STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

October 27, 2004
Amended: November 29, 2004

U.S. Army Corps of Engineers
P.O. Box 1890
Wilmington, NC 28402-1890

Attention: Mr. Dave Timpy, USACE
NCDOT Coordinator

Dear Sir:

Subject: **Application for Nationwide 23 Permit**

Proposed replacement of Bridge No. 3 over Little Northeast Creek, in Onslow County, Division 3, Fed. Project No. BRSTP-1423(3), State Project No. 8.2261201, WBS Element 33224.1.1, TIP **B-3682.**

Proposed widening and realignment of SR 1423 (Old Thirty Road) from SR 1411 (Waters Road) to SR 1427 (Grants Creek Loop), in Onslow County, Division 3, Fed. Project No. STP-1423(2), State Project No. 8.7326024, WBS Element 35052.1.1, TIP **W-3413**.

Please find the enclosed copies of the Restoration Plan, half size plans, and the amended permit drawings.

The proposed bridge replacement project, TIP B-3682, calls for the replacement of Bridge No. 3 on SR 1423. Bridge No. 3 crosses Little Northeast Creek, located in the New River and Tributaries Subbasin 03-05-02. The current bridge is 70 feet long, with a 24 foot roadway width. Built in 1964, it consists of four spans and has a reinforced concrete floor and timber joists on timber caps and piles. The deck is 12 feet above the streambed of Little Northeast Creek. According to NCDOT Bridge Maintenance records, the bridge's sufficiency rating is 19.9 out of a possible 100.0. Part of the roadway will be realigned, and a new bridge will be built on a new location to replace the existing bridge. Traffic will be maintained on the existing alignment during the construction period. The existing bridge will be removed upon completion of the new bridge.

Roadway improvement project W-3413 is located adjacent to the proposed bridge replacement project and will be included with B-3682 for permitting purposes. This 2.0 mile project proposes to improve the horizontal curvature of SR 1423 from SR 1427 to SR 1413 in Onslow County. Bridge No. 3 will be removed and replaced at a new location in conjunction with this

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

TELEPHONE: 919-715-1500
FAX: 919-715-1501
WEBSITE: WWW.NCDOT.ORG

LOCATION:
2728 CAPITAL BLVD
PLB SUITE 168
RALEIGH NC 27604

proposed alignment. Currently SR 1423 is a two-lane paved facility, with pavement width varying from 18 feet to 21 feet. The existing roadway is characterized by tangent sections with abrupt transitions to sharp curvature. The existing horizontal alignments are substandard for the posted speed limit. The realigned roadway will be upgraded to AASHTO standards. The realigned roadway will have a 24 foot travelway, with 4 foot paved shoulders and 4 foot grassed shoulders along each side. Where guardrail is required, shoulders will be increased by a minimum of 3 feet on each side. The new roadway will be at approximately the same elevation as the existing structure. This proposed project (W-3413) crosses three intermittent unnamed tributaries (UT) and one perennial UT of Horse Swamp.

An on-site field meeting was held on September 27, 2004. Attendees of this meeting include: Mr. Bill Arrington (NC Division of Coastal Management (DCM)), Mr. Dave Timpy (Army Corps of Engineers (USACOE)), Mr. Mason Herndon (Division 3 Environmental Officer) and Ms. Cheryl Knepp (NCDOT Office of Natural Environment (ONE)). This meeting addressed the following issues:

1) Summarize any discrepancies between the permit drawing impacts and impacts addressed in the CE.
   Discrepancies are minor between impacts accrued in the CE and in the permit drawings. The CE offers a guideline on proposed work, where the permit drawings are the actual designed impacts. When the CE is signed, the design plan is preliminary; and, therefore, impacts are estimates. Wetlands A, B, and L were avoided with only temporary impacts being associated with them as stated in the CE (Table 3, CE B-3682). The impacts shown in the permit drawings for wetlands D, K, Q and P differed slightly from those shown in the CE (see also Table 13, CE W-3413). Channel impacts weren't calculated in the CE; channel impacts were associated with adjacent wetlands. The main difference between the CE and the permit drawings is the impact to UT 2 and wetlands M and N; the CE shows impacts totaling 0.0135 acre. The proposed permit drawings avoid impacts to that area altogether by decreasing the footprint of the proposed project through the reduction of median width, ROW widths, fill slopes and /or road shoulder width.
2) Describe the bridge construction methods to be used.
   After review of the structure plans, Mr. Mason Herndon determined the bridge will be cored slab concrete; therefore, top down construction will be used with pile driving installation methods.
3) Each TIP has a separate Categorical Exclusion document associated with it. For efficiency purposes, Mr. Timpy agreed to allow the projects to be permitted together.
4) The designation of Little Northeast Creek as a "public trust area" is questionable. The stream is marginally navigable by canoe. It seems the area directly under the bridge may have been dredged years ago to allow for greater clearance underneath. This dredging was done to allow safe passage of materials under the bridge during flood events. There is a navigational difference about 50 feet up and downstream of the bridge where the stream returns to its natural meander. It is questionable if a canoe could navigate that area. Mr. Arrington wanted to review the determination made in 2001. Upon conference with Mr. Arrington's supervisor, Ms. Cathy Brittingham, he came to the conclusion on 10/6/04, that the project does not fall within an AEC therefore not requiring a CAMA permit.
5) Create a restoration plan for the causeway and bridge removal.
   The removal of Bridge No. 3 should include extracting (or cutting to streambed elevation) the pilings, including those from previous bridge replacements. This will allow boat traffic to better maneuver Little Northeast Creek. The causeway will be graded down to normal elevation and replanted with indigenous wetland vegetation. The wetlands surrounding the causeway will be reconnected after the extirpation of the roadway. This on-site mitigation

will allow other impacts within the project area to counterbalance, therefore eliminating the off site mitigation request to the EEP. The complete Restoration Plan is attached.

6) All streams and tributaries that are to be impacted by roadway fill and pipe extensions were reviewed. This included UT #: 0, 1, 5, & 6. After examination, Mr. Timpy decided all would be considered intermittent, not requiring mitigation.
   Also, at the time of the site visit, all linear impacts were calculated from easement to easement. However, upon review, impacts will not extend that far. The following changes have been made:
   For "Fill in Surface Water", the impacts are shown from the end of the existing pipe out to the end of the new pipe on the upstream end and out to the end of the rip rap pad on the downstream end.
   For "Existing Channel Impacted," the channel length was measured from the end of the existing pipe to the end of the new pipe on the upstream end. For the downstream end, measurements were taken from the end of the existing pipe to the downstream end of the rip rap pad.

PROPOSED IMPACTS TO WATERS OF THE UNITED STATES

General Description: Horse Swamp and Little Northeast Creek are located in the White Oak River Basin (Hydrological Cataloging Unit 03030001) and are both classified by the Division of Water Quality as **C NSW**. **Neither High Quality Waters (HQW), Water Supplies (WS-I or WS-II), nor Outstanding Resource Waters (ORW) occur within 1.0 mile (1.6 km) of the project area.**

The structure targeted for replacement spans the open water stream associated with Little Northeast Creek. This section of Little Northeast Creek has been assigned Stream Index Number 19-16-2 by the NC DWQ. Little Northeast Creek flows into Northeast Creek approximately 3.8 miles downstream (south) of Bridge No. 3. Field investigations indicate that floodplain wetlands (WL: A, B, D, L) occur along both sides of Little Northeast Creek north and south of SR 1423. Little Northeast Creek is classified as a 303(d) Biologically Impaired Water from its source to Northeast Creek. According to the North Carolina 2003 Impaired Waters List, the cause of impairment is due to its low dissolved oxygen levels. Potential sources of this impairment are urban runoff or storm sewers. Table 1 explains the Cowardin Classification and NC DWQ rating for each impacted wetland. Additional streams or tributaries impacted by the widening roadway improvements are associated with Horse Swamp, which has been assigned Stream Index Number 19-16-2-1 by the NC DWQ. Horse Swamp flows into Little Northeast Creek. There are 3 wetlands (WL: K, Q, P) that will be associated with the impacts of the roadway widening project (see Table 2).

Table 1. Classification of Wetlands within the Project Area

PERMIT DRAWING STATION	CE SITE ID	COWARDIN CLASS	NC DWQ RATING
L 27+70 Lt/Rt	WL A	PFO1EM1	59
L 28+60 LT/RT	WL B	PFO1EM1	29
L 29+50 RT	WL D	PFO1EM1	33
L 25+50 RT	WL K	PFO1EM2B	42
L 27+20 LT/RT	WL L	PFO1EM1B	59
L 102+10 LT	WL Q	PFO1E	40
L 116+15 RT	WL P	PEM1	13

Wetland Impacts: The permanent wetland impacts, summarized in Table 2, total 0.15 acre of palustrine: forested broad-leaved deciduous wetlands. These impacts are associated with mechanized clearing, roadway fill and the installation of 24"and 48" Reinforced Concrete Pipes (RCP). These impacts are related to widening SR 1423. The temporary wetland impacts associated with this project are due to hand clearing inside the wetlands for placement of the new bridge. These temporary impacts total 0.16 acre (see permit drawing sheets 5-10 for further details).

Stream Impacts: The stream impacts, summarized in Table 2, include four intermittent UTs of Horse Swamp (DEM Index No. 19-16-2-1, 8/1/91). Permanent impacts associated with fill in surface water total 0.05 acre and 208 feet of impacts. These impacts are due to installation of 24", 36", 42" and 48" RCPs (see permit drawing sheets 5-10 for further details). ACOE had determined these streams to be intermittent requiring no mitigation (see field meeting summary above).

Table 2: Summary of Jurisdictional Impacts

Permit Drawing Station	CE Site ID	Permanent Wetlands (ac)		Temporary Wetlands (ac)		Surface Waters (SW)	
		R	NR	R	NR	Fill in SW (ac)	Channel Impacts (ft)
L 19+00 Rt	UT 0					0.02	47
L 27+70 Lt/Rt	WL A			0.07			
L 28+60 Lt/Rt	WL B				0.03		
L 29+50 Rt	WL D		0.05		0.02		
L 25+50 Rt	WL K		0.03				
L 27+20 Lt/Rt	WL L				0.05		
L 51+00 Lt/Rt	UT 1					0.01	60
L 102+10 Lt	WL Q	0.05					
L 102+30 Rt	UT 5					0.01	35
L 108+50 Lt/Rt	UT 6					0.01	66
L 116+15 Rt	WL P		0.02				
TOTAL		0.05	0.10	0.07	0.10	0.05	208

R = Riverine NR = Non-Riverine

Utility Impacts: There will be no permanent utility impacts associated with this site. Any necessary clearing of wetlands for utility installation will utilize mats and non-mechanized means, no grubbing methods will be used. All areas where new buried cable or aerial electric utility lines cross the creeks will be installed by the directional bore method. A detailed description of utility work to be performed follows:

Sta. 19+00 -L-
UT # 0 (UT= Unnamed Tributary) Permit Drawing says:
- Fill in surface water and Existing Channel Impacted
* proposed waterline on the north end of the proposed drainage pipe
* proposed water line does not impact the wetland permit drawing site and is outside (beyond) proposed drainage pipe on north side

Note: Sta. 28+00 -L- Northeast Little Creek
* utilize existing water line crossing under creek
* wetland on northside of bridge might be impacted slightly (if any) due to proposed water line relocation/construction

Sta. 51+00 -L-
UT #1 Permit Drawing says:
- Fill in surface water and Existing channel impacted
* proposed water line on the north end of the proposed pipe
* proposed water line is within toe of cut slope and under proposed drainage pipe

Sta. 102+50 -L-
Wetland Q Permit Drawing says:
- Fill in wetland and Mechanized clearing
* proposed water line will be under the proposed drainage pipe
* proposed water line is within toe of fill slope

Sta. 108+50 -L-
UT #6 Permit Drawing says:
- Fill in surface water and Existing channel impacted
* proposed water line will be under drainage

Bridge Demolition: When removing the existing bridge, NCDOT shall not allow debris to fall into the water. The contractor shall remove the bridge and submit plans for demolition in accordance with Article 402-2 of the Standard Specifications. Possible methods for bridge removal involve the contractor lifting out each span with a crane, or saw cutting the bridge in sections, and then lifting these sections out. The piles would either be pulled, or cut off at the mud line.

Removal of Bridge No. 3 should not cause any impacts to Little Northeast Creek or its adjacent wetlands, however, installation of a turbidity curtain is recommended for pile removal and installation.

Due to the possibility of anadramous fish in Little Northeast Creek, bridge demolition is classified as a Case 2, which allows no work at all in the water during moratorium periods associated with fish migration, spawning, and larval recruitment into nursery areas. This moratorium period begins February 15 and lasts until September 30.

Schedule for Construction: It is assumed that the Contractor will begin construction of the proposed bridge work shortly after the date of availability for the project. The let date is March 15, 2005 with a date of availability of April 26, 2005.

AVOIDANCE, MINIMIZATION AND MITIGATION

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.

Practical means to minimize impacts to surface waters and wetlands impacted by the proposed project include:

- Decreasing the footprint of the proposed project through the reduction of median width, ROW widths, fill slopes and /or road shoulder widths.
- Installation of temporary silt fences, turbidity curtains, earth berms, and temporary ground cover during construction.
- Strict enforcement of sedimentation and erosion control BMPs for the protection of surface waters and wetlands.
- Reduction of clearing and grubbing activity in and adjacent to water bodies.

The project was designed to avoid and minimize impacts to wetlands in the area to the maximum extent practicable. The project alignment was chosen to cross the narrowest band of wetlands at the bridge approaches. Additionally, a 200 foot long bridge is proposed which will span and avoid filling most of the wetlands in the area. As a result, impacts were avoided to wetlands A, B, E, F, H, and L. NCDOT also coordinated with the USACE to avoid filling the highest quality wetlands A and L. We were not able to avoid all impacts, however. Impacts to wetlands D and K were unavoidable due to the bridge approach fill. Impacts to wetlands D and K were minimized by decreasing the project footprint in wetlands by the use of 3:1 side slopes and crossing wetlands perpendicularly. Additionally, measures to control erosion during construction will be incorporated as well as strict enforcement of BMPs. The proposed restoration plan (see attached) is approved for on-site mitigation. Project Development & Environmental Analysis Natural Environment Engineering Unit shall be notified before any construction begins with the onsite mitigation proposal.

INDIRECT AND CUMMULATIVE IMPACTS

Based on the forecast in the Onslow County, North Carolina 1997 Land Use Plan, during the next seven to ten year period, Onslow County anticipates no substantial development in the study area. However, Onslow County has no formal zoning requirements; therefore, unplanned development may occur. The proposed improvements, while enhancing safety, are not expected to make the study area more attractive to developers. In addition, the lack of sewer services within the study area is expected to deter development. Furthermore, the proposed improvements will improve vehicle and driver safety along the roadway but will not increase capacity along the roadway. No public or private actions have taken place in the study area that would adversely affect its residents. Therefore, it is concluded that no past or present actions combine to result in a cumulative impact that would either adversely or beneficially affect the study area. Presently, a more thorough ICI report is being compiled and will be distributed upon its completion.

FEDERALLY PROTECTED SPECIES

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

As of January 29, 2003 the U.S. Fish and Wildlife Service (FWS) now lists twelve federally protected species for Onslow County (Table 3). Since the completion of the referenced CE, the bald eagle (*Haliaeetus leucocephalus*) has been added to this list. A species habitat determination is provided below along with a biological conclusion.

Table 3. Federally-Protected Species for Pender County

Scientific Name	Common Name	Status	Habitat Determination	Biological Conclusion
Dernochelys coriacea	Leatherback sea turtle	E	No	No Effect
Picoides borealis	Red-cockaded woodpecker	E	No	No Effect
Charardrius melodus	Piping plover	T	No	No Effect
Alligator mississippiensis	American Alligator	T(S/A)	No	Not Required
Caretta caretta	Loggerhead sea turtle	T	No	No Effect
Chelonia mydas	Green sea turtle	T	No	No Effect
Amaranthus pumilus	Seabeach amaranth	T	No	No Effect
Carex lutea	Golden sedge	PE	No	No Effect
Lysimachia asperulaefolia	Rough leaved loosestrife	E	No	No Effect
Felis concolor cougar	Eastern cougar	E*	No	No Effect
Thalictrum cooleyi	Cooley's meadowrue	E	No	No Effect
Haliaeetus leucocephalus	Bald Eagle	T (proposed for delisting)	No	No Effect

Essential Fish Habitat: The 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act (MSFCMA) set forth a new mandate for the National Marine Fisheries Service (NMFS), regional fishery management councils (FMC) and other Federal agencies to identify and protect important marine and anadromous fish habitat. The FMCs, with the assistance from NMFS, have delineated "essential fish habitat" (EFH) for managed species.

Onslow County is listed as a county that contains waterbodies in which EFH species are found. None of the waterbodies listed are located immediately within the project study area or vicinity, however, Little Northeast Creek flows into Northeast Creek which converges with the New River, a listed waterbody. The New River is approximately 8.9 miles downstream from the project site. Ron Sechler, of NMF, commented that an Essential Fish Habitat study "would not be necessary because the (project study) area was far enough away from the waters of primary concern." He also agreed that, due to the presence of freshwater mussels in Little Northeast Creek, it is not likely that EFH species would be found in the project study area. EFH species are usually found in waters of higher salinity content than freshwater mussels can live in.

REGULATORY APPROVALS

Section 404 Permit: This project is being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). Therefore, we do not anticipate requesting an individual permit but propose to proceed under a Nationwide 23 as authorized by a Nationwide Permit (67 FR 2020; January 15, 2002).

Section 401 Permit: We anticipate 401 General Certification number 3403 will apply to this project. The NCDOT will adhere to all general conditions of the Water Quality Certification. Therefore, in accordance with 15A NCAC 2H, Section .0500(a) we are providing two copies of this application to the North Carolina Department of Environmental and Natural Resources, Division of Water Quality, for their review.

A copy of this permit application will be posted on the DOT website at: http://www.ncdot.org/planning/pe/naturalunit/Permit.html.

If you have any questions or need additional information, please contact Ms. Cheryl Knepp at cknepp@dot.state.nc.us or (919) 715-1489.

Sincerely,

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

cc:
w/attachment
Mr. John Hennessy, Division of Water Quality (7 Copies)
Mr. Travis Wilson, NCWRC
Ms. Cathy Brittingham, NCDCM
Mr. Bill Arrington, NCDCM
Dr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. H. Allen Pope, P.E., Division Engineer
Mr. Mason Herndon, DEO

w/o attachment
Mr. Jay Bennett, P.E., Roadway Design
Mr. Omar Sultan, Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Mark Staley, Roadside Environmental
Mr. David Franklin, USACE, Wilmington
PDEA Project Planning Engineer

On-site Mitigation Plan

Proposed Replacement of Bridge No. 3 on SR 1423 over Little Northeast Creek and SR 1423 from SR 1411 to SR 1413 in Onslow County, North Carolina.

TIP No. B-3682/W-3413

October 22, 2004

Overview

Roadway improvement project W-3413 is located adjacent to the proposed bridge replacement project and will be included with B-3682 for permitting purposes. This 2.0 mile project proposes to improve the horizontal curvature of SR 1423 from SR 1427 to SR 1413 in Onslow County. Bridge No. 3 will be removed and replaced at a new location in conjunction with this proposed alignment. The NCDOT will replace the existing 70-foot long bridge over Little Northeast Creek with a new bridge approximately 200 feet in length, therefore, spanning a large portion of the existing wetlands. Moving the bridge to a new location approximately 80 feet downstream will allow for the removal of approximately 300 linear feet of causeway in previously filled wetlands beginning left of station 26+95-L- to left of station 30+50-L-, not including the bridge over Little Northeast Creek. The existing causeway will be removed and returned to an elevation resembling that of the adjacent wetlands.

Existing Conditions

Bridge No. 3 is currently a causeway, which fills wetland habitat adjacent to Little Northeast Creek. The adjacent community consists of green ash (*Fraxinus pennsylvanica*), river birch (*Betula nigra*), willow oak (*Quercus phellos*) and water oak (*Quercus nigra).*

Proposed Mitigation Activity: Causeway Removal

The removal of the old causeway will mean that approximately 0.28 acres of fill will be removed from wetlands associated with Little Northeast Creek. Approximately 300 feet of existing causeway will be lifted, restoring the palustrine broad leaved wetland underneath. It is anticipated that after the causeway is removed, existing wetlands will again be connected, allowing the natural wetland hydrology to return. Therefore, NCDOT proposes 0.28 acre of riverine wetland restoration credit.

The causeway should be removed to an elevation representative of the adjacent wetlands, not to the wetland delineation line. The elevation at the delineation line is the uppermost point of the wetland, consequently acting as the boundary between wetland conditions and upland dry conditions. Excavating the causeway to a representative elevation prevents a levee effect around the existing wetlands. The wetlands must be connected for hydrology to return. If the uncovered causeway soils are slightly lower than the adjacent wetlands, it is anticipated that organic materials carried by the wind, rain and/or brought in and out by the flushing of the adjacent wetlands will settle into the restored area. This will create the desired upper layer of natural material. It will also create small areas of micro-habitat for fish, amphibians, and small mammals.

Proposed Vegetation:

The NCDOT proposes to replant with indigenous vegetation. The area to be restored will be planted with green ash (*Fraxinus pennsylvanica*), river birch (*Betula nigra*), willow oak (*Quercus phellos*) and water oak (*Quercus nigra).* The NCDOT also expects natural colonization of native flora to occur around the removed causeway.

The proposed restoration area is currently a standing palustrine: forested broad-leaved deciduous wetland community. The canopy of this area is dominated by willow oak, water

oak, American beech (*Fagus grandifolia*), green ash, red maple (*Acer rubrum*), and American elm (*Ulmus americana*).

Proposed Hydrology:

The proximity of the restoration areas to Little Northeast Creek ensures that area will be saturated and/or inundated for extended periods of time. It is anticipated that after the causeway is removed, existing wetlands will again be connected, allowing the natural wetland hydrology to return.

Monitoring

As requested by the Army Corps of Engineers, the NCDOT will perform 3 years of photo monitoring with a site visit to determine if jurisdictional status has been met.

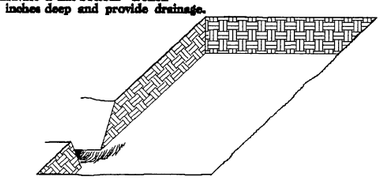
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3682/W-3413	RF-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

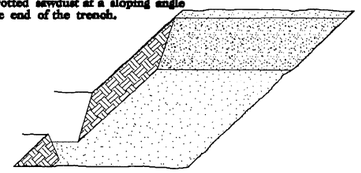
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

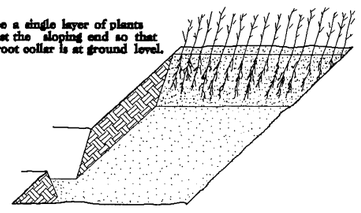
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



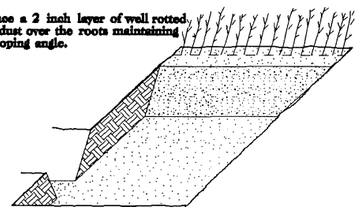
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



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

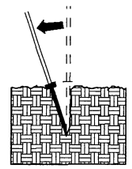


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

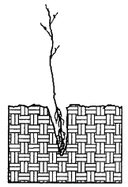


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

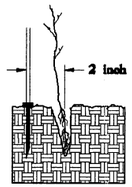
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



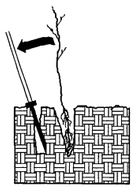
1. Insert planting bar as shown and pull handle toward planter.



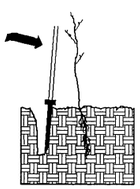
2. Remove planting bar and place seedling at correct depth.



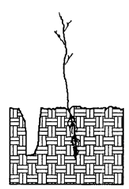
3. Insert planting bar 2 inches toward planter from seedling.



4. Pull handle of bar toward planter, firming soil at bottom.



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

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

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

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

REFORESTATION

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

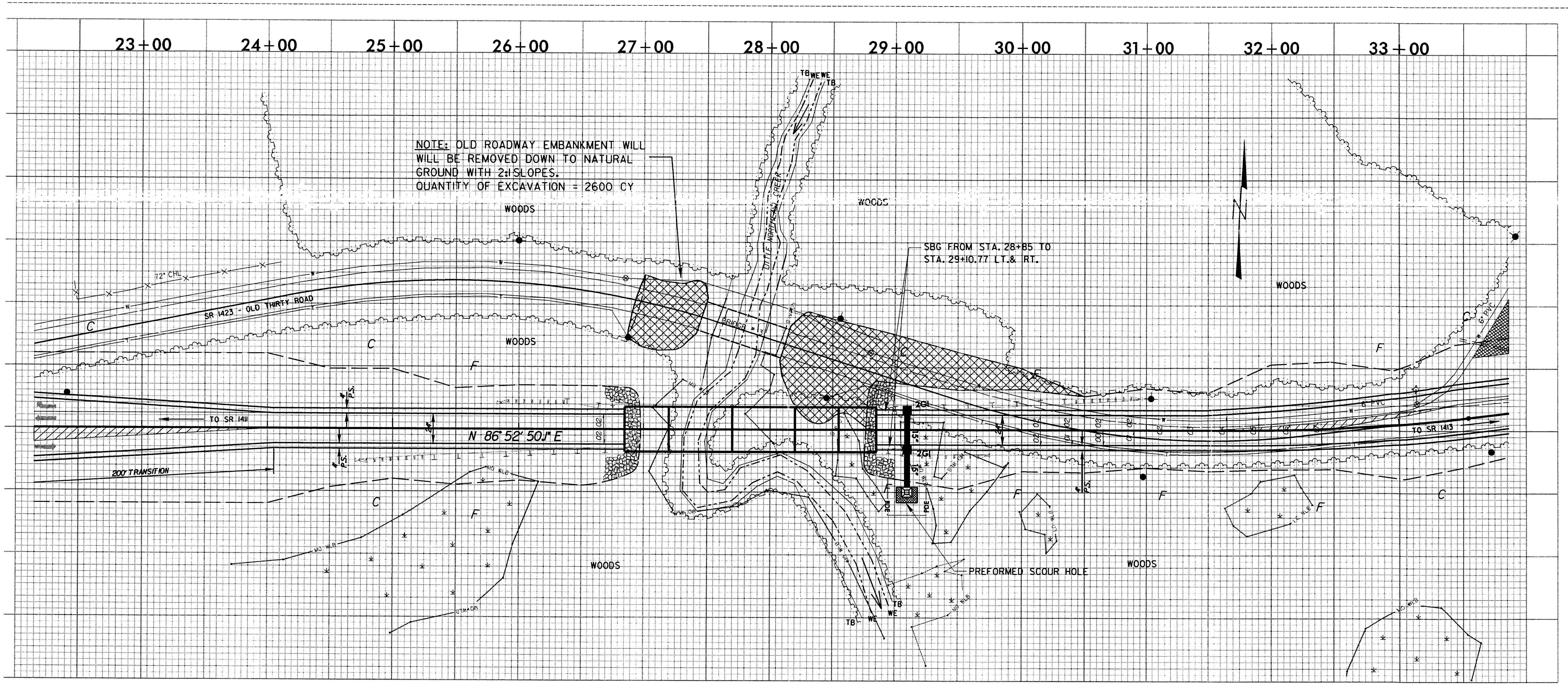
REFORESTATION

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

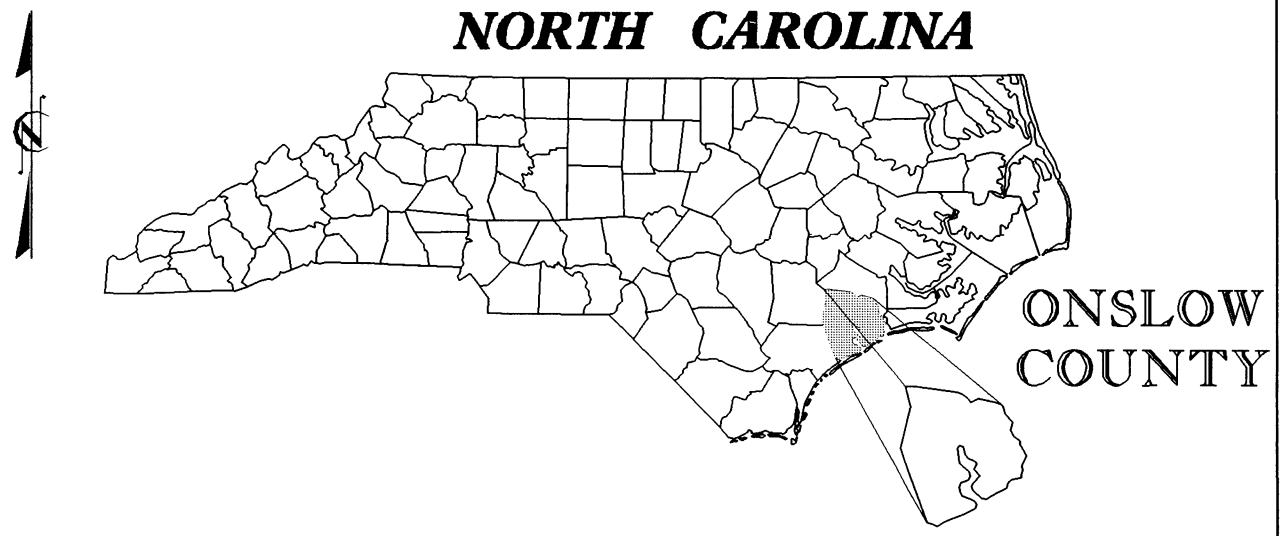
25% QUERCUS NIGRA	WATER OAK	12 in – 18 in BR
25% QUERCUS PHELLOS	WILLOW OAK	12 in – 18 in BR
25% BETULA NIGRA	RIVER BIRCH	12 in – 18 in BR
25% FRAXINUS PENNSYLVANICA	GREEN ASH	12 in – 18 in BR

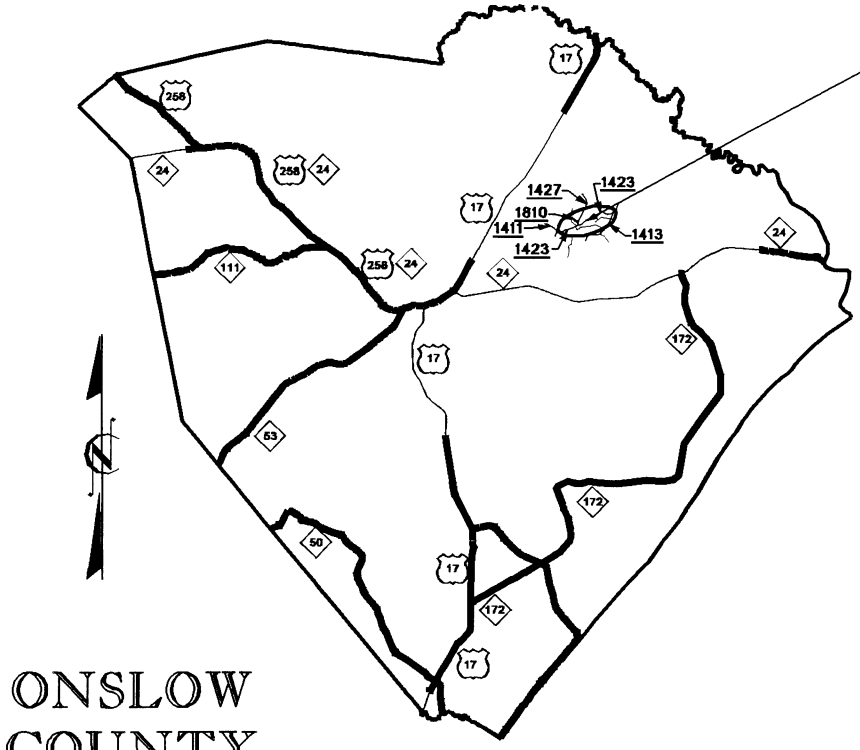
REFORESTATION DETAIL SHEET

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT



23+00
24+00
25+00
26+00
27+00
28+00
29+00
30+00
31+00
32+00
33+00
NOTE: OLD ROADWAY EMBANKMENT WILL
WILL BE REMOVED DOWN TO NATURAL
GROUND WITH 2:1 SLOPES.
QUANTITY OF EXCAVATION = 2600 CY
WOODS
LITTLE NORTHEAST CREEK
SBG FROM STA. 28+85 TO
STA. 29+10.77 LT.& RT.
72" CHL
SR 1423 - OLD THIRTY ROAD
BRIDGE
TO SR 1411
N 86° 52' 50.1" E
200' TRANSITION
TO SR 1413
6" PVC
2GI
PREFORMED SCOUR HOLE
TB
WE
P.S.
N





VICINITY MAP

(WETLANDS
&
SURFACE WATERS)

NCDOT

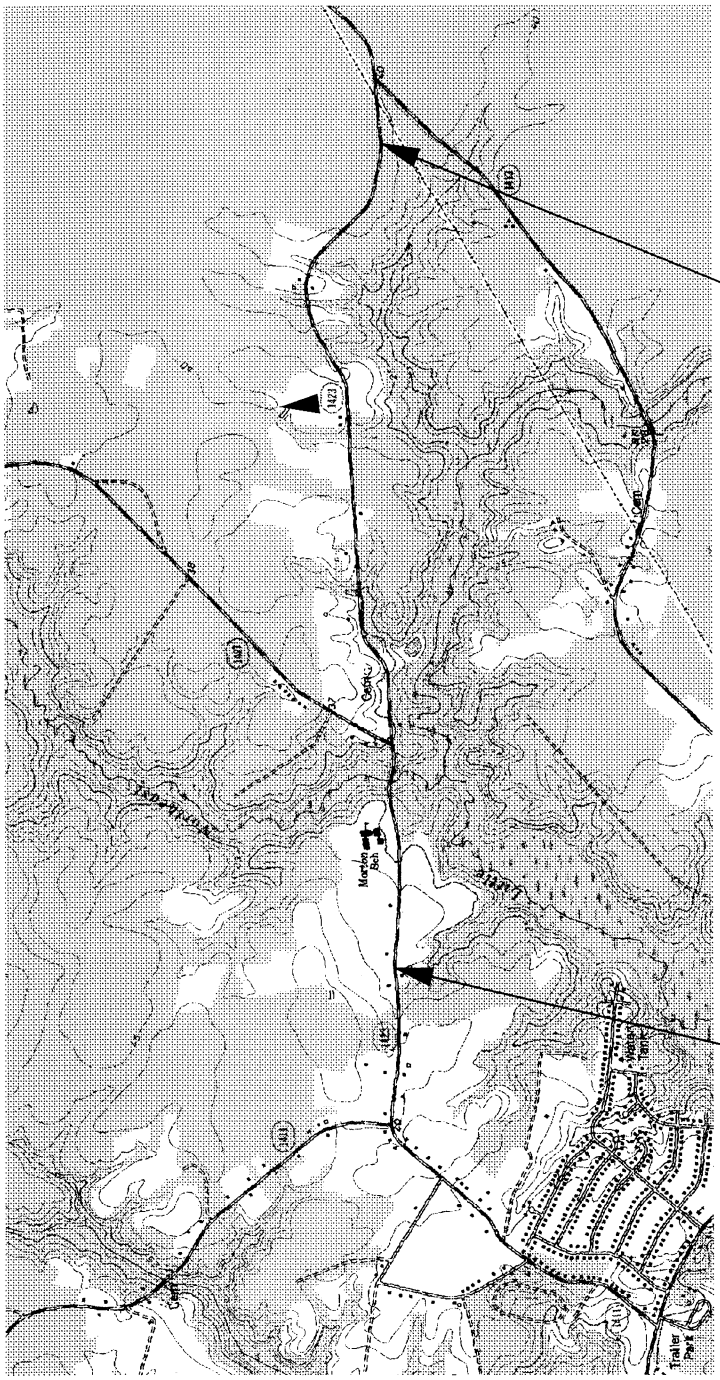
DIVISION OF HIGHWAYS

ONSLOW COUNTY

PROJECTS: 33224.1.1 (B-3682)
& 35052.1.1 (W-3413)

REPLACEMENT OF BRIDGE NO. 3
ON SR 1423 OVER LITTLE NE CREEK

SHEET 1 **OF** 12 **8 JUL 04**



SITE MAP

(WETLANDS & SURFACE WATERS)

NCDOT

DIVISION OF HIGHWAYS

ONSLOW COUNTY

PROJECTS: 33224.1.1 (B-3682) & 35052.1.1 (W-3413)

REPLACEMENT OF BRIDGE NO. 3 ON SR 1423 OVER LITTLE NE CREEK

SHEET 2 OF 12 **8 JUL 04**

WETLAND LEGEND

WLB WETLAND BOUNDARY

WETLAND

DENOTES FILL IN WETLAND

DENOTES FILL IN SURFACE WATER

DENOTES FILL IN SURFACE WATER (POND)

DENOTES TEMPORARY FILL IN WETLAND

DENOTES EXCAVATION IN WETLAND

DENOTES TEMPORARY FILL IN SURFACE WATER

DENOTES MECHANIZED CLEARING

FLOW DIRECTION

TB TOP OF BANK

WE EDGE OF WATER

C PROP. LIMIT OF CUT

F PROP. LIMIT OF FILL

PROP. RIGHT OF WAY

NG NATURAL GROUND

PL PROPERTY LINE

TDE TEMP. DRAINAGE EASEMENT

PDE PERMANENT DRAINAGE EASEMENT

EAB EXIST. ENDANGERED ANIMAL BOUNDARY

EPB EXIST. ENDANGERED PLANT BOUNDARY

WATER SURFACE

LIVE STAKES

BOULDER

CORE FIBER ROLLS

PROPOSED BRIDGE

PROPOSED BOX CULVERT

PROPOSED PIPE CULVERT

(DASHED LINES DENOTE EXISTNG STRUCTURES)

12"-48" PIPES

54" PIPES & ABOVE

SINGLE TREE

WOODS LINE

DRAINAGE INLET

ROOTWAD

RIP RAP

5 ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE

PREFORMED SCOUR HOLE (PSH)

LEVEL SPREADER (LS)

GRASS SWALE

BASE GRASS SWALE

NCDOT

DIVISION OF HIGHWAYS

ONSLOW COUNTY

PROJECTS: 33224.1.1 (B-3682) & 35052.1.1 (W-3413)

REPLACEMENT OF BRIDGE NO. 3 ON SR 1423 OVER LITTLE NE CREEK

SHEET 3 OF 12 **8 JUL 04**

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
5	John W. Banks, et. ux.	1075 Lullwater Circle McDonough, GA 30253
6	Thomas J. Marshall and Kathleen H. Marshall	207 Brentwood Ave. Jacksonville, NC 28540
7	Marijennie B. Warlick	1009 Country Club Drive Jacksonville, NC 28540
11	Marjorie Padgett	619 Old Thirty Road Jacksonville, NC 28546
15	Kathleen M. Leone	602 Old Thirty Road Jacksonville, NC 28546
16	John S. Martin	145 Harbord Drive Midway Park, NC 28544
22	Charles E. Franklin	237 Western Boulevard Jacksonville, NC 28546
23	Donald R. Croom	170 Croom Lane Jacksonville, NC 28546
24	Jeffery L. Lambert	816 Old Thirty Road Jacksonville, NC 28546
28	James V. Rose	828 Old Thirty Road Jacksonville, NC 28546
36	Joseph H. Henderson	1601 Pagan Road Raleigh, NC 27603

NCDOT

DIVISION OF HIGHWAYS

ONSLOW COUNTY

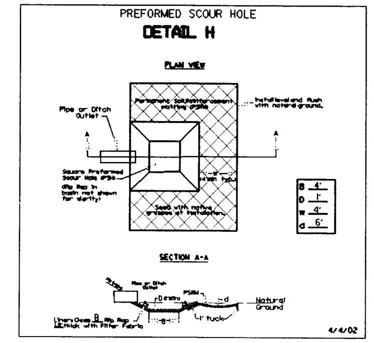
PROJECTS: 33224.1.1 (B-3682)
& 35052.1.1 (W-3413)

REPLACEMENT OF BRIDGE NO. 3
ON SR 1423 OVER LITTLE NE CREEK

PROJECT REFERENCE NO.	SHEET NO.
B-3682 & W-3413	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

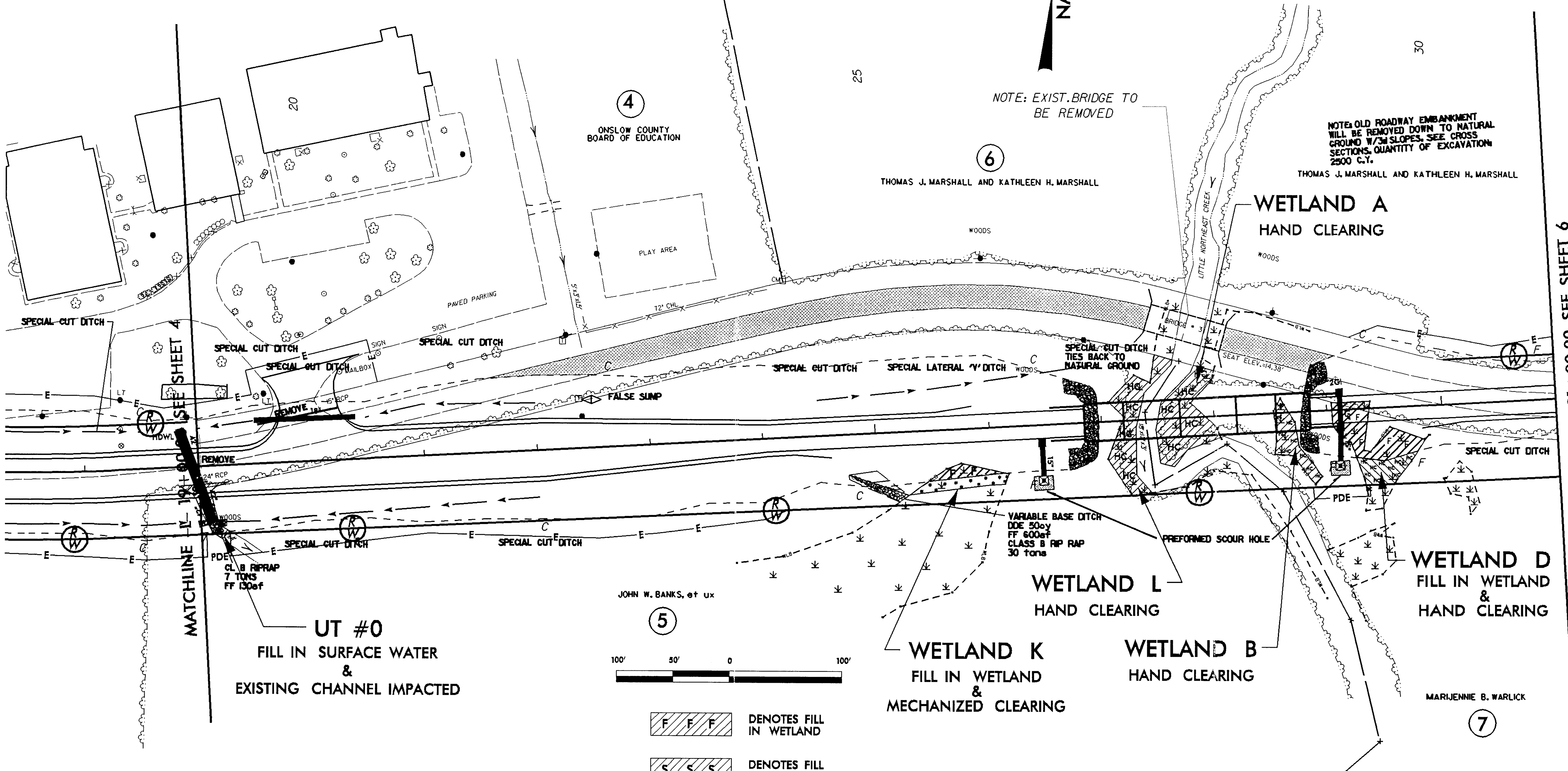
ENGLISH

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PROP. PAINTED ISLAND.
SEE TRAFFIC CONTROL PLANS

PAVEMENT REMOVAL & OBLITERATION



F F F	DENOTES FILL IN WETLAND
S S S	DENOTES FILL IN SURFACE WATER
* * * *	DENOTES MECHANIZED CLEARING
HC HC HC HC	DENOTES HAND CLEARING

REVISIONS

8/17/99

18-NOV-2004 13:42
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mkelly AT

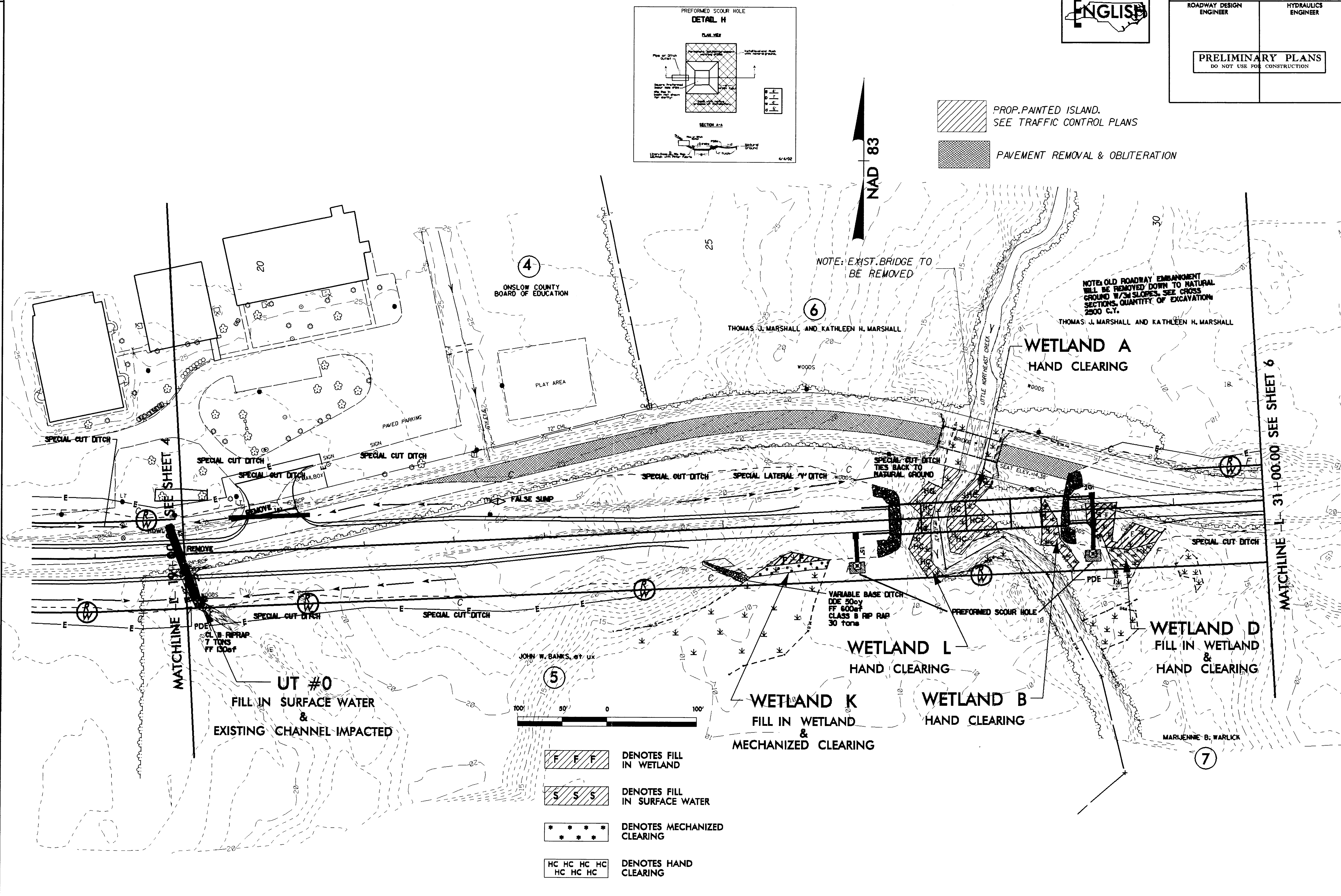
PROJECT REFERENCE NO.	SHEET NO.
B-3682 & W-3413	5A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH

REVISIONS

8/17/99



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r:\hydrau-1\cadd\permits\b3682p-2.psh

8/17/99

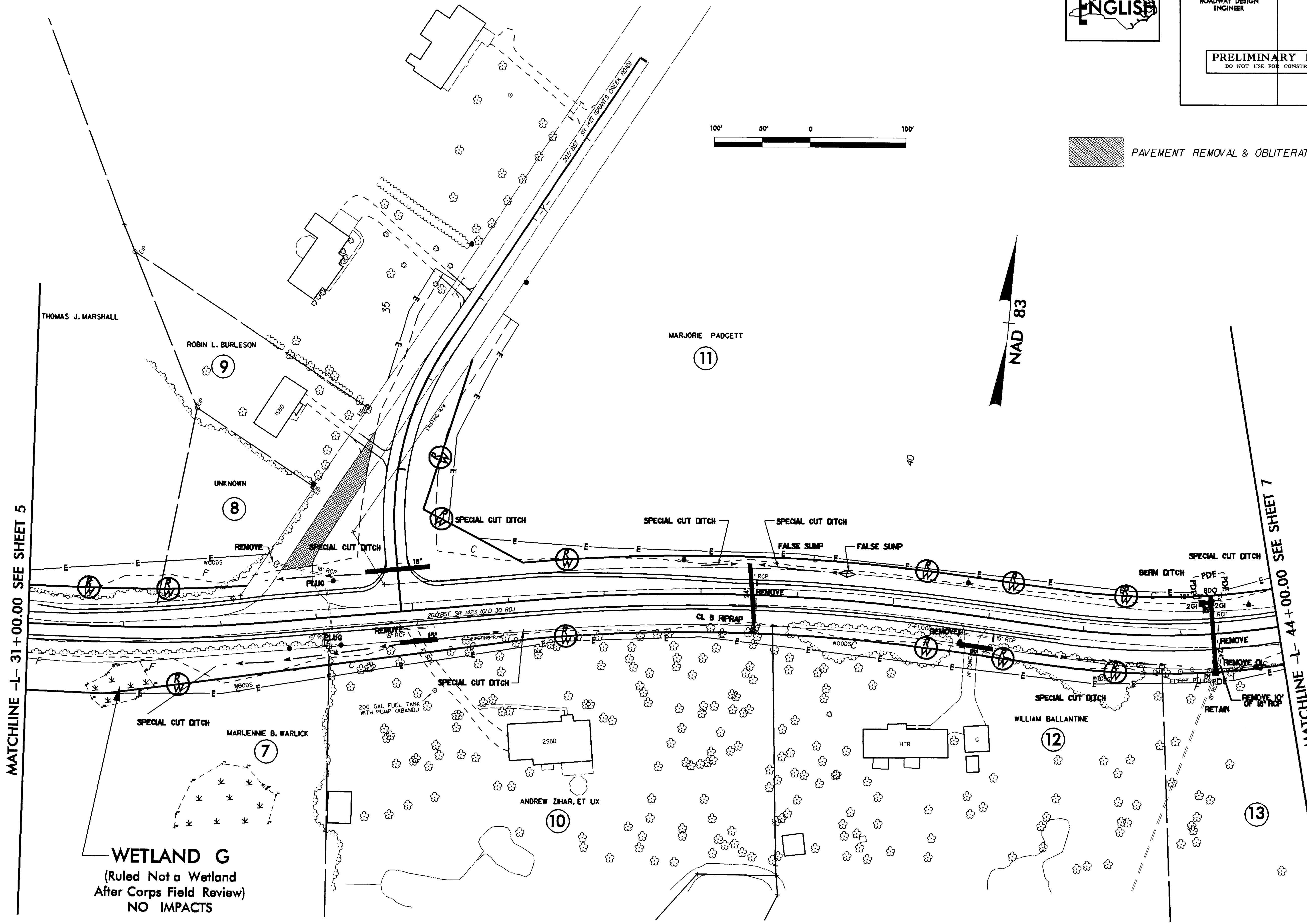
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-3682 & W-3413	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH

PAVEMENT REMOVAL & OBLITERATION



See sheet 12, 13 for -L- Profile

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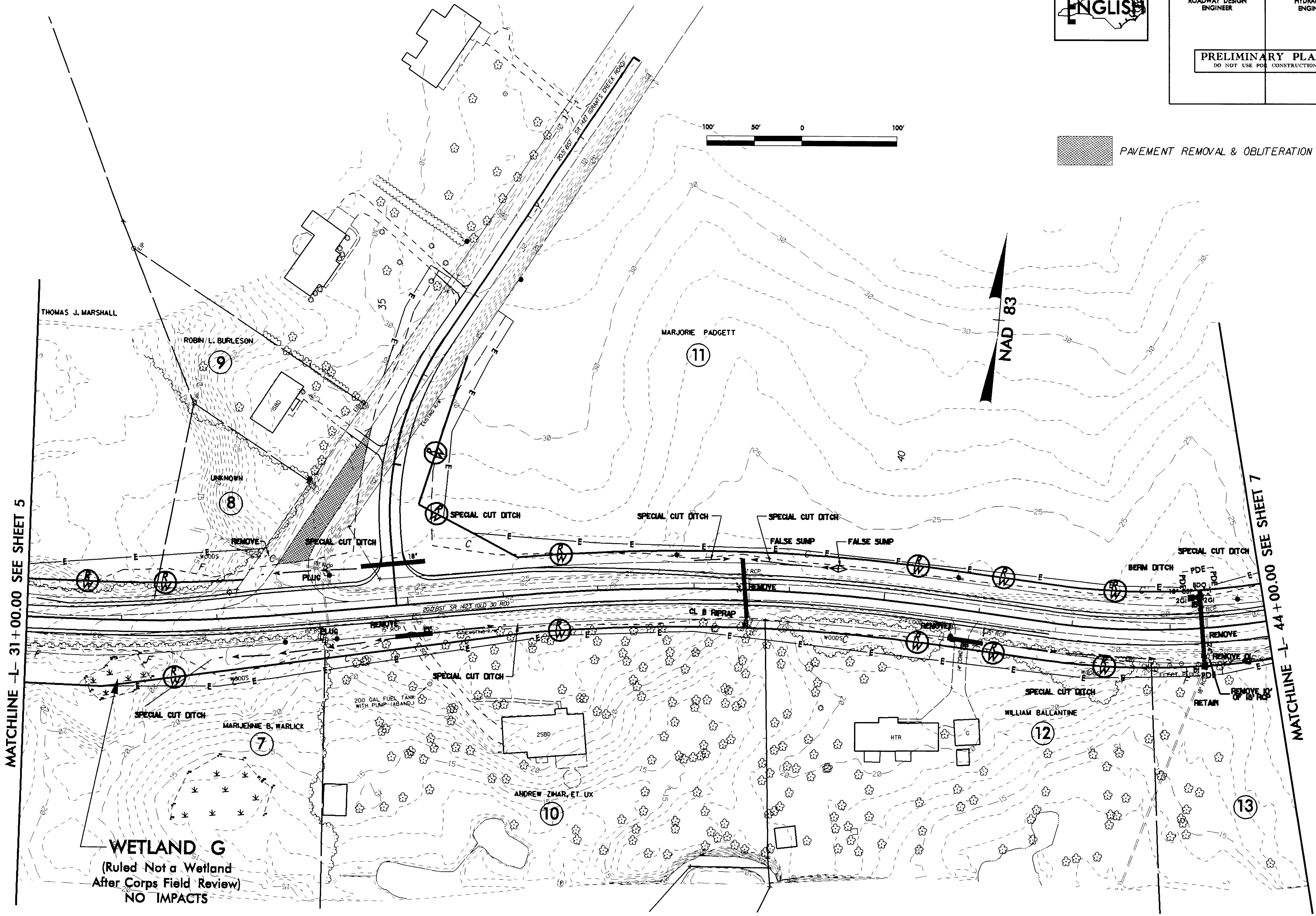
PROJECT REFERENCE NO.	SHEET NO.
B-3682 & W-3413	6A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



See sheet 12, 13 for -L- Profile

REVISIONS

8/17/99

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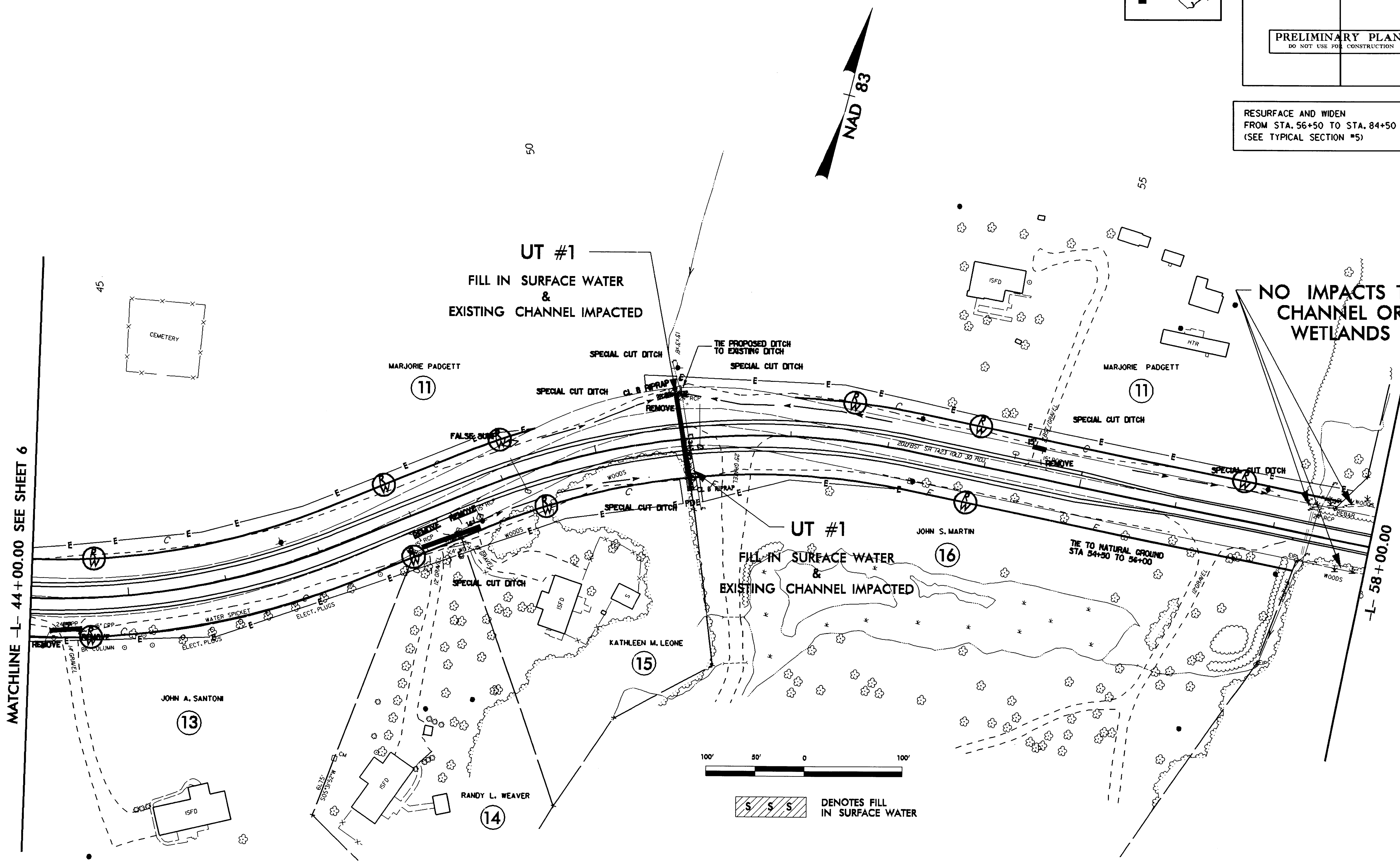
PROJECT REFERENCE NO.	SHEET NO.
B-3682 & W-3413	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH

RESURFACE AND WIDEN
FROM STA. 56+50 TO STA. 84+50
(SEE TYPICAL SECTION #5)



See sheet 13 for -L- Profile

REVISIONS

8/17/99

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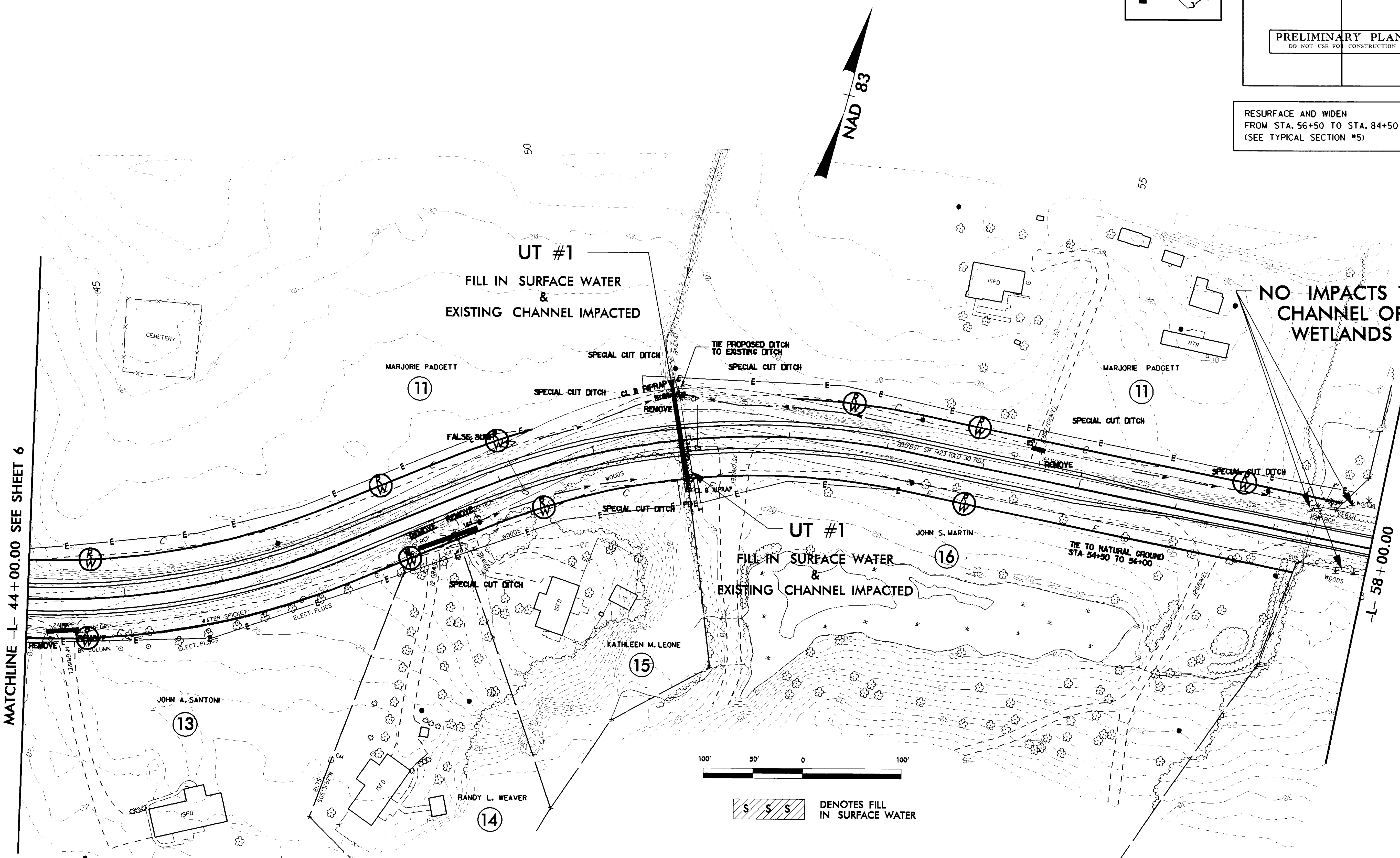
PROJECT REFERENCE NO.	SHEET NO.
B-3682 & W-3413	7A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

RESURFACE AND WIDEN
FROM STA. 56+50 TO STA. 84+50
(SEE TYPICAL SECTION #5)



See sheet 13 for -L- Profile

REVISIONS

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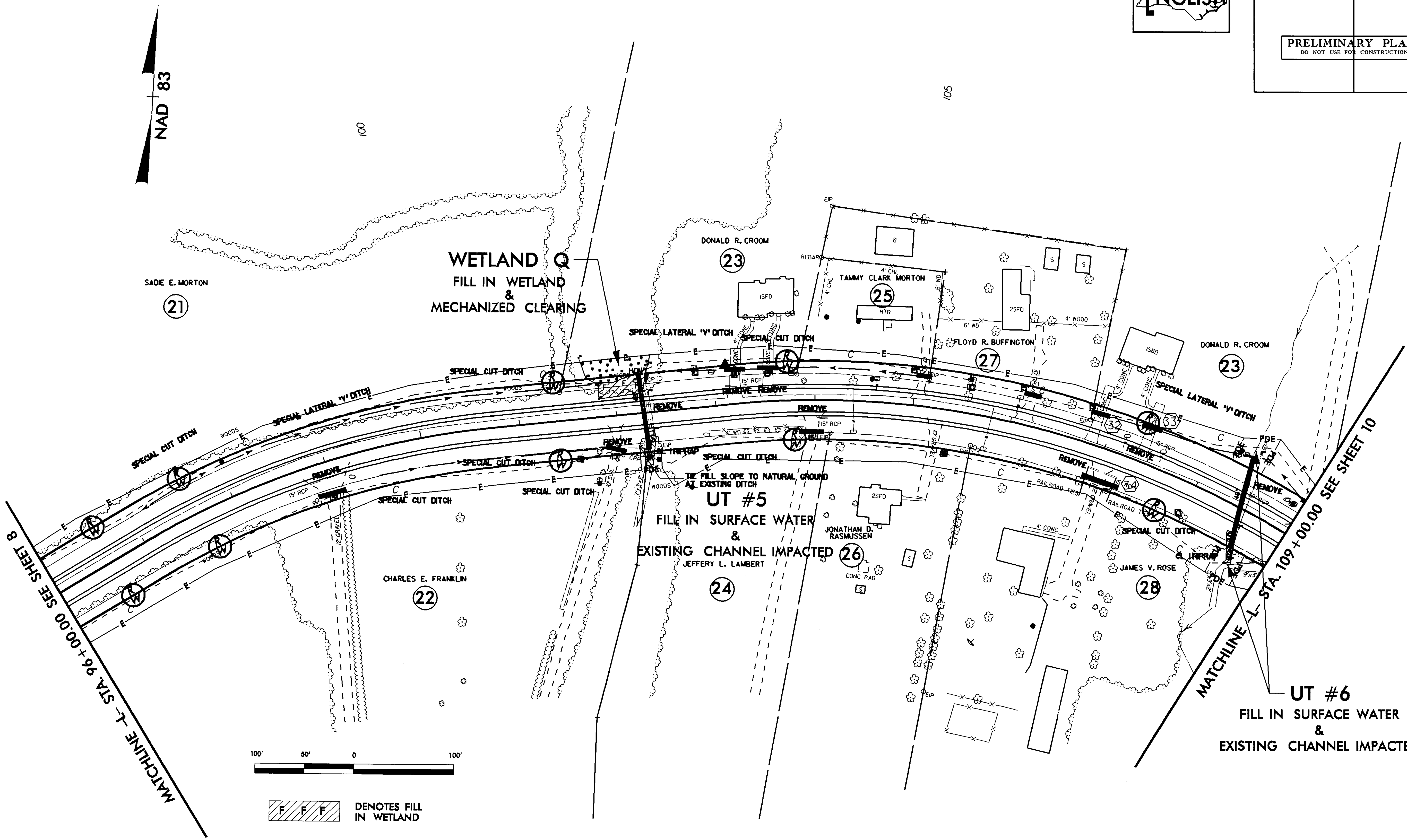
PROJECT REFERENCE NO.	SHEET NO.
B-3682 & W-3413	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH



DENOTES FILL IN WETLAND

DENOTES FILL IN SURFACE WATER

DENOTES MECHANIZED CLEARING

See sheet 15 for -L- Profile

REVISIONS

18-NOV-2004 14:36
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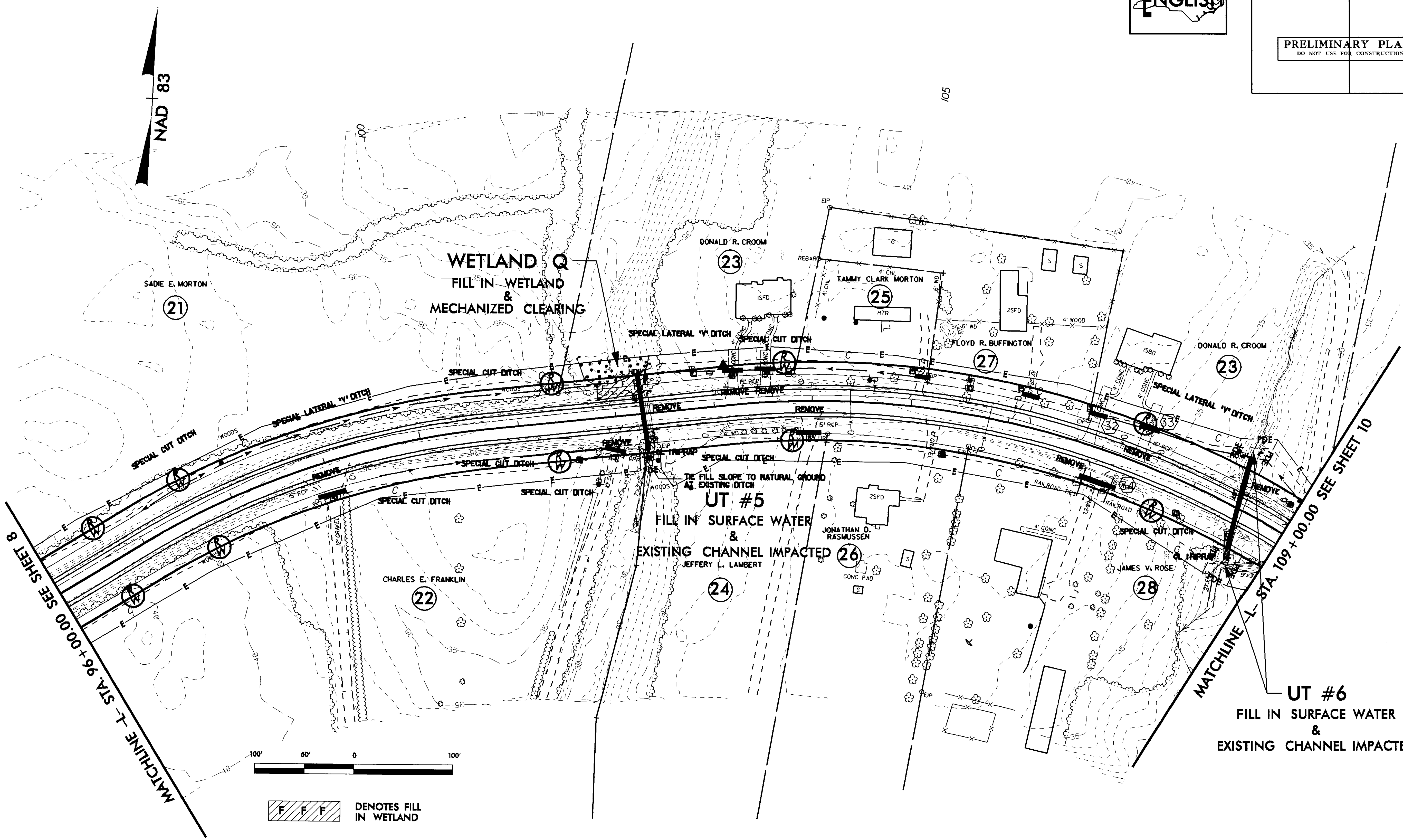
PROJECT REFERENCE NO.	SHEET NO.
B-3682 & W-3413	9A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH



DENOTES FILL IN WETLAND

DENOTES FILL IN SURFACE WATER

DENOTES MECHANIZED CLEARING

See sheet 15 for -L- Profile

REVISIONS

8/17/99

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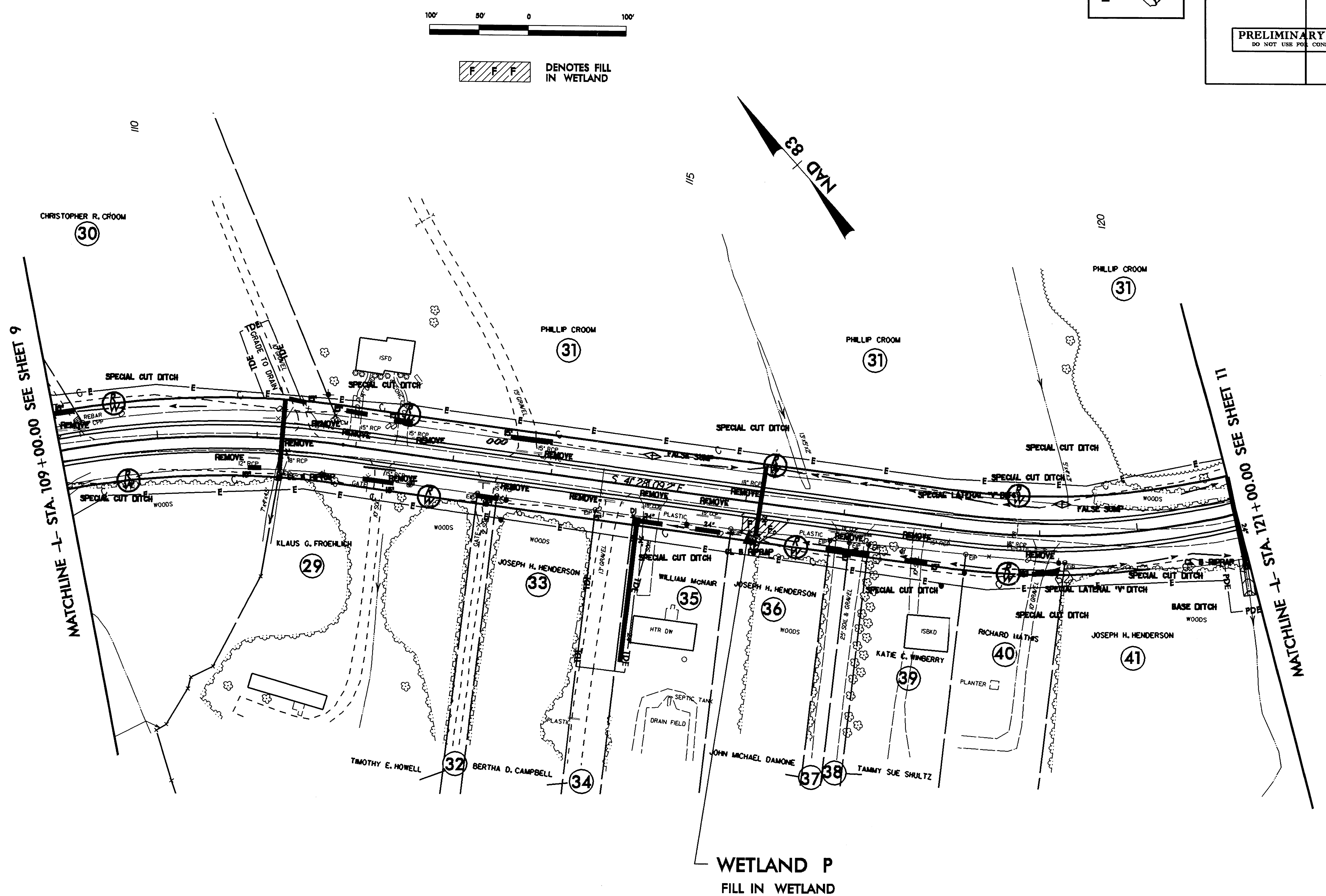
PROJECT REFERENCE NO.	SHEET NO.
B-3682 & W-3413	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



REVISIONS

See Sheet 15 for -L- Profile

22-NOV-2004 10:51
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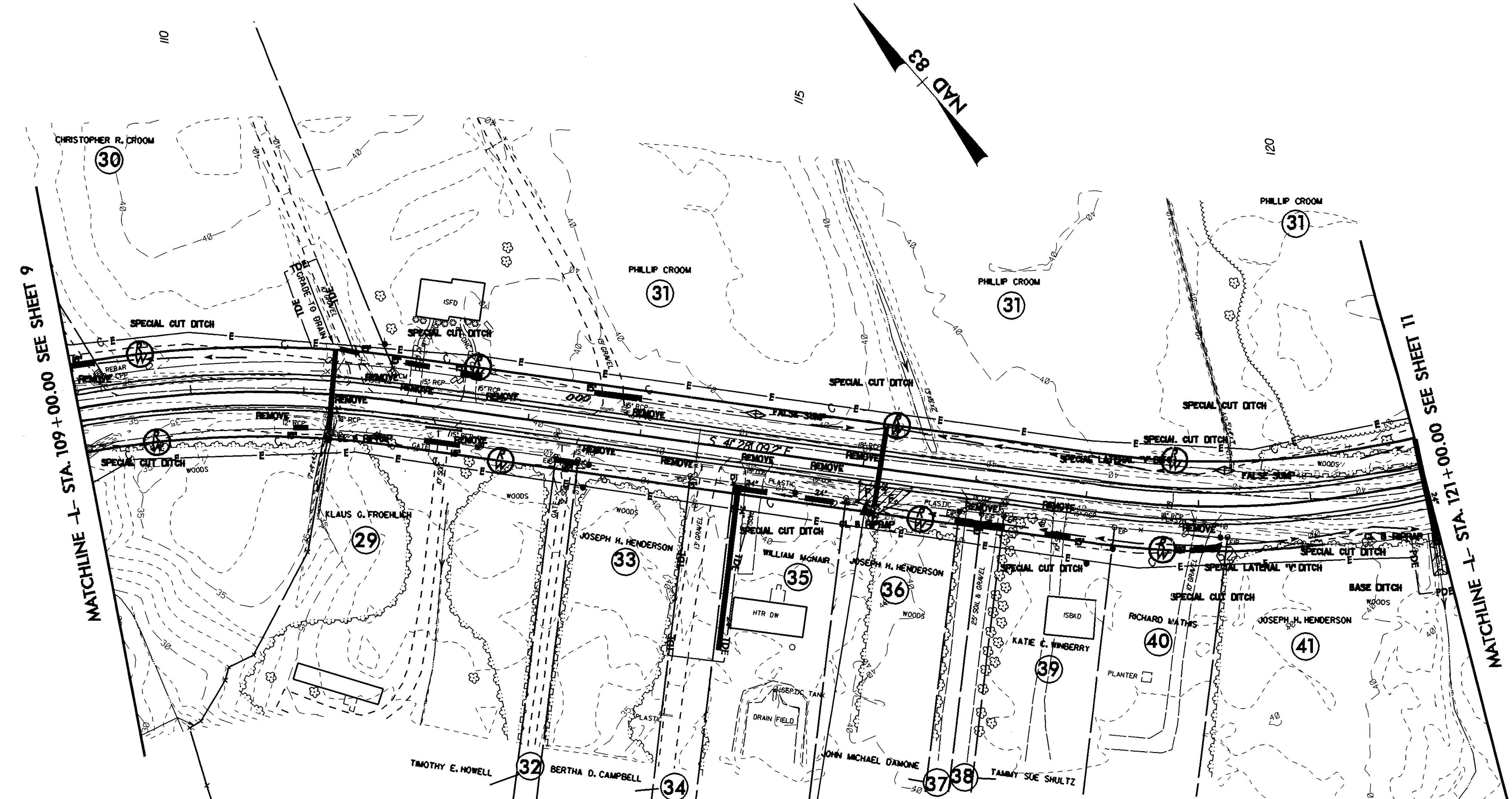
PROJECT REFERENCE NO.	SHEET NO.
B-3682 & W-3413	10A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ENGLISH

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

100' 50' 0 100'

F F F DENOTES FILL IN WETLAND



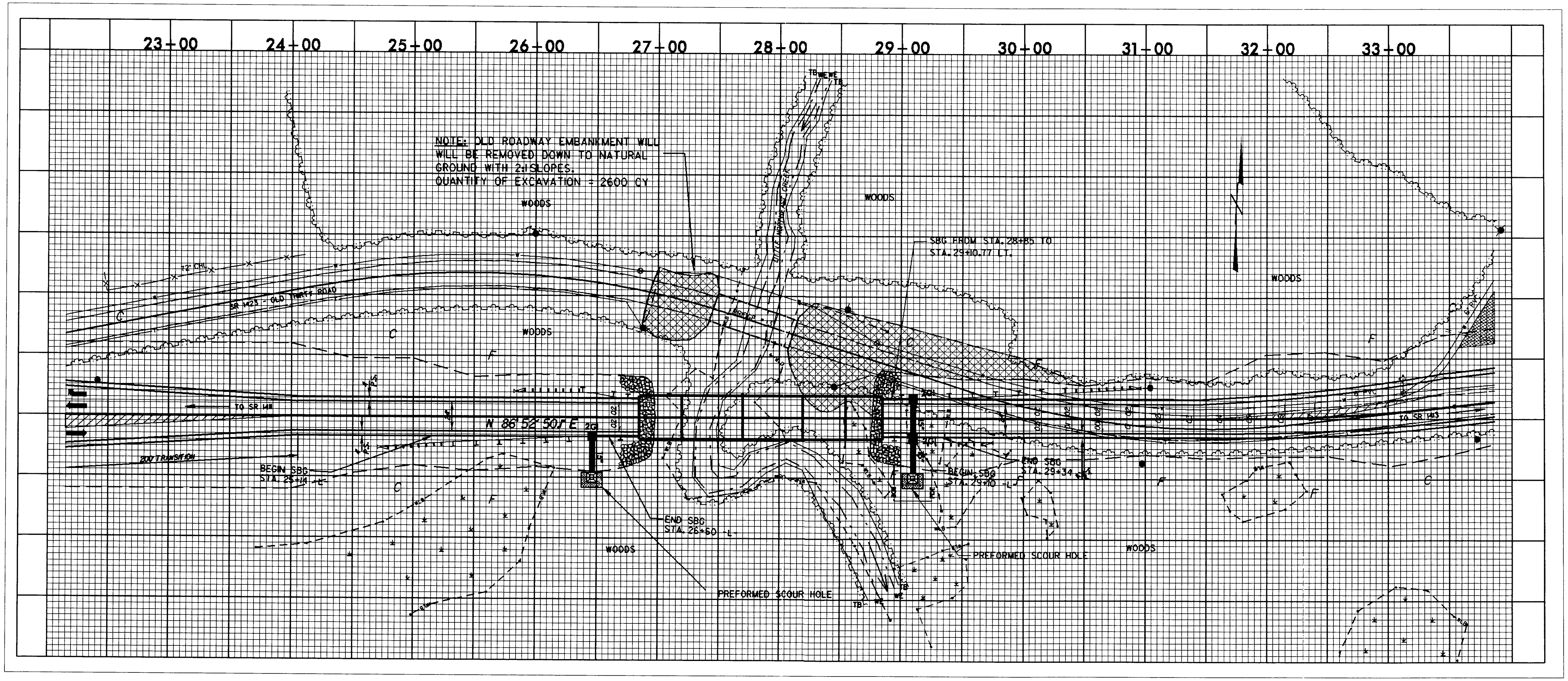
WETLAND P
FILL IN WETLAND

See Sheet 15 for -L- Profile

REVISIONS

8/17/9

22-NOV-2004 10:49
r:\hydraulic\cadd\permits\b323bb-1.psh


23+00
24+00
25+00
26+00
27+00
28+00
29+00
30+00
31+00
32+00
33+00
NOTE: OLD ROADWAY EMBANKMENT WILL
WILL BE REMOVED DOWN TO NATURAL
GROUND WITH 2:1 SLOPES.
QUANTITY OF EXCAVATION = 2600 CY
WOODS
WOODS
WOODS
WOODS
WOODS
WOODS
SBG FROM STA. 28+85 TO
STA. 29+10.77 LT.
N 86°52'50" E
BEGIN SBG
STA. 25+14 -L-
END SBG
STA. 26+60 -L-
BEGIN SBG
STA. 29+10 -L-
END SBG
STA. 29+34 -L-
PREFORMED SCOUR HOLE
PREFORMED SCOUR HOLE
TO SR 1143

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing (Method III) (ac)	Hand Clearing (ac)	SURFACE WATER IMPACTS: Fill In SW (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)	Natural Stream Design (ft)
UT #0	-L- 19+00 Rt	2 @ 42in RCP						0.02		47	
WL A	-L- 27+70 Lt & Rt	Bridge					0.07				
WL B	-L- 28+60 Lt & Rt	Bridge					0.03				
WL D	-L- 29+50 Rt	Roadway Fill	0.05				0.02				
WL K	-L- 25+50 Rt	Roadway Fill	0.01			0.02					
WL L	-L- 27+20 Lt & Rt	Bridge					0.05				
WL G	-L- 32+00 Rt	Roadway Fill	**RULED NOT A WETLAND BY CORPS.**								
UT #1	-L- 51+00 Lt & Rt	1 @ 36in RCP						0.01		60	
WL Q	-L- 102+10 Lt	Roadway Fill & 48in RCP	0.02			0.03					
UT #5	-L- 102+30 Rt	Roadway Fill & 48in RCP						0.01		35	
UT #6	-L- 108+50 Lt & Rt	Roadway Fill & 48in RCP						0.01		66	
TOTALS, THIS SHEET:			0.08	0	0.00	0.05	0.16	0.05	0	208	0

ACOE has determined UT 1, 5, and 6 are intermittent streams requiring no mitigation

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ONSLOW COUNTY
PROJECT 33224.1.1 (B-3682) &
PROJECT 35052.1.1 (W-3413)

Form Revised 3/22/01

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)	Hand Clearing (ac)	Fill In SW (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)	Natural Stream Design (ft)
WL P	-L- 116+15 Rt	Roadway Fill	0.02								
		& 24in RCP									
TOTALS, THIS SHEET:			0.02	0	0.00	0	0	0	0	0	0
PROJECT TOTALS:			0.10	0	0.00	0.05	0.16	0.05	0	208	0

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ONSLOW COUNTY
PROJECT 33224.1.1 (B-3682) &
PROJECT 35052.1.1 (W-3413)

Form Revised 3/22/01

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

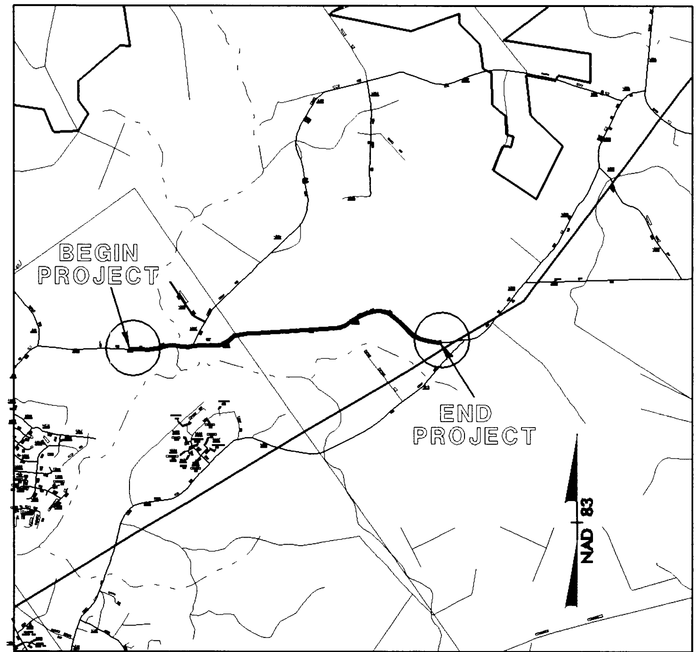
ONSLOW COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3682 & W-3413	1	

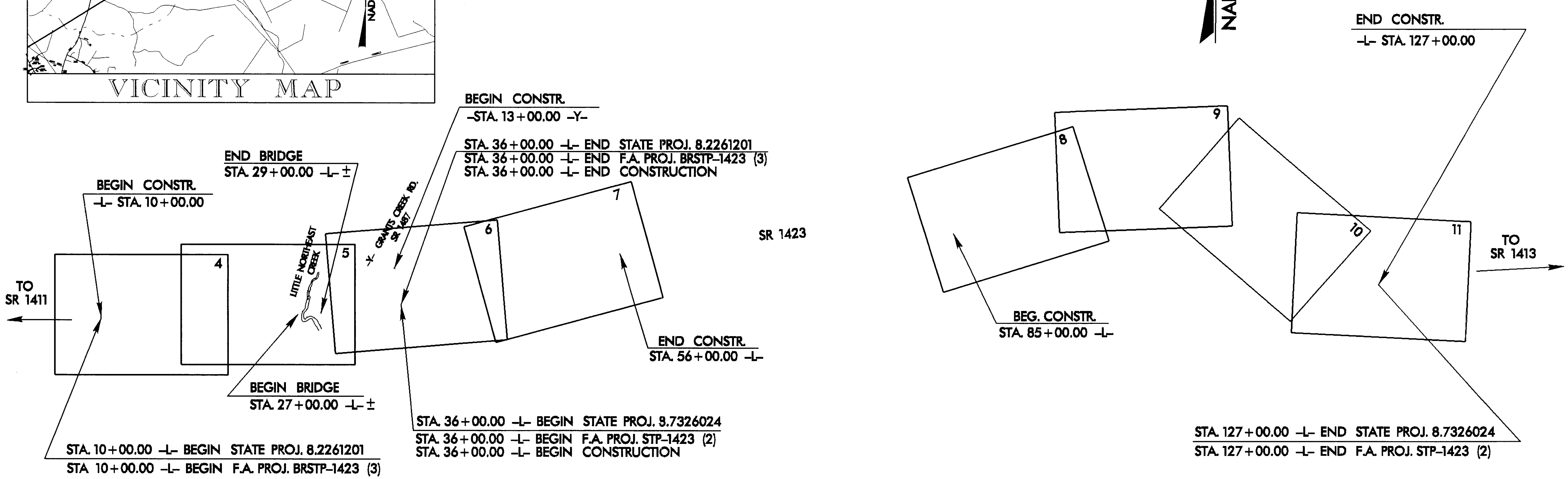
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
8.2261201	BRSTP-1423 (3)	P.E.
8.7326024	STP-1423 (2)	P.E.

LOCATION: B-3682 - BRIDGE NO. 3 OVER LITTLE NORTHEAST CREEK ON SR 1423 AT JACKSONVILLE
W-3413 - SR 1423 FROM NORTH OF 1411 TO SR 1413

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



VICINITY MAP



THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ______________

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

PROJECT: 8.2261201 B-3682
8.7326024 W-3413

GRAPHIC SCALES

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

DESIGN DATA

ADT 2003 = 3,200
ADT 2023 = 6,200
DHV = 9 %
D = 55 %
T = 3 % *
V = 50 MPH
* TTST 1 % DUAL 2 %
FUNC CLASS = LOCAL

PROJECT LENGTH

B-3682

LENGTH ROADWAY F.A. PROJECT BRSTP-1423 (3)	=	
LENGTH STRUCTURE F.A. PROJECT STP-1423 (3)	=	
TOTAL LENGTH STATE PROJECT 8.2261201	=	0.492 mi

W-3413

LENGTH ROADWAY F.A. PROJECT BRSTP-1423 (2)	=	1.723 mi
TOTAL LENGTH STATE PROJECT & 8.7326024	=	1.723 mi

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: August 16, 2002
LETTING DATE: January 20, 2004

JIMMY S. GOODNIGHT, P.E. — PROJECT ENGINEER
CYNTHIA B. PERRY, P.E. — PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: ______ P.E.
ROADWAY DESIGN ENGINEER
SIGNATURE: ______ P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
STATE DESIGN ENGINEER ______ P.E.
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED
DIVISION ADMINISTRATOR ______ DATE

23-NOV-2004 08:44
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09/08/99

PROJECT REFERENCE NO.	SHEET NO.
B-3682 & W-3413	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

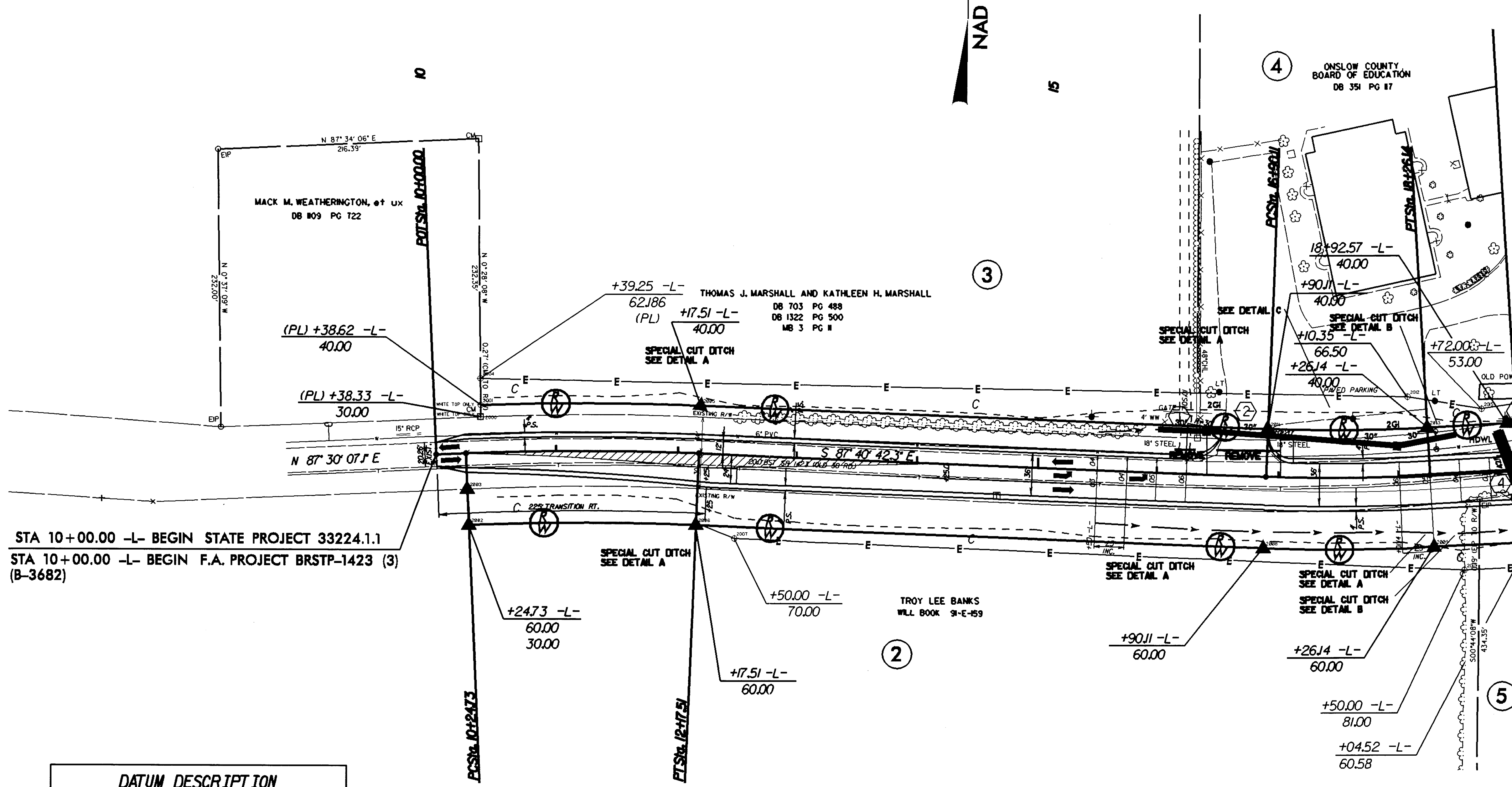
REVISIONS

PARCEL I WAS REVISED TO SHOW NO CLAIM. THE OWNER'S NAME WAS CHANGED ON PARCEL 3.THE AREA OF PARCEL 3 WAS REDUCED. ROW MARKERS WERE REMOVED ALONG PARCELS I AND 3. THESE REQUESTS WERE MADE BY DIV ROW (7-28-04). PJP 8-26-04

-L-
PI Sta 11+21.18
Δ = 4° 49' 10.6" (RT)
D = 2° 30' 00.0"
L = 192.78'
T = 96.45'
R = 2,291.83'
SE= EXIST.

-L-
PI Sta 17+58.18
Δ = 5° 26' 27.6" (LT)
D = 4° 00' 00.0"
L = 136.03'
T = 68.06'
R = 1,432.39'
SE= 0.06 ft/ft
RO= 150'

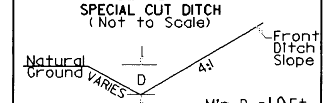
PROP. PAINTED ISLAND.
SEE TRAFFIC CONTROL PLANS



DATUM DESCRIPTION

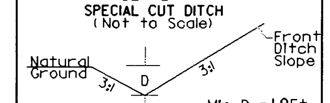
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B3682-3"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 375074.1570(ft) EASTING: 2507482.8440(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99992I278
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B3682-3" TO -L- STA 10+00.00 IS
N 86° 28' 31.39" W DISTANCE 689.3727 FEET
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



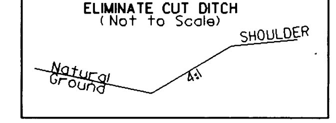
STA 12+00 -L- (LT & RT)
STA 15+50 TO 18+50 -L- (RT)
FROM STA 15+50 TO 16+00 (LT)

DETAIL B
SPECIAL CUT DITCH
(Not to Scale)



FROM STA 18+50 TO STA 19+00 -L- (LT)
STA 19+00 -L- (RT)

DETAIL C
ELIMINATE CUT DITCH
(Not to Scale)



FROM STA 16+50 TO STA. 18+00 -L- (LT)

See Sheet 12 for -L- Profile
See Sheet 16 for -Y- Profile

23-NOV-2004 10:35
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mkelly AT

8/17/99

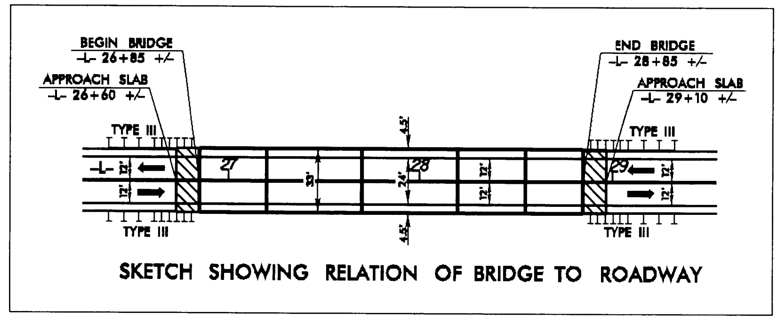
PROJECT REFERENCE NO.	SHEET NO.
B-3682 & W-3413	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

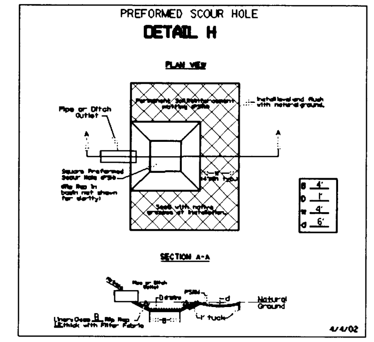
REVISIONS

CHANGES WERE MADE TO THE OWNER NAMES ON PARCELS 3 AND 5. PARCEL 6 WAS CHANGED TO PARCEL 3. THESE REQUESTS WERE MADE BY DIV ROW (7-28-04).
PJP 8-26-04

8/17/99



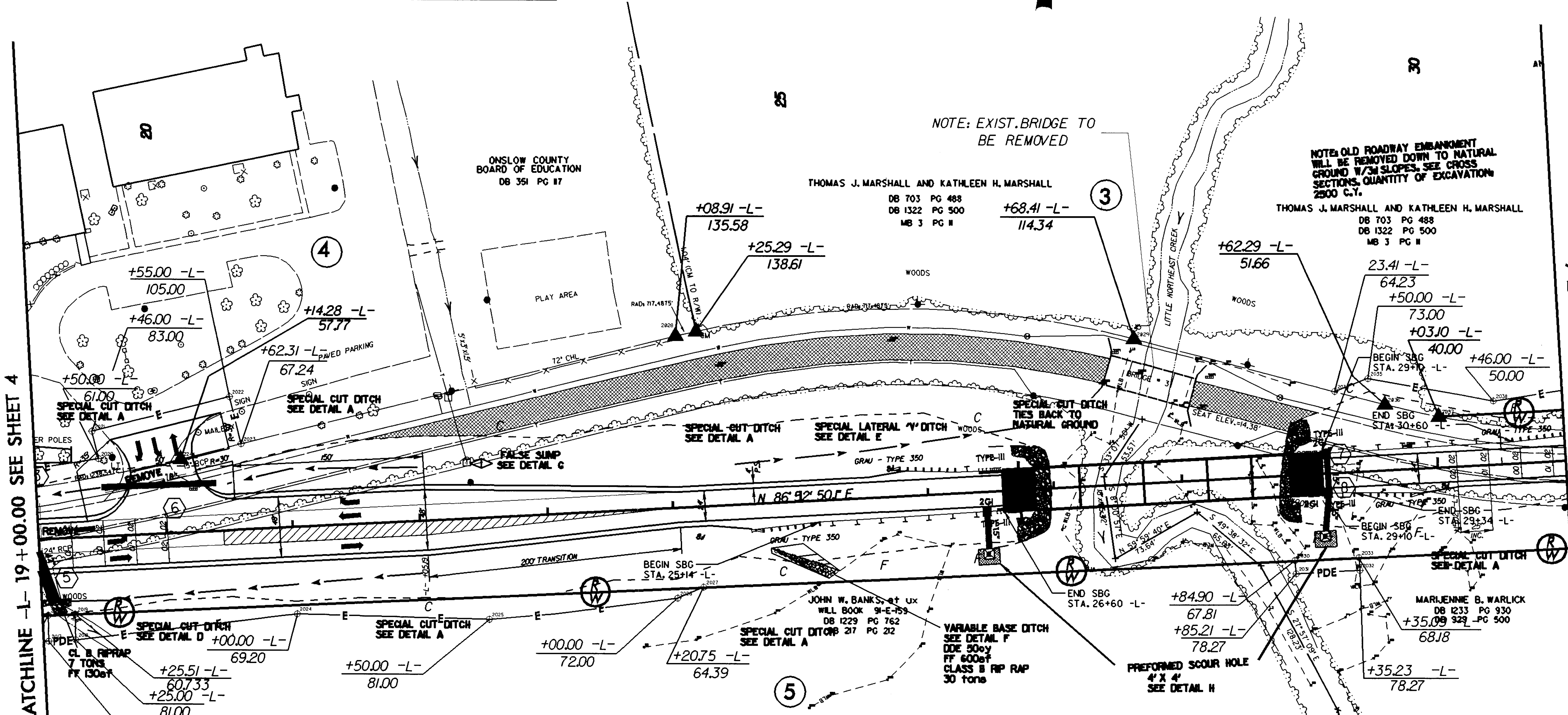
SKETCH SHOWING RELATION OF BRIDGE TO ROADWAY

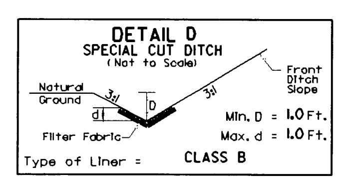


NAD 83

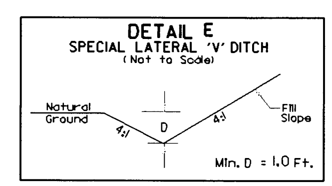
PROP. PAINTED ISLAND. SEE TRAFFIC CONTROL PLANS

PAVEMENT REMOVAL & OBLITERATION

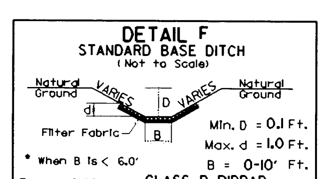




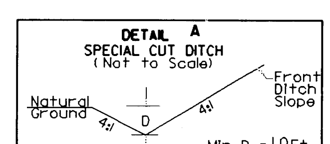
FROM STA 19+00 -L- TO STA 19+20 -L- (RT)



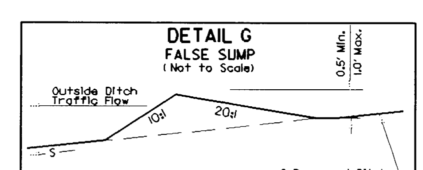
FROM STA 25+50 TO STA 27+00 -L- (LT)



STA 25+00 -L- (RT)



FROM STA 19+50 TO STA 22+50 -L- (RT)
FROM STA 19+50 TO STA 22+50 -L- (LT)
STA 30+50 -L- (RT)
STA 24+50 -L- (RT)
FROM STA 24+50 TO STA 25+00 -L- (LT)



STA 22+50 (LT)

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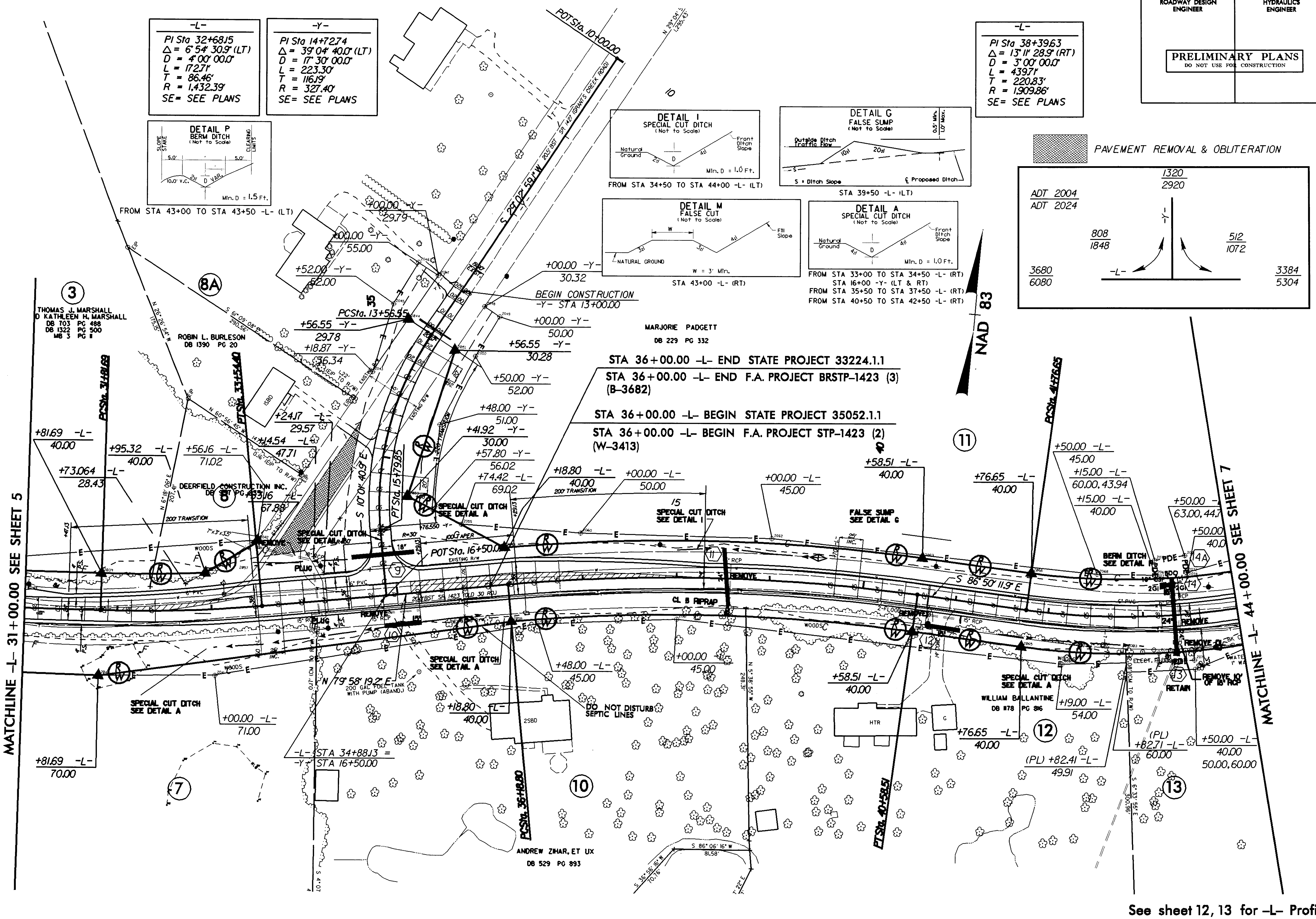
PROJECT REFERENCE NO.	SHEET NO.
B-3682 & W-3413	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

REVISIONS WERE MADE TO OWNER NAMES ON PARCELS 7, 8, 8A AND 11. REVISIONS WERE MADE TO THE TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 13. PJP 8-26-04

REVISIONS WERE MADE TO OWNER NAMES ON PARCELS 7, 8, 8A AND 13. ROW AREA WAS REVISED ON PARCELS 8 AND 11. REVISIONS WERE MADE TO THE TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 13. PJP 8-26-04



PROJECT REFERENCE NO.	SHEET NO.
B-3682 & W-3413	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

THE TEMPORARY CONSTRUCTION EASEMENT WAS REVISED ON PARCELS 11 AND 13. THE ROW MARKER LOCATION WAS MOVED ON PARCELS 11 AND 14. ROW REVISIONS WERE MADE ON PARCEL 11. THE OWNER'S NAME ON PARCEL 13 WAS REVISED. THESE WERE DN REQUESTS (7-28-04). PJP 8-26-04

8/17/99

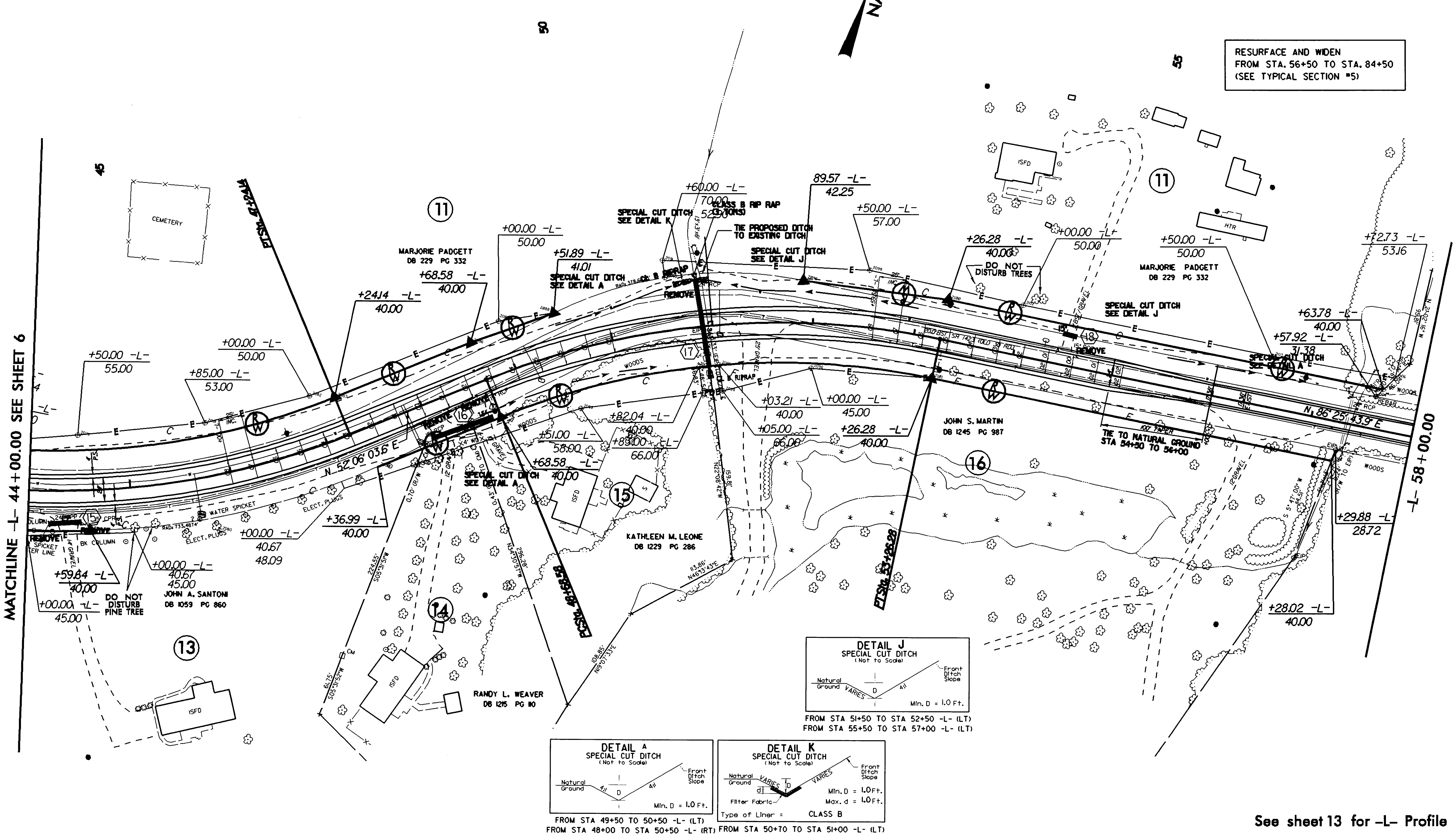
ENGLISH

-L-
PI Sta 44+62.75
Δ = 41° 03' 44.6" (LT)
D = 7° 30' 00.0"
L = 547.50'
T = 286.10'
R = 763.94'
SE= SEE PLANS

-L-
PI Sta 51+04.53
Δ = 34° 19' 40.3" (RT)
D = 7° 30' 00.0"
L = 457.70'
T = 235.95'
R = 763.94'
SE= SEE PLANS

NAD 83

RESURFACE AND WIDEN
FROM STA. 56+50 TO STA. 84+50
(SEE TYPICAL SECTION #5)



See sheet 13 for -L- Profile

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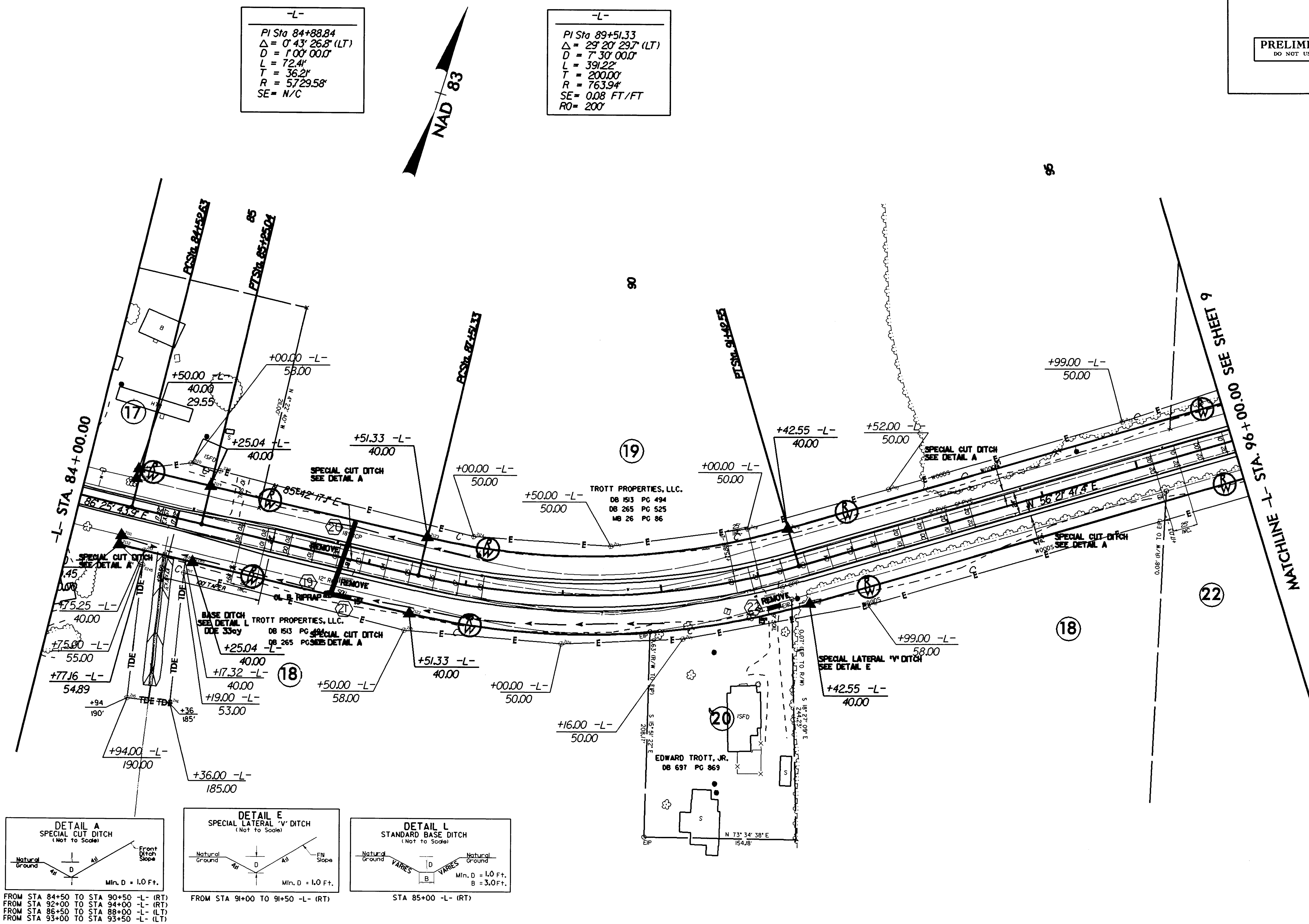
PROJECT REFERENCE NO.	SHEET NO.
B-3682 & W-3413	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

THE PROPERTY LINE ON PARCEL 19 WAS REMOVED. PARCEL 22 AND ITS OWNER'S NAME WAS ADDED TO THE PLAN.THESE WERE DIV ROW REQUESTS (7-28-04). PJP 8-26-04

8/17/99



See Sheet 14, 15 for -L- Profile

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PROJECT REFERENCE NO.	SHEET NO.
B-3682 & W-3413	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

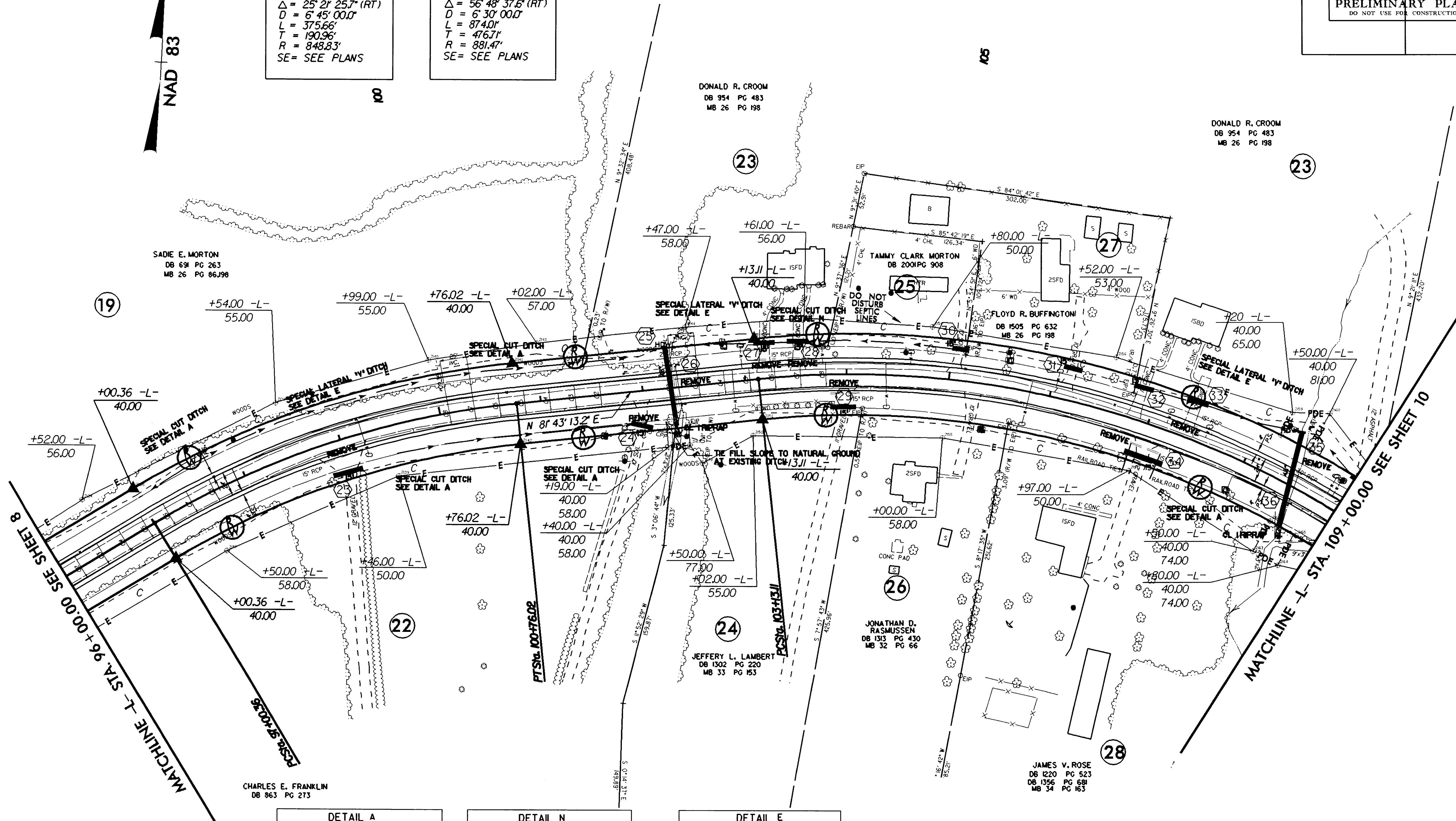
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

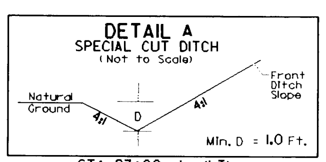
REVISIONS

PARCEL 21 WAS REVISED TO PARCEL 19. THE OWNER NAMES WERE REVISED ON PARCELS 19 AND 26. THESE WERE REQUESTS BY THE DIV ROW (7-28-04). PJP 8-26-04

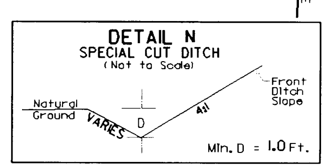
-L-
PI Sta 98+91.32
Δ = 25° 21' 25.7" (RT)
D = 6° 45' 00.0"
L = 375.66'
T = 190.96'
R = 848.83'
SE = SEE PLANS

-L-
PI Sta 107+89.82
Δ = 56° 48' 37.6" (RT)
D = 6° 30' 00.0"
L = 874.01'
T = 476.71'
R = 881.47'
SE = SEE PLANS

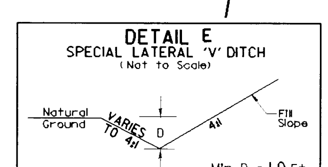




STA 97+00 -L- (LT)
FROM STA 99+50 TO 102+50 -L- (RT)
FROM STA 100+00 TO 101+50 -L- (LT)
FROM STA 108+00 TO 108+60.4 -L- (RT)



FROM STA 103+50 TO 105+00 -L- (LT)



FROM STA 97+50 TO STA 99+50 -L- (LT)
FROM STA 102+50 TO 103+00 -L- (LT)

See sheet 15 for -L- Profile

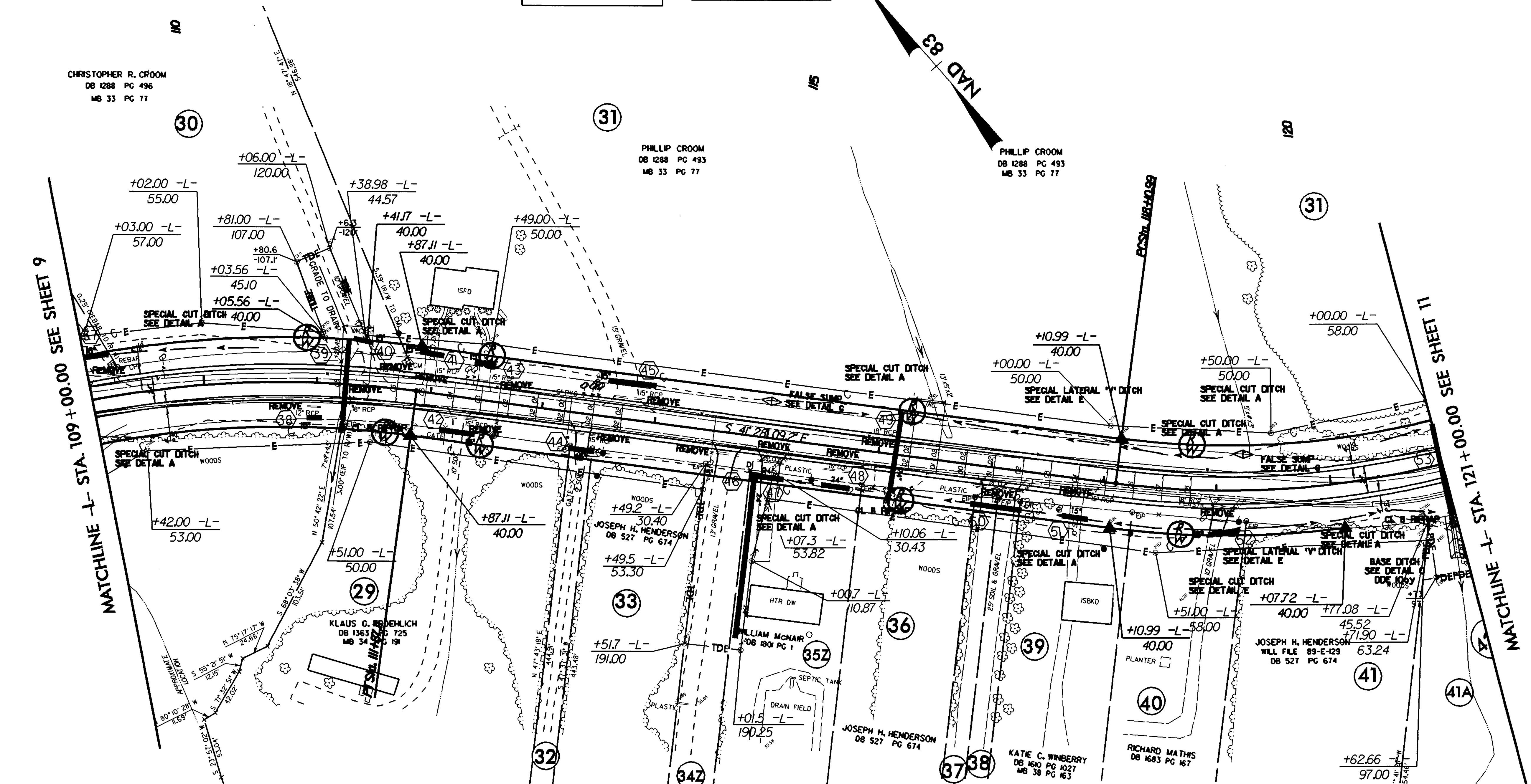
PROJECT REFERENCE NO.	SHEET NO.
B-3682 & W-3413	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

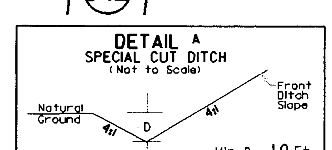
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS
ADDED TDE ON PARCEL 34 AND 35 ; REDUCED TCE ON PARCELS 33 AND 35 PER HYDRO REQUEST. 10-20-04 TDG

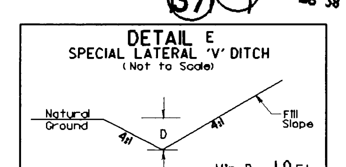
-L-
PI Sta 107+89.82
Δ = 56° 48' 37.6" (RT)
D = 6° 30' 00.0"
L = 874.01'
T = 476.71'
R = 881.47'
SE = 0.08 FT/FT
RO = 200'

-L-
PI Sta 120+77.27
Δ = 38° 25' 59.7" (LT)
D = 7° 30' 00.0"
L = 512.44'
T = 266.28'
R = 763.94'
SE = 0.08 FT/FT
RO = 200'

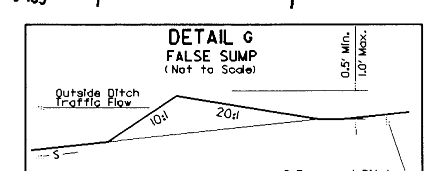




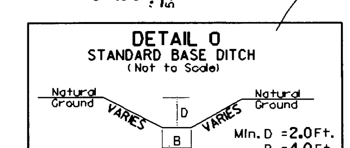
FROM STA 115+00 TO STA 119+00 -L- (RT)
STA 109+50 -L- (RT)
STA 112+00 -L- (LT)
FROM STA 109+50 TO STA 110+50 -L- (LT)
FROM STA 115+50 TO STA 116+50 -L- (LT)



FROM STA 117+00 TO STA 118+00 -L- (LT)
FROM STA 119+50 TO STA 120+00 -L- (RT)



STA 115+00 -L- (LT)
STA 119+23 -L- (LT)



STA 121+00 -L- (RT)

See Sheet 15 for -L- Profile

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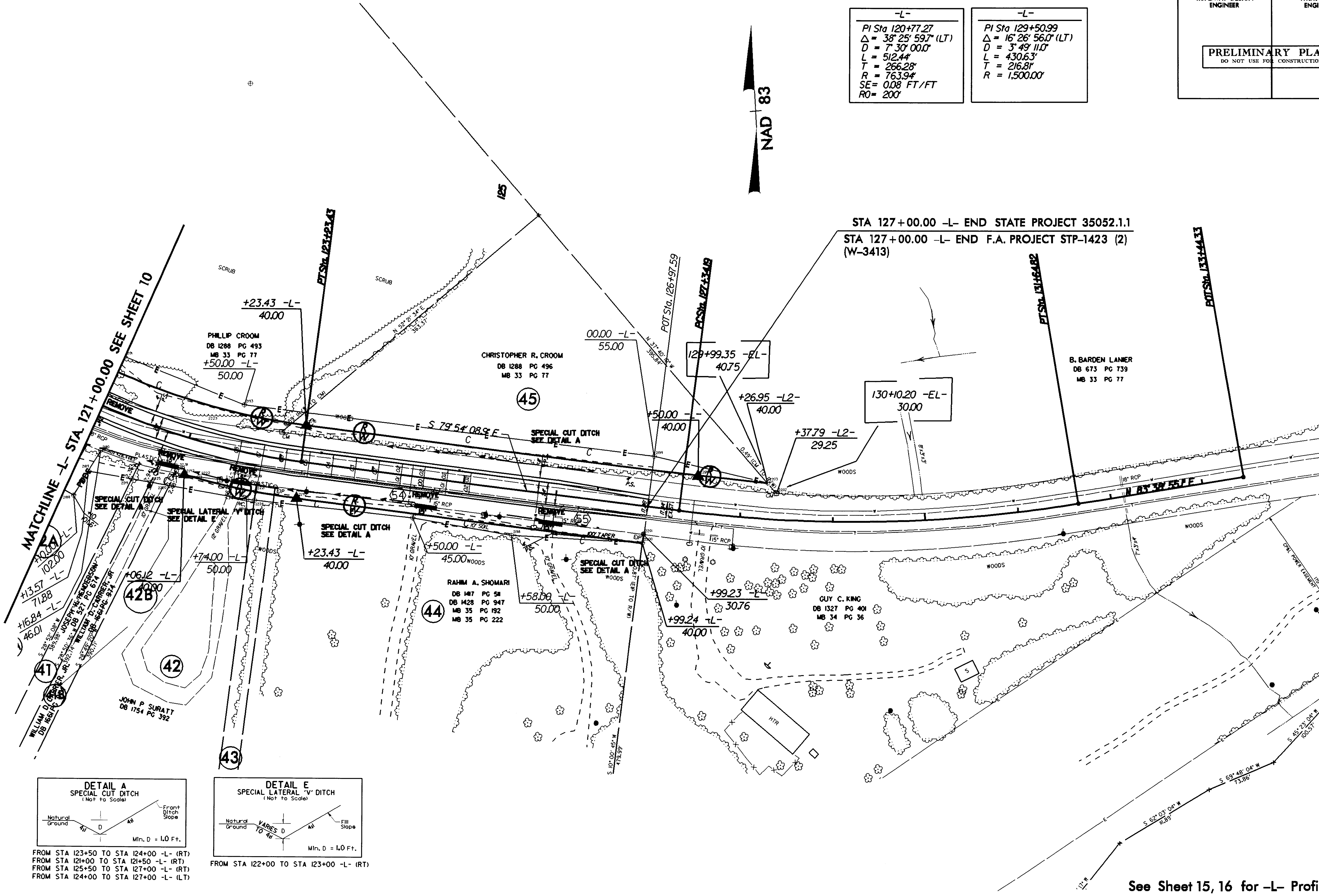
PROJECT REFERENCE NO.	SHEET NO.
B-3682 & W-3413	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-
PI Sta 120+77.27
Δ = 38° 25' 59.7" (LT)
D = 7° 30' 00.0"
L = 512.44'
T = 266.28'
R = 763.94'
SE= 0.08 FT/FT
RO= 200'

-L-
PI Sta 129+50.99
Δ = 16° 26' 56.0" (LT)
D = 3° 49' 11.0"
L = 430.63'
T = 216.81'
R = 1,500.00'



NAD 83
STA 127+00.00 -L- END STATE PROJECT 35052.1.1
STA 127+00.00 -L- END F.A. PROJECT STP-1423 (2) (W-3413)
MATCHLINE -L- STA. 121+00.00 SEE SHEET 10
PHILLIP CROOM
DB 1288 PG 493
MB 33 PG 77
CHRISTOPHER R. CROOM
DB 1288 PG 496
MB 33 PG 77
B. BARDEN LANIER
DB 673 PG 739
MB 33 PG 77
RAHIM A. SHOMARI
DB 1417 PG 511
DB 1428 PG 947
MB 35 PG 192
MB 35 PG 222
GUY C. KING
DB 1327 PG 401
MB 34 PG 36
JOHN P SURATT
DB 1754 PG 392
SPECIAL CUT DITCH SEE DETAIL A
SPECIAL LATERAL 'V' DITCH SEE DETAIL E
S 79° 54' 08.9" E
N 83° 38' 55" E
PT Sta. 123+23.43
POT Sta. 126+97.59
PC Sta. 127+34.19
PT Sta. 131+66.82
POT Sta. 133+44.33
DETAIL A
SPECIAL CUT DITCH
(Not to Scale)
Min. D = 1.0 Ft.
FROM STA 123+50 TO STA 124+00 -L- (RT)
FROM STA 121+00 TO STA 121+50 -L- (RT)
FROM STA 125+50 TO STA 127+00 -L- (RT)
FROM STA 124+00 TO STA 127+00 -L- (LT)
DETAIL E
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Min. D = 1.0 Ft.
FROM STA 122+00 TO STA 123+00 -L- (RT)

REVISIONS

THE PROPERTY AREAS OF PARCELS 41, 41A AND 41B WERE REVISED. THE OWNER'S NAME WAS REVISED ON PARCEL 45. THE ROW MONUMENTS ON PARCEL 46 WERE REMOVED. PARCEL 46 WAS REMOVED. THESE WERE REQUESTS MADE BY THE DIV ROW (7-28-04). PJP 8-26-04

See Sheet 15, 16 for -L- Profile

8/17/99

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5/28/99

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DITCH GRADES

LEFT DITCH GRADE

RIGHT DITCH GRADE

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 48.0	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 57.0	CFS
DESIGN HW ELEVATION	= 19.9	FT
100 YEAR DISCHARGE	= 90.0	CFS
100 YEAR HW ELEVATION	= 21.0	FT
OVERTOPPING FREQUENCY	= 25	YRS
OVERTOPPING DISCHARGE	= 60.0	CFS
OVERTOPPING ELEVATION	= 19.7	FT

BM "2 RAILROAD SPIKE IN 18" TWIN OAK
LT. OF -L- STA. 22+00 ELEV. 17.31'
N=375,298.8419 E=2,508,468.7692

-L-

BEGIN GRADE
-L- STA 12+50.00
EL = 27.36
INCLUDES 2" RESURFACING

END SPECIAL DITCH GRADE LEFT
-L- STA 12+50 EL.= 24.72

BEGIN SPECIAL DITCH GRADE LEFT
-L- STA 11+50 EL.= 25.78

BEGIN SPECIAL DITCH GRADE RIGHT
-L- STA 11+50 EL.= 25.81

END SPECIAL DITCH GRADE RIGHT
-L- STA 12+50 EL.= 24.48

PI = 14+00.00
EL = 25.35'
VC = 150'
K = 211

END SPECIAL DITCH GRADE LEFT
-L- STA 16+00 EL.= 18.77

PI = 15+50.00
EL = 24.40'
VC = 150'
K = 563

BEGIN SPECIAL DITCH GRADE LEFT
-L- STA 15+00 EL.= 22.07

BEGIN SPECIAL DITCH GRADE RIGHT
-L- STA 15+00 EL.= 21.83

PI = 17+00.00
EL = 23.05'
VC = 150'
K = 265

PI = 18+50.00
EL = 22.55'
VC = 100'
K = 125

BEGIN SPECIAL DITCH GRADE LEFT
-L- STA 18+50 EL.= 17.43

PI = 19+99.00
EL = 23.25'
VC = 140'
K = 125

END DITCH GRADE LEFT
-L- STA 22+50 EL.= 18.74

PI =18+85
El = 17.32

PI =19+00
El = 17.69

PROP.
2-42" RCP

PI =19+00
El = 17.03

PI = 18+00
EL = 20.33

PI =19+10
El = 16.40

PI =19+50
El = 17.84

END DITCH GRADE RIGHT
-L- STA 22+50 EL.= 18.74

See Sheet 4, 5 for Plan View

BEGIN BRIDGE
STA 26+85 +/-

END BRIDGE
STA 28+85 +/-

-L-

BEGIN DITCH GRADE LEFT
-L- STA 24+00 EL.= 17.77

PI = 25+00.00
EL = 20.00'
VC = 200'
K = 10750

PI =25+50
El = 14.82

END DITCH GRADE LEFT
-L- STA 27+00 EL.= 10.21

TIE TO NATURAL GROUND
-L- STA 27+46 EL.= 8.80

PI = 30+20.00
EL = 16.53'
VC = 350'
K = 99

PI = 33+90.00
EL = 27.20'
VC = 390'
K = 114

PI =34+00
El = 21.93

PI =34+50
El = 22.47

PI = 37+00.00
EL = 25.55'
VC = 200'
K = 479

PI =24+50.000
El = 17.62

END DITCH GRADE RIGHT
-L- STA 24+90 EL.= 17.00

BEGIN DITCH GRADE RIGHT
-L- STA 24+00 EL.= 17.77

BEGIN DITCH GRADE RIGHT
-L- STA 30+00 EL.= 13.60

END DITCH GRADE RIGHT
-L- STA 31+00 EL.= 16.50

BEGIN DITCH GRADE RIGHT
-L- STA 32+50 EL.= 18.83

END DITCH GRADE RIGHT
-L- STA 34+85 EL.= 22.59

BEGIN DITCH GRADE RIGHT
-L- STA 35+24 EL.= 23.09

END DITCH GRADE RIGHT
-L- STA 37+50 EL.= 21.77

See Sheet 5, 6 for Plan View

5/28/99

PIPE HYDRAULIC DATA		
DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 8.0	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 11.0	CFS
DESIGN HW ELEVATION	= 23.2	FT
100 YEAR DISCHARGE	= 18.0	CFS
100 YEAR HW ELEVATION	= 24.1	FT
OVERTOPPING FREQUENCY	= 25+	YRS
OVERTOPPING DISCHARGE	= 13.0	CFS
OVERTOPPING ELEVATION	= 23.4	FT

BM #3 RAILROAD SPIKE IN 24" OAK
RT. OF -L- STA. 43+15 ELEV. 28.72'
N=375,412.8349 E=2,510,559.3595

-L-

DITCH GRADES
LEFT DITCH GRADE
RIGHT DITCH GRADE

PIPE HYDRAULIC DATA		
DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 11.0	AC
DESIGN FREQUENCY	= 25.0	YRS
DESIGN DISCHARGE	= 15.0	CFS
DESIGN HW ELEVATION	= 24.5	FT
100 YEAR DISCHARGE	= 24.0	CFS
100 YEAR HW ELEVATION	= 26.0	FT
OVERTOPPING FREQUENCY	= 50	YRS
OVERTOPPING DISCHARGE	= 19.0	CFS
OVERTOPPING ELEVATION	= 25.0	FT

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BEGIN DITCH GRADE LEFT
-L- STA 38+00 EL.= 23.18

PI = 39+00.00
EL = 23.65'
VC = 175'
K = 131

END DITCH GRADE LEFT
-L- STA 39+50 EL.= 22.38

PI = 41+00.00
EL = 24.43'
VC = 200'
K = 137

TOP OF 2GI PI =43+33
EI = 18.41

PI = 43+50.00
EL = 21.75'
VC = 180'
K = 99

END DITCH GRADE LEFT
-L- STA 44+00 EL.= 18.61

PI = 45+00.00
EL = 22.88'
VC = 100'
K = 138

BEGIN DITCH GRADE LEFT
-L- STA 49+17 EL.= 25.97

PI = 48+40.00
EL = 27.90'
VC = 240'
K = 134

PI =38+50 EI = 21.40
PI =39+00 EI = 22.23
PI =42+50 EI = 20.78
PI =49+50 EI = 23.78
PI =50+50 EI = 25.56
PI =50+87 EI = 22.26
PI =51+00 EI = 24.61
PI =52+00 EI = 24.81

24.60 23.18 22.38 22.38 18.41 17.83 24.38 25.97 24.81 26.76

(-)0.9500% (+)0.3905% (+)0.3905% (-)1.0724% (-)1.0724% (+)0.7533% (+)0.7533% (+)1.4765% (+)1.4765% (-)0.3171%

PROP. 24" RCP
PROP. 36" RCP

BEGIN DITCH GRADE RIGHT
-L- STA 40+50 EL.= 21.38

END DITCH GRADE RIGHT
-L- STA 43+33 EL.= 17.83
(TOP OF DI)

BEGIN DITCH GRADE RIGHT
-L- STA 47+50 EL.= 24.38

END DITCH GRADE RIGHT
-L- STA 50+90 EL.= 18.80

See Sheet 6, 7 for Plan View

38 39 40 41 42 43 44 45 46 47 48 49 50 51 52

-L-

BM #4 RAILROAD SPIKE IN 12" PINE
RT. OF -L- STA. 64+09 ELEV. 37.96'
N=375,668.4897 E=2,512,522.9640

END GRADE
-L- STA 56+00.00
EL = 25.85

PI = 52+50.00
EL = 26.60'
VC = 200'
K = 11714

PI = 55+50.00
EL = 25.70'
VC = 100'
K = 167

PI = 56+50.00
EL = 26.00'
VC = 100'
K = 150

END DITCH GRADE LEFT
-L- STA 57+35 EL.= 20.61

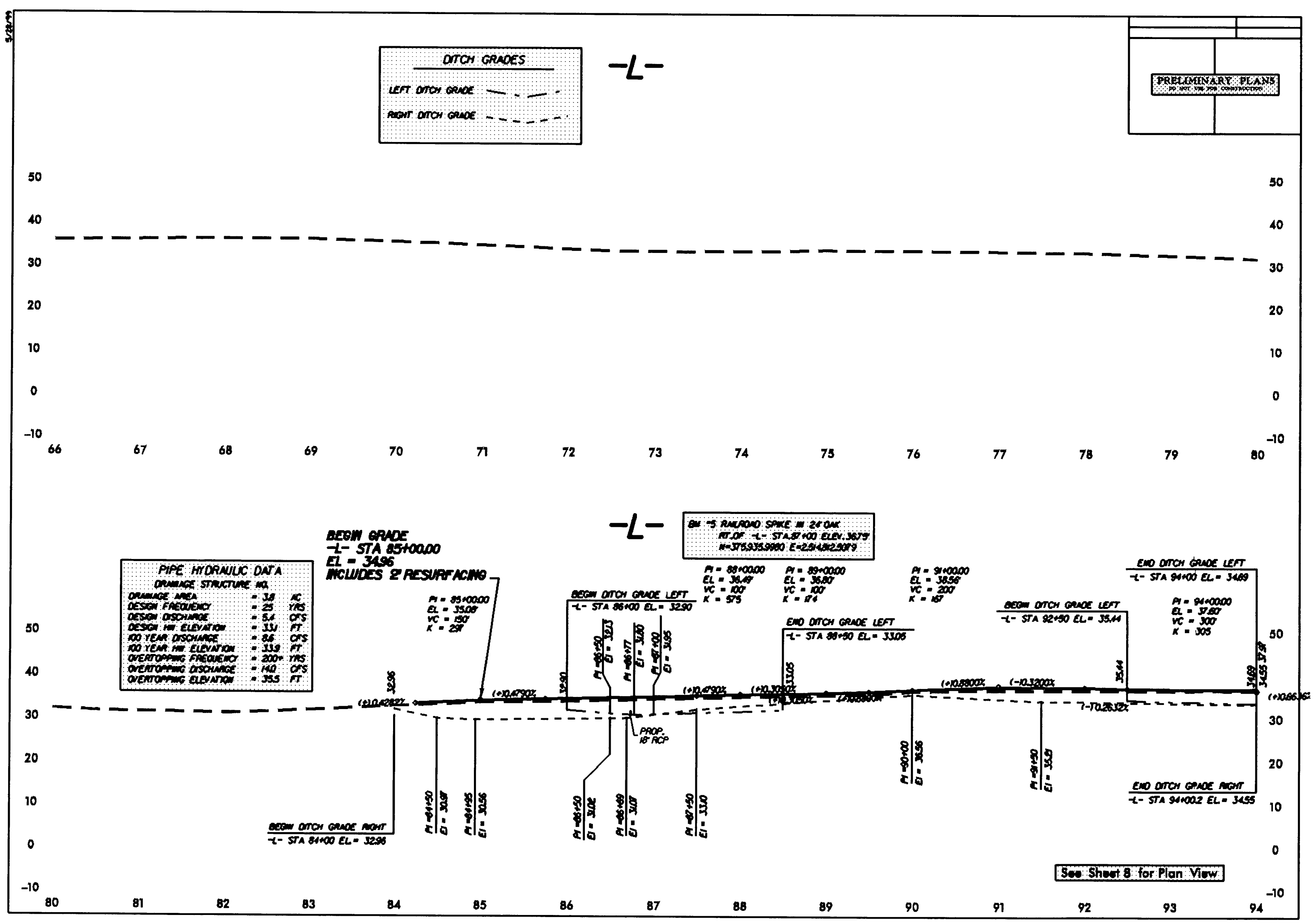
PI =52+00 EI = 24.81
PI = 53+00 EL = 25.51
PI =53+50 EI = 24.96
PI =54+00 EI = 24.54
PI =55+00 EL = 23.76
PI =57+00 EI = 23.16

24.81 26.76 25.01 20.61

(-)0.3171% (-)0.3000% (-)0.3000% (+)0.3000%

See Sheet 7 for Plan View

52 53 54 55 56 57 58 59 60 61 62 63 64 65 66


DITCH GRADES
LEFT DITCH GRADE
RIGHT DITCH GRADE
-L-
PRELIMINARY PLANS
-L-
BM #5 RAILROAD SPIKE IN 24" OAK
RT. OF -L- STA. 87+00 ELEV. 36.75'
N=375,935.9980 E=2,514,812.5079
BEGIN GRADE
-L- STA 85+00.00
EL = 34.96
INCLUDES 2" RESURFACING
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.
DRAINAGE AREA = 3.8 AC
DESIGN FREQUENCY = 25 YRS
DESIGN DISCHARGE = 5.4 CFS
DESIGN HW ELEVATION = 33.1 FT
100 YEAR DISCHARGE = 8.6 CFS
100 YEAR HW ELEVATION = 33.9 FT
OVERTOPPING FREQUENCY = 200+ YRS
OVERTOPPING DISCHARGE = 14.0 CFS
OVERTOPPING ELEVATION = 35.5 FT
PI = 85+00.00
EL = 35.08'
VC = 150'
K = 29'
BEGIN DITCH GRADE LEFT
-L- STA 86+00 EL.= 32.90
PI = 88+00.00
EL = 36.49'
VC = 100'
K = 575
PI = 89+00.00
EL = 36.80'
VC = 100'
K = 174
PI = 91+00.00
EL = 38.56'
VC = 200'
K = 167
END DITCH GRADE LEFT
-L- STA 88+50 EL.= 33.05
BEGIN DITCH GRADE LEFT
-L- STA 92+50 EL.= 35.44
END DITCH GRADE LEFT
-L- STA 94+00 EL.= 34.89
PI = 94+00.00
EL = 37.60'
VC = 300'
K = 305
PROP. 18" RCP
BEGIN DITCH GRADE RIGHT
-L- STA 84+00 EL.= 32.96
END DITCH GRADE RIGHT
-L- STA 94+00.2 EL.= 34.55
See Sheet 8 for Plan View

5/28/99

DITCH GRADES

LEFT DITCH GRADE

RIGHT DITCH GRADE

-L-

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 3.8	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 5.4	CFS
DESIGN HW ELEVATION	= 33.1	FT
100 YEAR DISCHARGE	= 8.6	CFS
100 YEAR HW ELEVATION	= 33.9	FT
OVERTOPPING FREQUENCY	= 200+	YRS
OVERTOPPING DISCHARGE	= 14.0	CFS
OVERTOPPING ELEVATION	= 35.5	FT

BEGIN GRADE
-L- STA 85+00.00
EL = 34.96
INCLUDES 2" RESURFACING

PI = 85+00.00
EL = 35.06'
VC = 150'
K = 297

BM #5 RAILROAD SPIKE IN 24" OAK
RT. OF -L- STA. 87+00 ELEV. 36.75'
N=375,935.9980 E=2,514,812.5079

PI = 88+00.00
EL = 36.49'
VC = 100'
K = 575

PI = 89+00.00
EL = 36.80'
VC = 100'
K = 174

PI = 91+00.00
EL = 38.56'
VC = 200'
K = 167

BEGIN DITCH GRADE LEFT
-L- STA 86+00 EL.= 32.90

END DITCH GRADE LEFT
-L- STA 88+50 EL.= 33.05

BEGIN DITCH GRADE LEFT
-L- STA 92+50 EL.= 35.44

END DITCH GRADE LEFT
-L- STA 94+00 EL.= 34.69

PI = 94+00.00
EL = 37.60'
VC = 300'
K = 305

PI =86+50
EI = 32.13

PI =86+77
EI = 31.80

PI =87+00
EI = 31.95

PROP. 18" RCP

(+)0.4790%

(+)0.3050%

(+)0.8800%

(-)0.3200%

(-)0.2632%

(+)0.4282%

(+)0.6636%

32.96

32.90

33.05

35.44

34.69

34.55

37.97

BEGIN DITCH GRADE RIGHT
-L- STA 84+00 EL.= 32.96

PI =84+50
EI = 30.97

PI =84+95
EI = 30.56

PI =86+50
EI = 31.02

PI =86+69
EI = 31.07

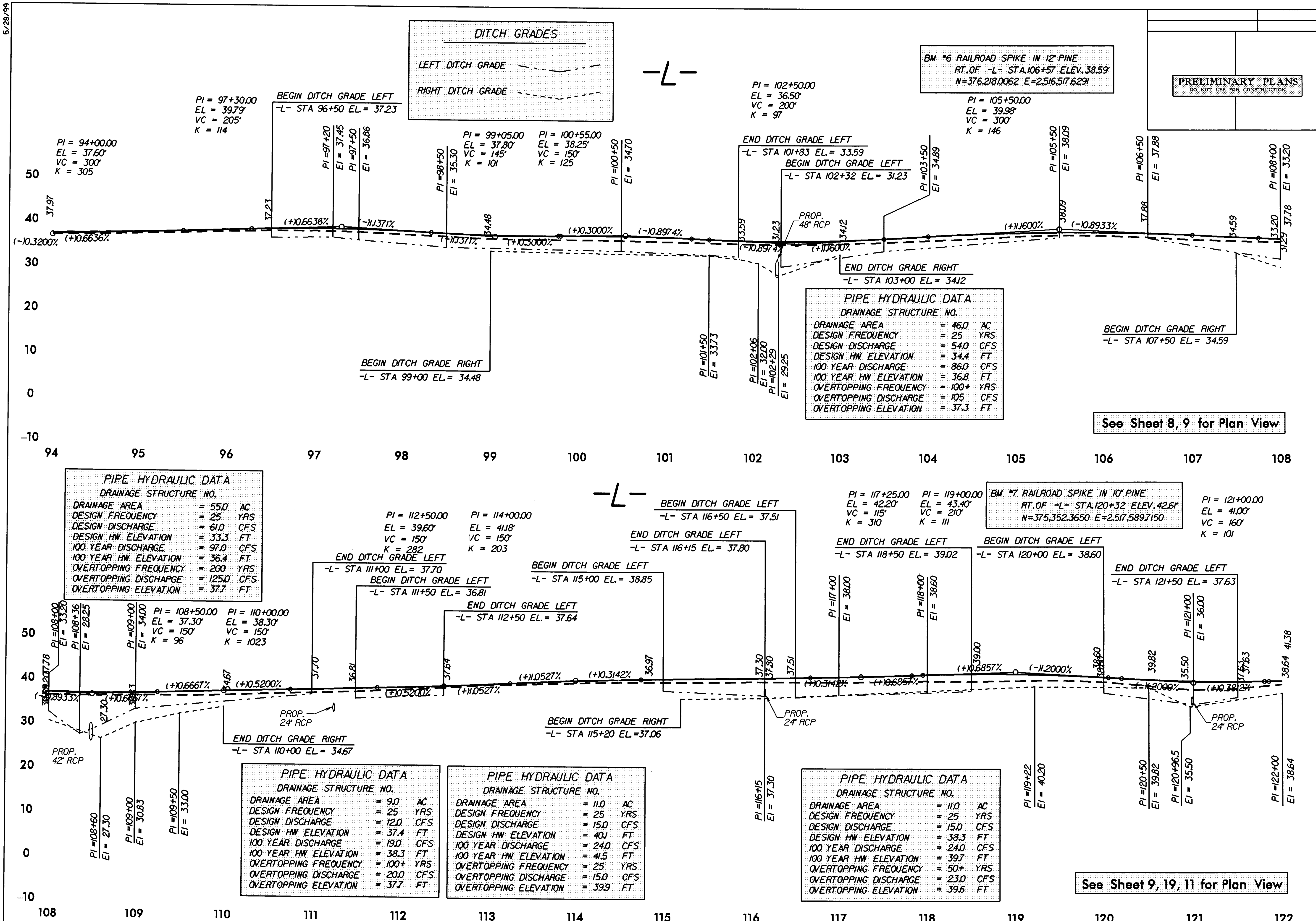
PI =87+50
EI = 33.10

PI =90+00
EI = 36.56

PI =91+50
EI = 35.21

END DITCH GRADE RIGHT
-L- STA 94+00.2 EL.= 34.55

See Sheet 8 for Plan View



5/28/99
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
DITCH GRADES
LEFT DITCH GRADE
RIGHT DITCH GRADE
-L-
BM #6 RAILROAD SPIKE IN 12" PINE
RT. OF -L- STA. 106+57 ELEV. 38.59'
N=376,218.0062 E=2,516,517.6291
PI = 94+00.00
EL = 37.60'
VC = 300'
K = 305
PI = 97+30.00
EL = 39.79'
VC = 205'
K = 114
BEGIN DITCH GRADE LEFT
-L- STA 96+50 EL.= 37.23
PI = 99+05.00
EL = 37.80'
VC = 145'
K = 101
PI = 100+55.00
EL = 38.25'
VC = 150'
K = 125
PI = 102+50.00
EL = 36.50'
VC = 200'
K = 97
END DITCH GRADE LEFT
-L- STA 101+83 EL.= 33.59
BEGIN DITCH GRADE LEFT
-L- STA 102+32 EL.= 31.23
PI = 105+50.00
EL = 39.98'
VC = 300'
K = 146
PROP. 48" RCP
END DITCH GRADE RIGHT
-L- STA 103+00 EL.= 34.12
BEGIN DITCH GRADE RIGHT
-L- STA 99+00 EL.= 34.48
BEGIN DITCH GRADE RIGHT
-L- STA 107+50 EL.= 34.59
See Sheet 8, 9 for Plan View
BM #7 RAILROAD SPIKE IN 10" PINE
RT. OF -L- STA. 120+32 ELEV. 42.61'
N=375,352.3650 E=2,517,589.7150
PI = 108+50.00
EL = 37.30'
VC = 150'
K = 96
PI = 110+00.00
EL = 38.30'
VC = 150'
K = 102.3
PI = 112+50.00
EL = 39.60'
VC = 150'
K = 282
PI = 114+00.00
EL = 41.18'
VC = 150'
K = 203
PI = 117+25.00
EL = 42.20'
VC = 115'
K = 310
PI = 119+00.00
EL = 43.40'
VC = 210'
K = 111
PI = 121+00.00
EL = 41.00'
VC = 160'
K = 101
END DITCH GRADE LEFT
-L- STA 111+00 EL.= 37.70
BEGIN DITCH GRADE LEFT
-L- STA 111+50 EL.= 36.81
END DITCH GRADE LEFT
-L- STA 112+50 EL.= 37.64
BEGIN DITCH GRADE LEFT
-L- STA 115+00 EL.= 38.85
END DITCH GRADE LEFT
-L- STA 116+15 EL.= 37.80
BEGIN DITCH GRADE LEFT
-L- STA 116+50 EL.= 37.51
END DITCH GRADE LEFT
-L- STA 118+50 EL.= 39.02
BEGIN DITCH GRADE LEFT
-L- STA 120+00 EL.= 38.60
END DITCH GRADE LEFT
-L- STA 121+50 EL.= 37.63
END DITCH GRADE RIGHT
-L- STA 110+00 EL.= 34.67
BEGIN DITCH GRADE RIGHT
-L- STA 115+20 EL.=37.06
PROP. 42" RCP
PROP. 24" RCP
See Sheet 9, 19, 11 for Plan View

PIPE HYDRAULIC DATA (-L- STA 102+29)

DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 46.0	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 54.0	CFS
DESIGN HW ELEVATION	= 34.4	FT
100 YEAR DISCHARGE	= 86.0	CFS
100 YEAR HW ELEVATION	= 36.8	FT
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 105	CFS
OVERTOPPING ELEVATION	= 37.3	FT

PIPE HYDRAULIC DATA (-L- STA 108+60)

DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 55.0	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 61.0	CFS
DESIGN HW ELEVATION	= 33.3	FT
100 YEAR DISCHARGE	= 97.0	CFS
100 YEAR HW ELEVATION	= 36.4	FT
OVERTOPPING FREQUENCY	= 200	YRS
OVERTOPPING DISCHARGE	= 125.0	CFS
OVERTOPPING ELEVATION	= 37.7	FT

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 9.0	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 12.0	CFS
DESIGN HW ELEVATION	= 37.4	FT
100 YEAR DISCHARGE	= 19.0	CFS
100 YEAR HW ELEVATION	= 38.3	FT
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 20.0	CFS
OVERTOPPING ELEVATION	= 37.7	FT

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 11.0	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 15.0	CFS
DESIGN HW ELEVATION	= 40.1	FT
100 YEAR DISCHARGE	= 24.0	CFS
100 YEAR HW ELEVATION	= 41.5	FT
OVERTOPPING FREQUENCY	= 25	YRS
OVERTOPPING DISCHARGE	= 15.0	CFS
OVERTOPPING ELEVATION	= 39.9	FT

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 11.0	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 15.0	CFS
DESIGN HW ELEVATION	= 38.3	FT
100 YEAR DISCHARGE	= 24.0	CFS
100 YEAR HW ELEVATION	= 39.7	FT
OVERTOPPING FREQUENCY	= 50+	YRS
OVERTOPPING DISCHARGE	= 23.0	CFS
OVERTOPPING ELEVATION	= 39.6	FT

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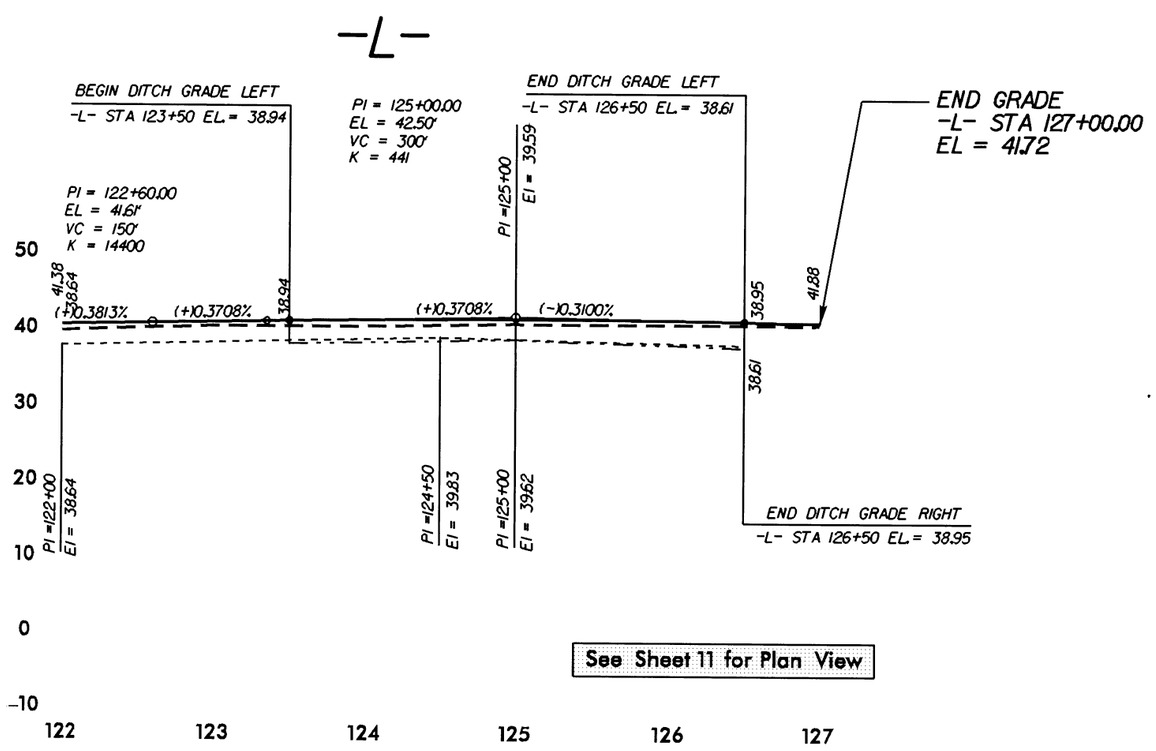


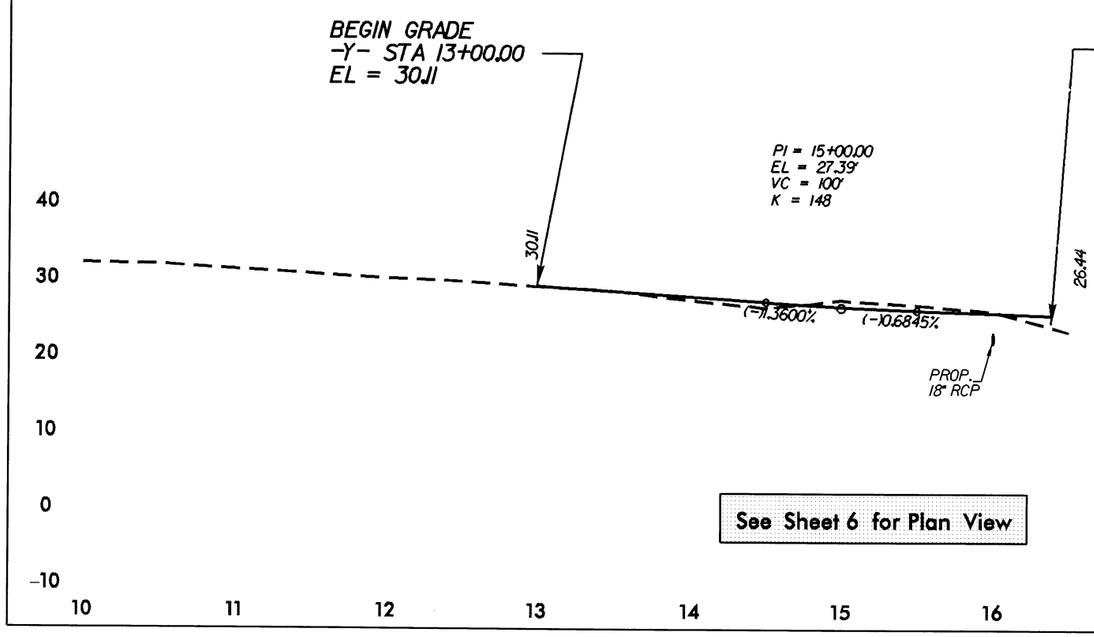
See Sheet 11 for Plan View

DITCH GRADES

LEFT DITCH GRADE

RIGHT DITCH GRADE

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



See Sheet 6 for Plan View

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 3.0	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 4.7	CFS
DESIGN HW ELEVATION	= 24.0	FT
100 YEAR DISCHARGE	= 8.0	CFS
100 YEAR HW ELEVATION	= 24.6	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 12.0	CFS
OVERTOPPING ELEVATION	= 25.6	FT

PROJECT REFERENCE NO.	SHEET NO.
B-3682 & W-3413	12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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DITCH GRADES

LEFT DITCH GRADE
RIGHT DITCH GRADE

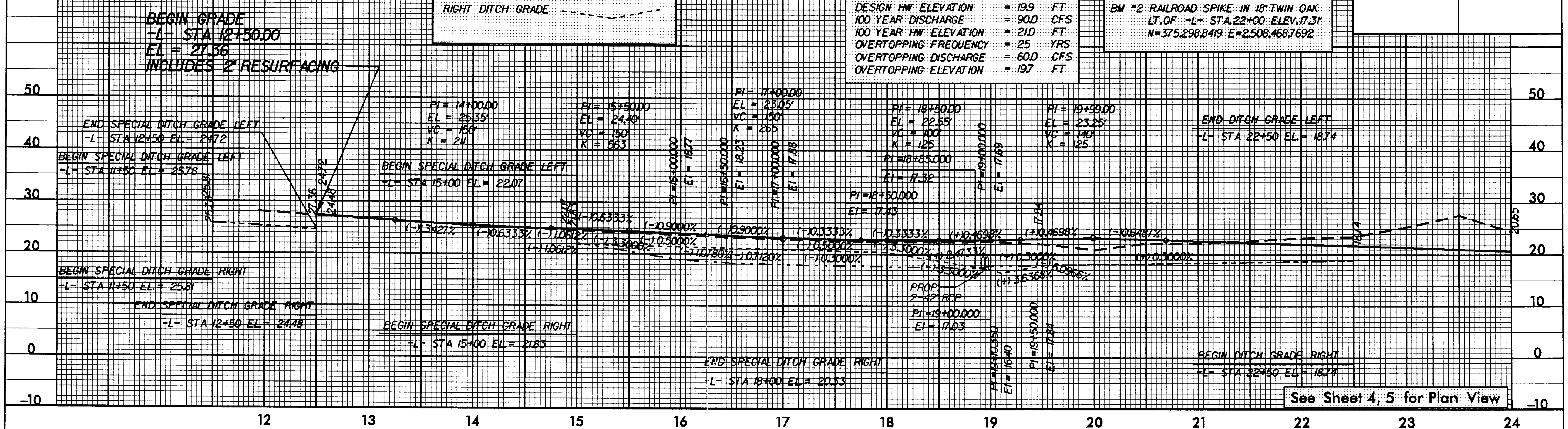
-L-

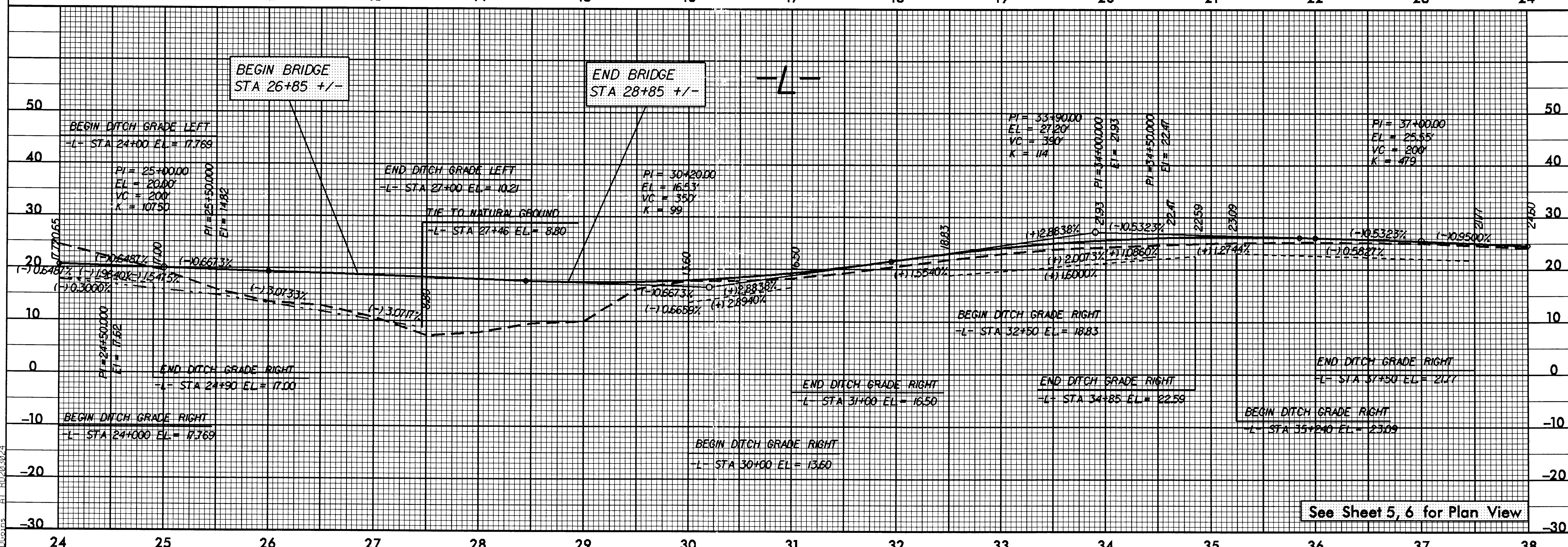
PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 48.0	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 57.0	CFS
DESIGN HW ELEVATION	= 19.9	FT
100 YEAR DISCHARGE	= 90.0	CFS
100 YEAR HW ELEVATION	= 21.0	FT
OVERTOPPING FREQUENCY	= 25	YRS
OVERTOPPING DISCHARGE	= 60.0	CFS
OVERTOPPING ELEVATION	= 19.7	FT

BM #2 RAILROAD SPIKE IN 18" TWIN OAK LT. OF -L- STA. 22+00 ELEV. 17.31' N=375,298.8419 E=2,508,468.7692





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