STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

September 2, 2008

U. S. Army Corps of Engineers
Regulatory Field Office
3331 Heritage Trade Drive, Suite 105
Wake Forest, NC 27587

ATTENTION: Mr. Monte Matthews
NCDOT Coordinator

SUBJECT: **Application for Nationwide Permits 13, 14 and Section 401 Water Quality Certification** for the widening of US 421 (King Street) from US 321 to East of NC 194 in Boone, Watauga County. Federal Project No. NHF-421(31), State Project No. 8.1751601, NCDOT Division 11, TIP No. U-4020. $570.00 Debit WBS Element 35015.1.1.

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes improvements to US 421 (King Street) from US 321 to East of NC 194 in Boone, Watauga County. The NCDOT proposes to widen US 421 to a multi-lane divided facility from NC 194 (Jefferson Avenue) to US 321 (Hardin Street). The NCDOT will also improve the intersections at the following roads intersecting US 421 (King Street): Grove Street, NC 194 (Jefferson Avenue), New Market Boulevard, US 221/NC 105, and US 321 (Hardin Street). The total length of the project is approximately 1.2 mile long.

A large portion of the traffic within the project corridor is attempting to make connections to either US 321, US 221, or NC 194. Both US 321 and US 221 intersect US 421 as five-lane facilities. US 421, east of the project corridor is also a five-lane facility. US 421 (King Street) currently operates at a level of service (LOS) D from NC 194 to US 221/NC

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.DOH.DOT.STATE.NC.US

LOCATION:
PARKER LINCOLN BUILDING,
2728 CAPITAL BLVD., SUITE 240
RALEIGH NC 27604

105 and at LOS F from US 221/NC 105 to US 321. The LOS will decrease to F throughout the length of the project if no improvements are made.

There will be a total of 202 feet of permanent impacts to three jurisdictional streams on this project. There are no wetlands in the project study area. Please find enclosed a copy of the preconstruction notification, Ecosystem Enhancement Program (EEP) mitigation acceptance letter, permit drawings, roadway design plans and Rapanos jurisdictional determination forms for the subject project.

NEPA DOCUMENT STATUS

An Environmental Assessment (EA) was submitted by the NCDOT in compliance with the National Environmental Policy Act (NEPA). The EA was approved on November 16, 2006. A Finding of No Significant Impact (FONSI) was approved on September 17, 2007. The EA explains the purpose and need for the project; provides a complete description of the alternatives considered; and characterizes the social, economic and environmental effects. After the EA was approved, it was circulated to the federal and local agencies. Copies of the EA and FONSI have been provided to regulatory review agencies involved in the approval process. Additional copies will be provided upon request.

IMPACTS TO WATERS OF THE UNITED STATES

General Description: The project is located in the New River Basin within HUC 05050001. There are three jurisdictional water resources within the project area for U-4020. These are Hardin Creek, UT1 and UT 2 to Hardin Creek. The North Carolina Department of Environment and Natural Resources classifies Hardin Creek and its tributary as "**C+**". The DWQ Index number for this portion of Hardin Creek and the UTs is 10-1-5. Hardin Creek is a perennial stream with an average baseflow width of 6 feet and an average depth of 1 foot. UT1 is a perennial stream with an average baseflow width of 3 feet, with an average depth of 2 – 6 inches. UT 2 to Hardin Creek is a perennial stream and has an average baseflow width of 1 foot and an average depth of 2 – 6 inches.

Jurisdictional Delineations: All streams were deemed to be perennial and jurisdictional during a site visit by NCDOT staff on February 21, 2006. There are no jurisdictional wetlands in the project study area.

Permanent Impacts: Permanent stream impacts for this project total 202 feet.

- Site 1: located at station –L-51+90 RT. There will be 121 linear feet of permanent impacts to UT1 to Hardin Creek due to the replacement and lengthening of the existing pipe and realignment of the stream. The current 48-foot pipe, with a 36-inch diameter will be removed and replaced with a 48-inch pipe approximately 64 feet long. An additional 57 feet of Class 1 rip rap will be placed in the newly aligned

stream channel to improve hydraulic conveyance of the stream into the pipe (Sheet 6 of 8).

- Site 2: located at station –L-68+88 RT. There will be two types of impacts at Site 2: culvert extension and bank stabilization. There will be 46 linear feet of permanent stream impacts to Hardin Creek and UT 2 where it ties into Hardin Creek at the current headwall, due to the extension of a culvert. The current 3 barrel (5'x5') culvert for Hardin Creek and the 60-inch pipe carrying UT 2 will be connected to a 2 barrel (10' x6') box culvert. This extension will account for 34 feet of permanent impact to Hardin Creek and 12 feet of permanent impact to UT 2. On the southeast side of Hardin Creek, a block wall will be removed and replaced with Class 1 rip rap (Sheet 7 of 8). This will account for an additional 35 feet of permanent impacts downstream of the culvert due to bank stabilization.

Temporary Impacts: Temporary impacts for this project total 0.02 acres.

- Site 1: located at station –L-51+90 RT. There will be 0.01 acre of temporary impacts on the upstream side of UT 1 to Hardin Creek due to temporary dewatering during pipe installation (Sheet 6 of 8).
- Site 2: located at station –L-68+88 RT. There will be 0.01 acre of temporary impacts on the downstream side of Hardin Creek and UT 2 to Hardin Creek due to stream management during the culvert extension (Sheet 7 0f 8).

Utility Impacts: There will be <0.01 acre of impact due to the relocation of an 8-inch sewer line. The current 8-inch line sits on the stream bed and must be moved to accommodate the widening roadway. The new line will be relocated and placed in the same fashion as the existing sewer line (Permit Utility Drawing Sheets 1 – 3).

Project Schedule: **This project has a proposed let date of April 21, 2009. The review date for this project is March 3, 2009.**

FEDERALLY PROTECTED SPECIES

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered, and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of January 31, 2008, the United States Fish and Wildlife Service (USFWS) lists eight federally protected species for Watauga County. Table 1 lists the species, their status and biological conclusion. A biological conclusion of No Effect was rendered for all species.

Table 1. Federally Protected Species for Macon County

Common Name	Scientific Name	Status	Habitat Analysis	Biological Conclusion
Bog turtle	*Clemmys muhlenbergii*	T (S/A)	No habitat	Not applicable
Carolina northern flying squirrel	*Glaucomys sabrinus coloratus*	E	No habitat	No Effect
Spruce-fir moss spider	*Micohexura montivaga*	E	No habitat	No Effect
Spreading avens	*Geum radiatum*	E	No habitat	No Effect
Roan Mountain bluet	*Houstonia montana*	E	No habitat	No Effect
Heller's blazing star	*Liatris helleri*	T	No habitat	No Effect
Blue Ridge goldenrod	*Solidago spithamaea*	T	No habitat	No Effect
Virginia big-eared bat	*Corynorhinus townsendii virginianus*	E	No habitat	No Effect

AVOIDANCE, MINIMIZATION, AND MITIGATION

Avoidance and Minimization: Avoidance examines all appropriate and practicable possibilities of averting impacts to "Waters of the United States". The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional stages; minimization measures were incorporated as part of the project design.

- Best Management Practices will be followed for this project as outlined in "NCDOT's Best Management Practices for Construction and Maintenance Activities".
- Currently piped streams will be improved to allow better hydrologic conveyance.
- Design Standards for Sensitive Watersheds will be used for protection of downstream waters.

Mitigation: There are 35 feet of permanent stream impacts associated with bank stabilization for this project, which is not considered a loss of "Waters of the United States". The remaining 167 feet of permanent impact will be mitigated by the use of EEP (Please see attached mitigation acceptance letter date July 29, 2008). There are no wetlands in the project area.

REGULATORY APPROVALS

Section 404 Permit: The use of rip rap for bank stabilization to Hardin Creek is anticipated to be authorized under a Section 404 Nationwide Permit Number 13. It is anticipated that the additional permanent impacts to Hardin Creek, UT1 and UT2 to Hardin Creek due to pipe extensions will be authorized under a Section 404 Nationwide Permit Number 14.

Application is hereby made for Department of the Army Nationwide Permit Numbers 13 and 14 for the above-described activities.

Section 401 Certification: In compliance with Section 143-215.3D(e) of the NCAC we will provide $570.00 to act as payment for processing the Section 401 (General Certification Numbers 3627 and 3689) permit application previously noted in this application (see Subject line). We are providing five copies of this application to the North Carolina Department of Environment and Natural Resources, Division of Water Quality, for their review and approval.

This project is located in a trout county, therefore comments from the North Carolina Wildlife Resources Commission (NCWRC) will be required prior to authorization by the Corps of Engineers. By copy of this letter and attachment, NCDOT hereby requests NCWRC review. NCDOT requests that NCWRC forward their comments to the Corps of Engineers and the NCDOT within 30 calendar days of receipt of this application.

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Jason Dilday at jldilday@ncdot.gov or (919) 715-5535. The application will be posted at http://207.4.62.65/PDEA/PermApps/.

Sincerely,

E. R. Lupke

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

w/attachment
- Mr. Brian Wrenn, NCDWQ (5 Copies)
- Ms. Marla Chambers, NCWRC
- Ms. Marella Buncick, USFWS

W/o attachment (see website for attachments)
- Dr. David Chang, P.E., Hydraulics
- Mr. Victor Barbour, P.E., Project Services Unit
- Mr. Mark Staley, Roadside Environmental
- Mr. Greg Perfetti, P.E., Structure Design
- Mr. Michael A. Pettyjohn, P.E. Division 11 Engineer
- Mr. Heath Slaughter, Division 11 Environmental Officer
- Mr. Jay Bennett, P.E., Roadway Design
- Mr. Majed Alghandour, P. E., Programming and TIP
- Mr. Art McMillan, P.E., Highway Design
- Mr. Ryan White, P.E., PDEA Project Planning Engineer
- Mr. Scott McLendon, USACE, Wilmington
- Ms. Beth Harmon, EEP
- Mr. Todd Jones, NCDOT External Audit Branch

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: Nationwide Permits 13 & 14

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: 1598 Mail Service Center
   Telephone Number: (919) 733-3141 Fax Number: (919) 733-9794
   E-mail Address: jldilday@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: Improvement of US 421 (King Street) from US 321 to East of NC 194

2. T.I.P. Project Number or State Project Number (NCDOT Only): U-4020

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

4. Location
   County: Watauga Nearest Town: Boone
   Subdivision name (include phase/lot number): N/A
   Directions to site (include road numbers/names, landmarks, etc.): US 421 from US 321 to East of NC 194

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): 36°13'06.21" °N -81°39'41.08" °W

6. Property size (acres): N/A

7. Name of nearest receiving body of water: Hardin Creek

8. River Basin: New
   (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: All portions of the study are have been disturbed and manipulated by human activities in the past. The immediate vicinity of the study area consists of residential and commercial properties.

10. Describe the overall project in detail, including the type of equipment to be used:

The proposed improvements consist of widening the existing roadway US 421(King Street.) to a multi-lane divided facility from NC 194 (Jefferson Avenue) to US 321 (Hardin Street). The NCDOT will also improve the intersections at the following roads intersecting US 421: Grove Steet, NC 194, New Market Boulevard, US 221/NC 105, and US 321. Standard construction equipment such as backhoes, bulldozers, cranes, pavers and other heavy machinery will be used.

11. Explain the purpose of the proposed work: A large portion of the traffic within the project corridor is attempting to make connection to either US 321, US 221 or NC 194. Both US 321 and US 221 intersect US 421 as five-lane facilities. US 421, east of the project corridor is also a five-lane facility. US 421 (King Street) currently operates at a level of service (LOS) D from NC 194 to US 221/NC 105 and at level of service F from US 221/NC 105 to US 321. The LOS will decrease to F throughout the project study corridor if no improvements are made.

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. All streams were deemed perennial.

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.
No

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:
There will be 190 feet of permanent impacts to Hardin Creek and two UTs. There will be 121feet of permanent impact to UT1 (Station –L- 51+90 RT) due to the lengthening of pipe and stream relocation. There will be 81 feet of permanent impacts to Hardin Creek and UT2. At site 2 (Station –L- 68+88 RT) there will be 34 feet of impacts to Hardin Creek and 12 feet of impact to UT 2 due to the extension of the culvert. There will be 35 feet of permanent impact due to the use of rip rap for bank stabilization. At site 2 there will also be <0.01 acre of impact due to the relocation of an 8-inch sewer line.

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 wetland impacts					
Total Wetland Impact (acres)					0

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

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)
1	UT 1 to Hardin Creek	Permanent	Perennial	3 ft.	121	0.01
1	UT1 to Hardin Creek	Temporary	Perennial	3 ft.	10	<0.01
2	Hardin Creek	Permanent	Perennial	7 ft.	69	0.01
2	UT 2 to Hardin Creek	Permanent	Perennial	1 ft.	12	<0.01
2	Hardin Creek	Temporary	Perennial	6 ft.	12	<0.01
Total Stream Impact (by length and acreage)					224	0.02

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 impacts				
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):	0.02 ac. perm., <0.01 ac. temp.
Wetland Impact (acres):	0
Open Water Impact (acres):	0
Total Impact to Waters of the U.S. (acres)	0.02 ac. perm., <0.01 ac. temp.
Total Stream Impact (linear feet):	202 ft permanent, 22 ft temporary

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.):
   Proposed use or purpose of pond (e.g., livestock watering, irrigation, aesthetic, trout pond, local stormwater requirement, etc.):
   Current land use in the vicinity of the pond:
   Size of watershed draining to pond: Expected pond surface area:

VII. Impact Justification (Avoidance and Minimization)

Specifically describe measures taken to avoid the proposed impacts. It may be useful to provide information related to site constraints such as topography, building ordinances, accessibility, and financial viability of the project. The applicant may attach drawings of alternative, lower-impact site layouts, and explain why these design options were not feasible. Also discuss how impacts were minimized once the desired site plan was developed. If applicable, discuss construction techniques to be followed during construction to reduce impacts.
NCDOT's Best Management Practices for the Protection of Surface Waters will be strictly enforced during the construction phase of the project.

VIII. Mitigation

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

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

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

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

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): 167 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
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 surfaces will increase as a result of this project. However, the terrain in the vicinity of the project is dominated by impervious services in the form of parking lots and the current roadway.

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:
US 421(King Street) is to be improved to increase safety and to allow better movement of traffic through the project corridor.

XV. Other Circumstances (Optional):

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

E. P. Lusk 9.2.08

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

Ecosystem Enhancement PROGRAM

July 29, 2008

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

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

U-4020, Boone – US 421 (King Street) from US 221 to US 321 (Hardin Street), Watauga County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream mitigation for the subject project. Based on the information supplied by you on July 28, 2008, the impacts are located in CU 05050001 of the New River Basin in the Northern Mountains (NM) Eco-Region, and are as follows:

Cold Stream: 167 feet

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

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

Sincerely,

William D. Gilmore, P.E.
EEP Director

cc: Mr. Monte Matthews, USACE – Raleigh Regulatory Field Office
Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit
File: U-4020

Hardin Creek and Tributaries

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: U-4020 (Widening of US 421 from US 321 to East of NC 194)

C. PROJECT LOCATION AND BACKGROUND INFORMATION:
State:NC County/parish/borough: Watauga City: Boone
Center coordinates of site (lat/long in degree decimal format): Lat. 36'13'06"° **N**, Long. 81'39'41"° **W**.
Universal Transverse Mercator:
Name of nearest waterbody: Hardin Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: South Fork New River
Name of watershed or Hydrologic Unit Code (HUC): 05050001
☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
☐ Office (Desk) Determination. Date:
☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Appear to be no** *"navigable waters of the U.S."* within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]
☐ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are** *"waters of the U.S."* within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
      ☐ TNWs, including territorial seas
      ☐ Wetlands adjacent to TNWs
      ☒ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
      ☐ Non-RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
      ☐ Impoundments of jurisdictional waters
      ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
      Non-wetland waters: 1200 linear feet: 1-7 width (ft) and/or acres.
      Wetlands: acres.

   c. **Limits (boundaries) of jurisdiction** based on: **Established by OHWM.**
      Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
   Explain: .

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[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
   Identify TNW: .

   Summarize rationale supporting determination: .

2. **Wetland adjacent to TNW**
   Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

   (i) General Area Conditions:
   Watershed size: **Pick List**
   Drainage area: **Pick List**
   Average annual rainfall: inches
   Average annual snowfall: inches

   (ii) Physical Characteristics:
   (a) Relationship with TNW:
   ☒ Tributary flows directly into TNW.
   ☐ Tributary flows through **Pick List** tributaries before entering TNW.

   Project waters are **Pick List** river miles from TNW.
   Project waters are **Pick List** river miles from RPW.
   Project waters are **Pick List** aerial (straight) miles from TNW.
   Project waters are **Pick List** aerial (straight) miles from RPW.
   Project waters cross or serve as state boundaries. Explain: .

   Identify flow route to TNW[5]: .
   Tributary stream order, if known: .

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) General Tributary Characteristics (check all that apply):

Tributary is:
- ☐ Natural
- ☐ Artificial (man-made). Explain: .
- ☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):
- Average width: feet
- Average depth: feet
- Average side slopes: **Pick List.**

Primary tributary substrate composition (check all that apply):
- ☐ Silts
- ☐ Sands
- ☐ Concrete
- ☐ Cobbles
- ☐ Gravel
- ☐ Muck
- ☐ Bedrock
- ☐ Vegetation. Type/% cover:
- ☐ Other. Explain: .

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: **Pick List**
Tributary gradient (approximate average slope): %

(c) Flow:

Tributary provides for: **Pick List**
Estimate average number of flow events in review area/year: **Pick List**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Pick List.** Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .
- ☐ Dye (or other) test performed: .

Tributary has (check all that apply):
- ☐ Bed and banks
- ☐ OHWM[6] (check all indicators that apply):
  - ☐ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☐ vegetation matted down, bent, or absent
  - ☐ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☐ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community
- ☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
- ☒ High Tide Line indicated by:
  - ☐ oil or scum line along shore objects
  - ☐ fine shell or debris deposits (foreshore)
  - ☐ physical markings/characteristics
  - ☐ tidal gauges
  - ☐ other (list):
- ☒ Mean High Water Mark indicated by:
  - ☐ survey to available datum;
  - ☐ physical markings;
  - ☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: .

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[6]A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7]Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☐ Riparian corridor. Characteristics (type, average width): .
- ☐ Wetland fringe. Characteristics: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size: acres

Wetland type. Explain: .

Wetland quality. Explain: .

Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:

Flow is: **Pick List**. Explain: .

Surface flow is: **Pick List**

Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .

- ☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:

- ☐ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain: .
  - ☐ Ecological connection. Explain: .
  - ☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW

Project wetlands are **Pick List** river miles from TNW.

Project waters are **Pick List** aerial (straight) miles from TNW.

Flow is from: **Pick List.**

Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .

Identify specific pollutants, if known: .

(iii) Biological Characteristics. Wetland supports (check all that apply):

- ☐ Riparian buffer. Characteristics (type, average width): .
- ☐ Vegetation type/percent cover. Explain: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **Pick List**

Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed: .

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☒ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Hardin Creek and its UTs have NCDWQ stream rating scores greater than 30.
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☒ Tributary waters: **1200** linear feet **1 - 7** width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

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[8]See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] **Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.***

Provide estimates for jurisdictional waters in the review area (check all that apply):
- ☐ Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres.
  - Identify type(s) of waters: .
- ☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
- ☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- ☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
  - ☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- ☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
- ☐ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
- ☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- ☐ Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource: .
- ☐ Wetlands: acres.

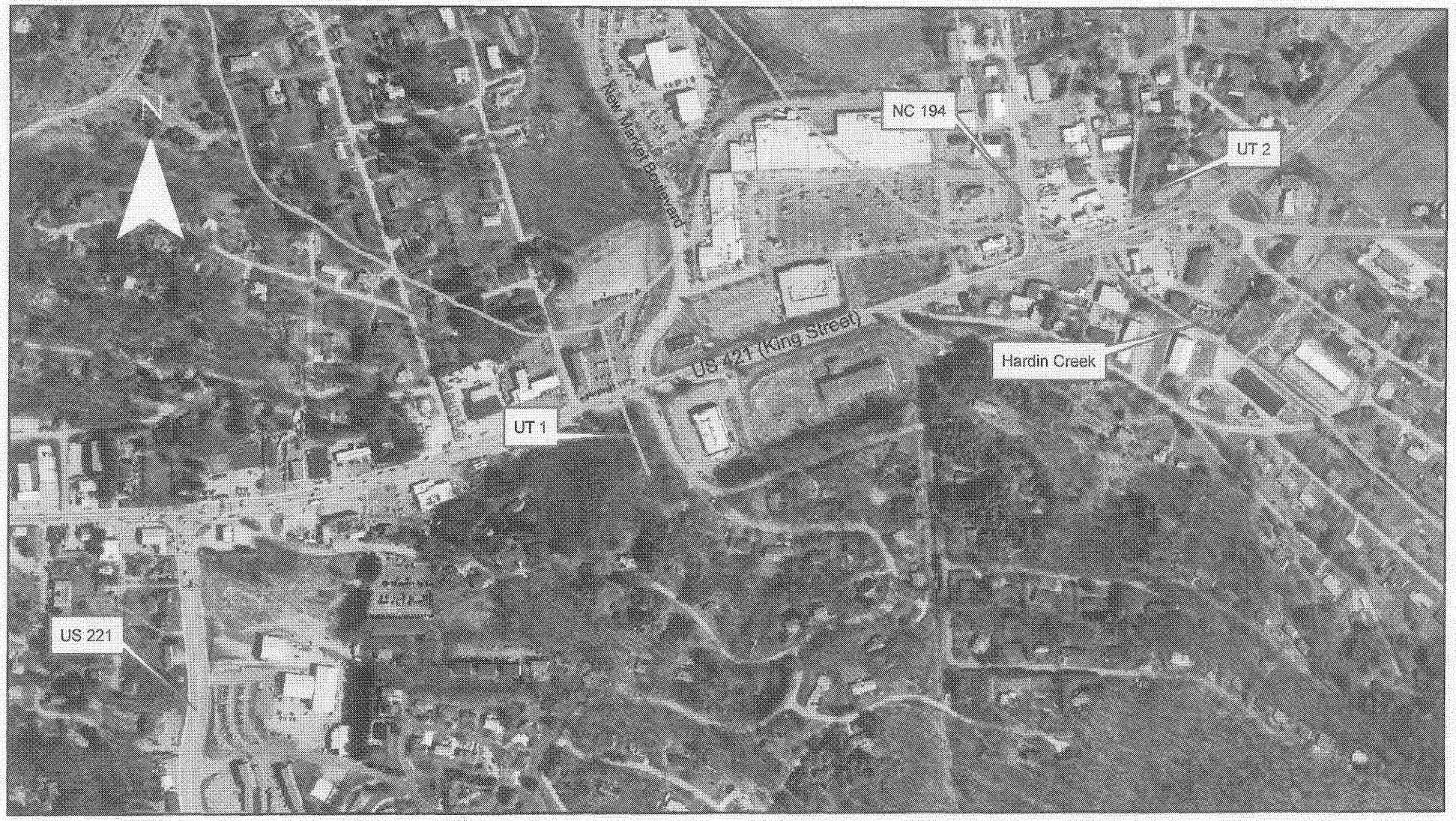
Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
- ☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- ☐ Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource: .
- ☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
- ☐ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
- ☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps: .
- ☐ Corps navigable waters' study: .
- ☐ U.S. Geological Survey Hydrologic Atlas: .
  - ☐ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☐ U.S. Geological Survey map(s). Cite scale & quad name: .
- ☐ USDA Natural Resources Conservation Service Soil Survey. Citation: .
- ☐ National wetlands inventory map(s). Cite name: .
- ☐ State/Local wetland inventory map(s): .
- ☐ FEMA/FIRM maps: .
- ☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- ☐ Photographs: ☐ Aerial (Name & Date): .
  - or ☐ Other (Name & Date): .
- ☐ Previous determination(s). File no. and date of response letter: .
- ☐ Applicable/supporting case law: .
- ☐ Applicable/supporting scientific literature: .
- ☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: .

U - 4020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New Market Boulevard
US 421 (King Street)
Hardin Creek
UT 1
US 221
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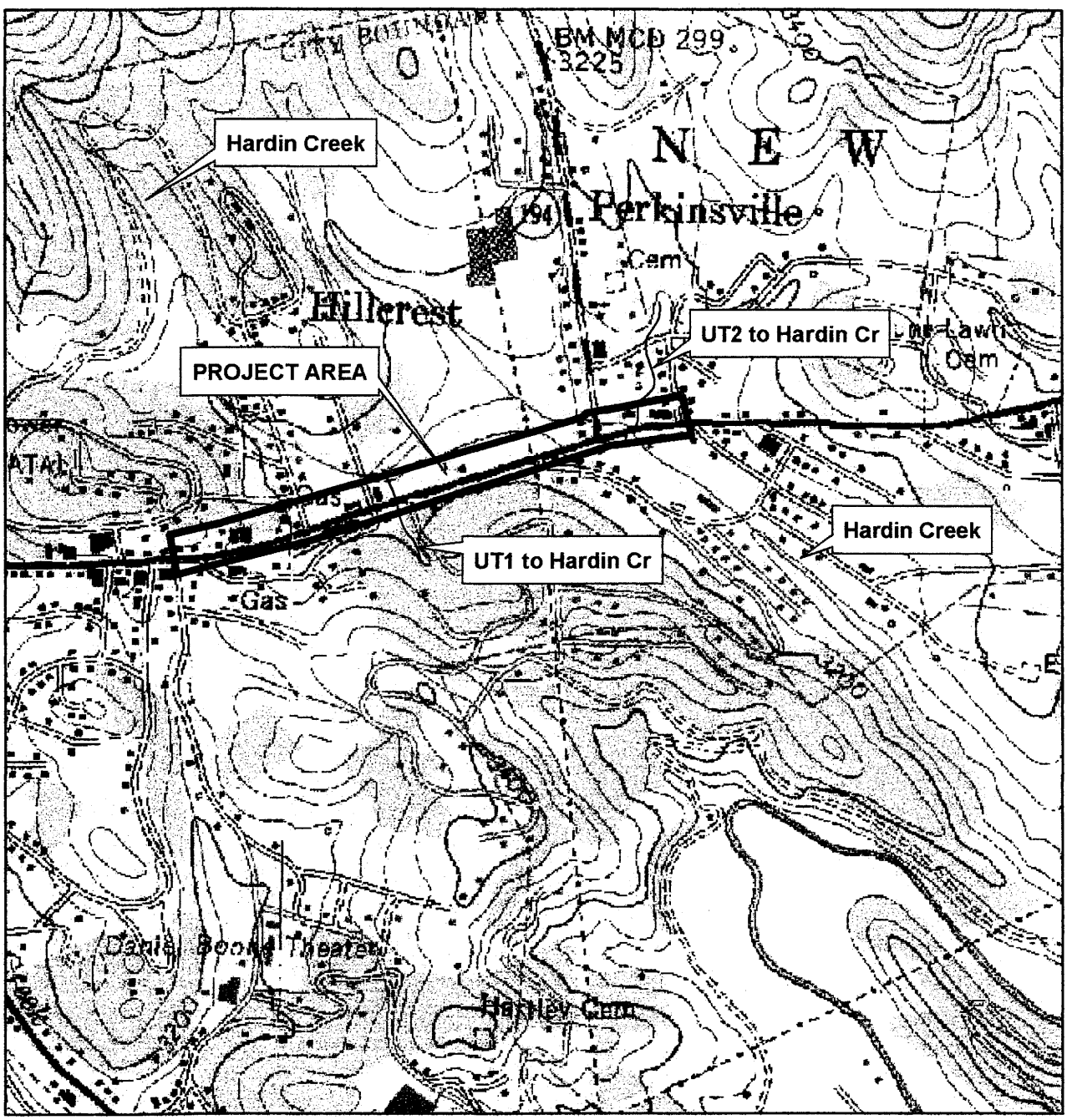
500
1,000
2,000 Feet



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

U-4020
Boone, NC
Wautaga County
US 421 Widening
Culvert Extensions on Hardin Creek and 2 UTs

Figure 2

Permit Drawing
Sheet 1 of

PROPERTY OWNERS

NAMES AND ADDRESSES

SITE NO.	PARCEL NO.	NAME	ADDRESS
1	54	Robert L. Dunnigan	156 Arrowhead Ct. Boone NC 28607
2	66	Joseph Jerry Idol, Jr.	1032 E. King Street Boone, NC 28607
	69	The Pantry, Inc.	1801 Douglas Dr. Sanford, NC 27330

Permit Drawing
Sheet 2 of 8

NCDOT

DIVISION OF HIGHWAYS

WATAUGA COUNTY

PROJECT: 35015.1.1 (U-4020)

US 421 (KING STREET)

FROM US 321

TO EAST OF NC 194

SHEET OF 10/16/01

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	-L- 51+90 RT.	48" RCP						0.01	0.01	121	10	
2	-L- 68+88 RT.	2 @ 10' x 6' RCBC						0.01	0.01	34	12	
2*	-L- 68+88 RT.	60" CMP, RCBC						0.00 **		12		
2	-L- 68+88 RT	Bank Stabilization								35		
TOTALS:								0.02	0.02	202	22	

* Section of UT near the confluence with Hardin Creek

** Less than 0.001 acre

Permit Drawing
Sheet 3 of 8

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

WATAUGA COUNTY
35015 (U-4020)

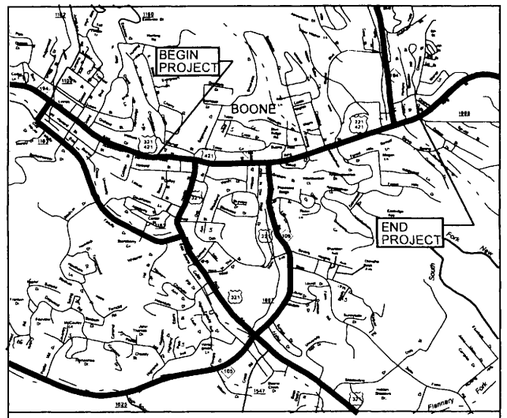
SHEET 7/28/2008

ATN Revised 3/31/05

09/08/99

CONTRACT: TIP PROJECT: U-4020

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

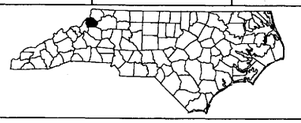
WATAUGA COUNTY

LOCATION: US 421 (KING STREET) FROM US 321 (HARDIN STREET TO EAST OF NC 194 (JEFFERSON ROAD) IN BOONE

TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERT, RETAINING WALLS AND SIGNALS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4020	1	

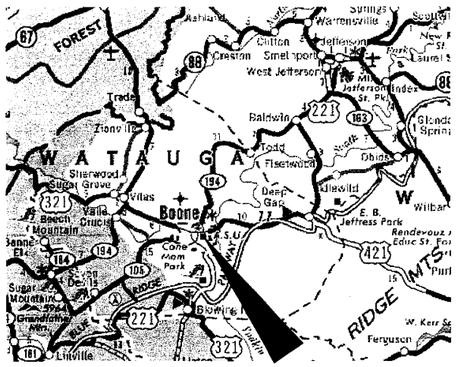
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
35015.1.1	NHF-421(31)	PE
35015.2.1	NHF-421(31)	R/W & UTIL



Permit Drawing
Sheet 4 of 8

SURFACE WATER PERMIT

NAD 83/93



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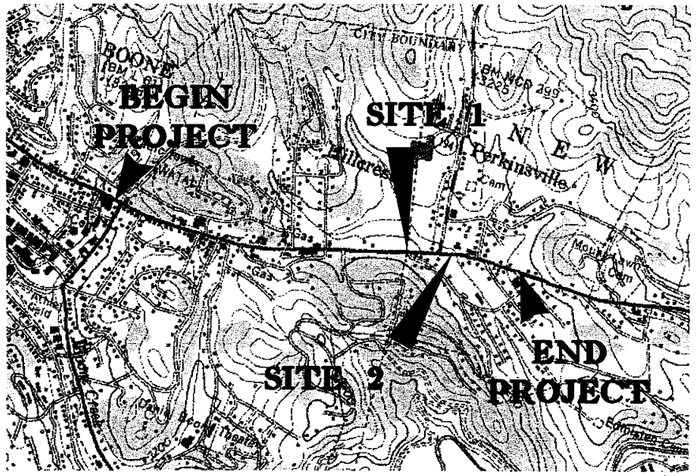


PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

40 20 0 40 80
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2004	=	39,700
ADT 2030	=	67,800
DHV	=	9 %
D	=	55 %
T	=	6 % *
V	=	40 MPH

* TTST 2% DUAL 4%

FUNCTIONAL CLASSICATION
MINOR ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-4020 = 1.098 MILES

TOTAL LENGTH OF TIP PROJECT U-4020 = 1.098 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 29, 2007

LETTING DATE:
APRIL 21, 2009

G.E. BREW, P.E.
PROJECT ENGINEER

I.T. YOUNIS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

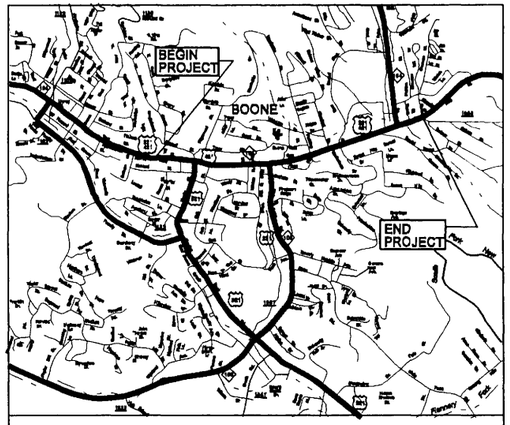
P.E.
STATE HIGHWAY DESIGN ENGINEER

07-JUL-2008 08:00
r:\hydraulics\permits_environmental\drawings\u4020_hyd_prm_SITE.dgn
smorgan AT HY23938I

TIP PROJECT: U-4020

CONTRACT:

See Sheet 1-A For Index of Sheets



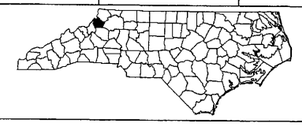
VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WATAUGA COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4020	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
35015.1.1	NHF-421(31)	PE
35015.2.1	NHF-421(31)	R/W & UTIL

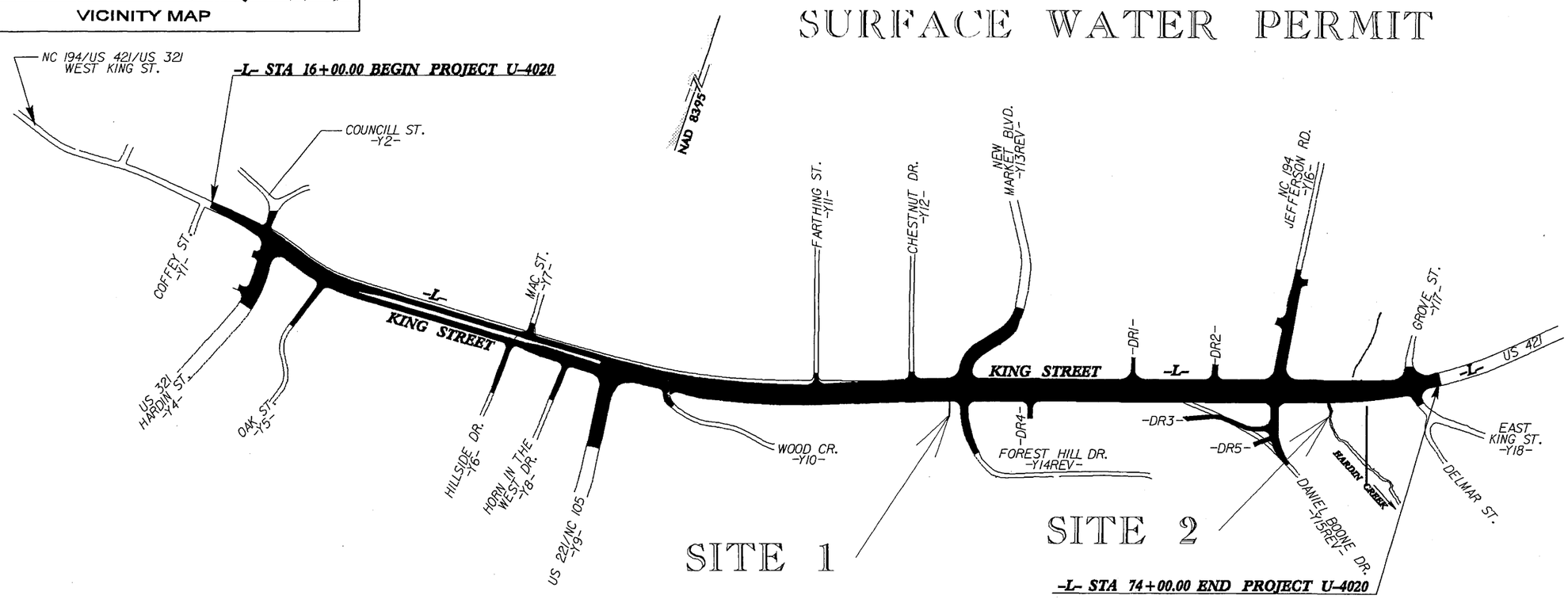


LOCATION: US 421 (KING STREET) FROM US 321 (HARDIN STREET TO EAST OF NC 194 (JEFFERSON ROAD) IN BOONE

TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERT, RETAINING WALLS AND SIGNALS

Permit Drawing
Sheet 5 of 8

SURFACE WATER PERMIT



THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF BOONE

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

PLANS: 40 20 0 40 80

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2004 =	39,700
ADT 2030 =	67,800
DHV =	9 %
D =	55 %
T =	6 % *
V =	40 MPH
* TTST 2%	DUAL 4%

FUNCTIONAL CLASSICATION
MINOR ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-4020 = 1.098 MILES

TOTAL LENGTH OF TIP PROJECT U-4020 = 1.098 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 29, 2007

LETTING DATE:
APRIL 21, 2009

G.E. BREW, P.E.
PROJECT ENGINEER

I.T. YOUNIS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

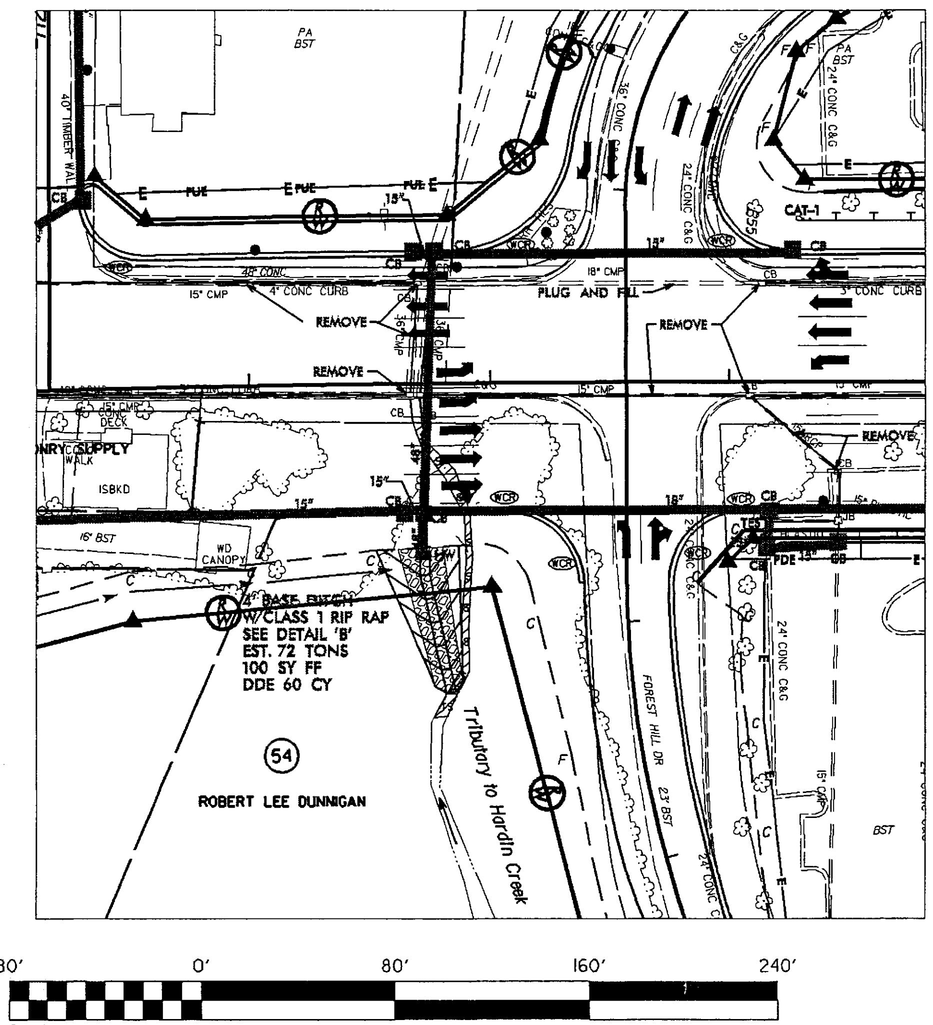
SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

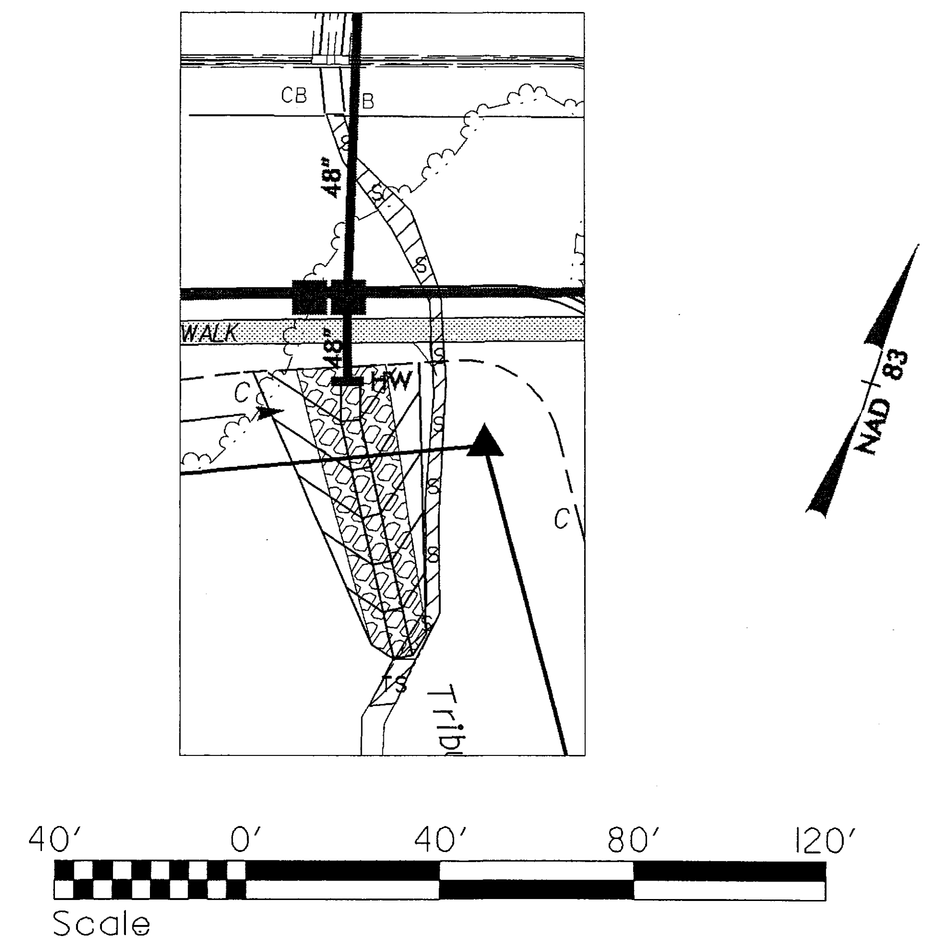
STATE HIGHWAY DESIGN ENGINEER P.E.

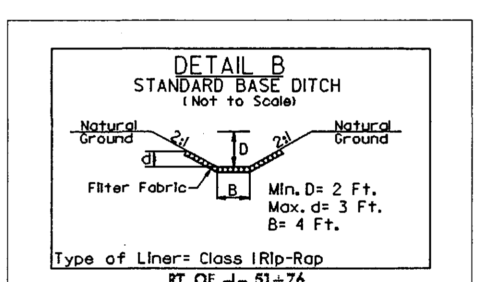
Site 1 Surface Water Impacts

Clipped Plan View



Enlargement





DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NCDOT
DIVISION OF HIGHWAYS
WATAUGA COUNTY
PROJECT: 35015.1.1 (U-4020)
US 421 (KING STREET)
FROM US321 TO
EAST OF NC 194

SHEET OF 06/26/08

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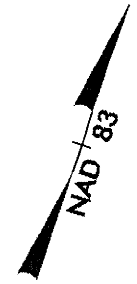
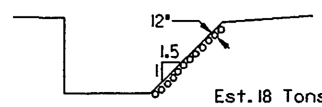


Site 2 Surface Water Impacts

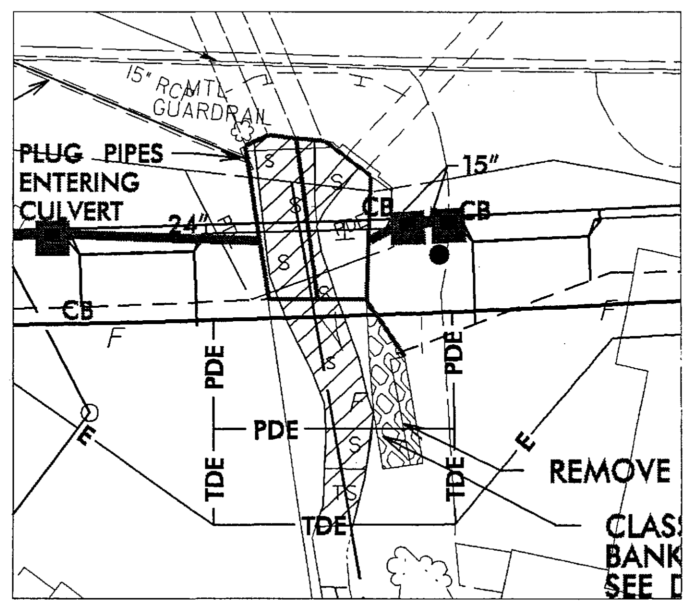
DETAIL C
EMBANKMENT STABILIZATION
(Not to Scale)

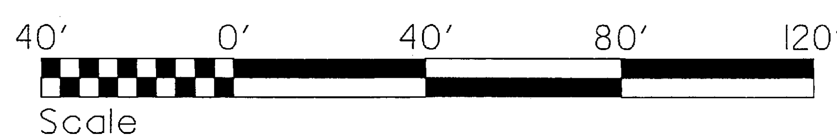


Type of Liner= CLASS I Rip-Rap
NO FILTER FABRIC

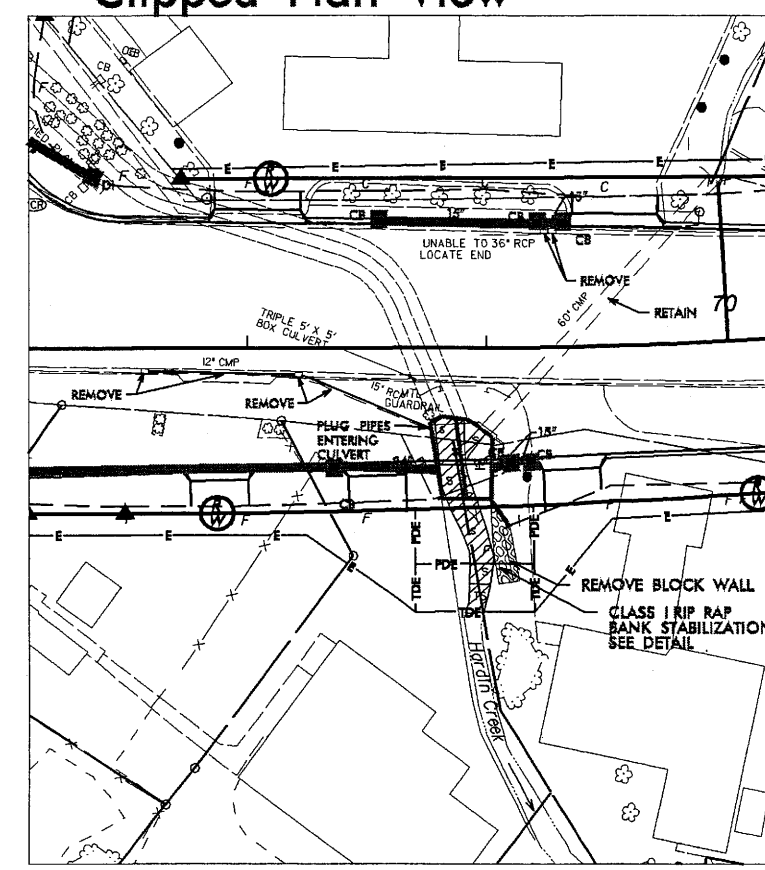
RT. OF -L- 69+05

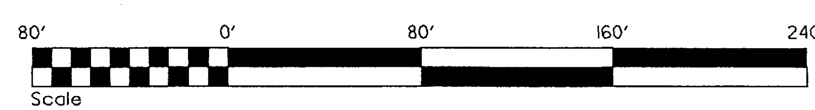
Enlargement





Clipped Plan View





▨ DENOTES IMPACTS IN SURFACE WATER

▨ DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NCDOT
DIVISION OF HIGHWAYS
WATAUGA COUNTY
PROJECT: 35015.1.1 (U-4020)
US 421 (KING STREET)
FROM US321 TO
EAST OF NC 194

SHEET OF 06/26/08

8/17/99

REVISIONS

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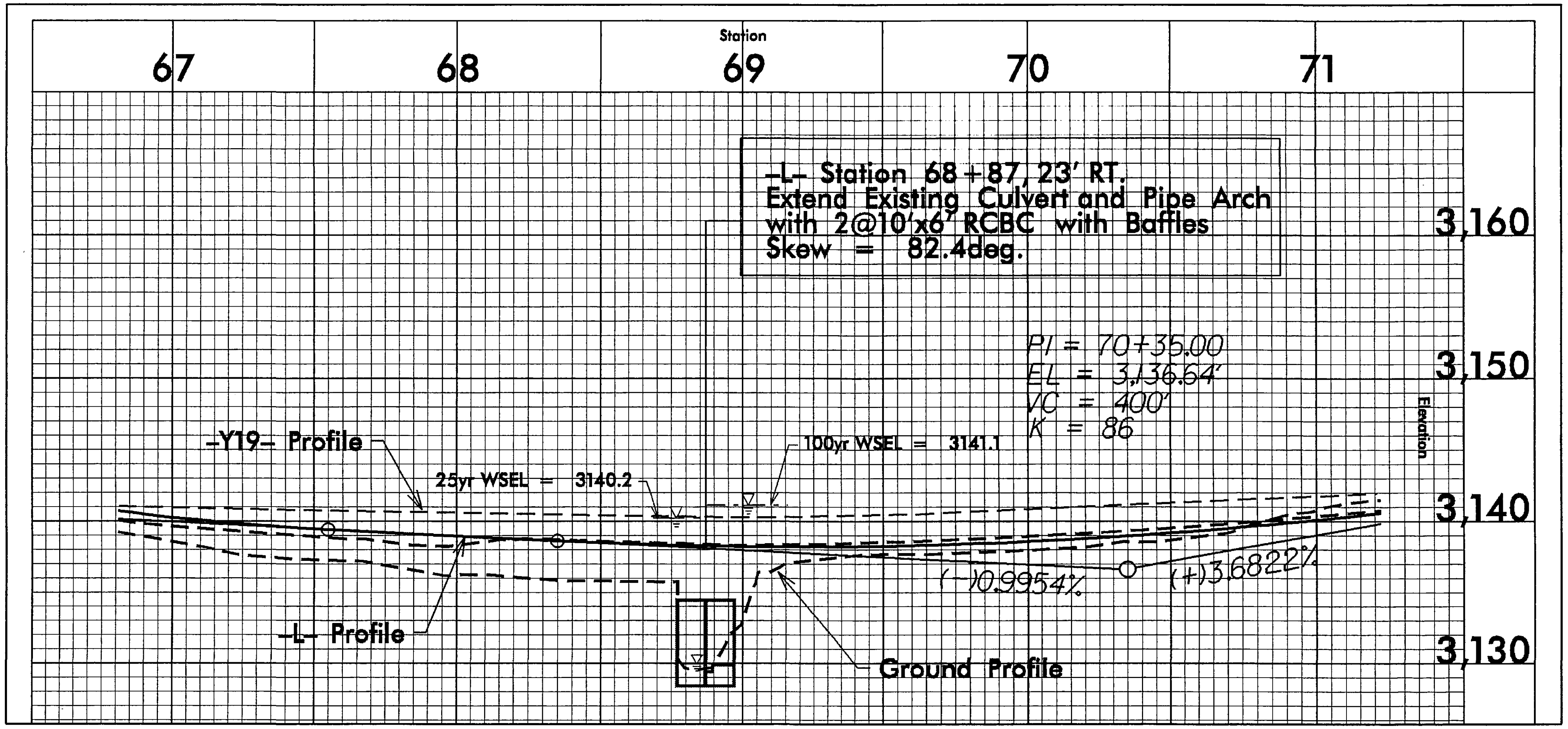
smorgan AT HY23938l

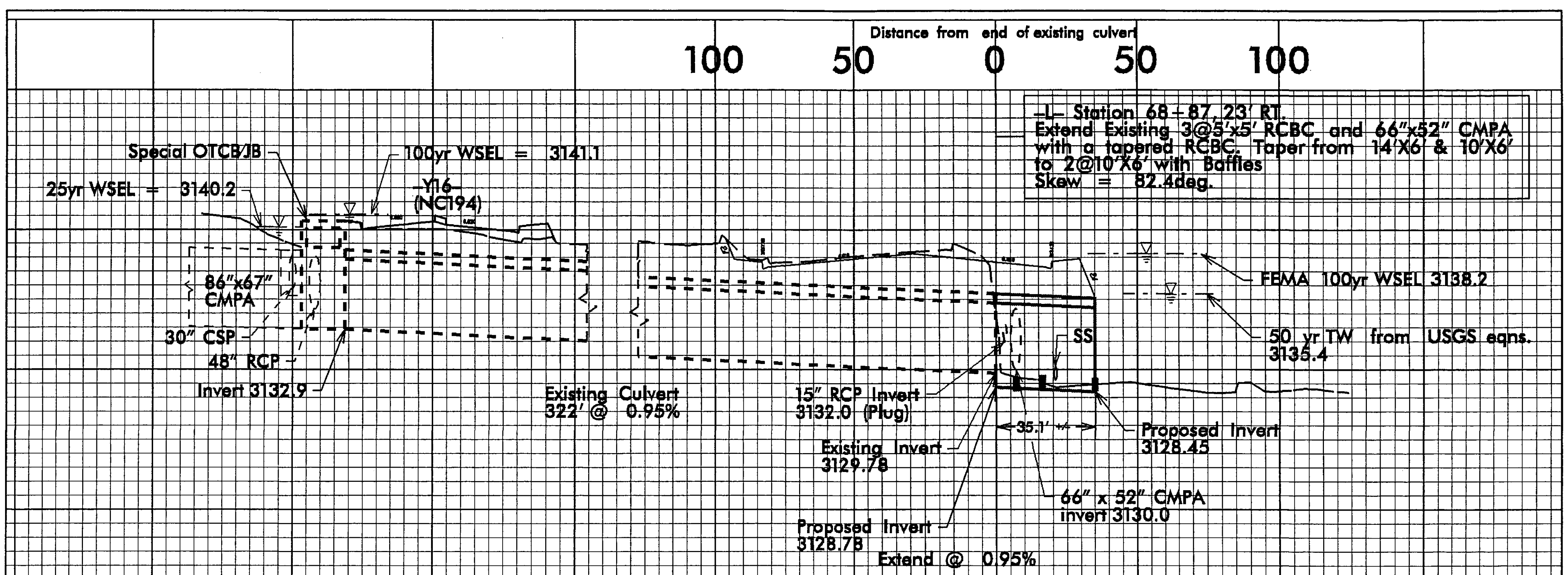
U-4020
PERMIT DRAWING
6/26/08

Site 2 Surface Water Impacts Profile Views

Permit Drawing Sheet 8 of 8



Roadway Profile



Culvert Profile

REVISIONS

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8/17/9

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS				SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing (Method III) (ac)	Fill In SW (Natural) (ac)	Fill In SW (Pond) (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)	Natural Stream Design (ft)
2	L 51+90-RT-	8" DI Sewer Line							<0.01		
TOTALS:			0.00	0.00	0.00	0.00	0.00	0.00	<0.01	0.00	0.00

Utility
Permit Drawing
Sheet 1 of 3

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Watauga County
Project 8.1751601 U-4020

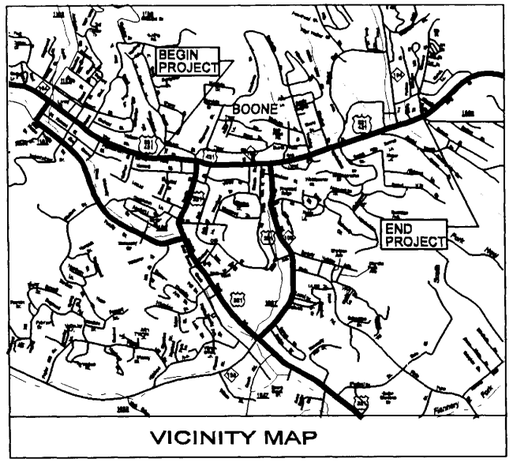
SHEET

Form Revised 3/22/01

09/08/

TIP PROJECT: U-4020

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WATAUGA COUNTY

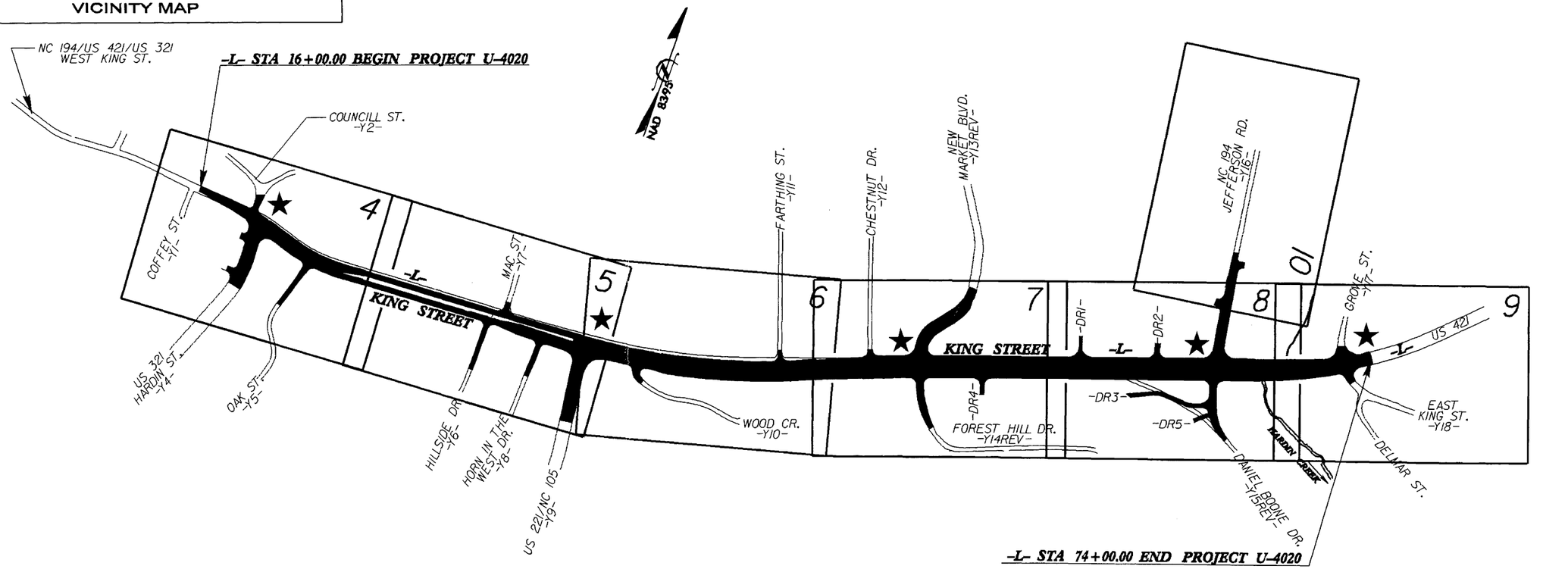
LOCATION: US 421 (KING STREET) FROM US 321 (HARDIN STREET TO EAST OF NC 194 (JEFFERSON ROAD) IN BOONE

TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERT, RETAINING WALLS AND SIGNALS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4020	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
35015.1.1	NHF-421(31)	PE
35015.2.1	NHF-421(31)	R/W & UTIL

Utility
Permit Drawing
Sheet 2 of 3



★ *SIGNALIZED INTERSECTION*

THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF BOONE

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONTRACT:

GRAPHIC SCALES

PLANS: 40 20 0 40 80

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2004 = 39,700
ADT 2030 = 67,800
DHV = 9 %
D = 55 %
T = 6 % *
V = 40 MPH
* TTST 2% DUAL 4%

FUNCTIONAL CLASSICATION
MINOR ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-4020 = 1.098 MILES

TOTAL LENGTH OF TIP PROJECT U-4020 = 1.098 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: NOVEMBER 29, 2007

LETTING DATE: APRIL 21, 2009

G.E. BREW, P.E.
PROJECT ENGINEER

I.T. YOUNIS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

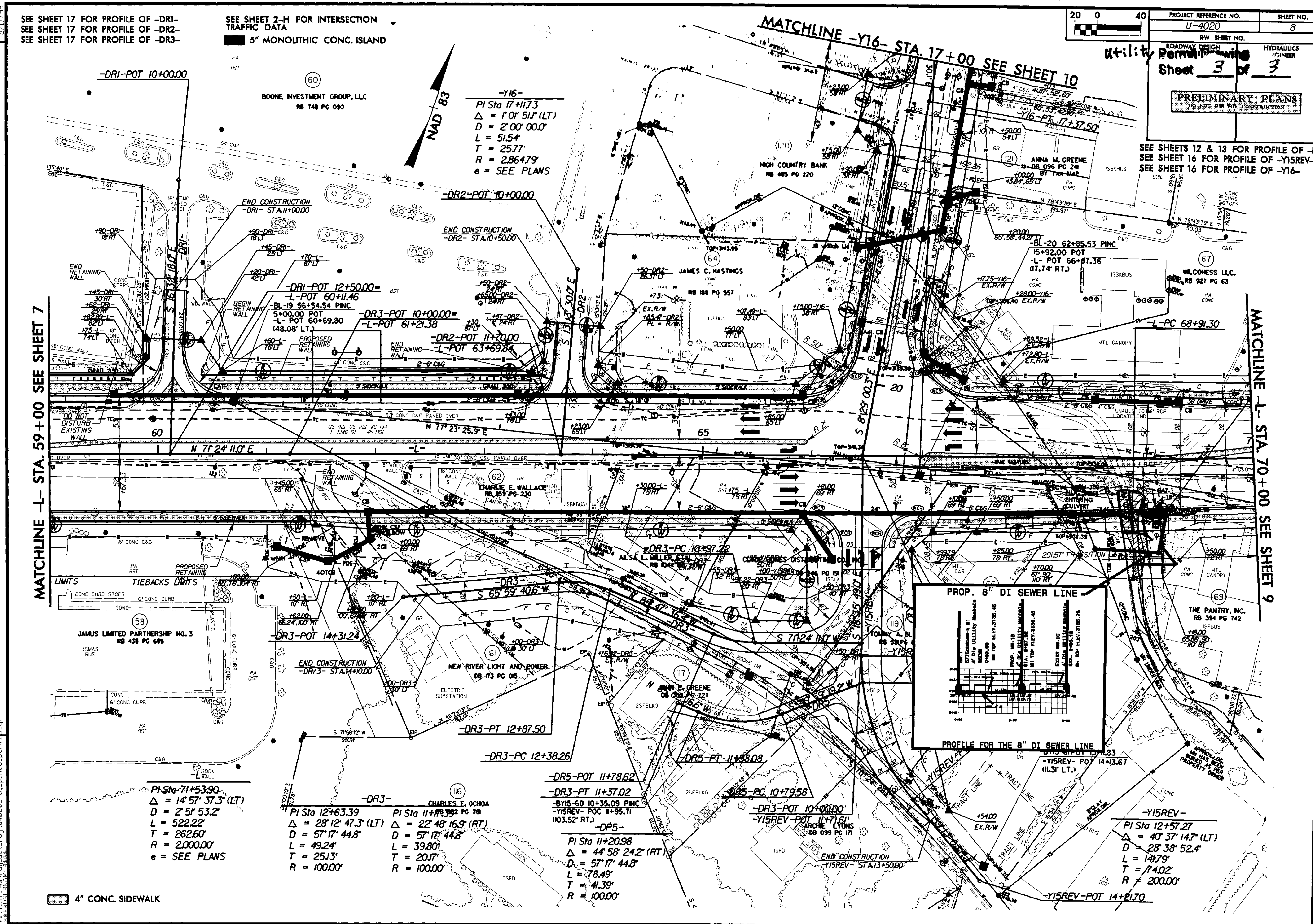
SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

8/17/99

REVISIONS



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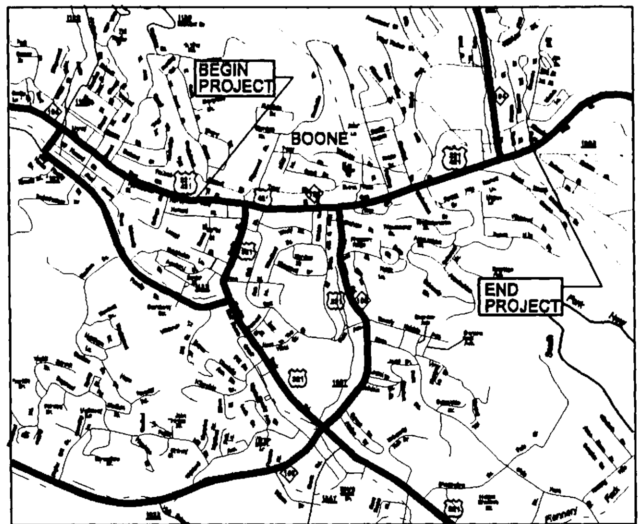
See Sheet 1-A For Index of Sheets



VICINITY MAP

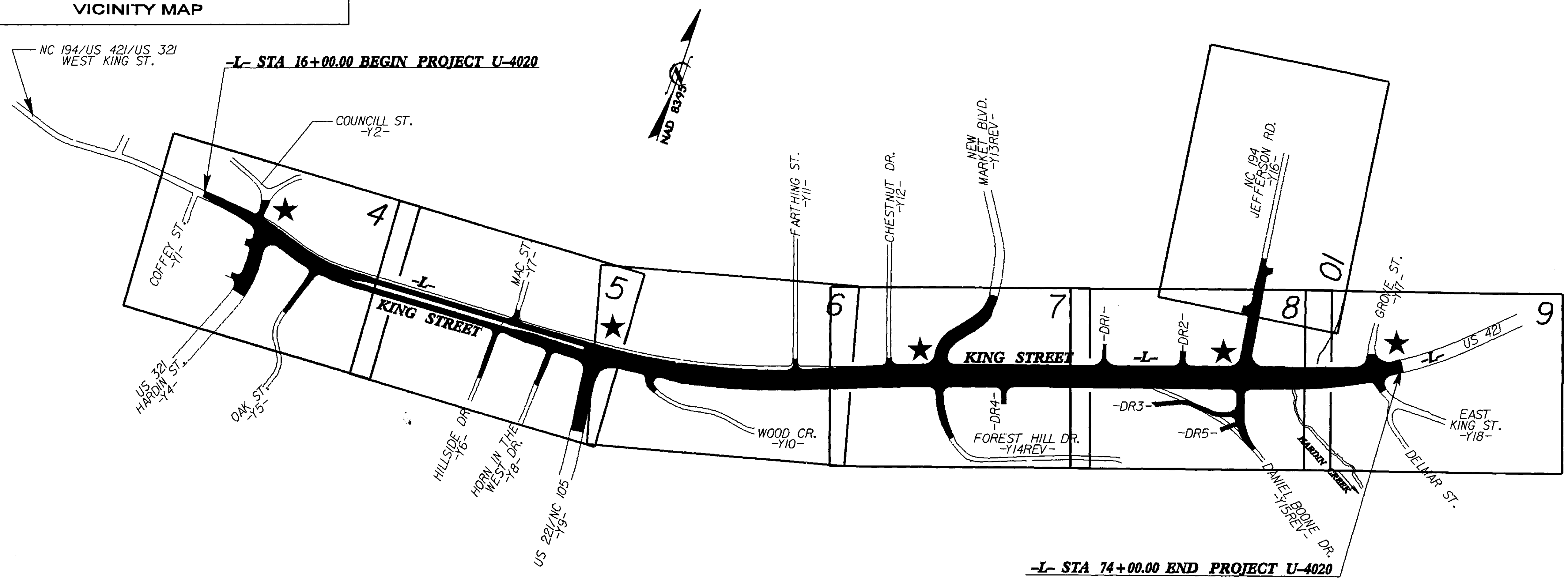
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WATAUGA COUNTY

LOCATION: US 421 (KING STREET) FROM US 321 (HARDIN STREET TO EAST OF NC 194 (JEFFERSON ROAD) IN BOONE

TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERT, RETAINING WALLS AND SIGNALS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4020	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
35015.1.1	NHF-421(31)	PE	
35015.2.1	NHF-421(31)	R/W & UTIL	



★ SIGNALIZED INTERSECTION

THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF BOONE

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

40 20 0 40 80
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2004 = 39,700
ADT 2030 = 67,800
DHV = 9 %
D = 55 %
T = 6 % *
V = 40 MPH
* TTST 2% DUAL 4%

FUNCTIONAL CLASSICATION
MINOR ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-4020 = 1.098 MILES

TOTAL LENGTH OF TIP PROJECT U-4020 = 1.098 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 29, 2007

LETTING DATE:
APRIL 21, 2009

G.E. BREW, P.E.
PROJECT ENGINEER

I.T. YOUNIS
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.

TIP PROJECT: U-4020

CONTRACT:

26-JUN-2008 14:07
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$$$$USERNAME$$$$

09/08/99

6/2/99

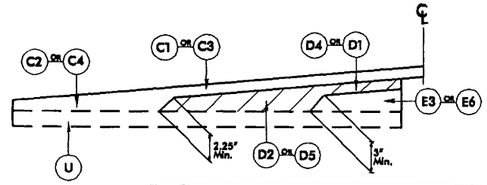
PROJECT REFERENCE NO.	SHEET NO.
U-4020	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

FINAL PAVEMENT SCHEDULE

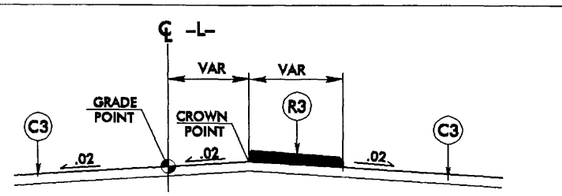
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E6	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
C2	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 TO EXCEED 1½" IN DEPTH.	J	PROP. 6" AGGREGATE BASE COURSE.
C3	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R1	2'-6" CONCRETE CURB AND GUTTER
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.	R2	1'-6" CONCRETE CURB AND GUTTER.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R3	5" MONOLITHIC CONCRETE ISLAND.
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 2¼" IN DEPTH OR GREATER THAN 4" IN DEPTH.	R4	CONCRETE SHOULDER BERM GUTTER.
D3	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	R5	8" x 16" CONCRETE CURB
D4	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R6	CONCRETE DRIVE
D5	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2¼" IN DEPTH OR GREATER THAN 4" IN DEPTH.	S	4" CONCRETE SIDEWALK.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL.
E2	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
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.	V	MILLING BITUMINOUS PAVEMENT 2.5"
E4	PROP. APPROX. 6.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 370.50 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	V1	MILLING BITUMINOUS PAVEMENT 0"- 3"
E5	PROP. APPROX. 8" ASPHALT CONCRETE SURFACE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	W	VARIABLE DEPTH ASPHALT PAVEMENT. (SEE WEDGING DETAIL)

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

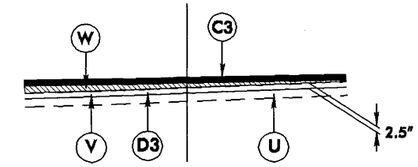


LINE	SURFACE				INTERMEDIATE				BASE	
	C1	C2	C3	C4	D1	D2	D4	D5	E3	E6
-L- (USE WITH TYP. SECTION 1, 2, 3,4,5)			X	X			X	X		X
-Y4- (USE WITH TYP. SECTION 7)	X	X			X	X			X	
-Y5-, -Y6-, (USE WITH TYP. SECTION 10, 12)	X	X							X	
-Y9- (USE WITH TYP. SECTION 14)			X	X			X	X		X
-Y13REV- (USE WITH TYP. SECTION 16)	X	X			X	X			X	
-DR1-, -DR2- (USE WITH TYP. SECTION 22)	X	X							X	
-Y8-, -Y14REV-, -Y15REV-	X	X							X	
-Y16- (USE WITH TYP. SECTION 19, 20)	X	X			X	X			X	

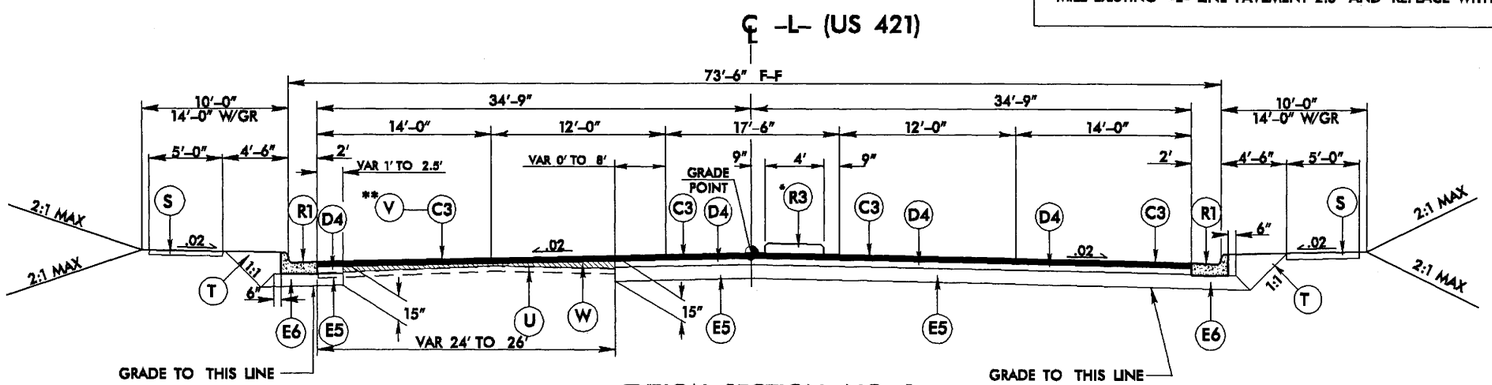
DETAIL SHOWING METHOD OF WEDGING



DETAIL 1
SUPERELEVATION TREATMENT ADJACENT TO PROPOSED CHANNELIZATION
TO BE USED IN CONJUNCTION WITH TYPICAL SECTION 3 AND 4
(SEE PLANS FOR LOCATIONS)



DETAIL 2 (MILLING OF EXISTING PAVEMENT)
TO BE USED IN CONJUNCTION WITH TYPICAL SECTIONS 1 – 5
MILL EXISTING -L- LINE PAVEMENT 2.5" AND REPLACE WITH I19.0C



** SEE MILLING DETAIL

TYPICAL SECTION NO. 1

*SEE PLANS FOR ISLAND LOCATIONS

-L- STA. 16+00.00 TO 16+50, OVERLAY EXISTING PAVEMENT

USE TYPICAL SECTION NO. 1
-L- STA. 16+50.00 TO 20+73.98, TRANSITION FROM EXISTING TO T.S. 1

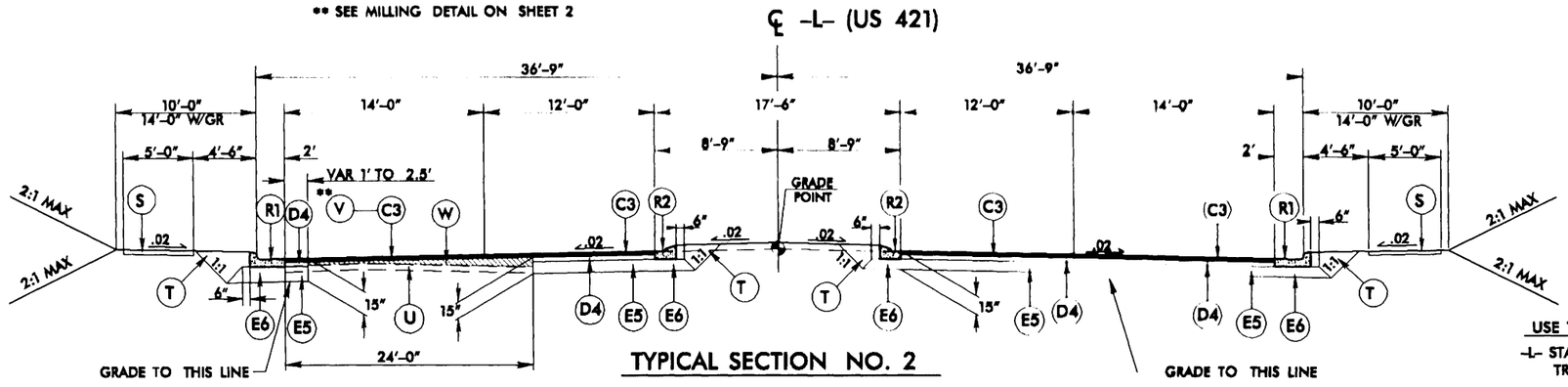
-L- STA. 20+73.98 TO 24+39.51

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

** SEE MILLING DETAIL ON SHEET 2



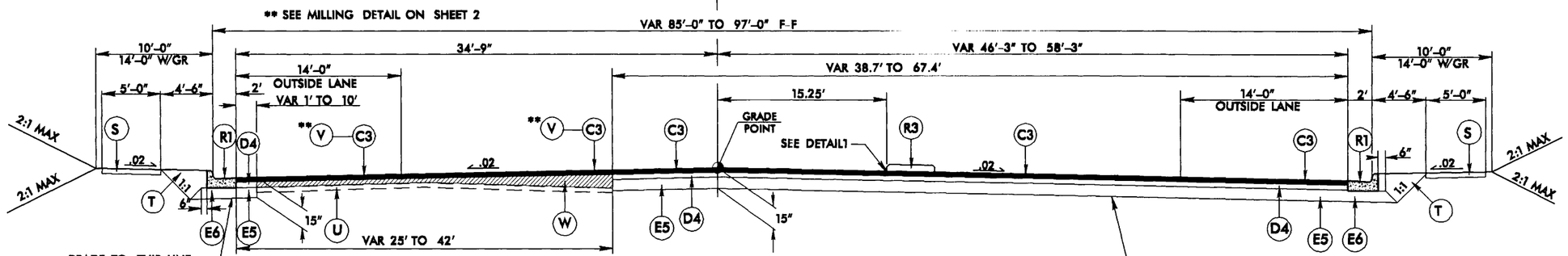
TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

-L- STA. 24+39.51 TO 25+39.51
TRANSITION FROM T.S. 1 TO T.S. 2

-L- STA. 25+39.51 TO 35+87.31

** SEE MILLING DETAIL ON SHEET 2



TYPICAL SECTION NO. 3

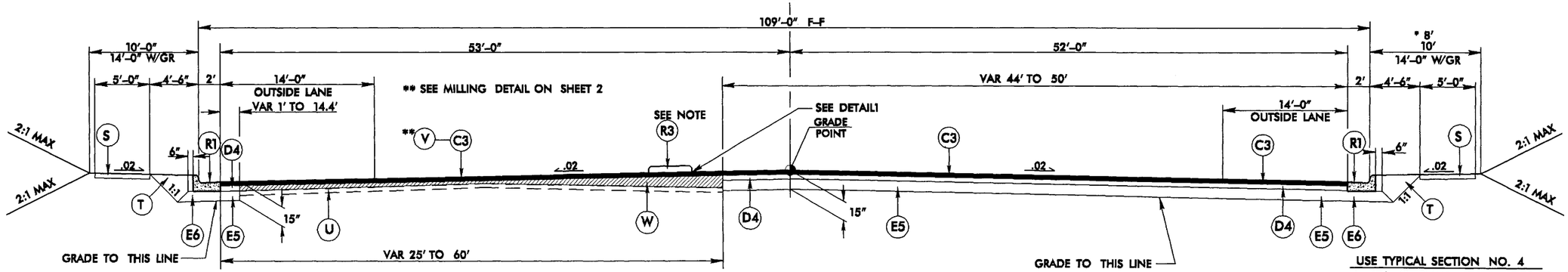
USE TYPICAL SECTION NO. 3

-L- STA. 35+87.31 TO 36+87.77,
TRANSITION FROM T.S. 2 TO T.S. 3

-L- STA. 36+87.77 TO 45+77.94

PAVEMENT SCHEDULE	
C1	3" S9.5B
C2	VAR. S9.5B
C3	3" S9.5C
C4	VAR. S9.5C
D1	4" I19.0B
D2	VAR. I19.0B
D3	2.5" I19.0C
D4	4" I19.0C
D5	VAR. I19.0C
E1	4" B25.0B
E2	5" B25.0B
E3	VAR. B25.0B
E4	6.5" B25.0C
E5	8" B25.0C
E6	VAR. B25.0C
J	6" ABC
R1	2'-6" C & G
R2	1'-6" C & G
R3	5" MONO. ISLAND
R4	SHLDR. BERM GUTTER
R5	8'x18" CURB
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 2.5"
V1	VAR. MILLING
W	WEDGING

℄ -L- (US 421)



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4

-L- STA. 45+77.94 TO 50+67.79, TRANSITION
FROM T.S. 3 TO T.S. 4

-L- STA. 50+67.79 TO 53+00.00

* -L- STA. 53+00.00 TO 61+00.00

-L- STA. 61+00.00 TO 67+49.12

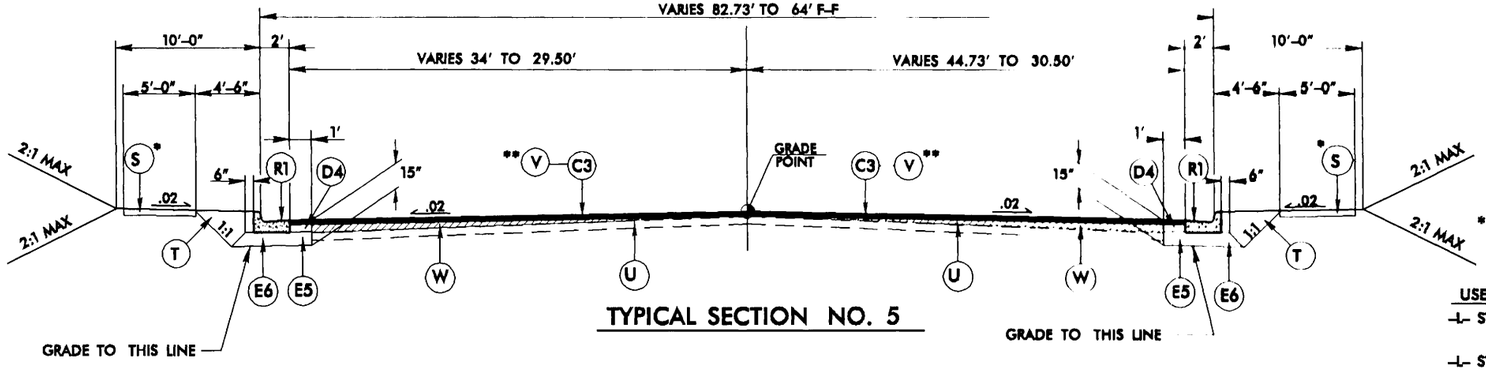
NOTE: SEE PLANS FOR ISLAND LOCATIONS

5/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-B
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

℄ -L- (US 421)

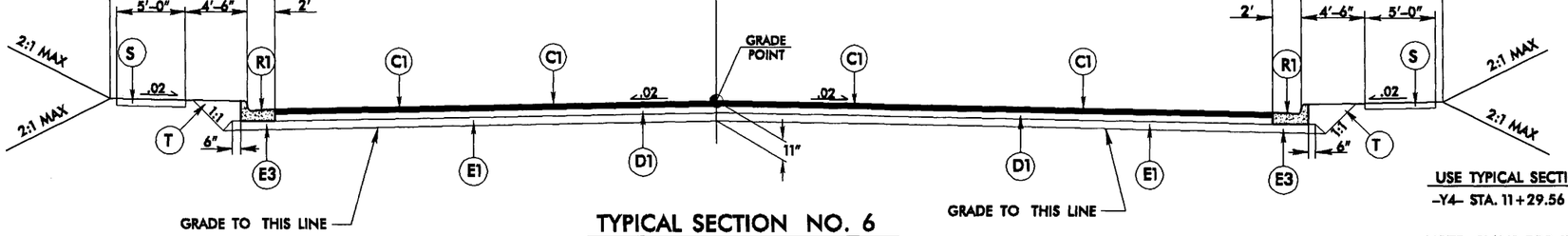


TYPICAL SECTION NO. 5

* SEE PLANS FOR SIDEWALK LOCATIONS
** SEE MILLING DETAIL ON SHEET 2

USE TYPICAL SECTION NO. 5
-L- STA. 67+49.12 TO 72+00.00, TRANSITION FROM T.S. 4 TO T.S. 5
-L- STA. 72+00.00 TO 74+00.00

℄ -Y4- (US 321)

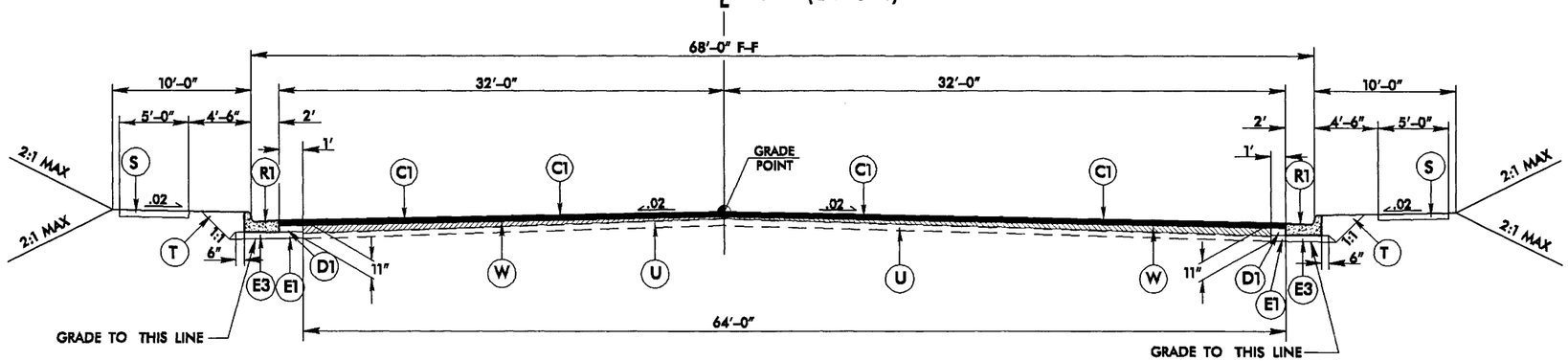


TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6
-Y4- STA. 11+29.56 TO 12+00.00

NOTE: PLANS FOR ISLAND LOCATIONS

℄ -Y4- (US 321)



TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7
-Y4- STA. 12+0.00 TO 13+50.00

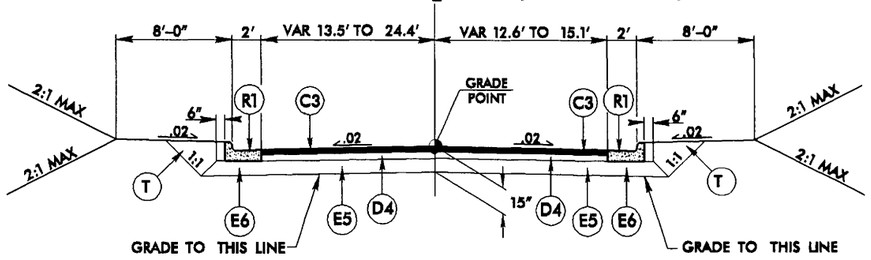
NOTE: PLANS FOR ISLAND LOCATIONS

PAVEMENT SCHEDULE	
C1	3" S9.5B
C2	VAR. S9.5B
C3	3" S9.5C
C4	VAR. S9.5C
D1	4" I19.0B
D2	VAR. I19.0B
D3	2.5" I19.0C
D4	4" I19.0C
D5	VAR. I19.0C
E1	4" B25.0B
E2	5" B25.0B
E3	VAR. B25.0B
E4	6.5" B25.0C
E5	8" B25.0C
E6	VAR. B25.0C
J	6" ABC
R1	2'-6" C & G
R2	1'-6" C & G
R3	5" MONO. ISLAND
R4	SHLDR. BERM GUTTER
R5	8'x18" CURB
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 2.5"
V1	VAR. MILLING
W	WEDGING

PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-C
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

℄ -Y2- (COUNCIL ST.)

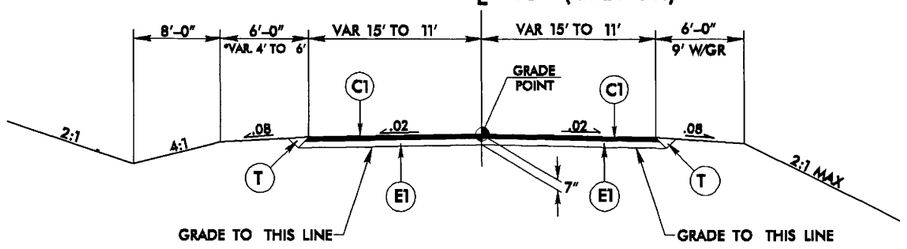


TYPICAL SECTION NO. 8

USE TYPICAL SECTION NO. 8
-Y2- STA. 12+50.00 TO 13+00.00, TRANSITION FROM EXISTING TO T.S. 8

-Y2- STA. 13+00.00 TO 13+03.03

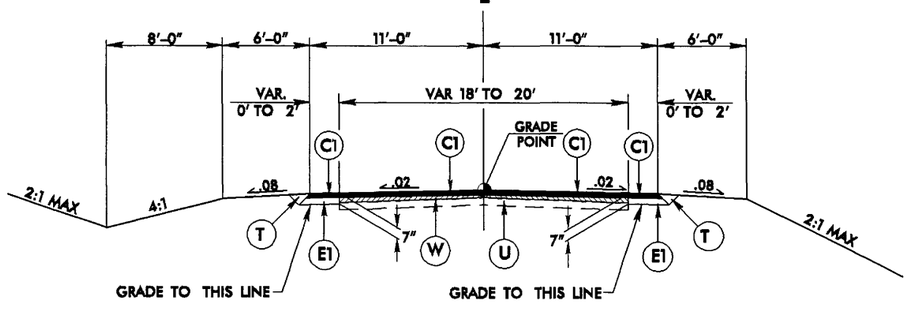
℄ -Y5- (OAK ST.)



TYPICAL SECTION NO. 9

USE TYPICAL SECTION NO. 9
-Y5- STA. 10+95.60 TO 12+50.00

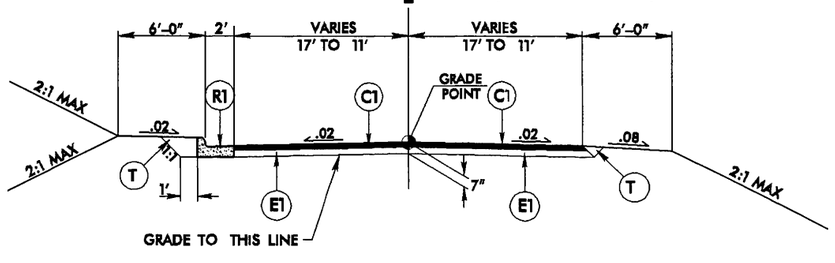
℄ -Y5- (OAK ST.)



TYPICAL SECTION NO. 10

USE TYPICAL SECTION NO. 10
-Y5- STA. 12+50.00 TO 13+00.00

℄ -Y6- (HILLSIDE DR.)



TYPICAL SECTION NO. 11

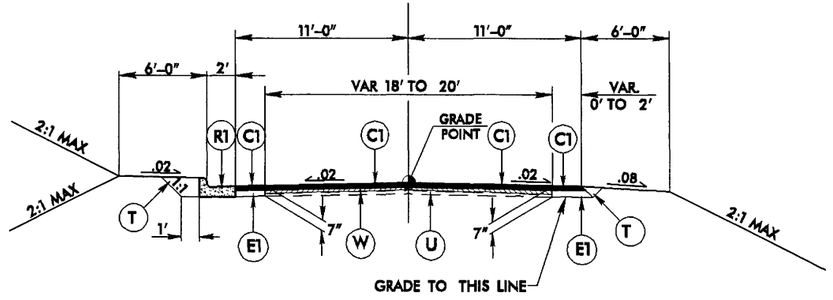
USE TYPICAL SECTION NO. 11
-Y6- STA. 10+92.68 TO 11+80.00

PAVEMENT SCHEDULE	
C1	3" S9.5B
C2	VAR. S9.5B
C3	3" S9.5C
C4	VAR. S9.5C
D1	4" I19.0B
D2	VAR. I19.0B
D3	2.5" I19.0C
D4	4" I19.0C
D5	VAR. I19.0C
E1	4" B25.0B
E2	5" B25.0B
E3	VAR. B25.0B
E4	6.5" B25.0C
E5	8" B25.0C
E6	VAR. B25.0C
J	6" ABC
R1	2'-6" C & G
R2	1'-6" C & G
R3	5" MONO. ISLAND
R4	SHLDR. BERM GUTTER
R5	8'x18" CURB
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 2.5"
V1	VAR. MILLING
W	WEDGING

PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-D
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

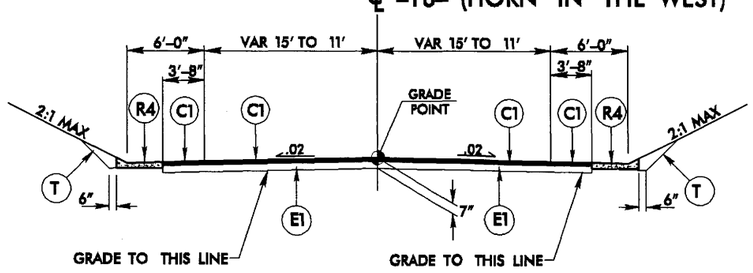
℄ -Y6- (HILLSIDE DR.)



TYPICAL SECTION NO. 12

USE TYPICAL SECTION NO. 12
-Y6- STA. 11+80.00 TO 12+10.00

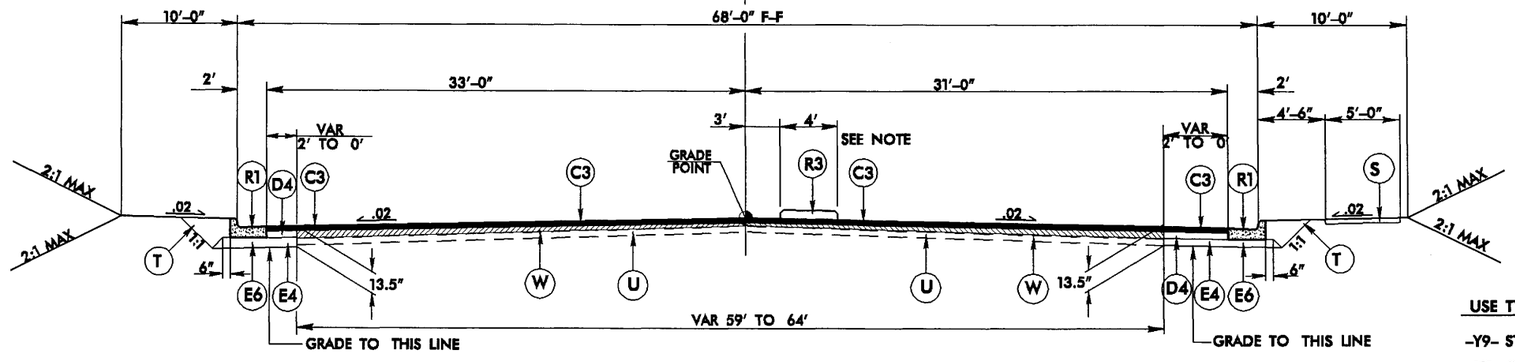
℄ -Y8- (HORN IN THE WEST)



TYPICAL SECTION NO. 13

USE TYPICAL SECTION NO. 13
-Y8- STA. 11+04.68 TO 12+00.00
-Y8- STA. 12+00.00 TO 12+50, TRANSITION FROM T.S. 13 TO EXISTING

℄ -Y9- (NC 105/US 221)

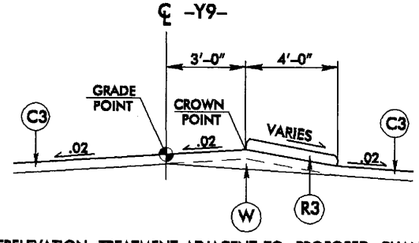


TYPICAL SECTION NO. 14

USE TYPICAL SECTION NO. 14
-Y9- STA. 11+48.99 TO 13+50.00
-Y9- STA. 13+50.00 TO 14+00, TRANSITION FROM T.S. 14 TO EXISTING

NOTE: SEE PLANS FOR ISLAND LOCATIONS

℄ -Y9-

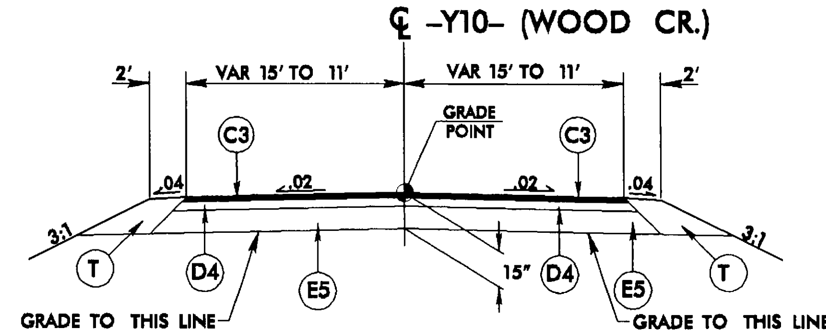


SUPERELEVATION TREATMENT ADJACENT TO PROPOSED CHANNELIZATION DETAIL
TO BE USED IN CONJUNCTION WITH TYPICAL SECTION 14
(SEE PLANS FOR LOCATIONS)

PAVEMENT SCHEDULE	
C1	3" S9.5B
C2	VAR. S9.5B
C3	3" S9.5C
C4	VAR. S9.5C
D1	4" I19.0B
D2	VAR. I19.0B
D3	2.5" I19.0C
D4	4" I19.0C
D5	VAR. I19.0C
E1	4" B25.0B
E2	5" B25.0B
E3	VAR. B25.0B
E4	6.5" B25.0C
E5	8" B25.0C
E6	VAR. B25.0C
J	6" ABC
R1	2'-6" C & G
R2	1'-6" C & G
R3	5" MONO. ISLAND
R4	SHLDR. BERM GUTTER
R5	8'x18" CURB
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 2.5"
V1	VAR. MILLING
W	WEDGING

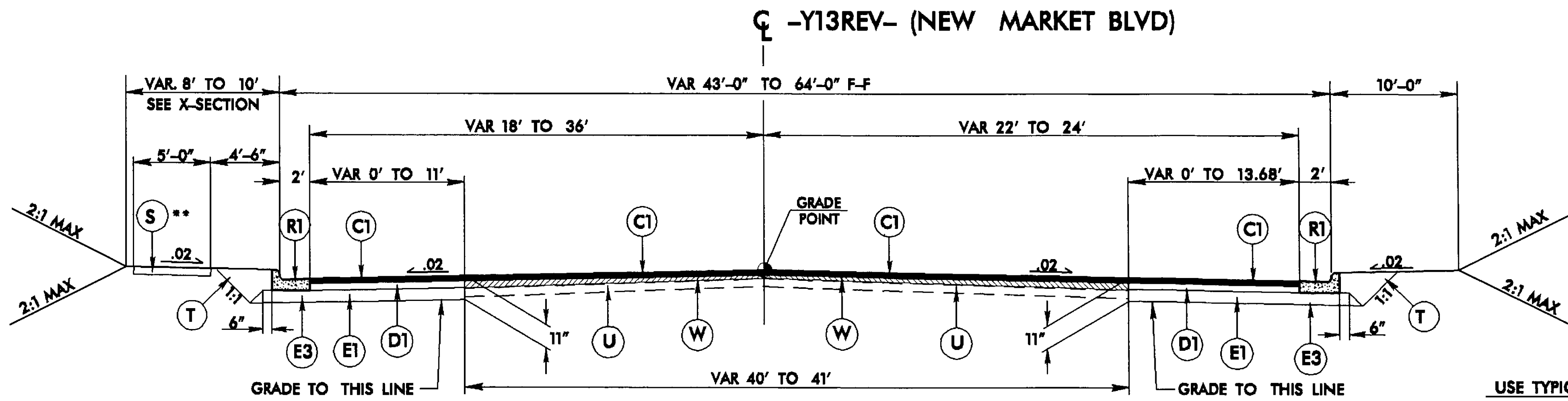
PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-E
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



TYPICAL SECTION NO. 15

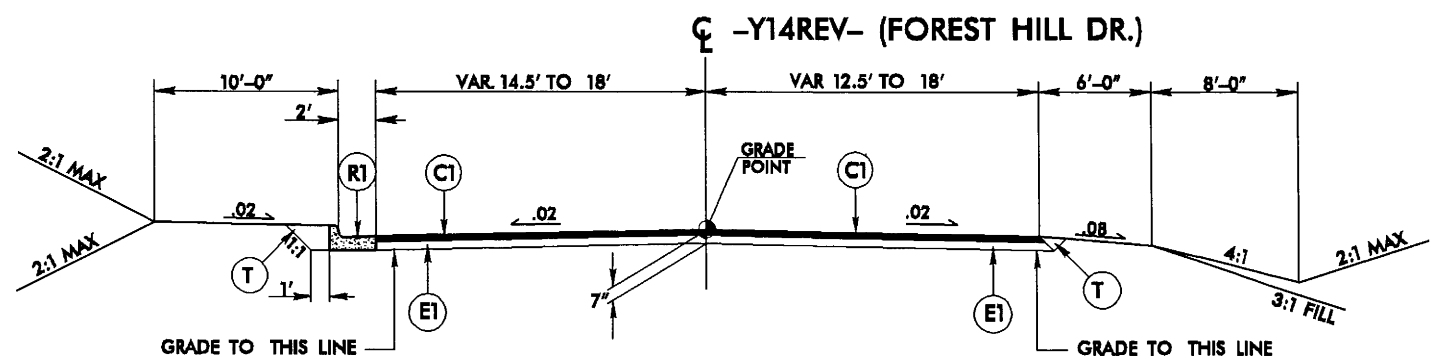
USE TYPICAL SECTION NO. 15
-Y10- STA. 11+33.33 TO 11+50.00



TYPICAL SECTION NO. 16

USE TYPICAL SECTION NO. 16
-Y13REV- STA. 15+00 TO 18+86.65

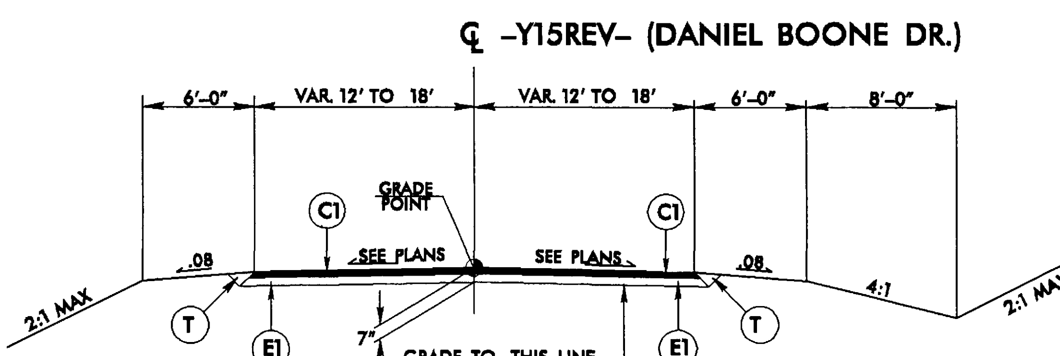
**SEE PLANS FOR SIDEWALK LOCATIONS



TYPICAL SECTION NO. 17

USE TYPICAL SECTION NO. 17
-Y14REV- STA. 10+84.79 TO 12+75.00

-Y14REV- STA. 12+75.00 TO 13+00, TRANSITION FROM T.S. 17 TO EXISTING



TYPICAL SECTION NO. 18

USE TYPICAL SECTION NO. 18
-Y15REV- STA. 10+84 TO 12+75.00

-Y15REV- STA. 12+75.00 TO 13+00, TRANSITION FROM T.S. 18 TO EXISTING

PAVEMENT SCHEDULE	
C1	3" S9.5B
C2	VAR. S9.5B
C3	3" S9.5C
C4	VAR. S9.5C
D1	4" I19.0B
D2	VAR. I19.0B
D3	2.5" I19.0C
D4	4" I19.0C
D5	VAR. I19.0C
E1	4" B25.0B
E2	5" B25.0B
E3	VAR. B25.0B
E4	6.5" B25.0C
E5	8" B25.0C
E6	VAR. B25.0C
J	6" ABC
R1	2'-6" C & G
R2	1'-6" C & G
R3	5" MONO. ISLAND
R4	SHLDR. BERM GUTTER
R5	8'x18" CURB
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 2.5"
V1	VAR. MILLING
W	WEDGING

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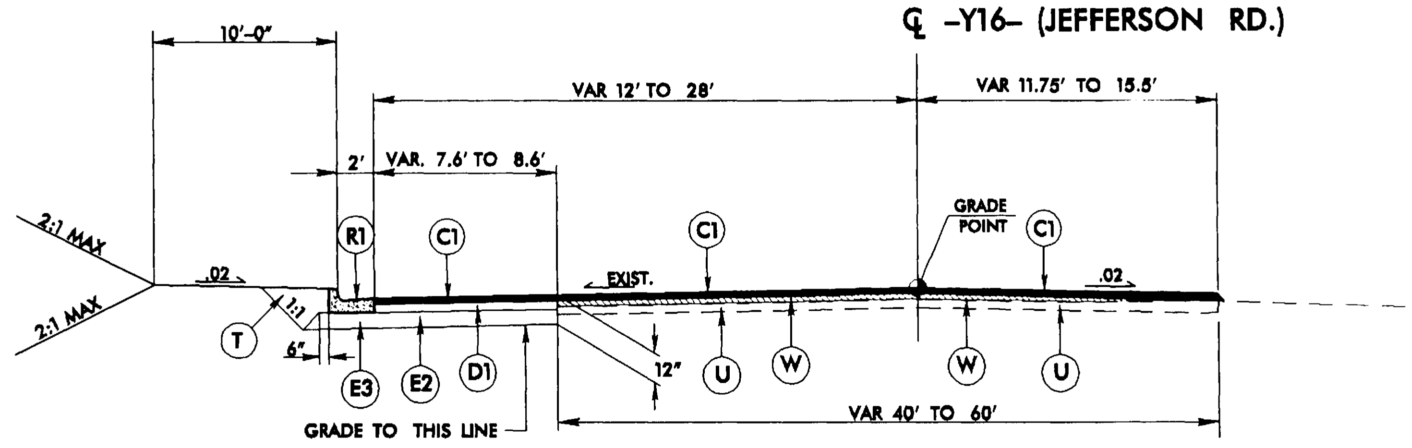
6/2/9

PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-F
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

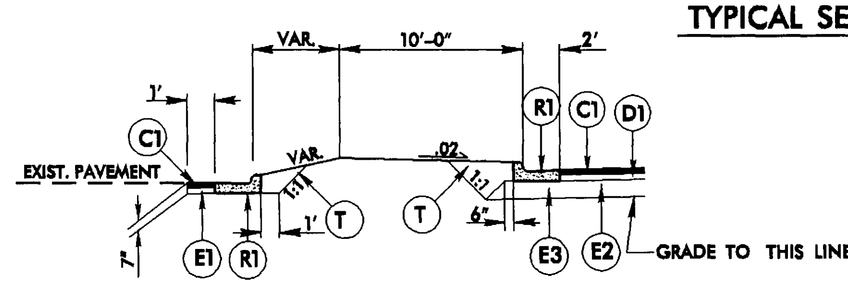
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y16- STA. 15+00 TO 15+89.41, TRANSITION FROM EXISTING TO T.S. 19

USE TYPICAL SECTION NO. 19
-Y16- STA. 15+89.41 TO 16+47.37

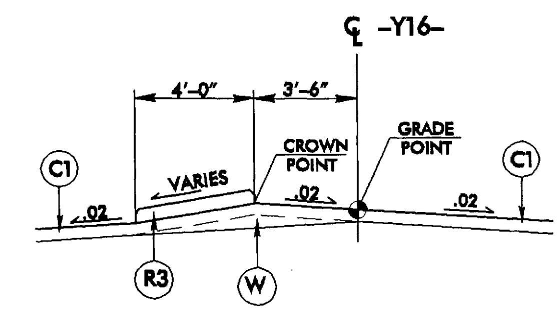


TYPICAL SECTION NO. 19



DETAIL 19A

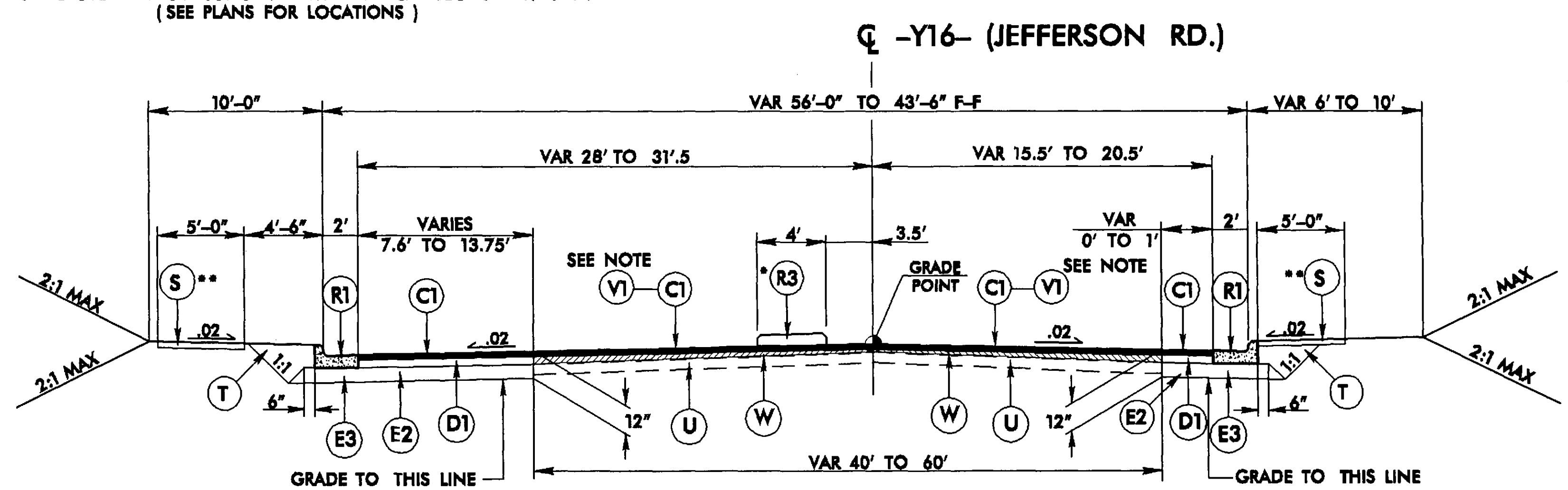
TO BE USED IN CONJUNCTION WITH TYPICAL SECTION 19 & 20
(SEE PLANS FOR LOCATIONS)



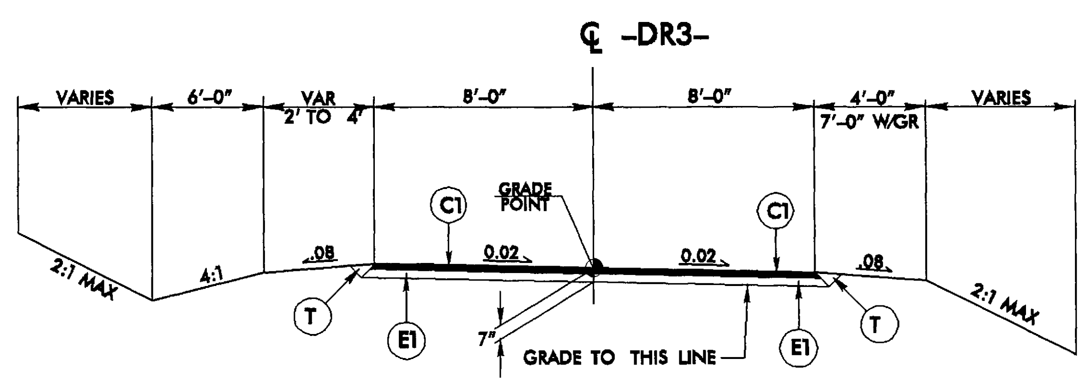
SUPERELEVATION TREATMENT ADJACENT TO PROPOSED CHANNELIZATION DETAIL
TO BE USED IN CONJUNCTION WITH TYPICAL SECTION 20
(SEE PLANS FOR LOCATIONS)

* SEE PLANS FOR ISLAND LOCATION
** SEE PLANS FOR SIDEWALK LOCATIONS
NOTE: MILL EXIST. PAVEMENT FROM STA 18+50 TO 19+44.69

USE TYPICAL SECTION NO. 20
-Y16- STA. 16+47.37 TO 19+44.69



TYPICAL SECTION NO. 20



TYPICAL SECTION NO. 21

USE TYPICAL SECTION NO. 21
-DRV3- STA. 10+55.28 TO 14+10.00

PAVEMENT SCHEDULE	
C1	3" S9.5B
C2	VAR. S9.5B
C3	3" S9.5C
C4	VAR. S9.5C
D1	4" I19.0B
D2	VAR. I19.0B
D3	2.5" I19.0C
D4	4" I19.0C
D5	VAR. I19.0C
E1	4" B25.0B
E2	5" B25.0B
E3	VAR. B25.0B
E4	6.5" B25.0C
E5	8" B25.0C
E6	VAR. B25.0C
J	8" ABC
R1	2'-6" C & G
R2	1'-6" C & G
R3	5" MONO. ISLAND
R4	SHLDR. BERM GUTTER
R5	8'x18" CURB
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 2.5"
V1	VAR. MILLING
W	WEDGING

6/2/99

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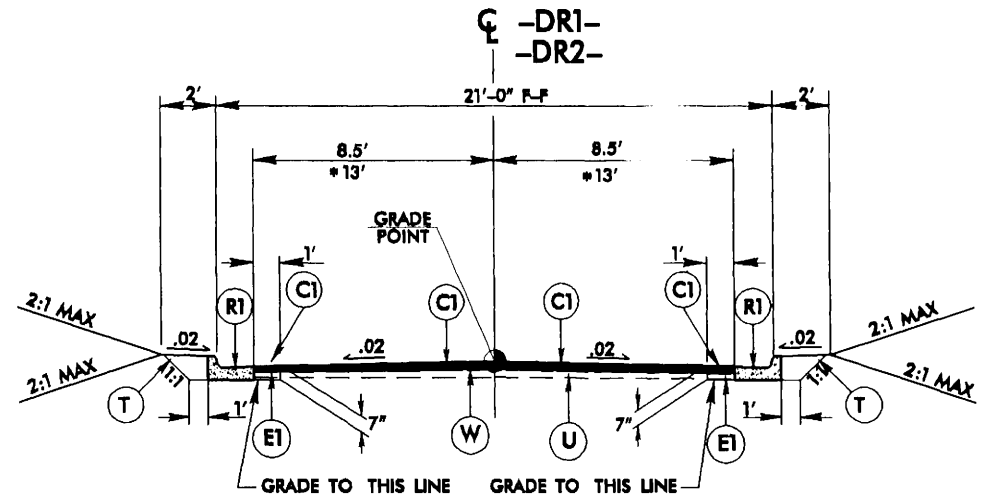
PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-G
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

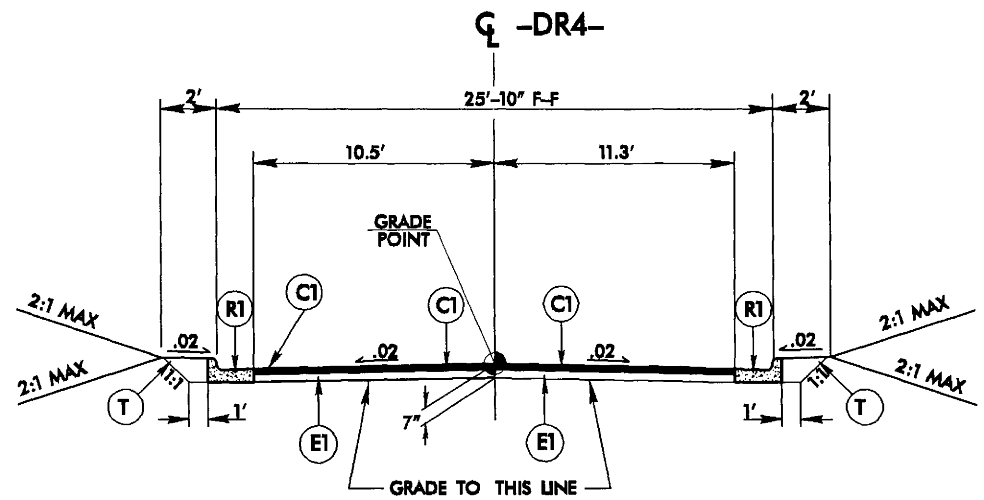


TYPICAL SECTION NO. 22

USE TYPICAL SECTION NO. 22

-DR1- STA. 11+00.00 TO 11+53.09

* -DR2- STA. 10+50.00 TO 10+85.97

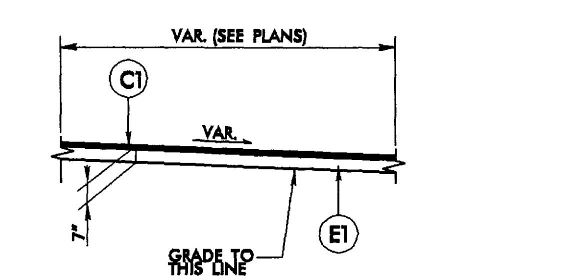


TYPICAL SECTION NO. 23

USE TYPICAL SECTION NO. 23

-DR4- STA. 10+84.78 TO 11+40.00

PAVEMENT SCHEDULE	
C1	3" S9.5B
C2	VAR. S9.5B
C3	3" S9.5C
C4	VAR. S9.5C
D1	4" I19.0B
D2	VAR. I19.0B
D3	2.5" I19.0C
D4	4" I19.0C
D5	VAR. I19.0C
E1	4" B25.0B
E2	5" B25.0B
E3	VAR. B25.0B
E4	6.5" B25.0C
E5	8" B25.0C
E6	VAR. B25.0C
J	6" ABC
R1	2'-6" C & G
R2	1'-6" C & G
R3	5" MONO. ISLAND
R4	SHLDR. BERM GUTTER
R5	8'x18" CURB
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 2.5"
V1	VAR. MILLING
W	WEDGING

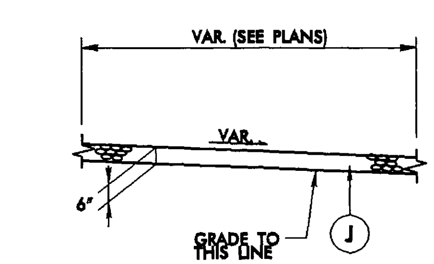


ROADWAY

MISC. PAVED PRIVATE DRIVES

REMARKS

SEE PLANS FOR LOCATIONS

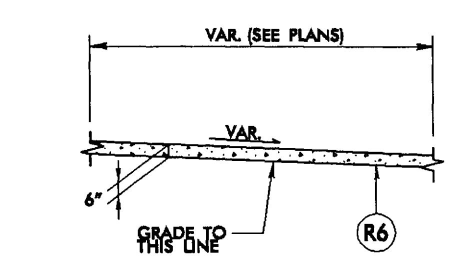


ROADWAY

MISC. UNPAVED PRIVATE DRIVES

REMARKS

SEE PLANS FOR LOCATIONS



ROADWAY

MISC. CONC PRIVATE DRIVES

REMARKS

SEE PLANS FOR LOCATIONS

6/2/99

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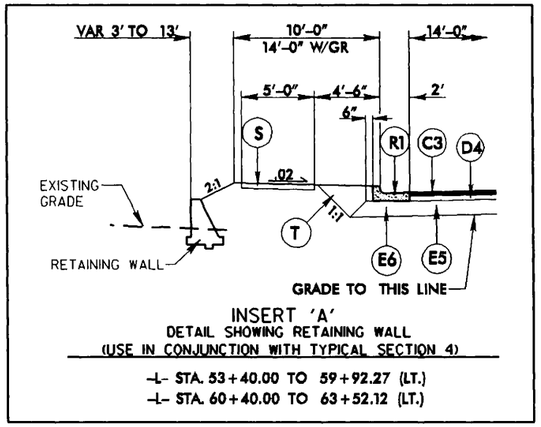
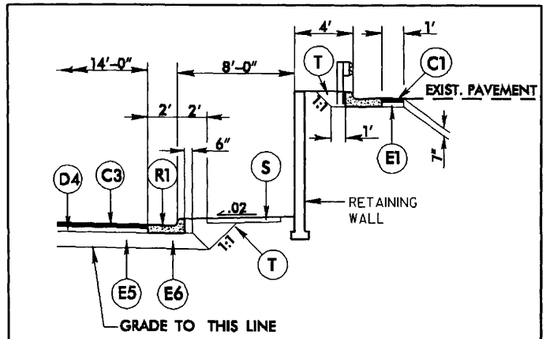
PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-H
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

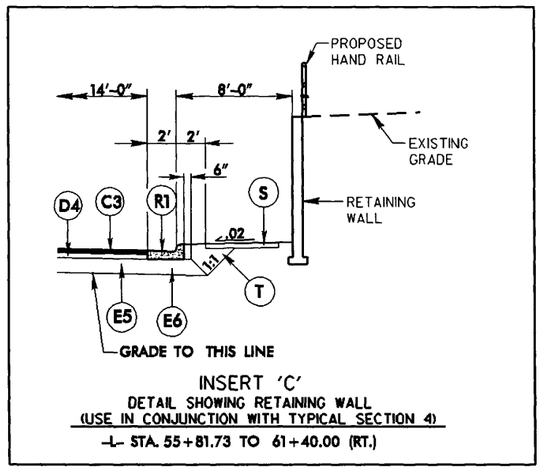
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



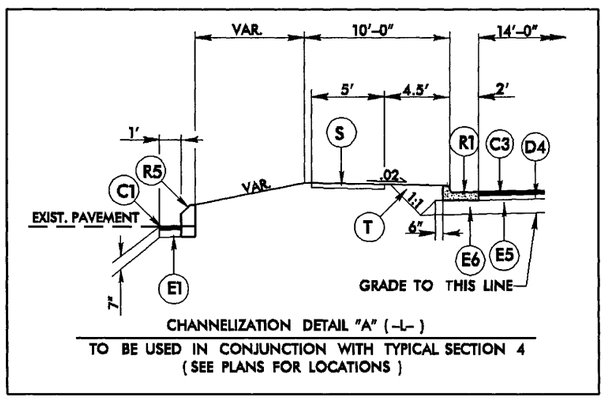
INSERT 'A'
DETAIL SHOWING RETAINING WALL
(USE IN CONJUNCTION WITH TYPICAL SECTION 4)
-L- STA. 53+40.00 TO 59+92.27 (LT.)
-L- STA. 60+40.00 TO 63+52.12 (LT.)



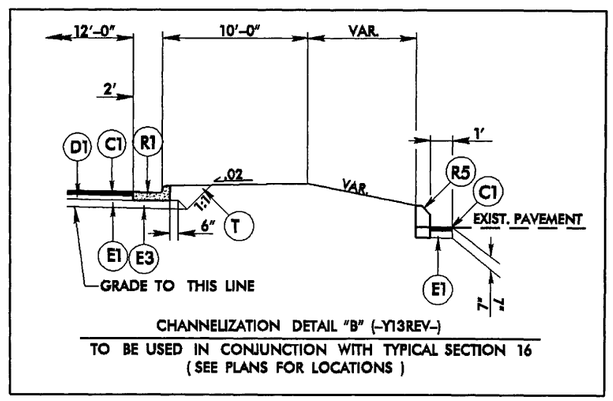
INSERT 'B'
DETAIL SHOWING RETAINING WALL
(USE IN CONJUNCTION WITH TYPICAL SECTION 4)
-L- STA. 53+06.45 TO 55+00.00 (RT.)



INSERT 'C'
DETAIL SHOWING RETAINING WALL
(USE IN CONJUNCTION WITH TYPICAL SECTION 4)
-L- STA. 55+81.73 TO 61+40.00 (RT.)



CHANNELIZATION DETAIL "A" (-L-)
TO BE USED IN CONJUNCTION WITH TYPICAL SECTION 4
(SEE PLANS FOR LOCATIONS)



CHANNELIZATION DETAIL "B" (-Y13REV-)
TO BE USED IN CONJUNCTION WITH TYPICAL SECTION 16
(SEE PLANS FOR LOCATIONS)

PAVEMENT SCHEDULE	
C1	3" S9.5B
C2	VAR. S9.5B
C3	3" S9.5C
C4	VAR. S9.5C
D1	4" I19.0B
D2	VAR. I19.0B
D3	2.5" I19.0C
D4	4" I19.0C
D5	VAR. I19.0C
E1	4" B25.0B
E2	5" B25.0B
E3	VAR. B25.0B
E4	6.5" B25.0C
E5	8" B25.0C
E6	VAR. B25.0C
J	6" ABC
R1	2'-6" C & G
R2	1'-6" C & G
R3	5" MONO. ISLAND
R4	SHLDR. BERM GUTTER
R5	8'x18" CURB
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 2.5"
V1	VAR. MILLING
W	WEDGING

REVISIONS

R/W REVISION 6/10/2008 I1- UPDATED PROPERTY OWNER INFORMATION FOR PARCEL 91

8/17/99

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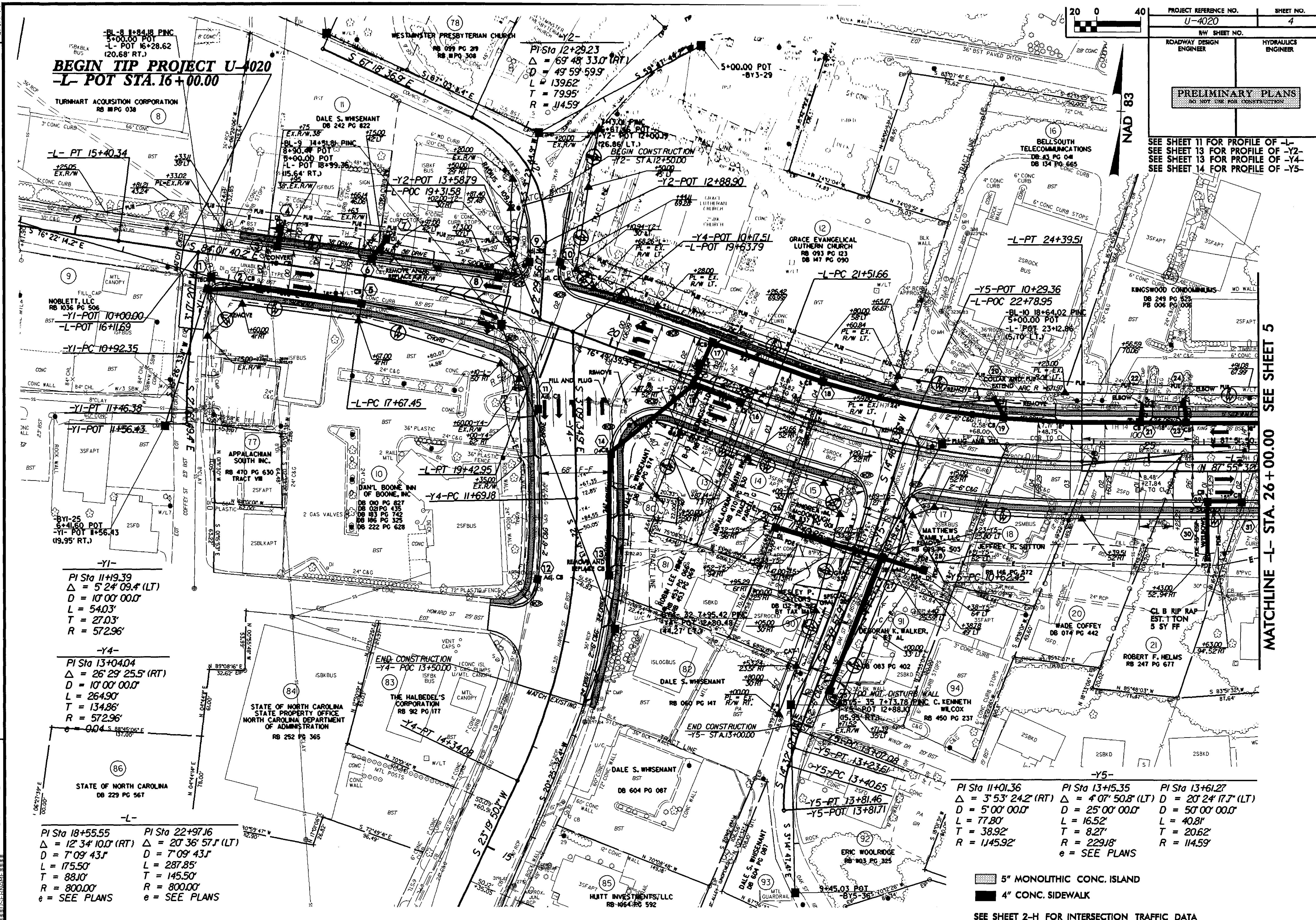


REVISIONS

R/W REVISION 6/10/2008 IY- UPDATED PL INFORMATION FOR PARCEL 32,REVISED R/W & EASEMENTS FOR PARCELS 96 & 95.
ELIMINATED CLAIM ON PARCEL 97 AND ADDED PARCEL 136.
COMBINED PARCELS 101,102,103,104 INTO PARCEL 101 AND UPDATED TOPO NEAR Y9.

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-4020	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

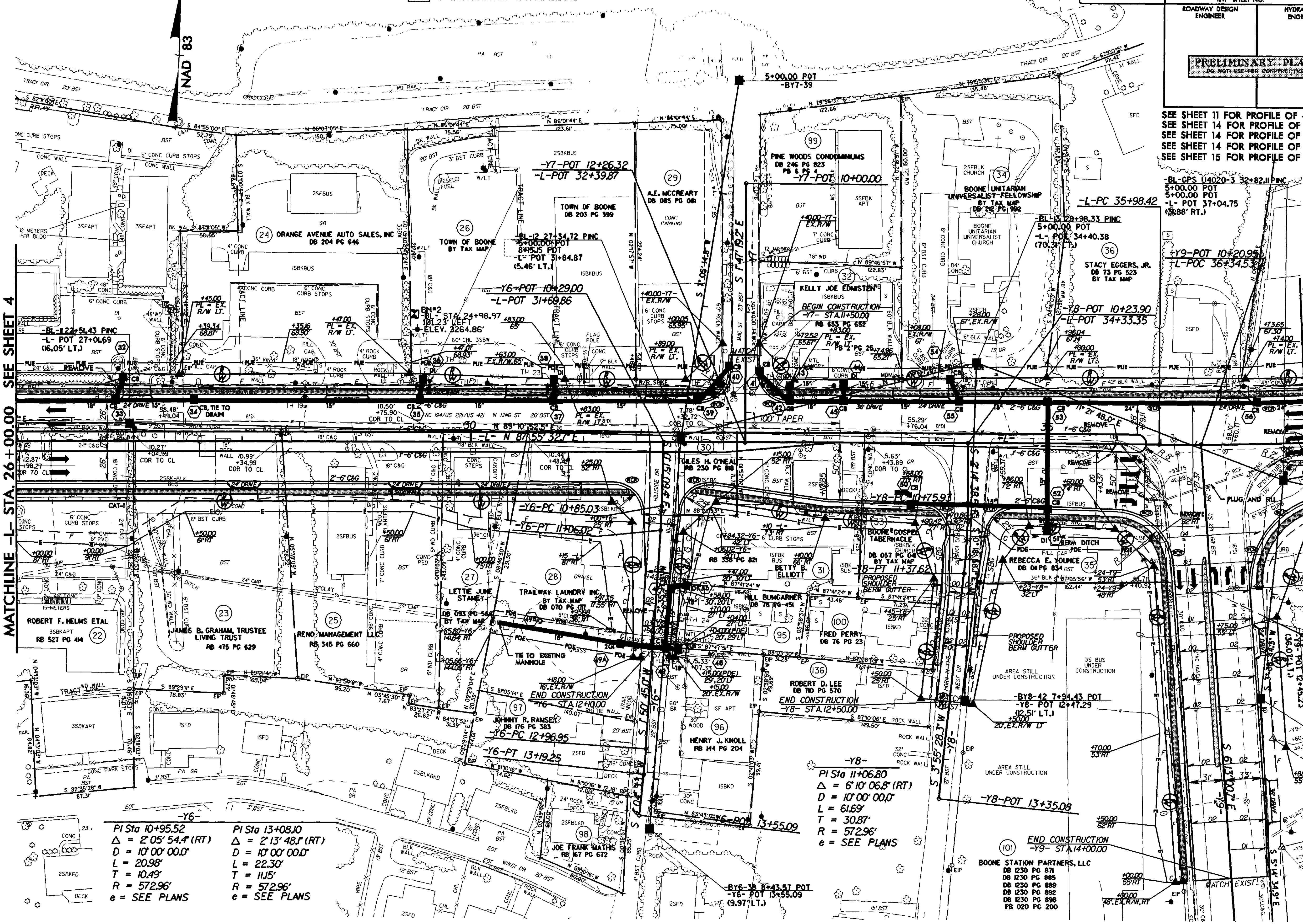
4" CONC. SIDEWALK

SEE SHEET 2-H FOR INTERSECTION TRAFFIC DATA

5" MONOLITHIC CONC. ISLAND

"SBG" DENOTES SHOULDER BERM GUTTER

SEE SHEET 11 FOR PROFILE OF -L-
SEE SHEET 14 FOR PROFILE OF -Y6-
SEE SHEET 14 FOR PROFILE OF -Y7-
SEE SHEET 14 FOR PROFILE OF -Y8-
SEE SHEET 15 FOR PROFILE OF -Y9-



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PROJECT REFERENCE NO.	SHEET NO.
U-4020	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

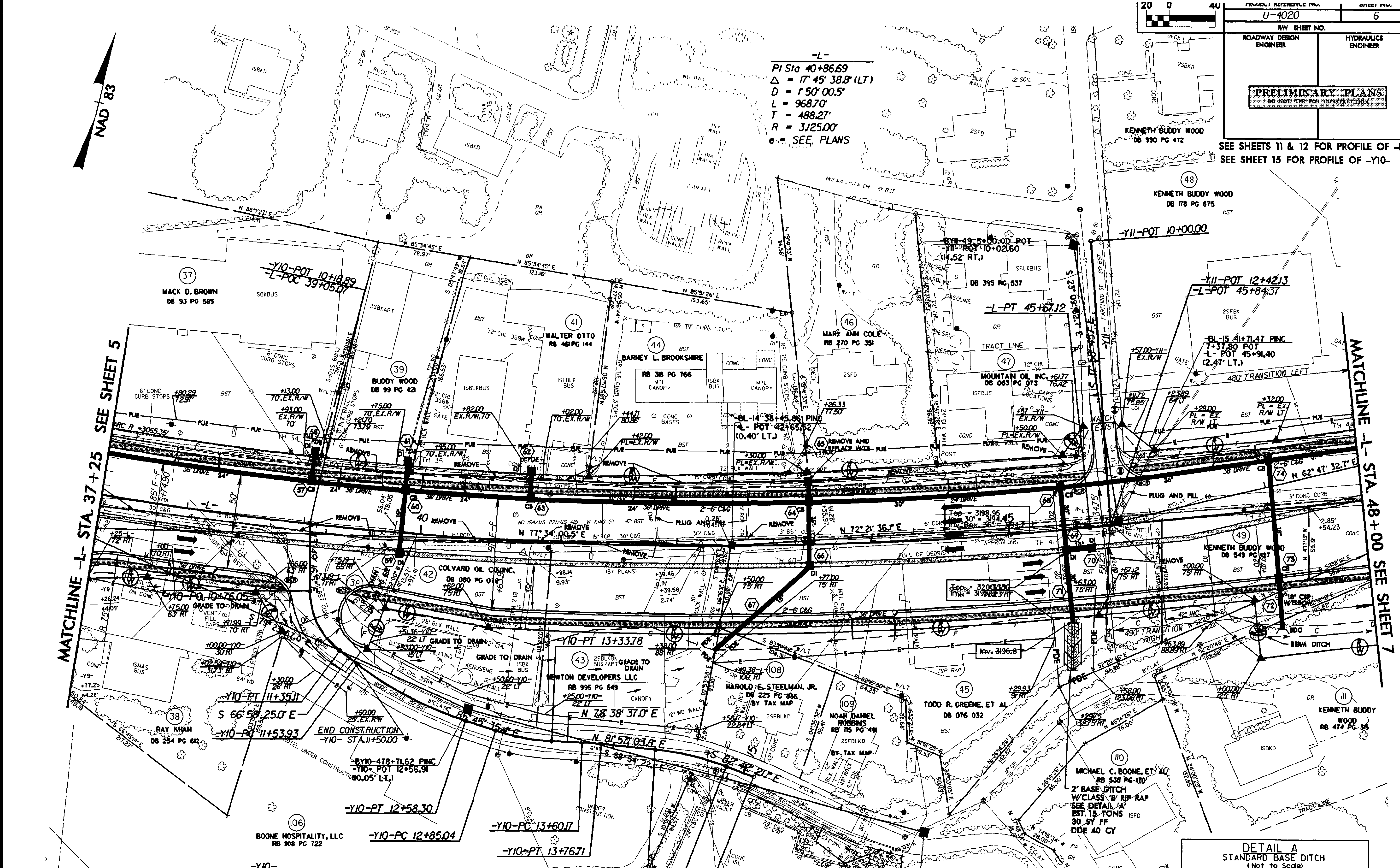
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SEE SHEETS 11 & 12 FOR PROFILE OF -L-
SEE SHEET 15 FOR PROFILE OF -Y10-

REVISIONS

R/W REVISION 6/10/2008 IY - ELIMINATED PARCEL 40 AND COMBINED WITH PARCEL 38
ELIMINATED PARCEL 112 AND COMBINED WITH PARCEL 111

-L-
PI Sta 40+86.69
Δ = 17° 45' 38.8" (LT)
D = 1° 50' 00.5"
L = 968.70'
T = 488.27'
R = 3,125.00'
e = SEE PLANS



NAD 83
MATCHLINE -L- STA. 37+25 SEE SHEET 5
MATCHLINE -L- STA. 48+00 SEE SHEET 7
MACK D. BROWN
DB 93 PG 585
BUDDY WOOD
DB 99 PG 421
WALTER OTTO
RB 461 PG 144
BARNEY L. BROOKSHIRE
RB 318 PG 764
MARY ANN COLE
RB 270 PG 351
MOUNTAIN OIL INC.
DB 063 PG 073
KENNETH BUDDY WOOD
DB 990 PG 472
KENNETH BUDDY WOOD
DB 178 PG 675
KENNETH BUDDY WOOD
DB 549 PG 127
KENNETH BUDDY WOOD
RB 474 PG 315
COLVARD OIL CO. INC.
DB 080 PG 070
NEWTON DEVELOPERS LLC
RB 995 PG 549
HAROLD E. STEELMAN, JR.
DB 225 PG 835
BY TAX MAP
NOAH DANIEL ROBBINS
RB 115 PG 491
BY TAX MAP
TODD R. GREENE, ET AL
DB 076 032
MICHAEL C. BOONE, ET AL
RB 535 PG 170
RAY KHAN
DB 254 PG 612
BOONE HOSPITALITY, LLC
RB 808 PG 722
STEEPLE CHASE, LLC
RB 320 PG 164
-Y10-POT 10+18.89
-L-POC 39+05.07
-Y11-POT 10+00.00
-Y11-POT 12+42.13
-L-POT 45+84.37
-L-PT 45+67.12
-BL-15 41+71.47 PINC
7+37.80 POT
-L- POT 45+91.40
(2.47' LT.)
BL-14 38+45.86 PINC
-L- POT 42+65.52
(0.40' LT.)
-Y10-PT 13+33.78
-Y10-PT 11+35.11
-Y10-PC 11+53.93
END CONSTRUCTION
-Y10- STA 11+50.00
-BY10-4 78+71.62 PINC
-Y10- POT 12+56.91
(0.05' LT.)
-Y10-PT 12+58.30
-Y10-PC 12+85.04
-Y10-PC 13+60.17
-Y10-PT 13+76.71
-Y10-PC 14+23.86
-Y10-PC 15+09.68
-Y10-PT 14+85.23
12+73.47 POT
-BY10-
N 77° 34' 00.5" E
N 72° 21' 36.1" E
N 62° 47' 32.7" E
N 78° 38' 37.0" E
N 81° 57' 03.8" E
S 82° 46' 21" E
S 66° 58' 25.0" E
480' TRANSITION LEFT
490' TRANSITION RIGHT
PLUG AND FILL
BERM DITCH
2' BASE DITCH
W/CLASS 'B' RIP RAP
SEE DETAIL 'A'
EST. 15 TONS
30 SY FF
DDE 40 CY
GRADE TO DRAIN
REMOVE
REMOVE AND REPLACE W/DI

PI Sta 11+07.89	PI Sta 12+06.59	PI Sta 13+09.57	PI Sta 13+68.44	PI Sta 14+54.73
Δ = 53° 09' 08.5" (LT)	Δ = 18° 47' 10.4" (LT)	Δ = 15° 35' 47.6" (LT)	Δ = 3° 18' 26.8" (RT)	Δ = 15° 20' 35.1" (RT)
D = 89° 59' 59.9"	D = 18° 00' 00.0"	D = 32° 00' 00.0"	D = 20° 00' 00.0"	D = 25° 00' 00.0"
L = 59.06'	L = 104.37'	L = 48.74'	L = 16.54'	L = 61.37'
T = 31.85'	T = 52.66'	T = 24.52'	T = 8.27'	T = 30.87'
R = 63.66'	R = 318.31'	R = 179.05'	R = 286.48'	R = 229.18'

-Y10-

5" MONOLITHIC CONC. ISLAND
4" CONC. SIDEWALK

DETAIL A
STANDARD BASE DITCH
(Not to Scale)

Natural Ground — Natural Ground
Filter Fabric
Min. D= 2 Ft.
Max. d= 2 Ft.
B= 2 Ft.

Type of Liner= Class B Rip-Rap
RT. OF -L- 45+45

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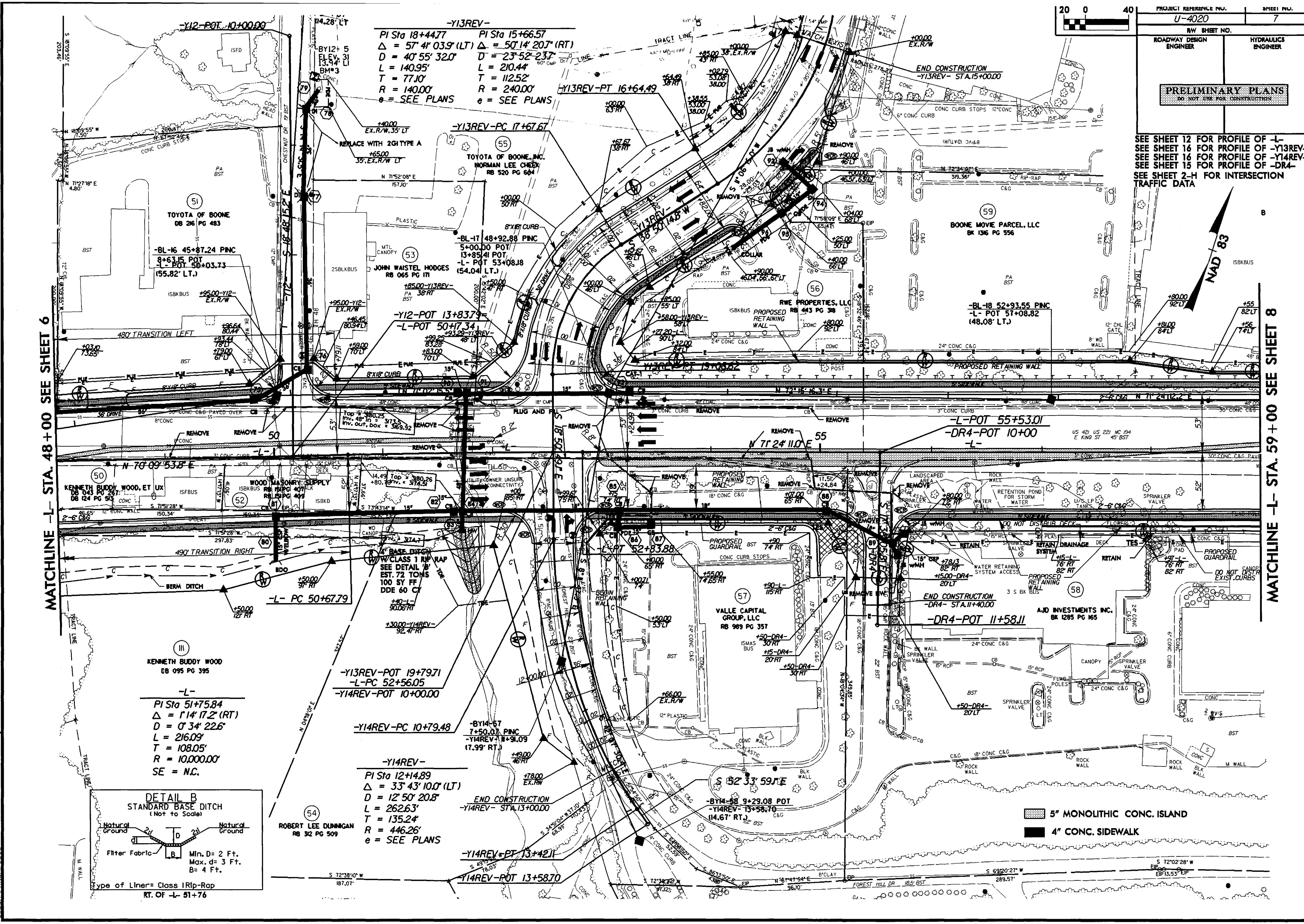
REVISIONS

R/W REVISION 6/10/2008 IY- ELIMINATED PARCEL 112 AND COMBINED WITH PARCEL III
UPDATED PROPERTY OWNER INFORMATION FOR PARCELS 58 AND 59
R/W REVISION 6/26/2008 IY- REVISED R/W & EASEMENT ON PARCEL 58



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SEE SHEET 17 FOR PROFILE OF –DR1–
SEE SHEET 17 FOR PROFILE OF –DR2–
SEE SHEET 17 FOR PROFILE OF –DR3–

SEE SHEET 2-H FOR INTERSECTION TRAFFIC DATA

5" MONOLITHIC CONC. ISLAND

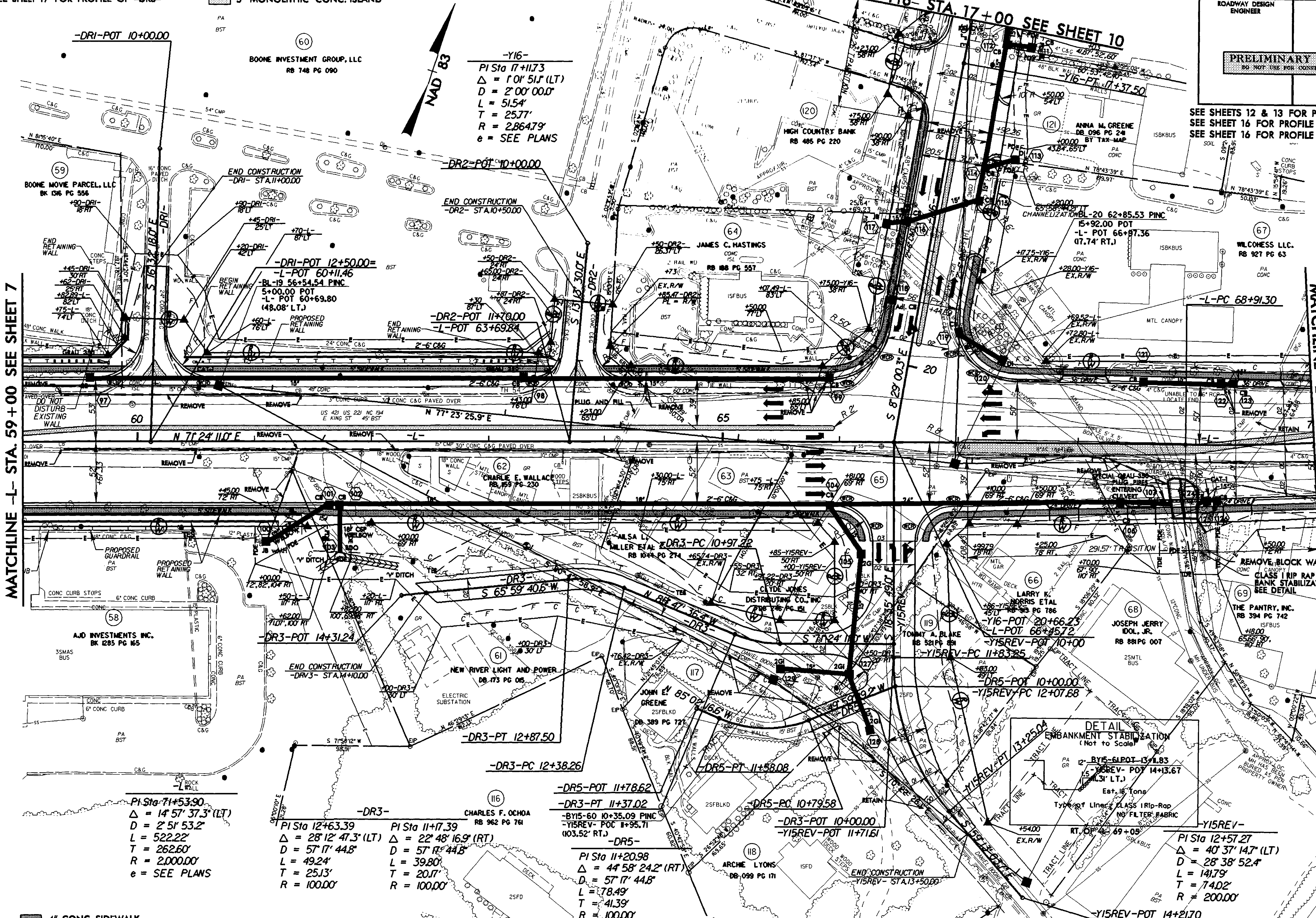
20 0 40	PROJECT REFERENCE NO.	SHEET NO.
	U-4020	8
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SEE SHEETS 12 & 13 FOR PROFILE OF –L–
SEE SHEET 16 FOR PROFILE OF –Y15REV–
SEE SHEET 16 FOR PROFILE OF –Y16–

REVISIONS

R/W REVISION 6/10/2008 IY– UPDATED PROPERTY OWNER INFORMATION FOR PARCELS 58 & 59
R/W REVISION 6/26/2008 IY– REVISED R/W &EASEMENTS ON PARCELS 58 & 61



4" CONC. SIDEWALK

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20 0 40	PROJECT REFERENCE NO.	SHEET NO.
	U-4020	9
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SEE SHEET 13 FOR PROFILE -L-
SEE SHEET 17 FOR PROFILE -Y17-
SEE SHEET 17 FOR PROFILE -Y18-
SEE SHEET 2-H FOR INTERSECTION TRAFFIC DATA

NAD 83

-Y17-
PI Sta 11+11.55
Δ = 11° 57' 31.6" (LT)
D = 13° 00' 00.0"
L = 91.99'
T = 46.16'
R = 440.74'
e = SEE PLANS

5" MONOLITHIC CONC. ISLAND
4" CONC. SIDEWALK

-L-
PI Sta 71+53.90
Δ = 14° 57' 37.3" (LT)
D = 2° 51' 53.2"
L = 522.22'
T = 262.60'
R = 2,000.00'
e = SEE PLANS

PI Sta 75+31.59
Δ = 7° 23' 08.8" (LT)
D = 4° 00' 00.0"
L = 184.64'
T = 92.45'
R = 1,432.39'
e = EXISTING

-Y18-
PI Sta 11+44.22
Δ = 45° 56' 44.0" (LT)
D = 30° 00' 00.0"
L = 153.15'
T = 80.96'
R = 190.99'
e = EXISTING

END TIP PROJECT U-4020
-L- POC STA 74+00.00

MATCHLINE -L- STA. 70+00 SEE SHEET 8

REVISIONS
R/W REVISION 6/10/2008 N- UPDATED PROPERTY OWNER INFORMATION FOR PARCEL 70

8/17/99

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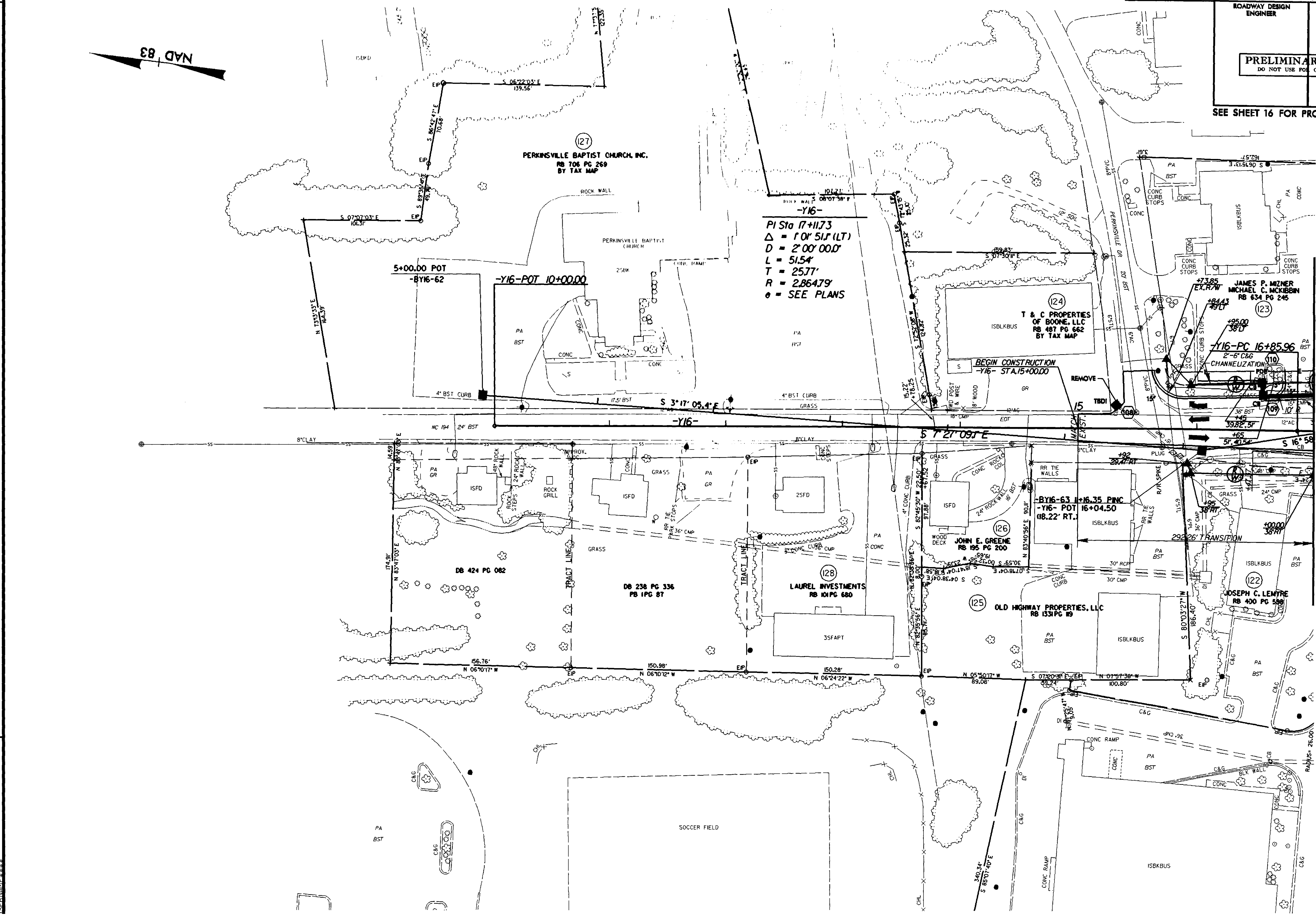
PROJECT REFERENCE NO.	SHEET NO.
U-4020	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SEE SHEET 16 FOR PROFILE -Y16-



REVISIONS

R/W REVISION 6/10/2008 N- UPDATED PL INFORMATION FOR PARCEL 122
REVISED R/W ON PARCEL 122

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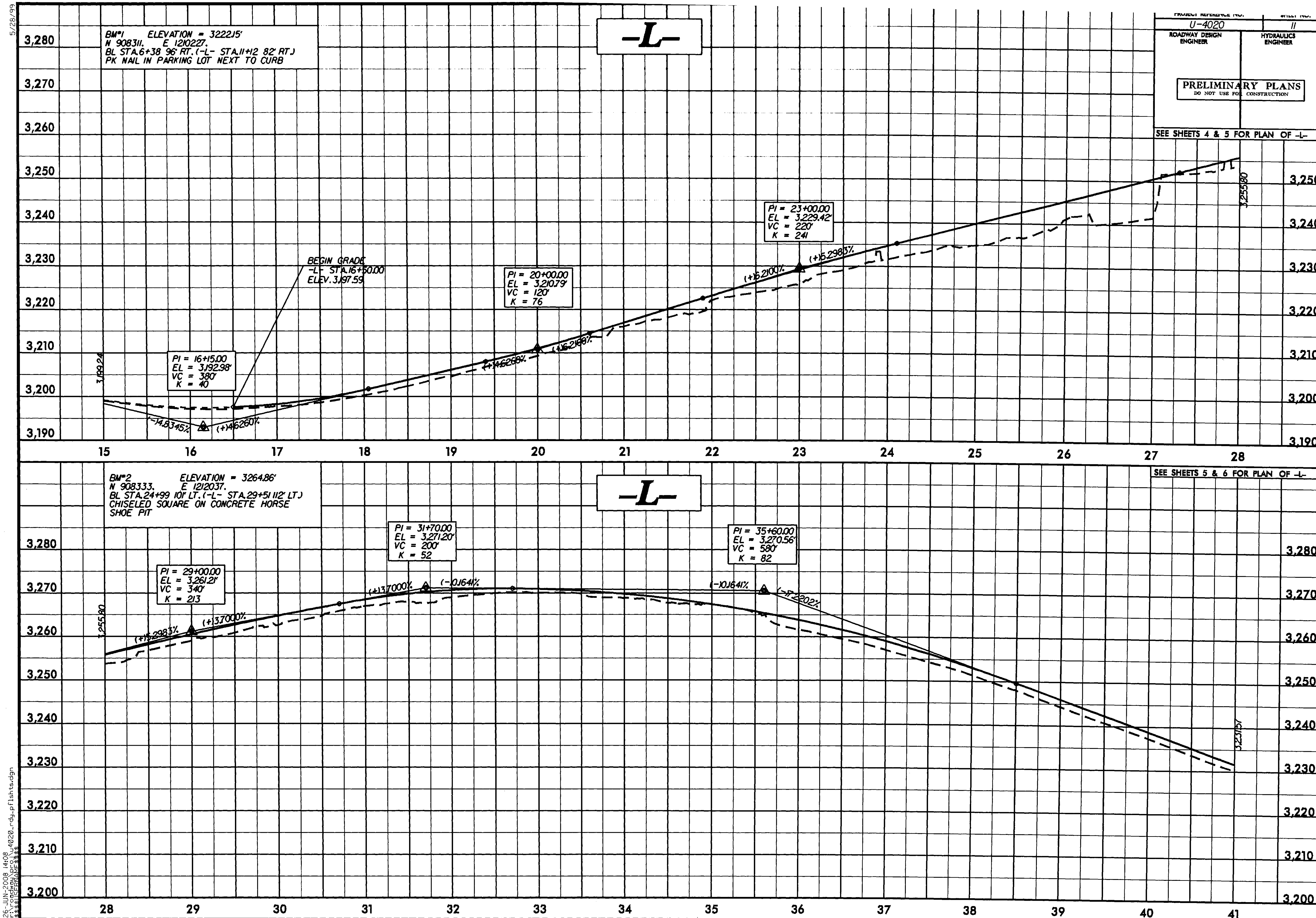
5/28/99



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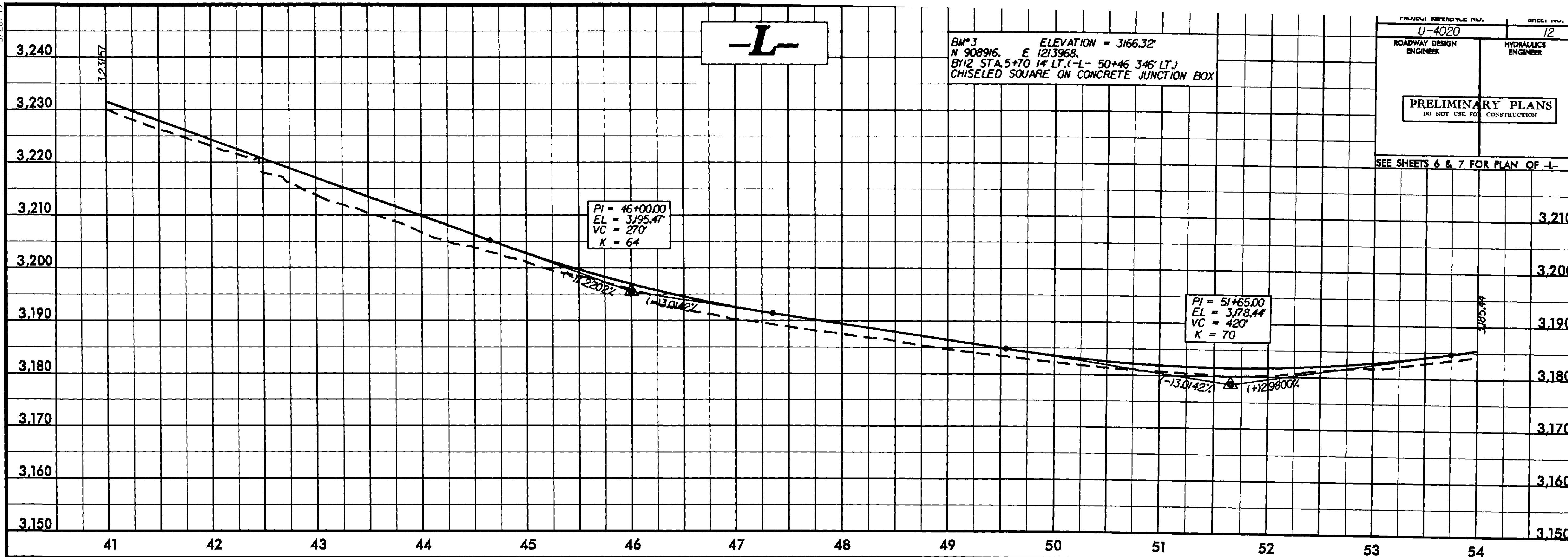
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-

BM#3 ELEVATION = 3166.32'
N 908916. E 1213968.
BY12 STA.5+70 14' LT.(-L- 50+46 346' LT.)
CHISELED SQUARE ON CONCRETE JUNCTION BOX

SEE SHEETS 6 & 7 FOR PLAN OF -L-



-L-

SEE SHEETS 7 & 8 FOR PLAN OF -L-

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PROJECT REFERENCE NO.	SHEET NO.
U-4020	13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SEE SHEETS 8 & 9 FOR PLAN OF -L-

-L-

BM#4 ELEVATION = 3156.50'
N 909277. E 1216348.
BY18 STA.6+97 25' LT. (-Y18- STA.12+07 48' LT.)
(-L- STA.73+81 38' RT.)
CHISELED SQUARE ON CONCRETE BASE FOR VACUUM AT WILCO

END GRADE
-L- STA.74+00.00
ELEV.3150.08

PI = 70+35.00
EL = 3136.64'
VC = 400'
K = 86

3140.2

(-)0.9954%

(+)3.8822%

Extend Existing 3 @ 5' x 5' RCBC and 66" x 52" CMPA with a tapered RCBC. Taper from 14' x 6' and 10' x 6' to 2 @ 10' x 6' with Baffles.

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 763	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 3140.2	FT
BASE DISCHARGE	= 1014	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 3141.1	FT
OVERTOPPING DISCHARGE	= 800	CFS
OVERTOPPING FREQUENCY	= 25+	YRS
OVERTOPPING ELEVATION	= 3140.5	FT

3,190 3,180 3,170 3,160 3,150 3,140 3,130 3,120 3,110 3,100

67 68 69 70 71 72 73 74 75 76

SEE SHEET 4 FOR PLAN OF -Y2-

-Y2-

BEGIN GRADE
-Y2- STA.12+50.00
ELEV.3211.01

PI = 13+15.00
EL = 3208.07'
VC = 20'

(-)4.5231%

(-)12.0501%

END GRADE
-Y2- STA.13+32.56
ELEV.3207.71

3,220 3,210 3,200 3,190 3,180 3,170 3,160

10 11 12 13

SEE SHEET 4 FOR PLAN OF -Y4-

-Y4-

PI = 12+15.00
EL = 3201.01'
VC = 150'
K = 78

(-)15.0034%

(-)13.0706%

END GRADE
-Y4- STA.13+00.00
ELEV.3198.40

BEGIN GRADE
-Y4- STA.10+54.91
ELEV.3209.02

3,210 3,200 3,190 3,180 3,170 3,160 3,150

10 11 12 13 14 15

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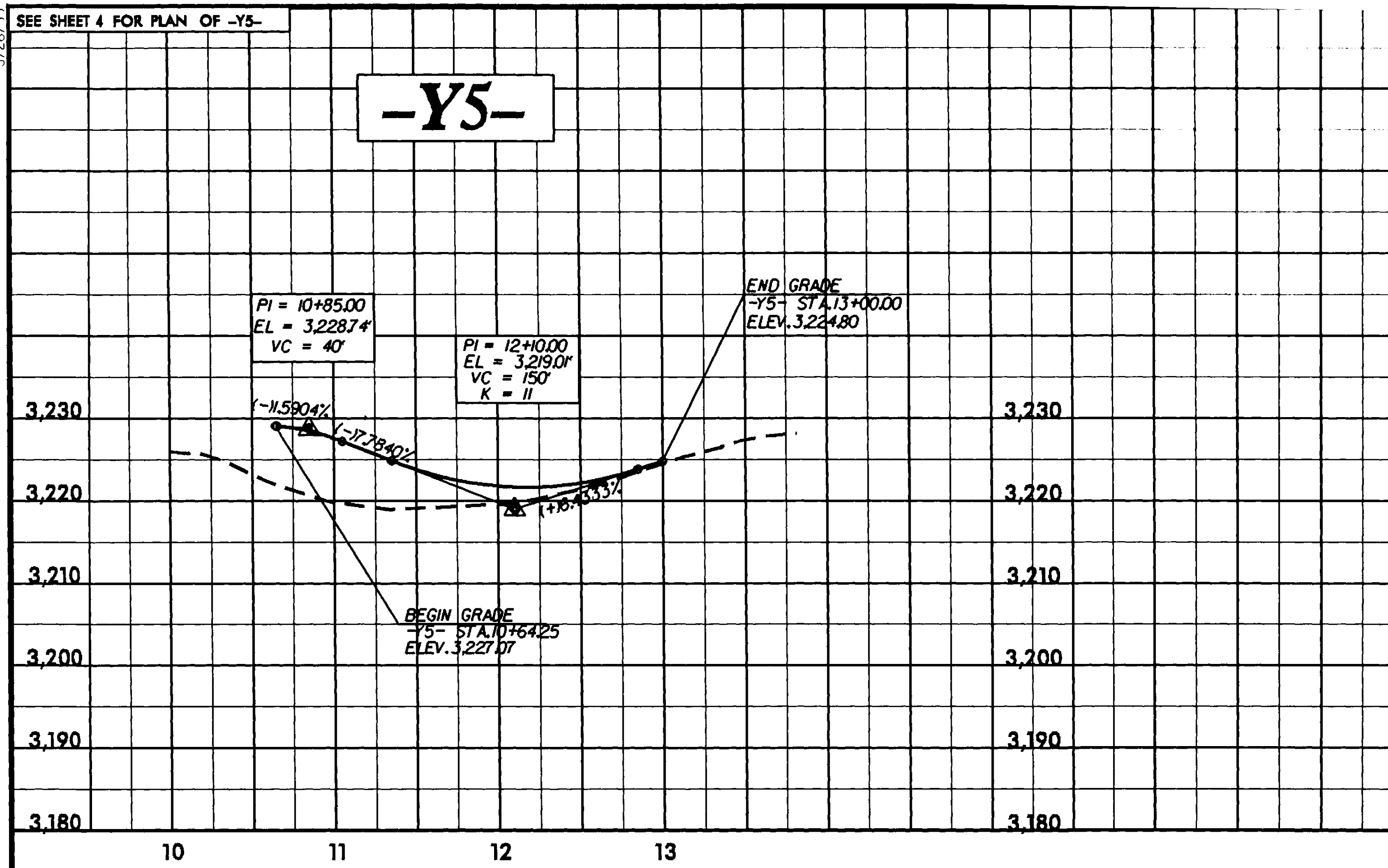
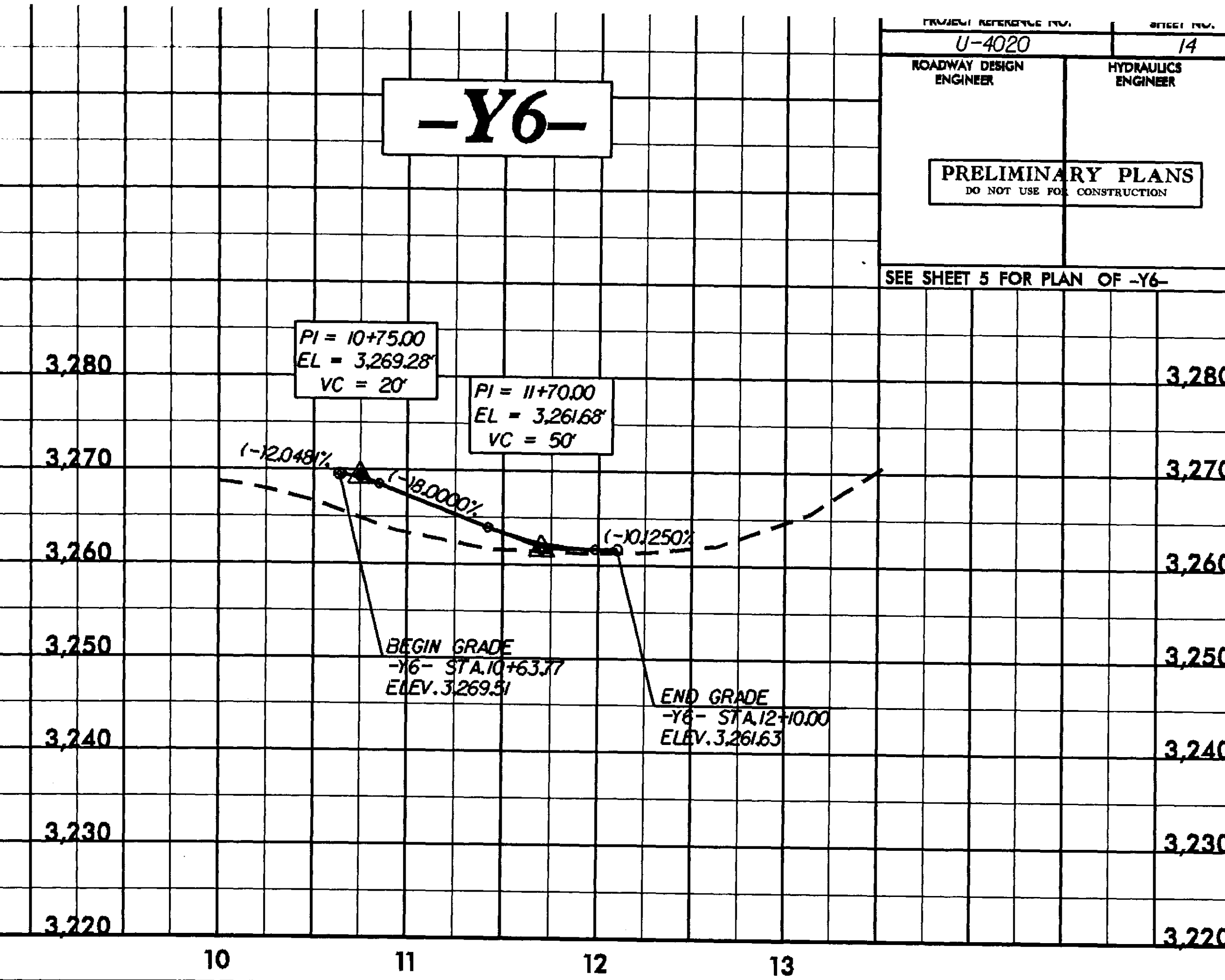
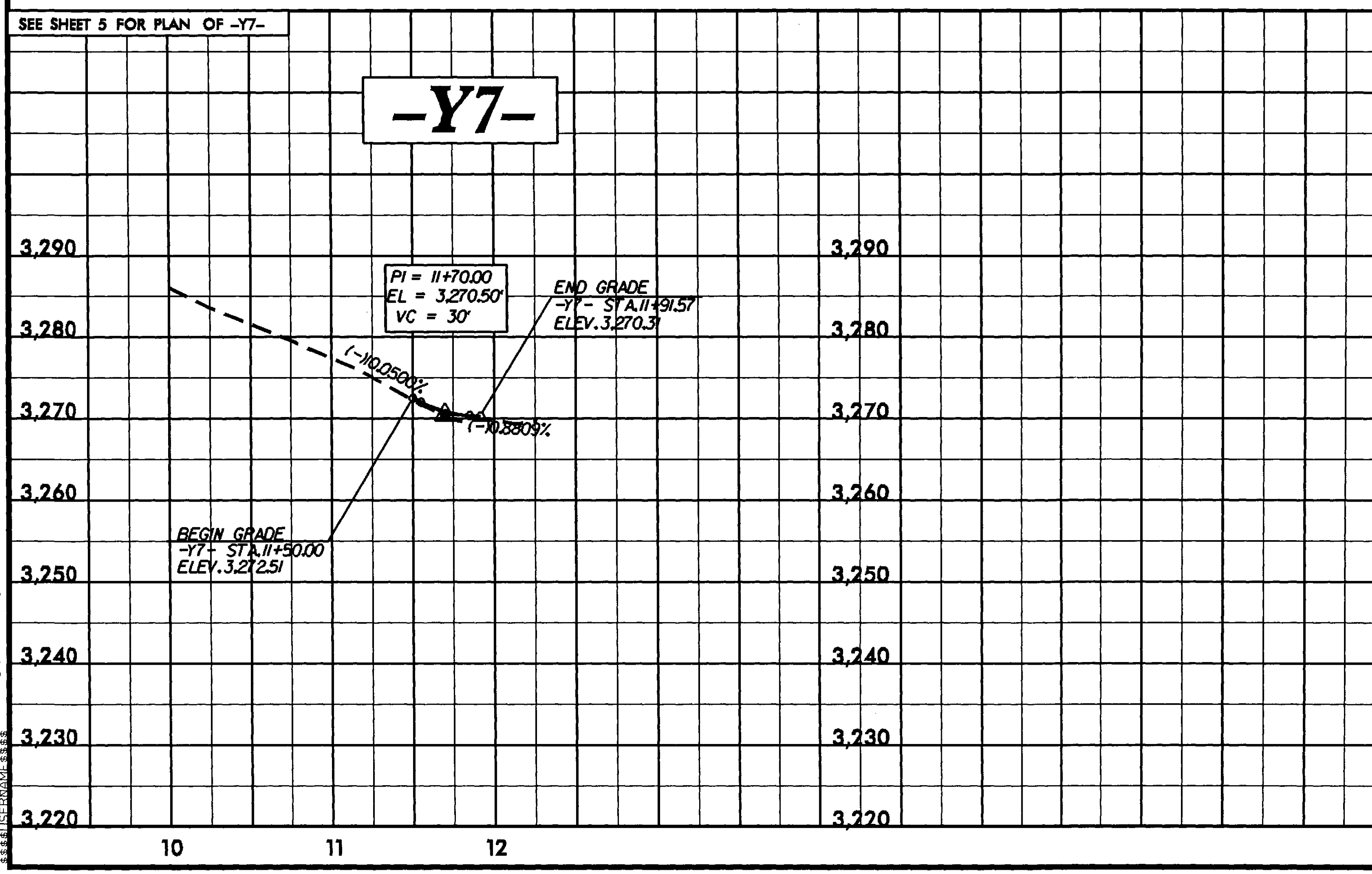
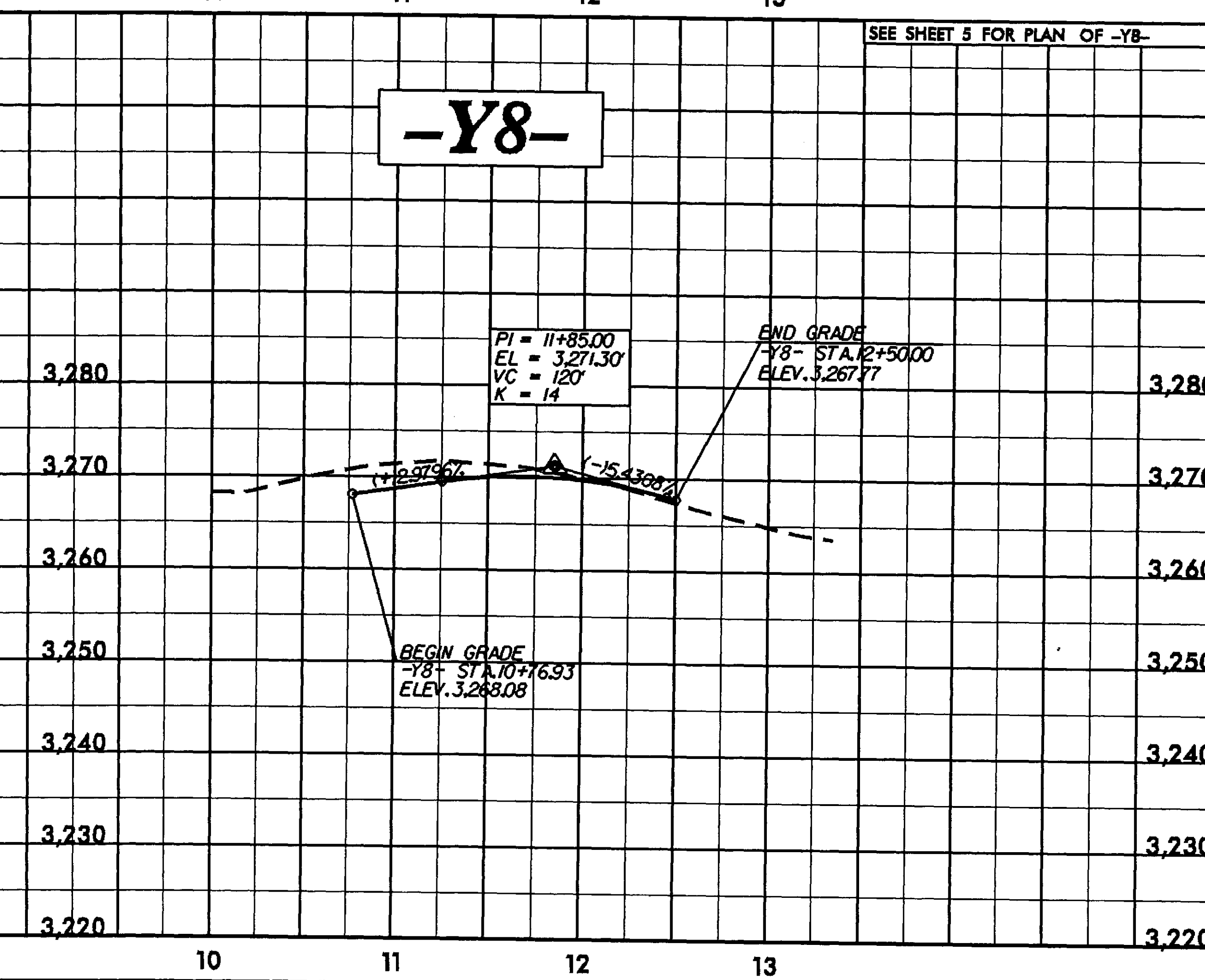
PROJECT REFERENCE NO.	SHEET NO.
U-4020	14
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION









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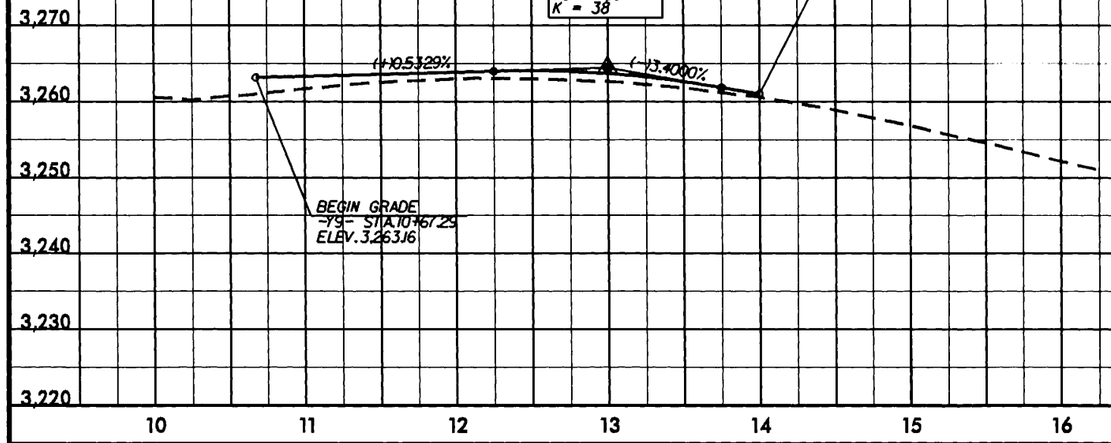
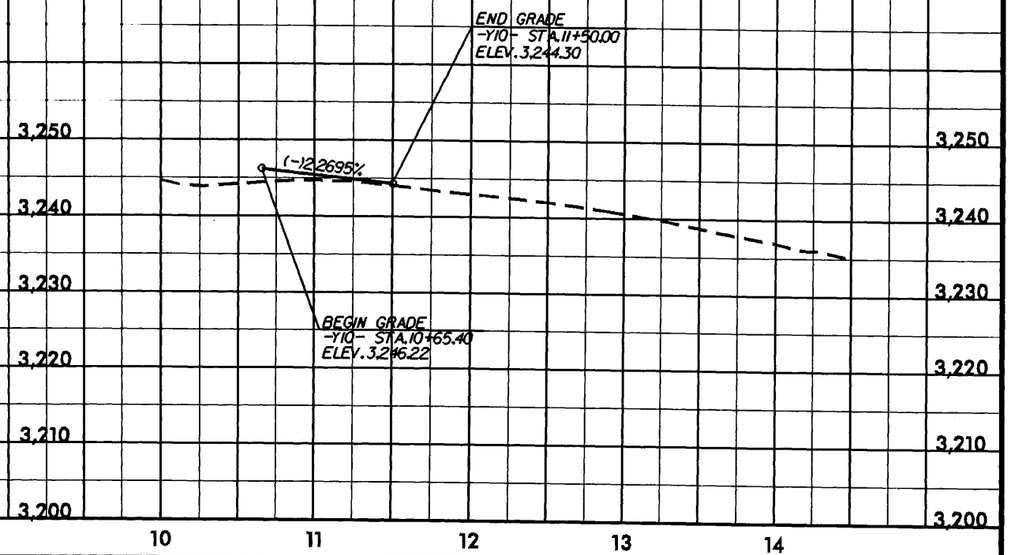
SEE SHEET 5 FOR PLAN OF -Y9-

-Y9-



-Y10-



PROJECT REFERENCE NO. U-4020 | SHEET NO. 15

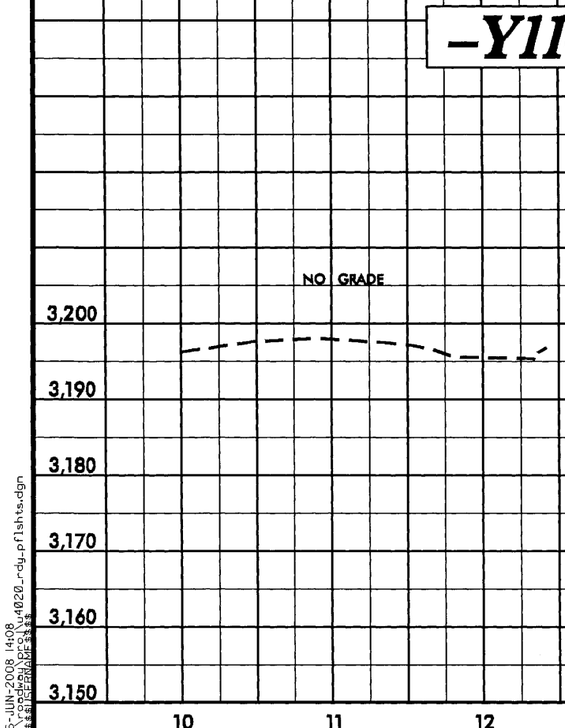
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

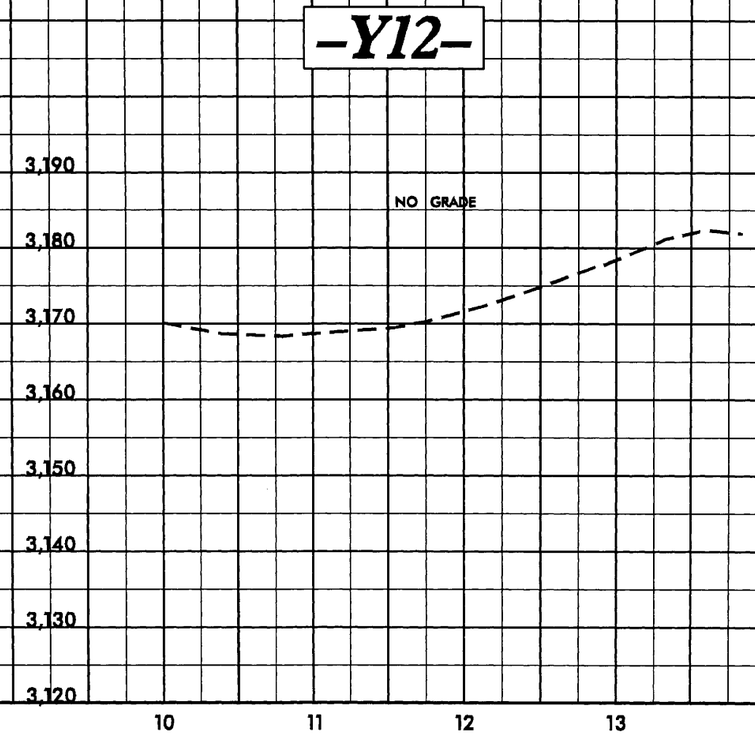
SEE SHEET 6 FOR PLAN OF -Y10-

SEE SHEET 7 FOR PLAN OF -DR4-

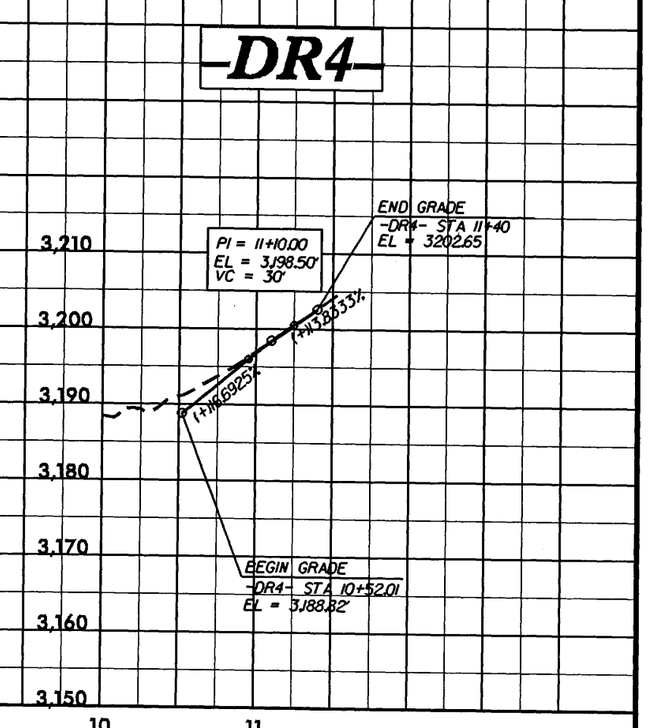
-Y11-



-Y12-



-DR4-



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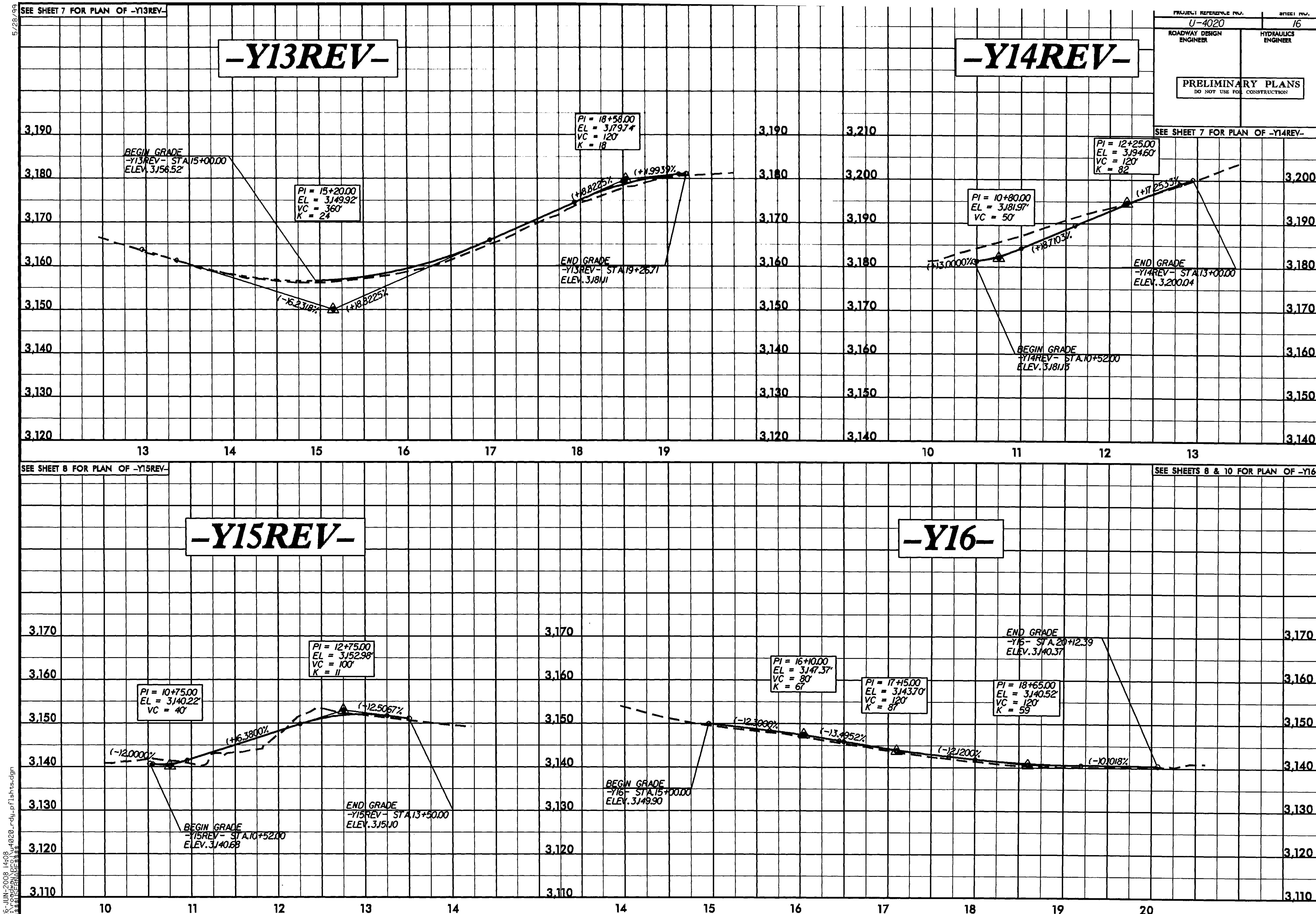
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PROJECT REFERENCE NO. U-4020
SHEET NO. 16
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SEE SHEET 7 FOR PLAN OF -Y13REV-
-Y13REV-
PI = 18+58.00
EL = 3,179.74'
VC = 120'
K = 18
BEGIN GRADE
-Y13REV- STA.15+00.00
ELEV. 3,156.52'
PI = 15+20.00
EL = 3,149.92'
VC = 360'
K = 24
(+)8.8225%
(+)1.9939%
END GRADE
-Y13REV- STA.19+26.71
ELEV. 3,181.11
(-)6.2318%
(+)8.8225%
-Y14REV-
SEE SHEET 7 FOR PLAN OF -Y14REV-
PI = 12+25.00
EL = 3,194.60'
VC = 120'
K = 82
PI = 10+80.00
EL = 3,181.97'
VC = 50'
(+)7.2533%
(+)8.7103%
(+)3.0000%
END GRADE
-Y14REV- STA.13+00.00
ELEV. 3,200.04
BEGIN GRADE
-Y14REV- STA.10+52.00
ELEV. 3,181.13
SEE SHEET 8 FOR PLAN OF -Y15REV-
-Y15REV-
PI = 12+75.00
EL = 3,152.98'
VC = 100'
K = 11
PI = 10+75.00
EL = 3,140.22'
VC = 40'
(-)12.5067%
(+)6.3800%
(-)2.0000%
END GRADE
-Y15REV- STA.13+50.00
ELEV. 3,151.10
BEGIN GRADE
-Y15REV- STA.10+52.00
ELEV. 3,140.68
SEE SHEETS 8 & 10 FOR PLAN OF -Y16-
-Y16-
END GRADE
-Y16- STA.20+12.39
ELEV. 3,140.37
PI = 16+10.00
EL = 3,147.37'
VC = 80'
K = 67
PI = 17+15.00
EL = 3,143.70'
VC = 120'
K = 87
PI = 18+65.00
EL = 3,140.52'
VC = 120'
K = 59
(-)2.3000%
(-)3.4952%
(-)2.1200%
(-)0.1018%
BEGIN GRADE
-Y16- STA.15+00.00
ELEV. 3,149.90
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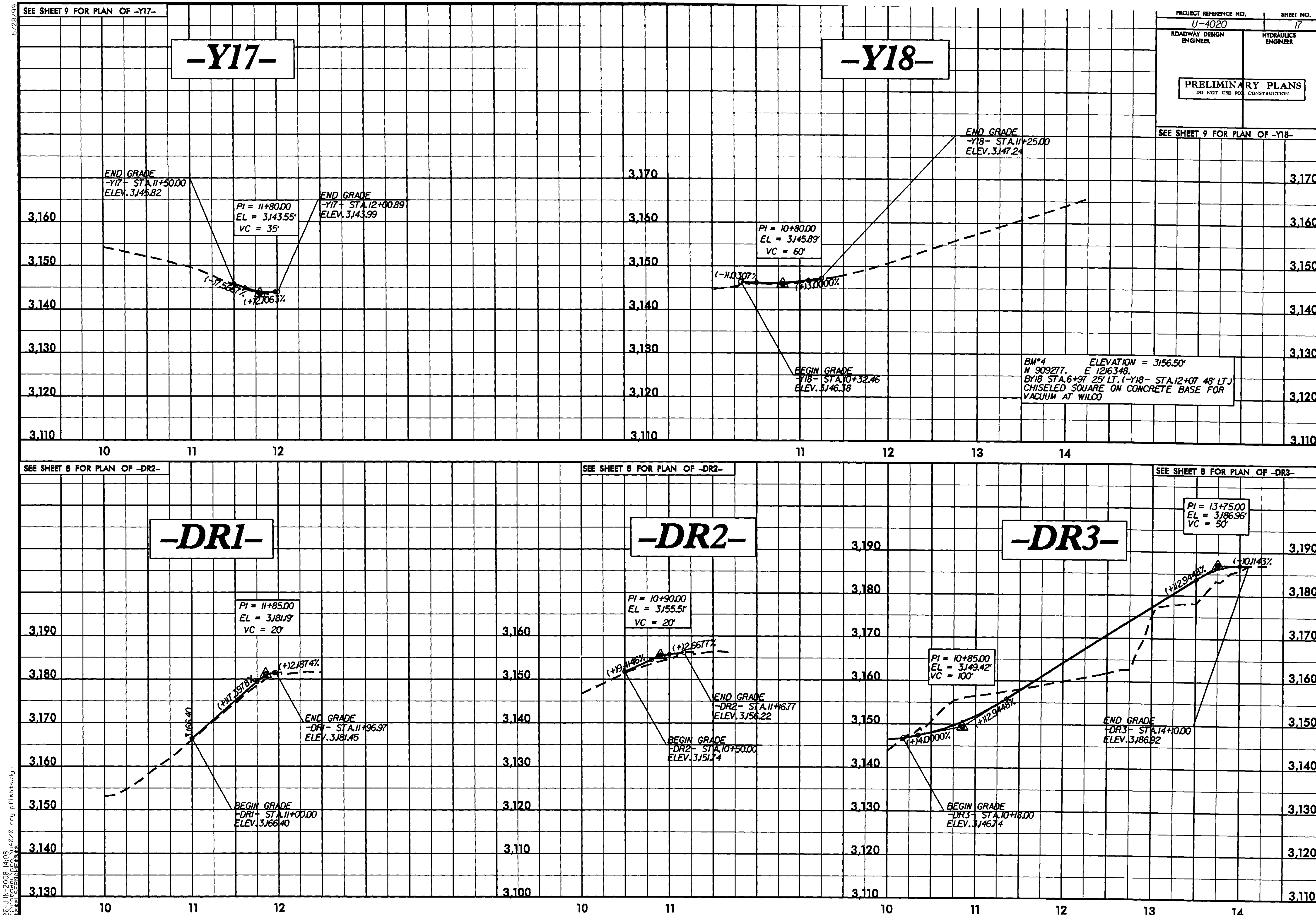
$$$$USERNAME$$$$


PROJECT REFERENCE NO. U-4020
SHEET NO. 17
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
5/28/99
SEE SHEET 9 FOR PLAN OF -Y17-
-Y17-
END GRADE
-Y17- STA.11+50.00
ELEV. 3,145.82
PI = 11+80.00
EL = 3,143.55'
VC = 35'
END GRADE
-Y17- STA.12+00.89
ELEV. 3,143.99
(-)11.5687%
(+)2.1063%
-Y18-
SEE SHEET 9 FOR PLAN OF -Y18-
END GRADE
-Y18- STA.11+25.00
ELEV. 3,147.24
PI = 10+80.00
EL = 3,145.89'
VC = 60'
(-)1.0307%
(+)3.0000%
BEGIN GRADE
-Y18- STA.10+32.46
ELEV. 3,146.38
BM*4 ELEVATION = 3156.50'
N 909277. E 1216348.
BY18 STA.6+97 25' LT. (-Y18- STA.12+07 48' LT.)
CHISELED SQUARE ON CONCRETE BASE FOR
VACUUM AT WILCO
3,170
3,160
3,150
3,140
3,130
3,120
3,110
10
11
12
13
14
SEE SHEET 8 FOR PLAN OF -DR2-
-DR1-
PI = 11+85.00
EL = 3,181.19'
VC = 20'
(+)17.3978%
(+)2.1874%
3,166.40
END GRADE
-DR1- STA.11+96.97
ELEV. 3,181.45
BEGIN GRADE
-DR1- STA.11+00.00
ELEV. 3,166.40
SEE SHEET 8 FOR PLAN OF -DR2-
-DR2-
PI = 10+90.00
EL = 3,155.51'
VC = 20'
(+)19.4146%
(+)2.6677%
END GRADE
-DR2- STA.11+16.77
ELEV. 3,156.22
BEGIN GRADE
-DR2- STA.10+50.00
ELEV. 3,151.74
SEE SHEET 8 FOR PLAN OF -DR3-
-DR3-
PI = 13+75.00
EL = 3,186.96'
VC = 50'
(+)12.9448%
(-)0.1143%
PI = 10+85.00
EL = 3,149.42'
VC = 100'
(+)4.0000%
(+)12.9448%
END GRADE
-DR3- STA.14+10.00
ELEV. 3,186.82
BEGIN GRADE
-DR3- STA.10+18.00
ELEV. 3,146.74
3,190
3,180
3,170
3,160
3,150
3,140
3,130
3,120
3,110
3,100
26-JUN-2008 14:08
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