



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

June 9, 2011

U. S. Army Corps of Engineers
Regulatory Field Office
151 Patton Avenue, Room 208
Asheville, NC 28801-5006

ATTN: Ms. Sarah Elizabeth Hair
NCDOT Coordinator

Dear Madam:

Subject: **Application for an Individual Section 404 and Section 401 Water Quality Certification** for the I-85/485 Interchange Modification in Mecklenburg County. Federal Aid Project No. MAF-117-1(3), Division 10, TIP No. R-2123CE. Debit \$570 from WBS 34379.1.17.

The North Carolina Department of Transportation (NCDOT) proposes to upgrade and modify the existing three-leg, free flow 'trumpet' I-85/I-485 interchange to a full directional free-way interchange (TIP No. R-2123CE) using a 'turbine' design. Existing culverts and pipes will be extended to accommodate the interchange modification in addition to installation of new pipes.

Please see the enclosed ENG 4345, Ecosystem Enhancement Program (EEP) mitigation acceptance letter, Concurrence Point 4B and 4C meeting minutes, Biological Opinion, State Stormwater Management Plan (SMP), permit drawings, design plans, and information related to jurisdictional delineations and re-verification.

Purpose and Need:

The purpose of this project is to complete the Charlotte Outer Loop (I-485) by modifying the existing three-leg, free flow 'trumpet' I-85/485 interchange to full directional free-way interchange. TIP Project No. R-2123CE and adjoining TIP Project No. R-2248E are the remaining two segments needed to complete the Charlotte Outer Loop (I-485), a circumferential freeway around the City of Charlotte.

Project Description:

The proposed project involves the modification of the existing three-leg, free flow 'trumpet' I-85/485 interchange to full directional free-way interchange with appropriate widening and tie ins along I-85 and I-485. The northern terminus of the project ends in Cabarrus County. The project proposes to construct a turbine interchange at the junction of I-485 and I-85, northeast of Charlotte, North Carolina.

The Mallard Creek Road (SR 2467) bridge over I-85, located just to the north of the proposed interchange modification, must be realigned and expanded as part of this project. To accommodate the new bridge, 0.43 miles of Mallard Creek Road will also be realigned, shifting the road slightly to the north of its existing location. The overpass to be replaced at Mallard Creek Road/I-85 is only a bridge replacement to accommodate additional lanes required for the proposed turbine I-85/I-485 interchange.

The interchange modification design and construction for TIP No. R-2123CE is being coordinated with TIP No. R-2248E, which completes the Charlotte Outer Loop and connects from NC 115 to I-85. The Section 404 Individual Permit application for TIP No. R-2248E was submitted to the US Army Corps of Engineers on April, 29, 2011.

Project design and construction coordination have also occurred with TIP No. I-3803B. This project is located north of TIP No. R-2123CE and involves widening I-85. TIP No. R-2123CE project will construct the stubouts for the lanes merging onto I-85 northbound from I-485 and exiting I-85 towards I-485. The Section 404 Individual Permit application for TIP No. I-3803B was submitted to the USACE on March 29, 2011.

Summary of Jurisdictional Impacts:

The project will permanently impact 0.79 acre of wetlands, 5,999 feet of streams (0.83 acre), and temporarily impact 340 feet (0.09 acre) of streams.

Summary of Utility Impacts:

One sewer line will be relocated. This work is in the same permit area of the stream relocation associated with Permit Site 15.

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. Detailed descriptions of these actions are presented in the mitigation portion of this application. The EEP will provide compensatory mitigation for all permanent impacts to waters of the US.

NEPA DOCUMENT STATUS

In 1989, the Federal Highway Administration (FHWA) approved and published a Final Environmental Impact Statement (FEIS) for extending I-485 from US 74 to I-85. The TIP project number for this project was R-2123. The R-2123 study included an analysis for modifying the existing trumpet interchange that connected US 29 and I-85. All of TIP No. R-2123 has been constructed except for the interchange modification, and this section is referred to as construction segment CE of R-2123.

Updated traffic volume projections were completed during the extensive coordination process associated with completing these projects. As a result of the updated traffic projections, operational deficiencies

were identified with the preliminary design (modified cloverleaf) of the interchange modification that was evaluated in the 1989 R-2123 FEIS.

Therefore a Categorical Exclusion was created to encompass this deficiency as well as update the document. This Categorical Exclusion was signed on November 30, 2009. The project design for the Categorical Exclusion involved a four-level interchange design to handle increased traffic volumes for construction segment TIP No. R-2123CE.

As noted previously, the design and construction of TIP No. R-2123CE has been coordinated with TIP No. R-2248E (I-485 from NC 115 to I-85) and TIP No. I-3803B (I-85 northbound from I-485 and exiting I-85 towards I-485).

The NCDOT placed the project out to construction through its Design-Build delivery mechanism. During its project design to secure the construction contract, the Design Build Team designed a 4-Level Stack interchange as described in the Categorical Exclusion for the project. The Design Build Team realized there were challenges associated with this interchange design. Challenges associated with the 4-Level Stack interchange included:

- High Bridges Over Heavy Traffic
- Traffic Restrictions
- Girder Erection/Splices Over Traffic
- Tall Mechanically Stabilized Earth Walls
- Stability Issues/Heavy Falsework Potential
- 2,000,000 yards of borrow material from off-site source
- Existing Interchange Conflicts
 - Maintenance of Traffic Requires Out of Sequence Bridge Construction
 - Bridge Construction Sequence Restricts Crane Access

With these challenges in mind, the Design Build Team realized that a turbine interchange would provide many benefits, and still meet the project's purpose and need. Benefits associated with the turbine design for TIP No. R-2123CE included:

- Flatter Roadway Profiles
- Smaller Embankments and MSE Walls
- Earthwork Balanced - Eliminates On-Road Hauling of Borrow
- Reduces Amount of Borrow Material
- Improved Sight Distance at Bridges
- Reduced Impacts:
 - Environmental – greatly reduced impacts to Stony Creek compared to 4-Level
 - Right of Way
 - Utilities
- Simpler Construction – No High-Level Flyover Bridges
- Safer I-85 Work Zone (includes On-Site Detour)
- Ease of Future Widening – to the inside lane area
- Reduced Impacts to Habitat for Schweinitz's Sunflower along Mallard Creek Road

In compliance with the NEPA/404 Merger Process, Concurrence Point 4B was reached on February 9, 2011 and through a field review on February 16, 2011. Concurrence Point 4C was reached April 13, 2011.

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 a usable and a reasonable expenditure, even if no additional transportation improvements are made in the area; and,
- (3) The project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

RESOURCE STATUS

Streams, creeks, and tributaries in the project study area are part of the Yadkin-Pee Dee River basin (USGS Hydrologic Unit 03040105; NCDWQ Subbasin 03-07-11). Stony Creek is located in the southern portion of the project area and provides the drainage for the majority of the proposed interchange. Unnamed tributaries to Rocky River provide drainage for the far northern portion of the project study area. There are no High Quality Waters (HQW), Outstanding Resource Waters (ORW), or Water Supply Watersheds (WS-I, WS-II, WS-III, or WS-IV) within 1.0 mile of the project area.

303(d) List

Stony Creek is a 303(d) listed (approved August 31, 2010). The reason for the rating is the fair bioclassification for ecological/biological integrity benthos.

Jurisdictional Determinations

Wetland determinations and streams within the study area of TIP No. R-2123CE were conducted using the field delineation method outlined in the 1987 Corps of Engineers Wetland Delineation Manual. Three jurisdictional wetlands were identified within the project study area based upon the Wetland Delineation Manual. The Corps of Engineers completed a review of the jurisdictional delineation on June 23, 2010.

An additional wetland has been added to the TIP No R-2123CE project. This wetland was originally included in the wetland delineation for TIP R-2248E (Site V). This wetland was reviewed by the Corps of Engineers on June 23, 2010.

Fifteen jurisdictional streams were identified in the project study area. The Corps of Engineers completed a review of the jurisdictional delineation (JD) on June 23, 2010.

Two additional streams have been included in TIP No. R-2123CE. These streams were originally included with TIP No. R-2248E. These streams were reviewed by the Corps of Engineers on June 23, 2010.

The NCDOT requests a final jurisdictional determination to be issued with the issuance of this permit.

IMPACTS TO WATERS OF THE U.S.

Tables 1A and 1B summarize the impacts to jurisdictional water resources. Site numbers correspond with the permit (hydraulic) drawings included in this application. The stream and wetland numbers correspond to the Figure 1 in the Categorical Exclusion, except Wetland Number V and Stream Numbers 22 and 23. These three sites were part of the delineation for TIP No. R-2248E, and they will be impacted by the TIP No. R-2123CE project as the end of TIP No. R-2123CE was shifted for construction purposes. A brief description of each impact site follows the tables.

Table 1A – R-2123CE Wetland Impacts

Permit Site	Wetland JD Reference	Wetland Size (ac)	Permanent Fill in Wetlands (ac)	Mechanized Clearing (ac)	Temporary Fill (ac)	Total Impacts (ac)	Mitigation Required (ac)
2	SA	0.04	0.04	0.00	0.00	0.04	0.08
4	CH	0.72	0.72	0.00	0.00	0.72	1.44
10	V#	0.02	0.02	0.00	0.00	0.02	0.04
14	CF	0.01	0.01	0.00	0.00	0.01	0.02
Total Impacts			0.79	0.00	0.00	0.79	1.58

* All wetlands impacted are riparian

notes that this wetland was originally in the study area for TIP No. R-2248E.

Table 1B. Impacts to jurisdictional streams

Permit Site No.	Stream Name	Stream JD Reference	Impact Type	Impact Length (linear feet)	Temporary Impacts (acre)	Mitigation Requirement
1	UT1 to Stony Creek (P)	BD	Perm. fill	49	0.01	USACE
			Bank Stabilization	--	--	--
			Temp. fill	--	--	--
2	UT to Stony Creek (P)	SB	Perm. fill	1,069	0.06	USACE & DWQ
			Bank Stabilization	63	--	DWQ ^{a/}
			Temp. fill	47	0.01	--
3	UT to Stony Creek (P)	SB	Perm. fill	239	0.03	USACE & DWQ
			Bank Stabilization	--	--	--
			Temp. fill	--	--	--
4	n/a wetland only					
5	Stony Creek	Stony Creek	Permanent fill	456	0.27	USACE & DWQ
			Bank Stabilization	195	--	DWQ ^{a/}
			Temporary fill	27	0.01	--
6	Stony Creek	Stony Creek	Permanent fill	80	0.03	USACE
			Bank Stabilization	--	--	--
			Temporary fill	92	0.04	--
7	UT to Stony Creek (I)	BA	Permanent fill	1,461	0.14	USACE, DWQ
			Bank Stabilization	--	--	--
			Temporary fill	37	<0.01	--
8	UT to Stony Creek (I)	BC	Permanent fill	280	0.03	USACE, DWQ
			Bank Stabilization	--	--	--
			Temporary fill	11	<0.01	--
9	UT to Stony Creek (I)	BB	Permanent fill	147	0.01	USACE
			Bank Stabilization	--	--	--
			Temporary fill	16	<0.01	USACE
10	UT to Stony Creek (I)	23 #	Permanent fill	276	0.02	USACE & DWQ
			Bank Stabilization	10	--	DWQ ^{a/}
			Temporary fill	20	<0.01	--
11	UT to Stony Creek (I)	22 #	Permanent fill	45	0.01	USACE
			Bank Stabilization	10 ^c	--	--
			Temporary fill	11	<0.01	--
12	UT to Stony Creek	CD	Permanent fill	151	0.01	USACE & DWQ
			Bank Stabilization	--	--	--
			Temporary fill	--	--	--
13	UT to Stony Creek	CM	Permanent fill	48	<0.01	USACE
			Bank Stabilization	--	--	--
			Temporary fill	--	--	--
14	UT to Stony Creek	CEC	Permanent fill	554	0.07	USACE & DWQ
			Bank Stabilization	--	--	--
			Temporary fill	20	<0.01	--
15	UT to Stony Creek	CEC	Permanent fill	198	0.03	USACE & DWQ
			Bank Stabilization	--	--	--
			Temporary fill	10	<0.01	--
16	UT to Rocky River (P)	UT10	Permanent fill	524	0.07	USACE & DWQ
			Bank Stabilization	--	--	--
			Temporary fill	23	<0.01	--
17	UT to Rocky River (P)	UT10A	Permanent fill	62	0.04	USACE
			Bank Stabilization	82 ^c	--	--
			Temporary fill	26	0.01	--
Total Temporary Impacts:				--	0.09 ^{b/}	--
Total Permanent Impacts (Perm. Fill + Bank Stabilization):				5,999	--	--
Permanent Impacts Requiring DWQ Mitigation (1:1):				5,476	--	--
Permanent Impacts Requiring USACE Mitigation (2:1):				5,639	--	--
Total Impacts Requiring Mitigation (2:1):				5,639	--	11,278 ⁺

^{a/} Mitigation for bank stabilization impact required by DWQ – not required by USACE.

^{b/} Value based on rounding, due to some of the individual impacts being <0.01 acre.

^{c/} Permanent impact <150' therefore mitigation for bank stabilization impact not required by DWQ.

⁺ Mitigation proposed by NCDOT (based on mitigation required by the USACE exceeding the amount required by DWQ).

Pipe, culvert and reinforced concrete box extensions associated with project construction will not be buried 20% of the pipe diameter below the natural streambed up to 1 foot as the streams begin within the existing project limits. The only exception to this is Permit Site 8, which will be buried 20% of the pipe diameter below the natural streambed up to 1 foot. These items were noted in discussions for Concurrence Point 4C, and will not be buried as they are located at the beginning of the stream jurisdictionally or will be extending existing structures that are not buried.

Permit Site 1: A 48" reinforced concrete pipe (RCP) will be installed to connect an existing 48" reinforced concrete pipe (RCP) with the 5' x 5' Reinforced Concrete Box Culvert (RCBC). There is 49 feet of channel impact.

Permit Site 2: This site involves stream and wetland impacts. The stream will be placed under fill for I-85 and for I-485 and into a 48" RCP (totaling 1,069 feet) with an additional 63 feet of bank stabilization and a temporary stream impact of 47 feet. The stream begins under the proposed fill for I-485. The wetland impact is a total loss of 0.04 acre.

Permit Site 3: This site will impact 239 feet of stream. The stream will be placed under fill for I-485 and into a 42" RCP.

Permit Site 4: As a result of the project, this wetland will be impacted. The entire wetland is not filled by project construction, but it is considered a total loss (0.72 acre) since it is inside the interchange.

Permit Site 5: The existing culvert (2-9' x 10') under I-85 to convey Stony Creek will be extended. The downstream end of the Stony Creek will be relocated to properly align the flow of Stony Creek out the culvert. No on-site mitigation credit is requested, and monitoring of the stream relocation will be not be required. The culvert extension requires 456 feet of impact with 195 feet of bank stabilization and 27 feet of temporary impact.

Permit Site 6: The existing 2-11' x 10' culvert will be retained. Impacts to Stony Creek involve temporary stream impacts upstream of the culvert to install an overflow stream channel that leads to a 12' x 14' culvert overflow, and then there are downstream impacts (80 feet) to install the overflow channel and place rip rap below ordinary water line at the outlet side of the culvert (right bank only – looking downstream). There is an additional 92 feet of temporary stream impact.

Permit Site 7: This site lies within the gore area of Ramp E. Stream impacts involve channel relocation (without mitigation credit) and placing the stream under Ramp G and E. Water will be conveyed through a 72" and then a 84" RCP. A field visit was made to review the on-site stream mitigation potential during Concurrence Point 4B. At Concurrence Point 4C, the NCDOT noted its concerns about on-site mitigation at Permit Site 7. No on-site stream mitigation credit will be sought for the channel relocation. Total stream loss is 1,461 feet with an additional 37 feet of temporary stream impact.

Permit Site 8: Ramp E (as the traffic moves from I-485 West onto I-85 North) requires filling and piping (66" RCP) the stream, and this causes a stream loss of 280 feet. There is an additional 11 feet of temporary stream impact.

Permit Site 9: This impact is also associated with Ramp E construction. The channel will be filled with water diverted into a base ditch before entering the pipe (66" RCP) under Ramp E. The stream loss at Site 9 totals 147 feet, and a temporary stream impact of 16 feet.

Permit Site 10: The impact area begins at the jurisdictional stream's origin and also involves a wetland impact. The stream reach and wetland will be filled by the proposed project. There is also a stream impact associated with the overflow pipe from the stormwater best management practice (BMP). Stream loss totals 276 feet from the corrugated steel pipe (CSP) with 10 feet of bank stabilization and 20 feet of temporary stream impact. The wetland impacts total 0.02 acre, a total wetland impact.

Permit Site 11: The impact area begins at the jurisdictional stream's origin as the stream reach will be filled by the proposed project. Stream loss totals 45 feet from the RCP with 10 feet of bank stabilization and 11 feet of temporary stream impact.

Permit Site 12: The stream reach begins at the outlet of a 24" corrugated metal pipe (CMP). The stream reach will be filled by extending the CMP, and then the remaining portion of the channel is being relocated into a base ditch. The impact is a total stream loss totaling 151 feet.

Permit Site 13: The stream reach begins just upslope of the existing 36" RCP which conveys water under I-85. The existing 36" RCP will be extended, and the stream impact totals 48 feet.

Permit Site 14: Construction of the project necessitates impacts to the stream and a total wetland take (0.01 acre) located along I-85 southbound. Due to topography constraints, it was not practicable to implement natural channel design for this impact/ relocation. On-site stream mitigation credit will not be sought for this stream relocation, and there will be no monitoring of the stream relocation. The stream loss total is 554 feet, and there is 20 feet of temporary stream impact.

Permit Site 15: The stream reach is being relocated as it will be filled in to accommodate project construction. On-site stream mitigation credit will not be sought for this stream relocation, and there will be no monitoring of the stream relocation. Due to the stream's location along the project and the sewer line crossing of the stream at this location, it was not considered practicable to implement natural channel design for this impact/ relocation. The stream loss total is 198 feet, and there is 10 feet of temporary stream impact.

Permit Site 16: The stream reach is being relocated as it will be filled in to accommodate project construction. On-site stream mitigation credit will not be sought for this stream relocation. Due to topography constraints, it was not practicable to implement natural channel design for this impact/ relocation. The stream loss total is 524 feet, and there is 23 feet of temporary stream impact.

Permit Site 17: The existing box culvert (6' x 8') is being extended to accommodate widening of I-85. Stream impacts at this site involve 62 feet from the culvert extension, 82 feet of bank stabilization and 26 feet of temporary impact.

MORATORIUM

No moratoriums are required by the U.S. Fish and Wildlife Service (USFWS) or the North Carolina Wildlife Resources Commission (NCWRC).

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 September 22, 2010, the USFWS lists four (4) federally protected species for Mecklenburg and Cabarrus County (Table 2).

Table 2. Federally Protected Species for Mecklenburg and Cabarrus County

All federally protected species for Mecklenburg and Cabarrus have an “Endangered” status.

Scientific Name	Common Name	County	Habitat Present	Biological Conclusion	Last Survey Date
<i>Echinacea laevigata</i>	Smooth coneflower	Mecklenburg	Yes	No Effect	September 2010
<i>Helianthus schweinitzii</i>	Schweinitz’s sunflower	Cabarrus & Mecklenburg	Yes	May Affect - Likely to Adversely Affect	September 2010
<i>Rhus michauxii</i>	Michaux’s sumac	Mecklenburg	Yes	No Effect	September 2010
<i>Lasmigona decorata</i>	Carolina heelsplitter	Cabarrus & Mecklenburg	Yes	May Affect - Not likely to Adversely Affect	June 2008

Habitat for each federally protected species was present in the project study area. The NCDOT completed a Biological Assessment (BA) for the project to review the proposed TIP No. R-2123CE in sufficient detail to determine whether it may affect any of the endangered, species listed in Table 2. A Biological Opinion, which is attached to this application, was issued by the US Fish and Wildlife Service on March 24, 2010, concurring with the Department’s findings.

A biological conclusion of ‘May Affect - Not likely to Adversely Affect’ was rendered for the Carolina heelsplitter in June 2008. Although no heelsplitters were located in any project study streams, Stony Creek meets habitat requirements and has associate species of the Carolina heelsplitter.

A Biological Opinion of ‘May Affect - Likely to Adversely Affect’ was rendered for Schweinitz’s sunflower. The most recent review of the area occurred in September 2010 by NCDOT, and site visit was to confirm the boundaries of the population. The NCDOT has implemented several measures to avoid impacts to Schweinitz’s sunflower. These measures, listed below, have been incorporated into the Design Build Team’s contractor, and the contractor will meet these measures:

- 1) The original I-85 interchange design from the 1990’s had a realignment of Mallard Creek Road to the south which would have impacted approximately 0.4 acre of the sunflower population. A decision was made to develop a northern alternative that appeared to avoid most of the Schweinitz’s sunflowers in the vicinity, improving and shifting the road slightly to the north of its existing location. The design was revised to parallel the existing bridge and minimize the road relocation. The design speed has been reduced to 45 mile per hour to reduce the relocation length.
- 2) To avoid indirect effects from parked or stored equipment, protective orange fencing will be placed around sunflower areas identified in the Biological Assessment as Units C, D and G.
- 3) Buried utility lines on the north side of Mallard Creek Road will be abandoned and relocated as part of the road realignment. In order to avoid affecting Schweinitz’s sunflowers, the contractor

will either directionally bore the utility lines in the vicinity of units D and E instead of trenching, or will avoid the area entirely.

- 4) To avoid adverse effects due to road maintenance, “do not mow” signs have been posted along Mallard Creek Road where sunflowers occur. Right-of-way managers have been informed that sunflower areas should be mowed periodically in winter and never in summer.
- 5) Sunflowers directly affected by construction will be transplanted further back off Mallard Creek Road into protected habitat.
- 6) To protect and improve sunflower habitat along the south side of Mallard Creek Road, trees will be hand cleared instead of mechanically cleared where sunflowers are currently being shaded out in the tree-clearing limits of sunflower unit A.
- 7) The NCDOT Roadside Environmental Unit’s native seed mix will be specified for erosion control along Mallard Creek Road.

The Design Build Team has further minimized impacts to Schweinitz’s sunflower by moving Mallard Creek Road slightly further to the north, the opposite side of the road of the existing sunflower population.

COMMUNITY IMPACTS

Localized cumulative impacts to Homewood Acres from TIP No. R-2123CE are expected, but are not expected to rise to the level of being significant. Specifically, right-of-way acquisition, relocations, access impacts, noise impacts and visual impacts are expected with the proposed project. Several of these impacts occur as a result of the construction of I-485 (TIP Project No. R-2248E).

Right of way impacts of the revised interchange design for R-2123CE are slightly different than before; one property previously subject to relocation will now be relocated, and one property previously not subject to relocation now will be. Impacts from this project will be localized to the northeast section of the subdivision. Homewood Drive will be cul-de-sac’ed at this location, which will result in minor mobility effects. Notable community cohesion effects are not expected. The proposed project will not substantially impact Homewood Acres overall.

Of the approximately 77 homes in Homewood Acres, 11 residents attended a Public Information Meeting in March 2011. No comments were received.

The project is not expected to result in disproportionately high and adverse impacts to low income or minority populations in this area.

INDIRECT CUMULATIVE IMPACT ANALYSIS

Existing rules for the 401 Water Quality Certification Program (15A NCAC 2H .0506(b)(4) require that the DWQ 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.”

Indirect Effects

Although development of the Future Land Use Study Area is expected to continue, the potential for project induced growth and land use change is low because the proposed project alone will not provide access to adjacent parcels. Residential, commercial, and industrial development is expected to continue in the Future Land Use Study Area with or without the project. Land use and development decisions in

this area are not likely to be notably altered by construction of the interchange as currently proposed. No notable indirect land use effects are expected as a result of the project.

Cumulative Effects

Direct impacts to natural resources by NCDOT projects have been addressed by avoidance, minimization, mitigation, or enhancement, consistent with programmatic agreements with the natural resource agencies during the Merger and Permitting processes.

Due to the access and mobility provided by I-77, I-85 and completed sections of the Outer Loop (I-485), growth is occurring in the Future Land Use Study Area. However, this growth is consistent with adopted transportation and land use plans.

Transit-oriented development is currently underway in the vicinity of planned Charlotte Area Transit System (CATS) transit stations. As needed, municipal sewer and water service are being extended to accommodate this planned growth.

The increased mobility and access provided by STIP Project R-2248E could accelerate planned commercial, industrial, residential, and mixed-use growth in the Future Land Use Study Area. However, these types of developments are consistent with locally adopted land use plans and are anticipated with or without the construction of the project. Stringent construction and development regulations including zoning, soil erosion and sedimentation control, stormwater management, impervious limits and stream buffer requirements will serve to temper the effects to notable features as land use change continues in the Future Land Use Study Area.

Given the minimal indirect effects of the project, any contribution of the project to cumulative effects resulting from current and planned development patterns should be minimal.

While the proposed project will have direct impact on some previously impacted resources, the proposed project will not notably contribute to cumulative impacts to these resources.

Localized cumulative impacts to Homewood Acres from TIP No. R-2123CE are expected. Specifically, right-of-way acquisition, relocations, access impacts, noise impacts and visual impacts are expected with the proposed project. While these impacts would occur with the construction of I-485 (STIP Project No. R-2248E), including the previous interchange design, the impacts would be increased with the proposed project. However, the impacts would be localized to the northeast section of the subdivision and the proposed project will not substantially impact Homewood Acres overall.

CULTURAL RESOURCES

Historical Structures:

This project is subject to compliance 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 with Section 106, codified at 36 CFR Part 800. Section 106 requires Federal agencies to take into account the effect of their undertakings (federally-funded, licensed, or permitted) on properties included in or eligible for inclusion in the National Register of Historic Places (NRHP) and to afford the Advisory Council a reasonable opportunity to comment on such undertakings.

In a scoping letter dated December 18, 2007 from the SHPO, the letter stated “We have conducted a review of the proposed undertaking and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the undertaking as proposed”.

Archaeology:

In a scoping letter dated December 18, 2007 from the SHPO, the letter stated “We have conducted a review of the proposed undertaking and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the undertaking as proposed”. Based on the Office of State Archaeology’s understanding of the project, the possibility of significant archaeological resources located within the Area of Potential Effect is unlikely.

SECTION 4(f)

There are no Section 4(f) resources in the project study area

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; minimization measures were incorporated as part of the project design.

Avoidance and Minimization:

The NCDOT has avoided impacting many streams and reduced impacts to streams to the greatest extent practicable. The NCDOT designed slopes at 2:1 to minimize impacts to the wetland at Permit Site 4. The entire wetland at Permit Site 4 is not filled by project construction, but since the wetland lies in an interchange, the entire wetland will be considered a total ‘take’.

The turbine interchange design has stream impacts comparable to those of the four-level stack as the turbine design has 5,999 feet of stream impact, whereas the four-level stack design was estimated to have 5,991 feet of stream impact (100% hydraulic design was not completed). The biggest difference involves impacts at Stony Creek as the turbine design impacts 731 feet (including 651 feet of culvert extensions and then 80 feet of impact install the overflow pipe for FEMA purposes) compared to an estimated 778 feet with the four level stack design. As discussed at Concurrence Point 4C, the Design-Build Team was able to incorporate a retaining wall along Ramp B to avoid impacts to Stony Creek.

Since Concurrence Point 4C, two items have changed with the Section 404 permit drawings. At Permit Site 6, a 12' x 14' culvert will be installed now instead of an 84" pipe. The change to a culvert will allow service vehicle access through the culvert into the interchange for the relocated sewer line.

The Design-Build Team now plans to construct a reinforced slope instead of a retaining wall. At the closest to Stony Creek, the distance from reinforced slope to the stream bank of Stony Creek is a similar distance as the retaining wall option (12 feet at closest for reinforced slope versus 20 feet, not including erosion control for either option). The majority of the reinforced slope is 30 feet or more from the top of bank. The proposed reinforced slope will be constructed from the backside and from the existing ramp. Erosion control measures will be 5 feet off the limit of the proposed slope limit of the reinforced slope. Trees along Stony Creek are not anticipated to be removed to accommodate construction of the reinforced slope nor will there be any stream impacts to Stony Creek at this location. The Design-Build Team determined the limit of disturbance, off of the top of bank for Stony Creek back to the reinforced slope, including erosion control, to be 7 feet.

Other specific examples of avoidance and minimization measures include:

- A modified basin will be utilized to control and reduce peak flow rates into receiving water bodies (at Permit Site 10);
- Pre-formed scour holes will be utilized at three locations (Station No. 60+90 -RPE- Left, 68+68 -RPH- Right, and 129+59 -Y- Right) to diffuse the concentrated flow from storm drain outlet pipes into non-erosive sheet flow to jurisdictional streams;
- Pavement runoffs will be treated through roadside grass swales, median swales, lateral swales, tail swales or existing natural swale before entering wetlands with non-erosive sheet flow.
- Grass swales will also be utilized in multiple locations to promote infiltration and provide treatment for discharge before runoff enters streams.
- Removed the 36" sanitary sewer line in the Stony Creek culvert under I-85; and,
- Riprap used for outlet protection will be placed on banks only and will not be placed in the streambed.

Compensation:

The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent practicable. The project will permanently impact 0.79 acre of wetlands, 5,999 feet of streams (360 linear feet of which is bank stabilization, and is not considered a loss of waters), and temporarily impact 340 feet (0.09 acre) of streams.

The NC Ecosystem Enhancement Program has agreed to provide compensatory mitigation for 5,639 linear feet of stream and 0.79 acre of wetlands. The acceptance letter is attached.

PROJECT SCHEDULE

In September 2010, the project was let to construction under the Design Build delivery mechanism. Start of construction is scheduled for September 2011. This application provides final design and impacts for the project.

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 Quality. 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 project's subject line). We are providing five (5) copies of this application to the NCDWQ for their review and approval.

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Michael Turchy at maturchy@ncdot.gov or (919) 707-6157. A copy of this permit application and its distribution list will be posted on the NCDOT website at <http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html>.

Sincerely,



for

Gregory J. Thorpe, Ph.D., Branch Manager
Project Development and Environmental Analysis Branch

cc: NCDOT Permit Application Standard Distribution List

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT
(33 CFR 325)

OMB APPROVAL NO. 0710-003
Expires December 31, 2004

Public reporting burden for this collection of information is estimated to average 10 hours per response, although the majority of applications should require 5 hours or less. This includes 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 this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Service Directorate of Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003), Washington, DC 20503. 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

Authority: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research and Sanctuaries Act, 33 USC 1413, Section 103. 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. 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 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 COMPLETED
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(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME North Carolina Department of Transportation Project Development & Environmental Analysis	8. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required)
6. APPLICANT'S ADDRESS 1548 Mail Service Center Raleigh, NC 27699-1548	9. AGENT'S ADDRESS
7. APPLICANT'S PHONE NOS. W/AREA CODE a. Residence b. Business 919-707-6000	10. AGENT'S PHONE NOS. W/AREA CODE a. Residence b. Business

11. STATEMENT OF AUTHORIZATION

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.

APPLICANT'S SIGNATURE

DATE

NAME, LOCATION, AND DESCRIPTION OR PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions) TIP No. R-2123 CE	
13. NAME OF WATERBODY, IF KNOWN (if applicable) Stony Creek and UTs as well as UTs of Rocky River	14. PROJECT STREET ADDRESS (if applicable)
15. LOCATION OF PROJECT Mecklenburg COUNTY NC STATE	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) Section, Township, Range, Lat/Lon, and/or Accessors's Parcel Number, for example.

17. DIRECTIONS TO THE SITE

Please see attached vicinity map and cover letter.

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

The project involves the modification of the existing three-leg, free flow 'trumpet' I-85/485 interchange to full directional free-way 'turbine' interchange. The northern terminus of the project ends in Cabarrus County. The project proposes to construct a turbine interchange at the junction of I-485 and I-85, northeast of Charlotte, North Carolina. Existing culverts and pipes will be extended to accommodate construction as well as the addition of new pipes. The Mallard Creek Road (SR 2467) bridge over I-85, located just to the north of the proposed interchange, must be realigned and expanded as part of this project.

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

The purpose of this project is to modify the existing three-leg, free flow 'trumpet' I-85/485 interchange to full directional free-way 'turbine' interchange.

USE BLOCKS 20-22 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

Impacts will result from the discharge of fill material in wetlands and streams, including the enclosing streams in new pipes and extending existing culverts and pipes. The roadway and associated shoulders will be widened, and new directional ramps will be constructed.

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

See attached cover letter.

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

See attached cover letter.

23. Is Any Portion of the Work Already Complete? Yes ___ No X IF YES, DESCRIBE THE COMPLETED WORK

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

Please see adjacent property landowners page in the permit drawing package.

25. List of Other Certifications 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
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* Would include but is not restricted to zoning, building, and flood plain permits

26. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the 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.

E. L. Lusk for Gregory J. Thorpe, PhD June 6, 2011

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.



June 7, 2011

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

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

R-2123CE, I-85/I-485 (Charlotte Outer Loop) Interchange, Mecklenburg County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream and riparian wetland mitigation for the subject project. Based on the information supplied by you on June 1, 2011, 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	5,639	1.58	0	0	0	0
Mitigation Units (Credits-up to 2:1)	0	0	11,278	3.16	0	0	0	0

EEP commits to implementing sufficient compensatory stream and riparian wetland mitigation credits to offset the impacts associated with this project in accordance with the N.C. Department of Environment and Natural Resources' Ecosystem Enhancement Program 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 EEP.

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

Sincerely,

William D. Gilmore, P.E.
EEP Director

cc: Ms. Liz Hair, USACE – Asheville Regulatory Field Office
Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit
File: R-2123CE

Restoring... Enhancing... Protecting Our State



Memorandum of Meeting

Date: February 9, 2011

Place\Time: NCDOT, Hydraulics Unit Conference Room, 1:00 P.M.

Participants: Liz Hair - USACE
Marla Chambers – NCWRC
Polly Lespinasse – NCDWQ
Donnie Brew – FHWA
Marella Buncick – USFWS
Chris Militscher - USEPA
Anne Gamber - NCDOT Hydraulics Unit
Rodger Rochelle - NCDOT Trans. Prog. Management
Trace Howell – NCDOT REU
Mark Laugisch – NCDOT REU
Mark Staley – NCDOT REU
Michael Turchy – NCDOT NEU
Pam Williams – NCDOT PPO
Tom Bacon – NCDOT PPO
Larry Thompson – NCDOT Div. 10
Jim Seybert – Lane Construction
Phillip Todd - Sepi
John Johnson - STV
Adam Freeman - STV
Tina Swiezy - RK&K
Matthew Cook - RK&K

Subject: NEPA\404 Merger Team – Concurrence Point 4B Meeting
R-2123CE – I-85 / I-485 Interchange, Mecklenburg and Cabarrus Counties

The 30% Hydraulic Review was held in order to reach agreement on concurrence point 4B for the I-85 / I-485 Interchange in Mecklenburg and Cabarrus Counties. The following items were discussed and conclusions reached:

John Johnson opened the meeting with a brief description of the project. He summarized the Design-Build team's reasonings for using a turbine interchange design instead of a 4-tier interchange design as was previously presented to the agencies in the review process (greater design variability, reduction in hauling offsite material to the project due to the high fills, safer construction of bridges.) A handout was provided noting the benefits of the turbine design versus the 4-tier interchange design. The project history will be included in the 404/401 permit application.

Tina Swiezy proceeded by describing RK&K's process for reviewing/summarizing the jurisdictional features as well as the turbine interchange's reduction in impacts to major stream features.

Matthew Cook then proceeded to review the project on a sheet by sheet basis. The review took a logical course through the project as opposed to reviewing sequential sheets due to the large nature of the interchange requiring unusual match lines in the sheet order.

I-85 Corridor

Sheet 11: No jurisdictional features affected.

Sheet 12: No jurisdictional features affected.

Sheet 13: No jurisdictional features affected.

Sheet 14: The jurisdictional stream –Y- 60+00 – 61+50 LT will be a total take.

The jurisdictional stream –Y- 61+50 – 66+00 LT was discussed. The existing stream essentially runs along the existing fill slope. The new design moves the stream out to run parallel to the new fill slope with a berm. It will be lined with riprap for stability. Given the steep nature of the existing contours, stream restoration here is not feasible. Existing pipes will be extended to the new stream alignment. Marella Buncick was concerned with the stability of the confluence of the new stream alignment and the existing stream and also the three outlet pipes just downstream of said confluence. The Design-Build team proposed trying to outlet the pipes at one location. Also it was proposed that the Team would extend the stream alignment to just beyond those outlets to provide riprap stability before the confluence with the existing channel and to provide a smooth transition and stream stability from the new relocated channel and the existing stream reach.

The jurisdictional stream –Y- 62+50 RT begins inside the proposed design and will be a total take.

The jurisdictional stream –Y- 68+50 – 70+00 LT was discussed as a possible restoration. Given the nature of the construction and the sanitary sewer realignment in this area, it was determined that a stabilized ditch would be preferred. **See sheet 9 comments for a field visit and recommendations.**

The wetland at –Y- 63+00 LT will be a total take.

Sheet 15: No jurisdictional features affected.

Sheet 21: No jurisdictional features affected.

Sheet 22: No jurisdictional streams or wetlands. The –Y1- alignment has been shifted slightly to the right to minimize the impacts to the Schweinitz's Sunflower.

Sheet 16: No jurisdictional features affected.

Sheet 17: The jurisdictional stream –Y- 131+50 – 135+50 RT was discussed. The existing stream essentially runs along the existing fill slope. The new design moves it out to run parallel to the new fill slope with a berm. It will be lined with riprap for stability. Given the steep nature of the existing contours and width of the proposed design, stream restoration here is not feasible. A more natural transition to the existing stream tie-ins will be used even if it increases the stream take. Riprap will also be used prominently at the outside bend of the downstream tie-in.

Sheet 18: The RCBC at –Y- 148+00 will be extended on the invert in and invert out. The jurisdictional stream will be affected at those extensions.

Sheet 19: No jurisdictional features affected.

Sheet 20: No jurisdictional features affected.

I-485 Corridor

Sheet 4: No jurisdictional features affected.

Sheet 5: No jurisdictional features affected.

Sheet 6: The jurisdictional stream along –RPH- 77+00 RT (Stony Creek) is being affected. A retaining wall at this location was discussed; however, given a) the nature of the high fill, b) the bend in the stream at this location, and c) the fact that a wall would be in the FEMA floodplain and could be undermined, it was determined that the fill slope with a stream realignment was the best option. Chris Militscher was concerned with the long fill slope at the stream realignment and that it could become unstable. The Design-Build Team agreed to explore options to alleviate this matter (rock plating, variable slopes.)

02/17/2011:

A field meeting was held with the following attendees: Polly Lespinasse, Liz Hair, Michael Turchey, Brett Fuelner (NCDOT), Joel Howard (NCDOT), Adam Freeman, Phillip Todd, Matthew Cook, Pete Stafford (RKK.)

Ms. Lespinasse and Ms. Hair were concerned with the ability to stabilize the stream once the relocation has taken place. Mr. Cook described the location of the proposed fill slope, stream bench, and new stream alignment in relation to the existing stream. The following measures were described in helping with the stability: 1) The outside bend of the stream would be lined with riprap along the bank, the bench, and partially up the new fill slope (this is where energy would be greatest at this point in the stream); 2) Stream surveys were performed at the relocation, and the stream relocation design will match as closely as possible the existing stream geometry; 3) The new stream would be in cut, not created out of fill material; and, 4) the existing stream, just upstream of the realignment, exhibited bedrock in the stream bottom, and it is the Team's belief that bedrock will present and provide grade stability for the stream relocation.

This issue of access was also raised. Mr. Freeman offered placing a gate in the controlled access to access the stream. The sanitary sewer easement that runs parallel to the stream

was offered as a means of access, however the easement is 150'+ away at the stream realignment.

In general, the agencies were asked if there are other measures we could use at this location. A bridge was suggested, however, given the parallel nature of the stream and ramp, this would be impractical as would an RCBC. A retaining wall was suggested. Mr. Cook stated that a wall might be in the FEMA regulated floodway which would be subject to higher flows and scour. The motoring public would be at a greater risk due to the wall supporting the entire roadway at this location. In addition, the stream would need to be relocated to construct the wall at the toe of slope in order to create room for equipment. If a wall was used and built further up the existing slope, it would be out of the floodplain.

The possibility of relocating the stream further away from the fill slope was also suggested as another option to prevent degradation of the proposed fill slope and to allow for stability of the proposed stream prior to allowing water through it. Vegetation would be allowed to grow through a growing season. Concern was raised about storm events affecting this stream reach during construction and during the time to allow the vegetation to grow.

The Team discussed how our alignment actually impacts less stream along Stony Creek than was impacted in the previous NCDOT 4 tiered design. The turbine ramp was designed to utilize as much of the existing graded ramp as possible. Shifting the ramp would result in more impact.

It was decided that the Team would determine impact takes compared to the original NCDOT 4 tiered design and other avoidance and minimization efforts. The avoidance option will involve the Team reevaluating the nature of using a wall: 1) Cost; 2) Safety during construction; 3) Impacts to floodplains; 4) Future maintenance and access. These findings would be presented in the 4C meeting.

The jurisdictional stream at -L- 62+00 RT will be a total take.

The portion of the jurisdictional stream at -L- 62+50-65+00 RT will be a total take. The 84" pipe that receives the drainage that was in the stream will not be buried since 1) we are tying to an existing 5'x7' RCBC that is not buried, 2) the junction boxes required due to the skewed connections of the RCBC extensions, and 3) the extreme length of the overall proposed system. For these reasons, the 84" pipe downstream will not be buried either.

Sheet 7: The jurisdictional stream -Y- 78+00-88+00 LT will be a total take. The stream begins apprx. 25' prior to the proposed fill slope at -Y- 88+00 LT. For this reason, the proposed cross pipe will not be buried. The middle portion of this stream will be affected by a temporary alignment for traffic control. It will be replaced with a ditch once the temporary alignment is removed. The pipe that receives the stream at -Y- 78+00 will also not be buried since we are tying to an existing junction box and existing 48' pipe under I-85, and because the entire stream upstream will be affected.

The jurisdictional stream at -L- 80+50-83+50 CL will be a total take.

The wetland at –Y- 79+00 LT will be a total take.

Sheet 8: The wetland at –RPH- 70+00 RT will be a total take.

Stony Creek jurisdictional stream will be affected by the 84” overflow pipe channels at –RPH- 28+00 LT and RT. The upstream channel will no longer have riprap. Discussion was had concerning clearing the Stony Creek bank of vegetation and the ability for the channel to vegetate itself beyond a grass liner once construction is complete. The riprap will remain in the downstream channel.

Stony Creek jurisdictional stream will be affected by the 2@9’x10’ RCBC extensions under I-85 (-Y- 70+00 LT and RT.) The RCBC length has been minimized to reduce impacts to the stream. The downstream tie-in has been designed to closely match the existing sinuosity of Stony Creek.

The jurisdictional stream at –Y- 74+50-76+00 RT will be a total take. This area was discussed as a possible restoration area. Given the short nature of the restoration and the location inside a gore area, it was determined that a stabilized ditch would be used.

Sheet 9: The jurisdictional stream at –RPE- 68+00 will be affected. The upstream portion will be ditched to a crosspipe that receives a different jurisdictional stream, however both jurisdictional streams currently meet under where our proposed alignment will be constructed. Therefore, we are not redirecting the drainage.

The jurisdictional stream at –RPE- 67+50 will be affected. A 66” pipe buried one foot will be used for conveyance.

The gore area between –RPF- and –RPE- currently has a jurisdictional stream. The design will impact portions of this stream. Per the RFP, the Design-Build Team was instructed to use a stream restoration in this area. Liz Hair and Polly Lespinasse were willing to look at this area again in the field in order to OK a restoration here. Michael Turchy, Phillip Todd, and Howard Woodall (RK&K) will accompany Ms. Hair, and Ms. Lespinasse on this field visit on February 16, 11:00 AM. Following their determination we will move forward with a restoration or use a stabilized ditch. In areas here that we are not affecting with the project, we will not attempt any restoration or enhancement. If a restoration is not used, the receiving pipe at –RPE-56+00 LT will not be buried.

02/17/2011:

A field meeting was held with the following attendees: Polly Lespinasse, Liz Hair, Michael Turchy, Brett Fuelner (NCDOT), Joel Howard (NCDOT), Adam Freeman, Phillip Todd, Matthew Cook, Pete Stafford (RKK.) It was determined that the best course of action would be to use a stabilized ditch instead of a restoration given the following reasons: 1) providing an access area for NCDOT off of the ramp to the site; 2) safety of public using ramp; 3) maintenance; 4) the limited area for buffers; and, 5) loss of existing canopy due to construction;. Ms. Lespinasse stated that she would prefer a ditch without riprap. It was decided that a ditch with a limited degree of sinuosity lined with PSRM only on the side slopes and a limited number of rock vanes would be installed. The Division will check the area for stability post construction. No

enhancement will be performed in other areas of this stream. This ditch design was also agreed upon for the realignment of a stream entering the Stony Creek RCBC. No compensatory mitigation will be performed.

The NCDOT will review and discuss its own guidance and policies, as well as have discussions with FHWA regarding its guidance and policies, for implementing stream relocations and/or mitigation within the interchange and share with the agencies and the Team at the project's 4C meeting.

Sheet 10: The jurisdictional stream at -L- 97+50 will be affected. It begins inside the project limits, therefore the pipes will not be buried. Due to alleviating the Pre vs. Post condition, the offsite drainage will be conveyed across the project separate from the roadway drainage and enter the stream. A basin will be utilized at the outlet of the roadway drainage to attenuate the post drainage flow prior to entering the jurisdictional stream.

The jurisdictional stream at -L- 100+50 will be affected. It begins inside the project limits, therefore the pipes will not be buried.

The wetland at -L- 97+50 CL will be a total take.

Memorandum of Meeting

Date: April 13, 2011

Place\Time: NCDOT, Hydraulics Unit Conference Room, 2:00 P.M.

Participants: Liz Hair – USACE (Conference call in)
Marella Buncick – USFWS (Conference call in)
Marla Chambers – NCWRC
Polly Lespinasse – NCDWQ
Donnie Brew – FHWA
Chris Militscher - USEPA
Bill Zerman - NCDOT Hydraulics Unit
Virginia Mabry - NCDOT Trans. Prog. Management
Barney Blackburn – NCDOT REU
Mark Laugisch – NCDOT REU
Mark Staley – NCDOT REU
Michael Turchy – NCDOT NEU
Leilani Paugh – NCDOT NEU
Ruth Brim - NCDOT
Byron Moore – NCDOT NEU
R.B. Wilkins – NCDOT Utilities
Shantray Dickens- NCDOT OCR
Pam Williams – NCDOT PPO
Tom Bacon – NCDOT PPO
Carla Dagnino - NCDOT PDEA
Larry Thompson – NCDOT Div. 10
Jim Seybert – Lane Construction
Ryan Lowder – Lane Construction
Phillip Todd - Sepi
John Johnson - STV
Adam Freeman - STV
Tina Swiezy - RK&K
Matthew Cook - RK&K

Subject: NEPA\404 Merger Team – Concurrence Point 4C Meeting
R-2123CE – I-85 / I-485 Interchange, Mecklenburg and Cabarrus Counties

The Permit Review was held in order to reach agreement on concurrence point 4C for the I-85 / I-485 Interchange in Mecklenburg and Cabarrus Counties. The following items were discussed and conclusions reached:

After introductions, Matthew Cook opened the meeting with a brief description of the project. He stated, as was summarized in the 4B meeting, that the Design-Build team used a turbine interchange design instead of a 4-tier interchange design as was previously presented to the agencies in the review process. He then presented the method to which

the impacts were determined, and that all wetlands on the project will be considered total takes.

Chris Militscher asked for the date of the Categorical Exclusion which was signed on November 30, 2009. The Categorical Exclusion is available on SEPT's FTP site. To download the information, go to: <ftp.sepiengineering.com>.

User name: R2123CE

Password: CE 11302009

It was asked if a State Stormwater Permit is required. The Team answered that it was not required. An updated Stormwater Management Plan will be issued with the minutes.

Polly Lespinasse requested that the permit clearly indicate which pipes were to be buried and which were not.

The permit sheets were then reviewed on a sheet by sheet basis. (Sheet labels are based on the Permit Drawing number X of 56 permit sheets.)

Sheet 4:

The property owner sheet will state the following: Labels for property owners located under separate cover. NCDOT will attach labels for the property owners list.

Sheet 8:

During the 4B review process, the design had an impact to Stony Creek at -RPH- 76+00 RT. The fill slope extended into Stony Creek which required a realignment of the stream. This impact has been removed. A retaining wall has now been designed to eliminate an impact to the Creek at this location. This site was previously Site 1 in the 4B package. Since the site has been removed, all other site numbers decreased by 1 for the 4C package (i.e. Site 2 in the 4B package is now Site 1 in the 4C package, et al.) Mr. Cook also stated that since the 4C package has been distributed, there has been a minor revision to the horizontal and vertical alignments along -RPG- and -RPC-; however these revisions did not affect the permit impacts in any way.

Site 1: Stream impact, no comments.

Site 7: Discussed on sheet 35.

Sheet 14:

Site 2: Stream and wetland impacts. Ms. Chambers asked about the impact in the area under the temporary alignment (which will be used for the motoring public.) This is considered a permanent fill in the stream up to the temporary alignment fill slope and temporary fill in the stream outside the fill slope. Discussion was had concerning the stability of the channel once the temporary alignment is removed and the channel is cut back in place. Mr. Cook stated that a note will be placed on the temporary construction plans to line the banks with Class I riprap. Ms. Lespinasse stated that after construction of this channel, a field evaluation needs to be conducted to determine if additional measures need to be taken for its stability. Ms. Chambers also asked about the stability of the confluence of the lateral base ditch and the outlet of the 42" RCP. The ditch only requires a grass lining for stability, however the Team has provided riprap as an additional measure of stability given the nature of the ditch (slope=5.16%) and the confluence with a jurisdictional feature. The Team will also ensure that Class I riprap

lines the banks in the area of the confluence. There will not be any blockage of the channel from riprap.

Site 3: Discussed on sheet 17.

Sheet 17:

Site 3: Stream impact, no comments.

Site 2: Discussed on sheet 14.

Sheet 21:

Site 4: Wetland impact. A stray line was left on the permit at this location indicating a pipe inside the wetland beyond the fill slope. This line has been deleted and the permit drawing included with the transmittal of these minutes.

Site 6: Stream impact. Ms. Lespinasse stated that she was concerned with only using Class B riprap in the outlet channel of the 84" overflow pipe. It was agreed that this would be changed to Class I riprap.

Sheet 28:

Mr. Cook stated that since the 4C package has been distributed, there has been a minor revision (lengthening) to the noise wall along –RPG–; however this revision did not affect the permit impacts in any way.

Site 5: Stream impact. Ms. Chambers asked what riprap was being used at the confluence of the Standard Base Ditch (exit of the 48" RCP from Site 2) and the tie in to Stony Creek. Mr. Cook stated that although the Standard Base Ditch only required Class B riprap, the Class II riprap along the banks of the Stony Creek tie in would be used in the area of the confluence to help prevent erosion and instability.

Site 15: Stream impact. Mr. Cook stated that a Rock Cross Vane and Rock Vanes have been included in the design to prevent erosion. The banks were lined with Permanent Soil Reinforced Matting (PSRM) and no measures placed in the channel bottom. A degree of sinuosity was included to the extent possible. This helped in the transition to Stony Creek. These measures were based on a field meeting held with the Team and the agencies on February 17, 2011 (to limit the amount of riprap in the channel as much as possible.) Ms. Lespinasse stated that she preferred Coir Fiber Matting to the PSRM. This change will be made to the ditch detail.

Site 2: Discussed on sheet 14.

Sheet 35:

Site 7: Stream impact. Mr. Cook stated that Rock Vanes have been included in the design to prevent erosion. The Rock Vanes were inadvertently left off the permit. They have been drawn in, and the permit drawing has been included with the transmittal of these minutes. The banks were lined with Permanent Soil Reinforced Matting (PSRM) and no measures placed in the channel bottom. A degree of sinuosity was included to the extent possible. These measures were based on a field meeting held with the Team and the agencies on February 17, 2011 (to limit the amount of riprap in the channel as much as possible.) Ms. Lespinasse stated that she preferred Coir Fiber Matting to the PSRM. This change will be made to the ditch detail. Ms. Paugh asked if any monitoring will be required after the channels are installed. Ms. Lespinasse stated that they would not be monitored. Ms. Paugh asked Ms. Hair if she was fine with no monitoring at the location, and she said no monitoring will be required. Ms. Paugh stated that she would prefer that the channels be lined with riprap instead of the design that was preferred by DWQ and

USACE (Coir Fiber Matting.) The agencies stated that they wanted as little riprap in the channels as possible, and the design was left as is with the exception of using Coir Fiber Matting instead of PSRM.

Sheet 41:

Site 8: Stream impact. The ditch detail outlet channel for this site will be updated to use Coir Fiber Matting instead of PSRM per Ms. Lespinasse. In no way will riprap block the channel. It will be installed on the banks only.

Site 9: Stream impact, no comments.

Site 7: Discussed on sheet 35.

Sheet 45:

R-2248E, the design build project for I-485 in Charlotte, joins R-2123CE on this sheet. The end of the R-2248E project design has been shown on this sheet for information only. There are wetland and stream impacts associated with this project that are technically under the R-2123CE footprint. However, these impacts will be permitted under the R-2248E permit package. The 48" RCP crosspipe being built by the R-2248E Team is carrying the drainage from the drained pond. The 24" / 30" RCP crosspipe being built by the R-2123CE Team is not carrying a jurisdictional stream. Mr. Cook also stated that since the 4C package has been distributed, there has been a minor revision to the superelevation along -L- and -RPE-, however these revisions did not affect the permit impacts in any way.

Site 10: Stream and wetland impacts. Mr. Cook explained the use of the 30" pipe that allows the offsite drainage to bypass the roadway footprint. He also discussed the use of the Modified Basin to attenuate peak flow as it leaves the site. Ms. Lespinasse asked if a preformed scour hole could be used at the outlet pipe of the basin and placed outside the jurisdictional stream. Mr. Cook stated that this was explored, however due to the elevation of the bottom of the basin coupled with the depth of the riser and the slope of the pipe, the pipe had to outlet to the stream to achieve positive drainage. The elevations outside the stream banks were too high to use a preformed scour hole. Ms. Chambers asked if the stream would be blocked by the riprap at the basin outlet pipe. Mr. Cook stated that riprap at this outlet pipe would be placed only along the banks, not in the stream channel bottom and would in no way be placed in the stream to block the flow.

Site 11: Stream impact, no comments.

Sheet 48:

Site 12: Stream impact, no comments.

Site 13: Stream impact, no comments.

Site 14: Stream and wetland impacts. Mr. Cook stated that per the 4B meeting, there is now a single pipe outlet in the -Y- 66+00 LT area as opposed to multiple pipe outlets. Also the ditch has been extended past the pipe outlet with riprap to ensure against erosion per the 4B meeting. Ms. Lespinasse asked what was the slope of the ditch along -Y- 63+00 LT. Mr. Cook responded 2.72%.

Site 15: Discussed on sheet 28.

Sheet 51:

Site 16: Stream impact. Mr. Cook stated that per the 4B meeting, the ditch transitions have been smoothed to better meet the existing channels and Class II riprap has been used to armor the outside banks at the transitions.

Sheet 53:

Site 17: Stream impact. Mr. Cook stated that per the 4B meeting, the ditch transition has been smoothed to better meet the existing channel and Class II riprap has been used to armor the outside bank at the transition. The entire Lateral Base Ditch is lined with riprap.



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Asheville Field Office
160 Zillicoa Street
Asheville, North Carolina 28801

March 24, 2010

Mr. John F. Sullivan, III
Division Administrator
Federal Highway Administration
310 New Bern Avenue, Suite 410
Raleigh, North Carolina 27601

Dear Mr. Sullivan:

Subject: Proposed I-485/I-85 Interchange Modification in Mecklenburg County, North Carolina,
TIP # R-2123CE, Federal Aid Project # MAF-117-1(3), WBS # 34378.1.17

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion (Opinion) based on our review of the North Carolina Department of Transportation's (NCDOT) Biological Assessment (BA) on the effects of the subject highway improvements on the federally endangered Schweinitz's sunflower (*Helianthus schweinitzii*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act). Your January 15, 2010, request for formal consultation was received on January 19, 2010.

In the BA, you determined that the following federally listed species would not be affected by the proposed project: Michaux's sumac (*Rhus michauxii*) and smooth coneflower (*Echinacea laevigata*). In addition, you determined that the project was "not likely to adversely affect" the Carolina heelsplitter (*Lasmigona decorata*). We concur with these determinations. Therefore, we believe the requirements under section 7 of the Act are fulfilled for these species. However, obligations under section 7 of the Act must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered, (2) this action is subsequently modified in a manner that was not considered in this review, or (3) a new species is listed or critical habitat is determined that may be affected by the identified action.

This Opinion is based on information provided in the BA, other available literature, telephone conversations, e-mail, office files, published literature, field investigations, and other sources of information. A complete administrative record of this consultation is on file at this office.

FHWA-NC DIVISION

REC'D

MAR 29 /

DIV ADMIN		
ASST DIV ADMIN		
CIV RIGHTS		ENG COORD
QUAL COORD		
MAJ PROJ ENG		
STRUCTURAL ENG		
FINANCIAL MGR		
FIN SPEC		FIN ASST
PROG ASST		COMP SPEC
P & PD TEAM LEADER		
PL-1		PL-2
PL-3		AIR QTY SPEC
CONTRTS		
PRECONST & ENV TEAM LEADER		
A-1		A-2
A-3		ROW OFFCR
ENV PROG SPEC		
OPS TEAM LEADER		
TE-1		TE-2
TE-3/SAFETY		P & M ENG
AM PROG MGR		
FILE		TRASH

BIOLOGICAL OPINION

CONSULTATION HISTORY

Early consultation for segments of this project began as long ago as 1989. This interchange, combined with the final roadway segment, completes the full circumferential freeway around the City of Charlotte--the Charlotte Outer Loop. The following history is for the interchange improvements only:

March 2009 – The NCDOT requests a field review of the project.

May 2009 – The Service attends a field review with the NCDOT and other agencies.

August 2009 – The NCDOT requests and receives concurrence for hydraulic structures and roadway design.

November 2009 – The NCDOT submits their BA.

December 2009 – The Service requests further information.

January 2010 – The NCDOT submits their revised BA.

DESCRIPTION OF THE PROPOSED ACTION

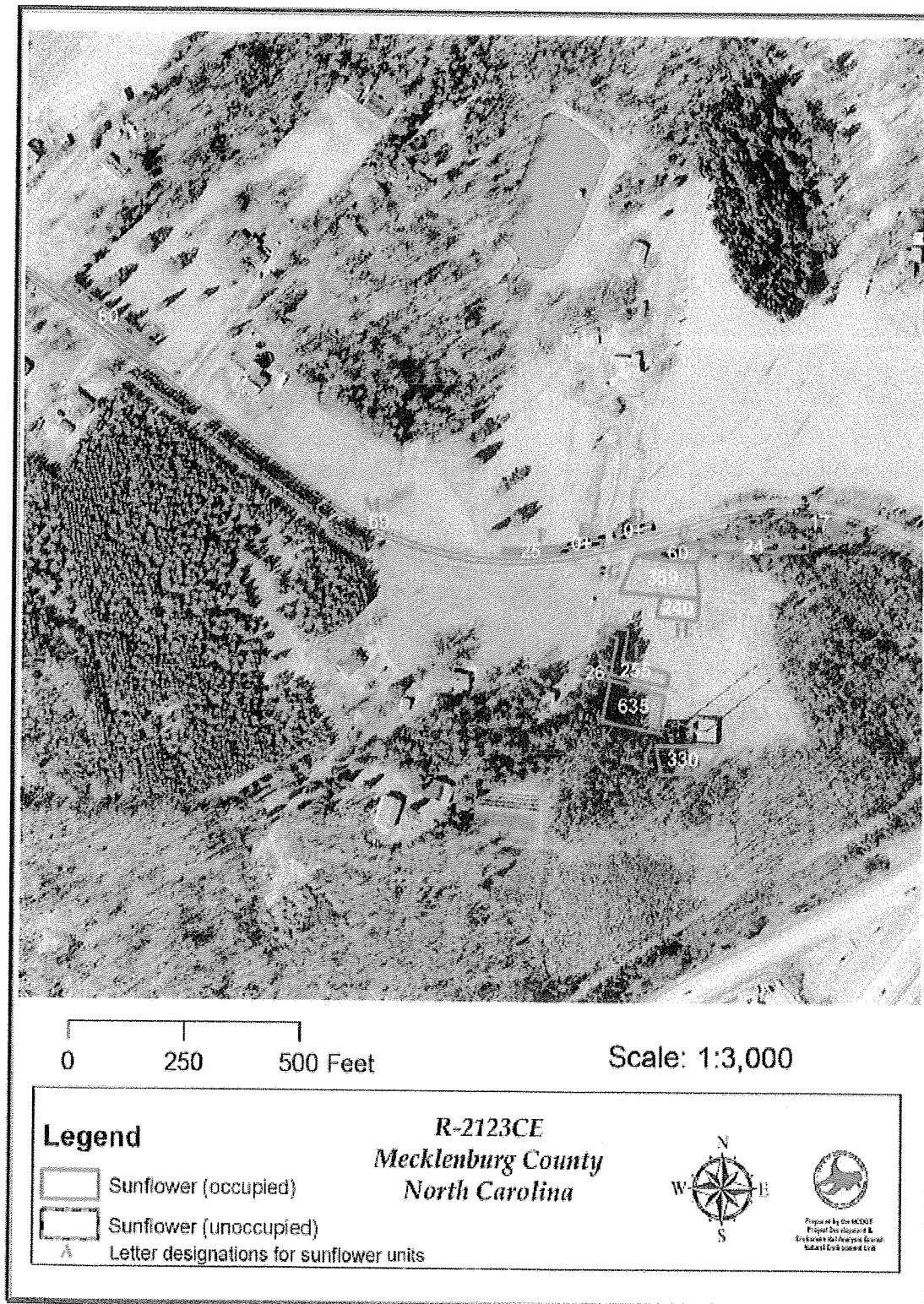
The NCDOT proposes to modify the existing trumpet interchange at I-485 and I-85 to a fully directional freeway-to-freeway interchange. The redesigned interchange will replace the existing interchange at the junction of I-485 and I-85 in northeastern Mecklenburg County. Construction of the new four-level interchange will require relocating the existing Mallard Creek Road bridge grade separation over I-485, including relocating 0.43 mile of Mallard Creek Road. The road relocation is required to realign and lengthen the bridge to accommodate the additional lanes of the interchange. The realignment of Mallard Creek Road will impact the Schweinitz's sunflower stems that are growing adjacent to the current road alignment.

Surveys conducted along the proposed corridor located 2,110 stems of the Schweinitz's sunflower in the immediate vicinity of the project. Although these plants represent one North Carolina Natural Heritage Program element occurrence record (104.103), they occur in several distinct clumps along the Mallard Creek Road right-of-way (ROW), in a power line ROW, and along a gravel road to a cell tower site. The distribution of these 2,110 stems has been described in 14 units (see Figure 1).

Units D and E combined had about 100 plants when surveyed in May of 2009. A subsequent September 2009 survey located no plants in these two units, likely a result of mowing. For the purposes of this consultation, it will be assumed that these two units each have 50 stems.

Direct impacts from the project will occur to 17 stems in Unit A, and another 110 stems will be potentially indirectly affected in Units C and D. The 17 stems in Unit A will be moved to a protected area for conservation.

Figure 1.



Conservation Measures

In order to offset impacts from the project, the NCDOT will designate the Mallard Creek Road Conservation Area and protect in perpetuity the 3.6-acre site. This site will include Units B, C, and G, which are currently occupied by the Schweinitz's sunflower (453 stems). The remainder of the site is currently unoccupied habitat. Unit A, which will be directly impacted by the project, is at the outer boundary of this site. The sunflowers directly impacted from construction will be transplanted into this protected habitat. A management plan will be written for the conservation area, including the removal of trees, a mowing scheme to manage the habitat, and a monitoring plan for determining the survival of the transplants and the other sunflowers on the site. In addition, "do not mow" signs will be posted along Mallard Creek Road, where sunflowers occur (Units D, E, F, M, and N), and will be managed with appropriate periodic winter mowing only.

Specific measures to avoid and minimize impacts to the Schweinitz's sunflower during construction include the following:

1. Place orange fencing around sunflower Units C, D, and G in order to avoid equipment staging or storage.
2. Avoid completely or directionally bore (instead of trenching) relocated utility lines in the vicinity of Units D and E.
3. Clear trees by hand (instead of mechanically clearing) where sunflowers are currently being shaded out in the tree-clearing limits of sunflower Unit A in order to protect and improve sunflower habitat along the south side of Mallard Creek Road.
4. Use the NCDOT Roadside Environmental Unit's native seed mix for erosion control along Mallard Creek Road.

Action Area

The action area should be determined based on consideration of all direct and indirect effects of the proposed action (50 CFR 402.2 and 402.14(h)(2)). The direct and indirect effects of the action and associated activities must be considered in conjunction with the effects of other past and present federal, state, or private activities, as well as the cumulative effects of reasonably certain future state or private activities within the action area.

The action area for project R-2123CE is the immediate area of the proposed interchange, including the 0.43 linear mile of Mallard Creek Road, the NCDOT ROW, and the adjacent 3.6-acre parcel along Mallard Creek Road that will be permanently conserved. The action area also includes the previously described areas of private land where the Schweinitz's sunflower occurs so that the entire sunflower population is considered (Units A-N).

STATUS OF THE SPECIES AND ITS CRITICAL HABITAT

Species Description and Life History

The Schweinitz's sunflower is a perennial herb of the aster family (Asteraceae). The species is endemic to the upper Piedmont of the Carolinas, with known centers of distribution around Charlotte and the greater Uwharrie region of North Carolina and extending south of Rock Hill, South Carolina. This species occurs in relatively open habitats, including early successional fields, forest ecotonal margins, or forest clearings. It thrives in full sun but also grows in the light shade of open stands of oak-pine-hickory. The Schweinitz's sunflower generally occurs on soils characterized as moist to dryish clays, clay-loams, or sandy-clay loams that often have a high gravel content. The recovery plan for this species points out the importance of soils--"The geology and soils of this area appear to be an important determining factor in the occurrence of the Schweinitz's sunflower"--to the distribution of the species. The Schweinitz's sunflower is known from a variety of soil types, including Herndon (most common), Georgeville, Iredell (Fine, Montmorillonitic, Thermic Typic Hapluduff), Enon (Fine, Mixed, Thermic Ultic Hapludalf), and Cecil (Clayey, Kaolinitic, Thermic Typic Hapludult) (Bates 2003, Service 1994).

Status and Distribution

The species was officially listed as endangered on May 7, 1991 (Service 1991), due to imminent threats and long-term vulnerability. The 1991 listing rule referenced 13 extant populations distributed across five North Carolina counties (Cabarrus, Mecklenburg, Rowan, Stanly, and Union) and one county in South Carolina (York). As of 2006, the species' global range consists of more than 85 populations distributed across 13 North Carolina counties (the original five plus Anson, Davidson, Gaston, Montgomery, Randolph, Richmond, Stokes, and Surry) and two South Carolina counties (Lancaster and York). Expansion of the known range beyond the greater Charlotte metropolitan area has enhanced the potential for recovery in other portions of the species' range (e.g., the Uwharrie portions of the North Carolina Piedmont). However, threats to the species continue to escalate with rapid urbanization and suburban sprawl in the greater Charlotte area.

Throughout the species' range, over 80 percent of the known sites occur in managed ROWs, where vegetation management practices mimic patterns of natural disturbance from fire or native grazers, which are largely absent from the present-day landscape. However, these same vegetation management practices pose a threat to these occurrences in that inappropriately timed mowing (e.g., during the growing season, prior to seed set) or excessive herbicide applications have adversely impacted the species at several of these locations. Many of these ROW occurrences are along existing roads that are subject to widening and improvement projects, which disturb or eliminate the existing adjacent ROW. The NCDOT has a program to sign roadside rare plant populations and manage these areas with mowing and/or herbicides applied during the dormant season. Despite these efforts, 28 of the 63 NCDOT sites containing the Schweinitz's sunflower were reportedly adversely impacted at least once as of 2003 (Bates 2003). Habitat for the species continues to become increasingly fragmented with the rapid urbanization of the Charlotte, North Carolina, metropolitan area. The greater Charlotte-Gastonia-Concord area of North and South Carolina was identified as one of the

35 fastest-growing large metropolitan areas in the country in a recent report examining the effects of sprawl upon endangered species (Ewing et al. 2005).

Portions of 28 extant populations (distributed across eight North Carolina counties and two South Carolina counties) have the potential to meet some of the recovery criteria for the species. Of the 28 extant populations with some protection potential, 22 (distributed across seven North Carolina counties and one South Carolina county) are in some form of ownership and management that could provide permanent protection for the species. Portions of 10 of these 22 populations have written management plans with components explicit to the Schweinitz's sunflower; however, implementation of these plans is a challenge at all locations due to the lack of resources (funding, staff time, etc.). Management plans are in draft for portions of the remaining 12 populations; the current owners may provide (or have indicated a willingness to provide) permanent protection for these populations. All of the 28 populations with the potential to provide permanent protection are monitored (or are expected to be monitored) on a regular basis. However, none of these populations currently shows a steadily increasing trend over a period of 5 years (a component of the recovery criteria set forth in the species' recovery plan).

Analysis of the Species Likely to be Affected

At a minimum, the action area contains about 2,110 Schweinitz's sunflower stems. Of the total, about 17 stems (Unit A) will be directly impacted by project construction. Another 110 stems (Units C and D) could be indirectly affected by possible temporary increases in erosion (these two units are located downslope of the construction area) and the invasion of nonnative plants following clearing.

ENVIRONMENTAL BASELINE

Under section 7(a)(2) of the Act, when considering the effects of an action on federally listed species, we are required to take into consideration the environmental baseline. The environmental baseline includes past and ongoing natural factors and past and present impacts from all federal, state, or private actions and other activities in the action area (50 CFR 402.02), including federal actions in the area that have already undergone section 7 consultation and the impacts from state or private actions that are contemporaneous with the consultation in progress. The discussion that follows is our evaluation of the factors and impacts from the activities within the action area that make up the environmental baseline.

Status of the Species Within the Action Area

The action area contains about 2,110 Schweinitz's sunflower stems. About 17 stems will be directly affected by construction and will be relocated to a protected area adjacent to the existing road. The protected area currently contains 453 stems. In addition to the direct impacts of the project, about 110 stems may be impacted indirectly. If the transplanted material (17 stems) does not survive, the subject project would result in the direct loss of 0.8 percent of the Schweinitz's sunflower stems within the action area. Additional indirect losses could affect up to 6 percent (including an additional 110 stems) of the total number of stems in the action area.

Factors Affecting the Species' Environment Within the Action Area

Surveys for Schweinitz's sunflower have been conducted across the entire action area. No other impacts are planned or expected beyond those described in this Opinion.

EFFECTS OF THE ACTION

Under section 7(a)(2) of the Act, "effects of the action" refers to the direct and indirect effects of an action on the species or its critical habitat, together with the effects of other activities that are interrelated or interdependent with that action. Under section 7 of the Act, the federal agency is responsible for analyzing these effects. The effects of the proposed action are added to the environmental baseline to determine the future baseline, which serves as the basis for the determination in this Opinion. Should the effects of the federal action result in a situation that would jeopardize the continued existence of the species, we may propose reasonable and prudent alternatives that the federal agency can take to avoid violation of section 7(a)(2) of the Act. The discussion that follows is our evaluation of the expected direct and indirect effects of the construction of the subject interchange. Indirect effects are those caused by the proposed action that will occur later but that are still reasonably certain to occur (50 CFR 402.02). We have determined that there are no interrelated or interdependent actions apart from the action under consideration.

Factors to be Considered

As previously stated, 17 of the estimated 2,110 Schweinitz's sunflower stems within the action area will be directly affected by the proposed road relocation. An estimated 110 additional stems may be impacted indirectly because of habitat changes at the edges of the construction corridor or temporary increases in erosion.

The NCDOT has agreed to permanently protect and manage a 3.6-acre site (with an estimated 453 stems) on the south side of Mallard Creek Road that currently contains sunflowers in a utility corridor. The 17 stems that will be directly affected by construction will be moved to this site.

The total number of Schweinitz's sunflower plants throughout its known range is not considered a limiting factor toward recovery of the species; rather, it is the protection of populations from continued developmental threats (such as the activities associated with this project) that is limiting the species' recovery.

Analyses of the Effects of the Action

Direct effects. Seventeen Schweinitz's sunflower stems in the action area will be directly affected by the proposed project. These 17 stems will be relocated to a permanently protected adjacent site.

Indirect effects. Indirect effects to Schweinitz's sunflower stems are anticipated to occur to about 110 stems. Impacts may result from the edge of the pavement out to the cleared ROW by

allowing increased sunlight (which may allow invasive species to spread and compete with the sunflowers that are there) or by causing temporary increases in erosion during construction.

Species' Response to the Proposed Action

The proposed construction activities will result in the removal of all vegetation within the impact area and the permanent conversion of suitable habitat to the roadway and maintained shoulders. The proposed project will result in direct impacts to an estimated 17 (Unit A) Schweinitz's sunflower stems out of the estimated 2,110 stems in the action area. The predicted impacts will not have appreciably negative effects on the recovery of the species.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this Opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require a separate consultation pursuant to section 7 of the Act (Service and National Marine Fisheries Service 1998). There are no other state, tribal, local, or private actions reasonably certain to occur in the action area that would affect the Schweinitz's sunflower.

CONCLUSION

After reviewing the current status of the Schweinitz's sunflower, the environmental baseline for the action area, the effects of the proposed project, the cumulative effects, and the proposed conservation measures, it is our biological opinion that the project as proposed is not likely to jeopardize the continued existence of the Schweinitz's sunflower. No critical habitat has been designated for this species; therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and federal regulations pursuant to section 4(d) of the Act prohibit the taking of endangered and threatened species without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, such as breeding, feeding, or sheltering. Harass is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not for the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited under the Act, provided that such taking is in compliance with the terms and conditions of this incidental take statement.

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, section 9(a)(2)(B) provides limited protection to listed plants from take to the extent that the Act

prohibits the removal and reduction to possession of federally listed endangered plants or the malicious damage to such plants on areas under federal jurisdiction or the destruction of endangered plants on nonfederal areas in violation of state law or regulation or in the course of any violation of a state criminal trespass law. Therefore, for this Opinion, incidental take does not apply, and an incidental take statement is not necessary.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to further minimize or avoid the adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. We request that the NCDOT implement the following conservation recommendations:

1. Notify the Service's Asheville Field Office when the Schweinitz's sunflower plants have been transplanted. This notification should occur no later than 2 weeks after transplanting.
2. Provide a written report summarizing the survival of relocated Schweinitz's sunflower plants, as well as any seemingly significant threats or management issues, within 13 months of the completion of transplanting. This report should be submitted to the NCNHP and the Service's Asheville Field Office. The report should include maps and photographs sufficient to clearly convey the general vicinity and specific location of the conservation (transplant) area, the specific locations within the project area in which the Schweinitz's sunflower occurs and is monitored, and a condition assessment of the species and its habitat.

We request notification of the implementation of any conservation recommendations by January 1st of each calendar year following the date of this Opinion. This notification can be sent via e-mail to members of our staff: Ms. Marella Buncick (marella_buncick@fws.gov), the lead biologist for this consultation, and/or Dr. Carolyn Wells (carolyn_wells@fws.gov), the species recovery lead for the Schweinitz's sunflower.

REINITIATION/CLOSING STATEMENT

This concludes formal consultation on the action outlined in your January 15, 2010, request for formal consultation. As provided in 50 CFR 402.16, the reinitiation of formal consultation is required where discretionary federal agency involvement or control over an action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion, (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this Opinion, or (4) a new species is listed or critical habitat is designated that may be affected by the action.

If you have any questions or concerns about this consultation or the consultation process in general, please feel free to contact Ms. Buncick at 828/258-3939, Ext. 237, or me, Ext. 223. In any future correspondence concerning this project, please reference our Log Number 4-2-09-342.

Sincerely,



Brian P. Cole
Field Supervisor

cc:

Ms. Laura Gadd, Botanist, North Carolina Department of Agriculture and Consumer Services,
Plant Protection Section, 1060 Mail Service Center, Raleigh, NC 27699-1060
Ms. Misty Buchanan, Botanist, Natural Heritage Program, North Carolina Department of
Environment and Natural Resources, 1601 Mail Service Center, Raleigh, NC 27699-1601
Regional Director, FWS, Atlanta, GA (ES, Attention: Mr. Ken Graham)

Literature Cited

- Bates, M. 2003. Status survey and protection prioritization of Schweinitz's sunflower, Report to the U.S. Department of the Interior, Fish and Wildlife Service, Charleston, SC.
- Ewing, R., J. Kostyack, D. Chen, B. Stein, and M. Ernst. 2005. Endangered by Sprawl: How Runaway Development Threatens America's Wildlife. National Wildlife Federation, Smart Growth America, and NatureServe.
- U.S. Fish and Wildlife Service. 1991. Endangered and threatened plants; determination of *Helianthus schweinitzii* (Schweinitz's sunflower) to be an endangered species. *Federal Register* 56(88):21087-21091.
- , 1994. Schweinitz's sunflower recovery plan. Atlanta, GA. 28 pp.
- U.S. Fish and Wildlife Service and National Marine Fisheries Service. 1998. Endangered Species Consultation Handbook - Procedures for Conducting Consultation and Conference Activities under Section 7 of the Endangered Species Act. Washington, D.C.

General Project Information

Project No.:	R-2123CE		Date:	3/4/2011		
City/Town:	Charlotte		Designer:	Matthew Cook		
County(ies):	Mecklenburg County	Cabarrus County	Project Manager:	Tina Swiezy		
River Basin(s):	Yadkin-Pee Dee		CAMA County?	no	TVA County?	no
Primary Receiving Water:	Stony Creek		NCDWQ Stream Index:			
NCDWQ Surface Water Classification for Primary Receiving Water			Primary:	Class C		
			Supplemental:			
Other Stream Classification:						
303(d) Stream?	no	Type(s) of Impairment:				
State Stormwater Permit Required?	no	If yes, why?				
Could the Project Impact Threatened or Endangered Species?	yes					
Description:	Schweintz's Sunflower					
Anadromous Fish Present?	no					
Description:						
Buffer Rules in Effect?	no	Buffer Rules:				

Existing Site

Description of Existing Project Area:	The project is located at the existing I-85 / I-485 interchange. The area is urban, however, there are woods located along the project. There is great variation in contours. There are two creeks running through the project, Stony Creek and an Unnamed Tributary to Rocky River that hydraulically require box culverts.					
Average Daily Traffic (existing):	I-85 2008: 104,600; I-485 2008: 66,600					
Existing Cross Section:	I-485: 3 lane open shoulder with depressed median; I-85: 8 lane open shoulder with barrier median					
Surrounding Land Use:	Woods along project, urban housing and commercial in outer drainage areas					
General Comments:						

Project Description

Description of Proposed Project:	The project consists of construction of the interchange between I-485 and I-85 and its approaches on existing and new location in Mecklenburg and Cabarrus Counties. The project will be overlay with ramp widening along I-85 and a 6-lane divided facility with a grass median along I-485. The southern portion of the interchange for I-485 is on existing location with the northern portion being new location. The interchange is a turbine design.					
Average Daily Traffic (proposed):	I-85 2035: 190,400; I-485 2035: 155,800					
Proposed Cross-Section:	I-485: 6 lane open shoulder, depressed median					
Interchange Modification:	yes	Median Type:	Depressed			
Terminus:	-L- 32+60.42					
Terminus:	-L- 106+80.74					
Project Length (lin. miles/feet):	1.405mi	Added Impervious Area (ac.):	Appr. 63			
General Comments:	A turbine interchange design is being used. I-485 is being extended in our project to meet R-2248E, I-485. This extension of I-485 is new location. The rest of the project is located on existing highway.					

Environmental Summary

Riparian Buffer and Jurisdictional Stream Impacts and Associated SCMs

[illegible]

General Comments:



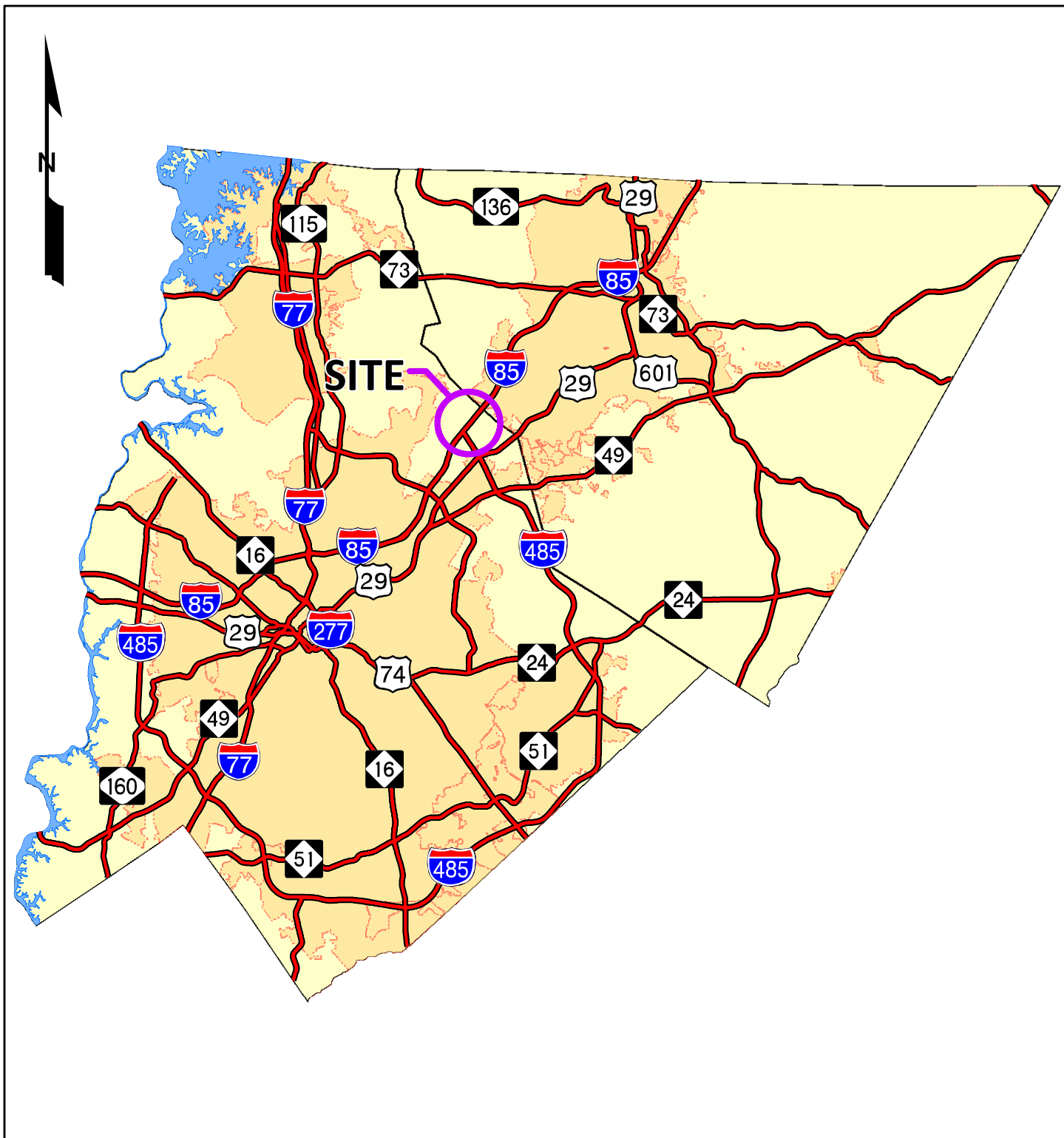
Released: July 2010 (DRAFT)

North Carolina Department of Transportation
Highway Stormwater Program
STORMWATER MANAGEMENT PLAN

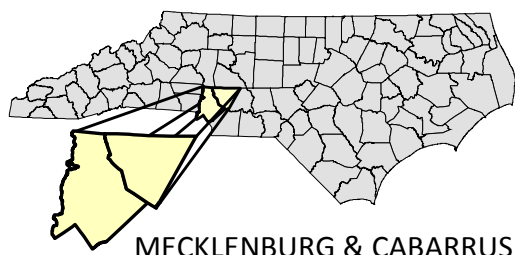
Version 1.1



Jurisdictional Wetlands		
Station	Type of Impact	Minimization of Impact
L 83+50CL RPF 33+80RT	48" RCP; Fill in wetland	Total take under roadway footprint
RPH 70+00 RT	84" RCP; Fill in wetland	2:1 fill slope
L 98+00 LT	30" CSP; Fill in wetland	Total take under roadway footprint
Y 61+40-66+75 LT	NA	Total take under roadway footprint
General Comments:		



VICINITY MAP

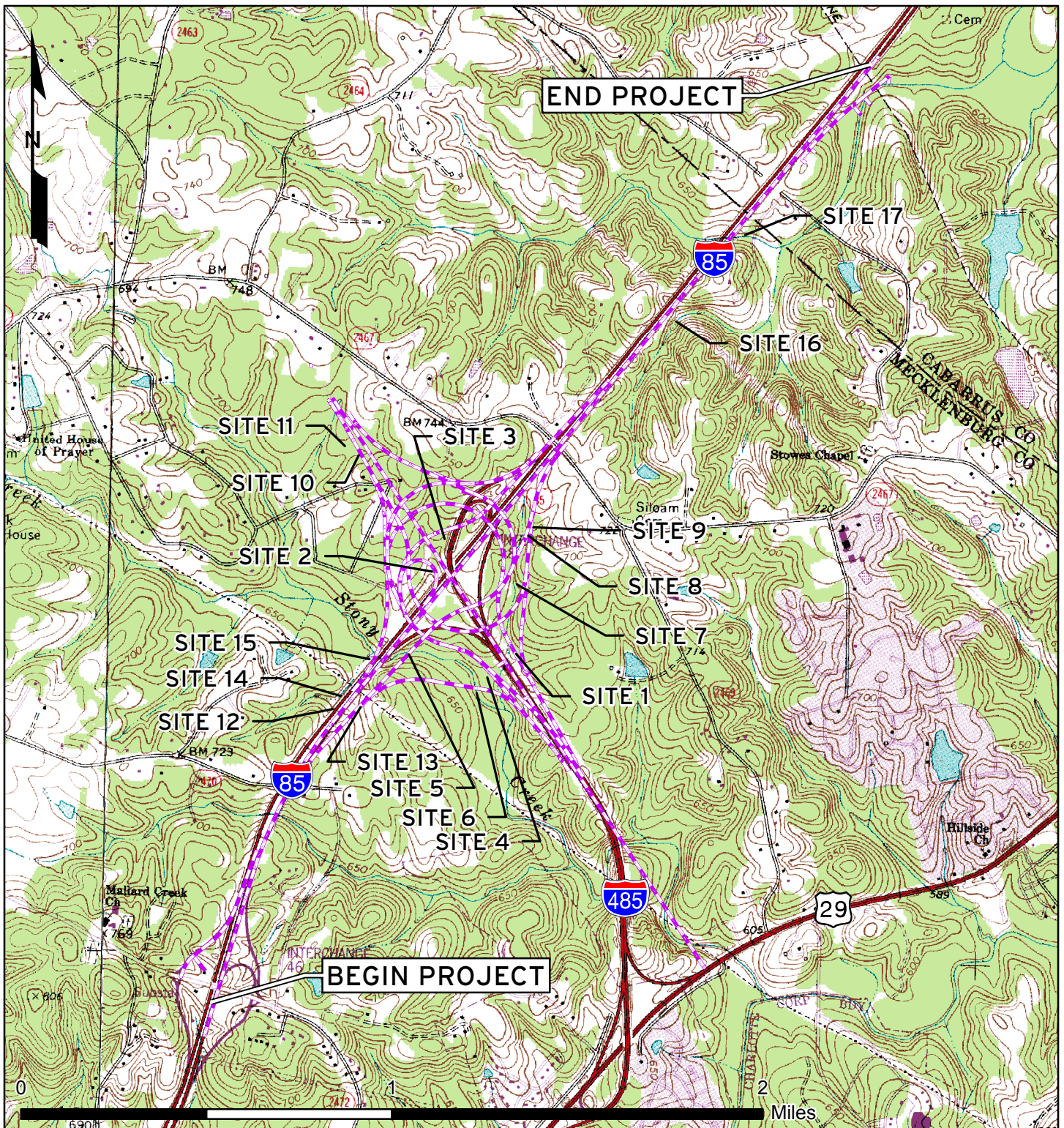


MECKLENBURG & CABARRUS

NCDOT

DIVISION OF HIGHWAYS
MECKLENBURG AND CABARRUS COUNTIES

PROJECT C202523 (R-2123CE)
I-85/ I-485 INTERCHANGE



LOCATION MAP

NCDOT

DIVISION OF HIGHWAYS
MECKLENBURG AND CABARRUS COUNTIES

PROJECT C20523 (R-2123CE)
I-85/ I-485 INTERCHANGE

SHEET 2

WETLAND PERMIT IMPACT SUMMARY												
Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	RPG 28+00 RT	48" RCP						0.01		49		
2	L 83+50CL RPF 33+80RT	48" RCP	0.04					0.06	0.01	1132	47	
3	L 80+50 RT	42" RCP						0.03		239		
4	RPH 70+00 RT	84" RCP	0.72									
5	Y 71+00 RT & LT	2@ 9'X10' RCBC						0.27	0.01	651	27	
6	RPB 28+00 RT & LT	84" LRFD						0.03	0.04	80	92	
7	PG 28+20RT RPF 56+95L	84" RCP						0.14	0.00 *	1461	37	
8	RPE 67+75 CL	66" RCP						0.03	0.00 *	280	11	
9	RPE 68+00 CL	66" RCP						0.01	0.00 *	147	16	
10	L 98+00 LT	30" CSP	0.02					0.02	0.00 *	286	20	
11	L 100+50 LT	30" RCP						0.01	0.00 *	55	11	
12	Y 61+00 LT	NA						0.01		151		
13	Y 62+50 RT	36" RCP						0.00 *		48		
14	Y 61+40-66+75 LT	NA	0.01					0.07	0.00 *	554	20	
15	Y 69+00 LT	NA						0.03	0.00 *	198	10	
16	Y 131+50-135+60 RT	NA						0.07	0.00 *	524	23	
17	Y 148+00 LT & RT	6' X 8' RCBC						0.04	0.01	144	26	
TOTALS:			0.79					0.83	0.09	5999	340	

*: < 0.01ac

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MECKLENBURG AND CABARRUS COUNTIES
PROJECT: C202523 (R-2123CE)

PERMIT DRAWING SHEET 3 OF 56

LABELS FOR PROPERTY OWNERS
LOCATED UNDER SEPARATE COVER

WETLAND AND STREAM IMPACTS

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

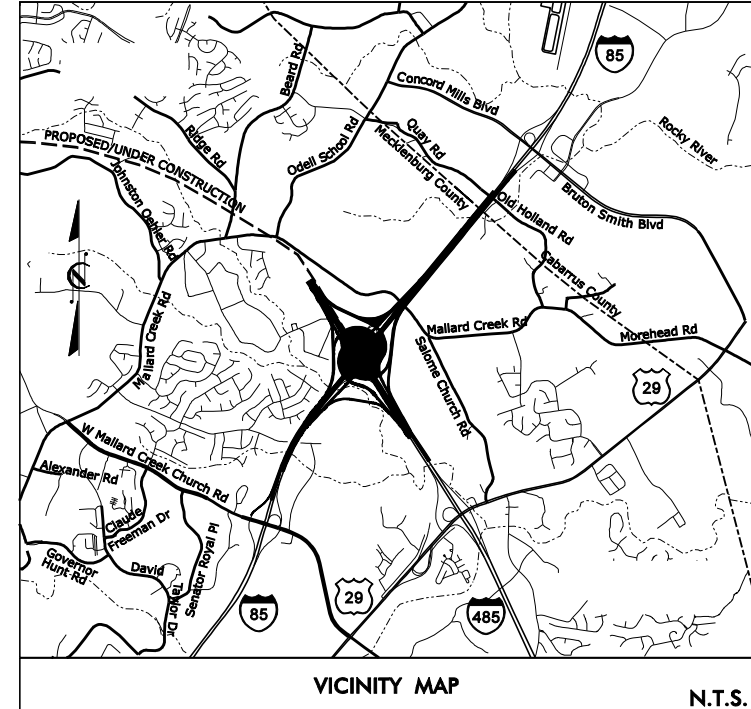
MECKLENBURG AND CABARRUS COUNTIES
PROJECT: C202523 (R-2123CE)

PERMIT DRAWING SHEET 4 OF 56

TIP PROJECT: R-2123CE

CONTRACT: C202523

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



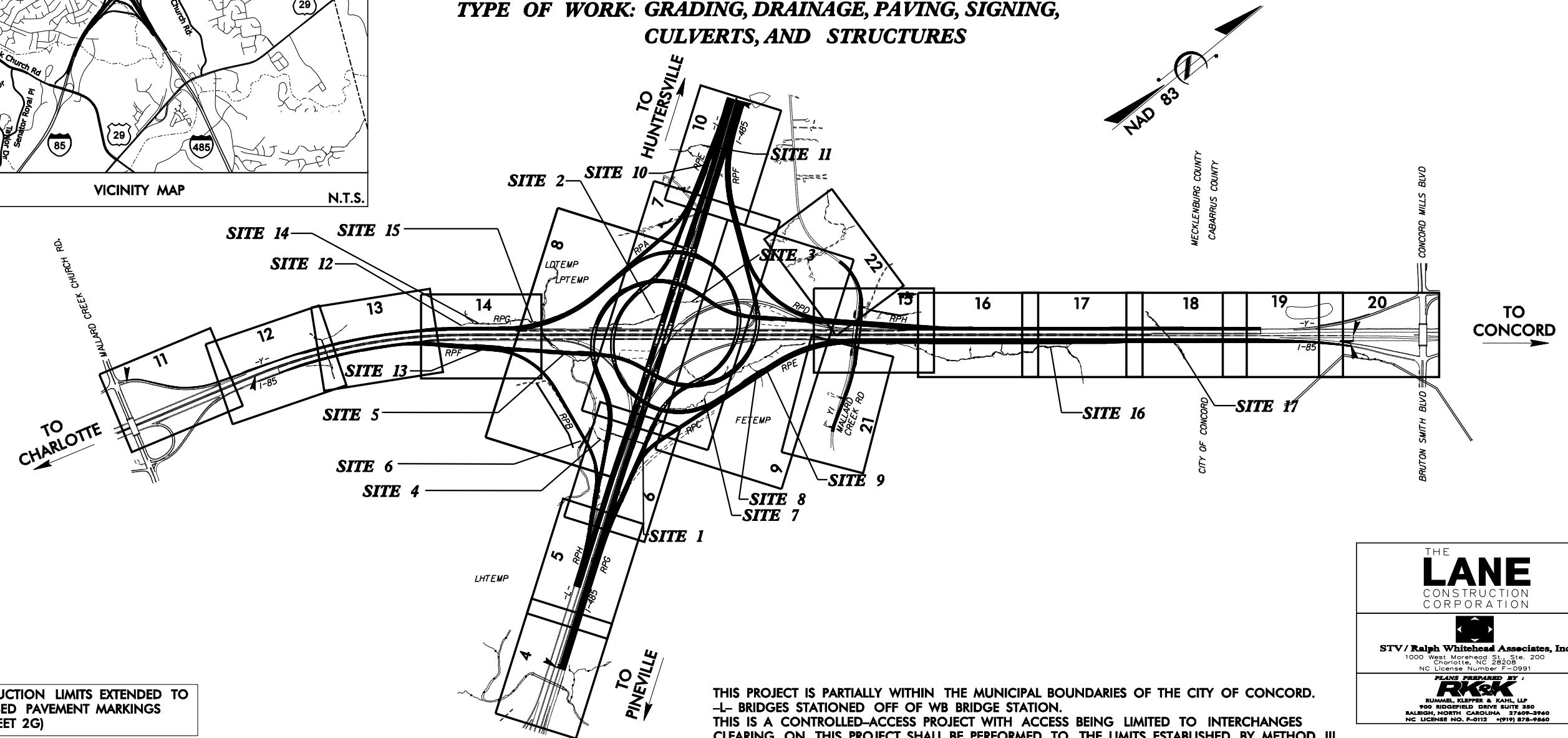
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MECKLENBURG & CABARRUS COUNTY

LOCATION: I-485 (CHARLOTTE EASTERN OUTER LOOP) / I-85
TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNING,
CULVERTS, AND STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2123CE	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34379.1J7	NHF-0485(26)	PE	
34379.2J7		R/W & UTILITY	
34379.3J7		CONST.	

PERMIT DRAWING
SHEET 5 OF 56



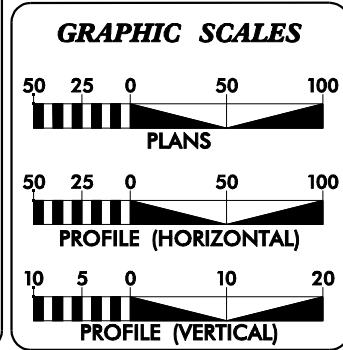
NOTE: CONSTRUCTION LIMITS EXTENDED TO
COVER PROPOSED PAVEMENT MARKINGS
(SEE DETAIL SHEET 2G)

THIS PROJECT IS PARTIALLY WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF CONCORD.
-L- BRIDGES STATIONED OFF OF WB BRIDGE STATION.
THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

THE
LANE
CONSTRUCTION
CORPORATION

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 MIDCAMP DRIVE SUITE 250
RALEIGH, NORTH CAROLINA 27609-3940
NC LICENSE NO. F-0112 (919) 878-9840



DESIGN DATA

I-485 (-L-)

ADT 2008	= 66,600
ADT 2035	= 155,800
DHV	= 10%
D	= 55%
T	= 13% *
V	= 70 mph

FUNCTIONAL CLASSIFICATION:
INTERSTATE
* (TTST 8% + DUAL 5%)

DESIGN DATA

I-85 (-Y-)

ADT 2008	= 104,600
ADT 2035	= 190,400
DHV	= 10%
D	= 55%
T	= 15% *
V	= 70 mph

FUNCTIONAL CLASSIFICATION:
INTERSTATE
* (TTST 10% + DUAL 5%)

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-2123CE	= 1.270 MILES
LENGTH OF STRUCTURE TIP PROJECT R-2123CE (BASED ON WB BRIDGES)	= 0.135 MILES
TOTAL LENGTH OF TIP PROJECT R-2123CE	= 1.405 MILES

NCDOT CONTACT: RODGER ROCHELLE, PE
Project Engineer - Alternate Delivery Unit

PLANS PREPARED FOR THE NCDOT BY:
STV/RALPH WHITEHEAD ASSOCIATES, INC.
1000 West Morehead St., Ste. 200, Charlotte NC, 28208
NC License Number F-0991

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: SEPTEMBER 28, 2010	JOHN N. JOHNSON, PE PROJECT ENGINEER
LETTING DATE: SEPTEMBER 28, 2010	JOSEPH A. FREEMAN, PE PROJECT DESIGN ENGINEER

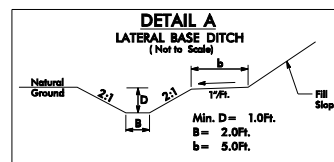
HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

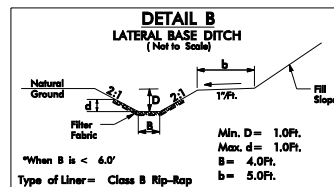
ROADWAY DESIGN ENGINEER

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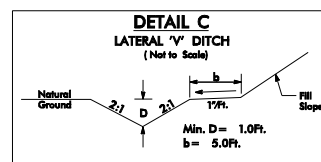
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA



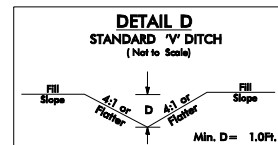
-L- STA. 71+70 TO STA. 74+57 RT
-RPE- STA. 37+25 TO STA. 39+00 RT
-RPG- STA. 33+50 TO STA. 34+00 LT
-RPG- STA. 39+40 TO STA. 41+75 LT
-Y- STA. 56+50 TO STA. 59+00 LT
-FETEMP- STA. 53+50 TO STA. 57+00 RT
-LTEMP- STA. 14+75 TO STA. 16+50 RT



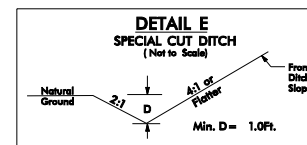
Type of Liner = Class B Rip-Rap
-L- STA. 77+85 TO STA. 82+25 LT
-RPE- STA. 27+89 TO STA. 28+35 RT
-RPE- STA. 39+00 TO STA. 41+10 RT
-RPE- STA. 67+73 TO STA. 68+25 RT
-Y- STA. 59+00 TO STA. 61+47 LT
-Y- STA. 146+50 TO STA. 149+53 RT
-Y- STA. 146+67 TO STA. 150+00 LT



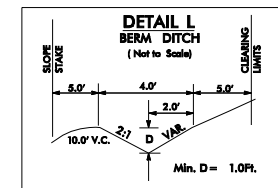
-L- STA. 79+90 TO STA. 82+00 RT
-L- STA. 83+13 TO STA. 86+00 LT
-L- STA. 83+35 TO STA. 85+50 RT
-RPF- STA. 65+50 TO STA. 67+50 LT
-RPG- STA. 34+00 TO STA. 35+75 LT
-RPH- STA. 15+23.28 TO STA. 23+20.13 LT
-Y- STA. 167+00 TO STA. 169+50 RT
-Y- STA. 20+00 TO STA. 22+00 RT



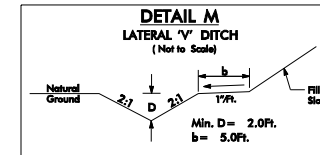
-L- STA. 54+50 TO STA. 60+00 RT
-RPE- STA. 29+50 TO STA. 31+33.99 LT
-RPG- STA. 63+00 TO STA. 65+50 RT



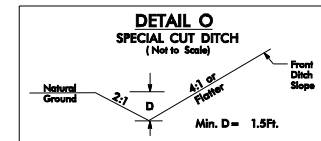
-L- STA. 42+50 TO STA. 43+50 LT
-L- STA. 92+50 TO STA. 98+00 LT
-L- STA. 104+50 TO STA. 106+50 RT
-RPE- STA. 25+00 TO STA. 27+50 LT
-RPE- STA. 11+60.65 TO STA. 14+13.15 RT
-RPD- STA. 12+73.34 TO STA. 15+88.41 RT
-RPE- STA. 19+90 TO STA. 21+90 RT
-RPF- STA. 68+50 TO STA. 72+00 RT
-RPH- STA. 20+50 TO STA. 23+50 RT
-RPH- STA. 33+25 TO STA. 34+00 RT
-RPH- STA. 37+50 TO STA. 41+50 RT
-Y- STA. 48+00 TO STA. 50+00 RT
-Y- STA. 105+00 TO STA. 108+00 RT
-Y- STA. 128+00 TO STA. 131+00 LT
-Y- STA. 157+50 TO STA. 160+50 RT
-Y- STA. 157+50 TO STA. 160+50 RT
-Y- STA. 29+50 TO STA. 31+00 RT



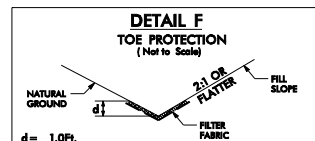
-L- STA. 89+50 TO STA. 95+00 RT
-L- STA. 105+50 TO STA. 107+00 RT
-RPD2- STA. 17+00 TO STA. 18+75 RT
-RPE- STA. 63+50 TO STA. 66+00 RT
-RPF- STA. 45+25 TO STA. 46+00 LT
-RPF- STA. 71+80 TO STA. 74+00 RT
-RPF- STA. 74+00 TO STA. 76+50 RT
-RPF- STA. 78+87 TO STA. 80+75 RT
-RPH- STA. 35+65 TO STA. 41+75 RT
-Y- STA. 45+18 TO STA. 55+00 RT
-Y- STA. 53+50 TO STA. 55+50 LT
-Y- STA. 112+44 TO STA. 114+50 LT
-Y- STA. 129+50 TO STA. 132+50 LT



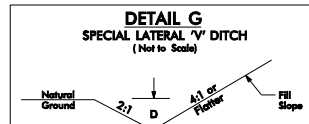
-Y- STA. 91+96 TO STA. 96+70 LT
-Y- STA. 31+00 TO STA. 32+20 RT
-FETEMP- STA. 55+00 TO STA. 55+90 LT



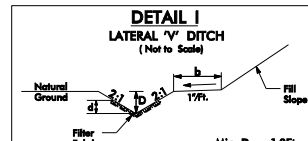
-RPE- STA. 19+50 TO STA. 28+50 RT



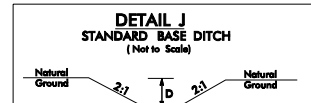
Type of Liner = Class B Rip-Rap
-L- STA. 78+10 TO STA. 79+90 RT
-RPE- STA. 47+35 TO STA. 47+85 LT
-RPF- STA. 17+50 TO STA. 24+00 LT
-RPF- STA. 30+00 TO STA. 32+50 LT
-RPG- STA. 27+00 TO STA. 32+15 LT
-RPG- STA. 41+45 TO STA. 41+95 LT
-RPG- STA. 51+50 TO STA. 52+50 RT
-RPG- STA. 79+40 TO STA. 81+10 LT
-RPH- STA. 69+00 TO STA. 72+10 LT
-Y- STA. 135+65 TO STA. 136+25 RT
-FETEMP- STA. 53+50 TO STA. 65+00 LT
-LTEMP- STA. 61+00 TO STA. 63+30 RT
-LTEMP- STA. 62+50 TO STA. 63+50 LT
-LTEMP- STA. 68+00 TO STA. 68+85 LT



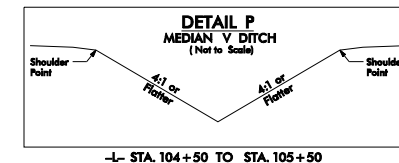
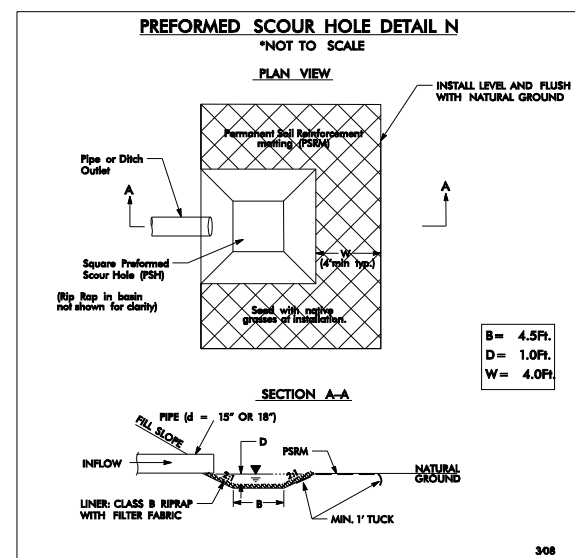
-RPE- STA. 14+13.15 TO STA. 17+50 RT
-RPF- STA. 79+84 TO STA. 80+78 LT
-Y- STA. 113+00 TO STA. 114+80 RT
-Y- STA. 21+00 TO STA. 23+70 LT
-LTEMP- STA. 50+00 TO STA. 52+00 LT
-LTEMP- STA. 52+00 TO STA. 53+50 RT



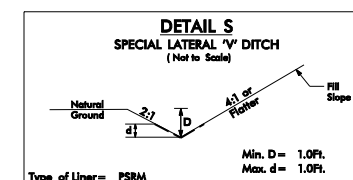
Type of Liner = Class B Rip-Rap
-RPF- STA. 30+50 TO STA. 32+75 RT
-RPF- STA. 55+25 TO STA. 58+00 LT
-RPF- STA. 63+00 TO STA. 65+50 LT
-Y- STA. 145+50 TO STA. 146+67 LT



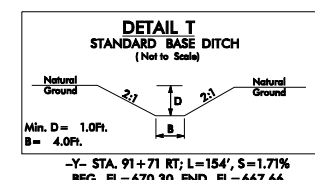
-RPH- STA. 63+85 LT; L=43', S=3.33%
BEG EL=631.43, END EL=630.00
(TIE TO PROPOSE PIPE)



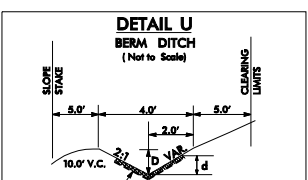
-L- STA. 104+50 TO STA. 105+50



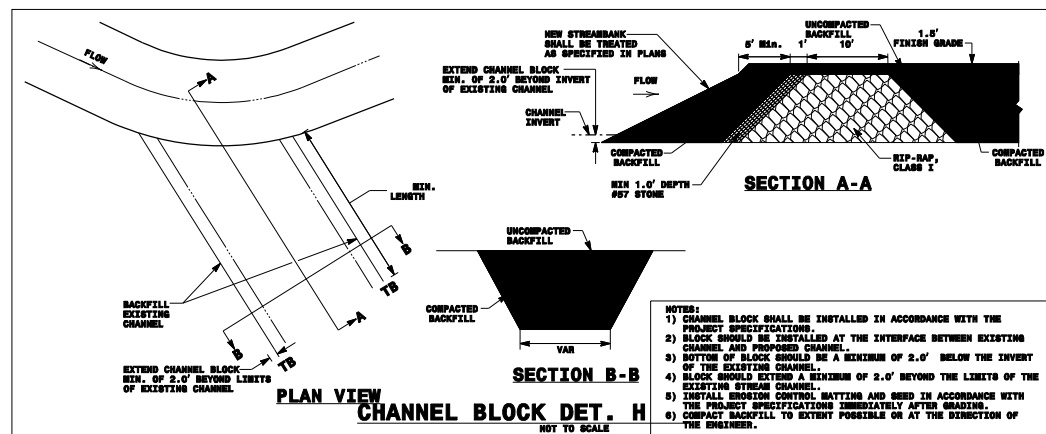
-RPE- STA. 17+07.54 TO STA. 18+42.12 RT



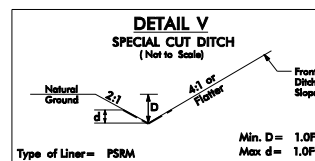
-Y- STA. 91+71 RT; L=154', S=1.71%
BEG EL=670.30, END EL=667.66
(TIE TO EXISTING DITCH)



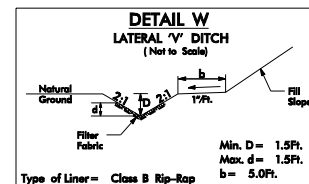
Type of Liner = Class I Riprap
-RPD- STA. 15+88.41 TO STA. 23+40 RT



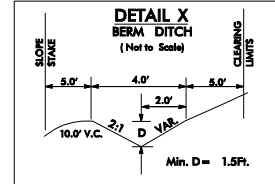
-RPE- STA. 59+00 LT
-RPF- STA. 56+60 RT
-RPF- STA. 57+33 RT
-RPG- STA. 82+35 RT



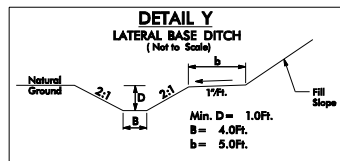
Type of Liner = PSRM
-RPD- 15+88.41 STA. TO STA. 18+50 RT
-L- 42+50 STA. TO STA. 43+50 LT



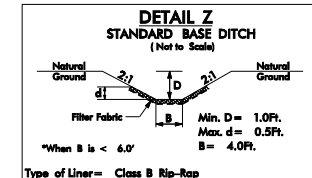
Type of Liner = Class B Rip-Rap
-Y- STA. 32+20 TO STA. 33+00 RT



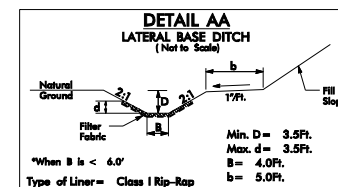
-RPH- STA. 21+70 TO STA. 23+20 RT



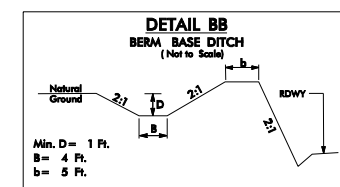
-RPH- STA. 60+50 TO STA. 69+00 LT
-Y- STA. 114+80 TO STA. 115+92 RT
-LTEMP- STA. 27+00 TO STA. 33+50 LT
-LTEMP- STA. 66+00 TO STA. 68+00 LT



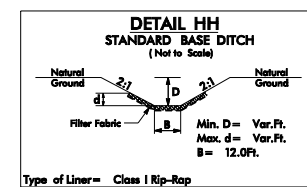
Type of Liner = Class B Rip-Rap
-Y- STA. 127+35 LT; L=25', S=15.08%
BEG EL=656.77, END EL=653.00



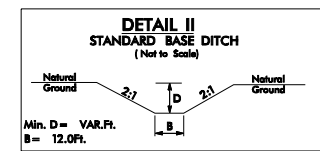
Type of Liner = Class I Rip-Rap
-Y- STA. 61+47 TO STA. 66+65 LT



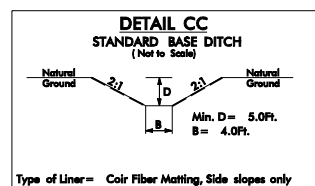
-Y- STA. 112+00 TO STA. 115+00 RT



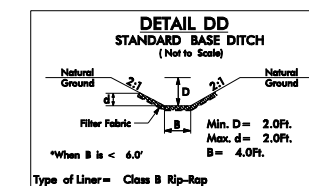
Type of Liner = Class I Rip-Rap
-RPE- STA. 28+35 RT; L=65', S=5.54%
BEG EL=617.30, END EL=613.70



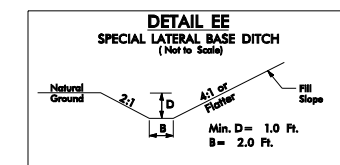
-RPE- STA. 26+75 LT; L=110', S=1.36%
BEG EL=620.00, END EL=618.50



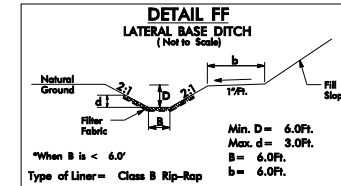
Type of Liner = Coir Fiber Matting, Side slopes only
-RPE- STA. 56+25 TO STA. 59+75 LT
-RPE- STA. 63+75 TO STA. 68+45 LT
-RPE- STA. 67+53 LT; L=50', S=1.00%
BEG EL=657.9, END EL=657.4



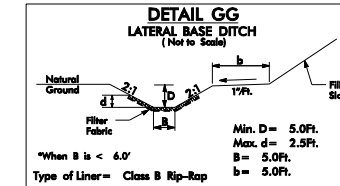
Type of Liner = Class B Rip-Rap
-RPF- STA. 34+50 RT; L=200', S=2.00%
BEG EL=624.0, END EL=620.0



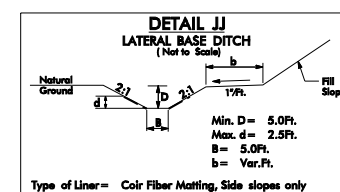
-Y- STA. 122+00 TO STA. 123+72 LT
-Y- STA. 126+50 TO STA. 127+65 LT



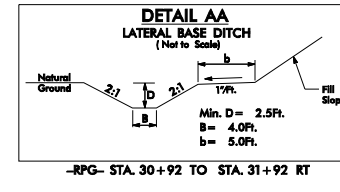
Type of Liner = Class B Rip-Rap
-Y- STA. 131+65 TO STA. 135+65 RT
(MATCH TO EXIST. STREAM)



Type of Liner = Class B Rip-Rap
-Y- STA. 61+47 TO STA. 66+65 LT

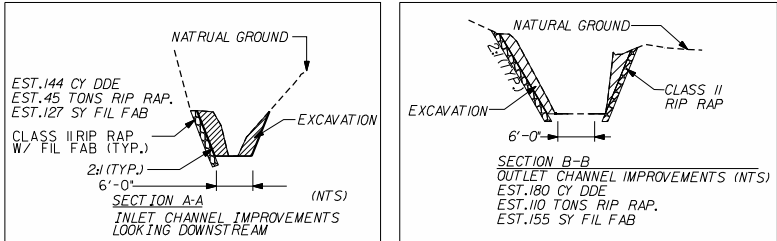


Type of Liner = Coir Fiber Matting, Side slopes only
-RPG- STA. 80+35 TO STA. 82+50 RT

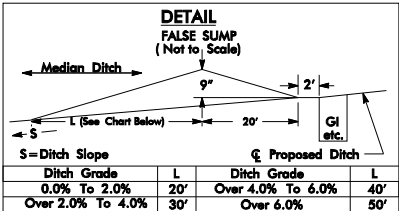


-RPG- STA. 30+92 TO STA. 31+92 RT

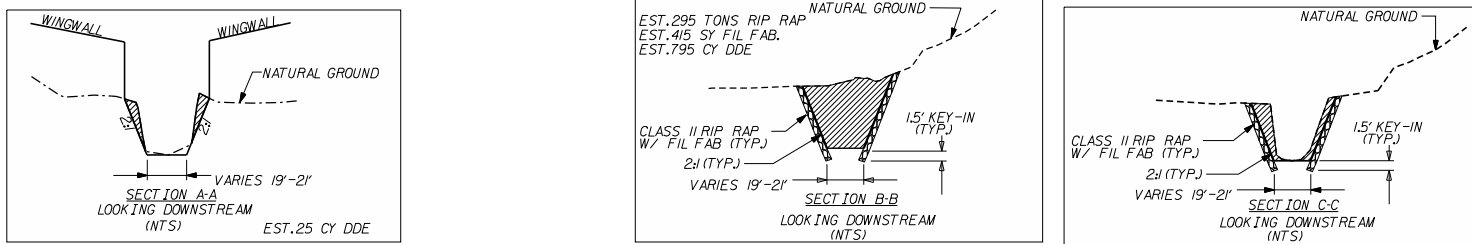
**DETAIL KK
UT TO ROCKY RIVER RCBC EXCAVATION**



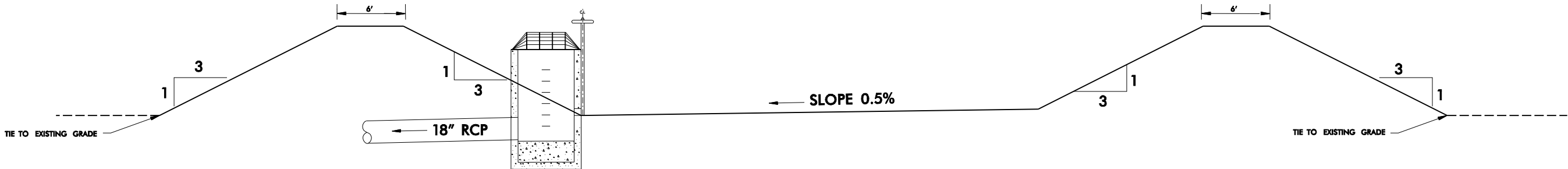
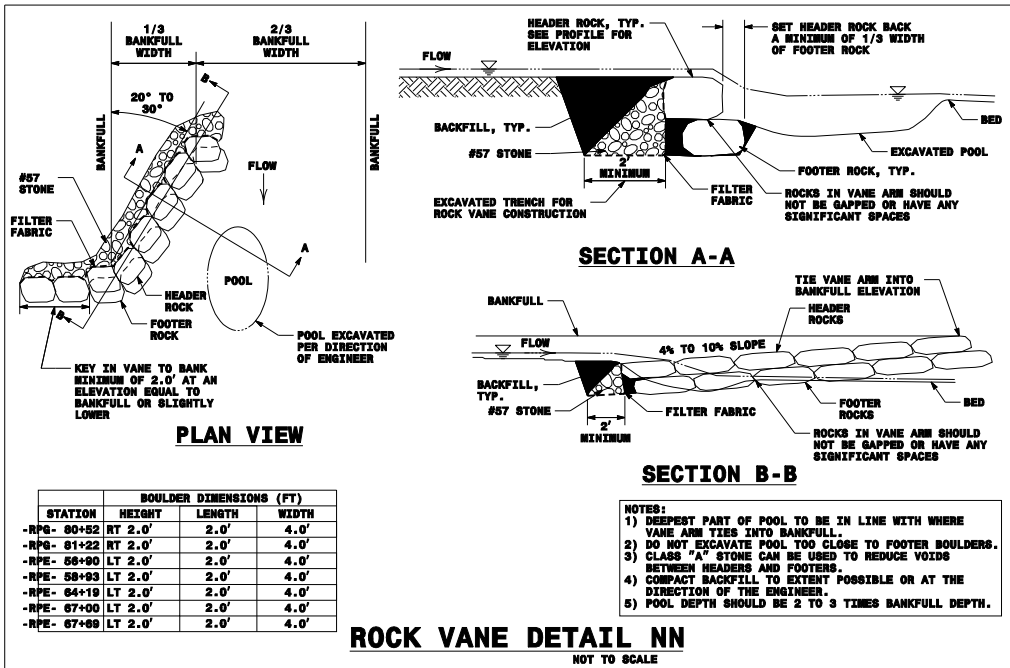
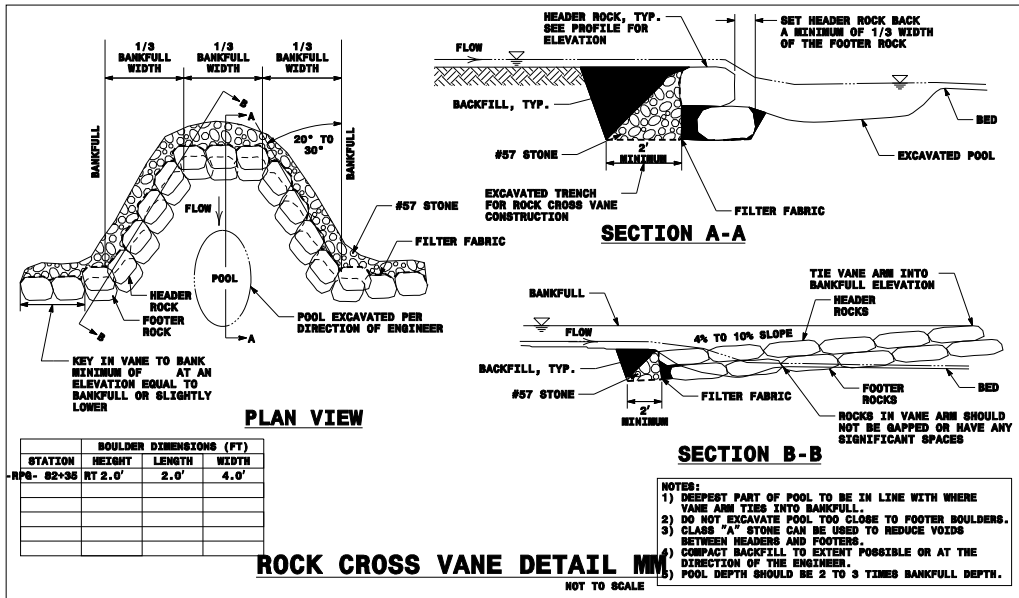
-Y- STA. 148+00



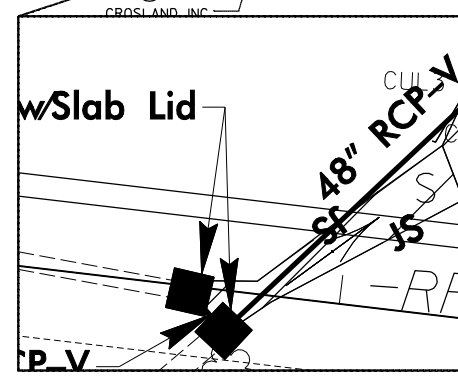
**DETAIL LL
STONY CREEK RCBC EXCAVATION**



-Y- STA. 70+00



**TYPICAL SECTION A-A - MODIFIED BASIN
N.T.S.**



THE
LANE
CONSTRUCTION
CORPORATION


STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

PLANS PREPARED BY:

RUMBLE, KLEPPER & KAHN, LLP
300 RODGERS DRIVE SUITE 300
BALHORN, NORTH CAROLINA 27608-2940
NC LICENSE NO. F-0112 (09/11) 878-7540

PROJECT REFERENCE NO.
R-2123CE

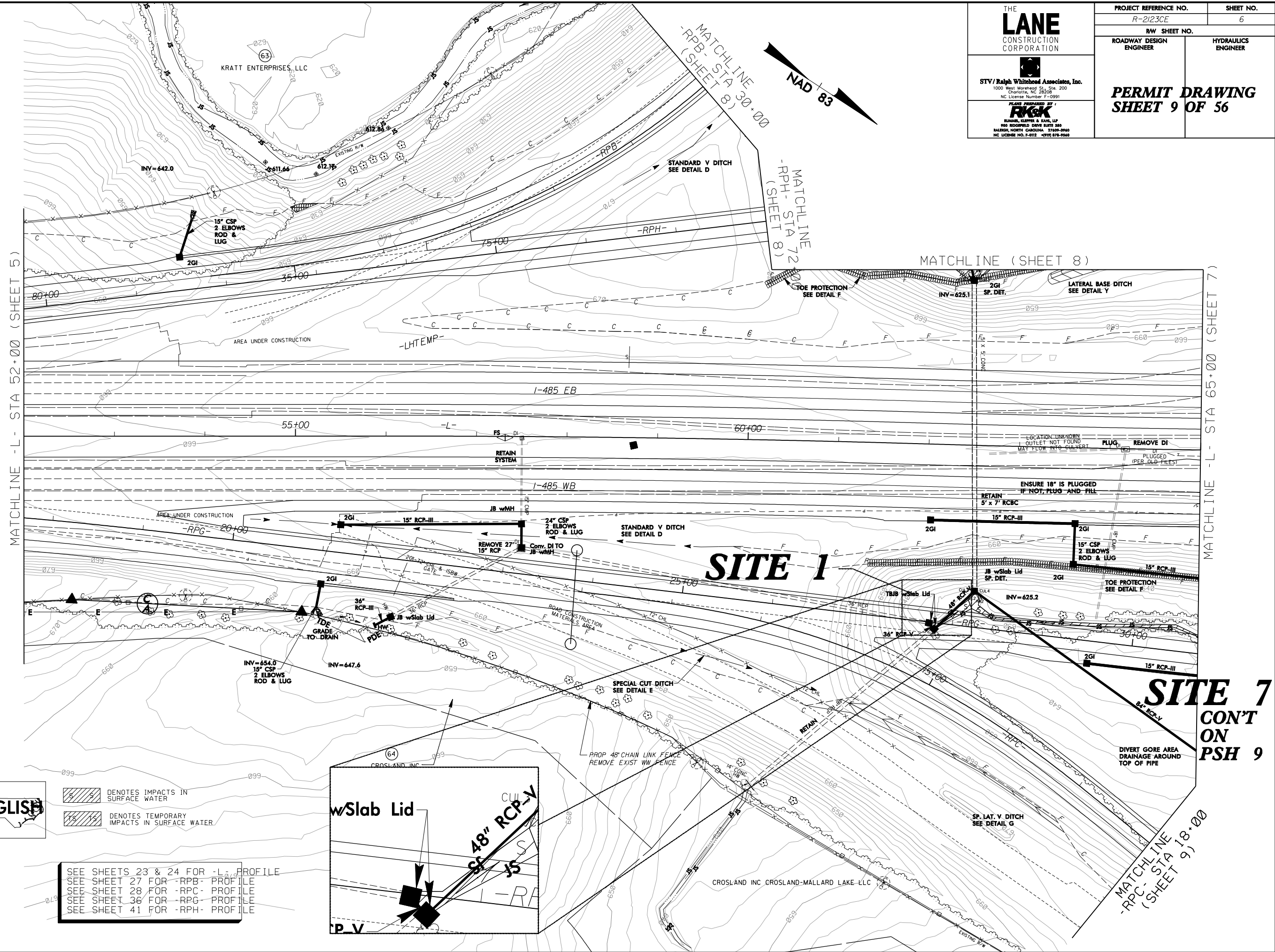
SHEET NO.
6

RW SHEET NO.

ROADWAY DESIGN
ENGINEER

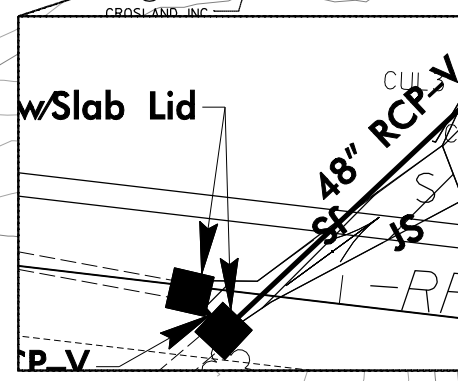
HYDRAULICS
ENGINEER

PERMIT DRAWING
SHEET 9 OF 56



-  DENOTES IMPACTS IN SURFACE WATER
-  DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SEE SHEETS 23 & 24 FOR -L- PROFILE
SEE SHEET 27 FOR -RPB- PROFILE
SEE SHEET 28 FOR -RPC- PROFILE
SEE SHEET 36 FOR -RPG- PROFILE
SEE SHEET 41 FOR -RPH- PROFILE



MATCHLINE - L- STA 65+00 (SHEET 7)

SITE 7
CON'T
ON
PSH 9

\$FILE\$
\$DATE\$

8/23/99

02040	PROJ. REFERENCE NO.	SHEET NO.
	R-2123CE	X-1

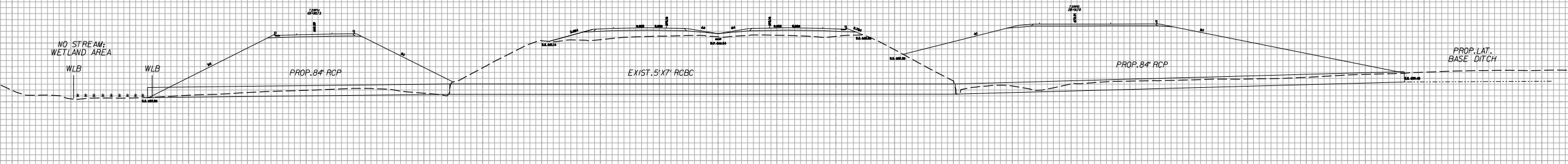
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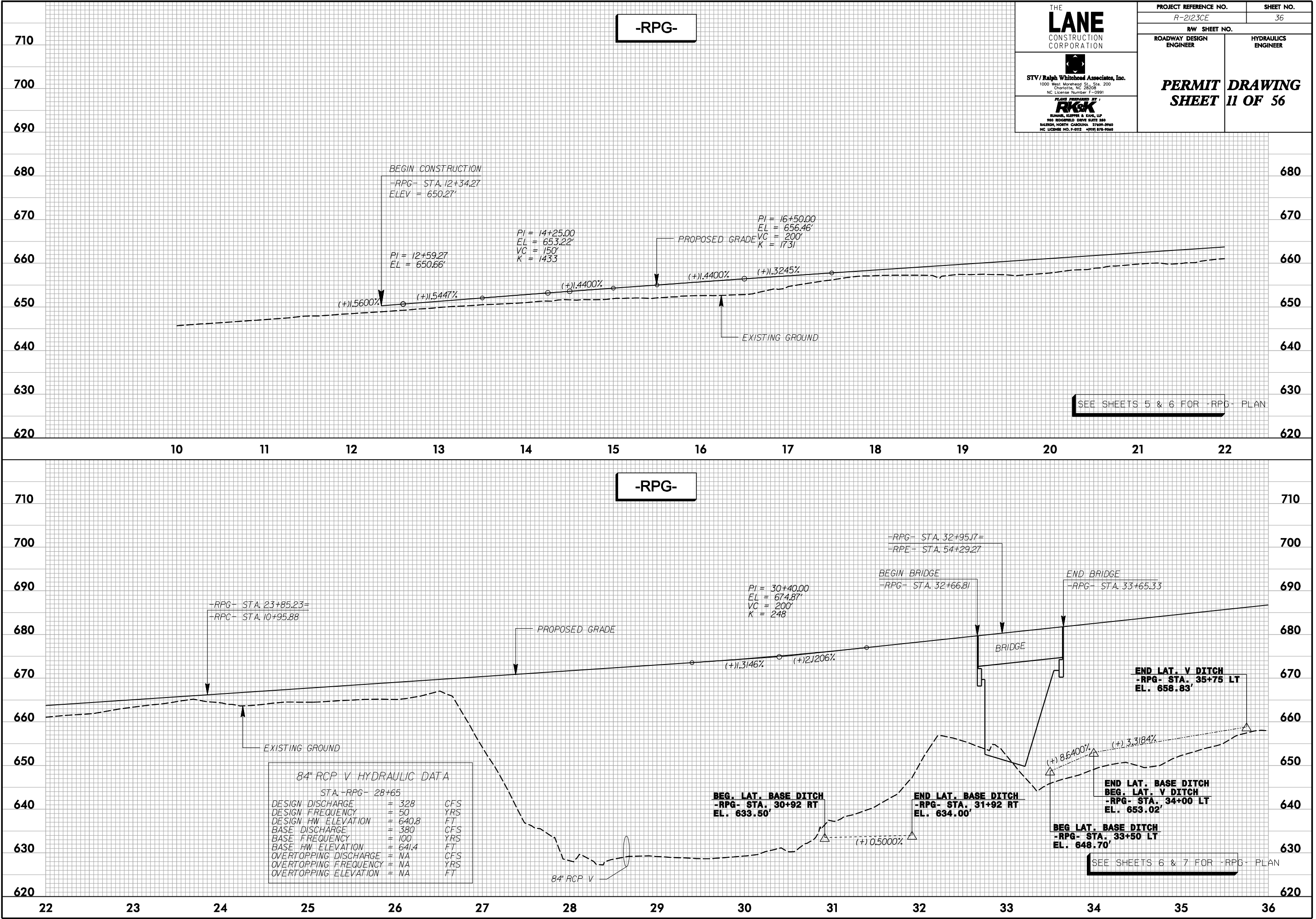
PERMIT DRAWING
SHEET 10 OF 56

-RPH- 69+89

-L- 62+50

-RPG- 28+92





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300 RODGERS DRIVE SUITE 300
BALFORD, NORTH CAROLINA 27008-2940
NC LICENSE NO. F-0112 (01/11) 876-7540

PROJECT REFERENCE NO.
R-2123CE

SHEET NO.
36

RW SHEET NO.

ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

**PERMIT
SHEET**

**DRAWING
11 OF 56**

SHEET 7A

MATCHLINE -Y- STA 78+50 (SHEET 8)

SITE 2

SITE 3

-SHEET 7B

**PERMIT DRAWING
SHEET 12 OF 56**

MATCHLINE - L - STA 65+00 (SHEET 6)

MATCHLINE (SHEET 9) MATCHLINE - RPE - STA 56+00 (SHEET 9)

MATCH LINE (SHEET 9)

MATCHLINE -Y- STA 95+00 (SHEET 9)

MATCHLINE -L- STA 93+00 (SHEET 10)

MATCHLINE
- RPF - STA 76+00
(SHEET 10)


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



SEE SHEETS 24 & 25 FOR -L- PROFILE
SEE SHEET 26 FOR -RPA- PROFILE
SEE SHEET 29 FOR -RPD- PROFILE
SEE SHEETS 30 & 31 FOR -RPE- PROFILE
SEE SHEETS 34 & 35 FOR -RPF- PROFILE
SEE SHEETS 36, 37, & 38 FOR -RPG- PROFILE
SEE SHEETS 39 & 40 FOR -RPH- PROFILE
SEE SHEET 44 FOR -Y- PROFILE
SEE SHEETS 2-H THRU 2-J FOR BRIDGE SKETCHES
SEE SHEETS 2-N THRU 2-T FOR TEMP ALIGNMENTS

SHEET 7A

MATCHLINE -Y- STA 78+50 (SHEET 8)

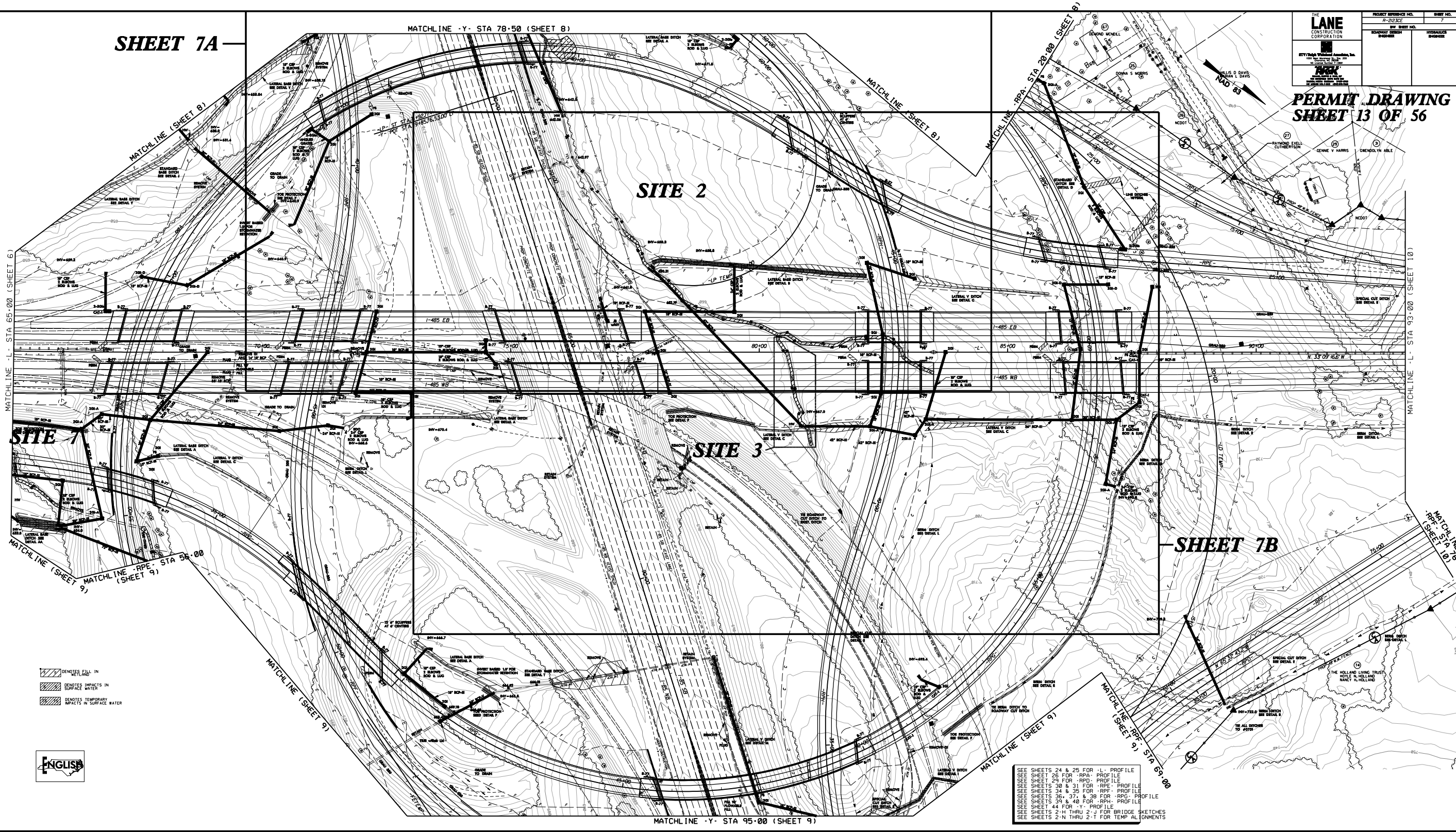
SITE 2

SITE 3

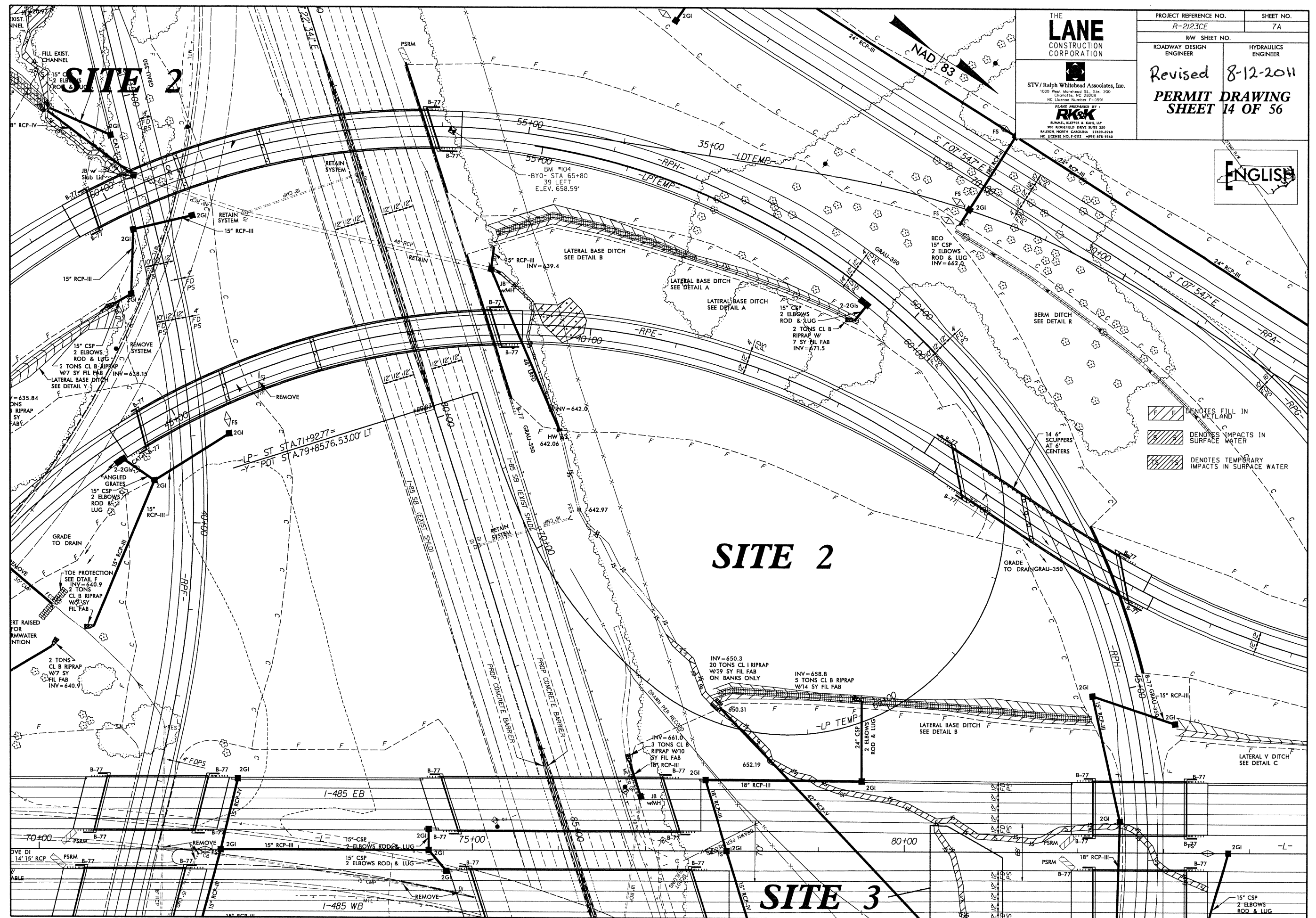
SHEET 7B

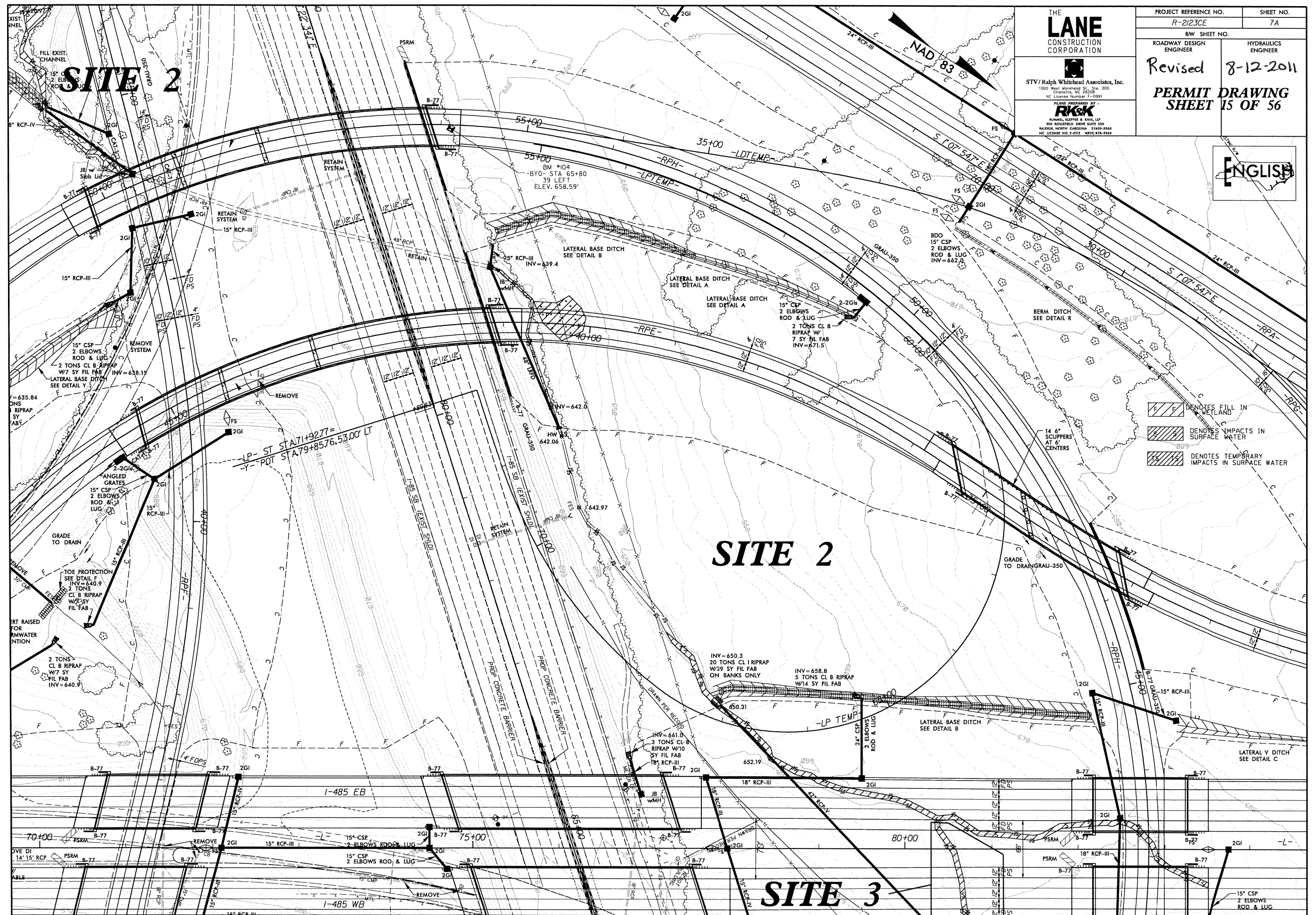
THE LANE CORPORATION
CITY/STATE/PROJECT NO.
PERMIT NO.
DRAWING NO.
SHEET NO.

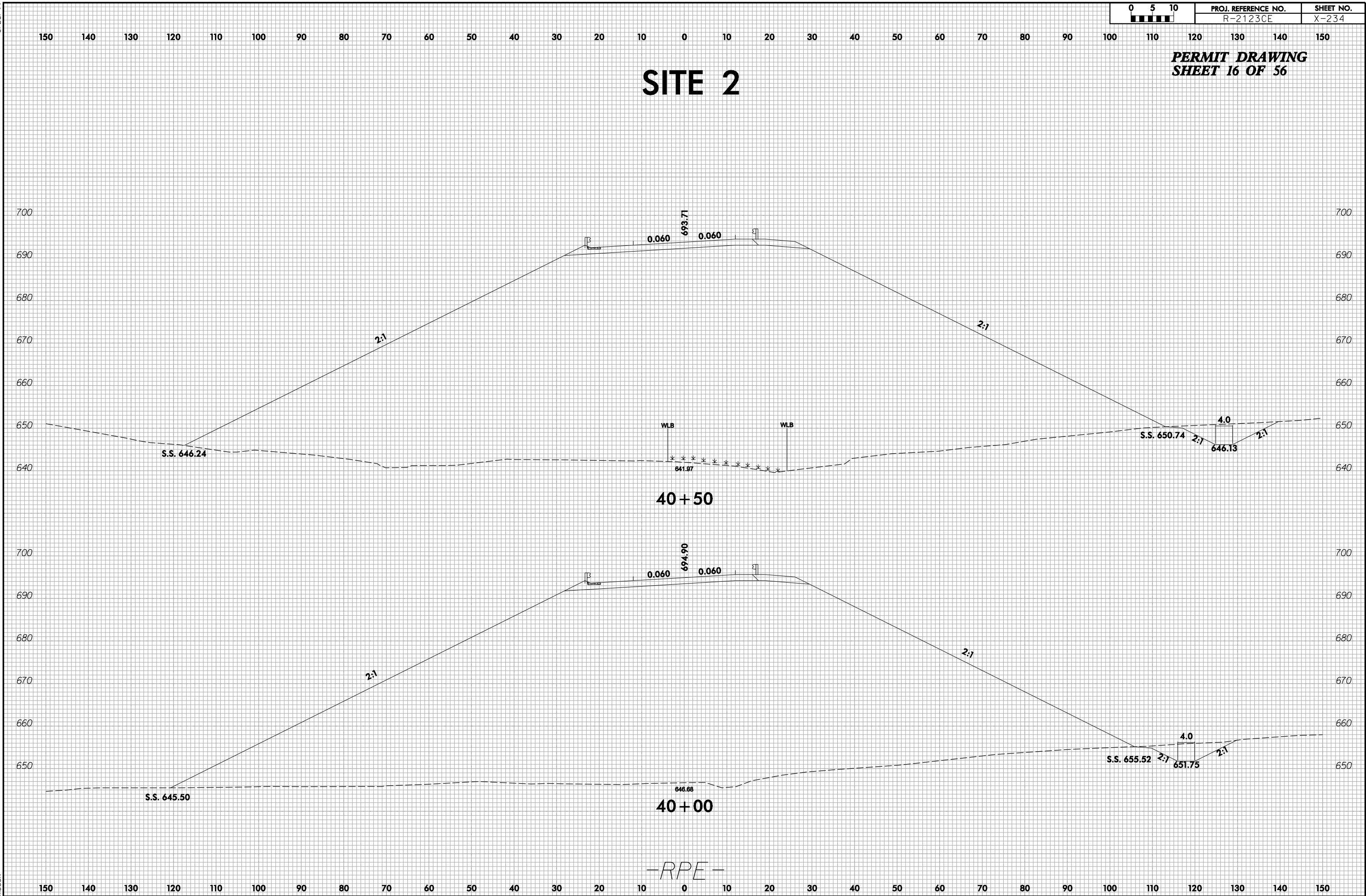
PERMIT DRAWING
SHEET 13 OF 56



SEE SHEETS 24 & 25 FOR -L- PROFILE
SEE SHEET 26 FOR -RPE- PROFILE
SEE SHEET 29 FOR -RPE- PROFILE
SEE SHEETS 30 & 31 FOR -RPE- PROFILE
SEE SHEETS 34 & 35 FOR -RPE- PROFILE
SEE SHEETS 36, 37, & 38 FOR -RPE- PROFILE
SEE SHEETS 39 & 40 FOR -RPE- PROFILE
SEE SHEET 44 FOR -Y- PROFILE
SEE SHEETS 2-H THRU 2-J FOR BRIDGE SKETCHES
SEE SHEETS 2-N THRU 2-T FOR TEMP. ALIGNMENTS







THE
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CORPORATION

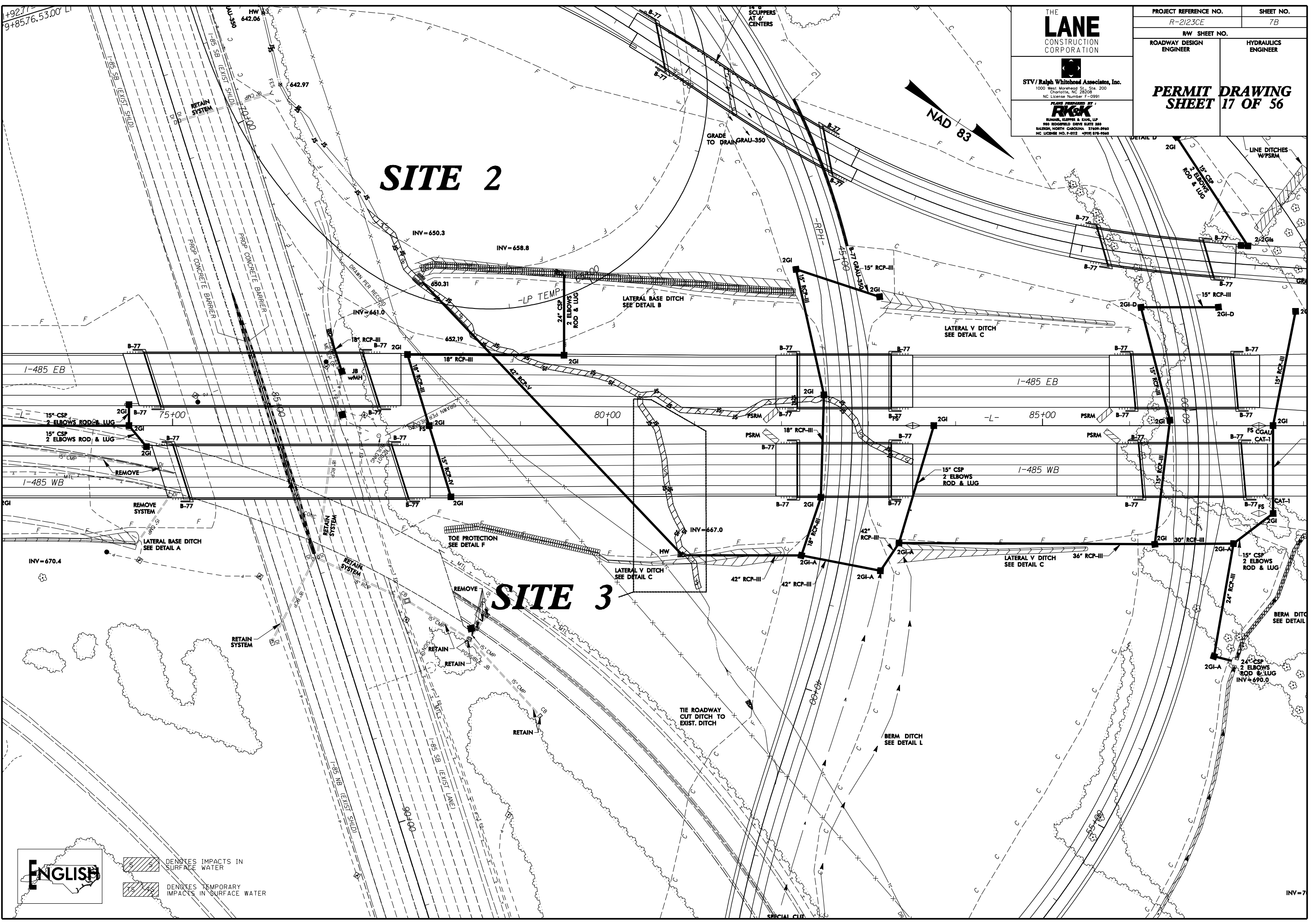
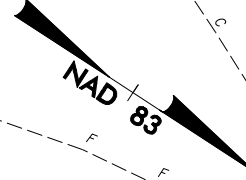


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Charlotte, NC 28208
NC License Number F-0991
PLANS PREPARED BY:
R&K
RUMMEL, KLEPPER & KAHN, LLP
300 RIDGEFIELD DRIVE SUITE 300
BALHORN, NORTH CAROLINA 27006-2940
NC LICENSE NO. F-0112 (911) 875-9540

PROJECT REFERENCE NO.		SHEET NO.
R-2123CE		7B
RW SHEET NO.		HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER		
PERMIT DRAWING SHEET 17 OF 56		

SITE 2

SITE 3



- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

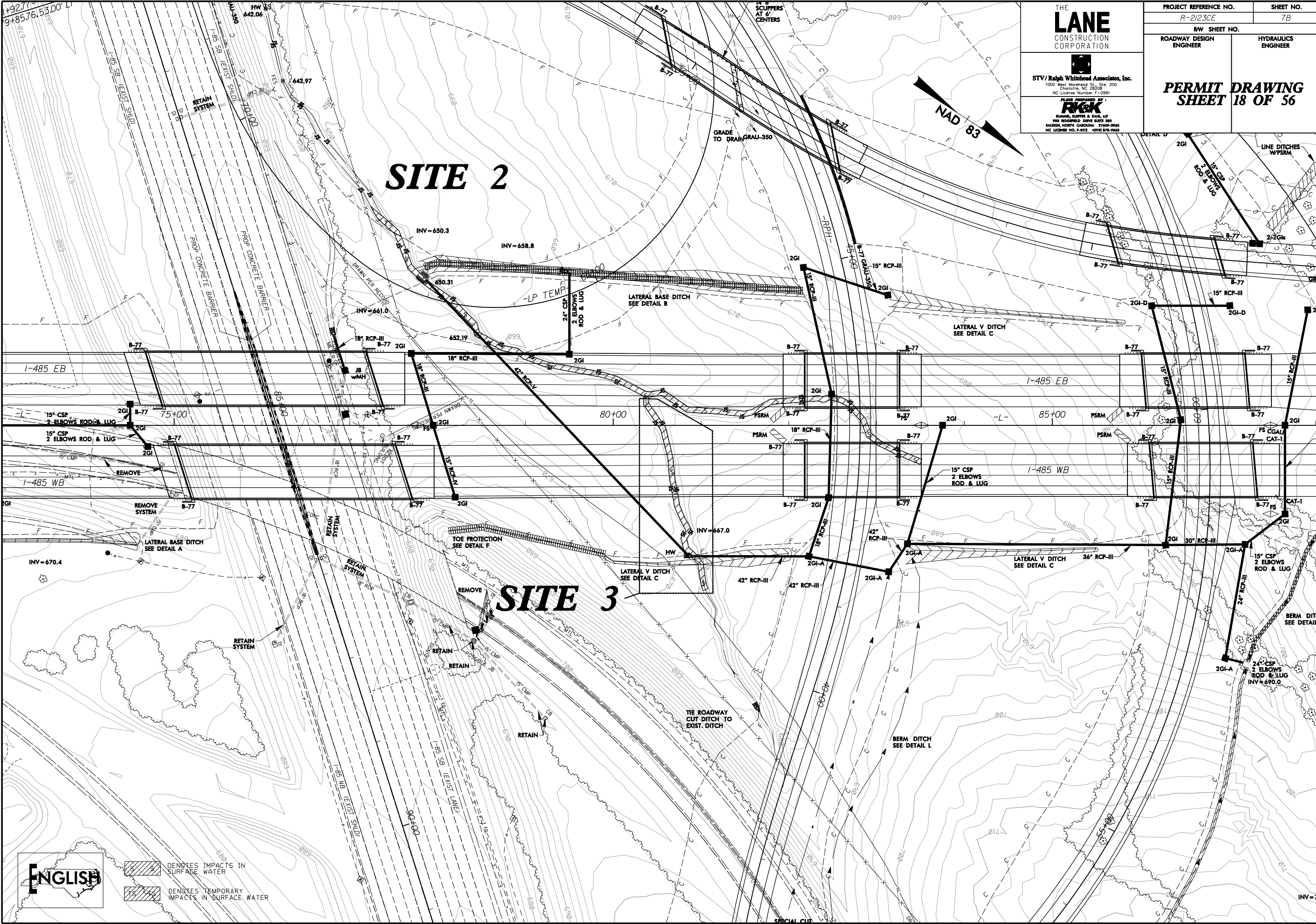
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900 RODGERS DRIVE SUITE 300
BALFOUR, NORTH CAROLINA 27008-2940
NC LICENSE NO. F-0112 (919) 875-7540

PROJECT REFERENCE NO.		SHEET NO.
R-2123CE		7B
RW SHEET NO.		HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER		
PERMIT DRAWING SHEET 18 OF 56		



ENGLISH

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SHEET 8B

MATCHLINE
- RPB. STA 16+0
(SHEET 14)

MATCHLINE
-RPF- STA
SHEET 1

MATCH 17

SITE 3

SITE

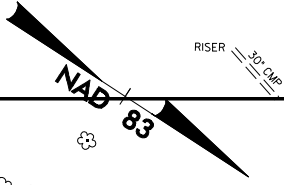
SITE C

SITE

-SHEET 8A

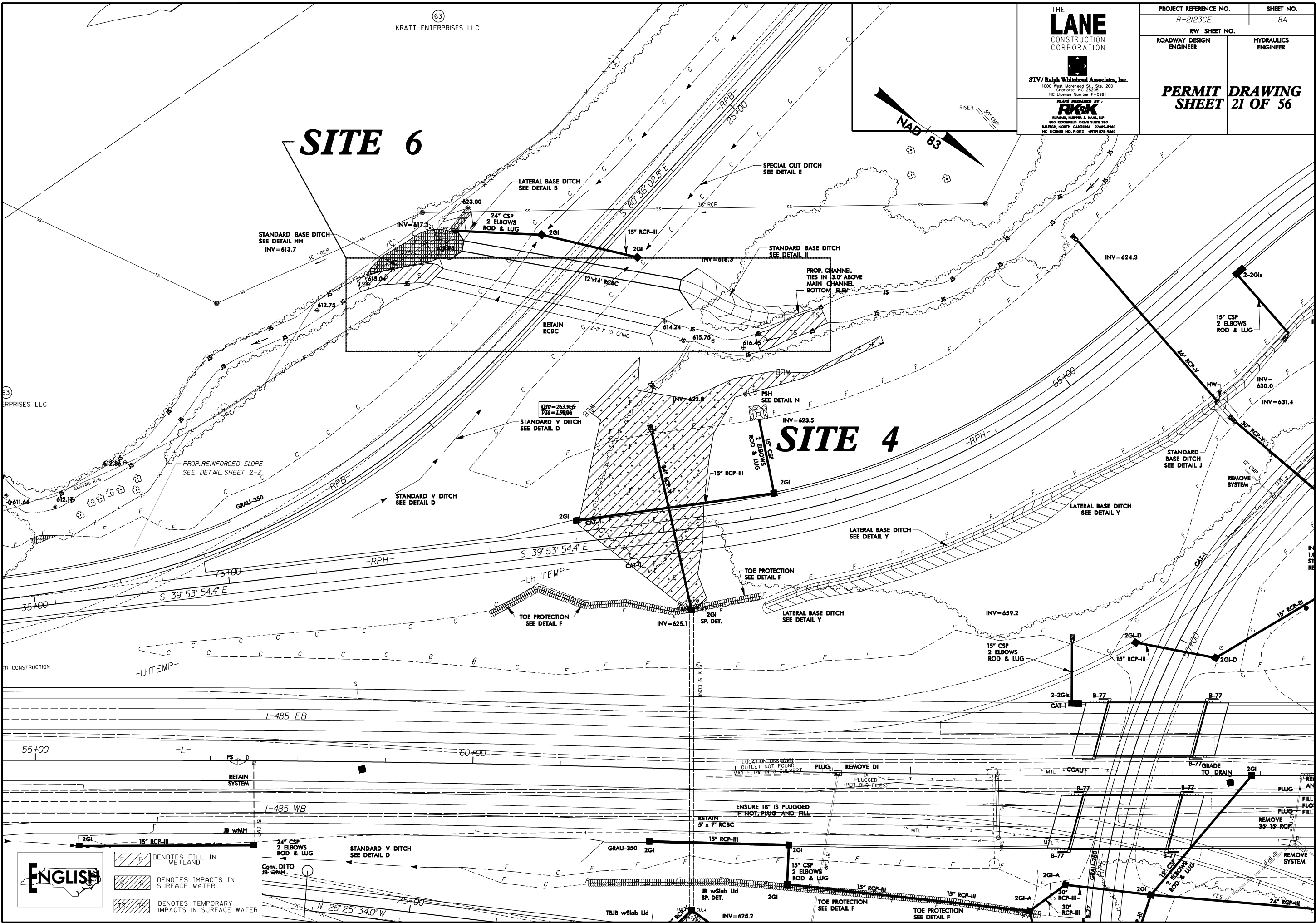
**PERMIT DRAWING
SHEET 19 OF 56**

SEE SHEET 26 FOR -RPA- PROFILE
SEE SHEET 27 FOR -RPB- PROFILE
SEE SHEETS 33 & 34 FOR -RPF- PROFILE
SEE SHEET 38 FOR -RPG- PROFILE
SEE SHEETS 40 & 41 FOR -RPH- PROFILE
SEE SHEET 2-1 FOR BRIDGE SKETCH



SITE 6

SITE 4

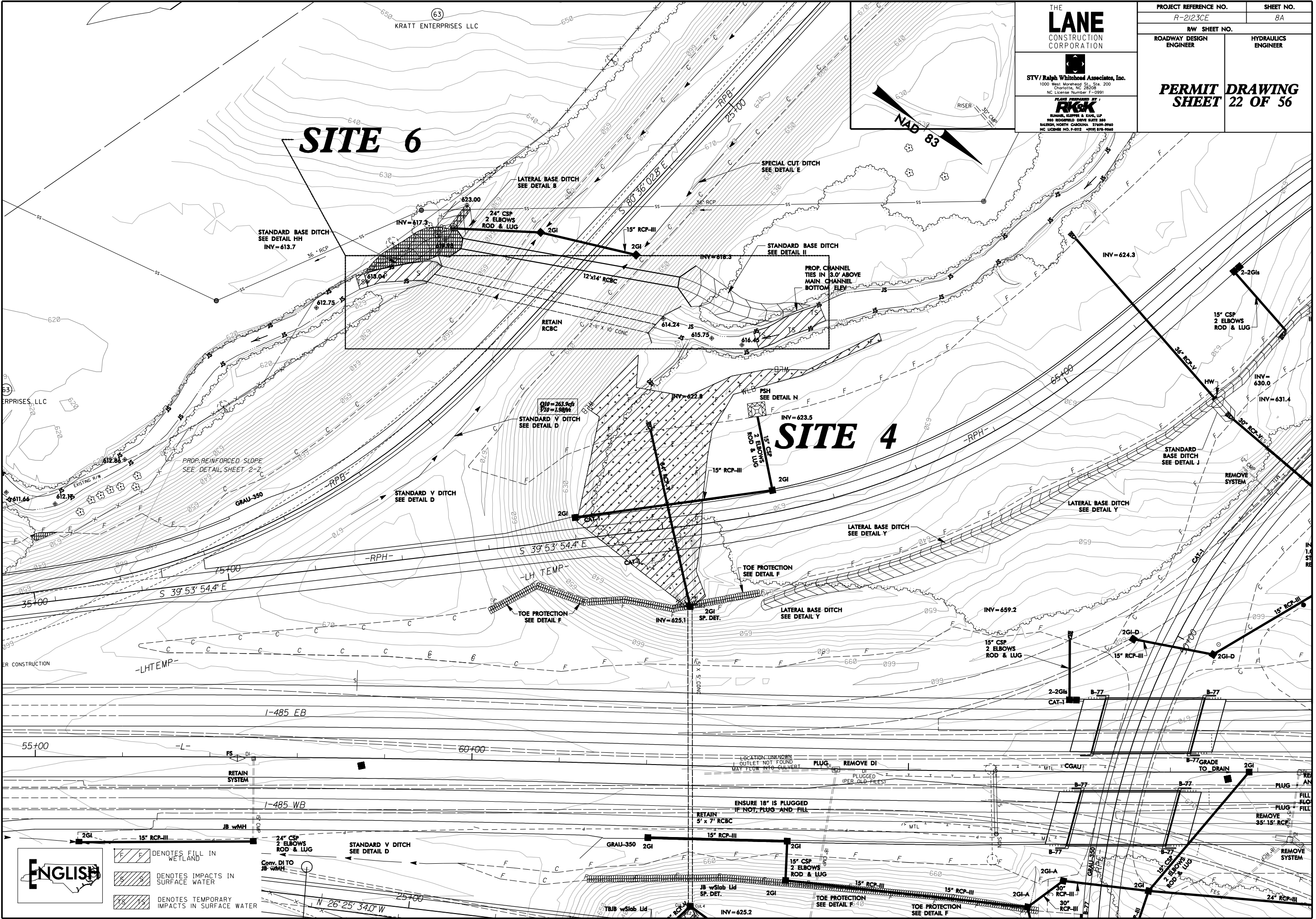


ENGLISH

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

Conv. DI TO JB w/MH

N 26° 25' 34.0" W



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NC LICENSE NO. F-0112 (01/11) 875-7540

PROJECT REFERENCE NO.

R-2123CE

SHEET NO.

8A

RW SHEET NO.

ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

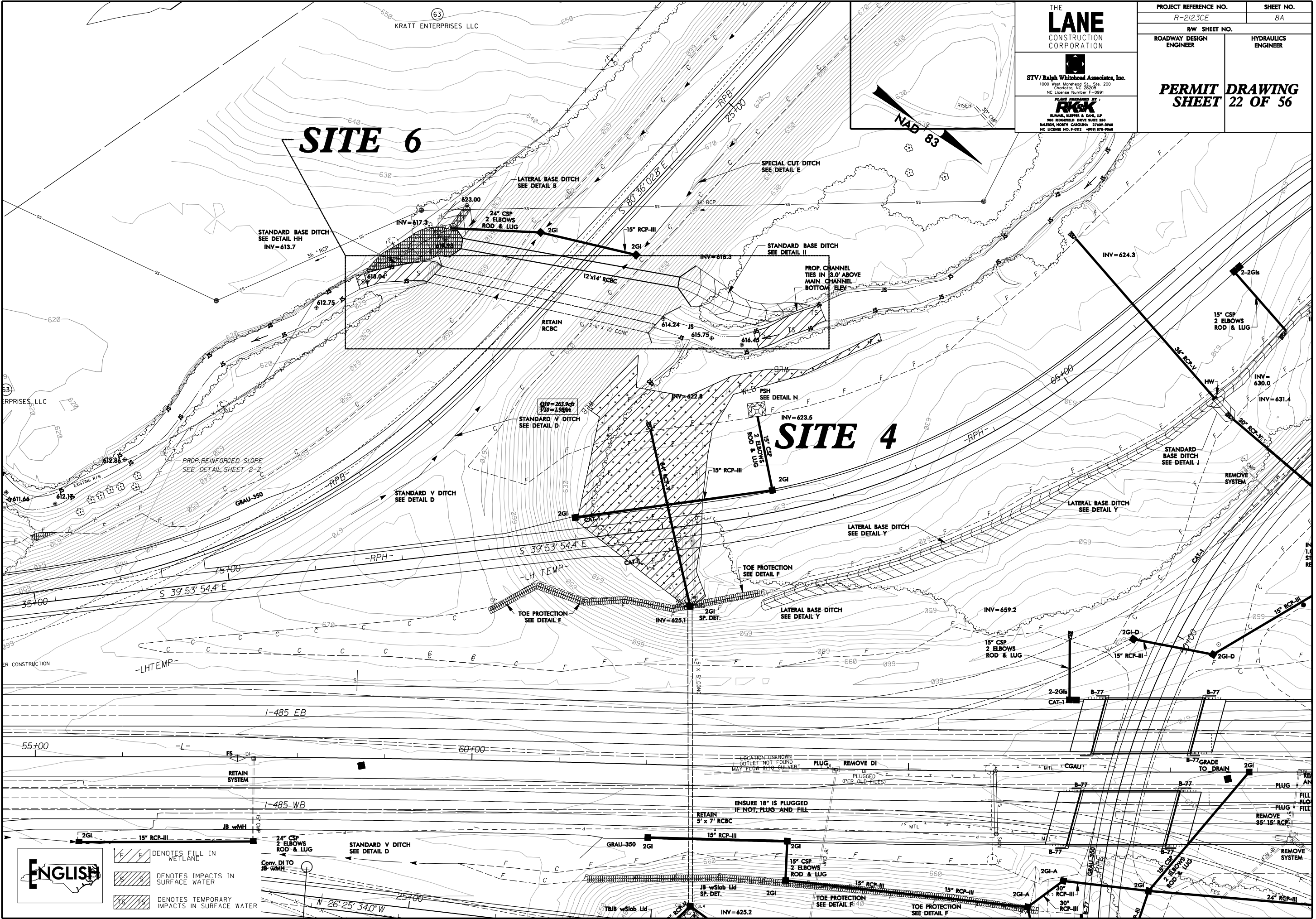
**PERMIT DRAWING
SHEET 22 OF 56**

ENGLISH

denotes fill in wetland

denotes impacts in surface water

denotes temporary impacts in surface water



8/23/99

02040	PROJ. REFERENCE NO.	SHEET NO.
	R-2123CE	X-1

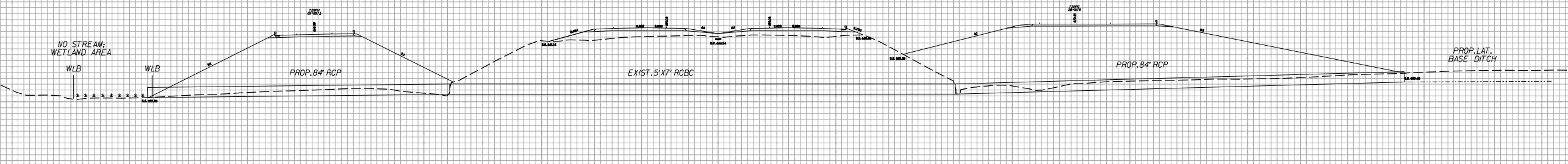
SITE 4

PERMIT DRAWING
SHEET 23 OF 56

-RPH- 69+89

-L- 62+50

-RPG- 28+92



8/23/99

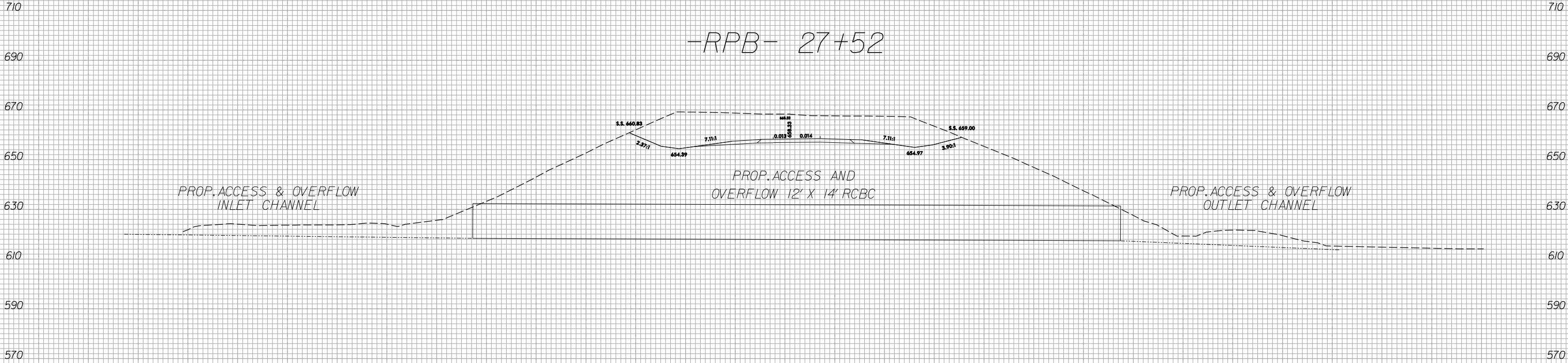
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	R-2123CE	

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SITE 6

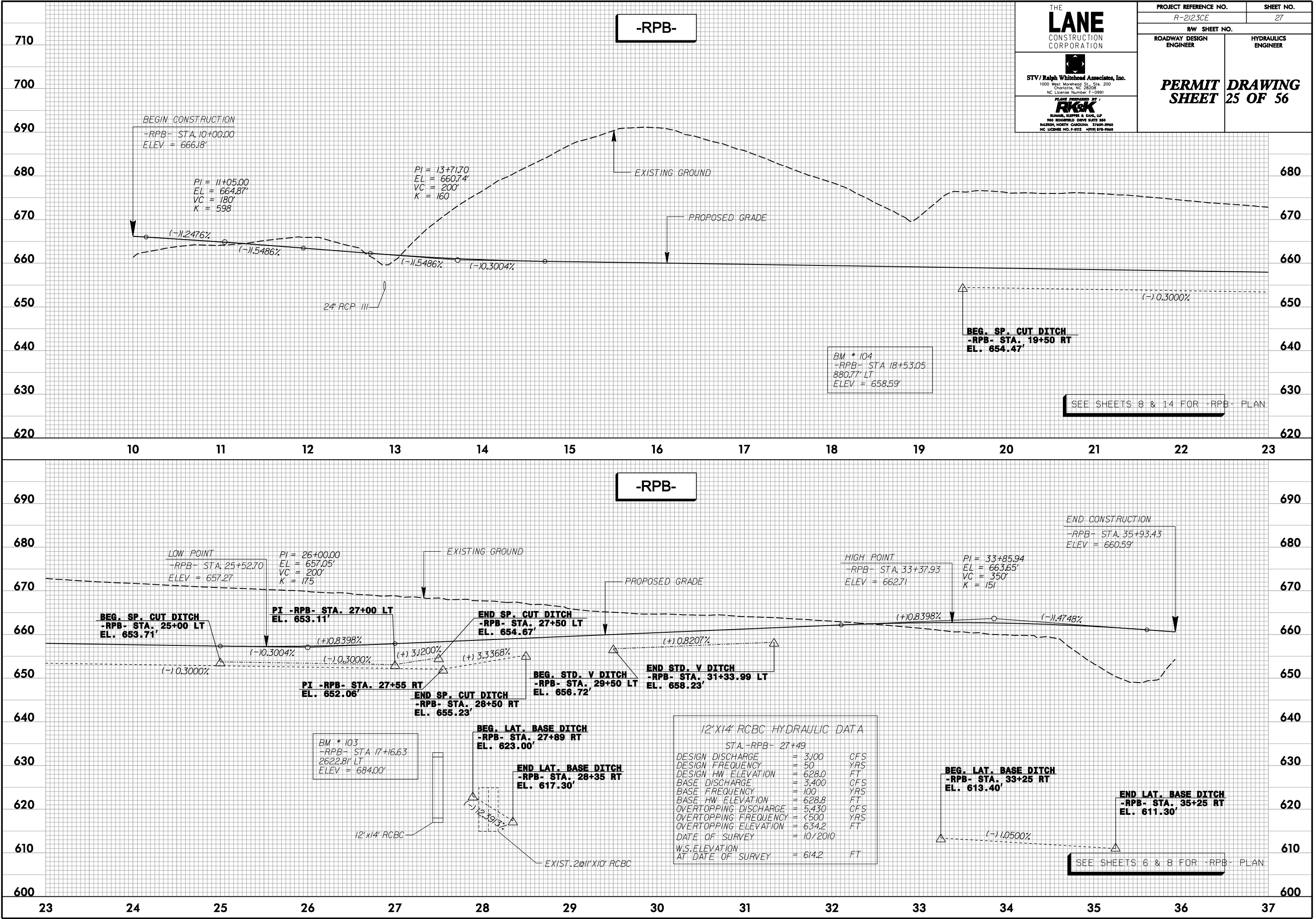
PERMIT DRAWING
SHEET 24 OF 56

-RPB- 27+52



05\25\11\540\02
r1\hydro\103\permits_environmental\Xsc\R2123CE_CULVERT_XPL_Site7.dgn
mcoak

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300



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NC License Number F-0991

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RUMBLE, KLEPPER & KAHN, LLP
300 HODGFIELD DRIVE SUITE 300
BALFORD, NORTH CAROLINA 27008-2940
NC LICENSE NO. F-0112 (01/11) 876-7540

PROJECT REFERENCE NO.
R-2123CE

SHEET NO.
27

ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

**PERMIT
SHEET**

**DRAWING
25 OF 56**

\$FILE \$
\$DATE \$

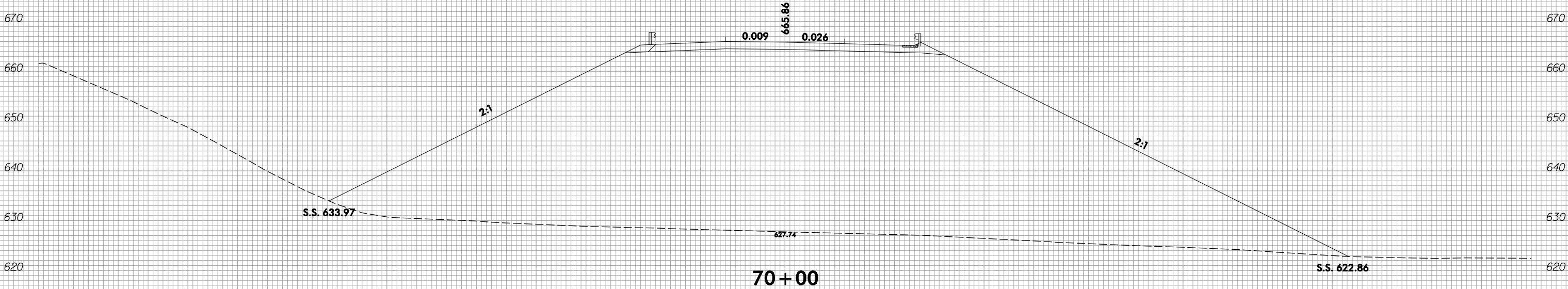
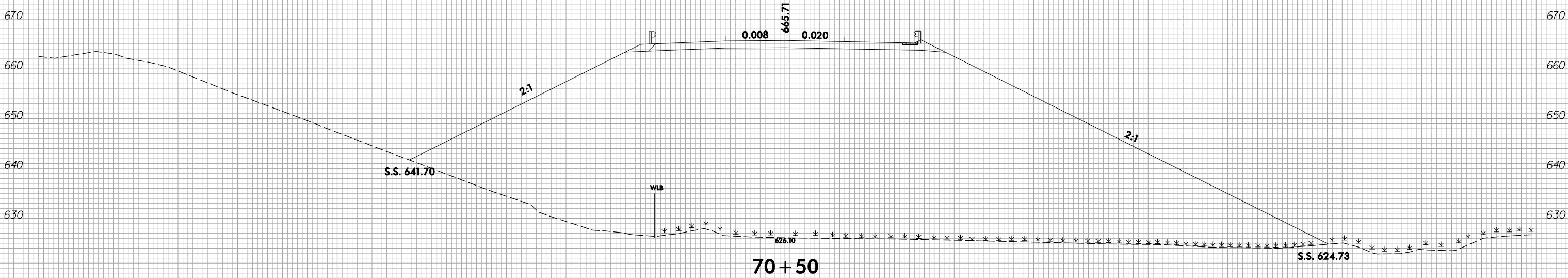
8/23/99

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			R-2123CE	X-362

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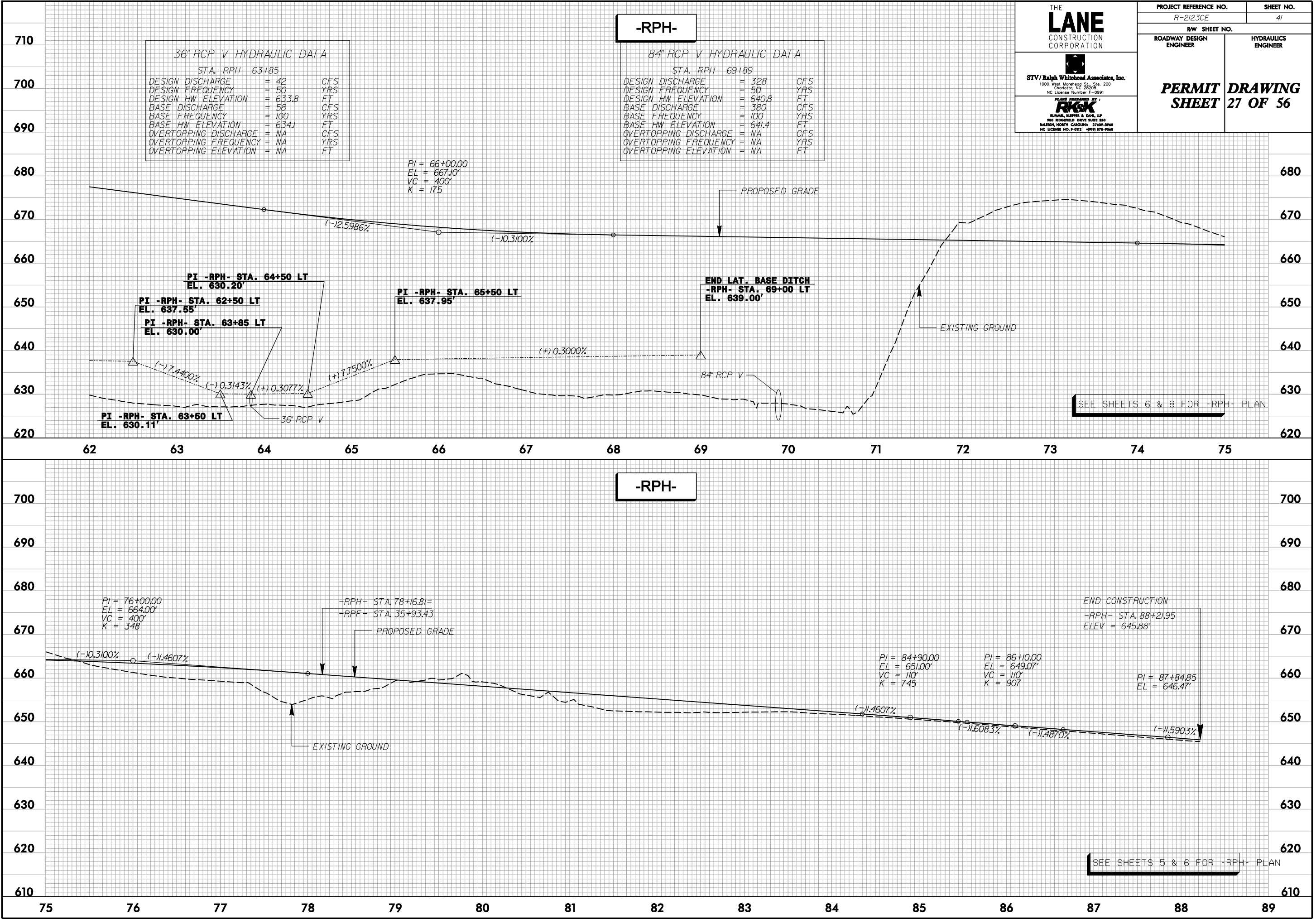
PERMIT DRAWING
SHEET 26 OF 56

SITE 4



-RPH-

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



36" RCP V. HYDRAULIC DATA			
STA. -RPH- 63+85			
DESIGN DISCHARGE	= 42	CFS	
DESIGN FREQUENCY	= 50	YRS	
DESIGN HW ELEVATION	= 633.8	FT	
BASE DISCHARGE	= 58	CFS	
BASE FREQUENCY	= 100	YRS	
BASE HW ELEVATION	= 634.1	FT	
OVERTOPPING DISCHARGE	= NA	CFS	
OVERTOPPING FREQUENCY	= NA	YRS	
OVERTOPPING ELEVATION	= NA	FT	

-RPH-

84" RCP V. HYDRAULIC DATA			
STA. -RPH- 69+89			
DESIGN DISCHARGE	= 328	CFS	
DESIGN FREQUENCY	= 50	YRS	
DESIGN HW ELEVATION	= 640.8	FT	
BASE DISCHARGE	= 380	CFS	
BASE FREQUENCY	= 100	YRS	
BASE HW ELEVATION	= 641.4	FT	
OVERTOPPING DISCHARGE	= NA	CFS	
OVERTOPPING FREQUENCY	= NA	YRS	
OVERTOPPING ELEVATION	= NA	FT	

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R-2123CE

SHEET NO.
41

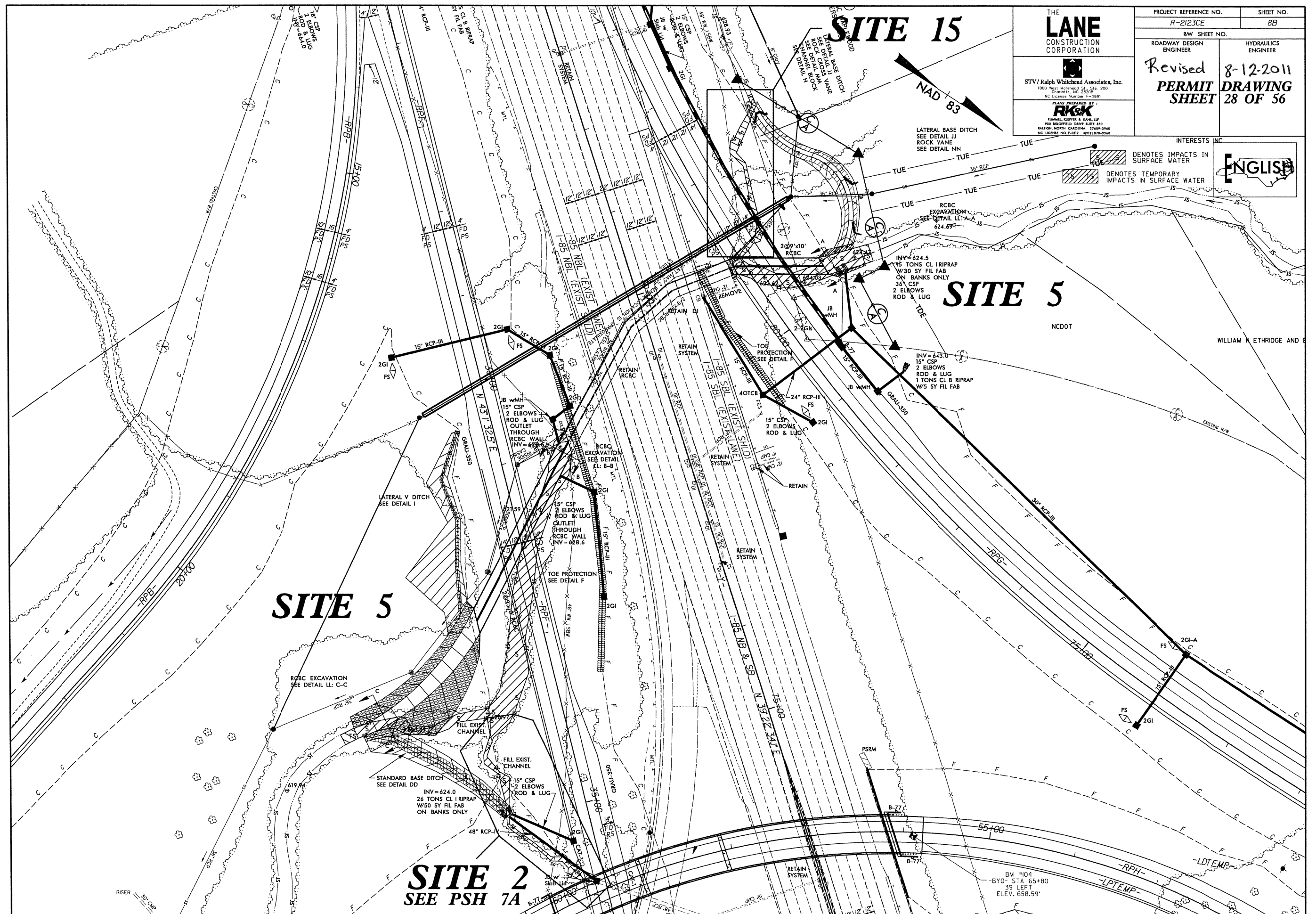
ROADWAY DESIGN
ENGINEER

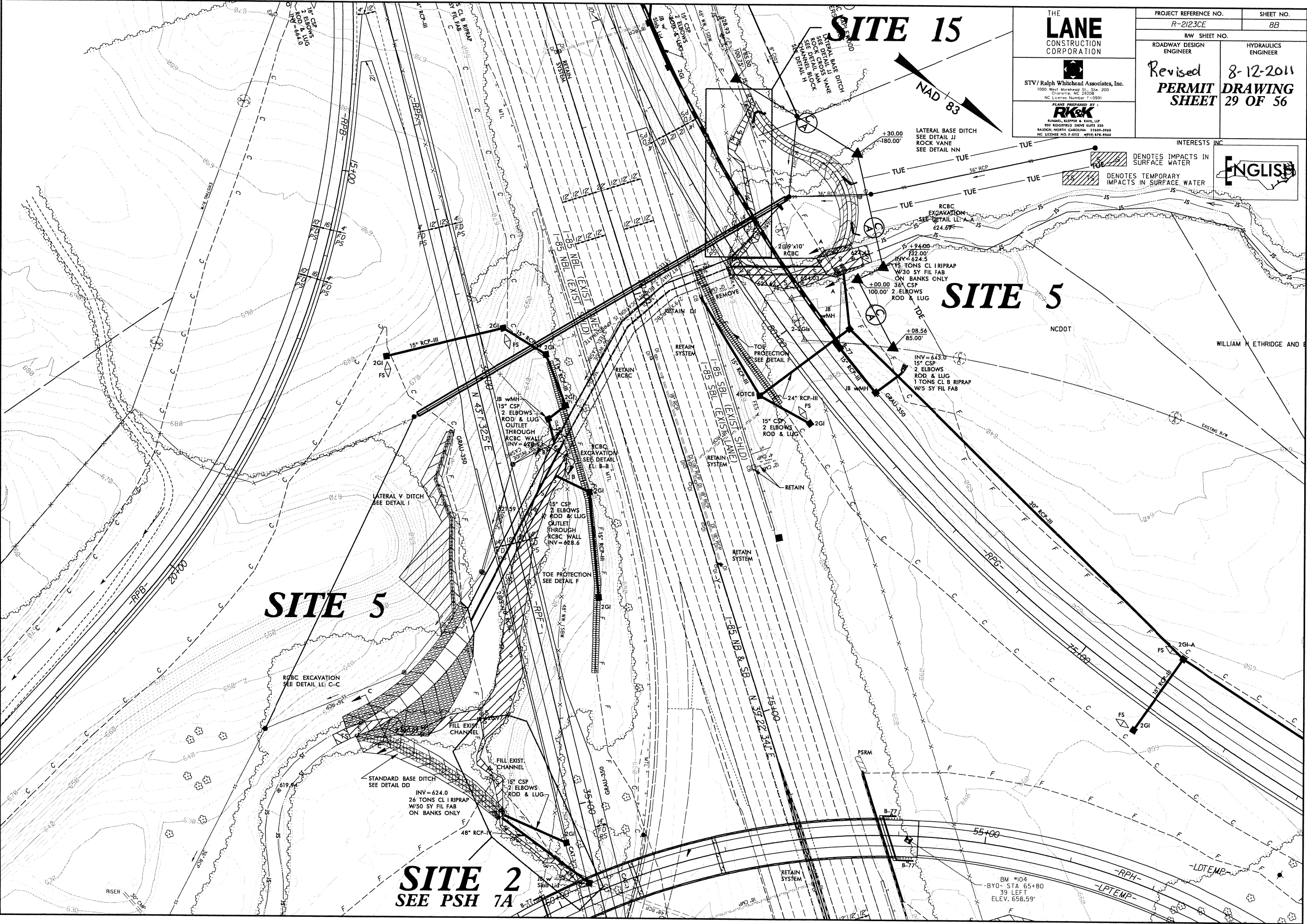
HYDRAULICS
ENGINEER

PERMIT
SHEET

DRAWING
27 OF 56

\$FILE \$
\$DATE \$





THE

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NC License Number F-0591

PLANNED BY

R&K

RUNNEL KLEPPER & EARL LLP

900 RODGERS DRIVE SUITE 250

RALEIGH, NORTH CAROLINA 27609-3960

NC LICENSE NO. F-0012 (M/F) 578-9560

PROJECT REFERENCE NO.

R-2123CE

SHEET NO.

8B

RW SHEET NO.

Revised

8-12-2011

ROADWAY DESIGN ENGINEER

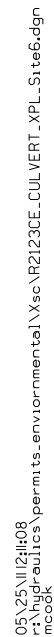
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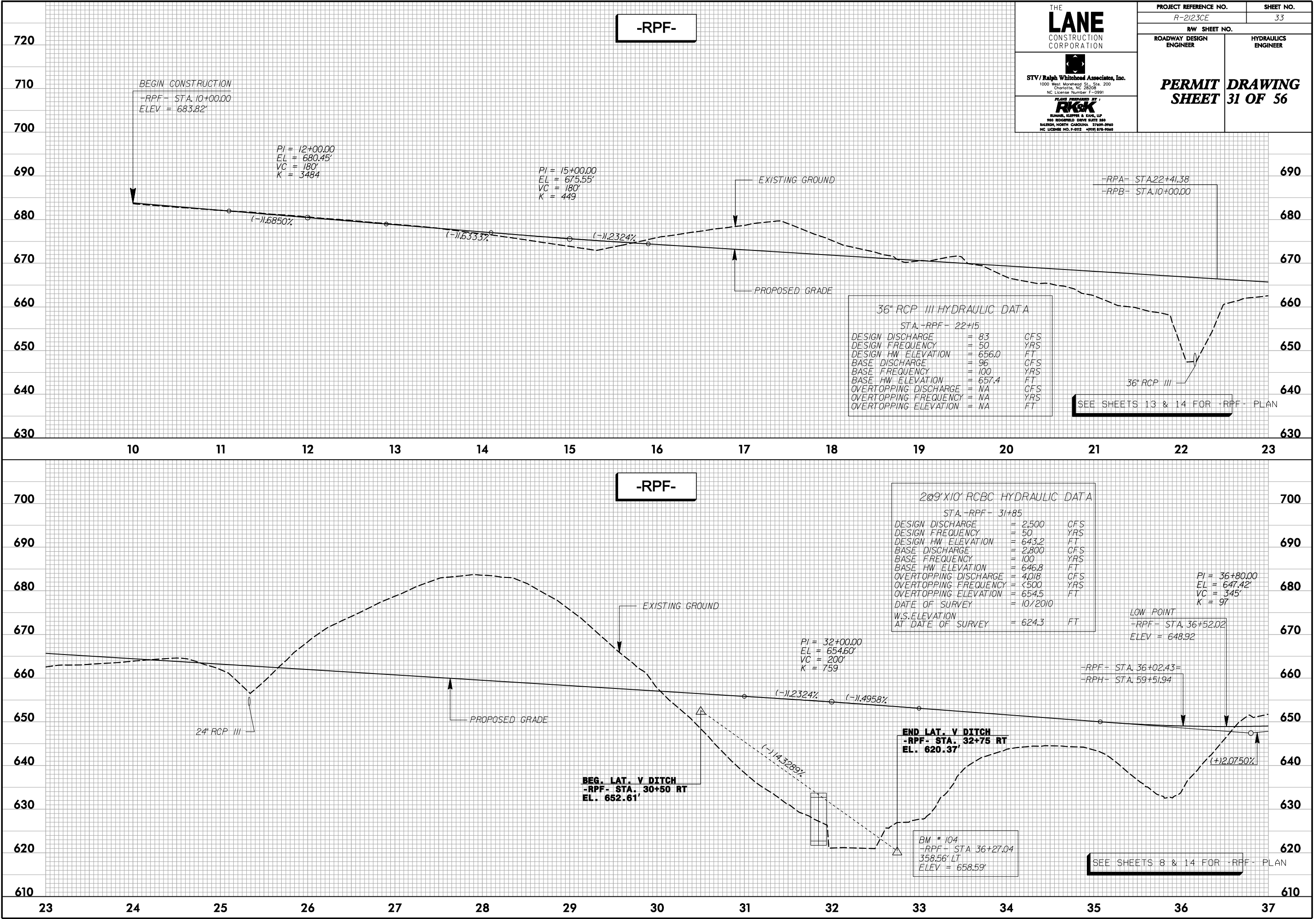
PERMIT SHEET

DRAWING

29 OF 56

**PERMIT DRAWING
SHEET 30 OF 56**





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PROJECT REFERENCE NO.
R-2123CE

SHEET NO.
33

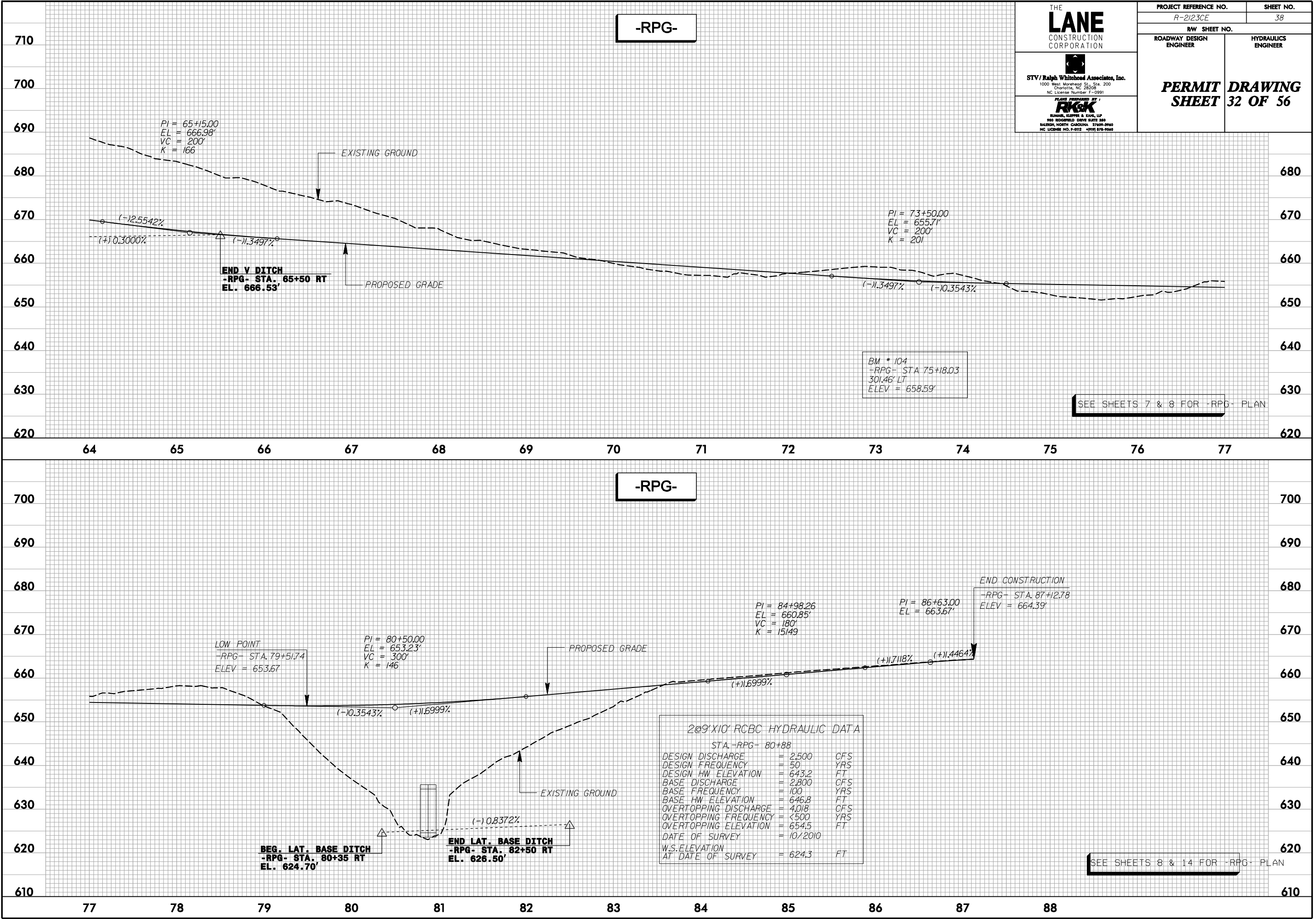
RW SHEET NO.

ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

**PERMIT
SHEET**

**DRAWING
31 OF 56**



-RPG-

PROJECT REFERENCE NO.
R-2123CE

SHEET NO.
38

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ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

PERMIT
SHEET

DRAWING
32 OF 56

PI = 65+15.00
EL = 666.98'
VC = 200'
K = 166

EXISTING GROUND

(-12.5542%

(+0.3000%

END V DITCH
-RPG- STA. 65+50 RT
EL. 666.53'

PROPOSED GRADE

PI = 73+50.00
EL = 655.71'
VC = 200'
K = 201

(-11.3497%

(-10.3543%

BM * 104
-RPG- STA 75+18.03
301.46' LT
ELEV = 658.59'

SEE SHEETS 7 & 8 FOR -RPG- PLAN

-RPG-

LOW POINT
-RPG- STA. 79+51.74
ELEV = 653.67'

PI = 80+50.00
EL = 653.23'
VC = 300'
K = 146

PROPOSED GRADE

(-10.3543%

(+11.6999%

PI = 84+98.26
EL = 660.85'
VC = 180'
K = 15149

PI = 86+63.00
EL = 663.67'

END CONSTRUCTION

-RPG- STA. 87+12.78
ELEV = 664.39'

(+11.7118%

(+11.4464%

269'X10' RCBC HYDRAULIC DATA		
STA. -RPG- 80+88		
DESIGN DISCHARGE	= 2,500	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 643.2	FT
BASE DISCHARGE	= 2,800	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 646.8	FT
OVERTOPPING DISCHARGE	= 4,018	CFS
OVERTOPPING FREQUENCY	= <500	YRS
OVERTOPPING ELEVATION	= 654.5	FT
DATE OF SURVEY	= 10/2010	
W.S.ELEVATION AT DATE OF SURVEY	= 624.3	FT

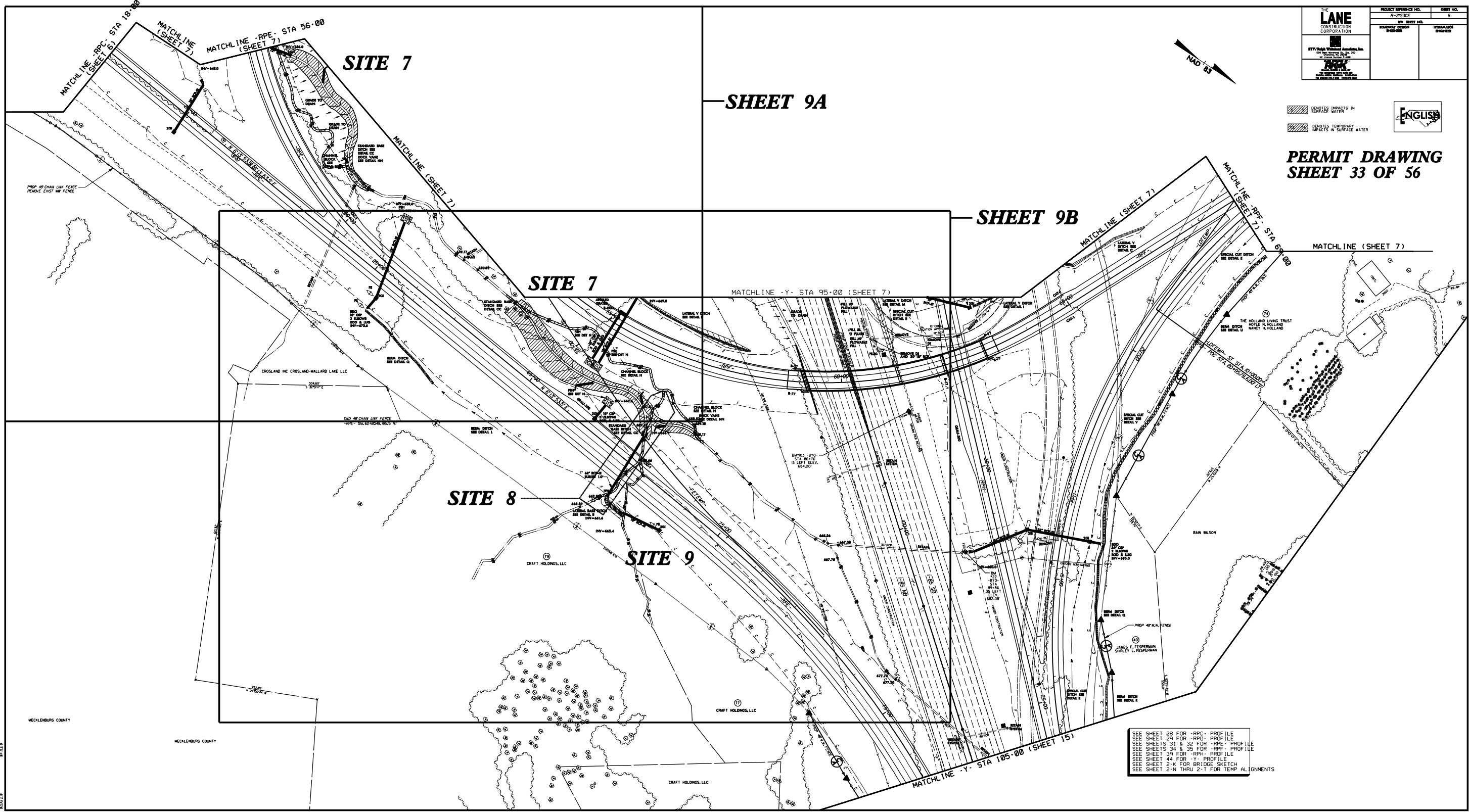
BEG. LAT. BASE DITCH
-RPG- STA. 80+35 RT
EL. 624.70'

END LAT. BASE DITCH
-RPG- STA. 82+50 RT
EL. 626.50'

EXISTING GROUND

(-) 0.8372%

SEE SHEETS 8 & 14 FOR -RPG- PLAN



 THE LANE CONSTRUCTION CORPORATION CITY/DALLAS/TEXAS/AMERICA, INC. 10000 N. CENTRAL EXPRESSWAY, SUITE 200 DALLAS, TEXAS 75243 TEL: 214/416-1000 FAX: 214/416-1001 WWW.LANECORP.COM	PROJECT REFERENCE NO. R-28232	SHEET NO. 9
	BY: BRYAN NO.	DATE: 01/11/2011
	DESIGNED BY: BRYAN	CHECKED BY: BRYAN

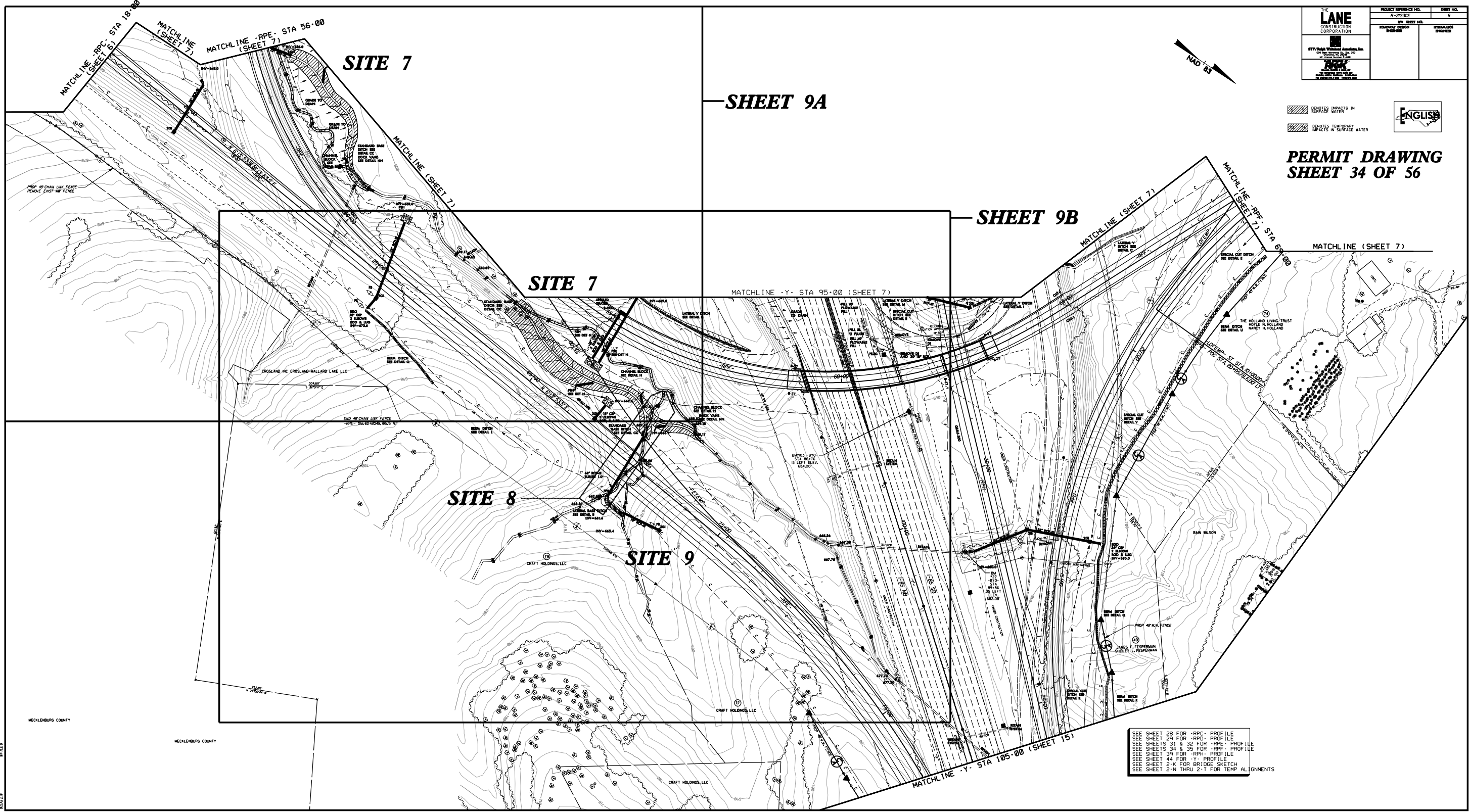
DENOTES IMPACTS IN SURFACE WATER

 DENOTES TEMPORARY IMPACTS IN SURFACE WATER



**PERMIT DRAWING
SHEET 33 OF 56**

SEE SHEET 28 FOR -RPC- PROFILE
 SEE SHEET 29 FOR -RPO- PROFILE
 SEE SHEETS 31 & 32 FOR -RPE- PROFILE
 SEE SHEETS 34 & 35 FOR -RPF- PROFILE
 SEE SHEET 39 FOR -RPH- PROFILE
 SEE SHEET 44 FOR -Y- PROFILE
 SEE SHEET 2-K FOR BRIDGE SKETCH
 SEE SHEET 2-N THRU 2-T FOR TEMP ALIGNMENTS



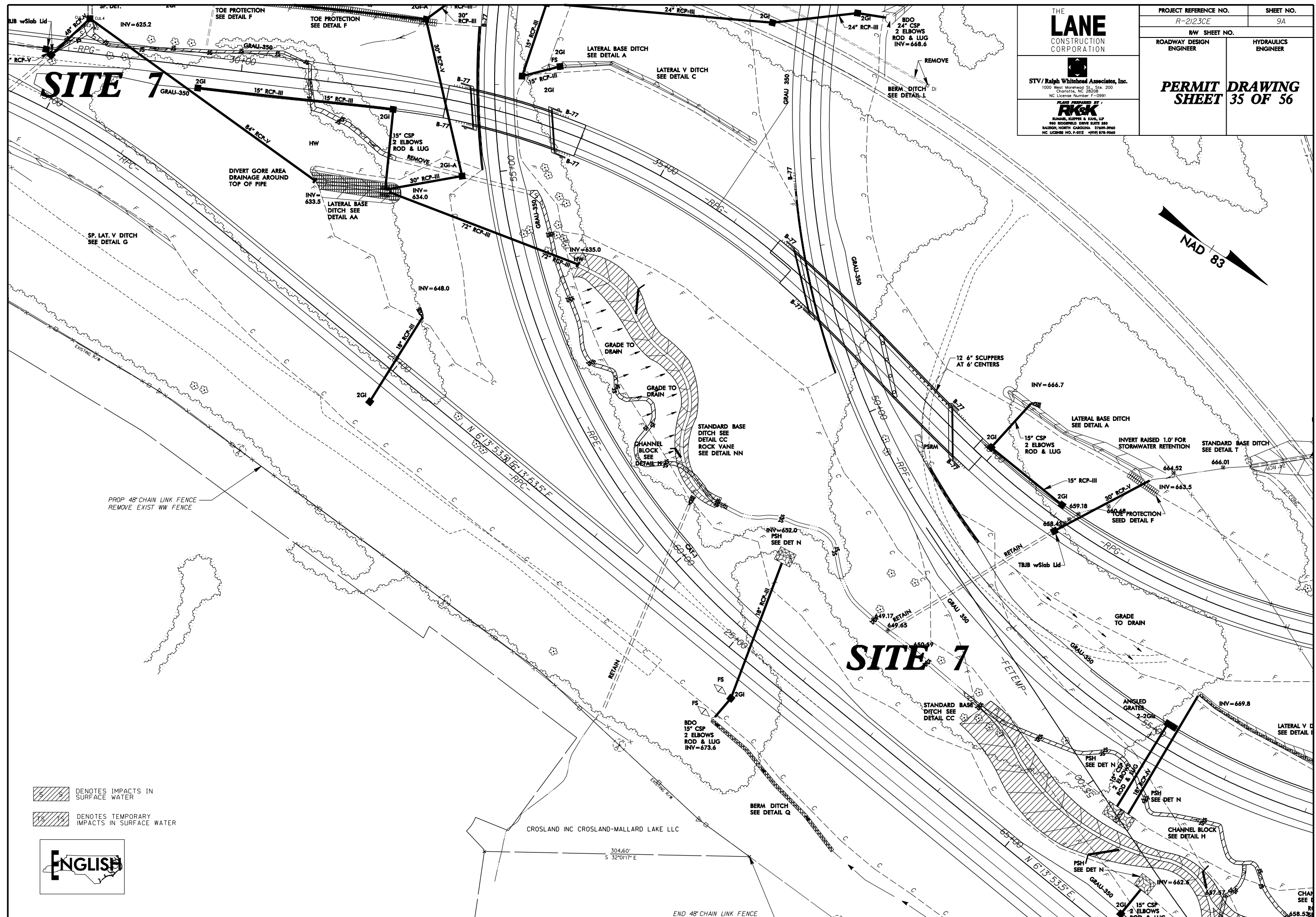
THE LANE CONSTRUCTION CORPORATION 10000 LANE DRIVE SUITE 100 DALLAS, TEXAS 75243 (214) 343-1234	PROJECT REFERENCE NO. R-2832E	SHEET NO. 9
	BY JOHN D. LANE REGISTERED PROFESSIONAL ENGINEER NO. 12345	DATE 01/15/2024
	CITY/STATE/ZIP 10000 LANE DRIVE SUITE 100 DALLAS, TEXAS 75243	

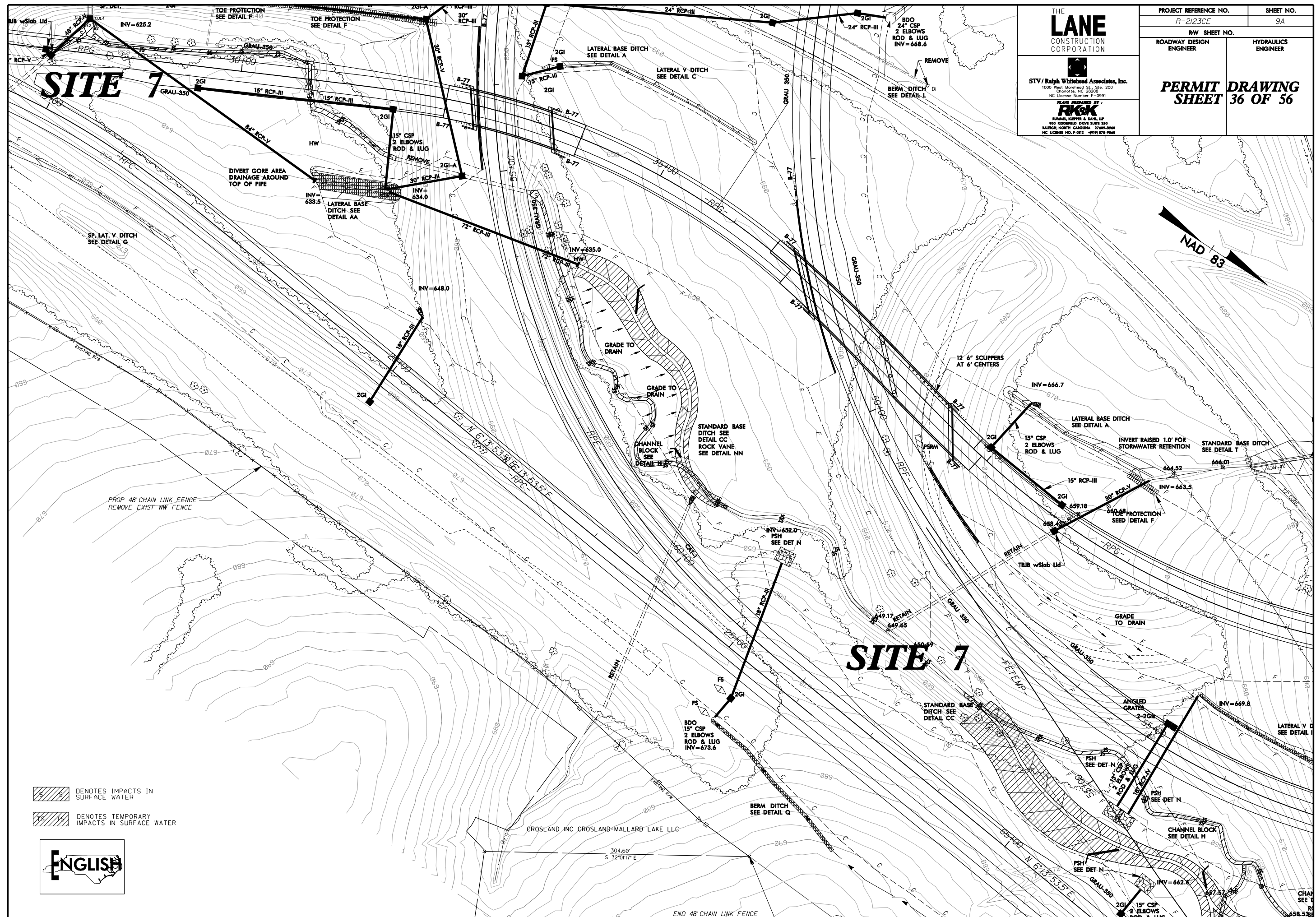
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER



**PERMIT DRAWING
SHEET 34 OF 56**

SEE SHEET 28 FOR -RPC- PROFILE
SEE SHEET 29 FOR -RPO- PROFILE
SEE SHEETS 31 & 32 FOR -RPE- PROFILE
SEE SHEETS 34 & 35 FOR -RPF- PROFILE
SEE SHEET 39 FOR -RPH- PROFILE
SEE SHEET 44 FOR -Y- PROFILE
SEE SHEET 2-K FOR BRIDGE SKETCH
SEE SHEET 2-N THRU 2-T FOR TEMP ALIGNMENTS





8/23/99

02040	PROJ. REFERENCE NO.	SHEET NO.
	R-2123CE	X-1

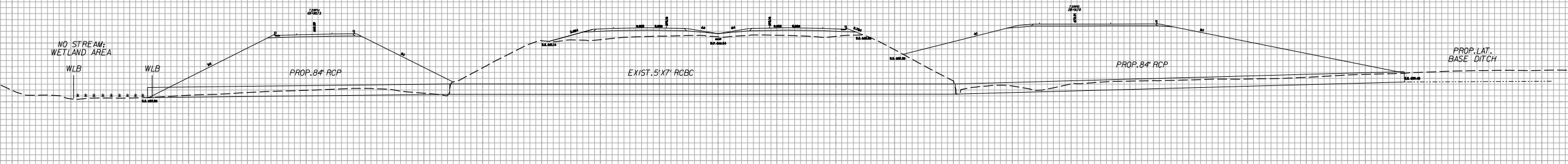
SITE 7

PERMIT DRAWING
SHEET 37 OF 56

-RPH- 69+89

-L- 62+50

-RPG- 28+92



8/23/99

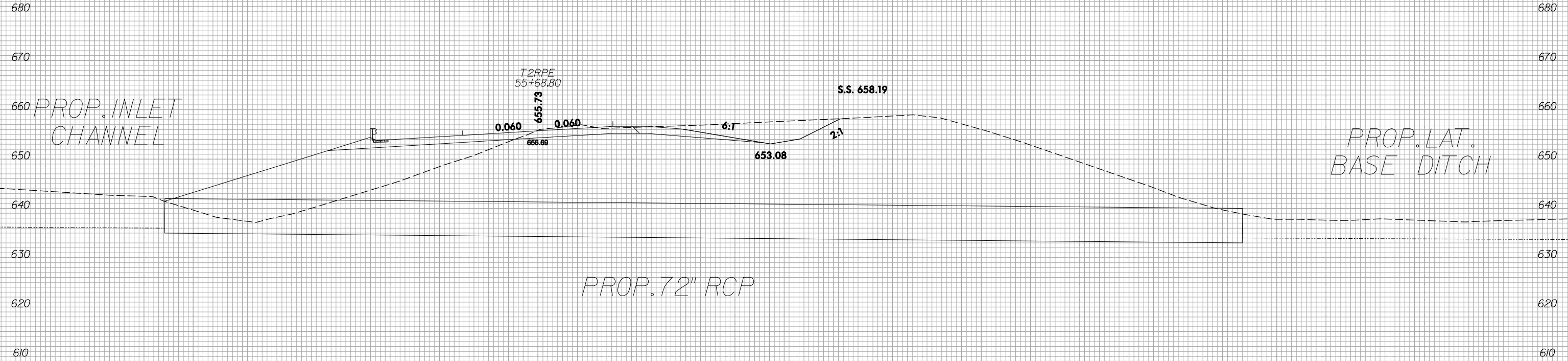
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			R-2123CE	

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PERMIT DRAWING
SHEET 38 OF 56

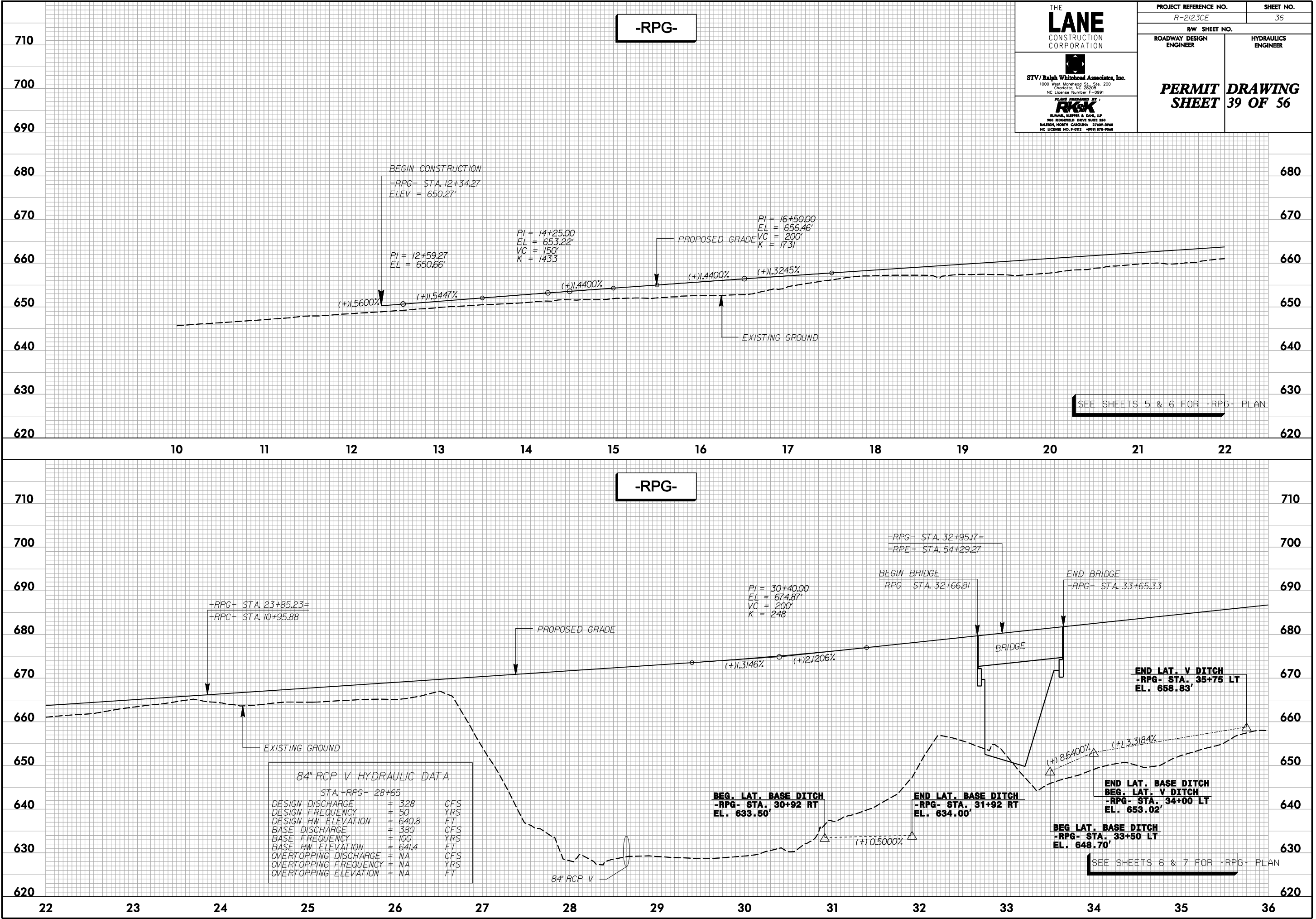
SITE 7

-RPE- 55+69



05\25\11\24626
r1\Hydraulics\PERMITS_Environmental\Xsc\R2123CE_CULVERT_XPL_Site8b.dgn
mcoak

100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200



THE
LANE
CONSTRUCTION
CORPORATION


STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

PLANS PREPARED BY:
R&K
RUMMEL, KLEPPER & KAHN, LLP
300 RODGERS DRIVE SUITE 300
BALFORD, NORTH CAROLINA 27008-2940
NC LICENSE NO. F-0112 (01/11) 876-7540

PROJECT REFERENCE NO.
R-2123CE

SHEET NO.
36

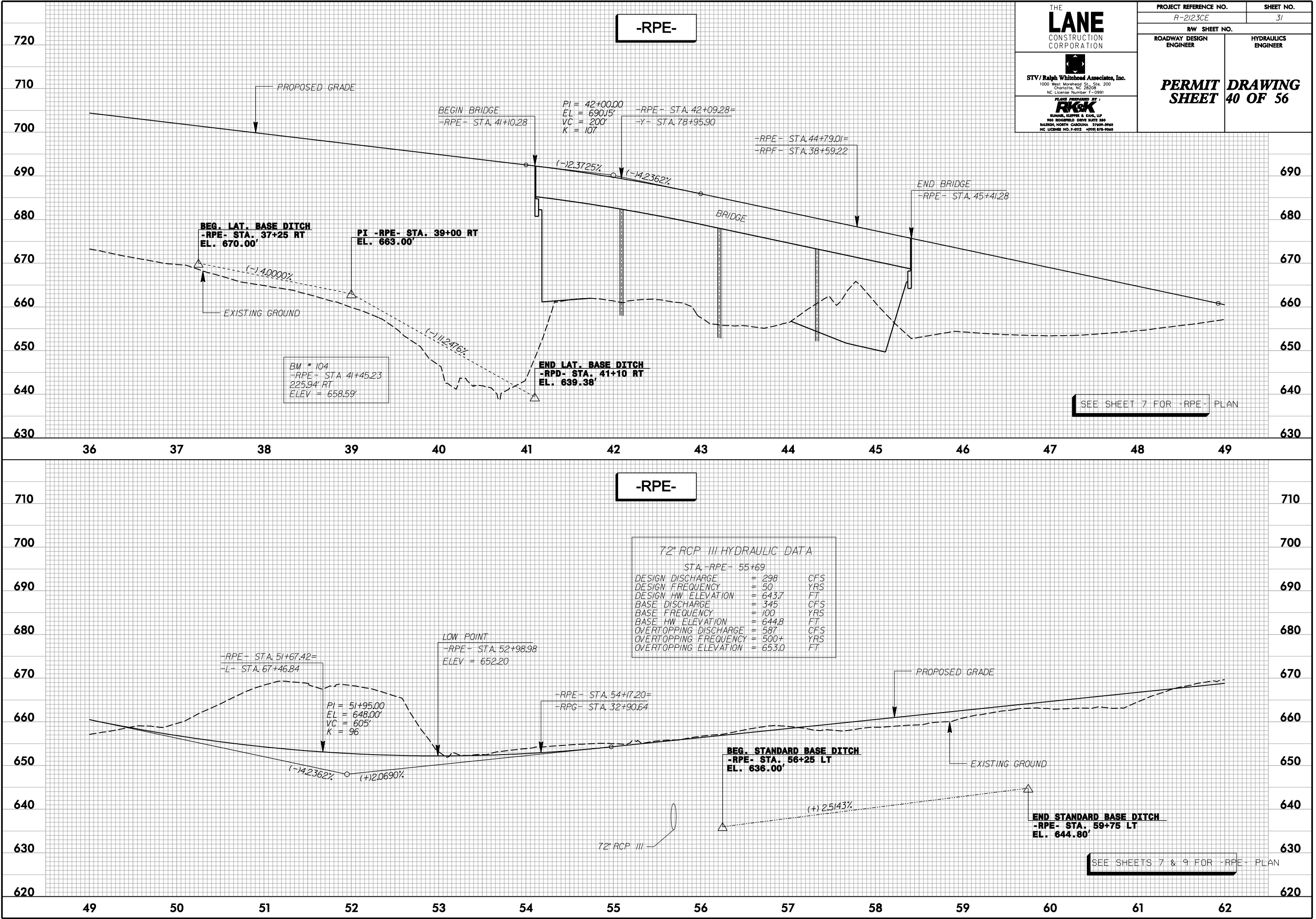
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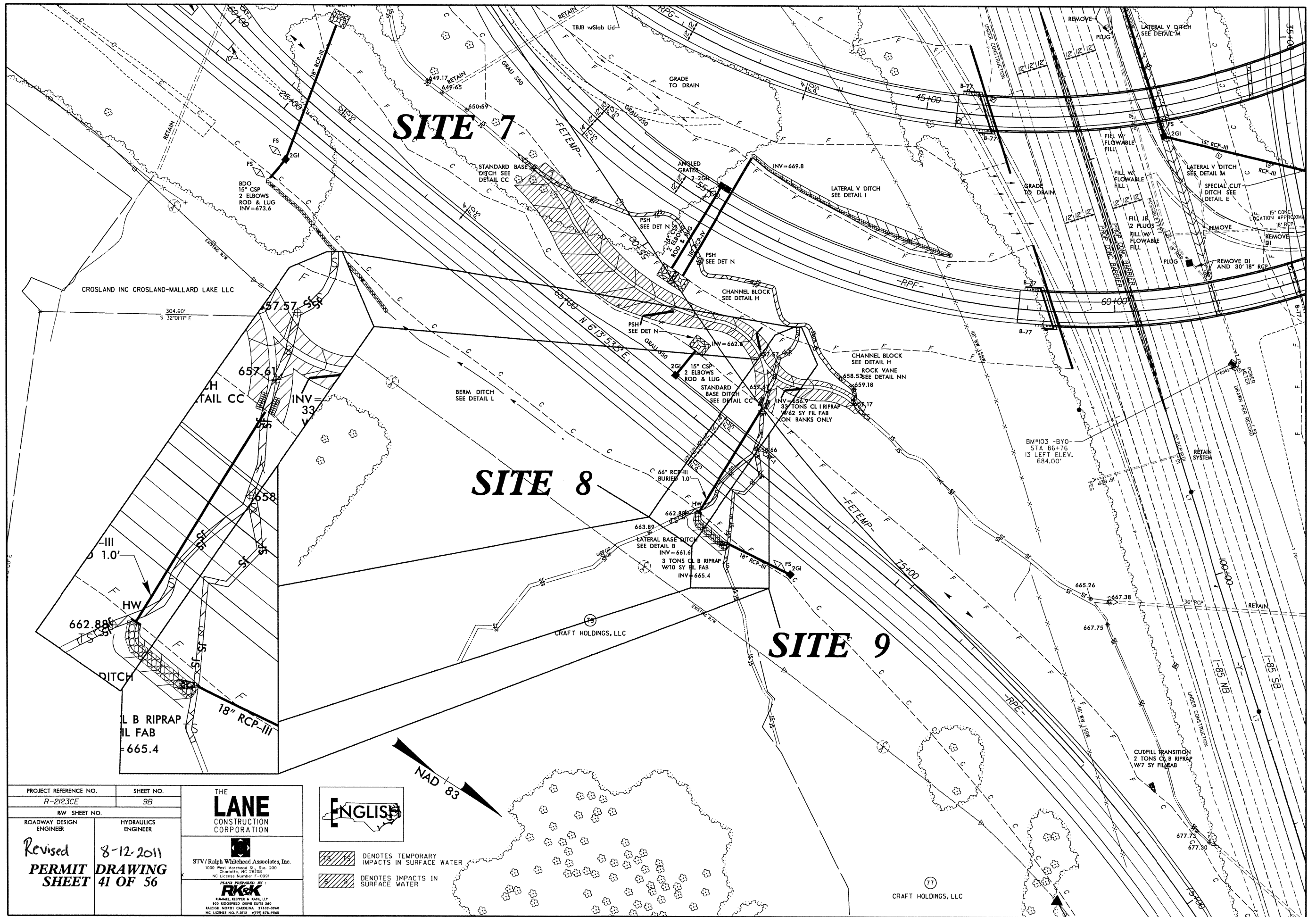
ROADWAY DESIGN
ENGINEER

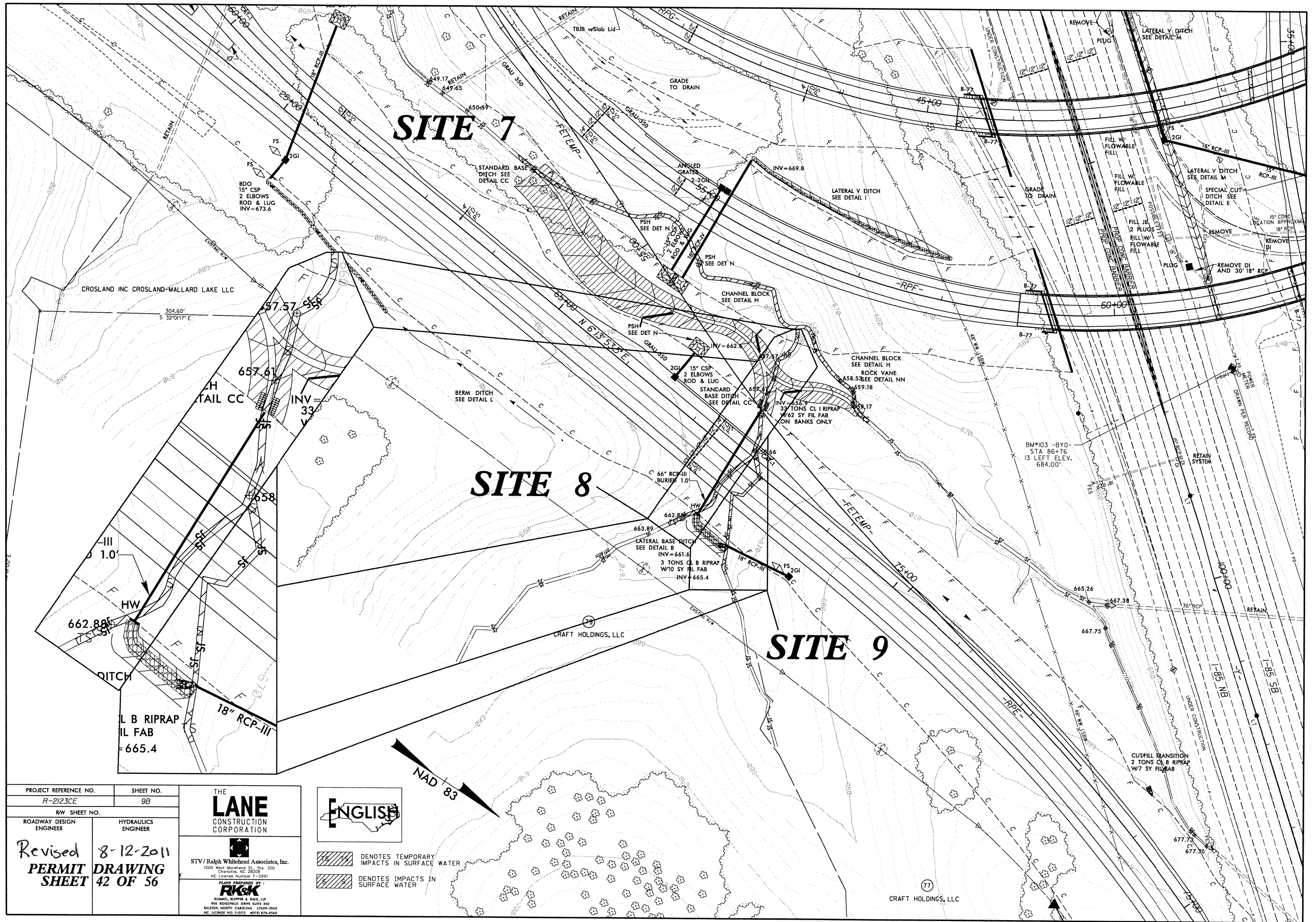
HYDRAULICS
ENGINEER

**PERMIT
SHEET**

**DRAWING
39 OF 56**







PROJECT REFERENCE NO. R-2123CE		SHEET NO. 9B	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER		
Revised 8-12-2011 PERMIT DRAWING SHEET 42 OF 56			

THE LANE CONSTRUCTION CORPORATION	
STV / Ralph Whitehead Associates, Inc. 1000 West Morehead St., Ste. 200 Charlotte, NC 28208 NC License Number: F-12991	
PLANS PREPARED BY: R&K RUMMEL, KLEPPER & KAHN, LLP PO BOX 1000000 DARTMOUTH SUITE 300 RALEIGH, NORTH CAROLINA 27609-3940 NC LICENSE NO. F-6112 40191 875-9580	

	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
	DENOTES IMPACTS IN SURFACE WATER

77
CRAFT HOLDINGS, LLC

8/23/99

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			R-2123CE	

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PERMIT DRAWING
SHEET 43 OF 56

SITE 8

-RPE- 67+64

T2RPE
67+63.91

677.51

0.020

0.020

2.15:1

3.82:1

664.43

PROP. 66" RCP

710

700

690

680

670

660

650

640

710

700

690

680

670

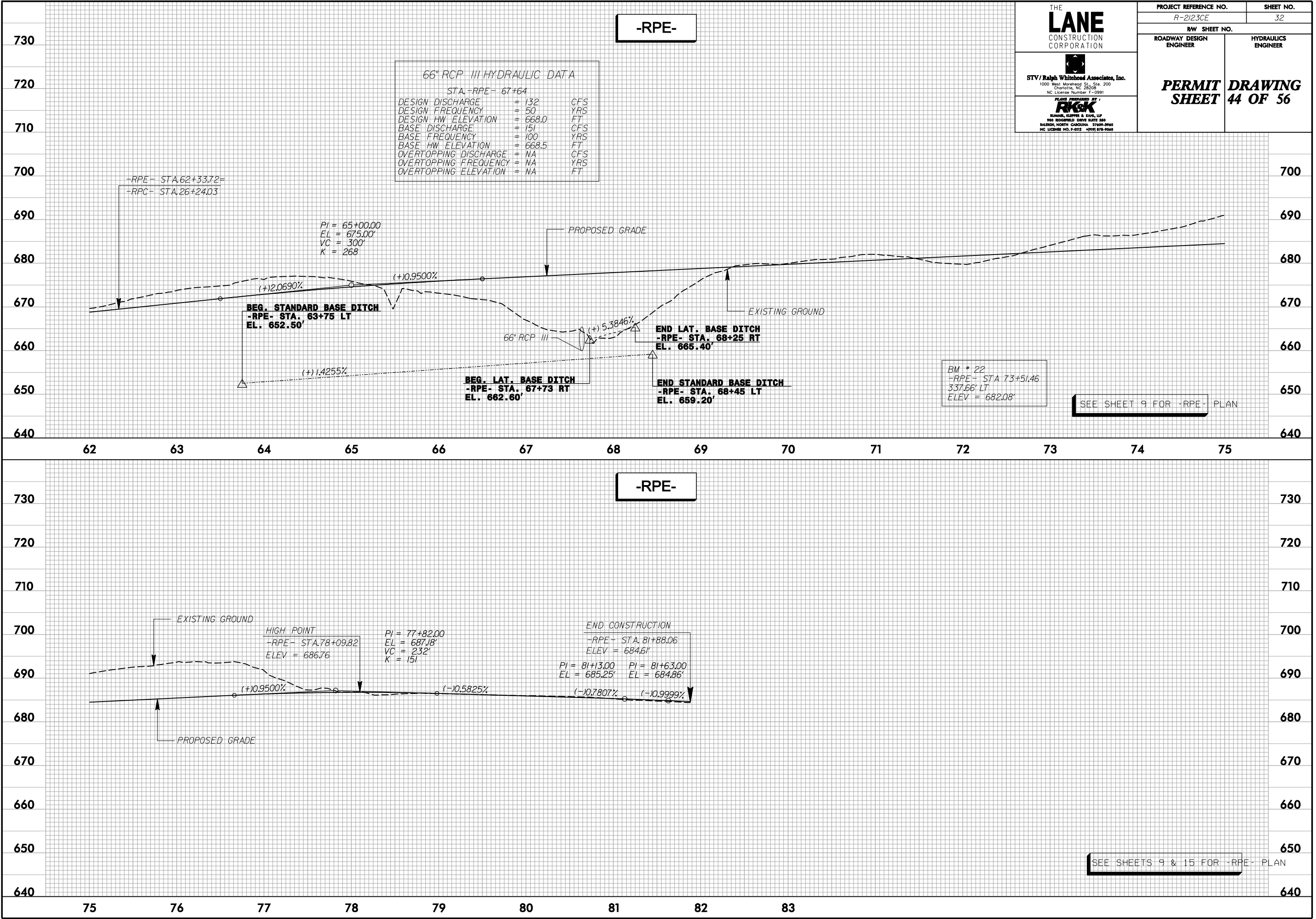
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650

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r1\Hydraulics\PERMITS_Environmental\Xsc\R2123CE_CULVERT_XPL_Site9.dgn
mcoak



THE
LANE
CONSTRUCTION
CORPORATION


STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

PLANS PREPARED BY:

RUMMEL, KLEPPER & KAHN, LLP
900 RODGERSFIELD DRIVE SUITE 500
BALFORD, NORTH CAROLINA 27008-2940
NC LICENSE NO. F-0112 (01/11) 876-7540

PROJECT REFERENCE NO.
R-2123CE

SHEET NO.
32

R/W SHEET NO.

ROADWAY DESIGN
ENGINEER

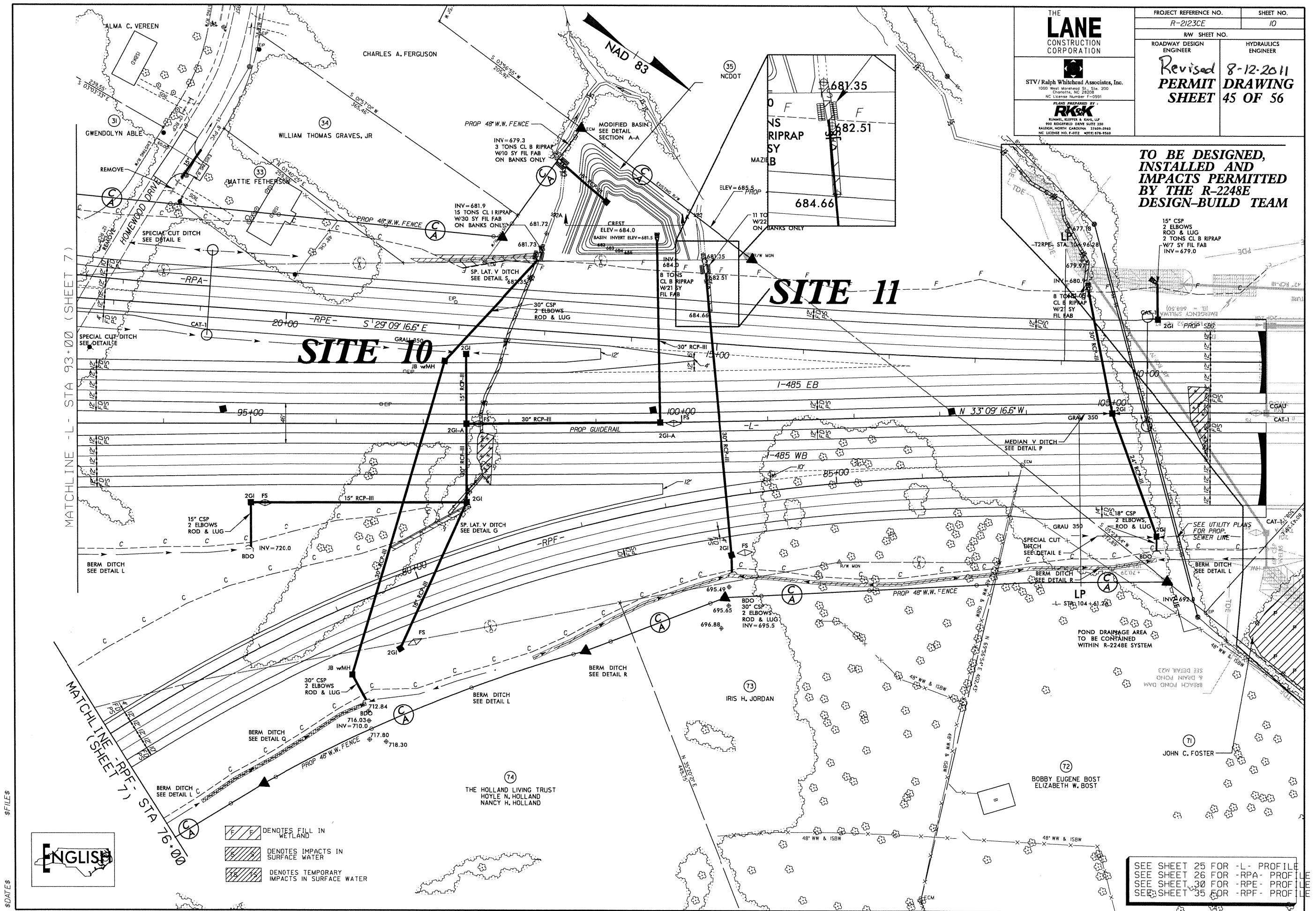
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ENGINEER

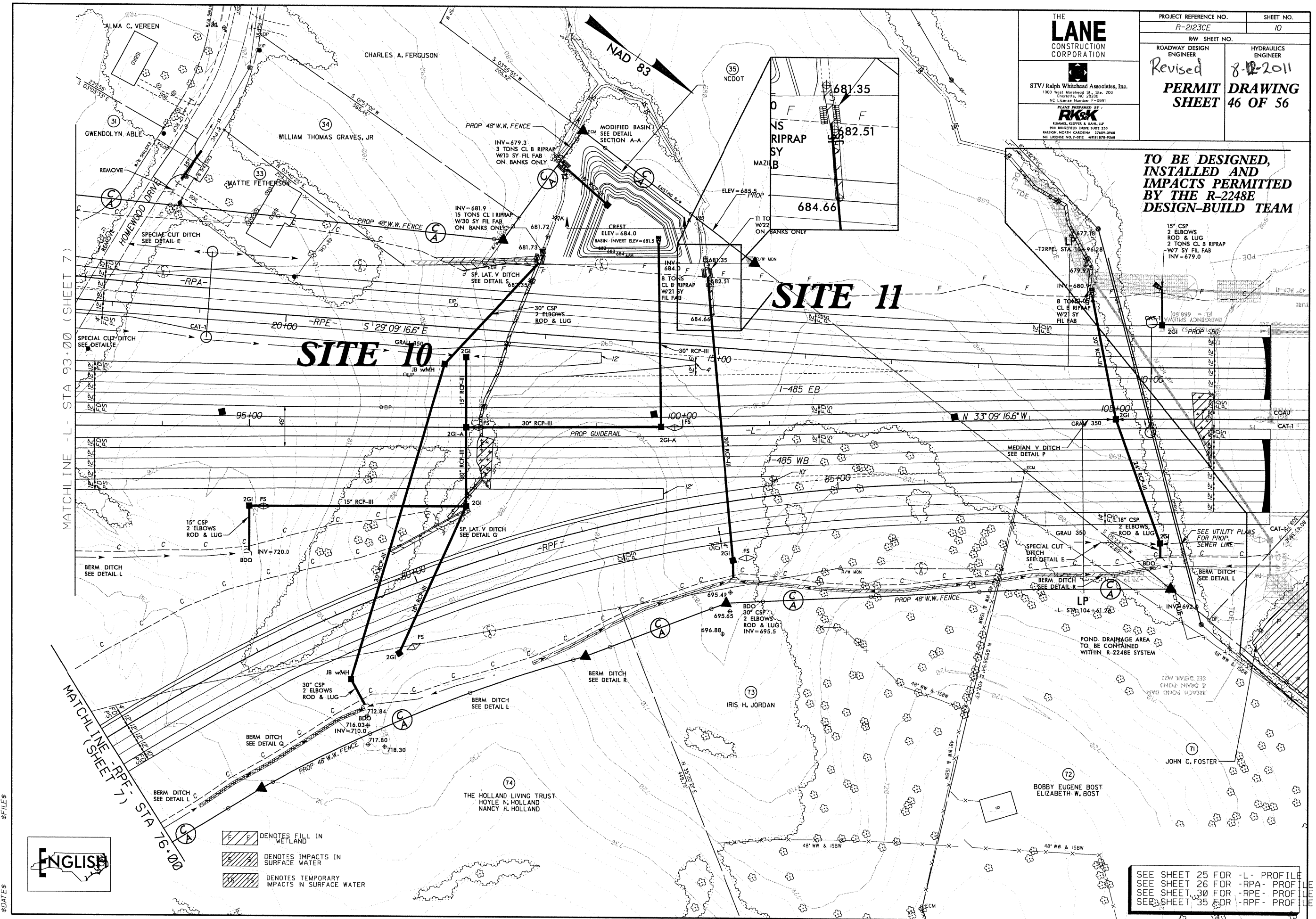
PERMIT
SHEET

DRAWING
44 OF 56

\$FILE \$
\$DATE \$

**TO BE DESIGNED,
INSTALLED AND
IMPACTS PERMITTED
BY THE R-2248E
DESIGN-BUILD TEAM**





THE
LANE
CONSTRUCTION
CORPORATION



STV / Ralph Whitehead Associates, Inc.
1000 West Wendover St. Ste. 200
Charlotte, NC 28208
NC License Number T-09991



R&K
RUMAL, KATPA & K&L LLP
900 RIDGEFIELD DRIVE SUITE 250
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. T-0112 WTTI 879-9560

PROJECT REFERENCE NO.
R-2123CE

SHEET NO.
10

RW SHEET NO.

ROADWAY DESIGN
ENGINEER
Revised

HYDRAULICS
ENGINEER
8-12-2011

PERMIT SHEET

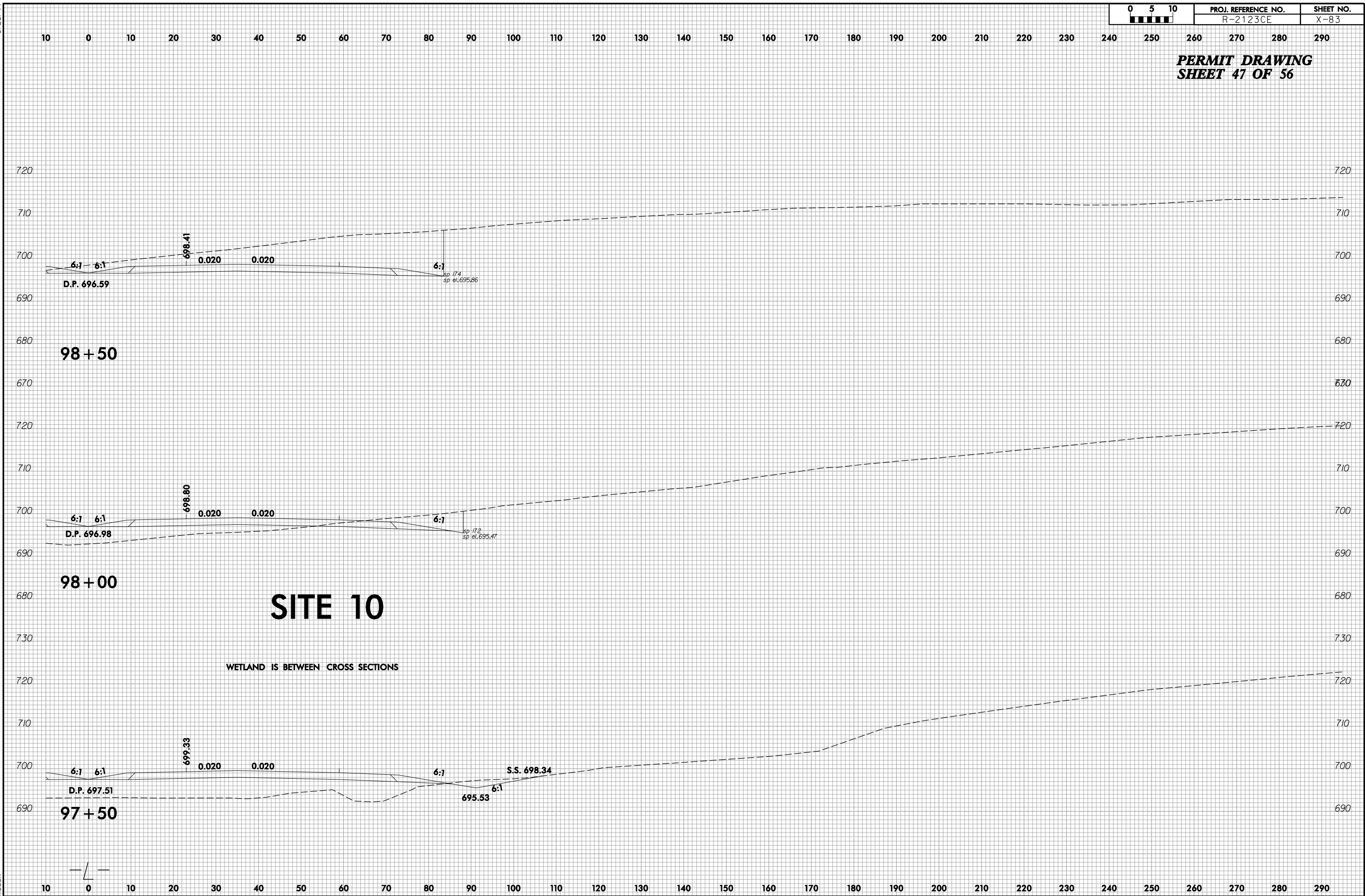
DRAWING 46 OF 56

**TO BE DESIGNED,
INSTALLED AND
IMPACTS PERMITTED
BY THE R-2248E
DESIGN-BUILD TEAM**

\$FILES\$
\$DATES\$

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

SEE SHEET 25 FOR -L- PROFILE
SEE SHEET 26 FOR -RPA- PROFILE
SEE SHEET 30 FOR -RPE- PROFILE
SEE SHEET 35 FOR -RPF- PROFILE



THE
LANE
CONSTRUCTION
CORPORATION


STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991


PLANE PREPARED BY
RUMMEL, KLEPPER & KAY, LLP
900 RIDGEFIELD DRIVE SUITE 300
RALEIGH, NORTH CAROLINA 27603-3960
NC LICENSE NO. F-0112 90191, 878-7560

PROJECT REFERENCE NO.
R-2123CE

SHEET NO.
14

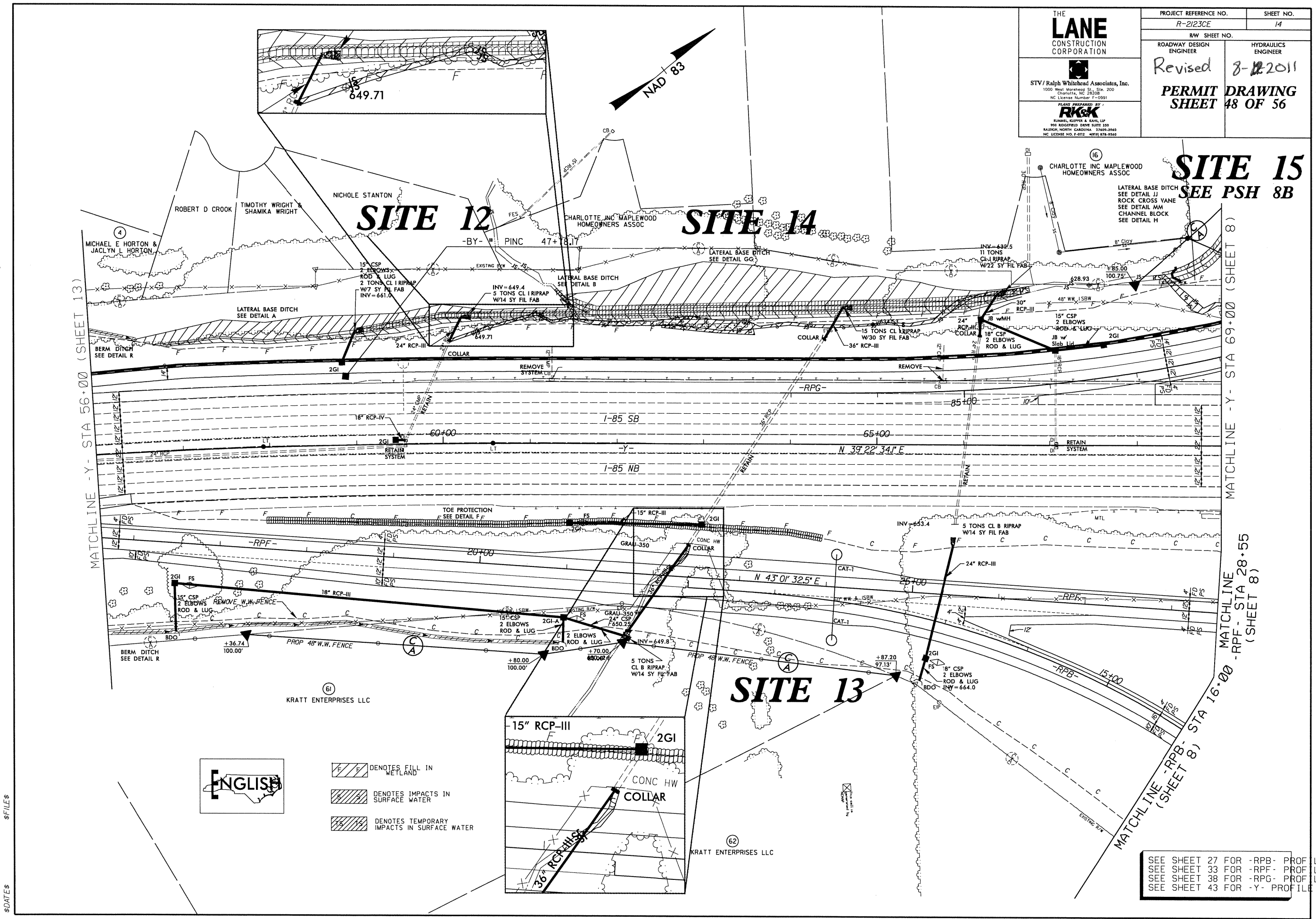
RW SHEET NO.

ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

Revised
8-12-2011

PERMIT DRAWING
SHEET 48 OF 56



SITE 15
SEE PSH 8B

LATERAL BASE DITCH
SEE DETAIL JJ
ROCK CROSS VANE
SEE DETAIL MM
CHANNEL BLOCK
SEE DETAIL H

CHARLOTTE INC MAPLEWOOD
HOMEOWNERS ASSOC

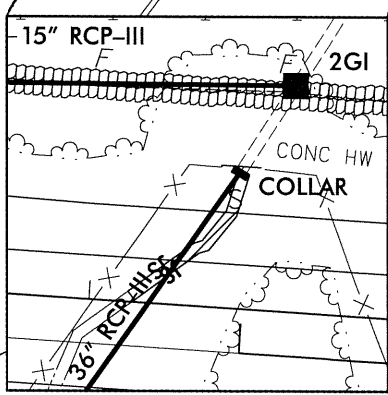
SITE 12

SITE 14

SITE 13

ENGLISH

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



SEE SHEET 27 FOR -RPB- PROFILE
SEE SHEET 33 FOR -RPF- PROFILE
SEE SHEET 38 FOR -RPG- PROFILE
SEE SHEET 43 FOR -Y- PROFILE

THE

LANE

CONSTRUCTION

CORPORATION

STV/Ralph Whitehead Associates, Inc.

1000 West Morehead St., Ste. 200

Charlotte, NC 28208

NC License Number F-0991

PLANS PREPARED BY:

RK&K

KUMAL, KLEPPER & KILLIP

901 RIDGEFIELD DRIVE SUITE 350

RALEIGH, NORTH CAROLINA 27609-3940

NC LICENSE NO. F-2012 WY191 878-7560

PROJECT REFERENCE NO.

R-2123CE

SHEET NO.

14

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

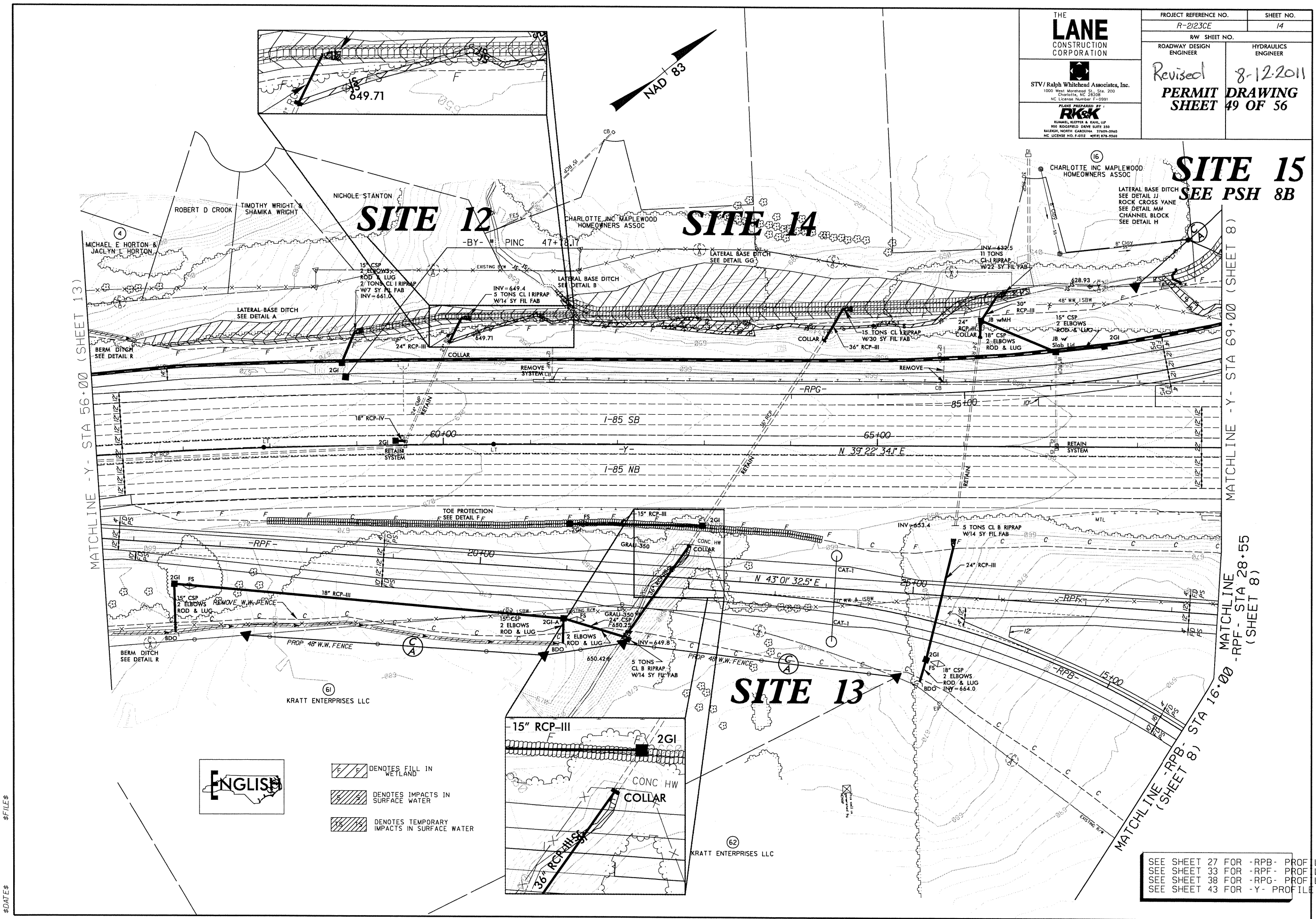
HYDRAULICS ENGINEER

Revised

8-12-2011

PERMIT DRAWING

SHEET 49 OF 56



SITE 15
SEE PSH 8B

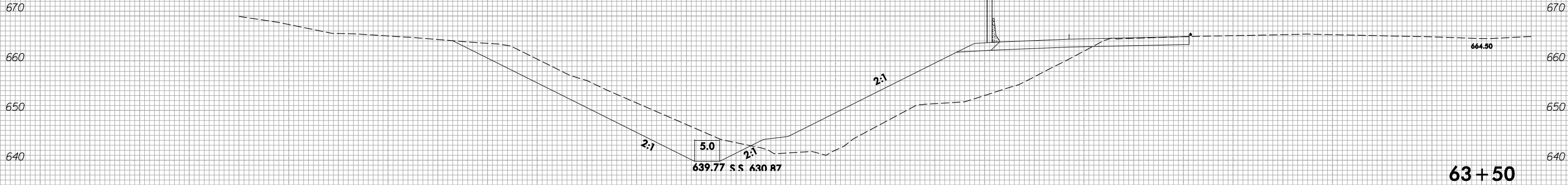
SEE SHEET 27 FOR -RPB- PROFILE
SEE SHEET 33 FOR -RPF- PROFILE
SEE SHEET 38 FOR -RPG- PROFILE
SEE SHEET 43 FOR -Y- PROFILE

8/23/99

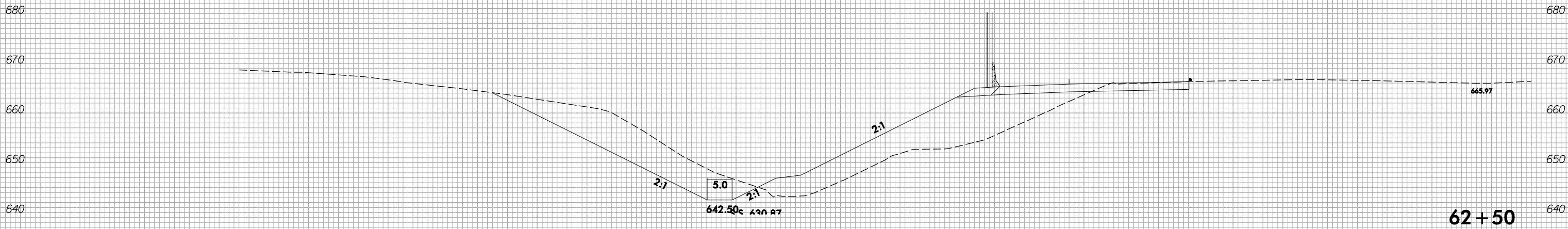
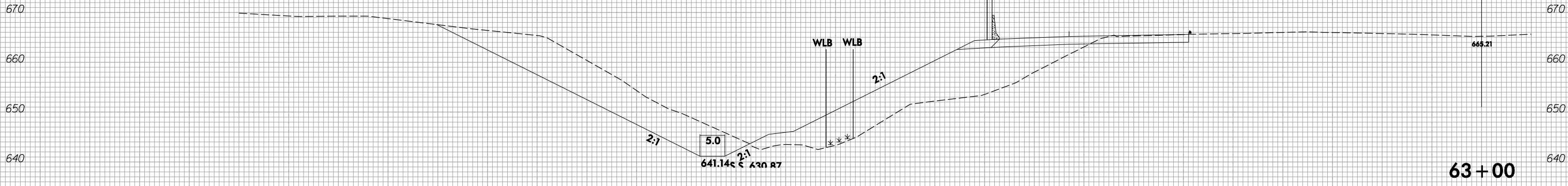
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	R-2123CE	X-100

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PERMIT DRAWING
SHEET 50 OF 56

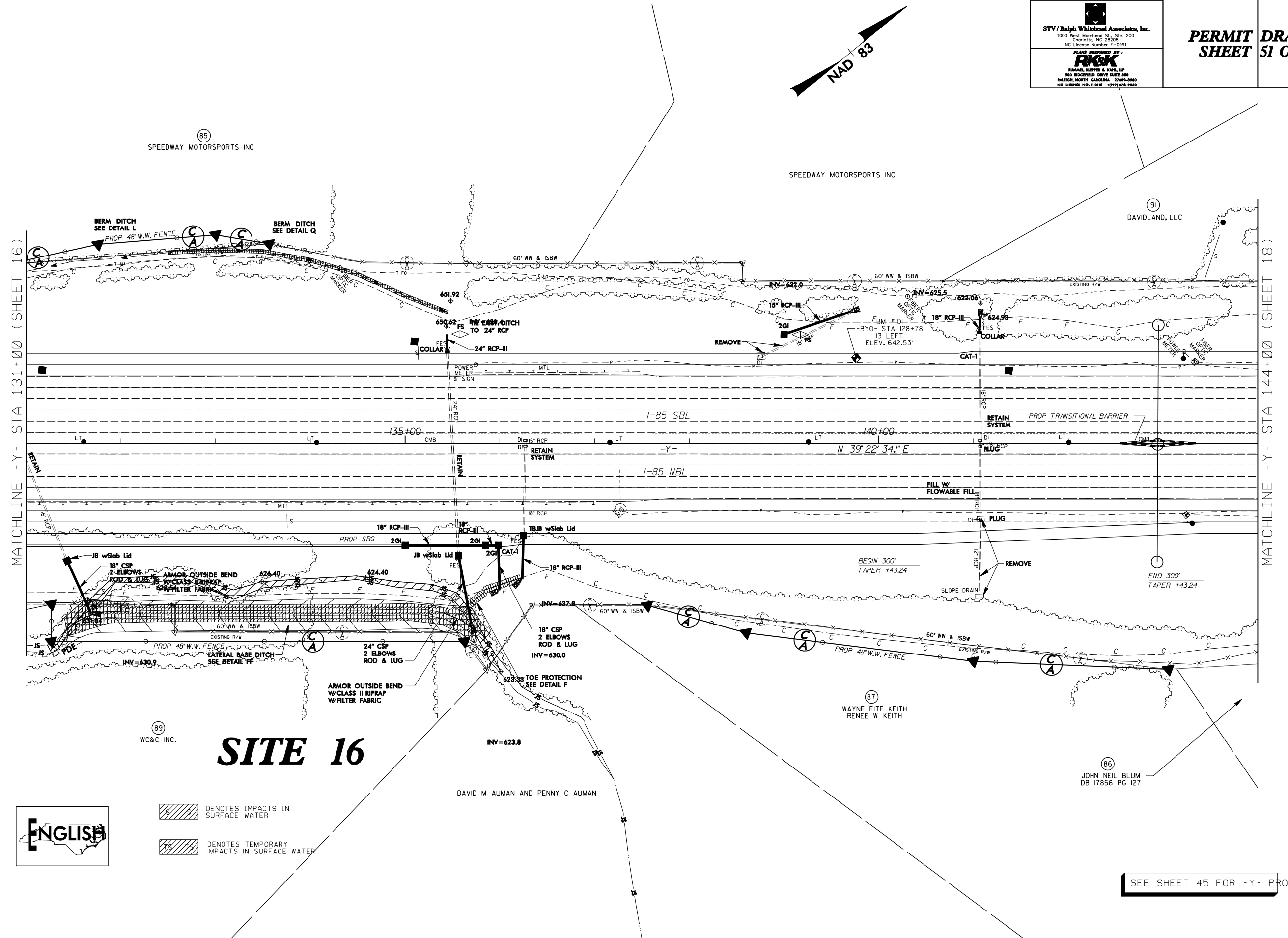


SITE 14



—Y—

05\25\11\3\34\07
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mcoak

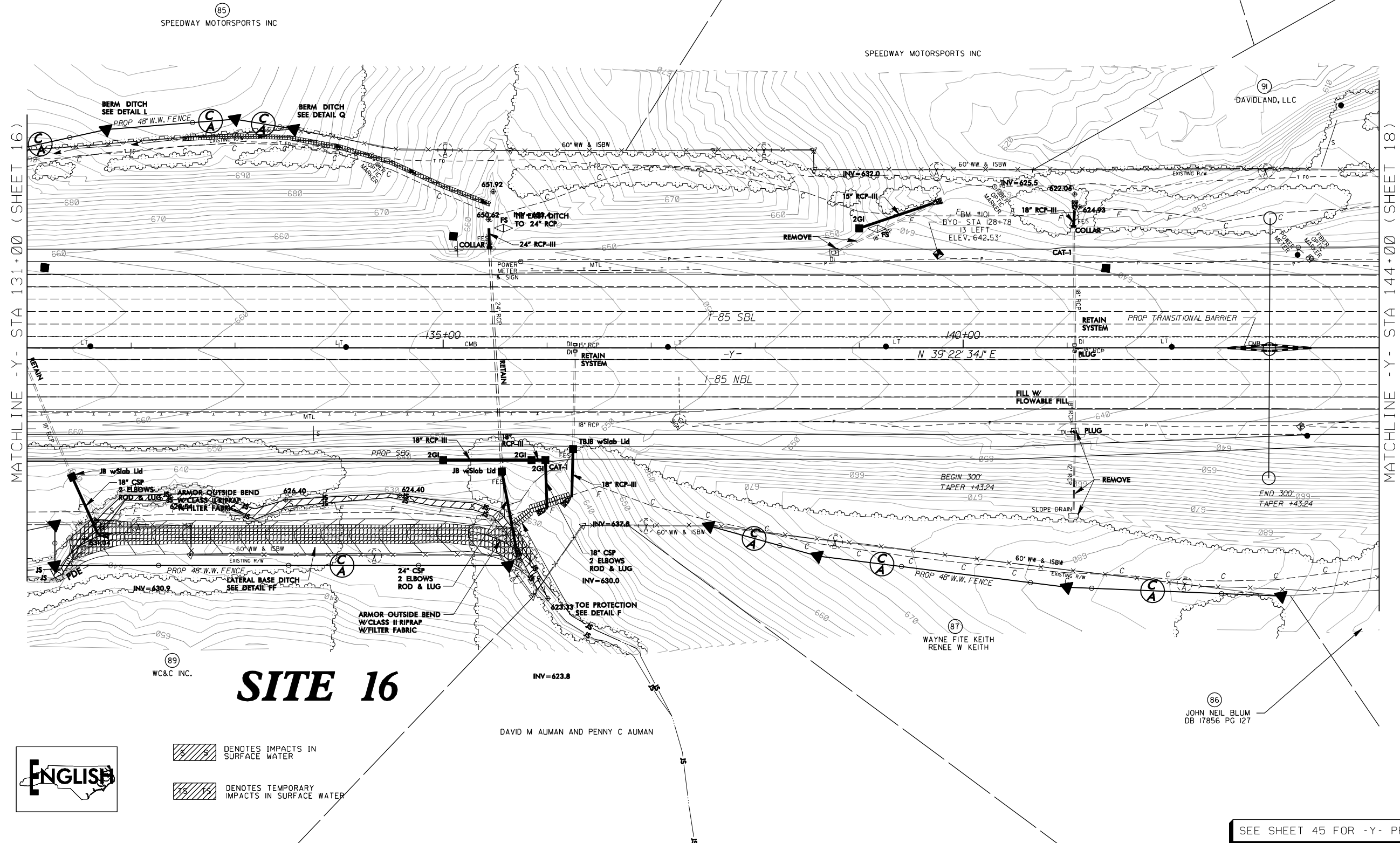


THE
LANE
CONSTRUCTION
CORPORATION


STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

PLANS PREPARED BY:
R&K
RUMMEL, KLEPPER & KAHN, LLP
900 RODGERSFIELD DRIVE SUITE 300
BALDWIN, NORTH CAROLINA 27006-2940
NC LICENSE NO. F-0112 (9/11) 876-7540

PROJECT REFERENCE NO.		SHEET NO.
R-2123CE		17
RW SHEET NO.		HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER		
PERMIT DRAWING		SHEET 52 OF 56



SITE 16



-  DENOTES IMPACTS IN SURFACE WATER
-  DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SEE SHEET 45 FOR -Y- PROFILE

THE
LANE
CONSTRUCTION
CORPORATION


STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

PLANS PREPARED BY:

RUMMEL, KLEPPER & KAHN, LLP
900 RODGERS DRIVE SUITE 300
BALFORD, NORTH CAROLINA 27008-2940
NC LICENSE NO. F-0112 (919) 876-7540

PROJECT REFERENCE NO.
R-2123CE

RW SHEET NO.
ROADWAY DESIGN
ENGINEER

PERMIT
SHEET

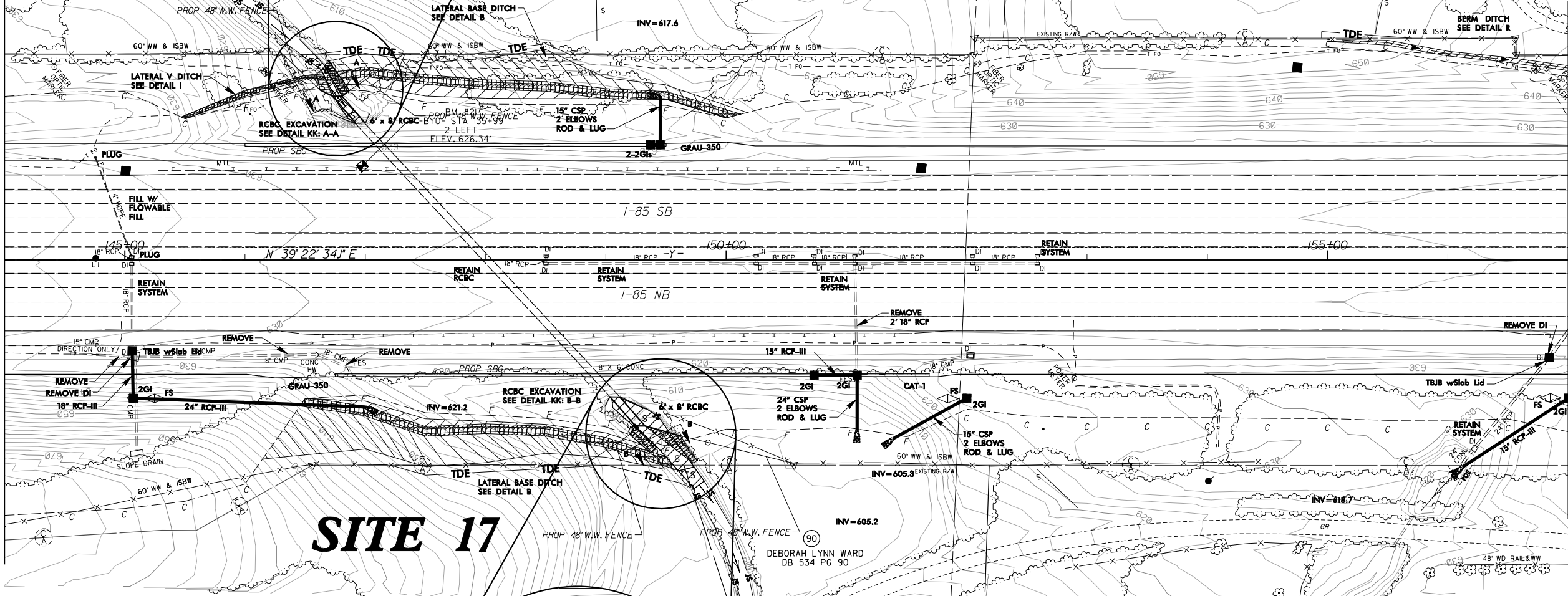
SHEET NO.
18

HYDRAULICS
ENGINEER

DRAWING
54 OF 56

MATCHLINE -Y- STA 144+00 (SHEET 17)

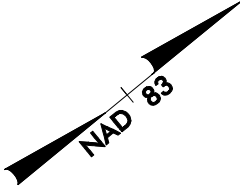
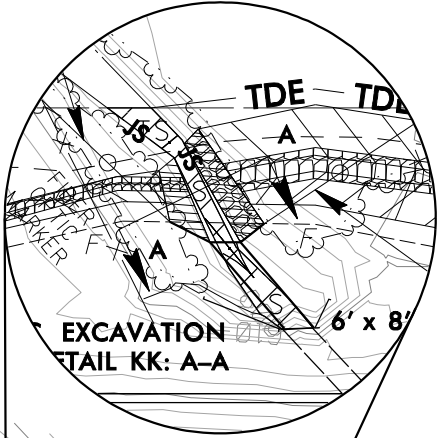
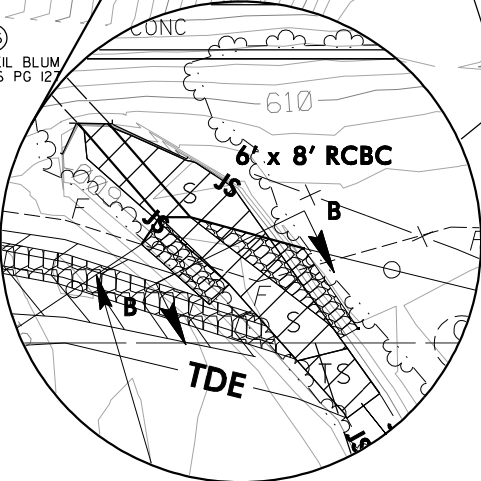
MATCHLINE -Y- STA 157+00 (SHEET 19)



SITE 17



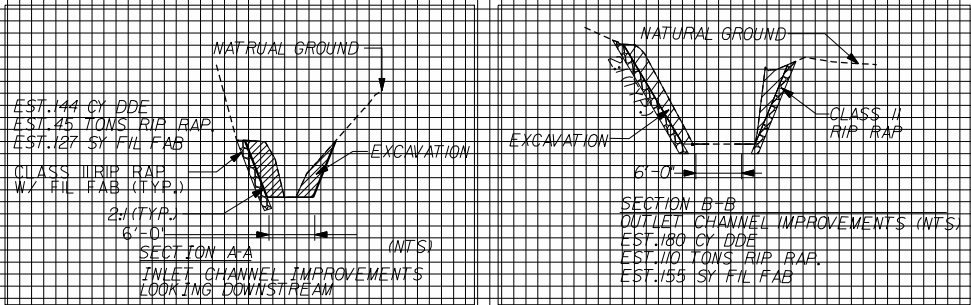
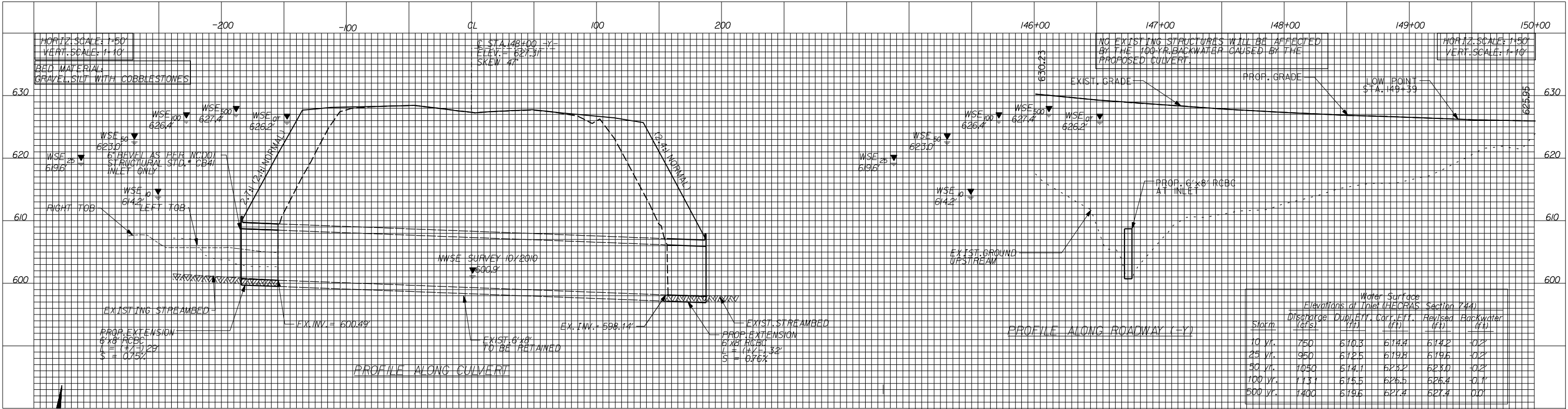
-  DENOTES IMPACTS IN SURFACE WATER
-  DENOTES TEMPORARY IMPACTS IN SURFACE WATER

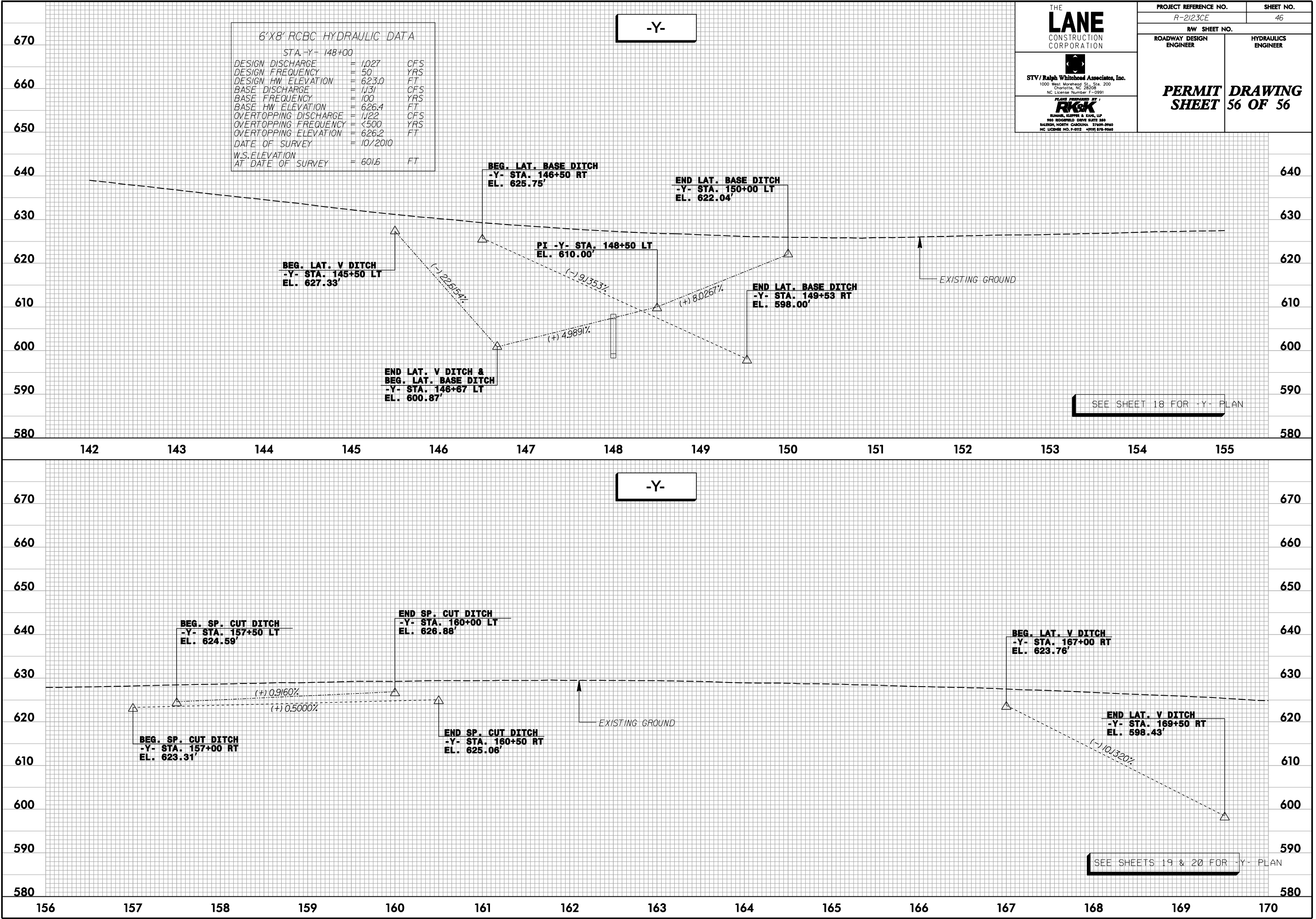


SEE SHEET 46 FOR -Y- PROFILE

SITE 17

PERMIT DRAWING
SHEET 55 OF 56





THE
LANE
CONSTRUCTION
CORPORATION


STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

PLANS PREPARED BY:

RUMMEL, KLEPPER & KAHN, LLP
300 RIDGEFIELD DRIVE SUITE 500
BALFORD, NORTH CAROLINA 27008-2940
NC LICENSE NO. F-0112 (01/11) 876-7540

PROJECT REFERENCE NO.
R-2123CE

SHEET NO.
46

ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

**PERMIT
SHEET**

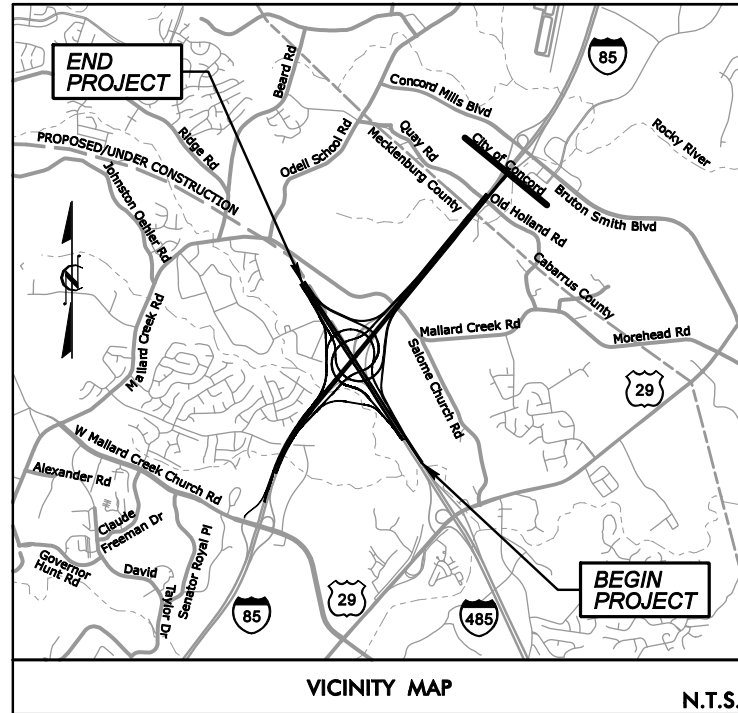
**DRAWING
56 OF 56**

\$FILE \$
\$DATE \$

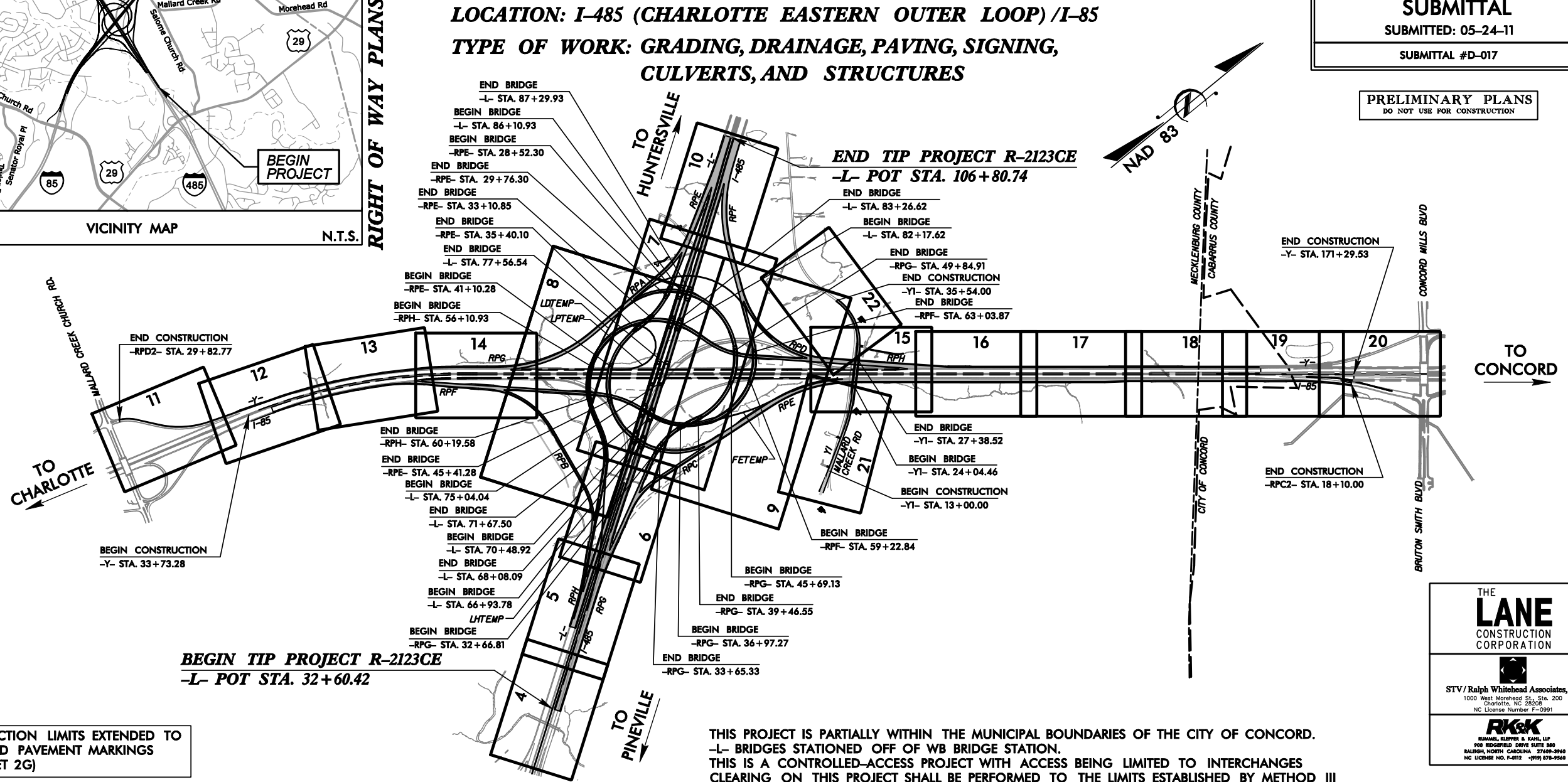
TIP PROJECT: R-2123CE

CONTRACT: C202523

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



RIGHT OF WAY PLANS



NOTE: CONSTRUCTION LIMITS EXTENDED TO COVER PROPOSED PAVEMENT MARKINGS (SEE DETAIL SHEET 2G)

THIS PROJECT IS PARTIALLY WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF CONCORD.
-L- BRIDGES STATIONED OFF OF WB BRIDGE STATION.
THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MECKLENBURG & CABARRUS COUNTY

LOCATION: I-485 (CHARLOTTE EASTERN OUTER LOOP) / I-85
TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNING,
CULVERTS, AND STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2123CE	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34379.117	NHF-0485(26)	PE	
34379.217		R/W & UTILITY	
34379.317		CONST.	

PERMIT APPLICATION
SUBMITTAL
SUBMITTED: 05-24-11
SUBMITTAL #D-017

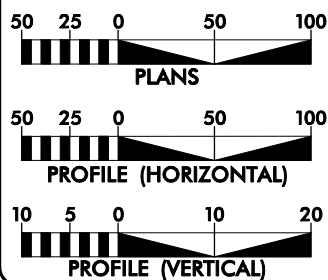
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

THE
LANE
CONSTRUCTION
CORPORATION

STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

R&K
RUSSELL, KILPATRICK & KILPATRICK, LLP
900 RIDGEFIELD DRIVE, SUITE 300
RALEIGH, NORTH CAROLINA 27609-2940
NC LICENSE NO. F-0112 - (919) 878-9560

GRAPHIC SCALES



DESIGN DATA

I-485 (-L-)
ADT 2008 = 66,600
ADT 2035 = 155,800
DHV = 10%
D = 55%
T = 13% *
V = 70 mph
FUNCTIONAL CLASSIFICATION:
INTERSTATE
* (TTST 8% + DUAL 5%)

DESIGN DATA

I-85 (-Y-)
ADT 2008 = 104,600
ADT 2035 = 190,400
DHV = 10%
D = 55%
T = 15% *
V = 70 mph
FUNCTIONAL CLASSIFICATION:
INTERSTATE
* (TTST 10% + DUAL 5%)

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-2123CE = 1.270 MILES
LENGTH OF STRUCTURE TIP PROJECT R-2123CE = 0.135 MILES
(BASED ON WB BRIDGES)
TOTAL LENGTH OF TIP PROJECT R-2123CE = 1.405 MILES

NCDOT CONTACT: RODGER ROCHELLE, PE
Project Engineer - Alternate Delivery Unit

PLANS PREPARED FOR THE NCDOT BY:
STV/RALPH WHITEHEAD ASSOCIATES, INC.
1000 West Morehead St., Ste. 200, Charlotte NC, 28208
NC License Number F-0991

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPTEMBER 28, 2010

LETTING DATE:
SEPTEMBER 28, 2010

JOHN N. JOHNSON, PE
PROJECT ENGINEER

JOSEPH A. FREEMAN, PE
PROJECT DESIGN ENGINEER

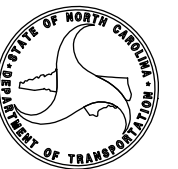
HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN
ENGINEER

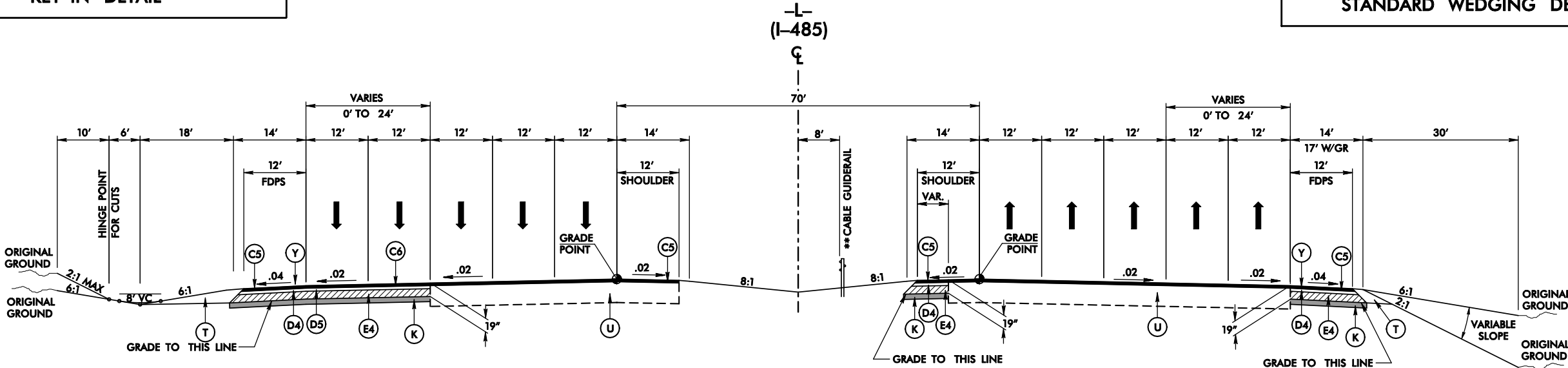
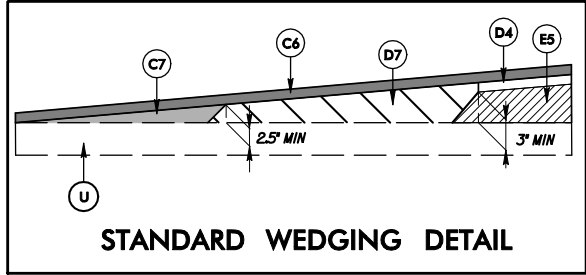
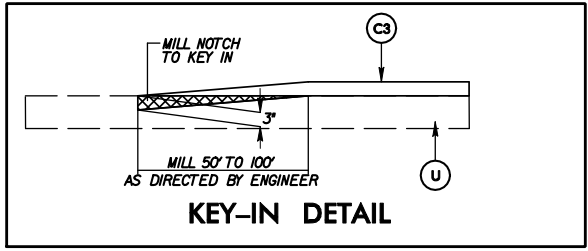
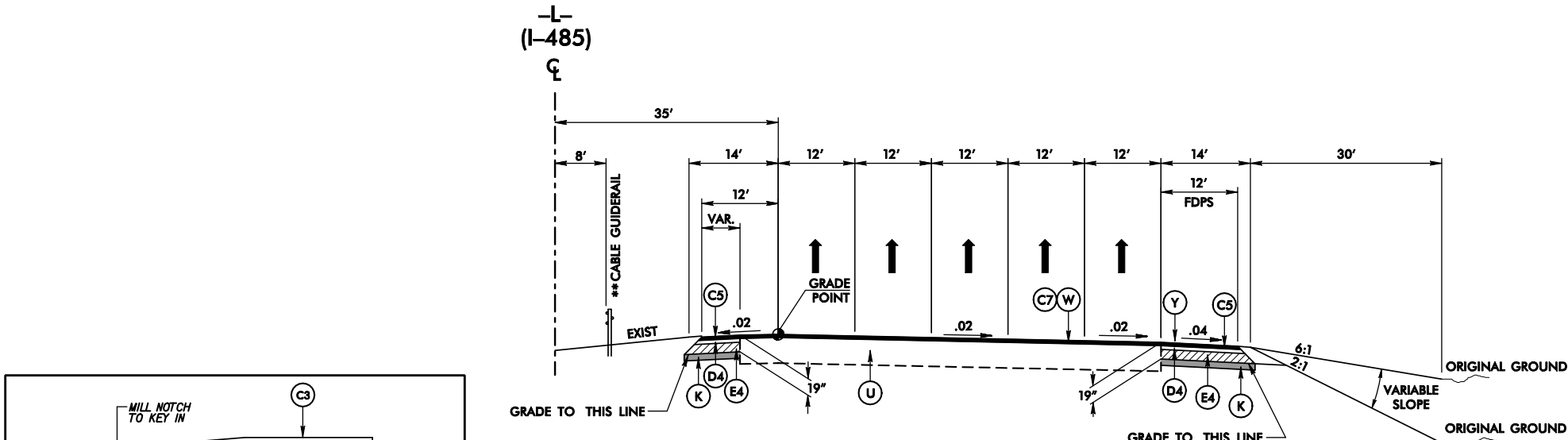
SIGNATURE: _____ P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



TYPICAL SECTION NO. 2
-L- STA 43+00.00 TO 59+10.00

NOTES:
ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE
TYPICAL SECTIONS SHOWN FOR TANGENT SECTIONS ONLY, SEE PLANS AND STANDARD DRAWINGS FOR SUPERELEVATION DETAILS.

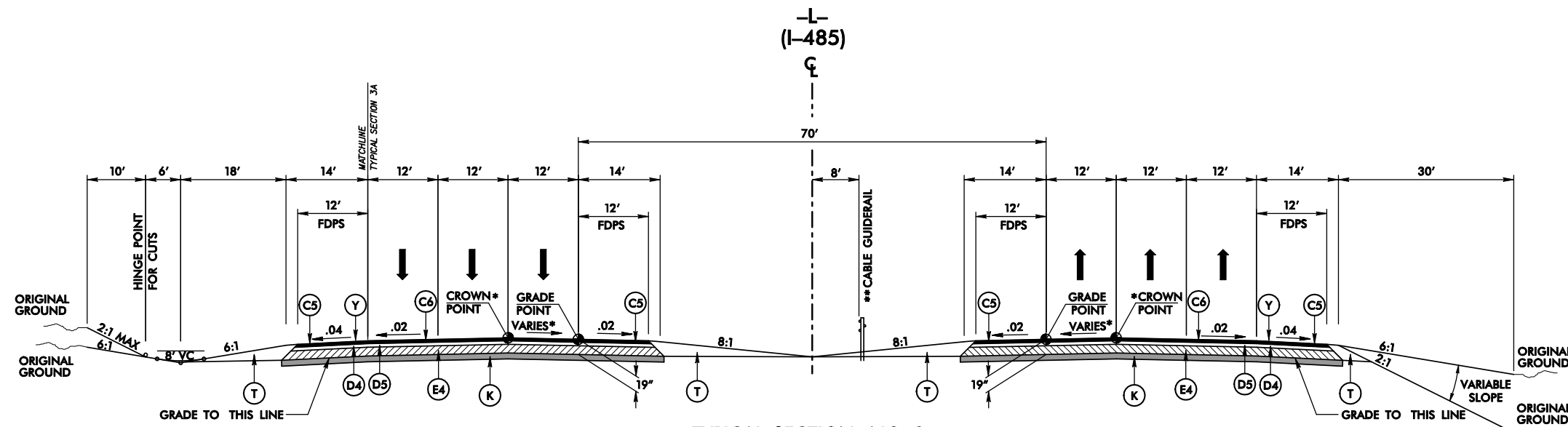
PAVEMENT SCHEDULE

A1	PROPOSED APPROXIMATE 10.5" JOINTED CONCRETE WITHOUT DOWELS	C5	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ.YD. IN EACH OF TWO LAYERS.	D5	PROP. APPROX. 3.5" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0D, AT AN AVERAGE RATE OF 399 LBS. PER SQ.YD.	E5	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ.YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" OR GREATER THAN 5.5" IN DEPTH.	R4	PROPOSED DOUBLE FACED CONCRETE BARRIER
A2	13" DOWEL JOINTED CONCRETE WITH 15' UNIFORM JOINT SPACING	C6	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ.YD. IN EACH OF TWO LAYERS.	D6	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ.YD.	J1	PROPOSED 10" AGGREGATE BASE COURSE	T	EARTH MATERIAL
A3	14" DOWEL JOINTED CONCRETE WITH 15' UNIFORM JOINT SPACING	C7	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 112 LBS. PER SQ.YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1.5" IN DEPTH OR GREATER THAN 2" IN DEPTH.	D7	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0D, AT AN AVERAGE RATE OF 114 LBS. PER SQ.YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2.5" OR GREATER THAN 4" IN DEPTH.	J2	PROPOSED 6" AGGREGATE BASE COURSE	U	EXISTING PAVEMENT
C1	PROP. APPROX. 1.25" ASPHALT CONCRETE SURFACE COURSE TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ.YD.	D1	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ.YD.	E1	PROP. APPROX. 3" ASPHALT CONCRETE BASE COURSE TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ.YD.	K	SUBGRADE STABILIZATION	W	VARIABLE DEPTH ASPHALT (SEE WEDGING DETAIL)
C2	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ.YD.	D2	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ.YD.	E2	PROP. APPROX. 7" ASPHALT CONCRETE BASE COURSE TYPE B25.0C, AT AN AVERAGE RATE OF 399 LBS. PER SQ.YD. IN EACH OF TWO LAYERS.	R1	EXPRESSWAY GUTTER	X1	PROPOSED 3" PERMEABLE ASPHALT DRAINAGE COURSE (PADC)
C3	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5C, AT AN AVERAGE RATE OF 224 LBS. PER SQ.YD.	D3	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ.YD.	E3	PROP. APPROX. 8" ASPHALT CONCRETE BASE COURSE TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ.YD. IN EACH OF TWO LAYERS.	R2	SHOULDER BERM GUTTER	X2	PROPOSED 4" PERMEABLE ASPHALT DRAINAGE COURSE (PADC)
C4	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ.YD. IN EACH OF TWO LAYERS.	D4	PROP. APPROX. 3.5" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0C, AT AN AVERAGE RATE OF 399 LBS. PER SQ.YD.	E4	PROP. APPROX. 12.5" ASPHALT CONCRETE BASE COURSE TYPE B25.0C, AT AN AVERAGE RATE OF 475 LBS. PER SQ.YD. IN EACH OF THREE LAYERS.	R3	PROPOSED SINGLE FACED CONCRETE BARRIER	Y	RUMBLE STRIPS

PAVEMENT SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.

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3/4/2011



TYPICAL SECTION NO. 3

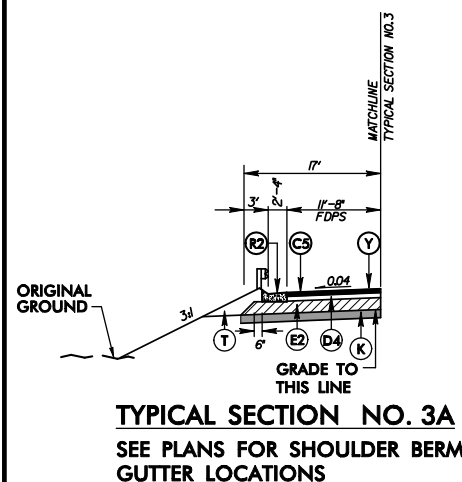
-L- STA 59+10.00 TO 66+93.78 (BEGIN BRIDGE)
-L- STA 68+08.09 (END BRIDGE) TO 70+48.92 (BEGIN BRIDGE)
-L- STA 71+67.50 (END BRIDGE) TO 75+04.04 (BEGIN BRIDGE)
BRIDGES STATIONED OFF OF WB BRIDGE

* CROWN POINT SHIFT (INSIDE LANE)

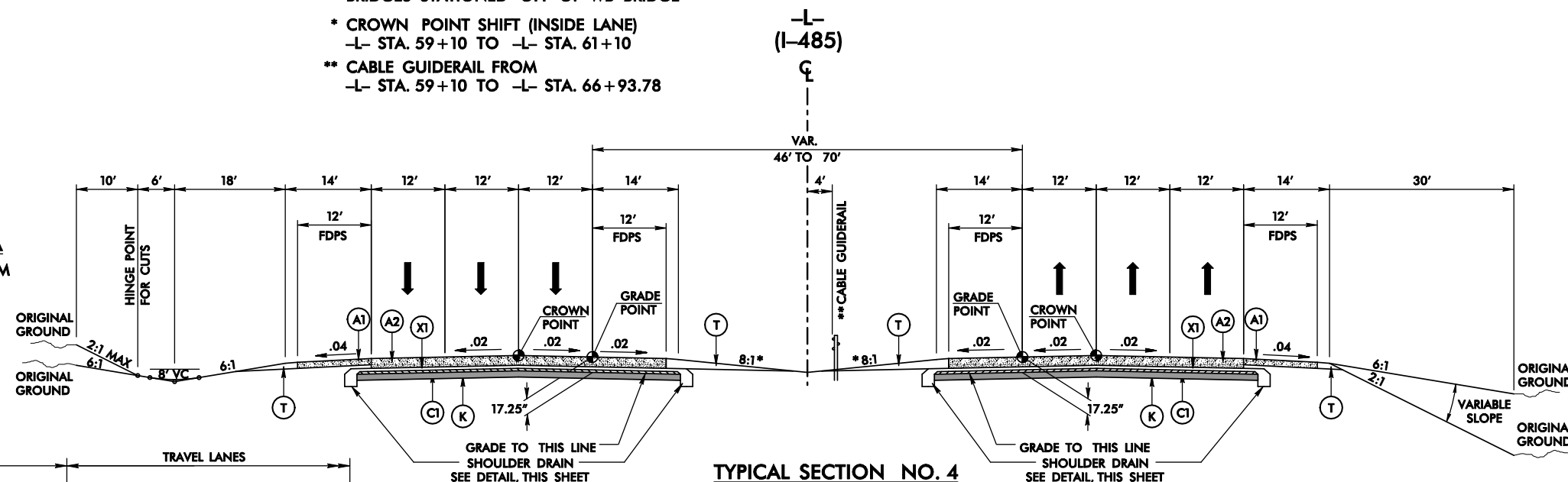
-L- STA. 59+10 TO -L- STA. 61+10

** CABLE GUIDERAIL FROM

-L- STA. 59+10 TO -L- STA. 66+93.78



TYPICAL SECTION NO. 3A
SEE PLANS FOR SHOULDER BERM
GUTTER LOCATIONS



TYPICAL SECTION NO. 4

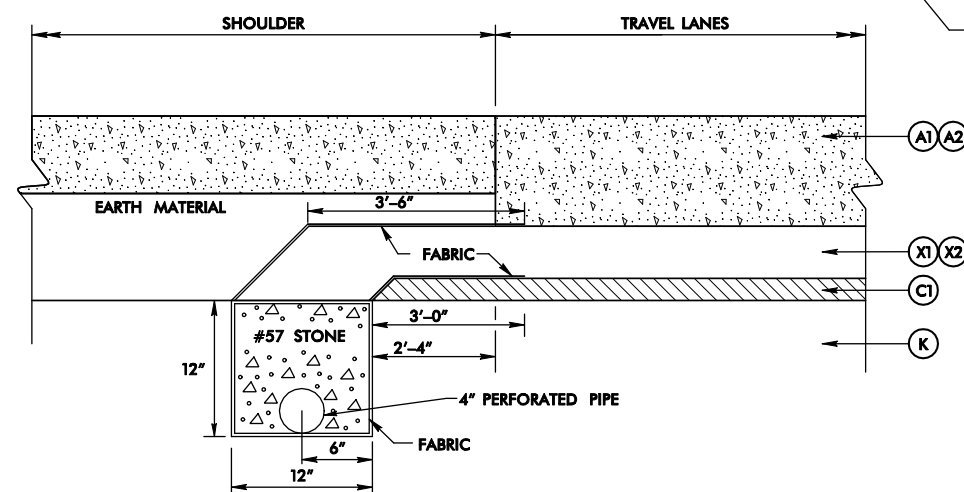
-L- STA 77+56.54 (END BRIDGE) TO 82+17.62 (BEGIN BRIDGE)
-L- STA 83+26.62 (END BRIDGE) TO 86+10.93 (BEGIN BRIDGE)
-L- STA 87+29.93 (END BRIDGE) TO 95+41.22

BRIDGES STATIONED OFF OF WB BRIDGE

* SLOPES VARIES FROM 6:1 TO 8:1
DEPENDING ON MEDIAN WIDTH.

** CABLE GUIDERAIL FROM

-L- STA. 87+29.93 -L- STA. 95+41.22



SHOULDER DRAIN DETAIL

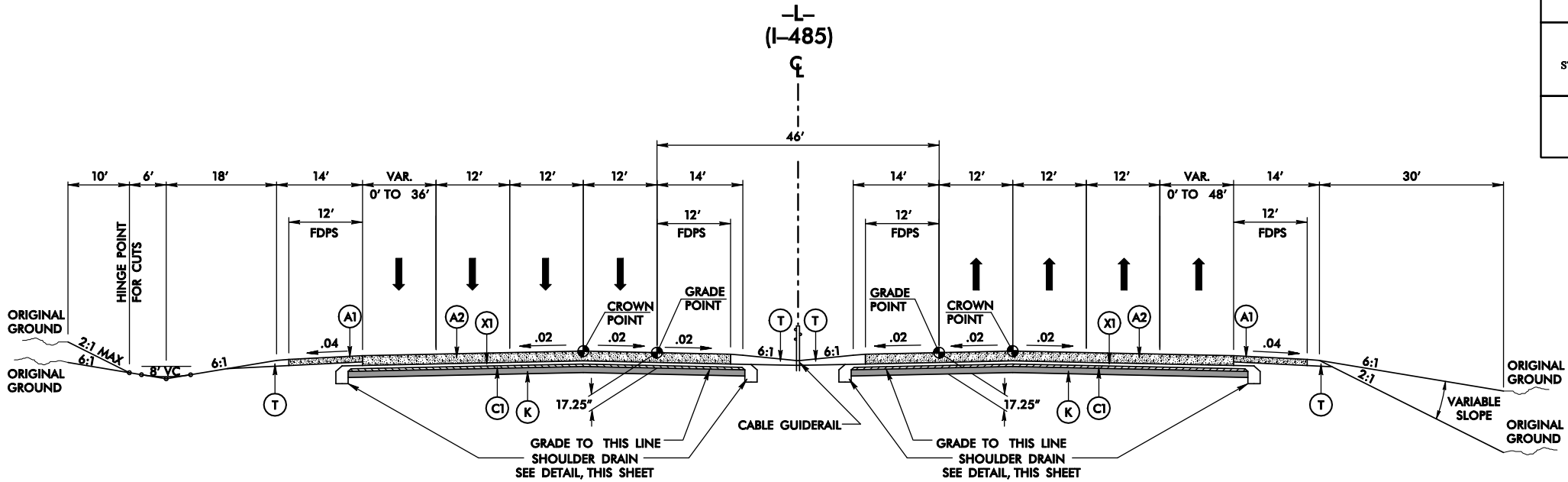
(LIMITS TO BE PROVIDED IN FUTURE SUBMITTAL)

NOTES:

ALL PAVEMENT SLOPES 1:1 UNLESS
NOTED OTHERWISE

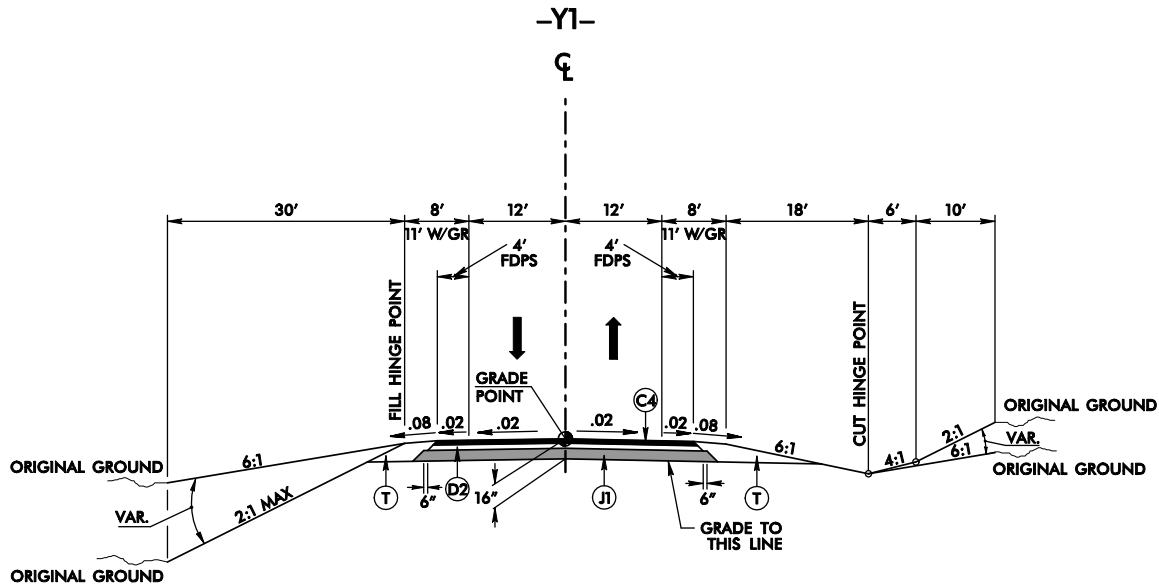
TYPICAL SECTIONS SHOWN FOR
TANGENT SECTIONS ONLY, SEE PLANS
AND STANDARD DRAWINGS FOR
SUPERELEVATION DETAILS.

PAVEMENT SLOPES ARE 1:1 UNLESS OTHERWISE
NOTED.



TYPICAL SECTION NO. 5

-L- STA 95+41.22 TO 106+80.74



TYPICAL SECTION NO. 6

-Y1- STA. 13+00.00 TO 24+07.85 (BEGIN BRIDGE)
-Y1- STA. 27+37.76 (END BRIDGE) TO 35+54.00

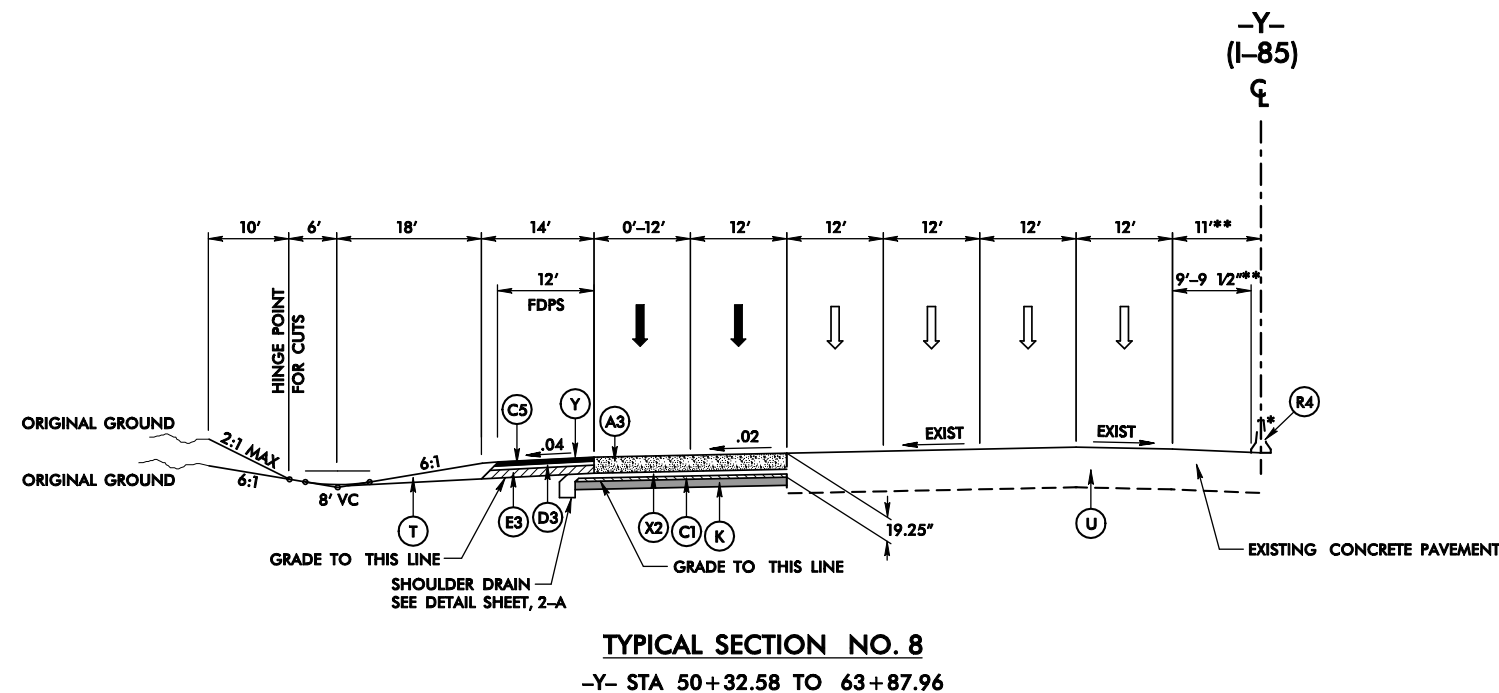
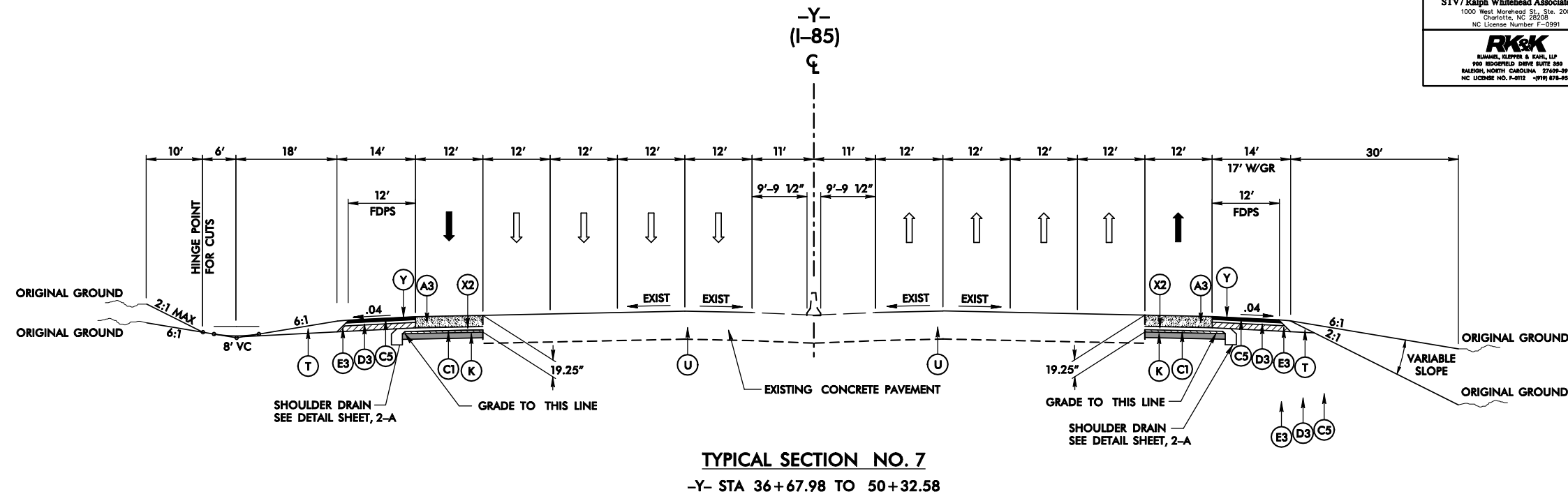
NOTES:

ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE

TYPICAL SECTIONS SHOWN FOR TANGENT SECTIONS ONLY, SEE PLANS AND STANDARD DRAWINGS FOR SUPERELEVATION DETAILS.

A1	10.5" CONCRETE
A2	13" CONCRETE
A3	14" CONCRETE
C1	1.25" SF9.5A
C2	1.5" S9.5D
C3	2" S9.5C
C4	3" S9.5B
C5	3" S9.5C
C6	3" S9.5D
C7	VAR. S9.5D
D1	2.5" I19.0B
D2	3" I19.0B
D3	3" I19.0C
D4	3.5" I19.0C
D5	3.5" I19.0D
D6	4" I19.0C
D7	VAR. I19.0D
E1	3" B25.0B
E2	7" B25.0C
E3	8" B25.0C
E4	12.5" B25.0C
E5	VAR. B25.0C
J1	10" ABC
J2	8" ABC
K	SUBGRADE STABILIZATION
R1	EXPRESSWAY GUTTER
R2	SHOULDER BERM GUTTER
R3	SINGLE FACED CONCRETE BARRIER
R4	DOUBLE FACED CONCRETE BARRIER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING
X1	3" PADC
X2	4" PADC
Y	RUMBLE STRIPS

PAVEMENT SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.



* SLOPES VARIES FROM 6:1 TO 8:1
DEPENDING ON MEDIAN WIDTH.

**** 7.67' IN AREAS OF MEDIAN BENTS.**

NOTES:

**ALL PAVEMENT SLOPES 1:1 UNLESS
NOTED OTHERWISE**

**TYPICAL SECTIONS SHOWN FOR
TANGENT SECTIONS ONLY, SEE PLANS
AND STANDARD DRAWINGS FOR
SUPERELEVATION DETAILS.**

A1	10.5" CONCRETE
A2	13" CONCRETE
A3	14" CONCRETE
C1	1.25" S9.5A
C2	1.5" S9.5D
C3	2" S9.5C
C4	3" S9.5B
C5	3" S9.5C
C6	3" S9.5D
C7	VAR. S9.5D
D1	2.5" I19.0B
D2	3" I19.0B
D3	3" I19.0C
D4	3.5" I19.0C
D5	3.5" I19.0D
D6	4" I19.0C
D7	VAR. I19.0D
E1	3" B25.0B
E2	7" B25.0C
E3	8" B25.0C
E4	12.5" B25.0C
E5	VAR. B25.0C
J1	10" ABC
J2	8" ABC
K	SUBGRADE STABILIZATION
R1	EXPRESSWAY GUTTER
R2	SHOULDER BERM GUTTER
R3	SINGLE FACED CONCRETE BARRIER
R4	DOUBLE FACED CONCRETE BARRIER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING
X1	3" PADC
X2	4" PADC
Y	RUMBLE STRIPS

PAVEMENT SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.



-RPA- STA 10+00.00 TO 23+84.85
 -RPC- STA 10+00.00 TO 26+24.03
 -RPD- STA 10+00.00 TO 26+39.04
 -RPE- STA 20+90.48 TO 28+52.30 (BEGIN BRIDGE)
 -RPE- STA 29+76.30 (END BRIDGE) TO 33+10.85 (BEGIN BRIDGE)
 -RPE- STA 35+40.10 (END BRIDGE) TO 41+10.28 (BEGIN BRIDGE)
 -RPF- STA 10+00.00 TO 59+22.84 (BEGIN BRIDGE)
 -RPG- STA 26+76.96 TO 32+61.08 (BEGIN BRIDGE)
 -RPG- STA 33+61.58 (END BRIDGE) TO 37+00.81 (BEGIN BRIDGE)
 -RPG- STA 39+46.83 (END BRIDGE) TO 45+69.13 (BEGIN BRIDGE)
 -RPH- STA 25+61.27 TO 56+10.93 (BEGIN BRIDGE)



-RPB- STA 10+00.00 TO 35+93.43



-RPE- STA 10+00.00 TO 20+90.48
 -RPE- STA 62+33.72 TO 81+88.06
 -RPF- STA 68+45.44 TO 87+60.92
 -RPH- STA 10+00.00 TO 25+61.27

NOTES:

ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE

TYPICAL SECTIONS SHOWN FOR
TANGENT SECTIONS ONLY, SEE PLANS
AND STANDARD DRAWINGS FOR
SUPERELEVATION DETAILS.

10' SHOULDER SHOULD BE USED ON
THE INSIDE OF CURVES THROUGH
CENTRAL AREA OF INTERCHANGE.
FLIP FOR RAMPS A & C.

A1	10.5" CONCRETE
A2	13" CONCRETE
A3	14" CONCRETE
C1	1.25" S9.5A
C2	1.5" S9.5D
C3	2" S9.5C
C4	3" S9.5B
C5	3" S9.5C
C6	3" S9.5D
C7	VAR. S9.5D
D1	2.5" I19.0B
D2	3" I19.0B
D3	3" I19.0C
D4	3.5" I19.0C
D5	3.5" I19.0D
D6	4" I19.0C
D7	VAR. I19.0D
E1	3" B25.0B
E2	7" B25.0C
E3	8" B25.0C
E4	12.5" B25.0C
E5	VAR. B25.0C
J1	10" ABC
J2	8" ABC
K	SUBGRADE STABILIZATION
R1	EXPRESSWAY GUTTER
R2	SHOULDER BERM GUTTER
R3	SINGLE FACED CONCRETE BARRIER
R4	DOUBLE FACED CONCRETE BARRIER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING
X1	3" PADC
X2	4" PADC
Y	RUMBLE STRIPS

PAVEMENT SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.

ALIGNMENT CURVE DATA

CURVE DATA -L-	
Pls Sta 59+00.44 Δ = 1° 43' 16.6" (RT) D = 0° 17' 11.3" L = 600.84' T = 300.44' R = 20,000.00' e = NC	Pls Sta 64+96.84 Δ = 1° 41' 45.0" (LT) D = 0° 17' 11.3" L = 591.96' T = 296.00' R = 20,000.00' e = NC
Pls Sta 99+71.23 Δ = 1° 52' 08.9" (LT) D = 0° 23' 42.5" L = 473.03' T = 236.53' R = 14,500.00' e = NC	Pls Sta 104+44.25 Δ = 1° 52' 08.9" (RT) D = 0° 23' 42.5" L = 473.03' T = 236.53' R = 14,500.00' e = NC

CURVE & SPIRAL DATA -Y-		
Pls Sta 33+64.17 Θs = 1° 51' 22.5" Ls = 450.00' LT = 300.02' ST = 150.02'	Pls Sta 46+75.74 Δ = 18° 59' 25.1" (RT) D = 0° 49' 30.0" L = 2,301.86' T = 1,161.58' R = 6,944.94' e = EXIST	Pls Sta 59+66.02 Θs = 1° 51' 22.5" Ls = 450.00' LT = 300.02' ST = 150.02'

CURVE & SPIRAL DATA -RPC-		
Pls Sta 11+33.40 Θs = 5° 30' 33.2" Ls = 200.00' LT = 133.40' ST = 66.73'	Pls Sta 14+24.79 Δ = 24° 23' 35.3" (RT) D = 5° 30' 33.2" L = 442.77' T = 224.79' R = 1,040.00' e = 5.8% RUNOFF = 200'	Pls Sta 17+09.50 Θs = 5° 30' 33.2" Ls = 200.00' LT = 133.40' ST = 66.73'

CURVE & SPIRAL DATA -RPD-		
Pls Sta 11+33.39 Θs = 4° 56' 21.4" Ls = 200.00' LT = 133.39' ST = 66.71'	Pls Sta 18+86.02 Δ = 61° 11' 59.7" (RT) D = 4° 56' 21.4" L = 1,239.04' T = 686.02' R = 1,160.00' e = 5.6% R = 200'	Pls Sta 25+05.76 Θs = 4° 56' 21.4" Ls = 200.00' LT = 133.39' ST = 66.71'

CURVE & SPIRAL DATA -RPE-		
Pls Sta 10+45.19 Θs = 0° 57' 17.80" Ls = 200.00' LT = 133.34' ST = 66.67'	Pls Sta 12+21.30 Δ = 2° 05' 24.5" (RT) D = 0° 57' 17.80" L = 218.88' T = 109.45' R = 6,000.00' e = 2.6% RUNOFF = 200'	Pls Sta 13+97.40 Θs = 0° 57' 17.80" Ls = 200.00' LT = 133.34' ST = 66.67'
Pls Sta 29+14.16 Θs = 5° 43' 46.5" Ls = 200.00' LT = 133.40' ST = 66.73'	Pls Sta 31+41.39 Δ = 18° 15' 03.4" (RT) D = 5° 43' 46.5" L = 318.54' T = 160.63' R = 1,000.00' e = 5.9% RUNOFF = 200'	Pls Sta 33+66.03 Θs = 5° 43' 46.5" Ls = 200.00' LT = 133.40' ST = 66.73'
Pls Sta 36+32.73 Θs = 6° 52' 41.7" Ls = 200.00' LT = 133.43' ST = 66.76'	Pls Sta 85+64.24 Δ = 160° 34' 03.0" (LT) D = 6° 52' 41.7" L = 2,334.43' T = 4,864.94' R = 833.00' e = 6.0% RUNOFF = 200'	Pls Sta 61+00.48 Θs = 6° 52' 41.7" Ls = 200.00' LT = 133.43' ST = 66.76'
Pls Sta 70+37.90 Θs = 3° 42' 59.34" Ls = 240.00' LT = 160.04' ST = 80.03'	Pls Sta 75+40.07 Δ = 25° 42' 42.0" (RT) D = 3° 05' 49.5" L = 830.19' T = 422.21' R = 1,850.00' e = 5.6% RUNOFF = 240'	Pls Sta 80+28.09 Θs = 3° 42' 59.3" Ls = 240.00' LT = 160.04' ST = 80.03'

CURVE & SPIRAL DATA -RPA-		
Pls Sta 11+33.39 Θs = 4° 56' 21.4" Ls = 200.00' LT = 133.39' ST = 66.71'	Pls Sta 13+85.22 Δ = 18° 08' 39.0" (RT) D = 4° 56' 21.4" L = 367.34' T = 185.22' R = 1,160.00' e = 5.6% RUNOFF = 200'	Pls Sta 16+34.06 Θs = 4° 56' 21.4" Ls = 200.00' LT = 133.39' ST = 66.71'

CURVE & SPIRAL DATA -RPC2-		
Pls Sta 11+33.34 Θs = 1° 06' 06.6" Ls = 200.00' LT = 133.34' ST = 66.67'	Pls Sta 16+33.25 Δ = 9° 31' 31.5" (RT) D = 1° 06' 06.6" L = 864.50' T = 433.25' R = 5,200.00' e = EXIST	Pls Sta 21+31.17 Θs = 1° 06' 06.6" Ls = 200.00' LT = 133.34' ST = 66.67'

CURVE DATA -YI-		
Pls Sta 12+21.44 Δ = 39° 36' 18.1" (RT) D = 9° 18' 59.0" L = 425.11' T = 221.44' R = 615.00' e = 4.0% RUNOFF = 84'	Pls Sta 20+32.27 Δ = 14° 22' 02.0" (LT) D = 3° 04' 49.50" L = 446.41' T = 234.43' R = 1,860.00' e = 4.5% RUNOFF = 108'	Pls Sta 32+44.12 Δ = 61° 10' 04.2" (LT) D = 8° 48' 53.0" L = 693.93' T = 384.16' R = 650.00' e = 4.0% RUNOFF = 84'

CURVE & SPIRAL DATA -RPD2-		
Pls Sta 11+33.39 Θs = 4° 56' 21.50" Ls = 200.00' LT = 133.39' ST = 66.71'	Pls Sta 18+86.02 Δ = 61° 11' 59.80" (RT) D = 4° 56' 21.50" L = 1,239.04' T = 686.02' R = 1,160.00' e = EXIST	Pls Sta 25+05.76 Θs = 4° 56' 21.50" Ls = 200.00' LT = 133.39' ST = 66.71'

CURVE & SPIRAL DATA -RPF-		
Pls Sta 11+18.36 Θs = 0° 49' 55.45" Θs = 2° 51' 53.24" Ls = 200.00' LT = 118.36' ST = 81.70'	Pls Sta 12+94.45 Δ = 5° 24' 26.8" (RT) D = 2° 51' 53.2" L = 188.76' T = 94.45' R = 2,000.00' e = 5.4% RUNOFF = 200'	Pls Sta 14+55.44 Θs = 2° 51' 53.2" Ls = 200.00' LT = 133.35' ST = 66.68'
Pls Sta 37+35.65 Θs = 4° 56' 21.4" Ls = 200.00' LT = 133.39' ST = 66.71'	Pls Sta 39+82.89 Δ = 17° 42' 02.3" (RT) D = 4° 56' 21.4" L = 358.36' T = 180.62' R = 1,160.00' e = 5.6% RUNOFF = 200'	Pls Sta 42+27.34 Θs = 4° 56' 21.4" Ls = 200.00' LT = 133.39' ST = 66.71'
Pls Sta 44+94.06 Θs = 6° 52' 41.7" Ls = 200.00' LT = 133.43' ST = 66.76'	Pls Sta 60+75.66 Δ = 122° 23' 37.7" (LT) D = 6° 52' 41.7" L = 1,779.43' T = 1,515.03' R = 833.00' e = 6.0% RUNOFF = 200'	Pls Sta 64+06.82 Θs = 6° 52' 41.7" Ls = 200.00' LT = 133.43' ST = 66.76'
Pls Sta 76+60.31 Θs = 3° 07' 51.30" Ls = 200.00' LT = 133.36' ST = 66.69'	Pls Sta 81+25.69 Δ = 24° 35' 03.10" (RT) D = 3° 07' 51.3" L = 785.21' T = 398.74' R = 1,830.00' e = 5.6% RUNOFF = 200'	Pls Sta 85+86.36 Θs = 0° 23' 49.52" Θs = 3° 07' 51.3" Ls = 200.00' LT = 125.86' ST = 74.20'

THE
LANE
CONSTRUCTION
CORPORATION

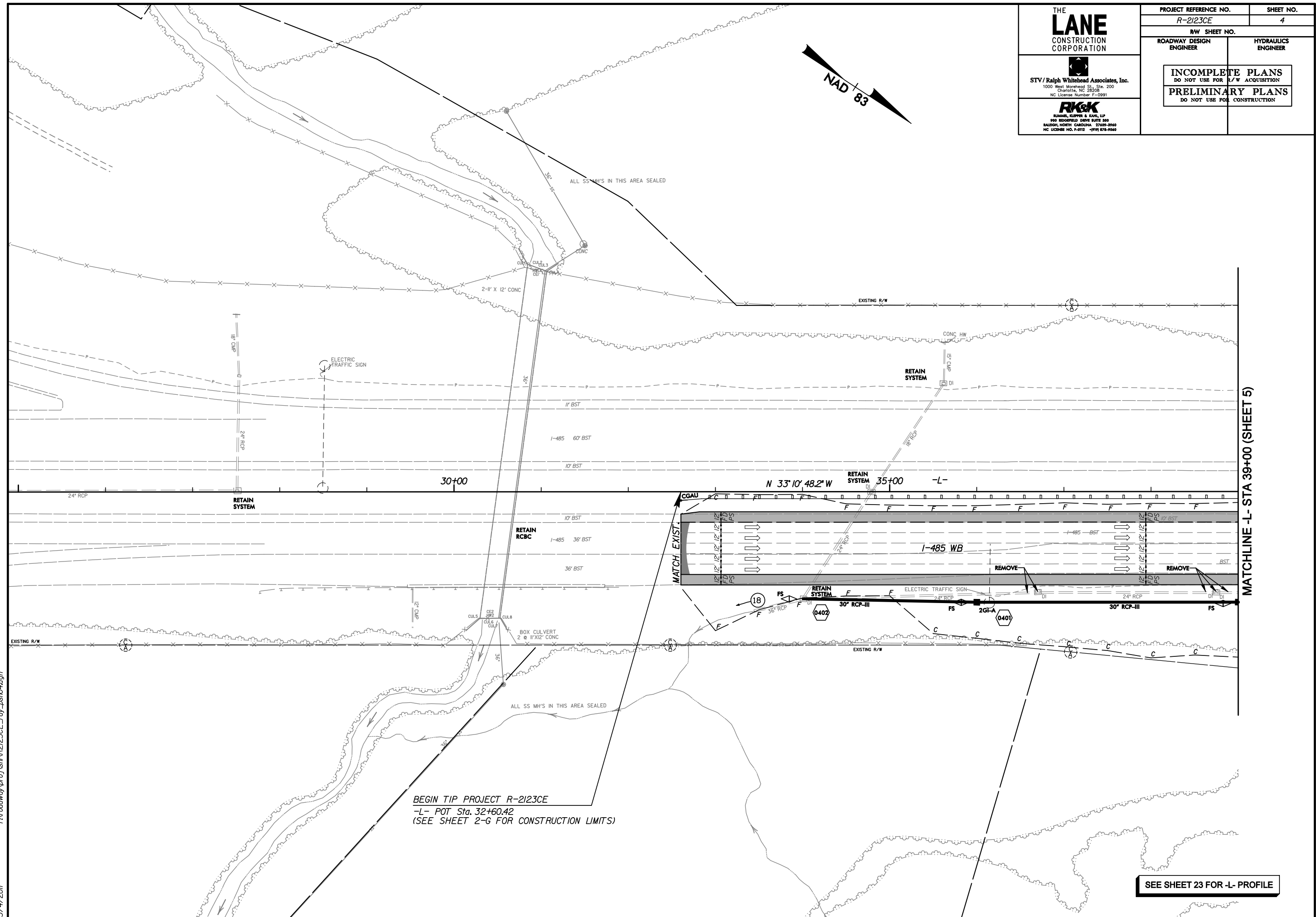

STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991


RUMMEL, KLEPPER & KAHL, LLP
810 REDWOOD DRIVE SUITE 300
RALEIGH, NORTH CAROLINA 27609-3910
NC LICENSE NO. F-8112 - (919) 875-9540

PROJECT REFERENCE NO.	
R-2123CE	
SHEET NO.	
3	
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

CURVE & SPIRAL DATA -RPH-		
Pls Sta 33+32.39 Θs = 5° 43' 46.5" Ls = 200.00' LT = 133.40' ST = 66.73'	Pls Sta 35+75.27 Δ = 19° 59' 43.6" (RT) D = 5° 43' 46.5" L = 348.99' T = 176.29' R = 1,000.00' e = 5.9% RUNOFF = 200'	Pls Sta 38+14.70 Θs = 5° 43' 46.5" Ls = 200.00' LT = 133.40' ST = 66.73'
Pls Sta 40+81.40 Θs = 6° 52' 41.7" Ls = 200.00' LT = 133.43' ST = 66.76'	Pls Sta 62+04.26 Δ = 135° 53' 40.0" (LT) D = 6° 52' 41.7" L = 1,975.71' T = 2,056.29' R = 833.00' e = 6.0% RUNOFF = 200'	Pls Sta 61+90.44 Θs = 6° 52' 41.7" Ls = 200.00' LT = 133.43' ST = 66.76'
Pls Sta 64+57.12 Θs = 1° 38' 13.3" Ls = 200.00' LT = 133.40' ST = 66.67'	Pls Sta 66+79.31 Δ = 21° 09' 54.9" (RT) D = 6° 52' 41.7" L = 307.71' T = 155.63' R = 833.00' e = 5.6% RUNOFF = 200'	Pls Sta 68+98.15 Θs = 1° 38' 13.3" Ls = 200.00' LT = 133.43' ST = 66.76'
Pls Sta 83+44.89 Θs = 1° 38' 13.3" Ls = 200.00' LT = 133.34' ST = 66.67'	Pls Sta 85+16.78 Δ = 3° 26' 39.7" (RT) D = 1° 38' 13.3" L = 210.40' T = 105.23' R = 3,500.00' e = 3.9% RUNOFF = 200'	Pls Sta 86+88.62 Θs = 1° 38' 13.3" Ls = 200.00' LT = 133.34' ST = 66.67'

CURVE & SPIRAL DATA -RPG-		
Pls Sta 30+67.83 Θs = 5° 43' 46.5" Ls = 200.00' LT = 133.40' ST = 66.73'	Pls Sta 34+03.46 Δ = 30° 06' 58.5" (RT) D = 5° 43' 46.5" L = 525.63' T = 269.04' R = 1,000.00' e = 5.9% RUNOFF = 200'	Pls Sta 37+26.78 Θs = 5° 43' 46.5" Ls = 200.00' LT = 133.40' ST = 66.73'
Pls Sta 39+93.49 Θs = 6° 52' 41.7" Ls = 200.00' LT = 133.43' ST = 66.76'	Pls Sta N/A Δ = 179° 46' 14.6" (LT) D = 6° 52' 41.7" L = 2,613.61' T = 416,338.31' R = 833.00' e = 6.0% RUNOFF = 200'	Pls Sta 67+40.43 Θs = 6° 52' 41.7" Ls = 200.00' LT = 133.43' ST = 66.76'
Pls Sta 73+39.01 Θs = 3° 45' 25.6" Ls = 240.00' LT = 160.04' ST = 80.03'	Pls Sta 79+60.94 Δ = 32° 59' 37.7" (RT) D = 3° 07' 51.3" L = 1,053.81' T = 541.96' R = 1,830.00' e = 5.6% RUNOFF = 240'	Pls Sta 85+52.81 Θs = 3° 45' 25.6" Ls = 240.00' LT = 160.04' ST = 80.03'

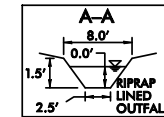
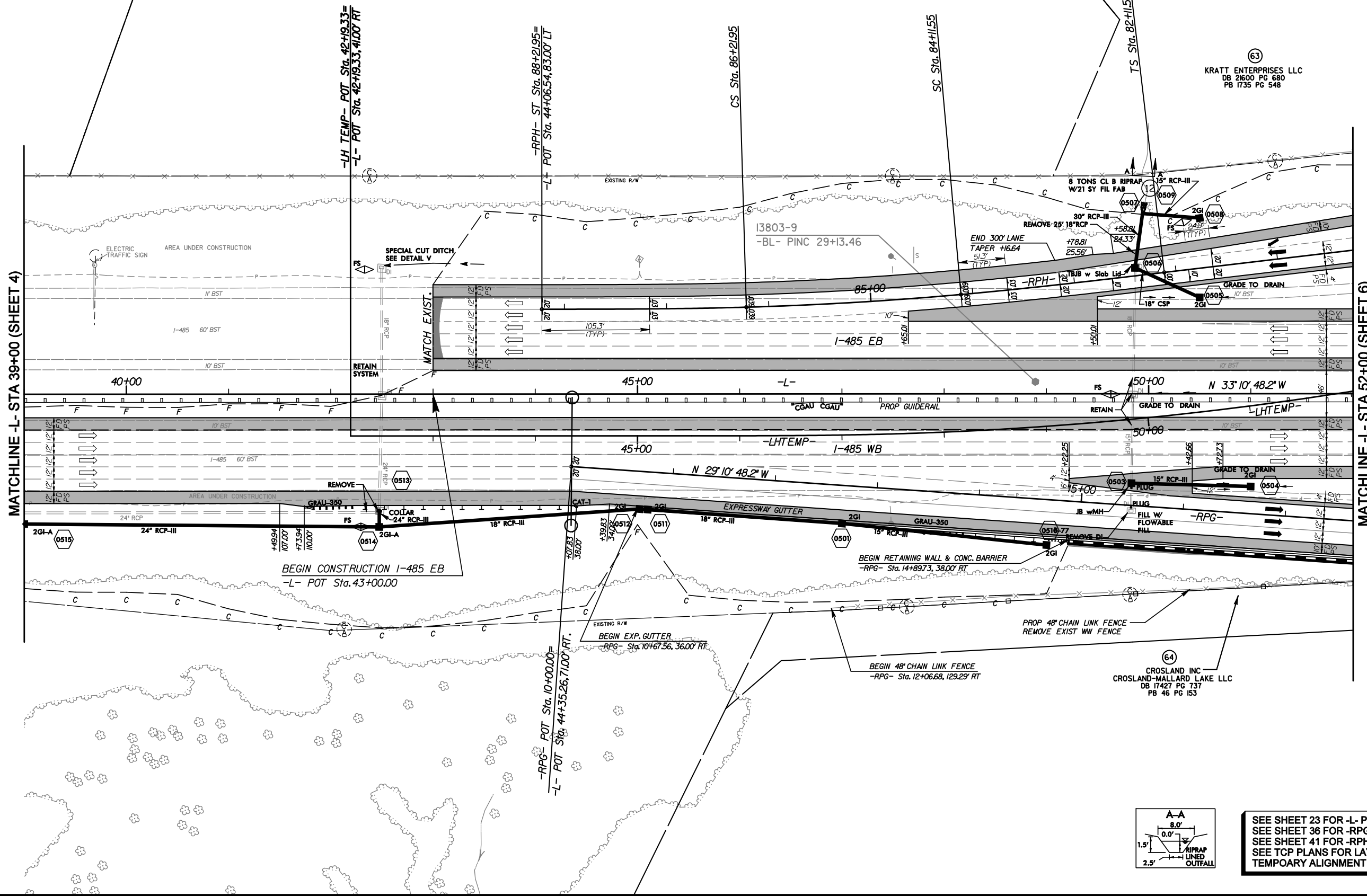
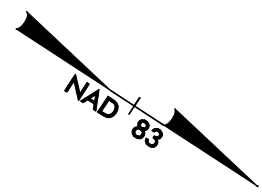


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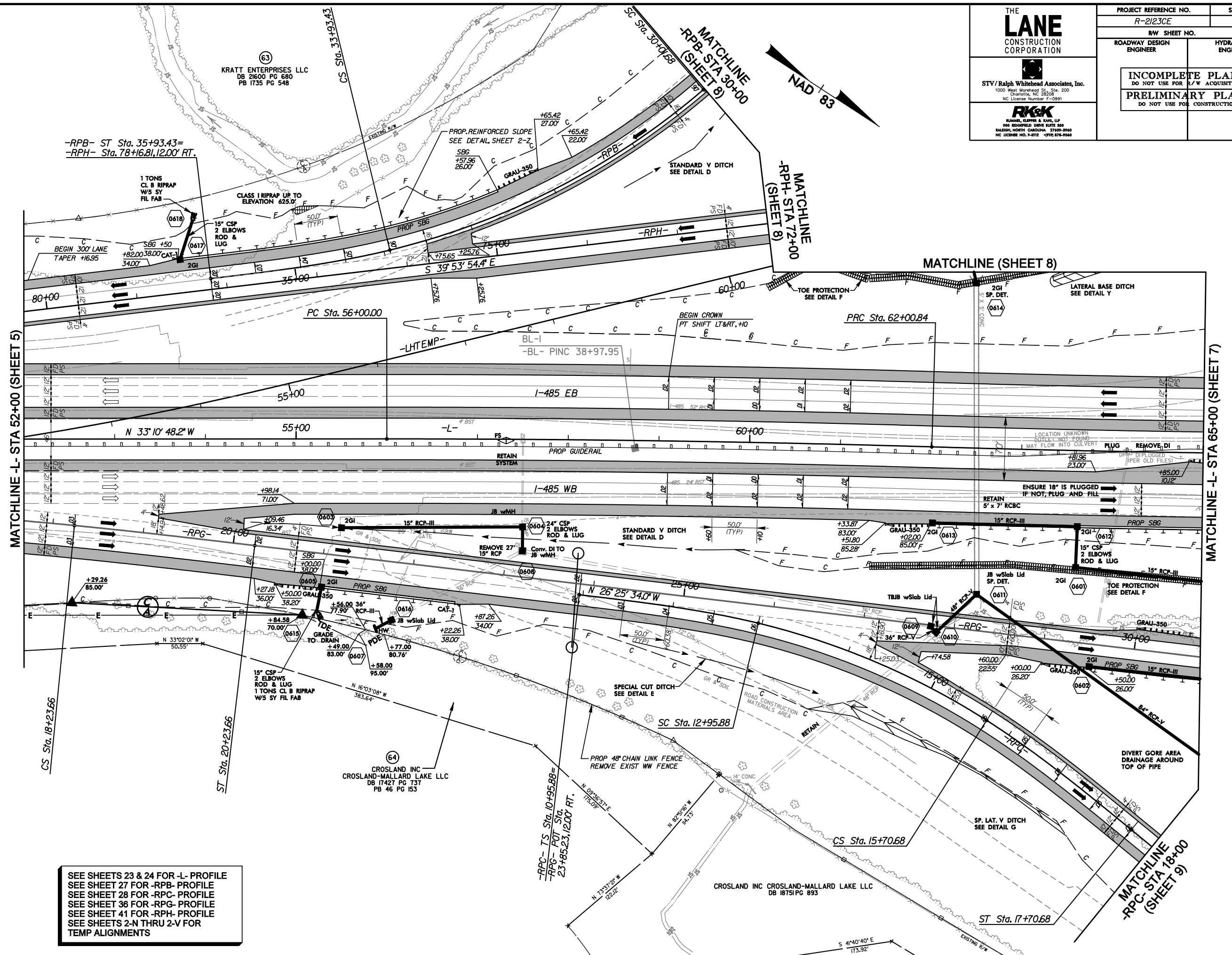
PROJECT REFERENCE NO. <i>R-2123CE</i>		SHEET NO. 5
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		



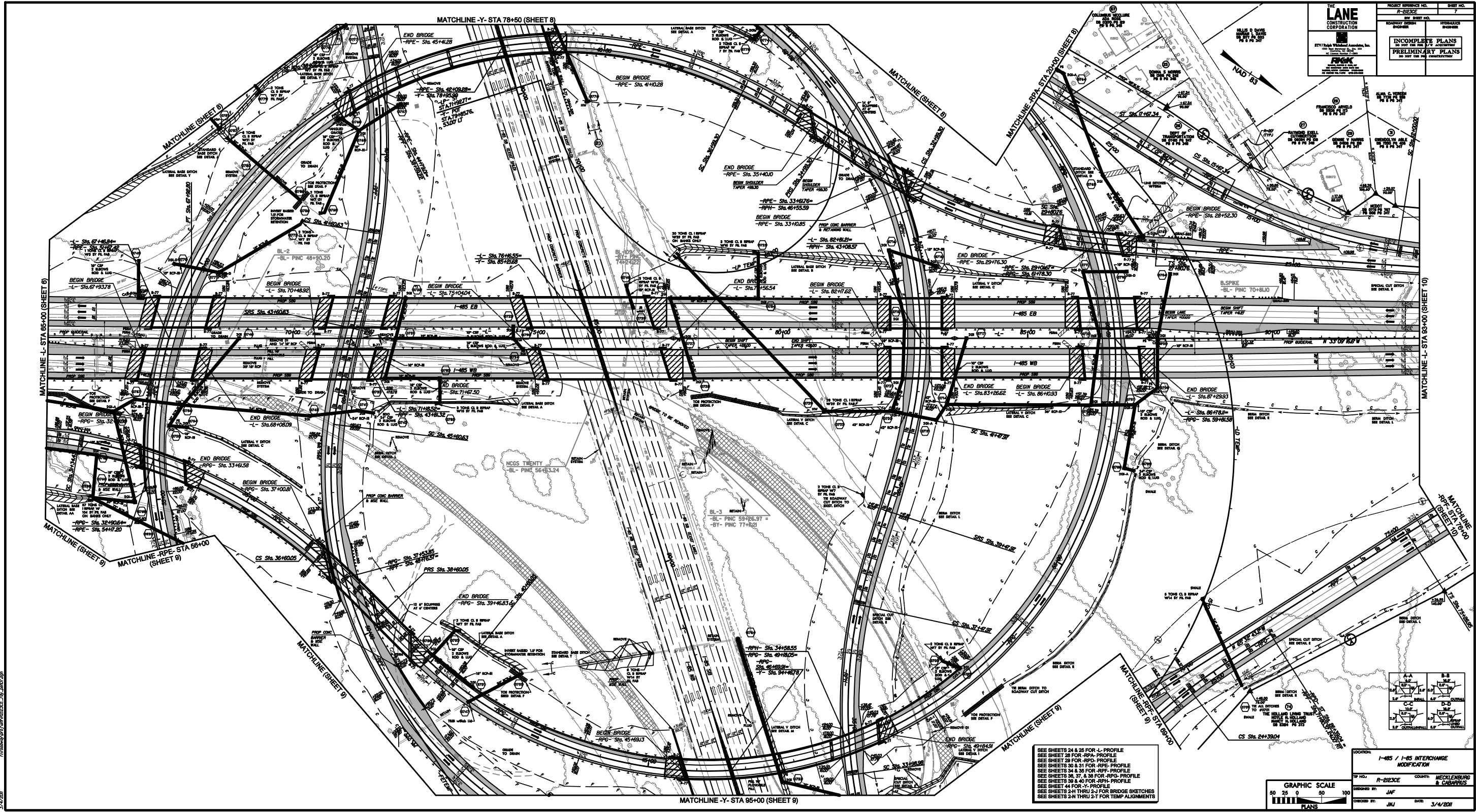
SEE SHEET 23 FOR -L- PROFILE
SEE SHEET 36 FOR -RPG- PROFILE
SEE SHEET 41 FOR -RPH- PROFILE
SEE TCP PLANS FOR LAYOUT OF
TEMPOARY ALIGNMENT

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SEE SHEETS 23 & 24 FOR -L- PROFILE
SEE SHEET 27 FOR -RPB- PROFILE
SEE SHEET 28 FOR -RPC- PROFILE
SEE SHEET 36 FOR -RPG- PROFILE
SEE SHEET 41 FOR -RPH- PROFILE
SEE SHEETS 2-N THRU 2-V FOR
TEMP ALIGNMENTS



THE LANE CORPORATION

CITY/STATE/PROJECT INFORMATION

PROJECT NO. R-21232

SHEET NO. 7

INCOMPLETE PLANS

PRELIMINARY PLANS

PROJECT NO. R-21232

SHEET NO. 7

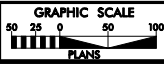
DATE: 3/4/2011

BY: JAF

CHECKED BY: JAF

DATE: 3/4/2011

SEE SHEETS 24 & 25 FOR L-PROFILE
SEE SHEET 26 FOR RPA-PROFILE
SEE SHEET 28 FOR RPD-PROFILE
SEE SHEETS 30 & 31 FOR RPE-PROFILE
SEE SHEETS 34 & 35 FOR RPP-PROFILE
SEE SHEETS 36, 37, & 38 FOR RPS-PROFILE
SEE SHEETS 39 & 40 FOR RPH-PROFILE
SEE SHEET 44 FOR Y-PROFILE
SEE SHEETS 24 THRU 24 FOR BRIDGE SKETCHES
SEE SHEETS 24 THRU 24 FOR TEMP ALIGNMENTS



LOCATION: I-85 / I-85 INTERCHANGE

MODIFICATION: R-21232

COUNTY: MECKLENBURG & CABARRUS

DATE: 3/4/2011

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Greenville, SC 29615

803.733.1100

www.thelane.com

PROJECT REFERENCE NO.

R-2522C

SHEET NO.

2

BY

JAF

CHECKED BY

JNU

DATE

5/25/2011

DESIGNED BY

JAF

PROJECT

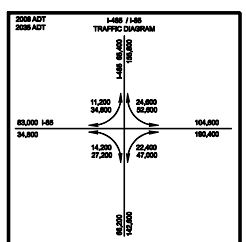
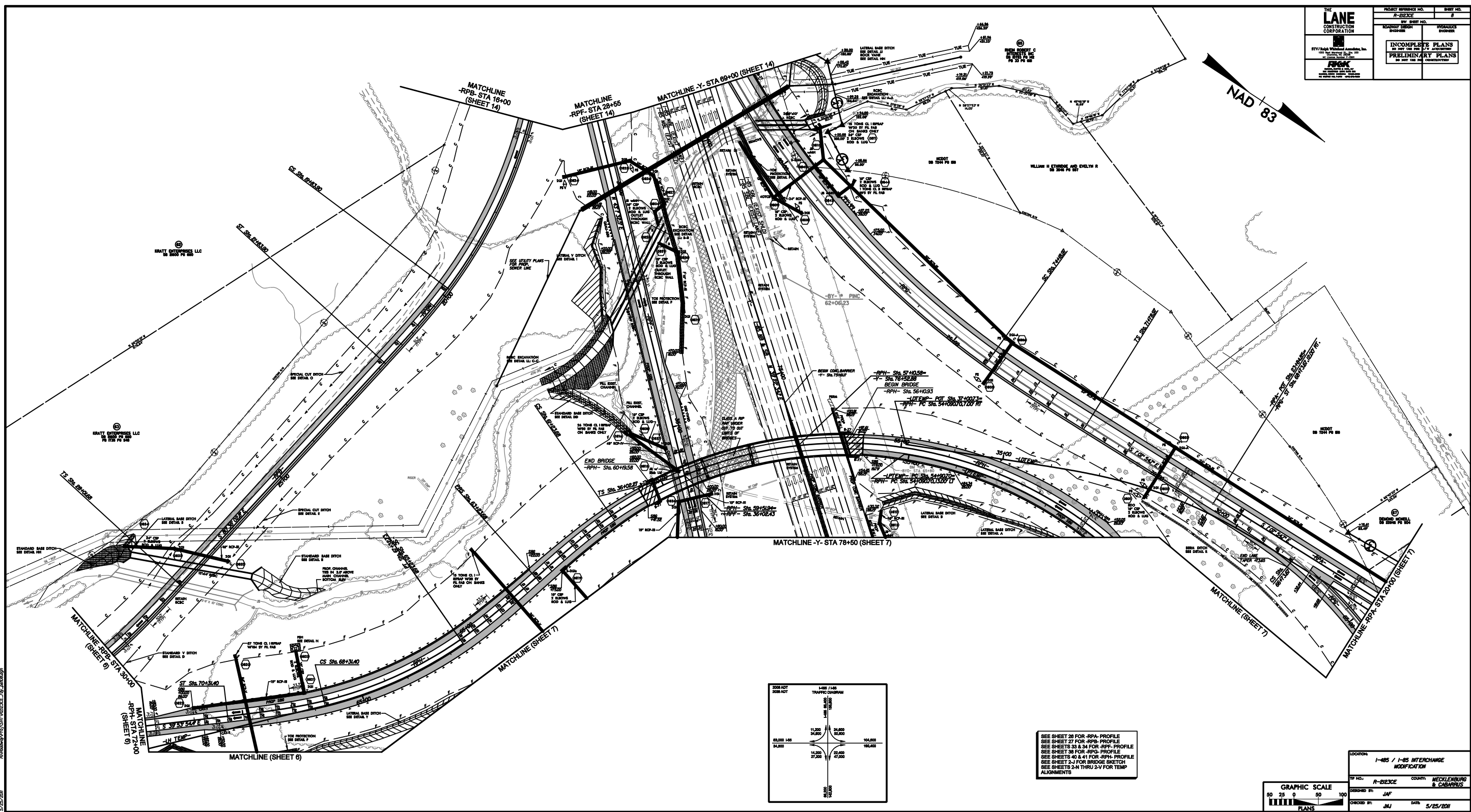
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INCOMPLETE PLANS

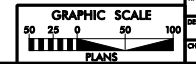
DO NOT USE FOR CONSTRUCTION

PRELIMINARY PLANS

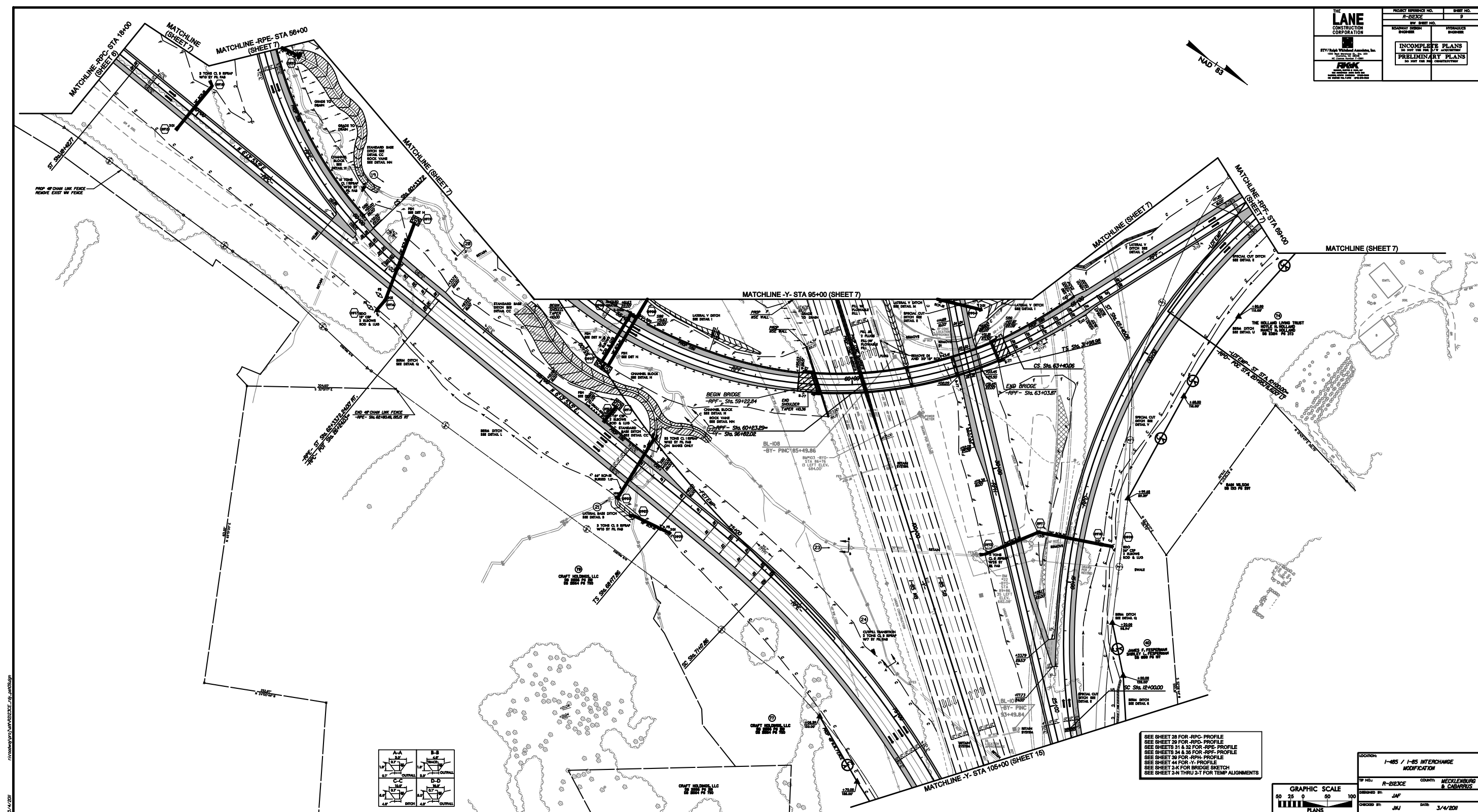
DO NOT USE FOR CONSTRUCTION



SEE SHEET 20 FOR -RPA- PROFILE
SEE SHEET 27 FOR -RFB- PROFILE
SEE SHEETS 33 & 34 FOR -RPF- PROFILE
SEE SHEET 38 FOR -RPG- PROFILE
SEE SHEETS 40 & 41 FOR -RPH- PROFILE
SEE SHEET 2-J FOR BRIDGE SKETCH
SEE SHEETS 2-A THRU 2-V FOR TEMP
ALIGNMENTS



LOCATION		1-85 / I-85 INTERCHANGE MODIFICATION	
PROJECT NO.	R-2522C	COUNTY	MECKLENBURG & CANNONBURG
DESIGNED BY	JAF	CHECKED BY	JNU
DATE	5/25/2011		

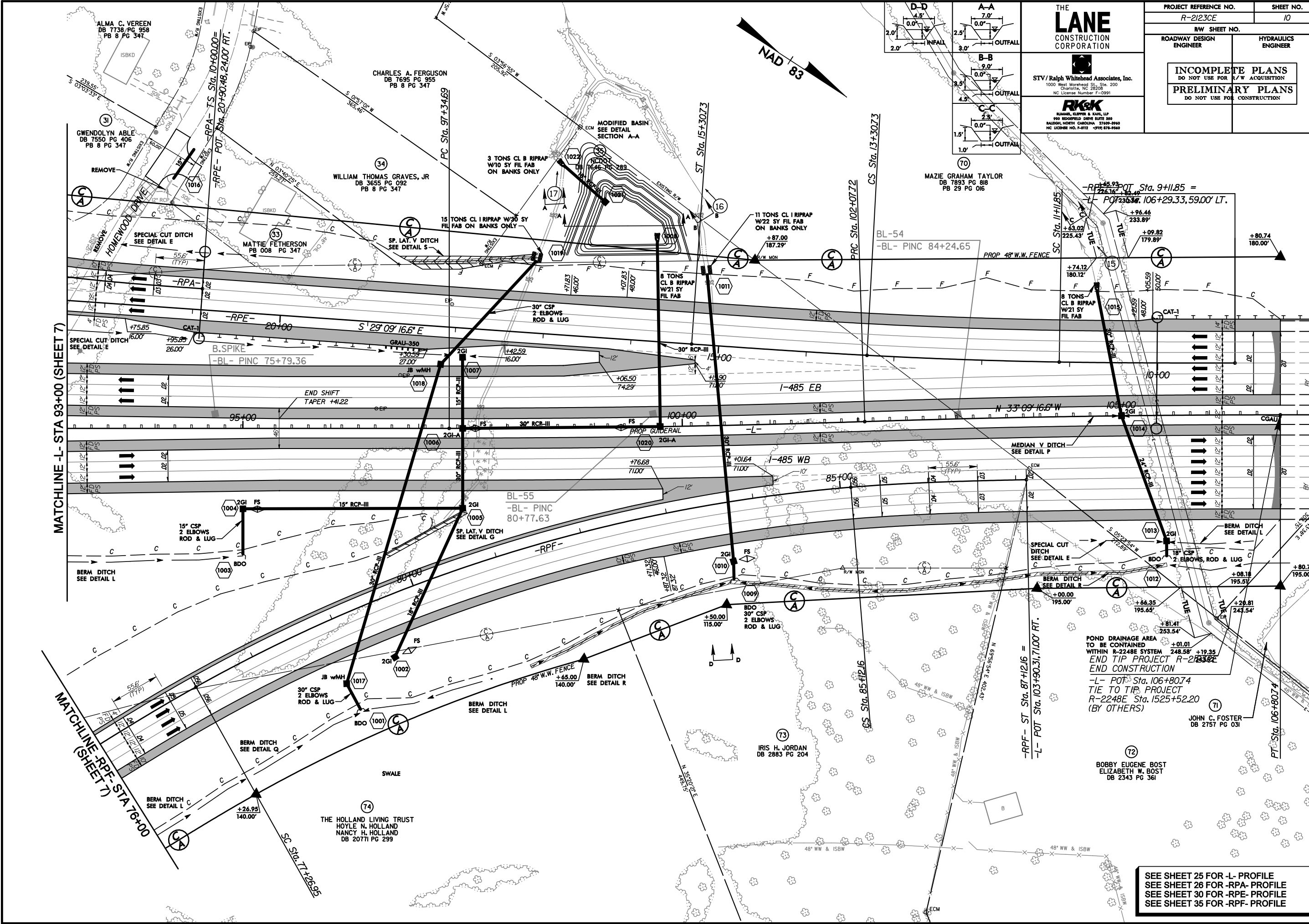


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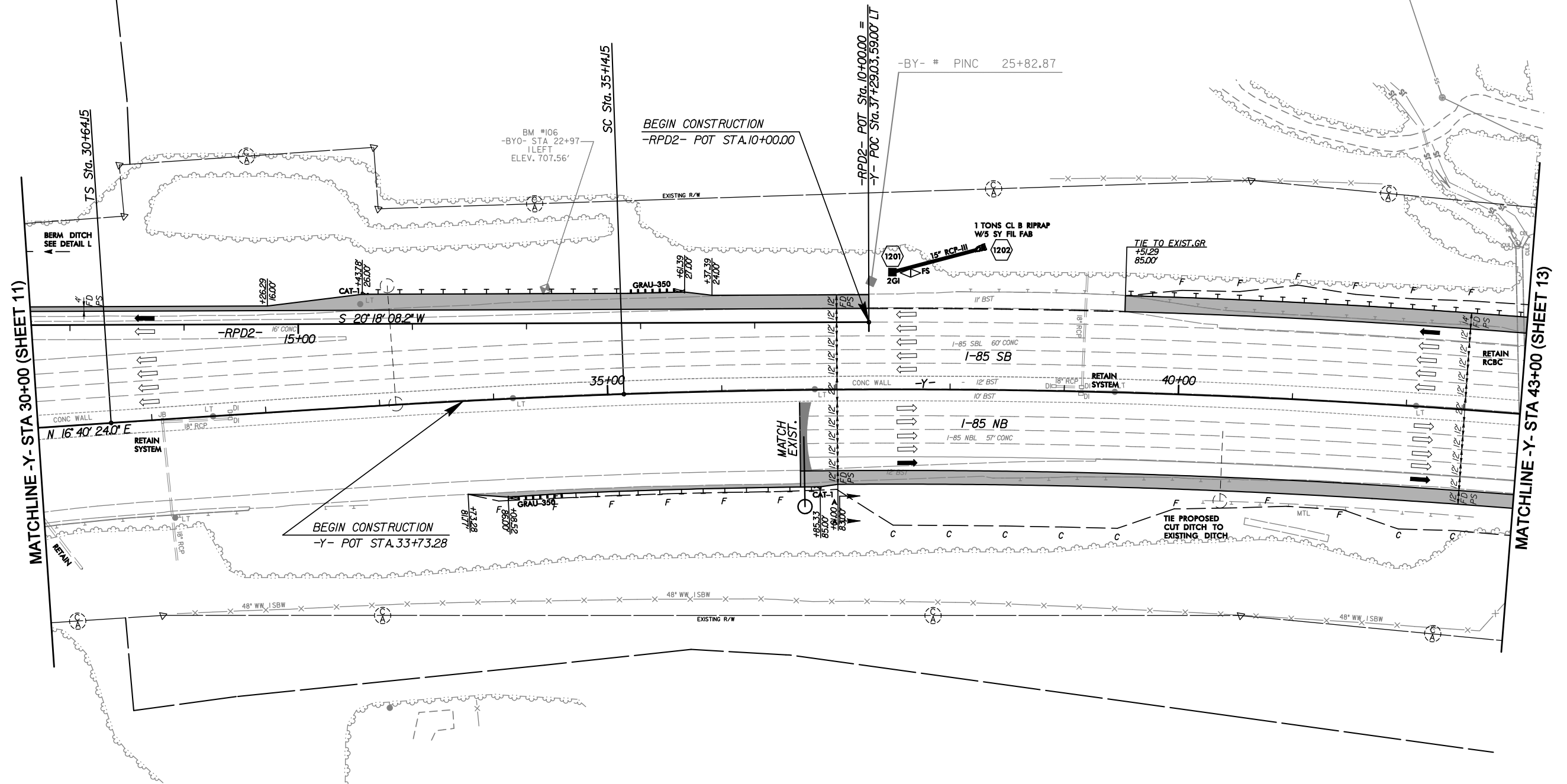
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RALEIGH, NORTH CAROLINA 27609-3960
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PROJECT REFERENCE NO. R-2123CE	SHEET NO. 10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



SEE SHEET 25 FOR -L- PROFILE
SEE SHEET 26 FOR -RPA- PROFILE
SEE SHEET 30 FOR -RPE- PROFILE
SEE SHEET 35 FOR -RPF- PROFILE

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PROJECT REFERENCE NO.
R-2123CE

SHEET NO.
13

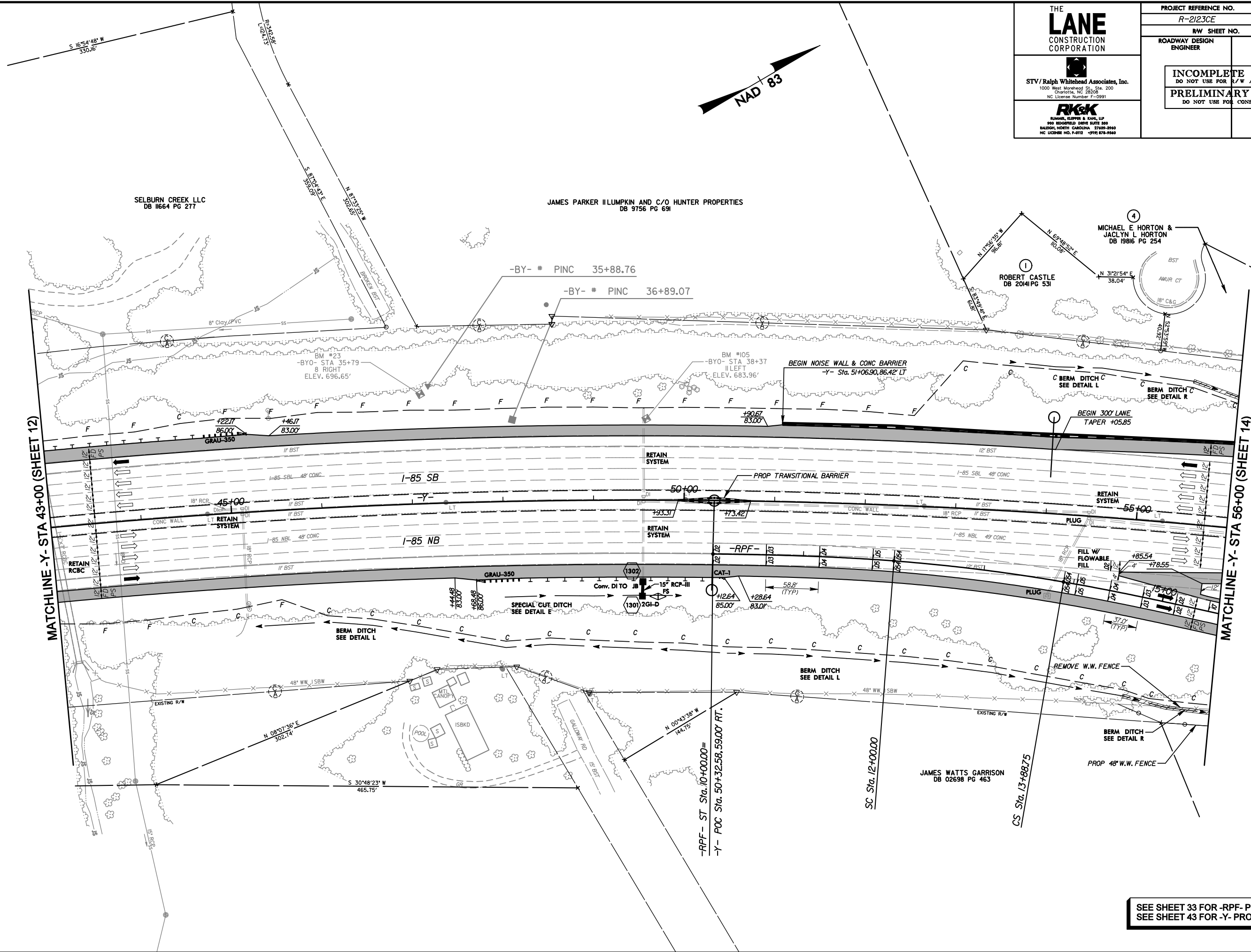
R/W SHEET NO.

ROADWAY DESIGN
ENGINEER

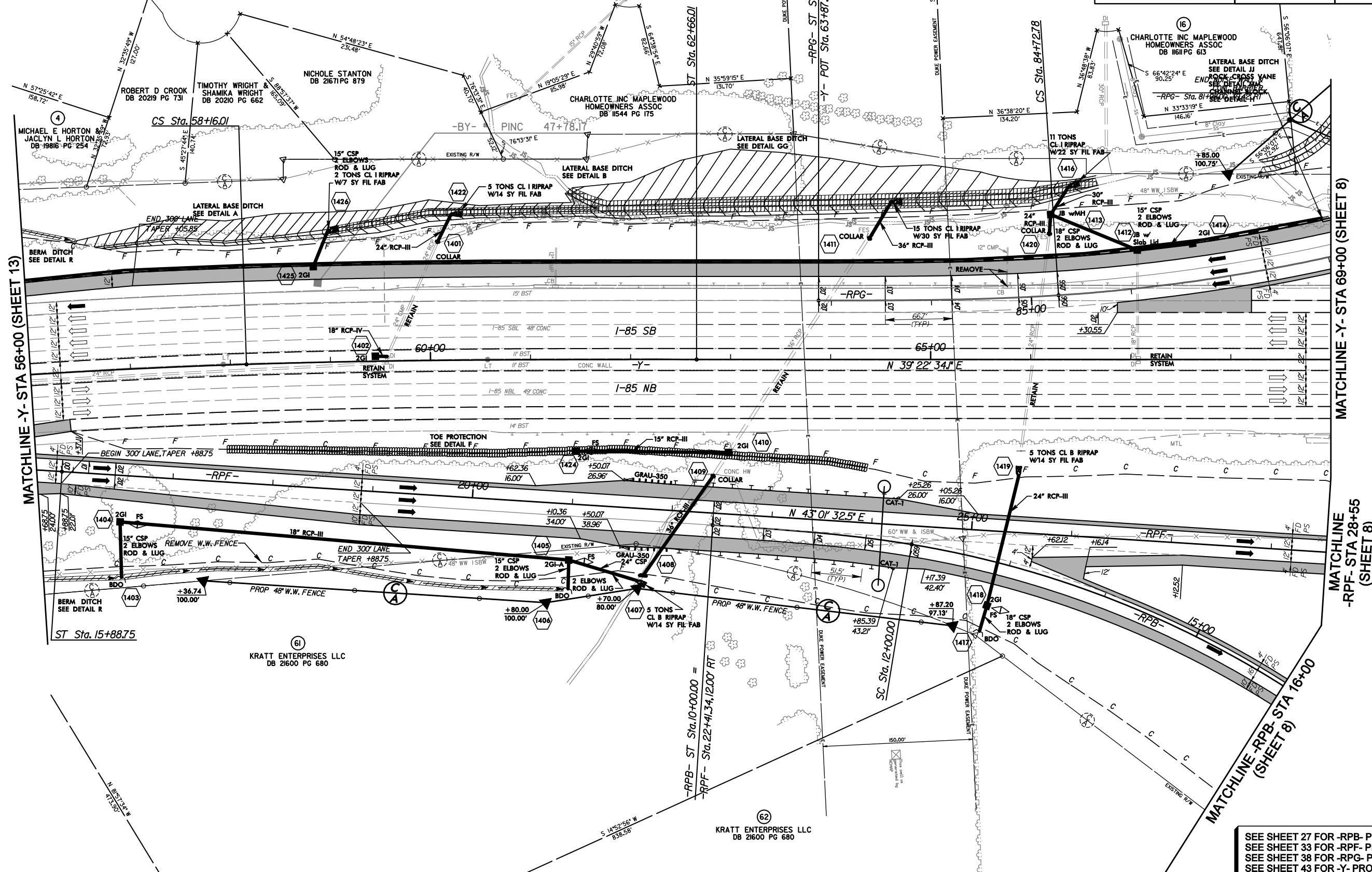
HYDRAULICS
ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

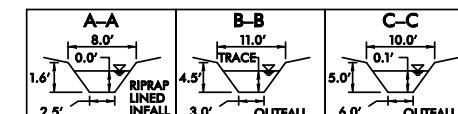
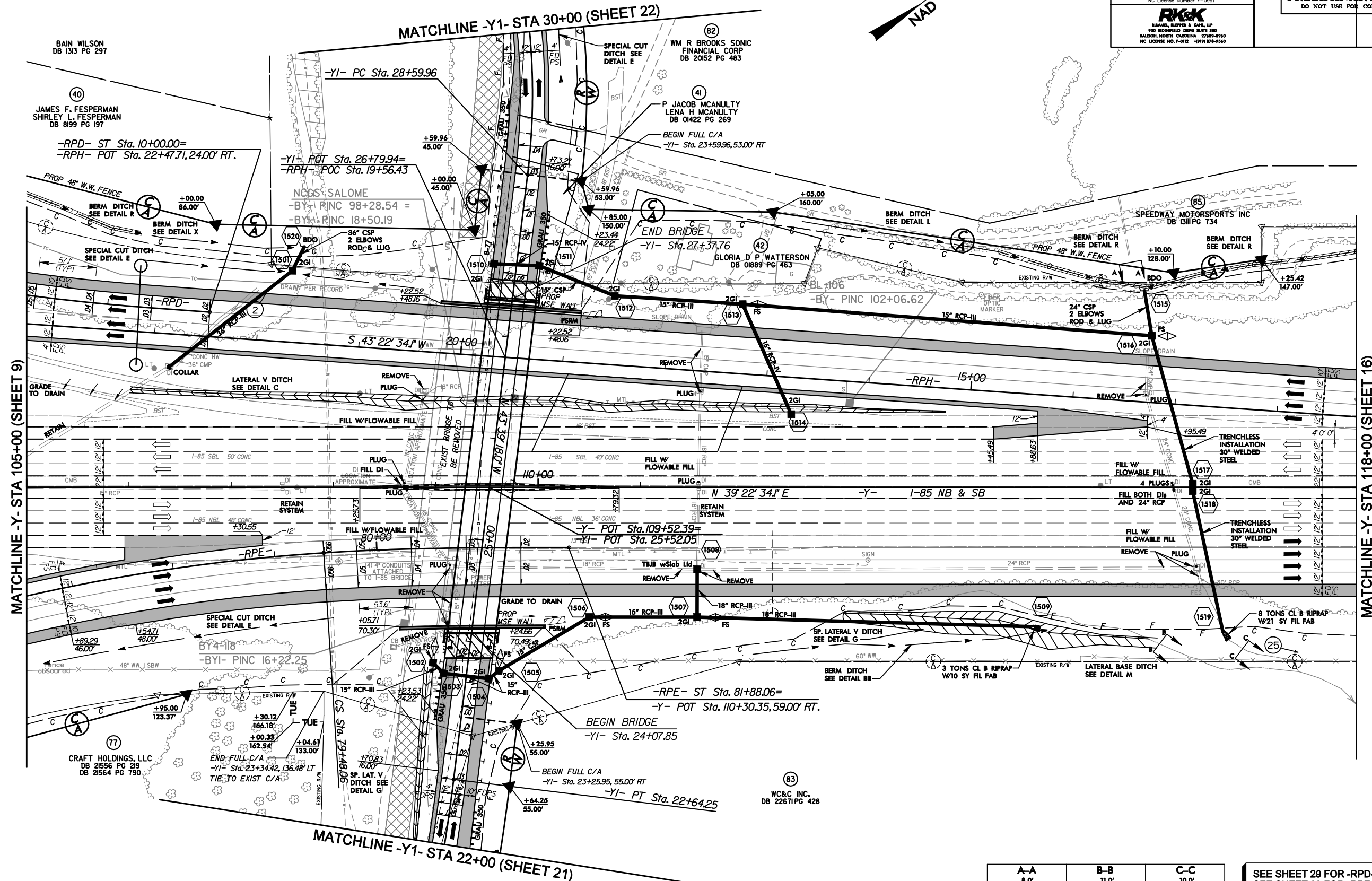
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 33 FOR -RPF- PROFILE
SEE SHEET 43 FOR -Y- PROFILE



SEE SHEET 27 FOR -RPB- PROFILE
SEE SHEET 33 FOR -RPF- PROFILE
SEE SHEET 38 FOR -RPG- PROFILE
SEE SHEET 43 FOR -Y- PROFILE



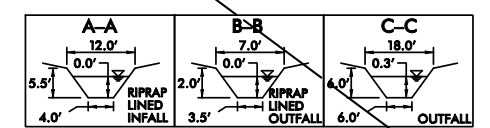
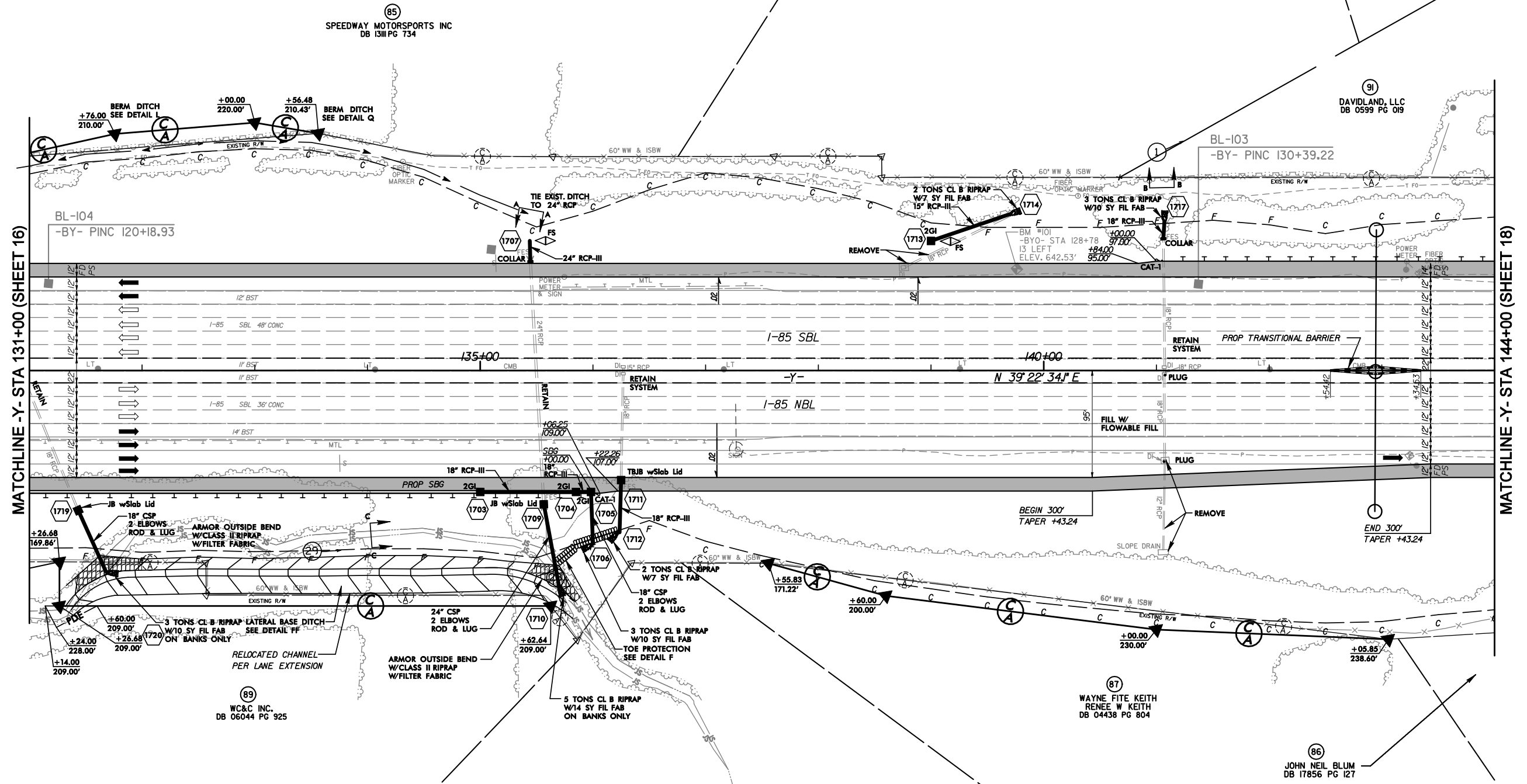
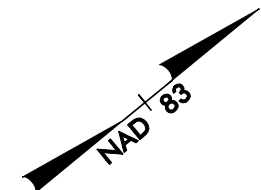
SEE SHEET 29 FOR -RPD- PROFILE
SEE SHEET 32 FOR -RPE- PROFILE
SEE SHEET 39 FOR -RPH- PROFILE
SEE SHEET 42 FOR -Y1- PROFILE
SEE SHEET 44 FOR -Y- PROFILE
SEE SHEET 2-K FOR BRIDGE SKETCH

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PROJECT REFERENCE NO.		SHEET NO.	
R-2123CE		17	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			



SEE SHEET 45 FOR -Y- PROFILE

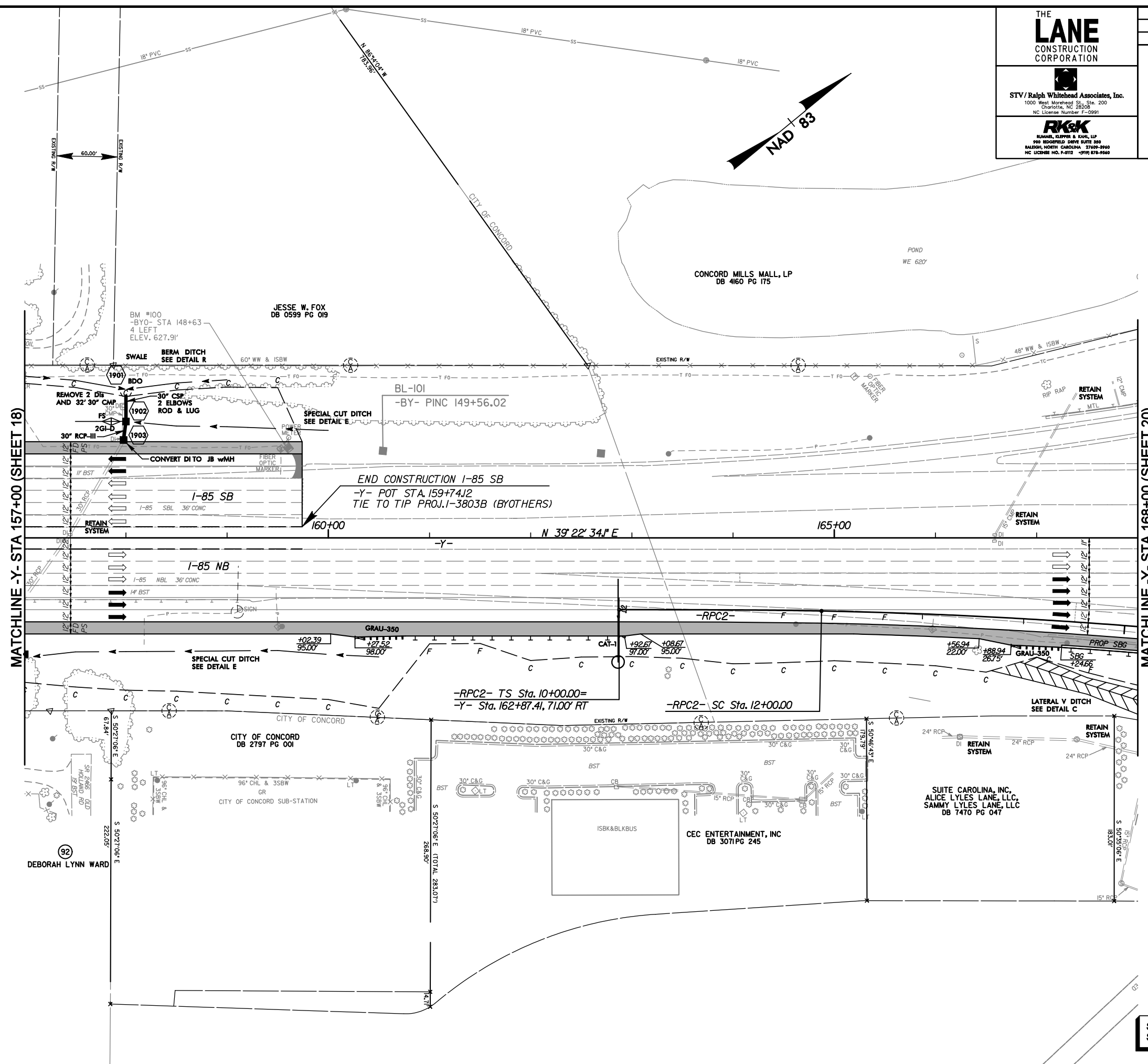
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PROJECT REFERENCE NO. <i>R-2123CE</i>		SHEET NO. <i>19</i>
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		



SEE SHEET 26 FOR -RPC2- PROFILE
SEE SHEET 46 FOR -Y- PROFILE

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DB 4160 PG 175

BRINKER NORTH CAROLINA, INC.
DB 3807 PG 225

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NC LICENSE NO. F-0112 -PHN 875-9560

PROJECT REFERENCE NO.

R-2123CE

SHEET NO.

20

R/W SHEET NO.

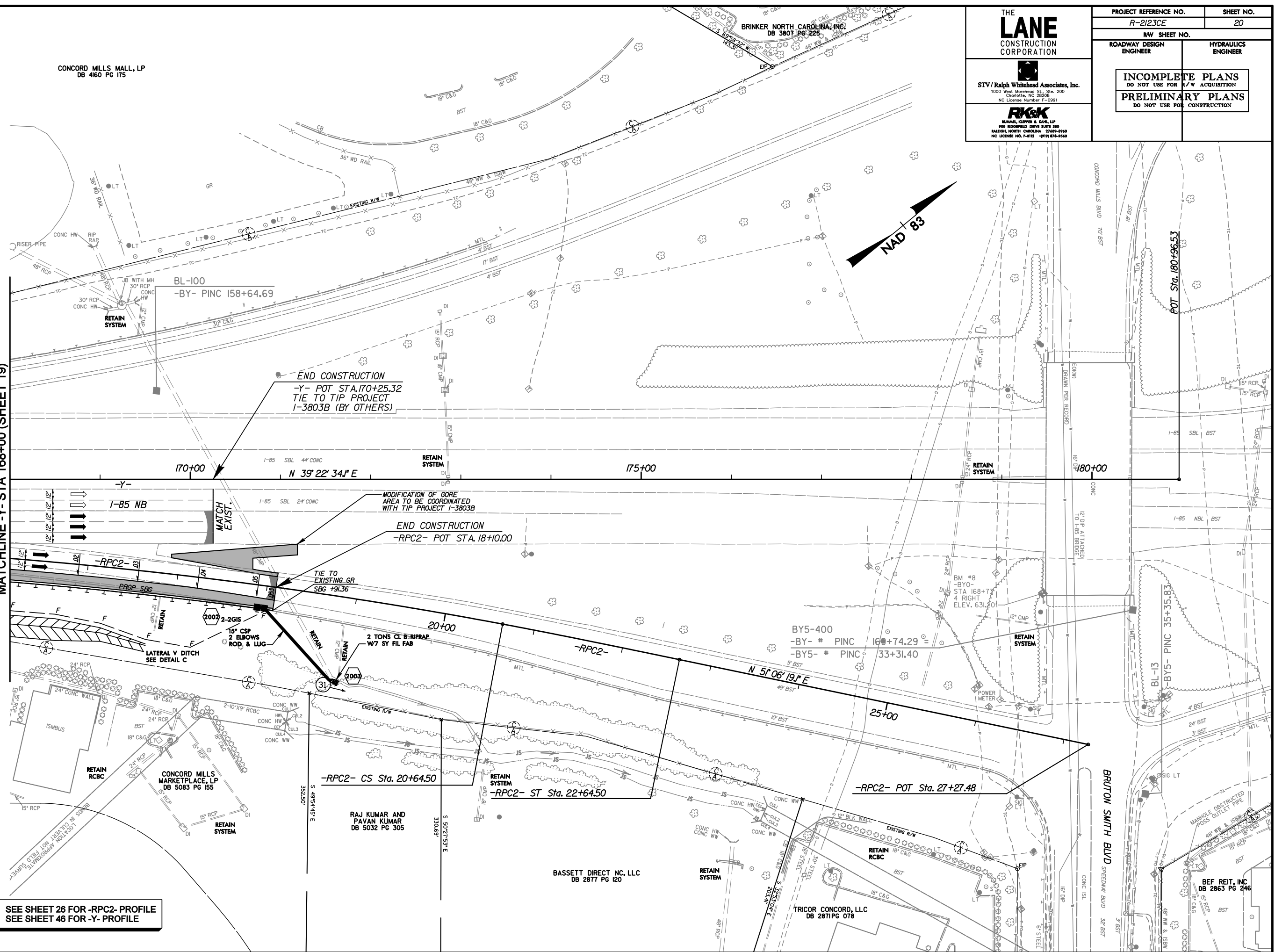
ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

MATCHLINE -Y- STA 168+00 (SHEET 19)



SEE SHEET 26 FOR -RPC2- PROFILE
SEE SHEET 46 FOR -Y- PROFILE

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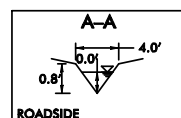
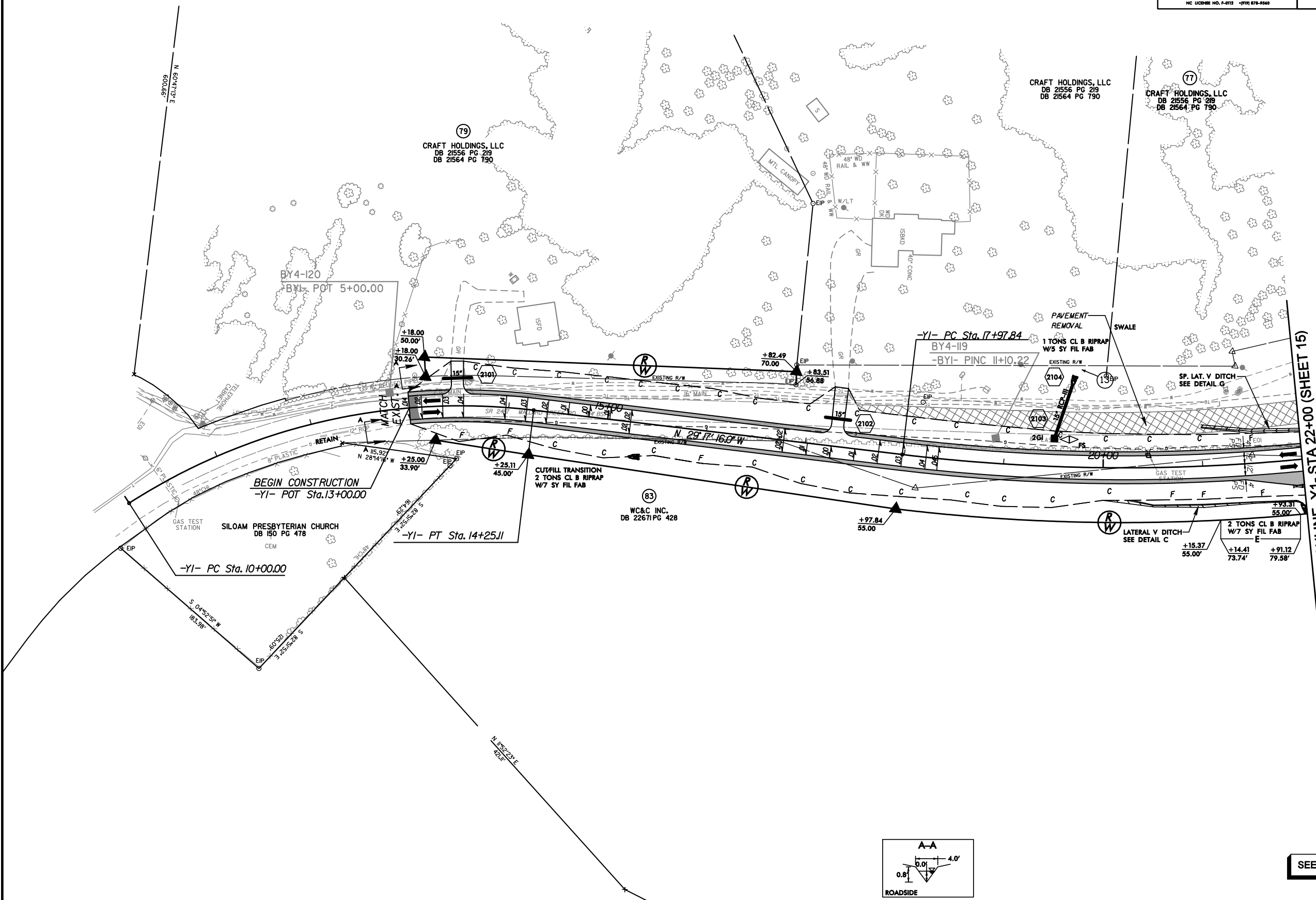
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PROJECT REFERENCE NO. <i>R-2123CE</i>		SHEET NO. <i>21</i>
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		



SEE SHEET 42 FOR -Y1- PROFILE

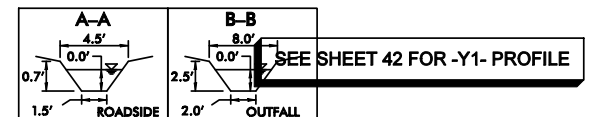
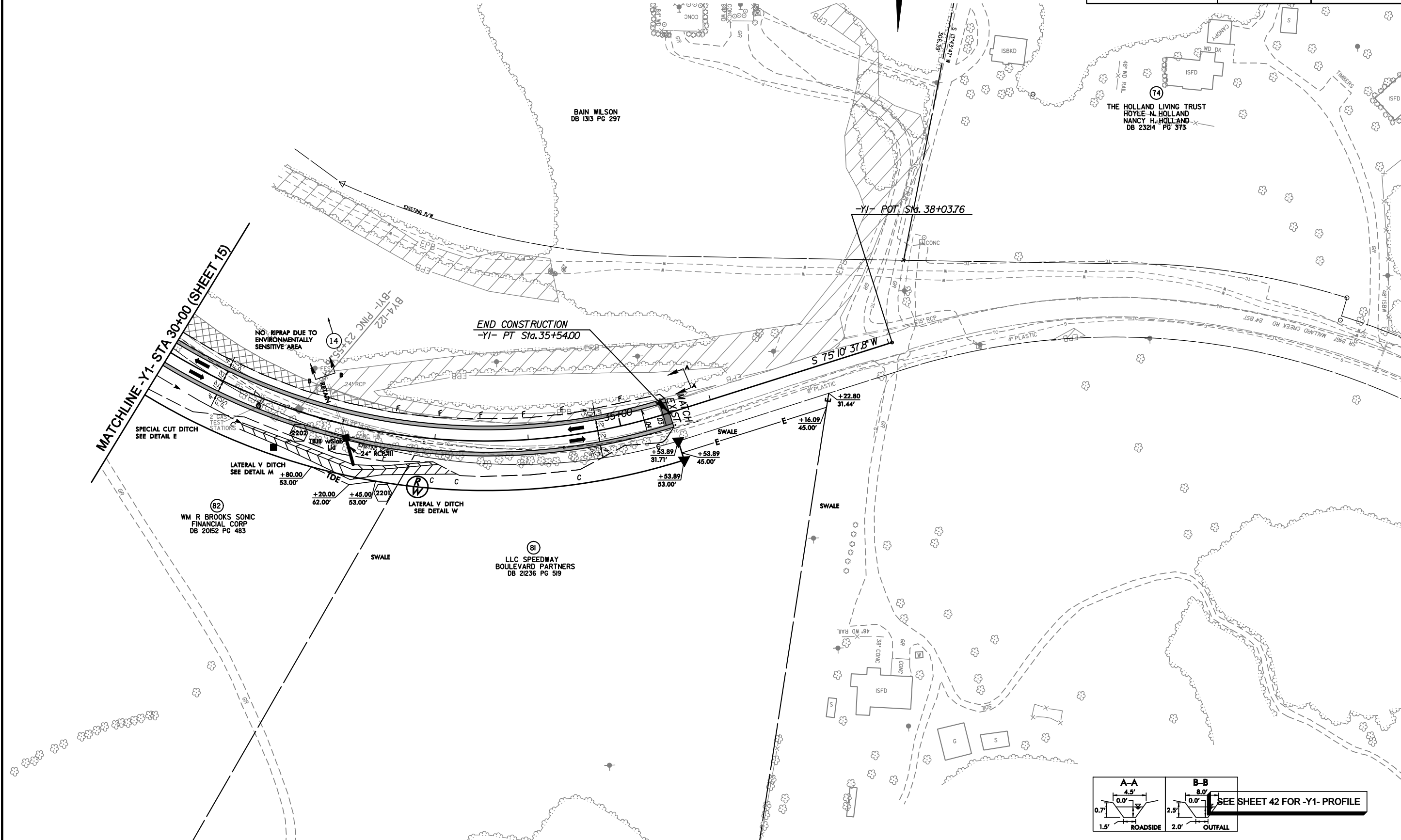
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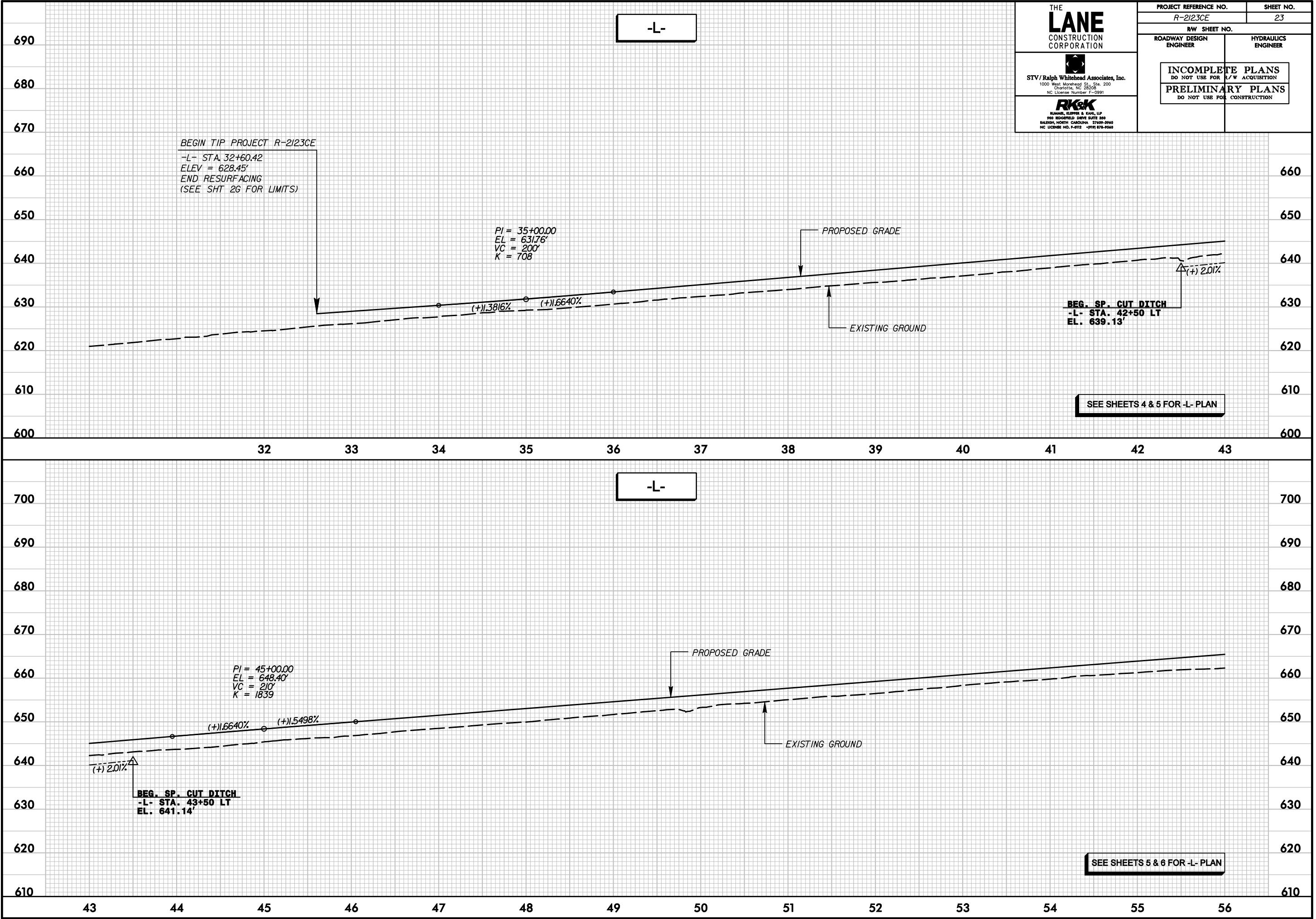

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PROJECT REFERENCE NO.		SHEET NO.
R-2123CE		22
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		



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PROJECT REFERENCE NO.
R-2123CE

SHEET NO.
23

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

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PROJECT REFERENCE NO.
R-2123CE

SHEET NO.
24

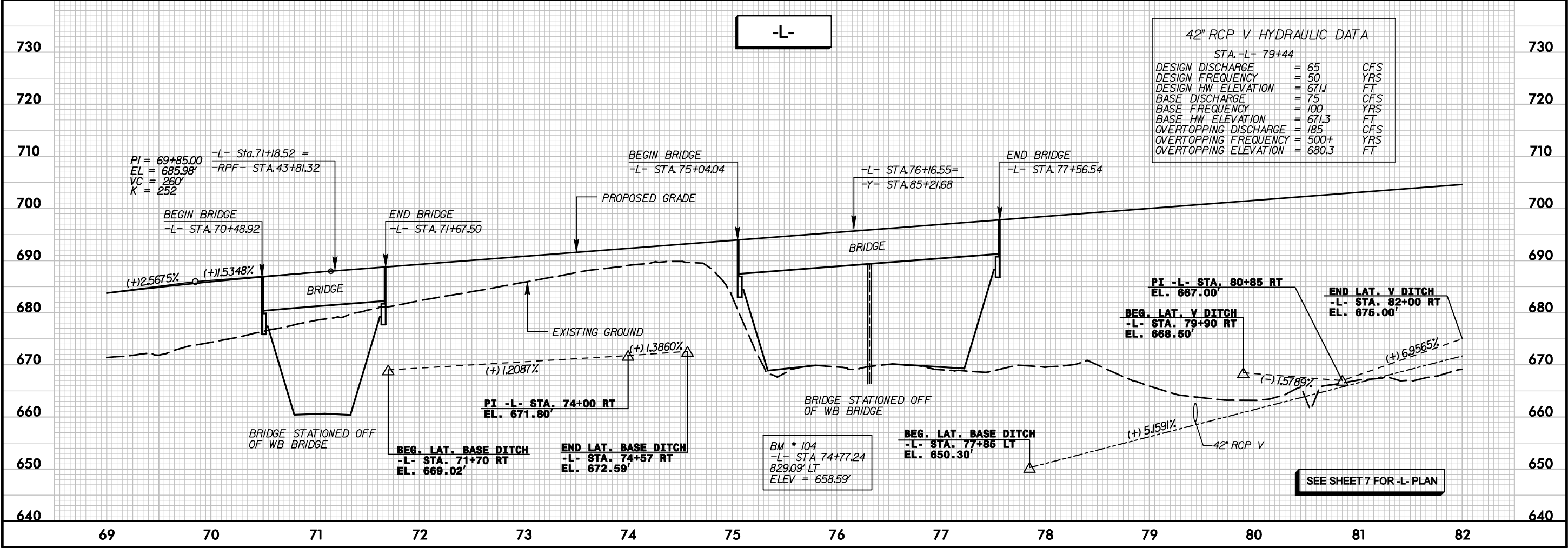
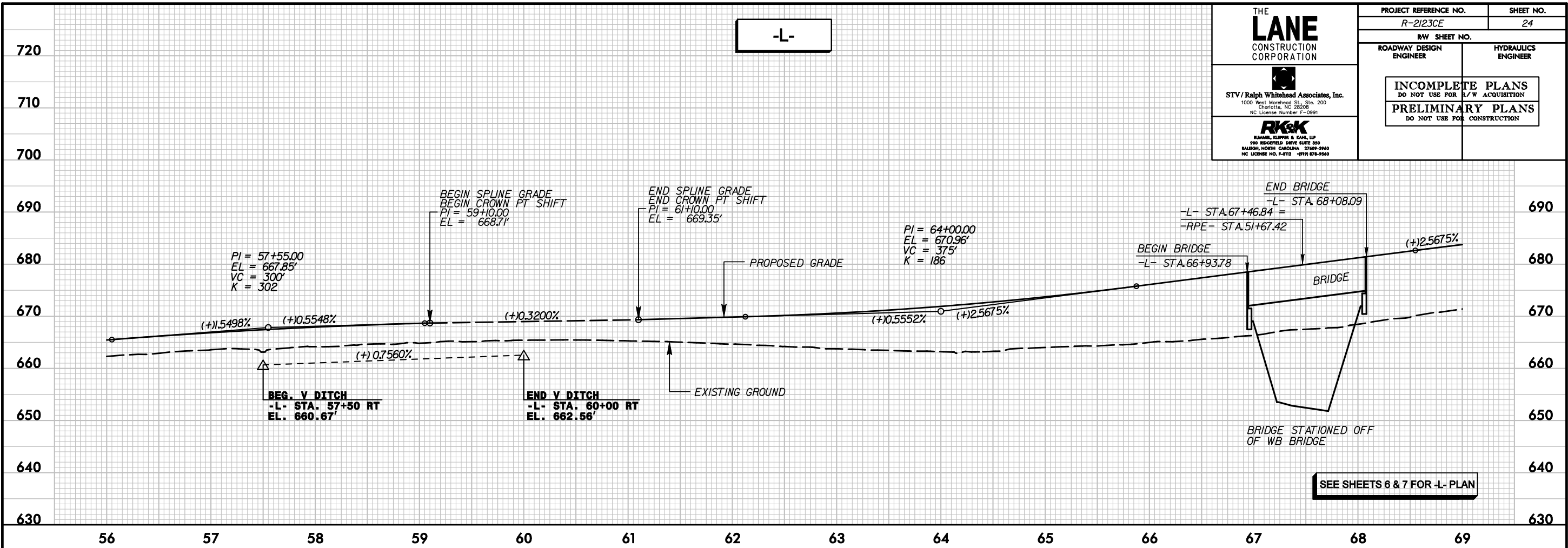
R/W SHEET NO.

ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

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PROJECT REFERENCE NO.
R-2123CE

SHEET NO.
25

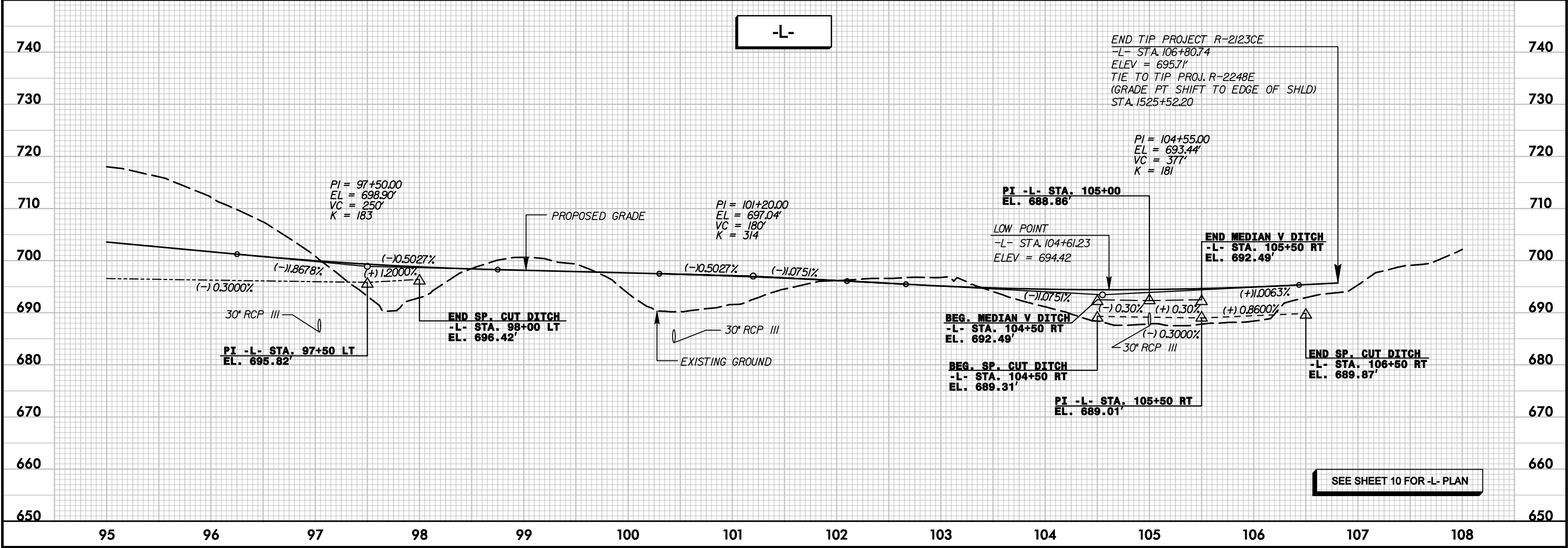
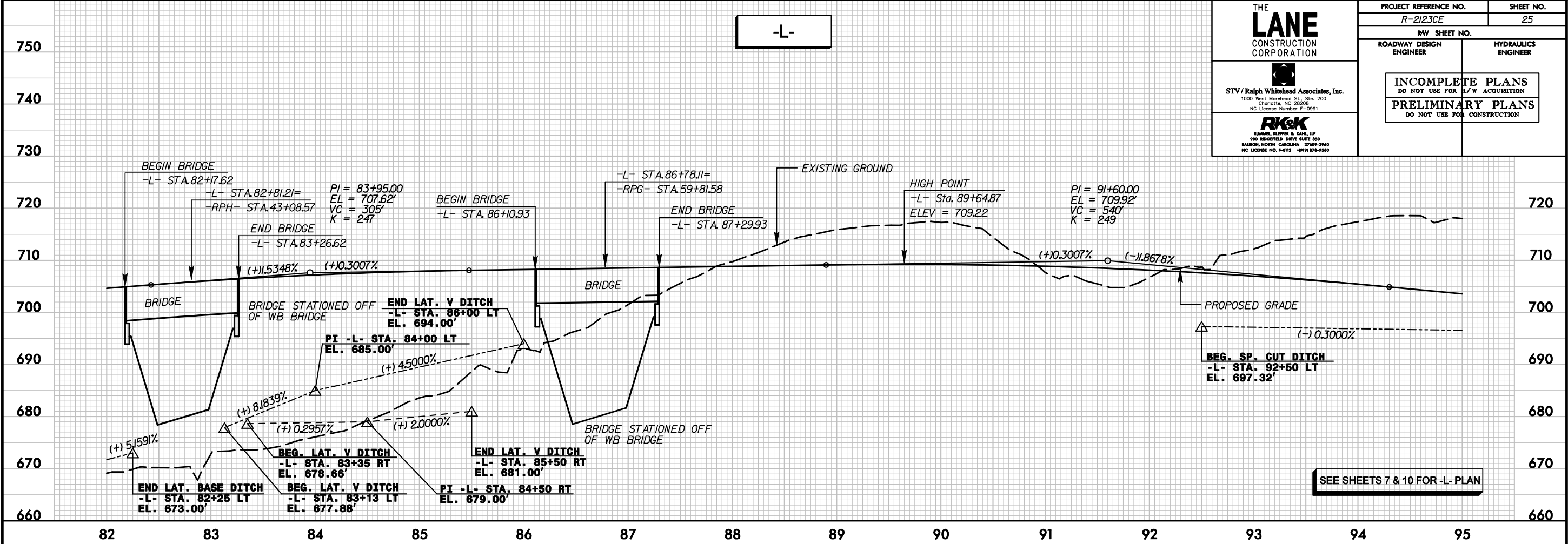
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ROADWAY DESIGN
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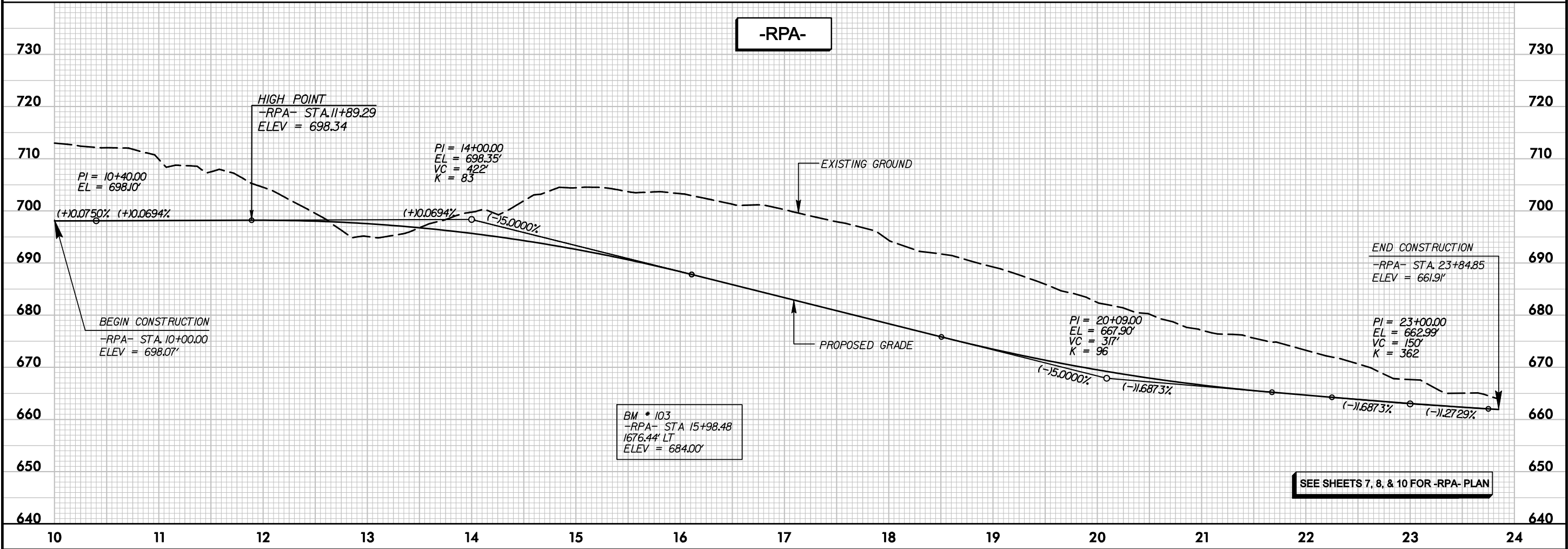
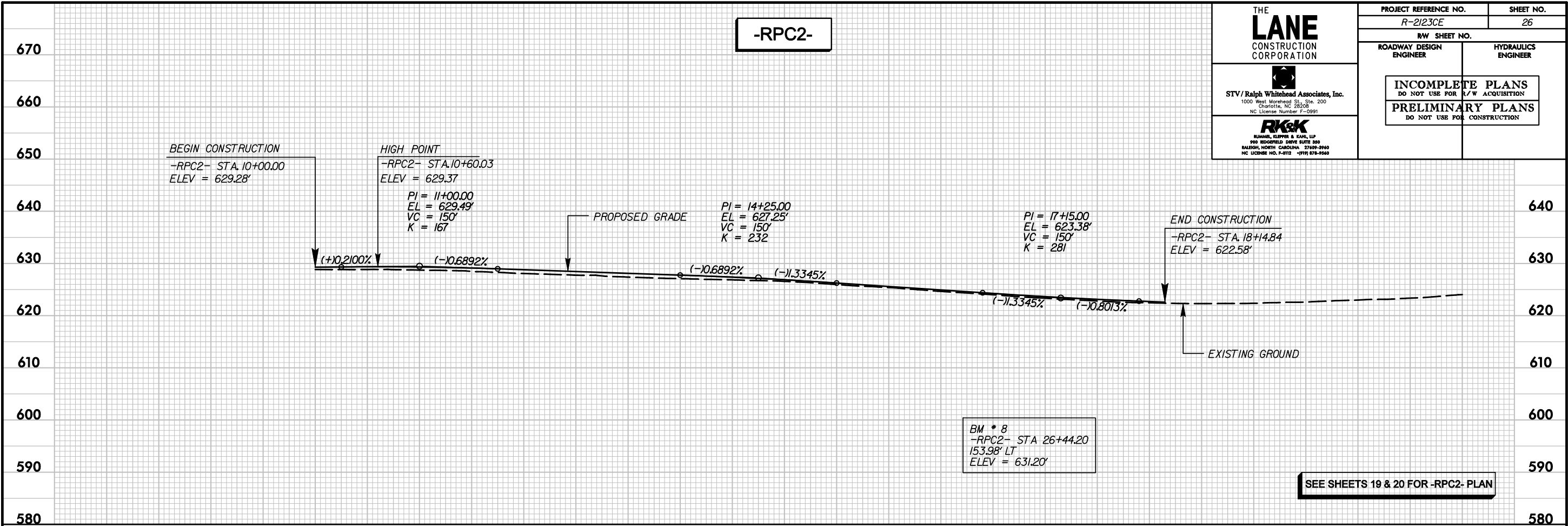
HYDRAULICS
ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

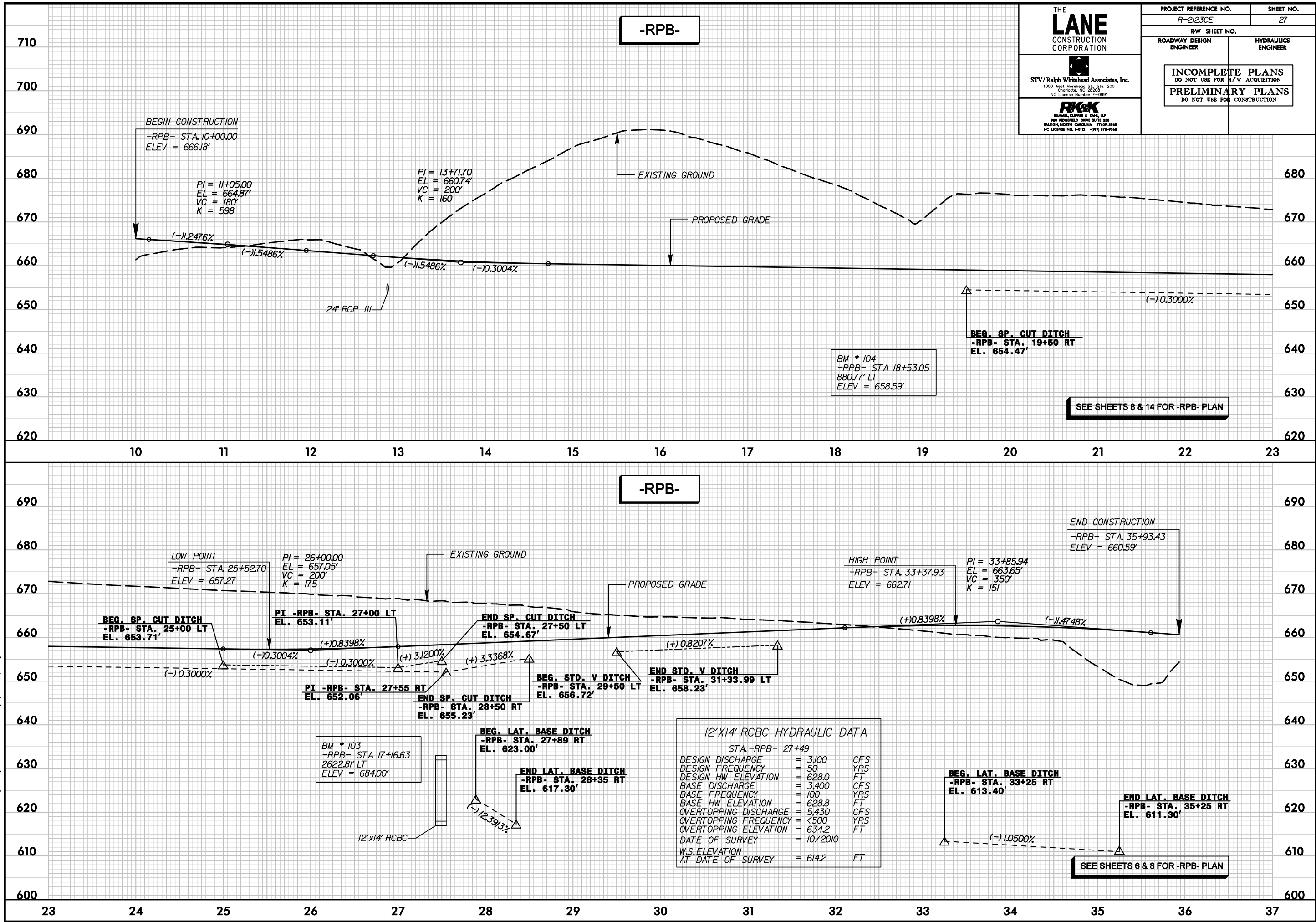


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PROJECT REFERENCE NO.
R-2123CE

SHEET NO.
27

RW SHEET NO.

ROADWAY DESIGN
ENGINEER

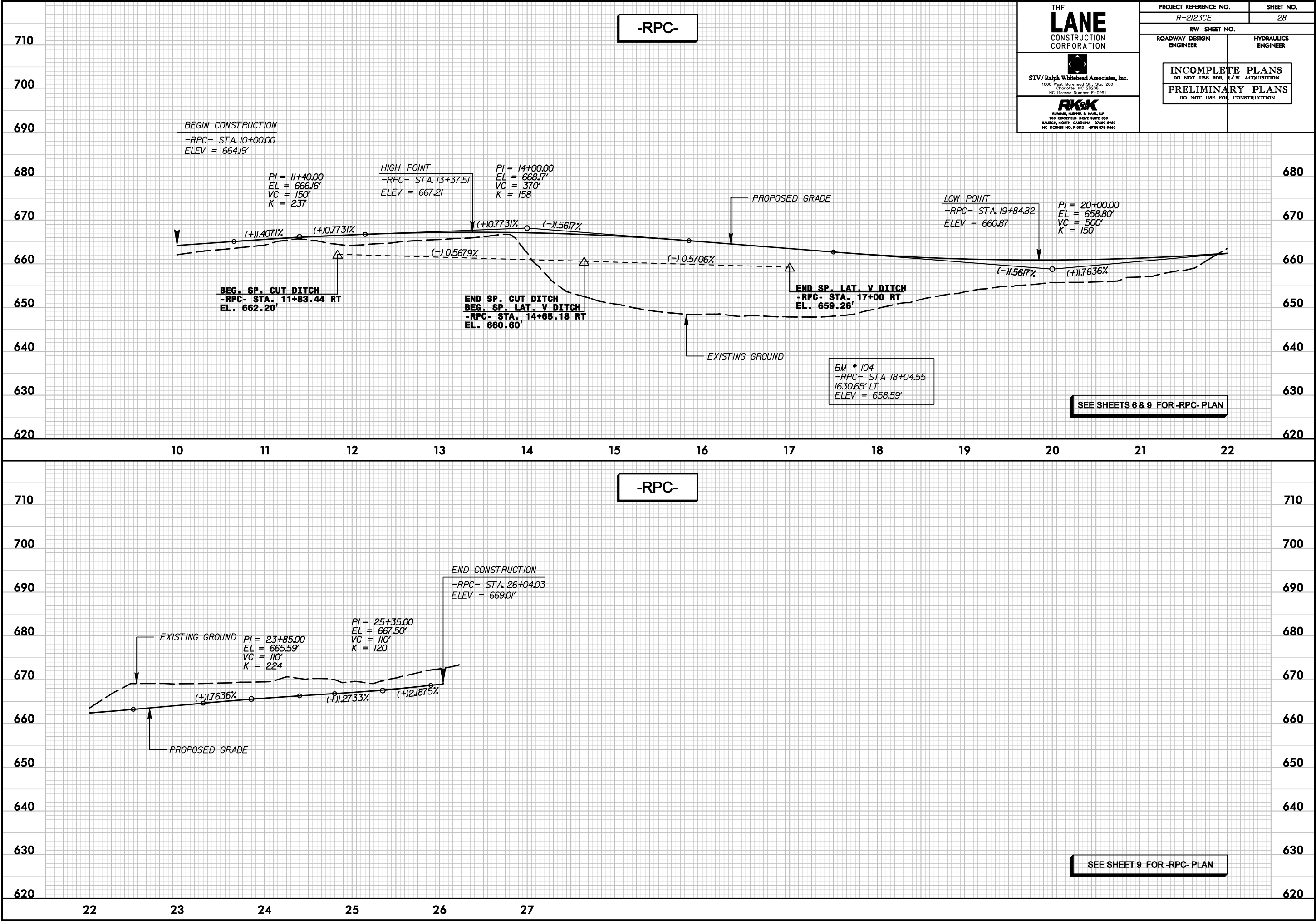
HYDRAULICS
ENGINEER

INCOMPLETE PLANS
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PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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PROJECT REFERENCE NO.

R-2123CE

SHEET NO.

28

R/W SHEET NO.

ROADWAY DESIGN
ENGINEER

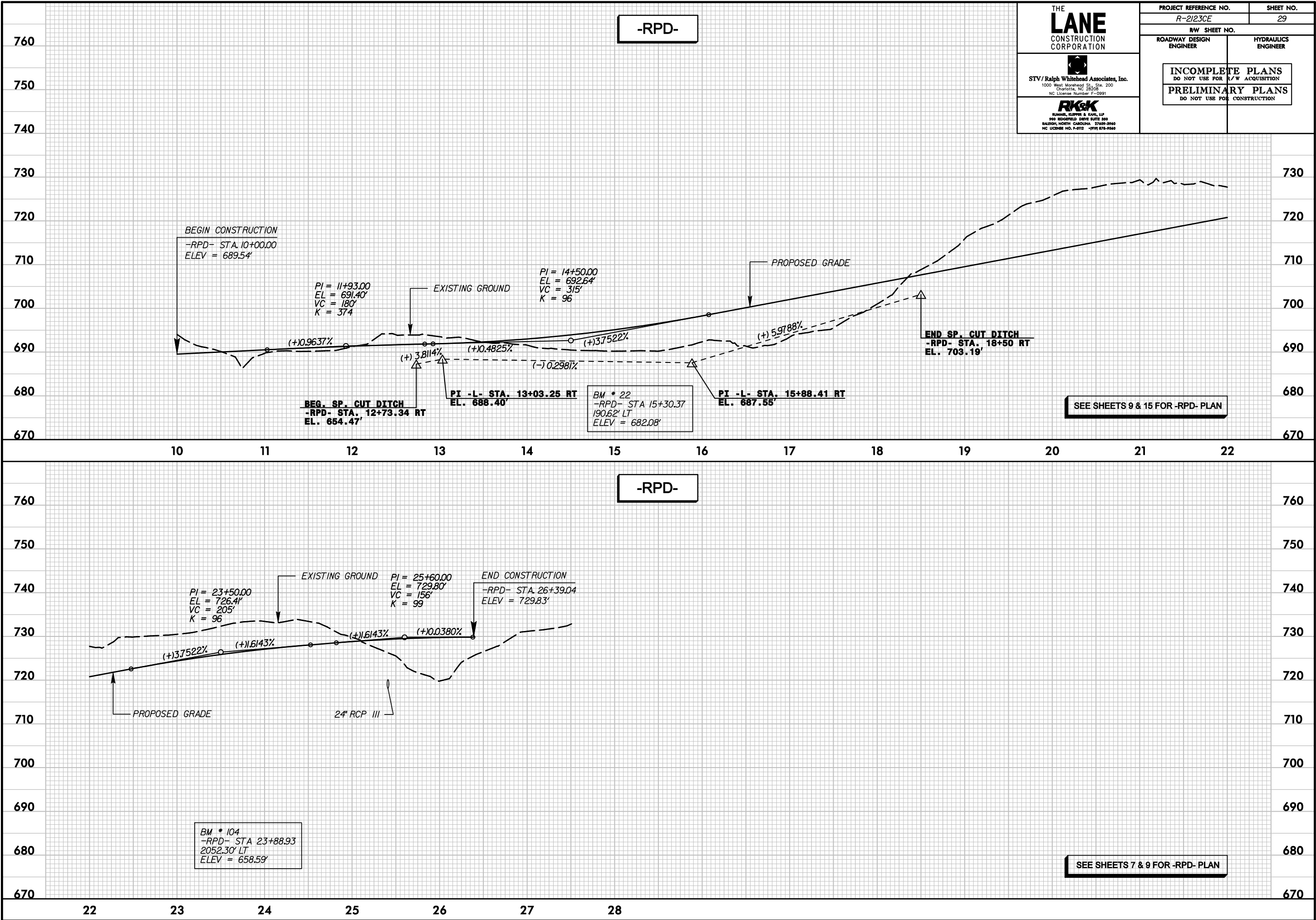
HYDRAULICS
ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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3/4/2011



PROJECT REFERENCE NO.
R-2123CE

SHEET NO.
30

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

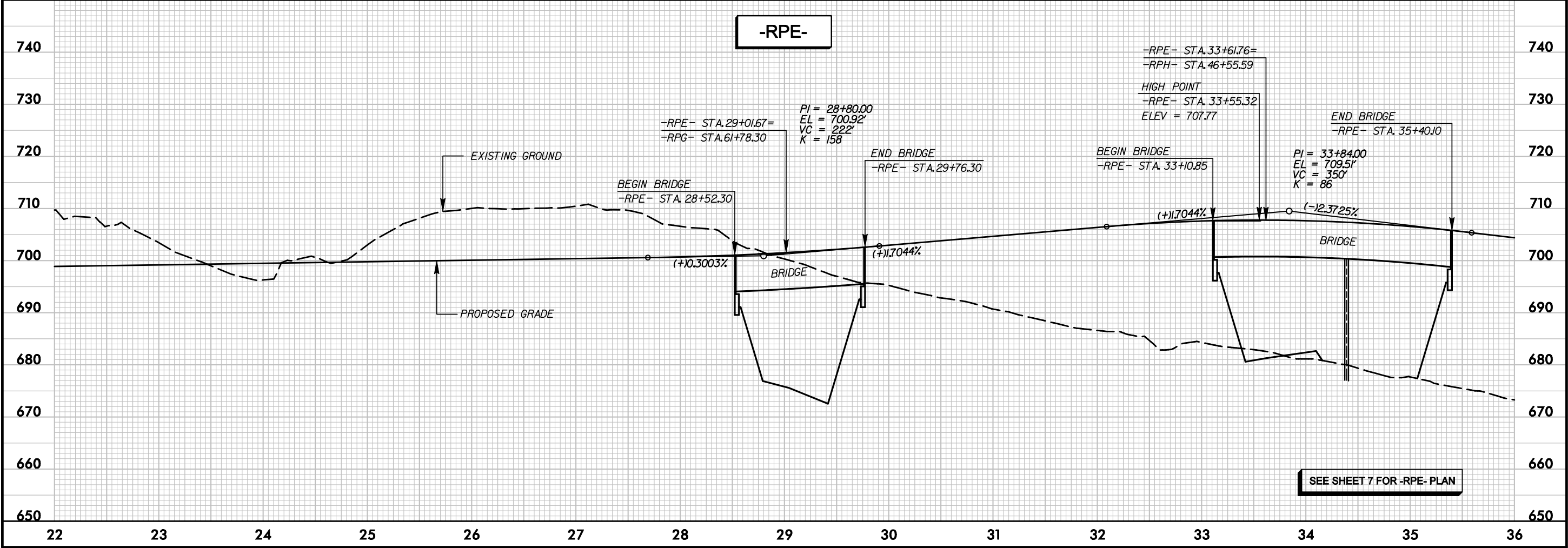
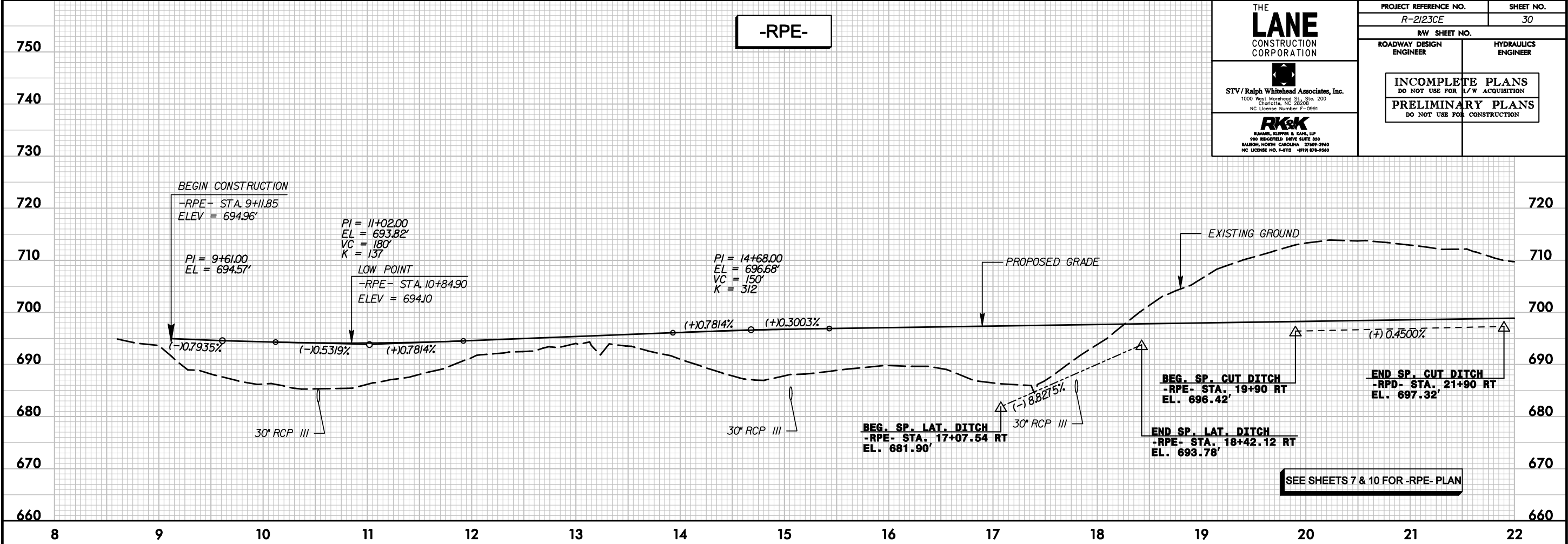
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DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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R-2123CE

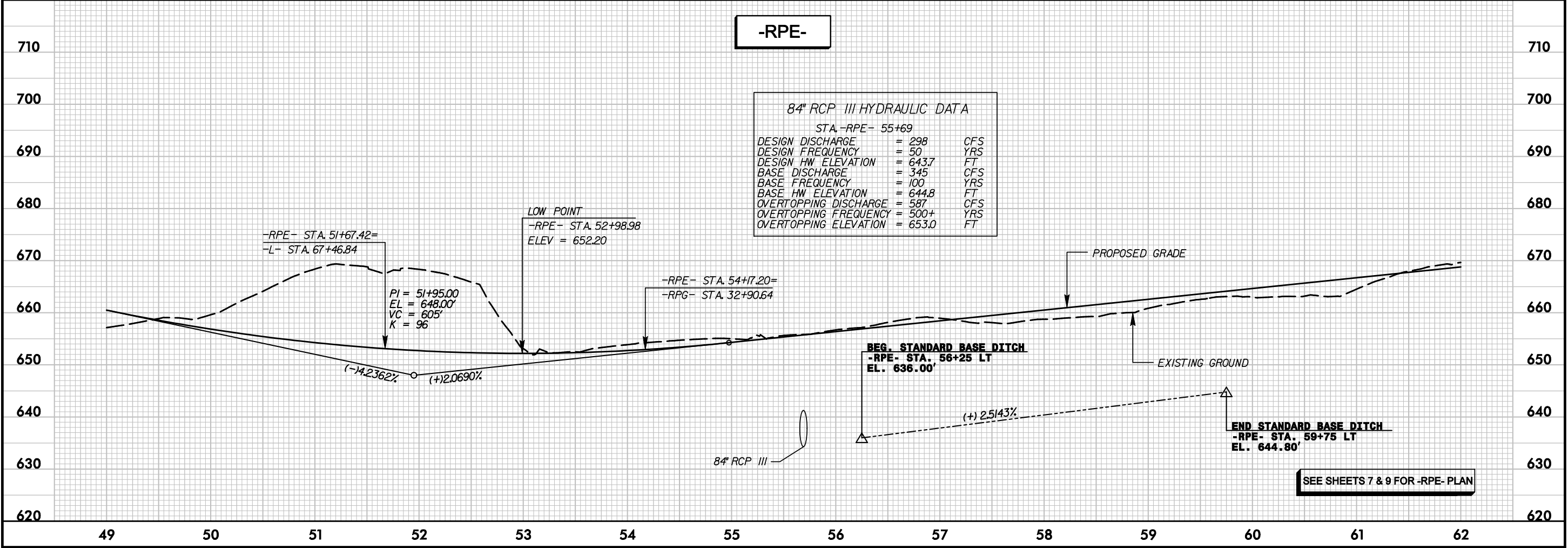
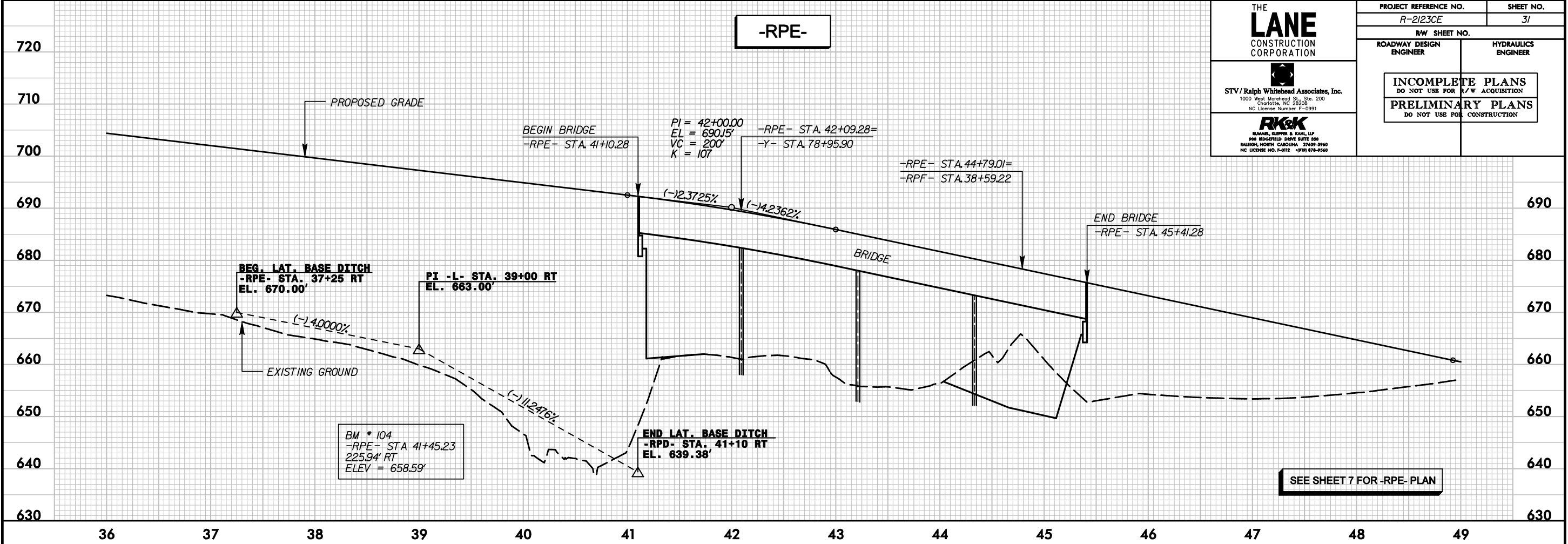
R/W SHEET NO.
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ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

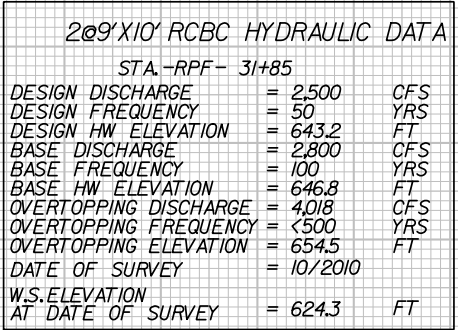
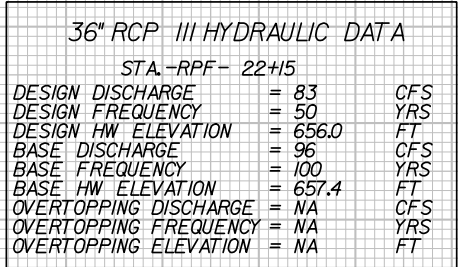
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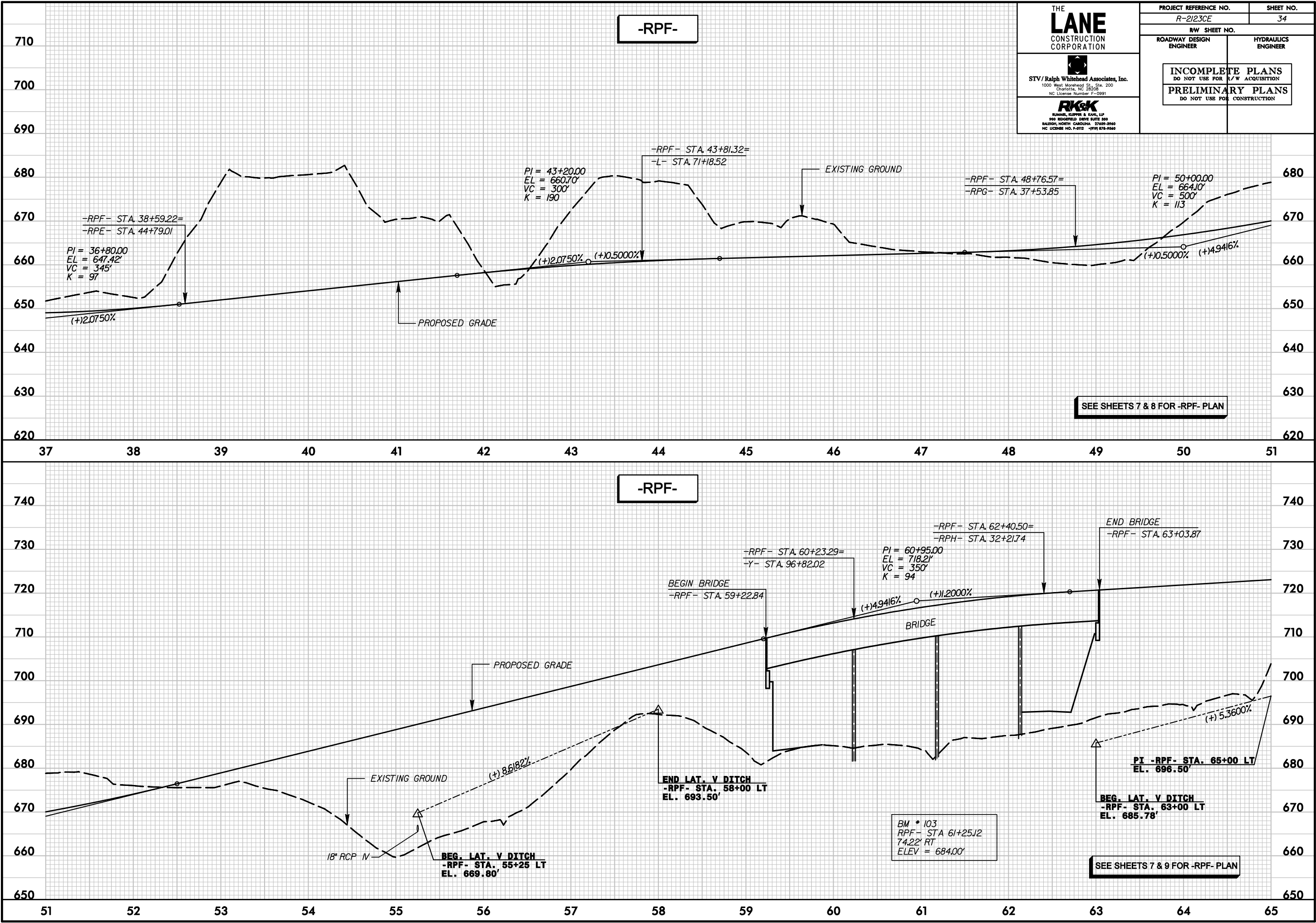
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PROJECT REFERENCE NO.
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SHEET NO.
35

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

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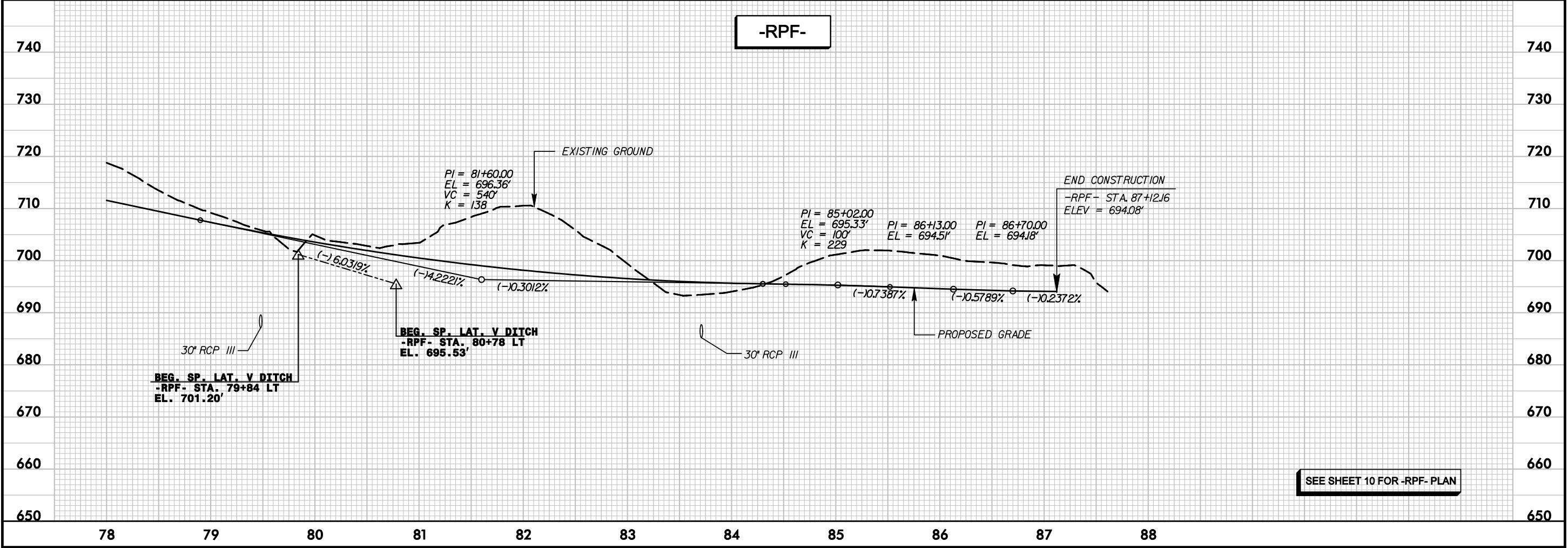
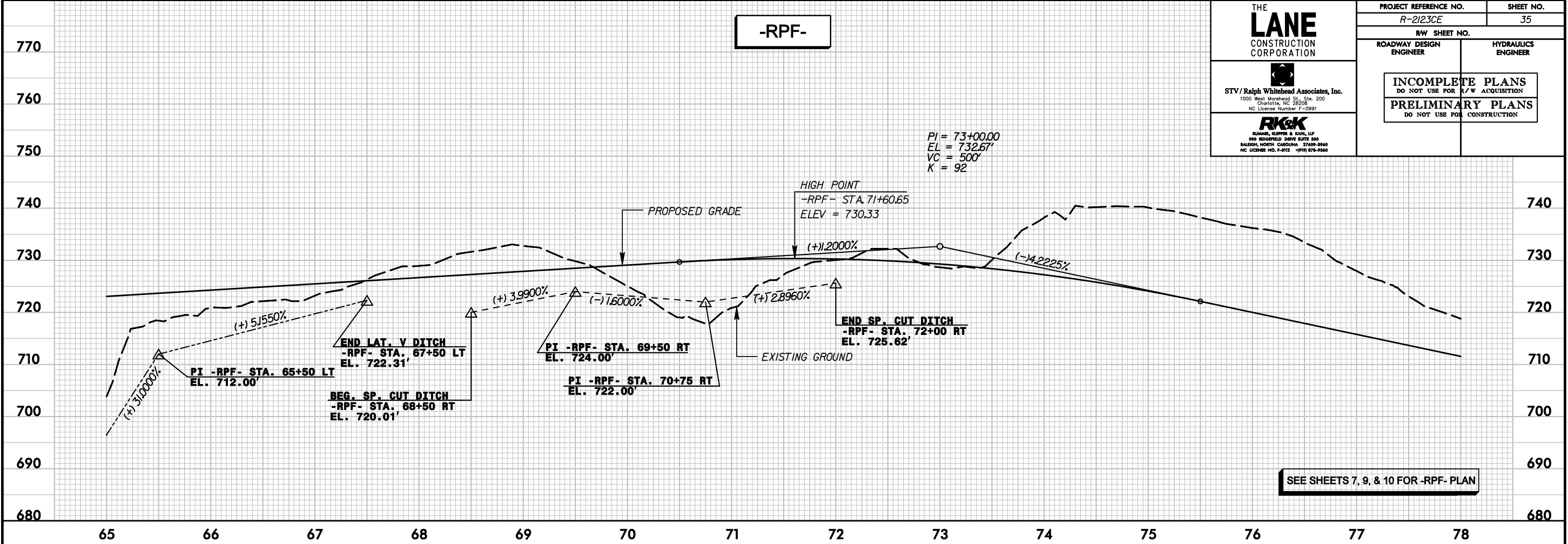
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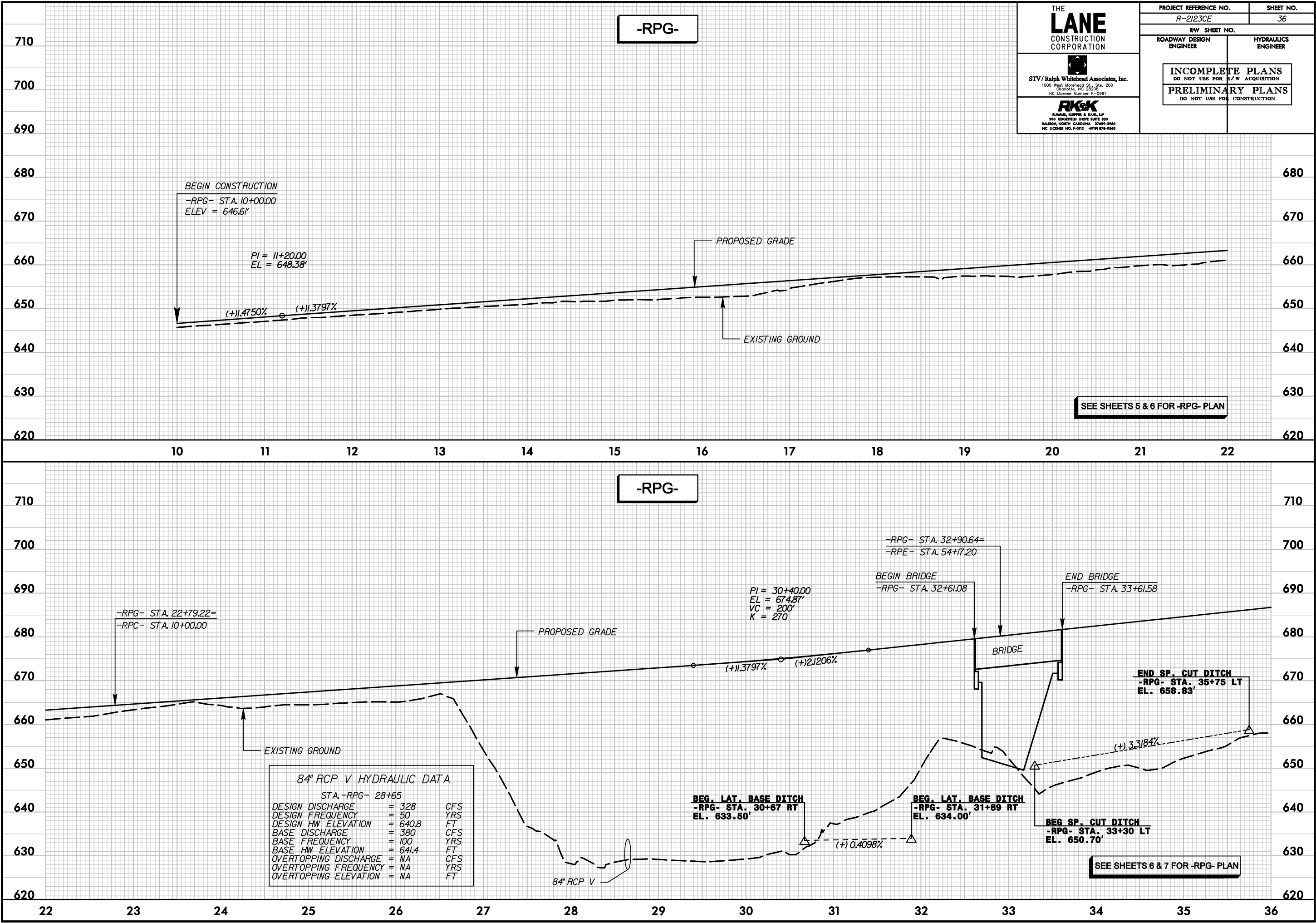

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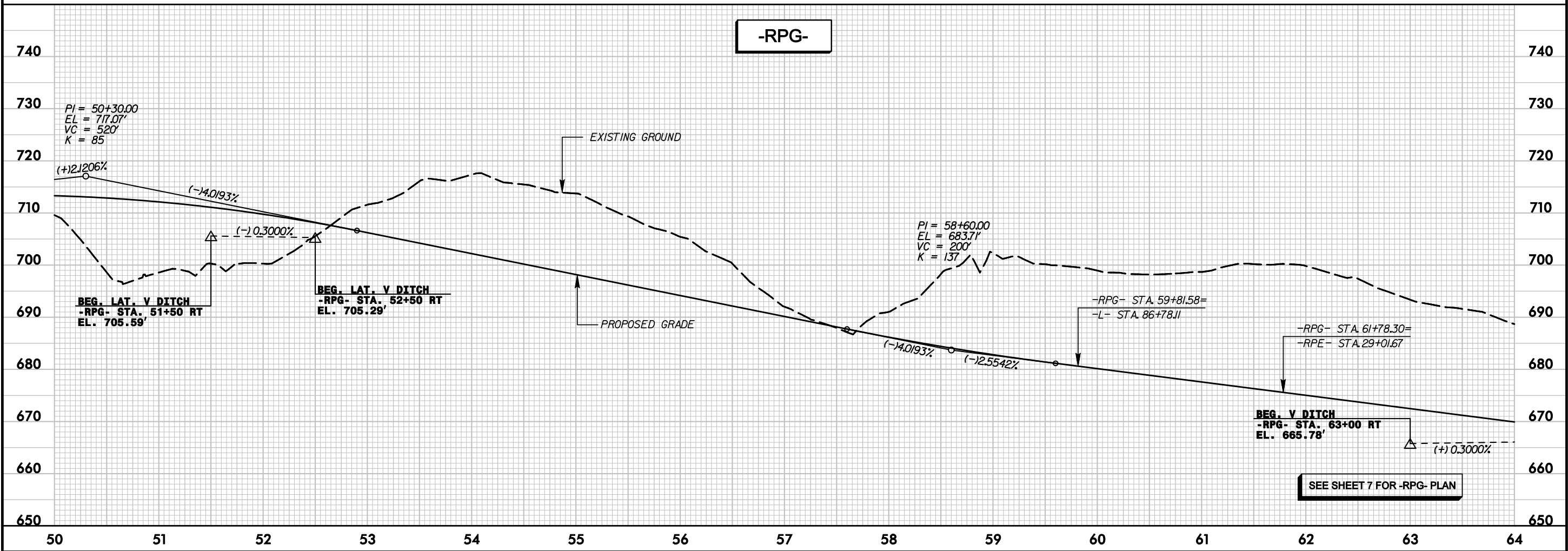
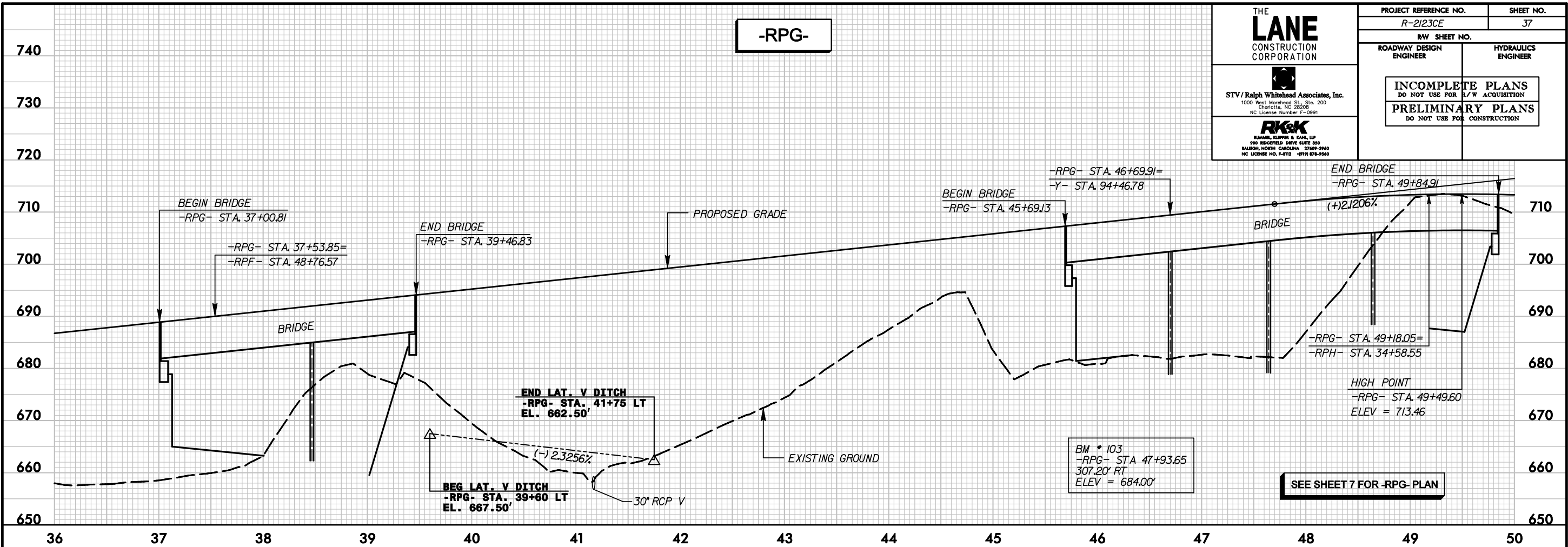
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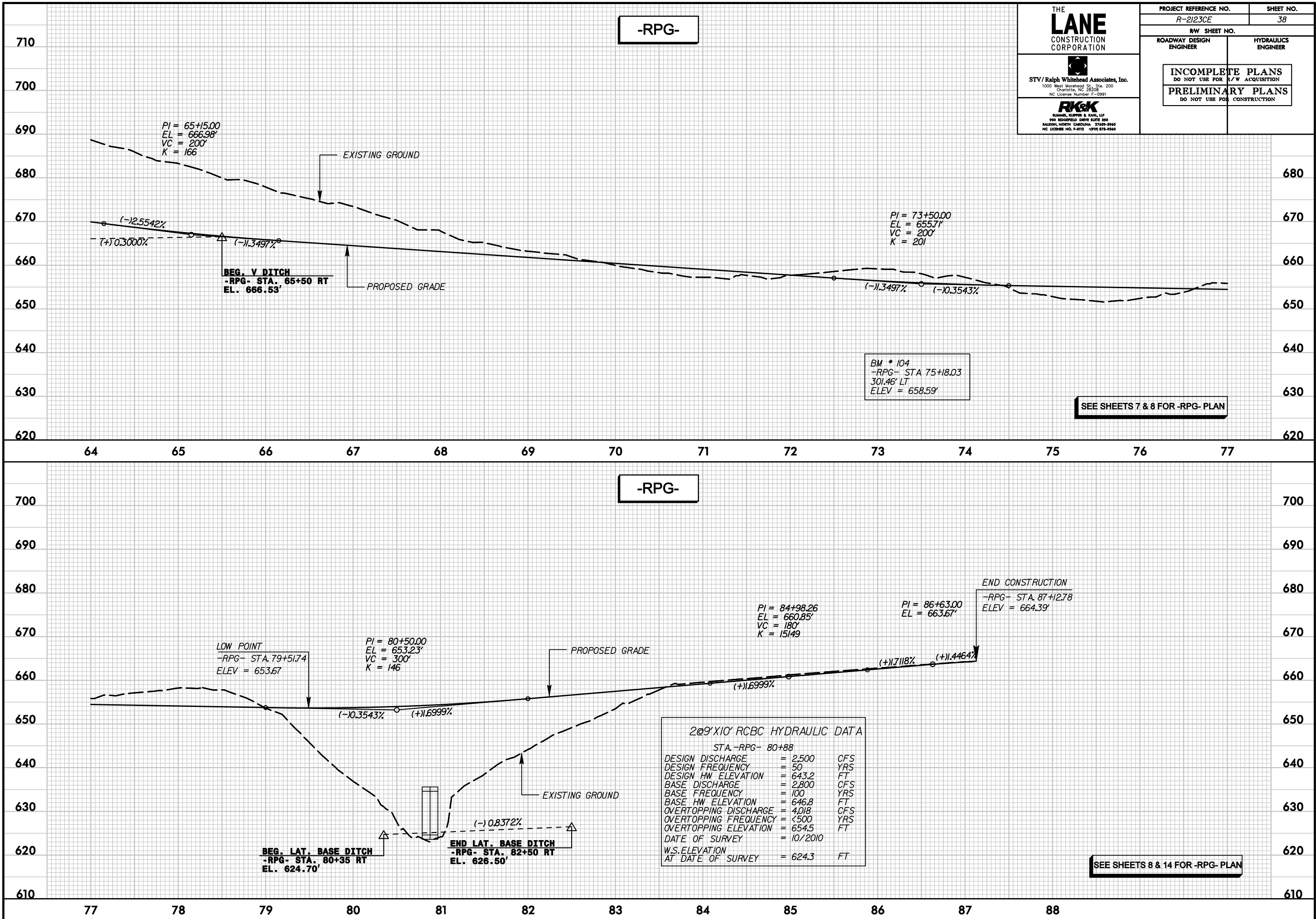
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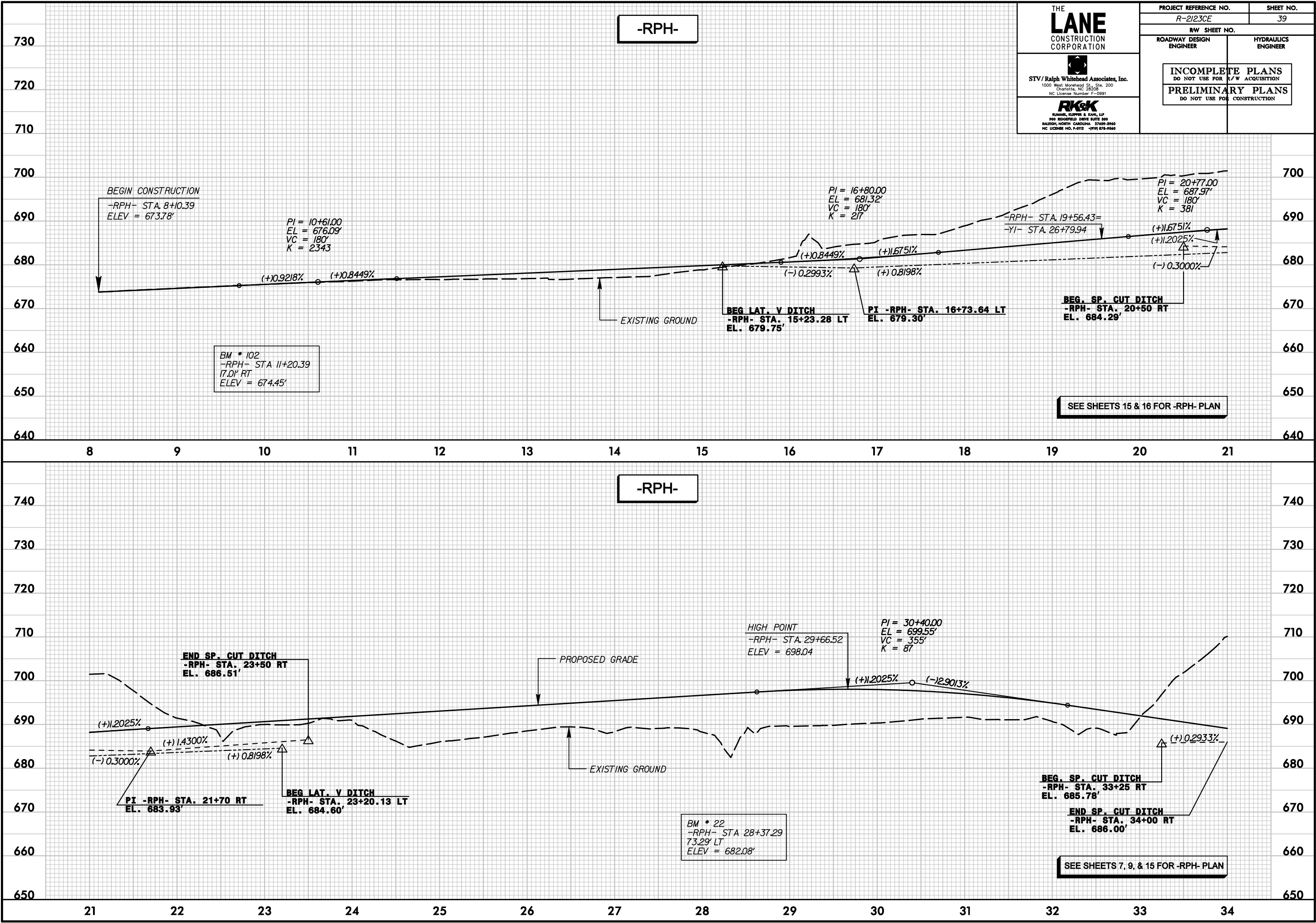


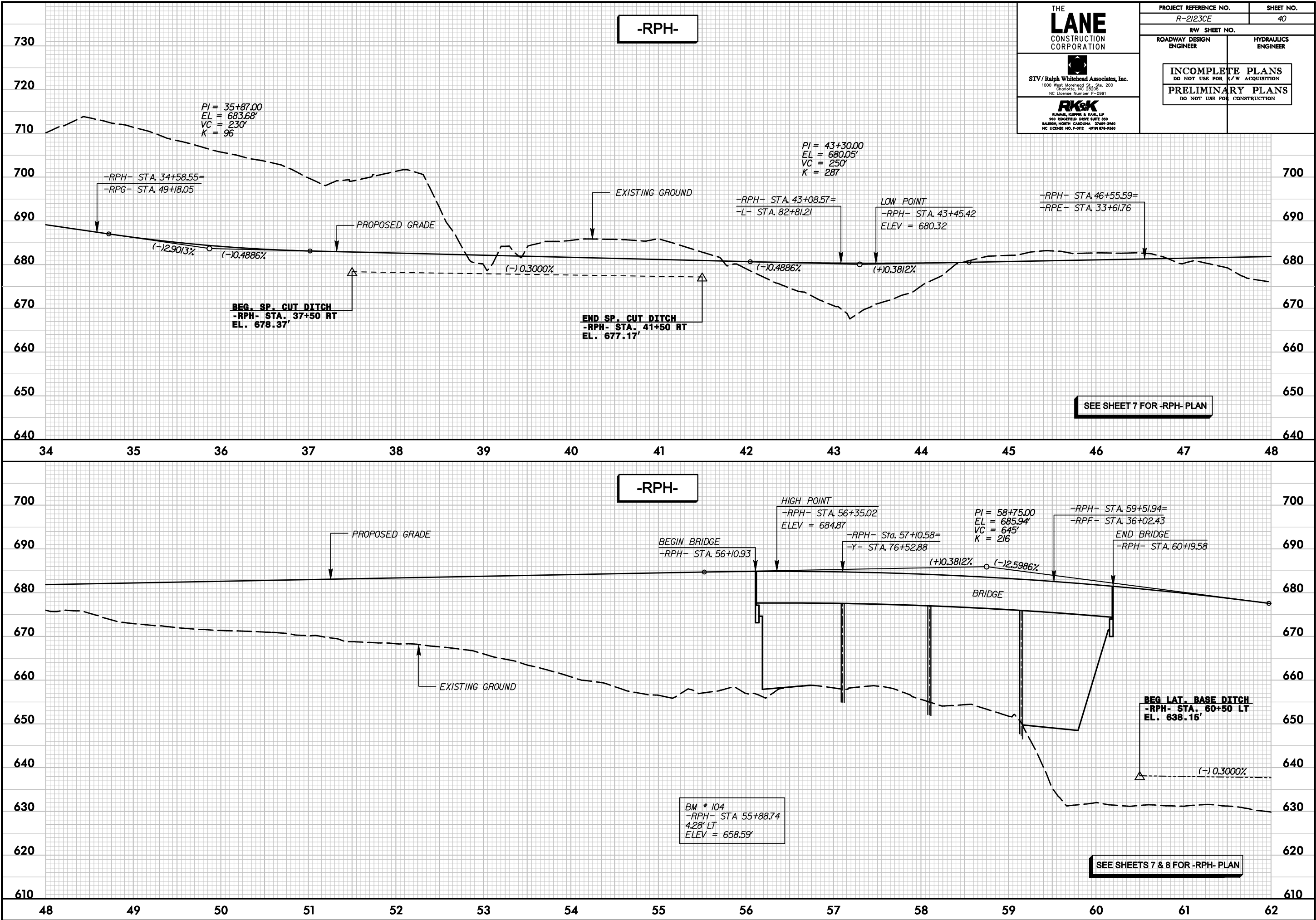
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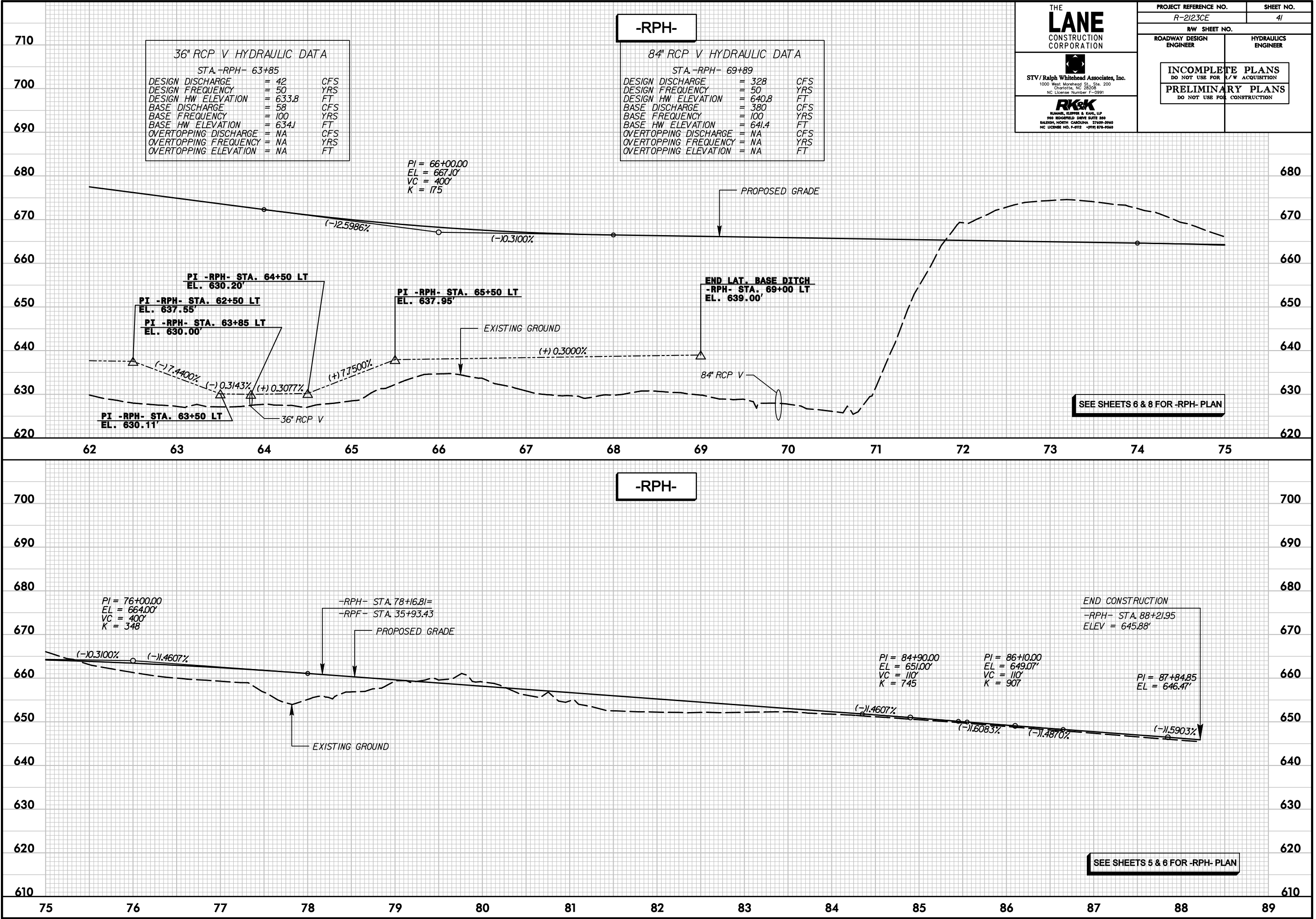
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R-2123CE		40
R/W SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
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PROJECT REFERENCE NO.
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SHEET NO.
42

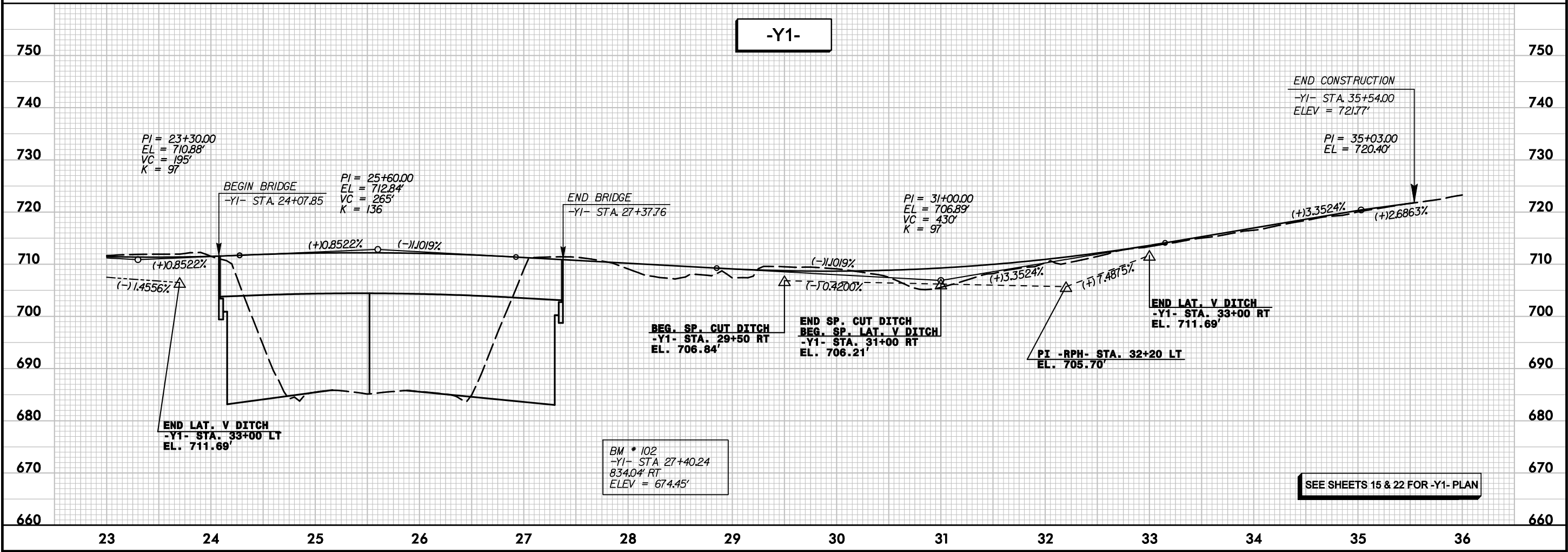
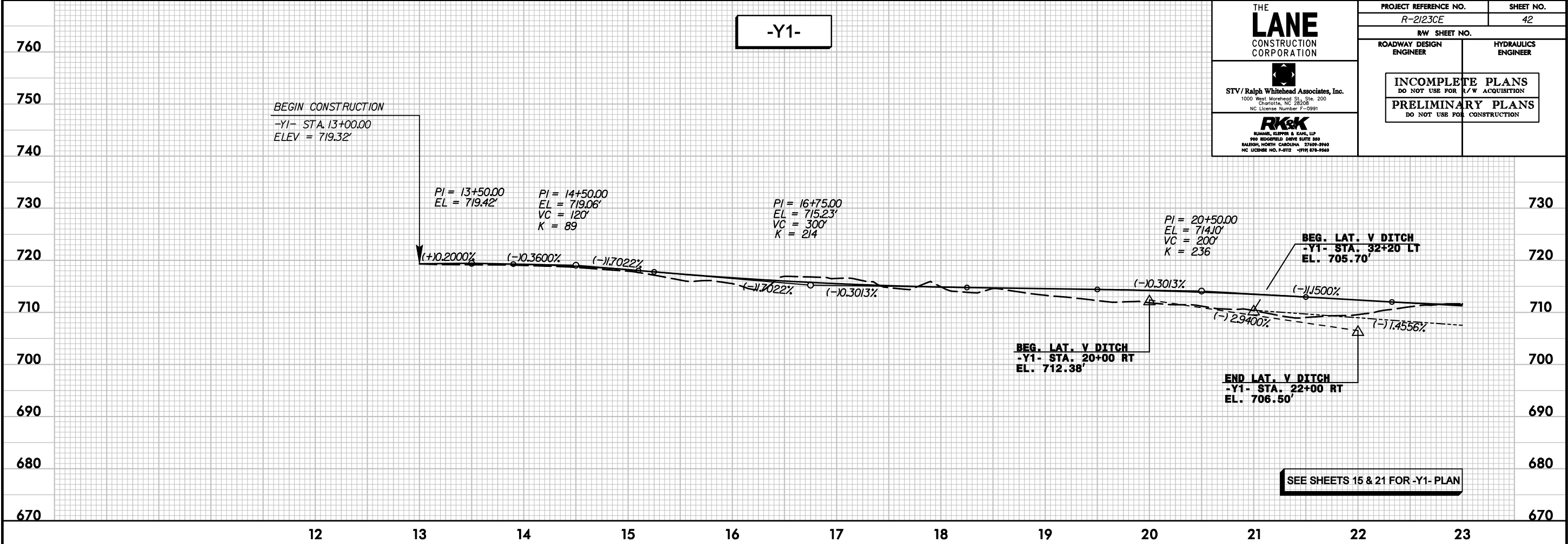
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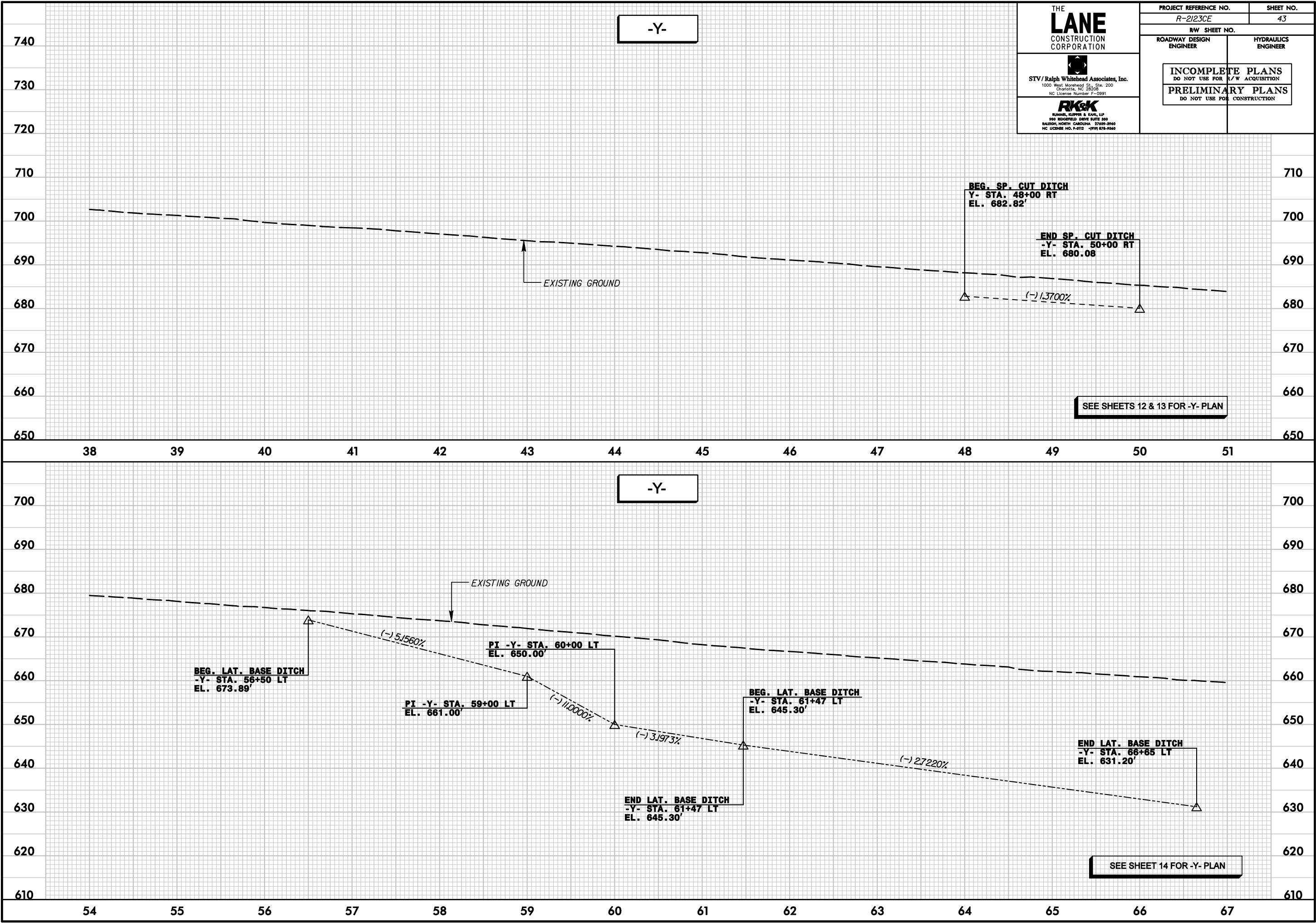
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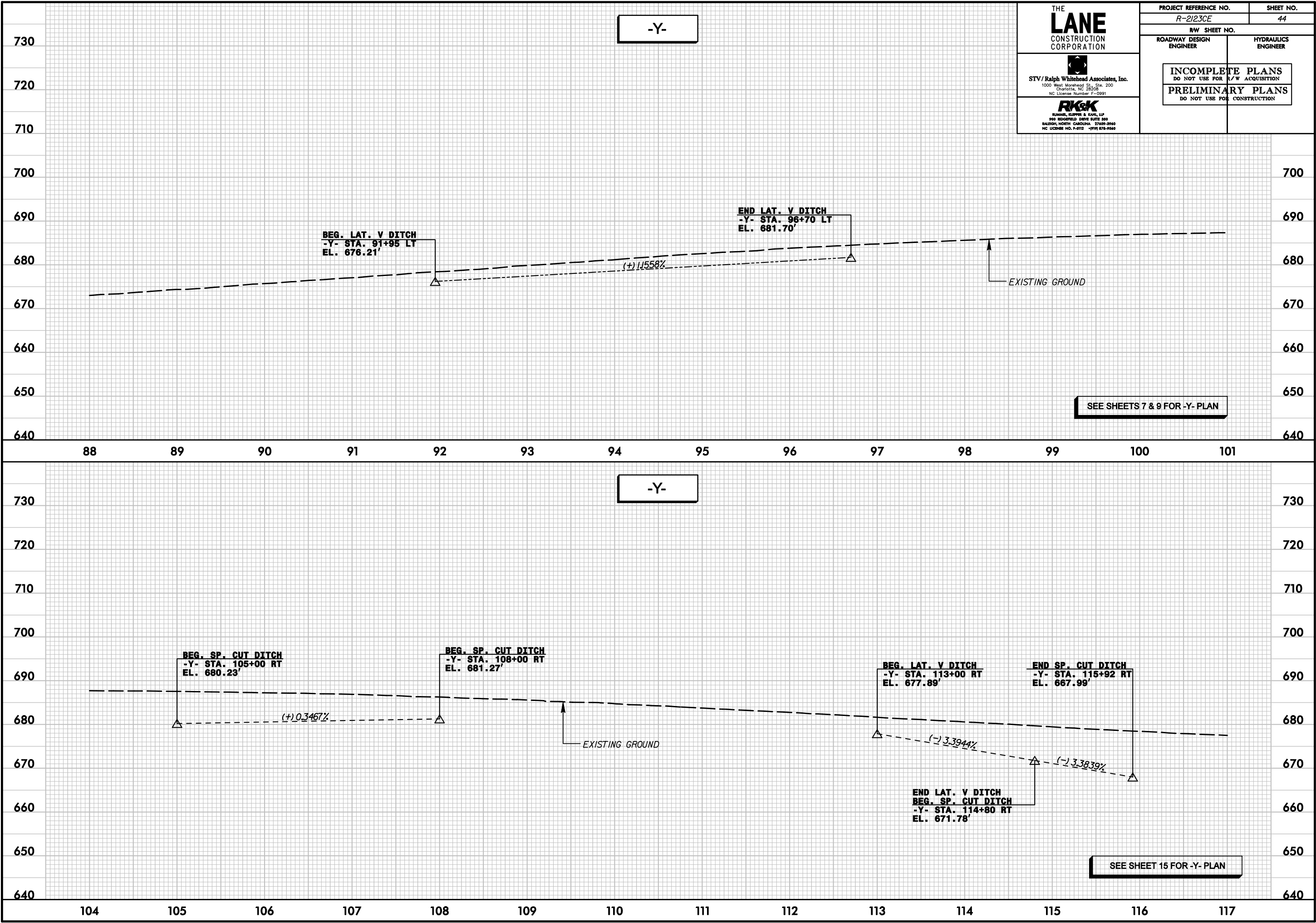
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PROJECT REFERENCE NO.
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44

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

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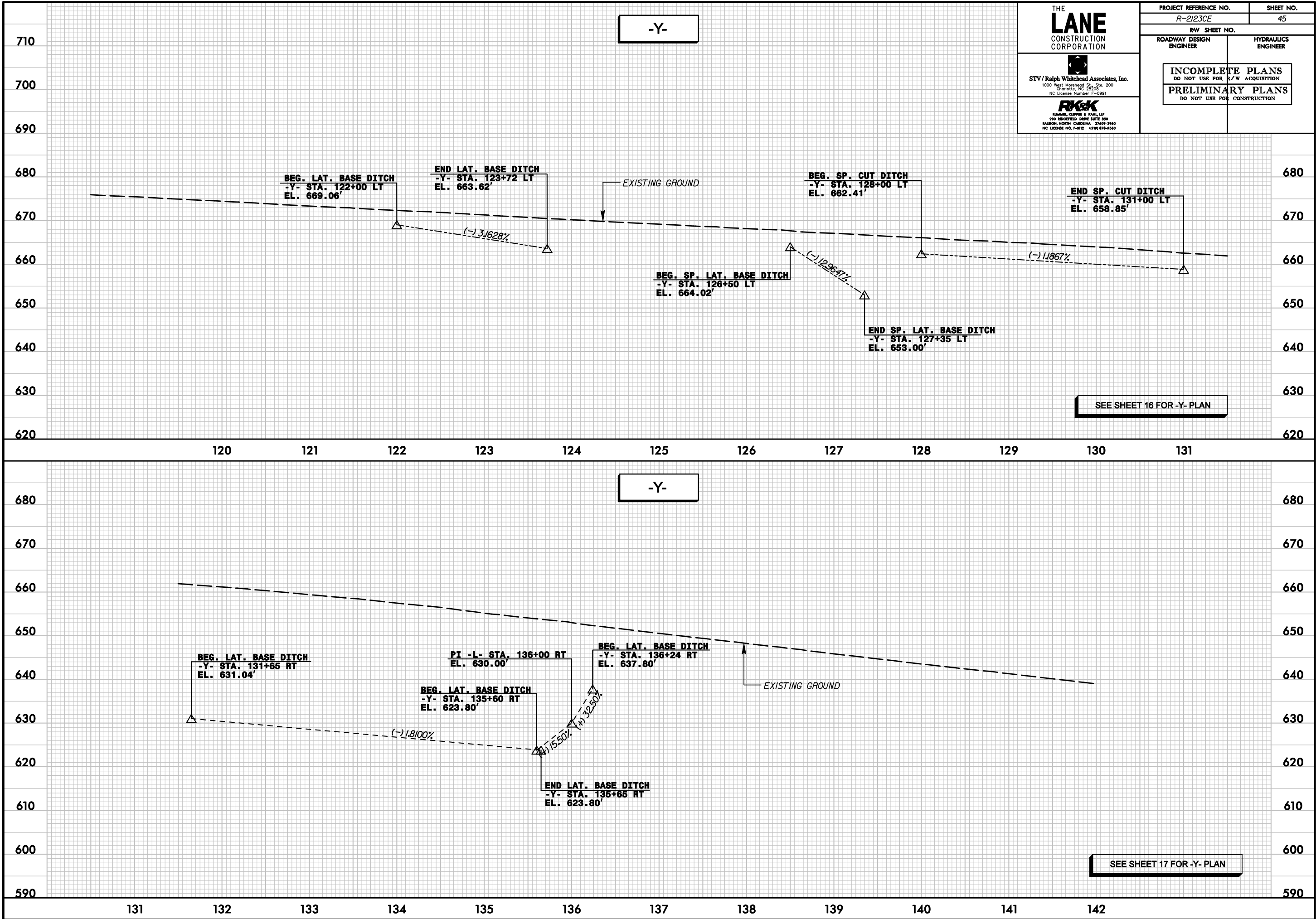
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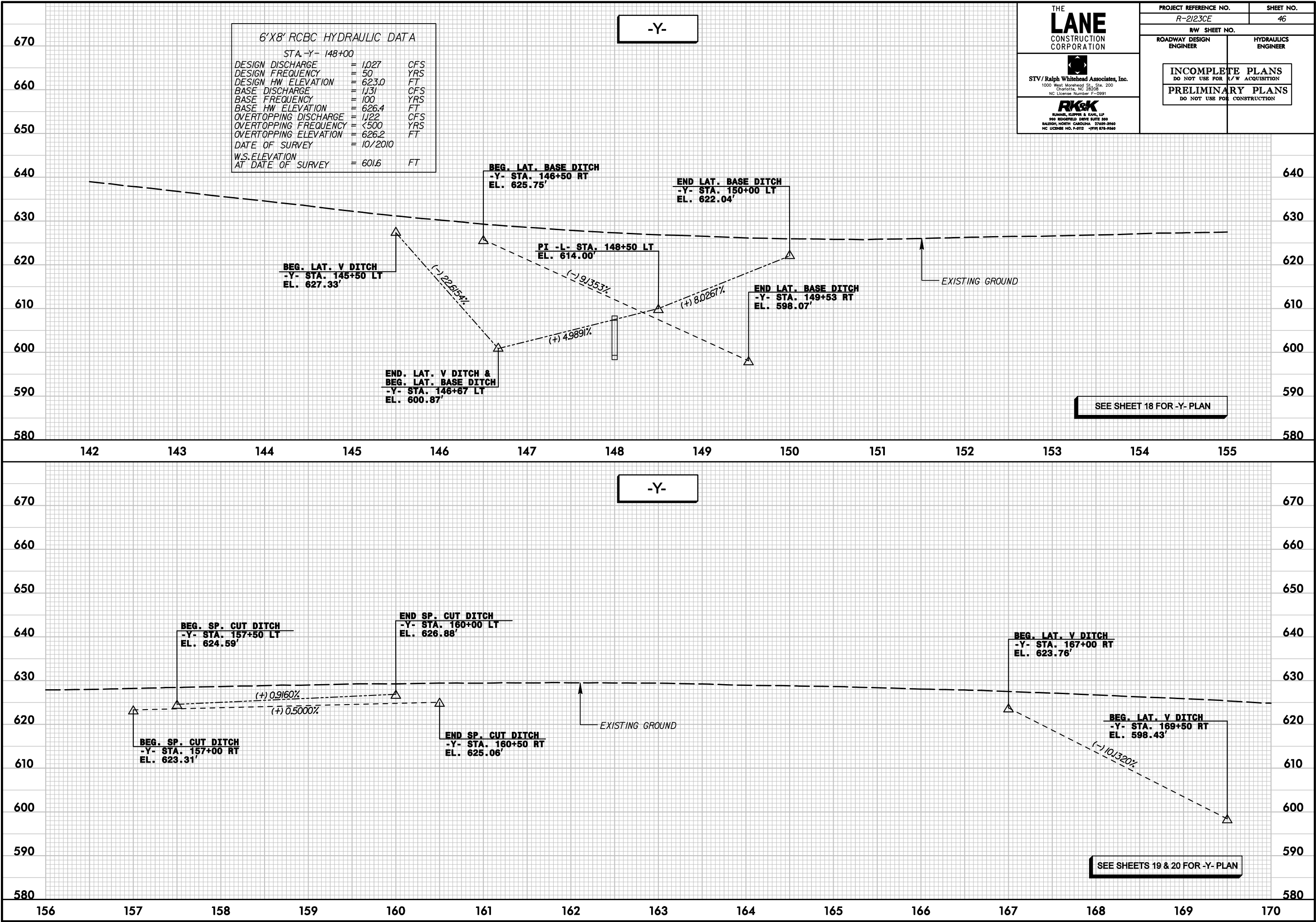
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	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

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