STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

November 15, 2012

U. S. Army Corps of Engineers
Regulatory Field Office
151 Patton Avenue, Room 208
Asheville, NC 28801-5006

ATTN: Ms. Lori Beckwith
NCDOT Coordinator

Subject: **Application for Section 404 Regional General Permit 198200031 and Section 401 Water Quality Certification** for the proposed replacement of Bridge No. 27 over Rock Creek on US 64 in Transylvania County, Federal Aid Project No.BRSTP-0064(99); Division 14; TIP No. B-5010, $240.00 Debit Work Order WBS Element 41536.1.1.

Dear Madam:

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 27 over Rock Creek on US 64 with a 90-foot reinforced concrete box culvert. There will be 140 linear feet of permanent impacts to surface waters which includes 50 feet of bank stabilization. In addition, 197 feet of temporary impacts to surface waters will result from dewatering during culvert installation and fill from the construction of the onsite detour.

Please see enclosed copies of the Pre-Construction Notification (PCN), North Carolina Wildlife Resource Commission Letter and email correspondence, EEP Acceptance Letter, stormwater management plan, permit drawings, and design plans for the above-referenced project. The Categorical Exclusion (CE) was completed in February 2012 and was distributed shortly thereafter. Additional copies are available upon request.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

TELEPHONE: 919-707-6100
FAX: 919-212-5785

WEBSITE: WWW.NCDOT.ORG

LOCATION:
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610-4328

Correspondence from the North Carolina Wildlife Resources Commission (NCWRC) dated February 11, 2008 states that a trout moratorium extending from October 15 to April 15 will be instituted for the project. By copy of this letter and attachment, NCDOT herby requests NCWRC review and forward for any updated comments for this project to the Army Corps of Engineers and the NCDOT within 30 calendar days of receipt of this application. This project calls for a letting date of April 16, 2013 and a review date of February 26, 2013; however, the let date may advance as additional funding becomes available.

A copy of this permit application and its distribution list will be posted on the NCDOT website at: http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html. If you have any questions or need additional information, please e-mail Jeff Hemphill at jhemphill@ncdot.gov.

Sincerely,

E. L. Lusk

for Gregory J. Thorpe, Ph.D., Manager
Project Development & Environmental Analysis Unit

Cc: NCDOT Permit Application Standard Distribution List
File

Office Use Only:
Corps action ID no. _____
DWQ project no. _____
Form Version 1.3 Dec 10 2008

Pre-Construction Notification (PCN) Form

A. Applicant Information

1. Processing

1a. Type(s) of approval sought from the Corps:	☒ Section 404 Permit	☐ Section 10 Permit
1b. Specify Nationwide Permit (NWP) number:	or General Permit (GP) number: 198200031	
1c. Has the NWP or GP number been verified by the Corps?	☐ Yes	☒ No

1d. Type(s) of approval sought from the DWQ (check all that apply):

☒ 401 Water Quality Certification – Regular ☐ Non-404 Jurisdictional General Permit

☐ 401 Water Quality Certification – Express ☐ Riparian Buffer Authorization

1e. Is this notification solely for the record because written approval is not required?	For the record only for DWQ 401 Certification: ☐ Yes ☒ No	For the record only for Corps Permit: ☐ Yes ☒ No
1f. Is payment into a mitigation bank or in-lieu fee program proposed for mitigation of impacts? If so, attach the acceptance letter from mitigation bank or in-lieu fee program.	☒ Yes	☐ No
1g. Is the project located in any of NC's twenty coastal counties. If yes, answer 1h below.	☐ Yes	☒ No
1h. Is the project located within a NC DCM Area of Environmental Concern (AEC)?	☐ Yes	☒ No

2. Project Information

2a. Name of project:	Replacement of Bridge #27 over Rock Creek on US 64
2b. County:	Transylvania
2c. Nearest municipality / town:	Sapphire
2d. Subdivision name:	*not applicable*
2e. NCDOT only, T.I.P. or state project no:	B-5010

3. Owner Information

3a. Name(s) on Recorded Deed:	North Carolina Department of Transportation
3b. Deed Book and Page No.	*not applicable*
3c. Responsible Party (for LLC i f applicable):	*not applicable*
3d. Street address:	1598 Mail Service Center
3e. City, state, zip:	Raleigh, NC 27699-1598
3f. Telephone no.:	(919) 707-6126
3g. Fax no.:	(919) 212-5785
3h. Email address:	jhemphill@ncdot.gov

4. Applicant Information (if different from owner)	
4a. Applicant is:	☐ Agent ☐ Other, specify:
4b. Name:	*not applicable*
4c. Business name (if applicable):	
4d. Street address:	
4e. City, state, zip:	
4f. Telephone no.:	
4g. Fax no.:	
4h. Email address:	
5. Agent/Consultant Information (if applicable)	
5a. Name:	*not applicable*
5b. Business name (if applicable):	
5c. Street address:	
5d. City, state, zip:	
5e. Telephone no.:	
5f. Fax no.:	
5g. Email address:	

B. Project Information and Prior Project History		
1. Property Identification		
1a. Property identification no. (tax PIN or parcel ID):	*not applicable*	
1b. Site coordinates (in decimal degrees):	Latitude: 35.1119 (DD.DDDDDD)	Longitude: - 82.9898 (-DD.DDDDDD)
1c. Property size:	1.13 acres	
2. Surface Waters		
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Rock Creek	
2b. Water Quality Classification of nearest receiving water:	C;Tr	
2c. River basin:	Savannah	
3. Project Description		
3a. Describe the existing conditions on the site and the general land use in the vicinity of the project at the time of this application: Rural residential/Golf Course Community		
3b. List the total estimated acreage of all existing wetlands on the property: 0		
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 190		
3d. Explain the purpose of the proposed project: To replace a structurally deficient (and/ or) functionally obsolete bridge.		
3e. Describe the overall project in detail, including the type of equipment to be used: The project involves replacing a 33-foot, single span bridge with a 90 foot, RCBC on the existing alignment with an on-site detour. Standard road building equipment, such as trucks, dozers, and cranes will be used.		
4. Jurisdictional Determinations		
4a. Have jurisdictional wetland or stream determinations by the Corps or State been requested or obtained for this property / project (including all prior phases) in the past? Comments:	☐ Yes	☒ No ☐ Unknown
4b. If the Corps made the jurisdictional determination, what type of determination was made?	☐ Preliminary ☐ Final	
4c. If yes, who delineated the jurisdictional areas? Name (if known):	Agency/Consultant Company: Other:	
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation.		
5. Project History		
5a. Have permits or certifications been requested or obtained for this project (including all prior phases) in the past?	☐ Yes	☒ No ☐ Unknown
5b. If yes, explain in detail according to "help file" instructions.		
6. Future Project Plans		
6a. Is this a phased project?	☐ Yes	☒ No
6b. If yes, explain.		

C. Proposed Impacts Inventory

1. Impacts Summary

1a. Which sections were completed below for your project (check all that apply):

☐ Wetlands ☒ Streams - tributaries ☐ Buffers

☒ Open Waters ☐ Pond Construction

2. Wetland Impacts

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

2a. Wetland impact number – Permanent (P) or Temporary (T)	2b. Type of impact	2c. Type of wetland (if known)	2d. Forested	2e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	2f. Area of impact (acres)
Site 1 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 2 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 3 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 4 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 5 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 6 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
				2g. **Total wetland impacts**	

2h. Comments:

3. Stream Impacts

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

3a. Stream impact number - Permanent (P) or Temporary (T)	3b. Type of impact	3c. Stream name	3d. Perennial (PER) or intermittent (INT)?	3e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	3f. Average stream width (feet)	3g. Impact length (linear feet)
Site 1 ☒ P ☐ T	Fill	Rock Creek	☒ PER ☐ INT	☒ Corps ☐ DWQ	15	90
Site 2 ☒ P ☐ T	Bank Stabilization	Rock Creek	☒ PER ☐ INT	☒ Corps ☐ DWQ	15	50
Site 3 ☐ P ☒ T	Fill/Dewatering	Rock Creek	☒ PER ☐ INT	☒ Corps ☐ DWQ	15	197
Site 4 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 5 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 6 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
					3h. **Total stream and tributary impacts**	140 Perm 197 Temp

3i. Comments:

4. Open Water Impacts

If there are proposed impacts to lakes, ponds, estuaries, tributaries, sounds, the Atlantic Ocean, or any other open water of the U.S. then individually list all open water impacts below.

4a. Open water impact number – Permanent (P) or Temporary (T)	4b. Name of waterbody (if applicable)	4c. Type of impact	4d. Waterbody type	4e. Area of impact (acres)
O1 ☐ P ☒ T		Fill	Pond	0.07
O2 ☐ P ☐ T				
O3 ☐ P ☐ T				
O4 ☐ P ☐ T				
			4f. Total open water impacts	0 Permanent 0.07 Temporary

4g. Comments:

5. Pond or Lake Construction

If pond or lake construction proposed, then complete the chart below.

5a. Pond ID number	5b. Proposed use or purpose of pond	5c. Wetland Impacts (acres)			5d. Stream Impacts (feet)			5e. Upland (acres)
		Flooded	Filled	Excavated	Flooded	Filled	Excavated	Flooded
P1								
P2								
	5f. Total							

5g. Comments:

5h. Is a dam high hazard permit required?	☐ Yes ☐ No If yes, permit ID no:
5i. Expected pond surface area (acres):	
5j. Size of pond watershed (acres):	
5k. Method of construction:	

6. Buffer Impacts (for DWQ)

If project will impact a protected riparian buffer, then complete the chart below. If yes, then individually list all buffer impacts below. If any impacts require mitigation, then you **MUST** fill out Section D of this form.

6a. Project is in which protected basin?	☐ Neuse ☐ Catawba	☐ Tar-Pamlico ☐ Randleman	☐ Other:

6b. Buffer impact number – Permanent (P) or Temporary (T)	6c. Reason for impact	6d. Stream name	6e. Buffer mitigation required?	6f. Zone 1 impact (square feet)	6g. Zone 2 impact (square feet)
B1 ☐ P ☐ T			☐ Yes ☐ No		
B2 ☐ P ☐ T			☐ Yes ☐ No		
B3 ☐ P ☐ T			☐ Yes ☐ No		
			6h. **Total buffer impacts**		

6i. Comments:

D. Impact Justification and Mitigation

1. Avoidance and Minimization

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

Onsite detour routed to the north to minimize project footprint; roadway grade maintained to minimize project footprint; and retaining walls utilized to limit cuts and disturbed areas.

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

The North Carolina Wildlife Resource Commission (WRC) issued a Trout Moratorium on February 11, 2008 for in stream construction covering the trout-spawning period from October 15 to April 15. The North Carolina Division of Water Quality (NCDWQ) has designated Rock Creek as trout waters; therefore, Design Standards in Sensitive Watersheds will be implemented for this project. Alternating baffles will be installed inside the culvert to maintain the natural width of the stream.

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

2a. Does the project require Compensatory Mitigation for impacts to Waters of the U.S. or Waters of the State?	☒ Yes ☐ No If no, explain:
2b. If yes, mitigation is required by (check all that apply):	☐ DWQ ☒ Corps
2c. If yes, which mitigat ion option will be used for this project?	☐ Mitigation bank ☒ Payment to in-lieu fee program ☐ Permittee Responsible Mitigation

3. Complete if Using a Mitigation Bank

3a. Name of Mitigation Bank: not applicable

3b. Credits Purchased (attach receipt and letter)	Type	Quantity

3c. Comments:

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

4a. Approval letter from in-lieu fee program is attached.	☐ Yes
4b. Stream mitigation requested:	90 linear feet
4c. If using stream mitigation, stream temperature:	☐ warm ☐ cool ☒ cold
4d. Buffer mitigation requested (DWQ only):	square feet
4e. Riparian wetland mitigation requested:	acres
4f. Non-riparian wetland mitigation requested:	acres
4g. Coastal (tidal) wetland mitigation requested:	acres

4h. Comments:

5. Complete if Using a Permittee Responsible Mitigation Plan

5a. If using a permittee responsible mitigation plan, provide a description of the proposed mitigation plan.

6. Buffer Mitigation (State Regulated Riparian Buffer Rules) – required by DWQ				
6a. Will the project result in an impact within a protected riparian buffer that requires buffer mitigation?			☐ Yes	☒ No
6b. If yes, then identify the square feet of impact to each zone of the riparian buffer that requires mitigation. Calculate the amount of mitigation required.				
Zone	6c. Reason for impact	6d. Total impact (square feet)	Multiplier	6e. Required mitigation (square feet)
Zone 1			3 (2 for Catawba)	
Zone 2			1.5	
	6f. **Total buffer mitigation required:**			
6g. If buffer mitigation is required, discuss what type of mitigation is proposed (e.g., payment to private mitigation bank, permittee responsible riparian buffer restoration, payment into an approved in-lieu fee fund).				
6h. Comments:				

E. Stormwater Management and Diffuse Flow Plan (required by DWQ)	
1. Diffuse Flow Plan	
1a. Does the project include or is it adjacent to protected riparian buffers identified within one of the NC Riparian Buffer Protection Rules?	☐ Yes ☒ No
1b. If yes, then is a diffuse flow plan included? If not, explain why. Comments: If required from 1a, see attached buffer permit drawings.	☐ Yes ☐ No
2. Stormwater Management Plan	
2a. What is the overall percent imperviousness of this project?	N/A
2b. Does this project require a Stormwater Management Plan?	☒ Yes ☐ No
2c. If this project DOES NOT require a Stormwater Management Plan, explain why:	
2d. If this project DOES require a Stormwater Management Plan, then provide a brief, narrative description of the plan: See attached permit drawings.	
2e. Who will be responsible for the review of the Stormwater Management Plan?	☐ Certified Local Government ☐ DWQ Stormwater Program ☒ DWQ 401 Unit
3. Certified Local Government Stormwater Review	
3a. In which local government's jurisdiction is this project?	not applicable
3b. Which of the following locally-implemented stormwater management programs apply (check all that apply):	☐ Phase II ☐ NSW ☐ USMP ☐ Water Supply Watershed ☐ Other:
3c. Has the approved Stormwater Management Plan with proof of approval been attached?	☐ Yes ☐ No
4. DWQ Stormwater Program Review	
4a. Which of the following state-implemented stormwater management programs apply (check all that apply):	☐ Coastal counties ☐ HQW ☐ ORW ☐ Session Law 2006-246 ☐ Other:
4b. Has the approved Stormwater Management Plan with proof of approval been attached?	☐ Yes ☐ No
5. DWQ 401 Unit Stormwater Review	
5a. Does the Stormwater Management Plan meet the appropriate requirements?	☐ Yes ☐ No N/A
5b. Have all of the 401 Unit submittal requirements been met?	☐ Yes ☐ No N/A

F. Supplementary Information		
1. Environmental Documentation (DWQ Requirement)		
1a. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land?	☒ Yes	☐ No
1b. If you answered "yes" to the above, does the project require preparation of an environmental document pursuant to the requirements of the National or State (North Carolina) Environmental Policy Act (NEPA/SEPA)?	☒ Yes	☐ No
1c. If you answered "yes" to the above, has the document review been finalized by the State Clearing House? (If so, attach a copy of the NEPA or SEPA final approval letter.) Comments:	☒ Yes	☐ No
2. Violations (DWQ Requirement)		
2a. Is the site in violation of DWQ Wetland Rules (15A NCAC 2H .0500), Isolated Wetland Rules (15A NCAC 2H .1300), DWQ Surface Water or Wetland Standards, or Riparian Buffer Rules (15A NCAC 2B .0200)?	☐ Yes	☒ No
2b. Is this an after-the-fact permit application?	☐ Yes	☒ No
2c. If you answered "yes" to one or both of the above questions, provide an explanation of the violation(s):		
3. Cumulative Impacts (DWQ Requirement)		
3a. Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality?	☐ Yes ☒ No	
3b. If you answered "yes" to the above, submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent DWQ policy. If you answered "no," provide a short narrative description. Due to the minimal transportation impact resulting from this bridge replacement, this project will neither influence nearby land uses nor stimulate growth. Therefore, a detailed indirect or cumulative effects study will not be necessary.		
4. Sewage Disposal (DWQ Requirement)		
4a. 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. not applicable		

5. Endangered Species and Designated Critical Habitat (Corps Requirement)		
5a. Will this project occur in or near an area with federally protected species or habitat?	☒ Yes	☐ No
5b. Have you checked with the USFWS concerning Endangered Species Act impacts?	☐ Yes	☒ No
5c. If yes, ind icate the USFWS Field Office you have contacted.	☐ Raleigh ☐ Asheville	
5d. What data sources did you use to determine whether your site would impact Endangered Species or Designated Critical Habitat? NCDOT field surveys for Virginia spiraea and mountain sweet pitcher plant- 6/24/09 & 5/21/12 found no specimens; A survey for small whorled pogonia on 8/14/07 found no specimens (with final design - no longer any pogonia habitat in project footprint); and a review of the North Carolina Natural Heritage database on 9/11/12 determined No Effect.		
6. Essential Fish Habitat (Corps Requirement)		
6a. Will this project occur in or near an area designated as essential fish habitat?	☐ Yes	☒ No
6b. What data sources did you use to determine whether your site would impact Essential Fish Habitat? NMFS County Index		
7. Historic or Prehistoric Cultural Resources (Corps Requirement)		
7a. Will this project occur in or near an area that the state, federal or tribal governments have designated as having historic or cultural preservation status (e.g., National Historic Trust designation or properties significant in North Carolina history and archaeology)?	☐ Yes	☒ No
7b. What data sources did you use to determine whether your site would impact historic or archeological resources? NEPA Documentation		
8. Flood Zone Designation (Corps Requirement)		
8a. Will this project occur in a FEMA-designated 100-year floodplain?	☒ Yes	☐ No
8b. If yes, explain how project meets FEMA requirements: NCDOT Hydraulics Unit coordination with FEMA		
8c. What source(s) did you use to make the floodplain determination? FEMA Maps		

Dr. Gregory J. Thorpe, Ph D Applicant/Agent's Printed Name	E. L. Lusk Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	11.16.12 Date

North Carolina Wildlife Resources Commission

TO: Carla Dagnino, Project Management, Western Region, NEU
Project Development and Environmental Analysis, NCDOT

FROM: Marla Chambers, Western NCDOT Permit Coordinator Marla Chambers
Habitat Conservation Program, NCWRC

DATE: February 11, 2008

SUBJECT: Scoping review of NCDOT's proposed bridge replacement projects in Buncombe, Clay Henderson, Madison, Mitchell, Surry, Transylvania, Watauga and Yancey Counties. TIP Nos. B-4715, B-4733, B-4547, B-4987, B-4988, B-4984, B-4581, B-4820, B-4989, B-5010, B-4668, B-4687, B-4851.

North Carolina Department of Transportation (NCDOT) has requested comments from the North Carolina Wildlife Resources Commission (NCWRC) regarding impacts to fish and wildlife resources resulting from the subject projects. Staff biologists have reviewed the information provided. The following preliminary comments are provided in accordance with the 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).

Our standard recommendations for bridge replacement projects of this scope 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.

Mailing Address: Division of Inland Fisheries • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 707-0220 • **Fax:** (919) 707-0028

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 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, Mr. Logan Williams with the NCDOT - ONE 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.

17. If culvert installation is being considered, conduct subsurface investigations prior to structure design to determine design options and constraints and to ensure that wildlife passage issues are addressed.

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

1. The culvert must be designed to allow for aquatic life and fish passage. Generally, the culvert or pipe invert should be buried at least 1 foot below the natural streambed (measured from the natural thalweg depth). If multiple barrels are required, barrels other than the base flow barrel(s) should be placed on or near stream bankfull or floodplain bench elevation (similar to Lyonsfield design). These should be reconnected to floodplain benches as appropriate. This may be accomplished by utilizing sills on the upstream end to restrict or divert flow to the base flow barrel(s). Silled barrels should be filled with sediment so as not to cause noxious or mosquito breeding conditions. Sufficient water depth should be provided in the base flow barrel during low flows to accommodate fish movement. If culverts are longer than 40-50 linear feet, alternating or notched baffles should be installed in a manner that mimics existing stream pattern. This should enhance aquatic life passage: 1) by depositing sediments in the barrel, 2) by maintaining channel depth and flow regimes, and 3) by providing resting places for fish and other aquatic organisms. In essence, the base flow barrel(s) should provide a continuum of water depth and channel width without substantial modifications of velocity.

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 along the existing channel alignment whenever possible to avoid channel realignment. Widening the stream channel must be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage.

4. Riprap should not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be professionally designed, sized, and installed.

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. Tall fescue should not be used in riparian areas. 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-4715, Buncombe Co., Bridge No. 655 over Broad River on SR 2797 (Rock Creek Rd.). Broad River, Class C Trout waters, is expected to support rainbow trout. A moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is recommended from January 1-April 15 to protect the egg and fry stages of rainbow trout. Sediment and erosion control measures should adhere to the design standards for sensitive watersheds.
2. B-4733, Clay Co., Bridge No. 11 over Chatuge Lake on NC 175. Chatuge Lake, Class C Trout, is not expected to have reproducing trout. The hellbender (*Cryptobranchus alleganiensis*), Federal Species of Concern (FSC) and state Special Concern (SC) has been observed at the project site. Sediment and erosion control should be well maintained. No additional concerns are indicated at this time. Standard recommendations should apply.
3. B-4547, Henderson Co., Bridge No. 45 over Devil Forks Creek on SR 1525 (Dana Rd.). No special concerns are indicated at this time. Standard recommendations should apply.
4. B-4987, Henderson Co., Bridge No. 35 over Clear Creek on SR 1572 (Apple Valley Rd.). Clear Creek is classified B Trout waters; however it is also on the 303(d) list of impaired waters. The stream is designated Hatchery Supported Designated Public Mountain Trout Water from the subject bridge upstream and the blotched chub (*Erimystax insiginis*), FSC and state Significantly Rare (SR) occurs downstream. A moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is recommended from January 1-April 15 to protect the egg and fry stages of rainbow trout. Sediment and erosion control measures should adhere to the design standards for sensitive watersheds. Public access should be coordinated for this site according to NCDOT guidelines and agreements with NCWRC.
5. B-4988, Henderson Co., Bridge No. 309 over Featherstone Creek on SR 1528. Featherstone Creek, Class C waters, may support rainbow trout; however we will not request a moratorium at this time. If trout are confirmed to be in the area prior to project construction, the rainbow trout moratorium may be requested.
6. B-4984, Madison Co., Bridge No. 138 over Big Pine Creek on SR 1151 (Big Pine Rd.?). Big Pine Creek, Class C waters, is Hatchery Supported Designated Public Mountain Trout Water; however significant trout reproduction is not expected this close to the confluence with the French Broad River. Logperch (*Percina caprodes*), state Threatened (T), have been observed at this confluence and the olive darter (*Percina squamata*), FSC and state SC; mountain madtom (*Noturus eleutherus*), state SC; and blotched chub, FSC and state SR; are found downstream in the French Broad River. Stringent sedimentation and erosion control

must be well maintained. Public access should be coordinated for this site according to NCDOT guidelines and agreements with NCWRC.

7. B-4581, Mitchell Co., Bridge No. 57 over White Oak Creek on SR 1199. White Oak Creek, Class C Trout waters, is not expected to have significant trout reproduction; however it flows into Cane Creek, which is managed as Delayed Harvest Trout waters by NCWRC and supports the olive darter (*Percina squamata*), FSC and state SC. The state and federally Endangered (E) Appalachian elktoe (*Alasmidonta raveneliana*) inhabits North Toe River further downstream. Stringent sedimentation and erosion control must be well maintained.
8. B-4820, Surry/Yadkin Co., Bridge No. 338 over the Yadkin River on SR 1420 and SR 1190 (Gwyn Street). The Yadkin River, Class C waters, supports good numbers of spotted bass and smallmouth bass in the area. Stringent sediment and erosion control should be well maintained. No additional concerns are indicated at this time. Standard recommendations should apply.
9. B-4989, Transylvania Co., Bridge No. 148 over Lamance Creek on SR 1326. Lamance Creek, Class C Trout waters, is located in the Nantahala National Forest Game Land and is classified Wild Trout Waters by NCWRC. A moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is recommended from October 15 to April 15. Sediment and erosion control measures should adhere to the design standards for sensitive watersheds. Public access should be coordinated for this site according to NCDOT guidelines and agreements with NCWRC.
10. B-5010, Transylvania Co., Bridge No. 27 over Rock Creek on US 64. Rock Creek, Class C Trout waters, supports brown trout in the project area. Oconee stream crayfish (*Cambarus chaugaensis*), state SC; bog turtle, (*Glyptemys muhlenbergii*), state T and federal T due to Similarity of Appearance; and green salamander (*aneides aeneus*), FSC and state E, are found nearby. A moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is recommended from October 15 to April 15. Sediment and erosion control measures should adhere to the design standards for sensitive watersheds.
11. B-4668, Watauga Co., Bridge No. 29 over Cove Creek on US 321. Cove Creek, Class C waters, supports trout in the vicinity and downstream in the Watauga River, Class B Trout HQW waters. The green floater (*Lasmigona subviridus*), FSC and state E, and hellbender (*Cryptobranchus alleganiensis*), FSC and state SC, have been observed at the confluence. A moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is recommended from October 15 to April 15. Sediment and erosion control measures should adhere to the design standards for sensitive watersheds.
12. B-4687, Yancey Co., Bridge No. 105 over Little Creek on SR 1411. Little Creek, Class C Trout waters, supports rainbow trout in the project area and flows to the Cane River, also Class C Trout waters. The Appalachian elktoe (*Alasmidonta raveneliana*), federal and state E; sharphead darter (*Etheostoma acuticeps*), FSC and state T; and stonecat (*Noturus flavus*), state E, occur in Cane River. A moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is recommended from January 1-April 15 to protect the egg and fry stages of rainbow trout. Sediment and erosion control measures should adhere to the design standards for sensitive watersheds.
13. B-4851, Yancey Co., Bridge No. 31 over Brush Creek on SR 1308. Brush Creek, Class C Trout waters, is not expected to support reproducing trout in the project area. It joins the North Toe River, Class C Trout waters, just downstream, which is inhabited by the Appalachian elktoe (*Alasmidonta raveneliana*), federal and state E, and wavy-rayed

lampmussel (*Lampsilis fasciola*), state SC. Sediment and erosion control measures should adhere to the design standards for sensitive watersheds.

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 (704) 984-1070. Thank you for the opportunity to review and comment on this project.

cc: Brian Wrenn, NCDWQ
Marella Buncick, USFWS
Angie Rodgers, NCNHP
Elizabeth Lusk, NCDOT

Ecosystem Enhancement PROGRAM

September 25, 2012

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

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

B-5010, Replace Bridge Number 27 on US 64 over Rocky Creek, Transylvania County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream mitigation for the subject project. Based on the information supplied by you on September 20, 2012, the impacts are located in CU 03060101 of the Savannah River basin in the Southern Mountains (SM) Eco-Region, and are as follows:

Savannah 03060101 SM	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	90	0	0	0	0	0	0	0

This impact and associated mitigation need were under projected by the NCDOT in the 2012 impact data. EEP will commit to implement sufficient compensatory stream mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies using the delivery timeline listed in Section F.3.c.iii of the N.C. Department of Environment and Natural Resources' Ecosystem Enhancement Program In-Lieu Fee Instrument dated July 28, 2010. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

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

Sincerely,

Suzanne Klimek for
EEP Acting Director

cc: Ms. Lori Beckwith, USACE – Asheville Regulatory Field Office
Ms, Amy Chapman, Division of Water Quality, Wetlands/401 Unit
File: B-5010

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

January 13, 2012

MEMORANDUM TO: File

FROM: Paul F. Fisher, P.E.
Hydraulics Unit

SUBJECT: Stormwater Management Plan
B-5010, Transylvania County

This project will replace bridge #27 over Rock Creek in Transylvania County. The following items were incorporated into the Hydraulic design of this project for stormwater quality considerations:

- Do not discharge stormwater directly into surface waters.
- On-Site Detour to north to minimize footprint.
- Use retaining walls to minimize cuts and disturbed area.
- Hold existing Roadway grade to minimize project footprint.

PFF

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
HYDRAULICS UNIT
1590 MAIL SERVICE CENTER
RALEIGH NC 27699-1590

TELEPHONE: 919-250-4100
FAX: 919-250-4108

WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
CENTURY CENTER COMPLEX
BUILDING B
1020 BIRCH RIDGE DRIVE
RALEIGH NC

09/08/99

See Sheet 1-A For Index of Sheets

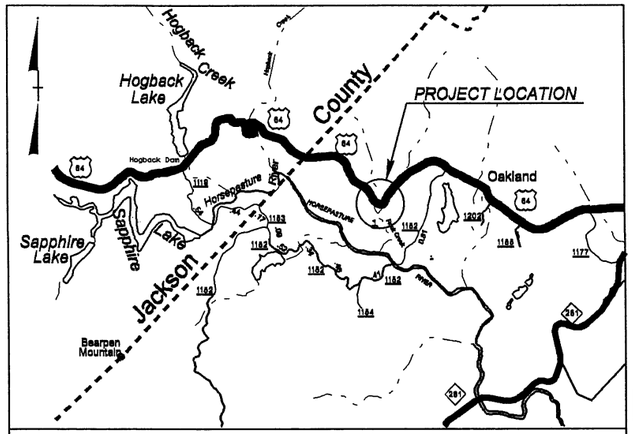
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5010	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
41536.1.1	BRSTP-0064(99)	P.E.

TRANSYLVANIA COUNTY

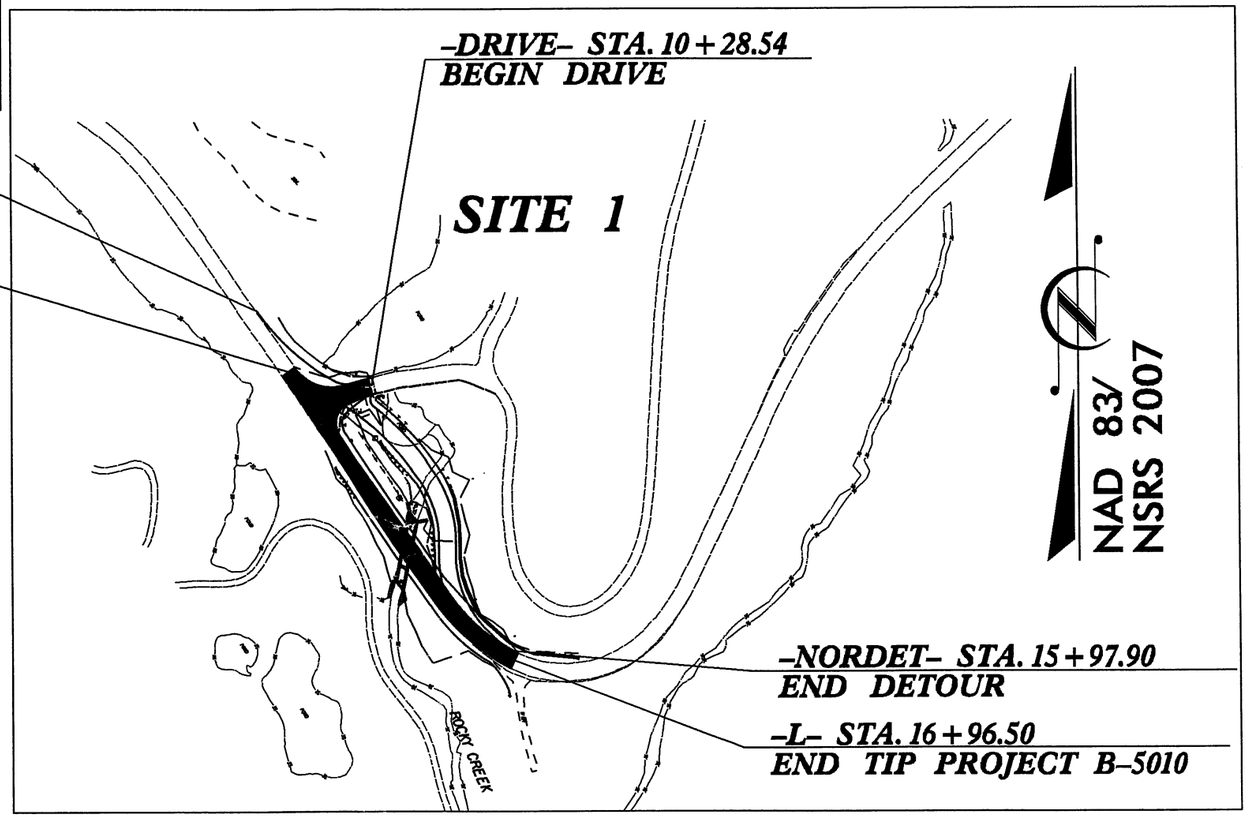
SURFACE WATER IMPACTS



VICINITY MAP

-NORDET- STA. 10+00.00
BEGIN DETOUR

-L- STA. 12+06.44
BEGIN TIP PROJECT B-5010



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

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

TIP PROJECT: B-5010

CONTRACT:

$$$$$$SYSTIME$$$$$$
$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$
$$$$$$USERNAME$$$$$$

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA
STATEWIDE TIER

ADT 2011	=	5435
ADT 2035	=	8600
DHV	=	11 %
D	=	65 %
T	=	26 % *
V	=	25 MPH

* TTST 3 DUAL 23

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5010 = 0.093 mi.

TOTAL LENGTH TIP PROJECT B-5010 = 0.093 mi.

Prepared in the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 16, 2012

LETTING DATE: APRIL 16, 2013

JIMMY GOODNIGHT, PE
PROJECT ENGINEER

TIM GOINS, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

Permit Drawing
Sheet 1 of 8

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

8/17/99

REVISIONS

SITE 1

▨ S S DENOTES IMPACTS IN SURFACE WATER

▨ TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

100' 0' 100' 200' 300'

SCALE: 1"= 100'

$$$$$$$SYSTIME$$$$$
$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

Permit Drawing
Sheet 2 of 8

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SITE 1

▨ S	DENOTES IMPACTS IN SURFACE WATER
▨ TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

100' 0' 100' 200' 300'

SCALE: 1"= 100'

$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

Permit Drawing
Sheet 2 of 3

8/17/99

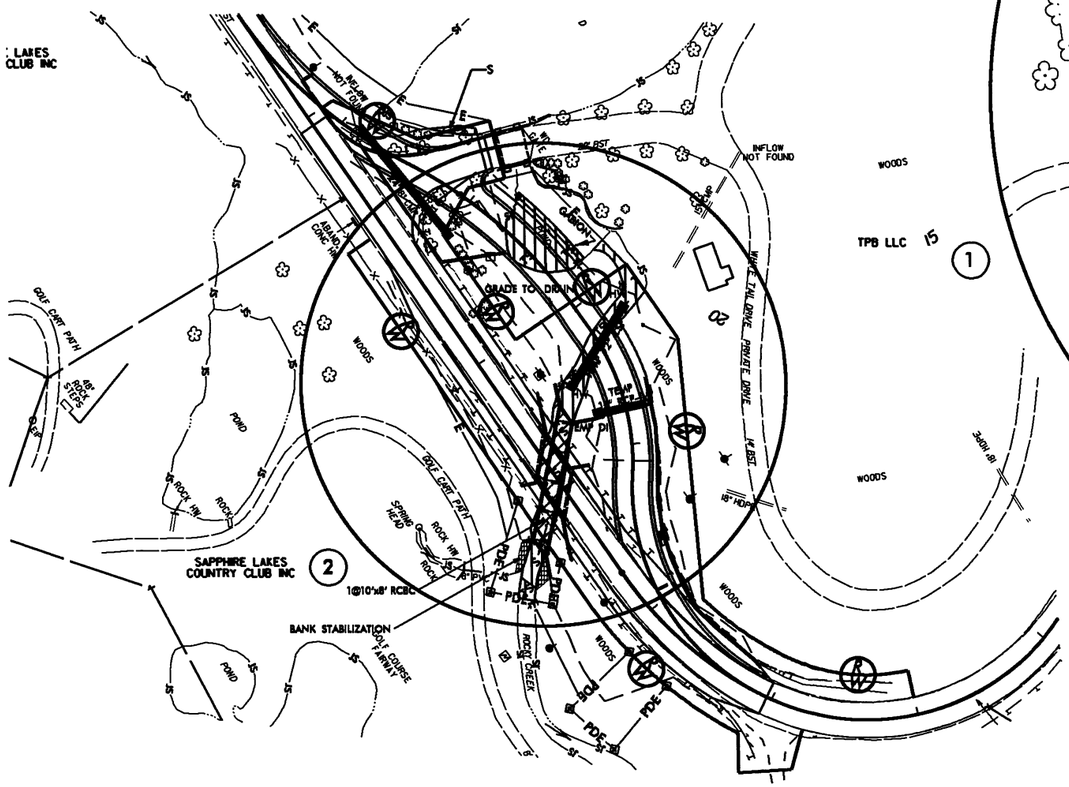
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-5010	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

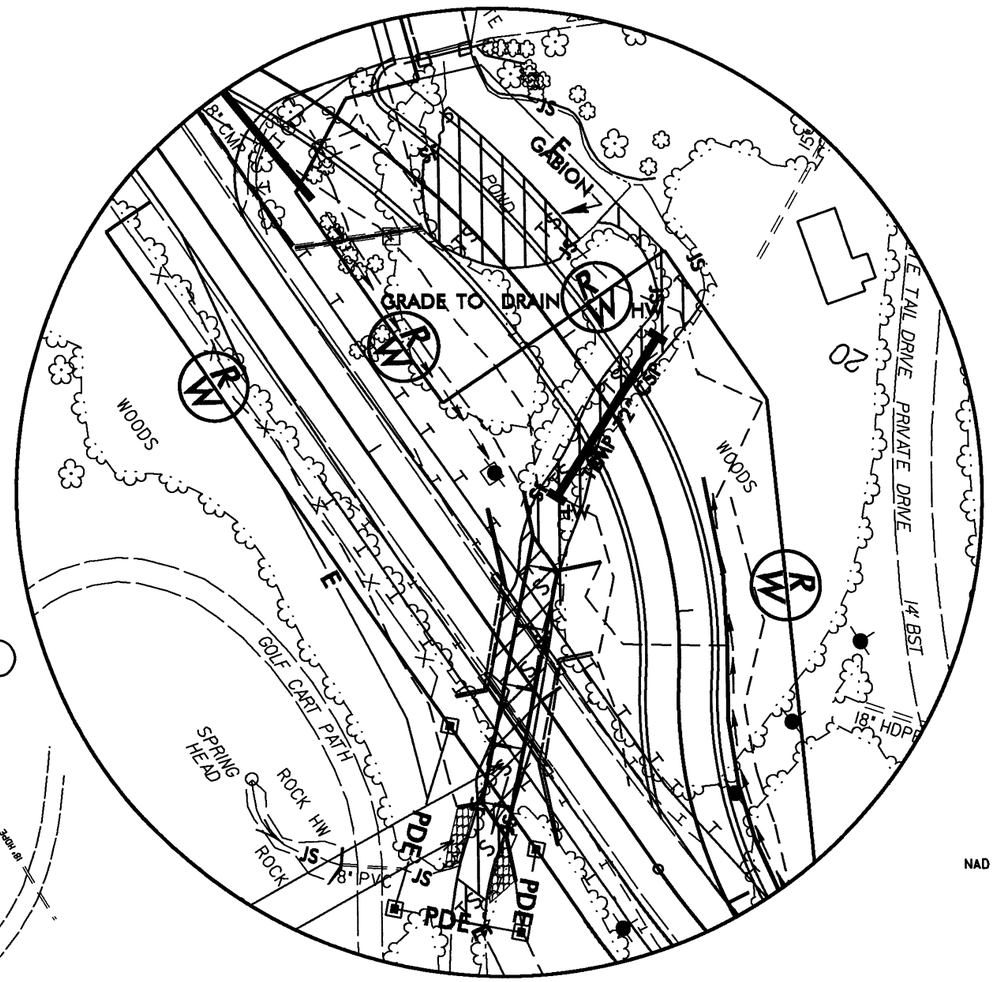
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

SITE 1



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



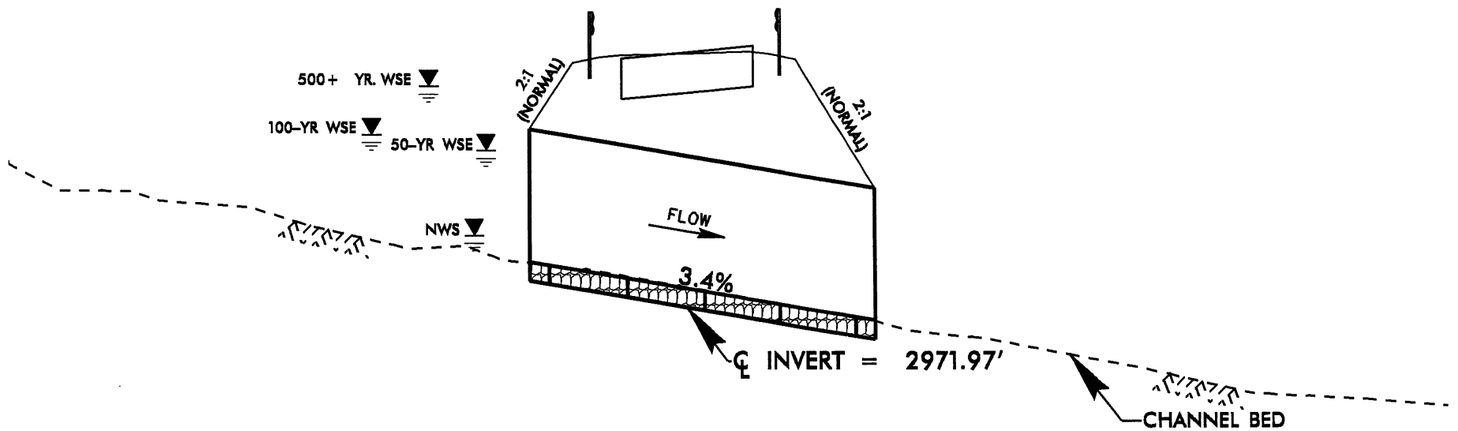
SITE 1(Enlargement)

▨ S S	DENOTES IMPACTS IN SURFACE WATER
▨ TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

```
$$$$$$SYSTIME$$$$$$
$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$
```

Permit Drawing
~~et~~ 4 of 8

1 @ 10' x 8' RCBC (1' BURY)
℄ STA. 14+89.00 –L–
℄ ELEV. = 2985.33'
SKEW = 45 DEGREES



PROFILE

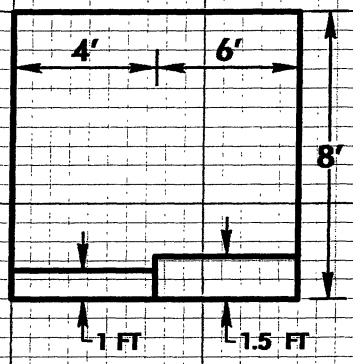
NCDOT
DIVISION OF HIGHWAYS
TRANSYLVANIA COUNTY
WBS: 41536.1.1 (B-5010)
REPLACE BRIDGE NO. 27
ON US 64 OVER
ROCKY CREEK

SHEET OF 05/14/12

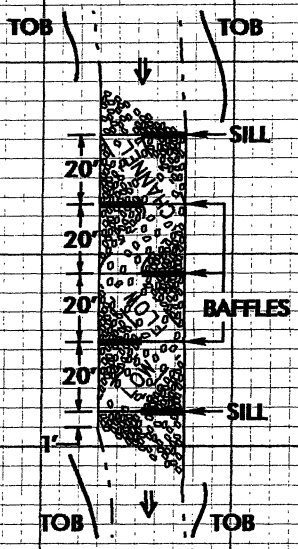
Permit Drawing
Sheet 5 of

NOTES:

- BED MATERIAL IS ROCKY WITH COBBLES AND SOME BOULDERS. RETAIN AND PLACE BACK IN RCBC.
- CONTRACTOR MAY NEED TO SUPPLEMENT NATURAL BED MATERIAL IN CULVERT BOTTOM WITH CLASS B RIP RAP.
- SILLS AND BAFFLES TO BE 1' WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.
- U/S WSE ON DAY OF SURVEY WAS 2975.5' (6/20/2011).
- ROADWAY FILL SLOPES ARE 2:1 NORMAL TO CENTERLINE.
- THIS PROJECT COMPLIES WITH LOCAL FLOODPLAIN MANAGEMENT REGULATIONS.



SECTION AT SILLS AND BAFFLES



PLAN VIEW

BOX CULVERT DETAIL
(NOT TO SCALE)

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	14+89 -L-	10'x8' RCBC(1'Bury)						0.03	0.07	90	197	
		Bank Stabilization						< 0.01		50		
TOTALS:								0.04	0.07	140	197	

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

TRANSYLVANIA COUNTY
WBS - 41536.1.1 (B-5010)

SHEET 8/30/2012

ATN Revised 3/31/05

Permit Drawing
Sheet 7 of 7

PROPERTY OWNERS

Site	Last Name/Owner	First Name	Address	City/Town	State	Zip Code
1	TPB LLC		PO Box 2497	Cashiers	NC	28717
1	Sapphire Lakes Country Club, Inc		19387 Rosman Hwy	Sapphire	NC	28774

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

TRANSYLVANIA COUNTY
WBS - 341536.1.1 (B-5010)

SHEET 5/14/2012

Permit Drawing
Sheet 2 of 2

05/08/99

TIP PROJECT: B-5010

CONTRACT: _____

See Sheet 1-A For Index of Sheets

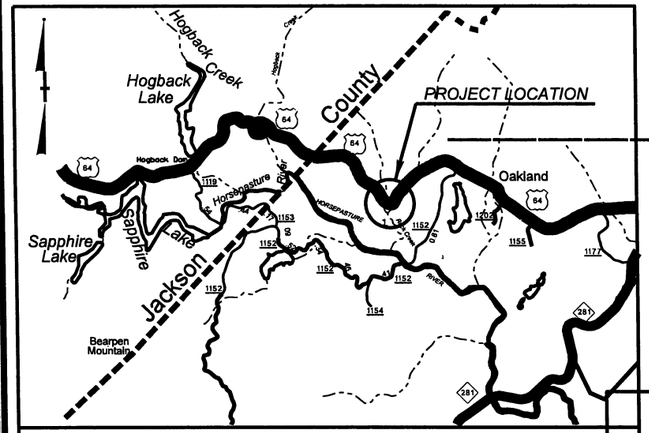
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSYLVANIA COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5010	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
41536.1.1	BRSTP-0064(99)	P.E.	

LOCATION: BRIDGE NO. 27 ON US 64 OVER ROCKY CREEK

TYPE OF WORK: GRADING, PAVING, DRAINAGE, GUARDRAIL, CULVERT AND STRUCTURE REMOVAL

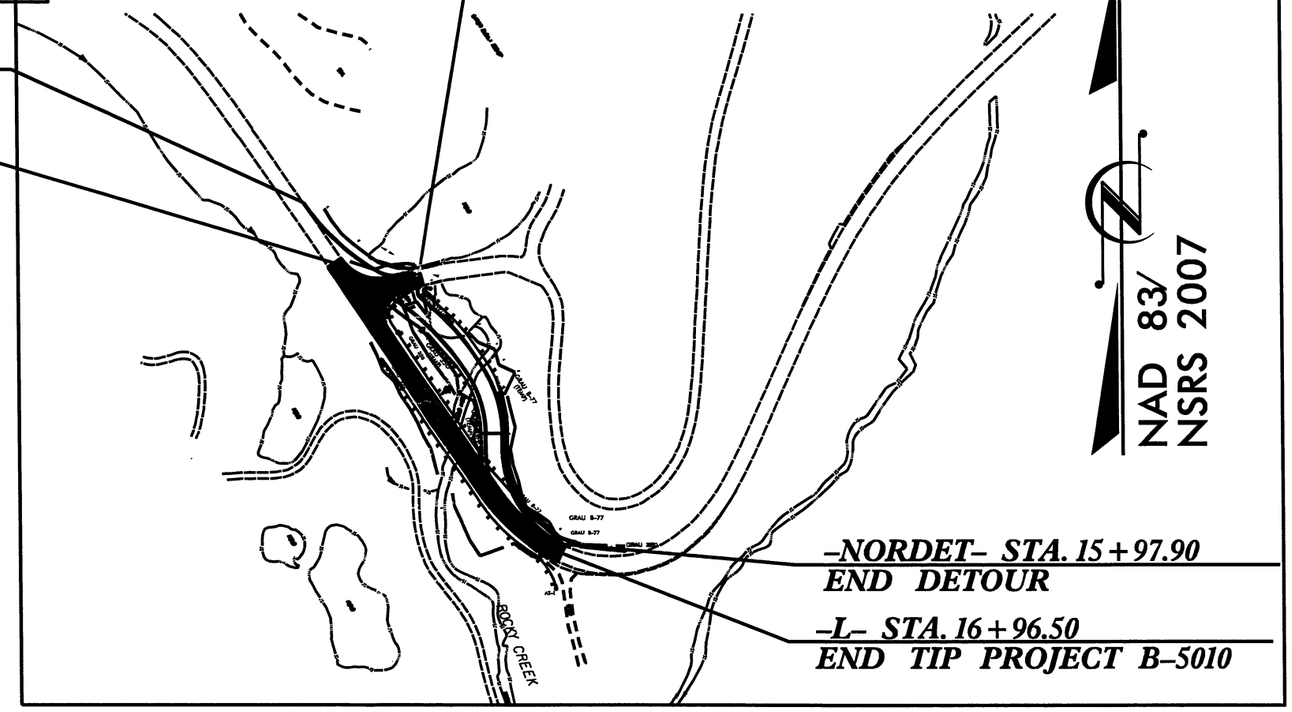


VICINITY MAP

–NORDET– STA. 10+00.00
BEGIN DETOUR

–L– STA. 12+06.44
BEGIN TIP PROJECT B-5010

–DRIVE– STA. 10+28.54
BEGIN DRIVE



–NORDET– STA. 15+97.90
END DETOUR

–L– STA. 16+96.50
END TIP PROJECT B-5010

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

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA
STATEWIDE TIER

ADT 2011 = 5435
ADT 2035 = 8600
DHV = 11 %
D ≐ 65 %
T = 26 % *
V = 25 MPH

* TTST 3 DUAL 23

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5010 = 0.093 mi.

TOTAL LENGTH TIP PROJECT B-5010 = 0.093 mi.

Prepared in the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 16, 2012

LETTING DATE: APRIL 16, 2013

JIMMY GOODNIGHT, PE
PROJECT ENGINEER

TIM GOINS, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

$$$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-5010	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

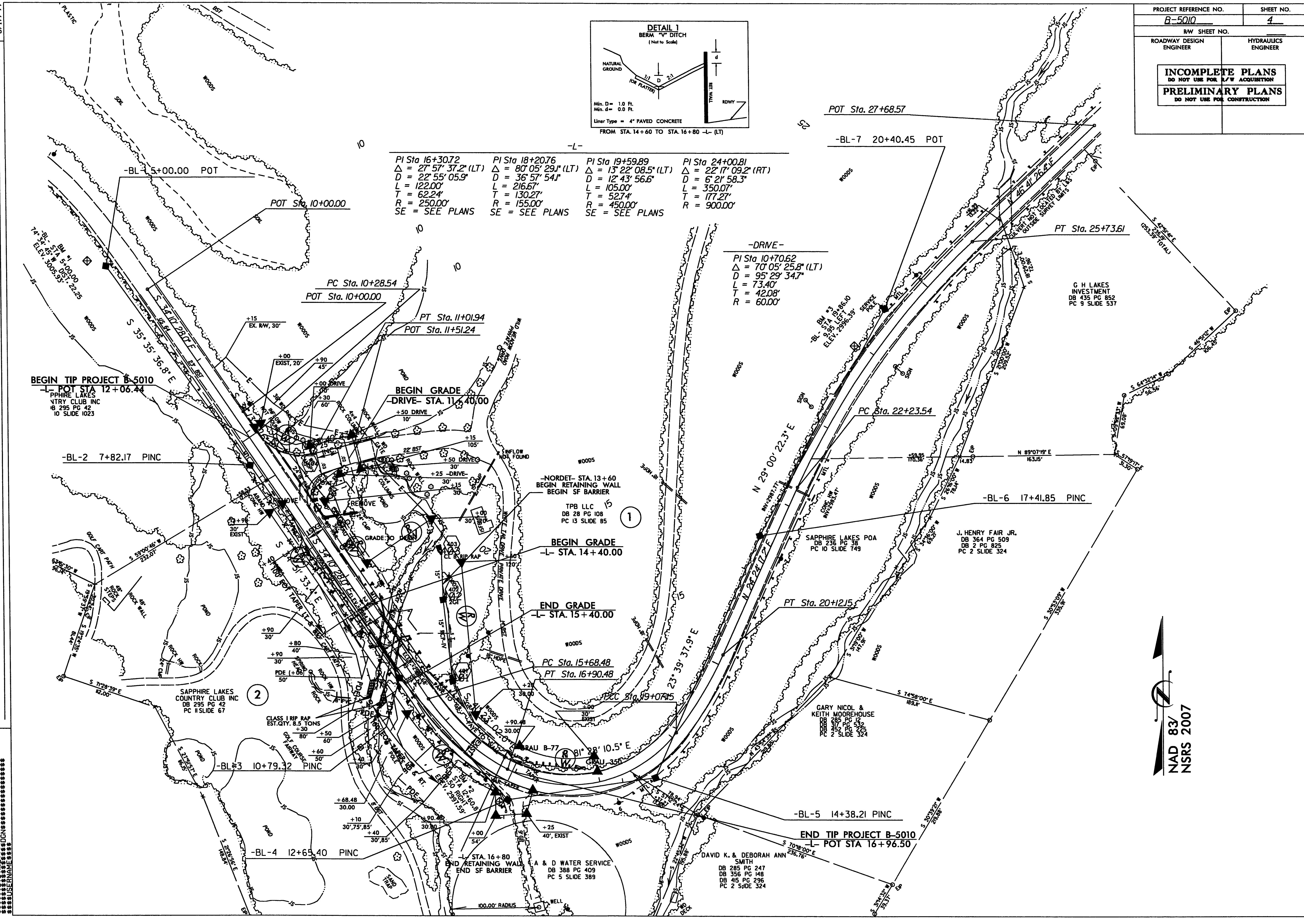
REVISIONS

-L-

PI Sta 16+30.72	PI Sta 18+20.76	PI Sta 19+59.89	PI Sta 24+00.81
△ = 27° 57' 37.2" (LT)	△ = 80° 05' 29.1" (LT)	△ = 13° 22' 08.5" (LT)	△ = 22° 17' 09.2" (RT)
D = 22° 55' 05.9"	D = 36° 57' 54.1"	D = 12° 43' 56.6"	D = 6° 21' 58.3"
L = 122.00'	L = 216.67'	L = 105.00'	L = 350.07'
T = 62.24'	T = 130.27'	T = 52.74'	T = 177.27'
R = 250.00'	R = 155.00'	R = 450.00'	R = 900.00'
SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS	

-DRIVE-

PI Sta 10+70.62
△ = 70° 05' 25.8" (LT)
D = 95° 29' 34.7"
L = 73.40'
T = 42.08'
R = 60.00'

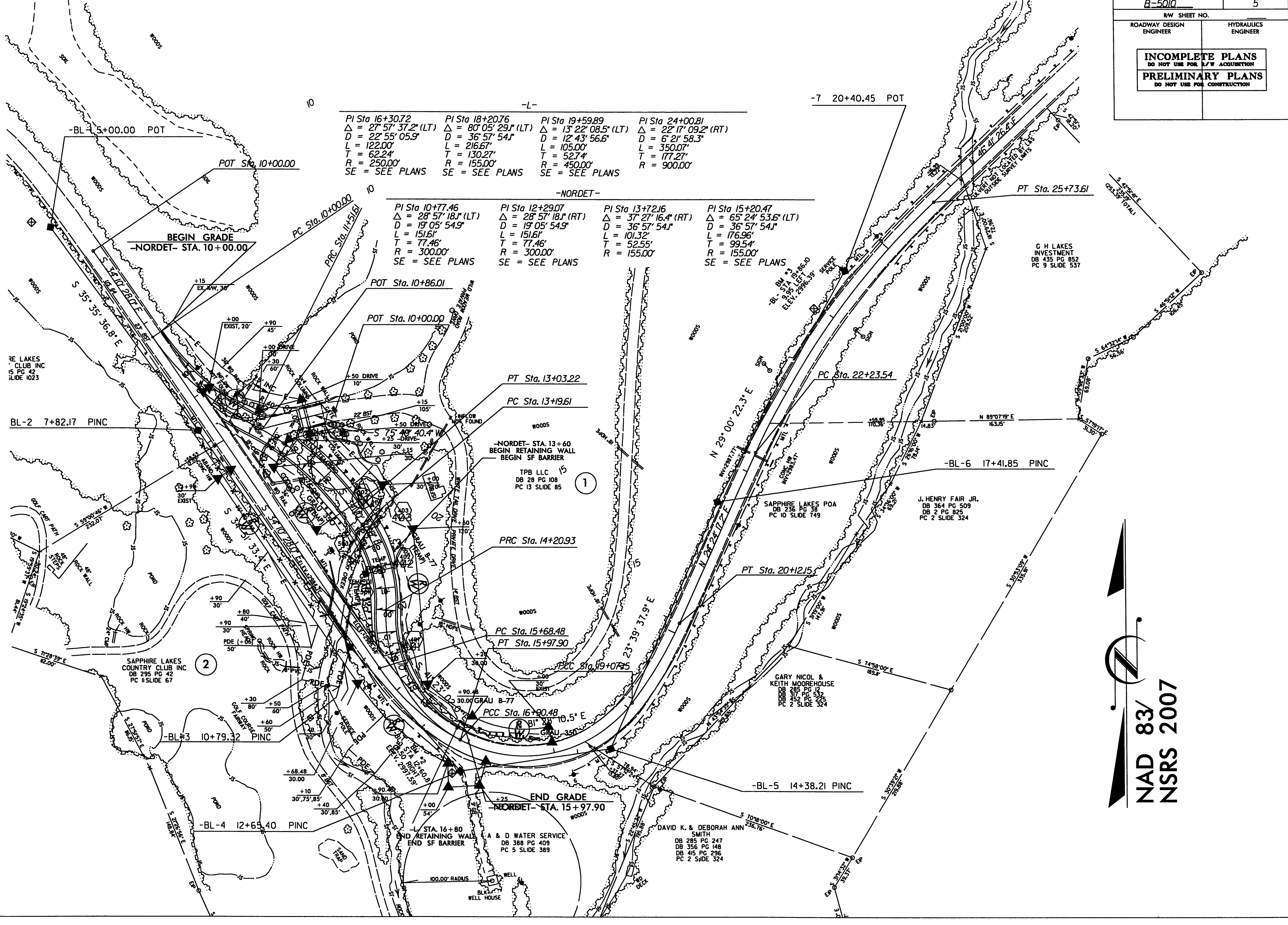


DETAIL 1
BERM "V" DITCH
(Not to Scale)
NATURAL GROUND
(OR FLATTER)
RET. WALL
RDWY
Min. D = 1.0 Ft.
Min. d = 0.0 Ft.
Liner Type = 4" PAVED CONCRETE
FROM STA. 14+60 TO STA. 16+80 -L- (LT)
-BL- 5+00.00 POT
POT Sta. 10+00.00
PC Sta. 10+28.54
POT Sta. 10+00.00
PT Sta. 11+01.94
POT Sta. 11+51.24
BEGIN TIP PROJECT B-5010
-L- POT STA 12+06.44
BEGIN GRADE
-DRIVE- STA. 11+40.00
-BL-2 7+82.17 PINC
-NORDET- STA. 13+60
BEGIN RETAINING WALL
BEGIN SF BARRIER
TPB LLC
DB 28 PG 108
PC 13 SLIDE 85
BEGIN GRADE
-L- STA. 14+40.00
END GRADE
-L- STA. 15+40.00
PC Sta. 15+68.48
PT Sta. 16+90.48
PCC Sta. 19+07.15
SAPPHIRE LAKES COUNTRY CLUB INC
DB 295 PG 42
PC 11 SLIDE 67
CLASS I RIP RAP
EST. QTY. 8.5 TONS
-BL-3 10+79.32 PINC
-BL-4 12+65.40 PINC
-L- STA. 16+80
END RETAINING WALL
END SF BARRIER
A & D WATER SERVICE
DB 388 PG 409
PC 5 SLIDE 389
100.00' RADIUS
WELL
POT Sta. 27+68.57
-BL-7 20+40.45 POT
PT Sta. 25+73.61
G H LAKES INVESTMENT
DB 435 PG 852
PC 9 SLIDE 537
PC Sta. 22+23.54
-BL-6 17+41.85 PINC
SAPPHIRE LAKES POA
DB 236 PG 38
PC 10 SLIDE 749
J. HENRY FAIR JR.
DB 364 PG 509
DB 2 PG 825
PC 2 SLIDE 324
PT Sta. 20+12.15
GARY NICOL &
KEITH MOOREHOUSE
-BL-5 14+38.21 PINC
END TIP PROJECT B-5010
-L- POT STA 16+96.50
DAVID K. & DEBORAH ANN SMITH
DB 285 PG 247
DB 356 PG 148
DB 415 PG 296
PC 2 SLIDE 324
N 29° 00' 22.3" E
23° 39' 37.9" E
S 35° 35' 36.8" E
WOODS
POND
NAD 83/
NSRS 2007

PROJECT REFERENCE NO.	SHEET NO.
B-5010	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-L-
PI Sta 16+30.72
△ = 27° 57' 37.2" (LT)
D = 22° 55' 05.9"
L = 122.00'
T = 62.24'
R = 250.00'
SE = SEE PLANS
PI Sta 18+20.76
△ = 80° 05' 29.1" (LT)
D = 36° 57' 54.1"
L = 216.67'
T = 130.27'
R = 155.00'
SE = SEE PLANS
PI Sta 19+59.89
△ = 13° 22' 08.5" (LT)
D = 12° 43' 56.6"
L = 105.00'
T = 52.74'
R = 450.00'
SE = SEE PLANS
PI Sta 24+00.81
△ = 22° 17' 09.2" (RT)
D = 6° 21' 58.3"
L = 350.07'
T = 177.27'
R = 900.00'
-NORDET-
PI Sta 10+77.46
△ = 28° 57' 18.1" (LT)
D = 19° 05' 54.9"
L = 151.61'
T = 77.46'
R = 300.00'
SE = SEE PLANS
PI Sta 12+29.07
△ = 28° 57' 18.1" (RT)
D = 19° 05' 54.9"
L = 151.61'
T = 77.46'
R = 300.00'
SE = SEE PLANS
PI Sta 13+72.16
△ = 37° 27' 16.4" (RT)
D = 36° 57' 54.1"
L = 101.32'
T = 52.55'
R = 155.00'
PI Sta 15+20.47
△ = 65° 24' 53.6" (LT)
D = 36° 57' 54.1"
L = 176.96'
T = 99.54'
R = 155.00'
SE = SEE PLANS
-BL-1 5+00.00 POT
POT Sta. 10+00.00
BEGIN GRADE
-NORDET- STA. 10+00.00
PC Sta. 10+00.00
PRC Sta. 11+51.61
POT Sta. 10+86.01
POT Sta. 10+00.00
PT Sta. 13+03.22
PC Sta. 13+19.61
-NORDET- STA. 13+60
BEGIN RETAINING WALL
BEGIN SF BARRIER
TPB LLC
DB 28 PG 108
PC 13 SLIDE 85
PRC Sta. 14+20.93
PC Sta. 15+68.48
PT Sta. 15+97.90
PCC Sta. 19+07.15
PCC Sta. 16+90.48
END GRADE
-NORDET- STA. 15+97.90
-L- STA. 16+80
END RETAINING WALL
END SF BARRIER
A & D WATER SERVICE
DB 388 PG 409
PC 5 SLIDE 389
-BL-2 7+82.17 PINC
-BL-3 10+79.32 PINC
-BL-4 12+65.40 PINC
-BL-5 14+38.21 PINC
-BL-6 17+41.85 PINC
-7 20+40.45 POT
PT Sta. 25+73.61
PC Sta. 22+23.54
PT Sta. 20+12.15
N 29° 00' 22.3" E
N 46° 41' 26.4" E
S 35° 35' 36.8" E
SAPPHIRE LAKES
COUNTRY CLUB INC
DB 295 PG 42
PC II SLIDE 67
SAPPHIRE LAKES POA
DB 236 PG 38
PC 10 SLIDE 749
G H LAKES
INVESTMENT
DB 435 PG 852
PC 9 SLIDE 537
J. HENRY FAIR JR.
DB 364 PG 509
DB 2 PG 825
PC 2 SLIDE 324
GARY NICOL &
KEITH MOOREHOUSE
DB 285 PG 12
DB 317 PG 532
DB 452 PG 225
PC 2 SLIDE 324
DAVID K. & DEBORAH ANN
SMITH
DB 285 PG 247
DB 356 PG 148
DB 415 PG 296
PC 2 SLIDE 324
100.00' RADIUS
WELL
BLK WELL HOUSE
NAD 83/
NSRS 2007

8/17/99

REVISIONS

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