STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

February 6, 2008

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

ATTENTION: Mr. Dave Baker
NCDOT Coordinator

SUBJECT: **Nationwide Permit 23 and 33 Applications** for the proposed Replacement of Bridge No. 7 on US 64 over the Broad River, Federal Aid No. BRSTP-0064(61), State Project No. 8.1891301, WBS Element No. 33600.1.1, Rutherford County. TIP No. B-4258.

Dear Sir:

Please find enclosed a copy of the Pre-Construction Notification, permit drawings, and 1/2 size plans for the above referenced project. A Categorical Exclusion was completed for the project on January 17, 2007 and distributed shortly thereafter. Additional copies are available upon request. The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 7 on a new alignment to the southwest with a new 39-foot wide and 260-foot long triple span bridge. There will be <0.01 acre of permanent impacts to surface waters from six drilled piers. Traffic will be maintained onsite utilizing the existing bridge during construction of the new bridge.

IMPACTS TO WATERS OF THE UNITED STATES

General Description: The water resource impacted for project B-4258 is the Broad River and is classified as "**C Tr**" by the North Carolina Division of Water Quality (NCDWQ). The project is located in the Broad River Basin, Hydrological Cataloguing Unit 03050105. Neither High Quality Waters (HQW), Water Supplies (WS-I: undeveloped watersheds or WS-II: predominately undeveloped watersheds), nor Outstanding Resource Waters (ORW) occur within 1.0 mile of project study area. The Broad River is not

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1548 MAIL SERVICE CENTER
RALEIGH NC 27699-1548

TELEPHONE: 919-733-3141
FAX: 919-733-9794

WEBSITE: WWW.NCDOT.ORG

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

designated as a North Carolina Natural or Scenic River, or as a national Wild and Scenic River. The Broad River is not listed as a 2006 303(d) impaired water nor are any listed within one mile of the project area.

Permanent Impacts: The construction of the new bridge (Site 1) will result in <0.01 acre (58 square feet) of permanent impacts to surface waters from six drilled piers.

Temporary Impacts: Temporary causeways will be utilized for the construction of the new bridge resulting in 0.28 acre of temporary impacts to surface waters. If the causeways are in place concurrently they will not block more than fifty percent of the channel. A temporary work bridge will be installed on the north side of the proposed bridge that will extend from one causeway to the other and will sit approximately two feet or higher above the surface of the Broad River.

Utilities: There are no impacts to jurisdictional resources due to utilities for this project.

Bridge Demolition: The existing bridge will not be demolished but will be retained as part of a pedestrian enhancement project.

FEDERALLY PROTECTED SPECIES

Plants and animals with federal classifications of Endangered (E), Threatened (T), Proposed Endangered (PE), Proposed Threatened (PT), are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of January 16, 2008, the United States Fish and Wildlife Service (USFWS) lists five federally protected species for Rutherford County (Table 1). Small-whorled pogonia was resurveyed in May 2007 with no specimens found.

The bald eagle has been delisted from the Endangered Species Act as of August 8, 2007. It is still protected under the Bald and Golden Eagle Protection Act. A survey for Bald Eagles was conducted December 4, 2007 by NCDOT personnel. Bald Eagle habitat is present to the east of the project at Lake Lure. Large trees near the lake were examined for eagle nests with no eagles or eagle nests being observed. The Natural Heritage Database was reviewed January 30, 2008 and no eagles were listed within one mile of the project area.

Table 1. Federally Protected Species of Rutherford County.

Common Name	Scientific Name	Federal Status	Habitat Present	Biological Conclusion
Indiana bat	*Myotis sodalis*	E	No	No Effect
Dwarf-flowered heartleaf	*Hexastylis naniflora*	T	No	No Effect
Small whorled pogonia	*Isotria medeoloides*	T	Yes	No Effect
White irisette	*Sisyrinchium dichotomum*	E	No	No Effect
Rock gnome lichen	*Gymnoderma lineare*	E	No	No Effect

MITIGATION

Avoidance and Minimization: NCDOT has minimized impacts to the fullest extent possible.

- Implementing and strictly enforcing Design Standards in Sensitive Watersheds (15A NCAC 4B.0124)

- A March 21, 2003 correspondence from the North Carolina Wildlife Resource Commission (NCWRC) listed a trout moratorium for this project from January 1 to April 15. The Greensheet from the Categorical Exclusion (CE) document incorrectly states that there is a trout moratorium from October 1 to April 15. The correct moratorium dates (January 1 to April 15) will be included in a revised greensheet that will be produced during the permitting process.

Compensatory Mitigation: Construction for this project will impose temporary impacts and minimal permanent impacts to jurisdictional waters. There are no HQWs or ORWs on the project, therefore, no mitigation is proposed for this project.

PROJECT SCHEDULE

The project is currently scheduled with review date of July 29, 2008 and to Let on September 16, 2008.

REGULATORY APPROVALS

Section 404 Permit: It is anticipated that the temporary dewatering of the Broad River be authorized under Section 404 Nationwide Permit 33 (Temporary Construction Access and Dewatering). We are, therefore, requesting the issuance of a Nationwide Permit 33 authorizing the temporary dewatering of East Fork Big Crabtree Creek. All other aspects of this project are being processed by the Federal Highway Administration as a "Categorical Exclusion". The NCDOT requests that these activities be authorized by a Nationwide Permit 23.

Section 401 Certification: We anticipate 401 General Certification numbers 3701 and 3688 will apply to this project. The NCDOT will adhere to all Water Quality Certification general conditions; therefore, we are not requesting written concurrence. We are providing two copies of this application to the North Carolina Department of Environmental and Natural Resources, Division of Water Quality, for their records.

We anticipate that comments from the NCWRC will be requested prior to authorization by the US Army Corps of Engineers (USACE). By copy of this letter and attachment, NCDOT hereby requests NCWRC review. NCDOT requests that NCWRC forward their comments to the USACE and NCDOT within 30 days of receipt of this application.

Thank you for your assistance with this project. A copy of this permit application will be posted on the NCDOT Website at http://207.4.62.65/PDEA/PermApps/. If you have any questions or need additional information, please contact Jeff Hemphill at (919) 715-1458.

Sincerely,

E. L. Lusk

for Gregory J. Thorpe, Ph.D., Environmental Management Director
Project Development and Environmental Analysis Branch

Cc

W/attachment

Mr. Brian Wrenn, NCDWQ **(2 Copies)**
Ms. Marella Buncick, USFWS
Ms. Marla Chambers, NCWRC
Mr. Harold Draper, TVA

W/o attachment (see website for attachments)

Dr. David Chang, P.E., Hydraulics
Mr. Victor Barbour, P.E., Project Services Unit
Mr. Greg Perfetti, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. J.J. Swain, P.E. (Div. 13)
Mr. Roger Bryan (Div. 13) DEO
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
Ms. Stacy Oberhausen, PDEA Project Planning Engineer

Office Use Only: Form Version March 05

USACE Action ID No. _____ **DWQ No.** _____

(If any particular item is not applicable to this project, please enter "Not Applicable" or "N/A".)

I. Processing

1. Check all of the approval(s) requested for this project:
   - ☒ Section 404 Permit
   - ☐ Section 10 Permit
   - ☐ 401 Water Quality Certification
   - ☐ Riparian or Watershed Buffer Rules
   - ☐ Isolated Wetland Permit from DWQ
   - ☐ Express 401 Water Quality Certification

2. Nationwide, Regional or General Permit Number(s) Requested: NWP 23 & 33

3. If this notification is solely a courtesy copy because written approval for the 401 Certification is not required, check here: ☒

4. If payment into the North Carolina Ecosystem Enhancement Program (NCEEP) is proposed for mitigation of impacts, attach the acceptance letter from NCEEP, complete section VIII, and check here: ☐

5. If your project is located in any of North Carolina's twenty coastal counties (listed on page 4), and the project is within a North Carolina Division of Coastal Management Area of Environmental Concern (see the top of page 2 for further details), check here: ☐

II. Applicant Information

1. Owner/Applicant Information
   Name: Gregory J. Thorpe, Ph.D., Environmental Management Director
   Mailing Address: NCDOT – Project Development and Environmental Analysis
   1598 Mail Service Center
   Raleigh, NC 27699-1598

   Telephone Number: (919) 733-3141 Fax Number: (919) 733-9794
   E-mail Address: jhemphill@dot.state.nc.us

2. Agent/Consultant Information (A signed and dated copy of the Agent Authorization letter must be attached if the Agent has signatory authority for the owner/applicant.)
   Name: _____
   Company Affiliation: _____
   Mailing Address: _____

   Telephone Number: _____ Fax Number: _____
   E-mail Address: _____

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: Bridge No. 7 over the Broad River on US 64.

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4258

3. Property Identification Number (Tax PIN): N/A

4. Location
   County: Rutherford Nearest Town: Chimney Rock Village
   Subdivision name (include phase/lot number): N/A
   Directions to site (include road numbers/names, landmarks, etc.): Take I-40 west to NC 9 at Exit 54 and turn left. Proceed south for approximately 13 miles to US 64 turn left. Head east for approximately 3.5 miles to the bridge 7 over the Broad River. The bridge crossing is just prior to Broad Rivers confluence with Lake Lure.

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): 35°26.15' °N 82°14.10' °W

6. Property size (acres): N/A

7. Name of nearest receiving body of water: Broad River

8. River Basin: Broad
   (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: The land uses surrounding and within the project study area are commercial and undeveloped.

10. Describe the overall project in detail, including the type of equipment to be used: NCDOT proposes to build a new 39 feet wide and 260 feet long triple span bridge on a new alignment to the southwest of existing Bridge No. 7 (158 feet long) over the Broad River. Six Piers in the water from the proposed bridge will result in 58 square feet of permanent impacts to surface water. The existing bridge will be retained as part of a pedestrian enhancement project. Traffic will be maintained onsite via the existing bridge. Construction equipment will consist of heavy trucks, earth moving equipment, cranes, etc.

11. Explain the purpose of the proposed work: The existing bridges are structurally deficient and according to federal guidelines are considered functionally obsolete. The replacement of these bridges will result in safer traffic operations.

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.

1. Provide a written description of the proposed impacts: Permanent stream impacts from bridge piers will occur with this action. Please see cover letter for more details.
2. 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)
No Wetlands					
Total Wetland Impact (acres)					0

3. List the total acreage (estimated) of all existing wetlands on the property: 0

4. 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)
Site 1	Broad River	Temporary	Perennial	160 ft	323	0.28
Total Stream Impact (by length and acreage)					323	0.28

5. 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)
No open water				

Total Open Water Impact (acres)				0

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

Stream Impact (acres):	0.28 (Temporary causeways)
Wetland Impact (acres):	0
Open Water Impact (acres):	0
Total Impact to Waters of the U.S. (acres)	0.28 (Temporary Impacts)
Total Stream Impact (linear feet):	323 (Temporary Impacts)

7. 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.

   _____

   _____

8. 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. Implementing Design Standards in Sensitive Watersheds and a trout moratorium will be enforced from January 1 to April 15.

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.
   No mitigation is proposed.

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
   Amount of Non-riparian wetland mitigation requested (acres): 0
   Amount of Coastal wetland mitigation requested (acres): 0

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		3 (2 for Catawba)	
2		1.5	
Total			

* 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.

3. 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. _____

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.
Impervious surface will not significantly increase as a result of this project.

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)

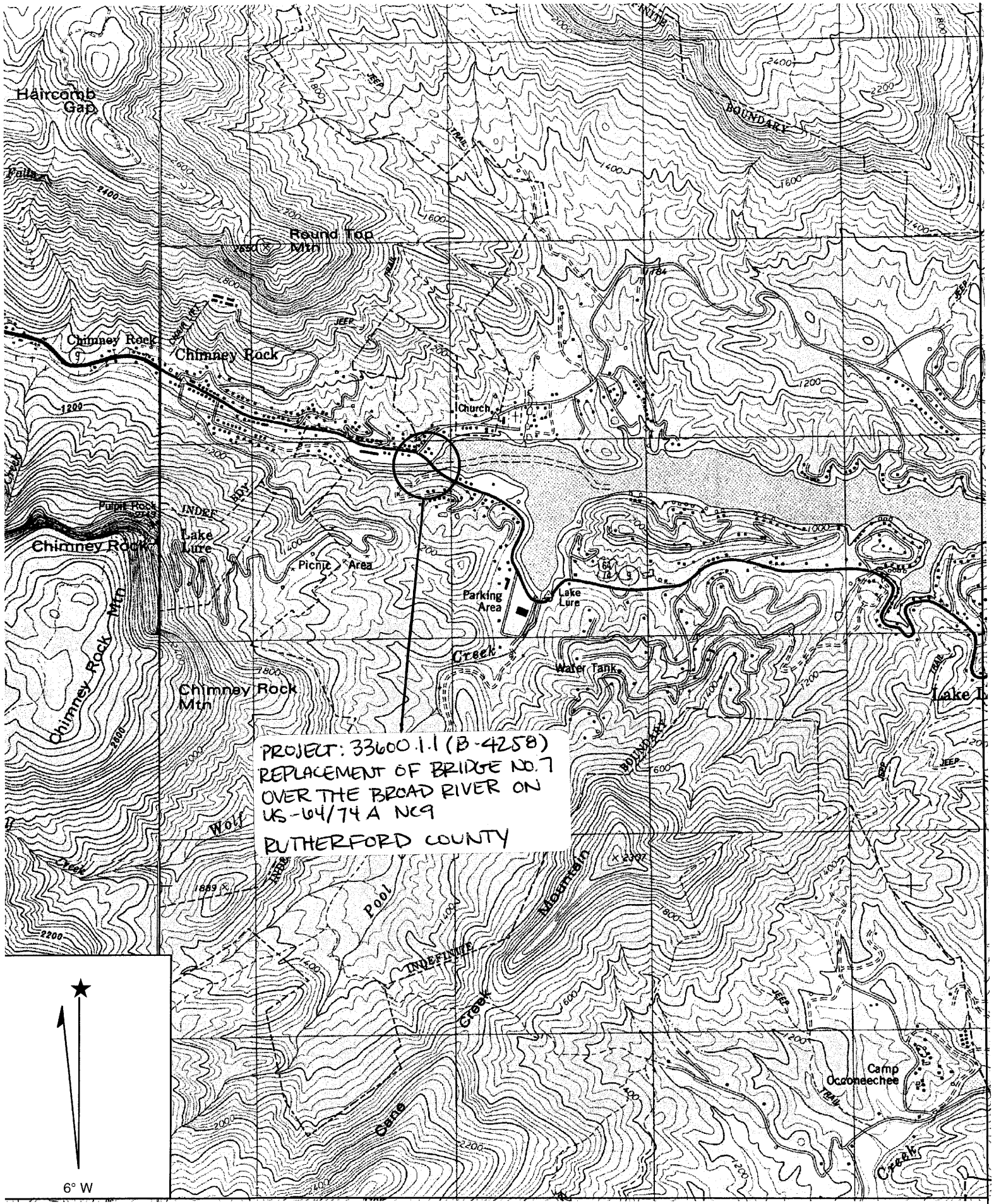
Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? Yes ☐ No ☒
If yes, please submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent North Carolina 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:

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).

E. L. Lusk 7-6-08

Applicant/Agent's Signature **Date**
(Agent's signature is valid only if an authorization letter from the applicant is provided.)



6° W

Name: LAKE LURE
Date: 10/25/2007
Scale: 1 inch equals 2000 feet

Location: 035° 25' 46.9" N 082° 13' 54.6" W
Caption: Project: 33600.1.1 (B-4258)
Rutherford County

Permit Drawing
Sheet 1 of 9

	OWNER'S NAME	ADDRESS
(4)	Robert S. and Martha Childs	P.O. Box 190 Lake Lure, NC
(9)	Michael and Donna M. Stead	518 Acadian Way Myrtle Beach, SC 29588
(10)	N.W. Sonny Beachum, Inc.	P.O. Box 105 Asheville, NC 28007

PROPERTY OWNER NAME AND ADDRESS

DIVISION OF HIGHWAYS
RUTHERFORD COUNTY

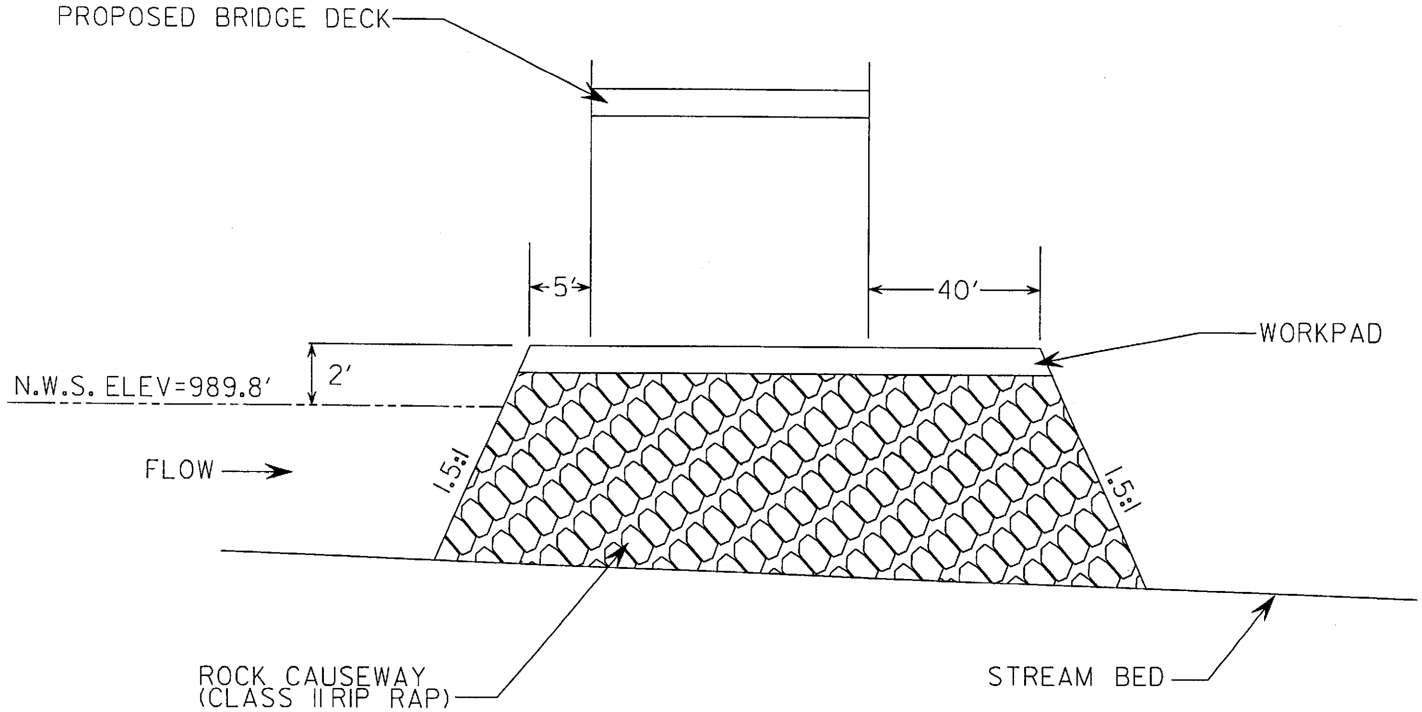
PROJECT: 33600.1.1 (B-4258)

REPLACEMENT OF BRIDGE NO. 7
OVER BROAD RIVER
ON US 64

10/25/2007

Permit Drawing

CAUSEWAY DETAIL
(NOT TO SCALE)



QUANTITIES OF ESTIMATES: CAUSEWAY I

VOLUME OF CLASS II RIP RAP= 950 yds^3
AREA OF CLASS II RIP RAP= 0.15 acres
Estimate 1350 Tons Class II Rip Rap

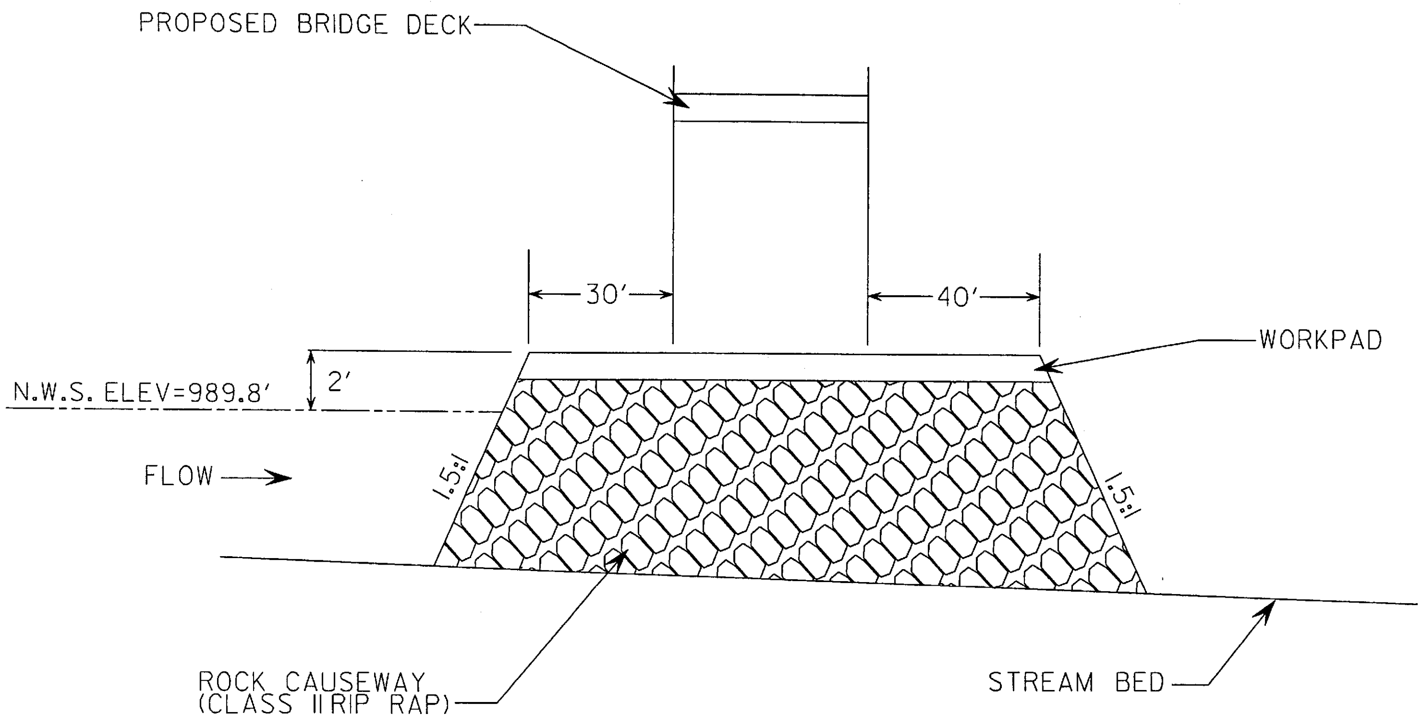
NCDOT

DIVISION OF HIGHWAYS
RUTHERFORD COUNTY
PROJECT: 33600.1.1 (B-4258)
REPLACEMENT OF BRIDGE NO.7
OVER BROAD RIVER ON US 64

10 / 25 / 2007

R:\6110\5612\Permits\V8_CausewayEng.dgn

CAUSEWAY DETAIL
(NOT TO SCALE)



QUANTITIES OF ESTIMATES: CAUSEWAY 2

VOLUME OF CLASS II RIP RAP= 725 yds^3
AREA OF CLASS II RIP RAP= 0.15 acres
Estimate 1030 Tons Class II Rip Rap

NCDOT

DIVISION OF HIGHWAYS
RUTHERFORD COUNTY
PROJECT: 33600.1.1 (B-4258)
REPLACEMENT OF BRIDGE NO.7
OVER BROAD RIVER ON US 64

10 // 25 // 2007

P:\0103602\Permits\V8_CausewayEng.dgn

Permit Drawing
Sheet 9 of 9

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	18+30 -L-	Causeway 1 (**)							0.14		148	
1	19+70 -L-	Causeway 2 (**)							0.14		175	
TOTALS:									0.28		323	

* IF CAUSEWAYS 1 AND 2 ARE IN PLACE AT SAME TIME THEY CANNOT BLOCK MORE THAN 50% OF THE CHANNEL.

** TOTAL LINEAR CHANNEL IMPACTS ALONG CENTERLINE OF BROAD RIVER FOR CAUSEWAYS 1 AND 2 IS APPROXIMATELY 250 LINEAR FEET.

*** TOTAL IMPACTS FROM PROPOSED PIERS IS 58 SQ. FT.

ATN Revised 3/31/05

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

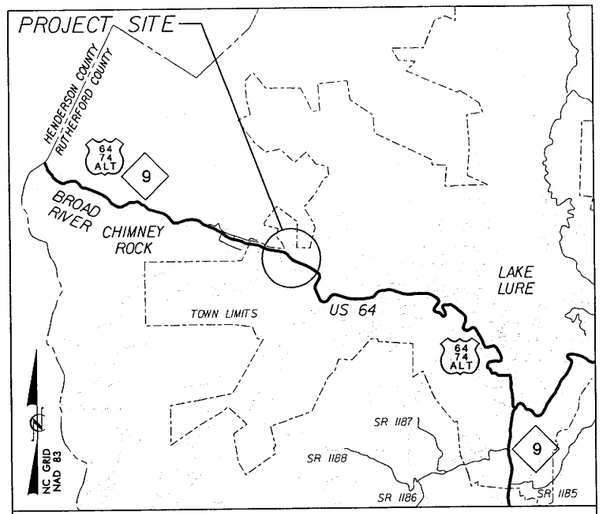
RUTHERFORD COUNTY
PROJECT: 33600.1.1 (B-4258)

11/26/2007

Permit Drawing Sheet 5 of 9

TIP PROJECT: B-4258

SEE SHEET 1-A FOR INDEX OF SHEETS
SEE SHEET 1-B FOR CONVENTIONAL PLAN SHEET SYMBOLS



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

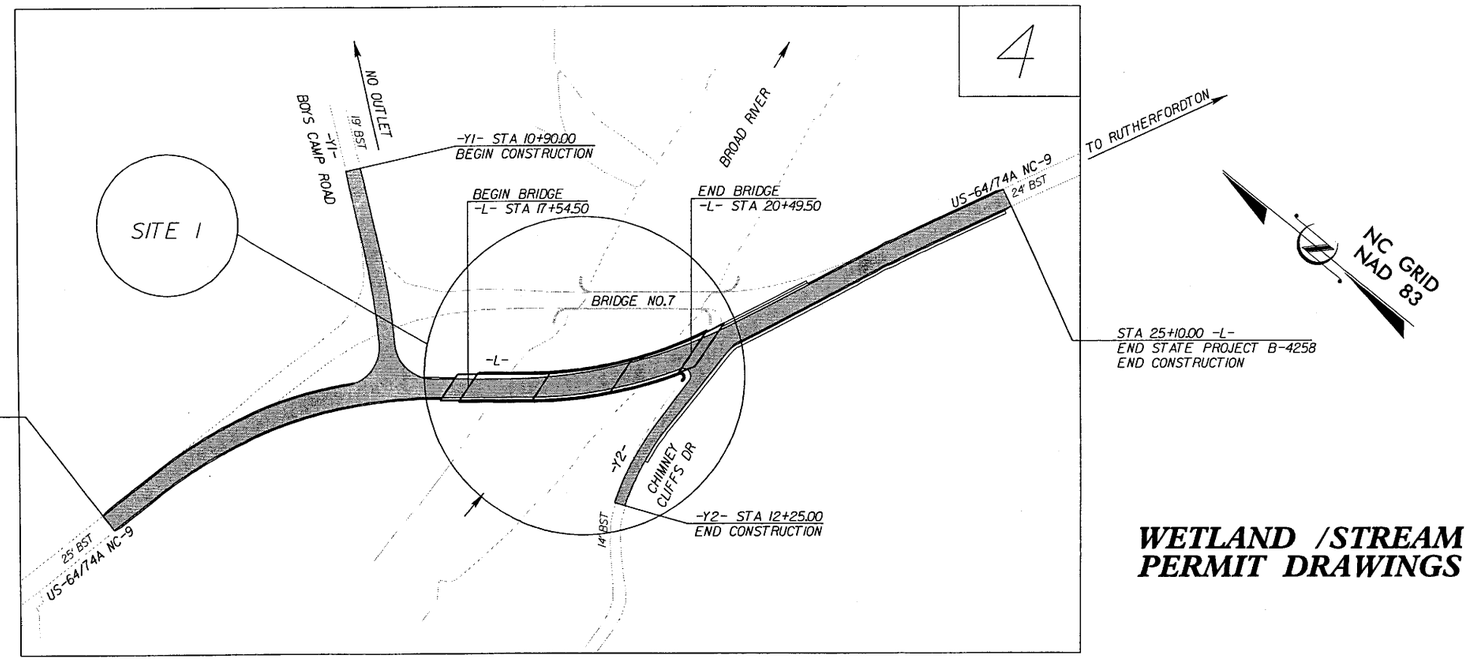
RUTHERFORD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4258	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33600.1.1	BRSTP-0064(61)	P.E.
33600.2.1	BRSTP-0064(61)	RIGHT-OF-WAY
33600.2.1	BRSTP-0064(61)	UTILITY

LOCATION: BRIDGE NO. 7 OVER THE BROAD RIVER ON US-64/74A NC-9

TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE



WETLAND /STREAM PERMIT DRAWINGS

NCDOT CONTACT: B.D. TAYLOR, P.E.
PROJECT ENGINEER
ROADWAY DESIGN UNIT

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF LAKE LURE

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONTRACT:

GRAPHIC SCALES

PLANS: 50 25 0 50 100
PROFILE (HORIZONTAL): 50 25 0 50 100
PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2007 = 4,300 VPD
ADT 2030 = 6,300 VPD
DHV = 9%
D = 55%
T = 5% *
V = 40 mph

FUNCTIONAL CLASSIFICATION:
RURAL MINOR ARTERIAL
* (TTST 2% + DUAL 3%)

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4258 = 0.185 MILE

LENGTH OF STRUCTURE TIP PROJECT B-4258 = 0.056 MILE

TOTAL LENGTH OF TIP PROJECT B-4258 = 0.241 MILE

PLANS PREPARED FOR THE NCDOT BY:

Kimley-Horn and Associates, Inc.

Post Office Box 33068
Raleigh, North Carolina 27636

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPTEMBER 21, 2007

LETTING DATE:
SEPTEMBER 16, 2008

JEFFREY W. MOORE, PE
PROJECT ENGINEER

J. JASON PACE. PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

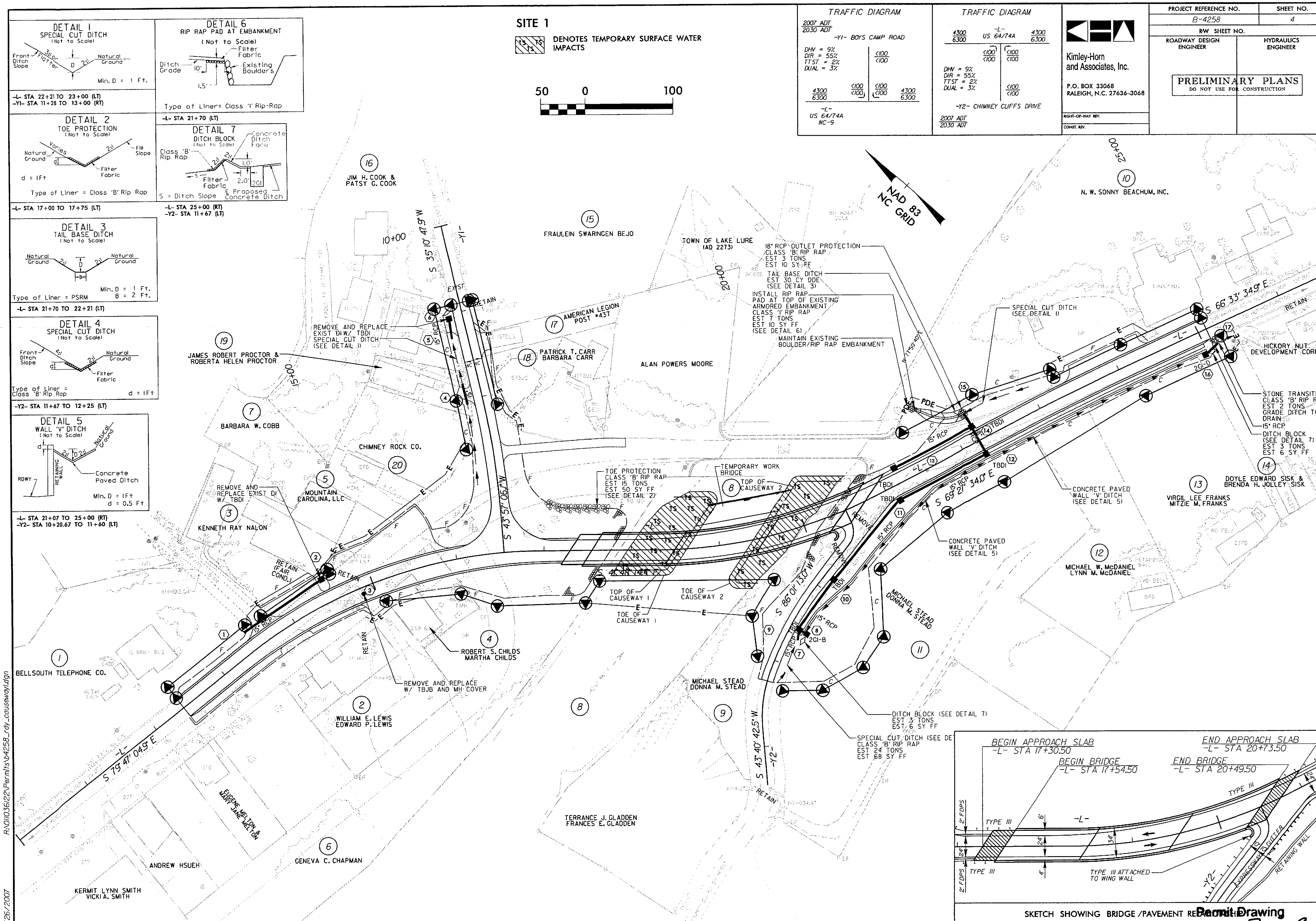
SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

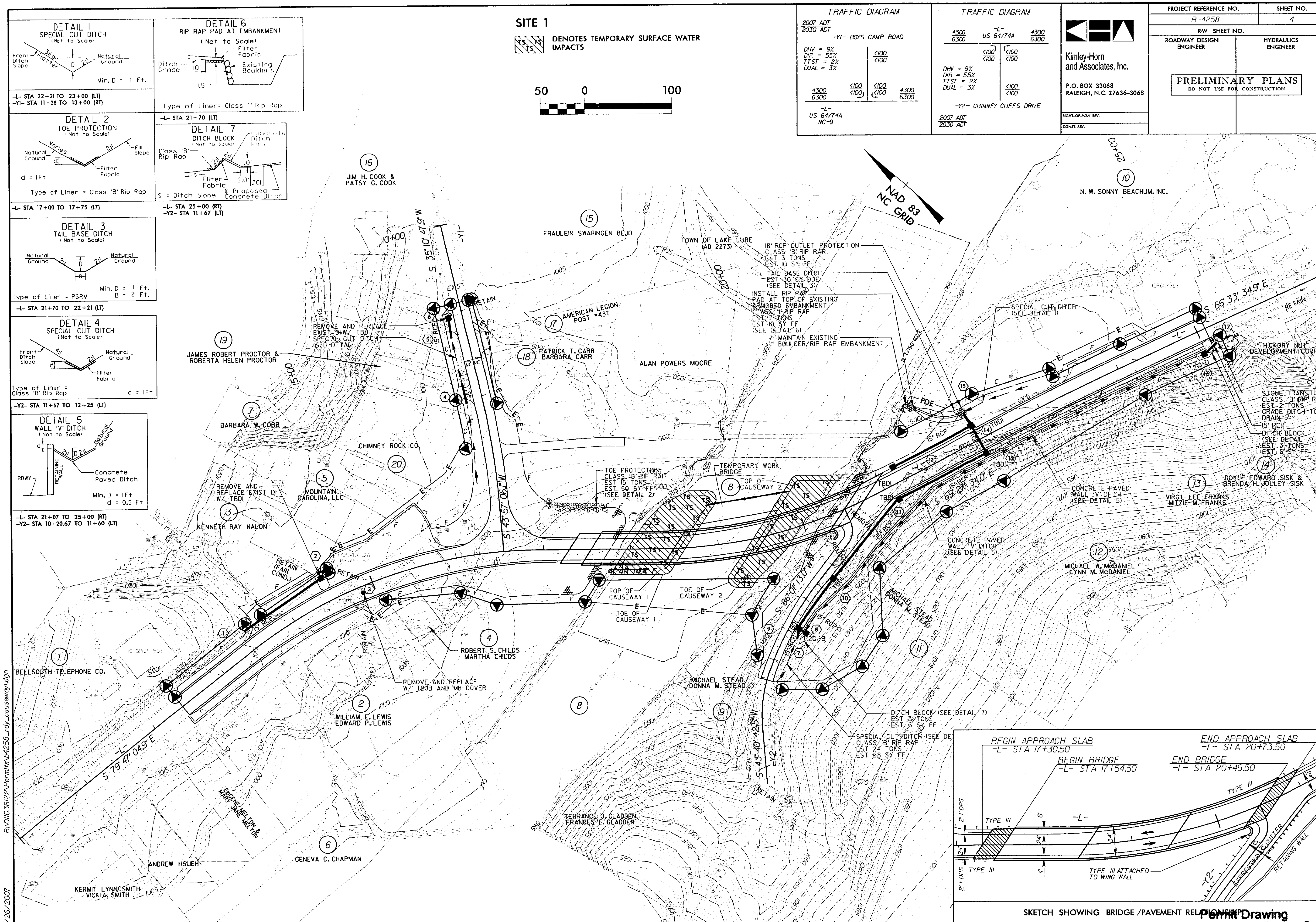
Permit Drawing
Sheet 6 of 9

P.E.
STATE HIGHWAY DESIGN ENGINEER

R:\DI\036\02\Permits\b4258_Wetland Vicinity Map.dgn
11/26/2007



DETAIL 1
SPECIAL CUT DITCH
(Not to Scale)
Front Ditch Slope
3:1 or Flatter
Natural Ground
Min. D = 1 Ft.
-L- STA 22+21 TO 23+00 (LT)
-Y1- STA 11+28 TO 13+00 (RT)
DETAIL 2
TOE PROTECTION
(Not to Scale)
Natural Ground
Varies
Fill Slope
Filter Fabric
d = 1Ft
Type of Liner = Class 'B' Rip Rap
-L- STA 17+00 TO 17+75 (LT)
DETAIL 3
TAIL BASE DITCH
(Not to Scale)
Natural Ground
Min. D = 1 Ft.
B = 2 Ft.
Type of Liner = PSRM
-L- STA 21+70 TO 22+21 (LT)
DETAIL 4
SPECIAL CUT DITCH
(Not to Scale)
Front Ditch Slope
Natural Ground
Filter Fabric
Type of Liner = Class 'B' Rip Rap
d = 1Ft
-Y2- STA 11+67 TO 12+25 (LT)
DETAIL 5
WALL 'V' DITCH
(Not to Scale)
Natural Ground
RETAINING WALL
RDWY
Concrete Paved Ditch
Min. D = 1Ft
d = 0.5 Ft
-L- STA 21+07 TO 25+00 (RT)
-Y2- STA 10+20.67 TO 11+60 (RT)
DETAIL 6
RIP RAP PAD AT EMBANKMENT
(Not to Scale)
Filter Fabric
Existing Boulders
Ditch Grade
Type of Liner= Class 'I' Rip-Rap
-L- STA 21+70 (LT)
DETAIL 7
DITCH BLOCK
(Not to Scale)
Concrete Ditch Face
Class 'B' Rip Rap
Filter Fabric
S = Ditch Slope
Proposed Concrete Ditch
-L- STA 25+00 (RT)
-Y2- STA 11+67 (LT)
SITE 1
DENOTES TEMPORARY SURFACE WATER IMPACTS
50 0 100
TRAFFIC DIAGRAM
2007 ADT
2030 ADT
-Y1- BOYS CAMP ROAD
DHV = 9%
DIR = 55%
TTST = 2%
DUAL = 3%
-L- US 64/74A NC-9
TRAFFIC DIAGRAM
-L- US 64/74A
-Y2- CHIMNEY CLIFFS DRIVE
Kimley-Horn and Associates, Inc.
P.O. BOX 33068
RALEIGH, N.C. 27636-3068
PROJECT REFERENCE NO. B-4258
SHEET NO. 4
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83 NC GRID
JIM H. COOK & PATSY G. COOK
FRAULEIN SWARINGEN BEJO
TOWN OF LAKE LURE
N. W. SONNY BEACHUM, INC.
AMERICAN LEGION POST #437
PATRICK T. CARR BARBARA CARR
ALAN POWERS MOORE
JAMES ROBERT PROCTOR & ROBERTA HELEN PROCTOR
BARBARA W. COBB
CHIMNEY ROCK CO.
MOUNTAIN CAROLINA, LLC
KENNETH RAY NALON
ROBERT S. CHILDS MARTHA CHILDS
BELLSOUTH TELEPHONE CO.
WILLIAM E. LEWIS EDWARD P. LEWIS
MICHAEL STEAD DONNA M. STEAD
TERRANCE J. GLADDEN FRANCES E. GLADDEN
EUGENE MELTON & MARY JANE MELTON
GENEVA C. CHAPMAN
ANDREW HSUEH
KERMIT LYNN SMITH VICKI A. SMITH
HICKORY NUT DEVELOPMENT CORP.
DOYLE EDWARD SISK & BRENDA H. JOLLEY SISK
VIRGIL LEE FRANKS MITZIE M. FRANKS
MICHAEL W. McDANIEL LYNN M. McDANIEL
18" RCP OUTLET PROTECTION CLASS 'B' RIP RAP EST 3 TONS EST 10 SY FF
TAIL BASE DITCH EST 30 CY DDE (SEE DETAIL 3)
INSTALL RIP RAP PAD AT TOP OF EXISTING ARMORED EMBANKMENT CLASS 'I' RIP RAP EST 7 TONS EST 10 SY FF (SEE DETAIL 6)
MAINTAIN EXISTING BOULDER/RIP RAP EMBANKMENT
SPECIAL CUT DITCH (SEE DETAIL 1)
STONE TRANSITION CLASS 'B' RIP RAP EST 2 TONS GRADE DITCH TO DRAIN 15" RCP
DITCH BLOCK (SEE DETAIL 7) EST 3 TONS EST 6 SY FF
CONCRETE PAVED WALL 'V' DITCH (SEE DETAIL 5)
REMOVE AND REPLACE EXIST D/W/ TBDI SPECIAL CUT DITCH (SEE DETAIL 1)
TOE PROTECTION CLASS 'B' RIP RAP EST 15 TONS EST 50 SY FF (SEE DETAIL 2)
TEMPORARY WORK BRIDGE
TOP OF CAUSEWAY 2
TOP OF CAUSEWAY 1
TOE OF CAUSEWAY 1
TOE OF CAUSEWAY 2
REMOVE AND REPLACE EXIST DI W/ TBDI
REMOVE AND REPLACE W/ TBJB AND MH COVER
DITCH BLOCK (SEE DETAIL 7) EST 3 TONS EST 6 SY FF
SPECIAL CUT DITCH (SEE DETAIL 4) CLASS 'B' RIP RAP EST 24 TONS EST 68 SY FF
S 79° 47' 04.9" E
S 35° 10' 47.9" W
S 43° 57' 06.1" W
S 86° 01' 13.0" W
S 43° 40' 42.5" W
S 69° 21' 34.0" E
S 66° 33' 34.9" E
BEGIN APPROACH SLAB -L- STA 17+30.50
BEGIN BRIDGE -L- STA 17+54.50
END APPROACH SLAB -L- STA 20+73.50
END BRIDGE -L- STA 20+49.50
TYPE III
TYPE III ATTACHED TO WING WALL
SKETCH SHOWING BRIDGE /PAVEMENT RE...
Permit Drawing 7 of 9
11/26/2007



PROJECT REFERENCE NO. B-4258
SHEET NO. 4
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Kimley-Horn and Associates, Inc.
P.O. BOX 33068
RALEIGH, N.C. 27636-3068
RIGHT-OF-WAY REV.
CONST. REV.
TRAFFIC DIAGRAM
2007 ADT
2030 ADT
-Y1- BOYS CAMP ROAD
DHV = 9%
DIR = 55%
TTST = 2%
DUAL = 3%
4300
6300
<100
-L-
US 64/74A
NC-9
TRAFFIC DIAGRAM
-Y2- CHIMNEY CLIFFS DRIVE
SITE 1
DENOTES TEMPORARY SURFACE WATER IMPACTS
50 0 100
DETAIL 1
SPECIAL CUT DITCH
(Not to Scale)
Front Ditch Slope
Natural Ground
Min. D = 1 Ft.
-L- STA 22+21 TO 23+00 (LT)
-Y1- STA 11+28 TO 13+00 (RT)
DETAIL 2
TOE PROTECTION
(Not to Scale)
Natural Ground
Fill Slope
Filter Fabric
d = 1Ft
Type of Liner = Class 'B' Rip Rap
-L- STA 17+00 TO 17+75 (LT)
DETAIL 3
TAIL BASE DITCH
(Not to Scale)
Natural Ground
Min. D = 1 Ft.
B = 2 Ft.
Type of Liner = PSRM
-L- STA 21+70 TO 22+21 (LT)
DETAIL 4
SPECIAL CUT DITCH
(Not to Scale)
Front Ditch Slope
Natural Ground
Filter Fabric
Type of Liner = Class 'B' Rip Rap
d = 1Ft
-Y2- STA 11+67 TO 12+25 (LT)
DETAIL 5
WALL 'V' DITCH
(Not to Scale)
RDWY
RETAINING WALL
Natural Ground
Concrete Paved Ditch
Min. D = 1Ft
d = 0.5 Ft
-L- STA 21+07 TO 25+00 (RT)
-Y2- STA 10+20.67 TO 11+60 (LT)
DETAIL 6
RIP RAP PAD AT EMBANKMENT
(Not to Scale)
Filter Fabric
Existing Boulders
Ditch Grade
Type of Liner= Class 'I' Rip-Rap
-L- STA 21+70 (LT)
DETAIL 7
DITCH BLOCK
(Not to Scale)
Class 'B' Rip Rap
Filter Fabric
Concrete Ditch
S = Ditch Slope
Proposed Concrete Ditch
-L- STA 25+00 (RT)
-Y2- STA 11+67 (LT)
NAD 83 NC GRID
JIM H. COOK & PATSY G. COOK
FRAULEIN SWARINGEN BEJO
TOWN OF LAKE LURE (AD 2273)
N. W. SONNY BEACHUM, INC.
AMERICAN LEGION POST #437
PATRICK T. CARR BARBARA CARR
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DITCH BLOCK (SEE DETAIL 7) EST 3 TONS EST 6 SY FF
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TOE PROTECTION CLASS 'B' RIP RAP EST 15 TONS EST 50 SY FF (SEE DETAIL 2)
TEMPORARY WORK BRIDGE
TOP OF CAUSEWAY 2
TOP OF CAUSEWAY 1
TOE OF CAUSEWAY 1
TOE OF CAUSEWAY 2
REMOVE AND REPLACE EXIST DI W/ TBDI
RETAIN (AIR COND.)
REMOVE AND REPLACE W/ TBJB AND MH COVER
DITCH BLOCK (SEE DETAIL 7) EST 3 TONS EST 6 SY FF
SPECIAL CUT DITCH (SEE DETAIL 4) CLASS 'B' RIP RAP EST 24 TONS EST 68 SY FF
S 79°47'04.9" E
S 43°57'06.1" W
S 35°10'47.9" W
S 66°33'34.9" E
S 69°27'34.0" E
S 86°01'30.0" W
S 43°40'42.5" W
BEGIN APPROACH SLAB -L- STA 17+30.50
BEGIN BRIDGE -L- STA 17+54.50
END APPROACH SLAB -L- STA 20+73.50
END BRIDGE -L- STA 20+49.50
TYPE III
TYPE III ATTACHED TO WING WALL
RETAINING WALL
SKETCH SHOWING BRIDGE /PAVEMENT RELATIONSHIP
Permit Drawing
Sheet 3 of 9
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11/26/2007

PROJECT REFERENCE NO.	SHEET NO.
B-4258	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Kimley-Horn and Associates, Inc.
P.O. BOX 33068
RALEIGH, N.C. 27636-3068

RIGHT-OF-WAY REV.
CONST. REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BM#3
BEARING AND DISTANCE TO
-L- STA 10+00.00 IS
S 32°13' 30.5" E AND 226.61'
RR SPIKE IN 36 INCH OAK

BM#2
-L- STA 16+08.65 (75.50' LT)
ELEV 1003.56'
RR SPIKE IN 42" INCH OAK

BEGIN GRADE
-L- STA 12+40.00 ELEV 1017.17'
TIE PROPOSED PAVEMENT TO EXISTING

PI = 14+43.00
EL = 1,013.57'
VC = 110'
K = 135
V = 60 MPH

(-)11.7734%

(-)10.9599%

BEGIN BRIDGE
-L- STA 17+54.50
ELEV 1010.58'

CL STA 19+02.00 -L-
1@ 95', 1@ 105', 1@ 95'
54" PRESTRESSED GIRDERS
CL ELEV = 1009.16'
SKEW = 12.5°

2' (TYP)

TOP OF
CAUSEWAY 1 AND 2
ELEV = 991.8'

NORMAL W.S.E.L.= 989.8'
@ EXISTING BRIDGE (10/07/05)

CLASS II RIP RAP
(STRUCTURE ITEM)
3.5' (TYP)

END BRIDGE
-L- STA 20+49.50
ELEV 1007.75'

(+)10.50%

(+)10.75%

BEGIN TAIL DITCH
GRADE LT
-L- STA 21+70.00
ELEV 1001.98'

END TAIL DITCH
BEGIN SPECIAL
DITCH GRADE LT
-L- STA 22+21.00
ELEV 1002.29'

END SPECIAL
DITCH GRADE LT
-L- STA 23+00.00
ELEV 1002.88'

END GRADE
BEGIN MILLING AND RESURFACING
-L- STA 24+16.00 ELEV 1004.23'

(-)10.9599%

END MILLING AND RESURFACING
-L- STA 25+10.00 ELEV 1003.26'
TIE PROPOSED PAVEMENT TO EXISTING

BM#1
-L- STA 28+18.08 (77.75' LT)
ELEV 998.80'
RR SPIKE IN 24 INCH NEEDLE PINE

UNCLASSIFIED STRUCTURE EXCAVATION

SEE SHEET NO.4 FOR -L- PLAN

-L- US-64/74A NC-9 (MEMORIAL HWY)

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 8600 CFS
DESIGN FREQUENCY	= 50 YR
DESIGN HW ELEVATION	= 955.5 FT
BASE DISCHARGE	= 10000 CFS
BASE FREQUENCY	= 100 YR
BASE HW ELEVATION	= 996.2 FT
OVERTOPPING DISCHARGE	= 23950 CFS
OVERTOPPING FREQUENCY	= 500 YR +
OVERTOPPING ELEVATION	= 1009.6 FT
DATE OF SURVEY	= 10/7/2005
W.S. ELEVATION AT DATE OF SURVEY	= 989.8 FT

BEGIN MILLING AND RESURFACING
-Y1- STA 10+90.00 ELEV 1007.03'
TIE PROPOSED PAVEMENT TO EXISTING

END MILLING AND RESURFACING
BEGIN GRADE
-Y1- STA 11+06.00 ELEV 1007.01'

PI = 12+01.00
EL = 1,006.53'
VC = 190'
K = 38
V = 30 MPH

(-)10.5053%

(+)11.0%

PI = 13+31.00
EL = 1,012.39'
VC = 70'
K = 13
V = 25 MPH

(+)4.5077%

(-)11.0%

(-)4.0%

BEGIN SPECIAL
DITCH GRADE RT
-Y1- STA 11+28.00
ELEV 1004.68'

END SPECIAL
DITCH GRADE RT
-Y1- STA 13+00.00
ELEV 1006.40'

END GRADE
-L- STA 16+55.00 (12' LT) =
-Y1- STA 13+68.00
ELEV 1012.02'

-L- STA 16+55.00 =
-Y1- STA 13+80.00
ELEV 1011.54'

-Y1- (BOYS CAMP ROAD)

SEE SHEET NO.4 FOR -Y1- PLAN

END GRADE
-Y2- STA 12+25.00 ELEV 1023.18'
TIE PROPOSED PAVEMENT TO EXISTING

PI = 11+20.00
EL = 1,009.30'
VC = 210'
K = 17
V = 20 MPH

(+)13.2190%

(+)15.24'

(+)4.0%

-L-

(+)1.0000%

END SPECIAL
DITCH GRADE LT
-Y2- STA 12+25.00
ELEV 1022.54'

BEGIN SPECIAL
DITCH GRADE LT
-Y2- STA 11+67.00
ELEV 1013.70'

BEGIN GRADE
-L- STA 20+50.03 (12' RT) =
-Y2- STA 10+12.00
ELEV 1008.22'

-L- STA 20+50.03 =
-Y2- STA 10+00.00
ELEV 1007.74'

-Y2- (CHIMNEY CLIFFS DRIVE)

SEE SHEET NO.4 FOR -Y2- PLAN

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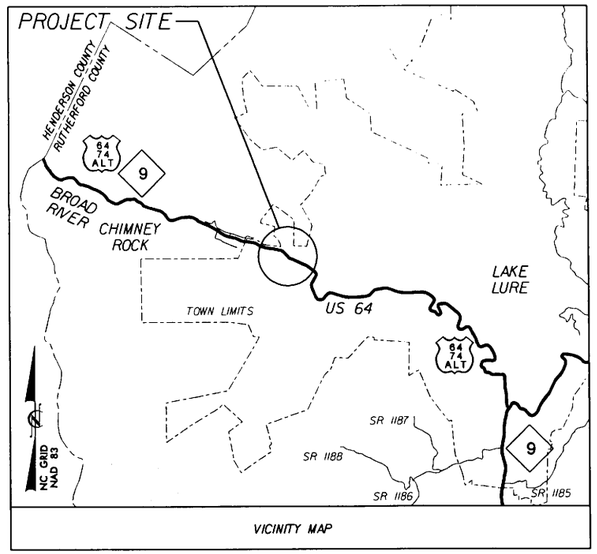
10/25/2007

Permit Drawing
Sheet 9 of 9

TIP PROJECT: B-4258

SEE SHEET 1-A FOR INDEX OF SHEETS
SEE SHEET 1-B FOR CONVENTIONAL PLAN SHEET SYMBOLS



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

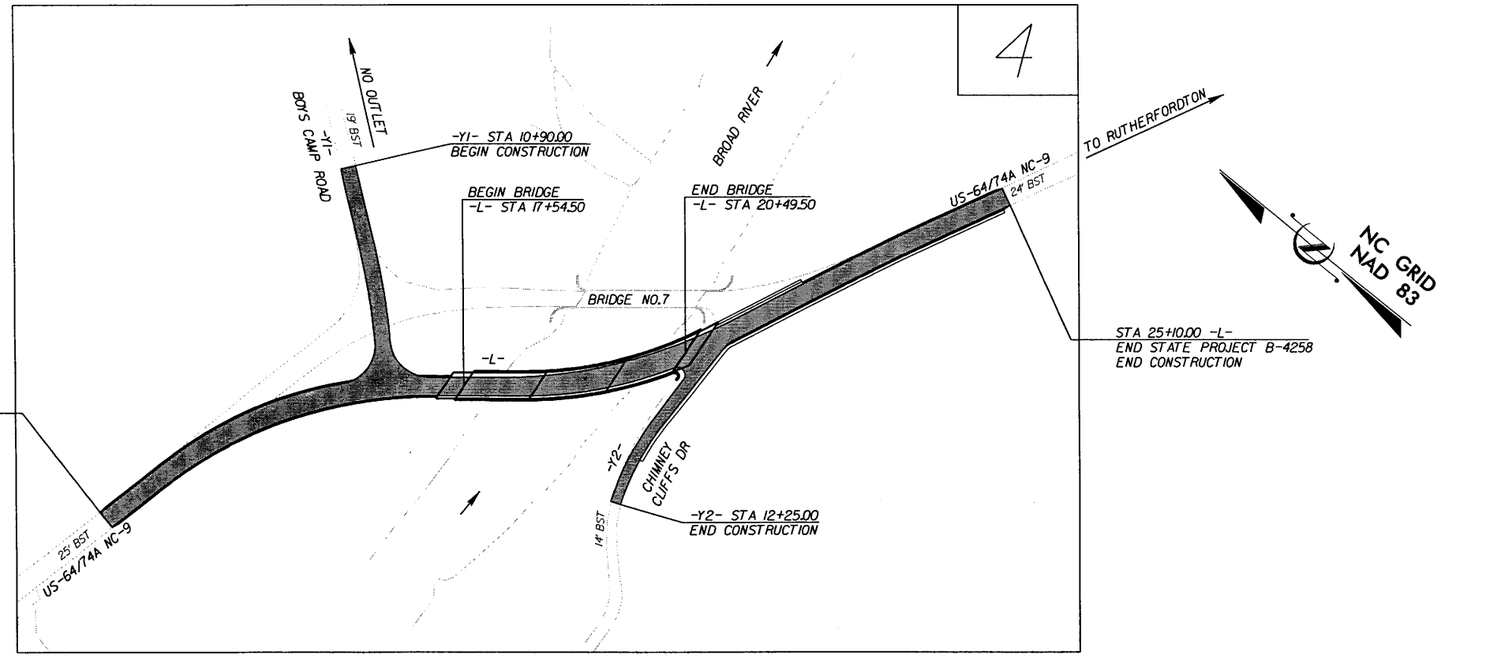
RUTHERFORD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4258	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33600.1.1	BRSTP-0064(61)	P.E.
33600.2.1	BRSTP-0064(61)	RIGHT-OF-WAY
33600.2.1	BRSTP-0064(61)	UTILITY

LOCATION: BRIDGE NO. 7 OVER THE BROAD RIVER ON US-64/74A NC-9

TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE



NCDOT CONTACT: B.D. TAYLOR, P.E.
PROJECT ENGINEER
ROADWAY DESIGN UNIT

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF LAKE LURE

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONTRACT:

GRAPHIC SCALES

PLANS: 50 25 0 50 100
PROFILE (HORIZONTAL): 50 25 0 50 100
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DESIGN DATA

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DHV = 9%
D = 55%
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FUNCTIONAL CLASSIFICATION:
RURAL MINOR ARTERIAL
* (TTST 2% + DUAL 3%)

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4258 = 0.185 MILE

LENGTH OF STRUCTURE TIP PROJECT B-4258 = 0.056 MILE

TOTAL LENGTH OF TIP PROJECT B-4258 = 0.241 MILE

PLANS PREPARED FOR THE NCDOT BY:

Kimley-Horn and Associates, Inc.

Post Office Box 33068
Raleigh, North Carolina 27636

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: SEPTEMBER 21, 2007

LETTING DATE: SEPTEMBER 16, 2008

JEFFREY W. MOORE, PE
PROJECT ENGINEER

J. JASON PACE. PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY DESIGN ENGINEER P.E.

R:\01\03622\Roadway\Pro\b4258_rdy_tshdgn
10/26/2007

Note: Not to Scale

**S.U.E. = Subsurface Utility Engineering*

PROJECT REFERENCE NO.	SHEET NO.
B-4258	1-B

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing High Quality Wetland Boundary — HQ WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- River Basin Buffer — RBB
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

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

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line
- Proposed Right of Way Line with Iron Pin and Cap Marker
- Proposed Right of Way Line with Concrete or Granite Marker
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Utility Easement — PUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Wheel Chair Ramp — WCR
- Curb Cut for Future Wheel Chair Ramp — CCFR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole — HH
- H-Frame Pole
- Recorded U/G Power Line — P
- Designated U/G Power Line (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Booth
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- Recorded U/G Telephone Cable — T
- Designated U/G Telephone Cable (S.U.E.*) — T
- Recorded U/G Telephone Conduit — TC
- Designated U/G Telephone Conduit (S.U.E.*) — TC
- Recorded U/G Fiber Optics Cable — T FO
- Designated U/G Fiber Optics Cable (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line — W
- Designated U/G Water Line (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Satellite Dish
- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- Recorded U/G TV Cable — TV
- Designated U/G TV Cable (S.U.E.*) — TV
- Recorded U/G Fiber Optic Cable — TV FO
- Designated U/G Fiber Optic Cable (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- Recorded U/G Gas Line — G
- Designated U/G Gas Line (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — ?UTL
- U/G Tank; Water, Gas, Oil
- A/G Tank; Water, Gas, Oil
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

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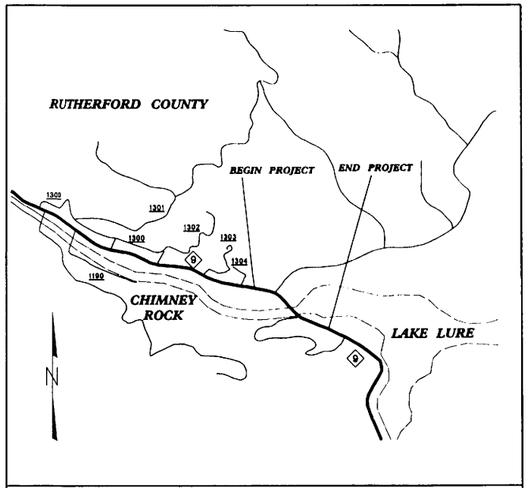
10/26/2007

PROJECT REFERENCE NO.	SHEET NO.
B-4258	1-C
Location and Surveys	

SURVEY CONTROL SHEET B-4258



VICINITY MAP - NOT TO SCALE

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	BL 1	629205.3490	1036702.4210	1009.23	OUTSIDE PROJECT LIMITS	
2	BL 2	629565.0400	1036417.0680	1006.91	12+53.75	28.28 RT
3	BL 3	629205.1490	1036702.4210	1009.23	20+97.71	31.30 LT
GPS2	B4258 2	628846.9500	1037426.8100	998.34	OUTSIDE PROJECT LIMITS	
GPS1	B4258 1	628862.2320	1038094.4650	999.68	OUTSIDE PROJECT LIMITS	

BY1

POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
6	BY1 6	629852.9910	1036710.4640	1009.09	OUTSIDE PROJECT LIMITS	
EQ2	BL 2	629565.0400	1036417.0680	1006.91	12+53.75	28.28 RT

BY2

POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
EQ1	BL 1	629205.3490	1036702.4210	1009.23	OUTSIDE PROJECT LIMITS	
7	BY2 7	629078.8950	1036272.8250	1046.80	OUTSIDE PROJECT LIMITS	

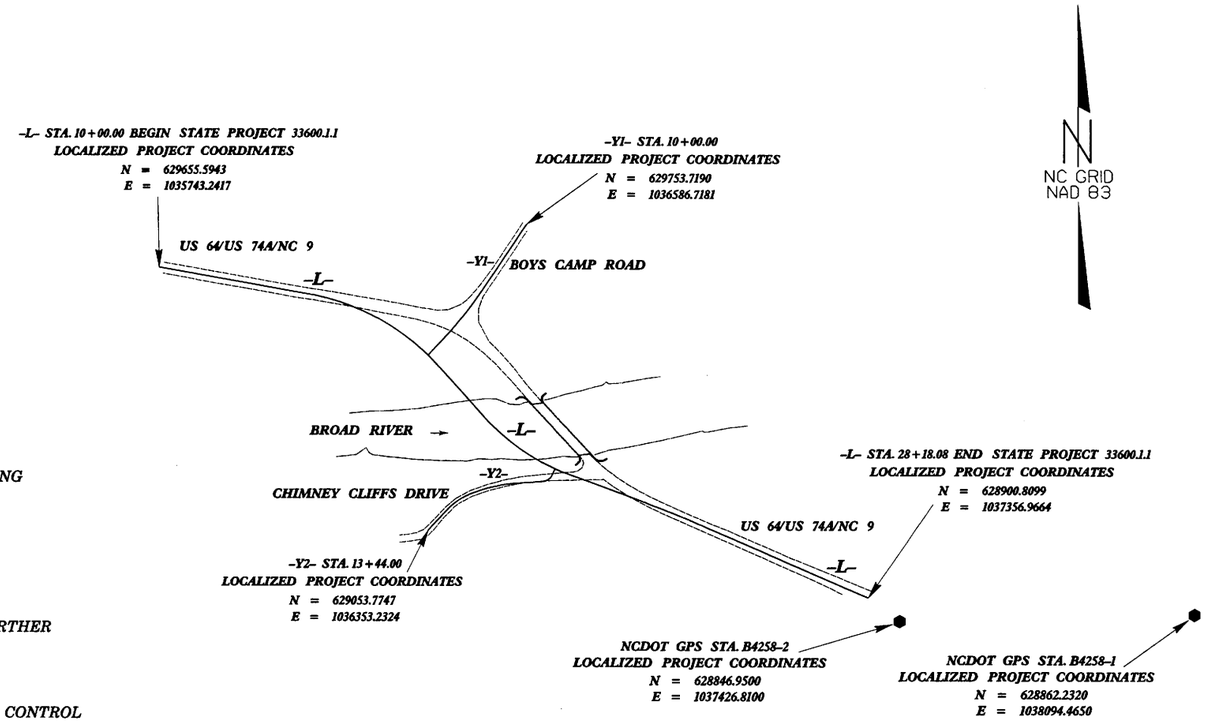
DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4258-2"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 628846.9500(ft) EASTING: 1037426.8100(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999824561
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4258-2" TO -L- STATION 10+00.00 IS
N 64°20'39" W 1867.70'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

BM1 ELEVATION = 998.80
N 628971 E 1037391
L STATION 28+18
N 26° 17' 35.5" E DIST 77.75
RR SPIKE IN 24 INCH NEEDLE PINE

BM2 ELEVATION = 1003.52
N 629439 E 1036403
L STATION 16+99 26 LEFT
RR SPIKE IN 42 INCH OAK

BM3 ELEVATION = 1065.39
N 629847 E 1035622
L STATION 10+00
N 32° 13' 30.5" W DIST 226.61
RR SPIKE IN 36 INCH OAK



NOTES:

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

THE FILES TO BE FOUND ARE AS FOLLOWS:
B4258_LS_CONTROL_060601.TXT

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 NGS ONLINE POSITIONING SERVICE (OPUS)

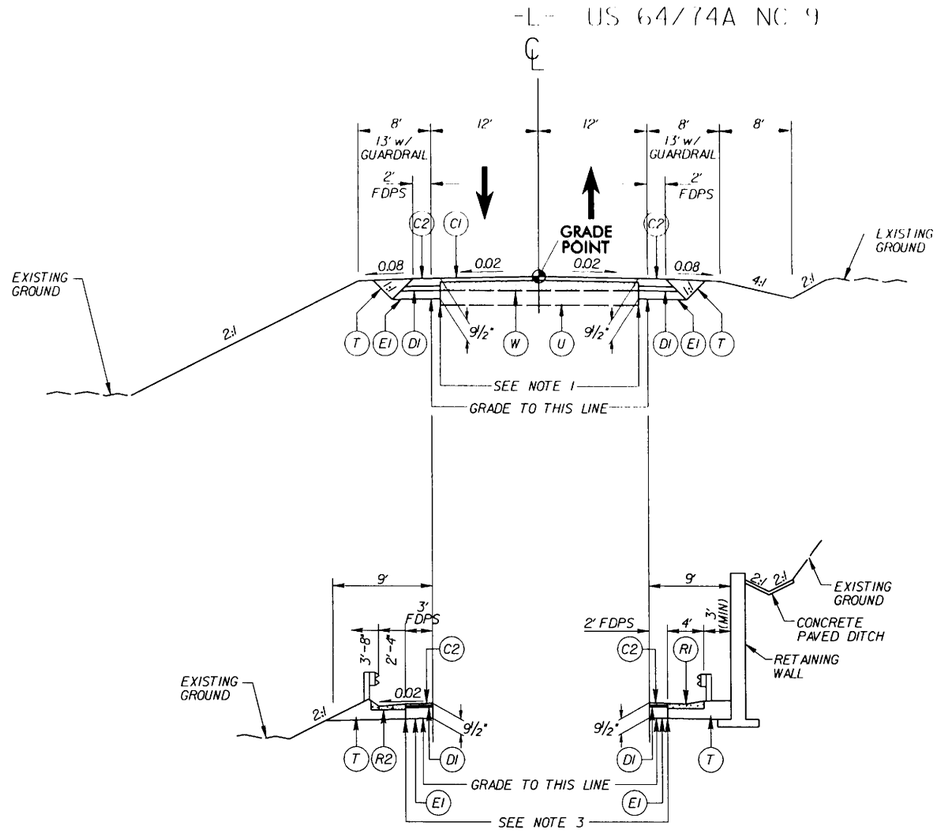
NOTE: DRAWING NOT TO SCALE

R:\01\036\02\Roadway\Pro\b4258_cty_tshdgn
10/26/2007

PROJECT REFERENCE NO.	SHEET NO.
B-4258	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

Kimley-Horn and Associates, Inc.
P.O. BOX 33068
RALEIGH, N.C. 27636-3068

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



TYPICAL SECTION NO. 1

-L- STA 12+40.00 TO STA 14+52.00
-L- STA 22+29.00 TO STA 25+10.00

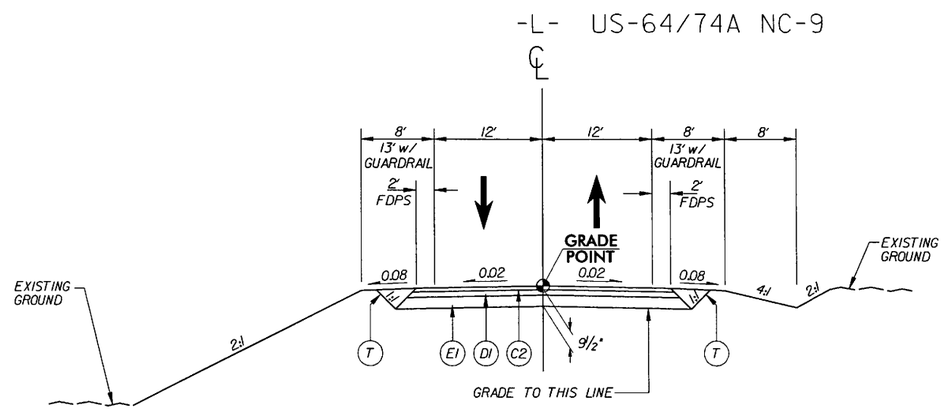
NOTES
1: SAWCUT EXISTING PAVEMENT TO PROVIDE A MINIMUM OF 1' FULL DEPTH PAVEMENT.
2: MILL AND RESURFACE (1.5" S9.5B) FROM -L- STA 24+16.00 TO STA 25+10.00.
3: MATCH FACE OF EXPRESSWAY GUTTER WITH PAVEMENT.

TYPICAL SECTION NO. 1A

-L- STA 21+10.00 TO STA 22+25.00 LT

TYPICAL SECTION NO. 1B

-L- STA 21+07.11 TO STA 25+00.00 RT



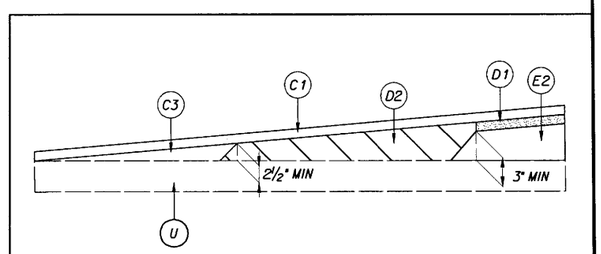
TYPICAL SECTION NO. 2

-L- STA 14+52.00 TO STA 17+54.50 (BEGIN BRIDGE)
-L- STA 20+49.50 (END BRIDGE) TO STA 22+29.00

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1.5" IN DEPTH OR GREATER THAN 2" IN DEPTH.
D1	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2.5" OR GREATER THAN 4" DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" OR GREATER THAN 5.5" DEPTH.
R1	PROPOSED 4' CONCRETE EXPRESSWAY GUTTER
R2	PROPOSED SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL W1)

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE INDICATED



WEDGING DETAIL FOR RESURFACING

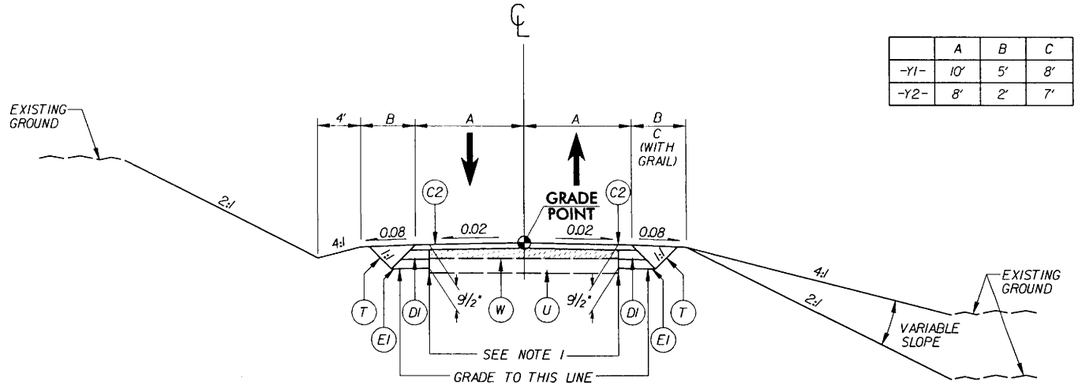
PROJECT REFERENCE NO.	SHEET NO.
B-4258	2-A

ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER

Kimley-Horn and Associates, Inc.
P.O. BOX 33068
RALEIGH, N.C. 27636-3068

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y1- BOYS CAMP ROAD
-Y2- CHIMNEY CLIFFS DRIVE



	A	B	C
-Y1-	10'	5'	8'
-Y2-	8'	2'	7'

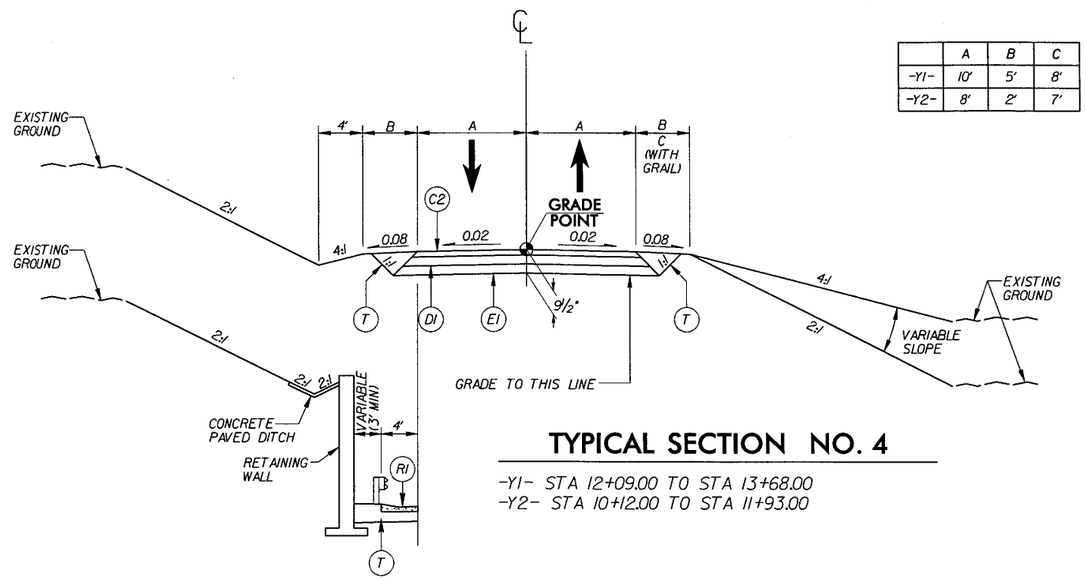
TYPICAL SECTION NO. 3

-Y1- STA 10+90.00 TO STA 12+09.00
-Y2- STA 11+93.00 TO STA 12+25.00

NOTES
1: SAWCUT EXISTING PAVEMENT TO PROVIDE A MINIMUM OF 1' FULL DEPTH PAVEMENT.
2: MILL AND RESURFACE (1.5" S9.5B) FROM -Y1- STA 10+90.00 TO STA 11+06.00.

PAVEMENT SCHEDULE	
C1	1.5" S9.5B
C2	3" S9.5B
C3	VARIABLE S9.5B
D1	2.5" I19.0B
D2	VARIABLE I19.0B
E1	4" B25.0B
E2	VARIABLE B25.0B
R1	PROPOSED 4' CONCRETE EXPRESSWAY GUTTER
R2	PROPOSED SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL W1)

-Y1- BOYS CAMP ROAD
-Y2- CHIMNEY CLIFFS DRIVE



	A	B	C
-Y1-	10'	5'	8'
-Y2-	8'	2'	7'

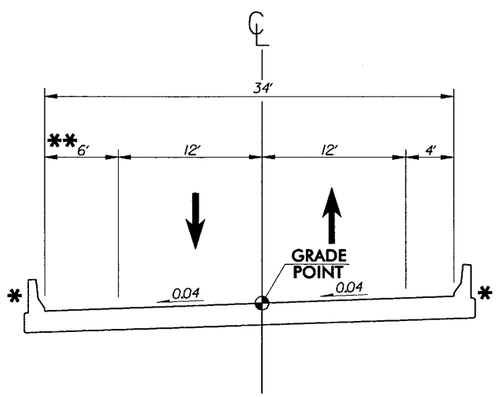
TYPICAL SECTION NO. 4

-Y1- STA 12+09.00 TO STA 13+68.00
-Y2- STA 10+12.00 TO STA 11+93.00

TYPICAL SECTION NO. 4A

-Y2- STA 10+20.66 TO STA 11+60.00 LT

-L- US-64/74A NC-9



BRIDGE TYPICAL SECTION NO. 1

DESIGN DATA

ADT 2007	=	4,300 VPD
ADT 2030	=	6,300 VPD
DHV	=	9%
D	=	55%
T	=	5%
TTST	=	2%
DUAL	=	3%
V	=	40 mph

* BRIDGE RAIL TO BE DETERMINED BY STRUCTURE DESIGN UNIT
** 6' SHOULDER WIDTH REQUIRED FOR HYDRAULIC SPREAD

R:\011036122\Roadway\Pro\b4258_rdy_typdgn
10/26/2007

NC GRID
NAD 83

BEGIN RETAINING WALL
-L- STA 25+00.00

END RETAINING WALL
-Y2- STA 11+60.00

RETAINING WALL

4' EXPRESSWAY GUTTER

SHOULDER BERM GUTTER

-L-

-Y2

2' FDPS

24"

2' FDPS

25+00

20+00

12+00

16'

PROJECT REFERENCE NO.	SHEET NO.
B-4258	2-B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

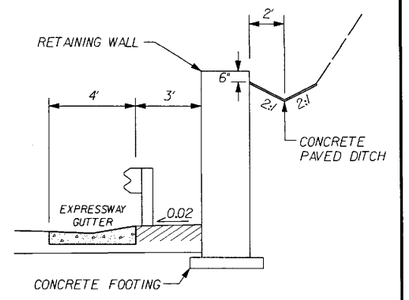
Kimley-Horn and Associates, Inc.

P.O. BOX 33068
RALEIGH, N.C. 27636-3068

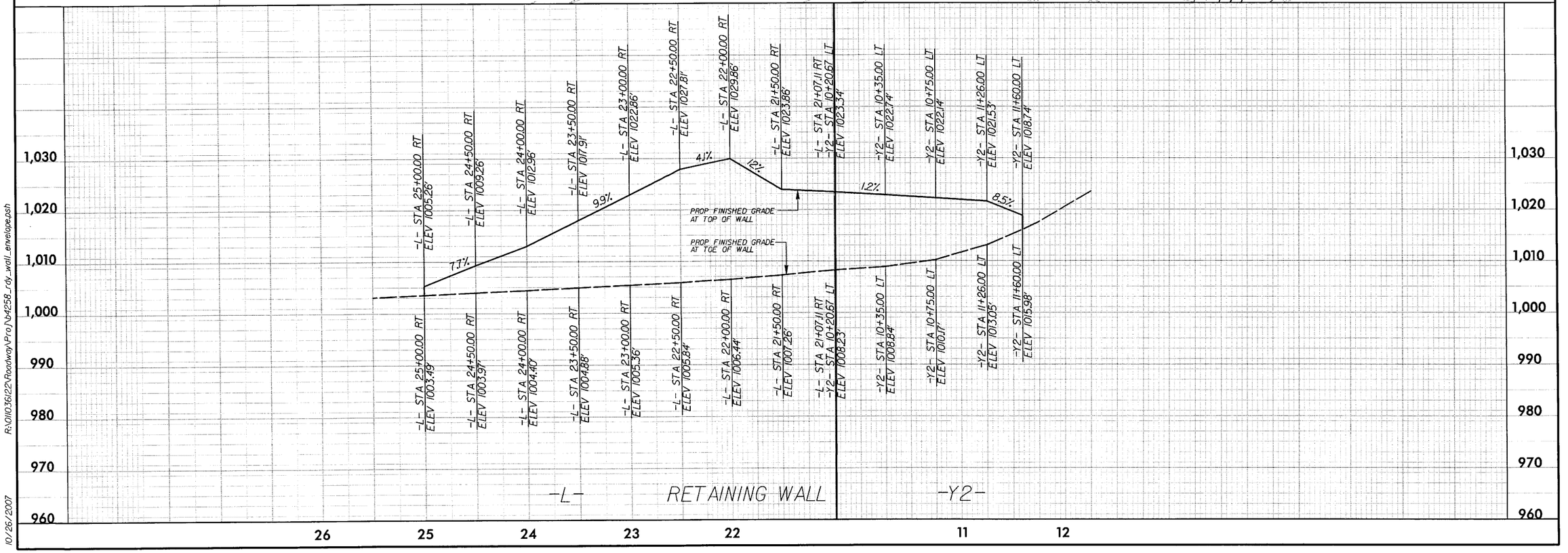
RIGHT-OF-WAY REV.

CONST. REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



TYPICAL - WALL (-L-)



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10/26/2007

COMPUTED BY: JJP DATE: 7/13/2007

CHECKED BY: LDR DATE: 7/13/2007

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
B-4258	3-A

Kimley-Horn and Associates, Inc.
P.O. Box 33068
Raleigh, N.C. 27636-3068

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE)								BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE)								CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D								15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)		QUANTITIES FOR DRAINAGE STRUCTURES	"TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B')		C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03			D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	M.D.I. TYPE "A" STD. 840.17 OR 840.26	M.D.I. TYPE "B" STD. 840.18 OR 840.27	M.D.I. TYPE "D" STD. 840.19 OR 840.28	M.D.I. FRAME WITH GRATE STD. 840.22	M.D.I. (W.S.) FRAME WITH TWO GRATES STD. 840.22	M.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	M.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	ADJUSTMENT OF CATCH BASINS	CONVERT EXIST CB TO JB	TBJB STD. 840.34	M.H. FRAME AND COVER STD. 840.54	J.B. STD. 840.31 OR 840.32	MANHOLE STD. 840.51	M.H. STD. 840.51 OR 840.53	T.B.D.I. STD. 840.35	T.B.D.I. (W.S.) FRAME WITH TWO GRATES STD. 840.20	T.B.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
SIZE								12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"				CU. YARDS			LIN. FT. A	B		TYPE OF GRATE																									
THICKNESS OR GAUGE		FROM	TO													.064	.064	.064	.064	.079	.079	.109	.109												R.C.P.	C.S.P.	PER EACH (0' THRU 5.0')	5.0' THRU 10.0'	10.0' AND ABOVE		E	F	G																								
13+47 -L-	LT	1	2		1013.00	1009.09	0.036		108																																																										
14+49.50 -L-	LT	2		1012.26	1004.52																																1	2.74																						1		1					REMOVE AND REPLACE EXIST DI
14+86 -L-	RT	3		1012.86	1002.57																																1	5	0.29																	1	1											REMOVE AND REPLACE EXIST JB
11+93 -Y1-	RT	4					0.01																									24																																			
11+28 -Y1-	RT	5	6		1004.68	1003.00	0.07		24																																																										
11+06 -Y1-	RT	6		1006.16	1002.13																																1																							1		1					REMOVE AND REPLACE EXIST DI
22+22 -L-	RT	12		1005.80	1002.73																																1																							1		1					TBDI TYPE 'B'
11+67 -Y2-	LT	7	9		1013.70	1012.00	0.142										12																																																		
11+55 -Y2-	LT	9		1015.20	1012.00																																1																							1		1					TBDI TYPE 'B'
11+55 -Y2-	LT	8		1017.22	1012.12																																1	0.10									1			1																		
11+55 -Y2-	LT	8	9		1012.12	1012.00	0.010		12																																																										
11+55 -Y2-	LT	9	10		1012.00	1006.24	0.080		72																																																							40	
10+84 -Y2-	LT	10		1010.10	1006.24																																1																							1		1					TBDI TYPE 'B'
10+84 -Y2-	LT	10	11		1006.24	1003.60	0.023		116																																																									
21+09 -L-	LT	11		1007.60	1003.60																																1																							1		1					TBDI TYPE 'B'
22+22 -L-	LT	11	12		1003.60	1002.73	0.008		112																																																									
22+22 -L-	RT	12	14		1002.73	1002.37	0.010			36																																																						24	
21+20 -L-	LT	13		1006.68	1003.40																																1																							1		1					TBDI TYPE 'B'
21+20 -L-	LT	13	14		1003.40	1002.37	0.010		100																																																									
22+21 -L-	LT	14		1005.79	1002.37																																1																							1		1					TBDI TYPE 'B'
22+21 -L-	LT	14	15		1002.37	1002.29	0.005			16																																																							
24+96 -L-	RT	16		1003.76	1001.84																																1											1		1																		
24+96 -L-	RT	16	17		1001.84	1001.64	0.010		20																																																									
SHEET TOTALS									564	52							12															24					11	7.84	0.29								1	1		2					1	1					8		8				64	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I.(N.S.)	GRATED DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

PROJECT REFERENCE NO.	SHEET NO.
B-4258	4

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

Kimley-Horn and Associates, Inc.
P.O. BOX 33068
RALEIGH, N.C. 27636-3068

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

RIGHT-OF-WAY REV.
CONST. REV.

TRAFFIC DIAGRAM (2007 ADT / 2030 ADT) — -Y1- BOYS CAMP ROAD — DHV = 9%, DIR = 55%, TTST = 2%, DUAL = 3% — -L- US 64/74A NC-9

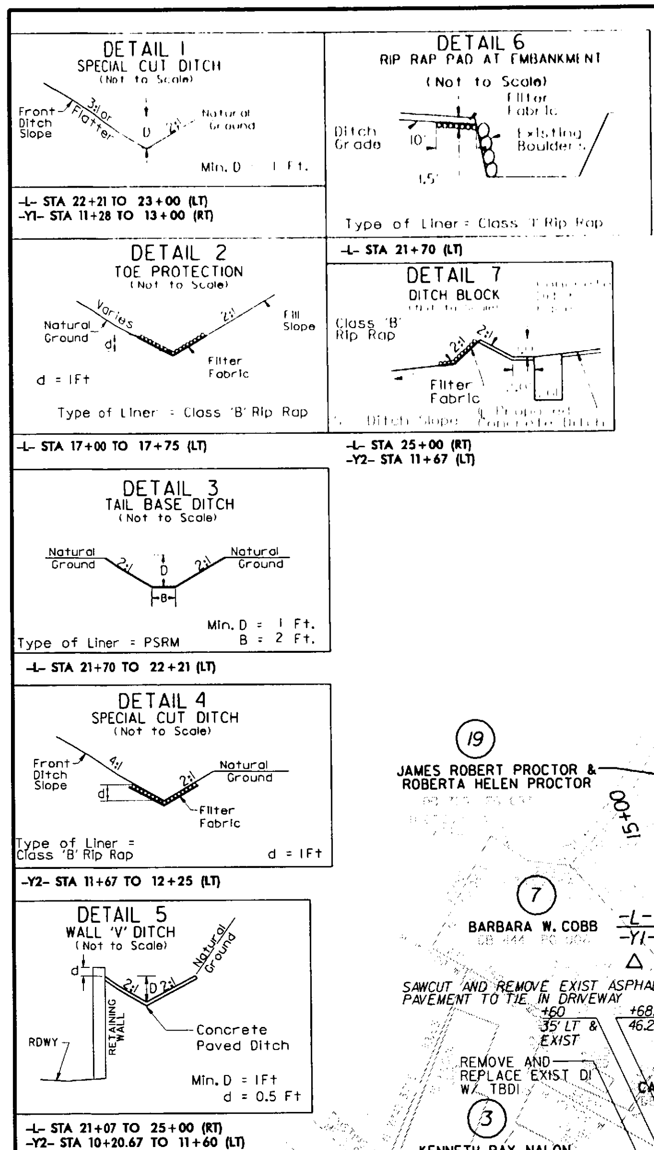
TRAFFIC DIAGRAM — -L- US 64/74A 4300 / 6300 — DHV = 9%, DIR = 55%, TTST = 2%, DUAL = 3% — -Y2- CHIMNEY CLIFFS DRIVE — 2007 ADT / 2030 ADT

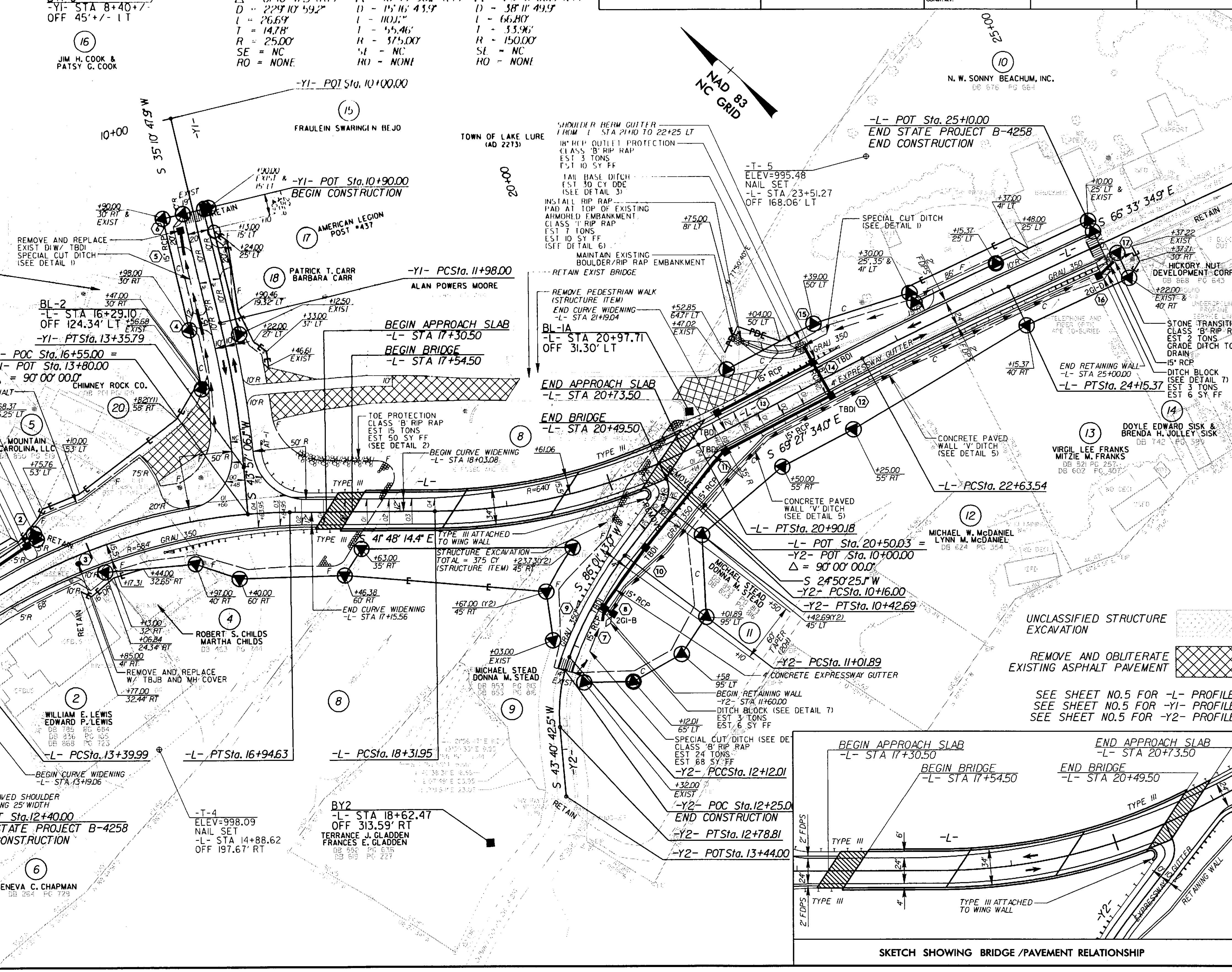
L

PI Sta 15+24.10	PI Sta 19+63.63	PI Sta 23+39.47	PI Sta 12+67.03
Δ = 37° 58' 50.4" (RT)	Δ = 27° 39' 19.6" (LT)	Δ = 2° 53' 59.1" (RT)	Δ = 8° 46' 18.3" (RT)
D = 10° 42' 34.2"	D = 10° 42' 34.2"	D = 1° 54' 35.5"	D = 6° 21' 58.3"
L = 354.64'	L = 258.23'	L = 151.85'	L = 137.79'
T = 184.11'	T = 131.68'	T = 75.93'	T = 69.05'
R = 535.00'	R = 535.00'	R = 3,000.00'	R = 900.00'
SE = 0.04	SE = 0.04	SE = NC	SE = NC
RO = 84.00'	RO = 84.00'	RO = NONE	RO = NONE

Y2

PI Sta 10+30.78	PI Sta 11+57.35	PI Sta 12+45.97
Δ = 61° 10' 47.9" (RT)	Δ = 16° 49' 30.2" (LT)	Δ = 25° 31' 00.3" (LT)
D = 229° 10' 59.2"	D = 15° 16' 43.9"	D = 38° 11' 49.9"
L = 26.69'	L = 110.12'	L = 66.80'
T = 14.78'	T = 55.46'	T = 33.96'
R = 25.00'	R = 375.00'	R = 150.00'
SE = NC	SE = NC	SE = NC
RO = NONE	RO = NONE	RO = NONE





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10/26/2007

PROJECT REFERENCE NO.	SHEET NO.
B-4258	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Kimley-Horn and Associates, Inc.
P.O. BOX 33068
RALEIGH, N.C. 27636-3068

RIGHT-OF-WAY REV.
CONST. REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BM#3
BEARING AND DISTANCE TO
-L- STA 10+00.00 IS
S 32°13' 30.5" E AND 226.61'
RR SPIKE IN 36 INCH OAK

BM#2
-L- STA 16+98.65 (25.50' LT)
ELEV 1003.52'
RR SPIKE IN 42 INCH OAK

BM#1
-L- STA 28+18.08 (77.75' LT)
ELEV 998.80'
RR SPIKE IN 24 INCH NEEDLE PINE

BEGIN GRADE
-L- STA 12+40.00 ELEV 1017.17'
TIE PROPOSED PAVEMENT TO EXISTING

PI = 14+43.00
EL = 1,013.57'
VC = 110'
K = 135
V = 60 MPH

(-)1.7734%

(-)0.9599%

BEGIN BRIDGE
-L- STA 17+54.50
ELEV 1010.58'

CL STA 19+02.00 -L-
1 @ 95', 1 @ 105', 1 @ 95'
54" PRESTRESSED GIRDERS
CL ELEV = 1009.16'
SKEW = 123°

END BRIDGE
-L- STA 20+49.50
ELEV 1007.75'

END MILLING AND RESURFACING
-L- STA 25+10.00 ELEV 1003.26'
TIE PROPOSED PAVEMENT TO EXISTING

(-)0.9599%

(+)0.50%

(+)0.75%

END SPECIAL
DITCH GRADE LT
-L- STA 23+00.00
ELEV 1002.88'

1.5:1

2' (TYP)

NORMAL W.S.E.L.= 989.8'
@ EXISTING BRIDGE (10/07/05)

CLASS II RIP RAP
(STRUCTURE ITEM)
3.5' (TYP)

BEGIN TAIL DITCH
GRADE LT
-L- STA 21+70.00
ELEV 1001.98'

END TAIL DITCH
BEGIN SPECIAL
DITCH GRADE LT
-L- STA 22+21.00
ELEV 1002.29'

END GRADE
BEGIN MILLING AND RESURFACING
-L- STA 24+16.00 ELEV 1004.23'

UNCLASSIFIED STRUCTURE EXCAVATION

SEE SHEET NO.4 FOR -L- PLAN

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 8600 CFS
DESIGN FREQUENCY	= 50 YR
DESIGN HW ELEVATION	= 955.5 FT
BASE DISCHARGE	= 10000 CFS
BASE FREQUENCY	= 100 YR
BASE HW ELEVATION	= 996.2 FT
OVERTOPPING DISCHARGE	= 23950 CFS
OVERTOPPING FREQUENCY	= 500 YR +
OVERTOPPING ELEVATION	= 1009.6 FT
DATE OF SURVEY	= 10/7/2005
W.S. ELEVATION AT DATE OF SURVEY	= 989.8 FT

-L- US-64/74A NC-9 (MEMORIAL HWY)

BEGIN MILLING AND RESURFACING
-Y1- STA 10+90.00 ELEV 1007.03'
TIE PROPOSED PAVEMENT TO EXISTING

END MILLING AND RESURFACING
BEGIN GRADE
-Y1- STA 11+06.00 ELEV 1007.01'

PI = 12+01.00
EL = 1,006.53'
VC = 190'
K = 38
V = 30 MPH

PI = 13+31.00
EL = 1,012.39'
VC = 70'
K = 13
V = 25 MPH

(-)10.5053%

(+)11.0%

(+)4.5077%

(-)11.0%

(-)4.0%

BEGIN SPECIAL
DITCH GRADE RT
-Y1- STA 11+28.00
ELEV 1004.68'

END SPECIAL
DITCH GRADE RT
-Y1- STA 13+00.00
ELEV 1006.40'

END GRADE
-L- STA 16+55.00 (12' LT) =
-Y1- STA 13+68.00
ELEV 1012.02'

-L- STA 16+55.00 =
-Y1- STA 13+80.00
ELEV 1011.54'

-Y1- (BOYS CAMP ROAD)

SEE SHEET NO.4 FOR -Y1- PLAN

END GRADE
-Y2- STA 12+25.00 ELEV 1023.18'
TIE PROPOSED PAVEMENT TO EXISTING

PI = 11+20.00
EL = 1,009.30'
VC = 210'
K = 17
V = 20 MPH

(+)13.2190%

(+)15.24%

(+)4.0%

(+)11.0000%

END SPECIAL
DITCH GRADE LT
-Y2- STA 12+25.00
ELEV 1022.54'

BEGIN SPECIAL
DITCH GRADE LT
-Y2- STA 11+67.00
ELEV 1013.70'

BEGIN GRADE
-L- STA 20+50.03 (12' RT) =
-Y2- STA 10+12.00
ELEV 1008.22'

-L- STA 20+50.03 =
-Y2- STA 10+00.00
ELEV 1007.74'

-Y2- (CHIMNEY CLIFFS DRIVE)

SEE SHEET NO.4 FOR -Y2- PLAN

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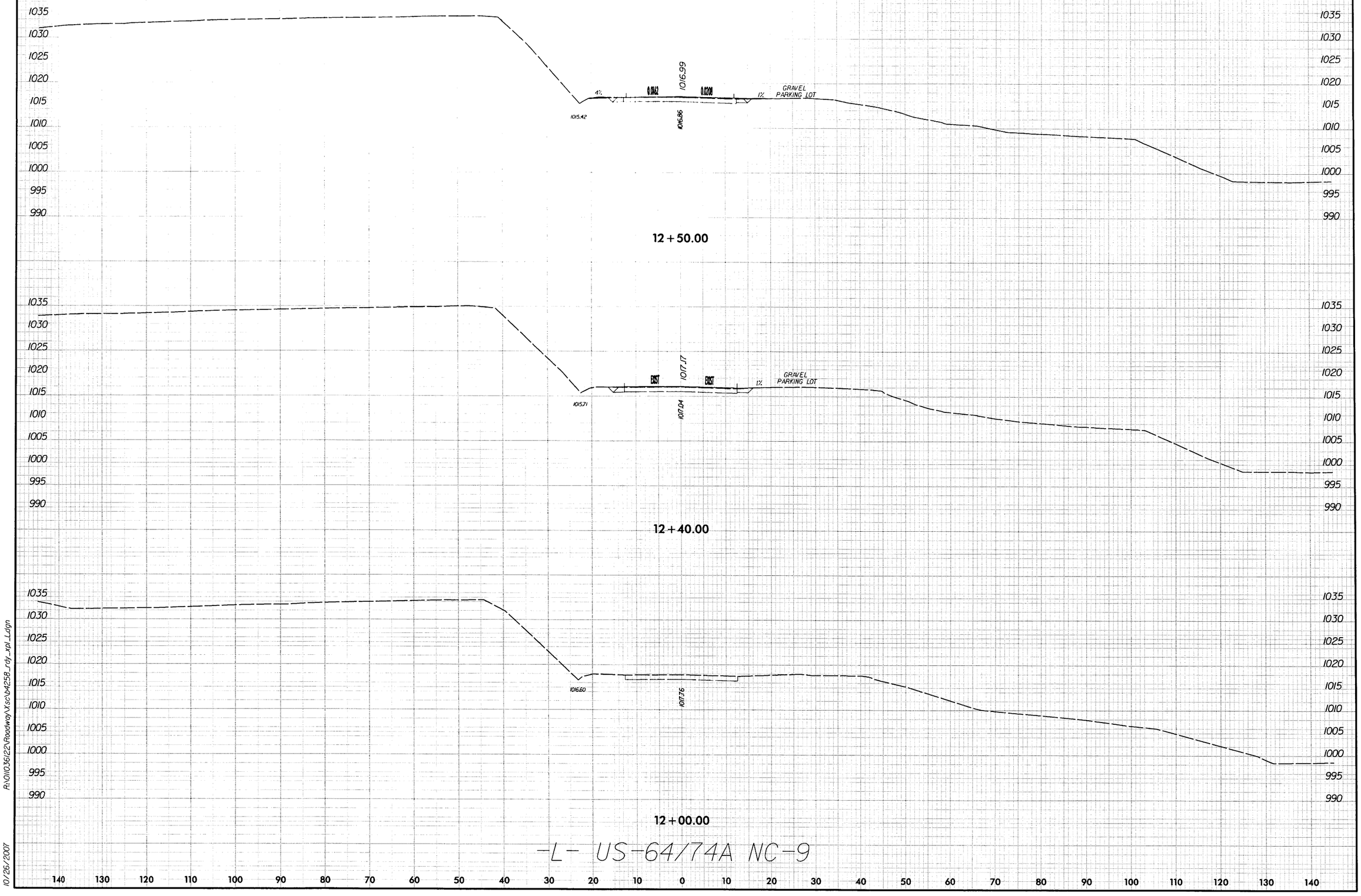
10/26/2007

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4258	X-1

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-L- US-64/74A NC-9

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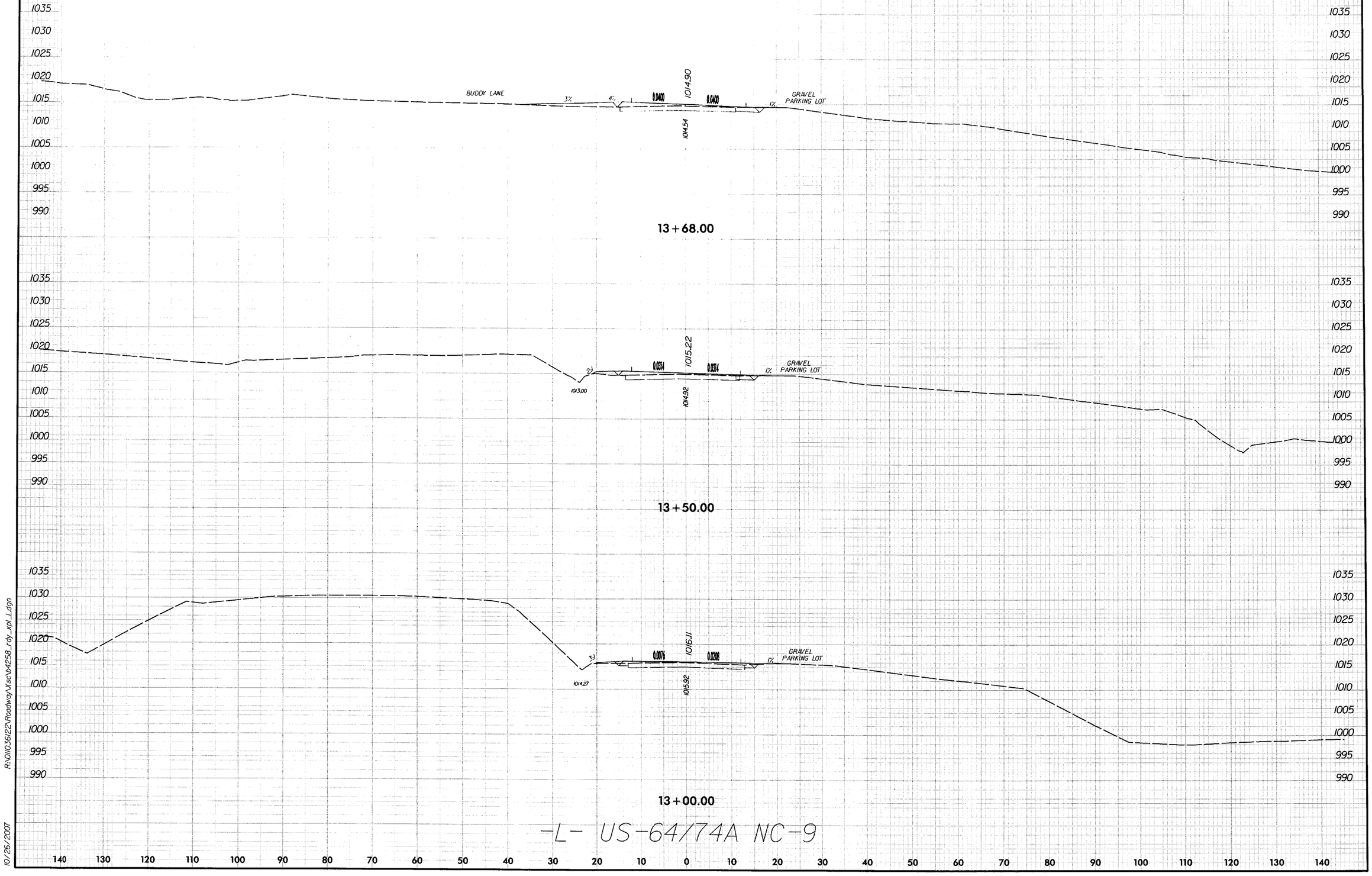
10/26/2007

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4258	X-2



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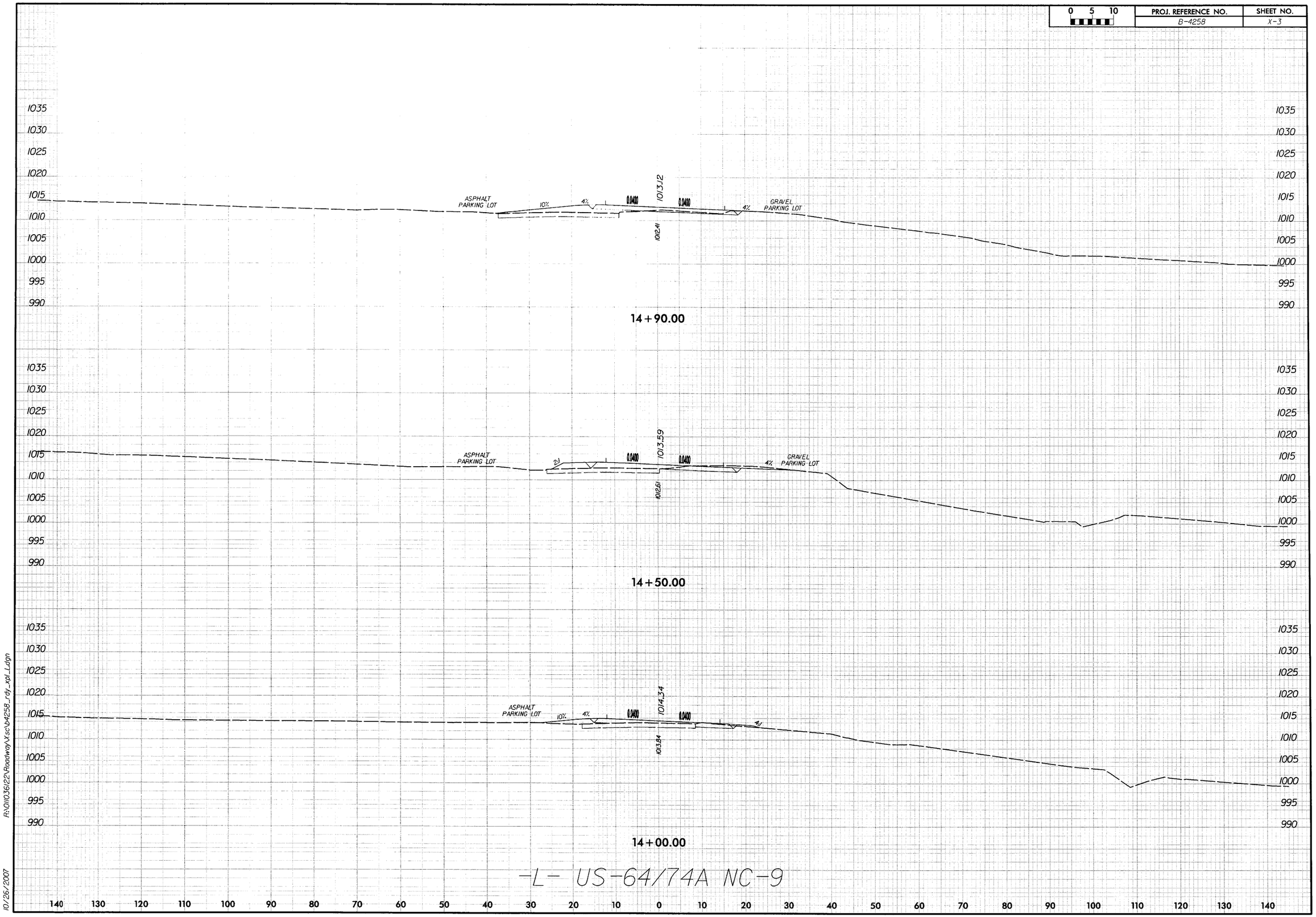
10/26/2007

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4258	X-3



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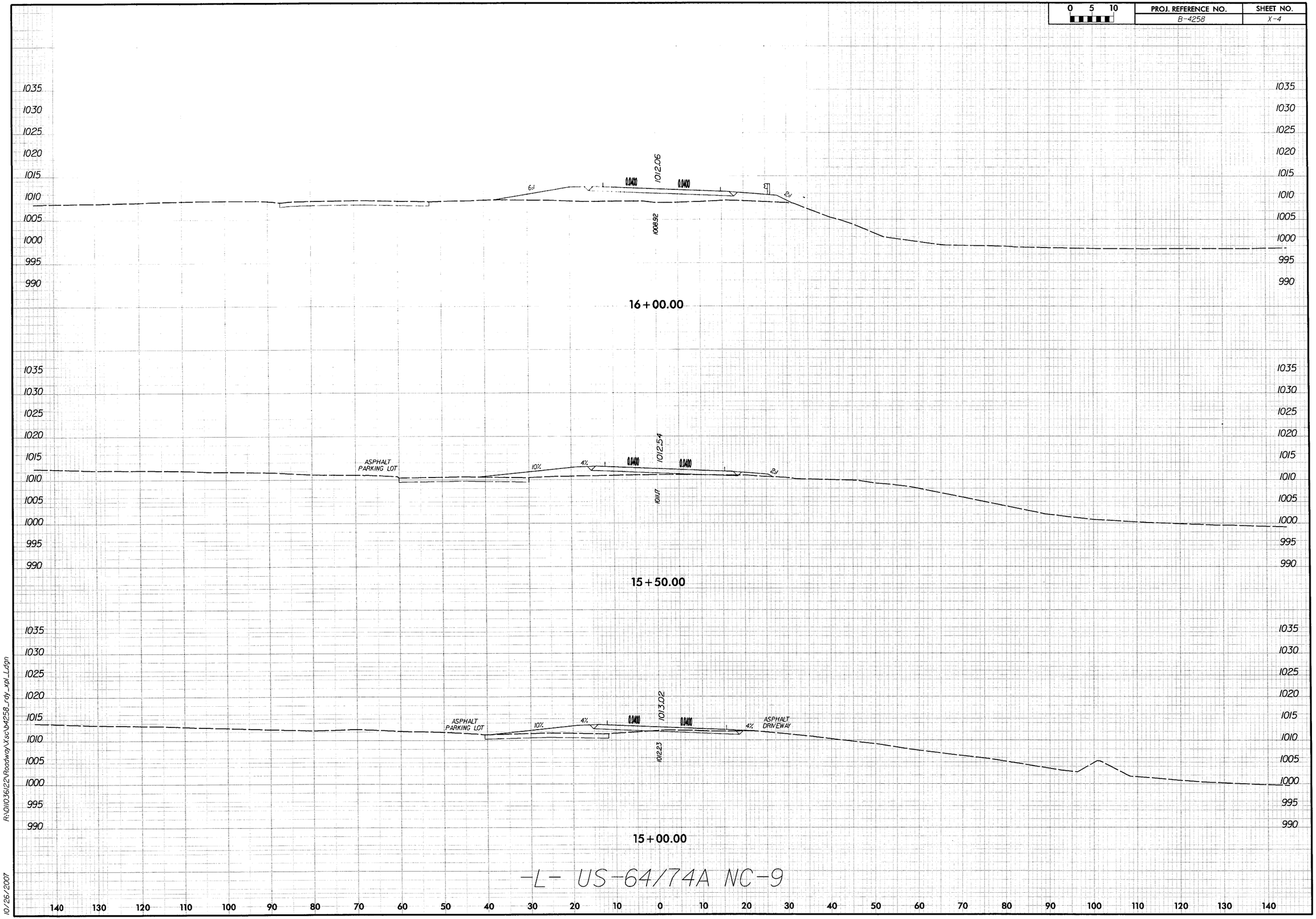
10/26/2007

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4258	X-4



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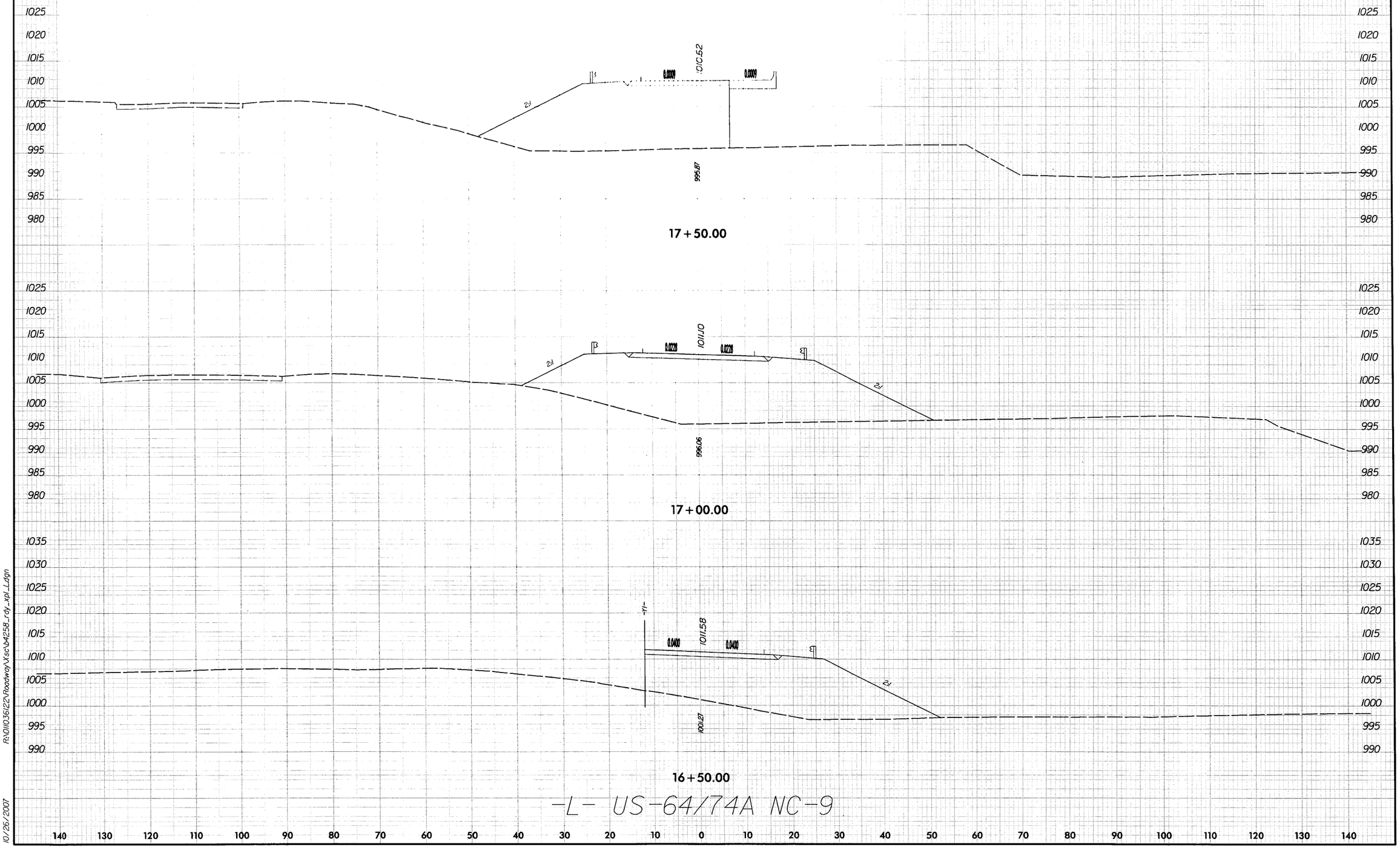
10/26/2007

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4258	X-5



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10/26/2007

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4258	X-6

1025
1020
1015
1010
1005
1000
995
990
985
980

1009.18
0.040D
0.040D
98778

19+00.00

1009.66
0.040D
0.040D
98802

18+50.00

1010.14
0.024B
0.024B
98698

18+00.00

-L- US-64/74A NC-9

140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

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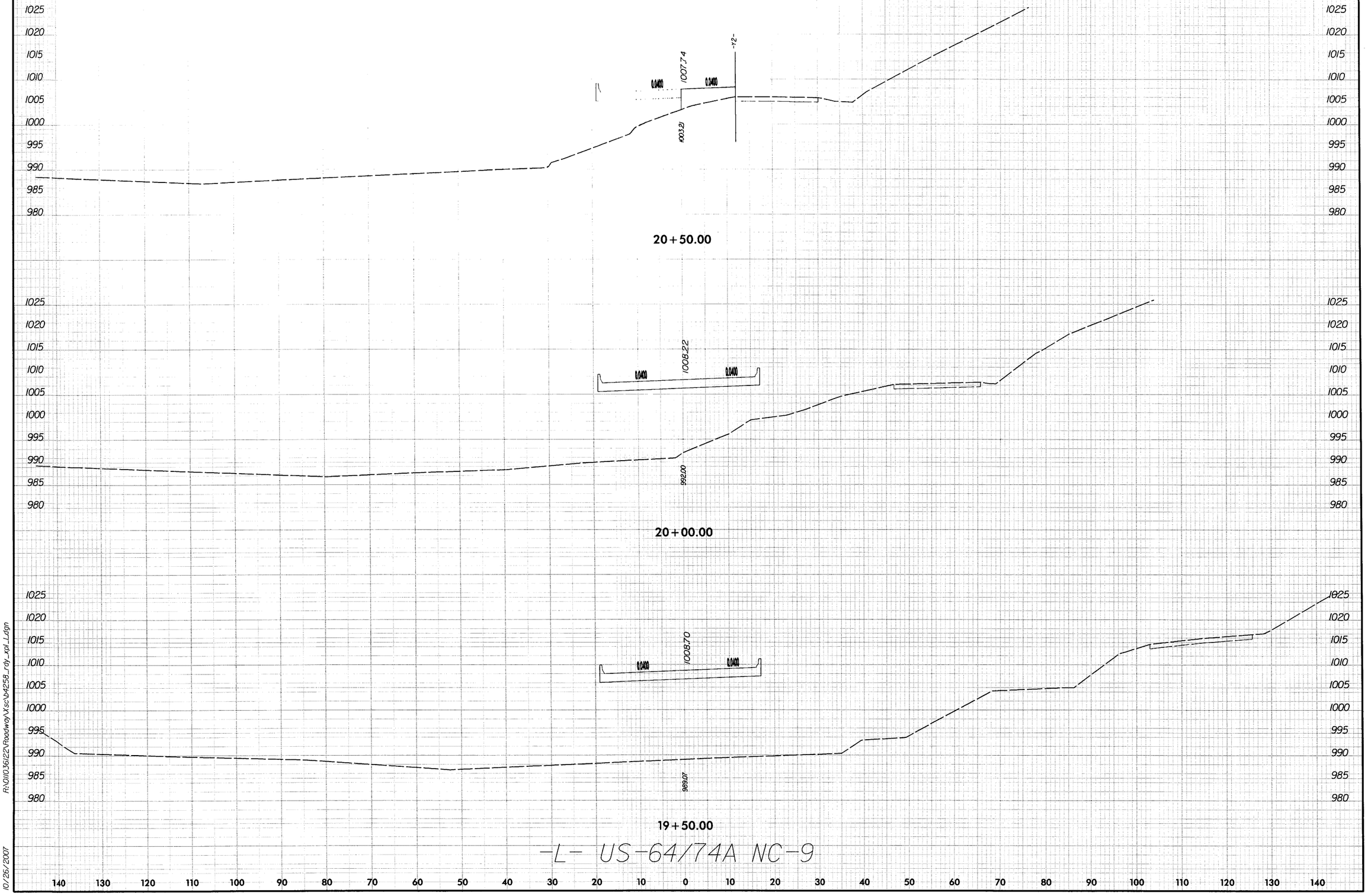
10/26/2007

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4258	X-7



-L- US-64/74A NC-9

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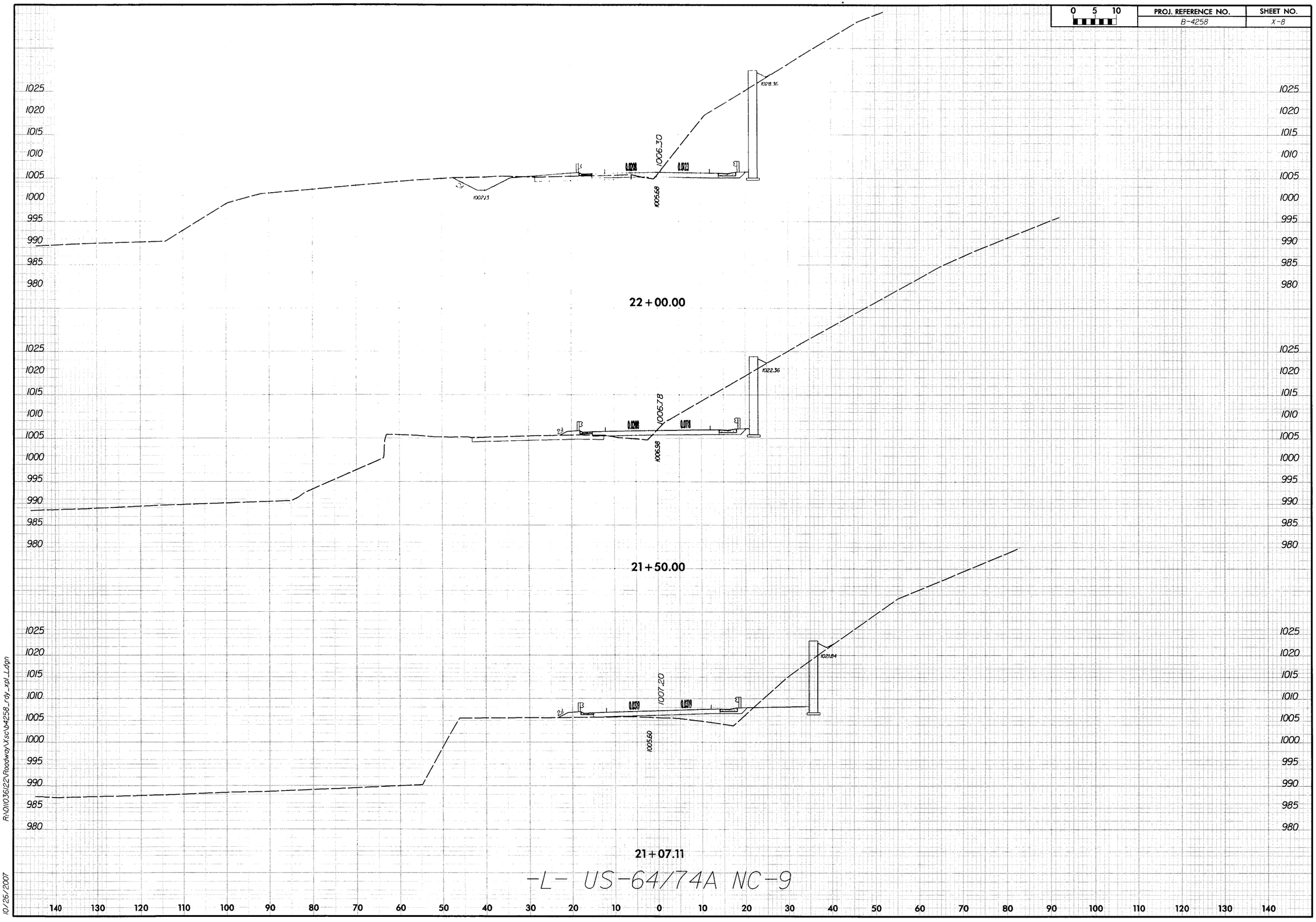
10/26/2007

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4258	X-8



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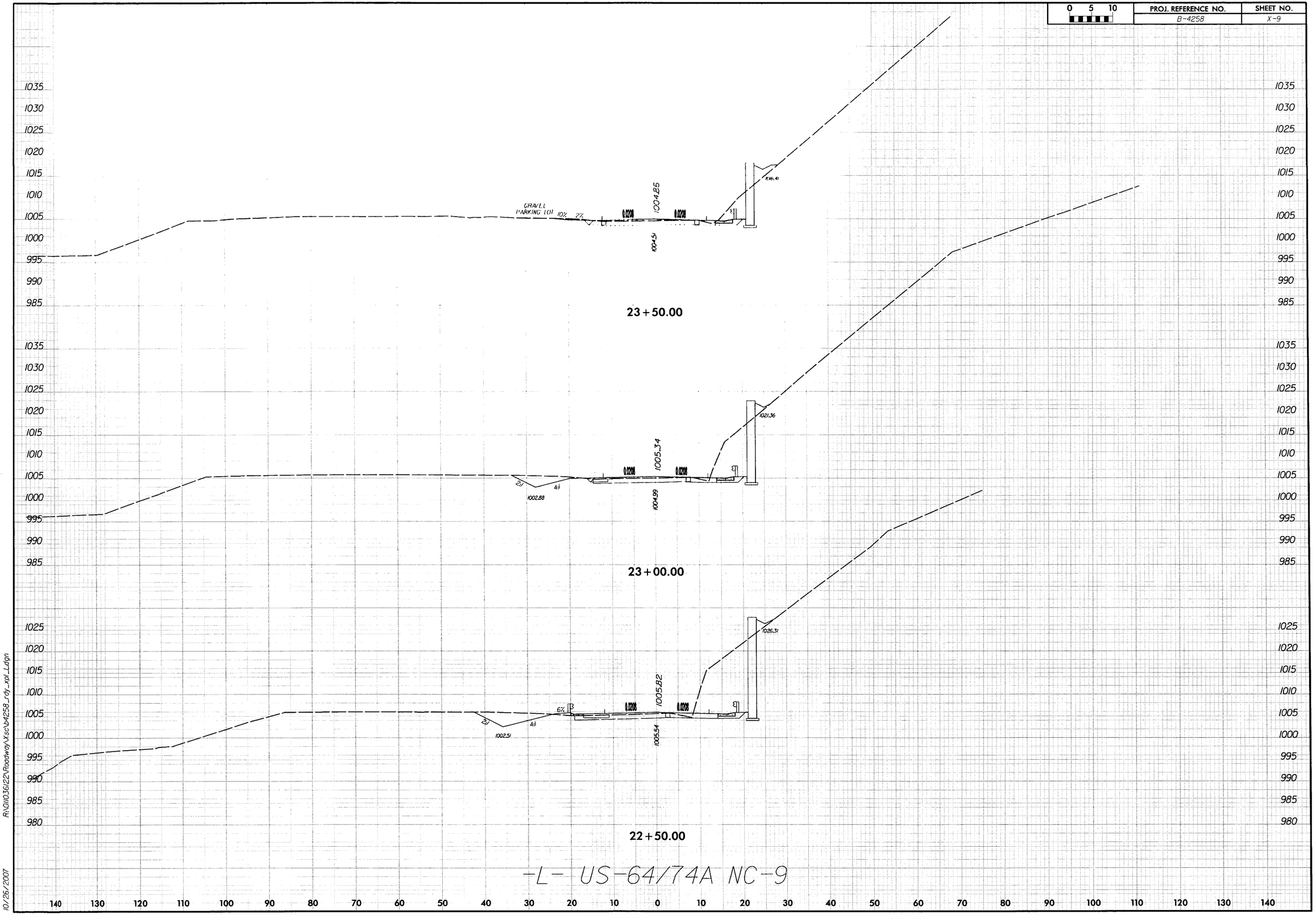
10/26/2007

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4258	X-9



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10/26/2007

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4258	X-10

1035 1030 1025 1020 1015 1010 1005 1000 995 990

1003.36 100376

25+00.00

1035 1030 1025 1020 1015 1010 1005 1000 995 990 985

1003.81 100176

24+50.00

1035 1030 1025 1020 1015 1010 1005 1000 995 990 985

GRAVEL PARKING LOT 10% 2% 0.020ft 0.020ft 1004.38 100496 100146

24+00.00

-L- US-64/74A NC-9

140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

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10/26/2007

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4258	X-11

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10/26/2007

1035
1030
1025
1020
1015
1010
1005
1000
995
990

1003.26

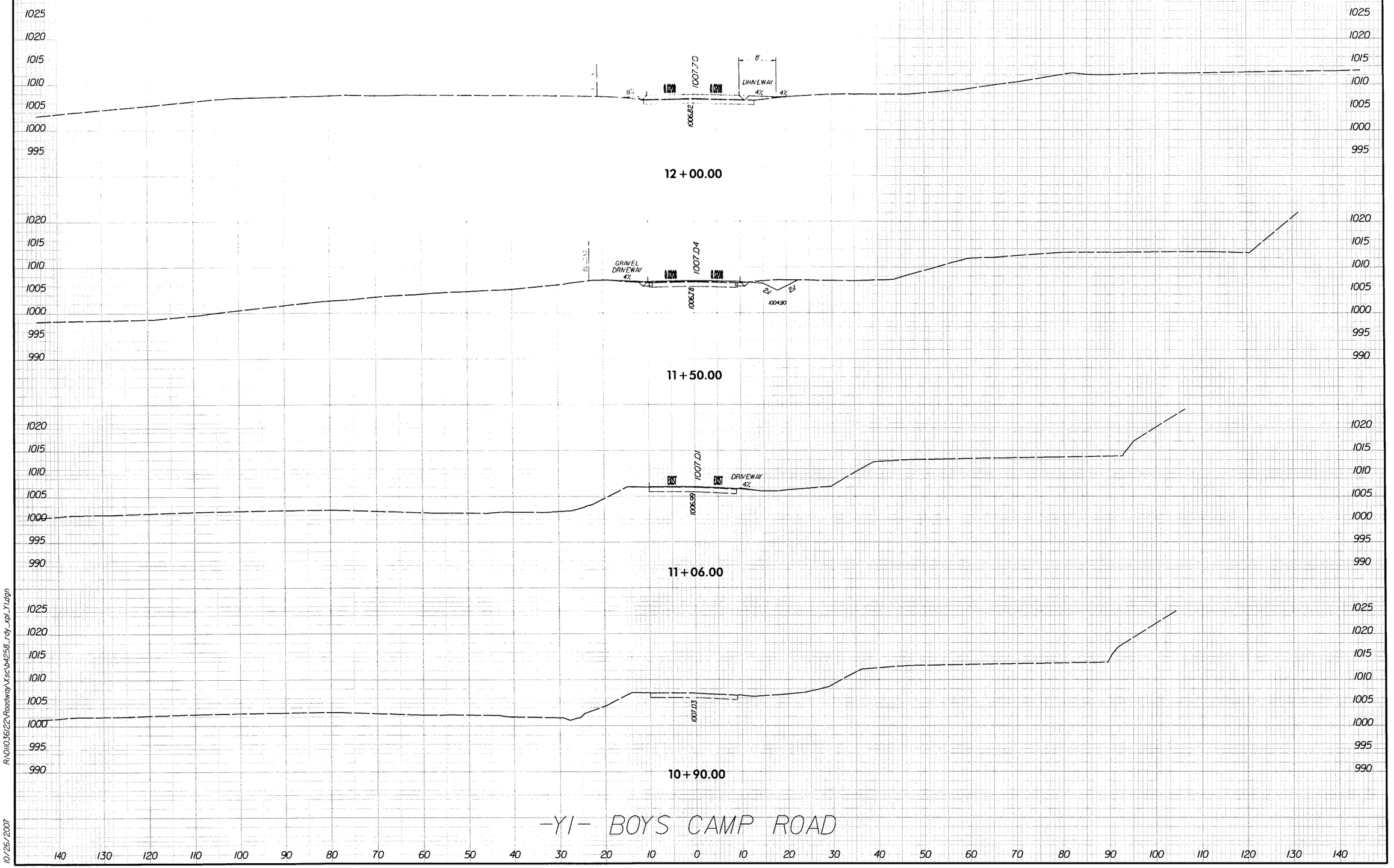
1001.67

25+10.00

-L- US-64/74A NC-9

140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4258	X-12



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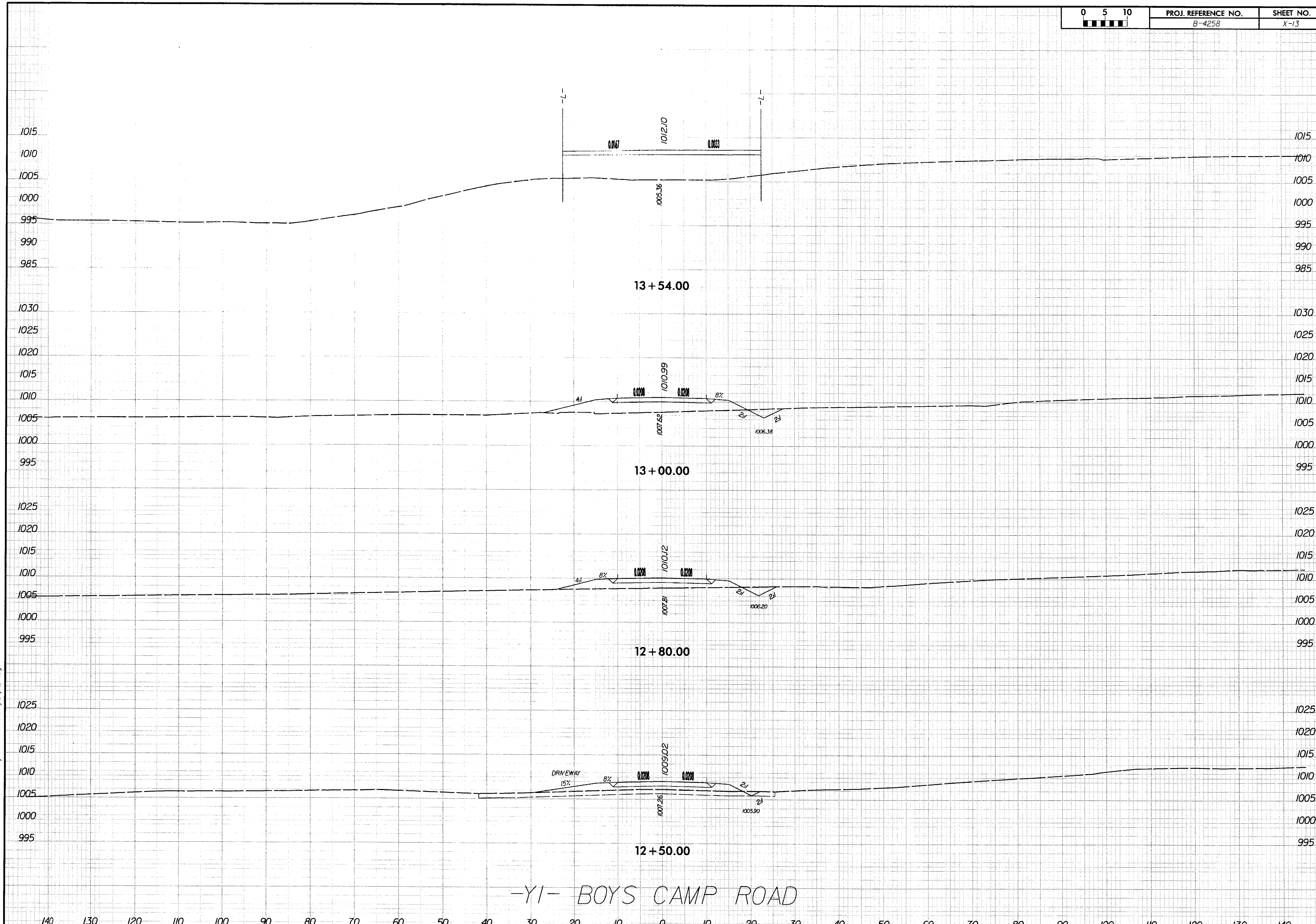
10/26/2007

PROJ. REFERENCE NO.	SHEET NO.
B-4258	X-13



-Y1- BOYS CAMP ROAD

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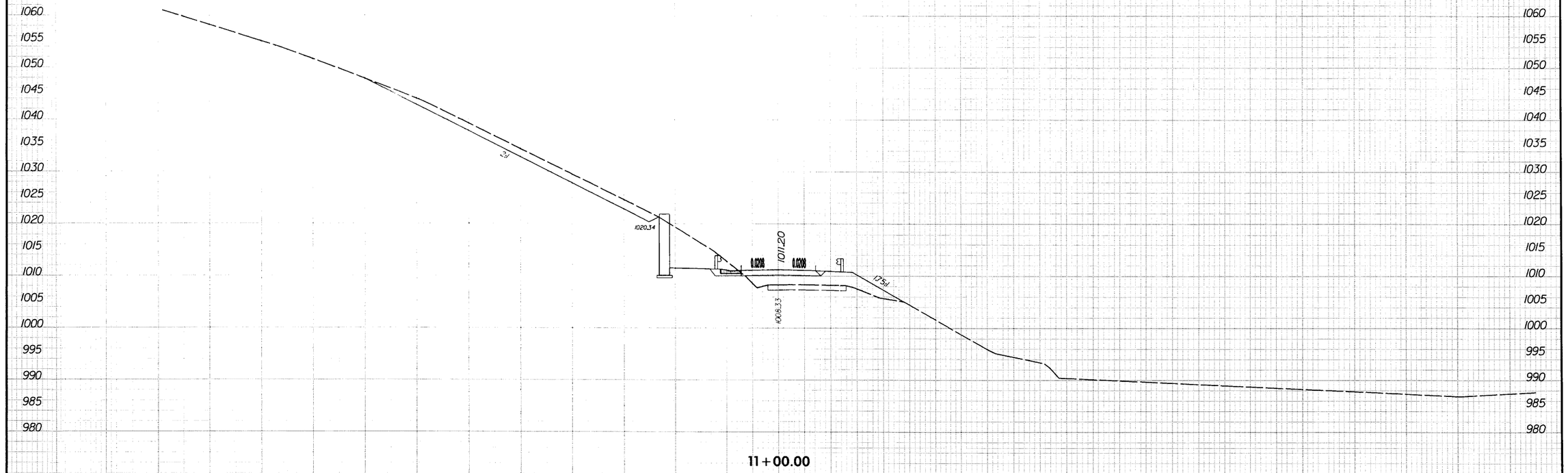
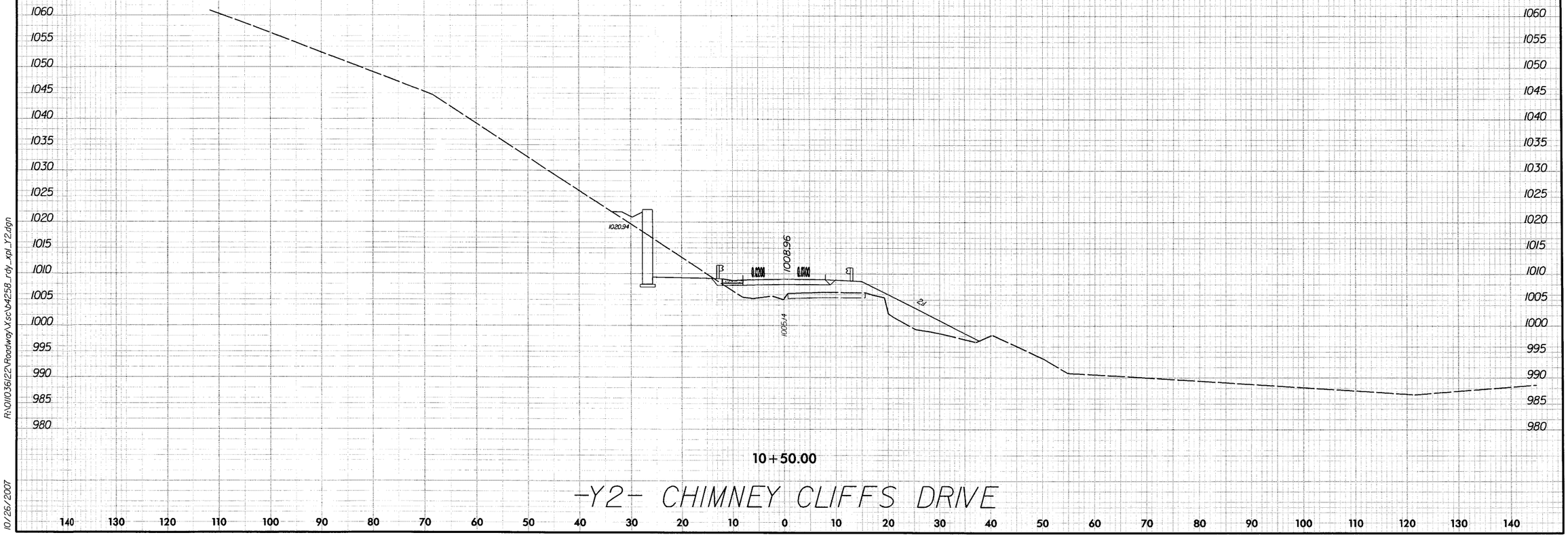
10/26/2007

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4258	X-14





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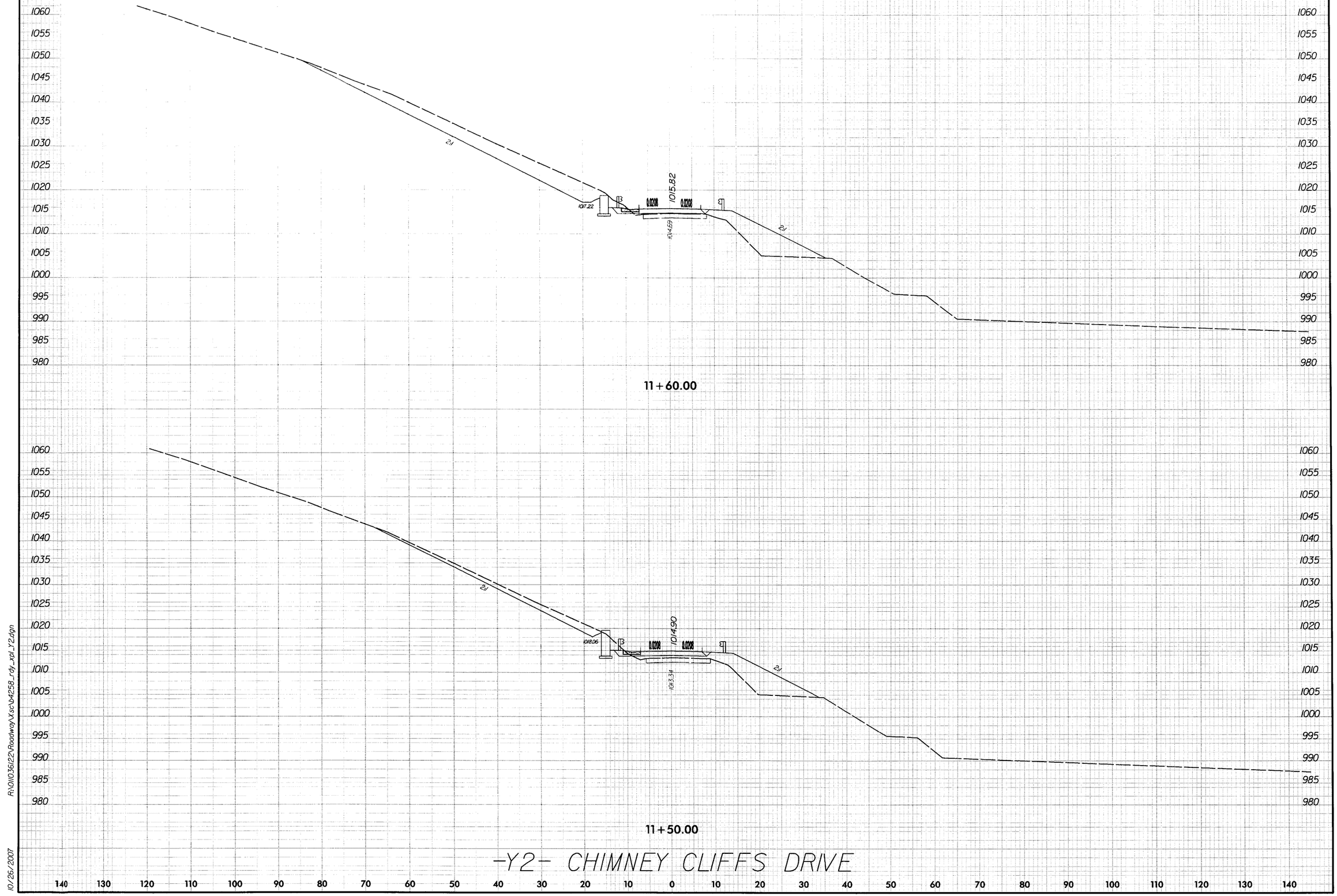
10/26/2007

-Y2- CHIMNEY CLIFFS DRIVE

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4258	X-15



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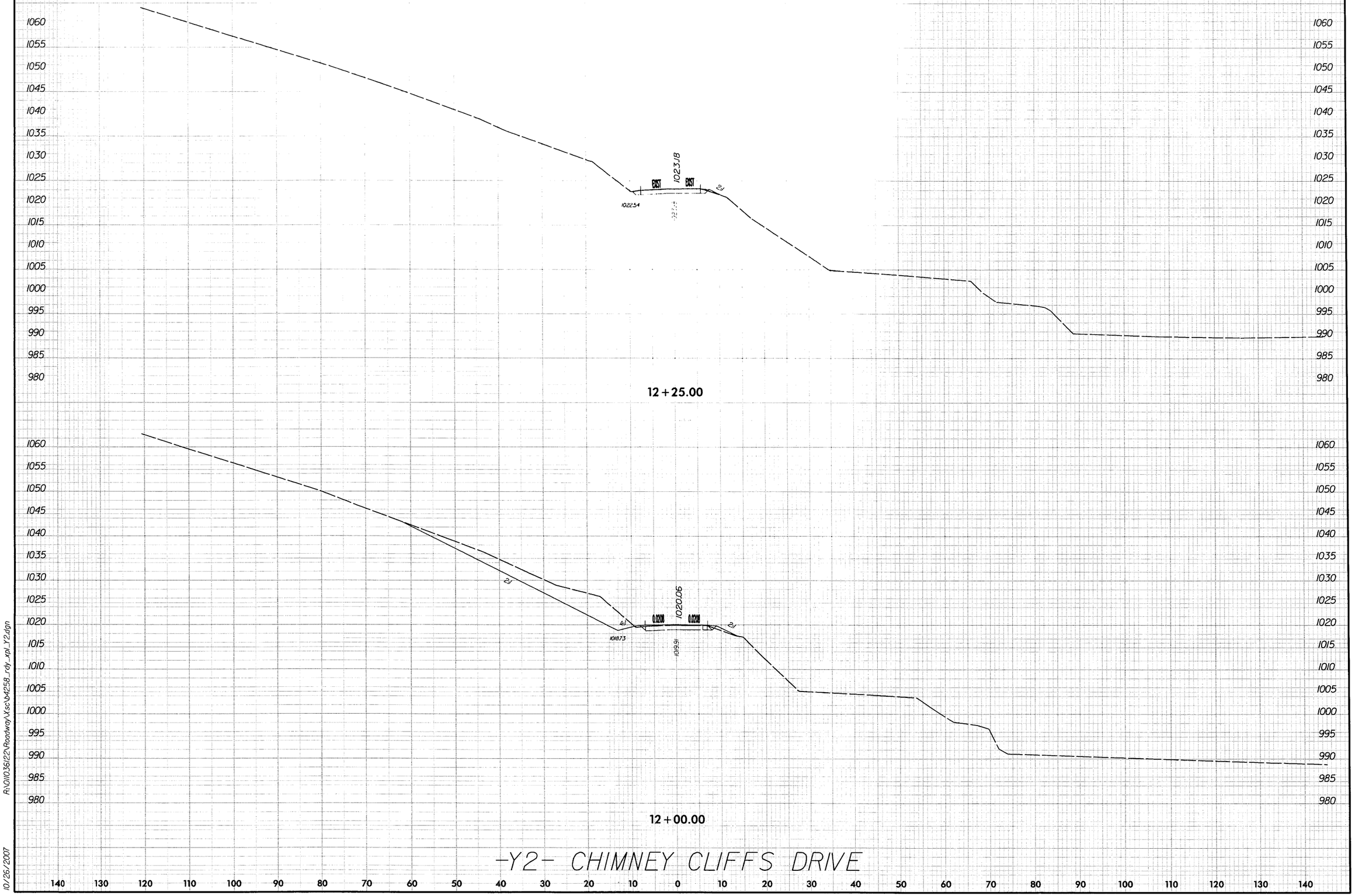
10/26/2007

-Y2- CHIMNEY CLIFFS DRIVE

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4258	X-16



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10/26/2007

-Y2- CHIMNEY CLIFFS DRIVE