



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

December 12, 2008

US Army Corps of Engineers  
Raleigh Field Office  
6508 Falls of Neuse Road, Suite 120  
Raleigh, NC 27615-6814

ATTENTION: Eric Alsmeyer  
NCDOT Coordinator, Division 5

Dear Sir:

**Subject: Application for Modification to Section 404 Nationwide Permits 23, 33, and 13, Section 401 Water Quality Certification, and Neuse Riparian Buffer Authorization** for the replacement of Bridge No. 29 over Clarks Creek on SR 1007 (Poole Road), Wake County. Federal Aid Project Number BRSTP-1007(8), WBS No. 33637.1.1, State Project No. 8.2409201, Division 5, T.I.P No. B-4300.

References: Section 404 Nationwide (NW) Permit Numbers 23, 33, and 13, issued June 6, 2008, USACE Action ID 2004-20705  
Section 401 General Water Quality Certification and Neuse Riparian Buffer Authorization, issued February 22, 2008, NCDENR-DWQ Water Quality Certification Project No. 20080313.

\$240.00 Debit from WBS Element 33637.1.1.

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 29 over Clarks Creek. The project proposes to demolish the existing bridge and replace with a reinforced concrete box-culvert because the drainage area is less than five square miles. The project involves constructing the box culvert on the existing alignment, while maintaining traffic on-site by a temporary detour.

The purpose of this submittal is to request a modification to the Section 404 permit, Section 401 Water Quality Certification, and Neuse Riparian Buffer Authorization for B-4300. Please see the enclosed copies of the permit drawings, Neuse Buffer impact drawings, design plans, and the Pre-Construction Notification (PCN) for the above-referenced project.

The revised design does not compromise NCDOT's compliance with the existing permit conditions. The revision has been evaluated for compliance with the avoidance/minimization criteria and is in compliance with all previous issues, including the following:

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

TELEPHONE: 919-715-1334 or  
919-715-1335  
FAX: 919-715-5501

**LOCATION:**  
2728 CAPITAL BLVD. SUITE 240  
RALEIGH NC 27604

WEBSITE: [WWW.NCDOT.ORG](http://WWW.NCDOT.ORG)

- Protected Species
- Aquatic Life passage
- FEMA compliance
- Cultural Resources

### **Summary of Changes to Jurisdictional Impacts**

Overall, changes in impacts at both Sites 1 and 2 since the original permit results in permanent stream impacts increase of 128 linear feet and temporary stream impacts decrease of 112 linear feet. The total revised permanent stream impacts are 276 linear feet (148 linear feet in original permit) and the total revised temporary stream impacts are 108 linear feet (220 linear feet in original permit). The stream impact changes are described in detail per site below.

#### Site 1 Temporary On-Site Detour Design

Construction of this project will involve the installation of 3 @ 84 inch corrugated steel pipes to convey Clark's Creek at Station 20+10 under the temporary on-site detour during construction of the project. This has been previously considered a temporary impact to Clark's Creek in the original permit. Installation of the three structures will require significant excavation in Clark's Creek and the adjacent bank and floodplain. An evaluation of the stream in this area indicates a fairly incised, unstable stream that exhibits high flow during rain events. The NCDOT Division 5 personnel have reviewed this area and have determined that the banks of Clark's Creek cannot be adequately stabilized with traditional non-hardening methods such as coir fiber matting after removal of the pipe structures. The NCDOT has determined to permanently install Class I rip-rap on the streambanks within the limits of the temporary pipe structures for bank stabilization. This results in changing the 55 linear feet of temporary stream impact from the original permit to permanent impact. An additional 16 feet of temporary impact in Clark's Creek from the inlet channel of the temporary pipes upstream to the easement line has also been calculated since the original permit (Permit Modification Summary Table for Site 1).

#### Site 1 Culvert Installation

The NCDOT has also determined that an additional 22 linear feet (permanent impact) of rip-rap along the stream channel in Clark's Creek was necessary for bank stabilization associated with the culvert installation. This reach was previously considered as temporary impact in the original permit. This results in decreasing the temporary stream impact of Clark's Creek from 70 linear feet to 48 linear feet. A total of 170 linear feet (148 linear feet in original permit) of permanent stream impact to Clark's Creek is associated with the culvert installation; 63 feet due to the box culvert installation and 107 feet (85 feet in original permit) of channel improvements and rip-rapping along the stream banks for bank stabilization (Permit Modification Summary Table for Site 1).

#### Site 2

The unnamed tributary to Clark's Creek flows parallel to the roadway from Station 17+00 to 20+00 Rt. The original design indicated that the UT to Clark's Creek would reach its conveyance to Clark's Creek downstream of the culvert wing wall. The NCDOT Division 5 Survey party staked the limits of the culvert and wing wall and determined that there is a direct conflict with the wing wall and the UT to Clark's Creek. The NCDOT Division 5 office has determined to relocate the lower end of the unnamed tributary to Clark's Creek to avoid this conflict. This results in a change from 95 linear feet of temporary impacts in the original permit to 51 linear feet of permanent stream impact and 44 linear feet of temporary stream impact (Permit Modification Summary Table for Site 2).

## Summary of Neuse Buffer Impacts

Mitigable buffer impacts have been reduced from 11,376 square feet (original permit) to 10,936 square feet for Zone 1 and from 3,933 square feet (original permit) to 3,893 square feet for Zone 2. Table 1 below lists the impacts in more detail. These revised impacts are also expressed in the Buffer Impact Summary Table submitted with the Permit Modification.

**Table 1. Neuse River Buffer Mitigable Impacts**

	Site 1 Road Crossing (Culvert)	Site 2 Impacts Other Than Road Crossing
Zone 1 Impact (sq. ft) Original Permit	10,254	1,122
Zone 1 Impact (sq. ft) Permit Modification	8,928	2,008
Zone 2 Impact (sq. ft) Original Permit	3,933	0
Zone 2 Impact (sq. ft) Permit Modification	3,893	0

## Mitigation

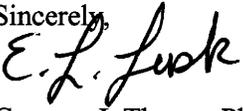
To offset the unavoidable 14,829 sq. ft. (10,936 sq. ft. for Zone 1 and 3,893 sq. ft. for Zone 2) of buffer impacts associated with T.I.P B-4300, the Jeffreys Warehouse Mitigation Site (described in the original permit) will be debited 38,648 sq. ft. (0.89 acres) [40,028 sq. ft. (0.92 acres) in original permit] of Neuse Buffer Restoration.

No compensatory mitigation for the additional permanent stream impacts is proposed. Streambanks along Clarks Creek are currently unstable in the project area. Approximately 107 feet (85 feet in original permit) of the 170 feet (148 feet in original permit) of total permanent impacts are for bank stabilization and do not constitute loss of waters of the U.S. The remaining minimal impact of 63 feet (culvert) is in a degraded section of stream directly under the existing bridge. The unnamed tributary to Clark's Creek is a channelized and unstable intermittent stream in its current condition; therefore, relocating 51 linear feet of the channel will not significantly impact its aquatic use or function.

## Regulatory Approvals

Application is hereby made for the modification of the Section 404 Permit from USACE and Section 401 Water Quality Certification and Neuse Riparian Buffer Authorization from DWQ. In compliance with Section 143-215.3D(e) of the NCAC we have provided a method of debiting \$240.00, as noted in the subject line of this application, as payment for processing the Section 401 Water Quality Certification modification application. We are providing five copies of this application to DWQ, for their use.

A copy of this permit modification will be posted on the NCDOT website at: <http://www.ncdot.org/doh/preconstruct/pe/>. If you have any questions or need additional information, please call Greg Price at (919) 715-5533.

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

cc: w/attachment

Mr. Brian Wrenn, NCDWQ (5 Copies)  
Mr. J. Wally Bowman, PE., Division 5 Engineer  
Mr. Chris Murray, Division 5 DEO

w/o attachment (see permits website for attachments)

Mr. Travis Wilson, NCWRC  
Mr. Gary Jordan, USFWS  
Ms. Anne Deaton, NCDMF  
Dr. David Chang, P.E., Hydraulics  
Mr. Mark Staley, Roadside Environmental  
Mr. Greg Perfetti, P.E., Structure Design  
Mr. Victor Barbour, P.E., Project Services Unit  
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. Theresa Ellerby, PDEA Project Planning Engineer  
Ms. LeiLani Paugh, NEU  
Mr. Randy Griffin, NEU

**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:

- |                                                                     |                                                                        |
|---------------------------------------------------------------------|------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Section 404 Permit              | <input checked="" type="checkbox"/> Riparian or Watershed Buffer Rules |
| <input type="checkbox"/> Section 10 Permit                          | <input type="checkbox"/> Isolated Wetland Permit from DWQ              |
| <input checked="" type="checkbox"/> 401 Water Quality Certification | <input type="checkbox"/> Express 401 Water Quality Certification       |

2. Nationwide, Regional or General Permit Number(s) Requested: NW 23, 33, & 13

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: North Carolina Department of Transportation

Mailing Address: Gregory J. Thorpe, Ph.D., Manager  
Project Development and Environmental Analysis Branch  
1598 Mail Service Center  
Raleigh, NC 27699-1598

Telephone Number: 919-733-3141 Fax Number: 919-733-9794

E-mail Address: gthorpe@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: Replace Bridge No. 29 over Clarks Creek on SR 1007 with a culvert.
2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4300
3. Property Identification Number (Tax PIN): N/A
4. Location  
County: Wake Nearest Town: Raleigh  
Subdivision name (include phase/lot number): N/A  
Directions to site (include road numbers/names, landmarks, etc.): Site is located on SR 1007 (Poole Road) near SR 2518 (Hodge Road) intersection.
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): 78.5078 °N 35.7540 °W
6. Property size (acres): Please refer to attached drawings.
7. Name of nearest receiving body of water: Clarks Creek
8. River Basin: Neuse  
(Note – this must be one of North Carolina's seventeen designated major river basins. The River Basin map is available at [http://h2o.enr.state.nc.us/admin/maps/.](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 local area surrounding the proposed project consists of gently rolling hills and land use is best described as residential development and natural forest vegetation.

10. Describe the overall project in detail, including the type of equipment to be used: NCDOT proposes to replace Bridge No. 29 over Clarks Creek with a box culvert on SR 1007. Heavy construction equipment such as cranes, excavators and dump trucks will be utilized during construction.

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11. Explain the purpose of the proposed work: The existing bridge was constructed in 1961 and received a sufficiency rating of 7.0 out of a possible 100 for a new structure during the last bridge inspection. Based on this rating, the bridge is considered functionally obsolete and structurally deficient. The project proposes to demolish the existing bridge and replace with a reinforced concrete box-culvert, resulting in safer transportation.

#### **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. Streams and wetlands were verified during site visit on June 8, 2004. No JD letter was sent by USACE. Per personal conversation with Eric Alsmeyer on December 12, 2008, no Rapanos forms are necessary.

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#### **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

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#### **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: Approximately 170 linear feet of Clarks Creek will be impacted resulting from a box culvert and 51 linear feet of UT to Clarks Creek will be relocated. Another 64 and 44 linear feet for Clarks Creek and UT to Clarks Creek, respectively, will be temporarily impacted. Aproximately 0.02 acres of wetland will be temporarily impacted by onsite detour.
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)
Site 1	Temporary road fill	Forested	Yes	20	0.02
Total Wetland Impact (acres)					0.02

3. List the total acreage (estimated) of all existing wetlands on the property: approx. 0.1 acre
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 (Perm)	Clarks Creek	Box Culvert	Perennial	25 feet	225	0.13
Site 1 (Temp)	Clarks Creek	Box Culvert	Perennial	25 feet	48	0.03
Site 1 (Temp)	Clarks Creek	Temp Culvert	Perennial	25 feet	16	0.01
Site 2 (Perm)	UT to Clarks Creek	Relocation	Intermittent	2 feet	51	< 0.01
Site 2 (Temp)	UT to Clarks Creek	Temp Access	Intermittent	2 feet	44	< 0.01
Total Stream Impact (by length and acreage)					384	0.17

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)
N/A				
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):	0.17
Wetland Impact (acres):	0.02
Open Water Impact (acres):	NA
Total Impact to Waters of the U.S. (acres)	0.19
Total Stream Impact (linear feet):	384

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.

N/A

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.): N/A

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

Current land use in the vicinity of the pond: N/A

Size of watershed draining to pond: N/A Expected pond surface area: N/A

## 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.

See cover letter.

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### 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/newetlands/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.

Compensatory mitigation for permanent stream impacts is not proposed (see cover letter).

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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): \_\_\_\_\_  
 Amount of buffer mitigation requested (square feet): \_\_\_\_\_  
 Amount of Riparian wetland mitigation requested (acres): \_\_\_\_\_  
 Amount of Non-riparian wetland mitigation requested (acres): \_\_\_\_\_  
 Amount of Coastal wetland mitigation requested (acres): \_\_\_\_\_

**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
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1	10,936	3	32,808
2	3,893	1.5	5,840
Total	14,829		38,648

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

If buffer mitigation is required, please discuss what type of mitigation is proposed (i.e., Donation of Property, Riparian Buffer Restoration / Enhancement, or Payment into the Riparian Buffer Restoration Fund). Please attach all appropriate information as identified within 15A NCAC 2B .0242 or .0244, or .0260. Mitigation will be provided by NCDOT, utilizing surplus credits from the Jeffereys Warehouse mitigation project located in HUC 03020201.

**XI. Stormwater (required by DWQ)**

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

N/A

**XII. Sewage Disposal (required by DWQ)**

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

N/A

**XIII. Violations (required by DWQ)**

Is this site in violation of DWQ Wetland Rules (15A NCAC 2H .0500) or any Buffer Rules?

Yes  No

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

**XIV. Cumulative Impacts (required by DWQ)**

Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? Yes  No

If yes, please submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent North Carolina Division of Water Quality policy posted on our website at <http://h2o.enr.state.nc.us/ncwetlands>. If no, please provide a short narrative description:

N/A

**XV. Other Circumstances (Optional):**

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

N/A

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*E. L. Luok*

12.11.08

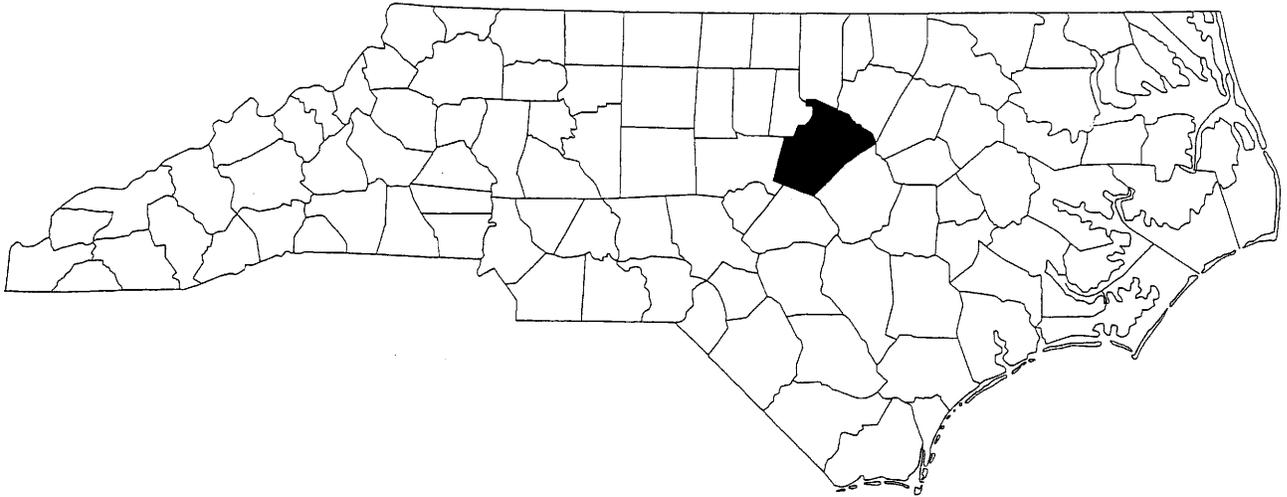
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**Applicant/Agent's Signature**

**Date**

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

# NORTH CAROLINA



2516

**END  
PROJECT**

4192

1007

2516

1007

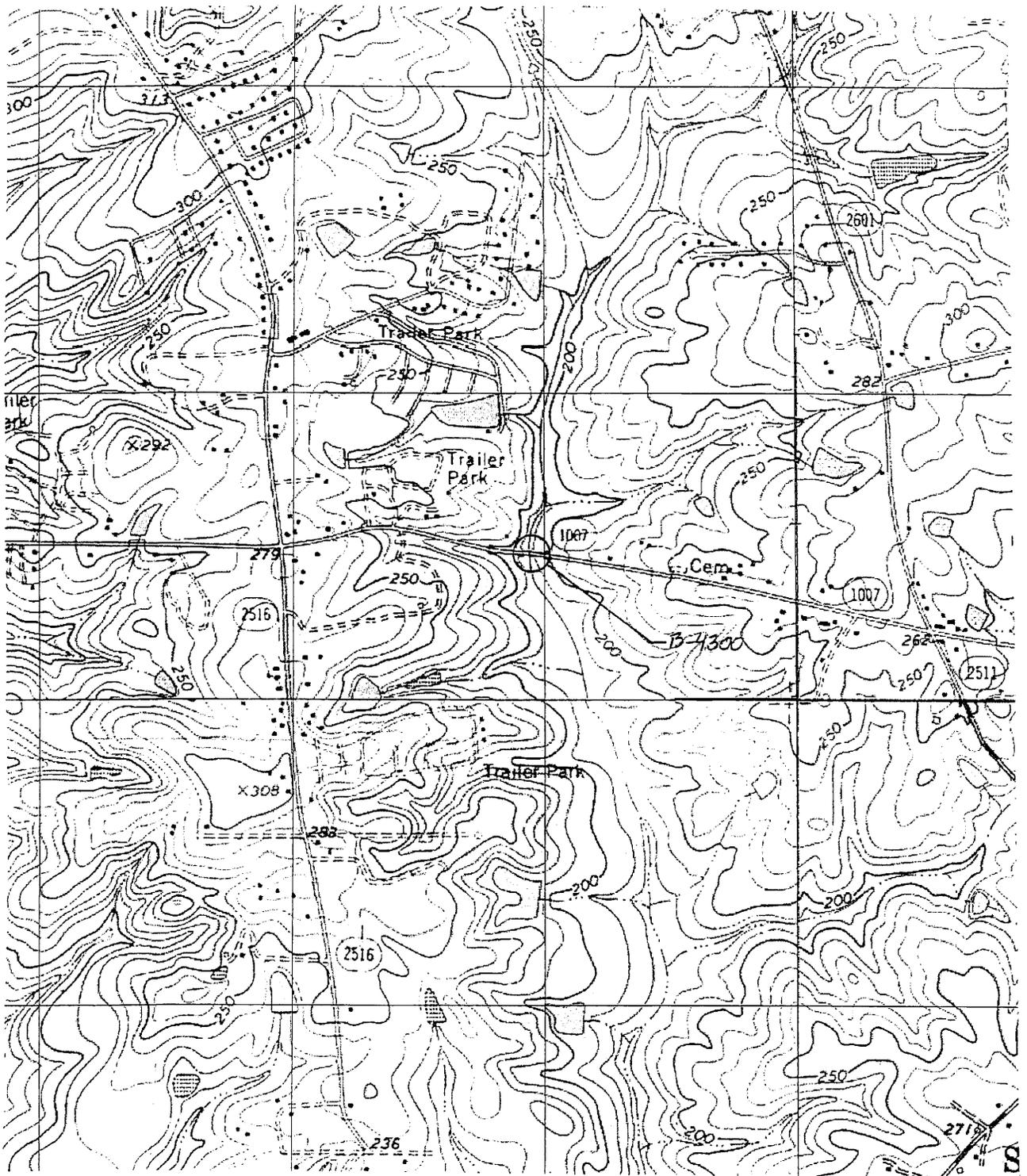
**BEGIN  
PROJECT**

VICINITY  
MAPS

NCDOT  
DIVISION OF HIGHWAYS  
WAKE COUNTY  
PROJECT: B-4300 (BRIDGE #29)  
BRIDGE NO. 29 OVER  
CLARKS CREEK  
ON SR 1007  
(POOLE ROAD)

SHEET 1 OF 10

10/1/2007



# TOPO MAP

SCALE: 1" : 1500'

## NCDOT

DIVISION OF HIGHWAYS  
 WAKE COUNTY  
 PROJECT: B-4300 (BRIDGE #29)  
 BRIDGE NO. 29 OVER  
 CLARKS CREEK  
 ON SR 1007  
 (POOLE ROAD)

STA. 15+00.00 -L- BEGIN CONSTRUCTION  
-L- STA. 15+00.00 -DET-

STA. 25+50.00 -L- END CONSTRUCTION  
STA. 25+61.55 -DET-

BEGIN CULVERT  
-L- STA. 19+94.00

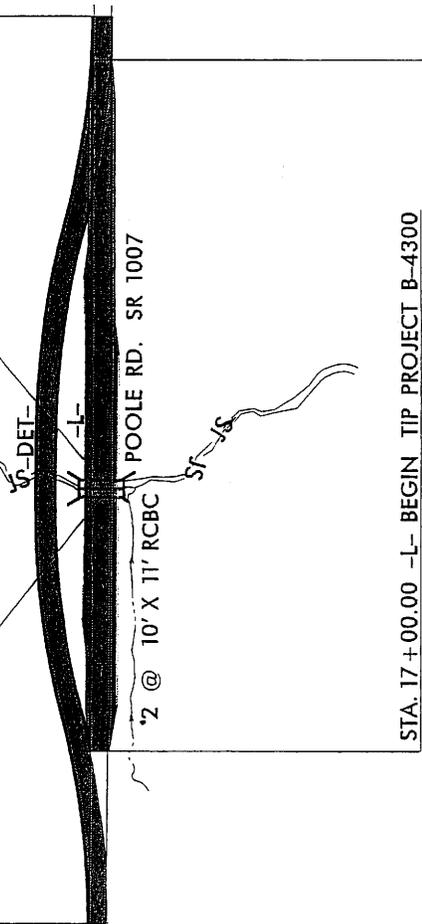
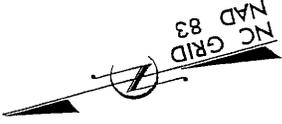
3 @ 84" CSP

CLARKS CREEK

END CULVERT  
-L- STA. 20+14.00

TO RALEIGH

TO KNIGHTDALE



STA. 17+00.00 -L- BEGIN TIP PROJECT B-4300

STA. 25+00.00 -L- END TIP PROJECT B-4300

SITE MAP  
NOT TO SCALE

NCDOT

DIVISION OF HIGHWAYS  
WAKE COUNTY

PROJECT: B-4300 (BRIDGE #29)

BRIDGE NO. 29 OVER

CLARKS CREEK

ON SR 1007

(POOLE ROAD)

SHEET 3 OF 10

10/1/2007

# PROPERTY OWNERS

## NAMES AND ADDRESSES

	NAMES	ADDRESSES
2	George H. Turner	1825 Pictou Road Raleigh, NC 27606
3	Eugene Banks	7429 Poole Road Raleigh, NC 27610
4	Andrew P. Broadie	7409 Poole Road Raleigh, NC 27610
5	Valley Woods Mobile Estates	2725 Hodge Road Knightdale, NC 27545

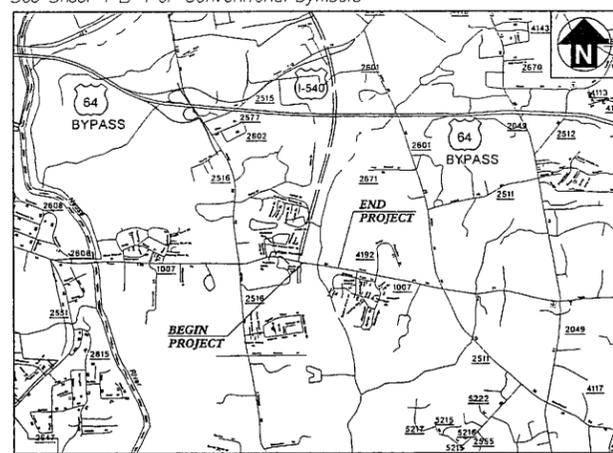
NCDOT

DIVISION OF HIGHWAYS  
WAKE COUNTY  
PROJECT: B-4300 (BRIDGE #29)  
BRIDGE NO. 29 OVER  
CLARKS CREEK  
ON SR 1007  
(POOLE ROAD)



09/08/09

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



VICINITY MAP

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**WAKE COUNTY**

LOCATION: BRIDGE NO. 29 OVER CLARKS CREEK ON SR 1007  
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND CULVERT

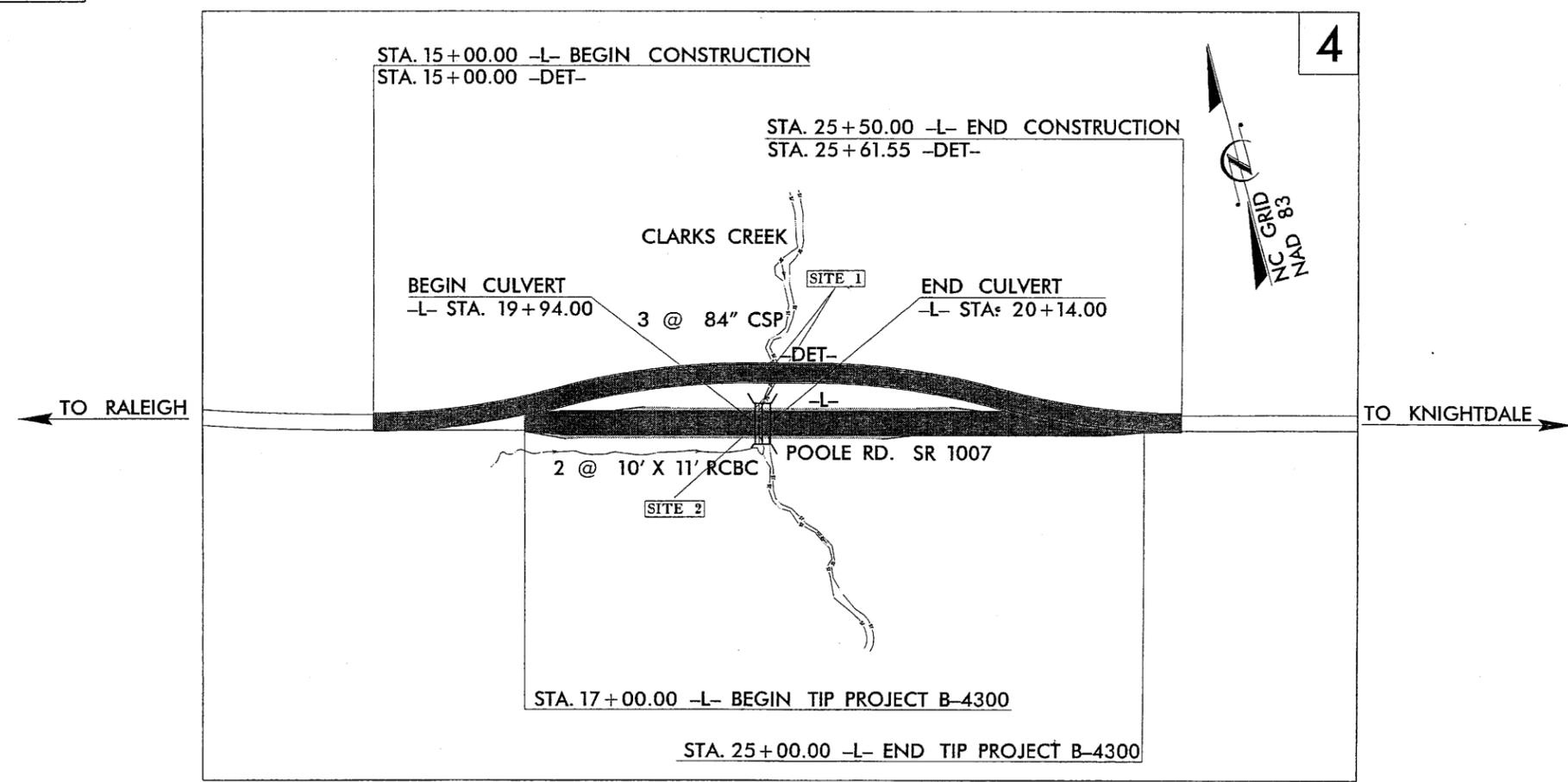
**STREAM & WETLAND IMPACTS**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4300	1	
W&S ELEMENT	P. A. PROJ. NO.	DESCRIPTION	
33637.1.1	BRSTP-1007(8)	P.E.	
33637.2.1	BRSTP-1007(8)	RW, UTL.	
33637.3.1	BRSTP-1007(8)	CONST.	

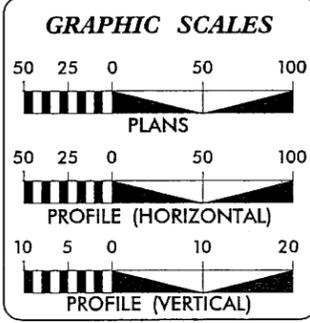
Permit Drawing  
Sheet 6 of 10

TIP PROJECT: B-4300

CONTRACT: C201897



**MULKEY**  
ENGINEERS & CONSULTANTS  
PO Box 33127  
RALEIGH, N.C. 27636  
(919) 851-1912  
(919) 851-1918 (FAX)  
WWW.MULKEYINC.COM



**DESIGN DATA**

ADT 2008 = 8,900
ADT 2030 = 19,500
DHV = 10 %
D = 75 %
T = 6 %*
V = 60 MPH
* TTST 1% DUAL 5%
Func. Classification - Major-Rural Collector

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4300 =	.148 MILES
LENGTH STRUCTURE TIP PROJECT B-4300 =	.004 MILES
TOTAL LENGTH TIP PROJECT B-4300 =	.152 MILES

Prepared in the Office of:

**MULKEY**  
ENGINEERS & CONSULTANTS  
FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION  
2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
AUGUST 17, 2007

LETTING DATE:  
AUGUST 19, 2008

TIM JORDAN, PE  
ROADWAY PROJECT ENGINEER

JEFF RECK, PE  
HYDRAULIC PROJECT ENGINEER

DOUG TAYLOR, PE  
NCDOT ROADWAY DESIGN PROJECT ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: \_\_\_\_\_ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: \_\_\_\_\_ P.E.

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER

11/17/2008 R:\HYDR\mulkeys\CADD\Permit\B4300\_hyd\_prm\_wet\_tsh.dgn 3:29:23 PM



8/17/99

# STREAM & WETLAND IMPACTS

**MULKEY**  
ENGINEERS & CONSULTANTS  
P.O. BOX 22137  
RALEIGH, N.C. 27628  
(919) 881-1912 FAX  
(919) 881-1918 IPAD  
WWW.MULKEYINC.COM

PROJECT REFERENCE NO. B-4300	SHEET NO. 2-B
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

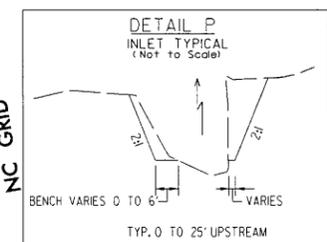
PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION

FOR -DET- PROFILE SEE SHEET 5

Permit Drawing  
Sheet 8 of 10

ENGLISH

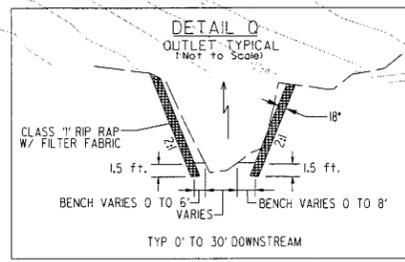
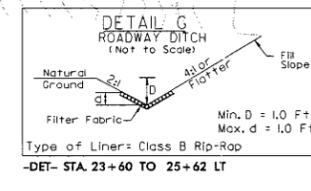
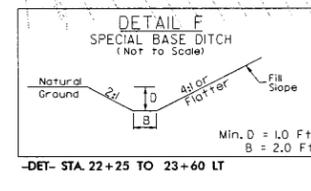
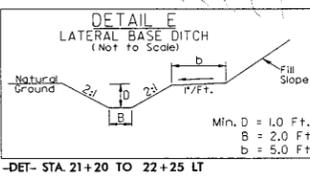
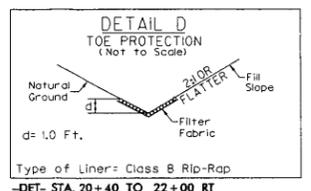
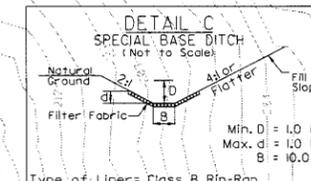
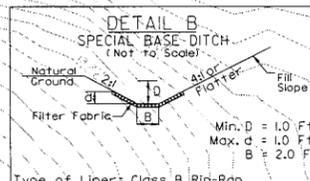
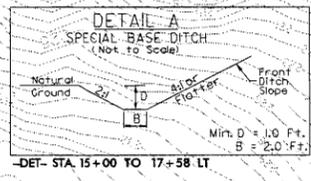
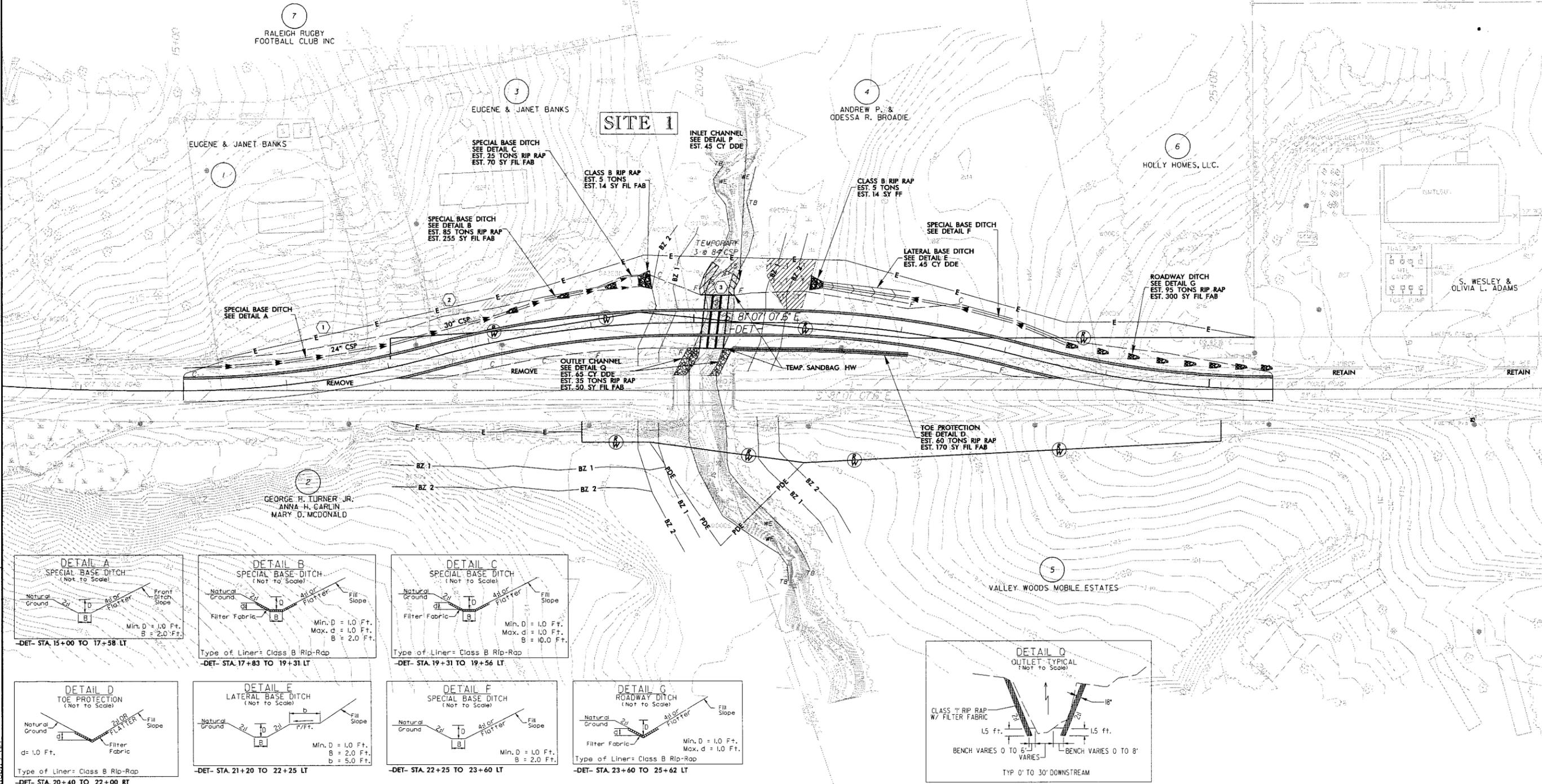
-  PERMANENT IMPACTS IN SURFACE WATER
-  TEMPORARY IMPACTS IN SURFACE WATER
-  DENOTES TEMPORARY FILL IN WETLAND
-  DENOTES CHANNEL EXCAVATION



NAD 83  
NC GRID

REVISIONS

12/24/2008  
C:\p09\proj\2006\149\00 IB-4300 Design\Hydraulics\CADD\Permit\B4300\_hyd.prm\_wet\_psh02b.dgn  
11:50:15 AM



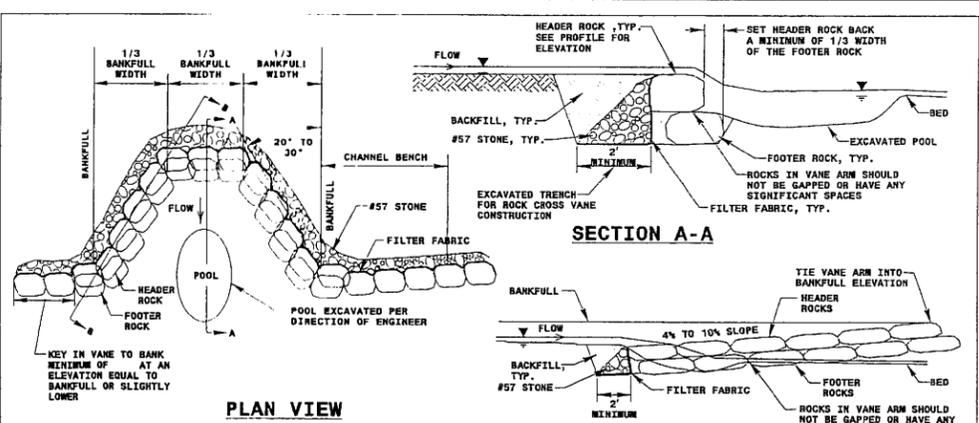
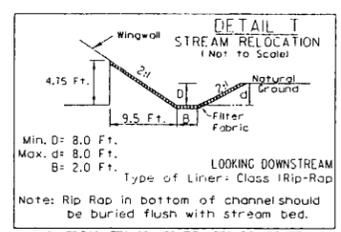
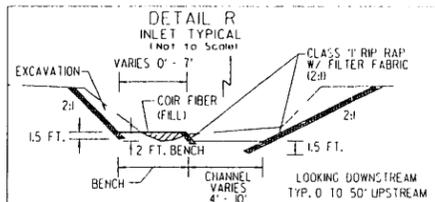
B/17/99



PROJECT REFERENCE NO. B-4300 SHEET NO. 4  
RW SHEET NO. HYDRAULICS ENGINEER

ENGLISH

PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION  
Permit Drawing  
Sheet 9 of 10  
FOR -L- PROFILE SEE SHEET 5

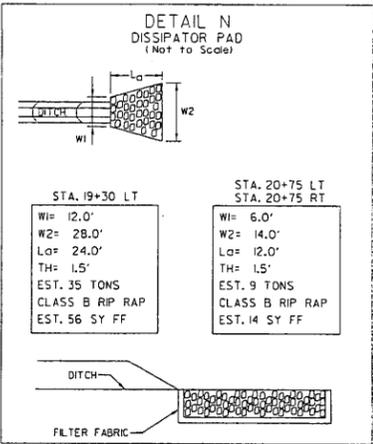


BOULDER DIMENSIONS (FT)

STATION	HEIGHT	LENGTH	WIDTH
19+00	2 FT	4 FT	4 FT
20+07	2 FT	4 FT	4 FT

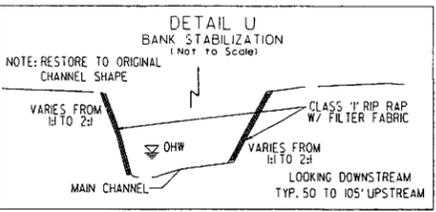
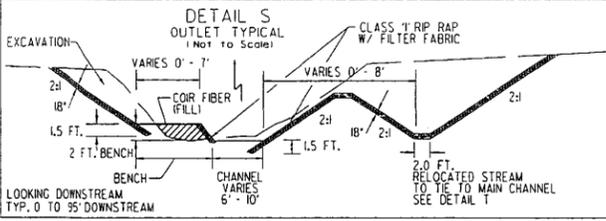
- NOTES:
1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
  2. DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
  3. CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
  4. COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
  5. POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.

DETAIL M  
ROCK CROSS VANE  
NOT TO SCALE

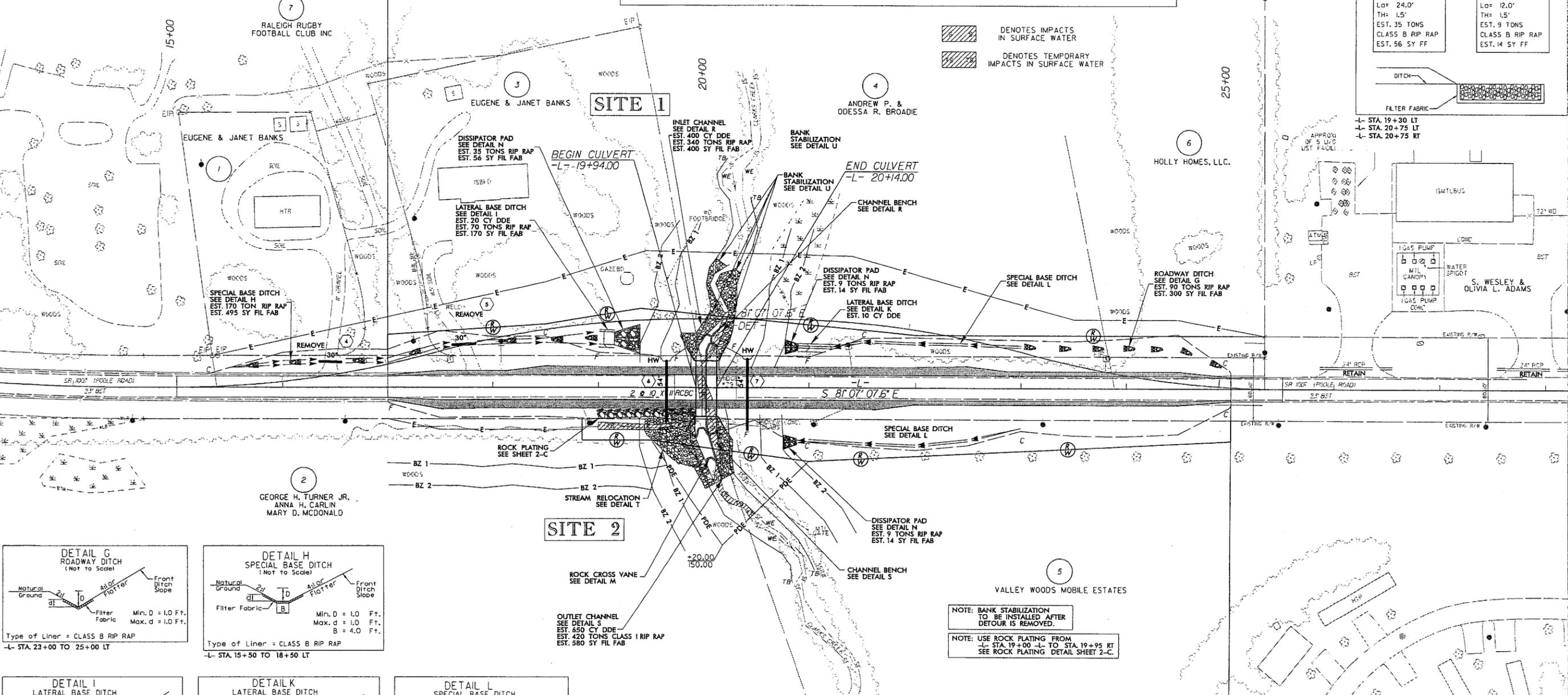


STA. 19+30 LT  
W1= 12.0'  
W2= 28.0'  
L1= 24.0'  
TH= 1.5'  
EST. 35 TONS CLASS B RIP RAP  
EST. 56 SY FF

STA. 20+75 LT  
W1= 6.0'  
W2= 14.0'  
L1= 12.0'  
TH= 1.5'  
EST. 9 TONS CLASS B RIP RAP  
EST. 14 SY FF



BEGIN PROJECT B-4300  
-L- POT Sta. 17+00.00



# STREAM & WETLAND IMPACTS

END PROJECT B-4300  
-L- POT Sta. 25+00.00

REVISIONS

1/17/2008  
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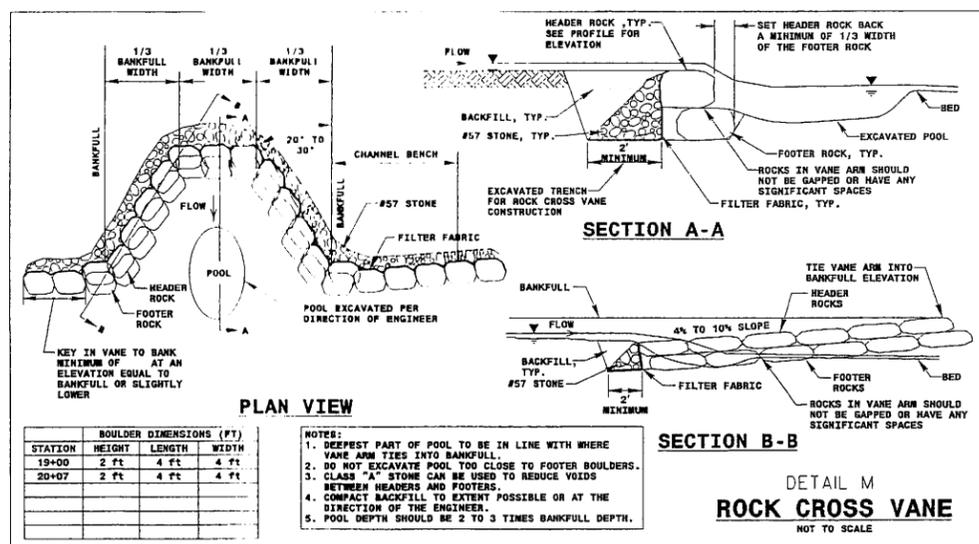
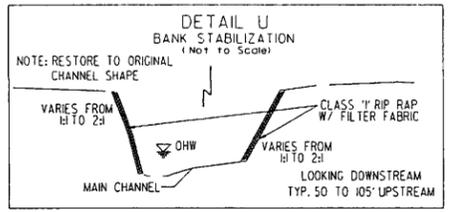
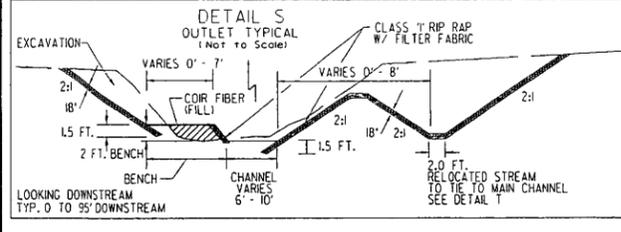
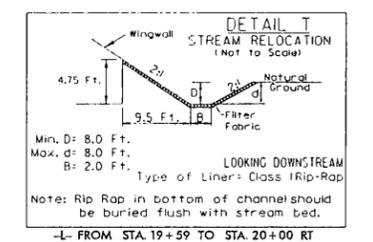
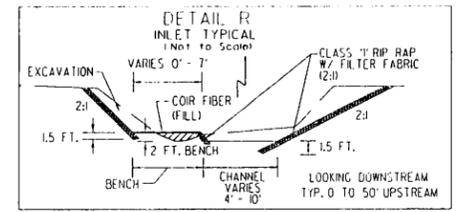
B.17/99

ENGLISH

PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION Permit Drawing Sheet 10 of 10 FOR -L- PROFILE SEE SHEET 5

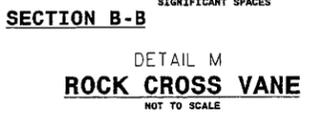


STA. 19+30 LT W1= 12.0' W2= 28.0' L1= 24.0' TH= 1.5' EST. 35 TONS CLASS B RIP RAP EST. 56 SY FF.	STA. 20+75 LT W1= 6.0' W2= 14.0' L1= 12.0' TH= 1.5' EST. 9 TONS CLASS B RIP RAP EST. 14 SY FF.
--------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------

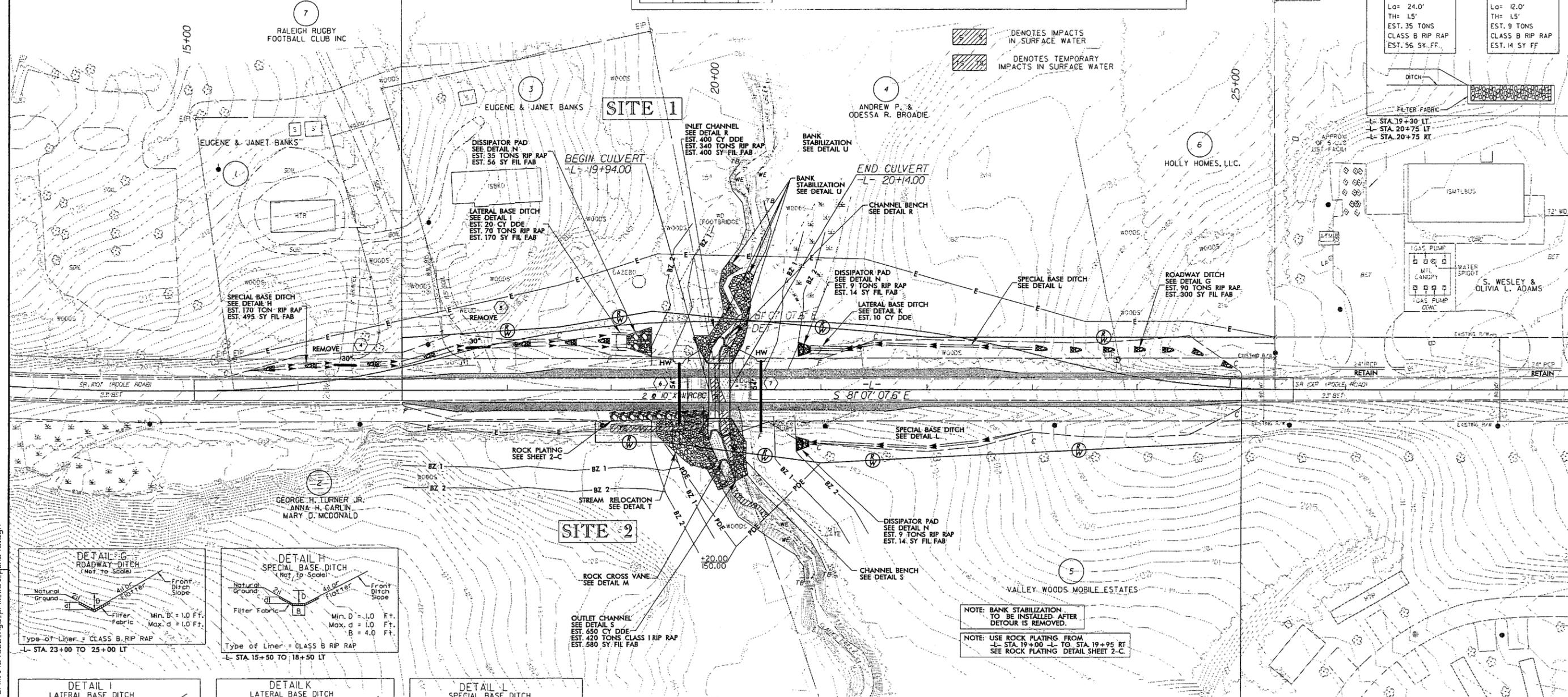


STATION	HEIGHT	LENGTH	WIDTH
19+00	2 FT.	4 FT.	4 FT.
20+07	2 FT.	4 FT.	4 FT.

- NOTES:
1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
  2. DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
  3. CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
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  5. POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.



BEGIN PROJECT B-4300 -L- POT Sta. 17+00.00



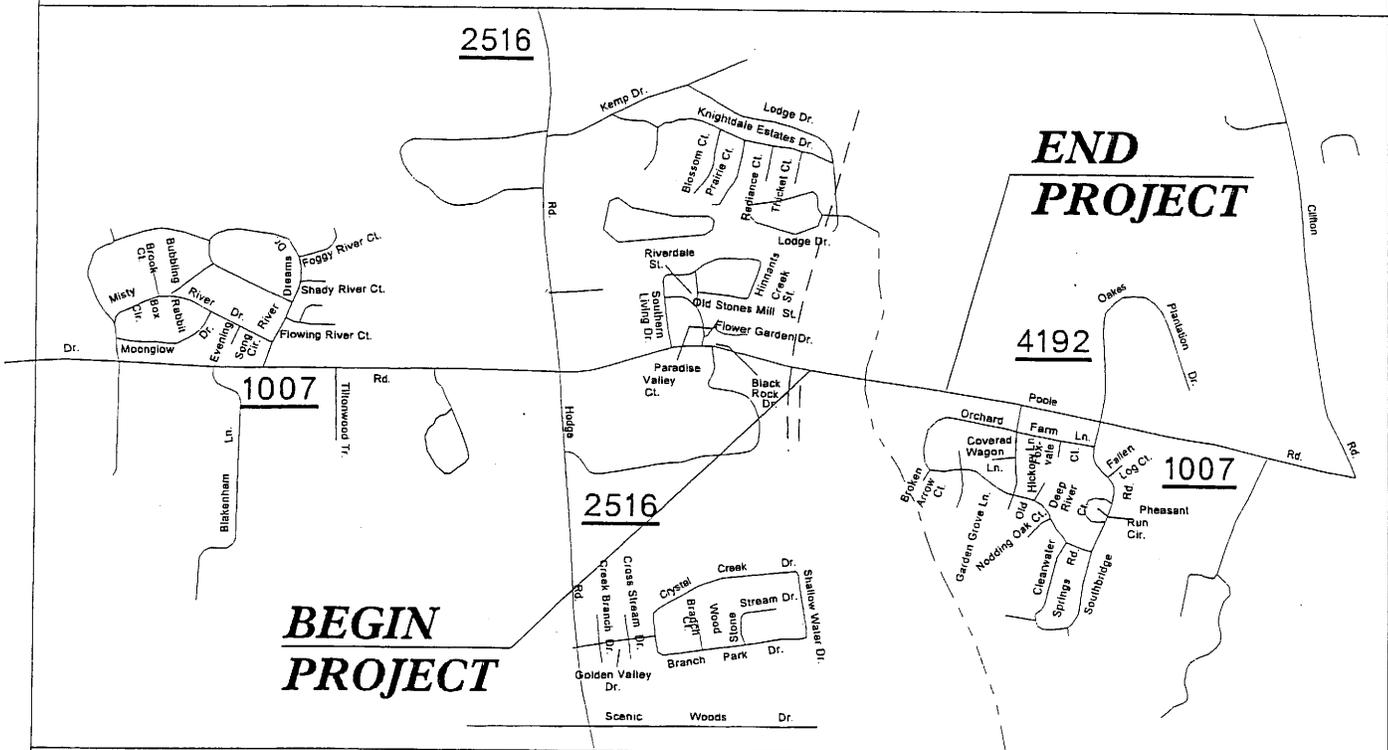
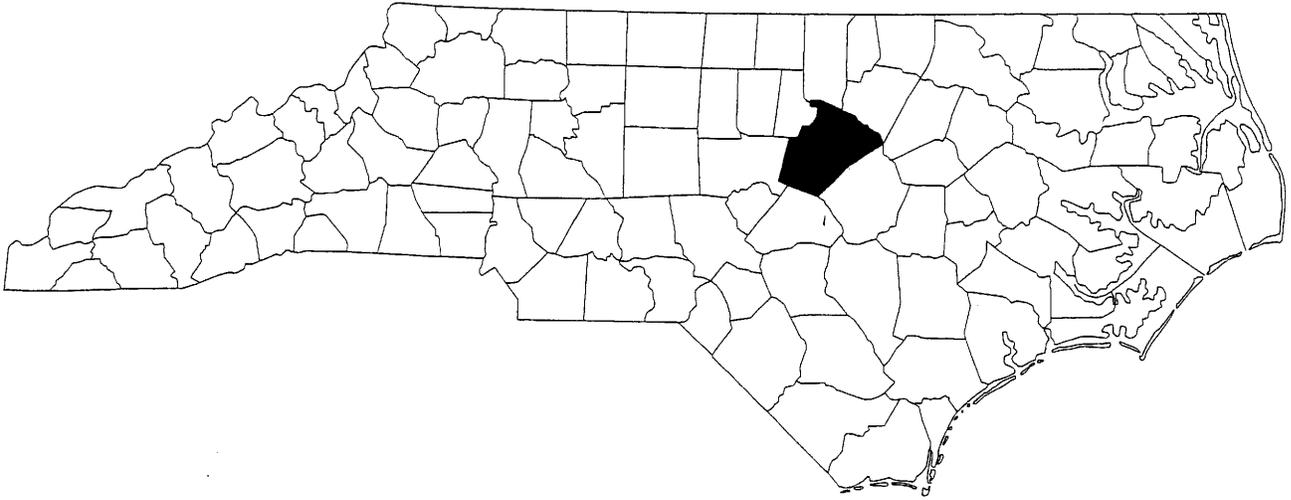
# STREAM & WETLAND IMPACTS

END PROJECT B-4300 -L- POT Sta. 25+00.00

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REVISIONS

# NORTH CAROLINA

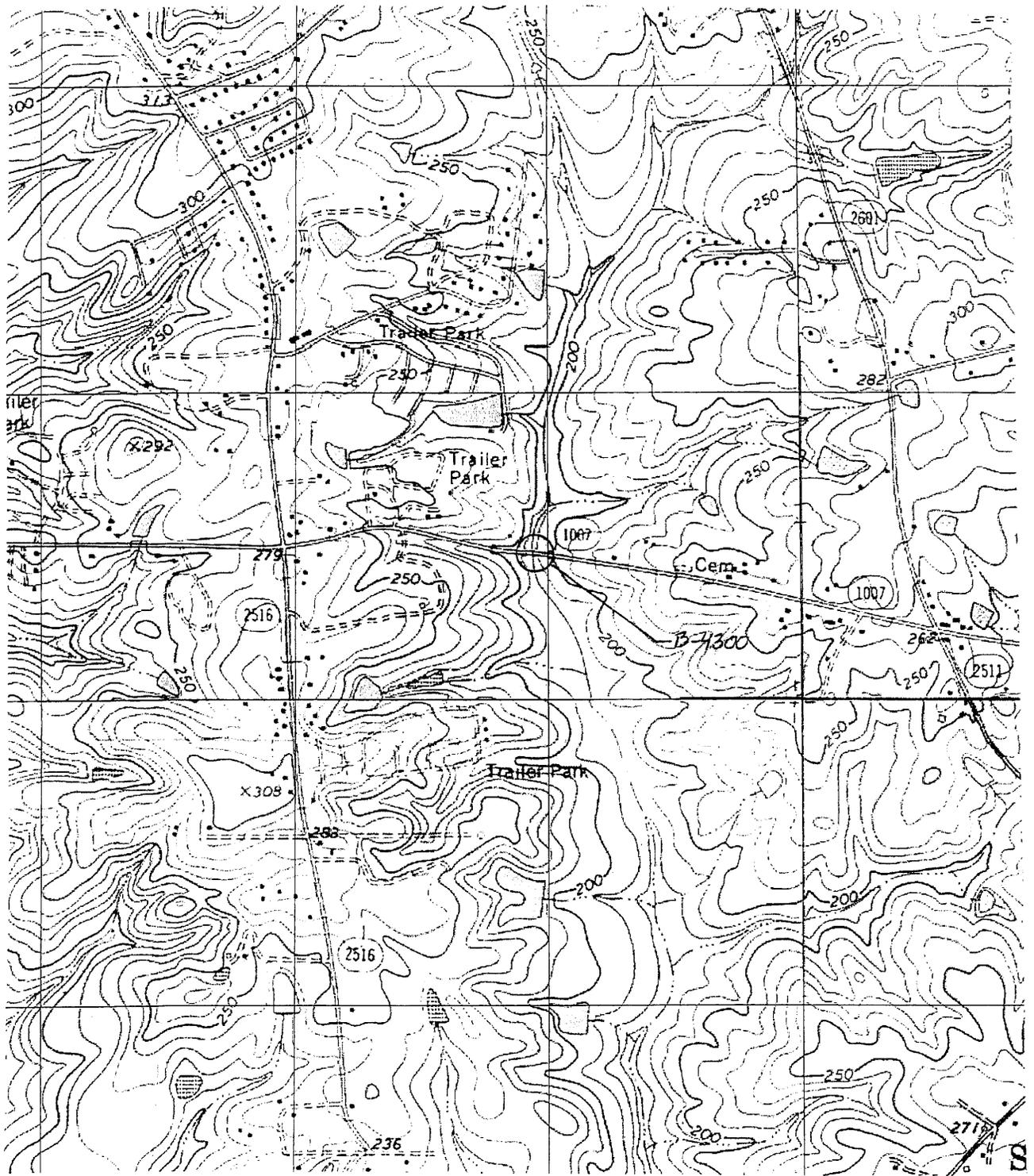


**BUFFER IMPACTS**

## VICINITY MAPS

**NCDOT**

DIVISION OF HIGHWAYS  
 WAKE COUNTY  
 PROJECT: B-4300 (BRIDGE #29)  
 BRIDGE NO. 29 OVER  
 CLARKS CREEK  
 ON SR 1007  
 (POOLE ROAD)



# TOPO MAP

SCALE: 1" : 1500'

NCDOT  
 DIVISION OF HIGHWAYS  
 WAKE COUNTY  
 PROJECT: B-4300 (BRIDGE #29)  
 BRIDGE NO. 29 OVER  
 CLARKS CREEK  
 ON SR 1007  
 (POOLE ROAD)

STA. 15+00.00 -L- BEGIN CONSTRUCTION  
-L- STA. 15+00.00 -DET-

STA. 25+50.00 -L- END CONSTRUCTION  
STA. 25+61.55 -DET-

BEGIN CULVERT  
-L- STA. 19+94.00

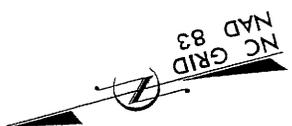
3 @ 84" CSP

END CULVERT  
-L- STA. 20+14.00

CLARKS CREEK

2 @ 10' X 11' RCBC

POOLE RD. SR 1007



TO RALEIGH

TO KNIGHTDALE

STA. 17+00.00 -L- BEGIN TIP PROJECT B-4300

STA. 25+00.00 -L- END TIP PROJECT B-4300

SITE MAP  
NOT TO SCALE

NCDOT

DIVISION OF HIGHWAYS  
WAKE COUNTY  
PROJECT: B-4300 (BRIDGE #29)  
BRIDGE NO. 29 OVER  
CLARKS CREEK  
ON SR 1007  
(POOLE ROAD)

SHEET 3 OF 8

10/1/2007

PROPERTY OWNERS  
NAMES AND ADDRESSES

	NAMES	ADDRESSES
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3	Eugene Banks	7429 Poole Road Raleigh, NC 27610
4	Andrew P. Broadie	7409 Poole Road Raleigh, NC 27610
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NCDOT

DIVISION OF HIGHWAYS  
WAKE COUNTY  
PROJECT: B-4300 (BRIDGE #29)  
BRIDGE NO. 29 OVER  
CLARKS CREEK  
ON SR 1007  
(POOLE ROAD)





# BUFFER IMPACTS

**MULKEY**  
ENGINEERS & CONSULTANTS  
PO BOX 32137  
RALEIGH, NC 27638  
(919) 281-1913  
WWW.MULKEYINC.COM

PROJECT REFERENCE NO. B-4300	SHEET NO. 2-B
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	

**PRELIMINARY PLANS**  
DO NOT USE FOR CONSTRUCTION

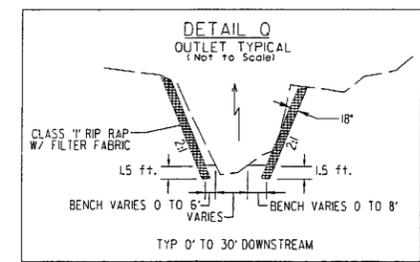
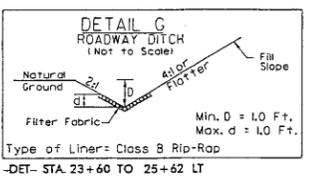
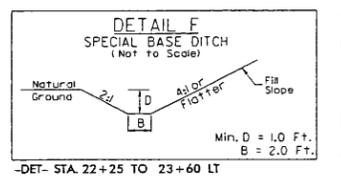
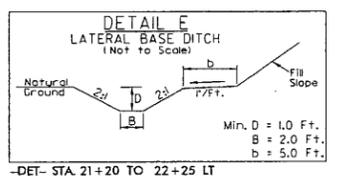
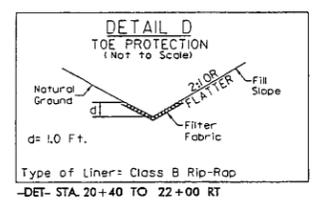
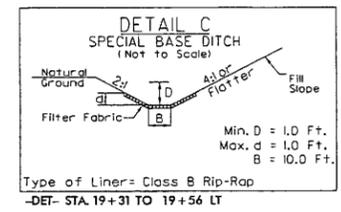
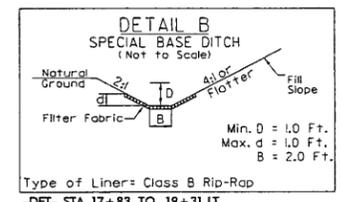
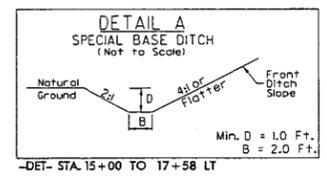
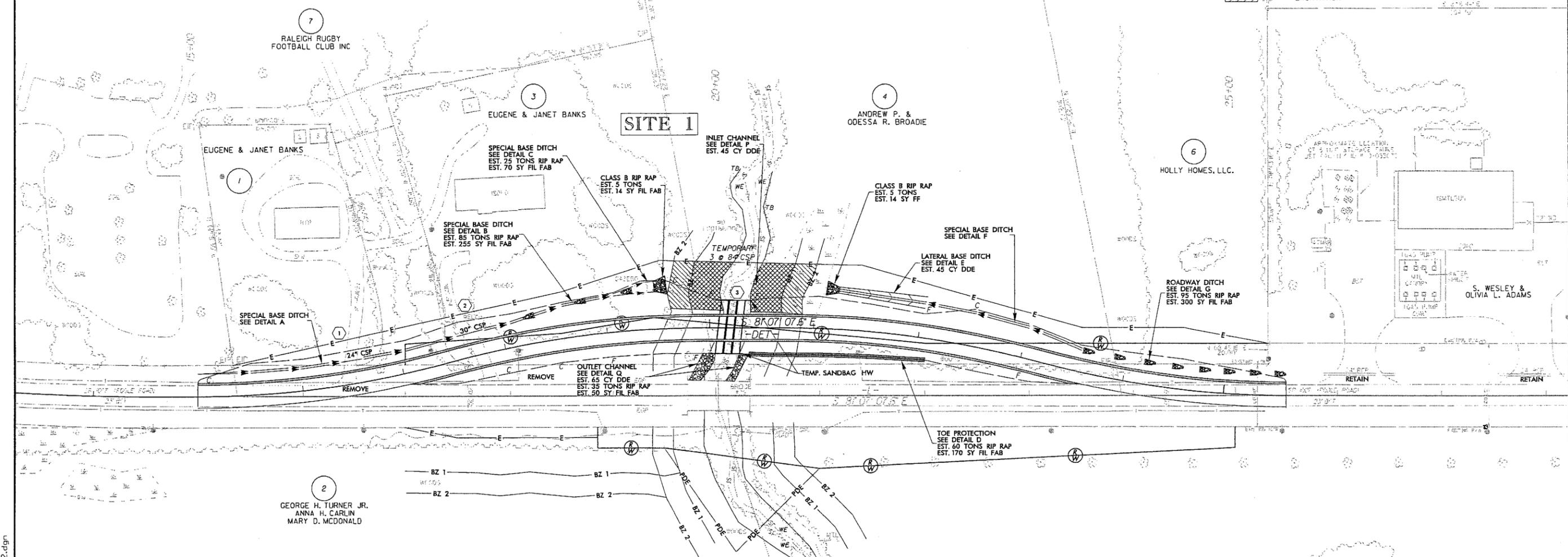
FOR -DET- PROFILE SEE SHEET 5

**ENGLISH**

Buffer Drawing  
Sheet 7 of 8

-  ALLOWABLE IMPACTS ZONE 1
-  ALLOWABLE IMPACTS ZONE 2
-  DENOTES CHANNEL EXCAVATION

REVISIONS

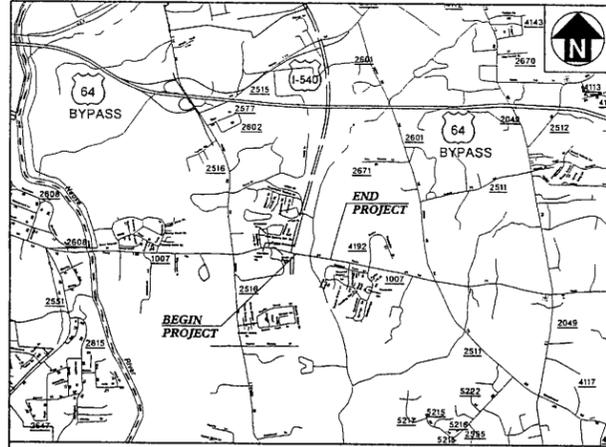


1/17/2008  
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09/08/09

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



VICINITY MAP

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

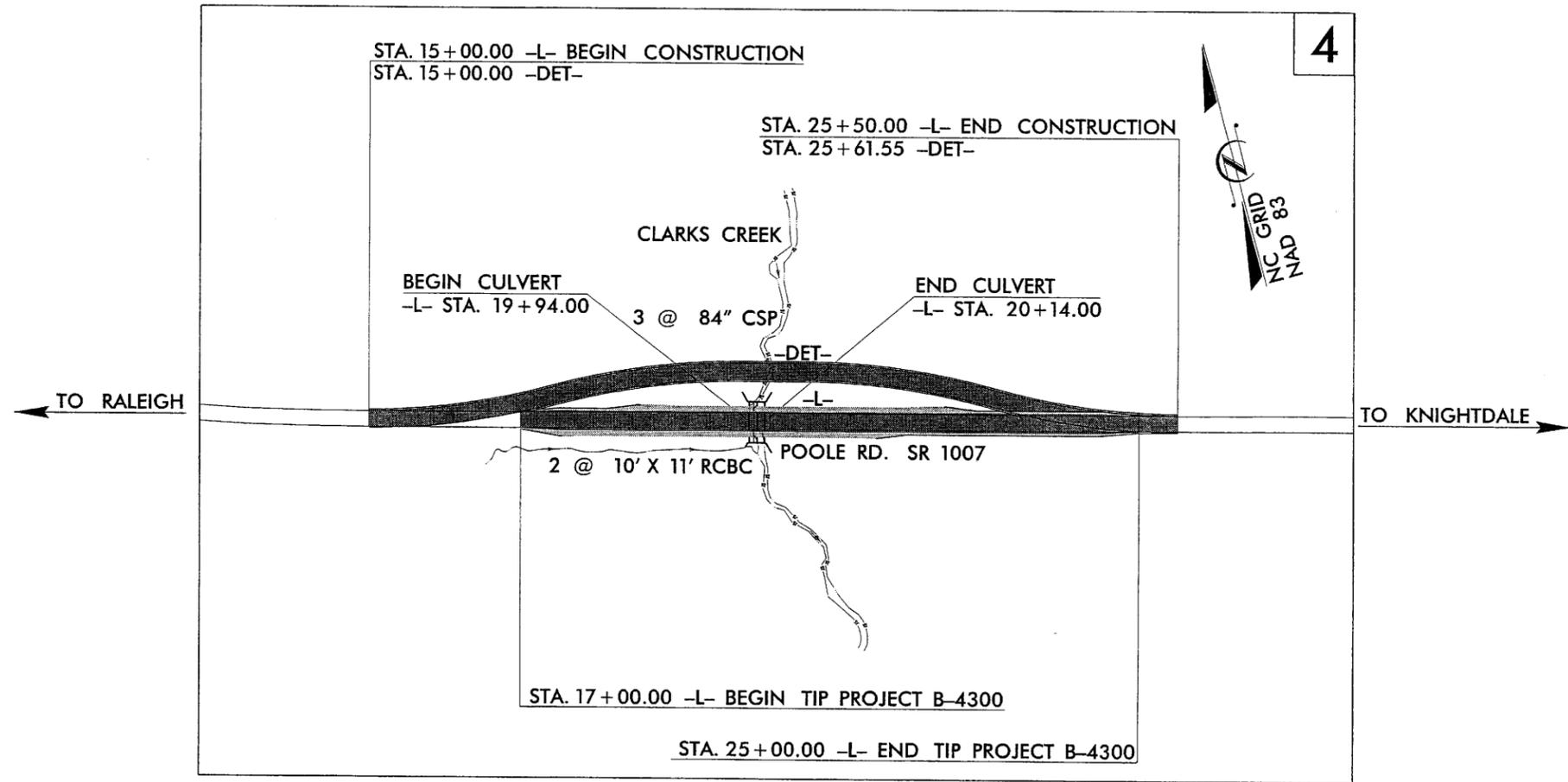
**WAKE COUNTY**

LOCATION: BRIDGE NO. 29 OVER CLARKS CREEK ON SR 1007  
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND CULVERT

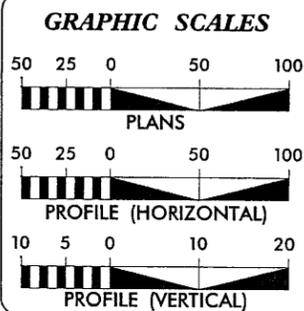
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4300	1	
W.A.S. ELEMENT	F.A. PROJ. NO.	DESCRIPTION	
33637.1.1	BRSTP-1007(8)	P.E.	
33637.2.1	BRSTP-1007(8)	RW, UTL.	
33637.3.1	BRSTP-1007(8)	CONST.	

TIP PROJECT: B-4300

CONTRACT: C201897



**MULKEY**  
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PO Box 33127  
RALEIGH, N.C. 27636  
(919) 851-1912  
(919) 851-1918 (FAX)  
WWW.MULKEYINC.COM



**DESIGN DATA**

ADT 2008 = 8,900  
ADT 2030 = 19,500  
DHV = 10 %  
D = 75 %  
T = 6 %\*  
V = 60 MPH

\* TTST 1% DUAL 5%  
Func. Classification - Major-Rural Collector

**PROJECT LENGTH**

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LENGTH STRUCTURE TIP PROJECT B-4300 = .004 MILES  
TOTAL LENGTH TIP PROJECT B-4300 = .152 MILES

Prepared in the Office of:

**MULKEY**  
ENGINEERS & CONSULTANTS  
FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION  
2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: AUGUST 17, 2007

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TIM JORDAN, PE  
ROADWAY PROJECT ENGINEER

JEFF RECK, PE  
HYDRAULIC PROJECT ENGINEER

DOUG TAYLOR, PE  
NCDOT ROADWAY DESIGN PROJECT ENGINEER

**HYDRAULICS ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

**ROADWAY DESIGN ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER

11/17/2008 R:\Roadway\Proj\B4300\_rdy\_tsh.dgn 3:35:39 PM

PROJECT REFERENCE NO. B-4300	SHEET NO. 1-A
ROADWAY DESIGN ENGINEER	

<p><u>Sheet #</u></p> <p>1</p> <p>1-A</p> <p>1-B</p> <p>1-C</p> <p>2</p> <p>2-A</p> <p>2-B</p> <p>2-C</p> <p>3</p> <p>3-A</p> <p>3-B</p> <p>4</p> <p>5</p> <p>TCP-1 thru TCP-7</p> <p>EC-1 thru EC-7</p> <p>RF-1</p> <p>UO-1 thru UO-2</p> <p>X-1</p> <p>X-2 thru X-5</p> <p>C-1 thru C-5</p>	<p><u>Description</u></p> <p>Title Sheet</p> <p>Index of Sheets, General Notes, &amp; List of Standards</p> <p>Conventional Symbols</p> <p>Survey Control Sheet</p> <p>Pavement Schedule, Wedging Detail &amp; Typical Sections</p> <p>Typical Sections</p> <p>Detour</p> <p>Rock Plating Detail</p> <p>Summary of Quantities</p> <p>List of Pipe, Endwalls, Etc. (For Pipe 48" &amp; Under) &amp; (For Pipe 54" &amp; Over)</p> <p>Summary of Earthwork, Summary of Pavement Removal, Guardrail Summary &amp; Temporary Guardrail Summary</p> <p>Plan</p> <p>Profile</p> <p>Traffic Control Plans</p> <p>Erosion Control Plans</p> <p>Refrestation Detail Sheet</p> <p>Utilities by Others Plans</p> <p>Cross Section Summary Sheet</p> <p>Cross-Sections</p> <p>Culvert Plans</p>	<p><u>2006 ROADWAY ENGLISH STANDARD DRAWINGS</u>      EFF. 07-18-06 REV. 01-02-07</p> <p>The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated July 18, 2006 are applicable to this project and by reference hereby are considered a part of these plans:</p> <table border="0"> <tr> <td style="text-align: center;">STD.NO.</td> <td style="text-align: center;">TITLE</td> </tr> <tr> <td colspan="2">DIVISION 2 - EARTHWORK</td> </tr> <tr> <td>200.03</td> <td>Method of Clearing - Method III</td> </tr> <tr> <td>225.02</td> <td>Guide for Grading Subgrade - Secondary and Local</td> </tr> <tr> <td>225.04</td> <td>Method of Obtaining Superelevation - Two Lane Pavement</td> </tr> <tr> <td colspan="2">DIVISION 3 - PIPE CULVERTS</td> </tr> <tr> <td>300.01</td> <td>Method of Pipe Installation - Method 'A'</td> </tr> <tr> <td>310.10</td> <td>Driveway Pipe Construction</td> </tr> <tr> <td colspan="2">DIVISION 5 - SUBGRADE, BASES AND SHOULDERS</td> </tr> <tr> <td>560.01</td> <td>Method of Shoulder Construction - High Side of Superelevated Curve - Method I</td> </tr> <tr> <td colspan="2">DIVISION 8 - INCIDENTALS</td> </tr> <tr> <td>806.01</td> <td>Concrete Right-of-Way Marker</td> </tr> <tr> <td>806.02</td> <td>Granite Right-of-Way Marker</td> </tr> <tr> <td>815.03</td> <td>Pipe Underdrain and Blind Drain</td> </tr> <tr> <td>816.04</td> <td>Markers for Drainage Structure and Concrete Pad</td> </tr> <tr> <td>838.21</td> <td>Reinforced Concrete Endwall - for Single 54" Pipe 90 Skew</td> </tr> <tr> <td>838.45</td> <td>Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40</td> </tr> <tr> <td>838.51</td> <td>Reinforced Brick Endwall - for Single 54" Pipe 90 Skew</td> </tr> <tr> <td>838.75</td> <td>Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70</td> </tr> <tr> <td>838.80</td> <td>Precast Endwalls - 12" thru 72" Pipe 90 Skew</td> </tr> <tr> <td>862.01</td> <td>Guardrail Placement</td> </tr> <tr> <td>862.02</td> <td>Guardrail Installation</td> </tr> <tr> <td>862.03</td> <td>Structure Anchor Units</td> </tr> <tr> <td>876.04</td> <td>Drainage Ditches with Class 'B' Rip Rap</td> </tr> <tr> <td>876.01</td> <td>Rip Rap in Channels</td> </tr> </table>	STD.NO.	TITLE	DIVISION 2 - EARTHWORK		200.03	Method of Clearing - Method III	225.02	Guide for Grading Subgrade - Secondary and Local	225.04	Method of Obtaining Superelevation - Two Lane Pavement	DIVISION 3 - PIPE CULVERTS		300.01	Method of Pipe Installation - Method 'A'	310.10	Driveway Pipe Construction	DIVISION 5 - SUBGRADE, BASES AND SHOULDERS		560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I	DIVISION 8 - INCIDENTALS		806.01	Concrete Right-of-Way Marker	806.02	Granite Right-of-Way Marker	815.03	Pipe Underdrain and Blind Drain	816.04	Markers for Drainage Structure and Concrete Pad	838.21	Reinforced Concrete Endwall - for Single 54" Pipe 90 Skew	838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40	838.51	Reinforced Brick Endwall - for Single 54" Pipe 90 Skew	838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70	838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew	862.01	Guardrail Placement	862.02	Guardrail Installation	862.03	Structure Anchor Units	876.04	Drainage Ditches with Class 'B' Rip Rap	876.01	Rip Rap in Channels
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General Notes:

2006 Specifications  
Effective: 07-18-06  
Revised: 07-18-06

- Grading and Surfacing or Resurfacing and Widening:**  
The grade lines shown denote the finished elevation of the proposed surfacing at grade points shown on the typical sections. Where no grade lines are shown, the profiles shown denote the top elevation of the existing pavement along the center line of survey on which the proposed resurfacing will be placed. Grade lines may be adjusted by the engineer in order to secure a proper tie-in.
- Clearing:**  
Clearing on this project shall be performed to the limits established by method III.
- Superelevation:**  
All curves on this project shall be superelevated in accordance with Std. no. 225.04 using the rate of superelevation and runoff shown on the plans. Superelevation is to be revolved about the grade points shown on the typical sections.
- Shoulder Construction:**  
Asphalt, earth, and concrete shoulder construction on the high side of superelevated curves shall be in accordance with Std. no. 560.01.
- Side Roads:**  
The contractor will be required to do all necessary work to provide suitable connections with all roads, streets, and drives entering this project. This work will be paid for at the contract unit price for the particular items involved.
- Underdrains:**  
Underdrains shall be constructed in accordance with Std. no. 815.03 at locations directed by the engineer.
- Guardrail:**  
The guardrail locations shown on the plans may be adjusted during construction as directed by the engineer. The contractor should consult with the engineer prior to ordering guardrail material.
- Temporary Shoring:**  
Shoring required for the maintenance of traffic will be paid for as "Extra Eork" in accordance with section 104-7.
- Subsurface Plans:**  
No subsurface plans are available on this project. The contractor should make his own investigation as to the subsurface conditions.
- Utilities:**  
Utility owners on this project are Bell South, Progress Energy, AT&T, and Time Warner Cable.  
  
Any relocation of existing utilities will be accomplished by others.
- Right-of-Way Markers:**  
All right-of-way markers on this project shall be placed by contract.

3/15/06

Note: Not to Scale

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

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CONVENTIONAL PLAN SHEET SYMBOLS

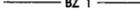
### BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	----- 
Property Corner	----- 
Property Monument	----- 
Parcel/Sequence Number	----- 
Existing Fence Line	----- 
Proposed Woven Wire Fence	----- 
Proposed Chain Link Fence	----- 
Proposed Barbed Wire Fence	----- 
Existing Wetland Boundary	----- 
Proposed Wetland Boundary	----- 
Existing Endangered Animal Boundary	----- 
Existing Endangered Plant Boundary	----- 

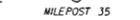
### BUILDINGS AND OTHER CULTURE:

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

### HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	----- 
Jurisdictional Stream	----- 
Buffer Zone 1	----- 
Buffer Zone 2	----- 
Flow Arrow	----- 
Disappearing Stream	----- 
Spring	----- 
Wetland	----- 
Proposed Lateral, Tail, Head Ditch	----- 
False Sump	----- 

### RAILROADS:

Standard Gauge	----- 
RR Signal Milepost	----- 
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	----- 
Proposed Control of Access	----- 
Existing Easement Line	----- 
Proposed Temporary Construction Easement	----- 
Proposed Temporary Drainage Easement	----- 
Proposed Permanent Drainage Easement	----- 
Proposed Permanent Utility Easement	----- 

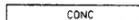
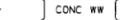
### ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	----- 
Proposed Slope Stakes Fill	----- 
Proposed Wheel Chair Ramp	----- 
Proposed Wheel Chair Ramp Curb Cut	----- 
Curb Cut for Future Wheel Chair Ramp	----- 
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	----- 

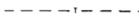
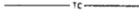
### EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	----- 
Bridge Wing Wall, Head Wall and End Wall	----- 
MINOR:	
Head and End Wall	----- 
Pipe Culvert	----- 
Footbridge	----- 
Drainage Box: Catch Basin, DI or JB	----- 
Paved Ditch Gutter	----- 
Storm Sewer Manhole	----- 
Storm Sewer	----- 

### UTILITIES:

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

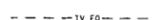
### TELEPHONE:

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

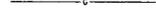
### WATER:

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

### TV:

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

### GAS:

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

### SANITARY SEWER:

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

### MISCELLANEOUS:

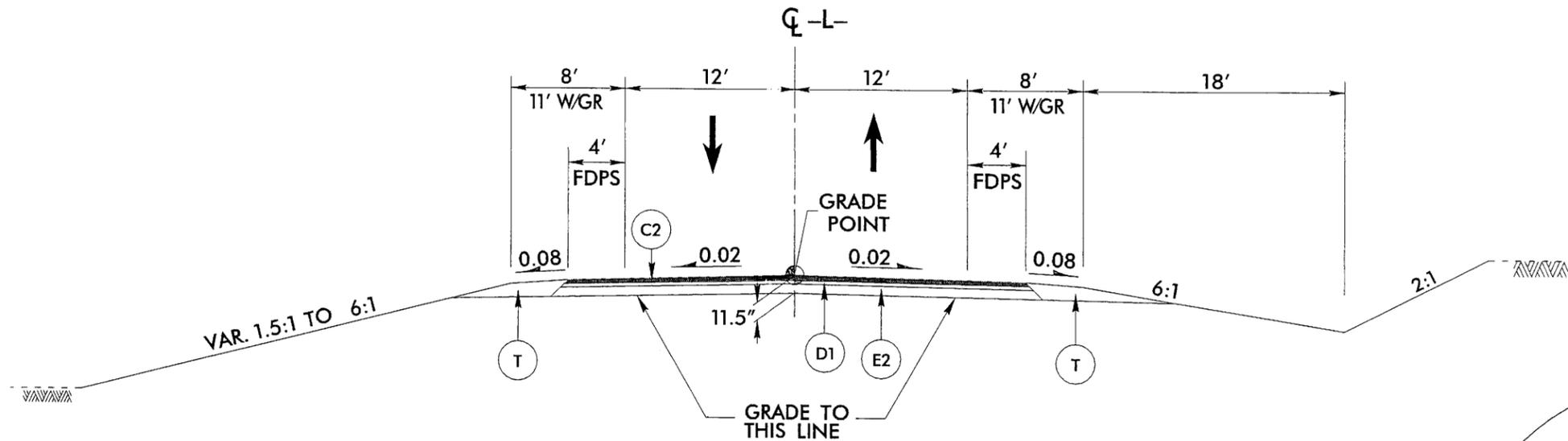
Utility Pole	----- 
Utility Pole with Base	----- 
Utility Located Object	----- 
Utility Traffic Signal Box	----- 
Utility Unknown U/G Line	----- 
U/G Tank; Water, Gas, Oil	----- 
A/G Tank; Water, Gas, Oil	----- 
U/G Test Hole (S.U.E.*)	----- 
Abandoned According to Utility Records	----- 
End of Information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

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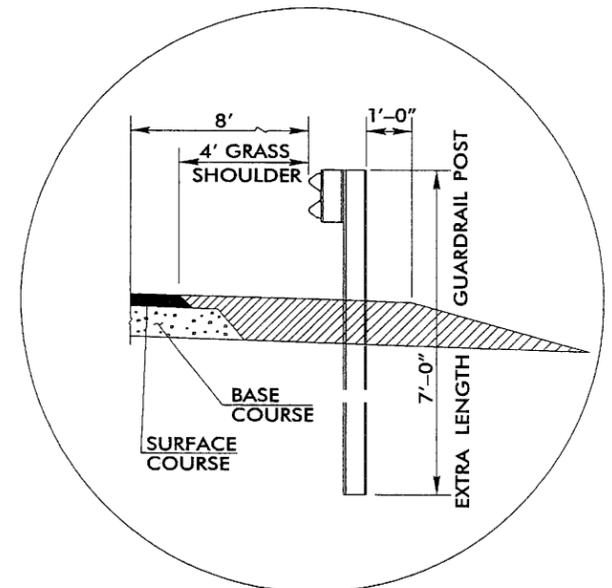


PROJECT REFERENCE NO. B-4300	SHEET NO. 2-A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

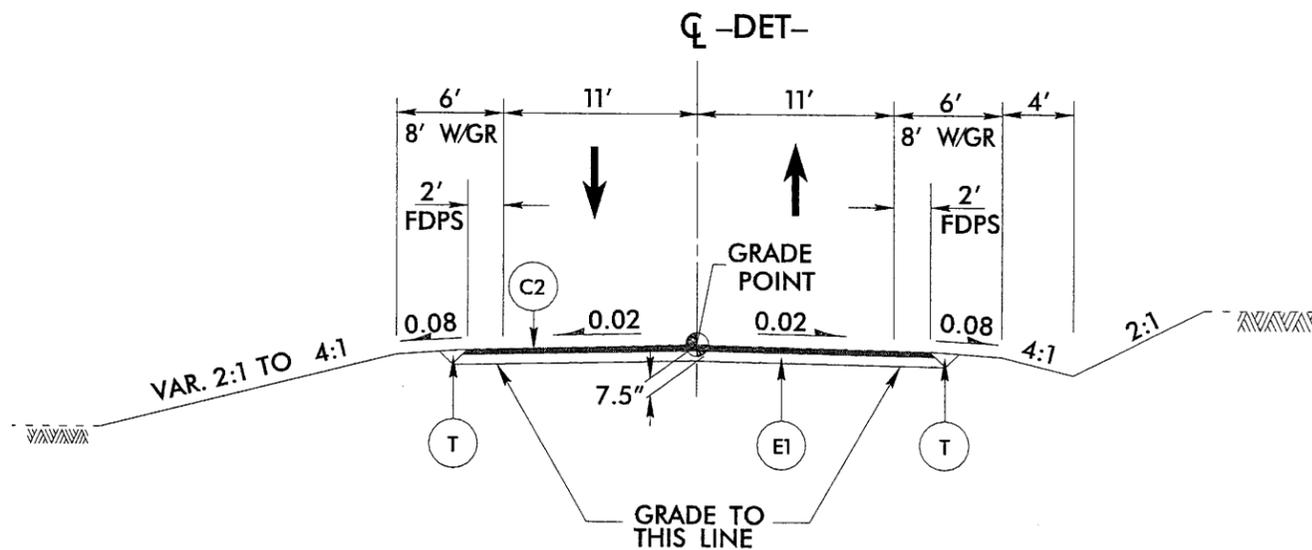


**TYPICAL SECTION NO. 2**

USE TYPICAL SECTION NO. 2  
AT THE FOLLOWING LOCATIONS  
-L- STA. 19+60.00 TO STA. 23+75.00



USE IN CONJUNCTION WITH TYPICAL SECTION NOS. 1 & 2.  
-L- STA. 19+25+/- TO STA. 19+95+/- RT



**TYPICAL SECTION NO. 3**

USE TYPICAL SECTION NO. 3  
AT THE FOLLOWING LOCATIONS  
-DET- STA. 16+39.53 TO STA. 24+25.34

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C2	3" S9.5B
D1	3" I19.0B
E1	4 1/2" B25.0B
E2	5 1/2" B25.0B
T	EARTH MATERIAL

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**PAVEMENT SCHEDULE**

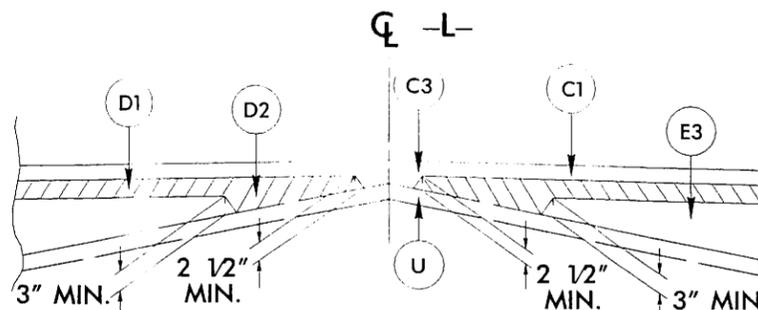
(FINAL PAVEMENT DESIGN)

C1	PROP. APPROX. 1½" 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 1½" IN DEPTH OR GREATER THAN 2" IN DEPTH.
D1	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 342 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 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
E2	PROP. APPROX. 5½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
E3	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" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

**MULKEY**  
ENGINEERS & CONSULTANTS  
P.O. BOX 32137  
RALEIGH, N.C. 27636  
(919) 851-1918 FAX  
WWW.MULKEYINC.COM

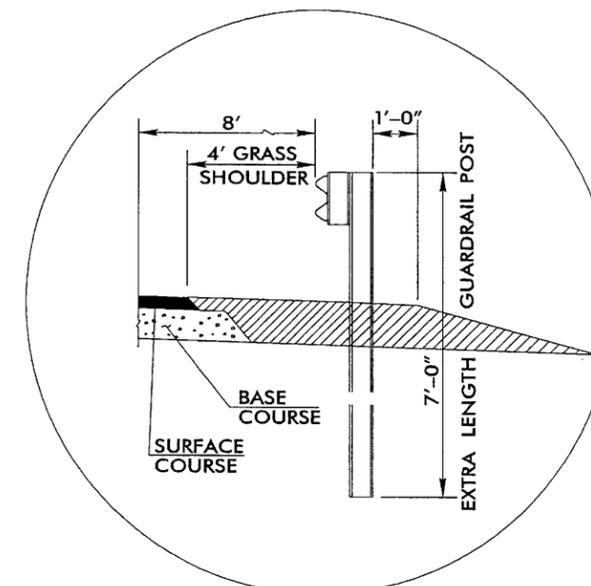
PROJECT REFERENCE NO. B-4300	SHEET NO. 2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER



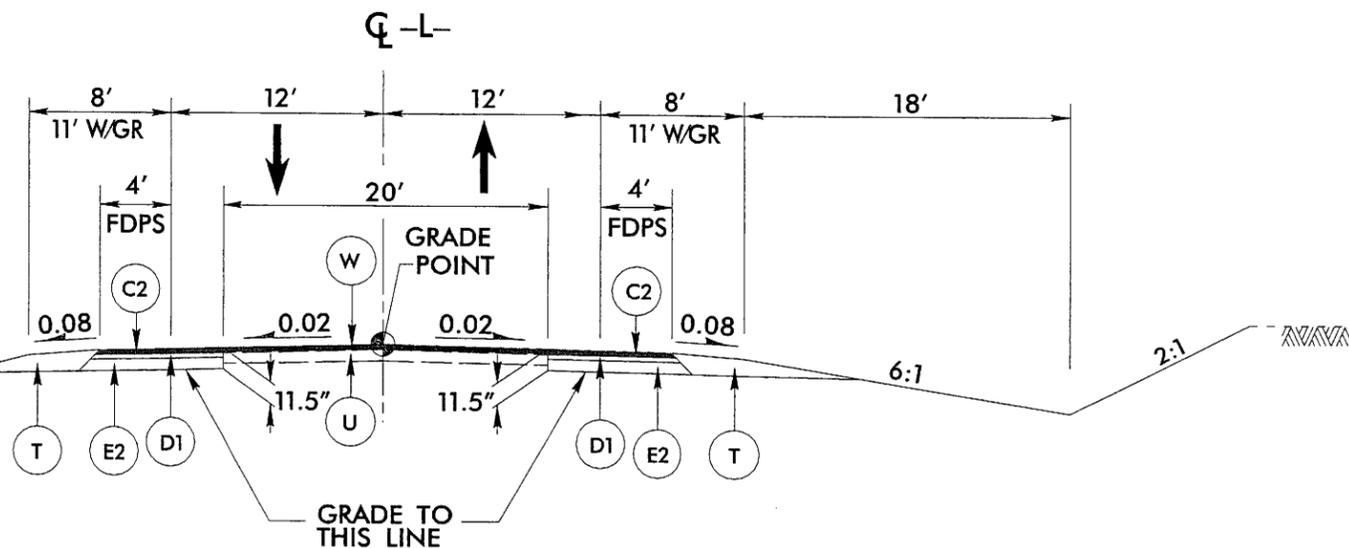
**DETAIL SHOWING METHOD OF WEDGING**

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1

NOTE: AFTER DETOUR REMOVAL, OVERLAY EXISTING PAVEMENT WITH (C1) FROM  
 -L- STA. 15+00.00 TO STA. 17+50.00  
 -L- STA. 24+50.00 TO STA. 25+50.00



USE IN CONJUNCTION WITH TYPICAL SECTION NOS. 1 & 2.  
 -L- STA. 19+25+/- TO STA. 19+95+/- RT



**TYPICAL SECTION NO. 1**

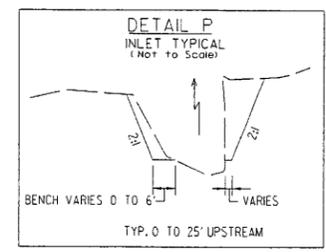
USE TYPICAL SECTION NO. 1 AT THE FOLLOWING LOCATIONS

- TRANSITION FROM EXISTING TO T.S. NO. 1 FROM
  - L- STA. 17+00.00 TO STA. 17+50.00
  - L- STA. 17+50.00 TO STA. 19+60.00
  - L- STA. 23+75.00 TO STA. 24+50.00
- TRANSITION FROM T.S. NO. 1 TO EXISTING
  - L- STA. 24+50.00 TO STA. 25+00.00

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B-4300

-L-		-DET-			
PI Sta 13+19.19	PI Sta 16+23.76	PI Sta 18+69.82	PI Sta 21+93.19	PI Sta 24+39.25	
$\Delta = 7'04'' 12.2'' (LT)$	$\Delta = 15'13'' 29.4'' (LT)$	$\Delta = 15'13'' 29.4'' (RT)$	$\Delta = 15'13'' 29.4'' (RT)$	$\Delta = 15'13'' 29.4'' (LT)$	
D = 2'22'' 25.1'	D = 6'11'' 14.8"				
L = 237.26'	L = 246.06'	L = 246.06'	L = 246.06'	L = 246.06'	
T = 149.12'	T = 123.76'	T = 123.76'	T = 123.76'	T = 123.76'	
R = 2413.34'	R = 926.00'	R = 926.00'	R = 926.00'	R = 926.00'	
	SE = 04'	SE = 04'	SE = 04'	SE = 04'	
	RO = 96'	RO = 96'	RO = 96'	RO = 96'	

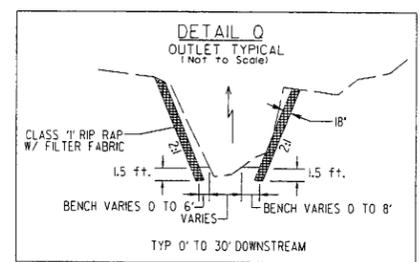
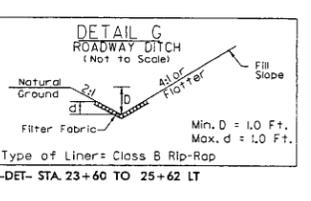
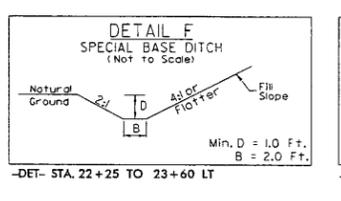
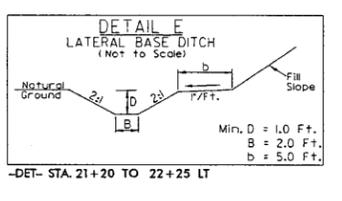
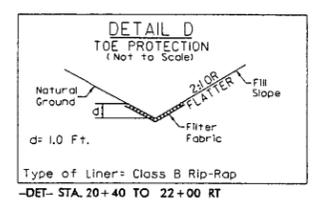
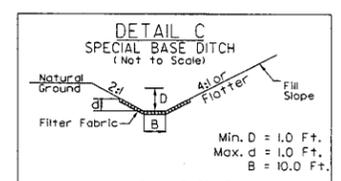
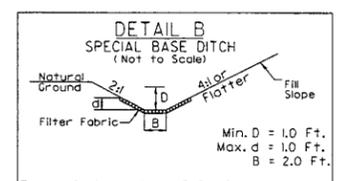
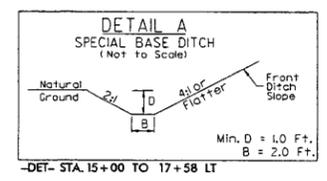
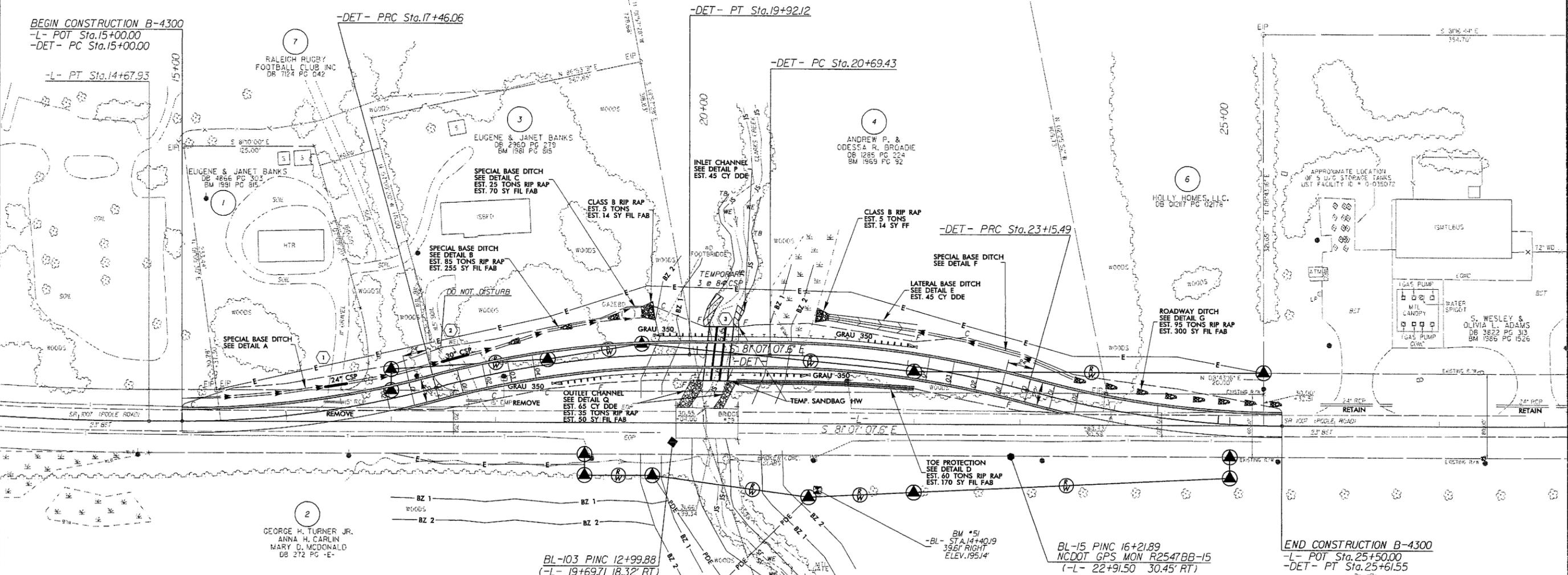


**MULKEY**  
ENGINEERS & CONSULTANTS  
PO BOX 33137  
RALEIGH, N.C. 27638  
(919) 851-1918 (FAX)  
WWW.MULKEYINC.COM

PROJECT REFERENCE NO. B-4300	SHEET NO. 2-B
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	

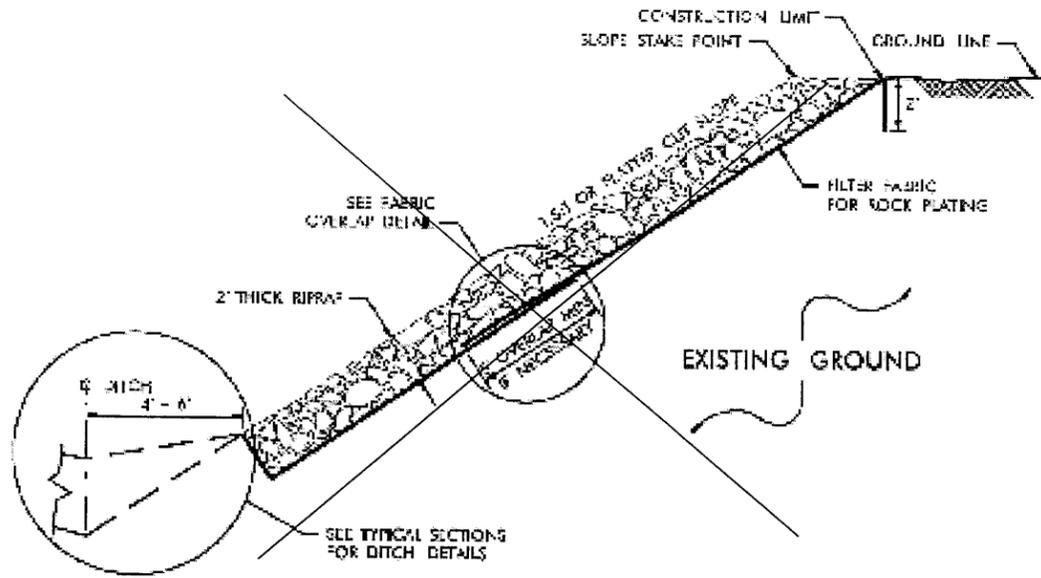
FOR -DET- PROFILE SEE SHEET 5

REVISIONS



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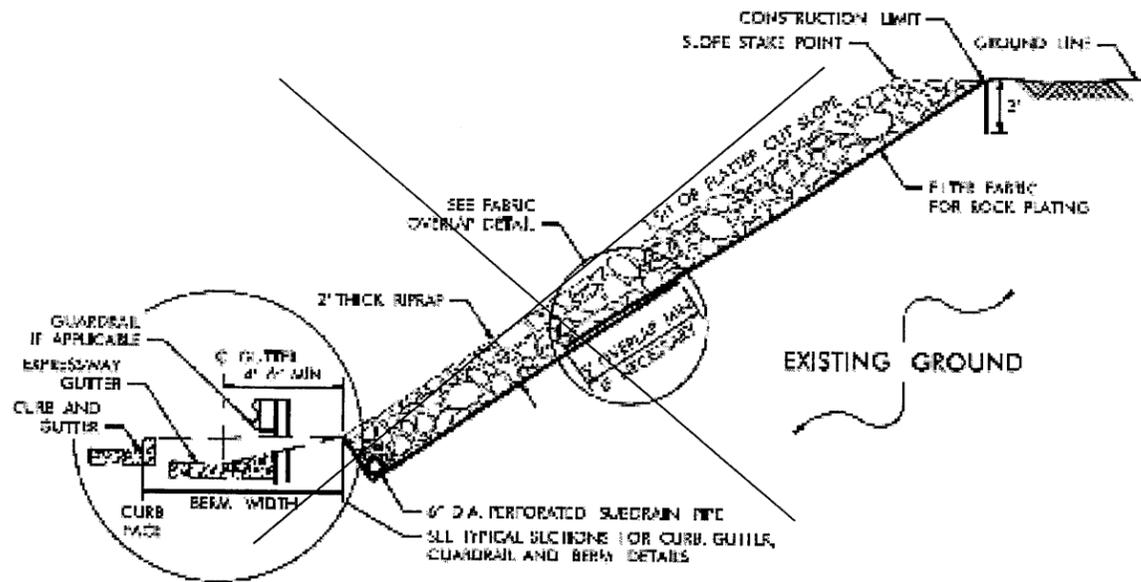
PROJECT REFERENCE NO.		SHEET	
B-4300		2-C	
DESIGNED BY	CHECKED BY	DATE	SCALE



**ROCK PLATING DETAIL NO. 3**

USE ROCK PLATING DETAIL NO. 3 AT THE FOLLOWING LOCATIONS:

STA ± TO STA ± SLOPES.

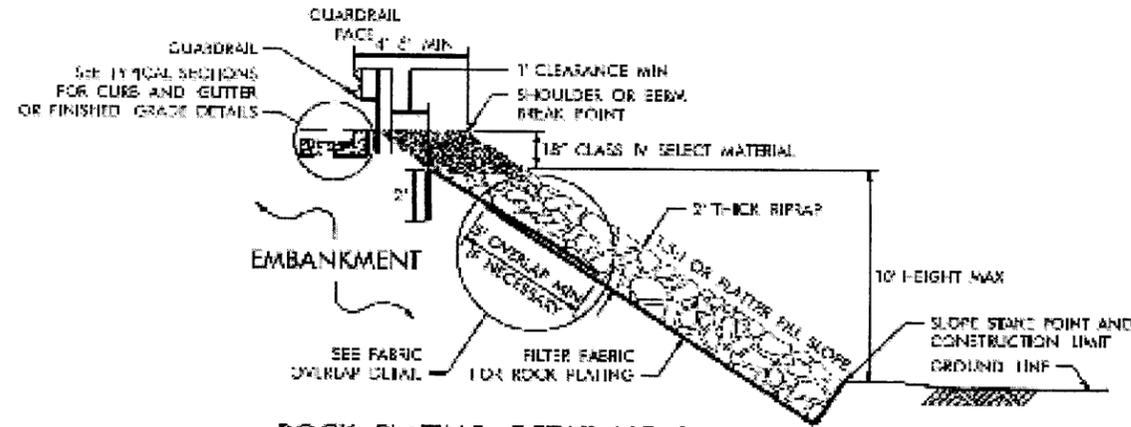


**ROCK PLATING DETAIL NO. 4**

USE ROCK PLATING DETAIL NO. 4 AT THE FOLLOWING LOCATIONS:

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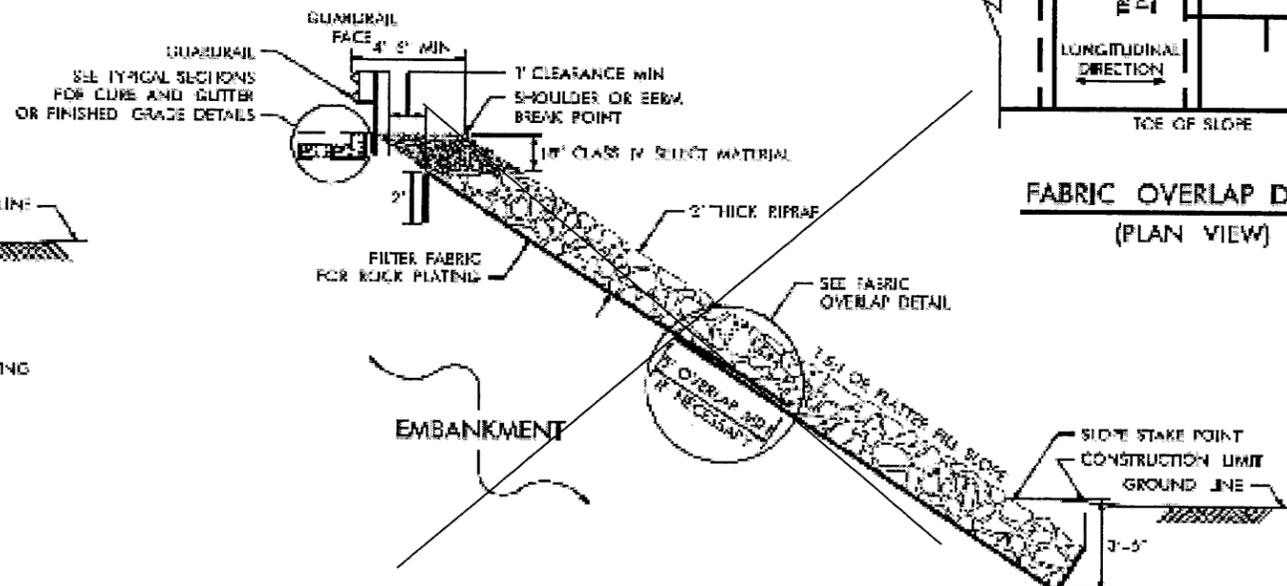
FOR ROCK PLATING, SEE ROCK PLATING SPECIAL PROVISION.



**ROCK PLATING DETAIL NO. 1**

USE ROCK PLATING DETAIL NO. 1 AT THE FOLLOWING LOCATIONS:

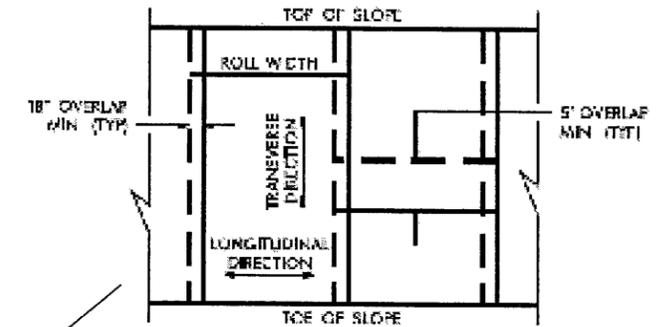
STA 18+50 ± TO STA 20+50 ± EXTEND ROCK PLATING LIMITS TO 1.5:1 SLOPES.



**ROCK PLATING DETAIL NO. 2**

USE ROCK PLATING DETAIL NO. 2 AT THE FOLLOWING LOCATIONS:

STA ± TO STA ± SLOPES.

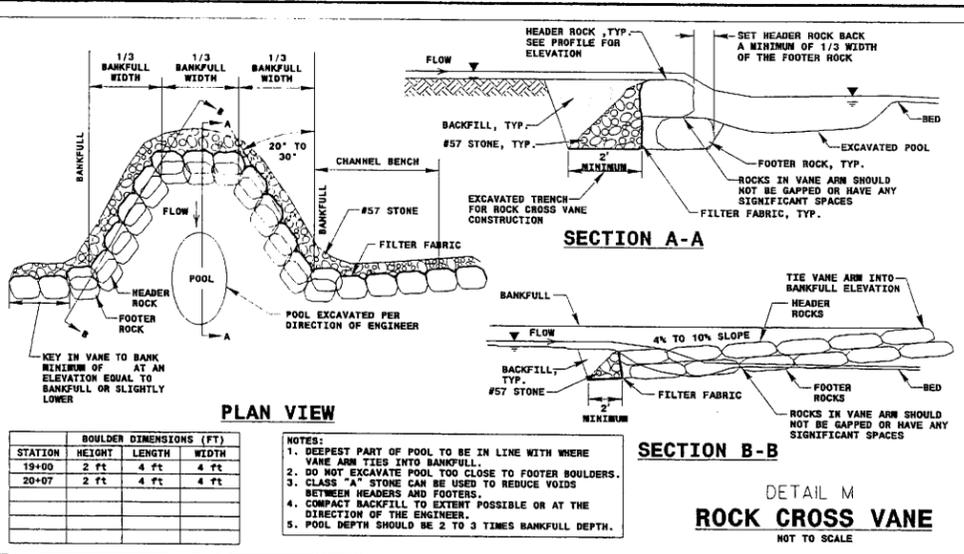
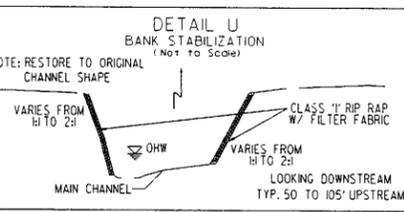
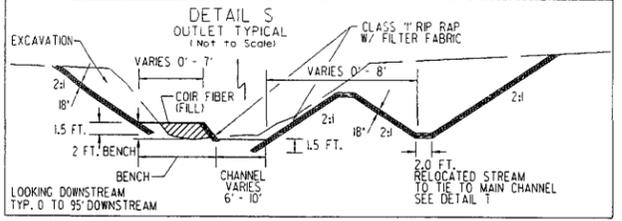
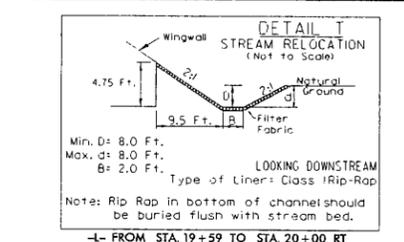
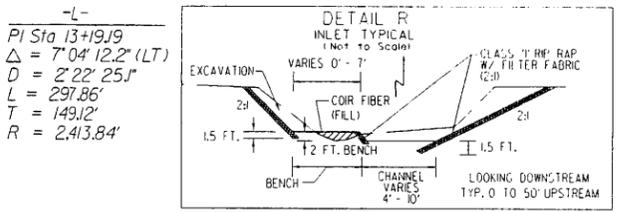


**FABRIC OVERLAP DETAIL (PLAN VIEW)**



**GEOTECHNICAL ENGINEERING UNIT**  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

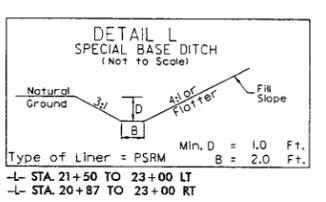
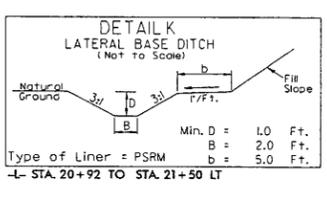
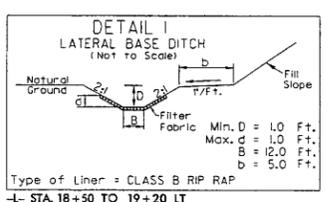
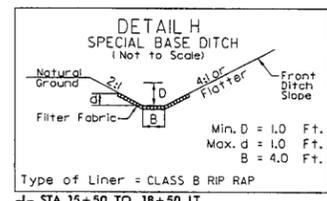
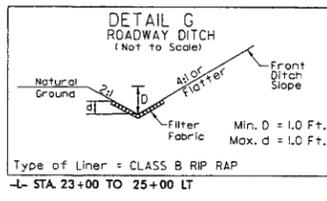
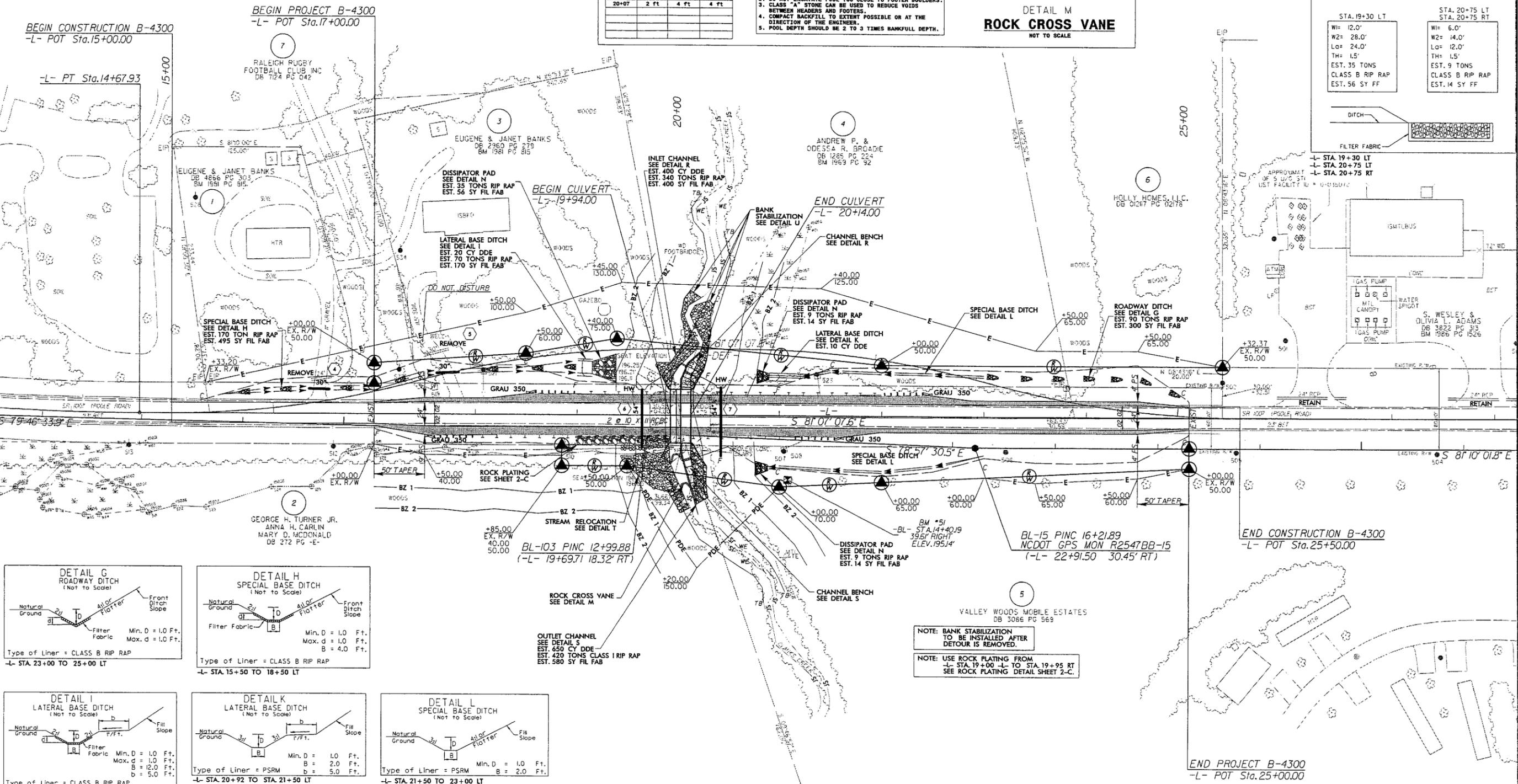
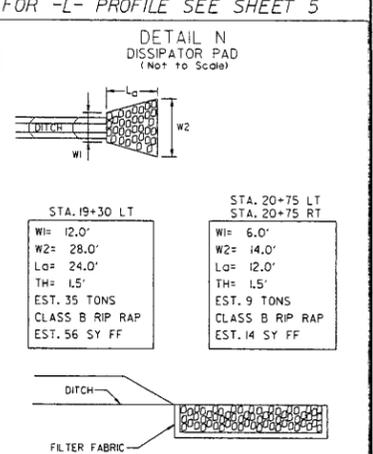
STANDARD DRAWING NO. 1002.01  
**STANDARD ROCK PLATING DETAILS**  
 DATE: 9-18-05



**BOULDER DIMENSIONS (FT)**

STATION	HEIGHT	LENGTH	WIDTH
19+00	2 ft	4 ft	4 ft
20+07	2 ft	4 ft	4 ft

- NOTES:**
1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
  2. DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
  3. CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
  4. COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
  5. POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.



NOTE: BANK STABILIZATION TO BE INSTALLED AFTER DETOUR IS REMOVED.

NOTE: USE ROCK PLATING FROM -L- STA. 19+00 -L- TO STA. 19+95 RT SEE ROCK PLATING DETAIL SHEET 2-C.



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5/28/98

**CULVERT HYDRAULIC DATA**  
54" RCP (WEST)

DESIGN DISCHARGE	= 95	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 196.2	FT
BASE DISCHARGE	= 104	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 196.4	FT
OVERTOPPING DISCHARGE	= 165	CFS
OVERTOPPING FREQUENCY	= 100 +	YRS
OVERTOPPING ELEVATION	= 198.3	FT

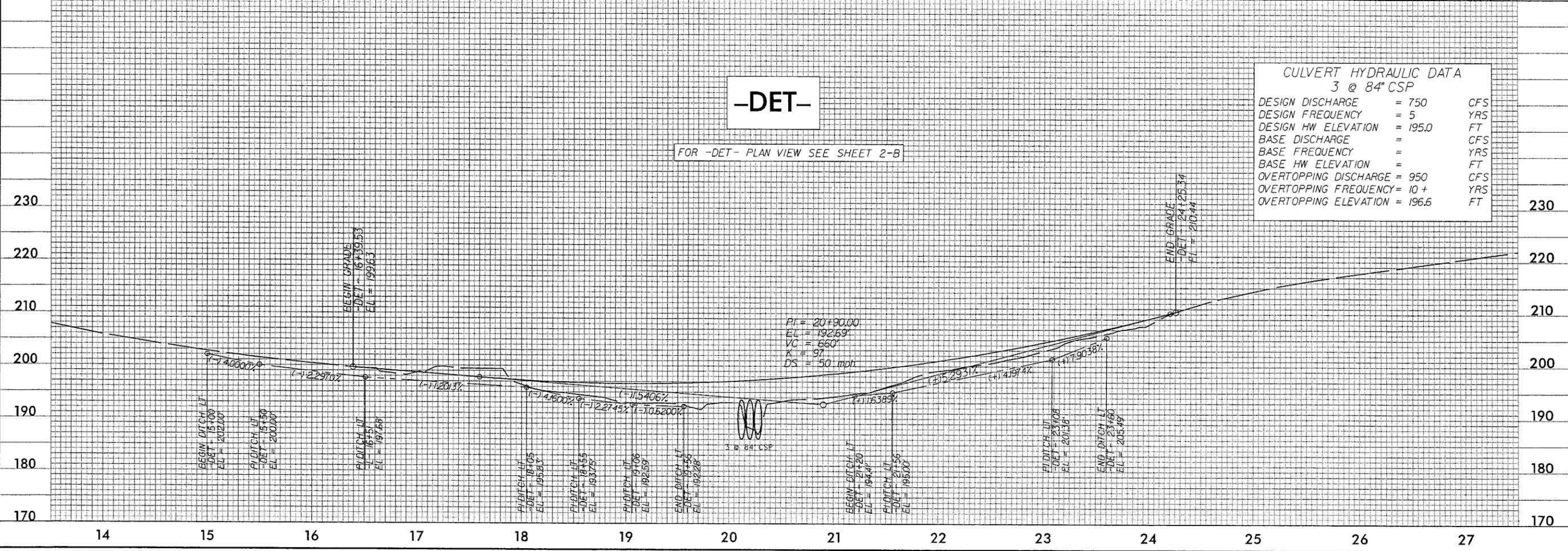
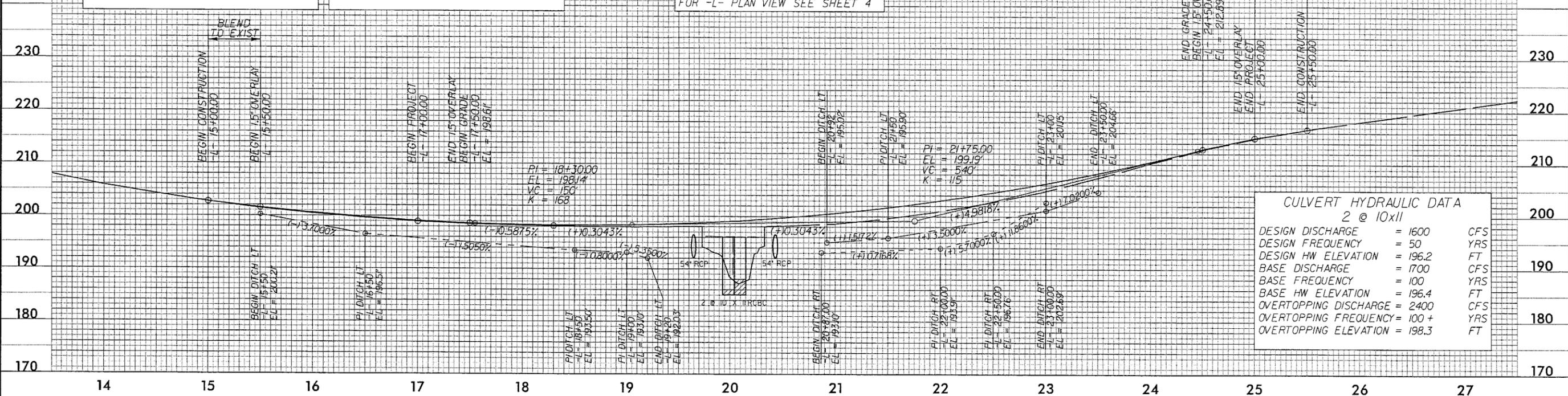
**CULVERT HYDRAULIC DATA**  
54" RCP (EAST)

DESIGN DISCHARGE	= 95	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 196.2	FT
BASE DISCHARGE	= 104	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 196.4	FT
OVERTOPPING DISCHARGE	= 165	CFS
OVERTOPPING FREQUENCY	= 100 +	YRS
OVERTOPPING ELEVATION	= 198.3	FT

BM -#51  
RAILROAD SPIKE IN 16" PIN OAK  
-BL- STA 14+40 40' RIGHT  
EL = 195.14'  
-L- STA 21+08.43 63.19' RIGHT

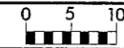


PROJECT REFERENCE NO.	B-4300
ROADWAY DESIGN ENGINEER	
SHEET NO.	5
HYDRAULICS ENGINEER	

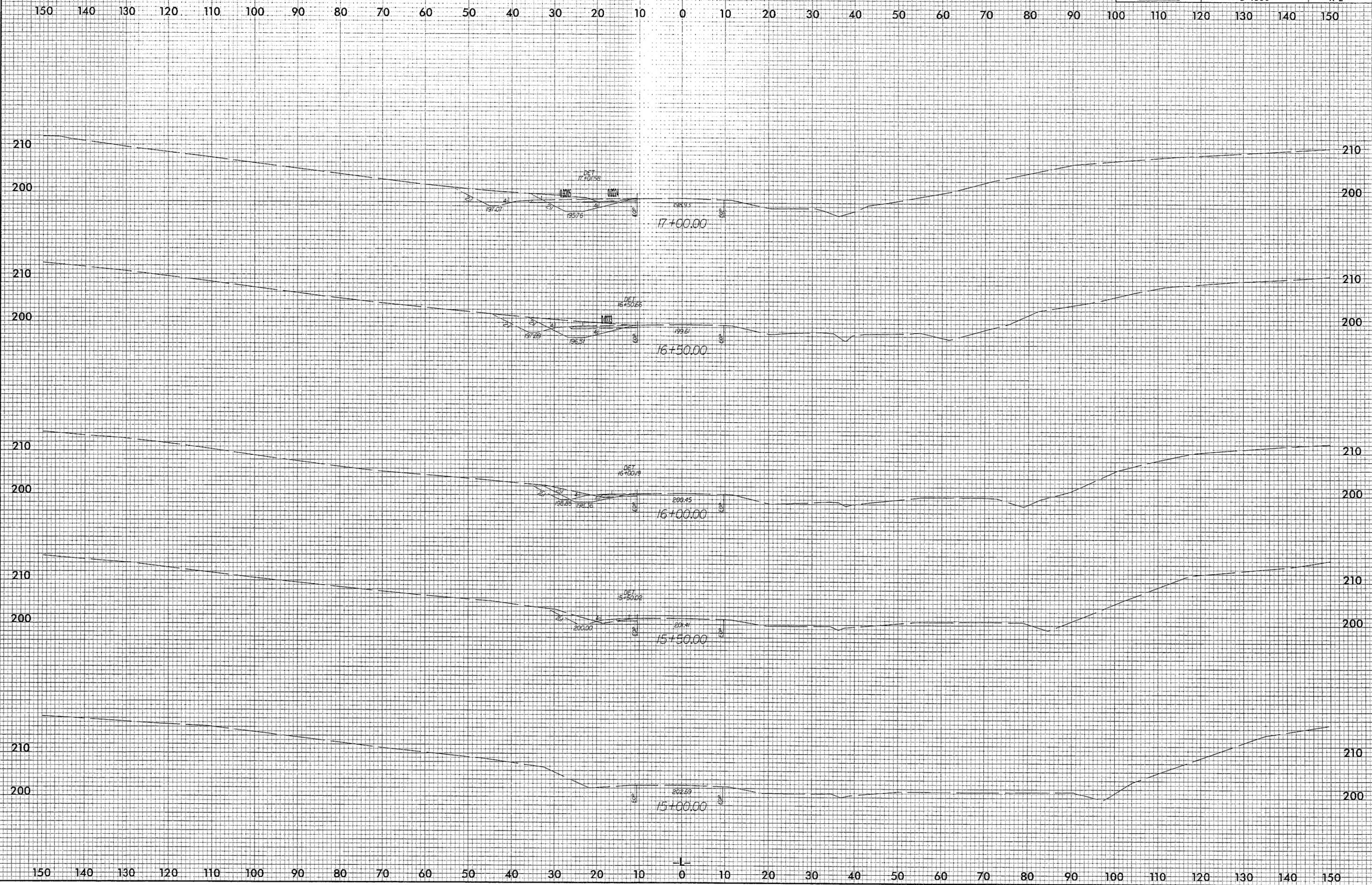


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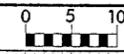


PROJ. REFERENCE NO.	SHEET NO.
B-4300	X-2



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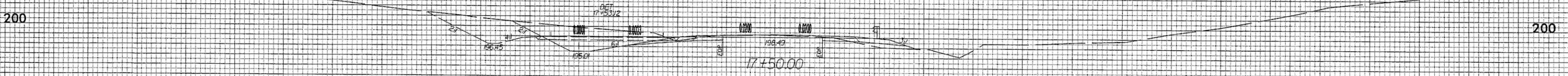
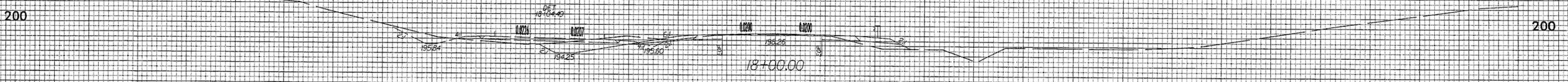
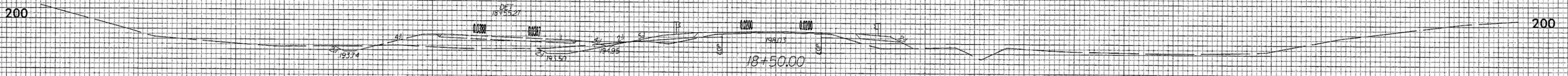
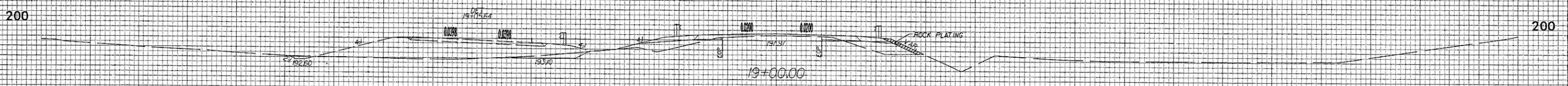
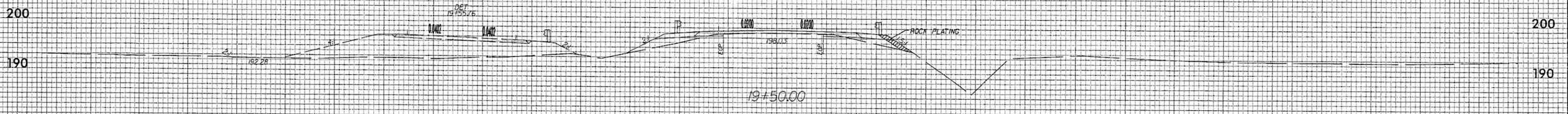
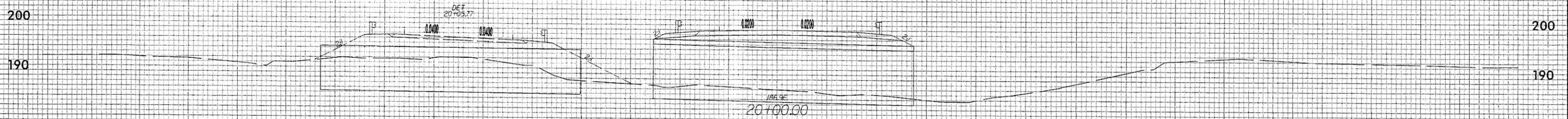
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PROJ. REFERENCE NO.  
B-4300

SHEET NO.  
X-3

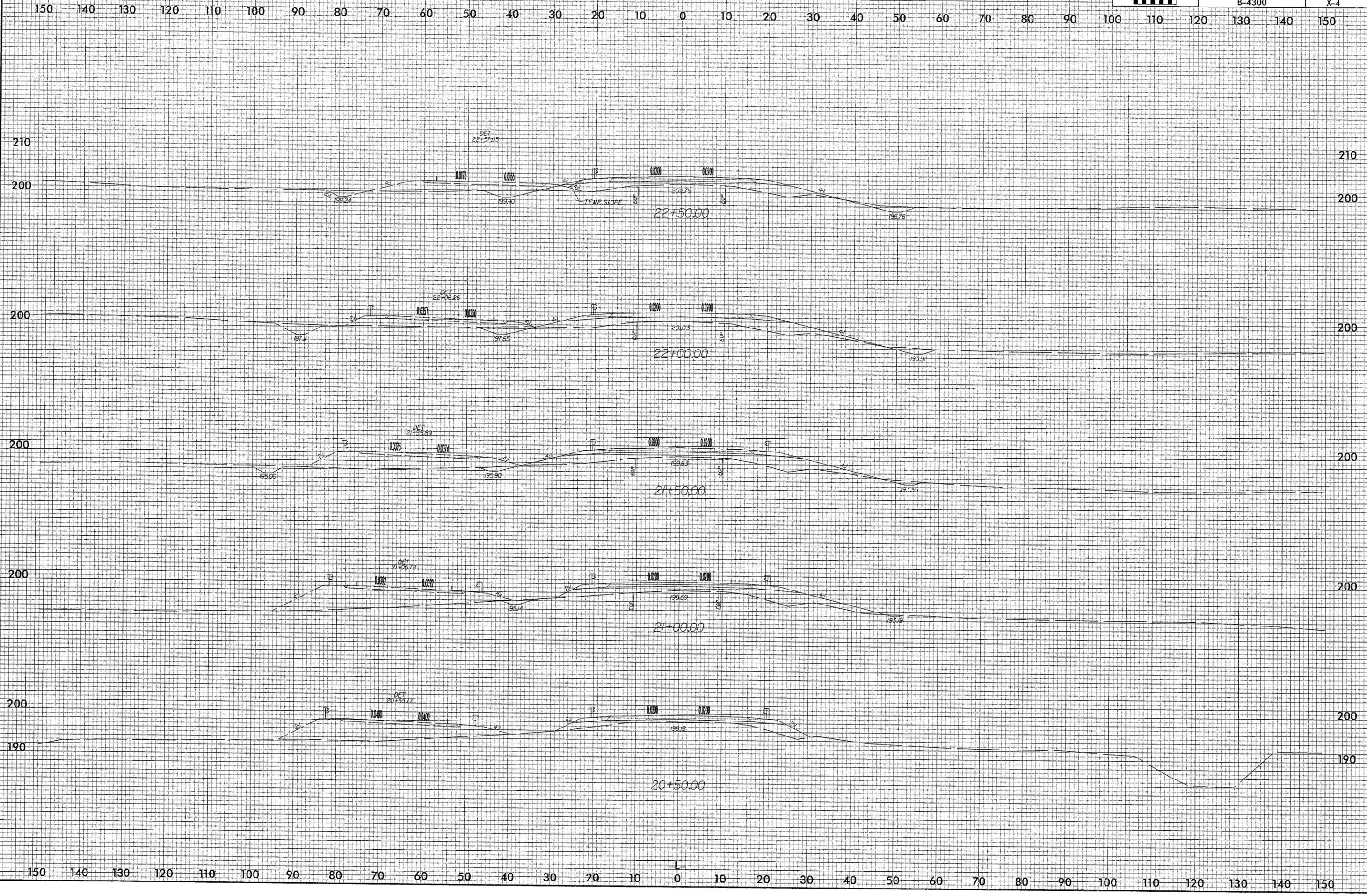
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