



PAT McCrory
Governor

NICHOLAS J. TENNYSON
Secretary

June 16, 2016

U. S. Army Corps of Engineers
Regulatory Field Office
151 Patton Avenue, Room 208
Asheville, NC 28805

ATTN: Ms. Amschler
NCDOT Coordinator

Subject: **Application for an Individual Section 404 and Section 401 Water Quality Certification** for the proposed improvements to NC 3 (Mooresville Road), Kannapolis Parkway to Dale Earnhardt Boulevard / Loop Road (SR 1691), Kannapolis in Cabarrus County; Division 10, TIP No. U-3440.
Debit \$570 from WBS 39010.1.1.

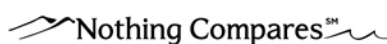
Dear Ms. Amschler:

The North Carolina Department of Transportation (NCDOT) proposes to improve NC 3 (Mooresville Road) from the Kannapolis Parkway to Dale Earnhardt Boulevard/Loop Road (SR 1691). The improvements will widen Mooreseville Road to a four lane divided facility. The typical section will consist of two 11-foot travel lanes and a 5-foot bicycle lane in each direction, with a 23.5-foot wide grass median. Sidewalks are proposed on both sides of the proposed facility for the entire length of the project. The project is approximately 2.6 miles in length.

Please see the enclosed ENG 4345, the North Carolina Division of Mitigation Services (NCDMS) Acceptance Letter (dated May 19, 2016), Meeting Minutes – Concurrence Point 4A, 4B, 4C; State Stormwater Management Plan (SMP), permit drawings, and design plans for the above referenced project.

Purpose and Need:

The primary purpose of the proposed project is to reduce delays along NC 3 (Mooresville Road), which is experiencing congestion and is expected to reach Level of Service (LOS) F in the immediate future. The proposed improvements will be of benefit providing an increased ease of travel between the Kannapolis Parkway and downtown Kannapolis.



Summary of Jurisdictional Impacts:

Proposed permanent impacts to jurisdictional areas total 0.05 acre of wetland impacts and 2,209 linear feet of stream impacts, of which 255 LF are bank stabilization impacts.

Summary of Utility Impacts:

There will be no impacts associated with utility relocations.

Summary of Mitigation:

The project has been designed to avoid and minimize impacts to jurisdictional areas throughout the National Environmental Policy Act (NEPA) and design processes. However, project impacts will necessitate compensatory mitigation for the unavoidable impacts. Of the 2,209 linear feet of permanent stream impacts, 255 are for bank stabilization, that does not require mitigation by the USACE, leaving 1,954 linear feet of permanent stream impacts requiring mitigation. The 0.05 acre of permanent wetland impact also requires mitigation. NCDOT has acquired compensatory mitigation for these unavoidable impacts from the Division of Mitigation Services (DMS).

NEPA DOCUMENT STATUS

An Environmental Assessment (EA) was completed for this project in June 2011. A State Finding of No Significant Impact (SFONSI) was approved on January 27, 2015. Copies of these documents can be found on the NCDOT Website: <http://connect.ncdot.gov/resources/Environmental/Pages/default.aspx>.

In compliance with the NEPA/404 Merger Process, Concurrence Point 4A was reached on December 18, 2013. All parties agreed that the 4A meeting would also serve as the 4B and 4C meetings, with the stipulation that NCDOT would forward revised drainage plans to the Agencies prior to submittal of the permit drawings. The Agencies were notified of the posting of the revised drainage plans on January 29, 2014.

PROJECT SCHEDULE

The project has a Let date of October 18, 2016, and a Let Review Date of August 30, 2016. **NCDOT will need permits by August 30, 2016, in order to start the contract for this project.**

INDEPENDENT UTILITY

The subject project is in compliance with 23 CFR Part 771.111(f) which lists the Federal Highway Administration (FHWA) characteristics of independent utility of a project:

- (1) The project connects logical termini and is of sufficient length to address environmental matters on a broad scope,
- (2) The project is usable and a reasonable expenditure, even if no additional transportation improvements are made in the area;

(3) The project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

RESOURCE STATUS

Waters within the project area are located in the Yadkin/Pee Dee River Basin (HUC 03040105), Subbasin 03-07-12. There are no Outstanding Resource Waters (ORW), High Quality Waters (HQW), Water Supply Waters (WS-I or WS-II) waters within 1.0 mile of the project area. One (1) named stream, Irish Buffalo Creek, as well as eight (8) unnamed tributaries (UTs) to Irish Buffalo Creek are located within the project area. The stream Index Number for Irish Buffalo Creek and the associated UTs is 13-17-9-(2), and the Best Use Classification is C.

Please note that two of the UTs to Irish Buffalo Creek (UT-7 and UT-8, as presented in Table 2) were previously identified as Miller Branch (UT-8) and UT to Miller Branch (UT-7) in the NRTR and in the EA / SFONSI. Current available information identifies these two streams as UTs to Irish Buffalo Creek. To maintain consistency with the EA/SFONSI, Table 2 and the Permit Drawings in this application have maintained the use of Miller Branch and UT to Miller Branch (Site S1 and Site MB), with Table 2 footnoted.

303(d) Impaired Waters:

Irish Buffalo Creek had previously been listed in the 2012 303(d) for turbidity, as noted in the EA/SFONSI. However, Irish Buffalo Creek is not listed in the North Carolina 2014 Final 303(d) list of impaired waters for turbidity or sedimentation, nor is it listed on the draft 2016 303(d) list for turbidity or sedimentation. As such, *Design Standards in Sensitive Watersheds* will not be implemented.

IMPACTS TO WATERS OF THE U.S.

Tables 1 and 2 summarize the impacts to jurisdictional wetlands and streams, respectively. Site numbers correspond with the permit (hydraulic) drawings included in this application. The stream numbers correspond to the NRTR to differentiate between the several UTs to Irish Buffalo Creek, with the exception of UT-7 and UT-8, as noted previously. A brief description of each impact site will follow the tables.

Table 1 – U-3440 Wetland Impacts*

Site	Wetland Number	Wetland Size (ac)	Permanent Fill in Wetlands (ac)	Excavation (ac)	Mechanized Clearing (ac)	Hand Clearing (ac)	Impacts Requiring Mitigation (ac)
WA	WA	0.05	0.05	--	--	--	0.05
Total Impacts			0.05	--	--	--	0.05

* Wetland impacted is riparian.

Table 2 – U-3440 Stream Impacts

Site	Stream Name & Intermittent (I) or Perennial (P)	Stream No. (from NRTR)	Impact Type	Permanent Impact (linear feet)	Temporary Impacts (acres/feet)	Mitigation Requirement ^{2/}	
S1	UT to Miller Branch ^{1/} (P) [UT to Irish Buffalo Ck]	UT-7	Perm. Fill	300	--	USACE & DWR	
			Bank Stabilization	--	--	--	
			Temp Fill	--	--	--	
MB	Miller Branch ^{1/} (P) [UT to Irish Buffalo Ck]	UT-8	Perm. Fill	214	--	USACE & DWR	
			Bank Stabilization	--	--	--	
			Temp Fill	--	<0.01 / 51	--	
IBC	Irish Buffalo Creek (P)	IBC	Perm. Fill	--	--	--	
			Bank Stabilization	37	0.02 / 63	--	
			Temp Fill	--	0.01 / 96	--	
S2	UT to Irish Buffalo Creek (P)	UT-1	Perm. Fill	251	--	USACE & DWR	
			Bank Stabilization	--	--	--	
			Temp Fill	--	<0.01 / 22	--	
S3	UT to Irish Buffalo Creek (P)	UT-2	Perm. Fill	126	--	USACE & DWR	
			Bank Stabilization	54	<0.01 / 9	DWR	
			Temp Fill	--	--	--	
S4	UT to Irish Buffalo Creek (P)	UT-3	Perm. Fill	181	--	USACE & DWR	
			Bank Stabilization	59	0.01 / 27	DWR	
			Temp. Fill	--	--	--	
S5	UT to Irish Buffalo Creek (P)	UT-4	Perm. Fill	105	--	USACE	
			Bank Stabilization	24	<0.01 / 18	--	
			Temp. Fill	--	--	--	
S6	UT to Irish Buffalo Creek (P)	UT-5	Perm. Fill	246	--	USACE & DWR	
			Stream realignment	72	--	USACE & DWR	
			Bank Stabilization	15	<0.01 / 17	DWR	
			Temp. Fill	--	<0.01 / 10	--	
S7-1	UT to Irish Buffalo Creek (P)	UT-6	Perm. Fill	24	--	USACE & DWR	
			Bank Stabilization	12	<0.01 / 8	DWR	
			Temp. Fill	--	<0.01 / 31	--	
S7-2	UT to Irish Buffalo Creek (P)		Perm. Fill	265	--	USACE & DWR	
			Bank Stabilization	42	<0.01 / 10	DWR	
			Temp. Fill	--	--	--	
S7-3	UT to Irish Buffalo Creek (P)		Perm. Fill	170	--	USACE & DWR	
			Bank Stabilization	12	<0.01 / 36	DWR	
			Temp. Fill	--	--	--	
Total Temporary Impacts:				--	0.06 ^{3/}	--	
Total Perm. Impacts (Perm. Fill + Bank Stabilization):				2,209	--	--	
Permanent Impacts Requiring DWR Mitigation:				2,148 ^{4/}	--	--	
Permanent Impacts Requiring USACE Mitigation:				1,954 ^{5/}	--	--	
Total Impacts Requiring Mitigation:				1,954†	--	†	

1/ – Noted as Miller Branch and UT to Miller Branch in Document; however, they are both UTs to Irish Buffalo Creek (maintained the naming for consistency with permit drawings and EA/SFONSI).

2/ – Mitigation for bank stabilization impacts required by DWR (if >150 LF to a single feature) – not required by USACE.

3/ – Values are based on rounding, due to some of the individual impacts being <0.01 acre. No mitigation required.

4/ – NCDWR stream mitigation is at a ratio of 1:1.

5/ – USACE stream mitigation is typically at a ratio of 2:1.

† – Final mitigation requirement will be up to the USACE and DWR. Mitigation for 1,954 LF of permanent stream impact (at 2:1 ratio) has been requested from DMS.

Permit Site S1: A portion of UT-7 to Irish Buffalo Creek (IBC) will be impacted from roadway fill, resulting in 300 LF of permanent stream impacts, and will be re-located outside of the fill slope.

Permit Site MB: An existing 1 @ 10'X7' Reinforced Concrete Box Culvert (RCBC) carrying the flow of UT-8 to IBC across NC 3 will be removed, and a 1 @ 10'X9' RCBC, with notched, alternating sills and baffles, will be installed. UT-8 IBC will be re-routed at the inlet and outlet of the RCBC, resulting in a total of 214 LF of permanent stream impacts and <0.01 acre (51 LF) of temporary impacts.

Permit Site IBC: A bridge over Irish Buffalo Creek will be removed, and two new bridges will be constructed. The right bridge will be built where the existing bridge is located. The left bridge will be built to the left (upstream) of the existing bridge. The bridges will each consist of 3 spans (1 @ 30', 1 @ 60', and 1 @ 40'), pre-stressed concrete girders with end bends. Temporary rock causeways will be used for construction of three of the four bents, which are all located on the banks, resulting in 0.01 acre (96 LF) of temporary stream impacts. Additionally, there will 37 LF of permanent stream impact from bank stabilization, and 0.02 acre (47 LF) and <0.01 acre (16 LF) of temporary impacts where two proposed ditches tie in to IBC, on the right and on the left, respectively.

Permit Site WA: The relocation of UT-1 to IBC, which is located upstream and downstream of Wetland WA, will result in 0.05 acre of permanent impact to Wetland WA from roadway fill.

Permit Site S2: The relocation of UT-1 to IBC will result in a total of 251 LF of permanent stream impact in two sections, one section between Wetland WA and IBC (142 LF), and one section upstream of Wetland WA (109 LF). Additionally, there will be <0.01 acre (22 LF) of temporary stream impact to the upstream section of UT-1 to IBC.

Permit Site S3: An existing 30-inch Reinforced Concrete Pipe (RCP) carrying the flow of UT-2 to IBC across NC 3 will be filled in-place, and a 42-inch welded steel pipe will be installed, via trenchless installation means, resulting in 126 LF of permanent stream impact. There will be an additional 54 LF of bank stabilization impacts on the downstream (left) side, with an associated <0.01 acre (9 LF) of temporary impacts.

Permit Site S4: An existing 1 @ 5'X5' RCBC carrying the flow of UT-3 to IBC across NC 3 will be filled in place, and a 66-inch welded steel pipe will be installed, via trenchless installation means, resulting in 181 LF of permanent stream impact. There will be an additional 47 LF of bank stabilization impacts, with associated temporary impacts of <0.01 acre (18 LF) on the downstream (left) side of the pipe, and an additional 12 LF of bank stabilization impacts, with associated temporary stream impacts of <0.01 acre (9 LF) on the upstream (right) side.

Permit Site S5: An existing 30-inch RCP carrying the flow of UT-4 to IBC across NC 3 will be filled in place, and a 36-inch welded steel pipe will be installed, via trenchless installation means, resulting in 105 LF of permanent stream impact. There will be an additional 12 LF of bank stabilization impacts, with associated temporary impacts of <0.01 acre (12 LF) on the downstream (left) side of the pipe, and an additional 12 LF of bank stabilization impacts, with associated temporary impacts of <0.01 acre (6 LF) on the upstream (right) side of the pipe.

Permit Site S6: An existing 1 @ 10'X12' RCBC carrying the flow of UT-5 to IBC across NC 3 will be removed, and a 2 @ 8'X10' RCBC (with alternating sills and baffles in the low flow barrel and sills in the main barrel) will be installed, resulting in 246 LF of permanent stream impact. At the inlet end of the new RCBC, there will be stream re-alignment for long-term stream stability, resulting in 72 LF of permanent stream impacts, and <0.01 acre (10 LF) of associated temporary impacts. Bank stabilization of the re-aligned stream section will fall within the footprint of the stream re-alignment, resulting in no additional bank stabilization impacts for that section. There will be 15 LF of bank stabilization impacts, with associated temporary impacts of <0.01 acre (17 LF), on the downstream (left) side of the RCBC.

Permit Site S7-1: An existing 36-inch RCP carrying the flow of UT-6 to IBC across Miller Street will be removed, and a 48-inch RCP will be installed, resulting in 24 LF of permanent stream impact, and <0.01 acre (31 LF) of temporary stream impacts on the upstream (right) side. There will be an additional 12 LF of bank stabilization impacts upstream of the new RCP where a base ditch will tie in to UT-6 to IBC, along with an associated <0.01 (8 LF) of temporary stream impacts.

Permit Site S7-2: An existing 1 @ 5'X6' RCBC carrying the flow of UT-7 to IBC across NC 3 will be extended with a 66-inch RCP on each end, resulting in 265 LF of permanent stream impact. There will be an additional 22 LF of bank stabilization impacts, with associated temporary impacts of <0.01 acre (10 LF), on the upstream (left) side of the new RCP, and an additional 20 LF of bank stabilization impacts on the downstream (right) side.

Permit Site S7-3: Jurisdiction of UT-7 to IBC starts at the outlet of an existing 30-inch RCP (~Station L 136+20). There will be 170 LF of permanent stream impacts to UT-7 to IBC from roadway fill. There will be 12 LF of bank stabilization impact where flow from a 36-inch Concrete Metal Pipe (CMP) and where a lateral base ditch ties in to UT-7 to IBC, along with associated temporary impacts of <0.01 acre (36 LF).

MORATORIUM

This project is not in a North Carolina Wildlife Resource Commission Trout county. As such, there is no trout moratorium for this project.

FEDERALLY PROTECTED SPECIES

Plants and animals with Federal classification of Endangered (E) or Threatened (T) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of April 2, 2015, the USFWS lists three federally protected species for Cabarrus County (Table 3).

Summary of Species with Habitat:

Northern long-eared bat (NLEB): The NLEB was added to the list subsequent to the completion of the SFONSI. According to the North Carolina Natural Heritage Program (NHP) Biotics Database, most recently updated October 2015, the nearest NLEB hibernacula record is 76 miles west (EO ID 32171) and no known NLEB roost trees occur within 150 feet of the project area. EO 32171 represents Black Rock Cliffs Cave near Grandfather Mountain with multiple observations from 1986 to 2011.

NCDOT has also reviewed the USFWS Asheville Field office website for consistency with NHP records (http://www.fws.gov/asheville/htmls/project_review/NLEB_in_WNC.html). This project is located entirely outside of the red highlighted areas (12-digit HUC) that the USFWS Asheville Field Office has determined to be representative of an area that may require consultation.

NCDOT has determined that the proposed action does not require separate consultation on the grounds that the proposed action is consistent with the final Section 4(d) rule, codified at 50 C.F.R. § 17.40(o) and effective February 16, 2016. NCDOT may presume its determination is informed by best available information and consider Section 7 responsibilities fulfilled for NLEB. NCDOT made notification to USFWS on April 12, 2016.

Schweinitz's sunflower: Habitat for Schweinitz's sunflowers exists along roadside shoulders, edges of agricultural fields, and disturbed areas. Surveys were conducted on September 30, 2010, October 22, 2013, and on October 15, 2015. No individuals of this species have been identified within the project and there are no known occurrences within 1.0 mile of the project.

Table 3 – Federally protected species listed for Cabarrus County

Scientific Name	Common Name	Federal Status*	Habitat Present	Biological Conclusion
<i>Lasmigona decorata</i>	Carolina heelsplitter	E	No ^{1/}	No Effect
<i>Myotis septentrionalis</i>	Northern long-eared bat	T	Yes	MA-NLAA ^{2/}
<i>Helianthus schweinitzii</i>	Schweinitz's sunflower	E	Yes	No Effect

* T – Threatened, E – Endangered

^{1/} A mussel survey was conducted October 6, 2008, by NCDOT biologists. It was determined that the Carolina heelsplitter does not occur in Irish Buffalo Creek or in the upper UTs to Irish Buffalo Creek, or in the UTs to Irish Buffalo Creek identified in the NRTR and Document as Miller Branch and UT to Miller Branch.

^{2/} MA-NLAA = May Affect – Not Likely to Adversely Affect

INDIRECT CUMULATIVE IMPACT ANALYSIS

Existing rules for the 401 Water Quality Certification Program (15A NCAC 2H .0506(b)(4) require that the DWR determine that a project “does not result in cumulative impacts, based on past or reasonably anticipated future impacts, that cause or will cause a violation of downstream water quality standards.”

An Indirect and Cumulative Effects Assessment (ICE) was completed for this project on July 1, 2010. Copies of this report are available upon request. This report concluded the following:

Indirect and Cumulative Effects to the Human Environment

Analysis of potential indirect and cumulative effects on this project suggests that development activities in the area will likely occur with or without the project construction. Analysis of the State and local development regulations suggests that the policies currently in place will mitigate any potential impacts of the minor project related effects. It is not anticipated that this project will have an effect on future stormwater runoff or water quality within the project study area.

The cumulative effects on this project, when considered in the context of other past, present and future actions, and the resulting impact on notable human and natural features are anticipated to be minimal.

CULTURAL RESOURCES

In order to comply with Section 106 of the National Historic Preservation Act (1966, as amended), FHWA and NCDOT must evaluate the project’s impact upon any extant architectural and archaeological resources, and determine if additional measure will be necessary to mitigate any adverse effects of the project upon any significant properties and sites.

Archaeological Resources:

As noted in the Environmental Assessment, in correspondence dated November 8, 2007, the NC-HPO recommended no archaeological survey for this project.

Historic Architectural Resources:

There are two historic districts which are eligible for listing in the NRHP along the project corridor. The evaluation that outlines coordination that has occurred and the measures proposed to minimize harm to these resources in accordance with Section 106 of the National Historic Preservation Act of 1966 as amended and implemented by the Advisory Council on Historic Preservation’s regulations for compliance codified as 36

CFR Part 800, is included in the State Finding of No Significant Impacts (SFONSI) document, dated January 2015.

A Memorandum of Agreement (MOA) has been completed between NCDOT, the USACE, and the North Carolina Historic Preservation Office (NC-HPO). The MOA, agreed to and signed by the USACE on November 14, 2014, is included in Appendix B of the SFONSI. The MOA covers terms for the proposed project construction, impacts and mitigation for the historic resources. In the MOA, there is a stipulation that states that the USACE shall ensure that measures (included in the MOA) are made part of any permit issued to NCDOT for the undertaking, and in general include:

- I. Photographic Recordation
- II. Conduct Oral History and Gather Documentary Materials
- III. Develop an Interpretive Exhibit
- IV. Retaining Walls
- V. Pedestrian Crosswalk
- VI. Unanticipated Discovery
- VII. Dispute Resolution
- VIII. Amendments
- IX. Termination
- X. Duration.

FEMA COMPLIANCE

The project has been coordinated with appropriate state and local officials and the Federal Emergency Management Agency (FEMA) to assure compliance with FEMA, state, and local floodway regulations.

WILD AND SCENIC RIVER SYSTEM

The project will not impact any designated Wild and Scenic Rivers or any rivers included in the list of study rivers (Public Law 90-542, as amended).

MITIGATION OPTIONS

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning and NEPA compliance stages, and minimization measures were incorporated as part of the project design.

Avoidance and Minimization:

Historic District: During project development, NCDOT explored reduced median widths, use of curb and gutter, and retaining walls as part of its minimization effort, particularly

within the Juniper-Pine-Moorseville-Chestnut and Frog Hollow Mill Village historic district. Minimization planning for the typical section of the proposed facility within the historic district proposed to reduce the width of the inside and outside travel lanes to 11 feet and 13 feet, respectively. The existing pavement will be replaced, but the existing grade and placement for curb and gutter will be maintained with the proposed construction where feasible.

Existing drainage patterns and outfalls have been maintained where possible. Other specific examples of avoidance and minimization measures for the project include:

- Best Management Practices (BMPs) will be utilized during construction to attempt to reduce the stormwater impacts to receiving streams and wetlands due to erosion and runoff.
- Site S1: includes channel relocation rather than piping.
- Site MB: RCBC includes baffles with low flow channel and sills to retain native bed material.
- Site IBC: Dual bridges will span Irish Buffalo Creek, with bents located on top of banks to avoid permanent stream impacts.
- Site S2: includes stream channel relocation (open channel flow) rather than piping.
- Site S6: the use of sills in the 2 @ 8'X10' RCBC, with alternating sills and baffles in the low flow barrel, and sills in the main barrel to maintain native bed material.
- Burying of each new structure appropriately to ensure that the bed material will be retained as much as possible.
- The unregistered landfill in the southwest quadrant of the NC3 / Mooresville Road and Bethpage Road intersection will be avoided with an alignment shift to the north of the existing NC 3 facility.

Compensation:

The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent practicable as described above. Tables 1 and 2 summarize the wetland and stream impacts for this project. As the USACE mitigation requirement is greater than that of DWR (2:1 ratio and 1:1 ratio, respectively) the USACE stream impact value is used for compensatory mitigation determination (see Table 2). NCDOT has obtained compensatory mitigation for 0.05 acre of wetland impacts and 1,954 linear feet of stream impact from the DMS.

REGULATORY APPROVALS

Section 404: Application is hereby made for a USACE Individual 404 Permit as required for the above-described activities.

Section 401: We are hereby requesting a 401 Water Quality Certification from the N. C. Division of Water Resources. In compliance with Section 143 215.3D(e) of the NCAC, we will provide \$570.00 to act as payment for processing the Section 401 permit

application previously noted in this application (see Subject line). We are providing five (5) copies of this application to the NCDWR for their review and approval.

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Bill Barrett at wabarrett@ncdot.gov or (919) 707-6103. A copy of this application and distribution list will also be posted on the NCDOT website at: <http://connect.ncdot.gov/resources/Environmental/Pages>.

Sincerely,



Philip S. Harris, P.E., C.P.M.
Natural Environment Section Head

cc:
NCDOT Permit Application Standard Distribution List.

**U.S. ARMY CORPS OF ENGINEERS
APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT**

33 CFR 325. The proponent agency is CECW-CO-R.

OMB APPROVAL NO. 0710-0003
EXPIRES: 28 FEBRUARY 2013

Public reporting for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE
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(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME First - Philip Middle - S. Last - Harris Company - NCDOT-PDEA E-mail Address -		8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required) First - Middle - Last - Company - E-mail Address -	
6. APPLICANT'S ADDRESS: Address- 1548 Mail Service Center City - Raleigh State - NC Zip - 27699 Country - USA		9. AGENT'S ADDRESS: Address- City - State - Zip - Country -	
7. APPLICANT'S PHONE NOS. w/AREA CODE a. Residence b. Business c. Fax 919-707-6100		10. AGENTS PHONE NOS. w/AREA CODE a. Residence b. Business c. Fax	

STATEMENT OF AUTHORIZATION

11. I hereby authorize, _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

SIGNATURE OF APPLICANT

DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions) U-3440			
13. NAME OF WATERBODY, IF KNOWN (if applicable) Irish Buffalo Creek and its UTs		14. PROJECT STREET ADDRESS (if applicable) Address	
15. LOCATION OF PROJECT Latitude: °N Longitude: °W		City - State- Zip-	
16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) State Tax Parcel ID Municipality Section - Township - Range -			

17. DIRECTIONS TO THE SITE

Please see attached vicinity map and cover letter.

18. Nature of Activity (Description of project, include all features)

The North Carolina Department of Transportation (NCDOT) proposes to improve NC 3 (Mooresville Road) from the Kannapolis Parkway to Dale Earnhardt Boulevard/Loop Road (SR 1691). The improvements will widen Mooresville Road to a four-lane divided facility. The typical section will consist of two 11-foot travel lanes and a 5-foot bicycle lane in each direction, with a 23.5-foot wide grass median. Sidewalks are proposed on both sides of the proposed facility for the entire length of the project. The project is approximately 2.6 miles in length.

Irish Buffalo Creek, and eight unnamed tributaries to Irish Buffalo Creek will be impacted from the project.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

The primary purpose of the proposed project is to reduce delays along NC 3/Mooresville Road, which is experiencing congestion and is expected to reach level of service F in the immediate future. The proposed improvements will be of benefit providing an increased ease of travel between the Kannapolis Parkway and downtown Kannapolis.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

Impacts will result from widening the roadway and shoulders, and the extension of the associated pipes/culverts..

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards
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See attached cover letter.

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres See attached cover letter.
or

Linear Feet See attached cover letter.

23. Description of Avoidance, Minimization, and Compensation (see instructions)

See attached cover letter.

24. Is Any Portion of the Work Already Complete? ☐ Yes ☐ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address- See attached permit drawings.

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

 06-16-2016

SIGNATURE OF APPLICANT DATE SIGNATURE OF AGENT DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.



PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

May 19, 2016

Mr. Philip S. Harris, III, P.E., CPM
Project Development and Environmental Analysis Unit
North Carolina Department of Transportation
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Mr. Harris:

Subject: Mitigation Acceptance Letter:

U-3440, NC 3 Widening from Proposed Westside Bypass (TIP U-2009) to SR 1691 (Loop Road), Cabarrus County

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the compensatory stream and riparian wetland mitigation for the subject project. Based on the information supplied by you on May 17, 2016, the impacts are located in CU 03040105 of the Yadkin River basin in the Southern Piedmont (SP) Eco-Region, and are as follows:

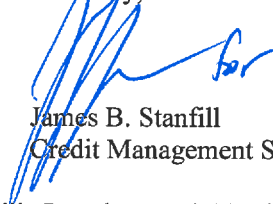
Yadkin 03040105 SP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	1,954.0	0.05	0	0	0	0

*Some of the stream and/or wetland impacts may be proposed to be mitigated at a 1:1 mitigation ratio. See permit application for details.

DMS commits to implementing sufficient compensatory stream and riparian wetland mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies in accordance with the In-Lieu Fee Instrument dated July 28, 2010. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from DMS.

If you have any questions or need additional information, please contact Beth Harmon at 919-707-8420.

Sincerely,



James B. Stanfill
Credit Management Supervisor

cc: Ms. Crystal Amschler, USACE – Asheville Regulatory Field Office
Ms. Amy Chapman, NCDWR
File: U-3440

NCDOT Project: U-3440 / 39010.1.1

NC 3 Mooresville Road, Cabarrus County

Meeting Minutes Concurrence Point 4A, 4B, 4C

Meeting Location : NCDOT Structure Design Conference Room

December 18, 2013

Attendees:

Jennifer Harris	NCDOT - PDEA	jhharris1@ncdot.gov	919-707-6025
Bill Barrett	NCDOT - NES	wabarrett@ncdot.gov	919-707-6103
Carla Dagnino	NCDOT - NES	cdagnino@ncdot.gov	919-707-6110
John Conforti	NCDOT - PDEA	jgconforti@ncdot.gov	919-707-6015
Stephen Morgan	NCDOT - Hydro	smorgan@ncdot.gov	919-707-6739
Steve Bondor	Stantec - Hydro	steven.bondor@stantec.com	919-532-2305
Laura Sutton	NCDOT - Structures	lsutton@ncdot.gov	919-707-6551
Katrina Washington	NCDOT - Roadway	kwashington@ncdot.gov	919-707-6343
Brenda Moore	NCDOT - Roadway	blmoore@ncdot.gov	919-707-6285
Undrea Major	NCDOT - PDEA	ujmajor@ncdot.gov	919-707-6028
Alan Johnson	NCDWR	Alan.Johnson@ncdenr.gov	704-663-1699
Amanda Fuemmeler	USACE	Amanda.Fuemmeler@usace.army.mil	828-271-7980
Marella Buncick	USFWS	marell_buncick@fws.gov	828-258-3939
Marla Chambers	NC WRC	marla.chambers@ncwildlife.org	704-485-8291
Scott Allen	NCDOT Div. 10	sallen@ncdot.gov	704-983-4400

1. Agencies noted that all streams in this project are included in the 303d impaired list for turbidity and that direct discharge from the roadway drainage systems should be avoided if possible.

2. Stream S1 / Plan Sheet 6 / L sta 39+50 LT – requested that NCDOT attempt to relocate the 42” pipe outfall to the opposite side of the roadway to allow flow in a ditch prior to discharge into stream S1.
3. Stream MB / Plan Sheet 6 / L sta 40+60 – requested that baffles inside 10’ x 8 box culvert include a low flow opening that matches stream width instead of 10’ width of box culvert. NCDOT noted that design will include 6’ wide low flow opening in the baffles.
4. Stream S2 / Plans Sheet 8 / L sta 70+00 LT - requested that NCDOT attempt to reduce the length of the 48” pipe below the access drive.
5. Stream S4 / Plan Sheet 10 / L sta 98+00 RT – requested that NCDOT attempt to add base ditch at top of bank for 15” CSP outfall, add bank stabilization, and align perpendicular to bank.
6. Stream S5 / Plan Sheet 11 / L sta 109+75 – NCDOT will add riprap bank protection at each end of 36” RCP cross pipe.
7. Stream S6 / Plan Sheet 12
 - a. L Sta 115+50 LT – requested that NCDOT attempt to move 24” CSP outfall from left side to right side of road allow flow in a lateral ditch prior to discharge into stream.
 - b. Y15 Sta 11+70 RT - requested that NCDOT attempt to move 18” CSP outfall from bottom of stream to top of bank in a ditch. NCDOT noted that there is not adequate space at top of bank however the outfall could be moved to the left side of the road at the top of bank in a ditch. Bank stabilization will be added to end of the outfall ditch.
8. Stream S7 / Plan Sheet 12 / L sta 125+00 RT – requested that NCDOT move 18” CSP outfall approximately 20’ from stream.
9. Stream S7 / Plan Sheet 13
 - a. L sta 128+20 LT - requested that NCDOT add some type of treatment device at outfall of 24” CSP. No device is possible however due to steep slopes.
 - b. L sta 135+00 LT – discussed feasibility of extending retaining wall to sta 134+80; upon further investigation however all parties agreed the stream was too close to the roadway for a retaining wall to avoid stream impact.
10. All parties agreed that this meeting could serve as the 4B and 4C meetings and that NCDOT would forward revised drainage plans to the agencies before submittal of the permit drawings. The original drainage design as presented during this meeting will be included with the revised design to allow comparison. Therefore no additional meeting would be required.



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

Project/TIP No.: U-3440

County(ies): Cabarrus

Page 1 of 2

General Project Information

Project No.:	U-3440	Project Type:	Roadway Relocation	Date:	5/13/2016
NCDOT Contact:	Stephen Morgan, PE	Contractor / Designer:	Steven Bondor, PE / Stantec Consulting Inc.		
Address:	Design Support Group 1020 Birch Ridge Drive Raleigh, NC 27610	Address:	801 Jones Franklin Road Suite 300 Raleigh NC 27606		
	Phone:		919-707-6739	Phone:	919-851-1919
	Email:		smorgan@ncdot.gov	Email:	steven.bondor@stantec.com
City/Town:	Kannapolis	County(ies):	Cabarrus		
River Basin(s):	Yadkin-Pee Dee	CAMA County?	No		
Primary Receiving Water:	Irish Buffalo Creek	NCDWQ Stream Index No.:	13-17-9-(2)		
NCDWQ Surface Water Classification for Primary Receiving Water	Primary:	Class C			
	Supplemental:	None			
Other Stream Classification:					
303(d) Impairments:	None				
Buffer Rules in Effect	N/A				

Project Description

Project Length (lin. Miles or feet):	2.646 miles	Surrounding Land Use:	urban	
	Proposed Project		Existing Site	
Project Built-Upon Area (ac.)	31.25 ac.		20.00 ac.	
Typical Cross Section Description:	Typical cross section varies however along the -L- line there is double 11' travel lanes on left and right of the project with 5' bike lanes on both sides of the road.			
Average Daily Traffic (veh/hr/day):	Design/Future: 16800/23900	Existing:	16800/2015	

General Project Narrative: The NCDOT proposed to improve NC 3 (Mooresville Road) from the Kannapolis Parkway to Dale Earnhardt Boulevard/ Loop Road (SR 1691). The proposed improvements will widen Mooresville Road to a four lane divided facility. The typical section will consist of two 11 foot travel lanes and a 5 foot bicycle lane in each direction, with a 23.5 foot wide grass median. Sidewalks are proposed on both sides of the proposed facility for the entire length of the project. The project is approximately 2.6 miles in length.

References



(Version 1.2; Released September 2011)

Page 2 of 2

Surface Water Impacts

* List all stream and surface water impact locations regardless of jurisdiction or size.
Equalizer Pipes to be noted as a minimization of impacts.
All proposed SCMs listed must also be listed under Swales, Preformed Sour Holes and other Energy Dissipators, or Other Stormwater Control Measures.

See Attachment

References

Description of Minimization of Impacts or Mitigation

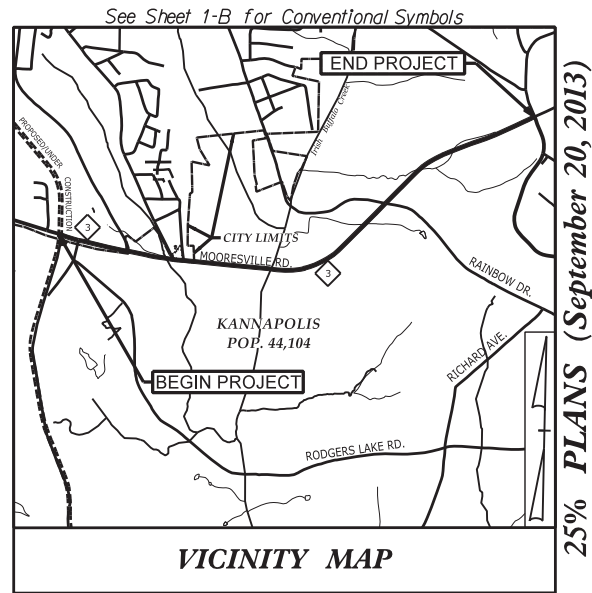
Site S1: Includes channel relocation rather than piping. Site MB: Pipe outfall located 80' from stream channel in riprap lined ditch. Box culvert includes baffles with low flow channel and sills to retain native bed material. Site IBC: Pipe outfalls located 200'-300' from channel. Bridge bents located on top of banks to prevent permanent surface water impacts. Site S2: Includes stream channel relocation rather than piping. Site S3: Includes riprap on banks only at pipe inlet and outlet to minimize permanent surface water impacts. Site S4: Includes riprap on banks only at pipe outlet to minimize permanent surface water impacts. Pipe buried 1' below channel bed. Site S5: Includes riprap on banks only at pipe inlet and outlet to minimize permanent surface water impacts. Site S6: Box culvert includes baffles with low flow channel and sills to retain native bed material. Pipe outfall located 140' from channel. Site S7-1: Pipe outfall located 40' from channel. Site S7-2: Includes riprap on banks only at pipe inlet and outlet to minimize permanent surface water impacts. Site S7-3: Includes riprap on banks only at pipe outlet to minimize permanent surface water impacts.

09/08/99

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U-3440-Permit Drawings-20150407.pdf

TIP PROJECT: U-3440

CONTRACT:

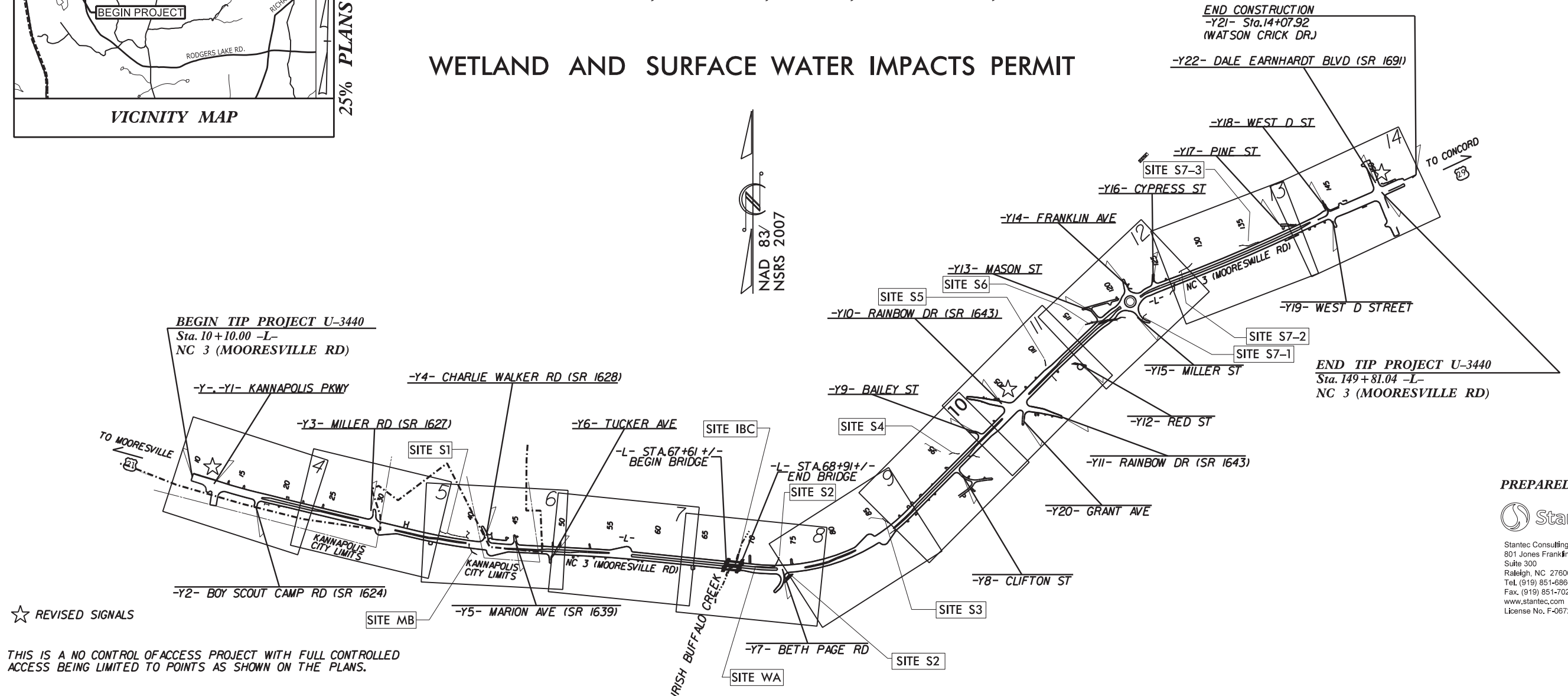


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CABARRUS COUNTY

LOCATION: NC 3, PROPOSED WEST SIDE BYPASS TO
SR 1691 (LOOP ROAD) IN KANNAPOLIS
TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, AND SIGNALS

WETLAND AND SURFACE WATER IMPACTS PERMIT



PERMIT DRAWING
SHEET 1 OF 23

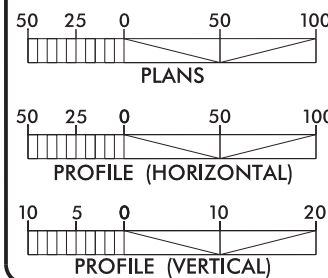
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3440	1	
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
39010.1.1	STP-0003(6)	PE	

PREPARED BY:



Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

GRAPHIC SCALES



DESIGN DATA

ADT 2015 = 16,800
ADT 2035 = 23,900
DHV = 12 %
D = 60 %
T = 9 % *
V = 50 MPH
HIST. AREA V = 40 MPH
*(TTST 7% + DUALS 2%)
FUNC CLASS = MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-3440 = 2.621 MILES
LENGTH STRUCTURE TIP PROJECT U-3440 = 0.025 MILE
TOTAL LENGTH TIP PROJECT U-3440 = 2.646 MILES

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

2012 STANDARD SPECIFICATIONS
RIGHT OF WAY DATE:
MAY 29, 2015
LETTING DATE:
OCTOBER 18, 2016

MICHAEL LINDGREN, P.E.
PROJECT ENGINEER
MICHAEL LITTLEFIELD, P.E.
PROJECT DESIGN ENGINEER

NCDOT CONTACT: BRENDA MOORE, PE
ROADWAY DESIGN ENGINEERING
COORDINATION SECTION ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN
ENGINEER

SIGNATURE: P.E.

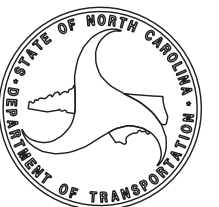


Diagram of a T-intersection with a left-turn lane. The approach from the left has a left-turn lane (L) and a through lane (3). The intersection is a T-junction with a single through lane. The departure to the right has a through lane. Traffic volumes are shown for each movement.

Movement	Volume
Left Turn (L)	14200
Through (3)	22900
Through (T-junction)	2900
Through (Departure)	1800
Left Turn (Departure)	2100
Through (Total)	23600

NAD 83/NSRS 2007

SITE S1

LITTLE, BRANDON

LATERAL 3' BASE DITCH—
EST. 1183.9 CY DDE
LINE WITH PSRM
EST. 337 SY
SEE DETAIL 6A

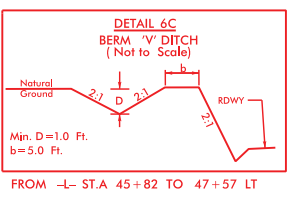
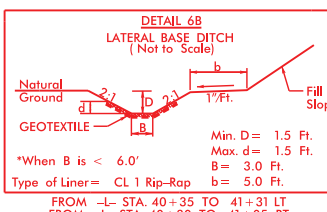
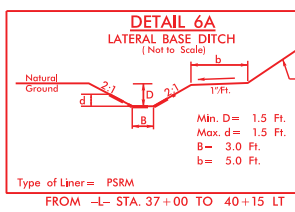
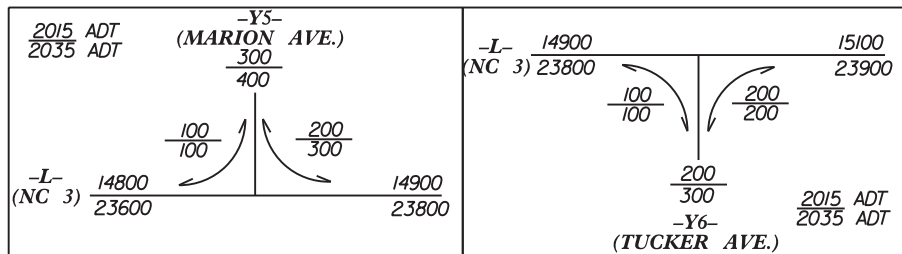
CHANNEL CLEANOUT

SITE MB

LATERAL 3' BASE DITCH
LINE WITH CL 1 RIP RAP
EST. 79 TONS
EST. 399.0 CY DDE
EST. 143 SY GEOTEXTILE
SEE DETAIL 100

CL. 1 RIP RAP
EST. 24 TONS
EST. 13.0 CY DDE

TEMPORARY SURFACE
WATER IMPACTS


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 Fax. (919) 851-7024
www.stantec.com
 License No. F-0672DENOTES IMPACTS IN
SURFACE WATERDENOTES TEMPORARY
IMPACTS IN SURFACE WATER|

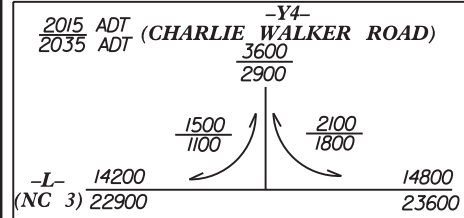
MATCHLINE -L- STA 36+00.00 SEE SHEET 5

MATCHLINE -L- STA 50+00.00 SEE SHEET 7

12
WILKINSON.

8/17/99

NOTE: SEE SHEET 15 THRU 16 FOR -L- PROFILE
SEE SHEET 21 FOR -Y4-, -Y5-, & -Y6- PROFILE
SEE SHEET 2-G FOR -Y4- INTERSECTION DETAIL



NAD 83/NSRS 2007



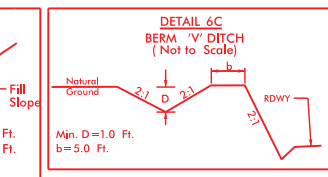
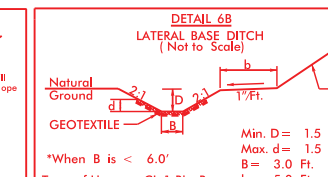
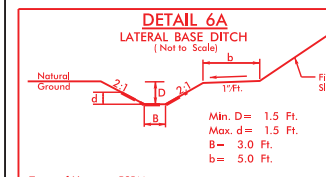
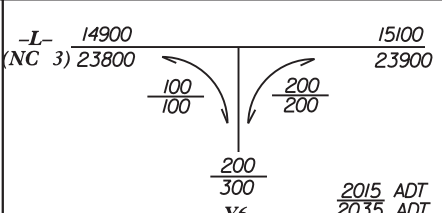
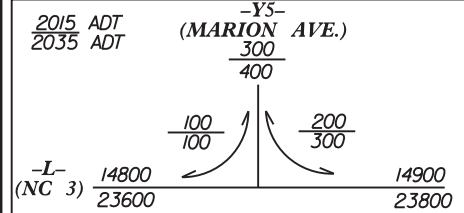
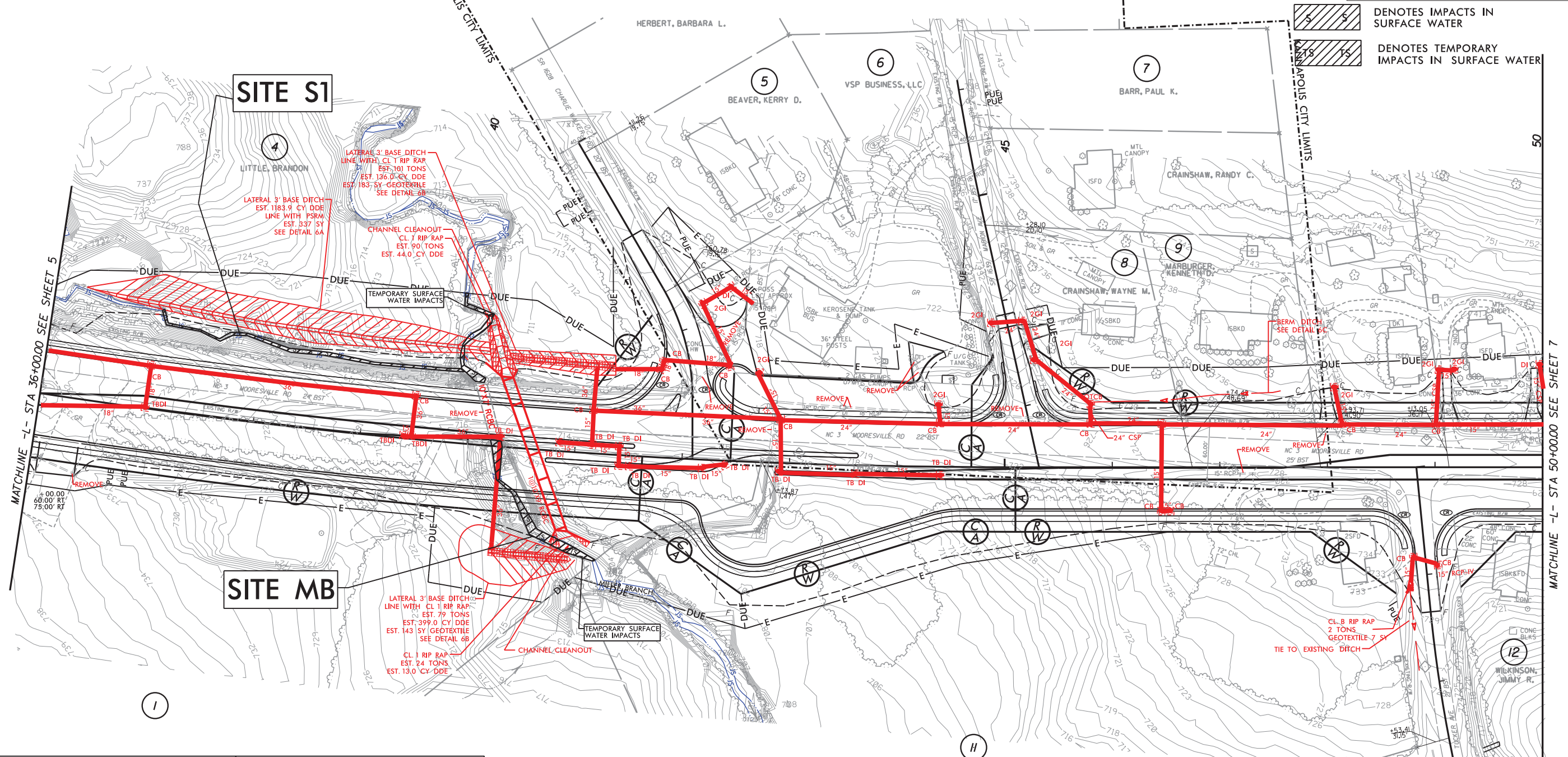
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PROJECT REFERENCE NO.		SHEET NO.
U-3440		6
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

PERMIT DRAWING SHEET 3 OF 23

5 5
S S
DENOTES IMPACTS IN
SURFACE WATER

5 5
S S
DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

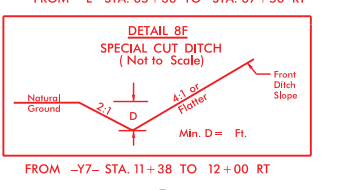
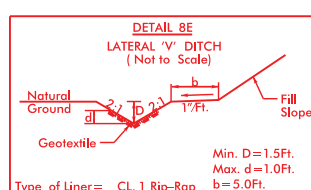
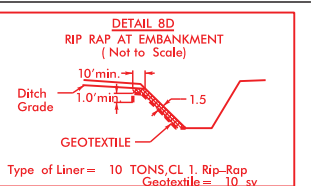
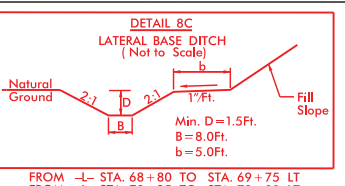
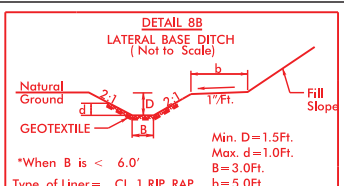
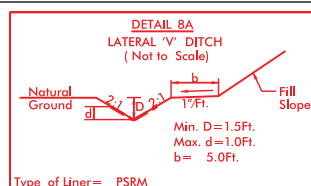
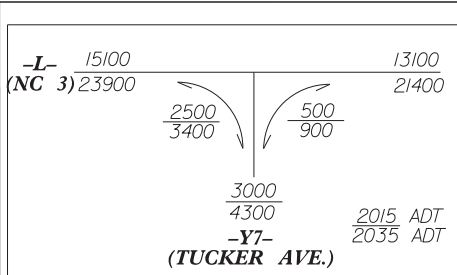


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STANTEC
U-3440 Permit Drawings 20150407.dwg

8/17/99

12/6/16 ROW REV: ADDED PUE ON PARCEL 20; CHANGED PDE TO DUE FROM -L- 70+35 THRU 73+20, ADDED PUE, AND REVISED TCE ON PARCEL 21; ADDED PUE AND REVISED TCE ON PARCEL 22; -ML-
5/10/16 ROW REV: ADJUSTED EX ROW OFFSETS BASED ON THE FIELD STAKING ON PARCELS 19, 20, 20A, & 22. - CM

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U3440 Permit Drawings_20150407.pdf



PERMIT DRAWING SHEET 5 OF 23

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



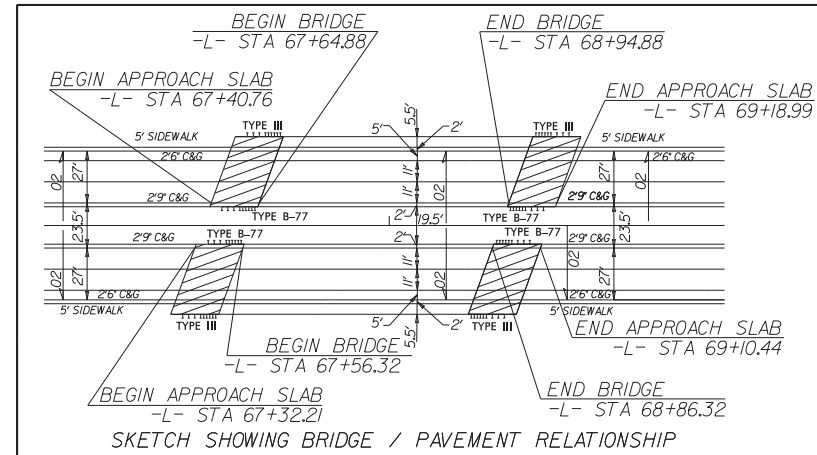
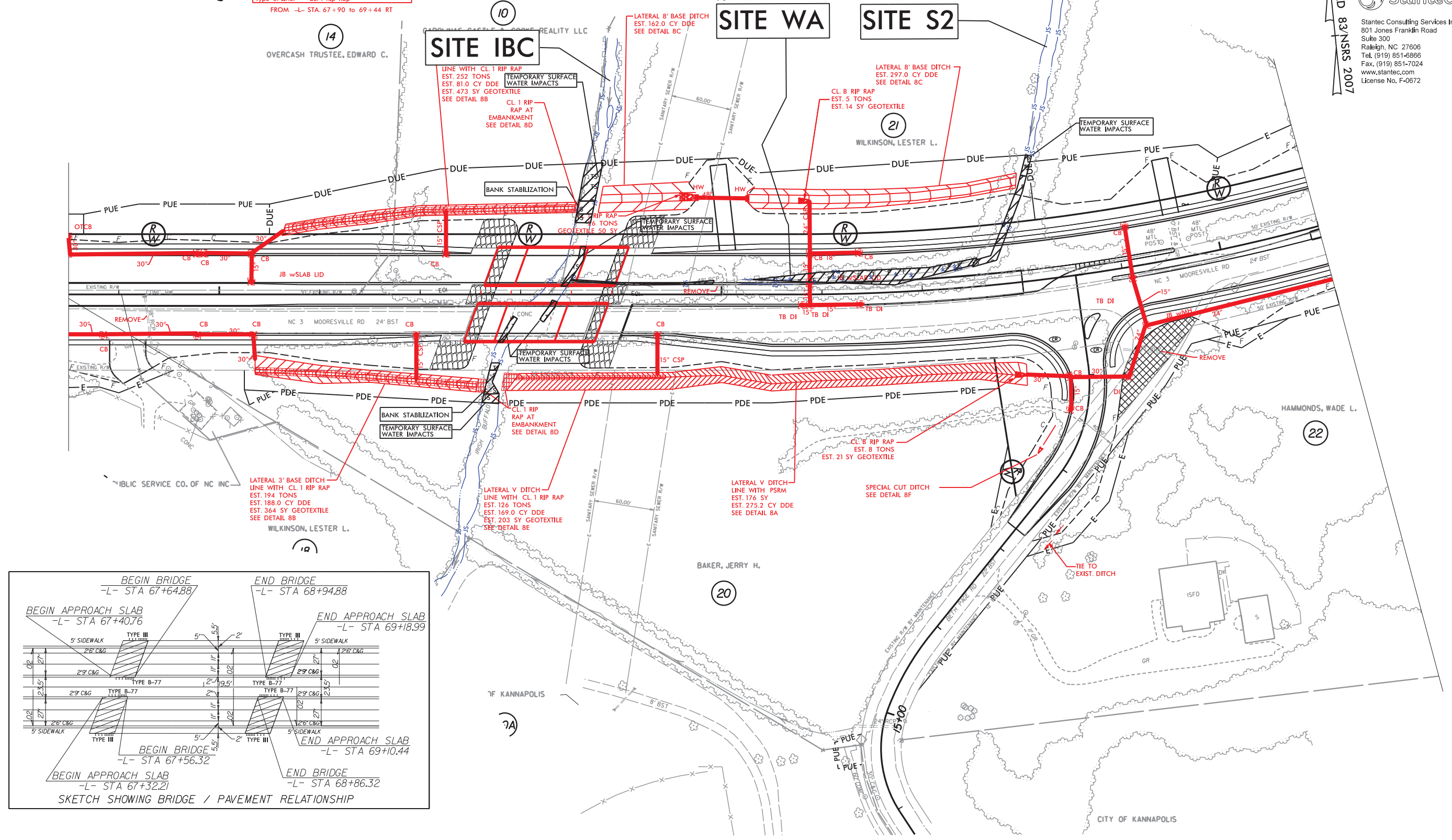
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U-3440	8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

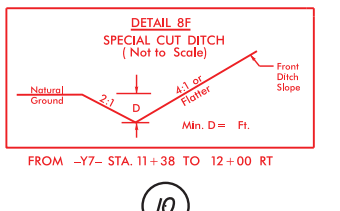
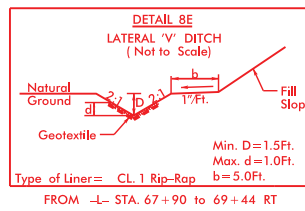
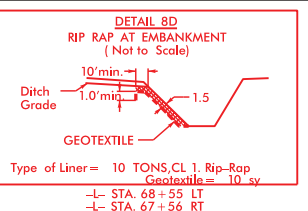
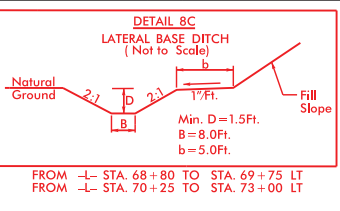
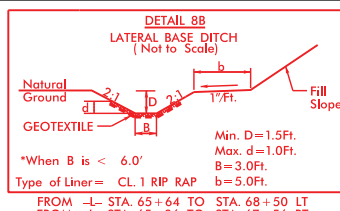
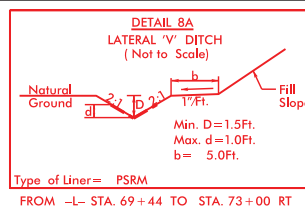
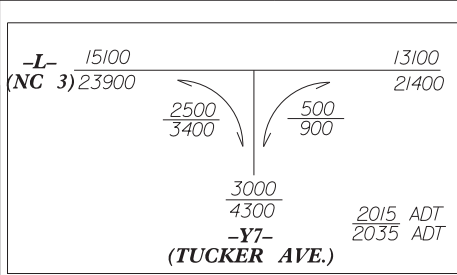
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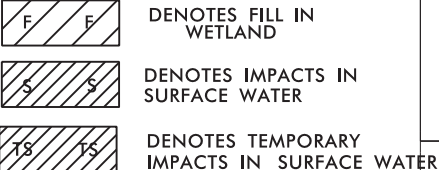
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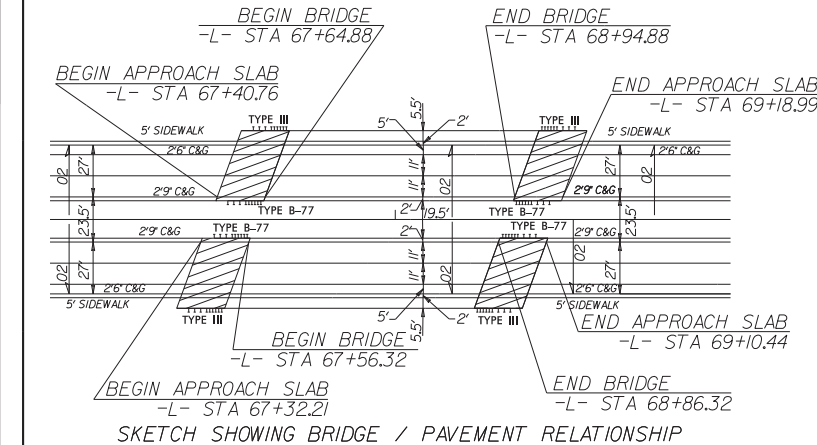
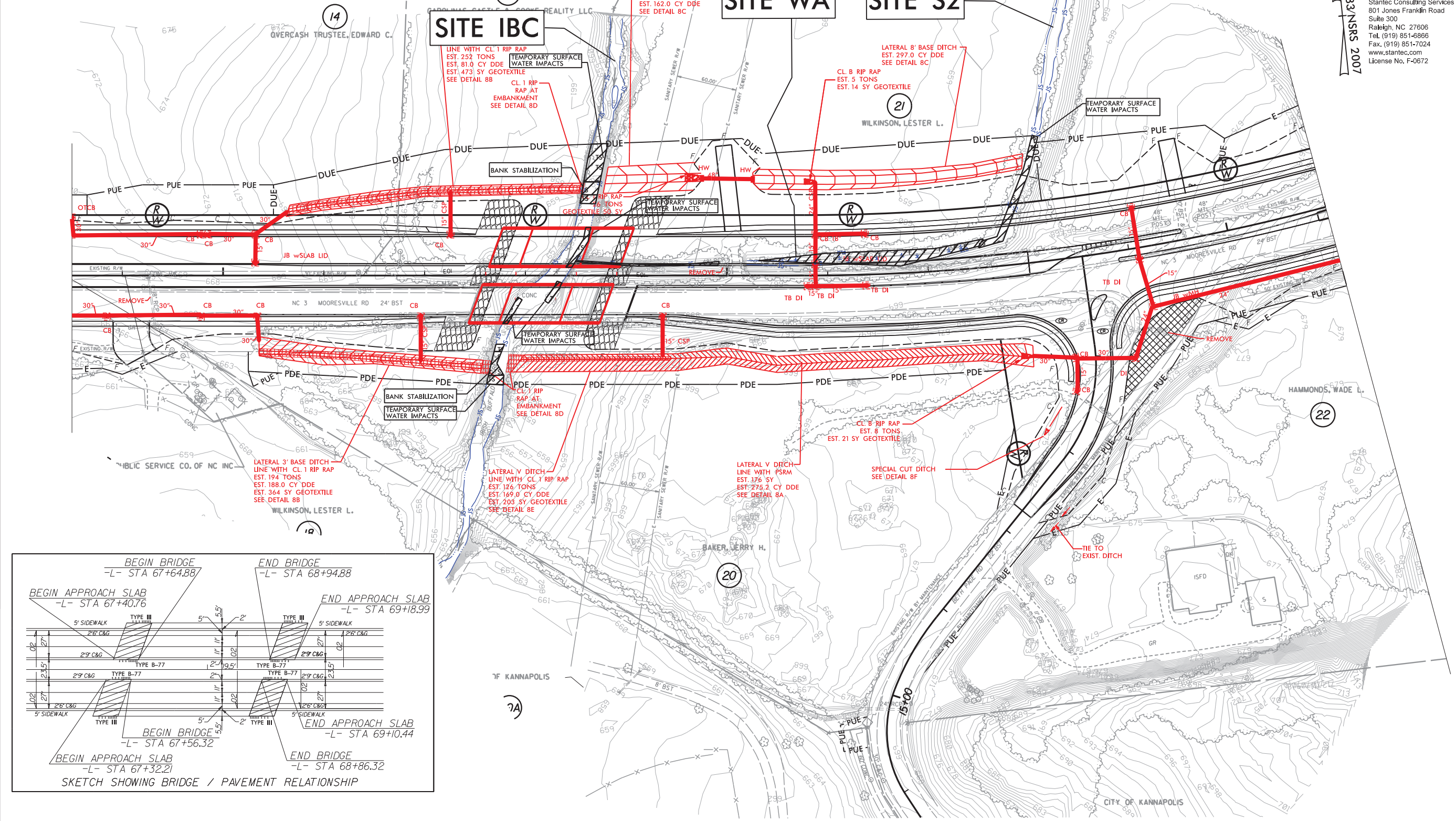
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PROJECT REFERENCE NO.	SHEET NO.
U-3440	8
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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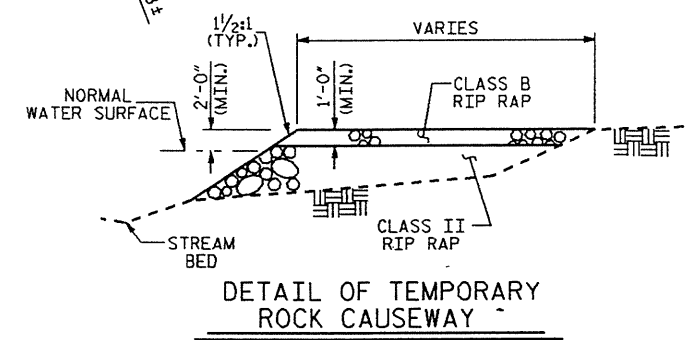
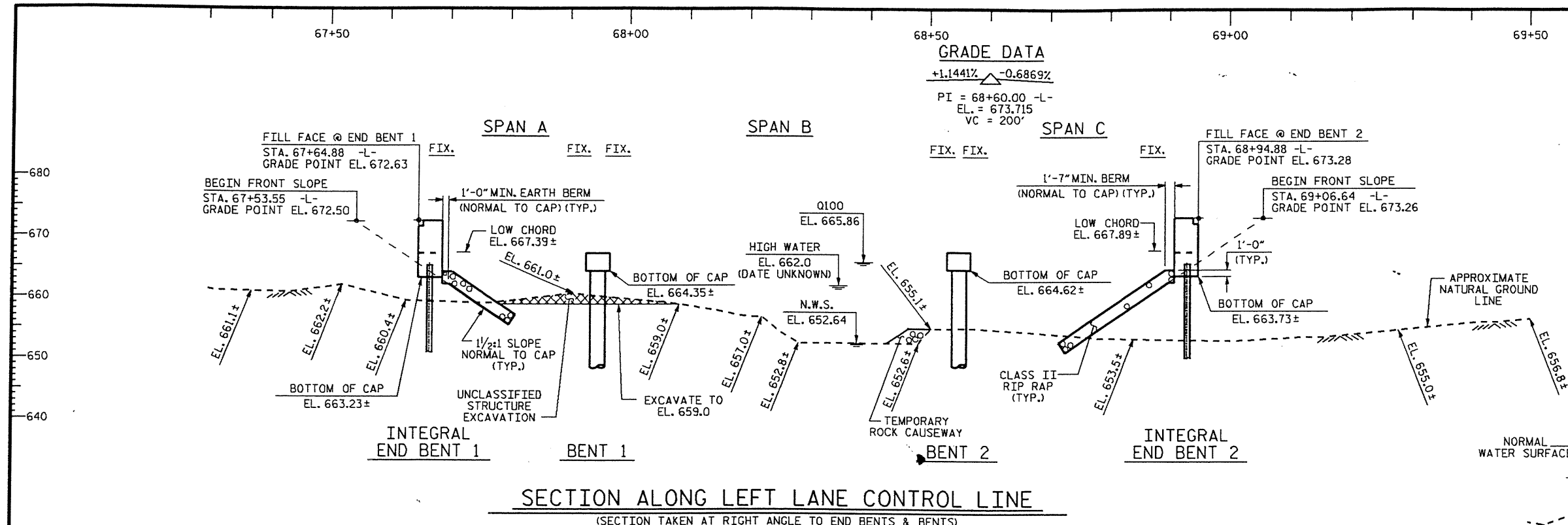
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Fax. (919) 851-7024
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REVISIONS
12/6/16 ROW REV: ADDED PUE ON PARCEL 20, CHANGED PDE TO DUE FROM -L- 70+35 THRU 73+20, ADDED PUE, AND REVISED TCE ON PARCEL 21, ADDED PUE AND REVISED TCE ON PARCEL 22, -ML
5/10/16 ROW REV: ADJUSTED EX RW OFFSETS BASED ON THE FIELD STAKING ON PARCELS 19, 20, 20A, & 22. - CM

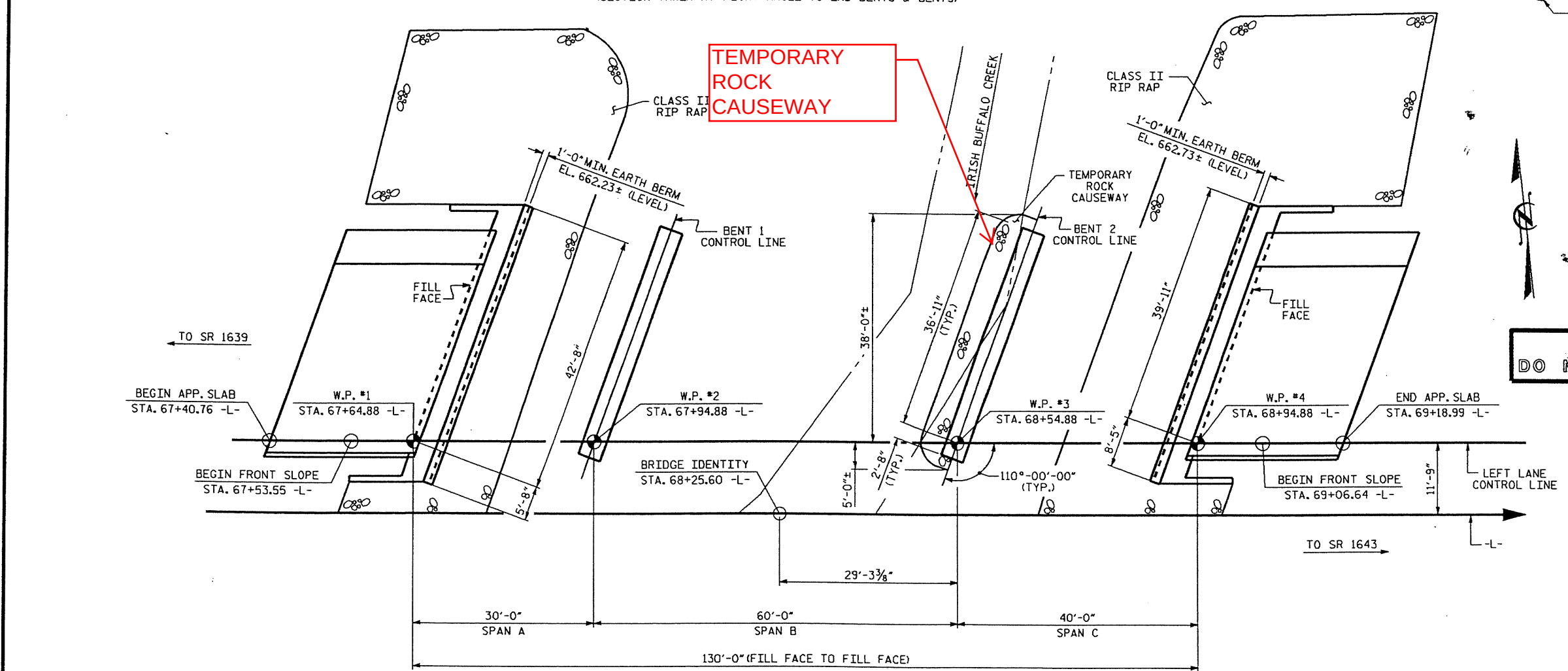
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PERMIT DRAWING
SHEET 7 OF 23



I HEREBY CERTIFY THESE PLANS
ARE THE AS-BUILT PLANS

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PLAN
(PILES & COLUMNS NOT SHOWN FOR CLARITY)

PROJECT NO. U-3440
CABARRUS COUNTY
STATION: 68+25.60 -L-

SHEET 1 OF 2 BRIDGE No. 402

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
PRELIMINARY
GENERAL DRAWING
FOR BRIDGE OVER IRISH
BUFFALO CREEK ON NC 3
BETWEEN SR 1639 AND SR 1643
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS
2			4			

DRAWN BY: T. H. CARROLL DATE: 6/3/14
CHECKED BY: R. P. PATEL DATE: 6/9/14
DESIGN ENGINEER OF RECORD: T. H. CARROLL DATE: 6/19/14

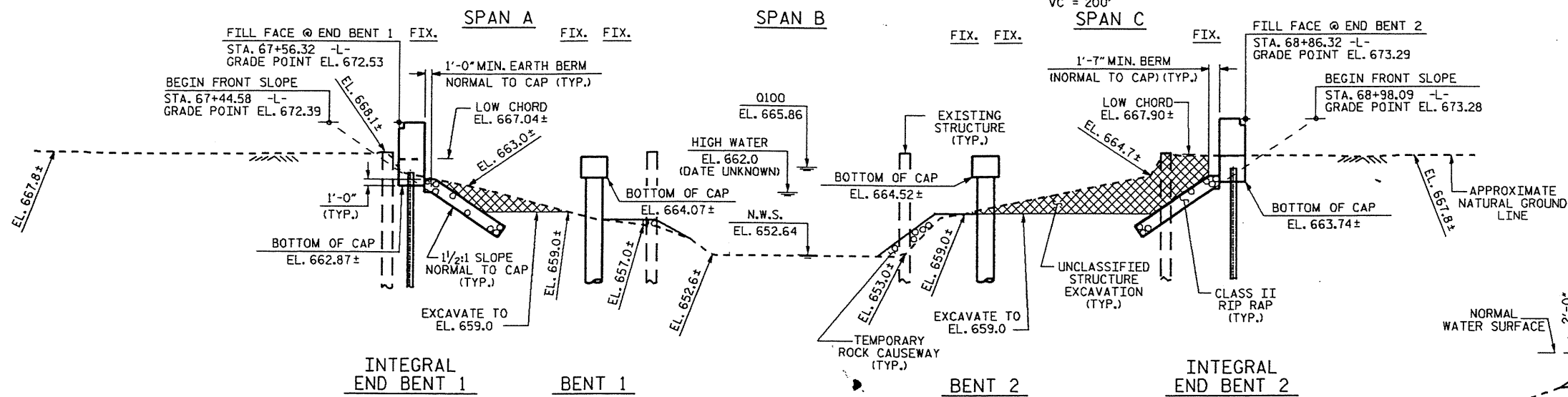
67+00 67+50 68+00 68+50 69+00

GRADE DATA

+1.1441% -0.6869%

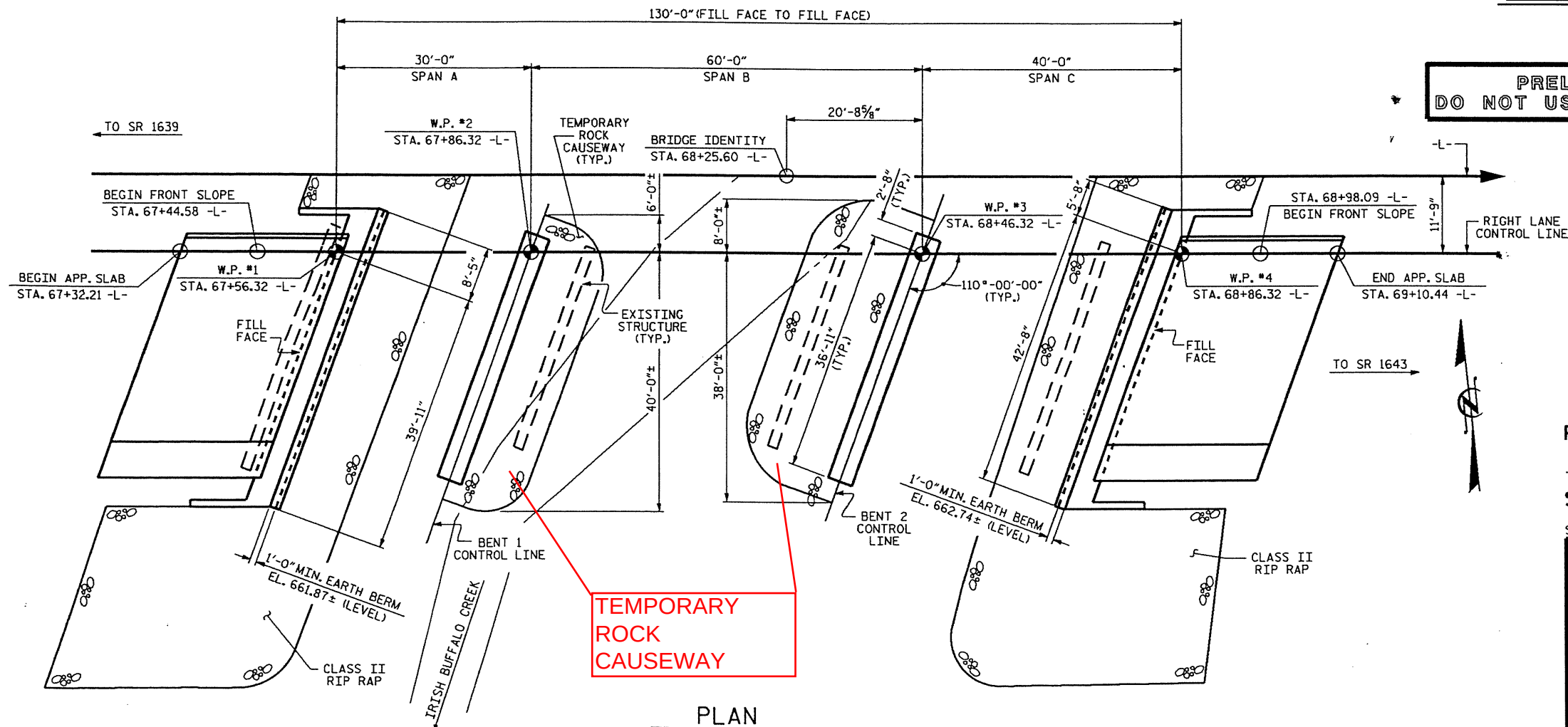
PI = 68+60.00 -L-
EL. = 673.715
VC = 200'

PERMIT DRAWING
SHEET 8 OF 23



SECTION ALONG RIGHT LANE CONTROL LINE

(SECTION TAKEN AT RIGHT ANGLE TO END BENTS & BENTS)



PLAN

(PILES & COLUMNS NOT SHOWN FOR CLARITY)

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

I HEREBY CERTIFY THESE PLANS
ARE THE AS-BUILT PLANS

PROJECT NO. U-3440
CABARRUS COUNTY
STATION: 68+25.60 -L-

SHEET 1 OF 2 REPLACES BRIDGE No. 36

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HALEIGH

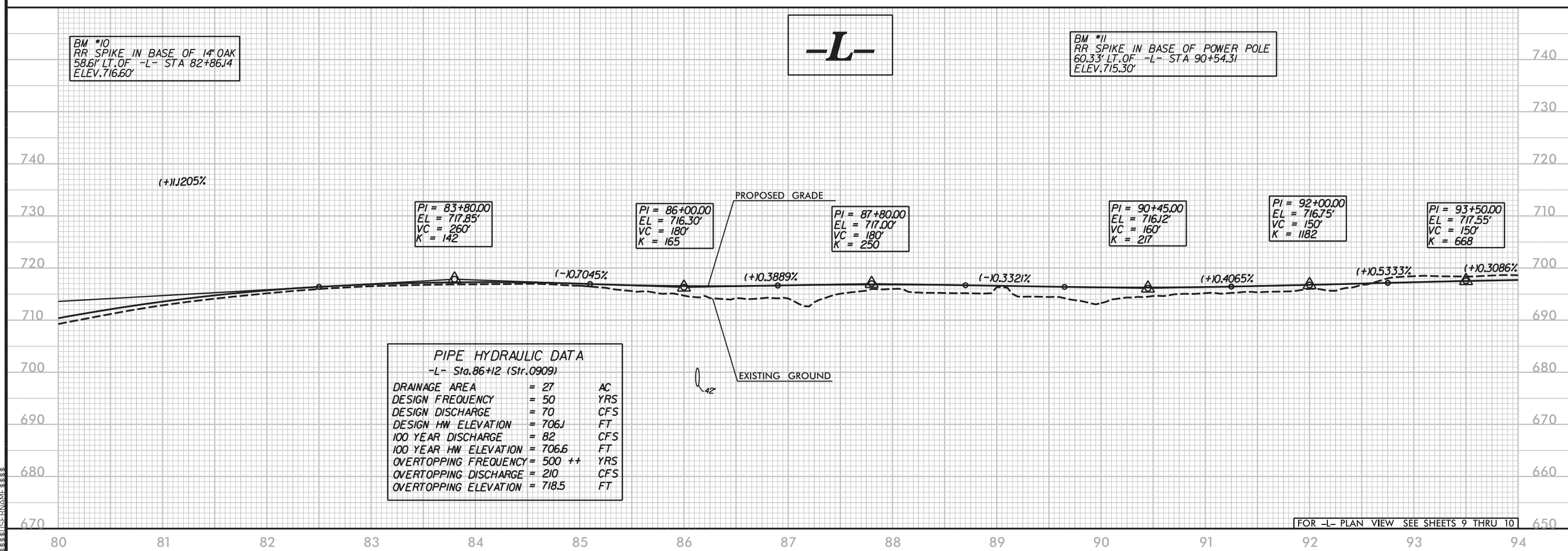
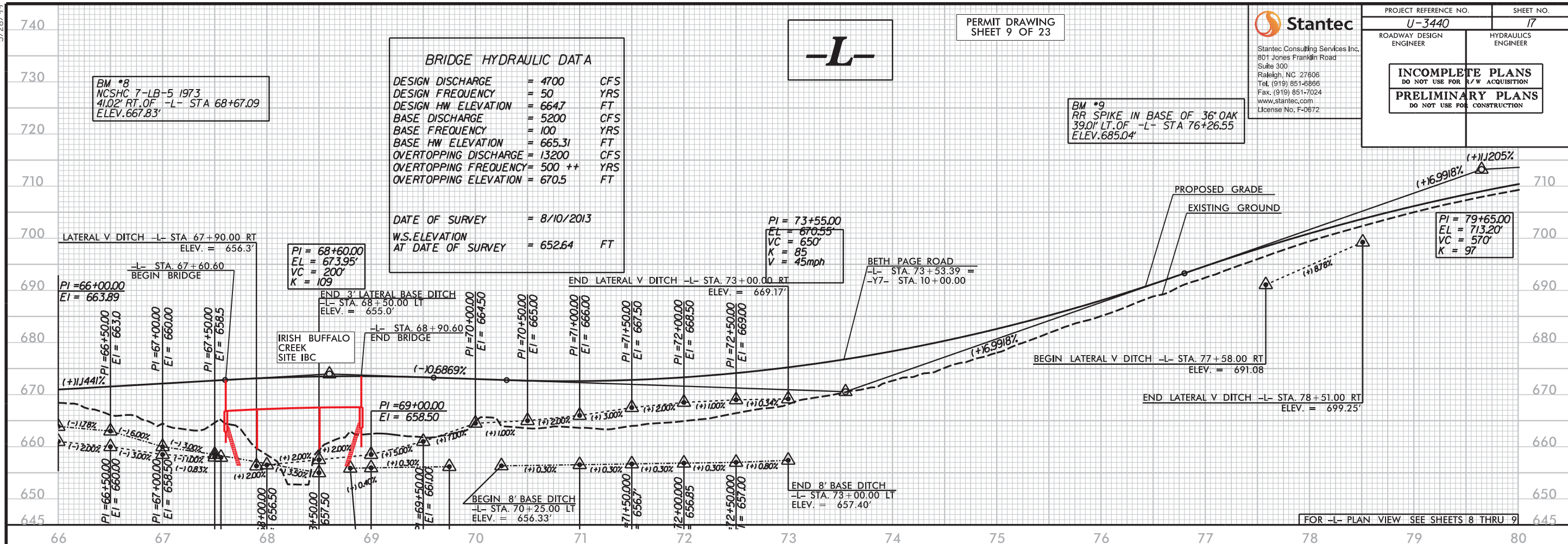
PRELIMINARY
GENERAL DRAWING
FOR BRIDGE OVER IRISH
BUFFALO CREEK ON NC 3
BETWEEN SR 1639 AND SR 1643
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS
2			4			

DRAWN BY: T. H. CARROLL DATE: 6/3/14
CHECKED BY: R. P. PATEL DATE: 6/9/14
DESIGN ENGINEER OF RECORD: T. H. CARROLL DATE: 6/19/14

29-OCT-2015 12:22
R:\Structure\Plan\Str02\U3440_SD_P02_02.dgn
d-smith

STR. #2



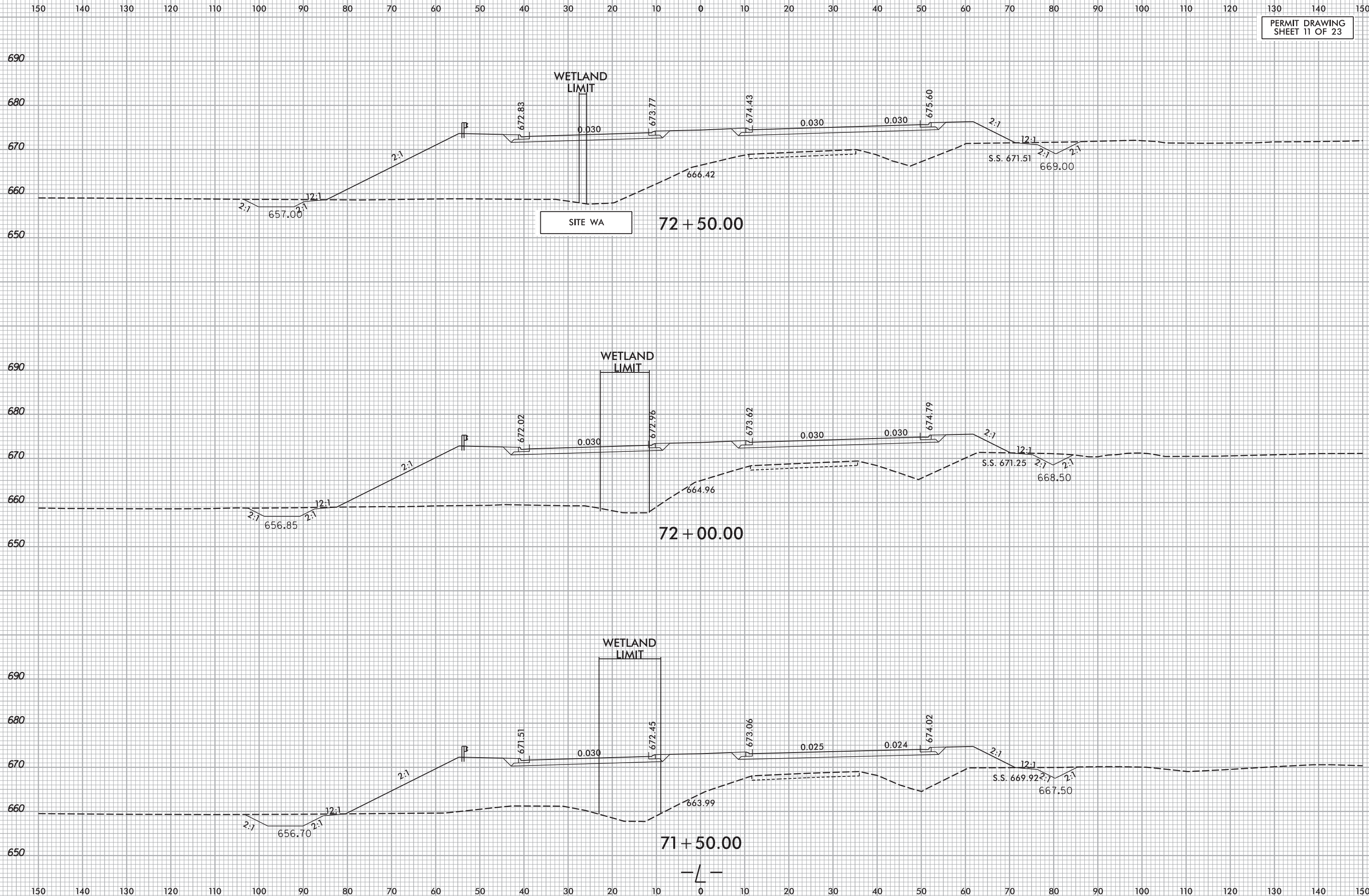


8/23/99



PROJ. REFERENCE NO.	SHEET NO.
U-3440	X-43

PERMIT DRAWING
SHEET 11 OF 23

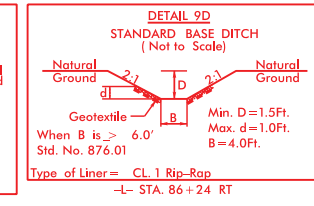
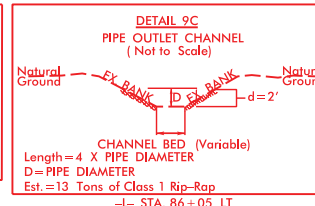
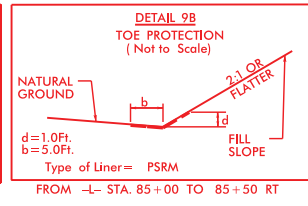
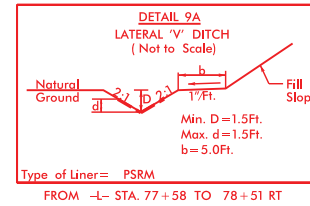


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PERMIT DRAWING
SHEET 12 OF 23



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN
SURFACE WATER

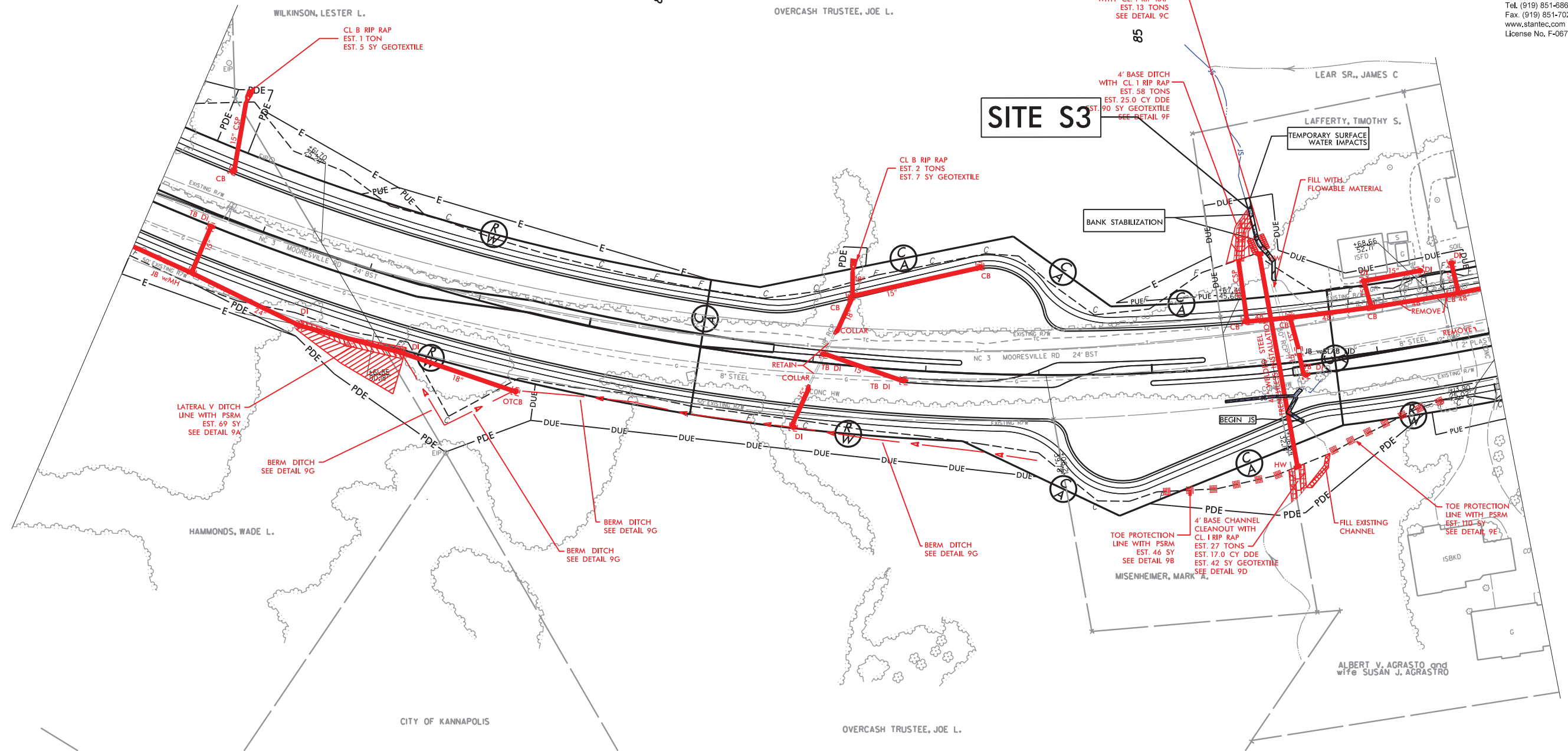
-L-
PI Sta 80+28.76
$\Delta = 50^\circ 54' 39.2''$ (LT)
$D = 2^\circ 51' 53.2''$
$L = 1,777.13'$
$T = 952.04'$
$R = 2,000.00'$
$RO = 144'$
$e = .03$



PROJECT REFERENCE NO.	SHEET NO.
U-3440	9
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



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REVISIONS

12/16/15 ROW REV: CHANGED PROPERTY LINES, PROPERTY OWNER NAME, AND DEED REFERENCE ON PARCELS 26 & 28 - M
12/6/16 ROW REV: ADDED PUE AND REVISED TCE ON PARCELS 22 & 23; ADDED PUE ON PARCEL 24; CHANGED PDE TO DUE FROM -L- 79+65 THRU 84+00 ON PARCEL 26; REVISED PUE ON PARCEL 28 - M
5/10/16 ROW REV: ADJUSTED EX ROW & PL STATIONS AND/OR OFFSETS BASED ON THE FIELD STAKING ON PARCEL 22; REVISED PROPERTY LINE BETWEEN PARCELS 24 & 25 - CM

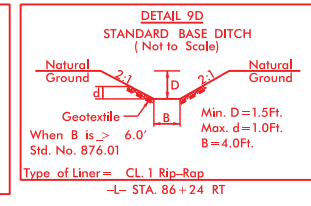
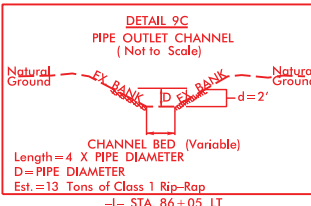
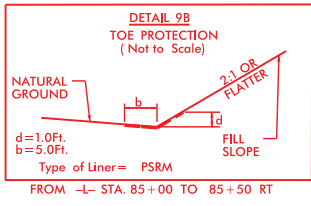
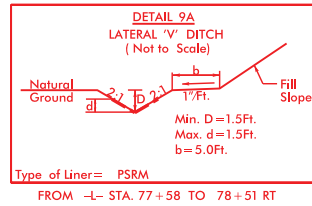
PERMIT DRAWING SHEET 13 OF 23



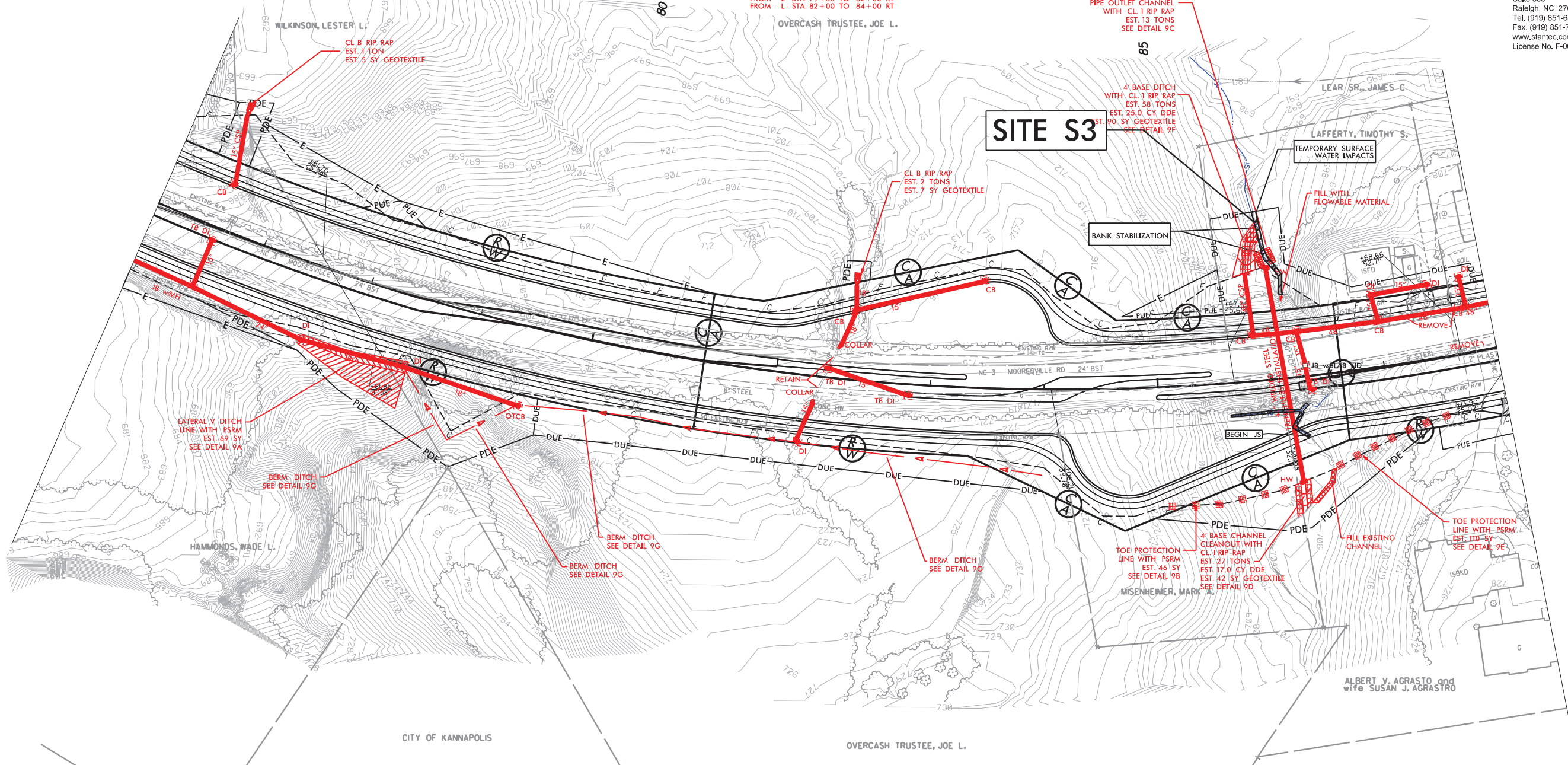
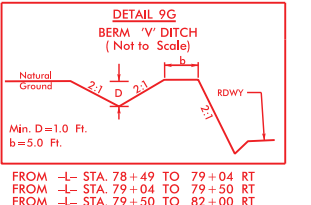
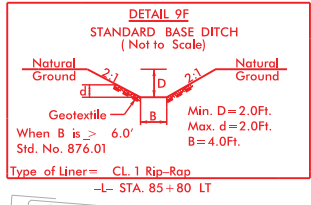
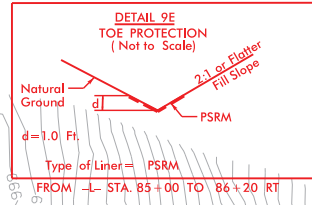
DENOTES TEMPORARY
IMPACTS IN SURFACE WATER



DENOTES IMPACTS IN
SURFACE WATER



-L-
PI Sta 80+28.76
 $\Delta = 50' 54' 39.2''$ (LT)
D = 2' 51' 53.2"
L = 1,777.13'
T = 952.04'
R = 2,000.00'
RO = 144'
e = .03



PROJECT REFERENCE NO. <i>U-3440</i>		SHEET NO. <i>9</i>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

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50 25 0 50 100

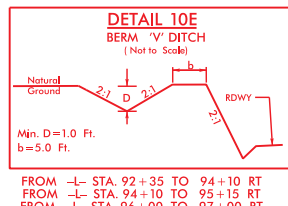
1S 1S

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S

DENOTES IMPACTS IN SURFACE WATER

NOTE: DRIVEWAY RADII
ARE 5FT UNLESS
OTHERWISE NOTED



REVISIONS

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$\frac{2015}{2035} \text{ ADT}$
 $\frac{2015}{2035} \text{ ADT}$
(BAILEY ST.)
 $\frac{100}{100}$
 $\frac{50}{50}$ $\frac{100}{100}$
 $\frac{13300}{21600}$ $\frac{13400}{21700}$
(NC 3)



50 25 0 50 100

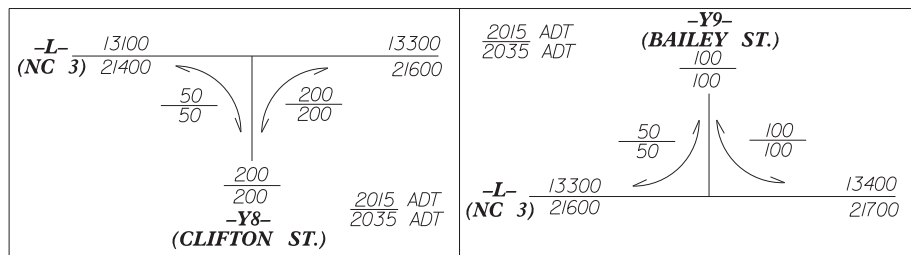
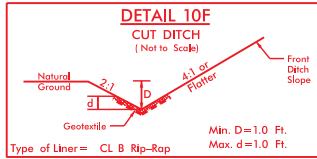
1S 1S

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S

DENOTES IMPACTS IN SURFACE WATER

NOTE: DRIVEWAY RADII
ARE 5FT UNLESS
OTHERWISE NOTED



REVISIONS

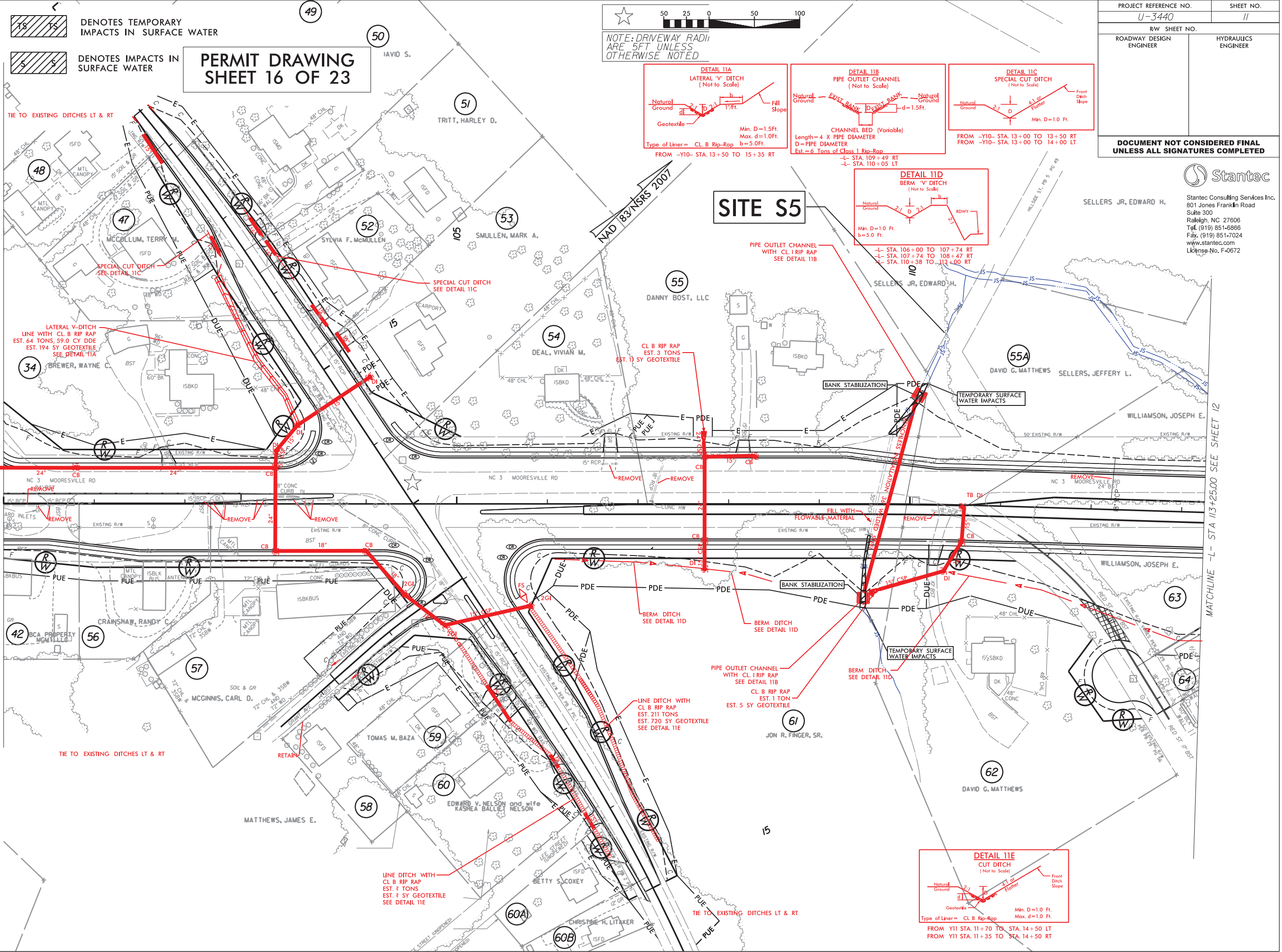
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REVISIONS

12/16/15 ROW REV: AMENDED PROPERTY LINES ON PARCEL 60 AND CREATED PARCELS 60A & 60B; REVISED ROW AND PDE ON PARCEL 63; CHANGED PROPERTY OWNER NAME, DEED REFERENCE, AND REMOVED PDE ON PARCEL 64. -ML
 12/16/16 ROW REV: REMOVED PUE AND REVISED TCE ON PARCELS 42, 49, & 50; REVISED PUE ON PARCELS 42, 56, & 57; ADDED PUE AND REVISED TCE ON PARCEL 48; ADDED PUE WHICH CREATED PARCEL NO. 49A; REVISED PUE AND TCE ON PARCELS 54, 55, & 60; REVISED ROW, PUE AND ADDED TCE ON PARCELS 58 & 59; ADDED PUE ON PARCELS 60A & 60B; ADDED PUE, REVISED DUE AND CHANGED DUE TO PDE FROM -Y11- 11+61 THRU 12+62.72 & -Y11- 11+61 THRU 12+108+45 ON PARCEL 61. -ML
 3/21/16 ROW REV: AMENDED EXIST ROW LINES REVISOR ROW PUE AND TCE ON PARCELS 60 & 60A. -KH
 5/10/16 ROW REV: ADJUSTED EX ROW STATIONS AND/OR OFFSETS BASED ON THE FIELD STAKING ON PARCELS 48, 49, 49A, 54, 55, 57, 60A, 60B, & 61 THRU 63. - CM

8/17/99

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MATCHLINE -L- STA 100+00.00 SEE SHEET 10

MATCHLINE -L- STA 113+25.00 SEE SHEET 12



DETAIL 11D
BERM 'V' DITCH
 (Not to Scale)

Labels in diagram: Natural Ground, 2:1, D, b, RDWY, 2:1.

Min. D = 1.0 Ft.
 b = 5.0 Ft.

DETAIL 11E
CUT DITCH
 (Not to Scale)

Labels in diagram: Natural Ground, 2:1, g, b, 4:1 or Flatter, Front Ditch Slope, Geotextile.

Min. D=1.0 Ft.
 Max. d=1.0 Ft.

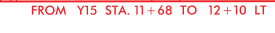
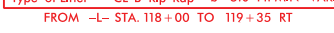
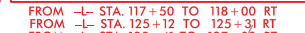
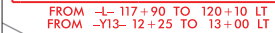
Type of Liner = CL B Rip-Rap

FROM Y11 STA. 11+70 TO STA. 14+50 LT
 FROM Y11 STA. 11+35 TO STA. 14+50 RT

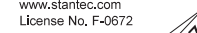
PERMIT DRAWING
SHEET 17 OF 23

MATCHLINE -L- STA 113+25.00 SEE SHEET 12

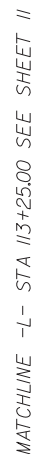
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50 100



PERMIT DRAWING

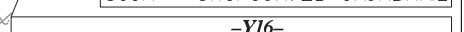


ē = SEE PLANS

-RABT- (CIRCLE)
PI Sta 0+00.00
$\Delta = 360^{\circ} 00' 00.0''$ (RT)
$D = 93^{\circ} 55' 39.0''$
$L = 383.27'$
$T = 0.00'$
$R = 61.00'$
RO = SEE PLANS
e = SEE PLANS

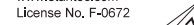
*SEE DETAIL SHEET 2C-2
FOR CURB AND GUTTER
10' TRANSITION TO PAVED
SHOULDER

SCGR = SHOPCURVED GAURDRAIL



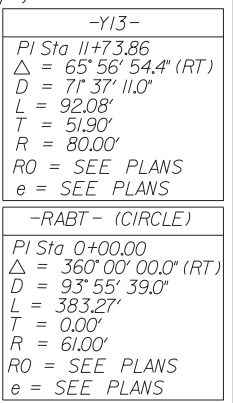
NOTE: SEE SHEETS 18 THRU 19 FOR -L- PROFILE
SEE SHEET 23 FOR -Y13-, -Y14-, & -Y15- PROFILE
SEE SHEET 24 FOR -Y16- PROFILE
SEE SHEET 25 FOR -RABT- PROFILE
SEE SHEET 2B-4 FOR -L-, -Y14-, & -Y15- ROUNDABOUT DETAILS
SEE CULVERT SHEETS C-1 THRU C-

-Y15-
PI Sta 12+49.25
$\Delta = 55^\circ 36' 22.2''$ (LT)
$D = 38^\circ 11' 49.9''$
$L = 145.58'$
$T = 79.10'$
$R = 150.00'$
RO = SEE PLANS
e = SEE PLANS



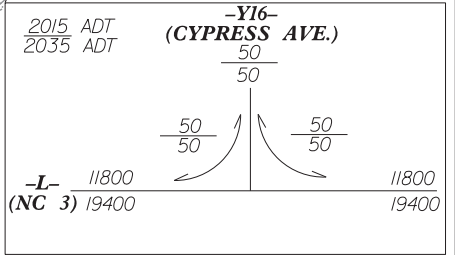
PERMIT DRAWING
SHEET 19 OF 23

ĕ = SĖĖ PLĀŅŠ



*SEE DETAIL SHEET 2C-2
FOR CURB AND GUTTER
10' TRANSITION TO PAVED
SHOULDER

SCGR = SHOPCURVED GAURDRAIL



NOTE: SEE SHEETS 18 THRU 19 FOR -L- PROFILE
SEE SHEET 23 FOR -Y13-, -Y14-, & -Y15- PROFILE
SEE SHEET 24 FOR -Y16- PROFILE
SEE SHEET 25 FOR -RABT- PROFILE
SEE SHEET 2B-4 FOR -L-, -Y14-, & -Y15- ROUNDABOUT DETAIL
SEE CULVERT SHEETS C-1 THRU C-

-Y15-
PI Sta 12+49.25
$\Delta = 55^{\circ} 36' 22.2" (LT)$
$D = 38' 11" 49.9"$
$L = 145.58'$
$T = 79.10'$
$R = 150.00'$
RO = SEE PLANS
e = SEE PLANS

PERMIT DRAWING
SHEET 20 OF 23

CENTERLINE STA. -L- 117+50
2 @ 8' x 10' RCBC
GRADE POINT 708.8'
SKEW = 34.4 DEGREES

3.62:1.0
2:1 NORMAL

3.62:1.0
2:1 NORMAL

PROP 100 YR = 700.75'

PROP 50 YR = 700.1'

NWSEL = 693.4'
(8/10/2013)

BOTTOM OF CULVERT
BURY 1'

2 @ 8' x 10' RCBC
CL EL. = 688.2
SLOPE = 2.4%

NCDOT
PERFORMANCE TABLE

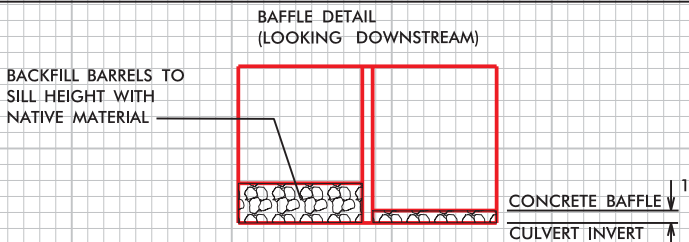
	FREQUENCY				
	10yr.	25yr.	50yr.	100yr.	500yr.
NATURAL	697.8	698.9	699.6	699.87	700.4
EXISTING	697.8	699.2	699.6	700.28	702.2
PROPOSED	697.6	699.4	700.1	700.75	702.2

@SECTION 3757; CE 3770
204 FT. US FROM CL OF REVISED CULVERT

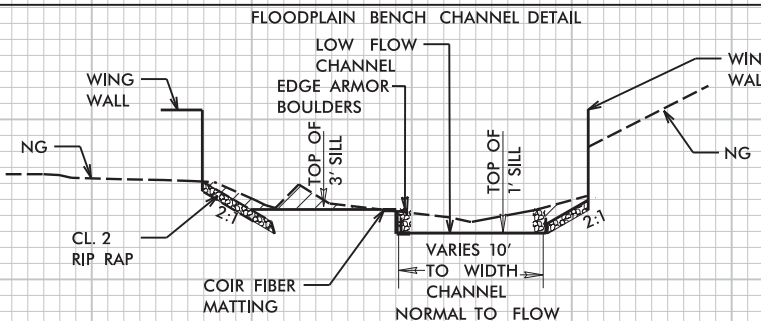
FEMA
PERFORMANCE TABLE

	100yr.
DUPLICATE EFFECTIVE	N/A
CORRECTED EFFECTIVE	700.0
REVISED	700.0

@SECTION 3757; CE 3770
204 FT. US FROM CL OF REV. C



NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.



INLET/OUTLET SILL AND
CHANNEL CLEANOUT (LOOKING DOWNSTREAM)
(NOT TO SCALE)



NOTES:

1. THE EDGE OF THE LOW FLOW CHANNEL SHALL BE ARMORED WITH BOULDERS. THE DEPTH OF ARMOR PROTECTION SHOULD EXTEND 1.5' BELOW THE STREAM BED LINED WITH COIR FIBER MATTING.
2. EDGE ARMOR CAN BE NATURAL STREAM BOULDERS OR EXTRACTED FROM CLASS 1 RIP RAP OR SHOT ROCK MATERIAL AND CAN BE CUBICAL OR RECTANGULAR IN NATURE.
3. ACCEPTABLE BOULDERS FOR THE EDGE ARMOR SHALL HAVE THE FOLLOWING MINIMUM DIMENSIONS; 3'X2'X1'. UNSUITABLE EDGE ARMOR MATERIAL THAT REMAINS FROM CLASS 1 RIP RAP OR SHOT ROCK STORES, MAY BE USED IN BACK FILL OF THE OVER BANK AREA OR DISCARDED.

2 @ 8' x 10' RCBC

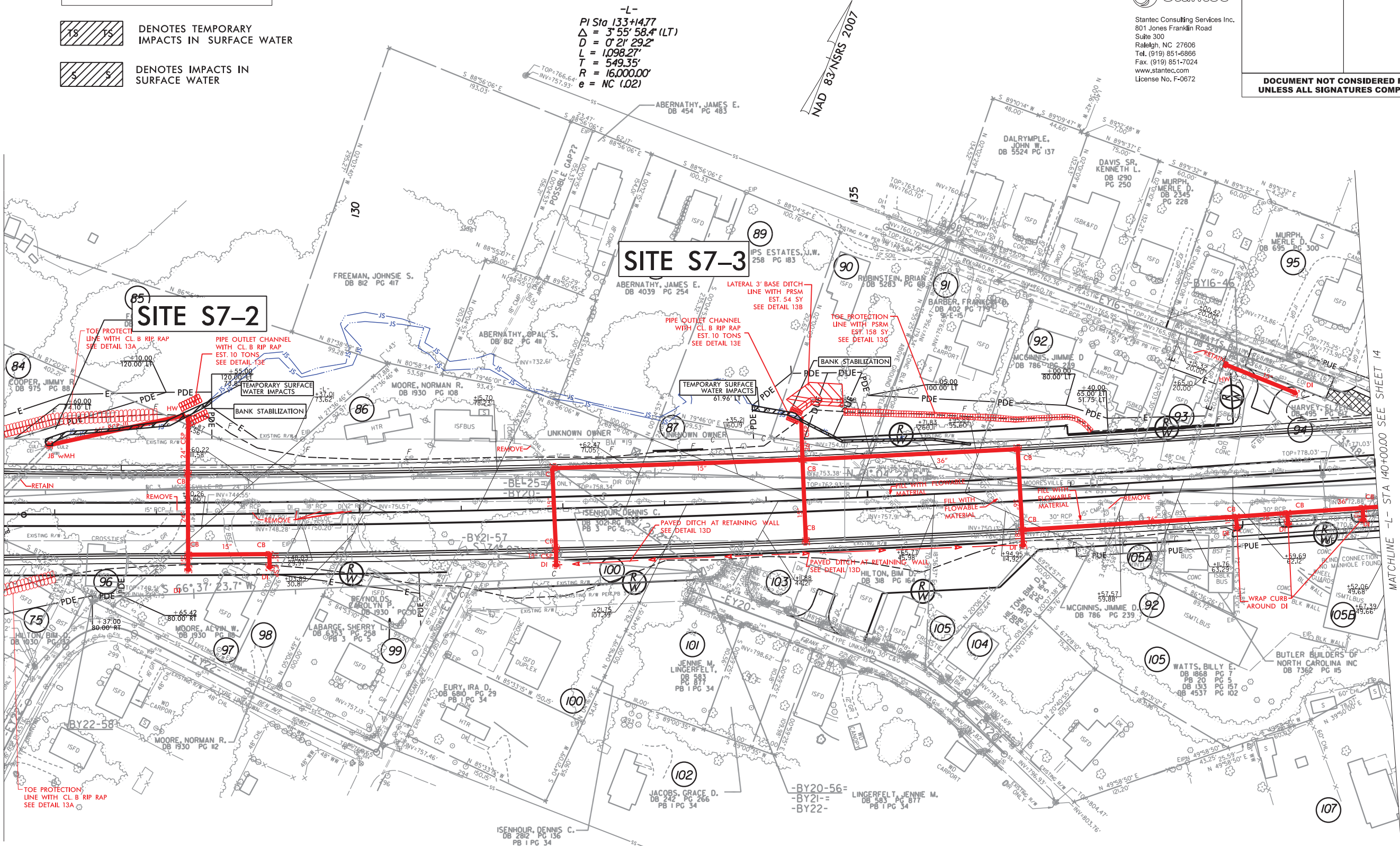
NC GRID
83/NSRS 2007

 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

 DENOTES IMPACTS IN SURFACE WATER

NAD 83/NSRS 2007

MATCHLINE -L- STA 140+00.00 SEE SHEET



DETAIL 13E
PIPE OUTLET CHANNEL
(Not to Scale)

Natural Ground — EX BANK — D BANK — Natural Ground

CHANNEL BED (Variable)
Length = 4 X PIPE DIAMETER.
D = PIPE DIAMETER
Est. = 10 Tons of Class B Rip-Rap
—L— STA. 128 + 20 LT

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 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

 DENOTES IMPACTS IN SURFACE WATER

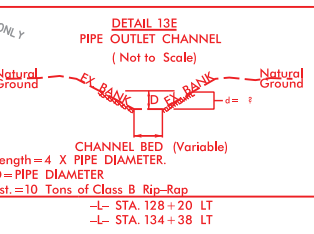
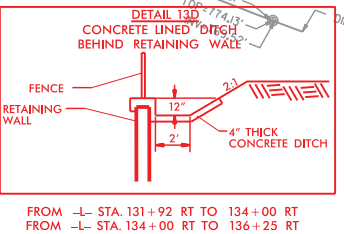
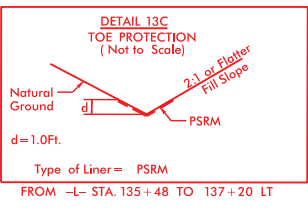
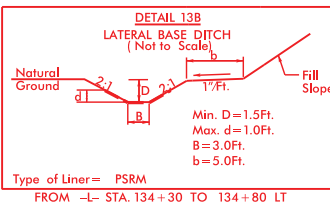
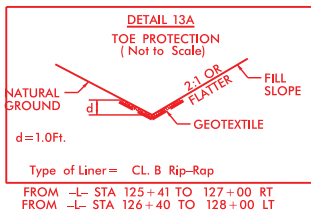
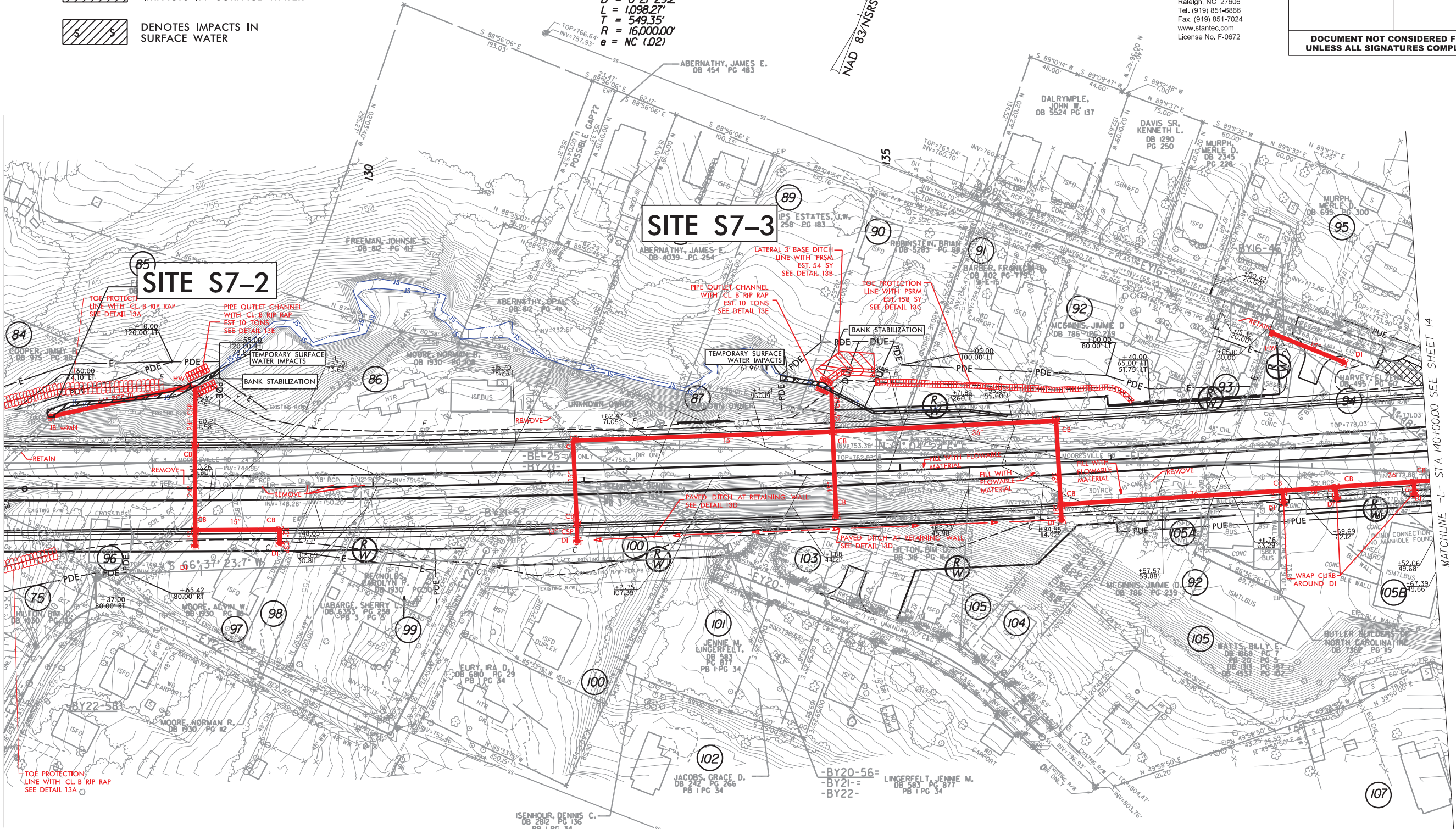
-L-

PI Sta 133+14.77
 $\Delta = 3^\circ 55' 58.4''$ (LT)
 $D = 0^\circ 21' 29.2''$
 $L = 1,098.27'$
 $T = 549.35'$
 $R = 16,000.00'$
 $e = NC (.02)$

NAD 83/NSRS 2007

MATCHLINE -L- STA 126+50.00 SEE SHEET 12

MATCHLINE -L- STA 140+00.00 SEE SHEET



REVISIONS

12716/15 ROW REV: COMBINED PARCELS 92 & 104 INTO PARCEL 92 AND ELIMINATED PARCEL NO. 106; - ML
12716/15 ROW REV: REMOVED DUE, ADDED PDE, AND REVISED TCE ON PARCELS 84 & 85; CHANGED DUE TO PDE FROM -L- 133+-90 THRU 134+-66 ON PARCELS 89 & 90; REVISED DUE AND PUE ON PARCEL 90; REMOVED DUE AND ADDED PDE ON PARCELS 91 & 92; REVISED TCE ON PARCEL 92; REVISED PUE ON PARCELS 92, 93, 104, 105, & 107; ADDED PUE ON PARCEL 95; REMOVED PUE ON PARCELS 100, 101, & 102; -ML
12716/16 ROW REV: AMENDED PROPERTY LINES AND CREATED PARCELS 105A & 105B; - KH
12716/16 ROW REV: ELIMINATED PUE ON PARCEL 86; ADJUSTED X RW STATIONS AND/OR OFFSETS BASED ON THE FIELD STAKING ON PARCELS 87, 90, 92, 94, 95, 99, 100, 105B, & 107; - CM

20150407
STANTEC
U3440_Permit Drawings_20150407.pdf

WETLAND PERMIT IMPACT SUMMARY													
			WETLAND IMPACTS						SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill in Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Temp 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)
S1	L 37+00 TO 40+15 LT	ROAD FILL							0.02		300		
MB	L 40+61	10' X 9' RCBC							0.03	< 0.01	214	51	
IBC	L 68+25	BRIDGE								0.01		96	
IBC	L 68+55 LT	BANK STABILIZATION							< 0.01	0.02	13	47	
IBC	L 67+61 RT	BANK STABILIZATION							< 0.01	< 0.01	24	16	
WA	L 70+30 TO 72+56 LT	ROAD FILL	0.05										
S2	L68+50 TO 69+93 LT	ROAD FILL							< 0.01		142		
S2	L72+70 TO 73+16 LT	ROAD FILL							0.02	< 0.01	109	22	
S3	L 86+12	42" WELDED STEEL							< 0.01		126	0	
S3	L 86+12 LT	BANK STABILIZATION							< 0.01	< 0.01	54	9	
S4	L 97+30	66" WELDED STEEL							0.01		181		
S4	L 96+43 LT	BANK STABILIZATION							< 0.01	< 0.01	47	18	
S4	L 97+92 RT	BANK STABILIZATION							< 0.01	< 0.01	12	9	
S5	L 109+75	36" WELDED STEEL							0.01		105		
S5	L 110+07 LT	BANK STABILIZATION							< 0.01	< 0.01	12	12	
S5	L 109+46 RT	BANK STABILIZATION							< 0.01	< 0.01	12	6	
S6	L 117+50	2-8' X 10' RCBC							0.08		246		
S6	L115+79 LT	BANK STABILIZATION							< 0.01	< 0.01	15	17	
S6	L119+23 RT	STREAM REALIGNMENT							0.01	< 0.01	72	10	
S7-1	Y15 12+25	48" RCP							< 0.01	< 0.01	24	31	
S7-1	Y15 12+25	BANK STABILIZATION							< 0.01	< 0.01	12	8	
S7-2	L 126+30	66" RCP							0.03		265		
S7-2	L 125+15 RT	BANK STABILIZATION							< 0.01		20		
S7-2	L 128+55 LT	BANK STABILIZATION							< 0.01	< 0.01	22	10	
S7-3	L 134+38	ROAD FILL							< 0.01		170		
S7-3	L 134+38	BANK STABILIZATION							< 0.01	< 0.01	12	36	
TOTALS*:			0.05						0.26	0.06	2209	399	

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
U-344005/13/2016
CABARRUS COUNTY
WBS - 39010.1.1 (U-3440)

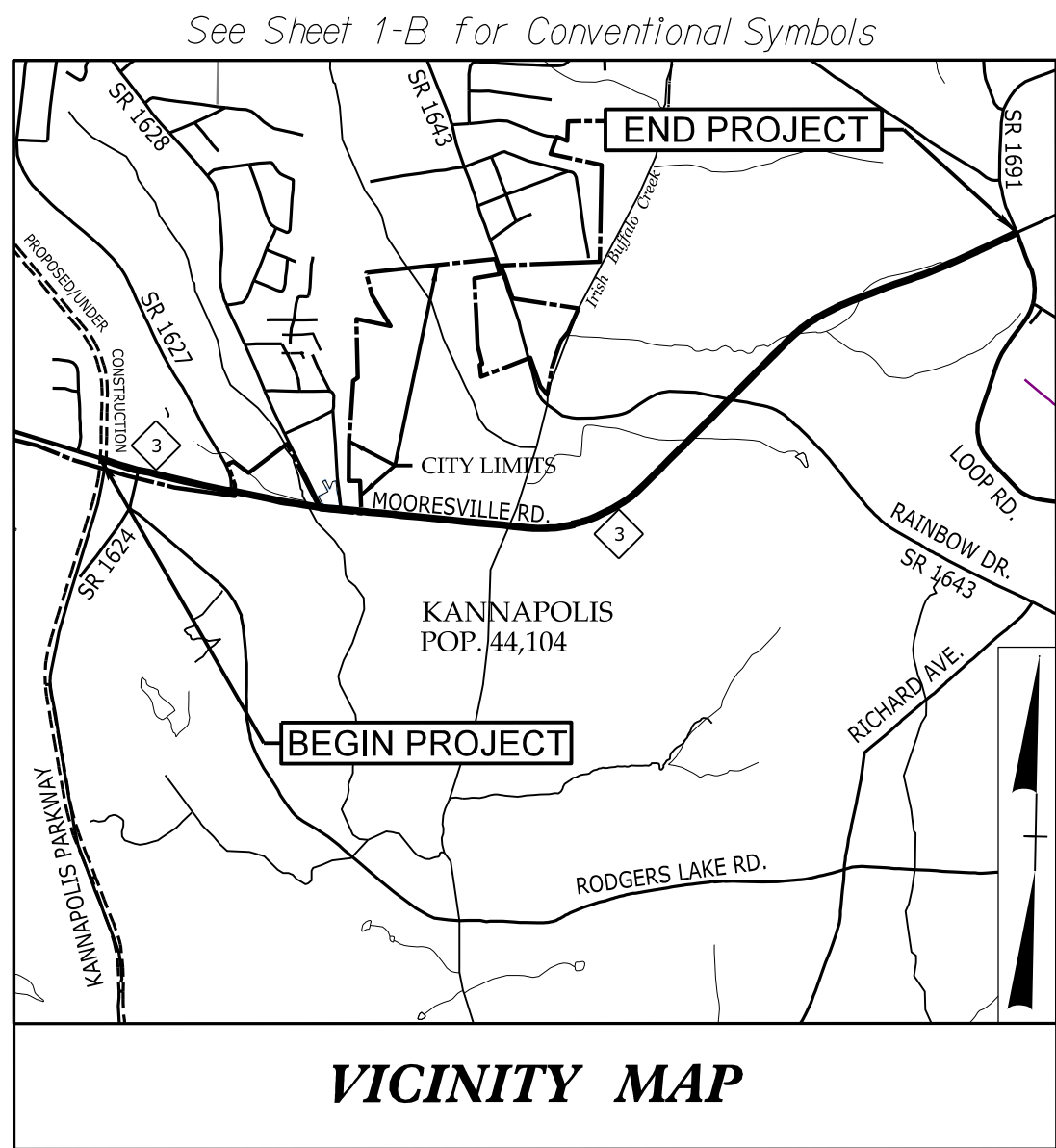
SHEET23 OF 23

4/15/2016 U:\Roadway\Proj\U-3440_Rdy_1.fsh.dgn T:\jarvis

09/05/99

TIP PROJECT: U-3440

CONTRACT: C203803



VICINITY MAP

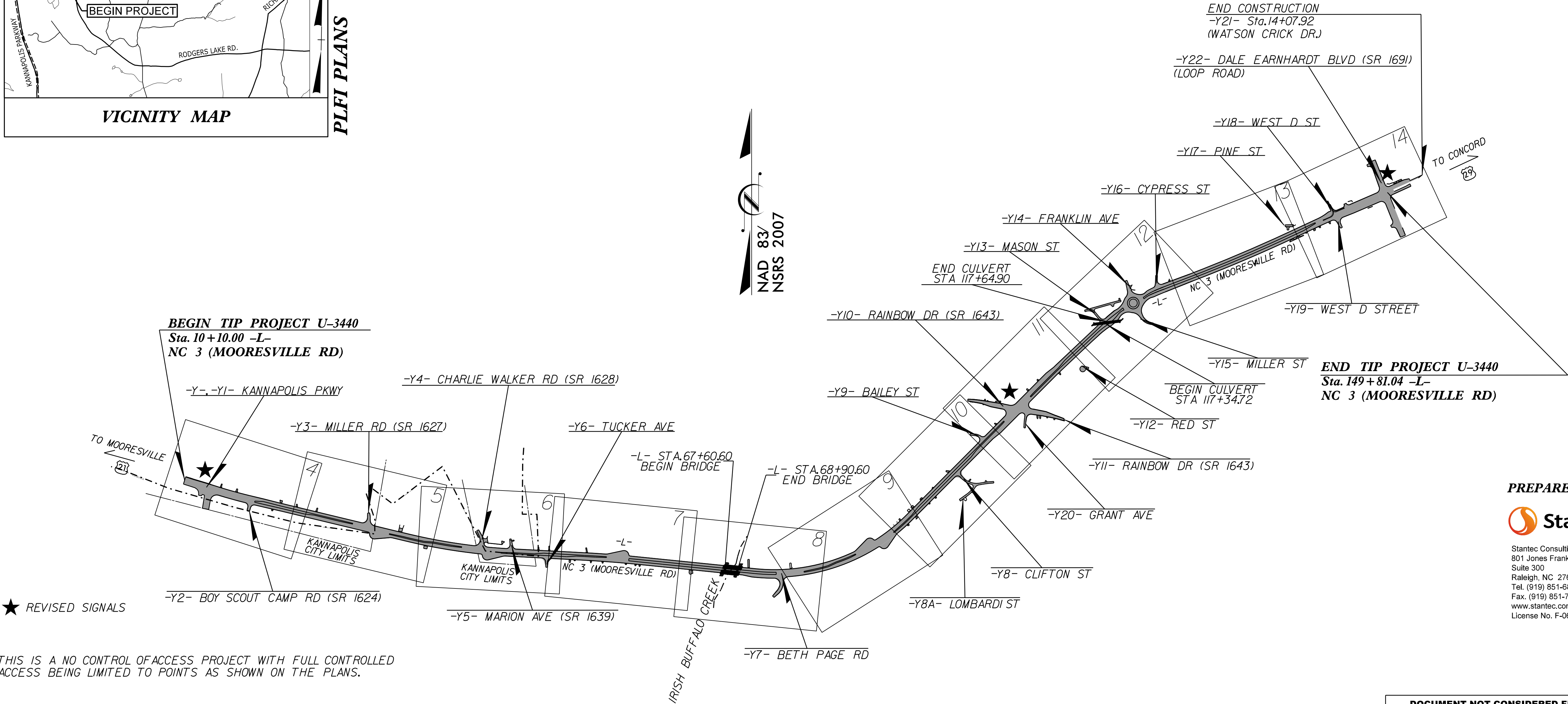
PLFI PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CABARRUS COUNTY

LOCATION: NC 3, FROM PROPOSED WEST SIDE BYPASS (U-2009) TO
SR 1691 (LOOP ROAD) IN KANNAPOLIS
TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, AND SIGNALS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3440	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
39010.1.1	STP-0003(6)	PE	
39010.2.2		R /W	
39010.2.RU1		UTIL	
39010.3.2		CONSTR.	

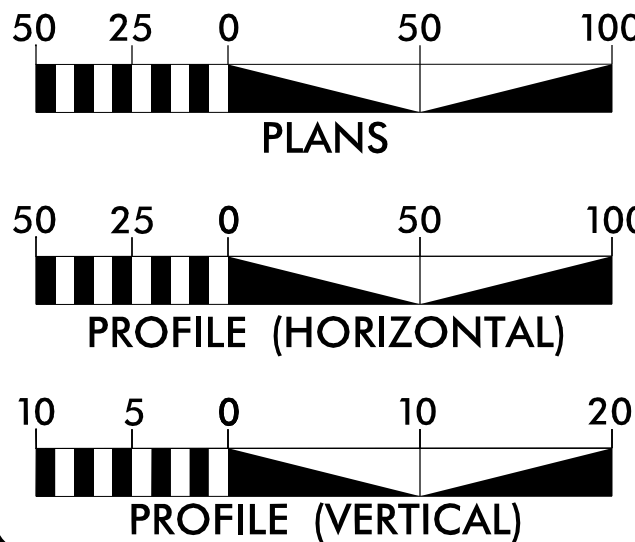


★ REVISED SIGNALS

THIS IS A NO CONTROL OF ACCESS PROJECT WITH FULL CONTROLLED ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.

SEE SHEET I-A FOR INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS.
SEE SHEETS I-C1 THROUGH I-C7 FOR CONTROL SURVEY SHEETS NOTES.

GRAPHIC SCALES



DESIGN DATA

ADT 2016 = 17,155
ADT 2036 = 23,900
K = 12 %
D = 60 %
T = 9 % *
V = 50 MPH
HIST. AREA V = 40 MPH
*(TTST 7% + DUALS 2%)
FUNC CLASS = MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-3440 = 2.621 MILES
LENGTH STRUCTURE TIP PROJECT U-3440 = 0.025 MILE
TOTAL LENGTH TIP PROJECT U-3440 = 2.646 MILES

Prepared in the Office of Stantec:
FOR DIVISION OF HIGHWAYS
801 Jones Franklin Rd., Suite 300, Raleigh NC, 27606

2012 STANDARD SPECIFICATIONS
RIGHT OF WAY DATE: MAY 29, 2015
LETTING DATE: OCTOBER 18, 2016

MICHAEL LINDGREN, P.E.
PROJECT ENGINEER
MICHAEL LITTLEFIELD, P.E.
PROJECT DESIGN ENGINEER

NCDOT CONTACT: REKHA PATEL, PE
ROADWAY DESIGN ENGINEERING
COORDINATION SECTION ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

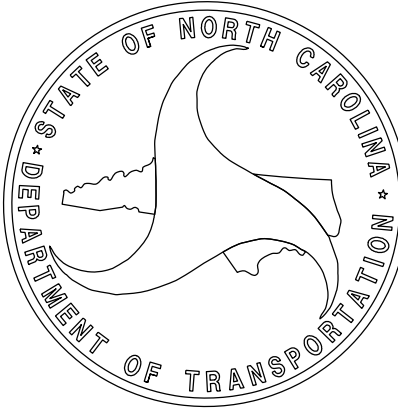
SIGNATURE: _____ P.E.

PREPARED BY:



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STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS
CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

PROJECT REFERENCE NO.	SHEET NO.
U-3440	1B

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Property Corner	-----X
Property Monument	□ EOM
Parcel/Sequence Number	⑫③
Existing Fence Line	-X-X-X-
Proposed Woven Wire Fence	-----○-----
Proposed Chain Link Fence	-----□-----
Proposed Barbed Wire Fence	-----◇-----
Existing Wetland Boundary	-----WLB-----
Proposed Wetland Boundary	-----WLB-----
Existing Endangered Animal Boundary	-----EAB-----
Existing Endangered Plant Boundary	-----EPB-----
Existing Historic Property Boundary	-----HPB-----

Known Contamination Area: Soil	-----☠-----☠
Potential Contamination Area: Soil	-----?-----?
Known Contamination Area: Water	-----☠-----☠
Potential Contamination Area: Water	-----?-----?
Contaminated Site: Known or Potential	-----☠-----?

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	-----
Proposed Right of Way Line with Concrete or Granite R/W Marker	-----
Proposed Control of Access Line with Concrete C/A Marker	-----
Existing Control of Access	-----
Proposed Control of Access	-----
Existing Easement Line	-----E-----
Proposed Temporary Construction Easement	-----E-----
Proposed Temporary Drainage Easement	-----TDE-----
Proposed Permanent Drainage Easement	-----PDE-----
Proposed Permanent Drainage / Utility Easement	-----DUE-----
Proposed Permanent Utility Easement	-----PUE-----
Proposed Temporary Utility Easement	-----TUE-----
Proposed Aerial Utility Easement	-----AUE-----
Proposed Permanent Easement with Iron Pin and Cap Marker	-----◆-----

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	-----C-----
Proposed Slope Stakes Fill	-----F-----
Proposed Curb 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	-----
U/G Power Line LOS B (S.U.E.*)	-----
U/G Power Line LOS C (S.U.E.*)	-----
U/G Power Line LOS D (S.U.E.*)	-----

TELEPHONE:

Existing Telephone Pole	-----
Proposed Telephone Pole	-----
Telephone Manhole	-----
Telephone Pedestal	-----
Telephone Cell Tower	-----
U/G Telephone Cable Hand Hole	-----
U/G Telephone Cable LOS B (S.U.E.*)	-----
U/G Telephone Cable LOS C (S.U.E.*)	-----
U/G Telephone Cable LOS D (S.U.E.*)	-----
U/G Telephone Conduit LOS B (S.U.E.*)	-----
U/G Telephone Conduit LOS C (S.U.E.*)	-----
U/G Telephone Conduit LOS D (S.U.E.*)	-----
U/G Fiber Optics Cable LOS B (S.U.E.*)	-----
U/G Fiber Optics Cable LOS C (S.U.E.*)	-----
U/G Fiber Optics Cable LOS D (S.U.E.*)	-----

WATER:

Water Manhole	-----
Water Meter	-----
Water Valve	-----
Water Hydrant	-----
U/G Water Line LOS B (S.U.E.*)	-----
U/G Water Line LOS C (S.U.E.*)	-----
U/G Water Line LOS D (S.U.E.*)	-----
Above Ground Water Line	-----

TV:

TV Pedestal	-----
TV Tower	-----
U/G TV Cable Hand Hole	-----
U/G TV Cable LOS B (S.U.E.*)	-----
U/G TV Cable LOS C (S.U.E.*)	-----
U/G TV Cable LOS D (S.U.E.*)	-----
U/G Fiber Optic Cable LOS B (S.U.E.*)	-----
U/G Fiber Optic Cable LOS C (S.U.E.*)	-----
U/G Fiber Optic Cable LOS D (S.U.E.*)	-----

GAS:

Gas Valve	-----
Gas Meter	-----
U/G Gas Line LOS B (S.U.E.*)	-----
U/G Gas Line LOS C (S.U.E.*)	-----
U/G Gas Line LOS D (S.U.E.*)	-----
Above Ground Gas Line	-----

SANITARY SEWER:

Sanitary Sewer Manhole	-----
Sanitary Sewer Cleanout	-----
U/G Sanitary Sewer Line	-----
Above Ground Sanitary Sewer	-----
SS Forced Main Line LOS B (S.U.E.*)	-----
SS Forced Main Line LOS C (S.U.E.*)	-----
SS Forced Main Line LOS D (S.U.E.*)	-----

MISCELLANEOUS:

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

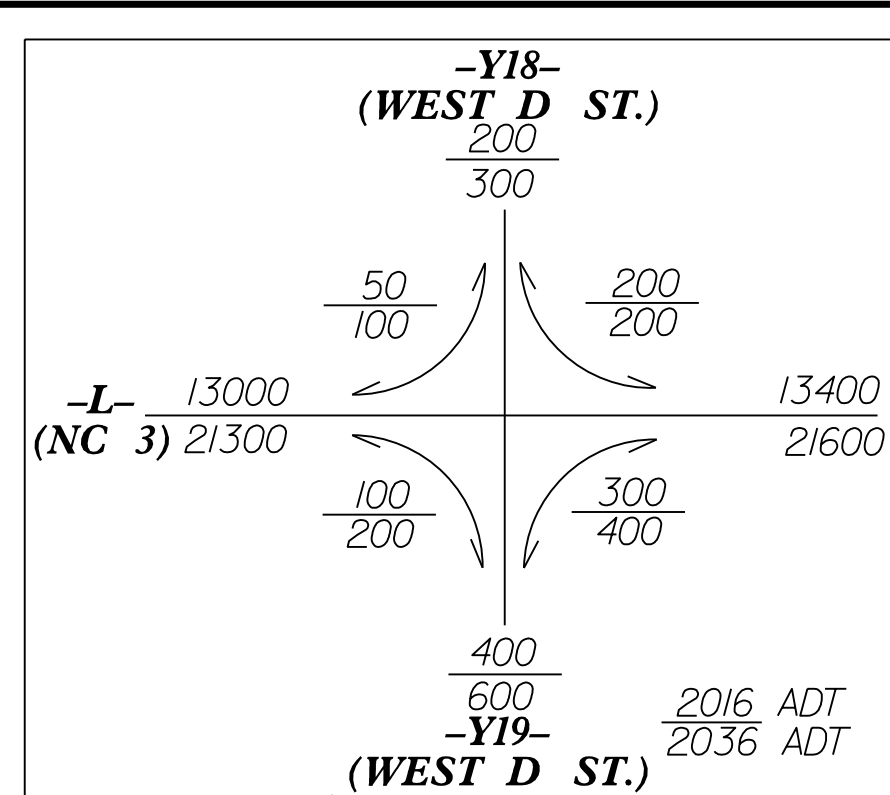
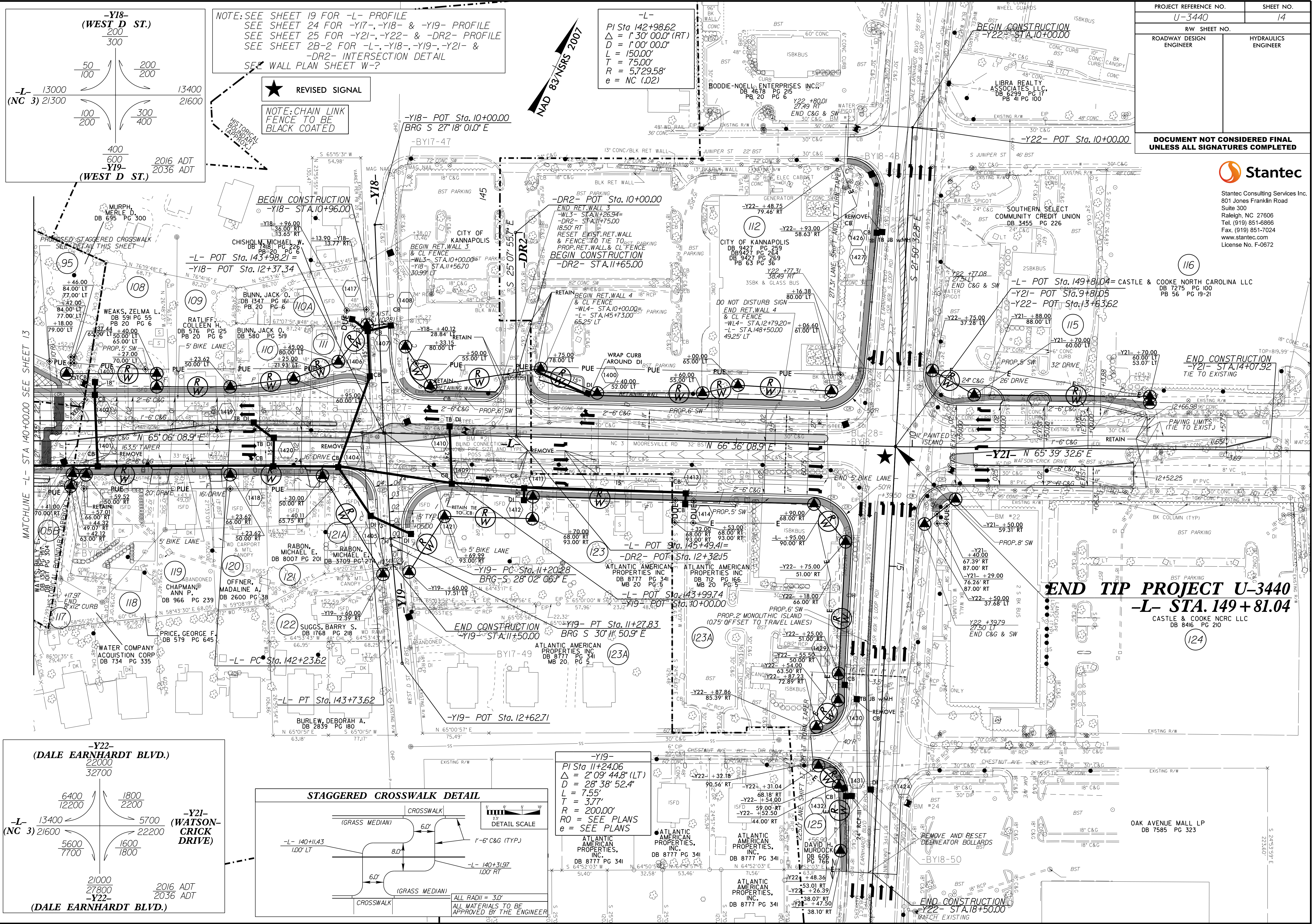
PROJECT REFERENCE NO.		SHEET NO.
U-3440		14
RW SHEET NO.		HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		



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CASTLE & COOKE NORTH CAROLINA LLC
DB 7275 PG 100
PB 56 PG 19-21

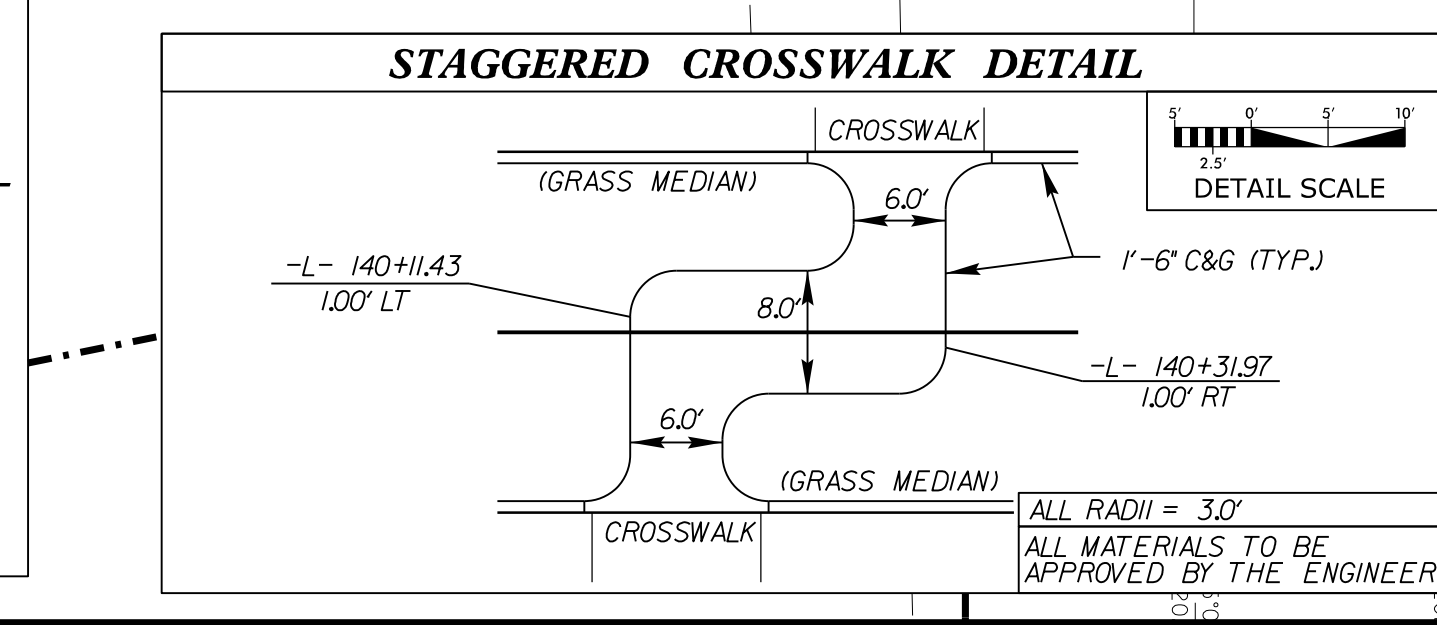
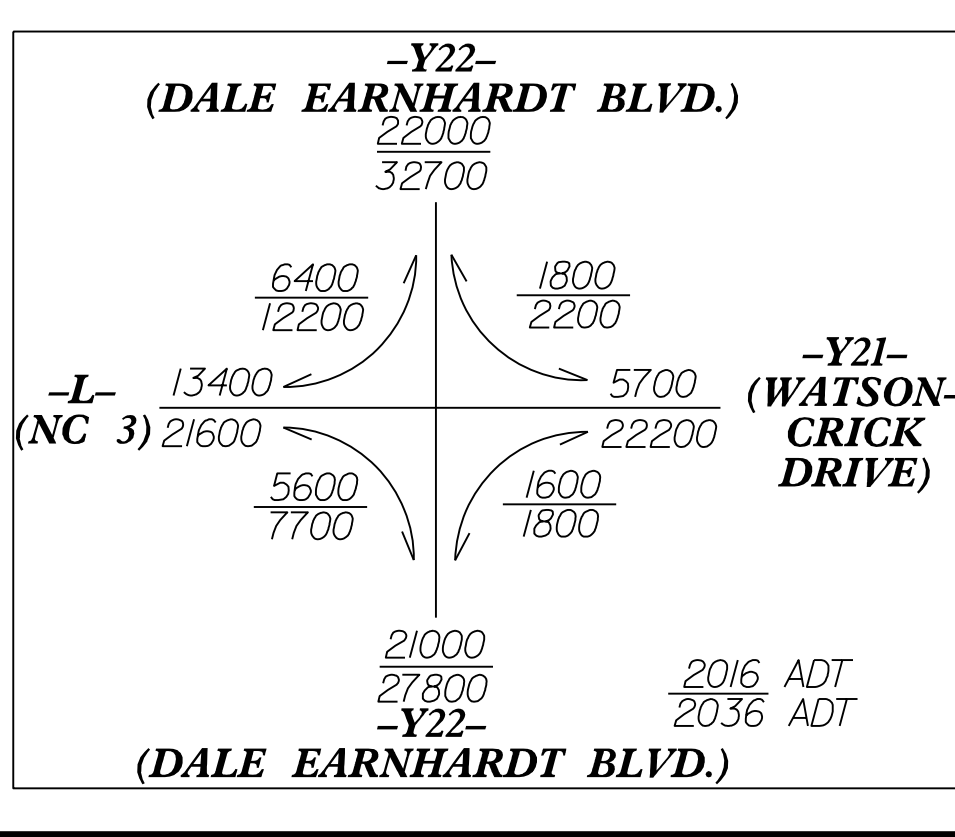
END TIP PROJECT U-3440
-L- STA. 149+81.04
CASTLE & COOKE NCRC LLC
DB 8416 PG 210



NOTE: SEE SHEET 19 FOR -L- PROFILE
SEE SHEET 24 FOR -Y17-, -Y18- & -Y19- PROFILE
SEE SHEET 25 FOR -Y21-, -Y22- & -DR2- PROFILE
SEE SHEET 2B-2 FOR -L-, -Y18-, -Y19-, -Y21- & -DR2- INTERSECTION DETAIL
SEE WALL PLAN SHEET W-?

★ REVISED SIGNAL
NOTE: CHAIN LINK FENCE TO BE BLACK COATED

-L-
PI Sta 142+98.62
 $\Delta = 1' 30'' 00.0''$ (RT)
 $D = 1' 00'' 00.0''$
 $L = 150.00'$
 $T = 75.00'$
 $R = 5,729.58'$
 $e = NC (1.02)$



-Y19-
PI Sta 11+24.06
 $\Delta = 2' 09'' 44.8''$ (LT)
 $D = 28' 38'' 52.4''$
 $L = 7.55'$
 $T = 3.77'$
 $R = 200.00'$
RO = SEE PLANS
e = SEE PLANS

OAK AVENUE MALL LP
DB 7585 PG 323

REVISIONS

MATCHLINE -L- STA 126+50.00 SEE SHEET 12

MATCHLINE -L- STA 140+00.00 SEE SHEET 14

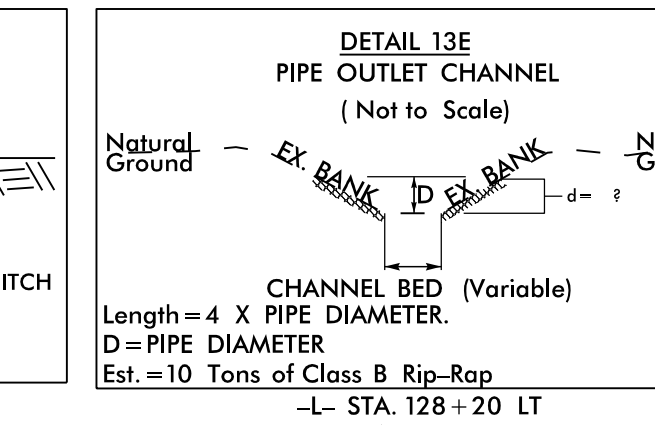
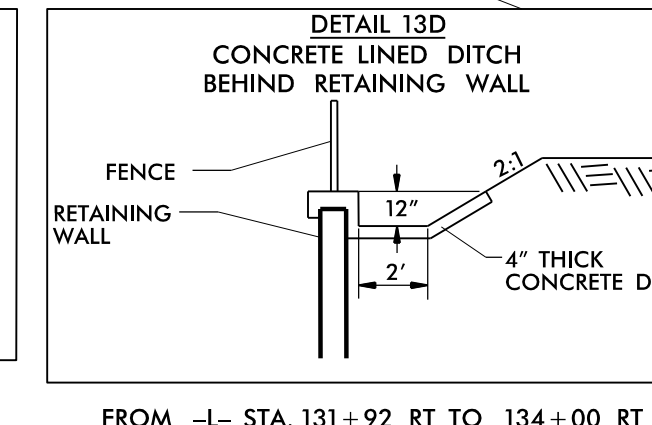
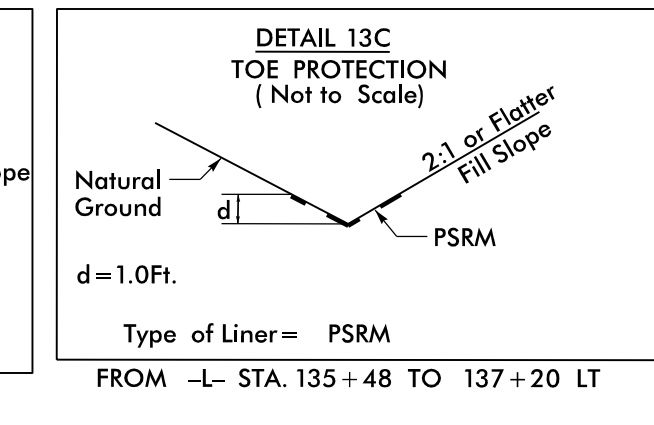
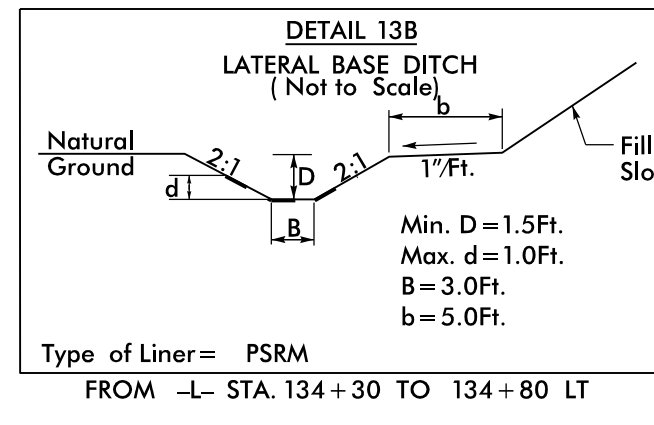
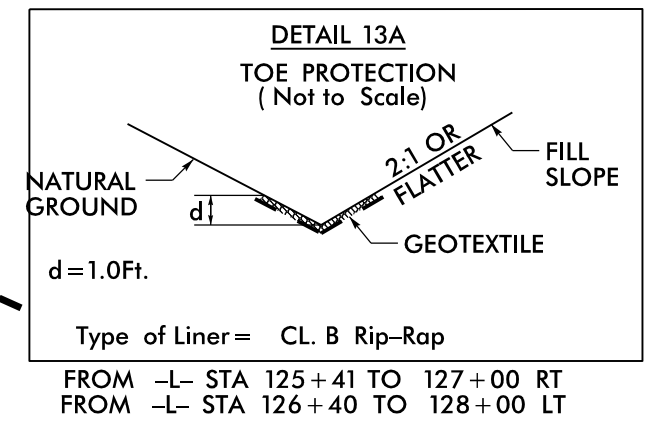
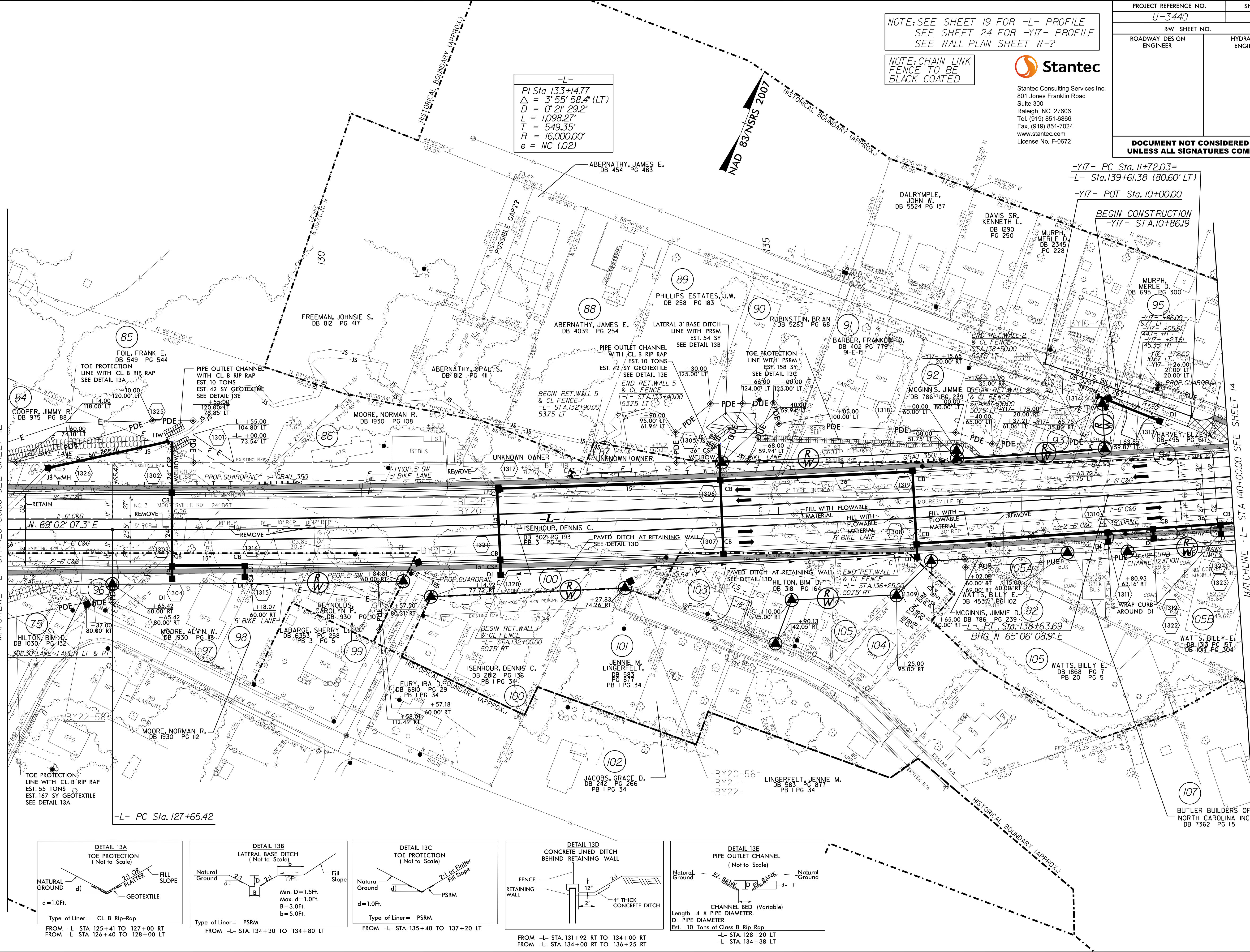
NOTE: SEE SHEET 19 FOR -L- PROFILE
SEE SHEET 24 FOR -Y17- PROFILE
SEE WALL PLAN SHEET W-?

NOTE: CHAIN LINK
FENCE TO BE
BLACK COATED



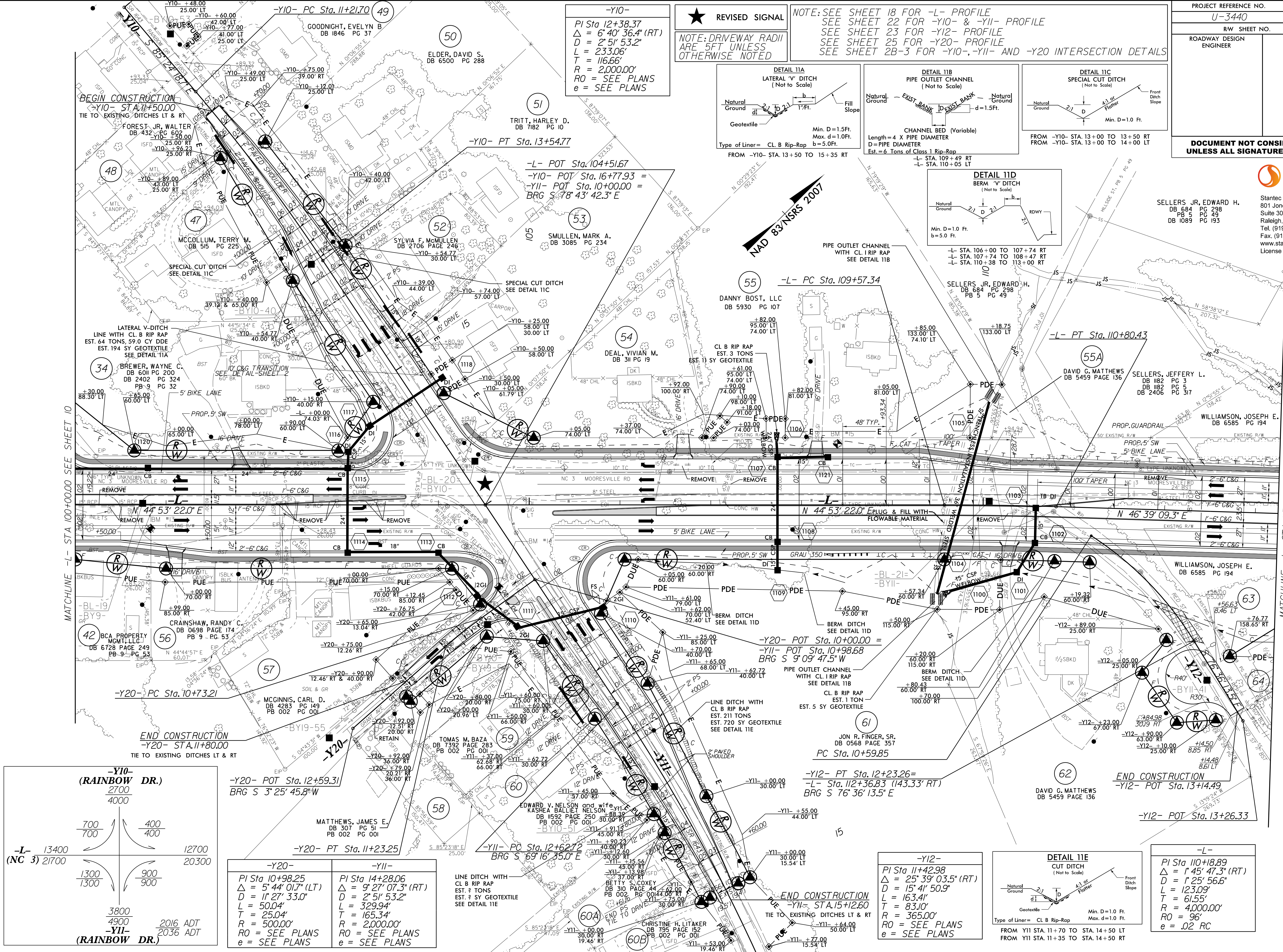
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PROJECT REFERENCE NO.		SHEET NO.
U-3440		13
RW SHEET NO.		
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
</		





REVISIONS

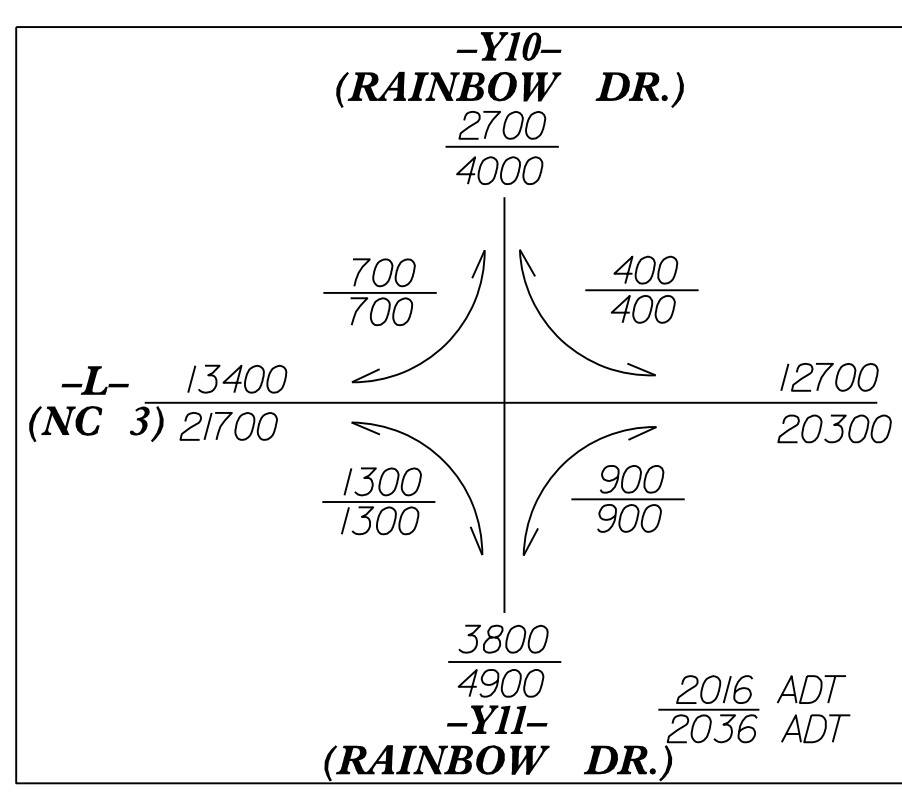
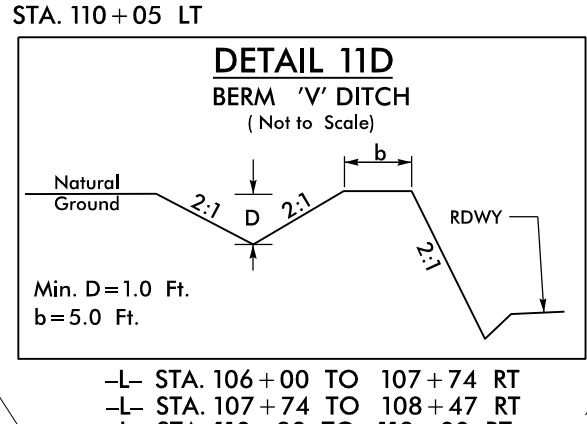
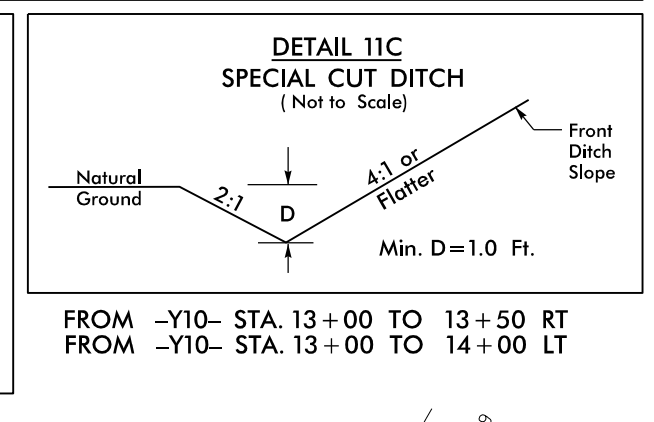
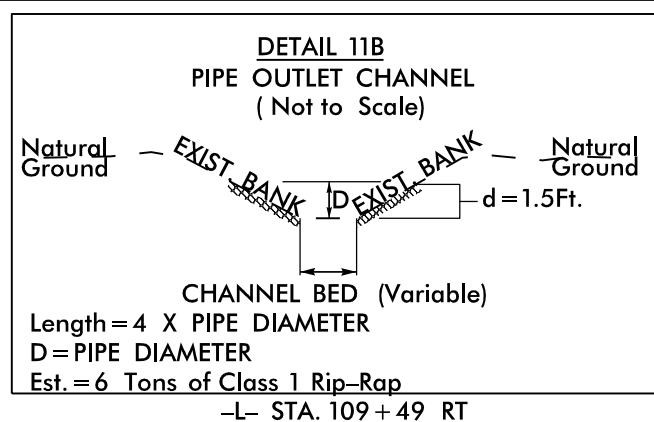
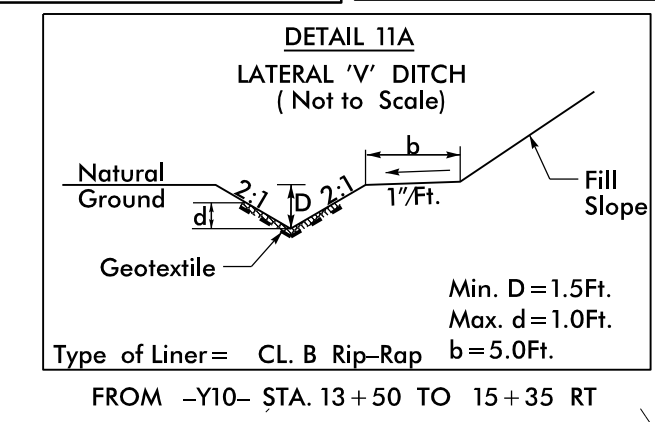


★ REVISED SIGNAL

NOTE: DRIVEWAY RADII ARE 5 FT UNLESS OTHERWISE NOTED

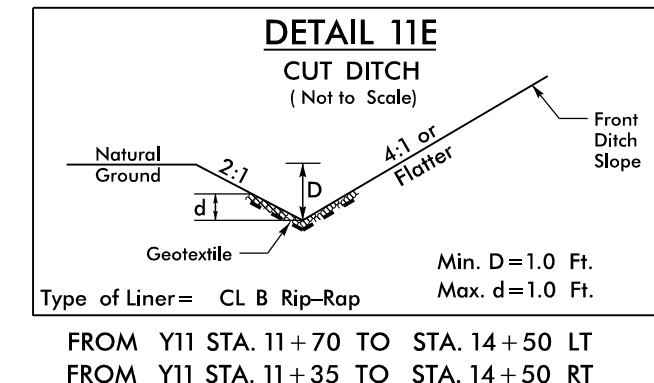
NOTE: SEE SHEET 18 FOR -L- PROFILE
SEE SHEET 22 FOR -Y10- & -Y11- PROFILE
SEE SHEET 23 FOR -Y12- PROFILE
SEE SHEET 25 FOR -Y20- PROFILE
SEE SHEET 28-3 FOR -Y10-, -Y11- AND -Y20 INTERSECTION DETAILS

-Y10-
PI Sta 12+38.37
 $\Delta = 6' 40'' 36.4''$ (RT)
 $D = 2' 51'' 53.2''$
 $L = 233.06'$
 $T = 116.66'$
 $R = 2,000.00'$
 $RO = \text{SEE PLANS}$
 $e = \text{SEE PLANS}$



-Y20-	-Y11-
PI Sta 10+98.25	PI Sta 14+28.06
$\Delta = 5' 44'' 01.7''$ (LT)	$\Delta = 9' 27'' 07.3''$ (RT)
$D = 1' 27'' 33.0''$	$D = 2' 51'' 53.2''$
$L = 50.04'$	$L = 329.94'$
$T = 25.04'$	$T = 165.34'$
$R = 500.00'$	$R = 2,000.00'$
$RO = \text{SEE PLANS}$	$RO = \text{SEE PLANS}$
$e = \text{SEE PLANS}$	$e = \text{SEE PLANS}$

-Y12-
PI Sta 11+42.98
 $\Delta = 25' 39'' 03.5''$ (RT)
 $D = 15' 41'' 50.9''$
 $L = 163.41'$
 $T = 83.10'$
 $R = 365.00'$
 $RO = \text{SEE PLANS}$
 $e = \text{SEE PLANS}$



-L-
PI Sta 110+18.89
 $\Delta = 1' 45'' 47.3''$ (RT)
 $D = 1' 25'' 56.6''$
 $L = 123.09'$
 $T = 61.55'$
 $R = 4,000.00'$
 $RO = 96'$
 $e = .02 RC$

PROJECT REFERENCE NO.		SHEET NO.
U-3440		11
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

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SELLERS JR, EDWARD H.
DB 684 PG 298
PB 5 PG 49
DB 1089 PG 193

DAVID G. MATTHEWS
DB 5459 PAGE 136

SELLERS, JEFFERY L.
DB 1182 PG 5
DB 2406 PG 317

WILLIAMSON, JOSEPH E.
DB 6585 PG 194

END CONSTRUCTION
-Y12- POT Sta. 13+26.33

-Y12- PT Sta. 12+23.26 =
-L- Sta. 112+36.83 (143.33' RT)
BRG S 76° 36' 13.5° E

-Y20- POT Sta. 10+00.00 =
-Y11- POT Sta. 10+98.68
BRG S 9° 09' 47.5° W

-Y11- PC Sta. 12+62.72
BRG S 69° 16' 35.0° E

-Y20- POT Sta. 12+59.31
BRG S 3° 25' 45.8° W

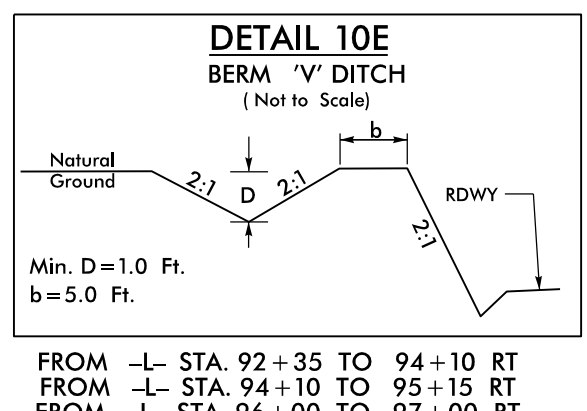
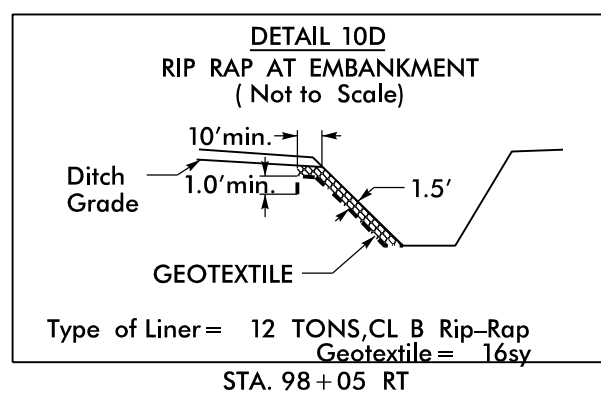
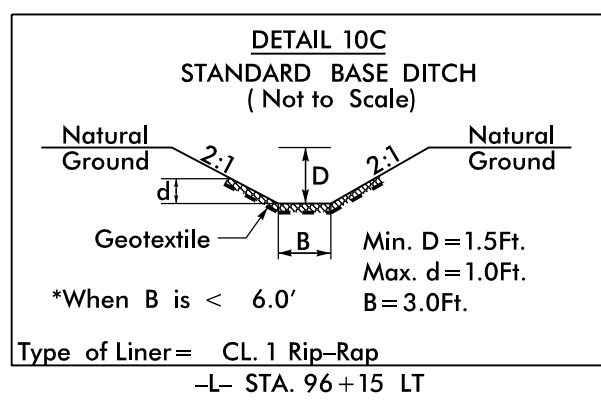
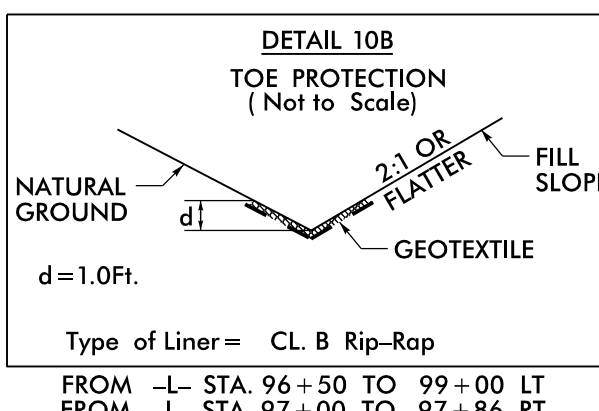
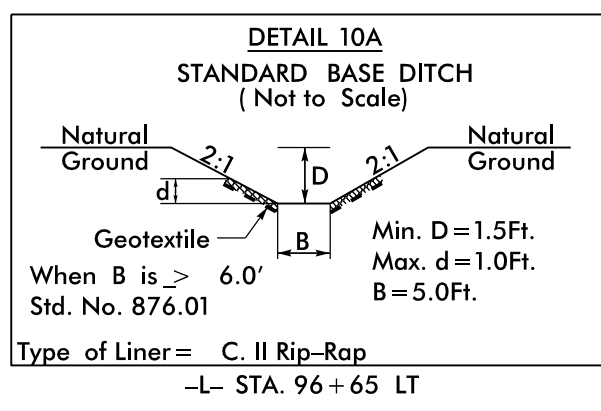
END CONSTRUCTION
-Y20- STA. 11+80.00
TIE TO EXISTING DITCHES LT & RT

MATCHLINE -L- STA 100+00.00 SEE SHEET 10

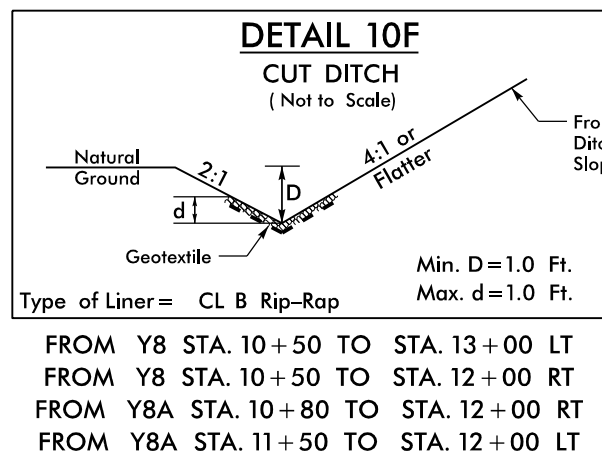
MATCHLINE -L- STA 113+25.00 SEE SHEET 12

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-Y9-
PI Sta. 12+41.02
 $\Delta = 39^\circ 26' 04.3''$ (RT)
D = 57' 17" 44.8"
L = 68.83'
T = 35.84'
R = 100.00'
RO = SEE PLANS
e = SEE PLANS



*SEE DETAIL SHEET 2C-2
FOR CURB AND GUTTER
10' TRANSITION TO PAVED
SHOULDER

NOTE: SEE SHEETS 17 THRU 18 FOR -L- PROFILE
SEE SHEET 22 FOR -Y8- & -Y9- PROFILE
SCGR = SHOP CURVED GUARDRAIL

NOTE: DRIVEWAY RADII
ARE 5FT UNLESS
OTHERWISE NOTED

-Y9- POT Sta. 10+00.00
BRG S 84° 32' 42.3" E

BEGIN CONSTRUCTION
-Y9- STA. 11+50.00

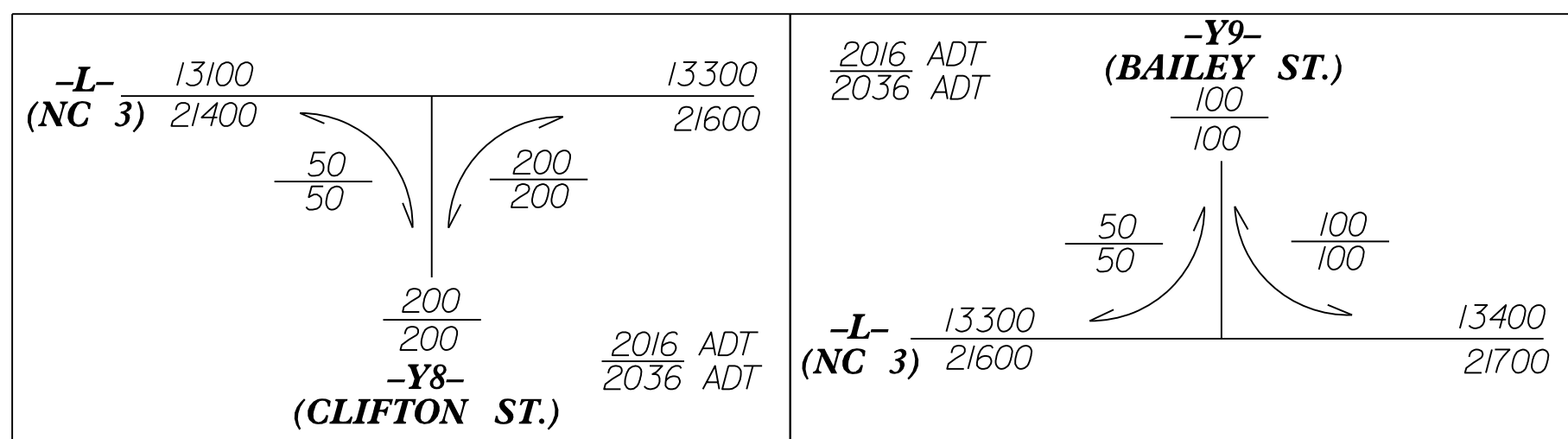
-Y9- PC Sta. 12+05.18

-L- PT Sta. 88+53.84

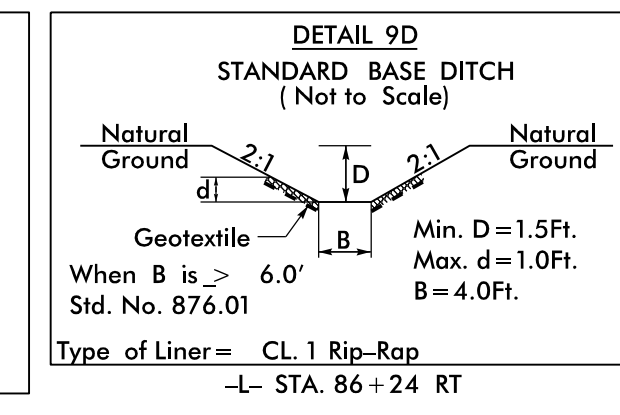
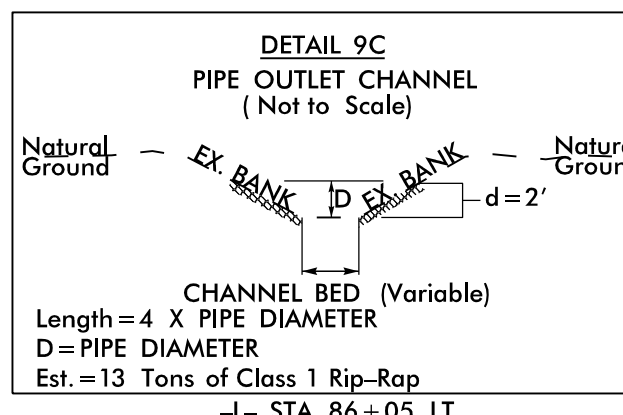
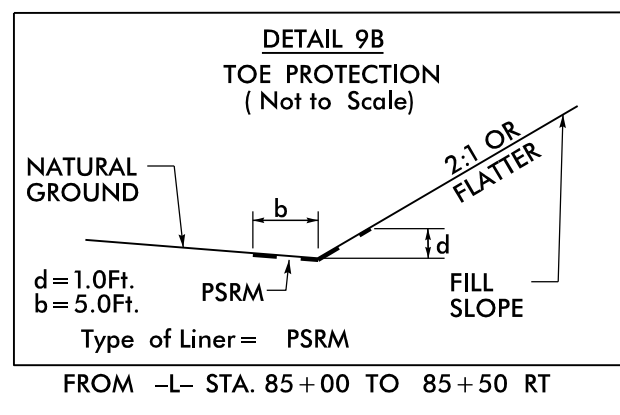
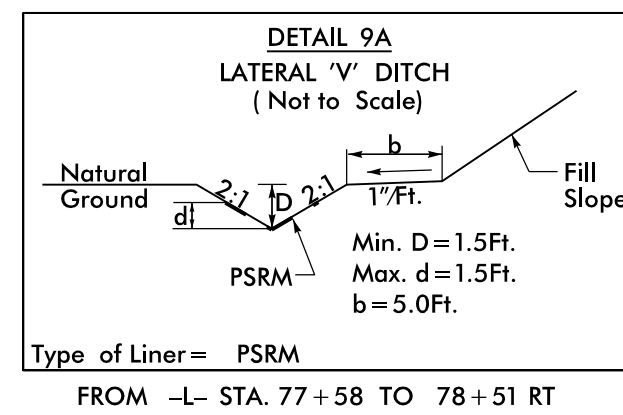
PI Sta. 80+28.76
 $\Delta = 50^\circ 54' 39.2''$ (LT)
D = 2' 5" 53.2"
L = 177.13'
T = 952.04'
R = 2,000.00'
RO = 144'
e = .03

MATCHLINE -L- STA 88+00.00 SEE SHEET 9

MATCHLINE -L- STA 100+00.00 SEE SHEET 11

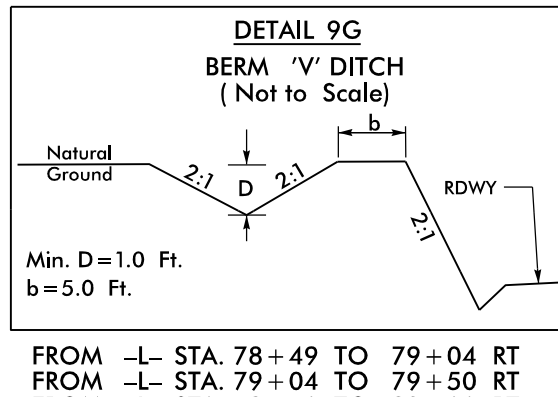
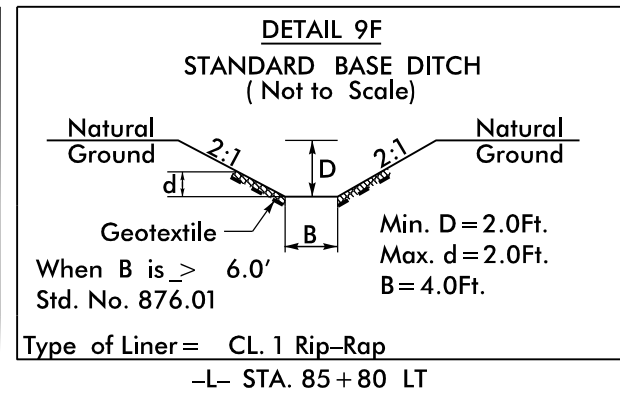
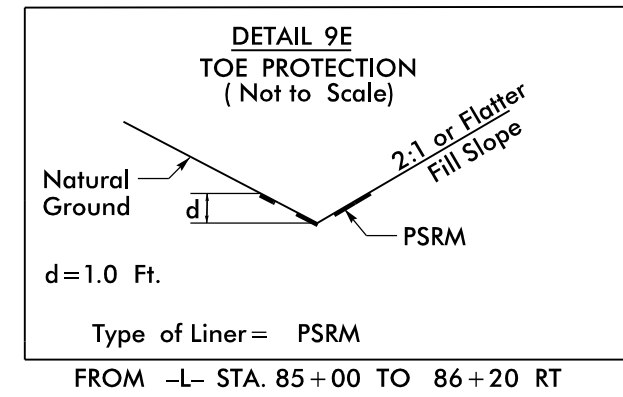


-Y8-	-Y8A-	-Y8A-
PI Sta. 12+11.32	PI Sta. 11+49.82	PI Sta. 11+49.82
$\Delta = 56^\circ 53' 52.3''$ (LT)	$\Delta = 7^\circ 54' 05.4''$ (RT)	$\Delta = 22^\circ 10' 11.8''$ (LT)
D = 28' 38" 52.4"	D = 5' 22" 47.6"	D = 22' 55" 05.9"
L = 198.61'	L = 146.87'	L = 96.73'
T = 108.36'	T = 73.55'	T = 48.98'
R = 200.00'	R = 1,065.00'	R = 250.00'
RO = SEE PLANS	RO = SEE PLANS	RO = SEE PLANS
e = SEE PLANS	e = SEE PLANS	e = SEE PLANS

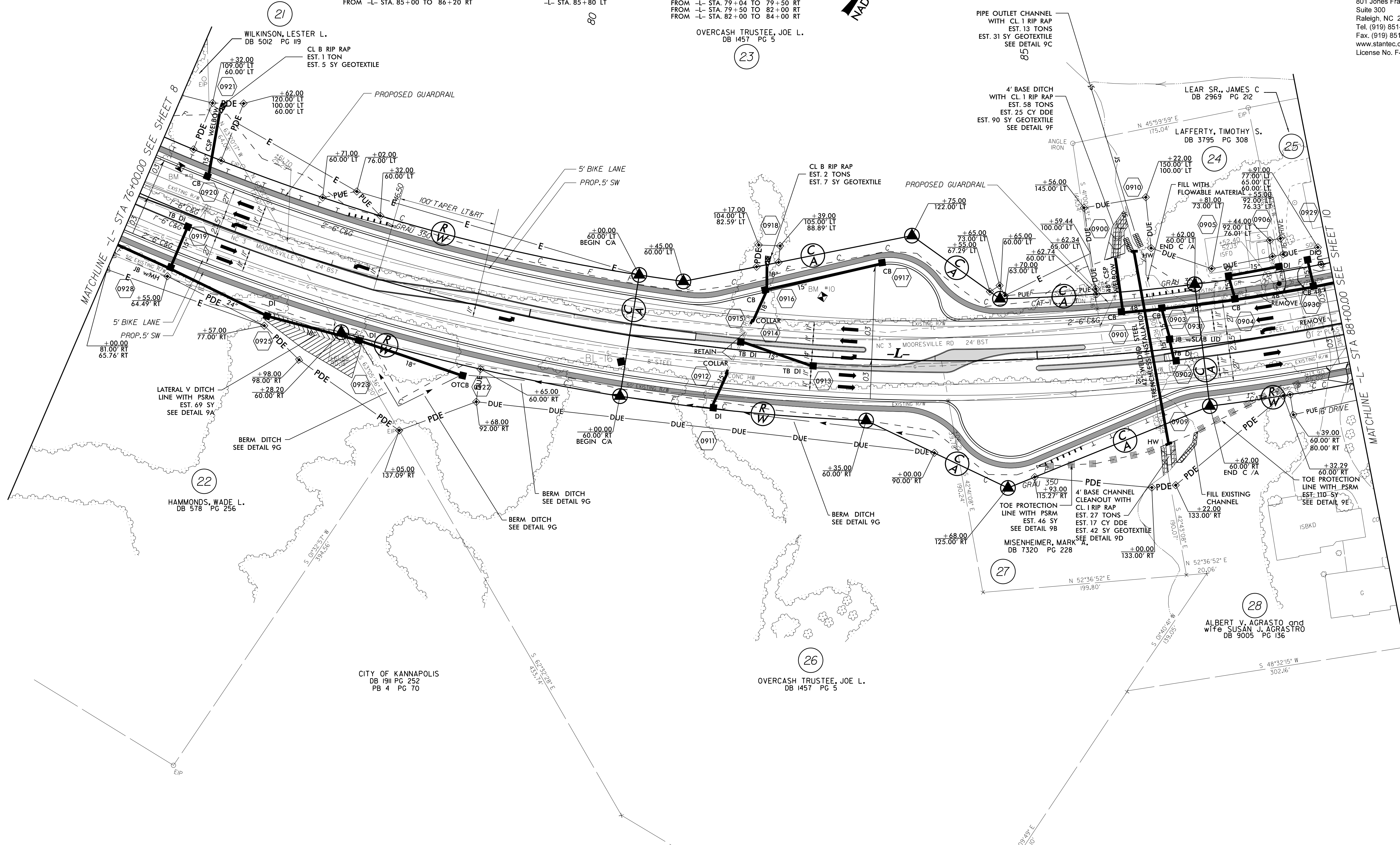


-L-

PI Sta 80+28.76
 $\Delta = 50^\circ 54' 39.2''$ (LT)
D = 2' 5" 53.2"
L = 1,777.13'
T = 952.04'
R = 2,000.00'
RO = 144'
e = .03



NOTE: SEE SHEET 17 FOR -L- PROFILE
SEE SHEET 2B-2 FOR -L- BULBOUT DETAIL



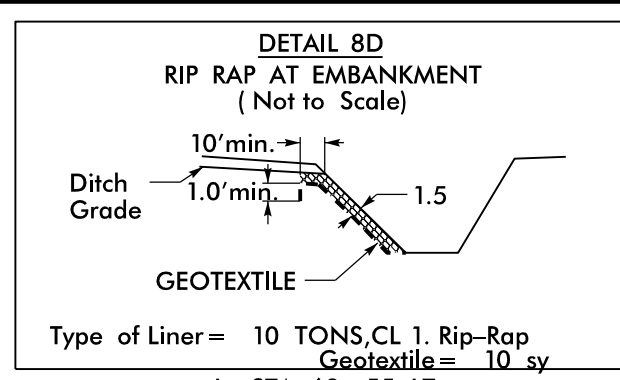
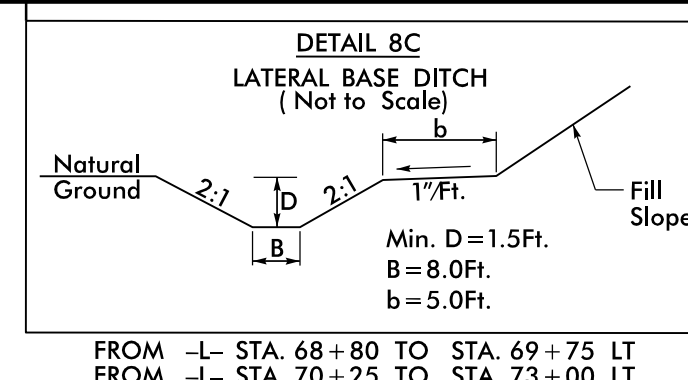
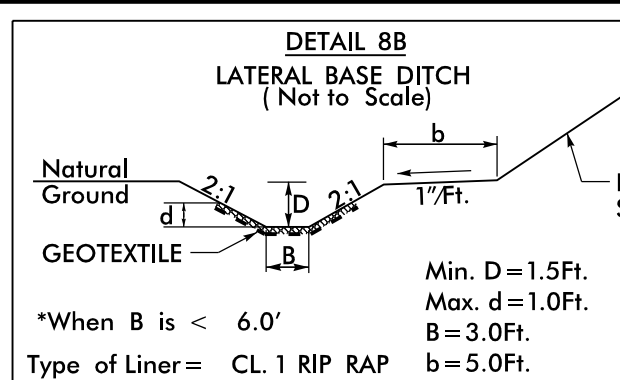
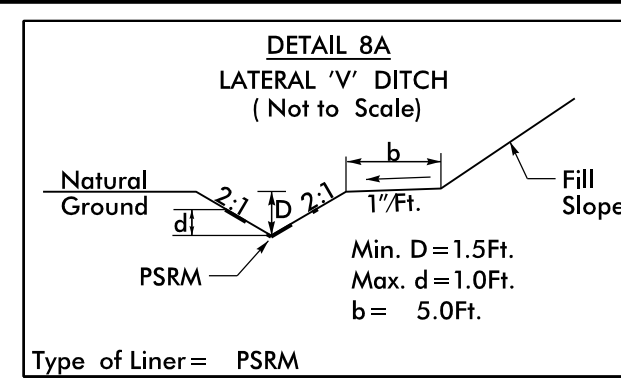
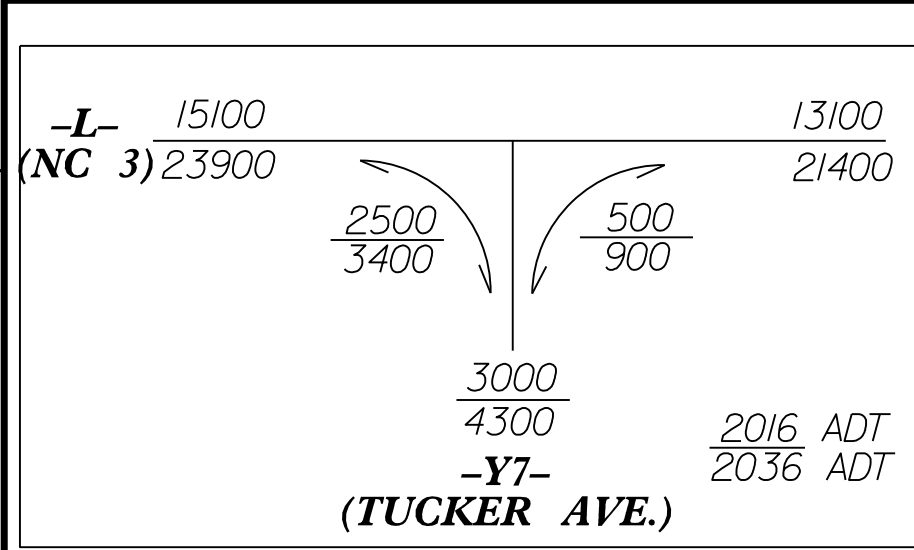
PROJECT REFERENCE NO.	SHEET NO.
U-3440	9
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



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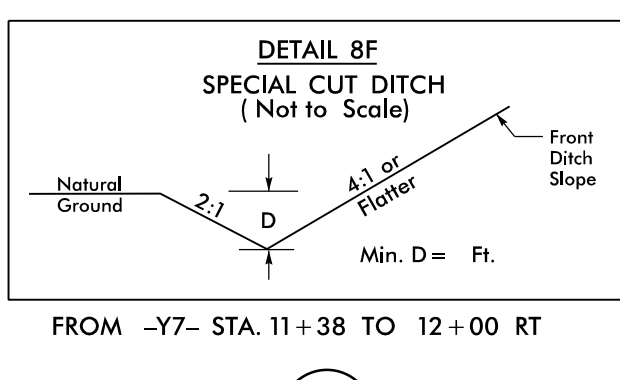
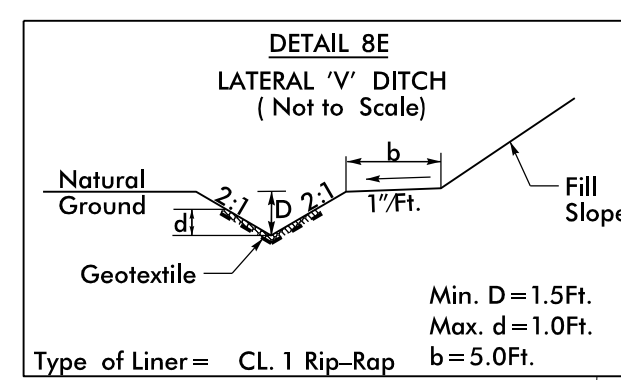
6/13/2016
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NOTE: SEE SHEET 16 THRU 17 FOR -L- PROFILE
SEE SHEET 21 FOR -Y7- PROFILE
SEE SHEET 2B-1 FOR -Y7- INTERSECTION DETAIL
SEE STRUCTURES SHEET S-1 THRU S-

**TRANSITION 1'-6" C&G TO 2'-9" C&G
-L- STA. 65+29.0 TO STA. 65+79.45 LT & RT
-L- STA. 70+76.71 TO STA. 71+24.71 LT & RT

*SEE DETAIL SHEET 2C-2
FOR CURB AND GUTTER
10' TRANSITION TO PAVED
SHOULDER



-L-
PI Sta 80+28.76
 $\Delta = 50^\circ 54' 39.2''$ (LT)
D = 2' 5' 53.2"
L = 1,777.13'
T = 952.04'
R = 2,000.00'
RO = 144'
e = .03

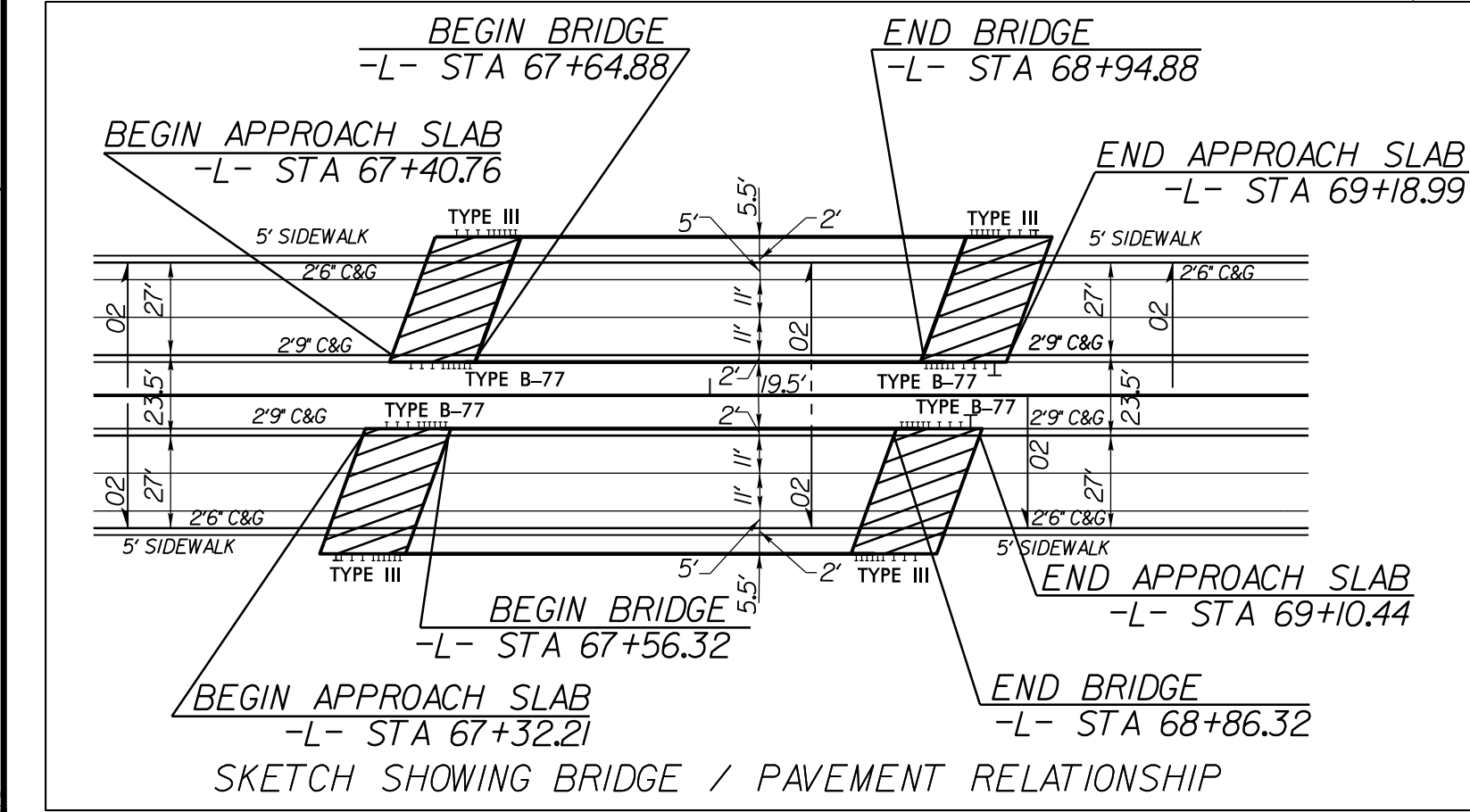
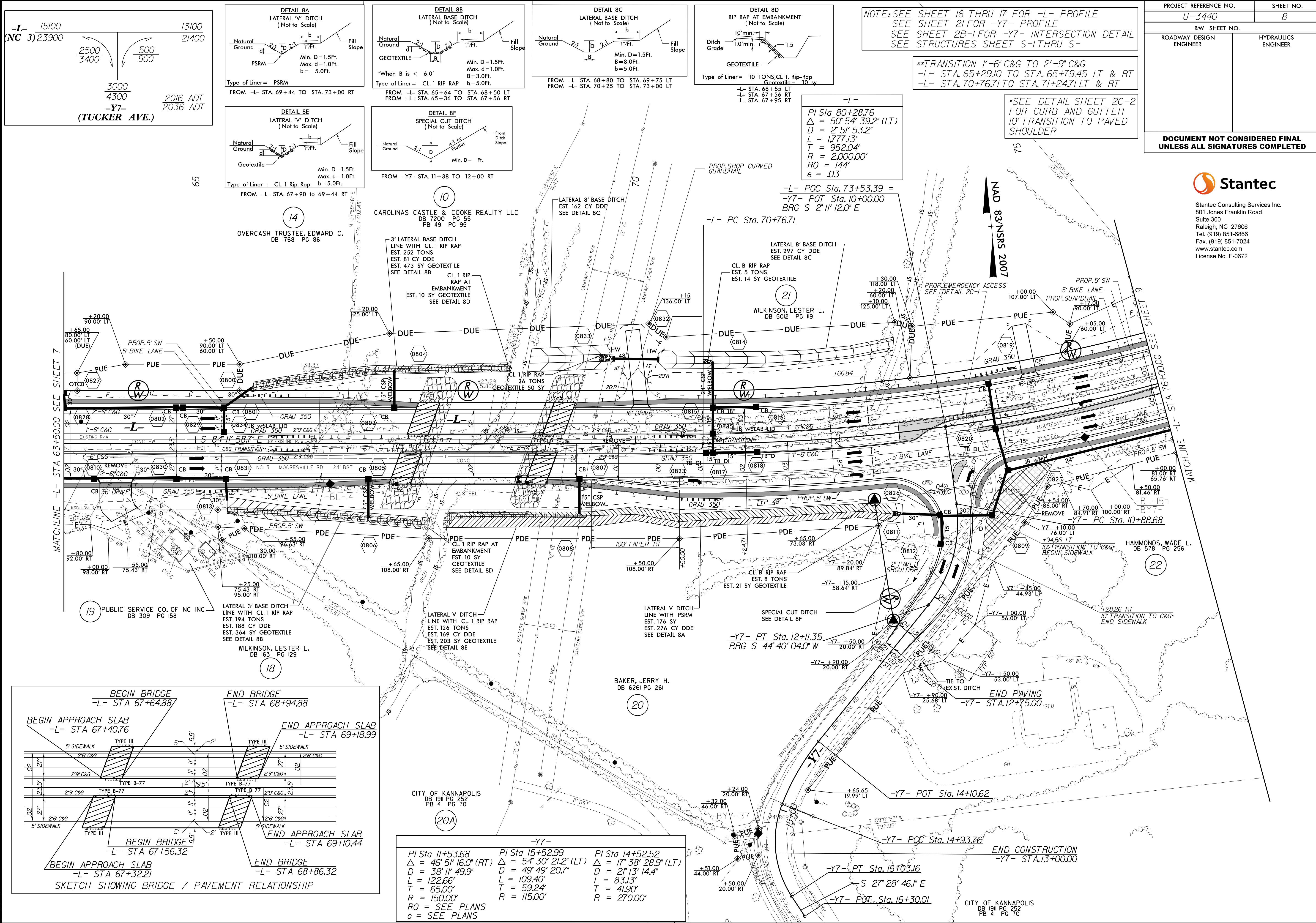
-L- POC Sta. 73+53.39 =
-Y7- POT Sta. 10+00.00
BRG S 2° 11' 12.0" E

-L- PC Sta. 70+76.71

(21)
WILKINSON, LESTER L.
DB 5012 PG 119

CL B RIP RAP
EST. 5 TONS
EST. 14 SY GEOTEXTILE

LATERAL 8' BASE DITCH
EST. 297 CY DDE
SEE DETAIL 8C



CITY OF KANNAPOLIS
DB 1911 PG 252
PB 4 PG 70

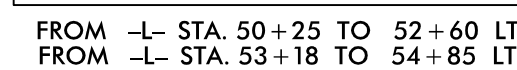
-Y7-		
PI Sta 11+53.68 $\Delta = 46^\circ 51' 16.0''$ (RT) D = 38' 11" 49.9" L = 122.66' T = 65.00' R = 150.00' RO = SEE PLANS e = SEE PLANS	PI Sta 15+52.99 $\Delta = 54^\circ 30' 21.2''$ (LT) D = 49' 49" 20.7" L = 109.40' T = 59.24' R = 115.00'	PI Sta 14+52.52 $\Delta = 17^\circ 38' 28.9''$ (LT) D = 21' 13" 14.4" L = 83.13' T = 41.90' R = 270.00'

PROJECT REFERENCE NO.		SHEET NO.
U-3440		8
RW SHEET NO.		HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER		
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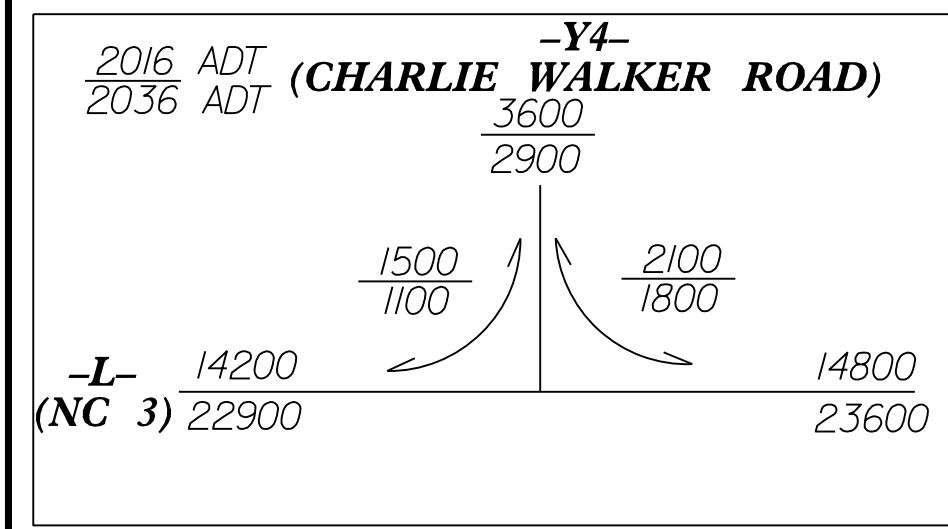
-L-
PI Sta 55+69.28
$\Delta = 2^\circ 44' 07.7''$ (RT)
$D = 0^\circ 28' 38.9''$
$L = 572.91'$
$T = 286.51'$
$R = 12,000.00'$
$e = NC (.02)$



MATCHLINE -L- STA 63+50.00 SEE SHEET 8

PROJECT REFERENCE NO.		SHEET NO.
U-3440		6
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

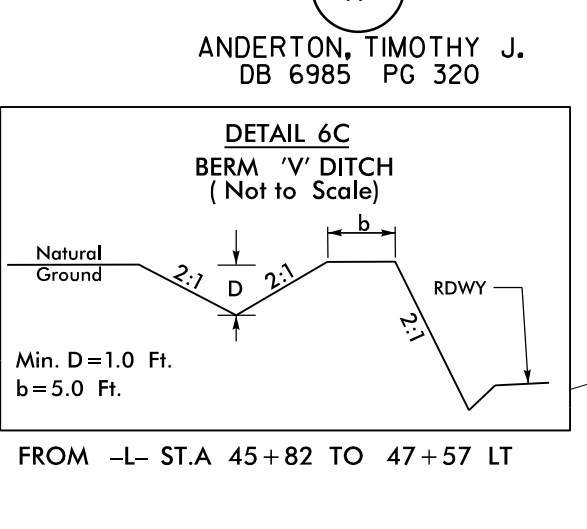
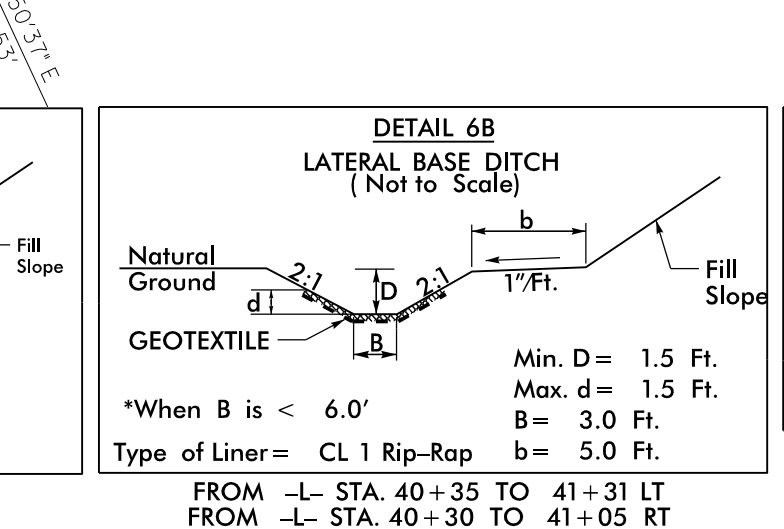
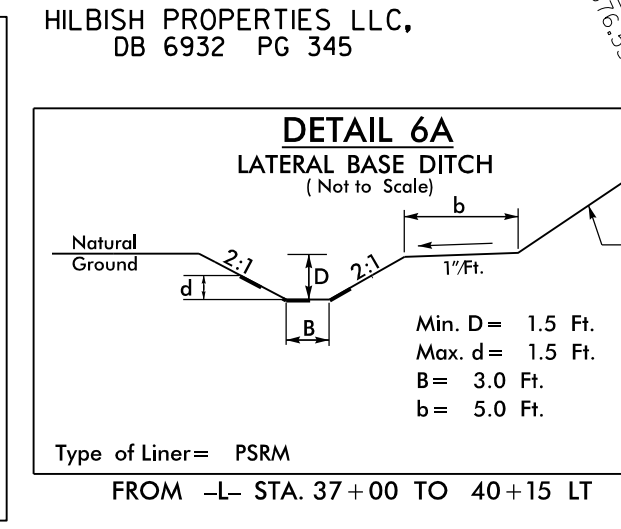
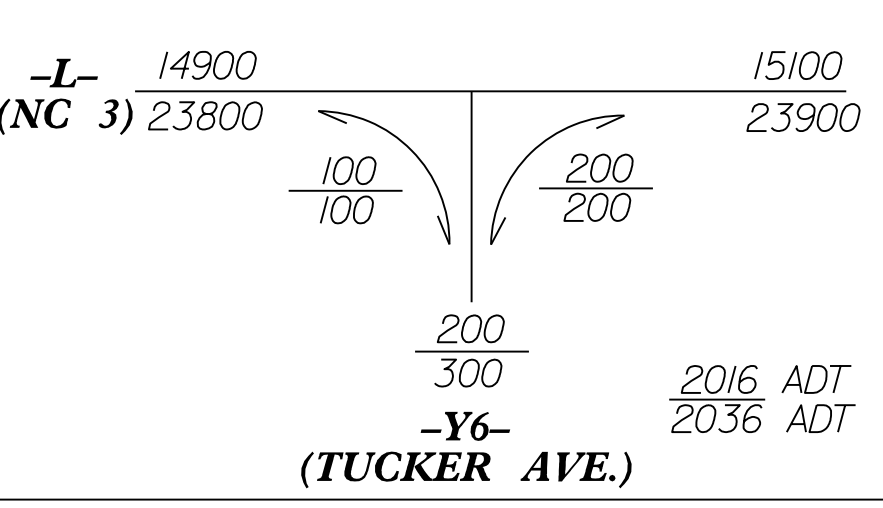
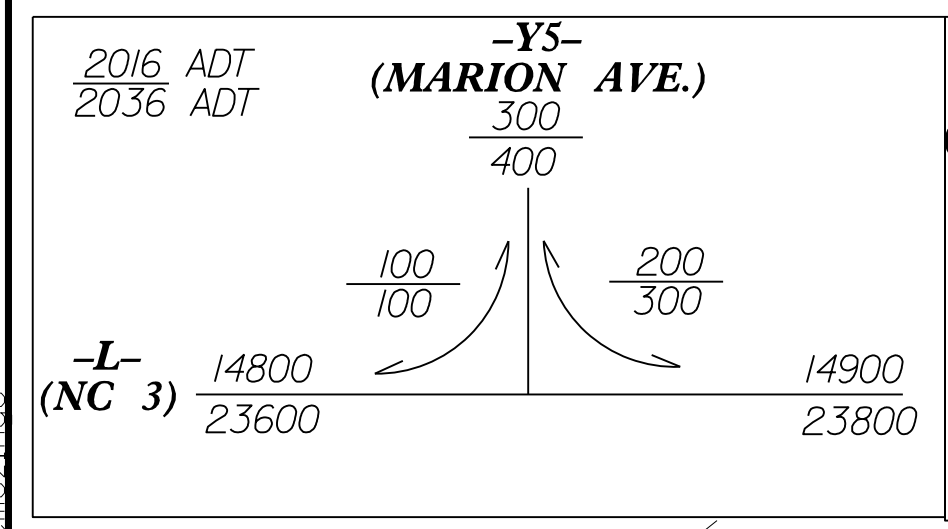
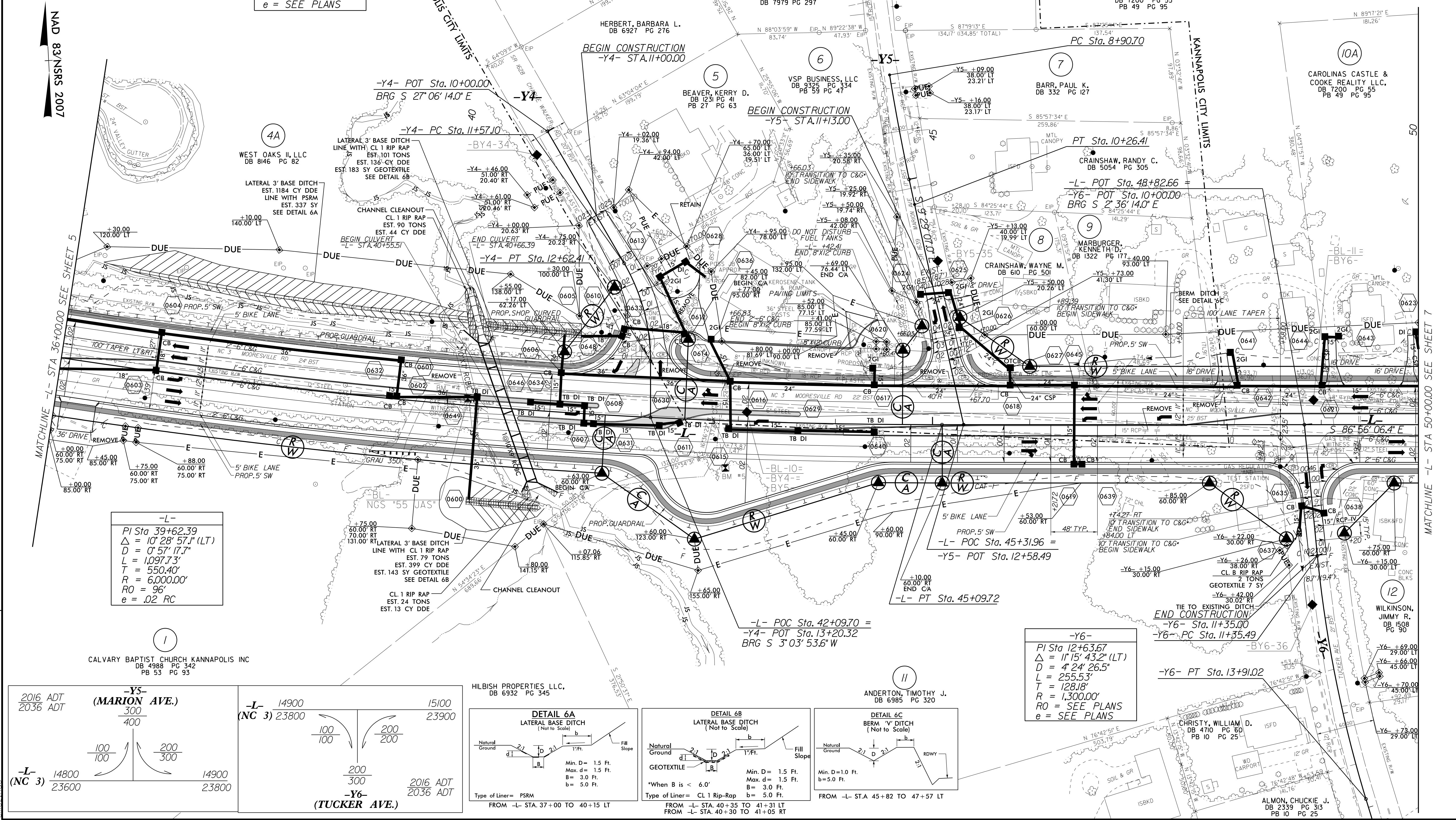
NOTE: SEE SHEET 15 THRU 16 FOR -L- PROFILE
SEE SHEET 21 FOR -Y4-, -Y5-, & -Y6- PROFILE
SEE SHEET 2B-1 FOR -Y4- INTERSECTION DETAIL
SEE CULVERT SHEET C-1 THRU C-



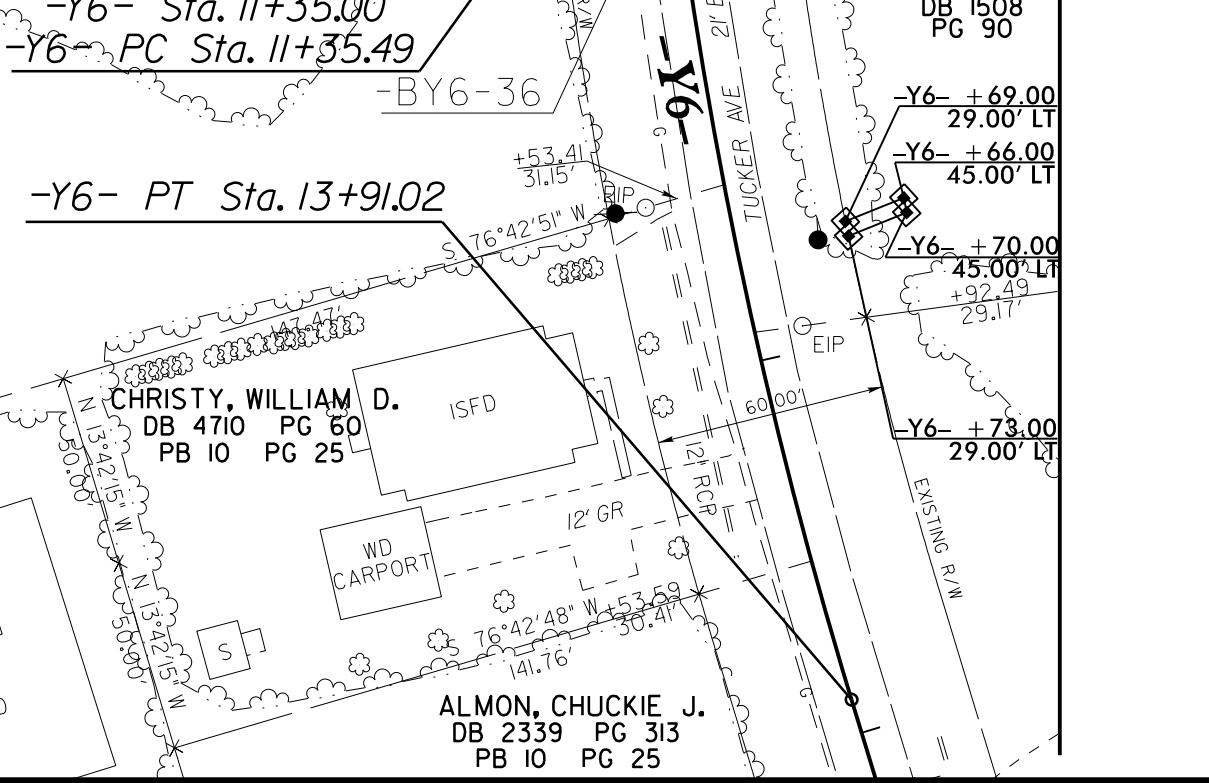
NOTE: DRIVEWAY RADII ARE 5 FT UNLESS OTHERWISE NOTED

-Y4-
PI Sta. 12+11.01
 $\Delta = 30' 10'' 07.6''$ (RT)
 $D = 28' 38'' 52.4''$
 $L = 105.31'$
 $T = 53.91'$
 $R = 200.00'$
RO = SEE PLANS
e = SEE PLANS

-Y5-
PI Sta. 9+58.57
 $\Delta = 3' 14'' 23.4''$ (LT)
 $D = 2' 23'' 14.4''$
 $L = 135.71'$
 $T = 67.87'$
 $R = 2,400.00'$

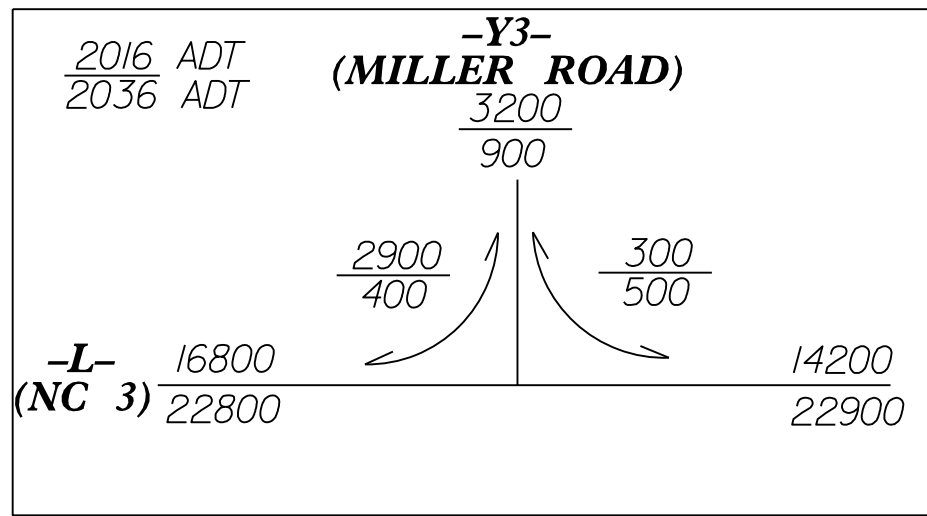


-Y6-
PI Sta. 12+63.67
 $\Delta = 11' 15'' 43.2''$ (LT)
 $D = 4' 24'' 26.5''$
 $L = 255.53'$
 $T = 128.18'$
 $R = 1,300.00'$
RO = SEE PLANS
e = SEE PLANS



8/17/99
6/13/2016
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smo2016

8/17/99



NOTE: SEE SHEET 15 FOR -L- PROFILE
SEE SHEET 20 FOR -Y3- PROFILE
SEE SHEET 2B-1 FOR -Y3- INTERSECTION DETAIL

PROJECT REFERENCE NO.		SHEET NO.
U-3440		5
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
</		

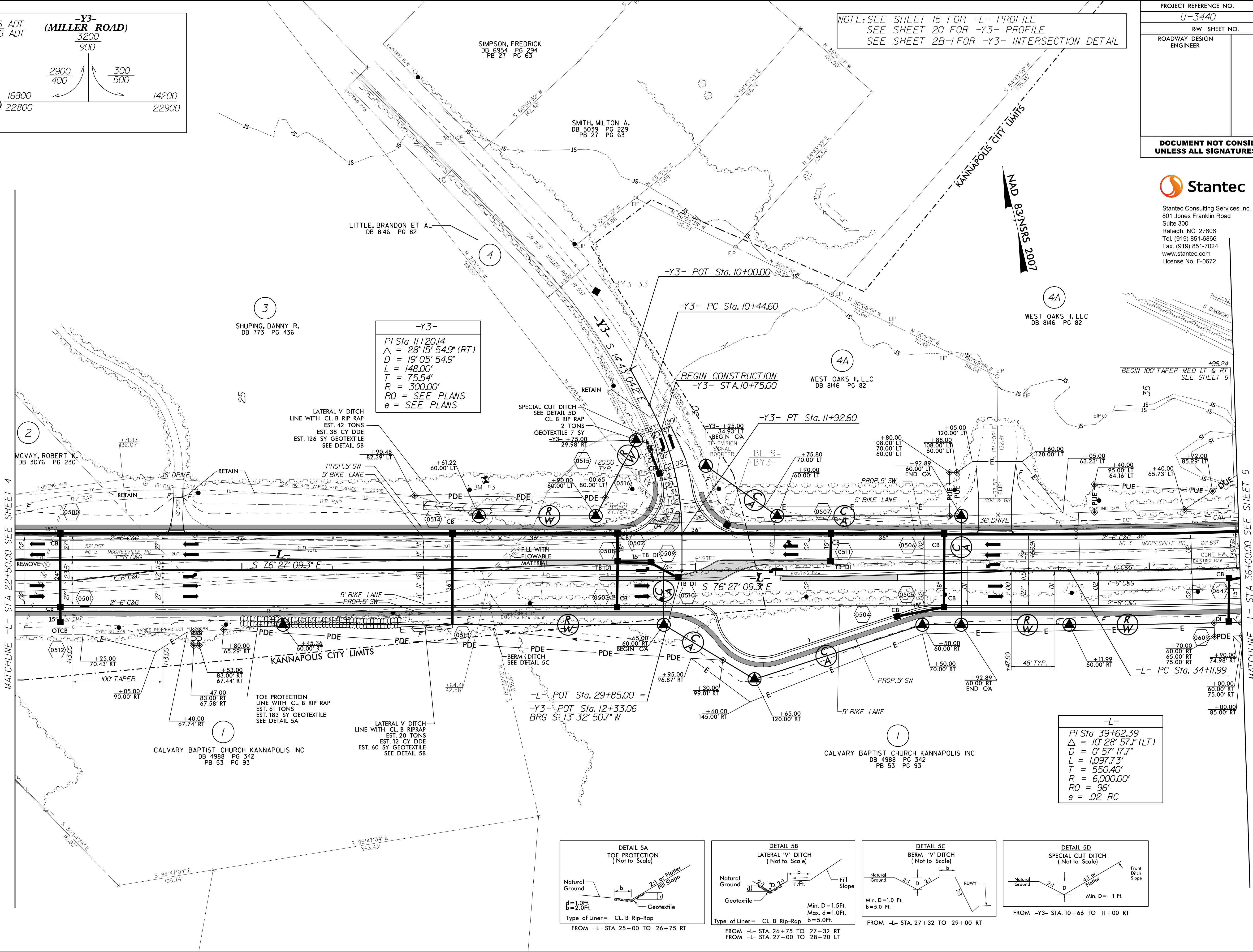


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REVISIONS

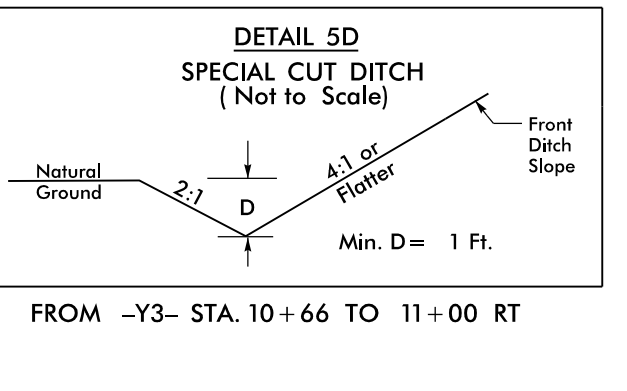
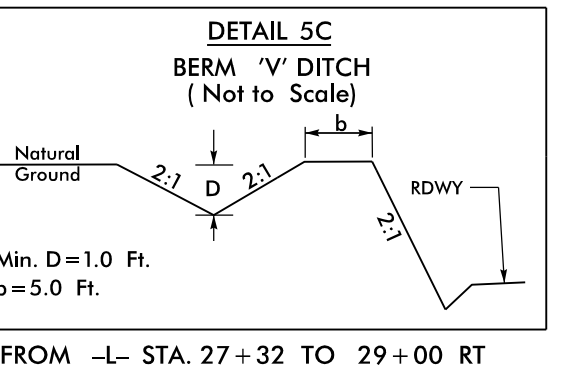
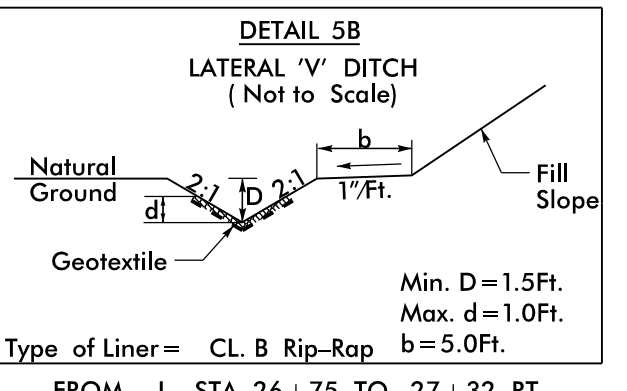
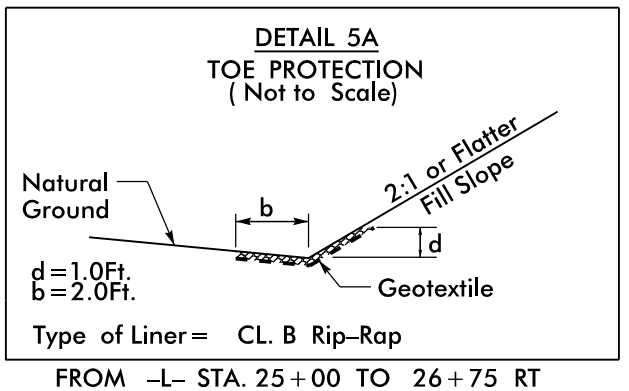
MATCHLINE -L- STA 22+50.00 SEE SHEET 4

MATCHLINE -L- STA 36+00.00 SEE SHEET 6



-Y3-
PI Sta. 11+20.14
 $\Delta = 28^\circ 15' 54.9''$ (RT)
 $D = 19^\circ 05' 54.9''$
 $L = 148.00'$
 $T = 75.54'$
 $R = 300.00'$
 $RO = \text{SEE PLANS}$
 $e = \text{SEE PLANS}$

-L-
PI Sta. 39+62.39
 $\Delta = 10^\circ 28' 57.1''$ (LT)
 $D = 0^\circ 57' 17.7''$
 $L = 1,097.73'$
 $T = 550.40'$
 $R = 6,000.00'$
 $RO = 96'$
 $e = .02$ RC



6/13/2016
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★ REVISED SIGNAL

DETAIL 4A
SPECIAL DITCH
(Not to Scale)

Type of Liner = PSRM

FROM -Y2- STA. 11+20 TO 12+30 RT

-L-
$PI\ Sta\ 15+20.75$
$\Delta = 4^{\circ}18'59.8" (LT)$
$D = 1^{\circ}08'45.3"$
$L = 376.69'$
$T = 188.44'$
$R = 5,000.00'$
$RO = 96'$
$e = .02\ RC$

2

-L- POT Sta. 17+34.33 =
-Y2- POT Sta. 10+00.00
BRC S 13° 34' 24" W

-L- PT Sta. 17+09.01

16' DRIVE

THIGPEN, ALTON H.
DB 405 PG 45
DB 5198 PG 114

Diagram illustrating the layout of Boy Scout Camp Road, showing distances and directions:

- Top left: $\frac{-L-}{(NC\ 3)}$
- Top right: $\frac{16000}{22200}$
- Bottom left: $\frac{900}{2000}$
- Bottom center: $\frac{2600}{4600}$
- Bottom right: $\frac{1700}{2600}$
- Far right: $\frac{16800}{22800}$
- Bottom right (ADT): $\frac{2015}{2035}$ ADT
- Bottom center: $\frac{-Y2-}{(BOY\ SCOUT\ CAMP\ ROAD)}$

-Y-	-YI-
<i>PI Sta 12+39.04</i>	<i>PI Sta 12+31.09</i>
$\Delta = 8' 47'' 42.0''$ (RT)	$\Delta = 8' 47'' 42.0''$ (RT)
$D = 2' 01'' 29.1''$	$D = 1' 59'' 07.6''$
$L = 434.38'$	$L = 442.97'$
$T = 217.62'$	$T = 221.92'$
$R = 2,829.79'$	$R = 2,885.79'$
$RO = \text{SEE PLANS}$	$RO = \text{SEE PLANS}$
$e = \text{SEE PLANS}$	$e = \text{SEE PLANS}$

(15000)

(15000)

(15400)

(NC 3) 14800 20600 16000 22200

5700 / 7000 6900 / 8200

12600 / 19800 2016 ADT / 2036 ADT

-Y- & -YI-
(KANNAPOLS PARKWAY)

-YI- STA. 10+85.11 (12.33' RT)
MEDIAN PAVING LIMITS
BETWEEN -Y- & -YI-

MULLIS, VIC A.
DB 7195 PG 196

-YI- PC Sta. 10+09.17

END CONSTRUCTION
-YI- STA.12+25.00

SPECIAL GRADE TAIL DITCH
LINE WITH PSRM
EST. 77 SY
SEE DETAIL 4A

END CONSTRUCTION
Y2 STA 12+30

-Y2- POT Sta. 13+06.23

-L- POT Sta. 10+00.00

LINDA D
096 PG 1
25 PG 3

ABC PARKWAY LL
DB 8303 PG 122

-Y- POT Sta. 10+00.00
-L- POT Sta. 11+93.26
BPC S 5° 31' 35" W

-Y- PC Sta 10+21.42

END CONSTRUCTION

R/W)

10' TRANSITION FROM 4'PS TO C&G
SEE DETAIL - SHEET 2C-2
BEGIN SIDEWALK

-1- PC Sta 13+32.32

COSENTINO, FRANCIS M.
DB 4229 PG 100

-YI- POT Sta. 10+00.00
-L- POT Sta. 12+50.58
PDC 6 5° 34' 35" W

+98.56 (-YI-)
10' TRANSITION TO C&G*
BEGIN SIDEWALK
MATCH EXISTING PAVING LIMITS ON -YI-

$$-YI = PC \text{ Sta } 10+09.17$$

END CONSTRUCTION
-YI- STA.12+25.00

CORNERSTONE BAPTIST CHURCH
DB 3620 PG 297

PI Sta 12+31.09
$\Delta = 8^{\circ} 47' 42.0''$ (RT)
$D = 1^{\circ} 59' 07.6''$
$L = 442.97'$
$T = 221.92'$
$R = 2,885.79'$
RO = SEE PLANS

PI Sta 12+31.09
$\Delta = 8^{\circ} 47' 42.0''$ (RT)
$D = 1^{\circ} 59' 07.6''$
$L = 442.97'$
$T = 221.92'$
$R = 2,885.79'$
RO = SEE PLANS

REVISIONS

5/13/2016
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smozingo