



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

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SECRETARY

October 12, 2007

U.S. Army Corps of Engineers
Raleigh Regulatory Field Office
6508 Falls of Neuse Road, Suite 120
Raleigh, NC 27615-6814

ATTENTION: Mr. Eric Alsmeyer
NCDOT Coordinator, Division 5

Dear Sir:

SUBJECT: **Application for Section 404 Nationwide Permit 23, Section 401 Water Quality Certification, and Neuse Riparian Buffer Authorization** for the replacement of Bridge No. 125 over Smith Creek on SR 2045 (Burlington Mills Rd), Wake County, Division 5. Federal Aid Project No: BRZ-2045 (1), State Project No: 8.2408001, WBS No: 33245.1.1, TIP Project No: B-3705.

REFERENCE: U.S. Army Corps of Engineers Action ID No. 200120076 (reference number for project, not for any individual document; provided to NCDOT by USACE via email).

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 125 over Smith Creek on SR 2045 (Burlington Mills Rd) in Wake County. The current 121-foot long structure has a sufficiency rating of 6 out of 100 (for a new structure) and is considered functionally obsolete and structurally deficient. The replacement of this structure will result in safer traffic conditions.

The project proposes to construct a three-span bridge with 45-inch pre-stressed concrete girders directly north of the existing horizontal alignment. Traffic will be maintained on the current structure and, once the new bridge is built, the existing bridge will be demolished. The new structure will be 170 feet long and will have a 48-foot wide deck. The bridge will span Smith Creek. The new bridge will have two 12-foot lanes, a 12-foot center turn lane, a 4-foot shoulder on the north side of the bridge, and a 2-foot wide shoulder/ 5.5-foot sidewalk combination on the south side. The bridge approaches will have two 12-foot lanes, a 12-foot center turn lane, an 8-foot shoulder (4 feet of shoulder paved) on the north side, and curb and gutter on the south side.

The proposed design is slightly different than the preferred alternative that was described in the Categorical Exclusion (CE; Alternative 4). The CE stated that a 70-foot wide bridge with five lanes would be constructed in three stages on the existing horizontal alignment. However, due to financial constraints NCDOT has decided to reduce the number of lanes from five to three. The current bridge replacement proposal is essentially the 1st stage of the preferred alternative.

MAILING ADDRESS:
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LOCATION:
2728 CAPITAL BLVD., SUITE 240
RALEIGH NC 27604

Please see the enclosed copies of the permit drawings, design plans, Pre-Construction Notification (PCN), On-site Buffer Mitigation Plan, and Ecosystem Enhancement Program (EEP) mitigation acceptance letter for the above-referenced project. The CE was completed for this project in July 2002 and distributed shortly thereafter. Additional copies of this document are available upon request.

IMPACTS TO WATERS OF THE UNITED STATES

General Description

The project is located in the Neuse River Basin (sub-basin 03-04-02) in Wake County. This area is part of Hydrologic Cataloging Unit 03020201. Water resources within the project study area include Smith Creek, an unnamed tributary (UT-1) to Smith Creek, and two wetlands (WT-1 and WT-2). U.S. Army Corps of Engineers (USACE) Regulatory Specialist Eric Alsmeyer visited the study area on December 28, 2006 and verified the delineation of each water resource.

Smith Creek is a perennial stream that is approximately 25 to 30 feet wide. It is assigned Stream Index Number 27-23-(2) (05/01/1988) by the N.C. Division of Water Quality (NCDWQ) and has a best usage classification of **C NSW**. During field visits associated with the Natural Resources Technical Report (NRTR; September 2001), the water clarity was described as being moderate to poor, partially due to increased sediment loads. Water flow within the creek was moderate and substrate was primarily composed of sand and gravel.

UT-1 to Smith Creek is also a perennial stream, approximately 18 inches wide and one to two inches deep. During a field visit by NCDOT biologists on October 16, 2006, the water clarity was observed as being moderate, flow was moderate, and the substrate was composed of silt and sand. This tributary runs west through WT-2 into Smith Creek.

Neither High Quality Waters (HQW), Water Supplies (WS I or WS II), nor Outstanding Resource Waters (ORW) occur within 1.0 mile of the project study area. Additionally, Smith Creek is not included on NCDWQ's 2006 Final 303(d) List of Impaired Waters. However, Tom's Creek (Mill Creek), which is within 1.0 mile of the project study area, is on the 2006 list due to an overall impaired biological integrity. Both Smith Creek and Tom's Creek empty into the Neuse River, but they do not connect/flow in to each other at any point.

WT-1 is located northwest of the existing bridge and is adjacent to Smith Creek. This riverine wetland extends beyond the project boundaries to the north. WT-2 is located southeast of the existing bridge and is adjacent to Smith Creek. This riverine wetland extends beyond the project boundaries to the south. Both wetlands are classified as palustrine forested, temporarily flooded communities (PF01A Cowardin classification).

Permanent Impacts

There will be a total of 72 linear feet (0.03 acres) of permanent stream impacts associated with this project (Site 1). These impacts will occur along the west bank of Smith Creek where the current bridge crosses the creek and will result from stream bank repair work between Stations 26+00 -L-rt and 26+65 -L-rt. The repair work is necessary to repair erosion damage to the stream bank resulting from a large scour hole. Two hundred-pound to 700-pound stone will be used to fill the scour hole and stabilize the bank.

There will be no permanent stream impacts to UT-1 to Smith Creek associated with this project.

There are a total of 0.17 acres of permanent riverine wetland impacts to WT-1 associated with this project (Site 1). A total of 0.14 acres of impact will result from the placement of fill material into the wetland. The remaining 0.03 acres of impact will result from mechanized clearing within the wetland. The mechanized clearing will be performed 10 feet beyond the cut/fill line across the entire wetland.

There will also be 0.02 acres of permanent wetland impacts to WT-2 associated with this project (Site 2). These impacts are a result of mechanized clearing within the wetland for a Construction Easement.

Temporary Impacts

There are no temporary impacts associated with this project.

Bridge Demolition

The superstructure of Bridge No. 125 consists of a reinforced concrete floor on timber joists. The substructure consists of end bents, internal bents, and timber caps on timber piers. All components of the bridge will be removed without dropping any components into Waters of the U.S. The piers associated with the three in-stream bents will either be removed or snapped off level to the streambed. NCDOT shall adhere to NCDOT's Best Management Practices (BMPs) for Bridge Demolition and Removal.

Utility Impacts

There are no utility impacts to jurisdictional areas associated with this project. As an avoidance and minimization effort, Embarq will install a directional bore for telephone wiring under Smith Creek on the south side of Burlington Mills Road. They will be boring from high ground to high ground, resulting in no impacts to jurisdictional areas. The bore will begin around Station 29+05 -L- and will end around Station 24+40 -L-.

IMPACTS TO THE NEUSE RIVER RIPARIAN BUFFER

Riparian Buffer Impacts

This project is located within the Neuse River Basin and is therefore subject to Neuse River riparian buffer rules (15A NCAC 2B .0233). There will be a total of 13,036 square feet of impacts to the buffers of Smith Creek from the construction of the bridge (Site 1). A total of 8,188 square feet will occur in Zone 1 and 4,848 square feet will occur in Zone 2 (Table 1). According to the buffer rules, impacts associated with the construction of bridges are **Allowable**.

An additional 664 square feet of buffer impacts will occur along UT-1 to Smith Creek beyond the eastern end bent of the new structure (Site 2). A total of 505 square feet will occur in Zone 1 and 159 square feet will occur in Zone 2 (Table 1). These impacts are categorized as *road impacts other than crossings of streams and other surface waters* (or *road impacts other than crossings*) and are **Allowable with Mitigation** (listed as *Parallel Impacts* on the Buffer Impacts Summary sheet and *Mitigable Impacts* on the buffer drawings).

Additional *road crossing* impacts totaling less than 40 linear feet of riparian buffer will also occur along the west side of Smith Creek (Site 1; not shown in Table 1). A portion of the impacts will occur underneath and adjacent to the western approach slab of the new structure. These impacts will be in both Zones 1 and 2. The remainder of these road crossing impacts will occur south of the existing roadway in Zone 2. The buffer impacts are below the minimum threshold to be considered Allowable and are therefore considered **Exempt**. However, these impacts are shown with the same hatching as Allowable impacts on the buffer drawings.

Wetlands in Buffers

According to 15A NCAC 2B .0242, Section (3)(b)(iii), impacts to wetlands within Zones 1 and 2 of the riparian buffer that are subject to mitigation under 15A NCAC 2H .0506 shall comply with the mitigation ratios in 15A NCAC 2H .0506 only. Therefore, any wetland impacts that occur within either/both buffer zones will be subtracted from the buffer impacts and mitigated for as wetland impacts only.

Along Smith Creek, there is a total of 208 square feet of WT-1 impacts within buffer Zone 2 (Site 1; not in Table 1). This wetland overlaps the *road crossing* buffer impacts mentioned above, which are **Exempt** from mitigation. Therefore, mitigation will only be proposed for the wetland impacts.

Along UT-1 to Smith Creek, there are a total of 311 square feet of WT-2 impacts within its riparian buffer zones (Site 2). A total of 152 square feet occur in Zone 1 and 159 square feet occur in Zone 2 (Table 1). This wetland overlaps the buffer impacts considered *road impacts other than crossings* mentioned above, which are **Allowable with Mitigation**. Mitigation will only be proposed for the wetland impacts. Therefore, the square footage of WT-2 overlapping the buffer zones will be deducted from the buffer impacts. This will result in 353 square feet of Zone 1 impacts and zero square feet of Zone 2 impacts being considered for mitigation (Table 1).

Table 1. Neuse River Riparian Buffer Impacts

Type of Impact	Bridge	Road Impacts Other Than Crossings
Mitigation requirements (exempt, allowable, or allowable with mitigation)	Allowable	Allowable with Mitigation
Zone 1 Impact (sq. ft)	8,188	505
Wetlands In Buffer (WIB), Zone 1 (sq. ft)	---	152
Zone 2 Impact (sq. ft)	4,848	159
WIB, Zone 2 (sq. ft)	---	159
Total Zone 1 Impact, Minus WIB (sq. ft)	8,188	353
Total Zone 2 Impact, Minus WIB (sq. ft)	4,848	0
Total (Zones 1 and 2, Minus WIB (sq. ft)	13,036	353

Practical Alternatives Analysis

This bridge has been determined to be structurally deficient and functionally obsolete. Replacement of this inadequate structure will result in safer and more efficient traffic operations. Because this bridge needs to be replaced, impacts to the riparian buffers of Smith Creek and UT-1 to Smith Creek are unavoidable. In this case, replacing the existing bridge on a slightly new alignment and maintaining traffic on the existing bridge during construction provides the least amount of impacts to riparian buffers.

AVOIDANCE, MINIMIZATION, AND COMPENSATORY MITIGATION

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning and National Environmental Policy Act (NEPA) compliance stages; minimization measures were incorporated as part of the project design.

According to the Clean Water Act (CWA) §404(b)(1) guidelines, NCDOT must avoid, minimize, and mitigate, in sequential order, impacts to waters of the U.S. The following is a list of the project's jurisdictional stream and wetland avoidance/minimization activities proposed or completed by NCDOT:

Avoidance/Minimization

- Use of pre-formed scour holes and an energy dissipater.
- Use of directional boring for telephone utility work.
- No bents are to be placed in Smith Creek.
- During construction, traffic will be maintained on the existing structure.
- Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of stringent erosion control methods and use of NCDOT's BMPs for Protection of Surface Waters. NCDOT's BMP's for Bridge Demolition and Removal will also be implemented during this project.

Compensatory Mitigation

Stream and Wetland Mitigation through the Ecosystem Enhancement Program

No mitigation is proposed for the 72 linear feet of permanent stream impacts to Smith Creek because it is below the 150-foot threshold for requiring compensation. EEP will provide wetland mitigation for the 0.19 acres of permanent riverine wetland impacts resulting from this project. Please see the attached EEP mitigation acceptance letter, dated October 11, 2007.

Buffer Mitigation Requirement

There will be a total of 353 square feet of mitigable Zone 1 buffer impacts associated with this project. These impacts are considered *road impacts other than crossings* and are **Allowable with Mitigation**. To determine the mitigation requirement for these impacts, they were multiplied by the NCDWQ Zone 1 buffer multiplier of 3. This resulted in a total of 1,059 square feet of buffer mitigation being required for this project (Table 2).

On-site Buffer Mitigation

NCDOT will perform on-site buffer mitigation where SR 2045 (Burlington Mills Rd) currently passes over Smith Creek. The proposed mitigation will consist of restoring an area within buffer Zones 1 and 2 on the eastern bank of the creek (Site 1). This restoration will be used to mitigate for the 1,059 square feet of buffer mitigation required for this project.

The on-site restoration will occur where the existing earthen abutment is located. It will involve excavating the abutment to match the natural ground elevations. Although a similar abutment excavation will occur on the western bank, that area was not considered for restoration because of the amount of rip rap that will be placed there during construction. The excavated area will be ripped and disked prior to planting, if necessary. The restoration area will be planted following successful completion of site grading. As specified in the On-site Buffer Mitigation Plan (enclosed), the site will be planted with a mixture of approximately 40 percent (%) tulip poplar (*Liriodendron tulipifera*), 30 % percent southern red oak (*Quercus falcata*), and 30 % white oak (*Quercus alba*). Saplings will be planted six to ten feet, on center, at a density of approximately 680 trees per acre. The site will be visually inspected following completion of the project. NCDOT proposes no annual monitoring of the site.

There will be a total of 1,810 square feet of restoration associated with this project, with 1,330 square feet occurring in Zone 1 and 480 square feet occurring in Zone 2 (Table 2). After this on-site mitigation is applied to the 1,059 square feet of mitigation required, there will be a total of 751 square feet of

surplus buffer restoration on this project (Table 2). This surplus buffer restoration will be placed on NCDOT's On-site Mitigation Debit Ledger for use on future NCDOT projects.

Table 2. Proposed On-site Mitigation for Neuse River Riparian Buffer Impacts

	Type of Impact	Buffer Impacts*	NCDWQ Buffer Multiplier	Mitigation Requirement	On-site Buffer Restoration	On-site Mitigation Surplus
	Road Impacts Other Than Crossings					
Zone 1 (sq. ft)		353	3	1,059	1,330	271
Zone 2 (sq. ft)		0	1.5	0	480	480
Total (sq. ft)		353		1,059	1,810	751

*Wetlands in Buffers have been deducted from the buffer impacts.

FEDERALLY PROTECTED SPECIES

Plants and animals with federal classifications of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act (ESA) of 1973, as amended. As of its most recent update on May 10, 2007, the United States Fish and Wildlife Service (USFWS) website lists four federally-protected species for Wake County: the bald eagle (*Haliaeetus leucocephalus*), red-cockaded woodpecker (*Picoides borealis*), dwarf wedgemussel (*Alasmidonta heterodon*), and Michaux's sumac (*Rhus michauxii*).

Table 3. Federally protected species in Wake County

Scientific Name	Common Name	Federal Status	Biological Conclusion	Habitat Present
<i>Haliaeetus leucocephalus</i>	bald eagle	De-listed	Not Required	No
<i>Picoides borealis</i>	red-cockaded woodpecker	E	No Effect	No
<i>Alasmidonta heterodon</i>	dwarf wedgemussel	E	No Effect	Yes (poor quality)
<i>Rhus michauxii</i>	Michaux's sumac	E	No Effect	Yes

There is no suitable nesting or foraging habitat for the bald eagle within the project study area. Furthermore, a search of the North Carolina Natural Heritage Program (NCNHP) database (GIS shapefiles most recently updated on July 2, 2007) revealed no known populations of this species within 1.0 mile of the project. Therefore, a biological conclusion of **No Effect** was assigned to this species. According to a July 9, 2007 Federal Register release, the bald eagle was officially de-listed from the List of Endangered and Threatened Wildlife effective August 8, 2007 (50 CFR Part 17).

There is no suitable habitat for the red-cockaded woodpecker within the project study area. Furthermore, a search of the NCNHP database on October 9, 2007 revealed no known populations of this species

within 1.0 mile of the project. Therefore, a biological conclusion of **No Effect** has been assigned to this species.

A survey for potential dwarf wedgemussel habitat and individuals was performed by NCDOT biologists Logan Williams and Sue Brady on August 21, 2000. No mussels were found during the survey and the habitat was determined to be "somewhat degraded". NCDOT biologists Karen Lynch, Kathy Herring, and Heather Renninger reassessed the habitat and re-surveyed the study area on March 22, 2007. Again, no mussels were found during the survey. Shells of the invasive Asian clam (*Corbicula fluminea*) were present. As a result of these surveys and a review of historical data, it appears that the dwarf wedgemussel does not occur in this watershed. Additionally, the NCNHP database shows no known populations of this species within 1.0 mile of the project. Therefore, this project will not impact the dwarf wedgemussel and a biological conclusion of **No Effect** has been rendered for this species.

Initially, the biological conclusion for Michaux's sumac documented in the CE was **No Effect** due to lack of potential habitat. However, NCDOT biologists Jim Mason, Erica McLamb, and Greg Price re-evaluated the project area on October 16, 2006 and determined that potential habitat did exist in the form of disturbed roadsides and forest edges. Walking surveys totaling six man-hours were conducted and resulted in 100 percent coverage of the study area. No specimens of Michaux's sumac were observed. Furthermore, a review of the NCNHP database (most recently checked on October 9, 2007) revealed no known populations of this species within 1.0 mile of the project. Therefore, the Biological Conclusion of **No Effect** remains valid for this species.

SCHEDULE

The project calls for a review date of November 27, 2007, a letting of January 15, 2008, and a date of availability of February 26, 2008. It is expected that the contractor will choose to start construction in February/March 2008.

REGULATORY APPROVALS

Section 404 Permit: This project has been processed by the Federal Highway Administration as a "Categorical Exclusion" (CE) in accordance with 23 CFR 771.115(b). The NCDOT requests that activities described in the CE document be authorized by a Nationwide Permit 23 (72 FR 11092 – 11198; March 12, 2007).

Section 401 Permit: We anticipate that Section 401 General Water Quality Certification (WQC) 3632 will apply to this project. The NCDOT will adhere to all general conditions of this WQC. This project will impact Neuse Riparian Buffers and written concurrence will be required. In accordance with 15A NCAC 2H, Section .0500 (a) and 15A NCAC 2B, Section .0200, we are providing five copies of this application to the North Carolina Department of Environment and Natural Resources (NCDENR), NCDWQ, for their review.

Neuse Riparian Buffer Authorization: The proposed project has been designed to comply with the Neuse River Basin Riparian Buffer Protection Rule (15A NCAC 2B .0233). Therefore, we respectfully request a Neuse Riparian Buffer Authorization Certificate from NCDWQ.

A copy of this permit application will be posted on the NCDOT website at: <http://www.ncdot.org/doh/preconstruct/pe/>. If you have any questions or need additional information please call Mr. Jim Mason at (919) 715-5531.

Sincerely,

for 

Gregory J. Thorpe, Ph.D.
Environmental Management Director, PDEA

w/attachment:

Mr. John Hennessy, NCDWQ (5 Copies)
Mr. Travis Wilson, NCWRC
Mr. Gary Jordan, USFWS
Mr. Michael Street, NCDMF
Dr. David Chang, P.E., Hydraulics
Mr. Mark Staley, Roadside Environmental
Mr. Greg Perfetti, P.E., Structure Design
Mr. Victor Barbour, Project Services Unit
Mr. J. Wally Bowman, PE., Division Engineer
Mr. Chris Murray, DEO, Division 5

w/o attachment:

Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Scott McLendon, USACE, Wilmington
Mr. Mark Pierce, P.E., PDEA Project Planning Engineer
Ms. Beth Harmon, NCDOT Coordinator, Ecosystem Enhancement Program
Mr. Todd Jones, NCDOT External Audit Branch
Ms. LeiLani Paugh, Natural Environment Unit
Mr. Randy Griffin, Natural Environment Unit

III. Project Information

Attach a **vicinity map** clearly showing the location of the property with respect to local landmarks such as towns, rivers, and roads. Also provide a detailed **site plan** showing property boundaries and development plans in relation to surrounding properties. Both the vicinity map and site plan must include a scale and north arrow. The specific footprints of all buildings, impervious surfaces, or other facilities must be included. If possible, the maps and plans should include the appropriate USGS Topographic Quad Map and NRCS Soil Survey with the property boundaries outlined. Plan drawings, or other maps may be included at the applicant's discretion, so long as the property is clearly defined. For administrative and distribution purposes, the USACE requires information to be submitted on sheets no larger than 11 by 17-inch format; however, DWQ may accept paperwork of any size. DWQ prefers full-size construction drawings rather than a sequential sheet version of the full-size plans. If full-size plans are reduced to a small scale such that the final version is illegible, the applicant will be informed that the project has been placed on hold until decipherable maps are provided.

1. Name of project: Replacement of Bridge No. 125 over Smith Creek on SR 2045 (Burlington Mills Rd)
2. T.I.P. Project Number or State Project Number (NCDOT Only): B-3705
3. Property Identification Number (Tax PIN): N/A
4. Location
County: Wake Nearest Town: Wake Forest
Subdivision name (include phase/lot number): N/A
Directions to site (include road numbers/names, landmarks, etc.): US 1 north , right on SR 2045, proceed east to first bridge on SR 2045.
5. Site coordinates (For linear projects, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)
Decimal Degrees (6 digits minimum): _____°N _____°W
6. Property size (acres): N/A
7. Name of nearest receiving body of water: Smith Creek
8. River Basin: Neuse
(Note – this must be one of North Carolina's seventeen designated major river basins. The River Basin map is available at <http://h2o.enr.state.nc.us/admin/maps/>.)
9. Describe the existing conditions on the site and general land use in the vicinity of the project at the time of this application: SR 2045 is a two-lane, paved road in a rural-to-suburban setting. Land use is forested and residential within the study area.

10. Describe the overall project in detail, including the type of equipment to be used: _____
The project proposes to construct a three-span bridge with 45-inch pre-stressed concrete girders directly north of the existing horizontal alignment. Traffic will be maintained on the current structure and, once the new bridge is built, the existing bridge will be demolished. The new structure will be 170 feet long and will have a 48-foot wide deck. The new bridge will have two 12-foot lanes, a 12-foot center turn lane, a 4-foot shoulder on the north side of the bridge, and a 2-foot wide shoulder/ 5.5-foot sidewalk combination on the south side. The bridge approaches will have two 12-foot lanes, a 12-foot center turn lane, an 8-foot shoulder (4 feet of shoulder paved) on the north side, and curb and gutter on the south side. Heavy duty excavation equipment will be used such as trucks, dozers, cranes and other various equipment necessary for roadway construction.
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11. Explain the purpose of the proposed work: The current bridge has a sufficiency rating of 6 out of 100 and is considered to be functionally obsolete and structurally deficient. The replacement of this inadequate structure will result in safer and more efficient traffic operations.
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IV. Prior Project History

If jurisdictional determinations and/or permits have been requested and/or obtained for this project (including all prior phases of the same subdivision) in the past, please explain. Include the USACE Action ID Number, DWQ Project Number, application date, and date permits and certifications were issued or withdrawn. Provide photocopies of previously issued permits, certifications or other useful information. Describe previously approved wetland, stream and buffer impacts, along with associated mitigation (where applicable). If this is a NCDOT project, list and describe permits issued for prior segments of the same T.I.P. project, along with construction schedules. N/A _____

V. Future Project Plans

Are any future permit requests anticipated for this project? If so, describe the anticipated work, and provide justification for the exclusion of this work from the current application.

N/A _____

VI. Proposed Impacts to Waters of the United States/Waters of the State

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to wetlands, open water, and stream channels associated with the project. Each impact must be listed separately in the tables below (e.g., culvert installation should be listed separately from riprap dissipater pads). Be sure to indicate if an impact is temporary. All proposed impacts, permanent and temporary, must be listed, and must be labeled and clearly identifiable on an accompanying site plan. All wetlands and waters, and all streams (intermittent and perennial) should be shown on a delineation map, whether or not impacts are proposed to these systems. Wetland and stream evaluation and delineation forms should be included as appropriate. Photographs may be included at the applicant's discretion. If this proposed impact is strictly for wetland or stream mitigation, list and describe the impact in Section VIII below. If additional space is needed for listing or description, please attach a separate sheet.

Provide a written description of the proposed impacts: There will be a total of 72 linear feet (0.03 acres) of permanent stream impacts associated with this project (Site 1). These impacts will occur along the west bank of Smith Creek and will result from stream bank repair work between Stations 26+00 -L-rt and 26+65 -L-rt. The repair work will take place where the current bridge crosses Smith Creek and is necessary to repair erosion damage to the stream bank resulting from a large scour hole. There will be no permanent stream impacts to UT-1 to Smith Creek associated with this project. There are a total of 0.17 acres of permanent wetland impacts to WT-1 associated with this project (Site 1). A total of 0.14 acres of impact will result from the placement of fill material into the wetland. The remaining 0.03 acres of impact will result from mechanized clearing within the wetland. The mechanized clearing will be performed 10 feet beyond the cut/fill line across the entire wetland. There will also be a total of 0.02 acres of permanent wetland impacts to WT-2 associated with this project (Site 2). These impacts are a result of mechanized clearing within the wetland associated with a Construction Easement.

1. Individually list wetland impacts. Types of impacts include, but are not limited to mechanized clearing, grading, fill, excavation, flooding, ditching/drainage, etc. For dams, separately list impacts due to both structure and flooding.

Wetland Impact Site Number (indicate on map)	Type of Impact	Type of Wetland (e.g., forested, marsh, herbaceous, bog, etc.)	Located within 100-year Floodplain (yes/no)	Distance to Nearest Stream (linear feet)	Area of Impact (acres)
1	Permanent Fill	Forested	Yes	70	0.14
1	Mechanized Clearing	Forested	Yes	70	0.03
2	Mechanized Clearing	Forested	Yes	0	0.02
Total Wetland Impact (acres)					0.19

2. List the total acreage (estimated) of all existing wetlands on the property: 0.54

3. Individually list all intermittent and perennial stream impacts. Be sure to identify temporary impacts. Stream impacts include, but are not limited to placement of fill or culverts, dam construction, flooding, relocation, stabilization activities (e.g., cement walls, rip-rap, crib walls, gabions, etc.), excavation, ditching/straightening, etc. If stream relocation is proposed, plans and profiles showing the linear footprint for both the original and relocated streams must be included. To calculate acreage, multiply length X width, then divide by 43,560.

Stream Impact Number (indicate on map)	Stream Name	Type of Impact	Perennial or Intermittent?	Average Stream Width Before Impact	Impact Length (linear feet)	Area of Impact (acres)
1	Smith Creek	Stream Bank Repair/Filling of Scour Hole	Perennial	25-30 ft	72	0.03
Total Stream Impact (by length and acreage)					72	0.03

4. Individually list all open water impacts (including lakes, ponds, estuaries, sounds, Atlantic Ocean and any other water of the U.S.). Open water impacts include, but are not limited to fill, excavation, dredging, flooding, drainage, bulkheads, etc.

Open Water Impact Site Number (indicate on map)	Name of Waterbody (if applicable)	Type of Impact	Type of Waterbody (lake, pond, estuary, sound, bay, ocean, etc.)	Area of Impact (acres)
Total Open Water Impact (acres)				0.0

5. List the cumulative impact to all Waters of the U.S. resulting from the project:

Stream Impact (acres):	0.03
Wetland Impact (acres):	0.19
Open Water Impact (acres):	0
Total Impact to Waters of the U.S. (acres)	0.22
Total Stream Impact (linear feet):	72

6. Isolated Waters

Do any isolated waters exist on the property? Yes No

Describe all impacts to isolated waters, and include the type of water (wetland or stream) and the size of the proposed impact (acres or linear feet). Please note that this section only applies to waters that have specifically been determined to be isolated by the USACE.

7. Pond Creation

If construction of a pond is proposed, associated wetland and stream impacts should be included above in the wetland and stream impact sections. Also, the proposed pond should be described here and illustrated on any maps included with this application.

Pond to be created in (check all that apply): uplands stream wetlands

Describe the method of construction (e.g., dam/embankment, excavation, installation of draw-down valve or spillway, etc.): _____

Proposed use or purpose of pond (e.g., livestock watering, irrigation, aesthetic, trout pond, local stormwater requirement, etc.): _____

Current land use in the vicinity of the pond: _____

Size of watershed draining to pond: _____ Expected pond surface area: _____

VII. Impact Justification (Avoidance and Minimization)

Specifically describe measures taken to avoid the proposed impacts. It may be useful to provide information related to site constraints such as topography, building ordinances, accessibility, and financial viability of the project. The applicant may attach drawings of alternative, lower-impact site layouts, and explain why these design options were not feasible. Also discuss how impacts were minimized once the desired site plan was developed. If applicable, discuss construction techniques to be followed during construction to reduce impacts. NCDOT will use pre-formed scour holes and an energy dissipater on this project. Also, as an avoidance and minimization effort, Embarq will employ directional boring for telephone utility work. No bents are to be placed in Smith Creek. Additionally, during construction, traffic will be maintained on the existing structure. Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of stringent erosion control methods and use of NCDOT's BMPs for Protection of Surface Waters. NCDOT's BMP's for Bridge Demolition and Removal will also be implemented during this project.

VIII. Mitigation

DWQ - In accordance with 15A NCAC 2H .0500, mitigation may be required by the NC Division of Water Quality for projects involving greater than or equal to one acre of impacts to freshwater wetlands or greater than or equal to 150 linear feet of total impacts to perennial streams.

USACE – In accordance with the Final Notice of Issuance and Modification of Nationwide Permits, published in the Federal Register on January 15, 2002, mitigation will be required when necessary to ensure that adverse effects to the aquatic environment are minimal. Factors including size and type of proposed impact and function and relative value of the impacted aquatic resource will be considered in determining acceptability of appropriate and practicable mitigation as proposed. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland and/or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferable in the same watershed.

If mitigation is required for this project, a copy of the mitigation plan must be attached in order for USACE or DWQ to consider the application complete for processing. Any application lacking a required mitigation plan or NCEEP concurrence shall be placed on hold as incomplete. An applicant may also choose to review the current guidelines for stream restoration in DWQ's Draft Technical Guide for Stream Work in North Carolina, available at <http://h2o.enr.state.nc.us/ncwetlands/strmgide.html>.

1. Provide a brief description of the proposed mitigation plan. The description should provide as much information as possible, including, but not limited to: site location (attach directions and/or map, if offsite), affected stream and river basin, type and amount (acreage/linear feet) of mitigation proposed (restoration, enhancement, creation, or preservation), a plan view, preservation mechanism (e.g., deed restrictions, conservation easement, etc.), and a description of the current site conditions and proposed method of construction. Please attach a separate sheet if more space is needed.

2. Mitigation may also be made by payment into the North Carolina Ecosystem Enhancement Program (NCEEP). Please note it is the applicant's responsibility to contact the NCEEP at (919) 715-0476 to determine availability, and written approval from the NCEEP indicating that they are will to accept payment for the mitigation must be attached to this form. For additional information regarding the application process for the NCEEP, check the NCEEP website at <http://h2o.enr.state.nc.us/wrp/index.htm>. If use of the NCEEP is proposed, please check the appropriate box on page five and provide the following information:

Amount of stream mitigation requested (linear feet): 0
Amount of buffer mitigation requested (square feet): 0
Amount of Riparian wetland mitigation requested (acres): 0.19
Amount of Non-riparian wetland mitigation requested (acres): 0.00
Amount of Coastal wetland mitigation requested (acres): 0.00

IX. Environmental Documentation (required by DWQ)

1. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land? Yes No
2. If yes, does the project require preparation of an environmental document pursuant to the requirements of the National or North Carolina Environmental Policy Act (NEPA/SEPA)?
Note: If you are not sure whether a NEPA/SEPA document is required, call the SEPA coordinator at (919) 733-5083 to review current thresholds for environmental documentation.
Yes No

3. If yes, has the document review been finalized by the State Clearinghouse? If so, please attach a copy of the NEPA or SEPA final approval letter. Yes No

X. Proposed Impacts on Riparian and Watershed Buffers (required by DWQ)

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to required state and local buffers associated with the project. The applicant must also provide justification for these impacts in Section VII above. All proposed impacts must be listed herein, and must be clearly identifiable on the accompanying site plan. All buffers must be shown on a map, whether or not impacts are proposed to the buffers. Correspondence from the DWQ Regional Office may be included as appropriate. Photographs may also be included at the applicant's discretion.

1. Will the project impact protected riparian buffers identified within 15A NCAC 2B .0233 (Neuse), 15A NCAC 2B .0259 (Tar-Pamlico), 15A NCAC 02B .0243 (Catawba) 15A NCAC 2B .0250 (Randleman Rules and Water Supply Buffer Requirements), or other (please identify _____)? Yes No
2. If "yes", identify the square feet and acreage of impact to each zone of the riparian buffers. If buffer mitigation is required calculate the required amount of mitigation by applying the buffer multipliers.

Zone*	Impact (square feet)	Multiplier	Required Mitigation
1	353	3 (2 for Catawba)	1,059
2	0	1.5	0
Total	353		1,059

* Zone 1 extends out 30 feet perpendicular from the top of the near bank of channel; Zone 2 extends an additional 20 feet from the edge of Zone 1.

If buffer mitigation is required, please discuss what type of mitigation is proposed (i.e., Donation of Property, Riparian Buffer Restoration / Enhancement, or Payment into the Riparian Buffer Restoration Fund). Please attach all appropriate information as identified within 15A NCAC 2B .0242 or .0244, or .0260.

In addition to the mitigable buffer impacts listed above, there will be a total of 13,036 square feet of **Allowable bridge** impacts to the buffers of Smith Creek and UT-1 to Smith Creek associated with this project (Sites 1 and 2). A total of 8,188 square feet will occur in Zone 1 and 4,848 square feet will occur in Zone 2. There will also be additional **Exempt** buffer impacts to Zones 1 and 2 of Smith Creek. For the mitigable impacts listed above, NCDOT will perform limited on-site buffer mitigation where SR 2045 currently passes over Smith Creek. The proposed mitigation will consist of restoring riparian buffer within buffer Zones 1 and 2 on the eastern bank of the creek. This restoration will involve excavating the existing bridge abutment on the eastern bank to match the natural ground elevations. Although a similar abutment excavation will occur on the western bank, that area was not considered for restoration because of the amount of riprap that will be placed there during construction. The excavated area will be ripped and disked prior to planting, if necessary. The restoration area

will be planted following successful completion of site grading. As specified in the on-site buffer mitigation plan (enclosed), the site will be planted with a mixture of approximately 40 percent (%) tulip poplar (*Liriodendron tulipifera*), 30 % percent southern red oak (*Quercus falcata*), and 30 % white oak (*Quercus alba*). Saplings will be planted six to ten feet, on center, at a density of approximately 680 trees per acre. The site will be visually inspected following completion of the project. NCDOT proposes no annual monitoring of the site. There will be a total of 1,810 square feet of restoration associated with this project, with 1,330 square feet occurring in Zone 1 and 480 square feet occurring in Zone 2. After this on-site mitigation is applied to the 1,059 square feet of mitigation required, there will be a total of 751 square feet of surplus buffer restoration on this project. **This surplus buffer restoration will placed on NCDOT's On-site Mitigation Debit Ledger for use on future NCDOT projects.**

XI. Stormwater (required by DWQ)

Describe impervious acreage (existing and proposed) versus total acreage on the site. Discuss stormwater controls proposed in order to protect surface waters and wetlands downstream from the property. If percent impervious surface exceeds 20%, please provide calculations demonstrating total proposed impervious level. N/A

XII. Sewage Disposal (required by DWQ)

Clearly detail the ultimate treatment methods and disposition (non-discharge or discharge) of wastewater generated from the proposed project, or available capacity of the subject facility. N/A

XIII. Violations (required by DWQ)

Is this site in violation of DWQ Wetland Rules (15A NCAC 2H .0500) or any Buffer Rules?
Yes No

Is this an after-the-fact permit application? Yes No

XIV. Cumulative Impacts (required by DWQ)

Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? Yes No
If yes, please submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent North Carolina Division of Water Quality policy posted on our website at <http://h2o.enr.state.nc.us/ncwetlands>. If no, please provide a short narrative description: N/A

XV. Other Circumstances (Optional):

It is the applicant's responsibility to submit the application sufficiently in advance of desired construction dates to allow processing time for these permits. However, an applicant may choose to list constraints associated with construction or sequencing that may impose limits on work schedules (e.g., draw-down schedules for lakes, dates associated with Endangered and Threatened Species, accessibility problems, or other issues outside of the applicant's control).

N/A

E. P. Furr for Gregory J. Thorne, PhD Oct 12, 2007

Applicant/Agent's Signature

Date

(Agent's signature is valid only if an authorization letter from the applicant is provided.)



October 11, 2007

Mr. Gregory J. Thorpe, Ph.D.
Environmental Management Director
Project Development and Environmental Analysis Branch
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter (revision 1):

B-3705, Replace Bridge Number 125 over Smith Creek on SR 2045,
Wake County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory riparian wetland mitigation for the subject project. Based on the information supplied by you on October 11, 2007, the impacts are located in CU 03020201 of the Neuse River Basin in the Central Piedmont (SP) Eco-Region, and are as follows:

Riparian Wetlands:	0.17 acre (original request, April 26, 2007)
Riparian Wetlands:	0.19 acre (revised request, increase of 0.02 acre)

EEP commits to implementing sufficient compensatory riparian wetland mitigation to offset the impacts associated with this project by the end of the MOA Year in which this project is permitted, in accordance with Section X of the Amendment No. 2 to the Memorandum of Agreement between the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U. S. Army Corps of Engineers, fully executed on March 8, 2007. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-715-1929.

Sincerely,

A handwritten signature in black ink that reads "James B. Stimpert for". The signature is written in a cursive style.

William D. Gilmore, P.E.
EEP Director

cc: Mr. Eric Alsmeyer, USACE – Raleigh
Mr. John Hennessy, Division of Water Quality, Wetlands/401 Unit
File: B-3705 ✓



October 11, 2007

Mr. Eric Alsmeyer
U. S. Army Corps of Engineers
Raleigh Regulatory Field Office
6508 Falls of the Neuse Road, Suite 120
Raleigh, North Carolina 27615

Dear Mr. Alsmeyer:

Subject: EEP Mitigation Acceptance Letter (revision 1):

B-3705, Replace Bridge Number 125 over Smith Creek on SR 2045,
Wake County; Neuse River Basin (Cataloging Unit 03020201); Central
Piedmont (CP) Eco-Region

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory riparian wetland mitigation for the unavoidable impact associated with the above referenced project. As indicated in the NCDOT's mitigation request revision dated October 11, 2007, compensatory riparian wetland mitigation from EEP is required for approximately 0.19 acre of riparian wetland impacts.

Compensatory riparian wetland mitigation associated with this project will be provided in accordance with Section X of the Amendment No. 2 to the Memorandum of Agreement between the N. C. Department of Environment and Natural Resources, the N. C. Department of Transportation, and the U. S. Army Corps of Engineers fully executed on March 8, 2007 (Tri-Party MOA). EEP commits to implement sufficient compensatory riparian wetland mitigation up to 0.34 riparian wetland credits to offset the impacts associated with this project by the end of the MOA year in which this project is permitted. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

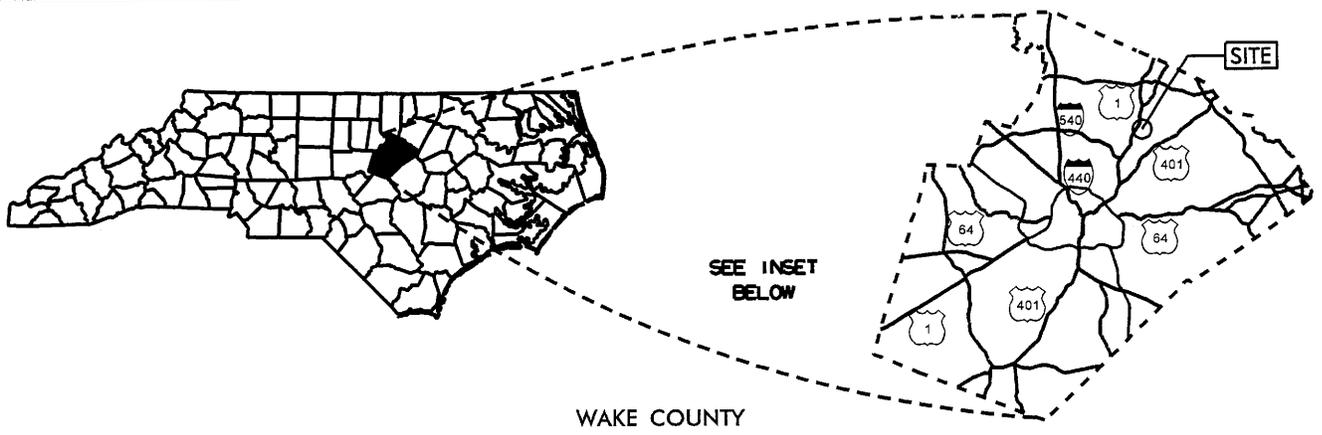
If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-715-1929.

Sincerely,

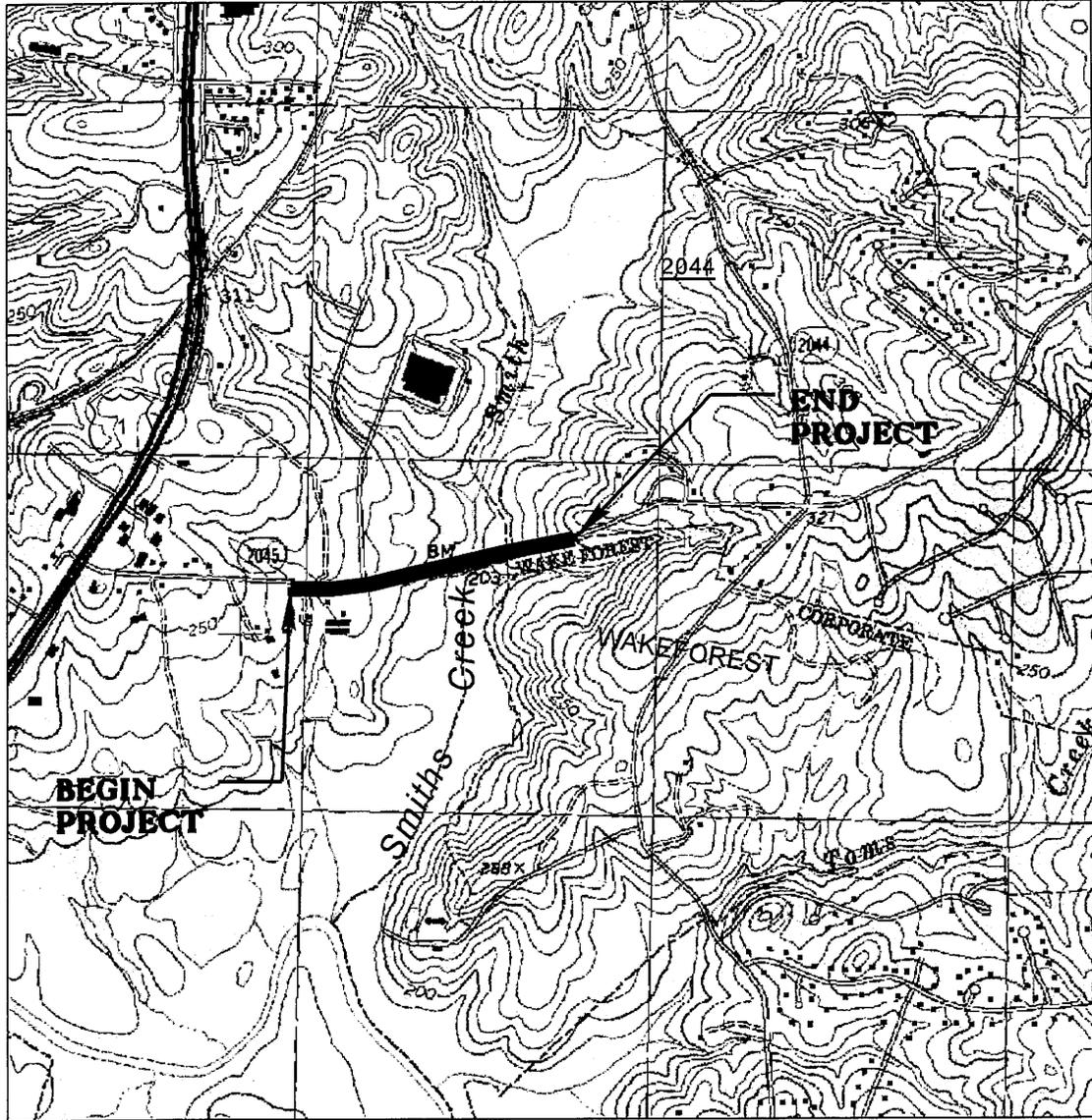
A handwritten signature in black ink that reads "James B. Stanfill for". The signature is written in a cursive, flowing style.

William D. Gilmore, P.E.
EEP Director

cc: Mr. Gregory J. Thorpe, Ph.D., NCDOT-PDEA
Mr. John Hennessy, Division of Water Quality, Wetlands/401 Unit
File: B-3705



WAKE COUNTY



WETLAND IMPACTS

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

WAKE COUNTY

**PROJECT: 33245.1.1 (B-3705)
BRIDGE NO. 125 ON SR 2045
(BURLINGTON MILLS RD)
OVER SMITH'S CREEK**

SHEET 1 OF 3

3 / 13 / 07

PROPERTY OWNERS
NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
1	DAVID D.FULLER, TRUSTEE	3800 BURLINGTON MILLS RD WAKE FOREST, NC 27587-8876
2	GRACIE P.MACON, ETAL ALICE MACON ADAMS AND JACK LYNN ADAMS	2624 BURLINGTON MILLS RD WAKE FOREST, NC 27587-8855
4	THURMAN D.KITCHEN III JOHN S.KITCHIN	PO BOX 1479 WINTER PARK, FL 32790-1479
5	CADDELL WOODS HOMEOWNERS ASSOCIATION, INC	2520A RELIANCE AVE APEX, NC 27539-6346

NCDOT

DIVISION OF HIGHWAYS
WAKE COUNTY

PROJECT: 33245.1.1 (B-3705)
BRIDGE NO.125 ON SR 2045
(BURLINGTON MILLS RD)
OVER SMITH'S CREEK

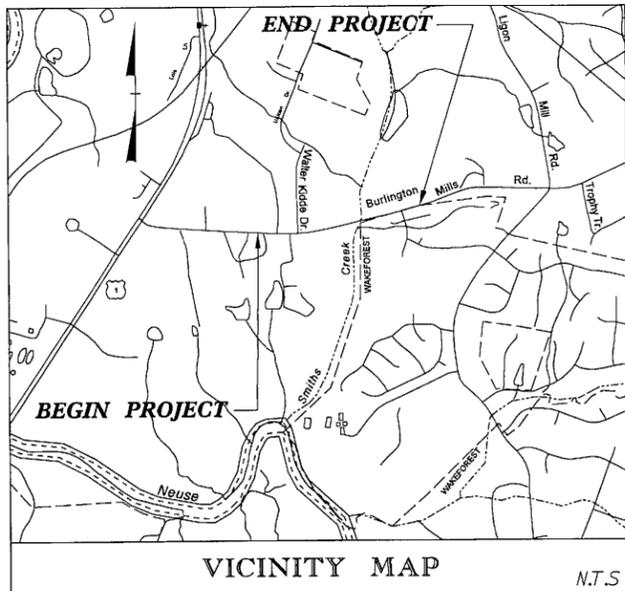
09/08/09

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
WAKE COUNTY

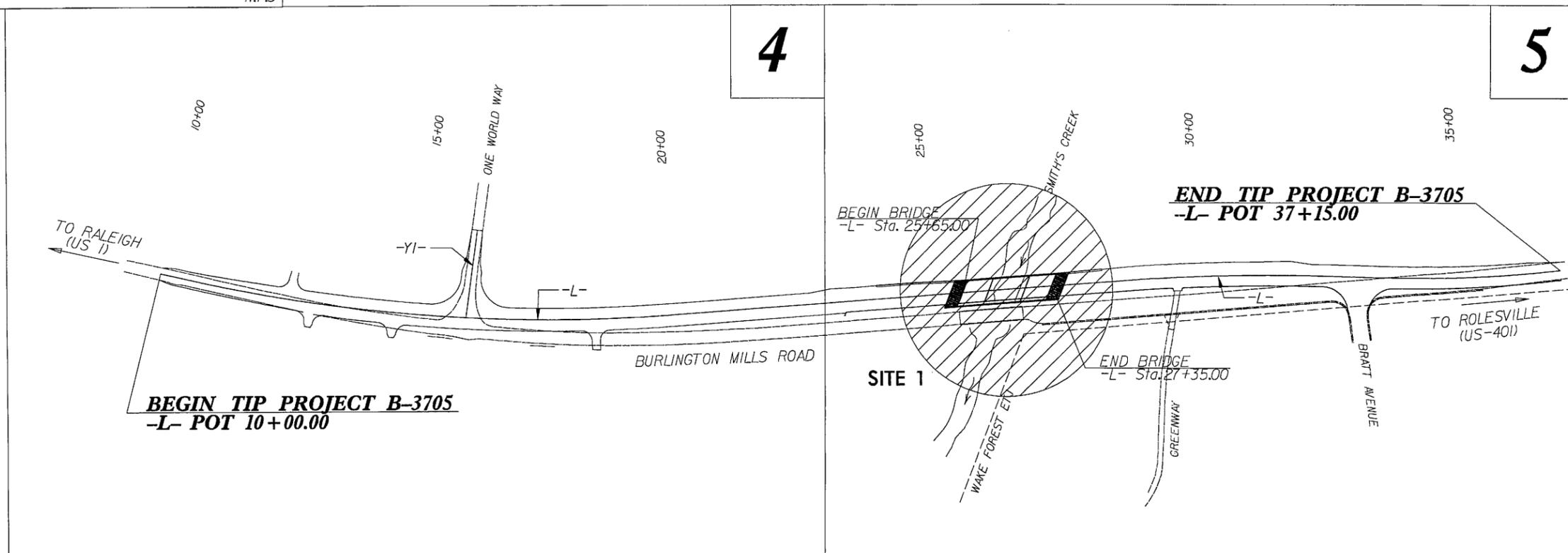
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N.C.	B-3705	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33245.1.1	BRZ-2045(1)	P.E.	
33245.2.1	BRZ-2045(1)	ROW/UTILITIES	

TIP PROJECT: B-3705



LOCATION: BRIDGE NO. 125 OVER SMITH'S CREEK ON SR 2045 (BURLINGTON MILLS RD)
TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURE

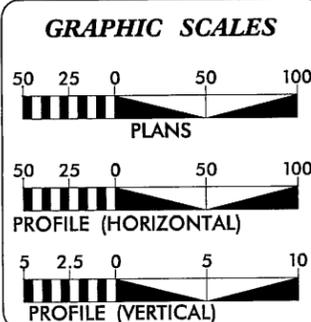
Permit Drawing
Sheet 4 of 8



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NCDOT CONTACT: B. DOUG TAYLOR, P.E. - ROADWAY DESIGN - ENGINEERING COORDINATION

CONTRACT:



DESIGN DATA

ADT 2007 =	10,280
ADT 2027 =	20,340
DHV =	10 %
D =	60 %
T =	3 % *
V =	50 MPH
* (TTST 1% + DUAL 2%)	
FUNCTIONAL CLASS.	RURAL MINOR COLLECTOR

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-3705 =	0.482 MILES
LENGTH OF STRUCTURE TIP PROJECT B-3705 =	0.032 MILES
TOTAL LENGTH OF TIP PROJECT B-3705 =	0.514 MILES

Prepared in the Office of:
WILBUR SMITH ASSOCIATES
421 FAYETTEVILLE STREET MALL, STE 1303
RALEIGH, NC, 27601
FOR: NORTH CAROLINA DEPT. OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: AUGUST 18, 2006	DAVID L. WILVER, P.E. PROJECT ENGINEER
LETTING DATE: JANUARY 15, 2008	JIM MORRISON, P.E. PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SIGNATURE: _____ P.E.

STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED DIVISION ADMINISTRATOR DATE

FILE: SP1LES
DATE: 08/19/09

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing Sheet 7 of 8

INFORMATION TO BE SHOWN ON PLANS

Design:	Discharge	6,000	c.f.s.	Frequency	50 YR	Elev.	199.0
Base Flood:	Discharge	7,500	c.f.s.	Frequency	100 yr.	Elev.	200.4
Overtopping:	Discharge	+13,000	c.f.s.	Frequency	+500 YR	Elev.	*204.8

* OVERTOPS AT SAG

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE = 6,000 CFS
DESIGN FREQUENCY = 50 YRS
DESIGN HW ELEVATION = 199.0 FT
BASE DISCHARGE = 7,500 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 200.4 FT
OVERTOPPING DISCHARGE = 13,000 CFS
OVERTOPPING FREQUENCY = 500 YRS
OVERTOPPING ELEVATION = 204.8 FT

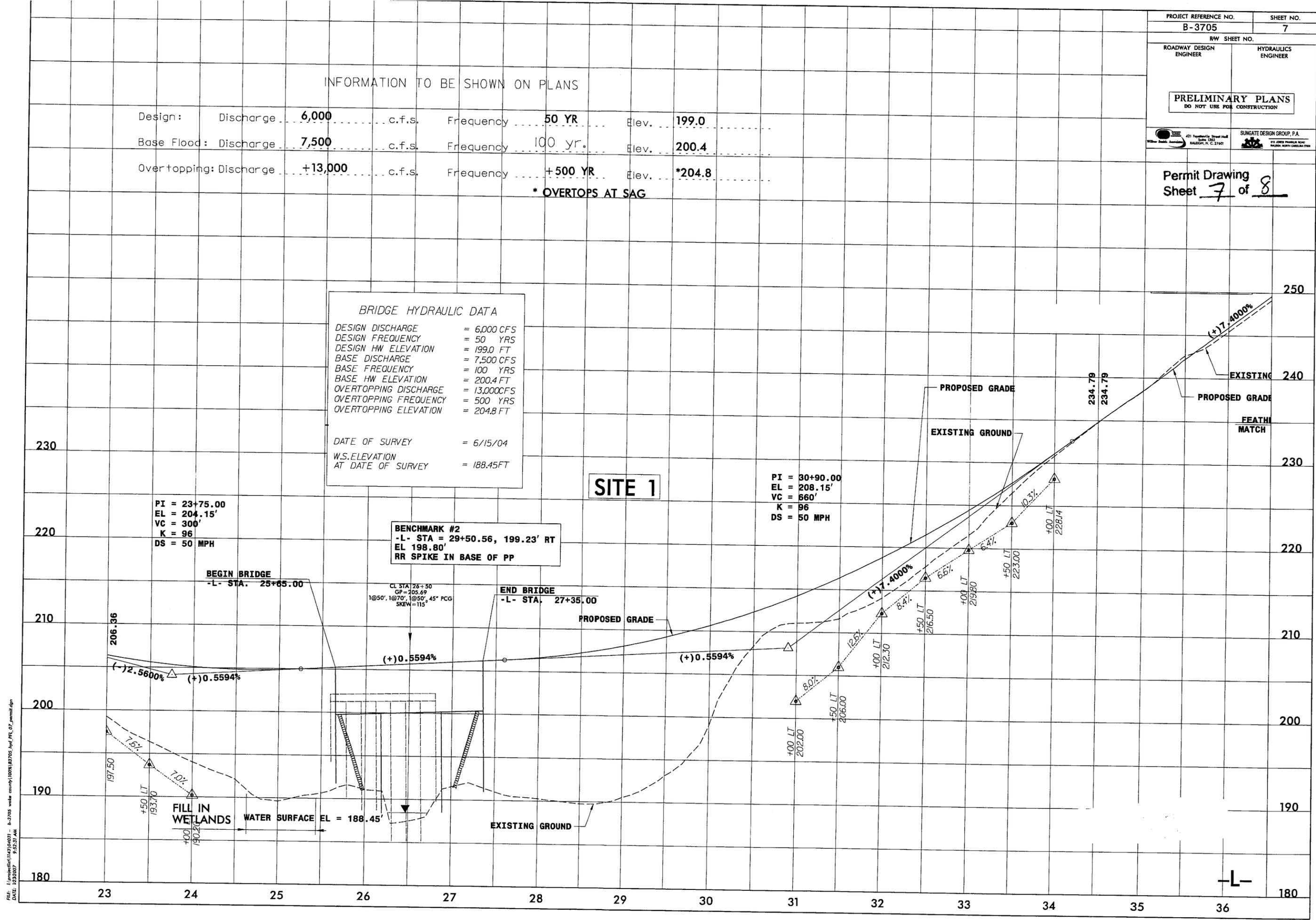
DATE OF SURVEY = 6/15/04
W.S. ELEVATION AT DATE OF SURVEY = 188.45 FT

PI = 23+75.00
EL = 204.15'
VC = 300'
K = 96
DS = 50 MPH

BENCHMARK #2
-L- STA. = 29+50.56, 199.23' RT
EL 198.80'
RR SPIKE IN BASE OF PP

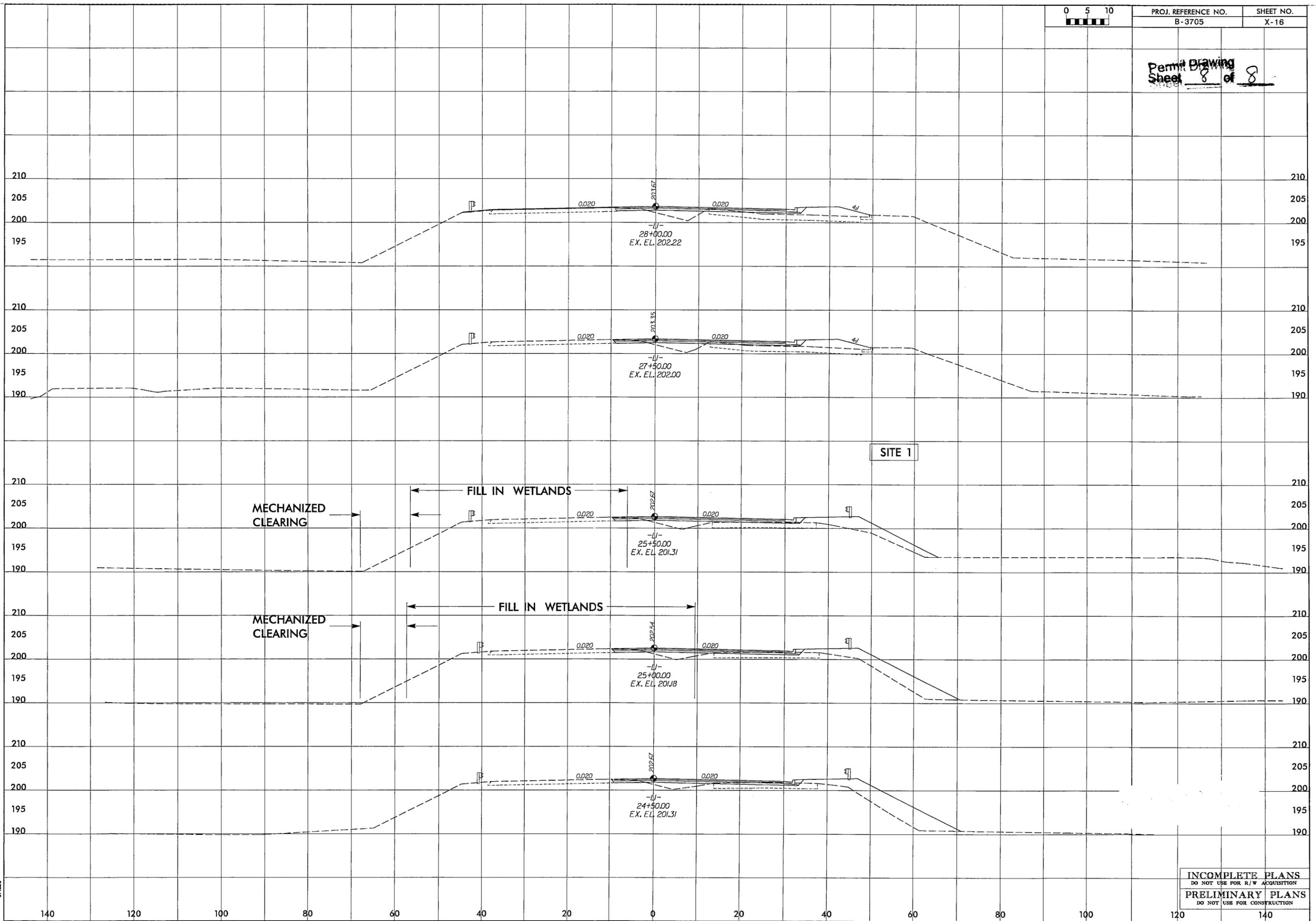
PI = 30+90.00
EL = 208.15'
VC = 660'
K = 96
DS = 50 MPH

SITE 1

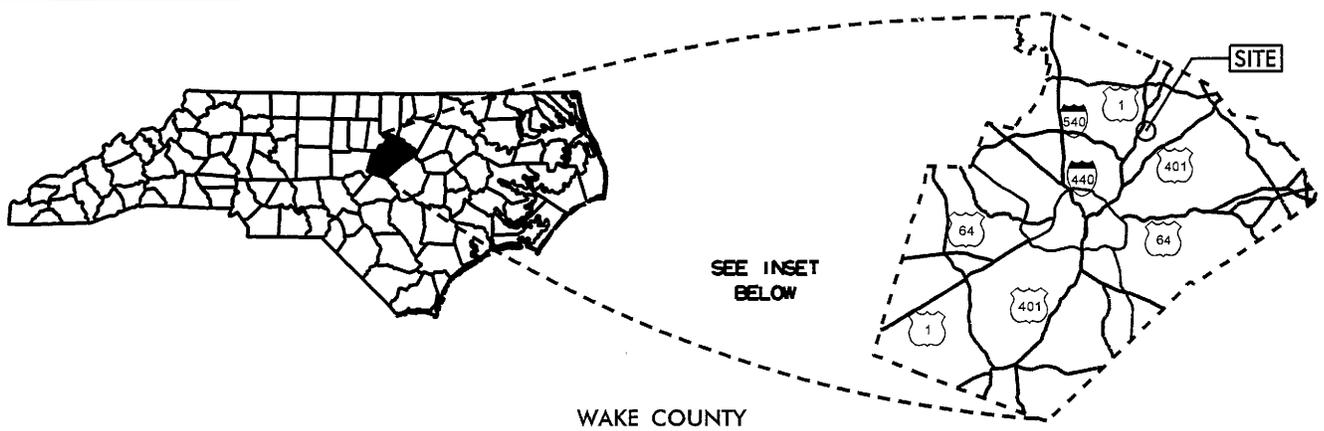


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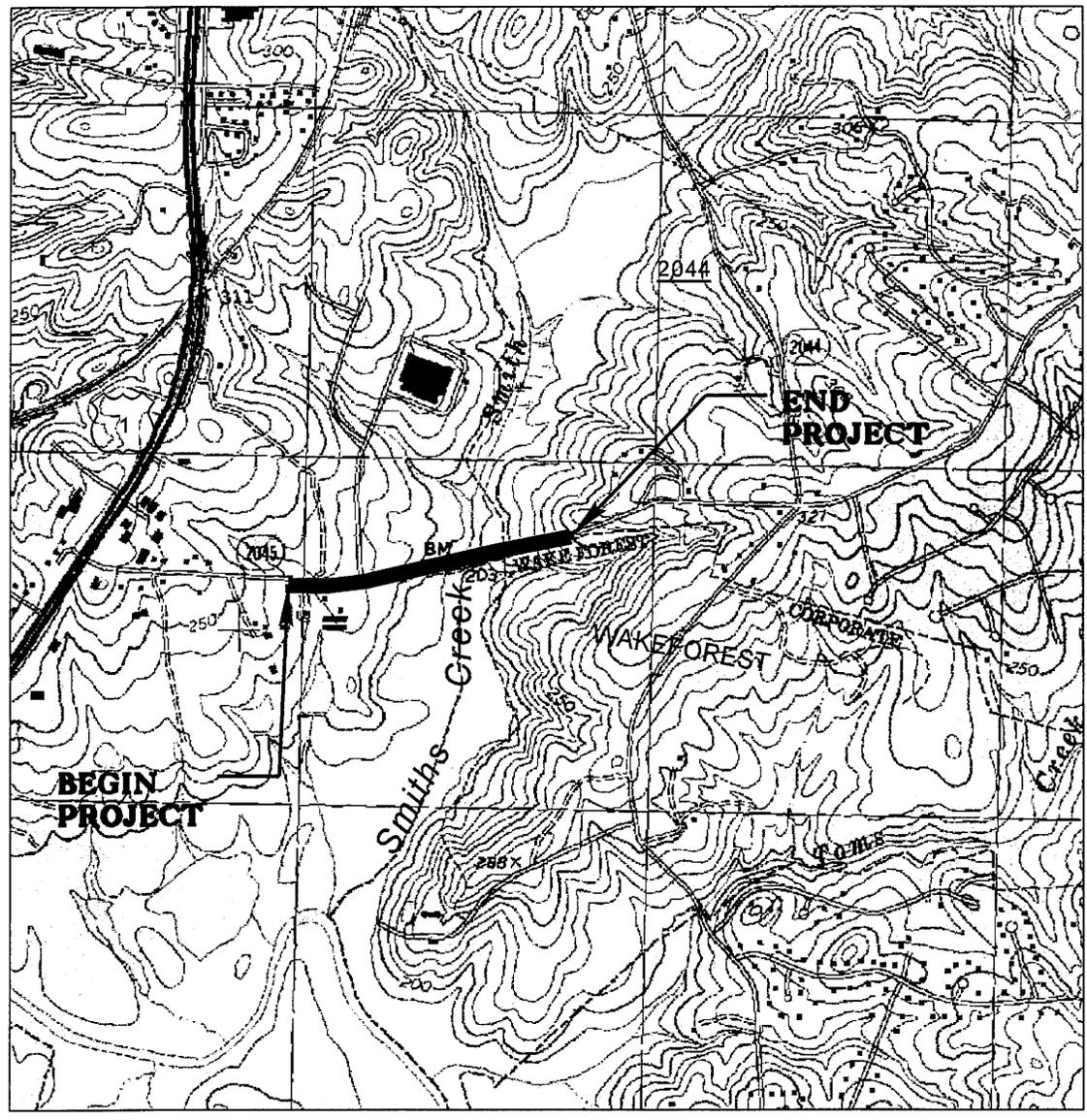
Permit Drawing
Sheet 8 of 8



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



WAKE COUNTY



BUFFER IMPACTS

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

WAKE COUNTY

**PROJECT: 33245.1.1 (B-3705)
BRIDGE NO. 125 ON SR 2045
(BURLINGTON MILLS RD)
OVER SMITH'S CREEK**

SHEET 1 OF 7 **3/13/07**

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
1	DAVID D. FULLER, TRUSTEE	3800 BURLINGTON MILLS RD WAKE FOREST, NC 27587-8876
2	GRACIE P. MACON, ETAL ALICE MACON ADAMS AND JACK LYNN ADAMS	2624 BURLINGTON MILLS RD WAKE FOREST, NC 27587-8855
4	THURMAN D. KITCHEN III JOHN S. KITCHIN	PO BOX 1479 WINTER PARK, FL 32790-1479
5	CADDELL WOODS HOMEOWNERS ASSOCIATION, INC	2520A RELIANCE AVE APEX, NC 27539-6346

NCDOT

**DIVISION OF HIGHWAYS
WAKE COUNTY**

**PROJECT: 33245.1.1 (B-3705)
BRIDGE NO. 125 ON SR 2045
(BURLINGTON MILLS RD)
OVER SMITH'S CREEK**

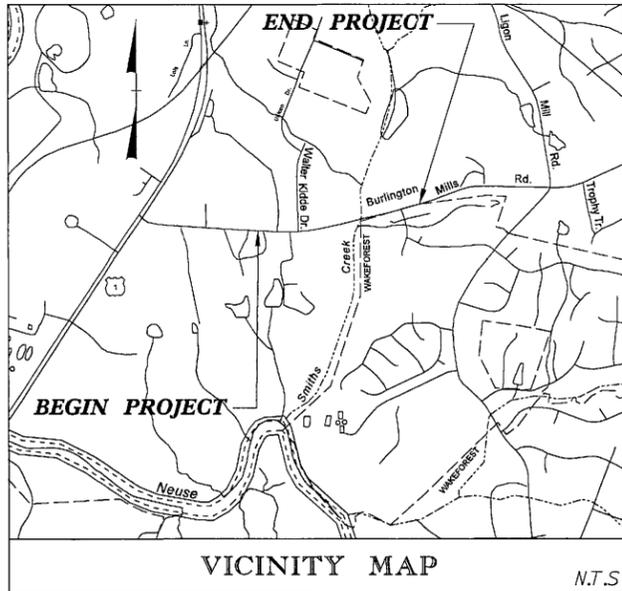
05/08/09

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
WAKE COUNTY

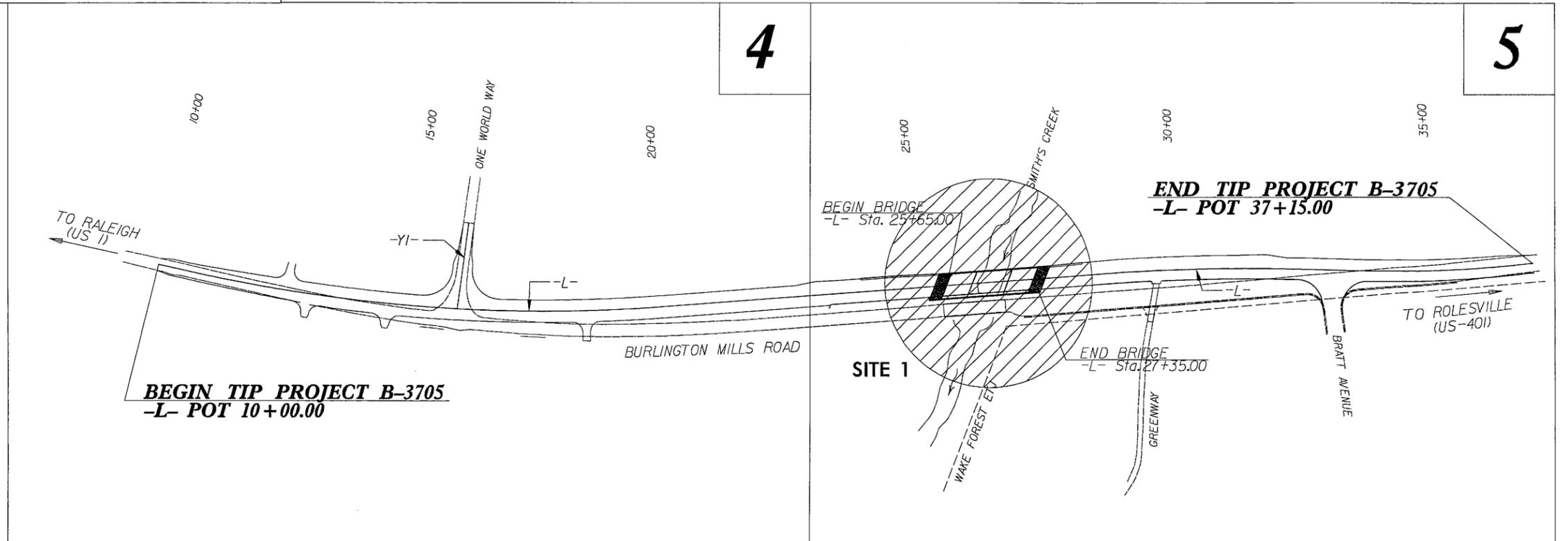
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3705	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33245.1.1	BRZ-2045(1)	P.E.	
33245.2.1	BRZ-2045(1)	ROW/UTILITIES	

TIP PROJECT: B-3705



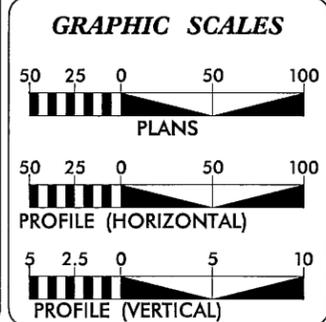
LOCATION: BRIDGE NO. 125 OVER SMITH'S CREEK ON SR 2045 (BURLINGTON MILLS RD)
TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURE

Buffer Drawing
Sheet 5 of 7



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NCDOT CONTACT: B. DOUG TAYLOR, P.E. - ROADWAY DESIGN - ENGINEERING COORDINATION



DESIGN DATA

ADT 2007 =	10,280
ADT 2027 =	20,340
DHV =	10 %
D =	60 %
T =	3 % *
V =	50 MPH
* (TTST 1% + DUAL 2%)	
FUNCTIONAL CLASS.	RURAL MINOR COLLECTOR

PROJECT LENGTH

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LENGTH OF STRUCTURE TIP PROJECT B-3705 =	0.032 MILES
TOTAL LENGTH OF TIP PROJECT B-3705 =	0.514 MILES

Prepared in the Office of:
WILBUR SMITH ASSOCIATES
421 FAYETTEVILLE STREET MALL, STE 1303
RALEIGH NC, 27601
FOR: NORTH CAROLINA DEPT. OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
AUGUST 18, 2006

LETTING DATE:
JANUARY 15, 2008

DAVID L. WILVER, P.E.
PROJECT ENGINEER

JIM MORRISON, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**

STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED DIVISION ADMINISTRATOR DATE

CONTRACT:

FILE: SMITHS ASSOCIATES

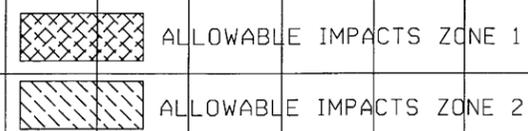
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Buffer Drawing
Sheet 7 of 7

INFORMATION TO BE SHOWN ON PLANS

Design:	Discharge	6,000	c.f.s.	Frequency	50 YR	Elev.	199.0
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Overtopping:	Discharge	+13,000	c.f.s.	Frequency	+500 YR	Elev.	*204.8

* OVERTOPS AT SAG



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE = 6,000 CFS
 DESIGN FREQUENCY = 50 YRS
 DESIGN HW ELEVATION = 199.0 FT
 BASE DISCHARGE = 7,500 CFS
 BASE FREQUENCY = 100 YRS
 BASE HW ELEVATION = 200.4 FT
 OVERTOPPING DISCHARGE = 13,000 CFS
 OVERTOPPING FREQUENCY = 500 YRS
 OVERTOPPING ELEVATION = 204.8 FT

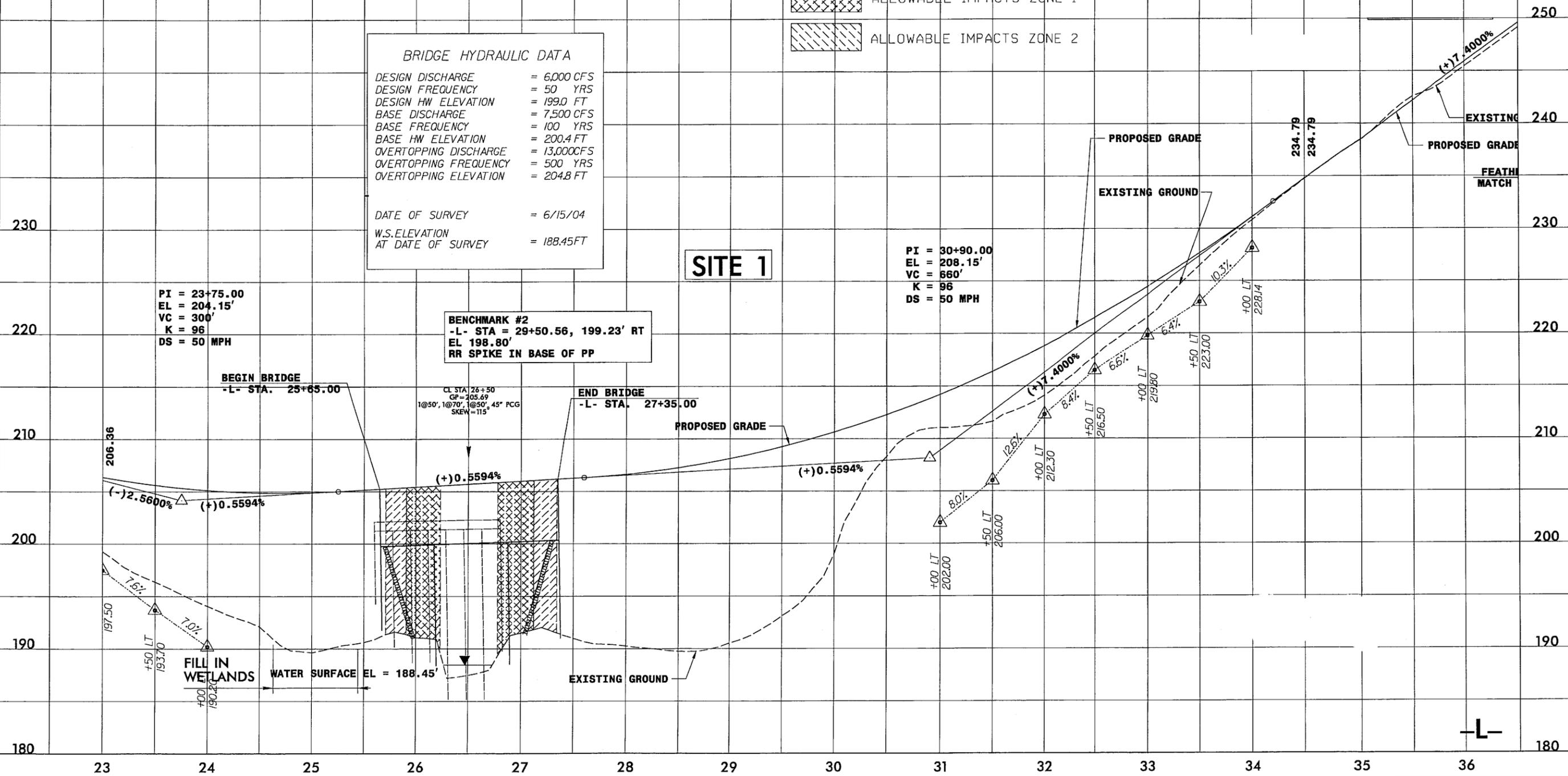
DATE OF SURVEY = 6/15/04
 W.S. ELEVATION AT DATE OF SURVEY = 188.45 FT

SITE 1

PI = 23+75.00
 EL = 204.15'
 VC = 300'
 K = 96
 DS = 50 MPH

BENCHMARK #2
 -L- STA = 29+50.56, 199.23' RT
 EL 198.80'
 RR SPIKE IN BASE OF PP

PI = 30+90.00
 EL = 208.15'
 VC = 660'
 K = 96
 DS = 50 MPH



FILE: \$FILES
DATE: \$DATE
\$TIMES

**Buffer Mitigation Plan
At Bridge No. 125 over Smith Creek
On SR 2045
Wake County**

**TIP B-3705
Federal Aid Project No. BRZ-1733 (13)
WBS No.33245.1.1**

October, 2007

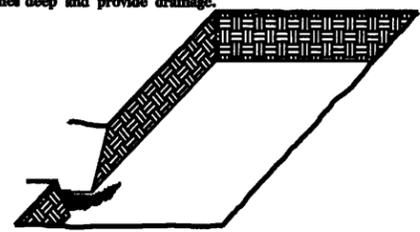
The North Carolina Department of Transportation (NCDOT) will perform on-site buffer mitigation at the Bridge No. 125 over Smith Creek on SR 2045 (Burlington Mills Rd). This mitigation occurs within Transportation Improvement Project (TIP) B-3705 in Wake County. The proposed mitigation site will consist of restoring 1330-sq. ft. of riparian buffer within Buffer Zone 1 and 480 sq. ft. in Zone 2 of the Neuse River Basin Buffer Zones. The restoration area will involve excavating the existing causeway to match the natural ground elevations. Excavated areas will be ripped and disked prior to planting if necessary. The restoration area will be planted after the completion of the site grading. The site will be planted with a mixture of Yellow Poplar (*Liriodendron Tulipifera*), Southern Red Oak (*Quercus Falcata*), and White Oak (*Quercus Alba*). To view a copy of the plan sheets for this project see sheet No. RF-2. This mixture of trees will be planted on six to ten foot centers at a density of 680 trees per acre. The site will visually be inspected after construction is complete. No annual monitoring is proposed for this site.

PLANTING DETAILS

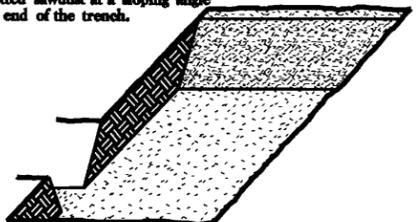
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

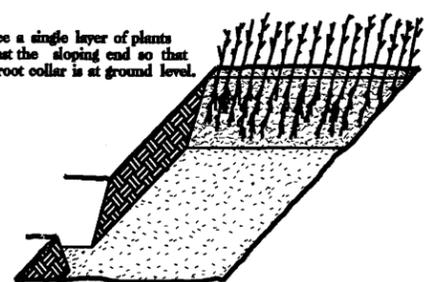
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



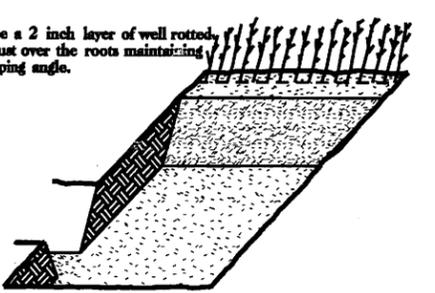
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.



5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

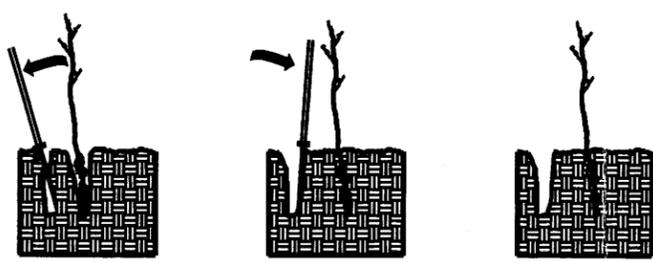


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR



1. Insert planting bar as shown and pull handle toward planter.
2. Remove planting bar and place seedling at correct depth.
3. Insert planting bar 2 inches toward planter from seedling.



4. Pull handle of bar toward planter, firming soil at bottom.
5. Push handle forward firming soil at top.
6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING BAG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.



KBC PLANTING BAR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.



ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

REFORESTATION

- TREE REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

40% LIRIODENDRON TULIPIFERA	YELLOW POPLAR	12 in - 18 in BR
30% QUERCUS FALCATA	SOUTHERN RED OAK	12 in - 18 in BR
30% QUERCUS ALBA	WHITE OAK	12 in - 18 in BR

09/08/99

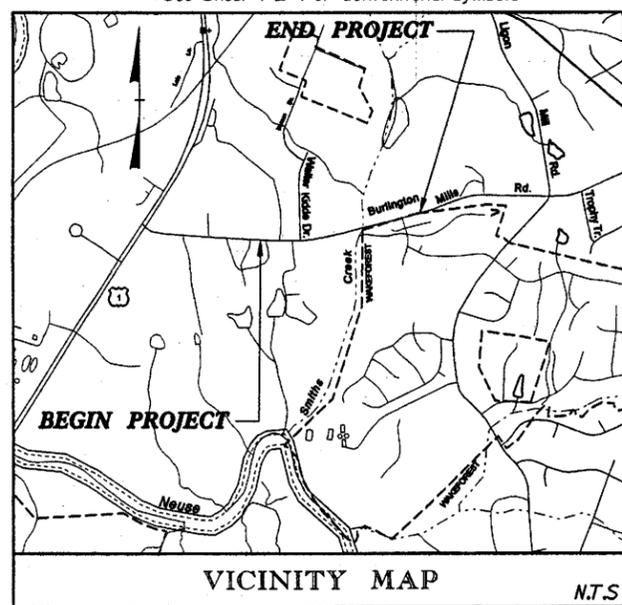
See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3705	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33245.1.1	BRZ-2045(1)	P.E.	
33245.2.2	BRZ-2045(1)	ROWUTILITIES	

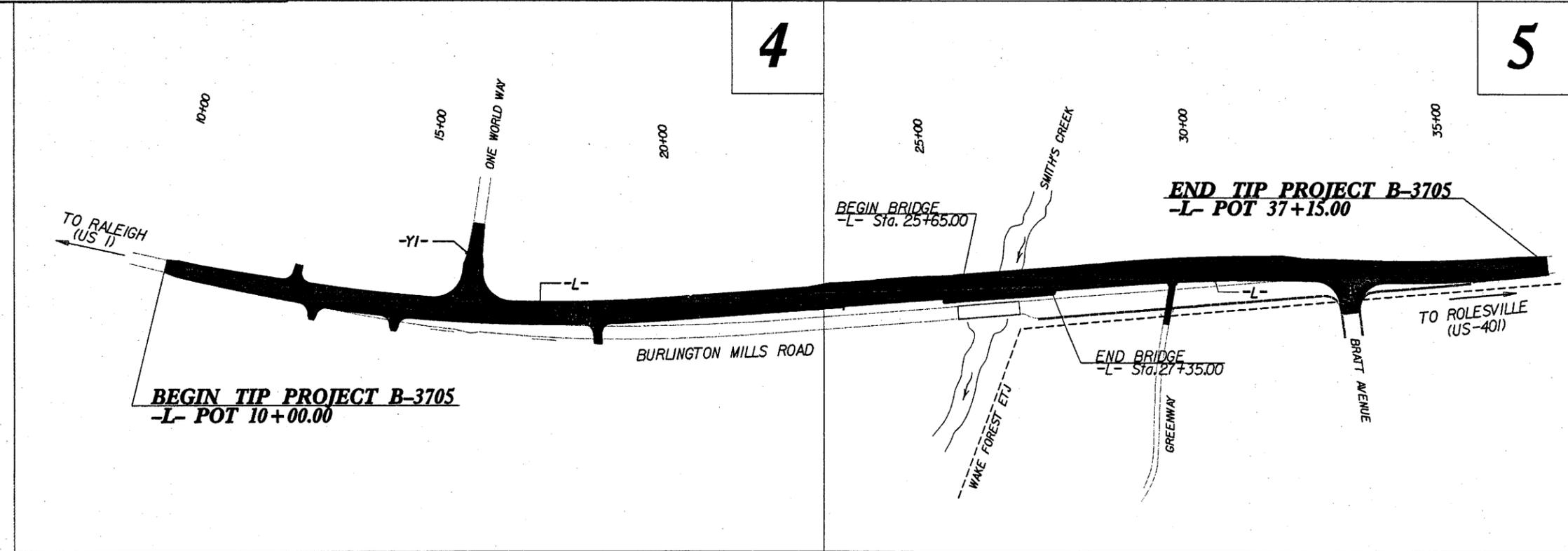
TIP PROJECT: B-3705



90% Plans 2/07

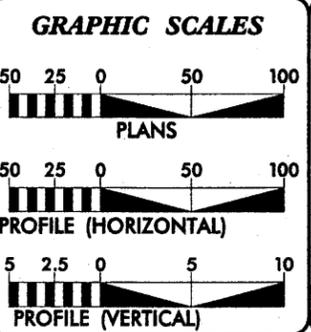


LOCATION: BRIDGE NO. 125 OVER SMITH'S CREEK ON SR 2045 (BURLINGTON MILLS RD)
TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURE



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NCDOT CONTACT: B. DOUG TAYLOR, P.E. - ROADWAY DESIGN - ENGINEERING COORDINATION



DESIGN DATA

ADT 2007 =	10,280
ADT 2027 =	20,340
DHV =	10 %
D =	60 %
T =	3 % *
V =	50 MPH
* (TTST 1% + DUAL 2%)	
FUNCTIONAL CLASS.	RURAL MINOR COLLECTOR

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-3705 =	0.482 MILES
LENGTH OF STRUCTURE TIP PROJECT B-3705 =	0.032 MILES
TOTAL LENGTH OF TIP PROJECT B-3705 =	0.514 MILES

Prepared in the Office of:
WILBUR SMITH ASSOCIATES
421 FAYETTEVILLE STREET MALL, STE 1303
RALEIGH, NC, 27601
FOR: NORTH CAROLINA DEPT. OF TRANSPORTATION
2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 19, 2007

LETTING DATE:
JANUARY 15, 2008

DAVID L. WILVER, P.E.
PROJECT ENGINEER

JIM MORRISON, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**

STATE DESIGN ENGINEER _____ P.E.

**DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION**

APPROVED _____ P.E.

DIVISION ADMINISTRATOR _____ DATE _____

CONTRACT:

FILE: F:\projects\B-3705\roadway\plan\1A703_001_01.dwg
DATE: 1/19/07 10:57:45 AM

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL SYMBOLS

*S.U.E = SUBSURFACE UTILITY ENGINEER

ROADS & RELATED ITEMS

Edge of Pavement	-----
Curb	-----
Prop. Slope Stakes Cut	----- C
Prop. Slope Stakes Fill	----- F
Prop. Woven Wire Fence	-----
Prop. Chain Link Fence	-----
Prop. Barbed Wire Fence	-----
Prop. Wheelchair Ramp	----- WCR
Curb Cut for Future Wheelchair Ramp	----- CCFR
Exist. Guardrail	-----
Prop. Guardrail	-----
Equality Symbol	-----
Pavement Removal	-----
RIGHT OF WAY	
Baseline Control Point	-----
Existing Right of Way Marker	-----
Exist. Right of Way Line w/Marker	-----
Prop. Right of Way Line with Proposed	-----
RW Marker (Iron Pin & Cap)	-----
Prop. Right of Way Line with Proposed	-----
(Concrete or Granite) RW Marker	-----
Exist. Control of Access Line	-----
Prop. Control of Access Line	-----
Exist. Easement Line	----- E
Prop. Temp. Construction Easement Line	----- E
Prop. Temp. Drainage Easement Line	----- TDE
Prop. Perm. Drainage Easement Line	----- PDE

HYDROLOGY

Stream or Body of Water	-----
River Basin Buffer	----- RBB
Flow Arrow	-----
Disappearing Stream	-----
Spring	-----
Swamp Marsh	-----
Shoreline	-----
Falls, Rapids	-----
Prop Lateral, Tail, Head Ditches	-----

STRUCTURES

MAJOR	
Bridge, Tunnel, or Box Culvert	----- CONC
Bridge Wing Wall, Head Wall and End Wall	----- CONC WW

MINOR	
Head & End Wall	----- CONC HW
Pipe Culvert	-----
Footbridge	-----
Drainage Boxes	----- CB
Paved Ditch Gutter	-----

UTILITIES

Exist. Pole	-----
Exist. Power Pole	-----
Prop. Power Pole	-----
Exist. Telephone Pole	-----
Prop. Telephone Pole	-----
Exist. Joint Use Pole	-----
Prop. Joint Use Pole	-----
Telephone Pedestal	-----
UG Telephone Cable Hand Hold	-----
Cable TV Pedestal	-----
UG TV Cable Hand Hold	-----
UG Power Cable Hand Hold	-----
Hydrant	-----
Satellite Dish	-----
Exist. Water Valve	-----
Sewer Clean Out	-----
Power Manhole	-----
Telephone Booth	-----
Cellular Telephone Tower	-----
Water Manhole	-----
Light Pole	-----
H-Frame Pole	-----
Power Line Tower	-----
Pole with Base	-----
Gas Valve	-----
Gas Meter	-----
Telephone Manhole	-----
Power Transformer	-----
Sanitary Sewer Manhole	-----
Storm Sewer Manhole	-----
Tank; Water, Gas, Oil	-----
Water Tank With Legs	-----
Traffic Signal Junction Box	-----
Fiber Optic Splice Box	-----
Television or Radio Tower	-----
Utility Power Line Connects to Traffic Signal Lines Cut Into the Pavement	----- TS

Recorded Water Line	-----
Designated Water Line (S.U.E.*)	-----
Sanitary Sewer	----- SS
Recorded Sanitary Sewer Force Main	----- FSS
Designated Sanitary Sewer Force Main(S.U.E.*)	----- FSS
Recorded Gas Line	----- G
Designated Gas Line (S.U.E.*)	----- G
Storm Sewer	----- S
Recorded Power Line	----- P
Designated Power Line (S.U.E.*)	----- P
Recorded Telephone Cable	----- T
Designated Telephone Cable (S.U.E.*)	----- T
Recorded U/G Telephone Conduit	----- TC
Designated U/G Telephone Conduit (S.U.E.*)	----- TC
Unknown Utility (S.U.E.*)	----- ?UTL
Recorded Television Cable	----- TV
Designated Television Cable (S.U.E.*)	----- TV
Recorded Fiber Optics Cable	----- FO
Designated Fiber Optics Cable (S.U.E.*)	----- FO
Exist. Water Meter	-----
UG Test Hole (S.U.E.*)	-----
Abandoned According to U/G Record	----- AATUR
End of Information	----- E.O.I.

BOUNDARIES & PROPERTIES

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Property Line Symbol	-----
Exist. Iron Pin	-----
Property Corner	-----
Property Monument	-----
Property Number	-----
Parcel Number	-----
Fence Line	-----
Existing Wetland Boundaries	----- WW & ISBW
High Quality Wetland Boundary	----- HQ WLB
Medium Quality Wetland Boundaries	----- MQ WLB
Low Quality Wetland Boundaries	----- LQ WLB
Proposed Wetland Boundaries	----- WLB
Existing Endangered Animal Boundaries	----- EAB
Existing Endangered Plant Boundaries	----- EPB

BUILDINGS & OTHER CULTURE

Buildings	-----
Foundations	-----
Area Outline	-----
Gate	-----
Gas Pump Vent or U/G Tank Cap	-----
Church	-----
School	-----
Park	-----
Cemetery	-----
Dam	-----
Sign	-----
Well	-----
Small Mine	-----
Swimming Pool	-----

TOPOGRAPHY

Loose Surface	-----
Hard Surface	-----
Change in Road Surface	-----
Curb	-----
Right of Way Symbol	----- R/W
Guard Post	----- O GP
Paved Walk	-----
Bridge	-----
Box Culvert or Tunnel	-----
Ferry	-----
Culvert	-----
Footbridge	-----
Trail, Footpath	-----
Light House	-----

VEGETATION

Single Tree	-----
Single Shrub	-----
Hedge	-----
Woods Line	-----
Orchard	-----
Vineyard	----- VINEYARD

RAILROADS

Standard Gauge	----- CSX TRANSPORTATION
RR Signal Milepost	----- MILEPOST 35
Switch	----- SWITCH

REVISIONS

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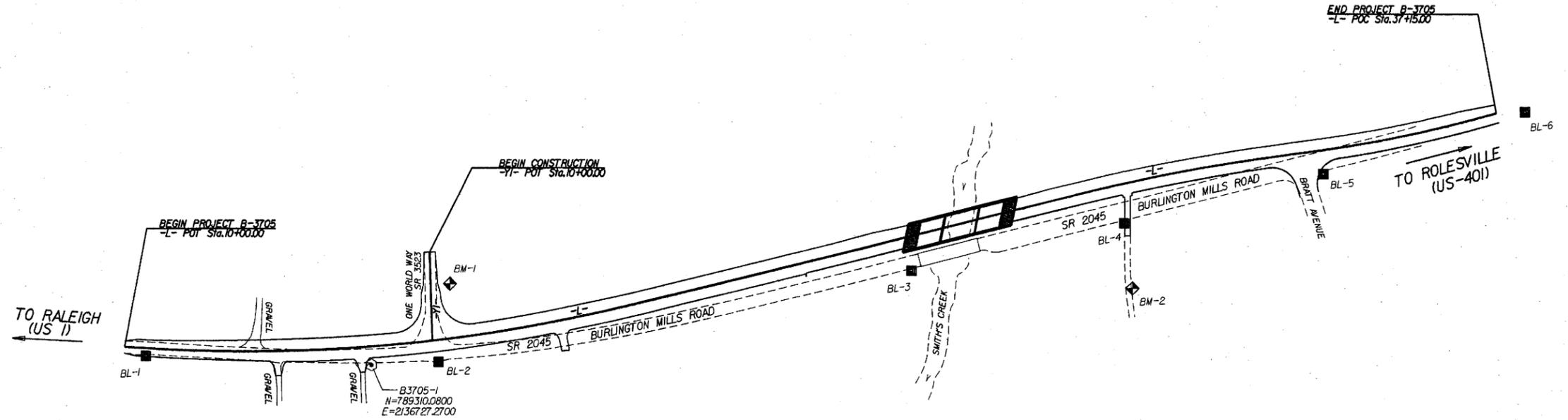
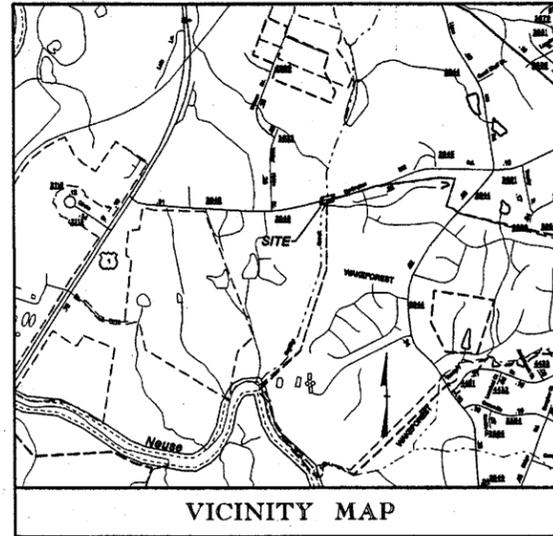
SURVEY CONTROL SHEET B-3705

WAKE COUNTY

**LOCATION: BRIDGE NO. 125 OVER SMITH'S CREEK
ON SR 2045 (BURLINGTON MILLS RD)**

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

B-3705



B3705-2
N=789360.095
E=2135674.4310

B3705-1
N=789310.0800
E=2136727.2700

BASELINE DATA

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
3	BL-1	789327.4017	2136291.4888	230.99	10+42.56	15.25 RT
4	BL-2	789315.8718	2136858.4521	223.05	16+04.74	42.20 RT
5	BL-3	789491.7279	2137778.4572	200.85	25+35.94	64.78 RT
6	BL-4	789582.6910	2138193.4959	204.15	29+62.30	74.32 RT
7	BL-5	789676.8432	2138581.3418	227.56	33+65.73	46.22 RT
8	BL-6	789796.6416	2138972.0469	257.00		OUTSIDE PROJECT LIMITS

BENCHMARK DATA

BM1 ELEVATION = 226.50
N 789466 E 2136881
L STATION 16+46 104' LEFT
Y1 STATION 10+62 38' LEFT
RR SPIKE SET IN 10' PINE

BM2 ELEVATION = 198.90
N 789458 E 2138209
L STATION 29+50 199' RIGHT
RR SPIKE SET IN BASE OF PP

DATUM DESCRIPTION

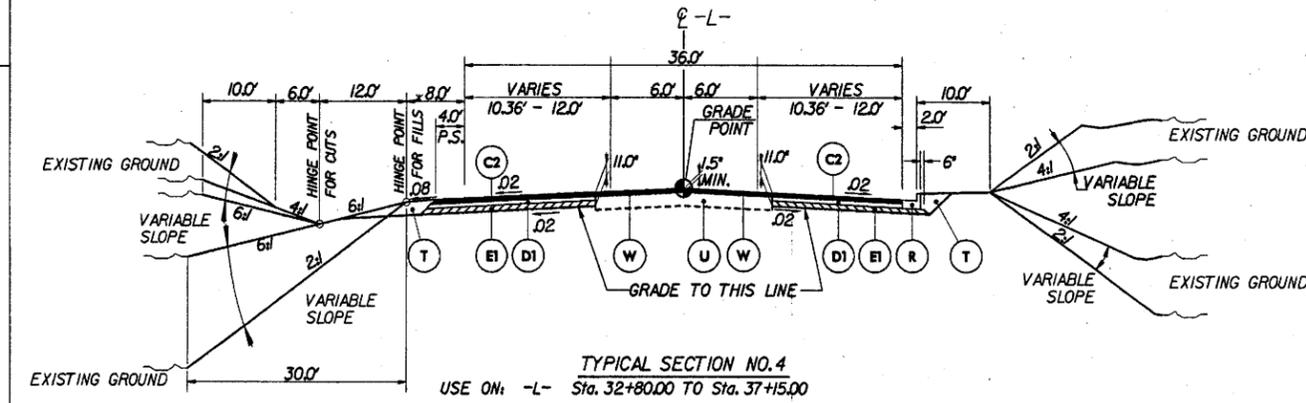
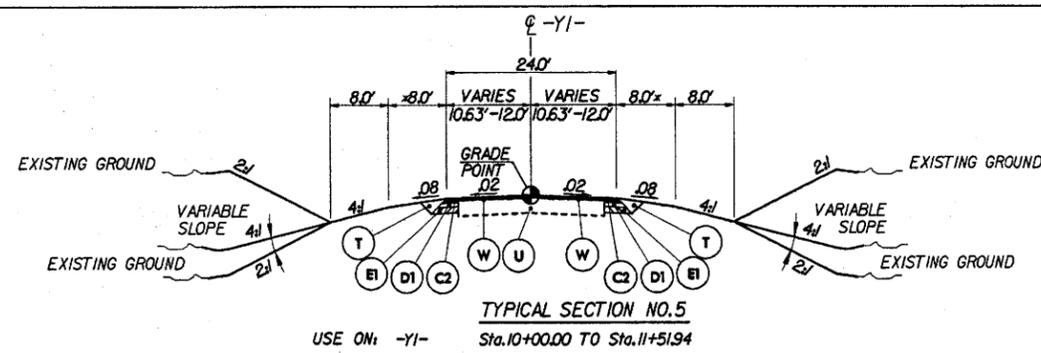
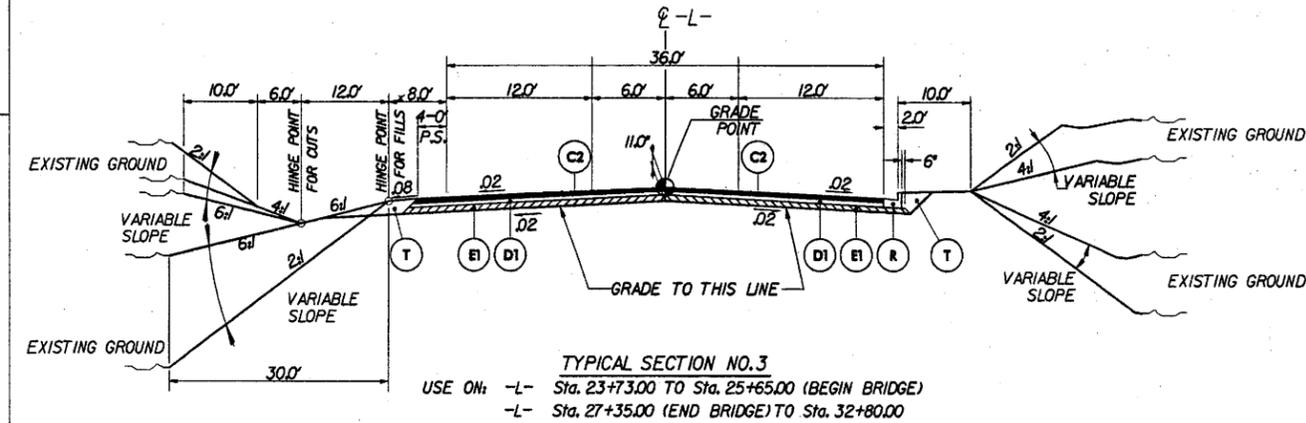
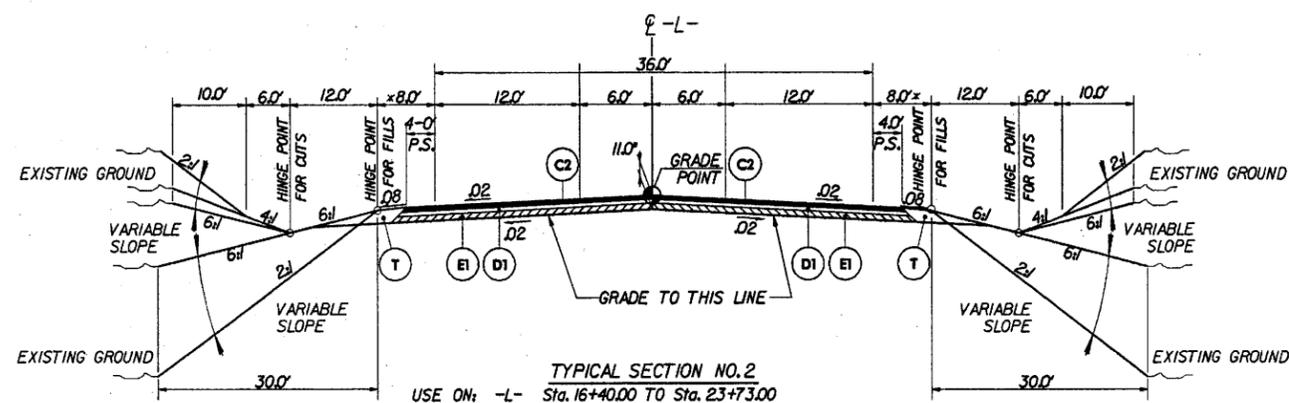
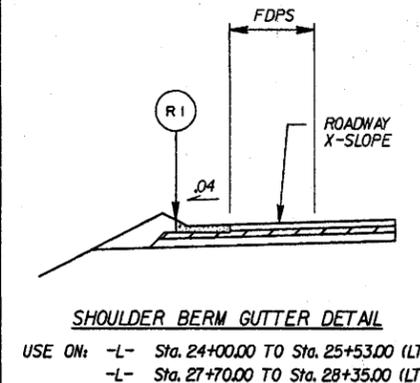
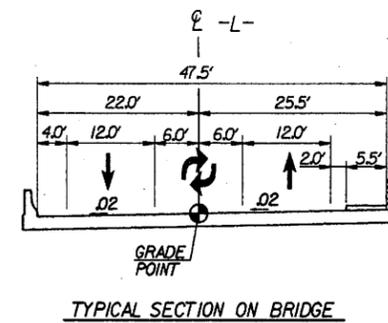
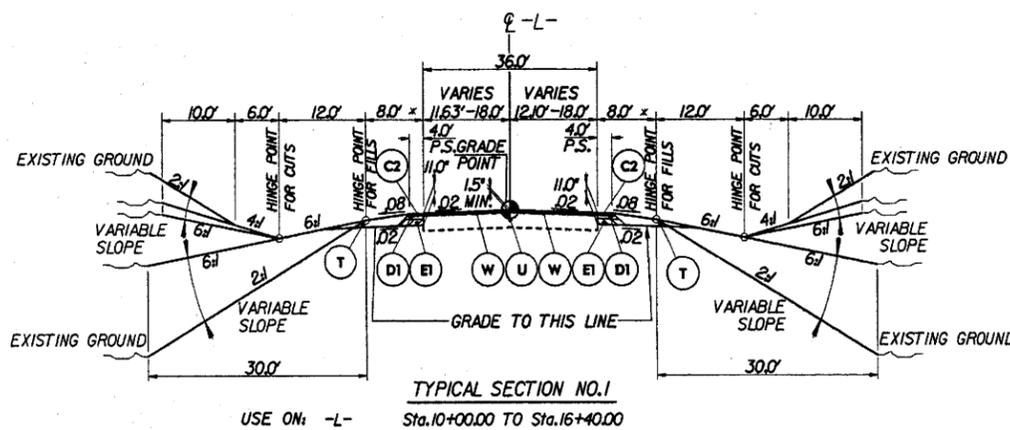
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B3705-1" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 789,310.0800(1) EASTING: 2,136,727.2700(1) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99993373 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B3705-1" TO L- STATION 10+00 IS N 85°48'37.8" W 478.68' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NGVD 88

NOTES:

THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.DOHDOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT](http://www.doh.dot.state.nc.us/preconstruct/highway/location/project)
THE FILES TO BE FOUND ARE AS FOLLOWS:
b3705_la_control_060711.kat

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
⊙ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM. NETWORK ESTABLISHED FROM HARN MONUMENTS

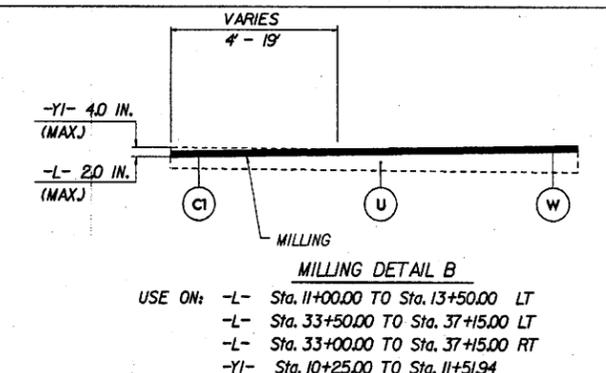
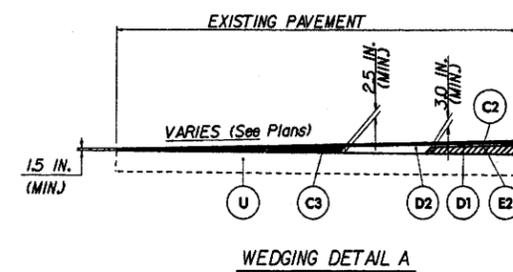
REVISIONS



PAVEMENT SCHEDULE

ITEM	DESCRIPTION	ITEM	DESCRIPTION
(C1)	PROP. APPROX. 1.5 IN. ASPHALT SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS/SY.	(E2)	PROP. VAR. DEPTH ASPHALT BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS/SY/IN IN LIFTS NOT LESS THAN 3 IN. NOR GREATER THAN 5.5 IN.
(C2)	PROP. APPROX. 3.0 IN. ASPHALT SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS/SY IN EACH OF TWO LIFTS.	(R)	2' - 6" CONCRETE CURB AND GUTTER
(C3)	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS/SY/IN IN LIFTS NOT LESS THAN 1.0 IN. NOR GREATER THAN 1.5 IN.	(R1)	SHOULDER BERM GUTTER
(D1)	PROP. APPROX. 4.0 IN. ASPHALT INT. COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS/SY	(T)	EARTH MATERIAL
(D2)	PROP. VAR. DEPTH ASPHALT INT. COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS/SY/IN. IN LIFTS NOT LESS THAN 2.25 IN. NOR GREATER THAN 4.0 IN.	(U)	EXISTING PAVEMENT
(E1)	PROP. APPROX. 4.0 IN. ASPHALT BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS/SY.	(W)	WEDGING (SEE DETAIL A)

NOTES : * TOTAL SHOULDER WIDTH TO BE INCREASED 3' WHERE GUARDRAIL IS USED.
USE 8" INCIDENTAL STONE BASE FOR GRAVEL DRIVES

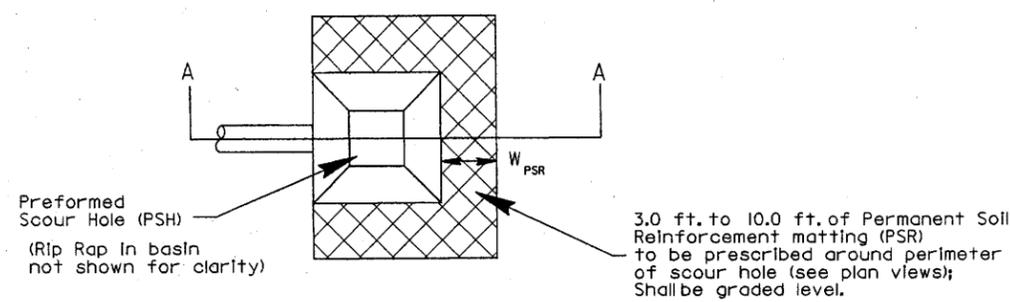


REVISIONS

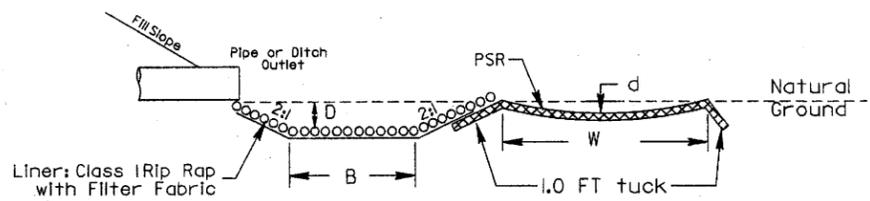
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PREFORMED SCOUR HOLE

(Not to scale)



Section A-A



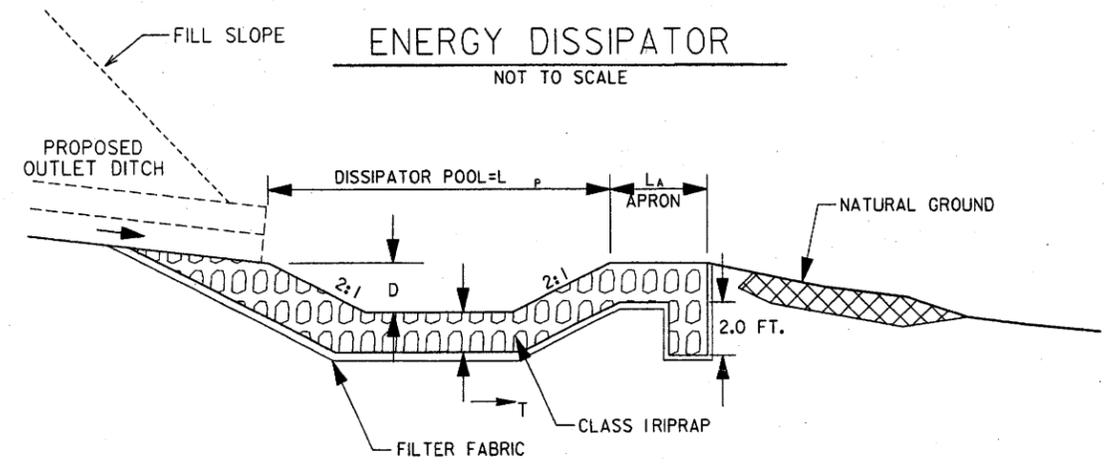
NOTE: *B* denotes size of basin; For example: 5.0ft.x 5.0ft. PSH, B=5.0

NOTE: The Permanent Soil Reinforcement matting (PSR) shall be seeded with native grasses at installation.

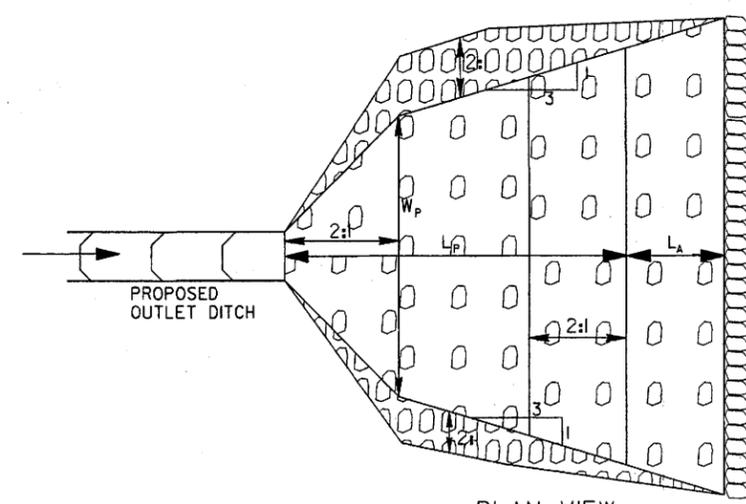
STATION	B FT.	D FT.	W _{PSR} FT.	d FT.	CLASS I RIP RAP TONS *	DDE (CU YD) *	FILTER FABRIC (SQ YD) *
24+71-L-Rt.	4	1.5	5	0.5	9	15	13
27+71-L-Lt.	4	1.5	5	0.5	9	15	13

ENERGY DISSIPATOR

NOT TO SCALE



PROFILE
NOT TO SCALE



PLAN VIEW
NOT TO SCALE

STATION	L _P FT.	W _P FT.	L _A FT.	T FT.	D FT.	CLASS I RIP RAP TONS *	DDE (CU YD) *	FILTER FABRIC (SQ YD) *
+/-24+25-L-Lt.	17	10	10	2	2'	62	78	50

* QUANTITIES FOR INFORMATION ONLY - INCIDENTAL TO "EACH" PAY ITEM

REVISIONS

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PRELIMINARY PLANS
 DO NOT USE FOR CONSTRUCTION

DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK
 IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBANKMENT +%	BORROW	WASTE
SUMMARY #1					
-L- 10+00.00 TO -L- 25+65.00 (BEG BRIDGE)	7,628		11,783	4,155	0
-Y1- 10+00.00 to -Y1- 11+51.94	44		13		31
SUBTOTAL: SUMMARY #1	7,672		11,796	4,155	31
SUMMARY #2					
-L- 27+35.00 (END BRIDGE) -L- 37+15.00	1,708		18,229	16,521	
SUBTOTAL: SUMMARY #2	1,708		18,229	16,521	
PROJECT TOTAL	9,380		30,025	20,676	31
LOSS DUE TO CLEARING AND GRUBBING	(400)		400	400	
WASTE TO BE USED IN LIEU OF BORROW				(31)	(31)
GRAND TOTAL	8,980		30,425	21,045	
SAY	* 9,000			21,100	
UNDERCUT CONTINGENCY (PER GEOTECH REPORT)		600			

NOTE: 1510 CY UNCLASSIFIED STRUCTURE EXCAVATION MAY BE USED IN ROADWAY EMBANKMENT IF DEEMED SUITABLE BY ENGINEER AS CONSTRUCTION PHASING ALLOWS.

* APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING".

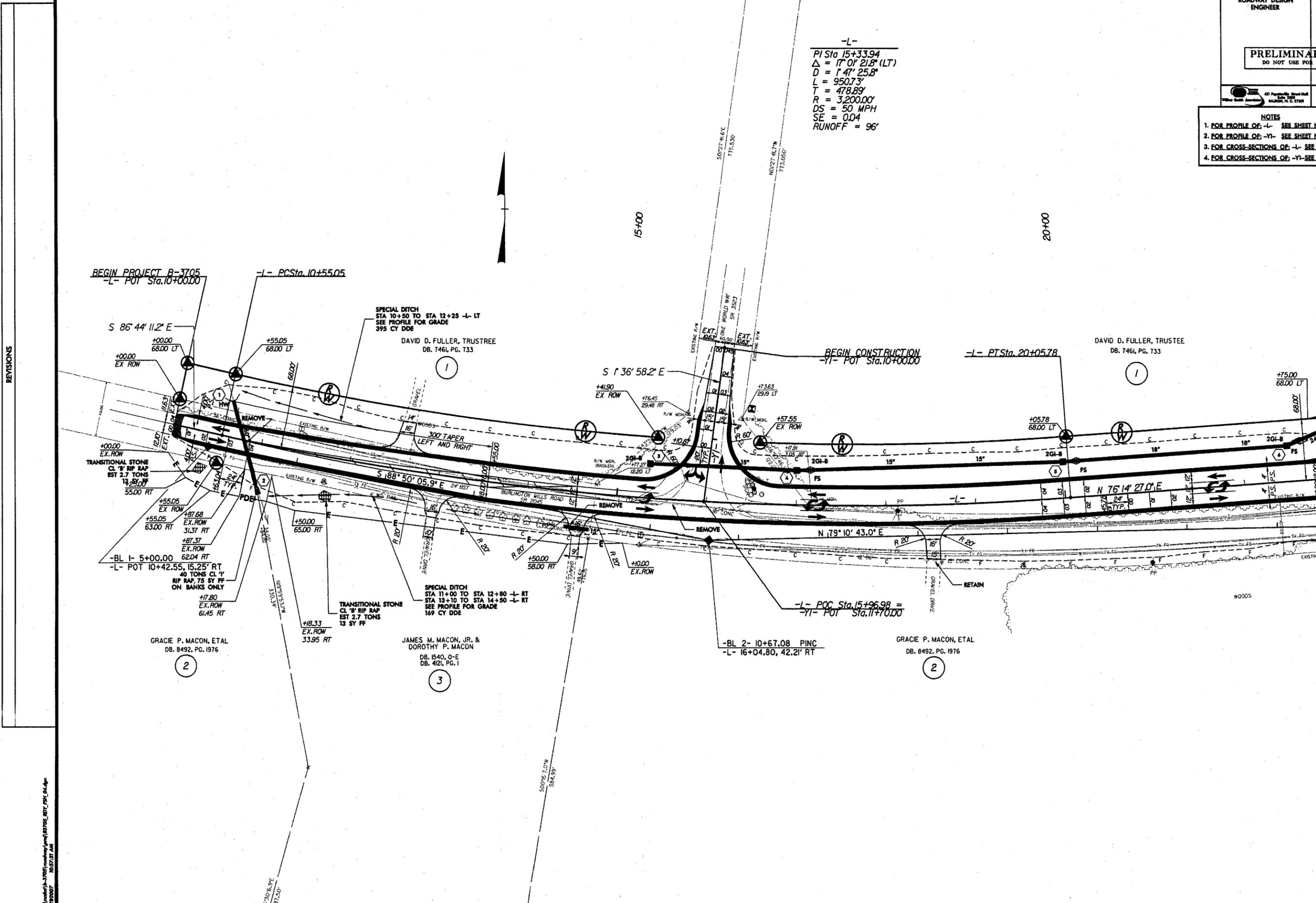
REVISIONS

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PROJECT REFERENCE NO. B-3705	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

- NOTES**
- FOR PROFILE OF: -L- SEE SHEET NO: 6
 - FOR PROFILE OF: -YI- SEE SHEET NO: 6
 - FOR CROSS-SECTIONS OF: -L- SEE SHEET NO: X-2 THRU X-11
 - FOR CROSS-SECTIONS OF: -YI- SEE SHEET NO: X-12

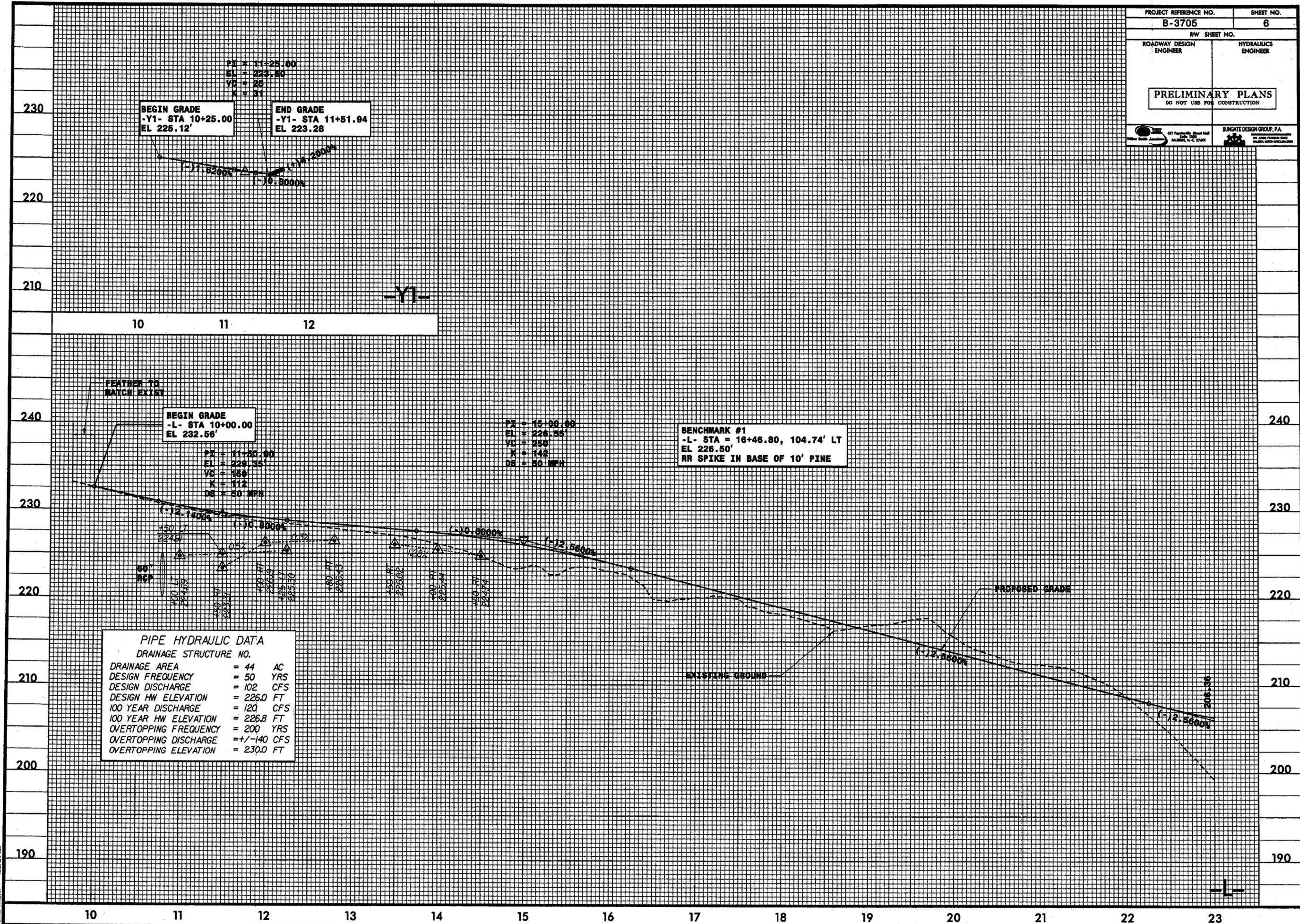
-L-
 PI Sta 15+33.94
 $\Delta = 17^{\circ} 01' 21.8''$ (LT)
 $D = 147' 25.8''$
 $L = 950.73'$
 $T = 478.89'$
 $R = 3,200.00'$
 $DS = 50$ MPH
 $SE = 0.04$
 $RUNOFF = 96'$



REVISIONS

MATCHLINE -L- Sta. 23+00.00
SEE SHEET 5

c:\pwork\1-3705\roadway\plan\180702_001_P01_04.dgn
 11/20/07 10:52:31 AM



BEGIN GRADE
-Y1- STA 10+25.00
EL 226.12'

END GRADE
-Y1- STA 11+51.94
EL 223.28

PI = 11+25.00
EL = 223.80
VC = 25
K = 31

BEGIN GRADE
-L- STA 10+00.00
EL 232.56'

PI = 11+50.00
EL = 229.35
VC = 150
K = 112
DS = 50 MPH

P2 = 15+05.00
EL = 226.55
VC = 250
K = 142
DS = 50 MPH

BENCHMARK #1
-L- STA = 16+48.80, 104.74' LT
EL 226.50'
RR SPIKE IN BASE OF 10' PINE

PIPE HYDRAULIC DATA	
DRAINAGE STRUCTURE NO.	
DRAINAGE AREA	= 44 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 102 CFS
DESIGN HW ELEVATION	= 226.0 FT
100 YEAR DISCHARGE	= 120 CFS
100 YEAR HW ELEVATION	= 226.8 FT
OVERTOPPING FREQUENCY	= 200 YRS
OVERTOPPING DISCHARGE	= +/- 140 CFS
OVERTOPPING ELEVATION	= 230.0 FT

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BRIDGE HYDRAULIC DATA

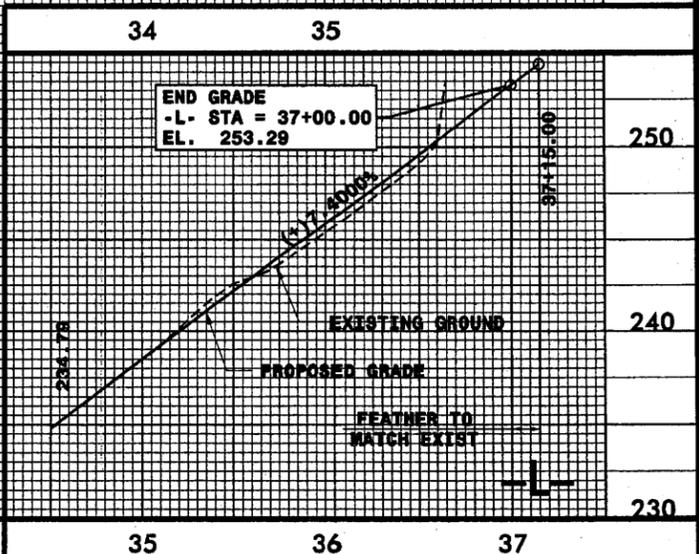
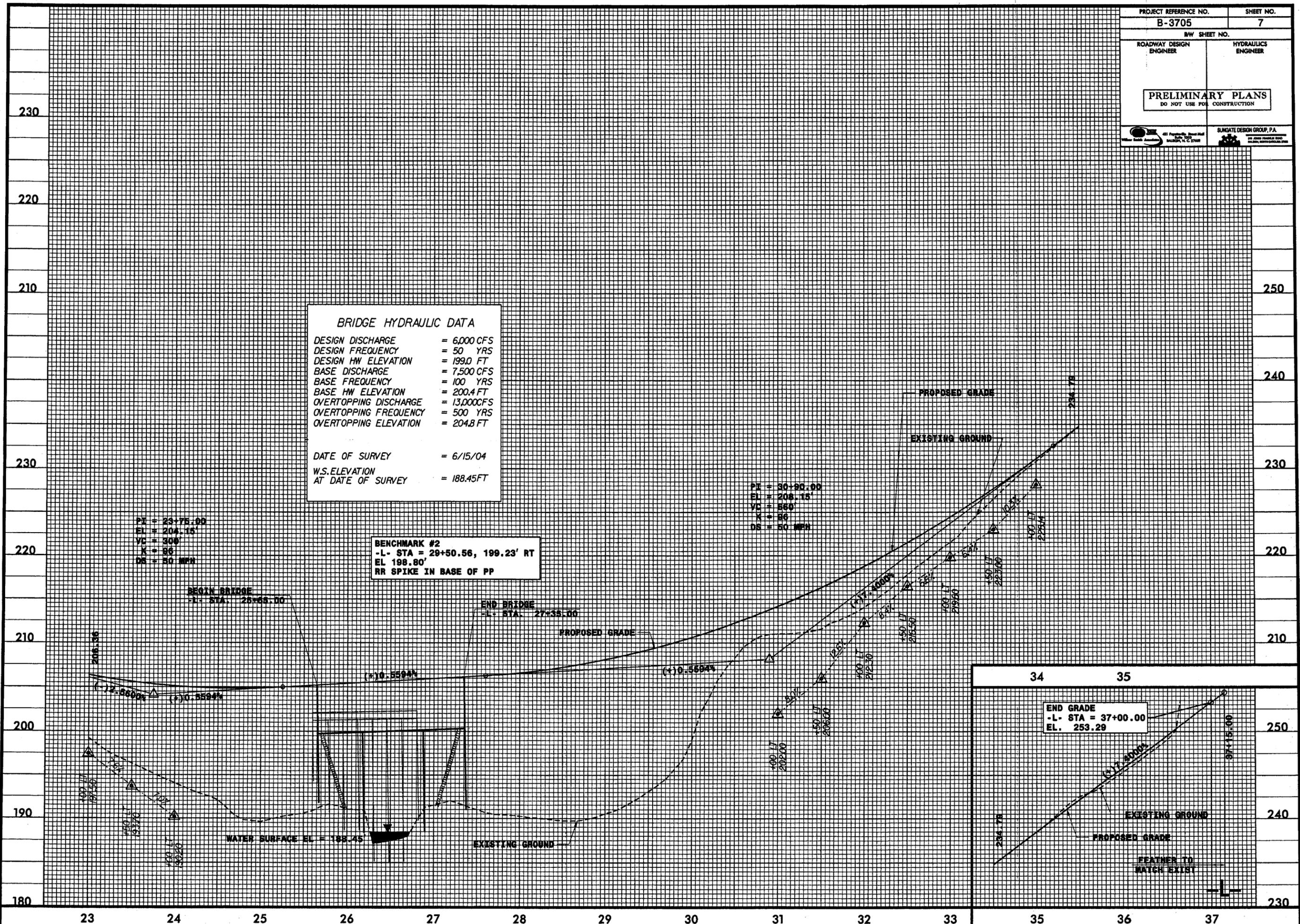
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DESIGN HW ELEVATION = 199.0 FT
BASE DISCHARGE = 7,500 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 200.4 FT
OVERTOPPING DISCHARGE = 13,000 CFS
OVERTOPPING FREQUENCY = 500 YRS
OVERTOPPING ELEVATION = 204.8 FT

DATE OF SURVEY = 6/15/04
W.S. ELEVATION AT DATE OF SURVEY = 188.45 FT

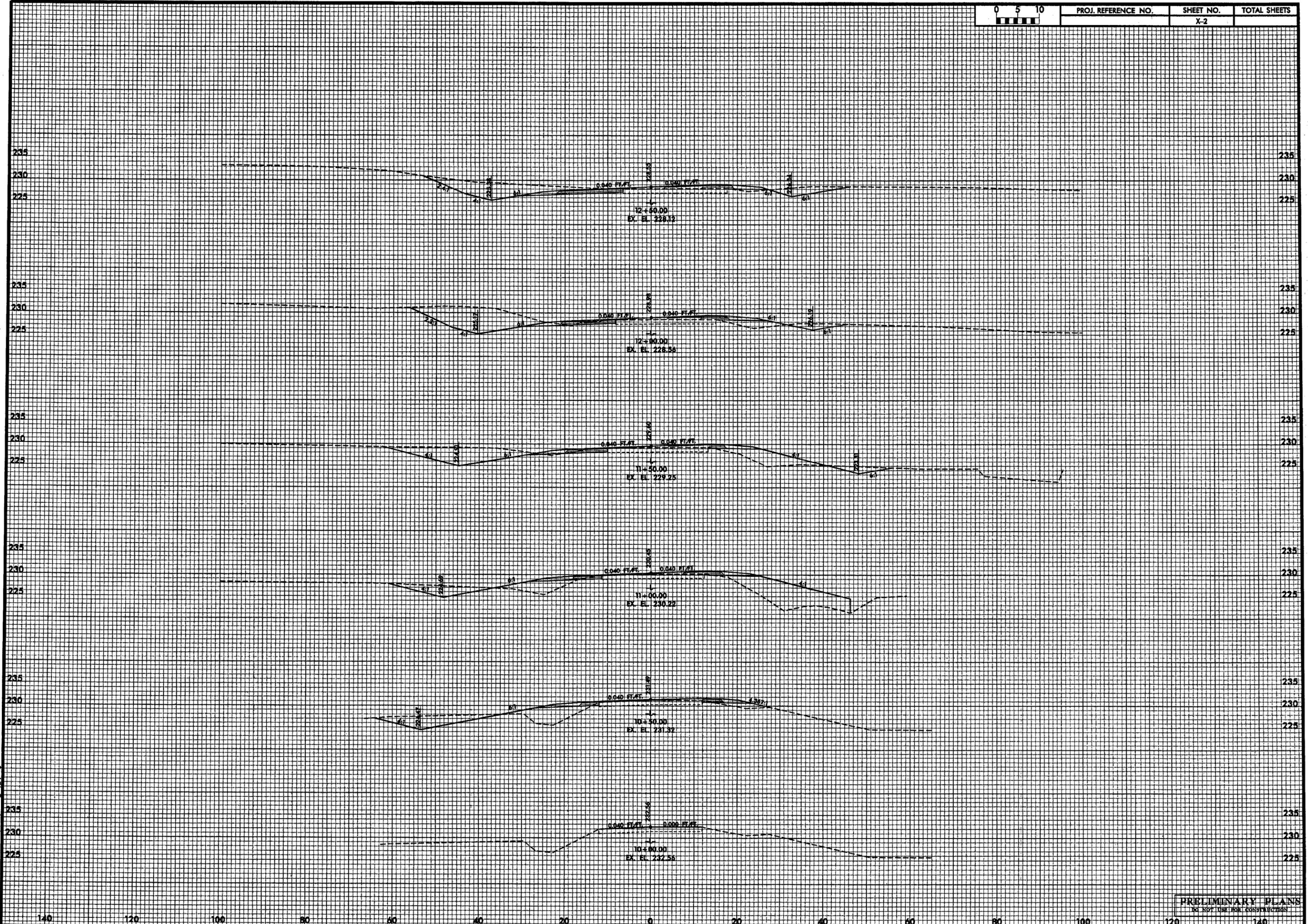
PI = 23+75.00
EL = 204.15'
VC = 300'
K = 86
DS = 50 MPH

BENCHMARK #2
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EL 198.80'
RR SPIKE IN BASE OF PP

PI = 30+90.00
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VC = 560'
K = 86
DS = 50 MPH

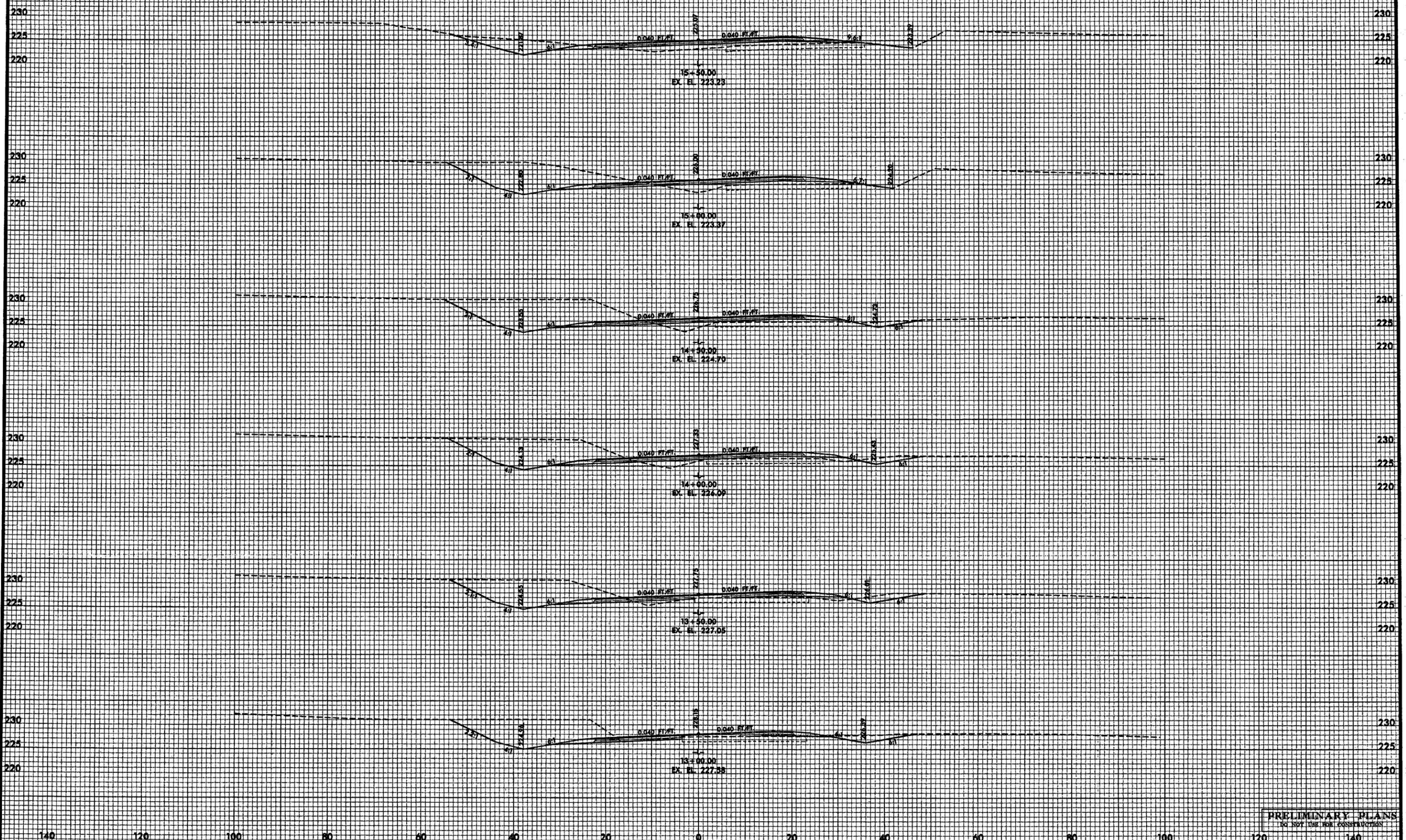


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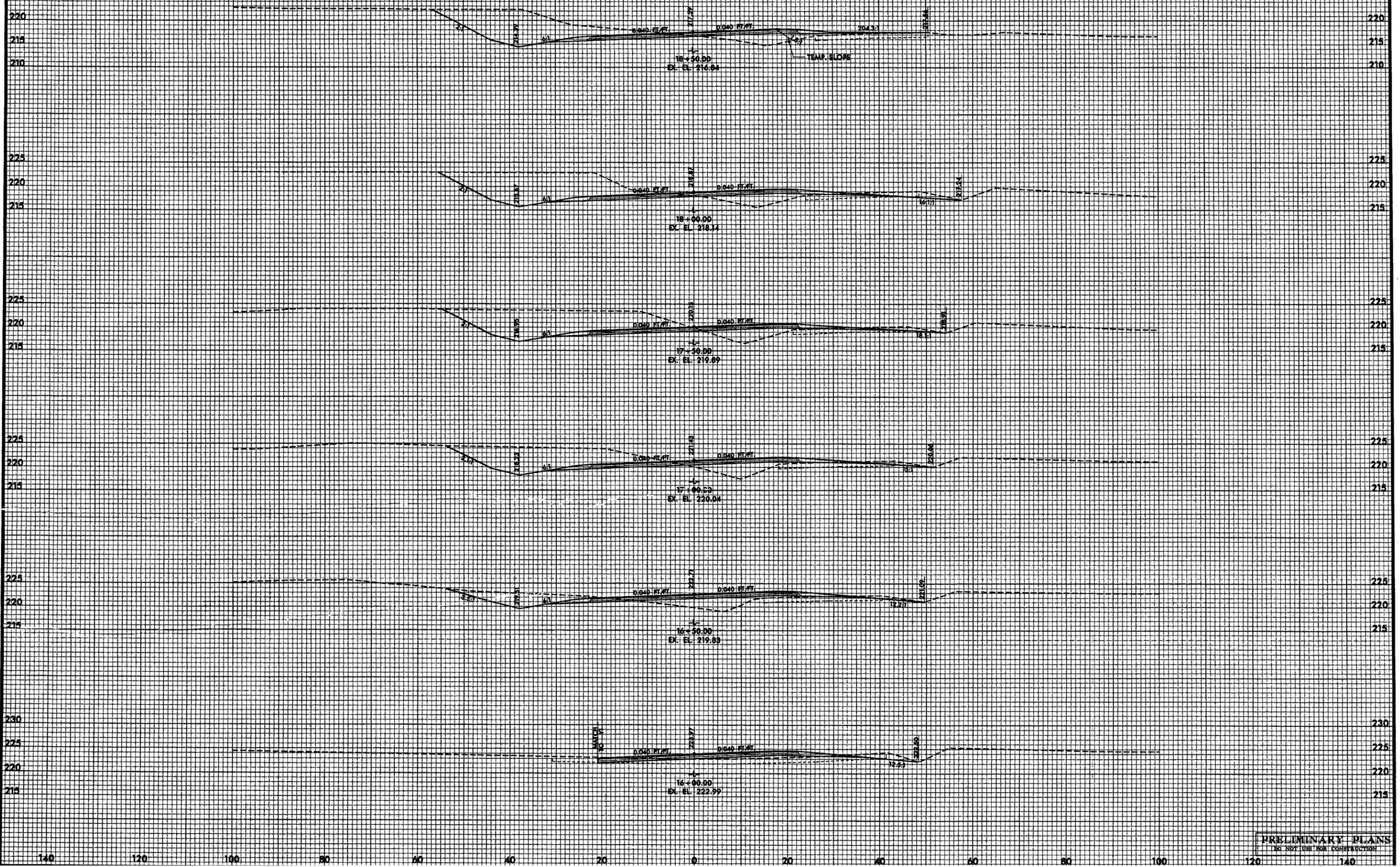


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PRELIMINARY PLANS
 DO NOT USE FOR CONSTRUCTION

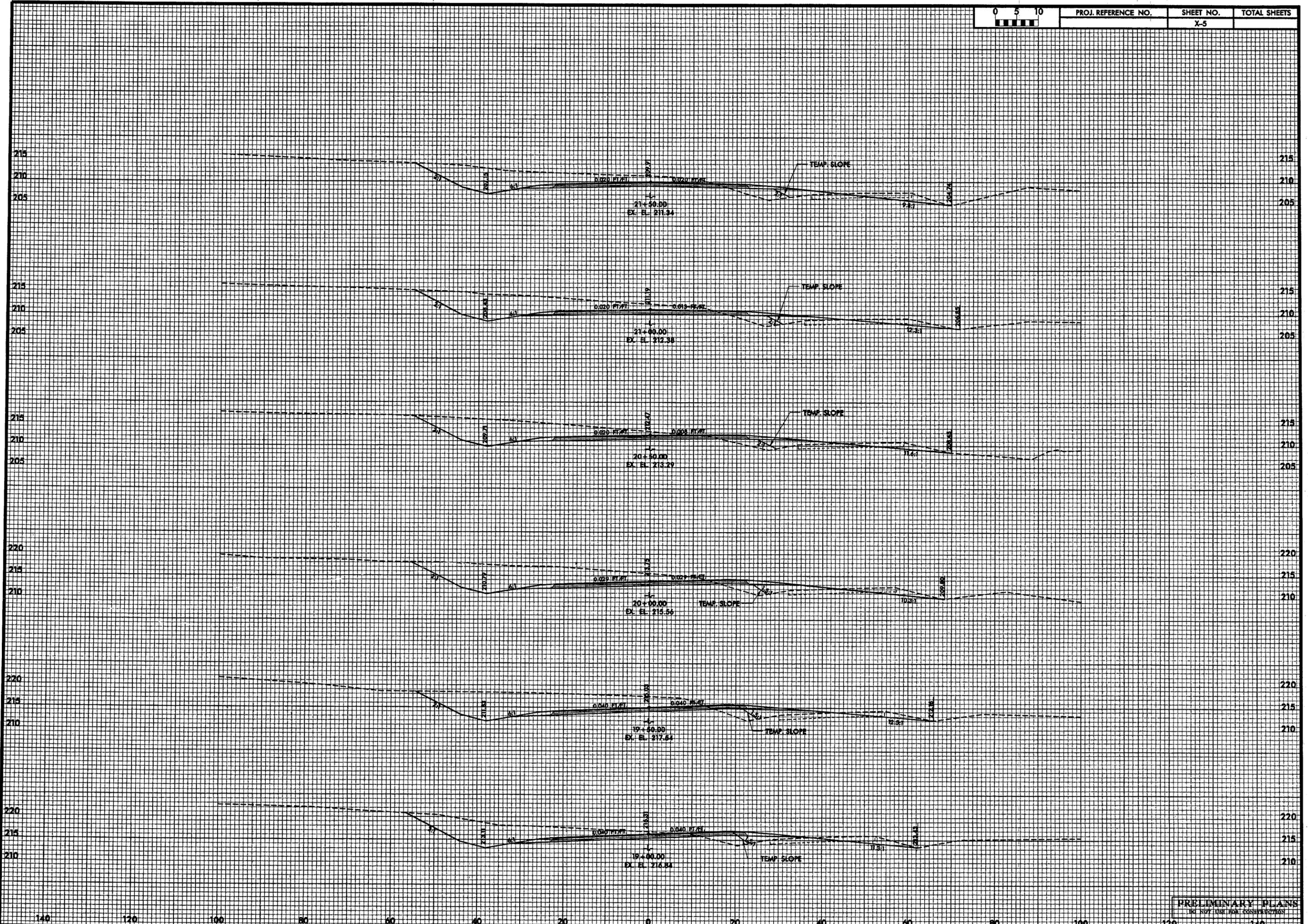


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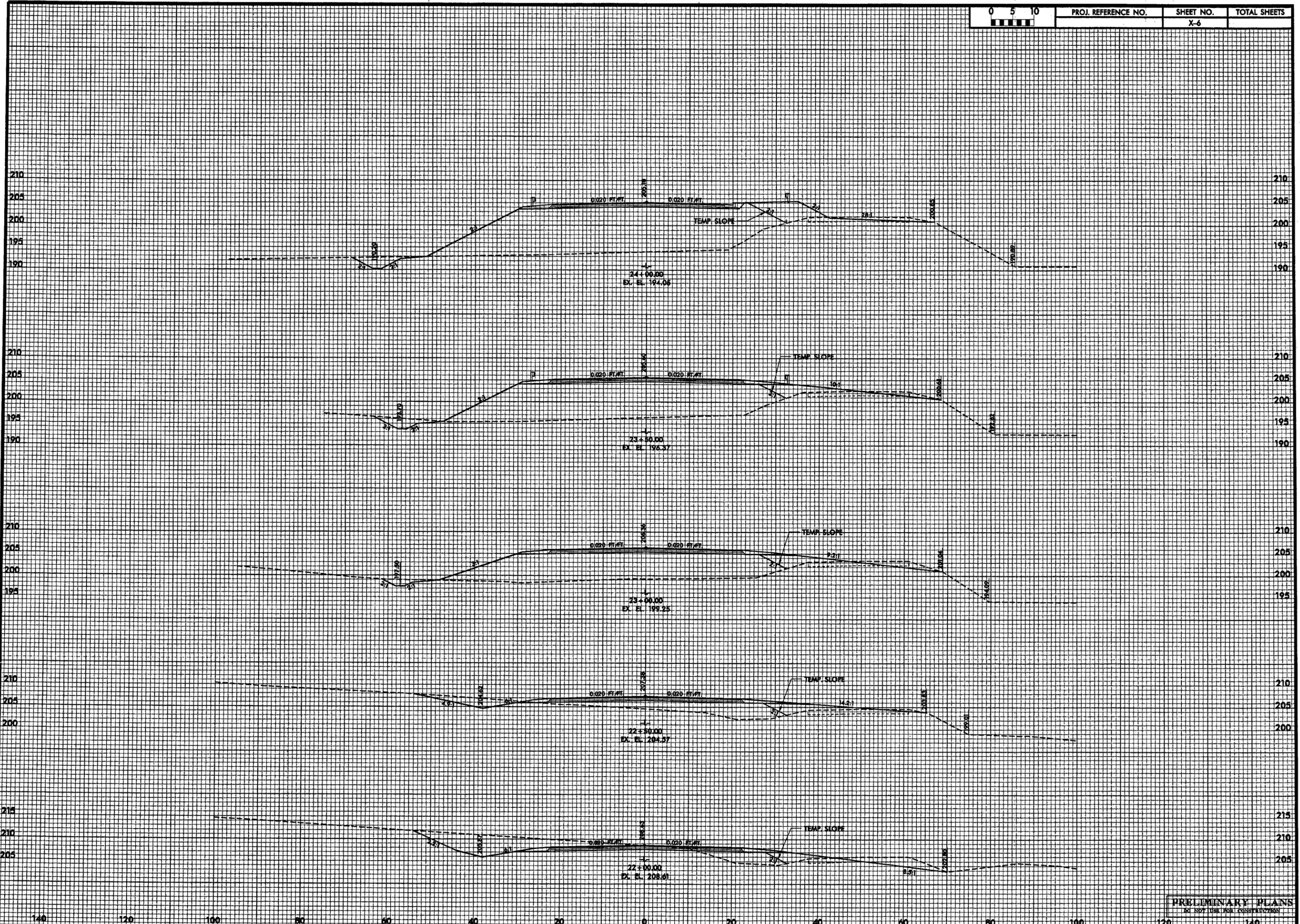


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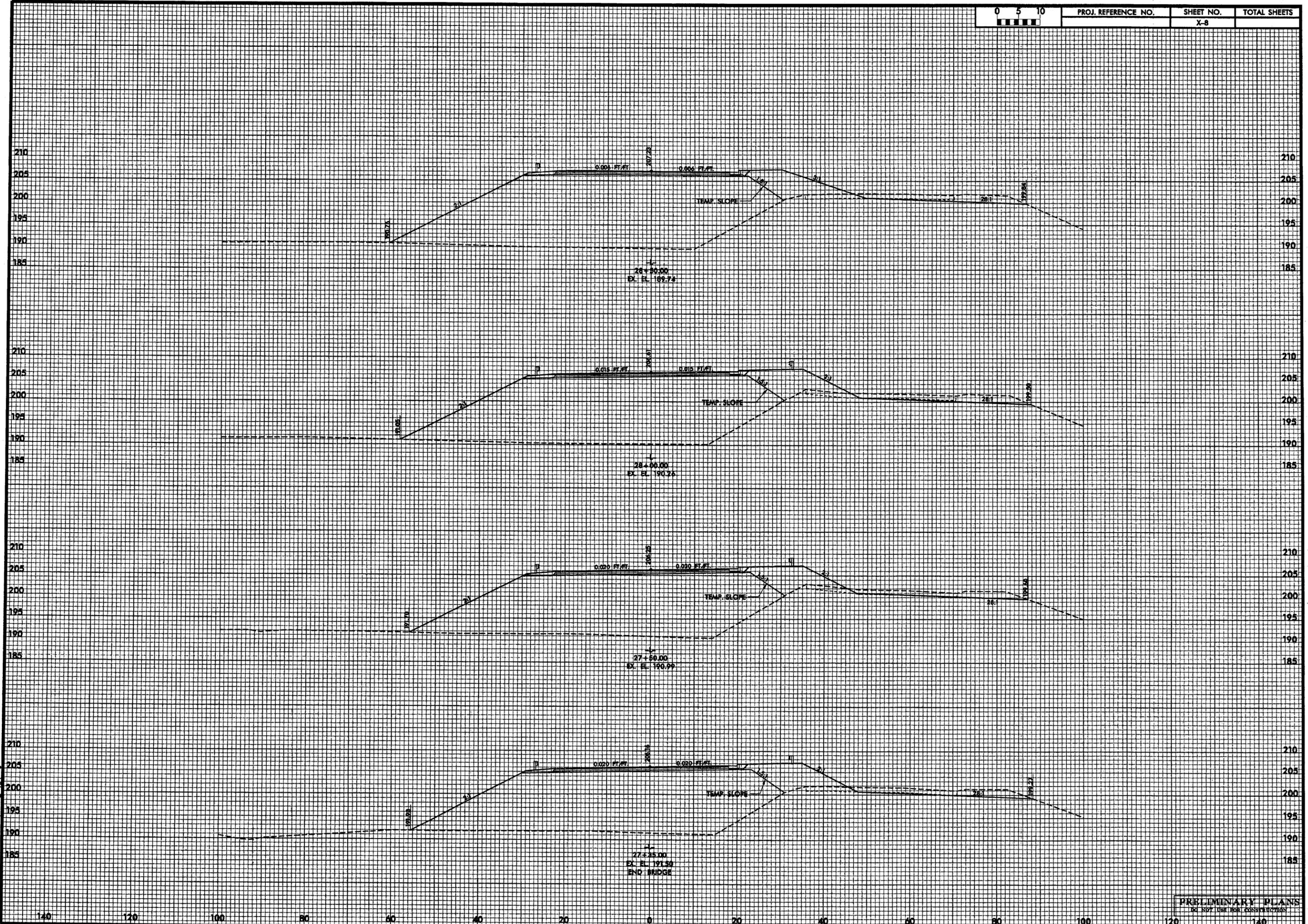
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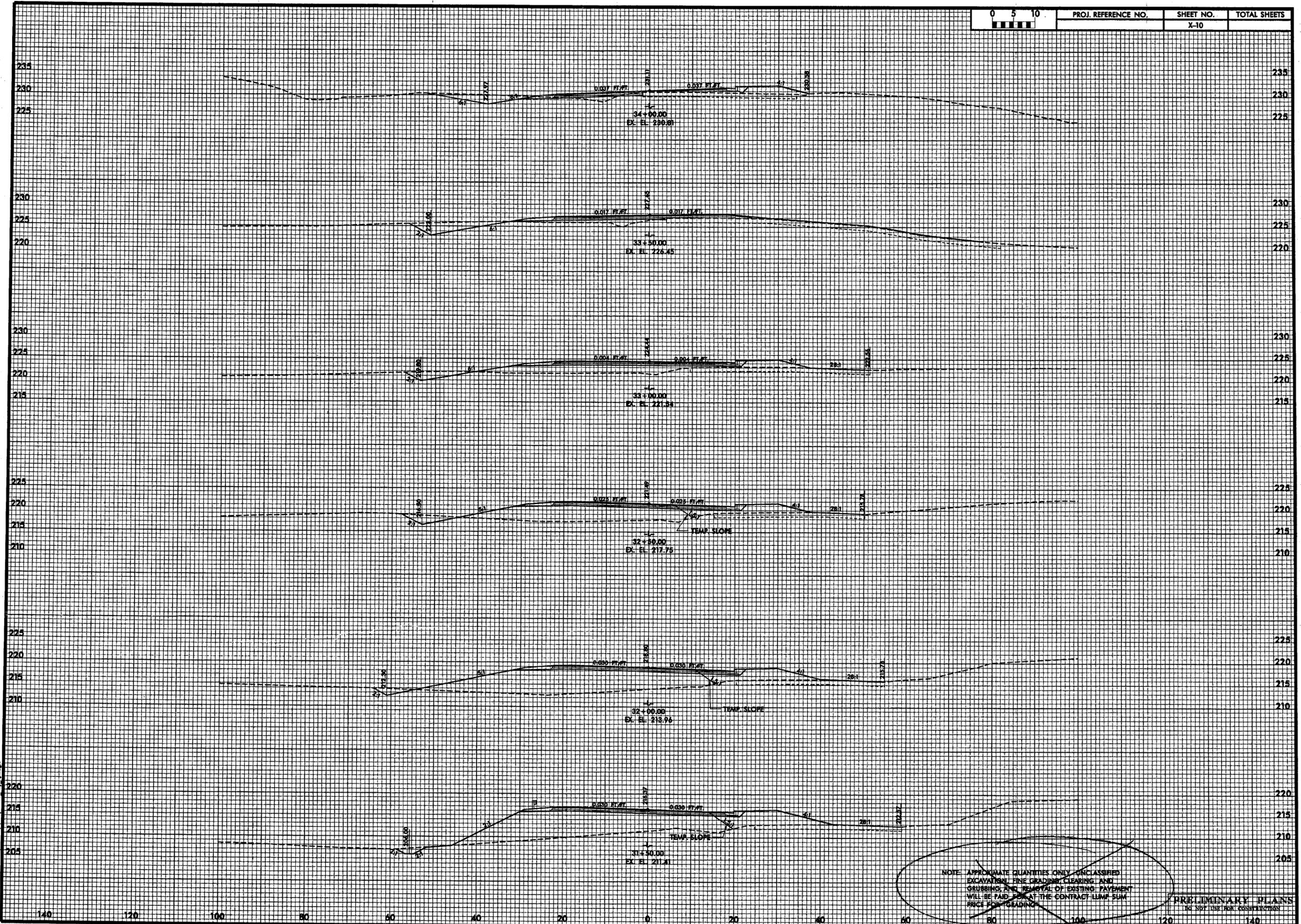
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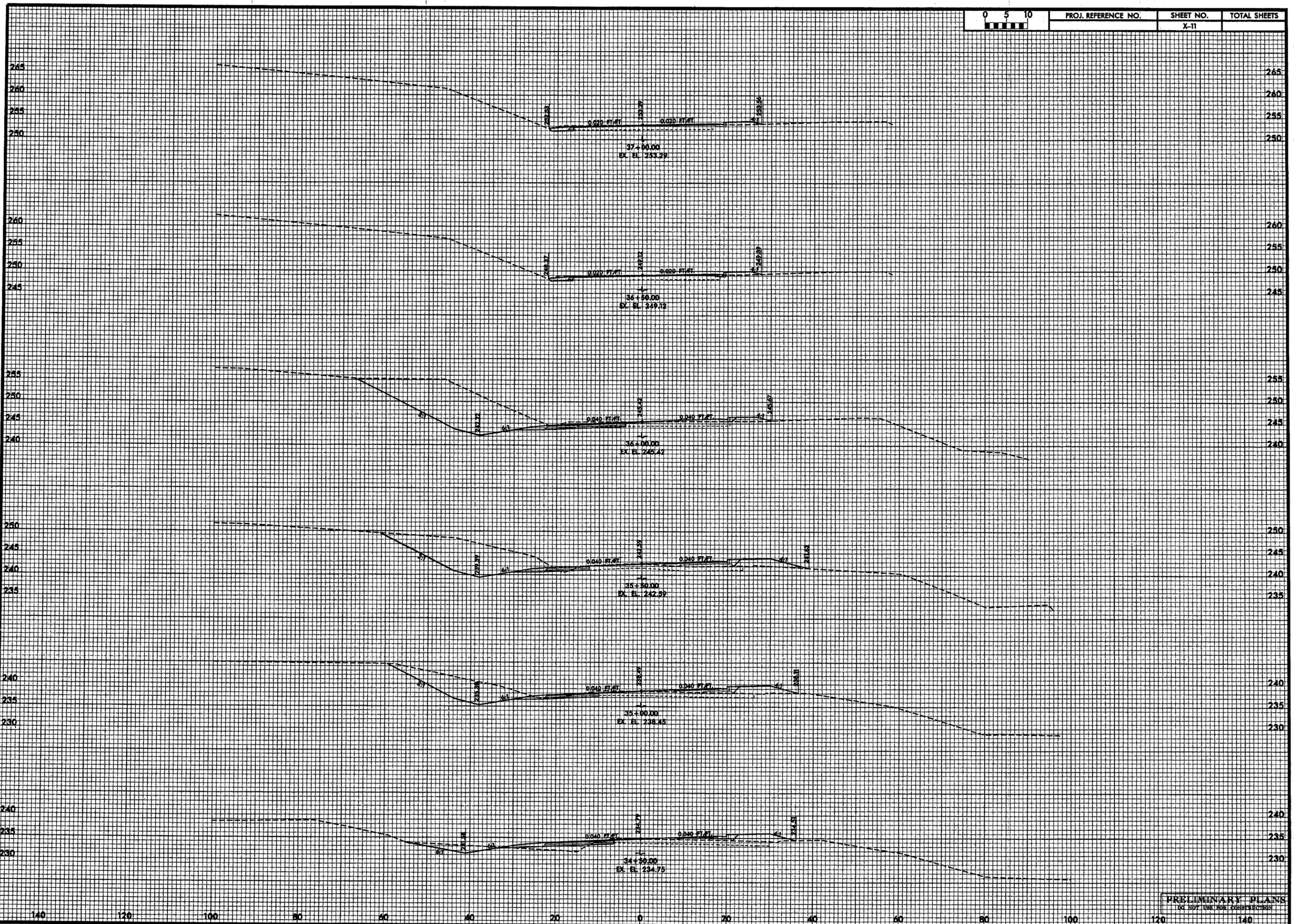
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NOTE: APPROXIMATE QUANTITIES ONLY UNCLASSIFIED
 EXCAVATION, FINE GRADING, CLEARING AND
 GRUBBING AND REMOVAL OF EXISTING PAVEMENT
 WILL BE PAID FOR AT THE CONTRACT LUMP SUM
 PRICE FOR GRADING

PRELIMINARY PLANS
 NO USE FOR CONSTRUCTION



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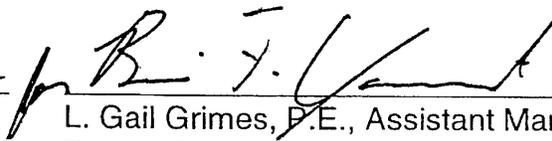


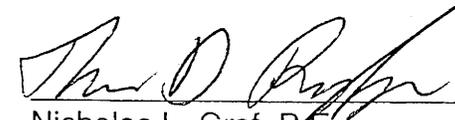
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Wake County
SR 2045
Bridge No. 125 Over Smith Creek
Federal Aid Project No. BRZ-2045(1)
State Project 8.2408001
TIP Project No. B-3705

CATEGORICAL EXCLUSION
US DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
AND
NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

APPROVED:

7/31/02 
DATE L. Gail Grimes, P.E., Assistant Manager
Project Development and Environmental Analysis Branch
NCDOT

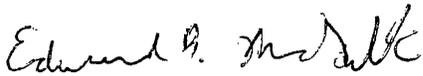
7/31/02 
DATE *For* Nicholas L. Graf, P.E.
Division Administrator, FHWA

Wake County
SR 2045
Bridge No. 125 Over Smith Creek
Federal Aid Project No. BRZ-2045(1)
State Project 8.2408001
TIP Project No. B-3705

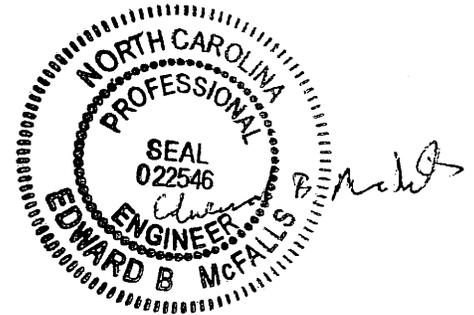
CATEGORICAL EXCLUSION

July 2002

Document Prepared by



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SPECIAL PROJECT COMMITMENTS

Wake County

SR 2045

Bridge No. 125 Over Smith Creek

Federal Aid Project No. BRZ-2045(1)

State Project 8.2408001

TIP Project No. B-3705

In addition to the standard Nationwide Permit No. 23 Conditions, the General Nationwide Permit Conditions, Section 404 Only Conditions, Regional Conditions, State Consistency Conditions, NCDOT's Guidelines for Best Management Practices for Bridge Demolition and Removal, NCDOT's Guidelines for Best Management Practices for the Protection of Surface Waters, General Certification Conditions, and Section 401 Conditions of Certification, the following special commitments have been agreed to by NCDOT:

Project Development and Environmental Analysis Branch, and Hydraulics Unit. The stream impacts associated with the project will likely be lower than the 150 linear-foot (45.7 m) threshold. If it becomes apparent during final design that more than 150 linear feet (45.7 m) of stream will be impacted, mitigation measures will be considered.

Wake County
SR 2045
Bridge No. 125 Over Smith Creek
Federal Aid Project No. BRZ-2045(1)
State Project 8.2408001
TIP Project No. B-3705

INTRODUCTION: The replacement of Bridge No. 125 is included in the 2002–2008 North Carolina Department of Transportation (NCDOT) Transportation Improvement Program and in the Federal-Aid Bridge Replacement Program. The location is shown in **Figure 1**. No substantial environmental impacts are anticipated. The project is classified as a Federal “Categorical Exclusion”.

I. PURPOSE AND NEED

NCDOT Bridge Maintenance Unit records indicate the bridge has a sufficiency rating of 6 out of a possible of 100 for a new structure. The bridge is considered functionally obsolete and structurally deficient. The replacement of this inadequate structure will result in safer and more efficient traffic operations.

II. EXISTING CONDITIONS

SR 2045 (Burlington Mills Road) in Wake County is functionally classified as a “Rural Minor Collector” in the Statewide Functional Classification System.

Through the project area, SR 2045 has an 18-foot (5.5 m) wide pavement and 6-foot (1.8 m) unstabilized shoulders. There is a widened curb-and-gutter section in front on the southeast side of the bridge. There is no recorded right-of-way; therefore, right-of-way is assumed to be to the edge of the pavement. The horizontal and vertical alignments are adequate. The speed limit posted on SR 2045 is 45 mph near the bridge. The existing bridge and roadway are shown in **Figure 4**.

The existing bridge was constructed in 1953. The superstructure consists of a reinforced concrete floor on timber joists. The substructure consists of timber caps on timber piles. The existing bridge consists of two 17-foot 9-inch (5.4 m) spans and five 17-foot 0-inch (5.2 m) spans with a clear roadway width of 24 feet (7.3 m). The crown of the roadway is situated 16 feet (4.9 m) over the bed of Smith Creek. The posted weight limit is 18 tons for single vehicles and 26 tons for trucks with trailers. The bridge is located in a tangent section of SR 2045 and crosses Smith Creek at approximately 90 degrees.

7,900 vehicles per day currently cross Bridge No. 125 on SR 2045. By the design year 2025, the average daily traffic volume is expected to increase to 15,000 vehicles per day. The projected traffic volume includes two percent dual-tired vehicles and one percent truck-tractor semi-trailers. Twelve school buses each cross the bridge two times daily. SR 2045 is not a designated bicycle route.

Three accidents were reported approximately 500 feet (152 m) from Bridge No. 125 in the period between January 1, 1998 and December 31, 2001. In addition, there were seven other accidents in the project vicinity mostly involving animals. Two of these accidents (not involving animals) occurred within 100 feet (30 m) of each other. One accident, the vehicle ran off the road to the right and alcohol impairment was suspected according to NCDOT Traffic Engineering Accident Analysis System. Another accident involved two vehicles sideswiping each other.

Underground telephone cable is located on the north side of SR 2045. The line crosses Smiths Creek on two poles. Overhead power and telephone lines are located on the south side of the existing structure. A fire hydrant is located approximately 150 feet (46 m) east of the bridge on the south side of SR 2045. There is curb and gutter on the south side of SR 2045 east of the bridge.

III. ALTERNATIVES

A. Project Description

The project replaces the existing bridge with a new bridge approximately on the existing horizontal alignment and above the existing grade. The bridge will carry two lanes of traffic over Smith Creek. It will have two 12-foot (3.6 m) lanes with 3-foot (0.9 m) shoulders. The bridge approaches will have two 12-foot (3.6 m) lanes with 8-foot (2.4 m) shoulders, 4 feet (1.2 m) of the shoulders being paved. The bridge is anticipated to be approximately 120 feet (37 m) long. **Figure 3** shows the typical cross-sections of the roadway approaches and bridge. The proposed design speed is 50 miles per hour (80 kilometers per hour).

B. Detailed Study Alternatives

Four alternatives were carried forward for detailed study in this Categorical Exclusion. They are shown on **Figure 2** and described below.

Alternative 1. This alternative replaces the bridge on its existing horizontal alignment while maintaining traffic on-site during construction on a temporary detour to the north of the existing bridge. The bridge would have a 30-foot (9.1 m) wide deck.

Alternative 2. This alternative replaces the bridge on its existing horizontal alignment while maintaining traffic on-site during construction on a temporary detour to the south of the existing bridge. The bridge would have a 30-foot (9.1 m) wide deck.

Alternative 3. This alternative replaces the bridge on its existing horizontal alignment while using an off-site detour to maintain traffic during construction. The bridge would have a 30-foot (9.1 m) wide deck. The detour consists of US 1, US 1A, SR 2044 (Ligon Mill Road), and SR 2045 (Burlington Mill Road). The total off-site detour length is approximately 6.2 miles (10 km). The detour is shown on **Figure 1**.

Alternative 4. This alternative replaces the bridge on its existing horizontal alignment while using multi-staged construction to maintain traffic on-site during construction. The bridge would have a 70-foot (21 m) wide deck. In Stage 1, the north side of the new bridge will be constructed while maintaining traffic on the existing bridge. Traffic will be shifted over to the north side of the new bridge in Stage 2. The existing bridge will be removed and the south side of the new bridge will be constructed. Stage 3 will consist of shifting traffic to the south to line up with the existing horizontal alignment.

C. Alternatives Eliminated From Further Study

No Action Alternative. This alternative consists of short-term minor reconstruction and maintenance activities that are part of an ongoing plan for continuing operation of the existing bridge and roadway system in the project area. Many of the structural elements are decaying. Decay has already reduced the bridge's safe load-bearing capacity.

D. Preferred Alternative

Alternative 4, replacing the existing bridge on its existing horizontal alignment while using multi-staged construction to maintain traffic on-site during construction is the preferred alternative. **Alternative 4** was selected because:

- It avoids community and commuter disruption caused by using an off-site detour during construction.
- It has the fewer overall natural resources and right-of-way impacts than the on-site detour alternatives.
- It is less costly than the other on-site detour alternatives.

IV. ESTIMATED COSTS

Construction and right-of-way cost estimates for the alternatives studied are presented below in **Table 1**.

Table 1. Estimated Costs

	Alternative 1	Alternative 2	Alternative 3	Preferred Alternative 4
Structure Removal	\$24,200	\$24,200	\$24,200	\$28,500
Structure	\$273,000	\$273,000	\$273,000	\$738,000
Roadway Approaches	\$269,294	\$269,294	\$269,294	\$611,384
Detour Structure & Approaches	\$982,894	\$982,894	N/A	N/A
Miscellaneous and Mobilization (15% Structure)	\$59,050	\$59,050	\$44,800	\$114,500
Miscellaneous and Mobilization (45% Roadway)	\$496,562	\$561,562	\$121,706	\$275,616
Engineering and Contingencies	\$345,000	\$350,000	\$117,000	\$282,000
Right-of-way/Utilities/Relocations	\$79,450	\$79,450	\$30,000	\$79,450
Total Cost of Alternative	\$2,529,450	\$2,599,450	\$880,000	\$2,129,450

The estimated cost of the project, as shown in the 2002-2008 Transportation Improvement Program, is \$785,000 including \$60,000 for right-of-way and \$600,000 for construction. Right-of-way acquisition is scheduled for Federal Fiscal Year 2002, with construction to follow in Federal Fiscal Year 2003.

V. NATURAL RESOURCES

A. Methodology

Published information and resources were collected prior to the field investigation. Information sources used to prepare this report include the following:

- United States Geological Survey (USGS) quadrangle map (Wake Forest, 1987)
- United States Fish and Wildlife Service (USFWS)
- National Wetlands Inventory (NWI) Map (Wake Forest, 1987)

- NCDOT aerial photograph of project area (1:1200)
- *Soil Survey of Wake County, North Carolina* (Natural Resources Conservation Service [NRCS] 1970)
- North Carolina Department of Environment and Natural Resources (NCDENR) basin-wide assessment information (NCDENR, 1996)
- USFWS list of protected and candidate species
- North Carolina Natural Heritage Program (NHP) files of rare species and unique habitats

Water resource information was obtained from publications posted on the World Wide Web by NCDENR Division of Water Quality. Information concerning the occurrence of federally protected species in the study area was obtained from the USFWS list of protected and candidate species (March 2002), posted on the World Wide Web by the Ecological Services branch of the USFWS office in North Carolina. Information concerning species under state protection was obtained from the NHP database of rare species and unique habitats. NHP files were reviewed for documented sightings of species on state or federal lists and locations of significant natural areas.

A general field survey was conducted along the proposed project route by Earth Tech biologists on December 7, 2000. Water resources were identified and their physical characteristics were recorded. For the purposes of this study, a brief habitat assessment was performed within the project area of Smith Creek. Plant communities and their associated wildlife were identified using a variety of observation techniques, including active searching, visual observations, and identifying characteristic signs of wildlife (sounds, tracks, scats, and burrows). Terrestrial community classifications generally follow Schafale and Weakley (1990) where appropriate and plant taxonomy follows Radford *et al.* (1968). Vertebrate taxonomy follows Potter *et al.* (1980), Martof *et al.* (1980), and Webster *et al.* (1985). Vegetative communities were mapped using aerial photography of the project site. Predictions regarding wildlife community composition involved general qualitative habitat assessment based on existing vegetative communities.

Jurisdictional wetlands, if present, were delineated and evaluated based on criteria established in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (USACE, 1987). Wetlands were classified based on Cowardin *et al.* (1979).

B. Physiography and Soils

The project area lies in the central portion of North Carolina within the Piedmont physiographic province. Elevations in the project area are approximately 190 feet (57.6 m) above mean sea level (National Geodetic Vertical Datum, 1929). The topography of the project vicinity is hilly with gentle slopes rising from both riverbanks.

The proposed project is in a rural area in Wake County between US1 and SR 2044 (Ligon Mill Road). Wake County's major economic resources are business, education, and industry. The population of Wake County in 1999 was 592,218 (North Carolina Office of State Budget, Planning and Management 1999).

Information about soils in the project area was taken from the *Soil Survey of Wake County, North Carolina* (USDA, 1970). The map units in the project area are Wehadkee and Bibb, and Helena sandy loam, 6 to 10 percent slope, eroded soils.

- **Wehadkee and Bibb (Wo)** soils are nearly level, poorly drained soils found in floodplains, narrow upland draws and in depressions throughout the county. This soil is mapped along the banks of the project area. These soils are wet, subject to frequent flooding of long duration, and the water table may be at the surface for nearly six months. Surface runoff is slow to ponded and infiltration is good to fair. The Wehadkee and Bibb soil series are on the state list of hydric soils.
- **Helena sandy loam (HeC2), 6 to 10 percent slope**, eroded soils are mapped within the project area. This soil is found on narrow slopes in the uplands, has fair infiltration, slow permeability, and rapid runoff. The water table is perched as a result of slow permeability.

Site index is a measure of soil quality and productivity. The index is the average height, in feet, that dominant and co-dominant trees of a given species attain in a specified number of years (typically 50). The site index applies to fully-stocked, even-aged, unmanaged stands. The soils in the project area have the following site indices:

- The Wehadkee and Bibb soils have a site index of 85 to 95 for loblolly pine (*Pinus taeda*), sweetgum (*Liquidambar styraciflua*), and water oak (*Quercus nigra*), and 85 to 100 for tulip poplar (*Liriodendron tulipifera*).
- The Helena sandy loam soils have a site index of 75 to 85 for loblolly pine, sweetgum, and tulip poplar, and 60 to 70 for shortleaf pine (*Pinus echinata*),

C. Water Resources

This section contains information concerning water resources likely to be impacted by the proposed project. Water resources assessments include the physical characteristics likely to be impacted by the proposed project (determined by field survey), best usage classifications, and water quality aspects of the water resources. Probable impacts to surface waters are also discussed, as well as means to minimize impacts.

1. Waters Impacted

The project is located in the Neuse River basin (NEU02 sub-basin). Smith Creek originates about 9 miles (14.6 km) northeast of the project area, just east of Wake Forest, NC. It drains the Wake Forest Reservoir and adjacent rural areas. The creek flows in a southwesterly direction to the project area. From the project area, the creek flows south for 0.75 miles (1.2 km) to its confluence with the Neuse River.

Smith Creek is approximately 35 feet (10.6 m) wide within the study area, except in the area directly under the bridge where the stream constricts to a width of 8 feet (2.4 m). The banks are generally 4 feet (1.2 m) high, well-vegetated, and have very little slumping. A wide to moderate floodplain is found on both sides of the stream. The water clarity is moderate to poor, flow is moderate, and substrate is sand and gravel. A large sand levee is present along nearly the entire length of the western bank of the stream within the project area. On the south (downstream) side of the bridge there are large sand and gravel bars on the inside of the meander bends. A canopy of hardwoods provides 90 percent canopy cover.

2. Water Resource Characteristics

Surface waters in North Carolina are assigned a classification by the DWQ that is designed to maintain, protect, and enhance water quality within the state. Smith Creek [Index # 27-23-(2)] is classified as a *Class C NSW* water body (NCDENR, 2001). Classification and index numbers for Smith Creek change both above and below Wake Forest Reservoir. The project site lies entirely within the C NSW classified section. *Class C* water resources are waters protected for aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. Secondary recreation includes wading, boating, and other uses involving human body contact with water where such activities take place in an infrequent, unorganized, or incidental manner. NSW, or nutrient sensitive waters require limits on nutrient inputs. There are no restrictions on watershed development activities in the project area.

No waters classified as High Quality Water (HQW), Water Supplies (WS-I or WS-II) or Outstanding Resource Waters (ORW) occur within 1 mile (1.6 km) of the project study area.

The project area is in a moderately to heavily developed watershed. Disturbances to the landscape were observed in the immediate vicinity, including a large residential area, and small agricultural fields. Potential threats to stream quality in this area are continued residential development that would result in increased sedimentation within the stream.

Basin-wide water quality assessments are conducted by the Environmental Sciences Branch, Water Quality Section of the DWQ (Jan 2001). The program has established monitoring stations for sampling selected benthic macroinvertebrates, which are known to have varying levels of tolerance to water pollution. An index of water quality can be derived from the number of taxa present and the ratio of tolerant to intolerant taxa. Streams can then be given a bioclassification ranging from Poor to Excellent.

There are three monitoring stations on Smith Creek. The station furthest upstream from the project site is located about 2.5 miles (4.05 km) upstream where the stream crosses SR 2049. It was sampled in December 1986 and classified as Fair. Another station is located about 1 mile (1.62 km) upstream of the project area where the creek crosses SR 2044. It was sampled in December 1986 and classified as Poor. A third station is located at the bridge within the project area. It was sampled in December of 1986 and given a Poor rating, then again in July 1995 and given a Good-Fair rating.

Point source discharges in North Carolina are permitted through the National Pollutant Discharge Elimination System (NPDES) program administered by the DWQ. Municipal, industrial, and other facilities that discharge directly into surface waters must obtain a permit. Homes that use a municipal wastewater system or a septic system, and do not discharge to surface waters do not require a permit under the program. There are two permits issued to discharge in Smith Creek as of January 2001 (NCDENR 2001).

One Minor, Non-municipal permit (#NC0007528) is issued to Wake Forest Township Wastewater Treatment Plant to discharge in Smith Creek about 0.5 miles (0.3 km) downstream from the project site. This permit is classified as "Water Plants, Surface Water". Another Minor, Non-municipal permit (#NC0073318) is issued to Ira D. Lee of Whipporwill Valley to discharge into Smith Creek about 0.75 miles (0.46 km) upstream from the project site. This permit is classified as "Domestic, Subdivisions".

3. Anticipated Impacts to Water Resources

a) General Impacts

Any action that affects water quality can adversely affect aquatic organisms. Temporary impacts during the construction phases may result in long-term impacts to the aquatic community. In general, replacing an existing structure in the same location with an off-site detour is the preferred environmental approach. Bridge replacement at a new location results in more severe impacts, and physical impacts are incurred at the point of bridge replacement.

Project construction may result in the following impacts to surface water resources:

- Increased sediment loading and siltation as a consequence of watershed vegetation removal, erosion, and/or construction.
- Decreased light penetration/water clarity from increased sedimentation.
- Changes in water temperature with vegetation removal.
- Changes in the amount of available organic matter with vegetation removal.
- Increased concentration of toxic compounds from highway runoff, construction activities and construction equipment, and spills from construction equipment.
- Alteration of water levels and flows as a result of interruptions and/or additions to surface and groundwater flow from construction.

Construction impacts may not be restricted to the communities in which the construction activity occurs, but may also affect downstream communities. Efforts will be made to ensure that no sediment leaves the construction site. NCDOT's Best Management Practices for the Protection of Surface Waters will be implemented, as applicable, during the construction phase of the project to ensure that no sediment leaves the construction site.

4. Impacts Related to Bridge Demolition and Removal

Case 3 applies to this bridge replacement project because Smith Creek has not been identified as a special resource water, is not associated with fish migration, spawning or larval recruitment, and is not known to contain any threatened or endangered species.

The superstructure consists of reinforced concrete with timber joints. The substructure consists of end bents and internal bents, and timber caps on timber piles. The maximum potential fill is 60.59 cubic yards (46.32 cubic meters).

D. Biotic Resources

Terrestrial and aquatic communities are included in the description of biotic resources. Living systems described in the following sections include communities of associated plants and animals. These descriptions refer to the dominant flora and fauna in each community and the relationships of these biotic components. Descriptions of the terrestrial systems are presented in the context of plant community classifications. These classifications follow Schafale and Weakley (1990) where possible. They are also cross-referenced to *The Nature Conservancy International Classification of Ecological Communities: Terrestrial Vegetation of the Southeastern United States* (Weakley *et al.*, 1998), which has recently been adopted as the standard land cover classification by the Federal Geographic Data Committee. Representative animal species that are likely to occur in these habitats (based on published range distributions) are also cited. Scientific nomenclature and common names (when applicable) are used for the

plant and animal species described. Subsequent references to the same species are by the common name only.

1. Plant Communities

Five terrestrial communities were identified within the project area: a disturbed roadside community, a floodplain forest, an upland forest, a pine plantation, and a wetland. Dominant faunal components associated with these terrestrial areas will be discussed in each community description. Many species are adapted to the entire range of habitats found along the project alignment, but may not be mentioned separately in each community description.

a) Disturbed Roadside Community

This community covers the area along the road shoulders in the project area. Species include greenbriar (*Smilax* sp.), a variety of grasses (including *Festuca*), privet (*Ligustrum* sp.), dewberry (*Rubus* sp.), Japanese honeysuckle (*Lonicera japonica*), wild onion (*Allium cernuum*), henbit (*Lamium amplexicaule*), clover (*Lespedeza* sp.), and goldenrod (*Solidago* sp.).

b) Floodplain Forest Community

This community occurs along the banks of Smith Creek. Canopy species include sycamore (*Platanus occidentalis*), green ash (*Fraxinus pennsylvanica* var. *subintegerrima*), sweetgum (*Liquidambar styraciflua*), and river birch (*Betula nigra*). The understory includes red maple (*Acer rubrum*), ironwood (*Carpinus caroliniana*), Japanese honeysuckle, dewberry, glaucous greenbriar (*Smilax glauca*), grapevine (*Vitis* sp.), winged elm (*Ulmus alata*), box elder (*Acer negundo*), poison ivy (*Rhus radicans*), tree-of-heaven (*Ailanthus altissima*), and privet. This community probably represents a marginal example of a Piedmont/Mountain Levee forest as described by Schafale and Weakley (1990). The TNC classification is most likely I.B.2.N.d.13 *Platanus occidentalis*-(*Fraxinus pennsylvanica*, *Celtis laevigata*, *Acer saccharinum*) Temporarily Flooded Forest Alliance.

c) Upland Forest Community

An upland forest community is present along the periphery of both wetland areas and the floodplain forests within the project area. Tree species in this community include loblolly pine (*Pinus taeda*), tulip poplar (*Liriodendron tulipifera*), sweetgum, southern red oak (*Quercus falcata*), white oak (*Quercus alba*), red cedar (*Juniperus virginiana*), winged elm, and dogwood (*Cornus florida*). Little to no herbaceous vegetation was observed due to the time of year the site visit occurred. This community is probably an example of a Basic Mesic Forest (Piedmont Subtype) as described by Schafale and Weakley (1990). The TNC

classification is most likely I.C.3.N.a.23 *Pinus taeda* – (*Liquidambar styraciflua*, *Liriodendron tulipifera*) forest alliance.

d) *Pine Plantation Community*

This community is present on the northeast side of Smith's Creek. This community contains only 15 to 20 year-old loblolly pine and various grasses. There are no community types listed by Schafale and Weakley (1990). The TNC equivalent is I.A.8.C.x.9 *Pinus taeda* Planted Forest Alliance.

e) *Wetland Community*

A forested wetland community is present on the northwest side of Smith Creek. In general, the plants within this community are growing in Wehadkee and Bibb soil. This wetland community is dominated by sweetgum, willow oak (*Quercus phellos*), red maple, sycamore, and green ash. Other shrub species include ironwood, privet, greenbriar, poison ivy, and cross vine (*Bignonea capreolata*). Herbaceous vegetation includes giant cane (*Arundinaria gigantea*), and sedge (*Carex* sp.). This community is similar in part to the Piedmont/Mountain Swamp Forest community as described by Schafale and Weakley (1990). The TNC equivalent is III.B.2.N.d.12. *Liquidambar styraciflua*- (*Liriodendron tulipifera*, *Acer rubrum*) Temporarily Flooded Forest Alliance.

A second forested wetland community lies on the southeast side of Smith Creek. The plants of this wetland are also growing in Wehadkee and Bibb soil. Tree species in this wetland include sweetgum, sycamore, red maple, green ash, and willow oak. Shrubs include red maple, green, winged elm, American holly (*Ilex opaca*), and ironwood. Vines and herbaceous vegetation include greenbriar, poison ivy, sedges, soft rush (*Juncus effusus*), and asters (*Aster* sp.). This wetland community is also similar in part to the Piedmont/Mountain Swamp Forest Community as described by Schafale and Weakley (1990). The TNC equivalent is also III.B.2.N.d.12. *Liquidambar styraciflua*- (*Liriodendron tulipifera*, *Acer rubrum*) Temporarily Flooded Forest Alliance.

2. Wildlife Communities

a) *Disturbed Roadside Community*

The animal species present in these disturbed habitats are opportunistic and capable of surviving on a variety of resources, ranging from vegetation to both living and dead faunal components. Northern mockingbird (*Mimus polyglottos*), starling (*Sturnus vulgaris*), and American robin (*Turdus migratorius*) are common birds that use these habitats. The area may also be used by the Virginia opossum (*Didelphis virginiana*), various species of mice (*Peromyscus* sp.),

Eastern garter snake (*Thamnophis sirtalis*), and American toad (*Bufo americanus*).

b) *Floodplain Forest Community*

While visiting this site, Earth Tech biologists observed downy woodpecker (*Picoides pubescens*), ruby-crowned kinglet (*Regulus calendula*), tufted titmouse (*Parus bicolor*), Carolina chickadee (*Parus carolinensis*), yellow-bellied sapsucker (*Sphyrapicus varius*), and gray squirrel (*Sciurus carolinensis*). Raccoon (*Procyon lotor*) and white-tailed deer (*Odocoileus virginianus*) may also be expected here, along with Carolina wren (*Thryothorus ludovicianus*), and eastern box turtle (*Terrapene carolina*).

c) *Upland Forest Community*

On the day of the site visit Earth Tech biologists observed red-bellied woodpecker (*Melanerpes carolinus*), Carolina chickadee (*Parus carolinensis*), yellow-rumped warbler (*Dendroica coronata*), northern cardinal (*Cardinalis cardinalis*), and song sparrow (*Pooecetes gramineus*). Rubbings of white-tailed deer were also seen within this community. Other species that might be expected include gray squirrel, southeastern shrew (*Sorex longirostris*), white-breasted nuthatch (*Sitta carolinensis*), and eastern box turtle.

d) *Pine Plantation Community*

Animals expected in this community include pine warbler (*Dendroica pinus*), ruby-crowned kinglet, striped skunk (*Mephitis mephitis*), eastern mole (*Scalopus aquaticus*), and corn snake (*Elaphe guttata guttata*).

e) *Wetland Community*

Due to the small size of these wetlands, the animals that utilize this community are essentially the same as those found in the Floodplain Forest. However, on the day of the site visit spring peepers (*Pseudacris crucifer*) were heard. Other amphibians such as southern cricket frogs (*Acris gryllus*) and southern chorus frogs (*Pseudacris nigrita*) may also utilize this wet area.

3. Aquatic Communities

Within the project area, Smith Creek is a low-gradient, third-order stream. The bed material consists of mostly of sand and gravel. On the day of the site visit, the water flow was moderate and clarity was moderate to poor. The riparian community is mostly deciduous trees and mixed evergreen-deciduous shrubs. No aquatic vegetation was observed.

Smith Creek has not been identified by fisheries biologists at the Wildlife Resources Commission as an important spawning area for any anadromous fishes.

4. Anticipated Impacts to Biotic Communities

Project construction will have various impacts to the previously described terrestrial and aquatic communities. Any construction activities in or near these resources have the potential to impact biological functions. This section quantifies and qualifies potential impacts to the natural communities within the project area in terms of the area impacted and the plants and animals affected. Temporary and permanent impacts are considered here along with recommendations to minimize or eliminate impacts.

a) Terrestrial Communities

Terrestrial communities in the project area will be impacted permanently by project construction from clearing and paving. Estimated impacts are based on the length of the alternative and the entire study corridor width. Alternative 1 and its detour are a total of 180 feet (54.5 m) wide. The bridge replacement portion of Alternative 1 is 850 feet (258.6 m) long and 90 feet (27.3 m) wide, and the detour for Alternative 1 is 1757 feet (532.4 m) long and 90 feet (27.3 m) wide. The bridge replacement portion of Alternative 2 is 850 feet (258.6 m) long and 90 feet (27.3 m) wide, and the detour is 1702 feet (515.8 m) long and 90 feet (27.3 m) wide. **Table 2** describes the potential impacts to terrestrial communities by habitat type. Because impacts are based on the entire study corridor width, the actual loss of habitat will likely be less than the estimate.

Table 2. Estimated Area of Impact to Terrestrial Communities

Community	Area of Impact in Acres (Hectares)							
	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	Temp.	Perm.	Temp.	Perm.	Temp.	Perm.	Temp.	Perm.
Disturbed Roadside	0.33 (0.12)	0.61 (0.22)	0.35 (0.13)	0.61 (0.22)	0.00 (0.00)	0.61 (0.22)	0.00 (0.00)	1.68 (0.68)
Floodplain Forest	0.81 (0.29)	0.25 (0.09)	0.29 (0.11)	0.25 (0.09)	0.00 (0.00)	0.25 (0.09)	0.00 (0.00)	0.52 (0.21)
Upland Forest	0.97 (0.35)	0.23 (0.08)	1.62 (0.59)	0.23 (0.08)	0.00 (0.00)	0.23 (0.08)	0.00 (0.00)	0.85 (0.34)
Pine Plantation	0.21 (0.08)	0.00 (0.00)						
Wetland	0.42 (0.15)	0.07 (0.03)	0.43 (0.16)	0.07 (0.03)	0.00 (0.00)	0.07 (0.03)	0.00 (0.00)	0.24 (0.10)
Total Impact	2.74 (0.99)	1.16 (0.42)	2.69 (0.99)	1.16 (0.42)	0.00 (0.00)	1.16 (0.42)	0.00 (0.00)	3.29 (1.33)

Alternative 3's permanent impacts are the same as **Alternatives 1 and 2**, but there are no temporary impacts. **Alternative 4**, will have less overall impacts as compared to **Alternatives 1 and 2**.

Destruction of natural communities along the project alignment will result in the loss of foraging and breeding habitats for the various animal species that utilize the area. Animal species will be displaced into surrounding communities. Adult birds, mammals, and some reptiles are mobile enough to avoid mortality during construction. Young animals and less mobile species, such as many amphibians, may suffer direct loss during construction. The plants and animals that are found in the upland communities are generally common throughout the piedmont of North Carolina.

Impacts to terrestrial communities, particularly in locations having steep to moderate slopes, can result in the aquatic community receiving heavy sediment loads as a consequence of erosion. Construction impacts may not be restricted to the communities in which the construction activity occurs, but may also affect downstream communities. Efforts should be made to ensure that no sediment leaves the construction site.

b) Wetland Communities

Two forested palustrine wetlands were identified within the project area. **Alternative 1** would impact 0.49 acres (0.18 hectares [ha]) of the wetland community; **Alternative 2** would impact 0.50 acres (0.19 ha) of the wetland community; **Alternative 3** would impact 0.07 acres (0.03 ha) of the wetland community; and **Alternative 4** would impact 0.24 acres (0.10 ha) of the wetland community. Project construction cannot be accomplished without infringing on the surface waters. Anticipated surface water impacts fall under the jurisdiction of the USACE and the DWQ.

c) Aquatic Communities

Impacts to aquatic communities include fluctuations in water temperatures as a result of the loss of riparian vegetation. Shelter and food resources, both in the aquatic and terrestrial portions of these organisms' life cycles, will be affected by losses in the terrestrial communities. The loss of aquatic plants and animals will affect terrestrial fauna which rely on them as a food source.

Temporary and permanent impacts to aquatic organisms may result from increased sedimentation. Aquatic invertebrates may drift downstream during construction and recolonize the disturbed area once it has been stabilized. Sediments have the potential to affect fish and other aquatic life in several ways, including the clogging and abrading of gills and other respiratory surfaces, affecting the habitat by scouring and filling of pools and riffles, altering water

chemistry, and smothering different life stages. Increased sedimentation may cause decreased light penetration through an increase in turbidity.

Wet concrete should not come into contact with surface water during bridge construction. Potential adverse effects can be minimized through the implementation of NCDOT *Best Management Practices for Protection of Surface Waters*. Because the stream in the proposed project area is designated as a WS-IV water, erosion control methods for high quality waters will be implemented as included in *NCDOT's Best Management Practices for Protection of Surface Waters* and *Erosion and Sediment Control Guidelines*.

E. Special Topics

This section provides inventories and impact analyses for two federal and state regulatory issues: "Waters of the United States." and rare and protected species.

1. "Waters of the United States": Jurisdictional Issues

Wetlands and surface waters fall under the broad category of "Waters of the United States" as defined in 33 CFR § 328.3 and in accordance with provisions of Section 404 of the Clean Water Act (33 U.S.C. 1344). These waters are regulated by the U.S. Army Corps of Engineers (USACE). Any action that proposes to dredge or place fill material into surface waters or wetlands falls under these provisions.

The Wake Forest, NC NWI map shows a palustrine forested temporarily flooded wetland on both banks of Smith Creek within the proposed project area. A site visit confirmed the presence of two jurisdictional wetlands; one each on the northwest and southeast sides of the stream within the project area. Smith Creek meets the definition of surface waters, and is therefore classified as Waters of the United States. The channel is 10 feet (3 m) wide within the project area.

Project construction cannot be accomplished without infringing on the surface waters. Anticipated surface water impacts fall under the jurisdiction of the USACE and the DWQ. Within the project area, Smith Creek is 13 feet (10.6 m) wide. Assuming two study corridors of 90 feet (27.3 m) for each alternate, the construction of the new bridge will impact 180 linear feet (54.5 m) of stream, and a total area of 2340 sq feet (709 sq m) of surface waters.

Two forested palustrine wetlands were identified within the project area. **Alternative 1** would impact 0.49 acres (0.18 hectares [ha]) of the wetland community; **Alternative 2** would impact 0.50 acres (0.19 ha) of the wetland community; **Alternative 3** would impact 0.07 acres (0.03 ha) of the wetland community; and **Alternative 4** would impact 0.24 acres (0.10 ha) of the wetland community.

2. Permits

Impacts to jurisdictional surface waters are anticipated from the proposed project. Permits and certifications from various state and federal agencies may be required prior to construction activities.

a) Section 404 of the Clean Water Act

Construction is likely to be authorized by Nationwide Permit (NWP) No. 23, as promulgated under 61 FR 2020, 2082; January 15, 2002. This permit authorizes activities undertaken, assisted, authorized, regulated, funded, or financed in whole or in part, by another Federal agency or department where that agency or department has determined that, pursuant to the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act:

- the activity, work, or discharge is categorically excluded from environmental documentation because it is included within a category of actions which neither individually nor cumulatively have a significant effect on the human environment; and
- the Office of the Chief Engineer has been furnished notice of the agency's or department's application for the categorical exclusion and concurs with that determination.

b) Section 401 Water Quality Certification

This project will also require a 401 Water Quality Certification or waiver thereof, from the Department of Environment and Natural Resources (DENR) prior to issuance of the NWP 23. Section 401 of the Clean Water Act requires that the state issue or deny water certification for any federally permitted or licensed activity that results in a discharge into Waters of the U.S. Final permit decision rests with the USACE.

c) Bridge Demolition and Removal

Demolition and removal of a highway bridge over Waters of the United States requires a permit from the U.S. Army Corps of Engineers if dropping components of the bridge into the water is the only practical means of demolition. Effective 9/20/99, this permit is included with the permit for bridge reconstruction. The permit application henceforth will require disclosure of demolition methods and potential impacts to the body of water in the planning document for the bridge reconstruction.

Section 402-2 "Removal of Existing Structures" of NCDOT's Standard Specifications for Roads and Structures stipulates that "excavated materials shall

not be deposited....in rivers, streams, or impoundments,” and “the dropping of parts or components of structures into any body of water will not be permitted unless there is no other practical method of removal. The removal from the water of any part or component of a structure shall be done so as to keep any resulting siltation to a minimum.” To meet these specifications, NCDOT shall adhere to Best Management Practices for the Protection of Surface Waters, as supplemented with Best Management Practices for Bridge Demolition and Removal.

In addition, all in-stream work shall be classified into one of three categories as follows:

Case 1) In-water work is limited to an absolute minimum, due to the presence of special resource waters or threatened and/or endangered species, except for the removal of the portion of the sub-structure below the water. The work is carefully coordinated with the responsible agency to protect the Special Resource Water or T&E species.

Case 2) No work at all in the water during moratorium periods associated with fish migration, spawning, and larval recruitment into nursery areas.

Case 3) No special restrictions other than those outlined in Best Management Practices for Protection of Surface Waters.

Case 3 applies to this bridge replacement project because Smith Creek has not been identified as a special resource water, is not associated with fish migration, spawning or larval recruitment, and is not known to contain any threatened or endangered species.

The stream bed in the project area is nearly all sand and gravel. Therefore, conditions in the stream do not raise sediment concerns and a turbidity curtain is not recommended.

3. Buffer Rules

As the project is located in the Neuse River Basin, Riparian Area Rules for Nutrient Sensitive Waters apply. The rules state that roads, bridges, stormwater management facilities, ponds, and utilities may be allowed where no practical alternative exists. They also state that these structures shall be located, designed, constructed, and maintained to have minimal disturbance, to provide maximum erosion protection, to have the least adverse effects on aquatic life and habitat, and to protect water quality to the maximum extent practical through the use of best management practices. Every reasonable effort will be made to avoid and minimize wetland and stream impacts. The Authorization Certificate for Neuse Buffer Impacts will be requested along with the 401 Water Quality Certification.

4. Mitigation

Because this project will likely be authorized under a Nationwide Permit, mitigation for impacts to surface waters may or may not be required by the USACE. In accordance with the Division of Water Quality Wetland Rules [15A NCAC 211 .0506 (h)] "Fill or alteration of more than one acre of wetlands will require compensatory mitigation; and fill or alteration of more than 150 linear feet (45.6 m) of streams may require compensatory mitigation." Because wetland impacts will be less than an acre, wetland mitigation likely will not be required. A total of 275 linear feet (83.3 m) of Smith Creek are located within the study corridor for the proposed project. If the final length of stream impact is greater than 150 linear feet (45.6 m), compensatory mitigation may be required.

F. Rare and Protected Species

Some populations of plants and animals are declining either as a result of natural forces or their difficulty competing with humans for resources. Rare and protected species listed for Wake County, and any likely impacts to these species as a result of the proposed project construction, are discussed in the following sections.

1. Federally Protected Species

Plants and animals with a federal classification of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended.

The USFWS lists 4 species under federal protection for Wake County as of March 2002. These species are listed in **Table 3**.

Table 3. Species Under Federal Protection for Wake County

Common Name	Scientific Name	Federal Status
Vertebrates		
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened
Red-cockaded woodpecker	<i>Picooides borealis</i>	Endangered
Invertebrates		
Dwarf wedge mussel	<i>Alasmidonta heterodon</i>	Endangered
Vascular Plants		
Michaux's sumac	<i>Rhus michauxii</i>	Endangered
Notes:	Endangered-A species that is threatened with extinction throughout all or a significant portion of its range. Threatened-A species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.	

A brief description of the characteristics and habitat requirements of each species follows, along with a conclusion regarding potential project impact.

***Haliaeetus leucocephalus* (bald eagle)**

Threatened

Family: Accipitridae
Federally Listed: 1967

A large raptor, the bald eagle has a wingspread of about 7 feet (2.12 m). Its plumage is mainly dark brown, and adults have a pure white head and tail. First year juveniles are often chocolate brown to blackish, sometimes with white mottling on the tail, belly, and underwings. The head and tail become increasingly white with age until full adult plumage is reached in the fifth or sixth year. An opportunistic predator, the bald eagle feeds primarily on fish but also takes a variety of birds, mammals, and turtles (both live and as carrion) when fish are not readily available.

The bald eagle is primarily riparian, associated with coasts, rivers, and lakes, usually nesting near bodies of water where it feeds. Selection of nesting sites varies tremendously depending on the species of trees growing in a particular area. In the Southeast, nests are constructed in dominant or codominant pines or cypress. Nests are usually constructed in living trees, but bald eagles will occasionally use dead ones.

Biological Conclusion:

No Effect

No suitable nesting sites exist within the project area. Furthermore, Smith Creek is not large enough to provide an adequate food source for bald eagles. A review of the NHP files did not reveal any records of bald eagles in the project vicinity. It can be determined that the project will not impact this threatened species.

***Picoides borealis* (red-cockaded woodpecker)**

Endangered

Family: Picidae
Federally Listed: 1970

The red-cockaded woodpecker is a small to medium sized bird about 8 inches (20.32 centimeters [cm]) long, with a wingspan of 13.8 to 14.96 inches (35 to 38 cm). There are black and white horizontal stripes on its back, and its cheeks and underparts are white. Its flanks are black streaked. The cap and stripe on the side of the neck and the throat are black. The male has a small red spot on each side of the black cap. After the first post-fledgling molt, fledgling males have a red crown patch. This woodpecker's diet is composed mainly of insects, which include ants, beetles, wood-boring insects, caterpillars, and corn earworms if available. About 16 to 18 percent of the diet includes seasonal wild fruit.

Open stands of pines with a minimum age of 80 to 120 years, depending on the site, provide suitable nesting habitat. Longleaf pines (*Pinus palustris*) are most commonly used, but other species of southern pine are also acceptable. Dense stands (stands that are primarily hardwood, or that have a dense hardwood understory) are avoided. Foraging habitat is provided in pine and pine hardwood stands 30 years old or older with foraging preference for pine trees 10 inches (25.4 cm) or larger in diameter. In good, well-stocked, pine habitat, sufficient foraging substrate can be provided on 80 to 125 acres (29.2 to 45.6 hectares).

Biological Conclusion:

No Effect

Within the project area no suitable red-cockaded woodpecker habitat exists. These birds are not associated with hardwood riparian areas or human-dominated maintained habitats. The pine plantation within the project area does not contain pine trees mature enough to contain nest cavities used by red-cockaded woodpeckers. A search of the NHP files did not reveal any records of red-cockaded woodpeckers in the project vicinity. It can be concluded that the project will not threaten this endangered species.

***Alasmidonta heterodon* (dwarf wedge mussel)**

Threatened

Family: Unionidae

Federally Listed: 1990

The dwarf wedge mussel's shell rarely exceeds 1.5 in (3.81 cm) in length. It is also the only North American freshwater mussel that has two lateral teeth on the right valve, but only one on the left (Fuller, 1977). The female's shell is inflated in the back where the marsupial gills are located. Little is known about the species' life history and reproductive cycle. Gravid females have been observed from late August until June (Clarke, 1981). Like other freshwater mussels, this species' eggs are fertilized in the female as sperm passes through its gills; the resulting larvae then attach to a fish host. Although this host is still unknown, strong evidence suggests that it is an anadromous fish which migrates from the ocean into freshwater to spawn.

The dwarf wedge mussel inhabits creek and river areas with a slow to moderate current and a sand, gravel, or muddy bottom. These areas must be nearly silt free. Four of the existing populations are located in North Carolina. One in the Little River (Johnston County); another on the Tar River (Granville County); and one each in two of the Tar River Tributaries (Franklin County).

Biological Conclusion:

No Effect

A search of the NHP files did not reveal any records of dwarf wedge mussels occurring in the project vicinity. NCDOT biologists performed surveys for the dwarf wedge mussel on August 21, 2000. No mussels were found during the

survey. Habitat in the vicinity of the bridge was determined to be somewhat degraded due to sediment loads. It can be concluded that this project will not impact this threatened species.

***Rhus michauxii* (Michaux's sumac)**

Endangered

Family: Anacardiaceae

Federally Listed: 1989

Michaux's sumac or false poison sumac is a densely hairy shrub with erect stems, which are 1 to 3 feet (0.3-0.9 m) in height. The shrub's compound leaves are narrowly winged at their base, dull on their tops, and veiny and slightly hairy on their bottoms. Each leaf is finely toothed on its edges. Flowers are greenish-yellow to white and are 4-5 parted. Each plant is unisexual. With a male plant the flowers and fruits are solitary, with a female plant all flowers are grouped in 3 to 5 stalked clusters. The plant flowers from April to June; its fruit, a dull red drupe, is produced in October and November.

Michaux's sumac grows in sandy or rocky open woods in association with basic soils. Apparently, this plant survives best in areas where some form of disturbance has provided an open area. Eleven of the plant's 16 remaining populations are on highway rights-of way, roadsides, or on the edges of artificially maintained clearings. Two other populations are in areas with periodic fires, and two more populations exist on sites undergoing natural succession. One population is situated in a natural opening on the rim of a Carolina bay. Currently, the plant survives in the following North Carolina Counties: Richmond (6 populations); Hoke (3 populations); Scotland (2 populations); Franklin (1 population); Davie (1 population); Robeson (1 population); and Wake (1 population).

Biological Conclusion:

No Effect

No habitat exists in the project area for Michaux's sumac. The soils in the project area are all acidic. A search of the NHP database found no occurrences of Michaux's sumac in the project vicinity. It can be concluded that the project will not impact this threatened species.

2. Federal Species of Concern

Federal Species of Concern (FSC) are not legally protected under the Endangered Species Act and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered. **Table 4** includes FSC species listed for Wake County and their state classifications. Organisms which are listed as Endangered (E), Threatened (T), or Special Concern (SC) on the North Carolina Natural Heritage Program list of Rare Plant and Animal Species are afforded state protection under the State Endangered Species Act and the North Carolina Plant Protection and

Conservation Act of 1979. However, the level of protection given to state-listed species does not apply to NCDOT activities.

Table 4. Federal Species of Concern in Wake County

Common Name	Scientific Name	State Status	Habitat present
Vertebrates			
Southeastern Bat *	<i>Myotis austroriparius</i>	SC	No
Bachman's Sparrow *	<i>Aimophila aestivalis</i>	SC	No
Southern Hognose Snake **	<i>Heterodon simus</i>	SR	No
Pinewoods Shiner	<i>Lythrurus matutinus</i>	SR	No
Carolina Darter	<i>Etheostoma collis lepidinion</i>	SR	No
Invertebrates			
Yellow Lance	<i>Elliptio lanceolata</i>	T	No
Atlantic Pigtoe	<i>Fusconaia masoni</i>	T	No
Green Floater	<i>Lasmigona subviridis</i>	E	No
Diana Fritillary **	<i>Speyeria diana</i>	SR	No
Vascular Plants			
Bog spicebush	<i>Lindera subcoriacea</i>	E	No
Sweet Pinesap *	<i>Monotropsis odorata</i>	C	No
Carolina Least Trillium *	<i>Trillium pusillum var pusillum</i>	E	No
Sources: Amoroso, ed., 1999; LeGrand and Hall, eds., 1999			
Key: T = Threatened, E = Endangered, SC = Special Concern, C = Candidate, SR = Significantly Rare			
* = Historic record. The species was last observed in the county more than 50 years ago.			
** = Obscure record. The date and/or location of observation is uncertain.			

Bog spicebush does not appear on the March 2002 USFWS list of protected species for Wake County, however this species is listed by the NC NHP on their website (last updated July 2001) as a Federal Species of Concern. John Finnegan, Data Systems Manager of the NC NHP, stated on August 21, 2001 that the NC NHP has one record of bog spicebush from northern Wake County in 1997. For this reason the bog spicebush remains on Table 4.

No FSC species were observed during the site visit. No FSC species are recorded by the NHP as occurring within two miles of the project site.

3. Summary of Anticipated Impacts

No impacts to federally protected species are anticipated.

VI. CULTURAL RESOURCES

A. Compliance Guidelines

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, implemented by the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800. Section 106 requires that for federally funded, licensed, or permitted projects having an effect on properties listed in or eligible for the National Register of Historic Places, the Advisory Council on Historic Preservation be given the opportunity to comment.

B. Historic Architecture

A field survey of the Area of Potential Effect (APE) was conducted. All structures within the APE were photographed, and later reviewed by the State Historic Preservation Office (SHPO). In a concurrence form dated February 17, 2000, the SHPO concurred that there are no historic architectural resources either listed in or eligible for listing in the National Register of Historic Places within the APE. A copy of the concurrence form is included in the appendix.

C. Archaeology

The SHPO in a memorandum dated November 16, 2000 recommended that archaeological site 31WA305** be investigated for National Register eligibility. The investigation resulted in a determination that the site is not eligible for listing in the National Register. The SHPO concurred with the finding in their April 25, 2002 memorandum; which is included in the appendix to this categorical exclusion.

VII. ENVIRONMENTAL EFFECTS

Anticipated impacts to the resources in the project area are described in this section. The project is considered to be a Federal "Categorical Exclusion" because of its limited scope and insignificant environmental consequences. The project is expected to have an overall positive impact. Replacement of an inadequate bridge will result in safer traffic operations.

The project is not in conflict with any plan, existing land use, or zoning regulation. No significant change in land use is expected to result from construction of the project.

No adverse effect on public facilities or services is anticipated. The project is not expected to adversely affect social, economic, or religious opportunities in the area.

No adverse effect on families or communities is anticipated. Right-of-way acquisition will be limited. There are no relocations.

There are no publicly owned parks, recreational facilities, or wildlife and waterfowl refuges of national, state, or local significance in the vicinity of the project.

The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impacts to prime and important farmland soils by all land acquisition and construction projects. Prime and important farmland soils are defined by the U.S. Natural Resources Conservation Service. No prime or important farmlands will be impacted by the proposed project. In addition, the proposed project is anticipated to be limited to the existing right of way, and the land use adjacent to the project is residential.

This project is an air quality "neutral" project, so it is not required to be included in the regional emission analysis (if applicable) and a project level CO analysis is not required. The project is located in Wake County, which is within the Raleigh-Durham nonattainment area for ozone (O₃) and carbon monoxide (CO) as defined by the EPA. The 1990 Clean Air Act Amendments (CAAA) designated these areas as "moderate" nonattainment area for O₃ and CO. However, due to improved monitoring data, these areas were redesignated as "maintenance" for O₃ on June 17, 1994 and "maintenance" for CO on September 18, 1995. Section 176(c) of the CAAA requires that transportation plans, programs, and projects conform to the intent of the state air quality implementation plan (SIP). The current SIP does not contain any transportation control measures for Wake County. The Capital Area 2025 Long Range Transportation Plan (LRTP) and the 2002-2008 Metropolitan Transportation Improvement Program (MTIP) has been determined to conform to the intent of the SIP. The USDOT air quality conformity approval for the LRTP was August 20, 1999 and the USDOT air quality conformity approval for the MTIP was October 1, 2001. The current conformity determination is consistent with the final conformity rule found in 40 CFR Parts 51 and 93. There has been no significant changes in the project's design concept or scope, as used in the conformity analyses.

Traffic volumes will not increase or decrease because of this project. There are no receptors located in the immediate project area. The project's impact on noise and air quality will not be significant.

Noise levels could increase during construction but will be temporary. If vegetation is disposed of by burning, all burning shall be done in accordance with applicable local laws and regulations of the North Carolina SIP for air quality

in compliance with 15 NAACO 2D.0520. This evaluation completes the assessment requirements for highway traffic noise (23 CFR Part 772) and for air quality (1990 CAAA and NEPA), and no additional reports are required.

An examination of records at the North Carolina Department of Environment and Natural Resources, Division of Water Quality, Groundwater Section, and the Division of Waste Management revealed neither underground storage tanks, hazardous waste sites, regulated or unregulated landfills, nor dump sites in the project area.

Wake County is a participant in the National Flood Insurance Program (NFIP). Flood Insurance Study maps for Wake County show that Bridge No. 125 is located in a FEMA 100-year floodplain. Replacement of this bridge is not expected to affect the 100-year floodplain. The hydraulic opening of the proposed bridge is greater than that of the existing bridge.

On the basis of the above discussions, it is concluded that no significant adverse environmental effects will result from implementation of this project.

VIII. PUBLIC INVOLVEMENT

A Citizens Informational Workshop was held from 4:00 p.m. to 7:00 p.m. on May 1, 2002, at the Wakefield Middle School. The Citizens Informational Workshop was a "drop-in" style workshop giving citizens an opportunity to meet "one-on-one" with project team member to ask questions and provide comments. The workshop was announced through "Notice of a Citizens Informational Workshop" in the *News and Observer* on April 18, 21, and 28; *La Conexion* April 22 and 29; the *Independent Weekly* on April 17 and 24. A Press Release was issued on April 24 and posted on the NCDOT website. A newsletter was mailed to property owners in the project area.

Comments received at the workshop and later by mail expressed concern about the magnitude of community and commuter disruption that **Alternative 3** may provide.

IX. AREAS OF CONTROVERSY

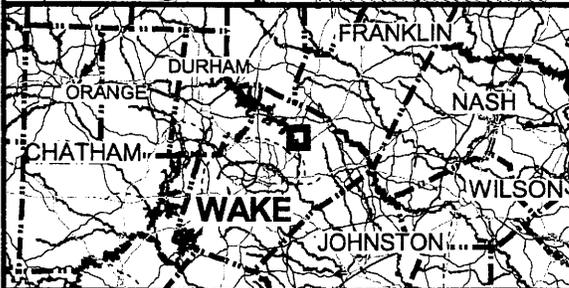
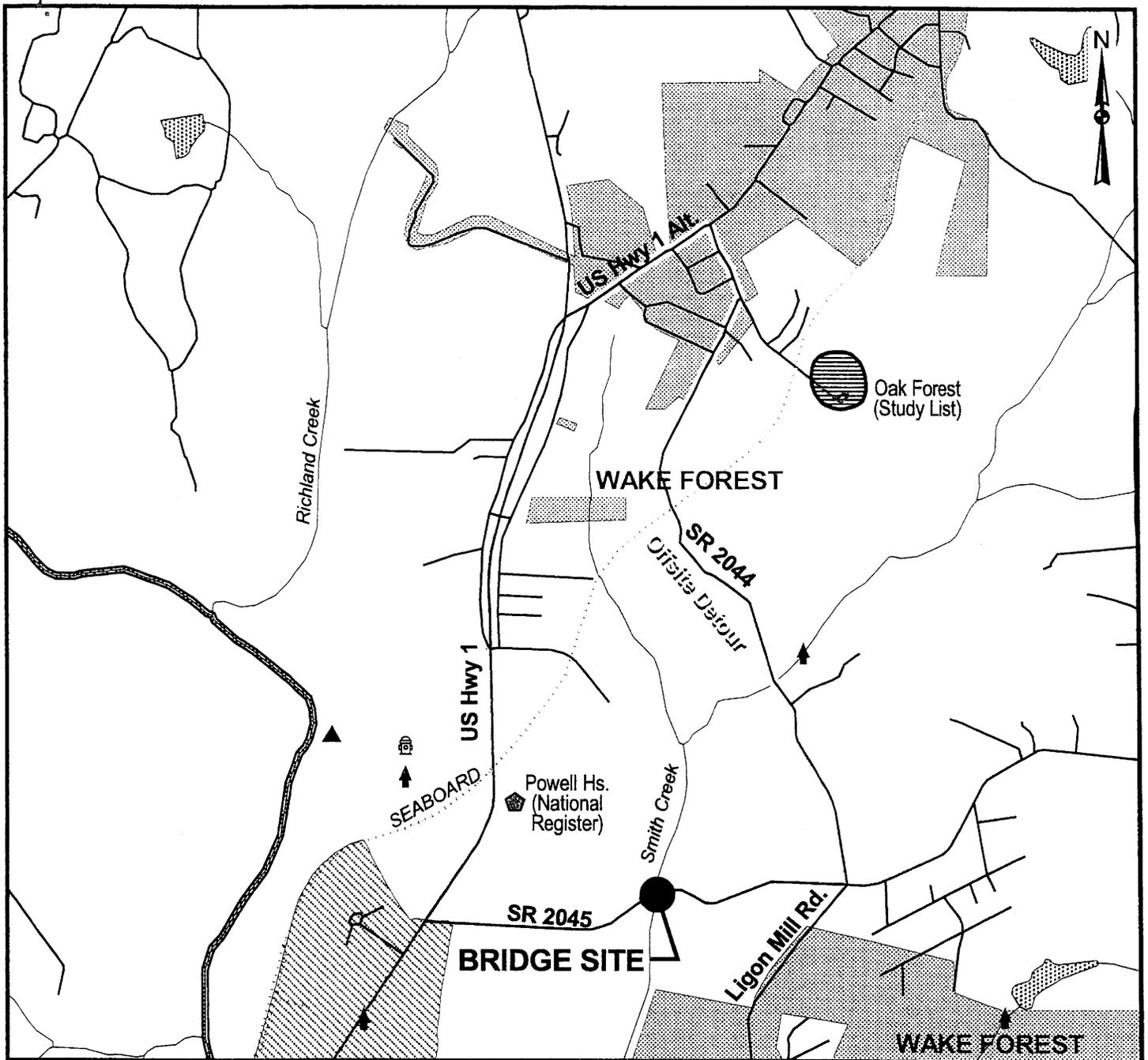
There are no areas of controversy on this project.

X. AGENCY COMMENTS

United States Department of Agriculture: Natural Resource Conservation Service. The Natural Resource Conservation Service has no comment at this time.

North Carolina Wildlife Resources Commission. The Wildlife Resource Commission conducted a review of the project and is not aware of any threatened or endangered species in the project vicinity. In addition, they had several general comments.

FIGURES



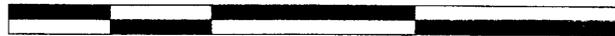
North Carolina - Department of Transportation
Division of Highways
Project Development and Environmental Analysis Branch

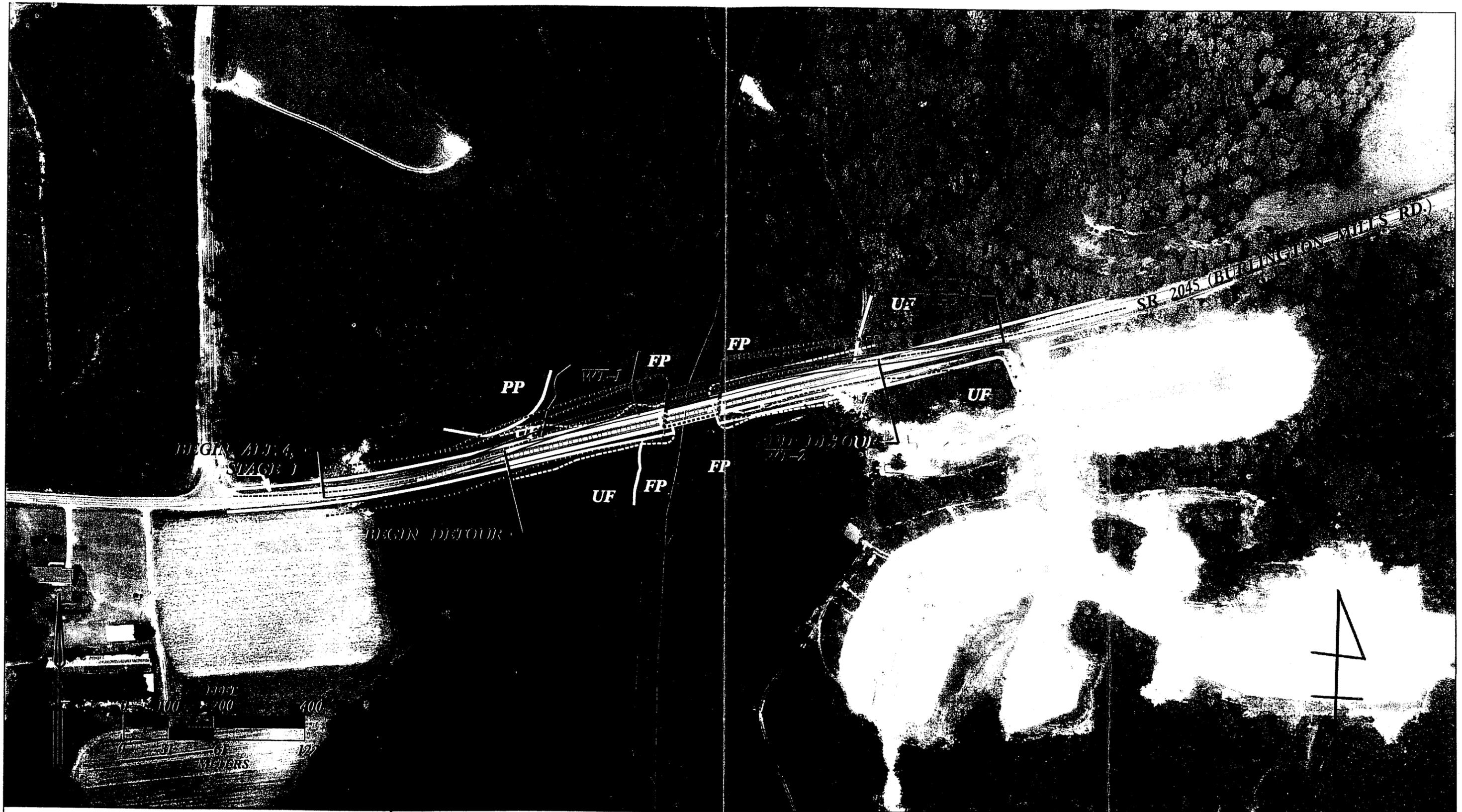
FIGURE 1
VICINITY MAP

REPLACEMENT OF BRIDGE NUMBER 125
ON SR 2045 OVER SMITH CREEK
WAKE COUNTY
TIP NO. B-3705



0.5 0 0.5 1 Miles





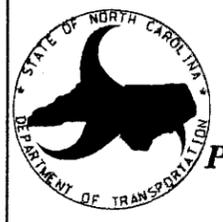
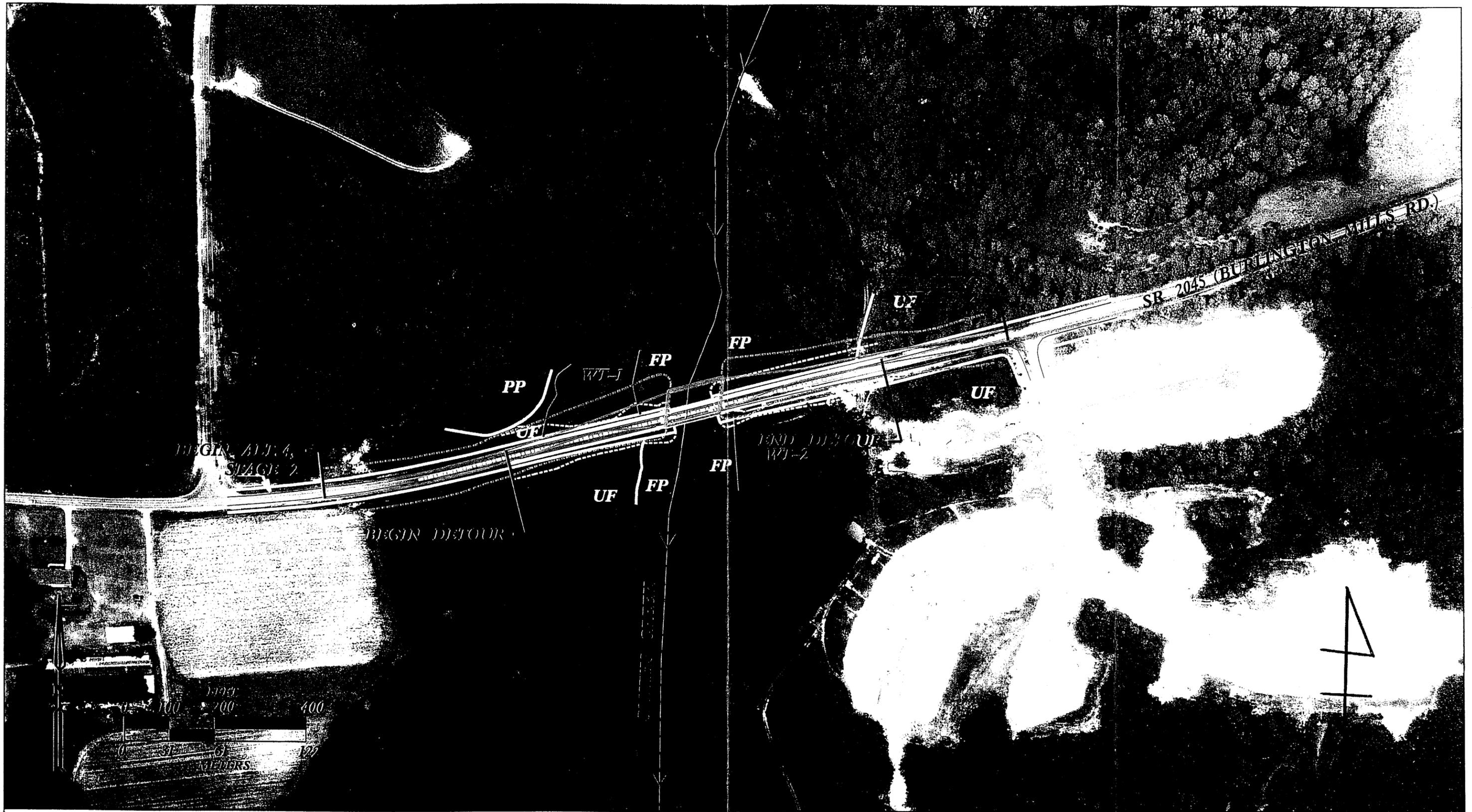

 North Carolina Department of
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FUNCTIONAL DESIGN

LEGEND

-----	Alt. 4, Stage 1, Centerline	-----	Detour, Centerline
———	Alt. 4, Stage 1, Edge of Pavement	-----	Detour, Edge of Pavement
---	Alt. 4, Stage 1, Construction Limits	-----	Detour, Construction Limits

FIGURE 2b
ALTERNATIVE 4, STAGE 1
REPLACEMENT OF BRIDGE NO. 125
ON SR 2045 OVER
SMITHS CREEK
WAKE COUNTY
TIP NO. B-3705

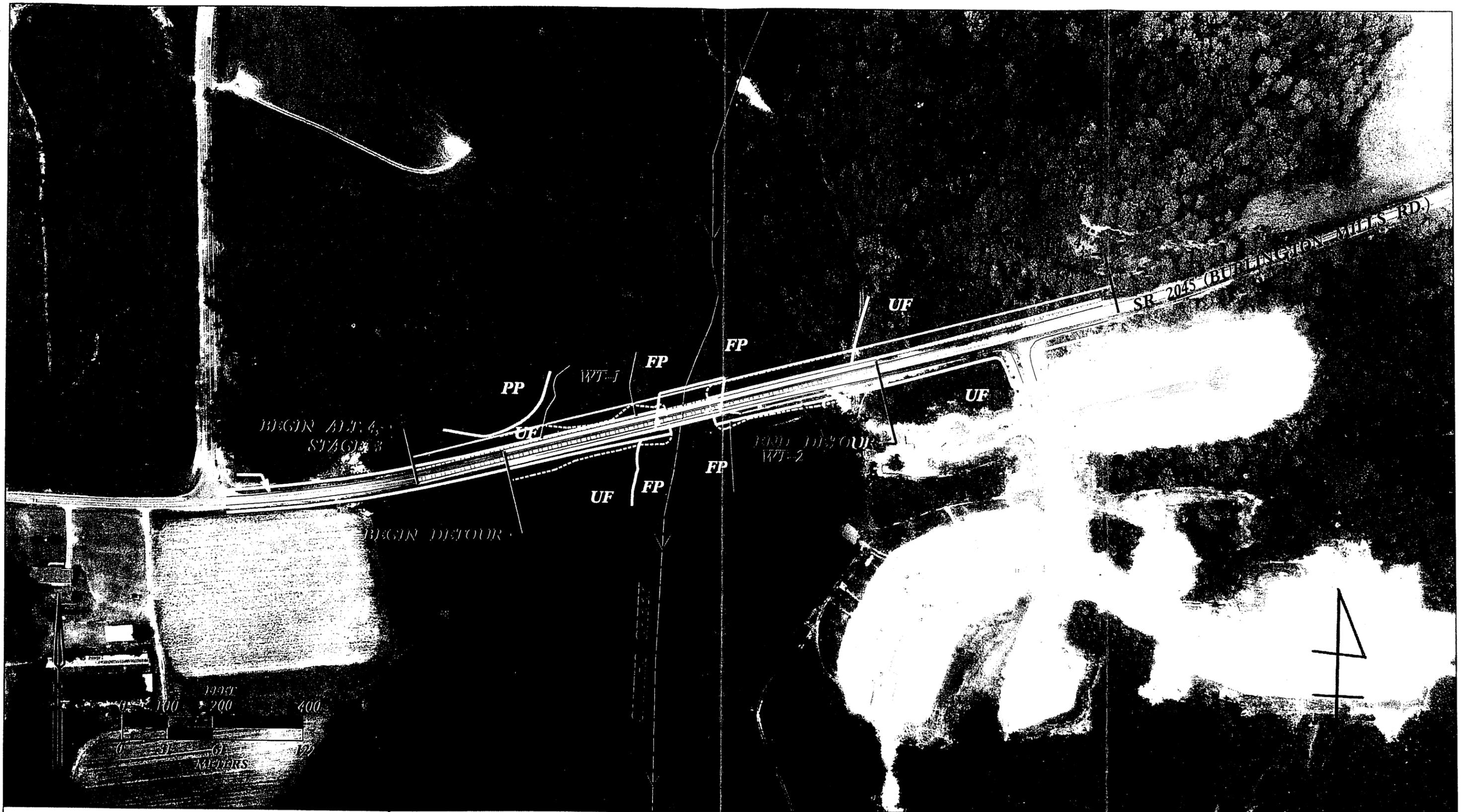


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**FUNCTIONAL DESIGN
 LEGEND**

- Alt. 4, Stage 2, Centerline
- Alt. 4, Stage 2, Edge of Pavement
- Alt. 4, Stage 2, Construction Limits
- Detour, Centerline
- Detour, Edge of Pavement
- Detour, Construction Limits

FIGURE 2c
ALTERNATIVE 4, STAGE 2
REPLACEMENT OF BRIDGE NO. 125
ON SR 2045 OVER
SMITHS CREEK
WAKE COUNTY
TIP NO. B-3705



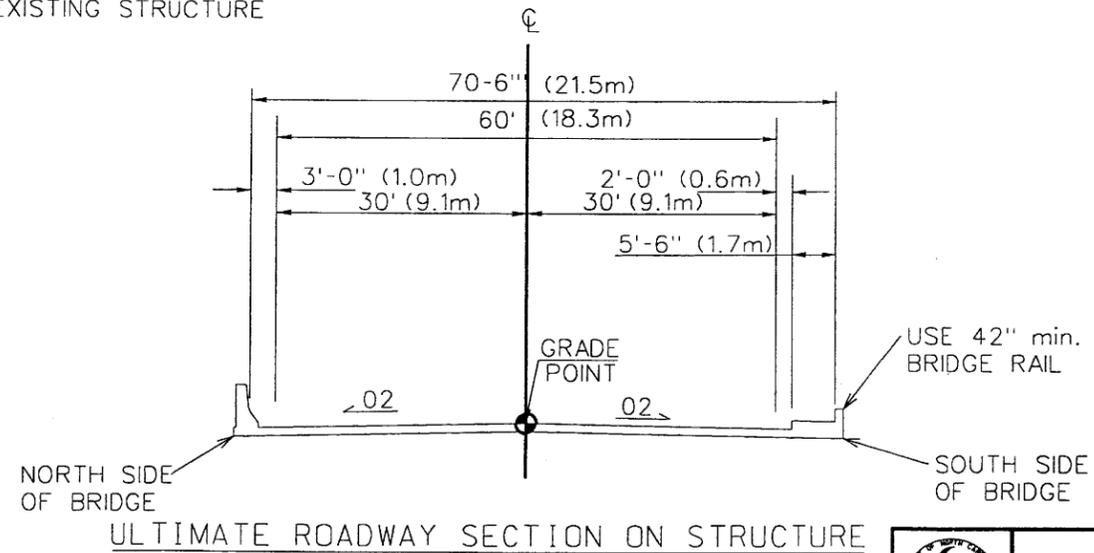
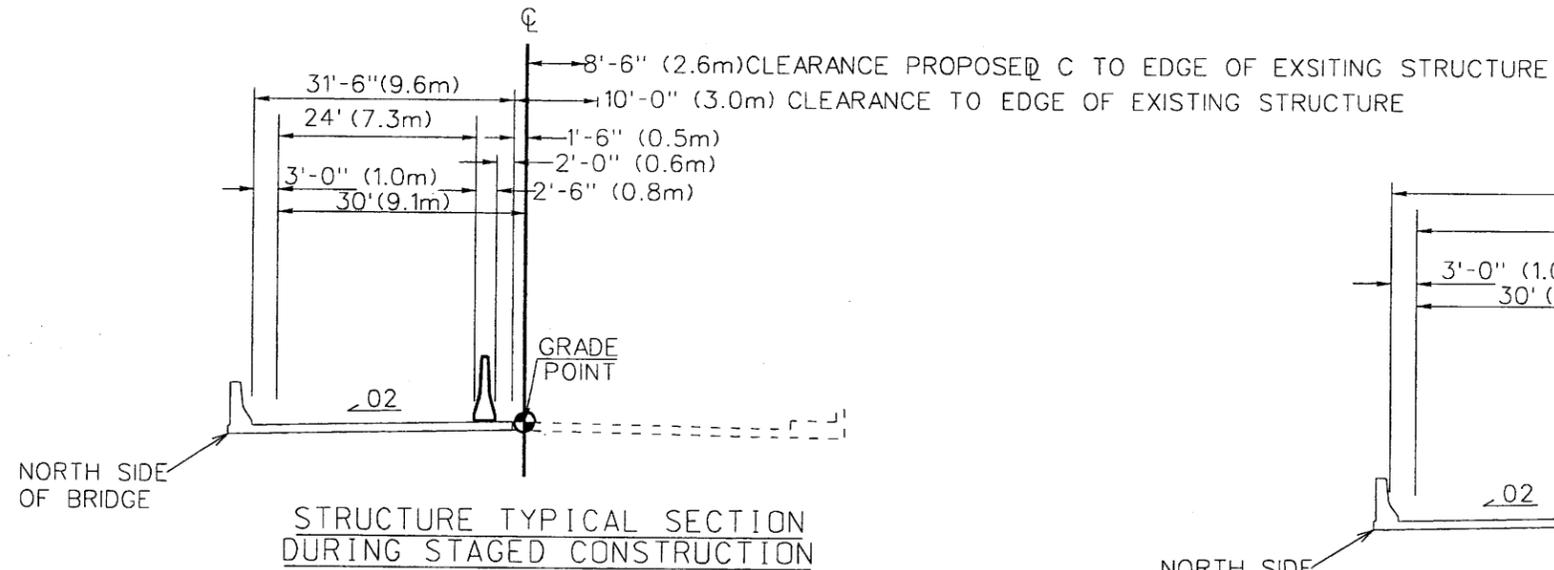
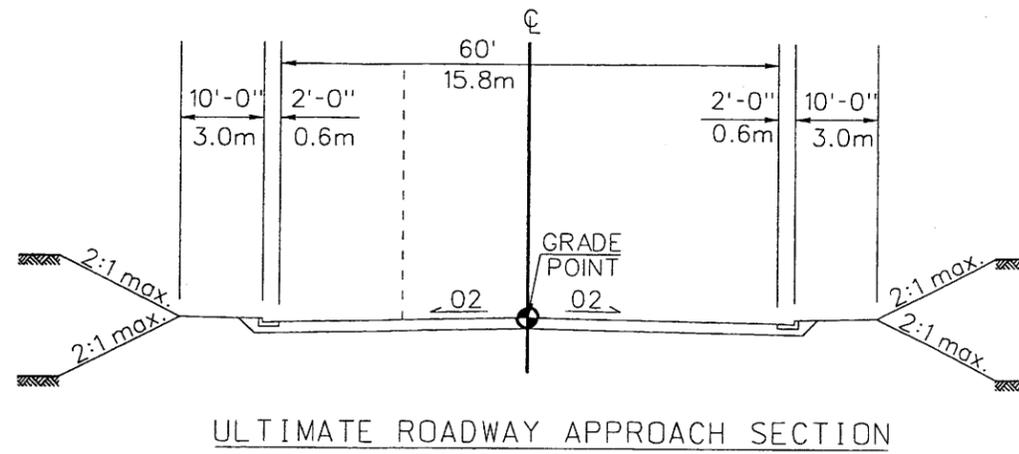
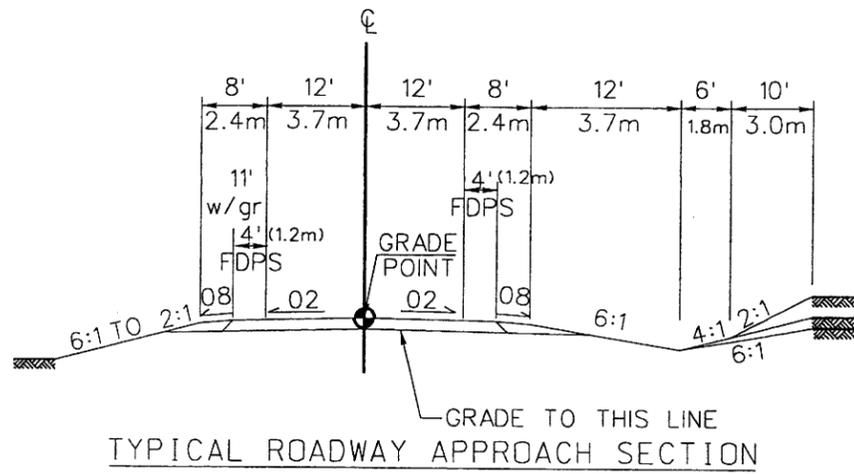

 North Carolina Department of
 Transportation
 Division of Highways
 Project Development & Environmental
 Analysis Branch

FUNCTIONAL DESIGN

LEGEND

<p>Alt. 4, Stage 3, Centerline</p> <p>Alt. 4, Stage 3, Edge of Pavement</p>	<p>Detour, Centerline</p> <p>Detour, Edge of Pavement</p> <p>Detour, Construction Limits</p>
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FIGURE 2d
ALTERNATIVE 4, STAGE 3
REPLACEMENT OF BRIDGE NO. 125
ON SR 2045 OVER
SMITHS CREEK
WAKE COUNTY
TIP NO. B-3705



TRAFFIC DATA

ADT 2002	7900
ADT 2025	15000
DUAL	2%
TTST	1%

FUNCTIONAL CLASSIFICATION: RURAL COLLECTOR (MINOR)

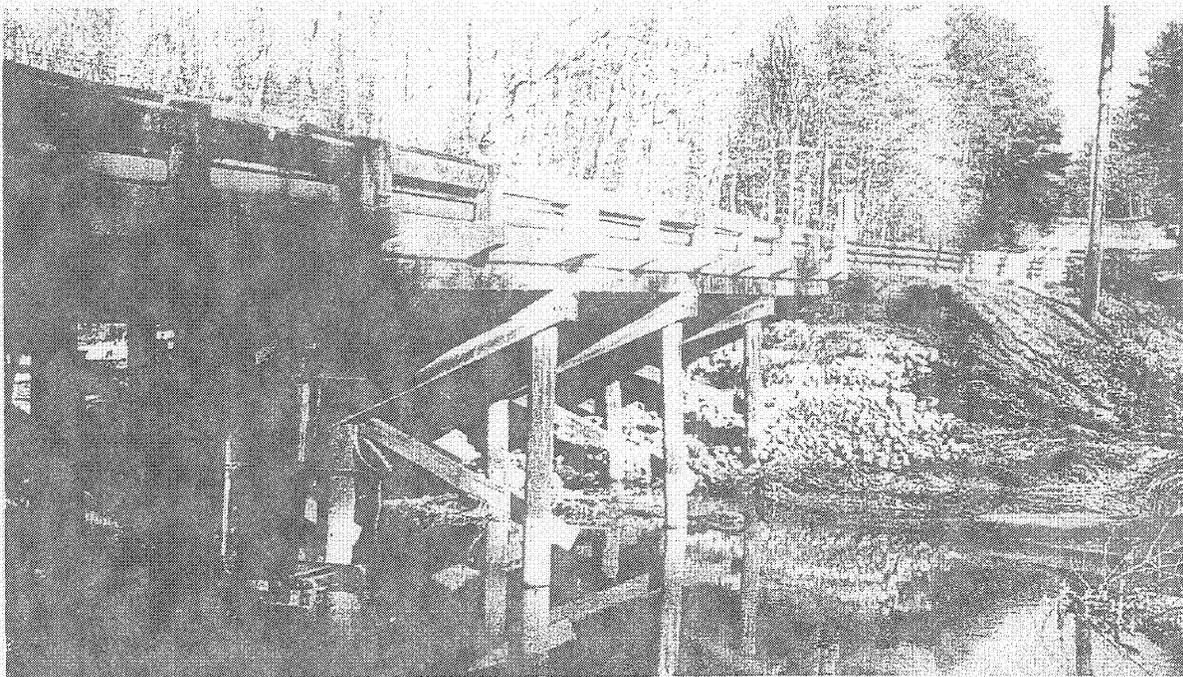


NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND
ENVIRONMENTAL ANALYSIS BRANCH

WAKE COUNTY
BRIDGE NO. 125 ON SR 2045
OVER SMITHS CREEK
TIP B-3705
TYPICAL SECTION
ALT. 4 (STAGE)

FIGURE 3b

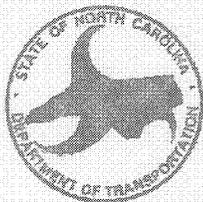
NOT TO SCALE



Looking at the bridge from the downstream side.

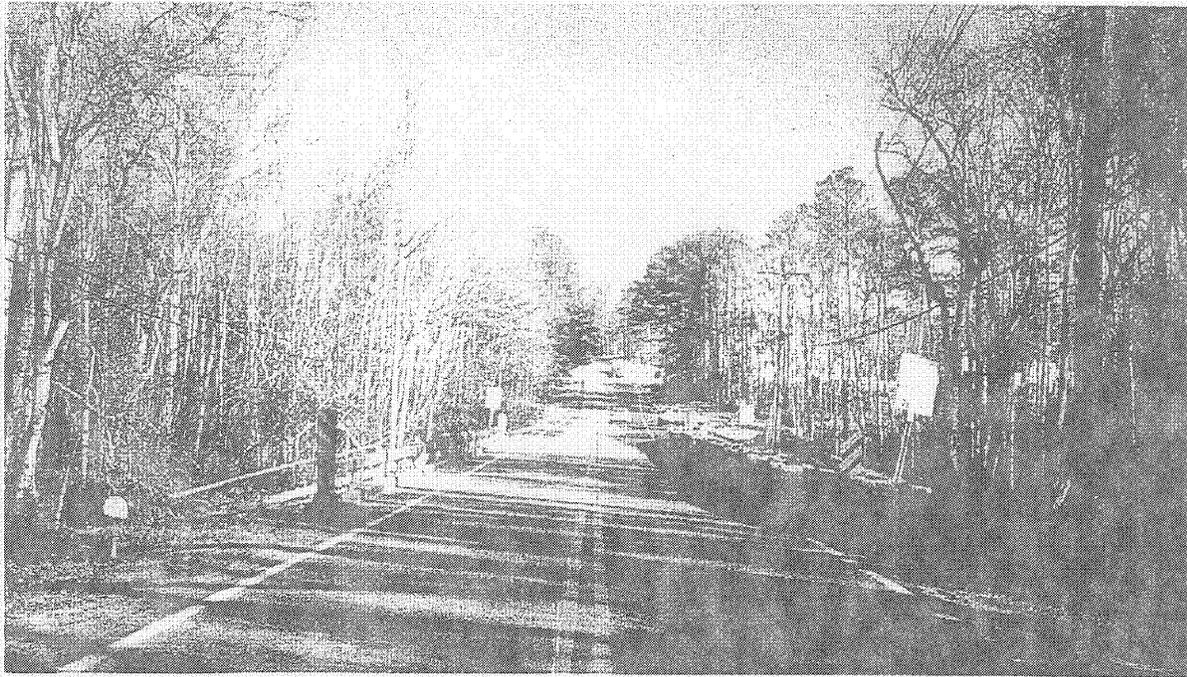


Looking downstream from the bridge.



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Environmental Analysis Branch

FIGURE 4a
REPLACEMENT OF BRIDGE NUMBER 125
ON SR 2045 OVER SMITHS CREEK
WAKE COUNTY
TIP NO. B-3705



Looking east at the bridge.



Looking upstream from the bridge.



North Carolina – Department of Transportation
Division of Highways
Project Development and
Environmental Analysis Branch

FIGURE 4b
REPLACEMENT OF BRIDGE NUMBER 125
ON SR 2045 OVER SMITHS CREEK
WAKE COUNTY
TIP NO. B-3705

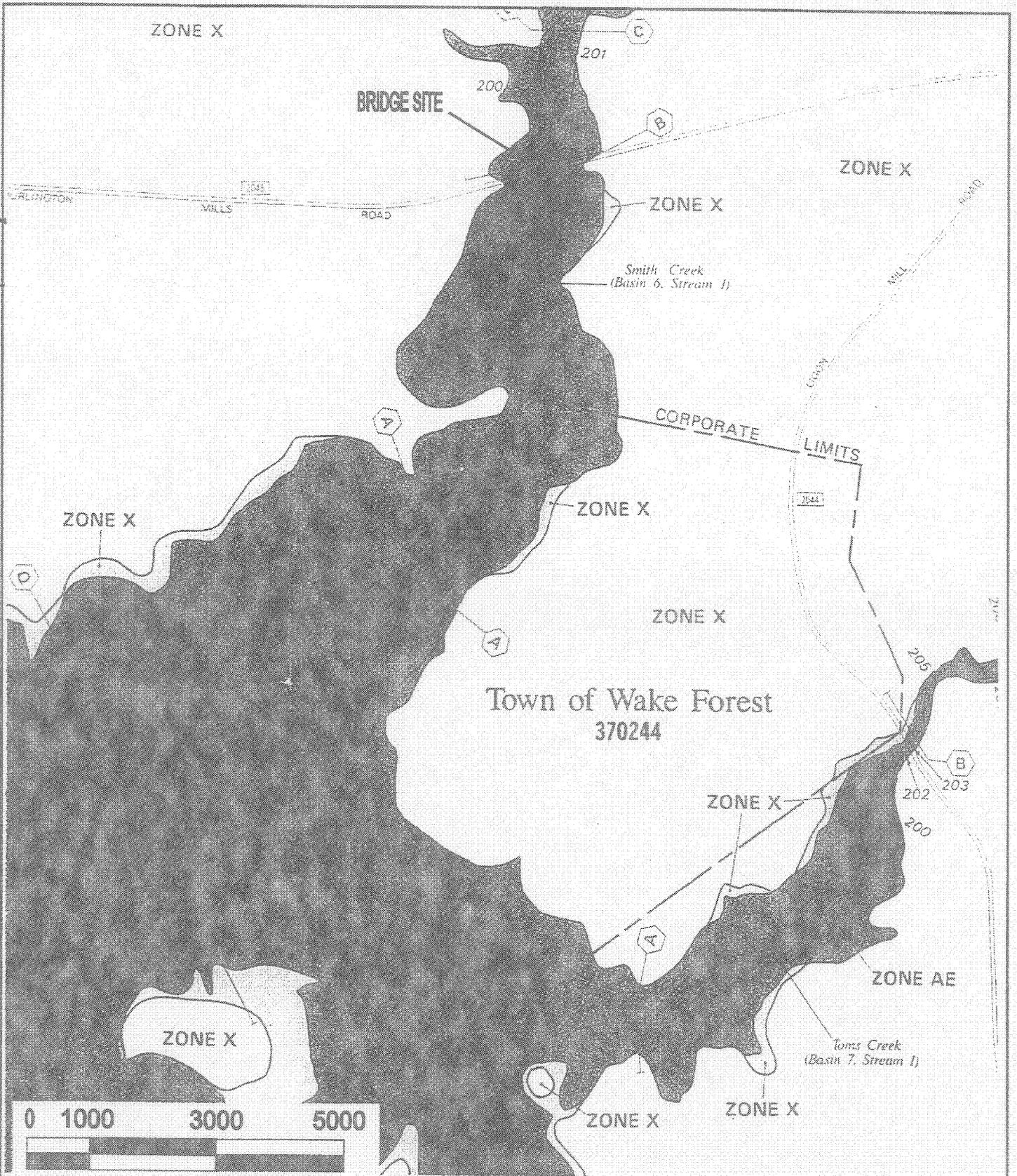


FIGURE 5
 FEMA 100 - YEAR FLOODPLAIN MAP
 REPLACEMENT OF BRIDGE NUMBER 125
 ON SR 2045 OVER FLAT CREEK
 WAKE COUNTY
 TIP NO. B-3705



North Carolina - Department of
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 Division of Highways
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 Environmental Analysis Branch

APPENDIX



United States
Department of
Agriculture

October 30, 2000

Natural
Resources
Conservation
Service

405 Bland Rd.
Suite 205
Raleigh, NC 27609

Mr. John Conforti
Project Development & Environmental Analysis Branch
1548 Mail Service Center
Raleigh, NC 27699-1548

(919) 873-2134

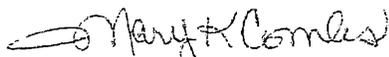
Dear Mr. Conforti:

Thank you for the opportunity to provide comments on Bridge Group XXVIII bridge replacement projects listed below:

TIP Project No.	County	Bridge Number	Road Carried	Stream Crossed
B-3643	Granville	72	SR1004 (Providence Rd.)	Hachers Run
B-3644	Granville	226	SR1120 (Veasey Rd.)	Knap of Reeds Creek
B-3645	Granville	201	SR 1435 (Davis Chapel Rd.)	Little Grassy Creek
B-3653	Halifax	162	SR1450 (Branch Rd.)	Chockoyotte Creek
B-3853	Halifax	82	NC561	Marsh Swamp
B-3702	Vance	19	SR 1305 (Barker Rd.)	Flat Creek
B-3915	Vance	21	SR 1303 (Hicksboro Rd.)	Flat Creek
B-3521	Wake	273	SR 1006 (Old Stage Rd.)	Middle Creek
B-3523	Wake	525	SR 1300 (Kildaire Farm Rd.)	Swift Creek
B-3530	Wake	174	SR 2320 (Riley Hill Rd.)	Buffalo Creek
B-3703	Wake	317	SR 1404 (Johnson Pond Rd.)	Middle Creek
B-3704	Wake	108	SR 1834 (Norwood Rd.)	Lower Bartons Creek
B-3705	Wake	125	SR 2045 (Burlington Mills Rd.)	Smiths Creek
B-3917	Wake	311	SR 1379 (Penny Rd.)	Lake Wheeler (Swift Cr.)
B-3918	Wake	127	SR 2044 (Ligon Mill Rd.)	Tom Creek

The Natural Resources Conservation Service does not have any comments at this time.

Sincerely,


Mary K. Combs
State Conservationist

B-3705



☒ North Carolina Wildlife Resources Commission ☒

Charles R. Fullwood, Executive Director

TO: Yvonne G. G. Howell, PE
Earth Tech

FROM: David Cox, Highway Project Coordinator
Habitat Conservation Program *David Cox*

DATE: October 8, 2001

SUBJECT: NCDOT Bridge Replacements in Granville, Halifax, Vance, and Wake counties of North Carolina. TIP Nos. B-3643, B-3644, B-3645, B-3653, B-3853, B-3702, B-3915, B-3521, B-3523, B-3530, B-3703, B-3704, B-3705, B-3917, and B-3918.

Biologists with the N. C. Wildlife Resources Commission (NCWRC) have reviewed the information provided and have the following preliminary comments on the subject project. Our comments are provided in accordance with provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

On bridge replacement projects of this scope our standard recommendations are as follows:

1. We generally prefer spanning structures. Spanning structures usually do not require work within the stream and do not require stream channel realignment. The horizontal and vertical clearances provided by bridges allows for human and wildlife passage beneath the structure, does not block fish passage, and does not block navigation by canoeists and boaters.
2. Bridge deck drains should not discharge directly into the stream.
3. Live concrete should not be allowed to contact the water in or entering into the stream.
4. If possible, bridge supports (bents) should not be placed in the stream.
5. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain

Bridge Memo

2

October 8, 2001

saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to revegetate naturally and minimizes disturbed soil.

6. A clear bank (riprap free) area of at least 10 feet should remain on each side of the stream underneath the bridge.
7. In trout waters, the N.C. Wildlife Resources Commission reviews all U.S. Army Corps of Engineers nationwide and general '404' permits. We have the option of requesting additional measures to protect trout and trout habitat and we can recommend that the project require an individual '404' permit.
8. In streams that contain threatened or endangered species, NCDOT biologist Mr. Tim Savidge should be notified. Special measures to protect these sensitive species may be required. NCDOT should also contact the U.S. Fish and Wildlife Service for information on requirements of the Endangered Species Act as it relates to the project.
9. In streams that are used by anadromous fish, the NCDOT official policy entitled "Stream Crossing Guidelines for Anadromous Fish Passage (May 12, 1997)" should be followed.
10. In areas with significant fisheries for sunfish, seasonal exclusions may also be recommended.
11. Sedimentation and erosion control measures sufficient to protect aquatic resources must be implemented prior to any ground disturbing activities. Structures should be maintained regularly, especially following rainfall events.
12. Temporary or permanent herbaceous vegetation should be planted on all bare soil within 15 days of ground disturbing activities to provide long-term erosion control.
13. All work in or adjacent to stream waters should be conducted in a dry work area. Sandbags, rock berms, cofferdams, or other diversion structures should be used where possible to prevent excavation in flowing water.
14. Heavy equipment should be operated from the bank rather than in stream channels in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into streams.
15. Only clean, sediment-free rock should be used as temporary fill (causeways), and should be removed without excessive disturbance of the natural stream bottom when construction is completed.
16. During subsurface investigations, equipment should be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.

If corrugated metal pipe arches, reinforced concrete pipes, or concrete box culverts are used:

1. The culvert must be designed to allow for fish passage. Generally, this means that the culvert or pipe invert is buried at least 1 foot below the natural stream bed. If multiple cells are required the second and/or third cells should be placed so that their bottoms are at stream bankfull stage (similar to Lyonsfield design). This could be

Bridge Memo

3

October 8, 2001

accomplished by constructing a low sill on the upstream end of the other cells that will divert low flows to another cell. This will allow sufficient water depth in the culvert or pipe during normal flows to accommodate fish movements. If culverts are long, notched baffles should be placed in reinforced concrete box culverts at 15 foot intervals to allow for the collection of sediments in the culvert, to reduce flow velocities, and to provide resting places for fish and other aquatic organisms moving through the structure.

2. If multiple pipes or cells are used, at least one pipe or box should be designed to remain dry during normal flows to allow for wildlife passage.
3. Culverts or pipes should be situated so that no channel realignment or widening is required. Widening of the stream channel at the inlet or outlet of structures usually causes a decrease in water velocity causing sediment deposition that will require future maintenance.
4. Riprap should not be placed on the stream bed.

In most cases, we prefer the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour should be designed and located to avoid wetland impacts, minimize the need for clearing and to avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure should be removed and the approach fills removed from the 100-year floodplain. Approach fills should be removed down to the natural ground elevation. The area should be stabilized with grass and planted with native tree species. If the area that is reclaimed was previously wetlands, NCDOT should restore the area to wetlands. If successful, the site may be used as wetland mitigation for the subject project or other projects in the watershed.

Project specific comments:

1. B-3643 - Granville County - Bridge No. 72 over Hatchers Run. Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.
2. B-3644 - Granville County - Bridge No. 226 over Knap of Reeds Creek. NCDOT should be aware that NCWRC has designated NCWRC gamelands in the vicinity of this bridge. Impacts to gameland properties should be avoided. There are also records of state listed mussels upstream of the project. Therefore, due to the potential for impacts to listed species we request that NCDOT perform a mussel survey prior to the construction of this bridge.
3. B-3645 - Granville County - Bridge No. 201 over Little Grassy Creek. Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.
4. B-3653 - Halifax County - Bridge No. 162 over Chockoyotte Creek. Due to the potential for anadromous fish at this location, NCDOT should closely follow the "Stream Crossing Guidelines for Anadromous Fish Passage". This includes an in-water work moratorium from February 15 to June 15. We are not aware of any threatened or endangered species in the project vicinity. Standard comments apply.
5. B-3853 - Halifax County - Bridge No. 82 over Marsh Swamp. Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.

Bridge Memo

4

October 8, 2001

6. B-3702 - Vance County - Bridge No. 19 over Flat Creek. Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.
7. B-3915 - Vance County - Bridge No. 21 over Flat Creek. Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.
8. B-3521 - Wake County - Bridge No. 273 over Middle Creek. Due to the potential for anadromous fish at this location, NCDOT should closely follow the "Stream Crossing Guidelines for Anadromous Fish Passage". This includes an in-water work moratorium from February 15 to June 15. There are also records of state listed mussels upstream of the project. Therefore, due to the potential for impacts to listed species we request that NCDOT perform a mussel survey prior to the construction of this bridge. Standard comments apply.
9. B-3523 - Wake County - Bridge No. 525 over Swift Creek. Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.
10. B-3530 - Wake County - Bridge No. 174 over Buffalo Creek. Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.
11. B-3703 - Wake County - Bridge No. 317 over Middle Creek. There are records of state listed mussels upstream of the project. Therefore, due to the potential for impacts to listed species we request that NCDOT perform a mussel survey prior to the construction of this bridge. Standard comments apply.
12. B-3704 - Wake County - Bridge No. 108 over Lower Bartons Creek. Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.
13. B-3705 - Wake County - Bridge No. 125 over Smiths Creek. Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.
14. B-3917 - Wake County - Bridge No. 311 over Lake Wheeler (Swift Creek). Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.
15. B-3918 - Wake County - Bridge No. 127 over Tom Creek. Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.

We request that NCDOT routinely minimize adverse impacts to fish and wildlife resources in the vicinity of bridge replacements. The NCDOT should install and maintain sedimentation control measures throughout the life of the project and prevent wet concrete from contacting water in or entering into these streams. Replacement of bridges with spanning structures of some type, as opposed to pipe or box culverts, is recommended in most cases. Spanning structures allow wildlife passage along streambanks, reducing habitat fragmentation and vehicle related mortality at highway crossings.

If you need further assistance or information on NCWRC concerns regarding bridge replacements, please contact me at (919) 528-9886. Thank you for the opportunity to review and comment on these projects.



North Carolina Department of Cultural Resources

State Historic Preservation Office

David L. S. Brook, Administrator

James B. Hunt Jr., Governor
Betty Ray McCain, Secretary

Division of Archives and History
Jeffrey J. Crow, Director

November 16, 2000

MEMORANDUM

TO: William D. Gilmore, PE, Manager
Project Development & Environmental Analysis Branch
NC Department of Transportation

FROM: David Brook *for David Brook*
Deputy State Historic Preservation Officer

RE: Replacement of Bridge #125 on SR 2045 over Smiths Creek
B-3705, Wake County, ER01-7794, Bridge Group XXVIII

Thank you for your memorandum of October 2, 2000 concerning the above project.

We have conducted a search of our files and are aware of no structures of historical or architectural importance located within the planning area.

Historic period archaeological site 31WA305** is located north of the existing bridge and may be affected by the proposed replacement project. Since this site has not been evaluated for National Register eligibility, we recommend that your staff archaeologists relocate site 31WA305** and conduct investigations sufficient to determine eligibility if the site will be affected by the proposed bridge replacement.

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

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, Environmental Review Coordinator, at 919/733-4763.

cc: Tom Padgett

3705

	Location	Mailing Address	Telephone/Fax
ADMINISTRATION	507 N. Blount St., Raleigh NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919) 733-4763 • 733-8653
ARCHAEOLOGY	421 N. Blount St., Raleigh NC	4619 Mail Service Center, Raleigh NC 27699-4619	(919) 733-7342 • 715-2671
RESTORATION	515 N. Blount St., Raleigh NC	4613 Mail Service Center, Raleigh NC 27699-4613	(919) 733-6547 • 715-4801
SURVEY & PLANNING	515 N. Blount St., Raleigh NC	4618 Mail Service Center, Raleigh NC 27699-4618	(919) 733-6545 • 715-4801



North Carolina Department of Cultural Resources
State Historic Preservation Office

David L. S. Brook, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary
Office of Archives and History

Division of Historical Resources
David J. Olson, Director

April 25, 2002

MEMORANDUM

TO: William D. Gilmore, Manager
Project Development and Environmental Analysis Branch
NCDOT Division of Highways

FROM: David Brook *David Brook*

SUBJECT: Archaeological Survey and Evaluation of Bridge No. 125 on SR 2045 over Smiths Creek,
Federal # BRZ-2045(1), 8.2408001, B-3705, Wake County, ER 01-7794 and ER 02-9331



Thank you for your letter of March 14, 2002, transmitting the survey report by Nick Bon-Harper of Legacy Research Associates, Inc. for the above project.

For purposes of compliance with Section 106 of the National Historic Preservation Act, we concur that the following property is not eligible for listing in the National Register of Historic Places under criterion D:

31WA1525

This site lacks subsurface integrity, yielded no diagnostic lithic or ceramic material and is unlikely to contribute substantive information concerning prehistoric occupation of the area.

Archaeological site 31WA305** is located outside the Area of Potential Effect (APE) and therefore, warrants no additional archaeological investigation in connection with this project. While we concur with the author's recommendations for no additional investigation for this bridge replacement project, there are specific concerns and corrections that need to be addressed in preparation of the final report. These are attached for the author's information.

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

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above-referenced tracking number.

cc: Matt Wilkerson, NCDOT
Deborah Joy, Legacy Research Associates, Inc.

	Location	Mailing Address	Telephone/Fax
Administration	507 N. Blount St, Raleigh, NC	4617 Mail Service Center, Raleigh 27699-4617	(919) 733-4763 • 733-8653
Restoration	515 N. Blount St, Raleigh, NC	4613 Mail Service Center, Raleigh 27699-4613	(919) 733-6547 • 715-4801
Survey & Planning	515 N. Blount St, Raleigh, NC	4618 Mail Service Center, Raleigh 27699-4618	(919) 733-4763 • 715-4801

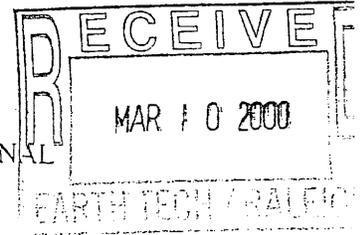
Specific Comments, Archaeological Survey Report
Replacement of Bridge No. 125 over Smiths Creek, B-3705
Wake County, ER 01-7794 and ER 02-9331

1. The archaeological site forms should not be double-sided. While this does save paper, double-sided forms do not microfilm legibly.
2. A short form should be used for site 31WA305** revisit, not an amateur site form. We will be happy to supply them if needed.
3. Page 5: The survey of the Raleigh-Durham Airport was 7200 acres, not 72,000 acres.
4. Page 7: Cantley 1992; Claggett & Cable 1982; Cultural Resource Group 1990; Eastman and Lautzenheiser 1992; Gossett & Gossett 1975, McCormick 1970; Gunn et al 1997a-b; and Little-Stokes 1979 are all compliance related reports.
5. The projects and sites described in Claggett & Cable 1982 and McCormick 1970 are located in Chatham County, not Wake.
6. There are more appropriate references for use as the basis for the prehistoric background section for this project than Purrington 1983 and Bass 1977.
7. Page 8: Margaret Wake Tryon was the wife of the last royal governor of the North Carolina colony, not the "wife of the states (sic) first governor."
8. Page 9: Paragraphs 4 and 5 under Survey Methodology give conflicting information concerning the number of shovel tests excavated.
9. The amount of acreage surveyed should be included in the report.
10. The entire report needs extensive editing

Federal Aid #BRZ2045(1)

TIP #B-3705

County: Wake



CONCURRENCE FORM FOR PROPERTIES NOT ELIGIBLE FOR THE NATIONAL REGISTER OF HISTORIC PLACES

Project Description: Replace Bridge No. 125 on SR 2045 over Smiths Creek

On February 17, 2000, representatives of the

- North Carolina Department of Transportation (NCDOT)
- Federal Highway Administration (FHWA)
- North Carolina State Historic Preservation Office (SHPO)

Reviewed the subject project at

- a scoping meeting
- photograph review session/consultation
- other

All parties present agreed

- there are no properties over fifty years old within the project's area of potential effect.
- there are no properties less than fifty years old which are considered to meet Criterion Consideration G within the project's area of potential effect.
- there are properties over fifty years old (list attached) within the project's area of potential effect, but based on the historical information available and the photographs of each property, properties identified as _____ are considered not eligible for the National Register and no further evaluation of them is necessary.
- there are no National Register-listed properties located within the project's area of potential effect.

Signed:

Mary Pope 2-17-2000
 Representative, NCDOT Date

Michael Dawson 2/17/00
 FHWA, for the Division Administrator, or other Federal Agency Date

April Cooper 2/17/2000
 Representative, SHPO Date

W.D. Wood, Deputy 2/23/2000
 State Historic Preservation Officer Date