



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

July 18, 2008

U. S. Army Corps of Engineers
Regulatory Field Office
Post Office Box 1890
Wilmington, NC 28402-1890

Attn: Mr. Brad Shaver
NCDOT Coordinator

Dear Sir:

Subject: Application for Nationwide Permits 14, 33, and Water Quality Certification for the proposed extension of SR 1357 (Smith Ave.) from west of US 17 Business to NC 130 (Holden Beach Rd.) in Shallotte, Brunswick County. Federal Project No. STP-1357(2), State Project No 8.2231601; TIP No. U-3462. Debit \$475.00 from WBS Element 34953.1.1.

Please find enclosed the permit drawings, Pre-Construction Notification form (PCN), half-size plan sheets, stormwater permit, and stormwater management plan for the above referenced project. An Environmental Assessment (EA) was submitted by NCDOT on January 22, 2003 in compliance with the National Environmental Policy Act. The EA explains the purpose and need for the project, provides a description of the alternatives considered, and characterizes the social, economic, and environmental effects. Following approval, the EA was circulated to federal, state, and local agencies. On February 27, 2004, a FONSI was approved for U-3462. 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.

The North Carolina Department of Transportation (NCDOT) proposes to construct, partially on new location, an extension of Smith Ave. from west of US 17 Business to NC 130. The project, located in the town of Shallotte in Brunswick County, is approximately 1.2 mi. in length. At the western terminus of the project, Smith Ave. will be widened to five lanes to its intersection with US 17 Business. From US 17 Business to NC 130, Smith Ave. extension will be a four lane median divided facility. Curb and gutter will be constructed on one side and a shoulder on the other side for the new location section from US 17 Business to the Home Depot shopping center. East of the shopping center, the curb and gutter will transition to a four lane median divided facility with shoulders on both sides. The four lane facility will transition back to two lanes before tying into NC 130 at the eastern terminus of the project. Permanent impacts will consist of 0.23 ac. to riparian wetlands, 305 ft. to streams, and 0.01 ac. to surface waters. Temporary

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

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FAX: 919-733-9794

WEBSITE: WWW.NCDOT.ORG

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

impacts will consist of 0.02 ac. to surface waters. Traffic will be maintained on the existing road during construction.

Impacts to Waters of the United States

General Description: The project is located in the Lumber River Basin (Hydrologic Unit 03040207). A best usage classification of "C SW HQW" has been assigned to Woodward Branch (Charles Branch) and its immediate tributaries [DWQ Index # 15-25-2-8]. As such, High Quality Waters (HQW) occur within the project area. Based on the field review by US Army Corps of Engineers (USACE) staff, Stream A (UT2 to Woodward Branch, permit drawing Site 1), south of Smith Ave. near the western project terminus, was determined to be jurisdictional but unimportant. The other streams, UT to Woodward Branch, Woodward Branch, and Stream B (UT to Shallotte River), were all determined to be jurisdictional and important. Neither Water Supplies (WS-I: undeveloped watersheds or WS-II: predominately undeveloped watersheds) nor Outstanding Resource Waters (ORW) occur within 1.0 mi. of the project study area. Woodward Branch is not designated as a North Carolina Natural or Scenic River, or as a National Wild and Scenic River. Additionally, Woodward Branch is not listed on the Final 2006 303(d) list of impaired waters due to sedimentation for the Lumber River Basin, nor does it drain into any Section 303(d) waters within 1.0 mi. of the project study area.

Permanent Impacts: Riparian wetlands adjacent to Woodward Branch and UT to Woodward Branch will be impacted by the proposed project. Construction of the proposed project will result in permanent impacts of 0.23 ac. due to fill material, excavation, and mechanized clearing (Table 1) (see permit drawings). Installation of five culverts or pipes will result in 305 ft. of permanent stream impacts and 0.01 ac. of surface water impacts (Table 2).

Temporary Impacts: This project will result in 0.02 ac. of temporary stream channel impacts due to the installation of five culverts or pipes (Table 2).

Utility Impacts: Utility work in jurisdictional areas will involve the use of directional bore techniques and will result in no impacts. Directional bore will be used to place a water line and telephone line under Stream A at Site 1 and under Woodward Branch and adjacent wetlands near sites 2 and 3. Bore pits will be located outside of jurisdictional areas.

Table 1. Wetland Impacts for U-3462 Brunswick County

Site	Station (From/To)	Wetland Type	Permanent Fill in Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)
2	-L- Sta. 32+77 / 34+19 Lt. & Rt.	Riparian	0.08	0.04	0.03
3	-Y- Sta. 15+47 / 17+98 Lt.	Riparian	0.00	0.04	0.04
Total			0.08	0.08	0.07

Table 2. Stream Impacts for U-3462 Brunswick County.

Site	Station (From/To)	Stream Name	DWQ Rating	Structure Size/Type	Stream Impacts (lf) Permanent	Stream Impacts (ac) Temporary
1	-L- Sta. 23+93 / 24+51 Rt	Stream A (UT2 to Woodward Branch)	C SW HQW	48" RCP	0	0.00
2	-L- Sta. 32+77 / 34+19 Lt. & Rt.	Woodward Branch	C SW HQW	2 @ 9' x 7' RCBC	112	0.00
2a	DRIVE3-11+32	UT to Woodward Branch	C SW HQW	2 @ 48" RCP	34	0.00
3	-Y- Sta. 15+47 / 17+98 Lt.	Woodward Branch	C SW HQW	2 @ 6' x 5' RCBC	19	0.00
4	-L- Sta. 55+56	Stream B (UT to Shallotte River)	SC HQW	72" RCP	140	0.01
Total					305	0.02

Federally Protected Species

As of January 31, 2008 the US Fish and Wildlife Service (USFWS) listed 14 federally protected species for Brunswick County (Table 3). The bald eagle was removed from the Endangered Species List on August 8, 2007. A biological conclusion of "no effect" remains valid for all species.

Table 3. Federally Protected Species in Brunswick County

Common Name	Scientific Name	Federal Status	Habitat	Biological Conclusion
American alligator	<i>Alligator mississippiensis</i>	T (S/A)	N	No Effect
Eastern cougar	<i>Puma concolor cougar</i>	E	N	No Effect
Green sea turtle	<i>Chelonia mydas</i>	T	N	No Effect
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	E	N	No Effect
Leatherback sea turtle	<i>Dermochelys coriacea</i>	E	N	No Effect
Loggerhead sea turtle	<i>Caretta caretta</i>	T	N	No Effect
Piping plover	<i>Charadrius melodus</i>	T	N	No Effect
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	N	No Effect
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	E	N	No Effect
West Indian manatee	<i>Trichechus manatus</i>	E	N	No Effect
Wood stork	<i>Mycteria americana</i>	E	N	No Effect
Cooley's meadowrue	<i>Thalictrum cooleyi</i>	E	N	No Effect
Rough-leaved loosestrife	<i>Lysimachia asperulaefolia</i>	E	N	No Effect
Seabeach amaranth	<i>Amaranthus pumilus</i>	T	N	No Effect

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) was delisted from the Endangered Species Act as of August 8, 2007. However, it is still protected under the Bald and Golden Eagle Protection Act. No suitable habitat exists within 660 feet of the project area. Therefore, this project will have no adverse effect on the bald eagle.

In-Stream Work Moratorium

All streams in the project area fall under the jurisdiction of the NC Wildlife Resources Commission (NCWRC). A letter from NCWRC dated April 26, 1999 does not request a moratorium for this project. The project is located within 1.0 mi. of a Fish Nursery Area. However, per email correspondence with NCDMF biologist Fritz Rohde on February 18, 2008, no moratorium is required for this project.

Essential Fish Habitat/Aquatic Life Movement Status

In accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) (PL 94-265) an Essential Fish Habitat Assessment was prepared in August 2003 and can be found in Appendix B of the FONSI. NOAA Fisheries (National Marine fisheries Service) reviewed the EFH Assessment and found it to be adequate for this project. The Assessment concludes that the project will impact EFH within Woodward Branch, UT to Shallotte River, and brackish marsh along Woodward Branch. Net impacts to EFH may be reduced with the restoration and creation of marsh adjacent to Woodward Branch as detailed in NCDOT's Wetland Restoration Plan.

Avoidance and Minimization

Avoidance examines all appropriate and practicable possibilities of averting impacts to "Waters of the United States". Due to the presence of surface waters and wetlands within the project study area, avoidance of all impacts is not possible. The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts. Minimization measures incorporated as part of the project design included:

- Aligning the footprint of U-3462 to avoid wetlands in the eastern extent of the study area
- Crossings of jurisdictional areas were angled to cross as perpendicular as possible to minimize impacts
- All fill slopes in wetland areas will be 3:1
- Implementation of Design Standards in Sensitive Watersheds during the entire life of the project
- Reduction of clearing and grubbing activity
- Reduction/elimination of direct discharge into streams
- Reduction of runoff velocity
- Re-establishment of vegetation on exposed areas, judicious pesticide and herbicide usage
- Minimization of in-stream activity
- Covering of exposed fill material and litter/debris control
- The RCBC and RCP proposed at Sites 2 and 3, respectively, will be buried one foot below the streambed to allow for natural aquatic passage

Mitigation

The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. The remaining, unavoidable impacts to 0.23 ac. of jurisdictional wetlands will be offset by 0.94 ac. of riverine wetland creation near sites 2 and 3. The unavoidable impacts to 305 linear ft. of jurisdictional stream will be offset by 95 linear ft. of stream restoration and 630 ft. of stream bank enhancement near sites 2 and 3. A Wetland Restoration Plan is included and outlines the specifics of this proposal.

Regulatory Approvals

Section 404 Permit: The NCDOT requests that these activities be authorized by a Nationwide 14 permit for the above described activities. We are also requesting the issuance of a Nationwide Permit 33 for the temporary stream channel impacts due to the installation of culverts and pipes (72 CFR; 11092-11198, March 12, 2007).

Section 401 Certification: We anticipate 401 General Certification numbers 3704 and 3688 will apply to this project, and are requesting written concurrence from the North Carolina Department of Environmental and Natural Resources, Division of Water Quality. Therefore, in accordance with 15A NCAC 2H, Section .0500(a), we are providing five copies of this application to the NCDWQ for their review and approval. Authorization to debit the \$475 Permit Application Fee from WBS Element 34953.1.1 is hereby given.

CAMA: Due to the absence of any Areas of Environmental Concern (see attached email dated October 13, 2004), this project will not require a CAMA permit as confirmed by North Carolina Division of Coastal Management staff. As previously stated the project will require a Nationwide permit, which has been determined to be consistent with the State's coastal program.

State Stormwater Permit: NCDOT received a stormwater permit (SW8080228), dated May 15, 2008, from NCDWQ (attached).

A copy of this application will be posted on the NCDOT website at: <http://www.doh.dot.state.nc.us/preconstruct/pe/neu/permit.html>

Thank you for your time and assistance with this project. Please contact David E. Bailey at debailey@ncdot.gov or (919) 715-7257 if you have any questions or need additional information.

Sincerely,



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

cc:

w/attachment

Mr. Brian Wrenn, NCDWQ (5 Copies)

w/o attachment (see website for attachments)

Dr. David Chang, P.E., Hydraulics

Mr. Jay Bennett, P.E., Roadway Design

Mr. Majed Alghandour, P. E., Programming and TIP

Mr. Steve Sollod, NCDCM

Mr. Art McMillan, P.E., Highway Design

Mr. Scott McLendon, USACE, Wilmington

Mr. Travis Wilson, NCWRC

Mr. Gary Jordan, USFWS

Mr. Ron Sechler, NMFS

Ms. Anne Deaton, NCDMF

Ms. Beth Smyre, P.E., PDEA

Mr. Mark Staley, Roadside Environmental

Mr. Greg Perfetti, P.E., Structure Design

Mr. Victor Barbour, P.E., Project Services Unit

Mr. H. Allen Pope, P.E., Division 3 Engineer

Mr. Mason Herndon, Division 3 Environmental Officer

Ms. LeiLani Paugh, NEU

Mr. Randy Griffin, NEU

Office Use Only:

Form Version March 05

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

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

I. Processing

1. Check all of the approval(s) requested for this project:

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

2. Nationwide, Regional or General Permit Number(s) Requested: NWP 14 and 33

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

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

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

II. Applicant Information

1. Owner/Applicant Information
Name: Gregory J. Thorpe, Ph.D., Environmental Management Director
Mailing Address: 1598 Mail Service Center

Telephone Number: (919) 733-3141 Fax Number: (919) 733-9794
E-mail Address: _____

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: Extension of SR 1357 (Smith Ave) from West of US 17 Business to NC 130 in Shallotte, Brunswick County
2. T.I.P. Project Number or State Project Number (NCDOT Only): U-3462
3. Property Identification Number (Tax PIN): N/A
4. Location
County: Brunswick Nearest Town: Shallotte
Subdivision name (include phase/lot number): N/A
Directions to site (include road numbers/names, landmarks, etc.): Take US 17 South to US 17 Business South in Shallotte, NC, turn right onto SR 1357 (Smith Ave).
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): See attached sheet °N _____ °W
6. Property size (acres): N/A
7. Name of nearest receiving body of water: Woodward (Charles) Branch
8. River Basin: Lumber
(Note – this must be one of North Carolina's seventeen designated major river basins. The River Basin map is available at <http://h2o.enr.state.nc.us/admin/maps/>.)
9. Describe the existing conditions on the site and general land use in the vicinity of the project at the time of this application: The project is located in an urban area in Brunswick County. Land around the site is mostly heavily used paved roads, parking lots, and commercial property, with some agricultural, residential, and forested land at the project termini.

10. Describe the overall project in detail, including the type of equipment to be used: NCDOT proposes to construct, partially on new location, an extension of SR 1357 (Smith Ave) from west of US 17 Business to NC 130. The project includes the extension, replacement, or installation of four pipe/culvert structures over jurisdictional streams. The project is approximately 1.2 miles in length. Standard NCDOT construction equipment will be used.
11. Explain the purpose of the proposed work: The purpose of the project is to relieve congestion and improve safety at the intersection of US 17 Business and NC 130 and to improve traffic flow from US 17 Bypass to NC 130. This project would realign the existing skew between SR 1357 (Smith Ave.) and NC 130.

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. A jurisdictional determination was issued by the USACE for a small property near the intersection of Smith Ave. and US 17 Business on November 20, 2002 under Action ID 200201098. A USACE jurisdictional determination for the remainder of the project was requested by NCDOT on February 26, 2008. Stormwater Permit No. SW8 080228 was received on May 20, 2008.

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 future permit requests are anticipated for this project.

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: Proposed impacts to jurisdictional areas of U-3462 total 0.23 acre of permanent wetland impacts, 0.01 acre of permanent surface water impacts, 0.02 acre of temporary surface water impacts, and 305 feet of permanent stream channel impacts.
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)
2	Permanent Fill	herbaceous	yes	abutting	0.08
2	Excavation	herbaceous	yes	abutting	0.04
2	Mechanized Clearing	herbaceous	yes	abutting	0.03
3	Excavation	herbaceous	yes	abutting	0.04
3	Excavation	herbaceous	yes	abutting	0.04
Total Wetland Impact (acres)					0.23

3. List the total acreage (estimated) of all existing wetlands on the property: 2.0 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	Stream A (UT2 to Woodward Branch)	Permanent Surface Water	Intermittent	3 ft	N/A - Unimportant Stream	0.01
2	Woodward Branch	Permanent Existing Channel	Perennial	5 ft.	112	0.02
2	Woodward Branch	Temporary Existing Channel	Perennial	5 ft.	41	0.00
2a	UT to Woodward Branch	Permanent Existing Channel	Perennial	4 ft	34	0.01
2a	UT to Woodward Branch	Temporary Existing Channel	Perennial	4 ft	20	0.00
3	Woodward Branch	Permanent Existing Channel	Perennial	5 ft	19	0.01
3	Woodward Branch	Temporary Existing Channel	Perennial	5 ft	16	0.00

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)
4	UT to Shallotte River	Permanent Existing Channel	Perennial	4 ft	140	0.03
4	UT to Shallotte River	Temporary Existing Channel	Perennial	4 ft	47	0.01
Total Permanent Stream Impact (by length and acreage)					305	0.07
Total Temporary Stream Impact (by length and acreage)					124	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)
N/A				
Total Open Water Impact (acres)				0.0

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

Stream Impact (acres):	0.09
Wetland Impact (acres):	0.23
Open Water Impact (acres):	0.0
Total Impact to Waters of the U.S. (acres)	0.32
Total Stream Impact (linear feet):	429

7. Isolated Waters

Do any isolated waters exist on the property? Yes No

Describe all impacts to isolated waters, and include the type of water (wetland or stream) and the size of the proposed impact (acres or linear feet). Please note that this section only applies to waters that have specifically been determined to be isolated by the USACE.

N/A

8. Pond Creation

If construction of a pond is proposed, associated wetland and stream impacts should be included above in the wetland and stream impact sections. Also, the proposed pond should be described here and illustrated on any maps included with this application.

Pond to be created in (check all that apply): uplands stream wetlands

Describe the method of construction (e.g., dam/embankment, excavation, installation of draw-down valve or spillway, etc.): N/A

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

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

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

VII. Impact Justification (Avoidance and Minimization)

Specifically describe measures taken to avoid the proposed impacts. It may be useful to provide information related to site constraints such as topography, building ordinances, accessibility, and financial viability of the project. The applicant may attach drawings of alternative, lower-impact site layouts, and explain why these design options were not feasible. Also discuss how impacts were minimized once the desired site plan was developed. If applicable, discuss construction techniques to be followed during construction to reduce impacts. The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts. Minimization measures incorporated as part of the project design include setting fill slopes at no steeper than a 3:1 ratio in jurisdictional areas, angling crossings of jurisdictional areas as perpendicular as possible to minimize impacts, no staging of construction equipment or storage of construction supplies in any jurisdictional areas, and aligning the footprint of U-3462 to avoid wetlands in the eastern extent of the study area. Design Standards in Sensitive Watersheds will be utilized during demolition of the existing bridge and construction of the new bridge. The structures proposed at Sites 2 and 4 will be buried one foot below the streambed to allow for natural aquatic passage

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.

The unavoidable permanent impacts to 0.23 acres of jurisdictional wetlands will be offset by 0.94 acre of riverine wetland creation near sites 2 and 3. The unavoidable permanent impacts to 305 linear feet of jurisdictional stream will be offset by 95 linear feet of stream restoration and 630 ft. of stream bank enhancement near sites 2 and 3. A Wetland Restoration Plan is included and outlines the specifics of this proposal.

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): N/A
Amount of buffer mitigation requested (square feet): N/A
Amount of Riparian wetland mitigation requested (acres): N/A
Amount of Non-riparian wetland mitigation requested (acres): N/A
Amount of Coastal wetland mitigation requested (acres): N/A

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
Total			0

* 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. N/A

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. See attached Stormwater Management Plan and Permit

XII. Sewage Disposal (required by DWQ)

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

XIII. Violations (required by DWQ)

Is this site in violation of DWQ Wetland Rules (15A NCAC 2H .0500) or any Buffer Rules?
Yes No

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

XIV. Cumulative Impacts (required by DWQ)

Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? Yes No
If yes, please submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent North Carolina Division of Water Quality policy posted on our website at <http://h2o.enr.state.nc.us/ncwetlands>. If no, please provide a short narrative description: _____
N/A

XV. Other Circumstances (Optional):

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

E. J. Luke

7-17-08

Applicant/Agent's Signature

Date

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

Attached Sheet:

III. Project Information

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.)

Waterbody Crossing (Site #)	Latitude	Longitude
1	33.9813 °N	78.3793 °W
2	33.9799 °N	78.3767 °W
2a	33.9799 °N	78.3776 °W
3	33.9787 °N	78.3777 °W
4	33.9755 °N	78.3723 °W

**Charles Branch Wetland and Stream Site
Mitigation Plan
U-3462
Extension of Smith Avenue
Brunswick County
March 31, 2008**

The North Carolina Department of Transportation (NCDOT) proposes onsite wetland and stream mitigation for U-3462 at the intersection of US 17 Business and Smith Avenue (SR 1537) in the western quadrants of the roadway project.

The Charles Branch site will provide 0.94 acres of wetland creation, 95 feet of stream restoration, and 630 feet of stream enhancement. Existing stormwater drainage and proposed roadway drainage to Charles Branch will be routed through the wetland creation areas before entering the stream and its unnamed tributary. This onsite mitigation package is proposed to offset the total project impacts that require mitigation, consisting of 0.23 acres of wetland and 305 feet of stream.

EXISTING CONDITIONS:

Within the western quadrants of the roadway project, Charles Branch flows for approximately 600 feet in a southerly direction, crossing under Smith Avenue. Charles Branch then turns easterly and flows under US 17 Business. Charles Branch is approximately 15 feet wide. Emergent marsh vegetation is established along and within both banks. The right bank grades abruptly to the adjacent access road fill. The left bank grades gradually to a shrub scrub wetland and then to regularly maintained uplands adjacent to US 17 Business fill slopes.

An Unnamed Tributary to Charles Branch flows parallel to Smith Avenue in an easterly direction for approximately 230 feet before crossing under an access road near its confluence with Charles Branch. The UT is approximately 6 feet wide. Emergent marsh vegetation is established along and within both banks. The right bank grades abruptly to a paved parking lot. The left bank grades abruptly to regularly maintained uplands adjacent to Smith Avenue fill slopes.

Current drainage from adjacent development in the southeastern quadrant of the project flows into a collection box near -Y- STA 16 +70 and then discharges into Charles Branch.

PROPOSED CONDITIONS:

On site mitigation is proposed for three areas within the western quadrants of the roadway project at Impact Site 2, 2A, and 3.

Mitigation associated with Site 2 is located along Charles Branch and north of Smith Avenue. Stream mitigation is proposed by removing the existing culvert in Charles Branch and the associated fill of Smith Avenue. The appropriate channel dimensions will be restored. The banks will be matted with coir fiber matting and planted with live stakes of black willow (*Salix nigra*) and silky dogwood (*Cornus amomum*) on 4 foot centers.

Mitigation associated with Site 2A is located along the UT to Charles Branch to the south of Smith Avenue. Wetland mitigation is proposed by grading the uplands and the access road to emergent marsh elevations. Target elevations will be determined by spot elevations in the existing marsh community within the banks of the UT to Charles Branch. Drainage from southwestern quadrant of the project will be discharged south of Smith Avenue and allowed to sheet flow across the wetland mitigation area. Stream mitigation is proposed by removing the existing culvert in the UT to Charles Branch at the access road and restoring the appropriate channel dimensions, tying the banks into the adjacent wetland mitigation area.

Mitigation associated with Site 3 is located along Charles Branch and to the west of US 17 Business. Wetland mitigation is proposed by grading the uplands and shrub scrub wetland to emergent marsh elevations. Target elevations will be determined by spot elevations in the existing marsh community within the banks of Charles Branch. Drainage from southeastern quadrant of the project will be redirected to the western quadrant and allowed to sheet flow across the wetland mitigation area. The access road along the western bank of Charles Branch will be removed and graded, as described at Site 2A, thereby connecting the two mitigation areas.

All wetland mitigation areas will be planted with the following species on three foot centers: sawgrass (*Cladium jamaicense*), soft rush (*Juncus effuses*), and woolgrass (*Scirpus cyperinus*).

MONITORING:

The Natural Environment Unit shall be contacted to provide construction oversight to ensure that the wetland mitigation area is constructed appropriately and to the target elevations.

NCDOT shall monitor the mitigation site by visual observation for stream stability and by photo points for survival and aerial cover of vegetation. NCDOT shall monitor the site for a minimum of three years or until the site is deemed successful. Monitoring will be initiated upon completion of the site planting.

Bailey, David E

From: Bill Arrington [Bill.Arrington@ncmail.net]
Sent: Wednesday, October 13, 2004 12:03 PM
To: anottingham
Cc: Greg Thorpe; Steve Sollod; Jim Gregson; Stephen Rynas
Subject: U-3462 Smith Ave. Extention

Andrew,

I had the opportunity to visit Smith Avenue in Shallotte and survey the U-3462 (Smith Avenue Extension) Project area for Area's of Environmental Concern (AEC's).

There are no AEC's in the U-3462 project area. The proposed project will not require a CAMA Permit but will be processed by the Division of Coastal Management through concurrence with a Consistency Determination to be submitted by the DOT as part of any request for a federal permit. Stephen Rynas, DCM Consistency Coordinator, will review this document and will generate the final concurrence with the document.

During the consistency review process, we may have additional comments on the project's environmental impacts, and may place conditions on the final consistency determination concurrence to minimize any environmental impacts. The information provided in this letter shall not preclude us from requesting additional information throughout the review process, following normal program consistency determination procedures.

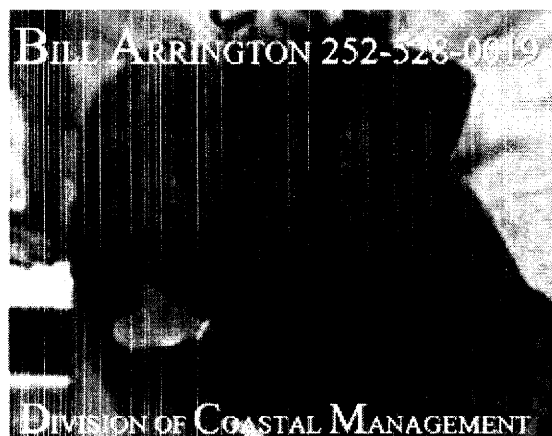
<!--[if !supportEmptyParas]--> <!--[endif]-->

Please contact me at (252) 528-0019 or via e-mail at bill.arrington@ncmail.net if you have any questions or concerns. Stephen Rynas can be contacted at by phone at (252) 808-2808, or via e-mail at stephen.rynas@ncmail.net.

I hope you are doing well,

Bill

--





Michael F. Easley, Governor

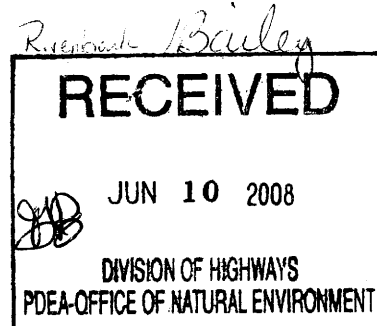
William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

Coleen H. Sullins Director
Division of Water Quality

May 15, 2008

David L. Thomas, Sr., P.E.
North Carolina Department of Transportation
124 Division Dr.
Wilmington, NC 28401

**Subject: Permit No. SW8 080228
Extension of S.R. 1357
Other Stormwater Permit
Linear Public Road / Bridge Project
Brunswick County**



Dear Mr. Thomas:

The Wilmington Regional Office received a complete Stormwater Management Permit Application for Extension of S.R. 1357 on April 25, 2008. Staff review of the plans and specifications has determined that the project, as proposed, will comply with the Stormwater Regulations set forth in Title 15A NCAC 2H .1000. We are forwarding Permit No. SW8 080228 dated May 15, 2008, for the construction of the subject project.

This permit shall be effective from the date of issuance until rescinded and shall be subject to the conditions and limitations as specified therein.

If any parts, requirements, or limitations contained in this permit are unacceptable, you have the right to request an adjudicatory hearing upon written request within Sixty (60) days following receipt of this permit. This request must be in the form of a written petition, conforming to Chapter 150B of the North Carolina General Statutes, and filed with the Office of Administrative Hearings, P.O. Drawer 27447, Raleigh, NC 27611-7447. Unless such demands are made this permit shall be final and binding.

If you have any questions, or need additional information concerning this matter, please contact either me or David Cox at (910) 796-7215.

Sincerely,

Edward Beck
Regional Supervisor
Surface Water Protection Section

ENB/dwc: S:\WQS\STORMWATER\PERMIT\080228.may08
cc: G. E. Brew, P.E.
Brunswick, County Building Inspections
David Cox
Wilmington Regional Office
Central Files

RECEIVED

MAY 19 2008

DIVISION 3 OFFICE

One North Carolina Naturally

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WATER QUALITY
STATE STORMWATER MANAGEMENT PERMIT
OTHER PERMIT

In accordance with the provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules and Regulations

PERMISSION IS HEREBY GRANTED TO

David L. Thomas & NCDOT

Extension of S.R. 1357

Shallotte, Brunswick County

FOR THE

construction of a public road / bridge in compliance with the provisions of 15A NCAC 2H .1000 (hereafter referred to as the "*stormwater rules*") and the approved stormwater management plans and specifications, and other supporting data as attached and on file with and approved by the Division of Water Quality and considered a part of this permit.

The Permit shall be effective from the date of issuance until rescinded and shall be subject to the following specific conditions and limitations:

I. DESIGN STANDARDS

1. The runoff from the impervious surfaces has been directed away from surface waters as much as possible.
2. The amount of built-upon area has been minimized as much as possible.
3. Best Management Practices are employed which minimize water quality impacts.
4. Approved plans and specifications for projects covered by this permit are incorporated by reference and are enforceable parts of the permit.
5. Vegetated roadside ditches are 3:1 slopes or flatter.

II. SCHEDULE OF COMPLIANCE

1. The permittee shall at all times provide adequate erosion control measures in conformance with the approved Erosion Control Plan.
2. The Director may notify the permittee when the permitted site does not meet one or more of the minimum requirements of the permit. Within the time frame specified in the notice, the permittee shall submit a written time schedule to the Director for modifying the site to meet minimum requirements. The permittee shall provide copies of revised plans and certification in writing to the Director that the changes have been made.
3. The permittee shall submit all information requested by the Director or his representative within the time frame specified in the written information request.

The permittee shall submit to the Director and shall have received approval for revised plans, specifications, and calculations prior to construction for the following items:

- a. Major revisions to the approved plans, such as road realignment, deletion of any proposed BMP, changes to the drainage area or scope of the project, etc.
 - b. Project name change.
 - c. Redesign of, addition to, or deletion of the approved amount of built-upon area, regardless of size.
 - d. Alteration of the proposed drainage.
5. The Director may determine that other revisions to the project should require a modification to the permit.

III. GENERAL CONDITIONS

1. Failure to abide by the conditions and limitations contained in this permit may subject the Permittee to an enforcement action by the Division of Water Quality, in accordance with North Carolina General Statutes 143-215.6A to 143-215.6C.
2. The permit issued shall continue in force and effect until revoked or terminated.
3. The permit may be modified, revoked and reissued or terminated for cause. The filing of a request for a permit modification, revocation and reissuance, or termination does not stay any permit condition.
4. The issuance of this permit does not prohibit the Director from reopening and modifying the permit, revoking and reissuing the permit, or terminating the permit as allowed by the laws, rules, and regulations contained in Title 15A of the North Carolina Administrative Code, Subchapter 2H.1000; and North Carolina General Statute 143-215.1 et. al.
5. The permit is not transferable to any person except after notice to and approval by the Director. The Director may require modification or revocation and reissuance of the permit to change the name and incorporate such other requirements as may be necessary. A formal permit request must be submitted to the Division of Water Quality accompanied by the appropriate fee, documentation from both parties involved, and other supporting materials as may be appropriate. The approval of this request will be considered on its merits, and may or may not be approved. The permittee is responsible for compliance with the terms and conditions of this permit until such time as the Director approves the transfer.
6. The issuance of this permit does not preclude the Permittee from complying with any and all statutes, rules, regulations, or ordinances which may be imposed by other government agencies (local, state and federal) which have jurisdiction.
7. The permittee shall notify the Division of any name, ownership or mailing address changes within 30 days.

Permit issued this, the 15th day of May, 2008

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION



for
Coleen Sullins, Director
Division of Water Quality
By Authority of the Environmental Management Commission

STORMWATER MANAGEMENT PLAN

U-3462, WBS No.: 34953.1.1

Date: 04/27/08

Brunswick County

Hydraulics Project Manager: Andrew Nottingham, PE

ROADWAY DESCRIPTION

The project involves the widening and extension of SR 1357 (Smith Avenue) in Shallotte. The project begins on Smith Avenue 0.4 mile west of the intersection with US17 Business and ends at NC 130 (Holden Beach Road) approximately 0.5 mile east of US 17Bus. The overall length of the project is 1.23 miles. The proposed typical section varies along the project, generally consisting of a 4-lane roadway section. Curb and gutter is used in the vicinity of the intersection of existing US 17Bus/NC 130 and shoulder section is used on the remainder of the project.

ENVIRONMENTAL DESCRIPTION AND IMPACTS

The project is located in the Lumber River Basin in the Coastal Physiographic Province. The natural ground elevation range is from 36 feet near the project's beginning to 8 feet at the project's terminus. The project impacts three streams. The first stream is a minor tributary of Charles Branch near the beginning of the project. It becomes jurisdictional at the outlet of an existing cross pipe. The second stream is Charles Branch located near the intersection of Smith Avenue and US 17 Business (intersection). The project will cross Charles Branch twice, first along Smith Avenue and then downstream along US 17 Business. The third stream is an unnamed tributary to Sharron Creek located between US17 Business and the project's terminus. Charles Branch is classified as Class C, Sw, and HQW waters. Sharron Branch is classified as SC and HQW waters.

The first stream impact will consist of replacing the existing reinforced concrete pipe (RCP) with a larger RCP. The Smith Avenue crossing of Charles Branch will consist of replacing existing metal arch pipes with a new reinforced concrete box culvert (RCBC) just downstream of the current crossing and removing the old metal pipes. The US17 Business crossing of Charles Branch will consist of extending the existing RCBC upstream to accommodate the new roadway cross section. The Sharron Creek tributary crossing will be a new crossing and will require a 72" reinforced concrete pipe.

The project will impact wetland areas also. The most significant wetland impacts occur at the Charles Branch site near the US17 Business intersection. On-site wetland mitigation is proposed at the southwest quadrant of the intersection to offset these impacts and to provide storm water treatment

BEST MANAGEMENT PRACTICES

Best Management Practices (BMPs) and measures used on the project are non-structural and attempt to reduce storm water impacts to the receiving streams due to erosion and runoff. Grassed roadside ditches have been used where possible along the project to convey storm water. In the areas where curb and gutter is used, multiple pipe outlets will

discharge to grassed roadside ditches or flat graded floodplains. In all cases, storm water is directed away from streams and the ditches use 3:1 or flatter side slopes. The inverts of all new culverts on jurisdictional streams or wetlands will be buried 20% of the pipe diameter, up to 1 foot deep. In locations where the proposed alignment will be shifted from the current alignment, the existing pavement will be removed. The remaining area will then be replanted with vegetation.

Where possible, existing storm water outlets have been retrofitted to provide treatment. For example, storm water runoff from the road and adjacent paved surfaces near the US17 Business intersection currently discharge directly into Charles Branch. The proposed drainage design will route this drainage across the road and into the wetland mitigation site before it enters Charles Branch. Similarly, current drainage south of the Charles Branch crossing at US17 Business directly discharges into the culvert, and the proposed design will redirect this outlet across US17 Business into a proposed grass lined ditch before it enters a tributary to Charles Branch.

Grass Swale Locations (all are along the Mainline, -L- or -LREV-)

- 21+00 to 22+20 Lt.
- 24+50 to 25+50 Rt.
- 31+50 to 33+50 Lt.
- 36+50 to 39+50 Lt.
- 48+50 to 50+00 Rt.
- 53+00 to 54+50 Rt.
- 57+50 to 61+00 Rt.
- 62+50 to 66+00 Rt.
- 67+00 to 69+95 Rt.
- 67+50 to 69+50 Lt.

Major Structure Locations

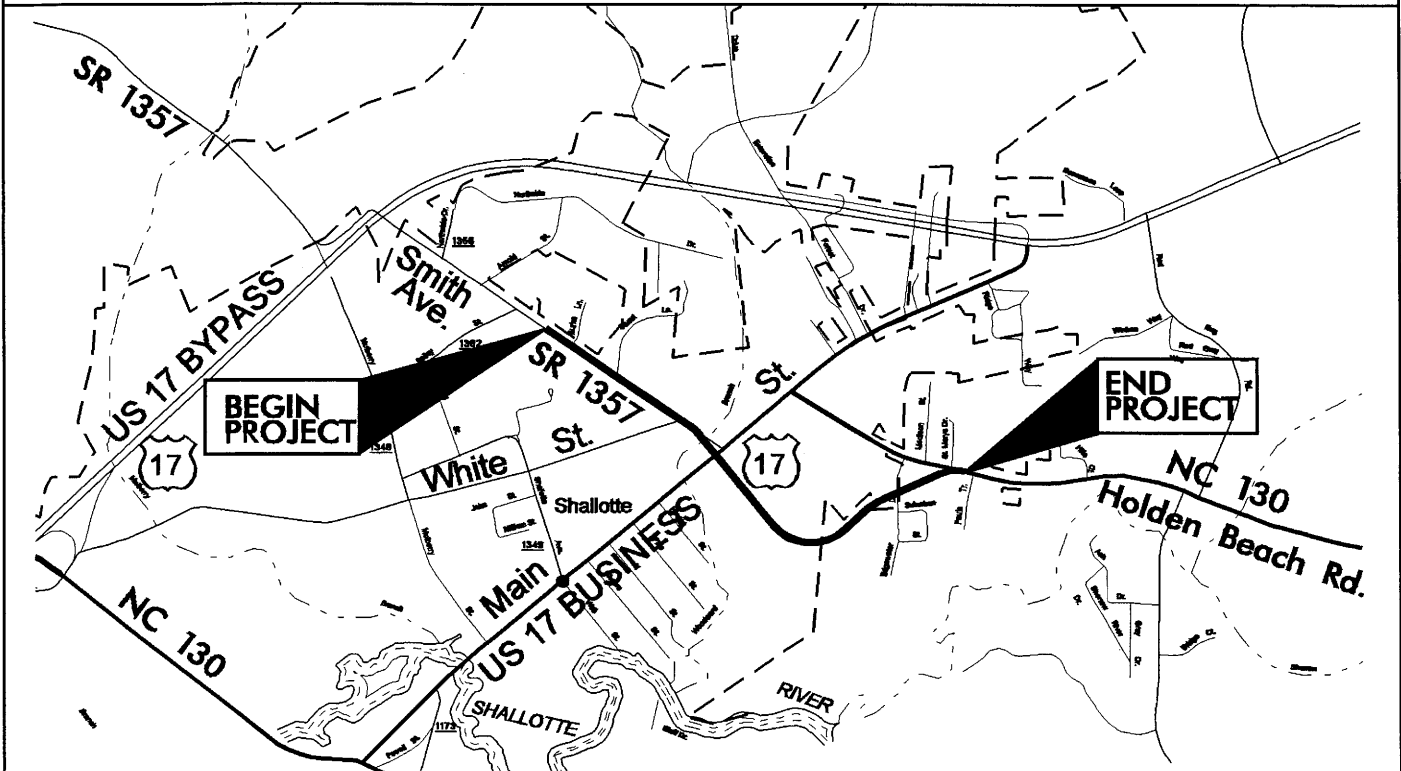
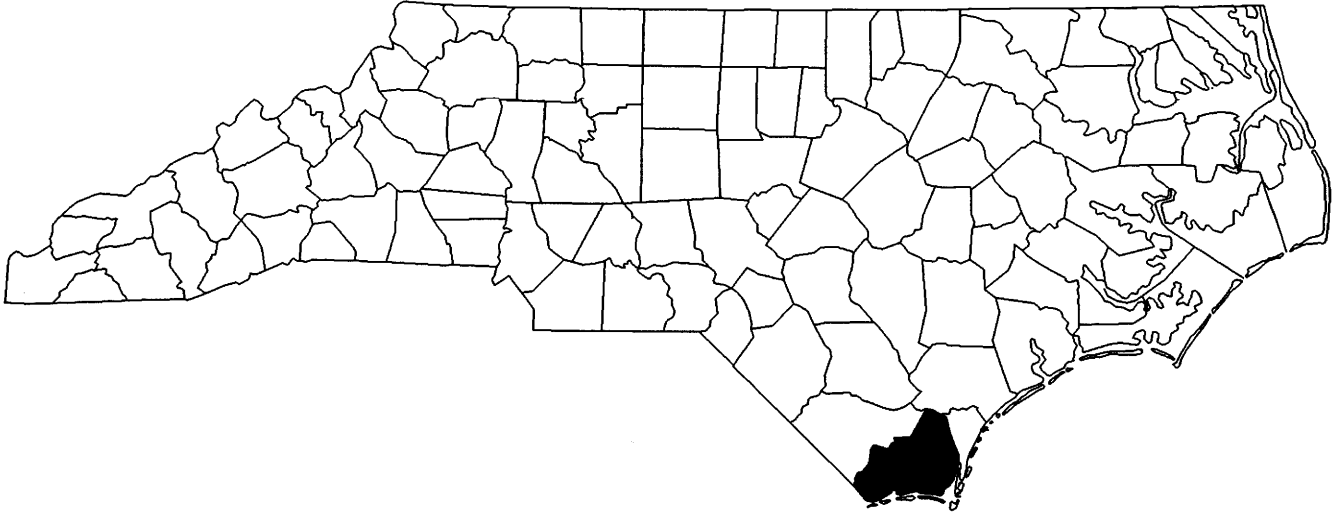
-L- Station 33+75

Remove existing 2 @ 8'2" x 5'9" CS Pipe Arches. Replace with 2 @ 9' x 7' RCBC buried 1.0 foot and located on new location to the west of existing pipe arches.

-Y- Station 15+60

Extend existing 6' x 5' reinforced concrete box culvert approximately 19 feet upstream.

NORTH CAROLINA



VICINITY MAPS

NCDOT
DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
WBS NO.: 34953.1.1 (U-3462)
EXTENSION OF SR 1357
FROM US 17 BUSINESS
TO NC 130 IN SHALLOTTE

Permit Drawing
Sheet 1 of 24

SHEET

11 / 30 / 07

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS						SURFACE WATER IMPACTS					
			Permanent Fill in Wetlands (ac)	Temp. Fill in Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)		
1	-L- Sta. 23+93 to 24+51 RL	48" RCP							0.01	0.00				*
2	-L- Sta. 32+77 to 34+19 Lt. & Rt.	2 @ 9' x 7' RCBC	0.08		0.04	0.03			0.02	0.00	112	41		*
2a	-DRIVE3- 11+32	2 @ 48" RCP							0.01	0.00	34	20		*
3	-Y- Sta. 15+47 to 17+98 Lt.	2 @ 6' x 5' RCBC	0.00		0.04	0.04			0.01	0.00	19	16		*
4	-L- Sta. 55+56	72" RCP							0.03	0.01	140	47		*
TOTALS:			0.08		0.08	0.07			0.07	0.02	305	124		

Onsite Mitigation

Note: The wetland mitigation shown near sites two and three totals 0.94 acre.
 Stream Bank Enhancement totals 630 ft.
 Stream restoration totals 95 ft.

* Proposed to offset all project impacts

NC DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

BRUNSWICK COUNTY
 WBS - 34953.1.1 (U-3462)

SHEET 3/20/2008

ATN Revised 3/31/05

Site No.	Parcel No.	Property Owner Name	Property Owner Address
1	6	Far Star Office Park c/o Waccamaw Bank	110 N. Powell Blvd. Whiteville NC 28472
	8	Coastal Federal Bank c/o Waccamaw Bank	110 N. Powell Blvd. Whiteville NC 28472
2	10	Taylor and Coffey LLC	7057-1 Beach Drive SW Ocean Isle Beach NC 28469
	14	R. D. White, III	P.O. Box 40, Shallotte, NC 28459
	15	White Investmensts	P.O. Box 40, Shallotte, NC 28459
	17	SJL Properties LLC	1 Causeway Dr. Ocean Isle Beach, NC 28469
	901	NC Department of Transportation	
3	14	R. D. White, III	P.O. Box 40, Shallotte, NC 28459
	901	NC Department of Transportation	
4	23	Mintz LLC et als (TLM Investments)	P.O. Box 264, Shallotte, NC 28459
	24	Shallotte Crossing LLC c/o Aston Properties LLC	6525 Morrison Blvd. Suite 300 Charlotte NC 28211

List of Property Owners

NC Dept. of Transportation
Division of Highways
Brunswick County
WBS No.: 34953.1.1 (U-3462)

Extension of SR 1357 From US 17 Business
to NC 130 in Shallotte

Sheet of 02/25/08

-L- STA 33+75
 2@9'x7' RCBC
 G.P. ELEV = 10.25'
 SKEW = 90°

EXISTING ROADBED & PIPES
 TO BE REMOVED

NATURAL GROUND

STREAM BED

INVERT 0.0

INVERT 0.0



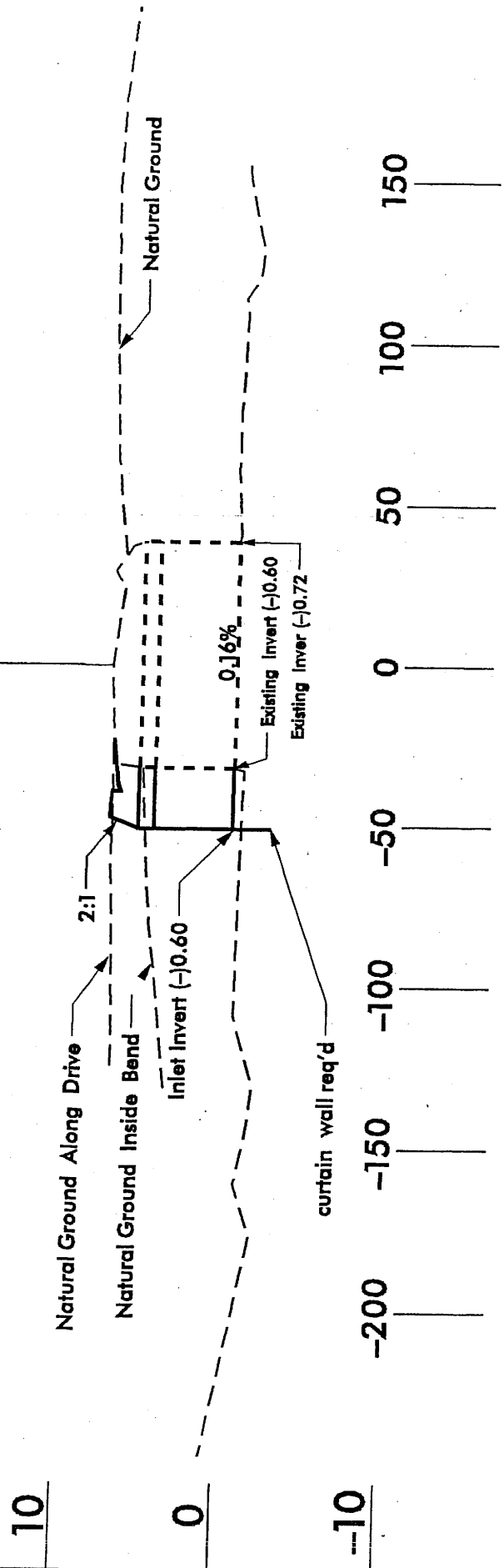
PROFILE - SITE 2

NCDOT

DIVISION OF HIGHWAYS
 BRUNSWICK COUNTY
 WBS NO.: 34953.L1 (U-3462)
 EXTENSION OF SR 1357
 FROM US 17 BUSINESS
 TO NC 130 IN SHALLOTTE

SHEET OF 07/31/2007

-Y- 15 + 59.77
 Extend existing 2 @ 6'x5' Box Culvert
 with 2 @ 6'x5' RCBC
 Skew = 90°



NCDOT
 DIVISION OF HIGHWAYS
 BRUNSWICK COUNTY
 WBS NO.: 34953.1.1 (U-3462)
 EXTENSION OF SR 1357
 FROM US 17 BUSINESS
 TO NC 130 IN SHALLOTTE

SHEET OF 07 / 31 / 2007

PROFILE - SITE 3

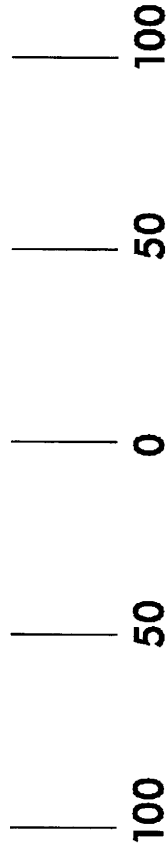
72" RCP
-L- STA. 55 + 56.1

EXISTING STREAMBED

INV = 5.0

S = .007

INV = 4.0



PROFILE - SITE 4

NCDOT

DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
WBS NO.: 34953.1.1 (U-3462)
EXTENSION OF SR 1357
FROM US 17 BUSINESS
TO NC 130 IN SHALLOTTE

SHEET

OF

11 / 30 / 2007

24

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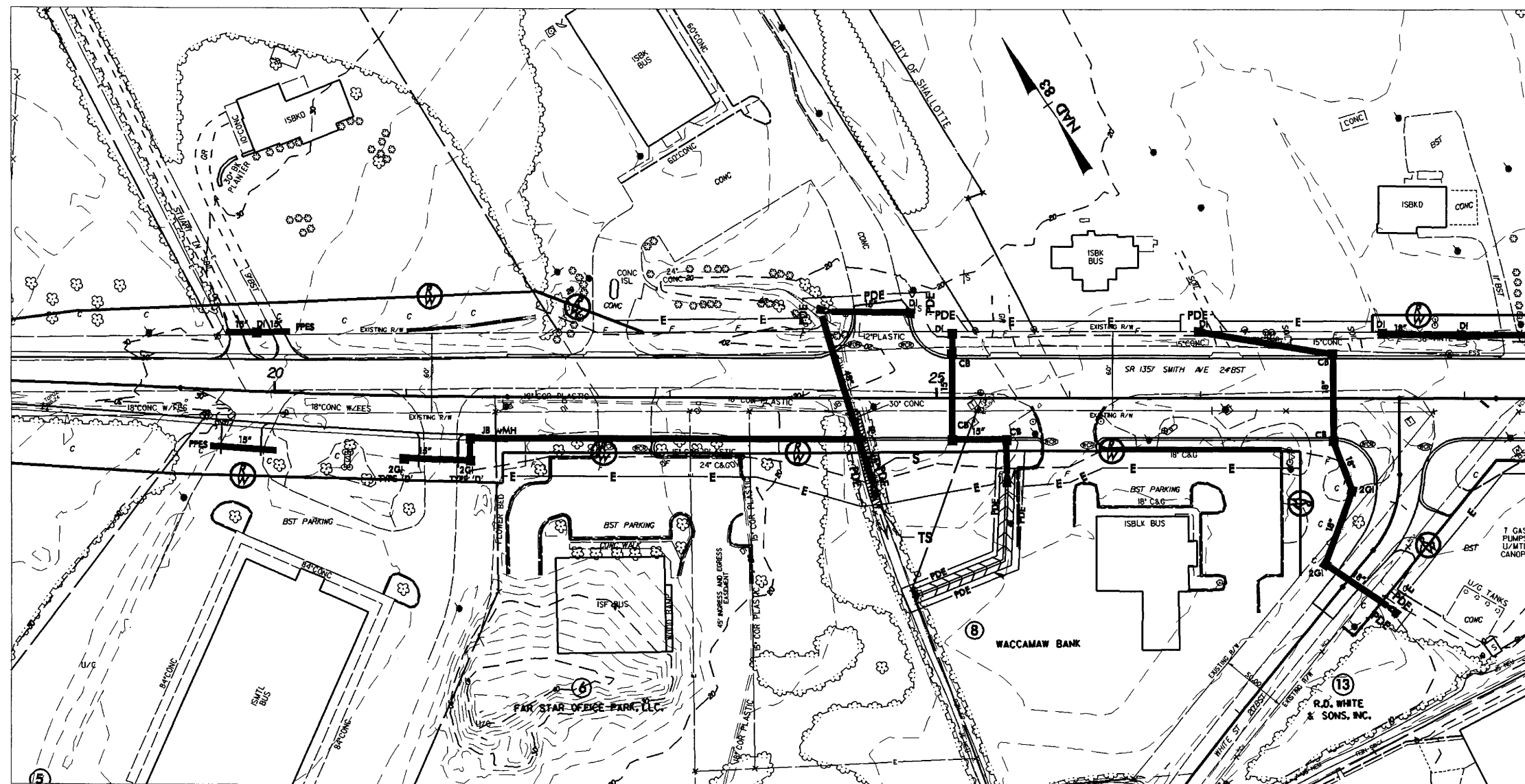
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U-3462

4

PERMIT DRAWING SITE ONE

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

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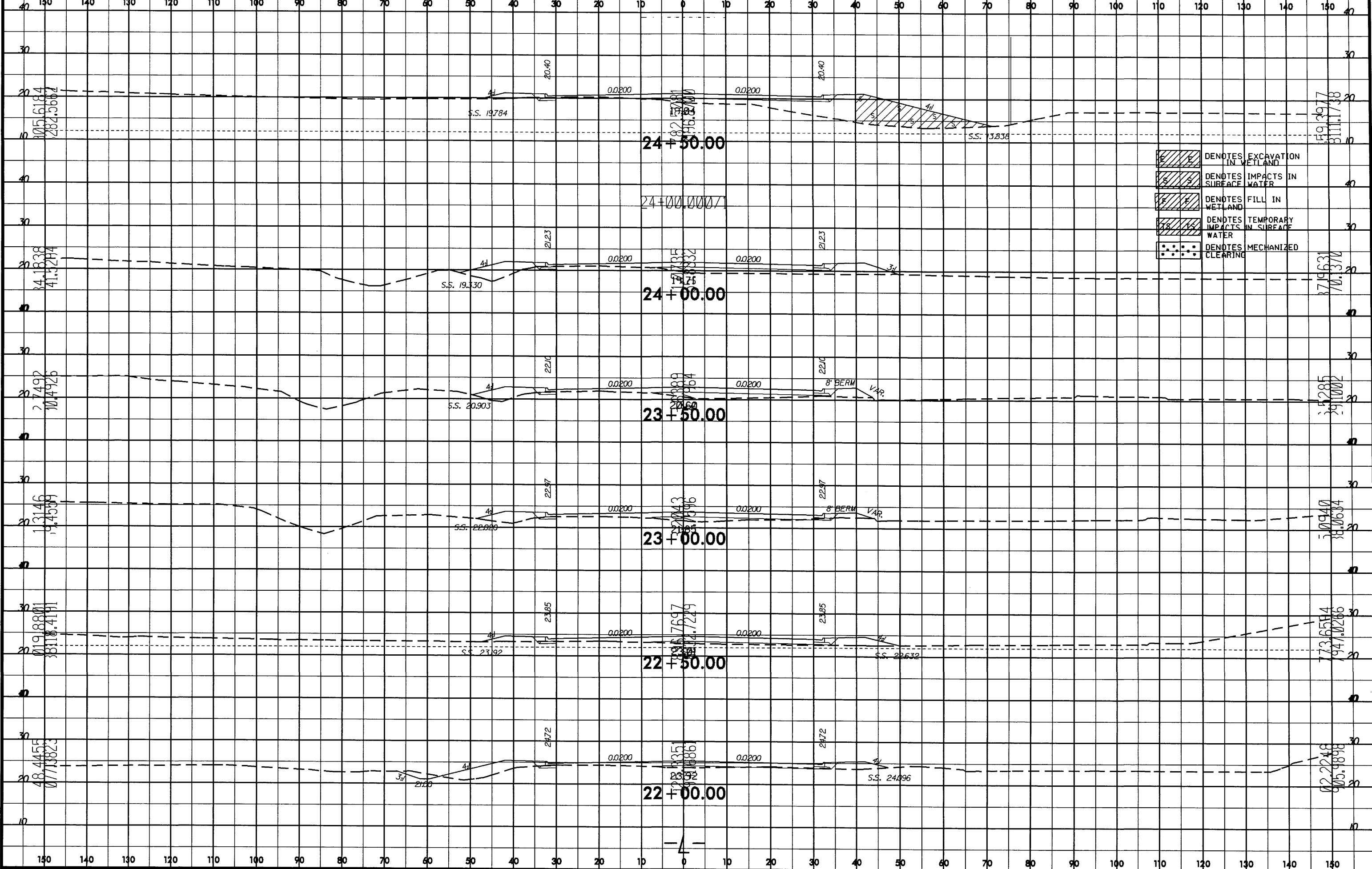
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blp5comb

8/23/08



PROJ. REFERENCE NO.
U-3462

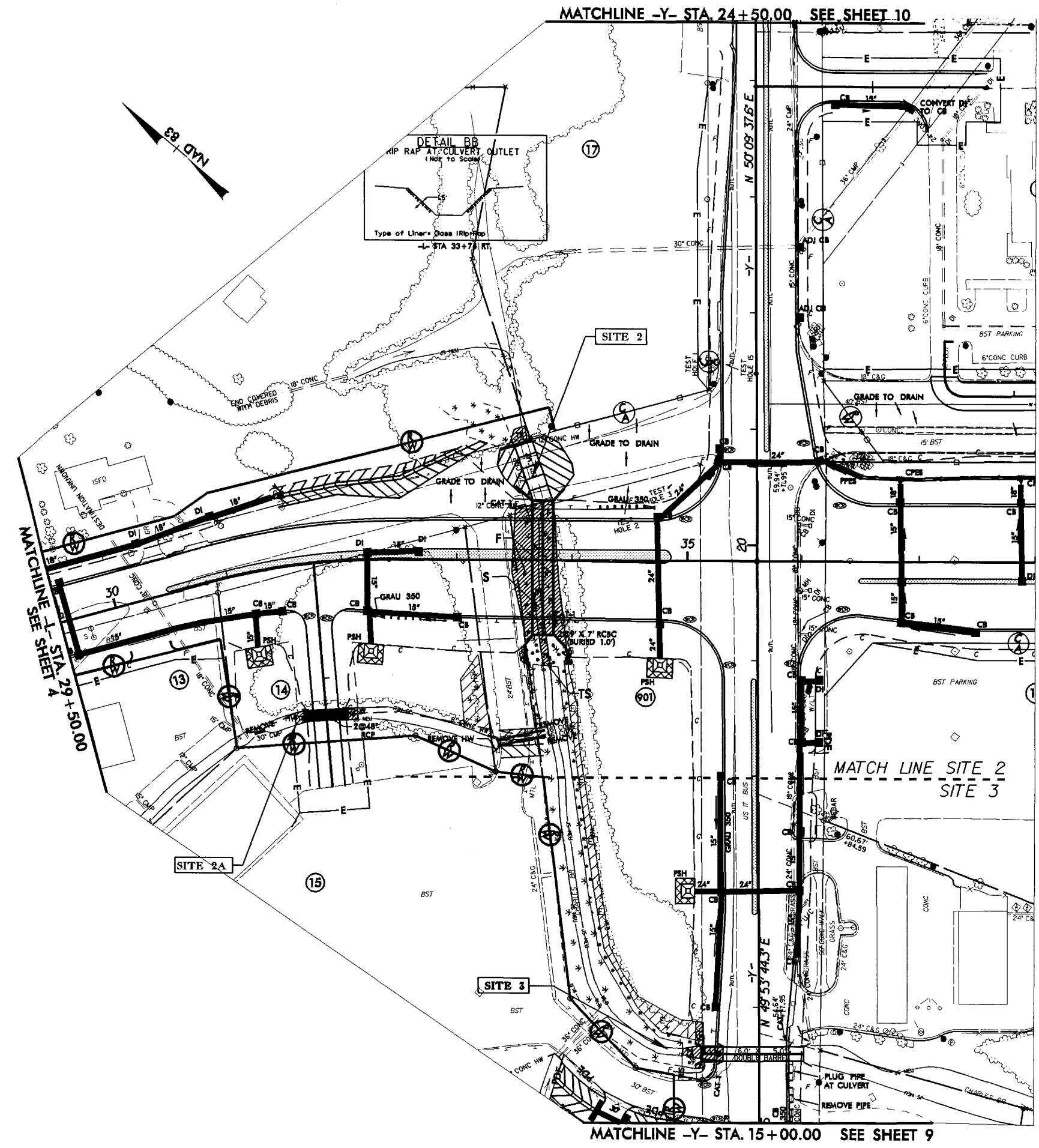
SHEET NO.
X-3



- DENOTES EXCAVATION IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING

PROJECT REFERENCE NO. U-3462	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

PERMIT DRAWING SITES TWO & THREE

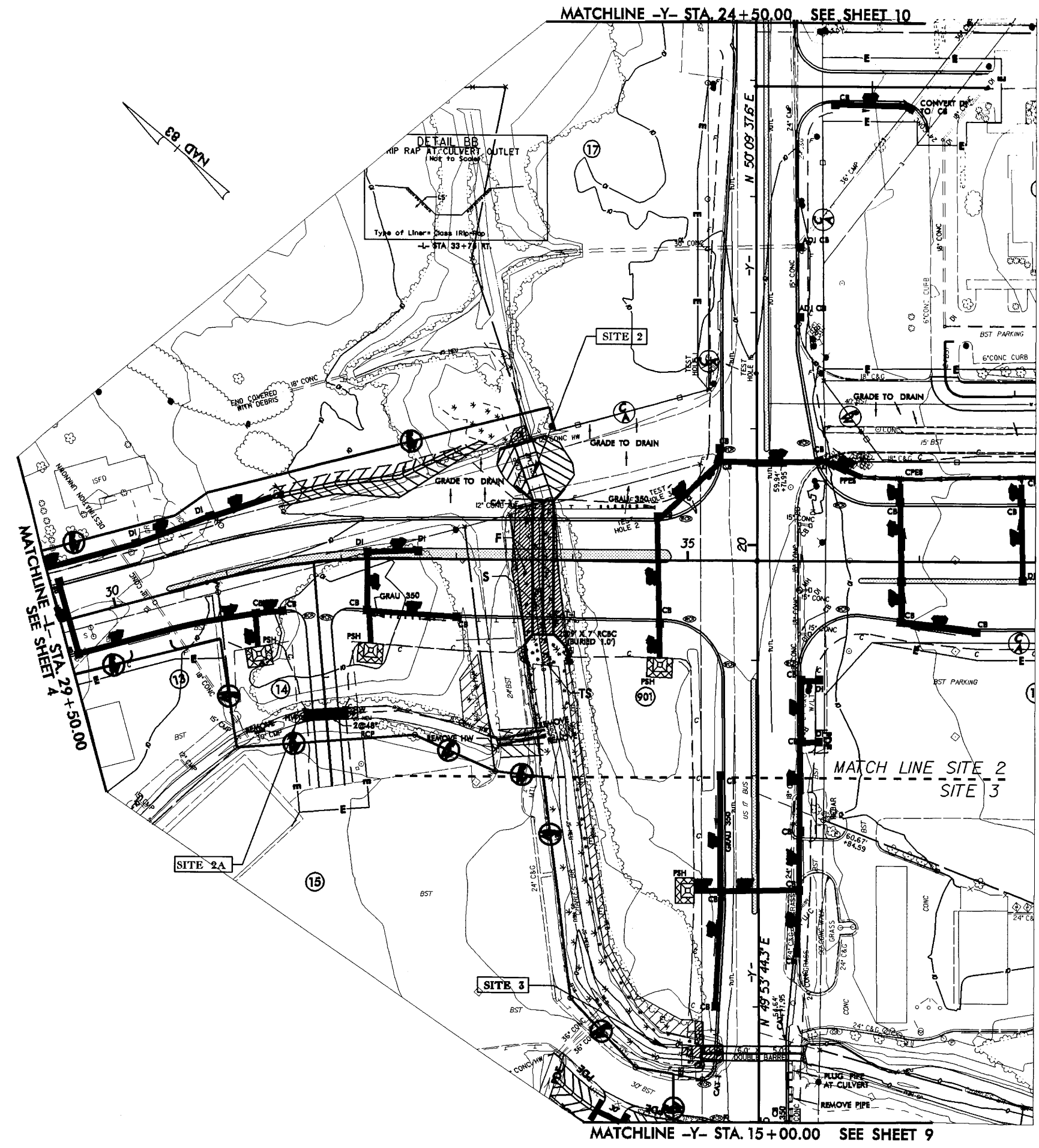


- DENOTES EXCAVATION IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING

12-MAR-2008 08:04
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 8/17/09

PROJECT REFERENCE NO. U-3462	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

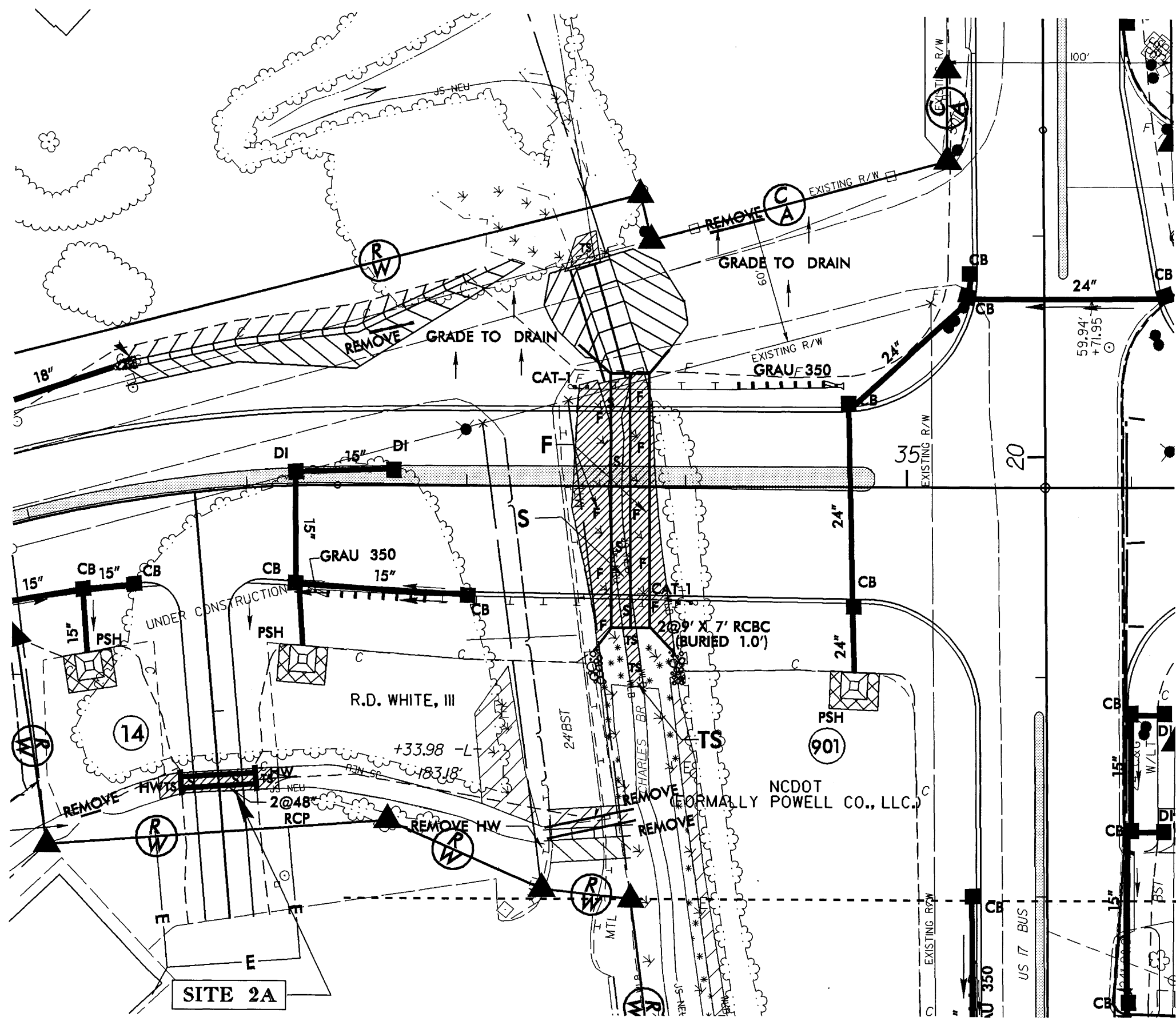
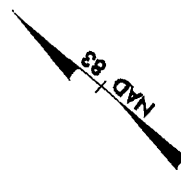
PERMIT DRAWING SITES TWO & THREE

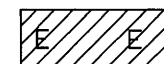
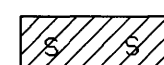

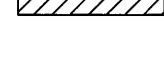
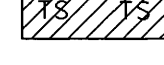


- DENOTES EXCAVATION IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING

8/17/04
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 11/22/07

PROJECT REFERENCE NO. U-3462	SHEET NO.
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

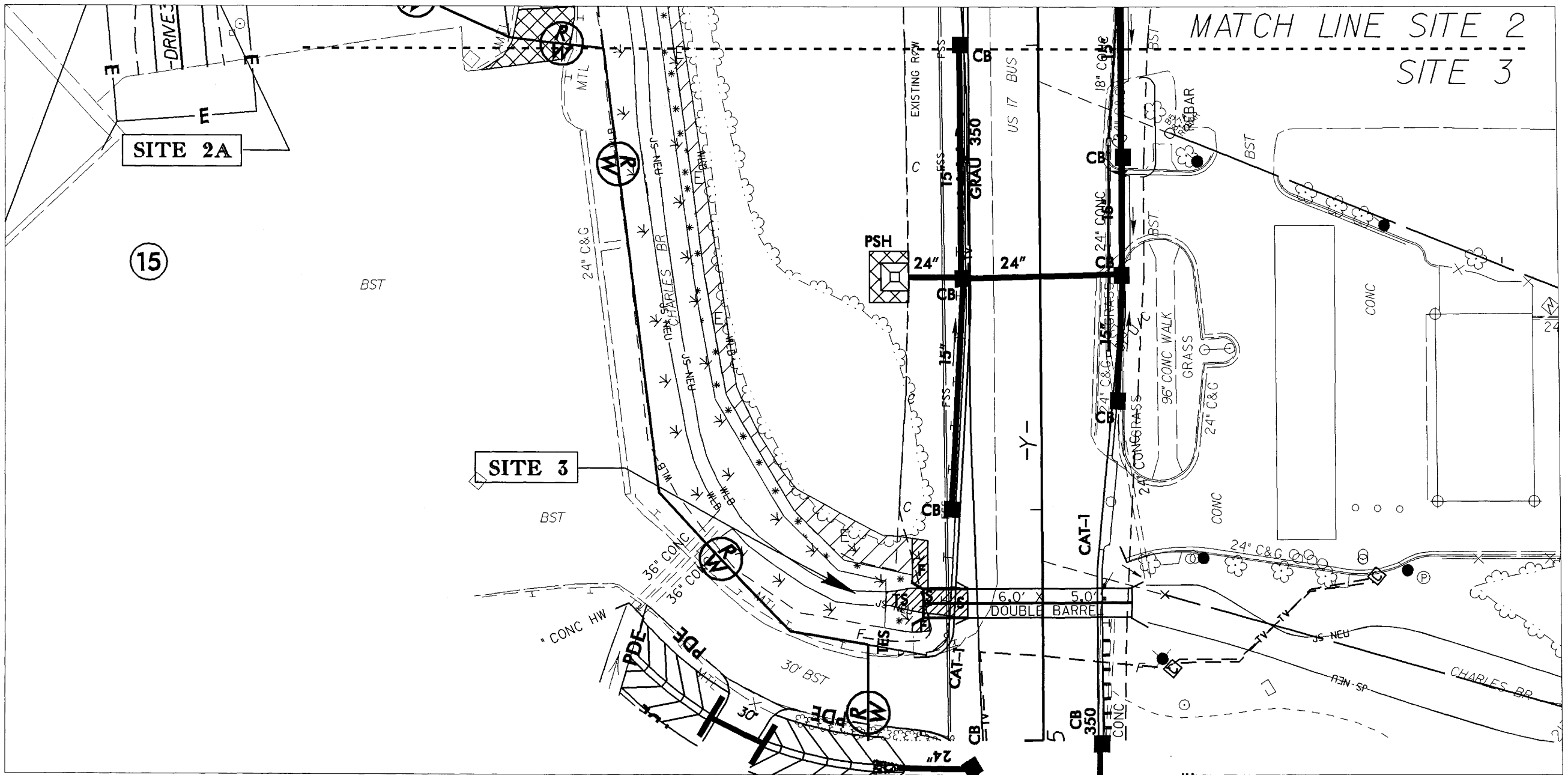


-  DENOTES EXCAVATION IN WETLAND
-  DENOTES IMPACTS IN SURFACE WATER
-  DENOTES FILL IN WETLAND
-  DENOTES TEMPORARY IMPACTS IN SURFACE WATER
-  DENOTES MECHANIZED CLEARING

MATCH LINE SITE 2
SITE 3

PERMIT DRAWING
ENLARGEMENT - SITE TWO

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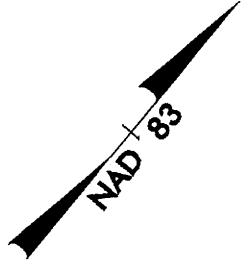
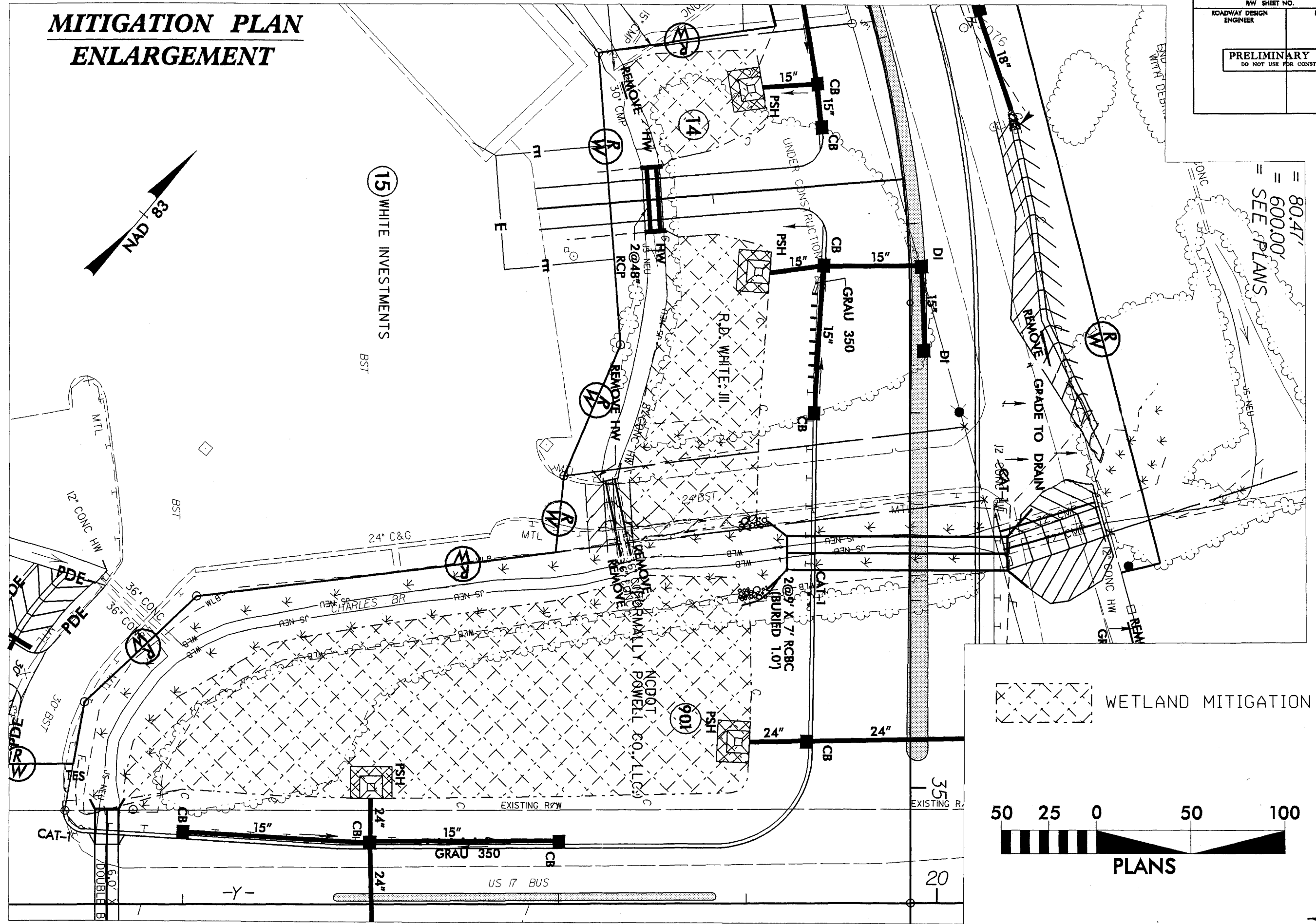


PERMIT DRAWING
ENLARGEMENT - SITE THREE

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 8/17/08

PROJECT REFERENCE NO. U-3462	SHEET NO.
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

MITIGATION PLAN ENLARGEMENT



15 WHITE INVESTMENTS

WETLAND MITIGATION

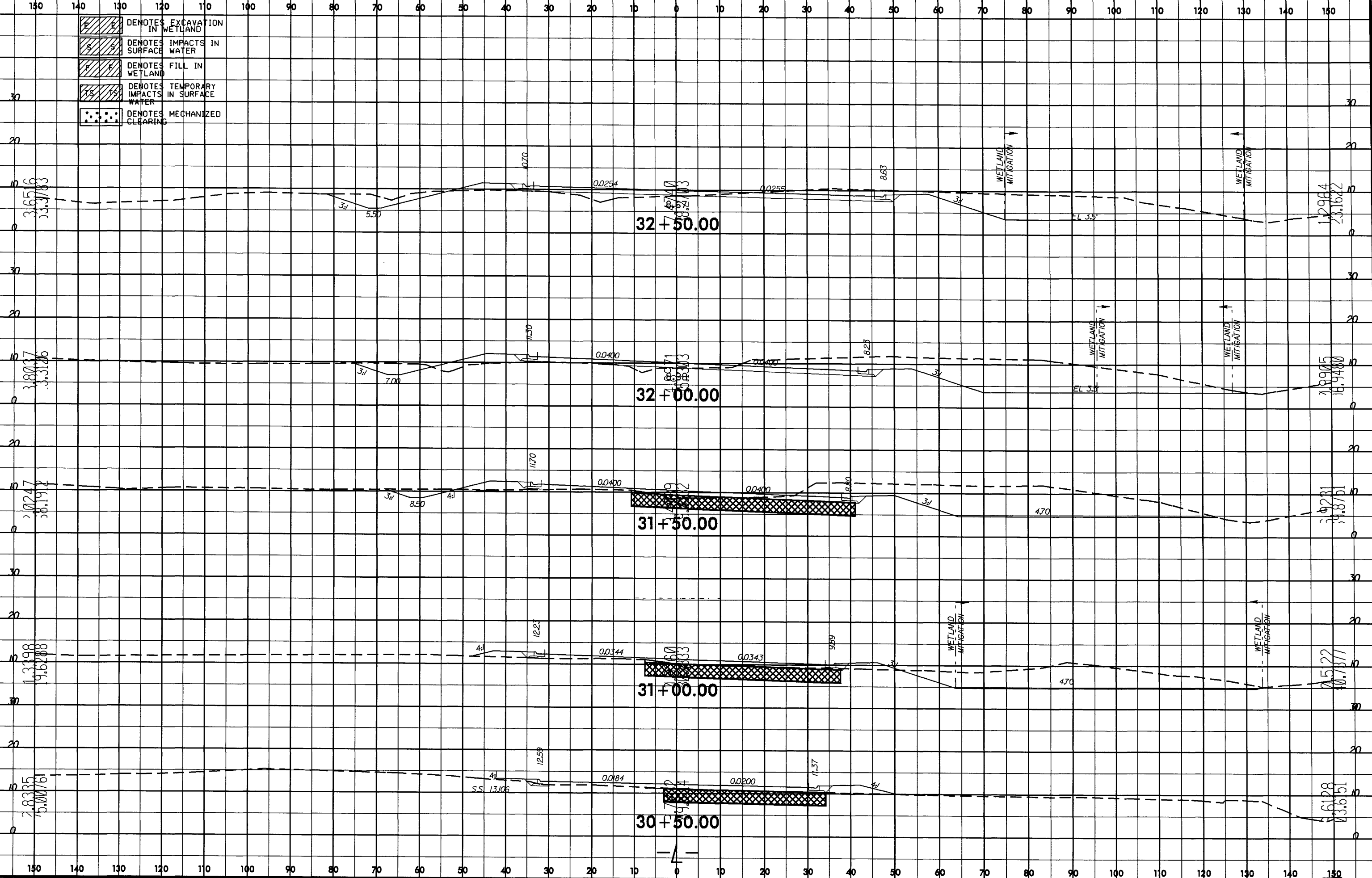







PLANS

Permit Drawing
Sheet 17 of 29

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 8/17/08

8/23/1

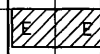

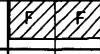
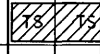
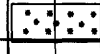


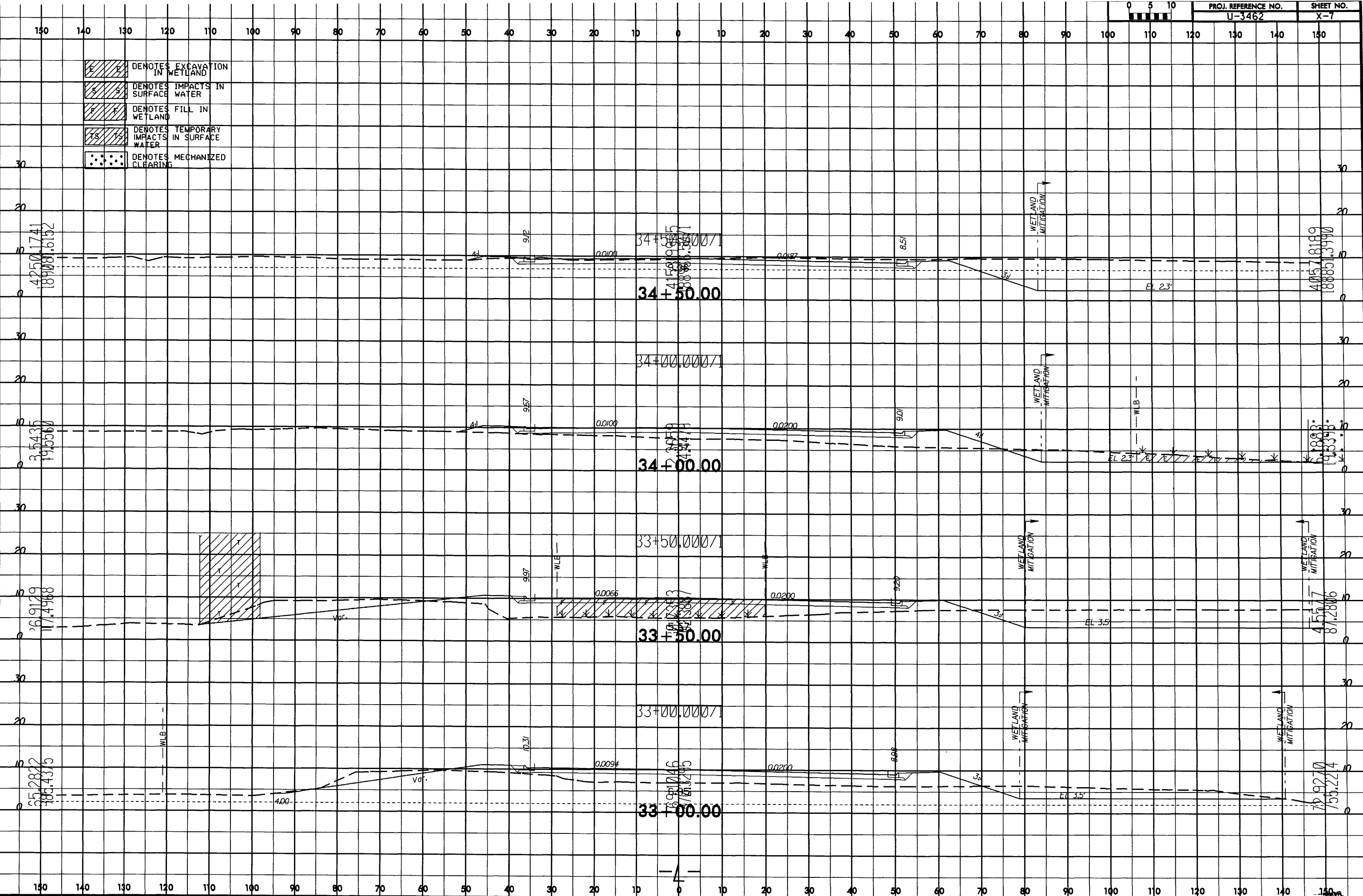
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-  DENOTES IMPACTS IN SURFACE WATER
-  DENOTES FILL IN WETLAND
-  DENOTES TEMPORARY IMPACTS IN SURFACE WATER
-  DENOTES MECHANIZED CLEARING

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8/23/1



-  DENOTES EXCAVATION IN WETLAND
-  DENOTES IMPACTS IN SURFACE WATER
-  DENOTES FILL IN WETLAND
-  DENOTES TEMPORARY IMPACTS IN SURFACE WATER
-  DENOTES MECHANIZED CLEARING

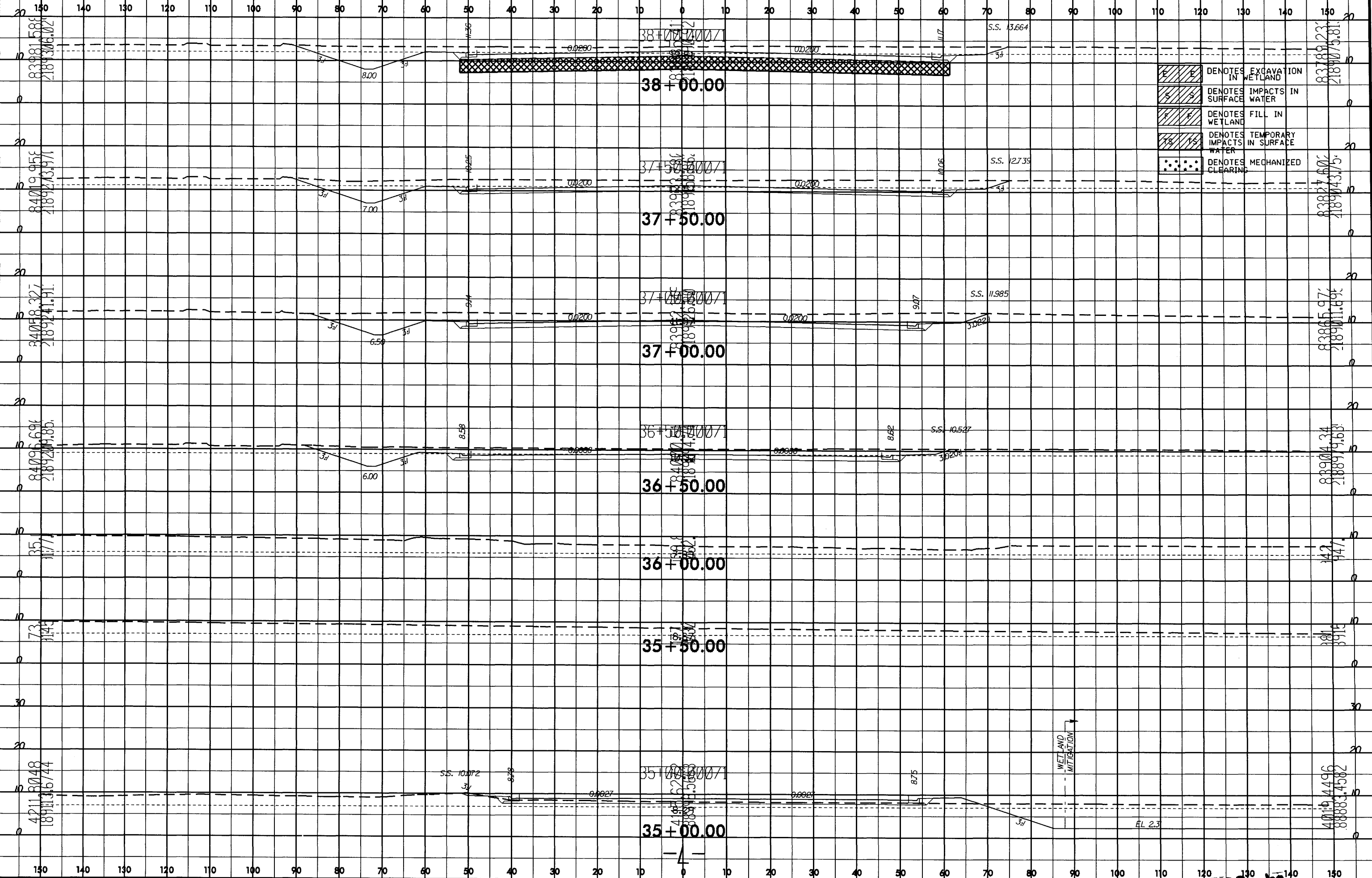


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PROJ. REFERENCE NO.
U-3462

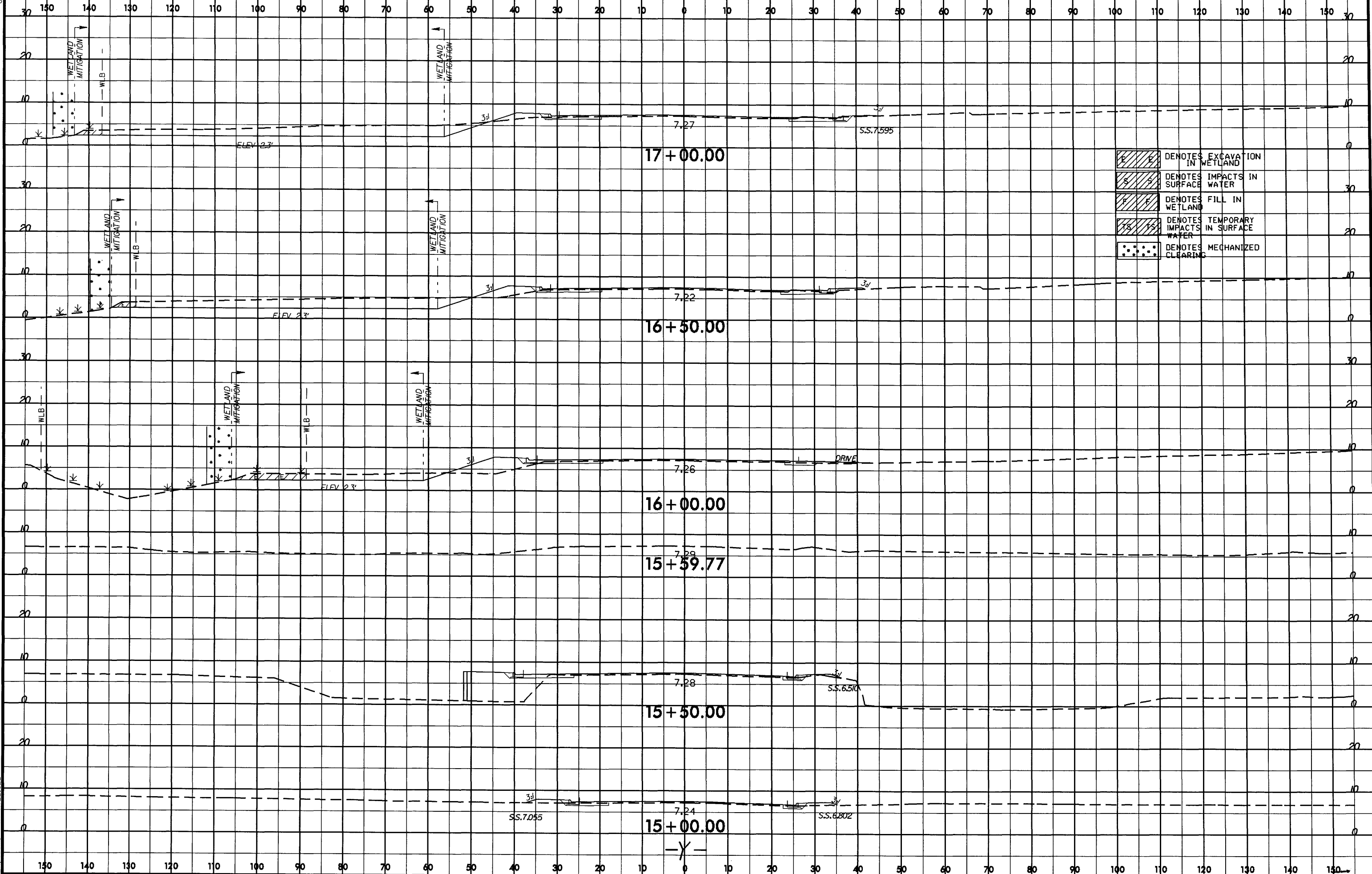
SHEET NO.
X-8



8/23/



PROJ. REFERENCE NO. U-3462 SHEET NO. X-4



	DENOTES EXCAVATION IN WETLAND
	DENOTES IMPACTS IN SURFACE WATER
	DENOTES FILL IN WETLAND
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
	DENOTES MECHANIZED CLEARING

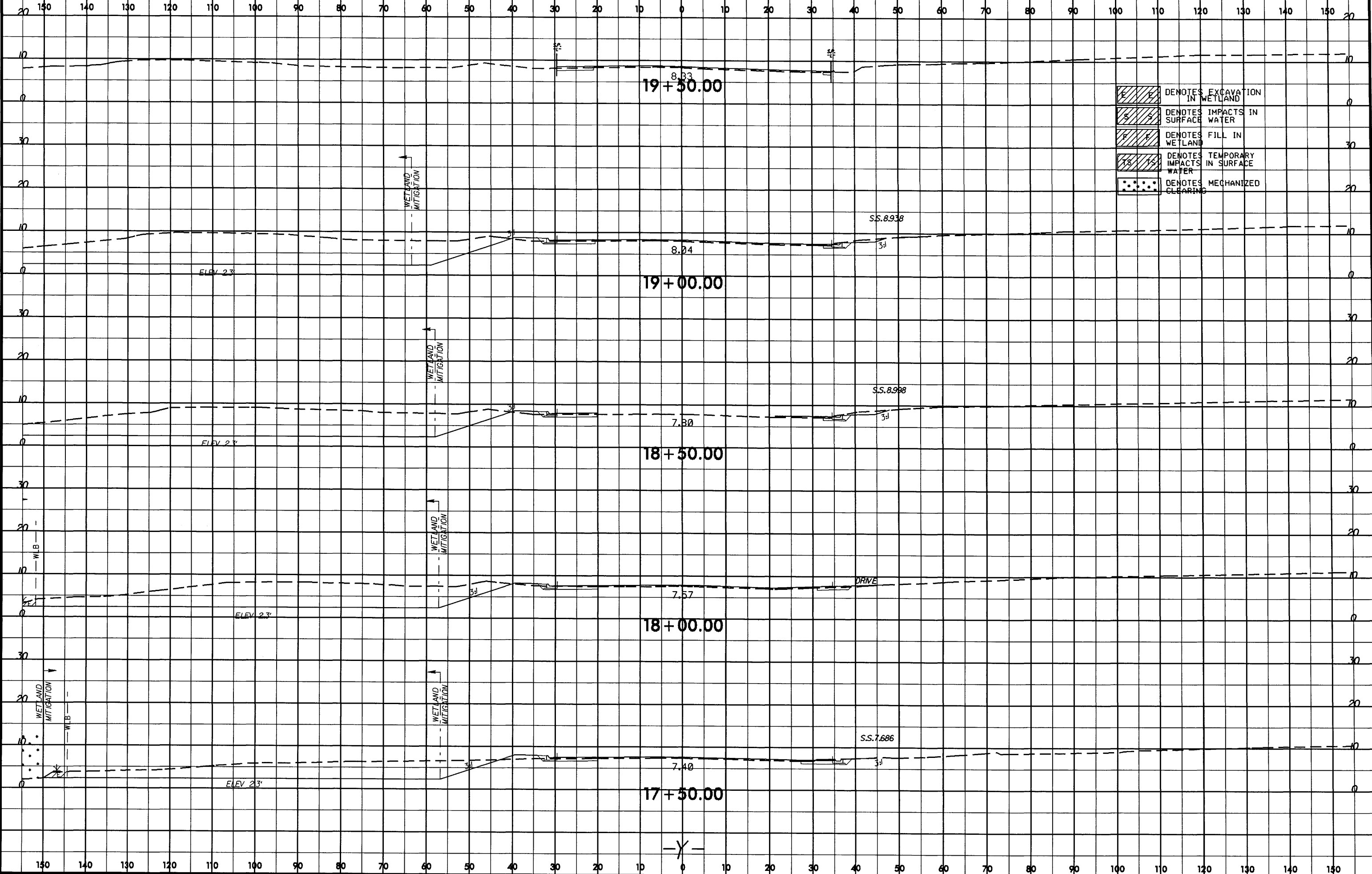
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



Permit Drawing

8/23/14



PROJ. REFERENCE NO. U-3462 SHEET NO. X-5



-  DENOTES EXCAVATION IN WETLAND
-  DENOTES IMPACTS IN SURFACE WATER
-  DENOTES FILL IN WETLAND
-  DENOTES TEMPORARY IMPACTS IN SURFACE WATER
-  DENOTES MECHANIZED CLEARING

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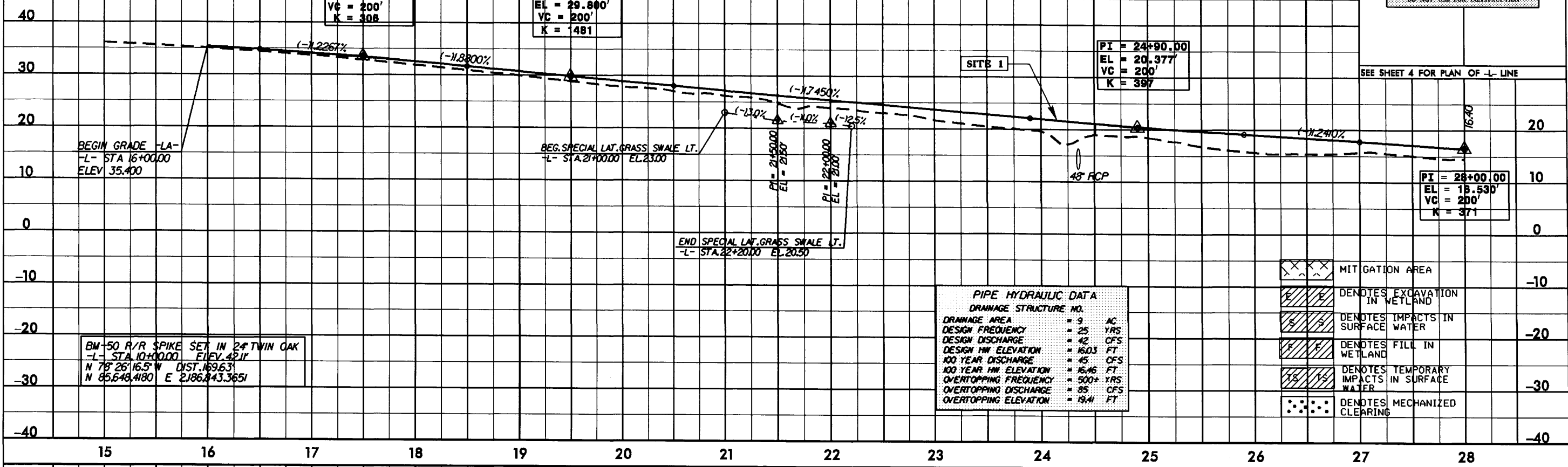
Permit Drawing

5/28/99

DITCH LEGEND	
LEFT DITCH	---
RIGHT DITCH	---

BM+51 SQUARE CUT SET IN CONG
 -L- STA 29+84.68 80J8' RIGHT
 ELEV. 11.23'
 N 84.4112329 E 2188.5898921

PROJECT REFERENCE NO.	U-3462	SHEET NO.	12
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
SEE SHEET 4 FOR PLAN OF -L- LINE			



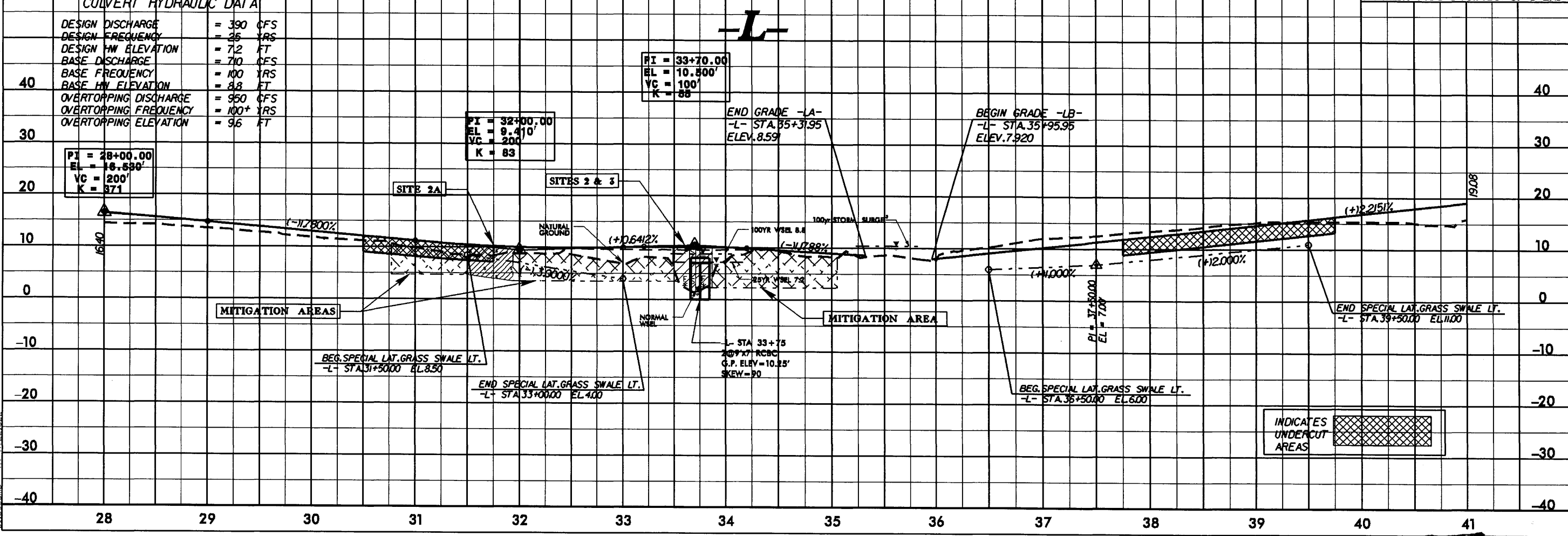
BM+50 R/R SPIKE SET IN 2" TWIN OAK
 -L- STA 10+00.00 ELEV. 42.11'
 N 78° 26' 16.5" W DIST. 169.63'
 N 85.6484180 E 2186.8433651

PIPE HYDRAULIC DATA	
DRAINAGE STRUCTURE NO.	9
DESIGN AREA	9 AC
DESIGN FREQUENCY	25 YRS
DESIGN DISCHARGE	42 CFS
DESIGN HW ELEVATION	16.03 FT
100 YEAR DISCHARGE	45 CFS
100 YEAR HW ELEVATION	16.46 FT
OVERTOPPING FREQUENCY	500+ YRS
OVERTOPPING DISCHARGE	85 CFS
OVERTOPPING ELEVATION	19.4 FT

	MITIGATION AREA
	DENOTES EXCAVATION IN WETLAND
	DENOTES IMPACTS IN SURFACE WATER
	DENOTES FILL IN WETLAND
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
	DENOTES MECHANIZED CLEARING

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 390 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 7.2 FT
BASE DISCHARGE	= 710 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 8.8 FT
OVERTOPPING DISCHARGE	= 950 CFS
OVERTOPPING FREQUENCY	= 100+ YRS
OVERTOPPING ELEVATION	= 9.6 FT



INDICATES UNDERCUT AREAS

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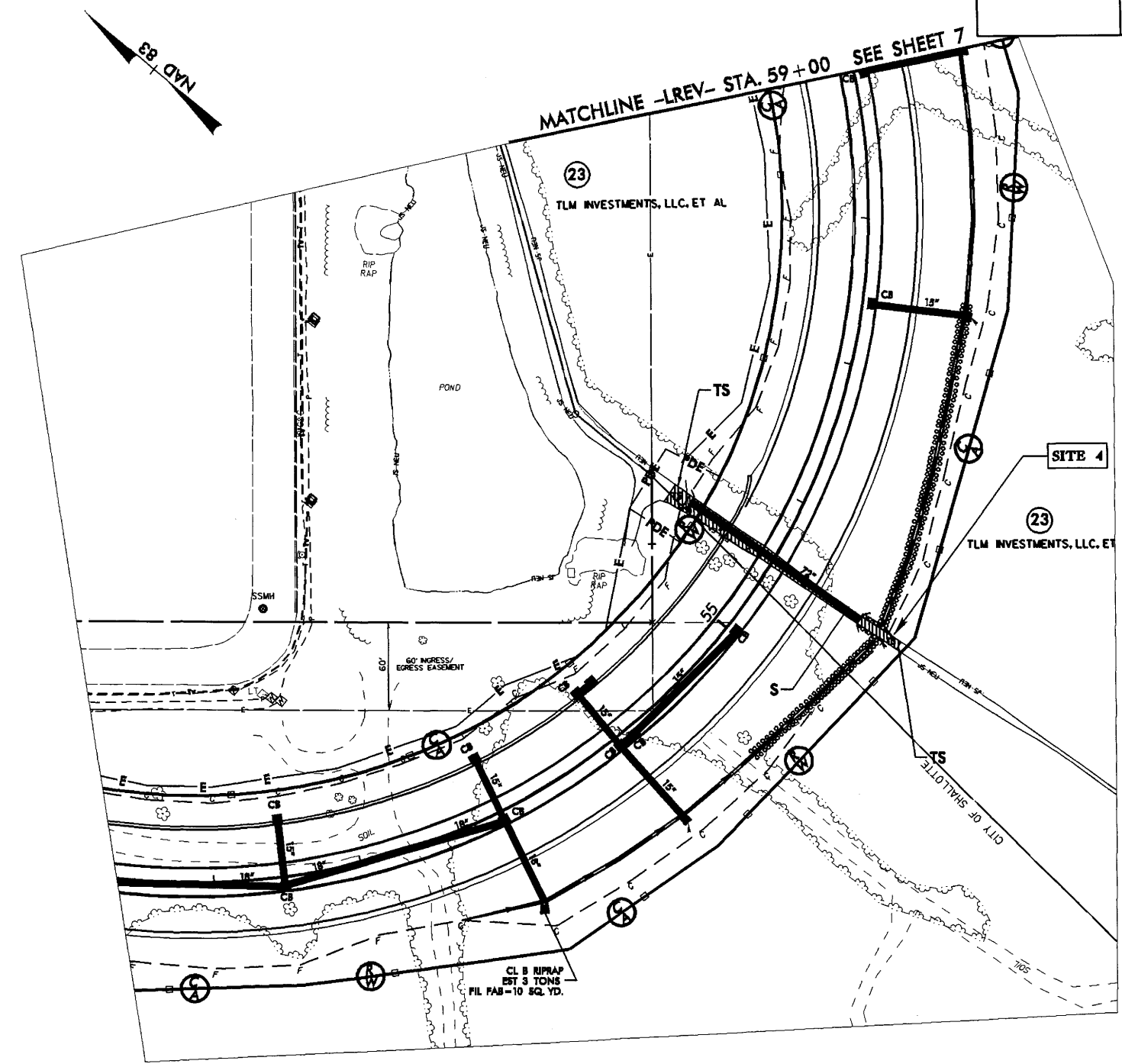
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




8/17/95

SEE SHEET 13 FOR PROFILE OF -LREV-

PROJECT REFERENCE NO. U-3462	SHEET NO. ---
R/W SHEET NO. 6	---
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

PERMIT DRAWING SITE FOUR



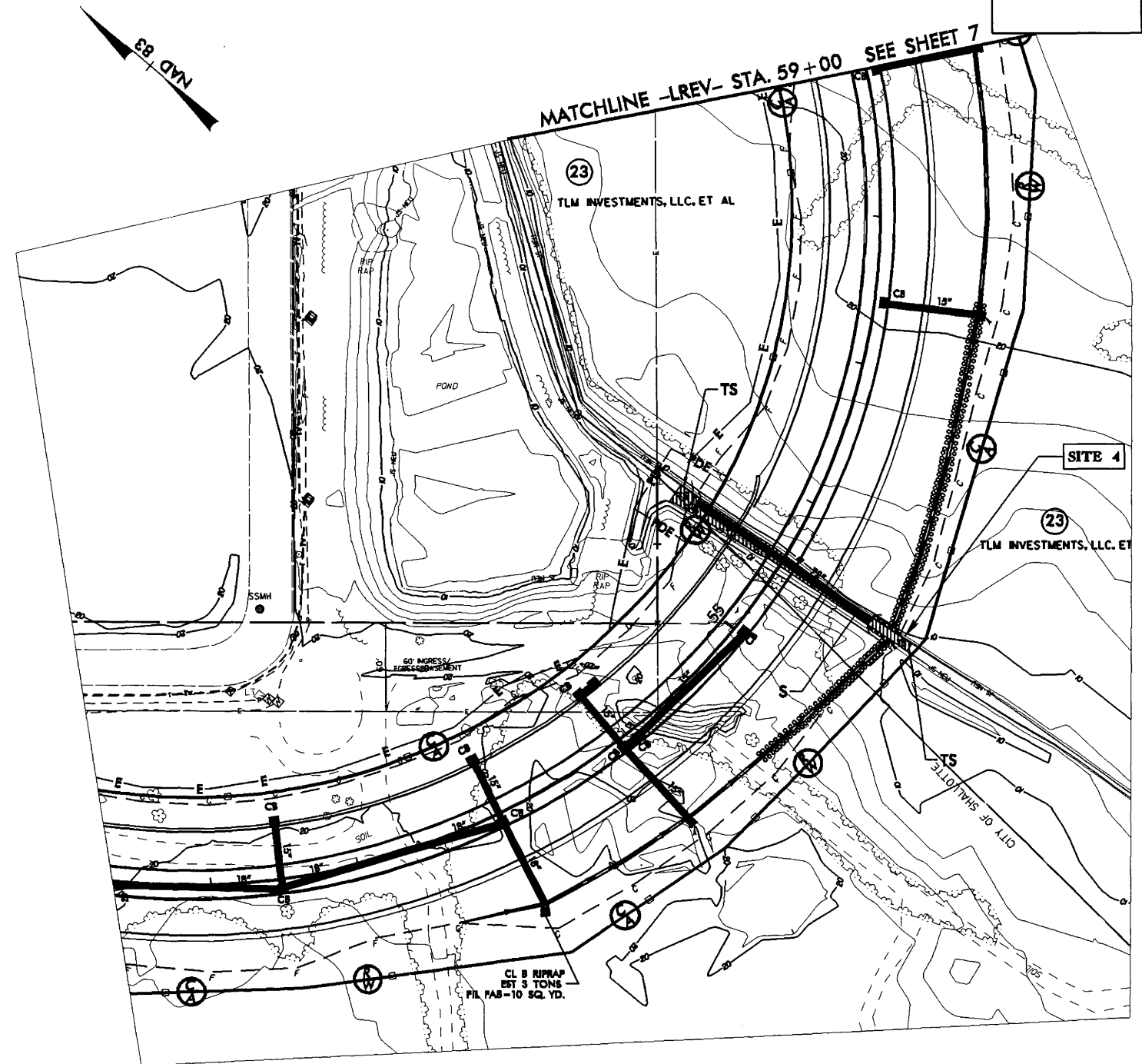
-  DENOTES EXCAVATION IN WETLAND
-  DENOTES IMPACTS IN SURFACE WATER
-  DENOTES FILL IN WETLAND
-  DENOTES TEMPORARY IMPACTS IN SURFACE WATER
-  DENOTES MECHANIZED CLEARING

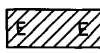

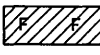
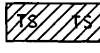

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PROJECT REFERENCE NO. U-3462	SHEET NO. 6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

SEE SHEET 13 FOR PROFILE OF -LREV-

PERMIT DRAWING SITE FOUR



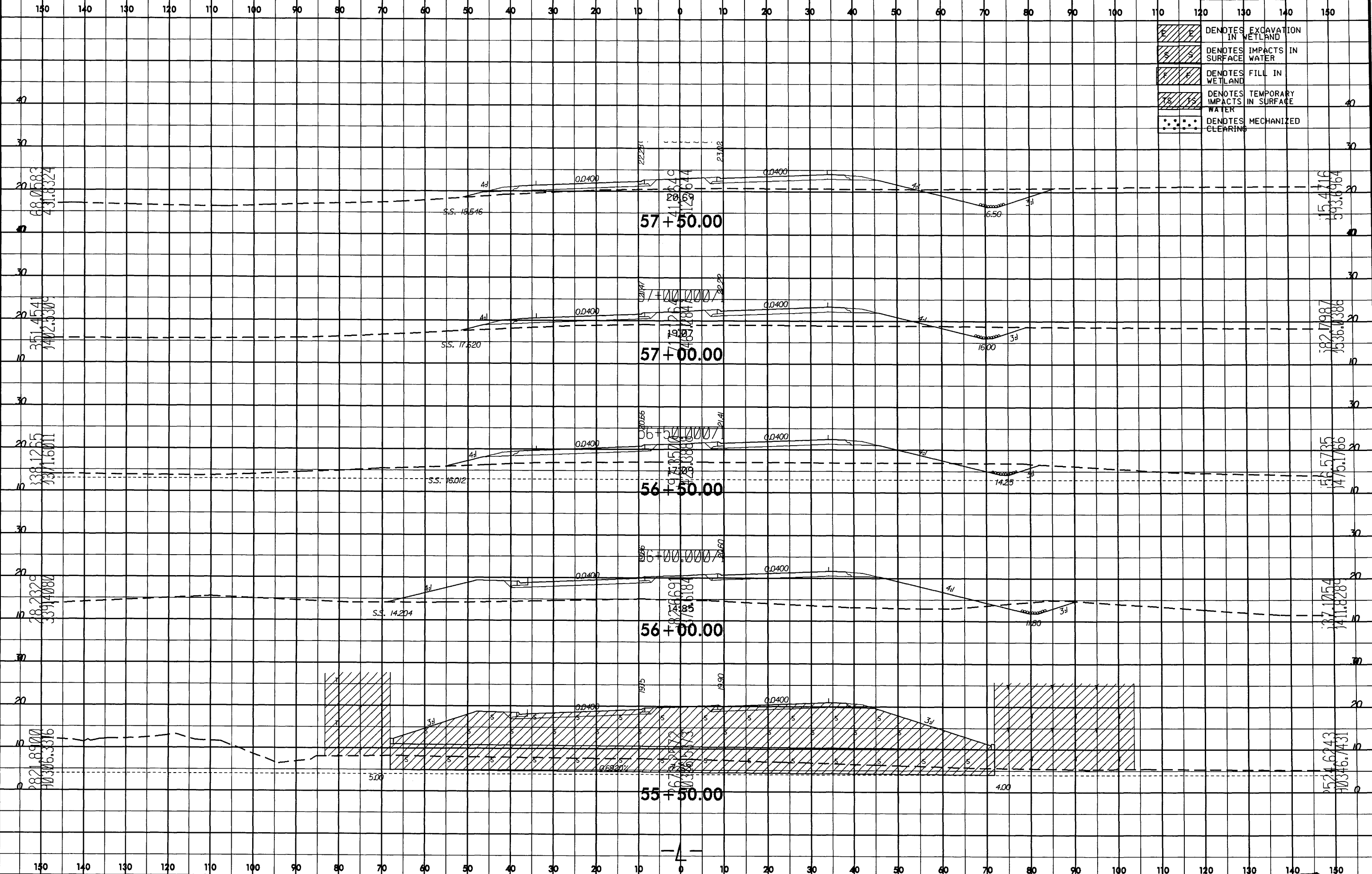
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-  DENOTES IMPACTS IN SURFACE WATER
-  DENOTES FILL IN WETLAND
-  DENOTES TEMPORARY IMPACTS IN SURFACE WATER
-  DENOTES MECHANIZED CLEARING

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PROJ. REFERENCE NO. U-3462 SHEET NO. X-15



	DENOTES EXCAVATION IN WETLAND
	DENOTES IMPACTS IN SURFACE WATER
	DENOTES WETLAND FILL IN
	DENOTES IMPACTS IN SURFACE WATER
	DENOTES MECHANIZED CLEARING

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 11/2/2007

See Sheet 1-A For Index of Sheets

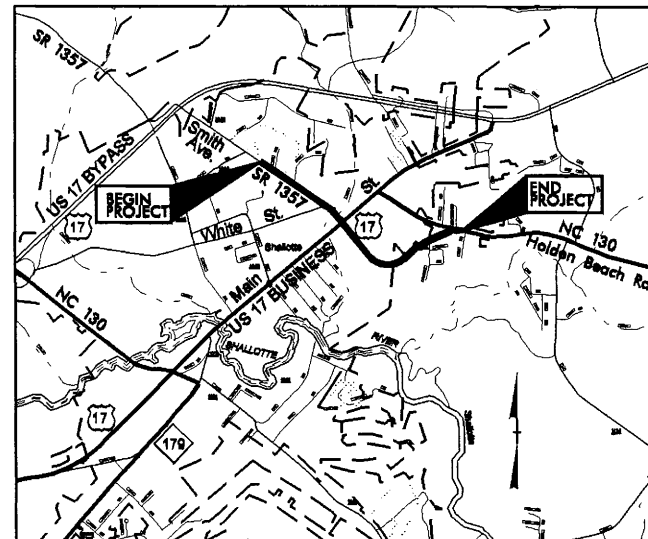
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY

LOCATION: EXTENSION OF SR 1357 FROM WEST OF
US 17 BUSINESS TO NC 130 IN SHALLOTTE

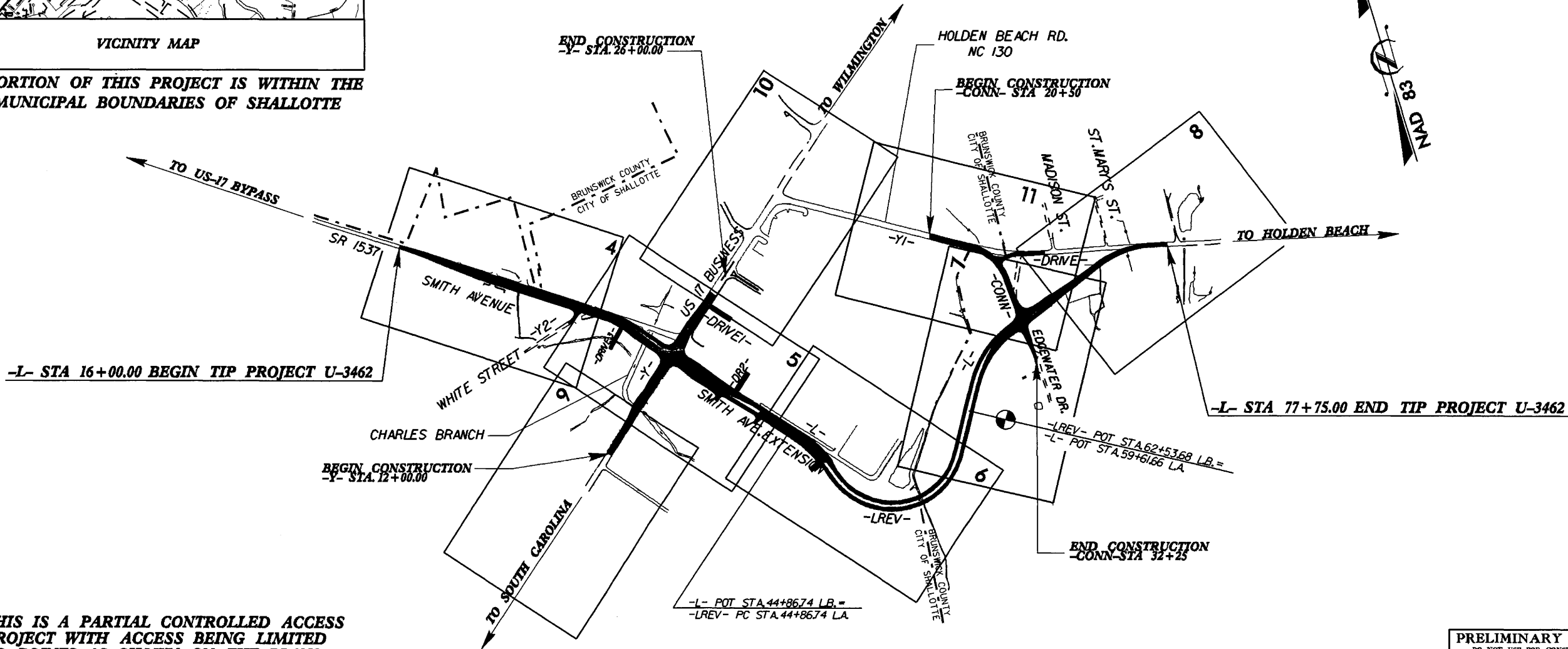
TYPE OF WORK: GRADING, WIDENING, DRAINAGE, PAVING, CURB AND
GUTTER, CULVERTS, AND TRAFFIC SIGNALS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3462	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34953.1.1	STP-1357(2)	PE	
34953.2.2	STP-1357(2)	R/W & UTIL	
34953.3.2	STP-1357(2)	CONST.	



VICINITY MAP

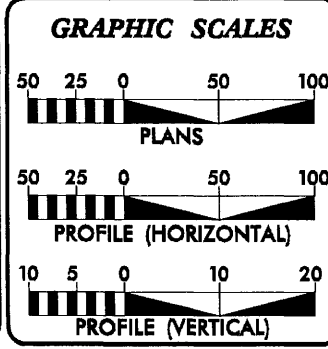
A PORTION OF THIS PROJECT IS WITHIN THE
MUNICIPAL BOUNDARIES OF SHALLOTTE



NOTE: THIS IS A PARTIAL CONTROLLED ACCESS
PROJECT WITH ACCESS BEING LIMITED
TO POINTS AS SHOWN ON THE PLANS

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



DESIGN DATA

ADT 2007=	6300 - 18,800
ADT 2035 =	16100 - 42,200
DHV =	10 %
D =	55 %
T =	3 % *
V =	40 MPH
* TTST 1%	DUAL 2%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-3462 =	1.225 MILES
TOTAL LENGTH OF TIP PROJECT U-3462 =	1.225 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JUNE 16, 2006

LETTING DATE:
DECEMBER 15, 2008

G.E. BREW, PE
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.

01-APR-2008 07:59 R:\Roadway\Proj\U3462_rdy_tsh.dgn \$\$\$USERNAME\$\$\$

TIP PROJECT: U-3462

CONTRACT: C202027

3/15/06

Note: Not to Scale
**S.U.E. = Subsurface Utility Engineering*

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○
Property Corner	✕
Property Monument	□
Parcel/Sequence Number	123
Existing Fence Line	-----
Proposed Woven Wire Fence	-----
Proposed Chain Link Fence	-----
Proposed Barbed Wire Fence	-----
Existing Wetland Boundary	-----
Proposed Wetland Boundary	-----
Existing Endangered Animal Boundary	-----
Existing Endangered Plant Boundary	-----

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	-----
Switch	-----
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	-----
Proposed Right of Way Line with Concrete or Granite Marker	-----
Existing Control of Access	-----
Proposed Control of Access	-----
Existing Easement Line	-----
Proposed Temporary Construction Easement	-----
Proposed Temporary Drainage Easement	-----
Proposed Permanent Drainage Easement	-----
Proposed Permanent Utility Easement	-----

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

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

UTILITIES:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

SURVEY CONTROL SHEET

PROJECT REFERENCE NO. U-3462	SHEET NO. 1-C
Location and Surveys	



NCGS STATION "MULBERRY"
 LOCALIZED PROJECT COORDINATES
 N = 87085.1500
 E = 2184832.8100

NCGS STATION "BOBBY"
 LOCALIZED PROJECT COORDINATES
 N = 88225.5880
 E = 2182363.6880

NCGS STATION "BAILEY"
 LOCALIZED PROJECT COORDINATES
 N = 85841.3966
 E = 2186627.1861

NCGS STATION "FORD"
 LOCALIZED PROJECT COORDINATES
 N = 85544.9140
 E = 2190223.5970

DATUM DESCRIPTION

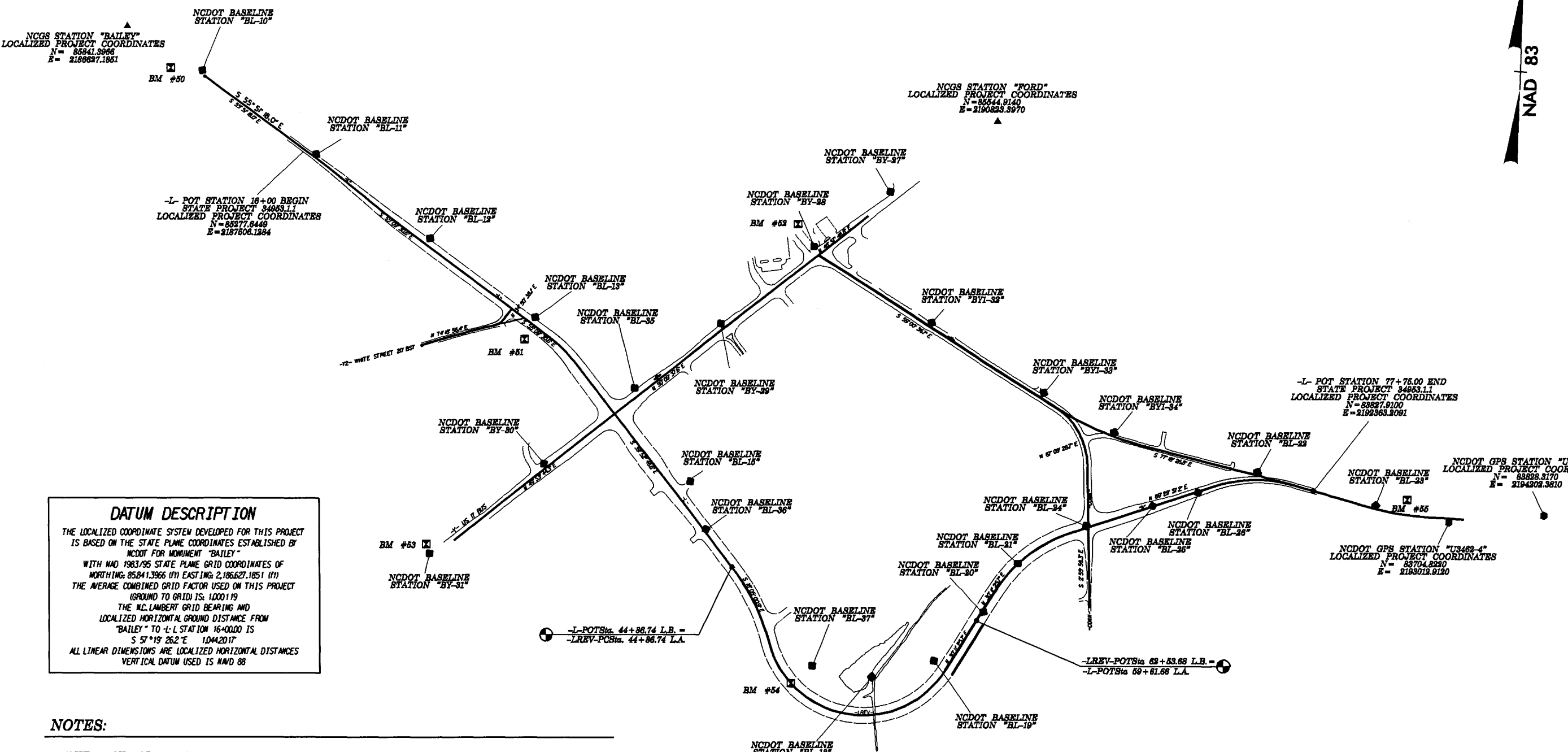
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "BAILEY" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 85841.3966 (ft) EASTING: 2,186,627.1861 (ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.000119 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BAILEY" TO -L- STATION 16+00.00 IS S 57°19' 26.2" E 1.0442017' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

NOTES:

- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATIONPROJECT](http://www.doh.dot.state.nc.us/preconstruct/highway/locationproject)
 FILE NAME: U3462_LS_CONTROL_050506.DGN
- SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- ⊙ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
- PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
- NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTS NAD 83'95
- SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NOTE: DRAWING NOT TO SCALE

6/2/99
 01-APR-2008 07:59 2462.LS-1C-050506.dgn
 PLOT DATE: 04/01/2008 08:41:11



SURVEY CONTROL SHEET

CONTROL DATA

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
10		BL-10	85641.5046	2186996.8620	38.27	OUTSIDE PROJECT LIMITS	
11		BL-11	85260.6929	2187559.6108	33.90	16+53.67	16.10 LT
12		BL-12	84878.6884	2188120.0447	21.02	23+32.00	35.05 LT
13		BL-13	84517.7534	2188638.8233	12.90	29+63.98	35.20 LT
35		BL-35	84197.9020	2189129.9600	9.10	35+21.11	153.58 LT
15		BL-15	83759.1050	2189413.2920	15.11	40+39.51	89.66 LT
36		BL-36	83532.5460	2189498.5630	19.99	42+68.04	9.83 LT
20		BL-20	83187.7104	2190838.4896	21.84	60+15.31	6.58 RT
21		BL-21	83426.6901	2190989.7876	21.44	62+99.06	1.77 LT
24		BL-24	83617.2574	2191302.0587	19.23	66+66.95	7.59 LT
25		BL-25	83727.3950	2191611.6216	17.23	69+95.48	2.31 LT
26		BL-26	83801.2384	2191822.4733	11.27	72+18.84	2.39 RT
22		BL-22	83907.9039	2192094.3429	10.90	75+02.58	36.53 LT
23		BL-23	83769.4039	2192661.2820	10.16	OUTSIDE PROJECT LIMITS	

BL	POINT	DESC.	NORTH	EAST	ELEVATION	LREV STATION	OFFSET
37		BL-37	82896.9290	2190030.2200	20.91	51+24.38	130.14 LT
18		BL-18	82854.4450	2190314.1290	10.96	55+69.97	180.94 LT
19		BL-19	82944.2052	2190608.9590	23.38	59+81.43	69.37 LT

BY	POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
6		BY-6 NCGS FORD	85544.9140	2190823.3970	35.02	OUTSIDE PROJECT LIMITS	
27		BY-27	85185.8676	2190323.8997	29.73	OUTSIDE PROJECT LIMITS	
28		BY-28	84908.6821	2189970.7815	25.60	32+41.65	46.54 LT
29		BY-29	84523.1187	2189538.6343	14.87	26+61.84	27.60 LT
35		BL-35	84197.9020	2189129.9600	9.10	21+39.88	39.73 LT
30		BY-30	83816.6755	2188704.6375	6.81	15+68.99	22.13 LT
31		BY-31	83366.7304	2188167.7594	21.01	OUTSIDE PROJECT LIMITS	

BY1	POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
28		BY-28	84908.6821	2189970.7815	25.56	OUTSIDE PROJECT LIMITS	
32		BY1-32	84564.5258	2190542.3254	24.98	16+25.58	21.89 LT
33		BY1-33	84248.7834	2191080.8956	24.49	22+49.85	28.52 LT
34		BY1-34	84071.8548	2191416.2204	21.90	26+34.69	19.06 LT

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY MCDOT FOR MONUMENT "BAILEY" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 85,841,396.6 (11) EASTING: 2,186,627.1851 (11) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.000119 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BAILEY" TO L-L STATION 16+00.00 IS S 57° 19' 26.2"E 1,044.2017' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAD 88

 BM50 ELEVATION = 42.11
 N 85648 E 2186843
 -L- STATION 10+00.00
 N 78° 26' 16.5" W DIST 169.63'
 R/R SPIKE SET IN 24' TWIN OAK

 BM51 ELEVATION = 11.23
 N 84411 E 2188590
 -L- STATION 29+85 DIST 80' RIGHT
 SQUARE CUT SET IN CONCRETE

 BM54 ELEVATION = 20.23
 N 82811 E 2189933
 -LREV- STATION 51+17 DIST 0.54' LEFT
 R/R SPIKE SET IN 12" PINE

 BM55 ELEVATION = 18.28
 N 83804 E 2192811
 -Y1- STATION 40+65 DIST 73.41' LEFT
 R/R SPIKE SET IN 30" OAK

 BM52 ELEVATION = 27.83
 N 85018 E 2189891
 -Y- STATION 32+53 DIST 181' LEFT
 R/R SPIKE SET IN 20" PINE

 BM53 ELEVATION = 19.24
 N 83412 E 2188152
 -Y- STATION 10+00
 S 80° 53' 19.0" W DIST 133.58
 SQUARE CUT SET IN CONCRETE

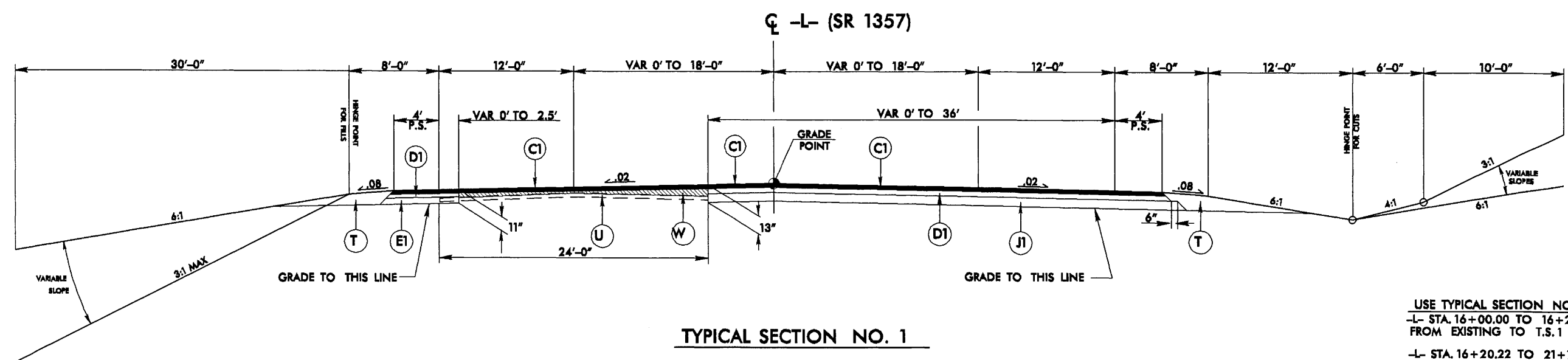
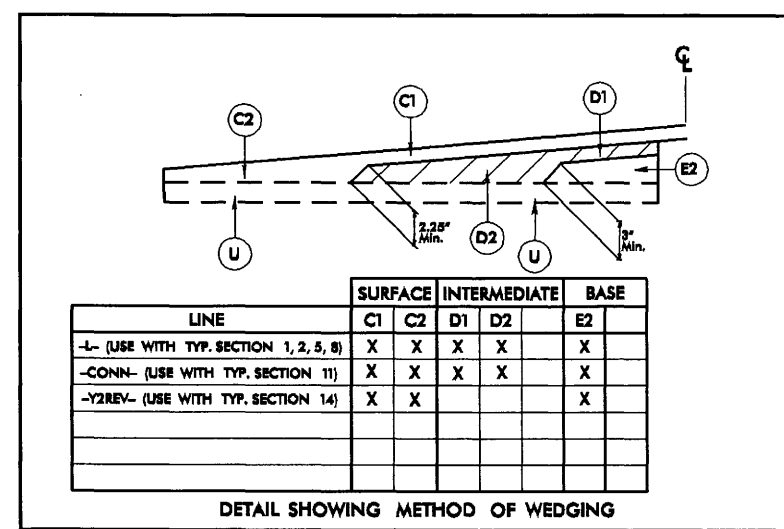
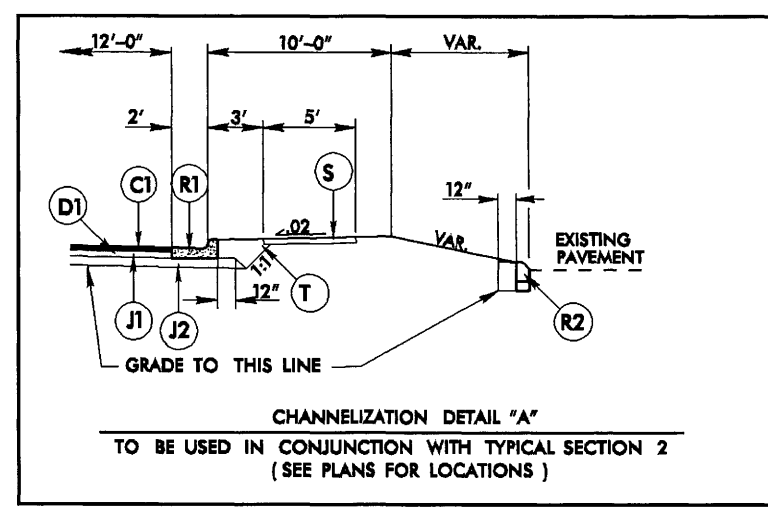
6/2/99

FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE 99.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R1	2'-8" CONCRETE CURB AND GUTTER.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE 99.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1 1/2" IN DEPTH.	R2	8"X12" CONCRETE CURB
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 2 1/4" 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. 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 5 1/2" IN DEPTH.	U	EXISTING PAVEMENT.
J1	PROP. 6" AGGREGATE BASE COURSE.	W	VARIABLE DEPTH ASPHALT PAVEMENT. (SEE WEDGING DETAIL)
J2	PROP. VAR. DEPTH AGGREGATE BASE COURSE.		
P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.		

PROJECT REFERENCE NO. U-3462	SHEET NO. 2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS <small>DO NOT USE FOR CONSTRUCTION</small>	

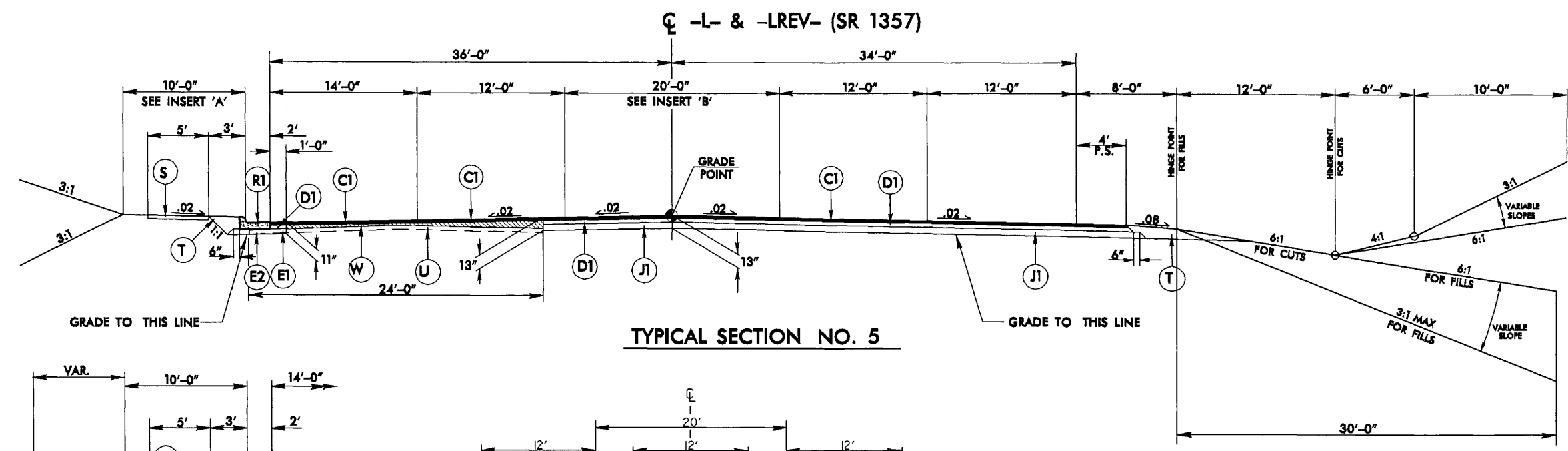
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



USE TYPICAL SECTION NO. 1
 -L- STA. 16+00.00 TO 16+20.22, TRANSITION FROM EXISTING TO T.S. 1
 -L- STA. 16+20.22 TO 21+78.35

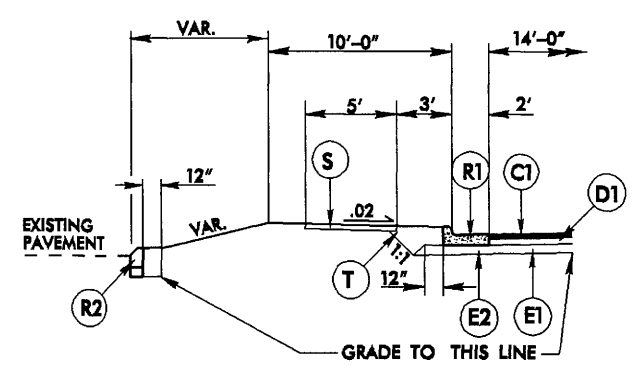
01-APR-2008 07:59 C:\PROJECTS\2008\DESIGN\U3462.rdj-typp.dgn

FINAL PAV'T DESIGN	
C1	3" S9.5B
D1	4" I19.0B
E1	4" B25.0B
E2	VAR B25.0B
J1	6" ABC
R1	2'-6" C & G
R2	1'-6" C & G
R3	5" MONO. ISLAND
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAV'T
W	WEDGING



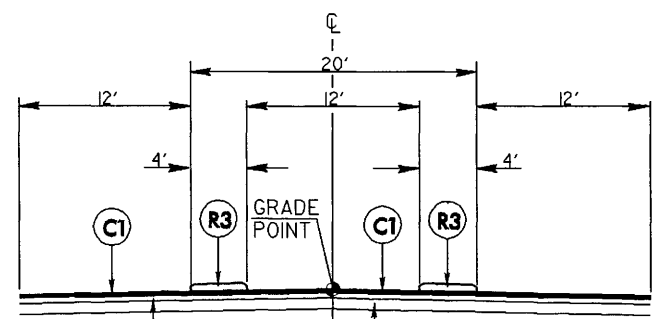
TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5
 -L- STA. 42+35.99 TO 44+86.74 L.B.
 -LREV- STA. 44+86.74 L.A. TO 46+50
 -LREV- STA. 46+50.00 TO 48+25.18,
 TRANSITION FROM T.S. 5 TO T.S. 4



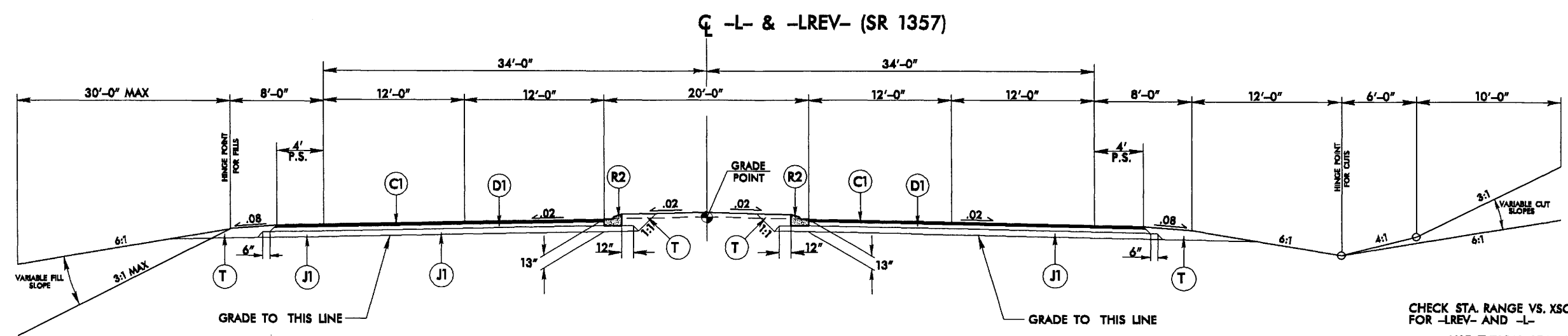
INSERT 'A'
CHANNELIZATION DETAIL

-L- STA. 42+50.00 TO 46+00.00 (LT.)



INSERT 'B'

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 5
 -L- STA. 42+35.99 TO 44+86.74 L.B. =
 -LREV- STA. 44+86.74 L.A. TO 48+25.18

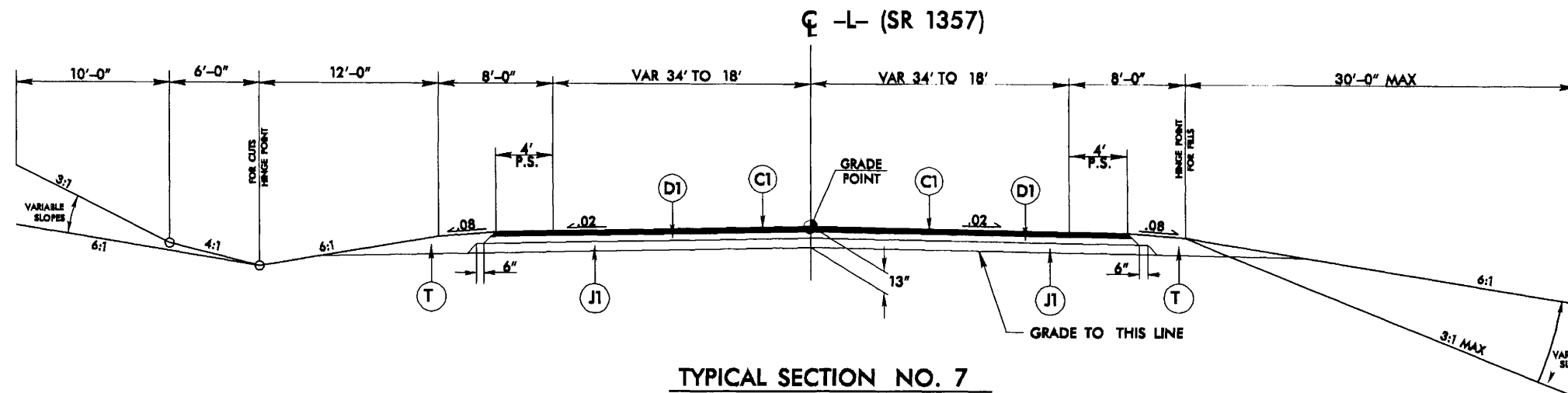


TYPICAL SECTION NO. 6

CHECK STA. RANGE VS. XSC
 FOR -LREV- AND -L-
 USE TYPICAL SECTION NO. 6
 -LREV- STA. 54+75.00 TO 62+53.68 L.B. =
 -L- STA. 59+61.66 L.A. TO 66+74.56

01-APP-2008_07159
 P:\work\proj\3462_rdy_tup.dgn
 \$\$\$SUSBRIDGE\$\$\$

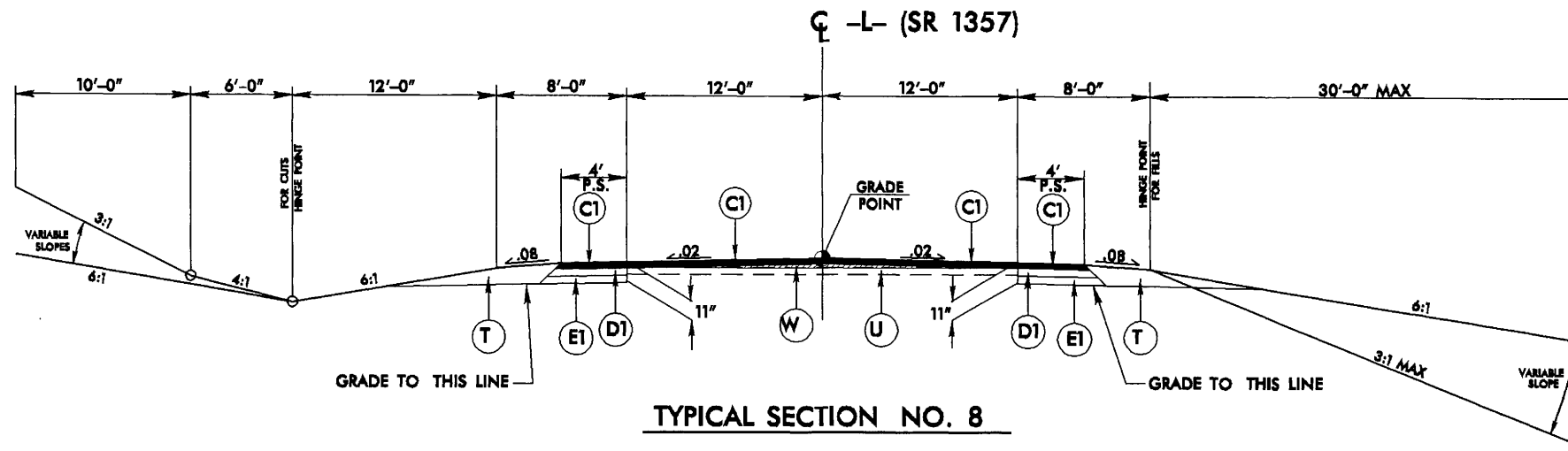
PROJECT REFERENCE NO. U-3462	SHEET NO. 2-C
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



TYPICAL SECTION NO. 7

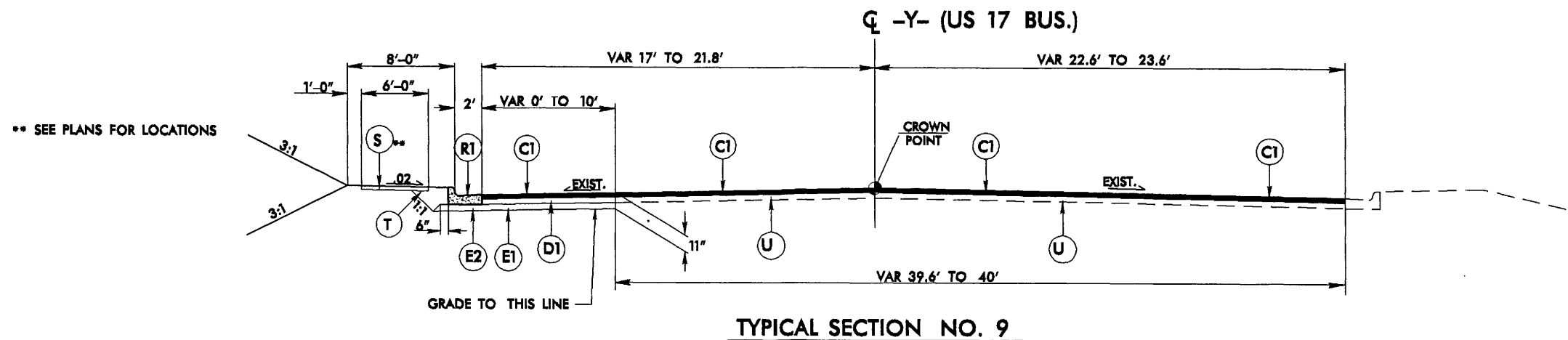
CHECK STATION RANGE VS XSC
USE TYPICAL SECTION NO. 7
 -L- STA. 66+74.56 TO 73+04.86

FINAL PAVEMENT DESIGN	
C1	3" S9.5B
D1	4" I19.0B
E1	4" B25.0B
E2	VAR. B25.0B
J1	6" ABC
R1	2'-6" C & G
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXIST PAVEMENT
W	WEDGING



TYPICAL SECTION NO. 8

USE TYPICAL SECTION NO. 8
 -L- STA. 73+04.86 TO 76+61.41, TRANSITION FROM T.S. 7 TO T.S. 8
 -L- STA. 76+61.41 TO 77+75.00



TYPICAL SECTION NO. 9

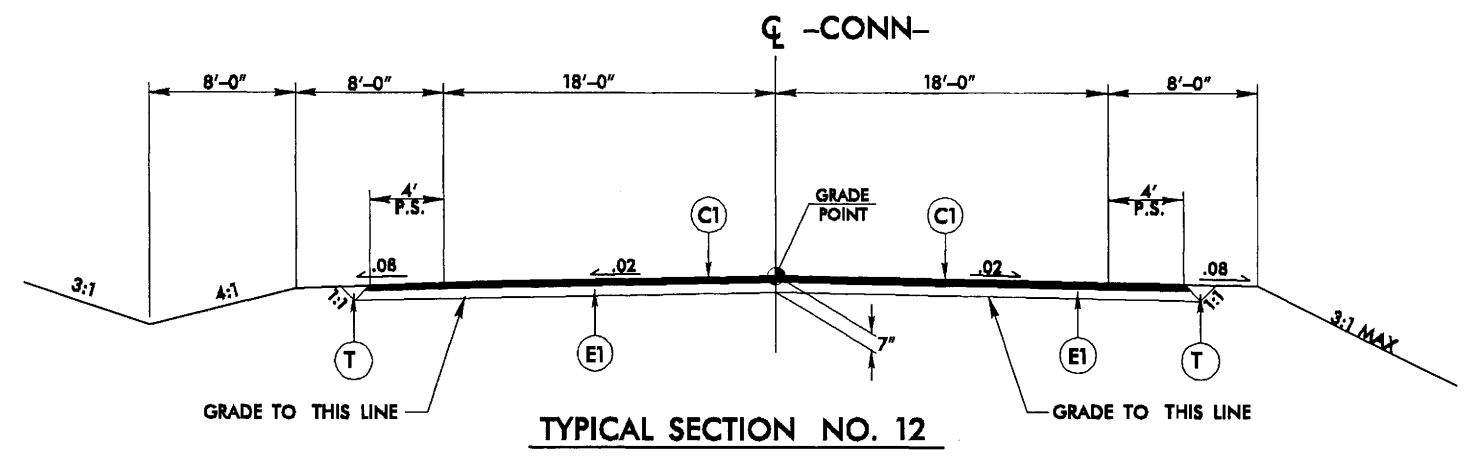
USE TYPICAL SECTION NO. 9
 -Y- STA. 12+00.00 TO 13+85.00

6/2/99

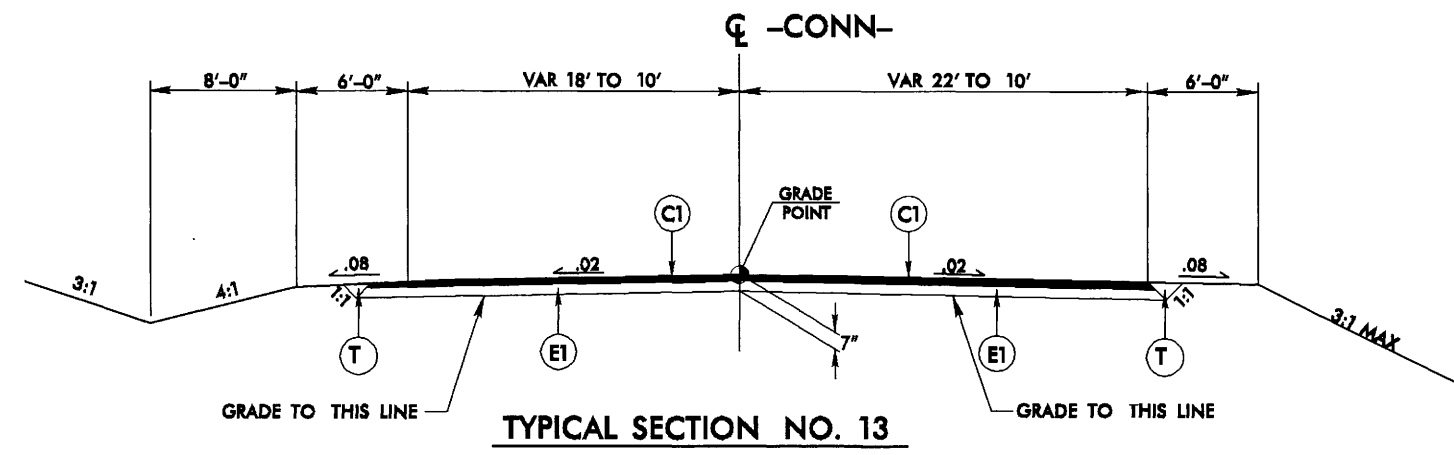
01-APR-2008 07:59
 C:\APR\2008\07_59\3462_rdu_ttyp.dgn
 REFERENCE

PROJECT REFERENCE NO. U-3462	SHEET NO. 2-E
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

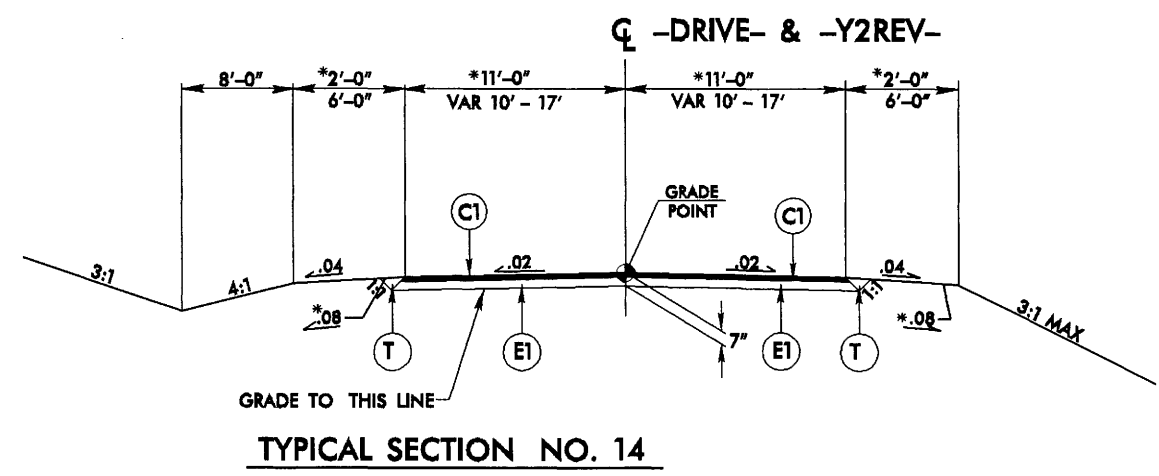
FINAL PAV'T DESIGN	
C1	3" S9.5B
E1	4" B25.0B
T	EARTH MATERIAL
U	EXIST. PAV'T
W	WEDGING



USE TYPICAL SECTION NO. 12
-CONN- STA. 23+32.03 TO 27+99.08



USE TYPICAL SECTION NO. 13
-CONN- STA. 30+45.78 TO 32+25.00



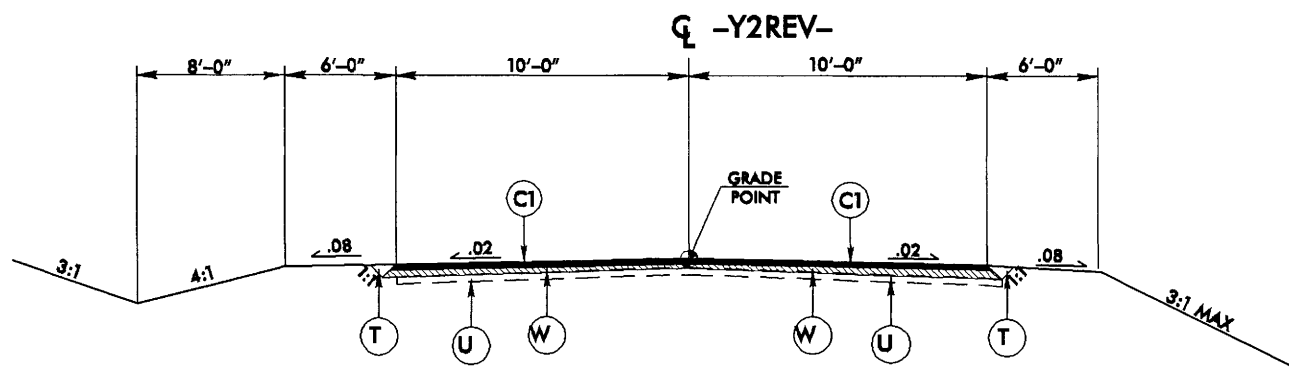
USE TYPICAL SECTION NO. 14
* -DRIVE- STA. 10+49.77 TO 12+00.00
-Y2REV- STA. 14+00.00 TO 14+18.42

5/2/99

01-APR-2008 08:00
U-3462.rdy-tyt.dgn
5:48:00 PM

6/2/99

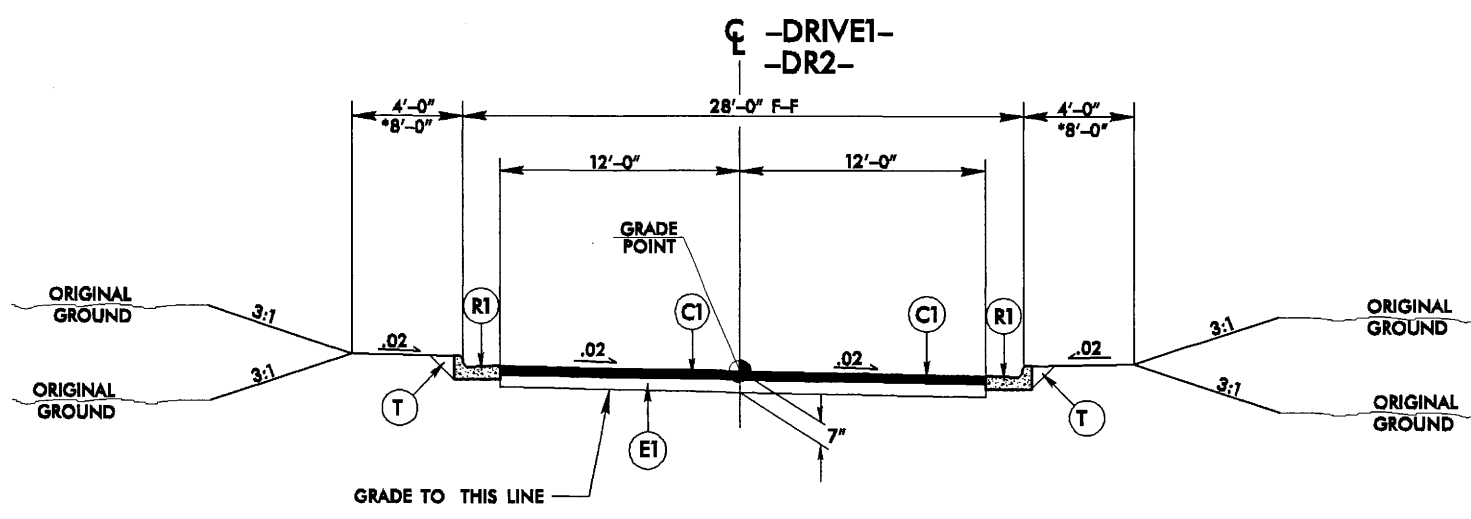
PROJECT REFERENCE NO. U-3462	SHEET NO. 2-F
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



TYPICAL SECTION NO. 15

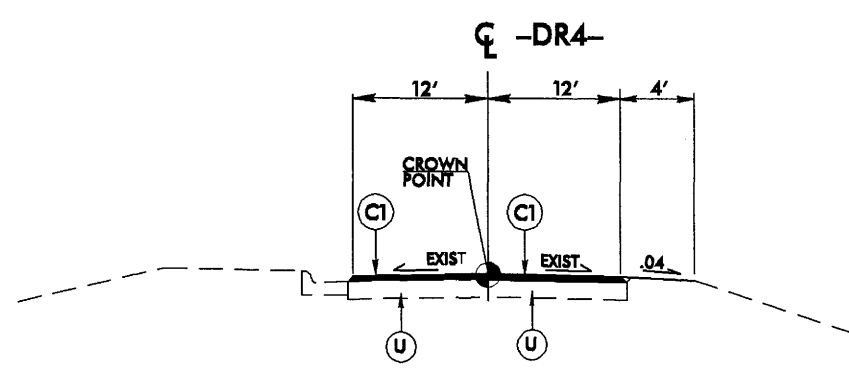
USE TYPICAL SECTION NO. 15
 -Y2REV- STA. 13+00.00 TO 13+50.00
 TRANSITION FROM EXISTING TO TS.15
 -Y2REV- STA. 13+50.00 TO 14+00.00

FINAL PAV'T DESIGN	
C1	3" S9.5B
E1	4" B25.0B
J1	6" ABC
P	PRIME COAT
R1	2'-6" C & G
T	EARTH MATERIAL
U	EXIST. PAV'T
W	WEDGING



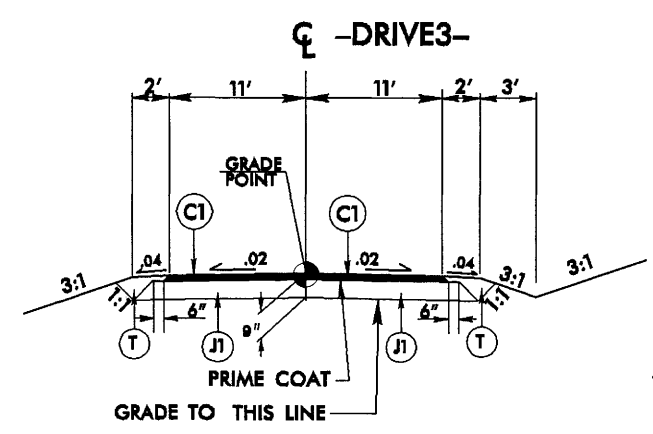
TYPICAL SECTION NO. 16

USE TYPICAL SECTION NO. 16
 -DRIVE1- STA. 10+66.48 TO 11+98.47
 *DR2- STA. 10+63.00 TO 11+11.00
 *DR2- STA. 11+11.00 TO 11+75, TRANSITION
 FROM T.S. 16 TO EXIST.



TYPICAL SECTION NO. 18

USE TYPICAL SECTION NO. 18
 -DR4- STA. 10+31.30 TO 13+50.18



TYPICAL SECTION NO. 17

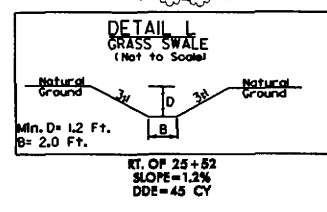
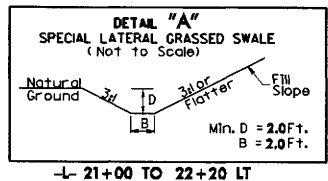
USE TYPICAL SECTION NO. 17
 -DRIVE3- STA. 10+56.62 TO 11+94.57

01-APR-2008 08:00
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 USERNAME

8/17/99

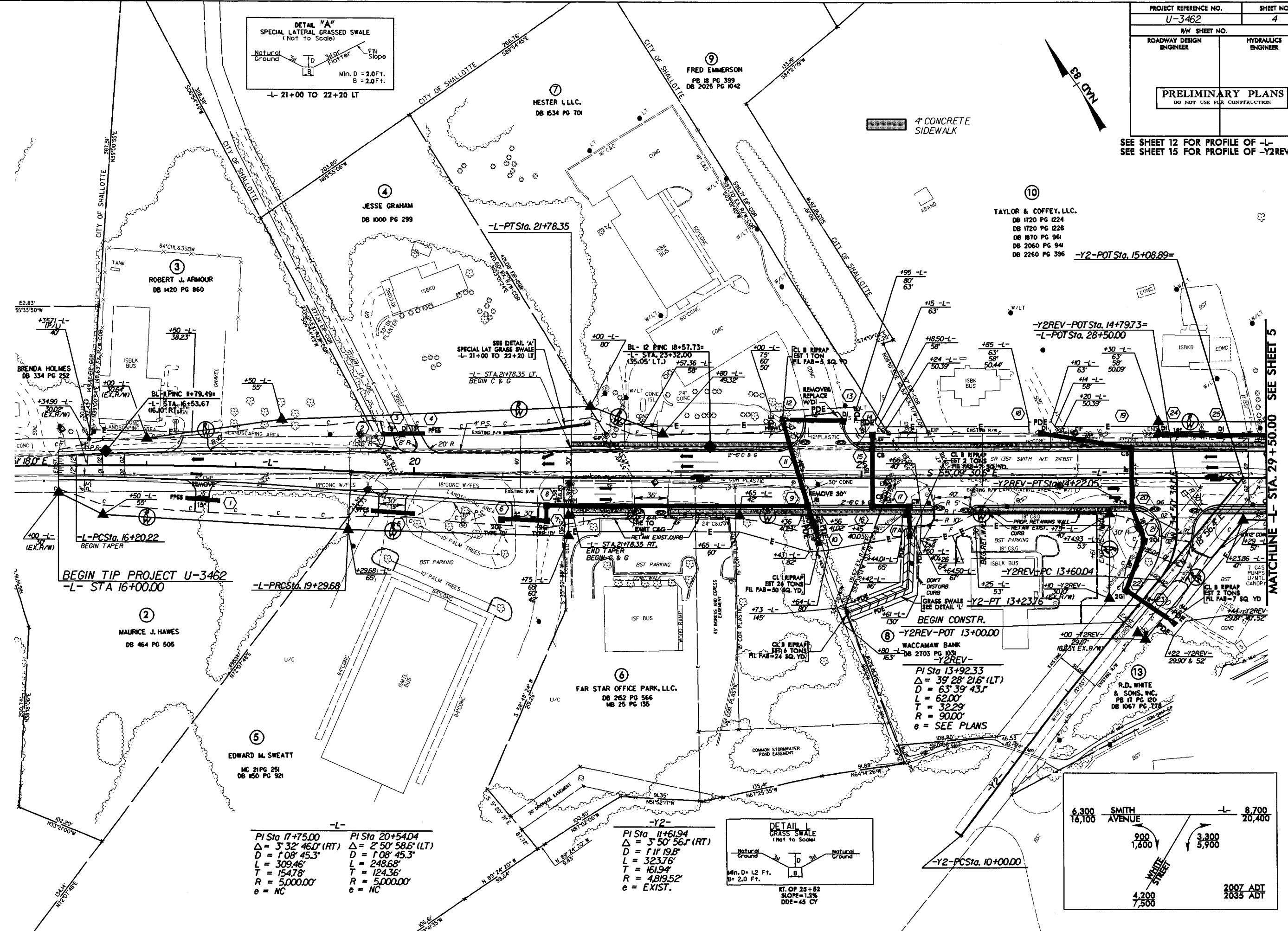
RAW REVISION- 5/27/2008 - BY [unreadable]
-UPDATED PROPERTY OWNER INFORMATION FOR PARCEL B.
-REVISED P&E & TCE ON PARCELS 7, 8 & 9.

27-MAY-2008 14:45
P:\PROJECTS\2008\U-3462\rdy_psh04.dgn
[unreadable]



PROJECT REFERENCE NO. U-3462	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

SEE SHEET 12 FOR PROFILE OF -L-
SEE SHEET 15 FOR PROFILE OF -Y2REV-

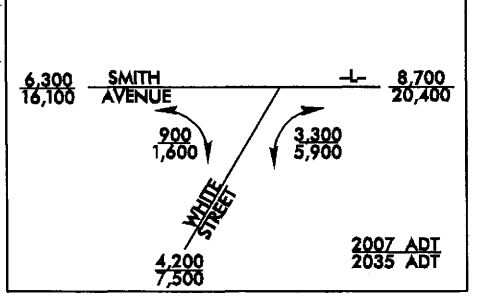


BEGIN TIP PROJECT U-3462
-L- STA 16+00.00

PI Sta 17+75.00 Δ = 3° 32' 46.0" (RT) D = 1' 08' 45.3" L = 309.46' T = 154.78' R = 5,000.00' e = NC	PI Sta 20+54.04 Δ = 2° 50' 58.6" (LT) D = 1' 08' 45.3" L = 248.68' T = 124.36' R = 5,000.00' e = NC
---	---

-Y2- PI Sta 11+61.94 Δ = 3° 50' 56.1" (RT) D = 1' 11' 19.8" L = 323.76' T = 161.94' R = 4,819.52' e = EXIST.

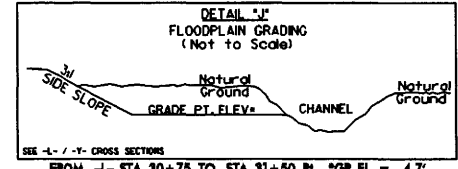
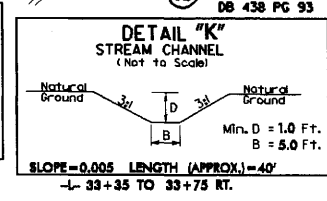
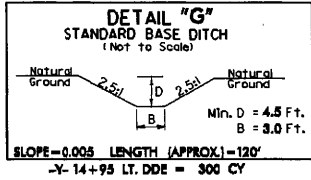
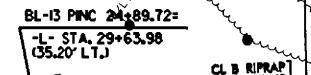
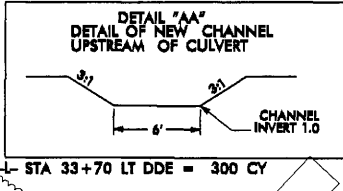
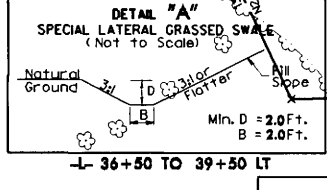
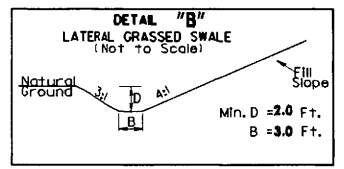
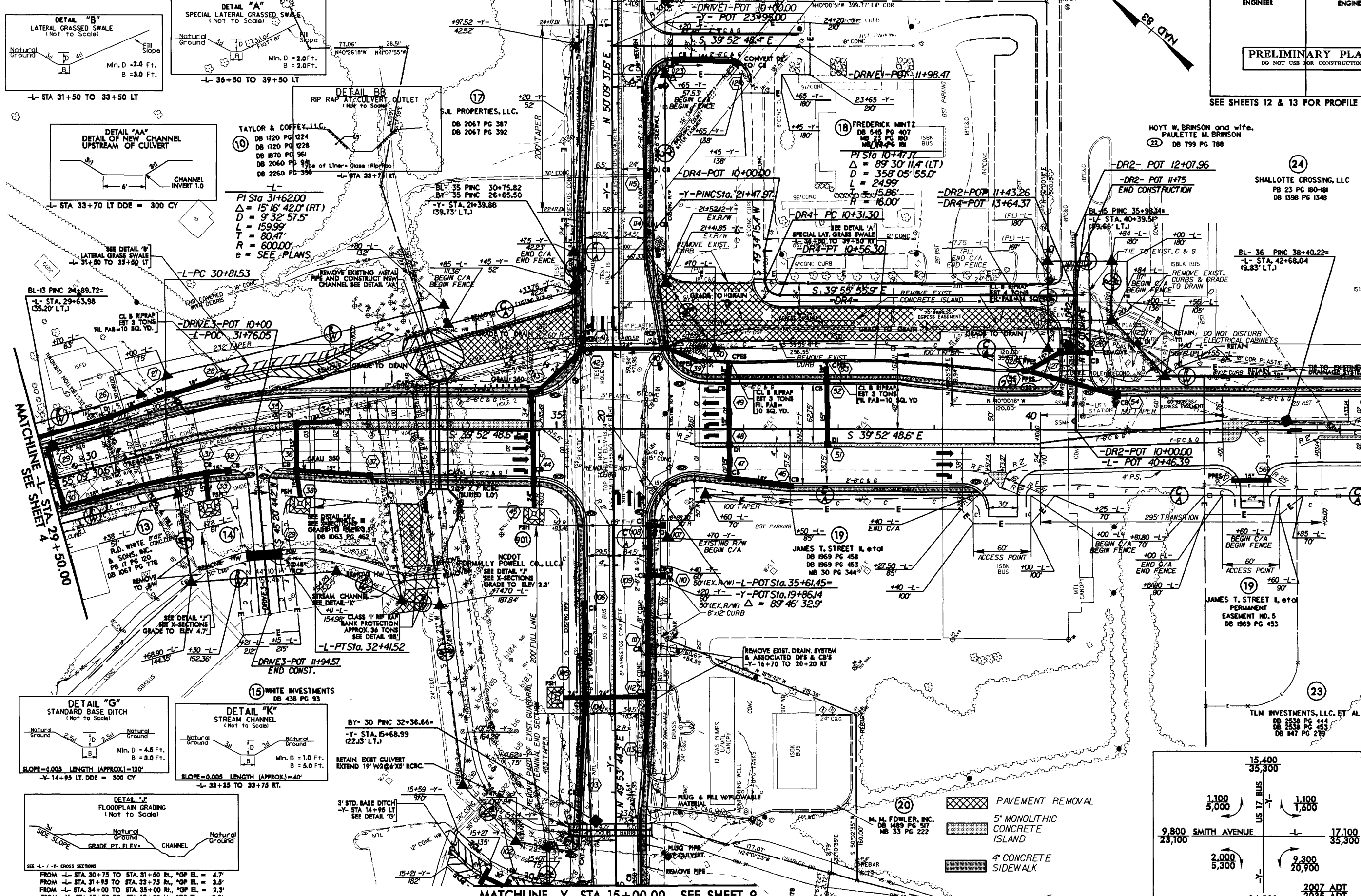
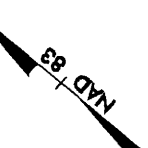
BEGIN CONSTR. -Y2REV-POT 13+00.00 WACCAMAW BANK DB 2703 PG 1031 -Y2REV- PI Sta 13+92.33 Δ = 39° 28' 21.6" (LT) D = 63° 39' 43.1" L = 62.00' T = 32.29' R = 90.00' e = SEE PLANS
--



MATCHLINE -L- STA. 29 + 50.00 SEE SHEET 5

SEE SHEETS 12 & 13 FOR PROFILE OF -L-

MATCHLINE -Y- STA. 24+50.00 SEE SHEET 10



FROM -L- STA. 30+75 TO STA. 31+50 RT, *GP EL. = 4.7'
 FROM -L- STA. 31+95 TO STA. 33+75 RT, *GP EL. = 3.5'
 FROM -L- STA. 34+00 TO STA. 35+00 RT, *GP EL. = 2.3'
 FROM -Y- STA. 15+70 TO STA. 19+00 LT, *GP EL. = 2.3'

MATCHLINE -Y- STA. 15+00.00 SEE SHEET 9

MATCHLINE -L- STA. 43+50.00 SEE SHEET 6

REVISIONS
 RAW REVISIONS-12/5/07- Y
 -ELIMINATED POE FROM PARCELS 18 & 20
 -REVISED TCE ON PARCEL 23

RAW REVISIONS-12/5/07- Y
 -ADDED DRIVEWAY AND SIDEWALK TO PARCEL 13 TO EDGE
 -RELOCATED RAW MONUMENT ON PARCEL 13 TO EDGE
 OF PARKING LOT AT RT -L- STA. 31+00 & UPDATED TCE.

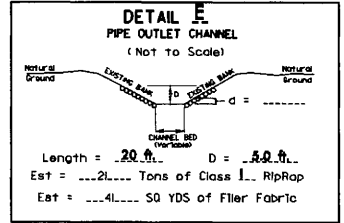
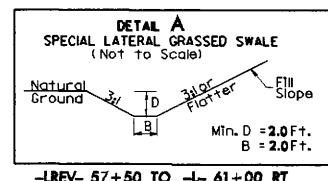
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15,400	35,300	1,100	1,600
9,800	23,100	2,000	20,900
24,500	54,900	2,007 ADT	2035 ADT

8/17/99

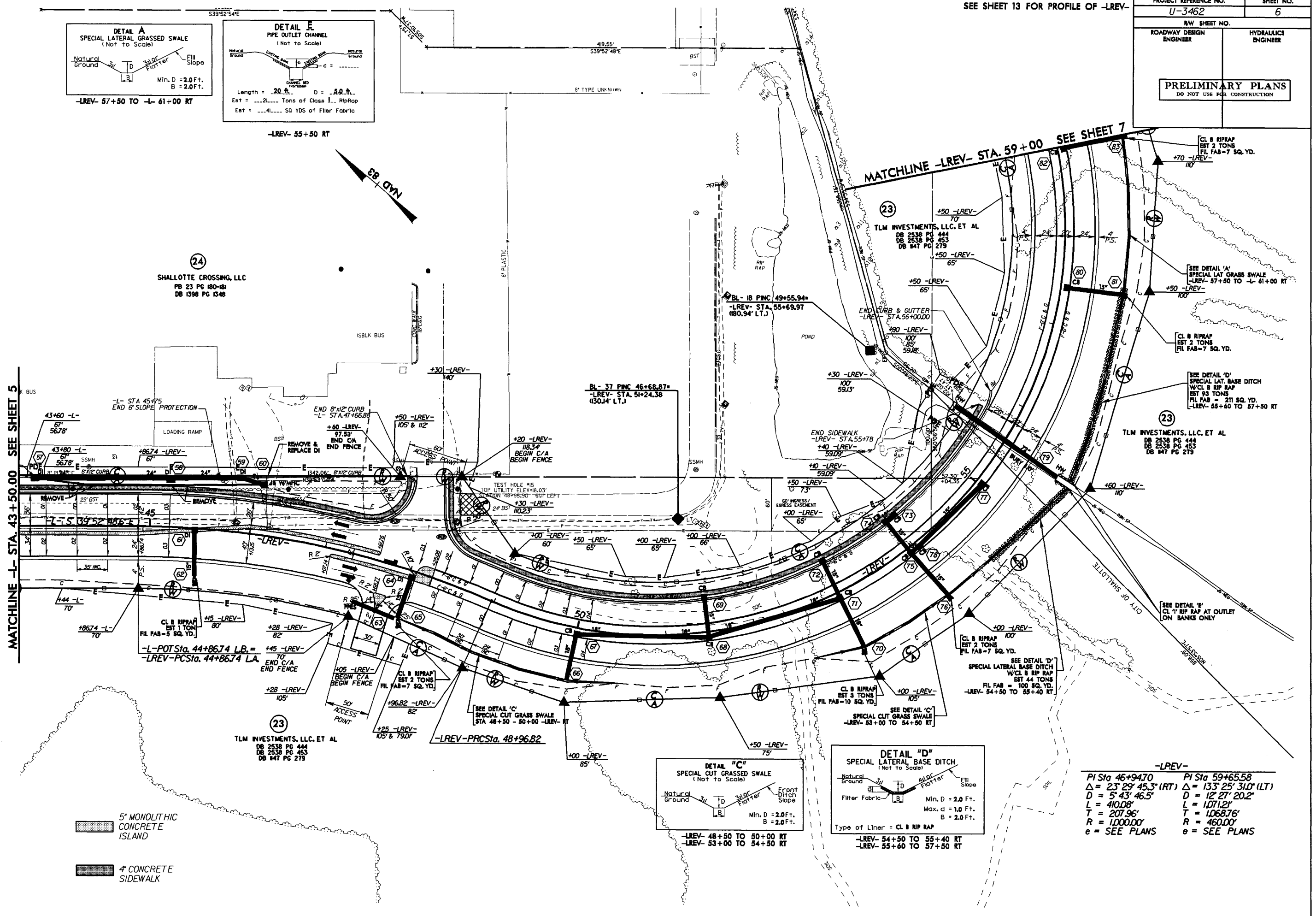
SEE SHEET 13 FOR PROFILE OF -LREV-

PROJECT REFERENCE NO. U-3462	SHEET NO. 6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



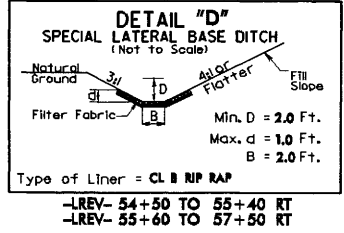
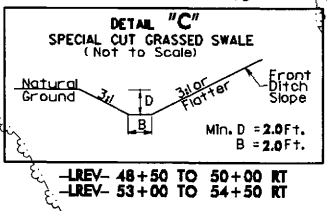
MATCHLINE -L- STA. 43+50.00 SEE SHEET 5

MATCHLINE -LREV- STA. 59+00 SEE SHEET 7



5' MONOLITHIC CONCRETE ISLAND

4' CONCRETE SIDEWALK



-LREV-

PI Sta 46+94.70	PI Sta 59+65.58
$\Delta = 23' 29' 45.3\" (RT)$	$\Delta = 133' 25' 31.0\" (LT)$
$D = 5' 43' 46.5\"$	$D = 12' 27' 20.2\"$
$L = 410.08'$	$L = 1,071.21'$
$T = 207.96'$	$T = 1,068.76'$
$R = 1,000.00'$	$R = 460.00'$
$e = \text{SEE PLANS}$	$e = \text{SEE PLANS}$

REVISIONS

NO. REVISIONS DATE BY

1. UPDATED PROPERTY OWNER INFO FOR PARCEL 23

2. REVISED TCE TO MATCH REVISED PROPERTY LINE (PPCL23)

3. COMBINED PARCELS 23 & 25 INTO PARCEL 23

4. REMOVED CONTAMINATED AREA FROM PARCEL 23

5. CORRECTED FLASHING OFFSETS ON PDE -L- 43+60 TO 43+80

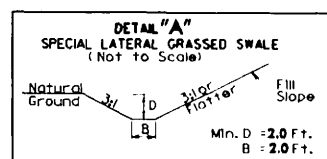
01-APP-2008 08-00

1:3462.dwg

3/3/08

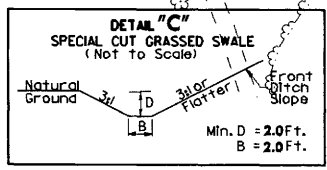
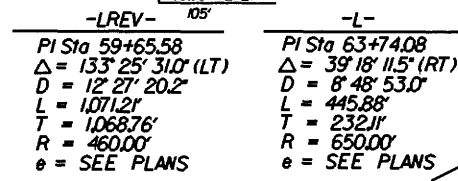
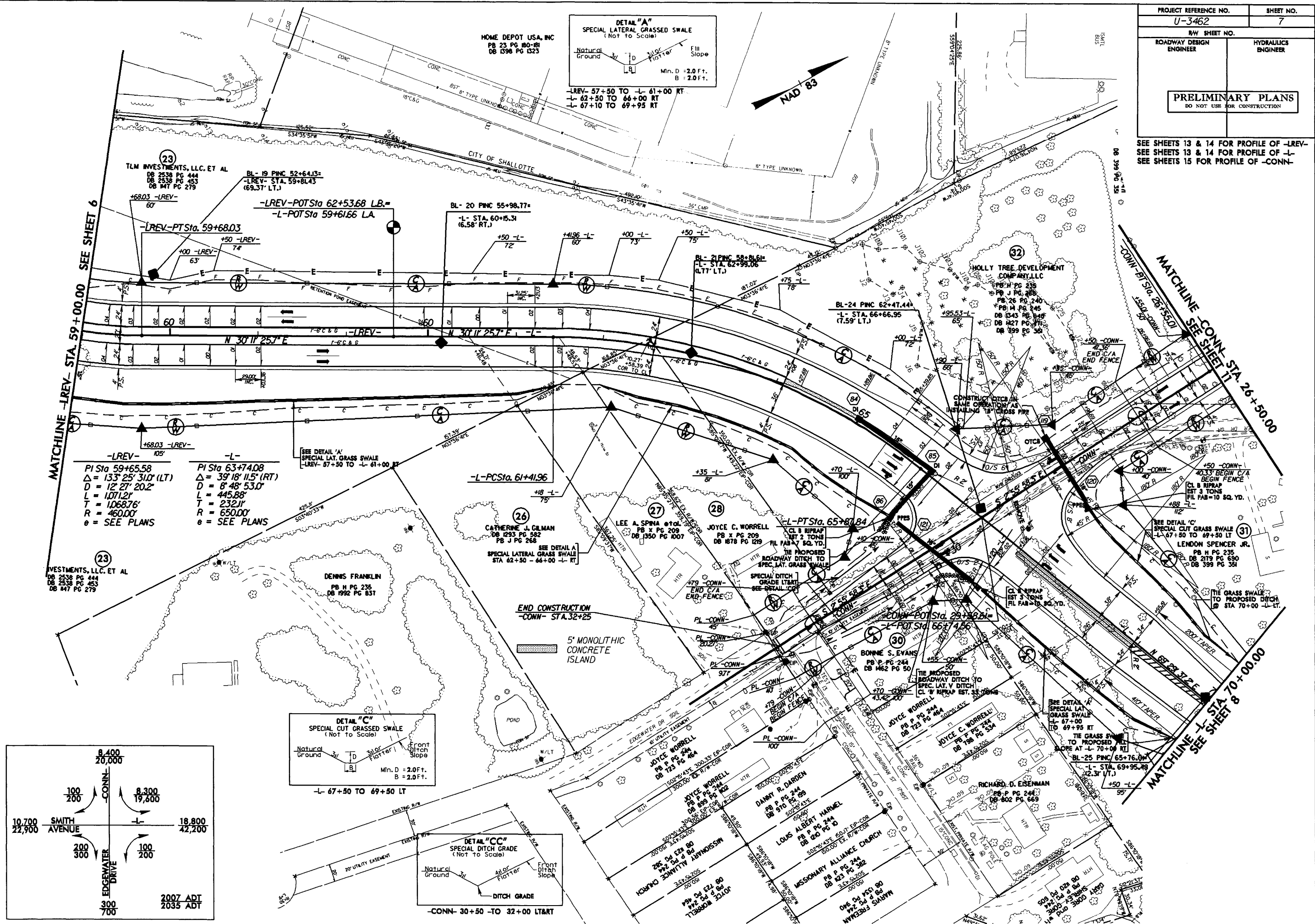
PROJECT REFERENCE NO.	SHEET NO.
U-3462	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	
DO NOT USE FOR CONSTRUCTION	

SEE SHEETS 13 & 14 FOR PROFILE OF -LREV-
SEE SHEETS 13 & 14 FOR PROFILE OF -L-
SEE SHEETS 15 FOR PROFILE OF -CONN-

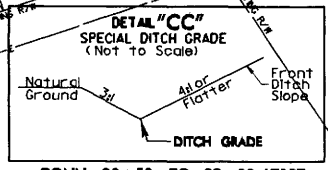


-LREV- 57+50 TO -L- 61+00 RT
-L- 62+50 TO 66+00 RT
-L- 67+10 TO 69+95 RT

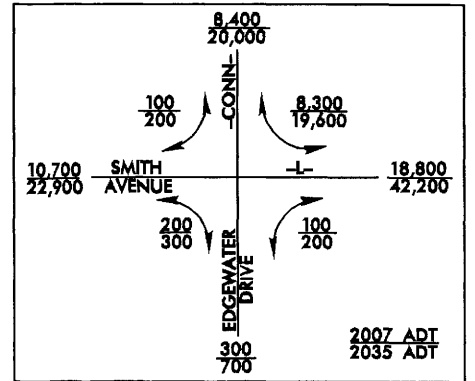
HOME DEPOT USA, INC
PB 23 PG 180-181
DB 0398 PG 0323



-L- 67+50 TO 69+50 LT



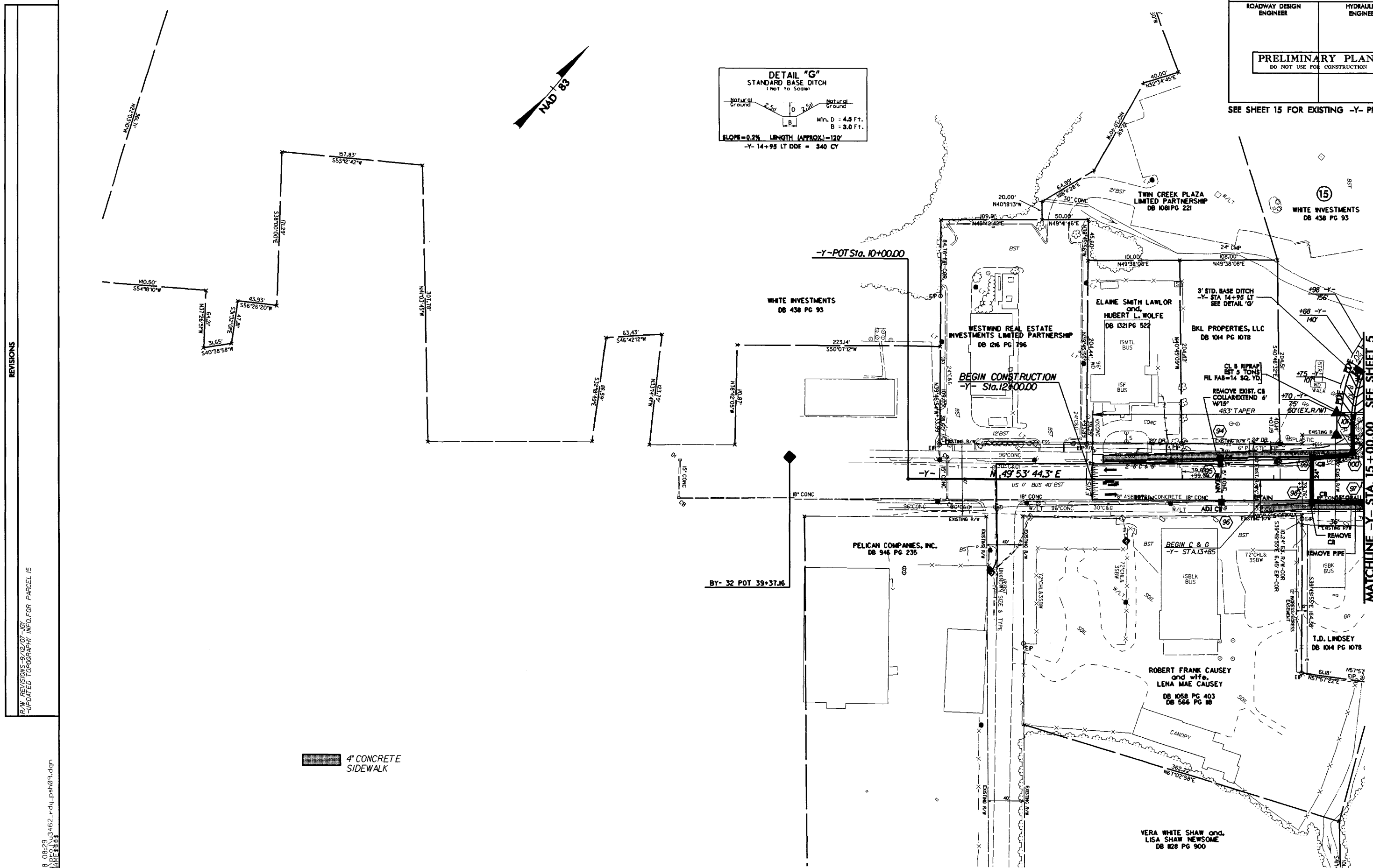
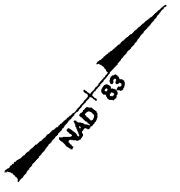
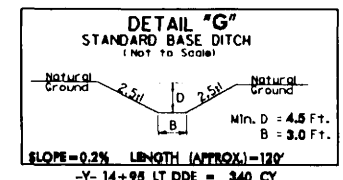
-CONN- 30+50 TO 32+00 LT&RT



REVISIONS
 R/W REVISIONS-9/12/07-JGT
 -UPDATED PROPERTY OWNER INFO-PARCELS 23,27,28,30,31
 -COMBINED PARCELS 23 & 25 INTO PARCEL 23
 -UPDATED MONUMENTS STA OFFSET NEAR PARCELS 27 & 28
 01-APR-2008 08:00
 S:\PROJECTS\U3462\rdj_psh07.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-3462	9
BW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

SEE SHEET 15 FOR EXISTING -Y- PROFILE



REVISIONS

R/W REVISIONS-9/12/07-JST
-UPDATED TOPOGRAPHY INFO. FOR PARCEL 15

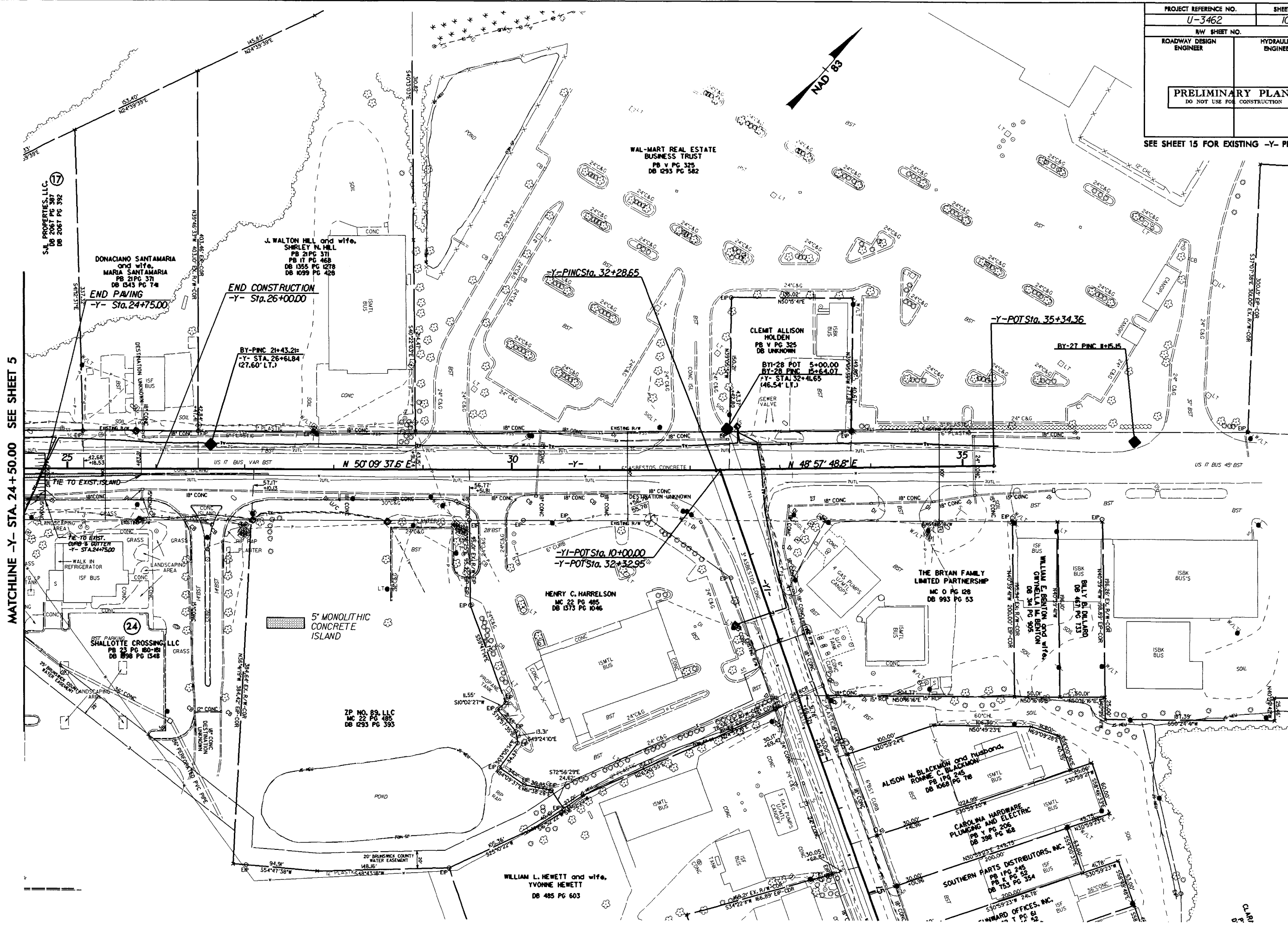
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3462.rdy.psh09.dgn
S:\PROJECTS\3462\DWG\3462.rdy.psh09.dgn

4" CONCRETE SIDEWALK

MATCHLINE -Y- STA. 15+00.00 SEE SHEET 5

PROJECT REFERENCE NO. U-3462	SHEET NO. 10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

SEE SHEET 15 FOR EXISTING -Y- PROFILE



MATCHLINE -Y- STA. 24+50.00 SEE SHEET 5

REVISIONS

R/W REVISIONS - 9/12/07 - AGI
- UPDATED PHOTOGRAPHY INFO FOR PARCEL 17
- UPDATED PROPERTY OWNER INFO FOR PARCEL 17
01-APP-2008_08.00
C:\WORKSPACE\3462.dwg
3/17/09

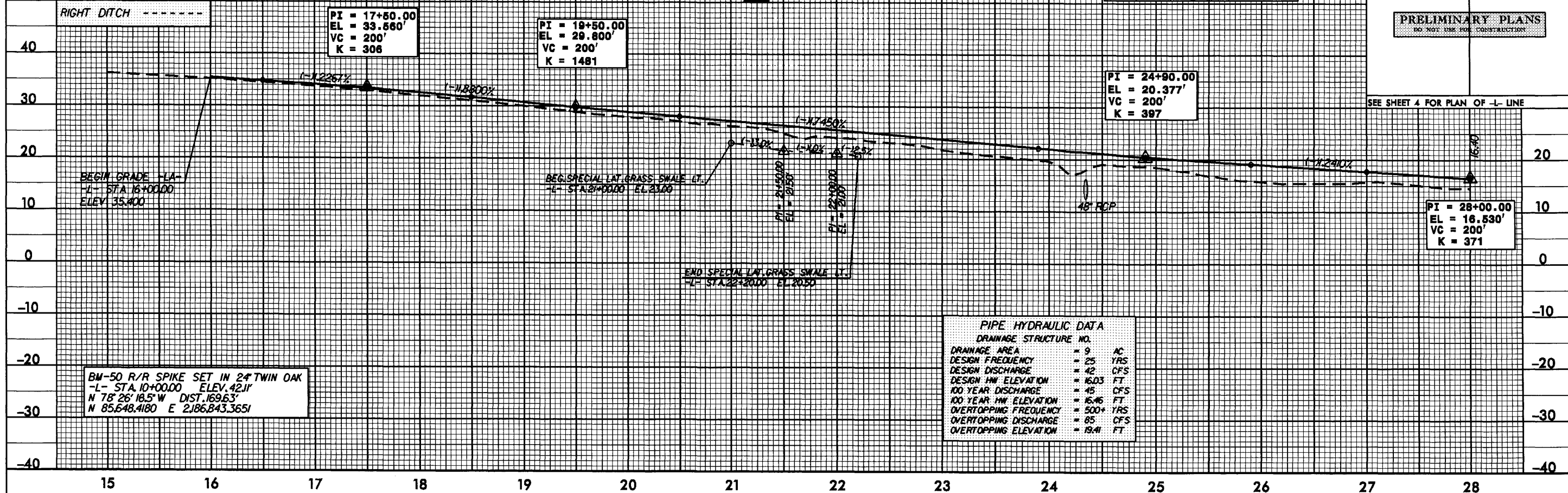
5/28/99

DITCH LEGEND	
LEFT DITCH	-----
RIGHT DITCH	-----

BM-51 SQUARE CUT SET IN CONC
 -L- STA. 29+84.68 80.18' RIGHT
 ELEV. 11.23'
 N 84.4112329 E 2188.589.8921

PROJECT REFERENCE NO.	U-3462	SHEET NO.	12
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			

SEE SHEET 4 FOR PLAN OF -L- LINE

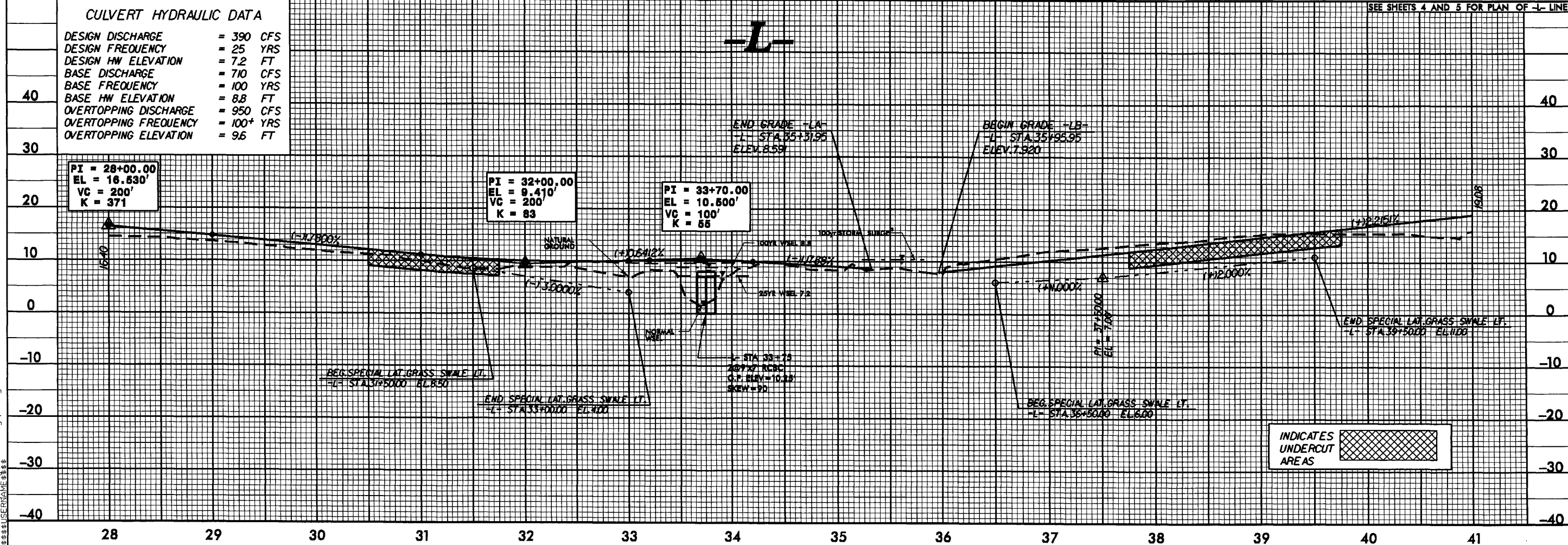


BM-50 R/R SPIKE SET IN 24 TWIN OAK
 -L- STA. 10+00.00 ELEV. 42.1'
 N 78° 26' 18.5" W DIST. 169.63'
 N 85.648.4180 E 2186.843.3651

PIPE HYDRAULIC DATA	
DRAINAGE STRUCTURE NO.	
DRAINAGE AREA	= 9 AC
DESIGN FREQUENCY	= 25 YRS
DESIGN DISCHARGE	= 42 CFS
DESIGN HW ELEVATION	= 16.03 FT
100 YEAR DISCHARGE	= 45 CFS
100 YEAR HW ELEVATION	= 16.46 FT
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING DISCHARGE	= 85 CFS
OVERTOPPING ELEVATION	= 19.4 FT

CULVERT HYDRAULIC DATA	
DESIGN DISCHARGE	= 390 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 7.2 FT
BASE DISCHARGE	= 710 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 8.8 FT
OVERTOPPING DISCHARGE	= 950 CFS
OVERTOPPING FREQUENCY	= 100+ YRS
OVERTOPPING ELEVATION	= 9.6 FT

SEE SHEETS 4 AND 5 FOR PLAN OF -L- LINE



INDICATES UNDERCUT AREAS

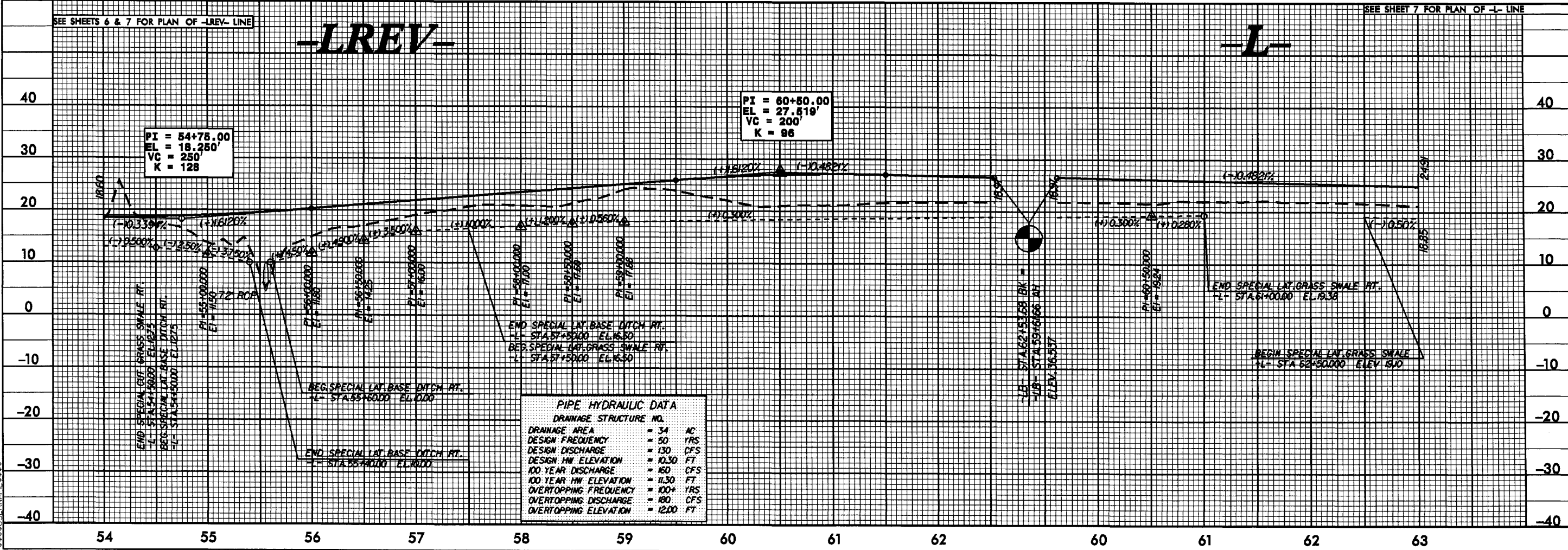
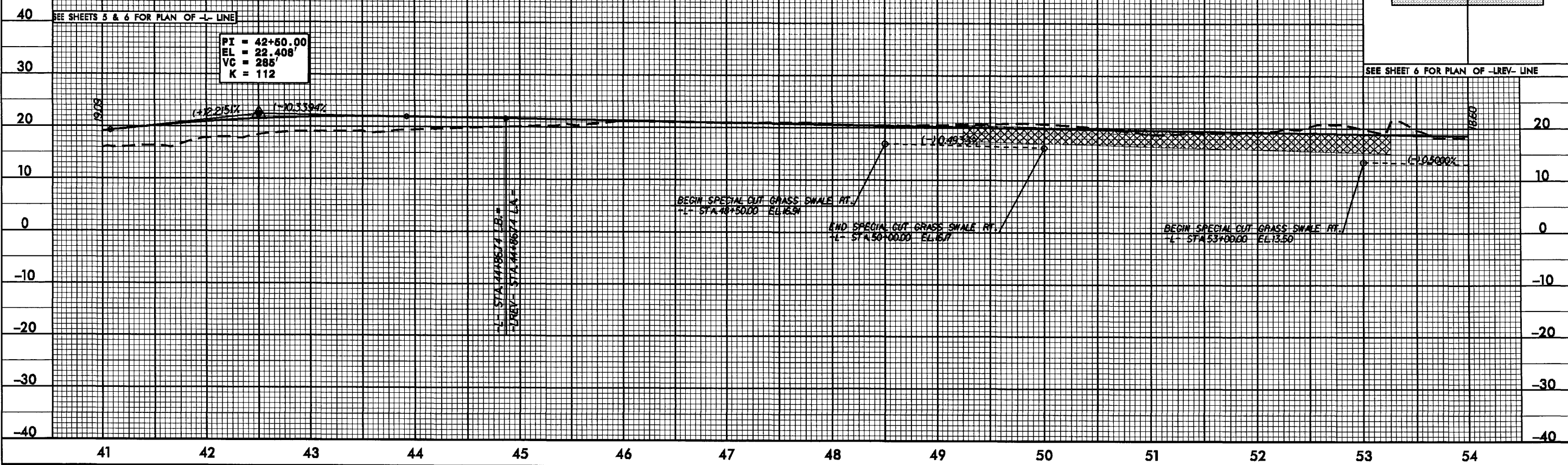
0:\APR-2008 08:00 3462.rdy.plt.dgn

5/28/99

DITCH LEGEND	
LEFT DITCH	-----
RIGHT DITCH	-----

BM-54 R/R SPIKE SET IN 12" PINE
 -LREV- STA. 51+17.00 0.54' LEFT
 ELEV. 20.23'
 N 82.8114102 E 2,189,932.9885

PROJECT REFERENCE NO. U-3462	SHEET NO. 13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



PIPE HYDRAULIC DATA	
DRAINAGE STRUCTURE NO.	
DRAINAGE AREA	= 34 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 130 CFS
DESIGN HW ELEVATION	= 10.30 FT
100 YEAR DISCHARGE	= 160 CFS
100 YEAR HW ELEVATION	= 11.30 FT
OVERTOPPING FREQUENCY	= 100+ YRS
OVERTOPPING DISCHARGE	= 180 CFS
OVERTOPPING ELEVATION	= 12.00 FT

01-APR-2008 08:38
 P:\p050601\p050601\3462_rdy_p1.dgn
 \$\$\$USERNAME\$\$\$

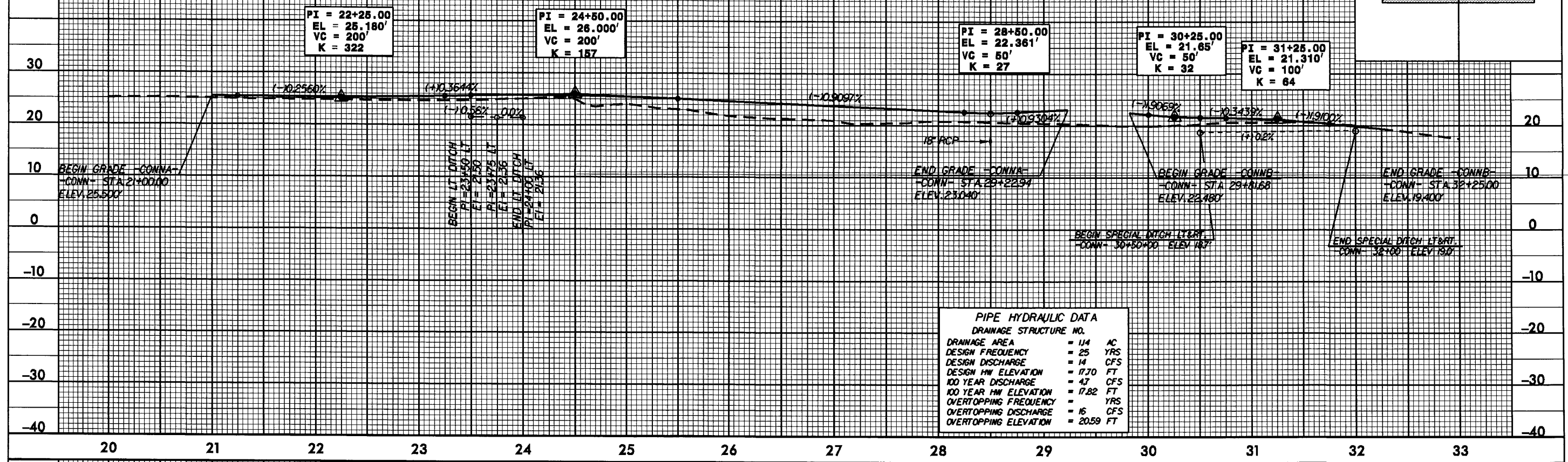
5/28/99

DITCH LEGEND	
LEFT DITCH	-----
RIGHT DITCH	-----

-CONN-

SEE SHEETS 7 AND 10 FOR PLAN OF -CONN- LINE

PROJECT REFERENCE NO. U-3462	SHEET NO. 15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS <small>DO NOT USE FOR CONSTRUCTION</small>	

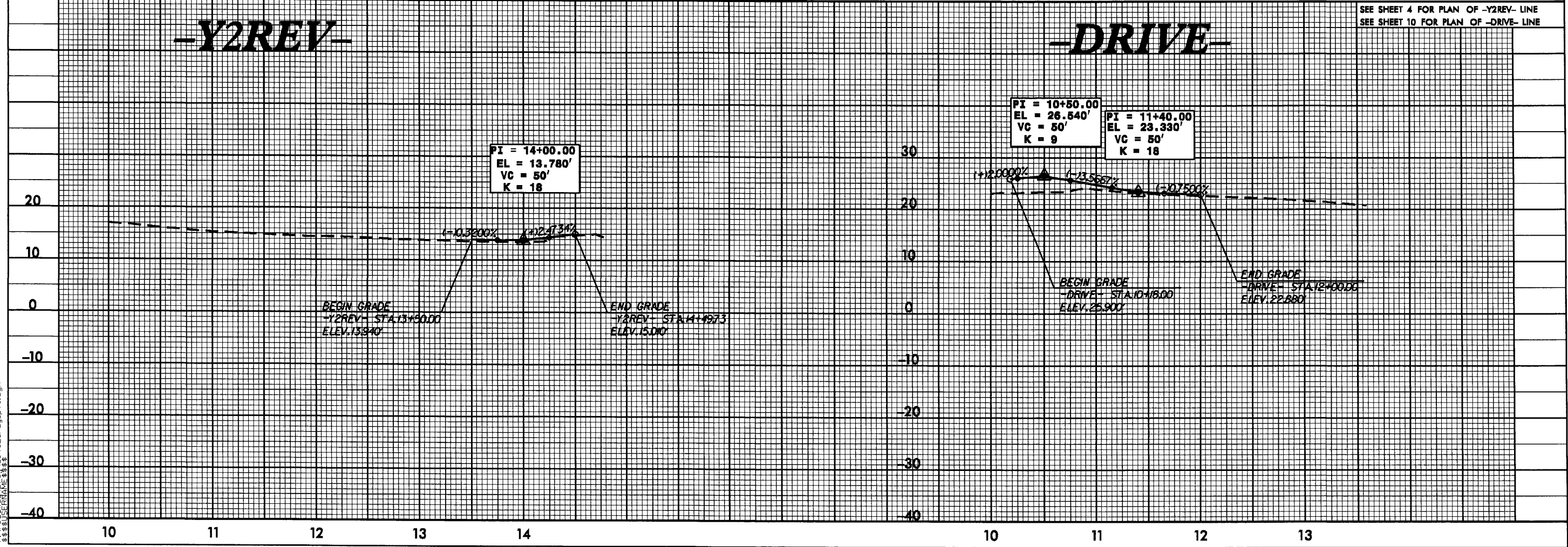


PIPE HYDRAULIC DATA	
DRAINAGE STRUCTURE NO.	
DRAINAGE AREA	= 114 AC
DESIGN FREQUENCY	= 25 YRS
DESIGN DISCHARGE	= 14 CFS
DESIGN HW ELEVATION	= 17.70 FT
100 YEAR DISCHARGE	= 47 CFS
100 YEAR HW ELEVATION	= 17.82 FT
OVERTOPPING FREQUENCY	= 16 YRS
OVERTOPPING DISCHARGE	= 16 CFS
OVERTOPPING ELEVATION	= 20.59 FT

-Y2REV-

-DRIVE-

SEE SHEET 4 FOR PLAN OF -Y2REV- LINE
SEE SHEET 10 FOR PLAN OF -DRIVE- LINE



01-APR-2008 08:00
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