STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

July 23, 2019

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

ATTN: Ms. Nicholle Braspennickx
NCDOT Coordinator

Dear Madam:

Subject: **Application for an Individual Section 404 and Section 401 Water Quality Certification** for the proposed I-40/I-77 interchange improvements including I-40 from west of SR 2003 (Radio Road) to SR 2158 (Old Mocksville Road) and I-77 from south of SR 2321 (East Broad Street) to south of SR 2171 (Jane Sower Road) in Iredell County. Division 12, TIP No. I-3819B.
Debit $570.00 from WBS 34192.3.2.

The North Carolina Department of Transportation (NCDOT) proposes to improve the I-40/I-77 interchange, beginning on I-40 approximately 3,400 feet west of the SR 2003 (Radio Road) overpass, heading east to the existing interchange with I-77 and ending at the existing interchange with SR 2158 (Old Mocksville Road), for a total length of 4.0 miles. Improvements to I-77 begin approximately 1,200 feet north of SR 2157 (Salisbury Road) and head north to the existing interchange with I-40 and end approximately 1,100 feet south of SR 2171 (Jane Sowers Road) for a total length of 3.63 miles.

The current I-40/I-77 interchange is a cloverleaf interchange, which contains loop ramps in three quadrants. A portion of the I-40/I-77 interchange improvements was previously built as part of the I-3819A project between 2012-2017, including removal of a loop ramp in the northeast quadrant and construction of a new directional ramp, which is grade separated under I-77 and I-40, to accommodate northbound I-77 to westbound I-40 traffic. I-3819A also included reconstruction of the northbound I-77 to eastbound I-40 ramp, construction of collector-distributor roadways on I-40, and interchange improvements on I-40 at US 21 and SR 2158 (Old Mocksville Road).

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I-3819B involves the construction of a turbine interchange. The interchange ramps previously constructed as part of the I-3819A project will remain as components of the new turbine interchange. The current interchange will be revised to a two-level turbine interchange replacing the loops in the northwest and southeast quadrants with directional ramps. New bridges will be constructed to accommodate the two-lane directional ramps for eastbound I-40 to northbound and southbound I-77. A new two-lane bridge will be constructed to accommodate traffic from westbound I-40 to southbound I-77; this new bridge will be constructed above I-77 and above I-40. The ramp for eastbound I-40 to northbound I-77 will be constructed as a two-lane directional ramp; above I-77, and below I-40. One loop ramp will remain and will be reconstructed in the southwest quadrant to accommodate southbound I-77 to eastbound I-40 traffic. I-40 and I-77 will be widened from two- to three-thru lanes in each direction in the project area, with additional lanes constructed to accommodate the new interchange ramps. In addition, a new eastbound collector-distributor (C-D) roadway will be constructed along the south side of I-40 between the existing US 21 interchange and the proposed turbine interchange.

The existing I-40 Diverging Diamond Interchange (DDI) at US 21 will remain in place. Improvements will be made to the existing eastbound I-40 interchange ramp at SR 2158 (Old Mocksville Road), The interchange with I-77 and SR 2321 (E. Broad Street) will maintain the current general configuration but the ramps from northbound and southbound I-77 will be widened to accommodate one additional lane on each ramp. In addition, the loop ramps from E. Broad Street to I-77 will be slightly realigned.

Please see the enclosed ENG 4345, Division of Mitigation Services (DMS) mitigation acceptance letter, updated CP 2A/4A form, permit drawing review minutes from 4B and 4C meetings, State Historic Preservation Office (HPO) concurrence forms, State Stormwater Management Plan (SMP), permit drawings, utility drawings, and design plans for the above referenced project.

Purpose and Need:

The primary purpose of this project is to improve traffic flow along the I-40 and I-77 corridors; and improve regional connectivity between Iredell County and points east, west, north, and south within North Carolina and across the Interstate System.

The I-40/I-77 interchange is currently experiencing traffic capacity deficiencies and the diminished ability to function as a North Carolina Strategic Highway Corridor and United States Interstate System. Capacity analysis was completed using High Capacity Software (HCS) to evaluate the freeway facility operations along these corridors using design year 2040 volumes generated from the new project forecast. The results of the analysis compared the proposed Build design to No-Build conditions within the project study area. The segment results for the Build alternative indicate that the proposed design would provide significant improvement to corridor operations for I-40 and I-77, in both directions, when compared to No-Build conditions. For the 2040 Build alternative, all freeway segments along I-40 and I-77 would operate at an acceptable Level of Service (LOS) D or better during the AM and PM peak hours throughout the project study area. The intersection capacity analysis results indicate that all ramp intersections in the project study area will have similar or better operations in the Build scenario when compared to the No-Build.

In addition to operational improvements, there are several safety benefits associated with the proposed design. The design will replace two of the three existing loop ramps with directional ramps, eliminate two weaving segments between loop ramps, conform to highway design requirements outlined by American Association of State Highway and Transportation Officials (AASHTO), and provide adequate acceleration and deceleration lane lengths throughout the study

area. In conclusion, the design proposed for the system interchange and surrounding area is not expected to adversely impact the traffic operations of the I-40 and I-77 Interstate facilities or the safety of the Interstate System.

Summary of Jurisdictional Impacts:
This project will result in 2,175 linear feet of permanent stream impacts, 1,019 linear feet of stream bank stabilization, and 0.07 acre (394 linear feet) of temporary stream impacts. There will also be 1.39 acres of permanent wetland impacts and 2.56 acres of hand clearing in wetlands.

Summary of Utility Impacts:
There will be a total of 0.02 acre of permanent wetland impacts and 0.27 acre of temporary wetland fill impacts associated with the relocation/installation of the gravity sewer line and electric utility tower.

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. Mitigatable impacts include 2,175 linear feet of permanent stream impacts as required by USACE (1,407 linear feet as required by NCDWR) and 1.41 acres of permanent wetland impacts (0.02 acre from utility impacts). DMS will provide all required mitigation for this project.

NEPA DOCUMENT STATUS

An Environmental Assessment (EA) was completed in November 2006 for this project A Finding of No Significant Impact (FONSI) was completed in August 2008. NEPA Construction Consultations were approved in January 2011 and May 2019.

In compliance with the NEPA/404 Merger Process, Concurrence Point (CP) 4B was reached on March 20, 2019. It was determined during the 4B Meeting that CP 2A/4A concurrence, previously achieved in 2008, was required to be re-submitted and signed due to design changes. CP 4C concurrence was reached on June 20, 2019. Minutes of the CP 4B and 4C meetings are attached.

All signatures for an updated CP 2A/4A form (attached) were received as of June 12, 2019.

PROJECT SCHEDULE

The project was let for construction on October 30, 2018. Early works construction in non-permit areas began on May 1, 2019. Construction of I-3819B is anticipated to be completed by June 2022.

INDEPENDENT UTILITY

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

(1) The project connects logical termini and is of sufficient length to address environmental matters on a broad scope,
(2) The project is usable and a reasonable expenditure, even if no additional transportation improvements are made in the area;
(3) The project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

RESOURCE STATUS

Water resources in the study area are part of the Yadkin-Pee Dee basin [U.S. Geological Survey(USGS) Hydrologic Unit 03040102]. Twenty-three jurisdictional streams were identified within the project area, including Fourth Creek, Morrison Creek, and unnamed tributaries (UTs) of Fourth Creek, Morrison Creek, Gregory Creek, and Beaver Creek. Only Fourth Creek and its UTs are located within the impact footprint of I-3819B (Table 1). There are no designated High-Quality Waters (HQW), Outstanding Resource Waters (ORW), or water supply watersheds (WS-I or WS-II) within or within 1.0 mile downstream of the study area.

Waters of the U.S. were delineated in 2005 and verified by the U.S. Army Corps of Engineers (USACE) in 2005 and 2012. In 2018, waters/wetlands within the entire project footprint were re-delineated in order to update everything in advance of the I-3819B let date. The most recent field visit verifying the water resources was conducted on May 10, 2018 with the USACE (Nicholle Braspennickx and Steve Kichefski) and North Carolina Division of Water Resources (NCDWR) (Donna Hood). A Preliminary Jurisdictional Determination (PJD) for I-3819B was issued by the USACE on October 9, 2018.

Table 1 – Impacted project area streams

Stream Name	NCDWR Index Number	Best Usage Classification	Description
Fourth Creek	12-108-20	C	Source to South Yadkin River

<u>303(d) Impaired Waters</u>:
The 2018 Final 303(d) list of impaired waters identifies a portion of Fourth Creek within the project study area (upstream of the confluence with Morrison Creek) as impaired due to fish. No other 303(d) streams have been identified within or within 1.0 mile downstream of the study area.

IMPACTS TO WATERS OF THE U.S.

Tables 2 through 4 summarize the impacts to jurisdictional water resources. Site numbers correspond with the permit (hydraulic) drawings included in this application. The stream and wetland IDs correspond to the 2018 NRTR update memo and PJD. The preliminary projected impacts for the overall project will be approximately 1.41 acres of permanent wetland impacts (0.02 acre from utility impacts), 2.56 acres of hand clearing in wetlands, less than 0.01 acre of permanent wetland impacts due to utilities, 0.27 acre of temporary wetland impacts due to utilities, 2,175 linear feet of permanent stream impacts requiring mitigation by USACE (1,407 linear feet required by NCDWR), 1,019 linear feet of permanent stream bank stabilization, and 0.07 acre (394 linear feet) of temporary stream impacts.

Table 2 – I-3819B Wetland Impacts*

Site	Wetland Number	Wetland Size (ac)	Permanent Fill in Wetlands (ac)	Mechanized Clearing (ac)	Hand Clearing (ac)	Impacts Requiring Mitigation (ac)
2	WC	2.94	0.32	0.09	--	0.41
2	WC/WD	2.94/9.57	0.02	0.02	0.62	0.05
3	WF	0.31	<0.01	0.01	--	0.02
4	WD	9.57	--	0.02	--	0.02
5	WD	9.57	0.03	0.05	1.94	0.09
8	WH	0.08	<0.01	<0.01	--	0.01
9	WK	1.20	0.40	0.08	--	0.47
11	WAN	0.21	0.19	0.02	--	0.21
26	WI	0.13	0.09	0.04	--	0.13
Total Wetland Impacts			**1.06[1]**	**0.33[1]**	**2.56**	**1.39[1]**

*All wetlands impacted are riparian

[1]Values are based on rounding, due to calculating totals with actual numbers to the thousandths

Table 3 – I-3819B Stream Impacts

Permit Site	Stream Name/ NRTR ID	Status/ Class	Permanent		Temporary Channel Impacts ac (lf)	USACE Required Mitigation lf	NCDWR Required Mitigation lf
			Channel Impacts lf (ac)	Bank Stabilization lf (ac)			
2	UT to Fourth Creek SJ	Perennial C	--	42	<0.01 (20)	--	--
3	UT to Fourth Creek SI	Perennial C	206 (0.02)	--	<0.01 (10)	206	--
5	UT to Fourth Creek SJ	Perennial C	--	--	<0.01 (40)	--	--
6	Fourth Creek	Perennial C	--	12 (<0.01)	<0.01 (20)	--	--
7	Fourth Creek	Perennial C	--	12 (<0.01)	<0.01 (20)	--	--
9	UT to Fourth Creek SL	Perennial C	747 (0.07)	--	<0.01 (10)	747	747

Table 3 – I-3819B Stream Impacts (continued)

Permit Site	Stream Name/ NRTR ID	Status/ Class	Permanent		Temporary Channel Impacts ac (lf)	USACE Required Mitigation lf	NCDWR Required Mitigation lf
			Channel Impacts lf (ac)	Bank Stabilization lf (ac)			
10	UT to Fourth Creek SK	Perennial C	--	25 (<0.01)	<0.01 (20)	--	--
12	UT to Fourth Creek SK	Perennial C	10 (<0.01)	--	0.01 (54)	10	--
13	UT to Fourth Creek SL	Perennial C	17 (<0.01)	44 (<0.01)	<0.01 (10)	17	17
14	UT to Fourth Creek SX	Intermittent C	17 (<0.01)	--	<0.01 (10)	17	--
15	UT to Fourth Creek SX	Intermittent C	--	11 (<0.01)	<0.01 (20)	--	--
16	UT to Fourth Creek SX	Intermittent C	112 (0.01)	--	<0.01 (10)	112	--
17	UT to Fourth Creek SX	Perennial C	115 (0.02)	--	<0.01 (14)	115	--
18	UT to Fourth Creek SW	Perennial C	72 (0.01)	--	<0.01 (10)	72	--
19	UT to Fourth Creek SW	Perennial C	34 (<0.01)	--	--	34	--
20	UT to Fourth Creek SBA	Perennial C	61 (0.01)	--	<0.01 (10)	61	--

Table 3 – I-3819B Stream Impacts (concluded)

Permit Site	Stream Name/ NRTR ID	Status/ Class	Permanent		Temporary Channel Impacts ac (lf)	USACE Required Mitigation lf	NCDWR Required Mitigation lf
			Channel Impacts lf (ac)	Bank Stabilization lf (ac)			
21	UT to Fourth Creek ST	Perennial C	176 (0.06)	--	<0.01 (21)	176	176
22	UT to Fourth Creek ST	Perennial C	467 (0.14)	873 (0.23)	<0.01 (10)	467	467
23	UT to Fourth Creek ST	Perennial C	--	--	<0.01 (33)	--	--
24	UT to Fourth Creek SU	Perennial C	49 (<0.01)	--	0.01 (10)	49	--
25	UT to Fourth Creek SU	Perennial C	44 (<0.01)	--	<0.01 (32)	44	--
27	UT to Fourth Creek SR	Perennial C	48 (0.01)	--	<0.01 (10)	48	--
Total Stream Impacts			**2175**	**1019**	**0.07* (394)**	**2175**	**1407**
			3194				

* Values are based on rounding

<u>Permit Site 1</u>: This site has been eliminated.

<u>Permit Site 2</u>: Roadway fill slopes resulting from the approach to a new three-lane ramp bridge will result in 0.32 acre of permanent fill and 0.09 acre of mechanized clearing impacts to wetland WC. The construction of bridge columns at two bent locations will result in 0.02 acre of permanent fill and 0.02 acre of mechanized clearing impacts to wetlands WC and WD. There will be 0.62 acre of hand clearing in wetlands WC and WD under and adjacent to the new bridge. In addition, riprap placed on the banks of stream SJ to protect against erosion at a bridge column will result in 42 lf of stream bank stabilization and <0.01 acre (20 lf) of temporary stream impact.

Permit Site 3: At this permit site there will be a total of 206 lf of permanent stream impacts to stream SI, which includes 184 lf of impacts due roadway fill and installation of a new 54" reinforced concrete pipe (RCP) under a new ramp, and 22 lf of impacts from the installation of Class I riprap for streambed stabilization at the outlet of the new pipe. Temporary stream impacts to stream SI will be <0.01 acre (10 lf). The roadway fill at this location will also result in <0.01 acre of permanent fill and 0.01 acre of mechanized clearing impacts in wetland WF.

Permit Site 4: Construction of the 1.5:1 fill slope and rock plating along a new two-lane ramp in the southwest quadrant of the turbine interchange will result in 0.02 acre of mechanized clearing impacts to wetland WD.

Permit Site 5: The construction of bridge columns at four bent locations for a new two-lane ramp bridge will result in 0.03 acre of permanent fill and 0.05 acre of mechanized clearing impacts to wetland WD. There will be 1.94 acres of hand clearing in wetland WD under and adjacent to the new bridge. This hand-cleared area would be utilized for construction access, with the contractor working off of mats. There will also be a temporary pipe installed for construction access that will result in <0.01 acre (40 lf) of temporary stream impacts to stream SJ. The pipe will be removed after construction and the stream will be restored to pre-construction contours.

Permit Site 6: Class II riprap will be installed at the outfall of a lateral ditch along the right bank of Fourth Creek, which will result in 12 lf of stream bank stabilization impacts and <0.01 acre (20 lf) of temporary stream impacts to Fourth Creek.

Permit Site 7: Class II riprap will be installed at the outfall of a lateral ditch along the bank of Fourth Creek, which will result in 12 lf of stream bank stabilization and <0.01 acre (20 lf) of temporary stream impacts to Fourth Creek.

Permit Site 8: Roadway fill slopes for a new three-lane ramp will result in <0.01 acre of permanent fill and <0.01 acre of mechanized clearing impacts to wetland WH.

Permit Site 9: Roadway fill slopes for a new ramp from westbound I-40 to northbound I-77 in the northeast quadrant will result in 0.40 acre of permanent fill and 0.08 acre of mechanized clearing impacts to wetland WK, and 747 lf of permanent stream impacts and <0.01 acre (10 lf) of temporary stream impacts to stream SL. To accommodate the new ramp, stream SL will be relocated to the north. The relocated stream will be stabilized with Class II riprap.

Permit Site 10: Class II riprap will be installed along the right bank of stream SK at the confluence with the relocated stream SL. This will result in 25 lf of stream bank stabilization impacts and <0.01 acre (20 lf) of temporary stream impacts to stream SK.

Permit Site 11: Roadway fill slopes resulting from the approach to a new bridge over stream SK will result in 0.19 acre of permanent fill impacts and 0.02 acre of mechanized clearing in wetland WAN. The permanent wetland fill impact at this site includes a Class B riprap apron at the outfall of a new 24" RCP storm water pipe.

Permit Site 12: An existing 2 @ 7'X 7' reinforced concrete box culvert (RCBC) will be removed and replaced by a new single span bridge on I-40 with a length of 160' and width of 183'over stream SK. The newly daylighted stream SK will be lined with Class II riprap to stabilize the channel. Impacts at this site total 10 lf of permanent stream impacts and <0.01 acre (54 lf) of temporary stream impacts to stream SK.

Permit Site 13: A new 24" corrugated steel pipe (CSP) will direct runoff to stream SL. At the pipe outlet, a new headwall will be installed and Class I riprap will be used to stabilize the streambed and bank. This will result in 17 lf of permanent streambed impacts and <0.01 acre (10 lf) of temporary stream impacts to stream SL. There will also be 44 lf of stream bank stabilization impacts to stream SL. This permit site is located within an NCDOT mitigation site (see Mitigation Options section below).

Permit Site 14: Class I riprap will be installed in stream SX at the pipe outlet of an existing 48" corrugated metal pipe (CMP) to stabilize the streambed. This will result in 17 lf of permanent stream impacts and <0.01 acre (10 lf) of temporary stream impacts to the intermittent section of stream SX.

Permit Site 15: A new 18" CSP will be installed on the east side of I-77 to carry storm water from the I-77 shoulder to be discharged to stream SX. At the outlet of the CSP, Class II riprap will extend down the left bank of stream SX. This will result in 11 lf of stream bank stabilization impacts and <0.01 acre (20 lf) of temporary stream impacts.

Permit Site 16: At this permit site, there will be a total of 112 lf of permanent stream impacts to the intermittent section of stream SX, which includes 13 lf of impacts resulting from the extension of an existing 54" RCP, and 99 lf of impacts from riprap in the channel for streambed stabilization. Temporary stream impacts to the intermittent section of stream SX will be <0.01 acre (10 lf) at this site.

Permit Site 17: At this permit site, there will be a total of 115 lf of permanent stream impacts to the perennial section of stream SX, which includes 17 lf of impacts resulting from the extension of an existing 54" RCP, and 98 lf of impacts from riprap that will be placed at the outlet of the extended pipe for streambed stabilization. Temporary stream impacts to the perennial section of stream SX will be <0.01 acre (14 lf) at this site.

Permit Site 18: At this permit site, there will be a total of 72 lf of permanent stream impacts to stream SW, which includes 39 lf of impacts resulting from the extension of an existing 54" RCP with a junction box and 33 lf of impacts resulting from the installation of an energy dissipator basin lined with Class II riprap at the outlet of the extended pipe. Temporary stream impacts to stream SW will be <0.01 acre (10 lf) at this site.

Permit Site 19: At this site, 34 lf of permanent stream impacts to stream SW will result from the installation of a segment of 54" RCP to connect two existing 54" RCPs.

Permit Site 20: At this permit site, there will be a total of 61 lf of permanent stream impacts to stream SBA, which includes 48 lf of impacts resulting from new roadway fill and 13 lf of impacts resulting from the relocation of stream SBA to the west and just outside of the new roadway fill slopes. Temporary stream impacts to stream SBA will be <0.01 ac (10 lf) at this site.

Permit Site 21: At this permit site, there will be a total of 176 lf of permanent stream impacts to stream ST, which includes 39 lf of impacts resulting from the extension of an existing 3 @ 9'X11' RCBC beneath I-77 and 137 lf of impacts resulting from streambed stabilization upstream of the extended RCBC. The streambed stabilization will be accomplished using native bed material to fill in scour holes in the channel bottom. Temporary stream impacts to stream ST will be <0.01 acre (21 lf) at this site.

Permit Site 22: At this permit site, there will be a total of 1,340 lf of permanent stream impacts to

stream ST, including 467 lf of pipe, fill and streambed impacts, and 873 lf of streambank stabilization. The permanent impacts to Stream ST at Site 22 are as follows:

- The extension of an existing 3 @ 9'X11' RCBC beneath I-77 will result in 45 lf of permanent stream impacts.
- At the outlet of the extended RCBC, natural bed material will be used for stream bed stabilization, resulting in 160 lf of permanent stream impacts.
- Beneath the Broad Street bridge, Stream ST will be shifted slightly to the east creating a new channel, which will result in 225 lf of permanent stream impacts.
- At the most downstream stream segment of stream ST within Site 22, riprap will be added at the outlet of an existing 18" RCP and will result in 37 lf of permanent stream impacts and <0.01 acre (10 lf) of temporary stream impacts.
- Class II riprap will be added to the base of a new retaining wall along I-77 and will extend along the left bank of stream ST, resulting in 873 lf of bank stabilization impacts to stream ST.

Permit Site 23: The construction of a new retaining wall adjacent to I-77 will result in <0.01 acre (33 lf) of temporary stream impacts to stream ST.

Permit Site 24: At this permit site, there will be a total of 49 lf of permanent stream impacts to stream SU, which includes 37 lf of impacts resulting from the extension of an existing 66" RCP and 12 lf of permanent stream impacts resulting from the installation of Class I riprap for streambed stabilization at the inlet of the extended RCP. Temporary stream impacts to stream SU will be <0.01 ac (10 lf).

Permit Site 25: There are two jurisdictional sections of stream SU that will be impacted at this permit site with a total of 44 lf of permanent stream impacts and <0.01 acre (32 lf) of temporary impacts to stream SU.

- At the upstream section, an existing 66" RCP will be extended to accommodate new roadway fill slopes and an existing scour hole will be lined with Class I riprap which will result in 10 lf of permanent impacts.
- The existing 72" CMP that carries stream SU downstream will remain in place and Class I and II riprap will be added for streambed and streambank stabilization, respectively, resulting in 24 lf of permanent impacts.
- A new dry detention basin will be created just south of stream SU with a new 24" RCP-III that will carry water from the new detention basin to stream SU. Where the new 24" RCP-III meets stream SU, a riprap pad with Class I riprap will be installed in stream SU that will result in 10 lf of permanent stream impacts. Temporary stream impacts to stream SU will be <0.01 acre (32 lf) at this site.

Permit Site 26: New roadway fill slopes and a new lateral ditch will result in 0.09 acre of permanent fill and 0.04 acre of mechanized clearing impacts to wetland WI.

Permit Site 27: At this permit site, there will be a total of 48 lf of permanent stream impacts to stream SR, which includes 29 lf of impacts resulting from the extension of an existing 60" RCP and 19 lf of permanent stream impacts resulting from the installation of Class I riprap for streambed stabilization at the outlet of the extended 60" RCP. Temporary stream impacts to stream SR will be <0.01 acre (10 lf) at this site.

Utility Site U-1: There will be 0.02 acre of temporary fill impacts to wetland WJ associated with

the relocation/installation of the gravity sewer line at Utility Site U-1 (see Table 4 and attached utility drawings). No mitigation is required for this utility relocation activity as it is temporary and does not constitute a loss of wetland.

Utility Site U-2: There will be 0.25 acre of temporary fill, 0.02 acre or mechanized clearing, and <0.01 acre of permanent fill impacts to wetland WD associated with the relocation of the Duke Energy transmission line and tower at Utility Site U-2. Temporary fill impacts to wetland WD will be due to the use of timber mats for site access and during construction of the footings for the tower. Mechanized clearing will occur in the new location of the tower in a 30'x30' area resulting in 0.02 acre of impacts. Permanent fill impacts will result from the placement of the four 4'x4' tower footings.

Table 4 – Summary of Utility Wetland Impacts for I-3819B

Site	Wetland ID	Impact Type	Temporary Impacts (ac)	Permanent Fill (ac)	Mechanized Clearing (ac)	Mitigation Requirement (ac)
U-1	WJ	Utility	0.02	--	--	--
U-2	WD	Utility	0.25	<0.01	0.02	0.02
TOTAL IMPACTS			**0.27**	**<0.01**	**0.02**	**0.02**

MORATORIUM

There are no trout waters or watersheds within the project area. Therefore, no moratoria are required for this project.

FEDERALLY PROTECTED SPECIES

Plants and animals with Federal classification of Endangered (E) or Threatened (T) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973 (ESA), as amended. As of June 27, 2018, the United States Fish and Wildlife (USFWS) lists three federally protected species, under the ESA for Iredell County (Table 5).

Table 5. Federally protected species list of Iredell County

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
Glyptemys muhlenbergii	Bog turtle	T (S/A)	N/A	N/A
Myotis septentrionalis	Northern long-eared bat	T	Yes	*
Hexastylis naniflora	Dwarf-flowered heartleaf	T	Yes	No Effect

T – Threatened
T (S/A) – Threatened due to similarity of appearance
*NLEB is consistent with the 4(d) rule

The bog turtle is listed by the USFWS as Threatened due to Similarity of Appearance (T (S/A)) and by the state as Threatened. Species designated T (S/A) are listed as threatened due to their similarity of appearance with rare species. According to the USFWS, T (S/A) species are not biologically endangered or threatened and are not subject to Section 7 consultation and biological conclusions are not required. Field reviews conducted for the 2006 NRTR found no occurrences or available habitat for the bog turtle located in the study area.

Although suitable habitat for the northern long-eared bat is present, NCDOT has satisfied the 4(d) requirements for this project with regard to this species.

Suitable habitat for dwarf-flowered heartleaf occurs throughout the study area. Systematic surveys of suitable habitat within the study area were conducted on April 9, 2018. No individuals of this species were identified. In addition, a review of N.C. Natural Heritage Program (NCNHP) records on July 1, 2019 indicated no known occurrences of this species within 1.0 mile of the study area. Therefore, this project will have No Effect on dwarf-flowered heartleaf.

INDIRECT CUMULATIVE IMPACT ANALYSIS

Existing rules for the 401 Water Quality Certification Program (15A NCAC 2H .0506(b)(4) require that the NCDWR 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 and Cumulative Effects to the Human Environment

Land Use/Development
While it is apparent that further study area development and eventual build-out is likely, project induced growth in the study area is expected to be minimal due to lack of new access provided by the project. The project is likely to have the greatest impact on location decisions made by industry, specifically warehousing and distribution related industries. Some of these industries may locate within the study area.

Commerce
Ultimately, the project is likely to facilitate intrastate and interstate commerce by increasing the

efficiency of the I-40/I-77 interchange.

Travel Patterns
The reconfiguration of the I-40/I-77 interchange will improve traffic flow, reduce congestion, and decrease travel time along the corridor. This will improve operations and traffic flow at this interchange and surrounding access points in and near Statesville.

Indirect and Cumulative Effects to the Natural Environment

Encroachment-alteration and induced growth effects to natural resources associated with the project are anticipated to be low. Specific impacts to natural resources in the study are discussed below.

Water Resources
Since the proposed project consists primarily of improvements within existing right of way and development has already occurred in many of the areas adjoining the project; indirect and cumulative impacts are expected to be minimal. The future land use assessment shows continued development in the area with or without the project.

Future development impacts to Fourth Creek include water quality degradation as a result of more impervious surfaces that block or redirect discharge and more storm drains that divert precipitation into streams instead of aquifers, which could increase erosion rates over time. Since the ICE in 2005, the Iredell County Land Development Code was put into effect on July 1, 2011 and last amended September 18, 2018. Chapter 9 (Development Plan and Permit Requirements) of the Iredell County Land Development Code requires an Erosion and Sedimentation Control Plan for any proposed activities that will disturb more than one acre on a tract (one half acre in a water supply watershed). This ordinance allows the County to review plans to ensure compliance with federal and state water quality laws, regulations and rules. The impact of this ordinance on water quality is not known at this time.

Wetlands
Unavoidable wetland impacts will be mitigated and efforts will be made to replace wetlands in-kind within the same watershed as the impacted site. Increased development expected because of current development trends is likely to result in negative impacts to study area wetlands. Minimal impacts to wetlands are likely because of development induced by the project.

CULTURAL RESOURCES

Historic Architectural Resources:
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. There are three NRHP-eligible properties within the project area, the Ramsey Farm Barn, the Ramsey Farm, and the McKee House. In a meeting between NCDOT, FHWA and the North Carolina State Historic Preservation Office (NC SHPO) on September 15, 2010 it was

determined that the project would have no adverse effect on the Ramsey Farm Barn. The plans shown at the meeting also resulted in a no adverse effect call for the Ramsey Farm provided that no noise wall was constructed along the historic boundary and a landscape buffer could be planted by NCDOT at the owner's request during right of way negotiations. Lastly, the design plans confirmed that there was no adverse effect on the McKee House because there are no construction activities planned within or adjacent to the historic boundary. A copy of the concurrence form signed by NCDOT, FHWA and NC SHPO during the meet is attached. A review of the NC SHPO on-line mapper (http://gis.ncdcr.gov/hpoweb/) on June 20, 2019 showed no additional sites on the National Register of Historic Places of eligible for listing located in the project area since the 2010 meeting. The proposed I-3819B design in the vicinity of these historic properties is generally the same as the design considered by NCDOT, FHWA, and NC SHPO in 2010.

Archaeological Resources:
Per a memo sent from the North Carolina Department of Cultural Resources (dated March 5, 2004 and included in the EA), they conducted a review of the I-3819 project and are aware of no historic resources that would be affected by the project.

Section 4(f) Resources:
Three potential Section 4(f) resources were identified in the project study area and were subsequently evaluated for Section 4(f) applicability. These resources include Pressly Elementary School, Northview Elementary School, and a greenway owned by the City of Statesville. The Statesville Greenway/Museum Greenway traverses the project boundary and parallels Fourth Creek. The current design will maintain wide-enough bridges to allow for greenway crossings as in the preliminary design and outlined in the environmental documents' Project Commitments. As established in the Project Commitments for the project, retaining walls will be built along the shoulders of I-77 to minimize impacts to Pressly Elementary School. Retaining walls were built along I-40 to minimize impacts to Northview Elementary School as part of the I-3819A project.

Section 6(f) Resources:
There are two Section 6(f) properties within the project area: Albert B. McClure Park II and Martin Luther King Jr. Park (previously named Lakewood Park). There will be no construction activities or impacts within or adjacent to the Albert B. McClure Park II property. The fill slopes along the Martin Luther King Jr. Park property boundary were revised to steeper slopes (1.75:1) to avoid impacts to the park.

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. The mitigation site established for the I-3819A project in the northeast quadrant will be impacted by the proposed I-3819B project. NCDOT will coordinate with NCDMS and the USACE to reconcile the mitigation credits offset.

Avoidance and Minimization:
NCDOT has reduced impacts to wetlands and streams to the greatest extent practicable, however avoidance is not possible. Information regarding the avoidance and minimization efforts is also detailed in the 2006 EA, 2008 FONSI, and the 2011 Construction Consultation. Specific examples of avoidance and minimization measures for I-3819B include:

- Wetlands WC and WD and stream SJ in the southwest quadrant of the I-40/I-77 interchange will be bridged to minimize impacts. The ramps over wetland WD were redesigned and shifted from the NCDOT preliminary design to minimize wetland clearing impacts. The redesign/shift of the new bridge also completely avoids impacts to wetland WG. Fill slopes at either end of the bridge will not encroach into the jurisdictional wetland boundaries any more than practicable.
- Hand clearing will be used in wetlands WC and WD under and adjacent to the new bridge to avoid permanent impacts to the wetlands. The hand clearing areas on the east side of the bridge will be used as a means of construction access and steel and wood mats will be used in wet areas for construction equipment to avoid ground disturbance.
- A temporary pipe crossing of stream SJ will be used for construction access for the new bridge in the southwest quadrant. The pipe will be removed after construction and the stream will be restored to pre-construction contours to avoid permanent impacts to the stream.
- The bridge proposed to span Fourth Creek at Permit Site 5 is being lengthened beyond what is needed hydraulically and will span an additional length of wetland WD that would have been impacted by roadway fill. This bridge over Fourth Creek will be constructed from each side of the stream to avoid stream impacts associated with the construction of the bridge.
- Roadway fill slopes at a 1.5:1 ratio with rock plating will be used at Permit Sites 3, 4, 15, and 23 to minimize wetland and stream impacts to wetlands WD and WF, and streams SI, SX, and ST. In the other fill slope locations in wetlands and near streams, slopes have been designed at a 2:1 ratio to avoid and minimize impacts to wetlands and streams.
- The alignment of the ramp in the northeast quadrant from westbound I-40 to northbound I-77 was shifted to the south from the NCDOT preliminary design to avoid direct wetland and stream impacts within the NCDOT mitigation site and minimize impacts to the mitigation site buffer.
- An existing culvert under I-40 to the east of I-77 will be removed to daylight stream SK and a new bridge over the stream will be constructed.
- A temporary bridge will be used over stream SK for construction access for the new ramp in the northeast quadrant. The temporary bridge will completely span stream SK to avoid stream impacts.

- The new retaining wall at Permit Site 22 will be built along I-77 to minimize impacts to the stream ST. Construction of the retaining wall will be conducted from the road side of I-77 and not from the channel to minimize "in stream" activities in stream ST.
- Sedimentation and erosion control best management practices (BMPs) will be strictly enforced for the protection of wetlands and streams.
- Impacts of the project are minimized through the use of Type III clearing and grubbing which does not clear the entire right of way width.
- Eight preformed scour holes (PSH) will be utilized throughout the project (see SMP) to provide diffuse flow in locations surrounding Fourth Creek and adjacent wetlands.
- Nine dry detention basins will be utilized throughout the project (see SMP) to mitigate peak flow increases due to increase in impervious area.

Compensation:
The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent practicable as described above. Tables 2, 3, and 4 summarize the wetland and stream impacts for this project as well as a breakdown of the impacts requiring mitigation by the USACE and NCDWR. This project will permanently impact 1.41 acres of wetlands (0.02 acre from utility impacts) and 3,194 linear feet of streams (2,175 linear feet of permanent fill and 1,019 linear feet of bank stabilization). This project will temporarily impact 0.07 acre (394 lf) of streams.

Per Tables 2 through 4, the total mitigation required by the USACE is 1.41 acres of wetlands and 2,175 linear feet of streams. Total stream mitigation required by NCDWR is 1,407 linear feet. The DMS will provide compensatory mitigation for these impacts.

REGULATORY APPROVALS

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

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

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Erin Cheely at ekcheely@ncdot.gov or (919) 707-6108. A copy of this application and distribution list will also be posted on the NCDOT website at: http://connect.ncdot.gov/resources/Environmental/Pages.

Sincerely,

Philip S. Harris III, P.E., C.P.M.
Environmental Analysis Unit Head

cc:
NCDOT Permit Application Standard Distribution List

U.S. Army Corps of Engineers (USACE)

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

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

Form Approved - OMB No. 0710-0003 Expires: 01-08-2018

The public reporting burden for this collection of information, OMB Control Number 0710-0003, is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. 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 APPLICATION TO THE ABOVE EMAIL.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned. System of Record Notice (SORN). The information received is entered into our permit tracking database and a SORN has been completed (SORN #A1145b) and may be accessed at the following website: http://dpcld.defense.gov/Privacy/SORNsIndex/DOD-wide-SORN-Article-View/Article/570115/a1145b-ce.aspx

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

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME
First - Philip Middle - S Last - Harris III
Company - North Carolina Department of Transportation
E-mail Address -

8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Middle - Last -
Company -
E-mail Address -

6. APPLICANT'S ADDRESS:
Address- 1598 Mail Service Center
City - Raleigh State - NC Zip - 27699 Country - USA

9. AGENT'S ADDRESS:
Address-
City - State - Zip - Country -

7. APPLICANT'S PHONE NOs. w/AREA CODE
a. Residence b. Business (919) 707-6000 c. Fax (919) 250-4224

10. AGENTS PHONE NOs. w/AREA CODE
a. Residence b. Business c. Fax

STATEMENT OF AUTHORIZATION

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

_____ SIGNATURE OF APPLICANT _____ DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)
TIP No. I-3819B; Proposed I-40/I-77 interchange area improvements in Iredell County, NC

13. NAME OF WATERBODY, IF KNOWN (if applicable)
Fourth Creek, Morrison Creek, Gregory Creek, Beaver Creek, & UTs

14. PROJECT STREET ADDRESS (if applicable)
Address
City - State- Zip-

15. LOCATION OF PROJECT
Latitude: °N 35.809806 Longitude: °W 80.861192

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)
State Tax Parcel ID Municipality
Section - Township - Range -

17. DIRECTIONS TO THE SITE

See attached vicinity map and cover letter.

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

The I-3819B section involves the construction of a turbine interchange. The current interchange will be revised to a two-level turbine interchange replacing the loops in the NW and SE quadrants with directional ramps. New bridges will be constructed to accommodate the two-lane directional ramps for eastbound I-40 to northbound and southbound I-77. A new two-lane bridge will be constructed to accommodate traffic from westbound I-40 to southbound I-77. The ramp for eastbound I-40 to northbound I-77 will be constructed as a two-lane directional ramp. One loop ramp will remain and will be reconstructed in the SW quadrant to accommodate southbound I-77 to eastbound I-40 traffic. I-40 and I-77 will be widened from two- to three-thru lanes in each direction in the project area, with additional lanes constructed to accommodate the new interchange ramp. In addition, a new eastbound collector-distributor roadway will be constructed along the south side of I-40 between the existing US 21 interchange and the proposed turbine interchange. Improvements will be made to the existing eastbound I-40 ramp at SR 2158. The loop ramps from E. Broad Street to I-77 will be slightly realigned and ramps from northbound and southbound I-77 will be widened to accommodate one additional lane on each ramp.

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

The I-40/I-77 interchange is currently experiencing traffic capacity deficiencies and the diminished ability to function as a North Carolina Strategic Highway Corridor and United States Interstate System. The primary purpose of this project is to improve traffic flow along the I-40 and I-77corridors; and improve regional connectivity between Iredell County and points east, west, north, and south within North Carolina and across the Interstate system. In addition to operational improvements, there are several safety benefits associated with the proposed design.

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

20. Reason(s) for Discharge

Proposed impacts are required as a result of widening the highway and its shoulders, constructing redesigned intersections (directional ramps and bridges) and lengthening/replacing existing hydraulic structures within the project area.

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

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards

See attached cover letter/permit drawings.

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

Acres See attached cover letter/permit drawings.

or

Linear Feet See attached cover letter/permit drawings.

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

See attached cover letter.

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

Early works construction began in May 2019 in areas that would not impact jurisdictional wetlands and streams.

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

a. Address- See attached table and permit drawings

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

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

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

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

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

07/23/2019

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.

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
TIM BAUMGARTNER
Director

NORTH CAROLINA
Environmental Quality

July 12, 2019

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

Dear Mr. Harris:

Subject: Mitigation Acceptance Letter:

I-3819B, I-40 / I-77 New Interchange and Improvements, Iredell County

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the compensatory stream and wetland mitigation for the subject project. Based on the information supplied by you on July 11, 2019, the impacts are located in CU 03040102 of the Yadkin Fear River basin in the Central Piedmont (CP) Eco-Region, and are as follows:

Yadkin 03040102 CP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	2,175.0	1.41	0	0	0	0

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

This mitigation acceptance letter replaces the mitigation acceptance letter issued on May 20, 2018. DMS commits to implementing sufficient compensatory stream and wetland mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies in accordance with the In-Lieu Fee Instrument dated July 28, 2010. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from DMS.

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

Sincerely,

Beth Harmon

for James B. Stanfill
DMS Asset Management Supervisor

cc: Mr. Steve Kichefski, USACE – Asheville Regulatory Field Office
Ms. Amy Chapman, NCDWR
File: I-3819B

Section 404/NEPA Merger Project Team Meeting
Concurrence Point No. 2A – Bridging Decisions and Alignment Review
And
Concurrence Point 4A – Avoidance and Minimization

I-40/I-77 Interchange Area Improvements
Iredell County, North Carolina
Federal Aid Project No. N/A (formerly IMS-40-2)
WBS Element No. 34192.3.2
TIP Project No. I-3819B

Approximate lengths of bridges for the preferred alternative for I-3819B are included in the attached Table 1 and are referenced to the attached figure dated March 20, 2019.

Avoidance and Minimization

- Resources within the I-3819B project area that were committed to being partly or completely bridged as part of the May 13, 2008 CP 2A/4A Agreement are still being bridged under I-3819B.
- The design and location of the bridges left to construct under I-3819B at current Resource IDs 5, 7, and 8 have not changed substantially since 2008. Impacts to jurisdictional resources are avoided at these locations. An existing culvert under I-77 will be removed at ID 7 and replaced with a bridge, as originally planned.
- The bridge at current Resource ID 6 has shifted to the south as part of the tighter turbine interchange footprint. This shift avoids impacts to the restored wetlands and streams in the mitigation site in the northeast quadrant and minimizes impacts to the mitigation site buffer.
- Mainline I-77 has been shifted slightly to the east, resulting in minimizing impacts to wetland WD. This shift has resulted in a minor fill impact to Wetland WH on the east side of I-77. Wetland WD has been rated Medium in accordance with the NC Wetland Assessment Method. Wetland WH has been rated Low.
- The bridging to be done under I-3819B in the southwest quadrant has changed since the May 13, 2008 CP 2A/4A Agreement to be less extensive at current Resource IDs 1, 2, 3, and 4 since the tighter turbine footprint avoids a lot of the acreage of wetland that would have previously been bridged.
    - Based on the mapping from the 2008 CP2A/4A packet, there will now be less impacts to wetlands WC and WD (W15) from fill as a result of the turbine interchange footprint. In addition, wetland shading impact is reduced by about 1.0 acre in the southwest quadrant.
    - Wetland WG is now completely avoided by the turbine design (no fill or shading).

The Project Team has concurred on this date of March 20, 2019 with the approximate bridge lengths proposed for I-3819B. The Project Team also concurred on March 20, 2019 that Avoidance and Minimization efforts to jurisdictional feature and other important resources (i.e., the mitigation site in the northeast quadrant) were completed for the preferred alternative (Turbine Interchange).

USACE	DocuSigned by: Nicholle Braspennickx 6/7/2019	NCDOT	DocuSigned by: [signature] 6/5/2019
USEPA	DocuSigned by: Amanetta Somerville 6/10/2019	USFWS	DocuSigned by: Claire Ellwanger 6/5/2019
NCDWR	DocuSigned by: Donna Hood 6/10/2019	NCWRC	DocuSigned by: Marla Chambers 6/12/2019
FHWA	DocuSigned by: Donnie Brew 6/6/2019	SHPO	DocuSigned by: Renee Gledhill-Earley 6/5/2019

Meeting Minutes

I-40/I-77 Interchange

To: Concurrence Point 4B Merger Meeting Attendees

From: Everett Gupton, PE

Date: March 20, 2019

Location: NCDOT Structures Design Conference Room, Raleigh, NC

Subject: Meeting Minutes for Concurrence Point 4B Merger Meeting
I-40/I-77 Interchange
TIP Numbers I-3819B, U-6039

Attendees (* By teleconference) (**submitted comments by email prior to meeting)

Nicholle Braspennickx	U.S. Army Corps of Engineers (USACE)
Monte Matthews	U.S. Army Corps of Engineers (USACE)
Amanetta Somerville*	US EPA
Claire Ellwanger	US Fish and Wildlife (USFW)
Donna Hood	N.C. Division of Water Resources (NCDWR)
Marla Chambers**	N.C. Wildlife Resources Commission (NCWRC)
Tim McFadden	NCDOT Design-Build
Dan Duffield	NCDOT Design-Build
Erin Cheely	NCDOT Environmental Assessment Unit (EAU)
John Jamison	NCDOT Environmental Policy Unit (EPU)
Larry Carpenter*	NCDOT Division 12
Matthew Evans*	NCDOT Division 12
Mark Staley	NCDOT Roadside Environmental Unit
Anthony Moore	NCDOT TEA
Patrick Tuttle?	NCDOT L & S (Region III)
James Jeffreys?	NCDOT L & S (Region III)
Matt Miltner	Lane Construction
Everett Gupton	WSP
Adam Karagosian	WSP
Daniel Bridges	WSP
Jason Gorrie	WSP
Chris Davis	WSP
Jon Becker	WSP

A Concurrence Point 4B meeting was held on March 20, 2019 in the NCDOT Structures Design Conference Room at 1:00 pm. The primary purpose of this meeting was to review the submitted 4B plans and discuss significant design changes. A summary of the agenda and discourse is provided below.

Note that the original design which was presented at the 2A and 4A review stage is referred to as the "NCDOT preliminary design" and the current design being proposed for construction and review at this 4B meeting is referred to as the "WSP/Lane design".

The meeting began with attendee introductions. After which, Everett Gupton began a PowerPoint presentation which has been attached to these meetings in PDF format. During presentation of the PowerPoint, several topics were discussed.

- Everett began with an introduction of the project, and how it relates to the I-3819A project, and provided a timeline of the project history.
- Everett presented a project timeline and stated the full construction is anticipated in November 2019 while earlier construction work outside of jurisdictional areas may commence as early as April 2019. An exhibit is included at the end of the minutes displaying the areas of early work outside of jurisdictional areas. After the project history, he presented the environmental commitments from the EA.
- Exhibits were shown which highlighted which improvements were part of the I-3819A project, and how the current WSP/Lane design ties into the I-3819A project.
- Exhibits were also presented which compared the overall WSP/Lane design to the NCDOT preliminary design.
- For reference, Everett mentioned that the quadrants of the proposed turbine interchange are identified as follows:
    - Northeast Quadrant – “A”
    - Northwest Quadrant – “B”
    - Southwest Quadrant – “C”
    - Southeast Quadrant – “D”
- Daniel Bridges presented a few of the significant design changes, and the impetus for each. These changes include:
    - **Shifting I-77 (near the crossing with I-40) to the east:** This shift minimized wetland impacts within quadrant C, and allowed for shifting of ramp in quadrant A, closer to the existing I-40 alignment.
- Everett provided a preliminary table of impact quantities. For the proposed design, WSP expects a slight increase in stream impacts, but fewer wetland impacts.
- In quadrant C, Everett presented that the proposed bridge over the wetland “WD” is fewer lanes (2 lanes) than the NCDOT design (4 lanes). Additionally, the alignment was selected to limit the number of bents in the wetland. Additionally, rock plating is specified along select Ramp C fill slopes to minimize impacts due to fill. The WSP/Lane design impacts a longer stream segment. This is due to the revised ramp layout. An existing 54” RCP outfall will be replaced by a 60” RCP outfall further downstream. However, also due to the revised ramp layouts, proposed wetland impacts are significantly less than what was shown in the NCDOT preliminary design.
- In quadrant A, WSP/Lane proposed reduction in impacts to the existing mitigation area buffers (as outlined during the I-3819A project). Everett estimated that the current proposed slope stakes encroach nearly 100’ less into the mitigation area than the NCDOT preliminary design.
    - Nicholle Braspennickx asked if there was any credit given for the mitigation site buffer. Erin Cheely indicated that the difference between wetland/stream credit and buffer credit was not broken out. This detail will need to be quantified and developed further for the 4C meeting.
- Everett presented that in quadrant A, the WSP/Lane design incorporates a channel change, in order to eliminate the need for a box culvert under the ramps. As with the NCDOT preliminary design, the WSP/Lane design shows the removal of the existing dual 7x7 concrete box culvert under I-40, and replacing it with a bridge.

- Everett reiterated that the design changes in quadrant A primarily minimize impacts to the mitigation site, and eliminates the need for a proposed culvert. Instead of the culvert, a channel change will be required. This results in a net increase in quantity of stream impact, but results in an open channel, rather than a closed culvert.
- Donna Hood pointed out that the NCDOT preliminary design is what was previously signed-off on by the Merger Team.
- Donna wondered if there is any way that the design team can gain environmental credit as a result of removing the dual 7x7 box culvert. She also discussed the possibility for "natural channel elements" with Erin. Donna asked that WSP/Lane evaluate options for a more natural stream surface (e.g., constructed riffles), as opposed to simply dumping riprap in the channel. Matt Miltner agreed that WSP and Lane are open to evaluating such a design. Everett pointed out that the channel is very flat in this location. Dan Duffield expressed concern about impeding hydraulic conveyance. Donna asked that at the very least, the riprap along the new channel bed should be embedded. It was mentioned that discussions regarding the channel design will continue up to, and through the 4C meeting.
- Donna asked about a comparison of pre vs post-construction discharges, and expressed support for the use of stormwater detention basins. Everett mentioned that the WSP/Lane design currently incorporates 7 detention basins.
- Nicholle asked whether federal funds are being used for I-3819B. Erin indicated that I-3819 has a federal EA and FONSI but I-3819B is now state funded. The I-3819A project used federal funds for construction.

Following general discussion, Everett presented each 4B plan sheet where potential impacts to jurisdictional waters and wetlands exist. Marla Chambers provided comments through email. Those comments have been inserted in the appropriate locations below and responses included.

<u>Sheet 5</u>

Everett mentioned that the existing 60" CMP was filled with flowable fill, and replaced with 72" RCP during the I-3819A project. The WSP/Lane design does not propose significant permanent impacts to jurisdictional features in this area. The design simply proposes a new headwall to reduce impacts from the roadway fill slope.

<u>Sheet 7</u>

No impacts to jurisdictional features are proposed on this sheet. Everett presented that existing stormwater outfalls will be retained and utilized. The WSP/Lane design incorporates new riprap to ensure stable outfall locations prior to flow entering wetland "WAA".

<u>Sheet 9A</u>

Again, Everett mentioned that there are no impacts to jurisdictional features in this area. Existing storm drain boxes will be adjusted to match the new proposed road surface and an existing riprap spillway channel will be utilized as an outfall location near Fourth Creek.

<u>Sheet 10</u>

The WSP/Lane design incorporates a proposed bridge along YRPCA to span an existing UT to Fourth Creek and existing wetlands. Stormwater outfalls in this area will discharge to old sediment basins. The berms of these basins will be removed in a manner that ensures minimal velocities discharging into the wetland. Nicholle asked if interior bridge piers were displayed on the map. Bridge piers were not shown, but Daniel and Matt offered to provide an elevation view of the bridge, to display the span configuration and the pier locations as compared to the environmental features.

Everett mentioned that the proposed 60" RCP in quadrant C (southwest quadrant), which will replace the existing 54" RCP, will incorporate outlet protection to a length of 4 times the pipe diameter. Additionally, the 54" RCP will be removed where feasible, and the rest filled with flowable fill.

Donna mentioned that on the I-85 project, they had issues where their jack and bore conflicted with the replaced pipe, and the outlet ended up in a different location than initially intended. She asked that WSP/Lane confirm how much space is required between the existing pipe and the newly proposed alignment to ensure there are no issues during the jack and bore process.

Matt reiterated that only the portion under I-40 is jack and bore, the rest will be installed via an open cut. Matt confirmed the separation shown currently is within construction tolerances for this type of work.

Sheet 11

Donna asked that the design team modify the alignment of the proposed channel change, so that it does not intersect the existing stream at a 90 degree angle.

Marla Chambers Email Comment: "Suggest a better angle where the channel change outlets to the stream".

> The design build team confirmed that they will look to make a better intersection angle where the channel change enters Tributary 3 to 4th Creek.

Nicholle asked if the plan sheet showed a bridge over the mitigation site. Everett clarified that a bridge is not proposed here but roadway fill for the ramp is proposed in this location. Everett reiterated that the WSP/Lane design in this location does minimize impacts to the existing mitigation area, with significantly less impact than the NCDOT preliminary design.

Everett presented that there is an existing bridge over tributary 3 along Ramp D from the I-3819A project. Our work along that bridge will be limited to shoulder pavement reconstruction.

Everett presented that an existing detention basin in the quadrant will be utilized to provide peak flow reduction, and Donna voiced her support.

Sheet 12

Marla Chambers Email Comment: "about station 122, is there a jurisdictional stream involved, being put in the stormwater system?"

> After a brief review of the blue line on this sheet, as presented on the 4B plans, Adam Karagosian and Erin confirmed that the line did not represent a jurisdictional feature.

Sheet 15

Everett mentioned that this sheet portrays the eastern extents of the project, and that although the design utilizes an outfall to an existing wetland, it does not require any physical adjustment of the storm drainage system in that area.

Donna asked for clarification on the large ditch drawn between the "L" alignment and the "Y15RPB" alignment. Everett mentioned that it may not necessarily be that steep, but both Dan and Everett mentioned that it is fairly deep.

Sheet 16

Everett mentioned that temporary impacts will be required along the eastern edge of I-77, in order to install rock plating (and a 1.5:1 slope). However, there should be no permanent impacts in this area. Donna stated that the stream in this location showed signs of degradation and stress. Donna stressed that constructing the rock plating in this location will be a challenge. Erin indicated the stream in this location is intermittent until it crosses under I-77 to the west.

Sheet 17

The WSP/Lane design continues the slope protection (rock plating) through to the existing culvert at station 37+50. The design also incorporates a supplement to the existing pipe.

Donna asked if the supplement is big enough. She was concerned about the function of the creek, and how far apart the pipes might end up. Erin asked that in the 4C meeting WSP/Lane show worst case scenario for jack and bore. She mentioned it is easier to show "more" impacts, in case the jack and bore ends up a bit further from the existing culvert than expected.

Everett confirmed that the permit drawings will show impacts for a graded bench. This will provide a conservative estimate of the impact area, in case the jack and bore ends up further than expected from the existing pipe. As such, the design is less likely to require permit modifications.

Dan asked if the design could incorporate the standard 500 feet of bank stabilization. Donna stated that she was not overly concerned about permitting of stabilization. Ensuring the stabilization measures work well, is more important.

Adam asked if stabilization could tie in to the toe of the stream (below the ordinary high water mark). Erin confirmed that such stabilization would be a permanent impact, but would not require mitigation.

Everett moved on to second cross-pipe supplement location on the same sheet (Station 47+00) and another detention basin. In the vicinity of this second supplement, Erin confirmed that the small segment between the existing 54" RCPs east of I-77 is jurisdictional.

Donna mentioned that this area is very flashy and asked that the design team evaluate larger pipes, or at least to ensure that the inlet and outlet areas will remain stable.

Everett briefly mentioned the current design criteria, and that junction boxes will be utilized to ensure stable conveyance.

Sheet 19

Everett began with discussion of the triple box culvert extension and highlighted the Broad Street bridge replacement. He also mentioned the location of the retaining wall to limit impacts to the stream.

Everett mentioned that there will be temporary impacts during construction of the retaining wall, but permanent impacts will be avoided where possible.

Matt mentioned that WSP/Lane are currently evaluating wall types, and are conducting soil borings right now.

Donna asked if the existing concrete slope protection under the Broad Street bridge would be removed. Daniel and Everett presented the proposed channel geometry and bank material. Everett also mentioned that the pier will be located on the bench. Everett mentioned that a channel change will be required beneath the bridge.

Daniel offered to provide an elevation view of this bridge as well. Everett shared an image from the current BSR which displayed the proposed layout, the slopes of the stream bank, and dimensions in relation to the proposed wall.

Everett mentioned that the impacts in this area are consistent with what was shown in the NCDOT preliminary plan. The WSP/Lane design does shorten the length of the retaining wall by approximately 400' (1300' total instead of 1700' total).

Erin asked if Everett could quickly address Marla's comment about the flow distribution between the three culverts. Everett mentioned that we could evaluate design options, but there would likely be issues with the base flood elevation if the design incorporated sills, floodplain benches, etc. Since this is a culvert extension designing sills and floodplain benches is not practical.

Sheet 20

Everett showed the detention basin in this area. Donna asked for clarification of the material of the spillway. Everett confirmed that it will be riprap lining.

Chris Davis mentioned that it is likely a City of Statesville easement in this area.

Erin and Donna wanted to confirm that riprap in the bed will be embedded.

Marla Chambers Email Comment: "lower left corner, 42" CSP & 5' basin coming from dry detention basin appear to cross stream ST, rather than come to the edge of it. Also outletting flow at a perpendicular angle to the stream – may need protection on opposite bank or angled differently. Also 5' basin at outlet of 66" CMP – basin rock should be imbedded in the stream bottom, if not already. Center of page – new 48" welded steel culvert – outlet should connect to the existing stream, rather than a riprap pad."

Sheet 21

Everett pointed out wetland impacts near the US-64 bridge. Everett mentioned that the shift of I-77 begins in this area and slightly increased wetland impacts here would be offset by decreased impacts in quadrant C.

Sheet 22

Everett highlighted the layout of the YRPAC bridge in the southwest quadrant, and explained that the horizontal alignment, and span configuration had been selected to minimize impacts to the wetland. Specifically, the alignment crosses in a narrower segment of the wetland, where one fewer bent would be constructed within the wetland boundary that in an earlier WSP/Lane Team configuration. Additionally, the WSP/Lane design impacts one small/skinny wetland on the east side of I-77, but it is more than offset by reduction of impacts along the west side of I-77.

Sheet 23

The WSP/Lane design requires some impact to the existing mitigation area buffer, but not to the jurisdictional resources on this sheet.

Donna asked how that reduction in impacts will be quantified and assessed. Erin and Nicholle will discuss if that is on a square footage basis. According to Erin, this mitigation site offset impacts for only the I-3819A project. She briefly mentioned that DMS may require re-payment for any impacts to the mitigation site.

After seeing another detention basin, Donna reiterated her support for them, and would like to see the level of storage and treatment provided by these basins.

Sheet 24

Everett mentioned that we are supplementing an existing 48" pipe with a proposed 42" pipe. Everett mentioned that the WSP/Lane design will utilize a trenchless pipe, a proposed headwall, and the existing riprap.

Erin suggested that modifications to the riprap at the outlet would be bank stabilization impacts in the mitigation area. The rest of the group appeared to agree.

Sheet 27

Everett mentioned that the northern extent of the current WSP/Lane design does not cross/impact stream "SR".

After completing the review of individual plan sheets, Everett opened the floor for discussion or comment.

- Nicholle asked for information on associated projects. Erin confirmed there are no permits required for the U-6039 portion of the project. Everett showed the location of the U-6039 project.
- Nicholle asked if the project area has changed. Erin confirmed that the project area has not changed.
- Nicholle pointed out that the DOT and Merger Team previously agreed that this would be a modified Merger process. Erin mentioned that concurrence for I-3819 included both CP 2A (bridging) and 4A and the merger process began at CP 2A/4A. CP 1, CP 2, and CP 3 were not included in previous merger discussions and decisions. .
- Erin and Donna discussed the 54" pipe in the southwest quadrant which was proposed to be retained in the NCDOT preliminary design, but is proposed for replacement in the WSP/Lane design. They noted that the existing 54" RCP was not large enough at the time to be included in the previous CP 2A decision.
- Nicholle asked when WSP/Lane would be submitting a permit application. WSP/Lane offered to check the schedule, but estimated a June timeframe.
- Donna mentioned that any significant design changes should be brought back to the merger team for review. That has not yet been done. She admitted that the WSP/Lane team has just recently developed a final design. She asked that an overview of the significant design changes be attached to the meeting minutes. The overview could then be reviewed and signed for administrative purposes.
- Erin offered a comparison of the two designs (what was presented for 2A, vs. the current WSP/Lane design).
- Erin said that the Team will resend the 2A/4A materials with the meeting minutes, for re-signature/finalization.
- Nicholle asked about the presence of threatened and endangered species. Erin indicated three species are listed and none are an issue. The updated NRTR (2018) found no heartleaf. Bog turtle is not an issue here. Northern long-eared bat is not an issue. Erin will check but believes a SLOPES memo has been completed. Monte Matthews confirmed that since FHWA signed off on the NEPA doc that they will be the lead on the NLEB. Erin will check to see if clearance has been provided to satisfy FHWA.
- Dan (Duffield) asked for confirmation about why we need to re-send the 2A/4A forms for signature. Donna and Erin mentioned that the forms will simply present the revised footprint, so that the signed 2A documents are in line with the current proposed design.
- Daniel (Bridges) asked for, and received, confirmed that even though the 2A/4A forms need to be re-sent for signature, the design can progress toward 4C.
- The updated 2A/4A form should describe "avoidance and minimization"
- Donna asked that WSP/Lane "keep it simple" on the 2A and 4A forms and simply show the footprint of the NCDOT preliminary design and the footprint of the WSP/Lane design.
- Adam asked for, and received, confirmation that 2A/4A goes through docusign only to those that need to sign. Everyone else will only receive the meeting minutes.
- Donna asked about utility impacts. Daniel (Bridges) mentioned that there is a tower carrying power lines that will need shifted. He also mentioned that the design will relocate the sewer line that is currently running through the dual 7x7 box culvert, which will be replaced by a bridge.

Daniel also mentioned a sewer relocation at broad street. Daniel reiterated that the only utility impacts outside of the project construction area is the one tower that needs to be relocated.

- Dan (Duffield) asked if anyone had final comments.
- Meeting closed with no further comment.

Meeting Minutes

I-40/I-77 Interchange

To: Concurrence Point 4C Merger Meeting Attendees

From: Everett Gupton, P.E.

Date: June 20, 2019

Location: NCDOT Structures Design Conference Room, Raleigh, NC

Subject: Meeting Minutes for Concurrence Point 4C Merger Meeting
I-40/I-77 Interchange
TIP Numbers I-3819B, U-6039

Attendees (* By teleconference)

Nicholle Braspennickx*	U.S. Army Corps of Engineers (USACE)
Donna Hood	N.C. Division of Water Resources (NCDWR)
Robert Patterson	N.C. Division of Water Resources (NCDWR)
Tim McFadden	NCDOT Design-Build
Erin Cheely	NCDOT Environmental Analysis Unit (EAU)
John Jamison	NCDOT Environmental Policy Unit (EPU)
Larry Carpenter*	NCDOT Division 12
Matthew Evans*	NCDOT Division 12
Mark Staley*	NCDOT
Jeffrey Wyatt*	NCDOT
James Tortorella*	NCDOT Roadway Design
James Jeffreys*	NCDOT Division 12 Locating Engineer
David Stutts	NCDOT Structures Management
Rodney Gantt	NCDOT Division 12 Staff Construction Engineer
Jim Seybert	Lane Construction
Matt Miltner	Lane Construction
Everett Gupton	WSP
Adam Karagosian	WSP
Daniel Bridges	WSP
Chris Davis*	WSP
Jon Becker	WSP

A Concurrence Point 4C meeting was held on June 20, 2019 in the NCDOT Structures Design Conference Room at 10:00 am. The primary purpose of this meeting was to review the submitted 4C permit plans. The following summarizes what was discussed.

The meeting began with a brief project description by Everett Gupton followed by attendee introductions. (both on the phone and in the room).

Everett went through a brief agenda and a brief project history with some key dates. Early works construction commenced in later April, 2019. Additionally, Everett showed aerial photos of existing conditions as well as the preliminary design vs. our current turbine design. He mentioned the goal of the changes regarding minimizing impacts to the I-3819A mitigation site in the northeast quadrant and the wetlands in the southwest quadrant.

Everett gave an overview of the Design Build Team's (DBT) stormwater management strategy that includes 9 detention basins, preformed scour holes, and vegetative conveyance to help with water quality and peak flow reduction.

Following general discussion, Everett presented each permit plan sheet where impacts to jurisdictional waters and wetlands are proposed. Everett also mentioned that Site 1 was determined to not be an impact and as such has been removed.

Sheet 2-9 (PSH 10): Sites 2 & 3 -

At Site 3, the DBT is proposing rock plating at a 1.5:1 slope to minimize stream and wetland impacts. The permit plans show fill impacts to the new pipe outfall. Donna Hood mentioned that the geotextile shown in the bed will need to be removed from the outlet stabilization. Additionally, the endwalls for the 30" and 60" pipes will need to be combined into a single endwall.

At site 2, Everett reviewed the proposed bridge construction. Donna suggested bank stabilization in SJ, near proposed bridge bent, since it will be close to the existing top of bank.

Donna wondered if any sun would reach under the bridge. Everett mentioned that the bridge has a minimum of 5-6 ft of clearance above existing ground. Everett displayed the bridge profile.

Sheet 10-21 (PSH 11): Sites 9, 10, 11, & 12 -

At site 12, Everett indicated that the DBT is proposing small impacts only as needed to remove the culvert. Donna asked about the detail, which Everett presented, and was approved by all.

Everett moved on to sites 9 and 10, presenting the channel change and the detail for the channel change. Donna asked about the details which she mentioned looked good. She also asked about the proposed slope of the new channel. Everett mentioned that it is approximately 1.4%. Donna mentioned that additional structures may be required in the field, to hold the grade and ensure stability. Donna indicated if large storm event comes through, the DBT may have to modify in the field.

Everett moved on to site 10 specifically, to talk about the outfall of the channel change to the proposed stream. Donna said that it was good to outlet at the normal water surface elevation. She mentioned that it might be worth it to look at stabilization on the opposite bank. Everett talked about the potential for overtopping in Tributary 3 if stream is ever flowing deep so that will help dissipate energy.

Sheet 22-25 (PSH 16): Sites 14 & 15 -

At site 14, the DBT is proposing adding stabilization since the last stick of the existing 48" pipe had fallen in. Donna mentioned there is a big scour hole at the end of an existing pipe. Matthew Evans confirmed it is the 24" coming from the south at around Station 31+00 (from the car dealership lot). Everett mentioned that is past our limits of reconstruction.

Everett moved on to site 15, where he presented proposed 1.5:1 slopes and rock plating to limit stream impacts. The DBT is proposing riprap at embankment at the end of a proposed pipe which is replacing an existing pipe outfall. Everett mentioned that the current drainage crossing the road will be re-routed. The 18" CMP will not be retained.

Sheet 26-29 (PSH 17): Sites 16, 17, 18, & 19 -

Everett presented that at Sites 16 and 17, the DBT will be supplementing the 54" pipe with a 42" pipe. Donna asked about the headwalls. Everett mentioned that the DBT is currently showing trenchless installation, but the DBT may be able to open cut it and lay the pipes closer together. Donna agreed, that it is good to show a little space if boring the pipe, but the DBT can move it closer if this location is open-cut. She just asked that the headwalls be combined if any closer together. If they remain 10-12 feet apart, just stabilize with big rock to limit erosion. Everett mentioned that site 16 is the inlet site, and site 17 is the outlet side. The DBT proposes more riprap at the outlet side. Donna asked to confirm if it was a ditch coming in from the south which was confirmed. At Site 16 Robert Patterson asked if the

inlet pipe into the SWM basin could be moved away from the outlet pipe. Everett indicated that this change has already been made and will be reflected in the final plans.

Everett moved on to site 19, where an existing 54" pipe with sufficient capacity is proposed to be retained and extended. He mentioned there is currently a small segment of stream between them, which could not be maintained given our slope stakes. Donna mentioned that she does not like small segments of open stream between pipes and is good with the new pipe section here. Donna asked why the pipes were zig zagging. Everett mentioned that the pipes were set to work out geometry into the box, and to limit HGL issues. Donna agreed, that small stream segments between pipes are not necessarily high quality, and there is not a huge issue with combining this to one closed system.

Everett moved on to site 18, where the DBT proposes a junction box to help with elevation. Robert asked to extend toe protection to the 15" CSP (north of dissipater basin). Donna asked how much the pipe in the junction box is being lowered. Everett checked and said that there is about 5 feet of drop in the junction box and is needed due to a large scour hole. Donna asked to confirm that the ultimate pipe outfall comes out AT or BELOW stream elevation. She just wants to make sure that energy dissipater does what it is supposed to. Everett presented the detail of the basin.

Matt Miltner asked that WSP provide a callout in the plans to label the drop box in this location.

Sheet 30 – 36 (PSH 19): Sites 20, 21, 22, & 23 -

Everett briefly discussed the impacts. He started with mentioning the Broad Street bridge replacement and the culvert extension.

Everett started the presentation of this area with site 20. He mentioned there is an existing pipe carrying an unnamed tributary to Tributary 2. Everett mentioned that the design proposes a change to open conveyance with a channel change to carry it to Tributary 2.

At Site 21, Everett mentioned that the DBT is performing some bank grading in this area to accommodate the culvert extension and improving bank slopes. Class 2 on the banks and native bed material to fill scour holes is proposed. Donna asked to confirm the hatching was impact. She also asked that the stream alignment be adjusted to include a more natural curve of the channel change into the Tributary 2 upstream of the culvert extension.

Everett moved on to Site 22, and presented that it includes the culvert extension, the channel change under the bridge, and the stabilization along the retaining wall.

Everett moved through them one at a time: extension, stabilization, channel change, etc.

He mentioned that the bed elevation modifications were only as needed to connect the two in a stable profile. He mentioned that once the channel change ends, the DBT is only proposing class II riprap from wall bottom to toe of stream. Everett showed the detail. Donna asked about access during construction. Matt Miltner and Jim Seybert confirmed that construction will be done from the road side and not from the stream channel. Everett mentioned that the wall excavation will be performed to the depth recommended by the Geotech team, and riprap will be placed to re-stabilize the bank.

Jim confirmed there are two options to accomplish all work from the road side.

Everett mentioned that the DBT is assuming this long stabilization does not require mitigation, stating the stabilization will eliminate the presence of bank erosion occurring currently. Donna, Erin Cheely, and Nicholle Braspennickx started discussing if this area is mitigable. Nicholle indicated she is not willing to commit at this time to a decision and asked for Donna's opinion. Donna indicated she would want see the final permit application submittal first, before making a commitment; Nicholle agreed. However, based on what they have seen in the creek so far, Donna is leaning toward not requiring mitigation. Nicholle has a similar opinion, that it does not seem mitigable, but they will not be able to commit at this point. Nicholle and Donna confirmed that if stream bank stabilization does require mitigation, it will be site specific, not cumulatively for the whole project.

Adam asked to confirm if embedded riprap in bed requires mitigation. Donna and Nicholle said yes, it does require mitigation.

Daniel Bridges asked to confirm when and how that decision would be made. Donna mentioned that the DBT should submit the permit as is, assuming no mitigation, and she would inform the team if mitigation would be required and at what ratio (i.e., likely either 1:1 or 0.5:1). Donna also mentioned the possibility of not requiring mitigation for the entire 850+lf of bank stabilization in this area.

Everett moved on to site 23, where the DBT is proposing 1.5:1 slopes with rock plating and temporary impacts only to ensure sufficient space for construction.

Sheet 37 – 40 (PSH 20): Sites 24 & 25

Everett presented Site 25, where there is a 66" RCP extension and junction box just upstream of an existing CMP (the survey shows the existing CMP as 60" but it was measured in the field as a 72"). He mentioned that the DBT is currently proposing a nearby detention basin, but water table tests are being performed to confirm if it is a feasible location.

Donna asked about the discharge into and out of the basin. Everett mentioned that the 50yr in is 36 cfs and out is 28 cfs. Erin and Everett discussed that the outfall of the basin should be drawn as outlet stabilization instead of riprap pad.

Sheet 41 – 45 (PSH 21): Site 26

Everett presented Site 26 where the DBT is proposing a total impact of the wetland along the fill slope. No other comments were made about this site.

Sheet 46 – 57 (PSH 22): Sites 4, 5, 6, 7, & 8

Everett presented the title sheet to illustrate where these sites are. Everett started with Site 4, where the DBT is showing mechanized clearing due to the proposed slope stake's proximity to the wetland. He then presented Site 5 and described the dimensions of the impacts the DBT is showing for the proposed bridge over the wetland. Currently, the DBT is proposing fill impacts at the interior bent locations with mechanized clearing offset 5 ft on either side. The remainder of the area under the bridge and 50 ft on either side of the bridge face is being proposed as hand clearing. Everett also mentioned that the DBT will be using a temporary pipe across the existing stream (SJ) for access. Donna asked how the DBT will be accessing the site. Matt confirmed that steel and wood mats would be used in the wet areas.

Nicholle asked the DBT to confirm if an access road is needed or if the DBT is using mats in wet areas. Matt Miltner again confirmed that mats will be used to traverse wet areas. The hand clearing areas on the east side of the bridge will be used as a means for construction access.

Everett moved on to Sites 6 and 7, where the DBT is proposing riprap at embankment impacts. Everett mentioned that these are the only proposed impacts to Fourth Creek on the project. The new bridge over Fourth Creek will be constructed from each side of Fourth Creek without additional impacts.

Everett moved on to Site 8 impacts, which includes a small section of wetland that is proposed to be impacted by a fill slope. No one had comments about this site.

Everett briefly moved through the cross sections and profiles to show the elevations of the bridges.

Sheet 58-61 (PSH 24): Site 13

Everett discussed the drainage system changes, and that the DBT no longer needs a jack and bore. Everett pointed out that this impact site is within the I-3819A mitigation site. He mentioned that a combined headwall for a proposed 24" pipe next to the existing 48" pipe at the outfall is being proposed. Everett then discussed the existing riprap in this location, and that the DBT will just be supplementing it with more riprap and grading a bench.

Donna again reiterated that no geotextile be shown in streambeds, ANYWHERE in jurisdictional stream impact site. The DBT will revise details accordingly.

Adam asked to confirm how that impact is being listed, and if bed stabilization is appropriate. Erin and Donna agree that the detail should be adjusted to label the "existing riprap".

Sheet 62 – 65 (PSH 27): Site 27 -

Everett moved on to site 27 where the DBT is extending an existing 60" RCP. Erin pointed out that this is new since 4B meeting. No comments were made at this site.

Sheet 66 (Impact Summary Table 1): Sites 1-18 -

Everett briefly displayed the impact table. No specific comments were made.

Sheet 67 (Impact Summary Table 2): Sites 19-27 -

Same as above.

Utility Sheets –

Everett started by describing Site U-1. At this site, the DBT is proposing a sanitary sewer relocation to remove the sanitary sewer line from the box culvert prior to being able to remove the culvert. Everett mentioned that the proposed pipe will be bored under the road (I-77). He showed the proposed alignment, how it will be constructed, where it will cross the wetland (WJ), and where it will tie to the existing sanitary sewer.

He then moved on to Site U-2 which encompasses the Duke transmission tower relocation. He mentioned that the existing tower will be relocated, and the DBT is showing an access path along the edge of their easement, to minimize wetland impacts. He mentioned that the DBT is showing a permanent fill impact for the new tower.

Adam pointed out that coordination with the Duke is on-going, and the impacts being shown are our best estimate of impact location at this time.

Nicholle asked for clarification on what the access path entails. Daniel mentioned the DBT just received plans from Duke, and that the DBT is not sure how they are clearing. In subsequent conversations with Duke Energy, access through jurisdictional areas will be accomplished through the use of mats. In addition, the proposed construction of the tower will result in permanent impacts from four 4'x4' footings for the tower. The remaining area around and under the tower will be used as the work area and covered in mats as appropriate.

Nicholle asked if the DBT will be monitoring the Duke work. Duke will be doing the work, but no one is sure how the permit will be set up to ensure the appropriate responsibility/liability for the parties involved.

Nicholle asked why the DBT is showing an access road here when access roads are not shown in impact site #5. that is Nicholle asked why the DBT is hatching the access road in the Duke ROW. Adam clarified that this hatched area will simply be for access through this jurisdictional area; the expectation is for Duke to drive across this area and have some soil disturbance, therefore it would be a temporary impact. Daniel clarified that the DBT requested them to use the south side of the easement to minimize wetland area impacts.

Erin asked the DBT to confirm that Lane's proposed access roads are within areas hatched as hand-clearing impacts. Everett and Adam confirmed this. Erin then reiterated that is why access roads are not shown in impact site #5, since they are within the hand-clearing impacts. Everett asked for clarification if the DBT can stop the Duke access road at our limits of hand-clearing. Erin instructed the DBT to show separate impacts, but label that it overlaps with other impacts so that they are not double counted.

Adam pointed out that an area within Site 5 does not contain trees and is very wet. This area is identified as hand clearing impacts. Adam asked if it needs to be classified differently depending on how many trees will be cut down. Erin clarified that the question is whether hand clearing in areas

where there are no trees needs to labeled/quantified differently. Donna indicated that identifying this area as “hand clearing” is acceptable.

Nicholle likes that hand clearing marks the limits of “authorized” activities and mechanized clearing around bridge bents is shown.

Everett asked if temporary impacts are fine around the tower being removed. Erin said that temporary seems fine, just give them room around the tower to work. {Note: In subsequent conversations with Duke Energy, Duke staff informed the DBT that the removal of the existing tower would result in the existing footings being hand excavated and “cut-off” 3-4 feet below existing ground.}

Donna asked the DBT to confirm that drawings submitted for the permit are the same ones given to field staff.

Proposed Early Works

Everett moved on to early works locations. He mentioned that not all blue shown represents jurisdictional features, and that all drainage infrastructure is shown in blue.

Everett showed that the majority of early work is along I-40, east of tributary 3. End bent work will be done over tributary 3, with no impacts, since there is an existing box culvert in this location. Everett moved on to ramp D, where the DBT is staying away from wetland impacts. Also, the DBT is showing early work along ramp AC, but again, it is not near any jurisdictional areas.

Miscellaneous Items

Donna asked about the concrete plant. Jim confirmed that the concrete plant will be in a location other than the first one proposed.

He also mentioned that fly ash would be contained. Donna said another site would be more agreeable.

Daniel mentioned that the new site is not by any jurisdictional features, and it is out of the floodplain.

Nicholle asked when the permit will be submitted. Adam mentioned that it will be submitted to DOT for review within the next week or two and it will be several weeks before it is submitted to the agencies

Erin will work on accounting for the impacts to the existing mitigation site. Donna confirmed that no significant portion of the mitigation site will be impacted. Adam asked if the DBT needs to include any information in the permit application specific to the impacts to the mitigation site, and if/how it will be reconciled with the “A” project. All agreed that the impacts to the mitigation site should be mentioned.

Nicholle said, feel free to reach out with any questions.

Federal Aid #: **IMS-40-2** *TIP#:* **I-3819** ***County*: Iredell**

CONCURRENCE FORM FOR ASSESSMENT OF EFFECTS

Project Description: Improvements to I-40/I-77 Interchange in Statesville

On September 15, 2010, representatives of the

- [x] North Carolina Department of Transportation (NCDOT)
- [x] Federal Highway Administration (FHWA)
- [x] North Carolina State Historic Preservation Office (HPO)
- [ ] Other

Reviewed the subject project and agreed on the effects findings listed within the table on the reverse of this signature page.

Signed:

Mary Pope Furr — 9/15/2010

Representative, NCDOT — Date

Donald W Brown — 9-15-10

FHWA, for the Division Administrator, or other Federal Agency — Date

Representative, HPO — Date

Renee Gledhill-Earley — 9-15-10

State Historic Preservation Officer — Date

Federal Aid #: **IMS-40-2** *TIP#:* **I-3819** *County*: **Iredell**

Property and Status	Effect Finding	Alternative	Reasons
Ramsey Farm (DE)	No Adverse Effect	all alternatives	no noise wall along property boundary - retaining wall will require soil nails - access to property from south - landscape buffer available @ owner's request
McKee House (DE)	No Effect	all alternatives	no constuction activities within or adjacent to historic boundary
Ramsey Farm Barn (DE)	No Adverse Effect	all alternatives	no constuction activities within or adjacent to historic boundary.

Initialed: NCDOT MPJ FHWA DB HPO Rye

☑ FHWA intends to use HPO's call of "No Adverse Effect" as the basis of a "de minimis" finding for the following properties, pursuant to Section 4(f): FHWA initials DB

Ramsey Farm

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element:	34192.3.2	**TIP No.:**	I-3819B / U-6039	**County(ies):**	Iredell	**Page**	1	**of**	6

General Project Information

WBS Element:	34192.3.2	**TIP Number:**	I-3819B / U-6039	**Project Type:**	Roadway Widening	**Date:**	3/13/2019
NCDOT Contact:	Dan Duffield			**Contractor / Designer:**	WSP		
Address:	Design-Build 1595 MAIL SERVICE CENTER(MAIL) RALEIGH, NC 27699-1595			**Address:**	434 Fayetteville St, Suite 1500 Raleigh, NC 27601		
Phone:	(919) 707-6611			**Phone:**	(919) 836-4071		
Email:	dcduffield@ncdot.gov			**Email:**	everett.gupton@wsp.com		
City/Town:	Statesville, NC			**County(ies):**	Iredell		
River Basin(s):	Yadkin-Pee Dee			**CAMA County?**	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	4.00	**Surrounding Land Use:**	Existing Interstate with commercial, residential, agricultural uses surrounding

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	184.5 ac.	107.1 ac.
Typical Cross Section Description:	I-40: Three 12' lanes EB & WB with 12' FDPS and Median Barrier - concrete I-40 EB CD: Two 12' lanes with 10' interior and 4' exterior FDPS - concrete I-77: Three 12' lanes NB & SB with 12' FDPS and Median Barrier - OGFC Broad St. (Y9): 4 lane divided w/ center turn lane and center island	I-40: Two 12' lanes EB & WB (typical) with grass median I-77: Two 12' lanes EB & WB (typical) with grass median Broad St: 4 lanes w/ center turn lane
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: Year:	Existing: I-40: 65,000, I-77: 64,000 Year: 2017

General Project Narrative: (Description of Minimization of Water Quality Impacts)

The Design-Build Project I-3819B/U-6039 will provide the ultimate I-40/I-77 interchange improvements and access management solutions on SR 2321 (East Broad Street) from Vine Street to SR 2422 (Signal Hill Drive). The project will also 1) provide I-40 collector-distributor roadways between the US 21 and I-77 interchanges, 2) modify the I-77 / East Broad Street interchange, and 3) widen I-77. No direct discharges from proposed bridges to jurisdictional streams are proposed on the project.

Project is utilizing vegetative conveyance to the maximum extent practical while utilizing the use of dry detention basins to mitigate peak flow increases due to increases in impervious area. In total, 9 dry detention basins are proposed on the project providing treatment for 2.2 ac-ft of volume at and average precipitation depth of 1.25 inches over the impervious area treated. In addition, 8 preformed scour holes are being utilized to provide diffuse flow in locations surrounding 4th Creek and adjacent wetlands.

In the NW quadrant of the I-77/I-40 interchange, the project involves removing a 2@7x7 RCBC conveying an unnamed tributary of Fourth Creek under I-40 and replacing it with a bridge. Under the bridge, a constructed channel consisting of CL II riprap for stablilty will replace the existing culvert. Upstream of the new bridge on I-40, a new bridge will be constructed over the same unnamed tributary to carry ramps from westbound I-40. South of the I-77/I-40 interchange, a new bridge will be constructed on I-77 over Fourth Creek, replacing the existing bridge.

The project also includes the replacement of the Broad Street bridge over I-77 and an unnamed tributary to 4th Creek which includes armoring the stream banks and some of the stream to stablize it with class II riprap. Upstream of the Broad Street bridge, an existing 3 @9'x11' RCBC will be extended on the upstream and downstream end under I-77. This culvert to will have some armoring done at the inlet and outlet to stabilize the channel.

Waterbody Information

Surface Water Body (1):	Fourth Creek	**NCDWR Stream Index No.:**	12-108-20		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	Fourth Creek		**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

WBS Element: 34192.3.2 **TIP No.:** I-3819B / U-6039 **County(ies):** Iredell

Additional Waterbody Information

Surface Water Body (2):	UT to Fourth Creek		**NCDWR Stream Index No.:**	12-108-20	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	Stream SI			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (3):	UT to Fourth Creek		**NCDWR Stream Index No.:**	12-108-20	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	Stream SJ			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (4):	UT to Fourth Creek		**NCDWR Stream Index No.:**	12-108-20	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	Stream SK			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (5):	UT to Fourth Creek		**NCDWR Stream Index No.:**	12-108-20	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	Stream SL			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

WBS Element: 34192.3.2 **TIP No.:** I-3819B / U-6039 **County(ies):** Iredell

Additional Waterbody Information

Surface Water Body (6):	UT to Fourth Creek		**NCDWR Stream Index No.:**	12-108-20	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	Stream SR			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (7):	UT to Fourth Creek		**NCDWR Stream Index No.:**	12-108-20	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	Stream ST			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (8):	UT to Fourth Creek		**NCDWR Stream Index No.:**	12-108-20	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	Stream SU			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (9):	UT to Fourth Creek		**NCDWR Stream Index No.:**	12-108-20	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	Stream SW			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

WBS Element: 34192.3.2 **TIP No.:** I-3819B / U-6039 **County(ies):** Iredell

Additional Waterbody Information

Surface Water Body (10):	UT to Fourth Creek		**NCDWR Stream Index No.:**	12-108-20	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	Stream SX			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (11):	UT to Fourth Creek		**NCDWR Stream Index No.:**	12-108-20	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	Stream SBA			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (12):			**NCDWR Stream Index No.:**		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**			
		Supplemental Classification:			
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?		Comments:			
NRTR Stream ID:				**Buffer Rules in Effect:**	
Project Includes Bridge Spanning Water Body?		**Deck Drains Discharge Over Buffer?**		**Dissipator Pads Provided in Buffer?**	
Deck Drains Discharge Over Water Body?		(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (13):			**NCDWR Stream Index No.:**		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**			
		Supplemental Classification:			
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?		Comments:			
NRTR Stream ID:				**Buffer Rules in Effect:**	
Project Includes Bridge Spanning Water Body?		**Deck Drains Discharge Over Buffer?**		**Dissipator Pads Provided in Buffer?**	
Deck Drains Discharge Over Water Body?		(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: **TIP No.:** I-3819B / U-6039 **County(ies):** Iredell

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)	BMP Associated w/ Buffer Rules?
22	Y_S - 119+77.66 222 LT	(1)Fourth Creek	PSH	Class 'B'		Pipe	18	9.0	12.0	N/A
22	Y_S - 120+90.01 117 LT	(1)Fourth Creek	PSH	Class 'B'		Pipe	15	0.5	5.6	N/A
22	Y_S - 122+17.70 152 RT	(1)Fourth Creek	PSH	Class 'B'		Pipe	18	6.1	12.7	N/A
22	Y_S - 123+37.62 161 RT	(1)Fourth Creek	PSH	Class 'B'		Pipe	15	3.7	10.4	N/A
22	Y_S - 125+00.28 182 RT	(1)Fourth Creek	PSH	Class 'B'		Pipe	15	5.6	10.7	N/A
22	YRPC - 22+09 79 RT	(3)UT to Fourth Creek	PSH	Class 'B'		Pipe	18	4.6	10.1	N/A
10	YRPCA - 16+67.32 2 LT	(3)UT to Fourth Creek	PSH	Class 'B'		Pipe	18	2.3	3.7	N/A
10	YRPC - 15+11.92 70 RT	(2)UT to Fourth Creek	PSH	Class 'B'		Pipe	15	1.8	7.8	N/A

Additional Comments

* Refer to the NCDOT Best Management Practices Toolbox (2014), NCDOT Standards, the Federal Highway Administration (FHWA) Hydraulic Engineering Circular No. 14 (HEC-14), Third Edition, Hydraulic Design of Energy Dissipators for Culverts and Channels (July 2006), as applicable, for design guidance and criteria.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 34192.3.2 **TIP No.:** I-3819B / U-6039 **County(ies):** Iredell

Other Best Management Practices

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	BMP Type	Drainage Area (ac)	New Built-Upon Area (ac)	Volume Treated (ac-ft)	Precipitation Depth Treated over NBUA (in)	BMP Associated w/ Buffer Rules?
10	-L- 127+01.68 244 LT	(3)UT to Fourth Creek	Dry Detention Basin	6.2	1.1	0.097681359	1.11	No
11	-L- 144+03.15 183 RT	(4)UT to Fourth Creek	Dry Detention Basin	9.0	4.7	0.523002755	1.39	No
17	-Y_S- 37+50 112 RT	(10)UT to Fourth Creek	Dry Detention Basin	0.7	0.5	0.060353535	1.56	No
17	-Y_S- 44+00 105 RT	(9)UT to Fourth Creek	Dry Detention Basin	2.5	1.2	0.147773186	1.61	No
19	-Y_S- 66+00 155 LT	(11)UT to Fourth Creek	Dry Detention Basin	5.8	4.3	0.215105601	0.63	No
19	-Y_S- 69+00 150 RT	(7)UT to Fourth Creek	Dry Detention Basin	12.7	2.2	0.236524334	1.35	No
19	-Y_S- 80+00 150 LT	(7)UT to Fourth Creek	Dry Detention Basin	4.8	2.2	0.365587695	2.11	No
20	-Y_S- 92+00 150 RT	(7)UT to Fourth Creek	Dry Detention Basin	4.4	3.7	0.307713499	1.05	No
23	-Y_N- 156+00.09 205 RT	(5)UT to Fourth Creek	Dry Detention Basin	3.0	0.9	0.118250689	1.68	No

Additional Comments

Basin located at -Y_S- 66+00 is constrained spacially due to existing ROW limits and the presence of a jurisdictional stream in the vicinity. This basin was mandated by the RFP for the project and was sized to the maximum extent to avoid impacts to the adjacent jurisdictional feature and avoid additional ROW acquisition.

09/08/99

TIP PROJECT: I-3819B/U-6039

PROJECT: 34192.1.2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

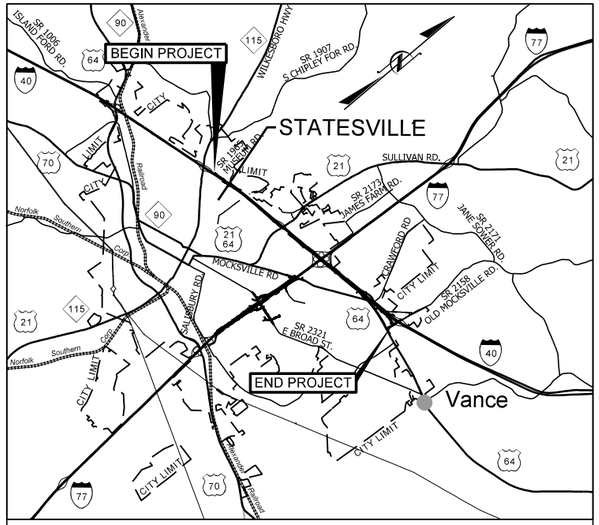
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-3819B/U-6039	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34192.1.2	IMS-40-2(124)	P.E.
34192.3.2	N/A	DESIGN BUILD

IREDELL COUNTY

LOCATION: I-40/I-77 INTERCHANGE INCLUDING I-40 FROM WEST OF SR 2003 (RADIO RD.) TO SR 2158 (OLD MOCKSVILLE RD.) & I-77 FROM SOUTH OF SR 2321 (EAST BROAD ST.) TO SOUTH OF SR 2171 (JANE SOWERS RD.)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, RETAINING WALLS, NOISE WALLS, AND TRAFFIC CONTROL



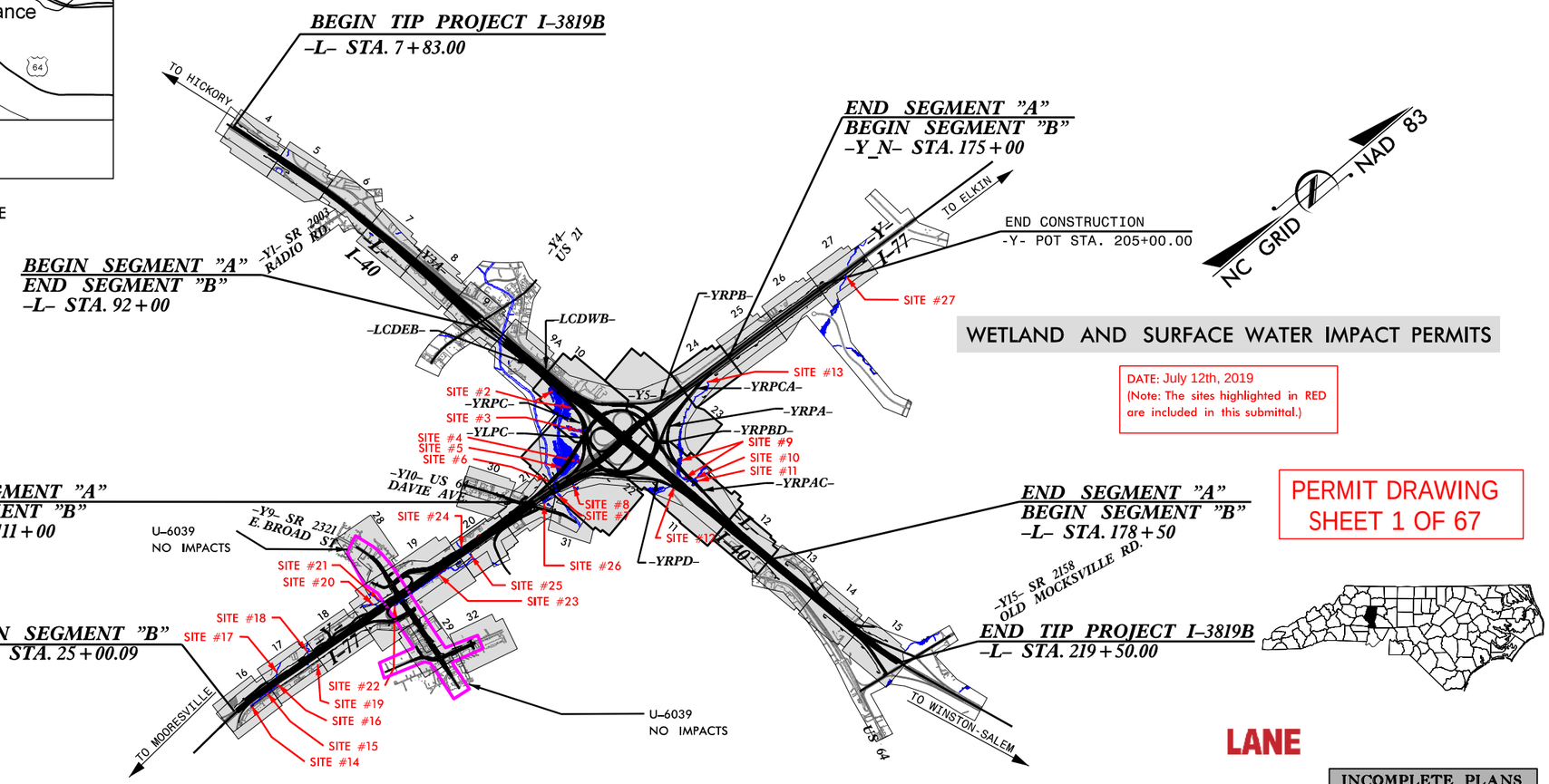
VICINITY MAP

THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF STATESVILLE AND THE TOWNSHIP OF BETHANY

100 50 0 100 200
PLANS

200 100 0 200 400
OVERSIZED PLANS

SCALE VARIES
INSETS



WETLAND AND SURFACE WATER IMPACT PERMITS

DATE: July 12th, 2019
(Note: The sites highlighted in RED are included in this submittal.)

PERMIT DRAWING
SHEET 1 OF 67

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

THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES

LANE

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

GRAPHIC SCALES

SEE ABOVE

DESIGN DATA

	I-40	I-77
ADT 2018 =	57,300	62,900
ADT 2040 =	72,500	77,500
DHV =	5,800	6,200
D =	55 %	55 %
T =	16 % *	19 % **
V =	60 MPH	60 MPH

* TTST 13 + DUAL 3 (I-40)
** TTST 16 + DUAL 3 (I-77)
CLASSIFICATION: INTERSTATE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT I-3819B	=	3.885
LENGTH STRUCTURES TIP PROJECT I-3819B	=	0.124
TOTAL LENGTH OF TIP PROJECT I-3819B	=	4.009

Prepared In the Office of:
WSP
1001 Morehead Square Dr., Suite 610, Charlotte, NC 28203
NC LIC NO. F-0165

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
OCTOBER 30, 2018

LETTING DATE:
OCTOBER 30, 2018

CHRISTOPHER D. DAVIS, P.E.
PROJECT ENGINEER

ERIC W. SECKINGER, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

6/3/2019
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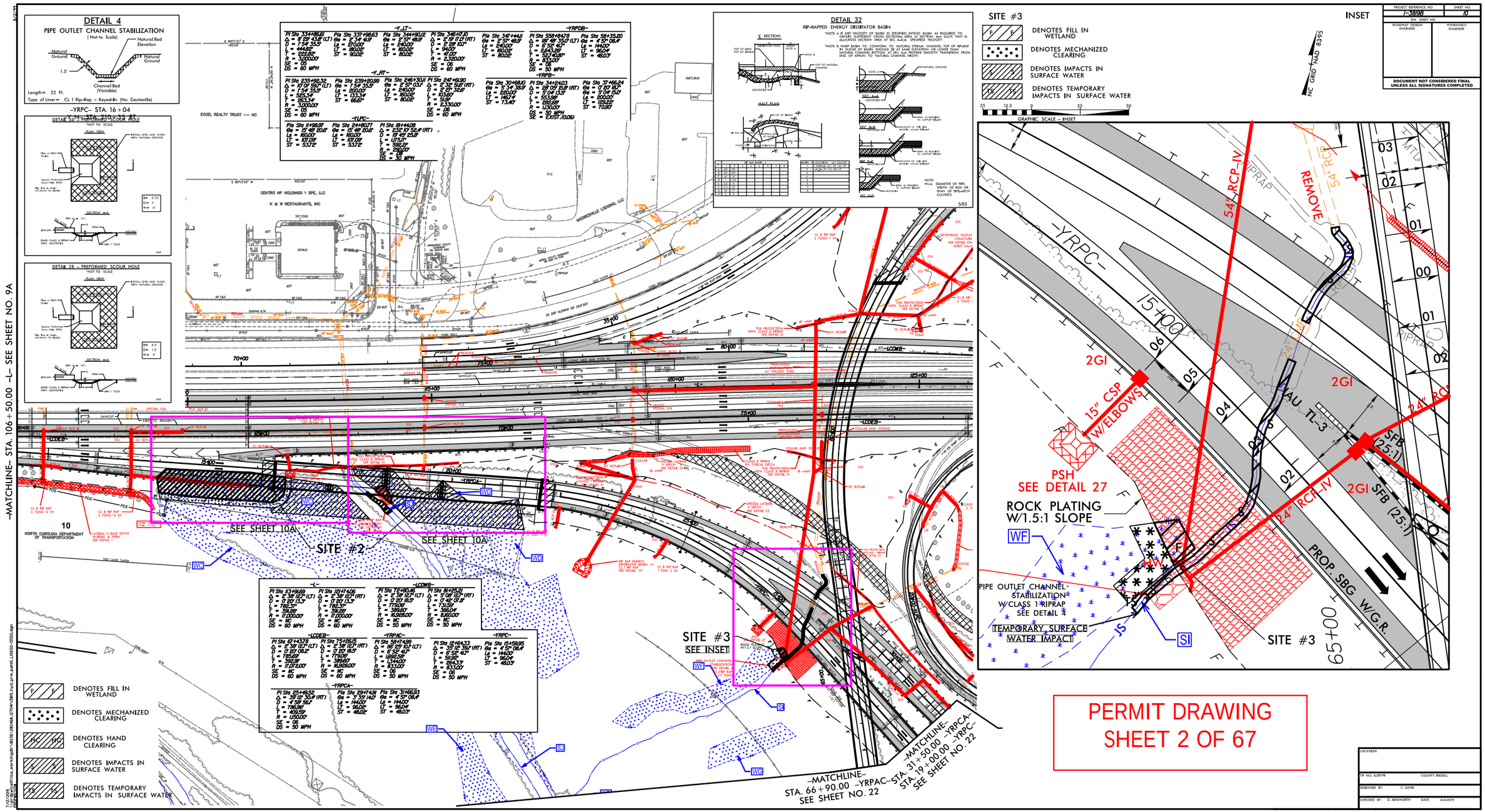
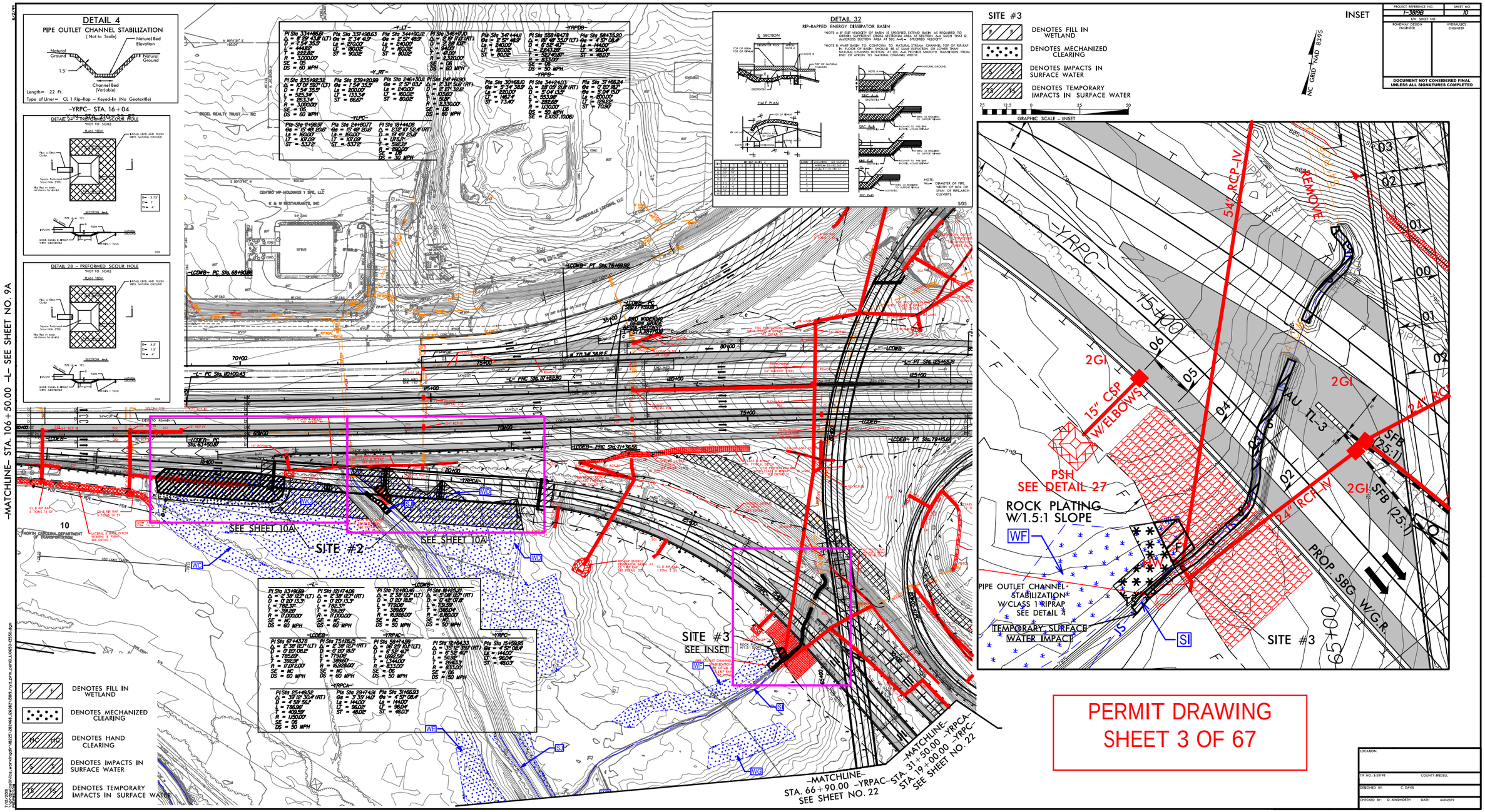
USMG675774



PERMIT DRAWING
SHEET 2 OF 67



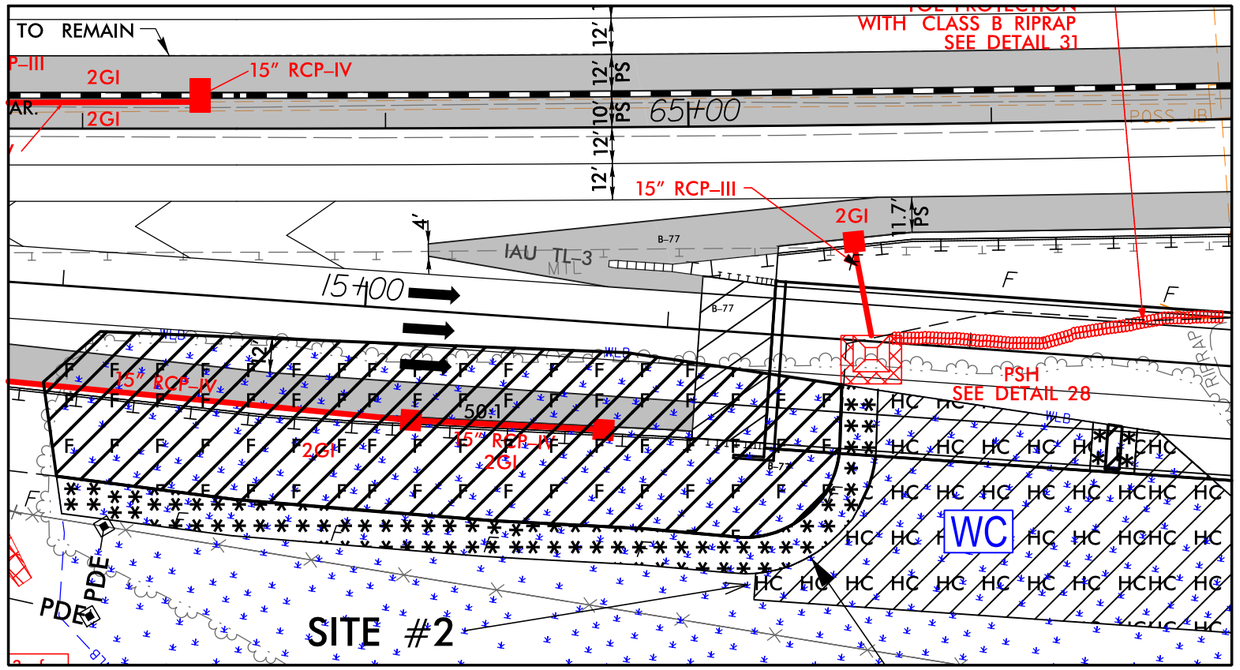
PERMIT DRAWING
SHEET 3 OF 67

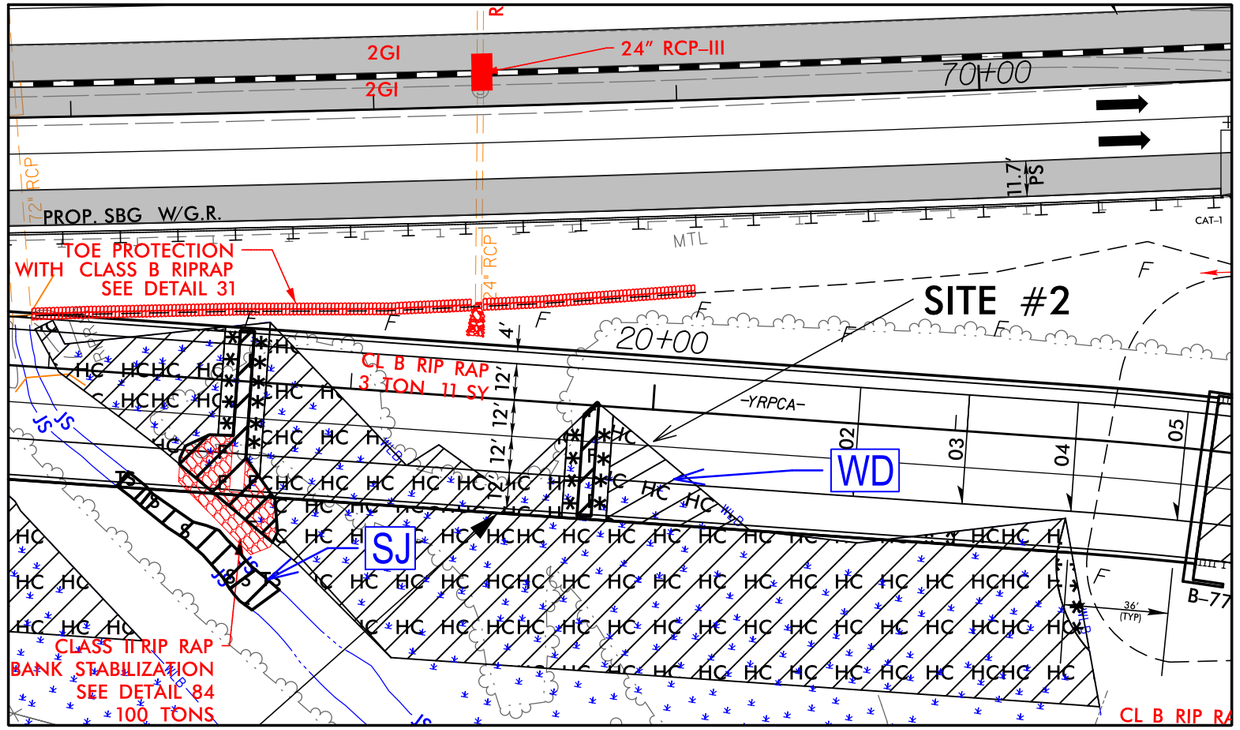
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

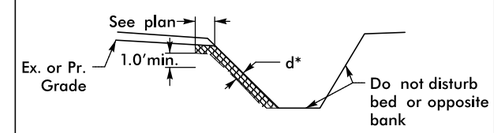
LOCATION:
TIP NO. I-3819B COUNTY: IREDELL
DESIGNED BY: C. DAVIS
CHECKED BY: D. AINSWORTH DATE: 4-2-2019

SITE #2





DETAIL 84
RIP RAP BANK STABILIZATION
(Not to Scale)



Type of Liner= CL 1 or CL 2 Rip Rap (see plan)
*d=18" for CL 1 and 30" for CL 2 (No Geotextile)

-YRPCA- STA. 18+65 RT
-YRPCA- STA. 77+00 RT

LANE WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	10A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

HC HC DENOTES HAND CLEARING

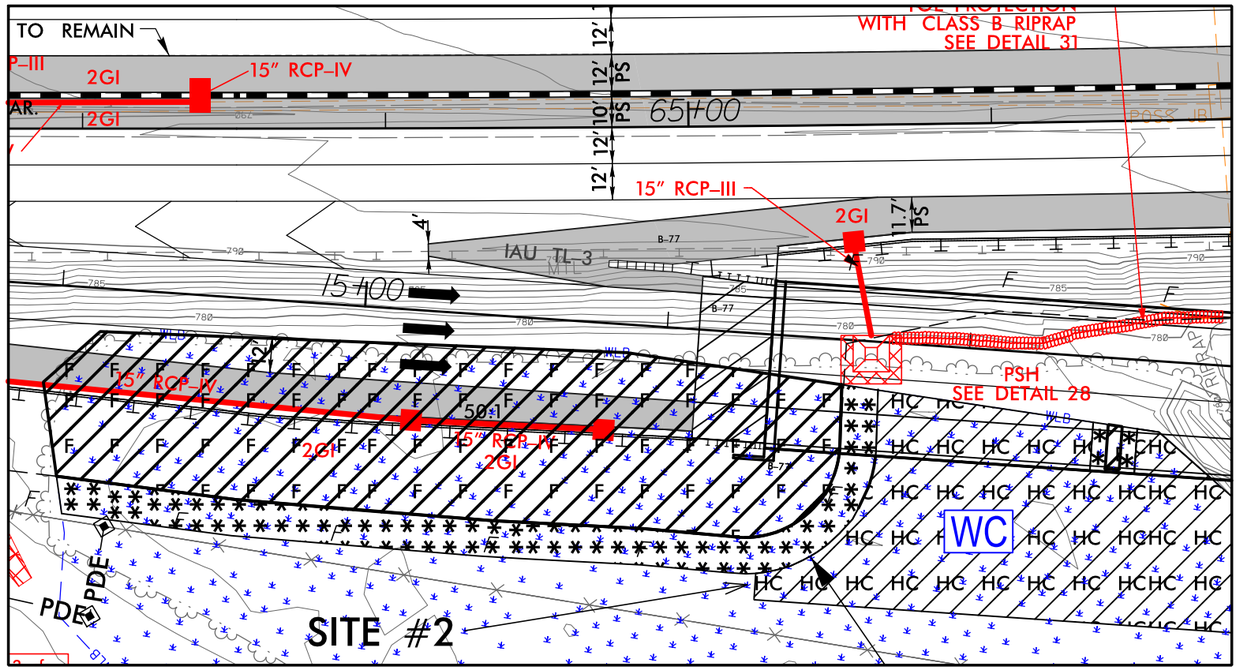
NC GRID NAD 83/95

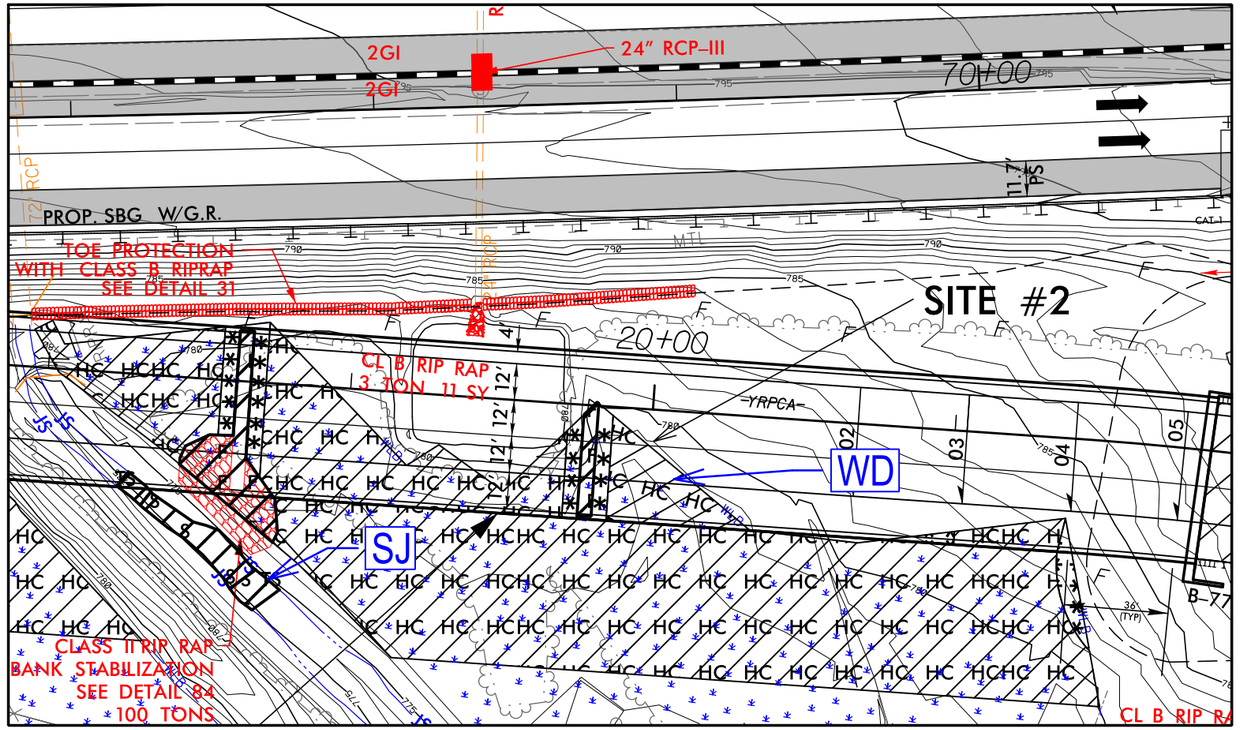
PERMIT DRAWING
SHEET 4 OF 67

50 25 0 50 100
GRAPHIC SCALE - INSET

7/12/2019
pr_dgnlsa01\ics_workingdir\18236\282468_127067\13819_hyd_prm_psh10A_L10650-13550.dgn
RIPWTS913

SITE #2

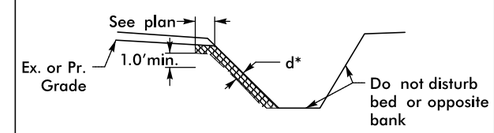




DETAIL 84

RIP RAP BANK STABILIZATION

(Not to Scale)



Type of Liner= CL 1 or CL 2 Rip Rap (see plan)
*d=18" for CL 1 and 30" for CL 2 (No Geotextile)

-YRPCA- STA. 18+65 RT
-YRPCA- STA. 77+00 RT

LANE WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	10A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

F F — DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

HC HC — DENOTES HAND CLEARING

NC GRID NAD 83/95

PERMIT DRAWING
SHEET 5 OF 67

50 25 0 50 100

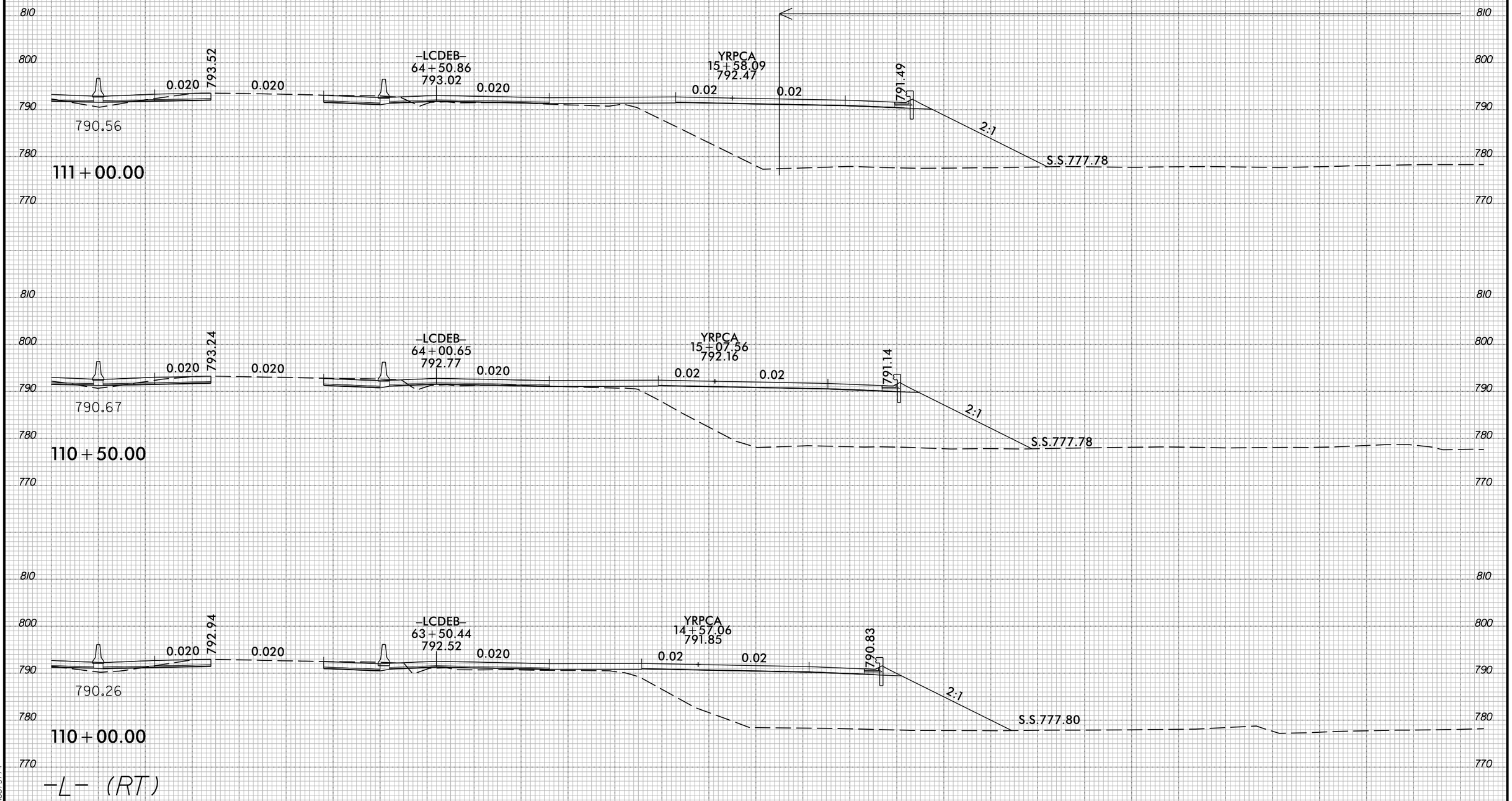
GRAPHIC SCALE - INSET

7/12/2019
DGN: pgrass01\ics_workingdir\18225\282468_127008\13819_hyd_prm_psh10A_L10650-13550.dgn
RIP: KITS013

PROJ. REFERENCE NO.	SHEET NO.
I-3819B	XA-76

PERMIT DRAWING
SHEET 6 OF 67

SITE #2
WC



8/23/99

5/31/2019
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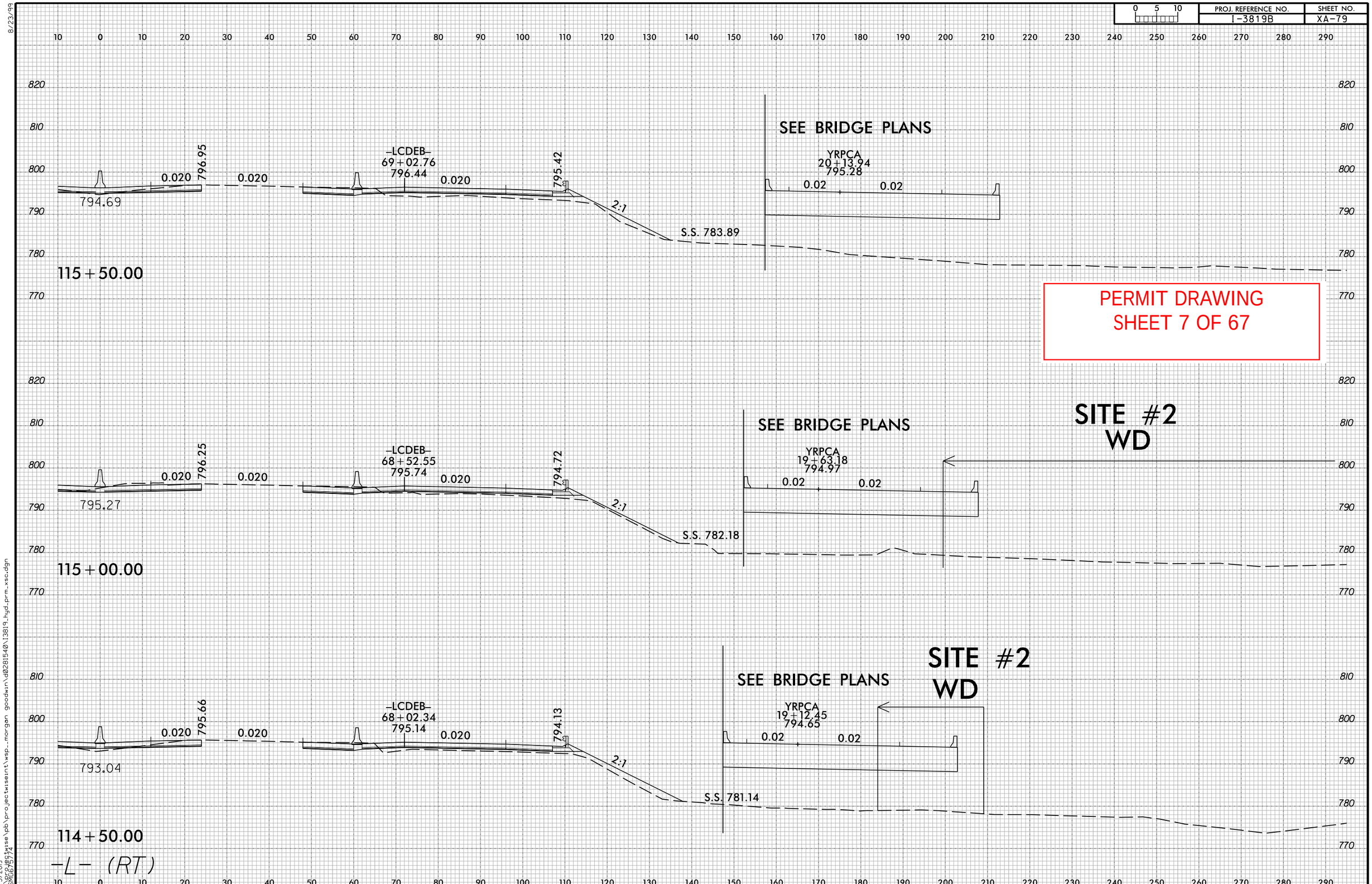
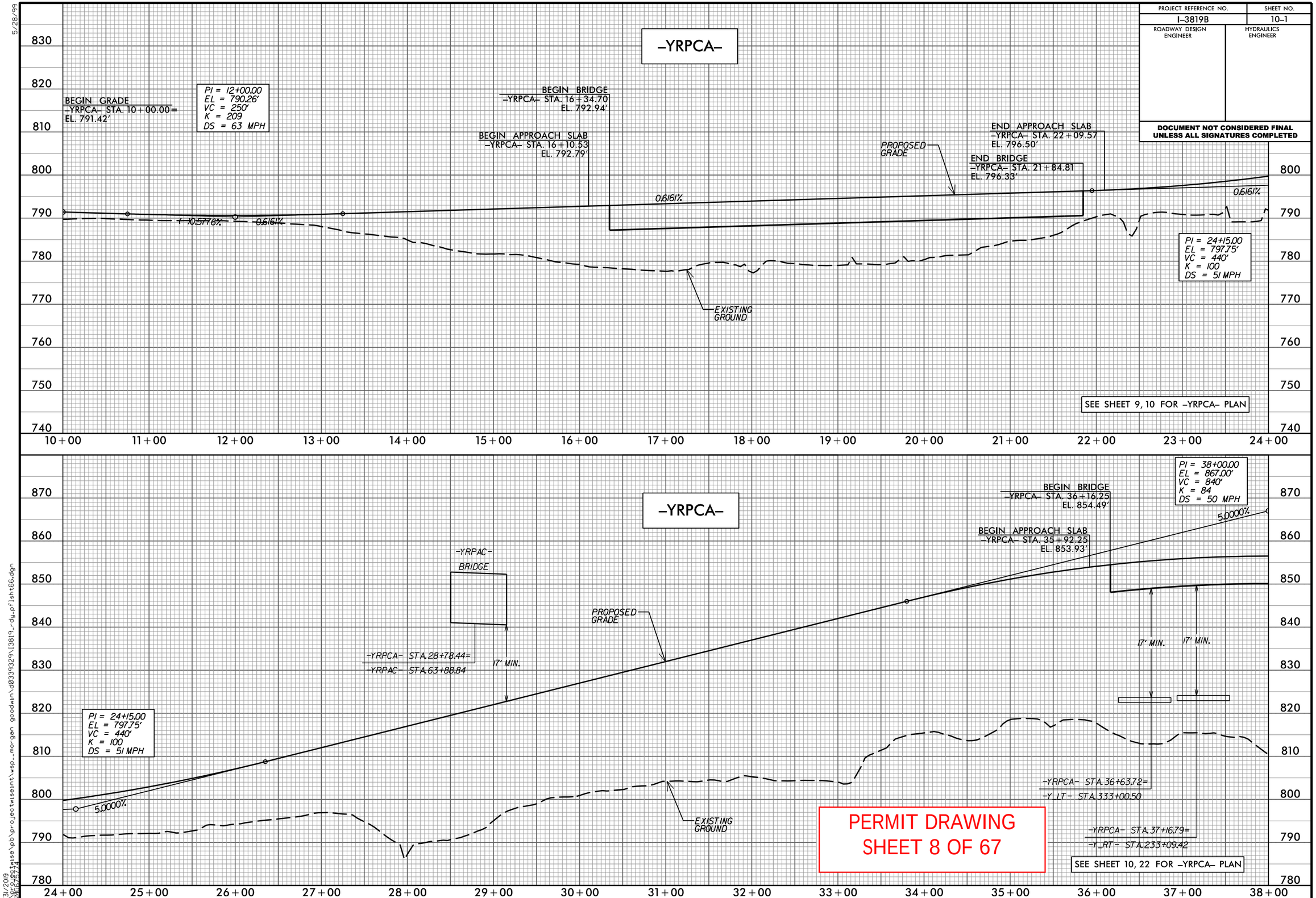
USMG675/74



PROJ. REFERENCE NO.
I-3819B
SHEET NO.
XA-79
PERMIT DRAWING
SHEET 7 OF 67
SITE #2
WD
SEE BRIDGE PLANS
YRPCA
20+13.94
795.28
0.02
0.02
-LCDEB-
69+02.76
796.44
796.95
795.42
0.020
0.020
0.020
794.69
2:1
S.S. 783.89
115+50.00
SEE BRIDGE PLANS
YRPCA
19+63.18
794.97
0.02
0.02
-LCDEB-
68+52.55
795.74
796.25
794.72
0.020
0.020
0.020
795.27
2:1
S.S. 782.18
115+00.00
SITE #2
WD
SEE BRIDGE PLANS
YRPCA
19+12.45
794.65
0.02
0.02
-LCDEB-
68+02.34
795.14
795.66
794.13
0.020
0.020
0.020
793.04
2:1
S.S. 781.14
114+50.00
-L- (RT)



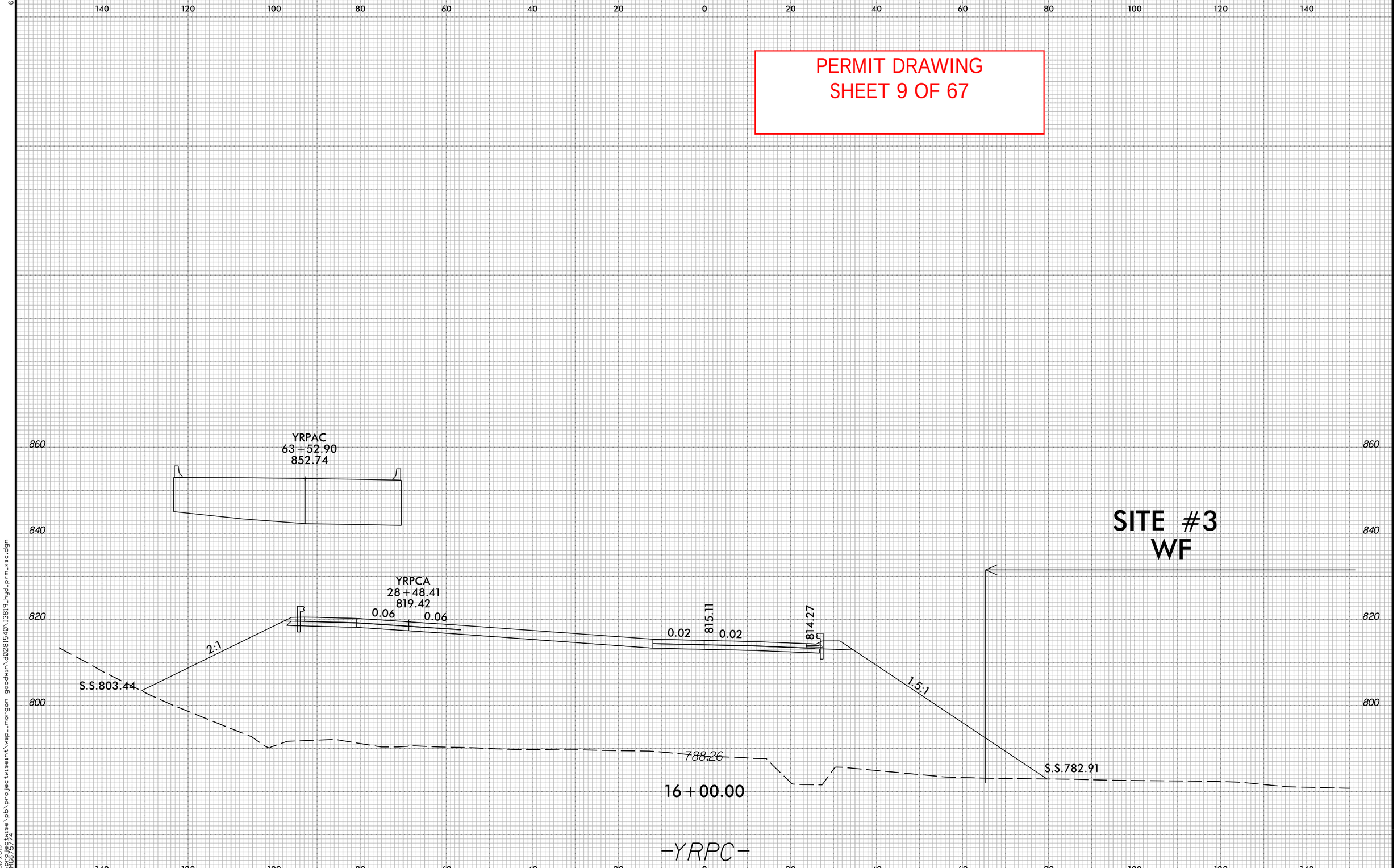
PERMIT DRAWING
SHEET 8 OF 67

5/28/99

5/31/2019
c:\projectwise\pb\projectwiseint\wsp_morgan goodwin\d0339329\I3819_rdy_pflsht66.dgn
USMG675774

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-3819	XA-252

PERMIT DRAWING
SHEET 9 OF 67



6/23/16

5/31/2019
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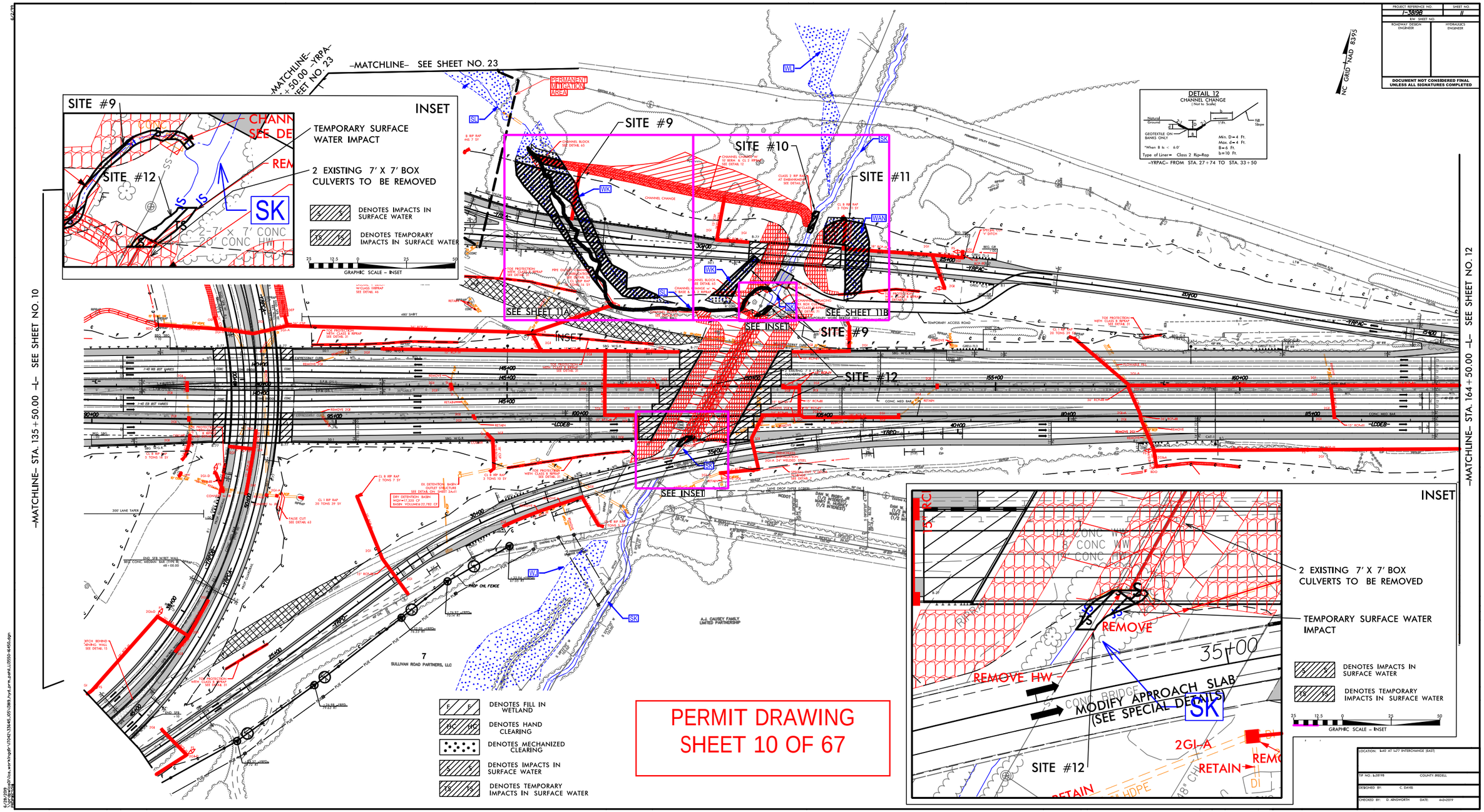
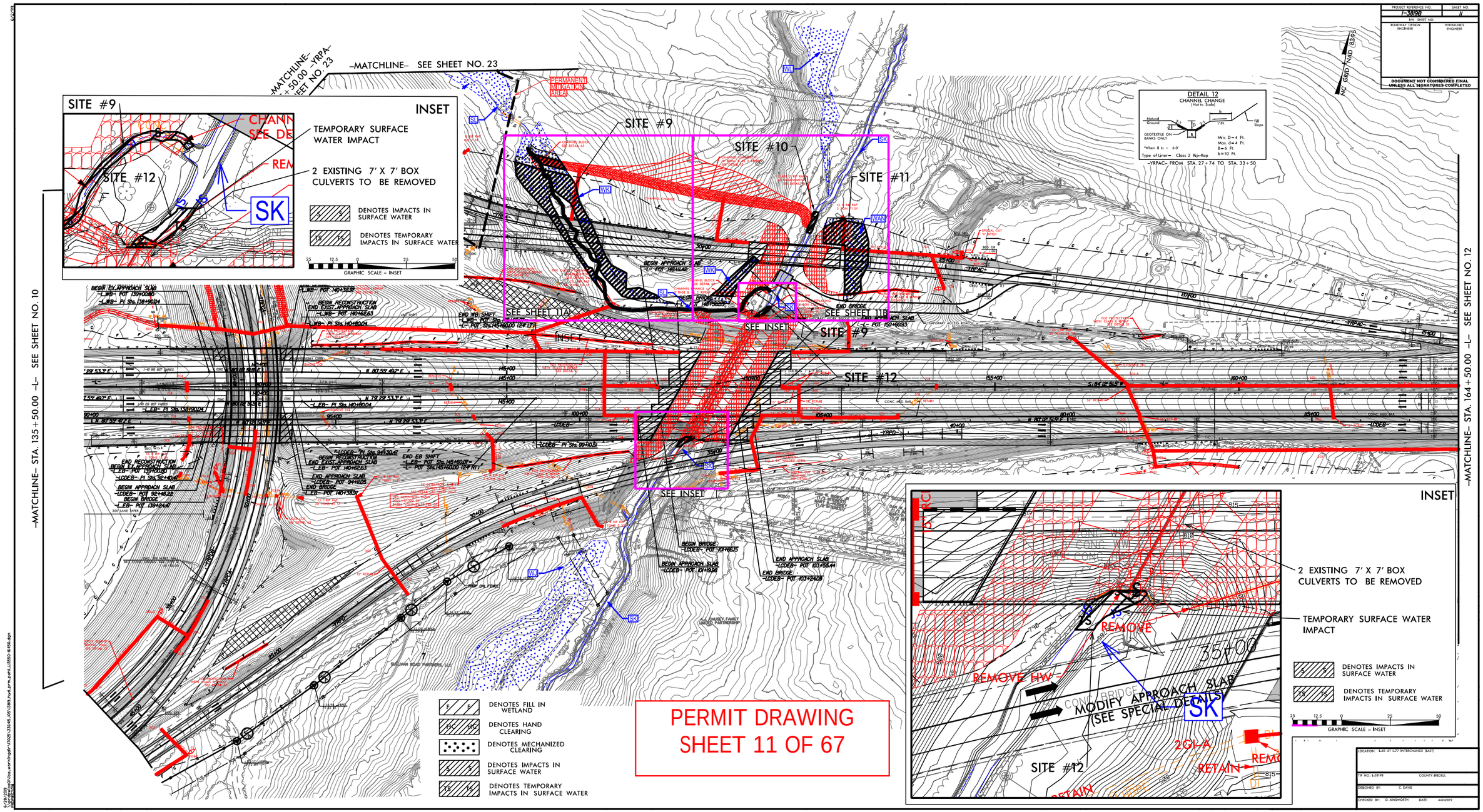
USMGB75/74



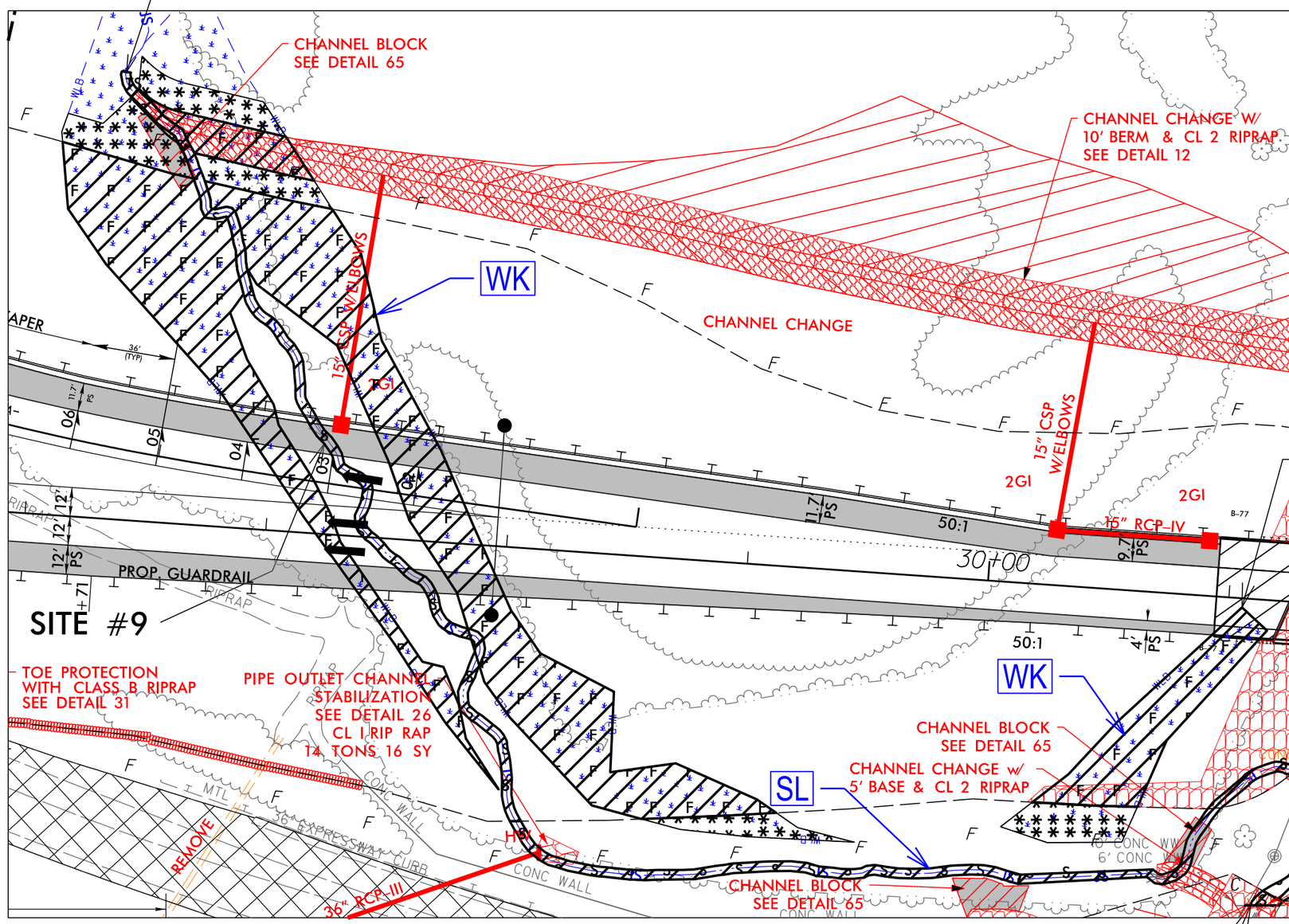
PERMIT DRAWING
SHEET 10 OF 67


-MATCHLINE- SEE SHEET NO. 23
-MATCHLINE- STA. 135+50.00 -L- SEE SHEET NO. 10
-MATCHLINE- STA. 164+50.00 -L- SEE SHEET NO. 12
INSET
SITE #9
SITE #10
SITE #11
SITE #12
SEE SHEET 11A
SEE SHEET 11B
SEE INSET
TEMPORARY SURFACE WATER IMPACT
2 EXISTING 7' X 7' BOX CULVERTS TO BE REMOVED
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
GRAPHIC SCALE - INSET
DETAIL 12
CHANNEL CHANGE
-YRPAC- FROM STA. 27+74 TO STA. 33+50
DENOTES FILL IN WETLAND
DENOTES HAND CLEARING
DENOTES MECHANIZED CLEARING
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
REMOVE
REMOVE HW
MODIFY APPROACH SLAB (SEE SPECIAL DETAILS)
RETAIN
PERMIT DRAWING
SHEET 11 OF 67
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
TIP NO. U-3818B
COUNTY: IREDELL
DESIGNED BY: C. DAVIS
CHECKED BY: D. ANGWORTH
DATE: 6-21-2019

LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	11A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NC GRID NAD 83/95

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

50 25 0 50 100

GRAPHIC SCALE – INSETS

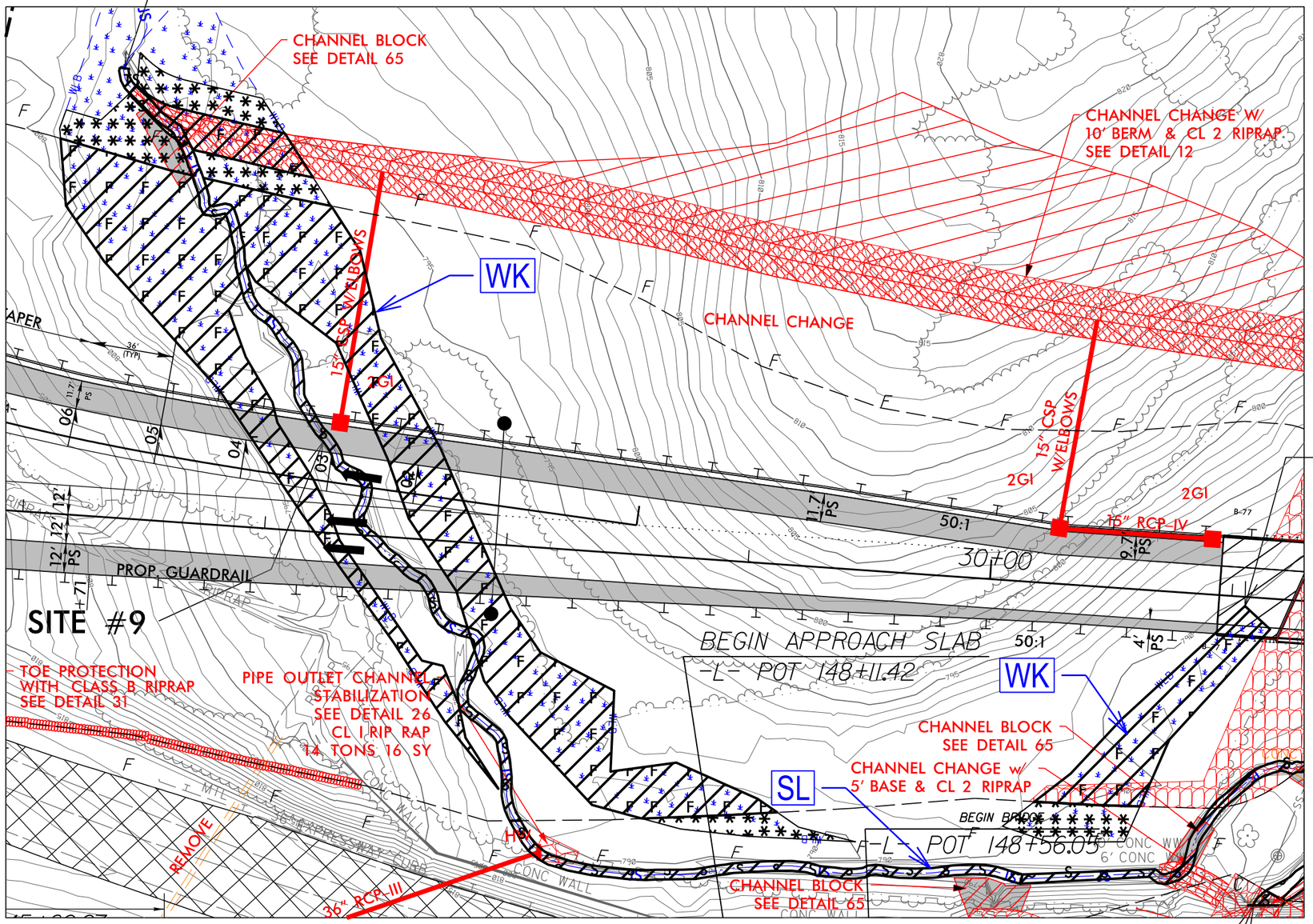
PERMIT DRAWING
SHEET 12 OF 67

07/02/19
c:\projectwise\pb\projectwisein\becker_jw\d0339329\I3819_hyd_prm_psh11A_L13550-16450.dgn
Becker, JW

LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	11A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NC GRID NAD 83/95

S S	DENOTES IMPACTS IN SURFACE WATER
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
F F	DENOTES FILL IN WETLAND
	DENOTES MECHANIZED CLEARING

50 25 0 50 100

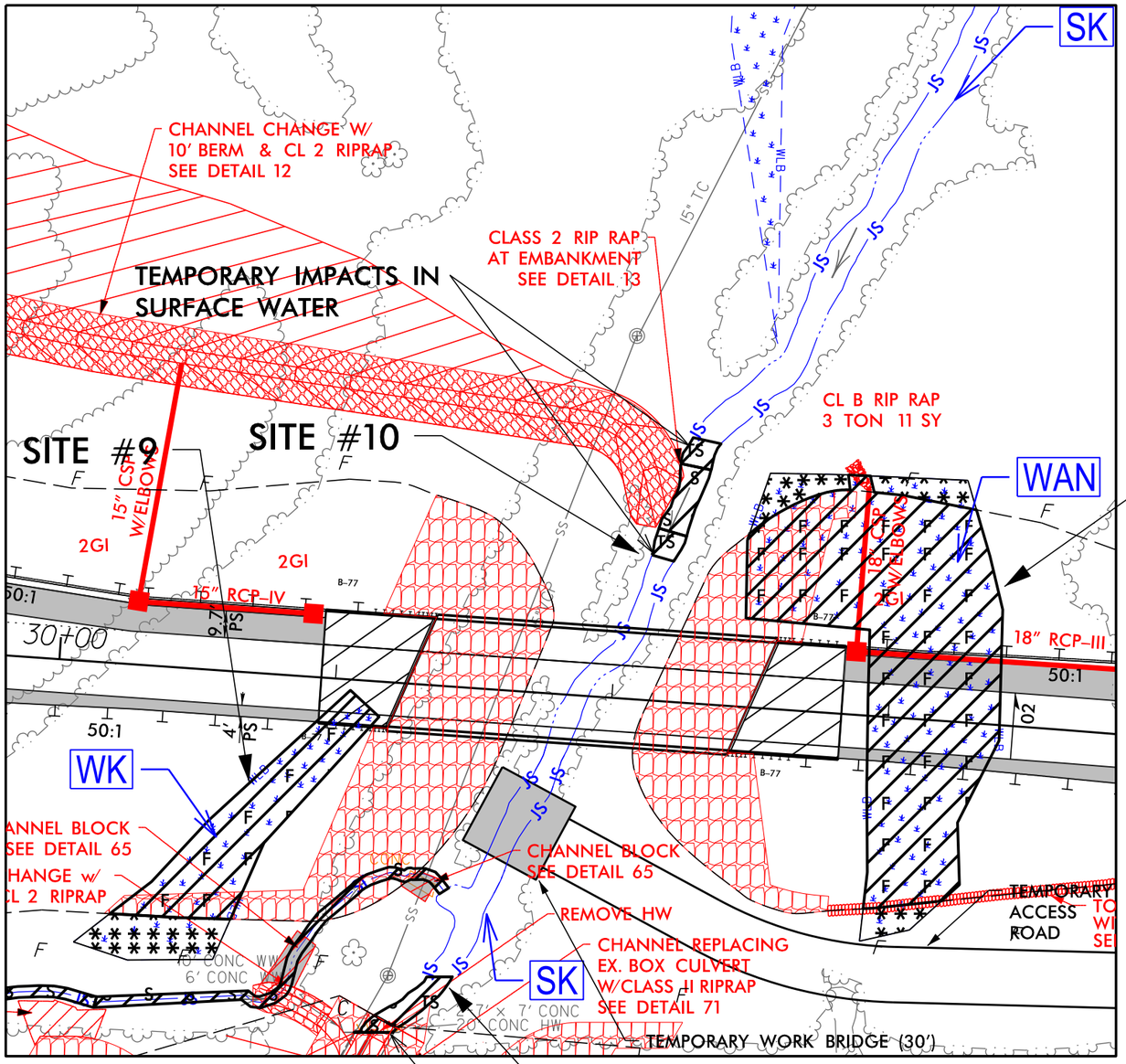
GRAPHIC SCALE – INSETS

PERMIT DRAWING
SHEET 13 OF 67

07/02/19
c:\projectwise\pb\projectwisent\becker_jw\d0339329\I3819_hyd_prm_psh11A_L13550-16450.dgn
Becker, JW

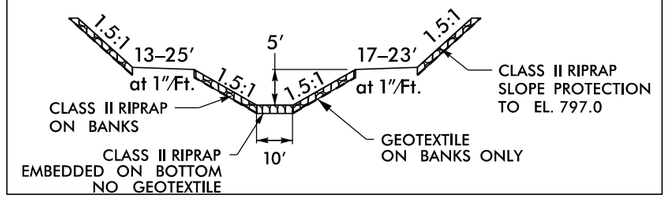
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	11B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PERMIT DRAWING
SHEET 14 OF 67

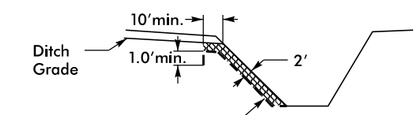
DETAIL 71
CHANNEL REPLACING EX. CULVERT
(Not to Scale)



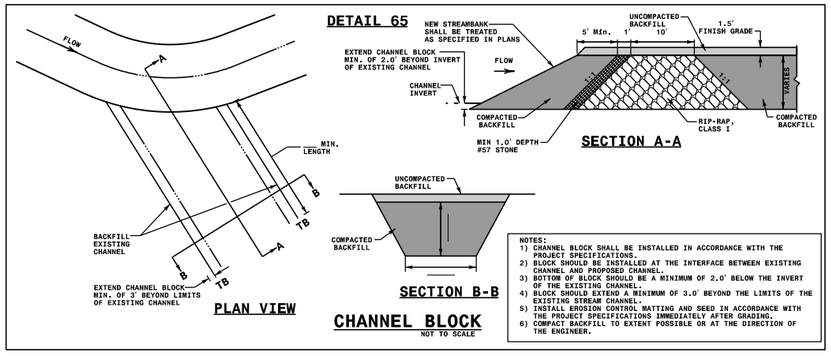
–L– STA. 149+36

NC GRID NAD 83/95

DETAIL 13
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= Class 2 Rip-Rap



DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

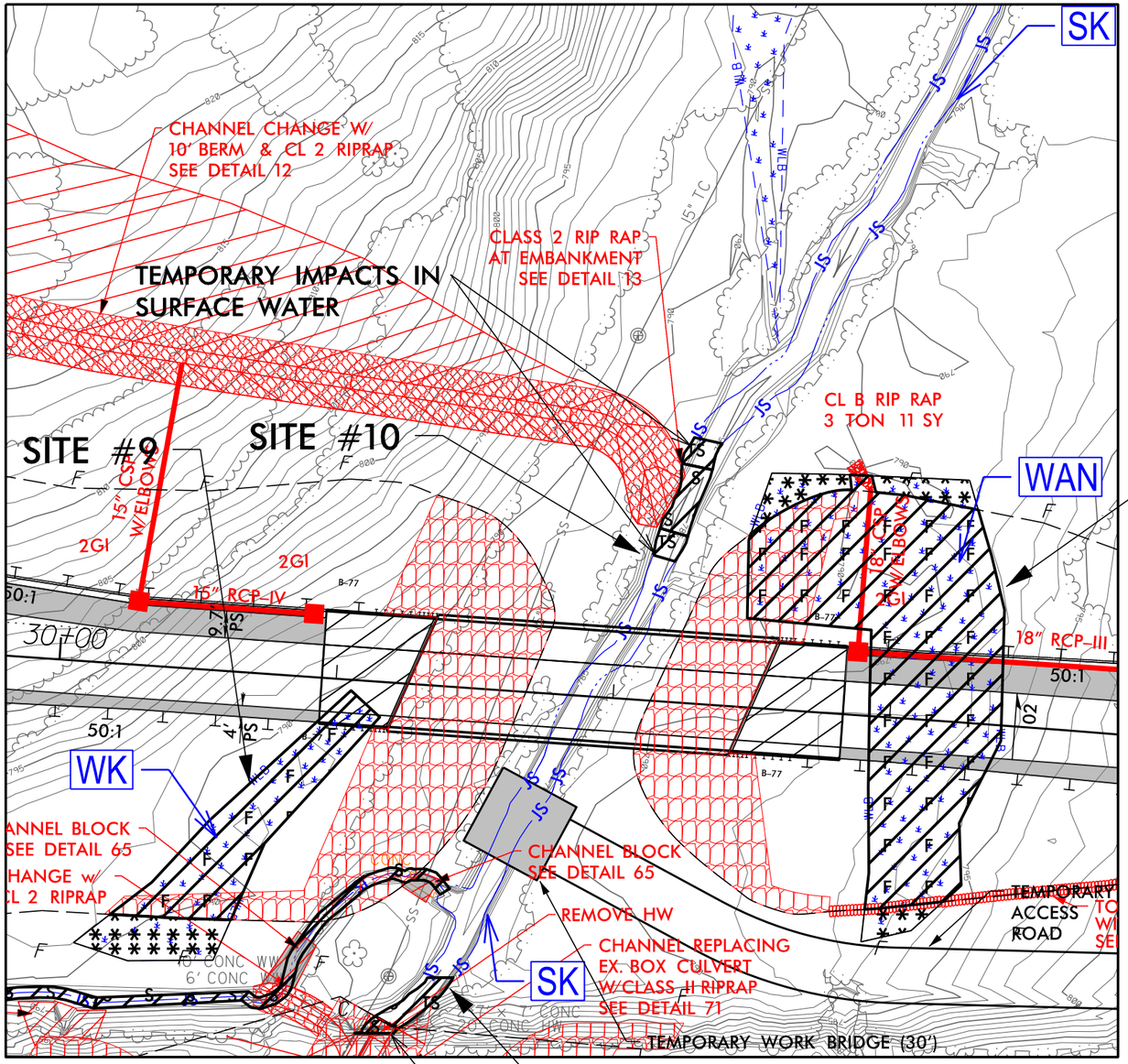
DENOTES MECHANIZED CLEARING

50 25 0 50 100
GRAPHIC SCALE – INSETS

07/02/19
c:\projectwise\pb\projectwiseint\becker_jw\d0339329\I3819_hyd_prm_psh11B_L13550-16450.dgn
Becker JW

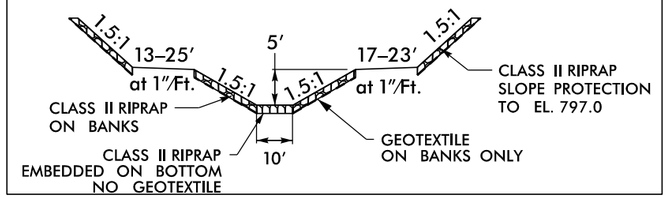
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	11B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PERMIT DRAWING
SHEET 15 OF 67

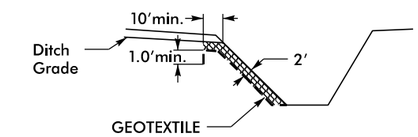
DETAIL 71
CHANNEL REPLACING EX. CULVERT
(Not to Scale)



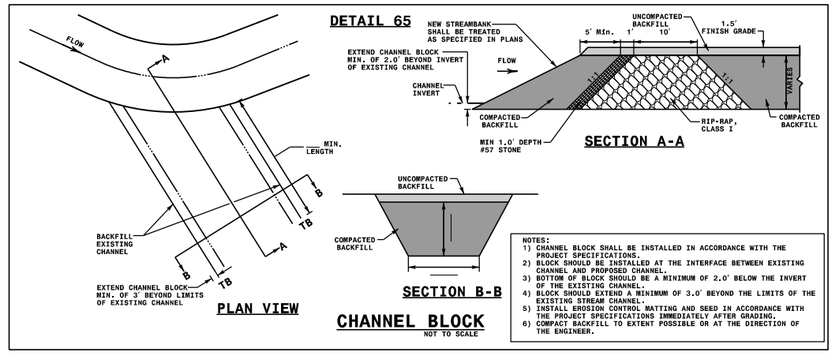
–L– STA. 149 + 36

NC GRID NAD 83/95

DETAIL 13
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner = Class 2 Rip-Rap



NOTES:
1) CHANNEL BLOCK SHALL BE INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
2) BLOCK SHOULD BE INSTALLED AT THE INTERFACE BETWEEN EXISTING CHANNEL AND PROPOSED CHANNEL.
3) BOTTOM OF BLOCK SHOULD BE A MINIMUM OF 2.0' BELOW THE INVERT OF THE EXISTING CHANNEL.
4) BLOCK SHOULD EXTEND A MINIMUM OF 3.0' BEYOND THE LIMITS OF THE EXISTING STREAM CHANNEL.
5) INSTALL EROSION CONTROL MATTING AND SEED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS IMMEDIATELY AFTER GRADING.
6) COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

F F — DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

50 25 0 50 100
GRAPHIC SCALE – INSETS

07/02/19
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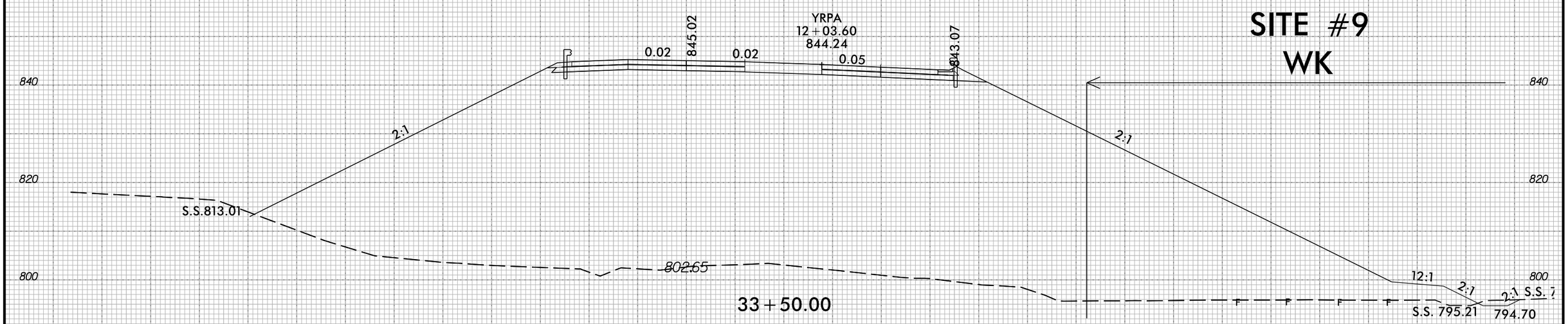
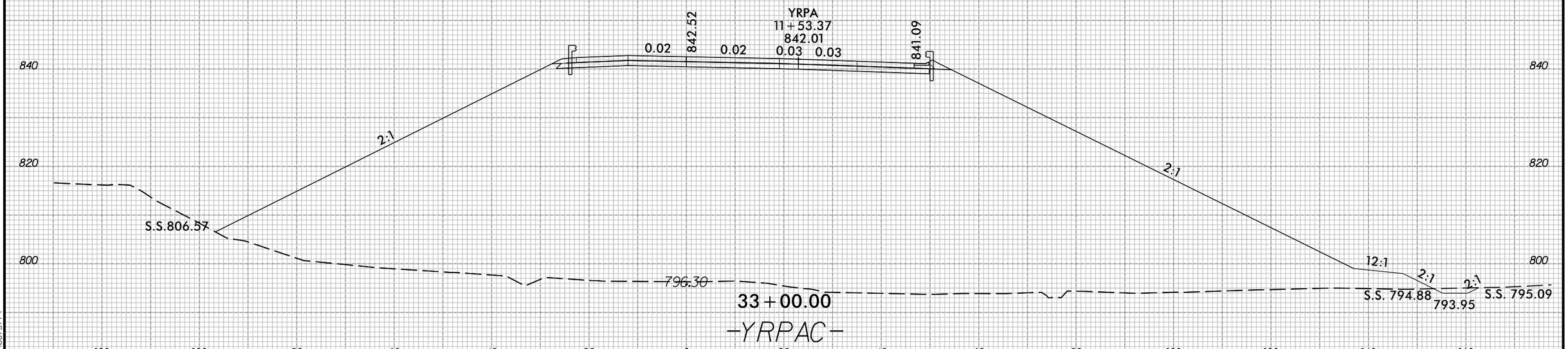
Becker JW

PROJ. REFERENCE NO.	SHEET NO.
II-38819B	XA-225

PERMIT DRAWING
SHEET 16 OF 67

SITE #9
WK





6/23/16

5/31/2019
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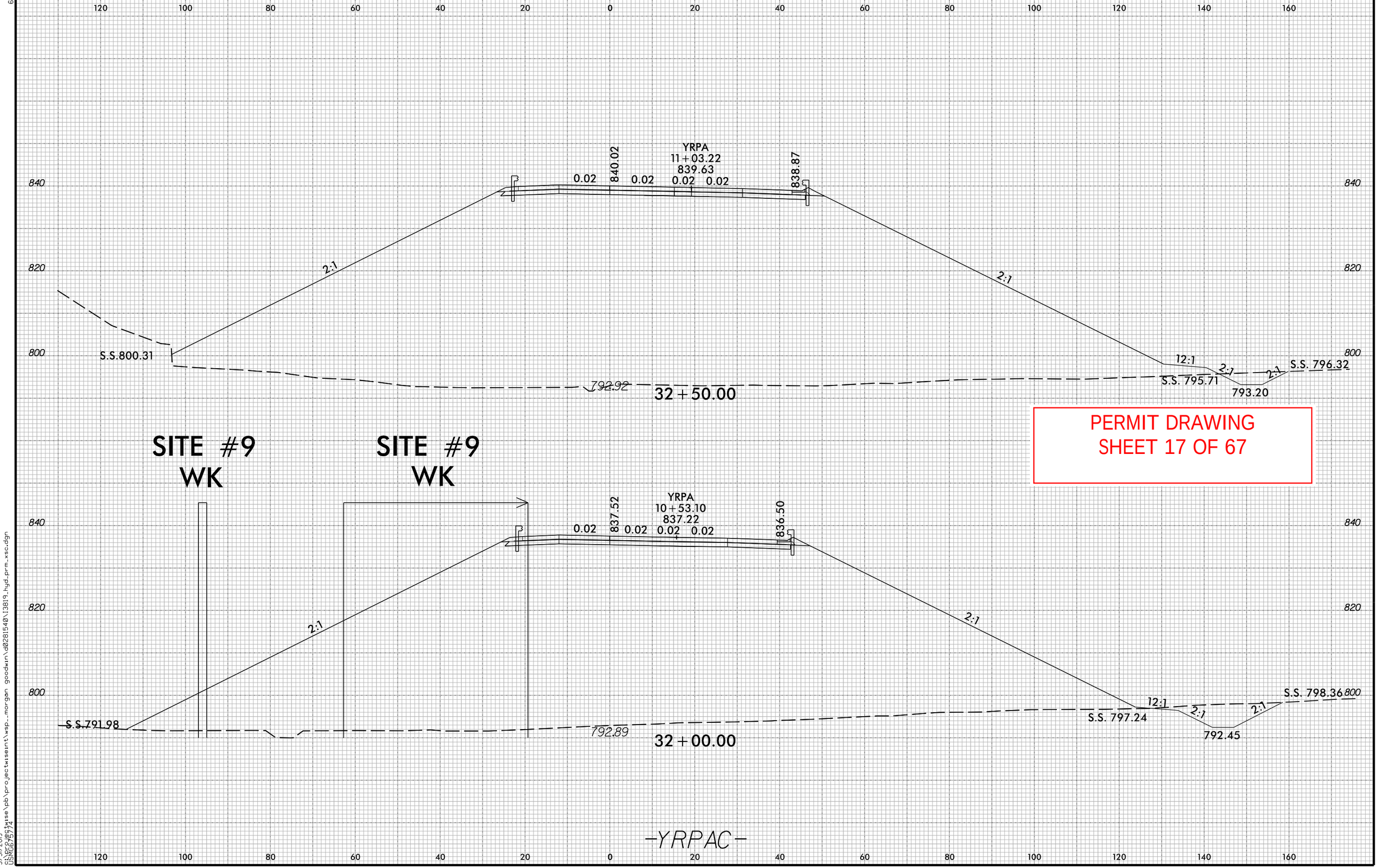
USMOG75174



PERMIT DRAWING
SHEET 17 OF 67

6/23/16

5/31/2019
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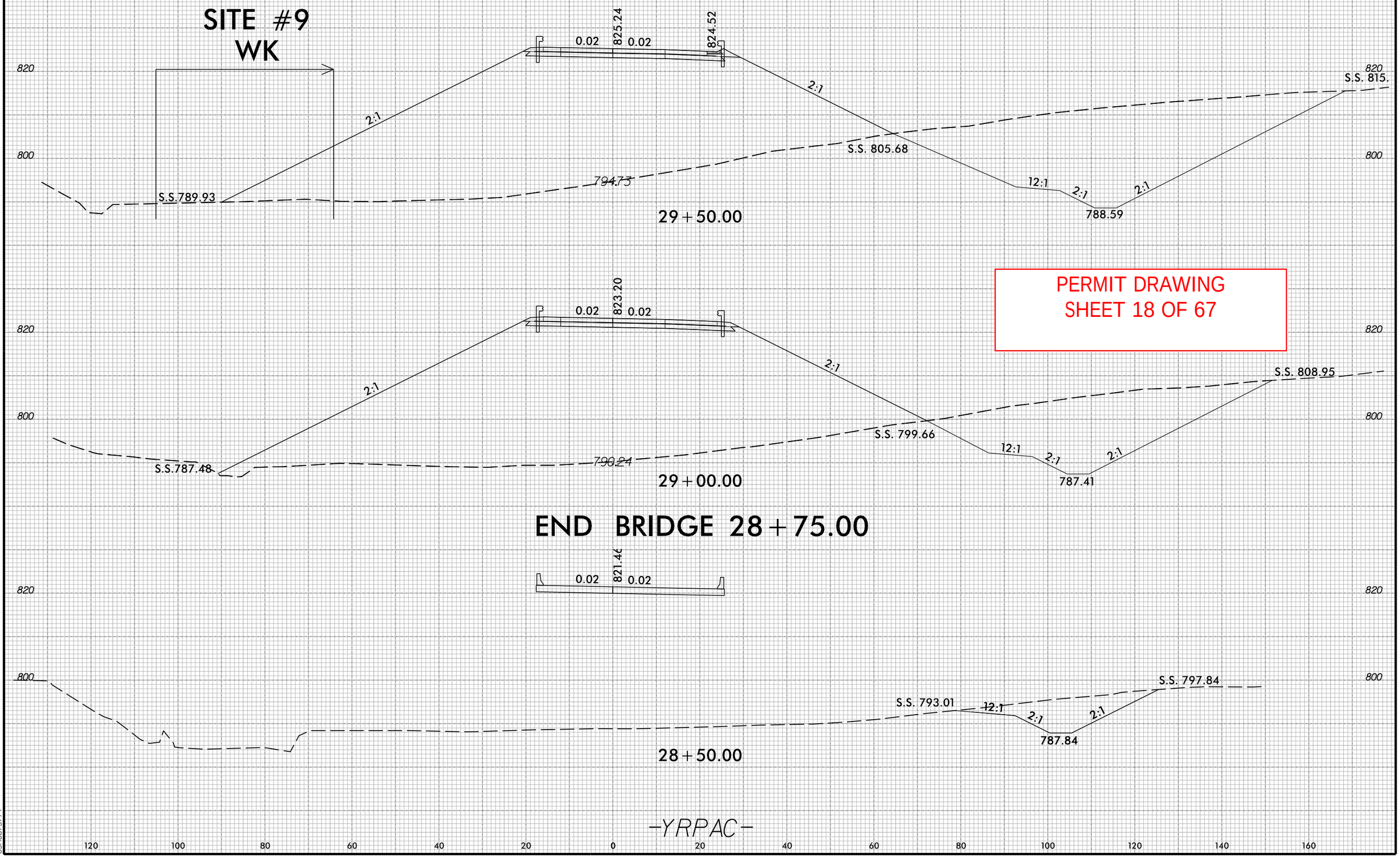
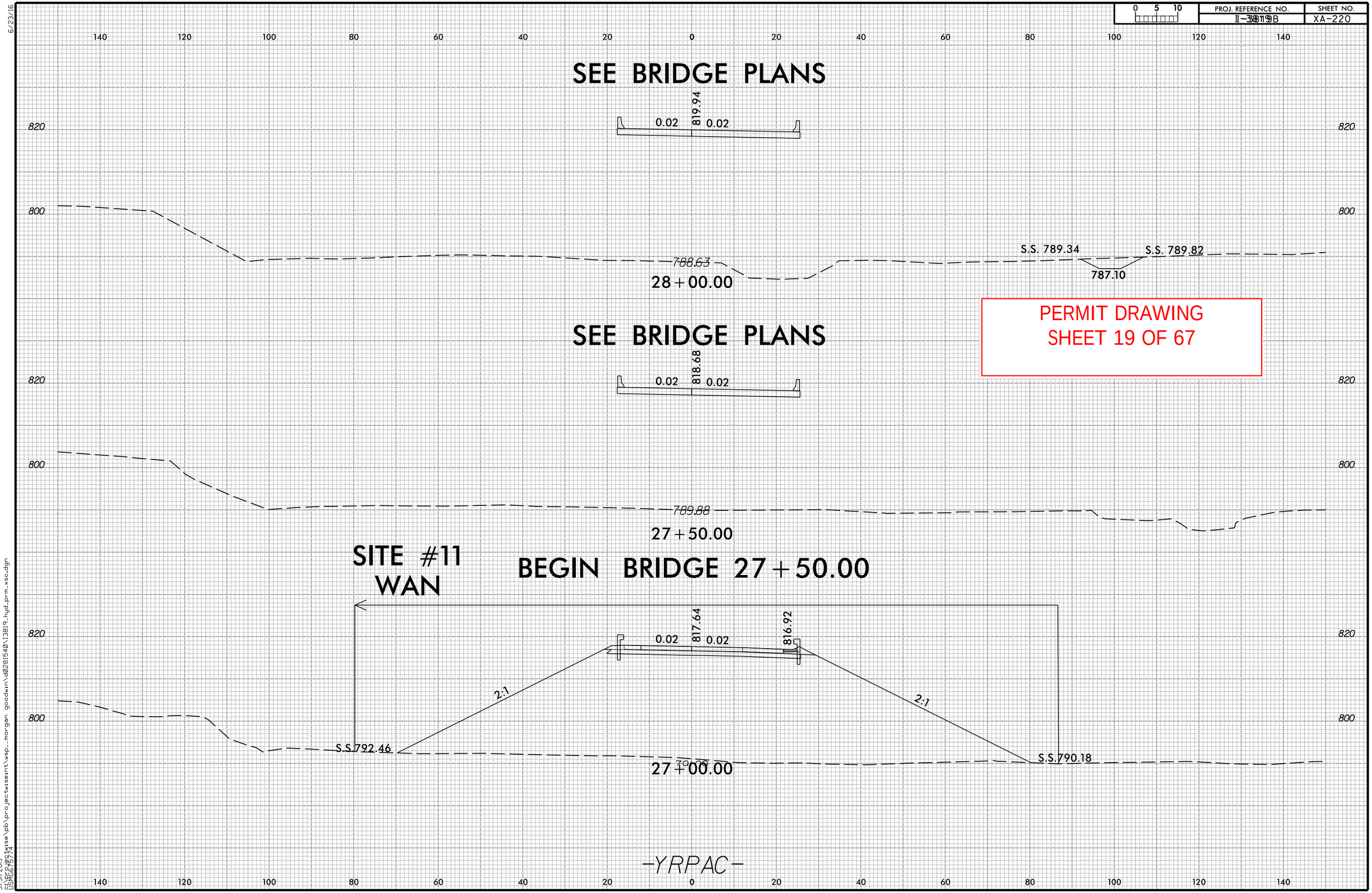


PROJ. REFERENCE NO.
SHEET NO.
XA-221
SITE #9
WK
825.24
824.52
0.02
0.02
2:1
S.S. 815.
S.S. 805.68
794.73
S.S.789.93
12:1
788.59
29+50.00
PERMIT DRAWING
SHEET 18 OF 67
823.20
S.S. 808.95
S.S. 799.66
S.S.787.48
790.24
787.41
29+00.00
END BRIDGE 28+75.00
821.46
S.S. 797.84
S.S. 793.01
787.84
28+50.00
-YRPAC-

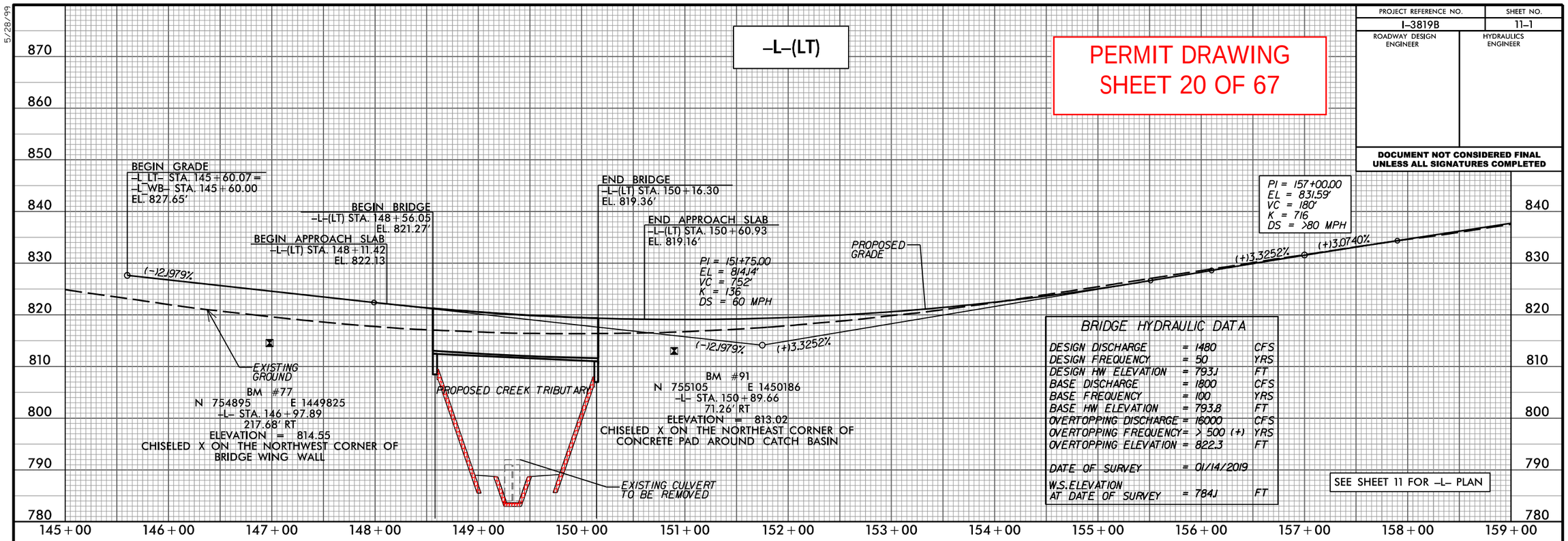


PERMIT DRAWING
SHEET 19 OF 67

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	11-1
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

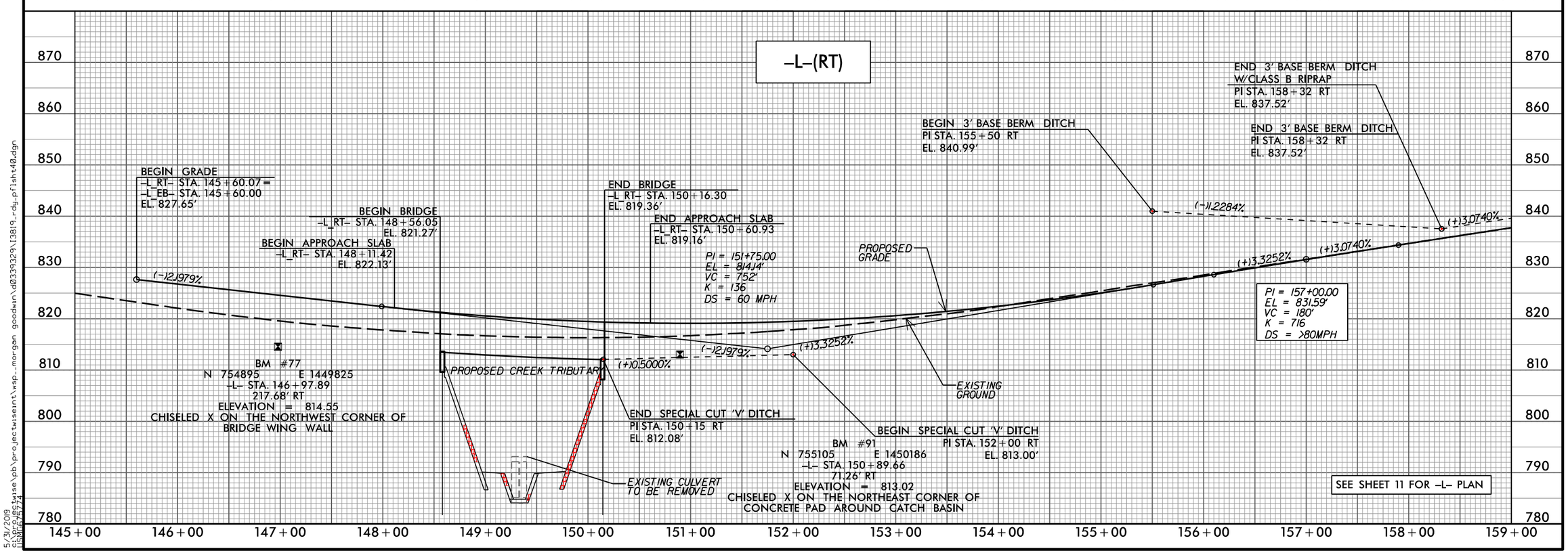
PERMIT DRAWING
SHEET 20 OF 67



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1480	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 793.1	FT
BASE DISCHARGE	= 1800	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 793.8	FT
OVERTOPPING DISCHARGE	= 16000	CFS
OVERTOPPING FREQUENCY	= > 500 (+)	YRS
OVERTOPPING ELEVATION	= 822.3	FT
DATE OF SURVEY	= 01/14/2019	
W.S. ELEVATION AT DATE OF SURVEY	= 784.1	FT

SEE SHEET 11 FOR -L- PLAN



SEE SHEET 11 FOR -L- PLAN

5/28/99
5/31/2019
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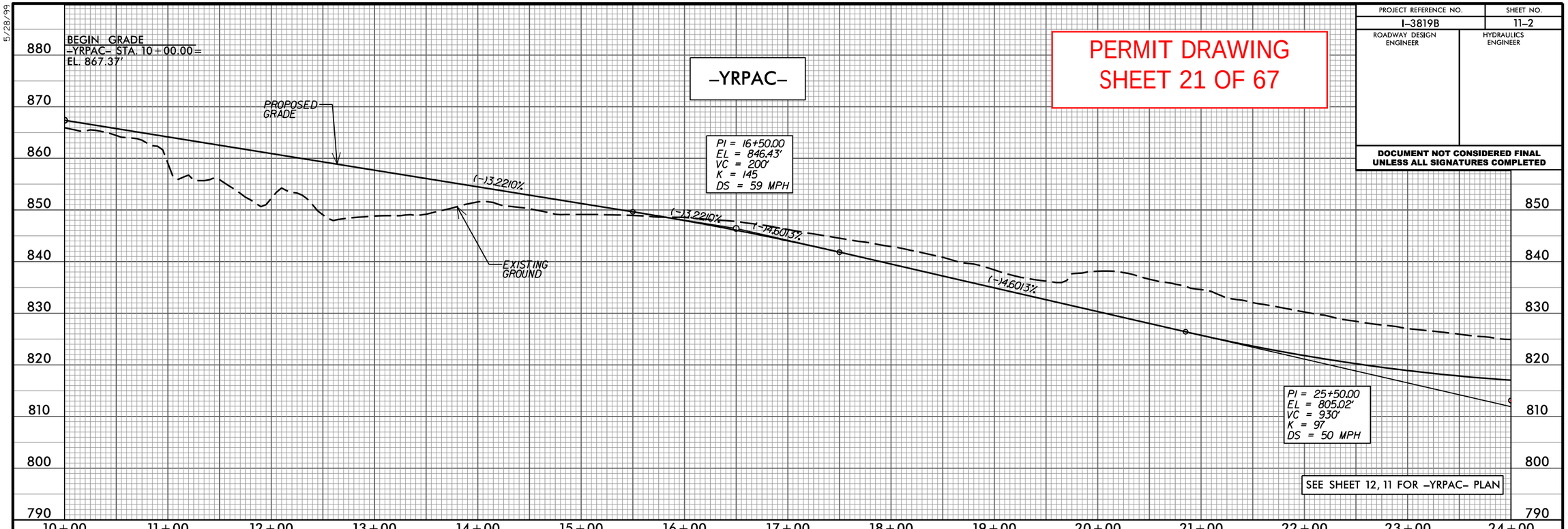
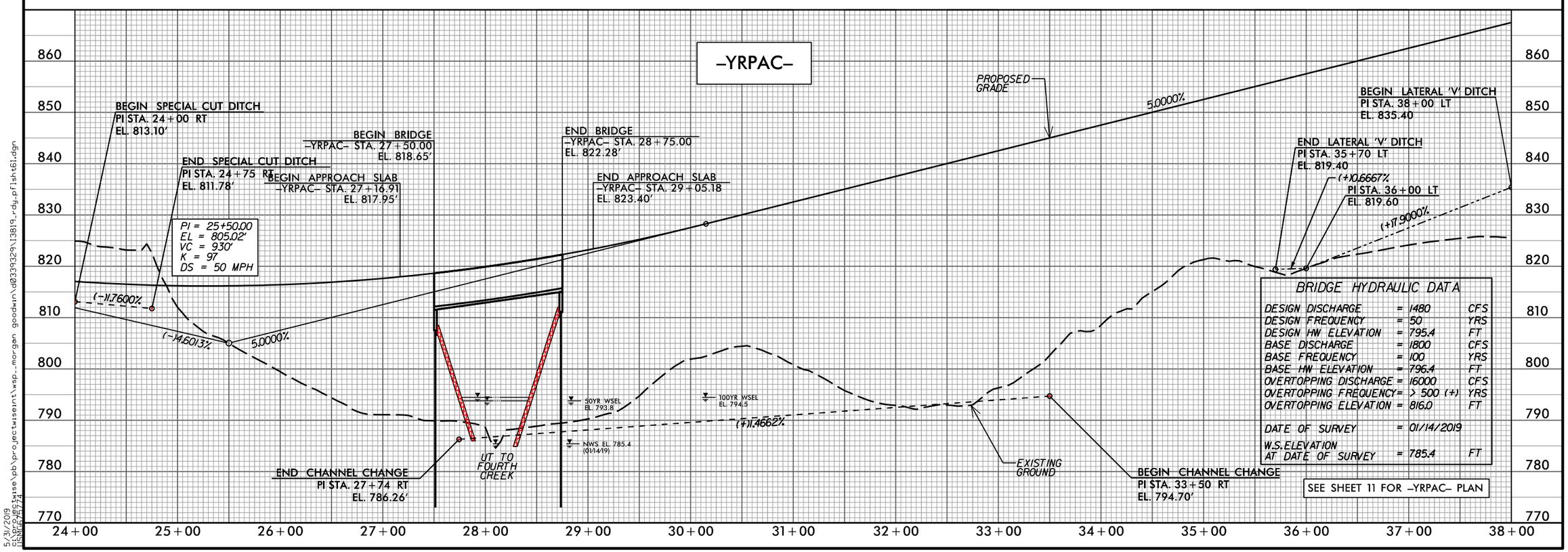
USMG675774

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	11-2
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 21 OF 67





BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	1480	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	795.4	FT
BASE DISCHARGE	=	1800	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	796.4	FT
OVERTOPPING DISCHARGE	=	16000	CFS
OVERTOPPING FREQUENCY	=	> 500 (+)	YRS
OVERTOPPING ELEVATION	=	816.0	FT
DATE OF SURVEY	=	01/14/2019	
W.S.ELEVATION AT DATE OF SURVEY	=	785.4	FT

5/28/99

5/31/2019
c:\projectwise\pb\projectwiseint\wsp_-morgan goodwin\d0339329\I3819_rdy_pflsht61.dgn
ss06/5/74

PERMIT DRAWING
SHEET 22 OF 67

LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

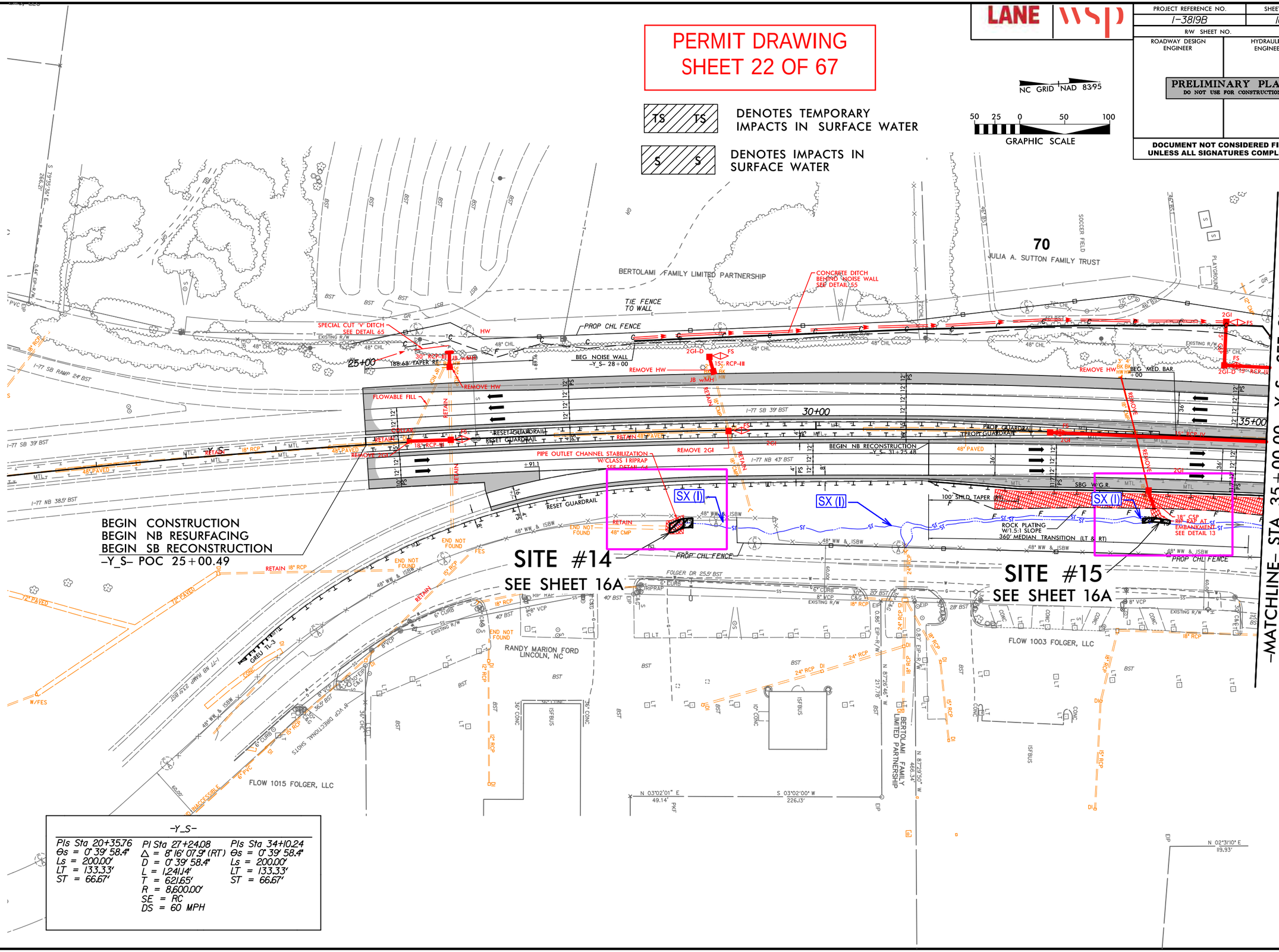
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

NC GRID NAD 83/95

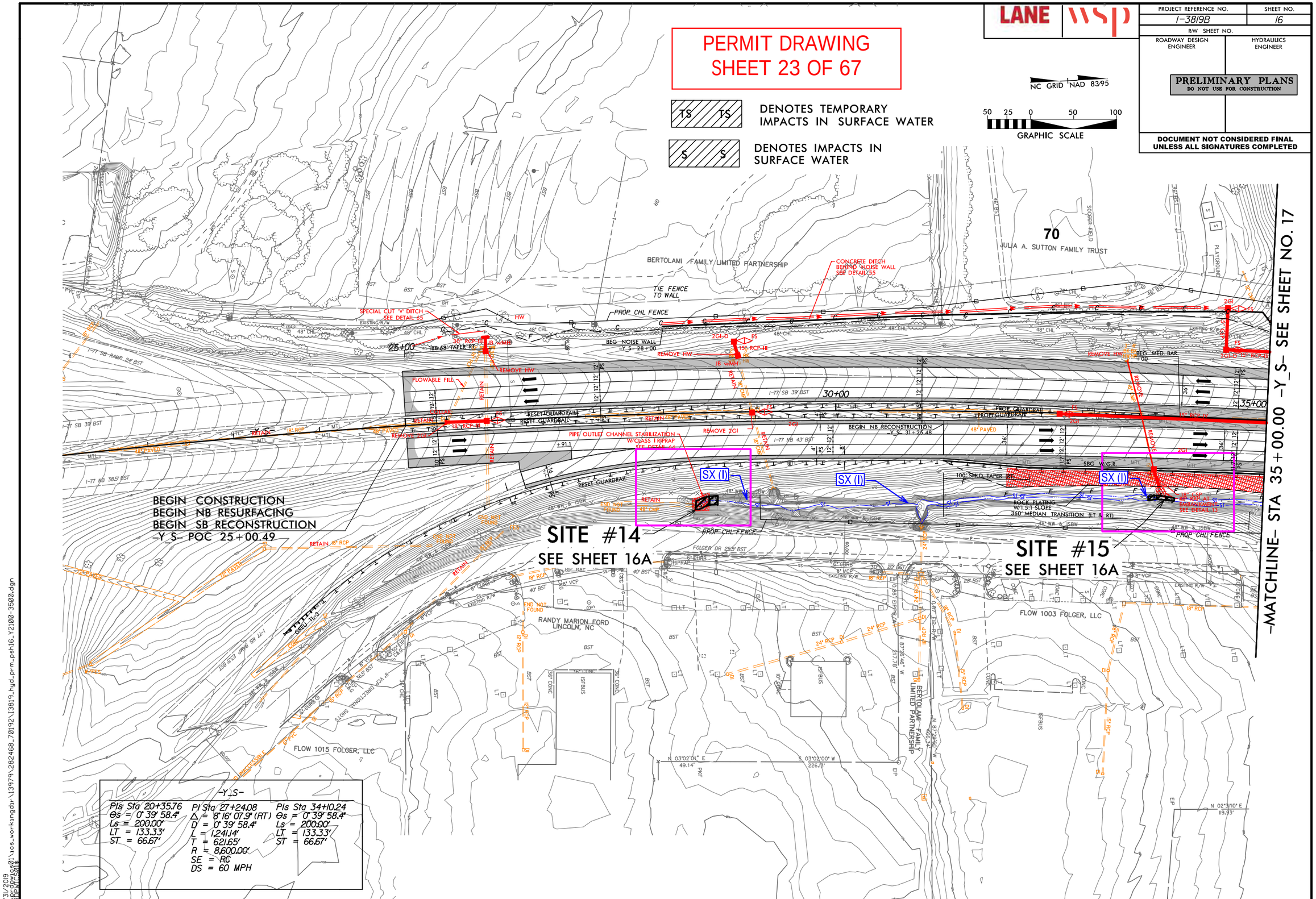
50 25 0 50 100
GRAPHIC SCALE



-Y_S-

PIs Sta 20+35.76	PI Sta 27+24.08	PIs Sta 34+10.24
Θs = 0° 39' 58.4"	Δ = 8° 16' 07.9" (RT)	Θs = 0° 39' 58.4"
Ls = 200.00'	D = 0° 39' 58.4"	Ls = 200.00'
LT = 133.33'	L = 1,241.14'	LT = 133.33'
ST = 66.67'	T = 621.65'	ST = 66.67'
	R = 8,600.00'	
	SE = RC	
	DS = 60 MPH	

5/31/2019
\\prdpwics02\ics_workingdir\5260\282468_70478\I3819_hyd_prm_psh16_Y2100-3500.dgn
PRDPWICS02$

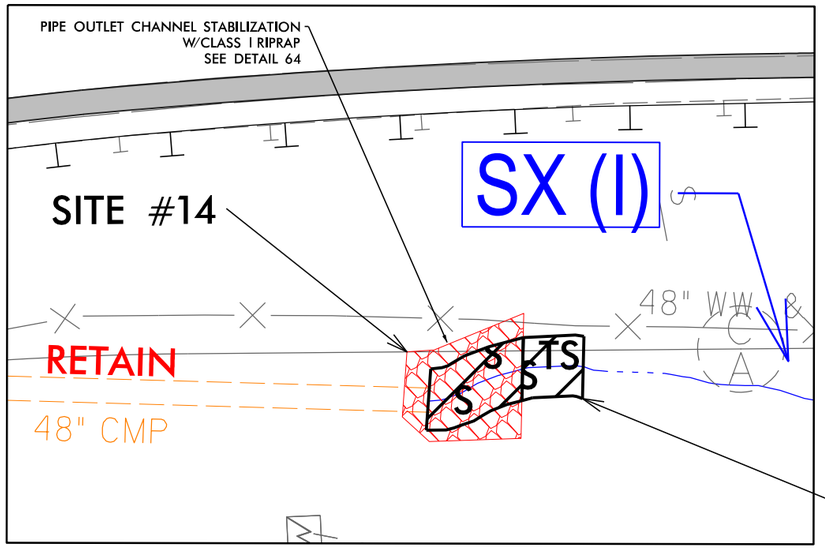


LANE
wsp
PROJECT REFERENCE NO.
I-3819B
SHEET NO.
16
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
PERMIT DRAWING
SHEET 23 OF 67
TS TS
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
S S
DENOTES IMPACTS IN SURFACE WATER
NC GRID NAD 83/95
50 25 0 50 100
GRAPHIC SCALE
70
JULIA A. SUTTON FAMILY TRUST
BERTOLAMI FAMILY LIMITED PARTNERSHIP
TIE FENCE TO WALL
PROP CHL FENCE
CONCRETE DITCH BEHIND NOISE WALL SEE DETAIL 55
SPECIAL CUT 'V' DITCH SEE DETAIL 65
BEG NOISE WALL -Y_S- 28+00
25+00
30+00
35+00
FLOWABLE FILL
RESET GUARDRAIL
PROP GUARDRAIL
BEGIN NB RECONSTRUCTION -Y_S- 31+25.48
PIPE OUTLET CHANNEL STABILIZATION W/CLASS I RIPRAP SEE DETAIL 64
SX (I)
ROCK PLATING W/1.5:1 SLOPE 360' MEDIAN TRANSITION (LT & RT)
BEGIN CONSTRUCTION
BEGIN NB RESURFACING
BEGIN SB RECONSTRUCTION
-Y_S- POC 25+00.49
SITE #14
SEE SHEET 16A
SITE #15
SEE SHEET 16A
RANDY MARION FORD LINCOLN, NC
FLOW 1003 FOLGER, LLC
FLOW 1015 FOLGER, LLC
BERTOLAMI FAMILY LIMITED PARTNERSHIP
-MATCHLINE- STA 35+00.00 -Y_S- SEE SHEET NO. 17
-Y_S-
PIs Sta 20+35.76
Θs = 0° 39' 58.4"
Ls = 200.00'
LT = 133.33'
ST = 66.67'
PI Sta 27+24.08
Δ = 8° 16' 07.9" (RT)
D = 0° 39' 58.4"
L = 1,241.14'
T = 621.65'
R = 8,600.00'
SE = RC
DS = 60 MPH
PIs Sta 34+10.24
Θs = 0° 39' 58.4"
Ls = 200.00'
LT = 133.33'
ST = 66.67'
5/31/2019
\prdpwics01\ics_workingdir\13979\282468_70192\13819_hyd_prm_psh16_Y2100-3500.dgn
PRDPWICS01$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	16A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

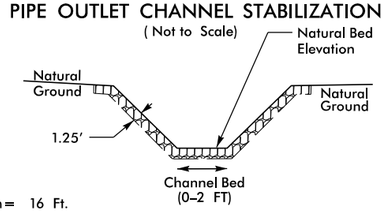
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INSET



TEMPORARY IMPACTS IN SURFACE WATER

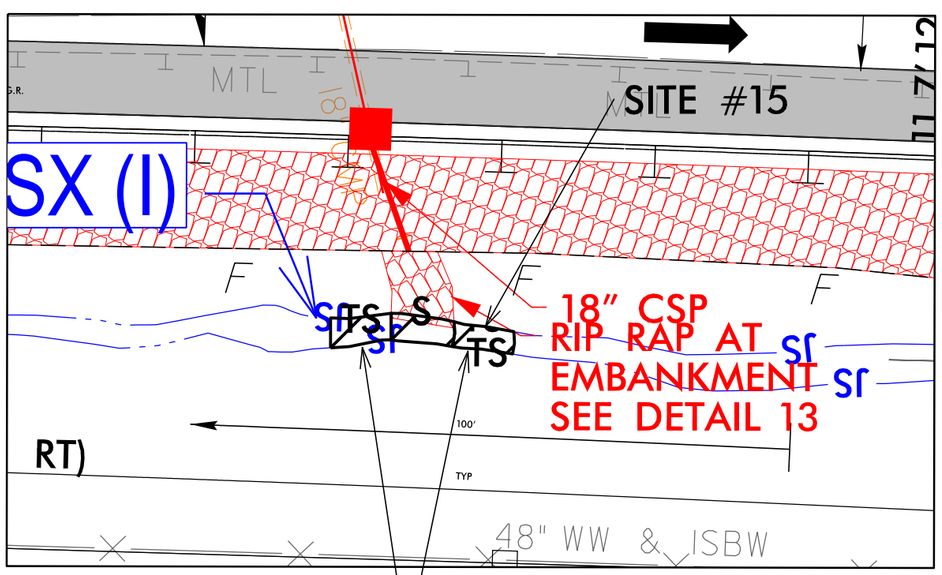
DETAIL 64
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



Length = 16 Ft.
Type of Liner = CL 1 Rip–Rap – Keyed–In (No Geotextile)

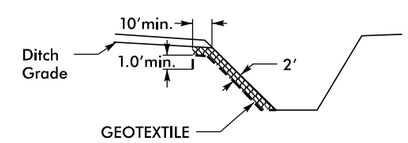
–Y S– STA. 28+35 RT

INSET



TEMPORARY IMPACTS IN SURFACE WATER

DETAIL 13
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner = Class 2 Rip–Rap

–Y_S– STA. 121+45

PERMIT DRAWING
SHEET 24 OF 67

NC GRID NAD 83/95

S — DENOTES IMPACTS IN SURFACE WATER

TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

25 12.5 0 25 50
GRAPHIC SCALE – INSETS

07/12/19
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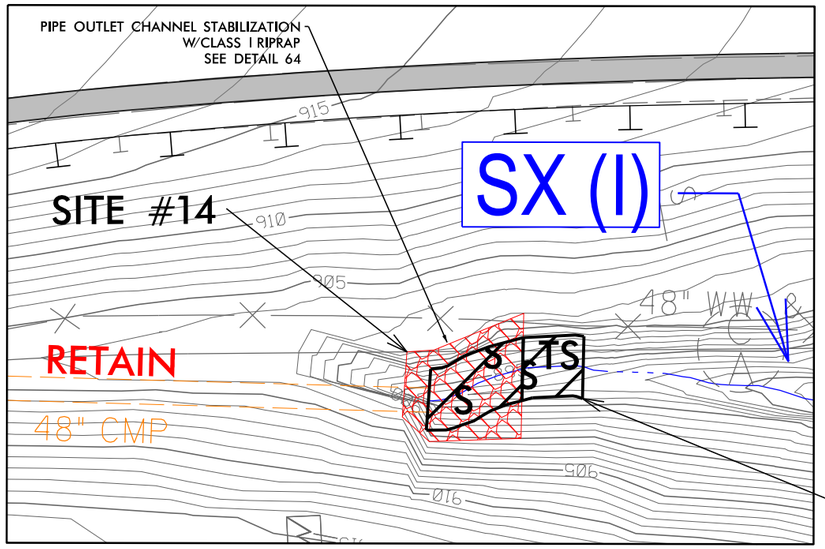
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	16A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INSET

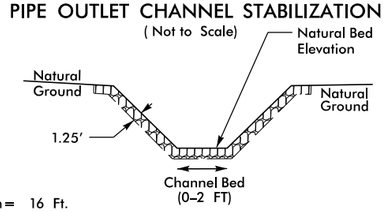


TEMPORARY IMPACTS IN SURFACE WATER

DETAIL 64

PIPE OUTLET CHANNEL STABILIZATION

(Not to Scale)

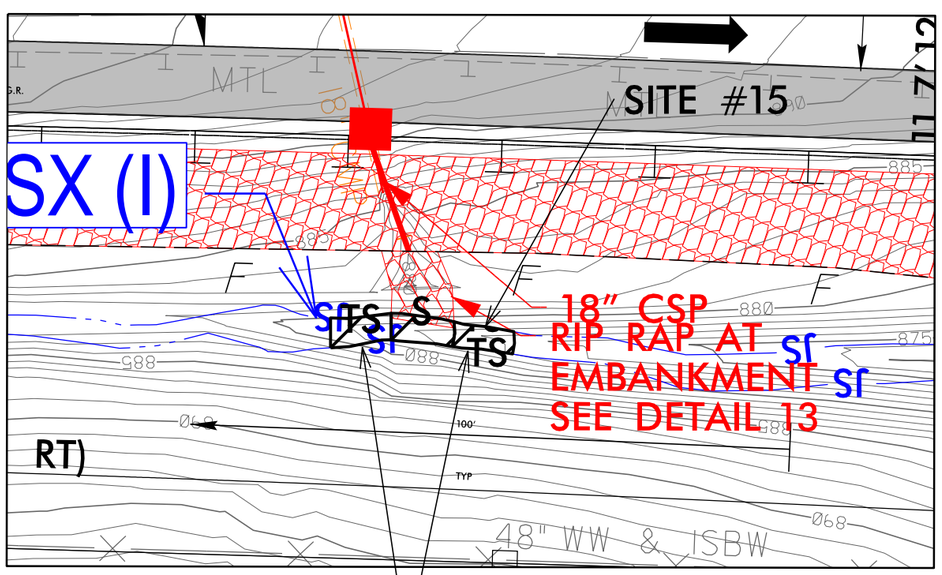


Length = 16 Ft.

Type of Liner = CL 1 Rip–Rap – Keyed–In (No Geotextile)

–Y S– STA. 28+35 RT

INSET

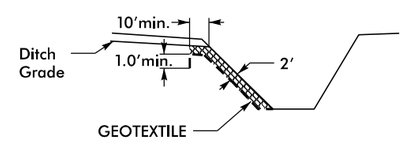


TEMPORARY IMPACTS IN SURFACE WATER

DETAIL 13

RIP RAP AT EMBANKMENT

(Not to Scale)



Type of Liner = Class 2 Rip–Rap

–Y_S– STA. 121+45

PERMIT DRAWING
SHEET 25 OF 67

NC GRID NAD 83/95

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

25 12.5 0 25 50

GRAPHIC SCALE – INSETS

07/12/19
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Becker, JW

LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

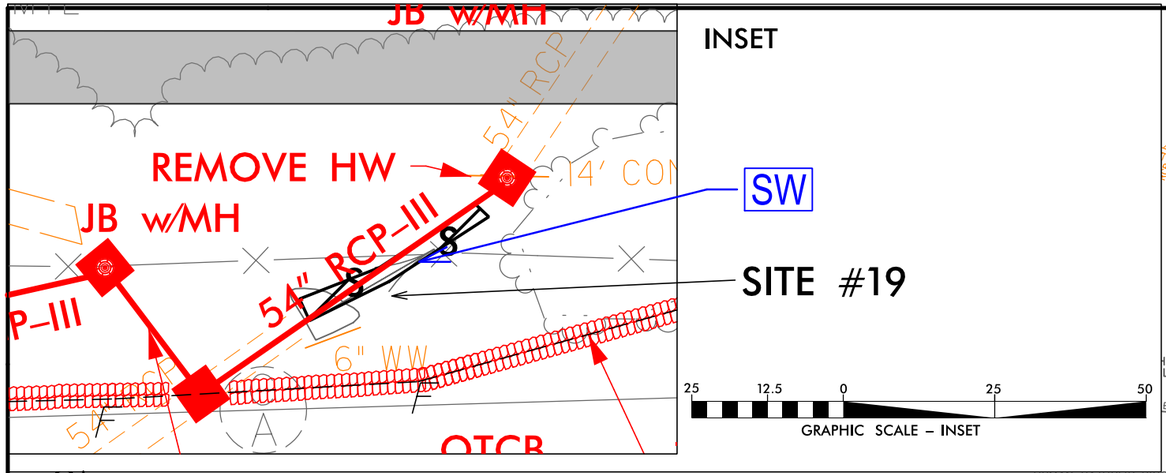
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

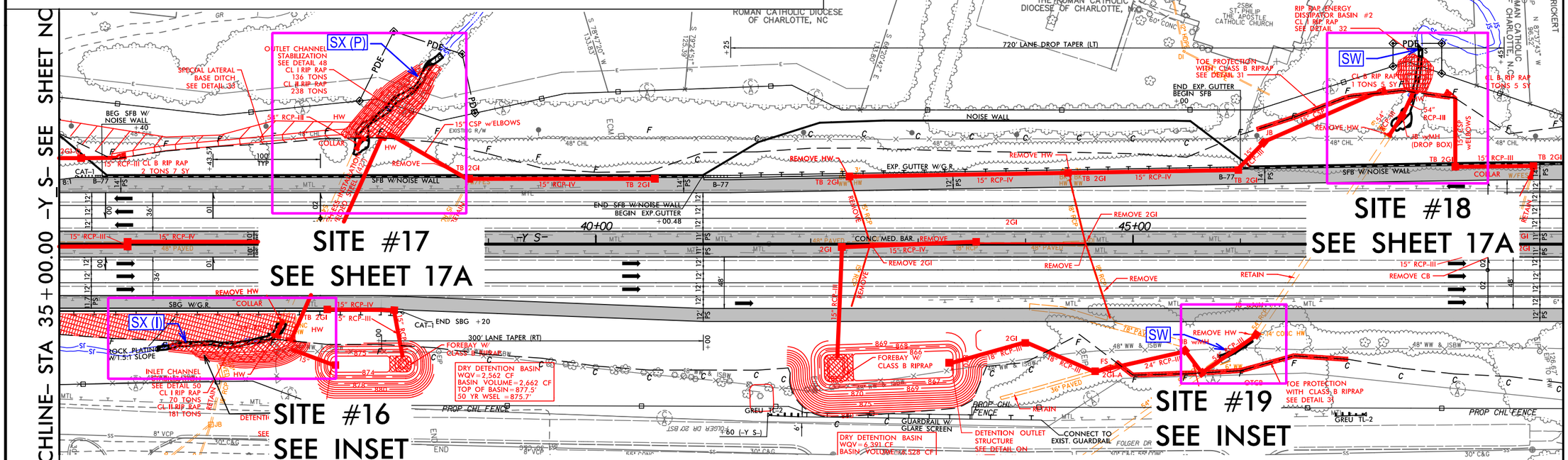
PERMIT DRAWING
SHEET 26 OF 67

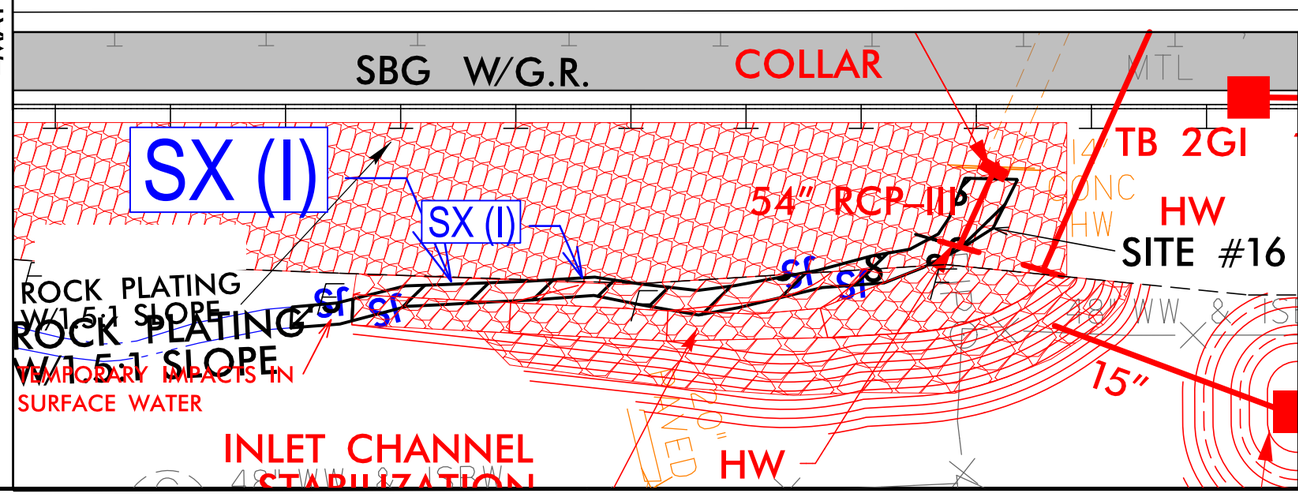
NC GRID NAD 83/95

GRAPHIC SCALE 50 25 0 50 100

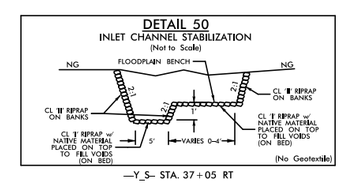
INSET







INSET



S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

GRAPHIC SCALE – INSET 25 12.5 0 25 50

7/12/2019
pr_psh17_sw18

LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

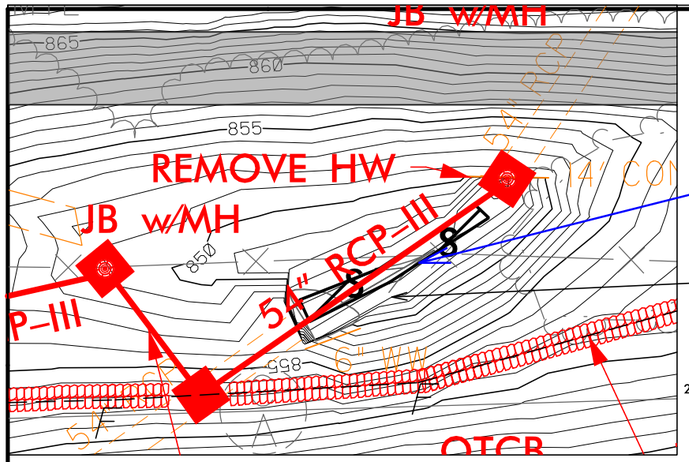
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 27 OF 67

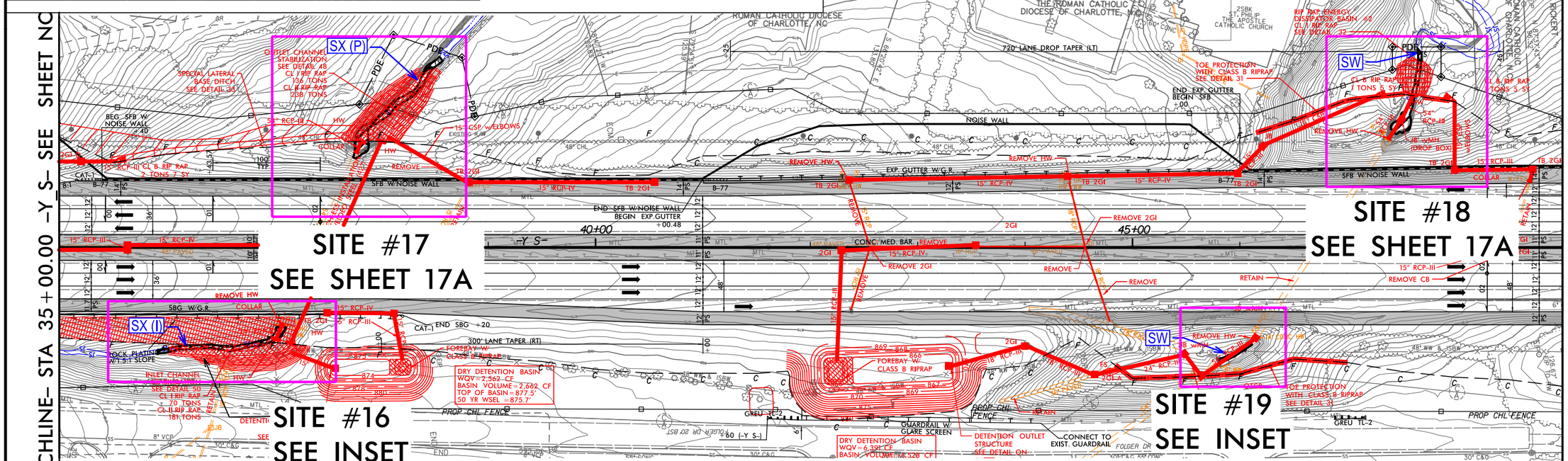
NC GRID NAD 83/95

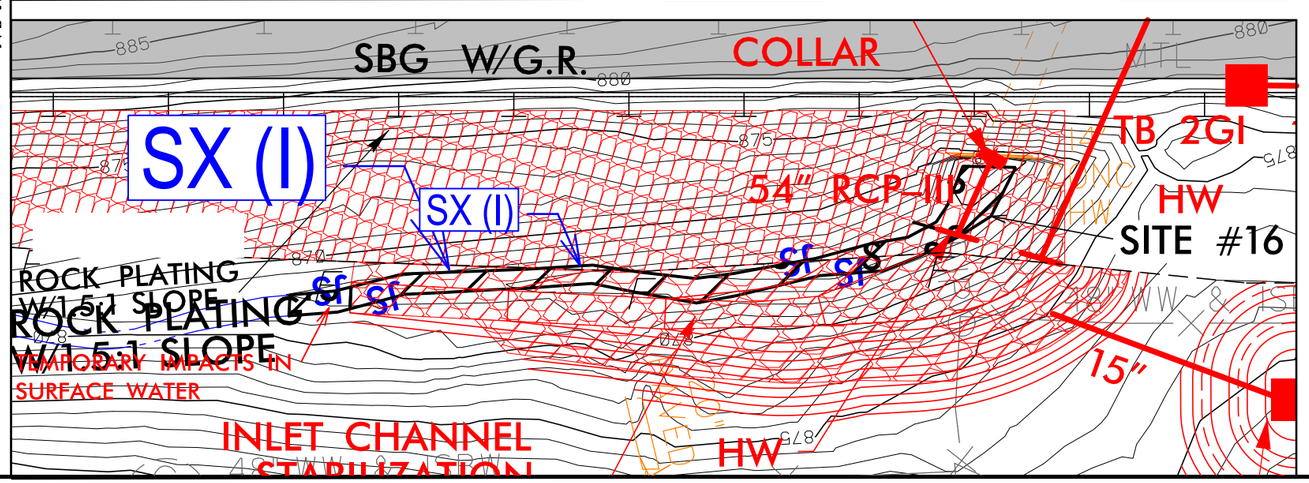
50 25 0 50 100
GRAPHIC SCALE

INSET

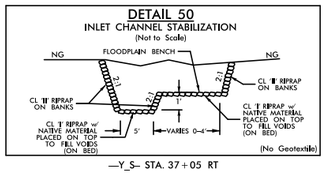


25 12.5 0 25 50
GRAPHIC SCALE – INSET





INSET



S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

25 12.5 0 25 50
GRAPHIC SCALE – INSET

7/12/2019
pr_prprocs01\ics_workingdir\18225\282468.126995\13819_hyd_prm_psh17_Y3500-4900.dgn

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	17A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

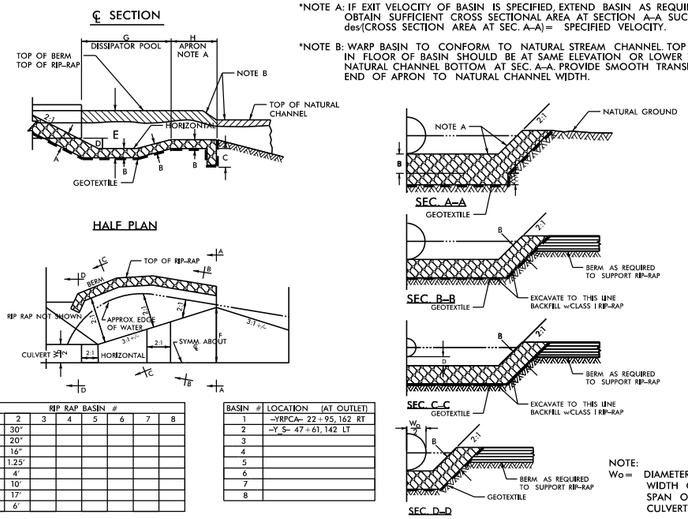
PERMIT DRAWING
SHEET 28 OF 67

DETAIL 32

RIP-RAPPED ENERGY DISSIPATOR BASIN

*NOTE A: IF EXIT VELOCITY OF BASIN IS SPECIFIED, EXTEND BASIN AS REQUIRED TO OBTAIN SUFFICIENT CROSS SECTIONAL AREA AT SECTION A–A SUCH THAT Q des/(CROSS SECTION AREA AT SEC. A–A)= SPECIFIED VELOCITY.

*NOTE B: WARP BASIN TO CONFORM TO NATURAL STREAM CHANNEL. TOP OF RIP-RAP IN FLOOR OF BASIN SHOULD BE AT SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM AT SEC. A–A. PROVIDE SMOOTH TRANSITION FROM END OF APRON TO NATURAL CHANNEL WIDTH.



DIM.	RIP RAP BASIN # 1	2	3	4	5	6	7	8
A	30"	30"						
B	20"	20"						
C	16"	16"						
D	1'	1.25'						
E	3.5'	4'						
F	6.3'	10'						
G	10'	17'						
H	5'	6'						

BASIN #	LOCATION (AT OUTLET)
1	–Y-RPC A– 22+95, 162 RT
2	–Y_S– 47+61, 142 LT
3	
4	
5	
6	
7	
8	

NOTE:
Wo = DIAMETER OF PIPE, WIDTH OF BOX OR SPAN OF PIPE-ARCH CULVERTS

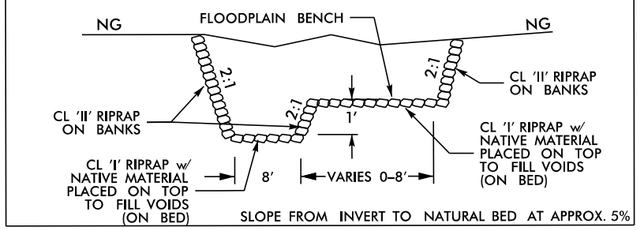
5/05

DETAIL 48

OUTLET CHANNEL STABILIZATION

(Not to Scale)

PLACEMENT DEPTH:
CL 1 – 24"
CL 2 – 30"
(No Geotextile)



—Y_S– STA. 37+95 LT

NC GRID NAD 83/95

S S DENOTES IMPACTS IN SURFACE WATER

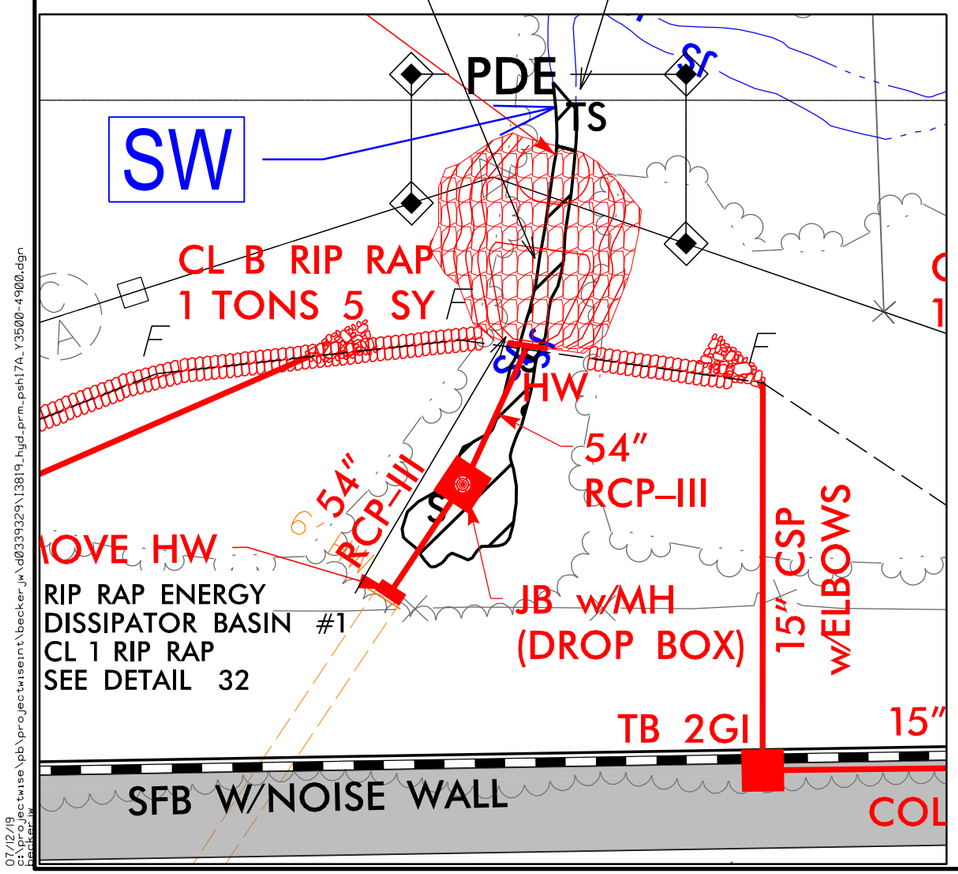
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

25 12.5 0 25 50
GRAPHIC SCALE – INSETS

INSET

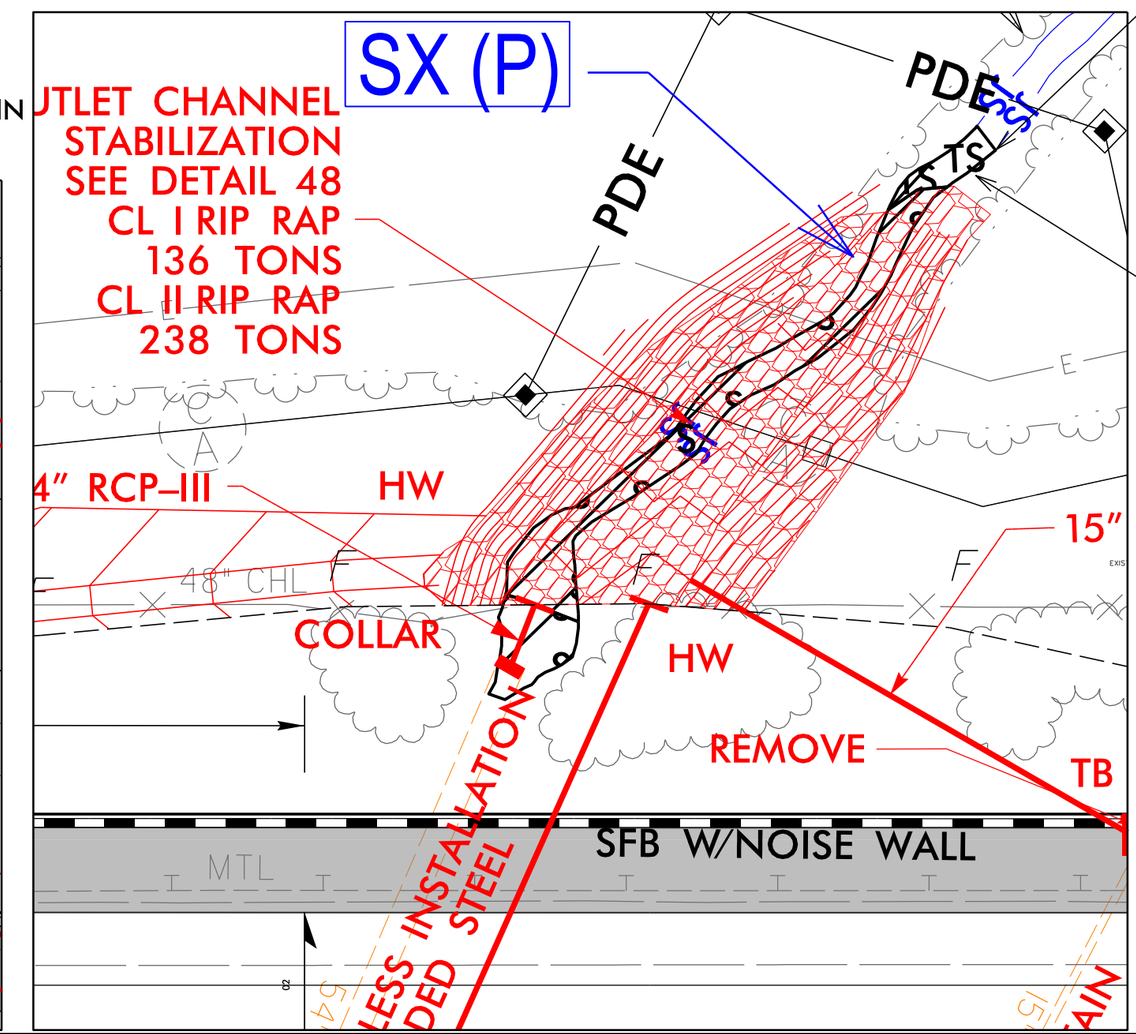
SITE #18

TEMPORARY IMPACTS IN SURFACE WATER



INSET

SITE #17



07/12/19
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Becker, JW

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	17A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LANE | WSP

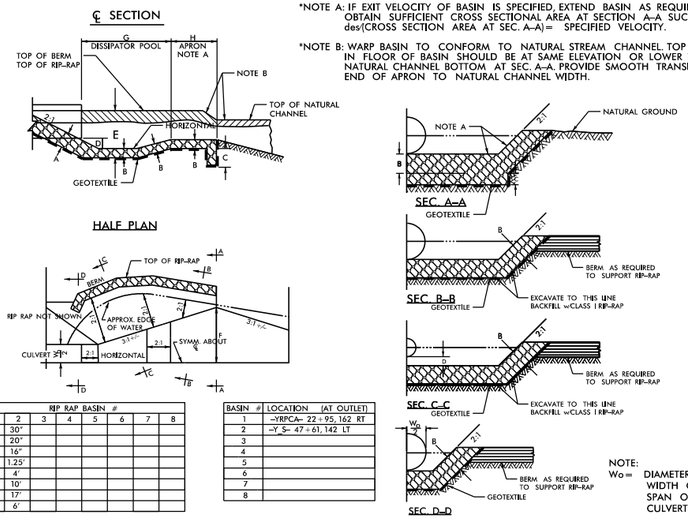
PERMIT DRAWING
SHEET 29 OF 67

DETAIL 32

RIP-RAPPED ENERGY DISSIPATOR BASIN

*NOTE A: IF EXIT VELOCITY OF BASIN IS SPECIFIED, EXTEND BASIN AS REQUIRED TO OBTAIN SUFFICIENT CROSS SECTIONAL AREA AT SECTION A–A SUCH THAT Q des/(CROSS SECTION AREA AT SEC. A–A)= SPECIFIED VELOCITY.

*NOTE B: WARP BASIN TO CONFORM TO NATURAL STREAM CHANNEL. TOP OF RIP-RAP IN FLOOR OF BASIN SHOULD BE AT SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM AT SEC. A–A. PROVIDE SMOOTH TRANSITION FROM END OF APRON TO NATURAL CHANNEL WIDTH.



DIM.	RIP RAP BASIN # 1	2	3	4	5	6	7	8
A	30"	30"						
B	20"	20"						
C	16"	16"						
D	1'	1.25'						
E	3.5'	4'						
F	6.3'	10'						
G	10'	17'						
H	5'	6'						

BASIN #	LOCATION (AT OUTLET)
1	–Y-RPC A– 22+95, 162 RT
2	–Y_S– 47+61, 142 LT
3	
4	
5	
6	
7	
8	

NOTE:
W_o = DIAMETER OF PIPE, WIDTH OF BOX OR SPAN OF PIPE-ARCH CULVERTS

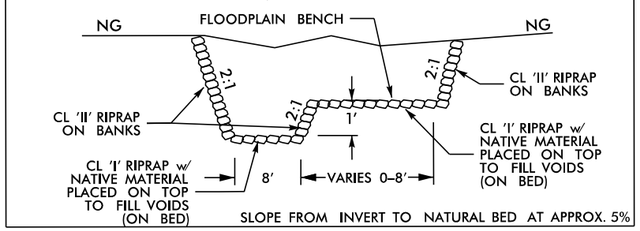
5/05

DETAIL 48

OUTLET CHANNEL STABILIZATION

(Not to Scale)

PLACEMENT DEPTH:
CL 1 – 24"
CL 2 – 30"
(No Geotextile)



—Y_S– STA. 37+95 LT

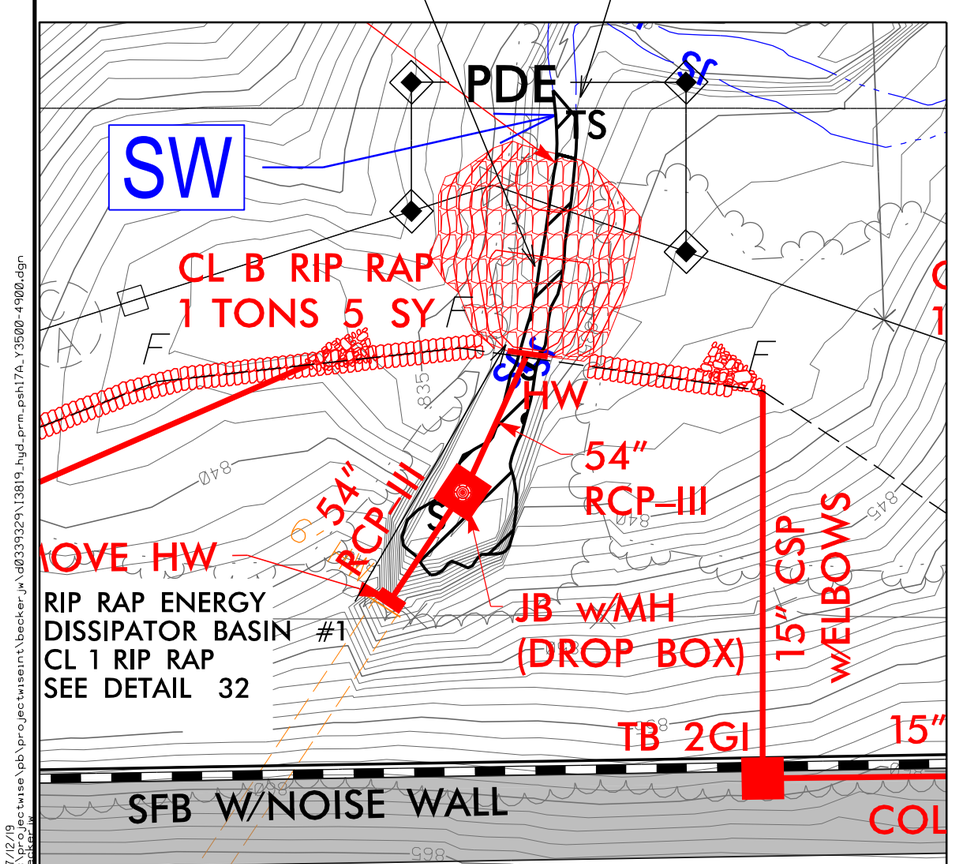
NC GRID NAD 83/95

S S DENOTES IMPACTS IN SURFACE WATER

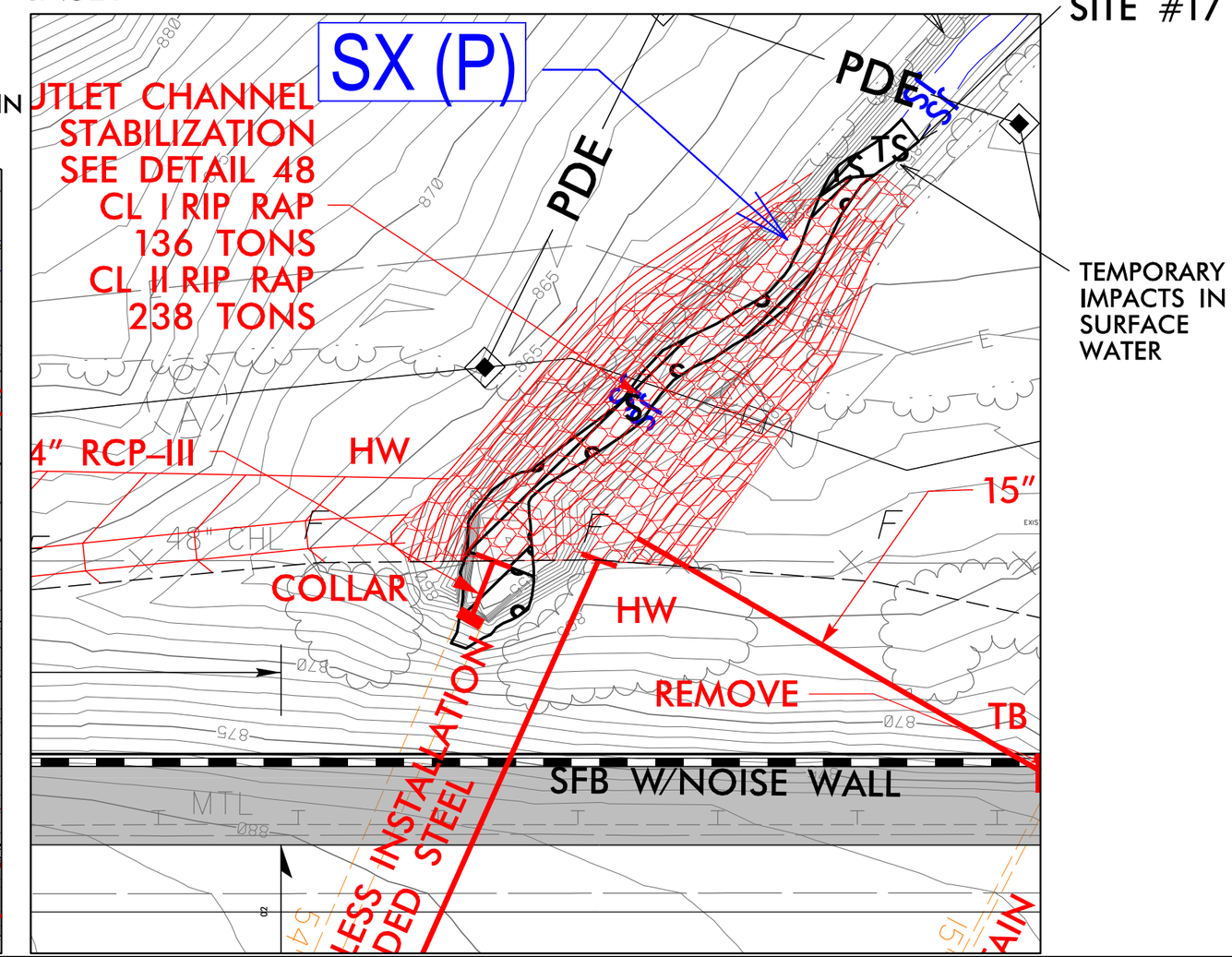
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

25 12.5 0 25 50
GRAPHIC SCALE – INSETS

INSET SITE #18



INSET SITE #17



07/12/19
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Becker, JW

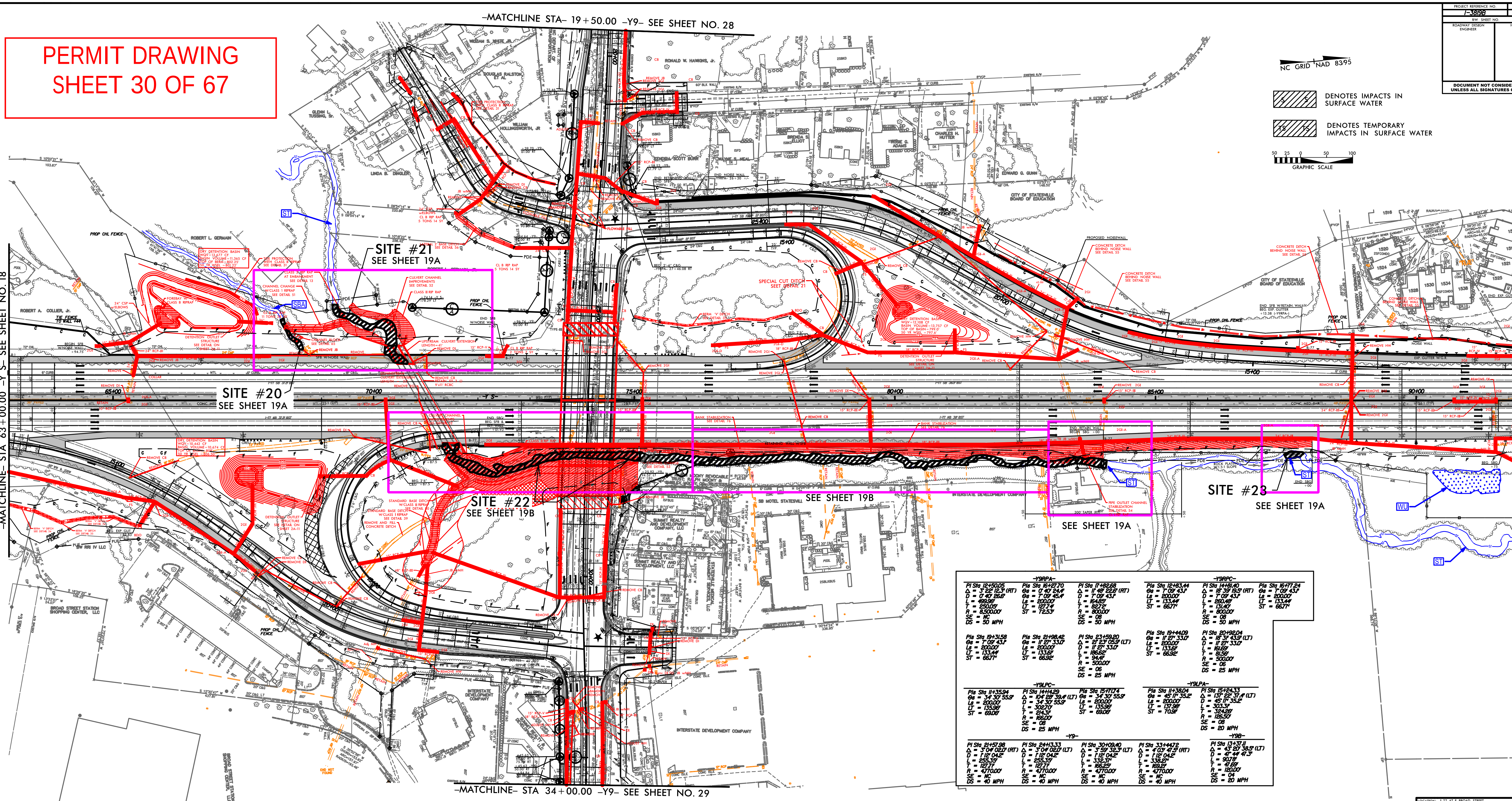
PERMIT DRAWING
SHEET 30 OF 67

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	19

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-Y9RPA-

PI Sta 12+50.05
Δ = 3°22'12.3" (RT)
D = 0°40'26.6"
L = 499.96'
T = 250.05'
R = 8,500.00'
SE = NC
DS = 50 MPH

PIs Sta 16+27.70
θs = 0°40'24.4"
θs = 7°09'45.4"
Ls = 200.00'
LT = 127.74'
ST = 72.53'

PI Sta 17+82.68
Δ = 11°48'22.6" (RT)
D = 7°09'43.1"
L = 164.85'
T = 82.72'
R = 800.00'
SE = .08
DS = 50 MPH

PIs Sta 19+31.58
θs = 7°09'43.1"
Ls = 200.00'
LT = 133.44'
ST = 66.77'

PIs Sta 21+98.42
θs = 11°27'33.0"
Ls = 200.00'
LT = 133.61'
ST = 66.92'

PI Sta 23+59.20
Δ = 21°23'05.9" (LT)
D = 11°27'33.0"
L = 186.62'
T = 94.41'
R = 500.00'
SE = .06
DS = 25 MPH

-Y9RPC-

PIs Sta 12+83.44
θs = 7°09'43.1"
Ls = 200.00'
LT = 133.44'
ST = 66.77'

PI Sta 14+81.40
Δ = 18°39'19.5" (RT)
D = 7°09'43.1"
L = 260.48'
T = 131.40'
R = 800.00'
SE = .08
DS = 50 MPH

PIs Sta 16+77.24
θs = 7°09'43.1"
Ls = 200.00'
LT = 133.44'
ST = 66.77'

PIs Sta 19+44.09
θs = 11°27'33.0"
Ls = 200.00'
LT = 133.61'
ST = 66.92'

PI Sta 20+92.04
Δ = 18°31'43.9" (LT)
D = 11°27'33.0"
L = 161.69'
T = 81.56'
R = 500.00'
SE = .06
DS = 25 MPH

-Y9LPC-

PIs Sta 11+35.94
θs = 34°30'55.9"
Ls = 200.00'
LT = 135.96'
ST = 69.06'

PI Sta 14+14.29
Δ = 104°28'39.4" (LT)
D = 34°30'55.9"
L = 302.70'
T = 214.31'
R = 166.00'
SE = .08
DS = 25 MPH

PIs Sta 15+71.74
θs = 34°30'55.9"
Ls = 200.00'
LT = 135.96'
ST = 69.06'

-Y9LPA-

PIs Sta 11+38.04
θs = 45°17'35.2"
Ls = 200.00'
LT = 137.98'
ST = 70.91'

PI Sta 15+24.33
Δ = 137°22'37.4" (LT)
D = 45°17'35.2"
L = 303.31'
T = 324.26'
R = 126.50'
SE = .08
DS = 20 MPH

-Y9-

PI Sta 21+57.98
Δ = 3°04'02.0" (RT)
D = 1°12'04.2"
L = 255.35'
T = 127.71'
R = 4,770.00'
SE = NC
DS = 40 MPH

PI Sta 24+13.33
Δ = 3°04'02.0" (LT)
D = 1°12'04.2"
L = 255.35'
T = 127.71'
R = 4,770.00'
SE = NC
DS = 40 MPH

PI Sta 30+09.40
Δ = 3°59'32.3" (LT)
D = 1°12'04.2"
L = 332.37'
T = 166.25'
R = 4,770.00'
SE = NC
DS = 40 MPH

PI Sta 33+44.72
Δ = 4°03'47.5" (RT)
D = 1°12'04.2"
L = 338.27'
T = 169.21'
R = 4,770.00'
SE = NC
DS = 40 MPH

-Y9B-

PI Sta 13+37.11
Δ = 43°20'38.5" (LT)
D = 47°44'47.3"
L = 90.78'
T = 47.69'
R = 120.00'
SE = .04
DS = 20 MPH

LOCATION: I-77 AT E. BROAD STREET
TIP NO.: I-3819B COUNTY: IREDELL
DESIGNED BY: C. DAVIS
CHECKED BY: D. AINSWORTH DATE: 4-2-2019

6/2/99
6/28/2019
\\prdpwics01\ics_workingdir\70421\336415_107\13819_hyd_prm_psh19_Y6300-9200.dgn
PRDPWICS01$

PERMIT DRAWING
SHEET 31 OF 67

PROJECT REFERENCE NO.	SHEET NO.
I-3818B	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

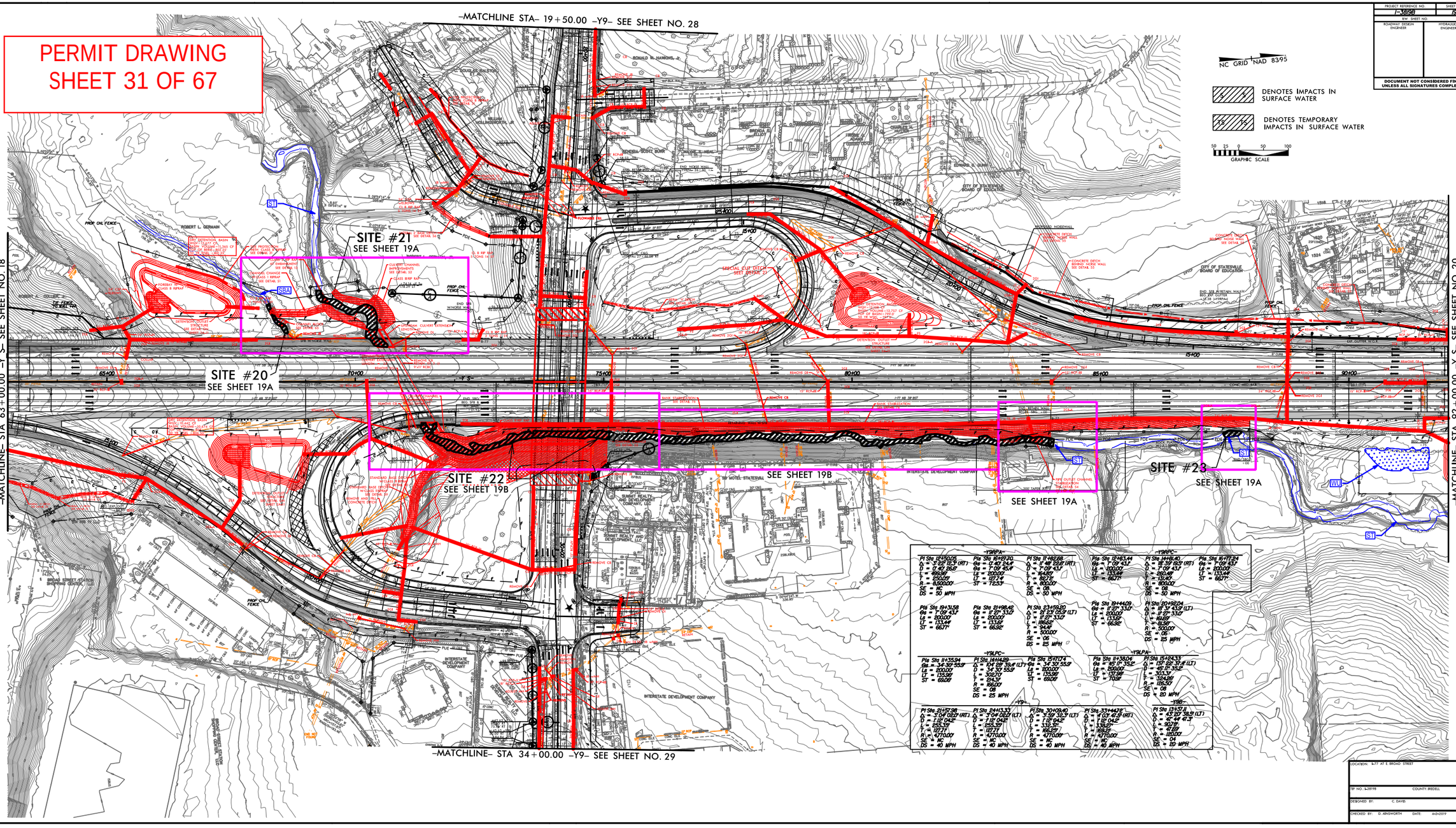
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NC GRID NAD 83/95

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

GRAPHIC SCALE 50 25 0 50 100



LOCATION: I-77 AT E. BROAD STREET

TIP NO. I-3818B COUNTY: IREDELL

DESIGNED BY: C. DAVIS

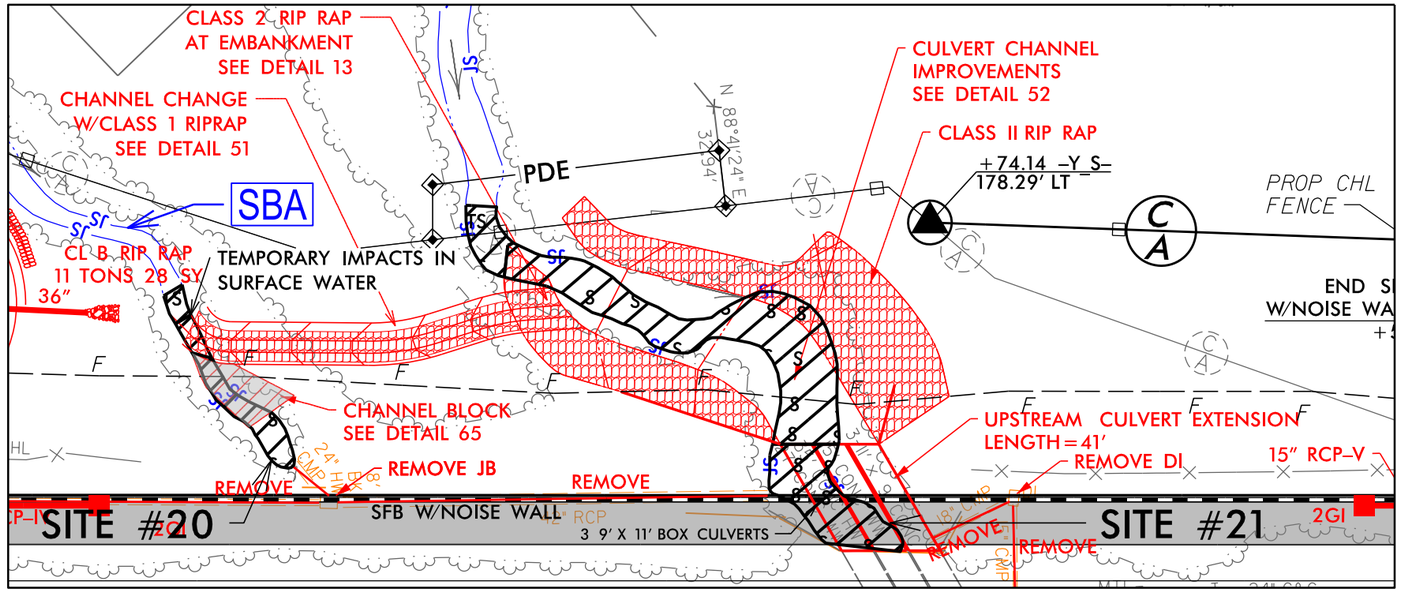
CHECKED BY: D. AINSWORTH DATE: 4-24-2019

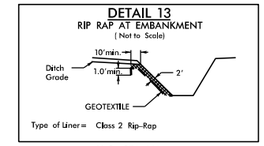
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	19A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

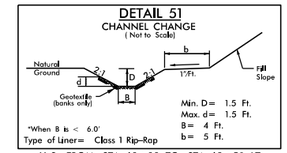
PERMIT DRAWING
SHEET 32 OF 67

INSET

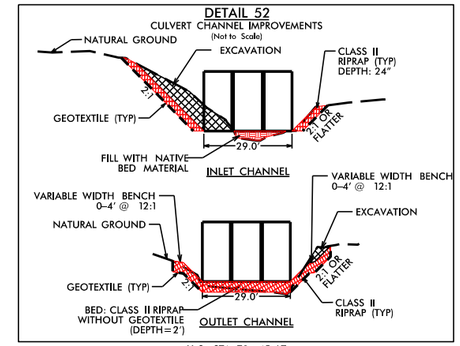




–Y S– STA. 121+45

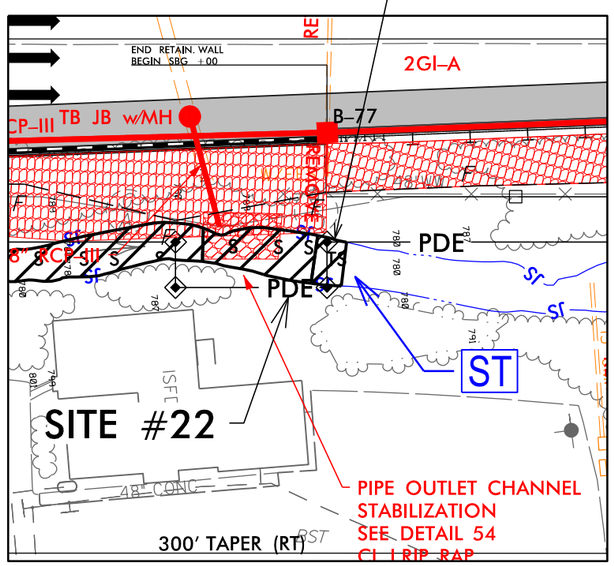


–Y S– FROM STA. 68+38 TO STA. 69+50 LT



–Y S– STA. 70+45 LT
–Y S– STA. 71+60 TO 73+25 RT

INSET



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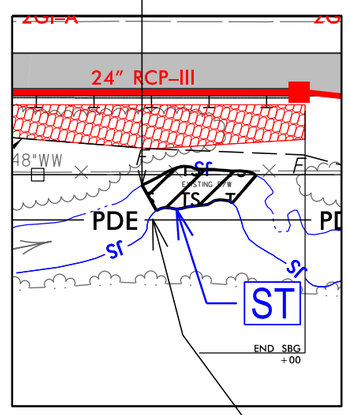

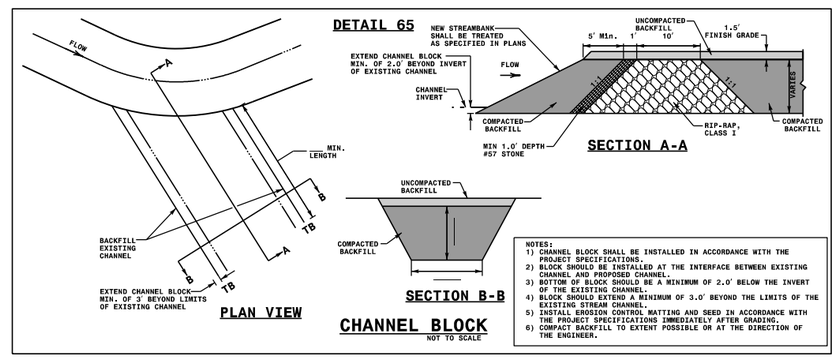

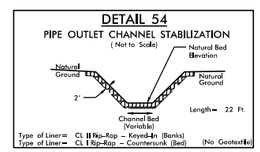

–Y S– STA. 83+65 RT
–Y S– STA. 94+40 RT

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NC GRID NAD 83/95

50 25 0 50 100
GRAPHIC SCALE – INSETS

07/12/19
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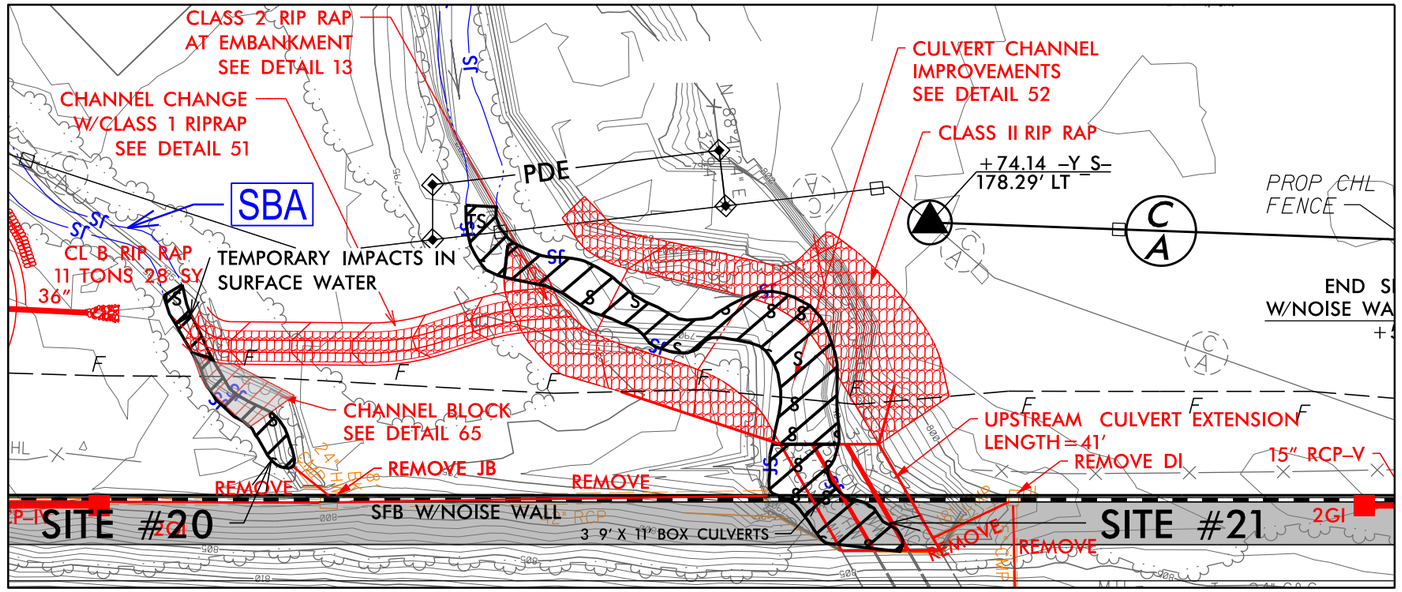
Becker jw

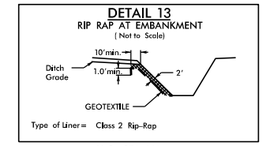
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	19A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

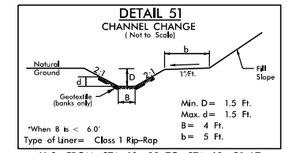
PERMIT DRAWING
SHEET 33 OF 67

INSET

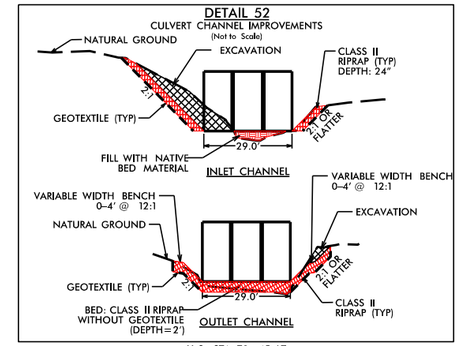




-Y_S- STA. 121+45

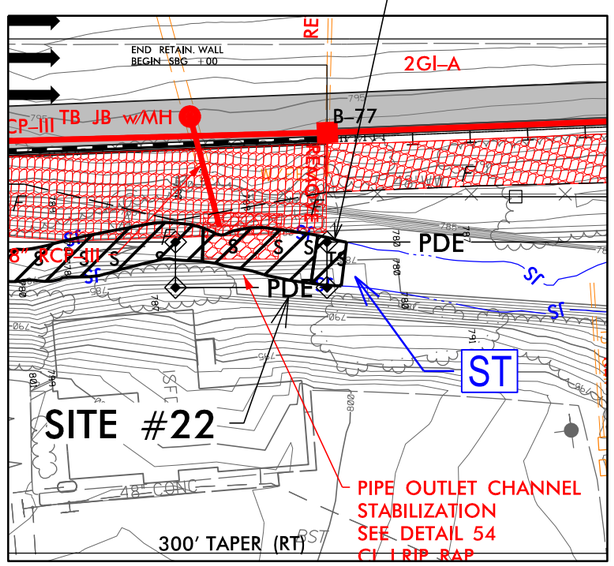


-Y_S- FROM STA. 68+38 TO STA. 69+50 LT



-Y_S- STA. 70+45 LT
-Y_S- STA. 71+60 TO 73+25 RT

INSET



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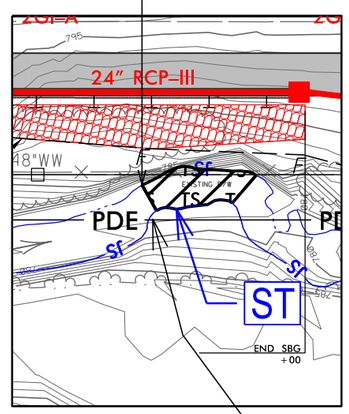

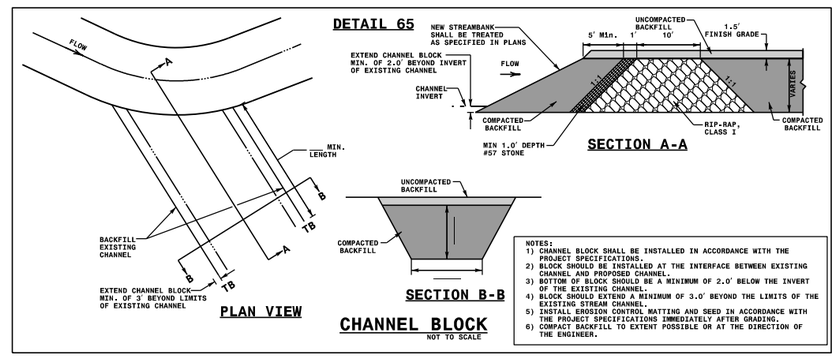

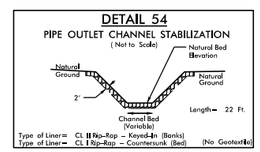

-Y_S- STA. 83+65 RT
-Y_S- STA. 94+40 RT

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NC GRID NAD 83/95

50 25 0 50 100
GRAPHIC SCALE - INSETS

07/12/19
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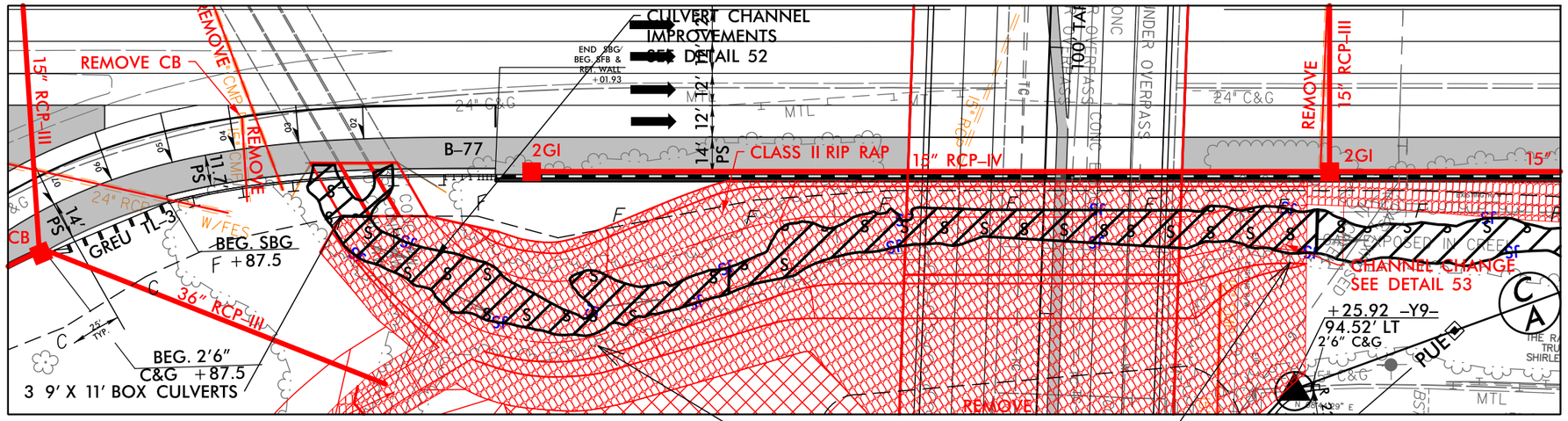
Becker,jw

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	19B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INSET

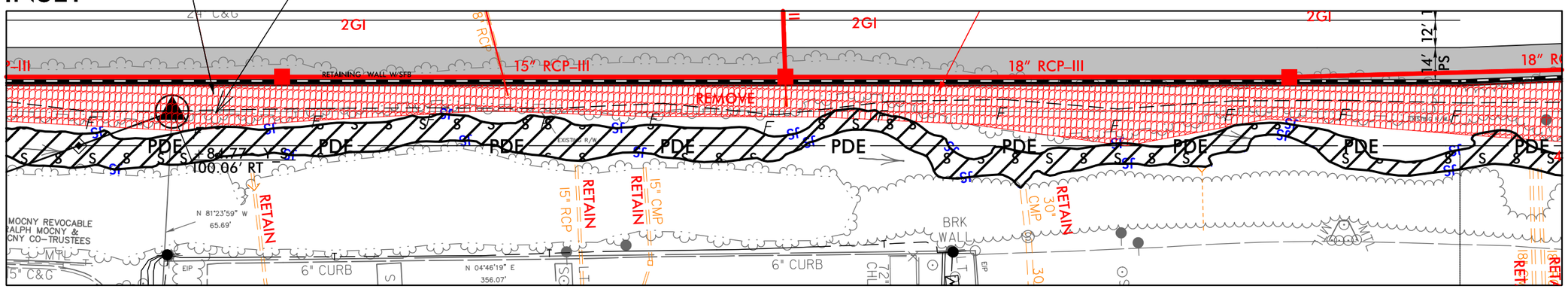


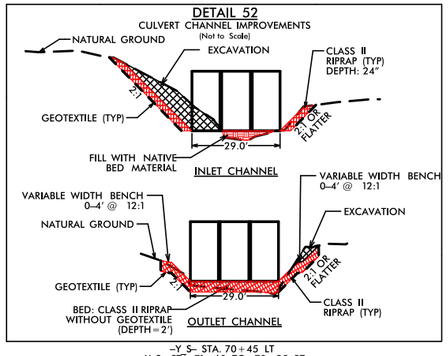
SITE #22

BANK STABILIZATION
SEE DETAIL 76

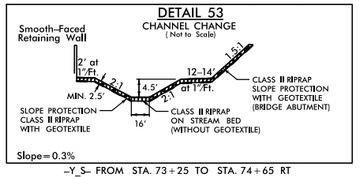
SITE #22

INSET

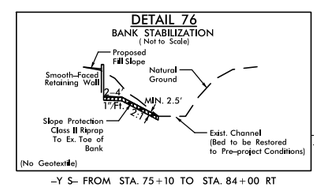




-Y S- STA. 70+45 LT
-Y_S- STA. 71+60 TO 73+25 RT



-Y_S- FROM STA. 73+25 TO STA. 74+65 RT



-Y S- FROM STA. 75+10 TO STA. 84+00 RT

NC GRID NAD 83/95

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50 25 0 50 100
GRAPHIC SCALE - INSETS

PERMIT DRAWING
SHEET 34 OF 67

7/12/2019
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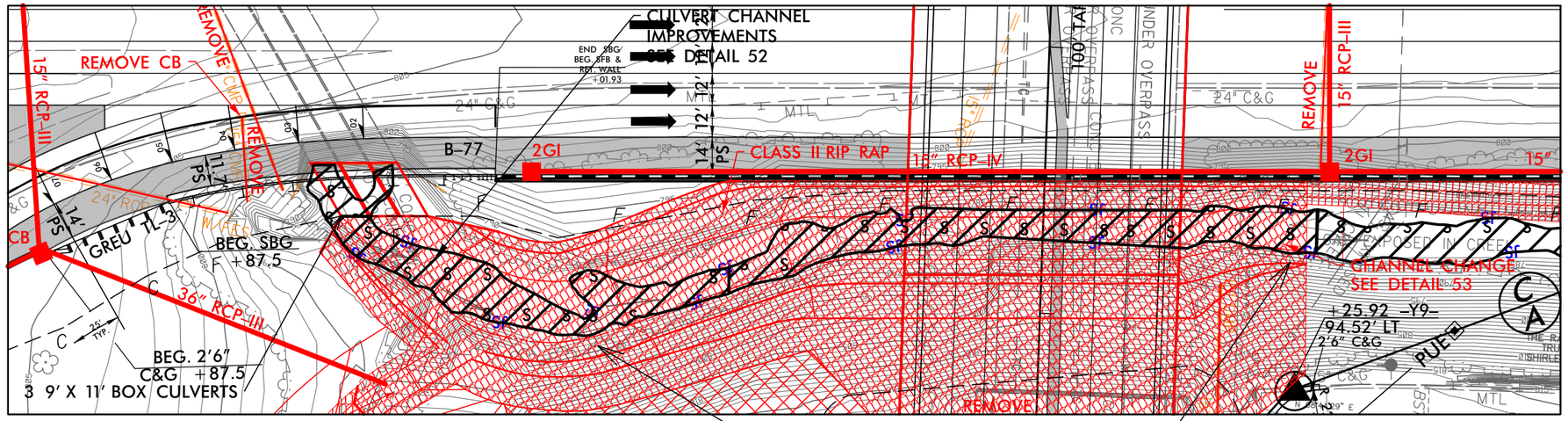
PRPWICS01$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	19B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INSET

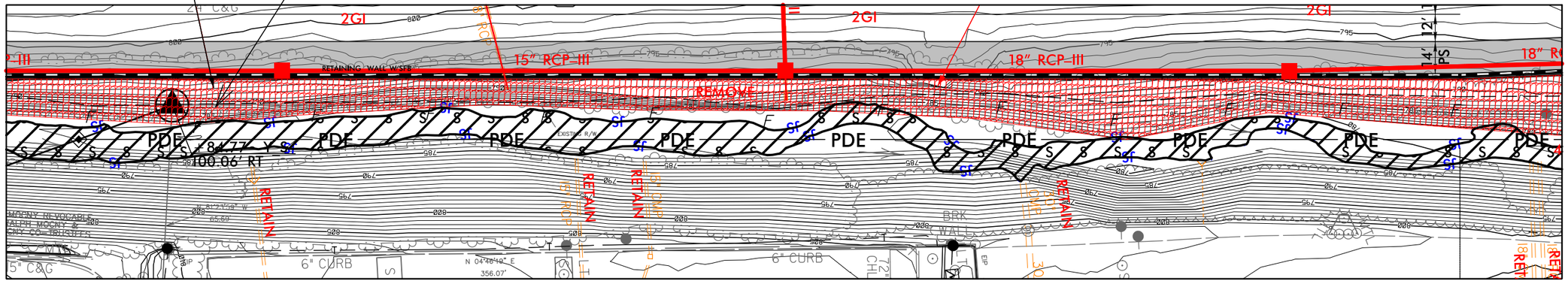


SITE #22

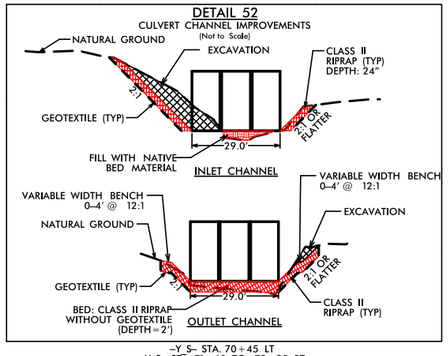
BANK STABILIZATION
SEE DETAIL 76

SITE #22

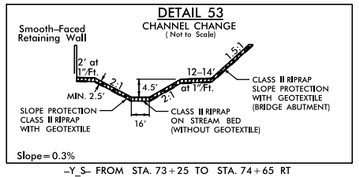
INSET



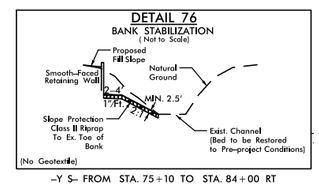
PERMIT DRAWING
SHEET 35 OF 67



-Y S- STA. 70+45 LT
-Y_S- STA. 71+60 TO 73+25 RT



-Y_S- FROM STA. 73+25 TO STA. 74+65 RT



-Y S- FROM STA. 75+10 TO STA. 84+00 RT

NC GRID NAD 83/95

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50 25 0 50 100
GRAPHIC SCALE – INSETS

7/12/2019
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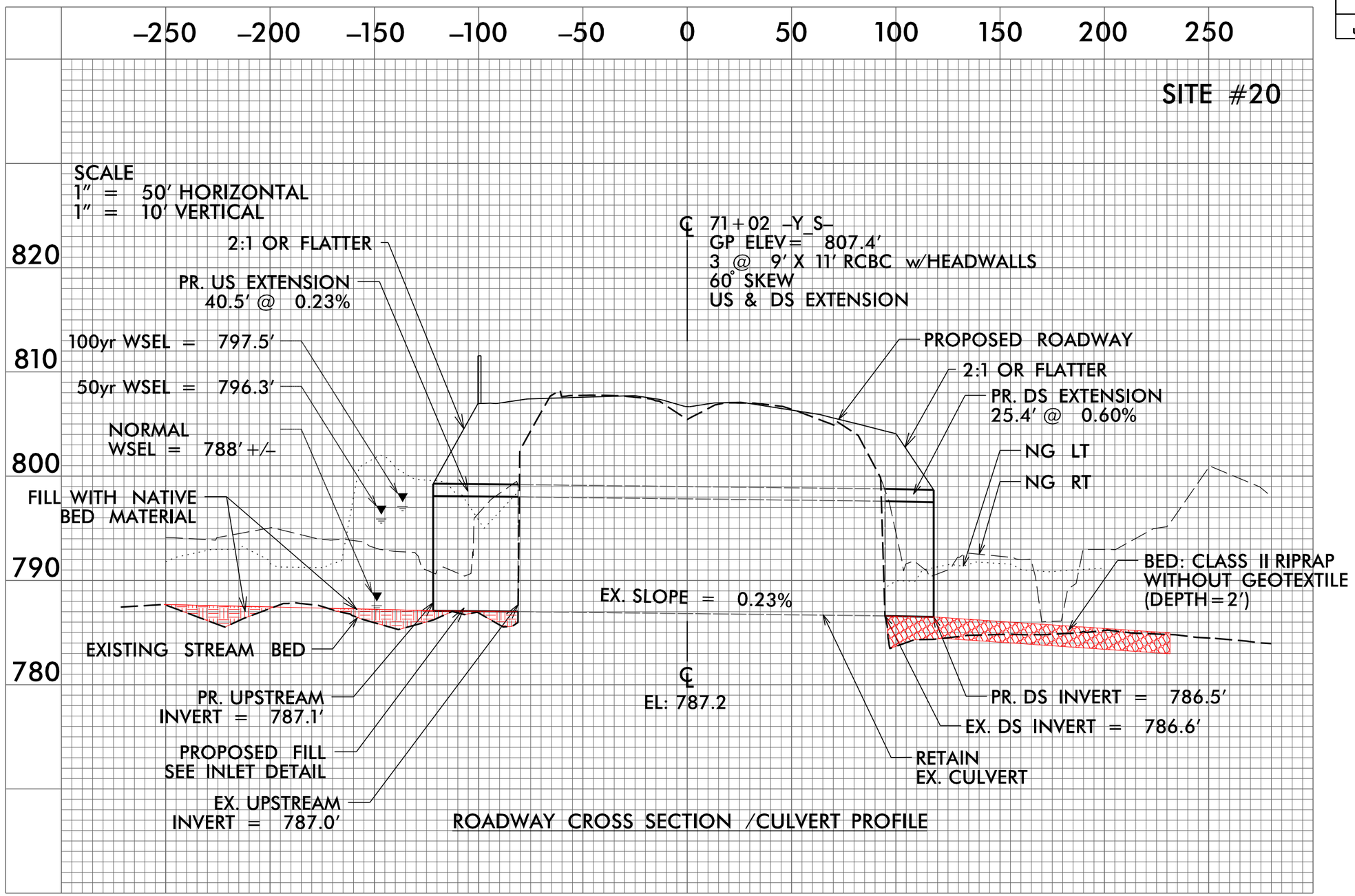
PRDPWICS01$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	19-X
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 36 OF 67



ROADWAY CROSS SECTION /CULVERT PROFILE

5/28/99

6/6/2019
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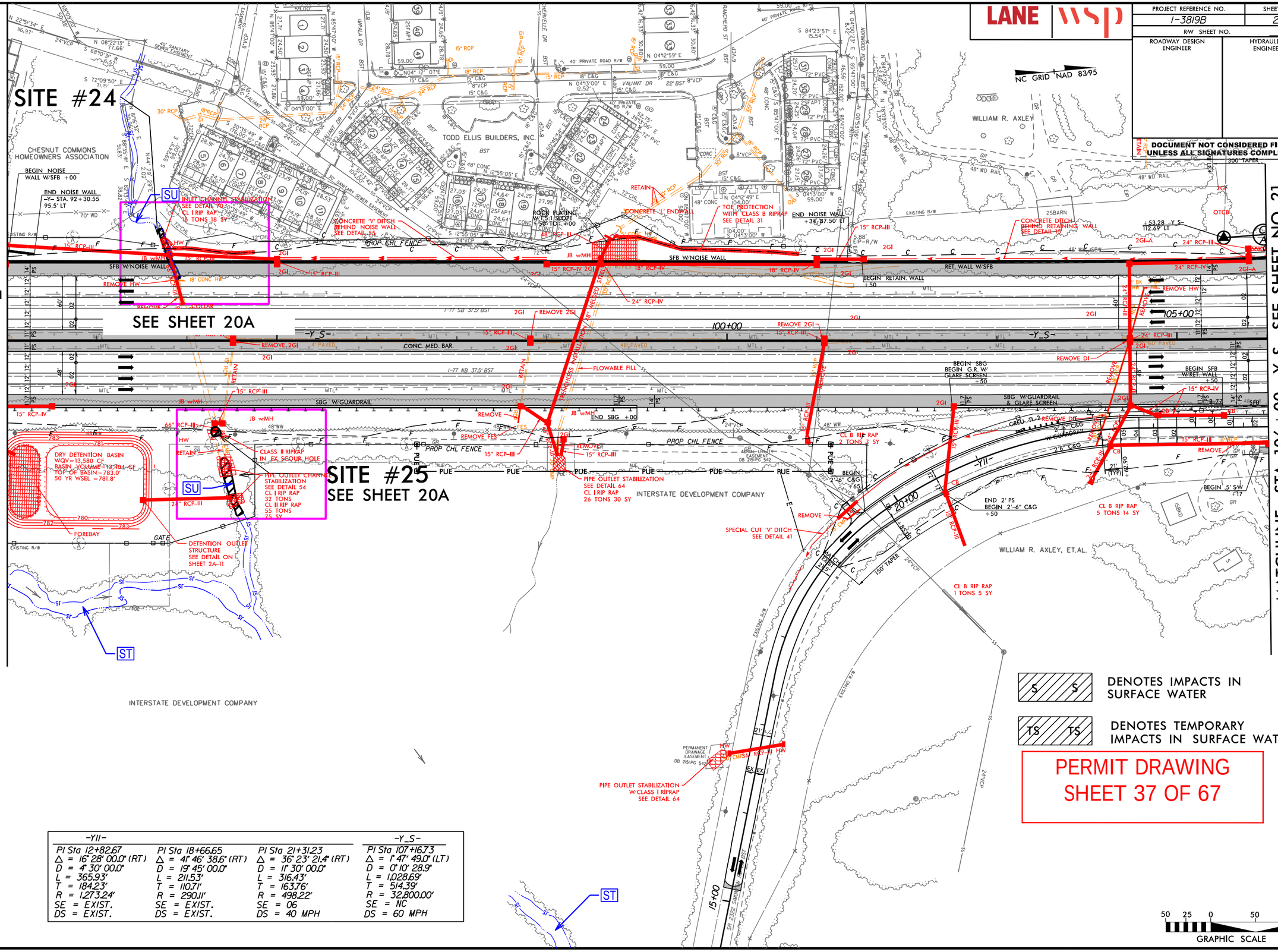
USMG675774

LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-Y11-			-Y_S-
PI Sta 12+82.67	PI Sta 18+66.65	PI Sta 21+31.23	PI Sta 107+16.73
Δ = 16° 28' 00.0" (RT)	Δ = 41° 46' 38.6" (RT)	Δ = 36° 23' 21.4" (RT)	Δ = 1° 47' 49.0" (LT)
D = 4° 30' 00.0"	D = 19° 45' 00.0"	D = 11° 30' 00.0"	D = 0° 10' 28.9"
L = 365.93'	L = 211.53'	L = 316.43'	L = 1,028.69'
T = 184.23'	T = 110.71'	T = 163.76'	T = 514.39'
R = 1,273.24'	R = 290.11'	R = 498.22'	R = 32,800.00'
SE = EXIST.	SE = EXIST.	SE = 06	SE = NC
DS = EXIST.	DS = EXIST.	DS = 40 MPH	DS = 60 MPH

S DENOTES IMPACTS IN SURFACE WATER

TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 37 OF 67

07/02/19
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Becker JW

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LANE | WSP

NC GRID NAD 83/95

–MATCHLINE– STA 92+00.00 –Y_S– SEE SHEET NO. 19

–MATCHLINE– STA. 106+00 –Y_S– SEE SHEET NO. 21

SITE #24

SEE SHEET 20A

SITE #25

SEE SHEET 20A

CHESNUT COMMONS HOMEOWNERS ASSOCIATION

TODD ELLIS BUILDERS, INC.

WILLIAM R. AXLEY

WILLIAM R. AXLEY, ET AL.

INTERSTATE DEVELOPMENT COMPANY

BEGIN NOISE WALL W/SFB +00

END NOISE WALL –Y– STA. 92+30.55 95.5' LT

INLET CHANNEL STABILIZATION SEE DETAIL 70 CL I RIP RAP 12 TONS 18 SY

CONCRETE 'V' DITCH BEHIND NOISE WALL SEE DETAIL 53

ROCK PLANTING W/ 1:1 SLOPE 50' TO +00

TOE PROTECTION WITH CLASS B RIPRAP SEE DETAIL 31

END NOISE WALL +36.87.50' LT

CONCRETE DITCH BEHIND RETAINING WALL SEE DETAIL 73

BEGIN RETAIN WALL +50

RET. WALL W/SFB

SFB W/NOISE WALL

SBG W/GUARDRAIL

CONC. MED. BAR.

FLOWABLE FILL

BEGIN SBG BEGIN G.R. W/ GLARE SCREEN +50

SBG W/GUARDRAIL & GLARE SCREEN

BEGIN SFB W/RET. WALL +50

END SBG +00

PROP. CHL FENCE

DRY DETENTION BASIN WQV=13,580 CF BASIN VOLUME 14,262 CF TOP OF BASIN = 783.0' 50' YX WSEL = 781.8'

FOREBAY

GATE

CLASS II RIPRAP IN FX SCOUR HOLE

PIPE OUTLET CHANNEL STABILIZATION SEE DETAIL 54 CL I RIP RAP 32 TONS CL II RIP RAP 55 TONS 75 SY

DETENTION OUTLET STRUCTURE SEE DETAIL ON SHEET 2A-11

PIPE OUTLET STABILIZATION SEE DETAIL 64 CL I RIP RAP 26 TONS 30 SY

CL B RIP RAP 2 TONS 7 SY

BEGIN 2'-6" C&G +65

END 2' PS BEGIN 2'-6" C&G +50

CL B RIP RAP 5 TONS 14 SY

CL B RIP RAP 1 TONS 6 SY

SPECIAL CUT 'V' DITCH SEE DETAIL 41

PIPE OUTLET STABILIZATION W/CLASS I RIPRAP SEE DETAIL 64

PERMANENT DRAINAGE EASEMENT

SR 2325 SMITH RD

–Y11–			–Y_S–
PI Sta 12+82.67	PI Sta 18+66.65	PI Sta 21+31.23	PI Sta 107+16.73
Δ = 16°28' 00.0" (RT)	Δ = 41° 46' 38.6" (RT)	Δ = 36°23' 21.4" (RT)	Δ = 1° 47' 49.0" (LT)
D = 4° 30' 00.0"	D = 19° 45' 00.0"	D = 11° 30' 00.0"	D = 0° 10' 28.9"
L = 365.93'	L = 211.53'	L = 316.43'	L = 1,028.69'
T = 184.23'	T = 110.71'	T = 163.76'	T = 514.39'
R = 1,273.24'	R = 290.11'	R = 498.22'	R = 32,800.00'
SE = EXIST.	SE = EXIST.	SE = 06	SE = NC
DS = EXIST.	DS = EXIST.	DS = 40 MPH	DS = 60 MPH

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 38 OF 67

50 25 0 50 100
GRAPHIC SCALE

07/02/19
c:\projectwise\pb\projectwiseint\becker_jw\d0339329\13819_hyd_prm_psh20_Y9200-10600.dgn
BECKER JW

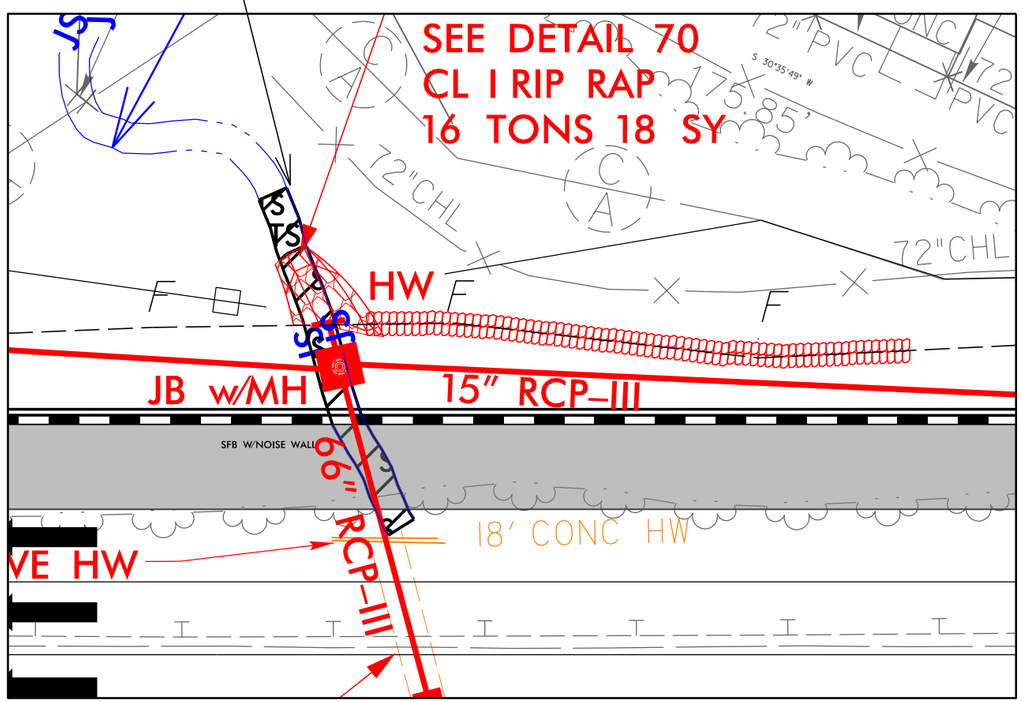
LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	20A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

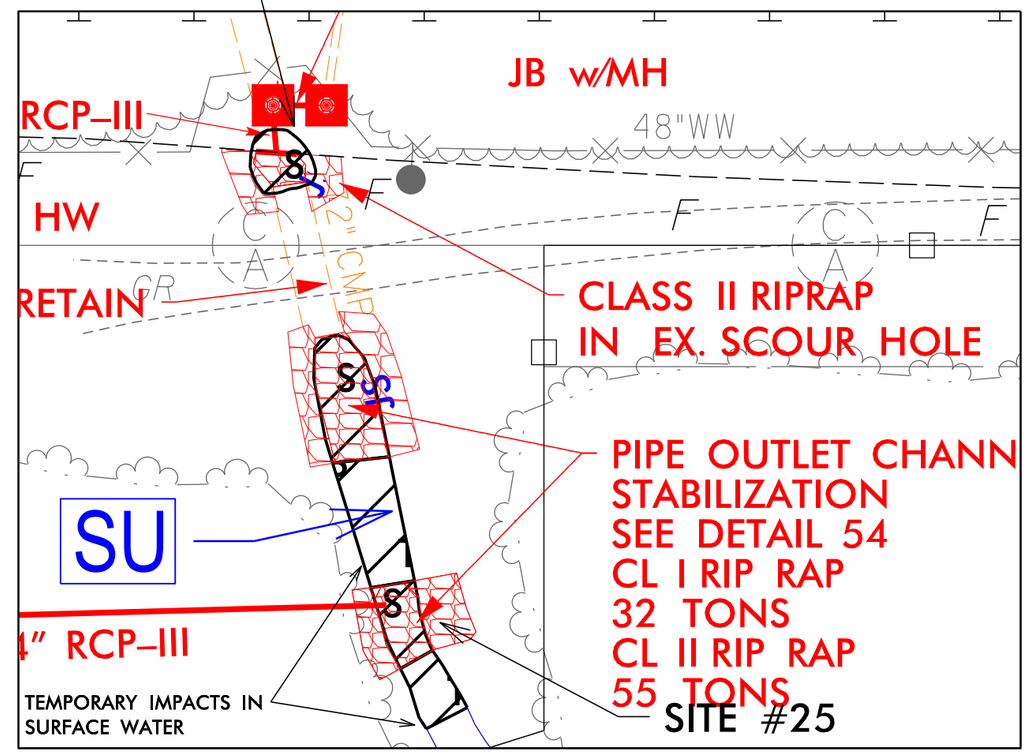
SITE #24

INSET



SITE #25

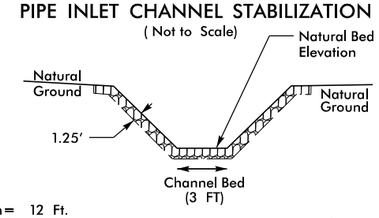
INSET



DETAIL 70

PIPE INLET CHANNEL STABILIZATION

(Not to Scale)



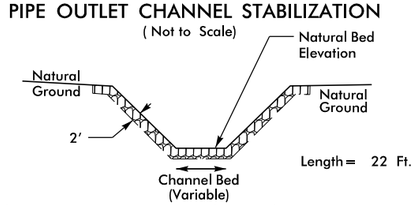
Length = 12 Ft.
Type of Liner = CL 1 Rip-Rap - Keyed-In (No Geotextile)

-Y_S- STA. 93+79 LT

DETAIL 54

PIPE OUTLET CHANNEL STABILIZATION

(Not to Scale)



Length = 22 Ft.
Type of Liner = CL II Rip-Rap - Keyed-In (Banks)
Type of Liner = CL I Rip-Rap - Countersunk (Bed) (No Geotextile)

NC GRID NAD 83/95

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 39 OF 67

25 12.5 0 25 50
GRAPHIC SCALE - INSETS

07/12/19
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Becker, JW

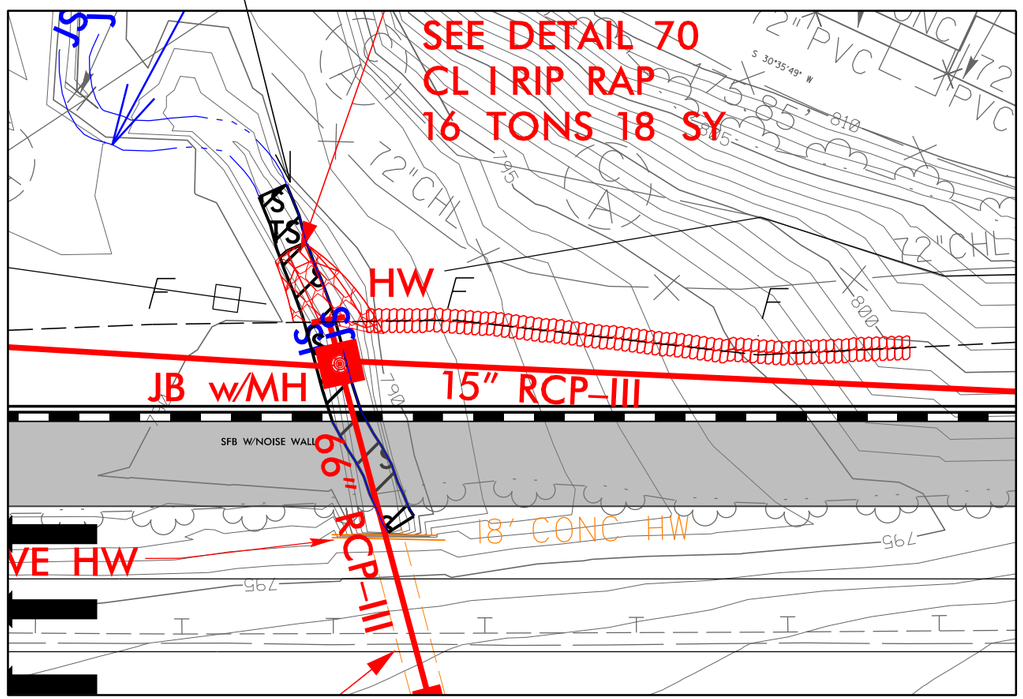
LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	20A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

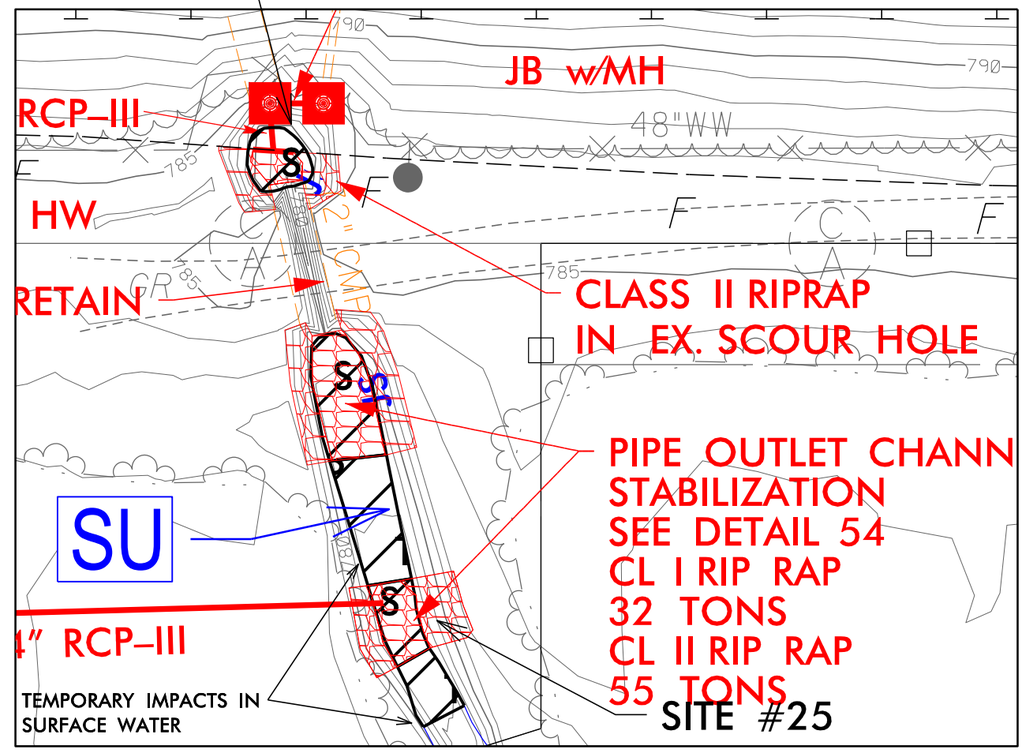
SITE #24

INSET



SITE #25

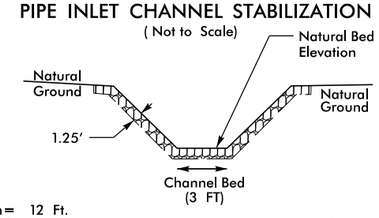
INSET



DETAIL 70

PIPE INLET CHANNEL STABILIZATION

(Not to Scale)



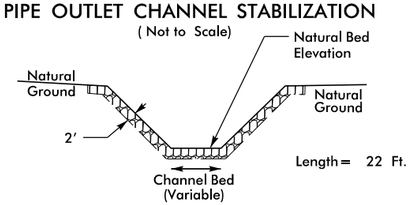
Length= 12 Ft.
Type of Liner= CL 1 Rip-Rap - Keyed-In (No Geotextile)

-Y_S- STA. 93+79 LT

DETAIL 54

PIPE OUTLET CHANNEL STABILIZATION

(Not to Scale)



Length= 22 Ft.
Type of Liner= CL II Rip-Rap - Keyed-In (Banks)
Type of Liner= CL I Rip-Rap - Countersunk (Bed) (No Geotextile)

NC GRID NAD 83/95

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 40 OF 67

25 12.5 0 25 50
GRAPHIC SCALE - INSETS

07/12/19
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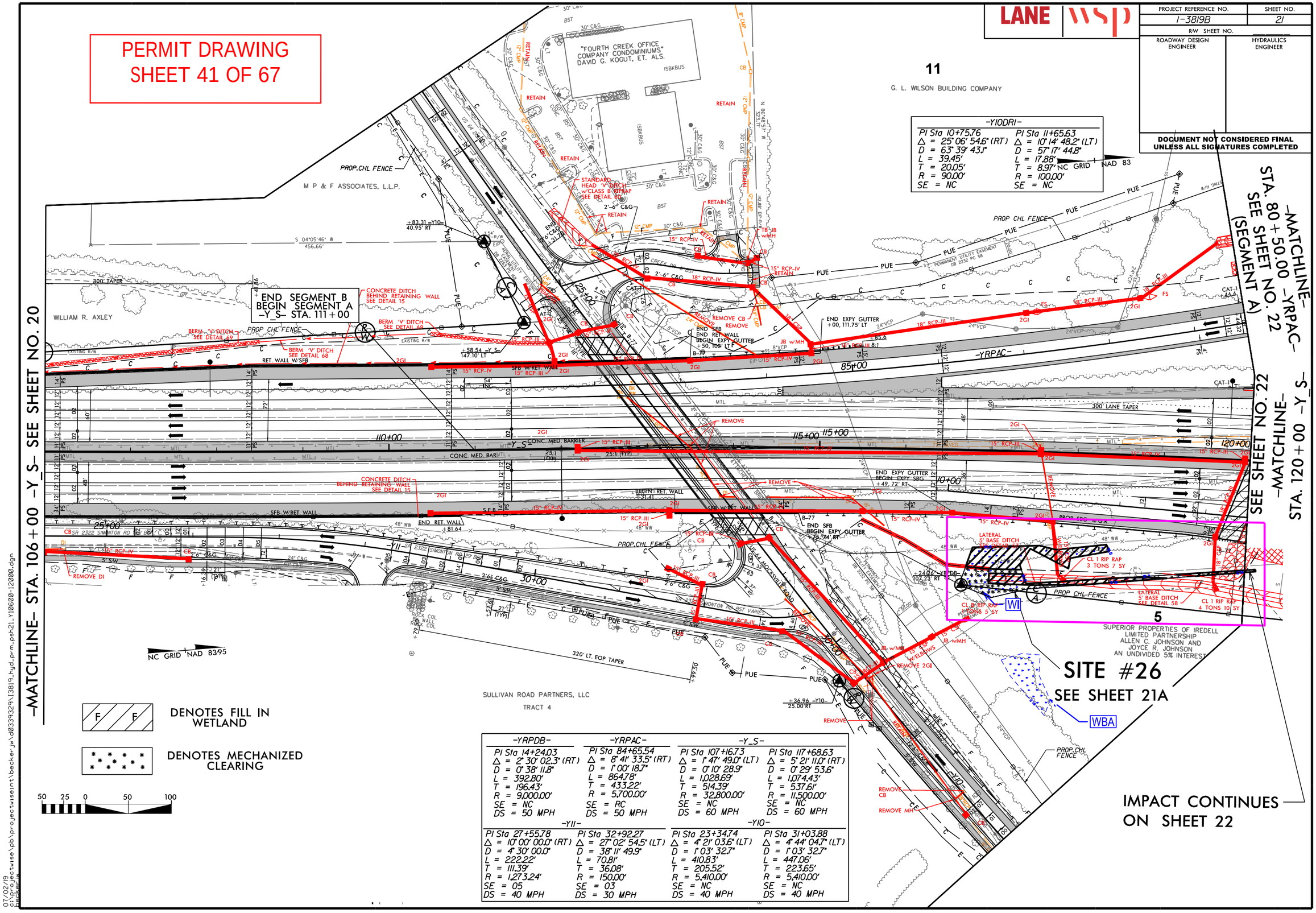
Becker, JW

PERMIT DRAWING
SHEET 41 OF 67

LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-YRPDB-

PI Sta 14+24.03
Δ = 2° 30' 02.3" (RT)
D = 0° 38' 11.8"
L = 392.80'
T = 196.43'
R = 9,000.00'
SE = NC
DS = 50 MPH

-YRPAC-

PI Sta 84+65.54
Δ = 8° 41' 33.5" (RT)
D = 1° 00' 18.7"
L = 864.78'
T = 433.22'
R = 5,700.00'
SE = RC
DS = 50 MPH

-Y_S-

PI Sta 107+16.73
Δ = 1° 47' 49.0" (LT)
D = 0° 10' 28.9"
L = 1,028.69'
T = 514.39'
R = 32,800.00'
SE = NC
DS = 60 MPH

PI Sta 117+68.63
Δ = 5° 21' 11.0" (RT)
D = 0° 29' 53.6"
L = 1,074.43'
T = 537.61'
R = 11,500.00'
SE = NC
DS = 60 MPH

-YII-

PI Sta 27+55.78
Δ = 10° 00' 00.0" (RT)
D = 4° 30' 00.0"
L = 222.22'
T = 111.39'
R = 1,273.24'
SE = 05
DS = 40 MPH

PI Sta 32+92.27
Δ = 27° 02' 54.5" (LT)
D = 38° 11' 49.9"
L = 70.81'
T = 36.08'
R = 150.00'
SE = 03
DS = 30 MPH

-YIO-

PI Sta 23+34.74
Δ = 4° 21' 03.6" (LT)
D = 1° 03' 32.7"
L = 410.83'
T = 205.52'
R = 5,410.00'
SE = NC
DS = 40 MPH

PI Sta 31+03.88
Δ = 4° 44' 04.7" (LT)
D = 1° 03' 32.7"
L = 447.06'
T = 223.65'
R = 5,410.00'
SE = NC
DS = 40 MPH

07/02/19
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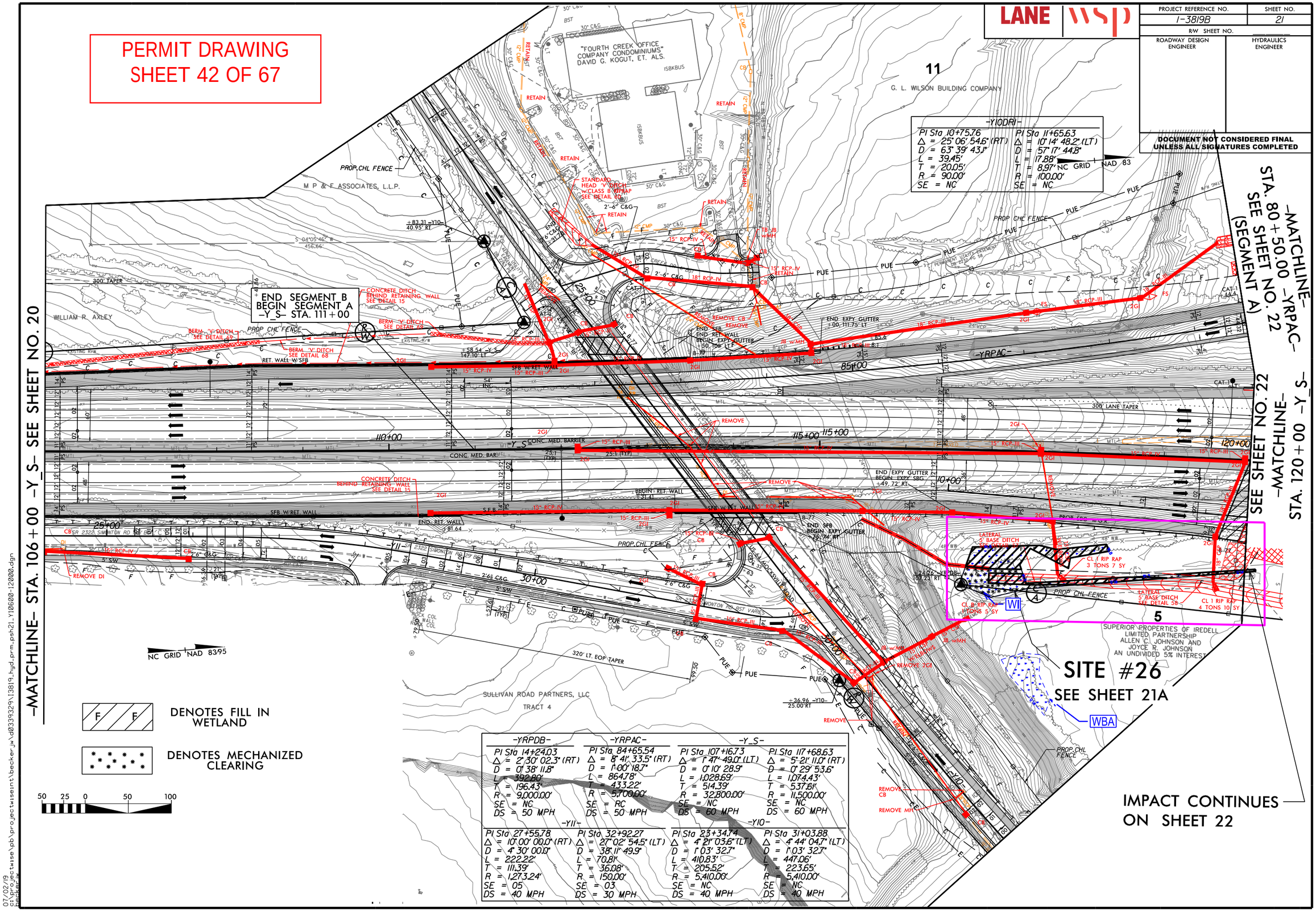
Becker, JW

PERMIT DRAWING
SHEET 42 OF 67

LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



07/02/19
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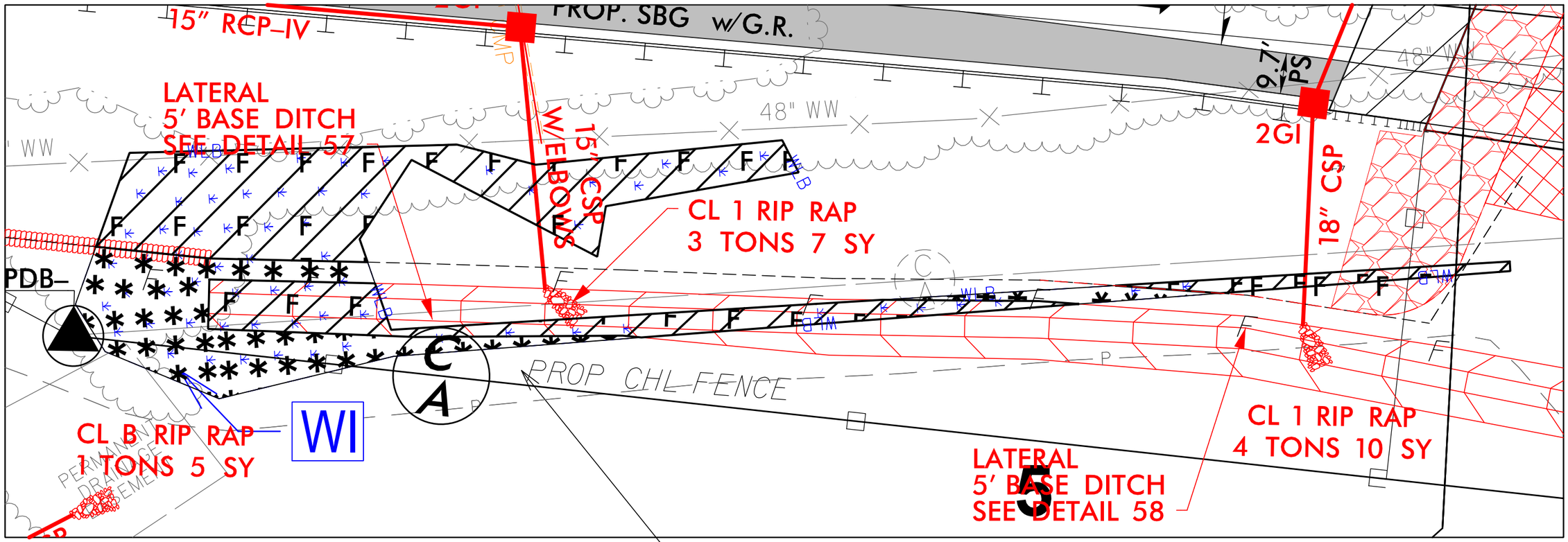
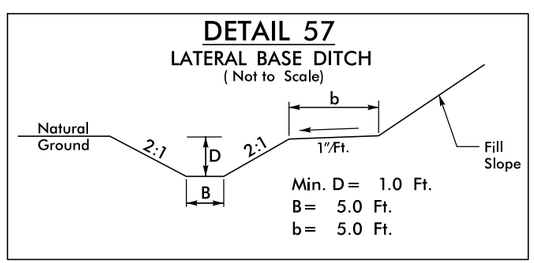
Becker, JW

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	21A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

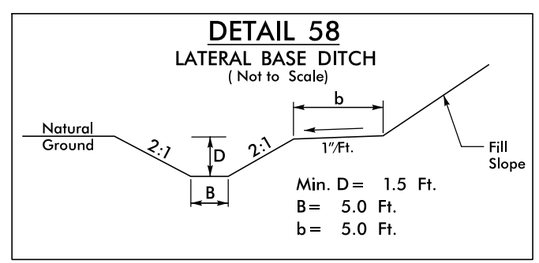
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





-Y_S- FROM STA. 117+00 TO STA. 118+50



-Y_S- FROM STA. 118+50 TO STA. 120+80

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

PERMIT DRAWING
SHEET 43 OF 67

25 12.5 0 25 50
GRAPHIC SCALE

6/6/2019
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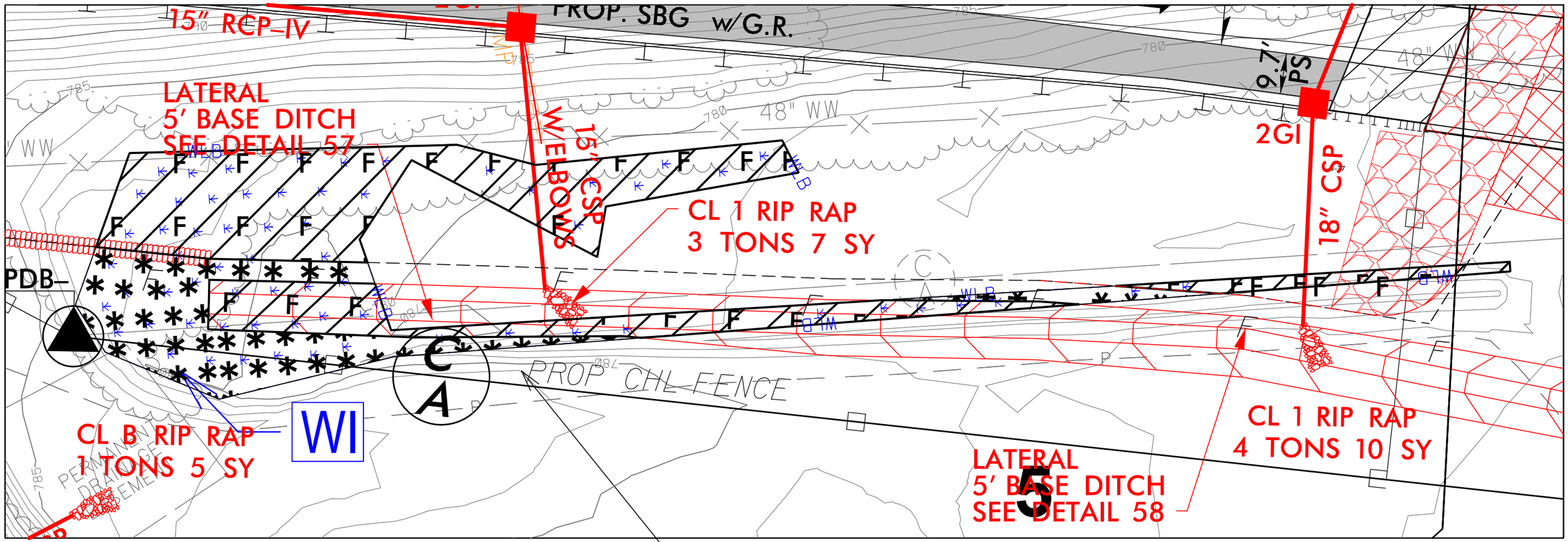
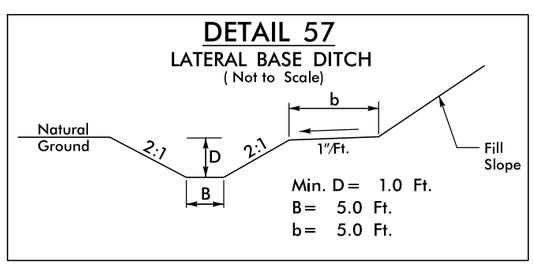
PRDPWICS01$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	21A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

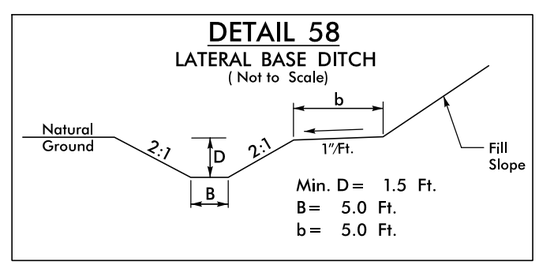
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





-Y_S- FROM STA. 117+00 TO STA. 118+50



-Y_S- FROM STA. 118+50 TO STA. 120+80

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

PERMIT DRAWING
SHEET 44 OF 67

25 12.5 0 25 50
GRAPHIC SCALE

6/6/2019
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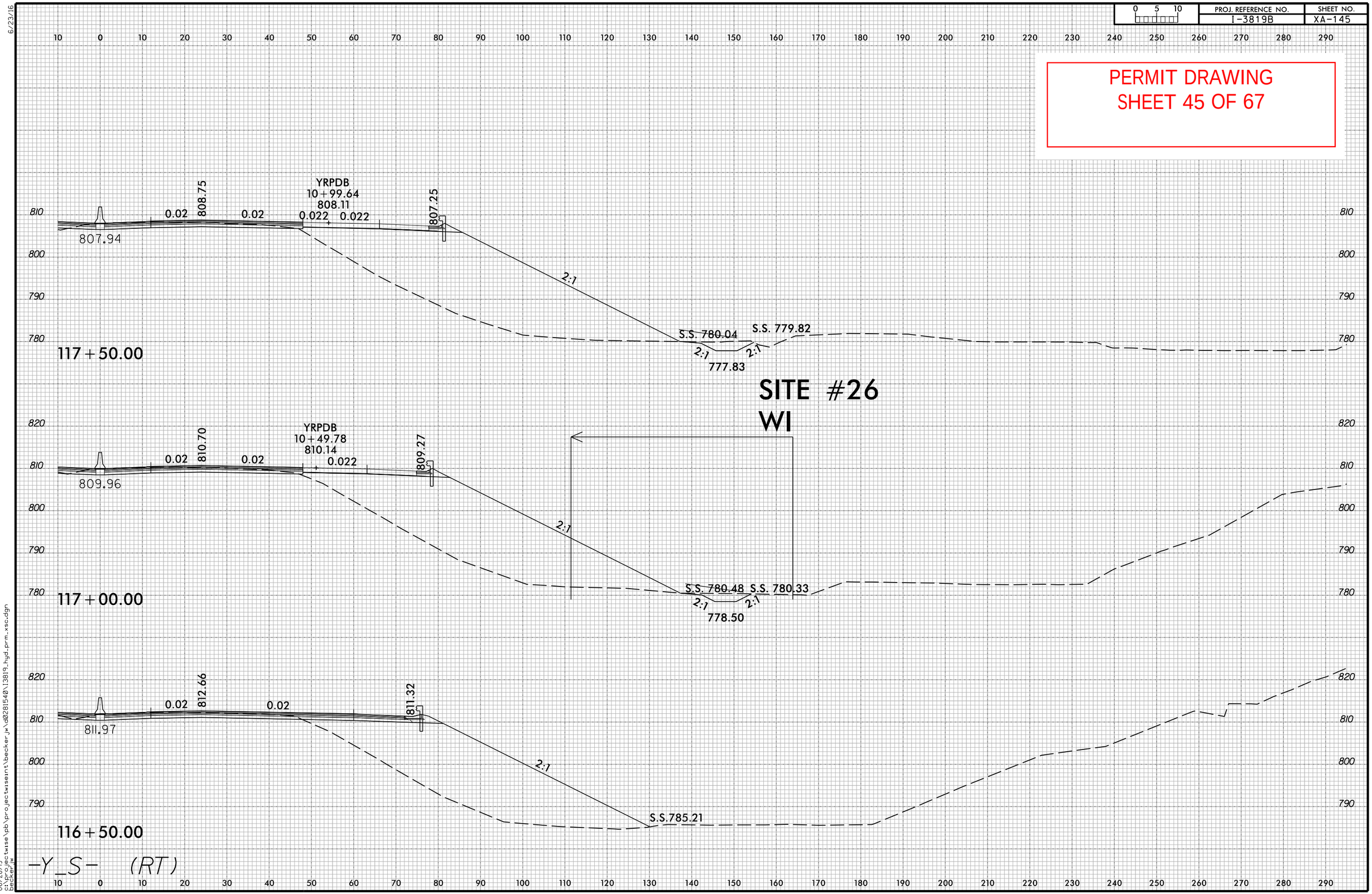
PRDPWTCS02$

PROJ. REFERENCE NO.	SHEET NO.
I-3819B	XA-145

PERMIT DRAWING
SHEET 45 OF 67



06/23/16

06/28/19
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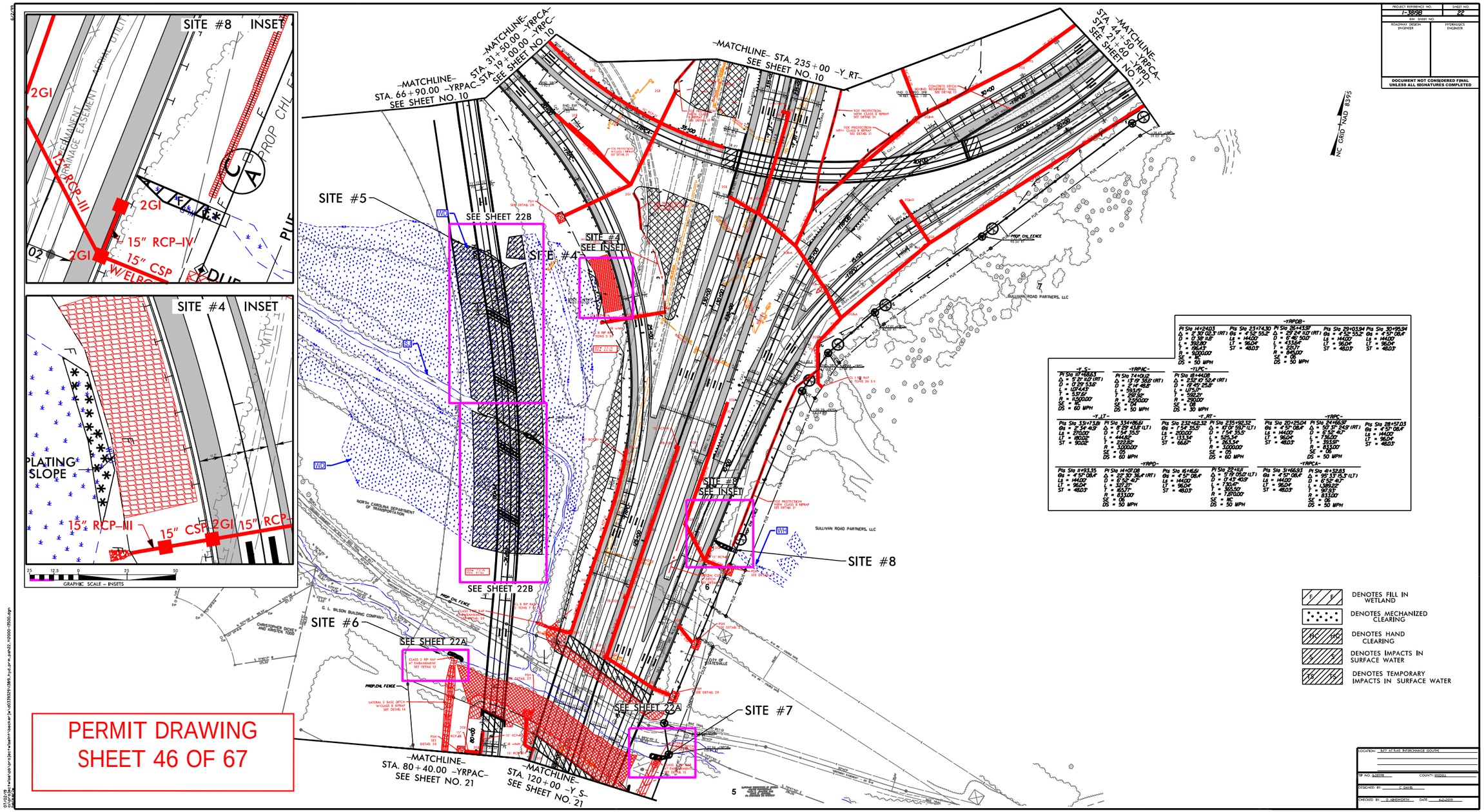
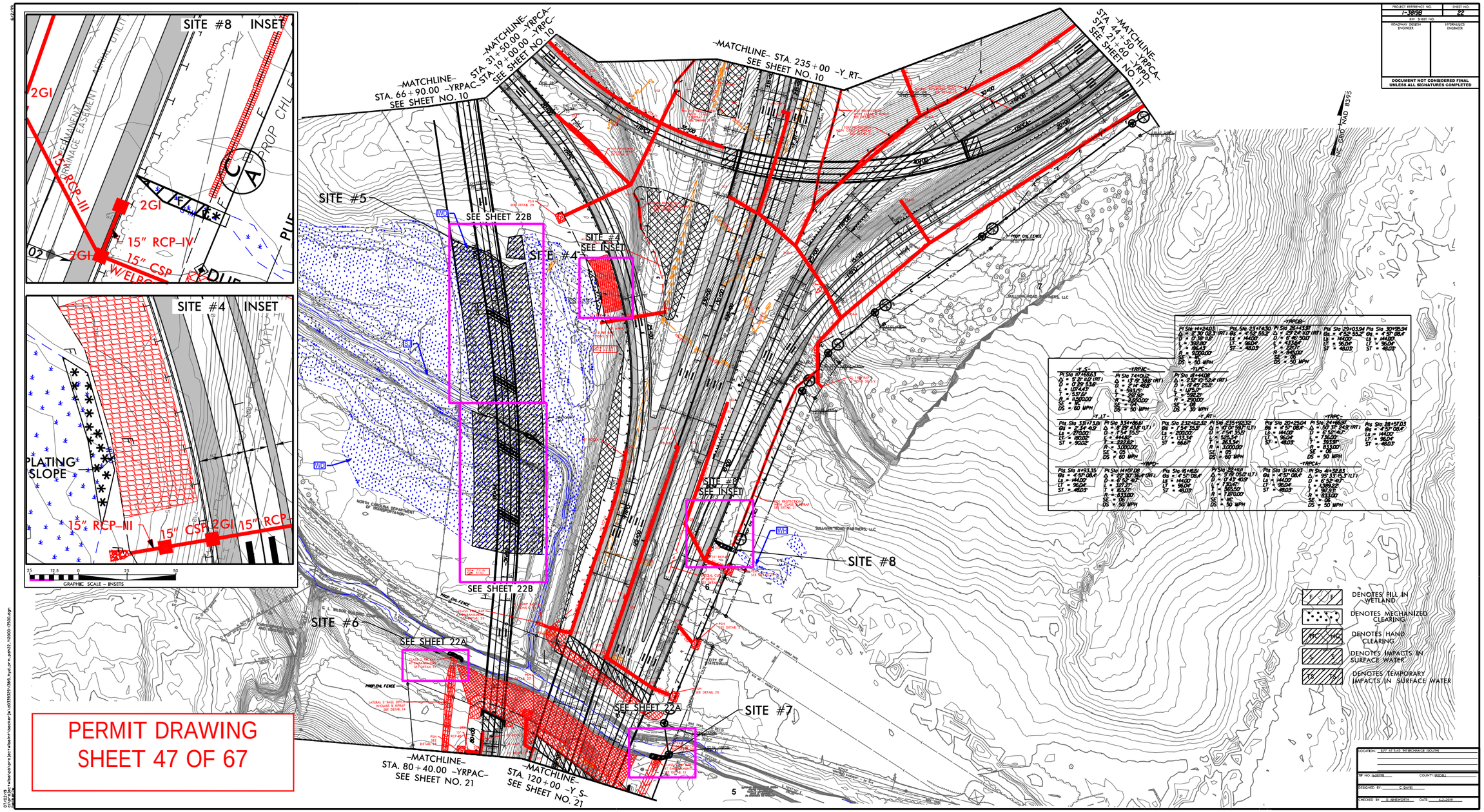
becker_jw



PERMIT DRAWING
SHEET 46 OF 67



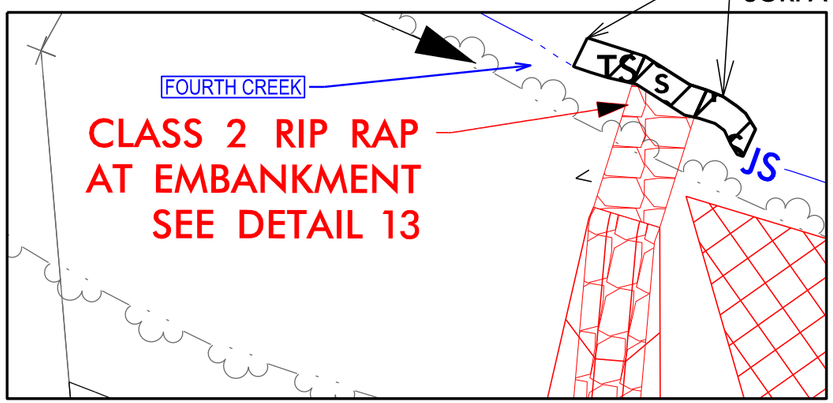
PERMIT DRAWING
SHEET 47 OF 67

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	22A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

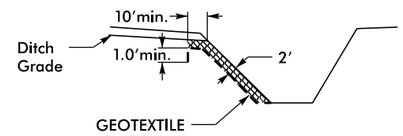
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SITE# 6 INSET



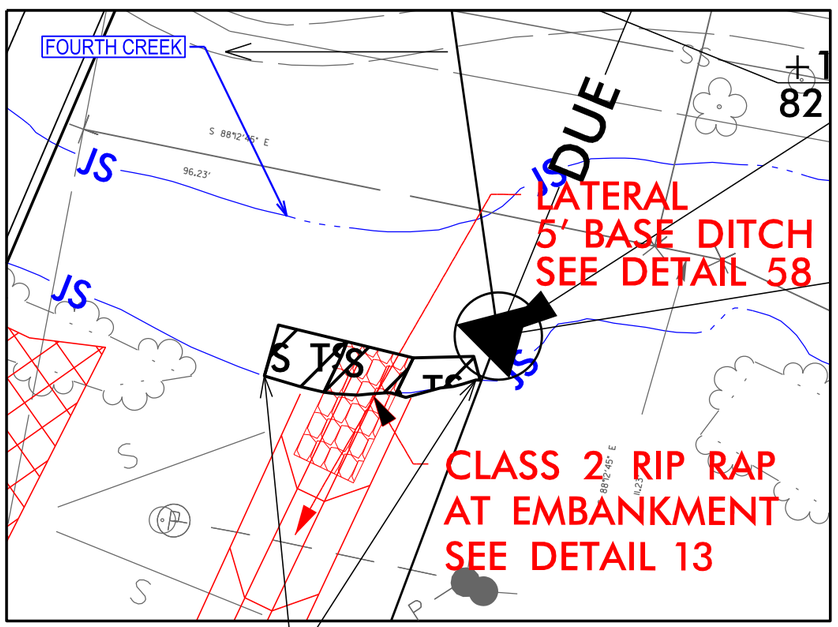
DETAIL 13
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= Class 2 Rip-Rap

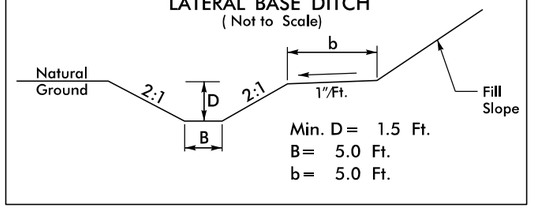
–Y_S– STA. 121+45
–YRPAC– 27+86 RT

SITE# 7 INSET



TEMPORARY IMPACTS IN SURFACE WATER

DETAIL 58
LATERAL BASE DITCH
(Not to Scale)



–Y_S– FROM STA. 118+50 TO STA. 120+80

PERMIT DRAWING
SHEET 48 OF 67

NC GRID NAD 83/95

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50 25 0 25 50
GRAPHIC SCALE – INSETS

07/02/19
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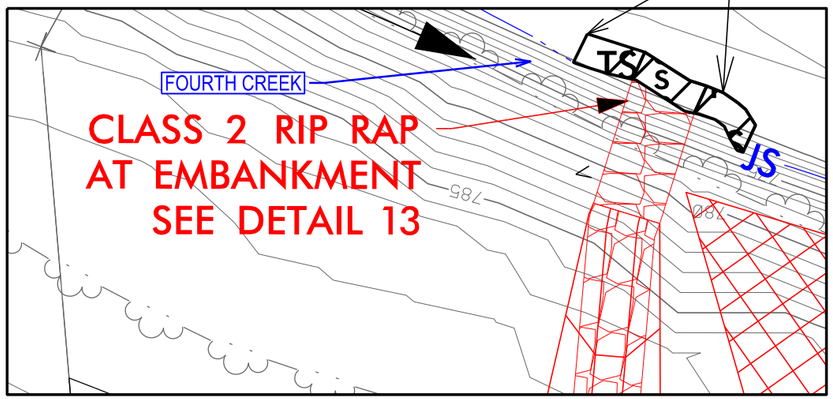
Becker, Jw

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	22A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

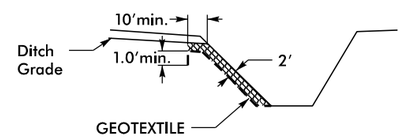
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SITE# 6 INSET



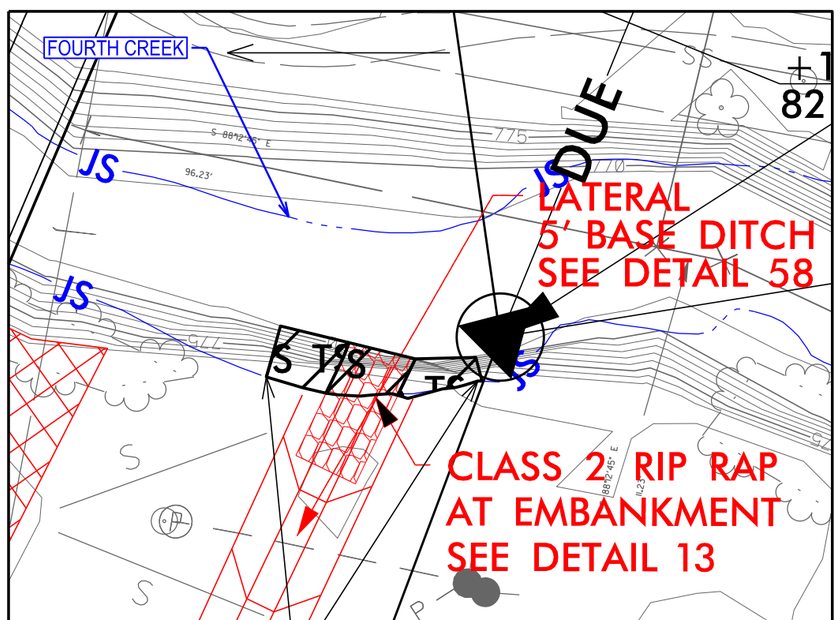
DETAIL 13
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= Class 2 Rip-Rap

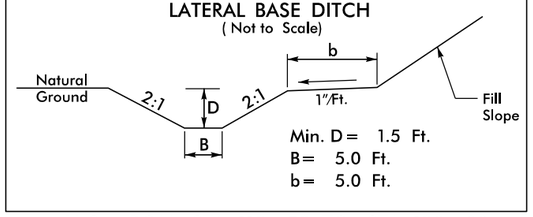
–Y_S– STA. 121+45
–YRPAC– 27+86 RT

SITE# 7 INSET



TEMPORARY IMPACTS IN SURFACE WATER

DETAIL 58
LATERAL BASE DITCH
(Not to Scale)



–Y_S– FROM STA. 118+50 TO STA. 120+80

PERMIT DRAWING
SHEET 49 OF 67

NC GRID NAD 83/95

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50 25 0 25 50
GRAPHIC SCALE – INSETS

07/02/19
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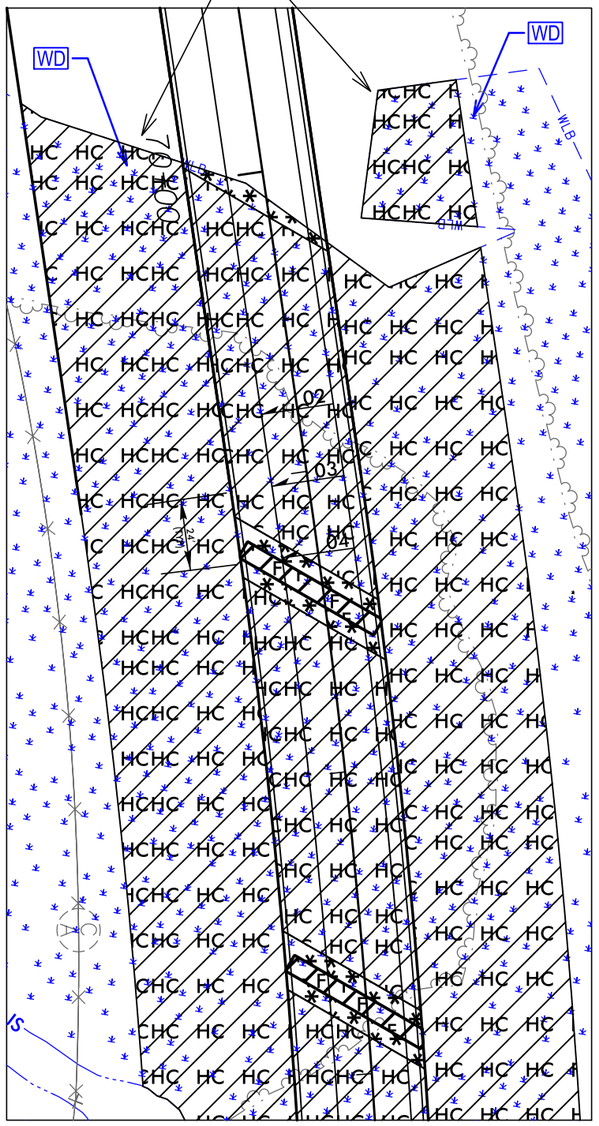
becker_jw

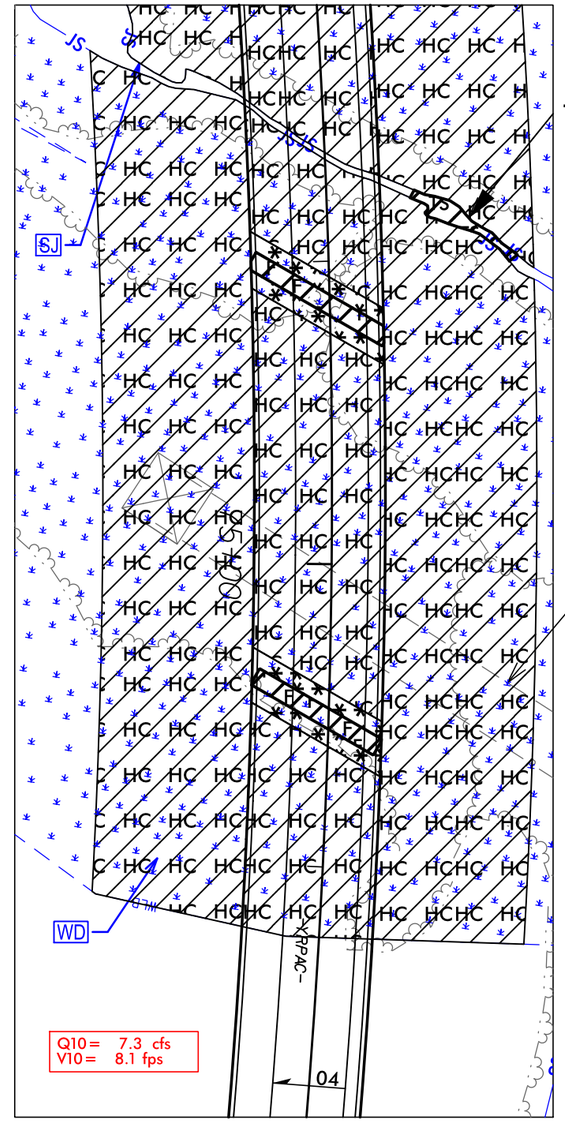
INSET

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	22B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





NC GRID NAD 83/95

TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
F F	DENOTES FILL IN WETLAND
	DENOTES MECHANIZED CLEARING
HC HC	DENOTES HAND CLEARING

PERMIT DRAWING
SHEET 50 OF 67

25 12.5 0 50 100
GRAPHIC SCALE – INSETS

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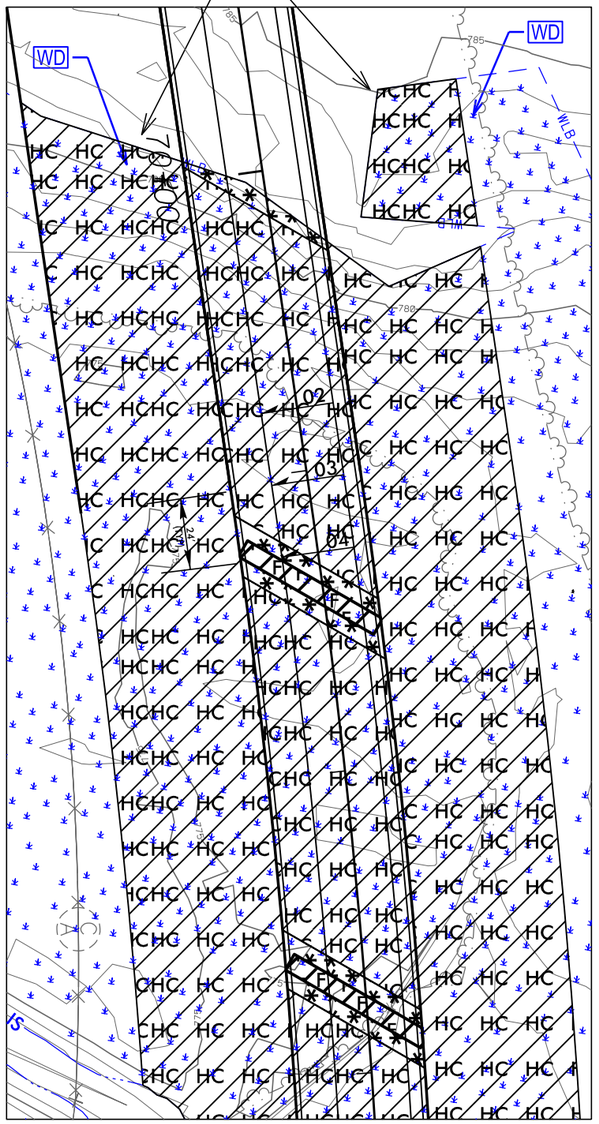
PRDPWICS01$

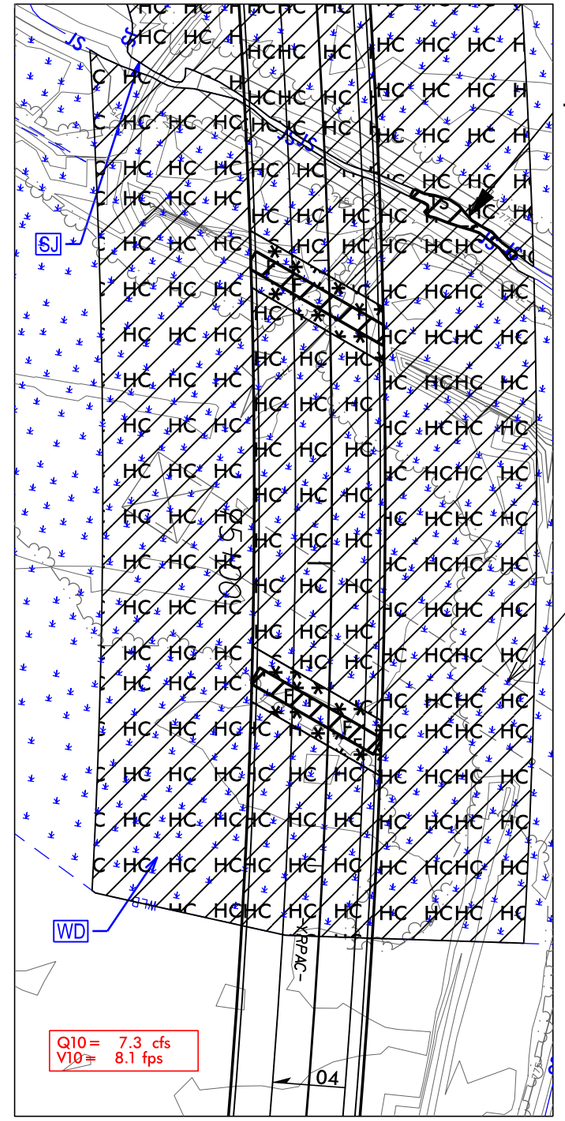
INSET

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	22B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





NC GRID NAD 83/95

TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
F F	DENOTES FILL IN WETLAND
	DENOTES MECHANIZED CLEARING
HC HC	DENOTES HAND CLEARING

PERMIT DRAWING
SHEET 51 OF 67

25 12.5 0 50 100
GRAPHIC SCALE – INSETS

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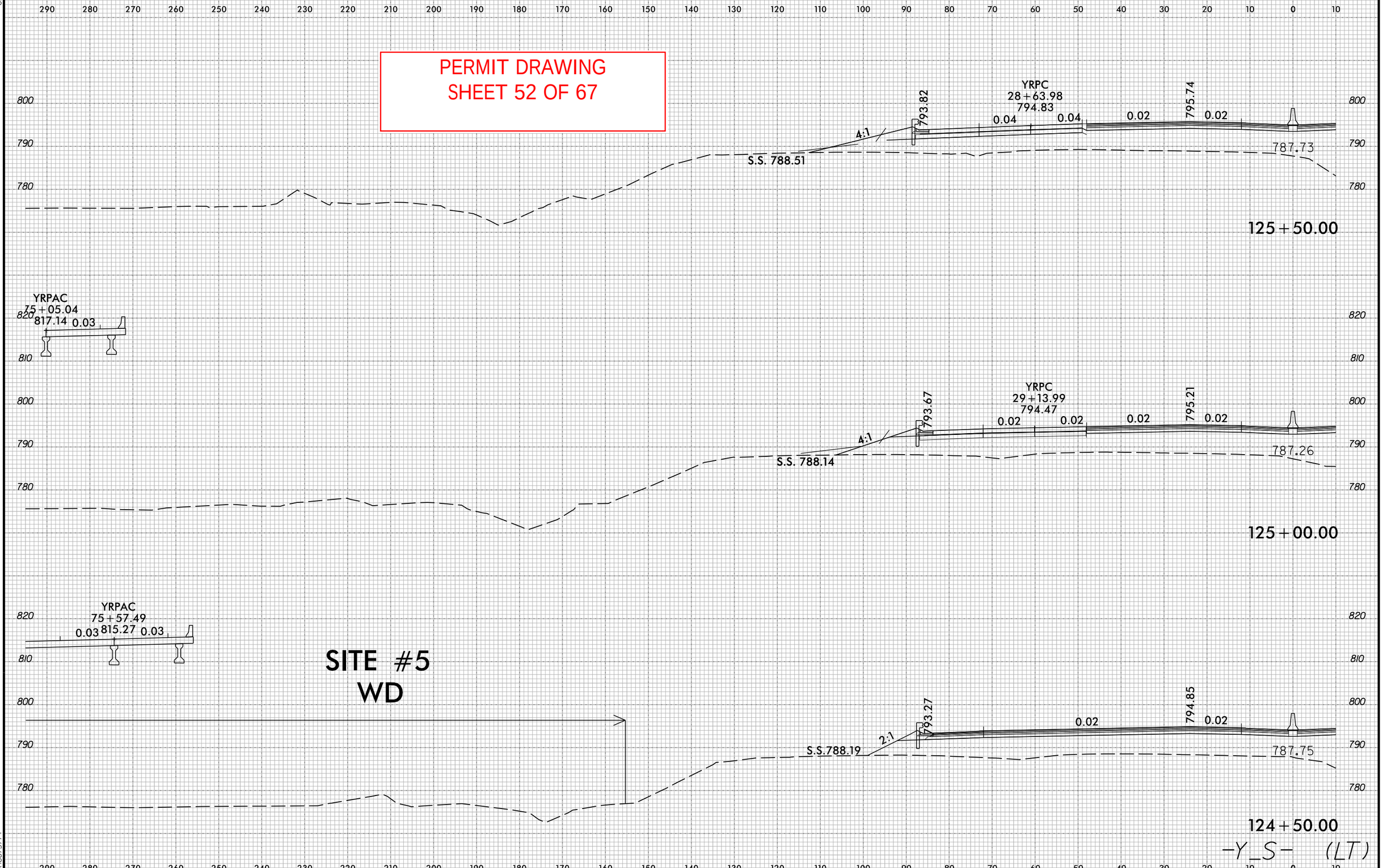
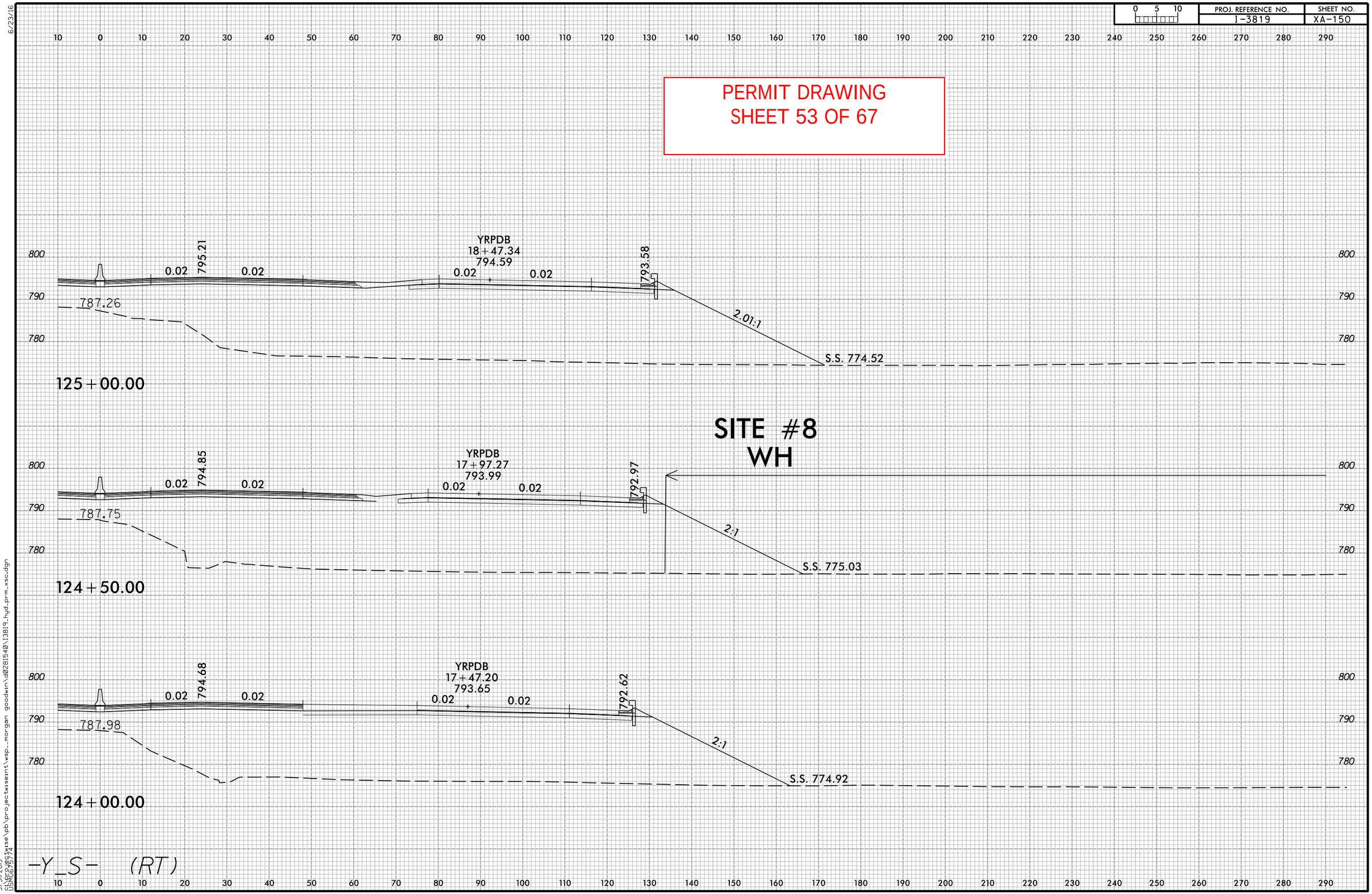
USMG675774



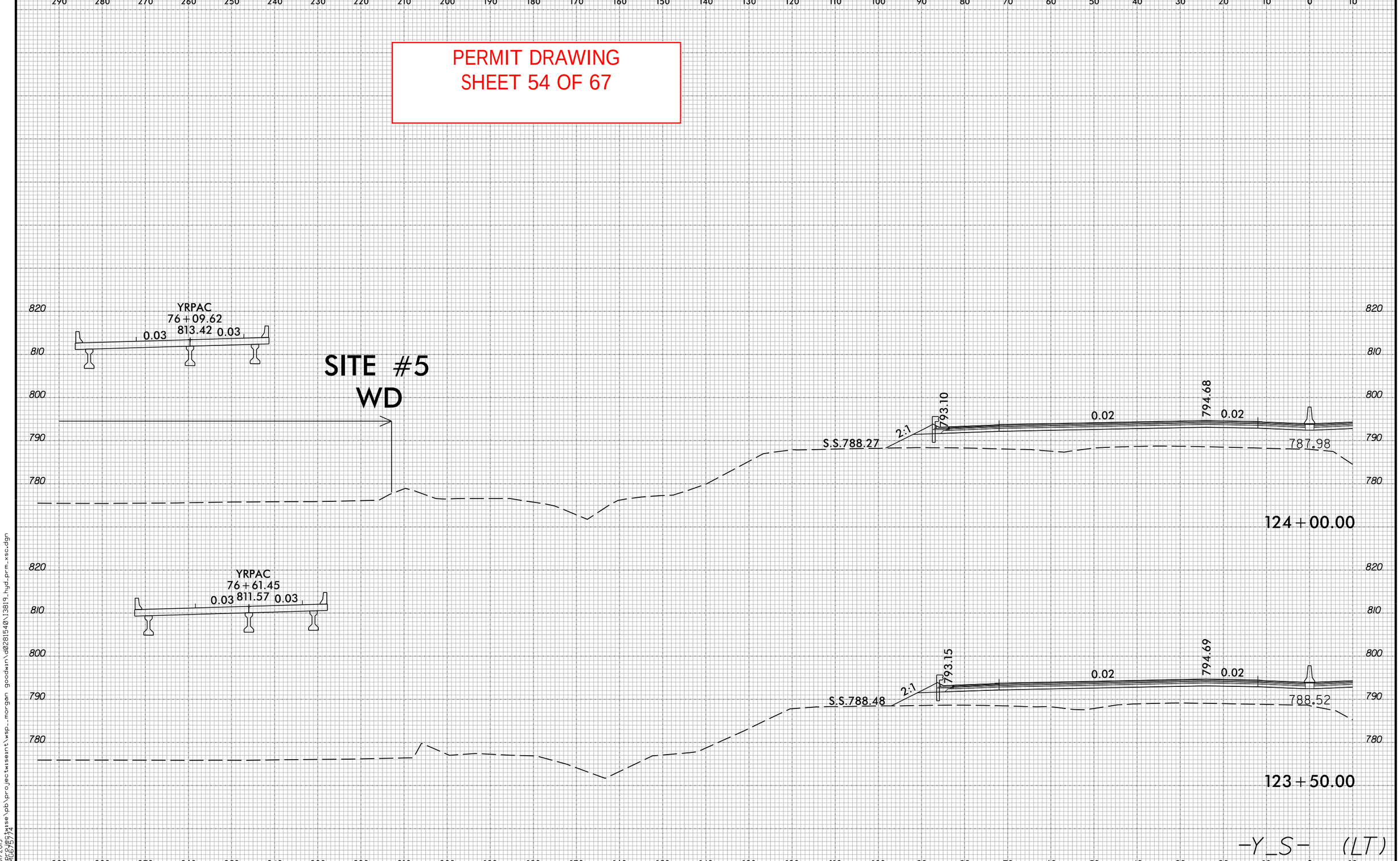
PROJ. REFERENCE NO.
I-3819
SHEET NO.
XA-137
PERMIT DRAWING
SHEET 52 OF 67
YRPC
28+63.98
794.83
793.82
795.74
0.04
0.04
0.02
0.02
4:1
S.S. 788.51
787.73
125+50.00
YRPAC
75+05.04
817.14
0.03
YRPC
29+13.99
794.47
793.67
795.21
0.02
0.02
0.02
0.02
4:1
S.S. 788.14
787.26
125+00.00
YRPAC
75+57.49
815.27
0.03
0.03
SITE #5
WD
793.27
794.85
0.02
0.02
2:1
S.S.788.19
787.75
124+50.00
-Y_S- (LT)



PROJ. REFERENCE NO.
I-3819
SHEET NO.
XA-150
PERMIT DRAWING
SHEET 53 OF 67
YRPDB
18+47.34
794.59
795.21
793.58
0.02
787.26
2.01:1
S.S. 774.52
125+00.00
SITE #8
WH
YRPDB
17+97.27
793.99
794.85
792.97
787.75
2:1
S.S. 775.03
124+50.00
YRPDB
17+47.20
793.65
794.68
792.62
787.98
S.S. 774.92
124+00.00
-Y_S- (RT)

PROJ. REFERENCE NO.	SHEET NO.
I-3819	XA-136

PERMIT DRAWING
SHEET 54 OF 67



6/23/16

5/31/2019
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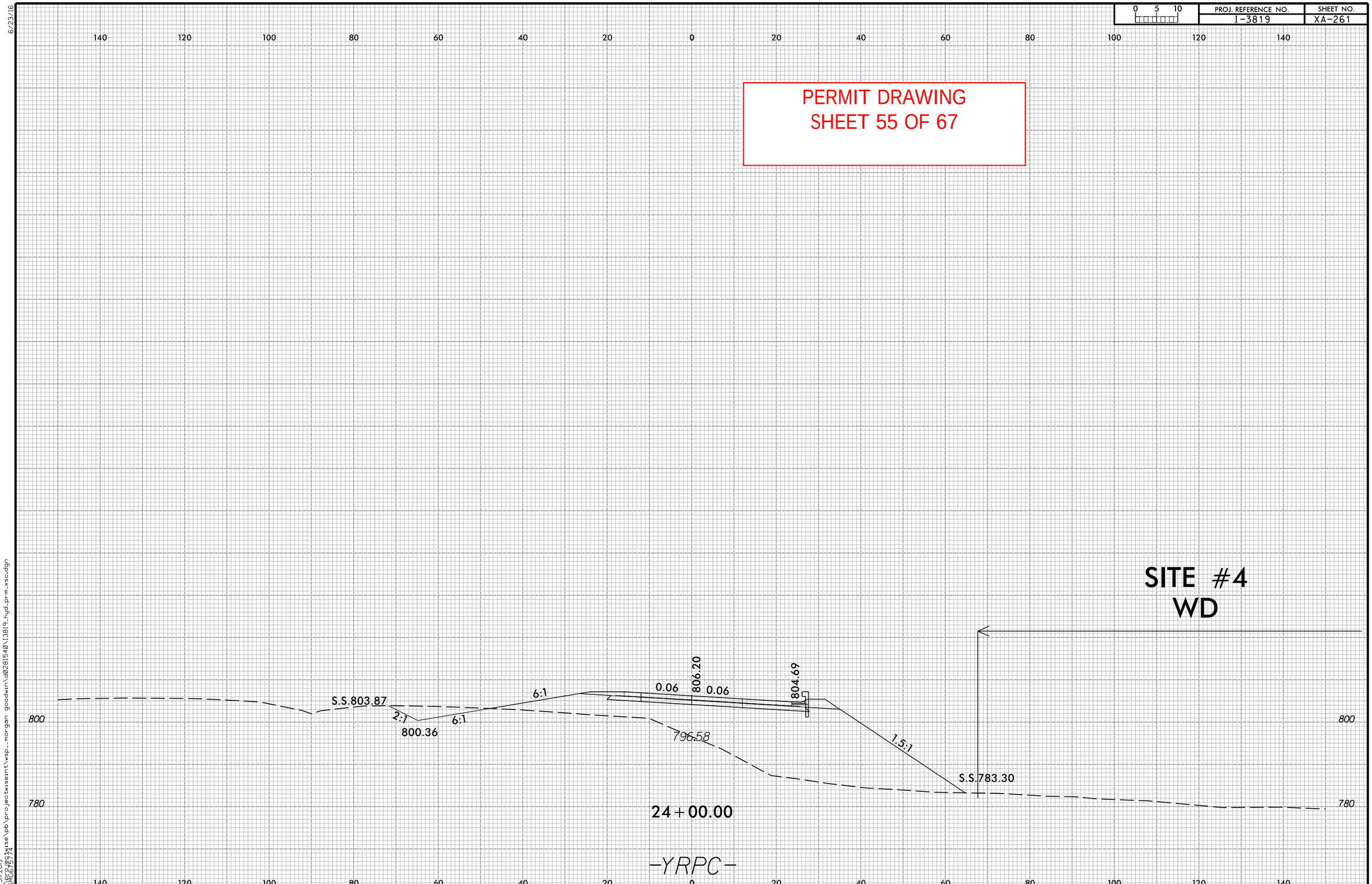

6/23/16

5/31/2019
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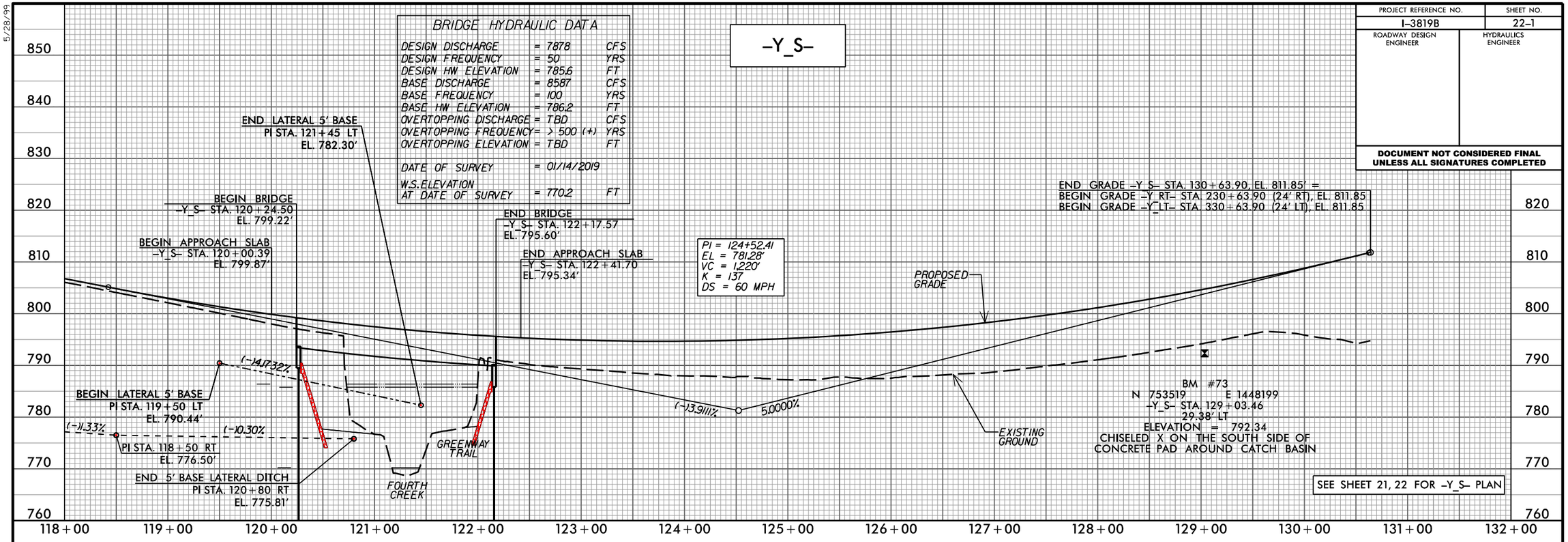

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PERMIT DRAWING
SHEET 56 OF 67

5/28/99

6/3/2019
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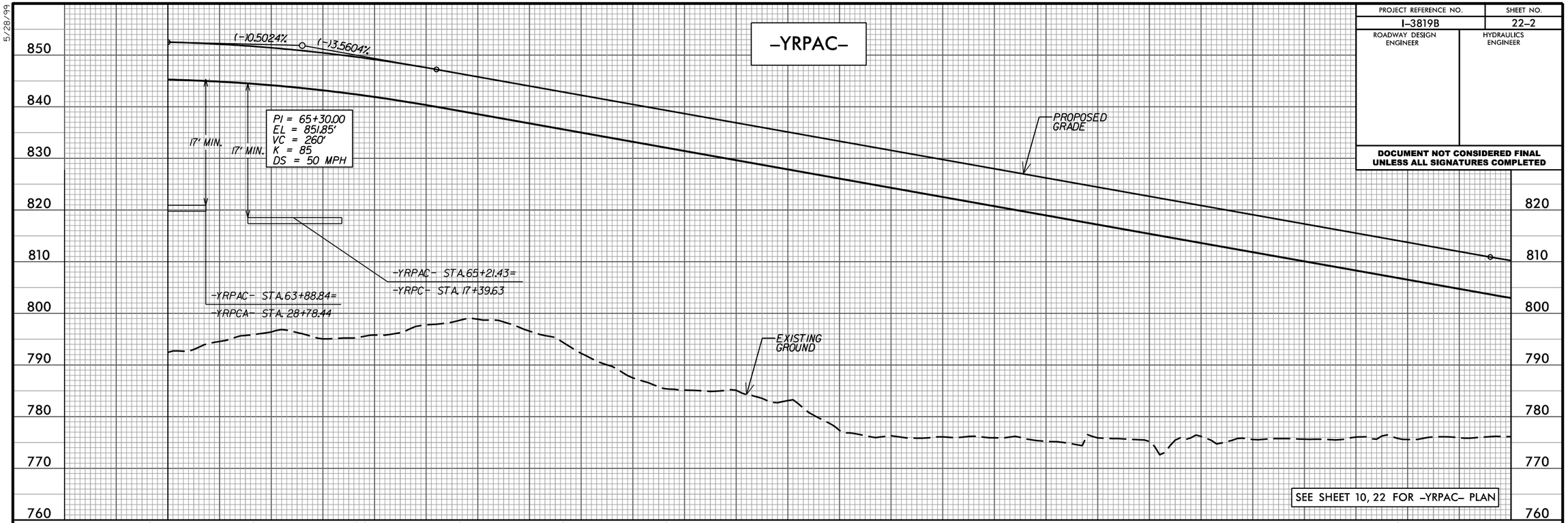
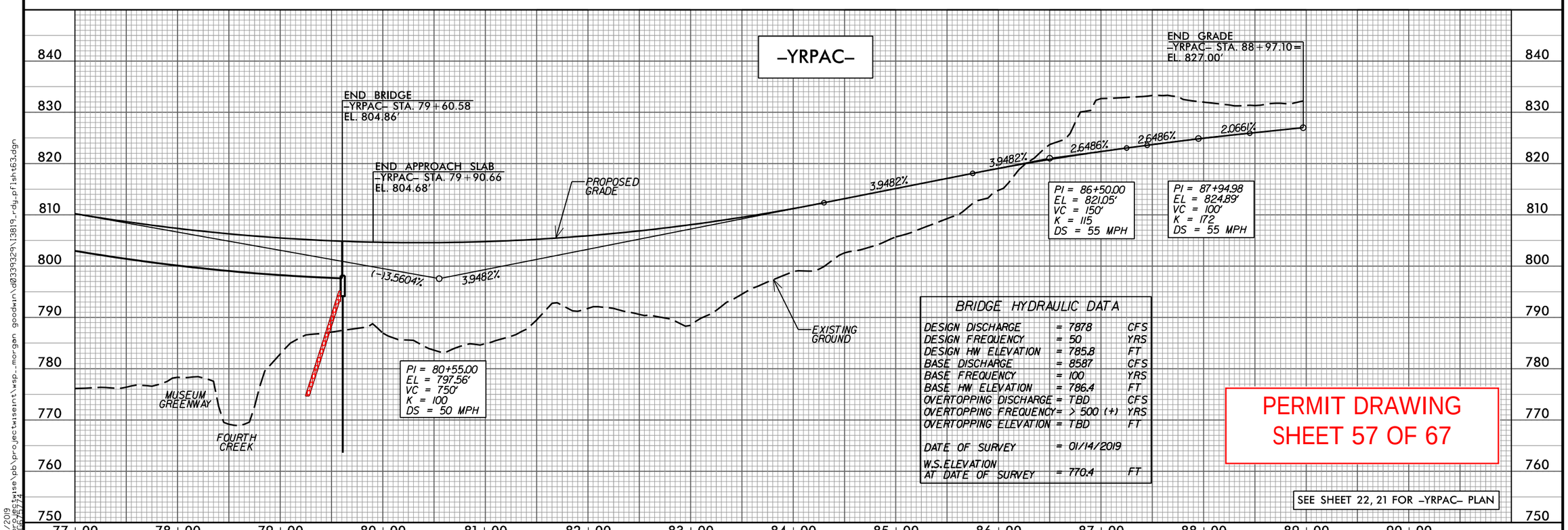
USMG675774

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	22-2
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 7878	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 785.8	FT
BASE DISCHARGE	= 8587	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 786.4	FT
OVERTOPPING DISCHARGE	= TBD	CFS
OVERTOPPING FREQUENCY	= > 500 (+)	YRS
OVERTOPPING ELEVATION	= TBD	FT
DATE OF SURVEY	= 01/14/2019	
W.S. ELEVATION AT DATE OF SURVEY	= 770.4	FT

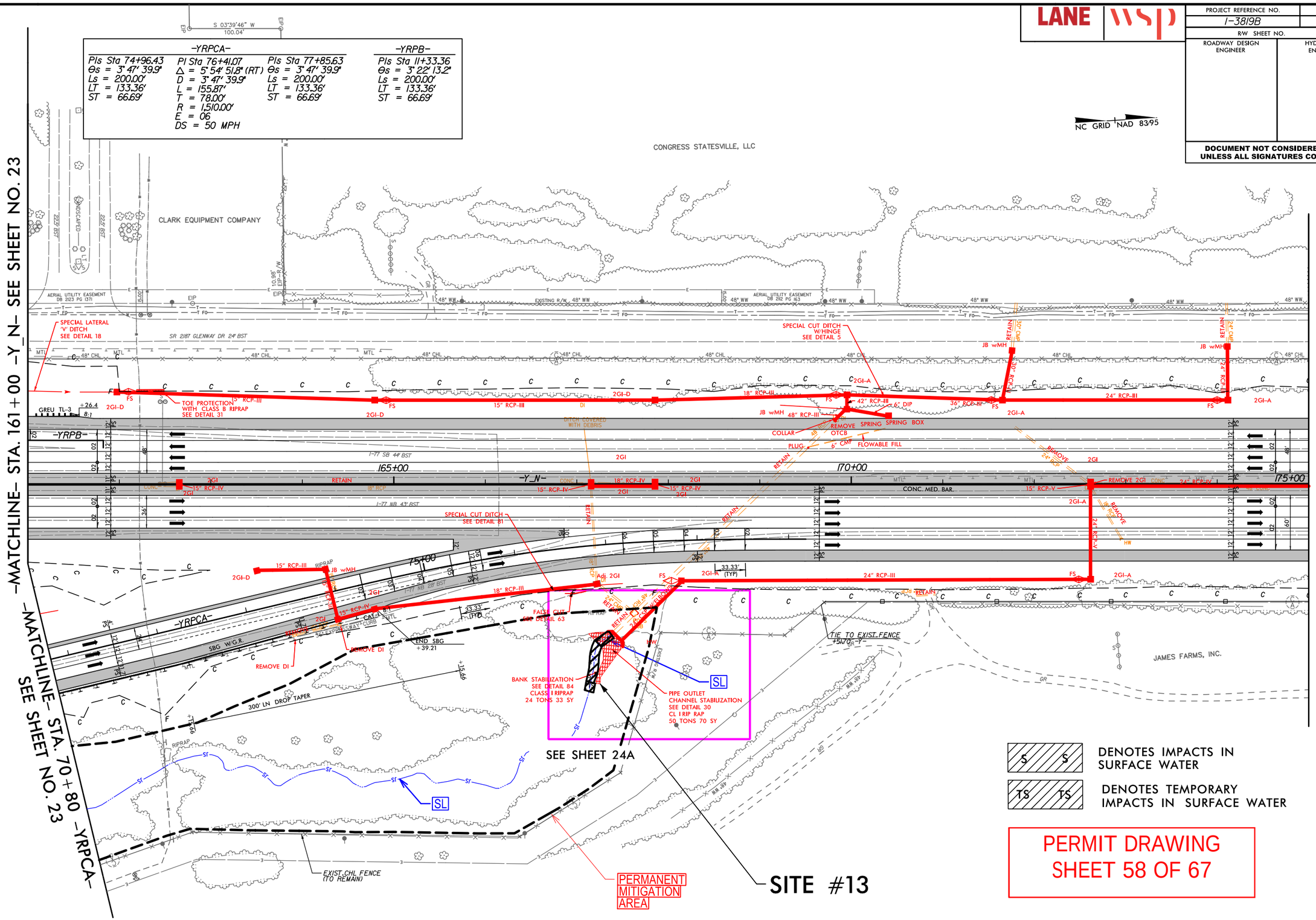
PERMIT DRAWING
SHEET 57 OF 67

5/28/99

5/31/2019
C:\pwworking\wise\pb\projectwiseint\wsp__morgan goodwin\d0339329\I3819_rdy_pflsht63.dgn

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 58 OF 67

6/28/2019
\\prdpwics01\ics_workingdir\17042\336415_108\13819_hyd_prm_psh24_Y16100-17500.dgn
PRDPWICS01$

LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

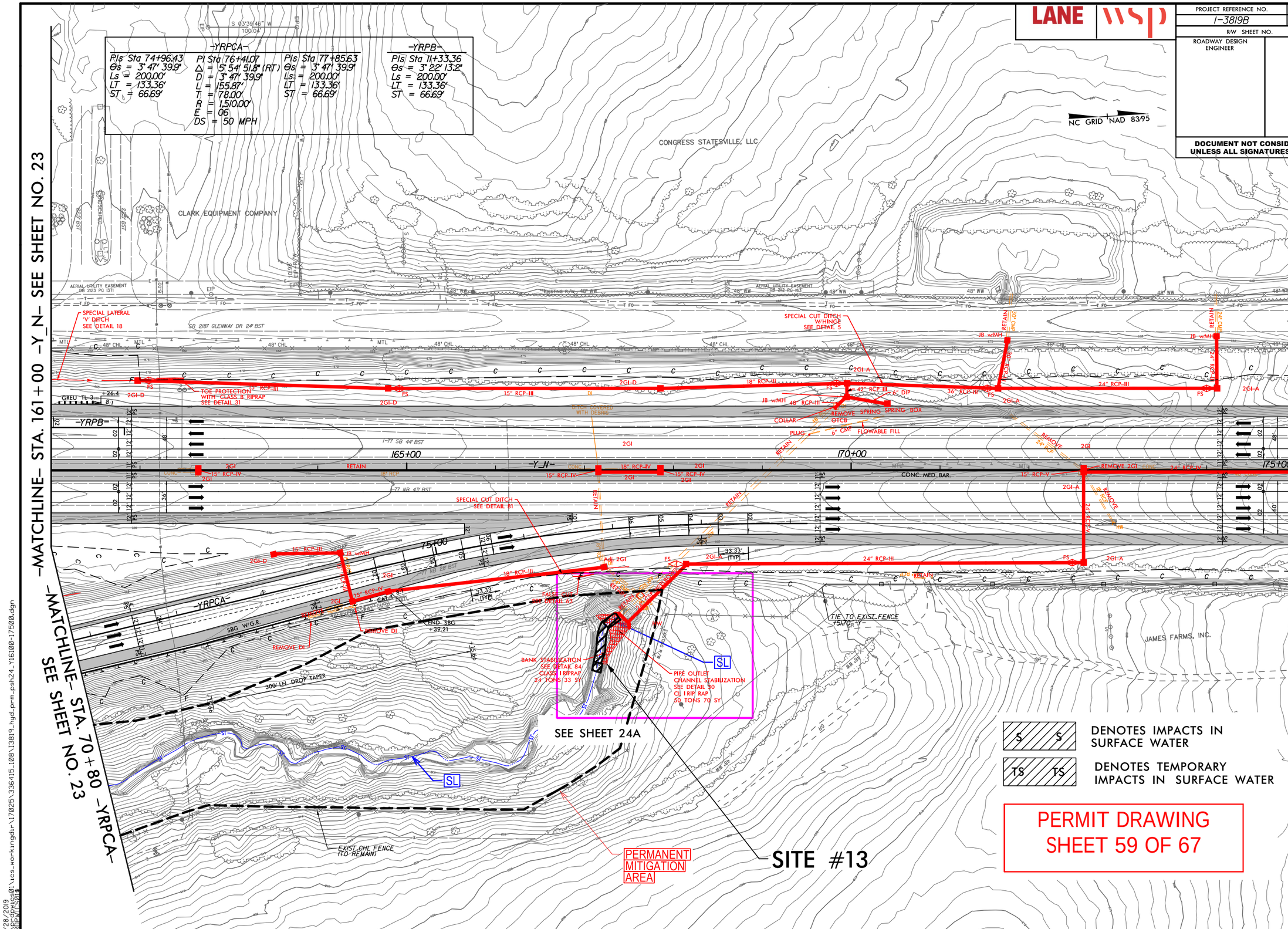
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-YRPCA-

PIs Sta 74+96.43	PI Sta 76+41.07	PIs Sta 77+85.63
Θs = 3° 47' 39.9"	Δ = 5° 54' 51.8" (RT)	Θs = 3° 47' 39.9"
Ls = 200.00'	D = 3° 47' 39.9"	Ls = 200.00'
LT = 133.36'	L = 155.87'	LT = 133.36'
ST = 66.69'	T = 78.00'	ST = 66.69'
	R = 1,510.00'	
	E = 06	
	DS = 50 MPH	

-YRPB-

PIs Sta 11+33.36
Θs = 3° 22' 13.2"
Ls = 200.00'
LT = 133.36'
ST = 66.69'

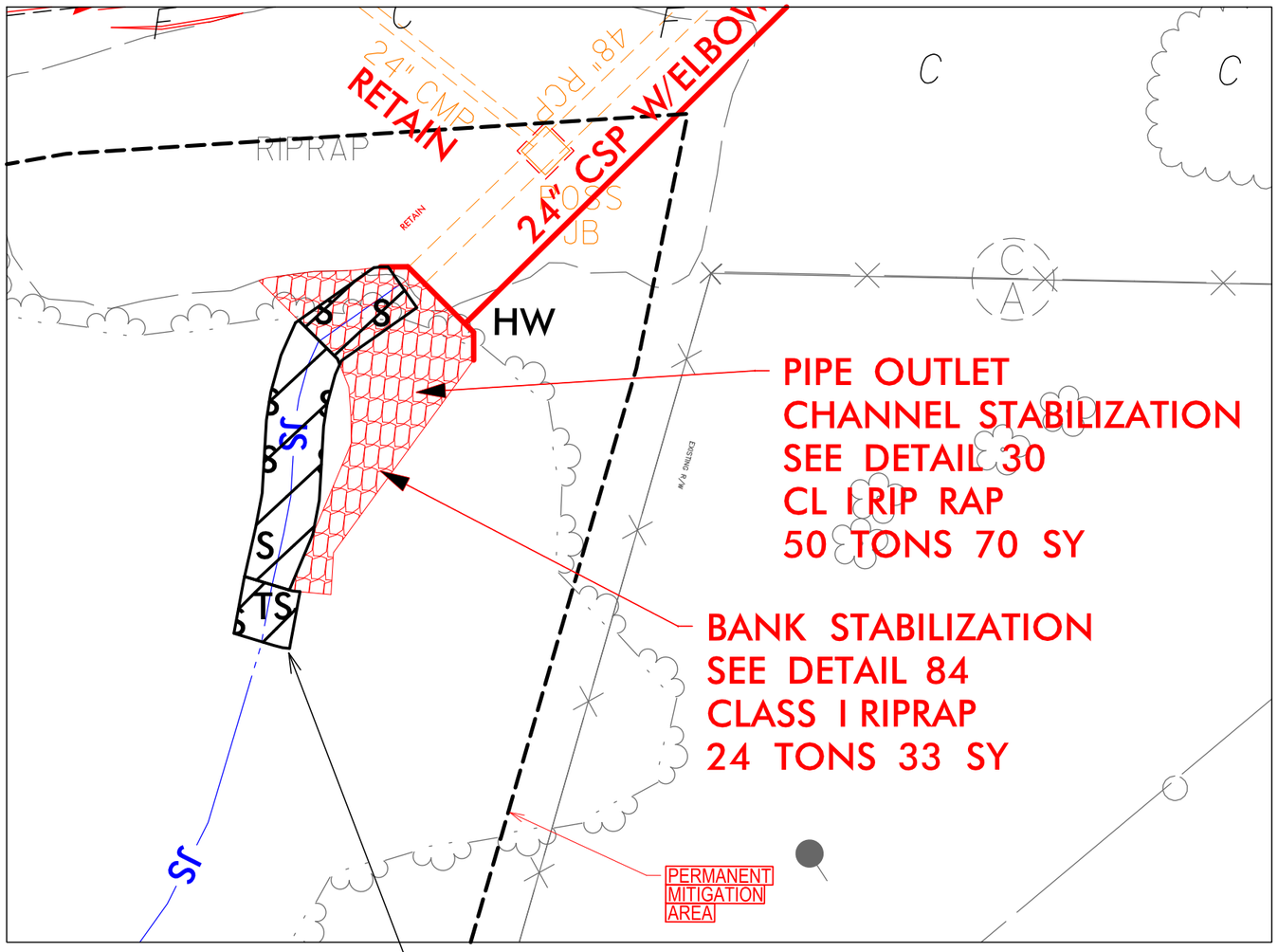


PERMIT DRAWING
SHEET 59 OF 67

6/28/2019
pw:\\pwdenver\projects01\ncs_workingdir\17025\336415_108\I3819_hyd_prm_psh24_Y16100-17500.dgn
PBFWTC\$DIS

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	24A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

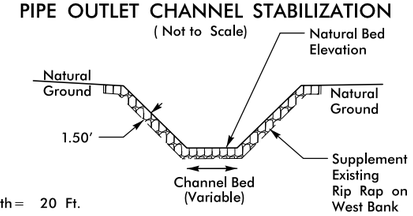


SITE #13

DETAIL 30

PIPE OUTLET CHANNEL STABILIZATION

(Not to Scale)



Length = 20 Ft.

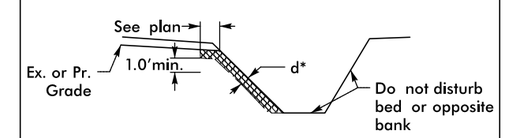
Type of Liner = CL 1 Rip-Rap - Keyed-In (No Geotextile)

-Y_N- STA. 167+45

DETAIL 84

RIP RAP BANK STABILIZATION

(Not to Scale)



Type of Liner = CL 1 or CL 2 Rip Rap (see plan)
*d=18" for CL 1 and 30" for CL 2 (No Geotextile)

-YRPCA- STA. 18+65 RT
-YRPCA- STA. 77+00 RT

NC GRID NAD 83/95

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 60 OF 67

50 25 0 25 50

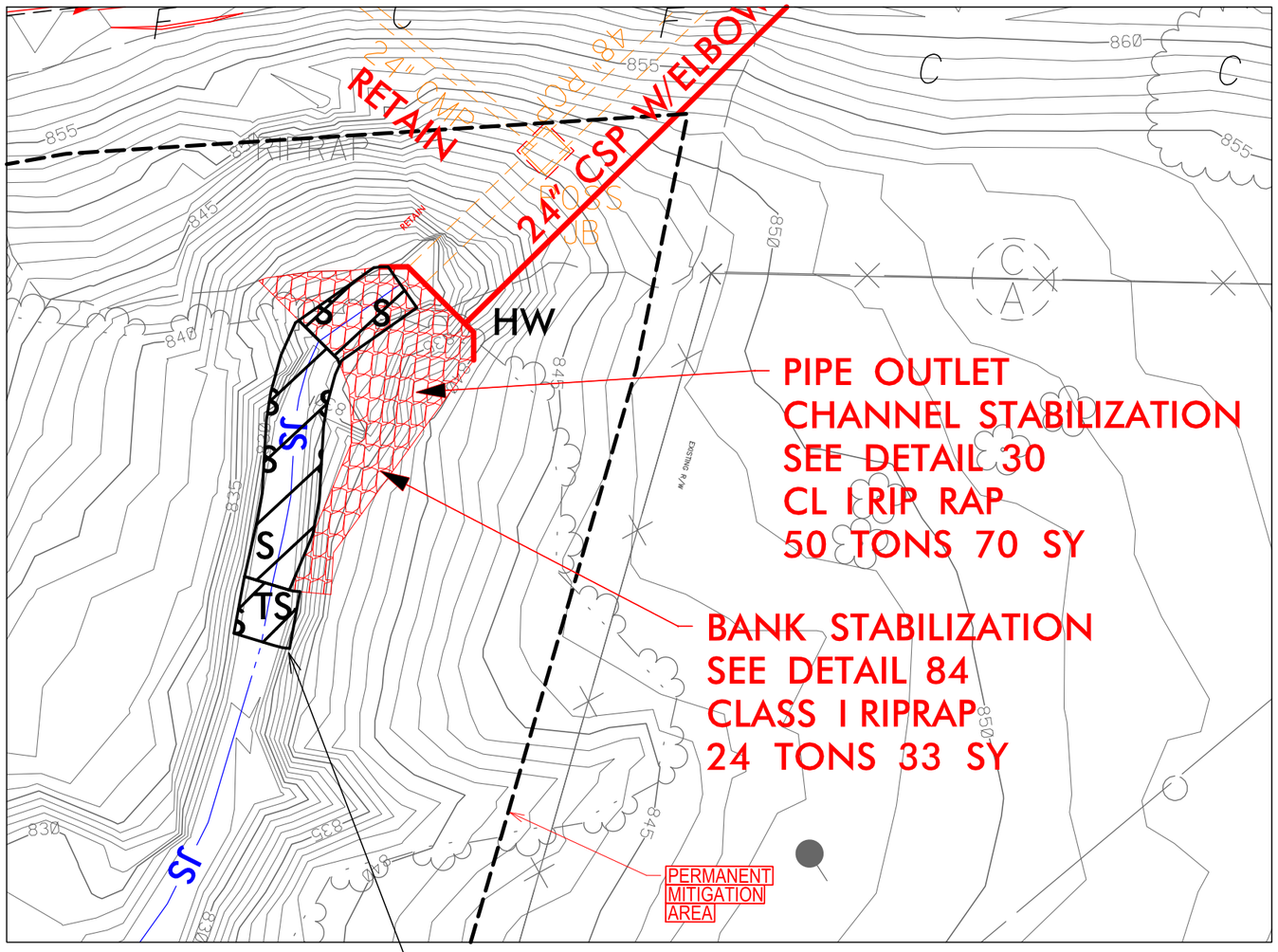
GRAPHIC SCALE - INSETS

7/12/2019
\\prdpwics01\ics_workingdir\18236\282468_127081\13819_hyd_prm_psh24A_Y16100-17500.dgn
PRDPWICS01$

LANE	wsp

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	24A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

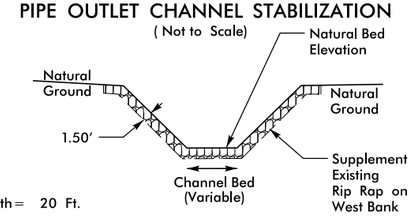


SITE #13

DETAIL 30

PIPE OUTLET CHANNEL STABILIZATION

(Not to Scale)



Length = 20 Ft.

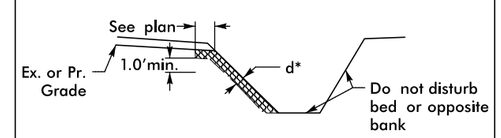
Type of Liner = CL 1 Rip-Rap - Keyed-In (No Geotextile)

-Y_N- STA. 167+45

DETAIL 84

RIP RAP BANK STABILIZATION

(Not to Scale)



Type of Liner = CL 1 or CL 2 Rip Rap (see plan)

*d = 18" for CL 1 and 30" for CL 2 (No Geotextile)

-YRPCA- STA. 18+65 RT

-YRPCA- STA. 77+00 RT

NC GRID NAD 83/95

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 61 OF 67

50 25 0 25 50

GRAPHIC SCALE - INSETS

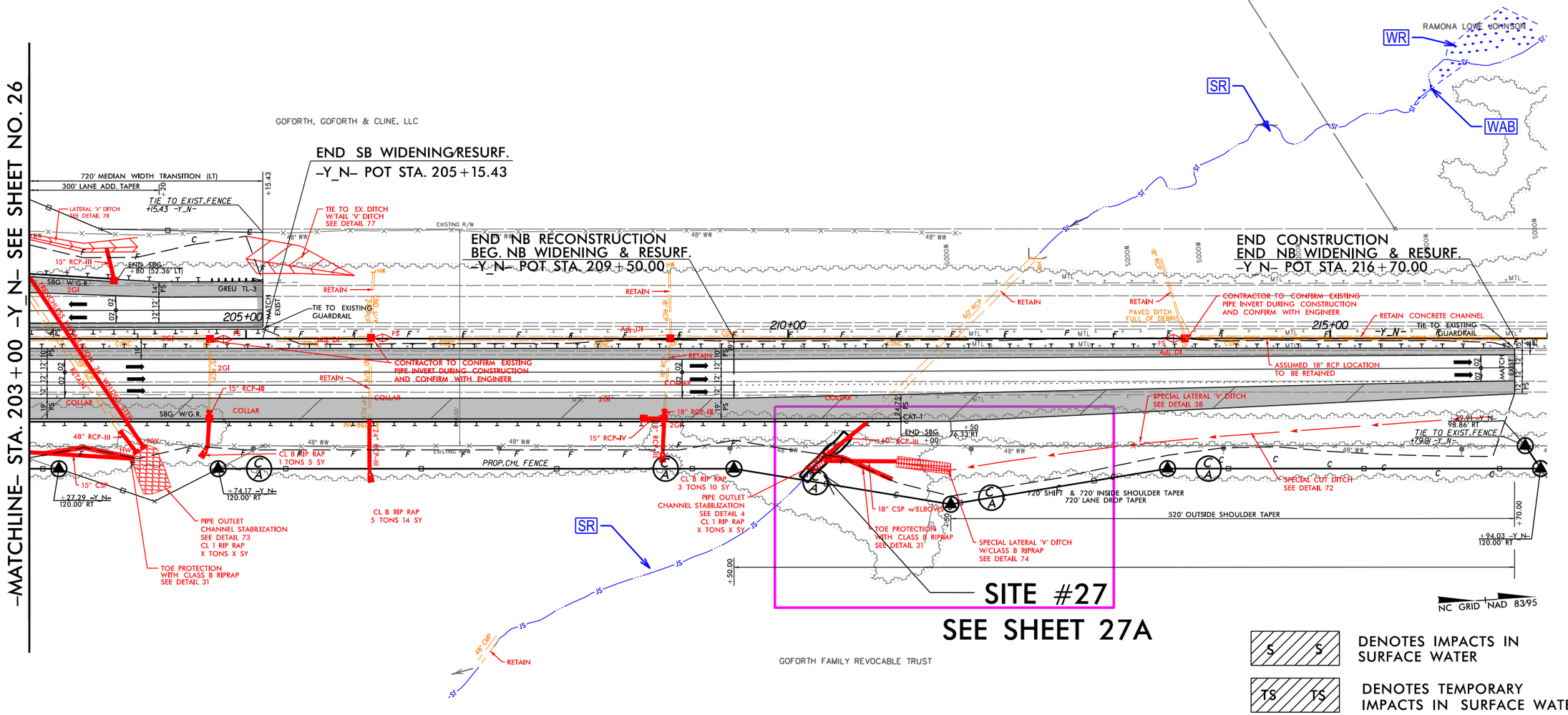
7/12/2019
\\prdpwics01\ics_workingdir\18225\282468_127022\13819_hyd_prm_psh24A_Y16100-17500.dgn
PRDPWICS01$

LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



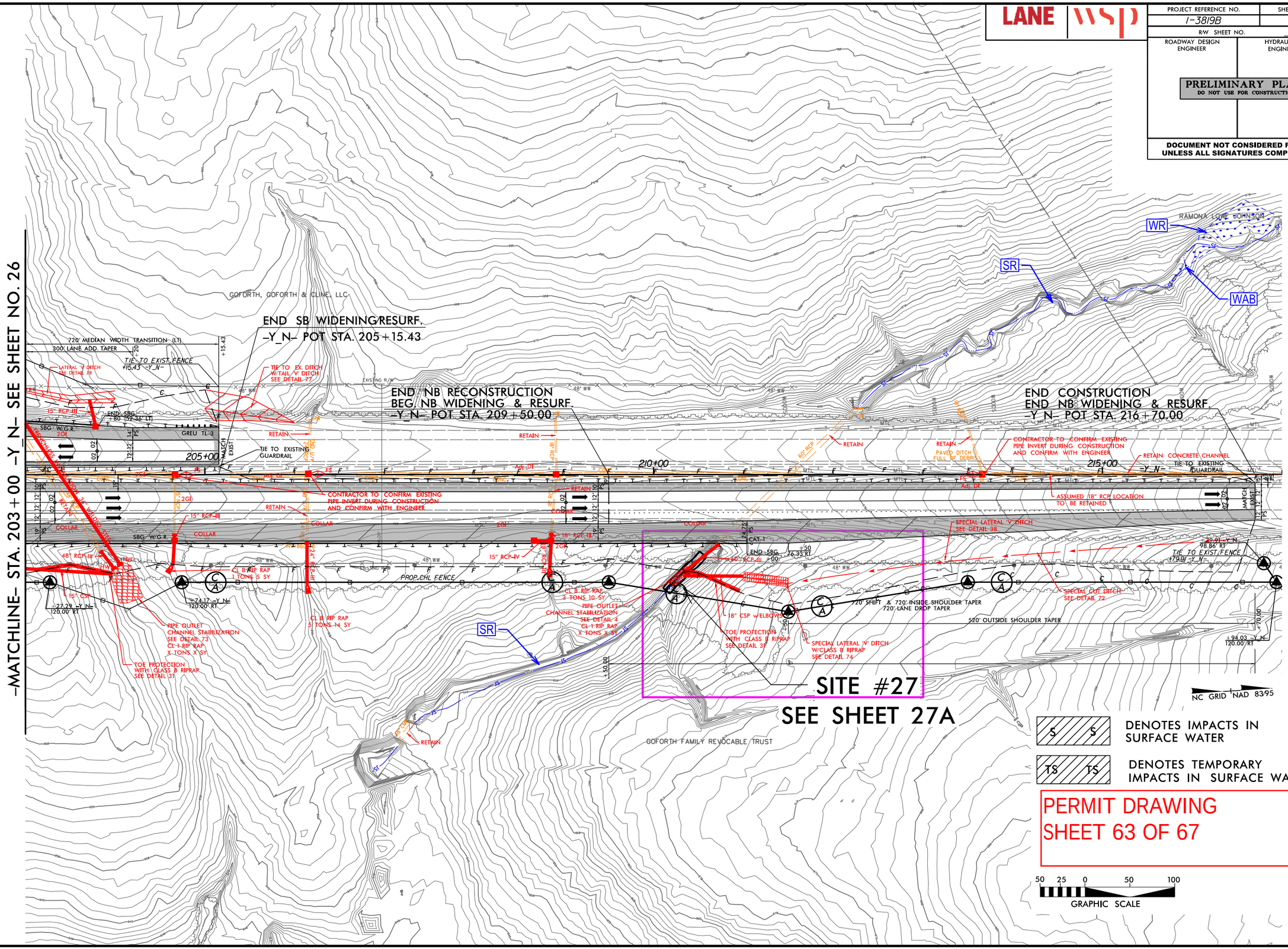
6/5/2019
$I3819B_PRELIM_SHEET_27.DGN

LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



6/5/2019
CIRCOMESTWISE\pbprojectwisent\wsp__morgan.goodwin\d0339329\I3819_hyd_prm_psh27_Y20300-217000.dgn
USMAS 22.7.4

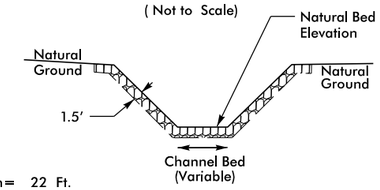
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	27A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 4

PIPE OUTLET CHANNEL STABILIZATION

(Not to Scale)



Length= 22 Ft.

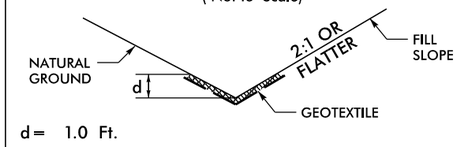
Type of Liner= CL 1 Rip-Rap - Keyed-In (No Geotextile)

-YRPC- STA. 16+04
-Y_N- STA. 210+35 RT

DETAIL 31

TOE PROTECTION

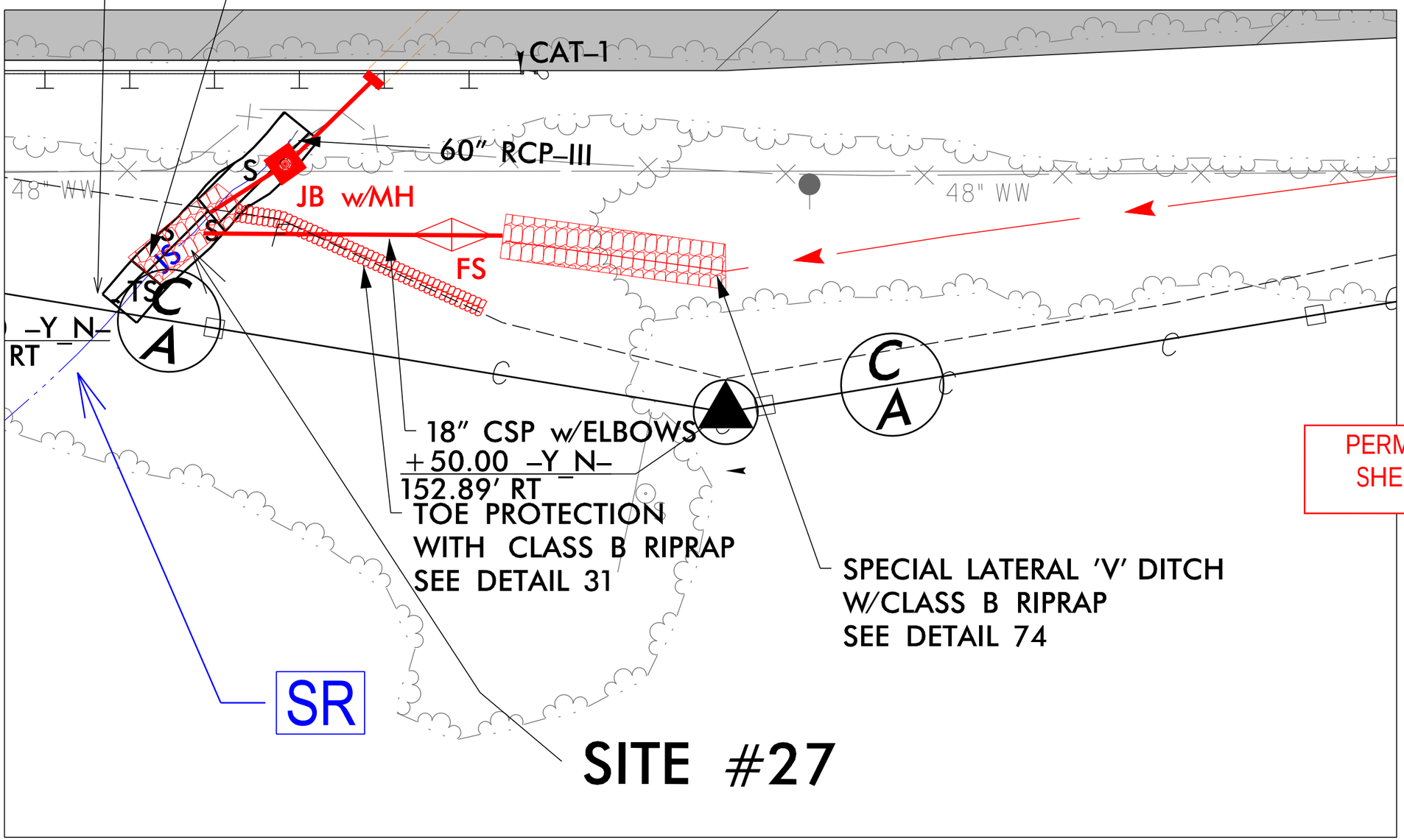
(Not to Scale)



d= 1.0 Ft.

Type of Liner= Class B Rip-Rap

INSET



PERMIT DRAWING
SHEET 64 OF 67

NC GRID NAD 83/95

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50 25 0 25 50

GRAPHIC SCALE - INSETS

07/12/19
c:\projectwise\pb\projectwiseint\becker_jw\d0339329\I3819_hyd_prm_psh27A_Y20300-21700.dgn

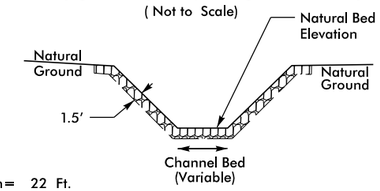
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	27A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 4

PIPE OUTLET CHANNEL STABILIZATION

(Not to Scale)



Length= 22 Ft.

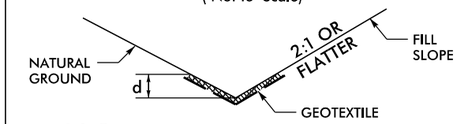
Type of Liner= CL 1 Rip-Rap - Keyed-In (No Geotextile)

-YRPC- STA. 16+04
-Y_N- STA. 210+35 RT

DETAIL 31

TOE PROTECTION

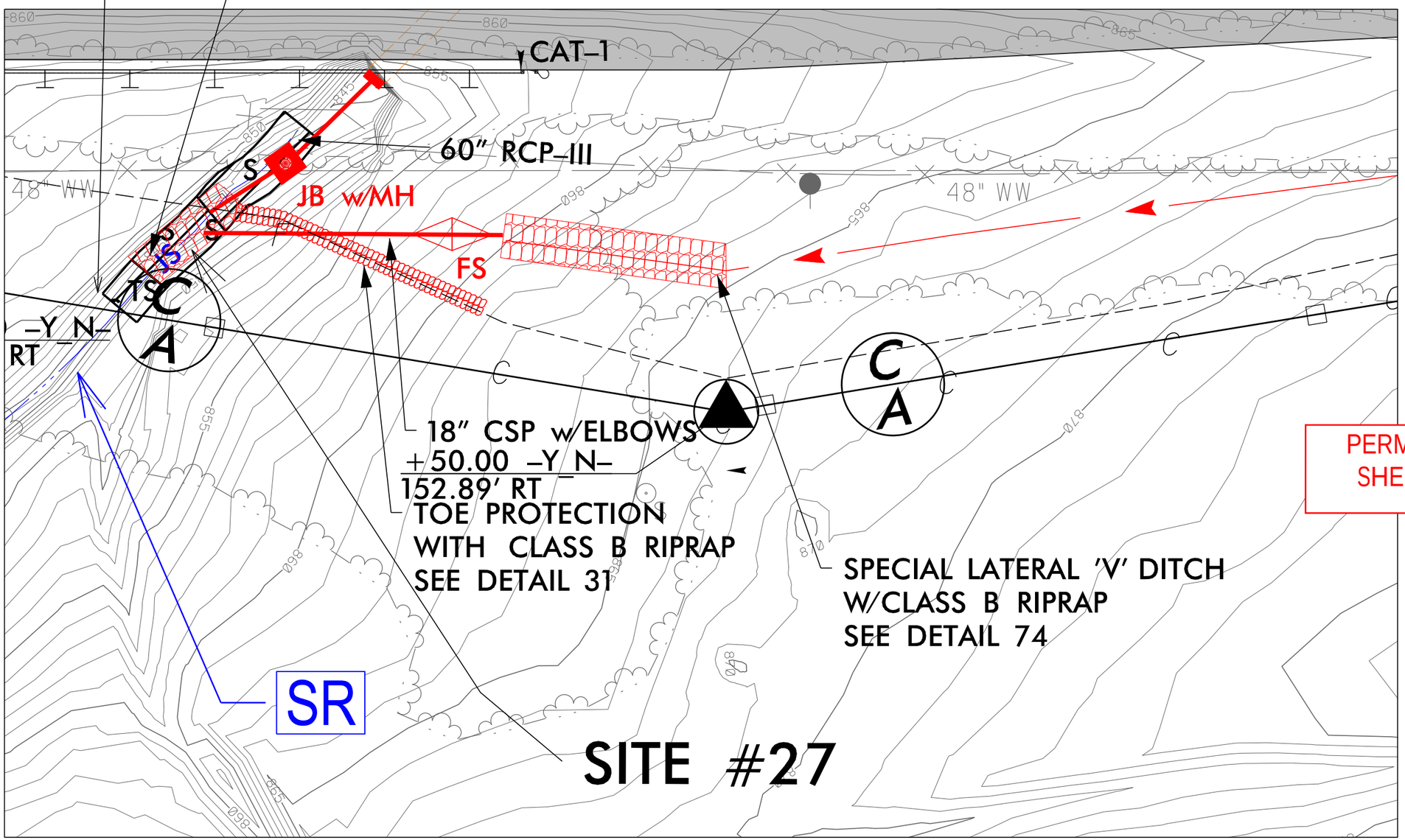
(Not to Scale)



d= 1.0 Ft.

Type of Liner= Class B Rip-Rap

INSET



PERMIT DRAWING
SHEET 65 OF 67

07/12/19
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Becker, JW

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	Site 1 Eliminated											
2	14+00 -21+50-YRPCA-	Roadway Fill	0.32			0.09						
2	16+70 - 21+50-YRPCA-	Bridge/Stream Bank Stabilization	0.02			0.02	0.62	< 0.01	< 0.01	42	20	
3	15+75-YRPC-	Roadway Fill	< 0.01			0.01		0.02	< 0.01	206	10	
4	24+00-YRPC-	Roadway Fill				0.02						
5	70+00 - 76+25 -YRPAC-	Bridge	0.03			0.05	1.94					
5	70+00 - 73+85 -YRPAC-	Temporary Pipe							< 0.01		40	
6	121+50-Y_LT-	Stream Bank Stabilization						< 0.01	< 0.01	12	20	
7	120+90-Y_RT-	Stream Bank Stabilization						< 0.01	< 0.01	12	20	
8	19+00-YRPDB-	Roadway Fill	< 0.01			< 0.01						
9	28+50 - 34+00-YRPAC-	Roadway Fill	0.40			0.08		0.07	< 0.01	747	10	
10	28+00-YRPAC-	Stream Bank Stabilization						< 0.01	< 0.01	25	20	
11	27+50 - 26+50-YRPAC	Roadway Fill	0.19			0.02						
12	149+00-150+00-L-	Bridge						< 0.01	0.01	10	54	
13	167+00-Y_RT-	Stream Bed Stabilization						< 0.01		17		
13	167+00-Y_RT-	Stream Bank Stabilization						< 0.01	< 0.01	44	10	
14	28+50-Y-	Stream Bed Stabilization						< 0.01	< 0.01	17	10	
15	33+75-Y-	Stream Bank Stabilization						< 0.01	< 0.01	11	20	
16	37+10-37+20-Y-	54" RCP Extension						< 0.01		13		
16	35+90-37+10-Y-	Stream Bed Stabilization						< 0.01	< 0.01	99	10	
17	37+70-37+80-Y-	54" RCP Extension						< 0.01		17		
17	37+80-38+50-Y-	Stream Bed Stabilization						0.01	< 0.01	98	14	
18	47+50-Y-	54" RCP Extension						< 0.01		39		
18	47+50-Y-	Stream Bed Stabilization						< 0.01	< 0.01	33	10	
SHEET 66 SUBTOTALS*:			0.97			0.29	2.56	0.16	0.04	1442	268	

*Rounded totals are sum of actual impacts for sites listed on Sheet 66. See Sheet 67 for project total.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
06/05/2019
IREDELL
TIP NO. I-3819B
WBS NO.

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
19	46+00-Y-	54" RCP Extension						< 0.01		34		
20	68+50-Y-	New Channel						< 0.01	< 0.01	13	10	
20	68+50-Y-	Roadway Fill						< 0.01		48		
21	70+20-Y-	3@9'X11" RCBC Extension						0.02		39		
21	69+20-70+20-Y-	Stream Bed Stabilization						0.05	< 0.01	137	21	
22	71+30-71+90-Y-	3@9'X11" RCBC Extension						< 0.01		45		
22	71+90-72+89-Y-	Stream Bed Stabilization						0.05		160		
22	72+89-75+10-Y-	New Channel						0.07		225		
22	75+10-83+59-Y-	Stream Bank Stabilization						0.23		873		
22	83+59-84+00-Y-	Stream Bed Stabilization						0.01	< 0.01	37	10	
23	87+70-Y-	Roadway Fill							< 0.01		33	
24	93+75-Y-	66" RCP Extension						< 0.01	< 0.01	49	10	
25	94+50-Y-	66" RCP Extension						< 0.01		10		
25	94+50-Y-	Stream Bed Stabilization						< 0.01	< 0.01	34	32	
26	116+70-120+10-Y-	Roadway Fill	0.09			0.04						
27	210+00-Y-	60" RCP Extension						< 0.01		29		
27	210+00-Y-	Stream Bed Stabilization						< 0.01	< 0.01	19	10	
SHEET 66 SUBTOTAL			0.97	0.00	0.00	0.29	2.56	0.16	0.04	1442	268	0
SHEET 67 SUBTOTAL			0.09	0.00	0.00	0.04	0.00	0.47	0.03	1752	126	0
PROJECT TOTALS*:			1.06	0.00	0.00	0.33	2.56	0.63	0.07	3194	394	0.00

*Rounded totals are sum of actual impacts for entire project area

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
06/05/2019
IREDELL
TIP NO. I-3819B
WBS NO.

Revised 2018 Feb

09/08/99

TIP PROJECT: I-3819B/U-6039

PROJECT: 34192.1.2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

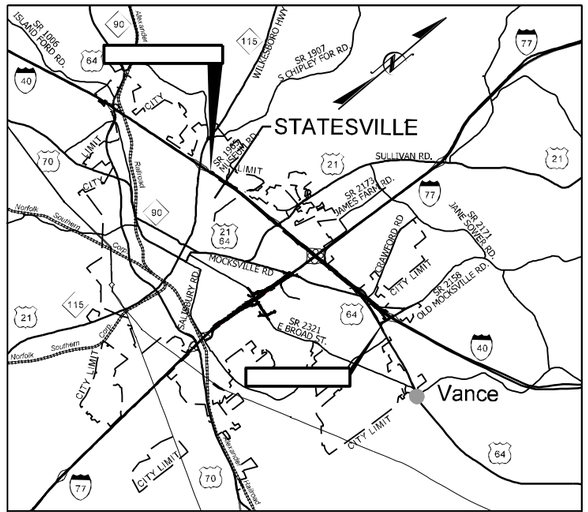
IREDELL COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-3819B/U-6039	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34192.1.2	IMS-40-2(124)	P.E.
34192.3.2	N/A	DESIGN BUILD

LOCATION: I-40/I-77 INTERCHANGE INCLUDING I-40 FROM WEST OF SR 2003 (RADIO RD.) TO SR 2158 (OLD MOCKSVILLE RD.) & I-77 FROM SOUTH OF SR 2321 (EAST BROAD ST.) TO SOUTH OF SR 2171 (JANE SOWERS RD.)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, RETAINING WALLS, NOISE WALLS, AND TRAFFIC CONTROL



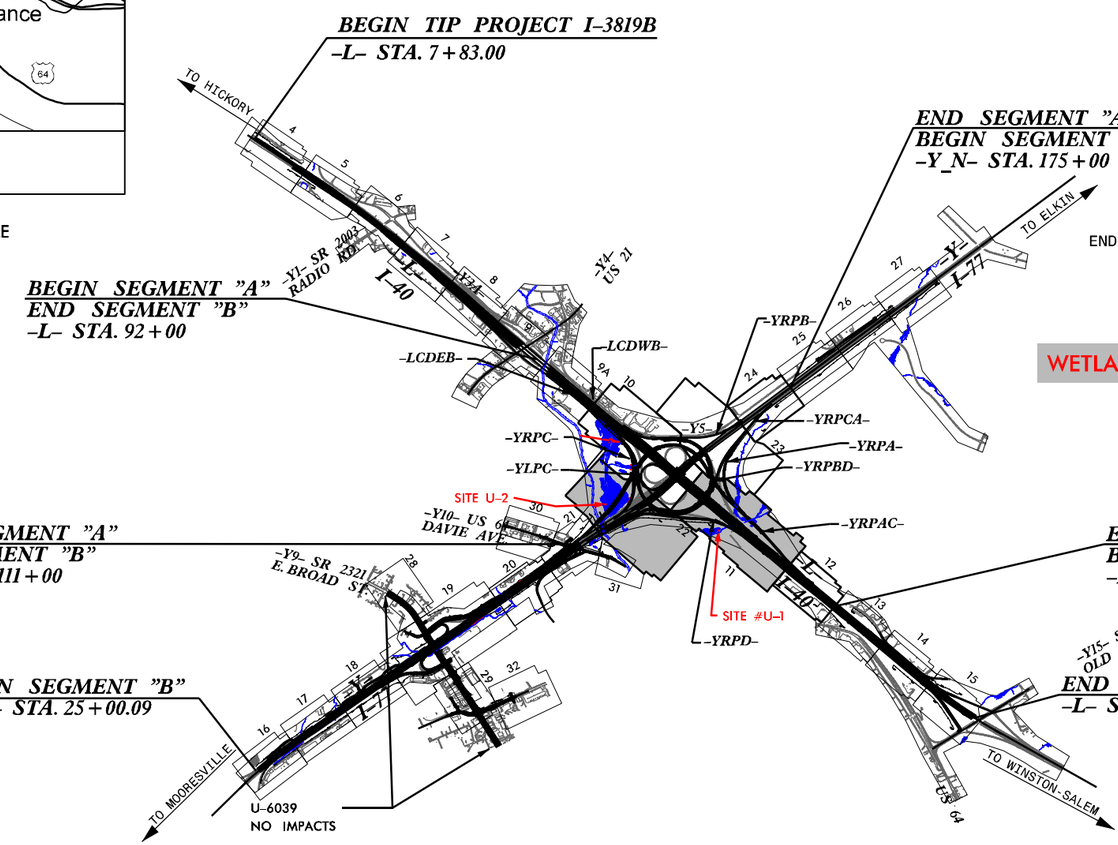
VICINITY MAP

THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF STATESVILLE AND THE TOWNSHIP OF BETHANY

100 50 0 100 200
PLANS

200 100 0 200 400
OVERSIZED PLANS

SCALE VARIES
INSETS



WETLAND AND SURFACE WATER IMPACT PERMITS

DATE: JULY 8, 2019
(Note: The sites highlighted in RED are included in this submittal.)

UTILITY PERMIT DRAWING
SHEET 1 OF 8

LANE

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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

THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES

GRAPHIC SCALES

SEE ABOVE

DESIGN DATA

		I-40	I-77
ADT 2018	=	57,300	62,900
ADT 2040	=	72,500	77,500
DHV	=	5,800	6,200
D	=	55 %	55 %
T	=	16 % *	19 % **
V	=	60 MPH	60 MPH

* TTST 13 + DUAL 3 (I-40)
** TTST 16 + DUAL 3 (I-77)
CLASSIFICATION: INTERSTATE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT I-3819B	=	3.885
LENGTH STRUCTURES TIP PROJECT I-3819B	=	0.124
TOTAL LENGTH OF TIP PROJECT I-3819B	=	4.009

Prepared In the Office of:
WSP
1001 Morehead Square Dr., Suite 610, Charlotte, NC 28203
NC LIC NO. F-0165

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 30, 2018

LETTING DATE: OCTOBER 30, 2018

CHRISTOPHER D. DAVIS, P.E.
PROJECT ENGINEER

ERIC W. SECKINGER, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

7/8/2019
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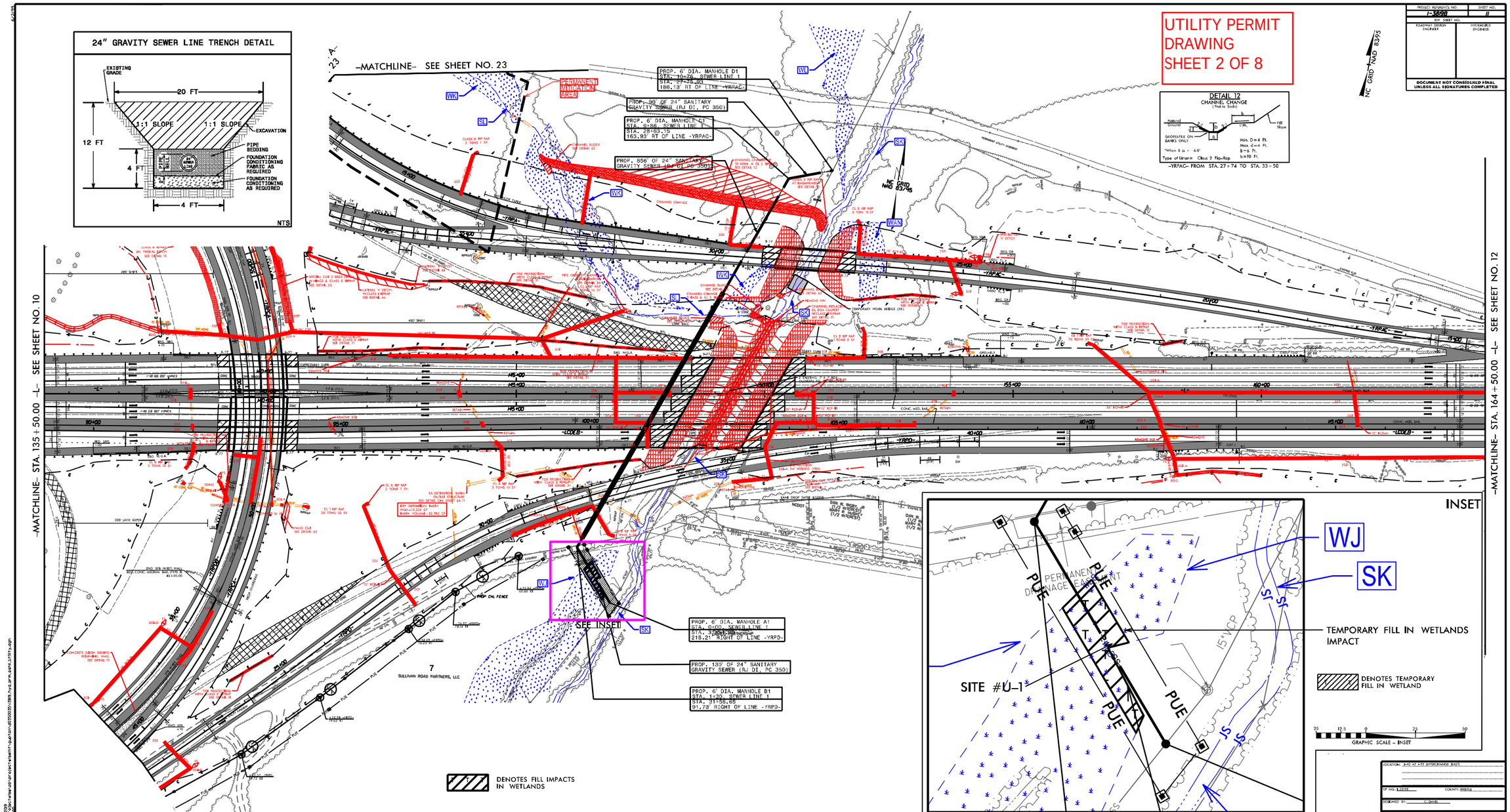
Gupton

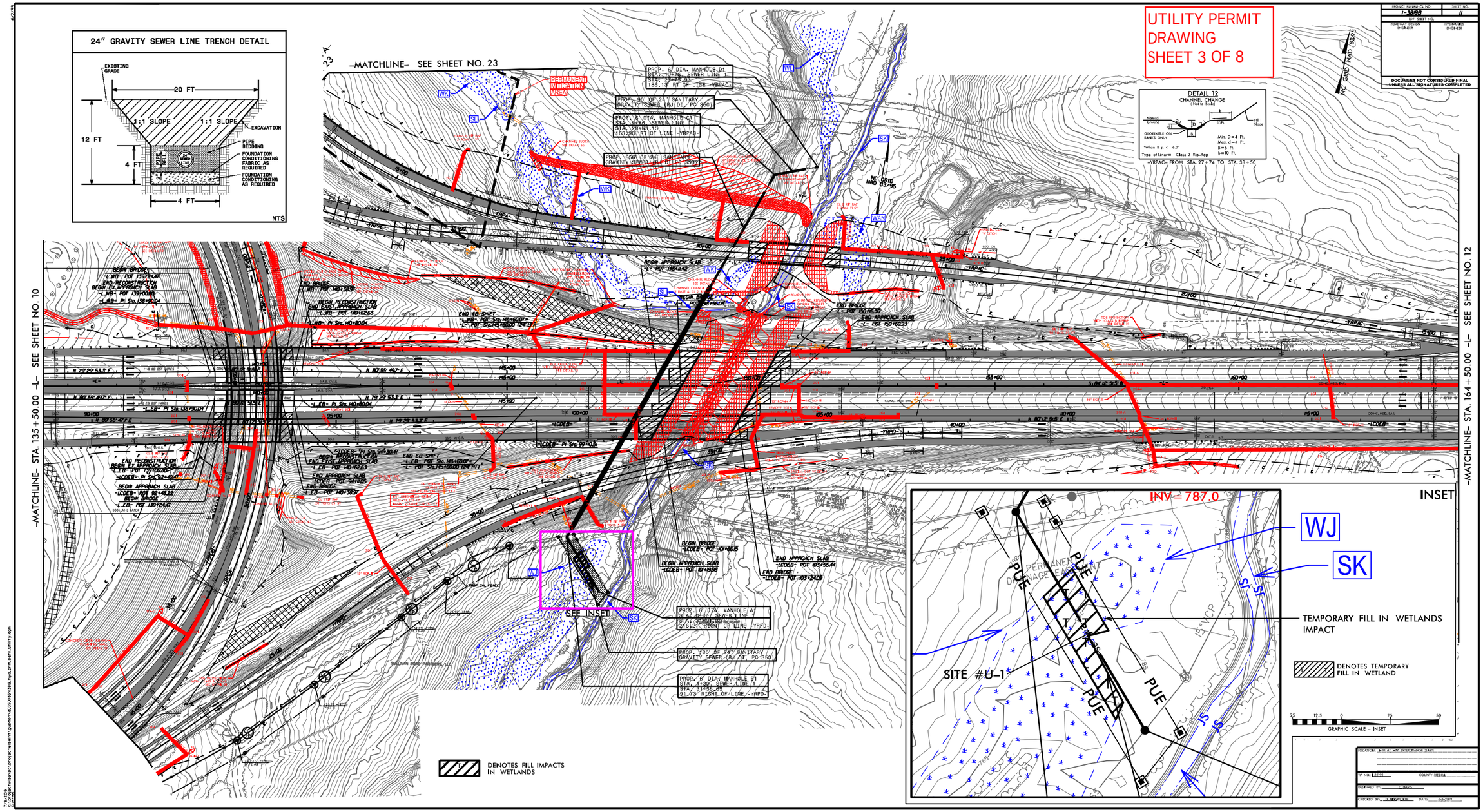


UTILITY PERMIT
DRAWING
SHEET 2 OF 8
24" GRAVITY SEWER LINE TRENCH DETAIL
EXISTING GRADE
20 FT
1:1 SLOPE
1:1 SLOPE
EXCAVATION
12 FT
4 FT
PIPE BEDDING
FOUNDATION CONDITIONING FABRIC AS REQUIRED
FOUNDATION CONDITIONING AS REQUIRED
4 FT
NTS
-MATCHLINE- SEE SHEET NO. 23
PERMANENT MITIGATION AREA
PROP. 6' DIA. MANHOLE D1
STA. 10+76, SEWER LINE 1
STA. 27+75.93
186.13' RT OF LINE -YRPAC-
PROP. 90' OF 24" SANITARY GRAVITY SEWER (RJ DI, PC 350)
PROP. 6' DIA. MANHOLE C1
STA. 9+86, SEWER LINE 1
STA. 28+83.15
163.93' RT OF LINE -YRPAC-
PROP. 856' OF 24" SANITARY GRAVITY SEWER (RJ DI, PC 350)
NC GRID NAD 83/95
DETAIL 12
CHANNEL CHANGE
-YRPAC- FROM STA. 27+74 TO STA. 33+50
-MATCHLINE- STA. 135+50.00 -L- SEE SHEET NO. 10
-MATCHLINE- STA. 164+50.00 -L- SEE SHEET NO. 12
SEE INSET
PROP. 6' DIA. MANHOLE A1
STA. 0+00, SEWER LINE 1
STA. 3[illegible]
218.21' RIGHT OF LINE -YRPD-
PROP. 130' OF 24" SANITARY GRAVITY SEWER (RJ DI, PC 350)
PROP. 6' DIA. MANHOLE B1
STA. 1+30, SEWER LINE 1
STA. 31+58.65
91.73' RIGHT OF LINE -YRPD-
SULLIVAN ROAD PARTNERS, LLC
DENOTES FILL IMPACTS IN WETLANDS
INSET
WJ
SK
PERMANENT DRAINAGE EASEMENT
PUE
SITE #U-1
TEMPORARY FILL IN WETLANDS IMPACT
DENOTES TEMPORARY FILL IN WETLAND
GRAPHIC SCALE - INSET
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

UTILITY PERMIT DRAWING SHEET 3 OF 8

PROJECT REFERENCE NO.	SHEET NO.
I-3589	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

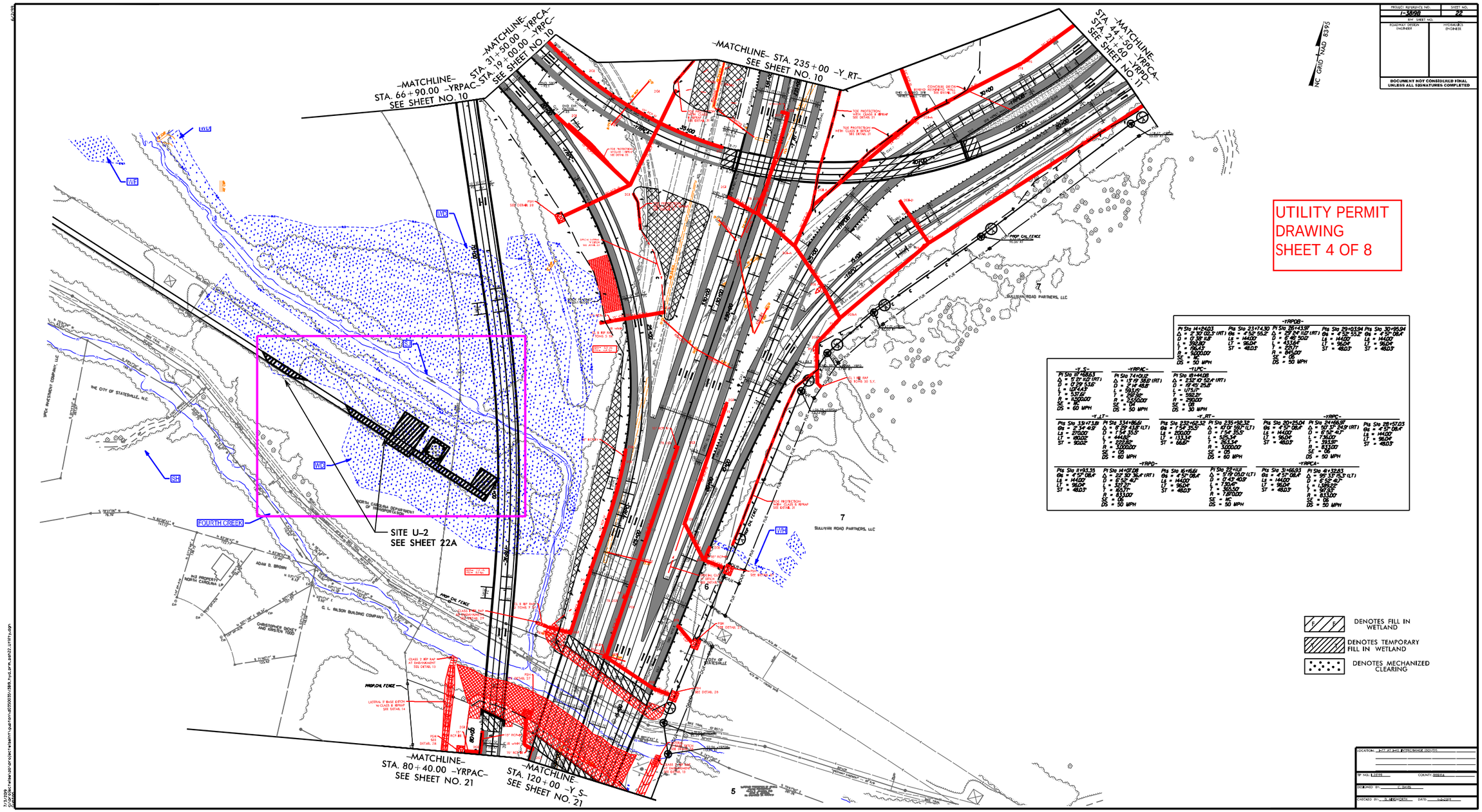


LOCATION: I-40 AT I-77 INTERCHANGE (EAST)

TIP NO. I-3589 COUNTY: IREDELL

DESIGNED BY: C. Davis

CHECKED BY: D. Arrington DATE: 6-6-2017



UTILITY PERMIT DRAWING SHEET 4 OF 8

PROJECT REFERENCE NO.	SHEET NO.
I-3898	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LOCATION: I-77 AT I-40 INTERCHANGE (SOUTH)

TIP NO. I-3898 COUNTY: IREDELL

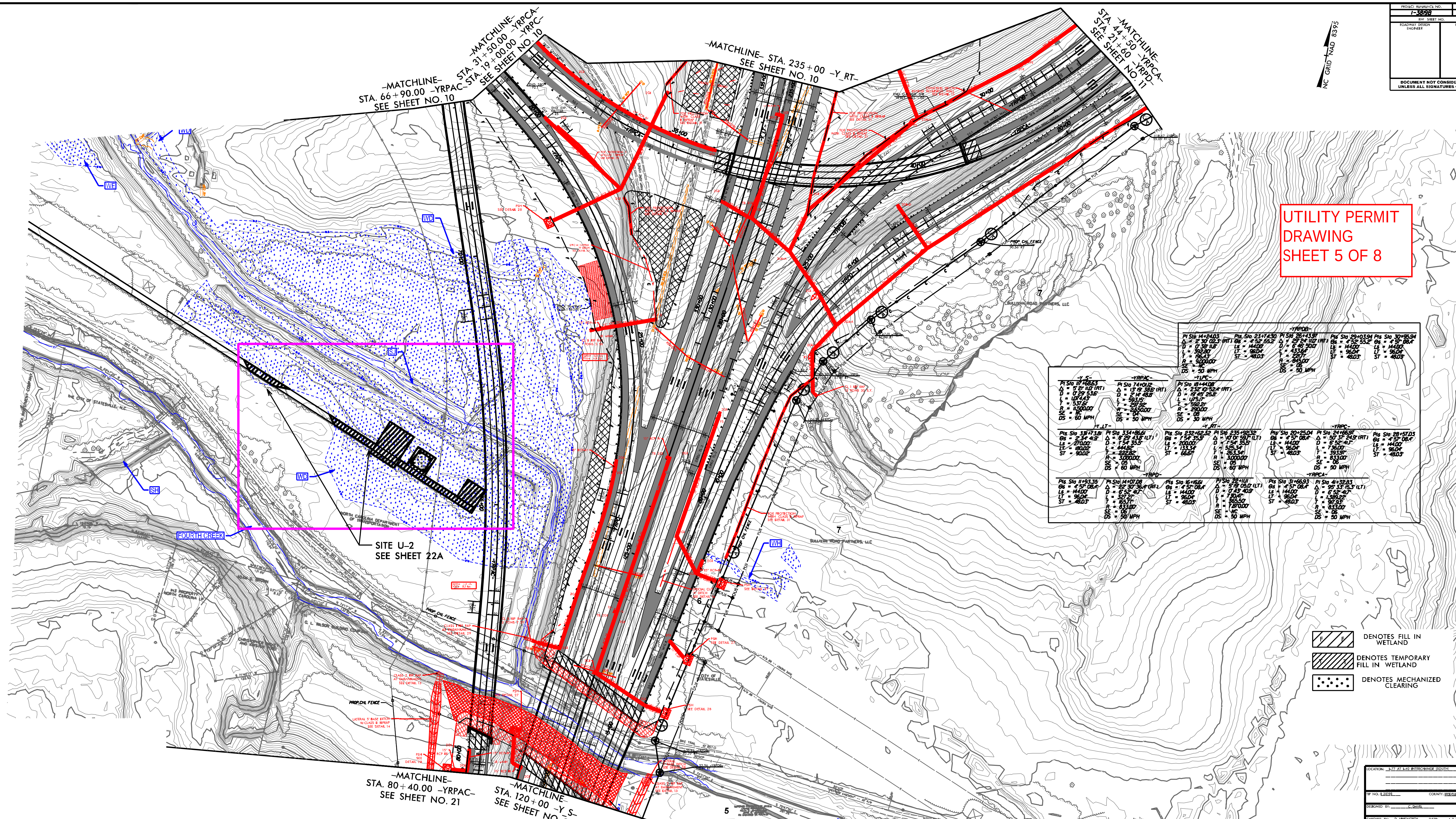
DESIGNED BY: C. DAVIS

CHECKED BY: D. ABERNETHY DATE: 4-30-2019

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

UTILITY PERMIT DRAWING
SHEET 5 OF 8



-Y_S-
PI Sta 117+68.63
Δ = 5°21' 11.0" (RT)
D = 0°29' 53.6"
L = 1,074.43'
T = 537.61'
R = 11,500.00'
SE = NC
DS = 60 MPH

-YRPAC-
PI Sta 74+01.12
Δ = 13°19' 38.6" (RT)
D = 2°14' 48.8"
L = 593.15'
T = 297.92'
R = 2,550.00'
SE = .04
DS = 50 MPH

-YLPC-
PI Sta 18+44.08
Δ = 232°10' 52.4" (RT)
D = 19°45' 25.8"
L = 1,175.17'
T = 592.21'
R = 290.00'
SE = .08
DS = 30 MPH

-YRPDB-
PI Sta 14+24.03: Δ = 2°30' 02.3" (RT), D = 0°38' 11.8", L = 392.80', T = 196.43', R = 9,000.00', SE = NC, DS = 50 MPH
PIs Sta 23+74.30: θs = 4°52' 55.2", Ls = 144.00', LT = 96.04', ST = 48.03'
PI Sta 26+43.97: Δ = 29°24' 11.0" (RT), D = 6°46' 50.0", L = 433.64', T = 221.71', R = 845.00', SE = .06, DS = 50 MPH
PIs Sta 29+03.94: θs = 4°52' 55.2", Ls = 144.00', LT = 96.04', ST = 48.03'
PIs Sta 30+95.94: θs = 4°57' 08.4", Ls = 144.00', LT = 96.04', ST = 48.03'

-Y_LT-
PIs Sta 331+73.81: θs = 2°34' 41.9", Ls = 270.00', LT = 180.02', ST = 90.02'
PI Sta 334+86.61: Δ = 8°29' 43.8" (LT), D = 1°54' 35.5", L = 444.82', T = 222.82', R = 3,000.00', SE = .05, DS = 60 MPH

-Y_RT-
PIs Sta 232+62.32: θs = 1°54' 35.5", Ls = 200.00', LT = 133.34', ST = 66.67'
PI Sta 235+92.32: Δ = 10°01' 59.7" (LT), D = 1°54' 35.5", L = 525.34', T = 263.34', R = 3,000.00', SE = .05, DS = 60 MPH

-YRPC-
PIs Sta 20+25.04: θs = 4°57' 08.4", Ls = 144.00', LT = 96.04', ST = 48.03'
PI Sta 24+66.97: Δ = 50°37' 24.9" (RT), D = 6°52' 41.7", L = 736.00', T = 393.97', R = 833.00', SE = .06, DS = 50 MPH
PIs Sta 28+57.03: θs = 4°57' 08.4", Ls = 144.00', LT = 96.04', ST = 48.03'

-YRPD-
PIs Sta 11+93.35: θs = 4°57' 08.4", Ls = 144.00', LT = 96.04', ST = 48.03'
PI Sta 14+07.08: Δ = 22°30' 36.4" (RT), D = 6°52' 41.7", L = 327.27', T = 165.77', R = 833.00', SE = .06, DS = 50 MPH
PIs Sta 16+16.61: θs = 4°57' 08.4", Ls = 144.00', LT = 96.04', ST = 48.03'
PI Sta 22+11.11: Δ = 5°19' 05.0" (LT), D = 0°43' 40.9", L = 730.47', T = 365.50', R = 7,870.00', SE = NC, DS = 50 MPH

-YRPCA-
PIs Sta 31+66.93: θs = 4°57' 08.4", Ls = 144.00', LT = 96.04', ST = 48.03'
PI Sta 41+32.83: Δ = 95°33' 15.3" (LT), D = 6°52' 41.7", L = 1,389.22', T = 917.93', R = 833.00', SE = .06, DS = 50 MPH

DENOTES FILL IN WETLAND
DENOTES TEMPORARY FILL IN WETLAND
DENOTES MECHANIZED CLEARING

LOCATION: I-77 AT I-40 INTERCHANGE (SOUTH)
TIP NO.: I-3819B COUNTY: IREDELL
DESIGNED BY: C. DAVIS
CHECKED BY: D. AINSWORTH DATE: 4-2-2019

6/2/99
7/3/2019
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gupton

LANE | WSP

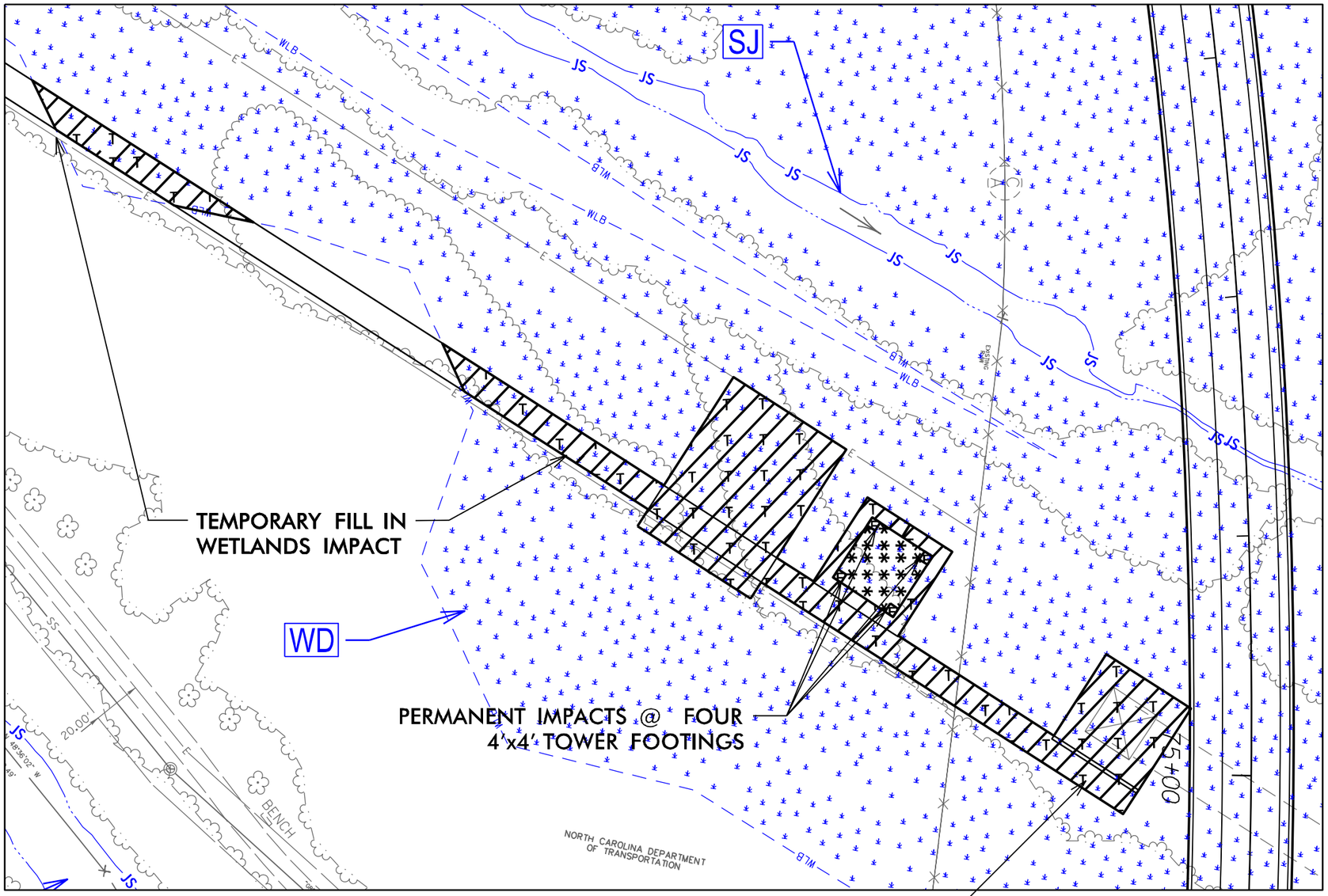
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	22A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

UTILITY PERMIT DRAWING
SHEET 6 OF 8

SITE U–2 INSET



NC GRID NAD 83/95

F F DENOTES FILL IN WETLAND

T T DENOTES TEMPORARY FILL IN WETLAND

DENOTES MECHANIZED CLEARING

50 25 0 25 50
GRAPHIC SCALE – INSETS

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Gupton

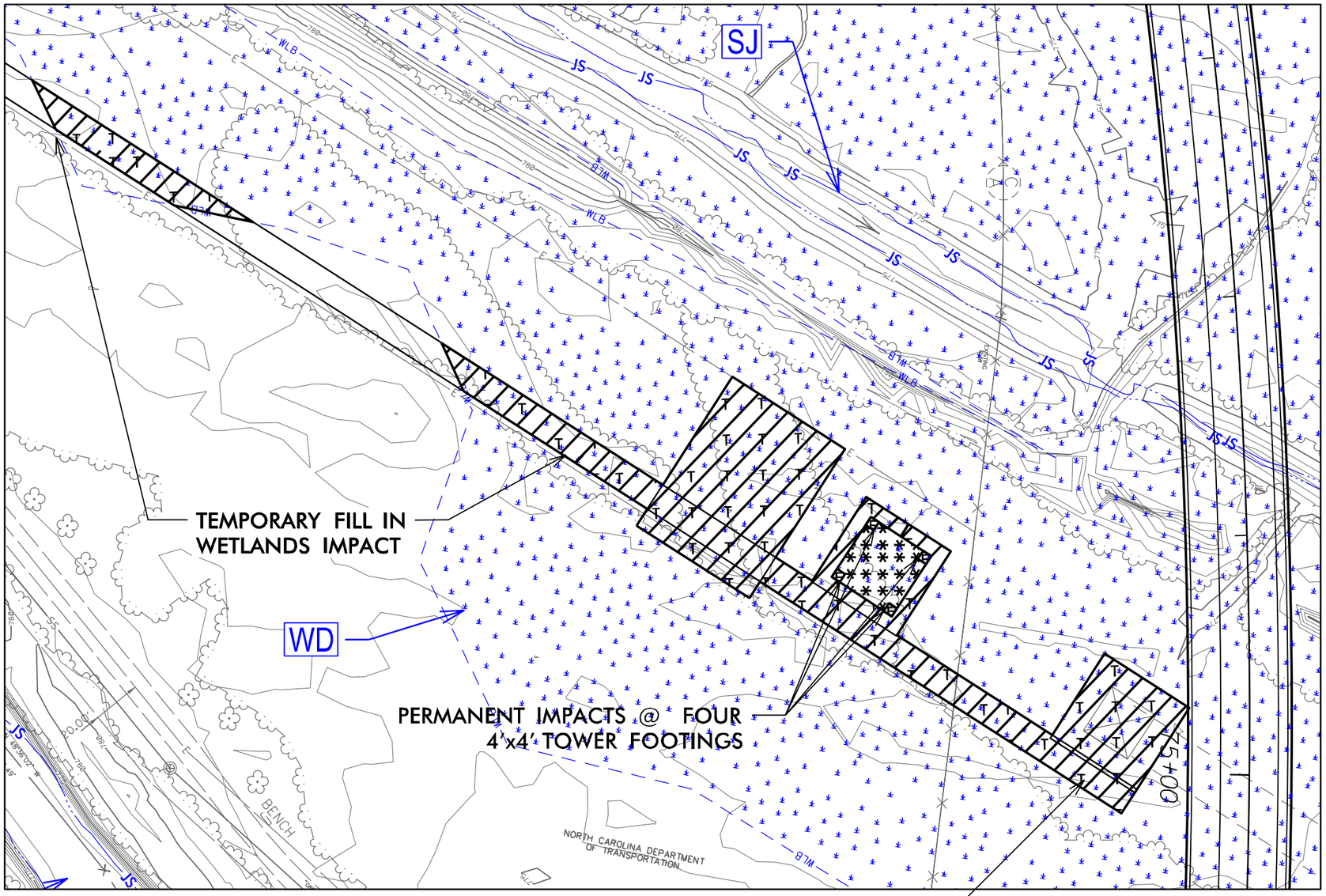
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	22A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

UTILITY PERMIT DRAWING
SHEET 7 OF 8

SITE U–2 INSET



AREA WITHIN 50' OF BRIDGE ALSO COUNTED AS HAND–CLEARING IMPACT IN ROADWAY & DRAINAGE PERMIT PLANS

NC GRID NAD 83/95

F F DENOTES FILL IN WETLAND

T T DENOTES TEMPORARY FILL IN WETLAND

DENOTES MECHANIZED CLEARING

50 25 0 25 50
GRAPHIC SCALE – INSETS

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Gupton

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
U-1	31+50-YRPD-	Utility		0.02								
U-2	75+00-YRPAC-**	Utility	< 0.01	0.25		0.02						
TOTALS*:			< 0.01	0.27		0.02						

*Rounded totals are sum of actual impacts for entire project area

**Permanent Impacts from four (4) 4-ft x 4-ft concrete foundations for new transmission tower locations.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
06/05/2019
IREDELL
TIP NO. I-3819B
WBS NO.

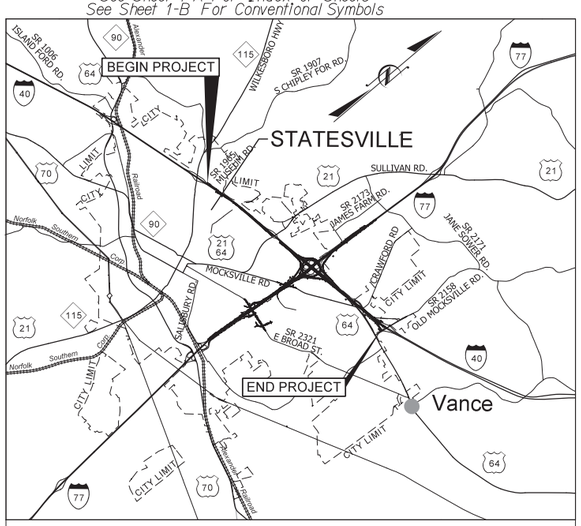
Revised 2018 Feb

09/08/99

TIP PROJECT: I-3819B/U-6039

CONTRACT: C204163

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



VICINITY MAP

THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF STATESVILLE AND THE TOWNSHIP OF BETHANY

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

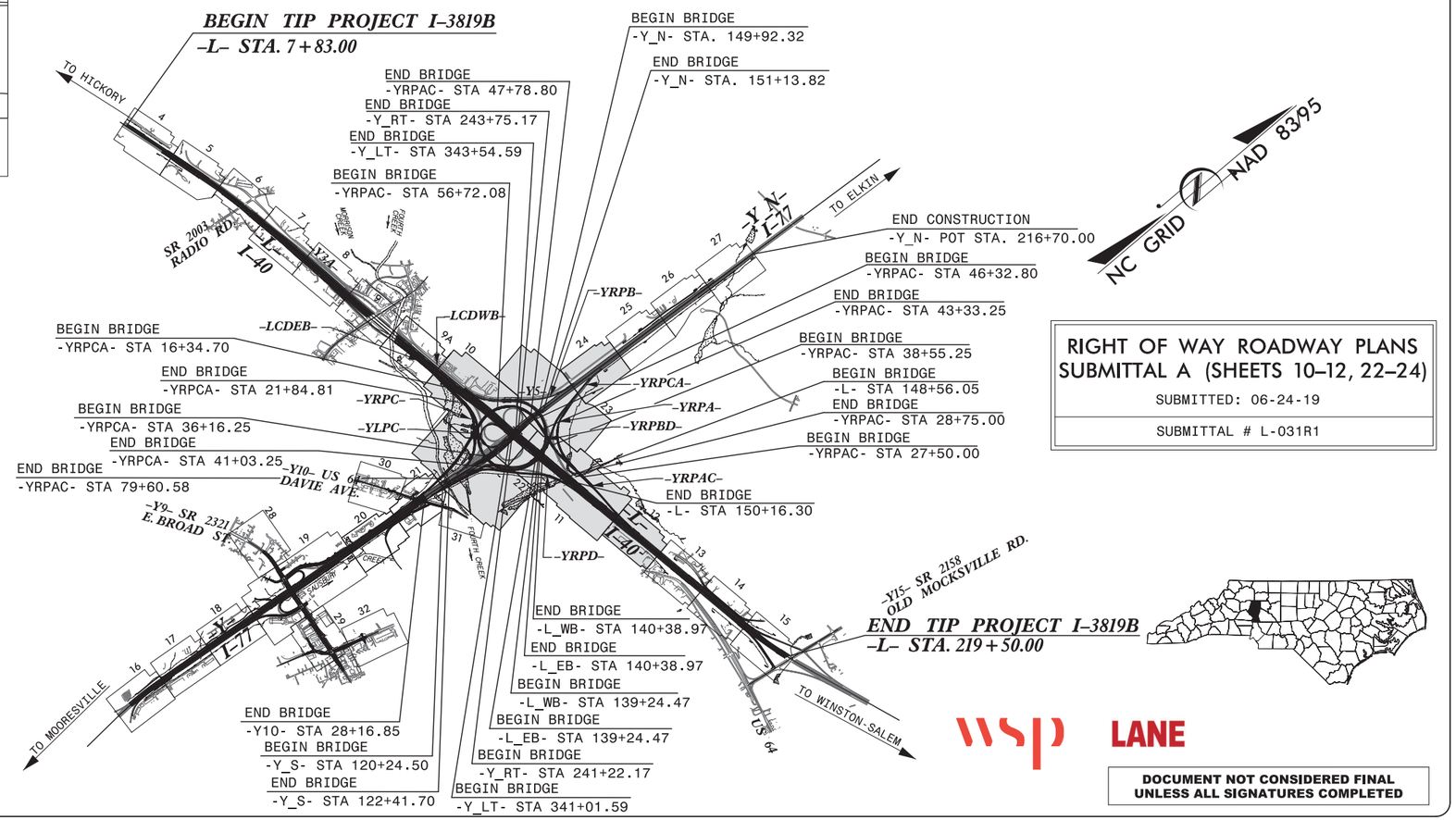
IREDELL COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-3819B/U-6039	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34192.1.2	IMS-40-2(124)	P.E.
34192.3.2	N/A	DESIGN BUILD

LOCATION: I-40/I-77 INTERCHANGE INCLUDING I-40 FROM WEST OF SR 2003 (RADIO RD.) TO SR 2158 (OLD MOCKSVILLE RD.) & I-77 FROM SOUTH OF SR 2321 (EAST BROAD ST.) TO SOUTH OF SR 2171 (JANE SOWERE RD.)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, RETAINING WALLS, NOISE WALLS, AND TRAFFIC CONTROL



RIGHT OF WAY ROADWAY PLANS
SUBMITTAL A (SHEETS 10-12, 22-24)
SUBMITTED: 06-24-19
SUBMITTAL # L-031R1

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

THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES

WSP LANE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

	I-40	I-77
ADT 2018 =	57,300	62,900
ADT 2040 =	72,500	77,500
DHV =	5,800	6,200
D =	55 %	55 %
T =	16 % *	19 % **
V =	60 MPH	60 MPH

* TTST 13 + DUAL 3 (I-40)
** TTST 16 + DUAL 3 (I-77)
CLASSIFICATION: INTERSTATE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT I-3819B	=	3.885
LENGTH STRUCTURES TIP PROJECT I-3819B	=	0.124
TOTAL LENGTH OF TIP PROJECT I-3819B	=	4.009

Prepared In the Office of:
WSP
1001 Morehead Square Dr., Suite 610, Charlotte, NC 28203
NC LIC NO. F-0165

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 30, 2018

LETTING DATE: OCTOBER 30, 2018

CHRISTOPHER D. DAVIS, P.E.
PROJECT ENGINEER

ERIC W. SECKINGER, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
P.E.
STATE HIGHWAY DESIGN ENGINEER

6/24/2019
\\wr-dgwics02\ics_workingdir\6076\336412_I66\I3819_rdy_TSH_A.dgn
PRDPWICS02$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	1-A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SUBMITTAL "A" ROADWAY SHEETS

1 ..... TITLE SHEET

1-A ..... INDEX OF SHEETS AND GENERAL NOTES

1-B ..... CONVENTIONAL SYMBOLS

1C-1 THRU 1C-24 ..... PROJECT SURVEY CONTROL

1D-1 THRU 1D—7 ..... CENTERLINE COORDINATE LIST

2A-1 THRU 2A-9 ..... TYPICAL SECTIONS, PAVEMENT SCHEDULE & DETAILS

2D-1 THRU 2D-4 ..... DRAINAGE DETAILS

2E-1 ..... SHEAR POINT DIAGRAM

10 THRU 12; 22 THRU 24 ..... PLAN SHEETS

37 THRU 42; 47 THRU 51; 55 THRU 58; 61 THRU 73 ..... PROFILE SHEETS

W-1 THRU W-2 ..... RETAINING WALL ENVELOPES

XA-0 ..... CROSS SECTIONS TITLE SHEET

XA-1 THRU XA-63 ..... -L- (LT) CROSS SECTIONS

XA-1 THRU XA-9 NOT IN THIS SUBMITTAL

XA-64 THRU XA-127 ..... -L- (RT) CROSS SECTIONS

XA-64 THRU XA-72 NOT IN THIS SUBMITTAL

XA-128 THRU XA-141 ..... -Y_S- (LT) CROSS SECTIONS

XA-128 THRU XA-132 NOT IN THIS SUBMITTAL

XA-142 THRU XA-154 ..... -Y_S- (RT) CROSS SECTIONS

XA-142 THRU XA-146 NOT IN THIS SUBMITTAL

XA-155 THRU XA-166 ..... -Y_RT- (LT) CROSS SECTIONS

XA-167 THRU XA-178 ..... -Y_RT- (RT) CROSS SECTIONS

XA-179 THRU XA-193 ..... -Y_N- (LT) CROSS SECTIONS

XA-194 THRU XA-208 ..... -Y_N- (RT) CROSS SECTIONS

XA-209 THRU XA-215 ..... -YRPA- CROSS SECTIONS

XA-216 THRU XA-246 ..... -YRPAC- CROSS SECTIONS

XA-247 THRU XA-261 ..... -YRPC- CROSS SECTIONS

XA-262 THRU XA-291 ..... -YRPCA- CROSS SECTIONS

XA-292 THRU XA-300 ..... -YRPD- CROSS SECTIONS

XA-301 THRU XA-307 ..... -YRPDB- CROSS SECTIONS

XA-308 THRU XA-312 ..... -YLPC- CROSS SECTIONS

GENERAL NOTES

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.05 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.02

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

BERM DITCHES:

BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 240.01 AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

UNDERDRAINS:

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER.

SHOULDER DRAINS:

SHOULDER DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 816.03 AND DETAILS IN PLANS AT LOCATIONS DIRECTED BY THE ENGINEER.

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.03 AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

STREET TURNOUT:

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

AT&T
CITY OF STATESVILLE POWER
CITY OF STATESVILLE WATER /SEWER
DUKE ENERGY DISTRIBUTION
DUKE ENERGY TRANSMISSION
ENERGY UNITED
IREDELL WATER CORP
PSNC GAS
SPECTRUM /TWC

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT.

CURB RAMPS

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS.
CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.05 and/or 848.06.

6/24/2019
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PDPW1CS01$

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	1-B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Computed Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

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

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easment Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line — RW
- New Right of Way Line with Pin and Cap — RW
- New Right of Way Line with Concrete or Granite R/W Marker — RW
- New Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- New Control of Access — CA
- Existing Easement Line — E
- New Temporary Construction Easement — E
- New Temporary Drainage Easement — TDE
- New Permanent Drainage Easement — PDE
- New Permanent Drainage / Utility Easement — DUE
- New Permanent Utility Easement — PUE
- New Temporary Utility Easement — TUE
- New Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- U/G Power Line LOS B (S.U.E.*) — P
- U/G Power Line LOS C (S.U.E.*) — P
- U/G Power Line LOS D (S.U.E.*) — P

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	1C-01
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

BLE

POINT	DESC.	NORTH	EAST	ELEVATION
GPS4	I3819-4	754490.9140	1448117.7020	847.50
478	BY-478	754355.6560	1448763.5530	839.38
477	BY-477	754956.9490	1449847.9290	815.70
476	BY-476	755200.8470	1450731.2280	828.37
BLE18	BLE-18	755401.4860	1451863.6110	863.19
BLE19	BLE-19	755568.3870	1452802.6400	892.40
BLE20	BLE-20	755729.1870	1453740.0370	907.60
BLE21	BLE-21	755872.7750	1454541.2890	905.21
BLE22	BLE-22	756023.6770	1455453.5900	898.94
BLE23	BLE-23	756219.6980	1456366.3730	892.64
BLE24	BLE-24	756513.6490	1457336.9070	885.92
BLE25	BLE-25	756786.9670	1458160.9990	877.17
BLE26	BLE-26	757158.9750	1459093.7350	870.75

BLW

POINT	DESC.	NORTH	EAST	ELEVATION
BLW13	BLW-13	754919.9730	1448270.1500	845.47
483	BY-483	755019.0190	1448921.7970	842.30
BLW11	BLW-11	755141.1730	1449643.6170	822.00
482	BY-482	755303.1620	1450544.9710	823.80
BLW9	BLW-9	755477.7250	1451591.7140	856.36
BLW8	BLW-8	755657.1330	1452559.3620	885.95
BLW7	BLW-7	755811.0040	1453522.3030	907.13
BLW6	BLW-6	755966.1790	1454411.0630	905.50
BLW5	BLW-5	756141.3120	1455378.1000	898.70
BLW4	BLW-4	756334.2400	1456318.8180	892.30
BLW3	BLW-3	756591.3240	1457139.8820	885.73
BLW2	BLW-2	756983.5200	1458131.7650	877.08
BLW1	BLW-1	757295.9950	1459047.1930	870.79

BLE1

POINT	DESC.	NORTH	EAST	ELEVATION
BLE28	BLE-28	752356.4510	1436191.2550	897.96
BLE1	BLE-1	752620.7520	1437075.8810	882.08
GPS1	I3819-1	752830.1780	1437614.1320	871.20
GPS12	BLE-2R	752890.2320	1438005.1030	876.51
EQ361	BY-361	753238.1920	1439545.2160	911.74

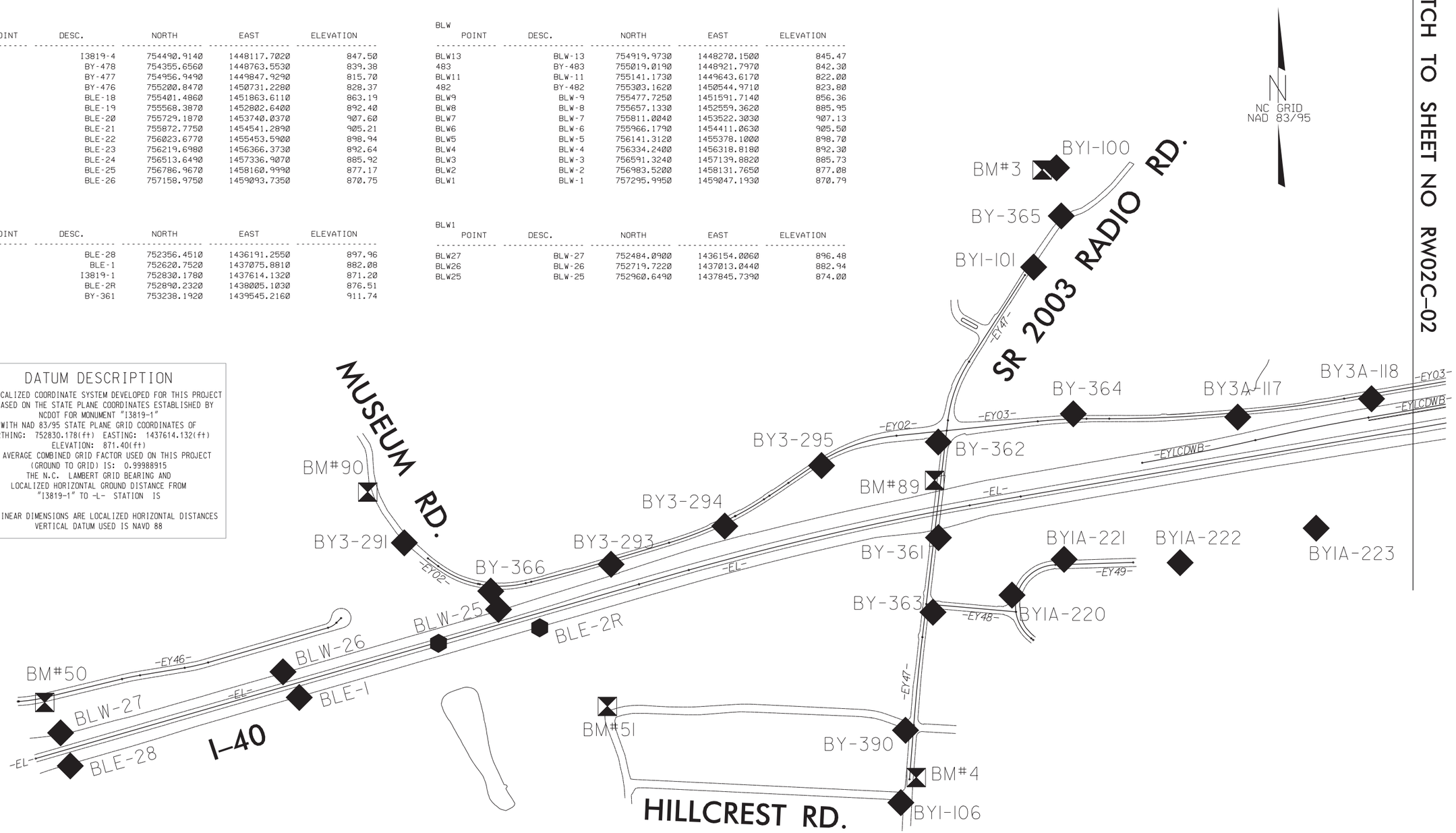
BLW1

POINT	DESC.	NORTH	EAST	ELEVATION
BLW27	BLW-27	752484.0900	1436154.0060	896.48
BLW26	BLW-26	752719.7220	1437013.0440	882.94
BLW25	BLW-25	752960.6490	1437845.7390	874.00

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "I3819-1"
WITH NAD 83/95 STATE PLANE GRID COORDINATES OF
NORTHING: 752830.178(ft) EASTING: 1437614.132(ft)
ELEVATION: 871.40(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99988915
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "I3819-1" TO -L- STATION IS

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88



BY1

POINT	DESC.	NORTH	EAST	ELEVATION
100	BY1-100	754666.3550	1440001.2510	852.80
365	BY-365	754480.4750	1440019.6480	841.06
101	BY1-101	754282.7420	1439912.9370	842.41
362	BY-362	753607.3400	1439544.4570	900.92
361	BY-361	753238.1920	1439545.2160	911.74
363	BY-363	752950.0210	1439523.8950	902.40
390	BY-390	752493.9660	1439417.8950	897.09
106	BY1-106	752214.6190	1439399.9340	892.52

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

REVISIONS

5/9/18

4/10/2019
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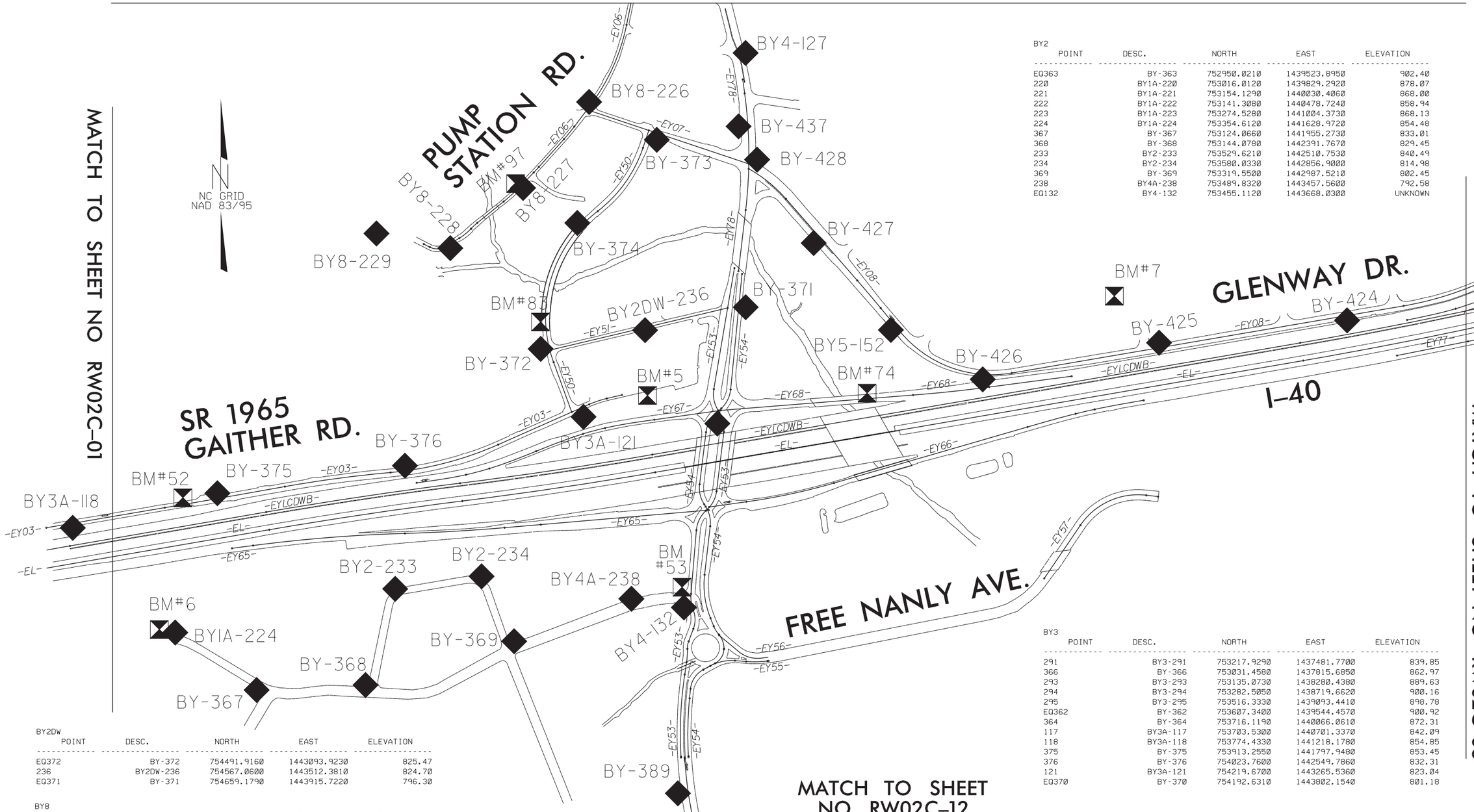
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	1C-02
Location and Surveys	

SURVEY CONTROL SHEET

MATCH TO SHEET NO RW02C-09

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



BY2 POINT	DESC.	NORTH	EAST	ELEVATION
EQ363	BY-363	752950.0210	1439523.8950	902.40
220	BY1A-220	753016.0120	1439829.2920	878.07
221	BY1A-221	753154.1290	1440030.4060	868.00
222	BY1A-222	753141.3080	1440478.7240	858.94
223	BY1A-223	753274.5280	1441004.3730	868.13
224	BY1A-224	753354.6120	1441628.9720	854.48
367	BY-367	753124.0660	1441955.2730	833.01
368	BY-368	753144.0780	1442391.7670	829.45
233	BY2-233	753529.6210	1442510.7530	840.49
234	BY2-234	753580.0330	1442856.9000	814.98
369	BY-369	753319.5500	1442987.5210	802.45
238	BY4A-238	753489.8320	1443457.5600	792.58
EQ132	BY4-132	753455.1120	1443668.0300	UNKNOWN

BY3 POINT	DESC.	NORTH	EAST	ELEVATION
291	BY3-291	753217.9290	1437481.7700	839.85
366	BY-366	753031.4580	1437815.6850	862.97
293	BY3-293	753135.0730	1438280.4380	889.63
294	BY3-294	753282.5050	1438719.6620	900.16
295	BY3-295	753516.3330	1439093.4410	898.78
EQ362	BY-362	753607.3400	1439544.4570	900.92
364	BY-364	753716.1190	1440066.0610	872.31
117	BY3A-117	753703.5300	1440701.3370	842.09
118	BY3A-118	753774.4330	1441218.1780	854.85
375	BY-375	753913.2550	1441797.9480	853.45
376	BY-376	754023.7600	1442549.7860	832.31
121	BY3A-121	754219.6700	1443265.5360	823.04
EQ370	BY-370	754192.6310	1443802.1540	801.18

BY2DW POINT	DESC.	NORTH	EAST	ELEVATION
EQ372	BY-372	754491.9160	1443093.9230	825.47
236	BY2DW-236	754567.0600	1443512.3810	824.70
EQ371	BY-371	754659.1790	1443915.7220	796.30

BY8 POINT	DESC.	NORTH	EAST	ELEVATION
EQ121	BY3A-121	754219.6700	1443265.5360	823.04
372	BY-372	754491.9160	1443093.9230	825.47
374	BY-374	754997.0410	1443240.7960	822.38
373	BY-373	755330.4260	1443559.3520	821.87

BY8A POINT	DESC.	NORTH	EAST	ELEVATION
229	BY8-229	754954.9390	1442435.6850	817.79
228	BY8-228	754895.9910	1442731.6520	796.44
227	BY8-227	755137.3850	1443023.3010	798.58
226	BY8-226	755482.2330	1443288.0620	808.28
225	BY8-225	756060.8030	1443480.5560	818.74

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

REVISIONS

5/9/18

4/10/2019
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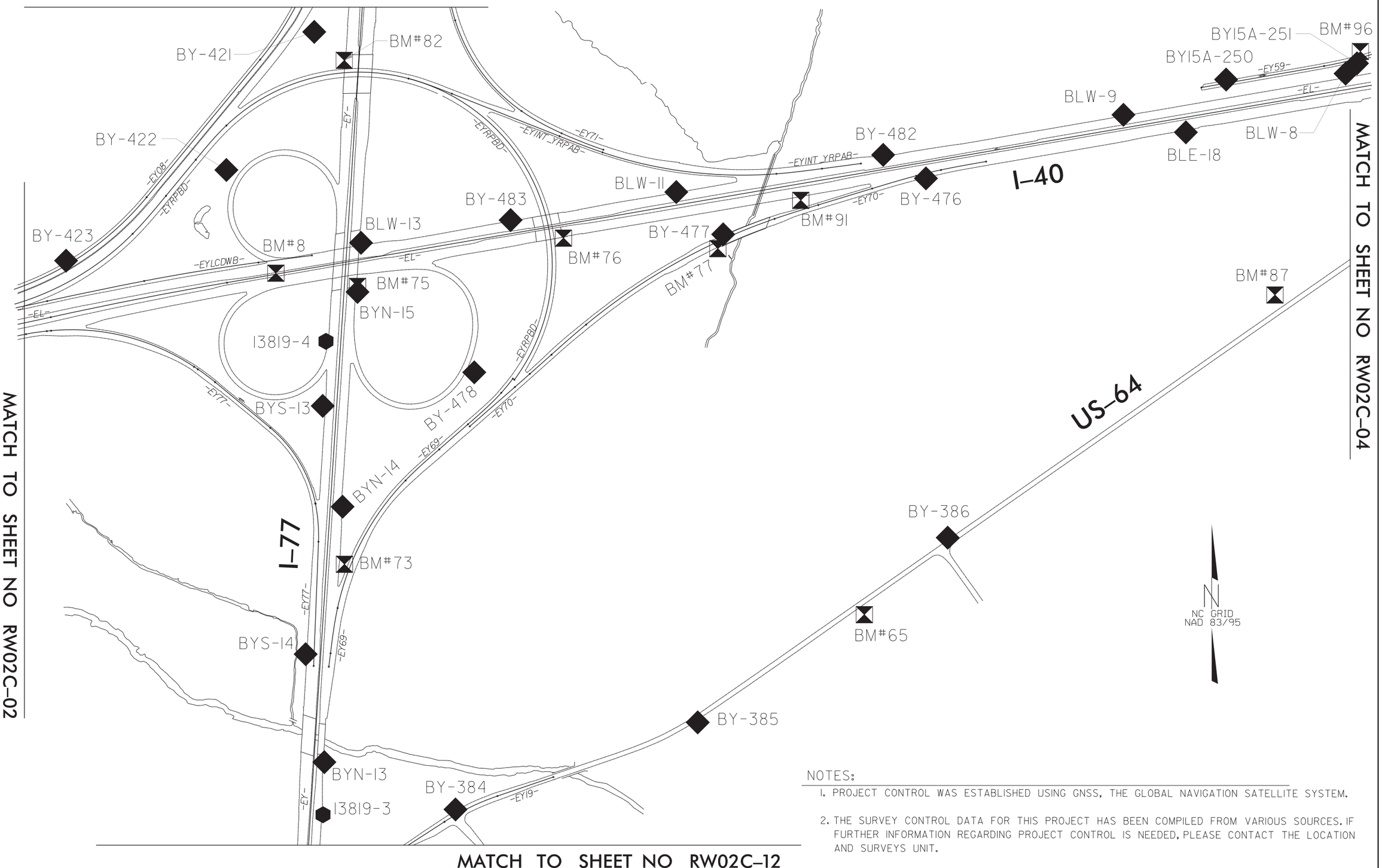
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	1C-03
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



NOTES:

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REVISIONS

5/9/18

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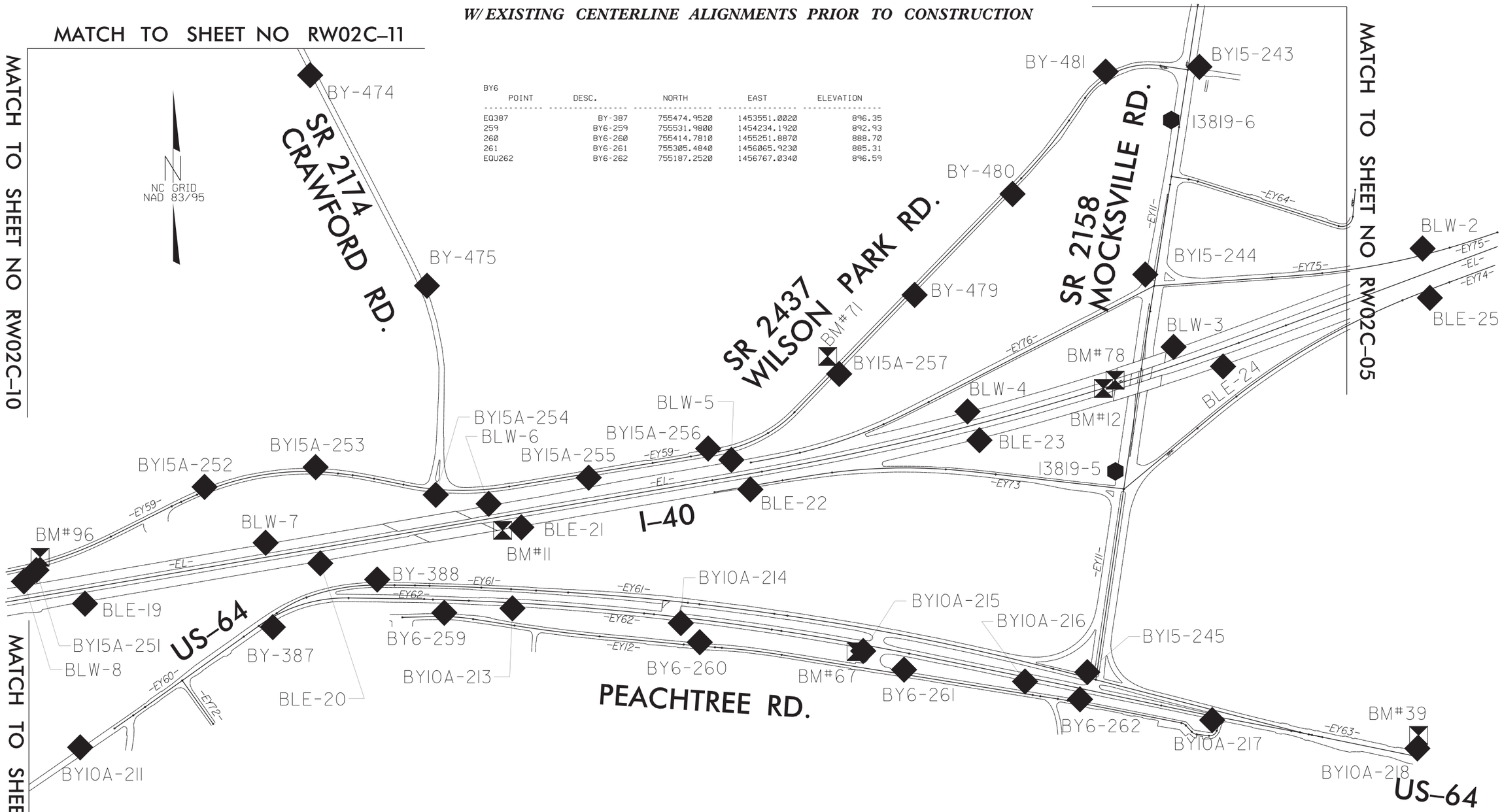
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	1C-04
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



BY6 POINT	DESC.	NORTH	EAST	ELEVATION
EQ387	BY-387	755474.9520	1453551.0020	896.35
259	BY6-259	755531.9800	1454234.1920	892.93
260	BY6-260	755414.7810	1455251.8870	888.70
261	BY6-261	755305.4840	1456065.9230	885.31
EQU262	BY6-262	755187.2520	1456767.0340	896.59

NOTES:

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REVISIONS

5/9/18

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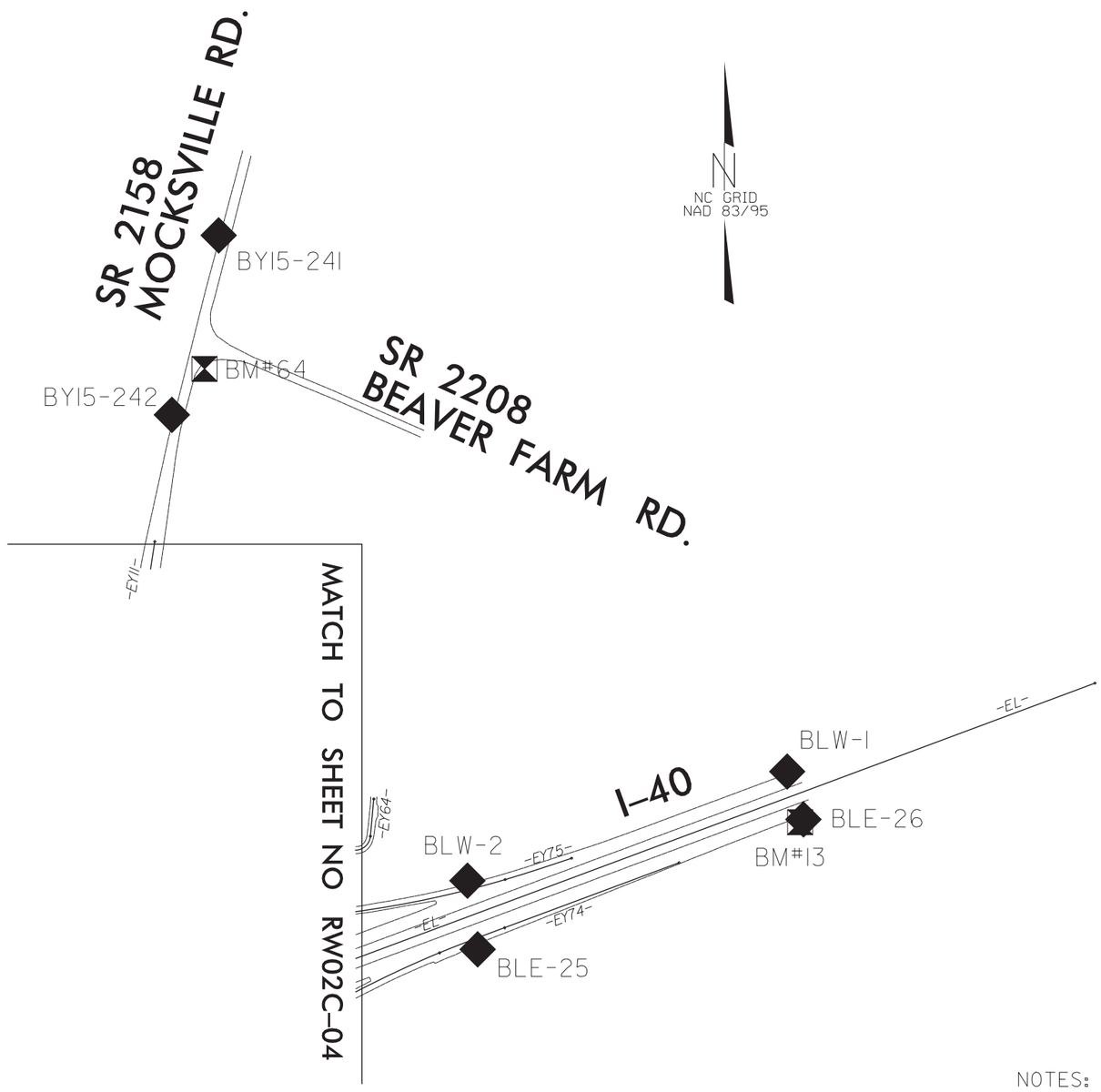
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	1C-05
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



BY15

POINT	DESC.	NORTH	EAST	ELEVATION
241	BY15-241	758830.8500	1457419.4740	829.10
242	BY15-242	758317.0830	1457285.4960	838.60
243	BY15-243	757707.3420	1457242.6960	849.96
GPS6	I3819-6	757495.4650	1457130.8400	851.50
244	BY15-244	756879.8710	1457027.2450	859.24
GPS5	I3819-5	756095.7030	1456908.2300	877.27
245	BY15-245	755295.5380	1456796.0560	898.30
EQ262	BY6-262	755187.2520	1456767.0340	896.59

BY15A

POINT	DESC.	NORTH	EAST	ELEVATION
250	BY15A-250	755631.4420	1452039.0170	867.14
251	BY15A-251	755702.0500	1452609.0560	879.36
252	BY15A-252	756033.5820	1453278.9590	891.32
253	BY15A-253	756112.4090	1453721.6360	898.58
254	BY15A-254	756001.9000	1454200.2310	904.35
255	BY15A-255	756070.4170	1454809.5960	906.21
256	BY15A-256	756186.6010	1455285.4160	904.17
257	BY15A-257	756483.7420	1455807.3800	893.89
479	BY-479	756798.4930	1456108.1070	880.65
480	BY-480	757200.7440	1456498.2560	870.35
481	BY-481	757688.2840	1456869.3490	850.41
EQ243	BY15-243	757707.3420	1457242.6960	849.96

NOTES:

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2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

REVISIONS

5/9/18

4/10/2019
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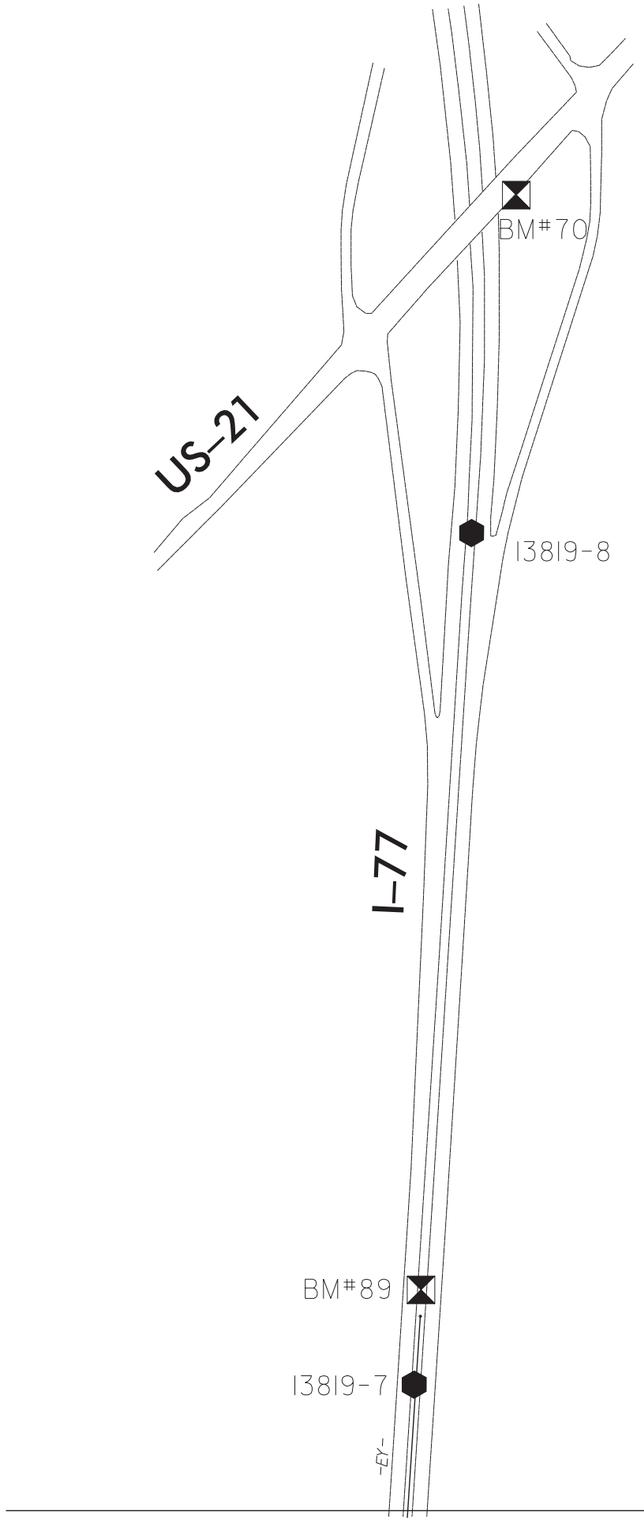
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	1C-06
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



BYN

POINT	DESC.	NORTH	EAST	ELEVATION
BYN27	BYN-27	765223.3180	1448924.9770	889.33
BYN26	BYN-26	764506.4100	1448874.6400	912.93
BYN25	BYN-25	763858.7610	1448834.2230	924.59
BYN24	BYN-24	763001.1210	1448795.5710	915.33
BYN23	BYN-23	762077.1520	1448722.0050	878.30
BYN22	BYN-22	761080.1930	1448657.6990	869.69
BYN21	BYN-21	759943.2280	1448583.3780	905.28
BYN20	BYN-20	759056.1830	1448528.8960	907.16
463	BY-463	758514.3810	1448496.2450	893.48
462	BY-462	757990.8800	1448482.6730	872.34
BYN18	BYN-18	757087.9210	1448412.7660	863.09
484	BY-484	756281.4700	1448526.7090	868.35
EQ483	BY-483	755019.0190	1448921.7970	842.30
BYN15	BYN-15	754705.8810	1448254.7630	860.74
BYN14	BYN-14	753770.0440	1448189.7960	809.69
BYN13	BYN-13	752656.9630	1448110.3880	796.08
GPS3	I3819-3	752427.7960	1448104.7980	804.48
BYN12	BYN-12	751774.9630	1448076.3650	UNKNOWN
BYN11	BYN-11	750947.3570	1447998.0050	UNKNOWN
BYN10	BYN-10	750045.4450	1447909.4880	796.38
BYN8	BYN-8	748100.4380	1447723.5330	802.51
BYN7	BYN-7	747220.4630	1447636.4670	821.57
BYN6	BYN-6	746261.7800	1447545.6020	853.19
BYN5	BYN-5	745452.7090	1447464.4410	866.90
BYN4	BYN-4	744409.3380	1447370.8920	877.51
BYN3	BYN-3	743456.9570	1447310.2650	914.45
BYN2	BYN-2	742557.4350	1447343.3930	949.85
BYN1	BYN-1	741949.7990	1447370.8740	955.21

BYS

POINT	DESC.	NORTH	EAST	ELEVATION
GPS8	I3819-8	768269.2750	1449069.0880	820.43
GPS7	I3819-7	766050.9590	1448919.5800	863.07
BYS1	BYS-1	765120.8670	1448813.1760	893.50
438	BY-438	764163.0650	1448749.5400	920.53
BYS3	BYS-3	763612.2500	1448703.1390	924.21
BYS4	BYS-4	762734.6050	1448659.3060	904.55
BYS5	BYS-5	761778.0190	1448596.3710	867.35
BYS6	BYS-6	760676.3290	1448525.6370	882.82
BYS7	BYS-7	759768.2780	1448470.0670	908.37
BYS8	BYS-8	758919.8350	1448414.7880	904.75
BYS9	BYS-9	757985.2300	1448355.3680	873.99
461	BY-461	756350.4970	1448243.1880	869.76
GPS4	I3819-4	754490.9140	1448117.7020	847.50
BYS13	BYS-13	754209.3530	1448103.2580	830.27
BYS14	BYS-14	753127.3110	1448029.0290	786.63
BYS15	BYS-15	752107.4250	1447976.8030	817.69
BYS16	BYS-16	751249.0060	1447915.6800	830.05
BYS17	BYS-17	750585.7550	1447853.4540	814.99
BYS18	BYS-18	749545.7430	1447749.9790	795.40
BYS19	BYS-19	748528.5500	1447656.6320	800.09
BYS20	BYS-20	747514.6620	1447558.8020	813.50
BYS21	BYS-21	746571.5040	1447468.1600	843.35
342	BY-342	746018.6270	1447412.4360	858.68
BYS22	BYS-22	745701.1270	1447381.6970	864.58
BYS24	BYS-24	743643.9660	1447193.7910	909.67
BYS25	BYS-25	742559.6750	1447220.1600	950.91
BYS26	BYS-26	741981.9910	1447253.6330	955.86

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

MATCH TO SHEET NO RW02C-07

REVISIONS

5/9/18

4/10/2019
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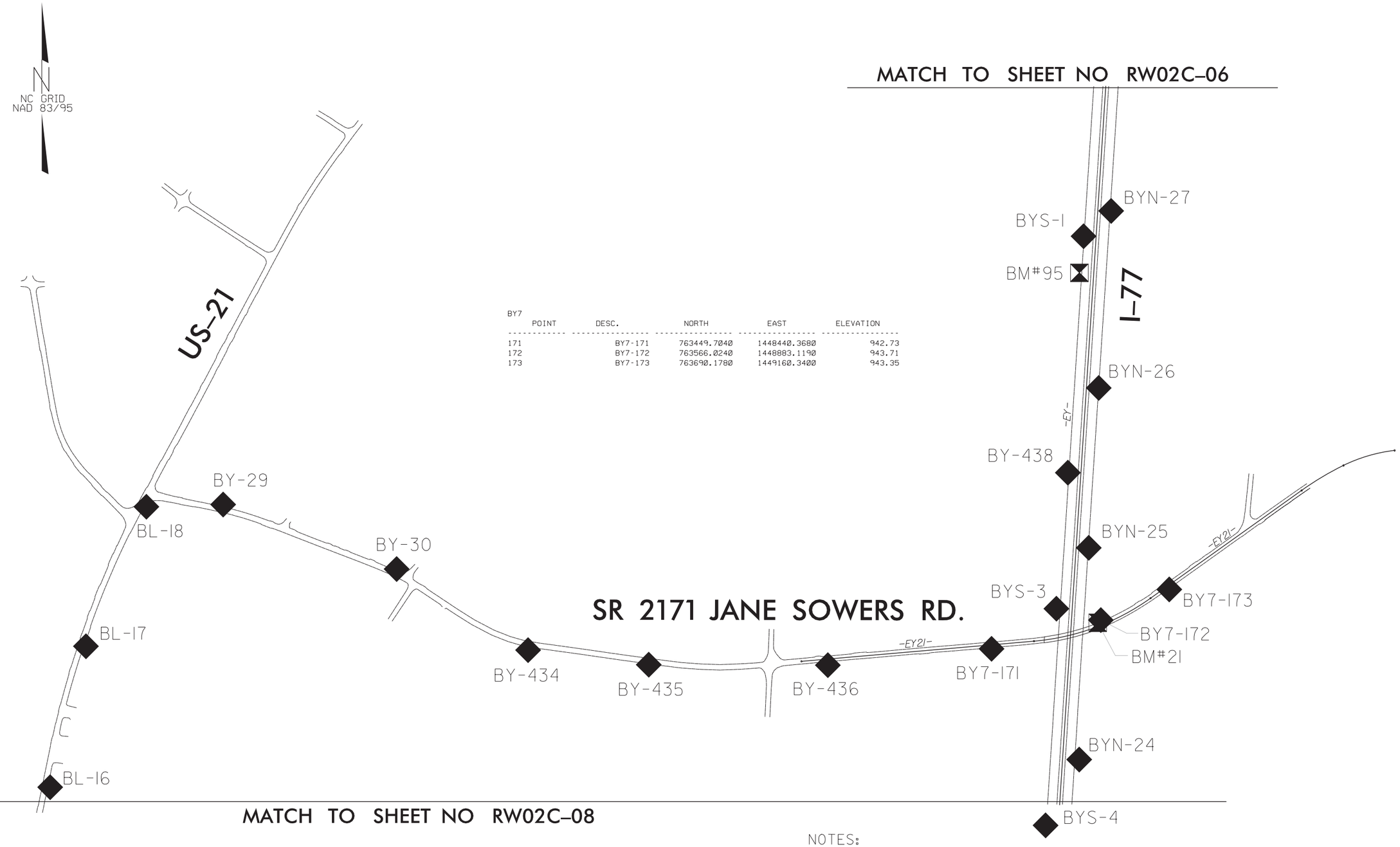
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	1C-07
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



BY7

POINT	DESC.	NORTH	EAST	ELEVATION
171	BY7-171	763449.7040	1448440.3680	942.73
172	BY7-172	763566.0240	1448883.1190	943.71
173	BY7-173	763690.1780	1449160.3400	943.35

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

REVISIONS

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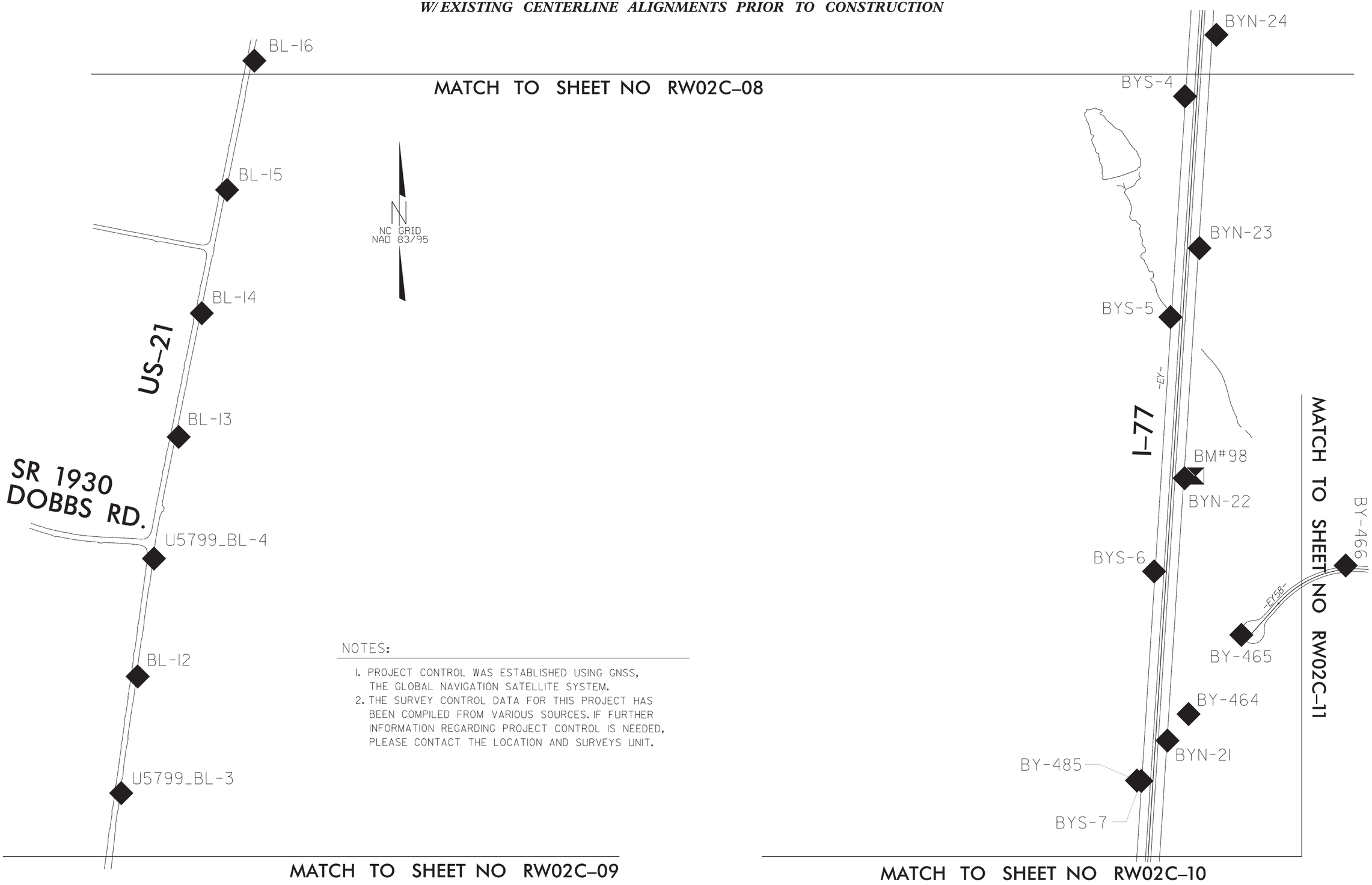
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	1C-08
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	1C-09
Location and Surveys	

SURVEY CONTROL SHEET

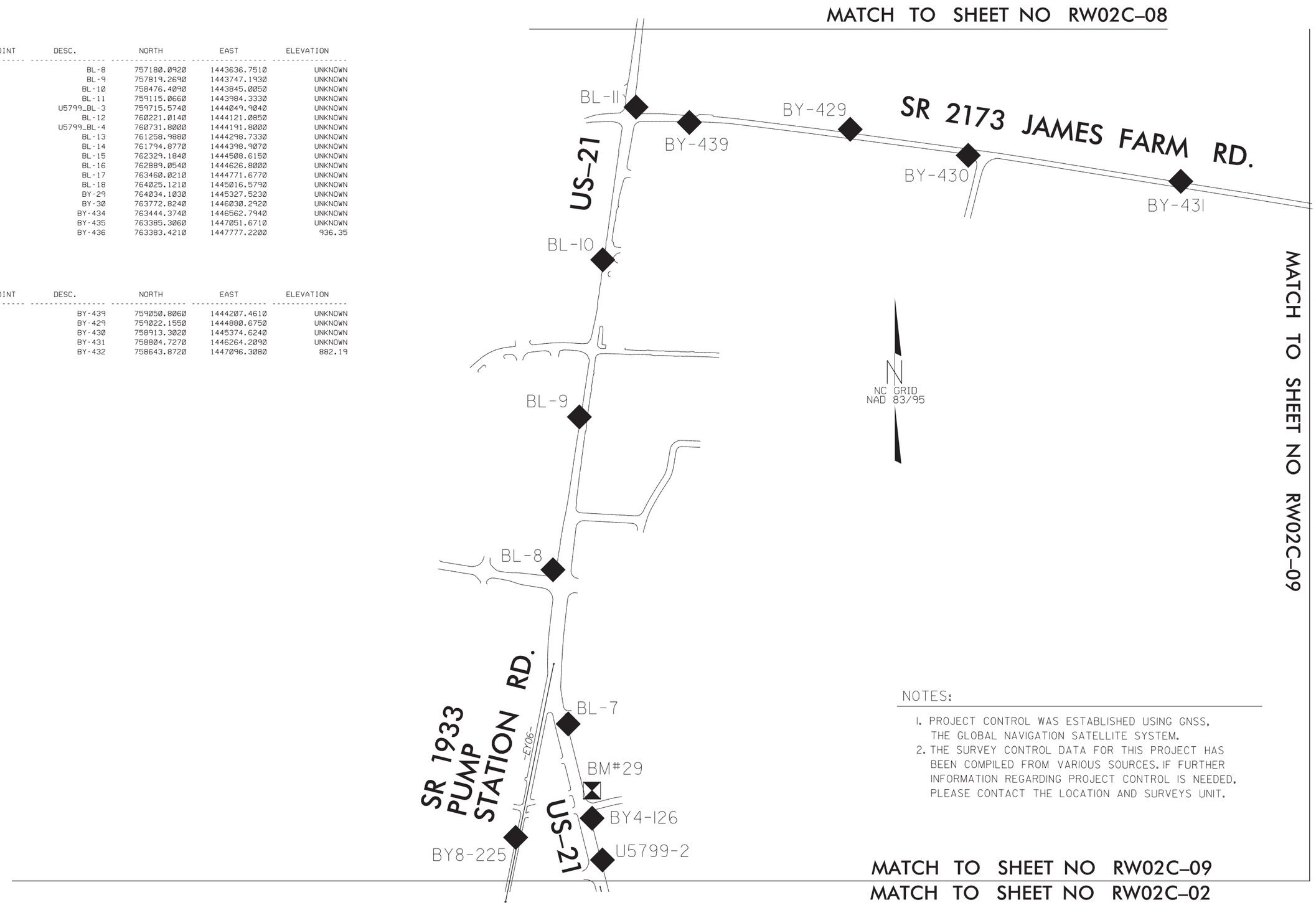
W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

BT1

POINT	DESC.	NORTH	EAST	ELEVATION
U508	BL-8	757180.0920	1443636.7510	UNKNOWN
U509	BL-9	757819.2690	1443747.1930	UNKNOWN
U510	BL-10	758476.4090	1443845.0050	UNKNOWN
U511	BL-11	759115.0660	1443984.3330	UNKNOWN
U503	U5799_BL-3	759715.5740	1444049.9040	UNKNOWN
U512	BL-12	760221.0140	1444121.0850	UNKNOWN
U504	U5799_BL-4	760731.8000	1444191.8000	UNKNOWN
U513	BL-13	761258.9880	1444298.7330	UNKNOWN
U514	BL-14	761794.8770	1444398.9070	UNKNOWN
U515	BL-15	762329.1840	1444508.6150	UNKNOWN
U516	BL-16	762889.0540	1444626.8000	UNKNOWN
U517	BL-17	763460.0210	1444771.6770	UNKNOWN
U518	BL-18	764025.1210	1445016.5790	UNKNOWN
U529	BY-29	764034.1030	1445327.5230	UNKNOWN
U530	BY-30	763772.8240	1446030.2920	UNKNOWN
434	BY-434	763444.3740	1446562.7940	UNKNOWN
435	BY-435	763385.3060	1447051.6710	UNKNOWN
436	BY-436	763383.4210	1447777.2200	936.35

BT2

POINT	DESC.	NORTH	EAST	ELEVATION
439	BY-439	759050.8060	1444207.4610	UNKNOWN
429	BY-429	759022.1550	1444880.6750	UNKNOWN
430	BY-430	758913.3020	1445374.6240	UNKNOWN
431	BY-431	758804.7270	1446264.2090	UNKNOWN
432	BY-432	758643.8720	1447096.3080	882.19



NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

REVISIONS

5/9/18

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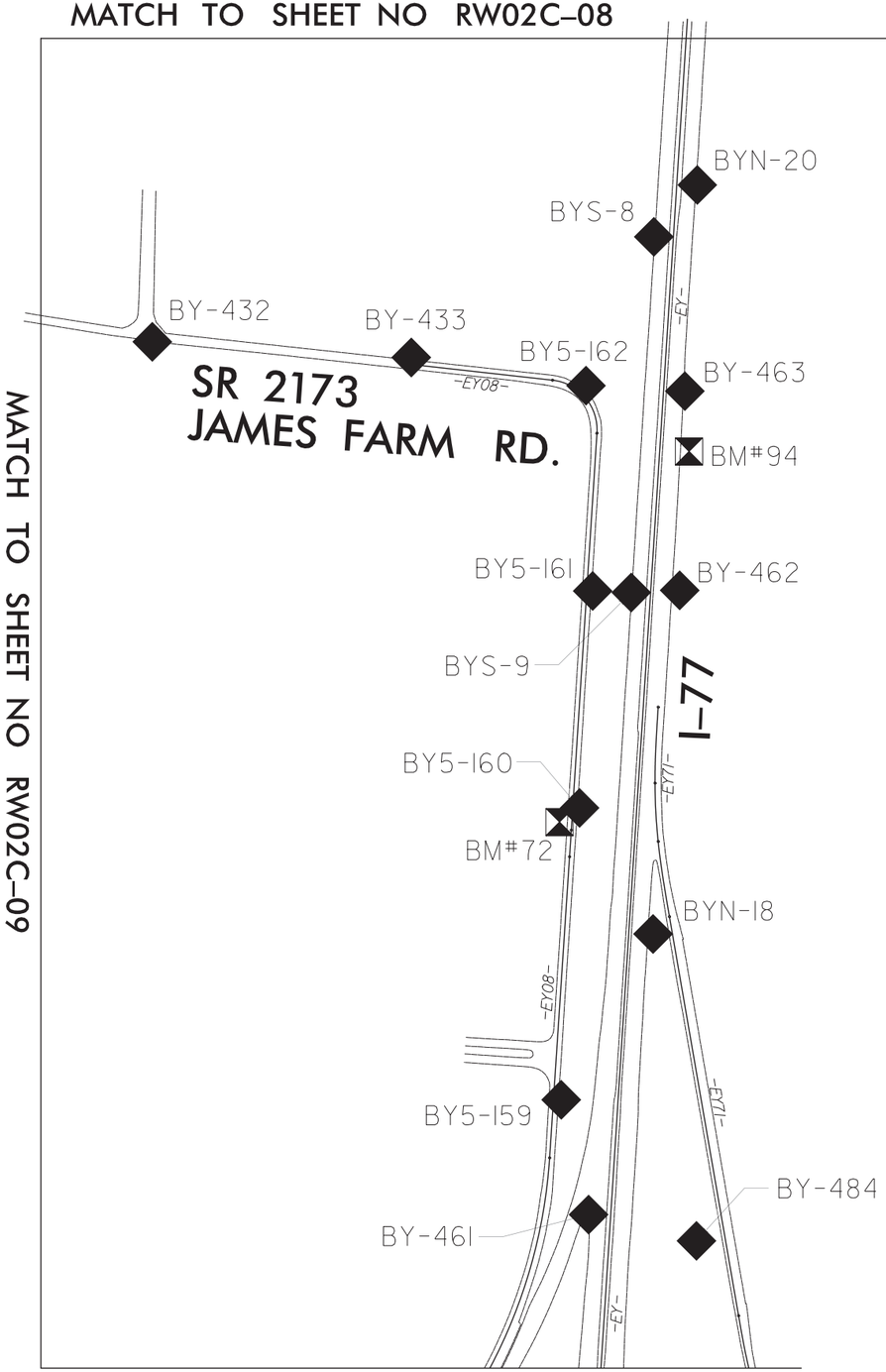
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	1C-10
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

MATCH TO SHEET NO RW02C-08

MATCH TO SHEET NO RW02C-11



MATCH TO SHEET NO RW02C-09

MATCH TO SHEET NO RW02C-03

MATCH TO SHEET NO RW02C-04

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NAD 83/95

BY5

POINT	DESC.	NORTH	EAST	ELEVATION
EQ226	BY8-226	755482.2330	1443288.0620	808.28
EQ373	BY-373	755330.4260	1443559.3520	821.87
EQ437	BY-437	755384.3740	1443887.1860	810.28
428	BY-428	755251.0400	1443961.3530	802.28
427	BY-427	754916.4230	1444188.2060	794.53
152	BY5-152	754567.9490	1444497.7130	804.25
426	BY-426	754369.9360	1444865.9440	789.73
425	BY-425	754516.7280	1445572.8230	793.55
424	BY-424	754606.4360	1446326.4520	793.45
423	BY-423	754842.1870	1446985.2230	811.39
422	BY-422	755237.3930	1447683.6370	UNKNOWN
421	BY-421	755839.1480	1448066.4020	856.58
159	BY5-159	756652.1660	1448171.2830	879.32
160	BY5-160	757419.1770	1448219.4080	880.53
161	BY5-161	757989.1710	1448253.9720	880.86
162	BY5-162	758528.7780	1448236.4140	893.35
433	BY-433	758602.8760	1447777.1500	897.46

NOTES:

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REVISIONS

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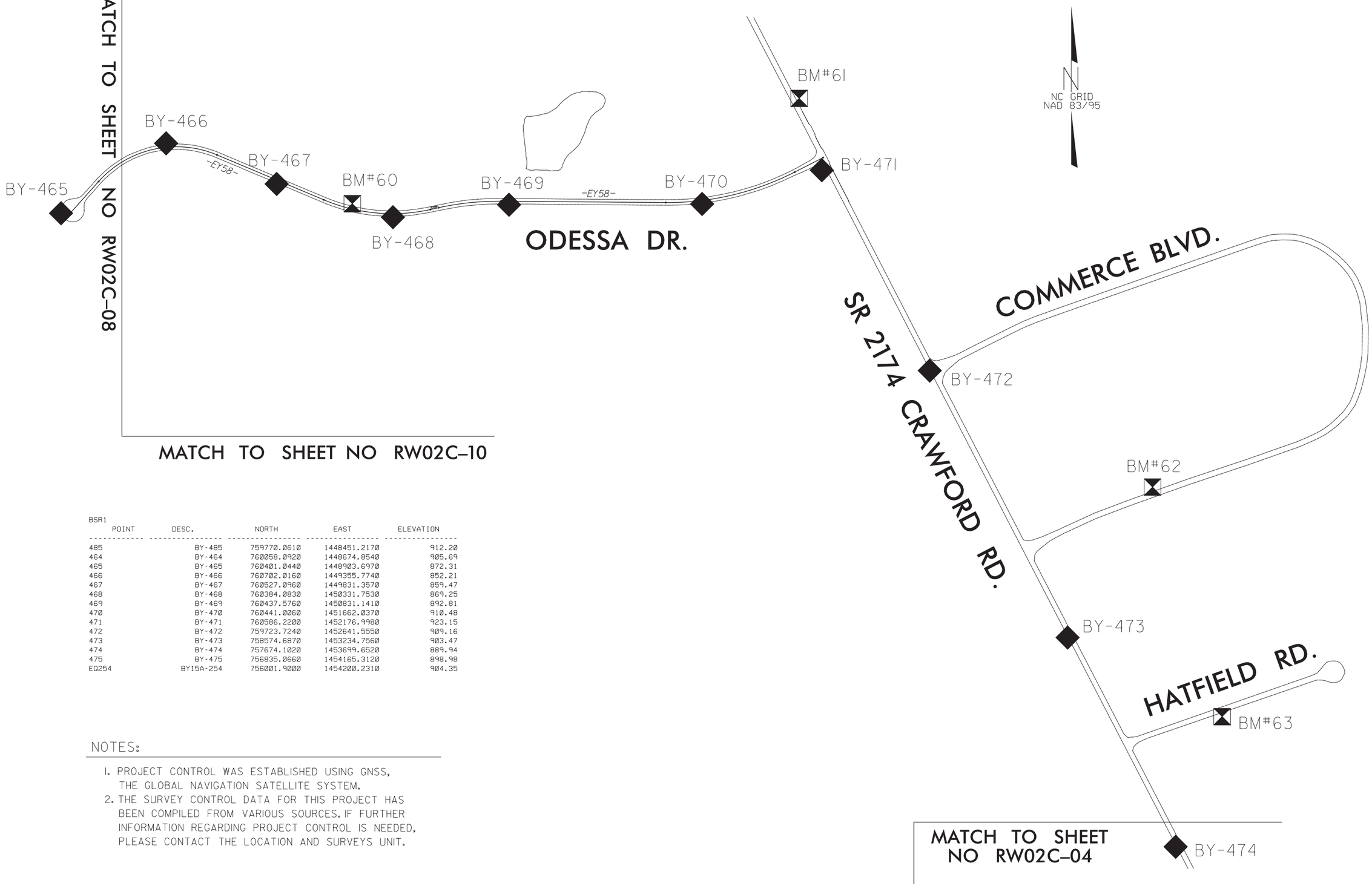
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	1C-11
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



BSR1

POINT	DESC.	NORTH	EAST	ELEVATION
485	BY-485	759770.0610	1448451.2170	912.20
464	BY-464	760058.0920	1448674.8540	905.69
465	BY-465	760401.0440	1448903.6970	872.31
466	BY-466	760702.0160	1449355.7740	852.21
467	BY-467	760527.0960	1449831.3570	859.47
468	BY-468	760384.0830	1450331.7530	869.25
469	BY-469	760437.5760	1450831.1410	892.81
470	BY-470	760441.0060	1451662.0370	910.48
471	BY-471	760586.2200	1452176.9980	923.15
472	BY-472	759723.7240	1452641.5550	909.16
473	BY-473	758574.6870	1453234.7560	903.47
474	BY-474	757674.1020	1453699.6520	889.94
475	BY-475	756835.0660	1454165.3120	898.98
EQ254	BY15A-254	756001.9000	1454200.2310	904.35

NOTES:

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REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	1C-12
Location and Surveys	

SURVEY CONTROL SHEET

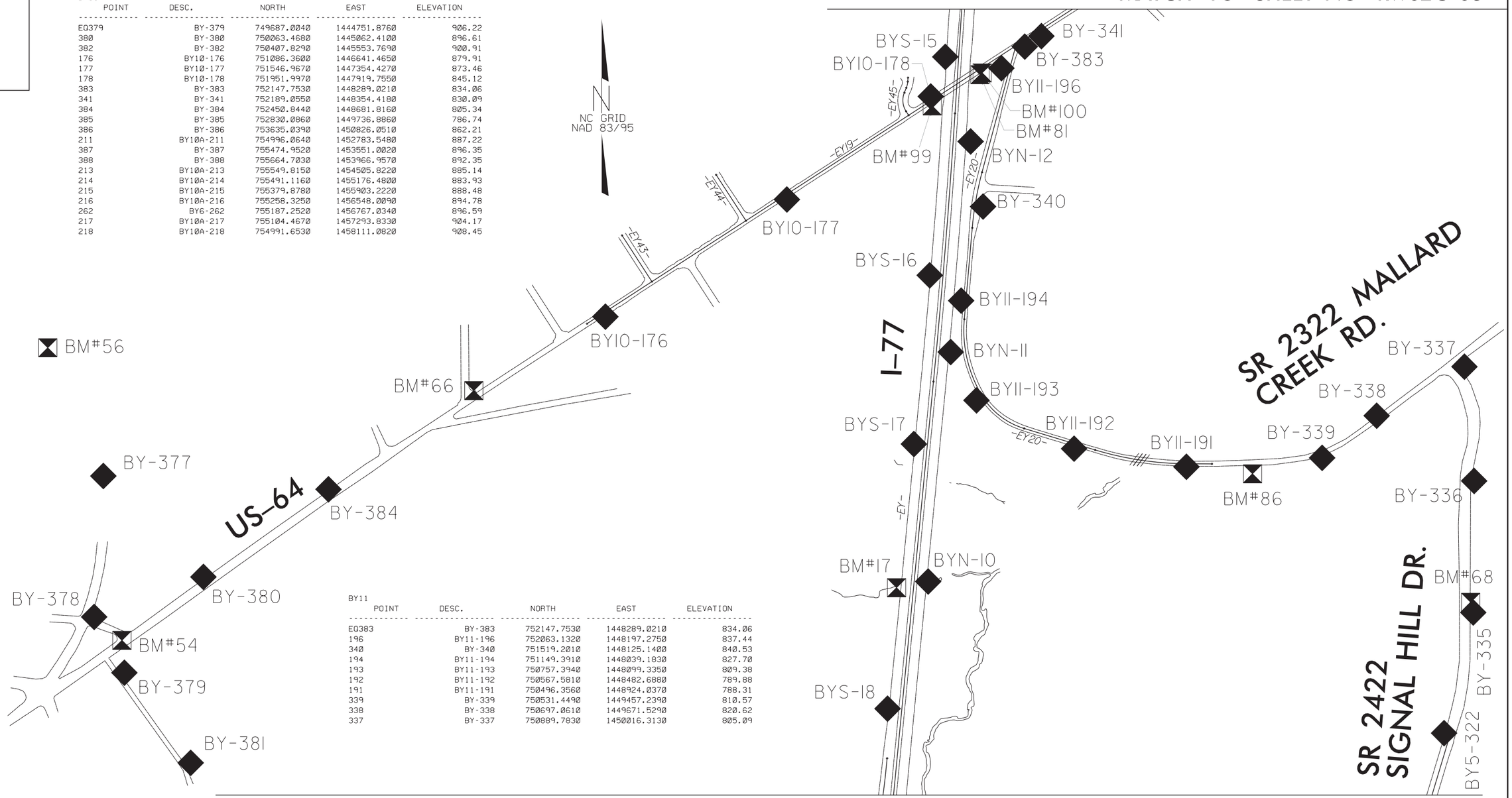
W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

MATCH TO SHEET NO RW02C-02

MATCH TO SHEET NO RW02C-03

BY10

POINT	DESC.	NORTH	EAST	ELEVATION
EQ379	BY-379	749687.0040	1444751.8760	906.22
380	BY-380	750063.4680	1445062.4100	896.61
382	BY-382	750407.8290	1445553.7690	900.91
176	BY10-176	751086.3600	1446641.4650	879.91
177	BY10-177	751546.9670	1447354.4270	873.46
178	BY10-178	751951.9970	1447919.7550	845.12
383	BY-383	752147.7530	1448289.0210	834.06
341	BY-341	752189.0550	1448354.4180	830.09
384	BY-384	752450.8440	1448681.8160	805.34
385	BY-385	752830.0860	1449736.8860	786.74
386	BY-386	753635.0390	1450826.0510	862.21
211	BY10A-211	754996.0640	1452783.5480	887.22
387	BY-387	755474.9520	1453551.0020	896.35
388	BY-388	755664.7030	1453966.9570	892.35
213	BY10A-213	755549.8150	1454505.8220	885.14
214	BY10A-214	755491.1160	1455176.4800	883.93
215	BY10A-215	755379.8780	1455903.2220	888.48
216	BY10A-216	755258.3250	1456548.0090	894.78
262	BY6-262	755187.2520	1456767.0340	896.59
217	BY10A-217	755104.4670	1457293.8330	904.17
218	BY10A-218	754991.6530	1458111.0820	908.45



BY11

POINT	DESC.	NORTH	EAST	ELEVATION
EQ383	BY-383	752147.7530	1448289.0210	834.06
196	BY11-196	752063.1320	1448197.2750	837.44
340	BY-340	751519.2010	1448125.1400	840.53
194	BY11-194	751149.3910	1448039.1830	827.70
193	BY11-193	750757.3940	1448099.3350	809.38
192	BY11-192	750567.5810	1448482.6880	789.88
191	BY11-191	750496.3560	1448924.0370	788.31
339	BY-339	750531.4490	1449457.2390	810.57
338	BY-338	750697.0610	1449671.5290	820.62
337	BY-337	750889.7830	1450016.3130	805.09

MATCH TO SHEET NO RW02C-13

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

REVISIONS

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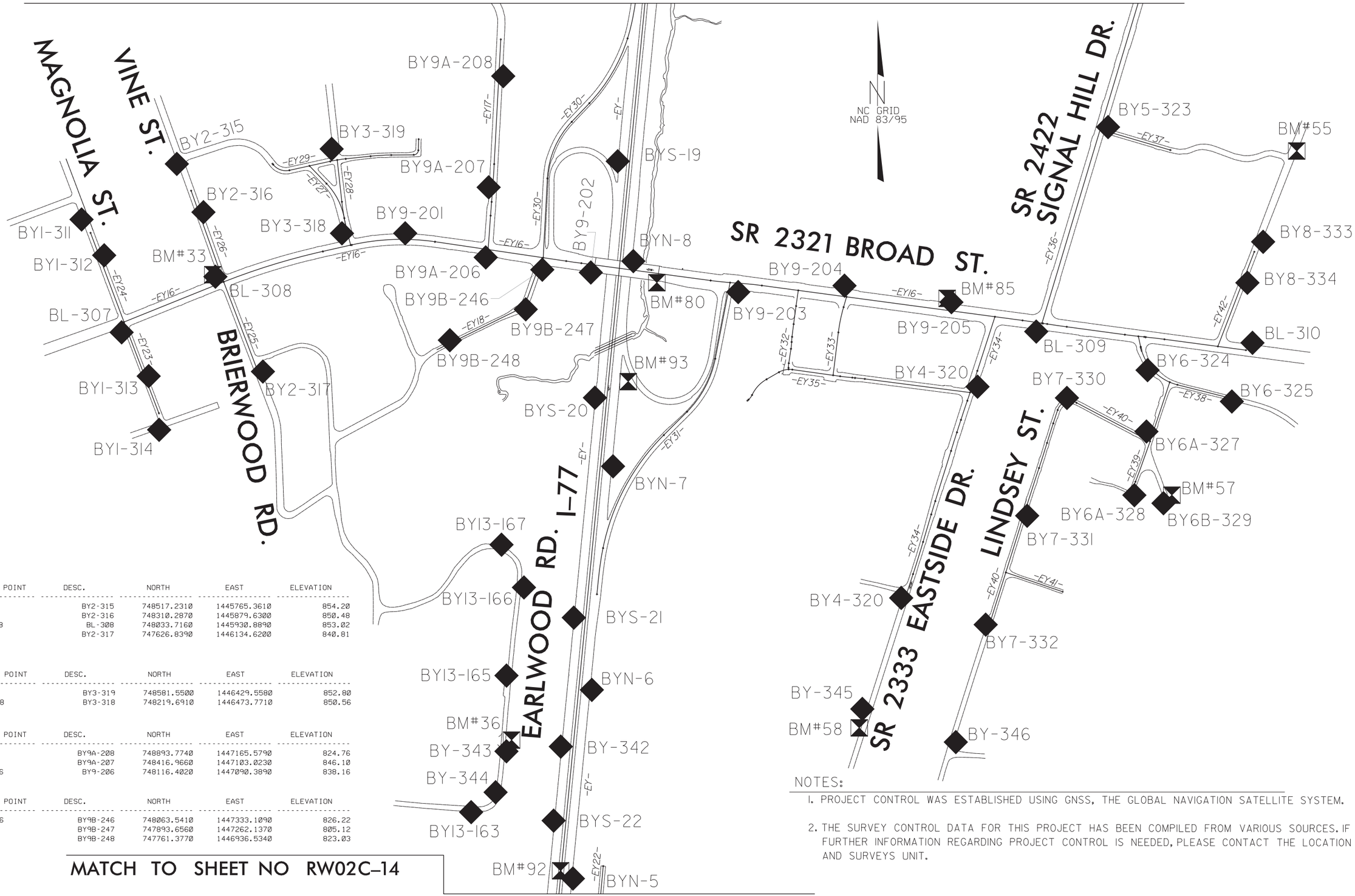
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	1C-13
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

MATCH TO SHEET NO RW02C-12



BY20

POINT	DESC.	NORTH	EAST	ELEVATION
315	BY2-315	748517.2310	1445765.3610	854.20
316	BY2-316	748310.2870	1445879.6300	850.48
EQ308	BL-308	748033.7160	1445930.8890	853.02
317	BY2-317	747626.8390	1446134.6200	840.81

BY21

POINT	DESC.	NORTH	EAST	ELEVATION
319	BY3-319	748581.5500	1446429.5580	852.80
EQ318	BY3-318	748219.6910	1446473.7710	850.56

BY22

POINT	DESC.	NORTH	EAST	ELEVATION
208	BY9A-208	748893.7740	1447165.5790	824.76
207	BY9A-207	748416.9660	1447103.0230	846.10
EQ206	BY9-206	748116.4020	1447090.3890	838.16

BY23

POINT	DESC.	NORTH	EAST	ELEVATION
EQ246	BY9B-246	748063.5410	1447333.1090	826.22
247	BY9B-247	747893.6560	1447262.1370	805.12
248	BY9B-248	747761.3770	1446936.5340	823.03

MATCH TO SHEET NO RW02C-14

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
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REVISIONS

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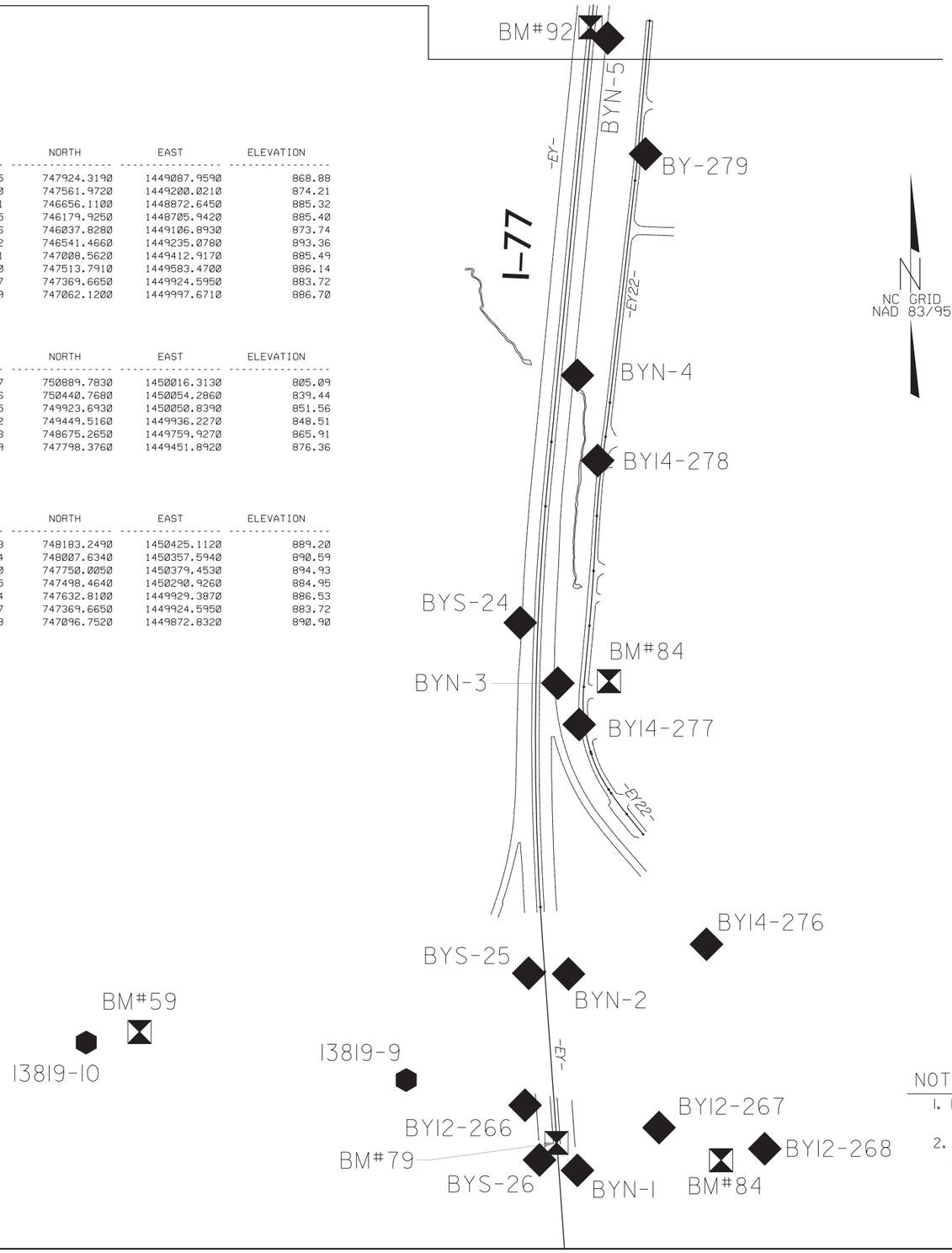
SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

MATCH TO SHEET NO RW02C-13



BY24

POINT	DESC.	NORTH	EAST	ELEVATION
EQ205	BY9-205	747924.3190	1449087.9590	868.88
320	BY4-320	747561.9720	1449200.0210	874.21
321	BY4-321	746656.1100	1448872.6450	885.32
345	BY-345	746179.9250	1448705.9420	885.40
346	BY-346	746037.8280	1449106.8930	873.74
332	BY7-332	746541.4660	1449235.0780	893.36
331	BY7-331	747008.5620	1449412.9170	885.49
330	BY7-330	747513.7910	1449583.4700	886.14
327	BY6A-327	747369.6650	1449924.5950	883.72
329	BY6B-329	747062.1200	1449997.6710	886.70

BY25

POINT	DESC.	NORTH	EAST	ELEVATION
EQ337	BY-337	750889.7830	1450016.3130	805.09
336	BY-336	750440.7680	1450054.2860	839.44
335	BY-335	749923.6930	1450050.8390	851.56
322	BY5-322	749449.5160	1449936.2270	848.51
323	BY5-323	748675.2650	1449759.9270	865.91
EQ309	BL-309	747798.3760	1449451.8920	876.36

BY26

POINT	DESC.	NORTH	EAST	ELEVATION
333	BY8-333	748183.2490	1450425.1120	889.20
334	BY8-334	748007.6340	1450357.5940	890.59
EQ310	BL-310	747750.0050	1450379.4530	894.93
325	BY6-325	747498.4640	1450290.9260	884.95
324	BY6-324	747632.8100	1449929.3870	886.53
EQ327	BY6A-327	747369.6650	1449924.5950	883.72
328	BY6A-328	747096.7520	1449872.8320	890.90

BY4

POINT	DESC.	NORTH	EAST	ELEVATION
U507	BL-7	756535.1980	1443700.4460	835.15
126	BY4-126	756140.7380	1443800.4920	837.52
U502	U5799-2	755966.4190	1443843.7640	836.88
127	BY4-127	755678.7580	1443915.2330	824.81
437	BY-437	755384.3740	1443887.1860	810.28
371	BY-371	754659.1790	1443915.7220	796.30
370	BY-370	754192.6310	1443802.1540	801.18
370	BY-370	754192.6310	1443802.1540	801.18
132	BY4-132	753455.1120	1443668.0300	UNKNOWN
389	BY-389	752709.7900	1443643.8540	809.74
135	BY4-135	752243.4640	1443799.6780	829.31
377	BY-377	750460.1780	1444669.1200	886.05
378	BY-378	749906.2990	1444633.1110	902.81
379	BY-379	749687.0040	1444751.8760	906.22
381	BY-381	749332.7680	1445012.4030	896.60
311	BY1-311	748278.9630	1445356.7620	875.56
312	BY1-312	748125.3210	1445453.8310	875.08
EQ307	BL-307	747794.9180	1445528.5940	879.37
313	BY1-313	747607.1600	1445644.6570	878.49
314	BY1-314	747376.9710	1445689.4470	861.97

BY9

POINT	DESC.	NORTH	EAST	ELEVATION
307	BL-307	747794.9180	1445528.5940	879.37
308	BL-308	748033.7160	1445930.8890	853.02
318	BY3-318	748219.6910	1446473.7710	850.56
201	BY9-201	748219.7820	1446745.0630	855.97
206	BY9-206	748116.4020	1447090.3890	838.16
246	BY9B-246	748063.5410	1447333.1090	826.22
202	BY9-202	748051.6090	1447541.2390	824.37
203	BY9-203	747967.6940	1448173.3490	824.29
204	BY9-204	747995.1500	1448629.4440	847.74
205	BY9-205	747924.3190	1449087.9590	868.88
309	BL-309	747798.3760	1449451.8920	876.36
310	BL-310	747750.0050	1450379.4530	894.93

BY12

POINT	DESC.	NORTH	EAST	ELEVATION
GPS10	I3819-10	742345.4840	1445850.8120	938.80
GPS9	I3819-9	742229.5210	1446841.2200	934.16
266	BY12-266	742151.2440	1447208.8420	937.64
267	BY12-267	742082.0130	1447623.5860	936.61
268	BY12-268	742016.6120	1447950.5920	932.46

BY13

POINT	DESC.	NORTH	EAST	ELEVATION
167	BY13-167	746884.3480	1447158.1130	822.25
166	BY13-166	746701.0570	1447254.4230	843.40
165	BY13-165	746323.1820	1447179.5020	869.47
343	BY-343	745998.4170	1447179.3300	839.34
344	BY-344	745822.7290	1447132.7480	844.36
163	BY13-163	745737.3660	1447027.9050	831.28

BY14

POINT	DESC.	NORTH	EAST	ELEVATION
279	BY-279	745094.4800	1447581.7600	878.57
278	BY14-278	744145.6700	1447433.3690	891.29
277	BY14-277	743329.0200	1447376.3870	919.90
276	BY14-276	742649.1300	1447770.4050	938.31
EQ267	BY12-267	742082.0130	1447623.5860	936.61

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

REVISIONS

5/9/18

4/10/2019
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davisch

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2A-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT SCHEDULE

A1	14″ PORTLAND CEMENT CONCRETE PAVEMENT (JOINTED WITH DOWELS)	R1	1′-6″ CONCRETE CURB AND GUTTER.
A2	11½″ PORTLAND CEMENT CONCRETE PAVEMENT (JOINTED WITH DOWELS)	R2	2′-6″ CONCRETE CURB AND GUTTER.
A3	13″ PORTLAND CEMENT CONCRETE PAVEMENT (JOINTED WITH DOWELS)	R3	5″ MONOLITHIC CONCRETE ISLAND (KEYED IN).
A4	14″ PORTLAND CEMENT CONCRETE PAVEMENT (JOINTED WITHOUT DOWELS)	R4	PROPOSED SHOULDER BERM GUTTER.
B	PROP. APPROX. ¾″ OPEN-GRADED ASPHALT FRICTION COURSE, TYPE FC-1 MODIFIED, AT AN AVERAGE RATE OF 90 LBS. PER SQ. YD. EXTENDED 1-FT. BEYOND EDGE OF TRAVEL LANE	R5	CONCRETE EXPRESSWAY GUTTER.
C1	PROP. APPROX. 1¼″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 138 LBS. PER SQ. YD.	R6	SINGLE FACED CONCRETE BARRIER.
C2	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 336 LBS. PER SQ. YD.	R7	CONCRETE MEDIAN BARRIER (T, T1, T2)
C3	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 330 LBS. PER SQ. YD.	R8	CONCRETE MEDIAN BARRIER (TYPE III/IV)
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS AT A MINIMUM LIFT OF 1″ NOT TO EXCEED 2″ IN DEPTH.	S	4″ CONCRETE SIDEWALK.
C5	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 AT A MINIMUM LIFT OF 1.5″ NOT TO EXCEED 2″ IN DEPTH.	T	EARTH MATERIAL.
C6	PROP. 1.5″ DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
D1	PROP. APPROX. 3″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	V	MILLING BITUMINUOS PAVEMENT (DEPTH VARIES)
D2	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAILS)
D3	PROP. APPROX. 2½″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	Y	MILLED RUMBLE STRIPS
D4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS AT A MINIMUM LIFT OF 2½″ NOT TO EXCEED 4″ IN DEPTH.		
E1	PROP. APPROX. 3″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.		
E2	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.		
E3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS AT A MINIMUM LIFT OF 3″ NOT TO EXCEED 5 1/2″ IN DEPTH.		
E4	PROP. APPROX. 12.5″ 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 AT A MININUM LIFT OF 3″ NOT TO EXCEED 5 1/2″ IN DEPTH.		
E5	PROP. APPROX. 13.5″ 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 AT A MININUM LIFT OF 3″ NOT TO EXCEED 5 1/2″ IN DEPTH.		
G1	PROP. 8″ CEMENT TREATED BASE COURSE.		
J1	PROP. 6″ AGGREGATE BASE COURSE.		
J2	PROP. 8″ AGGREGATE BASE COURSE.		
J3	PROP. VAR. DEPTH AGGREGATE BASE COURSE.		
J4	PROP. 6″ #57 STONE		
K1	12″ TYPE 1 AGGREGATE SUBGRADE.		
N1	NON-WOVEN GEOTEXTILE DRAINAGE LAYER		
P1	PRIME COAT. AT AVERAGE RATE OF 0.35 GAL. PER SQ. YD.		

6/24/2019
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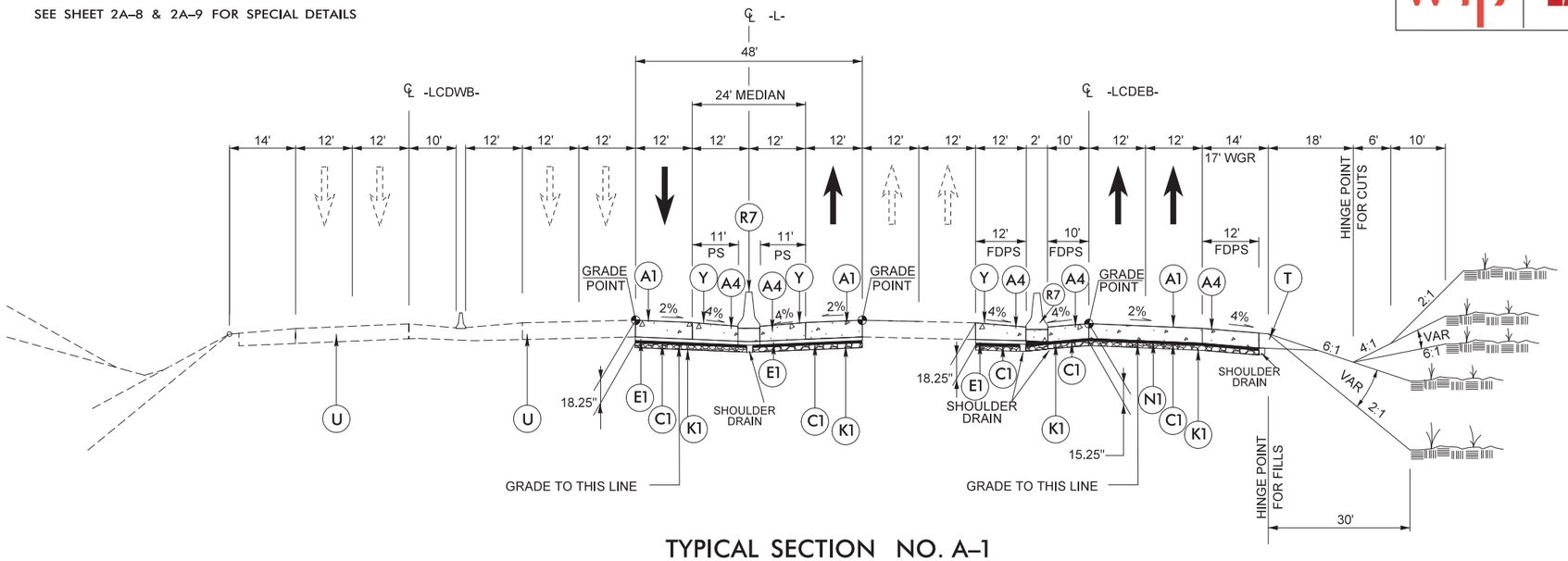
PROWCS01$

A1	14" PCCP (JOINTED WITH DOWELS)
A4	14" PCCP (JOINTED WITHOUT DOWELS)
C1	1¼" S9.5B
E1	3" B25.0C
K1	12" TYPE 1
N1	NON-WOVEN GEOTEXTILE DRAINAGE LAYER
R7	CONCRETE MEDIAN BARRIER
T	EARTH MATERIAL
U	EX PAVEMENT
Y	MILLED RUMBLE STRIPS

SEE SHEET 2A-8 & 2A-9 FOR SPECIAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2A-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

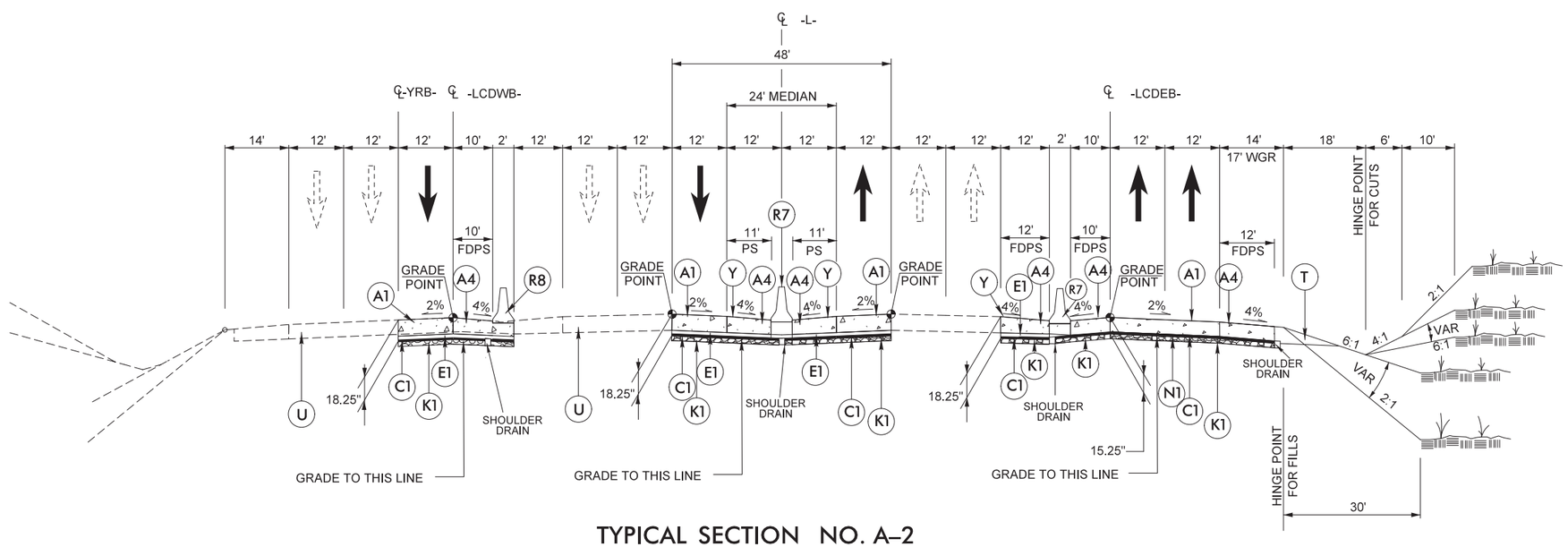
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION NO. A-1

-L- I-40

-L- STA. 93+40.14 TO 114+82.99



TYPICAL SECTION NO. A-2

-L- I-40

-L- STA. 114+82.99 TO 118+79.81

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

6/24/2019
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PRDPWICS01$

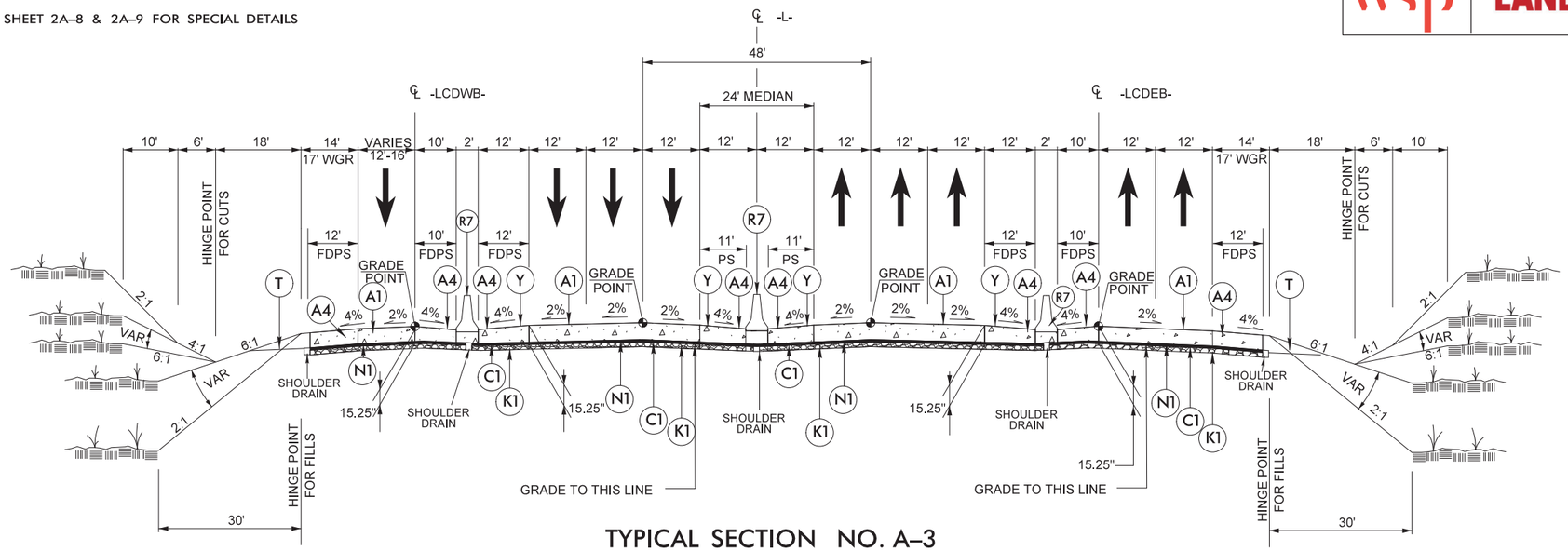
A1	14" PCCP (JOINTED WITH DOWELS)
A4	14" PCCP (JOINTED WITHOUT DOWELS)
C1	1¼" S9.5B
K1	12" TYPE 1
N1	NON-WOVEN GEOTEXTILE DRAINAGE LAYER
R7	CONCRETE MEDIAN BARRIER
T	EARTH MATERIAL
Y	MILLED RUMBLE STRIPS

SEE SHEET 2A–8 & 2A–9 FOR SPECIAL DETAILS

WSP | LANE

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2A-3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

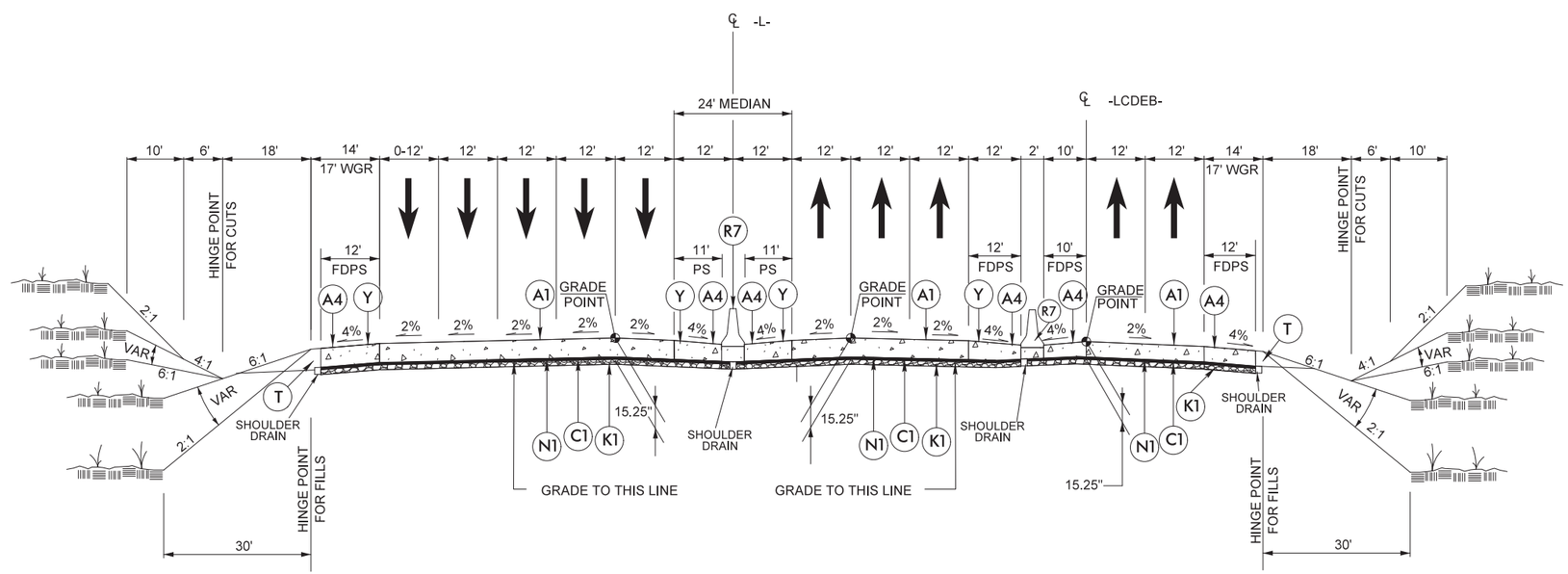
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION NO. A–3

–L– I–40

–L– STA. 118+79.81 TO STA 128+50.00



TYPICAL SECTION NO. A–4

–L– I–40

–L– STA. 128+50.00 TO STA 134+10.00

–L– STA. 145+60.07 TO BRIDGE STA 148+56.05

–L– BRIDGE STA. 150+16.30 TO STA 175+41.24

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

6/24/2019
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PROPWCS01$

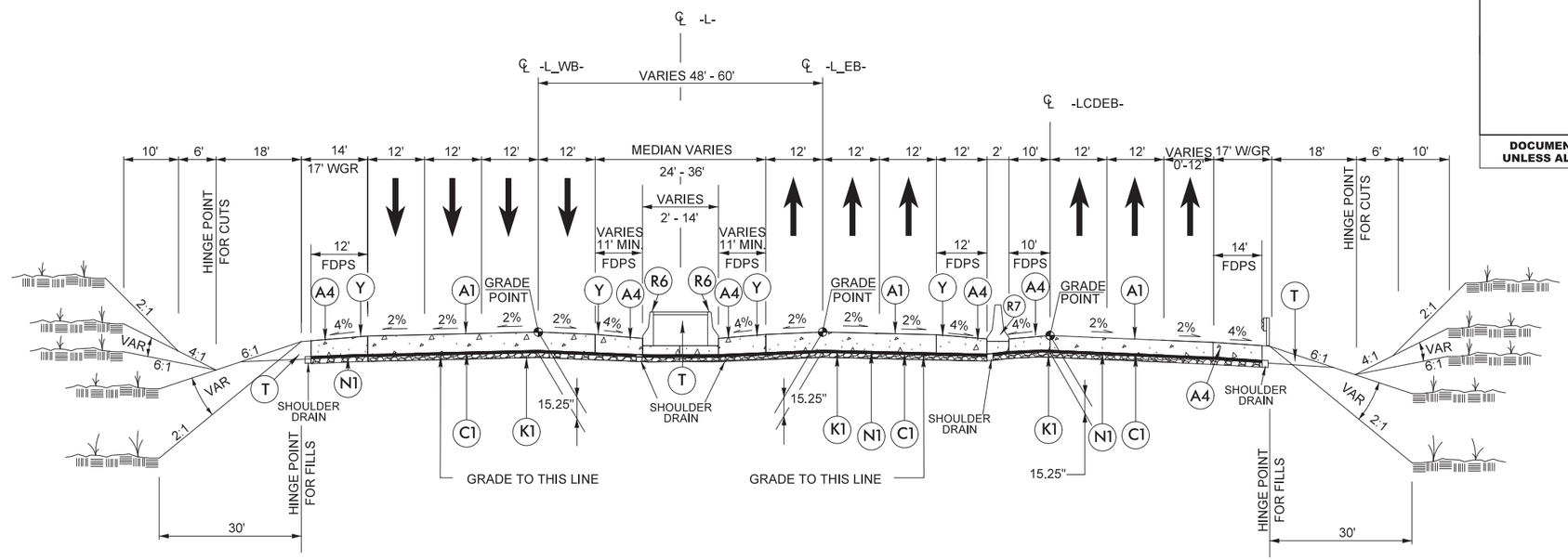
A1	14" PCCP (JOINTED WITH DOWELS)
A4	14" PCCP (JOINTED WITHOUT DOWELS)
C1	1¼" S9.5B
C2	3" S9.5D
D1	3" I19.0C
E4	12.5" B25.0C
K1	12" TYPE 1
N1	NON-WOVEN GEOTEXTILE DRAINAGE LAYER
P1	PRIME COAT
R7	CONCRETE MEDIAN BARRIER
T	EARTH MATERIAL
Y	MILLED RUMBLE STRIPS

SEE SHEET 2A–8 & 2A–9 FOR SPECIAL DETAILS

WSP | LANE

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2A-4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

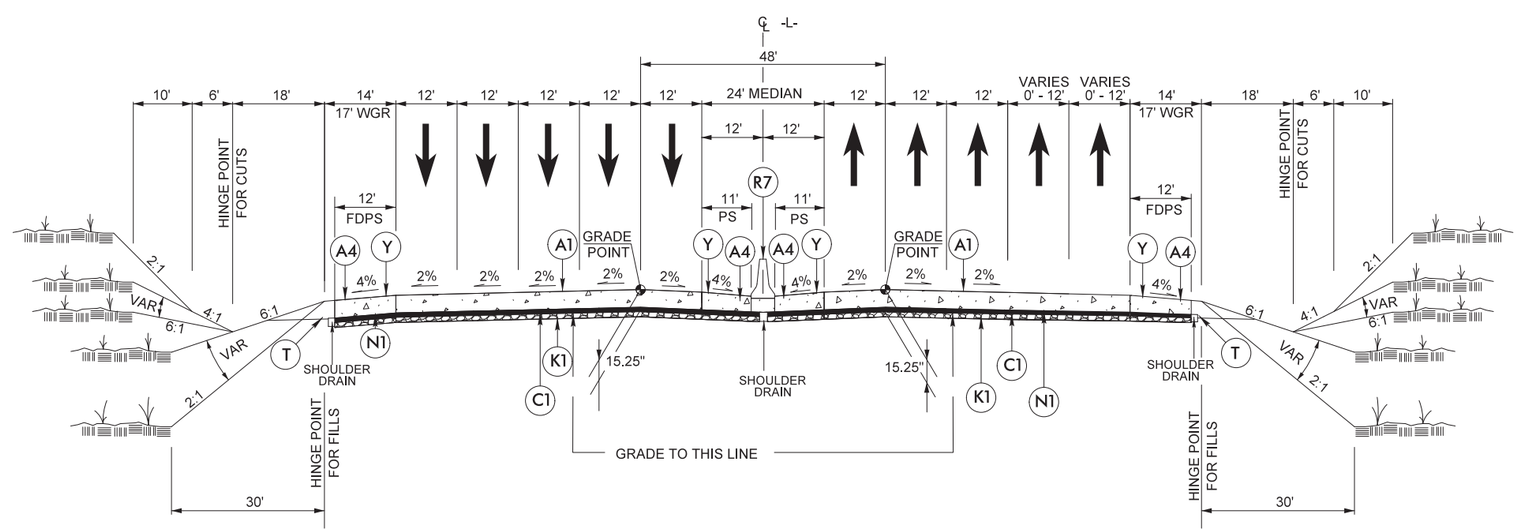


TYPICAL SECTION NO. A–5

–L– I–40

–L– STA. 134+10.00 TO BRIDGE STA 139+24.47

–L– BRIDGE STA. 140+39.33 TO STA 145+60.07



TYPICAL SECTION NO. A–6

–L– I–40

–L– STA. 175+41.24 TO 178+50.00

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

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DGN:Bridgeto01\ics_workingdir\1655\282440_478301\I3819_rdy_typ2A-4.dgn
PROD:WICS01$

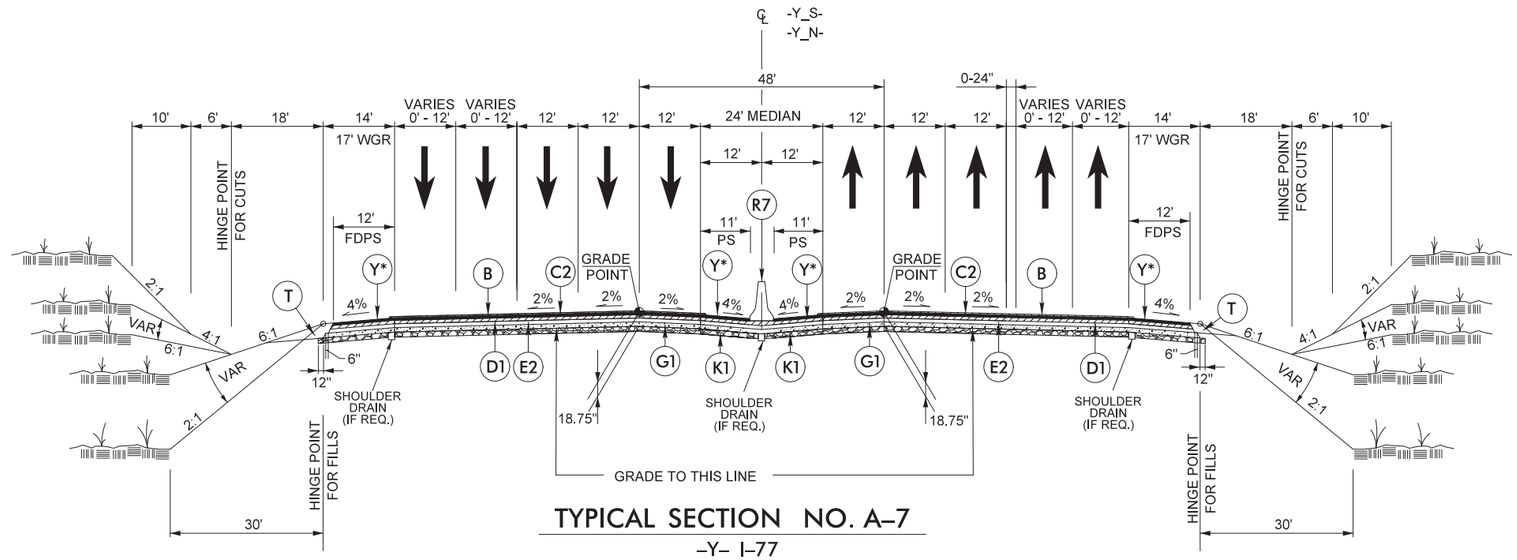
B	OGFC
C2	3" S9.5D
D1	3" I19.0C
E2	4" B25.0C
G1	8" CTB
K1	12" TYPE 1
R6	SINGLE FACED CONCRETE BARRIER
R7	CONCRETE MEDIAN BARRIER
T	EARTH MATERIAL
Y	MILLED RUMBLE STRIPS

SEE SHEET 2A–8 & 2A–9 FOR SPECIAL DETAILS

WSP | LANE

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2A-5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



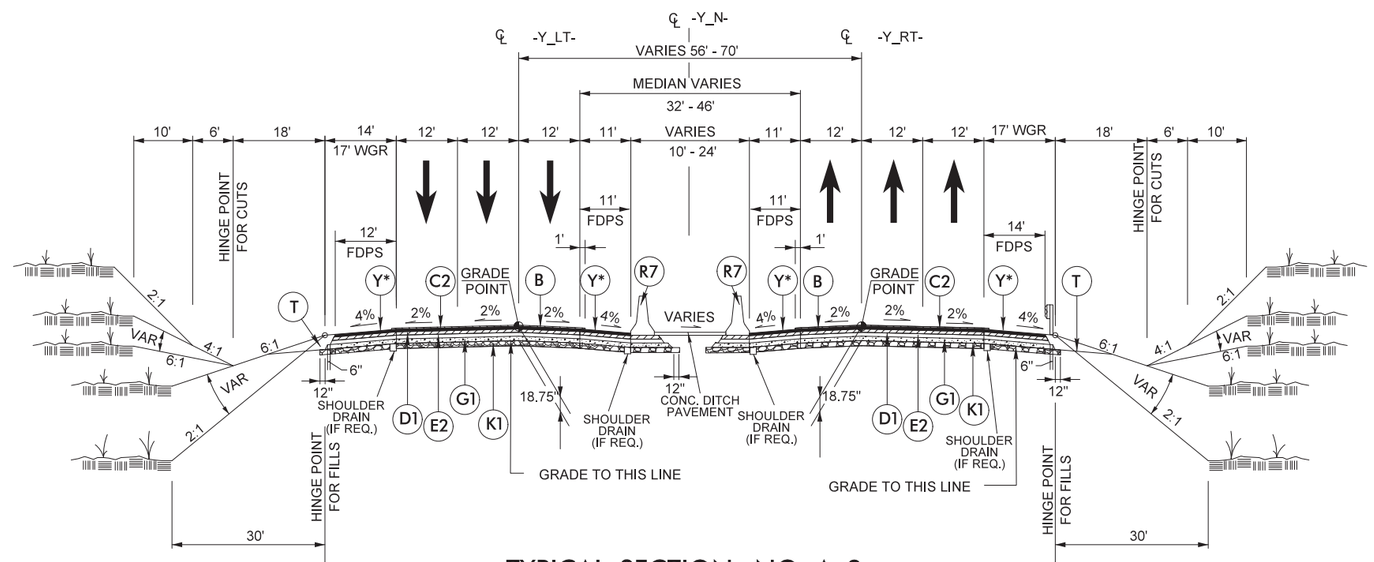
TYPICAL SECTION NO. A–7

–Y– I–77

–Y_S– STA. 111+00.00 TO BRIDGE STA. 120+24.50

–Y_S– BRIDGE STA. 122+17.56 TO 129+98.98

–Y_N– STA. 151+13.82 TO 175+00.00



TYPICAL SECTION NO. A–8

–Y– I–77

–Y_LT– STA. 329+93.79 TO BRIDGE STA 341+01.59

–Y_LT– BRIDGE STA. 343+54.59 TO –Y_N– STA. 149+32.32 BRIDGE

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.
* INSIDE EDGE OF MILLED RUMBLE STRIP SHALL BE 4" OFF O.G.F.C.

6/24/2019
PBPdgnts02\ics_workingdir\61I0\336412.167\I3819_rdy_typ2A-5.dgn
PBPWICS02$

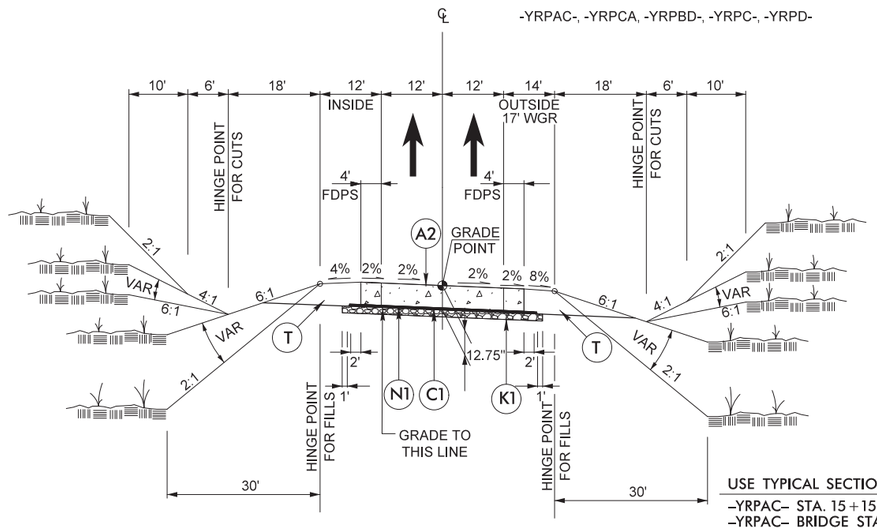
A2	11½" PCCP
A3	13" PCCP
C1	1¼" S9.5B
E1	3" B25.0C
E2	4" B25.0C
E3	B25.0C VARIES
K1	12" TYPE 1
N1	NON-WOVEN GEOTEXTILE DRAINAGE LAYER
R2	2'-6" C & G
R6	SINGLE FACED CONCRETE BARRIER
R8	TYPE III/IV BARRIER
T	EARTH MATERIAL

SEE SHEET 2A-8 & 2A-9 FOR SPECIAL DETAILS

WSP | LANE

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2A-6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

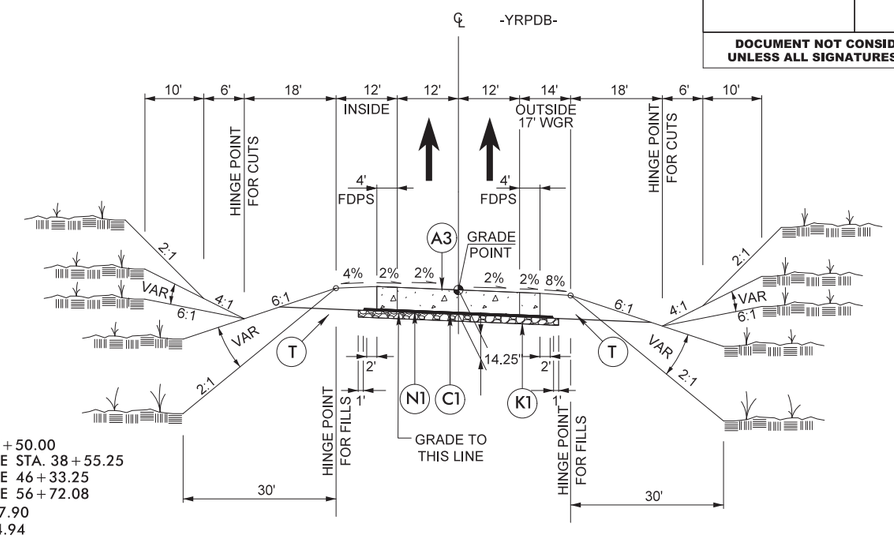


TYPICAL SECTION NO. A-9

-YRPAC- RAMP AC
-YRPCA- RAMP CA
-YRPC- RAMP C
-YRPD- RAMP D

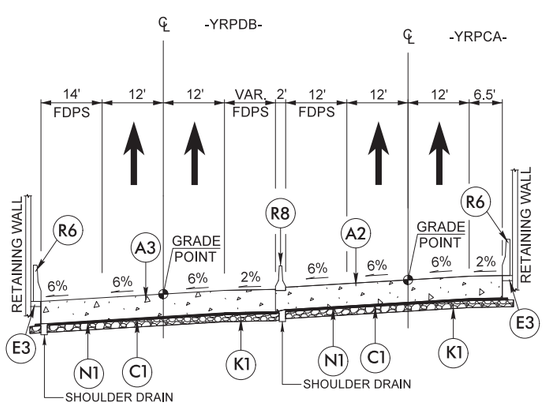
USE TYPICAL SECTION NO. A-9

-YRPAC- STA. 15+15.10 TO BRIDGE STA. 27+50.00
-YRPAC- BRIDGE STA. 28+75.00 TO BRIDGE STA. 38+55.25
-YRPAC- BRIDGE STA. 43+20.00 TO BRIDGE 46+33.25
-YRPAC- BRIDGE STA. 47+78.80 TO BRIDGE 56+72.08
-YRPAC- BRIDGE STA. 79+60.58 TO 83+97.90
-YRPCA- BRIDGE STA. 41+03.25 TO 75+34.94
-YRPC- STA. 15+86.14 TO STA 26+70.50
-YRPD- STA. 13+50.01 TO STA 32+16.40



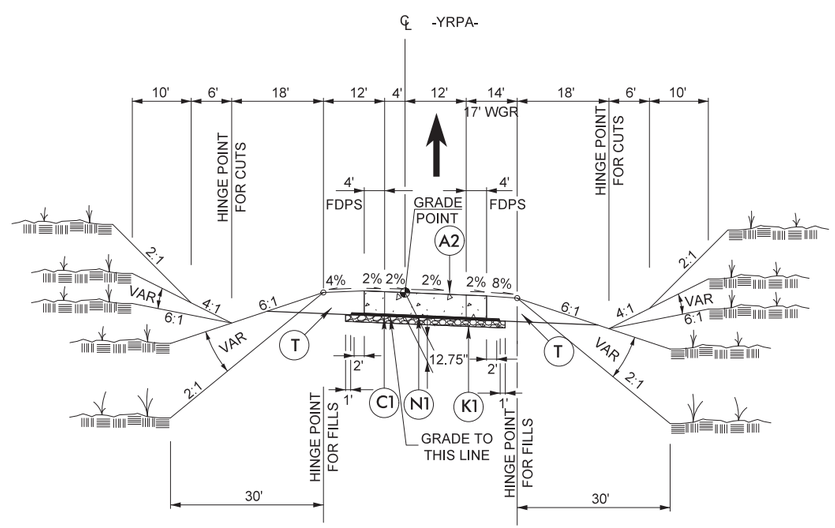
TYPICAL SECTION NO. A-10

-YRPDB- RAMP DB
-YRPDB- STA. 17+87.27 TO 52+20.68



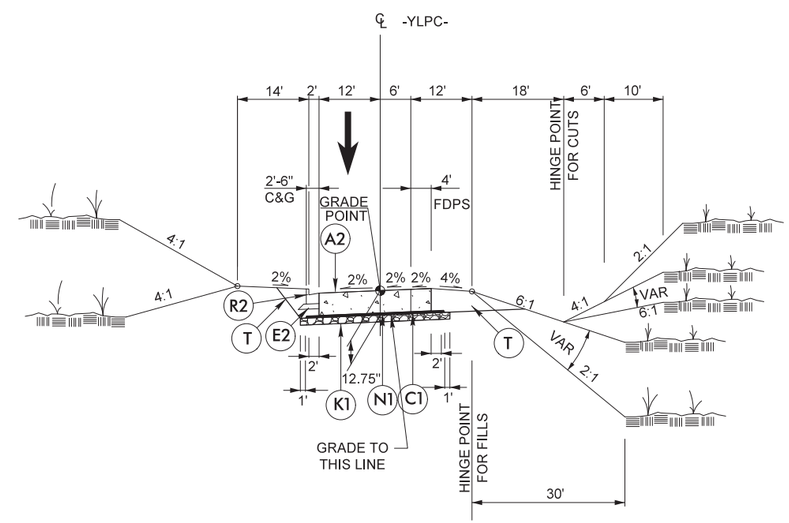
TYPICAL SECTION DETAIL NO. A-9 & A-10

-YRPCA- WITH -YRPDB- UNDER -L-



TYPICAL SECTION NO. A-11

-YRPA- RAMP A
-YRPA- STA. 13+20.38 TO 26+12.05



TYPICAL SECTION NO. A-12

-YLPC- LOOP C
-YLPC- STA. 13+25.31 TO 23+94.45

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

6/24/2019
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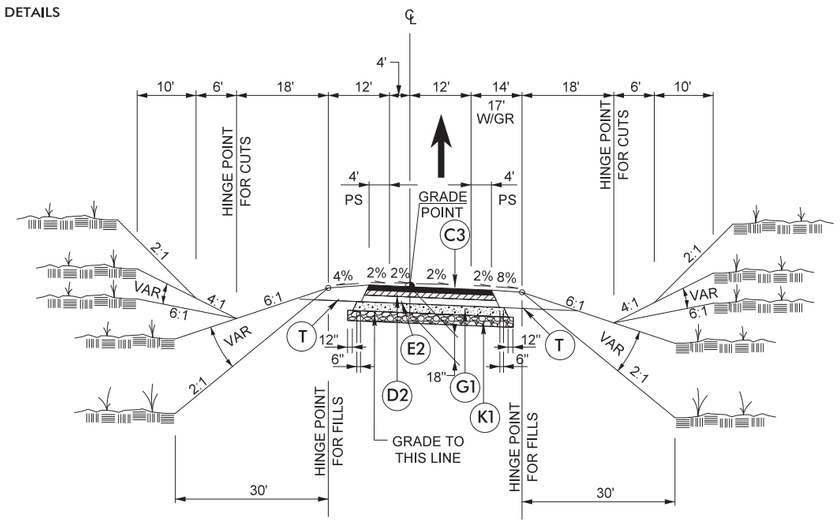
PRDPWICS01$

A3	13" PCCP
C1	1¼" S9.5B
C2	3" S9.5D
D1	3" I19.0C
D2	4" I19.0C
E1	3" B25.0C
E2	4" B25.0C
G1	8" CTB
K1	12" TYPE 1
N1	NON-WOVEN GEOTEXTILE DRAINAGE LAYER
T	EARTH MATERIAL

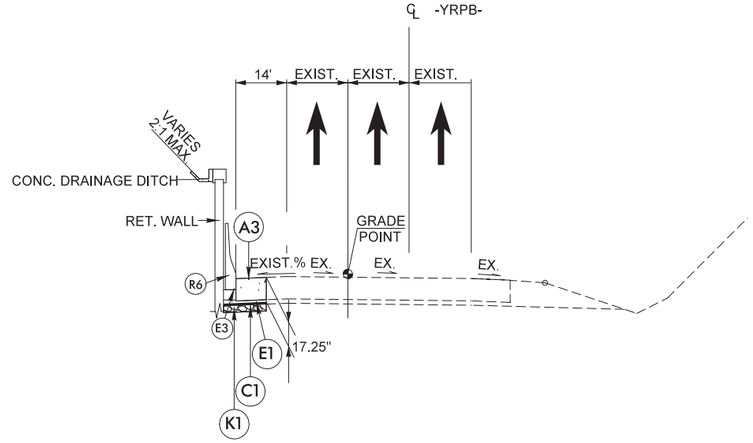
SEE SHEET 2A-8 & 2A-9 FOR SPECIAL DETAILS



TYPICAL SECTION NO. A-13

-YRPB- RAMP B

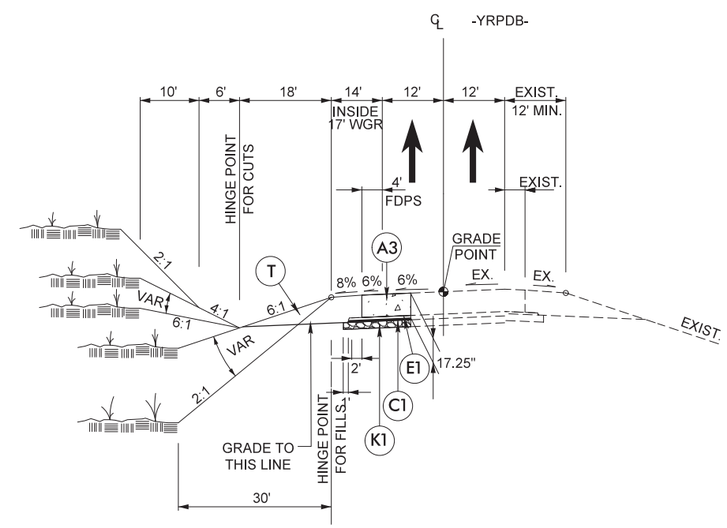
-YRPB- STA. 14+62.00 TO 15+03.54



TYPICAL SECTION NO. A-14

-YRPB- RAMP B

-YRPB- STA. 25+56.64 TO 30+80.36



TYPICAL SECTION NO. A-15

-YRPDB- RAMP DB

-YRPDB- STA. 52+20.68 TO 57+87.16

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

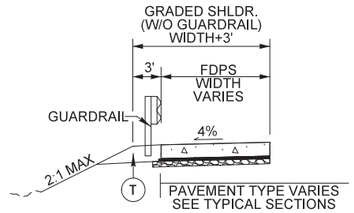
WSP | LANE

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2A-7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

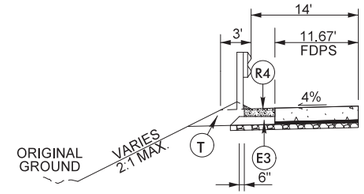
6/24/2019
pgrdgnrgs01\ics_workingdir\16551\282440_478304\3819_rdy_typ2A-7.dgn
RDP WICS01$

E1	3" B25.0C
E2	4" B25.0C
E3	B25.0C VARIES
J1	6" ABC
J2	8" ABC
R4	SBG
R5	EXP GUTTER
T	EARTH MATERIAL



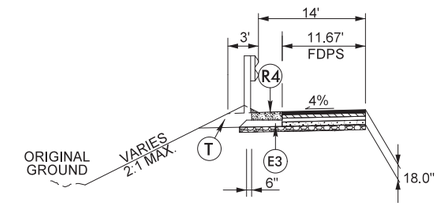
TYPICAL SECTION DETAIL NO. 1
GUARDRAIL DETAIL

SEE PLANS FOR GUARDRAIL LOCATIONS



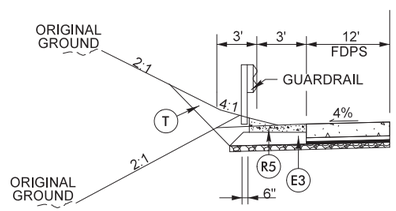
TYPICAL SECTION DETAIL NO. 2
SHOULDER BERM GUTTER

SEE PLANS FOR LOCATIONS ALONG:
–L–
–YRPCA–
–YRPC–
–YRPAC–
–YRPDB–
–YRPA–



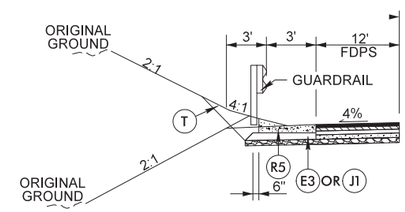
TYPICAL SECTION DETAIL NO. 3
SHOULDER BERM GUTTER

SEE PLANS FOR LOCATIONS ALONG:
–Y_S–
–Y_RT–
–Y_LT–
–Y_N–



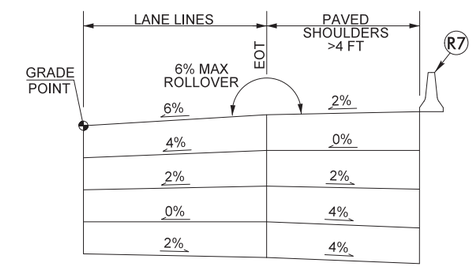
TYPICAL SECTION DETAIL NO. 5
EXPRESSWAY GUTTER W/GUARDRAIL

SEE PLANS FOR LOCATIONS ALONG:
–YRPC–



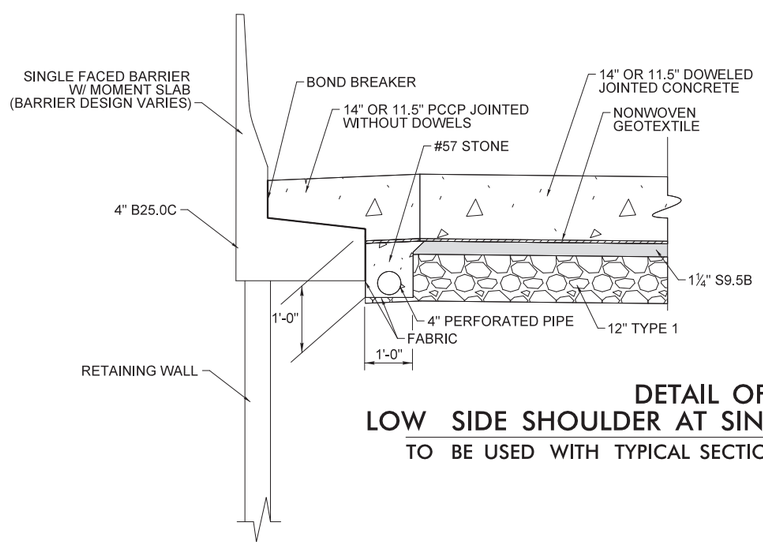
TYPICAL SECTION DETAIL NO. 6
EXPRESSWAY GUTTER W/G.R.

SEE PLANS FOR LOCATIONS ALONG:
–Y_S–



HIGH SIDE SHOULDER SLOPE ROLLOVER
FOR RAMPS AT 6% CROSS SLOPE & > 4' SHOULDERS

SEE PLANS FOR LOCATION
USE WITH –YRPC–, –YRPCA–, –YRPAC–, & –YRPDB–
TYPICAL SECTIONS WITH 6% SUPERELEVATION



DETAIL OF SHOULDER DRAIN
LOW SIDE SHOULDER AT SINGLE FACED BARRIER W/MOMENT SLABS

TO BE USED WITH TYPICAL SECTION A–1 THUR A–6, A–9, A–10, A–12, B–4 THRU B–7

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

WSP | LANE

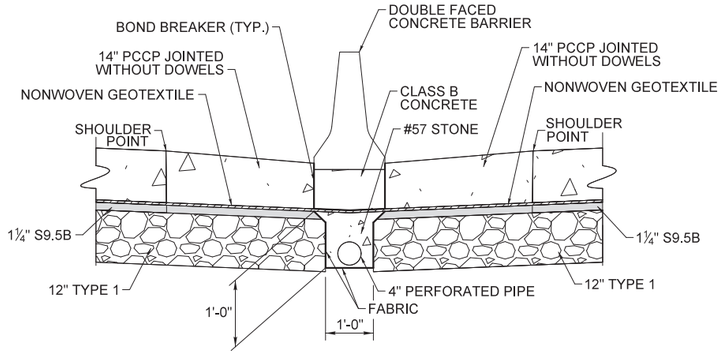
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2A-8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

6/24/2019
pw:\\pwdenvsa01\ics_workingdir\16557\282440.478306\13819_rdy_typ2a-8.dgn
RDP WCS01$

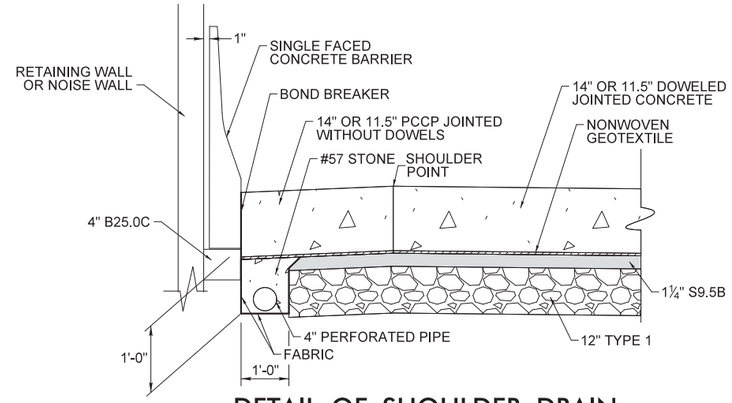
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2A-9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



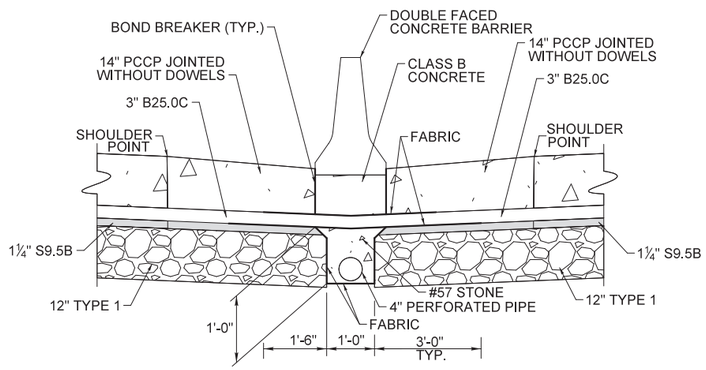
DETAIL OF SHOULDER DRAIN MAINLINE MEDIAN SHOULDER

TO BE USED WITH TYPICAL SECTION A–1 THRU A–6, B–5 & B–7



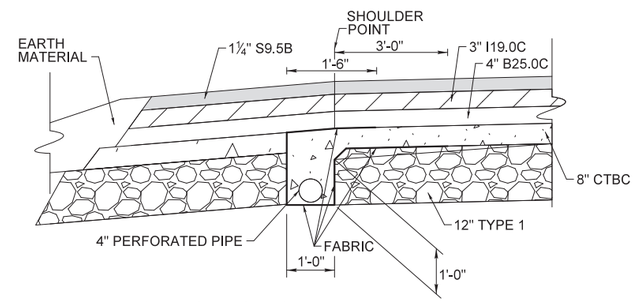
DETAIL OF SHOULDER DRAIN LOW SIDE SHOULDER AT RETAINING WALLS

TO BE USED WITH TYPICAL SECTION A–1 THUR A–6, A–9, A–10, A–12, B–4 THRU B–7



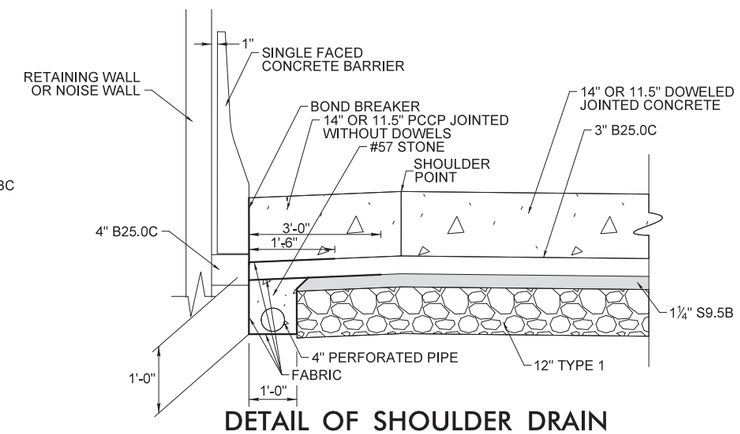
DETAIL OF SHOULDER DRAIN MAINLINE MEDIAN SHOULDER

TO BE USED WITH TYPICAL SECTION A–1, A–2, & B–6



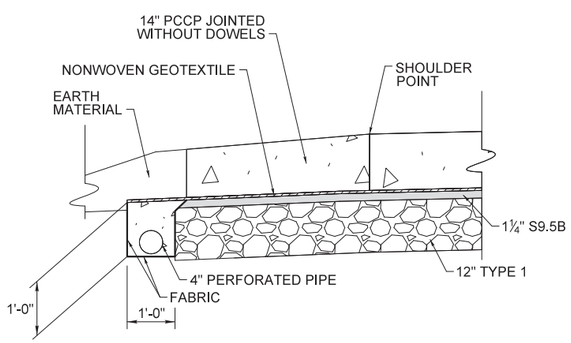
DETAIL OF SHOULDER DRAIN MAINLINE SHOULDER

TO BE USED WITH TYPICAL SECTION A–7, A–8, B–12, & B–13



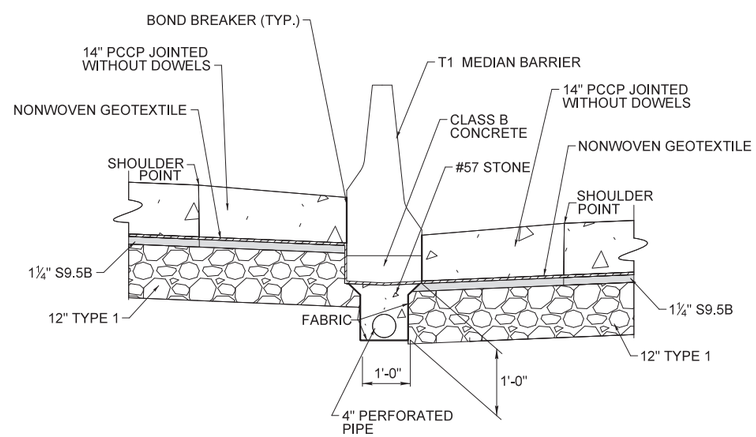
DETAIL OF SHOULDER DRAIN LOW SIDE SHOULDER AT RETAINING WALLS

TO BE USED WITH TYPICAL SECTION A–14



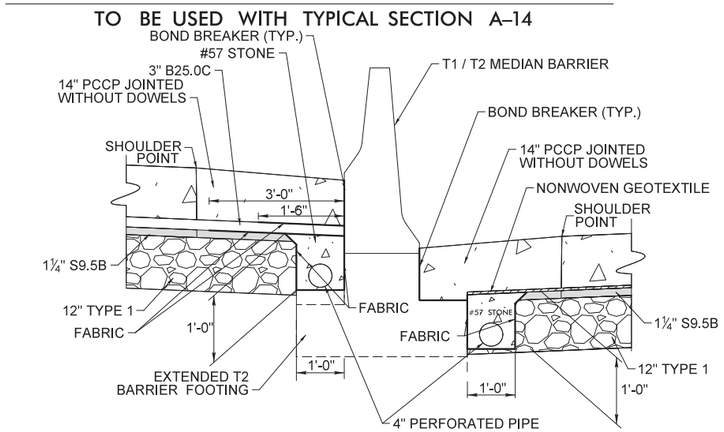
DETAIL OF SHOULDER DRAIN MAINLINE SHOULDER

TO BE USED WITH TYPICAL SECTION A–1 THRU A–6 & B–4 THRU B–7



DETAIL OF SHOULDER DRAIN WITH T1 MEDIAN BARRIER

TO BE USED WITH TYPICAL SECTION A–3 THRU A–5 & B–7



DETAIL OF SHOULDER DRAIN WITH T1 /T2 MEDIAN BARRIER

TO BE USED WITH TYPICAL SECTION A–1 THRU A–2 & B–4 THRU B–6

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

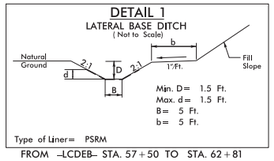
6/24/2019
n:\prodgraics02\ics_workingdir\6124\282440_478501\13819_rdy_typ2A-9.dgn
PDPW\CS02$

LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2D-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

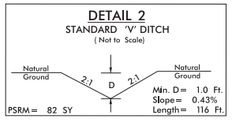
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 1
LATERAL BASE DITCH
(Not to Scale)



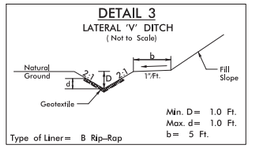
FROM –LCDEB– STA. 57+50 TO STA. 62+81

DETAIL 2
STANDARD 'V' DITCH
(Not to Scale)



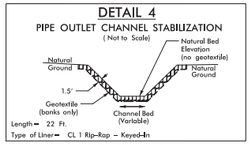
FROM –YRPAC– STA. 55+88 TO STA. 55+27

DETAIL 3
LATERAL 'V' DITCH
(Not to Scale)



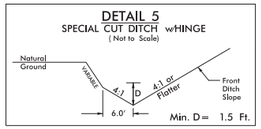
FROM –YRPAC– STA. 52+00 TO STA. 53+84

DETAIL 4
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



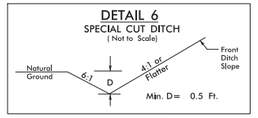
–YRPC– STA. 16+04
–Y_N– STA. 210+35 RT

DETAIL 5
SPECIAL CUT DITCH w/HINGE
(Not to Scale)



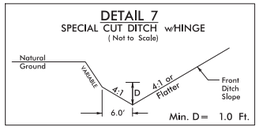
–YRPD– FROM STA. 28+00 TO STA. 28+75
–L_WB– FROM STA. 134+00 TO STA. 136+50
–L– FROM STA. 133+12 TO STA. 134+00

DETAIL 6
SPECIAL CUT DITCH
(Not to Scale)



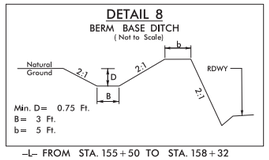
FROM –YRPD– STA. 28+75 TO STA. 29+66

DETAIL 7
SPECIAL CUT DITCH w/HINGE
(Not to Scale)



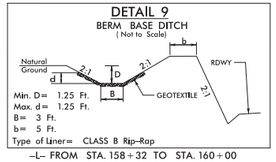
–L– FROM STA. 150+15 TO STA. 152+00

DETAIL 8
BERM BASE DITCH
(Not to Scale)



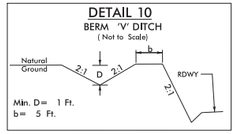
–L– FROM STA. 155+50 TO STA. 158+32

DETAIL 9
BERM BASE DITCH
(Not to Scale)



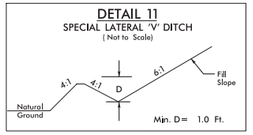
–L– FROM STA. 158+32 TO STA. 160+00

DETAIL 10
BERM 'V' DITCH
(Not to Scale)



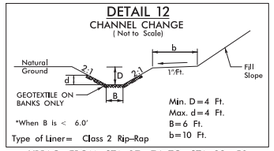
–L– FROM STA. 166+50 TO STA. 168+88
–L– FROM STA. 168+88 TO STA. 171+00

DETAIL 11
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



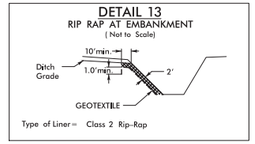
–YRPD– FROM STA. 12+60 TO STA. 13+14

DETAIL 12
CHANNEL CHANGE
(Not to Scale)



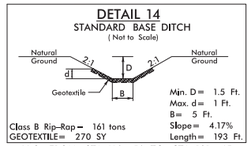
–YRPAC– FROM STA. 27+74 TO STA. 33+50

DETAIL 13
RIP RAP AT EMBANKMENT
(Not to Scale)



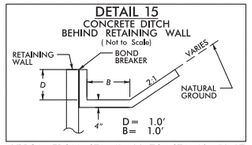
–Y_S– STA. 121+45
–YRPAC– 27+86 RT

DETAIL 14
STANDARD BASE DITCH
(Not to Scale)



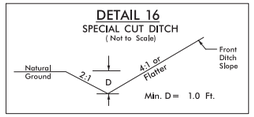
–Y_S– FROM STA. 119+50 TO STA. 121+45

DETAIL 15
CONCRETE DITCH BEHIND RETAINING WALL
(Not to Scale)



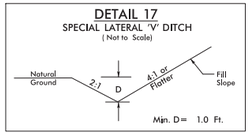
–YRPCA– FROM STA. 41+00 TO STA. 46+50 LT
–YRPDB– FROM STA. 46+00 TO STA. 47+50 LT
–YRPDB– FROM STA. 47+50 TO STA. 49+75 LT
–YRPAC– FROM STA. 50+80 TO STA. 52+50 RT
–YRPAC– FROM STA. 52+50 TO STA. 55+30 RT

DETAIL 16
SPECIAL CUT DITCH
(Not to Scale)



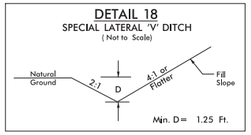
FROM –YRPCA – STA. 63+00 TO STA. 63+50

DETAIL 17
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



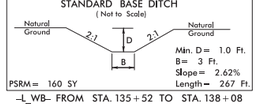
FROM –Y_N– STA. 156+20 TO STA. 160+50

DETAIL 18
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



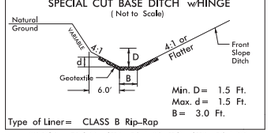
FROM –Y_N– STA. 157+37 TO STA. 161+97

DETAIL 19
STANDARD BASE DITCH
(Not to Scale)



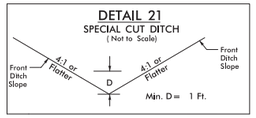
–L_WB– FROM STA. 135+52 TO STA. 138+08

DETAIL 20
SPECIAL CUT BASE DITCH w/HINGE
(Not to Scale)



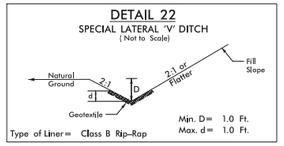
–YRPCA– FROM STA. 53+49 TO STA. 56+00

DETAIL 21
SPECIAL CUT DITCH
(Not to Scale)



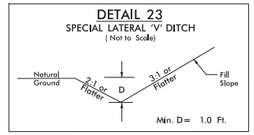
–YRPCA– FROM STA. 65+00 TO STA. 66+00
–Y9LPA– FROM STA. 12+00 to 12+50 RT

DETAIL 22
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



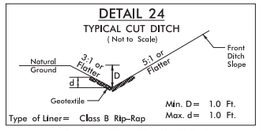
–L– FROM STA. 119+50 TO STA. 122+00 RT
–Y_RT– FROM STA. 239+00 TO 240+50 LT

DETAIL 23
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



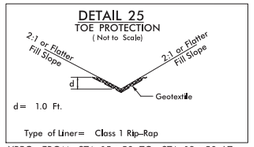
–YRPC– FROM STA. 11+50 TO STA. 15+50 LT
–YRPC– FROM STA. 22+00 TO STA. 23+00 LT
–YRPC– FROM STA. 23+00 TO STA. 24+50 LT

DETAIL 24
TYPICAL CUT DITCH
(Not to Scale)



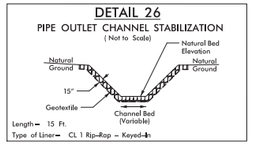
–Y_RT– FROM STA. 237+00 TO 239+00 LT

DETAIL 25
TOE PROTECTION
(Not to Scale)



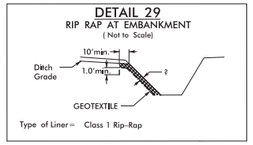
–YRPC– FROM STA. 15+50 TO STA. 18+50 LT
–YRPC– FROM STA. 20+50 TO STA. 22+00 LT
–YRPCA– FROM STA. 58+25 TO STA. 59+65 RT

DETAIL 26
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



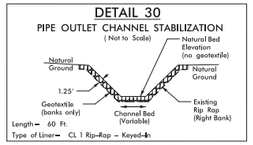
–L– STA. 147+14

DETAIL 29
RIP RAP AT EMBANKMENT
(Not to Scale)



–Y_S– STA. 121+45

DETAIL 30
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



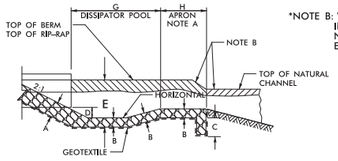
–Y_N– STA. 167+45

DETAIL 32
RIP-RAPPED ENERGY DISSIPATOR BASIN

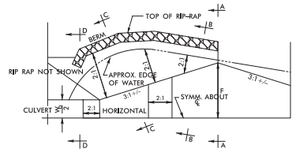
*NOTE A: IF EXIT VELOCITY OF BASIN IS SPECIFIED, EXTEND BASIN AS REQUIRED TO OBTAIN SUFFICIENT CROSS SECTIONAL AREA AT SECTION A–A SUCH THAT Q des(CROSS SECTION AREA AT SEC. A–A)= SPECIFIED VELOCITY.

*NOTE B: WARP BASIN TO CONFORM TO NATURAL STREAM CHANNEL TOP OF RIP-RAP IN FLOOR OF BASIN SHOULD BE AT SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM AT SEC. A–A. PROVIDE SMOOTH TRANSITION FROM END OF APRON TO NATURAL CHANNEL WIDTH.

℄ SECTION

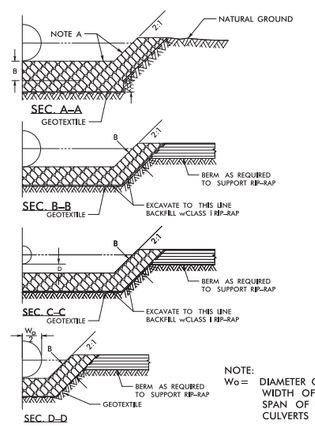


HALF PLAN



DIM.	RIP RAP BASIN #							
	1	2	3	4	5	6	7	8
A	30"	30"						
B	20"	20"						
C	16"	16"						
D	1'	1.25'						
E	3.5'	4'						
F	6.3'	10'						
G	10'	17'						
H	5'	6'						

BASIN #	LOCATION (AT OUTLET)
1	–YRPCA– 22+95, 162 RT
2	–Y_S– 47+61, 142 LT
3	
4	
5	
6	
7	
8	



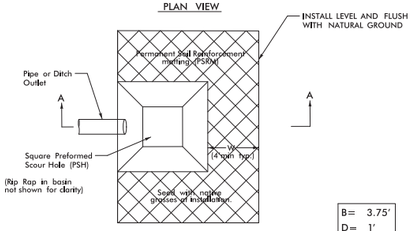
NOTE:
Wo= DIAMETER OF PIPE, WIDTH OF BOX OR SPAN OF PIPE-ARCH CULVERTS

5/05

FROM STA. TO STA.

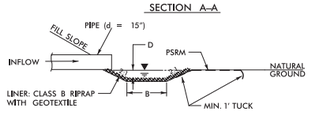
DETAIL 27 – PREFORMED SCOUR HOLE
*NOT TO SCALE

PLAN VIEW



B= 3.75'
D= 1'
W= 4'

SECTION A–A

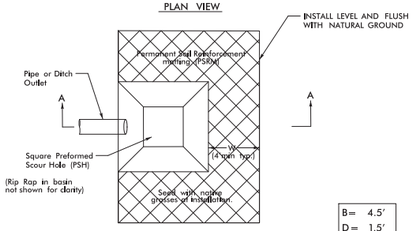


3/08

Y_S STA. 120+90
Y_S STA. 123+38
Y_S STA. 125+00
Y_N STA. 164+35
–YRPC– STA. 15+09

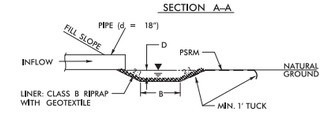
DETAIL 28 – PREFORMED SCOUR HOLE
*NOT TO SCALE

PLAN VIEW



B= 4.5'
D= 1.5'
W= 4'

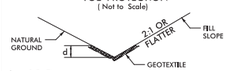
SECTION A–A



3/08

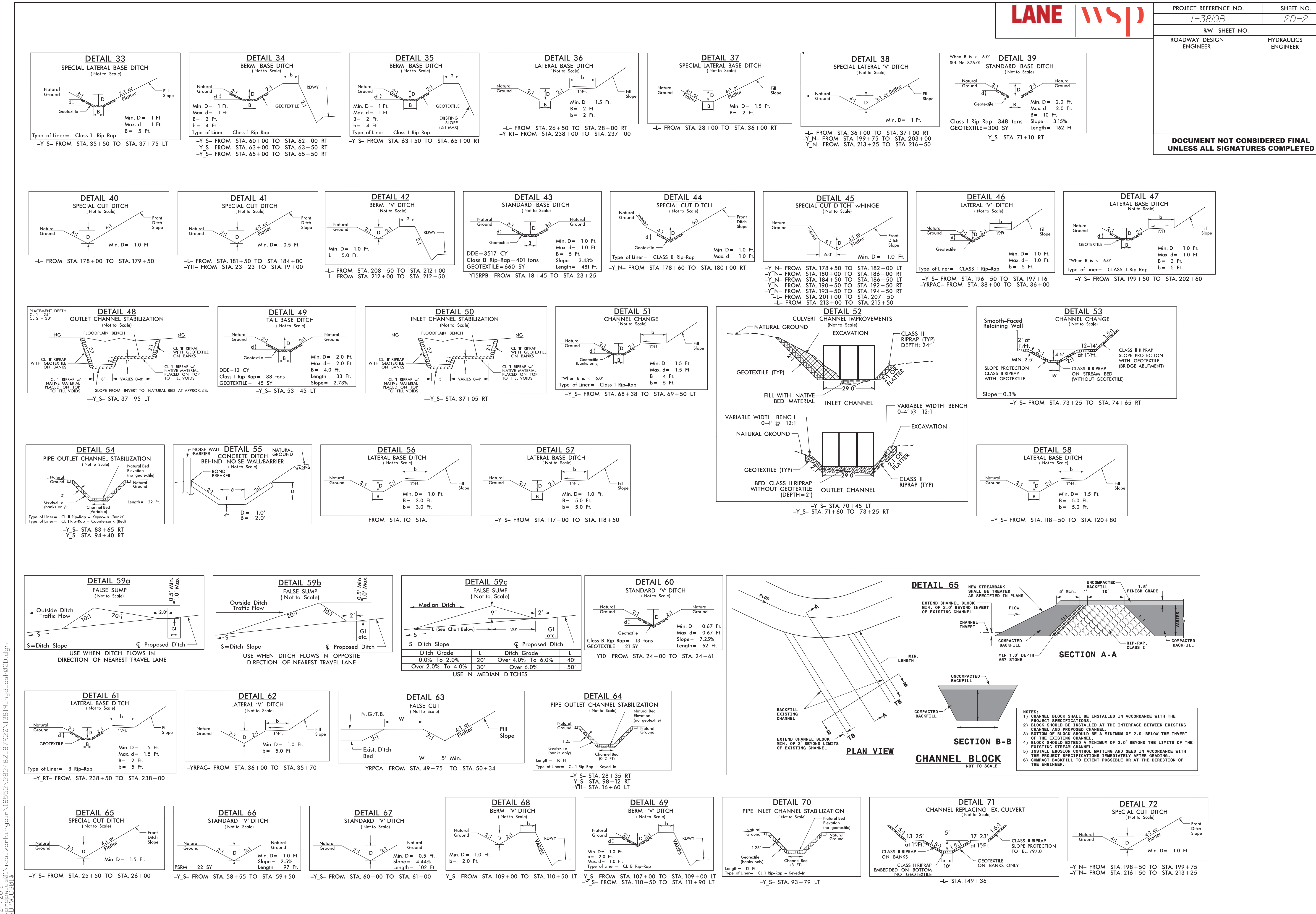
–LCDEB– STA. 65+59
Y_S STA. 119+78
Y_S STA. 122+18
–YRPC– STA. 21+09

DETAIL 31
TOE PROTECTION
(Not to Scale)



–L– FROM STA. 112+00 TO STA. 115+50
–L– FROM STA. 122+26 TO STA. 123+25
–L– FROM STA. 141+00 TO STA. 144+00
–L– FROM STA. 145+40 TO STA. 148+00
–L– FROM STA. 145+50 TO STA. 147+10
–YRPAC– FROM STA. 32+50 TO 37+95
–Y_S– FROM STA. 46+15 TO STA. 47+54 LT
–Y_S– FROM STA. 44+85 TO STA. 46+50 RT
–Y_S– FROM STA. 125+50 TO STA. 129+50
–Y_RT– FROM STA. 231+78 TO STA. 238+00
–Y_N– FROM STA. 151+64 TO STA. 153+55
–Y_N– FROM STA. 157+91 TO STA. 160+00
–Y_N– FROM STA. 162+19 TO STA. 162+49
–Y_N– FROM STA. 169+72 TO STA. 171+30
–YLPC– FROM STA. 14+00 TO STA. 16+55

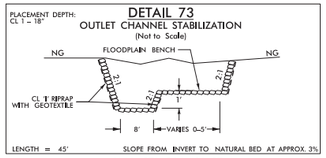
6/24/2019
hydrdpetc01\ics_workingdir\16552\282462_87920\I3819_hyd_psh02D.dgn
PROPWCS01$


LANE
wsp
PROJECT REFERENCE NO.
I-3819B
SHEET NO.
2D-2
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
DETAIL 33
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground
3:1
2:1 or Flatter
Fill Slope
Geotextile
Min. D = 1 Ft.
Max. d = 1 Ft.
B = 5 Ft.
Type of Liner = Class 1 Rip-Rap
-Y_S- FROM STA. 35+50 TO STA. 37+75 LT
DETAIL 34
BERM BASE DITCH
(Not to Scale)
GEOTEXTILE
RDWY
Min. D = 1 Ft.
Max. d = 1 Ft.
B = 2 Ft.
b = 4 Ft.
Type of Liner = Class 1 Rip-Rap
-Y_S- FROM STA. 60+00 TO STA. 62+00 RT
-Y_S- FROM STA. 63+00 TO STA. 63+50 RT
-Y_S- FROM STA. 65+00 TO STA. 65+50 RT
DETAIL 35
BERM BASE DITCH
(Not to Scale)
GEOTEXTILE
EXISTING SLOPE (2:1 MAX)
Min. D = 1 Ft.
Max. d = 1 Ft.
B = 2 Ft.
b = 4 Ft.
Type of Liner = Class 1 Rip-Rap
-Y_S- FROM STA. 63+50 TO STA. 65+00 RT
DETAIL 36
LATERAL BASE DITCH
(Not to Scale)
1"/Ft.
Min. D = 1.5 Ft.
B = 2 Ft.
b = 2 Ft.
-L- FROM STA. 26+50 TO STA. 28+00 RT
-Y_RT- FROM STA. 238+00 TO STA. 237+00
DETAIL 37
SPECIAL LATERAL BASE DITCH
(Not to Scale)
4:1 or Flatter
Min. D = 1.5 Ft.
B = 2 Ft.
-L- FROM STA. 28+00 TO STA. 36+00 RT
DETAIL 38
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
4:1
3:1 or flatter
Min. D = 1 Ft.
-L- FROM STA. 36+00 TO STA. 37+00 RT
-Y_N- FROM STA. 199+75 TO STA. 203+00
-Y_N- FROM STA. 213+25 TO STA. 216+50
When B is > 6.0'
Std. No. 876.01
DETAIL 39
STANDARD BASE DITCH
(Not to Scale)
Geotextile
Min. D = 2.0 Ft.
Max. d = 2.0 Ft.
B = 10 Ft.
Slope = 3.15%
Length = 162 Ft.
Class 1 Rip-Rap = 348 tons
GEOTEXTILE = 300 SY
-Y_S- STA. 71+10 RT
DETAIL 40
SPECIAL CUT DITCH
(Not to Scale)
6:1
Front Ditch Slope
Min. D = 1.0 Ft.
-L- FROM STA. 178+00 TO STA. 179+50
DETAIL 41
SPECIAL CUT DITCH
(Not to Scale)
4:1 or Flatter
Min. D = 0.5 Ft.
-L- FROM STA. 181+50 TO STA. 184+00
-Y11- FROM STA. 23+23 TO STA. 19+00
DETAIL 42
BERM 'V' DITCH
(Not to Scale)
Min. D = 1.0 Ft.
b = 5.0 Ft.
-L- FROM STA. 208+50 TO STA. 212+00
-L- FROM STA. 212+00 TO STA. 212+50
DETAIL 43
STANDARD BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 5 Ft.
Slope = 3.43%
Length = 481 Ft.
DDE = 3517 CY
Class B Rip-Rap = 401 tons
GEOTEXTILE = 660 SY
-Y15RPB- FROM STA. 18+45 TO STA. 23+25
DETAIL 44
SPECIAL CUT DITCH
(Not to Scale)
VARIABLE
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
Type of Liner = CLASS B Rip-Rap
-Y_N- FROM STA. 178+60 TO STA. 180+00 RT
DETAIL 45
SPECIAL CUT DITCH w/HINGE
(Not to Scale)
6.0'
Min. D = 1.0 Ft.
-Y_N- FROM STA. 178+50 TO STA. 182+00 LT
-Y_N- FROM STA. 180+00 TO STA. 186+00 RT
-Y_N- FROM STA. 184+50 TO STA. 186+50 LT
-Y_N- FROM STA. 190+50 TO STA. 192+50 RT
-Y_N- FROM STA. 193+50 TO STA. 194+50 RT
-L- FROM STA. 201+00 TO STA. 207+50
-L- FROM STA. 213+00 TO STA. 215+50
DETAIL 46
LATERAL 'V' DITCH
(Not to Scale)
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
b = 5 Ft.
Type of Liner = CLASS 1 Rip-Rap
-Y_S- FROM STA. 196+50 TO STA. 197+16
-YRPAC- FROM STA. 38+00 TO STA. 36+00
DETAIL 47
LATERAL BASE DITCH
(Not to Scale)
*When B is < 6.0'
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 3 Ft.
b = 5 Ft.
Type of Liner = CLASS 1 Rip-Rap
-Y_S- FROM STA. 199+50 TO STA. 202+60
PLACEMENT DEPTH:
CL 1 - 24"
CL 2 - 30"
DETAIL 48
OUTLET CHANNEL STABILIZATION
(Not to Scale)
NG
FLOODPLAIN BENCH
CL 'II' RIPRAP WITH GEOTEXTILE ON BANKS
CL 'I' RIPRAP w/ NATIVE MATERIAL PLACED ON TOP TO FILL VOIDS
8'
VARIES 0-8'
SLOPE FROM INVERT TO NATURAL BED AT APPROX. 5%
—Y_S— STA. 37+95 LT
DETAIL 49
TAIL BASE DITCH
(Not to Scale)
Min. D = 2.0 Ft.
Max. d = 2.0 Ft.
B = 4.0 Ft.
Length = 33 Ft.
Slope = 2.73%
DDE = 12 CY
Class 1 Rip-Rap = 38 tons
GEOTEXTILE = 45 SY
-Y_S- STA. 53+45 LT
DETAIL 50
INLET CHANNEL STABILIZATION
(Not to Scale)
5'
VARIES 0-4'
—Y_S— STA. 37+05 RT
DETAIL 51
CHANNEL CHANGE
(Not to Scale)
Geotextile (banks only)
*When B is < 6.0'
Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 4 Ft.
b = 5 Ft.
Type of Liner = Class 1 Rip-Rap
-Y_S- FROM STA. 68+38 TO STA. 69+50 LT
DETAIL 52
CULVERT CHANNEL IMPROVEMENTS
(Not to Scale)
NATURAL GROUND
EXCAVATION
CLASS II RIPRAP (TYP) DEPTH: 24"
GEOTEXTILE (TYP)
2:1 OR FLATTER
29.0'
FILL WITH NATIVE BED MATERIAL
INLET CHANNEL
VARIABLE WIDTH BENCH 0-4' @ 12:1
BED: CLASS II RIPRAP WITHOUT GEOTEXTILE (DEPTH = 2')
OUTLET CHANNEL
-Y_S- STA. 70+45 LT
-Y_S- STA. 71+60 TO 73+25 RT
DETAIL 53
CHANNEL CHANGE
(Not to Scale)
Smooth-Faced Retaining Wall
2' at 1"/Ft.
MIN. 2.5'
4.5'
12-14' at 1"/Ft.
1.5:1
16'
SLOPE PROTECTION CLASS II RIPRAP WITH GEOTEXTILE
CLASS II RIPRAP ON STREAM BED (WITHOUT GEOTEXTILE)
CLASS II RIPRAP SLOPE PROTECTION WITH GEOTEXTILE (BRIDGE ABUTMENT)
Slope = 0.3%
-Y_S- FROM STA. 73+25 TO STA. 74+65 RT
DETAIL 54
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)
Natural Bed Elevation (no geotextile)
2'
Geotextile (banks only)
Channel Bed (Variable)
Length = 22 Ft.
Type of Liner = CL II Rip-Rap - Keyed-In (Banks)
Type of Liner = CL I Rip-Rap - Countersunk (Bed)
-Y_S- STA. 83+65 RT
-Y_S- STA. 94+40 RT
DETAIL 55
CONCRETE DITCH BEHIND NOISE WALL/BARRIER
(Not to Scale)
NOISE WALL /BARRIER
NATURAL GROUND
VARIES
BOND BREAKER
4"
D = 1.0'
B = 2.0'
DETAIL 56
LATERAL BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft.
B = 2.0 Ft.
b = 3.0 Ft.
FROM STA. TO STA.
DETAIL 57
LATERAL BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft.
B = 5.0 Ft.
b = 5.0 Ft.
-Y_S- FROM STA. 117+00 TO STA. 118+50
DETAIL 58
LATERAL BASE DITCH
(Not to Scale)
Min. D = 1.5 Ft.
B = 5.0 Ft.
b = 5.0 Ft.
-Y_S- FROM STA. 118+50 TO STA. 120+80
DETAIL 59a
FALSE SUMP
(Not to Scale)
0.5' Min. 1.0' Max
Outside Ditch Traffic Flow
10:1
20:1
2.0'
GI etc.
S = Ditch Slope
℄ Proposed Ditch
USE WHEN DITCH FLOWS IN DIRECTION OF NEAREST TRAVEL LANE
DETAIL 59b
FALSE SUMP
(Not to Scale)
USE WHEN DITCH FLOWS IN OPPOSITE DIRECTION OF NEAREST TRAVEL LANE
DETAIL 59c
FALSE SUMP
(Not to Scale)
Median Ditch
9"
L (See Chart Below)
20'
Ditch Grade | L | Ditch Grade | L
0.0% To 2.0% | 20' | Over 4.0% To 6.0% | 40'
Over 2.0% To 4.0% | 30' | Over 6.0% | 50'
USE IN MEDIAN DITCHES
DETAIL 60
STANDARD 'V' DITCH
(Not to Scale)
Min. D = 0.67 Ft.
Max. d = 0.67 Ft.
Slope = 7.25%
Length = 62 Ft.
Class B Rip-Rap = 13 tons
GEOTEXTILE = 21 SY
-Y10- FROM STA. 24+00 TO STA. 24+61
DETAIL 65
CHANNEL BLOCK
NOT TO SCALE
FLOW
BACKFILL EXISTING CHANNEL
EXTEND CHANNEL BLOCK MIN. OF 3' BEYOND LIMITS OF EXISTING CHANNEL
MIN. LENGTH
PLAN VIEW
NEW STREAMBANK SHALL BE TREATED AS SPECIFIED IN PLANS
EXTEND CHANNEL BLOCK MIN. OF 2.0' BEYOND INVERT OF EXISTING CHANNEL
CHANNEL INVERT
UNCOMPACTED BACKFILL
5' Min. 1' 10'
1.5' FINISH GRADE
VARIES
COMPACTED BACKFILL
RIP-RAP, CLASS I
MIN 1.0' DEPTH #57 STONE
SECTION A-A
SECTION B-B
NOTES:
1) CHANNEL BLOCK SHALL BE INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
2) BLOCK SHOULD BE INSTALLED AT THE INTERFACE BETWEEN EXISTING CHANNEL AND PROPOSED CHANNEL.
3) BOTTOM OF BLOCK SHOULD BE A MINIMUM OF 2.0' BELOW THE INVERT OF THE EXISTING CHANNEL.
4) BLOCK SHOULD EXTEND A MINIMUM OF 3.0' BEYOND THE LIMITS OF THE EXISTING STREAM CHANNEL.
5) INSTALL EROSION CONTROL MATTING AND SEED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS IMMEDIATELY AFTER GRADING.
6) COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
DETAIL 61
LATERAL BASE DITCH
(Not to Scale)
Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 2 Ft.
b = 5 Ft.
Type of Liner = B Rip-Rap
-Y_RT- FROM STA. 238+50 TO STA. 238+00
DETAIL 62
LATERAL 'V' DITCH
(Not to Scale)
Min. D = 1.0 Ft.
b = 5.0 Ft.
-YRPAC- FROM STA. 36+00 TO STA. 35+70
DETAIL 63
FALSE CUT
(Not to Scale)
N.G./T.B.
Exist. Ditch Bed
W = 5' Min.
-YRPCA- FROM STA. 49+75 TO STA. 50+34
DETAIL 64
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)
1.25'
Channel Bed (0-2 FT)
Length = 16 Ft.
Type of Liner = CL 1 Rip-Rap - Keyed-In
-Y_S- STA. 28+35 RT
-Y_S- STA. 98+12 RT
-Y11- STA. 16+60 LT
DETAIL 65
SPECIAL CUT DITCH
(Not to Scale)
Min. D = 1.5 Ft.
-Y_S- FROM STA. 25+50 TO STA. 26+00
DETAIL 66
STANDARD 'V' DITCH
(Not to Scale)
Min. D = 1.0 Ft.
Slope = 2.5%
Length = 97 Ft.
PSRM = 22 SY
-Y_S- FROM STA. 58+55 TO STA. 59+50
DETAIL 67
STANDARD 'V' DITCH
(Not to Scale)
Min. D = 0.5 Ft.
Slope = 4.44%
Length = 102 Ft.
-Y_S- FROM STA. 60+00 TO STA. 61+00
DETAIL 68
BERM 'V' DITCH
(Not to Scale)
VARIES
Min. D = 1.0 Ft.
b = 2.0 Ft.
-Y_S- FROM STA. 109+00 TO STA. 110+50 LT
DETAIL 69
BERM 'V' DITCH
(Not to Scale)
Min. D = 1.0 Ft.
b = 2.0 Ft.
Max. d = 1.0 Ft.
Type of Liner = CL B Rip-Rap
-Y_S- FROM STA. 107+00 TO STA. 109+00 LT
-Y_S- FROM STA. 110+50 TO STA. 111+90 LT
DETAIL 70
PIPE INLET CHANNEL STABILIZATION
(Not to Scale)
Channel Bed (3 FT)
Length = 12 Ft.
Type of Liner = CL 1 Rip-Rap - Keyed-In
-Y_S- STA. 93+79 LT
DETAIL 71
CHANNEL REPLACING EX. CULVERT
(Not to Scale)
1.5:1
13-25' at 1"/Ft.
5'
17-23' at 1"/Ft.
CLASS II RIPRAP ON BANKS
CLASS II RIPRAP EMBEDDED ON BOTTOM NO GEOTEXTILE
10'
GEOTEXTILE ON BANKS ONLY
CLASS II RIPRAP SLOPE PROTECTION TO EL. 797.0
-L- STA. 149+36
DETAIL 72
SPECIAL CUT DITCH
(Not to Scale)
4:1 or Flatter
Min. D = 1.0 Ft.
-Y_N- FROM STA. 198+50 TO STA. 199+75
-Y_N- FROM STA. 216+50 TO STA. 213+25
6/24/2019
\\prdpwics01\ics_workingdir\16552\282462_87920\I3819_hyd_psh02D.dgn
PRDPWICS01$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2D-3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

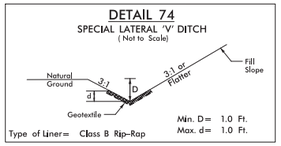
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 73
OUTLET CHANNEL STABILIZATION
(Not to Scale)



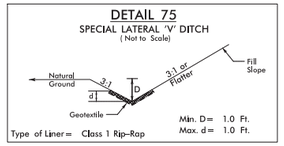
–Y_N– STA. 204+00 RT

DETAIL 74
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



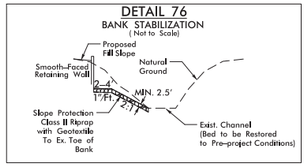
–Y_N– FROM STA. 211+00 TO STA. 211+50 RT

DETAIL 75
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



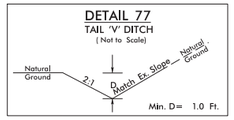
–Y_N– FROM STA. 195+00 TO STA. 197+35 RT

DETAIL 76
BANK STABILIZATION
(Not to Scale)



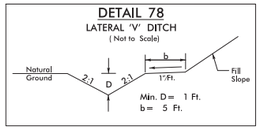
–Y_S– FROM STA. 75+10 TO STA. 84+00 RT

DETAIL 77
TAIL 'V' DITCH
(Not to Scale)



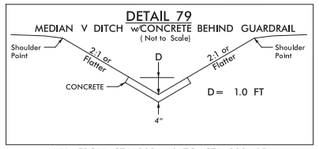
–Y_N– FROM STA. 205+00 TO STA. 206+00

DETAIL 78
LATERAL 'V' DITCH
(Not to Scale)



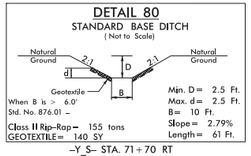
–Y_N– FROM STA. 202+65 TO STA. 204+00

DETAIL 79
MEDIAN V DITCH w/CONCRETE BEHIND GUARDRAIL
(Not to Scale)



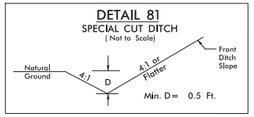
–Y_N– FROM STA. 208+40 TO STA. 209+15
–Y_N– FROM STA. 210+90 TO STA. 211+65

DETAIL 80
STANDARD BASE DITCH
(Not to Scale)



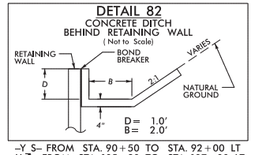
–Y_S– STA. 71+70 RT

DETAIL 81
SPECIAL CUT DITCH
(Not to Scale)



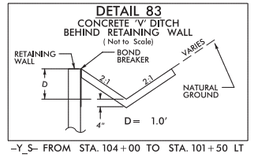
–Y_N– FROM STA. 166+50 TO STA. 167+50 RT

DETAIL 82
CONCRETE DITCH
BEHIND RETAINING WALL
(Not to Scale)



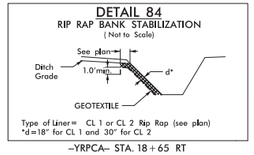
–Y_S– FROM STA. 90+50 TO STA. 92+00 LT
–Y_S– FROM STA. 105+80 TO STA. 107+00 LT
–Y_S– FROM STA. 101+00 TO STA. 105+50 LT
–Y_S– FROM STA. 110+50 TO STA. 112+00 LT
–Y_S– FROM STA. 192+00 TO STA. 198+80 LT

DETAIL 83
CONCRETE 'V' DITCH
BEHIND RETAINING WALL
(Not to Scale)



–Y_S– FROM STA. 104+00 TO STA. 101+50 LT

DETAIL 84
RIP RAP BANK STABILIZATION
(Not to Scale)



–YRPCA– STA. 18+65 RT
–YRPCA– STA. 77+00 RT

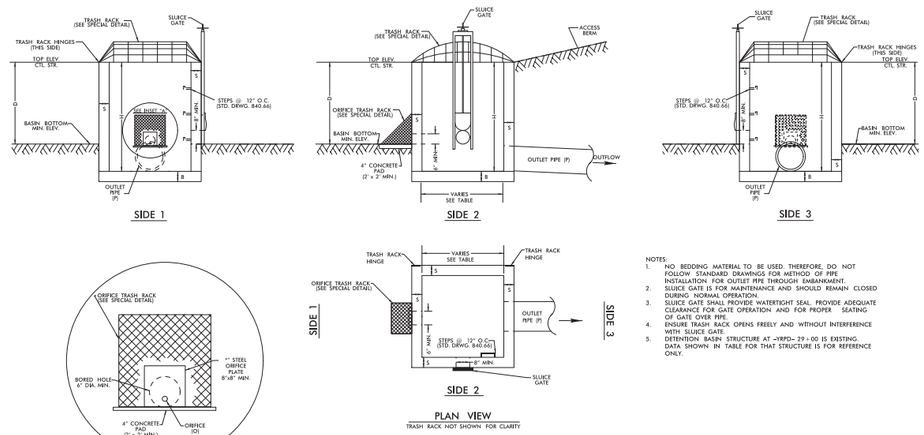
6/24/2019
p:\Projects01\ics_workingdir\16552\282462_87920\I3819_hyd_psh02D.dgn
FHDPW1CS01$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2D-4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRY DETENTION BASIN DRAWDOWN STRUCTURE

NOT TO SCALE



NOTES:
1. NO BEDDING MATERIAL TO BE USED. THEREFORE, DO NOT FOLLOW STANDARD DRAWINGS FOR METHOD OF PIPE INSTALLATION FOR OUTLET PIPE THROUGH EMBANKMENT.
2. SLUICE GATE IS FOR MAINTENANCE AND SHOULD REMAIN CLOSED DURING NORMAL OPERATION.
3. SLUICE GATE SHALL PROVIDE WATERTIGHT SEAL. PROVIDE ADEQUATE CLEARANCE FOR GATE OPERATION AND FOR PROPER SEATING OF GATE OVER PIPE.
4. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATE.
5. DETENTION BASIN STRUCTURE AT -YRPD- 29+00 IS EXISTING. DATA SHOWN IN TABLE FOR THAT STRUCTURE IS FOR REFERENCE ONLY.

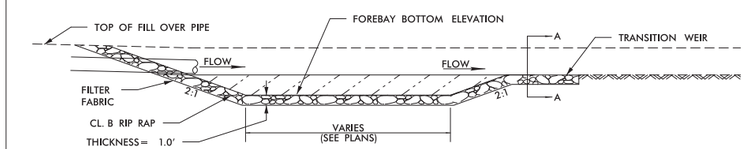
MINIMUM DIMENSIONS FOR DRY DETENTION BASIN DRAWDOWN STRUCTURE

STATION	STRUCTURE NUMBER	S (INCHES) 6" MIN.	B (INCHES) 6" MIN.	BASIN BOTTOM MINIMUM ELEV.	TOP ELEVATION CONTROL STRUCTURE	MAX. STORAGE DEPTH(D) FEET	INV. ELEV. CTL. STR.	CTL. STR. DIMENSIONS (W x L x H)	ORIFICE DIAMETER (O) INCHES	ORIFICE INV. ELEV.	OUTLET PIPE DIAMETER(P) INCHES
127+50 -L- LT		6"	6"	828.0'	829.5'	1.5'	827.36'	3' x 3' x 2.35'	2"	828.0'	18"
156+00 -Y N- RT		6"	6"	857.0'	858.5'	1.5'	853.5'	3' x 3' x 4.05'	3"	857.0'	24"
29+00 -YRPD- LT		6" (EXISTING)	6" (EXISTING)	794.75' (EX)	801.2' (EX)	4.2' (EX)	792.75' (EX)	5' x 5' x 8.45' (EX)	2" (EX)	797.0' (EX)	48" (EX)
37+50 -Y S- RT		6"	6"	873.0'	875.5'	2.5'	870.0'	4' x 4' x 5.5'	1"	873.0'	15"
40+00 -Y S- LT		6"	6"	866.0'	868.5'	2.5'	863.0'	4' x 4' x 5.5'	2"	866.0'	18"
44+00 -Y S- RT		6"	6"	865.0'	867.5'	2.5'	862.0'	4' x 4' x 5.5'	2"	865.0'	24"
66+00 -Y S- LT		6"	6"	799.0'	800.5'	1.5'	796.3'	5.5' x 5.5' x 4.2'	3"	799.0'	36"
69+00 -Y S- RT		6"	6"	804.0'	805.50'	1.5'	802.0'	5' x 5' x 3.5'	2"	804.0'	24"
80+00 -Y S- LT		6"	6"	794.5'	797.0'	2.5'	791.8'	4' x 4' x 5.2'	2"	794.0'	24"
92+00 -Y S- RT		6"	6"	781.0'	783.0'	2.0'	780.1'	4' x 4' x 2.9'	2"	781'	30"

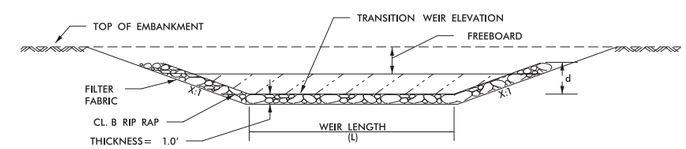
DETAIL ?

FOREBAY

(Not to Scale)



PROFILE VIEW



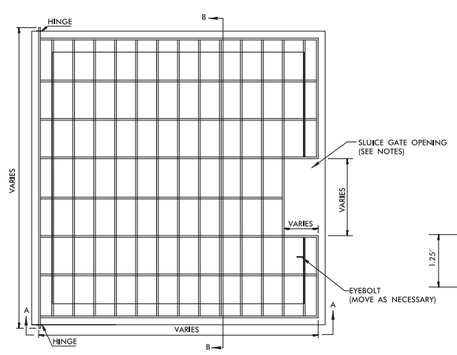
SECTION A-A
"TRANSITION BERM CROSS-SECTION"

MINIMUM DIMENSIONS FOR FOREBAY

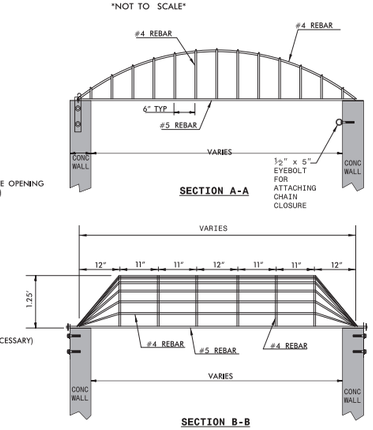
LOCATION	FOREBAY BOTTOM ELEV.	TRANSITION WEIR ELEV.	TRANSITION WEIR LENGTH (L)	WEIR SIDE SLOPES (X:1)	d
?	?	?	?	?	?
?	?	?	?	?	?
?	?	?	?	?	?
?	?	?	?	?	?
?	?	?	?	?	?
?	?	?	?	?	?
?	?	?	?	?	?

REMOVABLE ORIFICE TRASH RACK

NOT TO SCALE

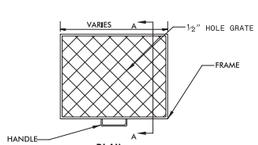


PLAN

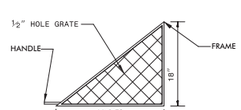


REBAR TRASH RACK
NOT TO SCALE

RISER TRASH RACK NOTES:
1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A 1/4" BEAD.
2. IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
3. EYEBOLT FOR CHAIN CLOSURE SHALL BE INSTALLED BY THE SAME METHOD AS THE HINGE PLATE BOLTS.
4. RACK AND HARDWARE SHALL BE ALUMINUM OR REBAR AND GALVANIZED IN ACCORDANCE WITH ASTM A-153.
5. PROVIDE OPENING IN TRASH RACK TO ACCOMODATE SLUICE GATE ON THE OUTLET PIPE. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATES.



PLAN



SECTION A-A

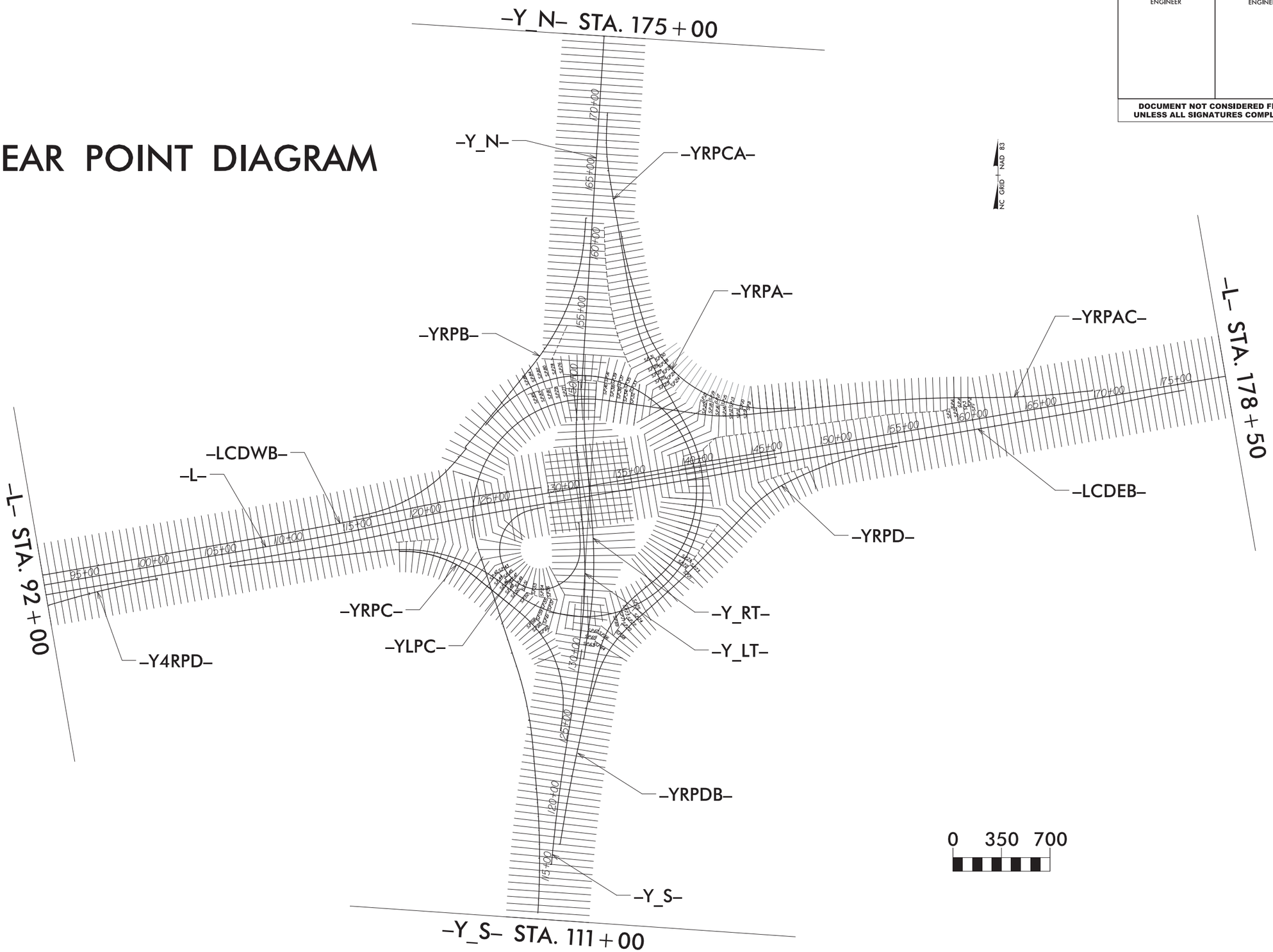
ORIFICE TRASH RACK NOTES:
1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A 1/4" BEAD.
2. IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
3. REMOVEABLE ORIFICE TRASH RACK SHALL BE ATTACHED TO CONCRETE BOX BY HINGE OR SLIDE RAIL SYSTEM.
4. RACK AND HARDWARE SHALL BE ALUMINUM OR GALVANIZED IN ACCORDANCE WITH ASTM A-153.

6/24/2019
pw:\\pwdenas01\ics_workingdir\16552\282462_87920\13819_hyd_psh02D.dgn
PROFICIO 2018

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2E-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SHEAR POINT DIAGRAM



5/7/2019
\\prdpwics01\ics_workingdir\11232\282440_268514\13819_Shear Point Diagram.dgn
PRDPWICS01$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NC GRID NAD 83/95

-Y_LT-				
PI Sta 334+86.61 Δ = 8° 29' 43.8" (LT) D = 1° 54' 35.5" L = 444.55' T = 222.82' R = 3,000.00' SE = 06 DS = 60 MPH	PIs Sta 337+98.63 Θs = 2° 34' 41.9" Ls = 270.00' LT = 180.02' ST = 90.02'	PIs Sta 344+90.12 Θs = 2° 57' 48.9" Ls = 240.00' LT = 160.02' ST = 80.02'	PI Sta 346+17.20 Δ = 2° 19' 17.0" (RT) D = 2° 28' 10.7" L = 94.00' T = 47.00' R = 2,320.00' SE = 06 DS = 60 MPH	PIs Sta 347+44.11 Θs = 2° 57' 48.9" Ls = 240.00' LT = 160.02' ST = 80.02'

-Y_RT-				
PI Sta 235+92.32 Δ = 10° 09' 59.7" (LT) D = 1° 54' 35.5" L = 525.34' T = 263.34' R = 3,000.00' SE = 06 DS = 60 MPH	PIs Sta 239+20.99 Θs = 1° 54' 35.5" Ls = 200.00' LT = 133.34' ST = 66.67'	PIs Sta 246+30.11 Θs = 2° 57' 03.1" Ls = 240.00' LT = 160.02' ST = 80.02'	PI Sta 247+61.90 Δ = 2° 32' 51.6" (RT) D = 2° 23' 33.6" L = 103.60' T = 51.81' R = 2,330.00' SE = 06 DS = 60 MPH	

-YLPC-		
PIs Sta 11+98.97 Θs = 15° 48' 20.6" Ls = 160.00' LT = 107.09' ST = 53.72'	PIs Sta 24+80.77 Θs = 15° 48' 20.6" Ls = 160.00' LT = 107.09' ST = 53.72'	PI Sta 18+44.08 Δ = 2.32° 10' 52.4" (RT) D = 19° 45' 25.8" L = 117.51' T = 59.02' R = 290.00' SE = 06 DS = 30 MPH

-YRPDB-	
PI Sta 558+84.78 Δ = 18° 48' 35.0" (LT) D = 6° 52' 40.7" L = 2,643.26' T = 1,327.40.87' R = 833.00' SE = 06 DS = 50 MPH	PIs Sta 58+35.20 Θs = 4° 57' 08.4" Ls = 144.00' LT = 96.04' ST = 48.03'

-YRPB-		
PI Sta 344+24.03 Δ = 28° 05' 01.8" (RT) D = 5° 04' 13.5" L = 553.98' T = 282.68' R = 1,130.00' DS = 50 MPH SE = EXIST.(0.06)	PIs Sta 37+66.24 Θs = 17° 01' 18.7" Ls = 9° 04' 15.0" Ls = 200.00' LT = 129.22' ST = 70.00'

-L-		
PI Sta 113+49.69 Δ = 2° 38' 12.7" (LT) D = 0° 20' 13.3" L = 782.37' T = 391.26' R = 17,000.00' SE = NC DS = 60 MPH	PI Sta 121+74.06 Δ = 2° 38' 12.7" (RT) D = 0° 20' 13.3" L = 782.37' T = 391.26' R = 17,000.00' SE = NC DS = 60 MPH	

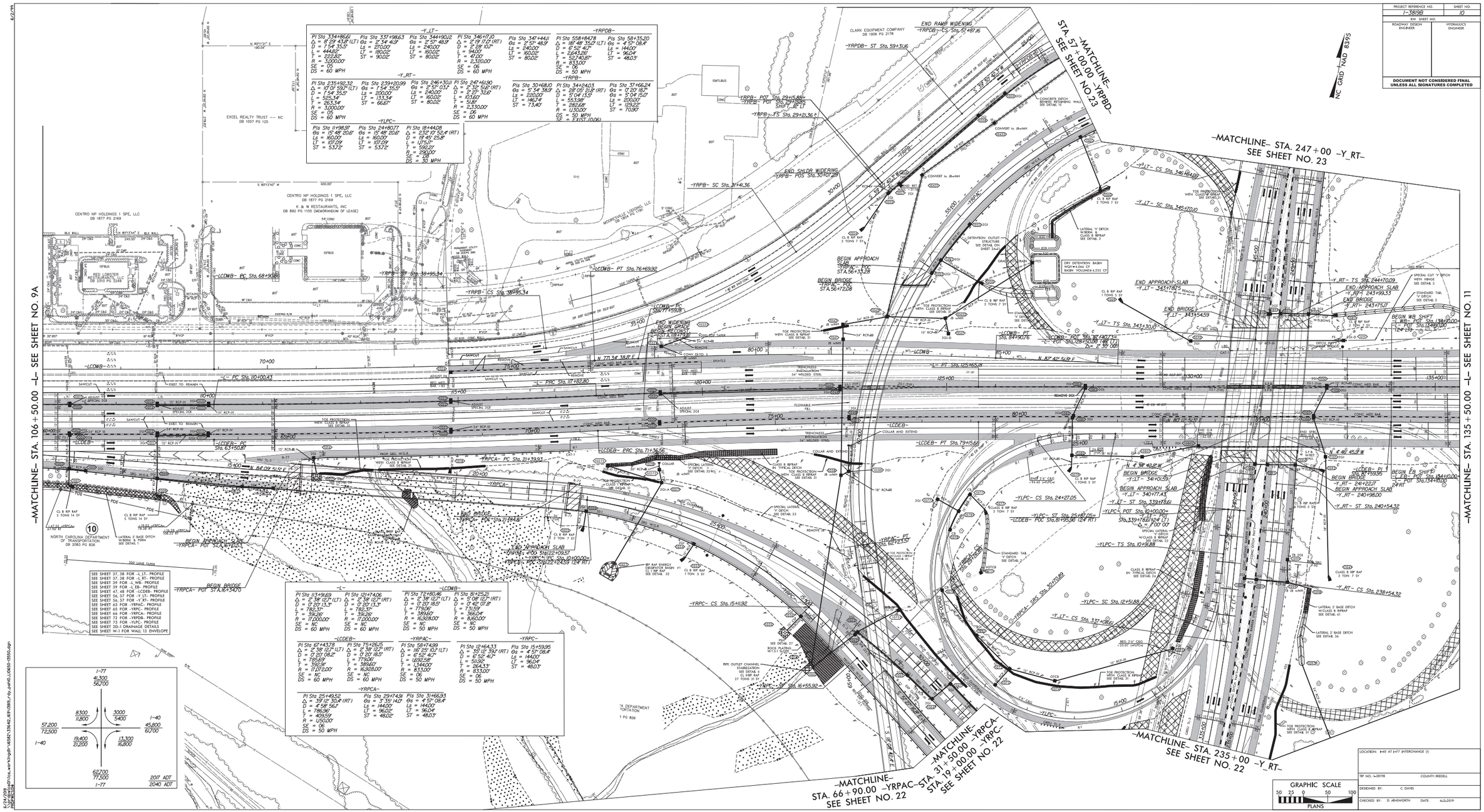
-LCDWB-		
PI Sta 72+80.46 Δ = 2° 38' 12.7" (LT) D = 0° 20' 18.5" L = 779.06' T = 389.60' R = 16,928.00' SE = NC DS = 50 MPH	PI Sta 81+25.21 Δ = 5° 08' 12.7" (RT) D = 0° 42' 01.8" L = 731.59' T = 366.04' R = 8,180.00' SE = NC DS = 50 MPH	

-LCDEB-		
PI Sta 67+43.78 Δ = 2° 38' 12.7" (LT) D = 0° 20' 08.2" L = 785.69' T = 392.91' R = 17,077.00' SE = NC DS = 60 MPH	PI Sta 75+26.15 Δ = 2° 38' 12.7" (RT) D = 0° 20' 18.5" L = 779.06' T = 389.60' R = 16,928.00' SE = NC DS = 60 MPH	

-YRPAC-		
PI Sta 58+74.99 Δ = 116° 25' 10.1" (LT) D = 6° 52' 40.7" L = 1,692.58' T = 1,344.00' R = 833.00' SE = 06 DS = 50 MPH	PI Sta 121+64.33 Δ = 35° 12' 39.1" (RT) D = 6° 52' 40.7" L = 510.82' T = 264.33' R = 833.00' SE = 06 DS = 50 MPH	

-YRPC-		
PI Sta 15+59.95 Θs = 4° 57' 08.4" Ls = 144.00' LT = 96.04' ST = 48.03'		

-YRPCA-		
PI Sta 25+49.52 Δ = 39° 12' 30.4" (RT) D = 4° 58' 56.1" L = 786.96' T = 409.59' R = 1,150.00' SE = 06 DS = 50 MPH	PIs Sta 29+74.91 Θs = 3° 39' 14.0" Ls = 144.00' LT = 96.02' ST = 48.02'	PIs Sta 31+66.93 Θs = 4° 57' 08.4" Ls = 144.00' LT = 96.04' ST = 48.03'



LOCATION: I-40 AT I-77 INTERCHANGE (I)

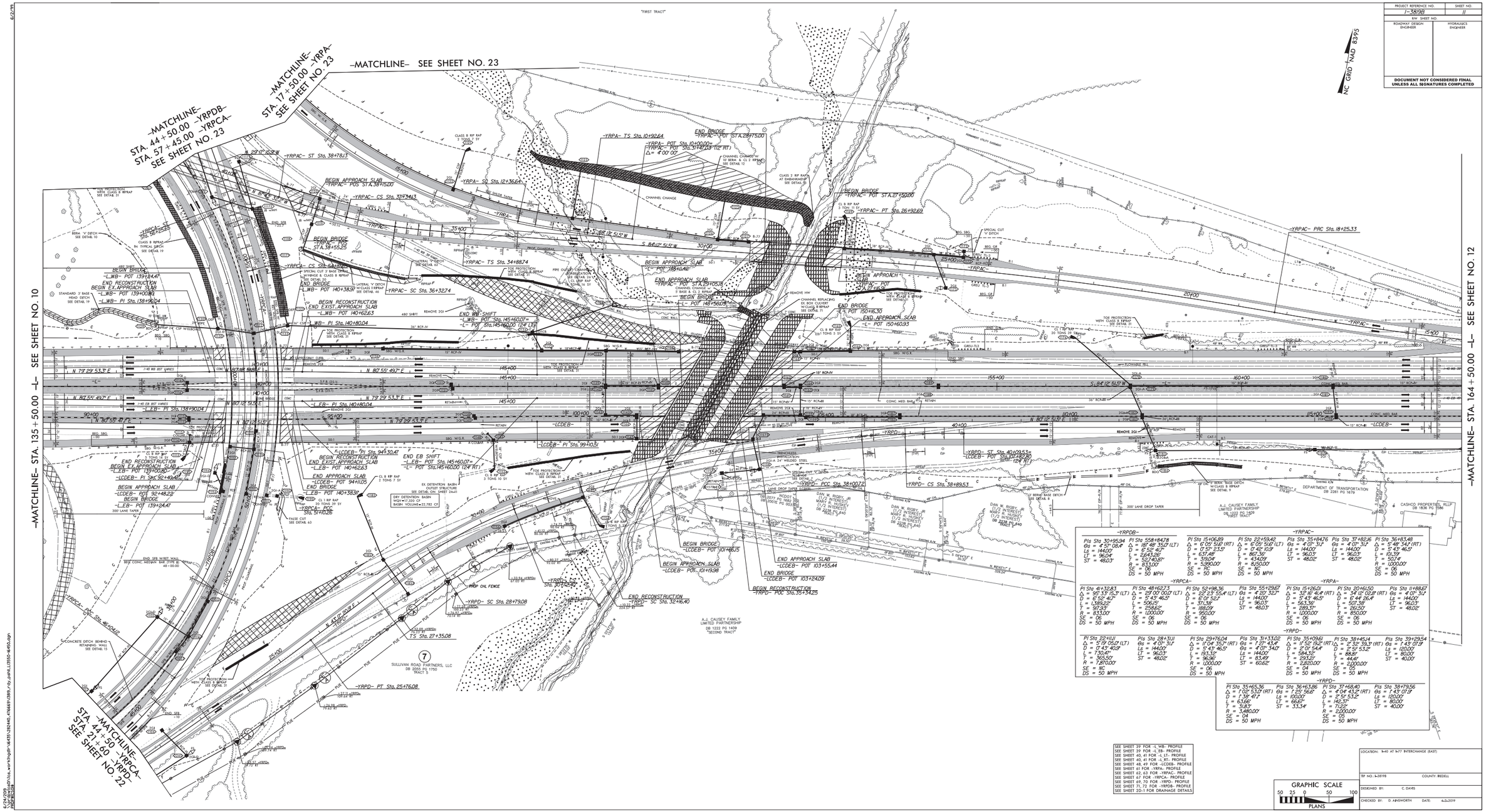
TIP NO. I-3819B COUNTY: IREDELL

DESIGNED BY: C. DAVIS

CHECKED BY: D. ARNSWORTH DATE: 4-3-2019

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SEE SHEET 39' FOR -L- WB- PROFILE
SEE SHEET 39' FOR -L- EB- PROFILE
SEE SHEET 40, 41 FOR -L, LT- PROFILE
SEE SHEET 40, 41 FOR -L, RT- PROFILE
SEE SHEET 48, 49 FOR -LCDEB- PROFILE
SEE SHEET 61 FOR -YRPA- PROFILE
SEE SHEET 62, 63 FOR -YRPAC- PROFILE
SEET SHEET 67 FOR -YRPCA- PROFILE
SEET SHEET 69, 70 FOR -YRPD- PROFILE
SEET SHEET 71, 72 FOR -YRPDB- PROFILE
SEET SHEET 20-1 FOR DRAINAGE DETAILS

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: I-40 AT I-77 INTERCHANGE (EAST)

TIP NO.: I-3819B COUNTY: IREDELL

DESIGNED BY: C. DAVIS

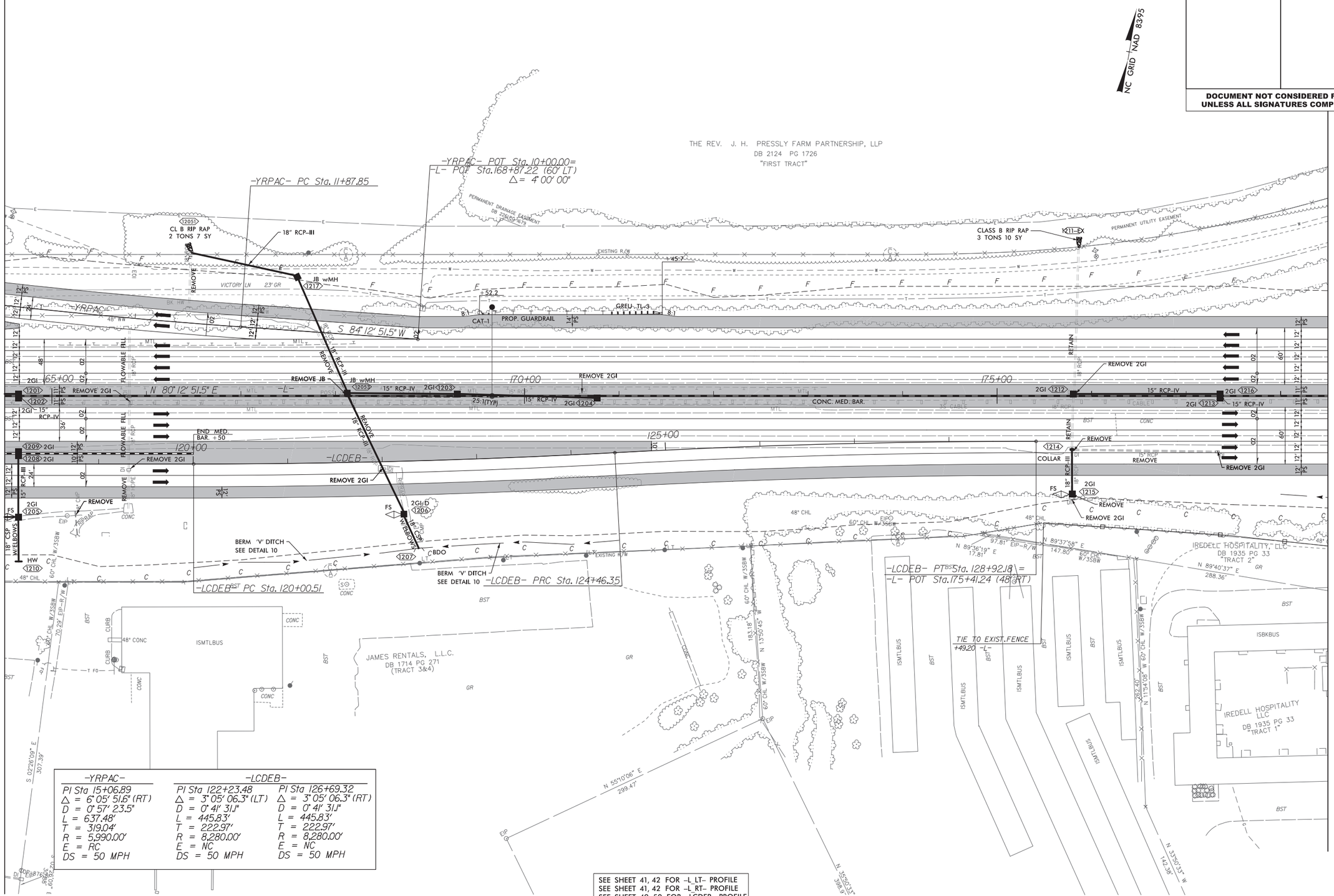
CHECKED BY: D. AINSWORTH DATE: 4-3-2019

K:234\2609
ainsworth\Use_work\hydr\I-3819B\I-3819_rdy_pshtl_L13550-B450.dgn

LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

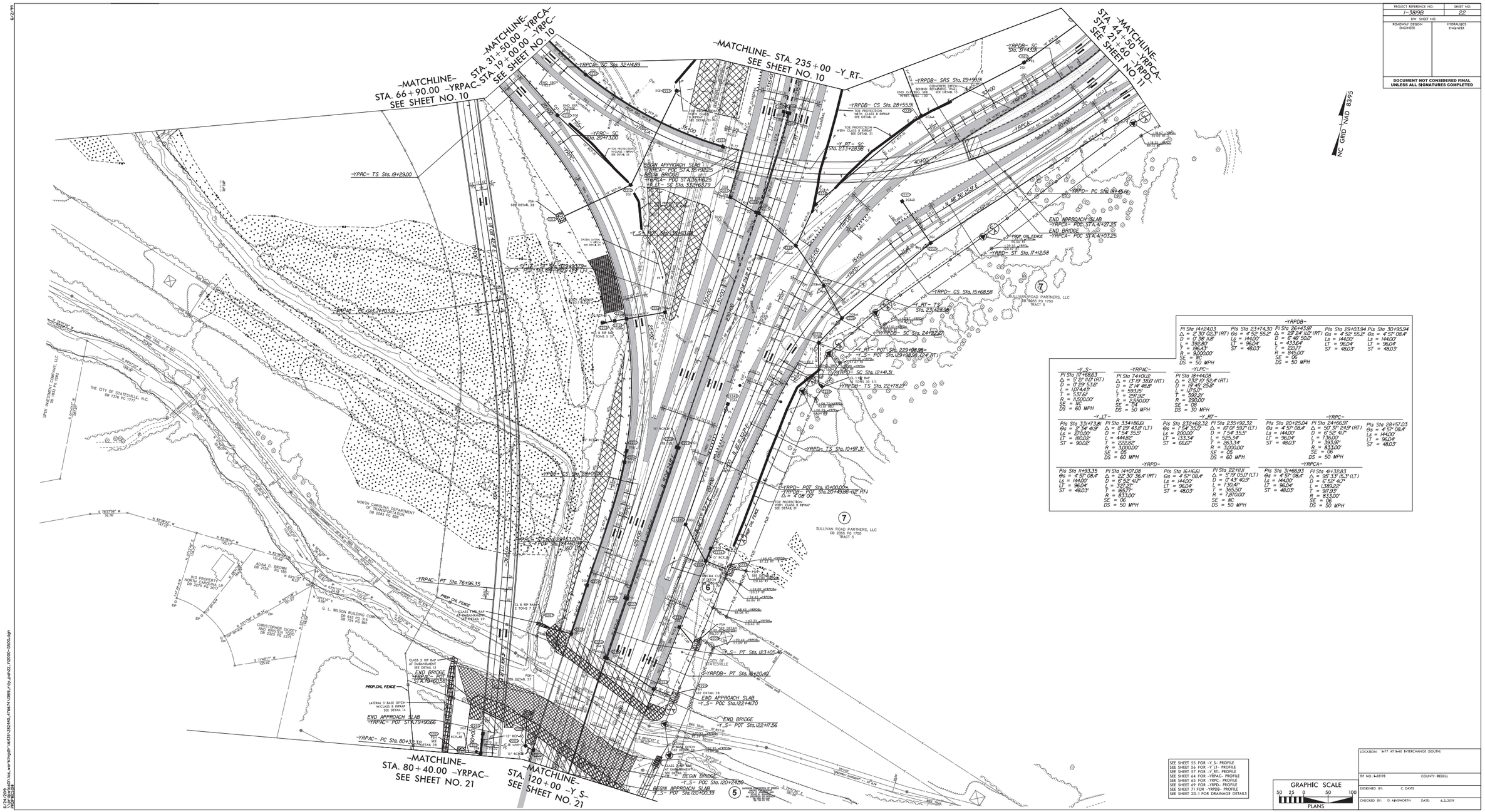


-YRPAC-	-LCDEB-	
PI Sta 15+06.89	PI Sta 122+23.48	PI Sta 126+69.32
Δ = 6° 05' 51.6" (RT)	Δ = 3° 05' 06.3" (LT)	Δ = 3° 05' 06.3" (RT)
D = 0° 57' 23.5"	D = 0° 41' 31.1"	D = 0° 41' 31.1"
L = 637.48'	L = 445.83'	L = 445.83'
T = 319.04'	T = 222.97'	T = 222.97'
R = 5,990.00'	R = 8,280.00'	R = 8,280.00'
E = RC	E = NC	E = NC
DS = 50 MPH	DS = 50 MPH	DS = 50 MPH

6/24/2019
R:\Roadways\Divisions\Hydraulics\Hydraulics_Unit\Projects\I-3819B\Roadway\Plans\I3819_rdy_psh12_L16450-17850.dgn

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SEE SHEET 55 FOR ~Y S~ PROFILE
SEE SHEET 56 FOR ~Y LT~ PROFILE
SEE SHEET 57 FOR ~Y RT~ PROFILE
SEE SHEET 64 FOR ~YRPAC~ PROFILE
SEE SHEET 65 FOR ~YRPC~ PROFILE
SEET SHEET 69 FOR ~YRPD~ PROFILE
SEE SHEET 71 FOR ~YRPDB~ PROFILE
SEE SHEET 20-1 FOR DRAINAGE DETAILS

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: I-77 AT I-40 INTERCHANGE (SOUTH)

TIP NO. I-3819B COUNTY: IREDELL

DESIGNED BY: C. DAVIS

CHECKED BY: D. AINSWORTH DATE: 4-3-2019

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PW:PW01SW
6/21/2019

PROJECT REFERENCE NO.	SHEET NO.
I-3898B	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-YRPA-

PI Sta 20+16.50	PIs Sta 23+55.41	PIs Sta 26+70.22	PIs Sta 29+76.95
Δ = 34°12' 02.8" (RT)	Θs = 4° 57' 11.8"	Θs = 0° 57' 17.2"	Θs = 0° 57' 17.2"
D = 6° 44' 36.4"	Ls = 144.00'	Ls = 100.00'	Ls = 100.00'
L = 507.38'	LT = 96.04'	LT = 66.67'	LT = 66.67'
T = 261.50'	ST = 48.03'	ST = 33.33'	ST = 33.33'
R = 850.00'			
SE = 06			
DS = 50 MPH			

-YRPDB-

PI Sta 23+20.56
Δ = 175° 16' 31.2" (LT)
D = 6° 52' 41.2"
L = 2,548.28'
T = 20,192.61'
R = 833.00'
SE = 06
DS = 50 MPH

-Y_LT-

PIs Sta 34+44.11
Θs = 2° 57' 48.9"
Ls = 240.00'
LT = 160.02'
ST = 80.02'

-YRPB-

PIs Sta 11+33.36	PI Sta 16+41.24	PIs Sta 21+30.12
Θs = 3° 22' 13.2"	Δ = 29° 06' 02.4" (RT)	Θs = 3° 22' 13.2"
Ls = 200.00'	D = 3° 22' 13.2"	Ls = 200.00'
LT = 133.36'	L = 863.43'	LT = 133.36'
ST = 66.69'	T = 441.24'	ST = 66.69'
	R = 1,700.00'	
	SE = E.I.C.T.	
	DS = 50 MPH	

-YRPCA-

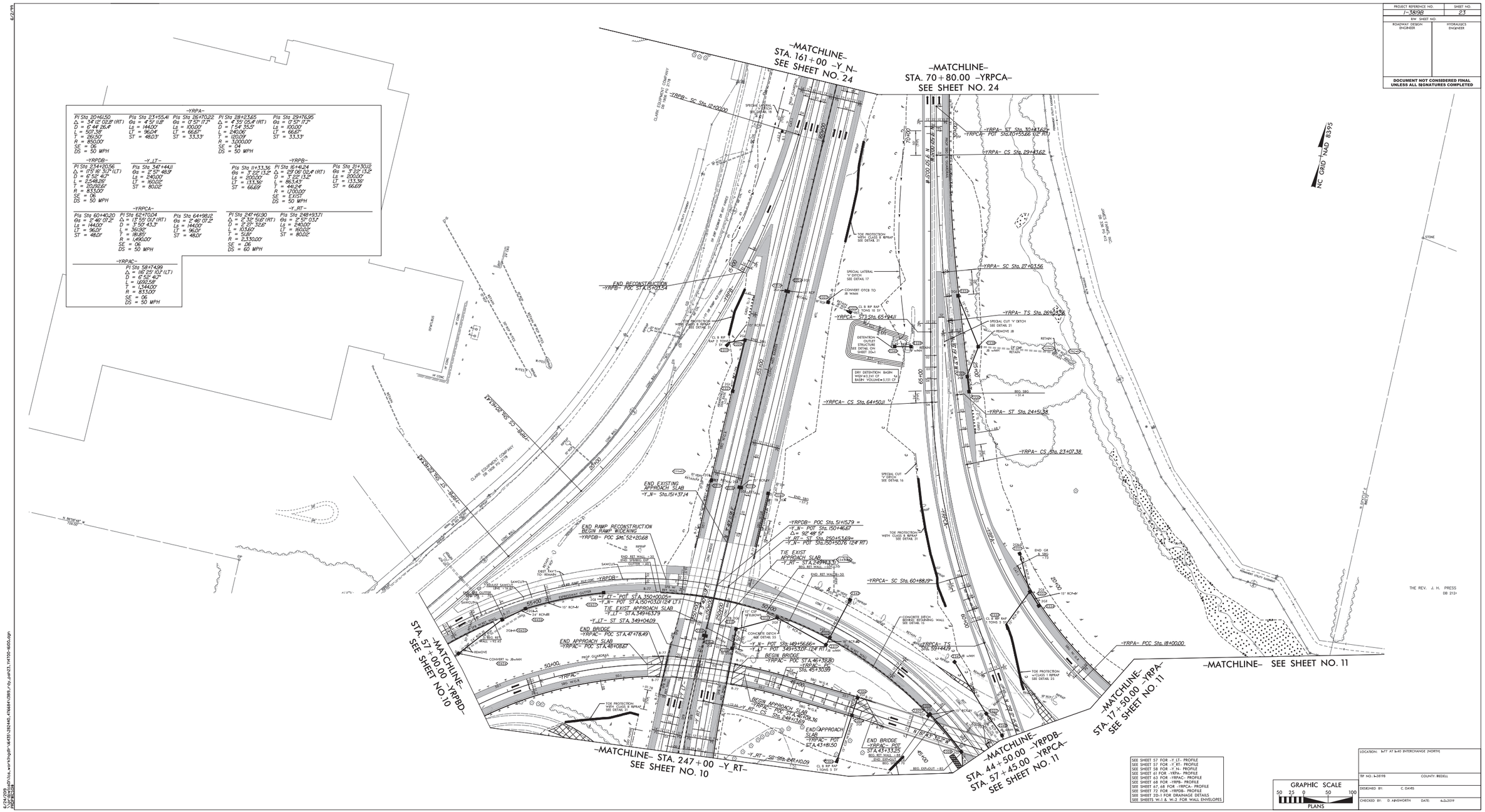
PIs Sta 60+40.20	PI Sta 62+70.04	PIs Sta 64+98.12	
Θs = 2° 46' 01.2"	Δ = 13° 55' 01.1" (RT)	Θs = 2° 46' 01.2"	
Ls = 144.00'	D = 3° 50' 43.3"	Ls = 144.00'	
LT = 96.01'	L = 361.92'	LT = 96.01'	
ST = 48.01'	T = 181.85'	ST = 48.01'	
	R = 1,490.00'		
	SE = 06		
	DS = 50 MPH		

-Y_RT-

PI Sta 241+61.90	PIs Sta 248+93.71
Δ = 2° 32' 51.6" (RT)	Θs = 2° 57' 03.1"
D = 2° 27' 13.6"	Ls = 240.00'
L = 103.60'	LT = 160.02'
T = 51.81'	ST = 80.02'
R = 2,330.00'	
SE = 06	
DS = 60 MPH	

-YRPAC-

PI Sta 58+17.49
Δ = 116° 25' 10.2" (LT)
D = 6° 52' 41.2"
L = 1,692.58'
T = 1,344.00'
R = 833.00'
SE = 06
DS = 50 MPH



SEE SHEET 57 FOR -Y_LT- PROFILE
SEE SHEET 57 FOR -Y_RT- PROFILE
SEE SHEET 58 FOR -Y_N- PROFILE
SEE SHEET 61 FOR -YRPA- PROFILE
SEE SHEET 63 FOR -YRPAC- PROFILE
SEE SHEET 66 FOR -YRPB- PROFILE
SEE SHEET 67, 68 FOR -YRPCA- PROFILE
SEE SHEET 72 FOR -YRPDB- PROFILE
SEE SHEET 20-1 FOR DRAINAGE DETAILS
SEE SHEETS W-1 & W-2 FOR WALL ENVELOPES

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: I-77 AT I-40 INTERCHANGE (NORTH)	
TIP NO. I-3898B	COUNTY: IREDELL
DESIGNED BY: C. DAVIS	
CHECKED BY: D. AINSWORTH	DATE: 4-5-2019

6/24/2019
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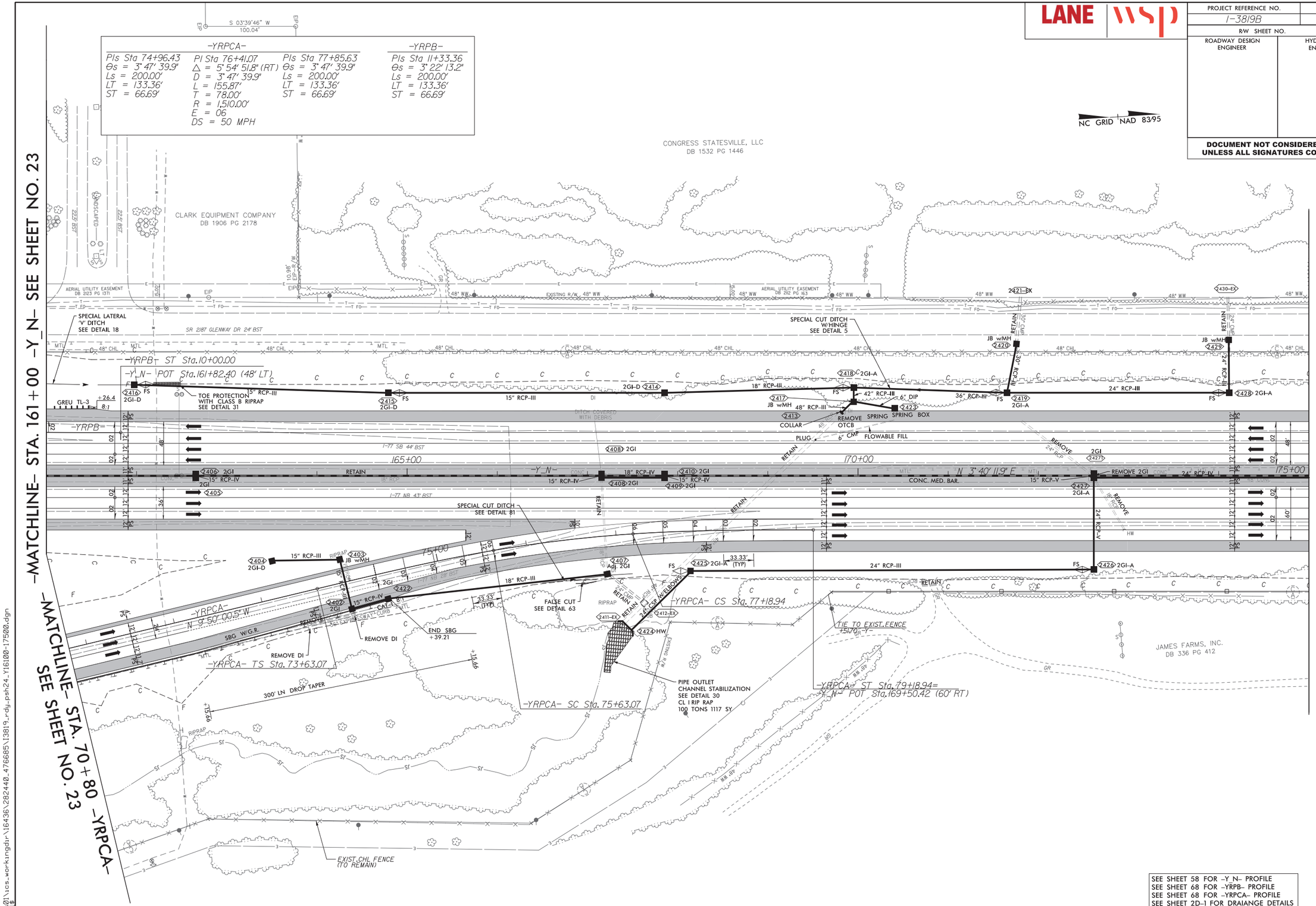
ASHEWORTH

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SEE SHEET 58 FOR -Y_N- PROFILE
SEE SHEET 68 FOR -YRPB- PROFILE
SEE SHEET 68 FOR -YRPCA- PROFILE
SEE SHEET 2D-1 FOR DRAIANGE DETAILS

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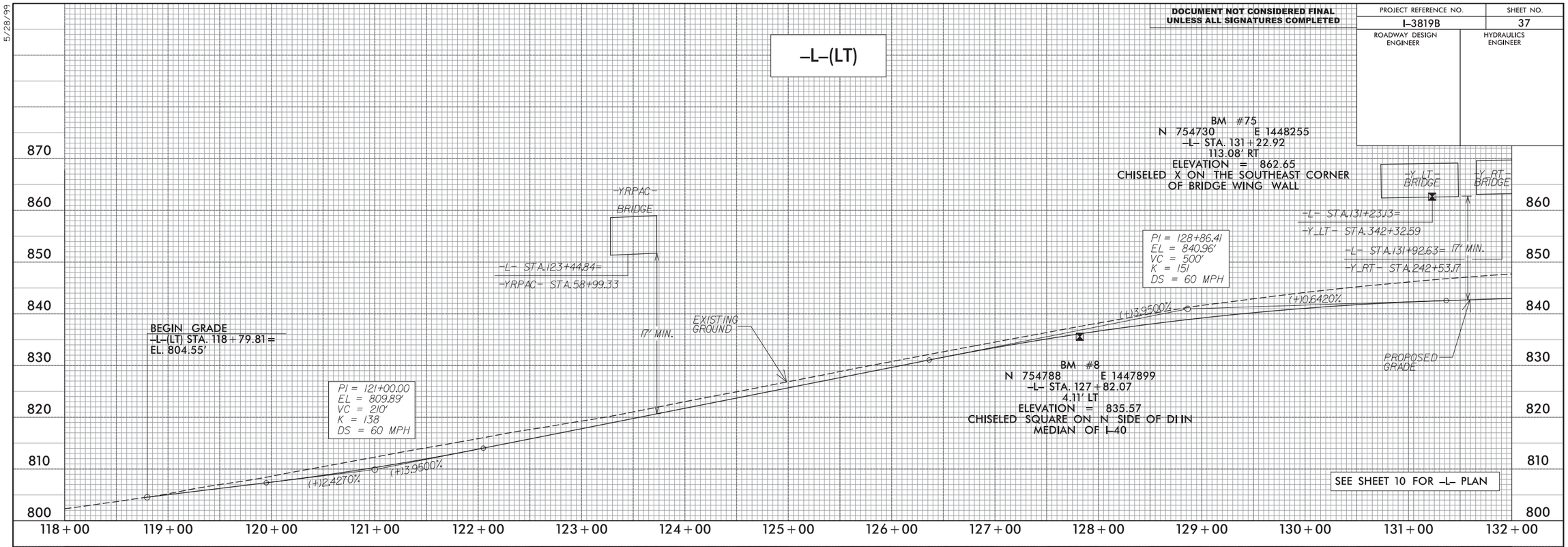
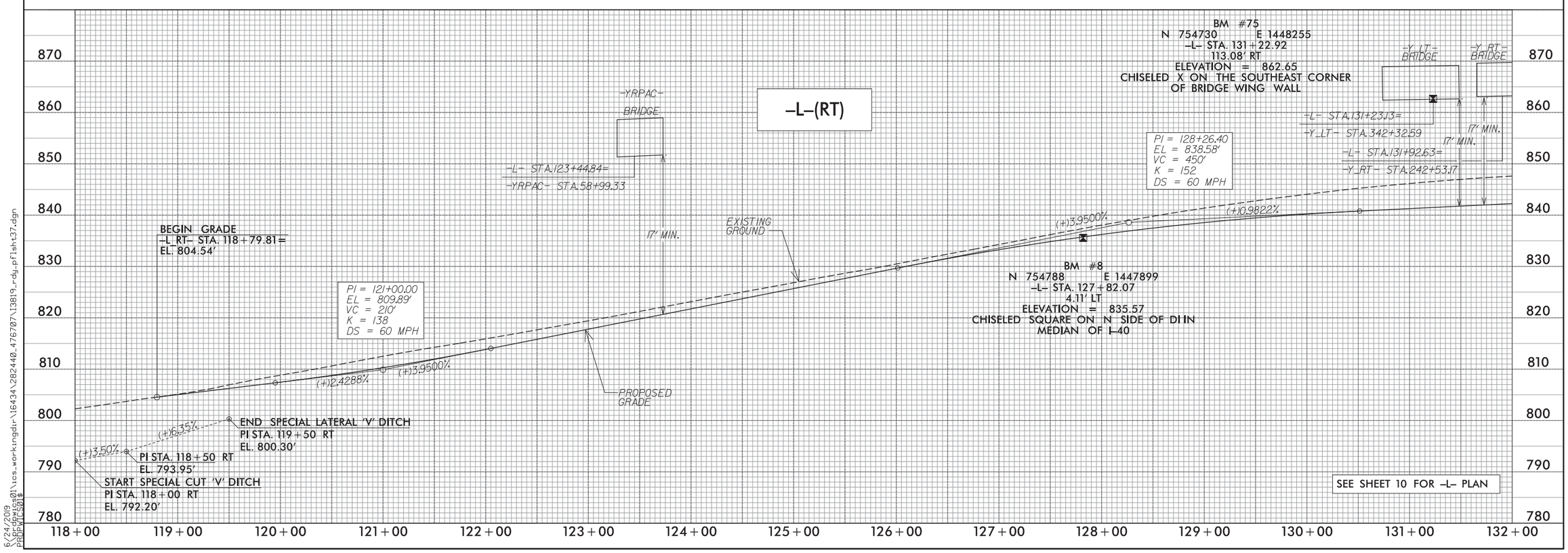
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	37
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER





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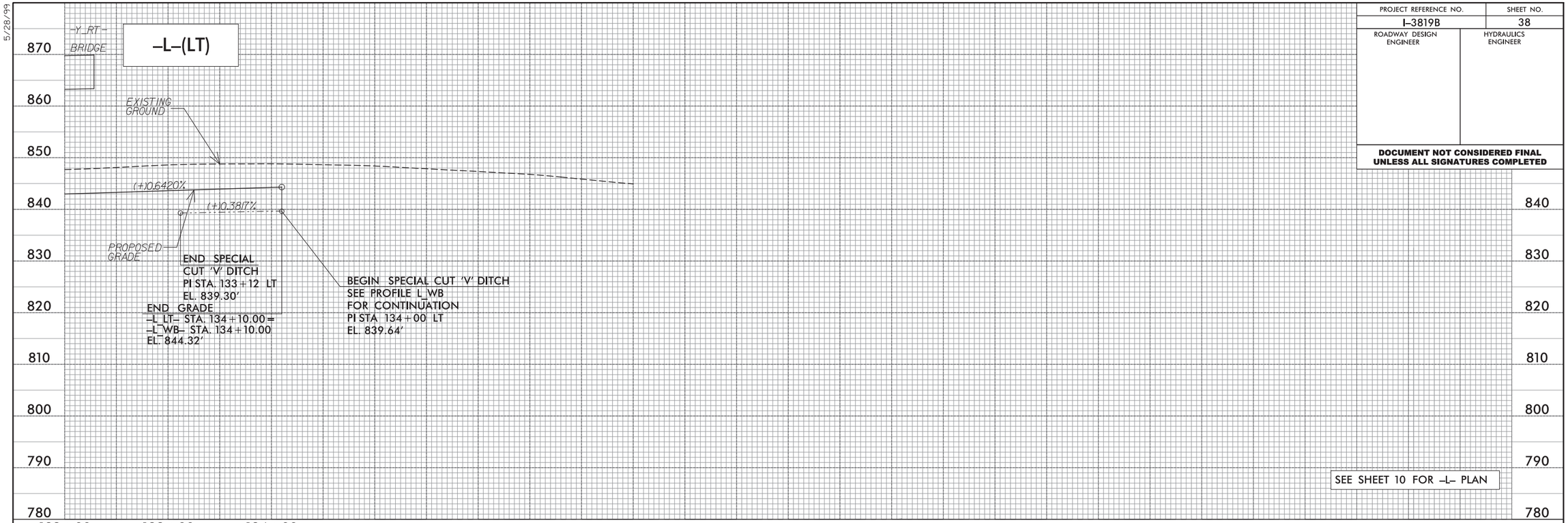
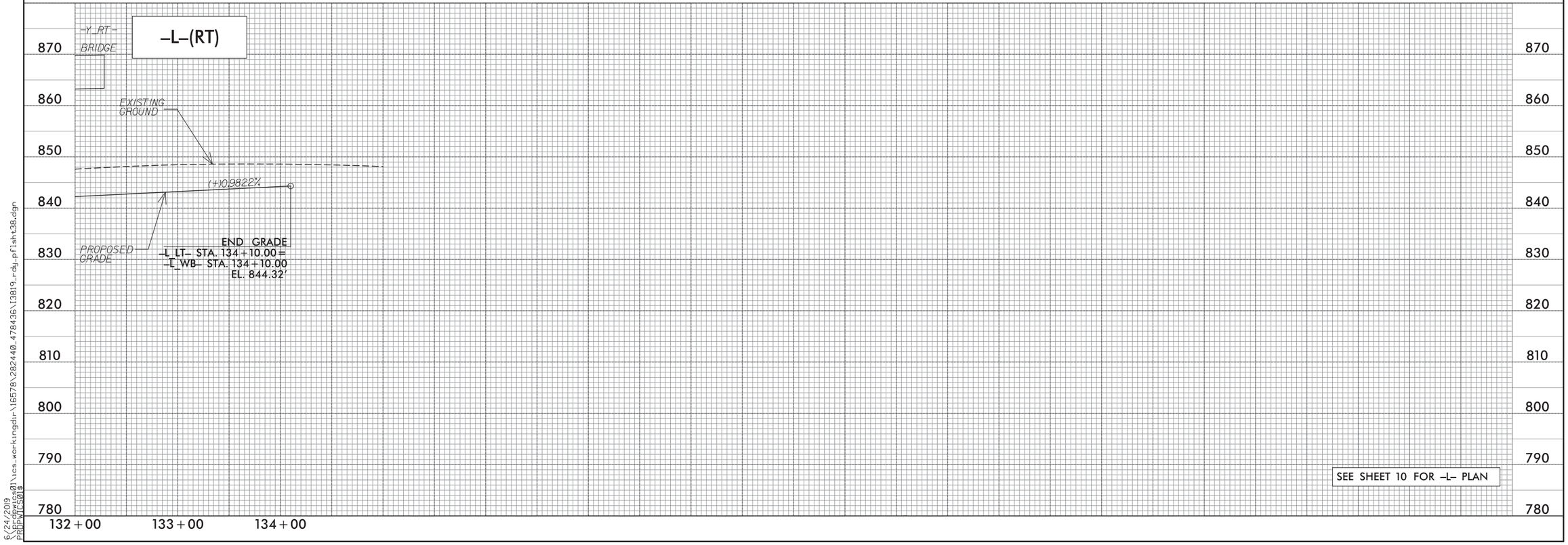
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	38
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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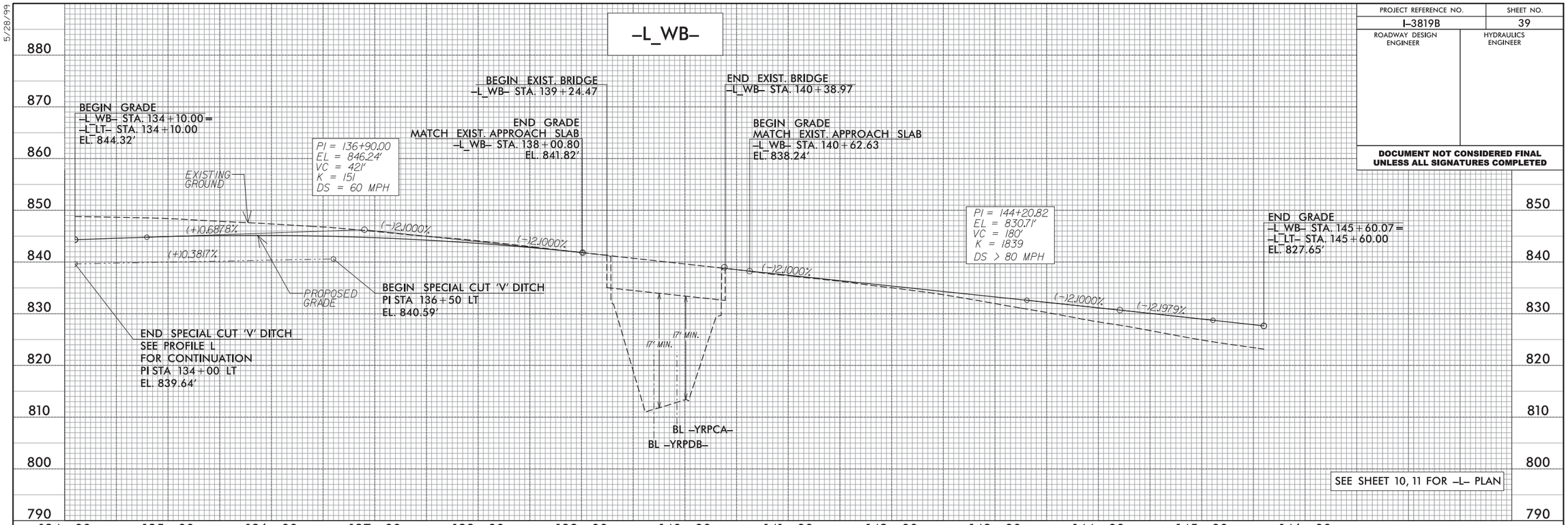
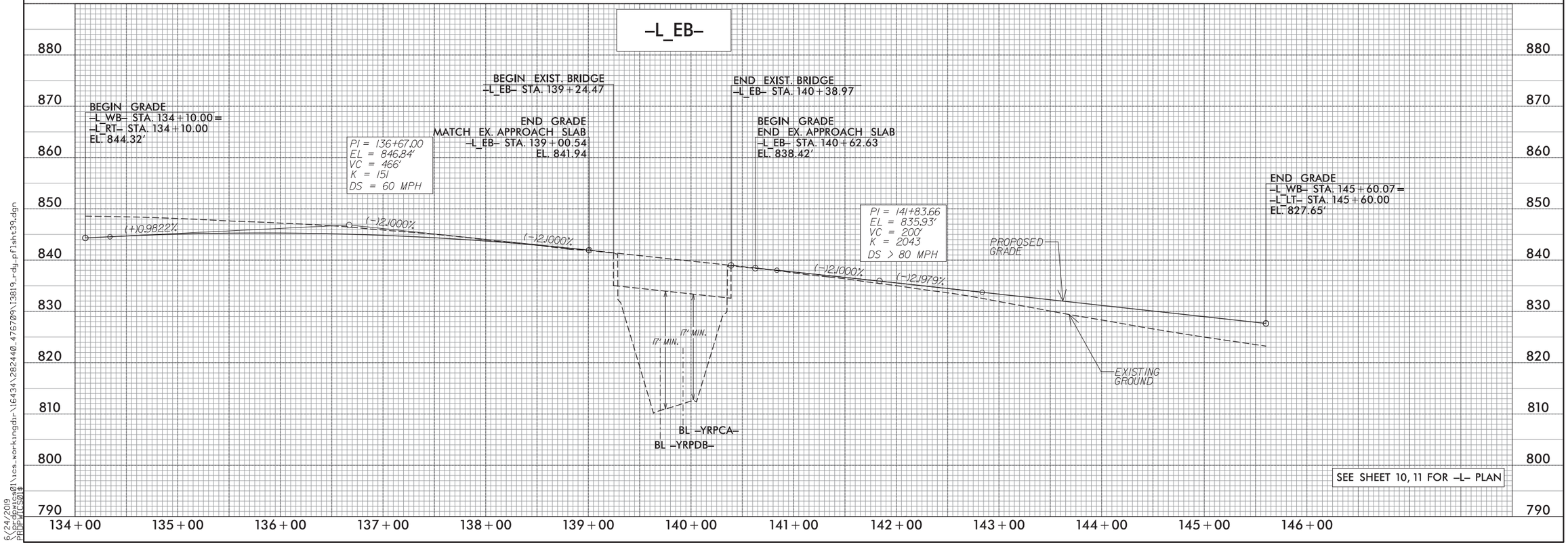
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	39
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	40
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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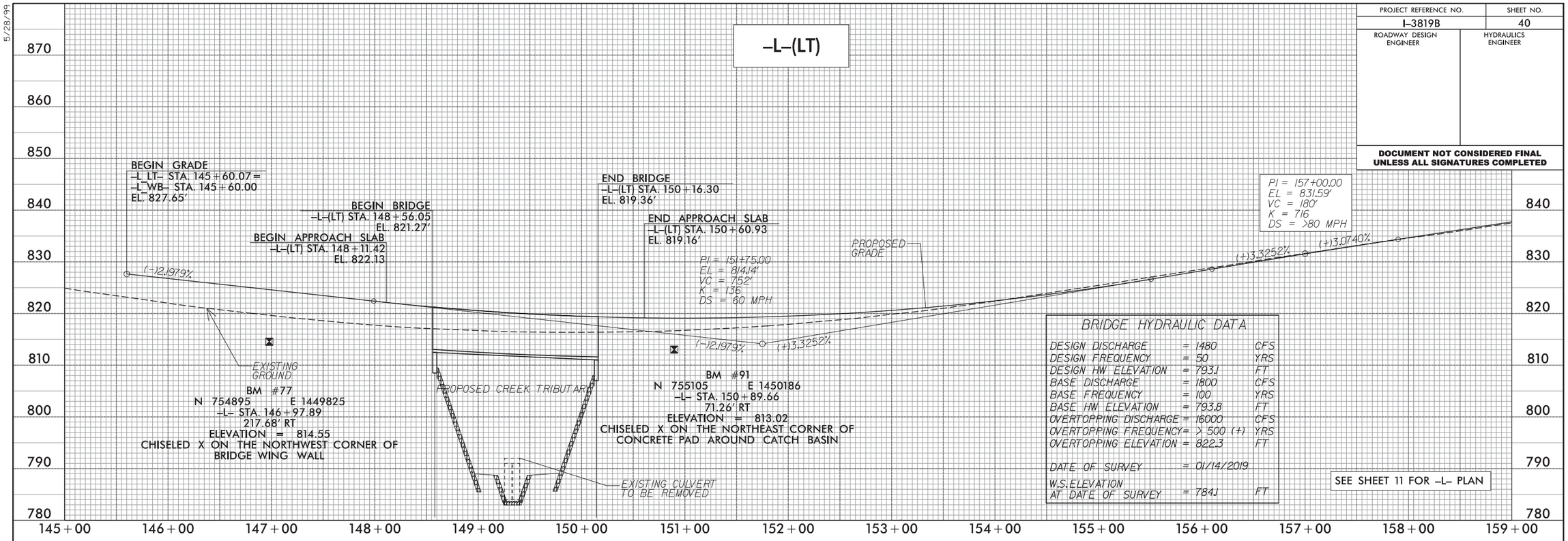

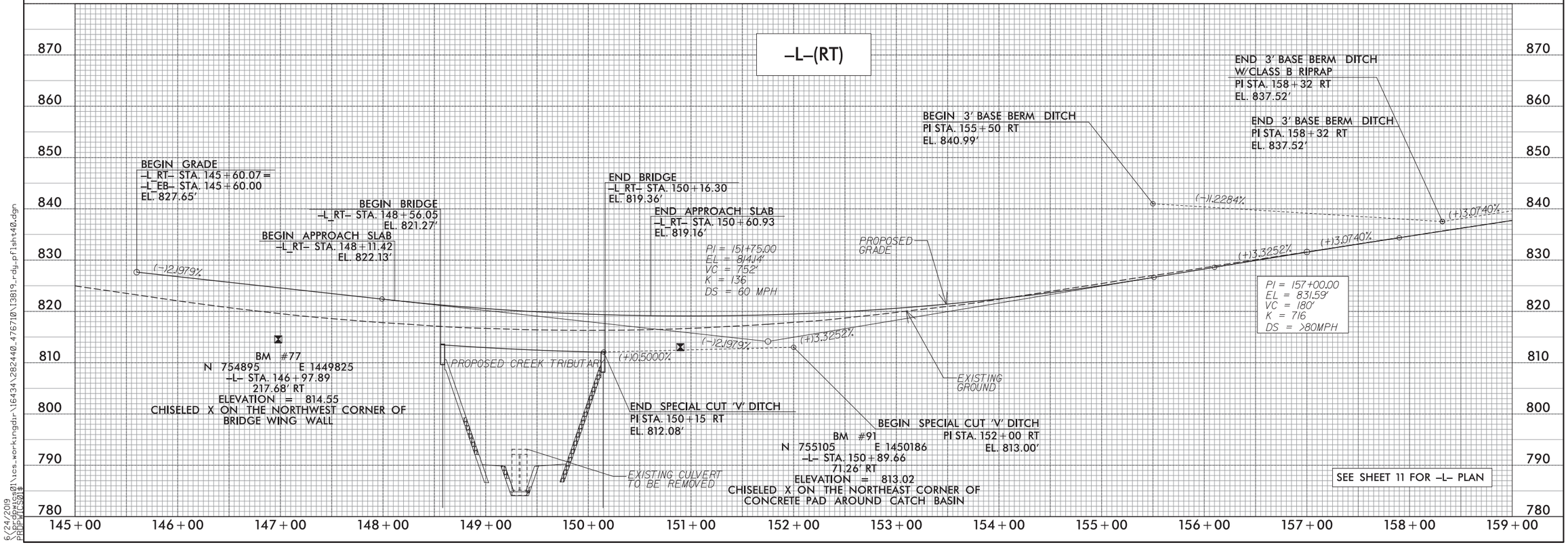

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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	41
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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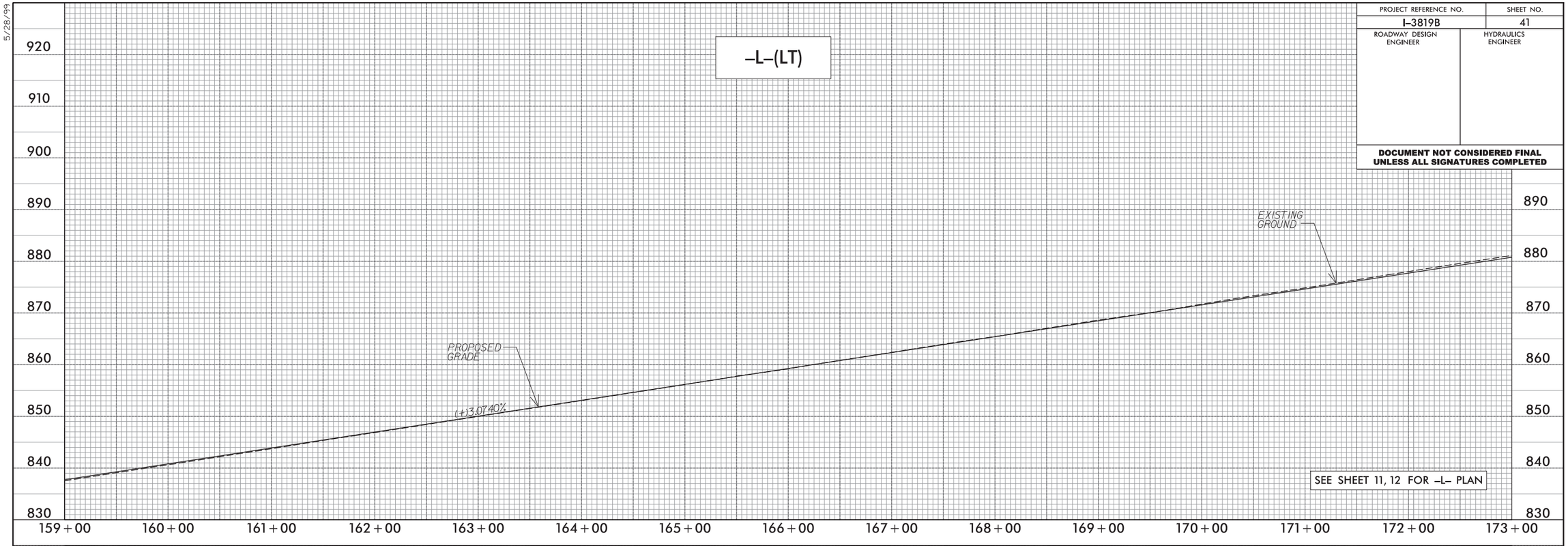

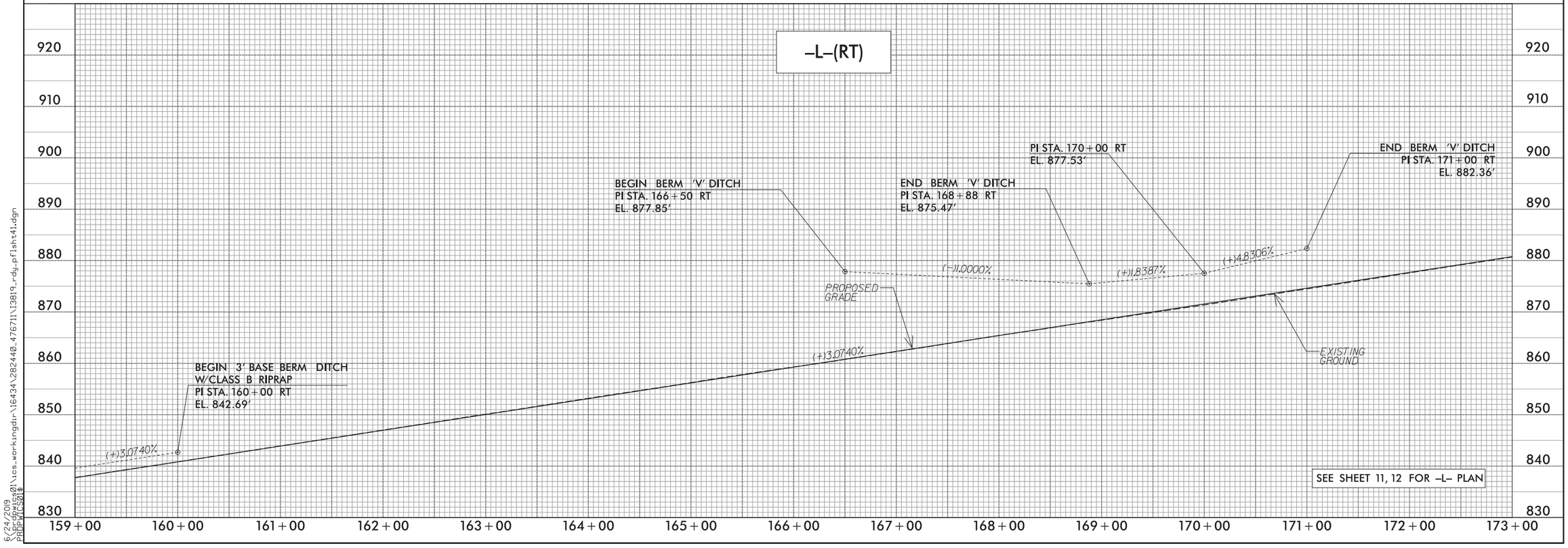

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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	42
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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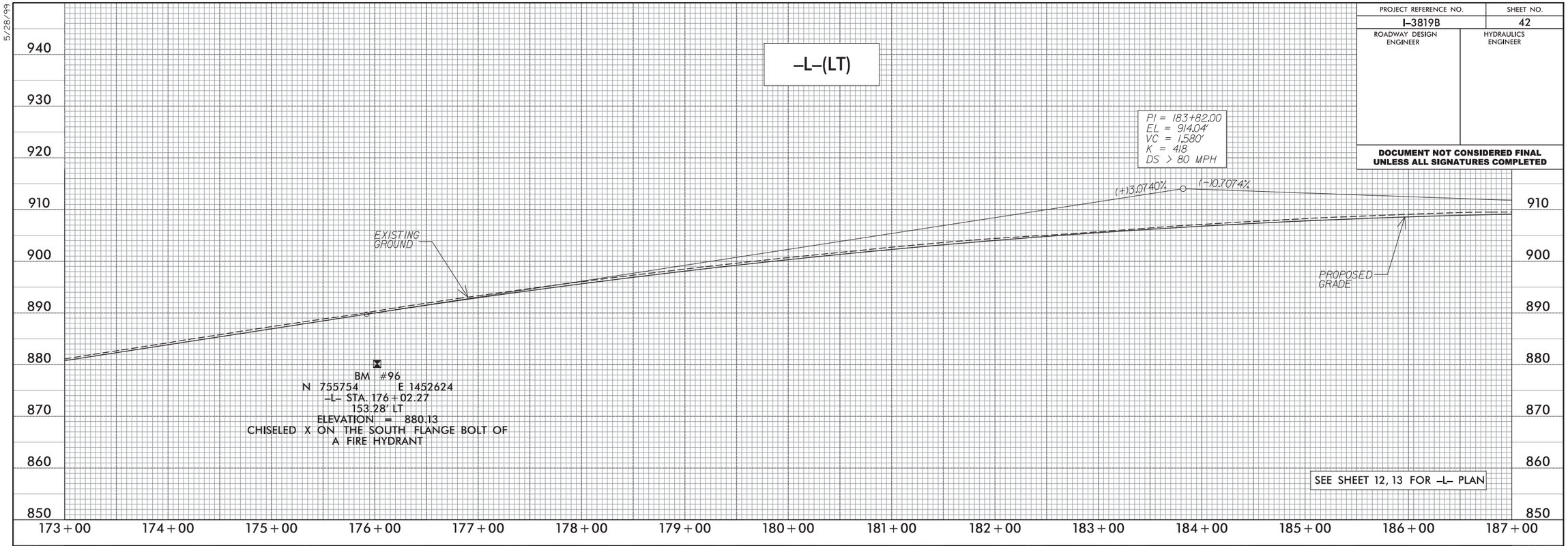

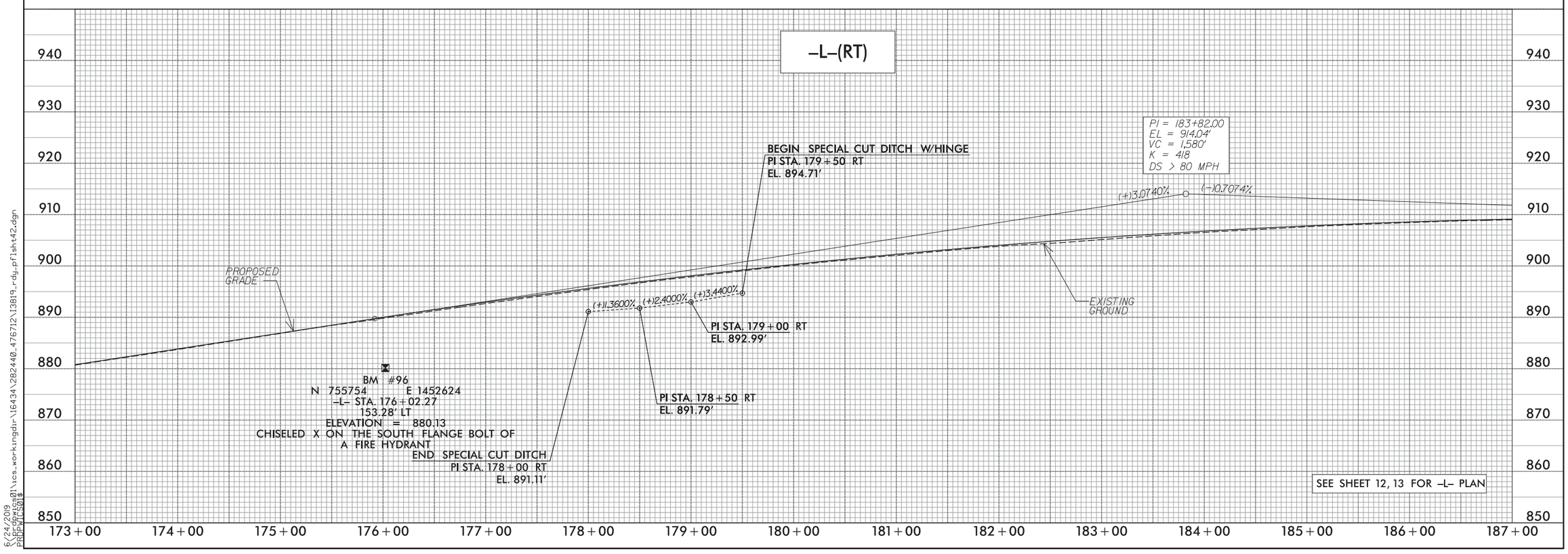

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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	47
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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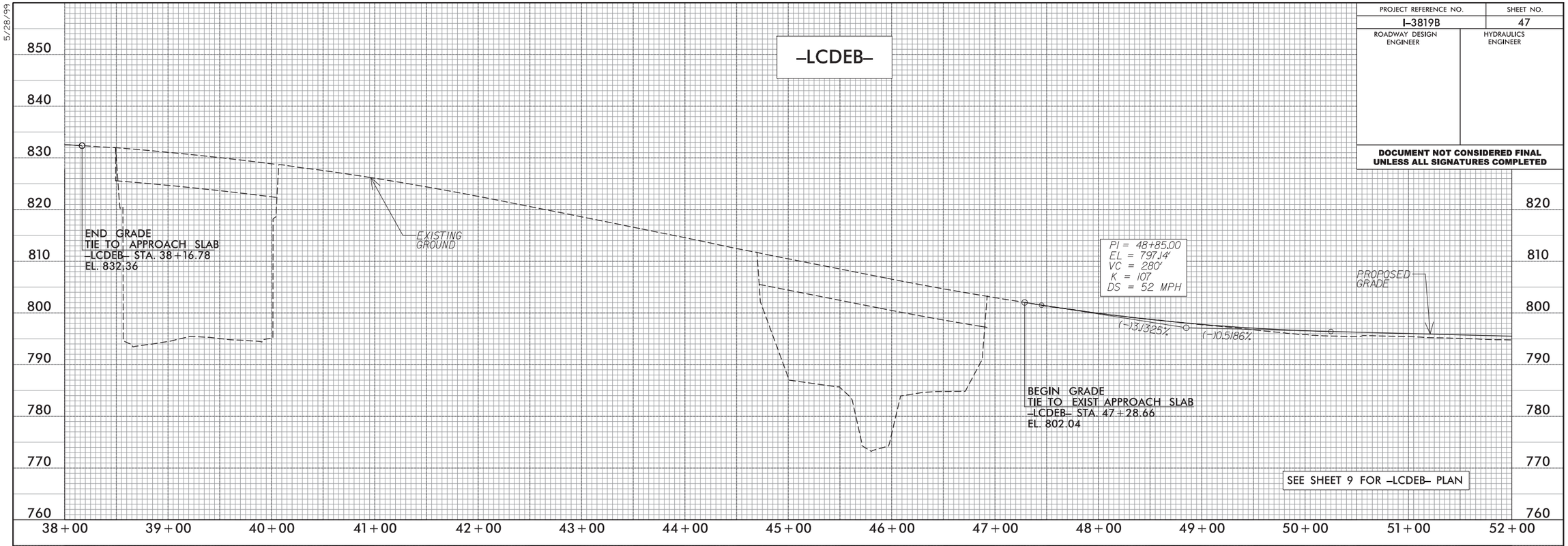

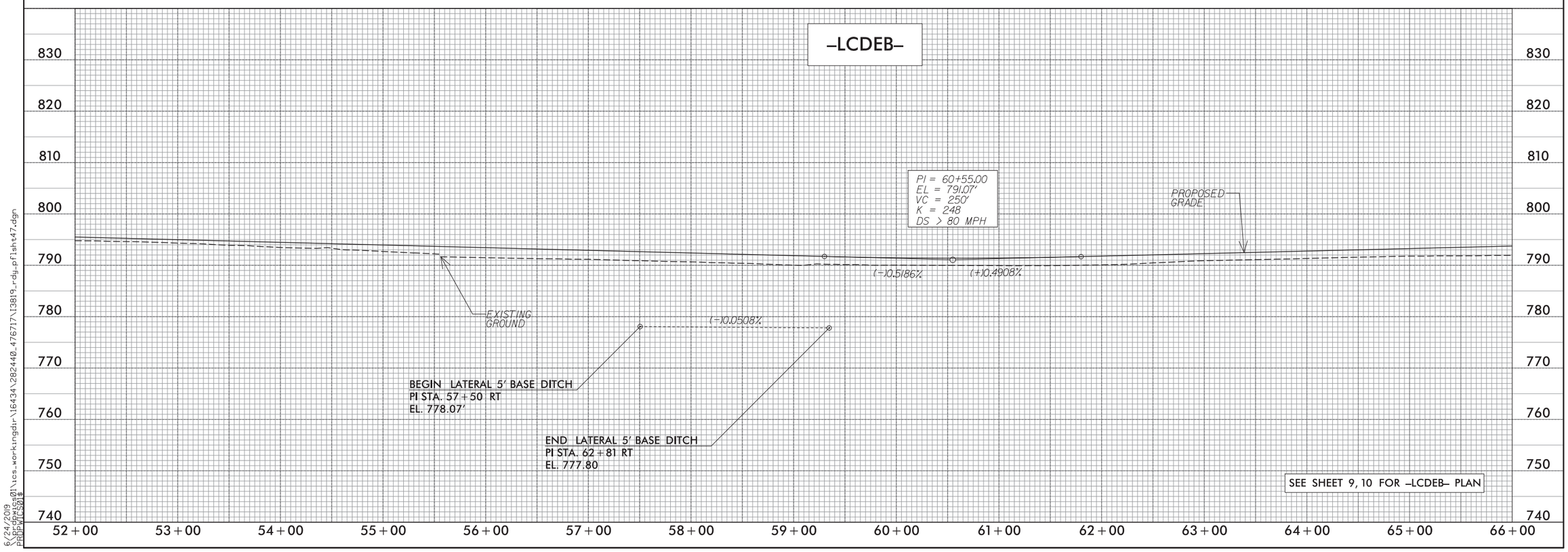

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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	48
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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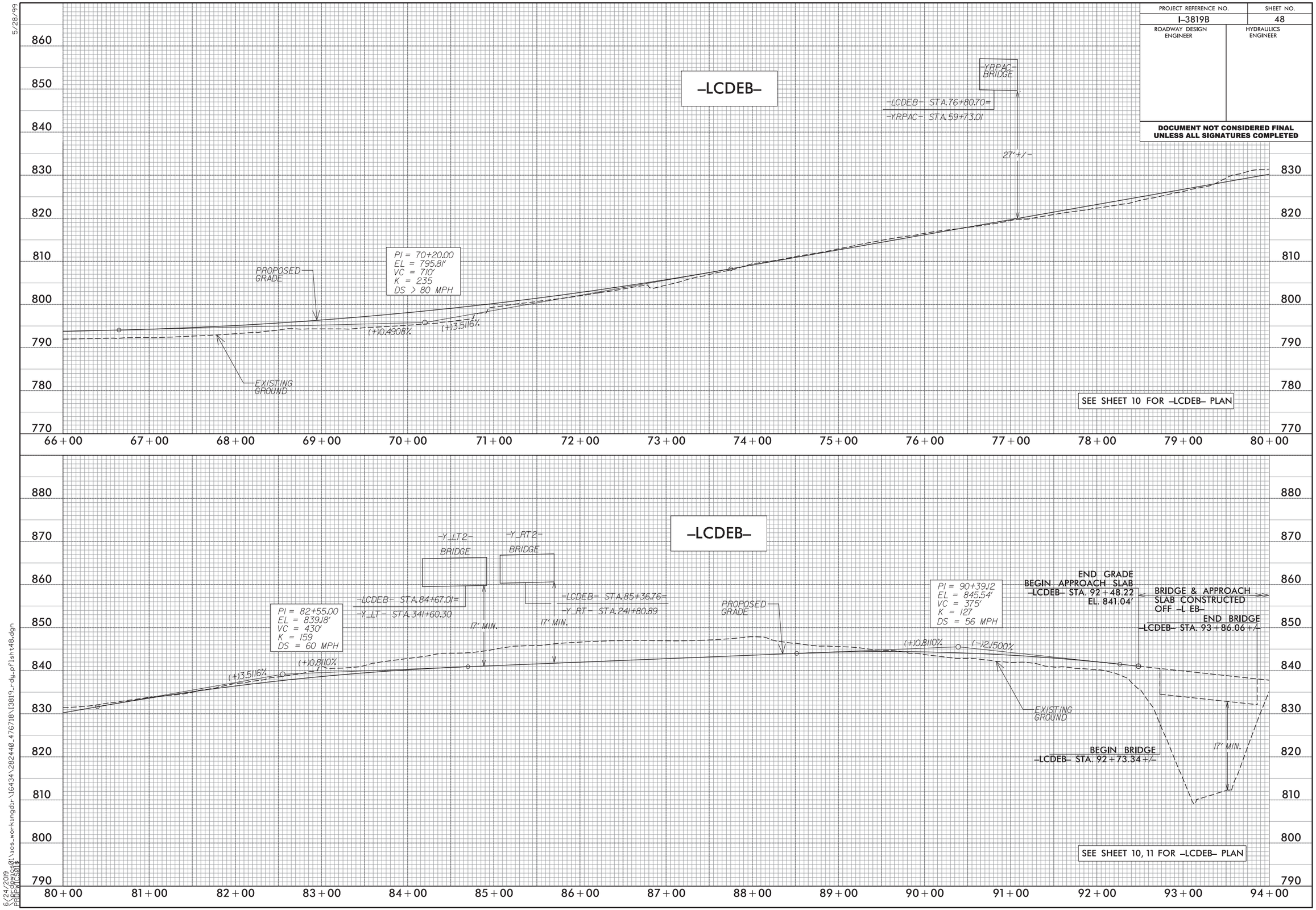

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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	49
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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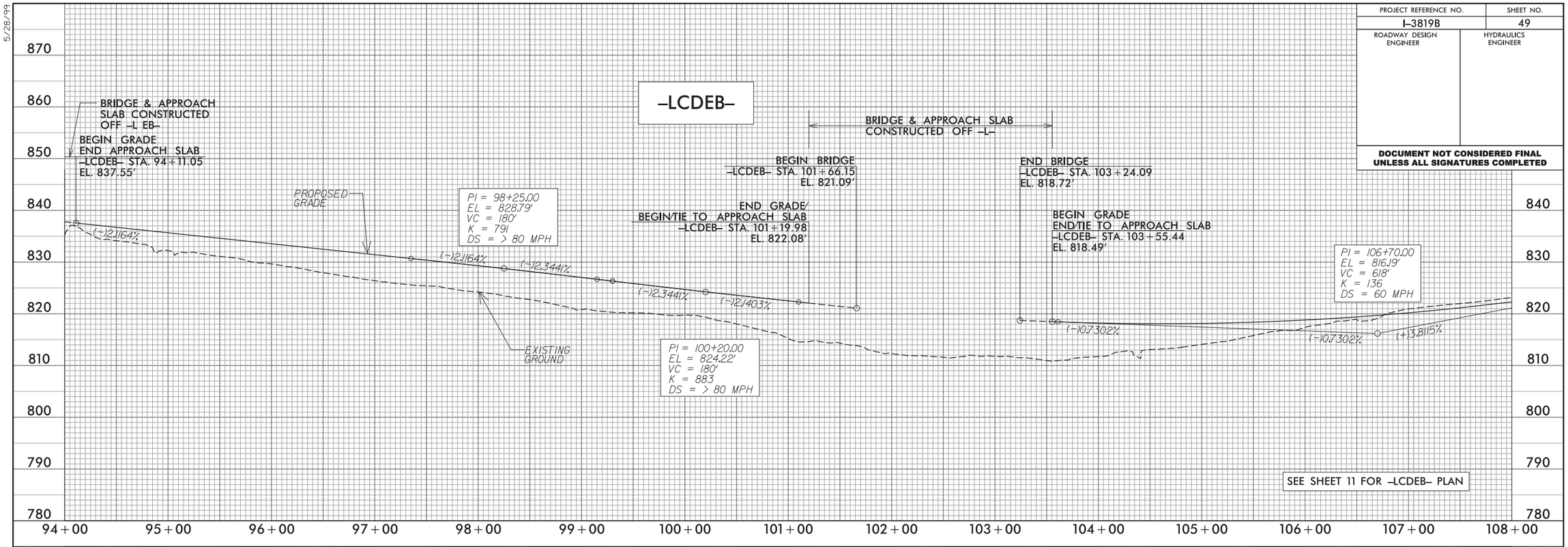

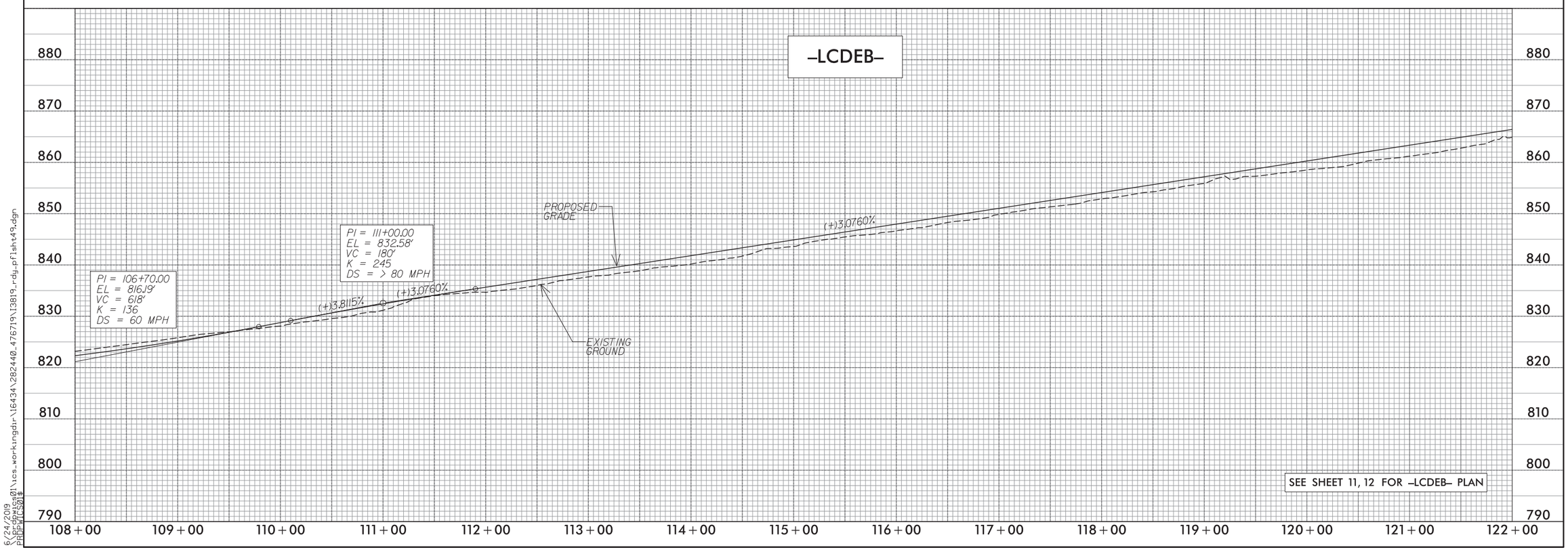

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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	50
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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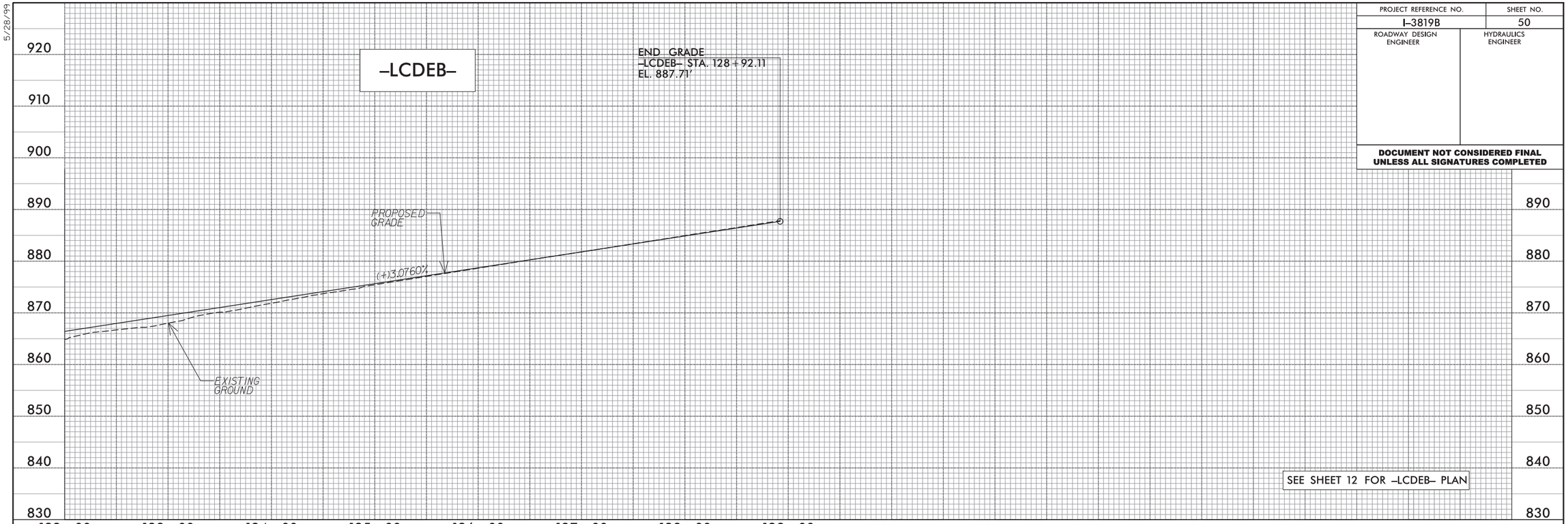

SEE SHEET 12 FOR -LCDEB- PLAN

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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	51
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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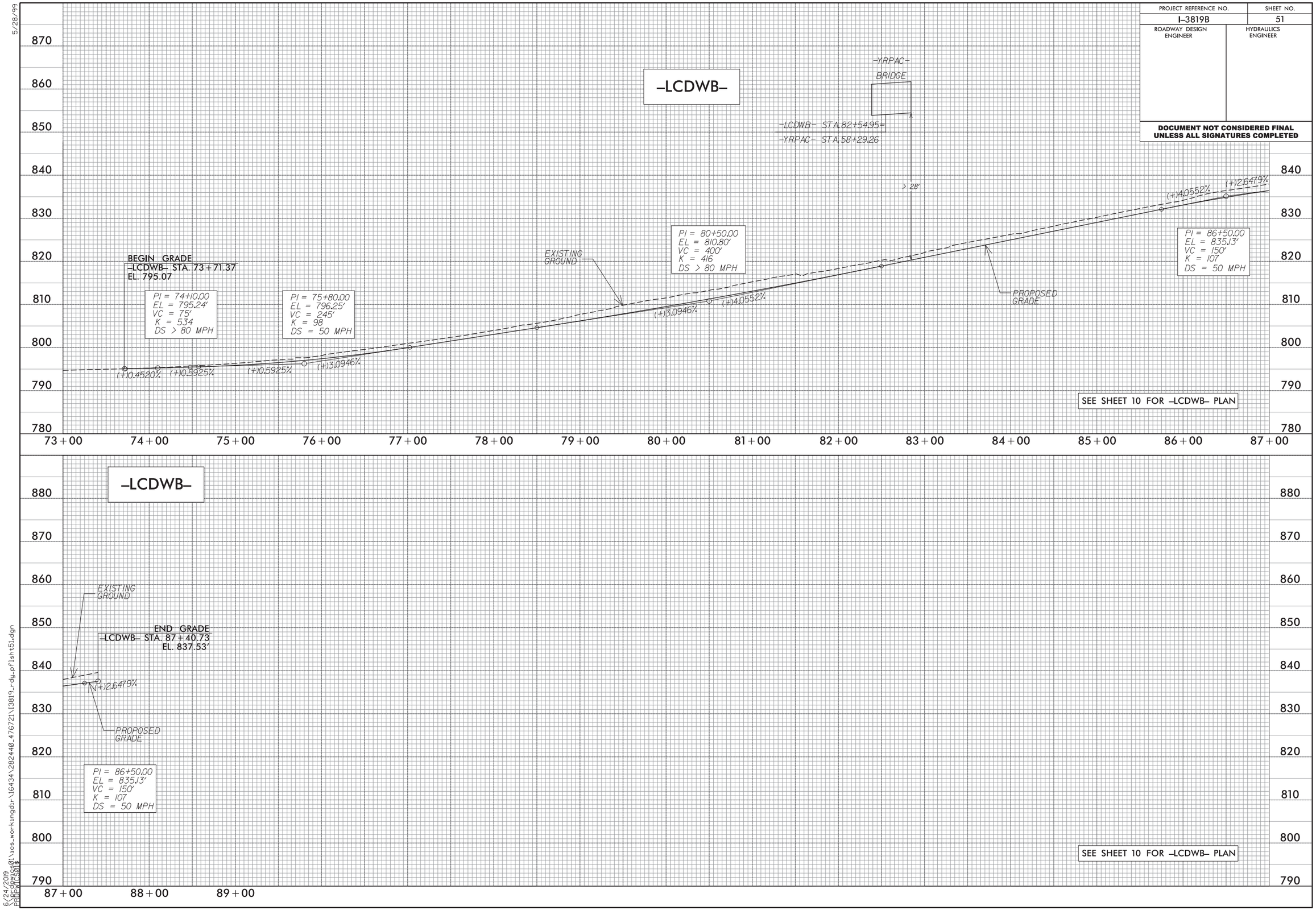

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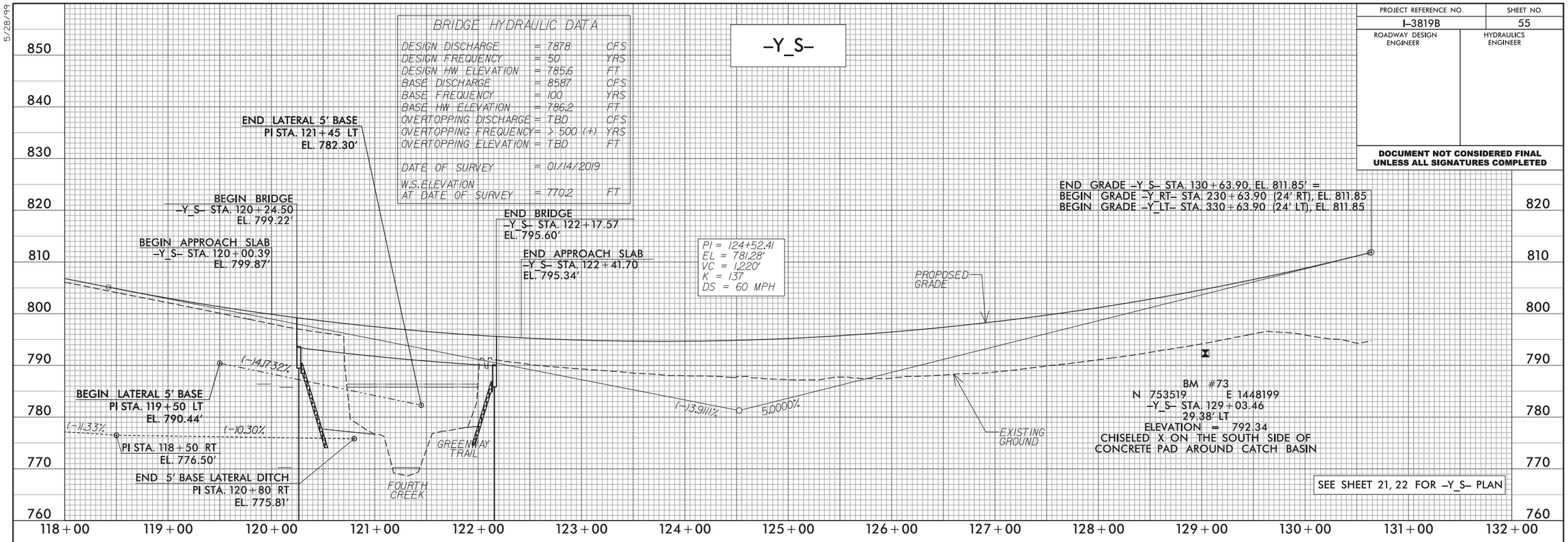

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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	55
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	56
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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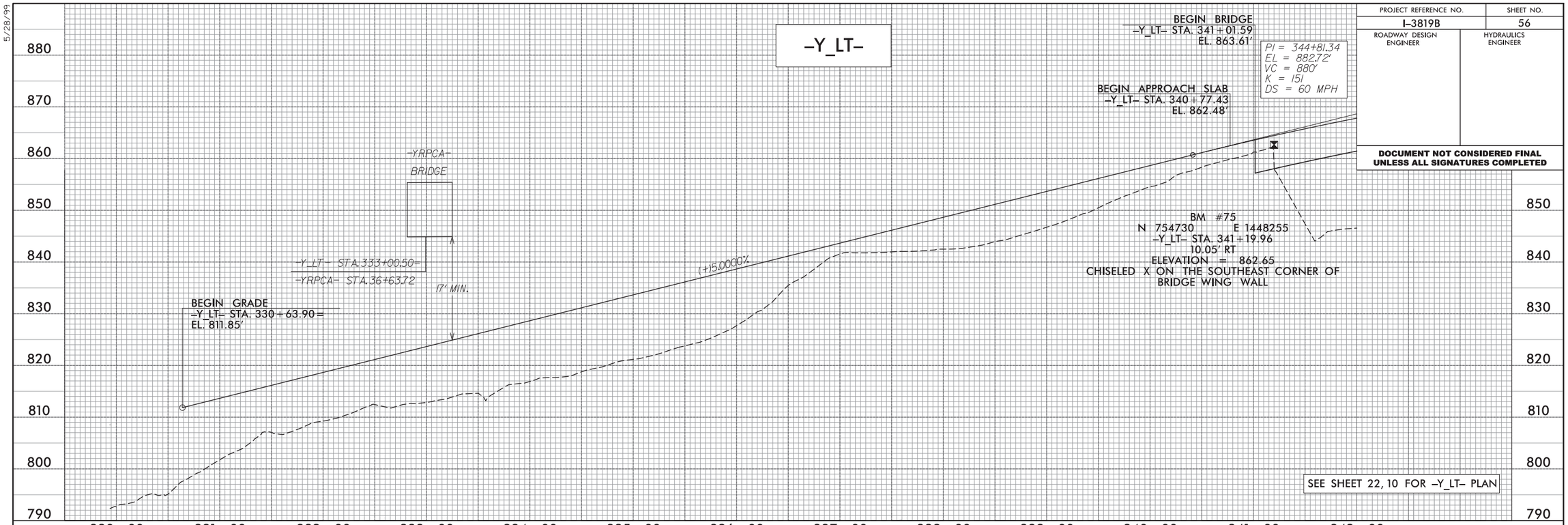

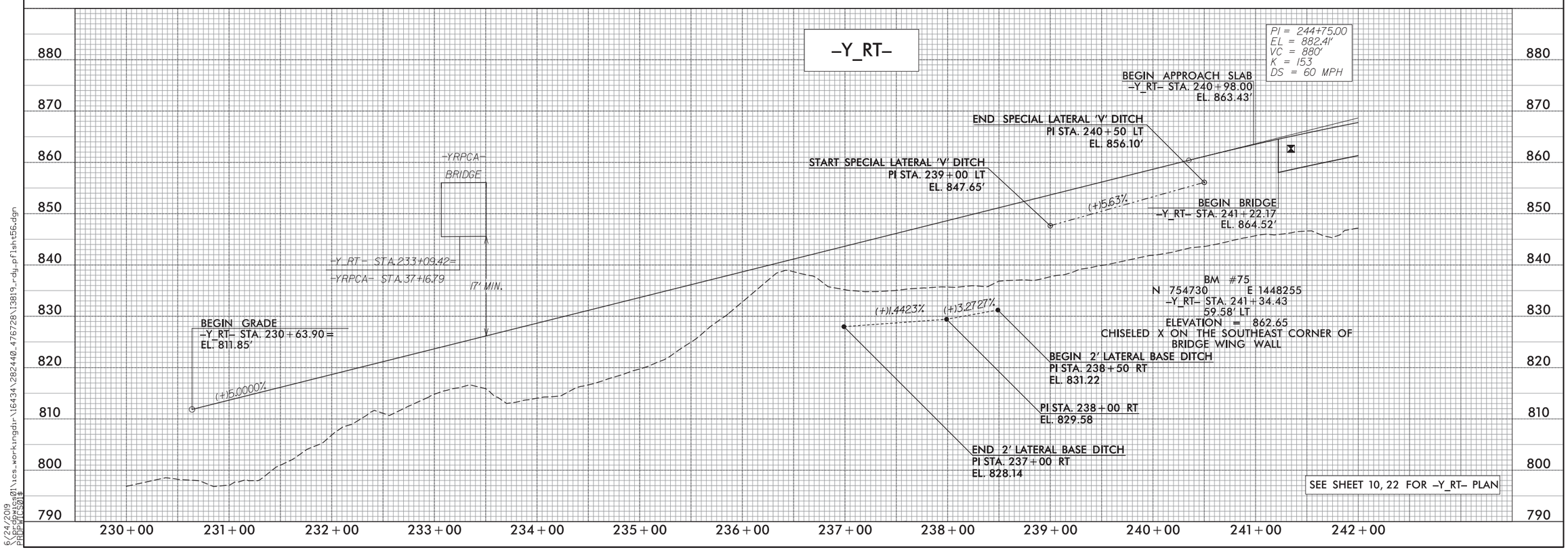

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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	57
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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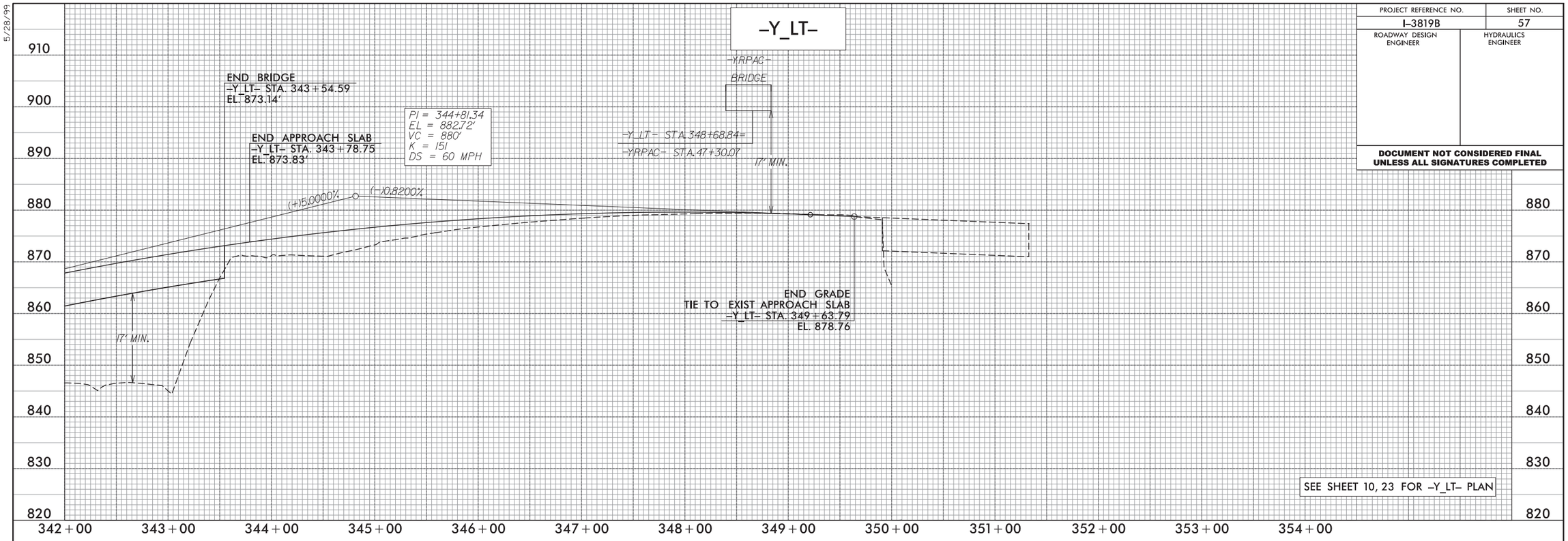

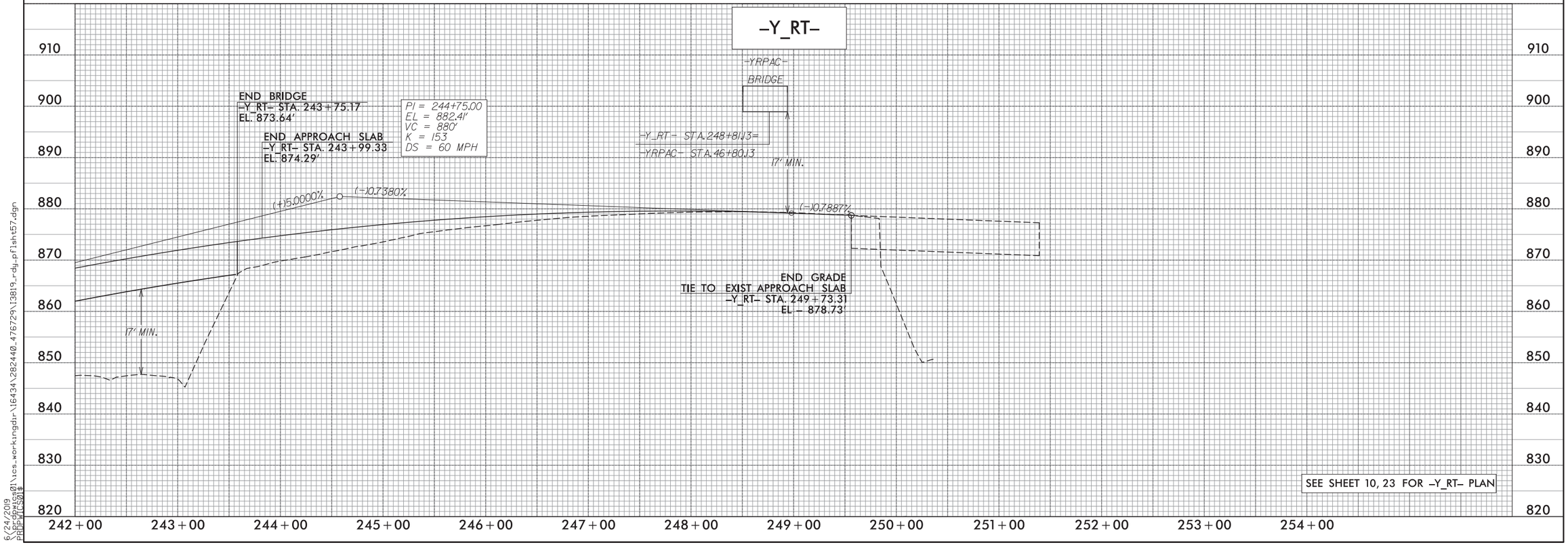

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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	58
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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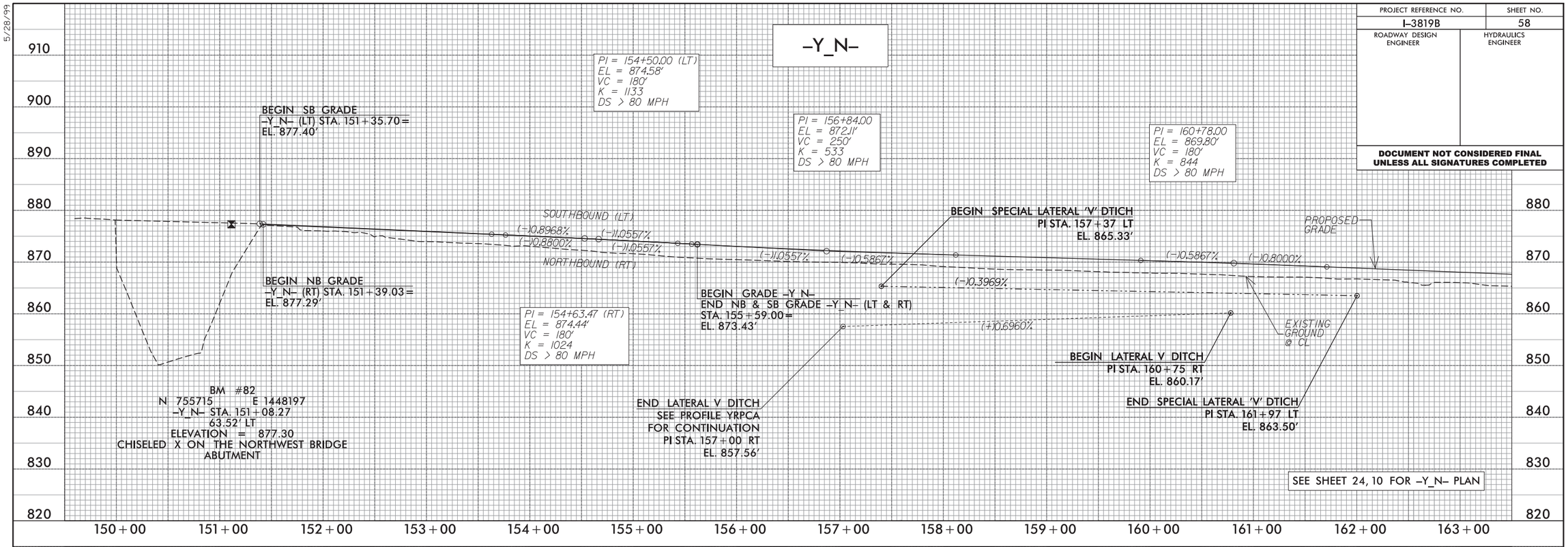

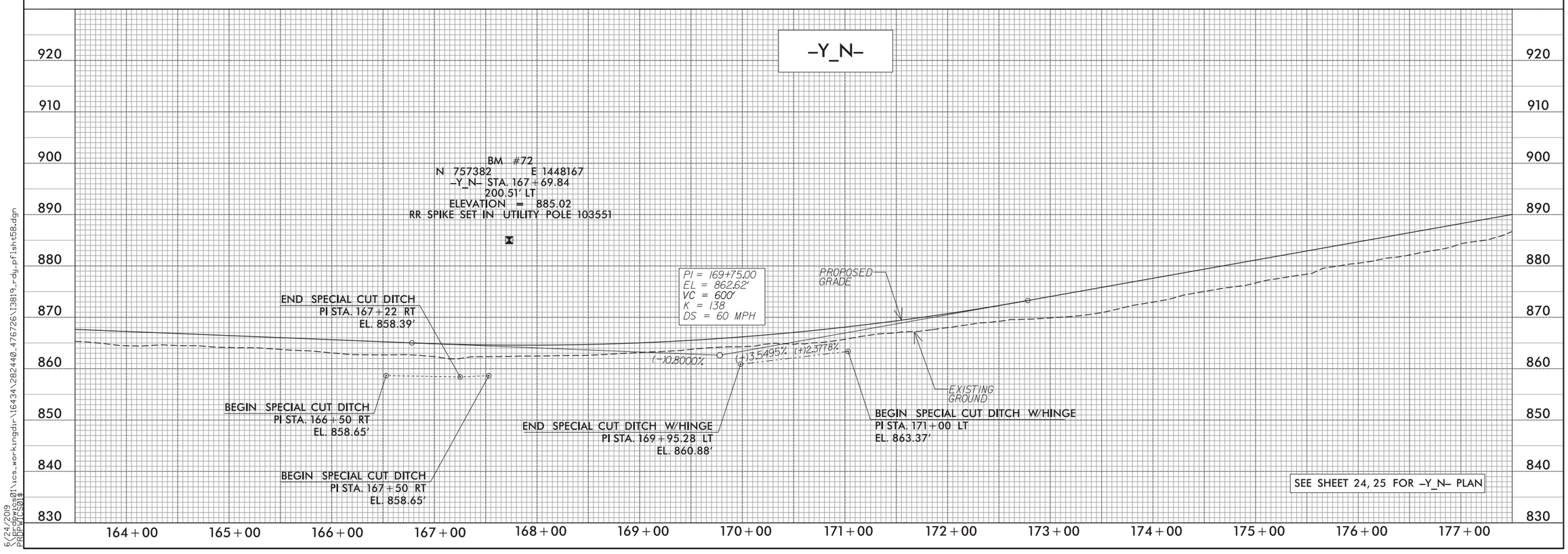

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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	61
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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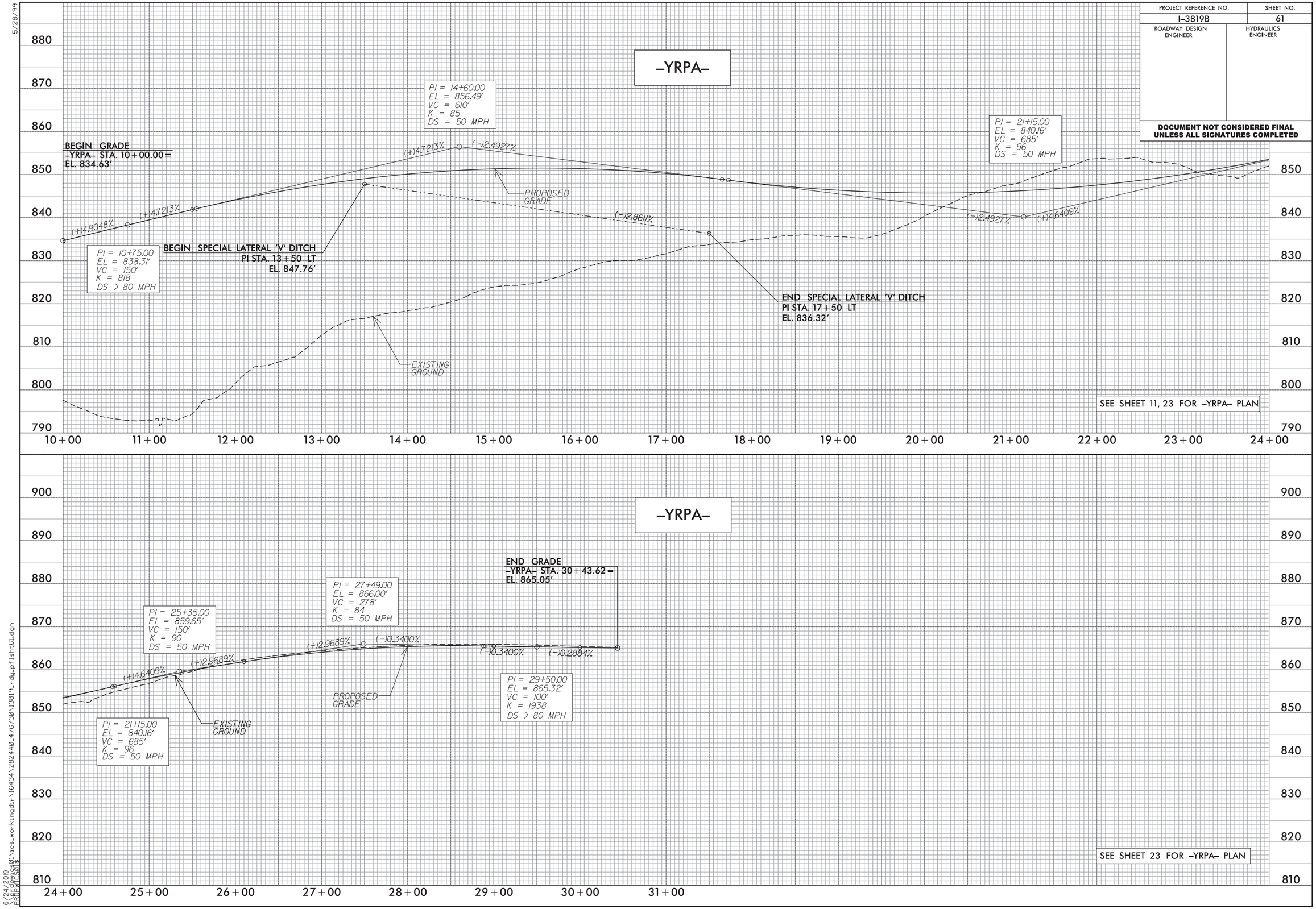

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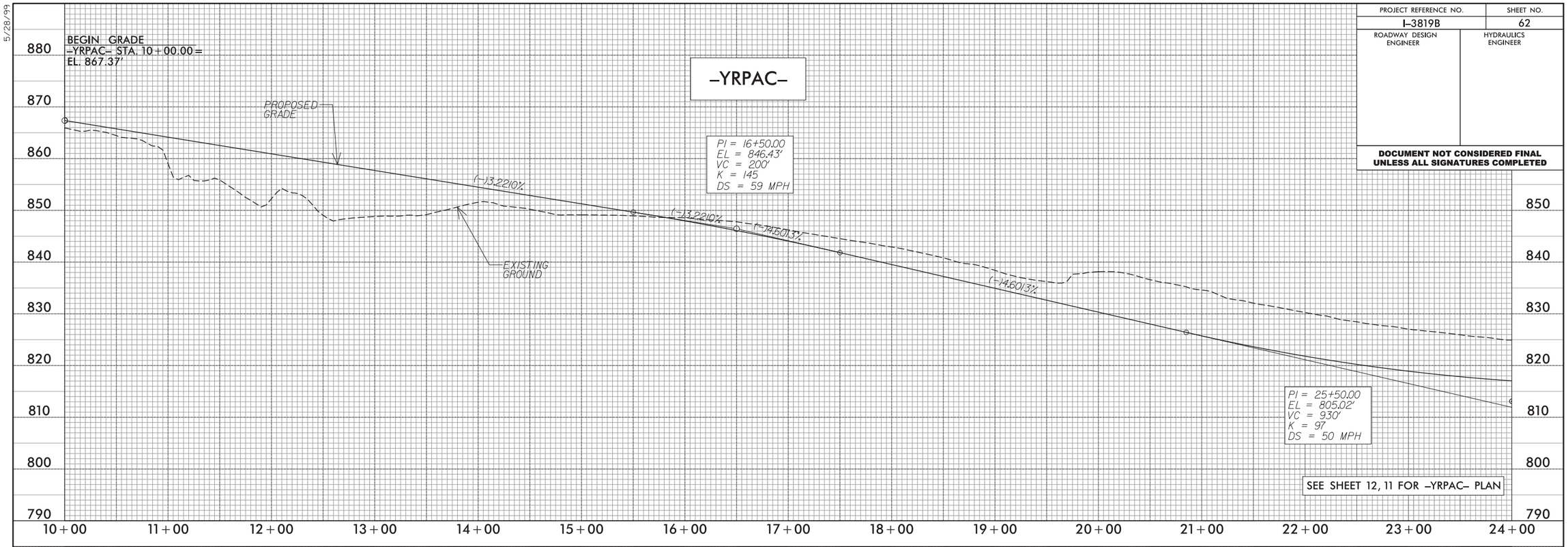
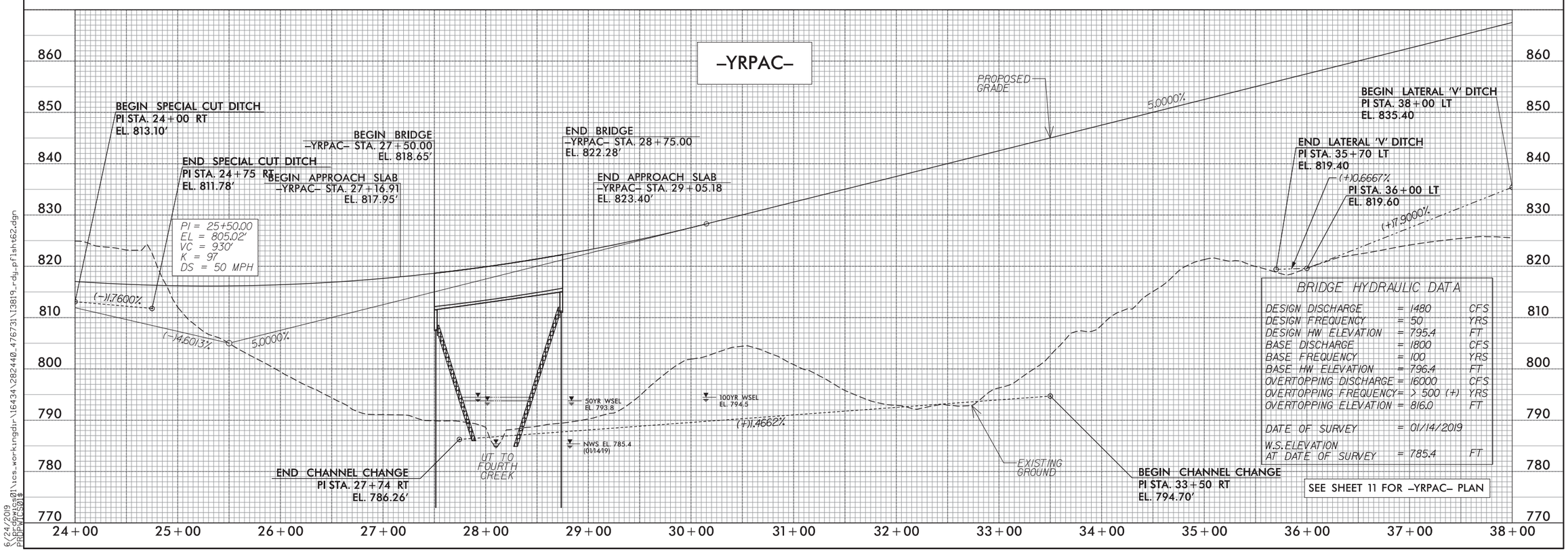
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	62
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





BRIDGE HYDRAULIC DATA

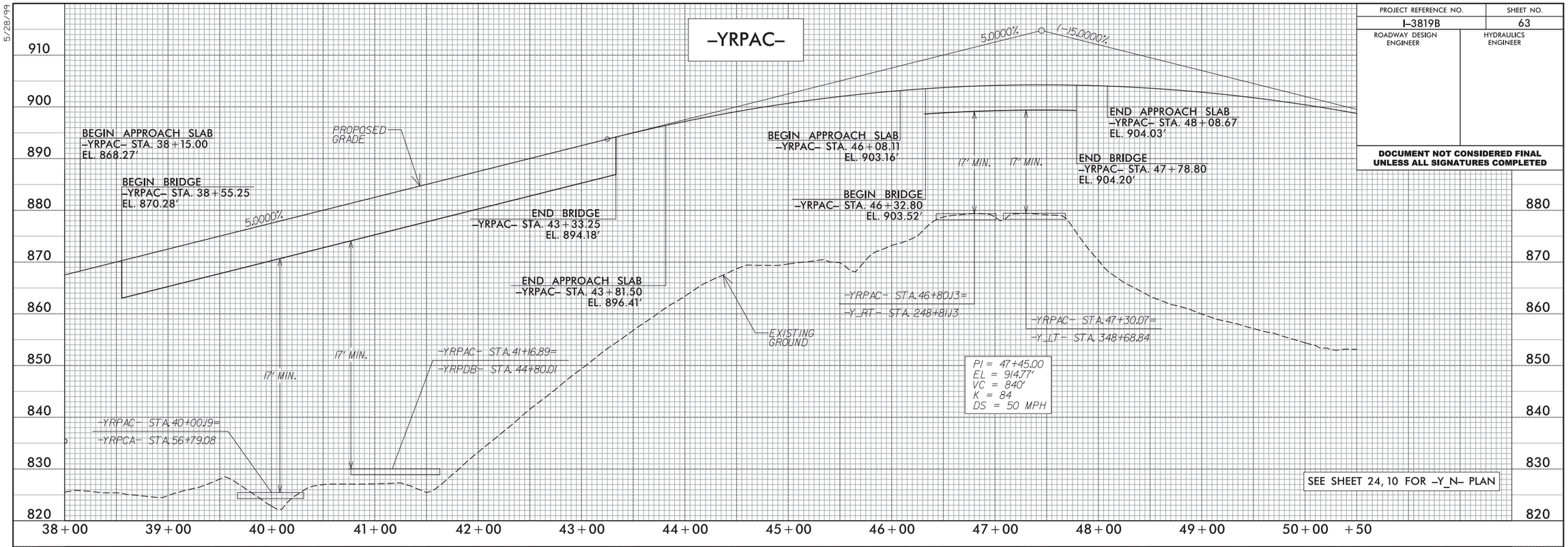
DESIGN DISCHARGE	= 1480	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 795.4	FT
BASE DISCHARGE	= 1800	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 796.4	FT
OVERTOPPING DISCHARGE	= 16000	CFS
OVERTOPPING FREQUENCY	= > 500 (+)	YRS
OVERTOPPING ELEVATION	= 816.0	FT
DATE OF SURVEY	= 01/14/2019	
W.S. ELEVATION AT DATE OF SURVEY	= 785.4	FT

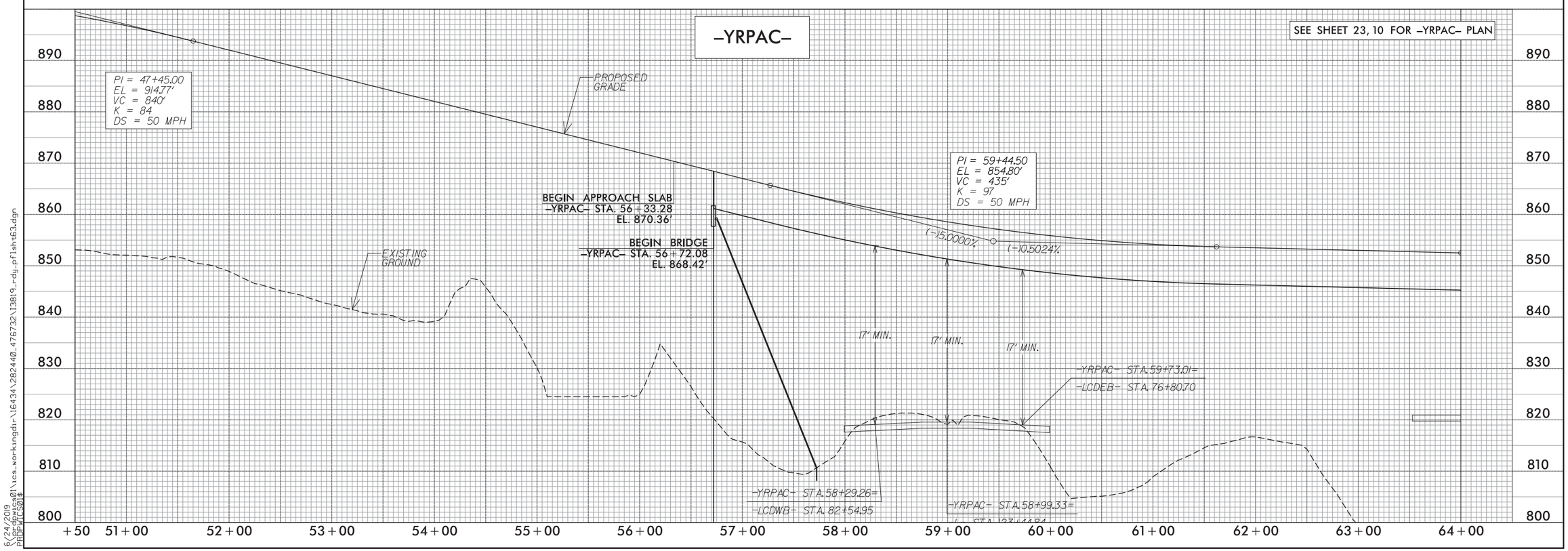
5/28/99

6/24/2019
\\prdpwics01\ics_workingdir\16434\282440_476731\I3819_rdy_pflsht62.dgn
PRDPWICS01$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	63
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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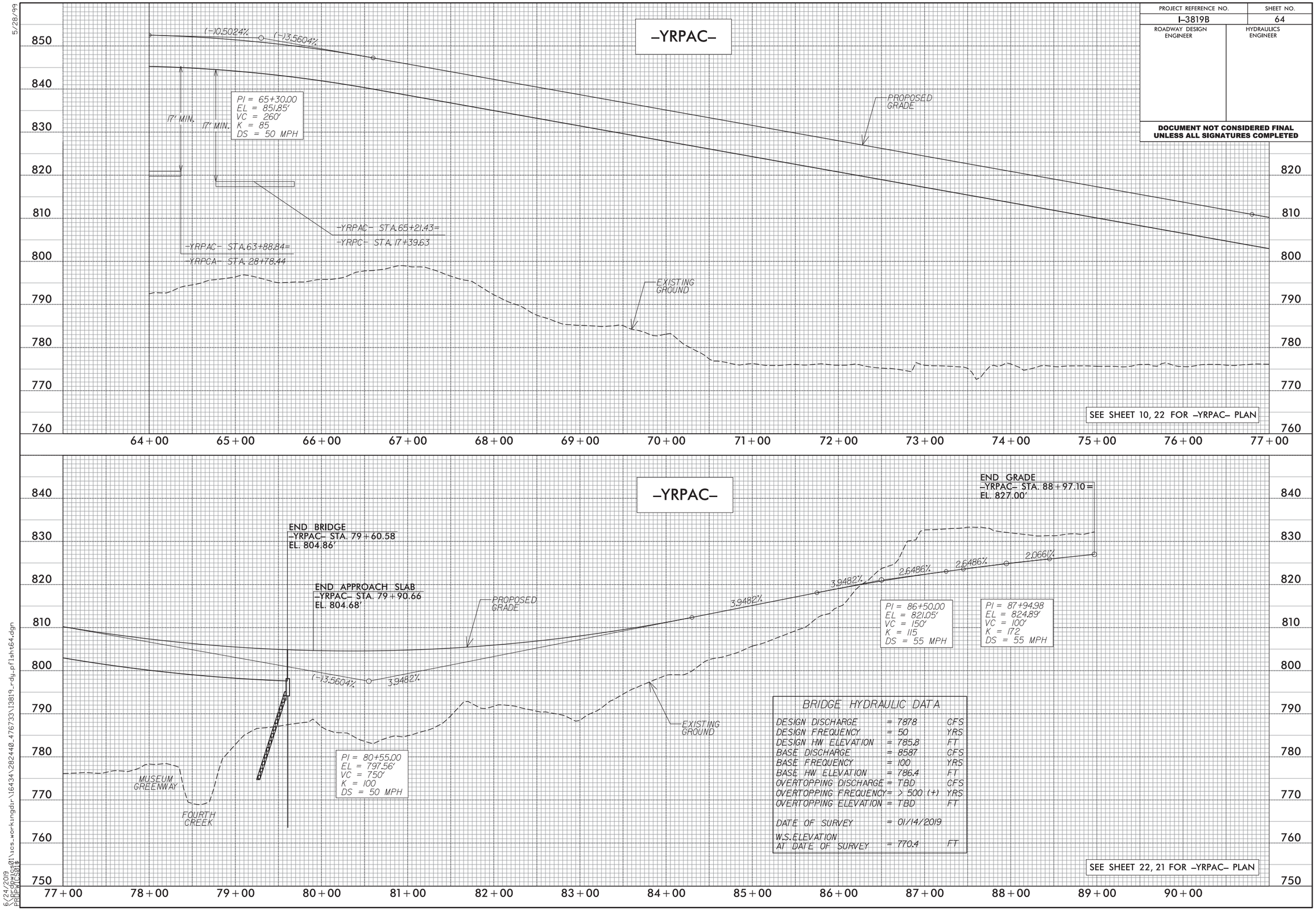
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	64
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 7878	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 785.8	FT
BASE DISCHARGE	= 8587	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 786.4	FT
OVERTOPPING DISCHARGE	= TBD	CFS
OVERTOPPING FREQUENCY	= > 500 (+)	YRS
OVERTOPPING ELEVATION	= TBD	FT
DATE OF SURVEY	= 01/14/2019	
W.S.ELEVATION AT DATE OF SURVEY	= 770.4	FT

5/28/99

6/24/2019
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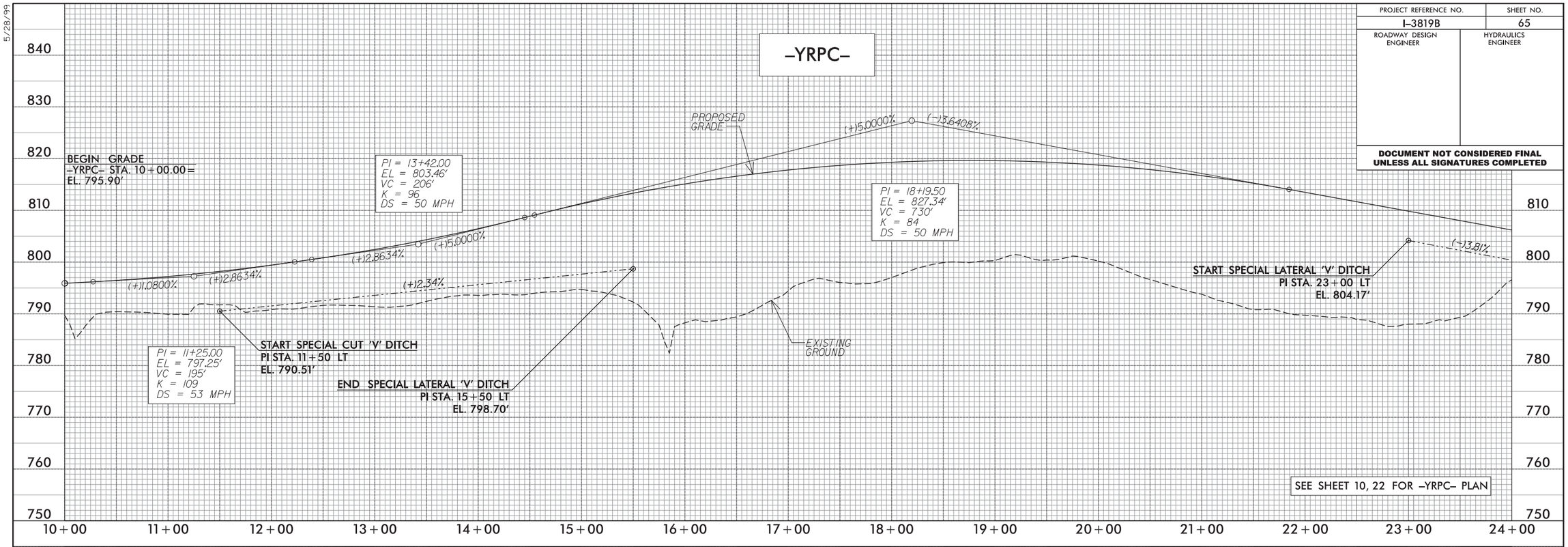
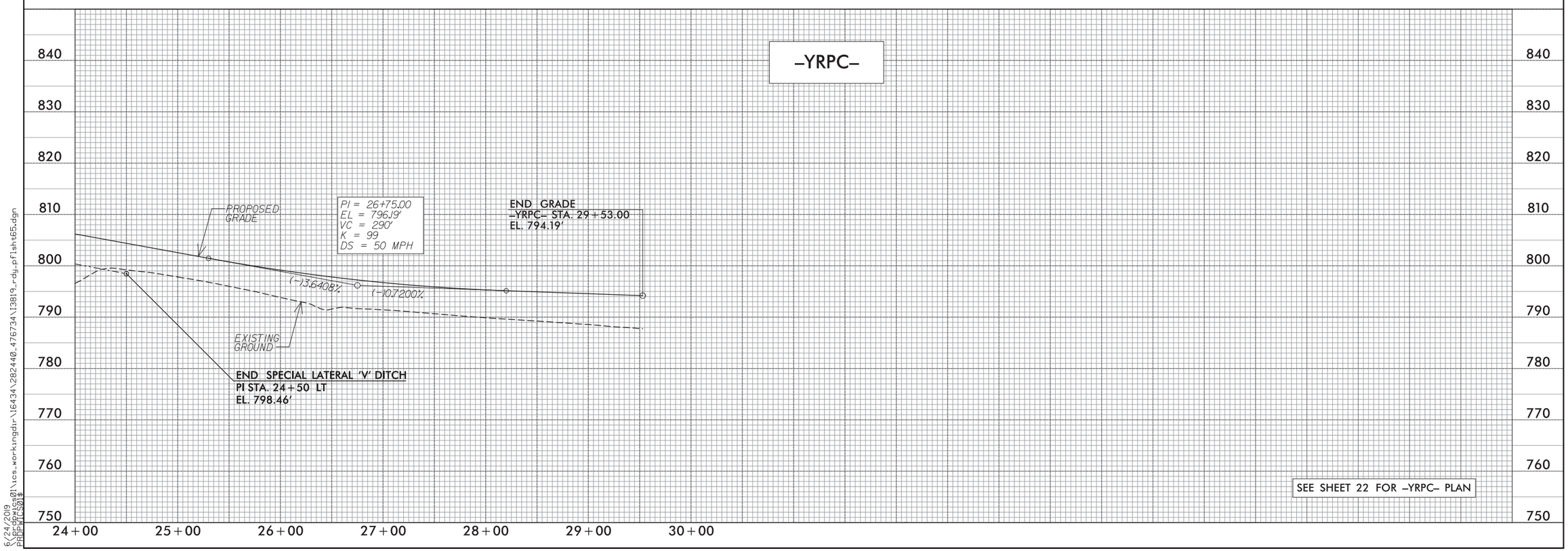
PRDPWICS01$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	65
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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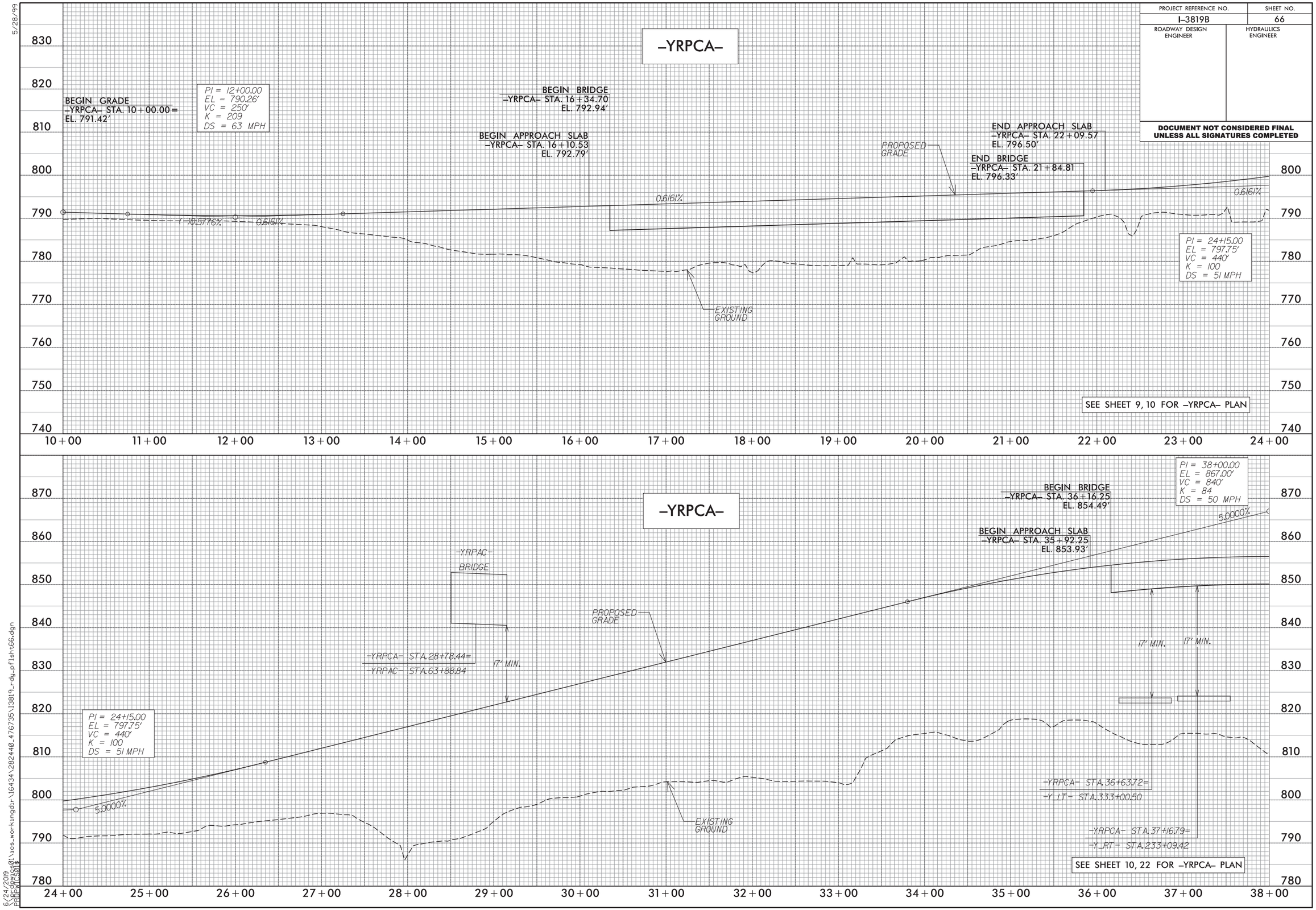
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	66
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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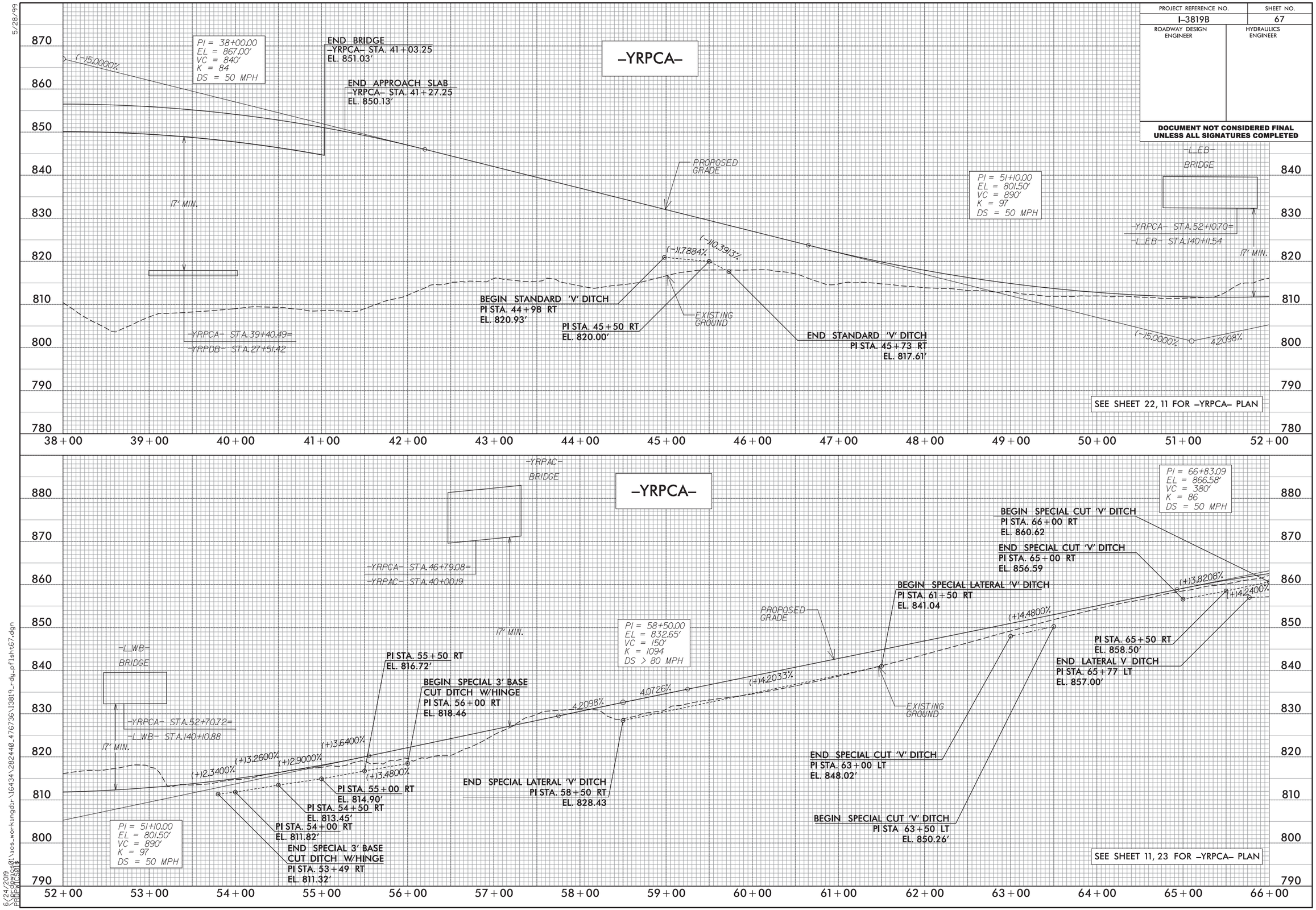
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	67
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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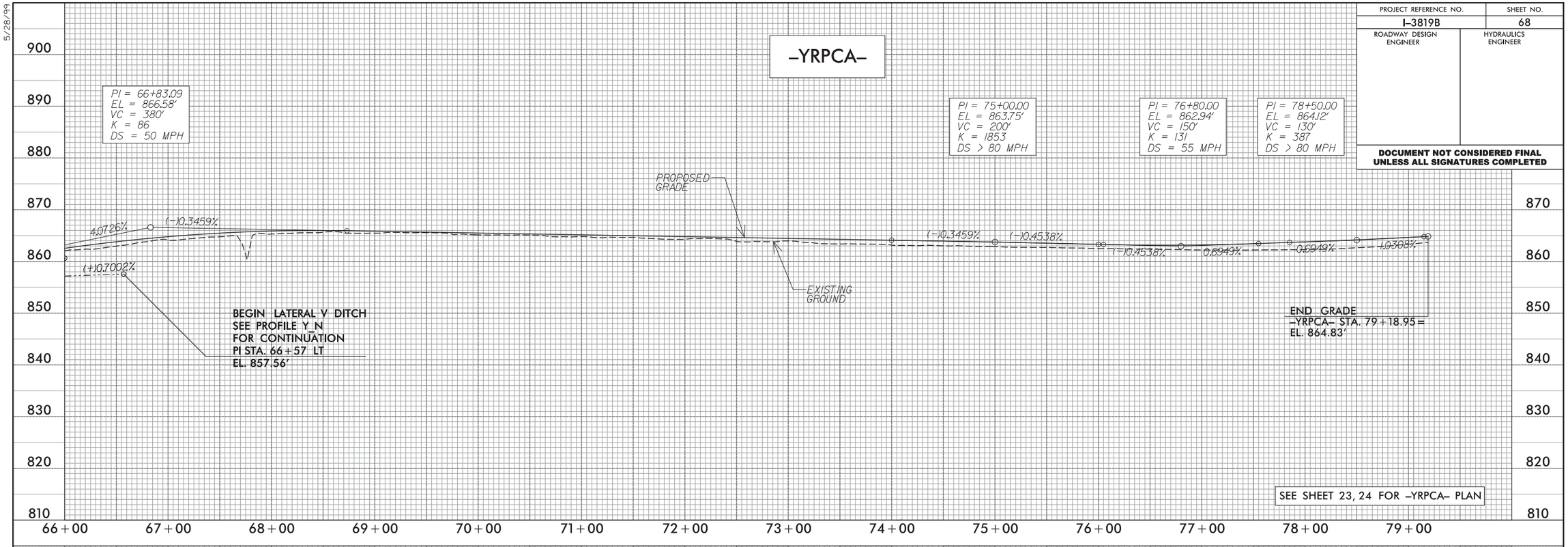
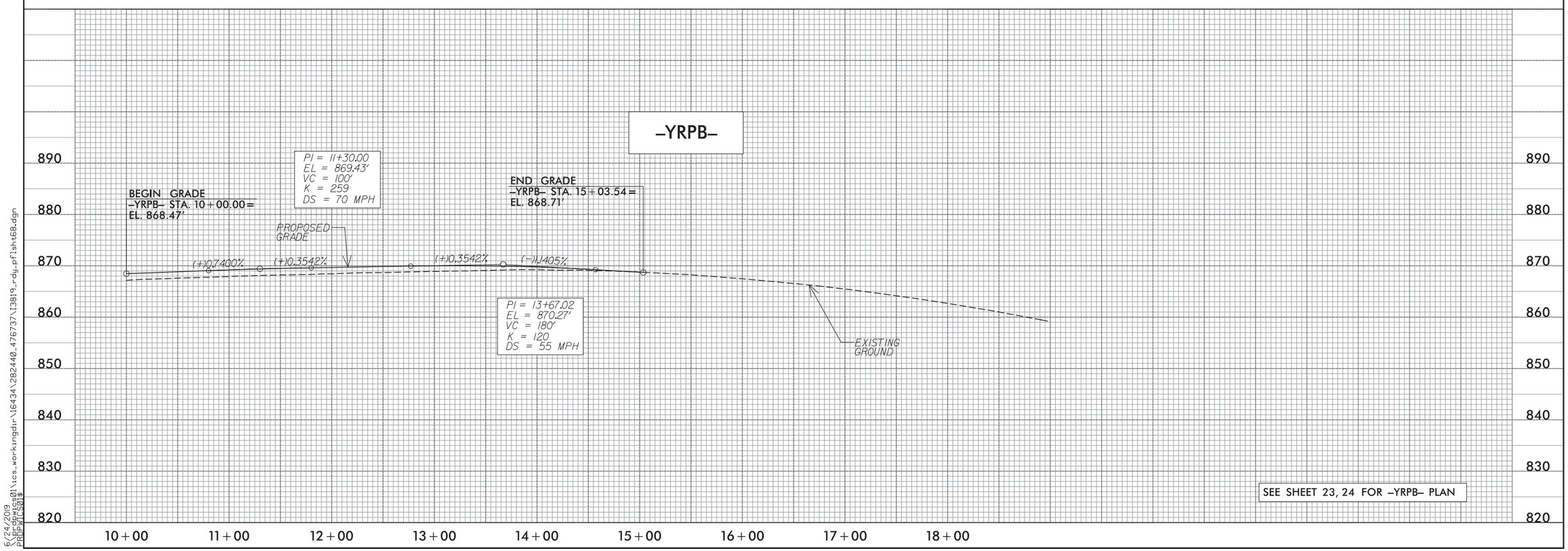
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	68
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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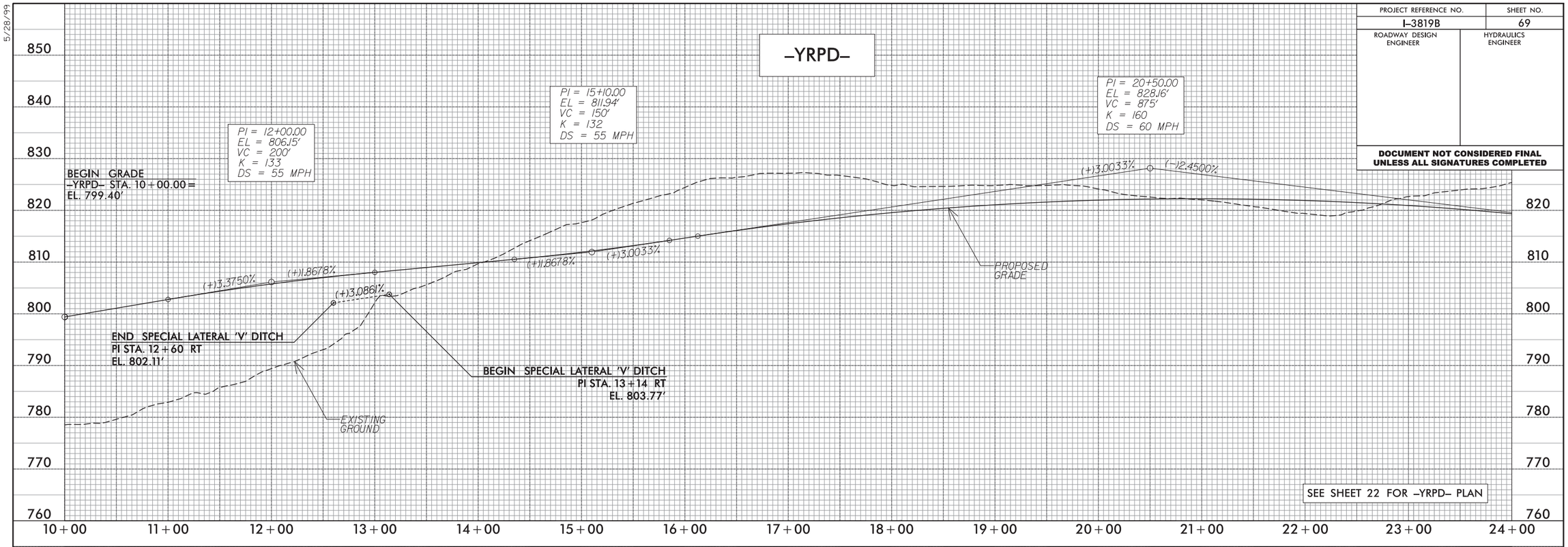
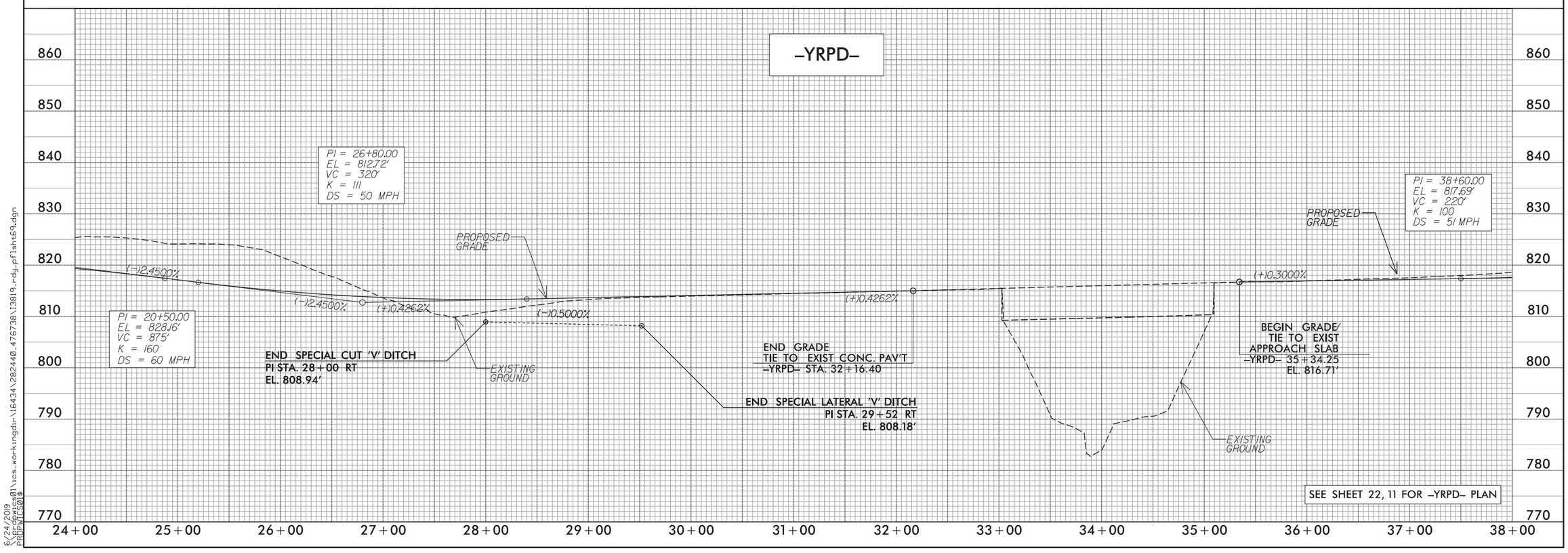
PROPWCS01$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	69
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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6/24/2019
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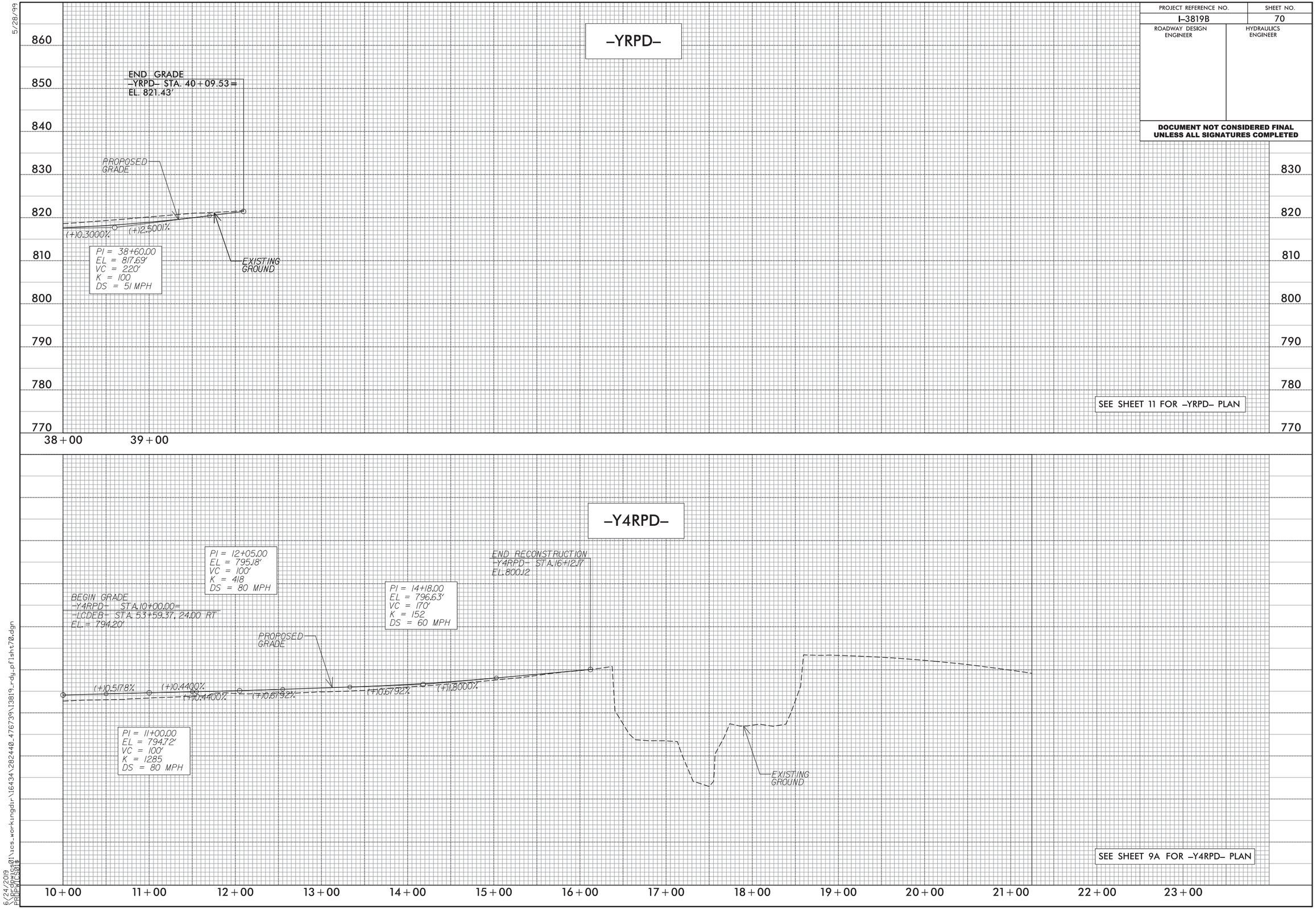
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	70
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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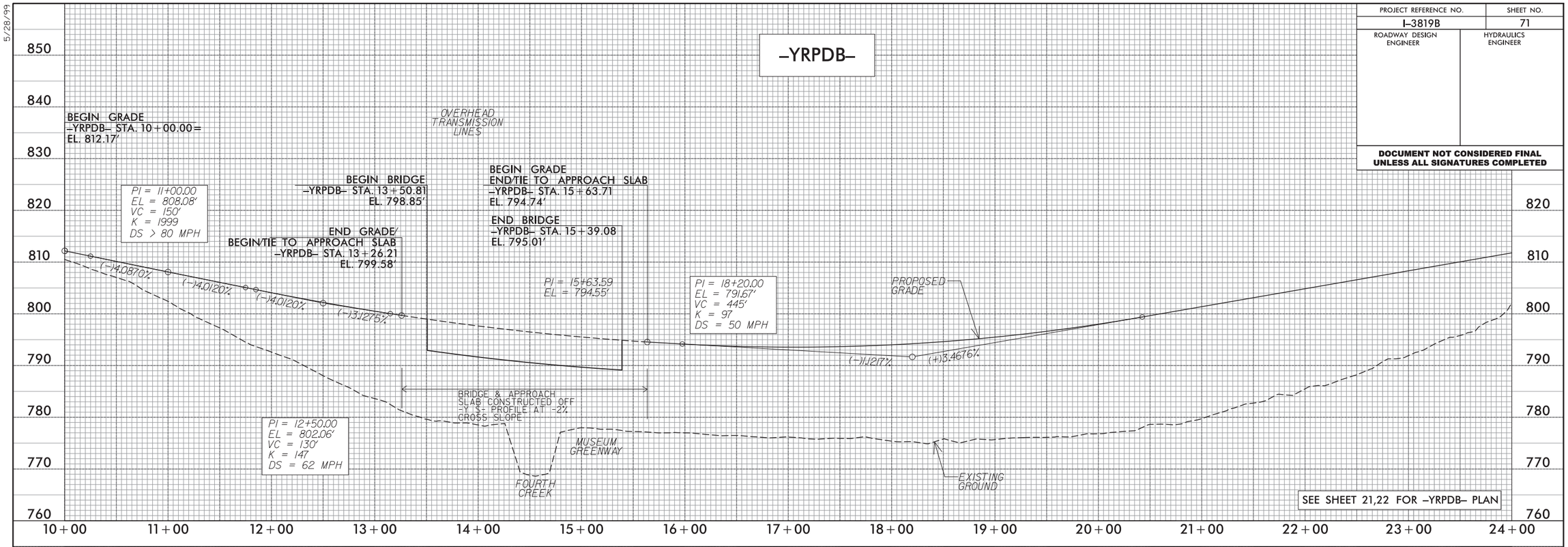
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	71
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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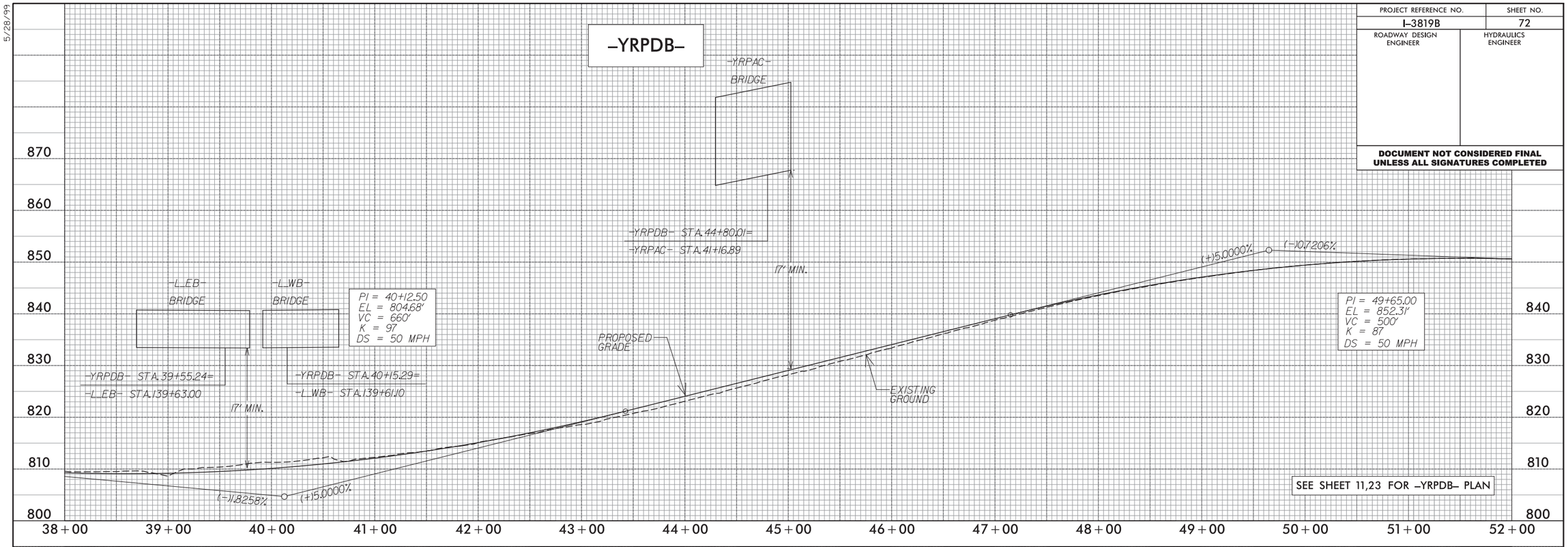
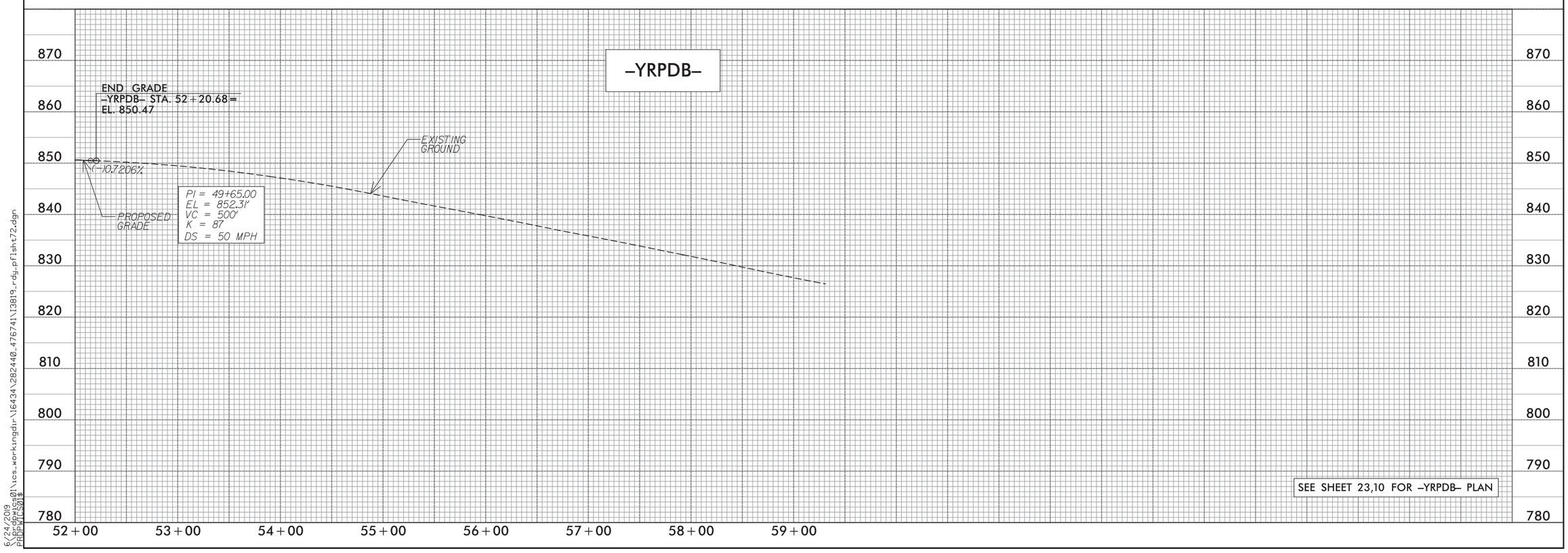
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	72
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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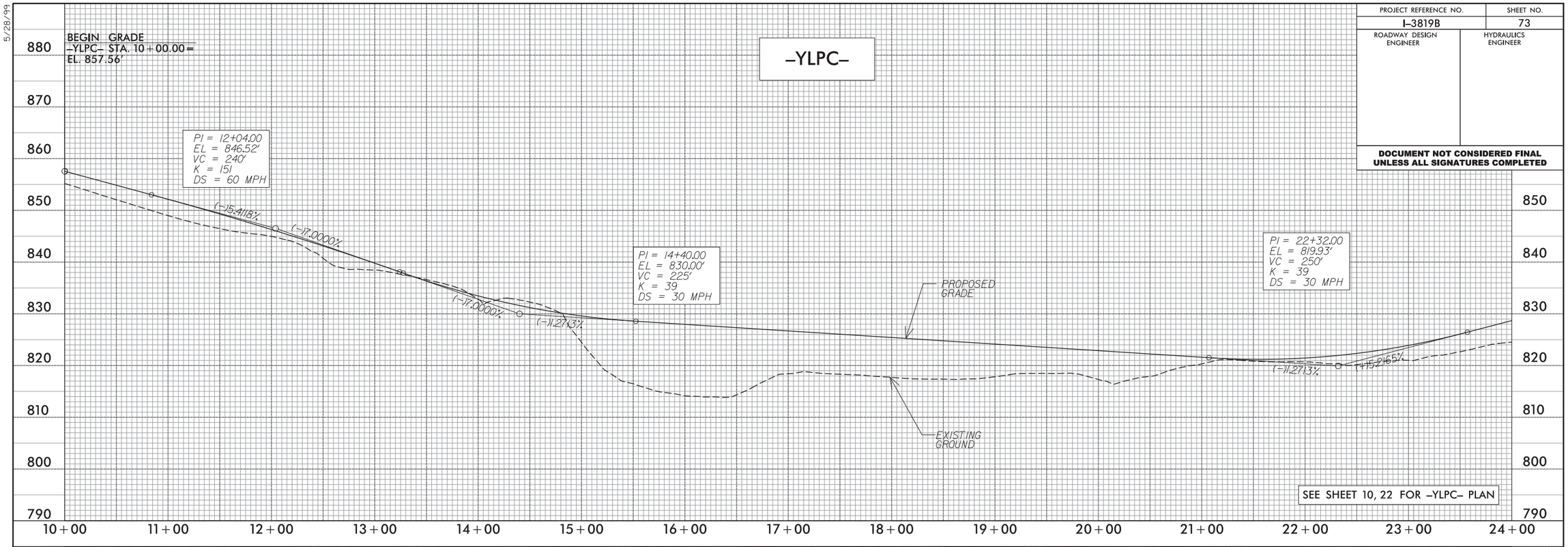
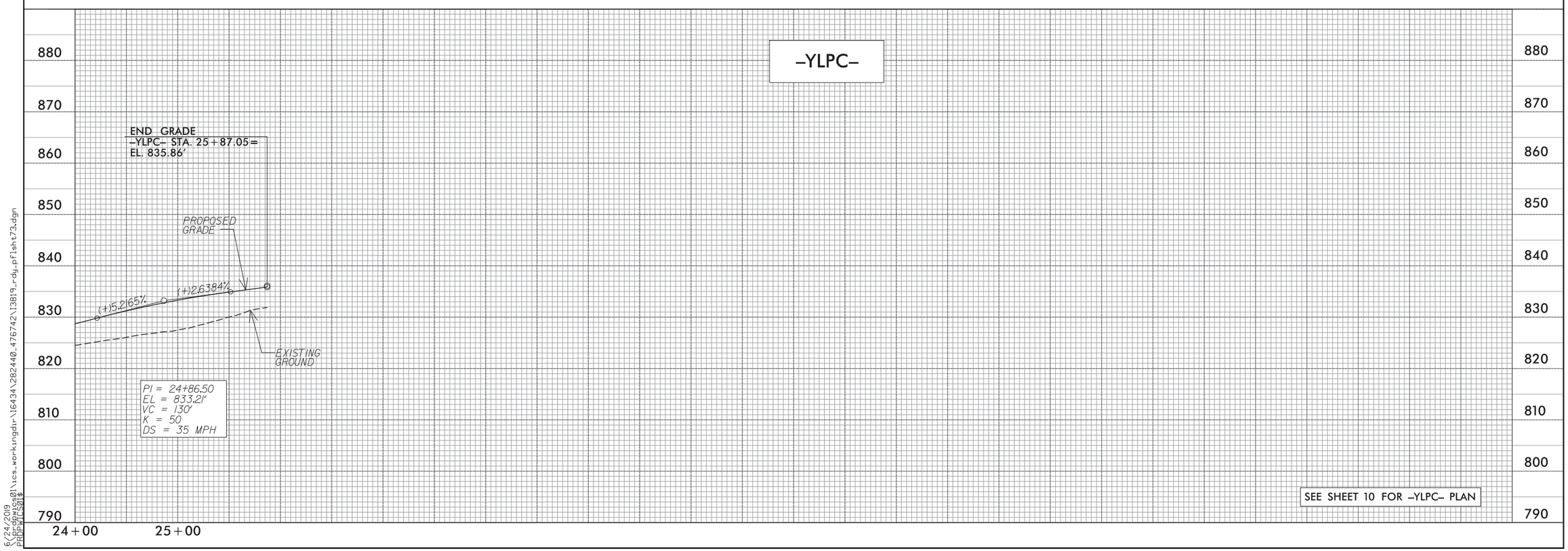
PROFILE01$

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	73
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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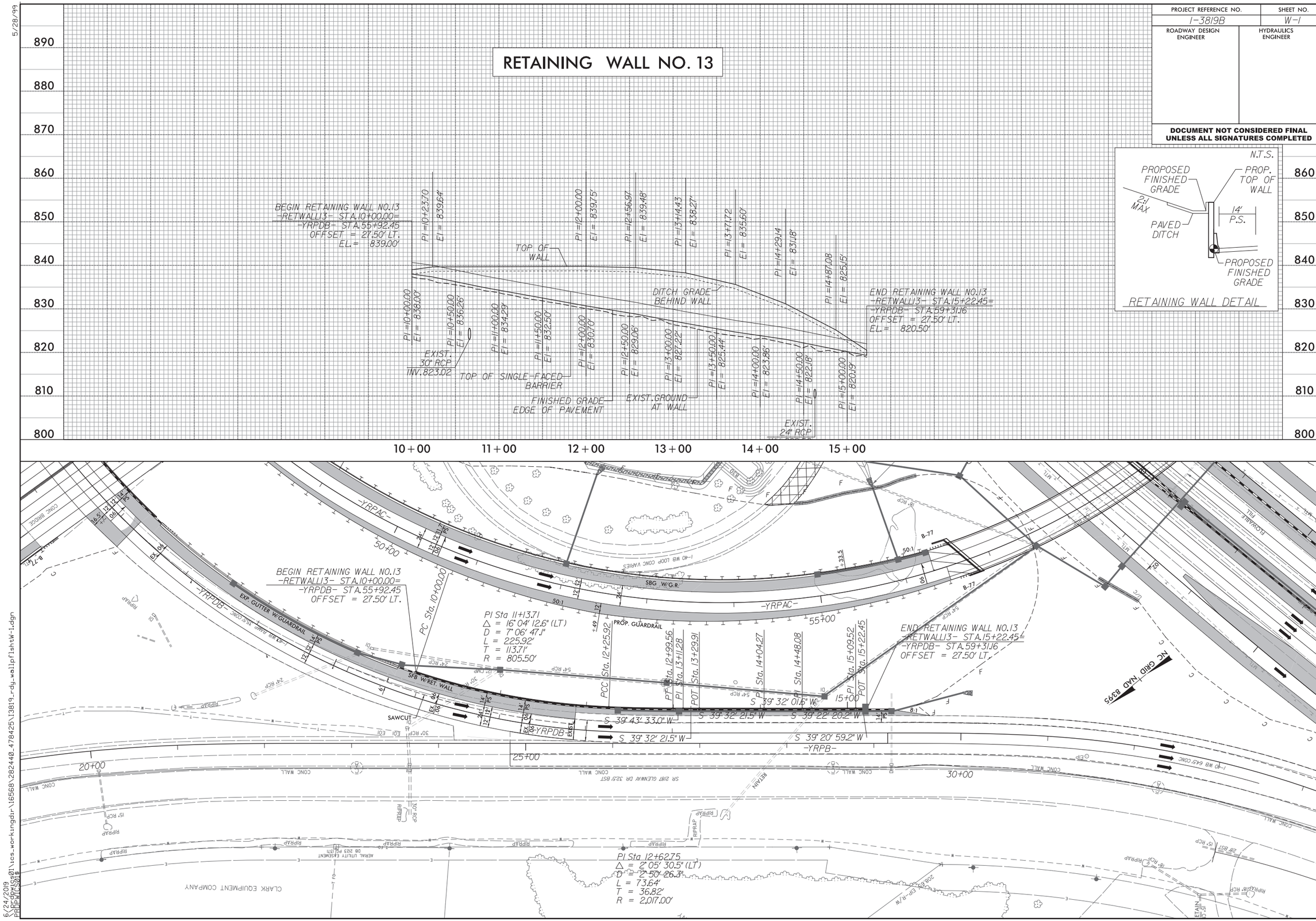
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	W-1
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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6/24/2019
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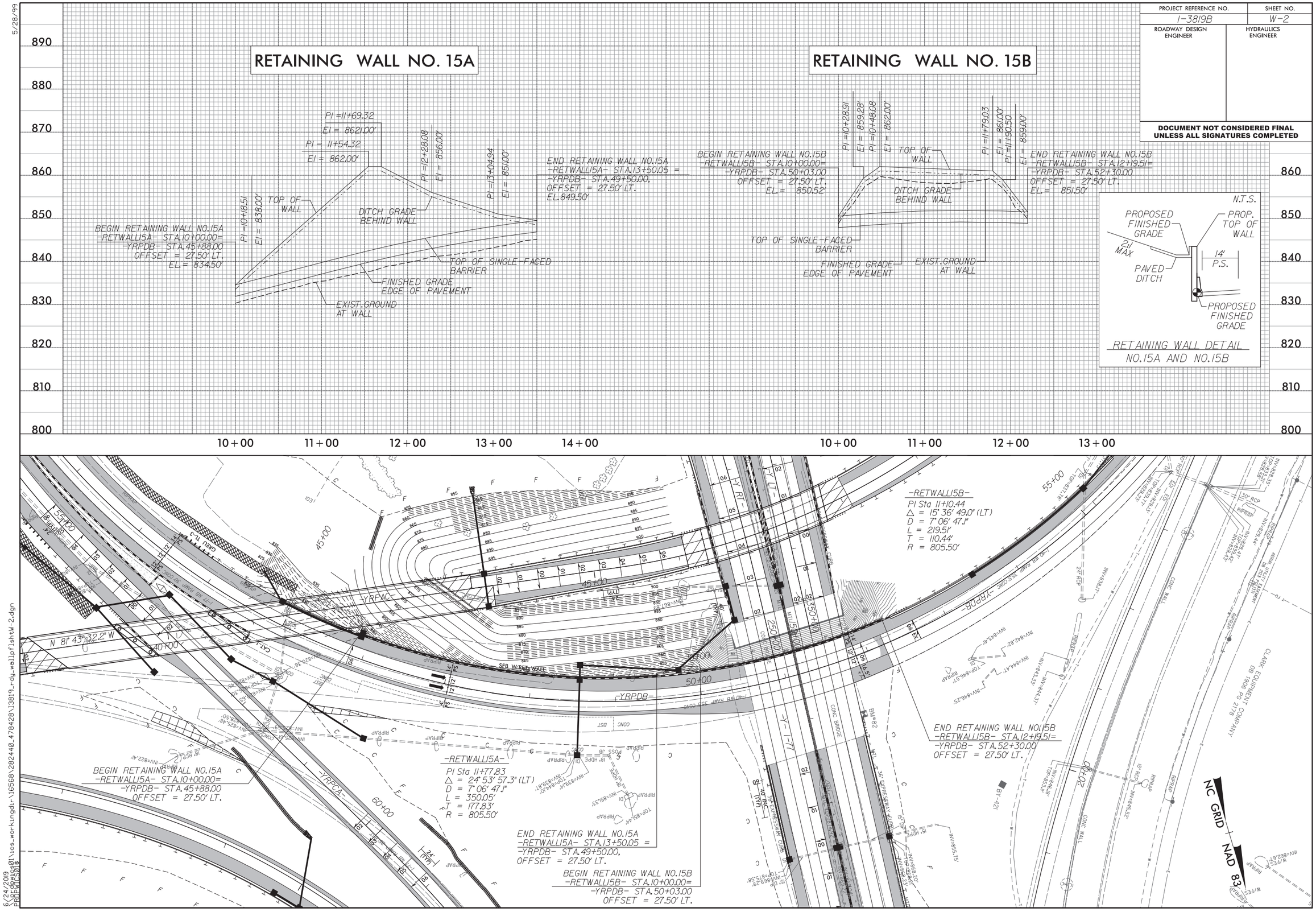
PRDPWICS01$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	W-2
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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6/24/2019
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PROPWICS01$

TIP PROJECT: I-3819B/U-6039

CONTRACT: C204163

09/08/99

6/16/2019
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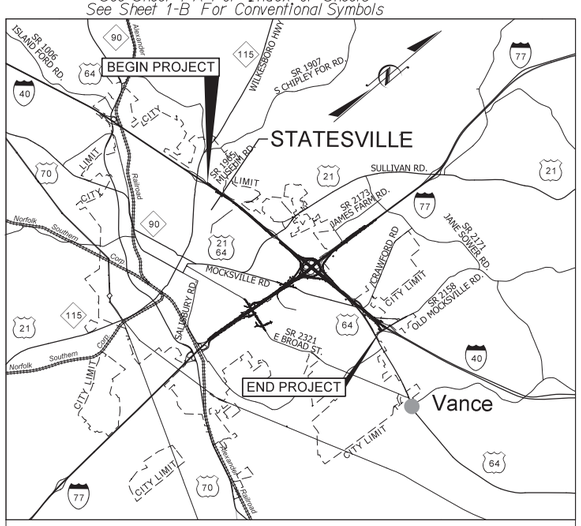
PRDPWICS01$

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



VICINITY MAP

THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF STATESVILLE AND THE TOWNSHIP OF BETHANY

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

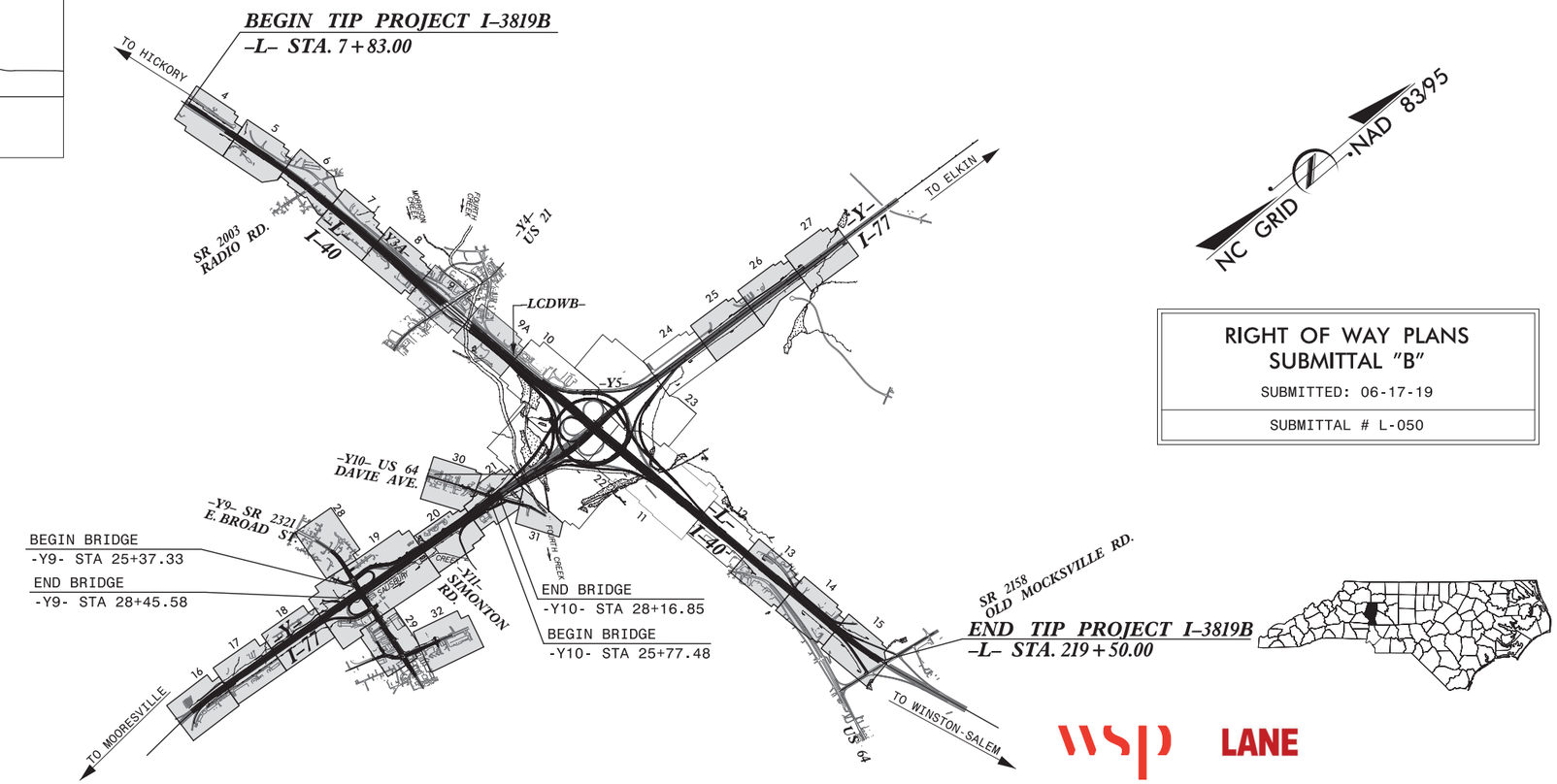
IREDELL COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-3819B/U-6039	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34192.1.2	IMS-40-2(124)	P.E.
34192.3.2	N/A	DESIGN BUILD

LOCATION: I-40/I-77 INTERCHANGE INCLUDING I-40 FROM WEST OF SR 2003 (RADIO RD.) TO SR 2158 (OLD MOCKSVILLE RD.) & I-77 FROM SOUTH OF SR 2321 (EAST BROAD ST.) TO SOUTH OF SR 2171 (JANE SOWERE RD.)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, RETAINING WALLS, NOISE WALLS, AND TRAFFIC CONTROL



RIGHT OF WAY PLANS
SUBMITTAL "B"
SUBMITTED: 06-17-19
SUBMITTAL # L-050

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

THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES

WSP LANE

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

	I-40	I-77
ADT 2018 =	57,300	62,900
ADT 2040 =	72,500	77,500
DHV =	5,800	6,200
D =	55 %	55 %
T =	16 % *	19 % **
V =	60 MPH	60 MPH

* TTST 13 + DUAL 3 (I-40)
** TTST 16 + DUAL 3 (I-77)
CLASSIFICATION: INTERSTATE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT I-3819B	=	3.885
LENGTH STRUCTURES TIP PROJECT I-3819B	=	0.124
TOTAL LENGTH OF TIP PROJECT I-3819B	=	4.009

Prepared In the Office of:
WSP
1001 Morehead Square Dr., Suite 610, Charlotte, NC 28203
NC LIC NO. F-0165

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 30, 2018

LETTING DATE: OCTOBER 30, 2018

CHRISTOPHER D. DAVIS, P.E.
PROJECT ENGINEER

ERIC W. SECKINGER, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

P.E.
STATE HIGHWAY DESIGN ENGINEER

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	1-A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SUBMITTAL 'B' ROADWAY SHEETS

1 ..... TITLE SHEET

1-A ..... INDEX OF SHEETS AND GENERAL NOTES

1-B ..... CONVENTIONAL SYMBOLS

2B-1 THRU 2B-16 ..... TYPICAL SECTIONS, PAVEMENT SCHEDULE & DETAILS

2D-1 THRU 2D-4 ..... DRAINAGE DETAILS

4 THRU 9A; 13 THRU 21; 25 THRU 32 ..... PLAN SHEETS

33 THRU 36; 42 THRU 47; 52 THRU 54; 58 THRU 60; 74 THRU 89 ..... PROFILE SHEETS

W-3 THRU W-7 ..... RETAINING WALL ENVELOPES

CROSS SECTIONS TITLE SHEET XB-0

-L- (LT) CROSS SECTIONS ..... XA-1 THRU XA-9

-L- (RT) CROSS SECTIONS ..... XA-64 THRU XA-72

-Y_S- (LT) CROSS SECTIONS ..... XA-128 THRU XA-132

-Y_S- (RT) CROSS SECTIONS ..... XA-142 THRU XA-146

XB-1 THRU XB-177 ..... -L-

XB-178 THRU XB-281 ..... -Y_S-

XB-282 THRU XB-315 ..... -Y_N-

XB-316 THRU XB-343 ..... -Y9- (-Y9A-, -Y9B-, -Y9C-, -Y9D-, -Y9E-, -Y9G-, & -Y9H-)

XB-344 THRU XB-355 ..... -Y10-

XB-356 THRU XB-357 ..... -Y10DR1-

XB-358 THRU XB-359 ..... -Y11-

XB-360 ..... -Y9LPA-

XB-361 THRU XB-362 ..... -Y9LPC-

XB-363 THRU XB-368 ..... -Y9RPA-

XB-369 THRU XB-372 ..... -Y9RPC-

XB-373 THRU XB-374 ..... -Y15RPC-

GENERAL NOTES

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.05 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.02

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

BERM DITCHES:

BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 240.01 AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

UNDERDRAINS:

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER.

SHOULDER DRAINS:

SHOULDER DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 816.03 AND DETAILS IN PLANS AT LOCATIONS DIRECTED BY THE ENGINEER.

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.03 AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

STREET TURNOUT:

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

AT&T
CITY OF STATESVILLE POWER
CITY OF STATESVILLE WATER /SEWER
DUKE ENERGY DISTRIBUTION
DUKE ENERGY TRANSMISSION
ENERGY UNITED
IREDELL WATER CORP
PSNC GAS
SPECTRUM /TWC

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT.

CURB RAMPS

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS.
CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.05 and/or 848.06.

6/17/2019
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PROFILE$$

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	1-B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Computed Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

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

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easment Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line — RW
- New Right of Way Line with Pin and Cap — RW
- New Right of Way Line with Concrete or Granite R/W Marker — RW
- New Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- New Control of Access — CA
- Existing Easement Line — E
- New Temporary Construction Easement — E
- New Temporary Drainage Easement — TDE
- New Permanent Drainage Easement — PDE
- New Permanent Drainage / Utility Easement — DUE
- New Permanent Utility Easement — PUE
- New Temporary Utility Easement — TUE
- New Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- U/G Power Line LOS B (S.U.E.*) — P
- U/G Power Line LOS C (S.U.E.*) — P
- U/G Power Line LOS D (S.U.E.*) — P

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

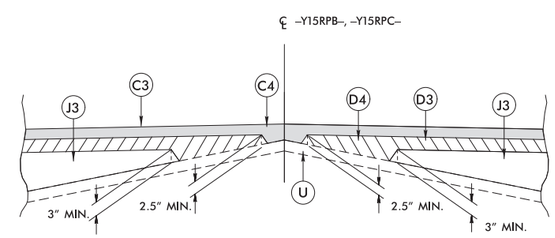
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)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

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2B-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

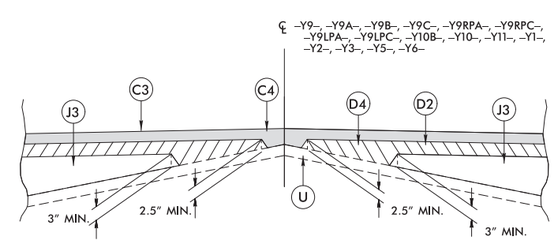
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT SCHEDULE

A1	14″ PORTLAND CEMENT CONCRETE PAVEMENT (JOINTED WITH DOWELS)	P1	PRIME COAT. AT AVERAGE RATE OF 0.35 GAL. PER SQ. YD.
A2	11½″ PORTLAND CEMENT CONCRETE PAVEMENT (JOINTED WITH DOWELS)	R1	1′-6″ CONCRETE CURB AND GUTTER.
A3	13″ PORTLAND CEMENT CONCRETE PAVEMENT (JOINTED WITH DOWELS)	R2	2′-6″ CONCRETE CURB AND GUTTER.
A4	14″ PORTLAND CEMENT CONCRETE PAVEMENT (JOINTED WITHOUT DOWELS)	R3	5″ MONOLITHIC CONCRETE ISLAND (KEYED IN).
B	PROP. APPROX. ¾″ OPEN-GRADED ASPHALT FRICTION COURSE, TYPE FC-1 MODIFIED, AT AN AVERAGE RATE OF 90 LBS. PER SQ. YD. EXTENDED 1-FT. BEYOND EDGE OF TRAVEL LANE	R4	PROPOSED SHOULDER BERM GUTTER (SBG)
C1	PROP. APPROX. 1¼″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 138 LBS. PER SQ. YD.	R5	CONCRETE EXPRESSWAY GUTTER.
C2	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 336 LBS. PER SQ. YD.	R6	SINGLE FACED CONCRETE BARRIER (SFB)
C3	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 330 LBS. PER SQ. YD.	R7	CONCRETE MEDIAN BARRIER (T, T1, T2)
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS AT A MINIMUM LIFT OF 1″ NOT TO EXCEED 2″ IN DEPTH.	S	4″ CONCRETE SIDEWALK.
C5	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 AT A MINIMUM LIFT OF 1.5″ NOT TO EXCEED 2″ IN DEPTH.	T	EARTH MATERIAL.
C6	PROP. 1.5″ DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
D1	PROP. APPROX. 3″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	V	MILLING BITUMINUOS PAVEMENT (DEPTH VARIES)
D2	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAILS)
D3	PROP. APPROX. 2½″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	Y	MILLED RUMBLE STRIPS
D4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS AT A MINIMUM LIFT OF 2½″ NOT TO EXCEED 4″ IN DEPTH.		
E1	PROP. APPROX. 3″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.		
E2	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.		
E3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS AT A MINIMUM LIFT OF 3″ NOT TO EXCEED 5 1/2″ IN DEPTH.		
E4	PROP. APPROX. 12.5″ 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 AT A MININUM LIFT OF 3″ NOT TO EXCEED 5 1/2″ IN DEPTH.		
E5	PROP. APPROX. 13.5″ 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 AT A MININUM LIFT OF 3″ NOT TO EXCEED 5 1/2″ IN DEPTH.		
G1	PROP. 8″ CEMENT TREATED BASE COURSE.		
J1	PROP. 6″ AGGREGATE BASE COURSE.		
J2	PROP. 8″ AGGREGATE BASE COURSE.		
J3	PROP. VAR. DEPTH AGGREGATE BASE COURSE.		
J4	PROP. 6″ #57 STONE		
K1	12″ TYPE 1 AGGREGATE SUBGRADE.		
M3	MILING 3″		
N1	NON-WOVEN GEOTEXTILE DRAINAGE LAYER		



Detail Showing Method of Wedging



Detail Showing Method of Wedging

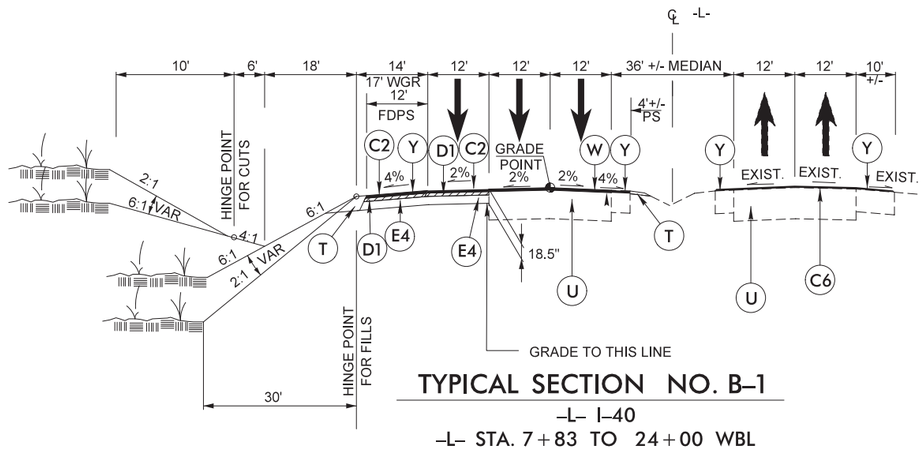
6/16/2019
\\prodgeos01\ics_workingdir\15632\282440.443781\3819_rdy_typ2B-01.dgn
PROFICS01$

C2	3" S9.5D
C5	VAR. S9.5D
C6	1.5" S9.5D
D1	3" I19.0C
D4	VAR. I19.0C
E3	VAR. B25.0C
E4	12.5" B25.0C
R7	MEDIAN CONCRETE BARRIER
T	EARTH MATERIAL
U	EX PAVEMENT
W	WEDGING
Y	MILLED RUMBLE STRIPS

WSP | LANE

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2B-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

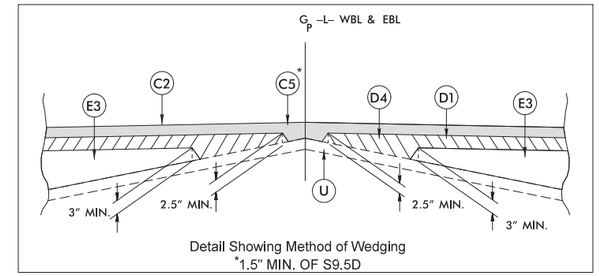


TYPICAL SECTION NO. B–1

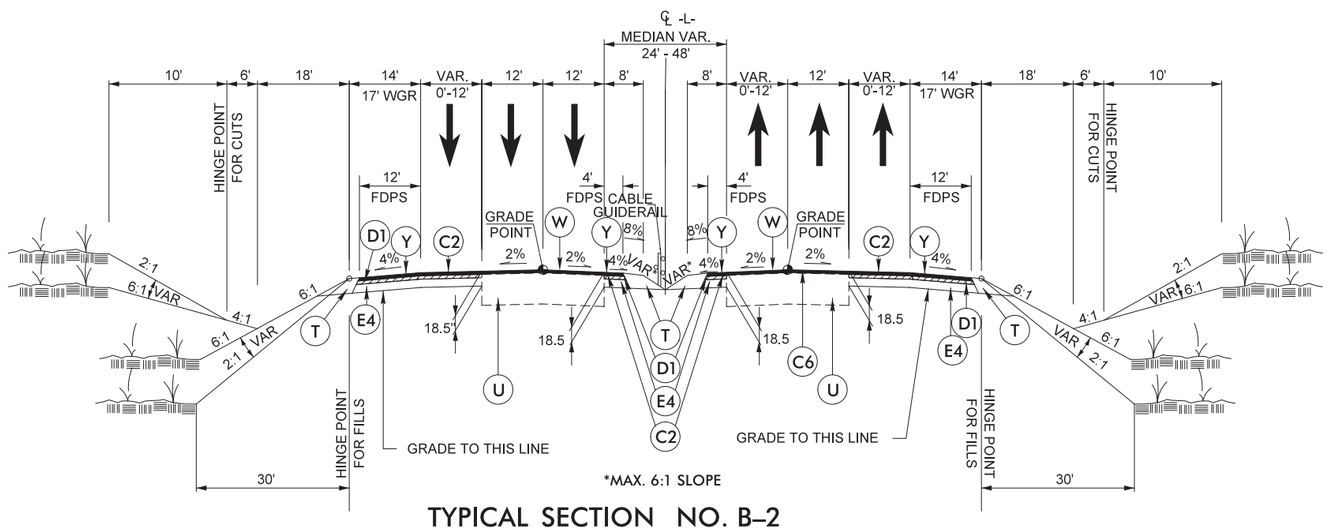
–L– I–40

–L– STA. 7+83 TO 24+00 WBL

–L– STA. 18+77.41 TO 24+00 EBL



Detail Showing Method of Wedging
*1.5" MIN. OF S9.5D

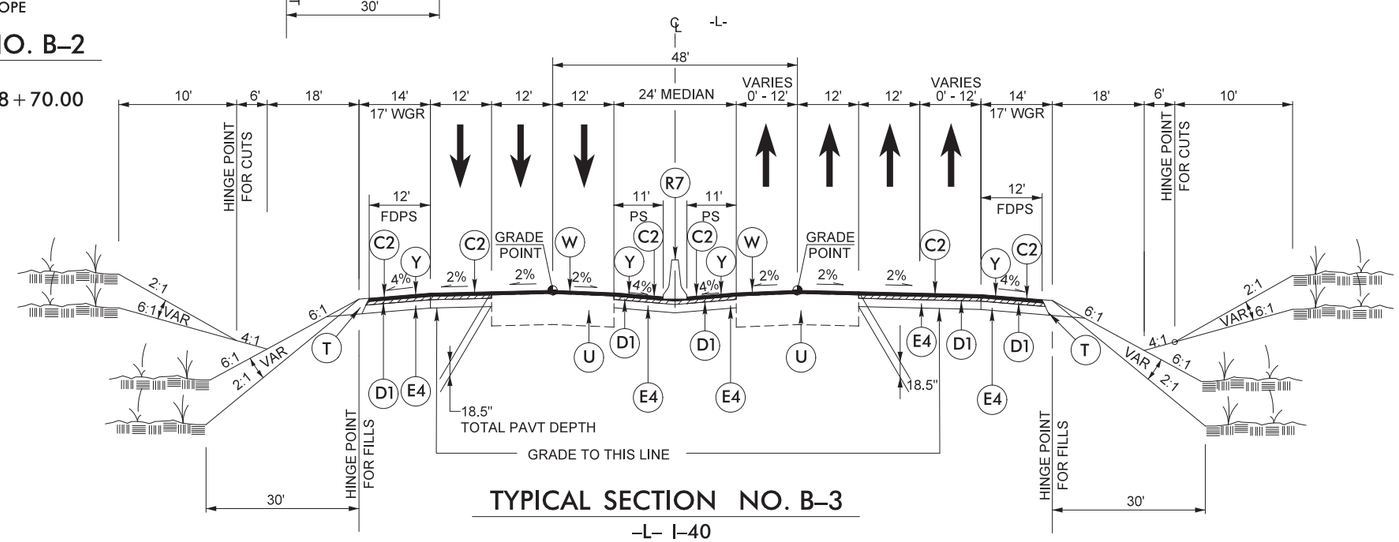


*MAX. 6:1 SLOPE

TYPICAL SECTION NO. B–2

–L– I–40

–L– STA. 24+00.00 TO 28+70.00



TYPICAL SECTION NO. B–3

–L– I–40

–L– STA. 28+70.00 TO 30+11.51

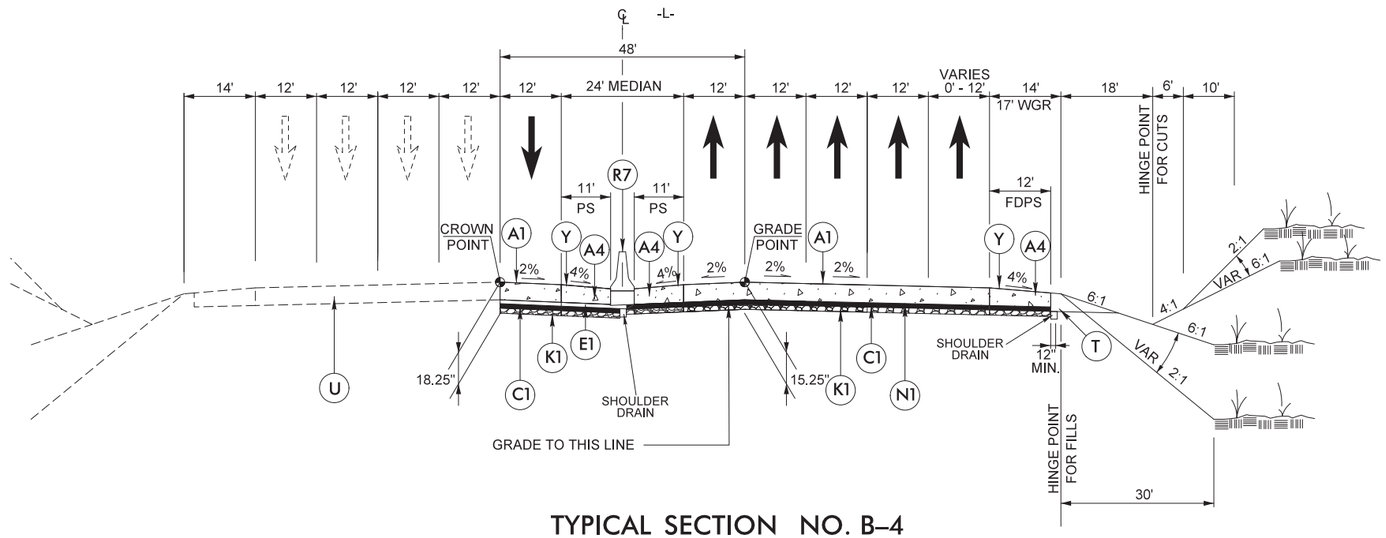
6/16/2019
DGN: proposed01\ics_workingdir\15632\282440_443782\13819_rdy_typ2B-02.dgn
PROPWCS01$

A1	14" PCCP W/ DOWELS
A4	14" PCCP JOINTED WITHOUT DOWELS
C1	1¼" SF9.5B
E1	3" B25.0C
E3	VAR. DEPTH B25.0C
K1	12" TYPE 1
N1	NON-WOVEN GEOTEXTILE DRAINAGE LAYER
R6	SINGLE FACED BARRIER
R7	MEDIAN CONCRETE BARRIER
T	EARTH MATERIAL
U	EX PAVEMENT
Y	MILLED RUMBLE STRIPS

WSP | LANE

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2B-3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

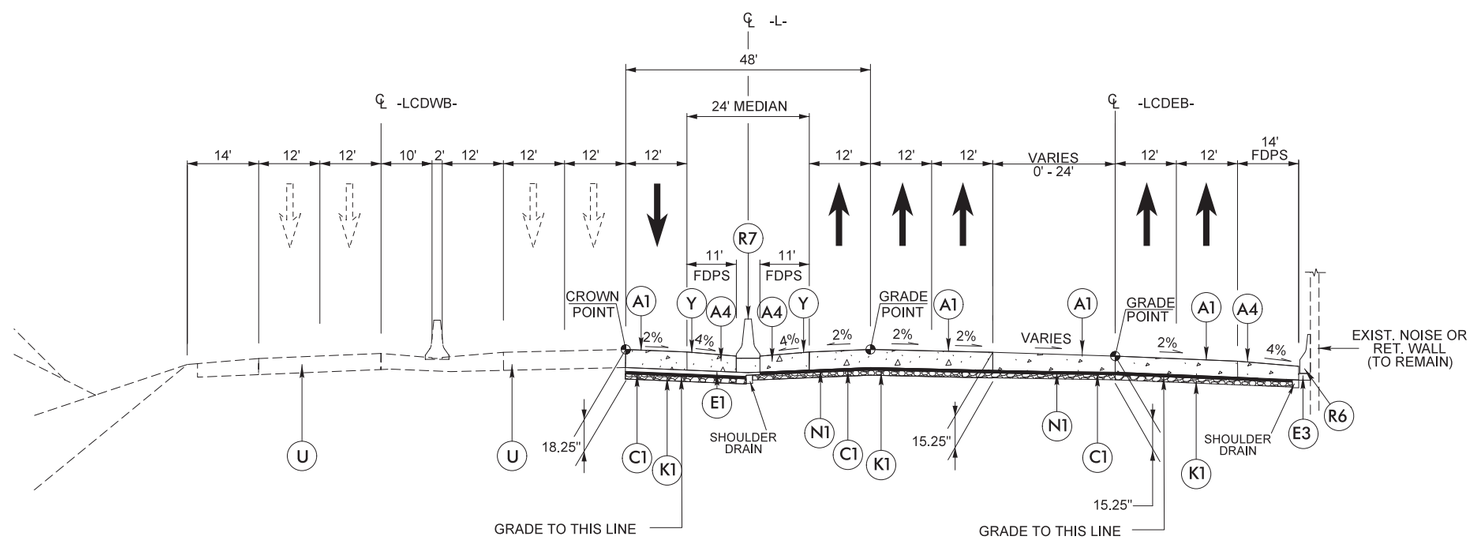
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION NO. B–4

–L– I–40

–L– STA. 30+11.51 TO 56+50.00



TYPICAL SECTION NO. B–5

–L– I–40

–L– STA. 56+50 TO 62+99.78

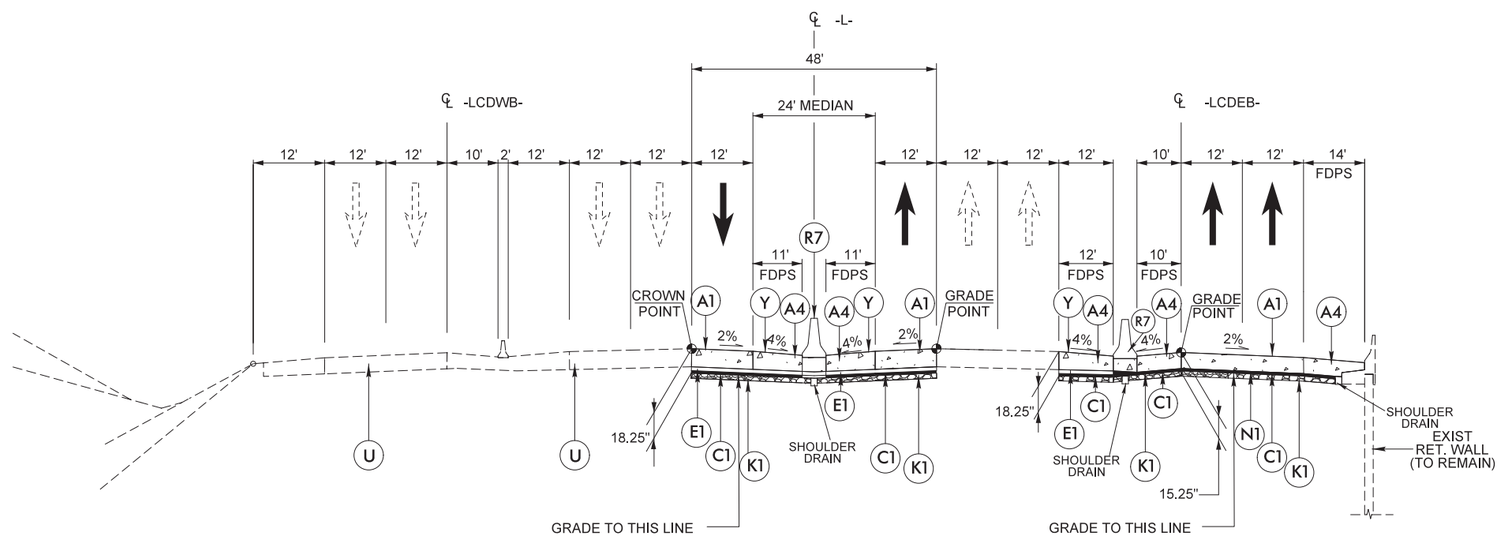
6/17/2019
DGN: pwgsa02\ics_workingdir\5841\282440.447017\I3819_rdy_typ2B-03.dgn
PLOT: ICS02$

A1	14" PCCP
A4	14" PCCP JOINTED WITHOUT DOWELS
C1	1¼" SF9.5B
E1	3" B25.0C
K1	12" TYPE 1
N1	NON-WOVEN GEOTEXTILE DRAINAGE LAYER
R7	MEDIAN CONCRETE BARRIER
T	EARTH MATERIAL
U	EX PAVEMENT
Y	MILLED RUMBLE STRIPS

wsp | LANE

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2B-4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION NO. B-6

-L- I-40

-L- STA. 62+99.78 TO BEGIN APPROACH SLAB STA. 84+86.64

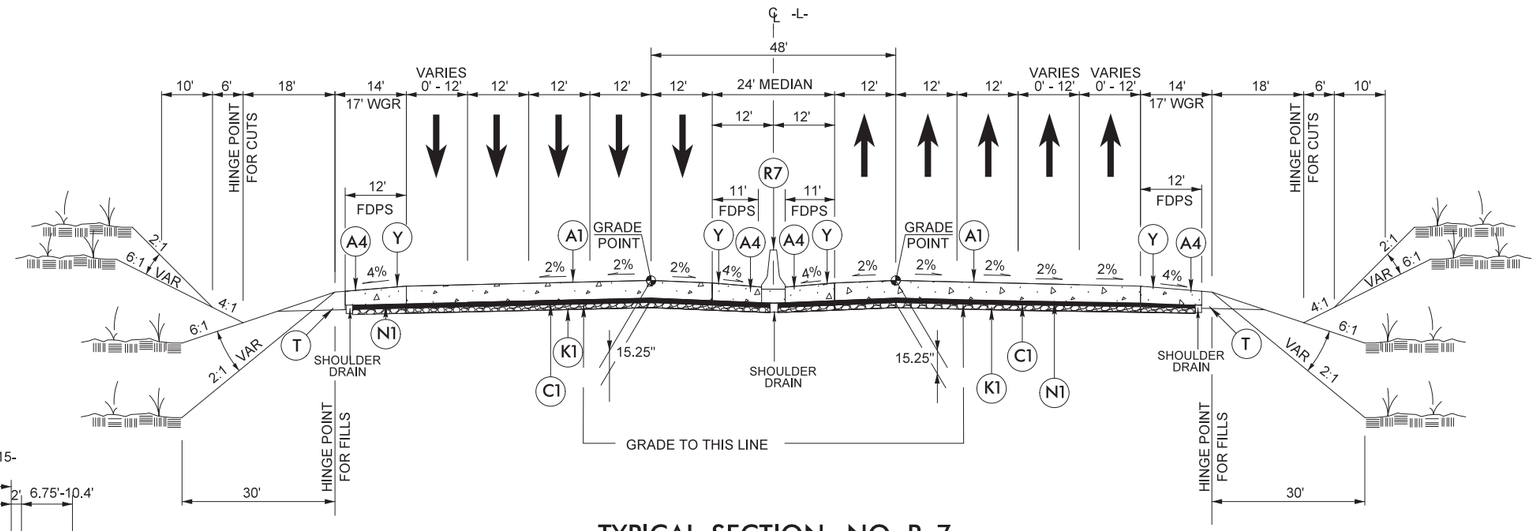
6/17/2019
\\prdpwics02\ics_workingdir\5841\282440_447018\I3819_rdy_typ2B-04.dgn
PRDPWICS02$

A1	14" PCCP W/ DOWELS
A4	14" PCCP JOINTED WITHOUT DOWELS
C1	1¼" SF9.5B
C2	3" S9.5D
D1	3" I19.0C
E2	4" B25.0C
E4	12.5" B25.0C
K1	12" TYPE 1
N1	NON-WOVEN GEOTEXTILE DRAINAGE LAYER
R7	MEDIAN CONCRETE BARRIER
T	EARTH MATERIAL
U	EX. PAVEMENT
Y	MILLED RUMBLE STRIPS

LANE

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2B-5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

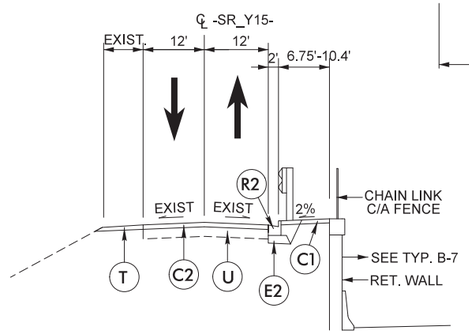
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION NO. B-7

-L- I-40

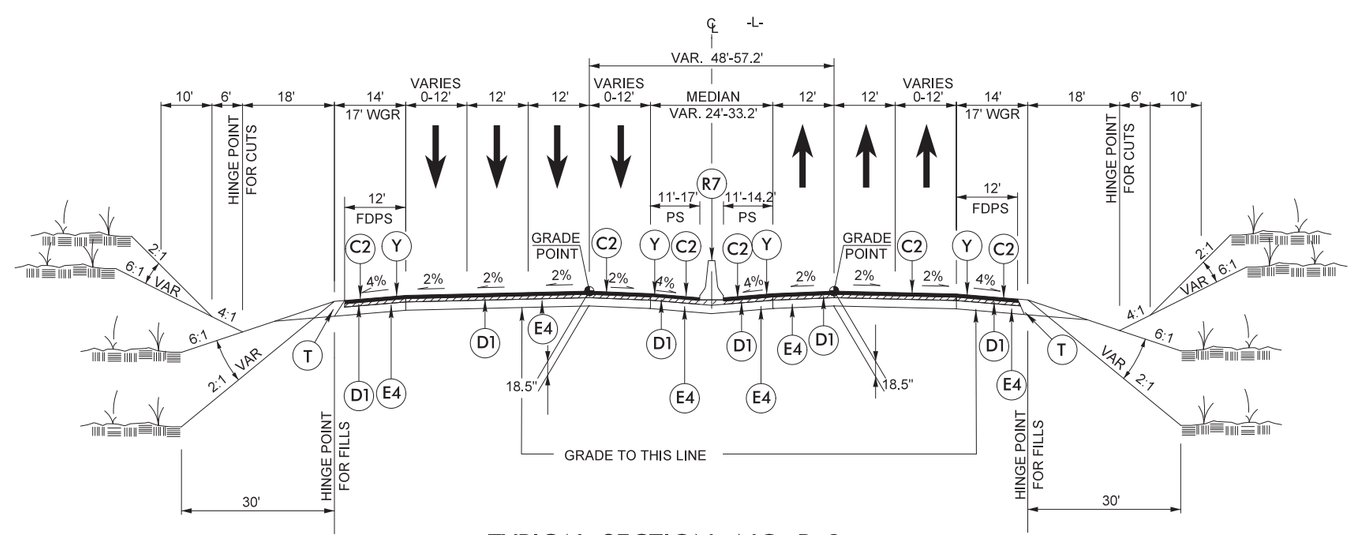
-L- STA. 178+50 TO 210+50



TYPICAL SECTION DETAIL NO. B-7A

-SR_Y15- WILSON PARK ROAD

-SR_Y15- STA. 13+91.65 TO 24+49.83



TYPICAL SECTION NO. B-8

-L- I-40

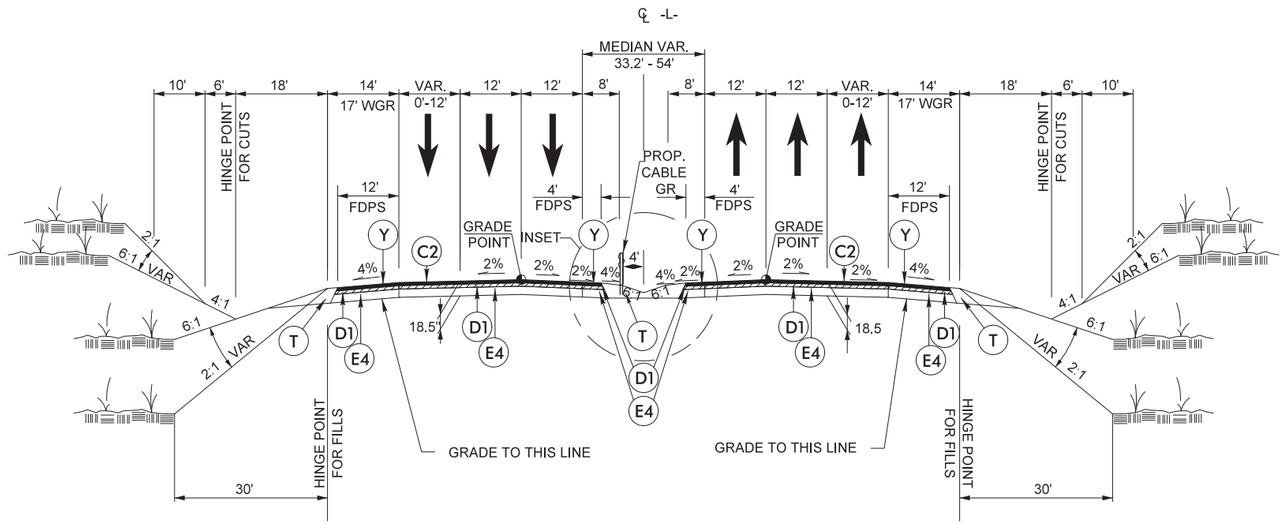
-L- STA. 210+50 TO 212+10

6/16/2019
\\prdpwics01\ics_workingdir\15632\282440_443785\13819_rdy_typ2B-05.dgn
PRDPWICS01$

C2	3" S9.5D
D1	3" I19.0C
E4	12.5" B25.0C
T	EARTH MATERIAL
Y	MILLED RUMBLE STRIPS

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2B-6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

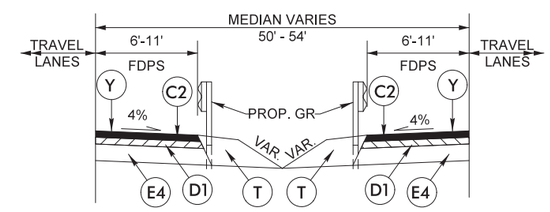


TYPICAL SECTION NO. B–9

–L– I–40

–L– STA. 212+10.00 TO 219+35.97 (WESTBOUND)

–L– STA. 212+10.00 TO 219+02.76 (EASTBOUND)



INSET TO TYPICAL SECTION NO. B–9

–L– STA. 216+87.00 TO 219+35.97

6/16/2019
\\prdpwics01\ics_workingdir\15632\282440_443786\I3819_rdy_typ2B-06.dgn
PROPWICS01$

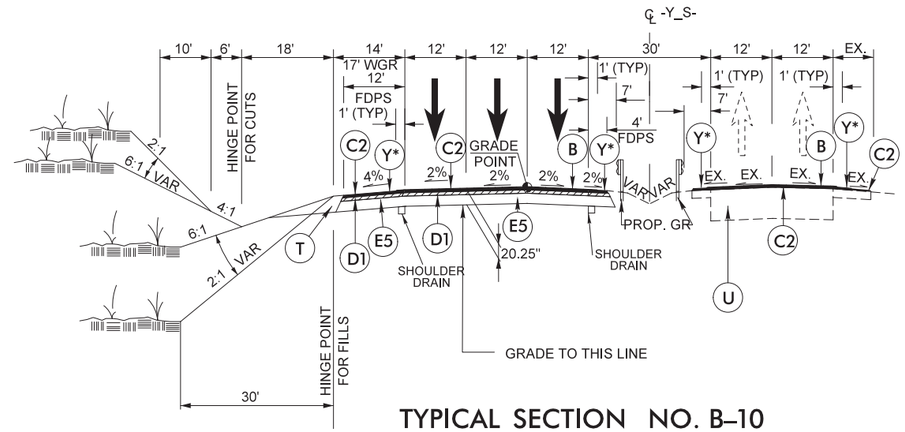
B	OGFC
C2	3" S9.5D
D1	3" I19.0C
E5	13.5" B25.0C
T	EARTH MATERIAL
U	EX PAVEMENT
Y	MILLED RUMBLE STRIPS

SEE SHEET 2A-8 & 2A-9 FOR SPECIAL DETAILS

WSP | LANE

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2B-7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

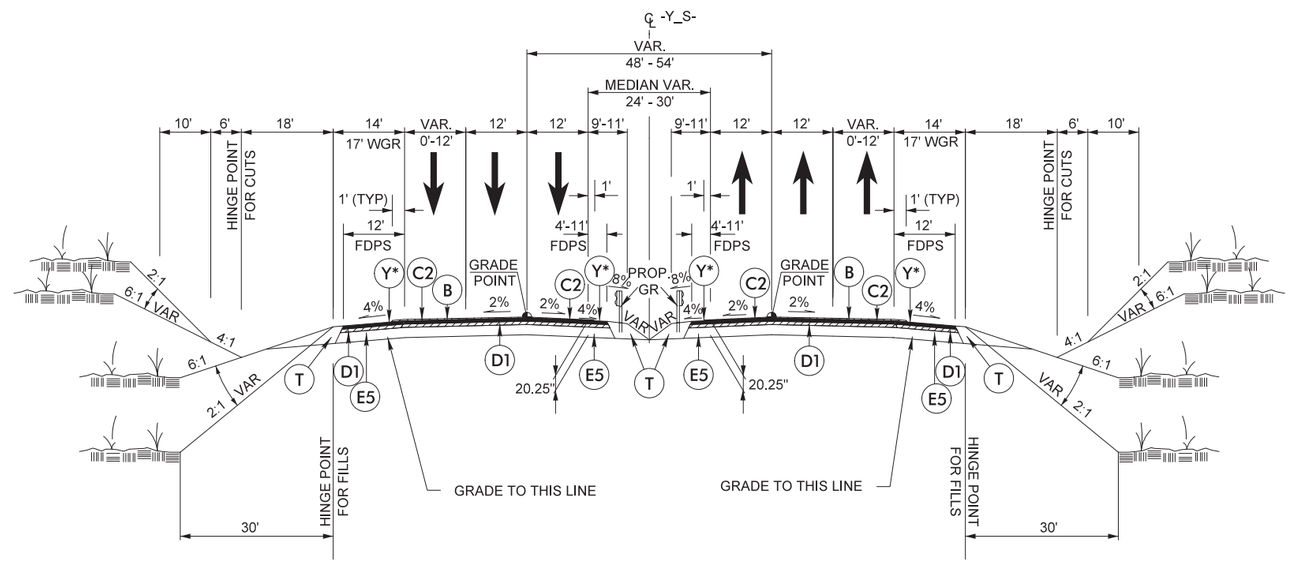
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION NO. B-10

-Y- I-77

-Y_S- STA. 25+00.49 TO 31+25.48



TYPICAL SECTION NO. B-11

-Y_S- I-77

-Y_S- STA. 31+25.48 TO 34+00.00

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.
* INSIDE EDGE OF MILLED RUMBLE STRIP SHALL BE 4" OFF O.G.F.C.

6/16/2019
PBPW\cs01\ics_workingdir\15632\282440.443787\13819_rdy_typ2B-07.dgn
PBPWICS01$

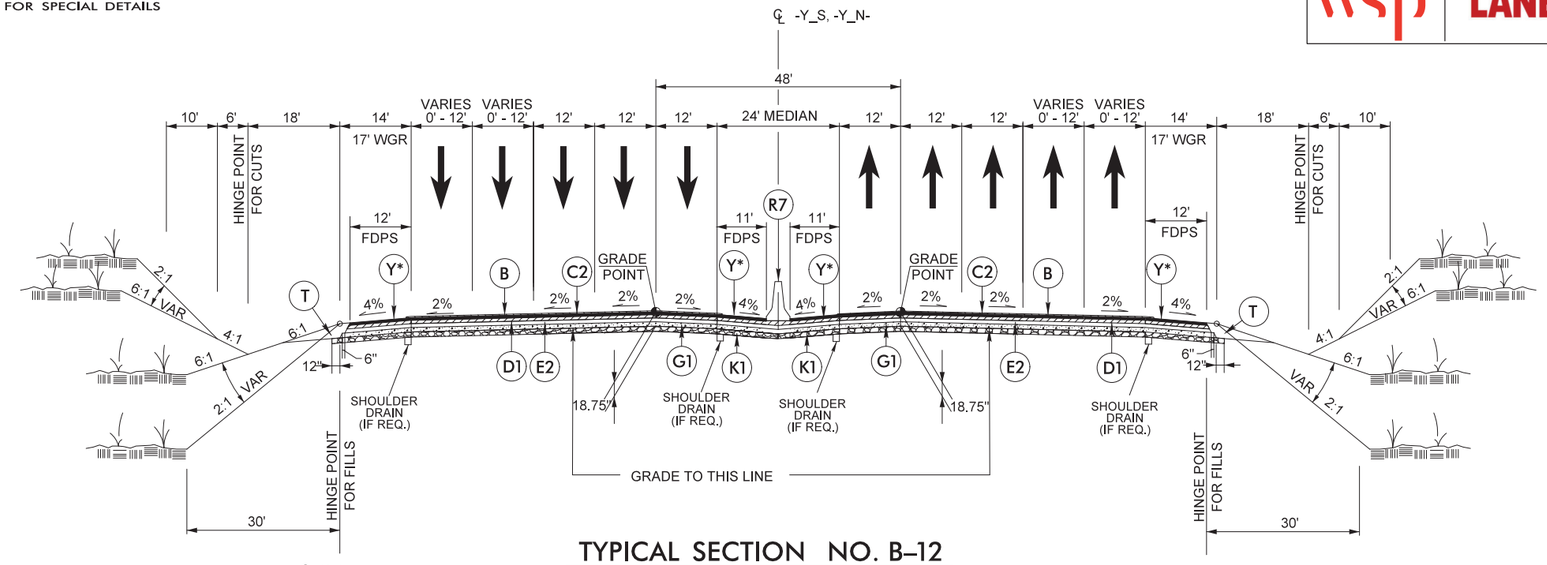
B	OGFC
C2	3" S9.5D
D1	3" I19.0C
E2	4" B25.0C
G1	8" CTB
K1	12" TYPE 1
R7	MEDIAN CONCRETE BARRIER
T	EARTH MATERIAL
U	EX PAVEMENT
W	WEDGING
Y	MILLED RUMBLE STRIPS

SEE SHEET 2A-8 & 2A-9 FOR SPECIAL DETAILS

WSP | LANE

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2B-8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

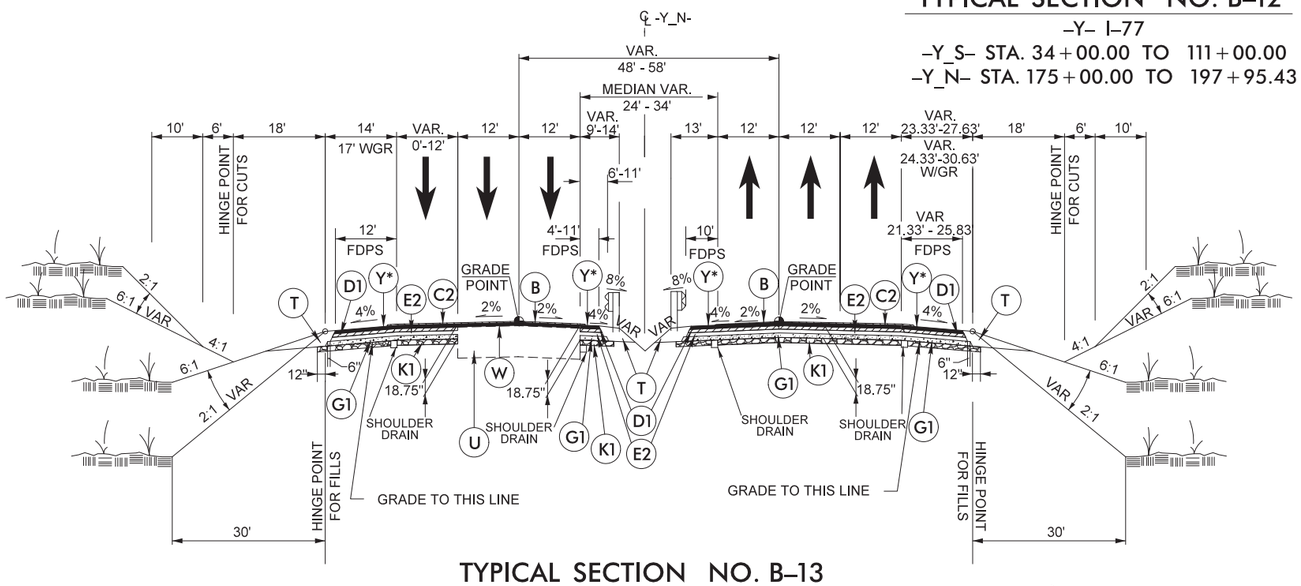


TYPICAL SECTION NO. B-12

-Y- I-77

-Y_S- STA. 34+00.00 TO 111+00.00

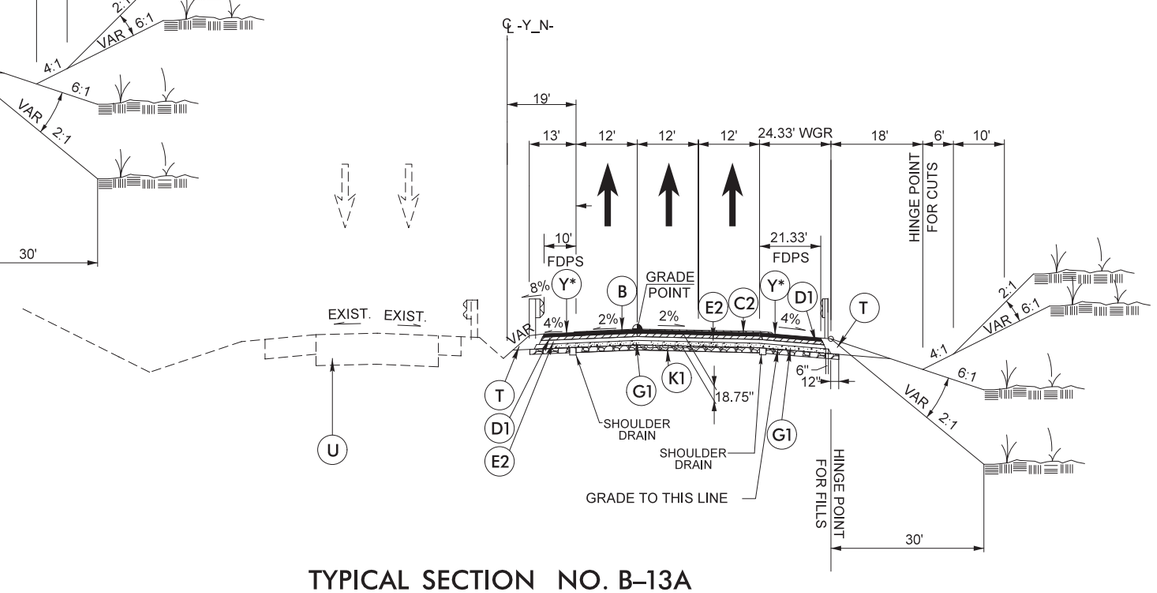
-Y_N- STA. 175+00.00 TO 197+95.43



TYPICAL SECTION NO. B-13

-Y- I-77

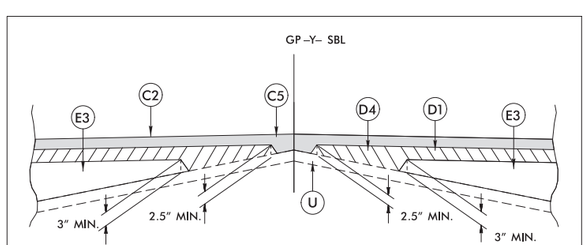
-Y_N- STA. 197+95.43 TO 205+15.43



TYPICAL SECTION NO. B-13A

-Y- I-77

-Y_N- STA. 205+15.43 TO 209+50.00



Detail Showing Method of Wedging

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.
* INSIDE EDGE OF MILLED RUMBLE STRIP SHALL BE 4" OFF O.G.F.C.

6/16/2019
\\prdpwics01\ics_workingdir\15632\282440_443788\13819_rdy_typ2B-08.dgn
PRDPWICS01$

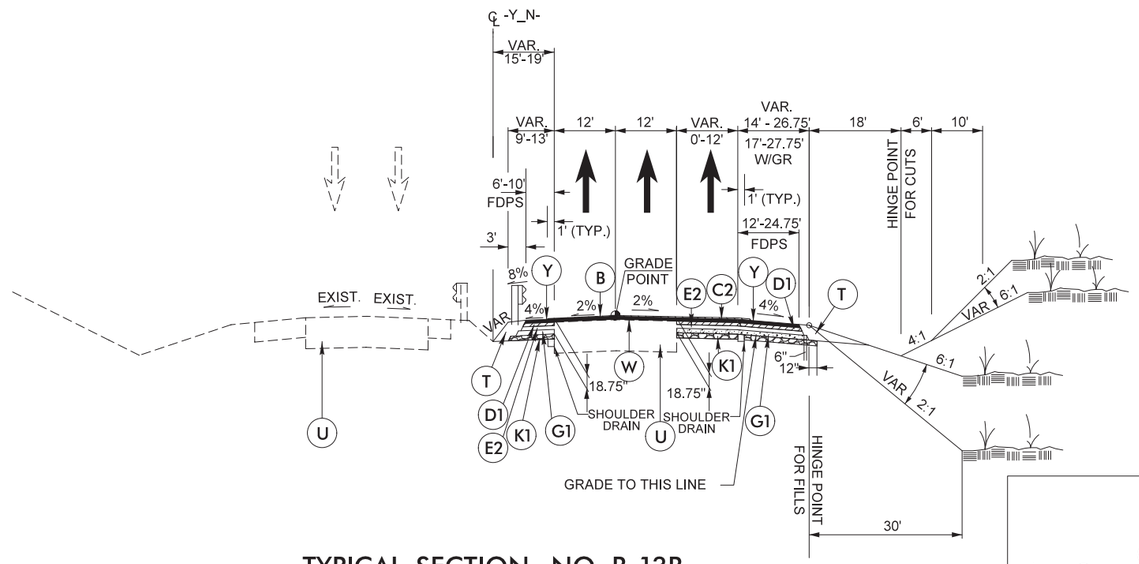
B	OGFC
C2	3" S9.5D
C3	3" S9.5B
D1	3" I19.0C
D2	4" I19.0C
D3	2½" I19.0C
E2	4" B25.0C
G1	8" CTB
J1	6" ABC
J2	8" ABC
K1	12" TYPE 1
T	EARTH MATERIAL
U	EX PAVEMENT
W	WEDGING
Y	MILLED RUMBLE STRIPS

SEE SHEET 2A-8 & 2A-9 FOR SPECIAL DETAILS

WSP | LANE

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2B-9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

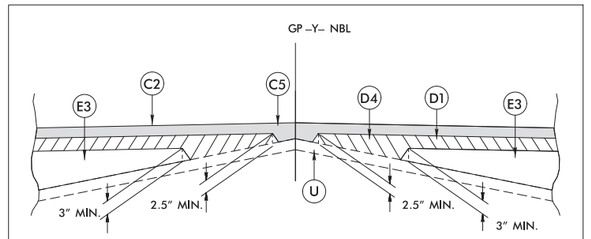
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



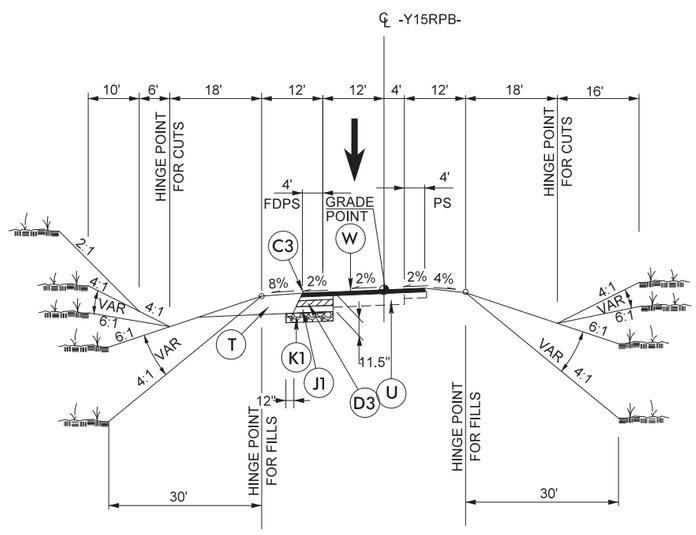
TYPICAL SECTION NO. B-13B

-Y- I-77

-Y_N- STA. 209+50.00 TO 216+70.00



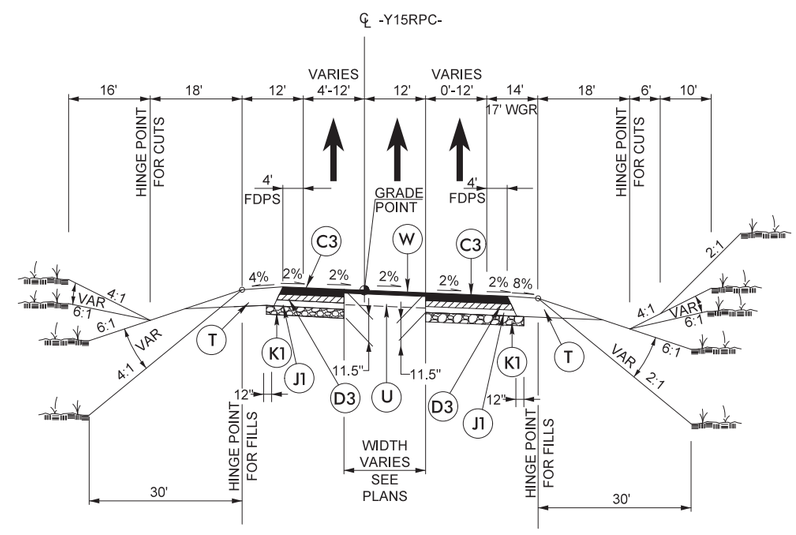
Detail Showing Method of Wedging



TYPICAL SECTION NO. B-14

-Y15RPB- RAMP B

-Y15RPB- STA. 14+79.70 TO 18+00.00



TYPICAL SECTION NO. B-15

-Y15RPC- RAMP C

-Y15RPC- STA. 14+94.43 TO 23+99.24

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.
* INSIDE EDGE OF MILLED RUMBLE STRIP SHALL BE 4" OFF O.G.F.C.

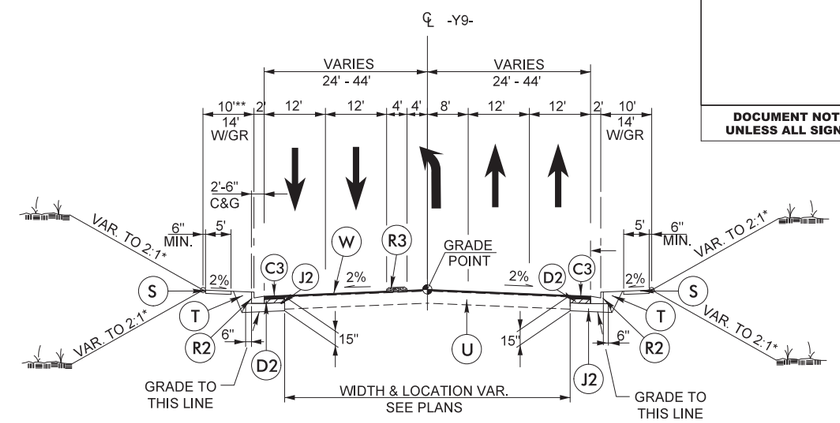
6/16/2019
\\prdpwics01\ics_workingdir\15632\282440_443789\13819_rdy_typ2B-09.dgn
PRDPWICS01$

C3	3" S9.5B
D2	4" I19.0C
J1	6" ABC
J2	8" ABC
K1	12" TYPE 1
R2	2'-6" C & G
R3	5" MCI
S	SIDEWALK
T	EARTH MATERIAL
U	EX PAVEMENT
W	WEDGING

WSP | LANE

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2B-10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



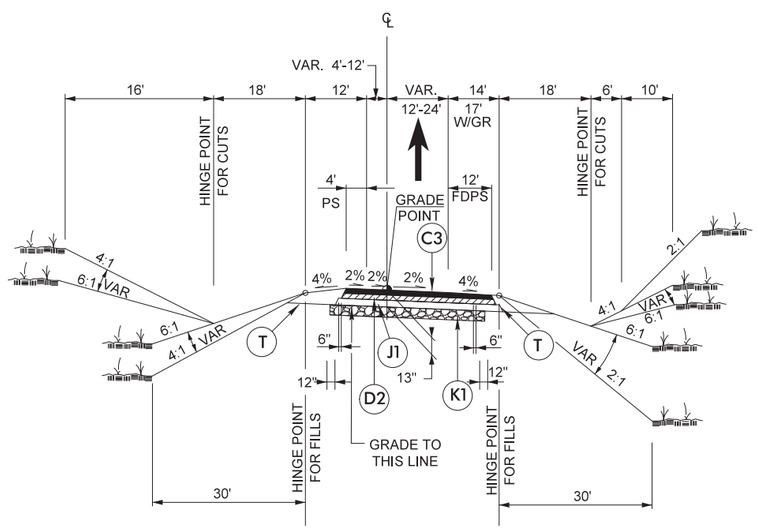
TYPICAL SECTION NO. B–16

–Y9– BROAD STREET

–Y9– STA. 14+41.60 TO BRIDGE STA. 25+37.33

–Y9– BRIDGE STA 28+45.58 TO 50+00.00

*4:1 MAX SIDE SLOPE WITHIN INTERCHANGE AREA
**12' WHEN SIDE SLOPE IS 2:1 (FROM STA. 34+64.70 TO STA. 35+67.70)



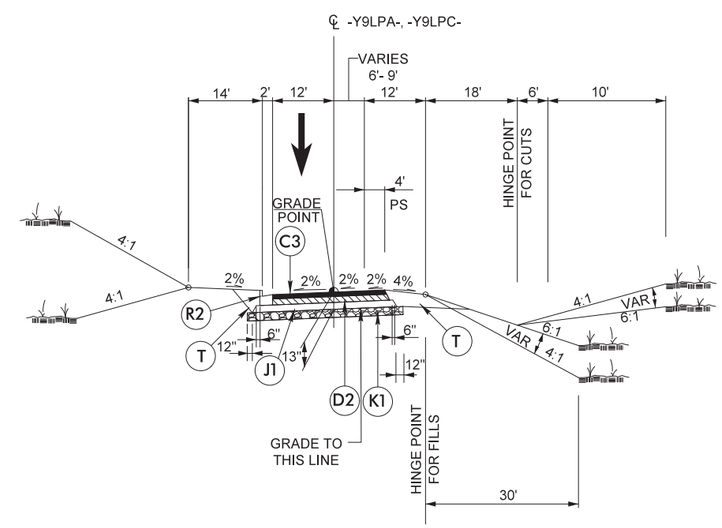
TYPICAL SECTION NO. B–17

–Y9RPA– RAMP A

–Y9RPA– STA. 17+13.86 TO 27+70.95

–Y9RPC– RAMP C

–Y9RPC– STA. 13+98.24 TO 24+52.47



TYPICAL SECTION NO. B–18

–Y9LPA– LOOP A

–Y9LPA– STA. 11+75.47 TO 18+11.27

–Y9LPC– LOOP C

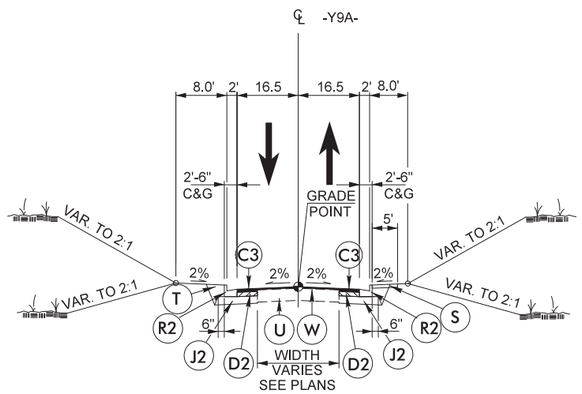
–Y9LPC– STA. 11+87.87 TO 18+91.43

6/16/2019
pbrdwrcs01\ncs_workingdir\15632\282440.443790\13819_rdy_typ2B-10.dgn
PBDWRCS01$

C3	3" S9.5B
D2	4" I19.0C
J2	8" ABC
K1	12" TYPE 1
R2	2'-6" C & G
R3	5" MCI
S	SIDEWALK
T	EARTH MATERIAL
U	EX PAVEMENT
W	WEDGING

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2B-11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

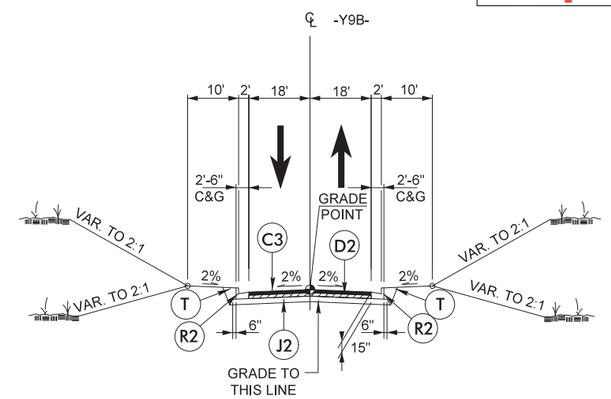
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION NO. B–19

–Y9A– KNOX ROAD

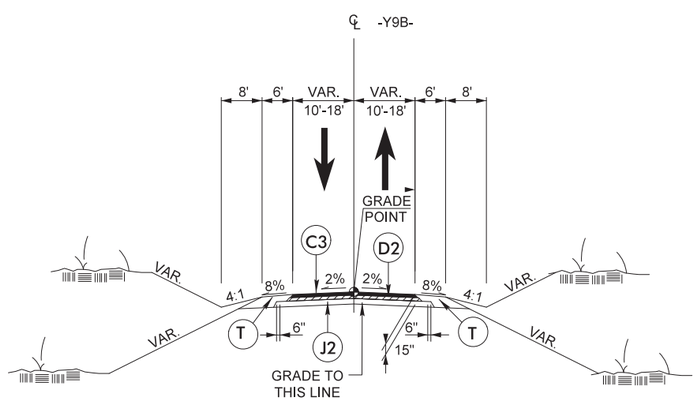
–Y9A– STA. 10+32.49 TO 11+56.68



TYPICAL SECTION NO. B–20

–Y9B– BEECHWOOD ROAD

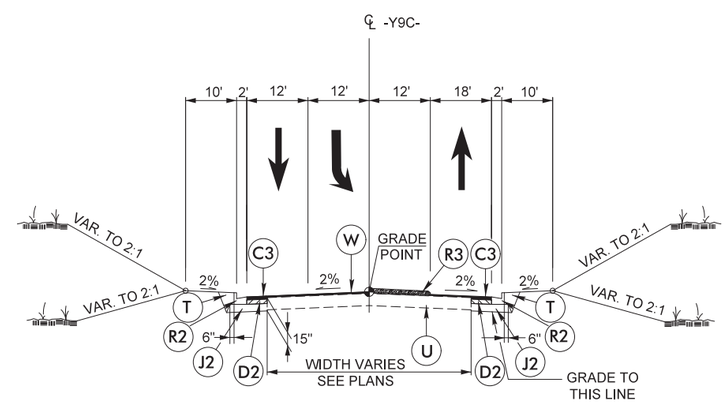
–Y9B– STA. 11+90.00 TO 14+98



TYPICAL SECTION NO. B–20A

–Y9B– BEECHWOOD ROAD

–Y9B– STA. 10+05.00 TO 11+90.00



TYPICAL SECTION NO. B–21

–Y9C– SHOPPING CENTER ENTRANCE

–Y9C– STA. 10+32.03 TO 11+69.41

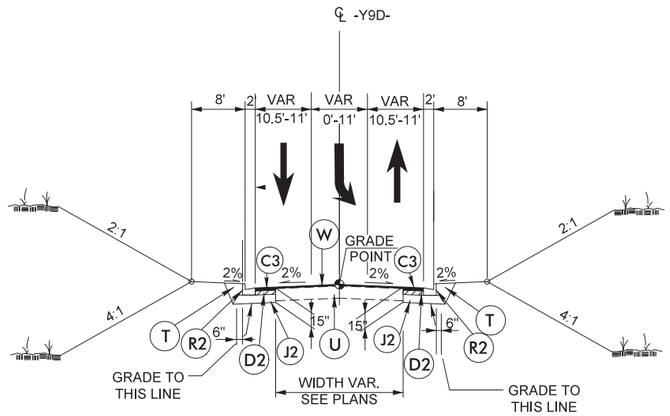
6/16/2019
\\prdpwics01\ics_workingdir\15632\282440_443791\13819_rdy_typ2B-11.dgn
PRDPWICS01$

C3	3" S9.5B
D2	4" I19.0C
J2	8" ABC
M3	MILLING
R2	2'-6" C & G
S	4" SIDEWALK
T	EARTH MATERIAL
U	EX PAVEMENT
W	WEDGING

WSP | LANE

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2B-12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

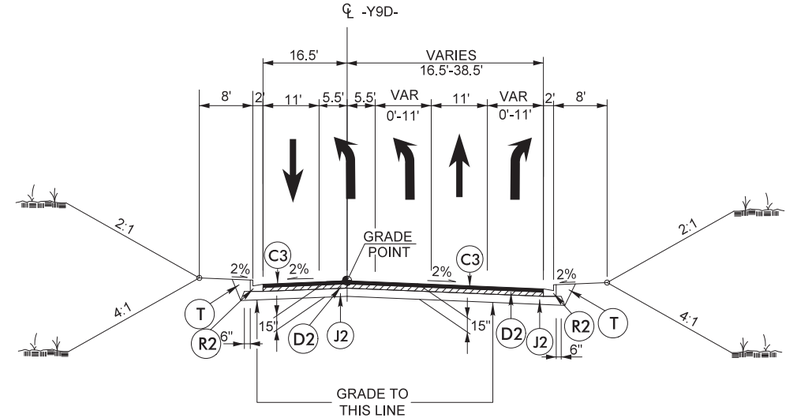
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION NO. B–22

–Y9D– EASTSIDE DRIVE

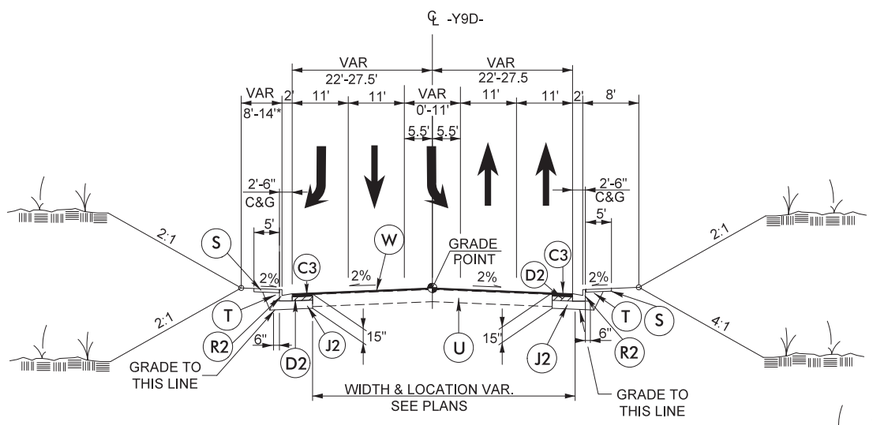
–Y9D– STA. 18+04.04 TO STA. 18+50.00



TYPICAL SECTION NO. B–23

–Y9D– EASTSIDE DRIVE

–Y9D– STA. 18+50.00 TO STA. 24+01.02



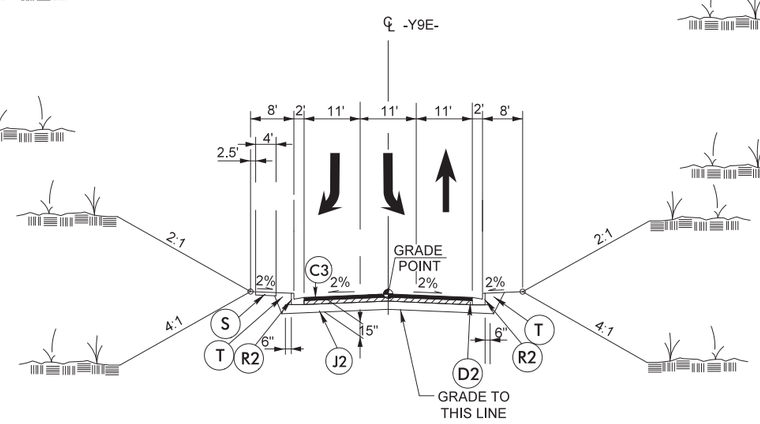
TYPICAL SECTION NO. B–24

–Y9D– SIGNAL HILL DRIVE

–Y9D– STA. 24+77.37 TO STA. 33+90.38

SEE PLAN FOR SIDEWALK LOCATION

*USE 14' BERM BETWEEN -Y9D- STA. 25+15 TO STA. 32+84

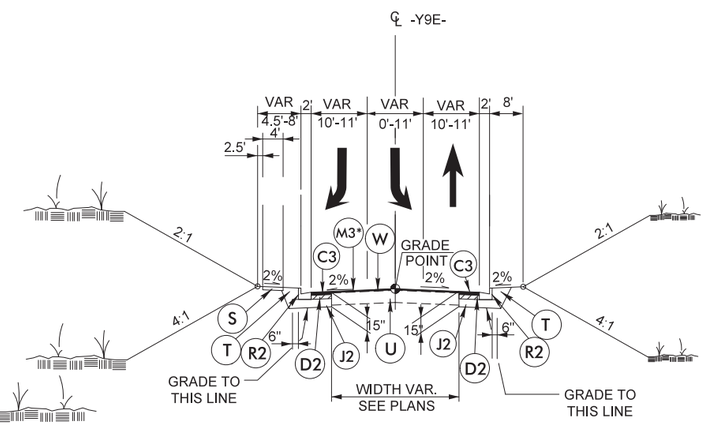


TYPICAL SECTION NO. B–25

–Y9E– CAROLINA STREET

–Y9E– STA. 10+16.50 TO STA. 11+35.00

SEE PLAN FOR SIDEWALK LOCATION



TYPICAL SECTION NO. B–25A

–Y9E– CAROLINA STREET

–Y9E– STA. 11+35.00 TO STA. 13+89.11

SEE PLAN FOR SIDEWALK LOCATION

*MILLING BETWEEN 13+00 TO 13+89.11

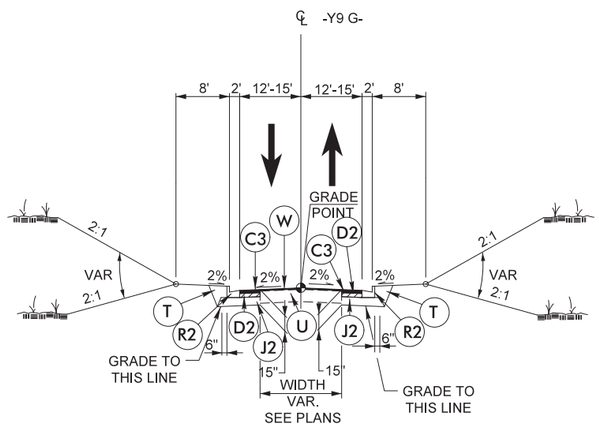
6/17/2019
\prdpwics02\ics_workingdir\5841\282440_447026\13819_rdy_typ2B-12.dgn
PRDPWICS02$

C3	3" S9.5B
D2	4" I19.0C
J2	8" ABC
R2	2'-6" C & G
T	EARTH MATERIAL
U	EX PAVEMENT
W	WEDGING

WSP | LANE

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2B-13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

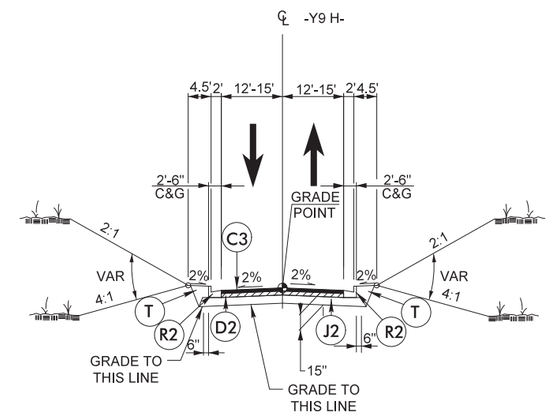
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION NO. B–26

–Y9G– DALE STREET

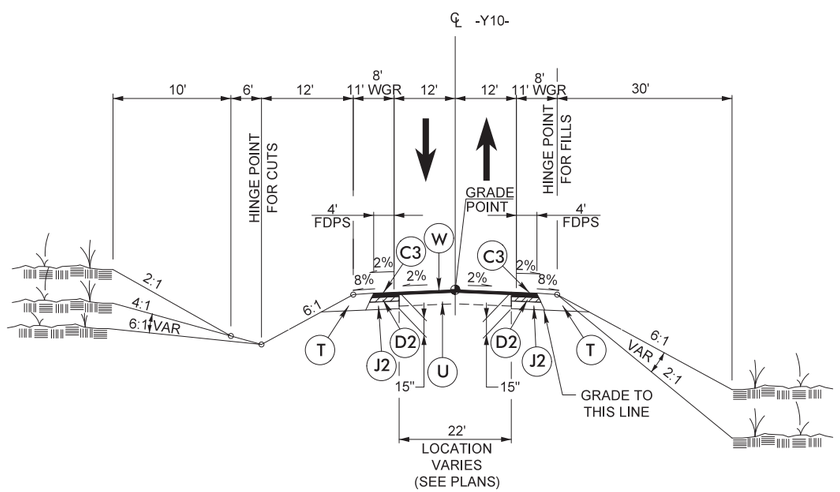
–Y9G– STA. 10+20 TO STA. 11+00.00



TYPICAL SECTION NO. B–26A

–Y9H– (DRIVEWAY)

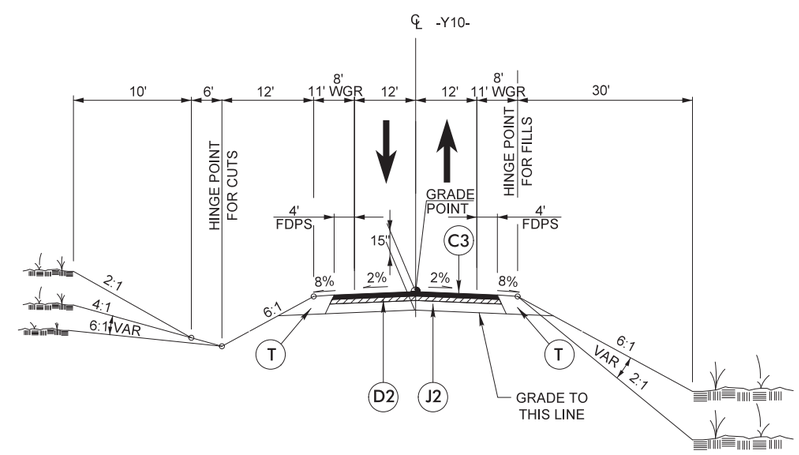
–Y9H– STA. 10+20 TO STA. 11+22.68



TYPICAL SECTION NO. B–27

–Y10– US 64 (DAVIE AVENUE)

–Y10– STA. 17+82.00 TO 21+20.00



TYPICAL SECTION NO. B–28

–Y10– US 64 (DAVIE AVENUE)

–Y10– STA. 21+20.00 TO BRIDGE STA. 25+75.79

6/16/2019
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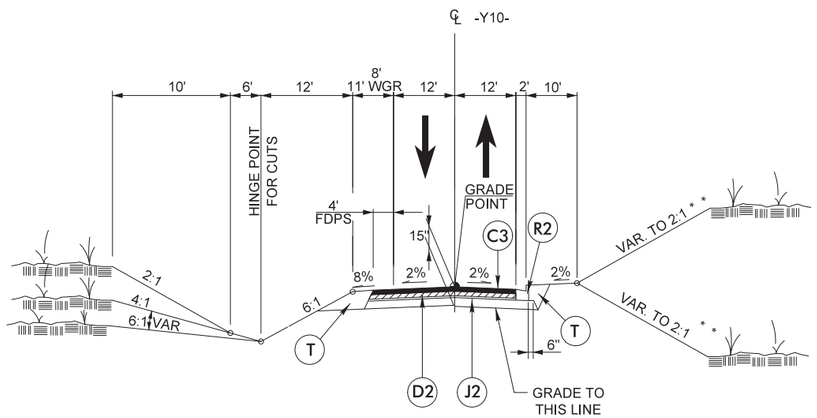
PROF:WTCS01$

C3	3" S9.5B
D2	4" I19.0C
J2	8" ABC
M3	MILLING (3")
R2	2'-6" C & G
S	SIDEWALK
T	EARTH MATERIAL
U	EX PAVEMENT
W	WEDGING

WSP | LANE

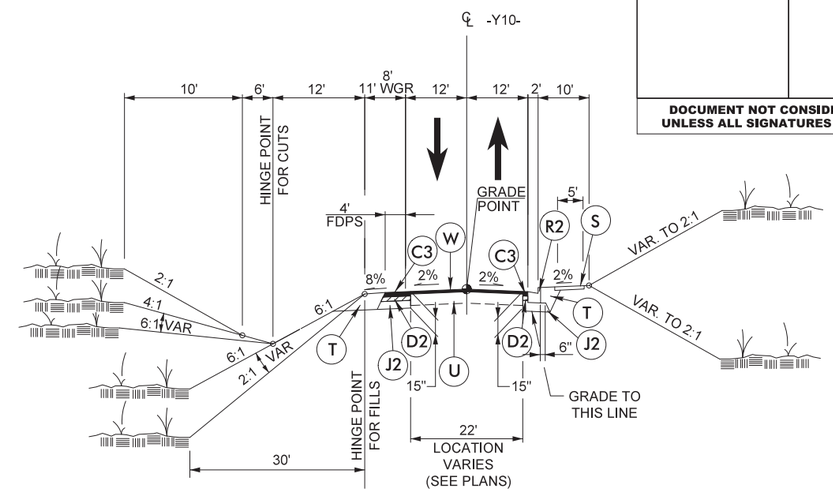
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2B-14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



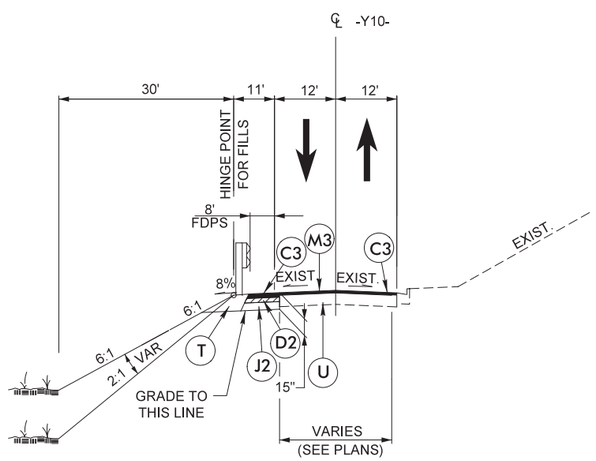
TYPICAL SECTION NO. B–29

–Y10– US 64 (DAVIE AVENUE)
–Y10– BRIDGE STA. 28+19.04 TO 31+50.00



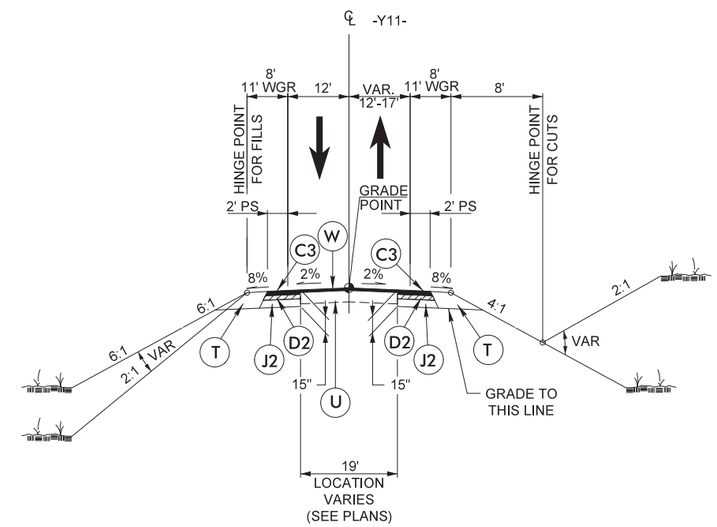
TYPICAL SECTION NO. B–30

–Y10– US 64 (DAVIE AVENUE)
–Y10– STA. 31+50.00 TO 33+97.20



TYPICAL SECTION NO. B–30A

–Y10– US 64 (DAVIE AVENUE)
–Y10– STA. 33+97.20 TO 36+88.00



TYPICAL SECTION NO. B–31

–Y11– SIMONTON ROAD
–Y11– STA. 19+00.00 TO 19+60.00

6/16/2019
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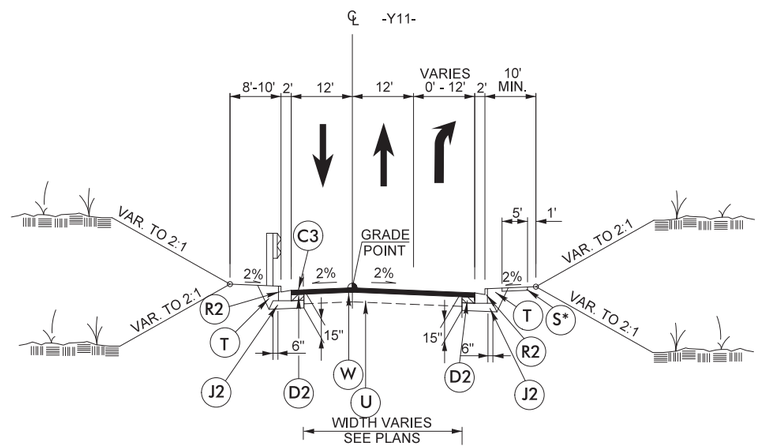
PRDPWICS01$

C1	1.25" S9.5B
C3	3" S9.5B
D2	4" I19.0C
J1	6" ABC
J2	8" ABC
R2	2'-6" C & G
S	SIDEWALK
T	EARTH MATERIAL
U	EX PAVEMENT
W	WEDGING

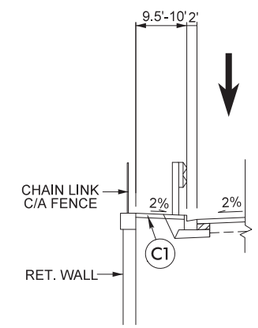
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2B-15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



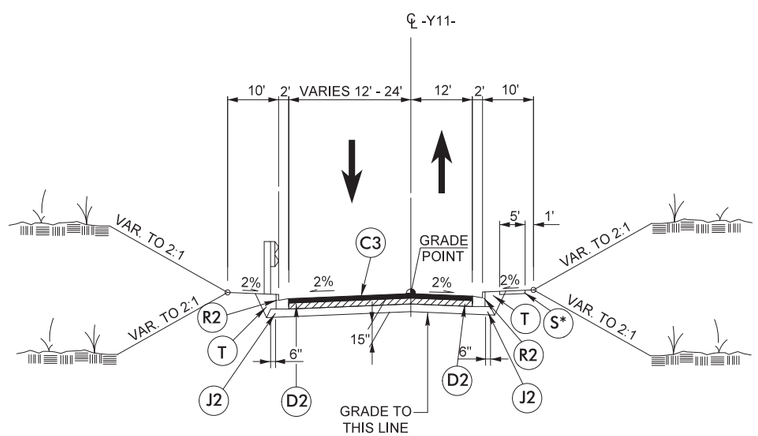
TYPICAL SECTION NO. B–32

–Y11– SIMONTON ROAD
–Y11– STA. 19+60.00 TO 31+50.00
*SIDEWALK LOCATION VARIES (SEE PLANS)



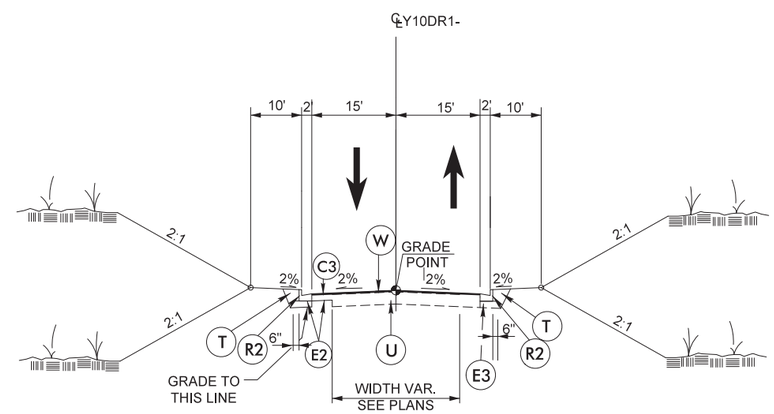
TYPICAL SECTION DETAIL NO. B–32A

–Y11– SIMONTON ROAD
–Y11– STA. 23+77.05 TO 26+91.92



TYPICAL SECTION NO. B–33

–Y11– SIMONTON ROAD
–Y11– STA. 31+50.00 TO 33+13.85
*SIDEWALK LOCATION VARIES (SEE PLANS)



TYPICAL SECTION NO. B–34

–Y10DR1– DRIVEWAY
–Y10DR1– STA. 10+12.80 TO STA. 12+34.54

6/16/2019
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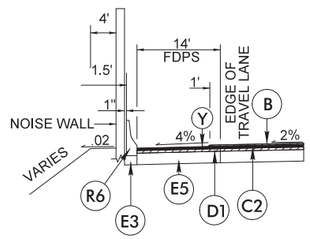
PRDPWTCS01$

B	OGFC
C2	3" S9.5D
C3	3" S9.5B
D1	3" I19.0C
D2	4" I19.0C
D3	2½" I19.0C
E3	VAR. DEPTH B25.0C
E5	13.5" B25.0C
G1	8" CTB
J1	6" ABC
J3	VAR. DEPTH ABC
K1	12" TYPE 1
R4	SBG
R5	EXPY. GUTTER
R6	SINGLE FACED BARRIER
T	EARTH MATERIAL
Y	MILLED RUMBLE STRIPS

WSP | LANE

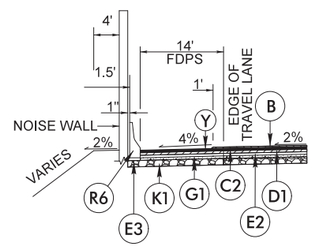
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2B-16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



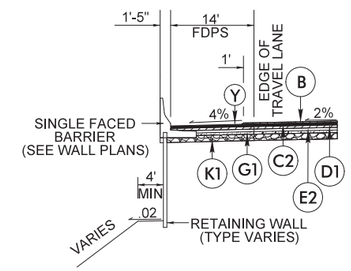
TYPICAL SECTION DETAIL NO. 1A NOISE WALL W/BARRIER WALL

SEE PLANS FOR LOCATIONS ALONG:
–Y_S–



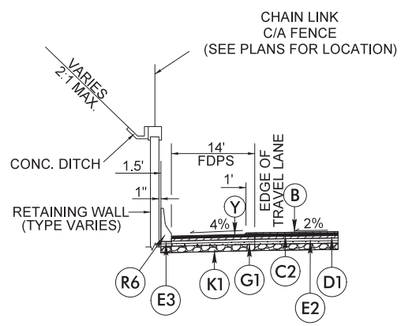
TYPICAL SECTION DETAIL NO. 1B NOISE WALL W/BARRIER WALL

SEE PLANS FOR LOCATIONS ALONG:
–Y_S–



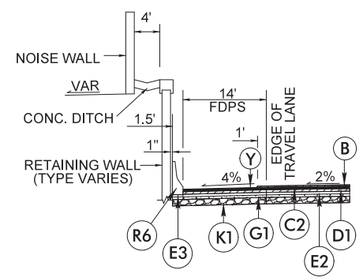
TYPICAL SECTION DETAIL NO. 2 RETAINING WALL AT FILL

SEE PLANS FOR LOCATIONS ALONG:
–Y_S–



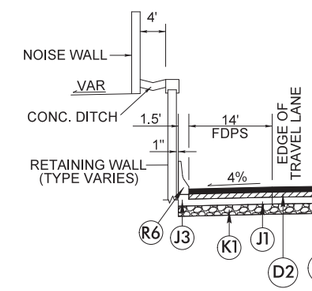
TYPICAL SECTION DETAIL NO. 3 RETAINING WALL IN CUT

SEE PLANS FOR LOCATIONS ALONG –Y_S–



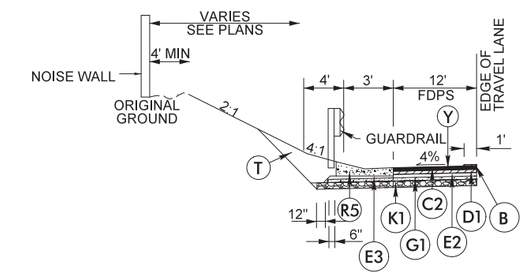
TYPICAL SECTION DETAIL NO. 4A RETAINING WALL WITH NOISE WALL

SEE PLANS FOR LOCATIONS ALONG –Y_S–



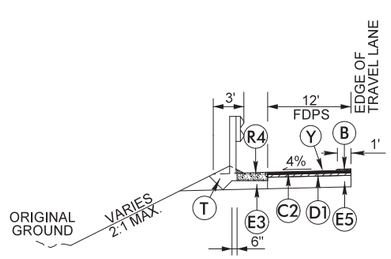
TYPICAL SECTION DETAIL NO. 4B RETAINING WALL WITH NOISE WALL

SEE PLANS FOR LOCATIONS ALONG –Y9RPA–



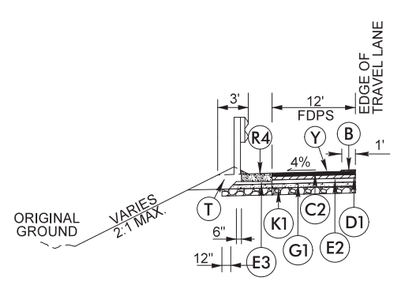
TYPICAL SECTION DETAIL NO. 5 EXPRESSWAY GUTTER W/GUARDRAIL

SEE PLANS FOR LOCATIONS ALONG:
–Y_S–



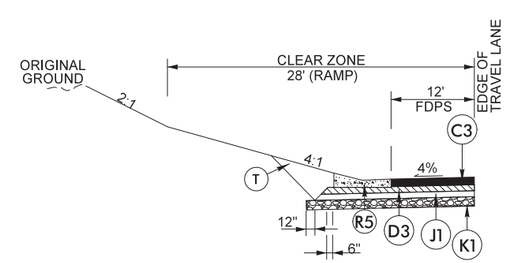
TYPICAL SECTION DETAIL NO. 6A SHOULDER BERM GUTTER

SEE PLANS FOR LOCATIONS ALONG –Y_S–



TYPICAL SECTION DETAIL NO. 6B SHOULDER BERM GUTTER

SEE PLANS FOR LOCATIONS ALONG –Y_S–



TYPICAL SECTION DETAIL NO. 7 EXPRESSWAY GUTTER W/O GUARDRAIL

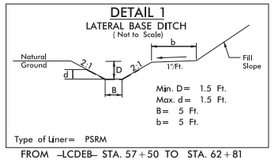
SEE PLANS FOR LOCATIONS ALONG:
–Y9RPC–

6/16/2019
pr:pprss01\ics_workingdir\15632\282440_443796\I3819_rdy_typ2B-16.dgn
PP:WICS01$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2D-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

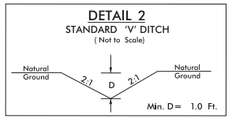
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 1
LATERAL BASE DITCH
(Not to Scale)



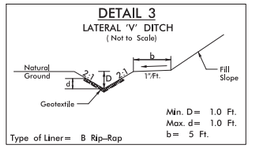
FROM –LCDEB– STA. 57+50 TO STA. 62+81

DETAIL 2
STANDARD 'V' DITCH
(Not to Scale)



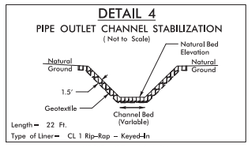
FROM –YRPAC– STA. 55+88 TO STA. 55+27

DETAIL 3
LATERAL 'V' DITCH
(Not to Scale)



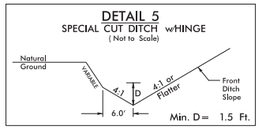
FROM –YRPAC– STA. 52+00 TO STA. 53+84

DETAIL 4
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



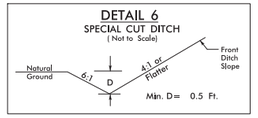
–YRPC– STA. 16+04
–Y_N– STA. 210+35 RT

DETAIL 5
SPECIAL CUT DITCH w/HINGE
(Not to Scale)



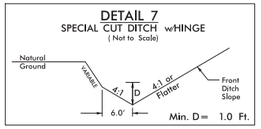
–YRPD– FROM STA. 28+00 TO STA. 28+75
–L_WB– FROM STA. 134+00 TO STA. 136+50
–L– FROM STA. 133+12 TO STA. 134+00

DETAIL 6
SPECIAL CUT DITCH
(Not to Scale)



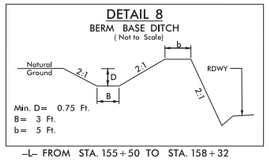
FROM –YRPD– STA. 28+75 TO STA. 29+66

DETAIL 7
SPECIAL CUT DITCH w/HINGE
(Not to Scale)



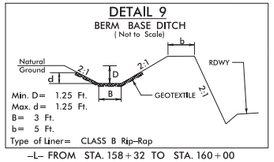
–L– FROM STA. 150+15 TO STA. 152+00

DETAIL 8
BERM BASE DITCH
(Not to Scale)



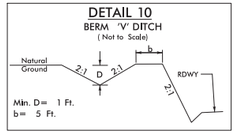
–L– FROM STA. 155+50 TO STA. 158+32

DETAIL 9
BERM BASE DITCH
(Not to Scale)



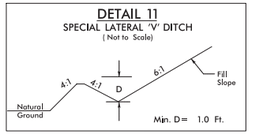
–L– FROM STA. 158+32 TO STA. 160+00

DETAIL 10
BERM 'V' DITCH
(Not to Scale)



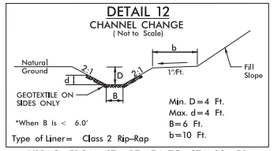
–L– FROM STA. 166+50 TO STA. 168+88
–L– FROM STA. 168+88 TO STA. 171+00

DETAIL 11
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



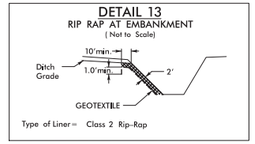
–YRPD– FROM STA. 12+60 TO STA. 13+14

DETAIL 12
CHANNEL CHANGE
(Not to Scale)



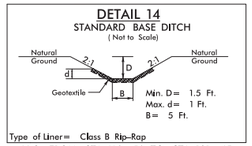
–YRPAC– FROM STA. 27+74 TO STA. 33+50

DETAIL 13
RIP RAP AT EMBANKMENT
(Not to Scale)



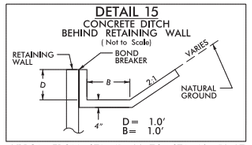
–Y_S– STA. 121+45
–YRPAC– 27+86 RT

DETAIL 14
STANDARD BASE DITCH
(Not to Scale)



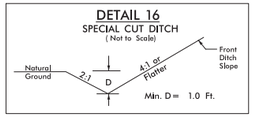
–Y_S– FROM STA. 119+50 TO STA. 121+45

DETAIL 15
CONCRETE DITCH BEHIND RETAINING WALL
(Not to Scale)



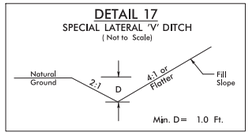
–YRPCA– FROM STA. 41+00 TO STA. 46+50 LT
–YRPDB– FROM STA. 45+20 TO STA. 52+52 LT
–YRPAC– FROM STA. 50+50 TO STA. 55+50 RT

DETAIL 16
SPECIAL CUT DITCH
(Not to Scale)



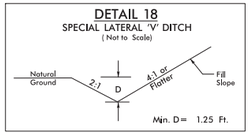
FROM –YRPCA – STA. 63+00 TO STA. 63+50

DETAIL 17
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



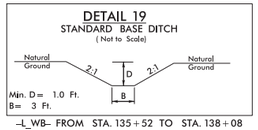
FROM –Y_N– STA. 156+20 TO STA. 160+50

DETAIL 18
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



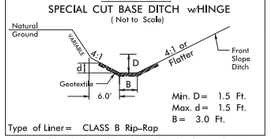
FROM –Y_N– STA. 157+37 TO STA. 161+97

DETAIL 19
STANDARD BASE DITCH
(Not to Scale)



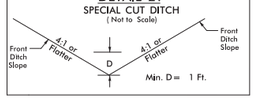
–L_WB– FROM STA. 135+52 TO STA. 138+08

DETAIL 20
SPECIAL CUT BASE DITCH w/HINGE
(Not to Scale)



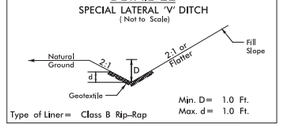
–YRPCA– FROM STA. 53+49 TO STA. 56+00

DETAIL 21
SPECIAL CUT DITCH
(Not to Scale)



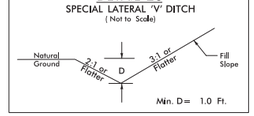
–YRPCA– FROM STA. 65+00 TO STA. 66+00
–Y9LPA– FROM STA. 12+00 to 12+50 RT

DETAIL 22
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



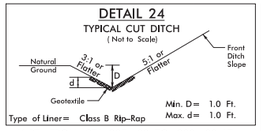
–L– FROM STA. 119+50 TO STA. 122+00 RT
–Y_RT– FROM STA. 239+00 TO 240+50 LT

DETAIL 23
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



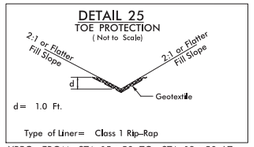
–YRPC– FROM STA. 11+50 TO STA. 15+50 LT
–YRPC– FROM STA. 22+00 TO STA. 23+00 LT
–YRPC– FROM STA. 23+00 TO STA. 24+50 LT

DETAIL 24
TYPICAL CUT DITCH
(Not to Scale)



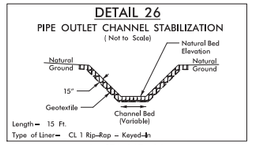
–Y_RT– FROM STA. 237+00 TO 239+00 LT

DETAIL 25
TOE PROTECTION
(Not to Scale)



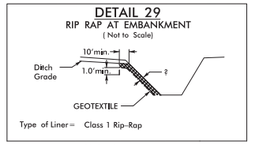
–YRPC– FROM STA. 15+50 TO STA. 18+50 LT
–YRPC– FROM STA. 20+50 TO STA. 22+00 LT
–YRPCA– FROM STA. 58+25 TO STA. 59+65 RT

DETAIL 26
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



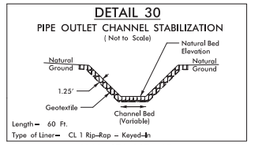
–L– STA. 147+14

DETAIL 29
RIP RAP AT EMBANKMENT
(Not to Scale)



–Y_S– STA. 121+45

DETAIL 30
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



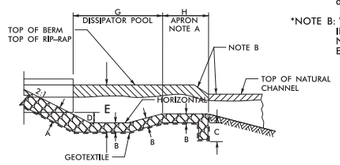
–Y_N– STA. 167+45

DETAIL 32
RIP-RAPPED ENERGY DISSIPATOR BASIN

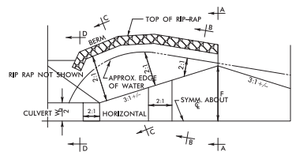
*NOTE A: IF EXIT VELOCITY OF BASIN IS SPECIFIED, EXTEND BASIN AS REQUIRED TO OBTAIN SUFFICIENT CROSS SECTIONAL AREA AT SECTION A–A SUCH THAT Q des/CROSS SECTION AREA AT SEC. A–A)= SPECIFIED VELOCITY.

*NOTE B: WARP BASIN TO CONFORM TO NATURAL STREAM CHANNEL TOP OF RIP-RAP IN FLOOR OF BASIN SHOULD BE AT SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM AT SEC. A–A. PROVIDE SMOOTH TRANSITION FROM END OF APRON TO NATURAL CHANNEL WIDTH.

℄ SECTION

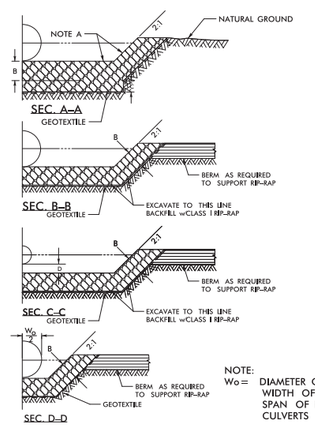


HALF PLAN



DIM.	RIP RAP BASIN #							
	1	2	3	4	5	6	7	8
A	30"	30"						
B	20"	20"						
C	16"	16"						
D	1'	1.25'						
E	3.5'	4'						
F	6.3'	10'						
G	10'	17'						
H	5'	6'						

BASIN #	LOCATION (AT OUTLET)
1	–YRPCA– 22+95, 162 RT
2	–Y_S– 47+61, 142 LT
3	
4	
5	
6	
7	
8	



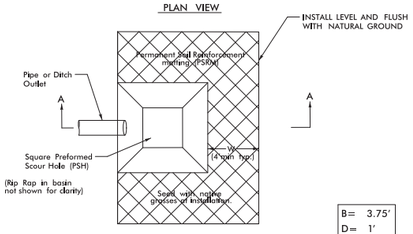
NOTE:
Wo= DIAMETER OF PIPE, WIDTH OF BOX OR SPAN OF PIPE-ARCH CULVERTS

5/05

FROM STA. TO STA.

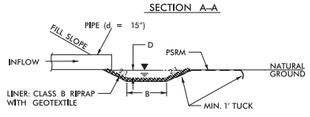
DETAIL 27 – PREFORMED SCOUR HOLE
*NOT TO SCALE

PLAN VIEW



B= 3.75'
D= 1'
W= 4'

SECTION A–A

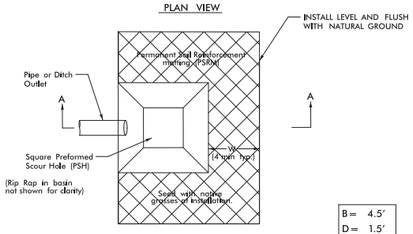


3/08

Y_S STA. 120+90
Y_S STA. 123+38
Y_S STA. 125+00
Y_N STA. 164+35
–YRPC– STA. 15+09

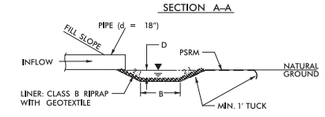
DETAIL 28 – PREFORMED SCOUR HOLE
*NOT TO SCALE

PLAN VIEW



B= 4.5'
D= 1.5'
W= 4'

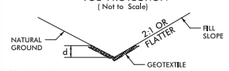
SECTION A–A



3/08

–LCDEB– STA. 65+59
Y_S STA. 119+78
Y_S STA. 122+18
–YRPC– STA. 21+09

DETAIL 31
TOE PROTECTION
(Not to Scale)



–L– FROM STA. 112+00 TO STA. 115+50
–L– FROM STA. 122+26 TO STA. 123+25
–L– FROM STA. 141+00 TO STA. 144+00
–L– FROM STA. 145+40 TO STA. 148+00
–L– FROM STA. 145+50 TO STA. 147+10
–YRPAC– FROM STA. 32+50 TO 37+95
–Y_S– FROM STA. 46+15 TO STA. 47+54 LT
–Y_S– FROM STA. 44+85 TO STA. 46+50 RT
–Y_S– FROM STA. 125+50 TO STA. 129+50
–Y_RT– FROM STA. 231+78 TO STA. 238+00
–Y_N– FROM STA. 151+64 TO STA. 153+55
–Y_N– FROM STA. 157+91 TO STA. 160+00
–Y_N– FROM STA. 162+19 TO STA. 162+49
–Y_N– FROM STA. 169+72 TO STA. 171+30
–YLPC– FROM STA. 14+00 TO STA. 16+55

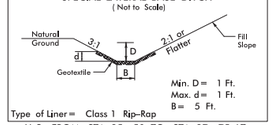
6/17/2019
pedpeters01\ics_workingdir\15670\336412_163\13819_hyd_psh02D.dgn
PROP WLCS01B

LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2D-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

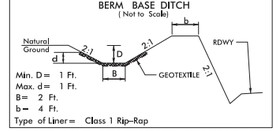
DETAIL 33
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Type of Liner= Class 1 Rip-Rap

–Y_S– FROM STA. 35+50 TO STA. 37+75 LT

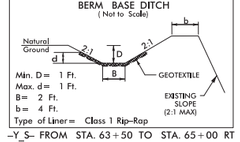
DETAIL 34
BERM BASE DITCH
(Not to Scale)



Type of Liner= Class 1 Rip-Rap

–Y_S– FROM STA. 60+00 TO STA. 62+00 RT
–Y_S– FROM STA. 63+00 TO STA. 63+50 RT
–Y_S– FROM STA. 65+00 TO STA. 65+50 RT

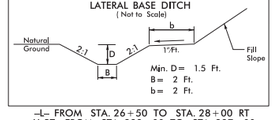
DETAIL 35
BERM BASE DITCH
(Not to Scale)



Type of Liner= Class 1 Rip-Rap

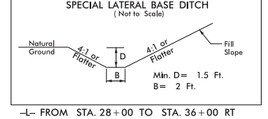
–Y_S– FROM STA. 63+50 TO STA. 65+00 RT

DETAIL 36
LATERAL BASE DITCH
(Not to Scale)



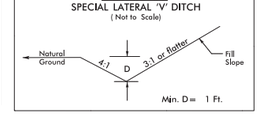
–L– FROM STA. 26+50 TO STA. 28+00 RT
–Y_RT– FROM STA. 238+00 TO STA. 237+00

DETAIL 37
SPECIAL LATERAL BASE DITCH
(Not to Scale)



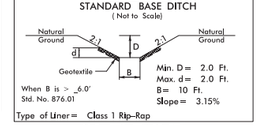
–L– FROM STA. 28+00 TO STA. 36+00 RT

DETAIL 38
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



–L– FROM STA. 36+00 TO STA. 37+00 RT
–Y_N– FROM STA. 199+75 TO STA. 203+00
–Y_N– FROM STA. 213+25 TO STA. 216+50

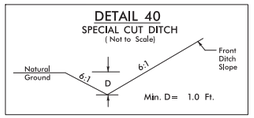
DETAIL 39
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= Class 1 Rip-Rap

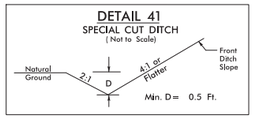
–Y_S– STA. 71+10 RT

DETAIL 40
SPECIAL CUT DITCH
(Not to Scale)



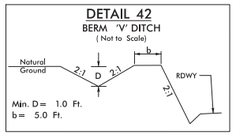
–L– FROM STA. 178+00 TO STA. 179+50

DETAIL 41
SPECIAL CUT DITCH
(Not to Scale)



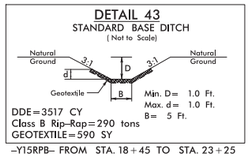
–L– FROM STA. 181+50 TO STA. 184+00
–Y11– FROM STA. 23+23 TO STA. 19+00

DETAIL 42
BERM 'V' DITCH
(Not to Scale)



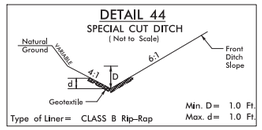
–L– FROM STA. 208+50 TO STA. 212+00
–L– FROM STA. 212+00 TO STA. 212+50

DETAIL 43
STANDARD BASE DITCH
(Not to Scale)



–Y15RPB– FROM STA. 18+45 TO STA. 23+25

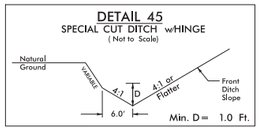
DETAIL 44
SPECIAL CUT DITCH
(Not to Scale)



Type of Liner= CLASS B Rip-Rap

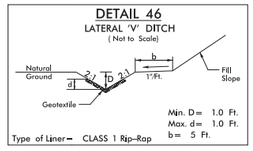
–Y_N– FROM STA. 178+60 TO STA. 180+00 RT

DETAIL 45
SPECIAL CUT DITCH w/HINGE
(Not to Scale)



–Y_N– FROM STA. 178+50 TO STA. 182+00 LT
–Y_N– FROM STA. 180+00 TO STA. 186+00 RT
–Y_N– FROM STA. 184+50 TO STA. 186+50 LT
–Y_N– FROM STA. 190+50 TO STA. 192+50 RT
–Y_N– FROM STA. 193+50 TO STA. 194+50 RT
–L– FROM STA. 201+00 TO STA. 207+50
–L– FROM STA. 213+00 TO STA. 215+50

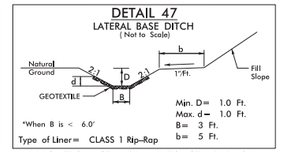
DETAIL 46
LATERAL 'V' DITCH
(Not to Scale)



Type of Liner= CLASS 1 Rip-Rap

–Y_S– FROM STA. 196+50 TO STA. 197+16
–YRPAC– FROM STA. 38+00 TO STA. 36+00

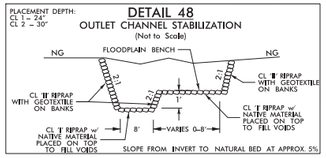
DETAIL 47
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= CLASS 1 Rip-Rap

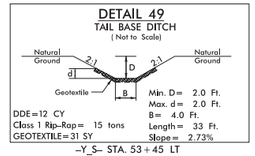
–Y_S– FROM STA. 199+50 TO STA. 202+60

DETAIL 48
OUTLET CHANNEL STABILIZATION
(Not to Scale)



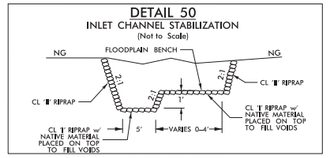
–Y_S– STA. 37+95 LT

DETAIL 49
TAIL BASE DITCH
(Not to Scale)



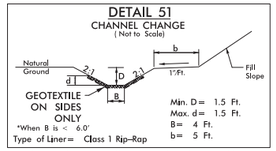
–Y_S– STA. 53+45 LT

DETAIL 50
INLET CHANNEL STABILIZATION
(Not to Scale)



–Y_S– STA. 37+05 RT

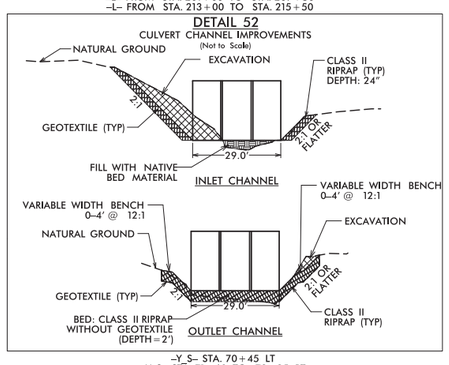
DETAIL 51
CHANNEL CHANGE
(Not to Scale)



Type of Liner= Class 1 Rip-Rap

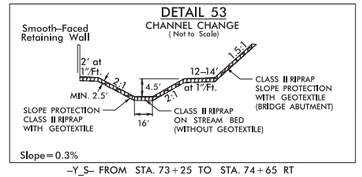
–Y_S– FROM STA. 68+38 TO STA. 69+50 LT

DETAIL 52
CULVERT CHANNEL IMPROVEMENTS
(Not to Scale)



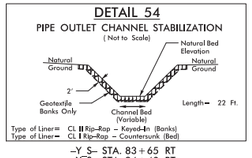
–Y_S– STA. 70+45 LT
–Y_S– STA. 71+60 TO 73+25 RT

DETAIL 53
CHANNEL CHANGE
(Not to Scale)



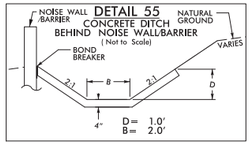
–Y_S– FROM STA. 73+25 TO STA. 74+65 RT

DETAIL 54
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)

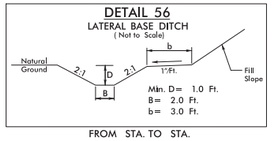


–Y_S– STA. 83+65 RT
–Y_S– STA. 94+40 RT

DETAIL 55
CONCRETE DITCH BEHIND NOISE WALL/BARRIER
(Not to Scale)

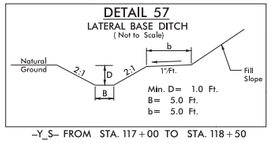


DETAIL 56
LATERAL BASE DITCH
(Not to Scale)



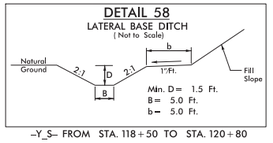
FROM STA. TO STA.

DETAIL 57
LATERAL BASE DITCH
(Not to Scale)



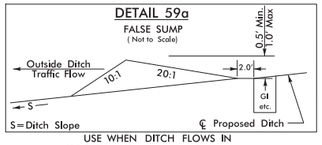
–Y_S– FROM STA. 117+00 TO STA. 118+50

DETAIL 58
LATERAL BASE DITCH
(Not to Scale)



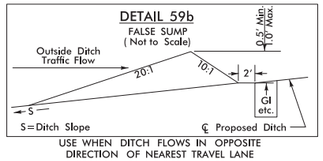
–Y_S– FROM STA. 118+50 TO STA. 120+80

DETAIL 59a
FALSE SUMP
(Not to Scale)



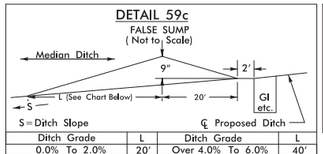
USE WHEN DITCH FLOWS IN DIRECTION OF NEAREST TRAVEL LANE

DETAIL 59b
FALSE SUMP
(Not to Scale)



USE WHEN DITCH FLOWS IN OPPOSITE DIRECTION OF NEAREST TRAVEL LANE

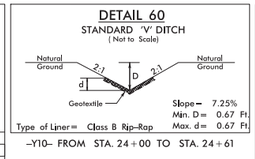
DETAIL 59c
FALSE SUMP
(Not to Scale)



Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

USE IN MEDIAN DITCHES

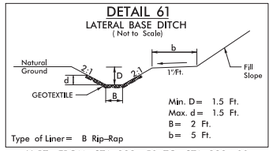
DETAIL 60
STANDARD 'V' DITCH
(Not to Scale)



Type of Liner= Class B Rip-Rap

–Y10– FROM STA. 24+00 TO STA. 24+61

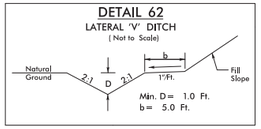
DETAIL 61
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= B Rip-Rap

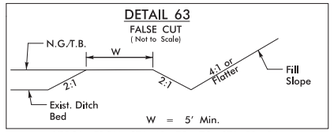
–Y_RT– FROM STA. 238+50 TO STA. 238+00

DETAIL 62
LATERAL 'V' DITCH
(Not to Scale)



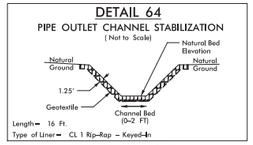
–YRPAC– FROM STA. 36+00 TO STA. 35+70

DETAIL 63
FALSE CUT
(Not to Scale)

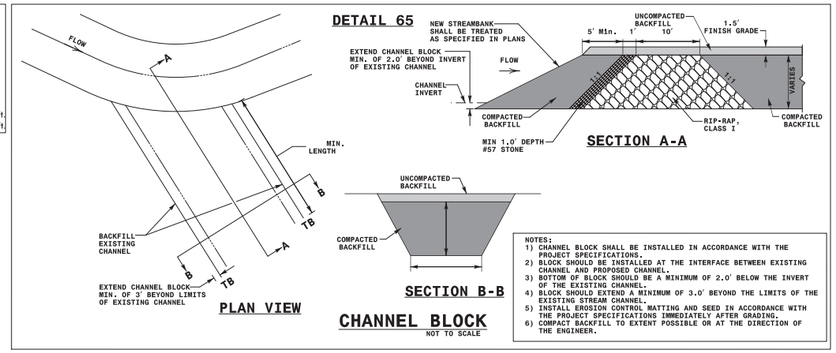


–YRPCA– FROM STA. 49+75 TO STA. 50+34

DETAIL 64
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



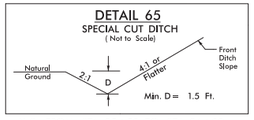
–Y_S– STA. 28+35 RT
–Y_S– STA. 98+12 RT
–Y11– STA. 16+60 LT

DETAIL 65


NOTES:
1) CHANNEL BLOCK SHALL BE INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
2) BLOCK SHOULD BE INSTALLED AT THE INTERFACE BETWEEN EXISTING CHANNEL AND PROPOSED CHANNEL.
3) BOTTOM OF BLOCK SHOULD BE A MINIMUM OF 2.0' BELOW THE INVERT OF THE EXISTING CHANNEL.
4) BLOCK SHOULD EXTEND A MINIMUM OF 3.0' BEYOND THE LIMITS OF THE EXISTING STREAM CHANNEL.
5) INSTALL EROSION CONTROL MATTING AND SEED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS IMMEDIATELY AFTER GRADING.
6) COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.

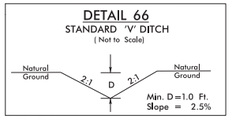
CHANNEL BLOCK
NOT TO SCALE

DETAIL 65
SPECIAL CUT DITCH
(Not to Scale)



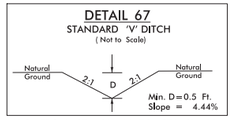
–Y_S– FROM STA. 25+50 TO STA. 26+00

DETAIL 66
STANDARD 'V' DITCH
(Not to Scale)



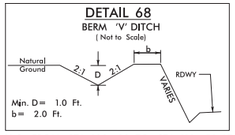
–Y_S– FROM STA. 58+55 TO STA. 59+50

DETAIL 67
STANDARD 'V' DITCH
(Not to Scale)



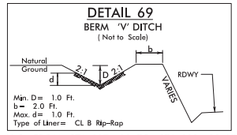
–Y_S– FROM STA. 60+00 TO STA. 61+00

DETAIL 68
BERM 'V' DITCH
(Not to Scale)



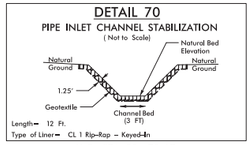
–Y_S– FROM STA. 109+00 TO STA. 110+50 LT

DETAIL 69
BERM 'V' DITCH
(Not to Scale)



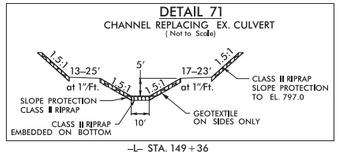
–Y_S– FROM STA. 107+00 TO STA. 109+00 LT
–Y_S– FROM STA. 110+50 TO STA. 111+90 LT

DETAIL 70
PIPE INLET CHANNEL STABILIZATION
(Not to Scale)



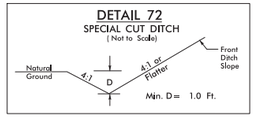
–Y_S– STA. 93+79 LT

DETAIL 71
CHANNEL REPLACING EX. CULVERT
(Not to Scale)



–L– STA. 149+36

DETAIL 72
SPECIAL CUT DITCH
(Not to Scale)



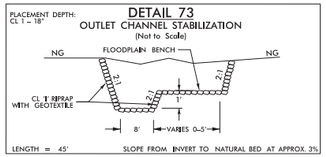
–Y_N– FROM STA. 198+50 TO STA. 199+75
–Y_N– FROM STA. 216+50 TO STA. 213+25

6/17/2019
DGN:pdxdxtg01\ics_workingdir\15670\336412_163\13819_hyd_psh02D.dgn
PROP:WTC01

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2D-3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

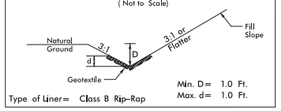
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 73
OUTLET CHANNEL STABILIZATION
(Not to Scale)



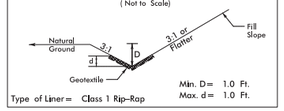
—Y_N– STA. 204+00 RT

DETAIL 74
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



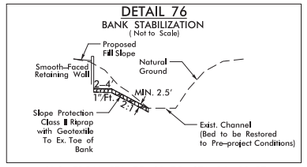
–Y_N– FROM STA. 211+00 TO STA. 211+50 RT

DETAIL 75
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



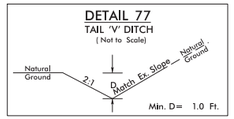
–Y_N– FROM STA. 195+00 TO STA. 197+35 RT

DETAIL 76
BANK STABILIZATION
(Not to Scale)



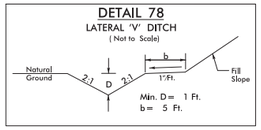
–Y_S– FROM STA. 75+10 TO STA. 84+00 RT

DETAIL 77
TAIL 'V' DITCH
(Not to Scale)



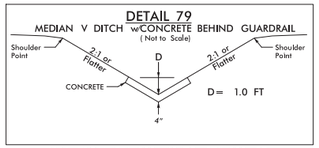
–Y_N– FROM STA. 205+00 TO STA. 206+00

DETAIL 78
LATERAL 'V' DITCH
(Not to Scale)



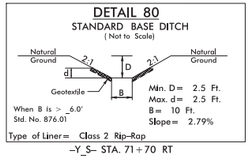
–Y_N– FROM STA. 202+65 TO STA. 204+00

DETAIL 79
MEDIAN V DITCH w/CONCRETE BEHIND GUARDRAIL
(Not to Scale)



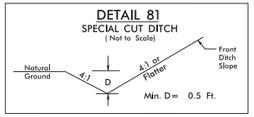
–Y_N– FROM STA. 208+40 TO STA. 209+15
–Y_N– FROM STA. 210+90 TO STA. 211+65

DETAIL 80
STANDARD BASE DITCH
(Not to Scale)



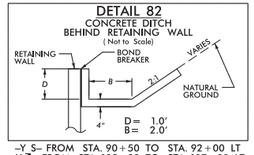
–Y_S– STA. 71+70 RT

DETAIL 81
SPECIAL CUT DITCH
(Not to Scale)



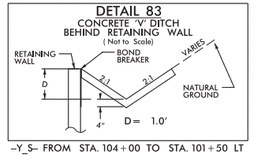
–Y_N– FROM STA. 166+50 TO STA. 167+50 RT

DETAIL 82
CONCRETE DITCH
BEHIND RETAINING WALL
(Not to Scale)



–Y_S– FROM STA. 90+50 TO STA. 92+00 LT
–Y_S– FROM STA. 105+80 TO STA. 107+00 LT
–Y_S– FROM STA. 101+00 TO STA. 105+50 LT
–Y_S– FROM STA. 110+50 TO STA. 112+00 LT
–Y_S– FROM STA. 192+00 TO STA. 198+80 LT

DETAIL 83
CONCRETE 'V' DITCH
BEHIND RETAINING WALL
(Not to Scale)



–Y_S– FROM STA. 104+00 TO STA. 101+50 LT

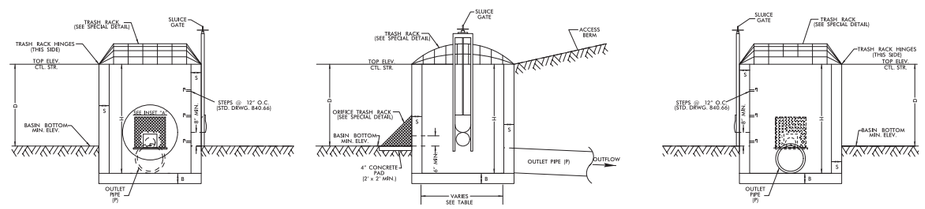
6/17/2019
DGN: pw:\\cs_workingdir\15670\336412_163\13819_hyd_psh02D.dgn

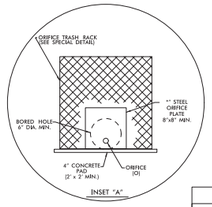
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	2D-4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

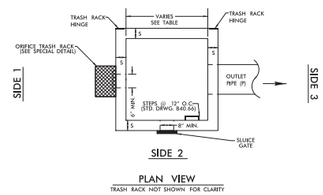
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRY DETENTION BASIN DRAWDOWN STRUCTURE

NOT TO SCALE







PLAN VIEW

TRASH RACK NOT SHOWN FOR CLARITY

NOTES:

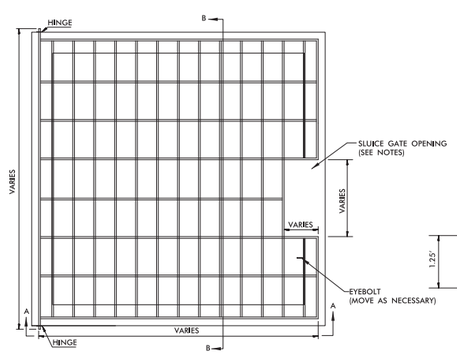
1. NO BEDDING MATERIAL TO BE USED. THEREFORE, DO NOT FOLLOW STANDARD DRAWINGS FOR METHOD OF PIPE INSTALLATION FOR OUTLET PIPE THROUGH EMBANKMENT.
2. SLUICE GATE IS FOR MAINTENANCE AND SHOULD REMAIN CLOSED DURING NORMAL OPERATION.
3. SLUICE GATE SHALL PROVIDE WATERTIGHT SEAL. PROVIDE ADEQUATE CLEARANCE FOR GATE OPERATION AND FOR PROPER SEATING OF GATE OVER PIPE.
4. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATE.
5. DETENTION BASIN STRUCTURE AT -Y-RPD- 29+00 IS EXISTING. DATA SHOWN IN TABLE FOR THAT STRUCTURE IS FOR REFERENCE ONLY.

MINIMUM DIMENSIONS FOR DRY DETENTION BASIN DRAWDOWN STRUCTURE

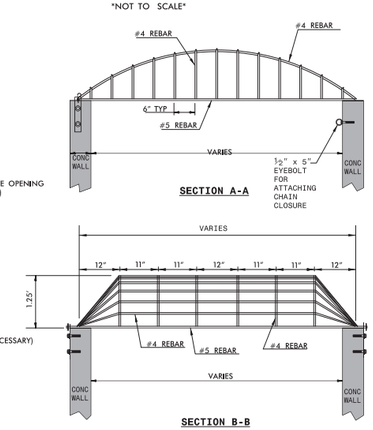
STATION	STRUCTURE NUMBER	S (INCHES) 6" MIN.	B (INCHES) 6" MIN.	BASIN BOTTOM MINIMUM ELEV.	TOP ELEVATION CONTROL STRUCTURE	MAX. STORAGE DEPTH(D) FEET	INV. ELEV. CTL. STR.	CTL. STR. DIMENSIONS (W x L x H)	ORIFICE DIAMETER (O) INCHES	ORIFICE INV. ELEV.	OUTLET PIPE DIAMETER(P) INCHES
127+50 -L- LT		6"	6"	828.0'	829.5'	1.5'	827.36'	3' x 3' x 2.35'	2"	828.0'	18"
156+00 -Y N- RT		6"	6"	857.0'	858.5'	1.5'	853.5'	3' x 3' x 4.05'	3"	857.0'	24"
29+00 -Y-RPD- LT		6" (EXISTING)	6" (EXISTING)	794.75' (EX)	801.2' (EX)	4.2' (EX)	792.75' (EX)	5' x 5' x 8.45' (EX)	2" (EX)	797.0' (EX)	48" (EX)
37+50 -Y S- RT		6"	6"	873.0'	875.5'	2.5'	870.0'	4' x 4' x 5.5'	2"	873.0'	15"
40+00 -Y S- LT		6"	6"	866.0'	868.5'	2.5'	863.0'	4' x 4' x 5.5'	2"	866.0'	18"
44+00 -Y S- RT		6"	6"	865.0'	867.5'	2.5'	862.0'	4' x 4' x 5.5'	2"	865.0'	24"
66+00 -Y S- LT		6"	6"	799.0'	800.5'	1.5'	796.3'	5.5' x 5.5' x 4.2'	3"	799.0'	36"
69+00 -Y S- LT		6"	6"	804.0'	805.50'	1.5'	802.0'	5' x 5' x 3.5'	2"	804.0'	24"
80+00 -Y S- LT		6"	6"	794.5'	797.0'	2.5'	791.8'	4' x 4' x 5.2'	2"	794.0'	24"
92+00 -Y S- RT		6"	6"	781.0'	783.0'	2.0'	780.1'	4' x 4' x 2.9'	2"	781'	30"

REMOVABLE ORIFICE TRASH RACK

NOT TO SCALE



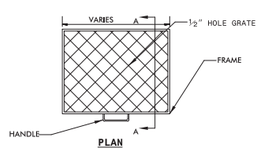
PLAN



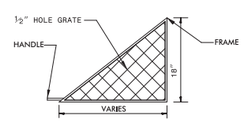
REBAR TRASH RACK
NOT TO SCALE

RISER TRASH RACK NOTES:

1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A 1/4" BEAD.
2. IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
3. EYEBOLT FOR CHAIN CLOSURE SHALL BE INSTALLED BY THE SAME METHOD AS THE HINGE PLATE BOLTS.
4. RACK AND HARDWARE SHALL BE ALUMINUM OR REBAR AND GALVANIZED IN ACCORDANCE WITH ASTM A-153.
5. PROVIDE OPENING IN TRASH RACK TO ACCOMODATE SLUICE GATE ON THE OUTLET PIPE. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATES.



PLAN



SECTION A-A

ORIFICE TRASH RACK NOTES:

1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A 1/4" BEAD.
2. IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
3. REMOVEABLE ORIFICE TRASH RACK SHALL BE ATTACHED TO CONCRETE BOX BY HINGE OR SLIDE RAIL SYSTEM.
4. RACK AND HARDWARE SHALL BE ALUMINUM OR GALVANIZED IN ACCORDANCE WITH ASTM A-153.

6/17/2019
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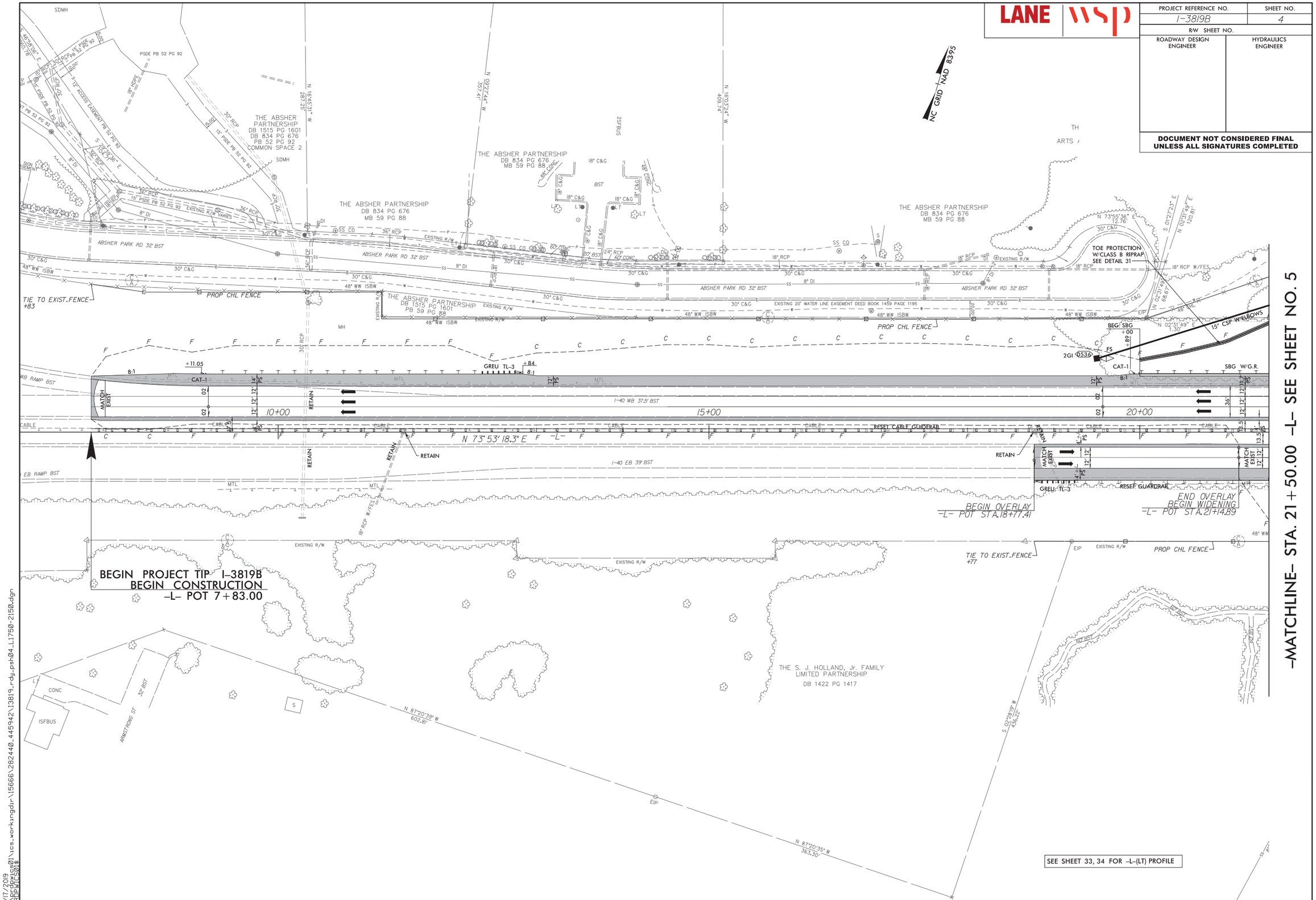
PROD\ICS01$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-MATCHLINE- STA. 21+50.00 -L- SEE SHEET NO. 5

6/17/2019
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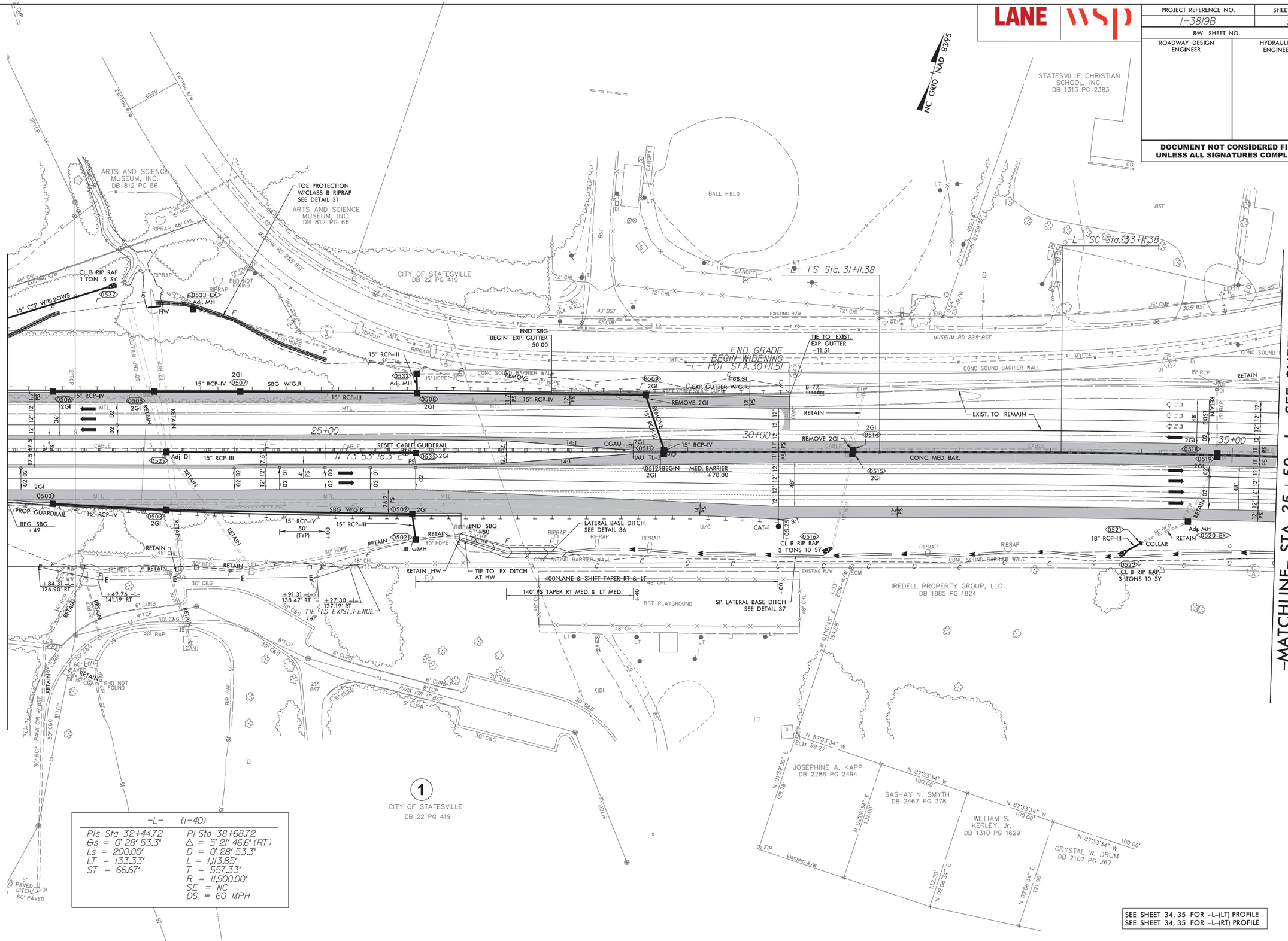
PRDPWICS01$

LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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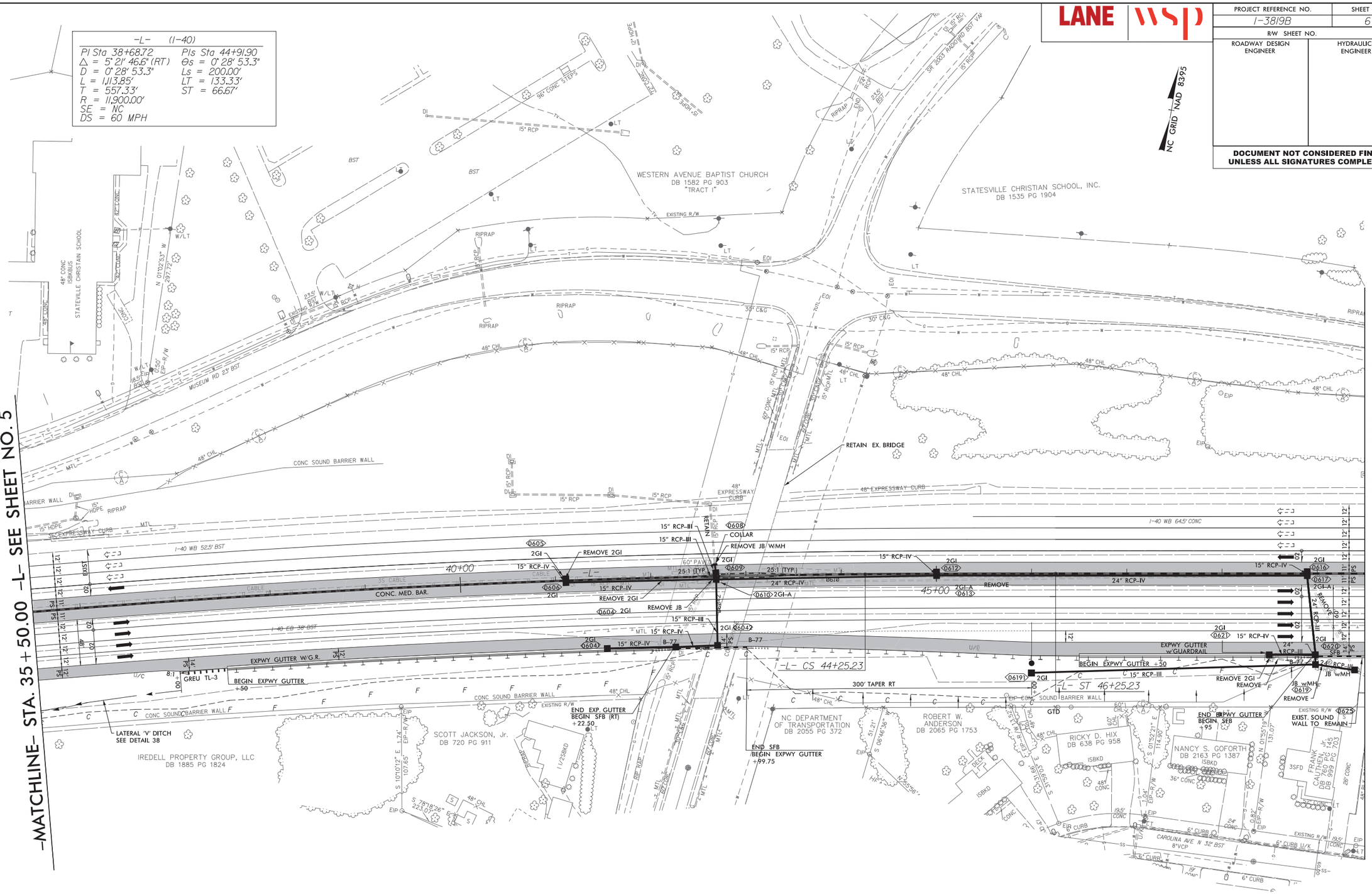
PROPWLCS01$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LANE | WSP

-L- (I-40)	
PI Sta 38+68.72	PIs Sta 44+91.90
Δ = 5° 21' 46.6" (RT)	Θs = 0° 28' 53.3"
D = 0° 28' 53.3"	Ls = 200.00'
L = 1,113.85'	LT = 133.33'
T = 557.33'	ST = 66.67'
R = 11,900.00'	
SE = NC	
DS = 60 MPH	



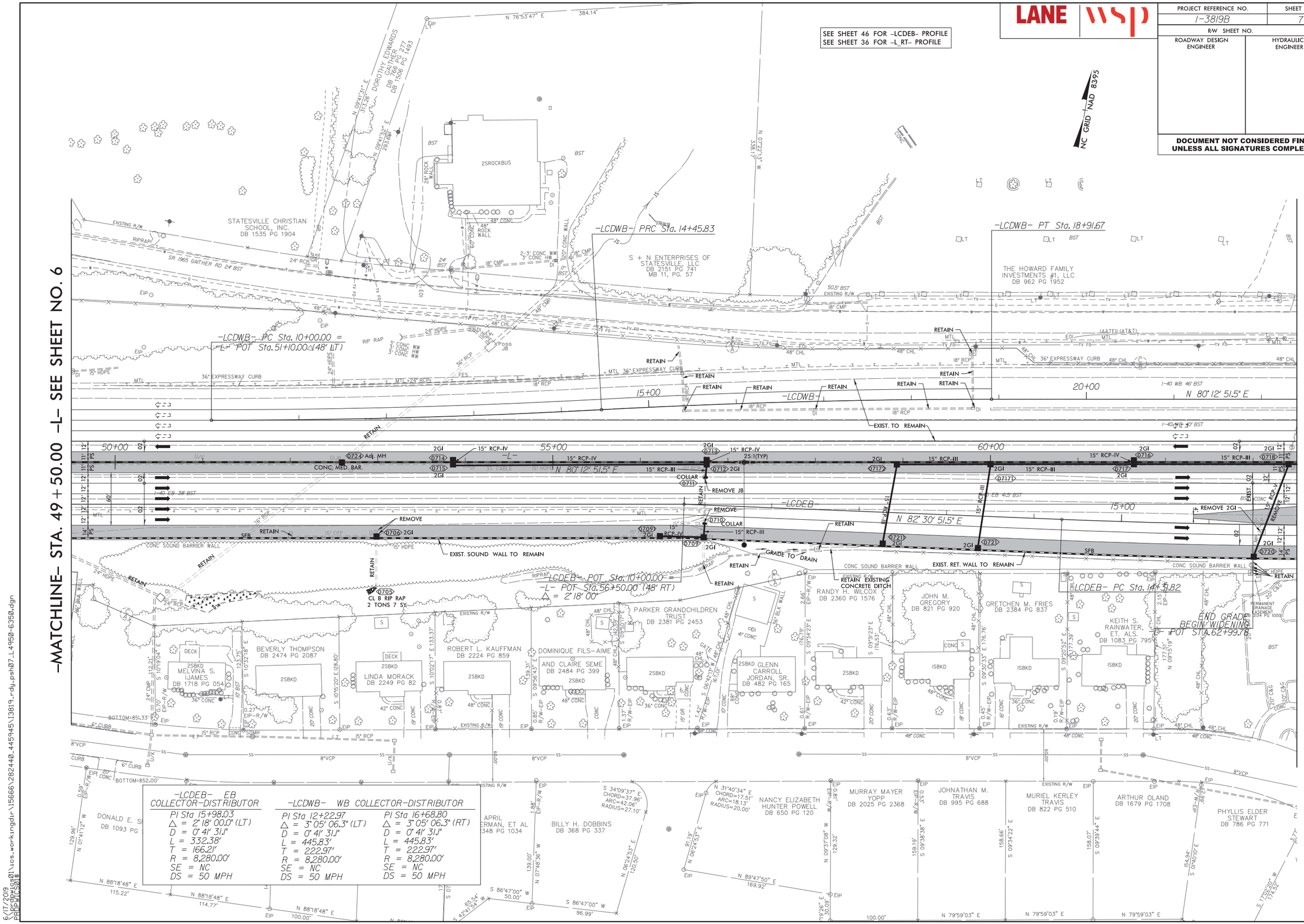
SEE SHEET 35, 36 FOR -L-(LT) PROFILE
SEE SHEET 35, 36 FOR -L-(RT) PROFILE

6/17/2019
PROPDesigns01\ncs.workingdir\15666\282440.445944\13819_rdy_psh06_L3550-4950.dgn
PROPWTC01

LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-LCDEB- EB COLLECTOR-DISTRIBUTOR	-LCDWB- WB COLLECTOR-DISTRIBUTOR	PI Sta 16+68.80
PI Sta 15+98.03	PI Sta 12+22.97	Δ = 3° 05' 06.3" (RT)
Δ = 2°18' 00.0" (LT)	Δ = 3° 05' 06.3" (LT)	D = 0° 41' 31.1"
D = 0° 41' 31.1"	D = 0° 41' 31.1"	L = 445.83'
L = 332.38'	L = 445.83'	T = 222.97'
T = 166.21'	T = 222.97'	R = 8,280.00'
R = 8,280.00'	R = 8,280.00'	SE = NC
SE = NC	SE = NC	DS = 50 MPH
DS = 50 MPH	DS = 50 MPH	

6/17/2019
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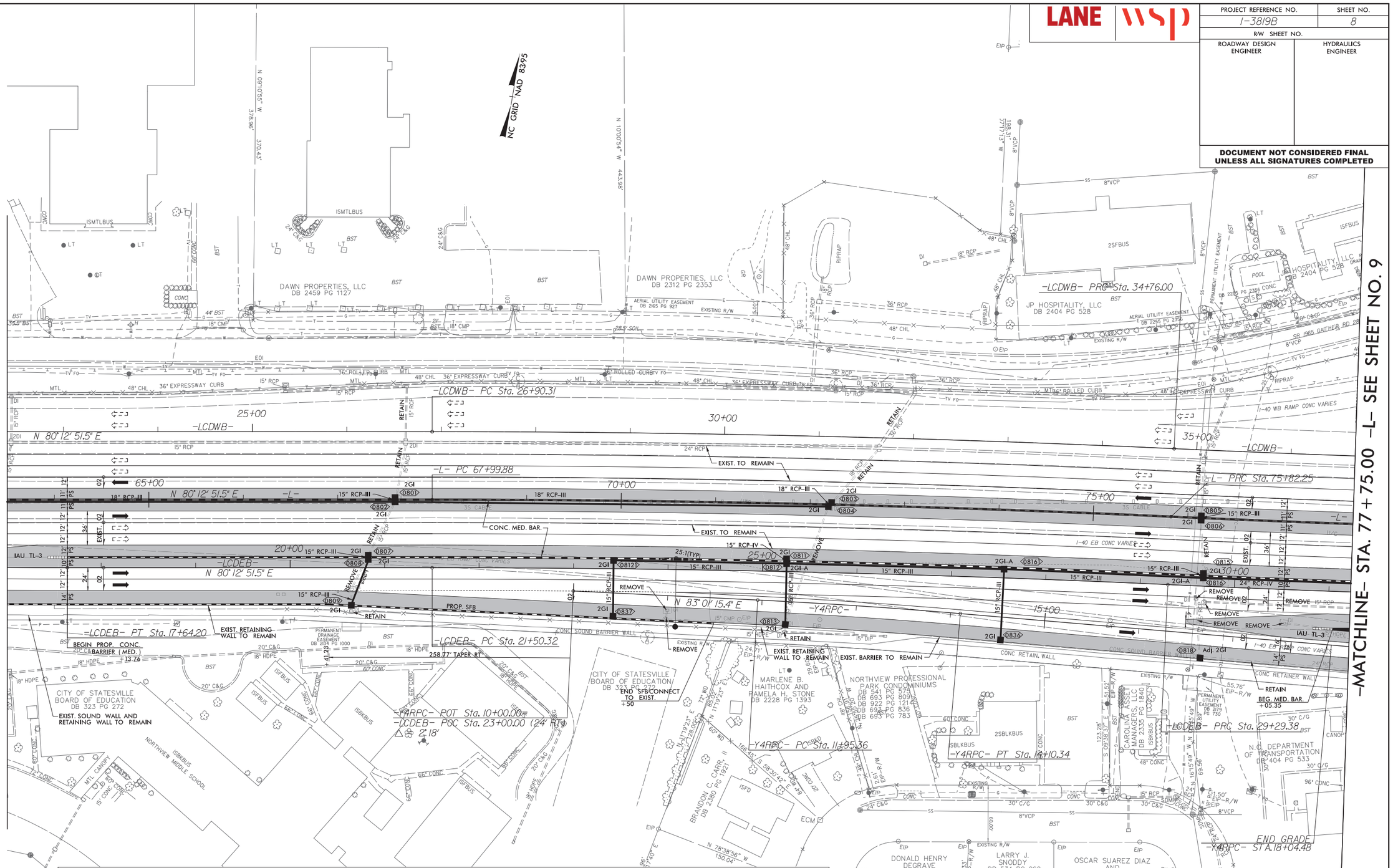
PROFILE01$

LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-L- (I-40)	-LCDWB- WB COLLECTOR-DISTRIBUTOR		-LCDEB- EB COLLECTOR-DISTRIBUTOR		-Y4RPC- RAMP C
PI Sta 71+91.14	PI Sta 30+83.22	PI Sta 38+65.60	PI Sta 15+98.03	PI Sta 25+39.92	PI Sta 33+22.29	PI Sta 13+02.86
△ = 2° 38' 12.7" (RT)	△ = 2° 38' 12.7" (RT)	△ = 2° 38' 12.7" (LT)	△ = 2° 18' 00.0" (LT)	△ = 2° 38' 12.7" (RT)	△ = 2° 38' 12.7" (LT)	△ = 2° 03' 10.3" (RT)
D = 0° 20' 13.3"	D = 0° 20' 08.2"	D = 0° 20' 18.5"	D = 0° 41' 31.1"	D = 0° 20' 18.5"	D = 0° 20' 08.2"	D = 0° 57' 17.7"
L = 782.37'	L = 785.69'	L = 779.06'	L = 332.38'	L = 779.06'	L = 785.69'	L = 214.98'
T = 391.26'	T = 392.91'	T = 389.60'	T = 166.21'	T = 389.60'	T = 392.91'	T = 107.50'
R = 17,000.00'	R = 17,072.00'	R = 16,928.00'	R = 8,280.00'	R = 16,928.00'	R = 17,072.00'	R = 6,000.00'
SE = NC	SE = NC	SE = NC	SE = NC	SE = NC	SE = NC	SE = RC
DS = 60 MPH	DS = 50 MPH	DS = 50 MPH	DS = 50 MPH	DS = 50 MPH	DS = 50 MPH	DS = 50 MPH

SEE SHEET 46 FOR -LCDEB- PROFILE
SEE SHEET 86 FOR -Y4RPC- PROFILE

6/17/2019
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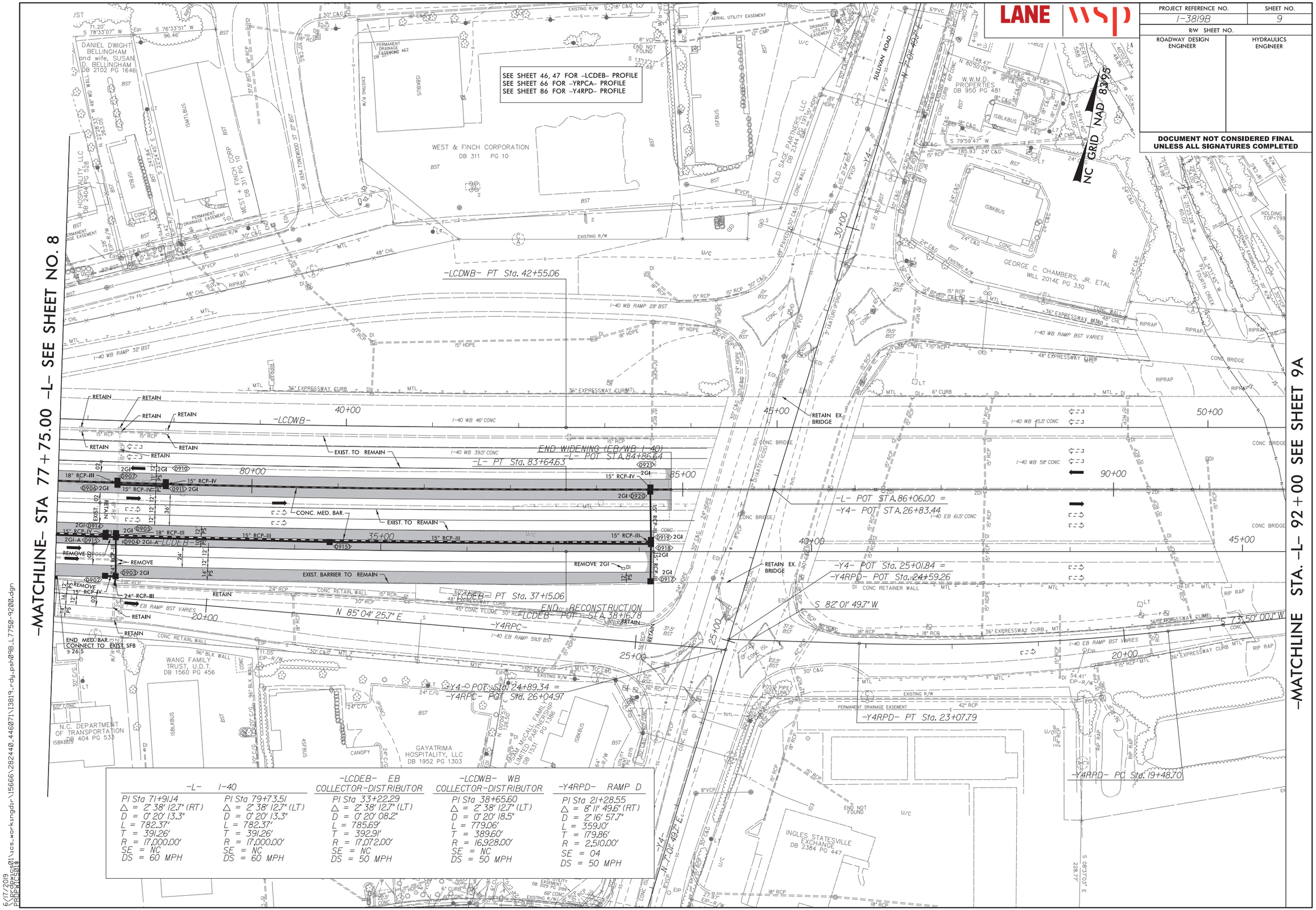
LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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DRP WCS01$

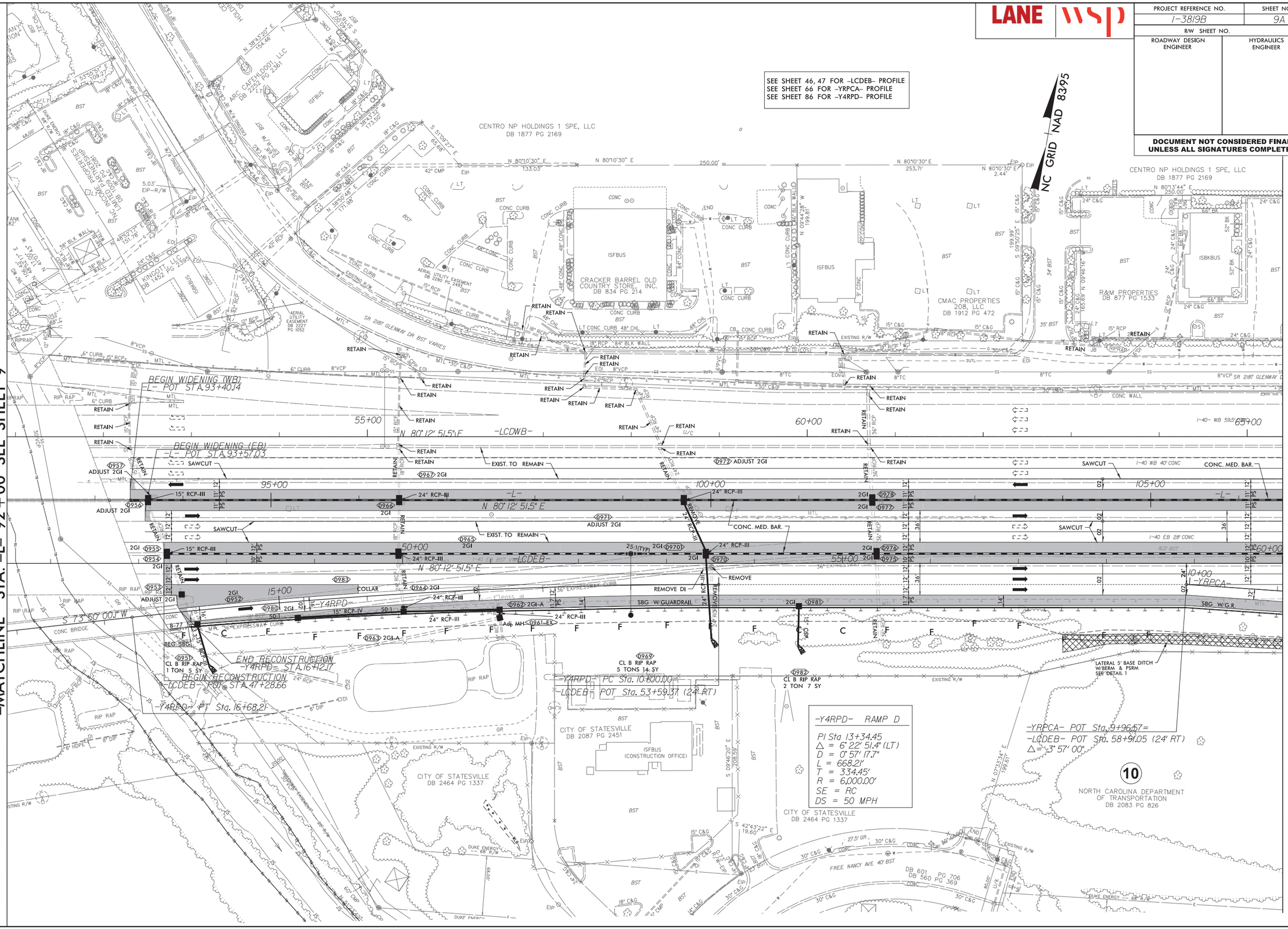
LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	9A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEE SHEET 46, 47 FOR -LCDEB- PROFILE
SEE SHEET 66 FOR -YRPCA- PROFILE
SEE SHEET 86 FOR -Y4RPD- PROFILE

NC GRID NAD 83/95



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PDP WCS01$

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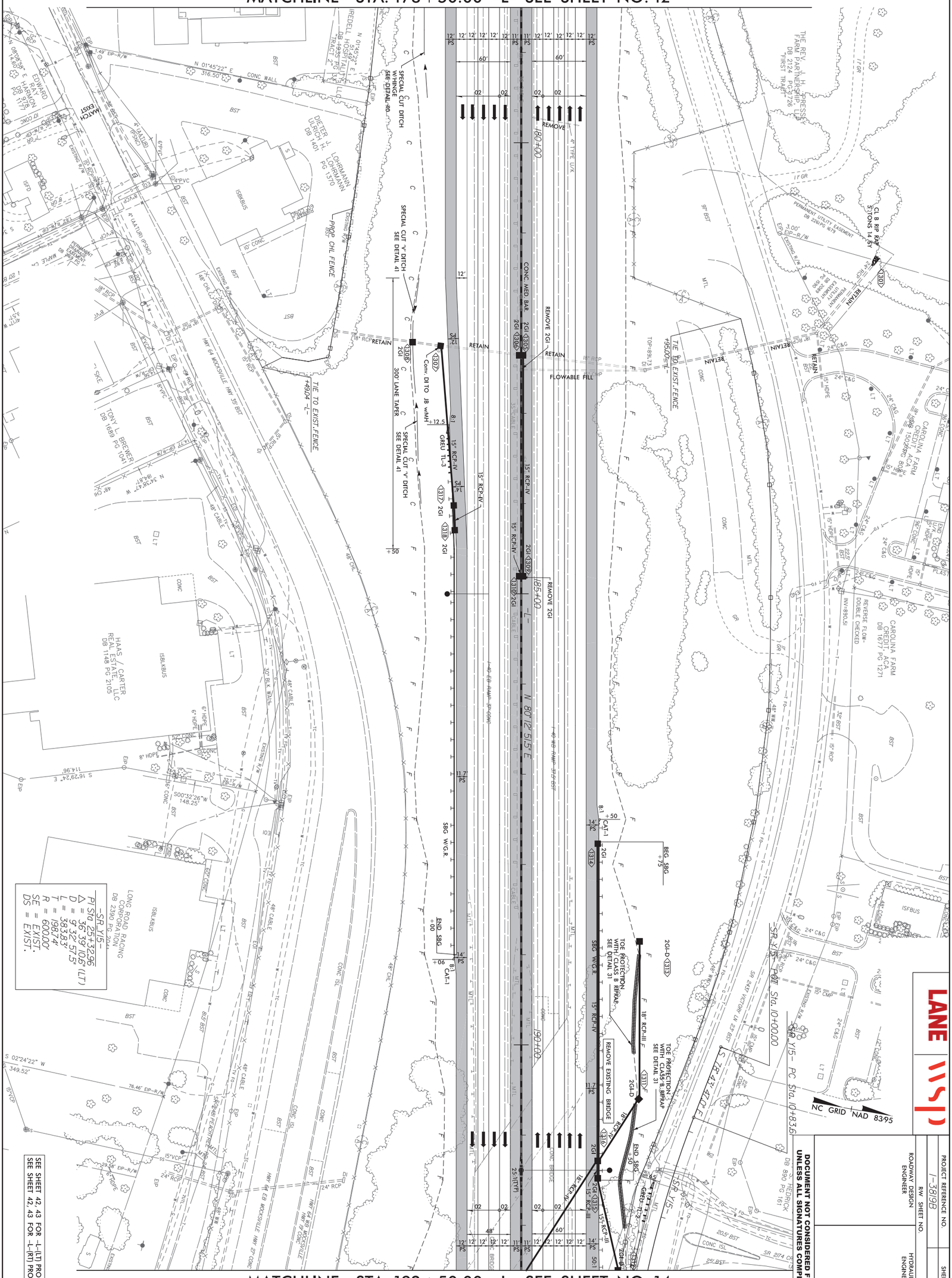
PRDPWICS01$

–MATCHLINE– STA. 178 + 50.00 –L– SEE SHEET NO. 12



–MATCHLINE– STA. 192 + 50.00 –L– SEE SHEET NO. 14

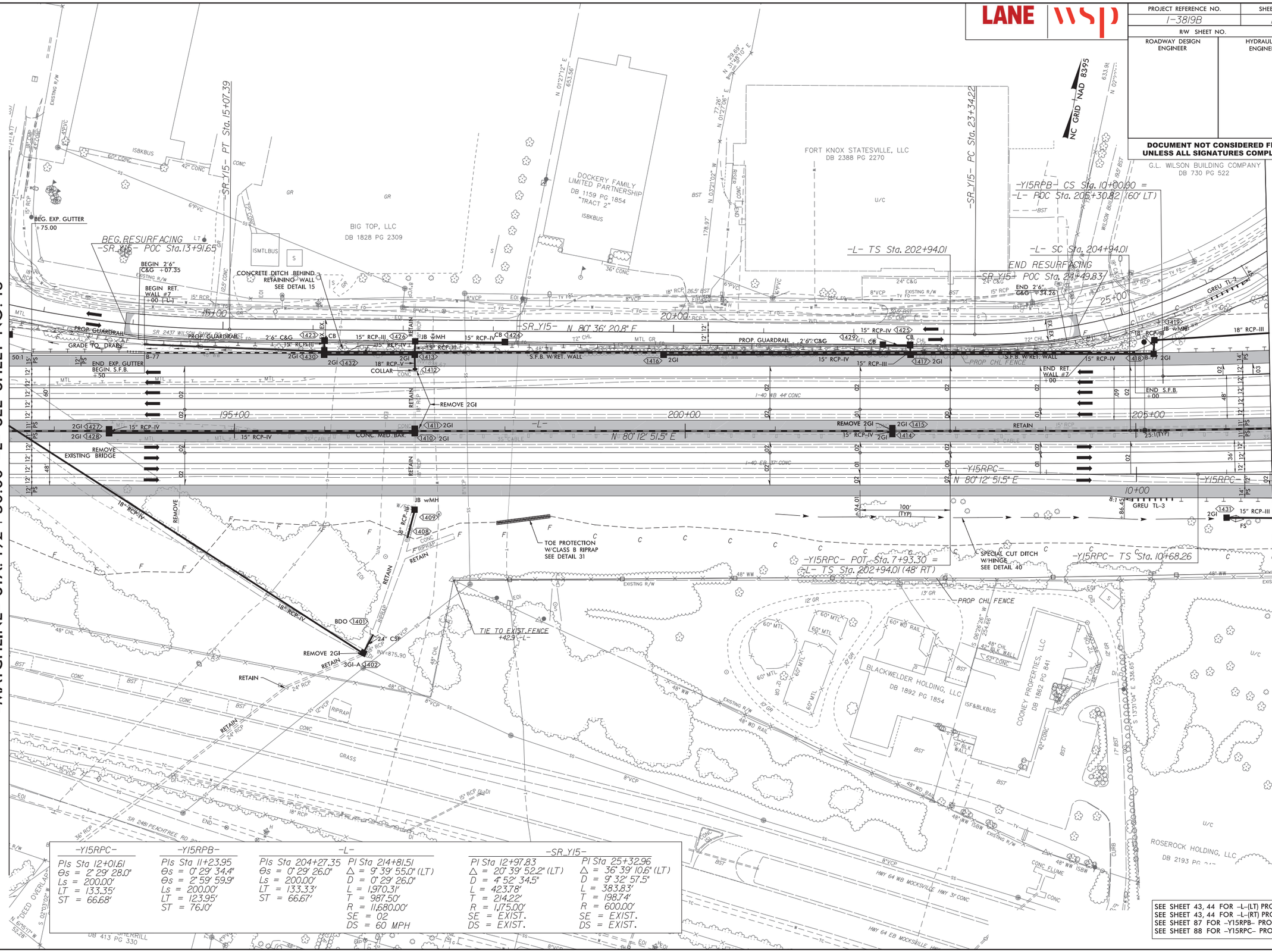
LANE WSP

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-Y15RPC-	-Y15RPB-	-L-		-SR_Y15-	
PIs Sta 12+01.61	PIs Sta 11+23.95	PIs Sta 204+27.35	PI Sta 214+81.51	PI Sta 12+97.83	PI Sta 25+32.96
Θs = 2° 29' 28.0"	Θs = 0° 29' 34.4"	Θs = 0° 29' 26.0"	Δ = 9° 39' 55.0" (LT)	Δ = 20° 39' 52.2" (LT)	Δ = 36° 39' 10.6" (LT)
Ls = 200.00'	Θs = 2° 59' 59.9"	Ls = 200.00'	D = 0° 29' 26.0"	D = 4° 52' 34.5"	D = 9° 32' 57.5"
LT = 133.35'	Ls = 200.00'	LT = 133.33'	L = 1,970.31'	L = 423.78'	L = 383.83'
ST = 66.68'	LT = 123.95'	ST = 66.67'	T = 987.50'	T = 214.22'	T = 198.74'
	ST = 76.10'		R = 11,680.00'	R = 1,175.00'	R = 600.00'
			SE = 02	SE = EXIST.	SE = EXIST.
			DS = 60 MPH	DS = EXIST.	DS = EXIST.

SEE SHEET 43, 44 FOR -L-(LT) PROFILE
SEE SHEET 43, 44 FOR -L-(RT) PROFILE
SEE SHEET 87 FOR -Y15RPB- PROFILE
SEE SHEET 88 FOR -Y15RPC- PROFILE

6/17/2019
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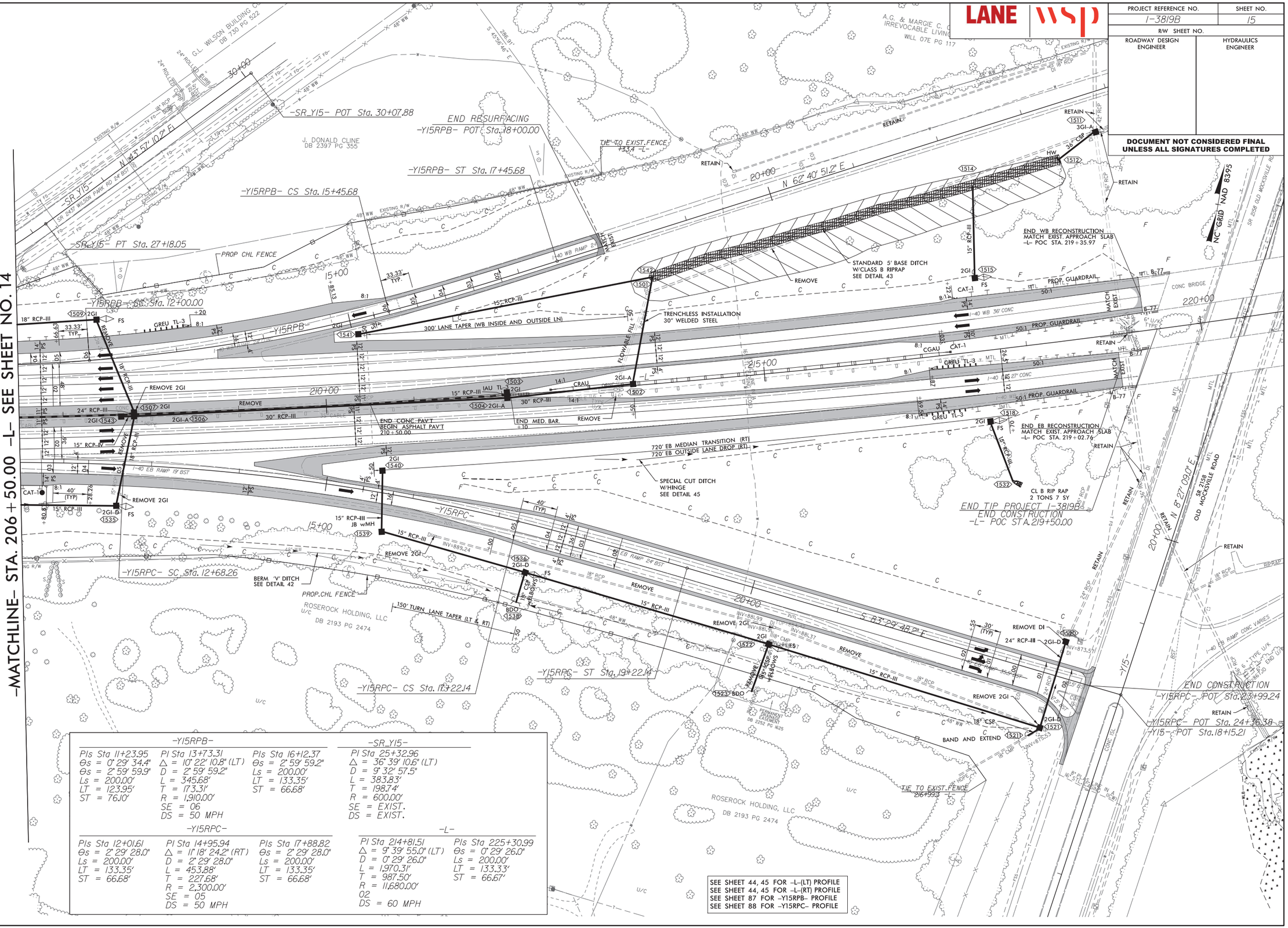
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-Y15RPB-			-SR_Y15-
PIs Sta 11+23.95	PI Sta 13+73.31	PIs Sta 16+12.37	PI Sta 25+32.96
Θs = 0° 29' 34.4"	Δ = 10° 22' 10.8" (LT)	Θs = 2° 59' 59.2"	Δ = 36° 39' 10.6" (LT)
Θs = 2° 59' 59.9"	D = 2° 59' 59.2"	Ls = 200.00'	D = 9° 32' 57.5"
Ls = 200.00'	L = 345.68'	LT = 133.35'	L = 383.83'
LT = 123.95'	T = 173.31'	ST = 66.68'	T = 198.74'
ST = 76.10'	R = 1,910.00'		R = 600.00'
	SE = 06		SE = EXIST.
	DS = 50 MPH		DS = EXIST.

-Y15RPC-			-L-	
PIs Sta 12+01.61	PI Sta 14+95.94	PIs Sta 17+88.82	PI Sta 214+81.51	PIs Sta 225+30.99
Θs = 2° 29' 28.0"	Δ = 11° 18' 24.2" (RT)	Θs = 2° 29' 28.0"	Δ = 9° 39' 55.0" (LT)	Θs = 0° 29' 26.0"
Ls = 200.00'	D = 2° 29' 28.0"	Ls = 200.00'	D = 0° 29' 26.0"	Ls = 200.00'
LT = 133.35'	L = 453.88'	LT = 133.35'	L = 1,970.31'	LT = 133.33'
ST = 66.68'	T = 227.68'	ST = 66.68'	T = 987.50'	ST = 66.67'
	R = 2,300.00'		R = 11,680.00'	
	SE = 05		02	
	DS = 50 MPH		DS = 60 MPH	

SEE SHEET 44, 45 FOR -L-(LT) PROFILE
SEE SHEET 44, 45 FOR -L-(RT) PROFILE
SEE SHEET 87 FOR -Y15RPB- PROFILE
SEE SHEET 88 FOR -Y15RPC- PROFILE

6/17/2019
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PRDPWICS01$

LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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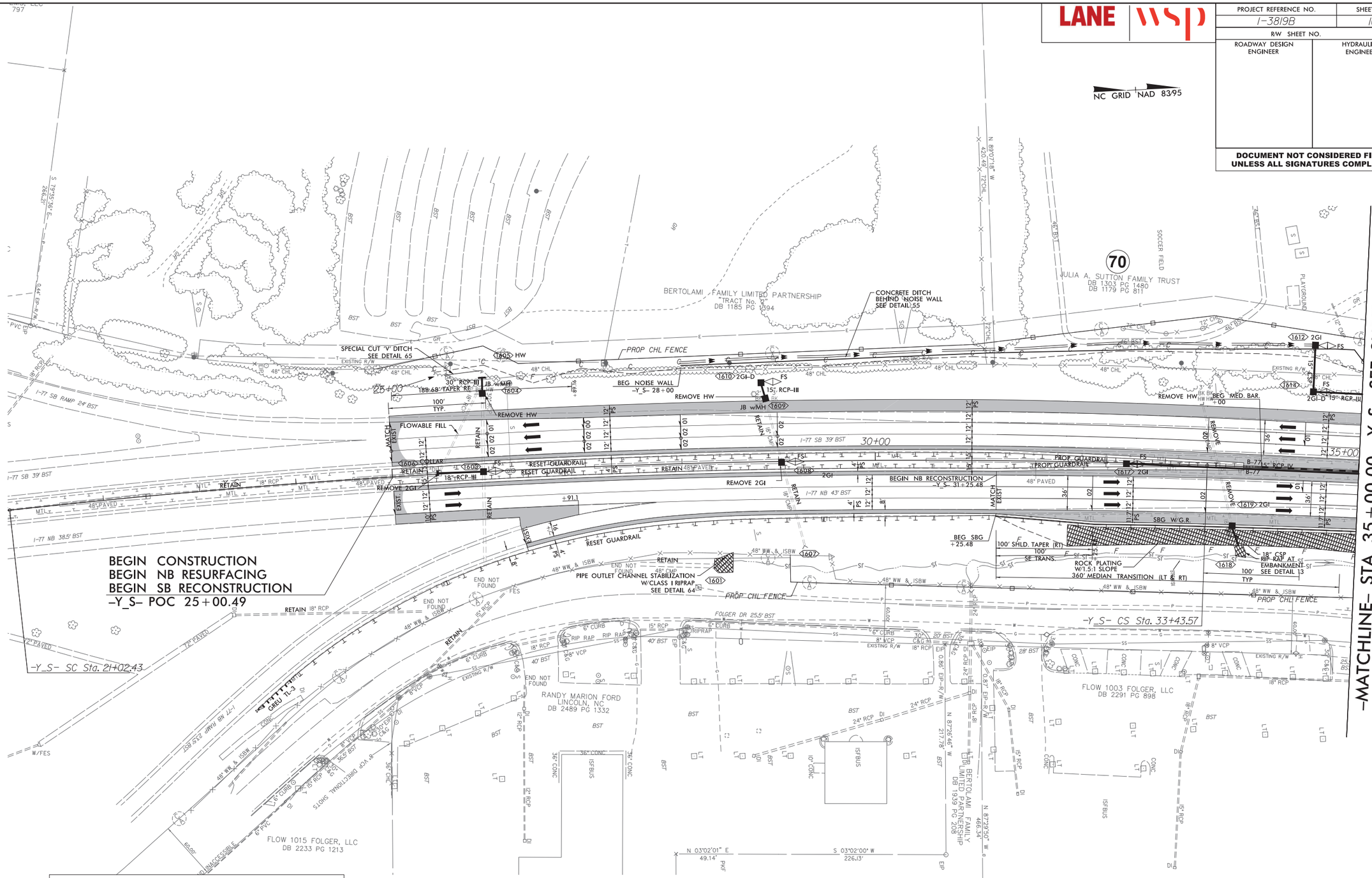

-Y_S-

PIs Sta 20+35.76	PI Sta 27+24.08	PIs Sta 34+10.24
Θs = 0° 39' 58.4"	Δ = 8° 16' 07.9" (RT)	Θs = 0° 39' 58.4"
Ls = 200.00'	D = 0° 39' 58.4"	Ls = 200.00'
LT = 133.33'	L = 1,241.14'	LT = 133.33'
ST = 66.67'	T = 621.65'	ST = 66.67'
	R = 8,600.00'	
	SE = RC	
	DS = 60 MPH	

6/17/2019
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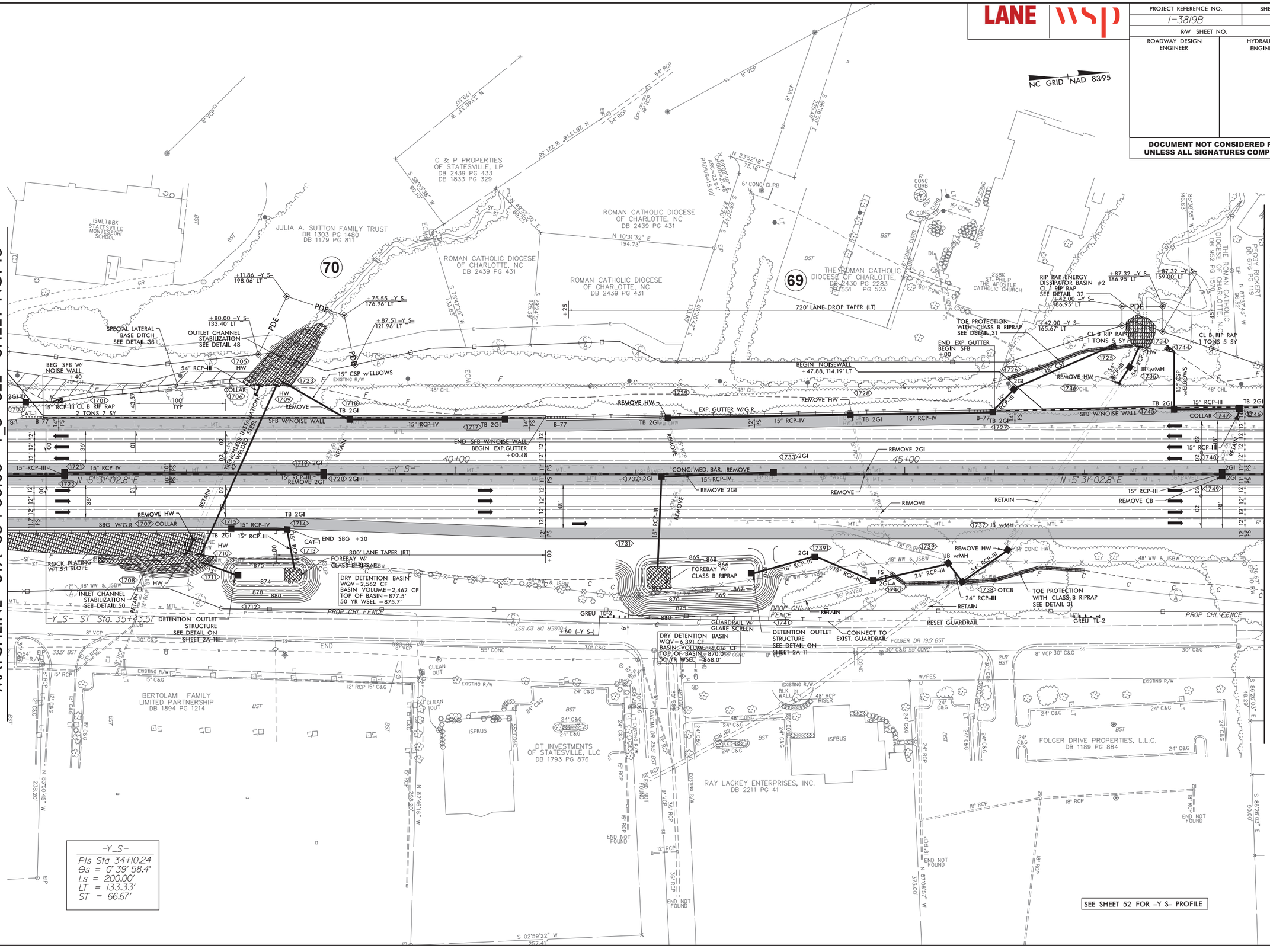
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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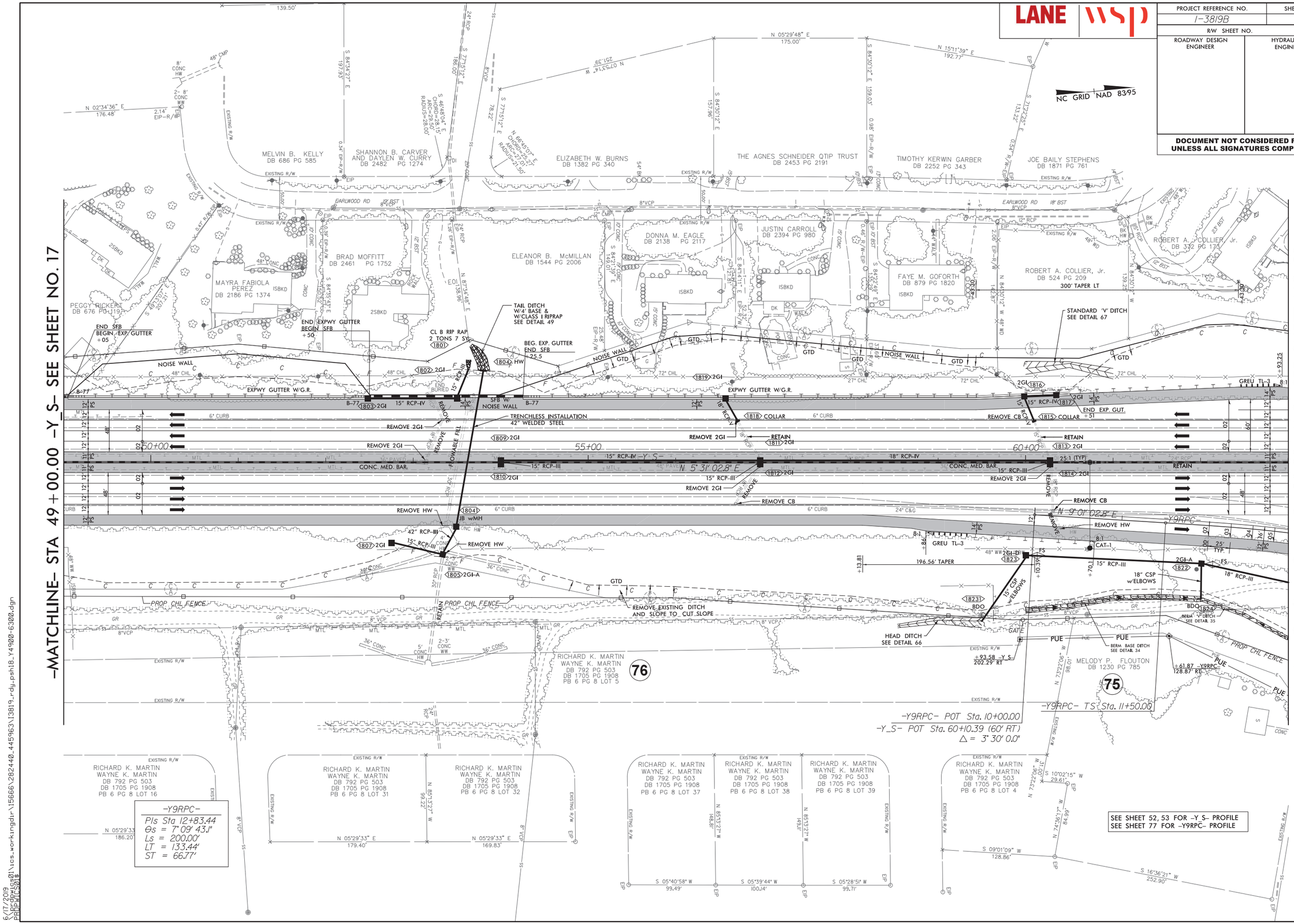
PROP_VTC_S01$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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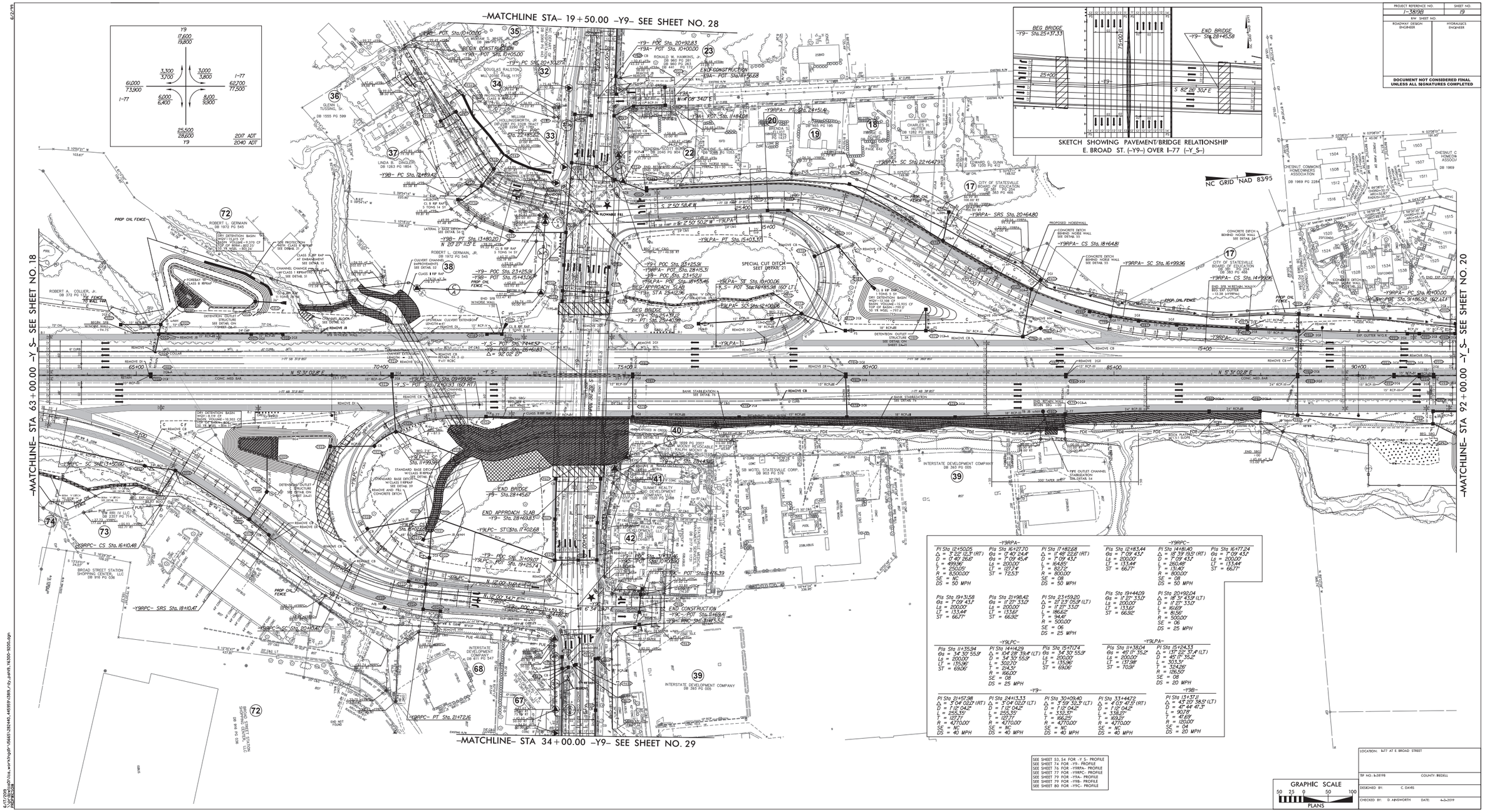
PROPWLCS01$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-Y9RPA-		
PI Sta 12+50.05 Δ = 3°22'12.3" (RT) D = 0°40'26.6" L = 499.36' T = 250.05' R = 8,500.00' SE = NC DS = 50 MPH	PI Sta 16+27.70 Θs = 0°40'24.4" Θs = 7°09'45.4" Ls = 200.00' LT = 177.74' ST = 72.53'	PI Sta 17+82.68 Δ = 11°48'22.6" (RT) D = 7°09'43.1" L = 164.85' T = 82.72' R = 800.00' SE = 08 DS = 50 MPH
PI Sta 19+31.58 Θs = 7°09'43.1" Ls = 200.00' LT = 133.44' ST = 66.77'	PI Sta 21+98.42 Θs = 11°27'33.0" Ls = 200.00' LT = 133.61' ST = 66.92'	PI Sta 23+59.20 Δ = 27°23'05.9" (LT) D = 11°27'33.0" L = 186.62' T = 94.41' R = 500.00' SE = 06 DS = 25 MPH

-Y9RPC-		
PI Sta 12+83.44 Θs = 7°09'43.1" Ls = 200.00' LT = 133.44' ST = 66.77'	PI Sta 14+81.40 Δ = 18°39'19.5" (RT) D = 7°09'43.1" L = 260.48' T = 131.40' R = 800.00' SE = 09 DS = 50 MPH	PI Sta 16+77.24 Θs = 7°09'43.1" Ls = 200.00' LT = 133.44' ST = 66.77'
PI Sta 19+44.09 Θs = 11°27'33.0" Ls = 200.00' LT = 133.61' ST = 66.92'	PI Sta 20+92.04 Δ = 18°31'43.9" (LT) D = 11°27'33.0" L = 161.61' T = 81.56' R = 500.00' SE = 06 DS = 25 MPH	

-Y9LPC-		
PI Sta 11+35.94 Θs = 34°30'55.9" Ls = 200.00' LT = 153.41' ST = 69.06'	PI Sta 14+14.29 Δ = 104°28'39.4" (LT) D = 34°30'55.9" L = 302.70' T = 214.31' R = 166.00' SE = 08 DS = 25 MPH	PI Sta 15+71.74 Θs = 34°30'55.9" Ls = 200.00' LT = 153.41' ST = 69.06'

-Y9LPA-	
PI Sta 11+38.04 Θs = 45°17'35.2" Ls = 200.00' LT = 137.98' ST = 70.31'	PI Sta 15+24.33 Δ = 137°22'37.4" (LT) D = 45°17'35.2" L = 303.31' T = 324.26' R = 126.50' SE = 08 DS = 20 MPH

-Y9-			
PI Sta 21+57.98 Δ = 3°04'02.0" (RT) D = 1°12'04.2" L = 255.35' T = 127.77' R = 4,770.00' SE = NC DS = 40 MPH	PI Sta 24+13.33 Δ = 3°04'02.0" (LT) D = 1°12'04.2" L = 255.35' T = 127.77' R = 4,770.00' SE = NC DS = 40 MPH	PI Sta 30+09.40 Δ = 3°59'32.3" (LT) D = 1°12'04.2" L = 333.37' T = 166.75' R = 4,770.00' SE = NC DS = 40 MPH	PI Sta 33+44.72 Δ = 4°03'47.5" (RT) D = 1°12'04.2" L = 338.21' T = 169.21' R = 4,770.00' SE = NC DS = 40 MPH

-Y9B-
PI Sta 13+37.11 Δ = 43°20'38.5" (LT) D = 47°44'41.3" L = 90.18' T = 47.69' R = 120.00' SE = 04 DS = 20 MPH

SEE SHEET 53, 54 FOR -Y S- PROFILE
SEE SHEET 74 FOR -Y9- PROFILE
SEE SHEET 76 FOR -Y9RPA- PROFILE
SEE SHEET 77 FOR -Y9RPC- PROFILE
SEE SHEET 79 FOR -Y9A- PROFILE
SEE SHEET 79 FOR -Y9B- PROFILE
SEE SHEET 80 FOR -Y9C- PROFILE

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: I-77 AT E. BROAD STREET

TIP NO: I-3819B COUNTY: IREDELL

DESIGNED BY: C. OAKES

CHECKED BY: D. AINSWORTH DATE: 4-3-2019

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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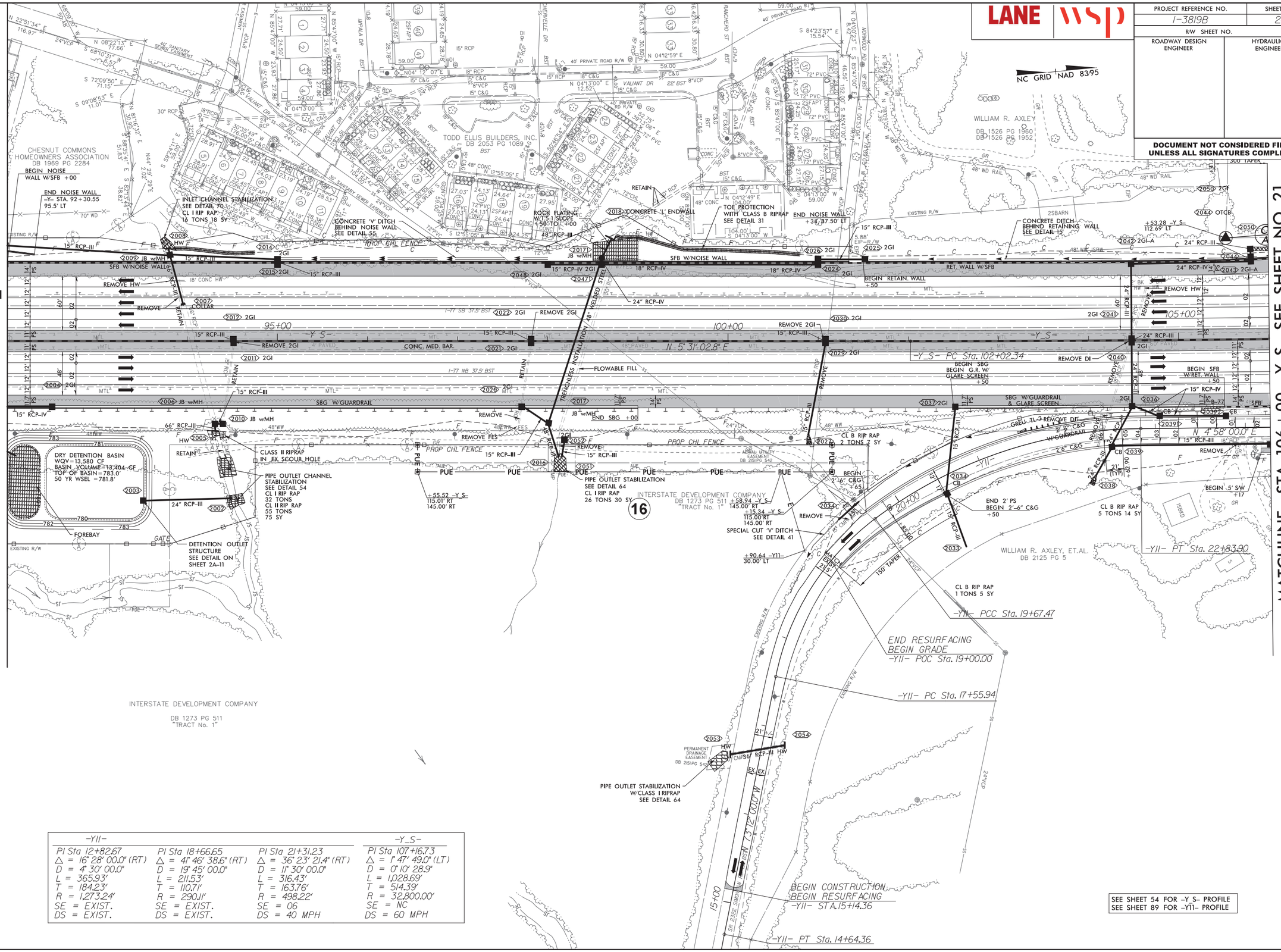

-Y11-			-Y_S-
PI Sta 12+82.67	PI Sta 18+66.65	PI Sta 21+31.23	PI Sta 107+16.73
Δ = 16° 28' 00.0" (RT)	Δ = 41° 46' 38.6" (RT)	Δ = 36° 23' 21.4" (RT)	Δ = 1° 47' 49.0" (LT)
D = 4° 30' 00.0"	D = 19° 45' 00.0"	D = 11° 30' 00.0"	D = 0° 10' 28.9"
L = 365.93'	L = 211.53'	L = 316.43'	L = 1,028.69'
T = 184.23'	T = 110.71'	T = 163.76'	T = 514.39'
R = 1,273.24'	R = 290.11'	R = 498.22'	R = 32,800.00'
SE = EXIST.	SE = EXIST.	SE = 06	SE = NC
DS = EXIST.	DS = EXIST.	DS = 40 MPH	DS = 60 MPH

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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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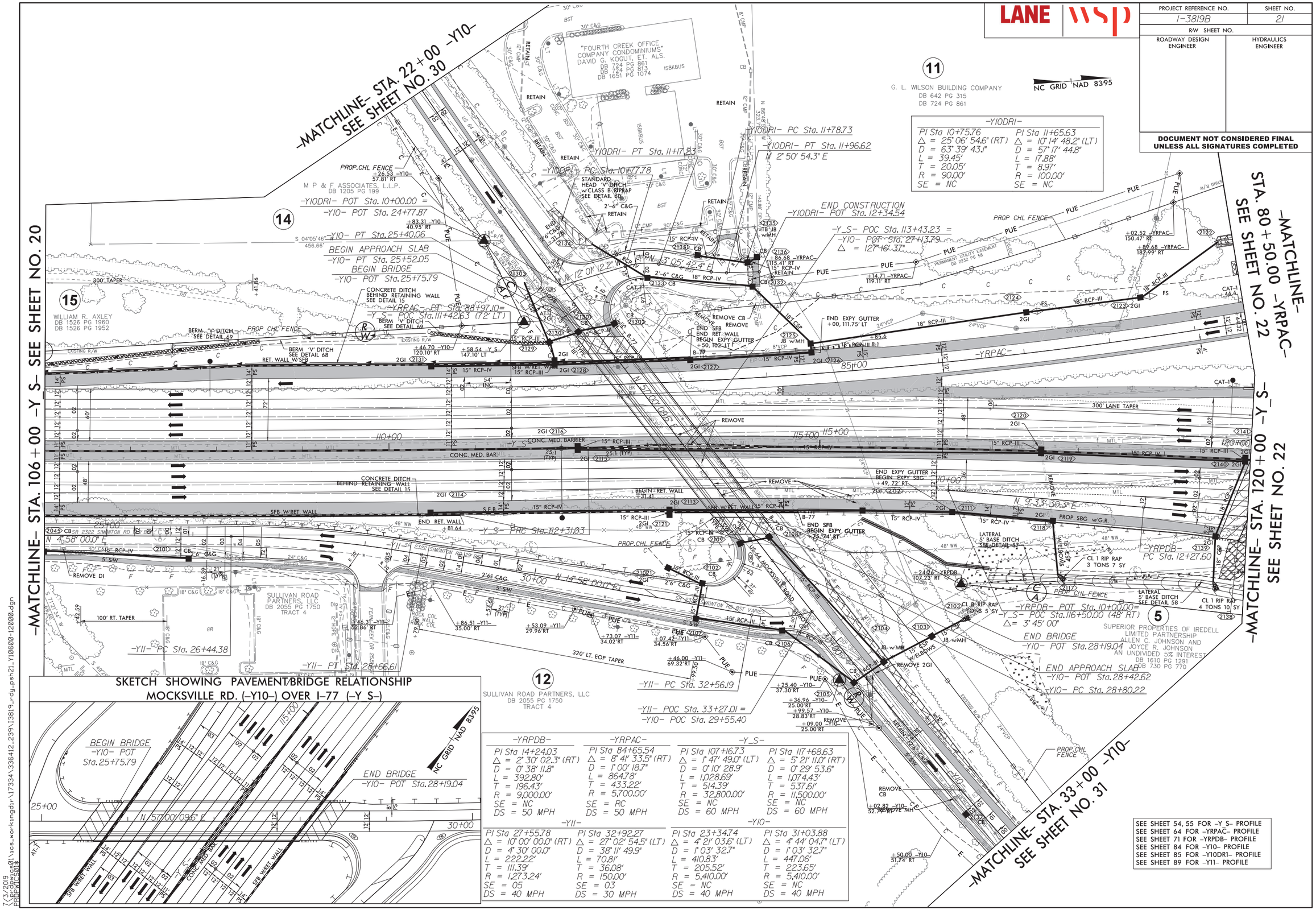

SKETCH SHOWING PAVEMENT/BRIDGE RELATIONSHIP MOCKSVILLE RD. (-Y10-) OVER I-77 (-Y S-)

-YRPDB-	-YRPAC-	-Y_S-	
PI Sta 14+24.03	PI Sta 84+65.54	PI Sta 107+16.73	PI Sta 117+68.63
Δ = 2° 30' 02.3" (RT)	Δ = 8° 41' 33.5" (RT)	Δ = 1° 47' 49.0" (LT)	Δ = 5° 21' 11.0" (RT)
D = 0° 38' 11.8"	D = 1° 00' 18.7"	D = 0° 10' 28.9"	D = 0° 29' 53.6"
L = 392.80'	L = 864.78'	L = 1,028.69'	L = 1,074.43'
T = 196.43'	T = 433.22'	T = 514.39'	T = 537.61'
R = 9,000.00'	R = 5,700.00'	R = 32,800.00'	R = 11,500.00'
SE = NC	SE = RC	SE = NC	SE = NC
DS = 50 MPH	DS = 50 MPH	DS = 60 MPH	DS = 60 MPH

-Y11-		-Y10-	
PI Sta 27+55.78	PI Sta 32+92.27	PI Sta 23+34.74	PI Sta 31+03.88
Δ = 10° 00' 00.0" (RT)	Δ = 27° 02' 54.5" (LT)	Δ = 4° 21' 03.6" (LT)	Δ = 4° 44' 04.7" (LT)
D = 4° 30' 00.0"	D = 38° 11' 49.9"	D = 1° 03' 32.7"	D = 1° 03' 32.7"
L = 222.22'	L = 70.81'	L = 410.83'	L = 447.06'
T = 111.39'	T = 36.08'	T = 205.52'	T = 223.65'
R = 1,273.24'	R = 150.00'	R = 5,410.00'	R = 5,410.00'
SE = 05	SE = 03	SE = NC	SE = NC
DS = 40 MPH	DS = 30 MPH	DS = 40 MPH	DS = 40 MPH

-Y10DRI-	
PI Sta 10+75.76	PI Sta 11+65.63
Δ = 25° 06' 54.6" (RT)	Δ = 10° 14' 48.2" (LT)
D = 63° 39' 43.1"	D = 57° 17' 44.8"
L = 39.45'	L = 17.88'
T = 20.05'	T = 8.97'
R = 90.00'	R = 100.00'
SE = NC	SE = NC

SEE SHEET 54, 55 FOR -Y_S- PROFILE
SEE SHEET 64 FOR -YRPAC- PROFILE
SEE SHEET 71 FOR -YRPDB- PROFILE
SEE SHEET 84 FOR -Y10- PROFILE
SEE SHEET 85 FOR -Y10DRI- PROFILE
SEE SHEET 89 FOR -Y11- PROFILE

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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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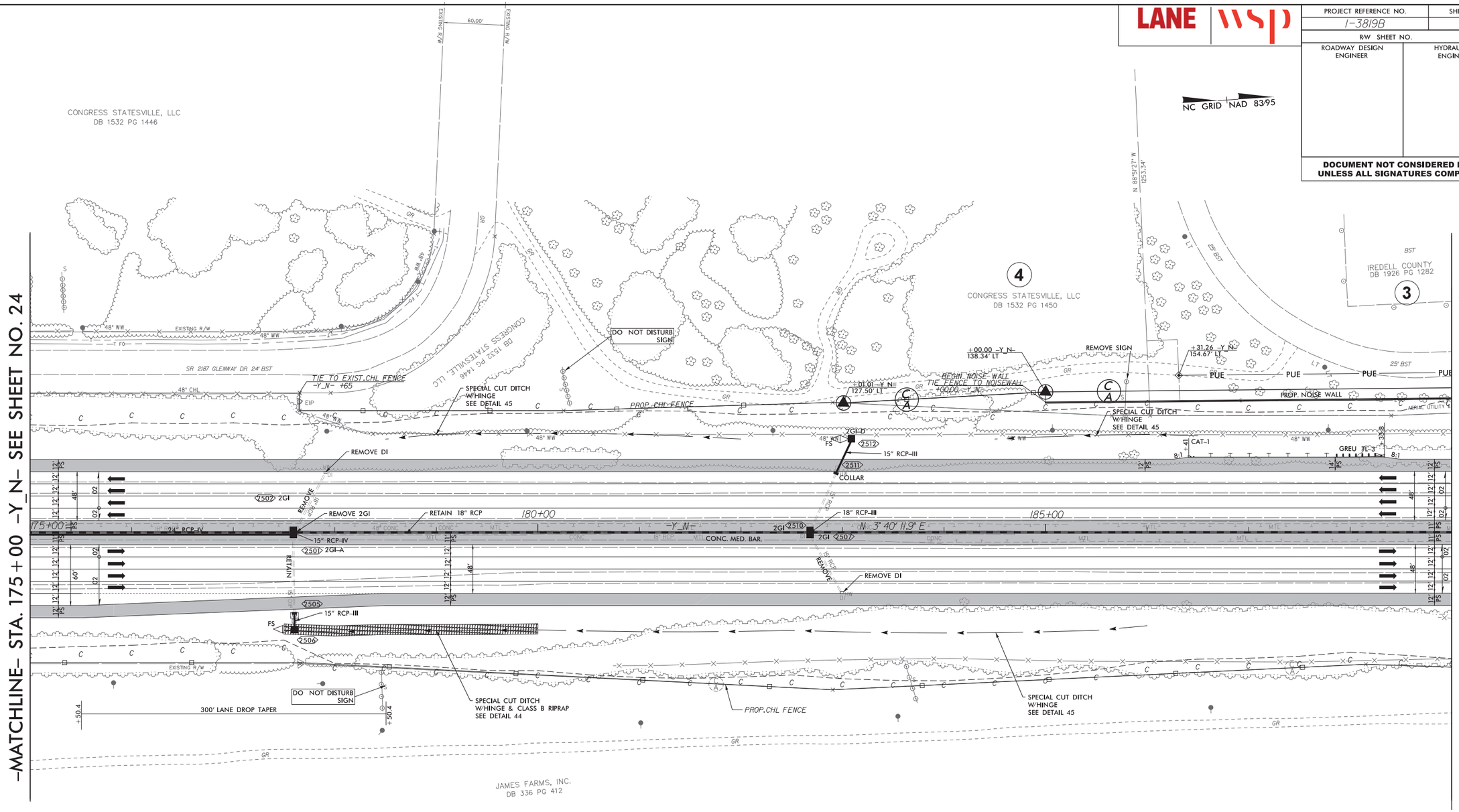

SEE SHEET 58, 59 FOR -Y_N- PROFILE

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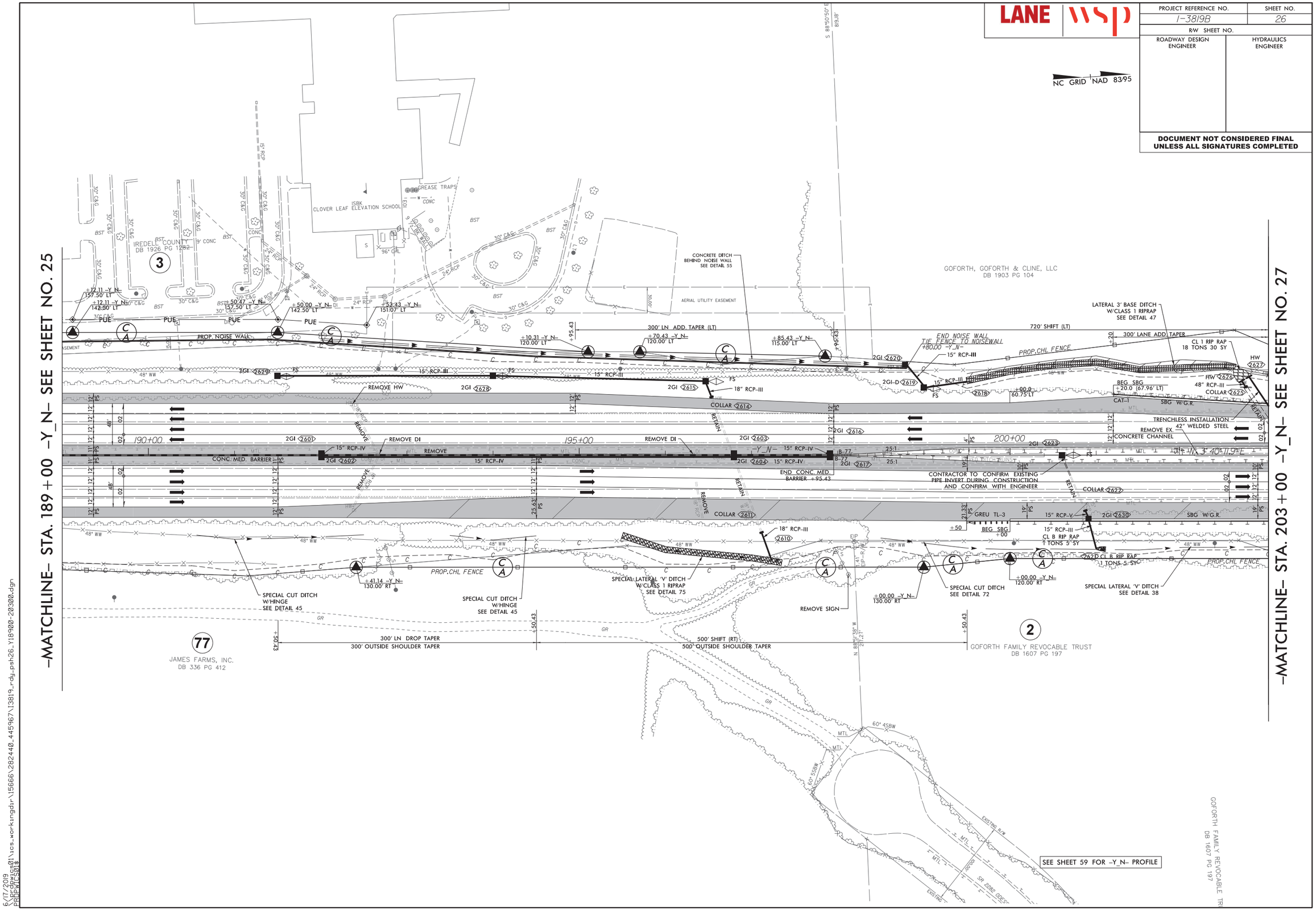
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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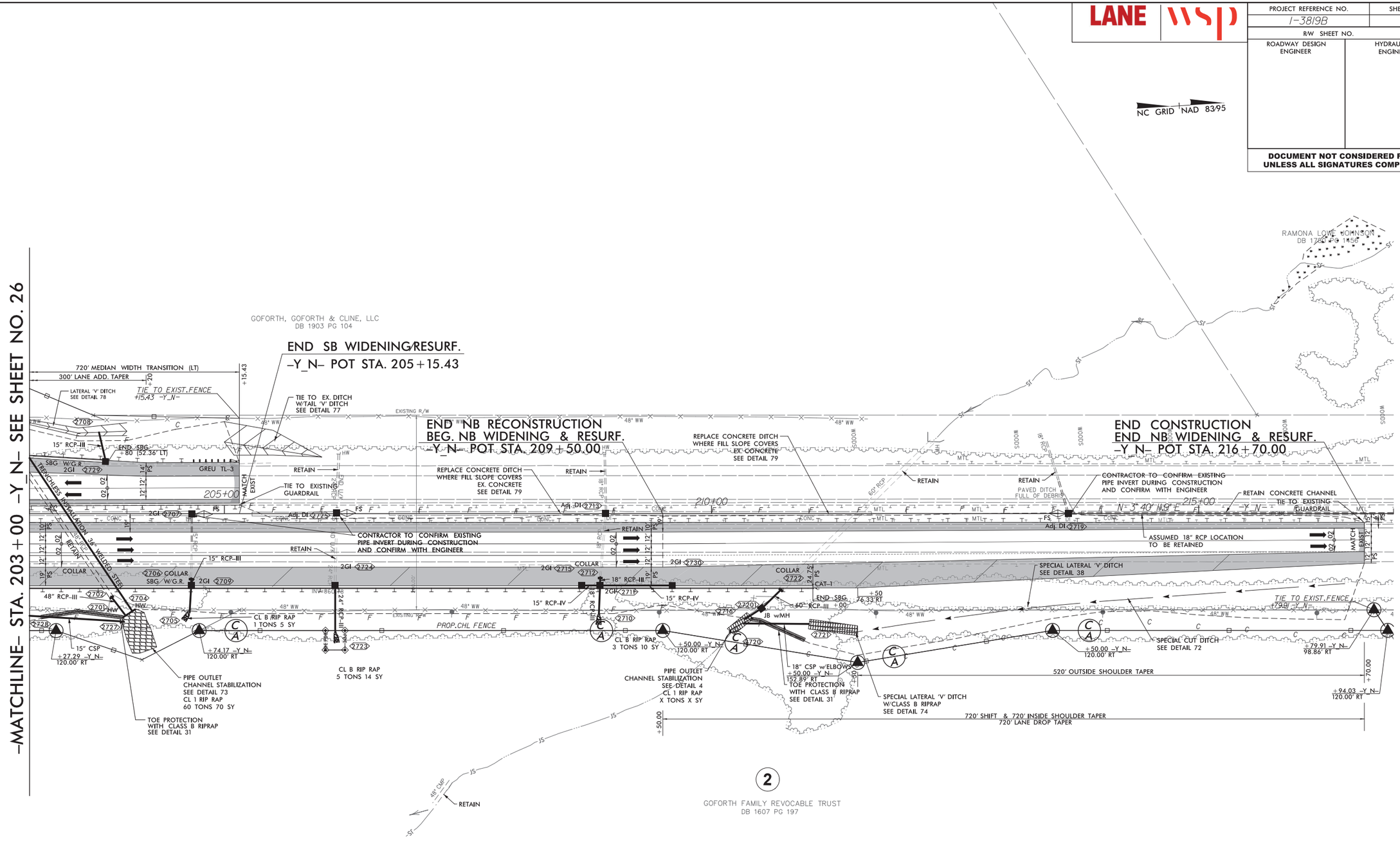
PROPWICS01$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SEE SHEET 59,60 FOR -Y_N- PROFILE

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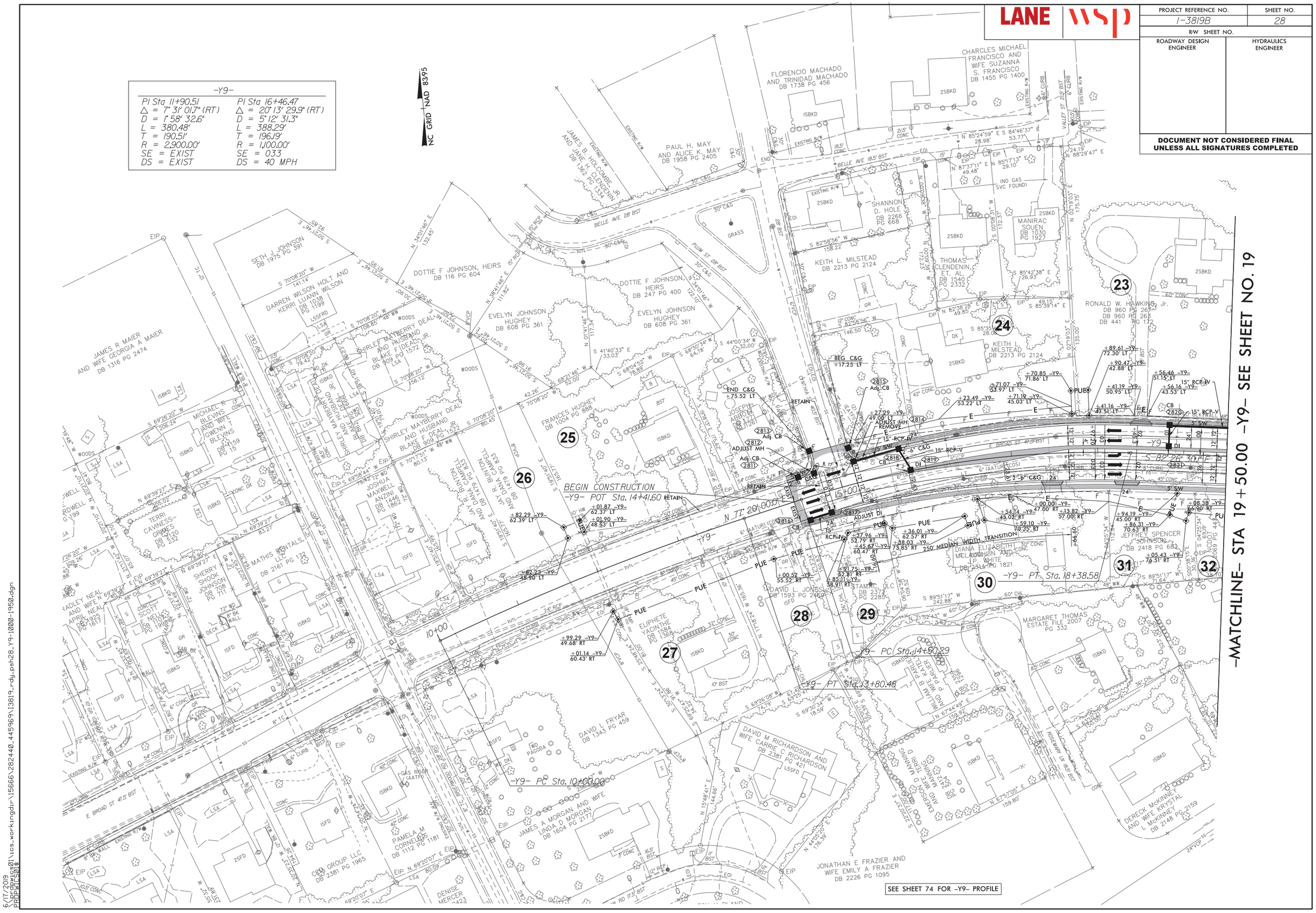
PRDPWICS01$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-Y9-	
PI Sta 11+90.51	PI Sta 16+46.47
△ = 7° 31' 01.7" (RT)	△ = 20° 13' 29.9" (RT)
D = 1° 58' 32.6"	D = 5° 12' 31.3"
L = 380.48'	L = 388.29'
T = 190.51'	T = 196.19'
R = 2,900.00'	R = 1,100.00'
SE = EXIST	SE = 033
DS = EXIST	DS = 40 MPH



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PRDPWICS01$

LANE | WSP

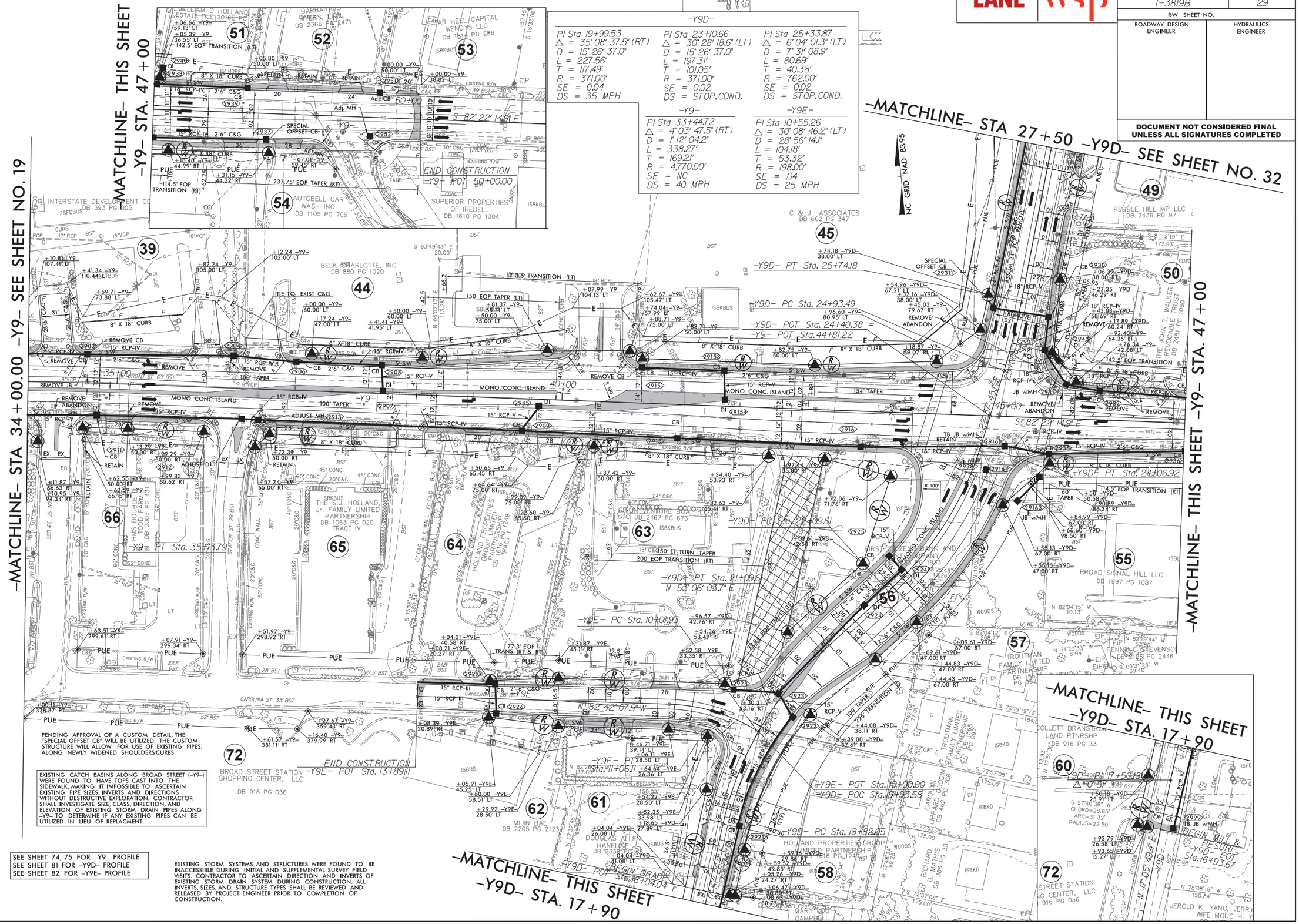
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	29
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-Y9D-

PI Sta 19+99.53	PI Sta 23+10.66	PI Sta 25+33.87
△ = 35° 08' 37.5" (RT)	△ = 30° 28' 18.6" (LT)	△ = 6° 04' 01.3" (LT)
D = 15° 26' 37.0"	D = 15° 26' 37.0"	D = 7° 31' 08.9"
L = 227.56'	L = 197.31'	L = 80.69'
T = 117.49'	T = 101.05'	T = 40.38'
R = 371.00'	R = 371.00'	R = 762.00'
SE = 0.04	SE = 0.02	SE = 0.02
DS = 35 MPH	DS = STOP.COND.	DS = STOP.COND.

-Y9-	-Y9E-
PI Sta 33+44.72	PI Sta 10+55.26
△ = 4° 03' 47.5" (RT)	△ = 30° 08' 46.2" (LT)
D = 1° 12' 04.2"	D = 28° 56' 14.1"
L = 338.27'	L = 104.18'
T = 169.21'	T = 53.32'
R = 4,770.00'	R = 198.00'
SE = NC	SE = .04
DS = 40 MPH	DS = 25 MPH



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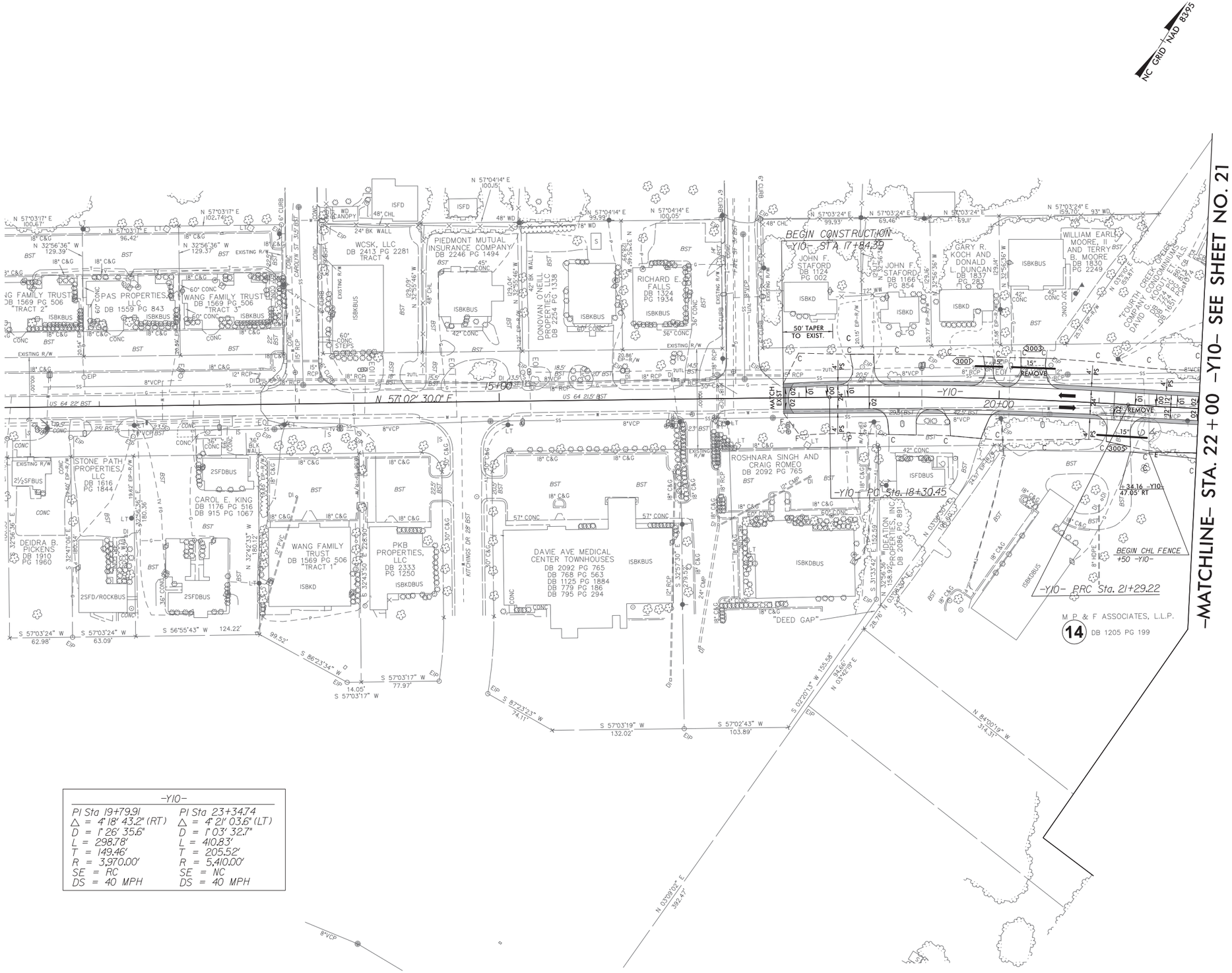
LANE | WSP

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	30
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-Y10-	
PI Sta 19+79.91	PI Sta 23+34.74
△ = 4° 18' 43.2" (RT)	△ = 4° 21' 03.6" (LT)
D = 1° 26' 35.6"	D = 1° 03' 32.7"
L = 298.78'	L = 410.83'
T = 149.46'	T = 205.52'
R = 3,970.00'	R = 5,410.00'
SE = RC	SE = NC
DS = 40 MPH	DS = 40 MPH

SEE SHEET 84 FOR -Y10- PROFILE

6/17/2019
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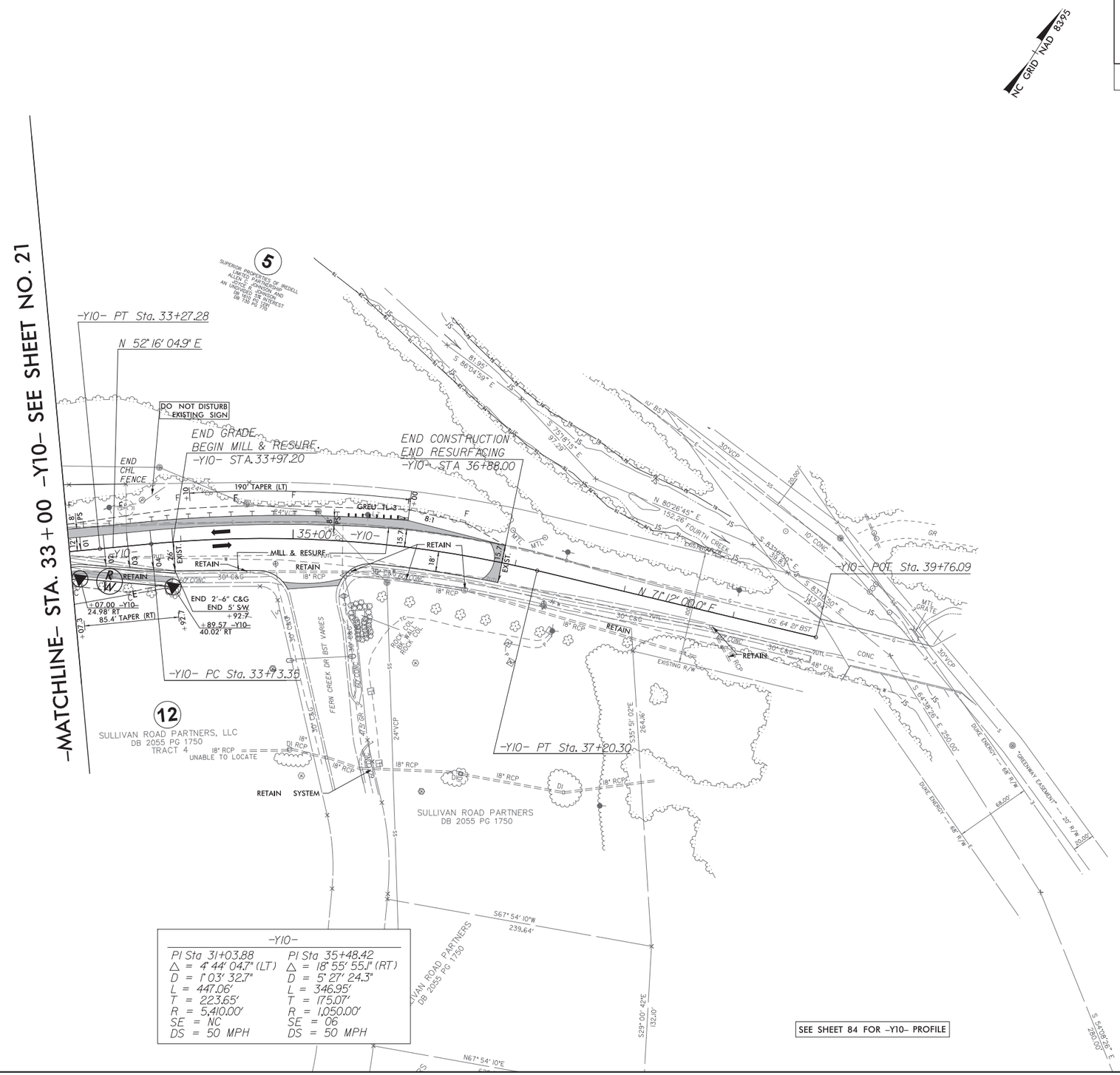
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-Y10-	
PI Sta 31+03.88	PI Sta 35+48.42
△ = 4° 44' 04.7" (LT)	△ = 18° 55' 55.1" (RT)
D = 1° 03' 32.7"	D = 5° 27' 24.3"
L = 447.06'	L = 346.95'
T = 223.65'	T = 175.07'
R = 5,410.00'	R = 1,050.00'
SE = NC	SE = 06
DS = 50 MPH	DS = 50 MPH

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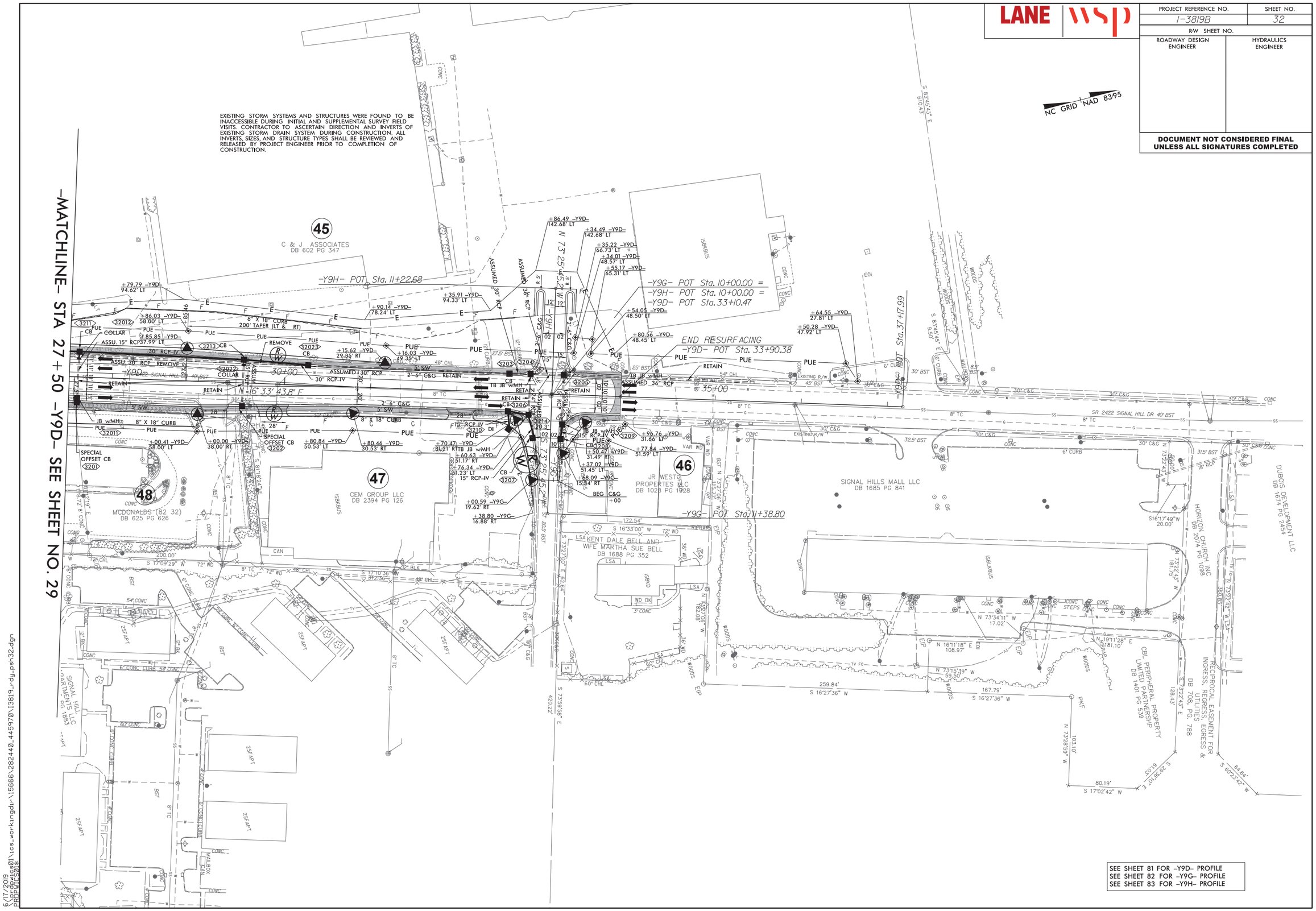
PROPWICS01$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	32
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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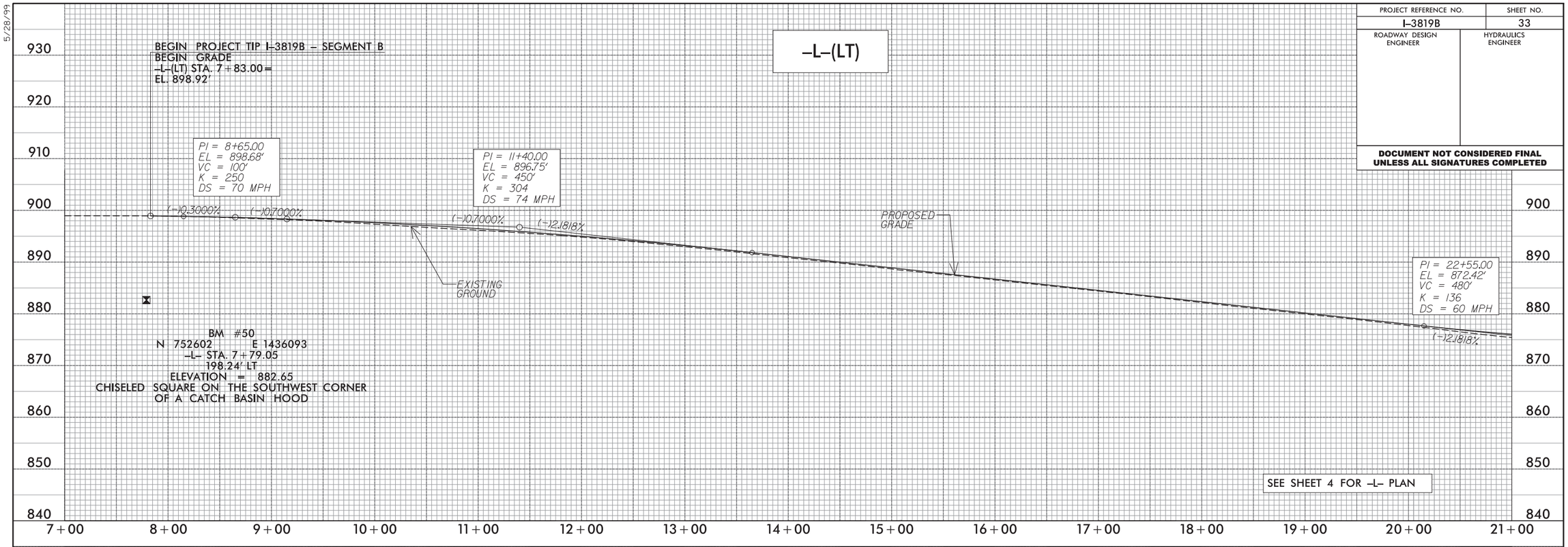
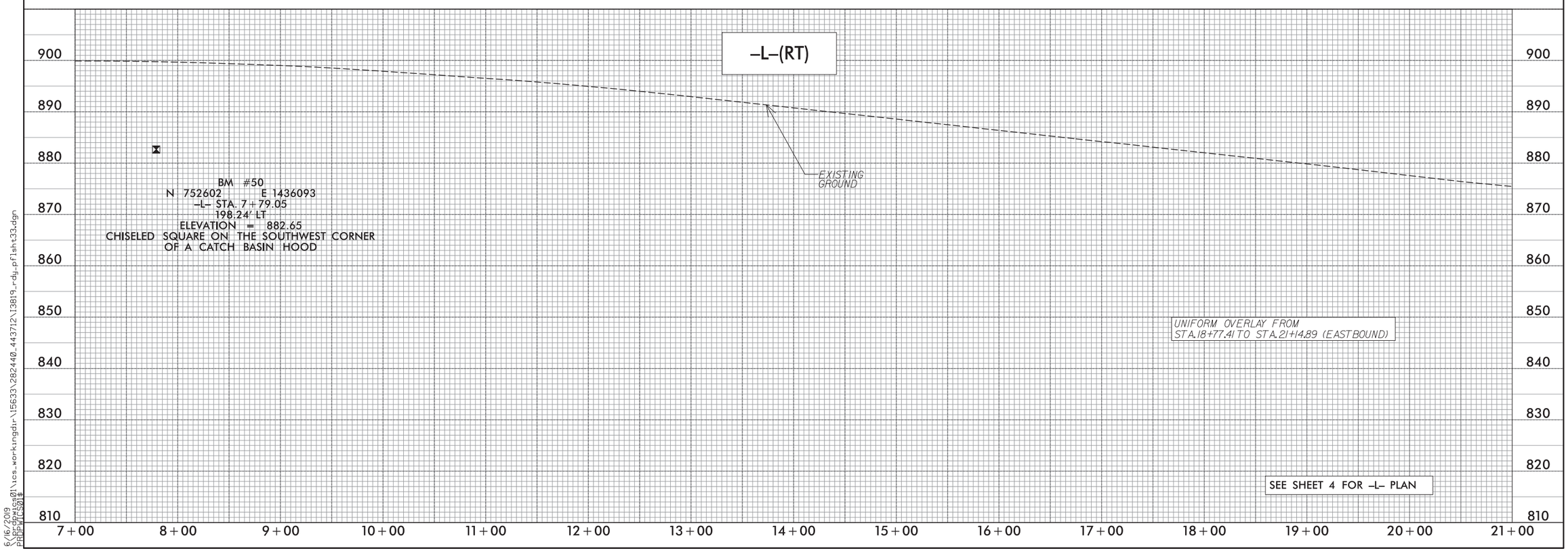
PROPWTCS01$

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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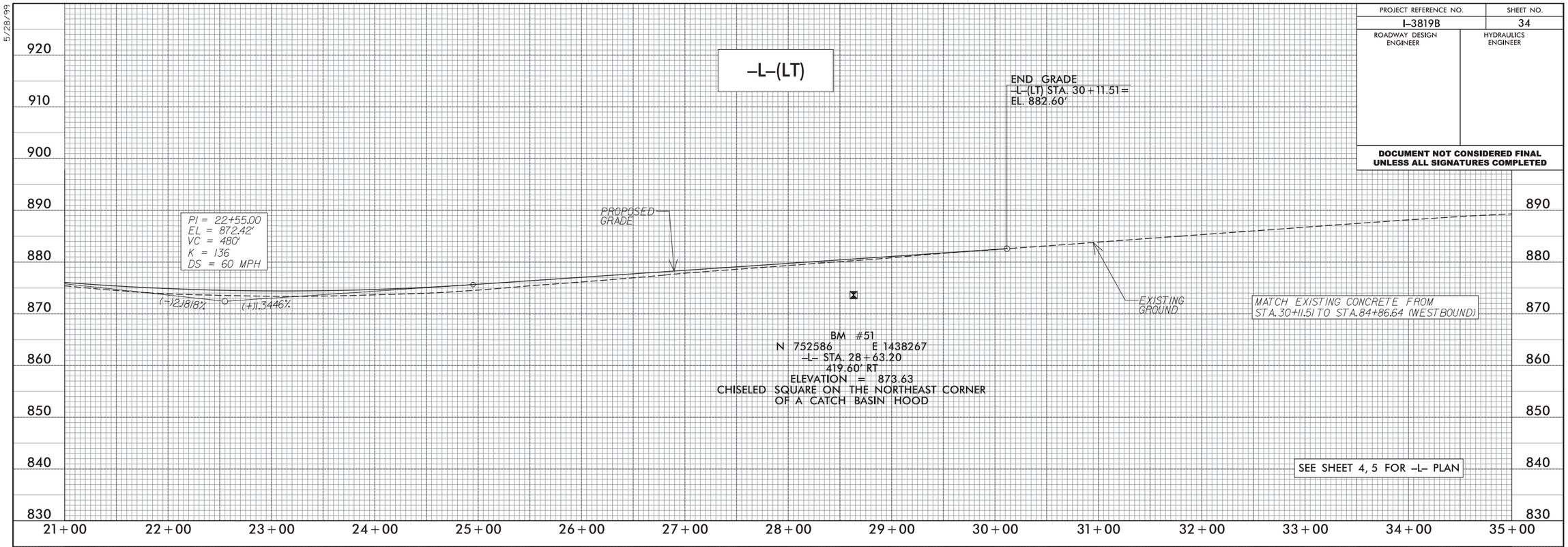
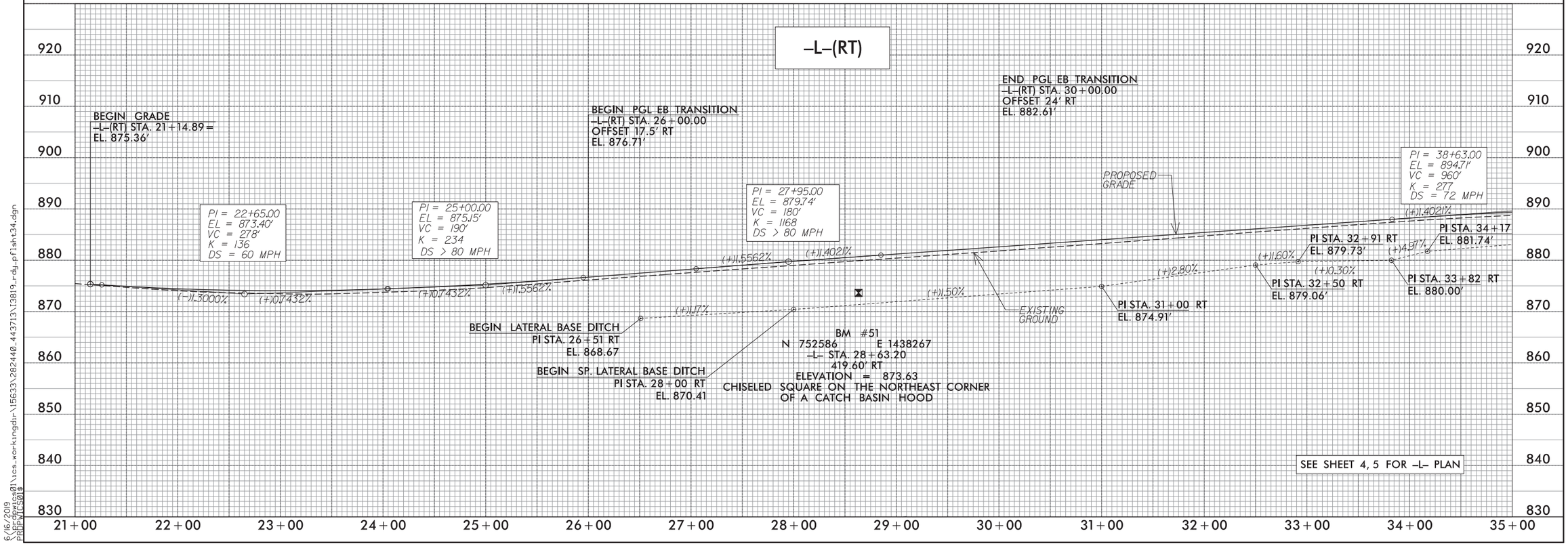
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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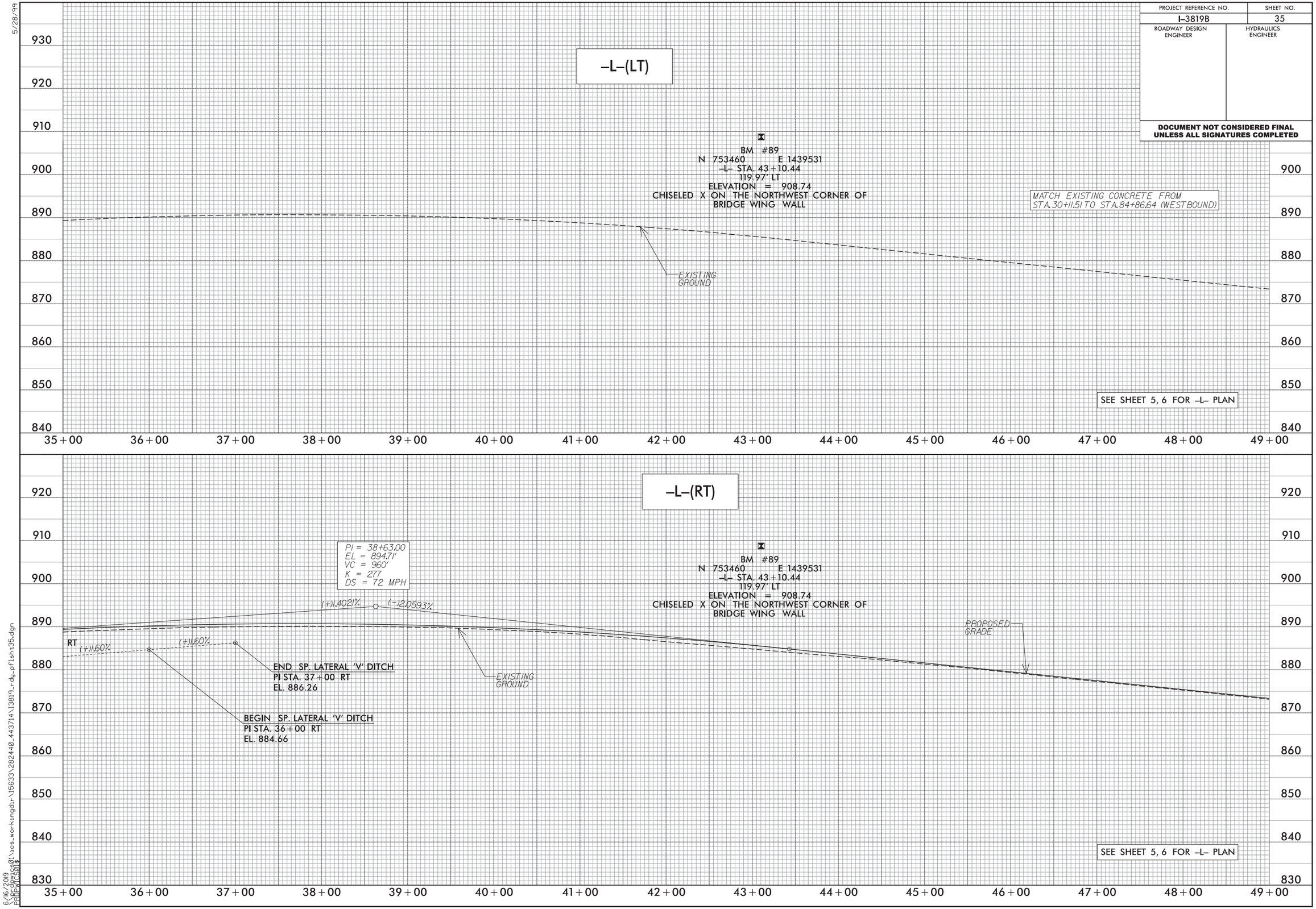
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	35
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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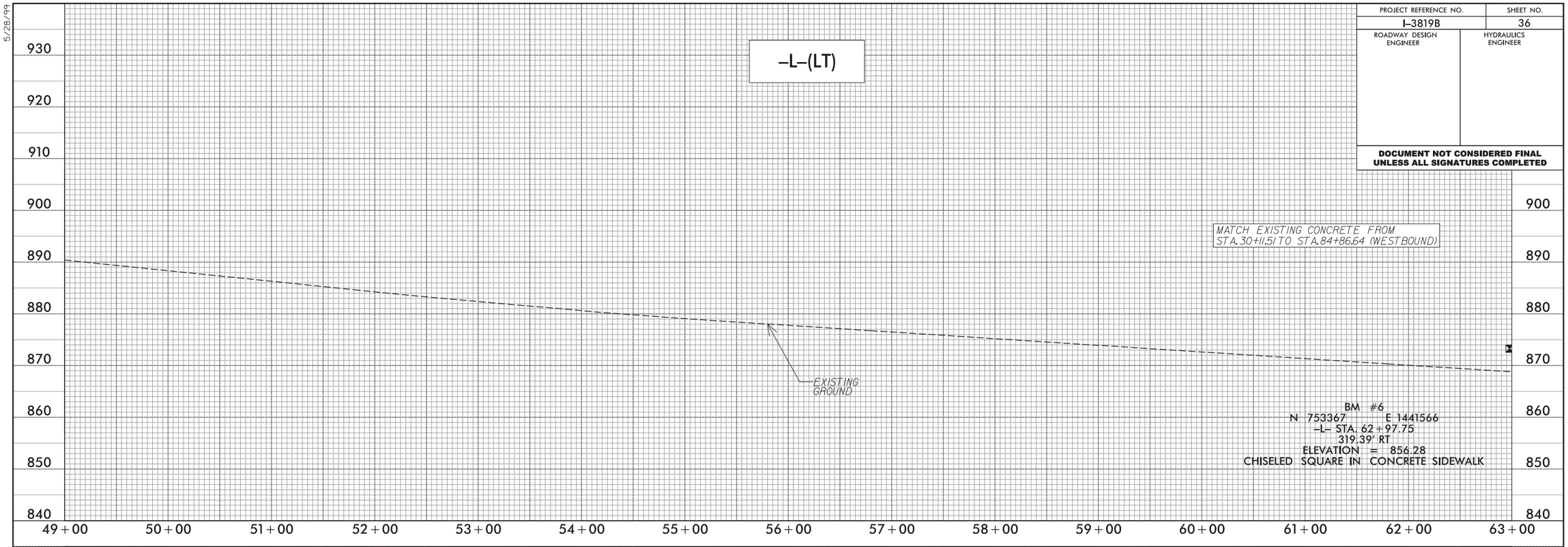
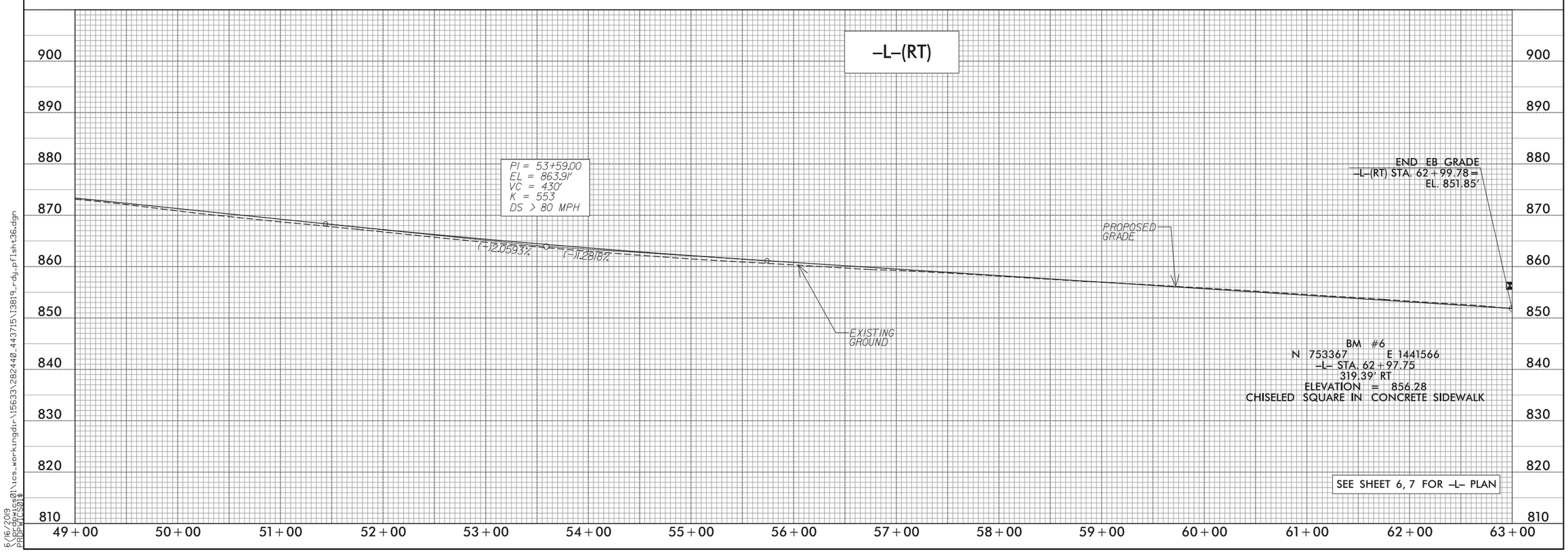
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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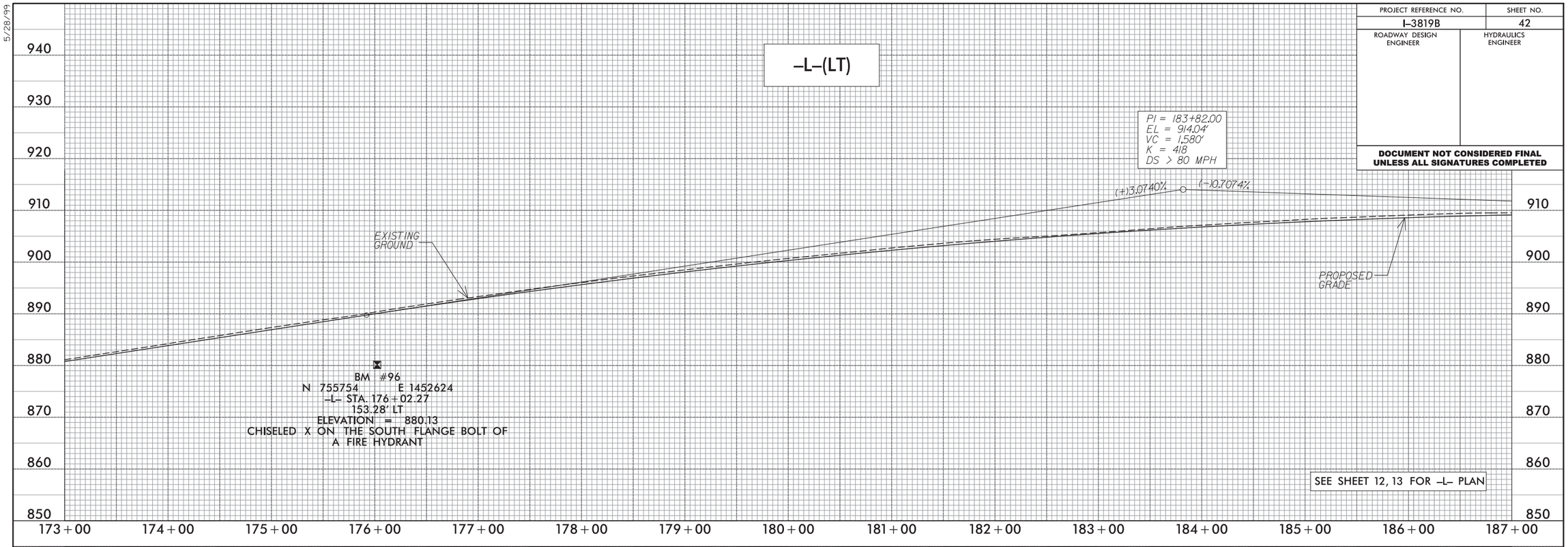
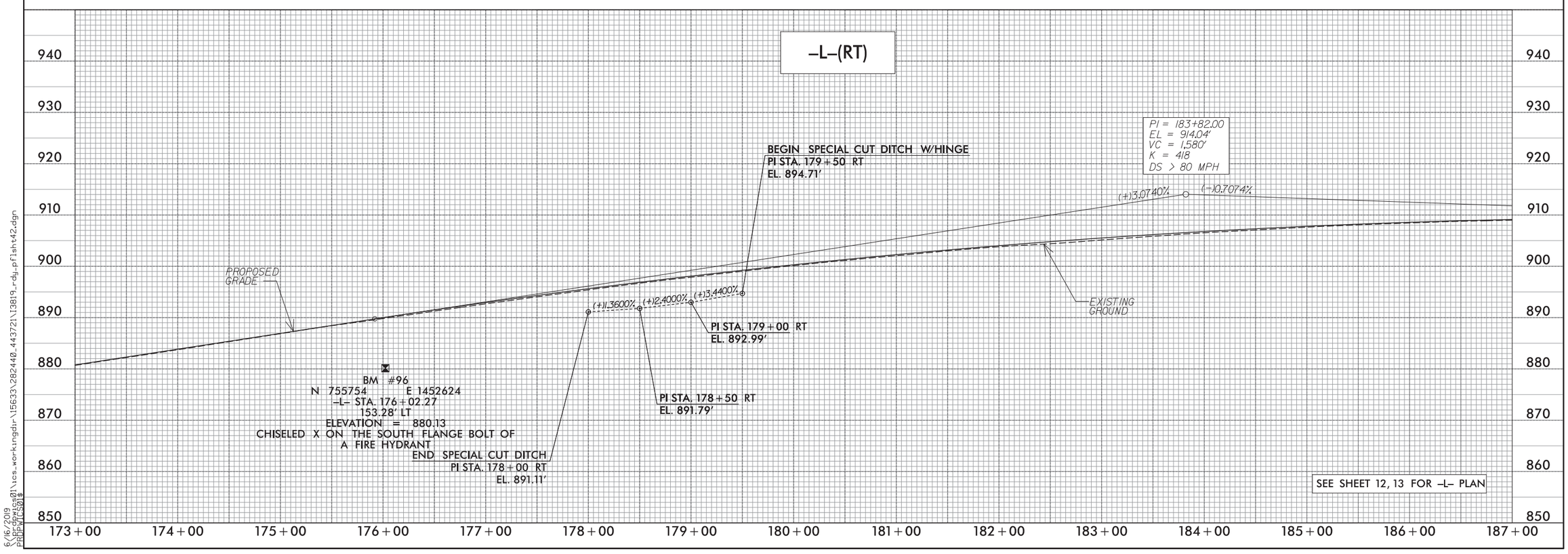
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	42
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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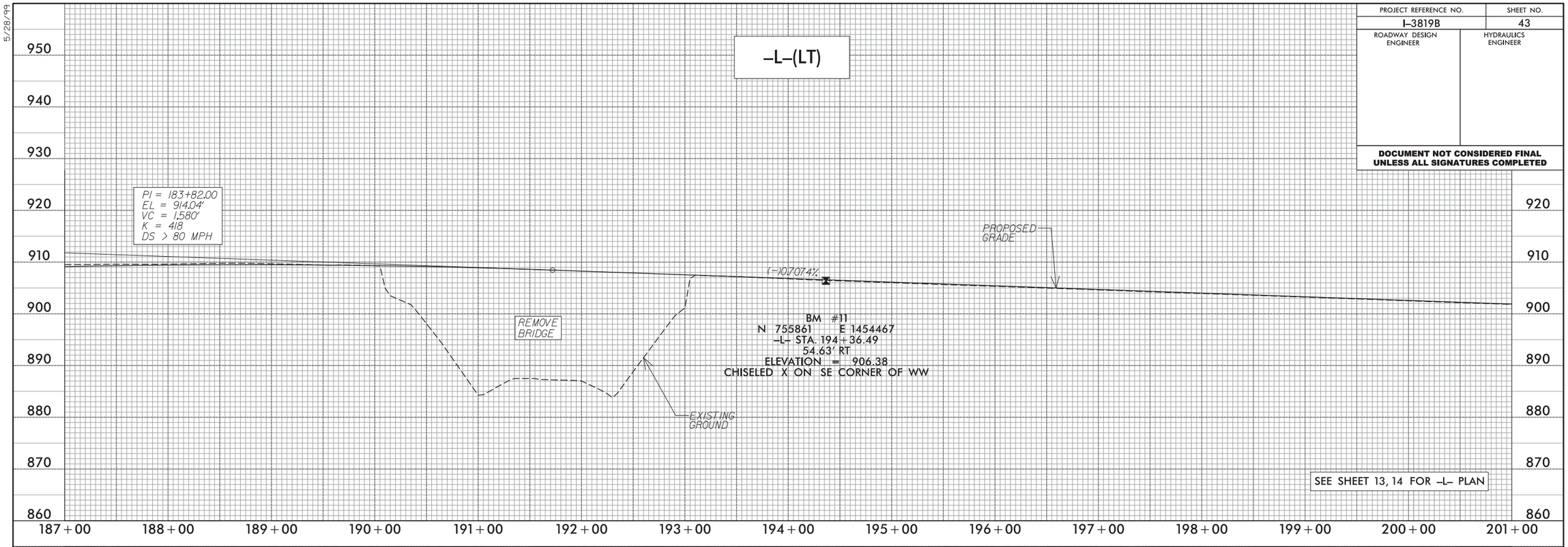
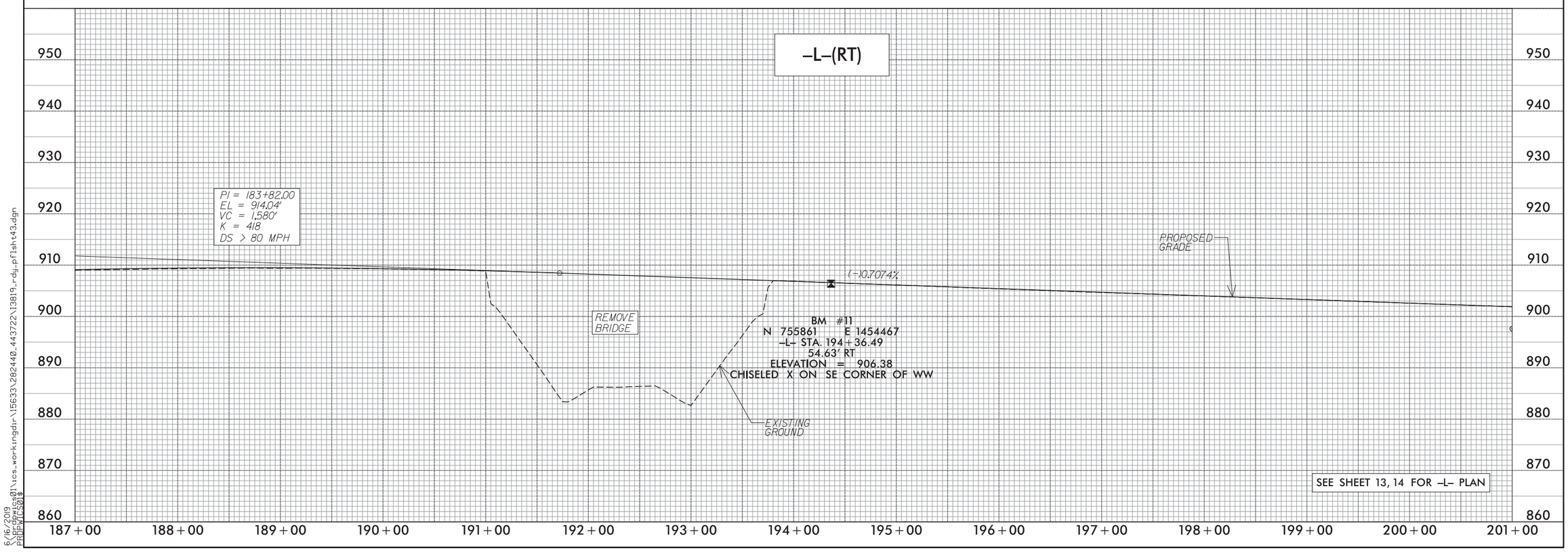
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	43
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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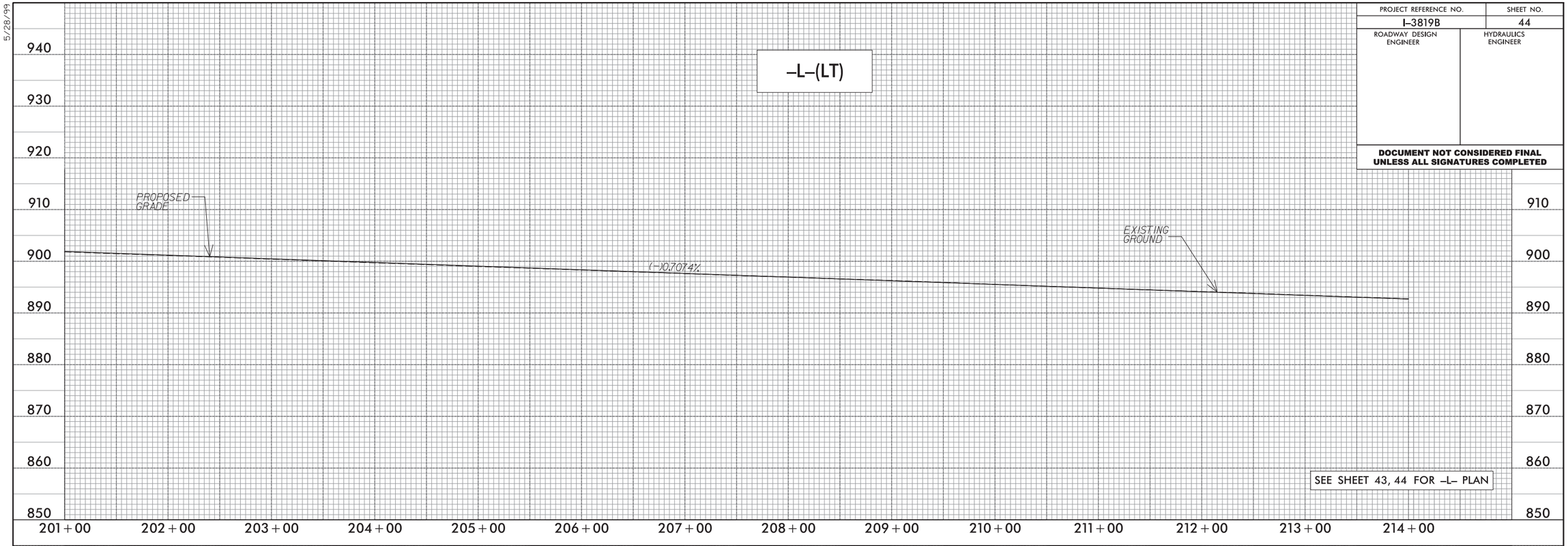
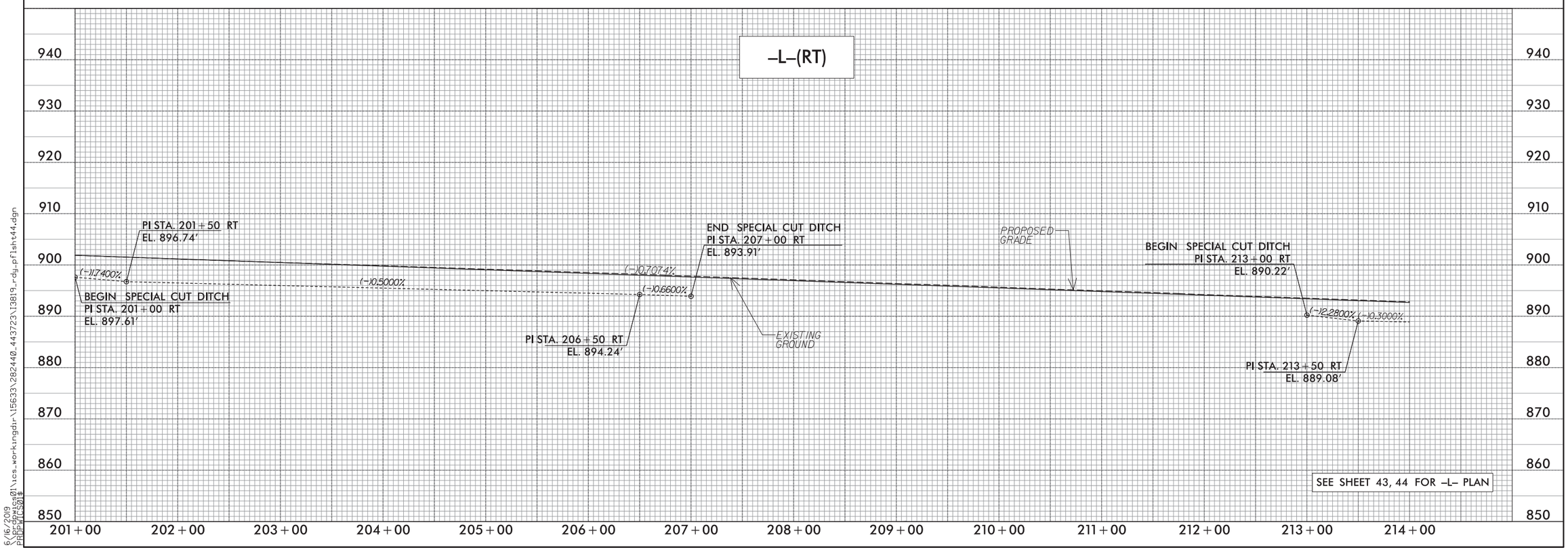
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	44
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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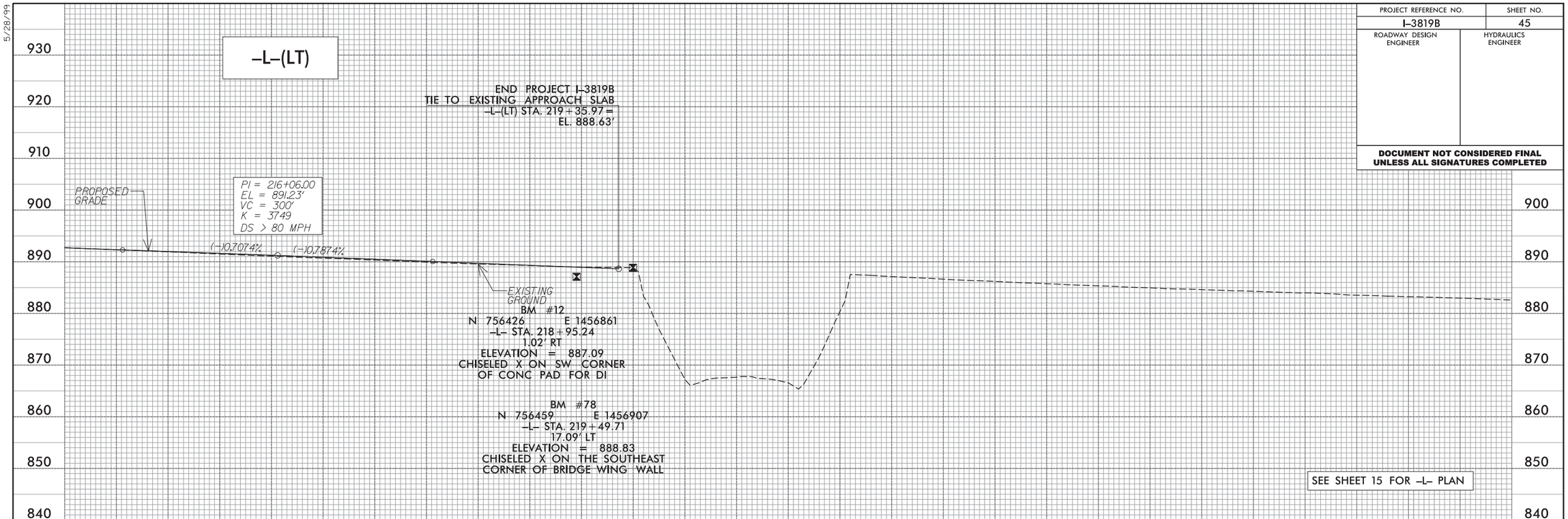
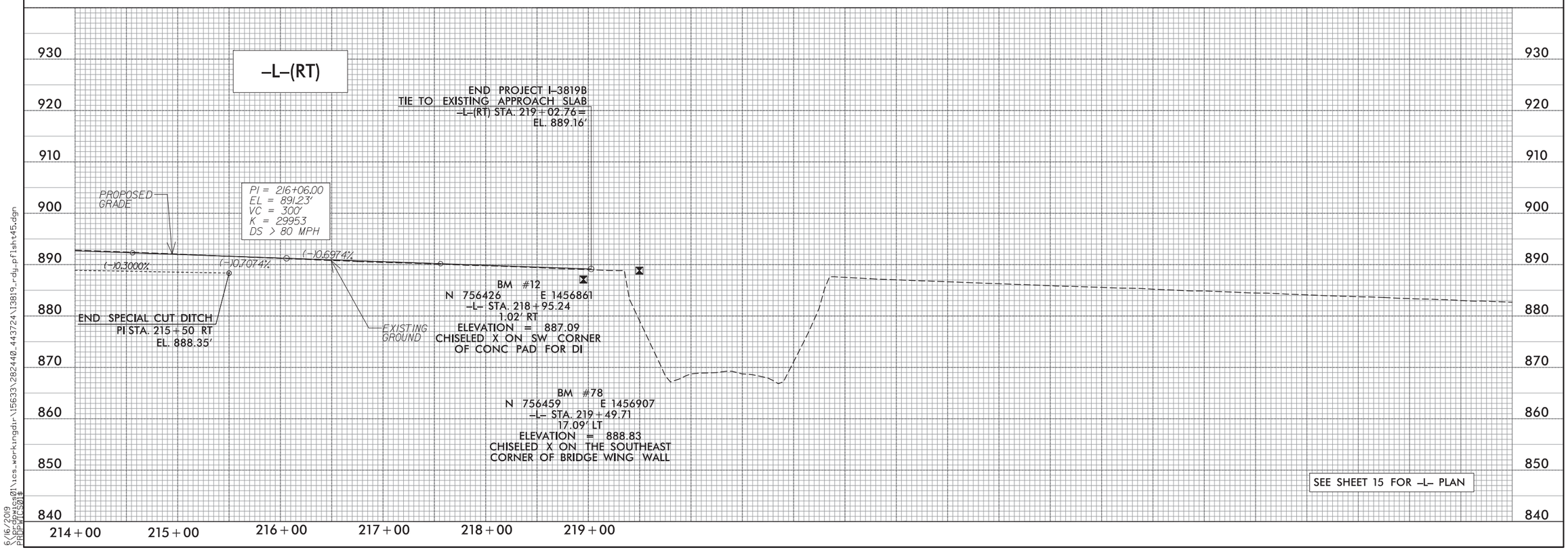
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	45
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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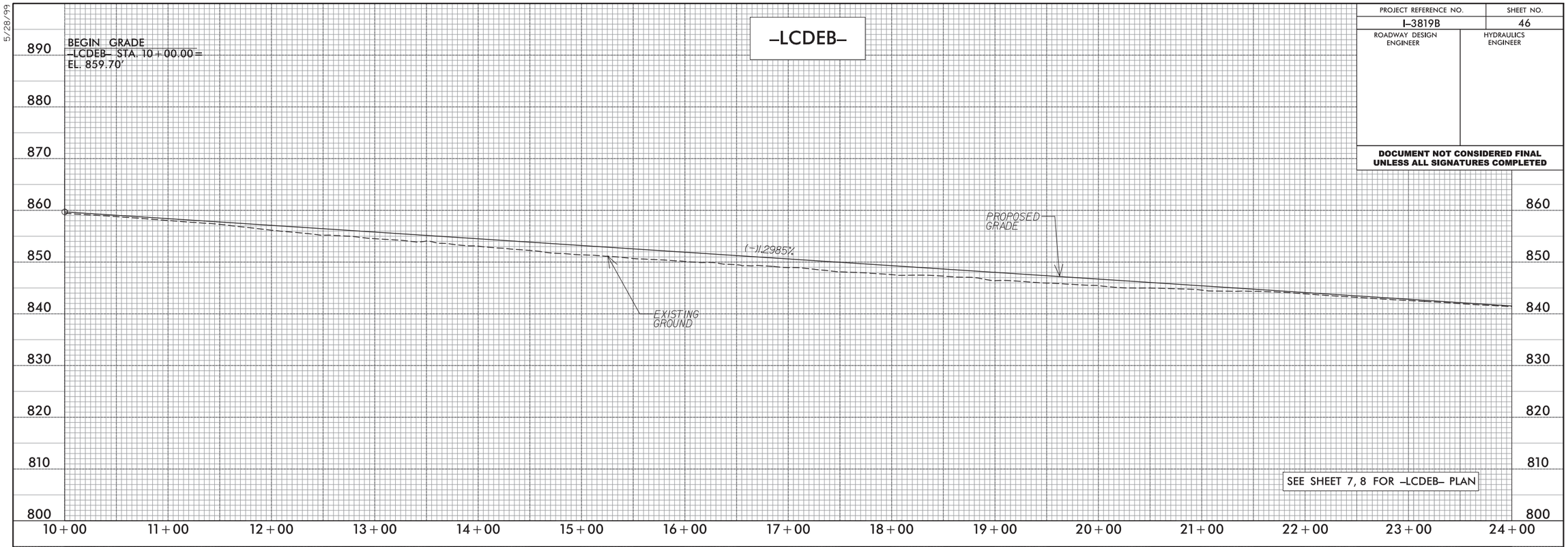
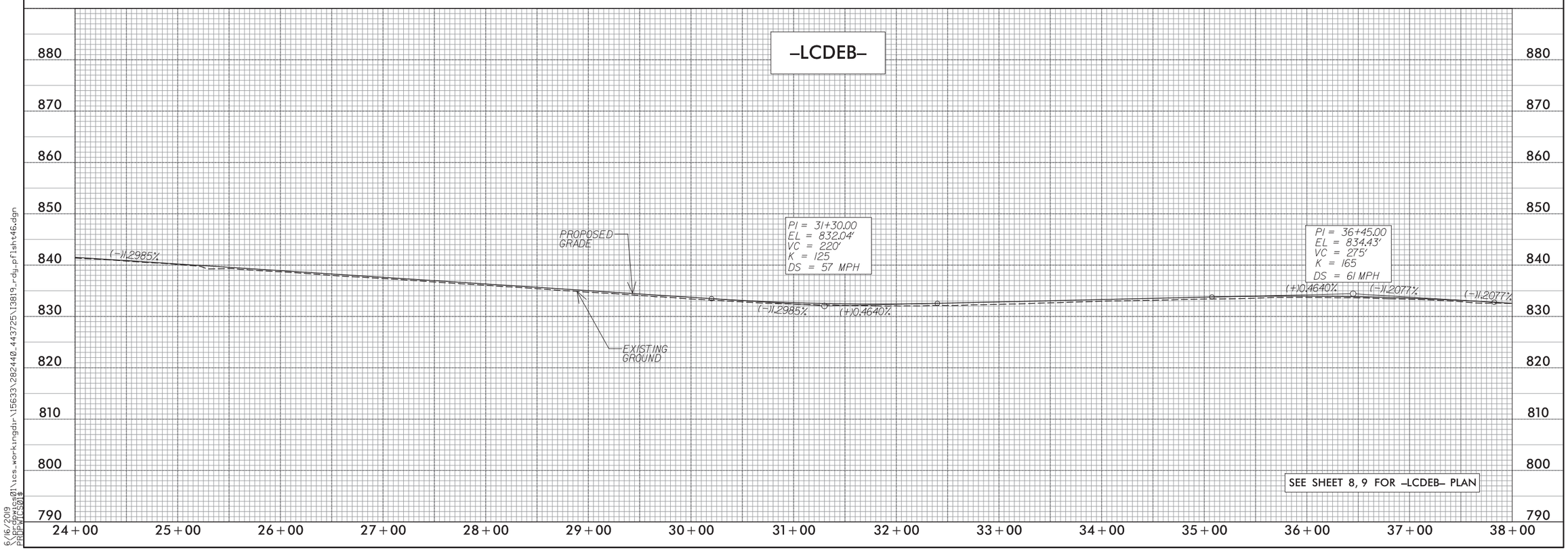
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	46
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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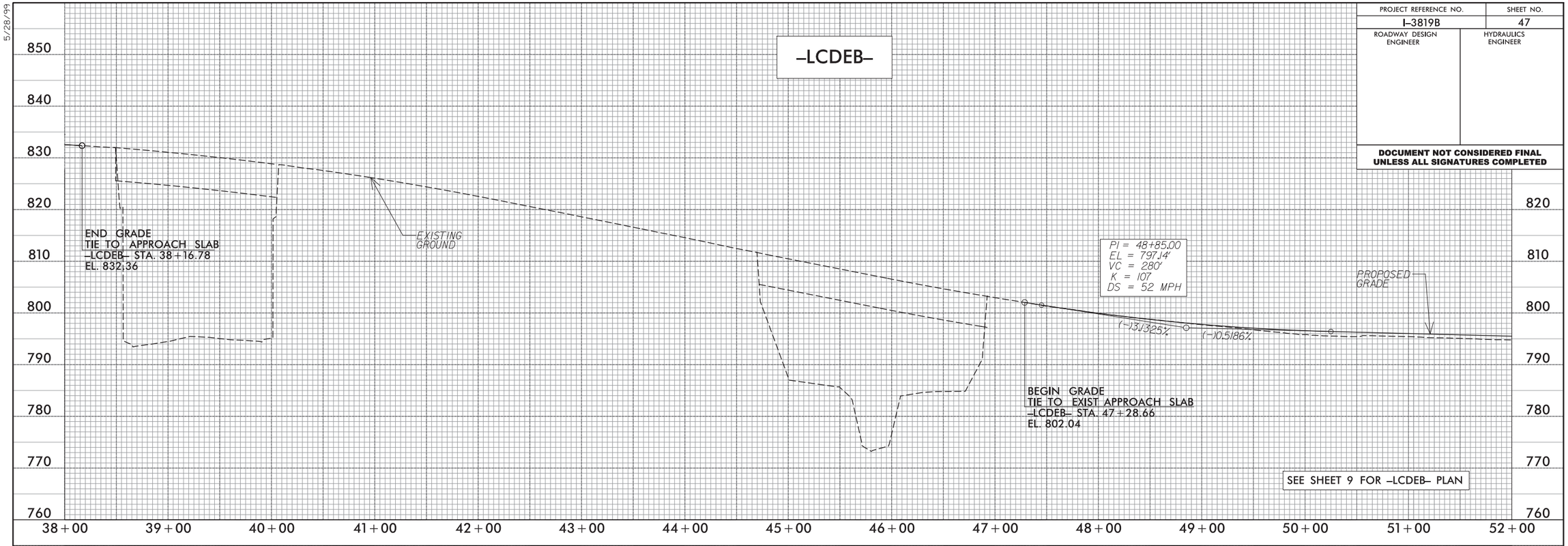
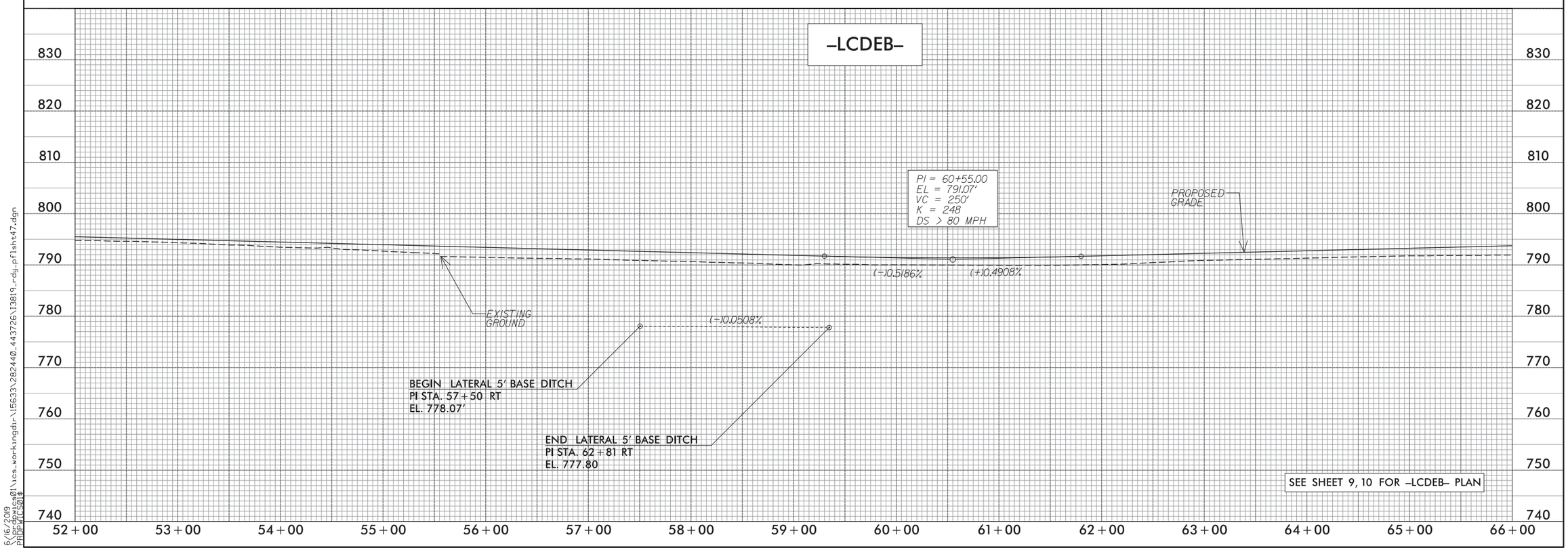
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	47
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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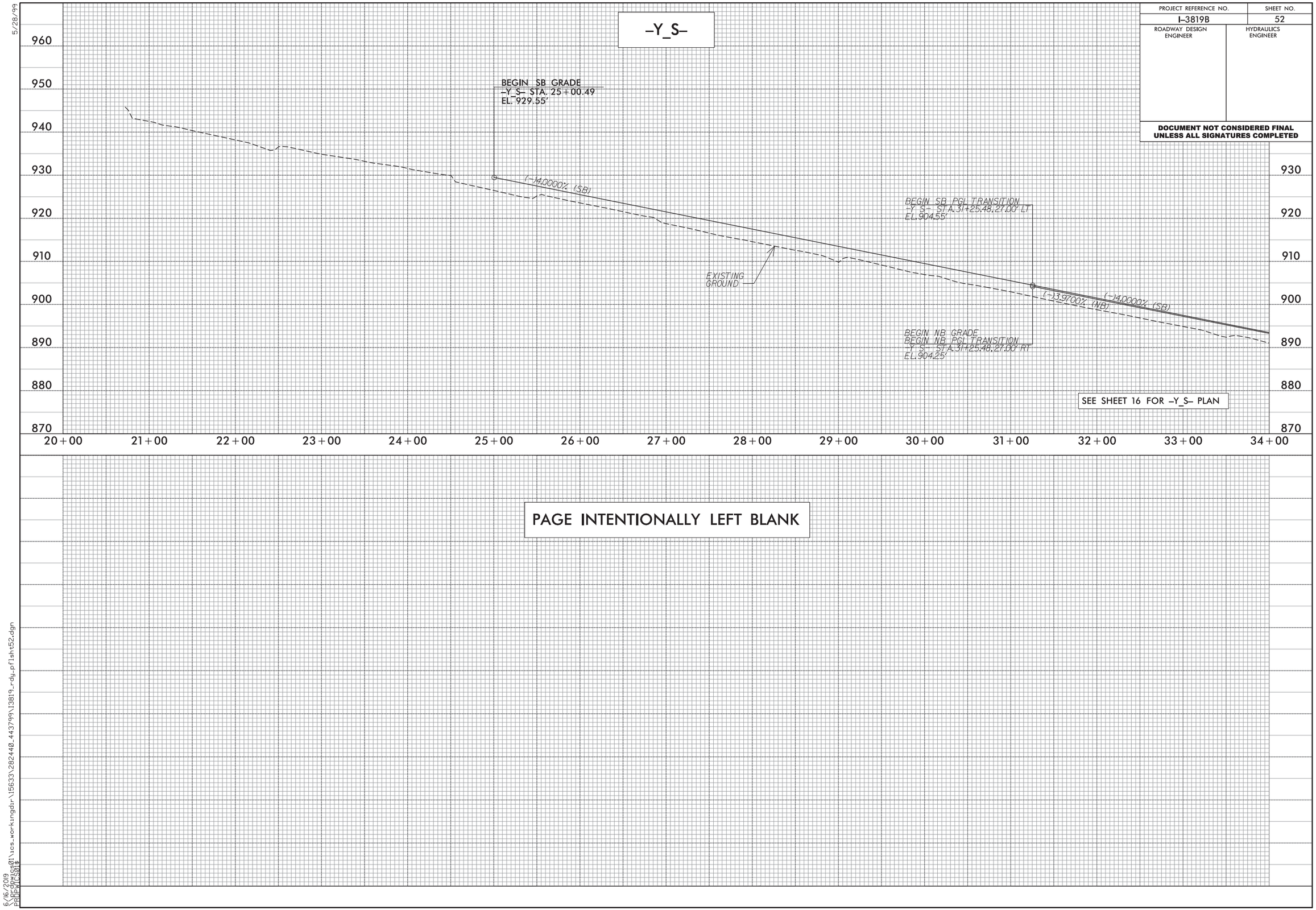

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	52
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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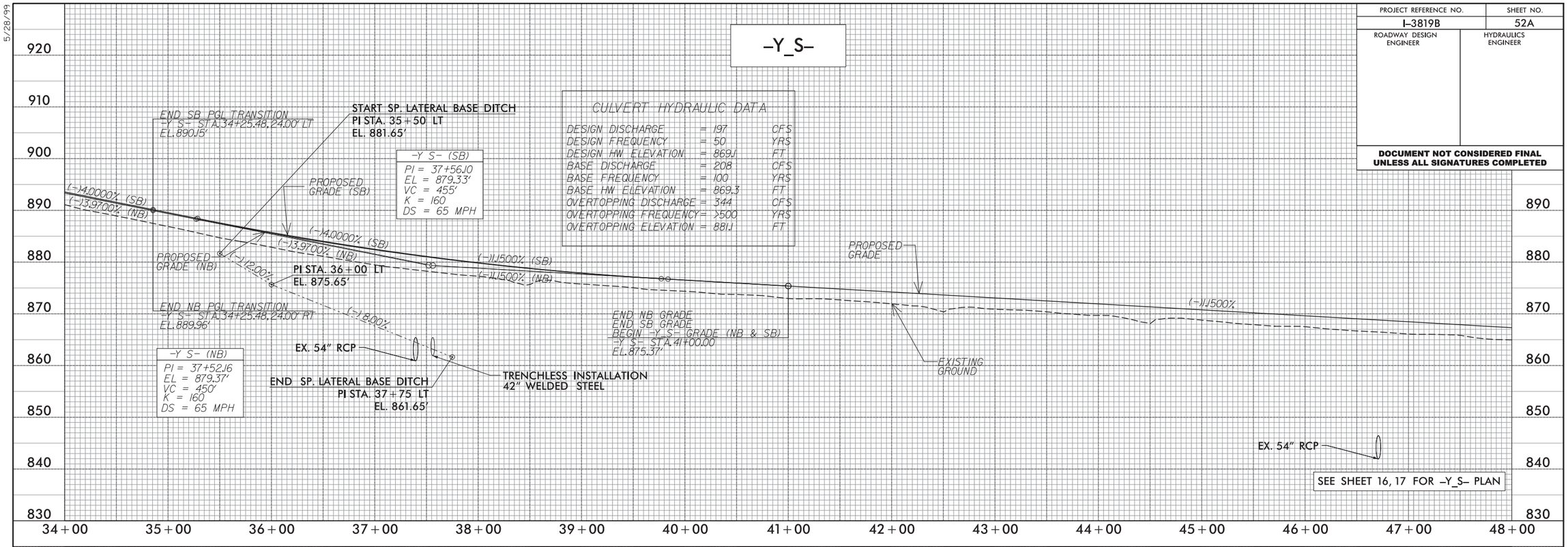
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	52A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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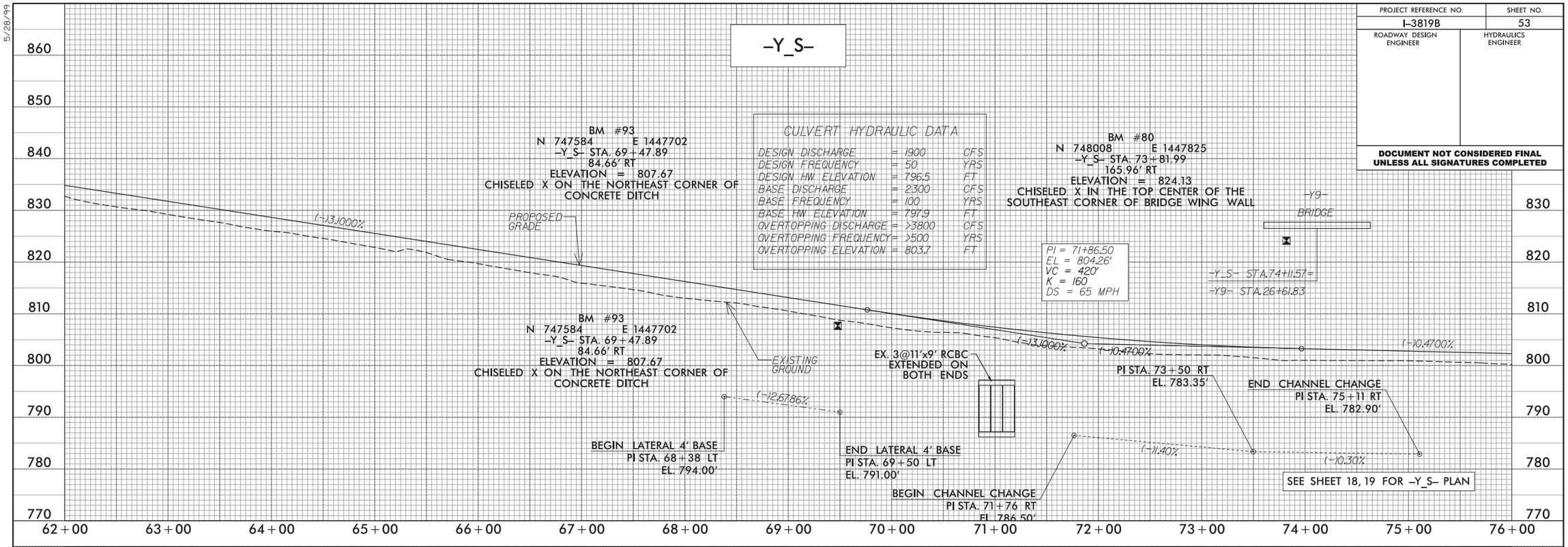
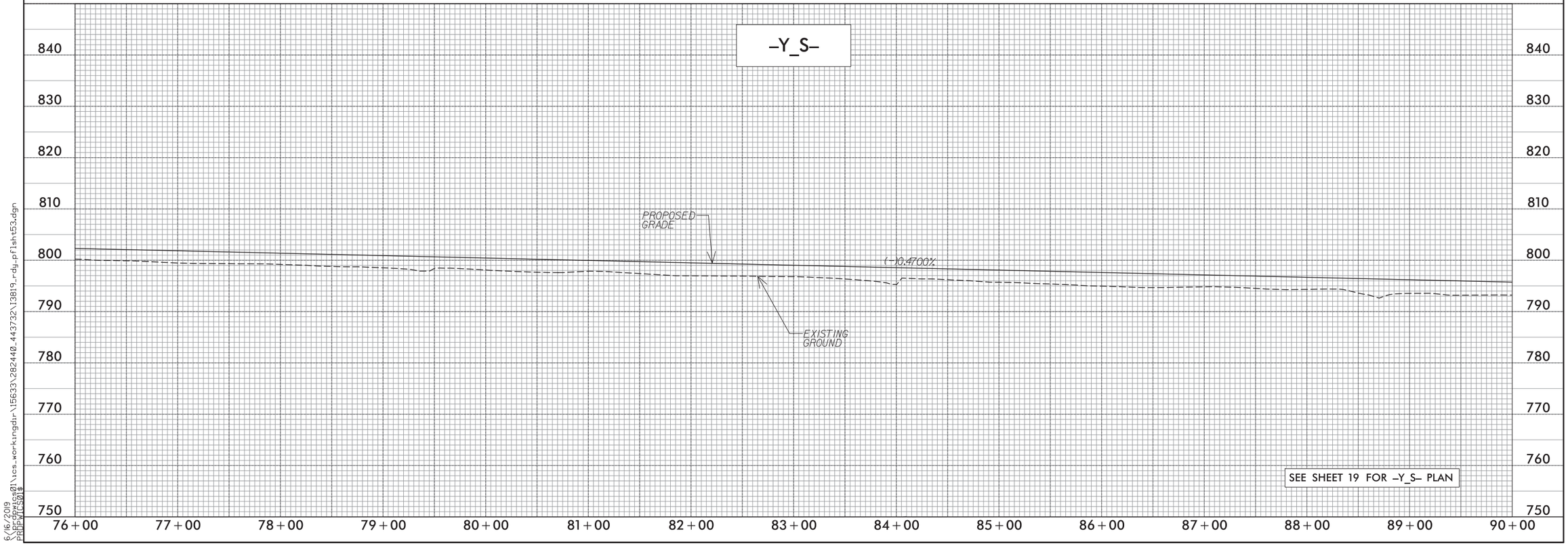
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	53
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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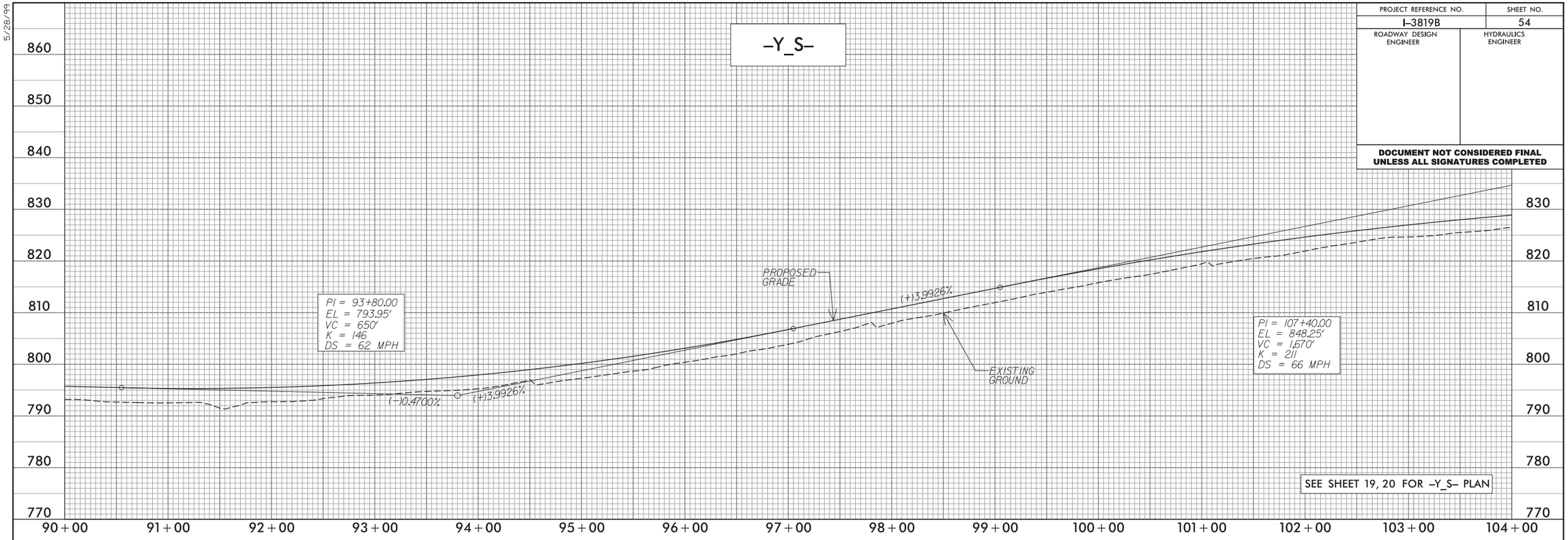
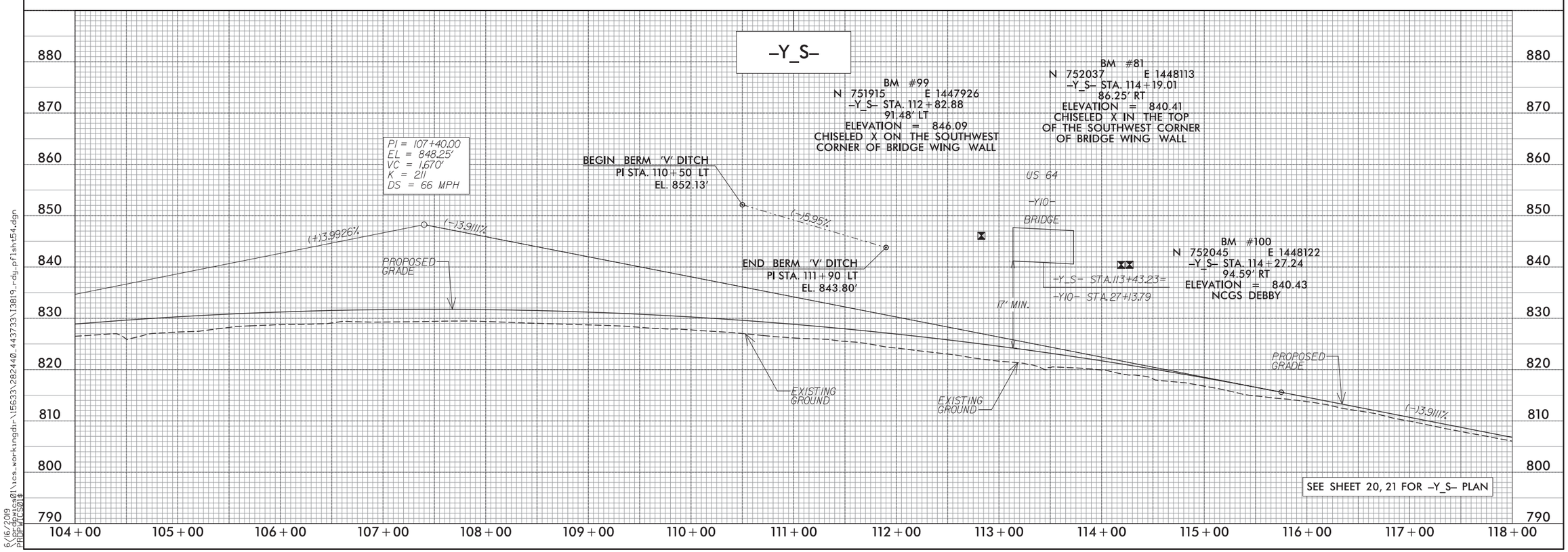
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	54
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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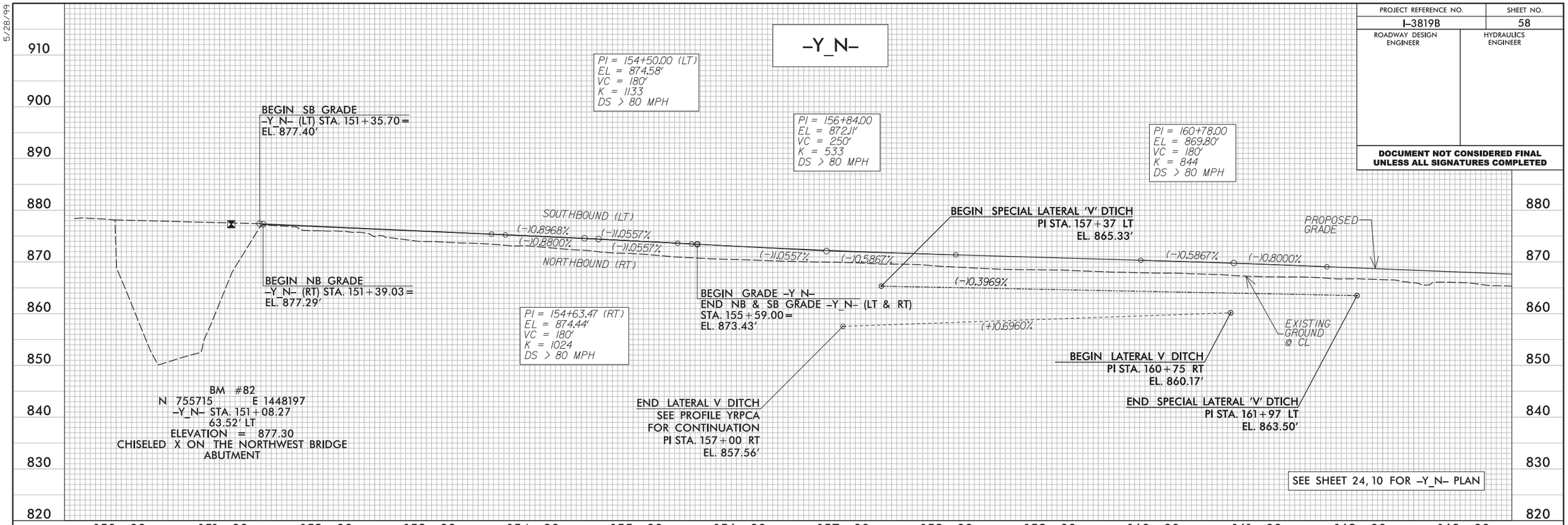
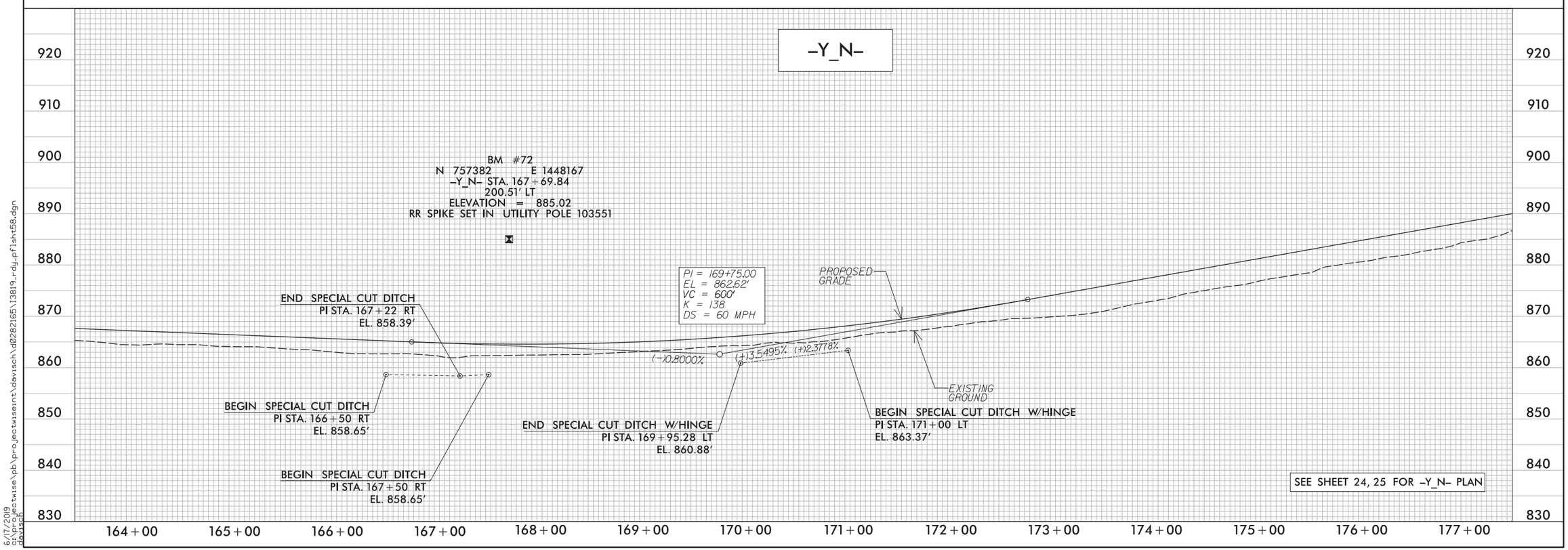
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	58
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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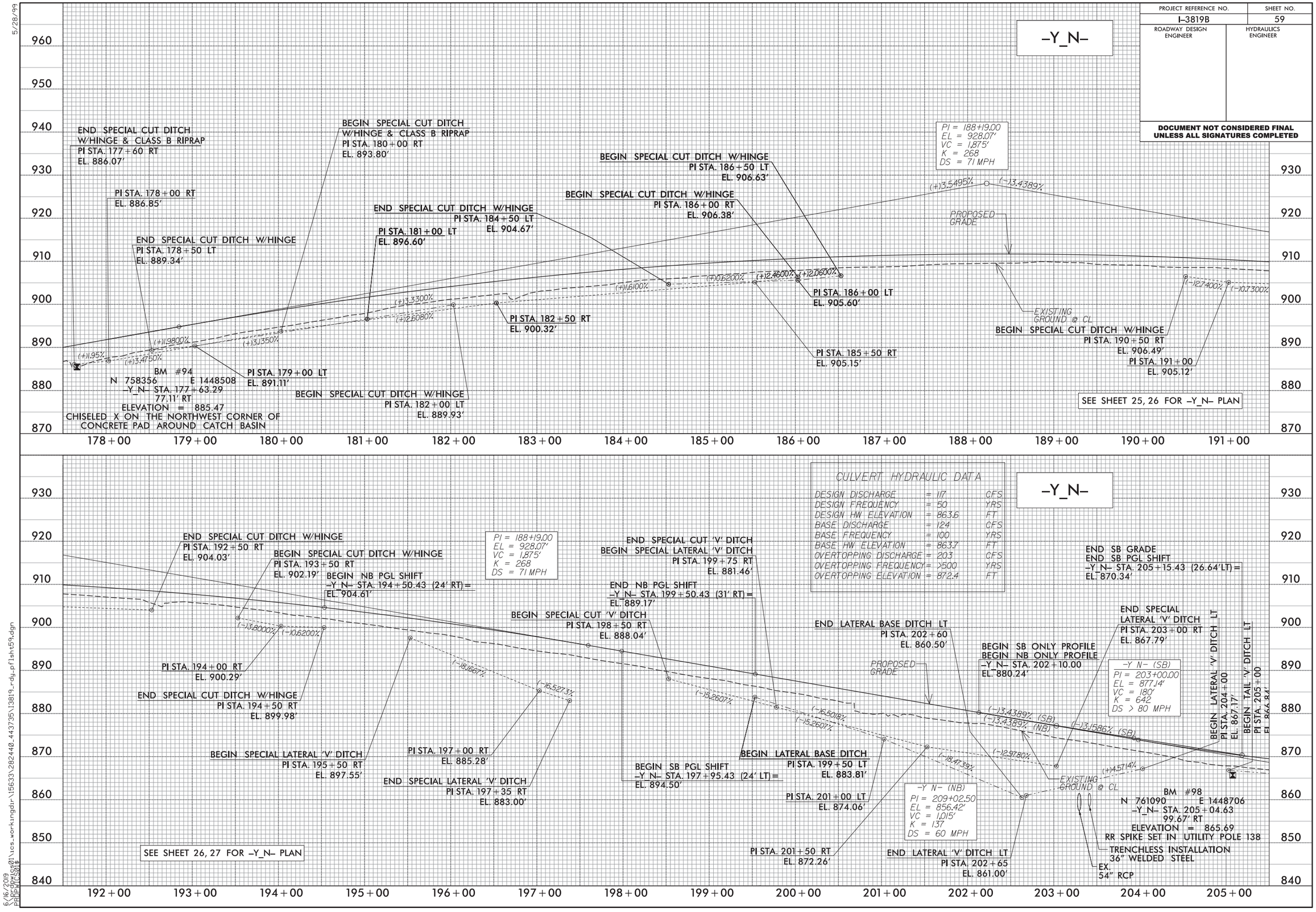
davisch

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	59
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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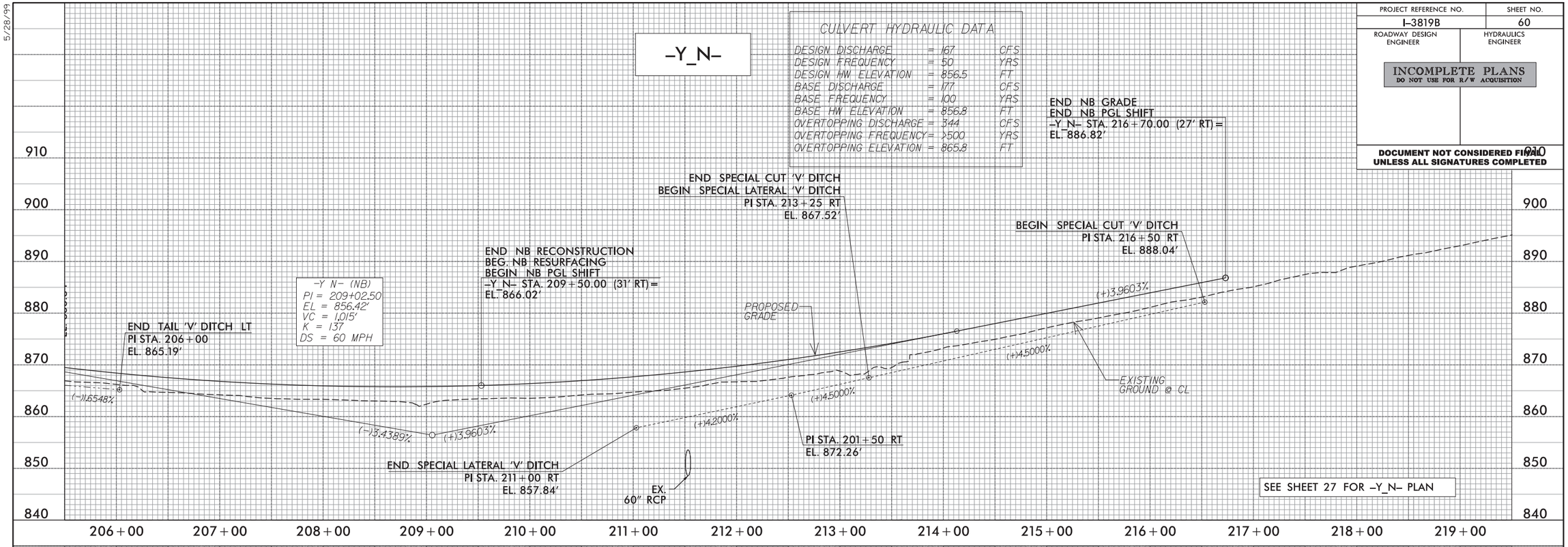

PROJECT REFERENCE NO.
I-3819B
SHEET NO.
60
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
-Y_N-
CULVERT HYDRAULIC DATA
DESIGN DISCHARGE = 167 CFS
DESIGN FREQUENCY = 50 YRS
DESIGN HW ELEVATION = 856.5 FT
BASE DISCHARGE = 177 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 856.8 FT
OVERTOPPING DISCHARGE = 344 CFS
OVERTOPPING FREQUENCY = >500 YRS
OVERTOPPING ELEVATION = 865.8 FT
END NB GRADE
END NB PGL SHIFT
-Y_N- STA. 216+70.00 (27' RT) =
EL. 886.82'
END SPECIAL CUT 'V' DITCH
BEGIN SPECIAL LATERAL 'V' DITCH
PI STA. 213+25 RT
EL. 867.52'
BEGIN SPECIAL CUT 'V' DITCH
PI STA. 216+50 RT
EL. 888.04'
END NB RECONSTRUCTION
BEG. NB RESURFACING
BEGIN NB PGL SHIFT
-Y_N- STA. 209+50.00 (31' RT) =
EL. 866.02'
-Y N- (NB)
PI = 209+02.50
EL = 856.42'
VC = 1,015'
K = 137
DS = 60 MPH
PROPOSED GRADE
END TAIL 'V' DITCH LT
PI STA. 206+00
EL. 865.19'
(-)1.6548%
(-)3.4389%
(+)3.9603%
(+)4.2000%
(+)4.5000%
(+)4.5000%
(+)3.9603%
EXISTING GROUND @ CL
PI STA. 201+50 RT
EL. 872.26'
END SPECIAL LATERAL 'V' DITCH
PI STA. 211+00 RT
EL. 857.84'
EX. 60" RCP
SEE SHEET 27 FOR -Y_N- PLAN
910
900
890
880
870
860
850
840
206+00
207+00
208+00
209+00
210+00
211+00
212+00
213+00
214+00
215+00
216+00
217+00
218+00
219+00
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6/16/2019
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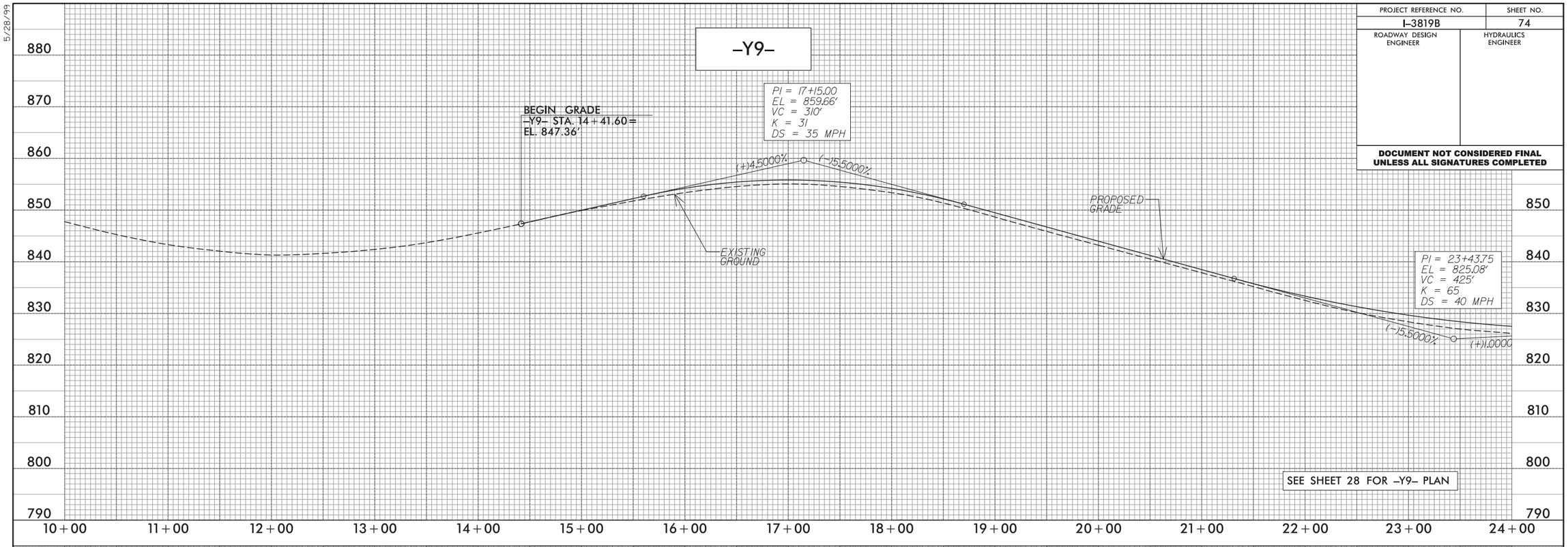
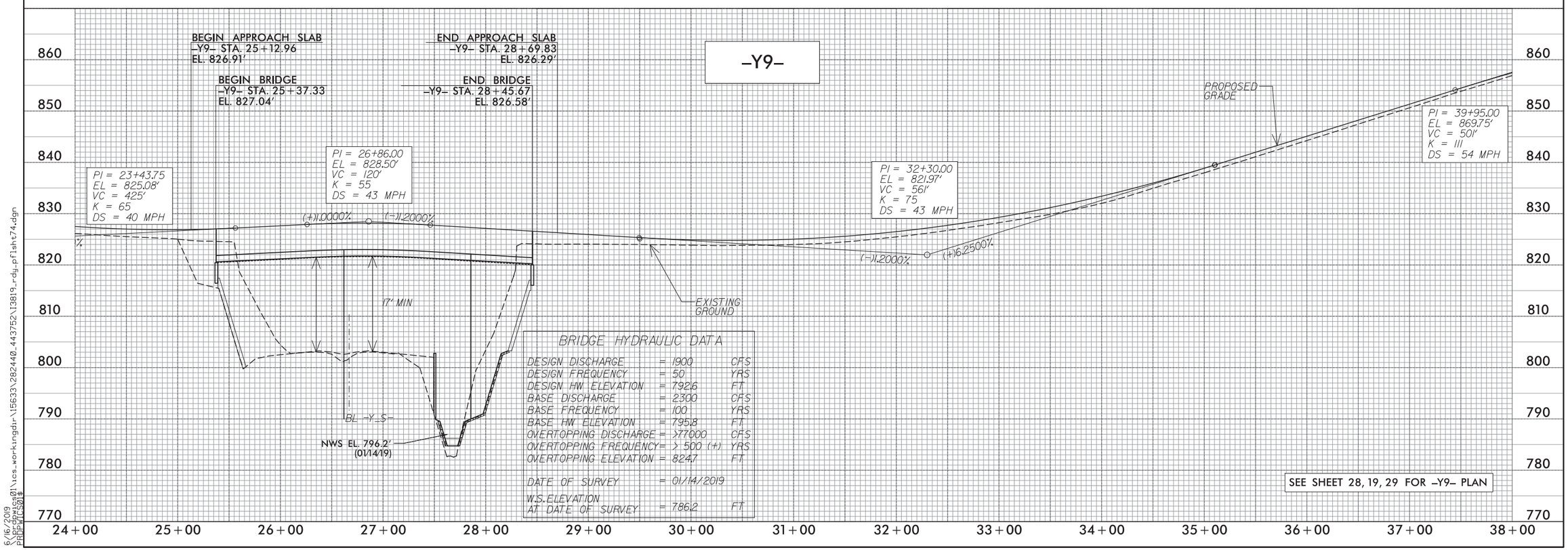
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	74
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1900	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 792.6	FT
BASE DISCHARGE	= 2300	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 795.8	FT
OVERTOPPING DISCHARGE	= >77000	CFS
OVERTOPPING FREQUENCY	= > 500 (+)	YRS
OVERTOPPING ELEVATION	= 824.7	FT
DATE OF SURVEY	= 01/14/2019	
W.S. ELEVATION AT DATE OF SURVEY	= 786.2	FT

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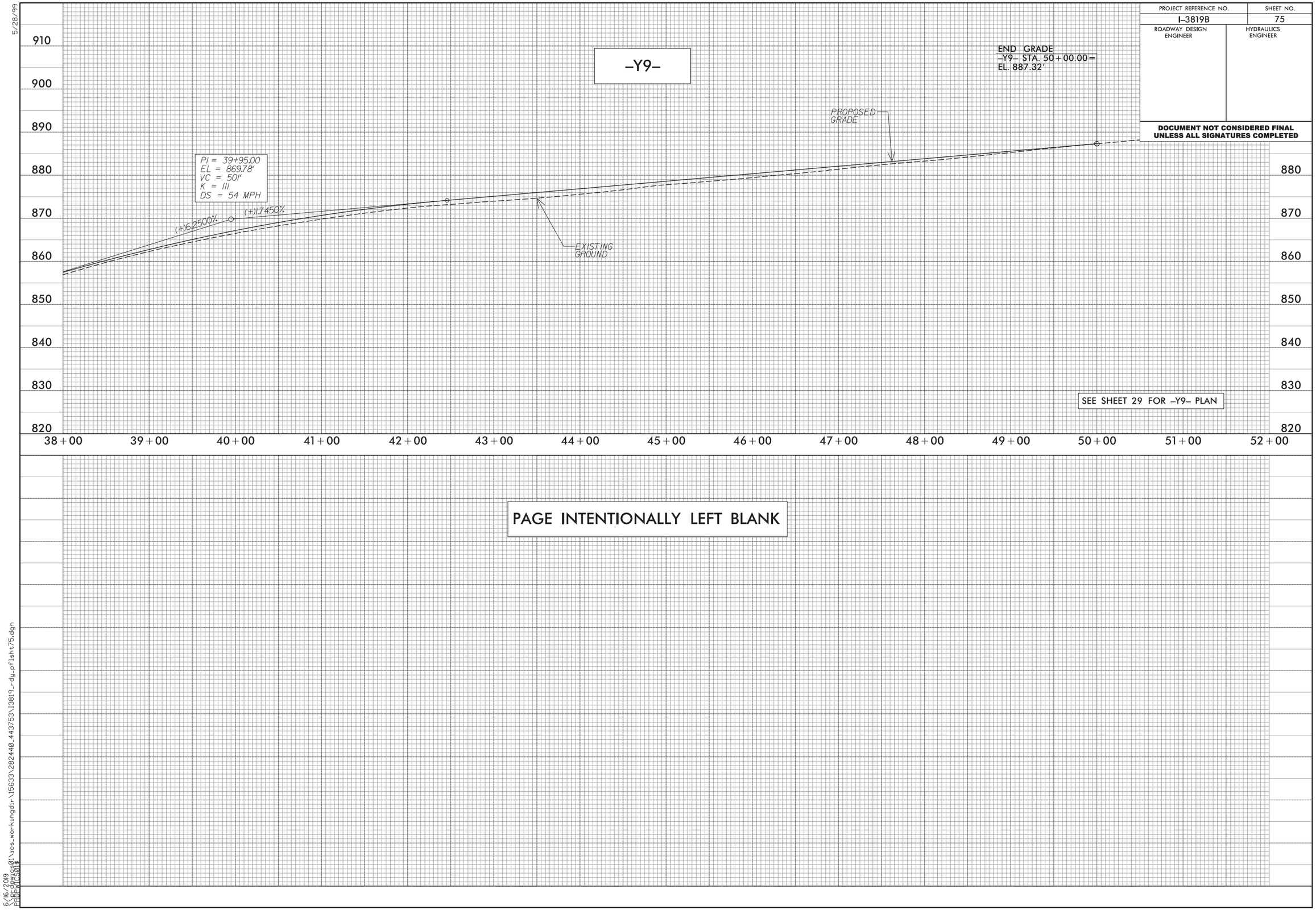

PROJECT REFERENCE NO.
I-3819B
SHEET NO.
75
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
-Y9-
END GRADE
-Y9- STA. 50+00.00=
EL. 887.32'
PROPOSED GRADE
PI = 39+95.00
EL = 869.78'
VC = 501'
K = 111
DS = 54 MPH
(+)6.2500%
(+)1.7450%
EXISTING GROUND
SEE SHEET 29 FOR -Y9- PLAN
910
900
890
880
870
860
850
840
830
820
38+00
39+00
40+00
41+00
42+00
43+00
44+00
45+00
46+00
47+00
48+00
49+00
50+00
51+00
52+00
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6/16/2019
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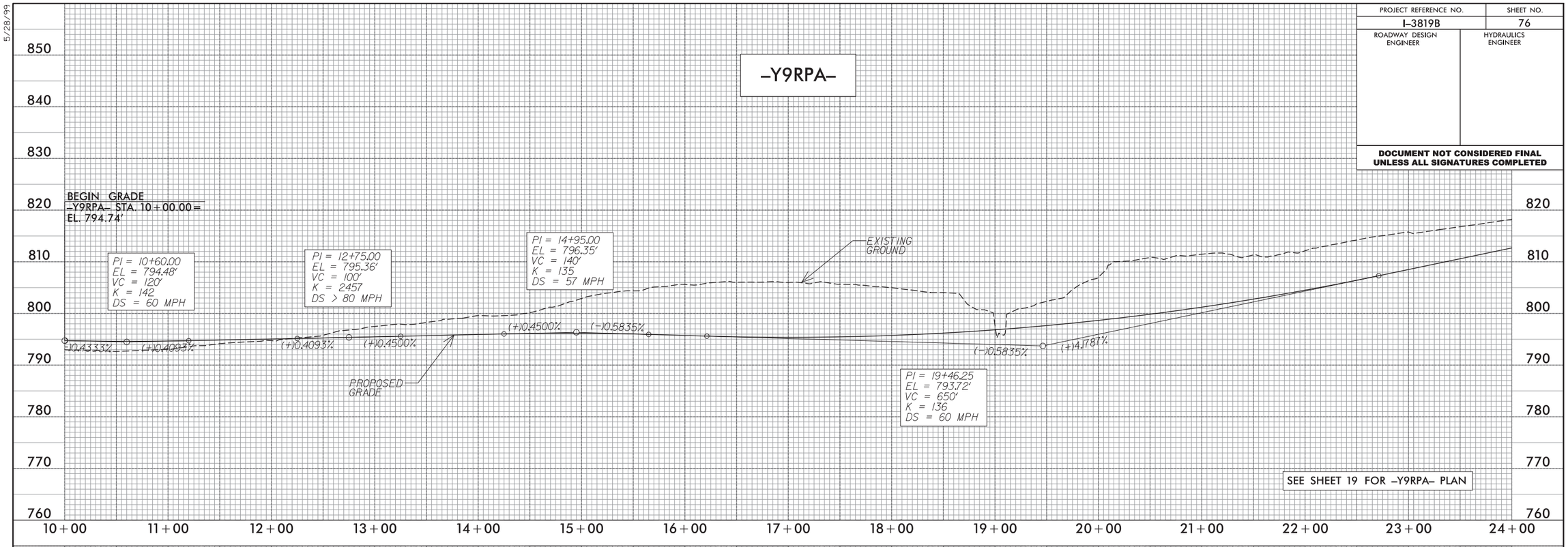
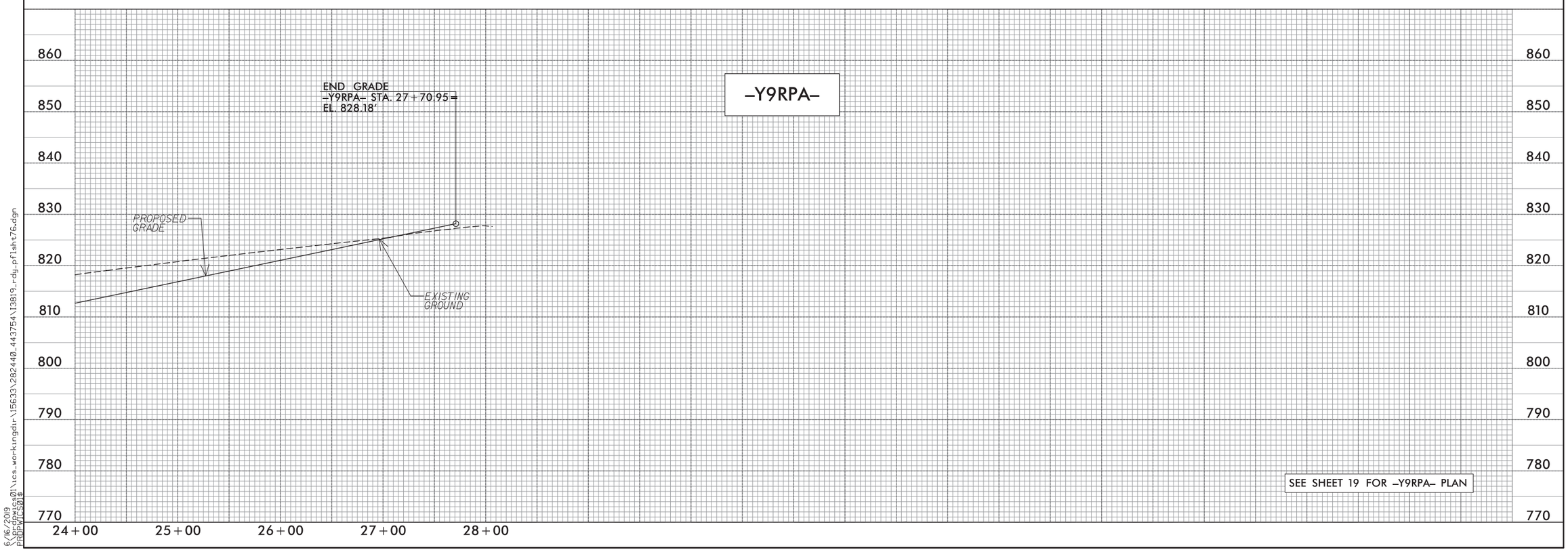
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	76
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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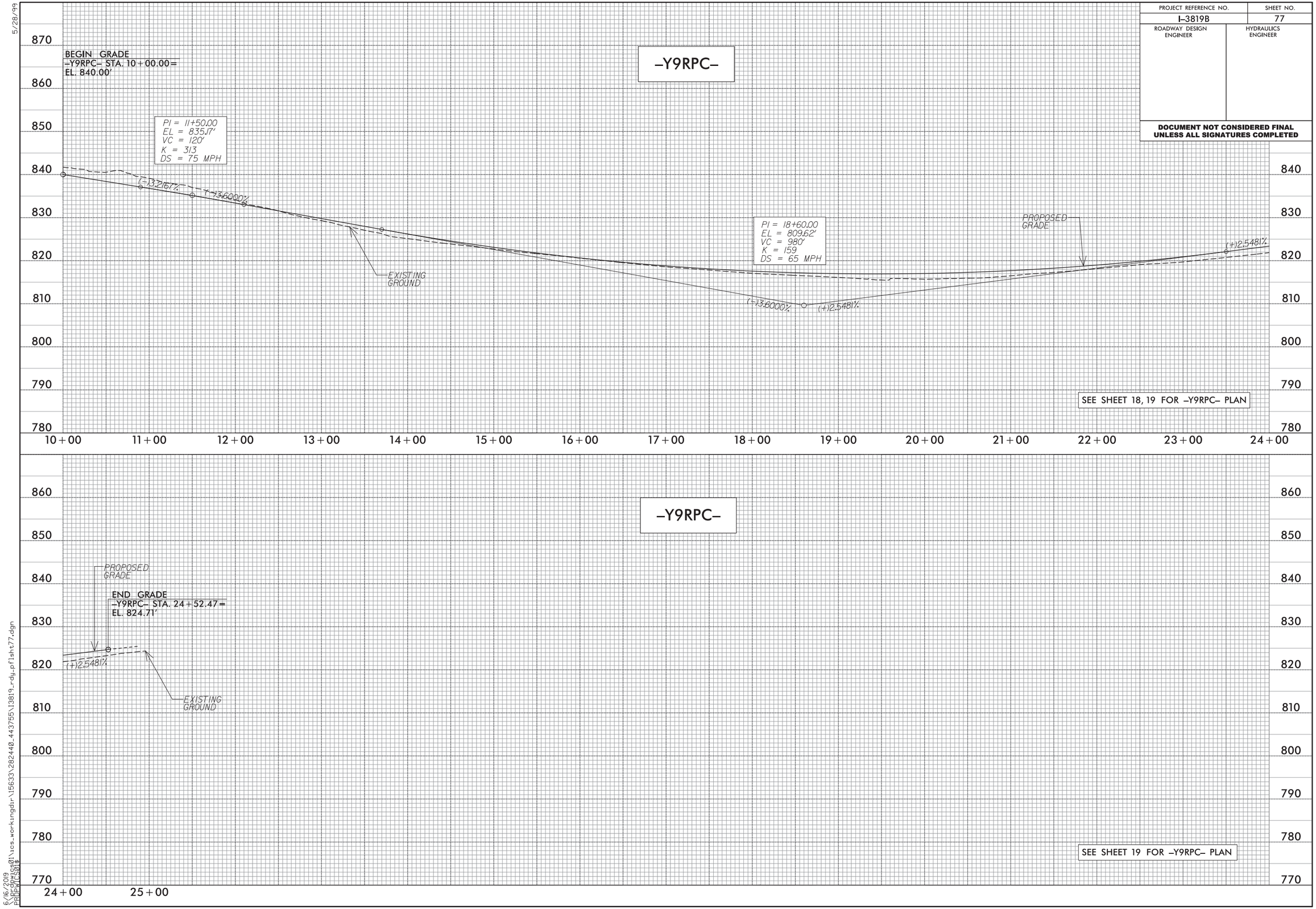
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	77
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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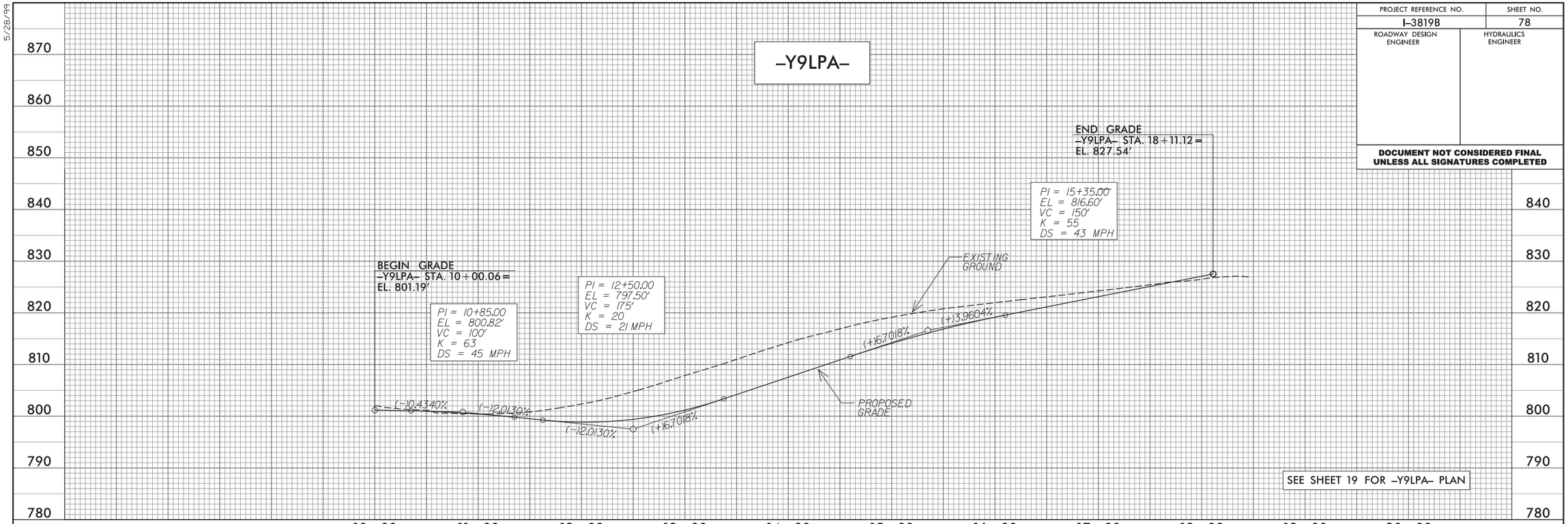
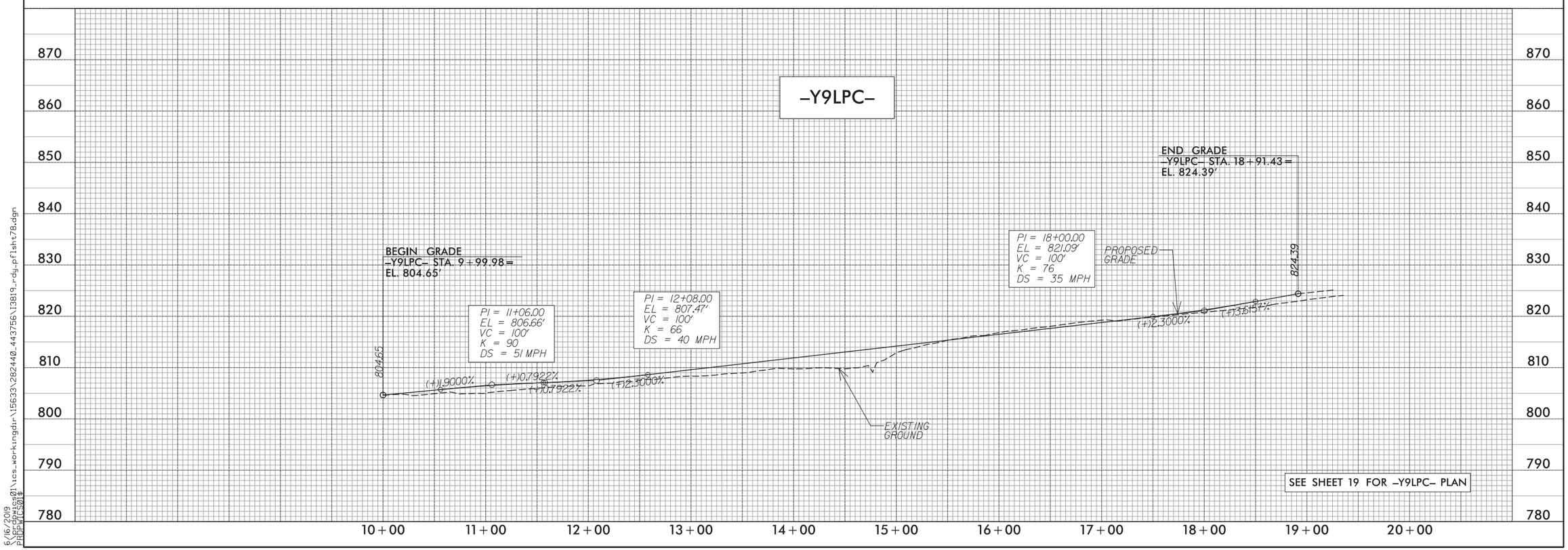
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	78
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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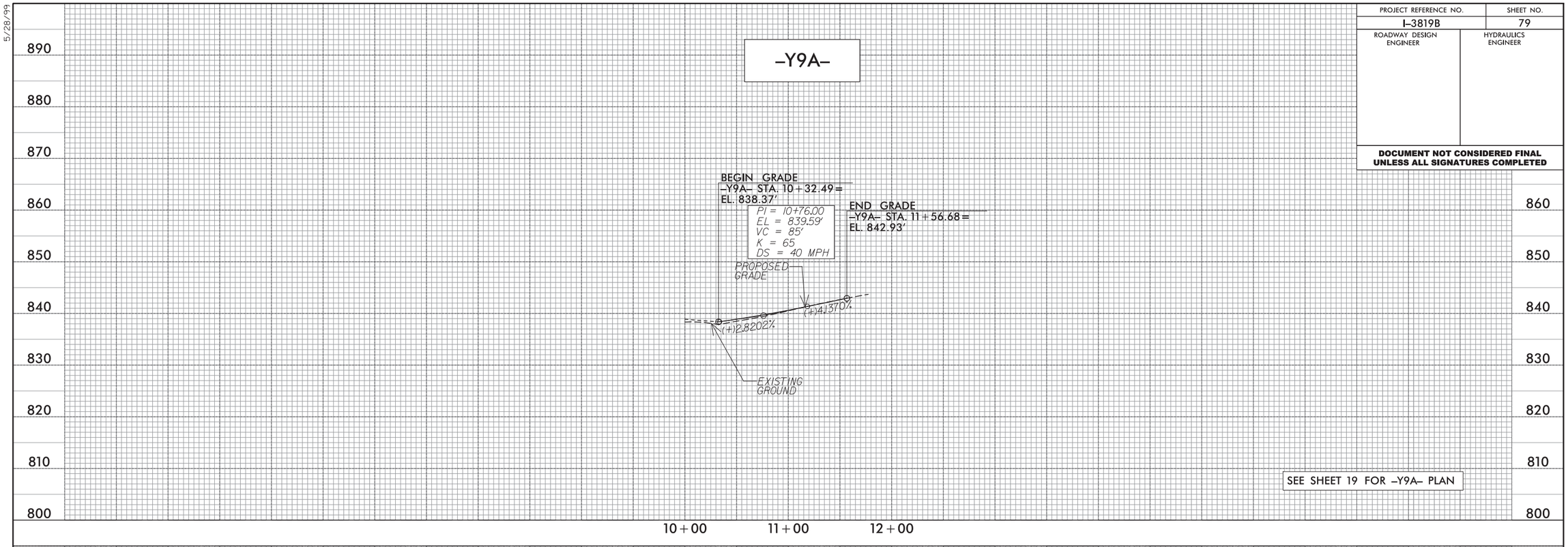
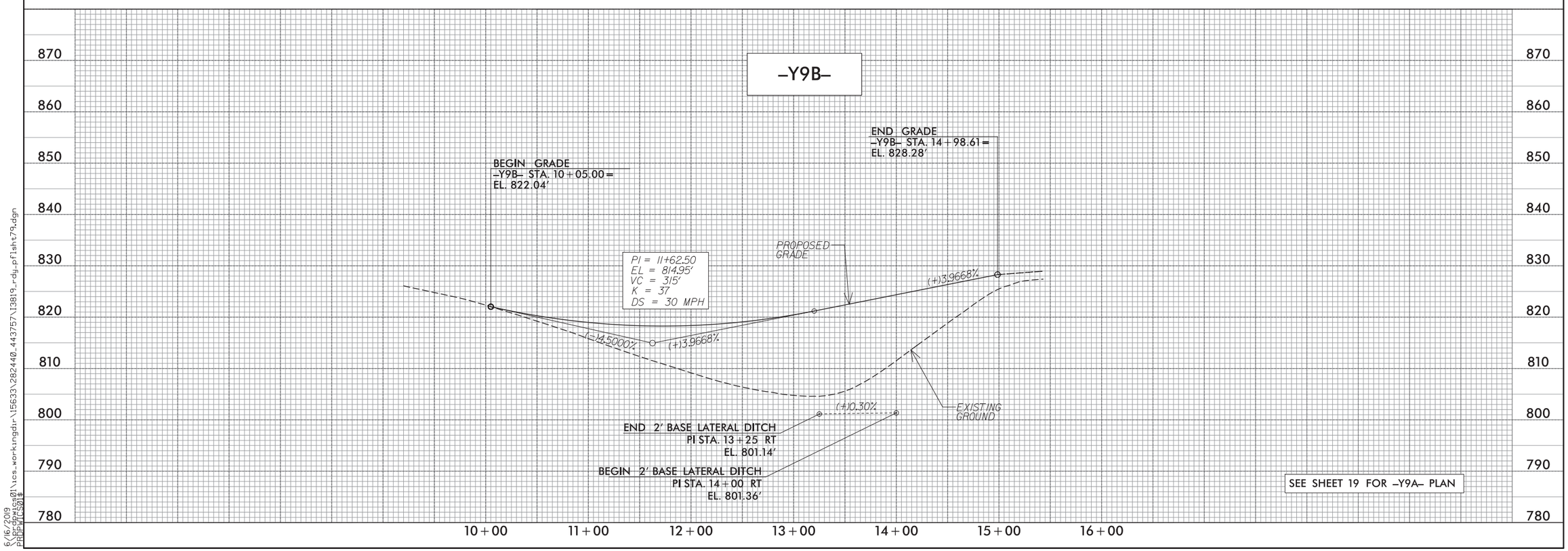
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	79
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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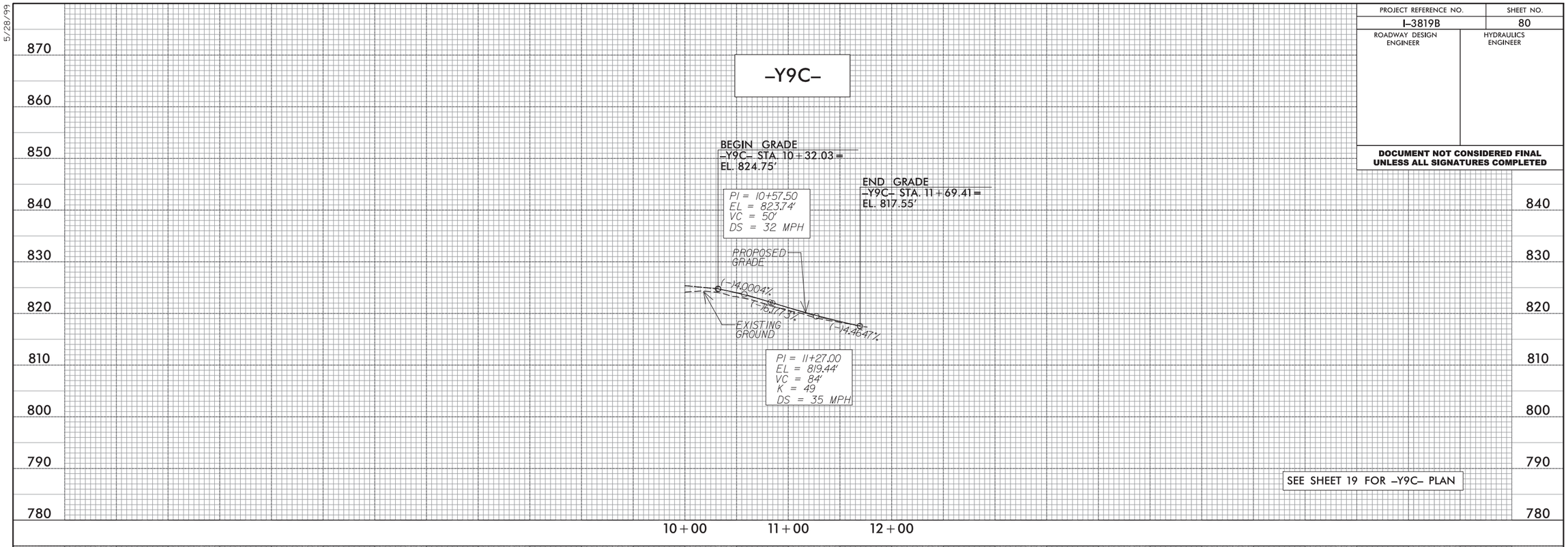
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	80
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SEE SHEET 19 FOR -Y9C- PLAN

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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	81
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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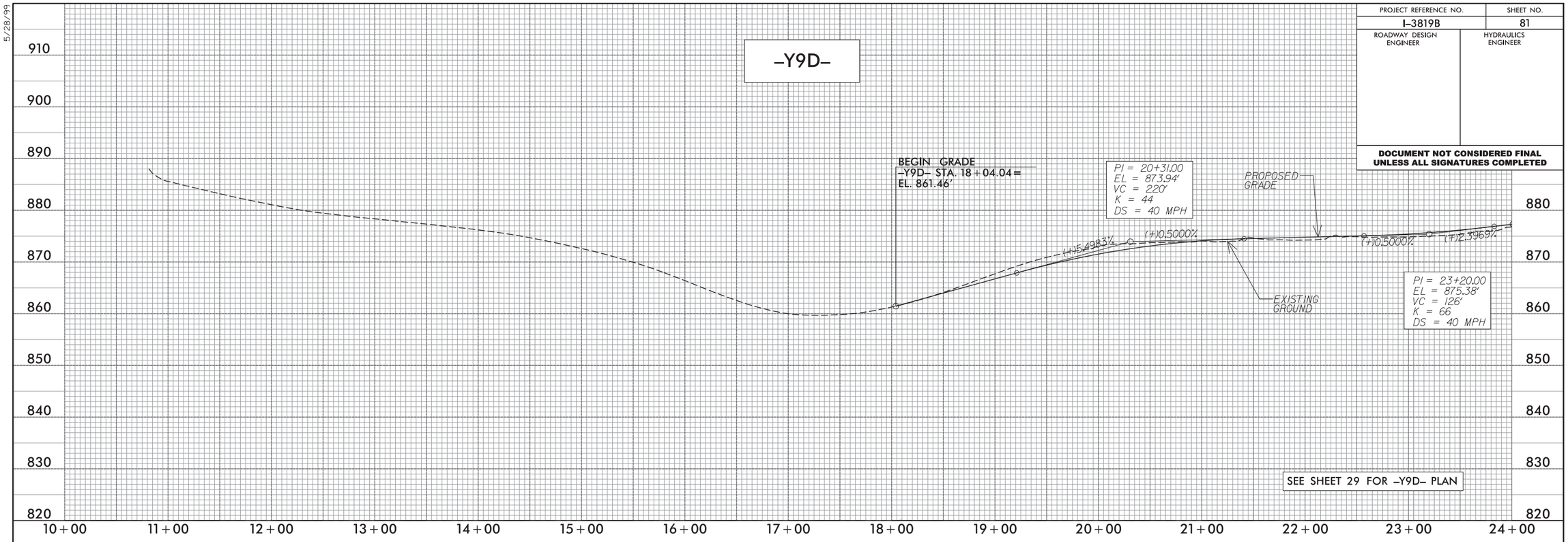

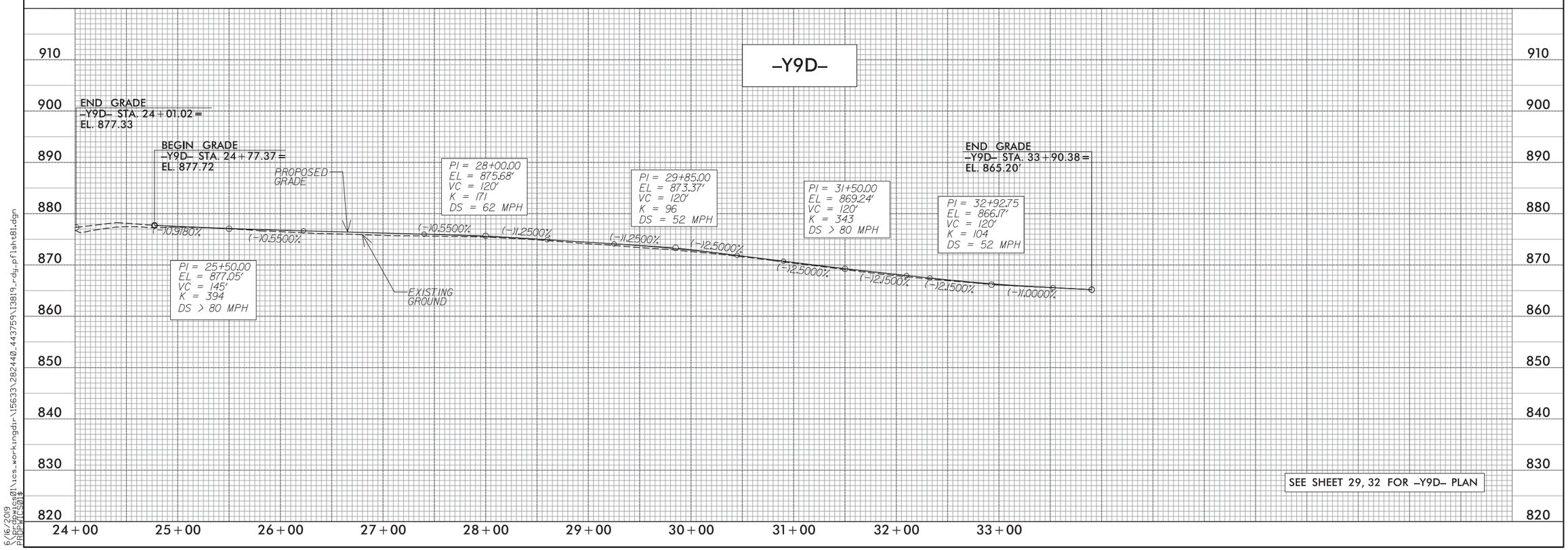

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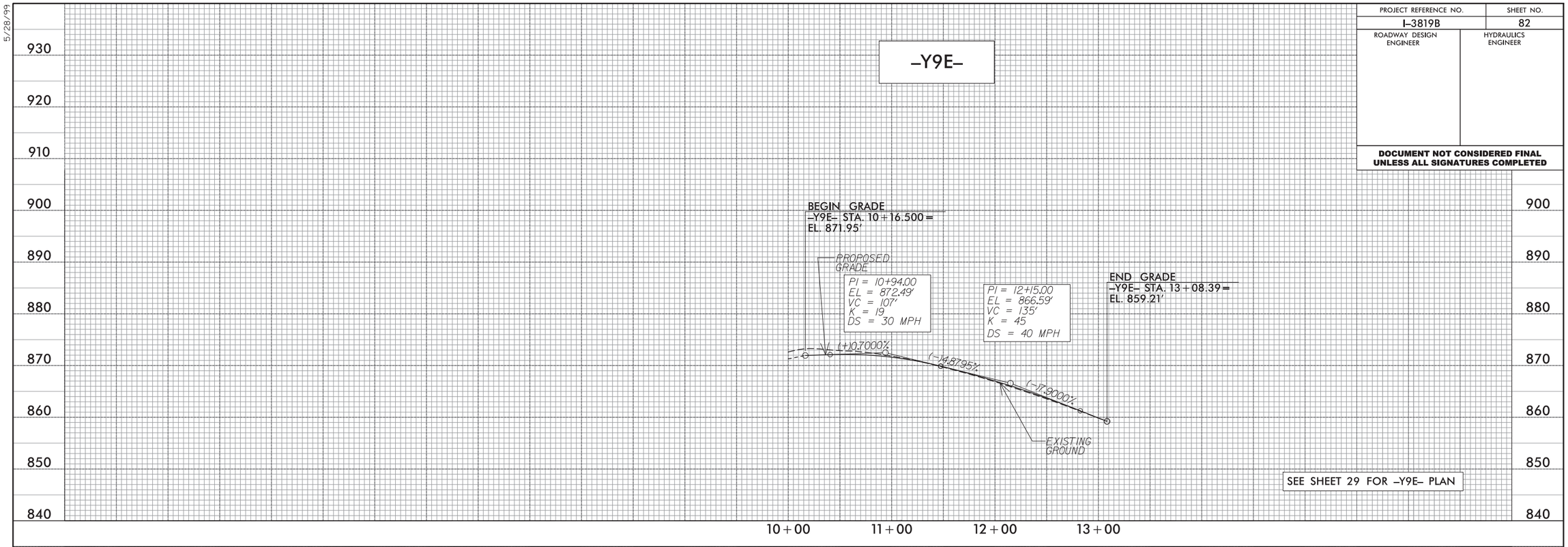
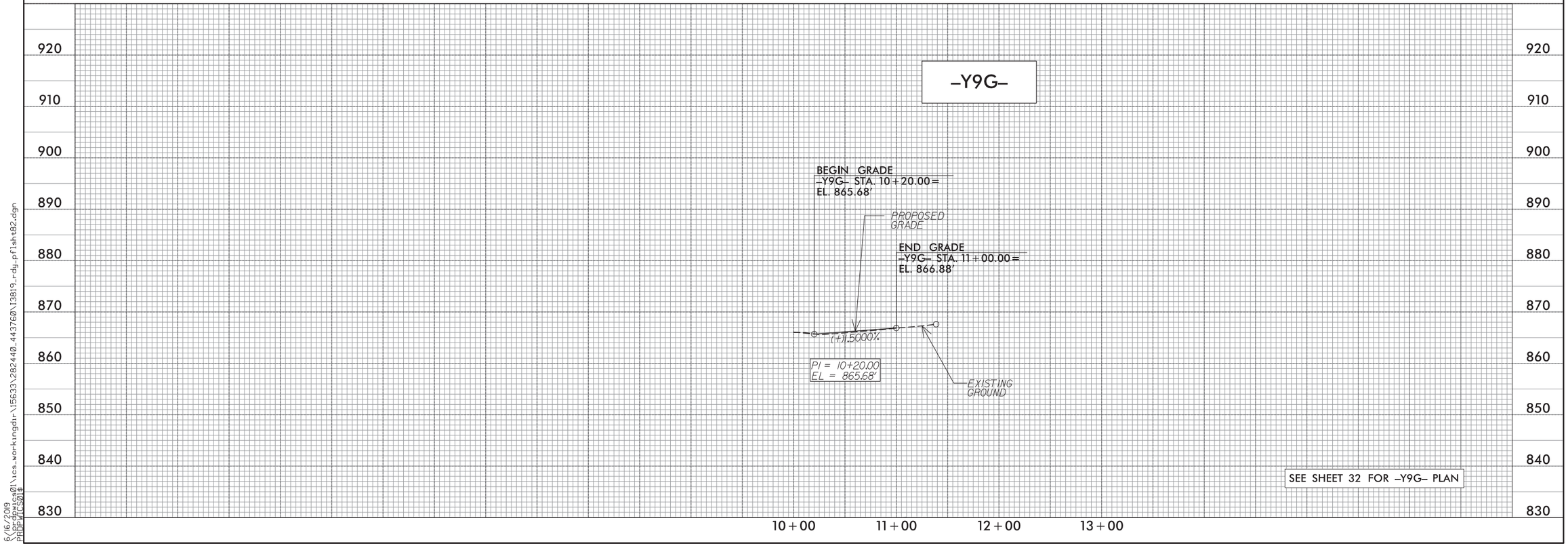
PROFILE

PROJECT REFERENCE NO.	SHEET NO.
I-3819B	82
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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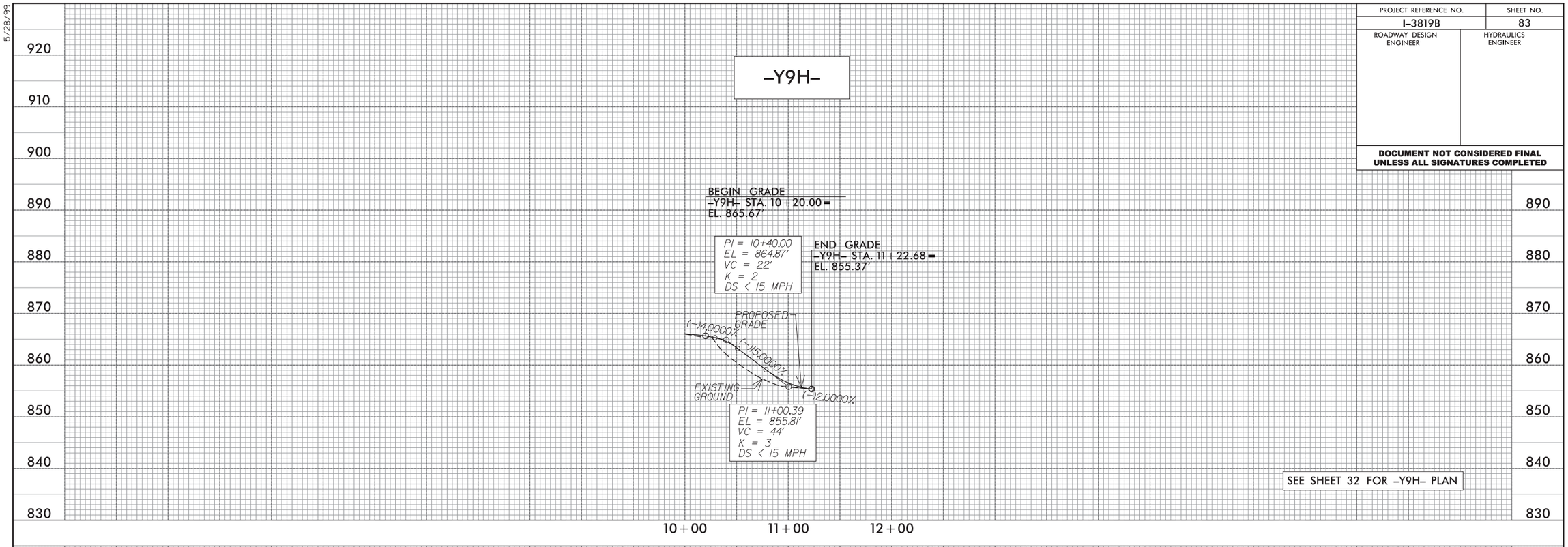
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	83
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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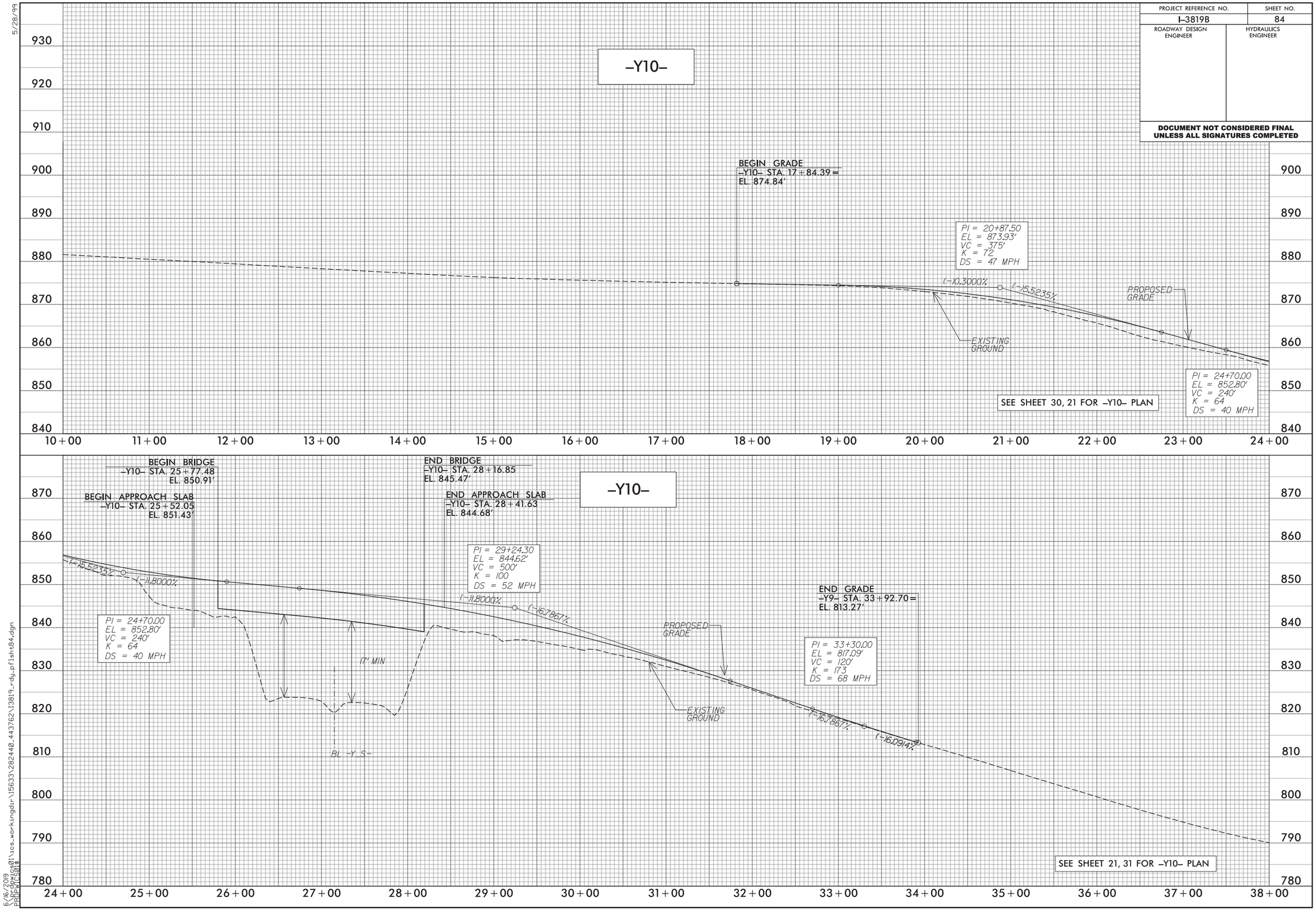
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	84
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	85
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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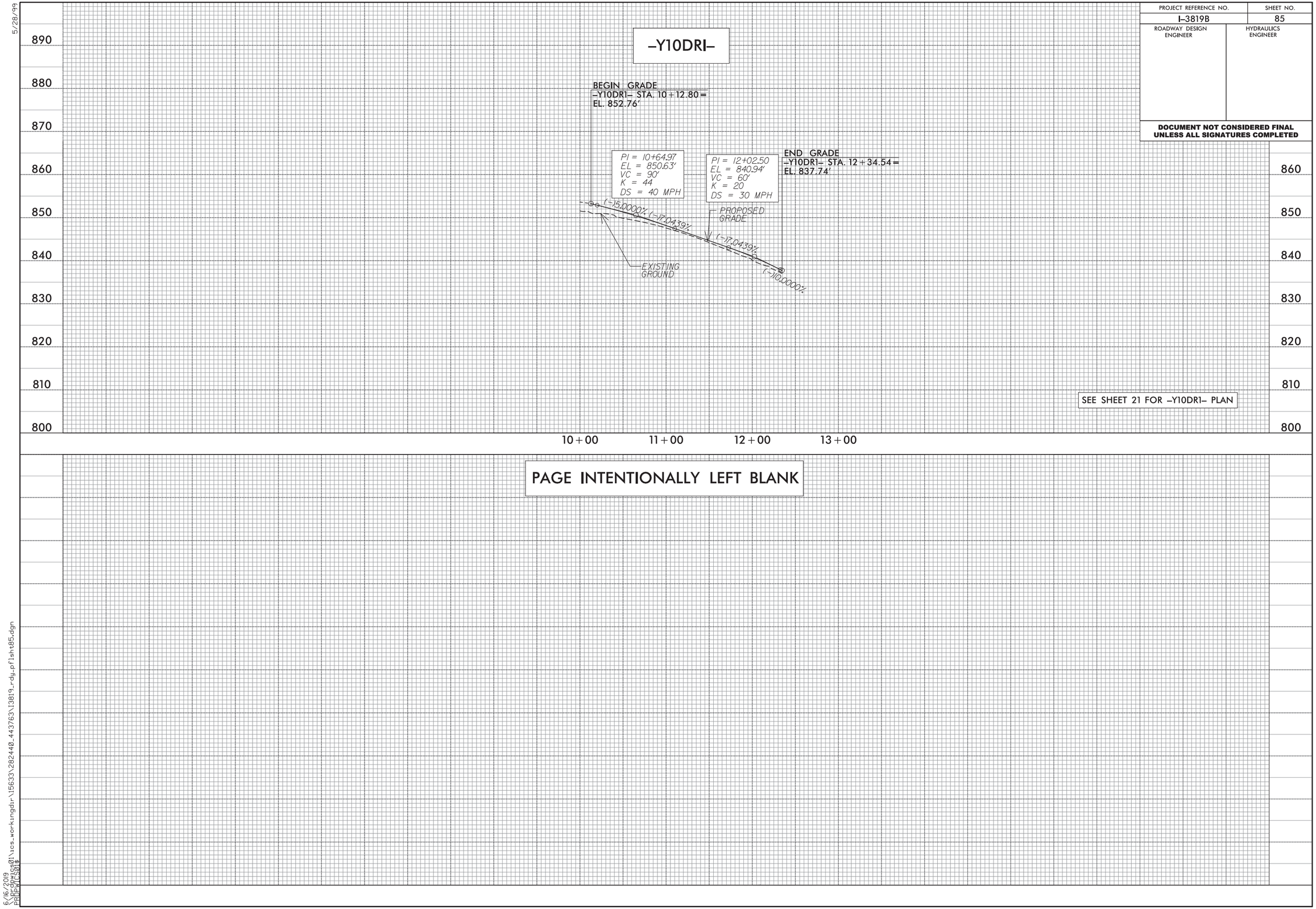

SEE SHEET 21 FOR -Y10DR1- PLAN

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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	86
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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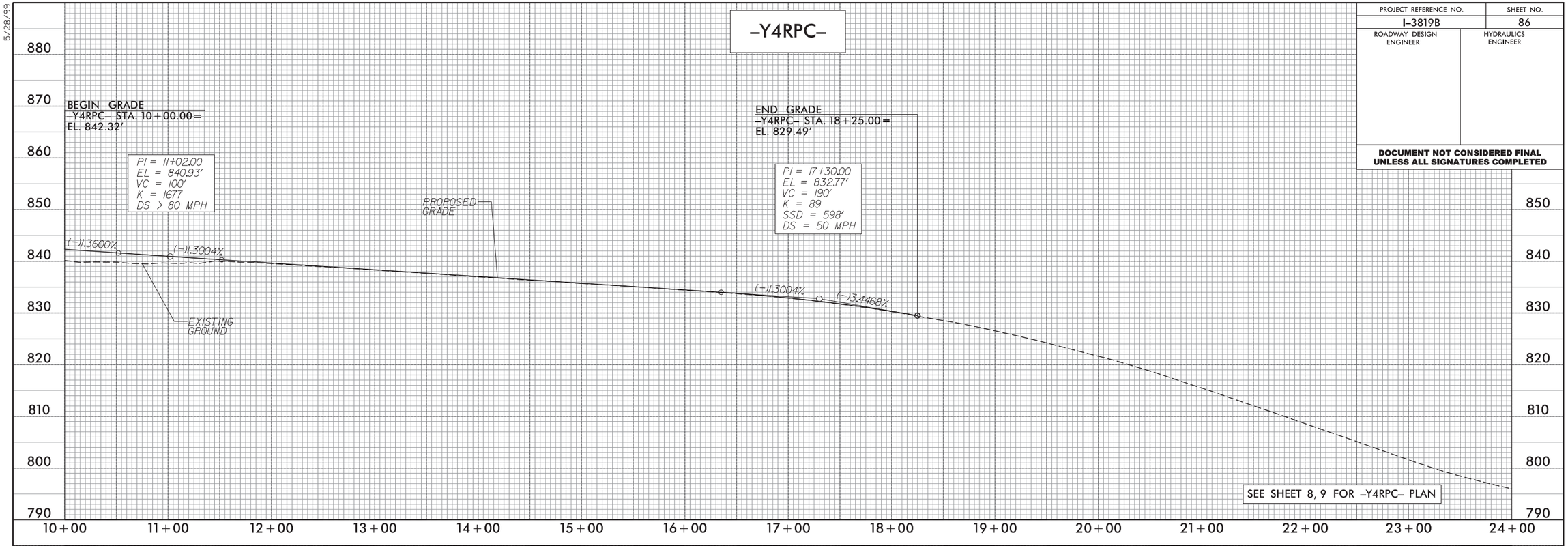

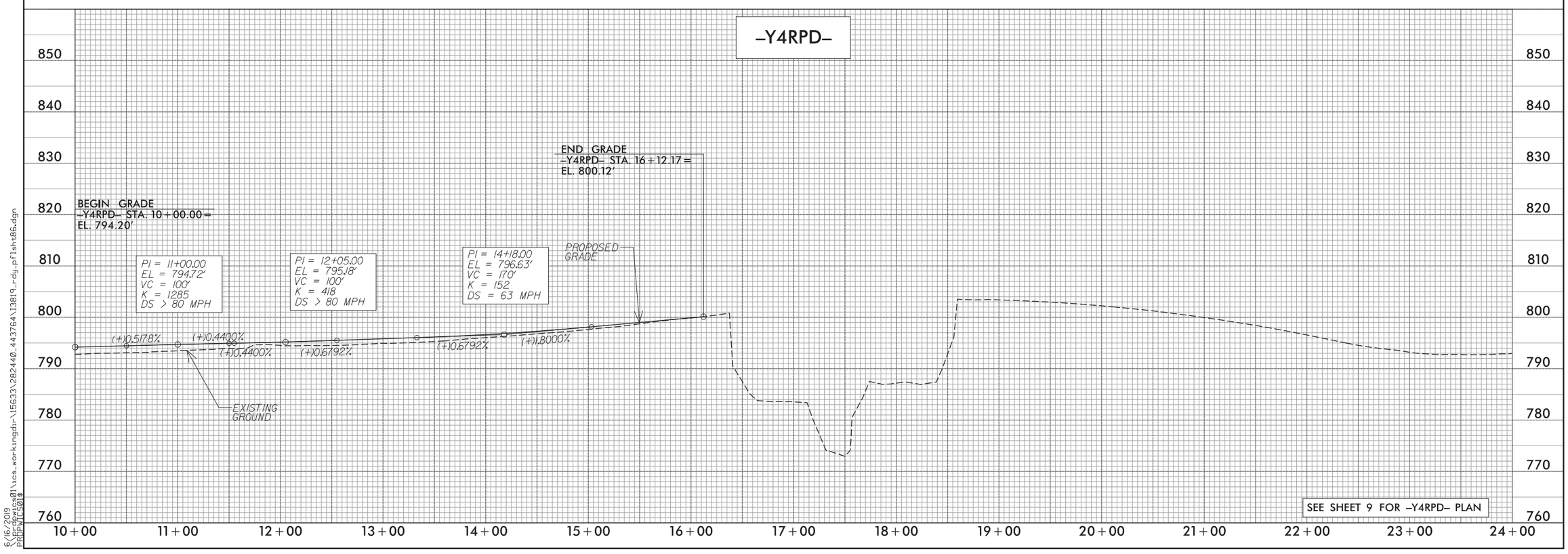

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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	87
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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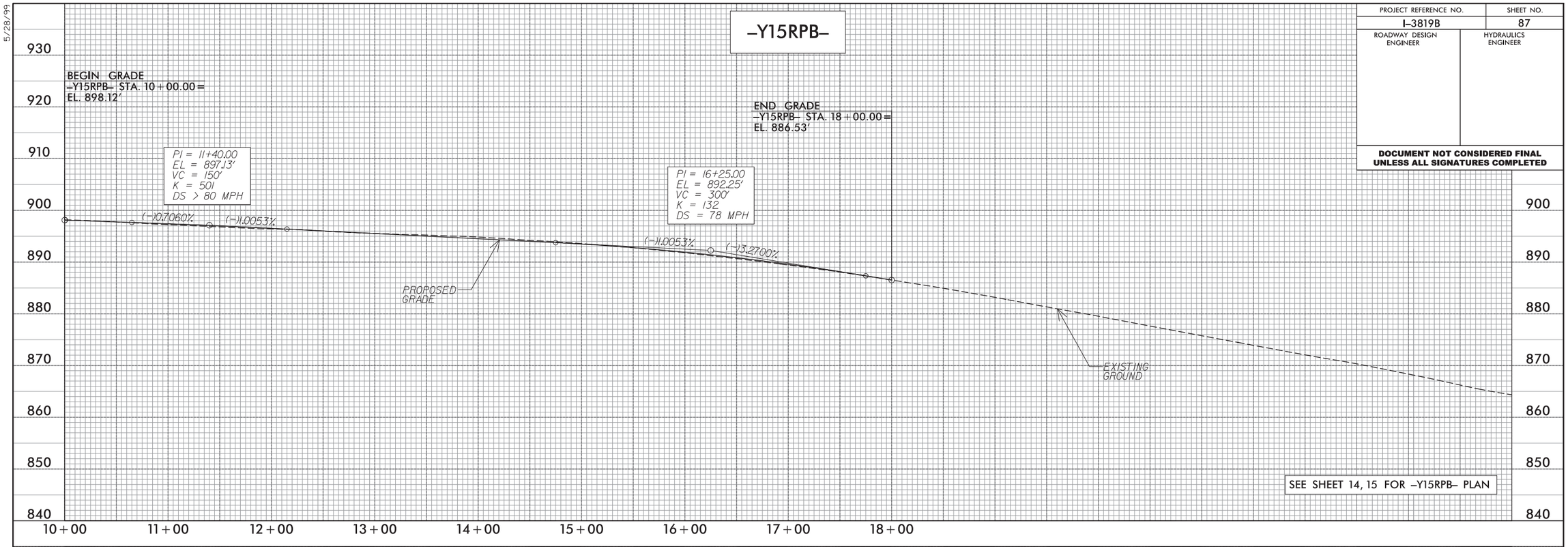

SEE SHEET 14, 15 FOR -Y15RPB- PLAN

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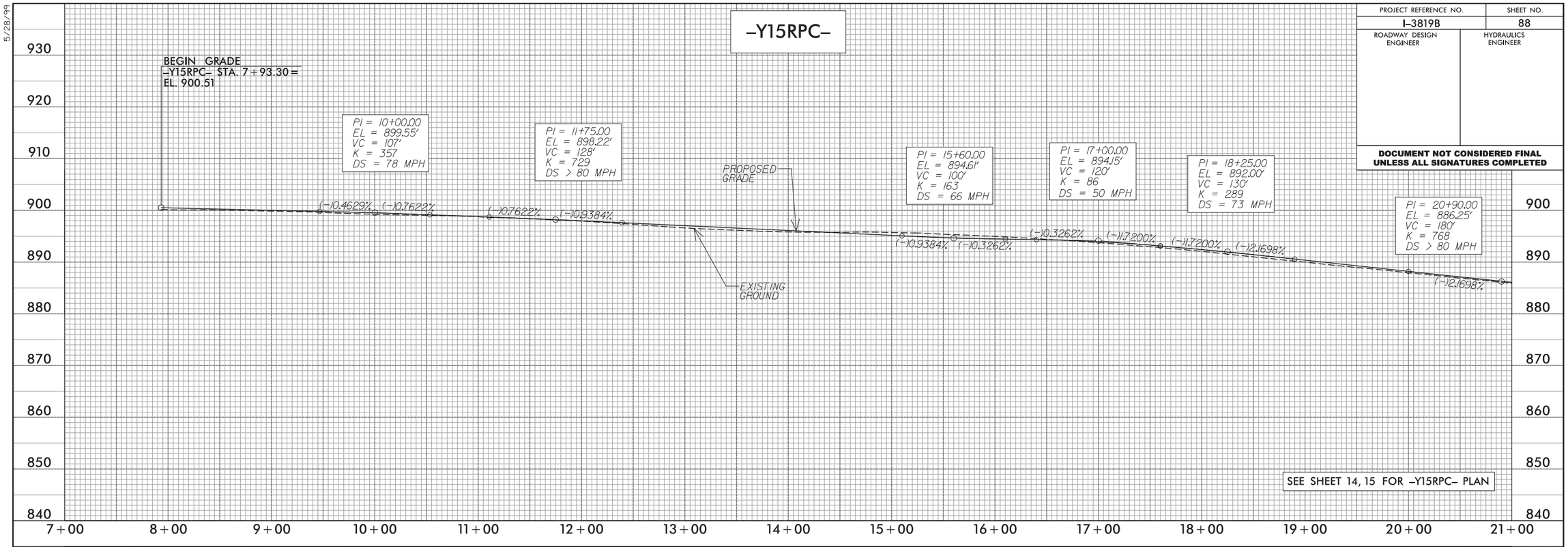
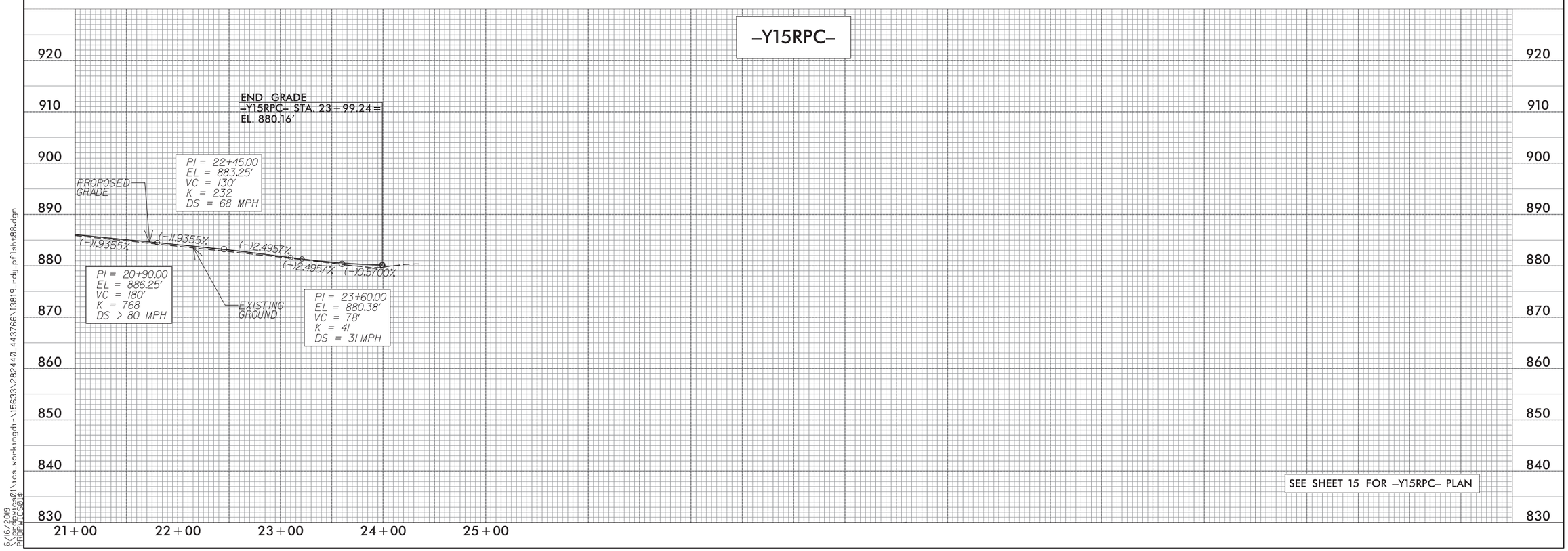
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	88
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





5/28/99

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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	89
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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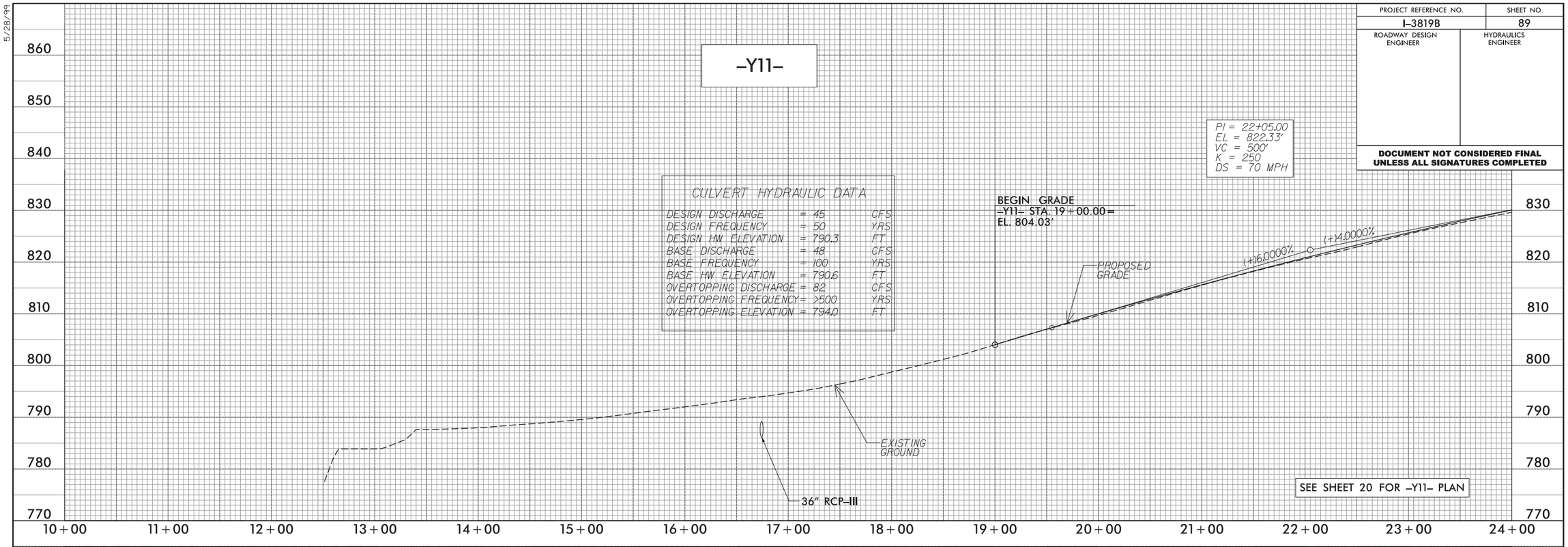

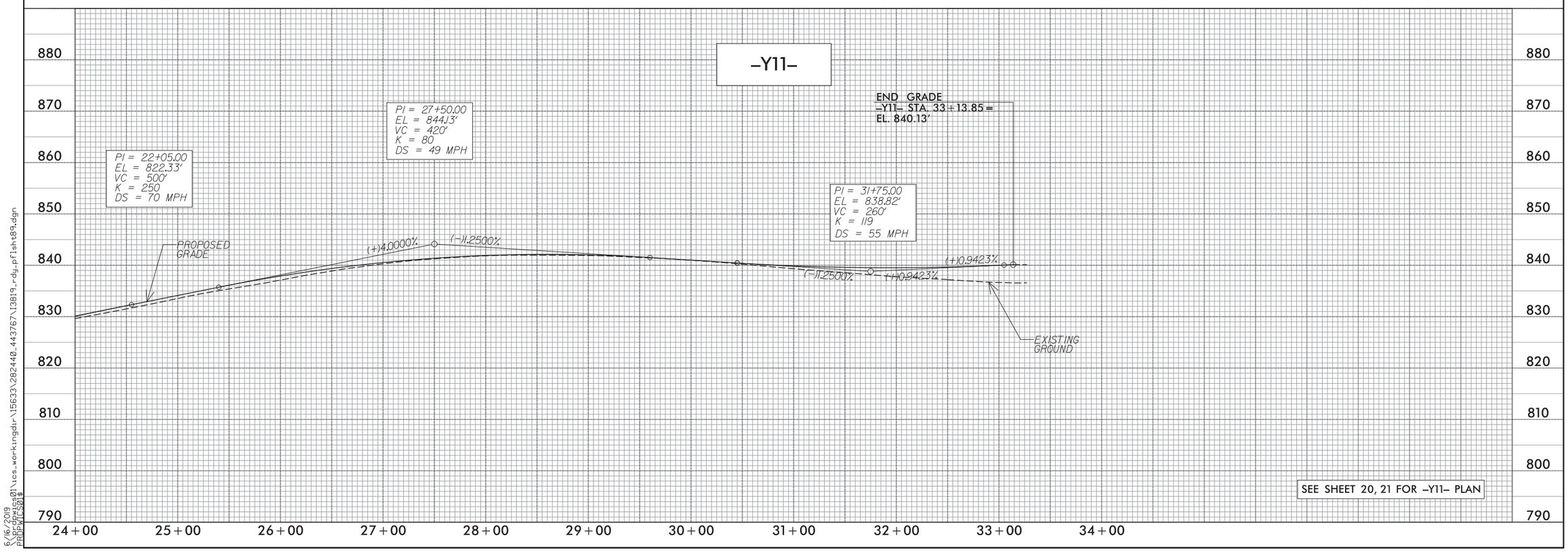

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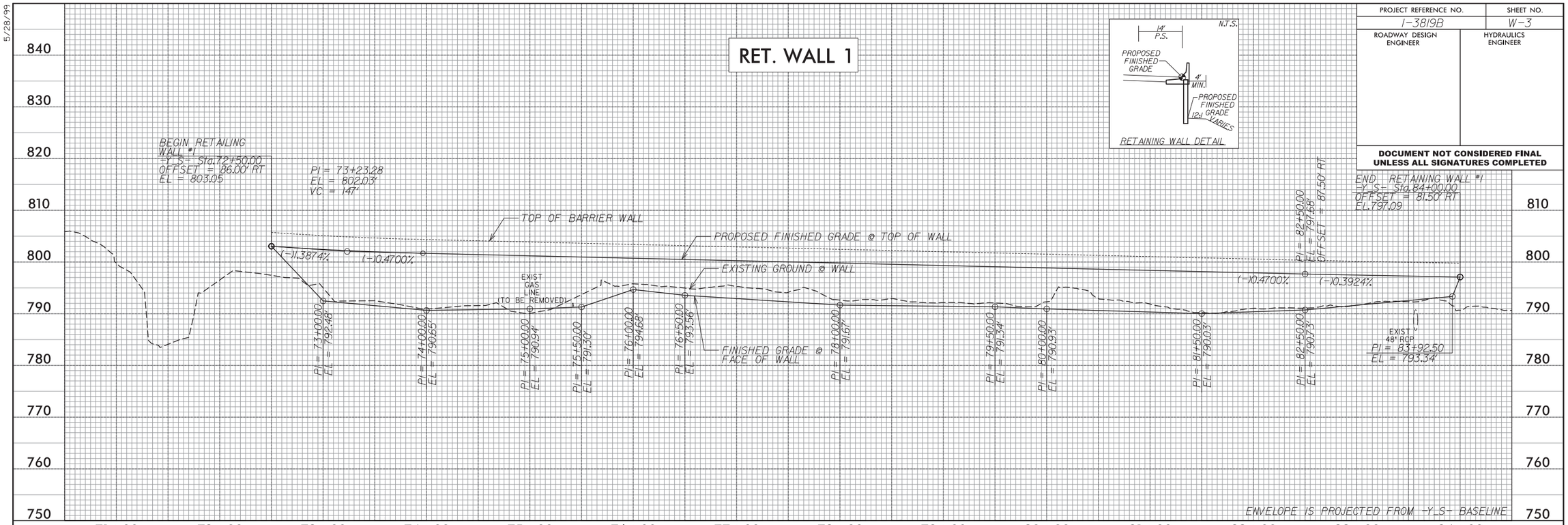
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	W-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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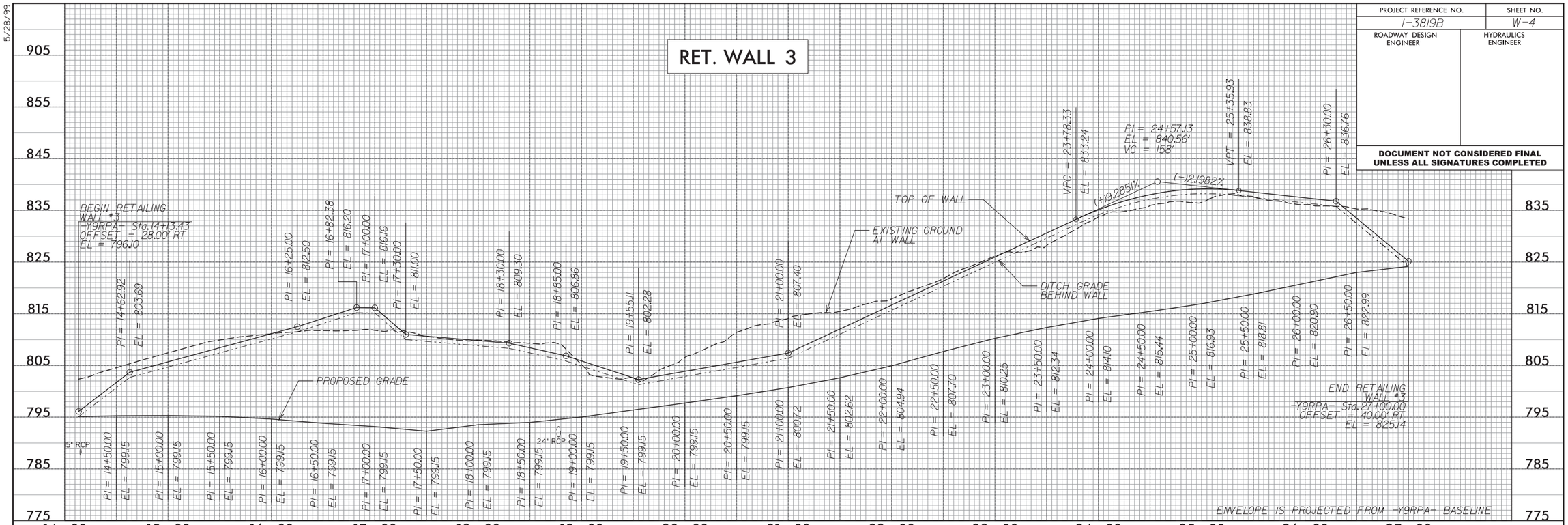
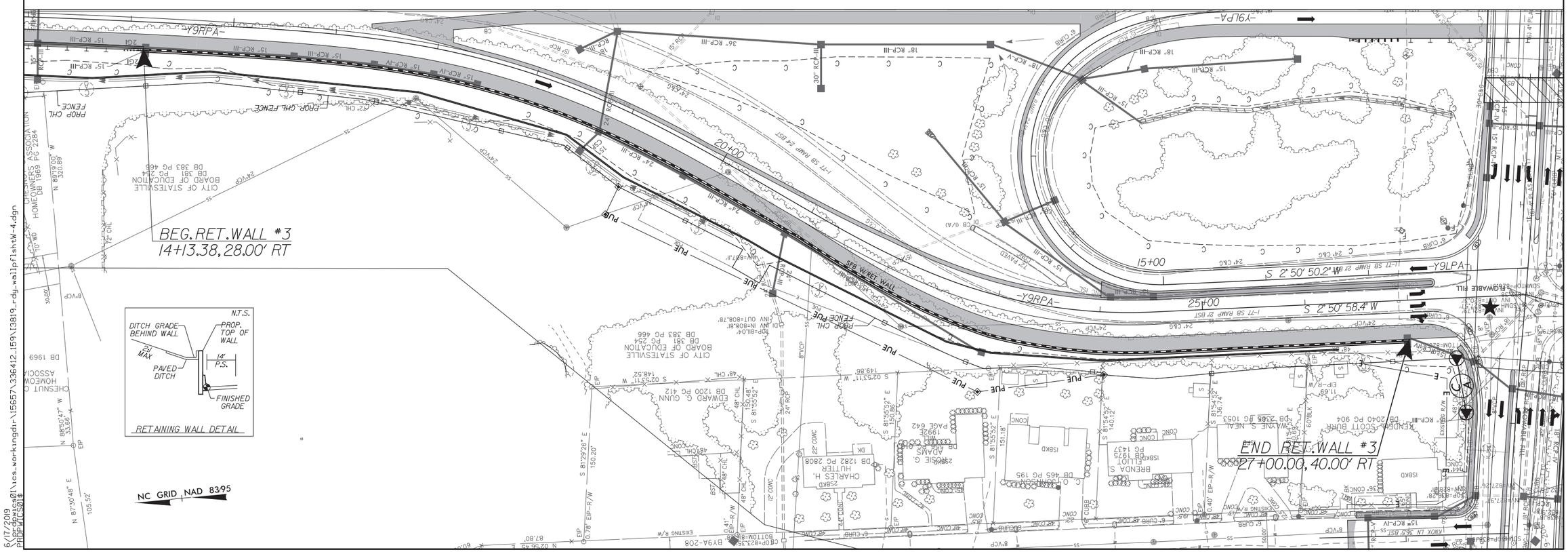
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	W-4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RET. WALL 3





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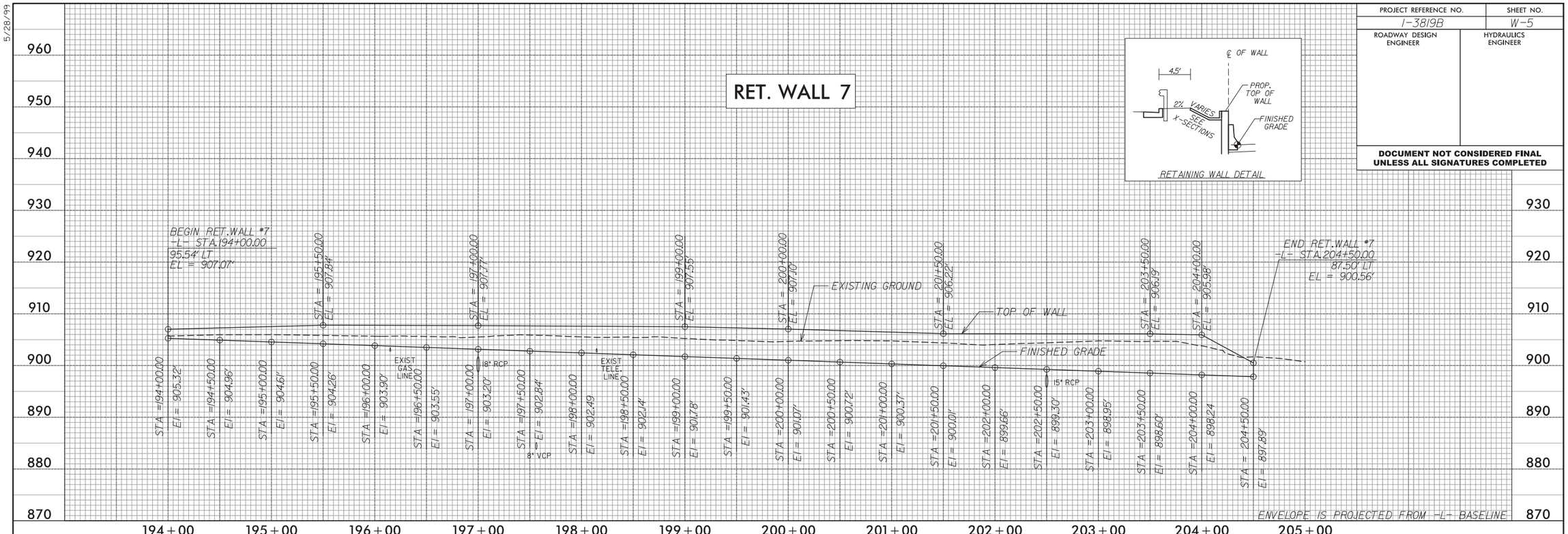
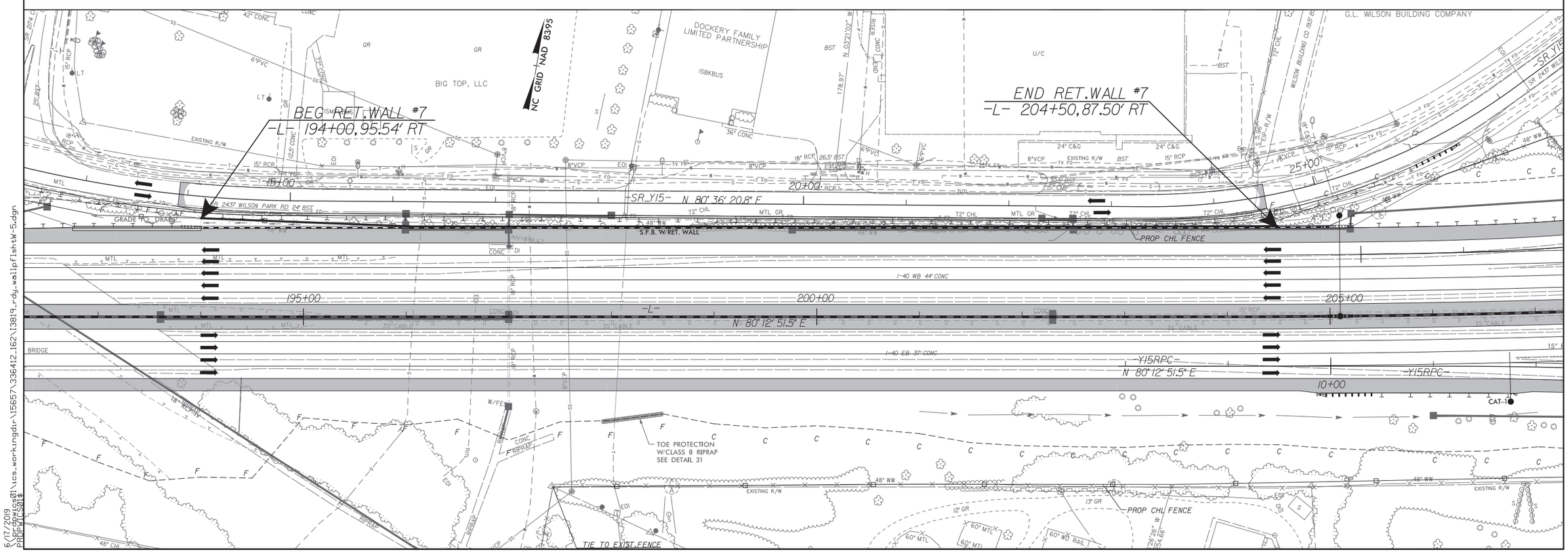
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	W-5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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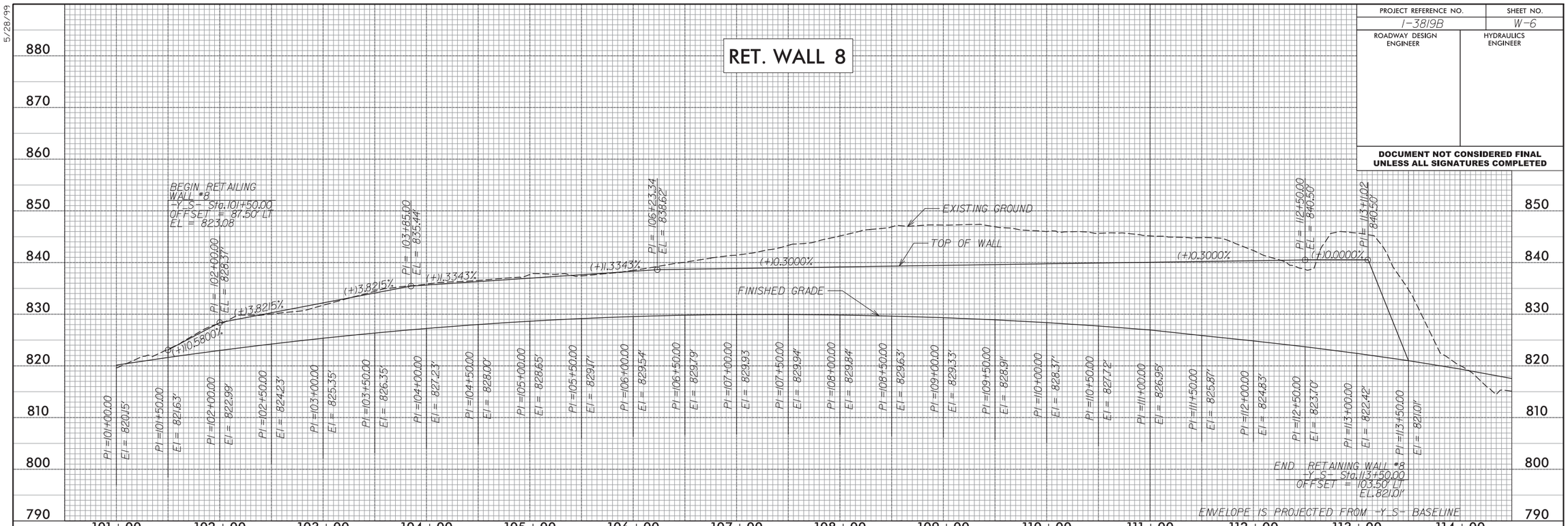
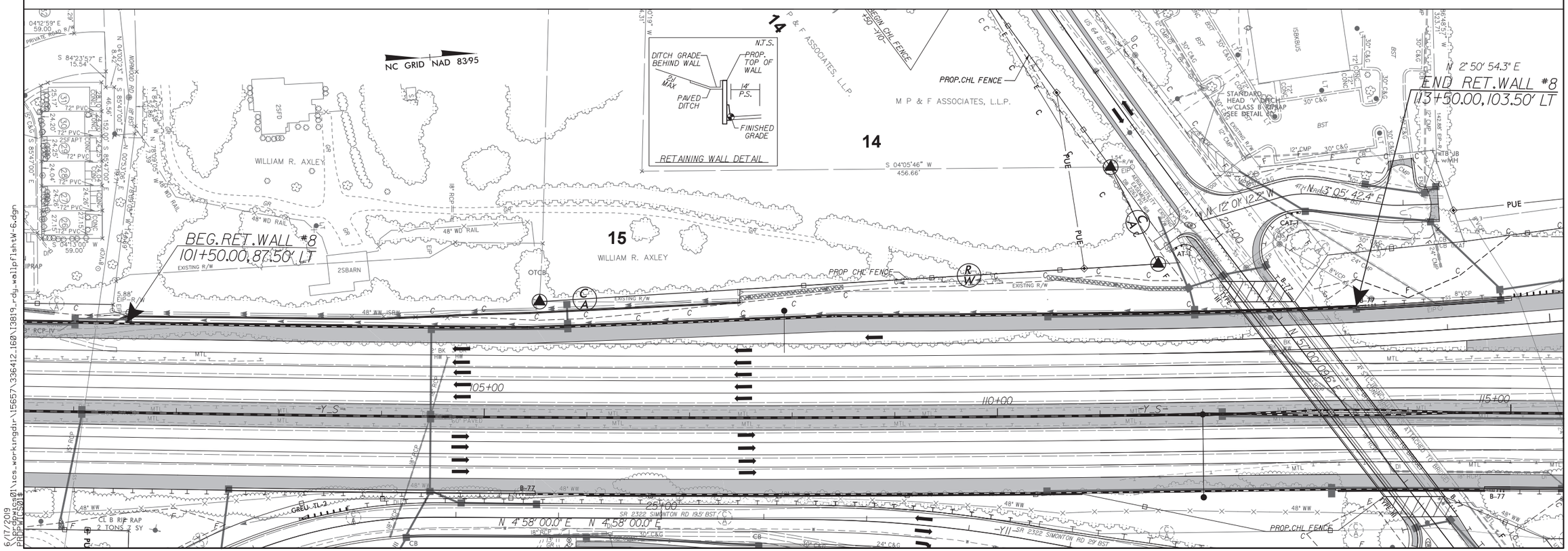
PROJECT REFERENCE NO.	SHEET NO.
I-3819B	W-6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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PROJECT REFERENCE NO.	SHEET NO.
I-3819B	W-7
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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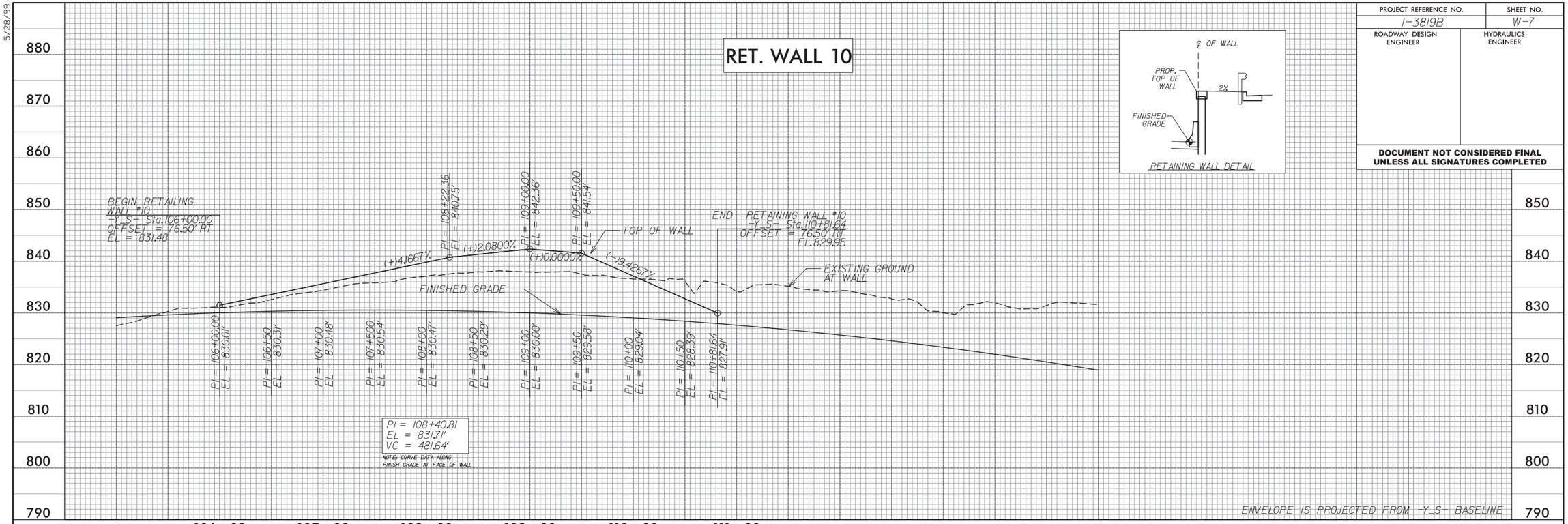
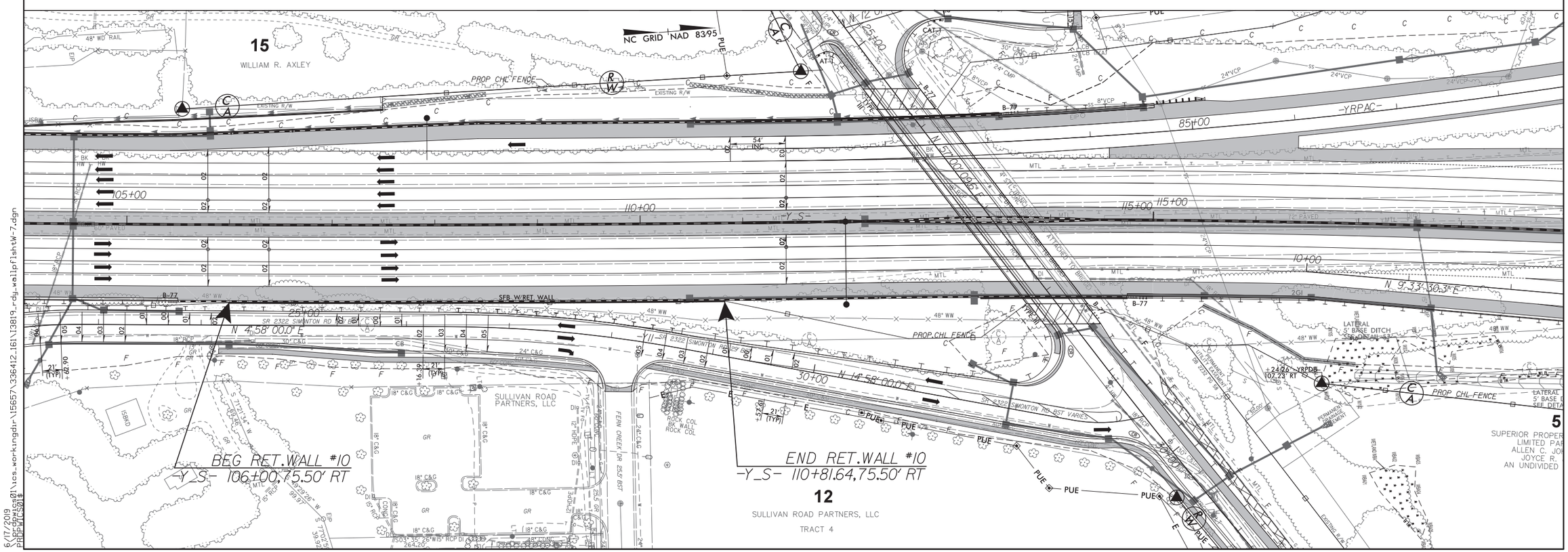
RET. WALL 10





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