Earthwork Balance Sheet

Volumes in Cubic Yards

PROJECT: U-6003 COUNTY: Forsyth DATE: 9/8/2023 COMPILED BY: Conrad, Joseph

CHAIN	STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
			TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. (+)15%		ROCK	SUITABLE	UNSUIT.	TOTAL
SUMMARY 1																
-L-	12+00.00	42+00.00	90,002	2,485	5,300	2,484	85,033	39,105	2,485	36,620	44,598			42,920	7,784	50,704
SUBTOTAL			90,002	2,485	5,300	2,484	85,033	39,105	2,485	36,620	44,598			42,920	7,784	50,704
SUMMARY 2																
-L-	42+00.00	62+00.00	76,228	3,015	1,000	2,503	70,710	9,316	3,015	6,301	10,261			63,464	3,503	66,967
SUBTOTAL			76,228	3,015	1,000	2,503	70,710	9,316	3,015	6,301	10,261			63,464	3,503	66,967
SUMMARY 3																
-Y15-	12+50.00	21+00.00	616			616		924		924	1,063	1,063			616	616
SUBTOTAL			616			616		924		924	1,063	1,063			616	616
SUMMARY 4																
-Y16-	11+50.00	16+50.00	597			597		441		441	507	507			597	597
SUBTOTAL			597			597		441		441	507	507			597	597
SUMMARY 5																
-DR1-	10+75.00	11+27.63	3				3	116		116	133	130				
SUBTOTAL			3				3	116		116	133	130				
SUMMARY 6																
-DR2-	10+25.00	11+00.00	7				7	38		38	44	37				
SUBTOTAL			7				7	38		38	44	37				
SHEET TOTALS			167,453	5,500	6,300	6,200	155,753	49,940	5,500	44,440	56,606	1,737		106,384	12,500	118,884

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGNER. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

Earthwork Balance Sheet

Volumes in Cubic Yards

PROJECT: U-6003 COUNTY: Forsyth DATE: 9/8/2023 COMPILED BY: Conrad, Joseph

CUMULATIVE TOTALS	EXCAVATION					EMBANKMENT				BORROW	WASTE			
	TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. (+)15%		ROCK	SUITABLE	UNSUIT.	TOTAL
SHEET 1 SUMMARY	167,453	5,500	6,300	6,200	155,753	49,940	5,500	44,440	56,606	1,737		106,384	12,500	118,884
SHEET TOTALS	167,453	5,500	6,300	6,200	155,753	49,940	5,500	44,440	56,606	1,737		106,384	12,500	118,884
LOSS DUE TO CLEARING AND GRUBBING	-16,000				-16,000							-16,000		-16,000
ADDITIONAL UNDERCUT			2,500			800		800	920	920			2,500	2,500
EARTH WASTE IN LIEU OF BORROW										-2,657		-2,657		-2,657
GRAND TOTAL	151,453	5,500	8,800	6,200	139,753	50,740	5,500	45,240	57,526			87,727	15,000	102,727
SAY	151,460													
DRAINAGE DITCH EXCAVATION	1,213													
ESTIMATED SHALLOW UNDERCUT	1,000													
ACCEPTABLE UNCLASSIFIED EXCAVATION = 26000 C.Y. NOT TO BE USED IN TOP 3' OF EMBANKMENT OR BACKFILL:														
-L-	31+25.00	33+25.00	4,333											
-L-	34+75.00	39+25.00	4,333											
-L-	46+75.00	51+25.00	4,333											
-L-	55+25.00	55+75.00	4,333											
-L-	57+25.00	59+25.00	4,333											
-L-	60+75.00	62+49.70	4,333											

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGNER. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

Revised 11/9/17

PRE-LET FIELD INSPECTION

Construction WBS#: 47138.3.1

County: Forsyth

T.I.P. #: **U-6003**

Team Lead: **Connie James, PE**

Management Group: **Division 9**

Instructions

An answer must be provided for **all** questions. If the question is not relevant to the project, then check N/A. Where needed, reply to the requests for additional information with complete statements so that there is not the possibility of a misunderstanding or confusion.

General

Does this project contain any new or unique construction techniques, processes, and/or products that are unfamiliar to the Department, Division, or the assigned Resident Engineer? If "Yes", a draft project special provision, details along with a Technical Bulletin (if available) of this unique construction technique, process, and/or product should be supplied to you for review and comment during this field inspection. Does this project have any constructability issues that should be addressed? If "Yes", briefly describe the issue(s) in the space below: Click here to provide additional information.	☐Yes ☒ No ☐Yes ☒ No
Based on your answers above, do you recommend: • An internal constructability review? • An external constructability review with representation from contractors affiliated with the Association of General Contractors (AGC)? • A Technical Bulletin to be prepared? • Training to be provided for the Resident Engineer and staff? Click here to provide additional information.	 ☒Yes ☐ No ☐Yes ☒ No ☐Yes ☒ No ☐Yes ☒ No
Recommend completion date for project based on a tentative letting date of **Click here to enter the let date**.	**Click here to select a completion date.**
Recommend the contract method felt most suitable for this project: conventional, A & B, or incentive/disincentive.	**Conventional**
Should a floating date of availability be used for this project? If "Yes", provide any recommendations in the space below: Click here to provide additional information.	☐Yes ☒ No ☐N/A
Are there any issues with the beginning and end of project and construction? If "Yes", list the locations in the space below: Click here to provide additional information.	☐Yes ☒ No ☐N/A
Will the construction surveying on this project be handled by the Department or the Contractor?	**Contractor**

Is the project survey line identified on the ground so it can be found and located by the prospective contractors? If "No", provide the location(s) where issues exist in the space below: Click here to provide additional information.	☒Yes ☐ No
Are there any existing hazardous waste sites or possible existing contaminated properties located within or immediately adjacent to the project right of way? If "Yes", list the locations in the space below: **Parcel #2 Quality Oil Company LLC**	☒Yes ☐ No
Are any monitoring wells within project limits? If "Yes", provide locations in the space below so that abandoning work may be coordinated by the Geoenvironmental Section before construction. Click here to provide additional information.	☐Yes ☒ No
Do you have any suggestions for consideration that would reduce the future maintenance costs of this project? If "Yes", list the locations in the space below: Click here to provide additional information.	☐Yes ☒ No
Should "Partnering" be utilized on this project? This concept of creating a cohesive relationship between the NCDOT, the Contractor, subcontractors, and suppliers, is highly encouraged particularly on large, complex projects when safety, efficiency, and completion within the targeted budget and schedule are extremely important. If "Yes", provide additional information on the type of partnering in the space below: Click here to provide additional information.	☐Yes ☒ No
Have the comments from the final design field inspection been incorporated? If "No", provide explanations for not doing so space below: **Not at this time**	☐Yes ☒ No

Barriers

The Roadway Standard Drawing, Std. 846.03 (Sheet 1 of 2), shows guardrail spanning an object that requires a post to be omitted. Does this project require that standard? If "Yes", list each location and the required standard in the space below: Click here to provide additional information.	☒Yes ☐ No
Will removed existing guardrail be stockpiled? Click here to provide additional information.	☐Yes ☒ No ☐N/A
Will the Division be able to furnish the temporary concrete barrier to the contractor for his use during construction of the project? If "Yes", designate the location from which the contractor must take delivery of the barrier and the location to which the contractor must return the barrier at the conclusion of the project in the space below: Click here to provide additional information.	☐Yes ☒ No ☐N/A
If the Contractor is to furnish the temporary concrete barrier, should barrier revert to the Contractor at the conclusion of the project? NOTE: If the Division wants to take possession of the barrier, it must reimburse the project for the salvage value of the barrier, this reimbursement must come from 100% State funds.	☒Yes ☐ No ☐N/A

Constructability/Permitting/Commitments

Have all environmental commitments been reviewed and can they be implemented? If "No", provide more detail below in the space below: Click here to provide additional information.	☒Yes ☐ No ☐N/A
Are any plan changes or modifications required that may jeopardize the status of the permit? If "Yes", list the locations in the space below: Click here to provide additional information.	☐Yes ☒ No ☐N/A
Are historic properties and / or archeological sites clearly identified on the plans? If "No", provide the location(s) where issues exist in the space below: Click here to provide additional information. Do the commitments clearly explain how the impacts to these sites will be avoided or minimized? If "No", provide suggestions on how the comments could be clarified below: Click here to provide additional information.	☐Yes ☒ No ☐N/A ☒Yes ☐ No
Are there any temporary pedestrian impacts listed on the list of environmental commitments (green sheets)? **No temporary but including accommodations at intersections**	☐Yes ☒ No

Driveways

Will high strength or quick cure concrete be required for driveway during construction of replacement operations? Click here to provide additional information.	☐Yes ☒ No

Earthwork

Are there any ways which project generated debris (i.e. removed concrete/asphalt pavement: clearing and grubbing-mulch; native planting) can be safely and economically incorporated into the construction of the project? If "Yes", provide more information in the space below: Click here to provide additional information.	☐Yes ☒ No
Can earthwork be utilized (as shown on the Earthwork Summary) during construction phasing of this project? For widening projects, this includes the ability of the contractor to haul earth material across traffic. If "No", provide more information in the space below: Click here to provide additional information.	☒Yes ☐ No ☐N/A
If this project fits within the guidelines, would you rather the contract be written as "Lump sum grading" or individual grading items? **Lump Sum**	☒Yes ☐ No
Is this project a good candidate for earthwork quantity determination using photogrammetric methods? Click here to provide additional information.	☐Yes ☒ No

Geotechnical (Must answer if sub-surface information is not available.)

Are any underdrains anticipated? If "Yes", estimate total length below: **500 LF**	☒Yes ☐ No

Is additional undercut excavation needed beyond what is shown in the geotech recommendations? If so, provide an estimate of that quantity. (Article 225-4) Click here to enter quantity.	☐Yes ☒ No

Grading

Has any grading occurred since field surveys and contour mapping were made? If "Yes", have these areas been identified and taken into account? Provide additional information in the space below: Click here to provide additional information.	☐Yes ☒ No

Load Restrictions

Are there load limit restrictions on roads and/or bridges in the project vicinity which will limit the contractor in the hauling equipment and materials? If "Yes:, will this be covered by Section 105-15 of the Standard Specifications? **No load restrictions in close proximity**	☐Yes ☒ No ☐Yes ☐ No

Material Usage and Measurement

Specify how borrow material will be measured. In place measurement, or truck measurement. (Article 230-5)	In Place Measurement
On Federal Aid projects, are materials furnished by the contractor or salvaged from the project to become the property of the department? If yes, the salvage value must be reimbursed from State funds for the material as part of the Federal Aid Agreement if the salvage value exceeds $5,000.00 except where the salvaged item will be reused in future projects eligible under Title 23 USC until its useful life is expended.	☐Yes ☒ No ☐N/A

Pavement

Will incidental stone base be required? (Article 545-1) If "Yes", estimate quantity in the space below: **500**	☒Yes ☐ No
Will asphalt plant mix pavement repair be required for repairing existing pavement? (Exclude pipe installations) If "Yes", estimate quantity in the space below: **100**	☒Yes ☐ No
Do you have any recommendations for mobile string line or fixed string line for the asphalt plant mix paver? (Article 610-8) If "Yes", provide further details in the space below: Click here to provide additional information.	☐Yes ☒ No

Has the method of rumble strip construction for concrete shoulders been clearly show in the plans? **N/A** Do you agree with the method as shown? **N/A** Is there another approved method more suitable for this project? If "Yes", provide more information in the space below: **N/A**	☐Yes ☐ No ☐Yes ☐ No ☐Yes ☐ No
Are there any resurfacing areas where incidental milling will be required to make a suitable tie back to the existing pavement? If "Yes", estimate quantity in the space below: **1600 SY**	☒Yes ☐ No
Do you want Final Surface Testing performed on this project? Click here to provide additional information.	☒Yes ☐ No

Right of Way

Which method of clearing is to be used? If "Other", please specify in the space below: Click here to provide additional information.	**Method III**
Are there trees which are to be preserved on field inspection prints. (Article 200-3) If "Yes", show on field inspection prints or provide locations in the space below: Click here to provide additional information.	☐Yes ☒ No
Are there areas in the Right-of-Way that are not to be cleared? If "Yes", show on field inspection prints or provide locations below: **Method III**	☒Yes ☐ No
What type of Right of Way marker installation is recommended for this project? NOTE: State forces place iron pin and caps as right of way markers. Placement of concrete/granite right of way markers shall be placed by contract. Click here to provide additional information.	**Concrete/Granite Markers by contract**

Traffic Operations

Is the Division aware of any traffic generating events that would require special design considerations and traffic control planning? If "Yes", provide the events below: Click here to provide additional information.	☐Yes ☒ No
Are there any locations where a non-gating impact attenuator should be specified (temporary detours, temporary traffic pattern, etc) that the completed project would only require a gating device? If "Yes", provide the locations in the space below: Click here to provide additional information.	☐Yes ☒ No ☐N/A
Have traffic maintenance and constructability issues been reviewed to ensure they will have no bearings on the permit status? If there are any potential conflicts with the permit status, list them in the space below: Click here to provide additional information.	☒Yes ☐ No

Are any street signs and markers to be removed and stockpiled by the Contractor? If "Yes", provide the locations in the space below: Click here to provide additional information.	☐Yes ☒ No
Are there any signing and/or pavement marking to be performed by force account? If "Yes", notify the Division Traffic Engineer who will furnish a cost estimate to the Roadway Design Unit. Click here to provide additional information.	☐Yes ☒ No
Is a $250 penalty ordinance and/or speed reduction ordinance recommended? Click here to provide additional information.	☐Yes ☒ No
Is a towing ordinance recommended? If "Yes", provide areas of concern in the space below: Click here to provide additional information.	☐Yes ☒ No
Has any development occurred recently to influence the project traffic volumes? If "Yes", advise what the impact is so that geometrics and pavement design can reflect the change in the space below: Click here to provide additional information.	☐Yes ☒ No
What will be the probable posted speed limit for this project? Click here to provide additional information.	35
In addition to portable changeable message signs (per each), is there a need for *short term* portable changeable message signs (for road closures, girder delivery, etc)? If "Yes", estimate the number of days in the space below: Click here to provide additional information.	☐Yes ☒ No ☐N/A

Temporary Shoring

Is Temporary Shoring for the maintenance of traffic required on this project? (Shoring required to maintain traffic is defined as shoring necessary to provide lateral support to the side of an excavation or embankment parallel to an open travelway when a theoretical 2:1 or steeper slope from the bottom of the excavation or embankment intersects the existing ground line closer than 5 feet (1.5m) from the edge of pavement of the open travelway.) List probable locations of this temporary shoring: Click here to provide additional information.	☐Yes ☒ No

Miscellaneous Comments

Click here to provide additional information.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Roy Cooper
Governor

J. Eric Boyette
Secretary

MEMO TO: Phillip Rogers, PE

FROM: Mr. Pat Ivey, PE

SUBJECT: Division 9 Final Pavement Design
U-6003, 8.123456789
-L- New Location Piney Grove Connector From NC 150/Main Street to SR 1969/Piney Grove Road
Forsyth County, Division 9

DATE: 7/24/2023

The pavement designs for the above project are as follows:

Line	Surface	Intermed.	Base	ABC	Stab.	SN_{REQ}
-L- New Location Piney Grove Connector	3.0" S9.5B	4.0" I19.0C	4.0" B25.0C	-	No	2.79
Y15 Piney Grove Road	3.0" S9.5B	4.0" I19.0C	4.0" B25.0C	-	No	2.95
Y16 Linville Springs Road	3.0" S9.5B	4.0" I19.0C	4.0" B25.0C	-	No	2.82
						1.89
						1.89
						1.89

Overlay the existing pavement with the following: 1.5" S9.5B
Mill existing pavement on NC 150 and Macy Grove Road to a depth of 1.5" and replace with 1.5" S9.5B.
For driveways -DR1- and -DR2- use 2.0" S9.5B and 4" B25.0C.
The mix designations provided for the above designs are in accordance with the 2018 NCDOT QMS manual.
If any additional information is needed, please contact: Connie James at 336-747-7800.

Design Information:

Initial Year:	2017	Projection Year:	2040
Initial Year ADT:	4,900	Proj. Yr. ADT:	10,300
% DUALS:	2.0	% TTST:	1.0
LANE/DIRECTION:	1	Des. Life (Years):	20
DIR %:	50	Subgrade M[r]:	8,043
Construction Year:	2024	Design TOT. 18K:	409,948
SN Required:	2.79	SN DESIGN:	4.28

SPI/ckj

cc: pavementrequests@ncdot.gov

Mailing Address:	*Telephone: 336-747-7800*	Location:
NC DEPARTMENT OF TRANSPORTATION	*Fax: (336)703-6693*	375 Silas Creek Parkway
Divison 9	*Customer Service: 1-877-368-4968*	Winston Salem, NC 27127
375 Silas Creek Parkway		
Winston Salem, NC 27127	*Website: www.ncdot.gov*	

PROPOSED DESIGN CRITERIA

U-6003
PINEY GROVE ROAD CONNECTOR

COMPUTED BY: ADS 8/21/17
CHECKED BY: DCS 12/20/17

ROUTE	(Piney Grove Rd Connector)	Piney Grove Rd (SR 1969) SOUTH	Piney Grove Rd (SR 1969) NORTH	LINEVILLE SPRINGS RD (SR 2030)	
LINE	**-L-**				
TRAFFIC DATA					
ADT LET YR = 2019	**5370**	**10180**	**9610**	**7090**	**DRAFT U-6003 12/5/07**
ADT DESIGN YR = 2039	**10070**	**12010**	**12740**	**9960**	**DRAFT U-6003 12/5/07**
TTST	**1%**	**1%**	**1%**	**1%**	**DRAFT U-6003 12/5/07**
DUALS	**2%**	**2%**	**2%**	**2%**	**DRAFT U-6003 12/5/07**
DHV	**10%**	**11%**	**10%**	**9%**	**DRAFT U-6003 12/5/07**
DIR	**55%**	**65%**	**65%**	**60%**	**DRAFT U-6003 12/5/07**
CLASSIFICATION	**Urban Minor Arterial**	**Major Collector**	**Major Collector**	**Local**	**SPOT ID H111223**
TERRAIN TYPE	**Rolling**	**Rolling**	**Rolling**	**Rolling**	**DM 1-1D**
DESIGN SPEED mph	**40 mph**	**40 mph**	**40 mph**	**40 mph**	**SPOT ID H111223**
POSTED SPEED mph	**35 mph**	**35 mph**	**35 mph**	**35 mph**	**SPOT ID H111223**
PROP. R/W WIDTH ft	**100 ft**	**VARIES**	**VARIES**	**VARIES**	**DM Pt II 9-1**
CONTROL OF ACCESS	**Partial**	**NONE**	**NONE**	**NONE**	**SPOT ID H111223**
RUMBLE STRIPS (Y/N)	**N**	**N**	**N**	**N**	**DM 1-4P**
ULT. TYPICAL SECTION TYPE	**2-Lane Divided**	**3-Lane C&G**	**2-Lane Shoulder**	**2-Lane Shoulder**	**SPOT ID H111223**
LANE WIDTH ft	**12 ft***	**12 ft (40' F-F)**	**12 ft**	**12 ft**	**DM 1-3A, DM 1-13**
SIDEWALKS (Y/N)	**Y**	**Y**	**N**	**N**	**Complete Streets, 2J**
BICYCLE LANES (Y/N)	**Y (4' Outside Lane)***	**N**	**N**	**N**	**Complete Streets, 2J**
CURB AND GUTTER (Y/N)	**Y**	**Y**	**N**	**N**	**SPOT ID H111223**
MEDIAN WIDTH ft (EP to EP)	**23 ft (raised)**				**Complete Streets, 2J**
MED. PROTECT. (GR/BARRIER)	**N/A**				
SHOULDER WIDTH (total)					
INSIDE/MEDIAN ft	**N/A**				
OUTSIDE w/o GR ft	**10 ft (BERM)**	**10 ft (BERM)**	**8'**	**8'**	**DM1-7D, 1-13 & Std. 862.01**
OUTSIDE w/ GR ft	**14 ft (BERM)**	**14 ft (BERM)**	**11'**	**11'**	**DM1-7D, 1-13 & Std. 862.02**
PAVED SHOULDER					
OUTSIDE TOTAL/FDPS ft	**N/A (C&G)**		**4'**	**4'**	**DM1-4O**
INSIDE/MEDIAN TOTAL/FDPS ft	**N/A**				
GRADE					
MAX.	**8%**	**10%**	**10%**	**10%**	**DM 1-14**
MIN.	**0.3%**	**0.3%**	**0.3%**	**0.3%**	
K VALUE					
SAG	**64**	**64**	**64**	**64**	**GB 3-161**
CREST	**44**	**44**	**44**	**44**	**GB 3-155**
HORIZ. ALIGN.					
MAX. SUPER.	**4%**	**4%**	**4%**	**4%**	**DM 1-15**
MIN. RADIUS ft	**533 ft**	**533 ft**	**533 ft**	**533 ft**	**GB 3-32**
SPIRAL (Y/N)	**N**	**N**	**N**	**N**	**DM 1-11**
CROSS SLOPES					
PAVEMENT	**.02**	**.02**	**.02**	**.02**	**GB 7-13**
PAVED SHOULDER	**N/A**	**N/A**	**.02**	**.02**	**DM1-4O**
TURF SHOULDER	**N/A**	**N/A**	**.08**	**.08**	**DM1-4O**
MEDIAN DITCH	**N/A**	**N/A**	**N/A**	**N/A**	
DITCH TYPICAL (A,B)	**N/A**	**N/A**	**A**	**A**	**DM1-2A**
CLEAR ZONE ft	**10 ft**	**10 ft**	**18 ft**	**18 ft**	****Memo (C&G) & DM1-4N**
TYPICAL SECTION NO.	**1**				

NOTES: *Consistent with adjacent project U-4734

****Memo from NCDOT State Highway Engineer, Feb 25, 2011 "Proposed Right of Way, Permanent Utiltiy Easement & Utility Pole/Fixed Object Placement"**

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

August 10, 2023

MEMORANDUM TO: Pat Ivey, PE
Division Engineer

ATTENTION: Connie K. James
Division Project Manager

FROM: DS EMW John Pilipchuk, LG, PE
State Geotechnical Engineer DocuSigned by: John L. Pilipchuk 52C44B94B8BE444...

STATE PROJECT: 47138.1.1 (U-6003)
COUNTY: FORSYTH
DESCRIPTION: New Route – From SR 1969 (Piney Grove Rd.) to NC 150 (N. Main St.)

SUBJECT: Revised Geotechnical Report – Design and Construction Recommendations

The Geotechnical Engineering Unit makes the following revised recommendations which supersede recommendations dated November 29, 2018 provided by Summit Design and Engineering. An inventory report and recommendation graphics report were previously submitted by Summit and stand as submitted.

I. Slope and Embankment Stability

A. *Slope Design*
Recommend all roadway slopes be constructed no steeper than 2:1 (H:V).

B. *Undercut*
Recommend 2,300 cubic yards of Undercut for Embankment Stability be included in the project contract for the following locations. The recommended undercut sections are shown by double-hatching on the accompanying cross-section sheets, at the locations listed below:

Line	Station (±)	Offset
-L-	20+75 – 22+25	Left & Right

An additional quantity of 700 cubic yards of Undercut for Embankment Stability should be included in the project contract as a contingency item to be used at the discretion of the Engineer. All undercut should be computed as material to be wasted. However, some material may be used outside of the pavement section at the discretion of the engineer.

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT
1589 MAIL SERVICE CENTER
RALEIGH, NC 27699-1589

Telephone: (919) 707-6850
Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location:
1020 BIRCH RIDGE DRIVE
RALEIGH, NC 27610

C. *Geotextile for Soil Stabilization*
Recommend 13,000 square yards of Geotextile for Soil Stabilization be included in the project contract, as follows:

10,000 square yards for embankment stability without undercut and before placement of Select Granular Material at the areas listed below. Cross sections corresponding to the locations listed below are included in the graphics report:

Line	Station (±)	Offset
-L-	13+75 – 15+25	Left & Right
-L-	18+25 – 19+25	Right
-L-	22+25 – 24+25	Right
-L-	26+75 – 31+75	Left & Right
-L-	43+75 – 45+25	Left & Right

2,300 square yards for embankment stability after undercut and before placement of Select Granular Material at the locations listed in Section I.B.

700 square yards for contingency areas of Undercut for Embankment Stability to be placed prior to the placement of Select Granular Material as noted in Section I.B.

II. Subgrade Stability

A. *Undercut for Subgrade Stability*
Recommend 4,000 cubic yards of Undercut for Subgrade Stability be included in the project contract for the following locations. The recommended undercut sections are shown by double-hatching on the accompanying cross-section sheets, at the locations listed below:

Line	Station (±)	Offset
-L-	12+25 – 13+75	Left & Right
-L-	16+75 – 19+25	Left & Right
-L-	22+25 – 24+25	Left & Right
-L-	55+25 – 57+75	Left & Right

An additional quantity of 1,000 cubic yards of Undercut for Subgrade Stability should be included in the project contract as a contingency item to be used at the discretion of the Engineer. All undercut should be computed as material to be wasted. However, some material may be used outside of the pavement section at the discretion of the engineer.

B. *Grade Point Undercut*
Recommend 800 cubic yards be included in the project contract for Grade Point Undercut.

C. *Aggregate Subgrade*
Shallow Undercut
Recommend 800 cubic yards of 12-inch Shallow Undercut for Aggregate Subgrade be included in the project contract for the following locations. The recommended shallow undercut sections are shown by shaded polygons on the accompanying cross-section sheets, at the locations listed below:

Line	Station (±)	Offset
-L-	11+70 – 12+25	Left & Right
-Y15-	14+75 – 17+75	Left & Right

-Y16-	11+40 – 16+77	Left & Right

An additional quantity of 200 cubic yards of 12-inch Shallow Undercut for Aggregate Subgrade should be included in the project contract as a contingency item to be used at the discretion of the Engineer. All undercut should be computed as material to be wasted. However, some material may be used outside of the pavement section at the discretion of the engineer.

Geotextile for Subgrade Stabilization
Recommend 3,800 square yards of Geotextile for Subgrade Stabilization to be included in the project contract as follows:

3,200 square yards for Aggregate Subgrade to be placed prior to the placement of Class IV Subgrade Stabilization Material at the areas noted in **Section II.C.**

600 square yards for contingency areas of Aggregate Subgrade to be to the placement of Class IV Subgrade Stabilization Material as noted in **Section II.C.**

Class IV Subgrade Stabilization Material
Recommend 2,500 tons of Class IV Subgrade Stabilization Material to be used as backfill for Shallow Undercut on Geotextile for Subgrade Stabilization, as follows:

2,100 tons on Geotextile for Subgrade Stabilization at the areas recommended for Aggregate Subgrade as noted in **Section II.C.**

400 tons on Geotextile for Soil Stabilization for contingency areas of Aggregate Subgrade as noted in **Section II.C.**

D. *Subsurface Drainage- Subsurface Drains*
Recommend 500 linear feet of Subdrain pipe used for Underdrain (Roadway Standard Drawing 815.03) be included in the project contract for the locations listed below:

Line	Station (±)	Offset
-L-	31+25 – 33+25	Left & Right

An additional quantity of 500 linear feet of Subdrain pipe used for Underdrain should be included in the project contract as a contingency item to be used at the discretion of the engineer.

E. *Geotextile for Soil Stabilization*
4,000 square yards for Undercut for Subgrade Stability to be placed prior to the placement of Select Granular Material at the areas noted in **Section II.A.**

1,000 square yards for contingency areas of Undercut for Subgrade Stability to be placed prior to placement of Select Granular Material as noted in **Section II.A.**

III. Borrow Specifications

A. *Shrinkage Factor*
Recommend a shrinkage factor of 15% for calculation earthwork quantities.

B. *Select Granular Material*
Recommend 18,000 cubic yards of Select Granular Material for embankment stability and subgrade stability on Geotextile for Soil Stabilization, as follows:

2,300 cubic yards on Geotextile for Soil Stabilization at the areas recommended for Undercut for Embankment Stability as noted in **Section I.B.**

700 cubic yards on Geotextile for Soil Stabilization for contingency areas of Undercut for Embankment Stability as noted in **Section I.B.**

10,000 cubic yards on Geotextile for Soil Stabilization at the areas recommended for embankment stability without undercut as noted in S**ection I.C.**

4,000 cubic yards on Geotextile for Soil Stabilization at the areas recommended for Undercut for Subgrade Stability as noted in **Section II.A.**

1,000 cubic yards on Geotextile for Soil Stabilization for contingency areas of Undercut for Subgrade Stability as noted in **Section II.A.**

Select Material for embankment construction on Geotextile for Soil Stabilization shall meet the criteria outlined in Standard Specifications, Article 1016-3 Class II or III. Construction utilizing Select Granular Material should follow section 265-3 of the Standard Specifications.

IV. Miscellaneous

A. *Reduction of Unclassified Excavation - Clearing and Grubbing*
A loss of 16,000 cubic yards of unclassified excavation is estimated on this project due to clearing and grubbing.

B. *Reduction of Unclassified Excavation – Unsuitable Unclassified Excavation*
A quantity of 6,200 cubic yards of Unsuitable Unclassified Excavation has been measured from the cross sections and should be calculated as material to be wasted. The high PI material is shown by single-hatching on the accompanying cross section sheets at the locations listed below:

Line	Station (±)	Offset
-L-	23+25 – 24+25	Left
-L-	52+75 – 55+25	Left & Right
-Y15-	14+75 – 16+25	Left
-Y16-	14+25 – 16+77	Left & Right

C. *Reduction of Unclassified Excavation – Acceptable*
A quantity of 26,000 cubic yards of Acceptable Unclassified Excavation has been measured from the cross sections. These materials are marginally acceptable for embankment construction and should only be used outside of the top three feet of embankment or backfill. The high PI material is shown by an asterisk pattern on the accompanying cross-section sheets, at the locations listed below:

Line	Station (±)	Offset
-L-	31+25 – 33+25	Left & Right
-L-	34+75 – 39+25	Left & Right
-L-	46+75 – 51+25	Left & Right
-L-	55+25 – 55+75	Left & Right
-L-	57+25 – 59+25	Left & Right
-L-	60+75 – 62+49.70	Right

D. *Rock Blasting*
Crystalline Rock is present above or within 6 feet of proposed grade at the following locations and may require blasting. Cross sections corresponding to the locations listed below are included in the graphics report.

Line	Station (±)	Offset
-L-	40+25 – 43+25	Left & Right
-L-	48+75 – 52+75	Left

Rock blasting shall meet statewide criteria outlined in the Standard Specifications, Section 220, "Blasting." A quantity of 5,500 cubic yards of rock excavation has been estimated based on calculations from the attached cross sections.

E. *Water Wells*
Water wells were identified within the proposed right-of-way at the following locations:

Line	Station (±)	Offset
-Y15-	18+89	47ft LT

Water wells should be abandoned per Standard Specification 205.

Respectfully Submitted,

DocuSigned by:
Shiping Yang
7A7310E67F76411...

Shiping Yang, PHD, PE 08/10/2023
Senior Geotechnical Engineer

DocuSigned by:
Shane C. Clark
1F4E87E6D6AD4EA...

Shane C. Clark
Western Regional Design Engineer

Document Not Considered Final Unless All Signatures Are Completed

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT
Summary of Quantities

WBS Number: 47138.1.1 County: FORSYTH Project Engineer: SY
TIP Number: U-6003 Field Office / PEF: HARRISBURG Project Geologist: JEB
Description: New Route – From SR 1969 (Piney Grove Rd.) to NC 150 (N. Main St.)

Pay Item No.	Pay Item/ Quantity Adjustment	Spec Book Section No. or Special Provision (SP) Reference	Report Section	Alignment	Begin Station	End Station	Quantity	Units / %
0015000000-N	Sealing Abandoned Wells	205 - Sealing Abandoned Wells	IV. E	-Y15-	18+89.00	18+89.00	1	EA
						Total Quantity of Sealing Abandoned Wells =	**1**	**EA**
0036000000-E	Undercut Excavation	225 - Roadway Excavation	I. B	-L-	20+75.00	22+25.00	2,300	CY
0036000000-E	Undercut Excavation	225 - Roadway Excavation	I. B	Contingency	N/A	N/A	700	CY
0036000000-E	Undercut Excavation	225 - Roadway Excavation	II. A	Varies	N/A	N/A	4,000	CY
0036000000-E	Undercut Excavation	225 - Roadway Excavation	II. A	Contingency	N/A	N/A	1,000	CY
0036000000-E	Undercut Excavation	225 - Roadway Excavation	II. B	Contingency	N/A	N/A	800	CY
						Total Quantity of Undercut Excavation =	**8,800**	**CY**
0195000000-E	Select Granular Material	265 - Select Granular Material	III. B	-L-	20+75.00	22+25.00	2,300	CY
0195000000-E	Select Granular Material	265 - Select Granular Material	III. B	Contingency	N/A	N/A	700	CY
0195000000-E	Select Granular Material	265 - Select Granular Material	III. B	Varies	N/A	N/A	10,000	CY
0195000000-E	Select Granular Material	265 - Select Granular Material	III. B	Varies	N/A	N/A	4,000	CY
0195000000-E	Select Granular Material	265 - Select Granular Material	III. B	Contingency	N/A	N/A	1,000	CY
						Total Quantity of Select Granular Material =	**18,000**	**CY**
0196000000-E	Geotextile for Soil Stabilization	270 - Geotextile for Soil Stabilization	I. C	Varies	N/A	N/A	10,000	SY
0196000000-E	Geotextile for Soil Stabilization	270 - Geotextile for Soil Stabilization	I. C	-L-	20+75.00	22+25.00	2,300	SY
0196000000-E	Geotextile for Soil Stabilization	270 - Geotextile for Soil Stabilization	I. C	Contingency	N/A	N/A	700	SY
0196000000-E	Geotextile for Soil Stabilization	270 - Geotextile for Soil Stabilization	II. E	Varies	N/A	N/A	4,000	SY
0196000000-E	Geotextile for Soil Stabilization	270 - Geotextile for Soil Stabilization	II. E	Contingency	N/A	N/A	1,000	SY
						Total Quantity of Geotextile for Soil Stabilization =	**18,000**	**SY**
1004500000-E	Geotextile for Subgrade Stabilization	505 - Aggregate Subgrade	II. C	Varies	N/A	N/A	3,200	SY
1004500000-E	Geotextile for Subgrade Stabilization	505 - Aggregate Subgrade	II. C	Contingency	N/A	N/A	600	SY
						Total Quantity of Geotextile for Subgrade Stabilization =	**3,800**	**SY**
1099500000-E	Shallow Undercut	505 - Aggregate Subgrade	II. C	Varies	N/A	N/A	800	CY
1099500000-E	Shallow Undercut	505 - Aggregate Subgrade	II. C	Contingency	N/A	N/A	200	CY
						Total Quantity of Shallow Undercut =	**1,000**	**CY**
1099700000-E	Class IV Subgrade Stabilization	505 - Aggregate Subgrade	II. C	Varies	N/A	N/A	2,100	TON
1099700000-E	Class IV Subgrade Stabilization	505 - Aggregate Subgrade	II. C	Contingency	N/A	N/A	400	TON
						Total Quantity of Class IV Subgrade Stabilization =	**2,500**	**TON**

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT
Summary of Quantities

WBS Number: 47138.1.1 | County: FORSYTH | Project Engineer: SY
TIP Number: U-6003 | Field Office / PEF: HARRISBURG | Project Geologist: JEB
Description: New Route – From SR 1969 (Piney Grove Rd.) to NC 150 (N. Main St.)

Pay Item No.	Pay Item/ Quantity Adjustment	Spec Book Section No. or Special Provision (SP) Reference	Report Section	Alignment	Begin Station	End Station	Quantity	Units / %
2044000000-E	6" Perforated Subdrain Pipe	815 - Subsurface Drainage	II. D	-L-	31+25.00	33+25.00	500	LF
2044000000-E	6" Perforated Subdrain Pipe	815 - Subsurface Drainage	II. D	Contingency	N/A	N/A	500	LF
						Total Quantity of 6" Perforated Subdrain Pipe =	**1,000**	**LF**
N/A	Unclassified Excavation - Acceptable, but not to be used in top 3 ft of embankment or backfill	225 - Roadway Excavation	IV. C	Varies	N/A	N/A	26,000	CY
						Total Quantity of Unclassified Excavation - Acceptable, but not to be used in top 3 ft of embankment or backfill =	**26,000**	**CY**

These Items Only Impact Earthwork Totals								
N/A	Loss Due to Clearing & Grubbing	200 - Clearing and Grubbing	IV. A	N/A	N/A	N/A	16,000	CY
N/A	Shrinkage Factor	235 - Embankments	III. A	N/A	N/A	N/A	15	%
N/A	Unclassified Excavation - Unsuitable Waste	225 - Roadway Excavation	IV. B	N/A	N/A	N/A	6,200	CY

TRAFFIC CONTROL SECTION
ENGINEER'S ESTIMATE FORM
2018 STANDARD SPECIFICATIONS

TIP No.: U-6003 English

WBS No

NC Project No:

FA-Project No:

County: FORSYTH

Description: MACY GROVE RD EXT. KERNERSVILLE LOOP FROM SR 1969 (PINEY GROVE RD) TO NC 150 (N. MAIN ST)

Date of Estimate: 9/8/2023

Estimate Prepared By: C. HARNDEN

Estimate Reviewed By: M. RZEPKA

Estimate Type:

- ☐ Scoping
- ☐ Letting List Verification
- ☐ Preliminary
- ☑ Final

THIS SECTION FOR COST ESTIMATE USE

Scoping Cost

Traffic Control Devices:

Pavement Markings:

Pavement Markers:

Delineation:

ITEM NO.			ITEM DESCRIPTION	QUANTITY	UNIT
GRP CODE	DESC. NO.	SEC NO.			
PM	4685000000-E	1205	THERMOPLASTIC (4", 90 MILS)	27089	LF
PM	4695000000-E	1205	THERMOPLASTIC (8", 90 MILS)	3396	LF
PM	4700000000-E	1205	THERMOPLASTIC (12", 90 MILS)	190	LF
PM	4709000000-E	1205	THERMOPLASTIC (24", 90 MILS)	487	LF
PM	4720000000-E	1205	THERMOPLASTIC PAVEMENT MARKING CHARACTER (90 MILS)	14	EA
PM	4725000000-E	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOLS (90 MILS)	62	EA
PM	4726110000-E	1205	HEATED-IN-PLACE THERMOPLASTIC SYMBOL (90 MILS)	20	EA
PM	4905000000-N	1253	SNOWPLOWABLE RAISED PAVEMENT MARKERS	322	EA

Estimates Summary for
TIP Project # U-6003

NCProject #:
FA-Project#:
WBS Number
County: FORSYTH
Description: MACY GROVE RD EXT. KERNERSVILLE LOOP FROM SR 1969 (PINEY GROVE RD) TO NC 150 (N. MAIN ST)

Date of Estimate: 9/8/2023
Prepared By: C. HARNDEN

	THERMOPLASTIC (4", 90 MILS)		
T10	(4") YELLOW EDGELINE	4867	LF
T13	(4") YELLOW DOUBLE CENTER	4712	LF
T1	(4") WHITE EDGELINE	13080	LF
T2	WHITE SOLID LANE LINE	3564	LF
T3	(4") 10 FT. WHITE SKIP	136	LF
T4	(4") 3 FT. - 9 FT./SP WHITE MINISKIP	550	LF
T5	(4") 2 FT. - 6 FT./SP WHITE MINISKIP	180	LF
	TOTAL (4", 90 MILS)	**27089**	**LF**
	THERMOPLASTIC (8", 90 MILS)		
T40	(8") WHITE GORELINE	2350	LF
T41	(8") WHITE DIAGONAL	428	LF
T42	(8") YELLOW DIAGONAL	203	LF
T43	(8") WHITE SOLID LANE LINE	250	LF
T44	(8") 3 FT. - 9 FT./SP WHITE MINISKIP	78	LF
T46	(8") WHITE CROSSWALK LINE	87	LF
	TOTAL (8", 90 MILS)	**3396**	**LF**
	THERMOPLASTIC (12", 90 MILS)		
T51	(12") WHITE DIAGONAL	190	LF
	THERMOPLASTIC PAVEMENT MARKING CHARACTER (90 MILS)		
T100	ALPHANUMERIC CHAR. (90 MIL)	14	EA

Estimates Summary for
TIP Project # U-6003

NCProject #:
FA-Project#:
WBS Number
County: FORSYTH
Description: MACY GROVE RD EXT. KERNERSVILLE LOOP FROM SR 1969 (PINEY GROVE RD) TO NC 150 (N. MAIN ST)

Date of Estimate: 9/8/2023
Prepared By: C. HARNDEN

	THERMOPLASTIC PAVEMENT MARKING SYMBOLS (90 MILS)		
T70	LEFT TURN ARROW	22	EA
T71	RIGHT TURN ARROW	23	EA
T72	STRAIGHT ARROW	17	EA
	TOTAL PAVEMENT MARKING SYMBOLS (90 MILS)	**62**	**EA**
	THERMOPLASTIC HEATED-IN-PLACE (90 MILS)		
T90	BICYCLE SYMBOL	10	EA
T91	BICYCLE STRAIGHT ARROW	10	EA
	TOTAL HEATED-IN-PLACE (90 MILS)	**20**	**EA**
	THERMOPLASTIC (24", 90 MILS)		
T61	WHITE STOPBAR (24", 90 MIL)	487	LF

	SNOWPLOWABLE RAISED PAVEMENT MARKERS		
ME - YELLOW & YELLOW	T13, (@ 80 FT spacing)	14	EA
ME - YELLOW & YELLOW	T13 - ISLANDS, (@ 40 FT spacing)	32	EA
MF - CRYSTAL & RED	T2, (@ 20 FT spacing)	93	EA
MF - CRYSTAL & RED	T2 - NC150, (@ 20 FT spacing)	33	EA
MF - CRYSTAL & RED	T3 - NC150, (@ 80 FT spacing)	7	EA
MF - CRYSTAL & RED	T40, (@ 20 FT spacing)	70	EA
MF - CRYSTAL & RED	T40 - NC150, (@ 20 FT spacing)	47	EA
MF - CRYSTAL & RED	T43 - NC150, (@ 20 FT spacing)	13	EA
MF - CRYSTAL & RED	T44 - NC 150, (@ 24 FT spacing)	13	EA
	TOTAL SNOWPLOWABLE RAISED PAVEMENT MARKERS	**322**	**EA**