilize temporary relocations where advantageous to the construction process and where it minimizes disruptions to service of utility.	Temporary relocations will also be evaluated and discussed with utility companies if feasible. For example, on one of the past emergency DB package 6, Richland County, Crowder provided temporary pile supports to temporarily relocate an AT&T line from the bridge to facilitate demolition and construction without waiting for the final relocation.	Early mobilization to specific jobsites could be garnered by the use of this mitigation. This would result in an early completion of certain project sites.	Not Applicable.

S-294 OVER WILSONS CREEK, ANDERSON COUNTY

S-53 OVER LITTLE ROCKY CREEK, CHESTER COUNTY

S-108 OVER BROWN CREEK, CHESTERFIELD COUNTY

S-765 OVER HANGING ROCK CREEK, LANCASTER COUNTY

APPENDIX C: APPROVED FORMAL ATCS

SCDOT
South Carolina

Formal ATCs

Date Received: **1/9/2023** Reponse Sent: **1/10/2023**

Crowder			SCDOT		
ATC No.	Primary Discipline	Concept	Response	Justification	Final?
1	Hydrology	S-765 bridge configuration revision	Not Approved		Yes
2	Hydrology	S-108 bridge configuration revision	Approved		Yes
3	Hydrology	S-294 bridge configuration revision	Approved		Yes
4	Structures	AASHTO BIV36 for longer spans on S-294/S-765	Approved		Yes
5	Structures	Steel Pile in place of PSC piles.	Approved		Yes
6	Structures	The use of pile bents to support an average span length exceeding 75 ft at site S-53	Approved		Yes
7	Structures	Galvanized steel piles at interior bent locations	Not Approved		Yes

Post Office Box 191
Columbia, South Carolina 29202-0191

Phone: (803) 737-2314
TTY: (803) 737-3870

AN EQUAL OPPORTUNITY
AFFIRMATIVE ACTION EMPLOYER

South Carolina Department of Transportation

Formal Alternative Technical Concepts Submittal Form

Project: Bridge Package 15, Anderson, Chester, Chesterfield, and Lancaster Counties **Project ID:** 8862230

ATC No.: 2 **Priority:** High **Team:** Crowder-JMT **Date:** 1/9/23

Description (required):

The Crowder-JMT team requests to revise the bridge configuration at S-108 over Brown Creek from a single longer bridge to one single-span bridge while still meeting the bridge hydraulic requirements. This would reduce the amount of existing roadway embankment excavation currently required for the single long bridge in the concept plans and eliminate the constriction of interior bents.

Usage:

This "bridge length" ATC concept would be utilized at three bridge sites, however this ATC is specifically for S-108 over Brown Creek. S-765 over Hanging Rock Creek and S-294 over Wilsons Creek will be covered under separate ATC's.

Deviations (required):

The revised Minimum Bridge Length is prescribed in the RFP in Attachment B Hydro - Package 15 Min Span Length. The Concept Plans and preliminary hydrologic and hydraulic assessment provides a single span 100-ft bridge. The ATC is requesting to reduce the bridge length from 100' to 75'.

Justification:

The Crowder-JMT team has performed a preliminary bridge hydraulic analysis with the proposed 75’ single span bridge. The analysis confirmed that this bridge configuration provides equal or better hydraulic performance for the 100-year event as compared with the RFP requirements and original concept plans. Our ATC also meets the 2 ft of freeboard requirement to the low chord elevation for the 25-year event. Our proposed concept eliminates excess bridge length, while providing the required hydraulic performance to save schedule and costs at the site.

Schedule:

Reduction of the single span bridge length would have not significant impacts to the schedule.

Impacts:

No perceived negative impacts to the structure or site.

History:

N/A

Risks:

There is no perceived risks to SCDOT, Public, or contractor with this ATC.

Costs (required):

This ATC would reduce the superstructure deck square footage, reduce the end bent pile lengths, and reduce the amount of existing roadway embankment excavation as compared to the 100’ single span concept. The savings resulting from this ATC are approximately $100,000.

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AN EQUAL OPPORTUNITY
AFFIRMATIVE ACTION EMPLOYER

Formal Alternative Technical Concepts Submittal Form

Project: Bridge Package 15, Anderson, Chester, Chesterfield, and Lancaster Counties **Project ID:** 8862230

ATC No.: 2 **Priority:** High **Team:** Crowder-JMT **Date:** 1/9/23

Quality:

This ATC would increase quality by providing equal or better hydraulic performance as compared to the concept plan while reducing construction costs.

Operations & Maintenance:

This ATC would not have any impacts to operations and maintenance since the shorter single span bridge still meets all hydraulic requirements.

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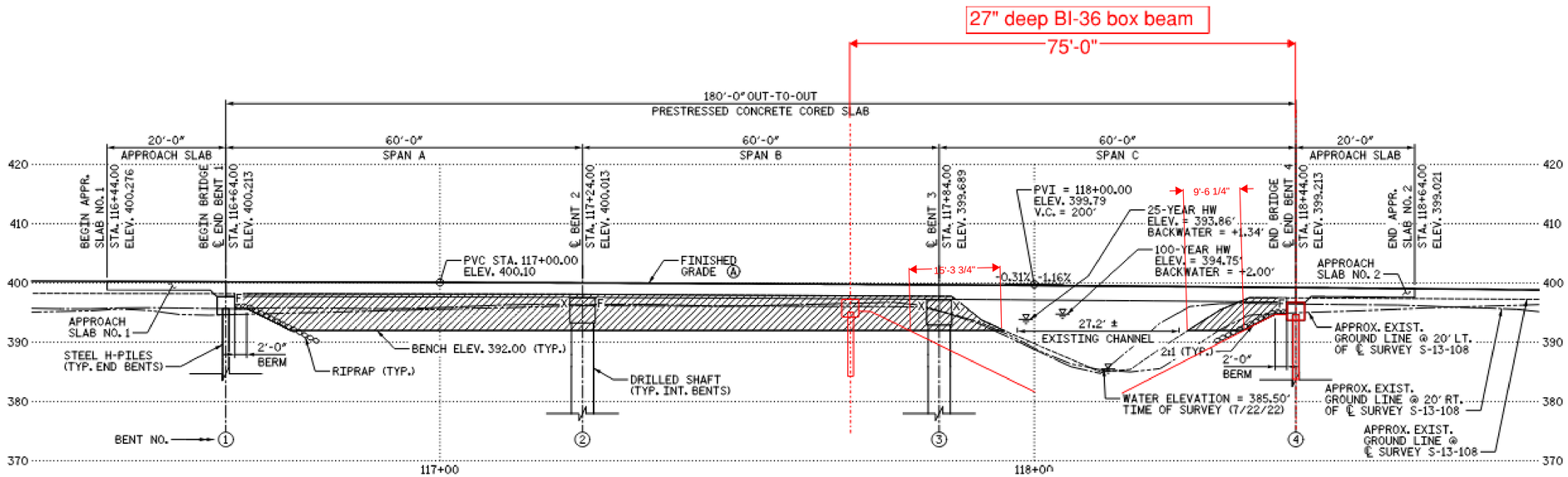
Columbia, South Carolina 29202-0191

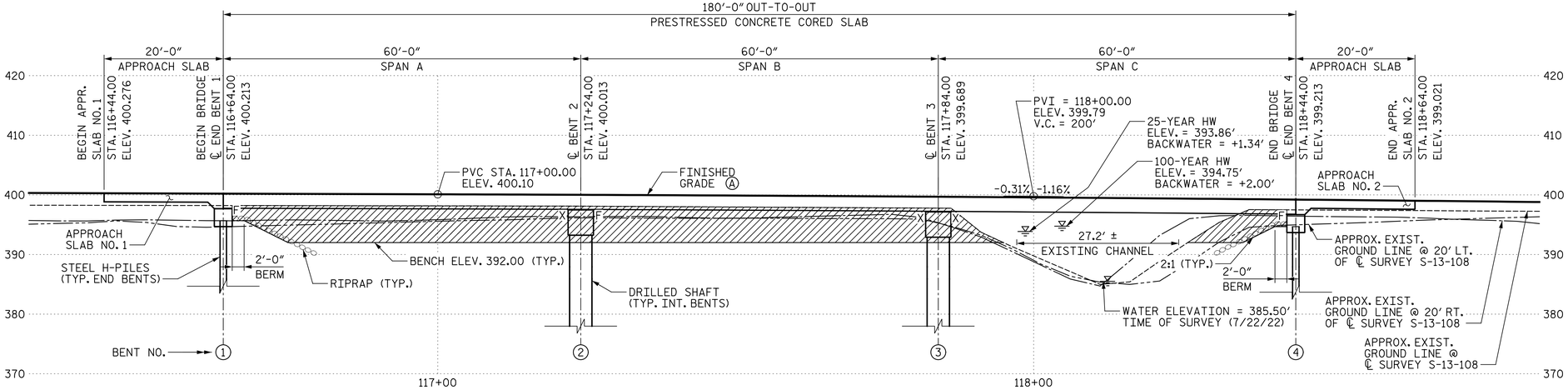
Phone: (803) 737-2314
TTY: (803) 737-3870

AN EQUAL OPPORTUNITY
AFFIRMATIVE ACTION EMPLOYER

BRIDGE PLANS ID	SHEET NO.
P041181-B01	2



SECTION ALONG ℄ SURVEY S-13-108



SECTION ALONG ℄ SURVEY S-13-108

NOTES:

Ⓐ PROPOSED PROFILE SET SO THAT THE NEW CHORD ELEVATION IS AT OR ABOVE THE EXISTING LOW CHORD ELEVATION.

Ⓑ INCLUDES 1'-0" MASH BARRIER PARAPET AND 1" SLAB EXTENSION.

Ⓒ REMOVE AND DISPOSE OF EXISTING 33'-0" x 45'-0"± 3-SPAN SIMPLE CONCRETE SLAB BRIDGE AND APPURTENANCES IN ACCORDANCE WITH SECTION 202.4.2 OF THE STANDARD SPECIFICATIONS.

F - DENOTES FIXED BEARING

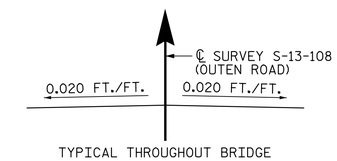
X - DENOTES EXPANSION BEARING

= EXCAVATE HATCHED AREA

CONTROL POINTS

CP3
ELEVATION = 409.10'
N 1080786.02 E 2187684.14
#5 REBAR

CP4
ELEVATION = 398.02'
N 1081235.27 E 2187519.92
#5 REBAR



SUPERELEVATION SKETCH

HYDROLOGY DATA

D.A. = 6.4 SQ. MILES
Q_25 = 1,610 CFS
VELOCITY_25 = 5.95 FPS
AREA FURNISHED UNDER_25 = 410.4 SQ. FT.
Q_100 = 2,280 CFS
VELOCITY_100 = 6.21 FPS
AREA FURNISHED UNDER_100 = 546.3 SQ. FT.

OVERTOPPING FLOOD

Q = 3,080 CFS
PROBABILITY < 0.2%

REV.			
REV.			
REV.			
REVIEWED			
QUAN.			
DR.	RAM	DJS	09-22
DES.			

CONCEPTUAL PLANS

NOT FOR CONSTRUCTION

HDR ENGINEERING INC. OF THE CAROLINAS
1201 MAIN STREET
SUITE 800
COLUMBIA, SC, 29201
803-509-6600

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BRIDGE PLAN AND PROFILE

S-13-108 (OUTEN ROAD) BRIDGE REPLACEMENT OVER BROWN CREEK

COUNTY	ROUTE
CHESTERFIELD	S-13-108

CADD FILE INFORMATION 3:26:45 PM
PLOTTED DATE: 09-22-22
FILE NAME: bP041181-B01_bp.dgn

Formal Alternative Technical Concepts Submittal Form

Project: Bridge Package 15, Anderson, Chester, Chesterfield, and Lancaster Counties **Project ID:** 8862230

ATC No.: 3 **Priority:** High **Team:** Crowder-JMT **Date:** 1/9/23

Description (required):

The Crowder-JMT team requests to revise the bridge configuration at S-294 over Wilsons Creek from a single longer multispan bridge to one single-span bridge while still meeting the bridge hydraulic requirements. This would reduce the amount of existing roadway embankment excavation currently required for the single long bridge in the concept plans and eliminate the constriction of interior bents.

Usage:

This "bridge length" ATC would be utilized at three bridge sites, however, this ATC is specifically for S-294 over Wilsons Creek. S-765 over Hanging Rock Creek and S-108 over Brown Creek will be covered under a separate ATC's. This ATC is contingent on approval of ATC 4. If ATC 4 is not approved, our team would like to provide a two span option with a reduced bridge length and utilize the stand beam lengths.

Deviations (required):

The Minimum Bridge Length is prescribed in the RFP in Attachment B Hydro - Package 15 Min Span Length. The Concept Plans and preliminary hydrologic and hydraulic assessment defines a three span 130-ft bridge (30'-70'-30'). The ATC is requesting to reduce the bridge length and use one single 120 ft span bridge.

Justification:

The Crowder-JMT team has performed a preliminary bridge hydraulic analysis with the proposed 120' single span bridge. The analysis has confirmed that this bridge configuration provides equal or better hydraulic performance for the 100-year event as compared with the RFP requirements and original concept plans. Our ATC also meets the 2 ft of freeboard requirement to the low chord elevation for the 25-year event. Our proposed concept eliminates the need for interior bents while providing the required hydraulic performance to save schedule and cost at the site. The Crowder/JMT team will ensure the projection of 2:1 spill-through slope, from top-of-riprap, does not intersect any point on all three channel profiles.

Schedule:

We expect approximately 1 month schedule savings in the construction time for each bridge with this ATC due to not drilling shafts and not doing "interior" bent work.

Impacts:

No perceived negative impacts to the structure or site. The long multi-span bridge would be replaced with a single span bridge with fewer elements to inspect and maintain.

History:

N/A

Risks:

There is no perceived negative risks with this ATC. This ATC would have significant schedule reductions and minimize the schedule risks.

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Formal Alternative Technical Concepts Submittal Form

Project: Bridge Package 15, Anderson, Chester, Chesterfield, and Lancaster Counties **Project ID:** 8862230

ATC No.: 3 **Priority:** High **Team:** Crowder-JMT **Date:** 1/9/23

Costs (required):

This ATC would eliminate two interior bents saving approximately $500,000. The overall bridge length would be reduced by 10' saving $150,000 in superstructure costs and the excavation and removal of embankment would be less.

Quality:

This ATC would increase quality by providing a similar hydraulic opening as the original concept plans while eliminating all interior bents. This eliminates the potential for debris accumulation, eliminates harder access for inspection of interior bents in water, and eliminates future maintenance of interior bents.

Operations & Maintenance:

This ATC would eliminate interior bents and have no exposed substructures for future damage and deterioration. Elimination of the interior bents would eliminate any potential for debris accumulation reduce future inspection cost with a single span and no interior bents to inspect.

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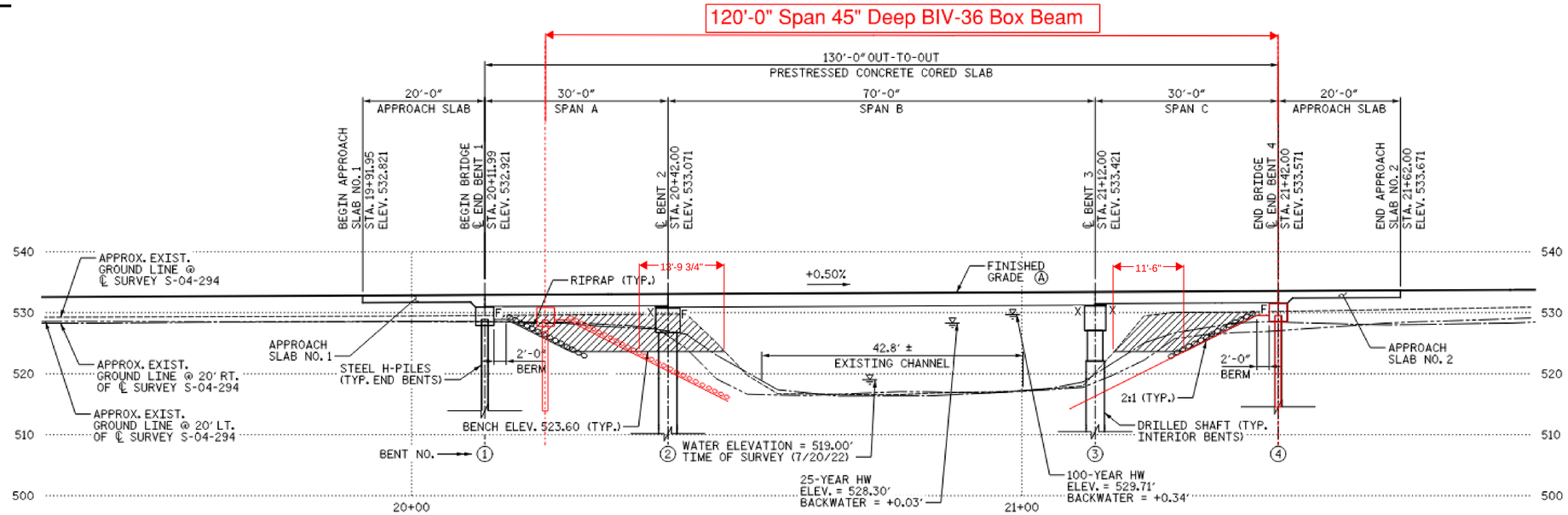
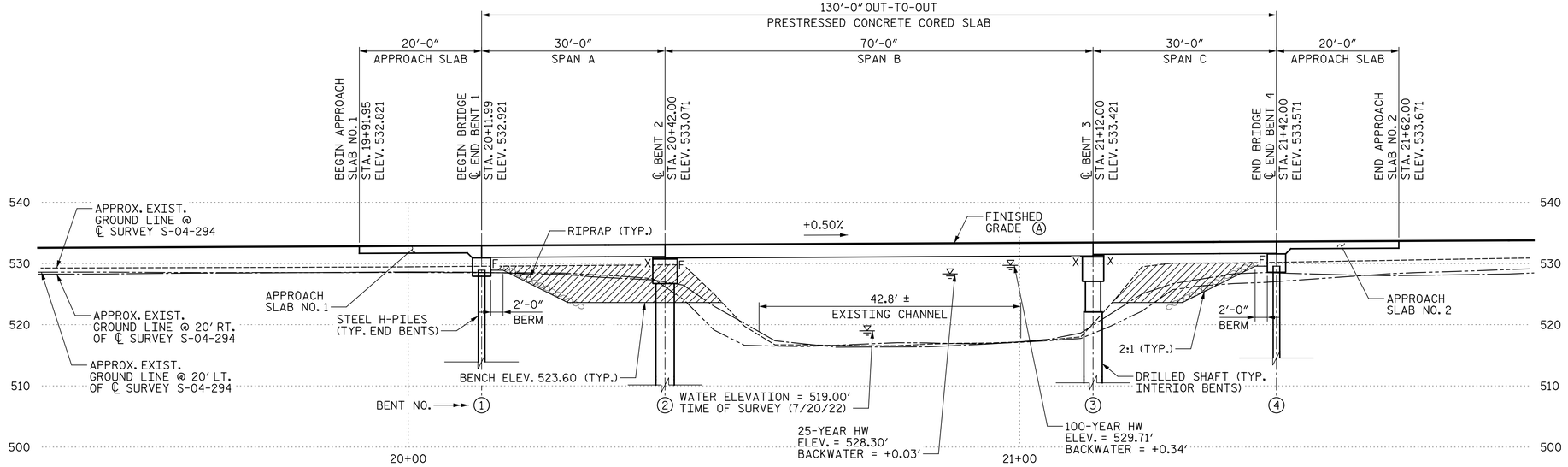
BRIDGE PLANS ID	SHEET NO.
P041156-B01	2



SECTION ALONG SURVEY ℄ S-04-294



SECTION ALONG SURVEY ℄ S-04-294

NOTES:

Ⓐ PROPOSED PROFILE SET SO THAT THE LOW CHORD SATISFIES THE HYDRAULIC REQUIREMENTS, SET FORTH BY THE RFP.

Ⓑ INCLUDES 1'-0" MASH BARRIER PARAPET AND 1" SLAB EXTENSION.

Ⓒ REMOVE AND DISPOSE OF EXISTING 27'-6" × 75'-0"± 5-SPAN SIMPLE CONCRETE SLAB BRIDGE AND APPURTENANCES IN ACCORDANCE WITH SECTION 202.4.2 OF THE STANDARD SPECIFICATIONS.

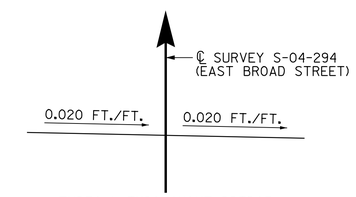
F - DENOTES FIXED BEARING

= EXCAVATE HATCHED AREA

CONTROL POINTS

MSC9
ELEVATION = 529.23'
N 899677.57 E 1510915.53

BM2
ELEVATION = 527.91'
N 899740.84 E 1510979.06



TYPICAL THROUGHOUT BRIDGE

SUPERELEVATION SKETCH

VERTICAL CURVE DATA

PVI = 16+40.00	PVI = 23+30.00
ELEV. 531.06	ELEV. 534.51
V.C. = 320'	V.C. = 300'

-9.51% +0.50% +7.76%

HORIZONTAL CURVE DATA

P.I. = 19+31.04
Δ = 20°46'54" (RT.)
Dc = 9°34'21"
T = 109.75'
L = 217.10'
E = 9.98'
R = 598.54'

HYDROLOGY DATA

D.A. = 29.4 SQ. MILES
Q_25 = 4,170 CFS
VELOCITY_25 = 5.3 FPS
AREA FURNISHED UNDER_25 = 891.5 SQ. FT.
Q_100 = 5,780 CFS
VELOCITY_100 = 6.3 FPS
AREA FURNISHED UNDER_100 = 1,055.6 SQ. FT.

OVERTOPPING FLOOD

Q = 7,690 CFS
PROBABILITY < 0.2%

REV.			
REV.			
REV.			
REVIEWED			
QUAN.			
DR.	RAM	DJS	09-22
DES.			

CONCEPTUAL PLANS

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SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BRIDGE PLAN AND PROFILE

S-04-294 (EAST BROAD STREET) BRIDGE REPLACEMENT OVER WILSONS CREEK

COUNTY	ROUTE
ANDERSON	S-04-294

CADD FILE INFORMATION 6:41:27 PM
PLOTTED DATE: 09-22-22
FILE NAME: bP041156-B01.bp.dgn

Formal Alternative Technical Concepts Submittal Form

Project: Bridge Package 15, Anderson, Chester, Chesterfield, and Lancaster Counties **Project ID:** 8862230

ATC No.: 5 **Priority:** Med **Team:** Crowder-JMT **Date:** 1/9/23

Description (required):

The Crowder-JMT team request to use an approved steel pile in place of a prestressed concrete (PSC) pile for conditions where a steel element can be driven, and placed inside a pre-drilled bore hole and concreted (drilled pile). This ATC would allow the team to achieve axial and lateral pile capacity in locations where subsurface conditions prevent adequate PSC pile penetration, in lieu of drilled shafts. The steel piles would be encased in concrete from at least 2 ft below the determined scour line up to the underside of the cap. A mechanical connection between the pile and the concrete cover will be provided by use of studs or rebar to aid in concrete adherence. Where drilled piles are used, the piles will be placed in the bore hole and driven with a pile hammer to confirm capacity prior to backfilling the annular space with concrete, or designed with drilled shaft bearing considerations. Rock coring, and laboratory unconfined compressive strength (UCS) testing will be performed at locations where this ATC is proposed. This will be done to verify rock quality and strength, and to ensure that the drilled pile is warranted and installed sufficiently deep enough into sound scour-resistant rock. The concrete encasement will provide a minimum of 3" cover to the steel pile element.

Usage:

Interior bents at locations where subsurface conditions prevent adequate PSC pile penetration to satisfy lateral pile stability below the design scour elevation, in lieu of using drilled shafts.

Deviations (required):

SCDOT Geotechnical Design Manual, Chapter 16 Deep Foundations, Section 16.5 Drilled Piles. Section 16.5 states drilled piles are typically used only at end bents, and prior approval is required to use drilled piles at interior bents. Further, drilled piles typically consist of steel H-piles having sizes of HP12x53 and HP14x73. Section 2.1.16 of the RFP Section 4b states that steel piles are only permitted at end bents. This ATC is requesting drilled steel piles in accordance with GDM Section 16.5, and with the concrete cover described above, be permitted at interior bents.

Justification:

No geotechnical data is available near locations of interior bents, and the available data indicate relatively shallow depths to PWR, rock or very stiff/dense residual soils that can prevent adequate penetration of a PSC pile at some sites. The axial and lateral bridge loads are not expected to be sufficiently high to warrant the additional cost of drilled shaft foundations.

Schedule:

This ATC will improve the schedule at bridges where it is applied. It also reduces schedule risks that come with mobilizing drilled shaft contractors to sites for so few shaft installations.

Impacts:

No negative impacts perceived.

History:

The ATC has been implemented by Crowder previously on the SCDOT CLRB 2020-1 package, as ATC4, and was used on two bridges. In addition, steel H-piles installed in pre-drilled bore holes with concrete backfill in rock is done routinely in the Piedmont geology of Georgia, and it is permitted by GDOT. The pile members are designed in accordance with AASHTO LRFD.

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Formal Alternative Technical Concepts Submittal Form

Project: Bridge Package 15, Anderson, Chester, Chesterfield, and Lancaster Counties **Project ID:** 8862230

ATC No.: 5 **Priority:** Med **Team:** Crowder-JMT **Date:** 1/9/23

Risks:

No major risks perceived with this ATC given that the use of steel mitigates potential driving risks associated with driving a concrete pile into hard residuum soils, PWR, and rock. Drilled piles can be driven after being placed in the bore hole to verify axial capacity is achieved, prior to backfilling the annular space with concrete to provide lateral support for the piles. This ATC also reduces schedule risks that come with mobilizing drilled shaft contractors to sites for so few shaft installations.

Costs (required):

Assuming this ATC is applied across all concept plans, this would replace a total of 9 interior drilled shaft bents with steel piles encased in concrete. We approximate this to be $20,000 savings per bent. Total potential savings of $180,000.

Quality:

Quality of the foundation is equal or better than without the ATC, as the risks of pile damage while driving through very dense partially weathered rock or encountering premature refusal on sound rock is mitigated with use of the drilled pilot hole. The concrete encasement around the pile in the drilled hole with be 4000DS.

Operations & Maintenance:

No difference as compared to other foundation types.

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Project: Bridge Package 15, Anderson, Chester, Chesterfield, and Lancaster Counties **Project ID:** 8862230

ATC No.: 6 **Priority:** Med **Team:** Crowder-JMT **Date:** 1/9/23

Description (required):

The Crowder-JMT team requests the use of pile bents on tributary adjacent spans greater than 75' at the S-53 Little Rocky Creek Bridge. This ATC is to eliminate the need to install drilled shafts as indicated in the concept plans. The use of this ATC is contingent upon further design to prove that all applicable loads and design criteria can be met with pile bents. All other bridge sites have spans of 75' or less and this would not apply. Pile bents will provide the required foundation load criteria as well as the desired "concrete element" in the water by means of using a driven or "drilled and cemented" prestressed concrete pile, or an H-pile with concrete encasement. Pile bents will use a minimum 6'-0" pile spacing. Pile size will be based on final design.

Usage:

Our intent is to only apply this at the S-53 Little Rocky Creek interior bents. All other bridge sites have spans of 75' or less.

Deviations (required):

This ATC requires a deviation from Exhibit 4b Section 2.1.20 state "Do not use Interior Pile Bents to support an average span length that exceeds 75 feet, considering both adjacent span lengths."

Justification:

Allowing this ATC enables the engineer of record to design the most efficient substructure for the site without compromising the ability of the bridge to meet all desired performance measures. Pile usage is expected to be more cost and schedule effective than shaft installation.

Schedule:

This ATC improves the schedule by having pile bents to install rather than drilled shafts and creates more foundation installation and schedule risk control for the contractor by self-performing pile installation.

Impacts:

This creates no negative impacts to SCDOT as the pile bents and associated spans can be designed to meet all required loads and performance expectations using pile bents.

History:

Bridges have been designed to be supported by pile bents with spans over 75 ft. on other projects.

Risks:

There are no risks to the SCDOT, Contractor, or Public from this ATC and normal risks associated to drilled shaft installation are eliminated.

Costs (required):

Assuming this ATC is applied across all 3 interior bents at S-53, this would replace all drilled shafts with piles. We approximate this to be a $50,000 savings per bent for approximately $150,000 savings to the bridge. It also eliminates any "risk pool money" assigned to shaft construction by a subcontractor.

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Formal Alternative Technical Concepts Submittal Form

Project: Bridge Package 15, Anderson, Chester, Chesterfield, and Lancaster Counties **Project ID:** 8862230

ATC No.: 6 **Priority:** Med **Team:** Crowder-JMT **Date:** 1/9/23

Quality:

This creates no adverse impacts to the quality of the substructure or of the site. Pile bents will provide the required foundation load criteria as well as the desired "concrete element" in the water by means of using a driven or "drilled and cemented" prestressed concrete pile, or an H-pile with concrete encasement.

Operations & Maintenance:

This creates no adverse impacts to SCDOT Operations and Maintenance.

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