



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY PERDUE
GOVERNOR

EUGENE CONTI
SECRETARY

Aug 2, 2012

MEMORANDUM TO: Mr. Mike Mills, PE
Division 7 Engineer

FROM: Philip S. Harris, III, P.E., Section Head
Natural Environment Section
Project Development and Environmental Analysis Unit

SUBJECT: Guilford County, Greensboro-High Point Road Improvements,
Federal Aid No. STP-4121(1)WBS No. 34802.1.1,
TIP U-2412 A&B / U-2524AE.

A handwritten signature in black ink, appearing to read "E. L. Fuchs".

Attached are the U.S. Army Corps of Engineers Section 404 Individual permit, N.C. Division of Water Quality (NCDWQ) Section 401 Water Quality Certification, and the NCDWQ Riparian Buffer Authorization. All environmental permits have been received for the construction of this project.

A copy of this permit package will be posted on the NCDOT website at:
<http://www.ncdot.gov/doh/preconstruct/pe/neu/permit.html>

Cc:

Mr. Randy Garris, P.E. State Contract Officer
Mr. Jerry Parker, Division Environ. Officer
Mr. Majed Alghandour, P. E., Program. and TIP
Mr. Jay Bennett, P.E., Roadway Design
Mr. Art McMillan, P.E., Hydraulics
Mr. Tom Koch, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. Ron Hancock, P.E., State Roadway Construction Engineer
Mr. Steve Brown, P.E., PDEA Planning Engineer
Ms. Beth Harmon, EEP
Mr. Phillip Ayscue, Office of Inspector General

PROJECT COMMITMENTS

T.I.P. Project No. U-2412/U-2524AE
Greensboro-High Point Road Improvements
Guilford County
Federal Aid Project No. STP-4121(1)
WBS Element 34802.1.1

COMMITMENTS FROM PROJECT DEVELOPMENT AND DESIGN

Project Development and Environmental Analysis (PDEA) Unit

A final design traffic noise study will be performed on the selected alternative (Alternative Corridor 2). The study will include, but will not be limited to, recommended noise wall locations at Loftyview Drive, Crestwood Circle, and Riverwalk Lane.

No change. Noise wall locations will be further investigated during final design.

Natural Environment Section, Hydraulics Unit

NCDOT will apply for the “general” major variance from the *Randleman Lake WaterSupply: Protection and Maintenance of Riparian Areas* with the Pre-Notification Application Form for the 401 Water Quality Certification. Written concurrence that the conditions of the “general” major variance must be obtained from the Division of Water Quality before any activities that impact buffers may begin.

Due to revisions of the Randleman Lake Water Supply Riparian Buffer rules, a major variance is no longer required for this project.

Hydraulics Unit, Roadside Environmental Unit

Since the alternative corridors cross the Deep River within a critical area, high quality water sedimentation controls in addition to NCDOT’s *Best Management Practices for Protection of Surface Waters* and *Design Standards in Sensitive Watersheds* will be implemented. Hazardous spill detention basins will be provided along the new location portion of the project between Enterprise Drive and Guilford College Road (SR 1546). If feasible from a topographical standpoint, combined spill and stormwater basins will be used. Stormwater regulations set forth by the Randleman Dam Watershed Nutrient Management Strategy (Randleman Rules) will be followed during the design and construction of the proposed project.

No Change.

Hydraulics Unit and Roadway Design Unit

The proposed Bull Run Creek Trail greenway is anticipated to follow Bull Run Creek. A bridge is proposed to carry the roadway over Bull Run Creek and its 50-foot buffers. The bridge will be designed to accommodate the proposed greenway on one side of the stream.

No Change.

The project will incorporate bridges to span the streams and buffers at an unnamed tributary to the Deep River (UT3), the Deep River itself, and Bull Run Creek, as discussed at Merger Meeting 2A.

No Change.

Wetlands associated with the Deep River will be spanned, as discussed at Merger Meeting 4A.

No Change.

PDEA Unit, Roadway Design Unit, and Structure Design Unit

In order to mitigate visual impacts to the Oakdale Cotton Mill Village Historic District, NCDOT will coordinate with the State Historic Preservation Office (SHPO) regarding the control of access fence to be located at the top of the cut slope adjacent to the district, the bridge rail, and guardrails on Oakdale Road (SR 1352).

No change. The final design of this section of the project will be coordinated with SHPO during final design.

Roadway Design Unit, Structure Design Unit

NCDOT will coordinate with Norfolk Southern to ensure the bridge over the railroad is correctly located and is designed to span future freight, high speed rail, and potential transit tracks. This will ensure the expansion of the freight tracks and installation of the high speed rail corridor will remain compatible with the project.

Coordination with Norfolk Southern is on-going at the time of this consultation.

Roadway Design Unit

During the preparation of right of way plans, NCDOT will prepare cost estimates for an alternative to eliminate the intersection of Forbes Drive and High Point Road and provide access to Forbes Drive properties via Hilltop Crest Road. This alternative will be presented at a public meeting subsequent to the publication of this FEIS. Unless proved not feasible, the Forbes Drive intersection will be eliminated to avoid impacts to a veterinarian business.

Impact to the veterinarian business has been minimized through the use of curb and gutter and slope adjustments. The Forbes Drive intersection will remain in the proposed project.

During the preparation of right of way plans, NCDOT will include bus pullovers at the project's intersections with Enterprise Drive, Manor Road, Mackay Road, and Hilltop Road, provided the pullovers do not increase the number of residential or business relocations.

No Change. Roadway Design is investigating inclusion of bus pullovers at these intersections.

In the vicinity of Guilford Memorial Park, NCDOT will hold the existing right of way line on the north side and widen the existing roadway to the south to avoid impacts to graves and trees associated with the cemetery.

No change. Impacts to the cemetery have been avoided.

During final design, NCDOT will optimize placement of additional median openings between Guilford College Road and Mackay Road. Specific locations that NCDOT will consider for median openings include: Scotland Road (SR 1368) and Guilford Memorial Park, and a median opening that serves Alberdingk-Boley and Daimler Chrysler.

No Change. Roadway Design is investigating placement of median openings between Guilford College Road and Mackay Road.

During final design, NCDOT will consider realigning Suttonwood Drive (SR 1370) Road to intersect existing High Point Road (SR 4121) across from Mackay Road (SR 1549).

A connection of Suttonwood Drive (SR 1370) to Mackay Road (SR 1549) to the south of existing High Point Road (SR 4121) is proposed to provide connectivity in this area.

Along curb and gutter portions of the project, 4.2 m (14-foot) outside through lanes will be provided to accommodate bicyclists.

No Change.

Right of Way and PDEA Unit

Once the owners of the dam at Owen Lake between Ring Street and Manor Drive have been identified through the Right of Way Branch's deed research, NCDOT will provide contact information to the Division of Land Quality for their use in pursuing repair or removal of the dam.

No Change.

Project design plans will not maintain access to Oak Village Drive and Creekside Drive of the Bull Run subdivision. This decision is based on preliminary right of way damage estimates and public input.

No change.

Traffic Engineering Branch

In the vicinity of the Ragsdale High School, Jamestown Middle School, and Millis Road Elementary School, NCDOT will consider the installation of a traffic signal with pedestrian accommodations at Vickrey Chapel Road and pedestrian crossings across Vickrey Chapel and Millis Roads, in the vicinity of the schools.

No change. NCDOT has proposed a traffic signal at the Vickrey Chapel Road intersection. Pedestrian accommodations will be evaluated for inclusion in the final design.

COMMITMENTS FROM PERMITTING

Division 7, Natural Environment Section, and Hydraulics Unit

It is recognized that plans for Section U-2412A are still in the preliminary state and accordingly, U-2412A is not authorized for construction at this time. Construction may commence on Section U-2412A only after: 1) all appropriate and practicable avoidance and minimization measures have been approved through the remaining 4C Merger Meeting; 2) a final jurisdictional determination for Section U-2412A is complete, occurring prior to the permit modification for this section; 3) final plan design has been completed and approved by the District Commander; and 4) a modification request, including a final compensatory mitigation plan for this Section, is submitted by NCDOT and approved by the District Commander.

When final design plans are completed for U-2412A, a modification to the 401 Water Quality Certification and the Randleman Lake Riparian Buffer Certification shall be submitted with five copies and fees to the NC Division of Water Quality. Final designs shall reflect all appropriate avoidance, minimization, and mitigation for impacts to wetlands, streams, and other surface waters, and buffers. No construction activities that impact any wetlands, streams, surface waters, or buffers located in U-2412A shall begin until after the permittee applies for, and receives a written modification of the 401 Water Quality Certification and the Randleman Lake Riparian Buffer Authorization from the NC Division of Water Quality. This modification shall include compensatory mitigation for applicable impacts to streams, wetlands, or riparian buffers associated with U-2412A.

Division 7 and Hydraulics Unit

Any modifications to this 401 Water Quality Certification that propose additional stream impacts or increased impervious surface requiring additional stormwater management may be subject the Jordan Water Supply Nutrient Strategy [15A NCAC02B .0267]. NCDOT shall coordinate with NCDWQ prior to submitting a modification request to determine the applicability of the Jordan Water Supply Nutrient Strategy. This condition does not apply to major modifications for additional sections of the project that were covered under the Finding of No Significant Impact or approved in the Avoidance and Minimization stage of the project.

DEPARTMENT OF THE ARMY PERMIT

Permittee: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION –
ATTN: DR. GREGORY J. THORPE, PH.D

Permit No: SAW-2000-21876

Issuing Office: USAED, WILMINGTON

NOTE: The term “you” and its derivatives, as used in this permit, means the permittee or any future transferee. The term “this office” refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of the office acting under the authority of the commanding officer.

You are authorized to perform work in the accordance with the terms and conditions specified below.

Project Description: The North Carolina Department of Transportation (NCDOT) has identified this project as TIP U-2412A&B/U-2524AE, which involves construction, and improvements to Greensboro-High Point Road (SR 1486-SR 4121) from US 311 Bypass in High Point to Hilltop Road in Greensboro, Guilford County, North Carolina. Specifically, the project includes a combination of widening improvements to existing High Point Road and construction on new location, including an interchange with the US 311 Bypass in High Point and the Greensboro Western Urban Loop. The project would permanently impact a total of 4,817 linear feet of streams, 1.62 acres of wetlands, and 3.65 acres of open water ponds. Additional temporary impacts are also proposed to 776 linear feet of stream channel to facilitate the construction of this project. To mitigate for all unavoidable permanent impacts to jurisdictional features, the applicant has proposed payment to the North Carolina Ecosystem Enhancement Program (NCEEP) to provide compensatory mitigation for the stream and wetland impacts from this project. However, since the portion identified as Section U-2412A is currently unfunded and letting more than 5 years out, NCDOT is not proposing mitigation at this time for that particular Section. A permit modification, prior to the start of construction on Section U-2412A, will require compensatory mitigation at that time.

As such, NCDOT would mitigate for 1,932 linear feet of permanent impacts to warm water streams and 0.63-acre of Riparian-Nonriverine wetland, in the Cape Fear River Basin, through payment to the EEP for restoration of 3,710 linear feet of warm water streams and 1.26 acre of Riparian-Nonriverine wetlands. EEP has agreed to provide the compensatory mitigation for the project, as outlined in a letter from Michael Ellison, dated May 31, 2012.

Project Location: The project, known as TIP U-2412A&B/U-2524AE, is a 7.9 mile length along Greensboro-High Point Road (SR 1486-SR 4121) from US 311 Bypass in High Point to Hilltop Road in Greensboro, Guilford County, North Carolina. This project includes the construction of a new interchange with the US 311 Bypass and the Greensboro Western Urban Loop. Impacts are proposed to five unnamed tributaries to Reddicks Creek, eight unnamed tributaries to Deep River, and two unnamed tributaries to Bull Run Creek. In addition, impacts are proposed to several nearby wetlands to facilitate this proposal. All project streams are tributaries to the Cape Fear River (Hydrologic Unit Code 03030003). The approximate center of project is at 36.0085° N., -79.9021° W).

Permit Conditions:

General Conditions:

1. The time Limit for completing the work authorized ends on December 31, 2032. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Conditions 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site eligible for listing in the National Register of Historic Places.
4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.
5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.
6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

*SEE ATTACHED SPECIAL CONDITIONS

Further Information:

1. **Congressional Authorities:** You have been authorized to undertake the activity described above pursuant to:
 - () Section 10 of the Rivers and Harbors Act of 1899 (33 U.S. C. 403).
 - (X) Section 404 of the clean Water Act (33 U.S.C. 1344).
 - () Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).
2. **Limits of this authorization.**
 - a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.
 - b. This permit does not grant any property rights or exclusive privileges.

- c. This permit does not authorize any injury to the property or rights of others.
- d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

- a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
- b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.
- c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
- d. Design or construction deficiencies associated with the permitted work.
- e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

- a. You fail to comply with the terms and conditions of this permit.
- b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (see 4 above).
- c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measure by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

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Failure to institute and carry out the details of the following special conditions below (listed as a-x) will result in a directive to cease all ongoing and permitted work within waters of the United States, including wetlands, associated with the permitted project, or such other remedies and/or fines as the U.S. Army Corps of Engineers District Commander or his authorized representatives may seek.

a) The North Carolina Division of Water Quality (DWQ) permit/certification number WQC003924 was issued for this project on June 4, 2012. Special conditions were issued associated with this water quality permit/certification and a copy of these conditions is attached as Exhibit A. These referenced conditions are hereby incorporated as special conditions of this permit.

b) All work authorized by this permit must be performed in strict compliance with the attached plans which were received on February 22, 2012. These plans are a part of this permit and identified as Exhibit B. Any modification to these plans must be approved by the US Army Corps of Engineers (USACE) prior to implementation.

c) It is recognized that plans for Section U-2412A are still in the preliminary state and accordingly, U-2412A is not authorized for construction at this time. Construction may commence on Section U-2412A only after: 1) all appropriate and practicable avoidance and minimization measures have been approved through the remaining 4C Merger Meeting; 2) a final jurisdictional determination for Section U-2412A is complete, occurring prior to the permit modification for this section; 3) final plan design has been completed and approved by the District Commander; and 4) a modification request, including a final compensatory mitigation plan for this Section is submitted by NCDOT and approved by the District Commander.

d) The permittee shall schedule a preconstruction meeting between its representatives, the contractor's representatives, and the Corps of Engineers, Raleigh Regulatory Field Office, NCDOT Regulatory Project Manager, prior to any work within jurisdictional waters and wetlands to ensure that there is a mutual understanding of all of the terms and conditions contained within this Department of the Army Permit. The permittee shall provide the USACE, Raleigh Regulatory Field Office, NCDOT Regulatory Project Manager, with a copy of the final plans at least two weeks prior to the preconstruction meeting along with a description of any changes that have been made to the project's design, construction methodology or construction timeframe. The permittee shall schedule the preconstruction meeting for a time when the USACE and North Carolina

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Division of Water Quality (NCDWQ) Project Managers can attend. The permittee shall invite the Corps and NCDWQ Project Managers a minimum of thirty (30) days in advance of the scheduled meeting in order to provide those individuals with ample opportunity to schedule and participate in the required meeting.

e) Except as authorized by this permit or any USACE approved modification to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, within waters or wetlands. This permit does not authorize temporary placement or double handling of excavated or fill material within waters or wetlands outside the permitted area. This prohibition applies to all borrow and fill activities connected with this project.

f) Except as specified in the plans attached to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, in such a manner as to impair normal flows and circulation patterns within waters or wetlands or to reduce the reach of waters or wetlands.

g) Compensatory mitigation for the unavoidable impacts to 1,932 linear feet of stream and 0.63 acre of Riparian-Nonriverine wetland impact associated with the proposed project shall be provided by the Ecosystem Enhancement Program (EEP), as outlined in the letter dated May 31, 2012, from Michael Ellison, EEP Deputy Director. Pursuant to the In-Lieu-Fee Instrument signed July 28, 2010, between the State of North Carolina, Ecosystem Enhancement Program and the US Army Corps of Engineers the EEP will provide 3,710 linear feet of restoration equivalent warm water stream channel and 1.26 acres of Riparian-Nonriverine wetland restoration equivalent in the Cape Fear River basin (Hydrologic Cataloging Unit 03030003) in accordance with Section F of the instrument. For wetlands, a minimum of 1:1 (impact to mitigation) must be in the form of wetland restoration.

h) All mechanized equipment will be regularly inspected and maintained to prevent contamination of waters and wetlands from fuels, lubricants, hydraulic fluids, or other toxic materials. In the event of a spill of petroleum products or any other hazardous waste, the permittee shall immediately report it to the N.C. Division of Water Quality at 1 (800) 858-0368 and provisions of the North Carolina Oil Pollution and Hazardous Substances Control Act will be followed.

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- i) The permittee shall advise the Corps in writing prior to beginning the work authorized by this permit and again upon completion of the work authorized by this permit.

- j) Unless otherwise authorized by this permit, all fill material placed in waters or wetlands shall be generated from an upland source and will be clean and free of any pollutants except in trace quantities. Metal products, organic materials (including debris from land clearing activities), or unsightly debris will not be used.

- k) The permittee shall require its contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project, and shall provide each of its contractors and/or agents associated with the construction or maintenance of this project with a copy of this permit. A copy of this permit, including all conditions, shall be available at the project site during construction and maintenance of this project.

- l) The permittee shall employ all sedimentation and erosion control measures necessary to prevent an increase in sedimentation or turbidity within waters and wetlands outside the permit area. This shall include, but is not limited to, the immediate installation of silt fencing or similar appropriate devices around all areas subject to soil disturbance or the movement of earthen fill, and the immediate stabilization of all disturbed areas. Additionally, the project must remain in full compliance with all aspects of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statutes Chapter 113A Article 4).

- m) The permittee shall remove all sediment and erosion control measures placed in wetlands or waters, and shall restore natural grades in those areas, prior to project completion.

- n) During the clearing phase of the project, heavy equipment must not be operated in surface waters or stream channels. Temporary stream crossings will be used to access the opposite sides of stream channels. All temporary diversion channels and stream crossings will be constructed of non-erodible materials. Grubbing of riparian vegetation will not occur until immediately before construction begins on a given segment of stream channel.

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- o) No fill or excavation for the purposes of sedimentation and erosion control shall occur within jurisdictional waters, including wetlands, unless it is included on the plan drawings and specifically authorized by this permit.
- p) The permittee, upon receipt of a notice of revocation of this permit or upon its expiration before completion of the work will, without expense to the United States and in such time and manner as the Secretary of the Army or his authorized representative may direct, restore the water or wetland to its pre-project condition.
- q) Violations of these conditions or violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act must be reported in writing to the Wilmington District U.S. Army Corps of Engineers within 24 hours of the permittee's discovery of the violation.
- r) The permittee will ensure that the construction design plans for this project do not deviate from the permit plans attached to this authorization. Written verification shall be provided that the final construction drawings comply with the attached permit drawings prior to any active construction in waters of the United States, including wetlands. Any deviation in the construction design plans will be brought to the attention of the Corps of Engineers, Raleigh Regulatory Field Office prior to any active construction in waters or wetlands.
- s) Prior to commencing construction within jurisdictional waters of the United States for any portion of the proposed project, the permittee shall forward the latest version of project construction drawings to the Corps of Engineers, Raleigh Regulatory Field Office NCDOT Regulatory Project Manager. Half-size drawings will be acceptable.
- t) The permittee shall take measures to prevent live or fresh concrete from coming into contact with any surface waters until the concrete has hardened.
- u) Measures will be included in the construction/installation that will promote the safe passage of fish and other aquatic organisms. The dimension, pattern, and profile of the stream above and below a pipe or culvert should not be modified by widening the stream channel or by reducing the depth of the stream in connection with the construction activity. The width, height, and gradient of a proposed opening should be such as to pass

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the average historical low flow and spring flow without adversely altering flow velocity. Spring flow should be determined from gauge data, if available. In the absence of such data, bankfull flow can be used as a comparable level.

v) Culverts greater than 48 inches in diameter will be buried at least one foot below the bed of the stream. Culverts 48 inches in diameter or less shall be buried or placed on the stream bed as practicable and appropriate to maintain aquatic passage, and every effort shall be made to maintain the existing channel slope. The bottom of the culvert must be placed at a depth below the natural stream bottom to provide for passage during drought or low flow conditions. Destabilizing the channel and head cutting upstream should be considered in the placement of the culvert. A waiver from the depth specifications in this condition may be requested in writing. The waiver will be issued if it can be demonstrated that the proposal would result in the least impacts to the aquatic environment.

w) To ensure that all borrow and waste activities occur on high ground and do not result in the degradation of adjacent wetlands and streams, except as authorized by this permit, the permittee shall require its contractors and/or agents to identify all areas to be used to borrow material, or to dispose of dredged, fill, or waste material. The permittee shall provide the USACE with appropriate maps indicating the locations of proposed borrow or waste sites as soon as the permittee has that information. The permittee will coordinate with the USACE before approving any borrow or waste sites that are within 400 feet of any streams or wetlands.

x) If the permittee discovers any previously unknown historic or archaeological sites while accomplishing the authorized work, he shall immediately stop work and notify the Corps of Engineers, Raleigh Regulatory Field Office NCDOT Regulatory Project Manager who will initiate the required State/Federal coordination.



North Carolina Department of Environment and Natural Resources

Division of Water Quality
Charles Wakild, P.E.
Director

Beverly Eaves Perdue
Governor



June 4, 2012

Dr. Greg Thorpe, PhD., Manager
Project Development and Environmental Analysis
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina, 27699-1548

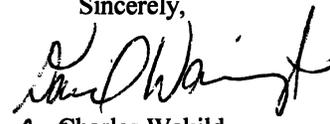
Subject: 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act and RANDLEMAN BUFFER RULES with ADDITIONAL CONDITIONS for Proposed improvements to Greensboro-High Point Road (SR 1486-SR 4121) from US 311 Bypass (future I-74) in High Point to Hilltop Road in Greensboro, Guilford County, Federal Aid Project No. STP-4121(1), State Project No. WBS Element No. 34802.1.1, TIP U-2412 A&B/U2524AE. NCDWQ Project No. 2012-0211.

Dear Dr. Thorpe:

Attached hereto is a copy of Certification No. 003924 issued to The North Carolina Department of Transportation (NCDOT) dated June 4, 2012

If we can be of further assistance, do not hesitate to contact us.

Sincerely,



for Charles Wakild
Director

Attachments

cc: Monte Matthews, US Army Corps of Engineers, Raleigh Field Office (electronic copy only)
Mike Mills, PE, Division 7 Engineer
Jerry Parker, Division 7 Environmental Officer
Chris Militscher, Environmental Protection Agency (electronic copy only)
Travis Wilson, NC Wildlife Resources Commission (electronic copy only)
Beth Harmon, Ecosystem Enhancement Program
Wetlands/401 Transportation Permitting Unit
File Copy

Transportation and Permitting Unit
1650 Mail Service Center, Raleigh, North Carolina 27699-1617
Location: 512 N. Salisbury St. Raleigh, North Carolina 27604
Phone: 919-807-6300 \ FAX: 919-807-6492
Internet: www.ncwaterquality.org

One
North Carolina
Naturally

401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act and RANDLEMAN BUFFER RULES with ADDITIONAL CONDITIONS

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Quality (NCDWQ) Regulations in 15 NCAC 2H .0500 and 15A NCAC 2B.0250. This certification authorizes the NCDOT to impact 5593 linear feet of jurisdictional streams, 1.81 acres of jurisdictional wetlands, 3.65 acres of open water, and 906306 square feet of protected riparian buffers in Guilford County. The project shall be constructed pursuant to the application dated received February 24, 2012 with additional information dated received March 15, 2012, May 23, 2012, and May 24, 2012. The authorized impacts are as described below:

Stream Impacts in the Cape Fear River Basin for U-2412A

Site	Permanent Fill in Intermittent Stream (linear ft)	Temporary Fill in Intermittent Stream (linear ft)	Permanent Fill in Perennial Stream (linear ft)	Temporary Fill in Perennial Stream (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
1				34	34	0
2			353	106	459	353
3A	213	11			224	0
3B	307	64			371	0
4			336	17	353	336
6			283	21	304	283
7A			418	33	451	418
7B	208				208	0
8				215	215	0
10A			100		100	0
10B			40	40	80	0
11			492	55	547	492
12			82		82	0
13			24	40	64	0
14			29	0	29	0
Total	728	75	2157	561	3521	1882

Total Stream Impact for U2412A: 3521 linear feet.

Stream Impacts in the Cape Fear River Basin for U-2412B

Site	Permanent Fill in Intermittent Stream (linear ft)	Temporary Fill in Intermittent Stream (linear ft)	Permanent Fill in Perennial Stream (linear ft)	Temporary Fill in Perennial Stream (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
1			265	51	316	265
2 *			295	20	315	295
3			503	7	510	503
4			331	19	350	331
5			455	33	488	455
6*			83	10	93	83
			1932	140	2072	1932

Total Stream Impact for U-2412B/U-2524AE: 2072 linear feet.

*Sites 2 and 6 are the same stream.

Wetland Impacts in the Cape Fear River Basin for U-2412A

Site	Fill (ac)	Fill (temporary) (ac)	Excavation (ac)	Mechanized Clearing (ac)	Hand Clearing (ac)	Area under Bridge (ac)	Total Wetland Impact (ac)
2	0.22			0.05			0.27
4	0.03						0.03

7A	0.45			0.04			0.49
8	0.02			0.04	0.19		0.25
11	0.08			0.04			0.12
12	0.01			0.01			0.02
Total	0.81			0.18	0.19		1.18

Total Wetland Impact for U2412A: 1.18 acres.

Wetland Impacts in the Cape Fear River Basin for U-2412B/U-2524AE

Site	Fill (ac)	Fill (temporary) (ac)	Excavation (ac)	Mechanized Clearing (ac)	Hand Clearing (ac)	Area under Bridge (ac)	Total Wetland Impact (ac)
2	0.07			0.01			0.08
6	0.41		0.14	<0.005			0.55
Total	0.48		0.14	0.01			0.63

Total Wetland Impact for U-2412B/U-2524AE: 0.63 acres.

Open Water Impacts in the Cape Fear River Basin for U-2412A

Site	Permanent Fill in Open Waters (ac)	Temporary Fill in Open Waters (ac)	Total Fill in Open Waters (ac)
2	0.60		0.60
10A	0.18		0.18
11	1.31		1.31
13	1.56		1.56
Total	3.65		3.65

Total Open Water Impact for U-2412A: 3.65 acres.

Randleman Lake Riparian Buffer Impacts for U-2412A

Site	Zone 1 Impact (sq ft)	minus Wetlands Zone 1 (sq ft)	= Zone 1 Buffers (sq ft)	Zone 1 Buffer Mitigation Required	Zone 1 Buffer Mitigation Required (3:1 ratio)	Zone 2 Impact (sq ft)	minus Wetlands Zone 2 (sq ft)	= Zone 2 Buffers (sq ft)	Zone 2 Buffer Mitigation Required	Zone 2 Buffer Mitigation Required (1.5:1 ratio)
1	5622	0	5622	5622	16866	3253	0	3253	3253	4888
2	49439	8770	40669	40669	122007	26456	2301	24155	24155	36233
3	42000	0	42000	42000	126000	22048	0	22048	22048	33072
4	24840	1254	23586	23586	70758	16144	35	16109	16109	24164
5	13942	0	13942	30	90	11643	0	11643	1376	2064
6	20445	0	20445	20445	61335	11763	0	11763	11763	17645
7	42395	13883	28512	28512	85536	23822	4811	19011	19011	28517
8	16108	2980	13128	0	0	10647	4392	6255	0	0
9	22580	0	22580	0	0	15399	0	15399	704	1056
10	29383	0	29383	29383	88149	16667	0	16667	16667	25001
11	61508	4190	57318	57318	171954	29610	519	29091	29091	43637
12	19695	696	18999	18999	56997	5647	0	5647	5647	8471
13	43041	0	43041	43041	129123	192821	0	192821	192821	289232
14	1975	0	1975	1975	5925	680	0	680	680	1020
Totals	392973	31773	361200	311580	934740	386600	12058	374542	343325	515000

Total Buffer Impact for U-2412A: 735742 square feet.

Randleman Lake Riparian Buffer Impacts for U-2412B/U-2524AE

Site	Zone 1 Impact (sq ft)	minus Wetlands Zone 1 (sq ft)	= Zone 1 Buffers (sq ft)	Zone 1 Buffer Mitigation Required	Zone 1 Buffer Mitigation Required (3:1 ratio)	Zone 2 Impact (sq ft)	minus Wetlands Zone 2 (sq ft)	= Zone 2 Buffers (sq ft)	Zone 2 Buffer Mitigation Required	Zone 2 Buffer Mitigation Required (1.5:1 ratio)
1	17804	0	17804	17804	53412	11396	0	11396	11396	17094
2	12522	3122	9400	9400	28200	7294	30	7264	7264	10896
3	31864	0	31864	31864	95592	21239	0	21239	21239	31859
4	18850	0	18850	18850	56550	11157	0	11157	11157	16736
5	21169	0	21169	21169	63507	10491	0	10491	10491	15737
6	6412	1161	5251	0	0	5795	1116	4679	0	0
Totals	108621	4283	104338	99087	297261	67372	1146	66226	61547	92322

Total Buffer Impact for U-2412B/U-2524AE: 170564 square feet.

The application provides adequate assurance that the discharge of fill material into the waters of the Cape Fear River Basin in conjunction with the proposed development will not result in a violation of applicable Water Quality Standards and discharge guidelines. Therefore, the State of North Carolina certifies that this activity will not violate the applicable portions of Sections 301, 302, 303, 306, 307 of PL 92-500 and PL 95-217 if conducted in accordance with the application and conditions hereinafter set forth.

This approval is only valid for the purpose and design that you submitted in your application dated received February 24, 2012 with additional information dated received March 15, 2012, May 23, 2012, and May 24, 2012. Should your project change, you are required to notify the NCDWQ and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one acre or 150 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). Additional buffer impacts may require compensatory mitigation as described in 15A NCAC.0248. For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

Condition(s) of Certification:

Project Specific Conditions

1. All stormwater runoff shall be directed as sheetflow through stream buffers at nonerosive velocities, unless otherwise approved by this certification.
2. All riparian buffers impacted by the placement of temporary fill or clearing activities shall be restored to the preconstruction contours and revegetated. Maintained buffers shall be permanently revegetated with non-woody species by the end of the growing season following completion of construction. For the purpose of this condition, maintained buffer areas are defined as areas within the transportation corridor that will be subject to regular NCDOT maintenance activities including mowing. The area with non-maintained buffers shall be permanently revegetated with native woody species before the next growing season following completion of construction.
3. Pursuant to 15A NCAC 2B.0250, sediment and erosion control devices shall not be placed in Zone 1 of any Randleman Buffer without prior approval by NCDWQ. At this time, NCDWQ has approved no sediment and erosion control devices in Zone 1, outside of the approved project impacts, anywhere on this project. Moreover, sediment and erosion control devices shall be allowed in Zone 2 of the buffers provided that Zone 1 is not compromised and that discharge is released as diffuse flow.
4. Any modifications to this 401 Water Quality Certification that propose additional stream impacts or increased impervious surface requiring additional stormwater management may be subject the Jordan Water Supply Nutrient Strategy [15A NCAC02B .0267]. NCDOT shall coordinate with NCDWQ prior to submitting a modification request to determine the applicability of the Jordan Water Supply Nutrient Strategy. This condition does not apply to major modifications for additional sections of the project that

were covered under the Finding of No Significant Impact or approved in the Avoidance and Minimization stage of the project.

5. The NCDOT Division Environmental Officer or Environmental Assistant will conduct a pre-construction meeting with all appropriate staff to ensure that the project supervisor and essential staff understand the potential issues with stream and pipe alignment at the permitted site. NCDWQ staff shall be invited to the pre-construction meeting.
6. Two copies of the final construction drawings shall be furnished to NCDWQ Central Office prior to the pre-construction meeting. The permittee shall provide written verification that the final construction drawings comply with the permit drawings contained in the application dated February 24, 2012. Any deviations from the approved drawings are not authorized unless approved by the NC Division of Water Quality.
7. Channel relocations shall be completed and stabilized, and approved on site by DWQ staff, prior to diverting water into the new channel. Stream banks shall be matted with coir-fiber matting, unless otherwise approved in this certification. Vegetation used for bank stabilization shall be limited to native riparian vegetation, and should include establishment of a vegetated buffer on both sides of the relocated channel to the maximum extent practical. Also, rip-rap may be allowed beyond the limits approved by this certification if it is necessary to maintain the physical integrity of the stream, but the applicant must provide written justification and any calculations used to determine the extent of rip-rap coverage requested. Once the stream has been turned into the new channel, it may be necessary to relocate stranded fish to the new channel to prevent fish kills.
8. At locations where ponds will be drained, proper measures will be taken to drain the pond with limited impact to upstream and downstream channel stability as well as to native aquatic species. Proper measures will be taken to avoid sediment release and/or sediment accumulation downstream as a result of pond draining. If typical pond draining techniques will create significant disturbance to native aquatic species, additional measures such as collection and relocation may be necessary to prevent a significant fish kill. NCDOT shall consult with NC Wildlife Resources staff to determine if there are any sensitive species, and the most appropriate measures to limit impacts to these species. The permittee shall ensure that the jurisdictional stream channel above and below the drained pond remain stable, and that no additional impacts occur within the natural stream channel as a result of draining the pond.
9. Bridge deck drains shall not discharge directly into the stream. Stormwater shall be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. Please refer to the most current version of *Stormwater Best Management Practices*.
10. Bridge piles and bents shall be constructed using driven piles (hammer or vibratory) or drilled shaft construction methods. More specifically, jetting or other methods of pile driving are prohibited without prior written approval from NCDWQ first.
11. No drill slurry or water that has been in contact with uncured concrete shall be allowed to enter surface waters. This water shall be captured, treated, and disposed of properly.
12. All pile driving or drilling activities shall be enclosed in turbidity curtains unless otherwise approved by NCDWQ in this certification.
13. All bridge construction shall be performed from the existing bridge, temporary work bridges, temporary causeways, or floating or sunken barges. If work conditions require barges, they shall be floated into position and then sunk. The barges shall not be sunk and then dragged into position. Under no circumstances should barges be dragged along the bottom of the surface water.
14. If multiple pipes or barrels are required, they shall be designed to mimic natural stream cross section as closely as possible including pipes or barrels at flood plain elevation and/or sills where appropriate. Widening the stream channel should be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage.
15. Riprap shall not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be properly designed, sized and installed.
16. The temporary stream impacts due to dewatering activities shall be graded to preconstruction contours and revegetated with appropriate native species.
17. The stream channel shall be excavated no deeper than the natural bed material of the stream, to the maximum extent practicable. Efforts must be made to minimize impacts to the stream banks, as well as to vegetation responsible for maintaining the stream bank stability. Any applicable riparian buffer impact for access to stream channel shall be temporary and be revegetated with native riparian species.
18. Compensatory mitigation for 1932 linear feet of impact to streams is required for the U-2412B/U2524AE project. We understand that you have chosen to perform compensatory mitigation for impacts to streams through the North Carolina Ecosystem Enhancement Program (EEP), and that the EEP has agreed to implement the mitigation for the project. EEP has indicated in a letter dated May 29, 2012 that they will

- assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with the EEP Mitigation Banking Instrument signed July 28, 2010.
19. Compensatory mitigation for impacts to 99087 square feet of protected riparian buffers in Zone 1 and 61547 square feet of protected riparian buffers in Zone 2 shall be required for the U-2412B/U2524AE project. We understand that you have chosen to perform compensatory mitigation for impacts to protected buffers through use of the North Carolina Ecosystem Enhancement Program (EEP). Mitigation for unavoidable impacts to Randleman Riparian Buffers shall be provided in the Cape Fear River Basin and done in accordance with 15A NCAC 2B .0250. EEP has indicated in a letter dated May 29, 2012 that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with the North Carolina Department of Environment and Natural Resources' Ecosystem Enhancement Program In-Lieu Fee Instrument signed July 28, 2010.
 20. Compensatory mitigation for impacts to 0.63 acres of riverine wetlands is required for the U-2412B/U2524AE project. We understand that you have chosen to perform compensatory mitigation for impacts to wetlands through the North Carolina Ecosystem Enhancement Program (EEP), and that the EEP has agreed to implement the mitigation for the project. EEP has indicated in a letter dated May 29, 2012 that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with the North Carolina Department of Environment and Natural Resources' Ecosystem Enhancement Program In-Lieu Fee Instrument signed July 28, 2010.
 21. When final design plans are completed for U2412A, a modification to the 401 Water Quality Certification and the Randleman Lake Riparian Buffer Certification shall be submitted with five copies and fees to the NC Division of Water Quality. Final designs shall reflect all appropriate avoidance, minimization, and mitigation for impacts to wetlands, streams, and other surface waters, and buffers. No construction activities that impact any wetlands, streams, surface waters, or buffers located in U-2412A shall begin until after the permittee applies for, and receives a written modification of the 401 Water Quality Certification and the Randleman Lake Riparian Buffer Authorization from the NC Division of Water Quality. This modification shall include compensatory mitigation for applicable impacts to streams, wetlands, or riparian buffers associated with U2412A.

General Conditions

22. Unless otherwise approved in this certification, placement of culverts and other structures in open waters and streams shall be placed below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20 percent of the culvert diameter for culverts having a diameter less than 48 inches, to allow low flow passage of water and aquatic life. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or streambeds or banks, adjacent to or upstream and down stream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by NCDWQ. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact NCDWQ for guidance on how to proceed and to determine whether or not a permit modification will be required.
23. If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete shall not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills.
24. During the construction of the project, no staging of equipment of any kind is permitted in waters of the U.S., or protected riparian buffers.
25. The dimension, pattern and profile of the stream above and below the crossing shall not be modified. Disturbed floodplains and streams shall be restored to natural geomorphic conditions.
26. The use of rip-rap above the Normal High Water Mark shall be minimized. Any rip-rap placed for stream stabilization shall be placed in stream channels in such a manner that it does not impede aquatic life passage.
27. The Permittee shall ensure that the final design drawings adhere to the permit and to the permit drawings submitted for approval.
28. All work in or adjacent to stream waters shall be conducted in a dry work area. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual such as sandbags, rock berms, cofferdams and other diversion structures shall be used to prevent excavation in flowing water.
29. Heavy equipment shall be operated from the banks rather than in the stream channel in order to minimize sedimentation and reduce the introduction of other pollutants into the stream.

30. All mechanized equipment operated near surface waters must be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials.
31. No rock, sand or other materials shall be dredged from the stream channel except where authorized by this certification.
32. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is prohibited.
33. The permittee and its authorized agents shall conduct its activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act) and any other appropriate requirements of State and Federal law. If NCDWQ determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions are necessary to assure compliance, NCDWQ may reevaluate and modify this certification.
34. All fill slopes located in jurisdictional wetlands shall be placed at slopes no flatter than 3:1, unless otherwise authorized by this certification..
35. A copy of this Water Quality Certification shall be maintained on the construction site at all times. In addition, the Water Quality Certification and all subsequent modifications, if any, shall be maintained with the Division Engineer and the on-site project manager.
36. The outside buffer, wetland or water boundary located within the construction corridor approved by this authorization shall be clearly marked by highly visible fencing prior to any land disturbing activities. Impacts to areas within the fencing are prohibited unless otherwise authorized by this certification.
37. The issuance of this certification does not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (i.e. local, state, and federal) having jurisdiction, including but not limited to applicable buffer rules, stormwater management rules, soil erosion and sedimentation control requirements, etc.
38. The Permittee shall report any violations of this certification to the Division of Water Quality within 24 hours of discovery.
39. Upon completion of the project (including any impacts at associated borrow or waste sites), the NCDOT Division Engineer shall complete and return the enclosed "Certification of Completion Form" to notify NCDWQ when all work included in the 401 Certification has been completed.
40. Native riparian vegetation must be reestablished in the riparian areas within the construction limits of the project by the end of the growing season following completion of construction.
41. There shall be no excavation from, or waste disposal into, jurisdictional wetlands or waters associated with this permit without appropriate modification. Should waste or borrow sites, or access roads to waste or borrow sites, be located in wetlands or streams, compensatory mitigation will be required since that is a direct impact from road construction activities.
42. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to protect surface waters standards:
 - a. The erosion and sediment control measures for the project must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual*.
 - b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*. The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
 - c. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*.
 - d. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.
43. Sediment and erosion control measures shall not be placed in wetlands or waters unless otherwise approved by this Certification.

Violations of any condition herein set forth may result in revocation of this Certification and may result in criminal and/or civil penalties. This Certification shall become null and void unless the above conditions are made conditions of the Federal 404 and/or Coastal Area Management Act Permit. This Certification shall expire upon the expiration of the 404 or CAMA permit.

If you wish to contest any statement in the attached Certification you must file a petition for an administrative hearing. You may obtain the petition form from the office of Administrative hearings. You must file the petition with the office of Administrative Hearings within sixty (60) days of receipt of this notice. A petition is considered filed when it is received in the office of Administrative Hearings during normal office hours. The Office of Administrative Hearings accepts filings Monday through Friday between the hours of 8:00am and 5:00pm, except for official state holidays. The original and one (1) copy of the petition must be filed with the Office of Administrative Hearings.

The petition may be faxed-provided the original and one copy of the document is received by the Office of Administrative Hearings within five (5) business days following the faxed transmission. The mailing address for the Office of Administrative Hearings is:

Office of Administrative Hearings
6714 Mail Service Center
Raleigh, NC 27699-6714
Telephone: (919)-431-3000, Facsimile: (919)-431-3100

A copy of the petition must also be served on DENR as follows:

Mr. William Cary, General Counsel
Department of Environment and Natural Resources
1601 Mail Service Center

This the 4th day of June 2012

DIVISION OF WATER QUALITY



for Charles Wakild
Director

WQC No. 3924

NCDWQ Project No.: _____

County: _____

Applicant: _____

Project Name: _____

Date of Issuance of 401 Water Quality Certification: _____

Certificate of Completion

Upon completion of all work approved within the 401 Water Quality Certification or applicable Buffer Rules, and any subsequent modifications, the applicant is required to return this certificate to the 401 Transportation Permitting Unit, North Carolina Division of Water Quality, 1650 Mail Service Center, Raleigh, NC, 27699-1650. This form may be returned to NCDWQ by the applicant, the applicant's authorized agent, or the project engineer. It is not necessary to send certificates from all of these.

Applicant's Certification

I, _____, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature: _____ Date: _____

Agent's Certification

I, _____, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature: _____ Date: _____

Engineer's Certification

_____ Partial _____ Final

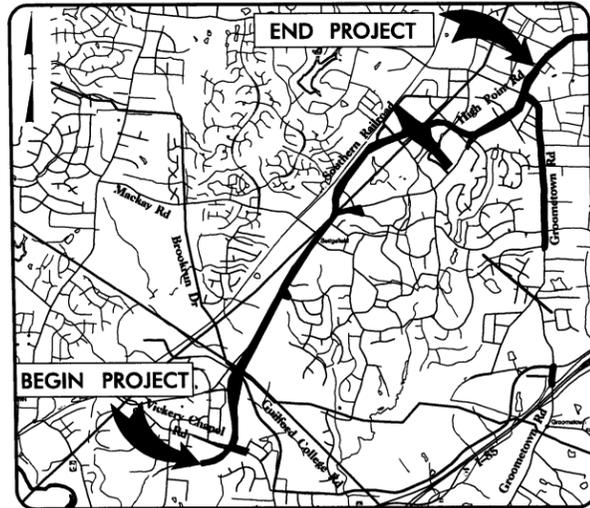
I, _____, as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe (periodically, weekly, full time) the construction of the project, for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature _____ Registration No. _____

Date _____

09/28/09

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

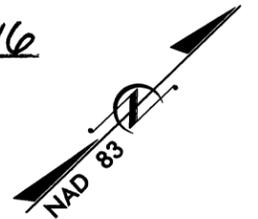
**LOCATION: SR 4121 (GREENSBORO /HIGH POINT ROAD)
FROM WEST OF VICKERY CHAPEL ROAD TO
HILLTOP ROAD**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERT
EXTENSION, STRUCTURES, SIGNING AND
SIGNALS**

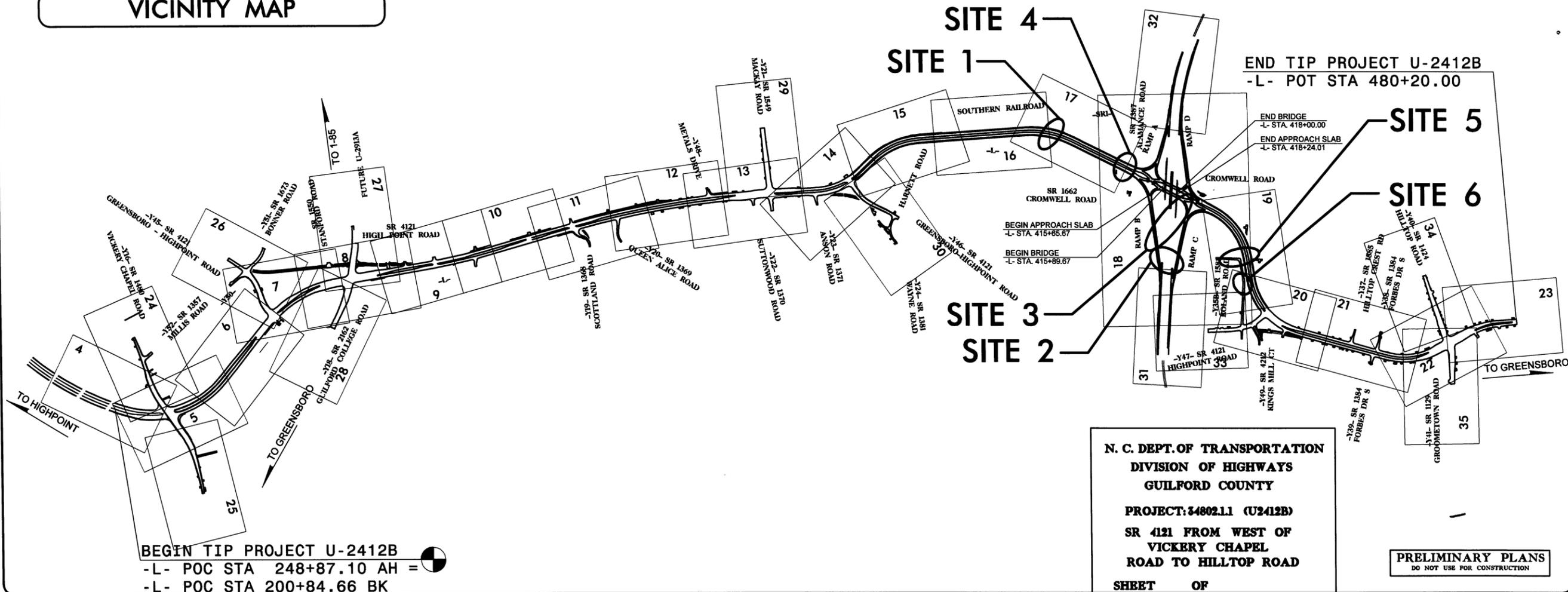
WETLAND & STREAM IMPACTS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2412B & U-2524AE	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34802.1.1	STP-4121(1)	P.E.	
34802.2.3	STP-4121(4)	RW	
34820.2.17		RW	

Permit Drawing
Sheet 1 of 16



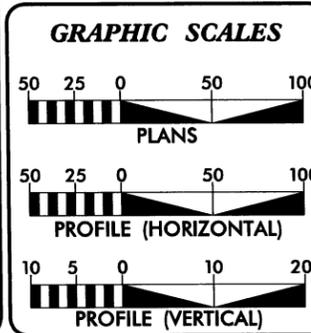
TIP PROJECTS: U-2412B & U-2524AE



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 34802.1.1 (U2412B)
SR 4121 FROM WEST OF
VICKERY CHAPEL
ROAD TO HILLTOP ROAD
SHEET OF

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONTRACT:



DESIGN DATA

ADT 2006 =	22,900
ADT 2030 =	37,900
DHV =	11 %
D =	60 %
T =	5 % *
V =	50 MPH
* (TTST 2% + DUAL 3%)	
FUNC CLASS URBAN ARTERIAL	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2412B =	4.198 MILES
LENGTH STRUCTURE TIP PROJECT U-2412B =	0.040 MILES
TOTAL LENGTH TIP PROJECT U-2412B =	4.198 MILES

NCDOT CONTACT: K. ZAK HAMIDI, P.E.
PROJECT ENGINEER ROADWAY DESIGN

Prepared In the Office of:
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC LIC. NO. F-0165

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 20, 2009

LETTING DATE:
AUGUST 21, 2012

CHRIS DAVIS, P.E.
PROJECT ENGINEER

DAVID B. GOURLEY, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

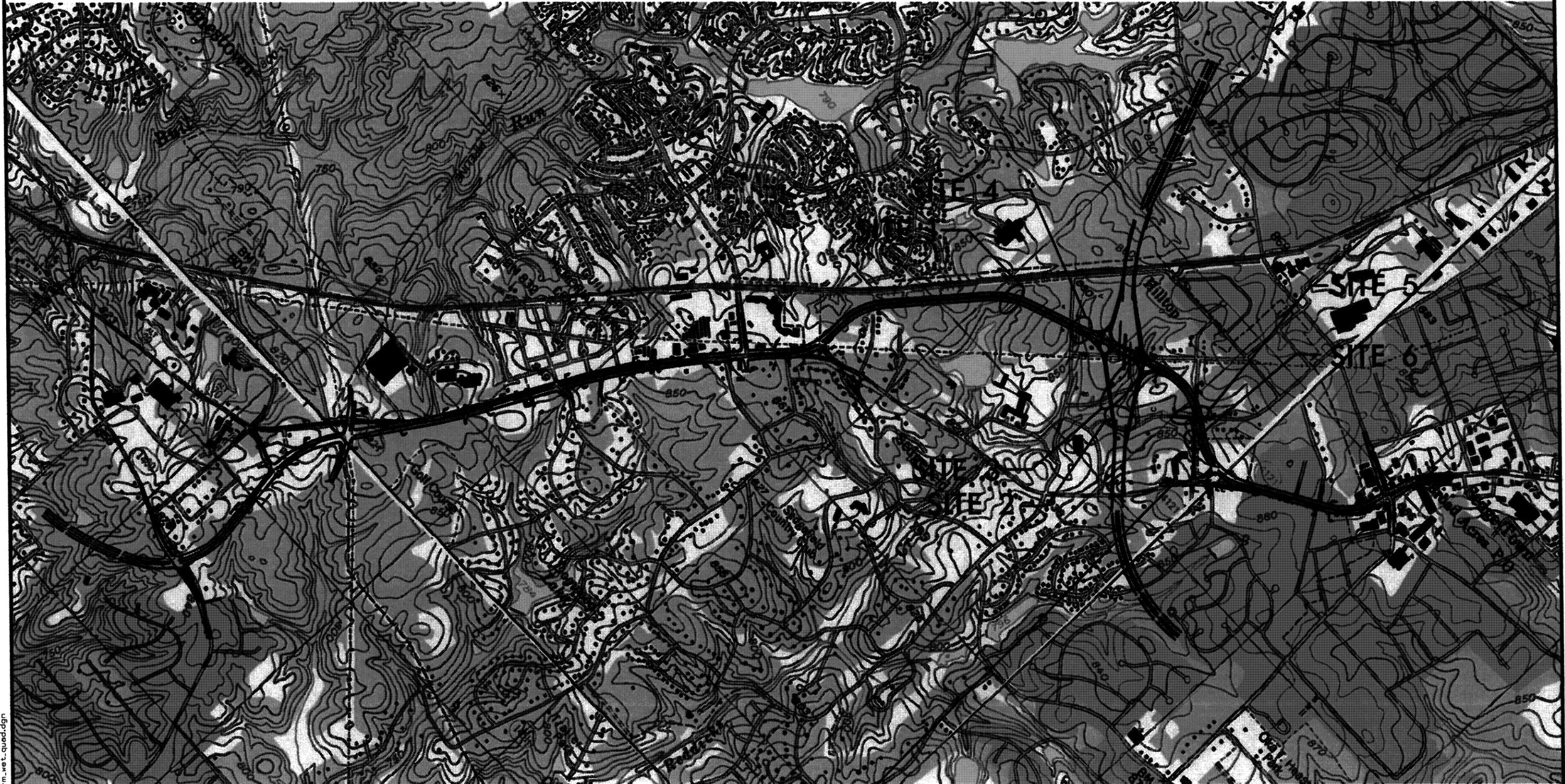
ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**

STATE HIGHWAY DESIGN ENGINEER

11/28/2011 R:\Hydraulics\PERMITS_Environment\Drawings\U-2412B_rmyd_prm_wet_tsh.dgn Florence & Hutcheson, Inc.



WETLAND & STREAM IMPACTS
TOPO MAP

SCALE: 1" = 1500'



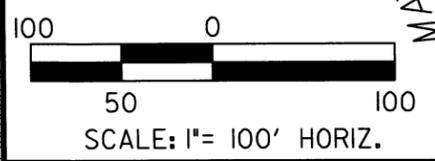
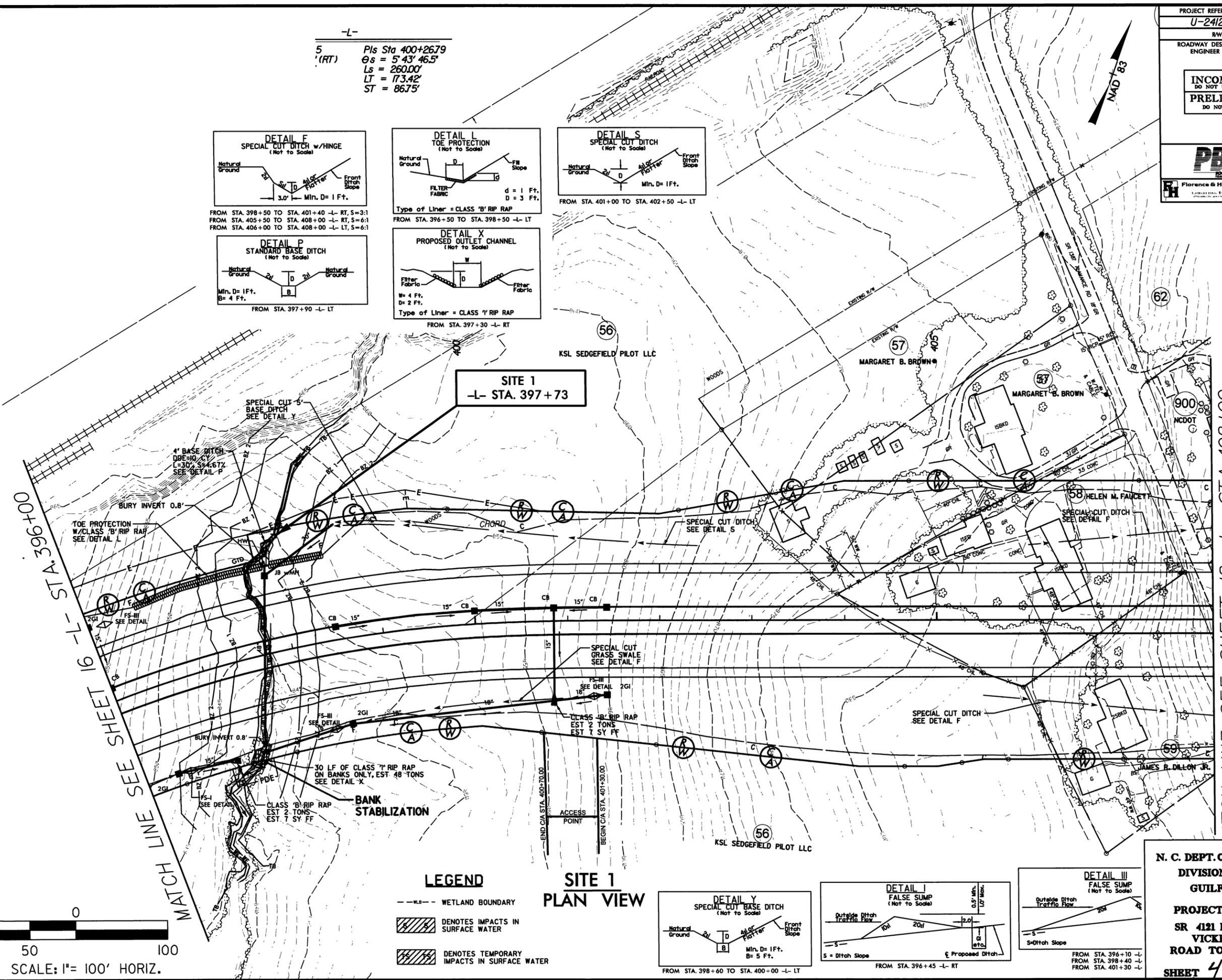
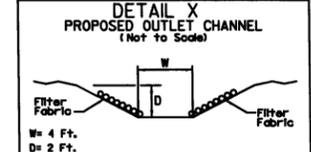
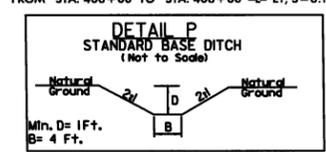
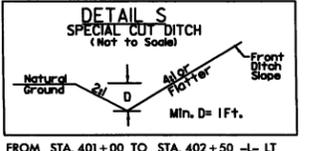
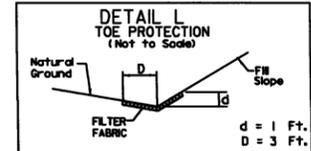
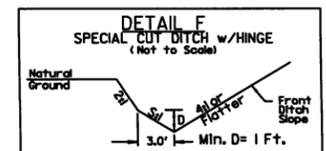
N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 GUILFORD COUNTY
 PROJECT: 34602.11 (U-2412B)
 SR 411 FROM WEST OF
 VICKERY CHAPEL
 ROAD TO HILLTOP ROAD
 SHEET 2 OF 16

8/17/99

\\23\2011\Projects\PERMITS_Environmental\Drawings\U-2412B_hyd_prm_wet_psh_17.dgn
Florence & Hutcheson, Inc.

PROJECT REFERENCE NO. U-2412B		SHEET NO. 17	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
		121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202 <small>NO SCALE TO PLAN</small>	

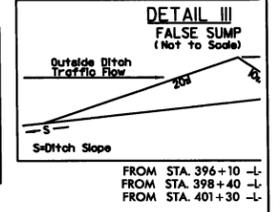
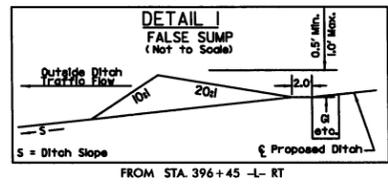
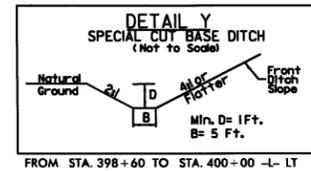
-L-
 5 Pls Sta 400+2679
 (RT) $\theta_s = 5^{\circ} 43' 46.5''$
 $L_s = 260.00'$
 $LT = 173.42'$
 $ST = 86.75'$



LEGEND

- WETLAND BOUNDARY
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

**SITE 1
PLAN VIEW**



**N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY**

PROJECT: 34802.11 (U-2412B)
SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

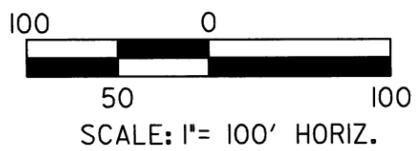
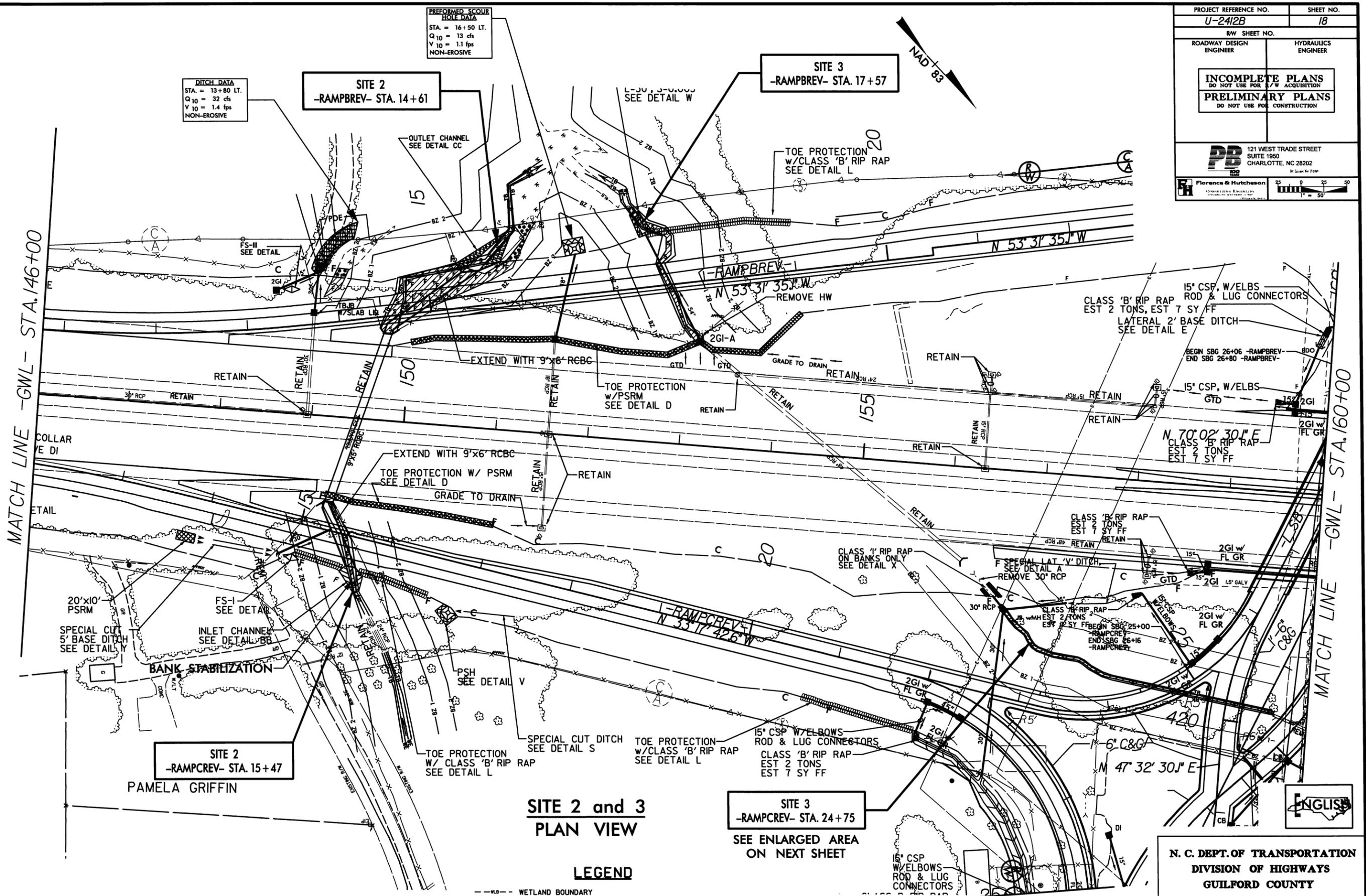
SHEET 4 OF 16

MATCH LINE SEE SHEET 16 -L- STA. 396+00

ATCH LINE SEE SHEET 18 -L- STA. 408+00



8/17/99



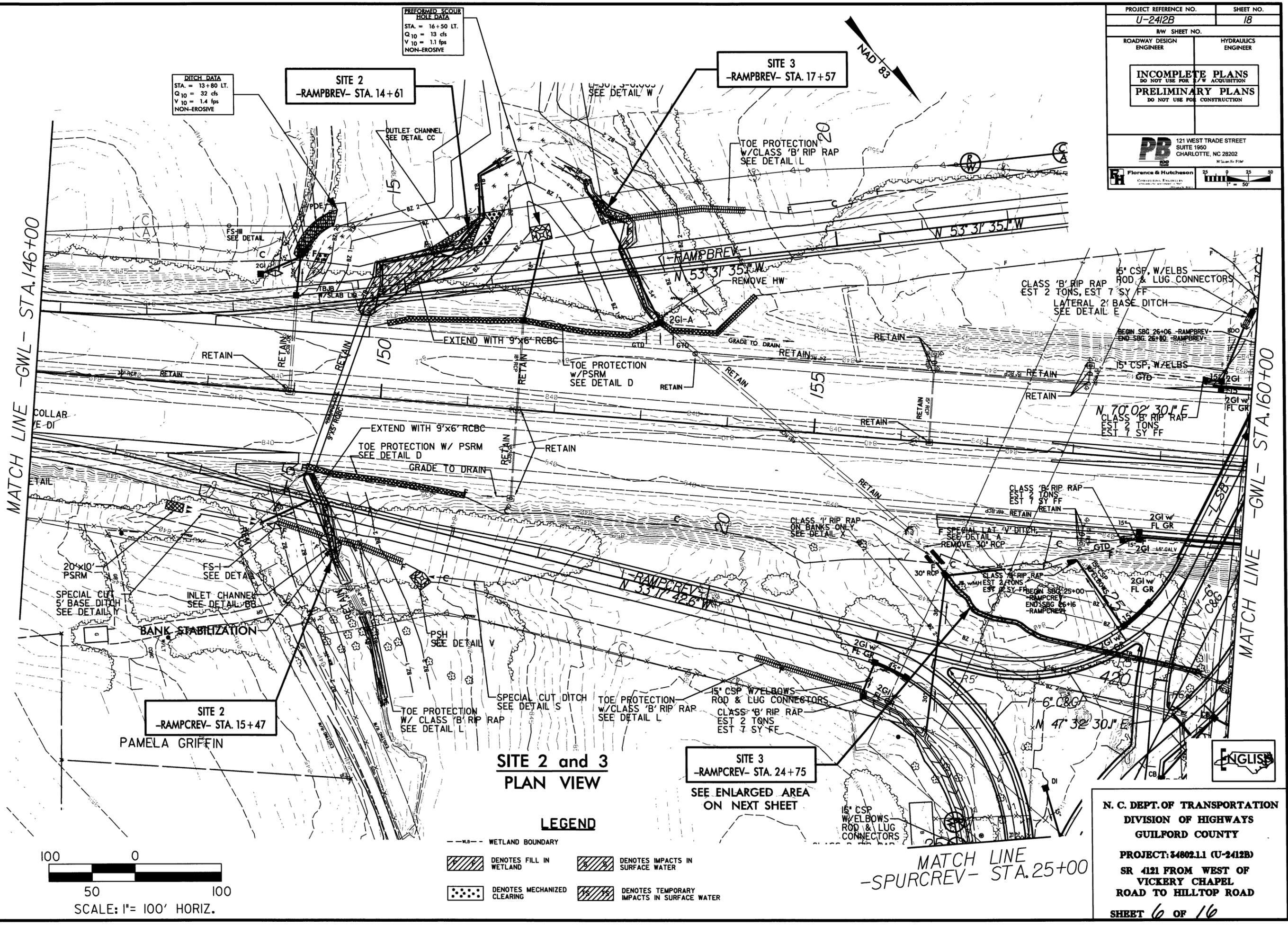
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.11 (U-2412B)
SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 5 OF 16

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 11/23/2001
 Florence & Hutcheson, Inc.

8/17/99
 I:\23\2011\PERMITS\Environmental\Drawings\U-2412B-Hyd.prm_wet.psh_18.dgn
 Florence & Hutcheson, Inc.



PREFORMED SCOUR HOLE DATA
 STA. = 16+50 LT.
 Q₁₀ = 13 cfs
 V₁₀ = 1.1 fps
 NON-EROSIVE

DITCH DATA
 STA. = 13+80 LT.
 Q₁₀ = 32 cfs
 V₁₀ = 1.4 fps
 NON-EROSIVE

SITE 2
 -RAMPBREV- STA. 14+61

SITE 3
 -RAMPBREV- STA. 17+57

SITE 2
 -RAMPCREV- STA. 15+47
 PAMELA GRIFFIN

SITE 3
 -RAMPCREV- STA. 24+75
 SEE ENLARGED AREA ON NEXT SHEET

SITE 2 and 3
PLAN VIEW

LEGEND

-  WETLAND BOUNDARY
-  DENOTES FILL IN WETLAND
-  DENOTES MECHANIZED CLEARING
-  DENOTES IMPACTS IN SURFACE WATER
-  DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCH LINE
 -SPURCREV- STA. 25+00

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY
 PROJECT: 34802.11 (U-2412B)
 SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD
 SHEET 6 OF 16

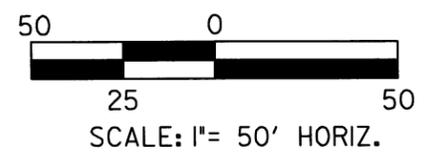
PROJECT REFERENCE NO. U-2412B	SHEET NO. 18
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202	
 Florence & Hutcherson CONSULTING ENGINEERS 1100 W. WILSON ST. #100 CHARLOTTE, NC 28202	

SITE 3
-RAMPCREV- STA. 24+75

SITE 3
ENLARGED AREA

LEGEND

 DENOTES IMPACTS IN SURFACE WATER

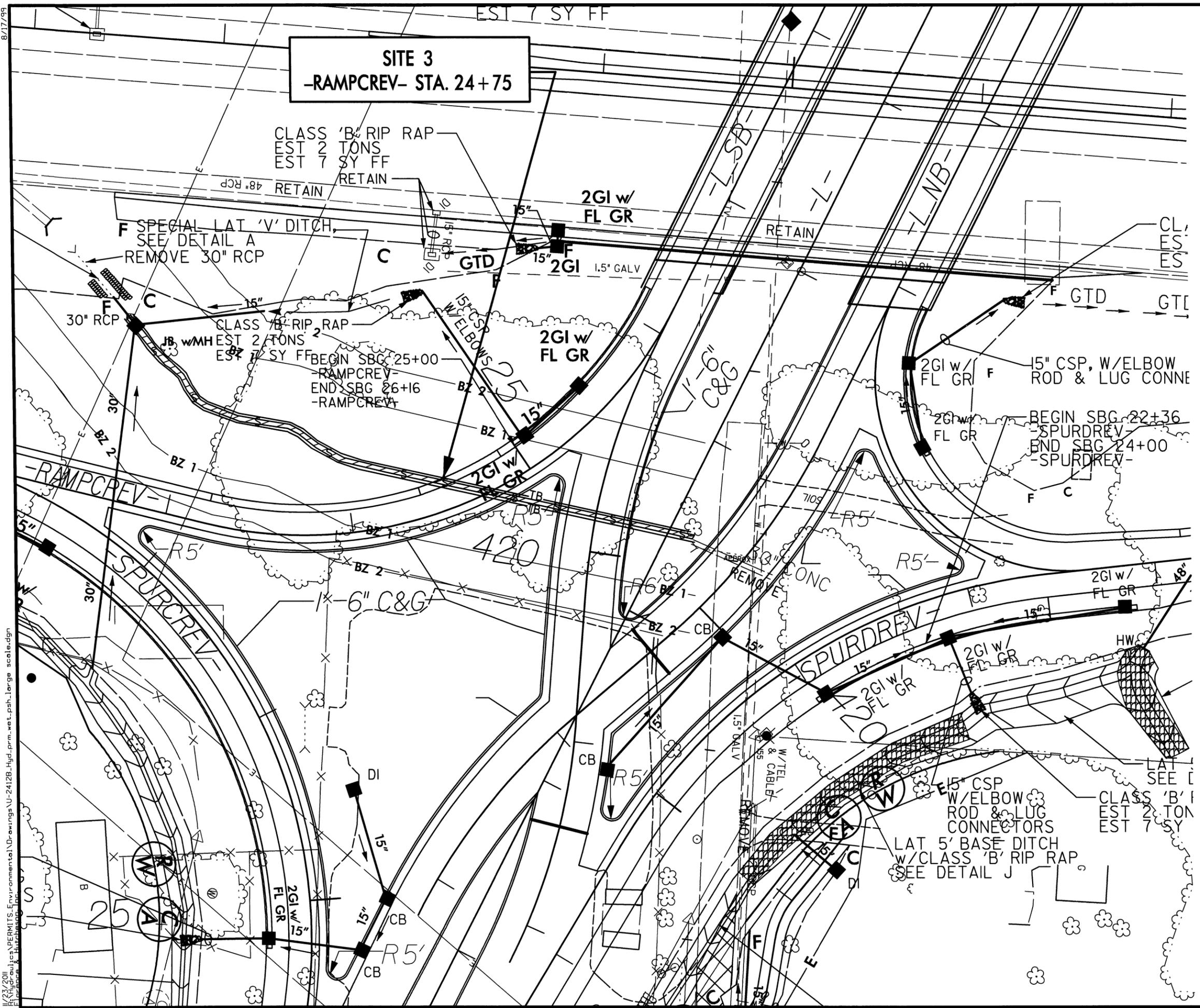


N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.11 (U-2412B)
SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD
SHEET 7 OF 16

8/17/99

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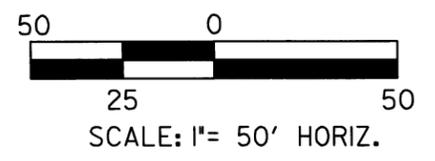
PROJECT REFERENCE NO. U-2412B	SHEET NO. 18
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202 <small>W/ License No. 50104</small>	
 Florence & Hutcheson <small>CONSULTING ENGINEERS</small>	
	

SITE 3
-RAMPCREV- STA. 24+75

SITE 3
ENLARGED AREA

LEGEND

 DENOTES IMPACTS IN SURFACE WATER

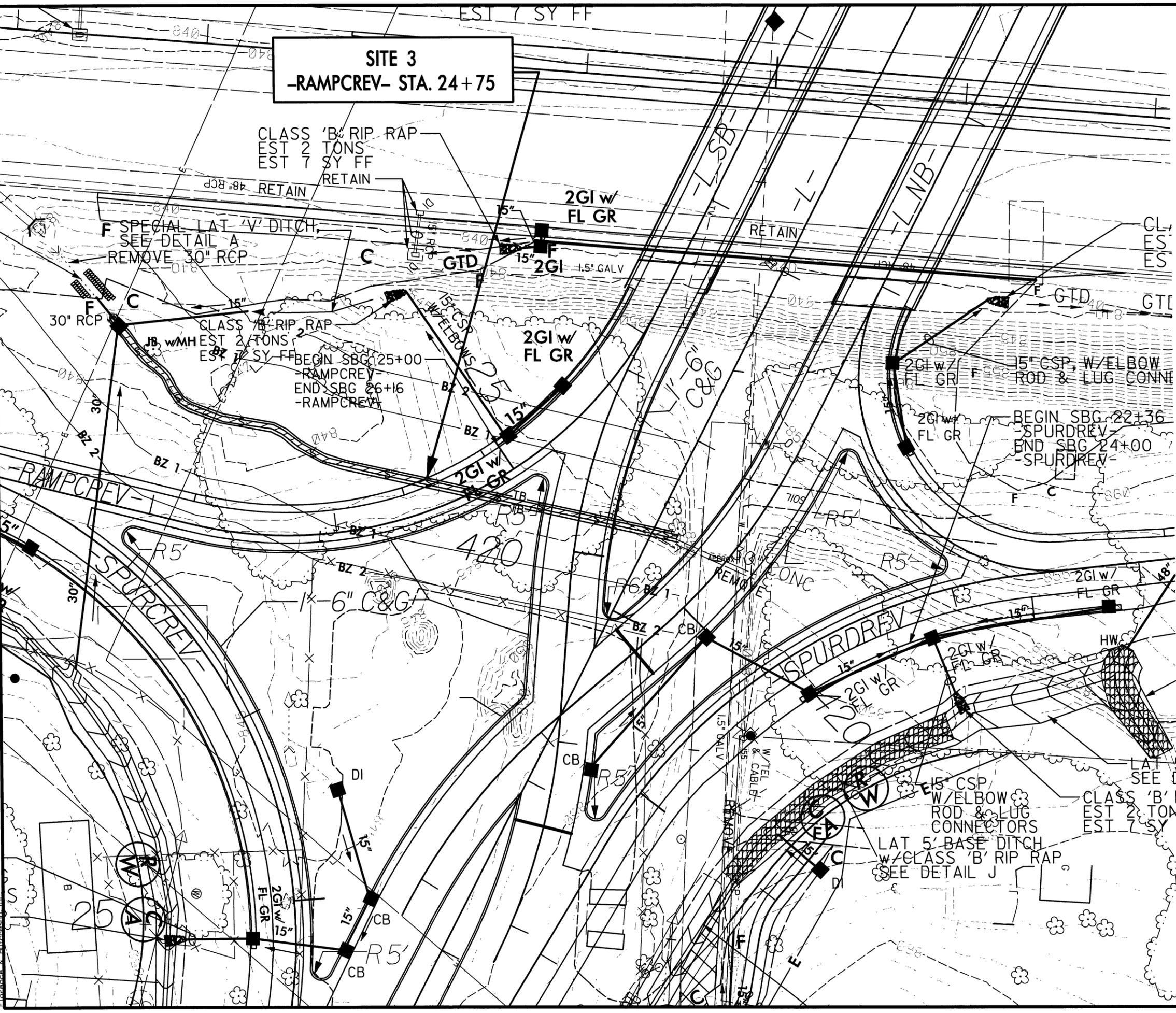


N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.11 (U-2412B)
SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 8 OF 16

8/17/99
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 Florence & Hutcheson, Inc.



8/17/99

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Florence & Hutcheson, Inc.

PROJECT REFERENCE NO. U-2412B	SHEET NO. 18
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR E/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202 <small>NO SCALE FOR PLOT</small>	
 Florence & Hutcheson CONSULTING ENGINEERS 25 0 25 50 1" = 50'	

SITE 4
-L- STA. 409+45



63
DEBORAH L. ALLEN

56
KSL SEDGEFIELD PILOT LLC

64
WALTER M. BROWN

66
ROBERT J. GARRETT

65
NCDOT

62
L & S DUHAN PROPERTIES I LIMITED PARTNERSHIP

KSL SEDGEFIELD PILOT LLC

61
JUDY LOMAX ET. AL.

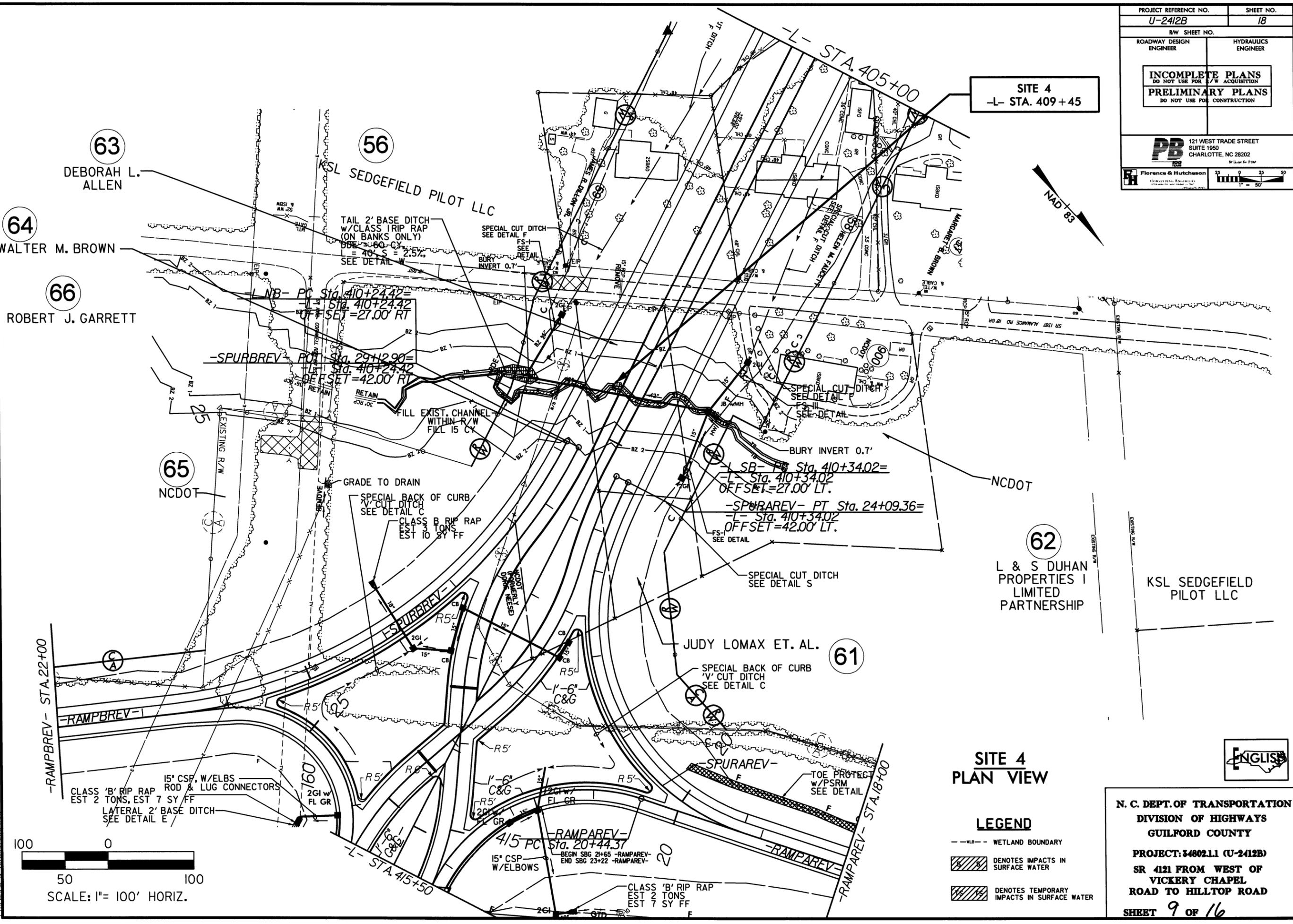
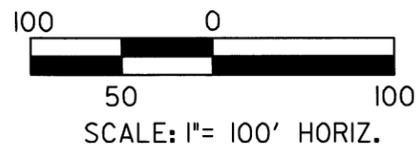
SITE 4 PLAN VIEW

- LEGEND**
-  WETLAND BOUNDARY
 -  DENOTES IMPACTS IN SURFACE WATER
 -  DENOTES TEMPORARY IMPACTS IN SURFACE WATER

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412B)
SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 9 OF 16

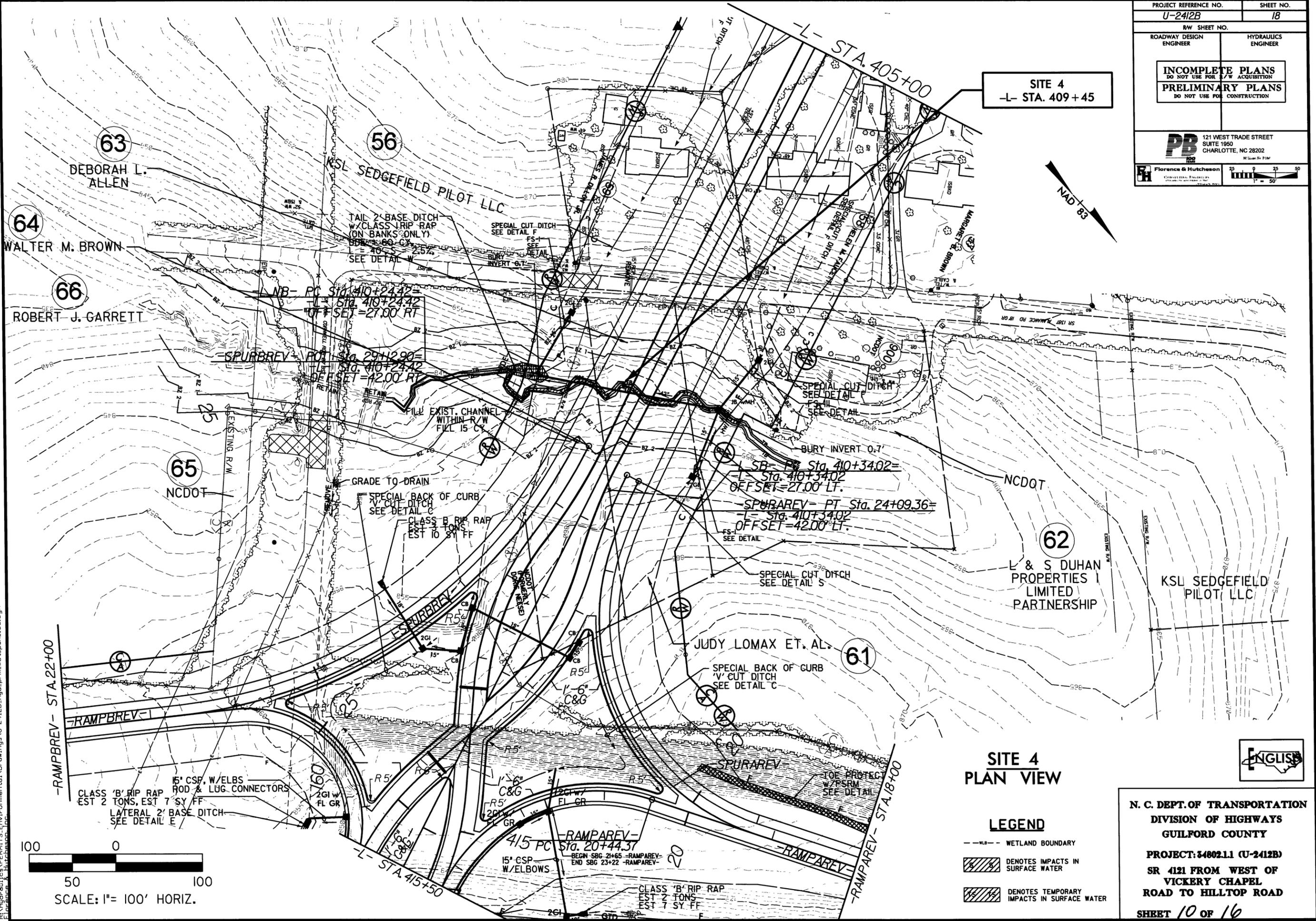


8/17/99

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Florence & Hutcheson, Inc.

PROJECT REFERENCE NO. U-2412B	SHEET NO. 18
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202 <small>INCORPORATED IN NC</small>	
 Florence & Hutcheson CONSULTING ENGINEERS 1" = 50'	

SITE 4
-L- STA. 409+45



SITE 4
PLAN VIEW

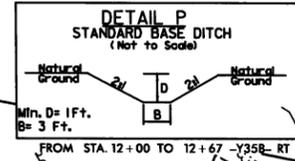
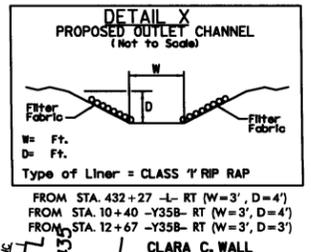
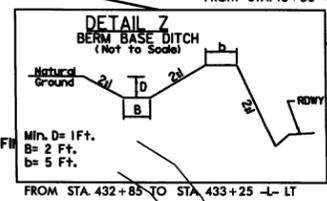
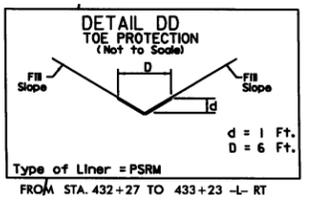
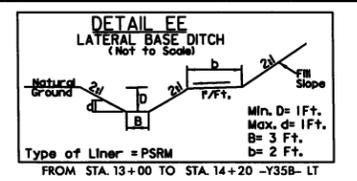
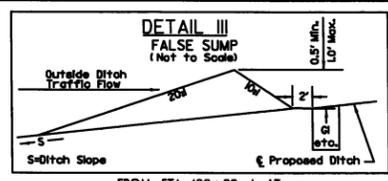
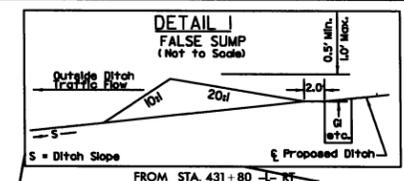
- LEGEND**
-  WETLAND BOUNDARY
 -  DENOTES IMPACTS IN SURFACE WATER
 -  DENOTES TEMPORARY IMPACTS IN SURFACE WATER

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

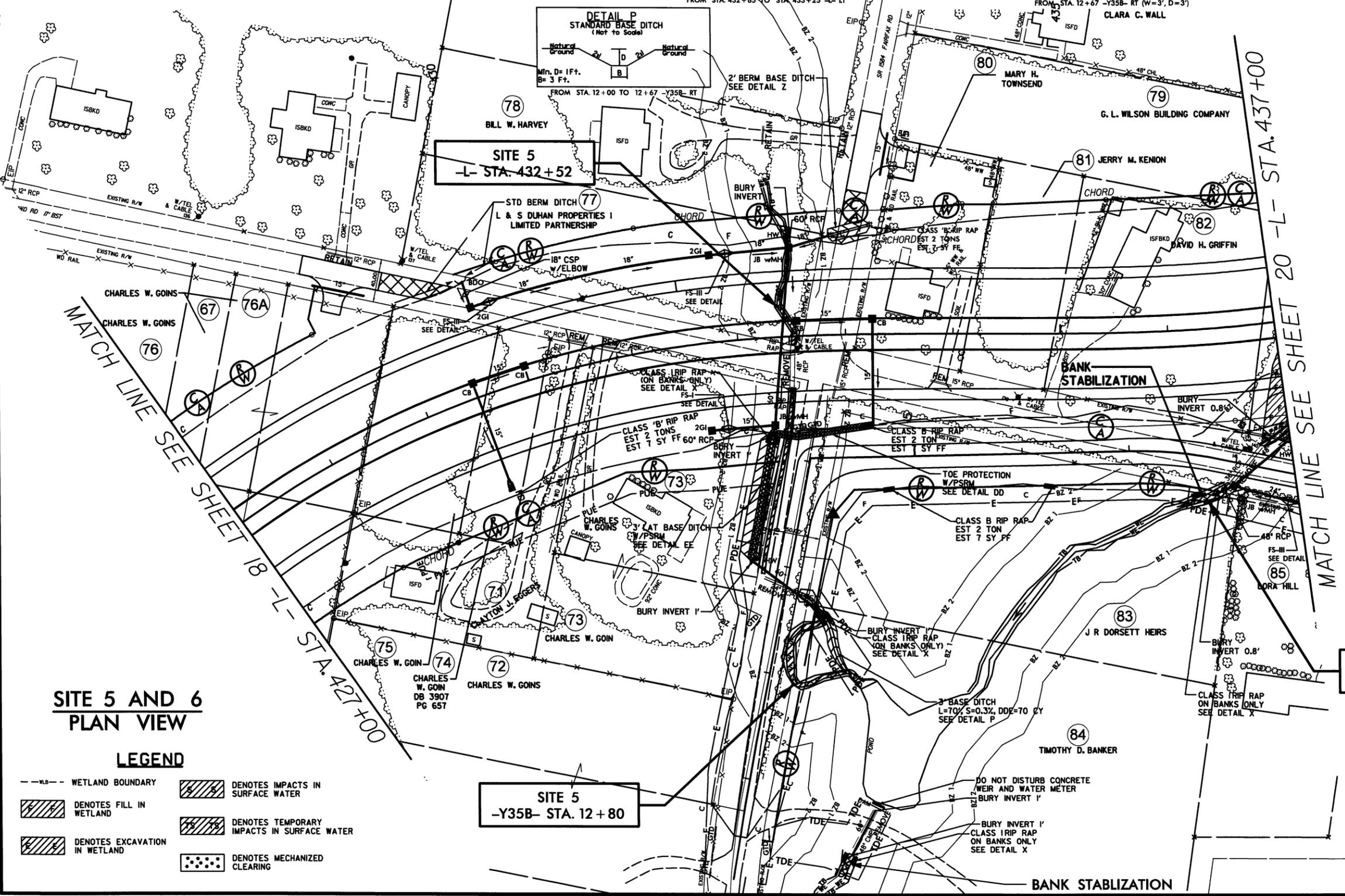
PROJECT: 34802.1.1 (U-2412B)
SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 10 OF 16





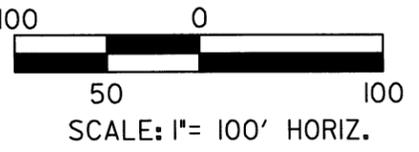
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 Florence & Hutcheson, Inc.



**SITE 5 AND 6
PLAN VIEW**

LEGEND

	WETLAND BOUNDARY		DENOTES IMPACTS IN SURFACE WATER
	DENOTES FILL IN WETLAND		DENOTES TEMPORARY IMPACTS IN SURFACE WATER
	DENOTES EXCAVATION IN WETLAND		DENOTES MECHANIZED CLEARING



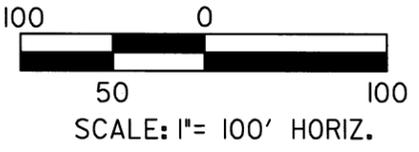
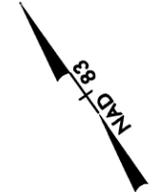
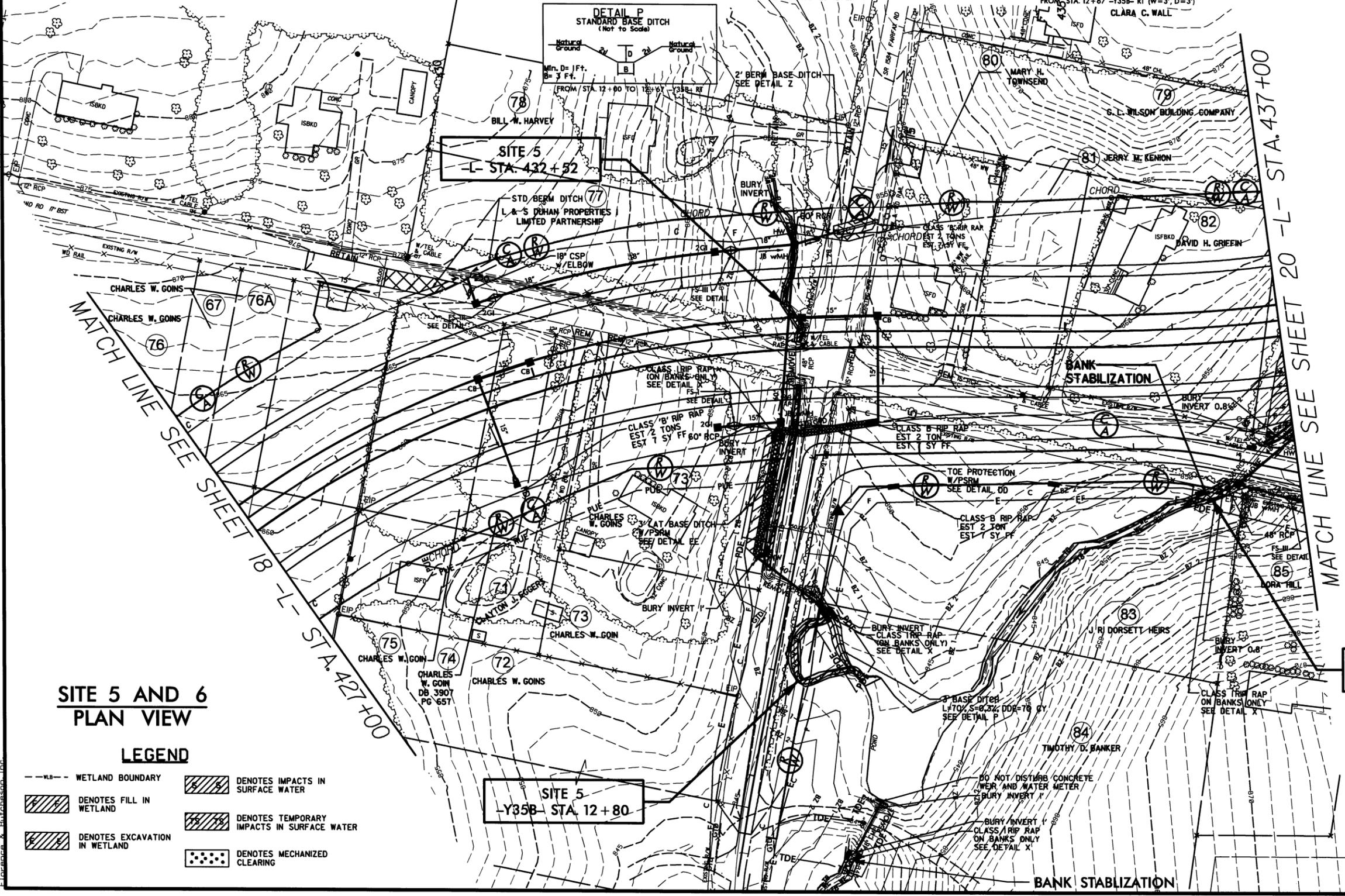
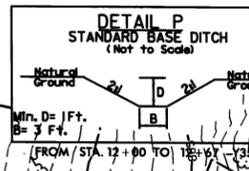
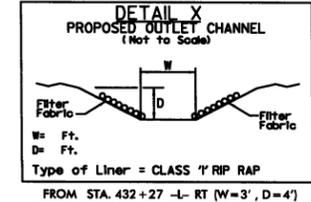
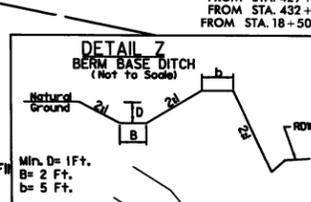
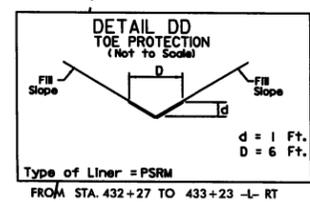
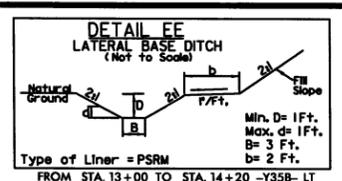
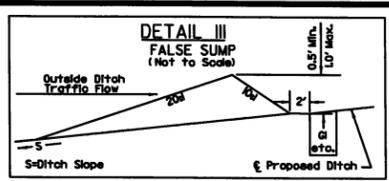
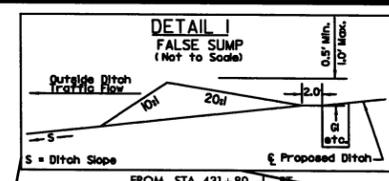
SITE 6
-Y35B- STA. 18 + 20

SITE 5
-Y35B- STA. 12 + 80

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 34802.1.1 (U-2412B)
SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD
SHEET 11 OF 16

8/17/99

PROJECT REFERENCE NO. U-2412B	SHEET NO. 19
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202	
 Florence & Hutcheson CONSULTING ENGINEERS 1000 W. WILSON ROAD SUITE 100 CHARLOTTE, NC 28202	



**SITE 5 AND 6
PLAN VIEW**

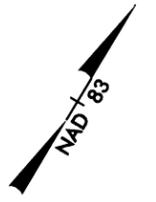
- LEGEND**
-  WETLAND BOUNDARY
 -  DENOTES FILL IN WETLAND
 -  DENOTES EXCAVATION IN WETLAND
 -  DENOTES IMPACTS IN SURFACE WATER
 -  DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 -  DENOTES MECHANIZED CLEARING

SITE 6
-Y35B- STA. 18+20

SITE 5
-Y35B- STA. 12+80

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 34802.11 (U-2412B)
SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD
SHEET 12 OF 16

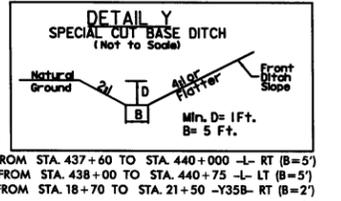
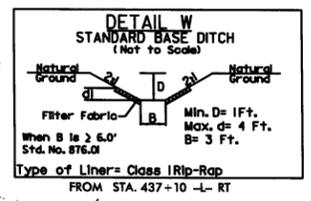
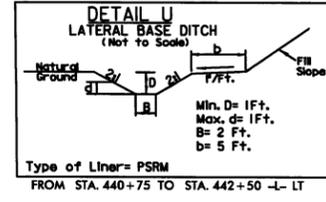
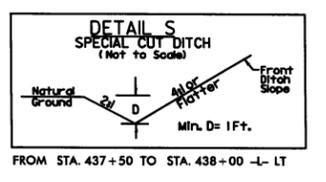
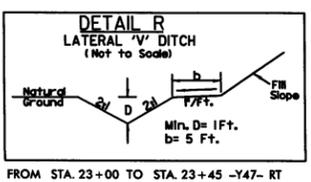
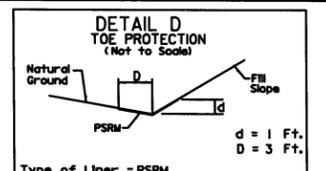
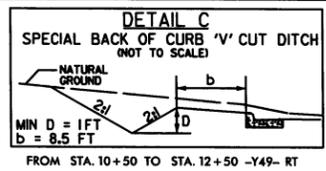
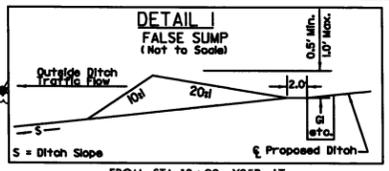
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 Florence & Hutcheson, Inc.



MATCH LINE SEE SHEET 21-L- STA. 450+00

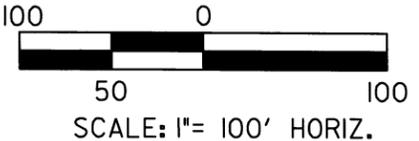
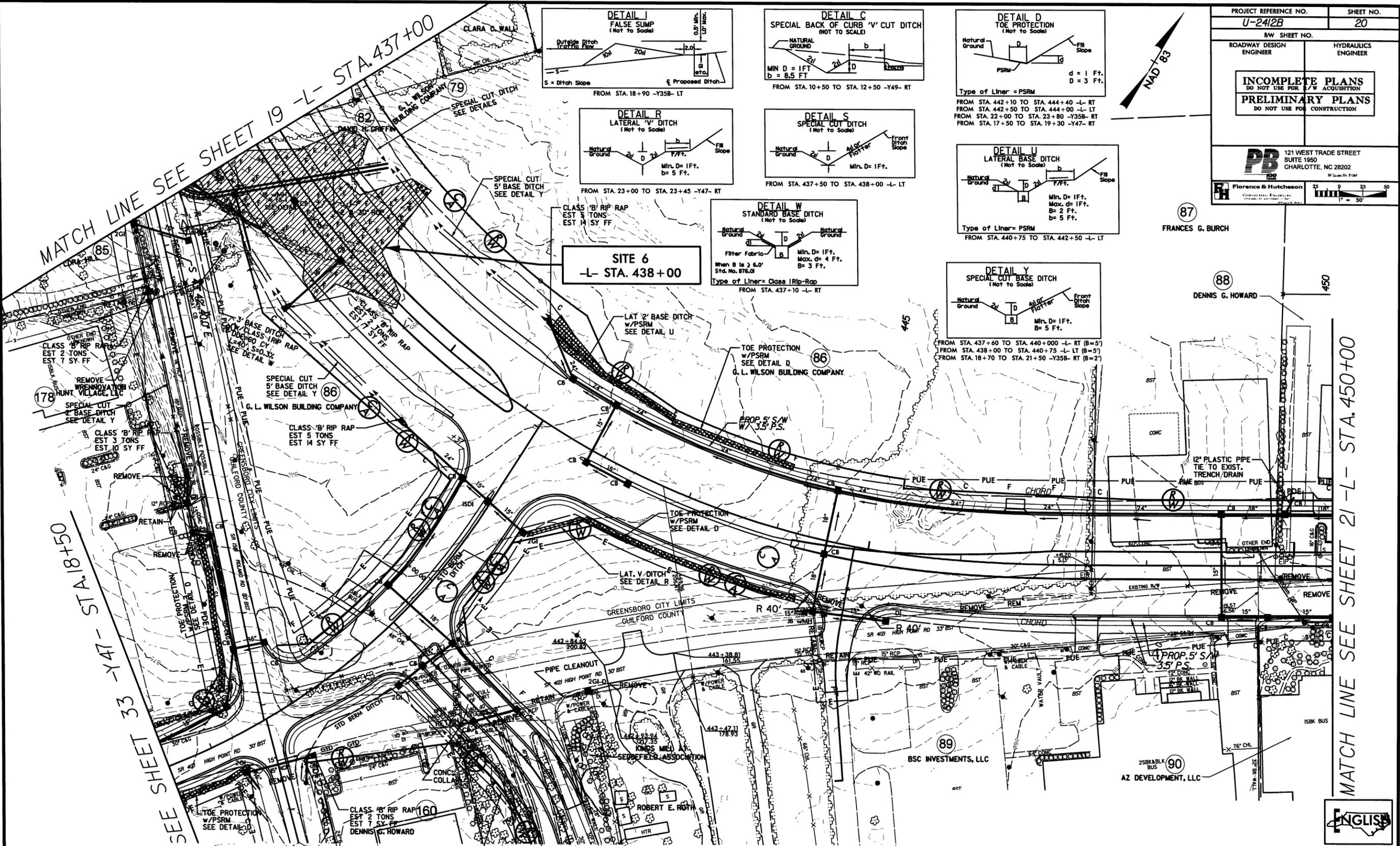
MATCH LINE SEE SHEET 19-L- STA. 437+00

SEE SHEET 33-Y47- STA. 18+50



SITE 6
-L- STA. 438+00

8/17/99
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Florence & Hutchinson, Inc.



SITE 6
PLAN VIEW

LEGEND

	WETLAND BOUNDARY		DENOTES EXCAVATION IN WETLAND
	DENOTES IMPACTS IN SURFACE WATER		DENOTES FILL IN WETLAND
	DENOTES MECHANIZED CLEARING		

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.11 (U-2412B)
SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 14 OF 16

WETLAND IMPACTS SUMMARY OF AFFECTED PROPERTY OWNERS

TRACT NO.	PROPERTY OWNER	ADDRESS	SITE NO.
(56)	KSL SEDGEFIELD PILOT LLC	5790 FLEET STREET, SUITE 300 CARLSBAD CA 92008	1
	NCDOT		2
	NCDOT		3
	NCDOT		4
	NCDOT		5
(64)	WALTER M. BROWN	6210 ROBLYN ROAD GREENSBORO N.C. 27410	6
(63)	DEBORAH L. ALLEN	500 ARROWHEAD DRIVE GREENSBORO N.C. 27410	6
(900)	NCDOT		6
(77)	L & S DUHAN PROPERTIES I LIMITED PARTNERSHIP	503 HOBBS ROAD GREENSBORO N.C. 27403	7
(73)	CHARLES W. GOIN	3015 ALAMANCE ROAD GREENSBORO N.C. 27407	8
(83)	J. R. DORSETT HEIRS	29458 WARMSPRINGS DRIVE MENIFEE CA 92584	8,9
(84)	TIMOTHY D. BANKER	2905 FAIRFAX ROAD GREENSBORO NC 27407	8
(85)	LORA HILL	2708 ROLAND ROAD GREENSBORO NC 27407	9
(86)	G. L. WILSON BUILDING COMPANY	190 WILSON PARK STATESVILLE NC 28625	9,10



NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 34802.1.1 (U-2412B)
SR 4121 FROM WEST OF
VICKERY CHAPEL
ROAD TO HILLTOP ROAD

SHEET 15 OF 16

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS						SURFACE WATER IMPACTS												
			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	-L- STA. 397+73	48" RCP																			
1	-L- STA. 397+73	BANK STABILIZATION																			
2	-RAMPBREV- STA. 14+61	EXTEND WITH 9' x 6' RCBC	0.07																		
2	-RAMPBREV- STA. 15+47	EXTEND WITH 9' x 6' RCBC				0.01															
2	-RAMPBREV- STA. 15+47	BANK STABILIZATION																			
3	-RAMPBREV- STA. 17+57	EXTEND WITH 54" RCP																			
3	-RAMPBREV- STA. 24+75	30" RCP																			
4	-L- STA. 409+45	42" RCP																			
5	-L- STA. 432+52	60" RCP																			
5	-Y35B- STA. 12+80	60" RCP																			
5	-Y35B- STA. 10+45	BANK STABILIZATION																			
6	-Y35B- STA. 18+20	48" RCP																			
6	-Y35B- STA. 18+20	BANK STABILIZATION	0.41		0.14																
6	-L- STA. 438+00	(2) 30" RCP																			
TOTALS:			0.48	0.00	0.14	0.01	0.00	0.00	0.18	0.02	0.02	1932	140	0							

NC DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 GUILFORD COUNTY
 Project - 34802.1.1 (U-2412B)
 11/23/2011
 SHEET **16** OF **16**

ATN Revised 3/31/05

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2412B & U-2524AE	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34802.1.1	STP-4121(1)	P.E.	
34802.2.3	STP-4121(4)	RW	
34820.2.17		RW	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

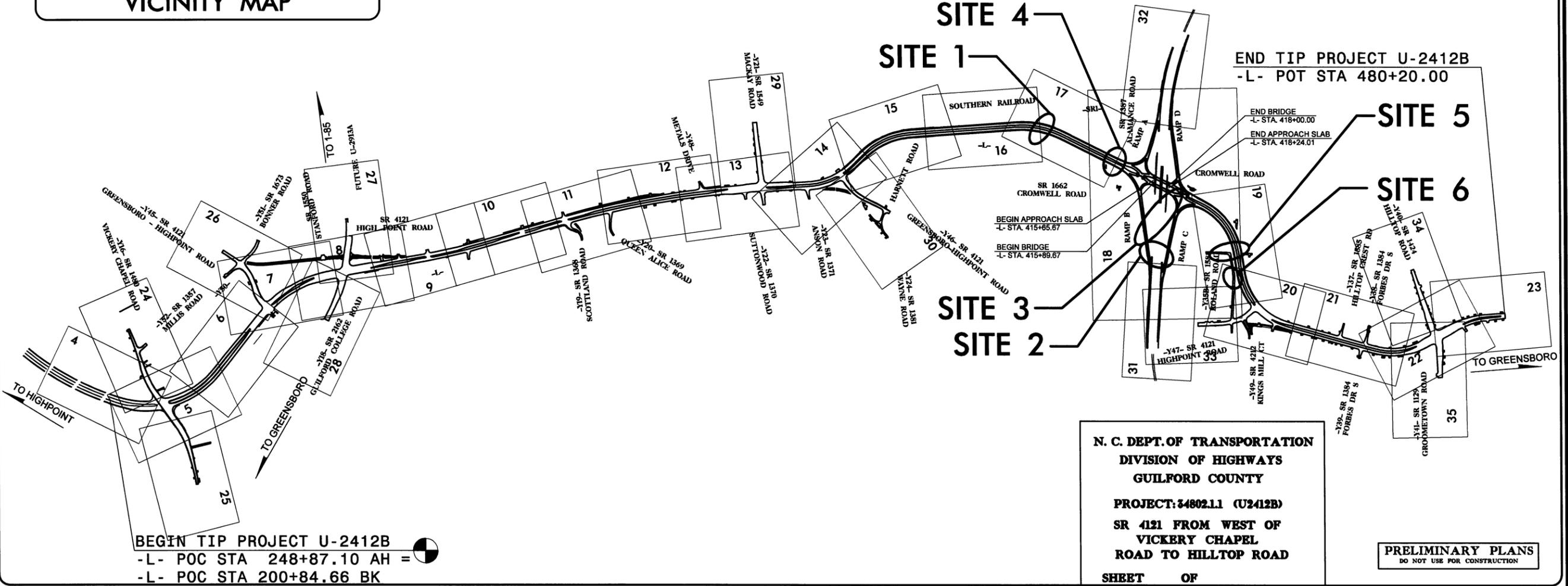
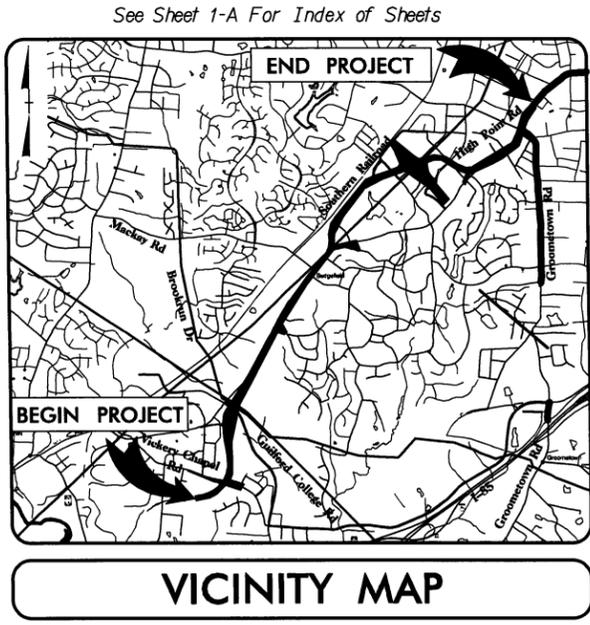
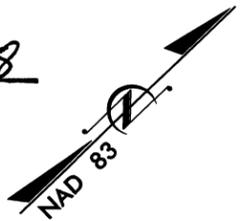
GUILFORD COUNTY

LOCATION: SR 4121 (GREENSBORO /HIGH POINT ROAD)
FROM WEST OF VICKERY CHAPEL ROAD TO
HILLTOP ROAD

TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERT
EXTENSION, STRUCTURES, SIGNING AND
SIGNALS

BUFFER IMPACTS

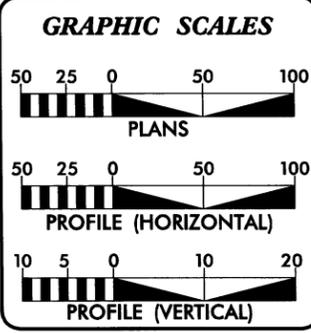
Buffer Drawing
Sheet 1 of 8



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 34802.1.1 (U2412B)
SR 4121 FROM WEST OF
VICKERY CHAPEL
ROAD TO HILLTOP ROAD
SHEET OF

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONTRACT: TIP PROJECTS: U-2412B & U-2524AE



DESIGN DATA

ADT 2006 =	22,900
ADT 2030 =	37,900
DHV =	11 %
D =	60 %
T =	5 % *
V =	50 MPH
* (TTST 2% + DUAL 3%)	
FUNC CLASS URBAN ARTERIAL	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2412B =	4.198 MILES
LENGTH STRUCTURE TIP PROJECT U-2412B =	0.040 MILES
TOTAL LENGTH TIP PROJECT U-2412B =	4.198 MILES

NCDOT CONTACT: K. ZAK HAMIDI, P.E.
PROJECT ENGINEER ROADWAY DESIGN

Prepared In the Office of:
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC LIC. NO. F-0165
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 20, 2009

LETTING DATE:
AUGUST 21, 2012

CHRIS DAVIS, P.E.
PROJECT ENGINEER

DAVID B. GOURLEY, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**

STATE HIGHWAY DESIGN ENGINEER



BUFFER IMPACTS

TOPO MAP

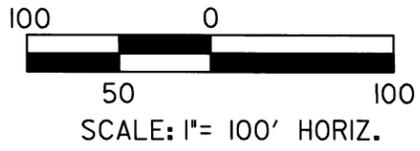
SCALE: 1" = 1500'



N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 GUILFORD COUNTY

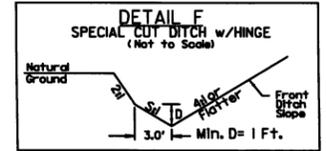
PROJECT: 44802.11 (U-2412B)
 SR 4121 FROM WEST OF
 VICKERY CHAPEL
 ROAD TO HILLTOP ROAD

SHEET 2 OF 8



$\Delta = 18' 54" 14.2' (RT)$
 $D = 4' 24" 26.5'$
 $L = 428.92'$
 $T = 216.43'$
 $R = 1,300.00'$
 $\theta = 0.04$
 $DS = 50 \text{ MPH}$

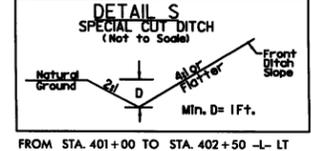
$\theta_s = 5' 43" 46.5'$
 $L_s = 260.00'$
 $LT = 173.42'$
 $ST = 86.75'$



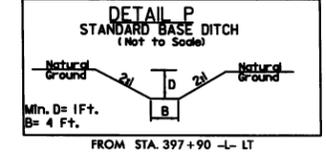
FROM STA. 398+50 TO STA. 401+40 -L- RT, S=3:1
 FROM STA. 405+50 TO STA. 408+00 -L- RT, S=6:1
 FROM STA. 406+00 TO STA. 408+00 -L- LT, S=6:1



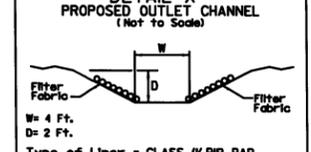
Type of Liner = CLASS 'B' RIP RAP
 FROM STA. 396+50 TO STA. 398+50 -L- LT



FROM STA. 401+00 TO STA. 402+50 -L- LT



FROM STA. 397+90 -L- LT



Type of Liner = CLASS 'Y' RIP RAP
 FROM STA. 397+30 -L- RT

GRASS SWALE FOR ONSITE DRAINAGE

GRASS SWALE DATA
 DA = 1.07 AC
 SLOPE = 0.003
 L REQ. = 107'
 L PRO. = 520'
 Q2 = 2.0 CFS
 V2 = 0.6 FPS
 Q10 = 2.9 CFS
 V10 = 0.7 FPS

NEW STORMWATER CONVEYANCE,
 MITIGABLE. LEVEL SPREADER NOT USED
 DUE TO TOPOGRAPHY CONSTRAINTS
 (CAN NOT DAYLIGHT UNTIL STREAM).
 GRASS SWALE USED TO CONTROL
 NITROGEN.

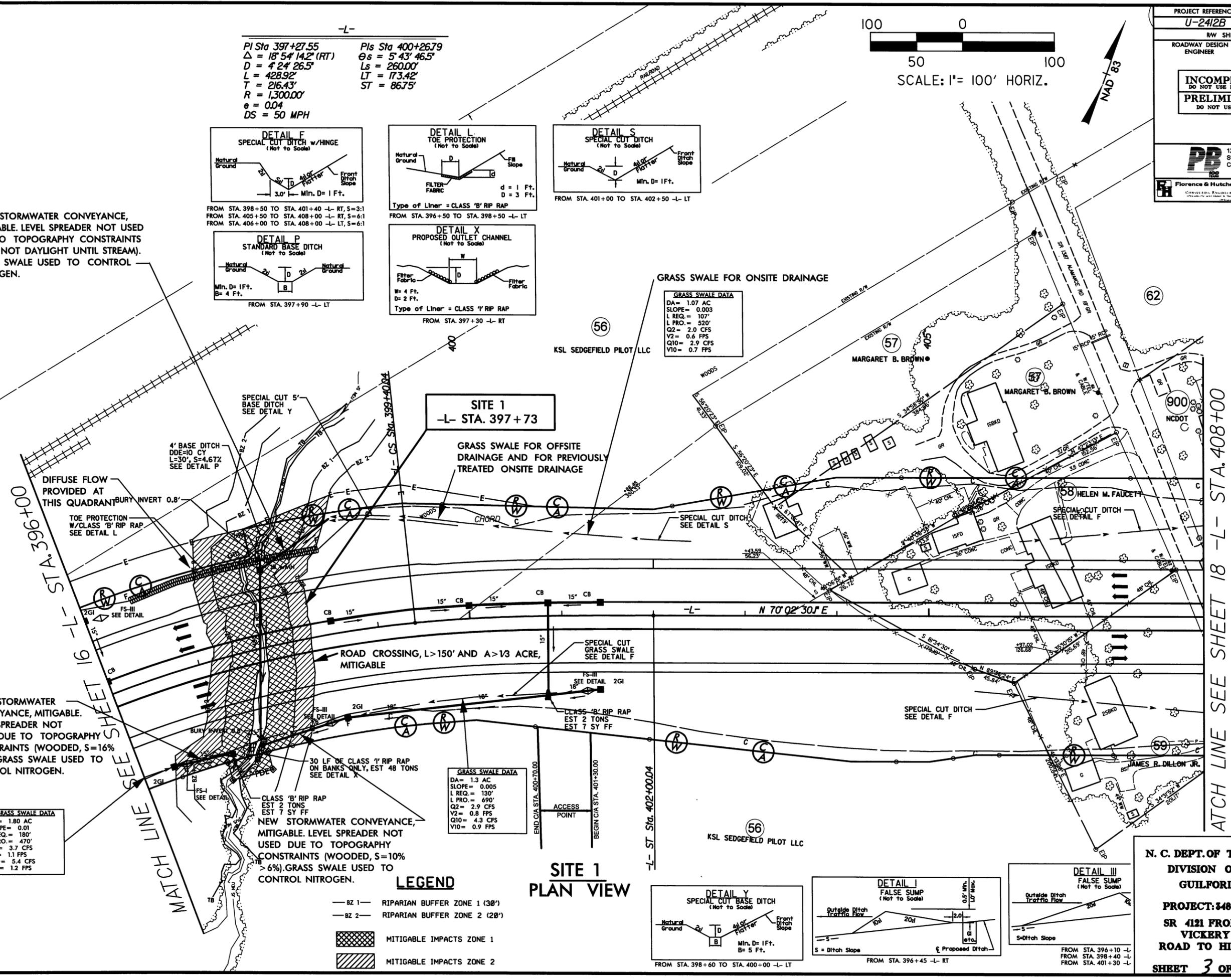
NEW STORMWATER CONVEYANCE,
 MITIGABLE. LEVEL SPREADER NOT
 USED DUE TO TOPOGRAPHY
 CONSTRAINTS (WOODED, S=16%
 > 6%). GRASS SWALE USED TO
 CONTROL NITROGEN.

NEW STORMWATER CONVEYANCE,
 MITIGABLE. LEVEL SPREADER NOT
 USED DUE TO TOPOGRAPHY
 CONSTRAINTS (WOODED, S=10%
 > 6%). GRASS SWALE USED TO
 CONTROL NITROGEN.

LEGEND

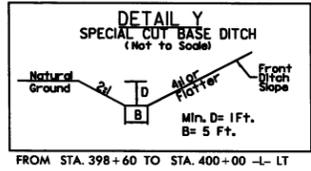
- BZ 1 — RIPARIAN BUFFER ZONE 1 (30')
- BZ 2 — RIPARIAN BUFFER ZONE 2 (20')
- MITIGABLE IMPACTS ZONE 1
- MITIGABLE IMPACTS ZONE 2

SITE 1 PLAN VIEW

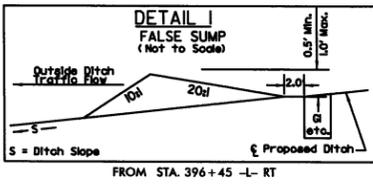


GRASS SWALE DATA
 DA = 1.80 AC
 SLOPE = 0.01
 L REQ. = 180'
 L PRO. = 470'
 Q2 = 3.7 CFS
 V2 = 1.1 FPS
 Q10 = 5.4 CFS
 V10 = 1.2 FPS

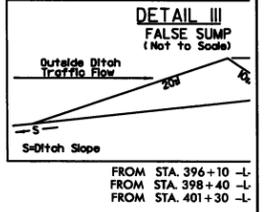
GRASS SWALE DATA
 DA = 1.3 AC
 SLOPE = 0.005
 L REQ. = 130'
 L PRO. = 690'
 Q2 = 2.9 CFS
 V2 = 0.8 FPS
 Q10 = 4.3 CFS
 V10 = 0.9 FPS



FROM STA. 398+60 TO STA. 400+00 -L- LT

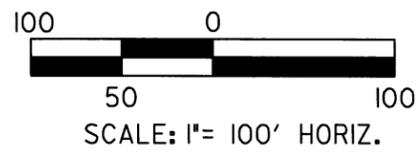
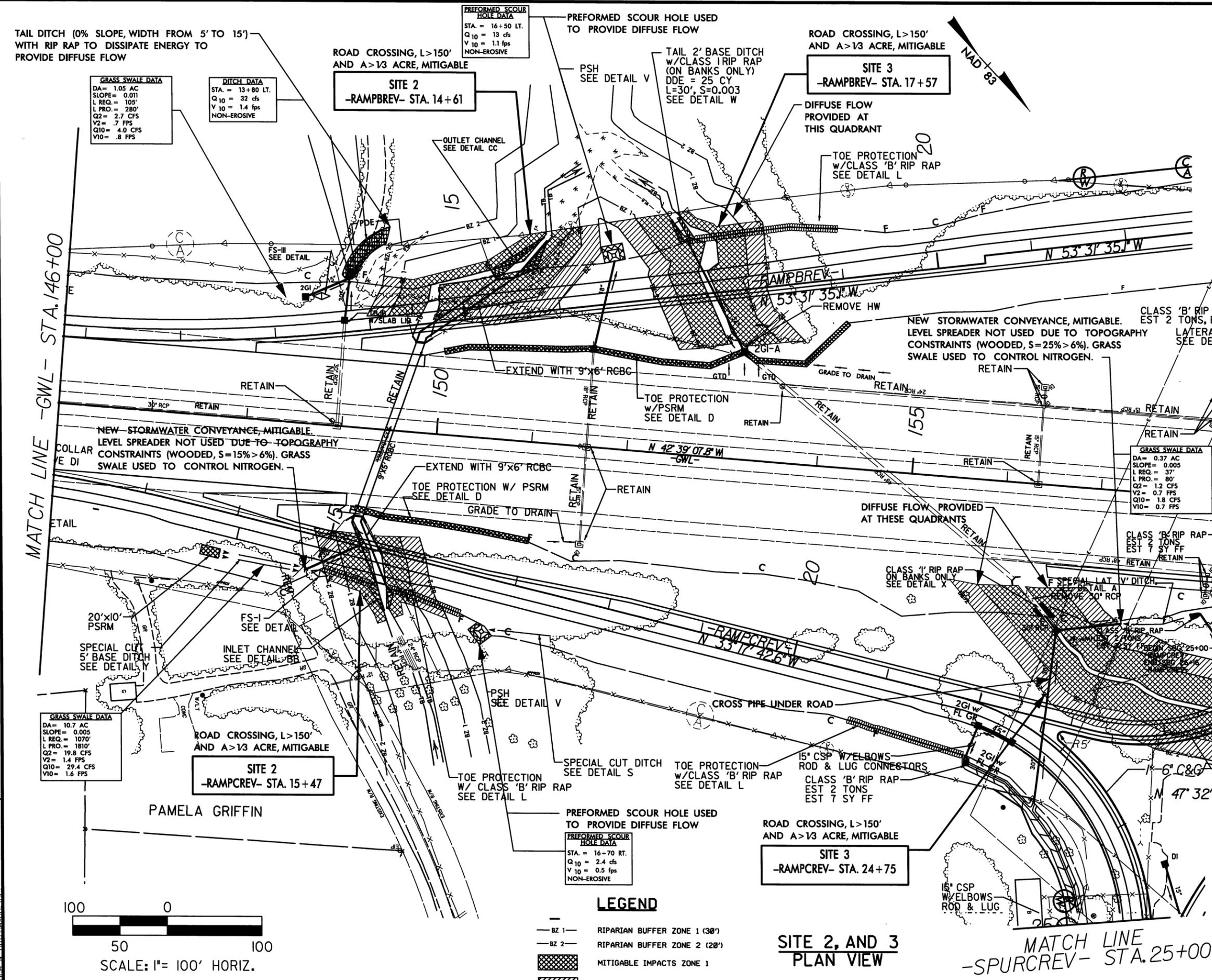


FROM STA. 396+45 -L- RT



FROM STA. 396+10 -L-
 FROM STA. 398+40 -L-
 FROM STA. 401+30 -L-

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 Florence & Hutcheson, Inc.



LEGEND

-  BZ 1 RIPARIAN BUFFER ZONE 1 (30')
-  BZ 2 RIPARIAN BUFFER ZONE 2 (20')
-  MITIGABLE IMPACTS ZONE 1
-  MITIGABLE IMPACTS ZONE 2

**SITE 2, AND 3
PLAN VIEW**

MATCH LINE -SPURCREV- STA. 25+00

REVISIONS

8/17/99
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 Florence & Hutcheson, Inc.

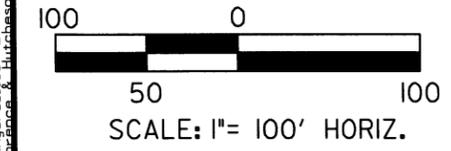
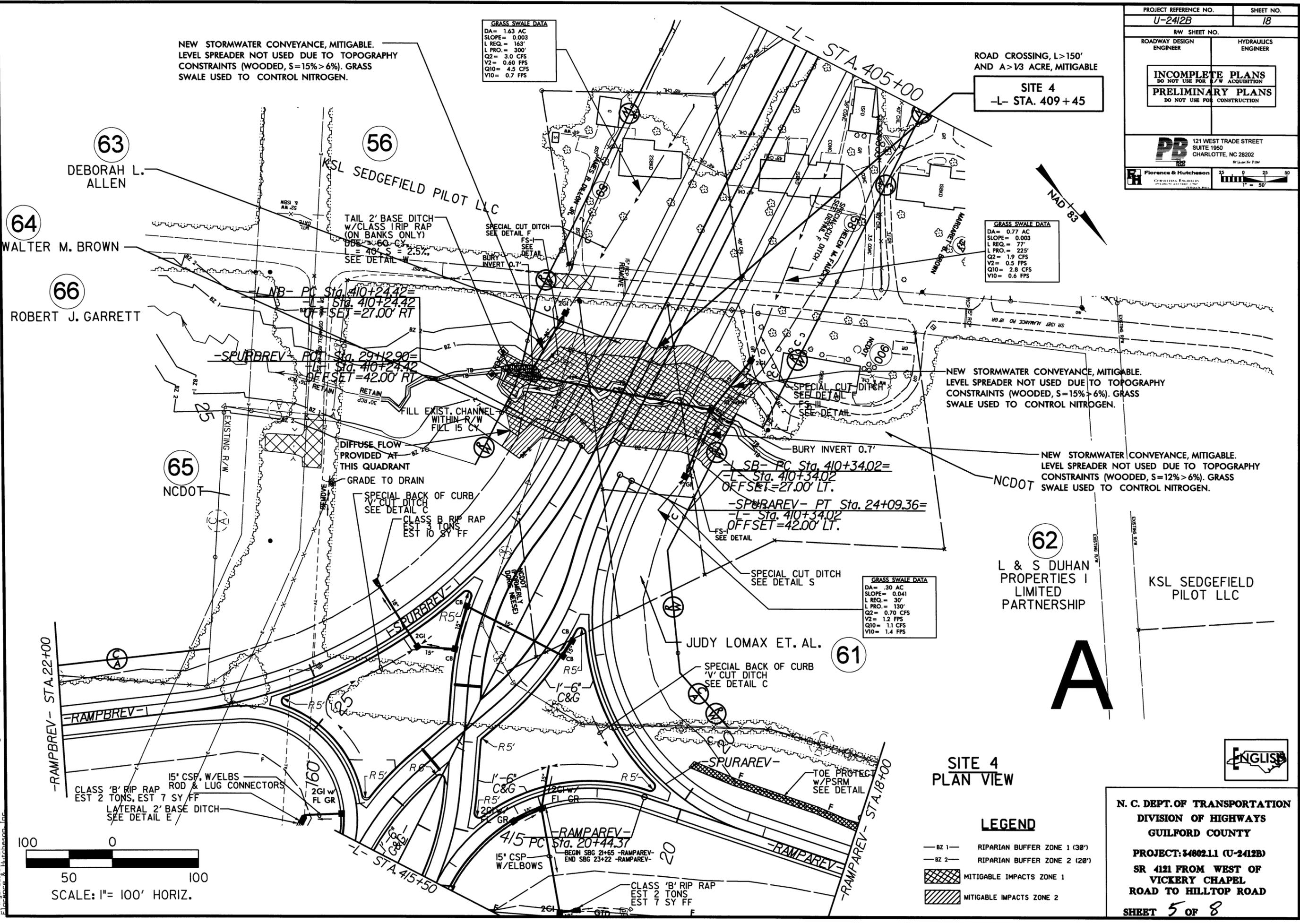
NEW STORMWATER CONVEYANCE, MITIGABLE.
 LEVEL SPREADER NOT USED DUE TO TOPOGRAPHY
 CONSTRAINTS (WOODED, S=15% > 6%). GRASS
 SWALE USED TO CONTROL NITROGEN.

ROAD CROSSING, L>150'
 AND A>13 ACRE, MITIGABLE

SITE 4
 -L- STA. 409+45

GRASS SWALE DATA
 DA = 0.77 AC
 SLOPE = 0.003
 L REQ. = 77'
 L PRO. = 225'
 Q2 = 1.9 CFS
 V2 = 0.5 FPS
 Q10 = 2.8 CFS
 V10 = 0.6 FPS

GRASS SWALE DATA
 DA = .30 AC
 SLOPE = 0.041
 L REQ. = 30'
 L PRO. = 130'
 Q2 = 0.70 CFS
 V2 = 1.2 FPS
 Q10 = 1.1 CFS
 V10 = 1.4 FPS



**SITE 4
 PLAN VIEW**

LEGEND

- BZ 1- RIPARIAN BUFFER ZONE 1 (30')
- BZ 2- RIPARIAN BUFFER ZONE 2 (20')
- MITIGABLE IMPACTS ZONE 1
- MITIGABLE IMPACTS ZONE 2

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412B)
SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 5 OF 8

A



8/17/99
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 ET:hydrau.fh
 1/23/2011

