STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J.R. "JOEY" HOPKINS
SECRETARY

May 1, 2024

U. S. Army Corps of Engineers
Raleigh Regulatory Field Office
3331 Heritage Trade Drive, Suite 105
Wake Forest, NC 27587

NC Division of Water Resources
Transportation Permitting Branch
1617 Mail Service Center
Raleigh, NC 27699-1617

ATTN: Mr. Eric Alsmeyer, NCDOT Coordinator

ATTN: Mr. Ryan Conchilla, NCDOT Coordinator

Subject: **Application for Section 404 Nationwide Permit 14, Section 401 Water Quality Certification, and Randleman Buffer Certification** for the Proposed Widening of SR 1818 / SR 1850 (Johnson Street / Sandy Ridge Road) from SR 1820 (Skeet Club Road) to Interstate 40 East in Guilford County, Division7, TIP No. U-4758, Debit $323 from WBS 40251.1.1.

Dear Sirs:

The North Carolina Department of Transportation (NCDOT) proposes to widen SR 1818 / SR 1850 (Johnson Street / Sandy Ridge Road) from SR 1820 (Skeet Club Road) to Interstate 40 East in Guilford County. This proposed widening includes the construction of a four-lane bridge over the West Fork Deep River on the location of the existing bridge and to the east. The existing bridge will be used for traffic during construction of the new bridge.

The Federal Highway Administration is the lead federal agency for this project.

Impact Summary
As a result of the proposed project, there will be a total of 15 linear feet of permanent stream impacts due to pipe placement within the West Fork Deep River, and 121 linear feet (0.03 ac) of temporary stream impacts due to construction of temporary causeways for removal of existing bents and construction access at multiple impact sites. There will also be 0.004 ac of temporary hand clearing within wetlands for construction access.

Surface waters within the project area are protected by the Randleman Lake Riparian Buffer Protection Rules. As proposed, this project would have Allowable Impacts totaling 11,326 square feet in Zone 1, and 9,793 in Zone 2. There would also be Mitigable Impacts totaling 1,057 square feet in Zone 1, and 9,765 square feet in Zone 2.

Impact Site 1 – Sta 14+05 / 14+79
Site 1 involves the construction of a new lateral 4' base ditch on the west side of SR 1818. There will also be a new system of reinforced concrete pipes (RCP) installed to accommodate the increased stormwater drainage from the proposed widening.

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL ANALYSIS UNIT
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

Telephone: (919) 707-6000
Customer Service: 1-877-368-4968
Website: www.ncdot.gov

Location:
1000 BIRCH RIDGE DRIVE
RALEIGH NC 27610

Impact Site 2 – Sta 54+51 / 55+97
Site 2 consists of the construction of a new four-lane bridge over the West Fork Deep River and associated stormwater management structures. The proposed bridge will be built over the West Fork Deep River on the location of the existing bridge and to the east to avoid impacts to the Johnson Street Sports Complex, which is a Section 6(f) resource. Oak Hollow Park (another Section 6(f) resource) is located on both sides of the proposed bridge.

These restrictions caused by the presence of these properties on both sides of the proposed structure limited the space available for hydraulic drainage design. The 30" and 36" pipes that are proposed on northeast and southeast sides of the crossing will have to be installed underneath the proposed fill slopes due to this lack of space. The need for an adequate burial depth of these two pipes will then require them to be outlet at the streambed elevation of the West Fork Deep River as shown on Permit Drawing Sheets 6 and 7.

A temporary causeway and other temporary impacts are shown for construction access and removal of the existing piles that are currently located within the banks of the West Fork Deep River.

Impact Site 3 – Sta 169+48 / 170+40
Site 3 consists of riparian buffer impacts due to roadway fill and stormwater BMP outlets associated with the proposed widening. All impacts at Site 3 are Allowable Zone 2 impacts.

Impact Site 4 – Sta 188+58 / 189+43
A standard 4' base ditch lined with riprap is being installed in conjunction with a new 36" RCP to route stormwater away from SR 1850 (Sandy Ridge Road) and SR 1916 (Rose Haven Road).

Impact Site 5 – Sta 41+89 to 48+22
The proposed road widening is resulting in expanded fill slope limits. These new fill slopes encroach into Zones 1 and 2 of the riparian buffers of a protected surface water (Pond P4).

Section 7
Protected Species listed from IPaC as of the date of this application:

Common Name	Federal Status	Survey Date(s)	Habitat Present	Biological Conclusion
Tricolored bat	Proposed Endangered	N/A	Yes	May Affect, Likely to Adversely Affect
Schweinitz's sunflower	Endangered	10/07/2021 09/12/2023	Yes	No Effect
Small whorled pogonia	Threatened	05/28/2019 06/29/2023	Yes	No Effect

Tricolored Bat
The US Fish and Wildlife Service has issued a programmatic conference opinion (PCO) in conjunction with the Federal Highway Administration (FHWA), the US Army Corps of Engineers (USACE), and NCDOT for the tricolored bat (TCB) (Perimyotis subflavus) in eastern North Carolina. The PCO covers the entire NCDOT program in Divisions 1-8, including all NCDOT projects and activities. NCDOT, FHWA, and USACE have agreed to three conservation measures (listed in the PCO) which will avoid/minimize take to TCBs. These conservation measures apply to all counties in Divisions 1-8. The programmatic determination for TCB for the NCDOT program is May Affect, Likely to Adversely Affect. Once the TCB is officially listed, the PCO will become the programmatic biological opinion (PBO) by formal request from FHWA and USACE. The PBO will ensure compliance with Section 7 of the Endangered Species Act for approximately five years (effective through December 31, 2028) for all NCDOT projects with a federal nexus in Divisions 1-8, which includes Guilford County, where TIP U-4758 is located.

Schweinitz's sunflower and small whorled pogonia
Multiple pedestrian surveys have been performed for these two plant species. Both surveys were last updated in 2023, with no individual plants of either species being observed.

In addition to the below-referenced documents, please find enclosed Pre-Construction Notification (PCN), Stormwater Management Plan, and Permit Drawings.

A copy of this permit application will be posted on the NCDOT Website at: http://connect.ncdot.gov/resources/Environmental.

If you have any questions or need additional information, please contact Rob Crowther at recrowther@ncdot.gov or (919) 707-6112.

Attachments:

- NCDMS Mitigation Acceptance Letter
- No National Register of Historic Places Eligible or Listed Archaeological Sites Present Form
- Historic Architecture and Landscapes No Survey Required Form
- Tribal Coordination Correspondence (Catawba Nation)
- Type III Categorical Exclusion Form (Signed 11/14/2018)

Sincerely,

for Michael A. Turchy
Environmental Coordination and Permitting Group Leader

ec: NCDOT Permit Application Standard Distribution List

Pre-Construction Notification

Pre-Construction Notification (PCN) Form

For Nationwide Permits and Regional General Permits

(along with corresponding Water Quality Certifications)

December 4, 2023 Ver 4.3

*Please note: fields marked with a red asterisk * below are required. You will not be able to submit the form until all mandatory questions are answered.*

Also, if at any point you wish to print a copy of the E-PCN, all you need to do is right-click on the document and you can print a copy of the form.

Below is a link to the online help file.

https://edocs.deq.nc.gov/WaterResources/DocView.aspx?dbid=0&id=2196924

A. Processing Information

If this is a courtesy copy, please fill in this with the submission date.

Does this project involve maintenance dredging funded by the Shallow Draft Navigation Channel Dredging and Aquatic Weed Fund or involve the distribution or transmission of energy or fuel, including natural gas, diesel, petroleum, or electricity? *

○ Yes ◉ No

Is this project connected with ARPA funding? *

○ Yes ◉ No

County (or Counties) where the project is located: *

Guilford

Is this a NCDMS Project *

○ Yes ◉ No

Click Yes, only if NCDMS is the applicant or co-applicant.

DO NOT CHECK YES, UNLESS YOU ARE DMS OR CO-APPLICANT.

Is this project a public transportation project? *

◉ Yes ○ No

This is any publicly funded by municipal,state or federal funds road, rail, airport transportation project.

Is this a NCDOT Project? *

◉ Yes ○ No

(NCDOT only) T.I.P. or state project number:

U-4758

WBS # *

40251.1.1

(for NCDOT use only)

1a. Type(s) of approval sought from the Corps: *

☑ Section 404 Permit (wetlands, streams and waters, Clean Water Act)

☐ Section 10 Permit (navigable waters, tidal waters, Rivers and Harbors Act)

Has this PCN previously been submitted? *

○ Yes

◉ No

1b. What type(s) of permit(s) do you wish to seek authorization? *

☑ Nationwide Permit (NWP)

☐ Regional General Permit (RGP)

☐ Standard (IP)

1c. Has the NWP or GP number been verified by the Corps? *

○ Yes ◉ No

Nationwide Permit (NWP) Number: 14 - Linear transportation

NWP Numbers (for multiple NWPS):

List all NW numbers you are applying for not on the drop down list.

1d. Type(s) of approval sought from the DWR: *

check all that apply

- [x] 401 Water Quality Certification - Regular
- [ ] 401 Water Quality Certification - Express
- [ ] Non-404 Jurisdictional General Permit
- [x] Riparian Buffer Authorization
- [ ] Individual 401 Water Quality Certification

1e. Is this notification solely for the record because written approval is not required?

*

For the record only for DWR 401 Certification: ○ Yes ◉ No

For the record only for Corps Permit: ○ Yes ◉ No

1f. Is this an after-the-fact permit application? *

○ Yes ◉ No

1g. Is payment into a mitigation bank or in-lieu fee program proposed for mitigation of impacts?

If so, attach the acceptance letter from mitigation bank or in-lieu fee program.

◉ Yes ○ No

Acceptance Letter Attachment

Click the upload button or drag and drop files here to attach document

FILE TYPE MUST BE PDF

1h. Is the project located in any of NC's twenty coastal counties? *

○ Yes ◉ No

1j. Is the project located in a designated trout watershed? *

○ Yes ◉ No

Link to trout information: http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/Trout.aspx

B. Applicant Information

1a. Who is the Primary Contact? *

Robert Crowther

1b. Primary Contact Email: *

recrowther@ncdot.gov

1c. Primary Contact Phone: *

(xxx)xxx-xxxx

(919)707-6112

1d. Who is applying for the permit? *

- [ ] Owner
- [x] Applicant (other than owner)

(Check all that apply)

1e. Is there an Agent/Consultant for this project? *

○ Yes ◉ No

2. Owner Information

2a. Name(s) on recorded deed: *

NCDOT

2b. Deed book and page no.:

2c. Contact Person:

(for Corporations)

2d. Address *

Street Address

1598 Mail Service Center

Address Line 2

City

Raleigh

State / Province / Region

NC

Postal / Zip Code

27699-1598

Country

US

2e. Telephone Number: *

(xxx)xxx-xxxx

(919)707-6108

2f. Fax Number:

(xxx)xxx-xxxx

2g. Email Address: *

ekcheely@ncdot.gov

3. Applicant Information (if different from owner)

3a. Name: *

Robert Crowther

3b. Business Name:

(if applicable)

3c. Address *

Street Address

1598 Mail Service Center

Address Line 2

City

Raleigh

State / Province / Region

NC

Postal / Zip Code

27699-1598

Country

US

3d. Telephone Number: *

(919)707-6112

(xxx)xxx-xxxx

3e. Fax Number:

(xxx)xxx-xxxx

3f. Email Address: *

recrowther@ncdot.gov

C. Project Information and Prior Project History

1. Project Information

1a. Name of project: *

TIP U-4758

1b. Subdivision name:

(if appropriate)

1c. Nearest municipality / town: *

High Point

2. Project Identification

2a. Property Identification Number:

(tax PIN or parcel ID)

2b. Property size:

(in acres)

2c. Project Address

Street Address

Address Line 2

City

State / Province / Region

Postal / Zip Code

Country

2d. Site coordinates in decimal degrees

Please collect site coordinates in decimal degrees. Use between 4-6 digits (unless you are using a survey-grade GPS device) after the decimal place as appropriate, based on how the location was determined. (For example, most mobile phones with GPS provide locational precision in decimal degrees to map coordinates to 5 or 6 digits after the decimal place.)

Latitude: *

36.065008

ex: 34.208504

Longitude: *

-80.007620

-77.796371

3. Surface Waters

3a. Name of the nearest body of water to proposed project: *

West Fork Deep River

3b. Water Resources Classification of nearest receiving water: *

WS-IV;CA

Surface Water Lookup

3c. What river basin(s) is your project located in? *

Cape Fear

3d. Please provide the 12-digit HUC in which the project is located. *

030300030101

River Basin Lookup

4. Project Description and History

4a. Describe the existing conditions on the site and the general land use in the vicinity of the project at the time of this application: *

Johnson Street and Sandy Ridge Road are 2-lane roads that together serve as a connection between Greensboro and High Point. General land use within the immediate proximity of this project is mostly residential and agriculture. There are other community resources located along these roads including churches, sports complexes, and Piedmont Triad Farmers Market. There are also large tracts of forested lands along stream corridors that are crossed by both Johnson Street and Sandy Ridge Road.

4b. Have Corps permits or DWR certifications been obtained for this project (including all prior phases) in the past? *

○ Yes ◉ No ○ Unknown

4f. List the total estimated acreage of all existing wetlands on the property:

5.00

4g. List the total estimated linear feet of all existing streams on the property:

(intermittent and perennial)

11,625

4h. Explain the purpose of the proposed project: *

The purposes of this proposed project are to improve existing and projected traffic flow and capacity on Johnson Street and Sandy Ridge Road, to provide facilities for pedestrians and bicyclists along the corridor, and to provide a facility that conforms to NCDOT roadway design standards.

Johnson Street and Sandy Ridge Road are important north-south transportation routes in the area that experience traffic congestion and delays due to capacity deficiencies. The corridor is locally and regionally important as a connection between High Point and Greensboro, including major destinations such as the Piedmont Triad International Airport (PTIA) and the Piedmont Triad Farmers Market. The existing roadways also lack adequate facilities for pedestrians and bicyclists, which limits mobility for these travelers.

4i. Describe the overall project in detail, including indirect impacts and the type of equipment to be used: *

The proposed project would widen Johnson Street and Sandy Ridge Road along the full project corridor from the current two-lane with grass shoulder facility to a four-lane median divided facility with 4' bike lanes in each direction and 5' sidewalks on each side.

A new four-lane bridge will be built over the West Fork Deep River on the location of the existing bridge and to the east to avoid impacts to the Johnson Street Sport Complex, which is a Section 6(f) resource. The existing bridge will be used for traffic during the construction of half of the proposed bridge, and then removed to complete bridge construction. The proposed bridge will have the same typical section as the proposed roadway.

Standard road and bridge building equipment such as trucks, dozers, and cranes will be used.

5. Jurisdictional Determinations

5a. Have the wetlands or streams been delineated on the property or proposed impact areas? *

◉ Yes ○ No ○ Unknown

Comments:

5b. If the Corps made a jurisdictional determination, what type of determination was made? *

◉ Preliminary ○ Approved ○ Not Verified ○ Unknown ○ N/A

Corps AID Number:

Example: SAW-2017-99999

SAW-2013-01044

5c. If 5a is yes, who delineated the jurisdictional areas?

Name (if known): Matthew Thomas and Benjamin Cogdell

Agency/Consultant Company: Atkins

Other:

5d. List the dates of the Corp jurisdiction determination or State determination if a determination was made by the Corps or DWR.

On-site agency meeting conducted on 08/12/2014. SAW-2013-01044 (PJD) issued on 03/11/2015.

On-site riparian buffer review conducted by NCDWR on 03/21/24 and determination issued on 03/28/24. NCDWR Project #20240225.

An on-site review of water resources was conducted by USACE (Eric Alsmeyer) on 04/23/24. No changes were made to jurisdictional boundaries, but one note was added to the permit drawings for Impact Site 2.

6. Future Project Plans

6a. Is this a phased project? *

○ Yes ◉ No

Are any other NWP(s), regional general permit(s), or individual permits(s) used, or intended to be used, to authorize any part of the proposed project or related activity? This includes other separate and distant crossing for linear projects that require Department of the Army authorization but don't require pre-construction notification.

D. Proposed Impacts Inventory

1. Impacts Summary

1a. Where are the impacts associated with your project? (check all that apply):

- [x] Wetlands
- [ ] Open Waters
- [x] Streams-tributaries
- [ ] Pond Construction
- [x] Buffers

2. Wetland Impacts

If there are wetland impacts proposed on the site, then complete this question for each wetland area impacted.

"W." will be used in the table below to represent the word "wetland".

2a. Site # * (?)	2a1 Reason * (?)	2b. Impact type * (?)	2c. Type of W. *	2d. W. name *	2e. Forested *	2f. Type of Jurisdicition * (?)	2g. Impact area *
1	Hand Clearing	T	Headwater Forest	WAA	Yes	Corps	0.004 (acres)

2g. Total Temporary Wetland Impact

0.004

2g. Total Permanent Wetland Impact

0.000

2g. Total Wetland Impact

0.004

2i. Comments:

3. Stream Impacts

If there are perennial or intermittent stream impacts (including temporary impacts) proposed on the site, then complete this question for all stream sites impacted.

"S." will be used in the table below to represent the word "stream".

	3a. Reason for impact * (?)	3b.Impact type *	3c. Type of impact *	3d. S. name *	3e. Stream Type * (?)	3f. Type of Jurisdiction *	3g. S. width *	3h. Impact length *
S1	Site 1 - Construction Access	Temporary	Culvert	UT to West Fork Deep River (SW)	Perennial	Both	5 Average (feet)	38 (linear feet)
S2	Site 2 - Construction Access	Temporary	Other	West Fork Deep River	Perennial	Both	25 Average (feet)	34 (linear feet)
S3	Site 2 - Construction Access	Temporary	Workpad/Causeway	West Fork Deep River	Perennial	Both	25 Average (feet)	49 (linear feet)
S4	Site 2 - Culvert Construction	Permanent	Culvert	West Fork Deep River	Perennial	Both	25 Average (feet)	15 (linear feet)

** All Perennial or Intermittent streams must be verified by DWR or delegated local government.

3i. Total jurisdictional ditch impact in square feet:

0

3i. Total permanent stream impacts:

15

3i. Total temporary stream impacts:

121

3i. Total stream and ditch impacts:

136

3j. Comments:

There are no bents proposed to be placed within the streambed of West Fork Deep River with the new bridge at Impact Site 2. Please see attached cover letter for further description of these stream impacts.

6. Buffer Impacts (for DWR)

If project will impact a protected riparian buffer, then complete the chart below. Individually list all buffer impacts below.

6a. Project is in which protect basin(s)? *

Check all that apply.

- [ ] Neuse
- [ ] Catawba
- [ ] Goose Creek
- [ ] Other
- [ ] Tar-Pamlico
- [x] Randleman
- [ ] Jordan Lake

6b. Impact Type * (?)	6c. Per or Temp * (?)	6d. Stream name *	6e. Buffer mitigation required? *	6f. Zone 1 impact *	6g. Zone 2 impact *

Site 1 Road Crossing - Allowable	P	UT to West Fork Deep River	No	807 (square feet)	1,245 (square feet)
Site 2 Road Crossing - Allowable	P	West Fork Deep River	No	0 (square feet)	1,247 (square feet)
Site 2 Bridge - Allowable	P	West Fork Deep River	No	9,215 (square feet)	3,869 (square feet)
Site 3 Road Crossing - Allowable	P	UT to West Fork Deep River	No	32 (square feet)	2,255 (square feet)
Site 4 Outlet Channel - Allowable	P	UT to West Fork Deep River	No	1,272 (square feet)	1,177 (square feet)
Site 5 Roadway Fill - Allowable w/ Mitigation	P	UT to West Fork Deep River	Yes	1,057 (square feet)	9,765 (square feet)

6h. Total buffer impacts:

	Zone 1	Zone 2
Total Temporary impacts:	0.00	0.00

	Zone 1	Zone 2
Total Permanent impacts:	12,383.00	19,558.00

	Zone 1	Zone 2
Total combined buffer impacts:	12,383.00	19,558.00

6i. Comments:

Please see attached cover letter for further description of these riparian buffer impacts.

E. Impact Justification and Mitigation

1. Avoidance and Minimization

1a. Specifically describe measures taken to avoid or minimize the proposed impacts in designing the project: *

The proposed widening project does not result in any sections of newly located roadway. The replacement of the existing bridge over the West Fork Deep River will maintain the approximately perpendicular crossing and not result in any wetland impacts. The existing bridge has 2 interior bents, 1 of which is within the banks of the West Fork Deep River. The proposed bridge will also have 2 interior bents, but both will be located outside of the river. The new bridge will not discharge deck water directly into the West Fork Deep River.

1b. Specifically describe measures taken to avoid or minimize the proposed impacts through construction techniques: *

Best management practices and sedimentation and erosion control measures will be used during construction of the proposed project. No more than 50% of the width of the West Fork Deep River shall be blocked at any one time during bridge demolition and construction. Temporary causeways will be removed using the least impactful measures possible.

2. Compensatory Mitigation for Impacts to Waters of the U.S. or Waters of the State

2a. Does the project require Compensatory Mitigation for impacts to Waters of the U.S. or Waters of the State?

(●) Yes ( ) No

2c. If yes, mitigation is required by (check all that apply):

[x] DWR [x] Corps

2d. If yes, which mitigation option(s) will be used for this project?

[ ] Mitigation bank [x] Payment to in-lieu fee program [ ] Permittee Responsible Mitigation

4. Complete if Making a Payment to In-lieu Fee Program

4a. Approval letter from in-lieu fee program is attached.

(●) Yes ( ) No

4b. Stream mitigation requested:

(linear feet)

15

4c. If using stream mitigation, what is the stream temperature:

warm

NC Stream Temperature Classification Maps can be found under the Mitigation Concepts tab on the Wilmington District's RIBITS website.

4d. Buffer mitigation requested (DWR only):

(square feet)

10,822

4e. Riparian wetland mitigation requested:

(acres)

4f. Non-riparian wetland mitigation requested:

(acres)

4g. Coastal (tidal) wetland mitigation requested:

(acres)

4h. Comments

NC DMS commits to implementing sufficient compensatory mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies in accordance with the In-Lieu Fee Instrument dated July 28, 2010. Please see attached Mitigation Acceptance Letter for further information.

6. Buffer mitigation (State Regulated Riparian Buffer Rules) - required by DWR

6a. Will the project result in an impact within a protected riparian buffer that requires buffer mitigation? If yes, you must fill out this entire form - please contact DWR for more information.

◉ Yes ○ No

6b. If yes, then identify the square feet of impact to each zone of the riparian buffer that requires mitigation calculate the amount of mitigation required in the table below.

	6c. Reason for impact	6d. Total impact (square feet)	Multiplier	6e. Required mitigation (square feet)	
Zone 1	Roadway Fill	1,057			
Zone 2	Roadway Fill	9,765			

6f. Total buffer mitigation required

6g. If buffer mitigation is required, is payment to a mitigation bank or NC Division of Mitigation Services proposed?

◉ Yes ○ No

6j. Comments:

NC DMS commits to implementing sufficient compensatory mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies in accordance with the In-Lieu Fee Instrument dated July 28, 2010. Please see attached Mitigation Acceptance Letter for further information.

F. Stormwater Management and Diffuse Flow Plan (required by DWR)

*** Recent changes to the stormwater rules have required updates to this section .***

1. Diffuse Flow Plan

1a. Does the project include or is it adjacent to protected riparian buffers identified within one of the NC Riparian Buffer Protection Rules?

◉ Yes ○ No

1b. All buffer impacts and high ground impacts require diffuse flow or other form of stormwater treatment. If the project is subject to a state implemented riparian buffer protection program, include a plan that fully documents how diffuse flow will be maintained.

All Stormwater Control Measures (SCM)s must be designed in accordance with the NC Stormwater Design Manual. Associated supplement forms and other documentation shall be provided.

What type of SCM are you providing?

- ☐ Level Spreader
- ☐ Vegetated Conveyance (lower SHWT)
- ☐ Wetland Swale (higher SHWT)
- ☑ Other SCM that removes minimum 30% nitrogen
- ☐ Proposed project will not create concentrated stormwater flow through the buffer

(check all that apply)

For a list of options to meet the diffuse flow requirements, click here.

2. Stormwater Management Plan

2a. Is this a NCDOT project subject to compliance with NCDOT's Individual NPDES permit NCS000250? *

◉ Yes ○ No

Comments:

G. Supplementary Information

1. Environmental Documentation

1a. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land? *

(●) Yes ( ) No

1b. If you answered "yes" to the above, does the project require preparation of an environmental document pursuant to the requirements of the National or State (North Carolina) Environmental Policy Act (NEPA/SEPA)? *

(●) Yes ( ) No

1c. If you answered "yes" to the above, has the document review been finalized by the State Clearing House? (If so, attach a copy of the NEPA or SEPA final approval letter.) *

(●) Yes ( ) No

2. Violations (DWR Requirement)

2a. Is the site in violation of DWR Water Quality Certification Rules (15A NCAC 2H .0500), Isolated Wetland Rules (15A NCAC 2H .1300), or DWR Surface Water or Wetland Standards or Riparian Buffer Rules (15A NCAC 2B .0200)? *

( ) Yes (●) No

3. Cumulative Impacts (DWR Requirement)

3a. Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? *

( ) Yes (●) No

3b. If you answered "no," provide a short narrative description.

The proposed action is a widening of an existing roadway that would improve projected traffic flow and provide facilities for pedestrians and bicyclists. Additional future development would be subject to local and state ordinances, but is not anticipated to occur as a result of this project.

4. Sewage Disposal (DWR Requirement)

4a. Is sewage disposal required by DWR for this project? *

( ) Yes ( ) No (●) N/A

5. Endangered Species and Designated Critical Habitat (Corps Requirement)

5a. Will this project occur in or near an area with federally protected species or habitat? *

(●) Yes ( ) No

5b. Have you checked with the USFWS concerning Endangered Species Act impacts? *

(●) Yes ( ) No

5c. If yes, indicate the USFWS Field Office you have contacted.

5d. Is another Federal agency involved? *

(●) Yes ( ) No ( ) Unknown

What Federal Agency is involved?

FHWA

5e. Is this a DOT project located within Division's 1-8? *

(●) Yes ( ) No

5j. What data sources did you use to determine whether your site would impact Endangered Species or Designated Critical Habitat? *

Review of USFWS Information for Planning and Consultation (IPaC) database. Please see attached cover letter for additional information regarding protected species.

6. Essential Fish Habitat (Corps Requirement)

6a. Will this project occur in or near an area designated as an Essential Fish Habitat? *

( ) Yes (●) No

6b. What data sources did you use to determine whether your site would impact an Essential Fish Habitat? *

Review of NOAA Fisheries Essential Fish Habitat Mapper.

7. Historic or Prehistoric Cultural Resources (Corps Requirement)

Link to the State Historic Preservation Office Historic Properties Map (does not include archaeological data: http://gis.ncdcr.gov/hpoweb/

7a. Will this project occur in or near an area that the state, federal or tribal governments have designated as having historic or cultural preservation status (e.g., National Historic Trust designation or properties significant in North Carolina history and archaeology)? *

(●) Yes ( ) No

7b. What data sources did you use to determine whether your site would impact historic or archeological resources? *

Please see attached Archaeology Form and Historic Architecture and Landscapes Form.

8. Flood Zone Designation (Corps Requirement)

Link to the FEMA Floodplain Maps: https://msc.fema.gov/portal/search

8a. Will this project occur in a FEMA-designated 100-year floodplain? *

(•) Yes ( ) No

8b. If yes, explain how project meets FEMA requirements:

This proposed project meets FEMA requirements by obtaining State Floodplain Compliance (SFC) approval through the Hydraulic Unit's Highway Floodplain Program.

8c. What source(s) did you use to make the floodplain determination? *

FEMA National Flood Hazard Layer and the North Carolina Flood Risk Information System.

Miscellaneous

Comments

Please use the space below to attach all required documentation or any additional information you feel is helpful for application review. Documents should be combined into one file when possible, with a Cover Letter, Table of Contents, and a Cover Sheet for each Section preferred.

Click the upload button or drag and drop files here to attach document

U-4758 PCN Attachment Package-compressed.pdf 39.22MB

File must be PDF or KMZ

Signature

*

☑ By checking the box and signing below, I certify that:

- The project proponent hereby certifies that all information contained herein is true, accurate, and complete to the best of my knowledge and belief'; and
- The project proponent hereby requests that the certifying authority review and take action on this CWA 401 certification request within the applicable reasonable period of time.
- I have given true, accurate, and complete information on this form;
- I agree that submission of this PCN form is a "transaction" subject to Chapter 66, Article 40 of the NC General Statutes (the "Uniform Electronic Transactions Act");
- I agree to conduct this transaction by electronic means pursuant to Chapter 66, Article 40 of the NC General Statutes (the "Uniform Electronic Transactions Act");
- I understand that an electronic signature has the same legal effect and can be enforced in the same way as a written signature; AND
- I intend to electronically sign and submit the PCN form.

Full Name: *

Erin K. Cheely

Signature *

Erin K. Cheely

Date

5/1/2024

Mitigation

ROY COOPER
Governor
ELIZABETH S. BISER
Secretary
MARC RECKTENWALD
Director

NORTH CAROLINA
Environmental Quality

April 12, 2024

Mr. Jamie Lancaster, P.E.
Environmental Analysis Unit
North Carolina Department of Transportation
Mail Service Center 1598
Raleigh, North Carolina 27699-1598

Dear Mr. Lancaster:

Subject: Mitigation Acceptance Letter: **TIP U-4758**, SR 1818 (Johnson Street) / SR 1850 (Sandy Ridge Road) Improvements from SR 1820 (Skeet Club Road) to South of I-40 in High Point, Guilford County

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the mitigation for the subject project. Based on the information supplied by you on April 12, 2024, the impacts are located in CU 03030003 of the Cape Fear River basin as follows:

Stream and Wetlands	River Basin	CU Location	Eco-Region	Stream			Wetlands		
				Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh
Impacts	Cape Fear	03030003	CP	0	0	15.000	0	0	0

*Some of the impacts may be proposed to be mitigated at various ratios. See permit application for details. DMS will provide the amount of stream and wetland mitigation included in the environmental permits.

All buffer mitigation requests and approvals are administrated through the Riparian Restoration Buffer Fund. The NCDOT will be responsible to ensure that appropriate compensation for the buffer mitigation will be provided in the agreed upon method of fund transfer. Upon receipt of the NCDWR's Buffer Authorization Certification, DMS will transfer funds from the NCDOT Stream and Wetland Mitigation Fund into the Riparian Restoration Buffer Fund. Upon completion of transfer payment, NCDOT will have completed its riparian buffer mitigation responsibility for TIP U-4758. Subsequently, DMS will conduct a review of current NCDOT ILF Program mitigation projects in the river basin to determine if available buffer mitigation credits exist. If there are buffer mitigation credits available, then the Riparian Restoration Buffer Fund will purchase the appropriate amount of buffer mitigation credits from NCDOT ILF Program.

Buffer	River Basin	CU	Eco-Region	Buffer Impacts		
				Zone 1	Zone 2	TOTAL
Impacts	Cape Fear	03030003	CP	1,057.000	9,765.000	10,822.000

DMS commits to implementing sufficient compensatory mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies in accordance with the In-Lieu Fee Instrument dated July 28, 2010. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from NCDEQ-DMS.

If you have any questions or need additional information, please contact Beth Harmon at 919-707-8420.

Sincerely,

Elizabeth Harmon

Elizabeth A. Harmon
DMS NCDOT ILF Coordinator

cc: Mr. Monte Matthews, USACE – Raleigh Regulatory Field Office
Ms. Amy Chapman, NCDWR
Mr. Brad Chilton, NCDOT
File: U-4758

Permit Drawings

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 3.00; Released August 2021)

General Project Information

WBS Element:	40251.1.1	**TIP Number:**	U-4758	**Project Type:**	Roadway Widening	**Date:**	3/27/2024	
NCDOT Contact:	Bryan Key			**Contractor / Designer:**	Josh Dalton			
	Address:	1000 Birch Ridge Drive, Raleigh, NC 27610 (Delivery) 1582 Mail Service Center, Raleigh, NC 27699-1582 (Mail)			**Address:**	905 Jones Franklin Road Raleigh, NC 27606		
	Phone:	(919) 707-6263			**Phone:**	(919) 859-2243		
	Email:	bckey@ncdot.gov			**Email:**	jdalton@ncdot.gov		
City/Town:	High Point			**County(ies):**	Guilford			
River Basin(s):	Cape Fear			**CAMA County?**	No			
Wetlands within Project Limits?	Yes							

Project Description

Project Length (lin. miles or feet):	4.492 miles	**Surrounding Land Use:**	Residential & Commercial		
	Proposed Project			**Existing Site**	
Project Built-Upon Area (ac.)	67.0	ac.		23.0	ac.
Typical Cross Section Description:	Four 12' lanes (2 lanes in each direction) with 4' bike lanes each direction, raised median, and 5' sidewalks each side.			Two 11' lanes with grass shoulder.	
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 37,100	Year:	2041	Existing: 24,400	Year: 2021

General Project Narrative: (Description of Minimization of Water Quality Impacts)

NCDOT in coordination with the City of High Point proposes the widening of SR 1818 / SR 1850 (Johnson Street / Sandy Ridge Road) from SR 1820 (Skeet Club Road) in City of High Point to Interstate 40 (I-40 East) in Guilford County. Grass lined channels were used where possible and riprap outlet channels were utilized at project outfalls, if needed. Three dry detention basins have been designed along the project cooridor to provide nurtient reduction and peak flow attenuation.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 3.00; Released August 2021)

WBS Element: 40251.1.1 **TIP/Proj No.:** U-4758 **County(ies):** Guilford

General Project Information

Waterbody Information

Surface Water Body (1):	West Fork Deep River (Oak Hollow Reservoir)		**NCDWR Stream Index No.:**	17-3-(0.7)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Water Supply IV (WS-IV)			
		Supplemental Classification:	CA			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:				**Buffer Rules in Effect:**	Randleman Lake	
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (2):	West Fork Deep River		**NCDWR Stream Index No.:**	17-3-(0.3)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Water Supply IV (WS-IV)			
		Supplemental Classification:				
Other Stream Classification:						
Impairments:	Fish Community	Benthos				
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:				**Buffer Rules in Effect:**	Randleman Lake	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (3):	East Fork Deep River		**NCDWR Stream Index No.:**	17-2-(0.3)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Water Supply IV (WS-IV)			
		Supplemental Classification:				
Other Stream Classification:						
Impairments:	Benthos					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:				**Buffer Rules in Effect:**	Randleman Lake	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 3.00; Released August 2021)

WBS Element: 40251.1.1 **TIP/Proj No.:** U-4758 **County(ies):** Guilford

Other Toolbox Best Management Practices

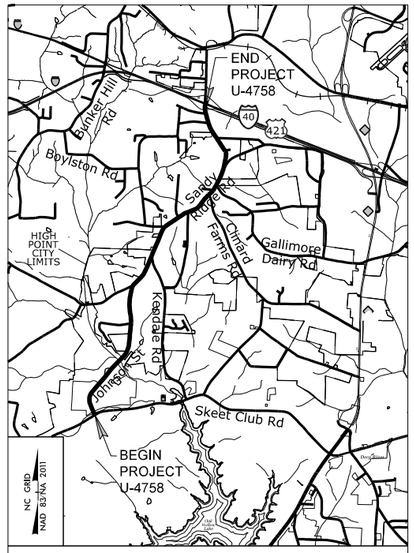
Sheet No.	Line	Station	Location (LT,RT,CL)	Latitude	Longitude	Surface Water Body	BMP Type	Drainage Area (ac)	New Built-Upon Area (ac)	Volume Treated (ac-ft)	Precipitation Depth Treated over NBUA (in)	BMP Associated w/ Buffer Rules?
8	L	59+05	RT	36.04683	-80.01313	(1)West Fork Deep River (Oak Hollow Reservoir)	Dry Detention Basin	3.3	2.9	0.2	0.87	No
16	L	170+83	LT	36.07367	-79.99906	(1)West Fork Deep River (Oak Hollow Reservoir)	Dry Detention Basin	6.1	4.3	0.19	0.56	Yes
22	Y29	33+00	LT	36.08767	-79.99583	(1)West Fork Deep River (Oak Hollow Reservoir)	Dry Detention Basin	5.3	1.6	0.276	2.18	No

Additional Comments

TIP PROJECT: U-4758

CONTRACT:

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols



VICINITY MAP

RIGHT OF WAY PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4758	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
40251.1.1	0710025/0710041	PE
40251.2.1	0710041	R/W
40251.2.2	0710041	UTILITIES

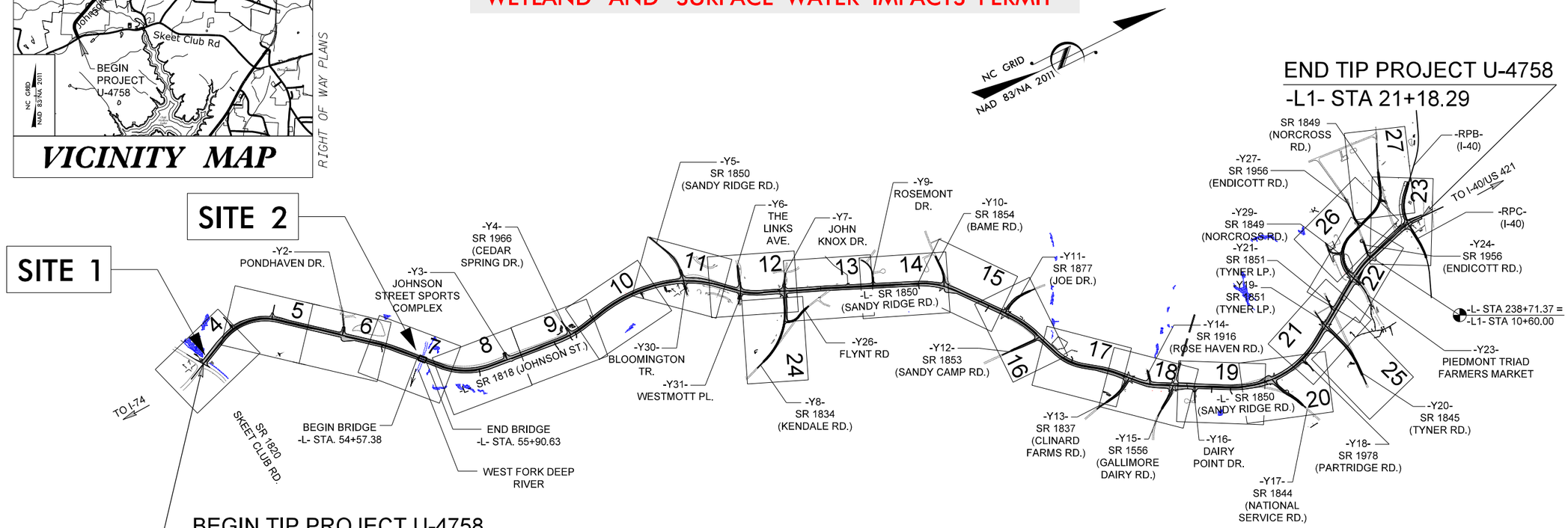
PERMIT DRAWING SHEET 1 OF 9

DATE: 5/1/2024

LOCATION: *SR 1818 (JOHNSON STREET) /SR 1850 (SANDY RIDGE ROAD) FROM SR 1820 (SKEET CLUB ROAD) TO SOUTH OF I-40 IN HIGH POINT*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, WIDENING, RESURFACING, SIGNALS, AND STRUCTURE*

WETLAND AND SURFACE WATER IMPACTS PERMIT

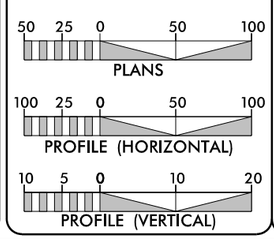


THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF HIGH POINT.

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II .

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2021 = 24,400
ADT 2041 = 37,100
K = 11 %
D = 60%
T = 9%*
V = 50 MPH
*TTST = 4% DUAL = 5%
FUNC CLASS = URBAN ARTERIAL REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-4758 = 4.467 MILES
LENGTH STRUCTURES TIP PROJECT U-4758 = 0.025 MILES
TOTAL LENGTH TIP PROJECT U-4758 = 4.492 MILES

NCDOT CONTACT: LAURA SUTTON, P.E

Prepared in the Office of:

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

SUNGATE DESIGN GROUP, P.A.
800 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
(919) 852-1567
ENGINEERING LICENSE NO.: C-4450

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: DECEMBER 17, 2021

LETTING DATE: DECEMBER 19, 2023

CLINTON J. MORGAN, P.E
PROJECT ENGINEER

BRUCE B. PAYNE, P.E
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

P.E.

SIGNATURE:

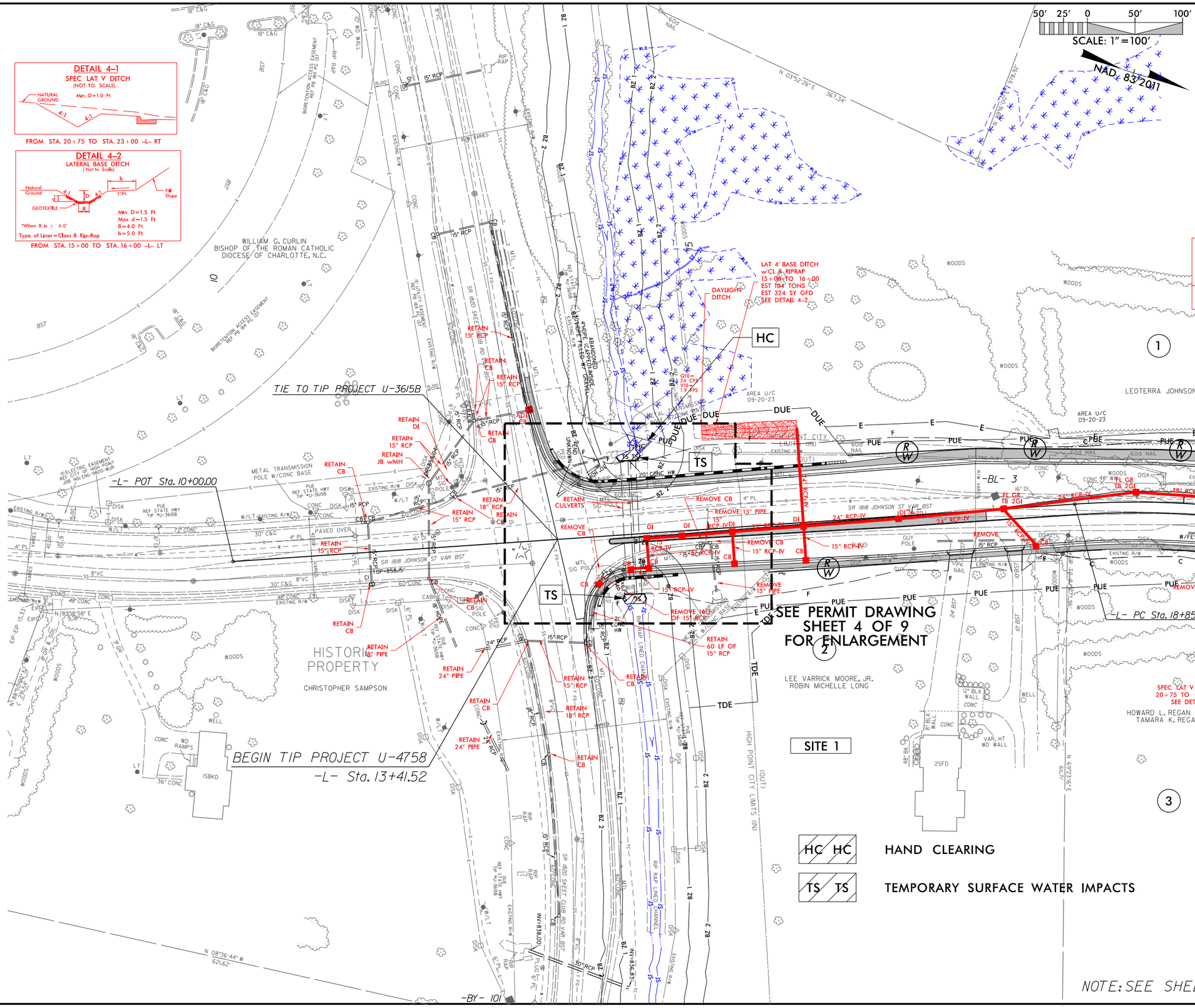
ROADWAY DESIGN ENGINEER

P.E.

SIGNATURE:

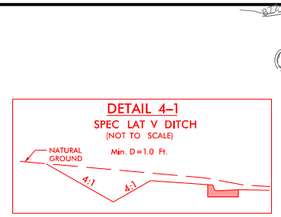
STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

8/17/99

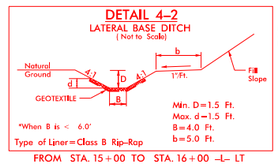


5/1/2024
U4758_Hyd_prm_wet_psh_04.dgn
rhoward

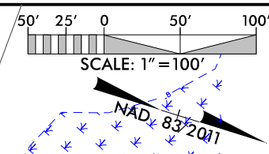
8/17/99



FROM STA. 20+75 TO STA. 23+00 -L- RT



FROM STA. 15+00 TO STA. 16+00 -L- LT



PROJECT REFERENCE NO.	SHEET NO.
U-4758	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 160 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27606 TEL (919) 859-2243 ENG FIRM LICENSE NO. C-890

PERMIT DRAWING SHEET 3 OF 9

DATE: 5/1/2024

WILLIAM G. CURLIN BISHOP OF THE ROMAN CATHOLIC DIOCESE OF CHARLOTTE, N.C.

TIE TO TIP PROJECT U-3615B

-L- POT Sta. 10+00.00

BEGIN TIP PROJECT U-4758
-L- Sta. 13+41.52

HISTORIC PROPERTY
CHRISTOPHER SAMPSON

LEOTERRA JOHNSON STREET LLC

LEE VARRICK MOORE, JR.
ROBIN MICHELLE LONG

HOWARD L. REGAN AND TAMARA K. REGAN

SITE 1

SR 1818 JOHNSON ST VAR BST

-L- PC Sta. 18+85.65

MATCHLINE SEE SHEET 5 -L- STA 21+00

SEE PERMIT DRAWING SHEET 4 OF 9 FOR ENLARGEMENT

HC HC HAND CLEARING

TS TS TEMPORARY SURFACE WATER IMPACTS

EXISTING SIGNAL

NOTE: SEE SHEET 28 FOR -L- PROFILE

5/1/2024
U4758_Hyd_prm_wet_psh_04a_con.dgn
rhoward

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-4758	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 4 OF 9

DATE: 5/1/2024

NAD 83/2011

BZ 2 END UNKNOWN

TS

TS TS

SS

SS

TS HC

HC

PUE

DISK

15+00

14+00

BZ 1

BZ 2

20' CONC HW

RIP RAP

MTL

60"CONC

SIG POLE

RETAIN CULVERTS

REMOVE CB

4" PL

REMOVE 15" PIPE

15" RCP–IV

DI

DI

DI

15" RC

REMOVE

15" RC

REMOVE CB

SITE 1

BZ 2

15" RCP–IV

BZ 1

CB

CB

CB

CB

15" RCP–IV

15" RCP–IV

CB

15" RCP–IV

BZ

TS

TS TS

REMOVE 16LF OF 15" RCP

HC HC HAND CLEARING

TS TS TEMPORARY SURFACE WATER IMPACTS

10' 5' 0 10' 20'
SCALE: 1"=20'

5/1/2024
U4758_Hyd_prm_wet_psh_04b_ViewIn.dgn
rhoward

8/17/99

S S SURFACE WATER IMPACTS

TS TS TEMPORARY SURFACE WATER IMPACTS

50' 25' 0 50' 100'
SCALE: 1"=100'

NAD 83/2011

PROJECT REFERENCE NO.	SHEET NO.
U-4758	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

SUNGATE DESIGN GROUP, P.A.
805 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

PERMIT DRAWING
SHEET 5 OF 9
DATE: 5/1/2024

NOTE: ALL AREAS LOCATED WITHIN THIS SHADED AREA ARE OF UNKNOWN JURISDICTION AND SHALL REMAIN UNDISTURBED THROUGHOUT CONSTRUCTION ACTIVITIES.

CL B RIPRAP TOE PROTECTION 50+50 TO 54+59 EST 181 TONS EST 523 SY GFD SEE DETAIL 7-1

CL II RIPRAP TO EL=815.3' @2:1 STA 54+34 TO 54+72 -L- LT

EXCAVATE TO ELEV=808.0

EXISTING BRIDGE TO BE REMOVED

EXCAVATE TO ELEV=807.0'

END RET. WALL #1 CL II RIPRAP PROT. EL=815.3' @ 1.5:1 STA 58+30 -L- LT

CL II RIPRAP TO EL=815.3' @1.5:1 STA 55+78 TO 56+19 -L- LT

CL II RIPRAP EST 130 TONS EST 140 SY GF

BEG. RET. WALL #1 CL II RIPRAP PROT. EL=815.3' @ 1.5:1 STA 56+19 -L- LT

CL B RIPRAP TOE PROTECTION 58+50 TO 60+50 EST 92 TONS EST 266 SY GFD SEE DETAIL 7-1

MATCHLINE SEE SHEET 6 -L- STA 47+00

MATCHLINE SEE SHEET 8 -L- STA 60+00

HIGH POINT CITY LIMITS (IN)

HIGH POINT CITY LIMITS (OUT)

17 MEADOW CREEK SUBDIVISION OWNERS' ASSOCIATION, INC. DB 5086 PG 1900 PB 138 PG 81 PB 139 PG 48

18 ALANNA ALEXANDER ZAMBRANO ROBERT BRANDWOOD DB 7881PG 1053 PB 77 PG 55

19 CITY OF HIGH POINT DB 1750 PG 137 PB 71PG 50

180 CITY OF HI DB 5095 PB 92 P

10' PUBLIC WALKWAY EASEMENT REF PB 139 PG 48

60' BST

15' ELECTRIC UTILITY EASEMENT REF PB 139 PG 48

DILAPIDATED WW FENCE

N 47° 03' 33.4" E

S 48° 28' 31.1" E

S 79° 28' 28.2" E

REMOVE 18" CMP

SPEC LAT 2' BASE DITCH 46+00 TO 47+50 SEE DETAIL 7-2

SPEC LAT 2' BASE DITCH 48+50 TO 51+33 SEE DETAIL 7-2

TEMPORARY CAUSEWAY

30" w/ELBOWS

36" w/ELBOWS

JB w/MH

DRAWDOWN STRUCTURE SEE DETAIL 1

DRY DET BASIN 8.1 EST. 1385 CY CUT EST. 234 CY FILL

10' WIDE ACCESS & MAINTENANCE BERM

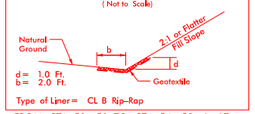
SEE PERMIT DRAWING SHEET 7 OF 9 FOR ENLARGEMENT

SITE 2

CL II RIPRAP TO EL=815.3' @2:1 STA 54+47 TO 54+72 -L- RT

CL II RIPRAP TO EL=815.3' @2:1 STA 55+78 TO 56+01 -L- RT

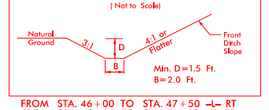
DETAIL 7-1
TOE PROTECTION
(Not to Scale)



d= 1.0 Ft.
b= 2.0 Ft.
Type of Liner= CL B Rip-Rap

FROM STA. 50+50 TO STA. 54+59 -L- LT
FROM STA. 58+50 TO STA. 60+50 -L- LT

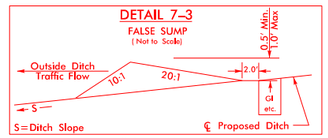
DETAIL 7-2
SPECIAL LAT 2' BASE DITCH
(Not to Scale)



Min. D=1.5 Ft.
B=2.0 Ft.

FROM STA. 46+00 TO STA. 47+50 -L- RT
FROM STA. 48+50 TO STA. 51+33 -L- RT

DETAIL 7-3
FALSE SUMP
(Not to Scale)



S=Ditch Slope

STA. 51+44 -L- RT

PAVEMENT REMOVAL

NOTE: SEE SHEET 29 FOR -L- PROFILE
SEE SHEET 45 FOR -DWAY1- PROFILE

5/1/2024
U4758_Hyd_prm_wet_psh_07.dgn
rhoward

8/17/99

S S SURFACE WATER IMPACTS

TS TS TEMPORARY SURFACE WATER IMPACTS

50' 25' 0 50' 100'
SCALE: 1"=100'

NAD 83/2011

PROJECT REFERENCE NO.	SHEET NO.
U-4758	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

PERMIT DRAWING SHEET 6 OF 9

DATE: 5/1/2024

NOTE: ALL AREAS LOCATED WITHIN THIS SHADED AREA ARE OF UNKNOWN JURISDICTION AND SHALL REMAIN UNDISTURBED THROUGHOUT CONSTRUCTION ACTIVITIES.

MATCHLINE SEE SHEET 6 -L- STA 47+00

MATCHLINE SEE SHEET 8 -L- STA 60+00

CL B RIPRAP TOE PROTECTION 50+50 TO 54+59 EST 181 TONS EST 523 SY GFD SEE DETAIL 7-1

CL II RIPRAP TO EL=815.3'@2:1 STA 54+34 TO 54+72 -L- LT

EXCAVATE TO ELEV=808.0

EXISTING BRIDGE TO BE REMOVED

END RET. WALL #1 CL II RIPRAP PROT. EL=815.3' @ 1.5:1 STA 58+30 -L- LT

EXCAVATE TO ELEV=807.0'

CL II RIPRAP TO EL=815.3' @1.5:1 STA 55+78 TO 56+19 -L- LT

BEG. RET. WALL #1 CL II RIPRAP PROT. EL=815.3' @ 1.5:1 STA 56+19 -L- LT

CL B RIPRAP TOE PROTECTION 58+50 TO 60+50 EST 92 TONS EST 266 SY GFD SEE DETAIL 7-1

TEMPORARY CAUSEWAY

SEE PERMIT DRAWING SHEET 7 OF 9 FOR ENLARGEMENT

SITE 2

CL II RIPRAP TO EL=815.3' @2:1 STA 55+78 TO 56+01 -L- RT

CL II RIPRAP TO EL=815.3' @2:1 STA 54+47 TO 54+72 -L- RT

SPEC LAT 2' BASE DITCH 46+00 TO 47+50 SEE DETAIL 7-2

SPEC LAT 2' BASE DITCH 48+50 TO 51+33 SEE DETAIL 7-2

REMOVE 18" CMP

DRY DET BASIN (6) EST. 1385 CY CUT EST. 234 CY FILL

10' WIDE ACCESS & MAINTENANCE BERM

DRAWDOWN STRUCTURE SEE DETAIL 7-1

MICHAEL E. O'BRIEN & BARBARA E. O'BRIEN DB 3966 PG 132 DB 4047 PG 319 DB 4870 PG 785 DB 6050 PG 2680 PB 108 PG 11 PB 14 PG 87

ALANNA ALEXANDER ZAMBRANO ROBERT BRANDWOOD DB 7881 PG 1053 PB 77 PG 55

MEADOW CREEK SUBDIVISION OWNERS' ASSOCIATION, INC. DB 5086 PG 1900 / DB 138 PG 81 PB 139 PG 48

CITY OF HIGH POINT DB 1750 PG 137 PB 71 PG 50

CITY OF HI DB 5095 PB 92 P

N 41° 03' 33.4" E

S 48° 28' 31" E

S 79° 28' 28.2" E

HIGH POINT CITY LIMITS (IN)

HIGH POINT CITY LIMITS (OUT)

DETAIL 7-1
TOE PROTECTION
(Not to Scale)

Natural Ground; b; 2:1 or Flatter Fill Slope; d; Geotextile

d= 1.0 Ft.
b= 2.0 Ft.

Type of Liner= CL B Rip-Rap

FROM STA. 50+50 TO STA. 54+59 -L- LT
FROM STA. 58+50 TO STA. 60+50 -L- LT

DETAIL 7-2
SPECIAL LAT 2' BASE DITCH
(Not to Scale)

Natural Ground; 3:1; D; 4:1 or Flatter; Front Ditch Slope; B

Min. D=1.5 Ft.
B=2.0 Ft.

FROM STA. 46+00 TO STA. 47+50 -L- RT
FROM STA. 48+50 TO STA. 51+33 -L- RT

DETAIL 7-3
FALSE SUMP
(Not to Scale)

Outside Ditch Traffic Flow; 10:1; 20:1; 0.5' Min. 1.0' Max; 2.0'; CL etc.; S

S=Ditch Slope ℄ Proposed Ditch

STA. 51+44 -L- RT

PAVEMENT REMOVAL

NOTE: SEE SHEET 29 FOR -L- PROFILE
SEE SHEET 45 FOR -DWAY1- PROFILE

5/1/2024
U4758_Hyd_prm_wet_psh_07a_con.dgn
rhoward

8/17/99

DUE DUE DUE

NOTE: ALL AREAS LOCATED WITHIN THIS SHADED AREA ARE OF UNKNOWN JURISDICTION AND SHALL REMAIN UNDISTURBED THROUGHOUT CONSTRUCTION ACTIVITIES.

VALVE

NAD 83/2011

10' 5' 0 10' 20'

SCALE: 1" = 20'

PROJECT REFERENCE NO.	SHEET NO.
U-4758	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 7 OF 9

DATE: 5/1/2024

WEST FORK DEEP RIVER

TEMPORARY CAUSEWAY

CB

CB

CB

15"

15" RCP–IV

30" w/ELBOWS

36" w/ELBOWS

BZ 1

BZ 2

BZ 1

BZ 2

TS

TS

TS

TS

TS

JS

JS

JS

JS

JS

TB

S

S

S

MTL

WOODS

PDE

SITE 2

PDE

S S SURFACE WATER IMPACTS

TS TS TEMPORARY SURFACE WATER IMPACTS

5/1/2024
U4758_Hyd_prm_wet_psh_07b_Viewln.dgn
rhoward

5/28/99

PERMIT DRAWING
SHEET 8 OF 9

DATE: 5/1/2024

–L–

PROJECT REFERENCE NO.	SHEET NO.
U-4758	29
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

PI = 40+95.00
EL = 853.01'
VC = 260'
K = 96

-Y2-
-L- Sta.40+81.70

(-)3.3524%

(-)0.6500%

BEG DITCH
PI STA 41+50 -L- RT
ELEV=850.6

(-)0.8000%

PI = 46+70.00
EL = 849.27'
VC = 420'
K = 102

0% SE
-L- Sta.45+66.19

(-)0.6500%

(-)4.7729%

CHANGE DITCH
PI=46+00.00
EL=847.00'

(-)4.0000%

END DITCH
PI STA 47+50 -L- RT
ELEV=841.00

PROPOSED GRADE

EXISTING GRADE

BEG DITCH
PI STA 48+50 -L- RT
ELEV=837.00

(-)4.8400%

PI = 51+15.00
EL = 828.03'
VC = 365'
K = 97

0% SE
-L- Sta.51+46.57

(-)4.7729%

(-)0.9974%

(-)3.0361%

PI=50+50
EL=827.32'

END DITCH
PI STA 51+33 -L- RT
ELEV=824.80

NOTE: SEE SHEET 6 & 7 FOR –L– PLAN VIEW

–L–

BEGIN STRUCTURE
-L- Sta.54+57.38
ELEV.= 824.62

END STRUCTURE
-L- Sta.55+90.63
ELEV.= 823.29

(-)0.9974%

EXISTING BRIDGE TO BE REMOVED

LOW SIDE
LOW CHORD

CLASS II RIP RAP TO TOP OF BERM 1.5:1 NORMAL

EXCAVATE TO ING ELEV @ CL=808.0

CLASS II RIP RAP TO TOP OF BERM 1.5:1 NORMAL

Min. 3.5'

WSE ON 9-23-2015 =802.8

NWS =803.0

PROPOSED GRADE

EXISTING GRADE

PI = 59+45.00
EL = 819.75'
VC = 450'
K = 115

(-)0.9974%

(+)2.9044%

(+)4.5000%

24" P1

BEG DITCH
PI STA 61+50 -L- LT
ELEV=819.00

END DITCH
PI STA 63+00 -L- LT
ELEV=825.75

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 4400	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 814.2	FT
BASE DISCHARGE	= 4900	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 814.9	FT
OVERTOPPING DISCHARGE	= 11000	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 820.6	FT
	=	FT
DATE OF SURVEY	= 9-23-2019	
W.S.ELEVATION AT DATE OF SURVEY	= 802.8	FT

PIPE HYDRAULIC DATA
24" PIPE Sta. 61+30 -L-

DRAINAGE AREA	= 3.3	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 12	CFS
DESIGN HW ELEVATION	= 820.8	FT
100 YEAR DISCHARGE	= 13	CFS
100 YEAR HW ELEVATION	= 820.9	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 29	CFS
OVERTOPPING ELEVATION	= 823.1	FT

NOTE: SEE SHEET 7 & 8 FOR –L– PLAN VIEW

5/1/2024
U4758_std_prm_wet_psh_07c_pfl.dgn
rhoward

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	14+08 / 14+47 -L- LT	Existing Culvert					< 0.01		< 0.01		28	
	14+05 / 14+30 -L- RT	Existing Culvert							< 0.01		10	
2	55+07 / 55+46 -L- RT	Bridge						< 0.01	0.02	15	83	
TOTALS*:							< 0.01	< 0.01	0.03	15	121	0

*Rounded totals are sum of actual impacts

NOTES:

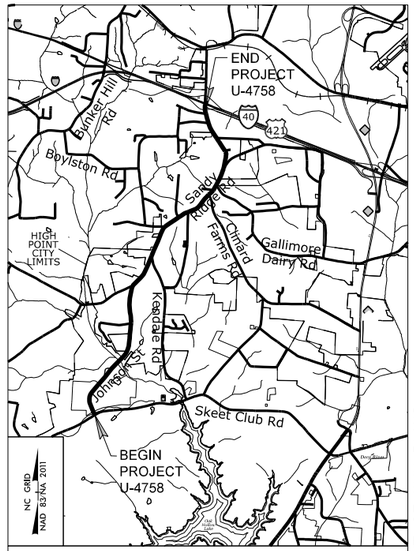
NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
5-1-2024
GUILFORD COUNTY
U-4758
40251.1.1

Revised 2018 Feb

TIP PROJECT: U-4758

CONTRACT:

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols



VICINITY MAP

RIGHT OF WAY PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4758	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
40251.1.1	0710025/0710041	PE
40251.2.1	0710041	R/W
40251.2.2	0710041	UTILITIES

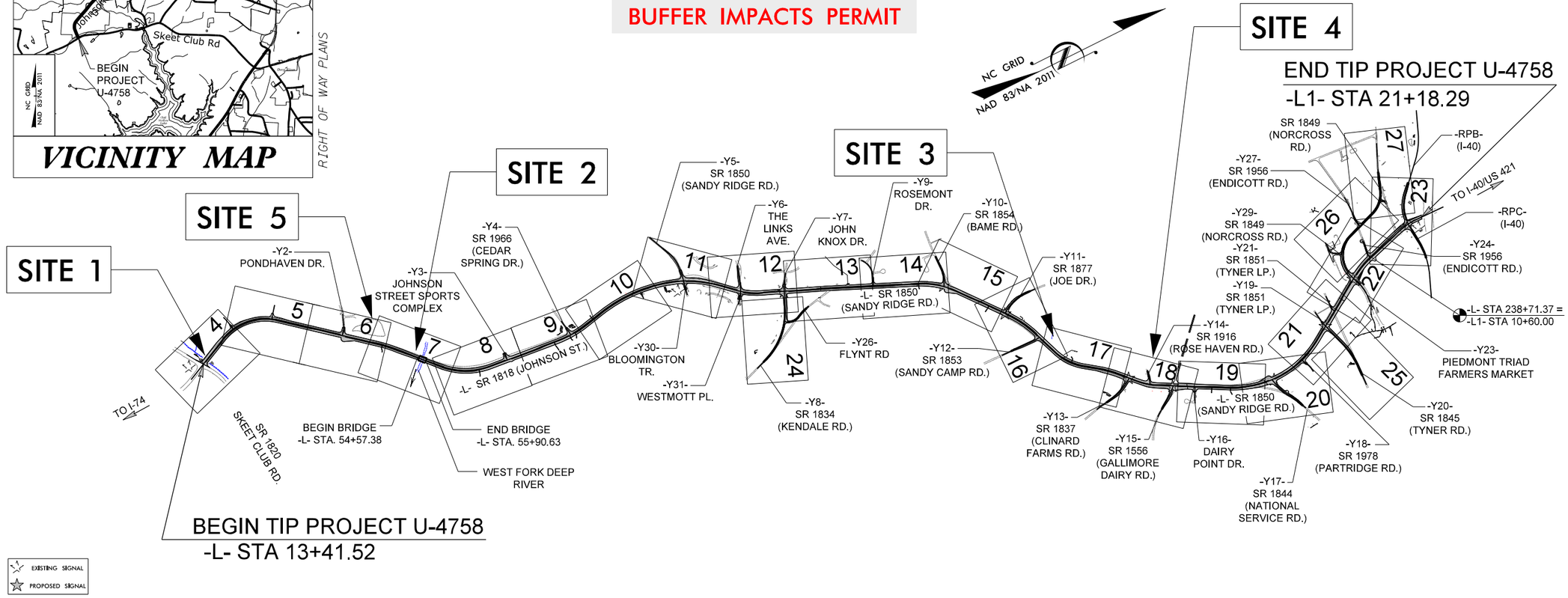
BUFFER DRAWING SHEET 1 OF 11

DATE: 3/27/2024

LOCATION: *SR 1818 (JOHNSON STREET) /SR 1850 (SANDY RIDGE ROAD) FROM SR 1820 (SKEET CLUB ROAD) TO SOUTH OF I-40 IN HIGH POINT*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, WIDENING, RESURFACING, SIGNALS, AND STRUCTURE*

BUFFER IMPACTS PERMIT



THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF HIGH POINT.

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II .

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

100 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2021 = 24,400
ADT 2041 = 37,100
K = 11 %
D = 60%
T = 9%*
V = 50 MPH
*TTST = 4% DUAL = 5%
FUNC CLASS = URBAN ARTERIAL REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-4758 = 4.467 MILES
LENGTH STRUCTURES TIP PROJECT U-4758 = 0.025 MILES
TOTAL LENGTH TIP PROJECT U-4758 = 4.492 MILES

NCDOT CONTACT: LAURA SUTTON, P.E

Prepared in the Office of:

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

SUNGATE DESIGN GROUP, P.A.
801 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
(919) 319-7888
ENGINEERING LICENSE NO.: C-4450

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: DECEMBER 17, 2021

LETTING DATE: DECEMBER 19, 2023

CLINTON J. MORGAN, P.E
PROJECT ENGINEER

BRUCE B. PAYNE, P.E
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

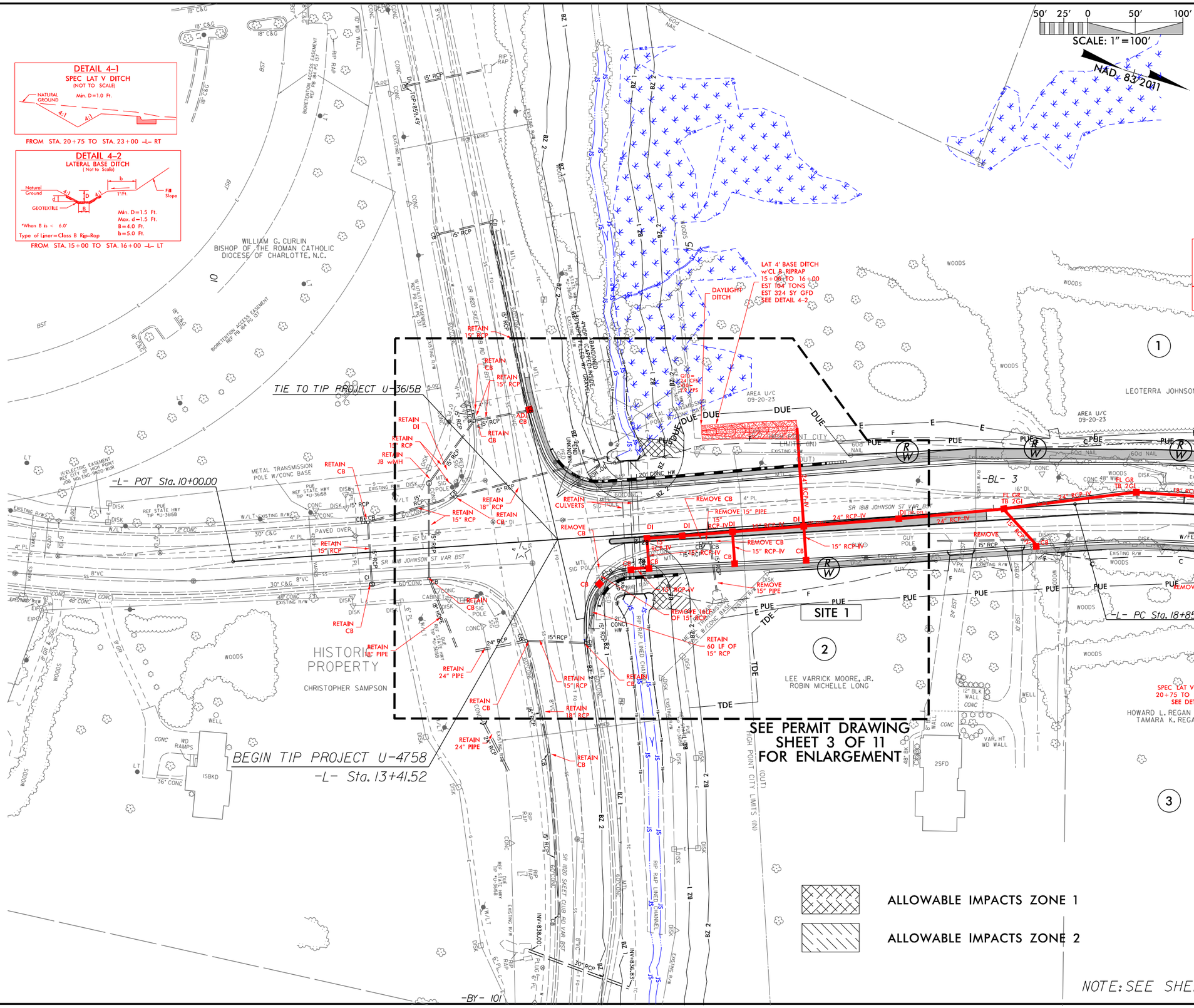
P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

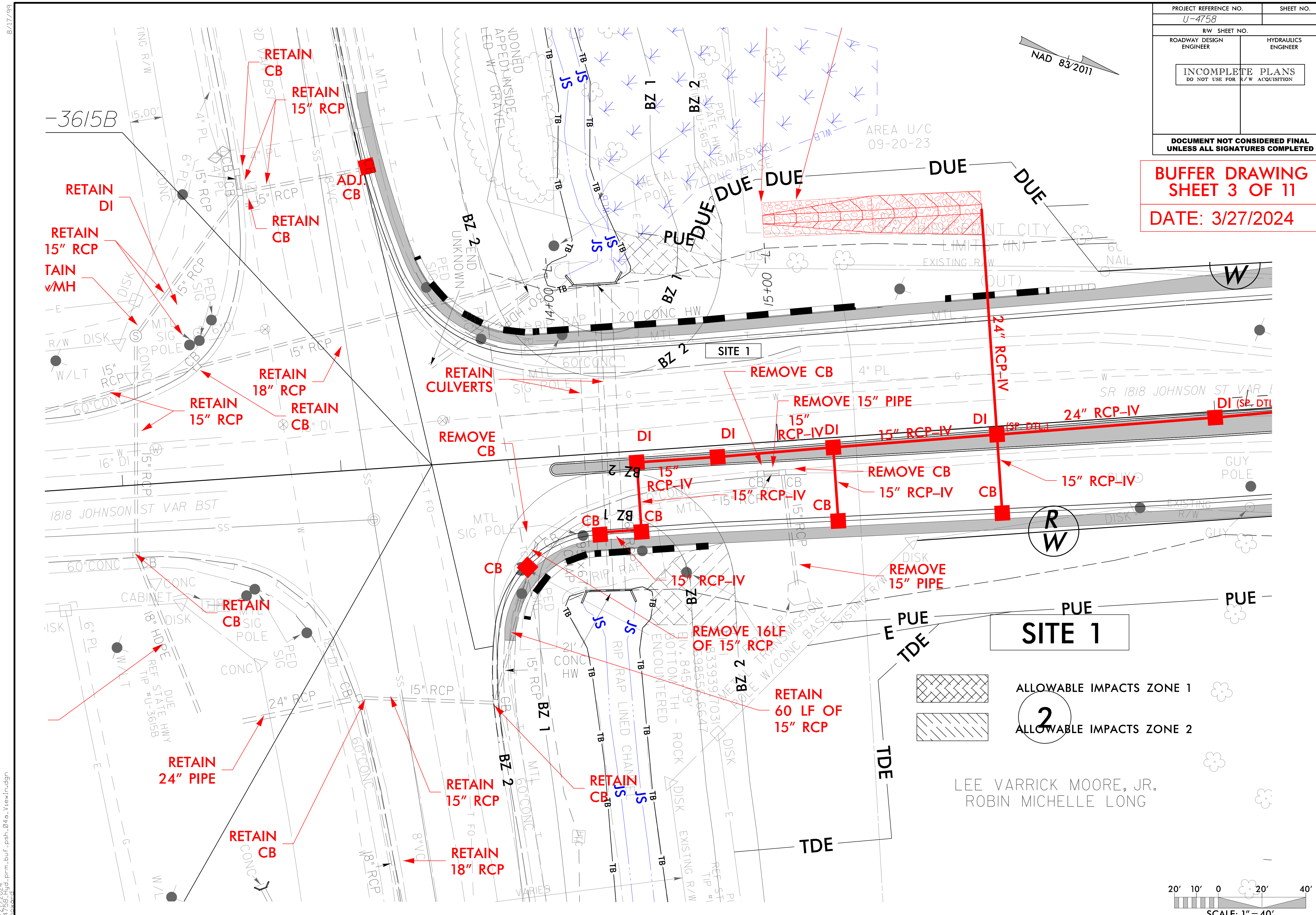
P.E.
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

8/17/99



3/27/2024
U4758_Hyd_prm_buf_psh_04.dgn
rdavard



PROJECT REFERENCE NO.
SHEET NO.
U-4758
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
BUFFER DRAWING
SHEET 3 OF 11
DATE: 3/27/2024
NAD 83/2011
-3615B
RETAIN CB
RETAIN 15" RCP
ADJ. CB
RETAIN CB
RETAIN DI
RETAIN 15" RCP
RETAIN 18" RCP
RETAIN 15" RCP
RETAIN CB
RETAIN CULVERTS
REMOVE CB
REMOVE CB
REMOVE 15" PIPE
15" RCP-IV
15" RCP-IV
24" RCP-IV
24" RCP-IV
DI
CB
REMOVE CB
REMOVE 15" PIPE
REMOVE 16LF OF 15" RCP
RETAIN 60 LF OF 15" RCP
RETAIN CB
RETAIN 24" PIPE
RETAIN 15" RCP
RETAIN CB
RETAIN CB
RETAIN 18" RCP
DUE
PUE
TDE
BZ 1
BZ 2
JS
SITE 1
AREA U/C 09-20-23
SR 1818 JOHNSON ST VAR BST
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
LEE VARRICK MOORE, JR.
ROBIN MICHELLE LONG
SCALE: 1"=40'

PROJECT REFERENCE NO.	SHEET NO.
U-4758	6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

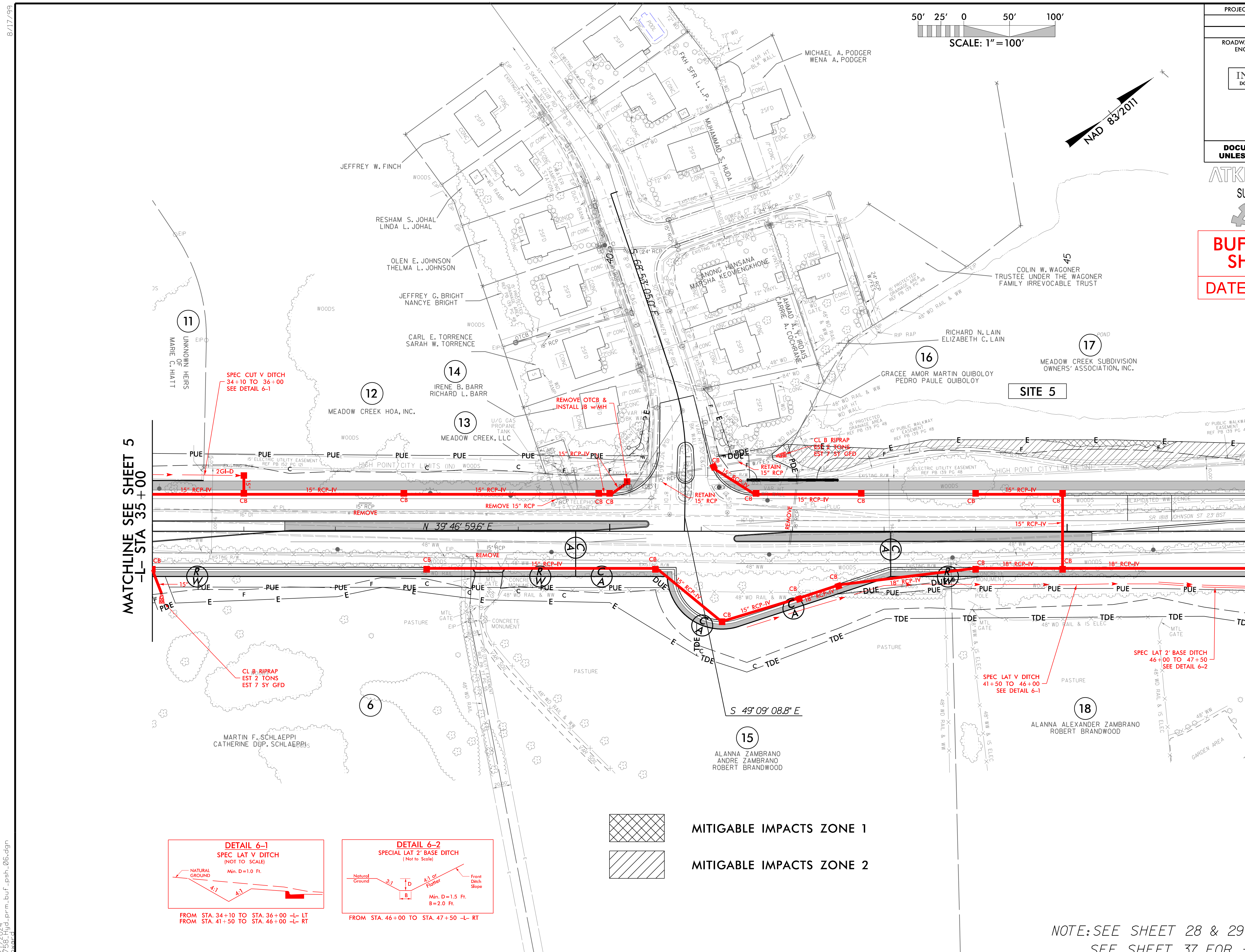
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

BUFFER DRAWING SHEET 4 OF 11

DATE: 3/27/2024



50' 25' 0 50' 100'
SCALE: 1" = 100'
NAD 83/2011
MATCHLINE SEE SHEET 5 -L- STA 35+00
MATCHLINE SEE SHEET 7 -L- STA 47+00
MICHAEL A. PODGER
WENA A. PODGER
JEFFREY W. FINCH
RESHAM S. JOHAL
LINDA L. JOHAL
OLEN E. JOHNSON
THELMA L. JOHNSON
JEFFREY G. BRIGHT
NANCYE BRIGHT
CARL E. TORRENCE
SARAH W. TORRENCE
IRENE B. BARR
RICHARD L. BARR
MEADOW CREEK HOA, INC.
MEADOW CREEK, LLC
UNKNOWN HEIRS OF MARIE C. HIATT
COLIN W. WAGONER
TRUSTEE UNDER THE WAGONER
FAMILY IRREVOCABLE TRUST
RICHARD N. LAIN
ELIZABETH C. LAIN
GRACEE AMOR MARTIN QUIBOLOY
PEDRO PAULE QUIBOLOY
MEADOW CREEK SUBDIVISION
OWNERS' ASSOCIATION, INC.
SITE 5
SPEC CUT V DITCH
34+10 TO 36+00
SEE DETAIL 6-1
REMOVE OTCB &
INSTALL JB w/MH
CL B RIPRAP
EST 2 TONS
EST 7 SY GFD
N 39° 46' 59.6" E
S 68° 53' 05.0" E
S 49° 09' 08.8" E
SPEC LAT V DITCH
41+50 TO 46+00
SEE DETAIL 6-1
SPEC LAT 2' BASE DITCH
46+00 TO 47+50
SEE DETAIL 6-2
MARTIN F. SCHLAEPPI
CATHERINE DUP. SCHLAEPPI
ALANNA ZAMBRANO
ANDRE ZAMBRANO
ROBERT BRANDWOOD
ALANNA ALEXANDER ZAMBRANO
ROBERT BRANDWOOD
PASTURE
WOODS
15" RCP-IV
18" RCP-IV
HIGH POINT CITY LIMITS (IN)
DETAIL 6-1
SPEC LAT V DITCH
(NOT TO SCALE)
NATURAL GROUND
Min. D=1.0 Ft.
FROM STA. 34+10 TO STA. 36+00 -L- LT
FROM STA. 41+50 TO STA. 46+00 -L- RT
DETAIL 6-2
SPECIAL LAT 2' BASE DITCH
(Not to Scale)
Natural Ground
4:1 or Flatter
Front Ditch Slope
Min. D=1.5 Ft.
B=2.0 Ft.
FROM STA. 46+00 TO STA. 47+50 -L- RT

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

NOTE: SEE SHEET 28 & 29 FOR -L- PROFILE
SEE SHEET 37 FOR -Y2- PROFILE

8/17/99
3/27/2024
U4758_Hyd_prm_buf_psh_06.dgn

8/17/99

MITIGABLE IMPACTS ZONE 2

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

50' 25' 0 50' 100'

SCALE: 1"=100'

NAD 83/2011

PROJECT REFERENCE NO.	SHEET NO.
U-4758	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

BUFFER DRAWING SHEET 5 OF 11

DATE: 3/27/2024

SITE 5

SITE 2

MATCHLINE SEE SHEET 6 -L- STA 47+00

MATCHLINE SEE SHEET 8 -L- STA 60+00

HIGH POINT CITY LIMITS (IN)

HIGH POINT CITY LIMITS (OUT)

MEADOW CREEK SUBDIVISION OWNERS' ASSOCIATION, INC.

ALANNA ALEXANDER ZAMBRANO
ROBERT BRANDWOOD

CL B RIPRAP TOE PROTECTION 50+50 TO 54+59 EST 181 TONS EST 523 SY GFD SEE DETAIL 7-1

CL II RIPRAP TO EL=815.3' @2:1 STA 54+34 TO 54+72 -L- LT

EXCAVATE TO ELEV=808.0

EXISTING BRIDGE TO BE REMOVED

EXCAVATE TO ELEV=807.0'

END RET. WALL #1 CL II RIPRAP PROT. EL=815.3' @ 1.5:1 STA 58+30 -L- LT

CL II RIPRAP EST 130 TONS EST 140 SY GF

CL II RIPRAP TO EL=815.3' @1.5:1 STA 55+78 TO 56+19 -L- LT

BEG. RET. WALL #1 CL II RIPRAP PROT. EL=815.3' @ 1.5:1 STA 56+19 -L- LT

CL B RIPRAP TOE PROTECTION 58+50 TO 60+50 EST 92 TONS EST 266 SY GFD SEE DETAIL 7-1

REMOVE 18" CMP

SPEC LAT 2' BASE DITCH 46+00 TO 47+50 SEE DETAIL 7-2

SPEC LAT 2' BASE DITCH 48+50 TO 51+33 SEE DETAIL 7-2

CL II RIPRAP TO EL=815.3' @2:1 STA 54+47 TO 54+72 -L- RT

CL II RIPRAP TO EL=815.3' @2:1 STA 55+78 TO 56+01 -L- RT

DRAWDOWN STRUCTURE SEE DETAIL 1

DRY DET BASIN 8.1 EST. 1385 CY CUT EST. 234 CY FILL

10' WIDE ACCESS & MAINTENANCE BERM

3:1 (TYP.)

MICHAEL E. O'BRIEN PARALLEL O'BRIEN

N 47° 03' 33.4" E

S 48° 28' 31.1" E

S 79° 28' 28.2" E

30" w/ELBOWS

36" w/ELBOWS

PAVEMENT REMOVAL

DETAIL 7-1
TOE PROTECTION
(Not to Scale)

Natural Ground; b; 2:1 or Flatter Fill Slope; d; Geotextile

d= 1.0 Ft.
b= 2.0 Ft.

Type of Liner= CL B Rip-Rap

FROM STA. 50+50 TO STA. 54+59 -L- LT
FROM STA. 58+50 TO STA. 60+50 -L- LT

DETAIL 7-2
SPECIAL LAT 2' BASE DITCH
(Not to Scale)

Natural Ground; -2:1; D; 4:1 or Flatter; Front Ditch Slope; B

Min. D=1.5 Ft.
B=2.0 Ft.

FROM STA. 46+00 TO STA. 47+50 -L- RT
FROM STA. 48+50 TO STA. 51+33 -L- RT

DETAIL 7-3
FALSE SUMP
(Not to Scale)

Outside Ditch Traffic Flow; 10:1; 20:1; 2.0'; 0.5' Min. 1.0' Max; CL etc.; S

S=Ditch Slope ℄ Proposed Ditch

STA. 51+44 -L- RT

NOTE: SEE SHEET 29 FOR -L- PROFILE
SEE SHEET 45 FOR -DWAY1- PROFILE

3/27/2024
U4758_Hyd_prm_buf_psh_07.dgn
rhoward

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-4758	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

BUFFER DRAWING SHEET 6 1F 10

DATE: 3/27/2024

SEE PERMIT DRAWING SHEET 7 OF 11 FOR ENLARGEMENT

SITE 3

DETAIL 16-1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

Natural Ground, 4:1, D, 4:1 or Flatter, Fill Slope
Min. D= 1.0 Ft.

FROM STA. 11+50 TO STA. 12+50 -Y12- LT
FROM STA. 11+00 TO STA. 15+00 -Y11- LT

DETAIL 16-2
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

Natural Ground, 2:1, 4:1, D, Fill Slope
Min. D= 1.0 Ft.

FROM STA. 12+00 TO STA. 13+00 -Y12- RT

DETAIL 16-3
TOE PROTECTION
(Not to Scale)

Natural Ground, b, 2:1 or Flatter Fill Slope, d, Geotextile
d= 1.0 Ft.
b= 2.0 Ft.
Type of Liner= CL B Rip-Rap

FROM STA. 169+85 TO STA. 172+50 -L- LT

DETAIL 16-4
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

Natural Ground, 4:1, D, d, 4:1 or Flatter, Fill Slope, Geotextile
Min. D =1.0 Ft.
Max. d =1.0 Ft.
Type of Liner= Class A Rip-Rap

FROM STA. 15+00 TO STA. 15+65 -Y11- LT

DETAIL 16-5
SPEC LAT V DITCH
(NOT TO SCALE)

NATURAL GROUND, Min. D=1.5 Ft., 4:1, 4:1

FROM STA. 169+00 TO STA. 180+00 -L- RT

-Y11- POT Sta. 16+83.58

END CONSTRUCTION
-Y11- Sta. 16+00.00

-Y11- PT Sta. 15+37.80

TIE PROPOSED DITCH TO EXST. DITCH LINE

DAYLIGHT DITCH

SPEC LAT V DITCH w/CL A RIPRAP 15+00 TO 15+65 EST 28 TONS EST 116 SY GFD SEE DETAIL 16-4

SPEC LAT V DITCH 11+00 TO 15+00 SEE DETAIL 16-1

RETAIN DI & 12" RCP

REMOVE 12" RCP

-L- PC Sta. 161+48.12

-Y11- PC Sta. 10+31.10

-Y11- POT Sta. 10+00.00=
-L- Sta. 160+85.43

MATCHLINE SEE SHEET 15
-L- STA 159+00

-Y12- 15

-Y12- 25

-BL- 25
-BY9- 25

-BL- 26
-BY9- 26

-L- PT Sta. 167+05.43

MATCHLINE SEE SHEET 17
-L- STA 171+00

-L- Sta.168+11.87 =
-Y12- POT Sta. 17+19.70

-Y12- PT Sta. 16+68.65

-Y12- PC Sta. 16+01.63

-Y12- POT Sta. 10+00.00

BEGIN CONSTRUCTION
-Y12- Sta.11+75.00

-BY9- 112

SPEC LAT V DITCH 169+00 TO 180+00 SEE DETAIL 16-5

SPEC LAT V DITCH 12+00 TO 13+00 SEE DETAIL 16-2

10' WIDE ACCESS & MAINTENANCE BERM

OUTLET CONTROL STRUCTURE SEE DETAIL 1

CL I RIPRAP EST 7 TONS EST 17 SY GFD

CL I RIPRAP EST 7 TONS EST 12 SY GFD

CL B RIPRAP EST 2 TONS EST 7 SY GFD

FL GR TB 2GI

RETAIN 12" CMP

RETAIN 15" RCP

RETAIN 12" HDPE

RETAIN DI & 12" HDPE

REMOVE 12" RCP

15" RCP-IV

18" RCP-IV

24" RCP-IV

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

PROPOSED SIGNAL

NOTE: SEE SHEET 33 FOR -L- PROFILE
SEE SHEET 39 FOR -Y11- & -Y12- PROFILE

NAD 83/2011

50' 25' 0 50' 100'
SCALE: 1"=100'

3/27/2024
U4756_Hyd_prm_buf_psh_16.dgn
rhoward

96 TERRY W. FRAZIER
95 350 SOUTH LAND HOLDING, LLC
94 HOWARD JOSEPH HOLYOAK
93 C&S PROPERTIES, INC.
92 KATHY A. NEWSOM
89 STEPHEN CHRISTOPHER PACCO
91
97 SANDY RIDGE METHODIST CHURCH
98 SANDY RIDGE METHODIST CHURCH
99 350 SOUTH LAND HOLDING LLC
100 JIMMY C. FLOWERS BECKY T. FLOWERS
101 MARK ALLEN BAKER IVY RAYLE BAKER
102 MARK ALLEN BAKER IVY RAYLE BAKER
102A WANDA DEAN ERIC N. HUTCHENS
103
BEACH SOUTH PROPERTIES, LLC
MARSHALL PETER HURLEY SANDRA B. HURLEY

8/17/99

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

12.5' 6.25' 0 12.5' 25'
SCALE: 1" = 25'

NAD 83/2011

PROJECT REFERENCE NO.	SHEET NO.
U-4758	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BUFFER DRAWING
SHEET 7 OF 11

DATE: 3/27/2024

SITE 3

-L- 170+00

OUTLET CONTROL STRUCTURE SEE DETAIL 1

CL I RIPRAP
EST 7 TONS
ST 17 SY GFD

JS

JS

BZ 2

BZ 1

PDE

3:1 (TYP.)

925.0

DRY DETENTION BASIN 16.1
EST. 4275 CY CUT
EST. 125 CY FILL

929.0

930.0

30"

WOODS

DUE

BZ 1

BZ 2

DUE

DUE

BZ 2

CL I RIPRAP
EST 4 TONS
EST 12 SY GFD

PUE

PUE

R
W

(REF. PB 21 P
EXIS 15" R

CB

15" RCP-IV

24" CAAP

WD BARN

FSS

DI

3/27/2024
U4756_Hyd_prm_buf_psh_16a_Viewin.dgn
rhoward

8/17/99

BUFFER DRAWING SHEET 8 OF 11

DATE: 3/27/2024

PROJECT REFERENCE NO.	SHEET NO.
U-4758	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

SEE PERMIT DRAWING SHEET 9 OF 11 FOR ENLARGEMENT

SITE 4

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

MATCHLINE SEE SHEET 17 –L– STA 182+50

MATCHLINE SEE SHEET 19 –L– STA 195+50

NAD 83/2011

STD 4' BASE DITCH w/CL I RIPRAP 180 LF @ 4.0% EST 323 TONS EST 683 SY GFD EST 160 CY DDE SEE DETAIL 18-6

SPEC LAT 4' BASE DITCH 10+00 TO 10+80 EST 163 TONS EST 293 SY GFD SEE DETAIL 18-1

SPEC LAT V DITCH 184+00 TO 184+77 SEE DETAIL 18-2

SPEC LAT V DITCH 10+17 TO 11+50 SEE DETAIL 18-8

SPEC LAT V DITCH 196+43 TO 192+25 SEE DETAIL 18-2

SPEC LAT V DITCH 11+00 TO 13+00 SEE DETAIL 18-5

SPEC LAT V DITCH 14+00 TO 15+00 SEE DETAIL 18-3

SPEC LAT V DITCH 10+50 TO 14+50 SEE DETAIL 18-5

SPEC LAT V DITCH 10+00 TO 11+00 SEE DETAIL 18-7

CL B RIPRAP EST 2 TONS EST 7 SY GFD

TIE PROPOSED DITCH TO EXISTING

RETAIN

RETAIN 24" RCP

REMOVE 12" RCP

REMOVE 15" RCP

REMOVE 15" RCP-IV

REMOVE 18" RCP-IV

REMOVE 24" RCP

15" RCP-IV

18" RCP-IV

24" RCP

FL GR TB 2GI

2GI

CB

MDCB

DETAIL 18-9
FALSE SUMP
(Not to Scale)
Outside Ditch Traffic Flow
20:1
10:1
2'
0.5' Min. 1.0' Max.
GI etc.
S=Ditch Slope
℄ Proposed Ditch

DETAIL 18-2
SPEC LAT V DITCH
(NOT TO SCALE)
NATURAL GROUND
Min. D=1.0 Ft.
4:1
4:1
FROM STA. 184+00 TO STA. 184+77 –L– LT
FROM STA. 190+43 TO STA. 192+25 –L– RT

DETAIL 18-3
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
3:1
D
4:1 or Flatter
Fill Slope
Min. D= 1.0 Ft.
FROM STA. 14+00 TO STA. 15+00 –Y15– LT

DETAIL 18-4
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground
3:1
d
D
4:1 or Flatter
Fill Slope
Geotextile
B
Min. D=2.0 Ft.
Max. d=1.5 Ft.
B=4.0 Ft.
Type of Liner=Class I Rip-Rap
FROM STA. 10+00 TO STA. 10+80 –Y14– RT

DETAIL 18-5
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
4:1
D
4:1 or Flatter
Fill Slope
Min. D=1.0 Ft.
FROM STA. 10+50 TO STA. 14+50 –Y13– RT
FROM STA. 11+00 TO STA. 13+00 –Y15– LT

DETAIL 18-6
STANDARD BASE DITCH
(Not to Scale)
Natural Ground
4:1
d
D
4:1
Natural Ground
Geotextile
B
Min. D=2.0 Ft.
Max. d=1.5 Ft.
B=4.0 Ft.
*When B is < 6.0'
Type of Liner=Class I Rip-Rap
STA. 9+50 –Y14– LT

DETAIL 18-7
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
4:1
D
4:1 or Flatter
Fill Slope
Min. D=1.5 Ft.
FROM STA. 10+00 TO STA. 11+00 –Y13– LT

DETAIL 18-8
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
4:1
D
4:1 or Flatter
Fill Slope
Min. D= 1.0 Ft.
FROM STA. 10+17 TO 11+50 STA. –Y14– LT

50' 25' 0 50' 100'
SCALE: 1"=100'

3/27/2024
U4756_Hyd_prm_buf_psh_18.dgn
rhoward

8/17/99

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

BUFFER DRAWING SHEET 9 OF 11

DATE: 3/27/2024

PROJECT REFERENCE NO.	SHEET NO.
U-4758	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

SITE 4

NAD 83/2011

STD 4' BASE DITCH w/CL I RIPRAP
180 LF @ 4.0%
EST 323 TONS
EST 583 SY GFD
EST 160 CY DDE
SEE DETAIL 18-6

SPEC LAT 4' BASE DITCH w/CL I RIPRAP
10+00 TO 10+80
EST 163 TONS
EST 293 SY GFD
SEE DETAIL 18-4

SPEC LAT V DITC
10+17 TO 11+5(
SEE DETAIL 18-8

ENRIQUE VARAS
GLORIA VARAS

FRANCISCO BATZIN
ESLY LOPEZ

BRADLEY C. PENNY
ANGELA RENEE PENNY

J. BOOHER

185

190

17

118

120

PDE

TDE

DUE

PUE

REMOVE

36" RCP-IV

24" RCP

15" RCP

HW

R/W

10' EASEMENT REF PB 38 PG 32

SR 1916 ROSE HAVEN RD

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

3/27/2024
U4758_Hyd_prm_buf_psh_18_Viewin.dgn
rhoward

RIPARIAN BUFFER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	IMPACTS									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	14+29 / 14+82 -L- LT	Existing Culvert	x			331	488	819					
	14+27 / 14+79 -L- RT		x			476	757	1233					
2	54+51 / 55+97 -L-	Roadway Fill	x				1247	1247					
		Bridge		x		9215	3869	13084					
3	169+48 / 170+40 -L- LT	Roadway Fill	x			32	2255	2287					
4	188+58 / 189+43 -L- LT	Outlet Channel	x			1272	1177	2449					
5	41+89 to 48+22 -L-LT	Roadway Fill			x				1057	9765	10822		
TOTALS*:						**11326**	**9793**	**21119**	**1057**	**9765**	**10822**	**0**	**0**

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
3-27-2024
GUILFORD COUNTY
U-4758
40251.1.1
SHEET 10 OF 11

Revised 2018 Feb

WETLANDS IN BUFFER IMPACTS SUMMARY

SITE NO.	STATION (FROM/TO)		WETLANDS IN BUFFERS ZONE 1 (ft^2)	WETLANDS IN BUFFERS ZONE 2 (ft^2)
1	14+29/14+47	-L- LT	99	
TOTAL:			**99**	**0**

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
3-27-2024
GUILFORD COUNTY
U-4758
45021.1.1
SHEET 11 OF 11

Revised 2018 Feb

Archaeology

ARCHAEOLOGICAL SURVEY REQUIRED FORM

This form only pertains to ARCHAEOLOGICAL RESOURCES for this project. It is not valid for Historic Architecture and Landscapes. You must consult separately with the Historic Architecture and Landscapes Group.

PROJECT INFORMATION

Project No:	**U-4758**	*County:*	**Guilford**
WBS No:	**40251.1.1**	*Document:*	**Federal PCE**
F.A. No:	**Unknown**	*Funding:*	☐ State ☒ Federal

Federal Permit Required? ☒ Yes ☐ No *Permit Type:* **USACE (Not Specified)**

Project Description: NCDOT is proposing to widen and realign SR 1818 (Johnson Street)/SR 1850 (Sandy Ridge Road) from SR 1820 (Skeet Club Road) to I-40 in Guilford County. Currently, Johnston Street/Sandy Ridge Road is a 2-lane, undivided facility. As proposed, the corridor will consist of a 4- to 5- lane divided facility with sidewalks and bike lanes. Project length measures about 4.40 miles. Based on Preliminary Design Plans, the Area of Potential Effects (APE) will equate to the extent of the Proposed ROW and any construction easements along the corridor. The realignment of several Y-lines (i.e. major intersecting roads) will also be included as a component of this project. Overall, the APE will encompass about 105.8 acres, inclusive of all existing roadways and development.

SUMMARY OF ARCHAEOLOGICAL RESOURCES REVIEW: *SURVEY REQUIRED*

Brief description of review activities, results of review, and conclusions:

This project was accepted on Monday, February 12, 2018. A map review and site file search was conducted at the Office of State Archaeology (OSA) on Tuesday, February 13, 2018. No large-scale archaeological surveys have been conducted in the area, and only one (1) archaeological site has been recorded within one mile of the corridor for the proposed project. In addition, this project was initially submitted to SHPO/OSA for review in Jun 2012, to which they replied, "with regard to archaeological resources, we have reviewed our maps and files and one recorded archaeological site, 31GF436**, may be located within your study area. We have no information regarding this historic archaeological site except for its location. We have contacted the site recorder and requested specific information, which we will forward to you. Additional, as yet unrecorded, archaeological resources may be present within the study area. Please forward more specific project information as it developed so we may assess the potential for effects to archaeological resources" (SHPO memo dated 28 Jun 2012).

Digital copies of HPO's maps (Kernersville and Guilford Quadrangles) as well as the HPOWEB GIS Service (http://gis.ncdcr.gov/hpoweb/) were last reviewed on Tuesday, February 20, 2018. As a result of an historic architecture survey conducted in 2014 for this project when it was initially submitted for review, numerous architectural resources were identified within or adjacent to the APE; however, intact archaeological deposits associated with these resources are not anticipated within the footprint of the proposed project. In addition, topographic maps, historic maps (NCMaps website), USDA soil survey maps, and aerial photographs were utilized and inspected to gauge environmental factors that may have contributed to historic or prehistoric settlement within the project limits, and to assess the level of modern, slope, agricultural, hydrological, and other erosive-type disturbances within and surrounding the archaeological APE.

This is a Federally funded project for which a Federal permit will be required. In addition, temporary and/or permanent construction easements will be necessary. Although not specified, it is anticipated that additional ROW along the corridor will be needed as well based on preliminary design plans. The size and shape of the APE have been drawn in a way to capture any areas that may be impacted beyond the NCDOT's existing ROW along all associated roadways. At this time, we are in compliance with NC GS 121-12a since there are no eligible (i.e. National Register-listed) archaeological resources located within the project's APE that would require our attention. Based on the description of the project and the size of the APE, activities will take place beyond NCDOT's existing 60-foot ROW. From an environmental perspective, the APE can be classified as mixed residential and agricultural, consisting primarily of the SR 1818 (Johnson Street)/SR 1850 (Sandy Ridge Road) corridor (and its intersecting roadways) and the immediately adjacent property. Various soil types are present throughout the APE, with roughly half of the corridor composed of soils (eroded or somewhat poorly drained) considered not favorable for intact archaeological sites/resources to be present. Preservation of archaeological materials within these soil type areas is likely to be poor. Nevertheless, intact pockets of undeveloped land and buffers adjacent to streams/rivers are present along the corridor. Sections of well-drained soils (e.g. Appling, Cecil, Coronaca, Enon, Madison, and Vance series) and relatively level terrain are present throughout the overall APE. Some areas consisting of these soil types have not been disturbed by development and have not been subjected to previous archaeological survey/review work. Such areas may be deemed favorable for containing intact archaeological deposits and will require formal archaeological investigations. The Office of State Archaeology (OSA) has reviewed various projects within the vicinity of the proposed APE for environmental compliance, including utility improvements (ERs 09-0483, 95-7921, 95-7918, and 99-7257), transportation improvements (ERs 04-3272, 02-7193, 02-7213, 06-0276, and 00-7310), stream restoration projects (ERs 03-1575 and 01-9215), a borrow pit (ER 06-0421), recreational development (ER 04-0912), and residential development (ER 00-10034). Remarkably, OSA did not recommend an archaeological survey for any of these projects based on each project's low probability of impacting significant archaeological sites. Within five (5) miles of the Study Area, NCDOT's Archaeology Group has reviewed several transportation-related projects for environmental compliance under the Programmatic Agreement (PA) with the State Historic Preservation Office (NC-HPO), most of which consist of small bridge replacement projects or various signal system upgrades throughout High Point. An interchange upgrade project at I-40 with Sandy Ridge Road (PA 16-10-0037 [TIP# I-5712]) has also been reviewed. Based on the limited nature and scope of these surrounding projects, no archaeological surveys were recommended. Despite the lack of recommendations for archaeological surveys in the vicinity of the APE, an archaeological survey is recommended for the proposed project based on the favorable soil conditions and topographical settings that will be impacted by the project. A visual inspection of the entire corridor should be conducted, followed then by systematic archaeological excavations within areas of moderate to high archaeological probability, focusing on areas of moderately well-drained to well-drained soils that have not been impacted by development and on known historic resources (if present) to determine if an archaeological component is also present. All cemeteries should also be properly recorded and delineated if said cemeteries are located within the APE. None of the property within the APE that requires further investigation is owned by the State of North Carolina so a State Archaeological Resources Protection Act (ARPA) permit should not be necessary. Should the description of this project change or design plans be made available prior to construction, additional consultation regarding archaeology will be required.

SUPPORT DOCUMENTATION

See attached: ☒ Map(s) ☒ Previous Survey Info ☐ Photos ☐ Correspondence
☐ Photocopy of County Survey Notes Other:

Project Tracking No.:

18-01-0050

FINDING BY NCDOT ARCHAEOLOGIST – *SURVEY REQUIRED*

Paul J Mohler

February 22, 2018

NCDOT ARCHAEOLOGIST **Date**

PROPOSED FIELDWORK COMPLETION DATE August 22, 2018

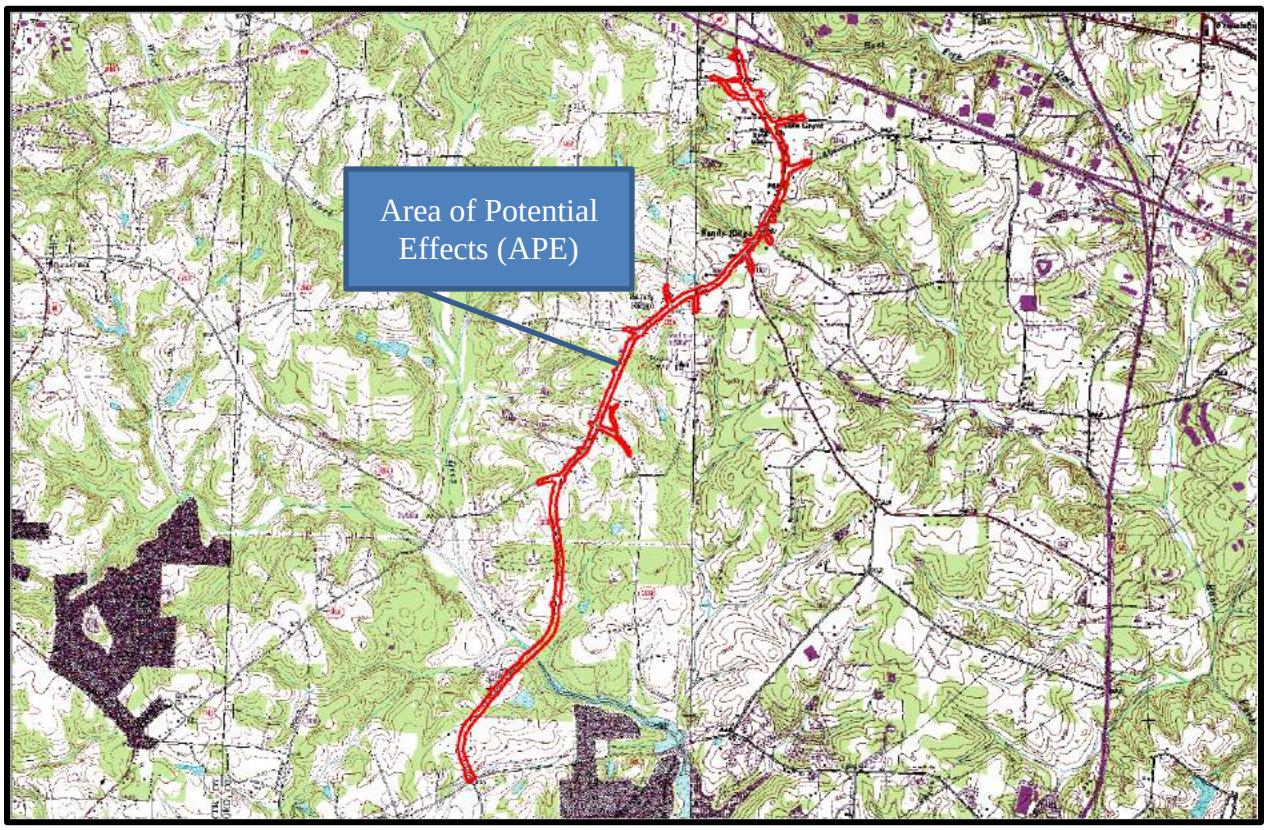


Figure 1: LEFT-Kernersville, NC (USGS 1969 [PR87]) and RIGHT-Guilford, NC (USGS 1951 [PR68]).

TIP# U-4758 (PA 18-01-0050) Widening of SR 1818 (Johnson St)/ SR 1850 (Sandy Ridge Rd) from SR 1820 (Skeet Club Rd) to I-40 Guilford County, NC

- Area of Potential Effects (APE)
- NCHPOpoints
- Local_District_Boundaries
- NCHPO_NR_SL_DOE_Boundaries
- Named_streams
- HYARUT
- mapfldhazar
- Cemetery
- Streets
- Guilford_2014Parcels

N

0 0.1 0.2 0.4 0.6 0.8 Miles

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

NO NATIONAL REGISTER OF HISTORIC PLACES ELIGIBLE OR LISTED ARCHAEOLOGICAL SITES PRESENT FORM

This form only pertains to ARCHAEOLOGICAL RESOURCES for this project. It is not valid for Historic Architecture and Landscapes. You must consult separately with the Historic Architecture and Landscapes Group.

PROJECT INFORMATION

Project No:	**U-4758**	*County:*	**Guilford**
WBS No:	**40251.1.1**	*Document:*	**Federal PCE**
F.A. No:	**Unknown**	*Funding:*	☐ State ☒ Federal

Federal Permit Required? ☒ Yes ☐ No *Permit Type:* **USACE (Not Specified)**

Project Description: *NCDOT is proposing to widen and realign SR 1818 (Johnson Street)/SR 1850 (Sandy Ridge Road) from SR 1820 (Skeet Club Road) to I-40 in Guilford County. Currently, Johnston Street/Sandy Ridge Road is a two-lane, undivided facility. As proposed, the corridor will consist of a four- to five- lane divided facility with sidewalks and bike lanes. Project length measures about 4.40 miles. Based on Preliminary Design Plans, the Area of Potential Effects (APE) will equate to the extent of the Proposed ROW and any construction easements along the corridor. The realignment of several Y-lines (i.e. major intersecting roads) will also be included as a component of this project. Overall, the APE will encompass about 105.8 acres, inclusive of all existing roadways and development.*

SUMMARY OF ARCHAEOLOGICAL FINDINGS

The North Carolina Department of Transportation (NCDOT) Archaeology Group reviewed the subject project and determined*:*

☒ **There are no National Register listed or eligible ARCHAEOLOGICAL SITES present within the project's area of potential effects. (Attach any notes or documents as needed)**
☐ No subsurface archaeological investigations were required for this project.
☐ Subsurface investigations did not reveal the presence of any archaeological resources.
☒ **Subsurface investigations did not reveal the presence of any archaeological resources considered eligible for the National Register.**
☒ **All identified archaeological sites located within the APE have been considered and all compliance for archaeological resources with Section 106 of the National Historic Preservation Act and GS 121-12(a) has been completed for this project.**

Brief description of review activities, results of review, and conclusions:

A map review and site file search was conducted at the Office of State Archaeology (OSA) on Tuesday, February 13, 2018. No large-scale archaeological surveys have been conducted in the area, and only one (1) archaeological site has been recorded within one mile of the corridor for the proposed project. OSA has no information regarding site 31GF436**, except for its location (Figure 1).

Digital copies of HPO's maps (Kernersville and Guilford Quadrangles) as well as the HPOWEB GIS Service (http://gis.ncdcr.gov/hpoweb/) were last reviewed on Tuesday, February 20, 2018. As a result of a historic architecture survey conducted in 2014 for this project, when it was initially submitted for review, numerous architectural resources were identified within or adjacent to the APE; however, intact archaeological deposits associated with these resources are not anticipated within the footprint of the proposed project. In addition, topographic maps, historic maps (NCMaps website), USDA soil survey maps, and aerial photographs were utilized and inspected to gauge environmental factors that may have contributed to historic or prehistoric settlement within the project limits, and to assess the level of modern, slope, agricultural, hydrological, and other erosive-type disturbances within and surrounding the archaeological APE.

New South Associates, Inc. (New South) conducted an intensive archaeological survey of the U-4758 Area of Potential Effects (APE) between April 10 and April 17, 2018 (Figures 2 and 3). This survey sought to identify and evaluate archaeological sites for National Register of Historic Places (NRHP) eligibility according to criteria outlined in 36 CFR §60.4. The survey included a visual inspection of the entire APE and systematically shovel-tested survey areas that were defined by NCDOT as having a moderate to high probability for the presence of archaeological sites (Figure 4). These areas consisted of moderately well-drained and well-drained soils that were not impacted by modern development. New South also recorded and evaluated three cemeteries located within or adjacent to the APE during the survey. The cemetery evaluations relied upon non-invasive data collection (e.g., photography and sketch mapping) and limited ground-penetrating radar (GPR) survey in one case.

Shovel testing of the designated survey areas utilized pre-plotted 30-meter interval shovel test locations. Field technicians visited all test locations during the survey. They did not excavate test locations within discernible disturbances or near buried utility lines. Excavated tests measured 30-centimeters in diameter and were excavated to sterile subsoil, the water table, or impenetrable substrate. Shovel test results (including soil color, texture, depths, and the presence/absence of cultural material) were recorded using smartphones equipped with a Memento data collection application. The field director collected sub-meter Global Positioning System (GPS) data for selected shovel tests, cemetery boundaries, and site locations.

All artifacts were returned to New South's laboratory in Stone Mountain, Georgia where they were washed and identified. Analysts identified the type, material, age, affiliation, and metrics of the collected artifacts according to standard techniques/typologies for both pre-contact and historic material. Raw materials for pre-contact lithic artifacts were classified according to procedures established by the NCDOT for the Carolina Slate Belt.

SURVEY AREA 1

Survey Area 1 was located to the southeast of the intersection of Sandy Ridge Road and Tyner Road (Figure 4). Planted white pines covered this upland area (Figure 5). The investigation identified a City of High Point sewer line along the northern edge of Survey Area 1, and a large push pile at the eastern edge of Sandy Ridge Road. Their presence indicates that road- and sewer-related disturbances have impacted this survey area. Eleven shovel test positions were excavated in this area. The excavated tests encountered five centimeters of dark brown (10YR 3/3) silty loam overlaying 15 centimeters of red (2.5YR 5/8) clay subsoil (Figure 6). Shovel testing and visual inspection did not locate any archaeological resources in Survey Area 1.

SURVEY AREA 2

Survey Area 2 was located on the eastern side of Sandy Ridge Road, extending northeast from the Partridge Road intersection (see Figure 4). This upland survey area included a zone of scrub vegetation, a natural gas transmission line, and the grassed yard of a single residence (Figure 7). There were four

shovel test positions investigated in this area, three of which were excavated and one test located near the natural gas line was not excavated. These tests uncovered 19 centimeters of brown (10YR 5/3) silty loam overlaying 10 centimeters of light yellowish brown (10YR 6/4) silty clay subsoil. The field investigation did not locate any archaeological resources in Survey Area 2.

SURVEY AREA 3

Survey Area 3 encompassed a segment of upland located between Sandy Ridge Road and Shields Road (see Figure 4). During the survey, a fallow agricultural field covered this landform (Figure 8). There were 12 shovel test positions investigated in this area. Of these, 11 were excavated, and one test was not excavated. The excavated tests indicate the survey area soils are limited to 20 centimeters of red (2.5YR 4/8) clay subsoil (Figure 9). These tests and visual inspection did not locate any archaeological remains in Survey Area 3.

SURVEY AREA 4

Survey Area 4 was located along the southeastern side of Sandy Ridge Road, south of the Shields Road intersection (Figure 10). This upland setting included a fallow agricultural field and a thin hardwood copse (Figure 11). There were six shovel test positions investigated in this area, five of which were excavated. None yielded cultural material. These tests typically encountered 30 centimeters of very dark brown (7.5YR 2.5/3) sandy loam overlaying 23 centimeters of very pale brown (10YR 7/4) sand (Figure 12). A reddish yellow (5YR 6/6) clay subsoil was uncovered 53 centimeters below ground surface. Shovel testing was suspended when the landowner informed the field crew that the survey area encompassed an area where he had added 80 truckloads of topsoil and subsequently raised the ground surface approximately 50 centimeters. He also stated that the underlying ground surface was low-lying and used for cultivation. Given the shovel testing results and past land use in this survey area, this unexcavated shovel test location was unlikely to contain any undisturbed soil strata.

SURVEY AREA 5

Survey Area 5 was located on the west side of Sandy Ridge Road, opposite the Dairy Point Drive intersection (see Figure 10). A grassy yard and a fallow agricultural field covered the survey area (Figure 13). The field crew excavated six shovel test positions in this area. None yielded cultural material. These tests uncovered 34 centimeters of brown (7.5YR 5/4) clay sand overlaying 11 centimeters of yellowish red (5YR 4/6) clay subsoil (Figure 14). No archaeological resources were identified in Survey Area 5 during the field investigation.

SURVEY AREA 6

Survey Area 6 was located on the north side of Gallimore Dairy Road, 60 meters southeast of the Sandy Ridge Road intersection (see Figure 10). A recently constructed commercial structure was erected in this survey area. This structure was screened from the road by scrub vegetation and does not appear on recent aerial photography (Figure 15). Three shovel test positions were excavated in Survey Area 6. These tests typically encountered 23 centimeters of reddish yellow (5YR 7/6) sandy clay overlaying nine centimeters of red (2.5YR 4/8) clay subsoil (Figure 16). These tests and visual inspection did not locate any archaeological resources in this survey area.

SURVEY AREA 7

Survey Area 7 was located opposite Survey Area 6, on the south side of Gallimore Dairy Road (see Figure 10). A low-lying grassy yard extended across this side of the road (Figure 17). Three shovel test positions typically identified 28 centimeters of light brown (7.5YR 6/4) clay sand overlaying 10 centimeters of yellowish red (5YR 4/6) clay subsoil (Figure 18). These tests and visual inspection of the survey area did not locate any archaeological resources.

SURVEY AREA 8

Survey Area 8 was located east of Clinard Farms Road (Figure 19). The local setting included a narrow band of woods and a newly constructed building and parking lot (Figure 20). Field technicians examined five shovel test positions in this area. Although the field crew was able to excavate three tests, disturbances prevented the excavation of the two remaining test locations in Survey Area 8. The excavated tests were negative for archaeological remains and typically uncovered 25 centimeters of yellowish red (5YR 5/6) clay subsoil (Figure 21). The field investigation did not locate any archaeological resources in this survey area.

SURVEY AREA 9

Survey Area 9 extended across an open field on the south side of Sandy Ridge Road, halfway between Clinard Farms Road and Sandy Camp Road (see Figure 19, Figure 22). Four shovel test positions were excavated in Survey Area 9. These tests typically encountered 30 centimeters of reddish brown (2.5YR 4/3) clay and did not produce cultural material (Figure 23). Visual inspection of the survey area also did not locate any archaeological resources.

SURVEY AREA 10

Survey Area 10 extends from the Clinard Farms Road intersection to a point 70 meters northeast of the Sandy Camp Road intersection, on the northwest side of Sandy Ridge Road (see Figure 19). This area included fallow agricultural fields and grassy front yards (Figure 24). Technicians examined 15 shovel test positions in this area, 13 of which were excavated. The excavated tests revealed 25 centimeters of reddish brown (2.5YR 5/3) clay overlaying light red (2.5YR 6/6) clay subsoil (Figure 25). None of the excavated tests produced artifacts. Two test locations were left unexcavated due to heavy disturbance related to driveway construction. The field investigation did not locate any archaeological resources in Survey Area 10.

SURVEY AREA 11

Survey Area 11 was located east of the Sandy Ridge Road intersection with Joe Drive (Figure 26). The local setting includes grassy lawn of the Sandy Ridge Road Methodist Church (Figure 27). Three negative shovel test positions were excavated in Survey Area 11. These tests typically uncovered 10 centimeters of dark brown (10YR 3/3) sandy clay loam overlaying 23 centimeters of yellowish brown (10YR 5/4) sandy clay (Figure 28). A reddish yellow (5YR 6/6) sandy clay subsoil was uncovered 33 centimeters below ground surface. No archaeological resources were identified in Survey Area 11 during this field investigation.

SURVEY AREA 12

Survey Area 12 follows the west side of Sandy Camp Road, south from the intersection with Sandy Ridge Road (see Figure 26). The local setting includes the grassy lawn of a single residence and the Sandy Ridge Methodist Church Cemetery (Figure 29). Five shovel test positions were examined in this area. The field crew excavated three shovel tests and left two unexcavated due to their proximity to an area with high potential for the presence of unmarked graves. The excavated tests uncovered 10 centimeters of dark yellowish brown (10YR 3/4) sandy clay loam overlying 13 centimeters of yellowish brown (10YR 5/4) sandy clay. A reddish yellow (5YR 6/6) sandy clay subsoil was encountered 23 centimeters below ground surface. Shovel testing and visual inspection of the survey area did not locate any artifacts.

SURVEY AREA 13

Survey Area 13 was located on the southeastern side of Sandy Ridge Road, across from the Bame Road intersection (see Figure 26). The local setting included a fallow agricultural field covered by raspberries and tall grass (Figure 30). Of the nine shovel test positions investigated in Survey Area 13, eight were excavated. The presence of pavement prevented excavation of the final test location. The excavated tests typically encountered 25 centimeters of yellowish brown (10YR 5/6) sandy clay loam and light red (2.5YR 6/8) clay subsoil. These tests and visual inspection did not locate any artifacts in this survey area.

SURVEY AREA 14

Survey Area 14 extends along the northwestern side of Sandy Ridge Road from the Presbyterian Homes parking lot southwest for 200 meters (Figure 31). The presence of three-meter-high earthen mounds and a berm, covered by grass, indicated that mechanical excavation heavily disturbed this area (Figure 32). All seven shovel test positions were excavated in Survey Area 14. These tests revealed 28 centimeters of reddish brown (2.5YR 5/3) clay sand overlaying red (2.5YR 5/8) clay subsoil (Figure 33). None yielded cultural material.

SURVEY AREA 15

Survey Area 15 was located 340 meters southwest of the Kendale Road intersection with Sandy Ridge Road, on the western edge of Kendale Road (see Figure 31). During the survey, this upland area included a fallow agricultural field and the grassy front yard of a single residence (Figure 34). Six shovel test positions were excavated in Survey Area 15. These tests typically encountered 34 centimeters of brown (7.5YR 5/4) sandy clay overlaying reddish brown (2.5YR 5/4) clay subsoil (Figure 35). Shovel testing and visual inspection of Survey Area 15 did not locate any artifacts.

SURVEY AREA 16

Survey Area 16 includes a ridgetop covered by a fallow agricultural field located between Kendale Road and Sandy Ridge Road (see Figure 31, Figure 36). The field crew investigated 28 shovel test positions in this area. This includes 22 pre-plotted tests and four 7.5-meter interval radials. Technicians excavated all of the pre-plotted tests and three radial tests (Figure 62). Demolition of a twentieth century house site heavily disturbed the final test location. The general soil uncovered in Survey Area 16 includes 20 centimeters of brown (7.5YR 4/3) sandy clay overlying 13 centimeters of light brown (7.5YR 6/3) clay (Figure 37). Subsoil, a reddish yellow (5YR 6/6) clay, was revealed 23 centimeters below ground surface. While subsurface artifact deposits were not identified in the survey area, one historic surface find was collected at Shovel Test 109. This find, designated as site 31GF569, is discussed below.

SURVEY AREA 17

Survey Area 17 extends northeast from the intersection of Sandy Ridge Road and Johnson Street (Figure 38). A fallow agricultural field extends across this upland area (Figure 39). The field crew excavated 13 out of 14 tests plotted in the survey area. The final test location was not excavated due to large ruts from land clearing. The excavated tests identified 28 centimeters of yellowish brown (10YR 5/6) loamy sand overlying reddish brown (5YR 4/4) sandy clay subsoil (Figure 40). Visual inspection and shovel testing did not locate any artifacts in Survey Area 17.

SURVEY AREA 18

Survey Area 18 was located at the southwestern corner of the Sandy Ridge Road intersection with

Johnson Street (see Figures 38 and 43). The survey area contains a fallow agricultural field currently under development (Figure 41). All 23 shovel test positions in Survey Area 18 were excavated. None yielded cultural material. These tests commonly contained 30 centimeters of dark yellowish brown (10YR 4/6) silty clay overlaying 10 centimeters of strong brown (7.5YR 5/8) sandy clay (Figure 42). Shovel testing and visual inspection of Survey Area 18 did not locate any archaeological sites.

SURVEY AREA 19

Survey Area 19 was located on the east side of Johnson Street, across from the Cedar Spring Drive intersection (Figures 43 and 46). The local setting includes wooded residential lots and a transmission line corridor (Figure 44). Technicians examined 18 shovel test positions in this area, 14 of which were excavated. Three test locations were not excavated due to heavy disturbance, and the final unexcavated test location was not shovel tested due to subsoil surface exposure. The excavated tests uncovered five centimeters of grayish brown (10YR 5/2) silty loam and 15 centimeters of light reddish brown (2.5YR 6/3) silty clay (Figure 45). Shovel tests exposed a reddish yellow (5YR 6/6) clay subsoil 20 centimeters below ground surface. None of the test locations produced cultural material. Visual inspection and shovel testing did not locate any archaeological sites in Survey Area 19.

SURVEY AREA 20

Survey Area 20 was located on the east side of Johnson Street, opposite the entrance to the Johnson Street Sports Complex (see Figure 46). This sideslope survey area contained young pines and scrub vegetation (Figure 47). The field crew excavated four of the five shovel test positions. These negative tests uncovered 20 centimeters of reddish brown (2.5YR 5/4) silty clay overlying light red (2.5YR 6/8) clay subsoil (Figure 48). The unexcavated test location was too disturbed to warrant subsurface testing. Visual inspection of this area and shovel testing did not identify any artifacts in this survey area.

SURVEY AREA 21

Survey Area 21 was located near the northeastern side of the West Fork Deep River (see Figure 46). The survey area contains a pine- and hardwood-covered ridgetoe overlooking a narrow section of floodplain (Figure 49). Twenty-one survey and radial shovel test positions were excavated in Survey Area 21 (Figure 60). These tests typically encountered 16 centimeters of dark brown (10YR 3/3) silty loam overlying red (2.5YR 5/8) clay subsoil (Figure 50). A single bucket auger test (Test A) was excavated between the boundary of Survey Area 21 and the stream. This test exposed 10 centimeters of dark yellowish brown (10YR 4/4) silty clay and 50 centimeters of yellowish red (5YR 5/8) compact silty clay. These soils indicate that alluviation did not deeply bury any A-horizon soils in the APE. A metavolcanic flake was recovered from Shovel Test 178 (Figure 46). A description of this archaeological resource, designated as site 31GF568, is provided below.

SURVEY AREA 22

Survey Area 22 was located on the southwestern side of the West Fork Deep River (Figure 51). The survey area includes a narrow floodplain and sideslope covered by hardwoods (Figure 52). Two shovel test positions were excavated in this area, both of which encountered 15 centimeters of dark yellowish brown (10YR 4/4) silty loam overlaying 35 centimeters of light yellowish brown (10YR 6/4) silty clay and reddish yellow (5YR 6/6) silty clay subsoil. Neither test yielded artifacts. A bucket auger test (Test B) exposed 20 centimeters of dark yellowish brown sandy clay loam before encountering the water table. This profile and those recorded during shovel testing indicate that alluvial processes have not deposited soils in this area. Shovel testing results, bucket augering, and visual inspection did not locate any archaeological remains or deeply-buried deposits in Survey Area 22.

SURVEY AREA 23

Survey Area 23 was located on the northeastern side of Johnson Street, beginning at the intersection of Johnson Street and Pondhaven Drive (see Figures 51 and 57). The local setting included residential lots and a small agricultural field covered by grass (Figure 53). The field crew examined 12 shovel test positions in this area. Eleven tests were excavated. One test location was too disturbed by driveway construction to merit subsurface testing. The general soil profile in Survey Area 23 includes 20 centimeters of light brown (7.5YR 6/3) sand overlying 12 centimeters of very dark brown (7.5YR 2.5/2) loam and reddish yellow (5YR 6/6) clay subsoil (Figure 54). Pedestrian survey and shovel testing did not locate any archaeological sites in Survey Area 23.

SURVEY AREA 24

Survey Area 24 was located across from Pondhaven Drive (see Figures 51 and 57). The local terrain includes a sideslope covered by hardwoods, fenceline cedars, and grasses and periwinkle ground cover (Figure 55). Survey Area 24 contained 35 shovel test positions. Field technicians excavated 29 of these tests, none of which yielded cultural material. Tests typically revealed 17 centimeters of very dark grayish brown (10YR 3/2) silty loam overlying six centimeters of yellowish brown (10YR 5/8) silty clay and reddish yellow (5YR 6/6) clay subsoil (Figure 56). The five remaining test locations were not suitable for subsurface testing due to the presence of road-related push piles and heavy disturbances. No archaeological sites were identified in Survey Area 24 during this field investigation.

SURVEY AREA 25

Survey Area 25 was located on the west side of Johnson Street, 180 meters north of its intersection with Skeet Club Road (see Figure 57). The survey area includes sideslope covered by a narrow band of woods and an abandoned agricultural field (Figure 58). Four shovel test positions were excavated in Survey Area 25. None yielded cultural material. These tests typically encountered 10 centimeters of dark brown (7.5YR 3/2) silt and reddish brown (2.5YR 5/3) clay subsoil. New South did not identify any archaeological sites in Survey Area 25.

IDENTIFIED RESOURCES AND RECOMMENDATIONS

SITE 31GF568

New South collected a single metavolcanic flake from Shovel Test 178, in Survey Area 21 (see Figure 46). During the site visit, hardwood trees and light density scrub vegetation covered this landform (Figure 59). The positive shovel test was excavated on a ridge toe overlooking the West Fork Deep River floodplain. Shovel Test 178 produced a temporally non-diagnostic precontact flake between 0-30 centimeters below ground surface. Technicians excavated a cruciform of 11 15-meter- and 7.5-meter-interval delineation shovel tests around the positive test location (Figure 60). These tests revealed 20 centimeters of dark brown (10YR 3/3) silty loam overlying red (2.5YR 5/8) silty clay subsoil (Figure 61). No additional artifacts were recovered from site 31GF568.

A single non-diagnostic lithic artifact was collected from site 31GF568. The artifact cannot be associated with any significant people or broad patterns of history. It does not convey any significance related to the works of a master craftsperson or embody any high design ideals. Shovel testing also shows that the site does not contain any significant artifact deposits or intact features and has a low potential to benefit future

research. For these reasons, New South recommends site 31GF568 not eligible for the NRHP under Criteria A, B, C, and D. No further work is recommended.

SITE 31GF569

A single fragment of nineteenth- or twentieth-century milk glass (Miller et al. 2000) was collected from the Survey Area 16 ground surface, at Shovel Test 109 (see Figure 31). This site was located on a ridgetop overlooking the intersection of Sandy Ridge Road and Kendale Road. The surface find was collected from the edge of an overgrown fence line that separated the survey area from an abandoned twentieth-century farmhouse complex, located 20 meters to the south. This complex was located outside of the APE and was undergoing demolition at the time of the field investigation.

Field technicians excavated four shovel tests during the site delineation (Figure 62). This included two 15-meter interval shovel tests to the north, east, and west of Shovel Test 109. The farmhouse complex was extensively disturbed, and no shovel tests were placed in this area. These tests and visual inspection of surrounding ground surface exposures did not locate any additional artifacts. Shovel testing revealed 25 centimeters of brown (7.5YR 4/2) loamy sand overlaying yellowish red (5YR 4/6) clay subsoil (Figure 63). Given the fallow field setting, the upper soil horizon likely resulted from agricultural activity.

Site 31GF569 contains a twentieth-century surface find that is presumably associated with the demolished farmhouse complex because of its proximity (Figure 64). The mechanical removal of these structures heavily reduced the potential for the area to contain intact subsurface artifact deposits or features. The site cannot be associated with any broad patterns of history or significant people. It does not convey any significance related to the works of a master craftsperson or embody any high design ideals. The disturbed site did not yield any subsurface artifacts, and the surface find lacks integrity. Therefore, New South recommends site 31GF569 not eligible for the NRHP under Criteria A, B, C, and D. No further work is recommended for the site.

SITE 31GF570, ZION HILL METHODIST CEMETERY

The Zion Hill Methodist Cemetery is located northwest of the Tyner Loop intersection with Sandy Ridge Road (Figure 65). The 60x40-meter (0.5-acre) cemetery is immediately west of the Zion Hill Methodist Church and is covered by a patchy grass lawn. The cemetery contains 12 loosely aligned north-south rows of headstones facing east made from concrete, marble, and granite (Figure 66). Several headstones bear evidence of displacement. The grave plots appear to be individually decorated and tended, the best example of which are Harriet and J.B. Lindsay's graves. The graves share a granite headstone and are covered by rows of small stones aligned parallel to the graves' long axes. These stones are embedded in a concrete ledger with the entire covering painted white. This treatment is representative of traditional African American burial practices (Vlach 1977). Though most of the headstones were legible, several pressed concrete markers were too eroded to read. One depression located near the southwestern corner of the cemetery suggests the presence of additional unmarked graves.

The earliest headstone identified at the Zion Hill Methodist cemetery dates from the 1880s (exact date illegible). Little background information is available for the Zion Hill Methodist Church. A 1920 soil map places a church at the current Zion Hill church building location. Cursory background research indicates that the names memorialized in the cemetery belong to tenant farmers with African American and European American backgrounds. According to her headstone, Harriet Lindsay, one of the African Americans interred in the cemetery, was born in 1854. This birthdate opens the possibility that Harriet and others buried in the cemetery were formerly enslaved.

Site 31GF570 encompasses the late nineteenth- and twentieth-century Zion Hill Methodist Church

cemetery. Background research did not identify any significant events associated with the cemetery. The cemetery does not convey any associations with broad patterns of history or contain the burials of notable individuals. The grave markers are representative of typical styles used during the late nineteenth and twentieth centuries. They do not convey any elements of high design or represent the works of a master craftsperson. Although the interments could provide biological data and funerary remains contained within the cemetery could be a rich source of historical information that could provide insight into the lifeways of lower-class society and marginalized ethnicities in the late nineteenth and twentieth century, the data obtained from their examination are unlikely to provide insights not already available through documentary analysis. New South recommends site 31GF570, the Zion Hill Methodist Cemetery, not eligible for the NRHP under Criteria A, B, C, and D.

Although the cemetery is recommended not eligible for the NRHP, New South recommends avoidance of this resource in accordance with North Carolina General Statute, Chapter 65, Article 12 and North Carolina General Statute, Chapter 70. If avoidance is not possible, it will be necessary to comply with these statutes after consultation with the State Archaeologist to determine the way any burials are to be removed and relocated.

SITE 31GF571, SMITH GROVE BAPTIST CEMETERY

The Smith Grove Baptist Church cemetery is located at the southwestern corner of the Tyner Loop Road intersection with Sandy Ridge Road (see Figure 65). A well-maintained grassy lawn covers this 75x55-meter (0.71-acre) cemetery. The interments are organized into 16 rows aligned north-south (Figure 67). The graves are oriented east-west, with the headstones facing east. The oldest headstone dates to 1905. Given the dates of death listed on cemetery markers, the cemetery was a focus of burial activity for most of the early twentieth century and continues to be used in the present day. Standing headstones were manufactured from marble, granite, and concrete.

Background research did not identify any significant events associated with the cemetery. The cemetery does not convey any associations with broad patterns of history or contain the burials of notable individuals. The cemetery does not meet eligibility Criteria A or B of the NRHP. The grave markers are representative of typical styles used during the twentieth century. They do not convey any elements of high design or represent the works of a master craftsperson. Thus, the cemetery does not meet NRHP Criterion C eligibility requirements. While the interments could provide biological data for studies of twentieth century lifeways, the data obtained from their examination is unlikely to provide significant insights that are not already addressed by available documentary evidence. Because the cemetery is unlikely to provide significant contributions to research, site 31GF571 does not meet NRHP Criterion D eligibility requirements. New South recommends site 31GF571, the Smith Grove Baptist Cemetery, not eligible for the NRHP under Criteria A, B, C, and D.

New South also recommends avoidance of the cemetery. North Carolina General Statute, Chapter 65, Article 12 and North Carolina General Statute, Chapter 70 provide additional protections for this cemetery. If avoidance is not possible, it will be necessary to comply with these statutes after consultation with the State Archaeologist to determine the manner in which any burials are to be removed and relocated.

SITE 31GF572, SANDY RIDGE METHODIST CEMETERY

The Sandy Ridge Methodist cemetery is located southeast of the Sandy Ridge Road intersection with Sandy Camp Road (see Figures 26 and 69). The Sandy Ridge Methodist Church is currently located northwest of the cemetery, directly across Sandy Ridge Road. The cemetery extends from the intersection southwest across a knoll covered by a well-manicured lawn, oak trees, and large holly trees

(Figure 68). It measures 105x155 meters (2.8 acres) and has not been previously recorded or evaluated for NRHP eligibility.

The interments located within the cemetery are organized in 30 rows aligned north-south. Grave markers were made from marble, granite, concrete, and fieldstone. While most of the headstones are legible, the nineteenth- and early twentieth-century headstones are eroded or obscured by lichen. Though most headstones are east-facing, several west-facing examples are also present. The headstones located closest to the Sandy Ridge Road and Sandy Camp Road intersection bear the oldest inscriptions in the cemetery.

Dating to 1856, the headstone of Martha Penix is the earliest legible marker in the cemetery. Ms. Penix's murder in 1856 was a locally notorious event that involved several members of the local community (Browning 2007; 2010a; 2010b). Though her headstone was identified in the cemetery, it was disturbed and found lying on the ground. Several depressions located near this marker demonstrate the presence of unmarked interments in this area. These headstones and unmarked graves suggest the portion of the APE located between the headstones and Sandy Camp Road contains additional unmarked graves.

The historical connection with the Methodist congregation prior to 1964, when the church moved to its current location, is unclear. The 1920 Soil Map of Guilford County shows a *Sandy Ridge Church* at the intersection of Sandy Ridge Road and Sandy Camp Road (Jurney et al. 1920). However, the official history for the congregation insists the church operated on land belonging to Ira Idol until land for the current church building was donated by Mr. and Mrs. Joe W Frazier, Sr. (Sandy Ridge United Methodist Church 2014). The presence of markers pre-dating the Methodist church's move likely relates to this earlier house of worship.

GEOPHYSICAL SURVEY

The geophysical survey was conducted by Sarah Lowry and Maeve Herrick on May 10, 2018. The goal of the geophysical survey was to identify unmarked graves on the easternmost edge of Sandy Ridge Methodist Church Cemetery, where the cemetery is adjacent to Sandy Camp Road. The GPR survey area was approximately 0.44 acre, including 0.2 acre located within the right of way (ROW) of Sandy Camp Road (Figure 70).

For the GPR data collection, two grids were established using metric measuring tapes. Grid corners were placed to cover a total survey area of 0.44 acre (1802 sq m) (Figure 70) (Table 1). Survey flags were used to indicate each grid corner. Grid corners and surface features, including grave markers, utility indicators, and a single tree, were mapped using an RTK GPS with one- to two-centimeter accuracy.

Table 1. Geophysical Grids

Label	Acres	Square Meters
Grid 1	0.25	1020
Grid 2	0.19	782
Total	0.44	1802

All spatial data were downloaded from the GPS and then imported into ArcMap 10, ESRI's geographic information system (GIS) program. Separate shapefiles were then created for the surface features and GPR grids. The advantage of this method is that each grid corner has associated coordinates and can be relocated.

GROUND-PENETRATING RADAR (GPR)

Ground-penetrating radar is a remote sensing technique frequently used by archaeologists to investigate a wide range of research questions. In archaeological applications, GPR is typically used to prospect for potential subsurface cultural features. Because GPR is a remote sensing technique, it is noninvasive, non-destructive, relatively quick, efficient, and highly accurate when used in appropriate situations. In cemeteries, GPR is commonly used to identify anomalies consistent with the expectations for human graves (Jones 2008; King et al. 1993).

Ground-penetrating radar data are acquired by transmitting pulses of radar energy into the ground from a surface antenna, reflecting the energy off buried objects, features, or bedding contacts, and then detecting the reflected waves back at the ground surface with a receiving antenna (Conyers 2004a). When collecting radar reflection data, surface radar antennas are moved along the ground in transects, typically within a survey grid, and a large number of subsurface reflections are collected along each line. As radar energy moves through various materials, the velocity of the waves will change depending on the physical and chemical properties of the material through which they are traveling (Conyers and Lucius 1996). The greater the contrast in electrical and magnetic properties between two materials at an interface, the stronger the reflected signal and, therefore, the greater the amplitude of reflected waves (Conyers 2004b).

When travel times of energy pulses are measured, and their velocity through the ground is known, distance (or depth in the ground) can be accurately measured (Conyers and Lucius 1996). Each time a radar pulse traverses a material with a different composition or water saturation, the velocity will change and a portion of the radar energy will reflect back to the surface and be recorded. The remaining energy will continue to pass into the ground to be further reflected, until it finally dissipates with depth.

The depths to which radar energy can penetrate, and the amount of resolution that can be expected in the subsurface, are partially controlled by the frequency (and therefore the wavelength) of the radar energy transmitted (Conyers 2004b). Standard GPR antennas emit radar energy varying from about 10 to 1,000 megahertz (MHz) in frequency. Low frequency antennas (10-120 MHz) generate long wavelength radar energy that can penetrate up to 50 meters in certain conditions but resolve only very large buried features. In contrast, the maximum depth of penetration of a 900 MHz antenna is about one meter or less in typical materials, but its generated reflections can resolve features with a maximum dimension of a few centimeters. Thus, a trade-off exists between depth of penetration and subsurface resolution.

The success of GPR surveys in archaeology is largely dependent on soil and sediment mineralogy, ground moisture, subsurface material moisture retention, the depth of buried features, feature preservation, and surface topography and vegetation. Electrically conductive or highly magnetic materials will quickly attenuate radar energy and prevent its transmission to depth. Depth penetration varies considerably depending on local conditions. Subsurface materials that absorb and retain large amounts of water can affect GPR depth penetration because of their low relative dielectric permittivity (RDP). In practical applications, this generally results in shallower than normal depth penetration because the radar signal is absorbed (attenuated) by the materials regardless of antenna frequency (Conyers 2004a; 2012; Conyers and Lucius 1996). Differential water retention can also positively affect data when a feature of interest retains more water than the surrounding soils and, therefore, presents a greater contrast.

The basic configuration for a GPR survey consists of an antenna (with both a transmitter and receiver), a harness or cart, and a wheel for calibrating distance. The operator then pulls or pushes the antenna across the ground surface systematically (a grid) collecting data along transects. These data are then stored by the receiver and available for processing.

The "time window" within which data were gathered was 50 nanoseconds (ns). This is the time during which the system is "listening" for returning reflections from within the ground. The greater the time window, the deeper the system can potentially record reflections. To convert time in nanoseconds to depth, it is necessary to determine the elapsed time it takes the radar energy to be transmitted, reflected, and recorded back at the surface by doing a velocity test. Hyperbolas were found on reflection profiles and measured to yield a relative dielectric permittivity (RDP), which is a way to calculate velocity. The shape of hyperbolas generated in programs is a function of the speed at which electromagnetic energy moves in the ground, and can therefore be used to calculate velocity (Conyers and Lucius 1996). The RDP for soils in the survey area was approximately 12.6, which, when converted to one-way travel time, (the time it takes the energy to reach a reflection source), is approximately 8.4 centimeters/nanosecond. All profiles and processed maps were converted from time in nanoseconds to depth in centimeters using this average velocity.

The first step was to calibrate the antenna to local conditions by walking the survey area and adjusting the instrument's gain settings. This method allows the user to get an average set of readings based on subtle changes in the RDP (Conyers 2004b). Field calibration was repeated as necessary to account for changes in soil and/or moisture conditions (Conyers 2004a). Effective depth penetration was approximately 1.75 meters (5.74 ft.). This is an adequate depth penetration for a 400 MHz antenna. Slight signal attenuation occurred at the bottom of the profile.

The field survey was conducted using a GSSI SIR-3000 using a 400 MHz antenna. Total survey area was approximately 0.44-acre (0.2-acre within the ROW). It is generally standard practice to orient transects perpendicular to the long axis of suspected features. The marked graves in the Sandy Ridge Road Methodist Church Cemetery were oriented west-east, so data were collected roughly north to south so that transects were perpendicular to graves. Transect spacing was 50 centimeters, an interval that has been demonstrated to generate the best resolution possible while still maintaining field efficiency (Pomfret 2005). Transects were collected in a zig-zag pattern, alternating starting direction, and started in the northeast grid corners.

All data were downloaded from the control unit to a laptop computer for post-processing. Radar signals are initially recorded by their strength and the elapsed time between their transmission and receipt by the antenna. Therefore, the first task in the data processing was to set "time zero", which tells the software where in the profile the true ground surface was. This is critical to getting accurate results when elapsed time is converted to target depth. A background filter was applied to the data, which removes the horizontal banding that can result from antenna energy "ringing" and outside frequencies such as cell phones and radio towers. Background noise can make it difficult to visually interpret reflections. Range gains were also applied to the data to amplify weaker reflections from later in the time window.

The next data processing step involved the generation of amplitude slice-maps (Conyers 2004b). Amplitude slice-maps are a three-dimensional tool for viewing differences in reflected amplitudes across a given surface at various depths. Reflected radar amplitudes are of interest because they measure the degree of physical and chemical differences in the buried materials. Strong, or high amplitude reflections often indicate denser (or different) buried materials. Amplitude slice-maps are generated through comparison of reflected amplitudes between the reflections recorded in vertical profiles. Amplitude variations, recorded as digital values, are analyzed at each location in a grid of many profiles where there is a reflection recorded. The amplitudes of all reflection traces are compared to the amplitudes of all nearby traces along each profile. This database can then be "sliced" horizontally and displayed to show the variation in reflection amplitudes at a sequence of depths in the ground. The result is a map that shows amplitudes in plan view, but also with depth.

Slicing of the data was done using the mapping program Surfer 8. Slice maps are a series of x,y,z values, with x (east) and y (north) representing the horizontal location on the surface within each grid and z representing the amplitude of the reflected waves. All data were interpolated using the Kriging method and then image maps were generated from the resulting files.

From the original .dzt files (raw reflection data), a series of image files was created for cross-referencing to the amplitude slice maps that were produced. Two-dimensional reflection profiles were also analyzed to determine the nature of the features identified on the amplitude slice maps. The reflection profiles show the geometry of the reflections, which can lend insight into whether the radar energy is reflecting from a flat layer (seen as a distinct band on profile) or a single object (seen as a hyperbola in profile). Individual profile analysis was used in conjunction with amplitude slice maps to provide stronger interpretations about possible features. Processing and slicing parameters were recorded.

The final step in the data processing is to integrate the depth slices with other spatial data. This was done using ArcGIS, which can display and manipulate all forms of spatial data created for this project, including GPR results, features, grid data, and base graphics such as aerial photography and topographic maps. The resulting anomalies were digitized as individual features and referenced to the coordinate system.

GEOPHYSICS IN CEMETERIES

Several factors influence the overall effectiveness of geophysics for detecting anomalies consistent with individual graves. Contrast between the remains, grave shaft, coffin, or casket and the surrounding soils is the most important variable. Remains that have a chemical or physical contrast from the subsurface materials surrounding them will cause GPR reflections of electromagnetic energy. Age of the graves is critical to this contrast. Older graves typically have less contrast and are more difficult to detect because they have had more time to decompose and are less likely to have intact coffins or caskets.

The burial "container" that the physical remains may have been placed in is also important and includes simple linen or cloth shrouds, pine boxes or wooden coffins, lead or other metal caskets, and burial vaults. In certain cases, hardware such as nails, hinges, and handles may be present, but not necessarily all the time. Although there is a high degree of variation in specific container types among different geographical regions, each of these tends to have been used at certain times throughout history and correlates with the presumed age of the grave. For example, burial shrouds were common throughout the seventeenth and early eighteenth centuries before being replaced by wooden coffins. It must also be noted that cultural trends and patterns tended to persist much longer in rural and/or economically depressed areas than in urban centers.

The section of the Sandy Ridge Methodist Church Cemetery surveyed for this project has both modern, marked graves and a large area with no marked graves where local informants and vegetation variation indicate that there are unmarked graves. The modern, marked graves should all have coffins or caskets. The unmarked section is thought to be an older section of the cemetery and field stone markers have been purportedly removed. These graves are likely older and may be in less formal burial containers, such as pine boxes, which would present less of a contrast with the surrounding soils.

GPR RESULTS

GPR results were based on analysis of the 400 MHz data, including individual reflection profiles and amplitude slice maps (Figures 71-77). The anomalies were identified in the GPR results and represent a contrast with their surrounding soils. The GPR results identified 106 probable graves within the Study

Area, 24 of which are marked by 16 headstones and 82 are unmarked (Appendix B). There were 27 probable graves either completely or partially within the project APE along Sandy Camp Road (Table 2). Only three of these graves were associated with markers. All of the markers identified and mapped in the survey area had associated GPR anomalies, and there were no markers located within the APE. Two double markers were associated with just one probable grave (anomalies 8 and 19), but it is likely that, in these cases, the double marker has been commissioned in advance of the second interment.

Table 1. Count of Possible Graves

Probable Grave Location	Unmarked Graves	Marked Graves	Total
Probable Graves within the Survey Area	82	24	106
Probable Graves within the APE	24	3	27

Many factors influence the overall effectiveness of geophysics for detecting anomalies consistent with graves, including soil type and acidity, moisture and precipitation, magnetic properties of soil, age of possible graves, likely grave depth, and burial container (e.g., shroud, wood coffin, metal casket, concrete vault). The probable graves in the survey area were identified based on their size, shape, depth, orientation, and overall characteristics in plan and profile view. New South takes a conservative approach to the identification of graves detected with geophysical data and, in general, if an anomaly has any of the attributes listed above, it is marked as a potential grave. Because of this, it is likely that some of the probable graves are false positives and were misidentified. It is impossible to conclusively ascertain the presence of graves without excavation, and caution is used in all interpretations made with GPR.

The survey area has one mature tree, and the tree's associated root system was visible in the GPR results. Every effort was made to filter out the tree roots and interpret only possible graves in the GPR results, but it is probable that, in some cases, anomalies identified as possible graves are tree roots, or that possible graves located very near the tree roots have been missed.

PROBABLE GRAVES

There were 106 probable graves (anomalies 1-106) identified in both of the GPR grids. There is a concentration of probable graves in the southern portion of the survey area, with 60 (63.83%) graves located in Grid 1. The only marked graves are located in Grid 1, and there are comparable counts of unmarked probable graves between the two grids (N=36 in Grid 1 and N=34 in Grid 2) (Figures 71 and 72). Within the project APE, there are 27 possible graves. Twelve graves straddle the APE, including three marked and nine unmarked. The remaining 15 probable graves in the APE are unmarked.

Graves were typically identified as a series of point-source reflections in profile (Figures 78 and 79). These reflections are typically produced by the grave shaft, casket, or void spaces created through interment (Conyers 2006:154). Reflections were identified as probable graves when they have the geometry of grave features in plan and profile view.

The GPR survey of the Sandy Ridge Church Cemetery identified 82 unmarked probable graves. A number of graves were identified outside the known extent of the cemetery, and the cemetery boundary should be adjusted to include those graves (Figure 80). It is likely that the unmarked probable graves are older graves within the cemetery where markers have been removed. The church pastor, Donna Freddle, indicated that, among parishioners, this area has been well known to contain unmarked graves and that the church has stopped using this area to inter individuals out of concern for disturbing graves (personal communication, May 10, 2018).

The Sandy Ridge Methodist cemetery contains approximately 720 identifiable mid-nineteenth through twenty-first-century interments and is still active. The cemetery was a burying ground for the nearby community for almost 100 years prior to the construction of the Sandy Ridge Methodist church. Criterion A of the NRHP requires that the cemetery is associated with events that have made significant contributions to broad patterns of history. This cemetery does not convey any associations to notable events. Under Criterion B, more archival work is needed to determine if any of the individuals interred in the cemetery were locally significant. The variety of headstones in the cemetery reflect several generations of headstone production, but are not considered representative of a type, period, or method of construction, or represent the work of a master. While studies of biological data and funerary remains from this cemetery may provide information on the overall health of the nearby population during the mid-nineteenth through twenty-first centuries, their study is unlikely to provide data not already addressed by available documentary evidence. New South recommends the site not eligible for the NRHP under Criteria A, B, C, and D.

New South recommends that the 106 geophysical anomalies identified as probable graves should be treated as such. Additionally, care should be taken if any ground is to be disturbed within the entire cemetery to avoid damaging any burials that might be present but were not detected because of poor preservation and ground conditions. **Caution should also be used when disturbances are planned adjacent to the cemetery boundary, and extreme care should be taken if any ground disturbance is planned west of Sandy Camp Road. There are probable graves within approximately four meters of the road, and the presence of additional graves cannot be ruled out.**

CONCLUSIONS

New South conducted an intensive survey of the U-4758 APE along Sandy Ridge Road and Johnson Street from April 10 to April 17, 2018. Two archaeological sites (31GF568 and 31GF569) were identified and evaluated for NRHP eligibility during the field investigation. Three cemeteries (31GF570, 31GF571, and 31GF572) were also documented and evaluated for the NRHP. Both sites and all three cemeteries are recommended not eligible for the NRHP. There is a high potential for the presence of unmarked graves within the project APE at cemetery 31GF572. GPR survey of a portion of the Sandy Ridge Methodist Cemetery identified the presence of three marked graves and 24 unmarked probable graves (n=27 total) in the APE. All three cemeteries should be avoided by proposed construction activities. North Carolina General Statute, Chapter 65, Article 12 and North Carolina General Statute, Chapter 70, provide additional protections for this cemetery. If avoidance is not possible, it will be necessary to comply with these statutes after consultation with the State Archaeologist to determine the method any burials are to be removed and relocated.

Based on these results, no additional archaeological work is recommended in conjunction with this project. I concur with the recommendations put forth by our consultant. If the project expands and impacts subsurface areas beyond the study area or if design plans change prior to construction, further archaeological consultation will be necessary.

Figure List:

SUPPORT DOCUMENTATION

See attached: ☒ Map(s) ☐ Previous Survey Info ☒ Photos ☐ Correspondence
Signed:

Paul J. Mohler

June 15, 2018

NCDOT ARCHAEOLOGIST **Date**

References Cited

Browning, Mary

2007 Murder shocked Deep River in 1856. *Greensboro News & Record*. Electronic document, www.greensboro.com/murder-shocked-deep-river-in/article_3d7801ad-2b36-563a-a0cf-81c26a14cd7a.html, accessed April 23, 2018.

2010a Confession in 1856 Penix murder. *Greensboro News & Record*. Electronic document, www.greensboro.com/news/community/confession-in-penix-murder/article_7a193484-ff92-5d4f-a079-2a706bfcc4a1.html, accessed April 23, 2018.

2010b Murder Confession 20 Years in the Making. *Greensboro News & Record*. Electronic document, www.greensboro.com/news/community/murder-confession-years-in-the-making/article_3f66e10a-9480-5ba9-b5f4-299b8fe9c196.html, accessed April 23, 2018.

Conyers, Lawrence

2004a Moisture and Soil Differences as Related to the Spatial Accuracy of GPR Amplitude Maps at Two Archaeological Test Sites. presented at the Tenth International Conference on Ground Penetrating Radar, The Netherlands.

2004b *Ground-Penetrating Radar for Archaeology*. AltaMira Press, Lanham, Maryland.

2006 Ground-Penetrating Radar. In *Remote Sensing in Archaeology: An Explicitly North American Perspective*, pp. 131–159. The University of Alabama Press, Tuscaloosa, Alabama.

2012 Interpreting Ground-Penetrating Radar for Archaeology. Left Coast Press, Walnut Creek, California.

Conyers, Lawrence and Jeffery Lucius

1996 Velocity Analysis in Archaeological Ground Penetrating Radar Studies. *Archaeological Prospection* 3(1):25–38.

Jones, Geoffrey

2008 Geophysical Mapping of Historic Cemeteries presented at the Conference on Historical and Underwater Archaeology, Albuquerque, New Mexico.

Jurney, Robert Campbell, Samuel Oscar Perkins, William Anderson Davis, and William Daniel Lee

1920 Soil Map, North Carolina, Guilford County Sheet. United States Government Printing Office, Washingthon, D.C.

King, Julia A., Bruce W. Bevan, and Robert J. Hurry

1993 The Reliability of Geophysical Surveys in Historic-Period Cemeteries: An Example from the Plains Cemetery, Mechanicsville, Maryland. *Historical Archaeology* 27(3):4–16.

Miller, George L., Patricia Samford, Ellen Shlasko, and Andrew Madsen

2000 Telling Time for Archaeologists. *Northeast Historical Archaeology* 29(1):1–22.

Pomfret, James E.

2005 *Ground Penetrating Radar Survey at Andersonville National Historic Site*. Report available from the Georgia Department of Transportation. Atlanta, Georgia.

Sandy Ridge United Methodist Church

2014 Sandy Ridge UMC - History. *Sandy Ridge United Methodist Church*. August. Electronic document, http://www.sandyridgeumc.org/history.html, accessed August 14, 2014.

Vlach, John M.

1977 Graveyards and Afro-American Art. *Southern Exposure* 5:161–165.

Appendix A: Shovel Test Log

STP ID	Results	Stratum	Description
1	Negative	I	0-5 10YR3/3 Dark Brown Silty Loam
	Negative	II	5-20 2.5YR5/8 Red Clay
2	Negative	I	0-18 5YR5/4 Reddish Brown Silty Clay
	Negative	II	18-25 2.5YR5/8 Red Clay
3	Negative	I	0-10 10YR5/6 Yellowish Brown Silty Clay
	Negative	II	10-30 5YR5/4 Reddish Brown
4	Negative	I	0-20 5YR5/6 Yellowish Red Silty Clay
	Negative	II	20-25 2.5YR4/6 Red Clay
5	Negative	I	0-25 5YR4/6 Yellowish Red Silty Clay
	Negative	II	25-28 2.5YR5/6 Red Clay
6	Negative	I	0-10 5YR4/6 Yellowish Red Silty Clay
	Negative	II	-28 2.5YR4/6 Red Clay
7	Negative	I	0-25 2.5YR6/8 Light Red Silty Clay
8	Negative	I	0-15 2.5YR6/3 Light Reddish Brown Clay
9	Negative	I	0-10 2.5YR7/6 Light Red Clay
10	Negative	I	0-25 10YR5/6 Yellowish Brown Silty Clay
	Negative	II	25-30 5YR5/4 Reddish Brown Clay
11	Negative	I	0-25 10YR5/6 Yellowish Brown Silty Clay
	Negative	II	25-30 5YR5/4 Reddish Brown Clay
12	Negative	I	0-13 10YR3/3 Dark Brown Silty Clay Loam
	Negative	II	13-21 7.5YR5/8 Strong Brown Silty Clay
13	Negative	I	0-19 10YR5/3 Brown Silty Loam
	Negative	II	19-29 10YR6/4 Light Yellowish Brown Silty Clay
14	Negative	I	0-15 2.5YR5/8 Red Clay
15	Not Excavated		
16	Not Excavated		
17	Negative	I	0-15 2.5YR5/8 Red Clay
18	Negative	I	0-23 2.5YR5/8 Red Clay
19	Negative	I	0-25 7.5YR5/8 Strong Brown Sandy Clay
	Negative	II	25-33 2.5YR5/8 Red Clay
20	Negative	I	0-26 7.5YR5/6 Strong Brown Sandy Clay
	Negative	II	26-41 2.5YR5/8 Red Clay
21	Negative	I	0-23 7.5YR4/4 Brown Silty Clay
	Negative	II	23-31 7.5YR7/8 Reddish Yellow Sandy Clay
22	Negative	I	0-20 2.5YR4/8 Red Clay
23	Negative	I	0-17 2.5YR5/8 Red Clay
24	Negative	I	0-15 2.5YR5/8 Red Clay
25	Negative	I	0-15 2.5YR5/8 Red Clay
26	Negative	I	0-16 2.5YR4/8 Red Clay
27	Negative	I	0-18 2.5YR5/8 Red Clay
28	Negative	I	0-30 7.5YR2.5/3 Very Dark Brown Sandy Loam
	Negative	II	30-53 10YR7/4 Very Pale Brown Sand
	Negative	III	53-60 5YR6/6 Reddish Yellow Clay
29	Negative	I	0-33 7.5YR2.5/3 Very Dark Brown Sandy Loam
30	Negative	I	0-33 7.5YR2.5/3 Very Dark Brown Sandy Loam
	Negative	II	33-40 7.5YR6/6 Reddish Yellow Clay
31	Negative	I	0-52 7.5YR4/4 Brown Sandy Loam
	Negative	II	52-62 5YR5/6 Yellowish Red Sandy Clay
32	Negative	I	0-25 7.5YR4/3 Brown Sandy Loam
	Negative	II	25-42 5YR5/1 Gray Sand
33	Not Excavated		
34	Negative	I	0-13 7.5YR3/1 Very Dark Gray Sand
	Negative	II	13-19 7.5YR6/3 Light Brown Sand
	Negative	III	19-28 5YR5/6 Yellowish Red Clay
35	Negative	I	0-37 2.5YR5/3 Reddish Brown Clay
36	Negative	I	0-34 7.5YR5/4 Brown Clay Sand

STP ID	Results	Stratum	Description
	Negative	II	34-45 5YR4/6 Yellowish Red Clay
37	**Negative**	I	0-18 7.5YR4/3 Brown Clay Sand
	Negative	II	18-27 5YR4/6 Yellowish Red Clay
38	**Negative**	I	0-24 7.5YR4/2 Brown Sandy Clay
	Negative	II	24-32 2.5YR4/8 Red Clay
39	**Negative**	I	0-30 7.5YR4/2 Brown Sand
	Negative	II	30-40 5YR6/6 Reddish Yellow Clay
40	**Negative**	I	0-34 7.5YR6/4 Light Brown Sand
	Negative	II	34-43 5YR4/6 Yellowish Red Clay
41	**Negative**	I	0-23 5YR7/6 Reddish Yellow Sandy Clay
	Negative	II	23-32 2.5YR4/8 Red Clay
42	**Negative**	I	0-27 5YR5/6 Yellowish Red Clay
43	**Negative**	I	0-28 7.5YR6/4 Light Brown Clay Sand
	Negative	II	28-38 5YR4/6 Yellowish Red Clay
44	**Negative**	I	0-35 7.5YR6/4 Light Brown Sand
	Negative	II	35-43 5YR4/6 Yellowish Red Clay
45	**Negative**	I	0-20 7.5YR2.5/2 Very Dark Brown Loam
	Negative	II	20-39 7.5YR6/3 Light Brown Sand
46	**Negative**	I	0-27 5YR4/6 Yellowish Red Clay
47	**Negative**	I	0-25 5YR5/6 Yellowish Red Clay
48	**Not Excavated**		
49	**Not Excavated**		
50	**Negative**	I	0-18 7.5YR4/4 Brown Loam
	Negative	II	18-30 2.5YR4/6 Red Clay
51	**Negative**	I	0-10 10YR4/3 Brown Silty Loam
	Negative	II	10-21 10YR5/6 Yellowish Brown Sandy Clay
	Negative	III	21-34 10YR6/8 Brownish Yellow Sandy Clay
52	**Negative**	I	0-20 2.5YR5/8 Red Clay
53	**Not Excavated**		
54	**Negative**	I	0-30 10YR3/4 Dark Yellowish Brown Silty Clay Loar
	Negative	II	30-43 10YR6/8 Brownish Yellow Silty Clay
55	**Negative**	I	0-33 7.5YR6/4 Light Brown Clay Sand
	Negative	II	33-41 5YR4/6 Yellowish Red Clay
56	**Not Excavated**		
57	**Negative**	I	0-23 10YR3/4 Dark Yellowish Brown Silty Loam
	Negative	II	23-35 10YR6/8 Brownish Yellow Silty Clay
58	**Negative**	I	0-28 2.5YR4/4 Reddish Brown Clay
59	**Negative**	I	0-28 2.5YR4/4 Reddish Brown Clay
60	**Negative**	I	0-25 2.5YR6/4 Light Reddish Brown Sandy Clay
	Negative	II	25-35 2.5YR5/4 Reddish Brown Sandy Clay
61	**Negative**	I	0-30 2.5YR5/4 Reddish Brown Sandy Clay
	Negative	II	30-35 2.5YR6/6 Light Red Sandy Clay
62	**Negative**	I	0-25 2.5YR5/3 Reddish Brown Clay
	Negative	II	25-30 2.5YR6/6 Light Red Clay
63	**Negative**	I	0-10 10YR3/2 Very Dark Grayish Brown Sandy Clay
	Negative	II	10-45 10YR6/6 Brownish Yellow Sandy Clay
	Negative	III	45-50 10YR7/3 Very Pale Brown Clay
64	**Negative**	I	0-8 10YR3/4 Dark Yellowish Brown Silty Clay Loam
	Negative	II	8-21 2.5YR6/4 Light Reddish Brown Sandy Clay
	Negative	III	21-30 10YR6/4 Light Yellowish Brown Sandy Clay
	Negative	IV	30-35 2.5YR7/4 Light Reddish Brown Sandy Clay
65	**Negative**	I	0-25 2.5YR5/4 Reddish Brown Sandy Clay
	Negative	II	25-35 2.5YR6/4 Light Reddish Brown Sandy Clay

STP ID	Results	Stratum	Description
66	**Negative**	I	0-5 10YR3/3 Dark Brown Sandy Clay Loam
	Negative	II	5-20 10YR5/4 Yellowish Brown Sandy Clay
	Negative	III	20-30 10YR6/6 Brownish Yellow Sandy Clay
67	**Negative**	I	0-10 10YR3/4 Dark Yellowish Brown Silty Clay Loar
	Negative	II	10-20 10YR5/8 Yellowish Brown Sandy Clay
	Negative	III	20-25 10YR6/8 Brownish Yellow Sandy Clay
68	**Negative**	I	0-10 10YR3/3 Dark Brown Sandy Clay Loam
	Negative	II	10-33 10YR5/4 Yellowish Brown Sandy Clay
	Negative	III	33-45 10YR6/6 Brownish Yellow Sandy Clay
69	**Negative**	I	0-10 10YR3/4 Dark Yellowish Brown Sandy Clay Lo
	Negative	II	10-25 10YR5/4 Yellowish Brown Sandy Clay
	Negative	III	25-30 10YR6/6 Brownish Yellow Sandy Clay
70	**Negative**	I	0-10 10YR3/4 Dark Yellowish Brown Sandy Clay Lo
	Negative	II	10-23 10YR5/4 Yellowish Brown Sandy Clay
	Negative	III	23-40 10YR6/8 Brownish Yellow Sandy Clay
71	**Not Excavated**		
72	**Not Excavated**		
73	**Negative**	I	0-5 10YR3/3 Dark Brown Silty Clay Loam
	Negative	II	5-8 5YR6/3 Light Reddish Brown Sandy Clay
	Negative	III	8-22 10YR5/8 Yellowish Brown Sandy Clay
	Negative	IV	22-30 2.5YR6/4 Light Reddish Brown Clay
74	**Not Excavated**		
75	**Negative**	I	0-17 2.5YR7/4 Light Reddish Brown Sandy Clay
	Negative	II	17-28 2.5YR6/8 Light Red Sandy Clay
76	**Negative**	I	0-8 10YR5/6 Yellowish Brown Silty Clay
	Negative	II	8-20 2.5YR6/4 Light Reddish Brown Sandy Clay
77	**Negative**	I	0-6 10YR5/2 Grayish Brown Sandy Loam
	Negative	II	6-20 10YR6/4 Light Yellowish Brown Clay Sand
	Negative	III	20-25 2.5YR6/4 Light Reddish Brown Sandy Clay
78	**Negative**	I	0-8 10YR4/2 Dark Grayish Brown Sandy Loam
	Negative	II	8-28 10YR5/6 Yellowish Brown Clay Sand
	Negative	III	28-33 2.5YR6/3 Light Reddish Brown Sandy Clay
79	**Negative**	I	0-25 2.5YR6/4 Light Reddish Brown Sandy Clay
	Negative	II	25-30 2.5YR7/6 Light Red Sandy Clay
80	**Negative**	I	0-25 10YR5/6 Yellowish Brown Sandy Clay Loam
	Negative	II	25-30 2.5YR6/8 Light Red Clay
81	**Negative**	I	0-10 10YR5/3 Brown Sandy Loam
	Negative	II	10-25 10YR6/4 Light Yellowish Brown Sandy Clay
	Negative	III	25-35 10YR6/6 Brownish Yellow Clay
82	**Negative**	I	0-10 10YR4/4 Dark Yellowish Brown Sandy Loam
	Negative	II	10-25 10YR6/4 Light Yellowish Brown Clay
83	**Negative**	I	0-20 5YR4/3 Reddish Brown Clay
	Negative	II	20-29 2.5YR5/8 Red Clay
84	**Negative**	I	0-28 2.5YR5/3 Reddish Brown Clay Sand
	Negative	II	28-36 2.5YR5/8 Red Clay
85	**Negative**	I	0-24 7.5YR4/4 Brown Clay Sand
	Negative	II	24-33 10YR6/6 Brownish Yellow Sand
	Negative	III	33-38 5YR4/6 Yellowish Red Clay
86	**Negative**	I	0-10 10YR5/2 Grayish Brown Sandy Loam
	Negative	II	10-25 10YR5/8 Yellowish Brown Clay Sand
	Negative	III	25-32 10YR6/4 Light Yellowish Brown Sandy Clay
87	**Negative**	I	0-23 7.5YR4/4 Brown Clay Sand
	Negative	II	23-27 7.5YR6/3 Light Brown Sand
	Negative	III	27-35 5YR4/6 Yellowish Red Clay
88	**Negative**	I	0-10 2.5YR6/6 Light Red Clay
	Negative	II	10-25 10YR6/6 Brownish Yellow Sandy Clay

STP ID	Results	Stratum	Description
89	**Negative**	I	0-27 2.5YR4/6 Red Clay
90	**Negative**	I	0-34 2.5YR5/3 Reddish Brown Clay
91	**Negative**	I	0-33 2.5YR5/3 Reddish Brown Clay
92	**Negative**	I	0-34 7.5YR5/4 Brown Sandy Clay
	Negative	II	34-42 2.5YR5/4 Reddish Brown Clay
93	**Negative**	I	0-35 7.5YR4/2 Brown Sandy Clay
	Negative	II	35-47 2.5YR5/4 Reddish Brown Clay
94	**Negative**	I	0-32 7.5YR4/2 Brown Sandy Clay
	Negative	II	32-40 2.5YR5/3 Reddish Brown Clay
95	**Negative**	I	0-11 7.5YR4/2 Brown Sandy Clay
	Negative	II	11-28 2.5YR4/3 Reddish Brown Clay
96	**Negative**	I	0-19 7.5YR5/2 Brown Sandy Clay
	Negative	II	19-32 7.5YR6/4 Light Brown Sand
	Negative	III	32-40 2.5YR4/6 Red Clay
97	**Negative**	I	0-30 7.5YR5/4 Brown Loamy Sand
	Negative	II	30-42 7.5YR6/4 Light Brown Sand
	Negative	III	42-51 5YR6/8 Reddish Yellow Clay
98	**Negative**	I	0-25 7.5YR5/2 Brown Loamy Sand
	Negative	II	25-38 7.5YR6/3 Light Brown Sand
	Negative	III	38-47 5YR6/6 Reddish Yellow Clay
99	**Negative**	I	0-15 7.5YR3/2 Dark Brown Sandy Clay
	Negative	II	15-30 2.5YR4/6 Red Clay
100	**Negative**	I	0-28 2.5YR4/3 Reddish Brown Clay Sand
	Negative	II	28-48 7.5YR6/4 Light Brown Clay Sand
	Negative	III	48-58 5YR6/6 Reddish Yellow Clay
101	**Negative**	I	0-31 2.5YR4/3 Reddish Brown Sandy Clay
	Negative	II	31-38 7.5YR6/3 Light Brown Clay Sand
	Negative	III	38-47 7.5YR7/6 Reddish Yellow Clay
102	**Negative**	I	0-30 7.5YR6/3 Light Brown Sand
	Negative	II	30-38 5YR6/8 Reddish Yellow Clay
103	**Negative**	I	0-27 7.5YR5/3 Brown Sandy Clay
	Negative	II	27-32 7.5YR6/4 Light Brown Sandy Clay Loam
	Negative	III	32-40 5YR6/8 Reddish Yellow Clay
104	**Negative**	I	0-20 7.5YR4/3 Brown Sandy Clay
	Negative	II	20-33 7.5YR6/3 Light Brown Clay
	Negative	III	33-43 5YR6/6 Reddish Yellow Clay
105	**Negative**	I	0-20 7.5YR4/2 Brown Sandy Clay
	Negative	II	20-34 7.5YR6/6 Reddish Yellow Clay
106	**Negative**	I	0-22 7.5YR4/2 Brown Sandy Clay
	Negative	II	22-29 2.5YR4/6 Red Clay
107	**Negative**	I	0-22 7.5YR4/4 Brown Sandy Clay
	Negative	II	22-32 2.5YR4/6 Red Clay
108	**Negative**	I	0-17 2.5YR4/6 Red Clay
	Negative	II	17-30 5YR6/6 Reddish Yellow Sandy Clay
	Negative	III	30-39 2.5YR4/6 Red Clay
109	**Historic Surface Find**	I	0-20 7.5YR4/3 Brown Sand
	Negative	II	20-30 10YR5/8 Yellowish Brown Sandy Clay
	Negative	III	30-42 7.5YR6/6 Reddish Yellow Clay
110	**Negative**	I	0-24 7.5YR4/2 Brown Sand
	Negative	II	24-33 2.5YR5/2 Weak Red Clay
111	**Negative**	I	0-18 2.5YR4/3 Reddish Brown Sandy Clay
	Negative	II	18-29 2.5YR4/6 Red Clay
112	**Negative**	I	0-20 7.5YR4/4 Brown Sandy Clay
	Negative	II	20-30 2.5YR4/6 Red Clay
113	**Negative**	I	0-20 7.5YR4/4 Brown Sandy Clay
	Negative	II	20-30 2.5YR4/6 Red Clay

STP ID	Results	Stratum	Description
114	**Negative**	I	0-20 10YR5/4 Yellowish Brown Sand
	Negative	II	20-30 2.5YR4/6 Red Clay
115	**Negative**	I	0-20 7.5YR4/2 Brown Silty Clay
	Negative	II	20-35 2.5YR4/6 Red Clay
116	**Negative**	I	0-27 7.5YR5/2 Brown Silty Clay
	Negative	II	27-36 2.5YR4/8 Red Clay
117	**Negative**	I	0-25 7.5YR4/3 Brown Silty Clay
	Negative	II	25-35 2.5YR5/6 Red Clay
118	**Negative**	I	0-17 2.5YR5/8 Red Clay
119	**Negative**	I	0-15 2.5YR5/8 Red Clay
120	**Negative**	I	0-20 7.5YR5/8 Strong Brown Clay Sand
	Negative	II	20-32 2.5YR5/8 Red Clay
121	**Negative**	I	0-28 10YR5/6 Yellowish Brown Loamy Sand
	Negative	II	28-36 5YR4/4 Reddish Brown Sandy Clay
122	**Negative**	I	0-28 10YR5/6 Yellowish Brown Loamy Sand
	Negative	II	28-34 5YR5/4 Reddish Brown Sandy Clay
123	**Negative**	I	0-37 10YR5/4 Yellowish Brown Loamy Sand
	Negative	II	37-45 10YR6/3 Pale Brown Sand
124	**Negative**	I	0-22 10YR5/4 Yellowish Brown Sandy Loam
	Negative	II	22-33 10YR6/3 Pale Brown Sandy Clay
125	**Negative**	I	0-28 7.5YR5/8 Strong Brown Sandy Clay Loam
	Negative	II	28-35 2.5YR5/8 Red Clay
126	**Negative**	I	0-30 5YR5/3 Reddish Brown Silty Clay
	Negative	II	30-35 5YR6/4 Light Reddish Brown Clay
127	**Negative**	I	0-15 5YR6/6 Reddish Yellow Sandy Clay Loam
	Negative	II	15-30 5YR5/8 Yellowish Red Sandy Clay
128	**Negative**	I	0-25 5YR6/6 Reddish Yellow Sandy Clay Loam
	Negative	II	25-30 5YR5/8 Yellowish Red Clay
129	**Negative**	I	0-30 5YR6/8 Reddish Yellow Sandy Clay Loam
	Negative	II	30-35 5YR6/3 Light Reddish Brown Sandy Clay
130	**Negative**	I	0-20 5YR5/4 Reddish Brown Sandy Clay
131	**Not Excavated**		
132	**Negative**	I	0-25 7.5YR4/6 Strong Brown Silty Clay Loam
	Negative	II	25-35 2.5YR4/6 Red Clay
133	**Negative**	I	0-30 7.5YR4/6 Strong Brown Silty Clay Loam
	Negative	II	30-40 2.5YR5/6 Red Clay
134	**Negative**	I	0-14 2.5YR5/6 Red Clay
135	**Negative**	I	0-42 2.5YR4/4 Reddish Brown Silty Clay
136	**Negative**	I	0-23 2.5YR4/4 Reddish Brown Silty Clay
137	**Negative**	I	0-14 2.5YR4/6 Red Clay
138	**Negative**	I	0-15 2.5YR4/6 Red Clay
139	**Negative**	I	0-17 2.5YR4/6 Red Clay
140	**Negative**	I	0-12 7.5YR4/4 Brown Silty Clay Loam
	Negative	II	12-27 2.5YR4/6 Red Clay
141	**Negative**	I	0-8 10YR4/4 Dark Yellowish Brown Silty Clay Loam
	Negative	II	8-26 10YR5/8 Yellowish Brown Sandy Clay
	Negative	III	26-33 10YR6/6 Brownish Yellow Sandy Clay
142	**Negative**	I	0-34 10YR5/6 Yellowish Brown Silty Clay
	Negative	II	34-43 10YR5/6 Yellowish Brown Sandy Clay
143	**Negative**	I	0-30 10YR4/6 Dark Yellowish Brown Silty Clay
	Negative	II	30-40 7.5YR5/8 Strong Brown Sandy Clay
144	**Negative**	I	0-40 5YR5/8 Yellowish Red Silty Clay
145	**Negative**	I	0-43 10YR4/4 Dark Yellowish Brown Sandy Clay Lo
	Negative	II	43-52 10YR6/8 Brownish Yellow Sand
146	**Negative**	I	0-38 10YR4/6 Dark Yellowish Brown Silty Clay Loar
	Negative	II	38-46 10YR6/8 Brownish Yellow Sandy Clay

STP ID	Results	Stratum	Description
147	Negative	I	0-9 10YR3/3 Dark Brown Silty Clay Loam
	Negative	II	9-20 2.5YR5/4 Reddish Brown Sandy Clay
	Negative	III	20-28 2.5YR6/8 Light Red Clay
148	Negative	I	0-32 10YR4/6 Dark Yellowish Brown Silty Clay Loar
	Negative	II	32-38 10YR6/8 Brownish Yellow Sandy Clay
149	Negative	I	0-18 5YR5/4 Reddish Brown Silty Clay
	Negative	II	18-30 2.5YR4/8 Red Clay
150	Negative	I	0-35 10YR5/6 Yellowish Brown Silty Clay Loam
	Negative	II	35-46 10YR6/8 Brownish Yellow Sandy Clay
151	Negative	I	0-9 10YR3/3 Dark Brown Silty Clay
	Negative	II	9-30 2.5YR6/4 Light Reddish Brown Clay
	Negative	III	30-34 5YR5/4 Reddish Brown Clay
152	Negative	I	0-18 2.5YR5/8 Red Clay
153	Negative	I	0-5 10YR3/3 Dark Brown Silty Clay Loam
	Negative	II	5-35 2.5YR6/4 Light Reddish Brown Silty Clay
	Negative	III	35-45 2.5YR5/4 Reddish Brown Sandy Clay
154	Negative	I	0-17 2.5YR4/6 Red Clay
155	Negative	I	0-20 7.5YR4/6 Strong Brown Silty Clay
	Negative	II	20-25 2.5YR6/8 Light Red Clay
156	Negative	I	0-35 5YR5/4 Reddish Brown Silty Clay
	Negative	II	35-40 2.5YR6/8 Light Red Clay
157	Negative	I	0-28 2.5YR5/3 Reddish Brown Silty Clay
	Negative	II	28-34 2.5YR6/8 Light Red Clay
158	Negative	I	0-25 2.5YR4/3 Reddish Brown Silty Clay
	Negative	II	25-30 2.5YR6/8 Light Red Clay
159	Negative	I	0-20 2.5YR6/4 Light Reddish Brown Silty Clay
160	Not Excavated		
161	Negative	I	0-5 10YR5/2 Grayish Brown Silty Loam
	Negative	II	5-20 2.5YR6/3 Light Reddish Brown Silty Clay
	Negative	III	20-30 2.5YR6/8 Light Red Clay
162	Negative	I	0-25 2.5YR6/4 Light Reddish Brown Silty Clay
163	Negative	I	0-20 2.5YR5/3 Reddish Brown Silty Clay
	Negative	II	20-25 2.5YR6/8 Light Red Clay
164	Negative	I	0-10 10YR6/6 Brownish Yellow Clay Loam
	Negative	II	10-25 2.5YR6/6 Light Red Clay
165	Negative	I	0-15 10YR6/6 Brownish Yellow Silty Clay
	Negative	II	15-20 5YR5/6 Yellowish Red Silty Clay
166	Not Excavated		
167	Negative	I	0-20 10YR5/8 Yellowish Brown Silty Loam
	Negative	II	20-25 2.5YR6/4 Light Reddish Brown Clay
168	Negative	I	0-15 2.5YR6/3 Light Reddish Brown Clay
169	Negative	I	0-15 2.5YR6/8 Light Red Clay
170	Not Excavated		
171	Not Excavated		
172	Negative	I	0-15 2.5YR5/6 Red Clay
173	Negative	I	0-26 2.5YR4/6 Red Silty Clay
	Negative	II	26-34 2.5YR6/8 Light Red Clay
174	Negative	I	0-10 2.5YR4/4 Reddish Brown Clay
	Negative	II	10-25 2.5YR6/8 Light Red Clay
175	Not Excavated		
176	Negative	I	0-22 2.5YR5/8 Red Silty Clay
	Negative	II	22-30 2.5YR6/8 Light Red Clay
177	Negative	I	0-20 2.5YR5/4 Reddish Brown Silty Clay
	Negative	II	20-25 2.5YR6/8 Light Red Clay

STP ID	Results	Stratum	Description
178	**Positive Prehistoric**	I	0-30 10YR5/3 Brown Silty Loam
	Positive Prehistoric	II	30-44 2.5YR4/4 Reddish Brown Loamy Clay
	Negative	III	44-52 2.5YR4/8 Red Clay
179	**Negative**	I	0-10 10YR3/4 Dark Yellowish Brown Silty Loam
	Negative	II	10-30 2.5YR5/4 Reddish Brown Sandy Clay Loam
	Negative	III	30-35 2.5YR6/3 Light Reddish Brown Clay
180	**Negative**	I	0-5 10YR4/3 Brown Silty Loam
	Negative	II	5-25 2.5YR2.5/4 Dark Reddish Brown Clay
181	**Negative**	I	0-10 2.5YR4/4 Reddish Brown Clay
182	**Negative**	I	0-10 2.5YR6/8 Light Red Clay
183	**Negative**	I	0-10 2.5YR6/8 Light Red Clay
184	**Negative**	I	0-5 10YR2/2 Very Dark Brown Silty Loam
	Negative	II	5-20 5YR6/8 Reddish Yellow Clay
185	**Negative**	I	0-15 2.5YR5/6 Red Clay
186	**Negative**	I	0-10 2.5YR6/8 Light Red Clay
187	**Negative**	I	0-10 2.5YR5/3 Reddish Brown Clay
188	**Negative**	I	0-15 10YR4/4 Dark Yellowish Brown Silty Loam
	Negative	II	15-50 10YR6/4 Light Yellowish Brown Silty Clay
	Negative	III	50-65 10YR6/3 Pale Brown Silty Clay
189	**Negative**	I	0-60 10YR4/4 Dark Yellowish Brown Silty Loam
	Negative	II	60-90 7.5YR4/6 Strong Brown Sandy Loam
190	**Negative**	I	0-21 7.5YR2.5/2 Very Dark Brown Silt
	Negative	II	21-37 2.5YR4/3 Reddish Brown Clay
191	**Negative**	I	0-36 7.5YR2.5/2 Very Dark Brown Silt
	Negative	II	36-47 5YR5/1 Gray Silty Clay
192	**Negative**	I	0-21 7.5YR2.5/3 Very Dark Brown Silt
	Negative	II	21-33 5YR4/6 Yellowish Red Sandy Clay
193	**Negative**	I	0-23 10YR5/8 Yellowish Brown Silt
	Negative	II	23-32 2.5YR6/4 Light Reddish Brown Clay
194	**Negative**	I	0-20 7.5YR6/3 Light Brown Sand
	Negative	II	20-32 7.5YR2.5/2 Very Dark Brown Loam
	Negative	III	32-43 2.5YR4/3 Reddish Brown Clay
195	**Negative**	I	0-23 7.5YR6/3 Light Brown Silty Loam
	Negative	II	23-26 2.5YR4/4 Reddish Brown Clay
196	**Not Excavated**		
197	**Negative**	I	0-37 7.5YR3/3 Dark Brown Silty Loam
	Negative	II	37-48 7.5YR6/4 Light Brown Sandy Loam
	Negative	III	48-55 5YR4/6 Yellowish Red Loamy Clay
198	**Negative**	I	0-37 7.5YR4/4 Brown Silty Loam
	Negative	II	37-56 7.5YR6/3 Light Brown Clay Loam
	Negative	III	56-63 5YR6/6 Reddish Yellow Clay
199	**Negative**	I	0-35 7.5YR3/4 Dark Brown Clay Sand
	Negative	II	35-44 7.5YR6/4 Light Brown Loamy Clay
	Negative	III	44-55 2.5YR6/4 Light Reddish Brown Clay
200	**Negative**	I	0-28 10YR3/6 Dark Yellowish Brown Clay Silt
	Negative	II	28-38 7.5YR7/6 Reddish Yellow Loamy Clay
	Negative	III	38-47 2.5YR7/6 Light Red Clay
201	**Negative**	I	0-27 10YR4/6 Dark Yellowish Brown Silty Clay
	Negative	II	27-36 2.5YR5/3 Reddish Brown Clay
202	**Negative**	I	0-5 10YR3/3 Dark Brown Silty Clay Loam
	Negative	II	5-20 5YR5/4 Reddish Brown Clay
203	**Negative**	I	0-20 5YR5/4 Reddish Brown Clay
204	**Negative**	I	0-5 10YR2/2 Very Dark Brown Silty Loam
	Negative	II	5-20 5YR5/4 Reddish Brown Clay
205	**Negative**	I	0-18 7.5YR3/2 Dark Brown Silt
	Negative	II	18-32 2.5YR4/6 Red Clay

STP ID	Results	Stratum	Description
206	Negative	I	0-10 10YR2/2 Very Dark Brown Silty Clay Loam
	Negative	II	10-30 7.5YR4/6 Strong Brown Clay
207	Negative	I	0-10 7.5YR4/2 Brown Silt
	Negative	II	10-23 5YR4/6 Yellowish Red Silty Clay
	Negative	III	23-34 2.5YR4/6 Red Clay
208	Negative	I	0-5 7.5YR5/6 Strong Brown Silty Clay Loam
	Negative	II	5-25 5YR5/4 Reddish Brown Clay
209	Negative	I	0-8 7.5YR2.5/3 Very Dark Brown Silt
	Negative	II	8-26 2.5YR4/6 Red Clay
210	Negative	I	0-20 5YR5/4 Reddish Brown Clay
211	Negative	I	0-30 7.5YR6/4 Light Brown Silty Loam
	Negative	II	30-42 7.5YR4/2 Brown Sand
	Negative	III	42-50 2.5YR4/3 Reddish Brown Sandy Clay
212	Negative	I	0-30 10YR5/3 Brown Silty Loam
	Negative	II	30-45 10YR6/3 Pale Brown Clay Loam
213	Negative	I	0-17 10YR3/2 Very Dark Grayish Brown Silty Loam
	Negative	II	17-23 10YR5/8 Yellowish Brown Silty Clay
	Negative	III	23-31 2.5YR3/1 Gark Reddish Gray Clay
214	Negative	I	0-17 7.5YR3/1 Very Dark Gray Silt
	Negative	II	17-31 5YR5/6 Yellowish Red Sandy Loam
	Negative	III	31-39 2.5YR5/3 Reddish Brown Clay
215	Negative	I	0-18 10YR5/3 Brown Silty Loam
	Negative	II	18-30 10YR6/3 Pale Brown Silty Clay
216	Negative	I	0-13 7.5YR2.5/3 Very Dark Brown Silt
	Negative	II	13-26 2.5YR4/6 Red Clay
217	Negative	I	0-17 10YR2/2 Very Dark Brown Silty Clay
	Negative	II	17-29 5YR4/6 Yellowish Red Clay
218	Negative	I	0-15 10YR3/3 Dark Brown Clay Loam
	Negative	II	15-25 5YR5/4 Reddish Brown Clay
219	Negative	I	0-11 7.5YR2.5/2 Very Dark Brown Silty Loam
	Negative	II	11-32 5YR4/6 Yellowish Red Clay
220	Not Excavated		
221	Negative	I	0-25 7.5YR2.5/3 Very Dark Brown Silty Clay
	Negative	II	25-37 5Y4/2 Olive Gray Sandy Clay
222	Negative	I	0-30 10YR3/3 Dark Brown Silty Clay Loam
	Negative	II	30-45 10YR5/2 Grayish Brown Clay Loam
223	Negative	I	0-23 7.5YR3/2 Dark Brown Silty Clay
	Negative	II	23-35 5Y4/2 Olive Gray Sandy Clay
224	Negative	I	0-15 7.5YR5/8 Strong Brown Clay Loam
225	Negative	I	0-14 7.5YR2.5/3 Very Dark Brown Silty Clay
	Negative	II	14-24 2.5YR4/4 Reddish Brown Silty Clay
	Negative	III	24-32 5Y5/6 Olive Clay
226	Negative	I	0-15 10YR3/3 Dark Brown Silty Loam
	Negative	II	15-25 10YR6/3 Pale Brown Clay Loam
227	Negative	I	0-16 7.5YR4/3 Brown Sand
	Negative	II	16-30 7.5YR6/3 Light Brown Clay Sand
	Negative	III	30-41 5YR4/6 Yellowish Red Clay
228	Negative	I	0-5 10YR3/3 Dark Brown Silty Clay Loam
	Negative	II	5-20 10YR6/3 Pale Brown Clay Loam
229	Negative	I	0-10 7.5YR2.5/3 Very Dark Brown Silt
	Negative	II	10-24 7.5YR6/3 Light Brown Sandy Clay
	Negative	III	24-33 5YR4/6 Yellowish Red Clay
230	Not Excavated		
231	Negative	I	0-30 10YR5/3 Brown Silty Loam
	Negative	II	30-50 10YR6/3 Pale Brown Clay Loam
232	Not Excavated		

STP ID	Results	Stratum	Description
233	Not Excavated		
234	Not Excavated		
235	Negative	I	0-5 10YR5/3 Brown Silty Loam
	Negative	II	5-35 10YR5/6 Yellowish Brown Silty Clay
236	Negative	I	0-8 7.5YR2.5/3 Very Dark Brown Silty Clay
	Negative	II	8-25 2.5YR4/3 Reddish Brown Clay
237	Negative	I	0-10 7.5YR3/2 Dark Brown Silt
	Negative	II	10-20 2.5YR5/3 Reddish Brown Clay
238	Negative	I	0-10 7.5YR3/2 Dark Brown Silty Loam
	Negative	II	10-19 10R4/6 Red Clay
239	Negative	I	0-14 7.5YR4/3 Brown Silty Clay
	Negative	II	14-23 2.5YR4/6 Red Clay
240	Negative	I	0-26 2.5YR4/3 Reddish Brown Clay
241	Negative	I	0-27 2.5YR4/3 Reddish Brown Clay Loam
242	Negative	I	0-30 2.5YR4/3 Reddish Brown Clay
243	Negative	I	0-25 5YR7/8 Reddish Yellow Clay
	Negative	II	25-32 5YR4/6 Yellowish Red Clay
5272-1N470E500	Negative	I	0-16 10YR3/3 Dark Brown Silty Loam
	Negative	II	16-28 2.5YR5/8 Red Clay
5272-1N485E500	Negative	I	0-26 7.5YR3/2 Dark Brown Silty Loam
	Negative	II	26-44 2.5YR4/3 Reddish Brown Loamy Clay
	Negative	III	44-53 2.5YR5/8 Red Clay
5272-1N492E500	Negative	I	0-25 7.5YR3/4 Dark Brown Loamy Silt
	Negative	II	25-33 2.5YR5/4 Reddish Brown Clay
5272-1N500E470	Negative	I	0-18 heavily disturbed soil
5272-1N500E482	Negative	I	0-21 10YR4/6 Dark Yellowish Brown Silty Loam
	Negative	II	21-36 2.5YR5/8 Red Silty Clay
5272-1N500E485	Negative	I	0-16 7.5YR4/3 Brown Loamy Silt
	Negative	II	16-25 2.5YR5/8 Red Clay
5272-1N500E507	Negative	I	0-30 10YR4/6 Dark Yellowish Brown Silty Loam
	Negative	II	30-40 2.5YR5/8 Red Clay
5272-1N500E515	Negative	I	0-17 7.5YR3/2 Dark Brown Silty Loam
	Negative	II	17-26 5YR4/3 Reddish Brown Loamy Clay
	Negative	III	26-35 2.5YR5/8 Red Clay
5272-1N500E530	Negative	I	0-20 10YR3/4 Dark Yellowish Brown Silty Loam
	Negative	II	20-30 2.5YR5/8 Red Clay
5272-1N507E500	Negative	I	0-24 7.5YR4/2 Brown Loamy Silt
	Negative	II	24-30 2.5YR5/8 Red Clay
5272-1N515E500	Negative	I	0-21 heavily disturbed soil
5272-2N485E500	Not Excavated		
5272-2N492E500	Negative	I	0-17 10YR2/2 Very Dark Brown Sandy Clay Loam
	Negative	II	17-27 2.5YR5/8 Red Clay
5272-2N500E485	Negative	I	0-26 10YR5/4 Yellowish Brown Loamy Sand
	Negative	II	26-35 7.5YR5/8 Strong Brown Sandy Clay
5272-2N500E515	Negative	I	0-21 2.5YR4/3 Reddish Brown Clay Loam
	Negative	II	21-28 2.5YR4/6 Red Clay
5272-2N515E500	Negative	I	0-25 7.5YR4/2 Brown Loamy Sand
	Negative	II	25-36 5YR4/6 Yellowish Red Clay
CI judgemental 1	Negative	I	0-16 2.5YR4/3 Reddish Brown Silty Clay
	Negative	II	16-29 2.5YR7/4 Light Reddish Brown Clay
	Negative	III	29-37 2.5YR4/6 Red Clay

Appendix B: GPR Anomalies

Anomaly ID	Label	Depth	Marked	Northing	Easting	Within ROW?
1	Probable grave	10-55 cmbs	Yes	3992409.6758	590048.3227	
2	Probable grave	10-80 cmbs	Yes	3992386.3056	590052.6570	
3	Probable grave	15-70 cmbs	Yes	3992386.5880	590048.0747	
4	Probable grave	25-55 cmbs	Yes	3992387.8635	590048.1906	
5	Probable grave	25-85 cmbs	Yes	3992384.8753	590052.7598	
6	Probable grave	40-85 cmbs	Yes	3992391.7491	590048.0167	
7	Probable grave	20-80 cmbs	Yes	3992393.0136	590048.1275	
8	Probable grave	25-115 cmbs	Yes	3992394.0897	590052.1596	
9	Probable grave	20-60 cmbs	Yes	3992396.4162	590051.9396	
10	Probable grave	25-90 cmbs	Yes	3992397.8605	590052.1691	
11	Probable grave	35-65 cmbs	Yes	3992399.2330	590052.2173	
12	Probable grave	35-70 cmbs	Yes	3992402.1237	590051.0245	
13	Probable grave	20-140 cmbs	Yes	3992401.4962	590047.2192	
14	Probable grave	10-75 cmbs	Yes	3992400.2313	590048.1276	
15	Probable grave	30-80 cmbs	Yes	3992399.0061	590048.0187	
16	Probable grave	25-65 cmbs	Yes	3992397.4890	590047.1498	
17	Probable grave	15-50 cmbs	Yes	3992408.3570	590056.0219	x
18	Probable grave	20-50 cmbs	Yes	3992409.5183	590055.9418	x
19	Probable grave	30-70 cmbs	Yes	3992411.9549	590056.2278	x
20	Probable grave	20-60 cmbs	Yes	3992410.3806	590053.1551	
21	Probable grave	25-50 cmbs	Yes	3992408.9167	590053.0834	
22	Probable grave	15-120 cmbs	Yes	3992407.9732	590052.8887	
23	Probable grave	10-95 cmbs	Yes	3992411.2089	590048.3390	
24	Probable grave	20-95 cmbs	Yes	3992416.1111	590048.6014	
25	Probable grave	25-70 cmbs	No	3992395.1112	590048.1041	
26	Probable	20-130 cmbs	No	3992419.735	590051.5058	

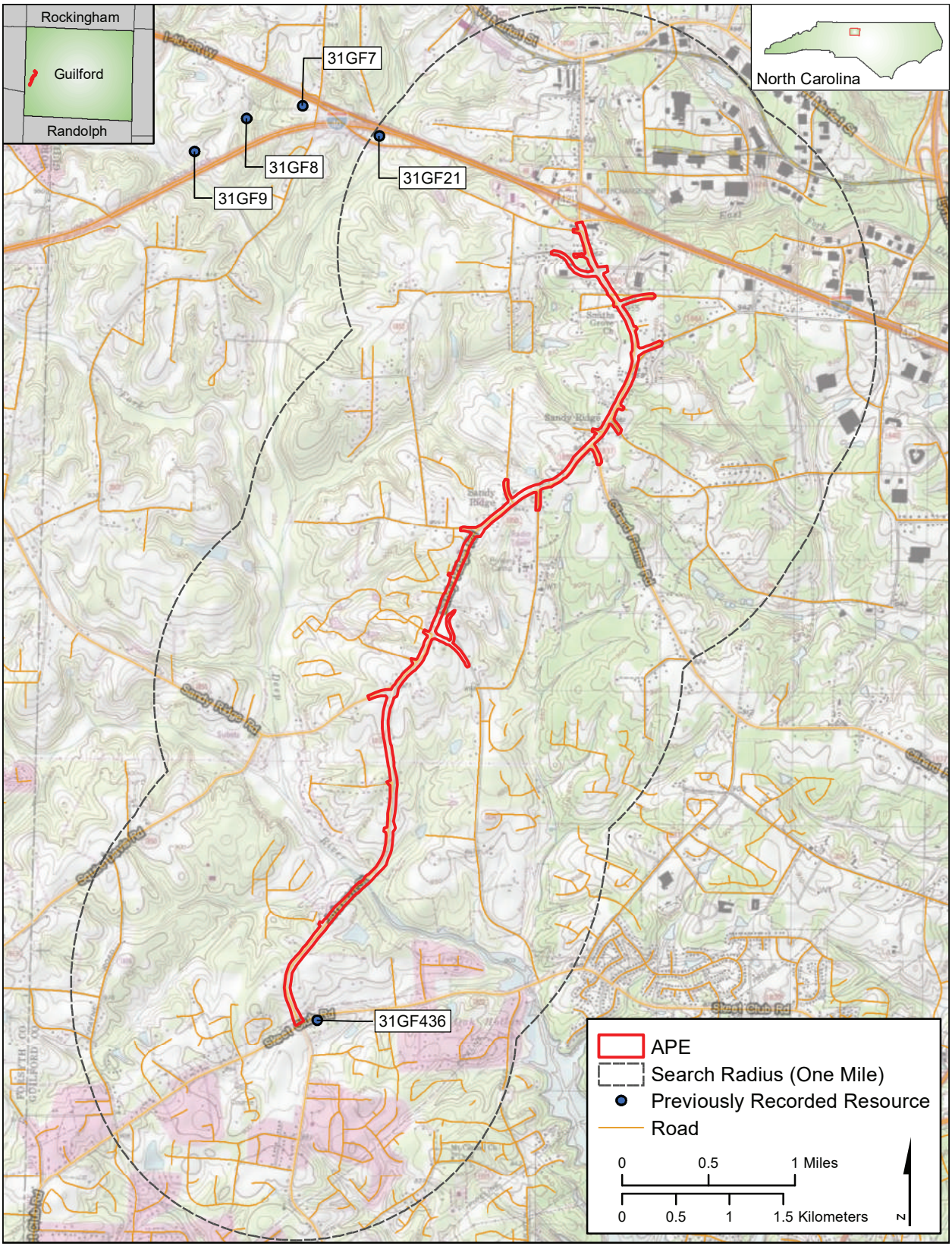
Anomaly ID	Label	Depth	Marked	Northing	Easting	Within ROW?
	grave			1		
27	Probable grave	20-80 cmbs	No	3992416.9474	590056.3837	x
28	Probable grave	20-80 cmbs	No	3992424.9909	590058.7035	x
29	Probable grave	55-90 cmbs	No	3992450.2808	590054.0533	
30	Probable grave	50-95 cmbs	No	3992444.3496	590054.0897	
31	Probable grave	70-105 cmbs	No	3992440.6928	590049.4659	
32	Probable grave	50-70 cmbs	No	3992466.0269	590061.6243	x
33	Probable grave	50-85 cmbs	No	3992477.7020	590062.4045	x
34	Probable grave	20-105 cmbs	No	3992413.4199	590052.8901	
35	Probable grave	40-110 cmbs	No	3992401.0923	590060.2658	x
36	Probable grave	30-140 cmbs	No	3992426.4369	590053.5268	
37	Probable grave	45-100 cmbs	No	3992421.9836	590049.0384	
38	Probable grave	40-150 cmbs	No	3992420.2274	590048.3618	
39	Probable grave	25-75 cmbs	No	3992419.0158	590057.6042	x
40	Probable grave	10-90 cmbs	No	3992414.1388	590048.5305	
41	Probable grave	45-105 cmbs	No	3992432.1624	590049.9386	
42	Probable grave	60-140 cmbs	No	3992429.9155	590052.7267	
43	Probable grave	45-135 cmbs	No	3992434.6869	590055.0021	
44	Probable grave	50-85 cmbs	No	3992431.1314	590049.9636	
45	Probable grave	25-110 cmbs	No	3992430.0329	590049.4127	
46	Probable grave	25-160 cmbs	No	3992429.0672	590049.4803	
47	Probable grave	40-115 cmbs	No	3992429.3126	590047.6007	
48	Probable grave	35-75 cmbs	No	3992434.9010	590050.5019	
49	Probable grave	30-60 cmbs	No	3992424.0973	590049.1901	
50	Probable grave	40-90 cmbs	No	3992426.0314	590049.4080	
51	Probable grave	30-150 cmbs	No	3992433.7370	590048.0824	
52	Probable	30-125 cmbs	No	3992424.876	590053.0640	

Anomaly ID	Label	Depth	Marked	Northing	Easting	Within ROW?
	grave			1		
53	Probable grave	35-115 cmbs	No	3992419.6158	590055.1305	
54	Probable grave	40-115 cmbs	No	3992422.2149	590051.6396	
55	Probable grave	35-135 cmbs	No	3992423.7058	590056.0693	x
56	Probable grave	35-90 cmbs	No	3992437.3649	590053.0325	
57	Probable grave	35-100 cmbs	No	3992442.1647	590051.3597	
58	Probable grave	30-145 cmbs	No	3992443.5260	590050.2566	
59	Probable grave	20-130 cmbs	No	3992442.2284	590048.5374	
60	Probable grave	35-70 cmbs	No	3992438.6175	590049.9676	
61	Probable grave	35-95 cmbs	No	3992439.6274	590049.6436	
62	Probable grave	25-160 cmbs	No	3992448.8753	590054.8900	
63	Probable grave	40-145 cmbs	No	3992454.9850	590050.7487	
64	Probable grave	40-130 cmbs	No	3992455.0456	590056.7289	x
65	Probable grave	35-150 cmbs	No	3992455.2755	590053.8962	
66	Probable grave	35-145 cmbs	No	3992450.4119	590050.0618	
67	Probable grave	45-125 cmbs	No	3992463.5227	590061.0308	x
68	Probable grave	15-70 cmbs	No	3992464.1587	590062.6304	x
69	Probable grave	20-90 cmbs	No	3992467.4307	590051.9141	
70	Probable grave	35-115 cmbs	No	3992469.8858	590054.2993	
71	Probable grave	20-100 cmbs	No	3992468.7292	590053.9471	
72	Probable grave	30-90 cmbs	No	3992465.7344	590054.5960	
73	Probable grave	65-100 cmbs	No	3992440.2412	590060.4390	x
74	Probable grave	30-140 cmbs	No	3992444.9110	590049.6851	
75	Probable grave	25-85 cmbs	No	3992441.9002	590053.8774	
76	Probable grave	30-85 cmbs	No	3992445.9584	590054.1088	
77	Probable grave	55-135 cmbs	No	3992437.0895	590060.0904	x
78	Probable	15-140 cmbs	No	3992443.092	590053.8421	

Anomaly ID	Label	Depth	Marked	Northing	Easting	Within ROW?
	grave			6		
79	Probable grave	25-150 cmbs	No	3992433.5486	590050.8423	
80	Probable grave	85-140 cmbs	No	3992392.5882	590050.9241	
81	Probable grave	30-140 cmbs	No	3992392.7647	590053.3379	
82	Probable grave	25-145 cmbs	No	3992385.3211	590055.2061	x
83	Probable grave	40-170 cmbs	No	3992456.2677	590049.1856	
84	Probable grave	35-160 cmbs	No	3992448.3692	590049.4278	
85	Probable grave	25-140 cmbs	No	3992446.1350	590049.0730	
86	Probable grave	35-115 cmbs	No	3992466.1280	590050.6702	
87	Probable grave	25-130 cmbs	No	3992417.7962	590049.5092	
88	Probable grave	20-140 cmbs	No	3992423.4628	590052.5823	
89	Probable grave	25-130 cmbs	No	3992428.0038	590060.8172	x
90	Probable grave	60-95 cmbs	No	3992471.9708	590061.4550	x
91	Probable grave	25-100 cmbs	No	3992457.4733	590061.4583	x
92	Probable grave	40-120 cmbs	No	3992382.7835	590051.9121	
93	Probable grave	40-100 cmbs	No	3992383.2117	590048.5692	
94	Probable grave	50-100 cmbs	No	3992415.7661	590056.6077	x
95	Probable grave	50-70 cmbs	No	3992476.0050	590048.9449	
96	Probable grave	60-100 cmbs	No	3992453.4857	590052.9957	
97	Probable grave	60-100 cmbs	No	3992452.4493	590052.5106	
98	Probable grave	45-70 cmbs	No	3992439.4165	590060.0873	x
99	Probable grave	40-65 cmbs	No	3992442.0863	590056.1698	x
100	Probable grave	70-100 cmbs	No	3992439.5236	590053.6045	
101	Probable grave	75-100 cmbs	No	3992460.5988	590053.2933	
102	Probable grave	40-80 cmbs	No	3992468.8019	590056.1973	x
103	Probable grave	40-80 cmbs	No	3992469.9313	590056.5489	x
104	Probable	40-80 cmbs	No	3992467.704	590057.0212	x

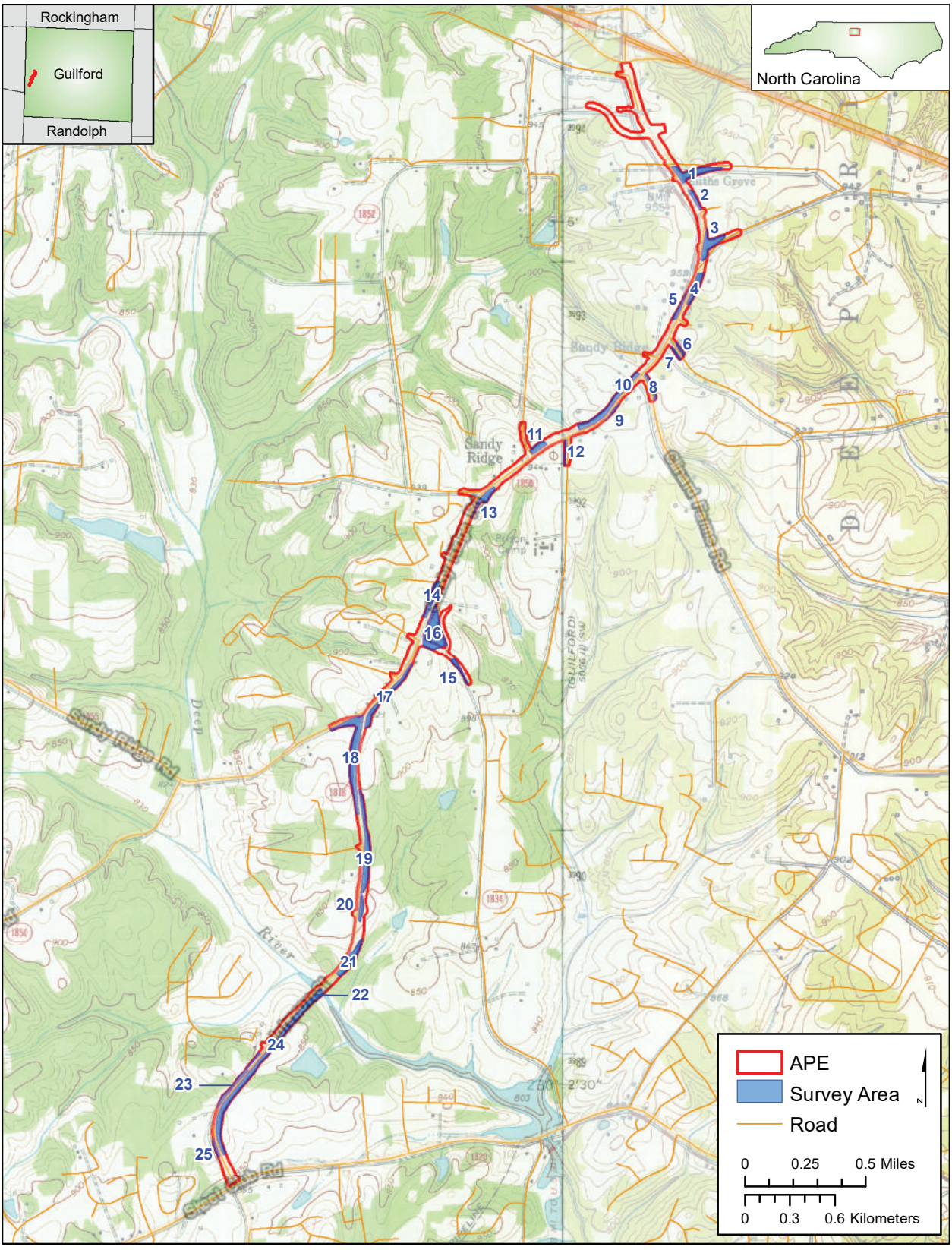
Anomaly ID	Label	Depth	Marked	Northing	Easting	Within ROW?
	grave			5		
105	Probable grave	70-90 cmbs	No	3992450.0869	590059.0404	x
106	Probable grave	45-75 cmbs	No	3992448.7909	590061.2281	x

Figure 1. Map of Previously Recorded Resources within One Mile of the Study Area



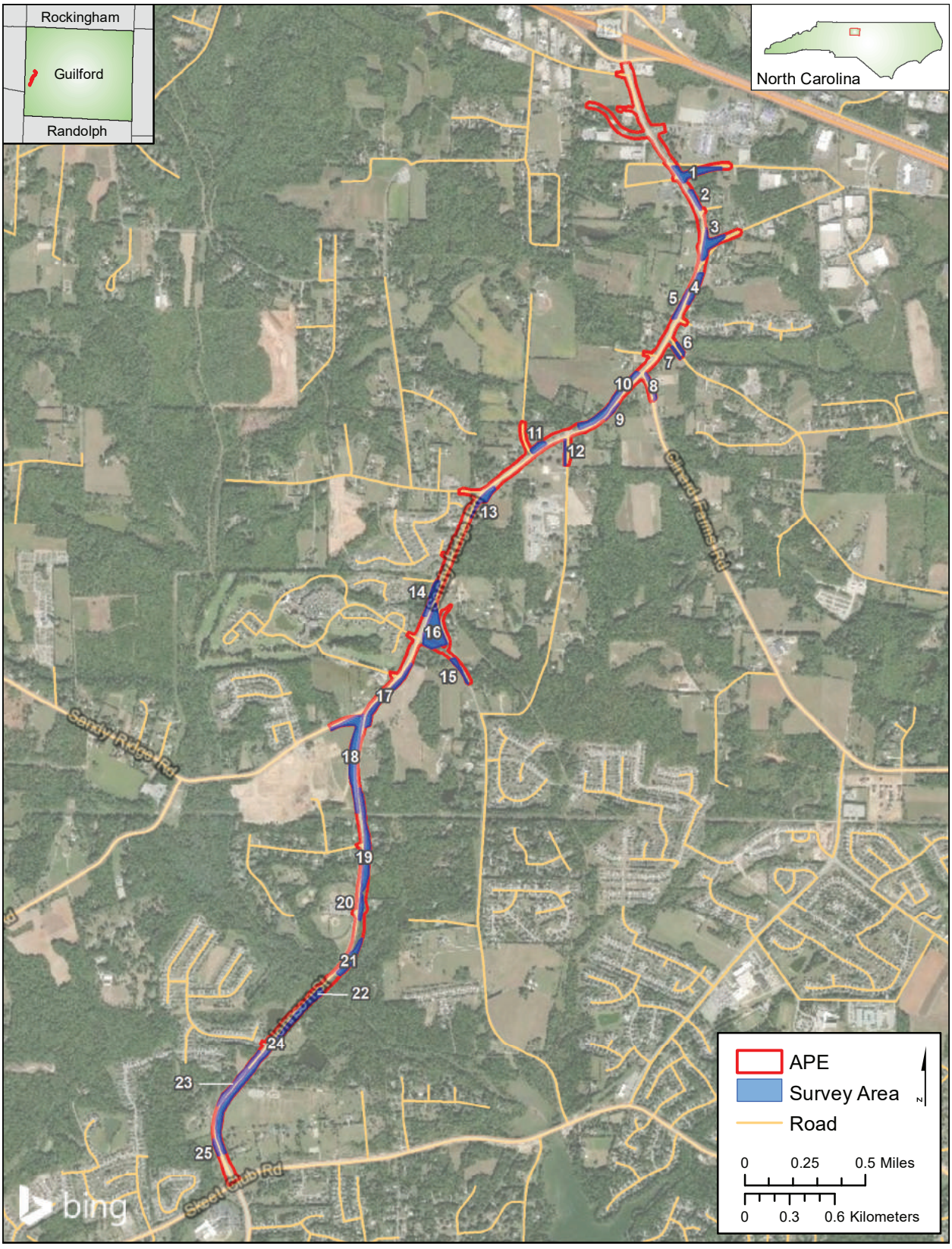
Sources: USGS Topographic Quadrangle Maps, Guilford and Kernersville, North Carolina (1979)

Figure 2. Survey Areas Shown on Historic Topography Maps



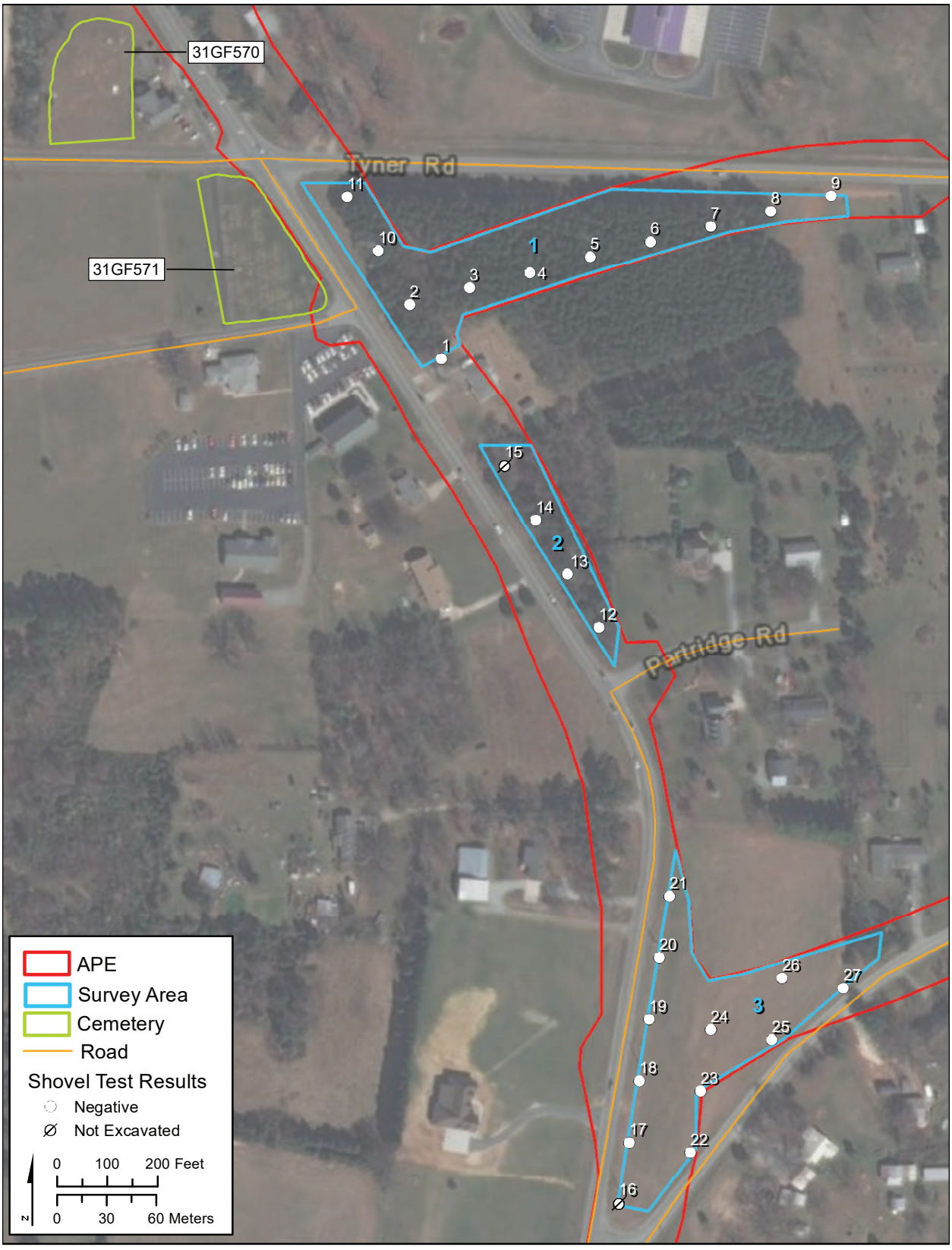
Sources: USGS Topographic Quadrangle Maps, Guilford (1951) and Kernersville (1969), North Carolina

Figure 3. Survey Areas Overlaid on Recent Aerial Photography



Source: ESRI World Imagery (2018)

Figure 4. Shovel Test Locations in Survey Areas 1, 2, and 3



Source: ESRI World Imagery (2018)

Figure 5. View of Survey Area 1

Figure 6. Typical Shovel Test in Survey Area 1

Figure 7. View of Survey Area 2

Figure 8. View of Survey Area 3

Figure 9. Typical Shovel Test in Survey Area 3

Figure 10. Shovel Test Locations in Survey Areas 4, 5, 6, and 7

Source: ESRI World Imagery (2018)

Figure 11. View of Survey Area 4

Figure 12. Typical Shovel Test in Survey Area 4

Figure 13. View of Survey Area 5

Figure 14. Typical Shovel Test in Survey Area 5

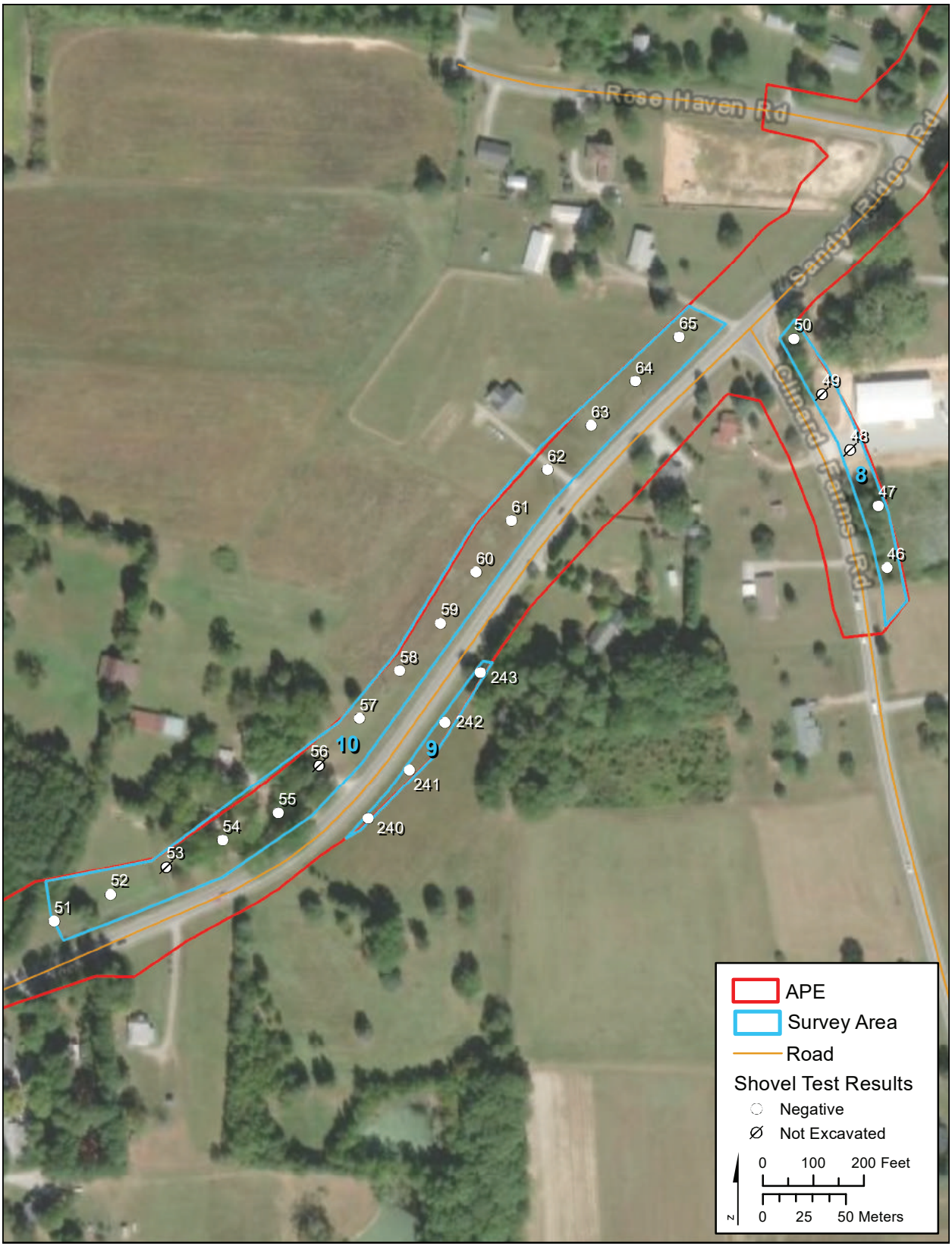
Figure 15. View of Survey Area 6

Figure 16. Typical Shovel Test in Survey Area 6

Figure 17. View of Survey Area 7

Figure 18. Typical Shovel Test in Survey Area 7

Figure 19. Shovel Test Locations in Survey Areas 8, 9, and 10



Source: ESRI World Imagery (2018)

Figure 20. View of Survey Area 8

Figure 21. Typical Shovel Test in Survey Area 8

Figure 22. View of Survey Area 9

Figure 23. Typical Shovel Test in Survey Area 9

Figure 24. View of Survey Area 10

Figure 25. Typical Shovel Test in Survey Area 10

Figure 26. Shovel Test Locations in Survey Areas 11, 12, and 13

Source: ESRI World Imagery (2018)

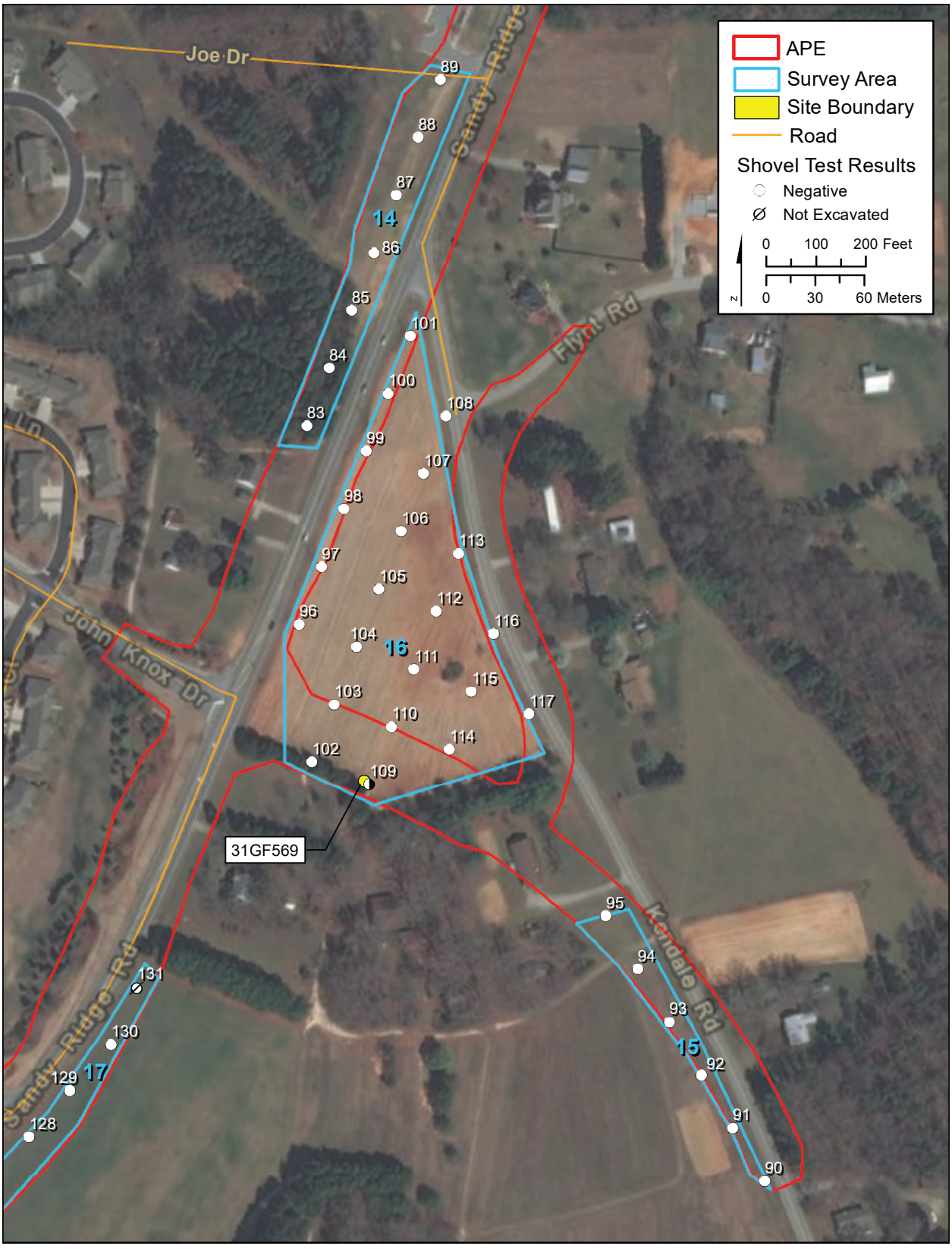
Figure 27. View of Survey Area 11

Figure 28. Typical Shovel Test in Survey Area 11

Figure 29. View of Survey Area 12

Figure 30. View of Survey Area 13

Figure 31. Shovel Test Locations in Survey Areas 14, 15, and 16



Source: ESRI World Imagery (2018)

Figure 32. View of Survey Area 14

Figure 33. Typical Shovel Test in Survey Area 14

Figure 34. View of Survey Area 15

Figure 35. Typical Shovel Test in Survey Area 15

Figure 36. View of Survey Area 16

Figure 37. Typical Shovel Test in Survey Area 16

Figure 38. Shovel Test Locations in Survey Area 17 and the Northern Portion of Survey Area 18

Source: ESRI World Imagery (2018)

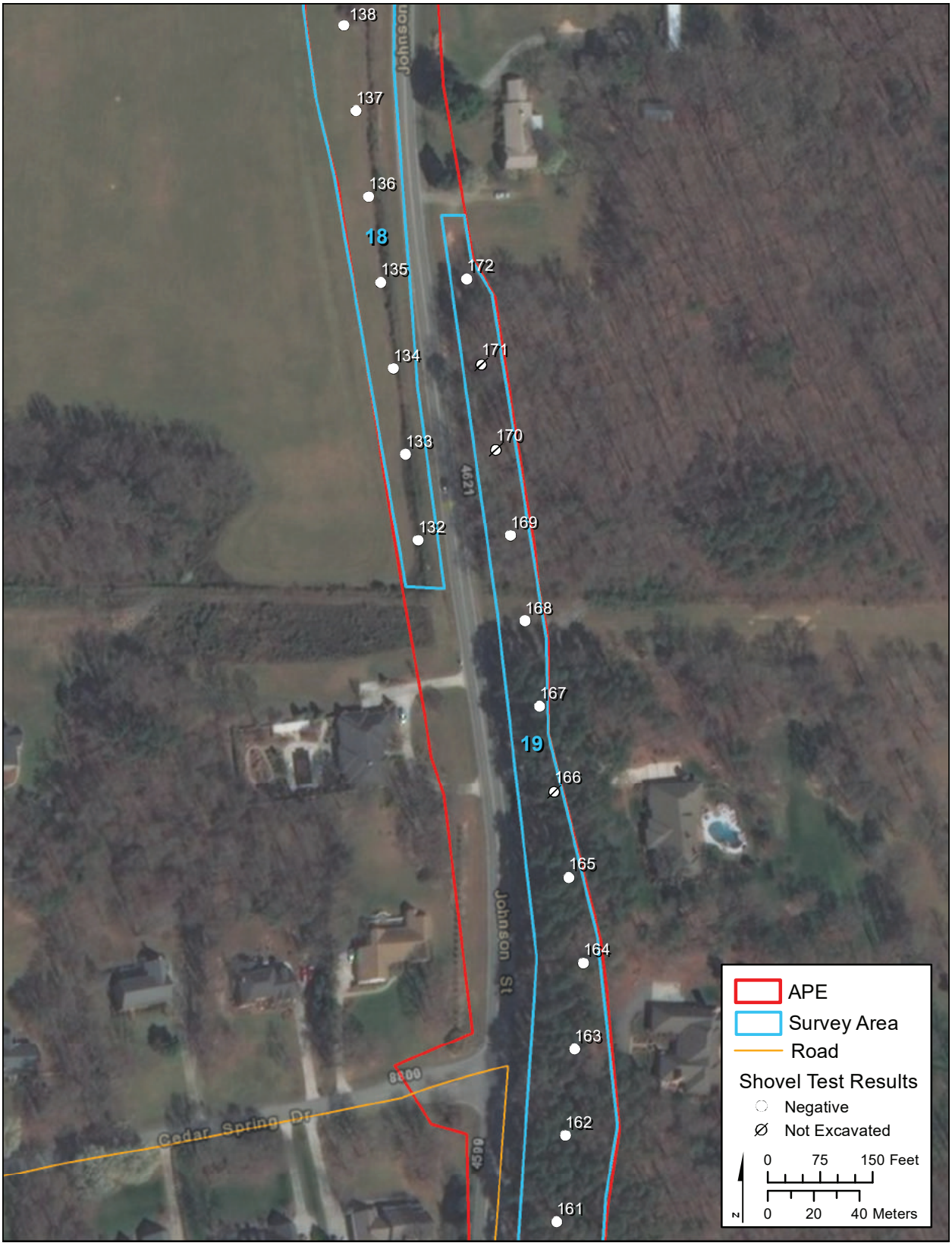
Figure 39. View of Survey Area 17

Figure 40. Typical Shovel Test in Survey Area 17

Figure 41. View of Survey Area 18

Figure 42. Typical Shovel Test in Survey Area 18

Figure 43. Shovel Test Locations in the Southern Portion of Survey Area 18 and the Northern Portion of Survey Area 19

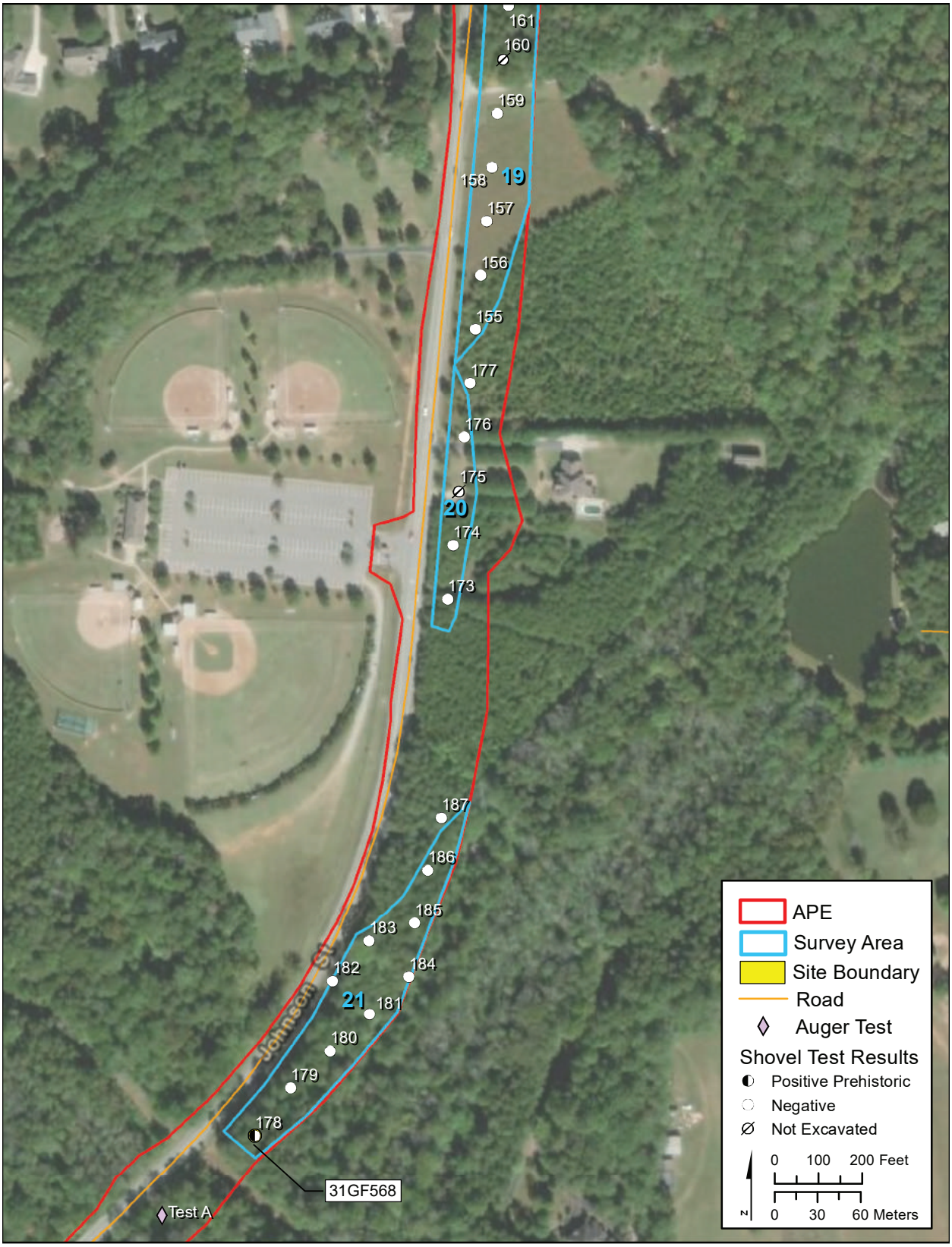


Source: ESRI World Imagery (2018)

Figure 44. View of Survey Area 19

Figure 45. Typical Shovel Test in Survey Area 19

Figure 46. Shovel Test Locations in the Southern Portion of Survey Area 19 and Survey Areas 20 and 21



Source: ESRI World Imagery (2018)

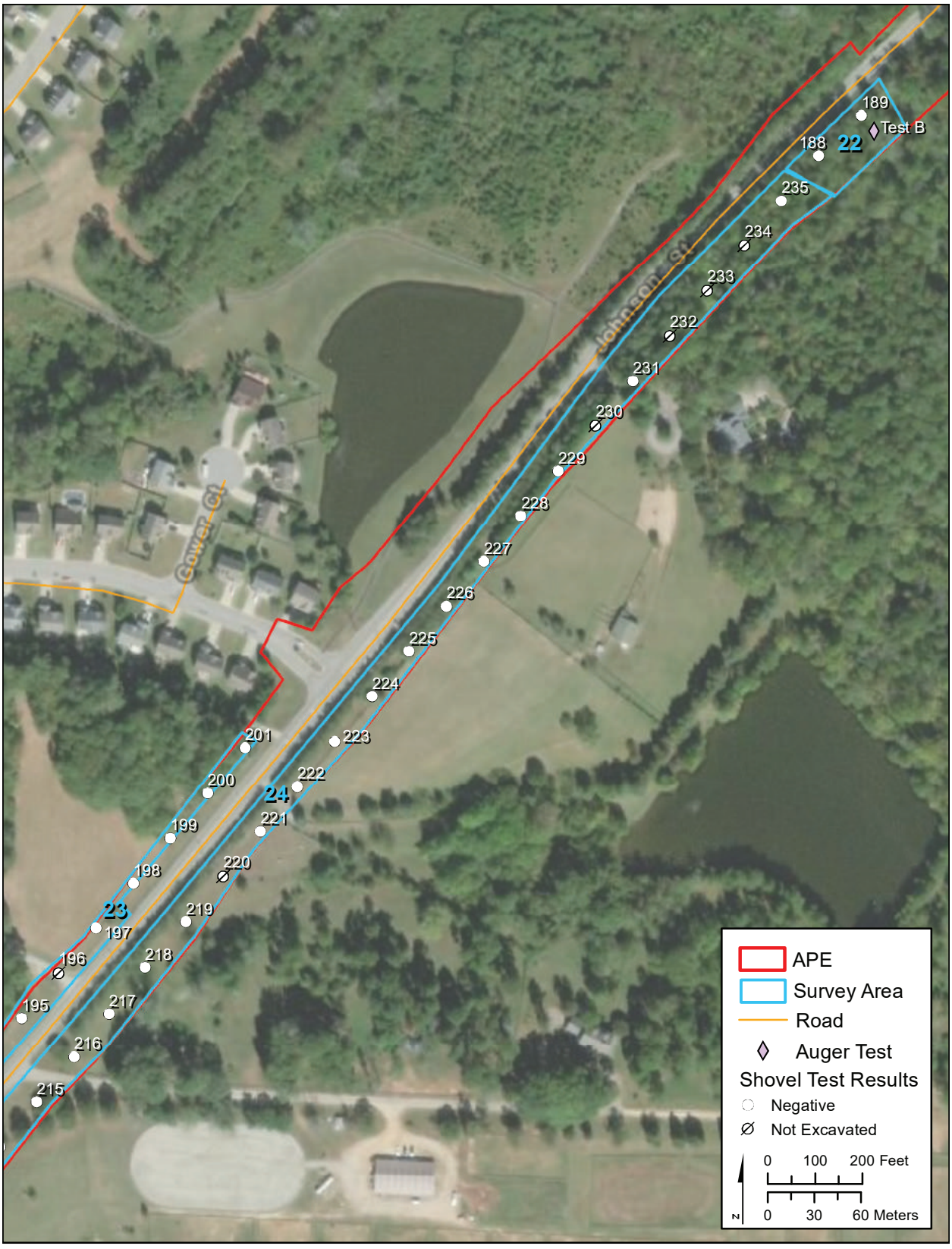
Figure 47. View of Survey Area 20

Figure 48. Typical Shovel Test in Survey Area 20

Figure 49. View of Survey Area 21

Figure 50. Typical Shovel Test in Survey Area 21

Figure 51. Shovel Test Locations in Survey Area 22 and Portions of Survey Areas 23 and 24



Source: ESRI World Imagery (2018)

Figure 52. View of Survey Area 22

Figure 53. View of Survey Area 23

Figure 54. Typical Shovel Test in Survey Area 23

Figure 55. View of Survey Area 24

Figure 56. Typical Shovel Test in Survey Area 24

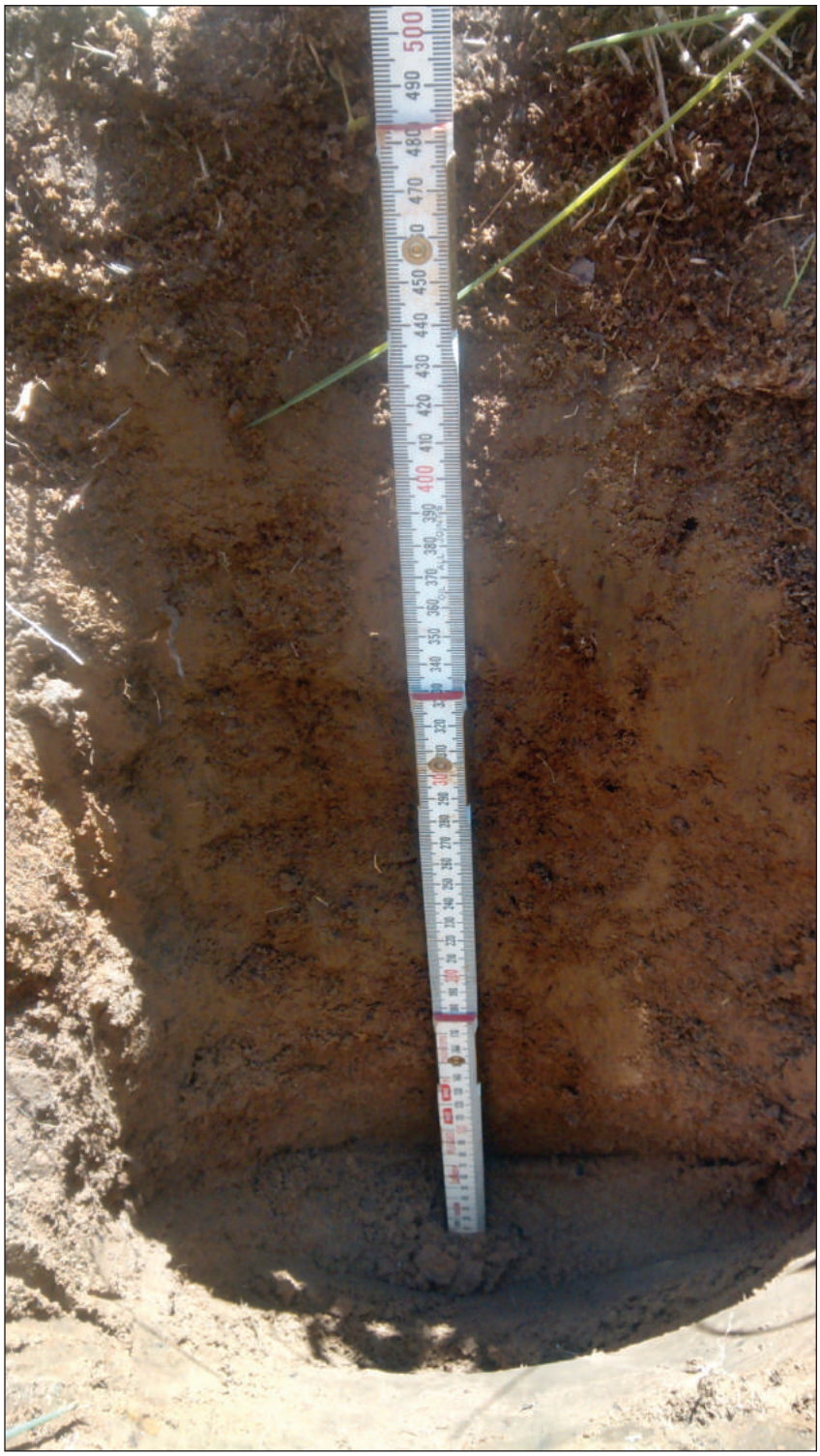
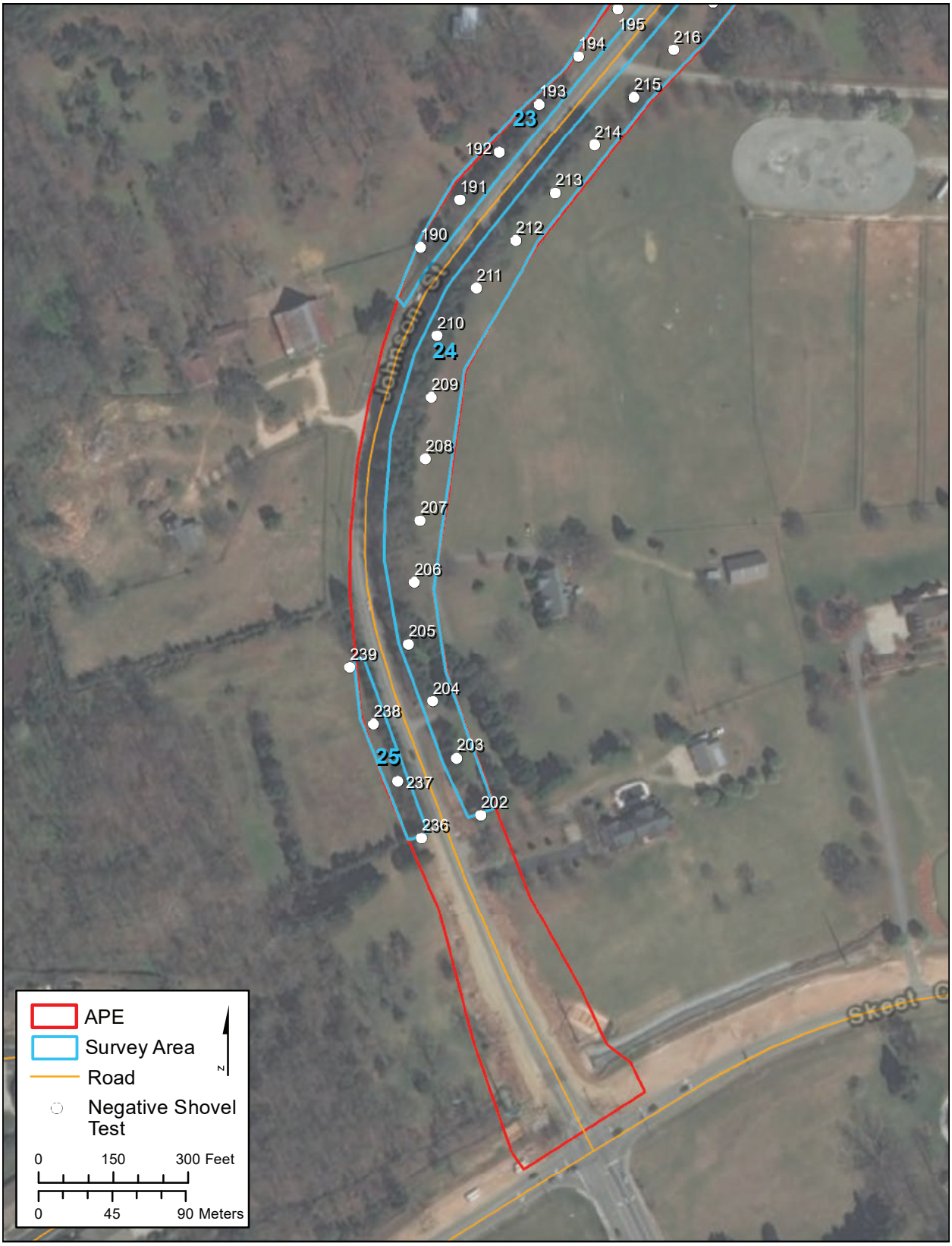


Figure 57. Shovel Test Locations in Survey Area 25 and the Western Portions of Survey Areas 23 and 24

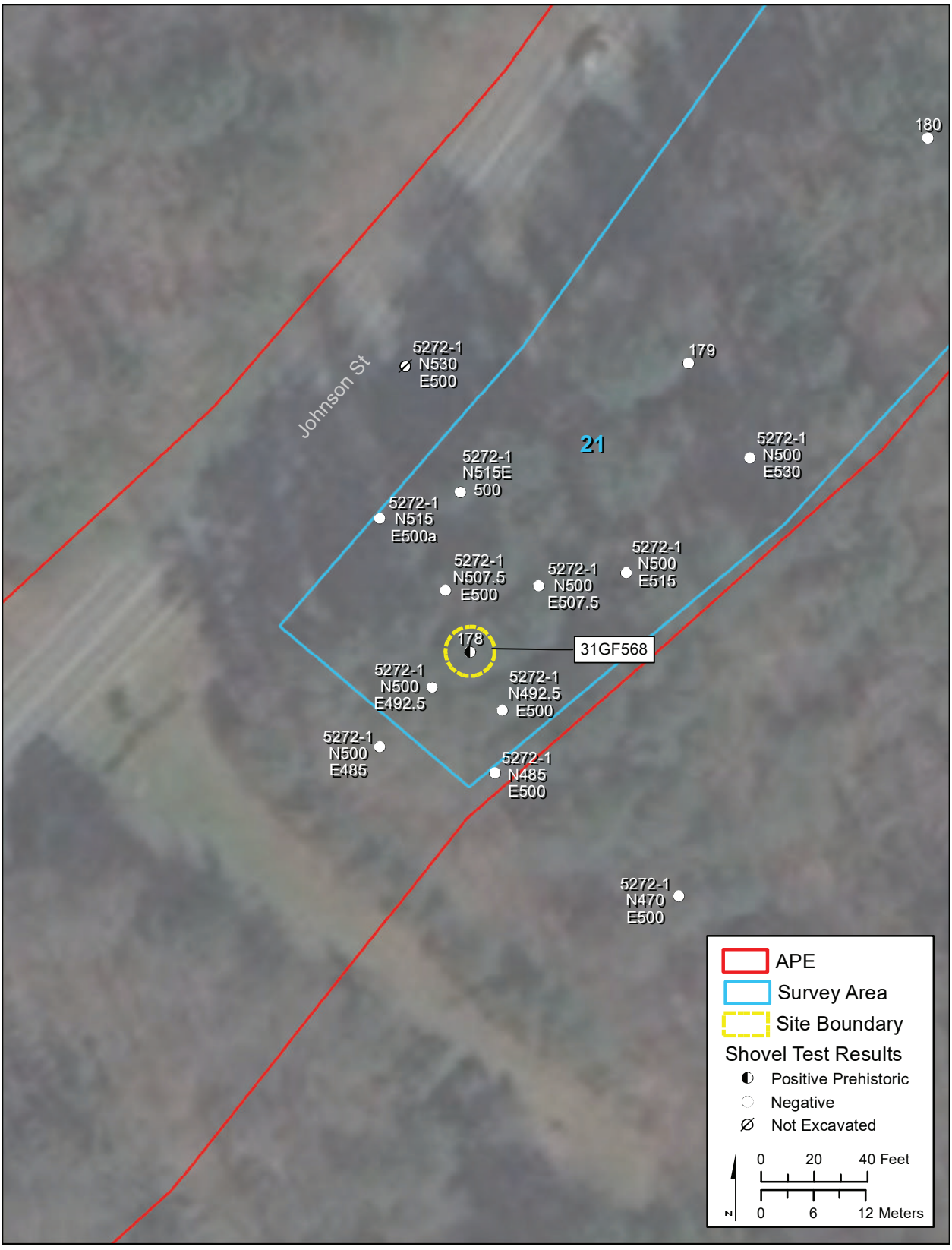


Source: ESRI World Imagery (2018)

Figure 58. View of Survey Area 25

Figure 59. View of Site 31GF568, Facing East

Figure 60. Map of Site 31GF568



Source: ESRI World Imagery (2018)

Figure 61. Typical Shovel Test Profile at Site 31GF568

Figure 62. Map of Site 31GF569

Source: ESRI World Imagery (2018)

Figure 63. Typical Shovel Test Profile at Site 31GF569

Figure 64. View of Site 31GF569, Facing South

Figure 65. Zion Hill Methodist Cemetery and Smith Grove Baptist Church Cemetery Locations

Source: ESRI World Imagery (2018)

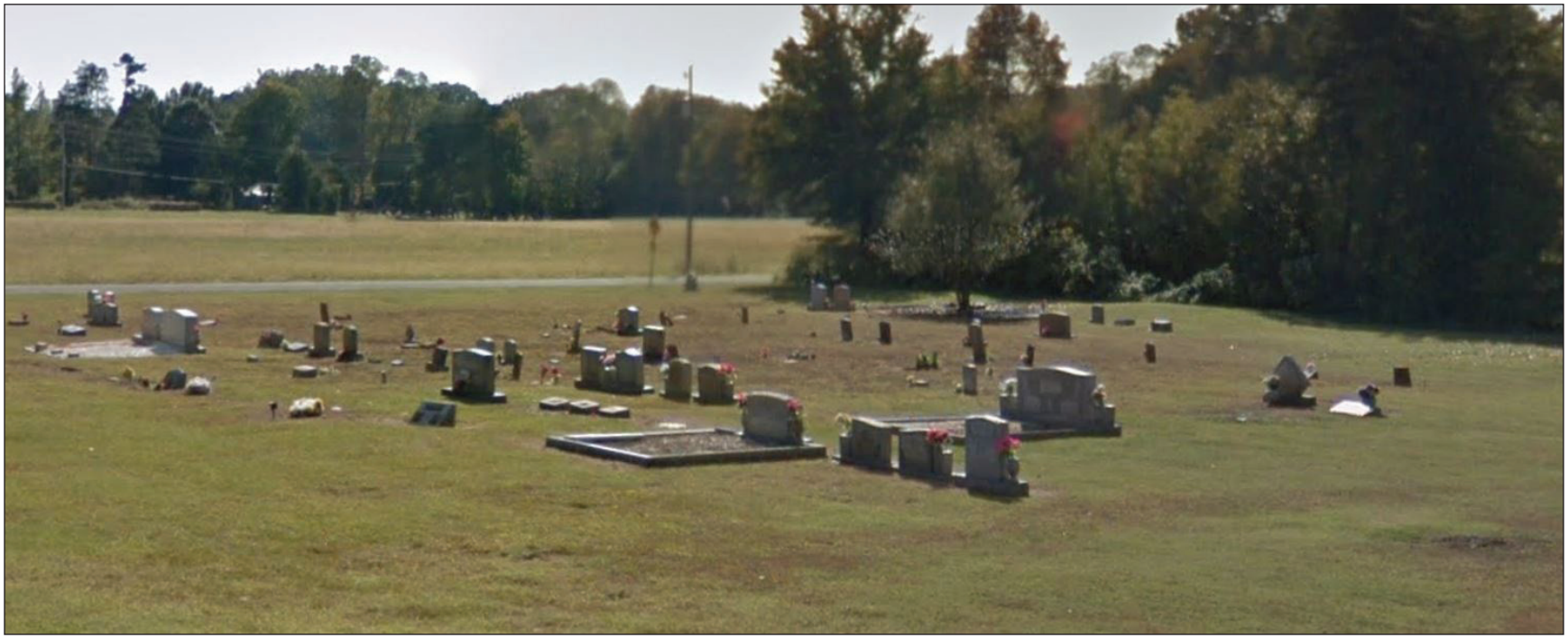


Figure 66. View of Zion Hill Methodist Cemetery

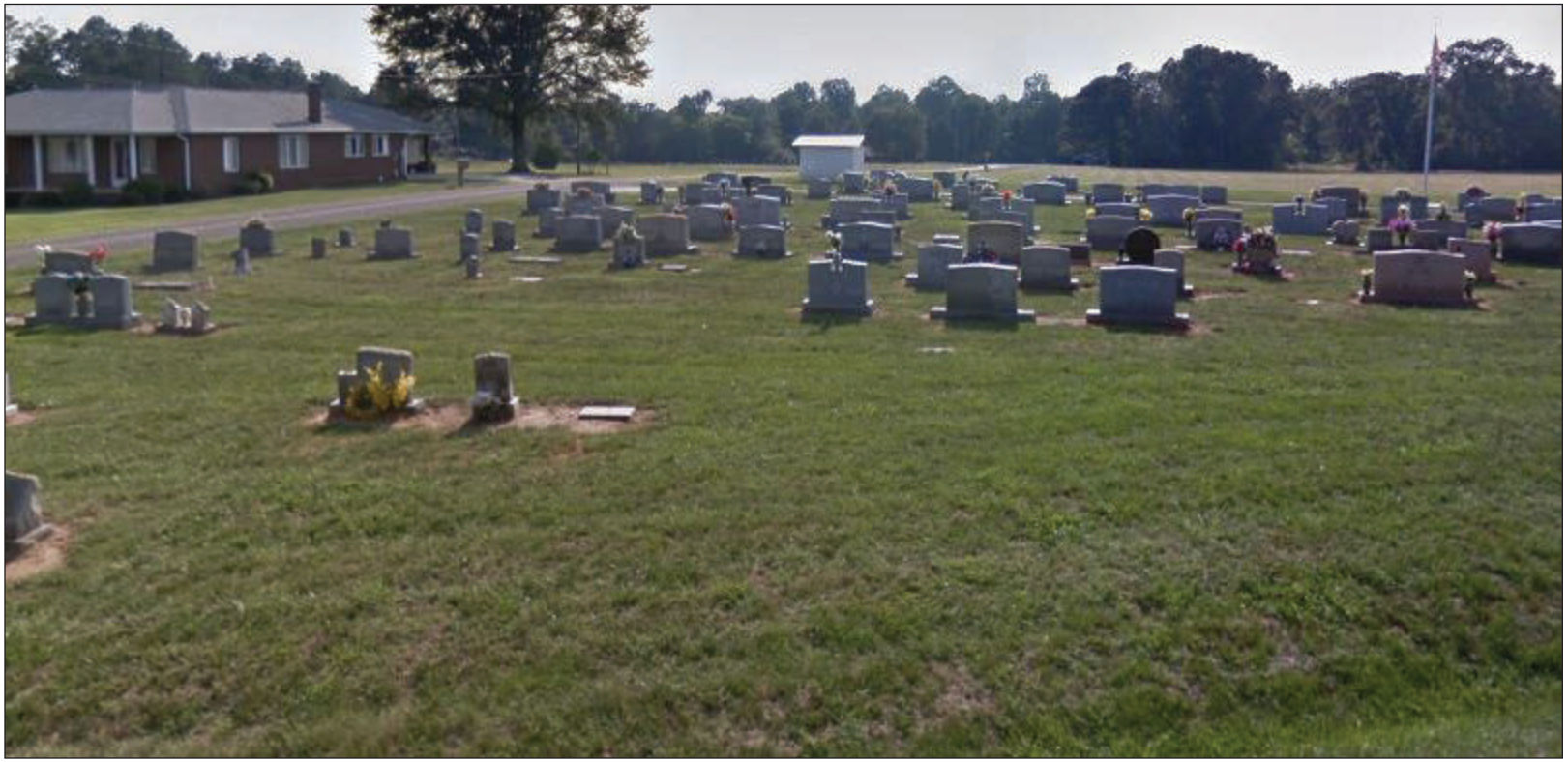


Figure 67. View of Smith Grove Baptist Church Cemetery

Figure 68. View of Sandy Ridge Methodist Church Cemetery

Figure 69. Map of GPR Survey Location

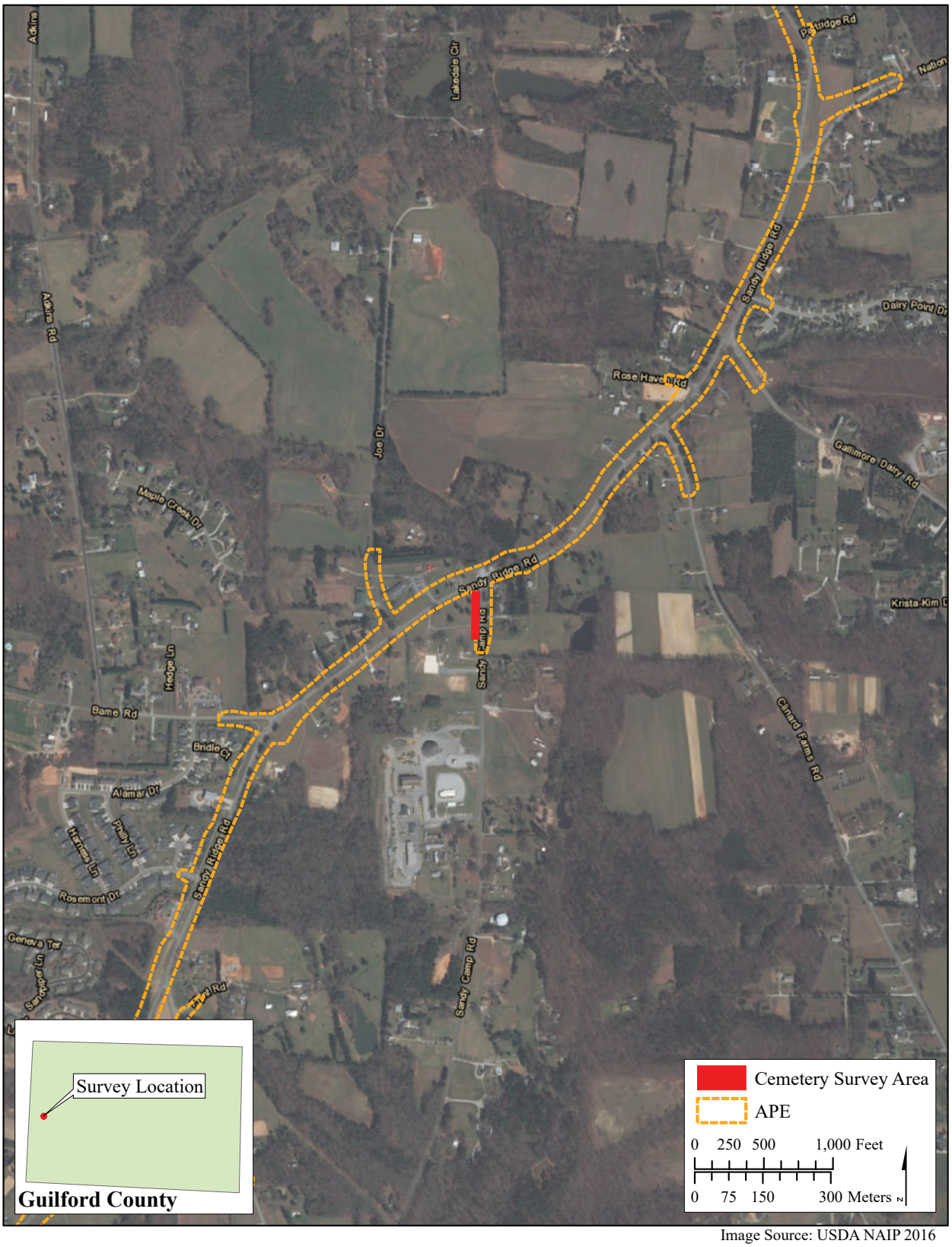


Image Source: USDA NAIP 2016

Figure 70. Map of GPR Grids

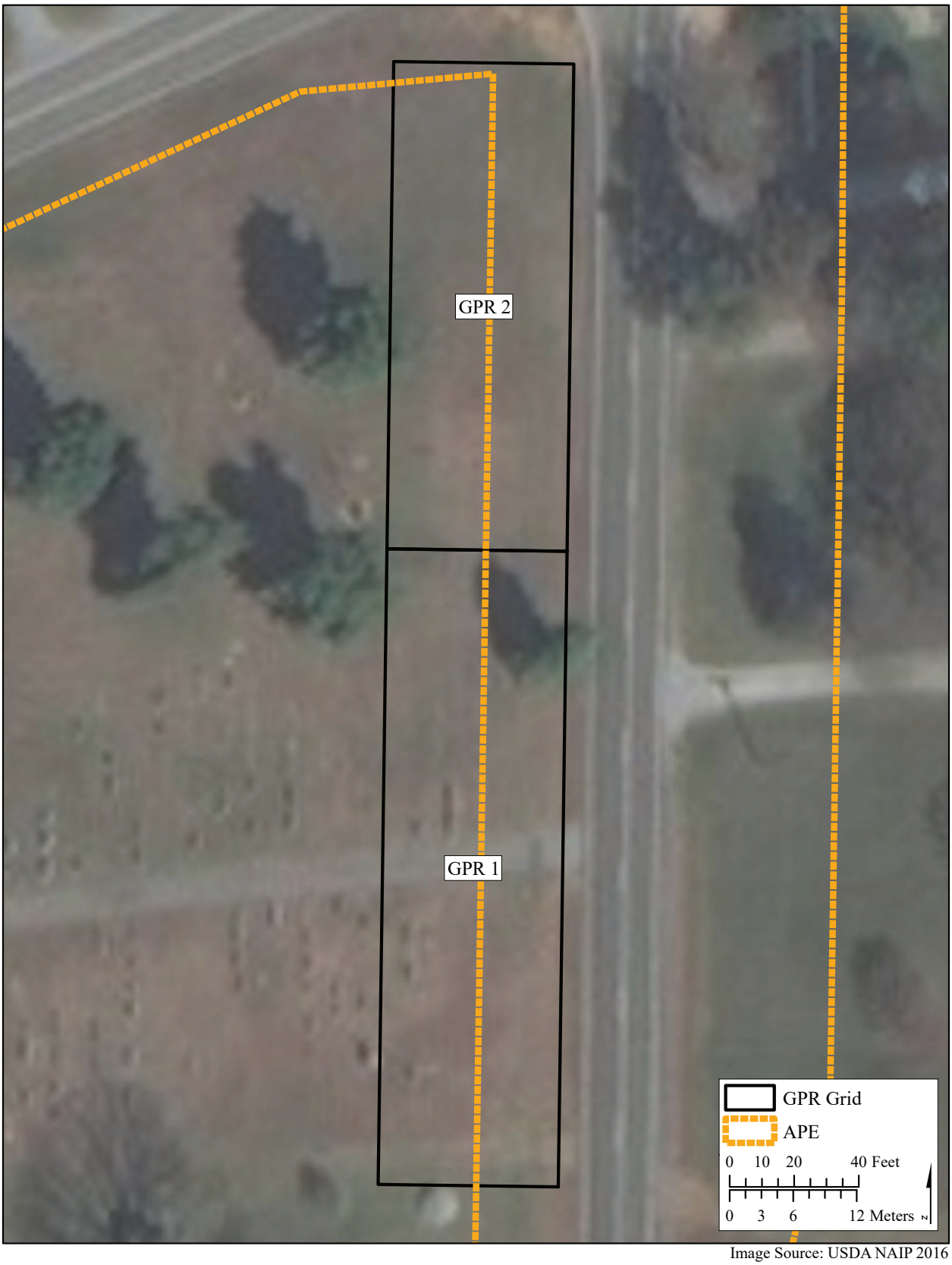


Image Source: USDA NAIP 2016

Figure 71. GPR Interpretations, 1 of 2

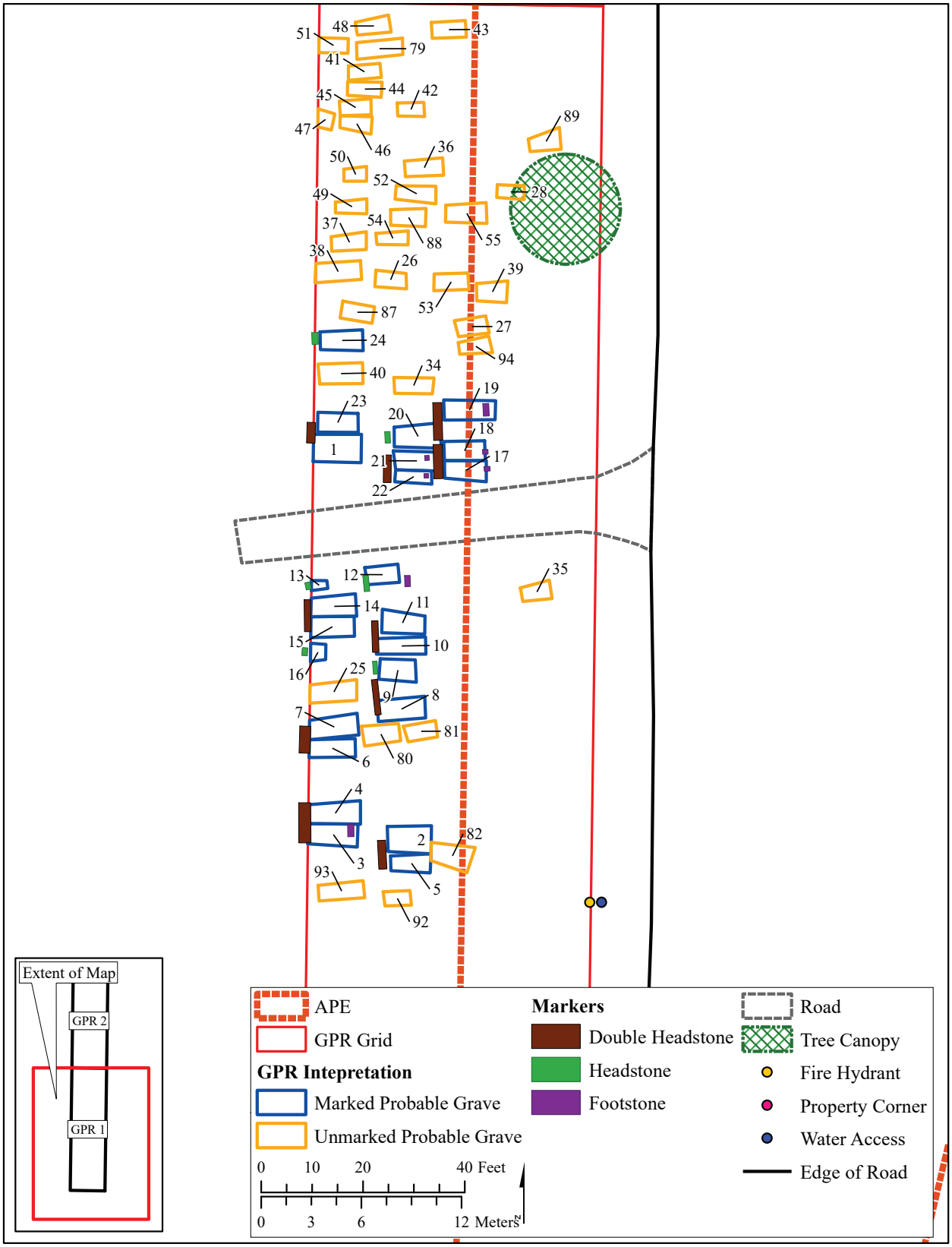


Figure 72. GPR Interpretations, 2 of 2

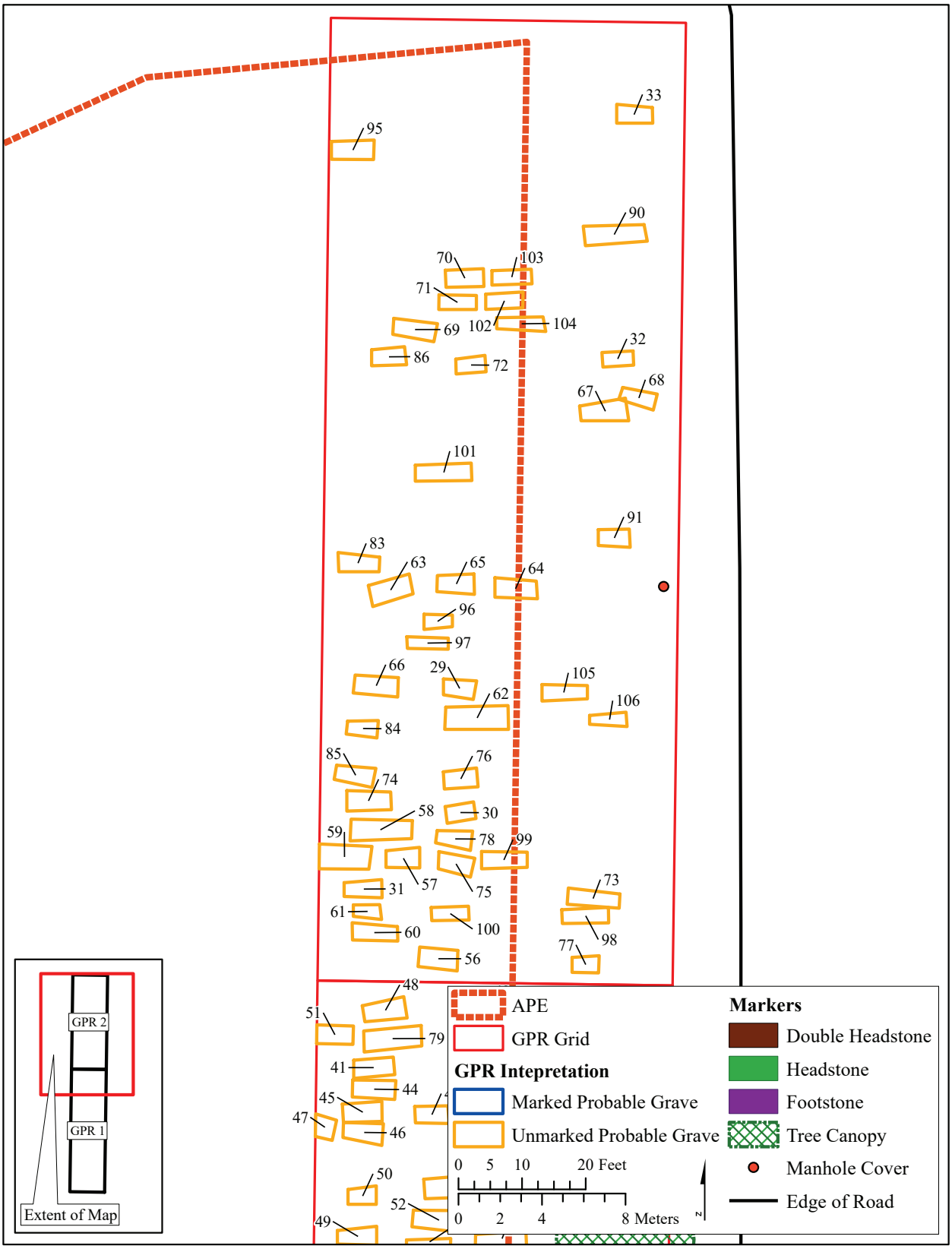


Figure 73. Slice Map of Grids 1 and 2, 0-30 cmbs

Image Source: USGS NAIP 2016

Figure 74. Slice Map of Grids 1 and 2, 30-60 cmbs

Image Source: USGS NAIP 2016

Figure 75. Slice Map of Grids 1 and 2, 60-90 cmbs

Image Source: USGS NAIP 2016

Figure 76. Slice Map of Grids 1 and 2, 90-120 cmbs

Image Source: USGS NAIP 2016

Figure 77. Slice Map of Grids 1 and 2, 120-150 cmbs

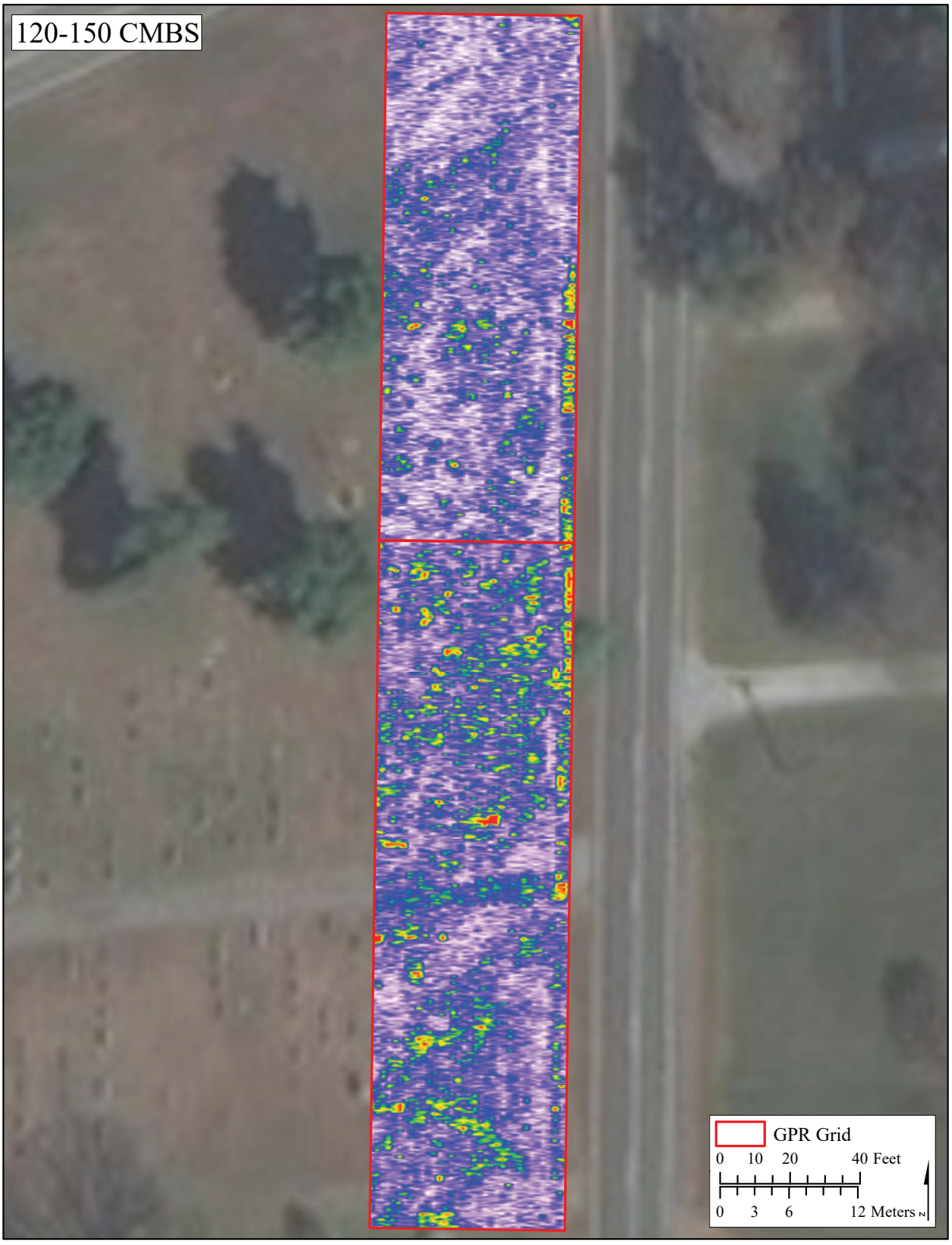


Image Source: USGS NAIP 2016

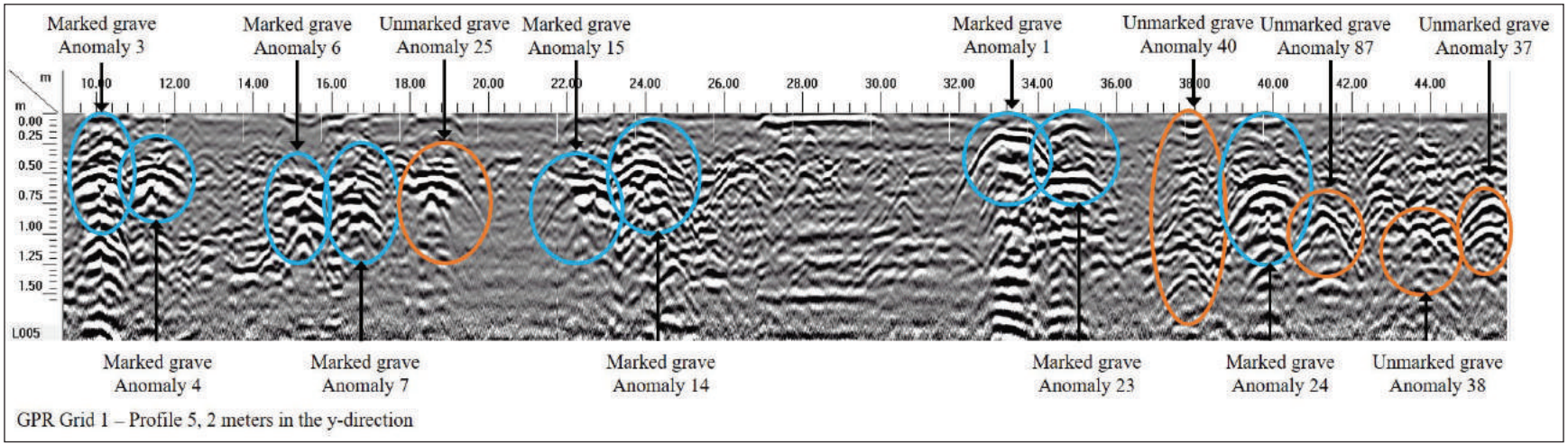


Figure 78. Example of Probable Graves in Profile, 1 of 2

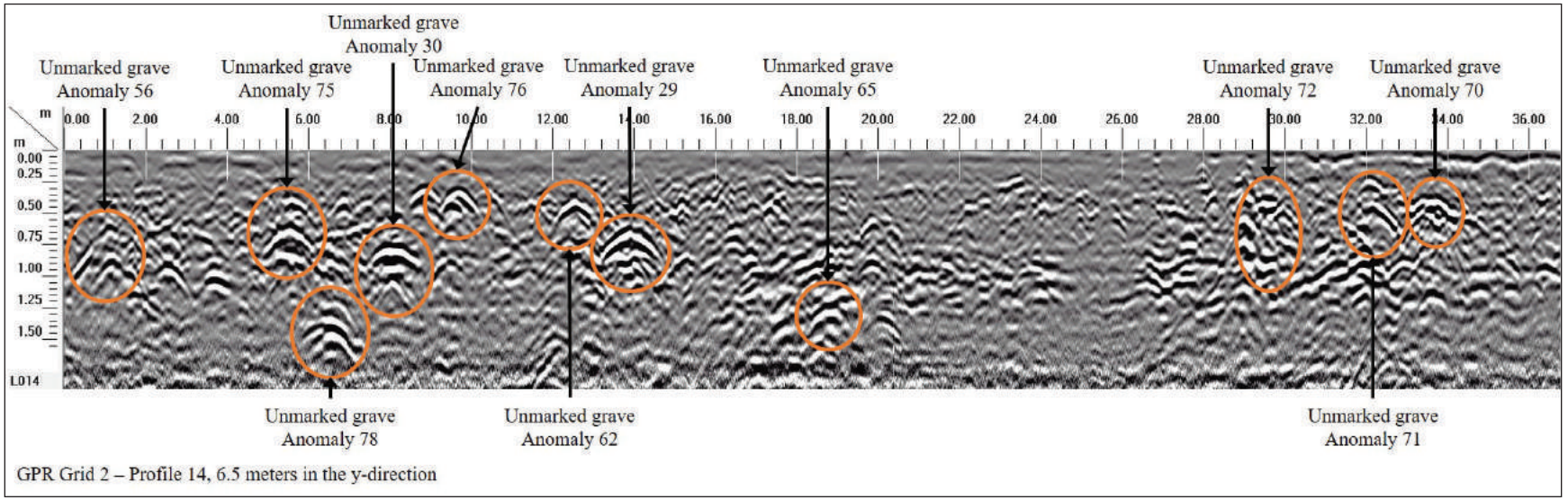


Figure 79. Example of Probable Graves in Profile, 2 of 2

Figure 80. Map of the Amended Cemetery Extent with GPR Results and Markers

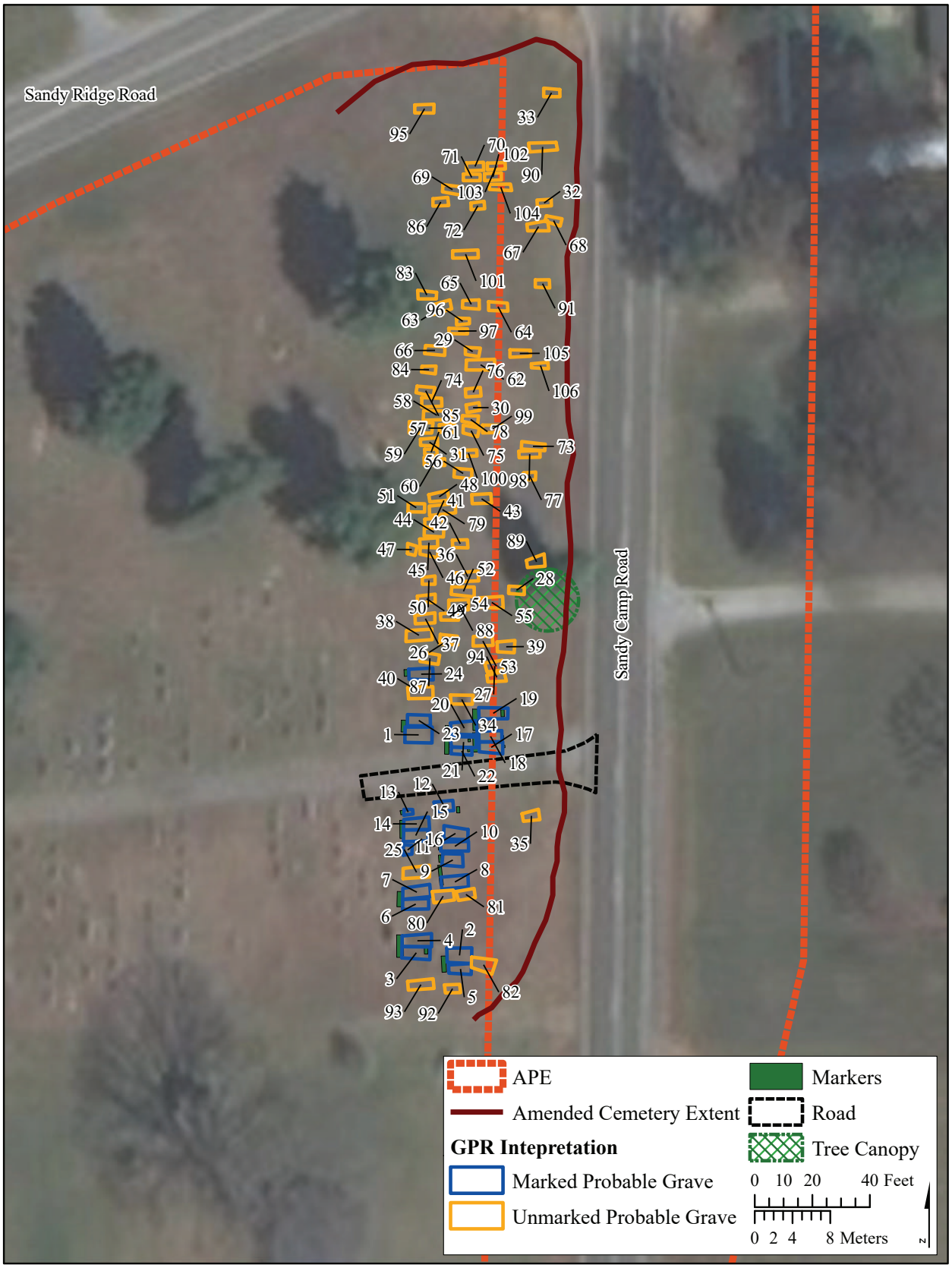


Image Source: USDA NAIP 2016

Historic Architecture and Landscapes

HISTORIC ARCHITECTURE AND LANDSCAPES NO SURVEY REQUIRED FORM

This form only pertains to Historic Architecture and Landscapes for this project. It is not valid for Archaeological Resources. You must consult separately with the Archaeology Group.

PROJECT INFORMATION

Project No:	U-4758	***County***:	Guilford
WBS No.:	40251.1.1	***Document Type:***	PCE
Fed. Aid No:	unknown	***Funding***:	☐ State ☒ Federal
Federal Permit(s):	☒ Yes ☐ No	***Permit Type(s)***:	USACE

Project Description:
Widen Johnson Street-Sandy Ridge Road from Skeet Club Road to I-40 (approximately 4.4 miles in length).

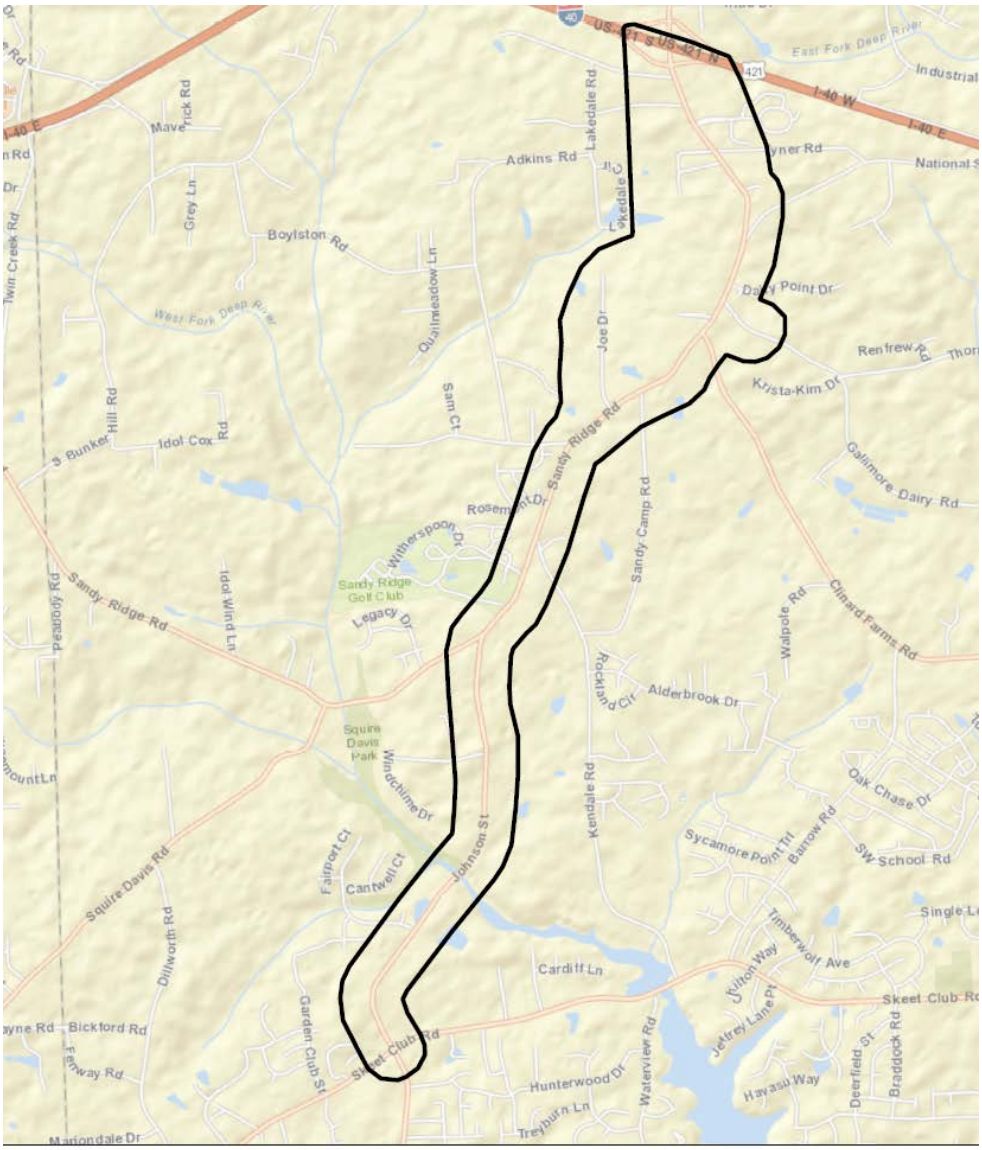
SUMMARY OF HISTORIC ARCHITECTURE AND LANDSCAPES REVIEW

Description of review activities, results, and conclusions:
According to the North Carolina State Historic Preservation Office online data base (HPOWEB 2018), there is one historically significant resource within the APE for the project, the Elihu and Abigail Mendenhall House (GF1544). This resource was determined eligible in 2001 and HPO confirmed it's eligibility in response to a report prepared by New South and Associates for this project. The design plans for the project show that any construction activities associated with the project are 400 feet away from the boundary of the historic property.

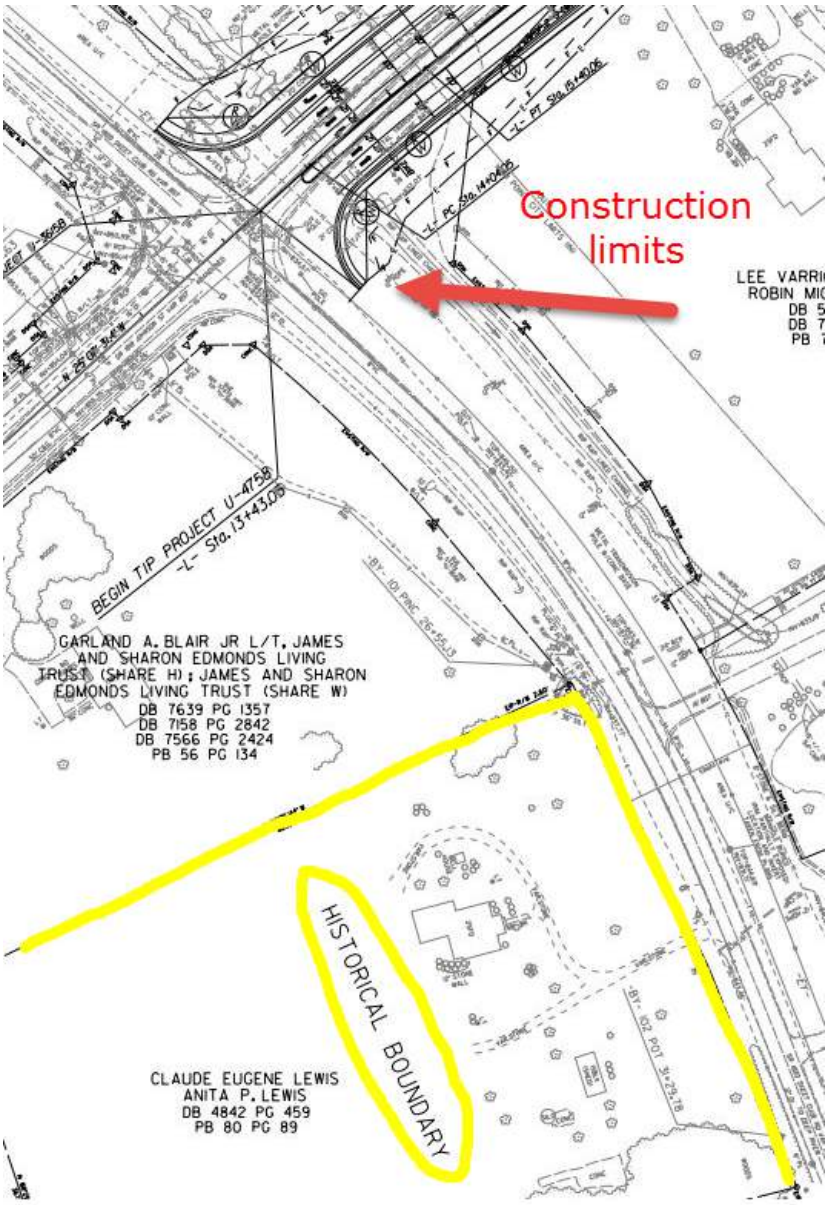
Why the available information provides a reliable basis for reasonably predicting that there are no unidentified significant historic architectural or landscape resources in the project area:
HPO GIS information, Guilford County GIS/Tax information, and Google Maps are considered valid for the purposes of determining the likelihood of historic resources being present. Furthermore, in 2014 New South and Associates completed an evaluation of all resources within the APE over fifty years of age project and confirmed that GF 1544 is the only eligible resource within the APE. Since the design plans do not show construction activities that would directly or indirectly impact the boundary of the historic property the project is not recommended for survey. Compliance with Section 106 is complete..

SUPPORT DOCUMENTATION

☒Map(s) ☐Previous Survey Info. ☒Photos ☐Correspondence ☐Design Plans



GF1544



FINDING BY NCDOT ARCHITECTURAL HISTORIAN

Historic Architecture and Landscapes -- NO SURVEY REQUIRED

Mary Pope Furr	**2/23/2018**
NCDOT Architectural Historian	Date

North Carolina Department of Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Pat McCrory
Secretary Susan Kluttz

Office of Archives and History
Deputy Secretary Kevin Cherry

October 16, 2014

Ellen Turco
New South Associates
408-B Blandwood Avenue
Greensboro, NC 27401

eturco@newsouthassoc.com

RE: Historic Structures Survey Report for Johnson Street Sandy Ridge Road, High Point, U-4758, Guilford County, ER 12-0959

Dear Ms. Turco:

Thank you for your letter of September 25, 2014, transmitting the above referenced report on a CD. We have reviewed the report and **concur that the Zion Hill Methodist Church (GF8660) and the Smith Grove Baptist Church (GF8668) are not eligible for listing in the National Register** of Historic Places for the reasons outlined.

We **concur that the Elihu Mendenhall House (GF1544) remains eligible for listing in the National Register** under Criterion B and C, with the house and the springhouse site as the two important historic resources.

We would like to note that Property #33 is of some interest in that this type of resource, which appears to be a low security prison work camp, seems to be a disappearing property. Given its location on the very edge of the Area of Potential Effects, we do not feel that it is necessary to address it further, unless the project changes and moves closer to the brick buildings.

As we cannot accept downloads for review and staff finds hardcopies of reports easier to review, we would appreciate your providing us with a hard, color copy of the current report for our files. In the future one hard copy and a CD will be appreciated.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579 or environmental.review@ncdcr.gov. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona M. Bartos

cc: Mary Pope Furr, NCDOT mfurr@ncdot.gov

Tribal Coordination

Catawba Indian Nation
Tribal Historic Preservation Office
1536 Tom Steven Road
Rock Hill, South Carolina 29730

Office 803-328-2427
Fax 803-328-5791

October 18, 2023

Attention: Colin Mellor
NC Department of Transportation
1582 Mail Service Center
Raleigh, NC 27699

Re. THPO #	TCNS #	Project Description
2023-193-256		Widening and re-alignment of SR 1818/SR 1850 from SR 1820 to I-40 in Guilford CO., STIP Project U-4758

Dear Mr. Mellor,

The Catawba have no immediate concerns with regard to traditional cultural properties, sacred sites or Native American archaeological sites within the boundaries of the proposed project areas. **However, the Catawba are to be notified if Native American artifacts and / or human remains are located during the ground disturbance phase of this project.**

If you have questions please contact Caitlin Rogers at 803-328-7369, or e-mail Caitlin.Rogers@catawba.com.

Sincerely,

Caitlin Rogers for

Wenonah G. Haire
Tribal Historic Preservation Officer

NEPA/SEPA Document

Type III Categorical Exclusion Action Classification Form

STIP Project No.	**U-4758**
WBS Element	**40251.1.1**
Federal Project No.	**HPP-0710(25)(26)(27)(28)**

A. Project Description:

The N.C. Department of Transportation (NCDOT) proposes to improve Johnson Street (SR 1818) and Sandy Ridge Road (SR 1850) from Skeet Club Road (SR 1820) to Interstate 40 (I-40) in the City of High Point and Guilford County. The project is approximately 4.4 miles long. **Figure 1** shows the project location and project study area.

B. Description of Need and Purpose:

The purposes of this project are to improve existing and projected traffic flow and capacity on Johnson Street and Sandy Ridge Road, to provide facilities for pedestrians and bicyclists along the corridor, and to provide a facility that conforms to NCDOT roadway design standards.

Johnson Street and Sandy Ridge Road are an important north-south transportation routes in the area that experiences traffic congestion and delays due to capacity deficiencies. The corridor is locally and regionally important as a connection between High Point and Greensboro, including major destinations such as the Piedmont Triad International Airport (PTIA) and Piedmont Triad Farmers Market. The existing roadways also lacks adequate facilities for pedestrians and bicyclists, which limits mobility for these types of travelers.

Addressing the need to increase capacity for vehicles as well as providing enhanced mobility for pedestrians and bicyclists are the main priorities of the proposed project. Another priority that will be addressed is to improve existing and future traffic flow. Another desired outcome is that the improved facility would serve as an alternative to NC 68 in accessing the PTIA.

C. Categorical Exclusion Action Classification: Type III

D. Proposed Improvements

Roadway

Johnson Street and Sandy Ridge Road will be widened along the full project corridor to a four-lane median divided facility. The typical section includes four 12-foot lanes, a 23-foot median, 4-foot bike lanes on each side, a 10-foot multi-use path on the west side (south of Gallimore Dairy Road), and a 5-foot sidewalk on the east side (**Figure 2**). North of Gallimore Dairy Road, the multi-use path will switch sides and be on the east side, with the sidewalk on the west side. A “best fit” widening scenario is proposed as shown in **Figure 3a-3l,** to avoid or minimize impacts to adjacent natural and community resources.

Median breaks will be provided at ten signalized intersections and five non-signalized intersections. Right-in / right-out access would be provided at seven locations. In addition, U-turn bulbs will be provided at four locations.

Structures

A new four-lane bridge will be built over the West Fork Deep River on the location of the existing bridge and to the east to avoid impacts to the Johnson Street Sports Complex, which is a Section 6(f) resource. The existing bridge will be used for traffic during the construction of half of the proposed bridge and then removed to build the other half. The bridge will have the same typical section as the roadway (**Figure 2**).

Design Speed and Speed Limit

A 50 mile per hour (MPH) design speed is proposed for Johnson Street and Sandy Ridge Road, and the posted speed limit will remain 45 MPH following construction.

Right-of-Way and Access Control

Right of way will be required along both sides of Johnson Street and Sandy Ridge Road to accommodate the widening. Additional right of way will also be required along the side streets to reconnect them to Johnson Street and Sandy Ridge Road:

Temporary construction easements will be required. Full control of access will be added at the four (4) U-turn bulbouts.

The project will physically impact and require the relocation of ten (10) single-family dwellings and two (2) businesses.

Bicycle Accommodations/Sidewalks

Four-foot striped bike lanes will be provided in both directions. A ten-foot multi-use path and five-foot sidewalk will also be provided on the opposite sides of the roadway.

Cost Estimates

Table 1 – Cost Estimates

	STIP (2018-2027)	Current Cost Estimates	Date
Roadway Cost		$33.7 M	March 2018
Structure Cost		$2.2 M	March 2018
Utilities		$1.2 M	March 2018
TOTAL	**$20.8 M**	**$35.9 M**	
R/W Cost	$5 M	$8.6 M	February 2018
TOTAL COST	**$25.8 M**	**$44.5 M**	

E. Special Project Information: (Provide a description of relevant project information, which may include: vicinity map, costs, alternative analysis (if any), traffic control and staging, and resource agency/public involvement).

Relationship to Adjacent STIP Projects

STIP Project U-4758 is located in Guilford County in proximity to three other STIP projects (**Table 2**).

Table 2 – Adjacent STIP Projects

STIP # (2018 -2027)	Project	Funding	Schedule
I-5712	I-40/US 421 – Sandy Ridge Road Interchange Improvements	$16.1 M	ROW: 2018 LET: 2020
U-6068	US 421 – Widen to 6 Lanes from Future I-74 in Kernersville to I-40	$110.9 M	ROW: 2025 LET: 2027
I-5981	I-40 – Widen to 6 Lanes from I-74/US 311 to US 421/Business 40	$142.7 M	ROW: 2024 LET: 2026

Alternatives

Five (5) general system approaches or alternatives were considered in addition to the No Build Alternative: New Location Alternative, Improve Existing Corridor Alternative, Transportation Demand Management, Transportation System Management, and Mass Transit/Multi-Modal Alternative were all evaluated.

An initial screening of the alternatives generally consisted of a “pass or fail” determination of the alternative’s ability to address transportation problems in meeting the purpose and need. If the approach “passed” qualitatively all elements of the purpose and need, then it would be retained for the next step in the alternatives screening process (**Table 3**).

No-Build Alternative

The No-Build Alternative serves as the baseline comparison for the design year (2040). This alternative assumes that the transportation system for Guilford County would evolve as currently planned in the High Point Metropolitan Planning Organization’s (MPO) 2035 Long-Range Transportation Plan (LRTP) in the project area.

Improve Existing Corridor Alternative

The Improve Existing Corridor Alternative would widen the roadway, improve intersections, and address geometric deficiencies from Skeet Club Road to I-40. This alternative also would provide facilities for pedestrians and bicyclists.

New-Location Alternative

The Johnson Street/Sandy Ridge Road Feasibility Study (October 2002) studied widening options for the corridor and recommended additional study of a new-location alignment for the northern section. The New-Location Alternative would involve construction of a new-location option in the northern section of the project.

Travel Demand Management (TDM) Alternative

TDM emphasizes regional means of reducing vehicle trips and vehicle miles traveled as well as increasing vehicle occupancy. It includes measures and activities that change traveler behavior by expanding traveler options in terms of travel method, travel time, travel route, travel costs, and travel quality/convenience. TDM measures usually do not involve major capital improvements. The TDM Alternative can include employer-based measures such as staggered work house or flex time and ridesharing (i.e. carpools/vanpools).

Transportation System Management (TSM) Alternative

The TSM Alternative approach typically consists of low-cost, minor transportation improvements to increase the efficiency of an existing facility without increasing the capacity (e.g. number of through lanes). TSM improvements can be operational (i.e. access control, turn prohibitions, speed restrictions, traffic signal timing optimization) or physical (turn lanes, intersection realignment, improved warning and information signs, new signals or stop signs, intersection geometric and signalization improvements).

Table 3 – Alternative Evaluation

	Primary Elements of the Purpose and Need			
ALTERNATIVES	Improve Existing & Projected Traffic Flow and Increases Capacity	Provides Facilities for Pedestrians and Bicyclists	Provides Facility that Conforms to Design Standards	Retain for Additional Study?
No-Build	FAIL	FAIL	FAIL	NO
Improve Existing Corridor (Alternative 1)	PASS	PASS	PASS	YES
New Location Alternative (Alternative 2)	PASS	PASS	PASS	YES
Transportation Demand Management (TDM)	FAIL	FAIL	FAIL	NO
Transportation System Management (TSM)	PASS	FAIL	PASS	NO
Mass Transit/Multi Modal	PASS	FAIL	FAIL	NO

Based on this evaluation, two alternatives were developed: Alternative 1, consisting of widening the existing corridor for the entire project; and Alternative 2, consisting of widening the existing corridor for the southern section and constructing part on new location in the northernmost section (north of Joe Drive).

Alternative 2 was eliminated from further consideration due to increased stream and wetland impacts, higher right of way costs and impacts, and lack of local support. Alternative 1 was retained as the alternative for detailed study and ultimately the build alternative. It consists of widening Johnson Street and Sandy Ridge Road along the full project corridor to a four-lane median divided facility with the "best fit" widening scenario to avoid or minimize impacts to adjacent natural and community resources. At the northern end of the project where there are closely spaced side streets and adjacent businesses between Tyner Road and I-40, various design options were evaluated.

The selection of a northern option is complicated by several adjacent projects which are in the project development stage and may impact the ramp locations and reconfigure the whole roadway network in the area.

Other projects within the same area, which may impact both the I-5712 and U-4758 projects, are U-6068 and I-5981 projects. U-6068 project is widening US 421 (Salem Parkway) to 6 lanes. The limits of the project include the connect to I-40, which is just east of the Sandy Ridge Road Interchange. I-5981 project is the widening of I-40 from I-74 to US 421. Adding any necessary additional lanes to these projects may impact the bridge structure of Sandy Ridge Road over I-40, which also may impact the configuration of the Sandy Ridge Road Interchange.

As a result of the complexity of the adjacent projects, the interim solution for U-4758 is the following configuration: Norcross Road would be a right-in/right-out on Sandy Ridge Road. Because of the heavy truck traffic on Norcross Road, it was recommended to realign Norcross Road south to intersect with the Piedmont Triad Farmers Market Entrance. Endicott Road would intersect with the realigned Norcross Road.

Due to complexity and schedule of the adjacent projects (I-5712, U-6068, and I-5981), additional coordination will be necessary in order to finalize the roadway configurations of Norcross Road, Endicott Road, and the Piedmont Triad Farmers Market entrance.

Public Involvement Summary

The project initially started out in 2012 as a City of High Point managed project under a Federal Highway Administration (FHWA) grant. Public outreach and involvement was a very important component of the project and included a project logo contest with the local high school, development of a Community Advisory Committee (CAC) and an Agency Steering Committee (ASC), small group meetings, website, newsletters, and three (3) public workshops.

The ASC included local staff from planning, engineering, parks and recreation, PART (Piedmont Authority for Regional Transportation), the MPO, and others, as well as state and federal agency representatives. The CAC members represent neighborhood's, business leaders, and other property owners along the corridor.

A timeline of the public involvement activities used in the identification, development, evaluation, and elimination of alternatives is provided below.

- January 2012 – River Landing Small Group Meeting
- February 2013 – Sandy Ridge United Methodist Church Meeting
- April 2013 - Public Workshop #1
- August 2013 - Design Alternatives Work Session - Joint meeting with Steering Committees (ASC and CAC) for input on development of Build Alternative Concepts
- February 2014 - Alternatives Review Meeting with City of High Point
- May 2014 - Design Review Meeting with City of High Point
- July 2014 - Design Alternatives Review Meeting with ASC and CAC
- September 2014 - Public Workshop #2
- November 2014 – Small Group Meeting with Northern Property Owners
- July 2015 - Detailed Study Alternative (DSA) Meeting with ASC and CAC
- March 2016 – Project Update Newsletter
- June 2016 – Project Status Meeting with Smith Grove Baptist Church, Zion Hill Methodist Church, and Sandy Ridge United Methodist
- August 2016 – Preferred Alternative Meeting with ASC and CAC
- February 2018 – Wesleyan Academy Meeting
- March 2018 - Sandy Ridge United Methodist Church Meeting
- August 2018 – Public Workshop #3

Agency Coordination

The NCDOT has continuously worked with the City of High Point, Guilford County, and other governmental agencies throughout the planning process. In June of 2012, a scoping packet was sent from the City of High Point to local, state, and federal agencies to solicit comments and collect pertinent project information early in the project development process. Agencies that comments were received from include:

- City of High Point Fire Department
- City of High Point Planning and Development Department
- City of High Point Parks and Recreation
- NC Department of Environment and Natural Resources
- NC Department of Agriculture and Consumer Services
- NC Department of Cultural Resources
- NCDOT
- NC Department of Public Safety, Emergency Management, and Geospatial and Technology
- NC Wildlife Resources Commission
- Federal Highway Administration
- US Environmental Protection Agency
- US Fish and Wildlife Service

In addition to the involvement of the Agency Steering Committee, the project development team also met with the NEPA/404 Merger Team in November 2014 and gained formal concurrence on Concurrence Point 1 (Purpose and Need) and Concurrence Point 2 (Detailed Study Alternatives to Carry Forward). Due to minimization and avoidance efforts during the design, the Merger Team concurred in February 2017 with removing the project from the Merger Process.

F. Project Impact Criteria Checklists:

Type III Actions		Yes	No
If the proposed improvement is identified as a Type III Class of Action answer all questions. • The Categorical Exclusion will require FHWA approval. • If any questions are marked "yes" then additional information will be required for those question in Section G.			
1	Does the project involve potential effects on species listed with the US Fish and Wildlife Service (USFWS) or National Marine Fisheries (NMFS)?	☒	☐
2	Does the project result in impacts subject to the conditions of the Bald and Golden Eagle Protection Act (BGPA)?	☐	☒
3	Does the project generate substantial controversy or public opposition, for any reason, following appropriate public involvement?	☐	☒
4	Does the project cause disproportionately high and adverse impacts relative to low-income and/or minority populations?	☐	☒
5	Does the project involve substantial residential or commercial displacements or right of way acquisition?	☐	☒
6	Does the project include a determination under Section 4(f)?	☒	☐
7	Is a project-level analysis for direct, indirect, or cumulative effects required based on the NCDOT community studies screening tool?	☐	☒
8	Is a project level air quality Mobile Source Air Toxics (MSAT) analysis required?	☐	☒
9	Is the project located in anadromous fish spawning waters?	☐	☒
10	Does the project impact waters classified as Outstanding Resource Water (ORW), High Quality Water (HQW), Water Supply Watershed Critical Areas, 303(d) listed impaired water bodies, buffer rules, or Submerged Aquatic Vegetation (SAV)?	☒	☐
11	Does the project impact waters of the United States in any of the designated mountain trout streams?	☐	☒
12	Does the project require a U.S. Army Corps of Engineers (USACE) Individual Section 404 Permit?	☐	☒
13	Will the project require an easement from a Federal Energy Regulatory Commission (FERC) licensed facility?	☐	☒
14	Does the project include Section 106 of the National Historic Preservation Act (NHPA) effects determination other than a no effect, including archaeological remains? Are there project commitments identified?	☒	☐
15	Does the project involve hazardous materials and/or landfills?	☒	☐
16	Does the project require work encroaching and adversely effecting a regulatory floodway or work affecting the base floodplain (100-year flood) elevations of a water course or lake, pursuant to Executive Order 11988 and 23 CFR 650 subpart A?	☒	☐

17	Is the project in a Coastal Area Management Act (CAMA) county and substantially affects the coastal zone and/or any Area of Environmental Concern (AEC)?	☐	☒
18	Does the project require a U.S. Coast Guard (USCG) permit?	☐	☒
19	Does the project involve construction activities in, across, or adjacent to a designated Wild and Scenic River present within the project area?	☐	☒
20	Does the project involve Coastal Barrier Resources Act (CBRA) resources?	☐	☒
Type III Actions (continued)		Yes	No
21	Does the project impact federal lands (e.g. USFS, USFWS, etc.) or Tribal Lands?	☐	☒
22	Does the project involve any changes in access control?	☐	☒
23	Does the project have a permanent adverse effect on local traffic patterns or community cohesiveness?	☐	☒
24	Will maintenance of traffic cause substantial disruption?	☐	☒
25	Is the project inconsistent with the STIP or the Metropolitan Planning Organization's (MPO's) Transportation Improvement Program (TIP) (where applicable)?	☐	☒
26	Does the project require the acquisition of lands under the protection of Section 6(f) of the Land and Water Conservation Act, the Federal Aid in Fish Restoration Act, the Federal Aid in Wildlife Restoration Act, Tennessee Valley Authority (TVA), Tribal Lands, or other unique areas or special lands that were acquired in fee or easement with public-use money and have deed restrictions or covenants on the property?	☒	☐
27	Does the project involve Federal Emergency Management Agency (FEMA) buyout properties under the Hazard Mitigation Grant Program (HMGP)?	☐	☒
28	Is the project considered a Type I under the NCDOT's Noise Policy?	☒	☐
29	Is there prime or important farmland soil impacted by this project as defined by the Farmland Protection Policy Act (FPPA)?	☒	☐
30	Are there other issues that arose during the project development process that effected the project decision?	☒	☐

G. Additional Documentation as Required from Section F

Response to Question #1 – Potential Effects on Listed Species

The US Fish and Wildlife Service has developed a programmatic biological opinion (PBO) in conjunction with the Federal Highway Administration, the US Army Corps of Engineers, and NCDOT for the northern long-eared bat (*Myotis septentrionalis*) in eastern North Carolina. The PBO covers the entire NCDOT program in Divisions 1-8, including all NCDOT projects and activities. The programmatic determination for the northern long-eared bat for the NCDOT program is "May Affect Likely to Adversely Affect." The PBO provides incidental take coverage for northern long-eared bats and will ensure compliance with Section 7 of the Endangered Species Act for five years for all NCDOT projects with a federal nexus in Divisions 1-8, which includes Guilford County.

Response to Question #6 – Section 4(f)

Section 4(f) is not applicable in this project due to "Joint Development". The project and the Regency Parkway to Interstate 40 Greenway, which extends across Johnson Street along the West Fork Deep River, are essentially being jointly developed since planning for the greenway has accounted for the future widening of Johnson Street and vice versa. Furthermore, the proposed greenway was considered in the bridging decision due to High Point's preference that the greenway be accommodated under the bridge. Finally, the new wider and higher bridge and multi-use path or sidewalk proposed throughout the project would provide a betterment to the resource by enhancing access and connectivity to the planned greenway and overall greenway system.

On March 8th and 21st, 2017, the City of High Point concurred with the determination that the greenway and future park component around the crossing are part of joint development and Section 4(f) is not applicable. FHWA also agreed with this determination. **Appendix A** includes the concurrence from the City of High Point.

Response to Question #8 – MSAT Analysis

The purpose of this project is to improve existing and projected traffic flow and capacity on Johnson Street and Sandy Ridge Road, and to provide facilities for pedestrians and bicyclists along the corridor by constructing a four-lane median divided roadway with bike lanes, sidewalk, and multi-use path. This project has been determined to generate minimal air quality impacts for Clean Air Act criteria pollutants and has not been linked with any special mobile source air toxic (MSAT) concerns. As such, this project will not result in changes in traffic volumes, vehicle mix, basic project location, or any other factor that would cause a meaningful increase in MSAT impacts of the project from that of the no-build alternative.

Response to Question #10 - Waters

West Fork Deep River is classified as Class WS IV and Critical Supply Watershed. Class WS-IV (Water Supply) waters are protected for uses such as drinking, culinary or food processing purposes. Since the proposed project corridor is partially located in a Critical Area, Hazardous Spill Basins will be required.

An identified Critical Area (CA) water associated with the West Fork Deep River (Oak Hollow Reservoir, Index No. 17-3-[0.7]) is located within the project vicinity. West Fork Deep River is also identified as impaired by the North Carolina 2014 Final 303(d) list of impaired waters due to Fish Community Poor (Nar, AL, FW).

131 linear feet of streams and 368 square feet (0.008 acres) of wetlands will be permanently impacted. These impacts will be assessed during final design and measures will be taken to minimize impacts to the extent practicable. 93 linear feet of streams and 1,385 square feet of ponds and wetlands will be temporarily impacted by the proposed construction easement. The project is located within the Randleman Lake Watershed Riparian Buffer Protection Program, and a total of 71,013 square feet (1.63 acres) of riparian buffers to streams and ponds will be impacted from this project.

Due to total wetland and surface water impacts being less than one-half acre and permanent impacts to any given stream are less than 300 linear feet, a Nationwide 14 permit for Linear Transportation Projects or General Permit may be used. A NCDWR Water Quality Certification No. 3886 would also be required. If the above-stated thresholds are exceeded, the project will require Individual Section 404 and 401 permits. The USACE holds the final discretion as to what permit will be required to authorize project construction. If a Section 404 permit is required, then a Section 401 Water Quality Certification (WQC) from the NCWR will be needed.

Response to Question #14 – Section 106

There is one Historic Architecture resource, the Elihu and Abigail Mendenhall House (GF1544), within the project's Area of Potential Effects (APE); however, the resource will not be impacted. There are no National Register listed or eligible Archaeological Sites present within the APE.

Three cemeteries are located within the APE:

- Zion Hill Methodist Cemetery (Site 31GF5700)
- Smith Grove Baptist Cemetery (Site 31GF571)
- Sandy Ridge Methodist Cemetery (Site 31GF572)

During the archaeological survey, the Sandy Ridge Methodist Cemetery was identified as having a high potential for the presence of unmarked graves. Ground penetrating radar survey of a portion of the Sandy Ridge Methodist Cemetery identified the presence of three marked graves and 24 unmarked probable graves.

All three cemeteries should be avoided by proposed construction activities. North Carolina General Statute, Chapter 65, Article 12 and North Carolina General Statute, Chapter 70, provide additional protections for the cemeteries. If avoidance is not possible, it will be

necessary to comply with these statutes after consultation with the State Archaeologist to determine the method any burials are to be removed and relocated. Relevant historic resources documents are attached in **Appendix B**. Due to the number of pages, the Archaeological Form in the appendix is the report only. The complete document is located at https://connect.ncdot.gov/site/Preconstruction/division/div07/U-4758/Human%20Environment/U-4758%20Guilford%20No%20NRHP%20Archaeological%20Sites%20Present%20Form.pdf

Response to Question #15 – Hazardous Waste

Two petroleum storage tanks are located within the project vicinity; one is located off of Sandy Camp Road and the other is located at the Circle K on Norcross Road.

Three underground storage tanks incidents, two of which are ranked as a low risk and one ranked as high risk, have occurred off of Norcross Road. Two other underground storage tank incidents (one high risk and one low risk) occurred off of Sandy Camp Road.

No other hazardous waste sites are located near the project.

Response to Question #16 – Floodways and Floodplains

The project encroaches upon a regulatory floodway (Zone AE) that is associated with the West Fork River, just south of the Johnson Street Sports Complex. Impacts to the floodway due to the project will be further evaluated during final design.

Response to Question #26 – Section 6(f)

The project does require the acquisition of lands under the protection of Section 6(f) of the Land and Water Conservation Act (LWCF). The project requires additional right of way from Oak Hollow Park (LWCF Project # 37-00174) property along the east side of the roadway at the West Fork Deep River Crossing in order to avoid the Johnson Street Sports Complex. A temporary easement will also need to be acquired from the Johnson Street Sports Complex in order to construct the widening of Johnson Street from two lanes to four lanes.

The proposed roadway and bridge improvements will require the conversion of use for approximately 0.8 acre of right of way and 0.9 acre of temporary easement from the Oak Hollow Park. The proposed non-conforming use for the temporary easement will require approximately 0.12 acre from the Johnson Street Sports Complex to reconstruct the entrance in its existing location. No replacement land will need to be acquired since the project will not permanently convert park property to non-recreation use.

This process has been initiated by the City of High Point, Parks and Recreation Director. Letters requesting the conversion of use and non-conforming use were submitted to the NC Division of Parks and Recreation.

The NCDOT Project Management Unit will continue to coordinate and support the City with these LWCF conversion of use and non-conforming use requests to ensure process completion.

Response to Question #28 – Traffic Noise

The source of this traffic noise information is from the "*Traffic Noise Report – Johnson Street Sandy Ridge Road Widening*" (October 2018) completed by Atkins.

Summary

A traffic noise evaluation was performed that preliminarily identified three noise barriers (NW5A, NW5B, and NW10) meet feasible and reasonable criteria found in the NCDOT Traffic Noise Policy. A more detailed analysis will be completed during project final design. Noise barriers found to be feasible and reasonable during the preliminary noise analysis may not be found to be feasible and reasonable during the final design noise analysis due to changes in proposed project alignment and other design considerations, surrounding land use development, or utility conflicts, among other factors. Conversely, noise barriers that were not considered feasible and reasonable may meet the established criteria and be recommended for construction. This evaluation was conducted in accordance with the highway traffic noise requirements of Title 23 CFR Part 772.

In accordance with NCDOT Traffic Noise Policy, the Federal/State governments are not responsible for providing noise abatement measures for new development for which building permits are issued after the Date of Public Knowledge. The Date of Public Knowledge of the proposed highway project will be the approval date of the Categorical Exclusion (CE).

Traffic Noise Impacts

The maximum number of receptors in each project alternative predicted to become impacted by future traffic noise is shown in **Table 4**. The table includes those receptors expected to experience traffic noise impacts by either approaching or exceeding the FHWA Noise Abatement Criteria or by a substantial increase in exterior noise levels.

Table 4 - Predicted Traffic Noise Impacts by Alternative*

Alternative	**Traffic Noise Impacts**			
	Residential (NAC B)	Places of Worship/Schools, Parks, etc. (NAC C & D)	Businesses (NAC E)	Total
Build 1	41	2	0	43

*Per TNM 2.5 and in accordance with 23 CFR Part 772

Noise Barriers

A noise barrier evaluation was conducted for this project utilizing the Traffic Noise Model (TNM 2.5) software developed by the FHWA. **Table 5** summarizes the results of the evaluation.

Table 5 - Preliminary Noise Barrier Evaluation Results

Alternative (Noise Barrier Location)	Length / Height (feet)	Square Footage	Number of Benefited Receptors	Square Feet per Benefited Receptor / Allowable Square Feet per Benefited Receptor	Preliminarily Feasible and Reasonable (Likely) for Construction[1]
NSA 5 / NW5A	351	3,149	4	1,050 / 2,000	Yes
NSA 5 / NW5B	338	2,880	2	1,440 / 2,000	Yes
NSA 10 / NW10	374	2,992	2	1,496 / 1,500	Yes

[1]The likelihood for barrier construction is preliminary and subject to change, pending completion of final design and the public involvement process.

Response to Question #29 – Prime Farmland

Farmland soils eligible for protection under the Farmland Protection Policy Act (FPPA) are present within the project footprint. A preliminary screening of farmland conversion impacts in the project area has been completed (NRCS Form CPA-106, Part VI) and a total score of 46 out of 160 points was calculated for the U-4758 project site (See U-4758 Community Characteristics Report, August 2012). Since the total site assessment score does not exceed the 60-point threshold established by NRCS, farmland conversion impacts may be anticipated, but are not considered notable.

H. Project Commitments

Guilford County
Johnson Street / Sandy Ridge Road Widening
Federal Project No. - HPP-0710(25)(26)(27)(28)
WBS No. – 40251.1.1
STIP No. – U-4758

NCDOT Project Management Unit

- Continue to coordinate and support the City with the LWCF conversion of use and non-conforming use requests to ensure process completion.

- Due to complexity and schedule of the adjacent projects (I-5712, U-6068, and I-5981), additional coordination will be necessary in order to finalize the roadway configurations of Norcross Road, Endicott Road, and the Piedmont Triad Farmers Market entrance.

- During final design, determine feasibility and reasonableness of installing noise barriers NW5A, NW5B, and NW10.

- Hazardous spill protection measures will be provided at stream crossings within ½ mile of the water supply watershed critical area for Oak Hollow Reservoir.

NCDOT Division 7

- Unmarked graves are possible at the Sandy Ridge Methodist Cemetery. North Carolina General Statute, Chapter 65, Article 12 and North Carolina General Statute, Chapter 70, provide protections for the cemeteries. If avoidance is not possible, it will be necessary to comply with these statutes after consultation with the State Archaeologist to determine the method any burials are to be removed and relocated.

- This project involves construction activities on or adjacent to a FEMA-regulated stream(s). Therefore, the Division will submit sealed as-built construction plants to the NCDOT Hydraulics Unit Upon completion of project construction, certifying the drainage structure(s) and roadway embankment located within the 100-year floodplain were built as shown in construction plans, both horizontally and vertically.

- Due to total wetland and surface water impacts being less than one-half acre and permanent impacts to any given stream are less than 300 linear feet, a Nationwide 14 permit for Linear Transportation Projects or General Permit may be used. A NCDWR Water Quality Certification No. 3886 would also be required. If the above-stated thresholds are exceeded, the project will require Individual Section 404 and 401 permits. The USACE holds the final discretion as to what permit will be required to authorize project construction. If a Section 404 permit is required then a Section 401 Water Quality Certification (WQC) from the NCWR will be needed.

I. Categorical Exclusion Approval

STIP Project No.	**U-4758**
WBS Element	**40251.1.1**
Federal Project No.	**HPP-0710(25)(26)(27)(28)**

Prepared By:

11/14/2018
Date

DocuSigned by:
Bob Boot
E1206F2898FD4D9...
Robert Boot, Senior NEPA Planner / Project Manager
Atkins

Prepared For: North Carolina Department of Transportation

Reviewed By:

11/14/2018
Date

DocuSigned by:
John Jamison
89F83E75FD11458...
for Derrick Weaver, Environmental Policy Unit Head
North Carolina Department of Transportation

NCDOT certifies that the proposed action qualifies as a Type III Categorical Exclusion.

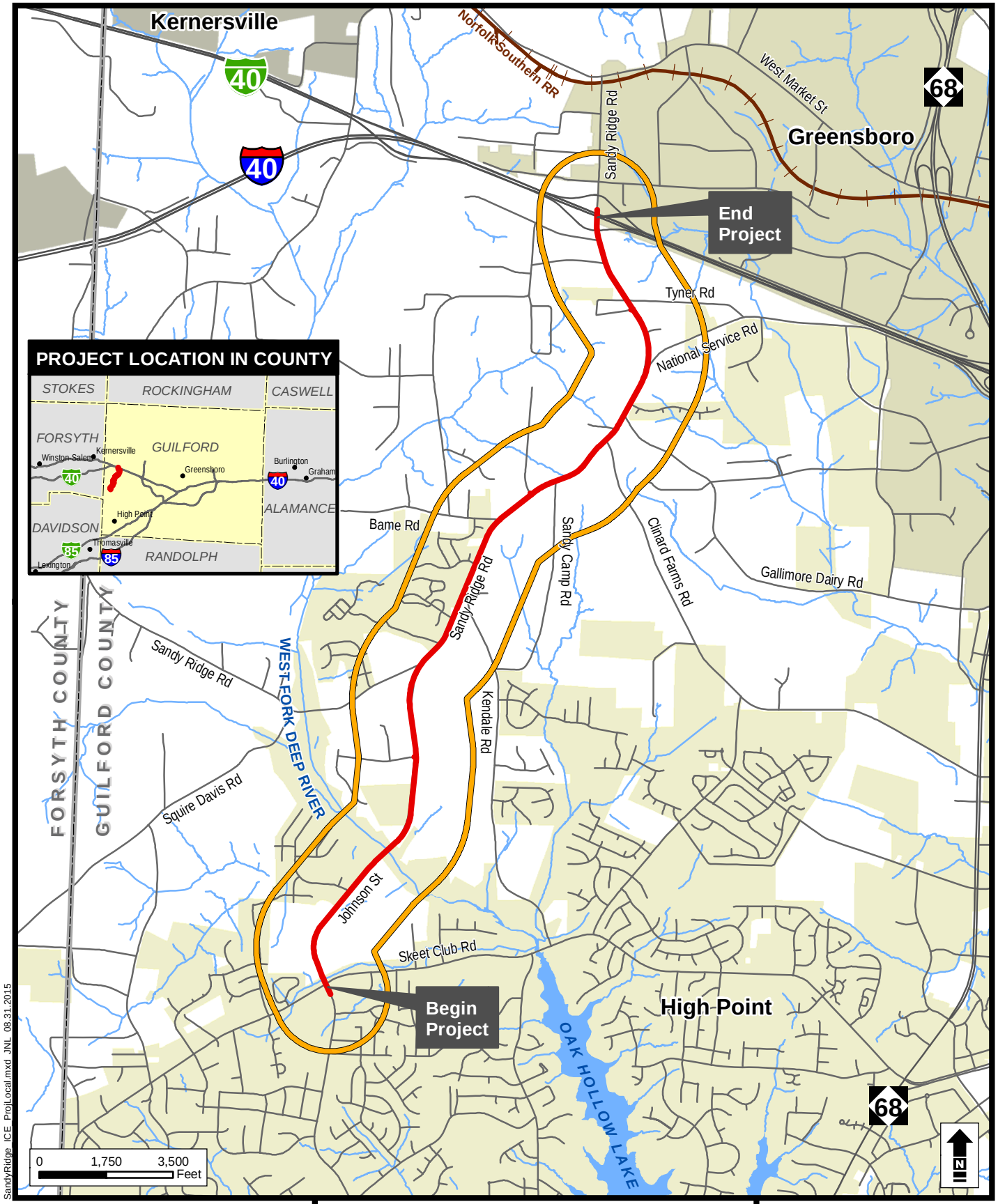
11/19/2018
Date

DocuSigned by:
P.E. Sutton
AE35E3E6727640E...
Laura Sutton, PE Project Management Team (Division 7,9,10) Lead
North Carolina Department of Transportation

FHWA Approval:

11/29/2018
Date

DocuSigned by:
for, Felix Davila
C1DEE33365CC4CD...
John F. Sullivan, III, PE, Division Administrator
Federal Highway Administration



SandyRidge_ICE_ProjLocal.mxd JNL 08.31.2015

JOHNSON ST / SANDY RIDGE RD IMPROVEMENT PROJECT

STIP PROJECT
NO. U-4758
Guilford County, NC

LEGEND

- Proposed Mainline
- Project Study Area
- Streams *Water*

Municipal Limits

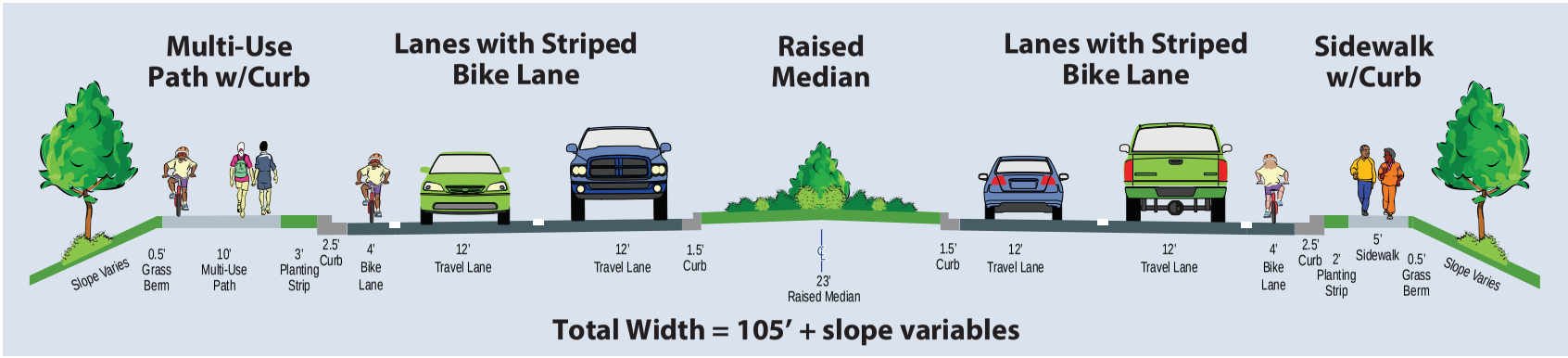
- Greensboro
- High Point
- Kernersville

Source: Guilford County, NCDOT, NCOneMap

PROJECT LOCATION MAP

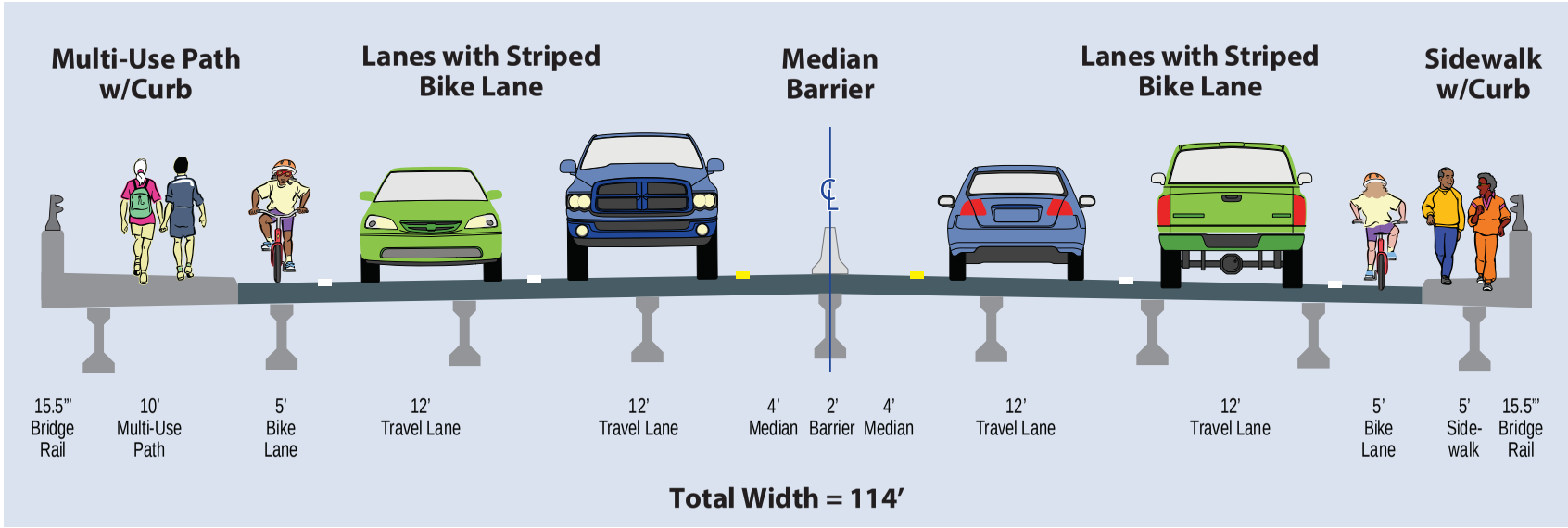
FIGURE 1

Roadway Typical Section



Total Width = 105′ + slope variables

Deep River Bridge Typical Section



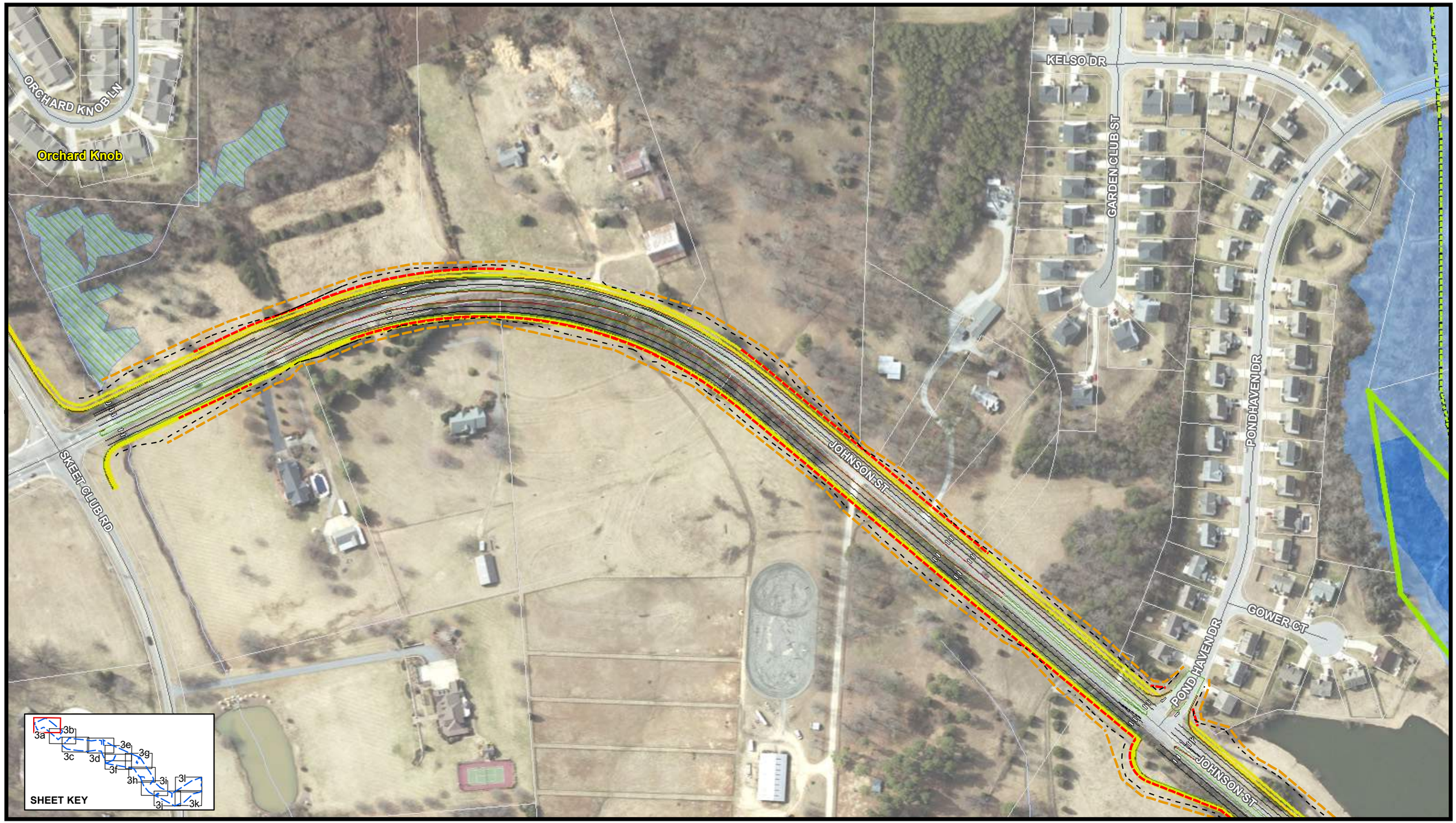
Total Width = 114′

JOHNSON ST / SANDY RIDGE RD IMPROVEMENT PROJECT

STIP PROJECT NO. U-4758
Guilford County, North Carolina

PROPOSED TYPICAL SECTION

FIGURE 2



JSSR_CE_PrelimDesignMapbook_Help.mxd 10.18.2018 JNL

JOHNSON ST / SANDY RIDGE RD IMPROVEMENT PROJECT

STIP PROJECT NO. U-4758
Guilford County, North Carolina

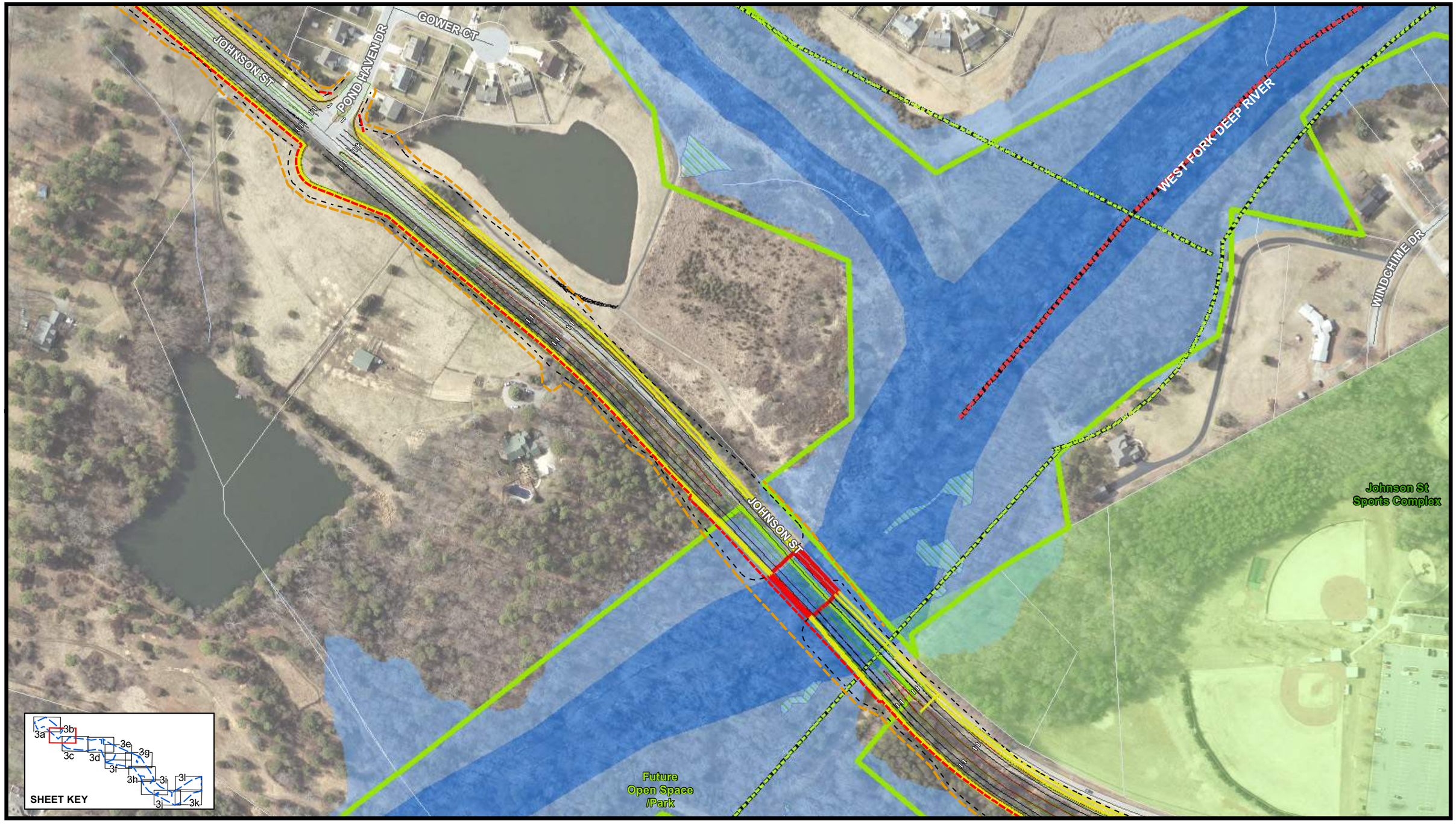
0 100 200 Feet
Source: Guilford County, NCDOT, NCSHPO, NCOneMap, Photography Date: 01/01/2014

Legend

- Proposed Concrete Curb and Gutter
- Proposed Sidewalk/ Multi-use Path
- Proposed Edge of Travel Lane
- Proposed Lane Lines
- Proposed Roadway Bridge
- Slopestake Lines
- Proposed Noise Barrier
- Proposed Right of Way
- Proposed Easement Construction
- Proposed Ashpalt Removal
- Proposed Concrete Island
- Proposed Lane Arrow
- Neighborhoods
- Cemetery
- Church
- EMT
- Fire Station
- Historic Sites
- Future Greenway
- County Parks
- Future Park
- Parcels
- 303(d) Streams
- Streams
- Delineated Wetlands
- Major Lakes
- Floodway
- 100 Year Floodplain
- State Owned Land
- Proposed Traffic Signal

SELECTED ALTERNATIVE
PRELIMINARY DESIGNS (SUBJECT TO CHANGE)

FIGURE 3a



JSSR_CE_PrelimDesignMapbook_Help.mxd 10.18.2018 JNL

JOHNSON ST / SANDY RIDGE RD IMPROVEMENT PROJECT

STIP PROJECT NO. U-4758
Guilford County, North Carolina

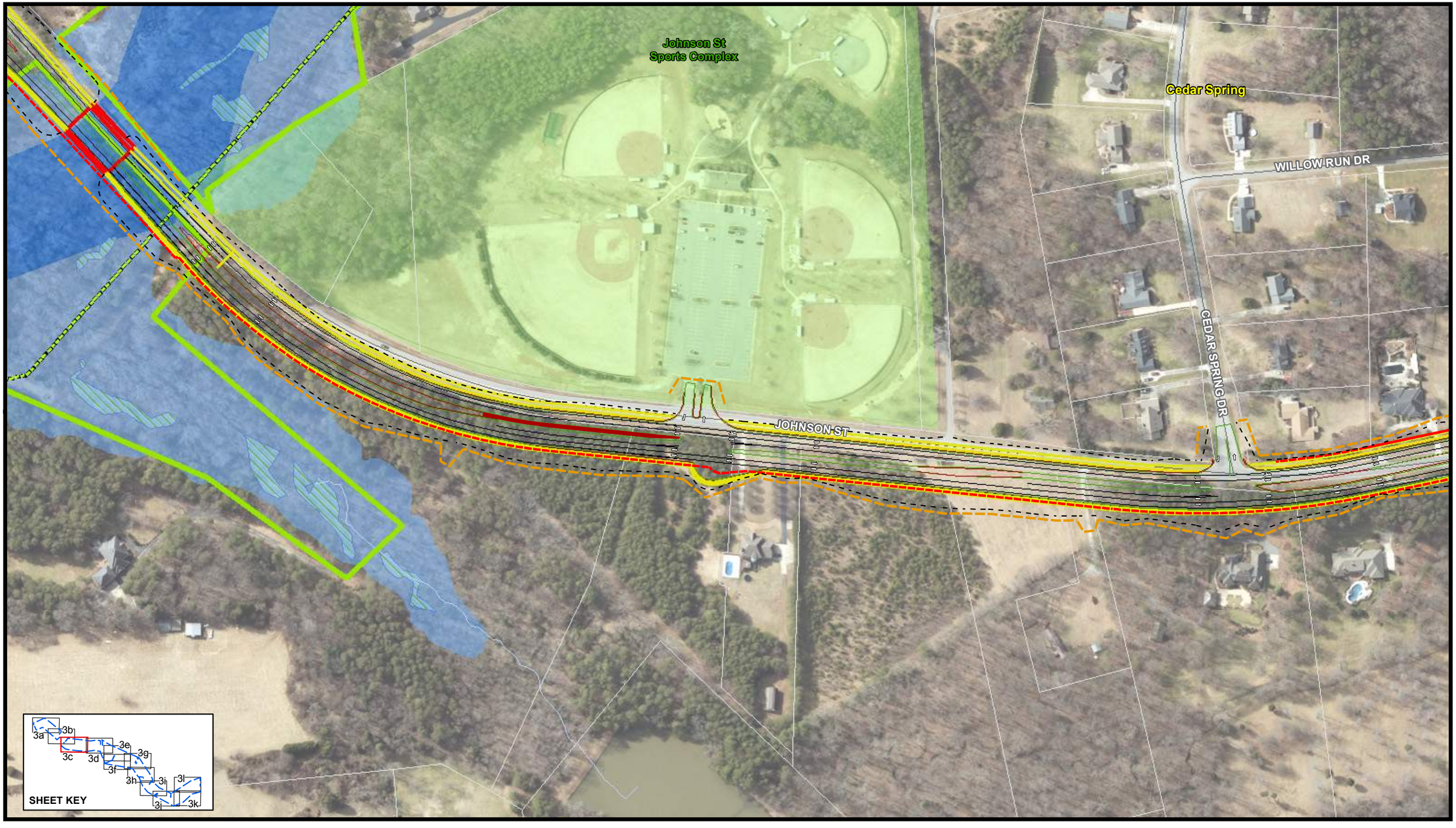
0 100 200 Feet
Source: Guilford County, NCDOT, NCSHPO, NCOneMap, Photography Date: 01/01/2014

Legend

- Proposed Concrete Curb and Gutter
- Proposed Sidewalk/ Multi-use Path
- Proposed Edge of Travel Lane
- Proposed Lane Lines
- Proposed Roadway Bridge
- Slopestake Lines
- Proposed Noise Barrier
- Proposed Right of Way
- Proposed Easement Construction
- Proposed Ashpalt Removal
- Proposed Concrete Island
- Proposed Lane Arrow
- XX Neighborhoods
- Cemetery
- Church
- EMT
- Fire Station
- Historic Sites
- Future Greenway
- County Parks
- Future Park
- Parcels
- 303(d) Streams
- Streams
- Delineated Wetlands
- Major Lakes
- Floodway
- 100 Year Floodplain
- State Owned Land
- Proposed Traffic Signal

SELECTED ALTERNATIVE
PRELIMINARY DESIGNS (SUBJECT TO CHANGE)

FIGURE 3b



JSSR_CE_PrelimDesignMapbook_Help.mxd 10.18.2018 JNL

JOHNSON ST / SANDY RIDGE RD IMPROVEMENT PROJECT

STIP PROJECT NO. U-4758
Guilford County, North Carolina

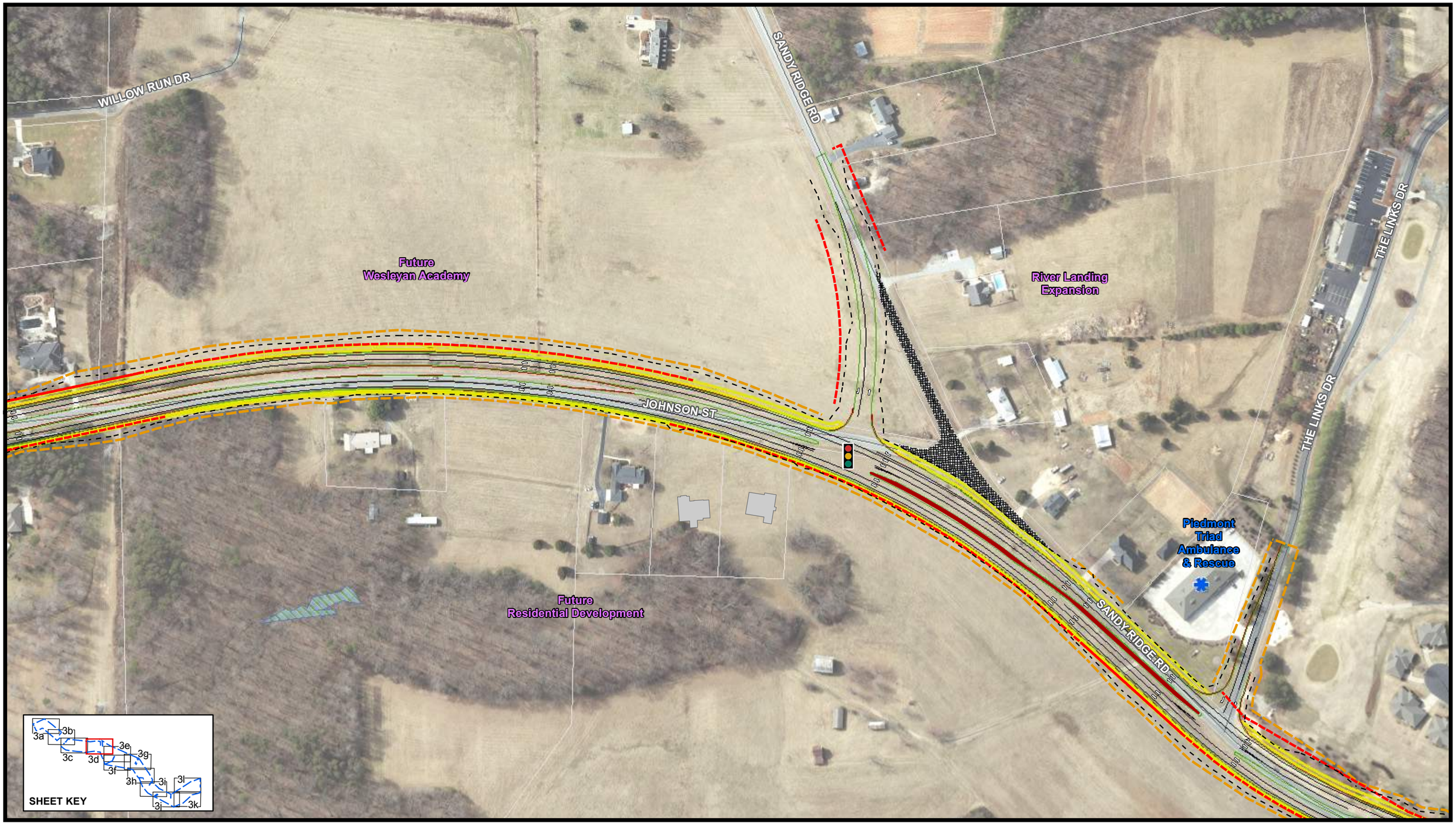
0 100 200 Feet
Source: Guilford County, NCDOT, NCSHPO, NCOneMap, Photography Date: 01/01/2014

Legend

- Proposed Concrete Curb and Gutter
- Proposed Sidewalk/ Multi-use Path
- Proposed Edge of Travel Lane
- Proposed Lane Lines
- Proposed Roadway Bridge
- Slopestake Lines
- Proposed Noise Barrier
- Proposed Right of Way
- Proposed Easement Construction
- Proposed Ashpalt Removal
- Proposed Concrete Island
- Proposed Lane Arrow
- Neighborhoods
- Cemetery
- Church
- EMT
- Fire Station
- Historic Sites
- Future Greenway
- County Parks
- Future Park
- Parcels
- 303(d) Streams
- Streams
- Delineated Wetlands
- Major Lakes
- Floodway
- 100 Year Floodplain
- State Owned Land
- Proposed Traffic Signal

SELECTED ALTERNATIVE
PRELIMINARY DESIGNS (SUBJECT TO CHANGE)

FIGURE 3c



JSSR_CE_PrelimDesignMapbook_Help.mxd 10.18.2018 JNL

JOHNSON ST / SANDY RIDGE RD IMPROVEMENT PROJECT

STIP PROJECT NO. U-4758
Guilford County, North Carolina

0 100 200 Feet

Source: Guilford County, NCDOT, NCSHPO, NCOneMap, Photography Date: 01/01/2014

Legend

- Proposed Concrete Curb and Gutter
- Proposed Sidewalk/ Multi-use Path
- Proposed Edge of Travel Lane
- Proposed Lane Lines
- Proposed Roadway Bridge
- Slopestake Lines
- Proposed Noise Barrier
- Proposed Right of Way
- Proposed Easement Construction
- Proposed Ashpalt Removal
- Proposed Concrete Island
- Proposed Lane Arrow
- XX Neighborhoods
- Cemetery
- Church
- EMT
- Fire Station
- Historic Sites
- Future Greenway
- County Parks
- Future Park
- Parcels
- 303(d) Streams
- Streams
- Delineated Wetlands
- Major Lakes
- Floodway
- 100 Year Floodplain
- State Owned Land
- Proposed Traffic Signal

SELECTED ALTERNATIVE
PRELIMINARY DESIGNS (SUBJECT TO CHANGE)

FIGURE 3d

JSSR_CE_PrelimDesignMapbook_Help.mxd 10.18.2018 JNL

JOHNSON ST / SANDY RIDGE RD IMPROVEMENT PROJECT

STIP PROJECT NO. U-4758
Guilford County, North Carolina

0 100 200 Feet
Source: Guilford County, NCDOT, NCSHPO, NCOneMap, Photography Date: 01/01/2014

Legend

- Proposed Concrete Curb and Gutter
- Proposed Sidewalk/ Multi-use Path
- Proposed Edge of Travel Lane
- Proposed Lane Lines
- Proposed Roadway Bridge
- Slopestake Lines
- Proposed Noise Barrier
- Proposed Right of Way
- Proposed Easement Construction
- Proposed Ashpalt Removal
- Proposed Concrete Island
- Proposed Lane Arrow
- Neighborhoods
- Cemetery
- Church
- EMT
- Fire Station
- Historic Sites
- Future Greenway
- County Parks
- Future Park
- Parcels
- 303(d) Streams
- Streams
- Delineated Wetlands
- Major Lakes
- Floodway
- 100 Year Floodplain
- State Owned Land
- Proposed Traffic Signal

SELECTED ALTERNATIVE
PRELIMINARY DESIGNS (SUBJECT TO CHANGE)

FIGURE 3e

JSSR_CE_PrelimDesignMapbook_Help.mxd 10.18.2018 JNL

JOHNSON ST / SANDY RIDGE RD IMPROVEMENT PROJECT

STIP PROJECT NO. U-4758
Guilford County, North Carolina

0 100 200 Feet
Source: Guilford County, NCDOT, NCSHPO, NCOneMap, Photography Date: 01/01/2014

Legend

- Proposed Concrete Curb and Gutter
- Proposed Sidewalk/ Multi-use Path
- Proposed Edge of Travel Lane
- Proposed Lane Lines
- Proposed Roadway Bridge
- Slopestake Lines
- Proposed Noise Barrier
- Proposed Right of Way
- Proposed Easement Construction
- Proposed Ashpalt Removal
- Proposed Concrete Island
- Proposed Lane Arrow
- Neighborhoods
- Cemetery
- Church
- EMT
- Fire Station
- Historic Sites
- Future Greenway
- County Parks
- Future Park
- Parcels
- 303(d) Streams
- Streams
- Delineated Wetlands
- Major Lakes
- Floodway
- 100 Year Floodplain
- State Owned Land
- Proposed Traffic Signal

SELECTED ALTERNATIVE
PRELIMINARY DESIGNS (SUBJECT TO CHANGE)

FIGURE 3f

JSSR_CE_PrelimDesignMapbook_Help.mxd 10.18.2018 JNL

JOHNSON ST / SANDY RIDGE RD IMPROVEMENT PROJECT

STIP PROJECT NO. U-4758
Guilford County, North Carolina

0 100 200 Feet

Source: Guilford County, NCDOT, NCSHPO, NCOneMap, Photography Date: 01/01/2014

Legend

- Proposed Concrete Curb and Gutter
- Proposed Sidewalk/ Multi-use Path
- Proposed Edge of Travel Lane
- Proposed Lane Lines
- Proposed Roadway Bridge
- Slopestake Lines
- Proposed Noise Barrier
- Proposed Right of Way
- Proposed Easement Construction
- Proposed Ashpalt Removal
- Proposed Concrete Island
- Proposed Lane Arrow
- Neighborhoods
- Cemetery
- Church
- EMT
- Fire Station
- Historic Sites
- Future Greenway
- County Parks
- Future Park
- Parcels
- 303(d) Streams
- Streams
- Delineated Wetlands
- Major Lakes
- Floodway
- 100 Year Floodplain
- State Owned Land
- Proposed Traffic Signal

SELECTED ALTERNATIVE
PRELIMINARY DESIGNS (SUBJECT TO CHANGE)

FIGURE 3g

JSSR_CE_PrelimDesignMapbook_Help.mxd 10.18.2018 JNL

JOHNSON ST / SANDY RIDGE RD IMPROVEMENT PROJECT

STIP PROJECT NO. U-4758
Guilford County, North Carolina

0 100 200 Feet

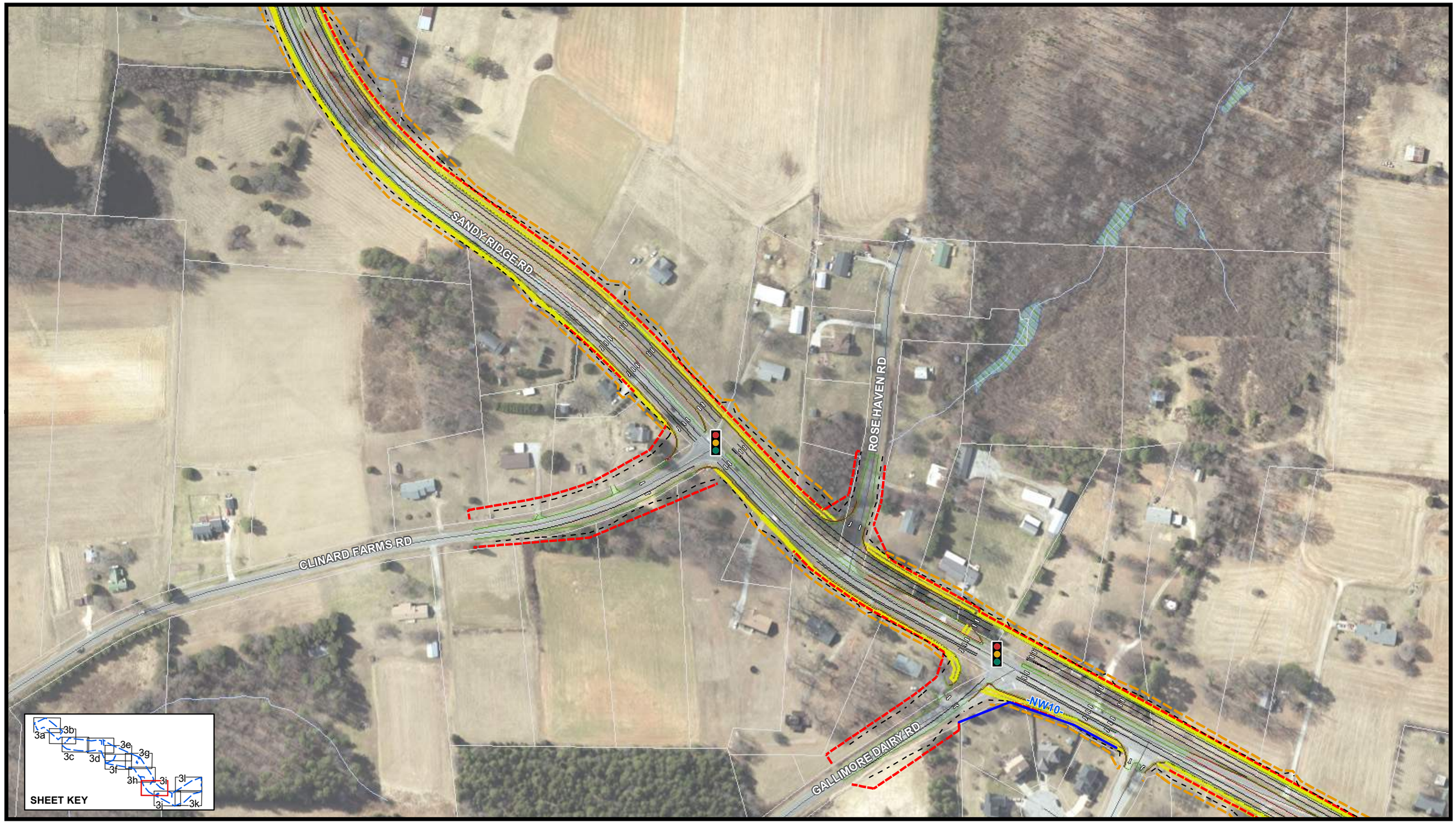
Source: Guilford County, NCDOT, NCSHPO, NCOneMap, Photography Date: 01/01/2014

Legend

- Proposed Concrete Curb and Gutter
- Proposed Sidewalk/ Multi-use Path
- Proposed Edge of Travel Lane
- Proposed Lane Lines
- Proposed Roadway Bridge
- Slopestake Lines
- Proposed Noise Barrier
- Proposed Right of Way
- Proposed Easement Construction
- Proposed Ashpalt Removal
- Proposed Concrete Island
- Proposed Lane Arrow
- Neighborhoods
- Cemetery
- Church
- EMT
- Fire Station
- Historic Sites
- Future Greenway
- County Parks
- Future Park
- Parcels
- 303(d) Streams
- Streams
- Delineated Wetlands
- Major Lakes
- Floodway
- 100 Year Floodplain
- State Owned Land
- Proposed Traffic Signal

SELECTED ALTERNATIVE
PRELIMINARY DESIGNS (SUBJECT TO CHANGE)

FIGURE 3h



JSSR_CE_PrelimDesignMapbook_Help.mxd 10.18.2018 JNL

JOHNSON ST / SANDY RIDGE RD IMPROVEMENT PROJECT

STIP PROJECT NO. U-4758
Guilford County, North Carolina

0 100 200 Feet

Source: Guilford County, NCDOT, NCSHPO, NCOneMap, Photography Date: 01/01/2014

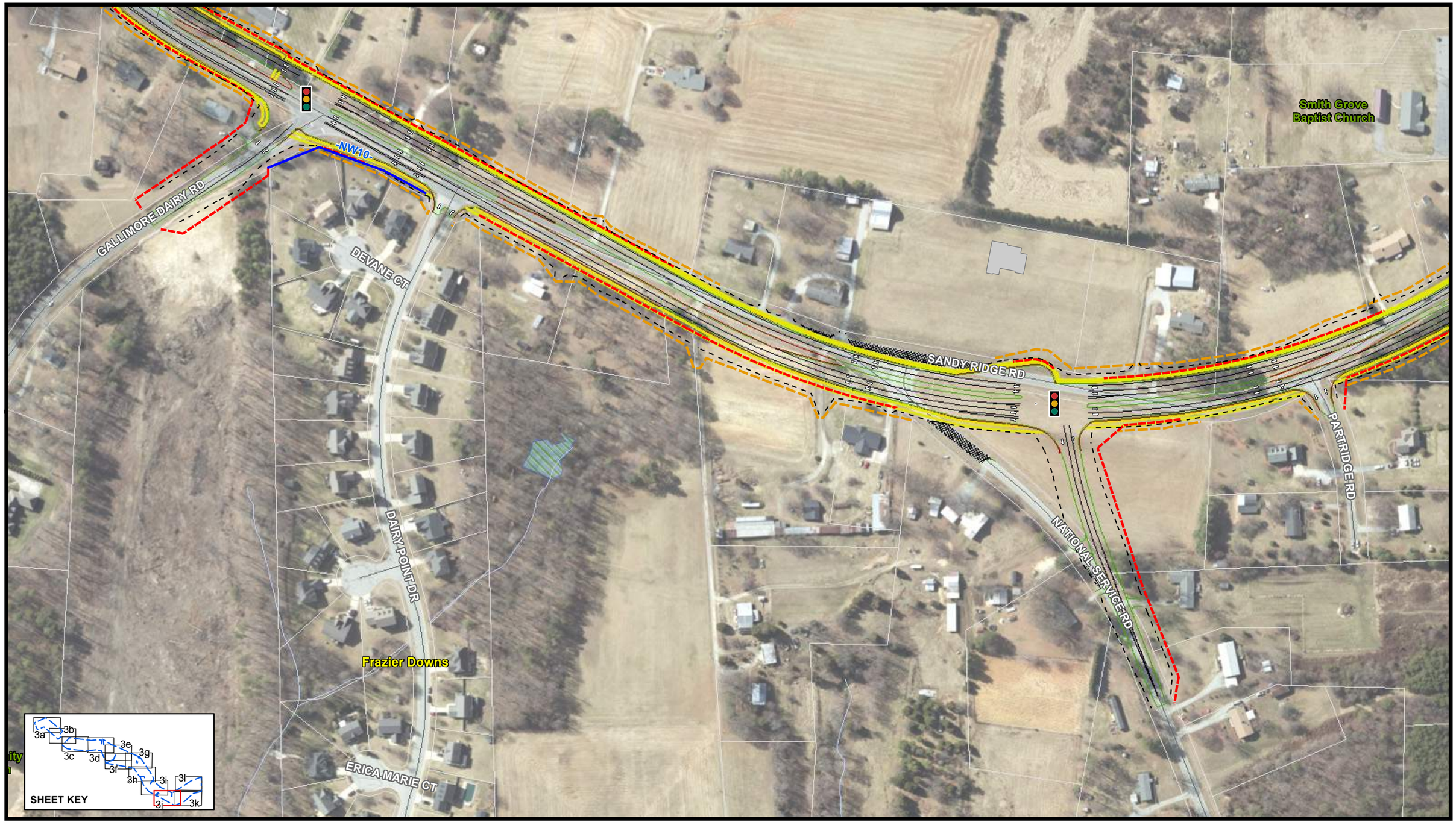
Legend

- Proposed Concrete Curb and Gutter
- Proposed Sidewalk/ Multi-use Path
- Proposed Edge of Travel Lane
- Proposed Lane Lines
- Proposed Roadway Bridge
- Slopestake Lines
- Proposed Noise Barrier
- Proposed Right of Way
- Proposed Easement Construction
- Proposed Ashpalt Removal
- Proposed Concrete Island
- Proposed Lane Arrow
- Neighborhoods
- Cemetery
- Church
- EMT
- Fire Station
- Historic Sites
- Future Greenway
- County Parks
- Future Park
- Parcels
- 303(d) Streams
- Streams
- Delineated Wetlands
- Major Lakes
- Floodway
- 100 Year Floodplain
- State Owned Land
- Proposed Traffic Signal

SELECTED ALTERNATIVE

PRELIMINARY DESIGNS (SUBJECT TO CHANGE)

FIGURE 3i



JSSR_CE_PrelimDesignMapbook_Help.mxd 10.18.2018 JNL

JOHNSON ST / SANDY RIDGE RD IMPROVEMENT PROJECT

STIP PROJECT NO. U-4758
Guilford County, North Carolina

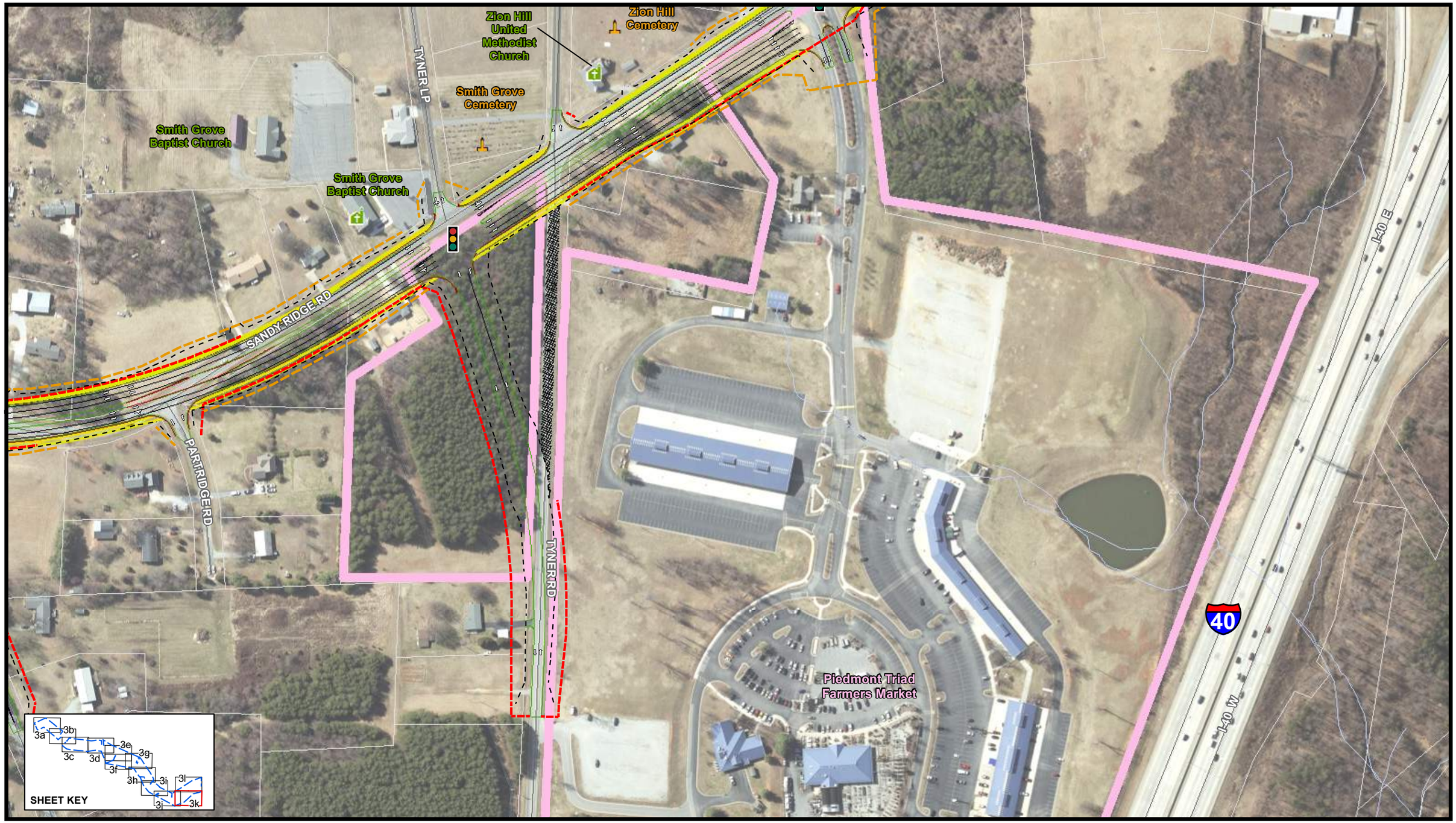
0 100 200 Feet
Source: Guilford County, NCDOT, NCSHPO, NCOneMap, Photography Date: 01/01/2014

Legend

- Proposed Concrete Curb and Gutter
- Proposed Sidewalk/ Multi-use Path
- Proposed Edge of Travel Lane
- Proposed Lane Lines
- Proposed Roadway Bridge
- Slopestake Lines
- Proposed Noise Barrier
- Proposed Right of Way
- Proposed Easement Construction
- Proposed Ashpalt Removal
- Proposed Concrete Island
- Proposed Lane Arrow
- Neighborhoods
- Cemetery
- Church
- EMT
- Fire Station
- Historic Sites
- Future Greenway
- County Parks
- Future Park
- Parcels
- 303(d) Streams
- Streams
- Delineated Wetlands
- Major Lakes
- Floodway
- 100 Year Floodplain
- State Owned Land
- Proposed Traffic Signal

SELECTED ALTERNATIVE
PRELIMINARY DESIGNS (SUBJECT TO CHANGE)

FIGURE 3j



JSSR_CE_PrelimDesignMapbook_Help.mxd 10.18.2018 JNL

JOHNSON ST / SANDY RIDGE RD IMPROVEMENT PROJECT

STIP PROJECT NO. U-4758
Guilford County, North Carolina

0 100 200 Feet

Source: Guilford County, NCDOT, NCSHPO, NCOneMap, Photography Date: 01/01/2014

Legend

- Proposed Concrete Curb and Gutter
- Proposed Sidewalk/ Multi-use Path
- Proposed Edge of Travel Lane
- Proposed Lane Lines
- Proposed Roadway Bridge
- Slopestake Lines
- Proposed Noise Barrier
- Proposed Right of Way
- Proposed Easement Construction
- Proposed Ashpalt Removal
- Proposed Concrete Island
- Proposed Lane Arrow
- XX Neighborhoods
- Cemetery
- Church
- EMT
- Fire Station
- Historic Sites
- Future Greenway
- County Parks
- Future Park
- Parcels
- 303(d) Streams
- Streams
- Delineated Wetlands
- Major Lakes
- Floodway
- 100 Year Floodplain
- State Owned Land
- Proposed Traffic Signal

SELECTED ALTERNATIVE

PRELIMINARY DESIGNS (SUBJECT TO CHANGE)

FIGURE 3k

Cheerwine Distribution Plant

ENDICOTT RD

NORCROSS RD

Circle K

Home Detectives

TYNER LP

Living Waterscapes

SANDY RIDGE RD

Truck Parts Specialist

Zion Hill United Methodist Church

Zion Hill Cemetery

SHEET KEY

3a 3b 3c 3d 3e 3f 3g 3h 3i 3j 3k 3l

JSSR_CE_PrelimDesignMapbook_Help.mxd 10.18.2018 JNL

JOHNSON ST / SANDY RIDGE RD IMPROVEMENT PROJECT

STIP PROJECT NO. U-4758

Guilford County, North Carolina

0 100 200 Feet

Source: Guilford County, NCDOT, NCSHPO, NCOneMap, Photography Date: 01/01/2014

Legend

- Proposed Concrete Curb and Gutter
- Proposed Sidewalk/ Multi-use Path
- Proposed Edge of Travel Lane
- Proposed Lane Lines
- Proposed Roadway Bridge
- Slopestake Lines
- Proposed Noise Barrier
- Proposed Right of Way
- Proposed Easement Construction
- Proposed Ashpalt Removal
- Proposed Concrete Island
- Proposed Lane Arrow
- XX Neighborhoods
- Cemetery
- Church
- EMT
- Fire Station
- Historic Sites
- Future Greenway
- County Parks
- Future Park
- Parcels
- 303(d) Streams
- Streams
- Delineated Wetlands
- Major Lakes
- Floodway
- 100 Year Floodplain
- State Owned Land
- Proposed Traffic Signal

SELECTED ALTERNATIVE

PRELIMINARY DESIGNS (SUBJECT TO CHANGE)

FIGURE 3I

APPENDIX A
SECTION 4(F) CONCURRENCE

Boot, Robert A

From: LEE TILLERY <lee.tillery@highpointnc.gov>
Sent: Tuesday, March 21, 2017 4:29 PM
To: Bereis, Kimberly D
Cc: MARK MCDONALD; Williams, John L
Subject: RE: NCDOT STIP No. U-4758 (JSSRR Widening) - Section 4(f) Letter **Response Requested**

I concur with the plan outlined below.

Thanks,
Lee

LEE TILLERY
CITY OF HIGH POINT
DIRECTOR, PARKS AND RECREATION

136 Northpoint Avenue | High Point, NC 27262
336.883.3473 | fax: 336.822.7209

From: Bereis, Kimberly D [mailto:Kimberly.Bereis@atkinsglobal.com]
Sent: Wednesday, March 15, 2017 11:20 AM
To: LEE TILLERY <lee.tillery@highpointnc.gov>
Cc: MARK MCDONALD <mark.mcdonald@highpointnc.gov>; Williams, John L <jlwilliams@ncdot.gov>
Subject: RE: NCDOT STIP No. U-4758 (JSSRR Widening) - Section 4(f) Letter **Response Requested**

Good morning, Lee.

John and I met with Felix Davila (FHWA) on Friday, and he agrees that Joint Development applies to the resource and U-4758 project in this case. However, he has requested clarification for us to include it the NEPA document. Please verify (with a response to this email) that your concurrence applies to the greenway (Regency) proposed along the WFDR as well as the future open space park around the crossing. Essentially, he just wants your concurrence that both the greenway and future park component apply, as the letter emphasizes the greenway portion within the park and greenway system.

Thanks,

Kim Bereis, AICP
Senior Planner/Project Manager, Transportation NEPA

ATKINS
Find out more about what we do and how we do it – www.atkinsglobal.com

5200 Seventy Seven Center Drive, #500, Charlotte, NC, 28217 | Tel: +1 (704) 522 7275 Ext. 4294404 | Fax: +1 (704) 525 2838 | Direct: +1 **(704) 665 4404** | Cell: +1 (704) 604 5883
Email: kimberly.bereis@atkinsglobal.com | Web: www.atkinsglobal.com/northamerica

---

From: LEE TILLERY [mailto:lee.tillery@highpointnc.gov]
Sent: Wednesday, March 08, 2017 3:40 PM

To: Bereis, Kimberly D <Kimberly.Bereis@atkinsglobal.com>
Cc: MARK MCDONALD <mark.mcdonald@highpointnc.gov>; Williams, John L <jlwilliams@ncdot.gov>
Subject: RE: NCDOT STIP No. U-4758 (JSSRR Widening) - Section 4(f) Letter **Response Requested**

Good afternoon Kimberly,

Thanks for the email. I agree with the position you guys presented in the letter and am in full agreement.

Thanks,
Lee

LEE TILLERY
CITY OF HIGH POINT
DIRECTOR, PARKS AND RECREATION

136 Northpoint Avenue | High Point, NC 27262
336.883.3473 | fax: 336.822.7209

From: Bereis, Kimberly D [mailto:Kimberly.Bereis@atkinsglobal.com]
Sent: Wednesday, March 08, 2017 1:37 PM
To: LEE TILLERY <lee.tillery@highpointnc.gov>
Cc: MARK MCDONALD <mark.mcdonald@highpointnc.gov>; Williams, John L <jlwilliams@ncdot.gov>
Subject: NCDOT STIP No. U-4758 (JSSRR Widening) - Section 4(f) Letter **Response Requested**

Good afternoon, Lee. Please find the attached, which Mark discussed with you this week. John and I are meeting with FHWA this Friday, so if you can provide a response by then it would be greatly appreciated (email response is sufficient).

Thank you!

Kim Bereis, AICP
Senior Planner/Project Manager, Transportation NEPA

ATKINS
Find out more about what we do and how we do it – www.atkinsglobal.com

5200 Seventy Seven Center Drive, #500, Charlotte, NC, 28217 | Tel: +1 (704) 522 7275 Ext. 4294404 | Fax: +1 (704) 525 2838 | Direct: +1 **(704) 665 4404** | Cell: +1 (704) 604 5883
Email: kimberly.bereis@atkinsglobal.com | Web: www.atkinsglobal.com/northamerica

---

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

March 8, 2017

Mr. Lee Tillery
City of High Point Parks & Recreation Director
136 Northpoint Avenue
High Point, NC 27262

Subject: STIP Project U-4758 (Improvements to SR 1818 (Johnson Street)/SR 1850 (Sandy Ridge Road) from SR 1820 (Skeet Club Road) to I-40), High Point, Guilford County
Section 4(f) Applicability and Compliance

Mr. Tillery,

As part of the project development activities for the subject project, NCDOT is required to review potential impacts to publicly-owned parks and recreation areas. For federally-funded projects, Section 4(f) of the DOT Act of 1966 provides certain protections to public parks (and other resources). Federally-funded Project U-4758 will require replacement of the current bridge carrying Johnson Street over the West Fork Deep River.

The City of High Point's *Bikeway, Greenway, and Trails Master Plan (Adopted November 29, 2010)* includes the **Regency Parkway to Interstate 40 Greenway**, which will extend across Johnson Street along the West Fork Deep River. While the greenway is planned, it is our understanding that no funds are currently allocated for this part of the greenway extension.

In addition to planning the greenway noted above, the City of High Point has actively planned and advocated for the widening of Johnson Street/Sandy Ridge Road. STIP Project No. U-4758 is currently transitioning from a locally administered project (LAP) under development by the City of High Point to NCDOT's management.

The FHWA *Section 4(f) Policy Paper* (2012) sets forth official FHWA policy on the applicability of Section 4(f) to various types of land and resources, and other Section 4(f) related issues. Since the greenway and the roadway widening are both in the planning phases, NCDOT believes Section 4(f) is not applicable in this case due to "Joint Development". STIP No. U-4758 and the greenway are essentially being jointly developed since planning for the greenway has accounted for the future widening of Johnson Street and vice versa. Furthermore, the proposed greenway was considered in the bridging decision due to High Point's preference that the greenway be accommodated under the bridge. Finally, the new wider and higher bridge and multi-use path or sidewalk proposed throughout the project would provide a betterment to the resource by enhancing access and connectivity to the planned greenway and overall greenway system.

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND
ENVIRONMENTAL ANALYSIS
1548 MAIL SERVICE CENTER
RALEIGH, NC 27699-1548

Telephone: (919) 707-6000
Fax: (919) 250-4224
Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location:
1000 BIRCH RIDGE DRIVE
RALEIGH, NC 27610

It is NCDOT's position that Section 4(f) does not apply to the project's crossing of this portion of the proposed Regency Parkway to Interstate 40 Greenway because the greenway and STIP Project No. U-4758 are being jointly planned/developed. As such, NCDOT plans to present this position to FHWA, and is requesting your written agreement on this position.

Thank you for assistance. If you have any questions about this, you may contact me at (919) 707-6178 or jlwilliams@ncdot.gov.

Sincerely,

John L. Williams, P.E.
NCDOT Project Planning Engineer

JLW/Atkins

cc: Felix Davila, P.E., FHWA

APPENDIX B
HISTORIC RESOURCES DOCUMENTS

Project Tracking No. (Internal Use)

18-01-0050

HISTORIC ARCHITECTURE AND LANDSCAPES NO SURVEY REQUIRED FORM

This form only pertains to Historic Architecture and Landscapes for this project. It is not valid for Archaeological Resources. You must consult separately with the Archaeology Group.

PROJECT INFORMATION

Project No:	U-4758	***County***:	Guilford
WBS No.:	40251.1.1	***Document Type:***	PCE
Fed. Aid No:	unknown	***Funding***:	☐ State ☒ Federal
Federal Permit(s):	☒ Yes ☐ No	***Permit Type(s)***:	USACE

Project Description:
Widen Johnson Street-Sandy Ridge Road from Skeet Club Road to I-40 (approximately 4.4 miles in length).

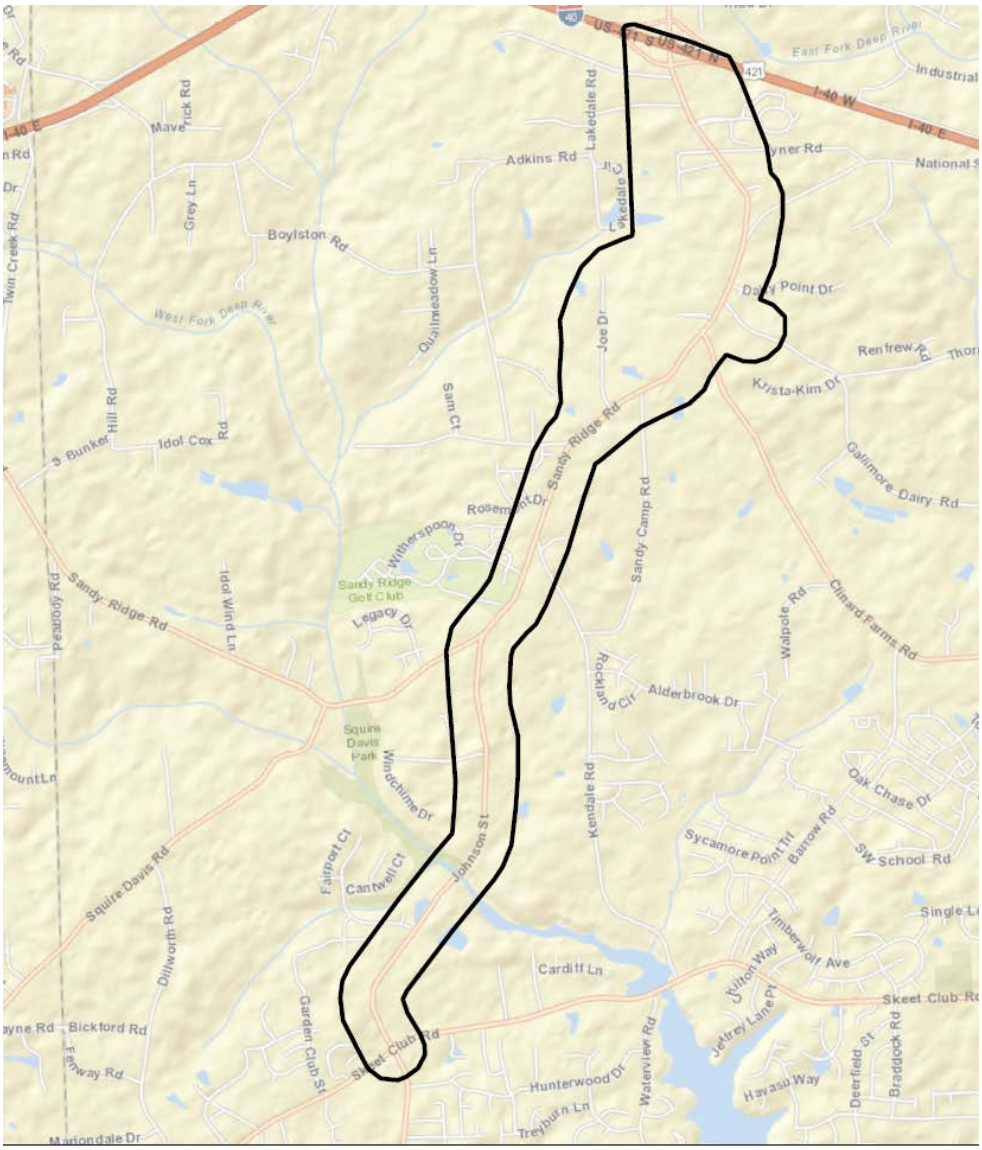
SUMMARY OF HISTORIC ARCHITECTURE AND LANDSCAPES REVIEW

Description of review activities, results, and conclusions:
According to the North Carolina State Historic Preservation Office online data base (HPOWEB 2018), there is one historically significant resource within the APE for the project, the Elihu and Abigail Mendenhall House (GF1544). This resource was determined eligible in 2001 and HPO confirmed it's eligibility in response to a report prepared by New South and Associates for this project. The design plans for the project show that any construction activities associated with the project are 400 feet away from the boundary of the historic property.

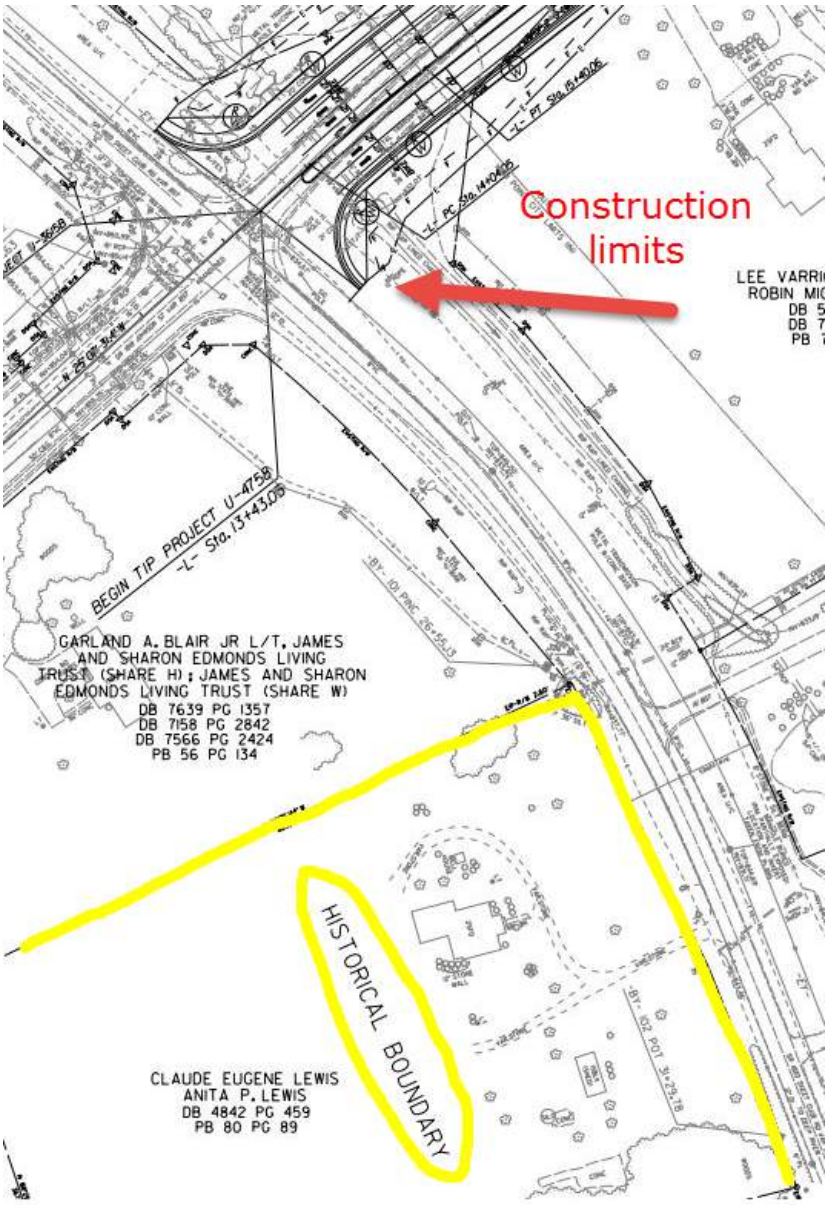
Why the available information provides a reliable basis for reasonably predicting that there are no unidentified significant historic architectural or landscape resources in the project area:
HPO GIS information, Guilford County GIS/Tax information, and Google Maps are considered valid for the purposes of determining the likelihood of historic resources being present. Furthermore, in 2014 New South and Associates completed an evaluation of all resources within the APE over fifty years of age project and confirmed that GF 1544 is the only eligible resource within the APE. Since the design plans do not show construction activities that would directly or indirectly impact the boundary of the historic property the project is not recommended for survey. Compliance with Section 106 is complete..

SUPPORT DOCUMENTATION

☒Map(s) ☐Previous Survey Info. ☒Photos ☐Correspondence ☐Design Plans



GF1544



FINDING BY NCDOT ARCHITECTURAL HISTORIAN

Historic Architecture and Landscapes -- NO SURVEY REQUIRED

Mary Pope Furr	**2/23/2018**
NCDOT Architectural Historian	Date

NO NATIONAL REGISTER OF HISTORIC PLACES ELIGIBLE OR LISTED ARCHAEOLOGICAL SITES PRESENT FORM

This form only pertains to ARCHAEOLOGICAL RESOURCES for this project. It is not valid for Historic Architecture and Landscapes. You must consult separately with the Historic Architecture and Landscapes Group.

PROJECT INFORMATION

Project No:	**U-4758**	*County:*	**Guilford**
WBS No:	**40251.1.1**	*Document:*	**Federal PCE**
F.A. No:	**Unknown**	*Funding:*	☐ State ☒ Federal

Federal Permit Required? ☒ Yes ☐ No *Permit Type:* **USACE (Not Specified)**

Project Description: *NCDOT is proposing to widen and realign SR 1818 (Johnson Street)/SR 1850 (Sandy Ridge Road) from SR 1820 (Skeet Club Road) to I-40 in Guilford County. Currently, Johnston Street/Sandy Ridge Road is a two-lane, undivided facility. As proposed, the corridor will consist of a four- to five- lane divided facility with sidewalks and bike lanes. Project length measures about 4.40 miles. Based on Preliminary Design Plans, the Area of Potential Effects (APE) will equate to the extent of the Proposed ROW and any construction easements along the corridor. The realignment of several Y-lines (i.e. major intersecting roads) will also be included as a component of this project. Overall, the APE will encompass about 105.8 acres, inclusive of all existing roadways and development.*

SUMMARY OF ARCHAEOLOGICAL FINDINGS

The North Carolina Department of Transportation (NCDOT) Archaeology Group reviewed the subject project and determined*:*

☒ **There are no National Register listed or eligible ARCHAEOLOGICAL SITES present within the project's area of potential effects. (Attach any notes or documents as needed)**
☐ No subsurface archaeological investigations were required for this project.
☐ Subsurface investigations did not reveal the presence of any archaeological resources.
☒ **Subsurface investigations did not reveal the presence of any archaeological resources considered eligible for the National Register.**
☒ **All identified archaeological sites located within the APE have been considered and all compliance for archaeological resources with Section 106 of the National Historic Preservation Act and GS 121-12(a) has been completed for this project.**

Brief description of review activities, results of review, and conclusions:

A map review and site file search was conducted at the Office of State Archaeology (OSA) on Tuesday, February 13, 2018. No large-scale archaeological surveys have been conducted in the area, and only one (1) archaeological site has been recorded within one mile of the corridor for the proposed project. OSA has no information regarding site 31GF436**, except for its location (Figure 1).

Digital copies of HPO's maps (Kernersville and Guilford Quadrangles) as well as the HPOWEB GIS Service (http://gis.ncdcr.gov/hpoweb/) were last reviewed on Tuesday, February 20, 2018. As a result of a historic architecture survey conducted in 2014 for this project, when it was initially submitted for review, numerous architectural resources were identified within or adjacent to the APE; however, intact archaeological deposits associated with these resources are not anticipated within the footprint of the proposed project. In addition, topographic maps, historic maps (NCMaps website), USDA soil survey maps, and aerial photographs were utilized and inspected to gauge environmental factors that may have contributed to historic or prehistoric settlement within the project limits, and to assess the level of modern, slope, agricultural, hydrological, and other erosive-type disturbances within and surrounding the archaeological APE.

New South Associates, Inc. (New South) conducted an intensive archaeological survey of the U-4758 Area of Potential Effects (APE) between April 10 and April 17, 2018 (Figures 2 and 3). This survey sought to identify and evaluate archaeological sites for National Register of Historic Places (NRHP) eligibility according to criteria outlined in 36 CFR §60.4. The survey included a visual inspection of the entire APE and systematically shovel-tested survey areas that were defined by NCDOT as having a moderate to high probability for the presence of archaeological sites (Figure 4). These areas consisted of moderately well-drained and well-drained soils that were not impacted by modern development. New South also recorded and evaluated three cemeteries located within or adjacent to the APE during the survey. The cemetery evaluations relied upon non-invasive data collection (e.g., photography and sketch mapping) and limited ground-penetrating radar (GPR) survey in one case.

Shovel testing of the designated survey areas utilized pre-plotted 30-meter interval shovel test locations. Field technicians visited all test locations during the survey. They did not excavate test locations within discernible disturbances or near buried utility lines. Excavated tests measured 30-centimeters in diameter and were excavated to sterile subsoil, the water table, or impenetrable substrate. Shovel test results (including soil color, texture, depths, and the presence/absence of cultural material) were recorded using smartphones equipped with a Memento data collection application. The field director collected sub-meter Global Positioning System (GPS) data for selected shovel tests, cemetery boundaries, and site locations.

All artifacts were returned to New South's laboratory in Stone Mountain, Georgia where they were washed and identified. Analysts identified the type, material, age, affiliation, and metrics of the collected artifacts according to standard techniques/typologies for both pre-contact and historic material. Raw materials for pre-contact lithic artifacts were classified according to procedures established by the NCDOT for the Carolina Slate Belt.

SURVEY AREA 1

Survey Area 1 was located to the southeast of the intersection of Sandy Ridge Road and Tyner Road (Figure 4). Planted white pines covered this upland area (Figure 5). The investigation identified a City of High Point sewer line along the northern edge of Survey Area 1, and a large push pile at the eastern edge of Sandy Ridge Road. Their presence indicates that road- and sewer-related disturbances have impacted this survey area. Eleven shovel test positions were excavated in this area. The excavated tests encountered five centimeters of dark brown (10YR 3/3) silty loam overlaying 15 centimeters of red (2.5YR 5/8) clay subsoil (Figure 6). Shovel testing and visual inspection did not locate any archaeological resources in Survey Area 1.

SURVEY AREA 2

Survey Area 2 was located on the eastern side of Sandy Ridge Road, extending northeast from the Partridge Road intersection (see Figure 4). This upland survey area included a zone of scrub vegetation, a natural gas transmission line, and the grassed yard of a single residence (Figure 7). There were four

shovel test positions investigated in this area, three of which were excavated and one test located near the natural gas line was not excavated. These tests uncovered 19 centimeters of brown (10YR 5/3) silty loam overlaying 10 centimeters of light yellowish brown (10YR 6/4) silty clay subsoil. The field investigation did not locate any archaeological resources in Survey Area 2.

SURVEY AREA 3

Survey Area 3 encompassed a segment of upland located between Sandy Ridge Road and Shields Road (see Figure 4). During the survey, a fallow agricultural field covered this landform (Figure 8). There were 12 shovel test positions investigated in this area. Of these, 11 were excavated, and one test was not excavated. The excavated tests indicate the survey area soils are limited to 20 centimeters of red (2.5YR 4/8) clay subsoil (Figure 9). These tests and visual inspection did not locate any archaeological remains in Survey Area 3.

SURVEY AREA 4

Survey Area 4 was located along the southeastern side of Sandy Ridge Road, south of the Shields Road intersection (Figure 10). This upland setting included a fallow agricultural field and a thin hardwood copse (Figure 11). There were six shovel test positions investigated in this area, five of which were excavated. None yielded cultural material. These tests typically encountered 30 centimeters of very dark brown (7.5YR 2.5/3) sandy loam overlaying 23 centimeters of very pale brown (10YR 7/4) sand (Figure 12). A reddish yellow (5YR 6/6) clay subsoil was uncovered 53 centimeters below ground surface. Shovel testing was suspended when the landowner informed the field crew that the survey area encompassed an area where he had added 80 truckloads of topsoil and subsequently raised the ground surface approximately 50 centimeters. He also stated that the underlying ground surface was low-lying and used for cultivation. Given the shovel testing results and past land use in this survey area, this unexcavated shovel test location was unlikely to contain any undisturbed soil strata.

SURVEY AREA 5

Survey Area 5 was located on the west side of Sandy Ridge Road, opposite the Dairy Point Drive intersection (see Figure 10). A grassy yard and a fallow agricultural field covered the survey area (Figure 13). The field crew excavated six shovel test positions in this area. None yielded cultural material. These tests uncovered 34 centimeters of brown (7.5YR 5/4) clay sand overlaying 11 centimeters of yellowish red (5YR 4/6) clay subsoil (Figure 14). No archaeological resources were identified in Survey Area 5 during the field investigation.

SURVEY AREA 6

Survey Area 6 was located on the north side of Gallimore Dairy Road, 60 meters southeast of the Sandy Ridge Road intersection (see Figure 10). A recently constructed commercial structure was erected in this survey area. This structure was screened from the road by scrub vegetation and does not appear on recent aerial photography (Figure 15). Three shovel test positions were excavated in Survey Area 6. These tests typically encountered 23 centimeters of reddish yellow (5YR 7/6) sandy clay overlaying nine centimeters of red (2.5YR 4/8) clay subsoil (Figure 16). These tests and visual inspection did not locate any archaeological resources in this survey area.

SURVEY AREA 7

Survey Area 7 was located opposite Survey Area 6, on the south side of Gallimore Dairy Road (see Figure 10). A low-lying grassy yard extended across this side of the road (Figure 17). Three shovel test positions typically identified 28 centimeters of light brown (7.5YR 6/4) clay sand overlaying 10 centimeters of yellowish red (5YR 4/6) clay subsoil (Figure 18). These tests and visual inspection of the survey area did not locate any archaeological resources.

SURVEY AREA 8

Survey Area 8 was located east of Clinard Farms Road (Figure 19). The local setting included a narrow band of woods and a newly constructed building and parking lot (Figure 20). Field technicians examined five shovel test positions in this area. Although the field crew was able to excavate three tests, disturbances prevented the excavation of the two remaining test locations in Survey Area 8. The excavated tests were negative for archaeological remains and typically uncovered 25 centimeters of yellowish red (5YR 5/6) clay subsoil (Figure 21). The field investigation did not locate any archaeological resources in this survey area.

SURVEY AREA 9

Survey Area 9 extended across an open field on the south side of Sandy Ridge Road, halfway between Clinard Farms Road and Sandy Camp Road (see Figure 19, Figure 22). Four shovel test positions were excavated in Survey Area 9. These tests typically encountered 30 centimeters of reddish brown (2.5YR 4/3) clay and did not produce cultural material (Figure 23). Visual inspection of the survey area also did not locate any archaeological resources.

SURVEY AREA 10

Survey Area 10 extends from the Clinard Farms Road intersection to a point 70 meters northeast of the Sandy Camp Road intersection, on the northwest side of Sandy Ridge Road (see Figure 19). This area included fallow agricultural fields and grassy front yards (Figure 24). Technicians examined 15 shovel test positions in this area, 13 of which were excavated. The excavated tests revealed 25 centimeters of reddish brown (2.5YR 5/3) clay overlaying light red (2.5YR 6/6) clay subsoil (Figure 25). None of the excavated tests produced artifacts. Two test locations were left unexcavated due to heavy disturbance related to driveway construction. The field investigation did not locate any archaeological resources in Survey Area 10.

SURVEY AREA 11

Survey Area 11 was located east of the Sandy Ridge Road intersection with Joe Drive (Figure 26). The local setting includes grassy lawn of the Sandy Ridge Road Methodist Church (Figure 27). Three negative shovel test positions were excavated in Survey Area 11. These tests typically uncovered 10 centimeters of dark brown (10YR 3/3) sandy clay loam overlaying 23 centimeters of yellowish brown (10YR 5/4) sandy clay (Figure 28). A reddish yellow (5YR 6/6) sandy clay subsoil was uncovered 33 centimeters below ground surface. No archaeological resources were identified in Survey Area 11 during this field investigation.

SURVEY AREA 12

Survey Area 12 follows the west side of Sandy Camp Road, south from the intersection with Sandy Ridge Road (see Figure 26). The local setting includes the grassy lawn of a single residence and the Sandy Ridge Methodist Church Cemetery (Figure 29). Five shovel test positions were examined in this area. The field crew excavated three shovel tests and left two unexcavated due to their proximity to an area with high potential for the presence of unmarked graves. The excavated tests uncovered 10 centimeters of dark yellowish brown (10YR 3/4) sandy clay loam overlying 13 centimeters of yellowish brown (10YR 5/4) sandy clay. A reddish yellow (5YR 6/6) sandy clay subsoil was encountered 23 centimeters below ground surface. Shovel testing and visual inspection of the survey area did not locate any artifacts.

SURVEY AREA 13

Survey Area 13 was located on the southeastern side of Sandy Ridge Road, across from the Bame Road intersection (see Figure 26). The local setting included a fallow agricultural field covered by raspberries and tall grass (Figure 30). Of the nine shovel test positions investigated in Survey Area 13, eight were excavated. The presence of pavement prevented excavation of the final test location. The excavated tests typically encountered 25 centimeters of yellowish brown (10YR 5/6) sandy clay loam and light red (2.5YR 6/8) clay subsoil. These tests and visual inspection did not locate any artifacts in this survey area.

SURVEY AREA 14

Survey Area 14 extends along the northwestern side of Sandy Ridge Road from the Presbyterian Homes parking lot southwest for 200 meters (Figure 31). The presence of three-meter-high earthen mounds and a berm, covered by grass, indicated that mechanical excavation heavily disturbed this area (Figure 32). All seven shovel test positions were excavated in Survey Area 14. These tests revealed 28 centimeters of reddish brown (2.5YR 5/3) clay sand overlaying red (2.5YR 5/8) clay subsoil (Figure 33). None yielded cultural material.

SURVEY AREA 15

Survey Area 15 was located 340 meters southwest of the Kendale Road intersection with Sandy Ridge Road, on the western edge of Kendale Road (see Figure 31). During the survey, this upland area included a fallow agricultural field and the grassy front yard of a single residence (Figure 34). Six shovel test positions were excavated in Survey Area 15. These tests typically encountered 34 centimeters of brown (7.5YR 5/4) sandy clay overlaying reddish brown (2.5YR 5/4) clay subsoil (Figure 35). Shovel testing and visual inspection of Survey Area 15 did not locate any artifacts.

SURVEY AREA 16

Survey Area 16 includes a ridgetop covered by a fallow agricultural field located between Kendale Road and Sandy Ridge Road (see Figure 31, Figure 36). The field crew investigated 28 shovel test positions in this area. This includes 22 pre-plotted tests and four 7.5-meter interval radials. Technicians excavated all of the pre-plotted tests and three radial tests (Figure 62). Demolition of a twentieth century house site heavily disturbed the final test location. The general soil uncovered in Survey Area 16 includes 20 centimeters of brown (7.5YR 4/3) sandy clay overlying 13 centimeters of light brown (7.5YR 6/3) clay (Figure 37). Subsoil, a reddish yellow (5YR 6/6) clay, was revealed 23 centimeters below ground surface. While subsurface artifact deposits were not identified in the survey area, one historic surface find was collected at Shovel Test 109. This find, designated as site 31GF569, is discussed below.

SURVEY AREA 17

Survey Area 17 extends northeast from the intersection of Sandy Ridge Road and Johnson Street (Figure 38). A fallow agricultural field extends across this upland area (Figure 39). The field crew excavated 13 out of 14 tests plotted in the survey area. The final test location was not excavated due to large ruts from land clearing. The excavated tests identified 28 centimeters of yellowish brown (10YR 5/6) loamy sand overlying reddish brown (5YR 4/4) sandy clay subsoil (Figure 40). Visual inspection and shovel testing did not locate any artifacts in Survey Area 17.

SURVEY AREA 18

Survey Area 18 was located at the southwestern corner of the Sandy Ridge Road intersection with

Johnson Street (see Figures 38 and 43). The survey area contains a fallow agricultural field currently under development (Figure 41). All 23 shovel test positions in Survey Area 18 were excavated. None yielded cultural material. These tests commonly contained 30 centimeters of dark yellowish brown (10YR 4/6) silty clay overlaying 10 centimeters of strong brown (7.5YR 5/8) sandy clay (Figure 42). Shovel testing and visual inspection of Survey Area 18 did not locate any archaeological sites.

SURVEY AREA 19

Survey Area 19 was located on the east side of Johnson Street, across from the Cedar Spring Drive intersection (Figures 43 and 46). The local setting includes wooded residential lots and a transmission line corridor (Figure 44). Technicians examined 18 shovel test positions in this area, 14 of which were excavated. Three test locations were not excavated due to heavy disturbance, and the final unexcavated test location was not shovel tested due to subsoil surface exposure. The excavated tests uncovered five centimeters of grayish brown (10YR 5/2) silty loam and 15 centimeters of light reddish brown (2.5YR 6/3) silty clay (Figure 45). Shovel tests exposed a reddish yellow (5YR 6/6) clay subsoil 20 centimeters below ground surface. None of the test locations produced cultural material. Visual inspection and shovel testing did not locate any archaeological sites in Survey Area 19.

SURVEY AREA 20

Survey Area 20 was located on the east side of Johnson Street, opposite the entrance to the Johnson Street Sports Complex (see Figure 46). This sideslope survey area contained young pines and scrub vegetation (Figure 47). The field crew excavated four of the five shovel test positions. These negative tests uncovered 20 centimeters of reddish brown (2.5YR 5/4) silty clay overlying light red (2.5YR 6/8) clay subsoil (Figure 48). The unexcavated test location was too disturbed to warrant subsurface testing. Visual inspection of this area and shovel testing did not identify any artifacts in this survey area.

SURVEY AREA 21

Survey Area 21 was located near the northeastern side of the West Fork Deep River (see Figure 46). The survey area contains a pine- and hardwood-covered ridgetoe overlooking a narrow section of floodplain (Figure 49). Twenty-one survey and radial shovel test positions were excavated in Survey Area 21 (Figure 60). These tests typically encountered 16 centimeters of dark brown (10YR 3/3) silty loam overlying red (2.5YR 5/8) clay subsoil (Figure 50). A single bucket auger test (Test A) was excavated between the boundary of Survey Area 21 and the stream. This test exposed 10 centimeters of dark yellowish brown (10YR 4/4) silty clay and 50 centimeters of yellowish red (5YR 5/8) compact silty clay. These soils indicate that alluviation did not deeply bury any A-horizon soils in the APE. A metavolcanic flake was recovered from Shovel Test 178 (Figure 46). A description of this archaeological resource, designated as site 31GF568, is provided below.

SURVEY AREA 22

Survey Area 22 was located on the southwestern side of the West Fork Deep River (Figure 51). The survey area includes a narrow floodplain and sideslope covered by hardwoods (Figure 52). Two shovel test positions were excavated in this area, both of which encountered 15 centimeters of dark yellowish brown (10YR 4/4) silty loam overlaying 35 centimeters of light yellowish brown (10YR 6/4) silty clay and reddish yellow (5YR 6/6) silty clay subsoil. Neither test yielded artifacts. A bucket auger test (Test B) exposed 20 centimeters of dark yellowish brown sandy clay loam before encountering the water table. This profile and those recorded during shovel testing indicate that alluvial processes have not deposited soils in this area. Shovel testing results, bucket augering, and visual inspection did not locate any archaeological remains or deeply-buried deposits in Survey Area 22.

SURVEY AREA 23

Survey Area 23 was located on the northeastern side of Johnson Street, beginning at the intersection of Johnson Street and Pondhaven Drive (see Figures 51 and 57). The local setting included residential lots and a small agricultural field covered by grass (Figure 53). The field crew examined 12 shovel test positions in this area. Eleven tests were excavated. One test location was too disturbed by driveway construction to merit subsurface testing. The general soil profile in Survey Area 23 includes 20 centimeters of light brown (7.5YR 6/3) sand overlying 12 centimeters of very dark brown (7.5YR 2.5/2) loam and reddish yellow (5YR 6/6) clay subsoil (Figure 54). Pedestrian survey and shovel testing did not locate any archaeological sites in Survey Area 23.

SURVEY AREA 24

Survey Area 24 was located across from Pondhaven Drive (see Figures 51 and 57). The local terrain includes a sideslope covered by hardwoods, fenceline cedars, and grasses and periwinkle ground cover (Figure 55). Survey Area 24 contained 35 shovel test positions. Field technicians excavated 29 of these tests, none of which yielded cultural material. Tests typically revealed 17 centimeters of very dark grayish brown (10YR 3/2) silty loam overlying six centimeters of yellowish brown (10YR 5/8) silty clay and reddish yellow (5YR 6/6) clay subsoil (Figure 56). The five remaining test locations were not suitable for subsurface testing due to the presence of road-related push piles and heavy disturbances. No archaeological sites were identified in Survey Area 24 during this field investigation.

SURVEY AREA 25

Survey Area 25 was located on the west side of Johnson Street, 180 meters north of its intersection with Skeet Club Road (see Figure 57). The survey area includes sideslope covered by a narrow band of woods and an abandoned agricultural field (Figure 58). Four shovel test positions were excavated in Survey Area 25. None yielded cultural material. These tests typically encountered 10 centimeters of dark brown (7.5YR 3/2) silt and reddish brown (2.5YR 5/3) clay subsoil. New South did not identify any archaeological sites in Survey Area 25.

IDENTIFIED RESOURCES AND RECOMMENDATIONS

SITE 31GF568

New South collected a single metavolcanic flake from Shovel Test 178, in Survey Area 21 (see Figure 46). During the site visit, hardwood trees and light density scrub vegetation covered this landform (Figure 59). The positive shovel test was excavated on a ridge toe overlooking the West Fork Deep River floodplain. Shovel Test 178 produced a temporally non-diagnostic precontact flake between 0-30 centimeters below ground surface. Technicians excavated a cruciform of 11 15-meter- and 7.5-meter-interval delineation shovel tests around the positive test location (Figure 60). These tests revealed 20 centimeters of dark brown (10YR 3/3) silty loam overlying red (2.5YR 5/8) silty clay subsoil (Figure 61). No additional artifacts were recovered from site 31GF568.

A single non-diagnostic lithic artifact was collected from site 31GF568. The artifact cannot be associated with any significant people or broad patterns of history. It does not convey any significance related to the works of a master craftsperson or embody any high design ideals. Shovel testing also shows that the site does not contain any significant artifact deposits or intact features and has a low potential to benefit future

research. For these reasons, New South recommends site 31GF568 not eligible for the NRHP under Criteria A, B, C, and D. No further work is recommended.

SITE 31GF569

A single fragment of nineteenth- or twentieth-century milk glass (Miller et al. 2000) was collected from the Survey Area 16 ground surface, at Shovel Test 109 (see Figure 31). This site was located on a ridgetop overlooking the intersection of Sandy Ridge Road and Kendale Road. The surface find was collected from the edge of an overgrown fence line that separated the survey area from an abandoned twentieth-century farmhouse complex, located 20 meters to the south. This complex was located outside of the APE and was undergoing demolition at the time of the field investigation.

Field technicians excavated four shovel tests during the site delineation (Figure 62). This included two 15-meter interval shovel tests to the north, east, and west of Shovel Test 109. The farmhouse complex was extensively disturbed, and no shovel tests were placed in this area. These tests and visual inspection of surrounding ground surface exposures did not locate any additional artifacts. Shovel testing revealed 25 centimeters of brown (7.5YR 4/2) loamy sand overlaying yellowish red (5YR 4/6) clay subsoil (Figure 63). Given the fallow field setting, the upper soil horizon likely resulted from agricultural activity.

Site 31GF569 contains a twentieth-century surface find that is presumably associated with the demolished farmhouse complex because of its proximity (Figure 64). The mechanical removal of these structures heavily reduced the potential for the area to contain intact subsurface artifact deposits or features. The site cannot be associated with any broad patterns of history or significant people. It does not convey any significance related to the works of a master craftsperson or embody any high design ideals. The disturbed site did not yield any subsurface artifacts, and the surface find lacks integrity. Therefore, New South recommends site 31GF569 not eligible for the NRHP under Criteria A, B, C, and D. No further work is recommended for the site.

SITE 31GF570, ZION HILL METHODIST CEMETERY

The Zion Hill Methodist Cemetery is located northwest of the Tyner Loop intersection with Sandy Ridge Road (Figure 65). The 60x40-meter (0.5-acre) cemetery is immediately west of the Zion Hill Methodist Church and is covered by a patchy grass lawn. The cemetery contains 12 loosely aligned north-south rows of headstones facing east made from concrete, marble, and granite (Figure 66). Several headstones bear evidence of displacement. The grave plots appear to be individually decorated and tended, the best example of which are Harriet and J.B. Lindsay's graves. The graves share a granite headstone and are covered by rows of small stones aligned parallel to the graves' long axes. These stones are embedded in a concrete ledger with the entire covering painted white. This treatment is representative of traditional African American burial practices (Vlach 1977). Though most of the headstones were legible, several pressed concrete markers were too eroded to read. One depression located near the southwestern corner of the cemetery suggests the presence of additional unmarked graves.

The earliest headstone identified at the Zion Hill Methodist cemetery dates from the 1880s (exact date illegible). Little background information is available for the Zion Hill Methodist Church. A 1920 soil map places a church at the current Zion Hill church building location. Cursory background research indicates that the names memorialized in the cemetery belong to tenant farmers with African American and European American backgrounds. According to her headstone, Harriet Lindsay, one of the African Americans interred in the cemetery, was born in 1854. This birthdate opens the possibility that Harriet and others buried in the cemetery were formerly enslaved.

Site 31GF570 encompasses the late nineteenth- and twentieth-century Zion Hill Methodist Church

cemetery. Background research did not identify any significant events associated with the cemetery. The cemetery does not convey any associations with broad patterns of history or contain the burials of notable individuals. The grave markers are representative of typical styles used during the late nineteenth and twentieth centuries. They do not convey any elements of high design or represent the works of a master craftsperson. Although the interments could provide biological data and funerary remains contained within the cemetery could be a rich source of historical information that could provide insight into the lifeways of lower-class society and marginalized ethnicities in the late nineteenth and twentieth century, the data obtained from their examination are unlikely to provide insights not already available through documentary analysis. New South recommends site 31GF570, the Zion Hill Methodist Cemetery, not eligible for the NRHP under Criteria A, B, C, and D.

Although the cemetery is recommended not eligible for the NRHP, New South recommends avoidance of this resource in accordance with North Carolina General Statute, Chapter 65, Article 12 and North Carolina General Statute, Chapter 70. If avoidance is not possible, it will be necessary to comply with these statutes after consultation with the State Archaeologist to determine the way any burials are to be removed and relocated.

SITE 31GF571, SMITH GROVE BAPTIST CEMETERY

The Smith Grove Baptist Church cemetery is located at the southwestern corner of the Tyner Loop Road intersection with Sandy Ridge Road (see Figure 65). A well-maintained grassy lawn covers this 75x55-meter (0.71-acre) cemetery. The interments are organized into 16 rows aligned north-south (Figure 67). The graves are oriented east-west, with the headstones facing east. The oldest headstone dates to 1905. Given the dates of death listed on cemetery markers, the cemetery was a focus of burial activity for most of the early twentieth century and continues to be used in the present day. Standing headstones were manufactured from marble, granite, and concrete.

Background research did not identify any significant events associated with the cemetery. The cemetery does not convey any associations with broad patterns of history or contain the burials of notable individuals. The cemetery does not meet eligibility Criteria A or B of the NRHP. The grave markers are representative of typical styles used during the twentieth century. They do not convey any elements of high design or represent the works of a master craftsperson. Thus, the cemetery does not meet NRHP Criterion C eligibility requirements. While the interments could provide biological data for studies of twentieth century lifeways, the data obtained from their examination is unlikely to provide significant insights that are not already addressed by available documentary evidence. Because the cemetery is unlikely to provide significant contributions to research, site 31GF571 does not meet NRHP Criterion D eligibility requirements. New South recommends site 31GF571, the Smith Grove Baptist Cemetery, not eligible for the NRHP under Criteria A, B, C, and D.

New South also recommends avoidance of the cemetery. North Carolina General Statute, Chapter 65, Article 12 and North Carolina General Statute, Chapter 70 provide additional protections for this cemetery. If avoidance is not possible, it will be necessary to comply with these statutes after consultation with the State Archaeologist to determine the manner in which any burials are to be removed and relocated.

SITE 31GF572, SANDY RIDGE METHODIST CEMETERY

The Sandy Ridge Methodist cemetery is located southeast of the Sandy Ridge Road intersection with Sandy Camp Road (see Figures 26 and 69). The Sandy Ridge Methodist Church is currently located northwest of the cemetery, directly across Sandy Ridge Road. The cemetery extends from the intersection southwest across a knoll covered by a well-manicured lawn, oak trees, and large holly trees

(Figure 68). It measures 105x155 meters (2.8 acres) and has not been previously recorded or evaluated for NRHP eligibility.

The interments located within the cemetery are organized in 30 rows aligned north-south. Grave markers were made from marble, granite, concrete, and fieldstone. While most of the headstones are legible, the nineteenth- and early twentieth-century headstones are eroded or obscured by lichen. Though most headstones are east-facing, several west-facing examples are also present. The headstones located closest to the Sandy Ridge Road and Sandy Camp Road intersection bear the oldest inscriptions in the cemetery.

Dating to 1856, the headstone of Martha Penix is the earliest legible marker in the cemetery. Ms. Penix's murder in 1856 was a locally notorious event that involved several members of the local community (Browning 2007; 2010a; 2010b). Though her headstone was identified in the cemetery, it was disturbed and found lying on the ground. Several depressions located near this marker demonstrate the presence of unmarked interments in this area. These headstones and unmarked graves suggest the portion of the APE located between the headstones and Sandy Camp Road contains additional unmarked graves.

The historical connection with the Methodist congregation prior to 1964, when the church moved to its current location, is unclear. The 1920 Soil Map of Guilford County shows a *Sandy Ridge Church* at the intersection of Sandy Ridge Road and Sandy Camp Road (Jurney et al. 1920). However, the official history for the congregation insists the church operated on land belonging to Ira Idol until land for the current church building was donated by Mr. and Mrs. Joe W Frazier, Sr. (Sandy Ridge United Methodist Church 2014). The presence of markers pre-dating the Methodist church's move likely relates to this earlier house of worship.

GEOPHYSICAL SURVEY

The geophysical survey was conducted by Sarah Lowry and Maeve Herrick on May 10, 2018. The goal of the geophysical survey was to identify unmarked graves on the easternmost edge of Sandy Ridge Methodist Church Cemetery, where the cemetery is adjacent to Sandy Camp Road. The GPR survey area was approximately 0.44 acre, including 0.2 acre located within the right of way (ROW) of Sandy Camp Road (Figure 70).

For the GPR data collection, two grids were established using metric measuring tapes. Grid corners were placed to cover a total survey area of 0.44 acre (1802 sq m) (Figure 70) (Table 1). Survey flags were used to indicate each grid corner. Grid corners and surface features, including grave markers, utility indicators, and a single tree, were mapped using an RTK GPS with one- to two-centimeter accuracy.

Table 1. Geophysical Grids

Label	Acres	Square Meters
Grid 1	0.25	1020
Grid 2	0.19	782
Total	0.44	1802

All spatial data were downloaded from the GPS and then imported into ArcMap 10, ESRI's geographic information system (GIS) program. Separate shapefiles were then created for the surface features and GPR grids. The advantage of this method is that each grid corner has associated coordinates and can be relocated.

GROUND-PENETRATING RADAR (GPR)

Ground-penetrating radar is a remote sensing technique frequently used by archaeologists to investigate a wide range of research questions. In archaeological applications, GPR is typically used to prospect for potential subsurface cultural features. Because GPR is a remote sensing technique, it is noninvasive, non-destructive, relatively quick, efficient, and highly accurate when used in appropriate situations. In cemeteries, GPR is commonly used to identify anomalies consistent with the expectations for human graves (Jones 2008; King et al. 1993).

Ground-penetrating radar data are acquired by transmitting pulses of radar energy into the ground from a surface antenna, reflecting the energy off buried objects, features, or bedding contacts, and then detecting the reflected waves back at the ground surface with a receiving antenna (Conyers 2004a). When collecting radar reflection data, surface radar antennas are moved along the ground in transects, typically within a survey grid, and a large number of subsurface reflections are collected along each line. As radar energy moves through various materials, the velocity of the waves will change depending on the physical and chemical properties of the material through which they are traveling (Conyers and Lucius 1996). The greater the contrast in electrical and magnetic properties between two materials at an interface, the stronger the reflected signal and, therefore, the greater the amplitude of reflected waves (Conyers 2004b).

When travel times of energy pulses are measured, and their velocity through the ground is known, distance (or depth in the ground) can be accurately measured (Conyers and Lucius 1996). Each time a radar pulse traverses a material with a different composition or water saturation, the velocity will change and a portion of the radar energy will reflect back to the surface and be recorded. The remaining energy will continue to pass into the ground to be further reflected, until it finally dissipates with depth.

The depths to which radar energy can penetrate, and the amount of resolution that can be expected in the subsurface, are partially controlled by the frequency (and therefore the wavelength) of the radar energy transmitted (Conyers 2004b). Standard GPR antennas emit radar energy varying from about 10 to 1,000 megahertz (MHz) in frequency. Low frequency antennas (10-120 MHz) generate long wavelength radar energy that can penetrate up to 50 meters in certain conditions but resolve only very large buried features. In contrast, the maximum depth of penetration of a 900 MHz antenna is about one meter or less in typical materials, but its generated reflections can resolve features with a maximum dimension of a few centimeters. Thus, a trade-off exists between depth of penetration and subsurface resolution.

The success of GPR surveys in archaeology is largely dependent on soil and sediment mineralogy, ground moisture, subsurface material moisture retention, the depth of buried features, feature preservation, and surface topography and vegetation. Electrically conductive or highly magnetic materials will quickly attenuate radar energy and prevent its transmission to depth. Depth penetration varies considerably depending on local conditions. Subsurface materials that absorb and retain large amounts of water can affect GPR depth penetration because of their low relative dielectric permittivity (RDP). In practical applications, this generally results in shallower than normal depth penetration because the radar signal is absorbed (attenuated) by the materials regardless of antenna frequency (Conyers 2004a; 2012; Conyers and Lucius 1996). Differential water retention can also positively affect data when a feature of interest retains more water than the surrounding soils and, therefore, presents a greater contrast.

The basic configuration for a GPR survey consists of an antenna (with both a transmitter and receiver), a harness or cart, and a wheel for calibrating distance. The operator then pulls or pushes the antenna across the ground surface systematically (a grid) collecting data along transects. These data are then stored by the receiver and available for processing.

The "time window" within which data were gathered was 50 nanoseconds (ns). This is the time during which the system is "listening" for returning reflections from within the ground. The greater the time window, the deeper the system can potentially record reflections. To convert time in nanoseconds to depth, it is necessary to determine the elapsed time it takes the radar energy to be transmitted, reflected, and recorded back at the surface by doing a velocity test. Hyperbolas were found on reflection profiles and measured to yield a relative dielectric permittivity (RDP), which is a way to calculate velocity. The shape of hyperbolas generated in programs is a function of the speed at which electromagnetic energy moves in the ground, and can therefore be used to calculate velocity (Conyers and Lucius 1996). The RDP for soils in the survey area was approximately 12.6, which, when converted to one-way travel time, (the time it takes the energy to reach a reflection source), is approximately 8.4 centimeters/nanosecond. All profiles and processed maps were converted from time in nanoseconds to depth in centimeters using this average velocity.

The first step was to calibrate the antenna to local conditions by walking the survey area and adjusting the instrument's gain settings. This method allows the user to get an average set of readings based on subtle changes in the RDP (Conyers 2004b). Field calibration was repeated as necessary to account for changes in soil and/or moisture conditions (Conyers 2004a). Effective depth penetration was approximately 1.75 meters (5.74 ft.). This is an adequate depth penetration for a 400 MHz antenna. Slight signal attenuation occurred at the bottom of the profile.

The field survey was conducted using a GSSI SIR-3000 using a 400 MHz antenna. Total survey area was approximately 0.44-acre (0.2-acre within the ROW). It is generally standard practice to orient transects perpendicular to the long axis of suspected features. The marked graves in the Sandy Ridge Road Methodist Church Cemetery were oriented west-east, so data were collected roughly north to south so that transects were perpendicular to graves. Transect spacing was 50 centimeters, an interval that has been demonstrated to generate the best resolution possible while still maintaining field efficiency (Pomfret 2005). Transects were collected in a zig-zag pattern, alternating starting direction, and started in the northeast grid corners.

All data were downloaded from the control unit to a laptop computer for post-processing. Radar signals are initially recorded by their strength and the elapsed time between their transmission and receipt by the antenna. Therefore, the first task in the data processing was to set "time zero", which tells the software where in the profile the true ground surface was. This is critical to getting accurate results when elapsed time is converted to target depth. A background filter was applied to the data, which removes the horizontal banding that can result from antenna energy "ringing" and outside frequencies such as cell phones and radio towers. Background noise can make it difficult to visually interpret reflections. Range gains were also applied to the data to amplify weaker reflections from later in the time window.

The next data processing step involved the generation of amplitude slice-maps (Conyers 2004b). Amplitude slice-maps are a three-dimensional tool for viewing differences in reflected amplitudes across a given surface at various depths. Reflected radar amplitudes are of interest because they measure the degree of physical and chemical differences in the buried materials. Strong, or high amplitude reflections often indicate denser (or different) buried materials. Amplitude slice-maps are generated through comparison of reflected amplitudes between the reflections recorded in vertical profiles. Amplitude variations, recorded as digital values, are analyzed at each location in a grid of many profiles where there is a reflection recorded. The amplitudes of all reflection traces are compared to the amplitudes of all nearby traces along each profile. This database can then be "sliced" horizontally and displayed to show the variation in reflection amplitudes at a sequence of depths in the ground. The result is a map that shows amplitudes in plan view, but also with depth.

Slicing of the data was done using the mapping program Surfer 8. Slice maps are a series of x,y,z values, with x (east) and y (north) representing the horizontal location on the surface within each grid and z representing the amplitude of the reflected waves. All data were interpolated using the Kriging method and then image maps were generated from the resulting files.

From the original .dzt files (raw reflection data), a series of image files was created for cross-referencing to the amplitude slice maps that were produced. Two-dimensional reflection profiles were also analyzed to determine the nature of the features identified on the amplitude slice maps. The reflection profiles show the geometry of the reflections, which can lend insight into whether the radar energy is reflecting from a flat layer (seen as a distinct band on profile) or a single object (seen as a hyperbola in profile). Individual profile analysis was used in conjunction with amplitude slice maps to provide stronger interpretations about possible features. Processing and slicing parameters were recorded.

The final step in the data processing is to integrate the depth slices with other spatial data. This was done using ArcGIS, which can display and manipulate all forms of spatial data created for this project, including GPR results, features, grid data, and base graphics such as aerial photography and topographic maps. The resulting anomalies were digitized as individual features and referenced to the coordinate system.

GEOPHYSICS IN CEMETERIES

Several factors influence the overall effectiveness of geophysics for detecting anomalies consistent with individual graves. Contrast between the remains, grave shaft, coffin, or casket and the surrounding soils is the most important variable. Remains that have a chemical or physical contrast from the subsurface materials surrounding them will cause GPR reflections of electromagnetic energy. Age of the graves is critical to this contrast. Older graves typically have less contrast and are more difficult to detect because they have had more time to decompose and are less likely to have intact coffins or caskets.

The burial "container" that the physical remains may have been placed in is also important and includes simple linen or cloth shrouds, pine boxes or wooden coffins, lead or other metal caskets, and burial vaults. In certain cases, hardware such as nails, hinges, and handles may be present, but not necessarily all the time. Although there is a high degree of variation in specific container types among different geographical regions, each of these tends to have been used at certain times throughout history and correlates with the presumed age of the grave. For example, burial shrouds were common throughout the seventeenth and early eighteenth centuries before being replaced by wooden coffins. It must also be noted that cultural trends and patterns tended to persist much longer in rural and/or economically depressed areas than in urban centers.

The section of the Sandy Ridge Methodist Church Cemetery surveyed for this project has both modern, marked graves and a large area with no marked graves where local informants and vegetation variation indicate that there are unmarked graves. The modern, marked graves should all have coffins or caskets. The unmarked section is thought to be an older section of the cemetery and field stone markers have been purportedly removed. These graves are likely older and may be in less formal burial containers, such as pine boxes, which would present less of a contrast with the surrounding soils.

GPR RESULTS

GPR results were based on analysis of the 400 MHz data, including individual reflection profiles and amplitude slice maps (Figures 71-77). The anomalies were identified in the GPR results and represent a contrast with their surrounding soils. The GPR results identified 106 probable graves within the Study

Area, 24 of which are marked by 16 headstones and 82 are unmarked (Appendix B). There were 27 probable graves either completely or partially within the project APE along Sandy Camp Road (Table 2). Only three of these graves were associated with markers. All of the markers identified and mapped in the survey area had associated GPR anomalies, and there were no markers located within the APE. Two double markers were associated with just one probable grave (anomalies 8 and 19), but it is likely that, in these cases, the double marker has been commissioned in advance of the second interment.

Table 1. Count of Possible Graves

Probable Grave Location	Unmarked Graves	Marked Graves	Total
Probable Graves within the Survey Area	82	24	106
Probable Graves within the APE	24	3	27

Many factors influence the overall effectiveness of geophysics for detecting anomalies consistent with graves, including soil type and acidity, moisture and precipitation, magnetic properties of soil, age of possible graves, likely grave depth, and burial container (e.g., shroud, wood coffin, metal casket, concrete vault). The probable graves in the survey area were identified based on their size, shape, depth, orientation, and overall characteristics in plan and profile view. New South takes a conservative approach to the identification of graves detected with geophysical data and, in general, if an anomaly has any of the attributes listed above, it is marked as a potential grave. Because of this, it is likely that some of the probable graves are false positives and were misidentified. It is impossible to conclusively ascertain the presence of graves without excavation, and caution is used in all interpretations made with GPR.

The survey area has one mature tree, and the tree's associated root system was visible in the GPR results. Every effort was made to filter out the tree roots and interpret only possible graves in the GPR results, but it is probable that, in some cases, anomalies identified as possible graves are tree roots, or that possible graves located very near the tree roots have been missed.

PROBABLE GRAVES

There were 106 probable graves (anomalies 1-106) identified in both of the GPR grids. There is a concentration of probable graves in the southern portion of the survey area, with 60 (63.83%) graves located in Grid 1. The only marked graves are located in Grid 1, and there are comparable counts of unmarked probable graves between the two grids (N=36 in Grid 1 and N=34 in Grid 2) (Figures 71 and 72). Within the project APE, there are 27 possible graves. Twelve graves straddle the APE, including three marked and nine unmarked. The remaining 15 probable graves in the APE are unmarked.

Graves were typically identified as a series of point-source reflections in profile (Figures 78 and 79). These reflections are typically produced by the grave shaft, casket, or void spaces created through interment (Conyers 2006:154). Reflections were identified as probable graves when they have the geometry of grave features in plan and profile view.

The GPR survey of the Sandy Ridge Church Cemetery identified 82 unmarked probable graves. A number of graves were identified outside the known extent of the cemetery, and the cemetery boundary should be adjusted to include those graves (Figure 80). It is likely that the unmarked probable graves are older graves within the cemetery where markers have been removed. The church pastor, Donna Freddle, indicated that, among parishioners, this area has been well known to contain unmarked graves and that the church has stopped using this area to inter individuals out of concern for disturbing graves (personal communication, May 10, 2018).

The Sandy Ridge Methodist cemetery contains approximately 720 identifiable mid-nineteenth through twenty-first-century interments and is still active. The cemetery was a burying ground for the nearby community for almost 100 years prior to the construction of the Sandy Ridge Methodist church. Criterion A of the NRHP requires that the cemetery is associated with events that have made significant contributions to broad patterns of history. This cemetery does not convey any associations to notable events. Under Criterion B, more archival work is needed to determine if any of the individuals interred in the cemetery were locally significant. The variety of headstones in the cemetery reflect several generations of headstone production, but are not considered representative of a type, period, or method of construction, or represent the work of a master. While studies of biological data and funerary remains from this cemetery may provide information on the overall health of the nearby population during the mid-nineteenth through twenty-first centuries, their study is unlikely to provide data not already addressed by available documentary evidence. New South recommends the site not eligible for the NRHP under Criteria A, B, C, and D.

New South recommends that the 106 geophysical anomalies identified as probable graves should be treated as such. Additionally, care should be taken if any ground is to be disturbed within the entire cemetery to avoid damaging any burials that might be present but were not detected because of poor preservation and ground conditions. **Caution should also be used when disturbances are planned adjacent to the cemetery boundary, and extreme care should be taken if any ground disturbance is planned west of Sandy Camp Road. There are probable graves within approximately four meters of the road, and the presence of additional graves cannot be ruled out.**

CONCLUSIONS

New South conducted an intensive survey of the U-4758 APE along Sandy Ridge Road and Johnson Street from April 10 to April 17, 2018. Two archaeological sites (31GF568 and 31GF569) were identified and evaluated for NRHP eligibility during the field investigation. Three cemeteries (31GF570, 31GF571, and 31GF572) were also documented and evaluated for the NRHP. Both sites and all three cemeteries are recommended not eligible for the NRHP. There is a high potential for the presence of unmarked graves within the project APE at cemetery 31GF572. GPR survey of a portion of the Sandy Ridge Methodist Cemetery identified the presence of three marked graves and 24 unmarked probable graves (n=27 total) in the APE. All three cemeteries should be avoided by proposed construction activities. North Carolina General Statute, Chapter 65, Article 12 and North Carolina General Statute, Chapter 70, provide additional protections for this cemetery. If avoidance is not possible, it will be necessary to comply with these statutes after consultation with the State Archaeologist to determine the method any burials are to be removed and relocated.

Based on these results, no additional archaeological work is recommended in conjunction with this project. I concur with the recommendations put forth by our consultant. If the project expands and impacts subsurface areas beyond the study area or if design plans change prior to construction, further archaeological consultation will be necessary.

Certificate Of Completion

Envelope Id: A3F494D2F5254B28B309941D39ED3F33
Subject: Please DocuSign: U-4758 Type III CE_11142018.pdf
Source Envelope:
Document Pages: 55
Certificate Pages: 5
AutoNav: Enabled
EnvelopeId Stamping: Enabled
Time Zone: (UTC-08:00) Pacific Time (US & Canada)

Signatures: 4
Initials: 0

Status: Completed

Envelope Originator:
Ian Berdeau
1616 E Millbrook Road
Suite 160
Raleigh, NC 27609
ian.berdeau@atkinsglobal.com
IP Address: 74.218.172.54

Record Tracking

Status: Original
11/14/2018 6:45:18 AM

Holder: Ian Berdeau
ian.berdeau@atkinsglobal.com

Location: DocuSign

Signer Events	Signature	Timestamp
Bob Boot Robert.Boot@atkinsglobal.com Security Level: Email, Account Authentication (None)	DocuSigned by: Bob Boot E1206F2898FD4D9... Signature Adoption: Pre-selected Style Using IP Address: 174.194.16.210 Signed using mobile	Sent: 11/14/2018 6:54:59 AM Viewed: 11/14/2018 7:17:54 AM Signed: 11/14/2018 7:18:30 AM
Electronic Record and Signature Disclosure: Accepted: 11/14/2018 7:17:54 AM ID: a1e695b3-9431-4dd7-860b-c65c354755e4		
John Jamison johnjamison@ncdot.gov Security Level: Email, Account Authentication (None)	DocuSigned by: John Jamison 89F83E75FD11458... Signature Adoption: Pre-selected Style Using IP Address: 199.90.35.12	Sent: 11/14/2018 7:18:32 AM Viewed: 11/14/2018 11:21:00 AM Signed: 11/14/2018 12:31:28 PM
Electronic Record and Signature Disclosure: Accepted: 11/26/2018 8:18:03 AM ID: d16bc467-500b-4e04-83d3-aa048a9e953f		
Laura Sutton lsutton@ncdot.gov Regional Team Lead - Divisions 7, 9 & 10 NCDOT Project Management Unit Security Level: Email, Account Authentication (None)	DocuSigned by: AE35E3E6727640E... Signature Adoption: Drawn on Device Using IP Address: 199.90.35.12	Sent: 11/14/2018 12:31:31 PM Viewed: 11/15/2018 9:58:31 AM Signed: 11/19/2018 6:53:49 AM
Electronic Record and Signature Disclosure: Accepted: 11/15/2018 9:58:31 AM ID: dd80f59a-6eea-4932-abdc-307351e7e0ea		
for, Felix Davila felix.davila@dot.gov Security Level: Email, Account Authentication (None)	DocuSigned by: for, Felix Davila C1DFE33365CC4CD... Signature Adoption: Pre-selected Style Using IP Address: 169.135.89.74	Sent: 11/19/2018 6:53:51 AM Resent: 11/29/2018 6:45:47 AM Viewed: 11/29/2018 6:47:46 AM Signed: 11/29/2018 6:51:38 AM
Electronic Record and Signature Disclosure:		

Signer Events	Signature	Timestamp
Accepted: 11/29/2018 6:47:46 AM ID: 24e935b4-783f-4ef8-b539-e8b2fb7bb5cf		

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	11/29/2018 6:45:47 AM
Certified Delivered	Security Checked	11/29/2018 6:47:46 AM
Signing Complete	Security Checked	11/29/2018 6:51:38 AM
Completed	Security Checked	11/29/2018 6:51:38 AM

Payment Events	Status	Timestamps

Electronic Record and Signature Disclosure

ELECTRONIC RECORD AND SIGNATURE DISCLOSURE

From time to time, Atkins (we, us or Company) may be required by law to provide to you certain written notices or disclosures. Described below are the terms and conditions for providing to you such notices and disclosures electronically through the DocuSign, Inc. (DocuSign) electronic signing system. Please read the information below carefully and thoroughly, and if you can access this information electronically to your satisfaction and agree to these terms and conditions, please confirm your agreement by clicking the 'I agree' button at the bottom of this document.

Getting paper copies

At any time, you may request from us a paper copy of any record provided or made available electronically to you by us. You will have the ability to download and print documents we send to you through the DocuSign system during and immediately after signing session and, if you elect to create a DocuSign signer account, you may access them for a limited period of time (usually 30 days) after such documents are first sent to you. After such time, if you wish for us to send you paper copies of any such documents from our office to you, you will be charged a $0.00 per-page fee. You may request delivery of such paper copies from us by following the procedure described below.

Withdrawing your consent

If you decide to receive notices and disclosures from us electronically, you may at any time change your mind and tell us that thereafter you want to receive required notices and disclosures only in paper format. How you must inform us of your decision to receive future notices and disclosure in paper format and withdraw your consent to receive notices and disclosures electronically is described below.

Consequences of changing your mind

If you elect to receive required notices and disclosures only in paper format, it will slow the speed at which we can complete certain steps in transactions with you and delivering services to you because we will need first to send the required notices or disclosures to you in paper format, and then wait until we receive back from you your acknowledgment of your receipt of such paper notices or disclosures. To indicate to us that you are changing your mind, you must withdraw your consent using the DocuSign 'Withdraw Consent' form on the signing page of a DocuSign envelope instead of signing it. This will indicate to us that you have withdrawn your consent to receive required notices and disclosures electronically from us and you will no longer be able to use the DocuSign system to receive required notices and consents electronically from us or to sign electronically documents from us.

All notices and disclosures will be sent to you electronically

Unless you tell us otherwise in accordance with the procedures described herein, we will provide electronically to you through the DocuSign system all required notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to you during the course of our relationship with you. To reduce the chance of you inadvertently not receiving any notice or disclosure, we prefer to provide all of the required notices and disclosures to you by the same method and to the same address that you have given us. Thus, you can receive all the disclosures and notices electronically or in paper format through the paper mail delivery system. If you do not agree with this process, please let us know as described below. Please also see the paragraph immediately above that describes the consequences of your electing not to receive delivery of the notices and disclosures

electronically from us.

How to contact Atkins:

You may contact us to let us know of your changes as to how we may contact you electronically, to request paper copies of certain information from us, and to withdraw your prior consent to receive notices and disclosures electronically as follows:

To contact us by email send messages to: kaitlyn.ihly@atkinsglobal.com

To advise Atkins of your new e-mail address

To let us know of a change in your e-mail address where we should send notices and disclosures electronically to you, you must send an email message to us at kaitlyn.ihly@atkinsglobal.com and in the body of such request you must state: your previous e-mail address, your new e-mail address. We do not require any other information from you to change your email address..

In addition, you must notify DocuSign, Inc. to arrange for your new email address to be reflected in your DocuSign account by following the process for changing e-mail in the DocuSign system.

To request paper copies from Atkins

To request delivery from us of paper copies of the notices and disclosures previously provided by us to you electronically, you must send us an e-mail to kaitlyn.ihly@atkinsglobal.com and in the body of such request you must state your e-mail address, full name, US Postal address, and telephone number. We will bill you for any fees at that time, if any.

To withdraw your consent with Atkins

To inform us that you no longer want to receive future notices and disclosures in electronic format you may:

i. decline to sign a document from within your DocuSign session, and on the subsequent page, select the check-box indicating you wish to withdraw your consent, or you may;

ii. send us an e-mail to kaitlyn.ihly@atkinsglobal.com and in the body of such request you must state your e-mail, full name, US Postal Address, and telephone number. We do not need any other information from you to withdraw consent.. The consequences of your withdrawing consent for online documents will be that transactions may take a longer time to process..

Required hardware and software

Operating Systems:	Windows® 2000, Windows® XP, Windows Vista®; Mac OS® X
Browsers:	Final release versions of Internet Explorer® 6.0 or above (Windows only); Mozilla Firefox 2.0 or above (Windows and Mac); Safari™ 3.0 or above (Mac only)
PDF Reader:	Acrobat® or similar software may be required to view and print PDF files
Screen Resolution:	800 x 600 minimum
Enabled Security Settings:	Allow per session cookies

** These minimum requirements are subject to change. If these requirements change, you will be asked to re-accept the disclosure. Pre-release (e.g. beta) versions of operating systems and browsers are not supported.

Acknowledging your access and consent to receive materials electronically

To confirm to us that you can access this information electronically, which will be similar to other electronic notices and disclosures that we will provide to you, please verify that you were able to read this electronic disclosure and that you also were able to print on paper or electronically save this page for your future reference and access or that you were able to e-mail this disclosure and consent to an address where you will be able to print on paper or save it for your future reference and access. Further, if you consent to receiving notices and disclosures exclusively in electronic format on the terms and conditions described above, please let us know by clicking the 'I agree' button below.
By checking the 'I agree' box, I confirm that:

- I can access and read this Electronic CONSENT TO ELECTRONIC RECEIPT OF ELECTRONIC RECORD AND SIGNATURE DISCLOSURES document; and

- I can print on paper the disclosure or save or send the disclosure to a place where I can print it, for future reference and access; and

- Until or unless I notify Atkins as described above, I consent to receive from exclusively through electronic means all notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to me by Atkins during the course of my relationship with you.